Before using this machine and equipment, fully understand the contents of this manual to ensure proper operation. Should any questions arise, please ask the nearest Technical Center or Technology Center.

**IMPORTANT NOTICE**

1. Be sure to observe the safety precautions described in this manual and the contents of the safety plates on the machine and equipment. Failure may cause serious personal injury or material damage. Please replace any missing safety plates as soon as possible.

2. No modifications are to be performed that will affect operation safety. If such modifications are required, please contact the nearest Technical Center or Technology Center.

3. For the purpose of explaining the operation of the machine and equipment, some illustrations may not include safety features such as covers, doors, etc. Before operation, make sure all such items are in place.

4. This manual was considered complete and accurate at the time of publication, however, due to our desire to constantly improve the quality and specification of all our products, it is subject to change or modification. If you have any questions, please contact the nearest Technical Center or Technology Center.

5. Always keep this manual near the machinery for immediate use.

6. If a new manual is required, please order from the nearest Technical Center or Technology Center with the manual No. or the machine name, serial No. and manual name.

Issued by Manual Publication Section, Yamazaki Mazak Corporation, Japan
SAFETY PRECAUTIONS

Preface

Safety precautions relating to the CNC unit (in the remainder of this manual, referred to simply as the NC unit) that is provided in this machine are explained below. Not only the persons who create programs, but also those who operate the machine must thoroughly understand the contents of this manual to ensure safe operation of the machine.

Read all these safety precautions, even if your NC model does not have the corresponding functions or optional units and a part of the precautions do not apply.

Rule

1. This section contains the precautions to be observed as to the working methods and states usually expected. Of course, however, unexpected operations and/or unexpected working states may take place at the user site.
   During daily operation of the machine, therefore, the user must pay extra careful attention to its own working safety as well as to observe the precautions described below.

2. Although this manual contains as great an amount of information as it can, since it is not rare for the user to perform the operations that overstep the manufacturer-assumed ones, not all of “what the user cannot perform” or “what the user must not perform” can be fully covered in this manual with all such operations taken into consideration beforehand.
   It is to be understood, therefore, that functions not clearly written as “executable” are “inexecutable” functions.

3. The meanings of our safety precautions to DANGER, WARNING, and CAUTION are as follows:

   ![DANGER]
   : Failure to follow these instructions could result in loss of life.

   ![WARNING]
   : Failure to observe these instructions could result in serious harm to a human life or body.

   ![CAUTION]
   : Failure to observe these instructions could result in minor injuries or serious machine damage.
SAFETY PRECAUTIONS

Basics

- After turning power on, keep hands away from the keys, buttons, or switches of the operating panel until an initial display has been made.
- Before proceeding to the next operations, fully check that correct data has been entered and/or set. If the operator performs operations without being aware of data errors, unexpected operation of the machine will result.
- Before machining workpieces, perform operational tests and make sure that the machine operates correctly. No workpieces must be machined without confirmation of normal operation. Closely check the accuracy of programs by executing override, single-block, and other functions or by operating the machine at no load. Also, fully utilize tool path check, solid check, and other functions, if provided.
- Make sure that the appropriate feed rate and rotational speed are designated for the particular machining requirements. Always understand that since the maximum usable feed rate and rotational speed are determined by the specifications of the tool to be used, those of the workpiece to be machined, and various other factors, actual capabilities differ from the machine specifications listed in this manual. If an inappropriate feed rate or rotational speed is designated, the workpiece or the tool may abruptly move out from the machine.
- Before executing correction functions, fully check that the direction and amount of correction are correct. Unexpected operation of the machine will result if a correction function is executed without its thorough understanding.
- Parameters are set to the optimum standard machining conditions prior to shipping of the machine from the factory. In principle, these settings should not be modified. If it becomes absolutely necessary to modify the settings, perform modifications only after thoroughly understanding the functions of the corresponding parameters. Modifications usually affect any program. Unexpected operation of the machine will result if the settings are modified without a thorough understanding.

Remarks on the cutting conditions recommended by the NC

- Before using the following cutting conditions:
  - Cutting conditions that are the result of the MAZATROL Automatic Cutting Conditions Determination Function
  - Cutting conditions suggested by the Machining Navigation Function
  - Cutting conditions for tools that are suggested to be used by the Machining Navigation Function
  Confirm that every necessary precaution in regards to safe machine setup has been taken – especially for workpiece fixturing/clamping and tool setup.
- Confirm that the machine door is securely closed before starting machining. Failure to confirm safe machine setup may result in serious injury or death.
SAFETY PRECAUTIONS

Programming

- Fully check that the settings of the coordinate systems are correct. Even if the designated program data is correct, errors in the system settings may cause the machine to operate in unexpected places and the workpiece to abruptly move out from the machine in the event of contact with the tool.

- During surface velocity hold control, as the current workpiece coordinates of the surface velocity hold control axes approach zeroes, the spindle speed increases significantly. For the lathe, the workpiece may even come off if the chucking force decreases. Safety speed limits must therefore be observed when designating spindle speeds.

- Even after inch/metric system selection, the units of the programs, tool information, or parameters that have been registered until that time are not converted. Fully check these data units before operating the machine. If the machine is operated without checks being performed, even existing correct programs may cause the machine to operate differently from the way it did before.

- If a program is executed that includes the absolute data commands and relative data commands taken in the reverse of their original meaning, totally unexpected operation of the machine will result. Recheck the command scheme before executing programs.

- If an incorrect plane selection command is issued for a machine action such as arc interpolation or fixed-cycle machining, the tool may collide with the workpiece or part of the machine since the motions of the control axes assumed and those of actual ones will be interchanged. (This precaution applies only to NC units provided with EIA functions.)

- The mirror image, if made valid, changes subsequent machine actions significantly. Use the mirror image function only after thoroughly understanding the above. (This precaution applies only to NC units provided with EIA functions.)

- If machine coordinate system commands or reference position returning commands are issued with a correction function remaining made valid, correction may become invalid temporarily. If this is not thoroughly understood, the machine may appear as if it would operate against the expectations of the operator. Execute the above commands only after making the corresponding correction function invalid. (This precaution applies only to NC units provided with EIA functions.)

- The barrier function performs interference checks based on designated tool data. Enter the tool information that matches the tools to be actually used. Otherwise, the barrier function will not work correctly.

- The system of G-code and M-code commands differs, especially for turning, between the machines of INTEGREX e-Series and the other turning machines. Issuance of the wrong G-code or M-code command results in totally non-intended machine operation. Thoroughly understand the system of G-code and M-code commands before using this system.

<table>
<thead>
<tr>
<th>Sample program</th>
<th>Machines of INTEGREX e-Series</th>
<th>Turning machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1000M3</td>
<td>The milling spindle rotates at 1000 min⁻¹.</td>
<td>The turning spindle rotates at 1000 min⁻¹.</td>
</tr>
<tr>
<td>S1000M203</td>
<td>The turning spindle rotates at 1000 min⁻¹.</td>
<td>The milling spindle rotates at 1000 min⁻¹.</td>
</tr>
</tbody>
</table>
For the machines of INTEGREX e-Series, programmed coordinates can be rotated using an index unit of the MAZATROL program and a G68 command (coordinate rotate command) of the EIA program. However, for example, when the B-axis is rotated through 180 degrees around the Y-axis to implement machining with the turning spindle No. 2, the plus side of the X-axis in the programmed coordinate system faces downward and if the program is created ignoring this fact, the resulting movement of the tool to unexpected positions may incite collisions.

To create the program with the plus side of the X-axis oriented in an upward direction, use the mirror function of the WPC shift unit or the mirror imaging function of G-code command (G50.1, G51.1).

After modifying the tool data specified in the program, be sure to perform the tool path check function, the solid check function, and other functions, and confirm that the program operates properly. The modification of tool data may cause even a field-proven machining program to change in operational status.

If the user operates the machine without being aware of any changes in program status, interference with the workpiece could arise from unexpected operation.

For example, if the cutting edge of the tool during the start of automatic operation is present inside the clearance-including blank (unmachined workpiece) specified in the common unit of the MAZATROL program, care is required since the tool will directly move from that position to the approach point because of no obstructions being judged to be present on this path.

For this reason, before starting automatic operation, make sure that the cutting edge of the tool during the start of automatic operation is present outside the clearance-including workpiece specified in the common unit of the MAZATROL program.

If axis-by-axis independent positioning is selected and simultaneously rapid feed selected for each axis, movements to the ending point will not usually become linear. Before using these functions, therefore, make sure that no obstructions are present on the path.
SAFETY PRECAUTIONS

Operations

WARNING

- Single-block, feed hold, and override functions can be made invalid using system variables #3003 and #3004. Execution of this means the important modification that makes the corresponding operations invalid. Before using these variables, therefore, give thorough notification to related persons. Also, the operator must check the settings of the system variables before starting the above operations.

- If manual intervention during automatic operation, machine locking, the mirror image function, or other functions are executed, the workpiece coordinate systems will usually be shifted. When making machine restart after manual intervention, machine locking, the mirror image function, or other functions, consider the resulting amounts of shift and take the appropriate measures. If operation is restarted without any appropriate measures being taken, collision with the tool or workpiece may occur.

- Use the dry run function to check the machine for normal operation at no load. Since the feed rate at this time becomes a dry run rate different from the program-designated feed rate, the axes may move at a feed rate higher than the programmed value.

- After operation has been stopped temporarily and insertion, deletion, updating, or other commands executed for the active program, unexpected operation of the machine may result if that program is restarted. No such commands should, in principle, be issued for the active program.

CAUTION

- During manual operation, fully check the directions and speeds of axial movement.

- For a machine that requires manual homing, perform manual homing operations after turning power on. Since the software-controlled stroke limits will remain ineffective until manual homing is completed, the machine will not stop even if it oversteps the limit area. As a result, serious machine damage will result.

- Do not designate an incorrect pulse multiplier when performing manual pulse handle feed operations. If the multiplier is set to 1000 times and the handle operated inadvertently, axial movement will become faster than that expected.
OPERATIONAL WARRANTY FOR THE NC UNIT

The warranty of the manufacturer does not cover any trouble arising if the NC unit is used for its non-intended purpose. Take notice of this when operating the unit.

Examples of the trouble arising if the NC unit is used for its non-intended purpose are listed below.

1. Trouble associated with and caused by the use of any commercially available software products (including user-created ones)
2. Trouble associated with and caused by the use of any Windows operating systems
3. Trouble associated with and caused by the use of any commercially available computer equipment

Operating Environment

1. Ambient temperature
   During machine operation: 0° to 50°C (0° to 122°F)

2. Relative humidity
   During machine operation: 10 to 75% (without bedewing)
   Note: As humidity increases, insulation deteriorates causing electrical component parts to deteriorate quickly.
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1 INTRODUCTION

This manual describes the meaning and setting of various parameters, and the meaning and elimination procedure of various alarms used for the MAZATROL MATRIX System. This document also gives the list of M-codes.

For detailed description of the MAZATROL MATRIX System, refer to the Operating Manual of the machine.

Read this manual and the Operating Manual of the machine carefully in order to make the best use of the possibilities of the MAZATROL MATRIX System.
1 INTRODUCTION

- NOTE -
2 PARAMETER

2-1 Outline

1. Scope of this chapter
   This chapter describes the parameters you can change as required. How to read the list is described in the beginning. Always refer to this list to change parameters.

2. Precautions on this chapter
   This chapter also gives parameters relating to optional functions. Accordingly, the list includes parameters which cannot be changed. Check the type of machine purchased by you and its specifications before you read the list.

   **Note 1:** The contents of this list are subjected to change without notice, for NC unit or machine improvement.

   **Note 2:** Any questions about the contents of this list should be communicated to Mazak Technical Center or Technology Center.

2-1-1 Types of parameters

Parameters, which refer to constants specific to the NC machines and equipment and the data necessary for cutting operations, possess a very important meaning.

Parameters can be broadly divided into the following three types according to their meaning.

- **User parameters**
  The data required for processes such as point machining, line machining, plane machining, turning, and EIA/ISO programmed machining, is registered. The USER PARAMETER display is used to register the user parameters.

- **Machine parameters**
  Constants related to the servomotors and spindle motors, machine status data etc. are registered. The MACHINE PARAMETER display is used to register the machine parameters.

- **Data I/O parameters**
  The data required for connection to external units such as a CMT unit and a tape unit, is registered. The DATA I/O PARAMETER display which can be selected on the DATA I/O display is used to register the data I/O parameters.
2-1-2 Precautions

1. Details of the parameters may differ according to the machine used, the presence/absence of an option(s), the production time of the NC machines and equipment, etc. Therefore, do not use the parameters of other machines.

2. The parameter list is supplied in the form of data sheets within the NC electronic cabinet at shipment of the machines. Be careful not to lose the list.

3. Before making changes to details of a parameter, make sure that the parameter is the one to be changed.

4. If details of the parameter to be changed cannot be clearly understood, contact Mazak Technical Center or Technology Center.

5. When changing details of a parameter, maintain records of the old and new data.

6. If the particular machine is not used for a long time, then the battery to protect the parameter memory will run down. (Battery alarm)
   In that case, errors will occur in the parameters and thus machine malfunctions may result. To prevent this, first check the existing details of the parameters closely against the separate parameter list and then make the necessary changes to the parameters.

7. In addition to the parameters listed in this document, those related to PLC (Programmable Logic Controller) are also available; refer to the OPERATING MANUAL of the machine for details of the PLC-related parameters and the PLC Parameter List in the ELECTRIC WIRING DIAGRAM.
### 2.2 Parameter List

#### 2.2-1 User parameter

1. **POINT (D)**

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Height of the second R-point during point machining</td>
</tr>
<tr>
<td>D2</td>
<td>Nominal diameter of spot-machining tool</td>
</tr>
<tr>
<td>D3</td>
<td>Number of revolutions during dwell at hole bottom in spot-machining cycle</td>
</tr>
<tr>
<td>D4</td>
<td>Maximum allowable spot-chamfering hole diameter element</td>
</tr>
<tr>
<td>D5</td>
<td>Prehole through speed during inversed spot-facing</td>
</tr>
<tr>
<td>D6</td>
<td>Drill-machining cycle setting element</td>
</tr>
<tr>
<td>D7</td>
<td>Drill-machining cycle setting element</td>
</tr>
<tr>
<td>D8</td>
<td>Maximum diameter of holes machinable on one drill</td>
</tr>
<tr>
<td>D9</td>
<td>Maximum diameter of holes machinable on two drills</td>
</tr>
<tr>
<td>D10</td>
<td>Maximum diameter of holes machinable on three drills</td>
</tr>
<tr>
<td>D11</td>
<td>Through-hole/tap-prehole machining overshoot</td>
</tr>
<tr>
<td>D12</td>
<td>Stop-hole machining hole-bottom clearance</td>
</tr>
<tr>
<td>D13</td>
<td>Spot-machining hole diameter (fixed value)</td>
</tr>
<tr>
<td>D14</td>
<td>Depth-of-cut setting element for drilling (ALMINUM)</td>
</tr>
<tr>
<td>D15</td>
<td>Depth-of-cut setting element for drilling (except AL)</td>
</tr>
<tr>
<td>D16</td>
<td>Number of revolutions during dwell at hole bottom for chamfering cutter or spot-machining tool in chamfering cycle</td>
</tr>
<tr>
<td>D17</td>
<td>Interference clearance of chamfering cutter</td>
</tr>
<tr>
<td>D18</td>
<td>Return feed rate for reaming or boring (cycle 3)</td>
</tr>
<tr>
<td>D19</td>
<td>Number of revolutions during dwell at hole bottom for end milling</td>
</tr>
<tr>
<td>D20</td>
<td>Radial depth-of-cut setting element for end milling</td>
</tr>
<tr>
<td>D21</td>
<td>Reference bottom-finishing allowance for end milling</td>
</tr>
<tr>
<td>D22</td>
<td>Tapping-cycle dwell time</td>
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<td>D23</td>
<td>Prehole clearance for end milling</td>
</tr>
<tr>
<td>D24</td>
<td>Number of revolutions during dwell at hole bottom for boring</td>
</tr>
<tr>
<td>Address (bit)</td>
<td>Outline</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>D25</td>
<td>Boring-bar tip relief</td>
</tr>
<tr>
<td>D26</td>
<td>Returning distance from hole bottom for boring or back-boring</td>
</tr>
<tr>
<td>D27</td>
<td>—</td>
</tr>
<tr>
<td>D28</td>
<td>Bottom-finishing amount of boring</td>
</tr>
<tr>
<td>D29</td>
<td>Chip removal time</td>
</tr>
<tr>
<td>D30</td>
<td>Number of incomplete threads in tapping cycle</td>
</tr>
<tr>
<td>D31</td>
<td>Tapper elongation amount for tapping</td>
</tr>
<tr>
<td>D32</td>
<td>Number of spindle revolutions until spindle CCW rotation begins in tapping cycle</td>
</tr>
<tr>
<td>D33</td>
<td>Back-boring tool tip relief</td>
</tr>
<tr>
<td>D34</td>
<td>—</td>
</tr>
<tr>
<td>D35</td>
<td>Prehole-drilling diameter setting element for reamer (drilling)</td>
</tr>
<tr>
<td>D36</td>
<td>Prehole-drilling diameter setting element for reamer (boring)</td>
</tr>
<tr>
<td>D37</td>
<td>Prehole-drilling diameter setting element for reamer (end milling)</td>
</tr>
<tr>
<td>D38</td>
<td>Reamer-prehole diameter setting element for boring or end milling</td>
</tr>
<tr>
<td>D39</td>
<td>Reamer-prehole diameter setting element for end milling</td>
</tr>
<tr>
<td>D40</td>
<td>Number of revolutions during dwell at spot-faced hole bottom for inversed spot-facing</td>
</tr>
<tr>
<td>D41</td>
<td>R-point height during point-machining</td>
</tr>
<tr>
<td>D42</td>
<td>Height of the third R-point during point machining</td>
</tr>
<tr>
<td>D43</td>
<td>Number of incomplete threads in tapping cycle for piped screw</td>
</tr>
<tr>
<td>D44</td>
<td>—</td>
</tr>
<tr>
<td>D45</td>
<td>Gradual decrements in drilling depth</td>
</tr>
<tr>
<td>D46</td>
<td>Minimum gradual drilling depth</td>
</tr>
<tr>
<td>D47</td>
<td>Reamer-prehole machining overshoot</td>
</tr>
<tr>
<td>D48</td>
<td>Feed override for the section to be chamfered in the planetary tapping cycle</td>
</tr>
<tr>
<td>D49</td>
<td>Amount of return at hole bottom during the planetary tapping cycle</td>
</tr>
<tr>
<td>D50</td>
<td>Auto-set feed rate for pre-hole machining in the planetary tapping cycle</td>
</tr>
<tr>
<td>D51</td>
<td>Auto-set feed rate for planetary tapping cycle</td>
</tr>
<tr>
<td>Address (bit)</td>
<td>Outline</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>D52</td>
<td>Reduction ratio for the G00-based relief rate during a very-deep-hole drilling cycle</td>
</tr>
<tr>
<td>D53</td>
<td>Number of times of pecking up to the return of the tool to a position near the starting point of the very-deep-hole drilling cycle of a drilling or turning-drilling unit</td>
</tr>
<tr>
<td>D54</td>
<td>Deceleration rate at cutting start for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D55</td>
<td>Drilling return distance for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D56</td>
<td>Number of revolutions during dwell at chip ejection position and hole bottom for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D57</td>
<td>Return speed for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D58</td>
<td>Feed rate reduction distance ratio at cutting start of a very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D59</td>
<td>Circumferential speed reduction ratio at cutting end of a very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
</tr>
<tr>
<td>D60</td>
<td>Automatic setting ratio of axial cutting feed rate during chamfering</td>
</tr>
<tr>
<td>D61 - D72</td>
<td>—</td>
</tr>
<tr>
<td>D73 - D77</td>
<td>Learning of cutting conditions (DEP-Z range)</td>
</tr>
<tr>
<td>D78 - D82</td>
<td>Learning of cutting conditions (WID-R range)</td>
</tr>
<tr>
<td>D83 - D90</td>
<td>—</td>
</tr>
<tr>
<td>D91 0</td>
<td>M04 is output/not output after the tool has dwelled at the hole bottom during a tapping cycle.</td>
</tr>
<tr>
<td></td>
<td>1 The tool dwells/does not dwell after M04 has been output at the hole bottom during a tapping cycle.</td>
</tr>
<tr>
<td></td>
<td>2 The tool dwells/does not dwell after it has been returned to the R-point during a tapping cycle.</td>
</tr>
<tr>
<td></td>
<td>3 If a drill is used in the pre-machining of the centering drill cycle, the R-point height is set to D1 or not.</td>
</tr>
<tr>
<td></td>
<td>4 The finishing tool path is shortened/not shortened during a true-circle processing cycle (end milling).</td>
</tr>
<tr>
<td></td>
<td>5 The tool path is shortened/not shortened during a true-circle processing cycle (chamfering).</td>
</tr>
<tr>
<td></td>
<td>6 If a pre-machining tool sequence is included in the same unit, the R-point height of the drill is set/not set to D1 or D42.</td>
</tr>
<tr>
<td></td>
<td>7 The R-point height of the chamfering cutter during the cycle 2 is set to D42 or not. The R-point height of the spot-machining tool during the chamfering cycle (cycle 2) is set to D42 or not.</td>
</tr>
<tr>
<td>D92 0</td>
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<td>1 The R1-point height of the back spot facing is set to D1 or not.</td>
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<td>2 If a chamfering cutter is included in the premachining tool sequence of the same unit, the R-point height of the reamer is set to D1 or not.</td>
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<td>F91 0</td>
<td>In response to move command without decimal point, tool moves by 1/tool moves by 10</td>
</tr>
<tr>
<td>1</td>
<td>Coordinate system shift using a MAZATROL program, valid/invalid</td>
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<td>Cycle time for saving the operational status management data</td>
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<td>Measuring equipment selection</td>
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<td>Selection of a rotational reference coordinate system for WPC-th</td>
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<tr>
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<td>Selection of measuring equipment</td>
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<td>3</td>
<td>Selection of whether workpiece measurement results and tool measurement results are to be stored into tool data of the lower turret</td>
</tr>
<tr>
<td>4</td>
<td>Selection of whether to enable or disable the fixed amount compensation function</td>
</tr>
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<td>Selection of measurement execution timing</td>
</tr>
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<td>6</td>
<td>Selection of tool measurement operation</td>
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<td>L107 0</td>
<td>Tool path drawing</td>
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<td>Tailstock type</td>
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<td>3</td>
<td>Whether tail thrust is also to be displayed in pounds (lbs)</td>
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<td>LBB No. setting for the grooving I.D. tool, threading I.D. tool, or touch sensor, valid/invalid</td>
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<td>5</td>
<td>XYZ-axis operation for the first T-command after cycle start</td>
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<td>A-axis operation for the first T-command after cycle start</td>
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<td>Fixed value (0)</td>
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<td>L109 0</td>
<td>Software limit 4 - Interference axial direction (1st set)</td>
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<td>Software limit 4 - Interference axial direction (2nd set)</td>
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<td>Software limit 4 - Interference axial direction (4th set)</td>
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<td>L110 0</td>
<td>Opposed-spindle lathe specifications</td>
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<td>Vertically inverted spindle specifications</td>
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<td>2</td>
<td>Axis name of the secondary spindle</td>
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<td>3</td>
<td>Whether to disable or enable the display of “section to be machined” in the milling tool sequence</td>
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<td>4</td>
<td>Display of the <strong>BUFFER, REMAIN</strong> and <strong>POSITION</strong> information during coordinate conversion</td>
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<td>Z-axis direction</td>
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<td>L113</td>
<td>Interference check reference axis (1st set of axes)</td>
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<td>Interference check reference axis (2nd set of axes)</td>
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<td>L115</td>
<td>Interference check reference axis (3rd set of axes)</td>
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<td>Interference check reference axis (4th set of axes)</td>
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<td>L117</td>
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<td>Interference clearance (1st set of axes)</td>
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<td>L126</td>
<td>Positioning direction of the head rotation - α-axis for oblique plane indexing</td>
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<td>L128</td>
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<tr>
<td>L129</td>
<td>Acceleration/deceleration filter (1st stage), G1 time constant</td>
</tr>
<tr>
<td>L130</td>
<td>Acceleration/deceleration filter (1st stage), G0 time constant</td>
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<td>L131</td>
<td>Acceleration/deceleration filter (2nd stage), G1 time constant</td>
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<td>Acceleration/deceleration filter (2nd stage), G0 time constant</td>
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<td>L133 - L138</td>
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<tr>
<td>L139</td>
<td>Minimum usable tool diameter of the measurable chamfering tool</td>
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<tr>
<th>Address (bit)</th>
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<td>Rapid feed rate</td>
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<tr>
<td>M2</td>
<td>Feed rate for initial zero-point return</td>
</tr>
<tr>
<td>M3</td>
<td>Cutting feed rate limit</td>
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<tr>
<td>M4</td>
<td>Offset of machine coordinates system</td>
</tr>
<tr>
<td>M5</td>
<td>Second zero-point coordinating value</td>
</tr>
<tr>
<td>M6</td>
<td>Third zero-point coordinating value</td>
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<tr>
<td>M7</td>
<td>Fourth zero-point coordinating value</td>
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<tr>
<td>M8</td>
<td>Maximum software limit specified by manufacturer (+ direction)</td>
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<tr>
<td>M9</td>
<td>Maximum software limit specified by manufacturer (– direction)</td>
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<tr>
<td>M10</td>
<td>Command unit</td>
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<tr>
<td>M11</td>
<td>Coding of address of axis</td>
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<tr>
<td>M12</td>
<td>Coding of incremental axis</td>
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<tr>
<td>M13</td>
<td>Axis name (for display)</td>
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<tr>
<td>M14</td>
<td>Shifting distance of the watchdog-less home position</td>
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<tr>
<td>M15</td>
<td>Axis name (for axis name changing)</td>
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<tr>
<td>M16</td>
<td>Zero-point shift amount</td>
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<td>M17 0</td>
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<td>1</td>
<td>Unit of output from MCP to servo amplifier</td>
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<td>Direction of machine zero-point return</td>
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<td>3</td>
<td>Error correction schema with servo on</td>
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<td>4</td>
<td>Type of axis</td>
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<td>Rotational direction of servo motor (for movement in (+) direction)</td>
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<td>Alarm/No alarm with axis removed</td>
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<td>M18 0</td>
<td>Type of C-axis</td>
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<td>Machine zero-point position</td>
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<td>Watchdog-less axis</td>
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<td>5</td>
<td>X-axis current position display in radius/diameter</td>
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<td>Automatic/manual simultaneous absolute-value updating</td>
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<td>7</td>
<td>Absolute-value detection</td>
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<td>M19 0</td>
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<td>In-position checking method</td>
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<td>5</td>
<td>Homing operation starting position check</td>
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<td>Backlash scheme to be adopted for watchdog-type returning to home position</td>
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<td>Rotational direction of the rotation axis (Dynamic offset II)</td>
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<td>Rapid-feed acceleration/deceleration type, Linear acceleration/deceleration</td>
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<td>Rapid-feed acceleration/deceleration type, First-order lag</td>
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<td>Cutting-feed acceleration/deceleration type, Exponential acceleration/linear deceleration</td>
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<td>Deceleration time constant for rapid-feed exponential acceleration/linear deceleration</td>
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<td>Type of stroke-end stop</td>
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<td>M25</td>
<td>Upper limit of inclined Y-axis access inhibition area (Soft limit 3)</td>
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<td>M26</td>
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<td>Optimum acceleration control: Target speed</td>
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<td>M29</td>
<td>Rapid feed clamping speed 1 for superposition control</td>
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<td>M30</td>
<td>Rapid feed clamping speed 2 for superposition control</td>
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<td>Cutting feed clamping speed for superposition control</td>
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<tr>
<td>M32</td>
<td>Safety speed for Safety supervisory mode 2</td>
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<td>M37</td>
<td>Safety clamping speed reduction judgment coefficient</td>
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<td>M38</td>
<td>Interference check distances for Intelligent Safety Shield, primary check distance</td>
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<tr>
<td>M39</td>
<td>Interference check distances for Intelligent Safety Shield, secondary check distance</td>
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<td>Cutting-feed time constant (linear acceleration/deceleration)</td>
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<td>Rapid-feed time constant (First-order lag)</td>
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<td>Time constant for post-interpolation rapid feed acceleration/deceleration filter</td>
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<td>Cutting-feed time constant (First-order lag)</td>
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<td>N7</td>
<td>OT time</td>
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<td>N8</td>
<td>Creeping speed during initial zero-point return</td>
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<tr>
<td>N9</td>
<td>Amount of grid ignorance during initial zero-point return</td>
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<td>N10</td>
<td>Grid spacing</td>
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<td>N11</td>
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<td>N12</td>
<td>Rapid-feed backlash</td>
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<td>Cutting-feed backlash</td>
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<td>N15</td>
<td>Width to which the machine posture change correction is to be applied</td>
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<td>Machine posture change correction value</td>
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<td>Linear-type rotational axis</td>
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<td>Rotational axis shortcut Invalid/Valid</td>
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<td>Bi-directional pitch error correction</td>
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<td>Relative polarity of control axis</td>
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<td>N25</td>
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<td>Time constant for shape correction rapid feed acceleration/deceleration filter</td>
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<td>S3</td>
<td>Feed forward gain for the MAZAK Precision Rapid Boring Tornado Option</td>
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<td>Axis of rotation of the tilting table</td>
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<td>Axis of rotation of the tilting table (Used for the automatic program origin calculation function)</td>
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<tr>
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<td>S15</td>
<td>Amount of reference position correction (Only for bidirectional pitch error correction)</td>
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<td>S16</td>
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<td>Tool change completion position of the long boring bar end tool</td>
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<td>S21</td>
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<tr>
<td>S22</td>
<td>Cutting feed clamping speed during tool tip point control</td>
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<td>S23</td>
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<td>Maximum RPM of spindle in each speed range (range 1 to 8)</td>
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<tr>
<td>SA9 - SA16</td>
<td>Constants for calculating each gear speed of the spindle (range 1 to 8)</td>
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<tr>
<td>SA17 - SA24</td>
<td>Maximum RPM of spindle during tapping cycle (range 1 to 8)</td>
</tr>
<tr>
<td>SA25 - SA32</td>
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<tr>
<td>BA115</td>
<td>Pre-interpolation acceleration/deceleration time constant for time constant changeover M-code (M885)</td>
</tr>
<tr>
<td>BA116</td>
<td>Pre-interpolation acceleration/deceleration time constant for time constant changeover M-code (M886)</td>
</tr>
<tr>
<td>BA117 - BA124</td>
<td>—</td>
</tr>
<tr>
<td>BA125</td>
<td>EIA tailstock barrier, tailstock usage valid/invalid</td>
</tr>
</tbody>
</table>

1 Tailstock present/absent
<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>EIA tool barrier, tool holder present/absent</td>
</tr>
<tr>
<td>3</td>
<td>Barrier tool nose position (EIA, automatic)</td>
</tr>
<tr>
<td>4</td>
<td>Setting of BA11 is handled as tailstock extruding length, valid/invalid</td>
</tr>
<tr>
<td>5</td>
<td>Output of spindle revolution M-code specified in same block as synchronous tapping, valid/invalid</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>BA126 0</td>
<td>System to be made valid without system selection for queuing</td>
</tr>
<tr>
<td>1</td>
<td>Y-axis interference type</td>
</tr>
<tr>
<td>2</td>
<td>Y-axis moving range display</td>
</tr>
<tr>
<td>3</td>
<td>Tool command scheme</td>
</tr>
<tr>
<td>4</td>
<td>FLASH tool valid/invalid</td>
</tr>
<tr>
<td>5</td>
<td>Milling spindle orientation command (M219), output/no output</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>BA127 - BA132</td>
<td>—</td>
</tr>
</tbody>
</table>
2-2-3 Data I/O parameter

1. CMT parameter (CMT)

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMT1 - CMT24</td>
<td>—</td>
</tr>
<tr>
<td>CMT25</td>
<td>Type of processing to be executed if the tool quantity data within the NC memory mismatches that of the CMT</td>
</tr>
<tr>
<td>CMT26 - CMT32</td>
<td>—</td>
</tr>
</tbody>
</table>

2. TAPE parameter (TAP)

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP1</td>
<td>Type of terminator</td>
</tr>
<tr>
<td>TAP2</td>
<td>Terminator code 1</td>
</tr>
<tr>
<td>TAP3</td>
<td>Terminator code 2</td>
</tr>
<tr>
<td>TAP4</td>
<td>Output of CR during ISO code punching</td>
</tr>
<tr>
<td>TAP5</td>
<td>DC code parity</td>
</tr>
<tr>
<td>TAP6</td>
<td>Feed section DC code output</td>
</tr>
<tr>
<td>TAP7</td>
<td>—</td>
</tr>
<tr>
<td>TAP8</td>
<td>—</td>
</tr>
<tr>
<td>TAP9</td>
<td>&quot;[&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP10</td>
<td>&quot;]&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP11</td>
<td>&quot;#&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP12</td>
<td>&quot;+&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP13</td>
<td>&quot;+&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP14</td>
<td>&quot;::&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP15</td>
<td>&quot;(&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP16</td>
<td>&quot;)&quot; code for paper tape reader/puncher for EIA</td>
</tr>
<tr>
<td>TAP17 - TAP24</td>
<td>—</td>
</tr>
<tr>
<td>TAP25</td>
<td>Paper tape puncher parity-V check</td>
</tr>
<tr>
<td>TAP26</td>
<td>Bit parameter related to paper tape reader/puncher</td>
</tr>
</tbody>
</table>
### 2. PARAMETER

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP27</td>
<td>Bit parameter related to program end code (M) for paper tape reader</td>
</tr>
<tr>
<td>TAP28</td>
<td>—</td>
</tr>
<tr>
<td>TAP29</td>
<td>Number of characters in feed section for paper tape puncher</td>
</tr>
<tr>
<td>TAP30</td>
<td>Number of characters in the space between O-number and program for paper tape puncher</td>
</tr>
<tr>
<td>TAP31</td>
<td>Number of characters in the space between programs for paper tape puncher</td>
</tr>
<tr>
<td>TAP32</td>
<td>—</td>
</tr>
</tbody>
</table>

### 3. DNC parameter (DNC)

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNC1</td>
<td>Type of terminator</td>
</tr>
<tr>
<td>DNC2</td>
<td>Terminator code 1</td>
</tr>
<tr>
<td>DNC3</td>
<td>Terminator code 2</td>
</tr>
<tr>
<td>DNC4</td>
<td>—</td>
</tr>
<tr>
<td>DNC5</td>
<td>DC code parity</td>
</tr>
<tr>
<td>DNC6 - DNC8</td>
<td>—</td>
</tr>
<tr>
<td>DNC9</td>
<td>Number of NC transmission retries during DNC file transfer</td>
</tr>
<tr>
<td>DNC10</td>
<td>Number of NC reception retries during DNC file transfer</td>
</tr>
<tr>
<td>DNC11</td>
<td>Number of NC transmission/reception retries during DNC command message transfer</td>
</tr>
<tr>
<td>DNC12</td>
<td>@ waiting time during DNC transmission</td>
</tr>
<tr>
<td>DNC13</td>
<td>“*”, TEXT waiting time during DNC transmission</td>
</tr>
<tr>
<td>DNC14</td>
<td>EOT waiting time during DNC transmission</td>
</tr>
<tr>
<td>DNC15</td>
<td>NC stop time after reception of !</td>
</tr>
<tr>
<td>DNC16</td>
<td>NC reset time after digital-out</td>
</tr>
<tr>
<td>DNC17</td>
<td>NC stop time from reception</td>
</tr>
<tr>
<td>DNC18</td>
<td>DNC command reply message waiting time</td>
</tr>
<tr>
<td>DNC19</td>
<td>DNC machine number</td>
</tr>
<tr>
<td>DNC20</td>
<td>NC transmission stop time of DNC (from reception to transmission)</td>
</tr>
<tr>
<td>DNC21</td>
<td>NC transmission stop time of DNC (from transmission to transmission)</td>
</tr>
<tr>
<td>Address (bit)</td>
<td>Outline</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>DNC22 - DNC24</td>
<td>—</td>
</tr>
<tr>
<td>DNC25 0</td>
<td>Type of processing to be executed if the tool quantity data within the NC memory mismatches that which has been transferred from the DNC memory</td>
</tr>
<tr>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>Handling of tool data and tool files in the M PLUS format, valid/invalid</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>DNC26 0</td>
<td>After program reception, a search is made/not made for the work number of that program.</td>
</tr>
<tr>
<td>1</td>
<td>Details of an alarm occurring in DNC are displayed or not.</td>
</tr>
<tr>
<td>2</td>
<td>Loading of programs having the same work number as that of the registered program in NC becomes impossible or not.</td>
</tr>
<tr>
<td>3</td>
<td>The function of the PROGRAM LOCK/ENABLE switch is released or not.</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Three digit G-format and G10 format codes input/output for MAZAK data transfer protocol</td>
</tr>
<tr>
<td>6</td>
<td>Binary to ASCII format input/output of MAZAK data transfer protocol</td>
</tr>
<tr>
<td>7</td>
<td>All programs having work numbers smaller than No. 9000 are erased/not erased at the start of program reception.</td>
</tr>
<tr>
<td>DNC27</td>
<td>—</td>
</tr>
<tr>
<td>DNC28</td>
<td>—</td>
</tr>
<tr>
<td>DNC29</td>
<td>Number of retry times with detection of a physical error</td>
</tr>
<tr>
<td>DNC30</td>
<td>Tool data/tool file message format</td>
</tr>
<tr>
<td>DNC31</td>
<td>—</td>
</tr>
<tr>
<td>DNC32</td>
<td>—</td>
</tr>
</tbody>
</table>
### 4. Other (IOP/DPR/IDD)

<table>
<thead>
<tr>
<th>Address (bit)</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP1 - IOP4</td>
<td>—</td>
</tr>
<tr>
<td>IOP5</td>
<td>Loading a program(s) of the same work number, alarm without overwriting/overwriting</td>
</tr>
<tr>
<td>IOP6</td>
<td>—</td>
</tr>
<tr>
<td>IOP7</td>
<td>Data entry for communication with the magazine-side display unit</td>
</tr>
<tr>
<td>IOP8</td>
<td>—</td>
</tr>
<tr>
<td>IOP9</td>
<td>Number of pitch error axes during text output</td>
</tr>
<tr>
<td>IOP10 - IOP16</td>
<td>—</td>
</tr>
<tr>
<td>DPR1</td>
<td>Baud rate</td>
</tr>
<tr>
<td>DPR2</td>
<td>Stop bit</td>
</tr>
<tr>
<td>DPR3</td>
<td>—</td>
</tr>
<tr>
<td>DPR4</td>
<td>Data bit</td>
</tr>
<tr>
<td>DPR5 - DPR7</td>
<td>—</td>
</tr>
<tr>
<td>DPR8</td>
<td>ISO code CR output and the output file size</td>
</tr>
<tr>
<td>DPR9</td>
<td>Method of handshaking</td>
</tr>
<tr>
<td>DPR10</td>
<td>DC code parity</td>
</tr>
<tr>
<td>DPR11</td>
<td>Feed section DC code output</td>
</tr>
<tr>
<td>DPR12</td>
<td>Waiting time</td>
</tr>
<tr>
<td>DPR13</td>
<td>Output format</td>
</tr>
<tr>
<td>DPR14</td>
<td>Selection of an output destination port</td>
</tr>
<tr>
<td>DPR15</td>
<td>Number of characters or the number of lines in feed section</td>
</tr>
<tr>
<td>DPR16</td>
<td>—</td>
</tr>
<tr>
<td>IDD1 - IDD16</td>
<td>—</td>
</tr>
</tbody>
</table>
2-3 Detailed Description

2-3-1 Structure of the parameter list

Each parameter list is written in the following format:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Display title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[3]</td>
<td>[4]</td>
<td>[9]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>[5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>[6]</td>
</tr>
<tr>
<td>Unit</td>
<td>[7]</td>
</tr>
<tr>
<td>Setting range</td>
<td>[8]</td>
</tr>
</tbody>
</table>

[1] Classification of parameters (USER, MACHINE or DATA I/O)
[2] Characters displayed at the upper part of the screen
[3] Parameter address displayed on the screen
  - Bit input type parameters have the bit No. shown in the parentheses below address.

Example:

```
<table>
<thead>
<tr>
<th>Address</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>P1  (bit 0)</td>
<td></td>
</tr>
</tbody>
</table>
```

Setting value for parameter P1 (bit 0) is indicated here

<table>
<thead>
<tr>
<th>Bit 0</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
<th>Bit 7</th>
</tr>
</thead>
</table>

[5] Applicable program

M....................Effective only for MAZATROL programs
E ....................Effective for EIA/ISO programs
M, E ...............Effective for MAZATROL programs and EIA/ISO programs
Conditions under which a changed parameter becomes valid

Example 1: "Immediate" designates that new parameter value becomes effective upon parameter change.

Example 2: "At power on" designates that new parameter value will become effective after procedure below.

1. Change parameter setting value.
2. Press power off button on the operation panel.
3. Press power on button on the operation panel.

Example 3: In the parameter list, "At I/O startup" means that the system operates at the parameter data entered before the start of I/O. If the parameter data is modified during I/O operation, the new data will not become valid until the I/O operation has been completed.

Units of data displayed

Allowable range of data

Details or meaning of the parameter
### 2-3-2 User parameter POINT (D)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Height of the second R-point during point machining</td>
<td>The height of the R-point during point machining is basically D41, however, it is changed to D1 under the following conditions.</td>
</tr>
</tbody>
</table>

#### Conditions
- Bit 6 of parameter D91 is set to 1 (D1 valid).
- There is a spot drill in the pre-machining tool sequence of the same unit.

<table>
<thead>
<tr>
<th>Tool sequence</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill</td>
<td>- Bit 6 of parameter D91 is set to 1 (D1 valid).</td>
</tr>
<tr>
<td></td>
<td>- There is a spot drill in the pre-machining tool sequence of the same unit.</td>
</tr>
<tr>
<td>Reamer</td>
<td>- Bit 2 of parameter D92 is set to 1 (D1 valid).</td>
</tr>
<tr>
<td></td>
<td>- There is a chamfering cutter in the pre-machining tool sequence of the same unit.</td>
</tr>
</tbody>
</table>

The nominal diameter of a spot-machining tool that is automatically set during automatic tool development.

#### Example:

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-φ</th>
<th>No.</th>
<th>HOLE-φ</th>
<th>HOLE-DEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CTR-DR</td>
<td>20.</td>
<td>10.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>↑</td>
<td></td>
<td>D2</td>
<td></td>
</tr>
</tbody>
</table>

#### D2
- Nominal diameter of spot-machining tool
- Program type: M
- Conditions: Immediate
- Unit: 1 mm/0.1 inch
- Setting range: 0 to 99

#### D3
- Number of revolutions during dwell at hole bottom in spot-machining cycle
- Program type: M
- Conditions: Immediate
- Unit: 1 revolution
- Setting range: 0 to 9

When the spot-machining tool reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D3 revolutions, and then return to the original position at the rapid feed rate.
### Table: Parameter Settings

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4</td>
<td>Maximum allowable spot-chamfering hole diameter element</td>
<td>Element used to set the maximum spot-chamfering hole diameter (d) during automatic tool development. Spot-chamfering occurs if ( d \leq D2 - D4 ). If ( d &gt; D2 - D4 ), the chamfering cutter is developed automatically.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
<tr>
<td>D5</td>
<td>Prehole through speed during inversed spot-facing</td>
<td>The feed rate of a tool as it is being passed through the prehole during an inversed spot-facing cycle. Note: 0.5 mm/rev if this parameter setting is 0.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>100 mm/min / 10 inch/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
<tr>
<td>D6, D7</td>
<td>Drill-machining cycle setting element</td>
<td>Element used to automatically set drill-machining cycles during automatic tool development.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machining cycle</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilling cycle</td>
<td>( \text{DEPTH} \leq \text{D6} )</td>
</tr>
<tr>
<td>High-speed deep-hole drilling cycle</td>
<td>( \text{D6} &lt; \text{DEPTH} \leq \text{D7} )</td>
</tr>
<tr>
<td>Deep-hole drilling cycle</td>
<td>( \text{D7} &lt; \text{DEPTH} )</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>D8</td>
<td>Maximum diameter of holes machinable on one drill</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of drills developed</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DIA ≤ D8</td>
</tr>
<tr>
<td>2</td>
<td>D8 &lt; DIA ≤ D9</td>
</tr>
<tr>
<td>3</td>
<td>D9 &lt; DIA ≤ D10</td>
</tr>
<tr>
<td>Alarm</td>
<td>D10 &lt; DIA</td>
</tr>
</tbody>
</table>

| D9      | Maximum diameter of holes machinable on two drills |

| D10     | Maximum diameter of holes machinable on three drills |

| D11     | Through-hole/tap-prehole machining overshoot |

Element used to automatically set the hole-drilling, endmilling, and boring depths during automatic tool development of inversed spot-facing, tapping, back-boring, through-hole drilling, through-hole counter-boring, and spot-faced tapping units.

Example:

```
SNo. TOOL NOM-Ø No. HOLE-Ø HOLE-DEPTH
1 CTR-DR 10. 10. (DEPTH + D11)
```

**Note:** See also parameter D30 for tapping units.

### Parameters Table

<table>
<thead>
<tr>
<th>Classification</th>
<th>Display title</th>
<th>USER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>D8</td>
<td>Maximum diameter of holes machinable on one drill</td>
<td>Element used to automatically set the number of drills which are automatically developed according to the hole diameter of the drill unit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of drills developed</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DIA ≤ D8</td>
</tr>
<tr>
<td>2</td>
<td>D8 &lt; DIA ≤ D9</td>
</tr>
<tr>
<td>3</td>
<td>D9 &lt; DIA ≤ D10</td>
</tr>
<tr>
<td>Alarm</td>
<td>D10 &lt; DIA</td>
</tr>
</tbody>
</table>

| D9      | Maximum diameter of holes machinable on two drills |

| D10     | Maximum diameter of holes machinable on three drills |

| D11     | Through-hole/tap-prehole machining overshoot |

Element used to automatically set the hole-drilling, endmilling, and boring depths during automatic tool development of inversed spot-facing, tapping, back-boring, through-hole drilling, through-hole counter-boring, and spot-faced tapping units.

Example:

```
SNo. TOOL NOM-Ø No. HOLE-Ø HOLE-DEPTH
1 CTR-DR 10. 10. (DEPTH + D11)
```

**Note:** See also parameter D30 for tapping units.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D12</td>
<td>Stop-hole machining hole-bottom clearance</td>
<td>Element used to automatically set the hole-drilling depth during automatic tool development of stop-hole counter-boring and stop-hole boring units.</td>
</tr>
</tbody>
</table>

**Example:**

```
SNo. TOOL NOM-φ No. HOLE-φ HOLE-DEP
1 DRILL 10. 10. 19.
```

**Note:** This parameter is invalid when the residual hole diameter is not 0.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
</tbody>
</table>

| D13     | Spot-machining hole diameter (fixed value) | Hole diameter is automatically set during automatic tool development when spot-chamfering is not to be performed. |

**Example:**

```
SNo. TOOL NOM-φ No. HOLE-φ HOLE-DEP
1 CTR-DR 20. 10. 10.
```

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>1 mm/0.1 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
</tbody>
</table>

| D14     | Depth-of-cut setting element for drilling (ALMINUM) | Element used to automatically set the depth-of-cut per drilling operation during automatic tool development. |

**HOLE-φ × D14:** when the material of the stock workpiece is AL (aluminum) in article MAT. 6 |

**HOLE-φ × D15:** when the material of the stock workpiece is other than AL in article MAT. 6 |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 10</td>
</tr>
</tbody>
</table>

| D15     | Depth-of-cut setting element for drilling (except AL) | Element used to automatically set the depth-of-cut per drilling operation during automatic tool development. |

**HOLE-φ × D14:** when the material of the stock workpiece is AL (aluminum) in article MAT. 6 |

**HOLE-φ × D15:** when the material of the stock workpiece is other than AL in article MAT. 6 |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 10</td>
</tr>
</tbody>
</table>
### Classification: USER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D16</strong></td>
<td>Number of revolutions during dwell at hole bottom for chamfering cutter or spot-machining tool in chamfering cycle</td>
<td>Z-axis feed dwell time at the hole bottom in the chamfering cycle of chamfering cutter or spot-machining tool. Set this time in spindle revolutions. When the chamfering cutter reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D16 revolutions, and then return to the original position at the rapid feed rate. <strong>Note:</strong> This parameter is invalid for chamfering with true-circle processing.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 revolution</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 9</td>
<td></td>
</tr>
</tbody>
</table>

| **D17** | Interference clearance of chamfering cutter | The clearance in order to prevent tool interference with a wall of the workpiece or with the hole bottom during a chamfering cycle. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | 0.1 mm/0.01 inch | |
| Setting range | 0 to 99 | |

| **D18** | Return feed rate for reaming or boring (cycle 3) | The feed rate at which the tool is returned from the hole bottom during reaming or boring. **Notes:** 1. Valid only when the setting of DEPTH for the reamer (tool sequence) is G01. 2. Valid only when the setting of PRE-DIA for the boring tool (tool sequence) is CYCLE 3. 3. If this parameter is 0, the tool is returned at the same feed rate as that of cutting. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | 100 mm/min / 10 inch/min | |
| Setting range | 0 to 9 | |

| **D19** | Number of revolutions during dwell at hole bottom for end milling | Z-axis feed dwell time at the hole bottom in an end milling cycle. Set this time in spindle revolutions. When the end mill reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D19 revolutions, and then return to the original position at the rapid feed rate. **Note:** This parameter is invalid for true-circle processing. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | 1 revolution | |
| Setting range | 0 to 999 | |
### D20

**Radial depth-of-cut setting element for end milling**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 1%
- **Setting range**: 0 to 100

**Description**

Element used to automatically set the radial depth-of-cut per end milling operation

\[
\text{Depth-of-cut} = \text{nominal diameter} \times \text{D20}
\]

Depth-of-cut is automatically set according to the value of this parameter when nominal diameter of the end mill is input.

**Example**:

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-(\phi)</th>
<th>No. HOLE-(\phi)</th>
<th>HOLE-DEP</th>
<th>PRE-DIA</th>
<th>PRE-DEPRGH</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>END MILL</td>
<td>20.0</td>
<td>40.0</td>
<td>10.0</td>
<td>30.0</td>
<td>0.0</td>
<td>12</td>
</tr>
</tbody>
</table>

\[(\text{NOM-}\phi \times \text{D20})\]

### D21

**Reference bottom-finishing allowance for end milling**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.1 mm/0.01 inch
- **Setting range**: 0 to 99

**Description**

The reference value for calculation of a bottom-finishing allowance which corresponds to the roughness level of the end milling (tool sequence). The finishing allowance in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are set using the expressions listed in the table below.

<table>
<thead>
<tr>
<th>Roughness</th>
<th>Bottom-finishing allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3</td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>D21</td>
</tr>
<tr>
<td>5</td>
<td>D21 × 0.7</td>
</tr>
<tr>
<td>6</td>
<td>D21 × 0.7 × 0.7</td>
</tr>
<tr>
<td>7</td>
<td>D21 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>8</td>
<td>D21 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>9</td>
<td>D21 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
</tbody>
</table>

### D22

**Tapping-cycle dwell time**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.01 sec.
- **Setting range**: 0 to 99

**Description**

Dwell time at the hole bottom or at the R-point. This value is valid when 1 is set for bit 0, 1 or 2 of parameter D91.

**Note**:

This parameter is valid only when the setting for roughness (RGH) of tapping (tool sequence) is FIX.

### D23

**Prehole clearance for end milling**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 1 mm/0.1 inch
- **Setting range**: 0 to 999

**Description**

The excess amount of prehole diameter over nominal diameter that is used to specify whether the Z-axis is to be moved at a rapid feed rate or at a cutting feed rate during true-circle processing with the end mill.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D24</strong></td>
<td>Number of revolutions during dwell at hole bottom for boring</td>
<td>Z-axis feed dwell time at the hole bottom in a boring cycle. Set this time in spindle revolutions. When the boring bar reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D24 revolutions, and then the spindle orientation will be performed. <strong>Note:</strong> This parameter is invalid if the roughness (RGH) of the boring (tool sequence) is 0.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 revolution</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td><strong>D25</strong></td>
<td>Boring-bar tip relief</td>
<td>The amount of relief provided for the tip of a boring bar to be kept clear of the hole wall after spindle orientation.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99</td>
<td></td>
</tr>
<tr>
<td><strong>D26</strong></td>
<td>Returning distance from hole bottom for boring or back-boring</td>
<td>The distance which the boring or back-boring tool is returned at the same feed rate as for cutting after the tool has reached the hole bottom. <strong>Note:</strong> Not valid if the setting for the roughness (RGH) of the boring (tool sequence) is 1.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99</td>
<td></td>
</tr>
<tr>
<td><strong>D27</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>
### Bottom-finishing amount of boring

**Address**: D28  
**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.1 mm/0.01 inch  
**Setting range**: 0 to 99

The distance which the boring bar is fed in at 70% of the original feed rate to finish the hole bottom.

**Note**: Not valid if the setting for the roughness (RGH) of the boring (tool sequence) is 1.

### Chip removal time

**Address**: D29  
**Program type**: M  
**Conditions**: Immediate  
**Unit**: 1 sec.  
**Setting range**: 0 to 99

The time required for a chip removal tool to complete a chip removal operation after the tool has been positioned to the hole.

### Number of incomplete threads in tapping cycle

**Address**: D30  
**Program type**: M  
**Conditions**: Immediate  
**Unit**: 1 thread  
**Setting range**: 0 to 9

To set number of incomplete threads in tapping cycle for metric screws and unified screws. In tapping, internal thread is tapped extra for the depth of \((D30 \times \text{pitch})\) in the direction of Z. This is also used as an element for automatically determining hole-drilling depth (HOLE-DEP) in the automatic tool development of the tapping unit.

**Example**:

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-Ø</th>
<th>No.</th>
<th>HOLE-Ø</th>
<th>HOLE-DEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DRILL</td>
<td>10.0</td>
<td>10.</td>
<td>19.</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{HOLE-DEP} = \text{DEPTH} + D11 + (D30 \times \text{pitch})
\]

**Related parameter**

D43: Number of incomplete threads in tapping cycle for piped screws

---

2-68
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D31</td>
<td>Tapper elongation amount for tapping</td>
<td>Excess amount of tool return due to elongation of the tapper during tapping cycle. Set this value in spindle revolutions.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 revolution</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9</td>
</tr>
<tr>
<td>D32</td>
<td>Number of spindle revolutions until spindle CCW rotation begins in tapping cycle</td>
<td>The number of inertial turns in tapping cycle that the spindle has rotated clockwise during the time from output of a spindle CCW rotation command to the start of spindle CCW rotation</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 revolution</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
<tr>
<td>D33</td>
<td>Back-boring tool tip relief</td>
<td>The amount of relief provided for a back-boring tool tip to be kept clear of the prehole walls as it is being passed through the prehole in the oriented state of the spindle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99</td>
</tr>
<tr>
<td>D34</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>D35</td>
<td>Prehole-drilling diameter setting element for reamer (drilling)</td>
<td>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is drilling.)</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.01 mm/0.001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999</td>
<td></td>
</tr>
<tr>
<td>D36</td>
<td>Prehole-drilling diameter setting element for reamer (boring)</td>
<td>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is boring.)</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.01 mm/0.001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999</td>
<td></td>
</tr>
<tr>
<td>D37</td>
<td>Prehole-drilling diameter setting element for reamer (end milling)</td>
<td>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is end milling.)</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.01 mm/0.001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| **D38** | Reamer-prehole diameter setting element for boring or end milling | 1) In automatic tool development of the reamer unit, if the pre-machining process is boring:

![Diagram of Boring-hole diameter](MPL021)

**Example:**

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-φ</th>
<th>HOLE-φ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BOR BAR</td>
<td>10.</td>
<td>(DIA – D38)</td>
</tr>
</tbody>
</table>

2) In automatic tool development of the reamer unit, if the pre-machining process is end milling:

![Diagram of End milling hole diameters](MPL022)

**Example:**

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-φ</th>
<th>HOLE-φ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>END MILL</td>
<td>15.</td>
<td>(DIA – D39)</td>
</tr>
<tr>
<td>2</td>
<td>END MILL</td>
<td>10.</td>
<td>(DIA – D38)</td>
</tr>
</tbody>
</table>

| **D39** | Reamer-prehole diameter setting element for end milling | |
| **D40** | Number of revolutions during dwell at spot-faced hole bottom for inversed spot-facing | Z-axis feed dwell time at the spot-faced hole bottom in an inversed spot facing cycle. Set this time in spindle revolutions. When the inversed spot-facing tool reaches the hole bottom, firstly the Z-axis will stop moving until the spindle makes D40 revolutions, and then the rotational direction of the spindle will reverse. (Feeding stops at hole bottom.) |
| **D41** | R-point height during point-machining | R-point height of each tool in the point-machining unit **Example:**

![Diagram of R-point height](MPL024)

**Note:** For the inversed spot-facing unit or the back-boring unit, this parameter can also be used for setting the clearance amount at the hole bottom. (≈D1, D42) |
### D42

**Meaning:** Height of the third R-point during point machining

**Description:**

The height of the R-point during point machining is basically D41, however it is changed to D42 under the following conditions.

<table>
<thead>
<tr>
<th>Tool sequence</th>
<th>Conditions</th>
</tr>
</thead>
</table>
| Drill         | - Bit 6 of parameter D91 is set to 1 (D42 valid).  
|               | - There is a drill in the pre-machining tool sequence of the same unit. |
| Chamfering cutter | - Bit 7 of parameter D91 is set to 1 (D42 valid).  
|               | - CYCLE 2 is selected for the machining cycle. |
| Spot          | - Bit 7 of parameter D91 is set to 1 (D42 valid).  
|               | - CYCLE 2 in the chamfering cycle is selected for the machining cycle. |

**Program type:** M  
**Conditions:** Immediate  
**Unit:** 0.1 mm/0.01 inch  
**Setting range:** –999 to 999

### D43

**Meaning:** Number of incomplete threads in tapping cycle for piped screw

**Description:**

To set number of incomplete threads in tapping cycle for piped screws (PT, PF, PS). In tapping, internal thread is tapped extra for the depth of (D43 × pitch) in the direction of Z.

This is also used as an element for automatically determining hole-drilling depth (HOLE-DEP) in the automatic tool development of the tapping unit.

**Example:**

<table>
<thead>
<tr>
<th>SNo.</th>
<th>TOOL</th>
<th>NOM-ø</th>
<th>HOLE-ø</th>
<th>HOLE-DEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DRILL</td>
<td>10.</td>
<td>10.</td>
<td>19.</td>
</tr>
</tbody>
</table>

\[
\text{HOLE-DEP} = (\text{DEPTH} + D11 + (D43 \times \text{pitch})]
\]
### Classification

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D44</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**Program type** —
**Conditions** —
**Unit** —
**Setting range** —

**Gradual decrements in drilling depth**

**D45**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.01 mm/0.001 inch
- **Setting range**: 0 to 9999

\[
\begin{align*}
q_i &= q_1 - D45 \times (i - 1) \quad (\text{if } q_i \geq b) \\
q_i &= b \quad (\text{if } q_i < b)
\end{align*}
\]

Set the minimum gradual drilling depth. However, if the residual hole depth is smaller than D46, actual drilling depth will be the same as the residual hole depth.

**D46**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.01 mm/0.001 inch
- **Setting range**: 0 to 9999

(\text{\^D46})
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D47</td>
<td>Reamer-prehole machining overshoot</td>
<td>Element used to automatically set the hole depth ((\text{HOLE-DEP})) of drilling, end milling and boring during automatic tool development of the reamer unit.</td>
</tr>
</tbody>
</table>

Program type: M  
Conditions: Immediate  
Unit: 0.01 mm/0.001 inch  
Setting range: 0 to 999

Example:
\[
\begin{align*}
\text{SNo.} & \quad \text{TOOL} & \quad \text{NOM-} & \quad \phi & \quad \text{HOLE-} & \quad \phi & \quad \text{HOLE-DEP} \\
1 & \quad \text{DRILL} & 10. & 10. & 21. & \quad \text{(DEPTH + D47)}
\end{align*}
\]

D48  
Feed override for the section to be chamfered in the planetary tapping cycle  
Feed override = Pre-hole machining feed in tapping tool sequence \(\times D48\)/100

Program type: M  
Conditions: Immediate  
Unit: %  
Setting range: 0 to 999

D49  
Amount of return at hole bottom during the planetary tapping cycle  
Amount of return = Tapping pitch \(\times D49/10\)

Program type: M  
Conditions: Immediate  
Unit: 0.1 thread  
Setting range: 0 to 999

D50  
Auto-set feed rate for pre-hole machining in the planetary tapping cycle  
The feed rate for pre-hole machining will be auto-set to D50 when the planetary tapping cycle is selected.

Program type: M  
Conditions: Immediate  
Unit: 0.01 mm/rev, 0.001 inch/rev  
Setting range: 0 to 999
### Address Meaning Description

**D51**

Auto-set feed rate for planetary tapping cycle

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.01 mm/rev, 0.001 inch/rev
- **Setting range**: 0 to 999

The feed rate will be auto-set to **D51** when the planetary tapping cycle is selected.

#### Example

<table>
<thead>
<tr>
<th>No.</th>
<th>TOOL NO.</th>
<th>φ</th>
<th>HOLE-NO.</th>
<th>φ</th>
<th>PRE-DIA</th>
<th>PRE-DEP</th>
<th>RGH</th>
<th>DEPTH</th>
<th>C-SP</th>
<th>FR</th>
<th>M</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TAP</td>
<td>10</td>
<td>23.7</td>
<td>PLANET</td>
<td>0.15</td>
<td>FIX</td>
<td>P1.5</td>
<td>50</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**D52**

Reduction ratio for the G00-based relief rate during a very-deep-hole drilling cycle

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: %
- **Setting range**: 0 to 100

Set the reduction ratio for the G00-based relief rate during the very-deep-hole drilling in a drilling or turning-drilling unit.

#### Example

Cutting feed

Rapid feed (G00)

**D53**

Number of times of pecking up to the return of the tool to a position near the starting point of the very-deep-hole drilling cycle of a drilling or turning-drilling unit

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: Times
- **Setting range**: 0 to 9999

Set the number of times of pecking to be executed before returning the tool to a position near the starting point of the very-deep-hole drilling cycle of a drilling or turning-drilling unit.

#### Example

If **D53** = 3:

After pecking has been repeated three times, the tool returns to a position near the starting point.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D54</td>
<td>End point - Programmed start point</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**D54**
Deceleration rate at cutting start for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle

\[ F' = F \times \frac{D54}{100} \]

- **F**: Specified feed rate
- **F'**: Feed rate at cutting start

Program type: M
Conditions: Immediate
Unit: %
Setting range: 0 to 100

**D55**
Drilling return distance for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle

\[ \ell = \begin{cases} \frac{D}{2 \times \tan \theta/2} & (0^\circ < \theta < 180^\circ) \\ 0 & (\theta \geq 180^\circ) \end{cases} \]

Program type: M
Conditions: Immediate
Unit: 0.001 mm/0.0001 inch
Setting range: 0 to 9999

**D56**
Number of revolutions during dwell at chip ejection position and hole bottom for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle

Set the number of revolutions of the milling spindle during dwell time at the chip ejection position and the hole bottom for the very-deep-hole drilling cycle or the decremental very-deep-hole machining cycle.

Program type: M
Conditions: Immediate
Unit: Revolutions
Setting range: 0 to 255
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D57</td>
<td>Return speed for very-deep-hole drilling cycle/decremental very-deep-hole machining cycle</td>
<td>Set the return speed for the very-deep-hole drilling cycle or the decremental very-deep-hole machining cycle.</td>
</tr>
</tbody>
</table>

| Program type | M |
| Conditions   | Immediate |
| Unit         | 0.001 mm/rev, 0.0001 inch/rev |
| Setting range | 0 to 9999 |

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D58</td>
<td>Feed rate reduction distance ratio at cutting start of a very-deep-hole drilling cycle (blind hole, through hole)</td>
<td>Set the feed rate reduction distance from the reference point at cutting start of a very-deep-hole drilling cycle (blind hole, through hole) during the point machining. Specify the ratio with respect to the drill diameter. If the nominal diameter of the drill is D, the feed rate reduction distance L at cutting start is calculated using the following calculation expression: [ L = D \times \frac{D58}{100} ] The feed rate is reduced by the ratio specified in D54 (feed rate reduction ratio at cutting start) by the distance L from the reference point (R).</td>
</tr>
</tbody>
</table>

<p>| Program type | M |
| Conditions   | After movement stop |
| Unit         | % |
| Setting range | 0 to 300 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D59</td>
<td>Circumferential speed reduction ratio at cutting end of a very-deep-hole drilling cycle (through hole)</td>
<td>Set the circumferential speed reduction ratio at cutting end of a very-deep-hole drilling cycle (through hole) during the point machining. If the circumferential speed during drilling is $S$, the circumferential speed $S'$ at cutting end is calculated using the following calculation expression: $S' = S \times \frac{D59}{100}$ The circumferential speed is reduced to $S'$ by “speed reduction distance immediately before the hole bottom” (hb specified in the program).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After movement stop</td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D60</td>
<td>Automatic setting ratio of axial cutting feed rate during chamfering</td>
<td>Set the ratio between automatic setting value for the feed rate in the axial cutting and that in the radial cutting during chamfering in the point machining.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After movement stop</td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D61 to D72</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

<p>| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range | — |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D73</strong> to <strong>D77</strong></td>
<td>Learning of cutting conditions (DEP-Z range)</td>
<td>Specify DEP-Z range for the end mill and the face mill from the learning data of cutting conditions. When learning data on the condition that DEP-Z is in the following range has been stored in the memory, learning is not effectuated again. For a DEP-Z range of the end mill, set a value of “DEPTH/NOM-φ” (at a unit of 0.1%). 0 to D73 .......... DEP-Z range (for end mill) 1 D73 to D74 .......... DEP-Z range (for end mill) 2 D74 to D75 .......... DEP-Z range (for end mill) 3 For a DEP-Z range of the face mill, set a value of “DEPTH” (at a unit of 0.1 mm or 0.01 inch). 0 to D76 .......... DEP-Z range (for face mill) 1 D76 to D77 .......... DEP-Z range (for face mill) 2</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1% (0.1 mm/0.01 inch)</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 1000</td>
<td></td>
</tr>
<tr>
<td><strong>D78</strong> to <strong>D82</strong></td>
<td>Learning of cutting conditions (WID-R range)</td>
<td>Specify WID-R range for the boring bar, back boring bar and end mill from the learning data of cutting conditions. When learning data on the condition that WID-R is in the following range has been stored in the memory, learning is not effectuated again. For a WID-R range of the boring bar and back boring bar, set a value of “DEPTH” (at a unit of 0.1 mm/0.01 inch). 0 to D78 .......... WID-R range (for boring bar and back boring bar) 1 D78 to D79 .......... WID-R range (for boring bar and back boring bar) 2 For a WID-R range of the end mill, set a value of “DEPTH/NOM-φ” (at a unit of 0.1%). 0 to D80 .......... WID-R range (for end mill) 1 D80 to D81 .......... WID-R range (for end mill) 2 D81 to D82 .......... WID-R range (for end mill) 3</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1% (0.1 mm/0.01 inch)</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 1000</td>
<td></td>
</tr>
<tr>
<td><strong>D83</strong> to <strong>D90</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>D91</td>
<td>－</td>
<td>M04 is output after the tool has dwelled at the hole bottom during a tapping cycle. The tool dwells after M04 has been output at the hole bottom during a tapping cycle. The tool dwells after it has been returned to the R-point during a tapping cycle. If a drill is used in the pre-machining of the centering drill cycle, the R-point height is set to D1. The finishing tool path is shortened during a true-circle processing cycle (end milling). The tool path is shortened during a true-circle processing cycle (chamfering). If a pre-machining tool sequence is included in the same unit, the R-point height of the drill is set to D1 or D42. The R-point height of the chamfering cutter during the cycle 2 is set to D42. The R-point height of the spot-machining tool during the chamfering cycle (cycle 2) is set to D42.</td>
</tr>
<tr>
<td>D92</td>
<td>－</td>
<td>During a true-circle processing (end milling) cycle, E17 is used for axial feed. The R1-point height of the back spot facing is set to D1. If a chamfering cutter is included in the pre-machining tool sequence of the same unit, the R-point height of the reamer is set to D1. If a chamfering cutter is included in the pre-machining tool sequence of the same unit, the R-point height of the tapping is set to D1. During planetary tapping, chips are ejected automatically prior to the threading process.</td>
</tr>
<tr>
<td>D93</td>
<td>－</td>
<td>Unidirectional positioning for point-machining</td>
</tr>
</tbody>
</table>

| Program type | M |
| Conditions   | Immediate |
| Unit         | Bit |
| Setting range | Binary, eight digits |

| Program type | M |
| Conditions   | Immediate |
| Unit         | Bit |
| Setting range | Binary, eight digits |

| Program type | M |
| Conditions   | Immediate |
| Unit         | Bit |
| Setting range | Binary, eight digits |

Unidirectional positioning for point-machining

(1: Execution, 0: No execution)

CTR-DR (Spot-machining tool)
DRILL (Drill)
REAMER (Reamer)
TAP (Tap)
BCK FACE (Inversed spot-facing tool)
BOR BAR (Boring tool)
B-B BAR (Back-boring tool)
CHAMFER (Chamfering cutter)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D94</td>
<td>—</td>
<td>Unidirectional positioning for point-machining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1: Execution, 0: No execution)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>END MILL (End mill)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planetary tapping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tornado cycle</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D95</td>
<td>—</td>
<td>Selection of the auto-setting method to be used for the MAZATROL program data items of the tapping unit (TAPPING and CBOR-TAP) and the diameter item of pipe taps on the TOOL DATA display.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For pipe-tapping items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Conventional method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: The text file concerned is referred to for the auto-setting of pipe-tapping data items in a MAZATROL program as well as on the TOOL DATA display.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For unified thread items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Conventional method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: The text file concerned is referred to for the auto-setting of the pre-hole diameter (PRE-DIA) within a tapping unit (for unified thread).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For metric thread items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Conventional method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: The text file concerned is referred to for the auto-setting of the pre-hole diameter (PRE-DIA) within a tapping unit (for metric thread).</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D96</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>to D144</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
### 2-3-3 User parameter  LINE/FACE/3D (E)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **E1** | Closed-pattern cutting start point and escape point setting element | Element used to set cutting start point and escape point for closed-pattern line- or face-machining. **Example:** Defined closed pattern. 

- **E1**

[Applicable units]
- LINE OUT, LINE IN, CHMF OUT and CHMF IN
- Wall finishing of STEP, POCKET, PCKT MT and PCKT VLY

**Program type:** M
**Conditions:** Immediate
**Unit:** 0.1 mm/0.01 inch
**Setting range:** 0 to 999

| **E2** | Cutting start point and escape point setting element (the first clearance) | Element used to set the cutting start point and escape point for line- or face-machining (the first clearance). **Example:** 

- NOM-φ/2 ≥ SRV-R

[Applicable units]
- All line-machining units
- Face-machining units other than FCE MILL, TOP EMIL, and SLOT

**Program type:** M
**Conditions:** Immediate
**Unit:** 0.1 mm/0.01 inch
**Setting range:** 0 to 999

Notes:
1. See the diagram of parameter E1 also.
2. Positioning of E2 at the escape point can be selected using E95, but only for line-machining units.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>E4</td>
<td>Reference allowance of finishing in radial direction</td>
<td>The reference value of each finishing allowance R (FIN-R) which is automatically set when the roughness levels of the line- or face-machining units have been set. The finishing allowance R in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are calculated using the expressions listed in the table below.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999</td>
</tr>
</tbody>
</table>
| E5      | Element used to set the cutting start point and escape point (the second clearance) | Element used to set the cutting start point and escape point (the second clearance) E2 is used generally as a clearance on the X-Y plane, however, E5 is used when the condition meets both of 1) and 2) mentioned below.  
1) There is pre-machining in the same unit.  
2) The parameter (E91 to E95) that makes E5 effective is set to ON (1).  
[Applicable units]  
LINE OUT, LINE IN, STEP, POCKET, PCKT MT, PCKT VLY  
[Related parameters]  
E91 bit 3, E92 bit 3, E93 bit 3, E94 bit 3, E95 bit 7  
* Parameter that effectuates E5 in the applicable unit. |
|         | Program type | M           |
|         | Conditions  | Immediate   |
|         | Unit        | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 999   |
| E6      | Reference allowance of finishing in axial direction | The reference value of each finishing allowance Z (FIN-Z) which is automatically set when the roughness levels of the line- or face-machining units have been set.  
The finishing allowance Z in the case of roughness level 4 becomes the value of this parameter, and the values for all other roughness levels are calculated using the expressions listed in the table below. |
|         | Program type | M           |
|         | Conditions  | Immediate   |
|         | Unit        | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 999   |

### Table: FIN-R

<table>
<thead>
<tr>
<th>Roughness</th>
<th>FIN-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3</td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>E4</td>
</tr>
<tr>
<td>5</td>
<td>E4 × 0.7</td>
</tr>
<tr>
<td>6</td>
<td>E4 × 0.7 × 0.7</td>
</tr>
<tr>
<td>7</td>
<td>E4 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>8</td>
<td>E4 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>9</td>
<td>E4 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
</tbody>
</table>

### Table: FIN-Z

<table>
<thead>
<tr>
<th>Roughness</th>
<th>FIN-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3</td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>E6</td>
</tr>
<tr>
<td>5</td>
<td>E6 × 0.7</td>
</tr>
<tr>
<td>6</td>
<td>E6 × 0.7 × 0.7</td>
</tr>
<tr>
<td>7</td>
<td>E6 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>8</td>
<td>E6 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>9</td>
<td>E6 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| E7      | Allowance of cutting start point in axial direction (the second clearance) | Allowance of cutting start point in axial direction For the line- or face-machining, $E9$ is used as an axial clearance for rapid access to the machining point from the initial point, however, $E7$ is used when the condition meets both of 1) and 2) mentioned below.  
1) There is pre-machining in the same unit.  
2) The parameter ($E91$ to $E97$) that makes $E7$ effective is set to ON (1).  
[Applicable units] All line-/face-machining units except the face milling and angular face unit. |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 99 |
| E8      | Radial interference clearance of chamfering cutter | The amount of clearance that prevents interference of the chamfering cutter with the walls during face-machining |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 999 |
| E9      | Allowance of axial-cutting start position (the first clearance) | Element used to set the position in which the cutting feed in axial direction is to be started after the line- or face-machining tool has been moved from the initial point toward the workpiece at a rapid feed rate  
Example:  
![Initial point](image)  
$E9$ |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 999 |
| E10     | Depth-of-cut-R automatic setting element (Face milling, End milling-top, End milling-step) | Element used to automatically set the radial depth-of-cut ($WID-R$) of the tool sequence in FCE MILL, TOP EMIL or STEP unit  
$WID-R = \frac{NOM-\phi \times E10}{10}$  
Example:  
<table>
<thead>
<tr>
<th>Sn0. TOOL</th>
<th>NOM-\phi</th>
<th>APRCH-X</th>
<th>APRCH-Y</th>
<th>TYPE</th>
<th>ZFD</th>
<th>DEP-Z</th>
<th>WID-R</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 FCE MILL 100A</td>
<td>?</td>
<td>?</td>
<td>XBI</td>
<td>♦</td>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>USER</td>
<td>Display title</td>
<td>LINE/FACE/3D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
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<td>--------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td><strong>Meaning</strong></td>
<td><strong>Description</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E11</strong></td>
<td>Axial interference clearance of chamfering cutter</td>
<td>The amount of clearance that prevents interference of the chamfering cutter with the bottom during chamfering.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.1 mm/0.01 inch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 5 to 40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E12</strong></td>
<td>Radial interference clearance of face milling unit and angular face milling unit</td>
<td>The amount of clearance that prevents interference between the tool and the figure during face milling. Example:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.1 mm/0.01 inch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E13</strong></td>
<td>Tool path setting element for end milling-top unit</td>
<td>Element used to set the tool path internal to the figure for end milling-top unit. Example:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 1 to 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E14</strong></td>
<td>Depth-of-cut-R automatic setting element (Pocket milling, Pocket milling-mountain, Pocket milling-valley)</td>
<td>Element used to automatically set the radial depth-of-cut (WID-R) of the tool sequence in POCKET, PCKT MT or PCKT VLY unit. Example:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
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</tr>
<tr>
<td>E15</td>
<td>Tool path setting element for face milling-top unit (reciprocating short)</td>
<td>Element used to set the tool path external to the defined figure for reciprocating-short machining with face milling unit. Example: Tool diameter × E15 10 Defined figure Tool diameter × E15 10 MPL033</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E16</td>
<td>Peripheral-cutting feed rate override for end milling-mountain unit</td>
<td>Override value of the idle-cutting feed rate at which tool of end milling-mountain unit is to be moved around the outer form of the workpiece. Note: Valid only when bit 0 of E91 is 1 and its bit 7 is 0. Example: FR × E16 Defined figure MPL034</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E17</td>
<td>Axial-cutting feed rate override</td>
<td>Override value of the feed rate at which the tool of a line- or face-machining unit (excluding face milling unit) is to be moved to the machining surface in an axial direction. Notes: 1. Valid only when ZFD of tool sequence is G01. 2. Feed overriding is invalid when this parameter is 0. Example: FR × E17 10 SRV-Z Machining surface MPL035</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E18</td>
<td>Override in case of the overall width cutting for pocket-machining</td>
<td>Override value of feed rate when the pocket-machining radial depth-of-cut becomes equal to the tool diameter. Example: FR × E18 10 MLP036</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: Overriding for overall width cutting is not valid when this parameter is 0. [Applicable units] Rough-machining of POCKET, PCKT MT, PCKT VLY and STEP
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E19</td>
<td>Returning feed rate override in case of bidirectional cutting for rough-machining of the end milling-slot unit.</td>
<td>Override value of tool returning feed rate in the rough-machining process of the end milling-slot unit, when the bidirectional cutting is executed. ( \text{FR} \times \frac{\text{E19}}{100} ) ( \text{Note:} ) The override value is invalid, when bit 5 of parameter E96 is set to OFF, or this parameter is set to 0. [Applicable unit] Returning path in rough-machining of SLOT</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999</td>
<td></td>
</tr>
<tr>
<td>E20</td>
<td>Axial cutting feed override during Z-axial cutting in the pecking mode of face machining</td>
<td>This parameter indicates the feed override value for axial pecking movement to the surface to be machined using a face-machining unit excepting a face milling unit. Feed rate during pecking operation = ( \text{FR} \times \frac{\text{E20}}{10} ) ( \text{Notes:} ) 1. Valid only when ZFD in the tool sequence is G01. 2. The feed override function is invalid when “0” is assigned to this parameter.</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 9</td>
<td></td>
</tr>
<tr>
<td>E21</td>
<td>Wall-cutting overlap in closed figure</td>
<td>The amount of overlap of the wall-cutting start and end areas in closed-pattern line- or face-machining ( \text{Example:} ) Defined closed pattern Escape point Cutting start point MPL037 ( \text{[Applicable units]} ) - LINE OUT, LINE IN, CHMF OUT and CHMF IN - Wall finishing of STEP, POCKET, PCKT MT, PCKT VLY and SLOT</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.1 mm/0.01 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999</td>
<td></td>
</tr>
<tr>
<td>E22</td>
<td>Override value of automatic corner overriding</td>
<td>Override value of automatic corner overriding in line- or face-machining ( \text{Example:} ) ( \text{FR} \times \frac{\text{E22}}{10} ) ( \text{Note:} ) Automatic corner overriding is invalid when this parameter is 0. ( \text{[Applicable units]} ) LINE RGT, LINE LFT, LINE OUT, LINE IN, STEP, POCKET, PCKT MT and PCKT VLY</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 99</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| E23     | Effective removal allowance (upper limit) of automatic corner overriding | The range of removal allowances (upper and lower limits) The automatic corner overriding becomes valid when the following line- or face-machining conditions are met: \[
\text{Tool diameter} \times \frac{E24}{100} \leq \text{Removal allowance} \leq \text{Tool diameter} \times \frac{E23}{100}
\] |

| Program type | M |
| Conditions | Immediate |
| Unit | 1% |
| Setting range | 1 to 99 |

| E24     | Effective removal allowance (lower limit) of automatic corner overriding | The shape angle range (upper limit) The automatic corner overriding becomes valid when the following line- or face-machining conditions are met: \[
\text{Shape angle} \leq E25
\] |

| Program type | M |
| Conditions | Immediate |
| Unit | 1% |
| Setting range | 1 to 99 |

| E25     | Effective angle (upper limit) of automatic corner overriding | \[
\text{Axial feed rate calculation parameter for a line milling finish.}
\]

| Program type | M |
| Conditions | Immediate |
| Unit | 1° |
| Setting range | 1 to 179 |

| E26     | Calculation coefficient for the finishing feed of line milling | \[
\text{Axial feed rate} = \frac{\text{Radial feed rate} \times E26}{100}
\] |

<p>| Program type | M |
| Conditions | Immediate |
| Unit | % |
| Setting range | 0 to 999 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| E27     | Radial direction feed rate calculation reference diameter for finish cutting in line machining unit | These parameters, the roughness code, etc. determine the finishing feed rate. - If the radial-finishing feed rate is taken as \( F_1 \), then: \[
F_1 = \begin{cases} 
\frac{E28 \times D}{E27 \times \alpha} \times Kf \times Z & (D < E27 \times \alpha) \\
E28 \times Kf \times Z & (D \geq E27 \times \alpha)
\end{cases}
\] \( D \): Tool diameter \( \alpha \): 0.1 (for metric specs.) or 0.01 (for inch specs.) \( Kf \): Roughness coefficient (Refer to the list below) \( Z \): Number of teeth |
|         | Program type | M |
|         | Conditions   | Immediate |
|         | Unit         | 0.1 mm/0.01 inch |
|         | Setting range | 0 to 65535 |
| E28     | Finishing feed rate calculation reference feed rate in line machining unit | Select whether the cutting conditions in the shape sequence during VFC mode are to be modified. The selection is valid only for milling. 0: Modification of the cutting conditions in the shape sequence 1: No modification of the cutting conditions in the shape sequence In the case of 0, only the cutting conditions in the tool sequence are modified. In the case of 1, both the cutting conditions in the tool sequence and the cutting conditions in the shape sequence are modified. |
|         | Program type | M |
|         | Conditions   | Immediate |
|         | Unit         | — |
|         | Setting range | 0, 1 |

<table>
<thead>
<tr>
<th>Roughness code</th>
<th>( K_1 )</th>
<th>( K_0 \times 0.8^{\cdot3} )</th>
<th>( K_0 \times 0.8^{\cdot2} )</th>
<th>( K_0 \times 0.8^{\cdot1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \nabla ) 1</td>
<td>( K_0 \times 0.8^{\cdot3} )</td>
<td>( \nabla \nabla ) 4</td>
<td>( K_0 )</td>
<td>( \nabla \nabla \nabla \nabla ) 7</td>
</tr>
<tr>
<td>( \nabla \nabla ) 2</td>
<td>( K_0 \times 0.8^{\cdot2} )</td>
<td>( \nabla \nabla \nabla ) 5</td>
<td>( K_0 \times 0.8 )</td>
<td>( \nabla \nabla \nabla \nabla ) 8</td>
</tr>
<tr>
<td>( \nabla \nabla \nabla ) 3</td>
<td>( K_0 \times 0.8^{\cdot1} )</td>
<td>( \nabla \nabla \nabla ) 6</td>
<td>( K_0 \times 0.8^{2} )</td>
<td>( \nabla \nabla \nabla \nabla ) 9</td>
</tr>
</tbody>
</table>

\( K_0 \) = Standard data 0.5
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E30</td>
<td>Radial clearance for wall attributes during line machining</td>
<td>An element that determines the starting point and escape point of radial cutting when CLOSED is specified for the wall attributes at the starting point and ending point of open-pattern line machining. When OPEN is specified, E2 is used.</td>
</tr>
</tbody>
</table>

**<CLOSED specified>**

![Diagram of CLOSED specified](image1)

**<OPEN specified>**

![Diagram of OPEN specified](image2)

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E31</td>
<td>Element that determines the amount of OPEN attribute wall protrusion for pocket-machining shape units</td>
<td>Element that determines the amount of OPEN attribute wall protrusion in pocket-machining shape units (POCKET, PCKT MT or PCKT VLY unit only)</td>
</tr>
</tbody>
</table>

![Diagram of E31](image3)

**Protrusion**

**Protrusion**

**Protrusion**

**Protrusion**

**CLOSED attribute**

**CLOSED attribute wall = \( \frac{\text{Tool dia. (Note)}}{10} \times \text{E31} \)**

**Note:** Nominal tool diameter in the tool sequence is used when tool data is absent.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E32</td>
<td>Element that automatically determines an approaching radius in a Z-direction helical approach scheme.</td>
<td>The approaching radius value to be used in the Z-direction helical approach scheme for helical machining is automatically determined by the parameter as follows: [ \text{Approaching radius} = \frac{\text{Tool dia.} \times E32}{100} ] - For helical approach (Helical circle 2 + 1/4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>Program type</th>
<th>Conditions</th>
<th>Conditions</th>
<th>Unit</th>
<th>Unit</th>
<th>Setting range</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>E32</td>
<td>M</td>
<td>After stop of movement</td>
<td>After stop of movement</td>
<td>%</td>
<td>%</td>
<td>1 to 999</td>
<td>1 to 999</td>
</tr>
</tbody>
</table>

| E33          | Approaching gradient during a helical approach scheme | Approaching gradient value during the helical approach scheme | Distance in Z-direction | Distance in XY-plane | - For helical approach (Helical circle 2 + 1/4) |

<table>
<thead>
<tr>
<th>Program type</th>
<th>Program type</th>
<th>Conditions</th>
<th>Conditions</th>
<th>Unit</th>
<th>Unit</th>
<th>Setting range</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>E33</td>
<td>M</td>
<td>After stop of movement</td>
<td>After stop of movement</td>
<td>%</td>
<td>%</td>
<td>1 to 999</td>
<td>1 to 999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
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</tr>
</tbody>
</table>
| E34     | Element that automatically determines an approaching distance in a Z-direction tapered approach scheme | The approaching distance value to be used in the Z-direction tapered approach scheme for tapered machining is automatically determined by the parameter as follows: 

\[
\text{Approaching distance} = \frac{\text{Tool dia.} \times E34}{100}
\]

- For tapered approach (3 tapers)

![Diagram showing approaching distance formula](image)

<table>
<thead>
<tr>
<th>Program type</th>
<th>Conditions</th>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>After stop of movement</td>
<td>%</td>
<td>1 to 999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| E35     | Approaching gradient during the tapered approach scheme | Approaching gradient value during the tapered approach scheme

\[
\frac{\text{Distance in Z-direction}}{\text{Distance in XY-plane}}
\]

- For tapered approach (3 tapers)

![Diagram showing approaching gradient](image)

<table>
<thead>
<tr>
<th>Program type</th>
<th>Conditions</th>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>After stop of movement</td>
<td>10%</td>
<td>1 to 999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>E36</td>
<td>Element that automatically determines an escape distance in the Z-direction tapered escape scheme</td>
<td>The escape distance value to be used in the Z-direction tapered escape scheme after tapered machining is automatically determined by the parameter as follows: ( \text{Escape distance} = \frac{\text{Tool dia.} \times E36}{10} )</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| E37 | Amount of return of pecking in the Z-axial pecking mode of face machining | This parameter indicates the amount of return of pecking in the Z-axial pecking mode of face machining. |
| Program type | M | |
| Conditions | After stop of movement | |
| Unit | Micron 0.001 mm 0.0001 inch Submicron for rotational axis 0.001 mm 0.0001 inch Submicron for all axes 0.0001 mm 0.00001 inch | |
| Setting range | 0 to 99999999 | |

| E38 | Returning feed rate of pecking in the Z-axial pecking mode of face machining | Set the returning feed rate of the pecking in the Z-axial pecking mode during the face machining. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | 0.01 mm/rev 0.001 inch/rev | |
| Setting range | 0 to 9999 | |

<p>| E39 to E54 | Invalid | |
| Program type | — | |
| Conditions | — | |
| Unit | — | |
| Setting range | — | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| E55 | 3-D Axial cutting-feed overriding | Feed overriding for cutting a workpiece in an axial direction using a 3-D unit. **Example:**

![Diagram](image1)

**Note:** Feed overriding is invalid when this parameter is 0.

| Program type | M |
| Conditions | Immediate |
| Unit | 10% |
| Setting range | 0 to 9 |

| E56 | 3-D Inversion check of curved-surface pattern | This parameter is used to select whether or not an alarm message is to be displayed if the curved surface of a defined pattern points in the – Z direction (normally, processing becomes impossible). **Example:**

![Diagram](image2)

**Note:** This parameter is invalid during high-speed rough processing.

| Program type | M |
| Conditions | Immediate |
| Unit | — |
| Setting range | 0, 1 |

| E57 | 3-D Severity check of cutting pitch | This parameter is used to select whether or not processing is to be performed in strict accordance with the tool-sequence pitch data setting. **Notes:**

1. This parameter is invalid during high-speed rough processing.
2. The operation time becomes long if this parameter is set to 1.

| Program type | M |
| Conditions | Immediate |
| Unit | — |
| Setting range | 0, 1 |

| E58 | 3-D Tool-diameter compensation | This parameter is used to select whether or not 3-D tool-diameter compensation according to tool data is to be made for the curved surface of a defined pattern **Example:**

![Diagram](image3)

<p>| Program type | M |
| Conditions | Immediate |
| Unit | — |
| Setting range | 0, 1 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-D</td>
<td>Allowance of axial-cutting start position</td>
<td>Element used to set the position in which the cutting feed in axial direction is to be started after the tool has been moved from the initial point toward the workpiece at a rapid feed rate. Example:</td>
</tr>
<tr>
<td>E59</td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td>Conditions Immediate</td>
<td>Unit 0.1 mm/0.01 inch</td>
<td>Setting range 0 to 999</td>
</tr>
<tr>
<td>3-D</td>
<td>Normal cutting allowance</td>
<td>The 3-D finish processing (cutting) allowance in the direction of the normal with respect to the defined pattern of the curved surface. Example:</td>
</tr>
<tr>
<td>E60</td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td>Conditions Immediate</td>
<td>Unit 0.1 mm/0.01 inch</td>
<td>Setting range 0 to 999</td>
</tr>
<tr>
<td>3-D</td>
<td>Search length for parallel cutting</td>
<td>The length of a short line segment which determines the next approximation point for tool-path creation. Depending on the tool-sequence selected: E61 is applicable for //1 or //2, or E62 is applicable for \1 or \2. This value will be handled as 0.1 mm (or 0.01 inch) if 0 is set here.</td>
</tr>
<tr>
<td>E61</td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td>Conditions Immediate</td>
<td>Unit 0.1 mm/0.01 inch</td>
<td>Setting range 0 to 999</td>
</tr>
<tr>
<td>3-D</td>
<td>Search length for right-angle cutting</td>
<td></td>
</tr>
<tr>
<td>E62</td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td>Conditions Immediate</td>
<td>Unit 0.1 mm/0.01 inch</td>
<td>Setting range 0 to 999</td>
</tr>
</tbody>
</table>
### E63
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E63</td>
<td>3-D Pattern display division segment (FL direction)</td>
<td>The number of segments into which the defined pattern of a curved surface is to be divided for display of the curved-surface pattern on the TOOL PATH CHECK display. Example: MPL046FL GL or normal to FL.</td>
</tr>
</tbody>
</table>

**Program type**: M  
**Conditions**: Immediate  
**Unit**: —  
**Setting range**: 0 to 999

**Note**: This parameter is used for display of a curved-surface pattern, and thus the pattern displayed may slightly differ from the actual pattern of the curved surface to be machined.

---

### E64
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E64</td>
<td>3-D Pattern display division segment (GL direction)</td>
<td>The allowance of cutting a workpiece along the wall of the area which has been set using the area check function. Example:</td>
</tr>
</tbody>
</table>

**Program type**: M  
**Conditions**: Immediate  
**Unit**: —  
**Setting range**: 0 to 999

---

### E65
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E65</td>
<td>3-D Radial cutting allowance for area check</td>
<td></td>
</tr>
</tbody>
</table>

**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.1 mm/0.01 inch  
**Setting range**: 0 to 999

---

### E66
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E66</td>
<td>3-D Axial cutting allowance for area check</td>
<td></td>
</tr>
</tbody>
</table>

**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.1 mm/0.01 inch  
**Setting range**: 0 to 999
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E67 to E75</td>
<td>3-D Processing error tolerance</td>
<td>The processing error tolerance with respect to a curved-surface pattern which corresponds to a #T setting (1 through 9) of the tool sequence.</td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.01 mm/0.001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 999</td>
<td></td>
</tr>
<tr>
<td>E76</td>
<td>3-D Entire-width override</td>
<td>The override value which becomes valid in case that the depth-of-cut in a radial direction becomes equal to the entire width (diameter) of the tool.</td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 9</td>
<td></td>
</tr>
<tr>
<td>E77</td>
<td>3-D Radial cutting allowance for high-speed rough processing (workpiece size appointment)</td>
<td>The clearance of high-speed rough processing (workpiece size appointment) between the tool and the figure.</td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.1 mm/0.01 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 999</td>
<td></td>
</tr>
<tr>
<td>E78</td>
<td>3-D Multiplying factor set for tolerance</td>
<td>0: 100%</td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 100</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>E79 to E82</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E83</th>
<th>3-D Region of radial machining during high-speed rough processing (offset appointment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
</tbody>
</table>

That amount of offset from a curved-surface pattern which determines the region of high-speed rough processing (offset appointment) in a radial direction.

Example: MPL051

<table>
<thead>
<tr>
<th>E84</th>
<th>3-D Region of axial machining during high-speed rough processing (offset appointment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
</tbody>
</table>

That distance from the bottom of a curved-surface pattern which determines the region of high-speed rough processing (offset appointment) in an axial direction.

Example: MPL052
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E85</td>
<td>3-D</td>
<td>Region of radial machining during high-speed rough processing: –X (workpiece size appointment)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>E86</td>
<td>3-D</td>
<td>Region of radial machining during high-speed rough processing: +X (workpiece size appointment)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>E87</td>
<td>3-D</td>
<td>Region of radial machining during high-speed rough processing: –Y (workpiece size appointment)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>E88</td>
<td>3-D</td>
<td>Region of radial machining during high-speed rough processing: +Y (workpiece size appointment)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>E89</td>
<td>3-D</td>
<td>Region of axial machining during high-speed rough processing (workpiece size appointment)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>That distance from the bottom of a curved-surface pattern which determines the region of high-speed rough processing (workpiece size appointment) in an axial direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Example: Region to be machined (Curved-surface pattern)</td>
</tr>
</tbody>
</table>

```
+Z

Region to be machined

Curved-surface pattern

Material height
```

<table>
<thead>
<tr>
<th>Program type</th>
<th>Conditions</th>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Immediate</td>
<td>0.1 mm/0.01 inch</td>
<td>0 to 9999</td>
</tr>
</tbody>
</table>

| E90         | —          | Invalid |

<table>
<thead>
<tr>
<th>Program type</th>
<th>Conditions</th>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
### Tool-path pattern selection for end milling-mountain unit

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E91</td>
<td></td>
<td>7 6 5 4 3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>0: Machining from inside to outside</td>
<td>0: Machining from inside to outside</td>
</tr>
<tr>
<td></td>
<td>1: Machining from outside to inside</td>
<td>1: Machining from inside to outside</td>
</tr>
<tr>
<td></td>
<td>0: Cutting direction inverted</td>
<td>1: Cutting direction fixed</td>
</tr>
<tr>
<td></td>
<td>1: Cutting direction fixed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: The R-point height is set always to E9.</td>
<td>0: The R-point height is set always to E9.</td>
</tr>
<tr>
<td></td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
</tr>
<tr>
<td></td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
</tr>
<tr>
<td></td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
</tr>
<tr>
<td></td>
<td>1: Rapid feed up to the intended surface + E9</td>
<td>1: Rapid feed up to the intended surface + E9</td>
</tr>
<tr>
<td></td>
<td>0: Tool path based on inside shape</td>
<td>0: Tool path based on inside shape</td>
</tr>
<tr>
<td></td>
<td>1: Tool path based on outside shape</td>
<td>1: Tool path based on outside shape</td>
</tr>
</tbody>
</table>

**Notes:**

1. If bit 0 = 0, tool path based on inside shape is selected automatically, irrespective of value of bit 7.
2. If bit 0 = 1 and bit 7 = 0, fixed direction of cutting is selected automatically, irrespective of value of bit 1.
3. Bit 4 becomes valid only for two or more rounds of cutting.

---

### Tool-path pattern selection for pocket milling unit

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E92</td>
<td></td>
<td>7 6 5 4 3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>0: Machining from inside to outside</td>
<td>0: Machining from inside to outside</td>
</tr>
<tr>
<td></td>
<td>1: Machining from outside to inside</td>
<td>1: Machining from outside to inside</td>
</tr>
<tr>
<td></td>
<td>0: The R-point height is set always to E9.</td>
<td>0: The R-point height is set always to E9.</td>
</tr>
<tr>
<td></td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
</tr>
<tr>
<td></td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
</tr>
<tr>
<td></td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
</tr>
<tr>
<td></td>
<td>1: Rapid feed up to the intended surface + E9</td>
<td>1: Rapid feed up to the intended surface + E9</td>
</tr>
</tbody>
</table>

---

Program type: M

Conditions: Immediate

Unit: Bit

Setting range: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E93</td>
<td>Tool-path pattern selection for pocket milling-mountain unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td></td>
<td>0: Machining from inside to outside</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Machining from outside to inside</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Cutting direction inversed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Cutting direction fixed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: The R-point height is set always to E9.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Rapid feed up to the intended surface + E9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E94</td>
<td>Tool-path pattern selection for pocket milling-valley unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td></td>
<td>0: Machining from inside to outside</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Machining from outside to inside</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Cutting direction inversed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Cutting direction fixed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: The R-point height is set always to E9.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: The clearance on X-Y plane is set always to E2.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: The clearance on X-Y plane is set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Rapid feed up to the intended surface + E9</td>
<td></td>
</tr>
</tbody>
</table>
## Tool-path pattern selection for line machining unit

**Classification** USER  
**Display title** LINE/FACE/3D

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| E95     |         | For the 2nd and subsequent rounds of cutting:  
          |         | 0: Not via the approach point  
          |         | 1: Via the approach point  
          |         | For the 2nd and subsequent rounds of cutting:  
          |         | 0: Escape to the Z-axis initial point  
          |         | 1: No escape on the Z-axis  
          |         | 1: Rapid feed up to the intended surface + E9  
          |         | 1: Escape is set to a point where the tool comes out of the removal allowance.  
          |         | The R-point height for central, right hand, left hand, outside and inside linear machining is:  
          |         | 0: Set always to E9  
          |         | 1: Set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively.  
          |         | The X-Y plane clearance for outside and inside linear machining is:  
          |         | 0: Set always to E2  
          |         | 1: Set to E5 or E2 when there is or isn’t pre-machining in the same unit, respectively.  

### Bit 2

- Bit 2 = 0
- Initial point
- Approach point
- Cutting start point

### Bit 3

- Approch point
- Escape point
- Bit 3 = 0
- Initial point
- Bit 3 = 1

### Bit 5

- Bit 5 = 0
- E2
- WID-R
- Escape point
- Bit 5 = 1
- E2

**Note:** Bit 3 valid only for inside/outside line machining unit.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E96</td>
<td>Tool-path pattern selection for end milling-slot unit</td>
<td>0: The R-point height is set always to E9. 1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively. For the 2nd and subsequent rounds of cutting: 0: Not via the approach point 1: Via the approach point 1: Rapid feed up to the intended surface + E9 Returning feed rate override of the end milling-slot unit 0: Invalid 1: Valid</td>
</tr>
<tr>
<td>E97</td>
<td>Tool-path pattern selection for end milling-top unit</td>
<td>0: The R-point height is set always to E9 1: The R-point height is set to E7 or E9 when there is or isn’t pre-machining in the same unit, respectively. 1: Rapid feed up to the intended surface + E9</td>
</tr>
<tr>
<td>E98</td>
<td>Cutting method selection for end milling-mountain, pocket milling-valley unit</td>
<td>1: The 1st cutting amount exceeds the command value at end milling-mountain or pocket valley-machining.</td>
</tr>
<tr>
<td>E99</td>
<td>—</td>
<td>Milling feed rate specification range for the shape sequence of the MAZATROL program 0: Valid for roughing 1: Valid for finishing Bottom/wall simultaneous finishing mode for pocket machining 0: Sequential (Conventional scheme) 1: Simultaneous</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>E100 to E103</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

**Tool path selection**

| Program type | M |
| Conditions | Immediate |
| Unit | Bit |
| Setting range | Binary, eight digits |

| E104 | |
| Cutting method after line machining approach point auto-setting |
| 0: Same operation as before auto-setting |
| 1: Operation with manually entered data |
| This bit specifies the returning position for each cutting operation during face-machining. |
| 0: Clearance point |
| 1: Initial point |

| E105 to E144 | — |
| Program type | — |
| Conditions | — |
| Unit | — |
| Setting range | — |

| Bit | |
| 7 | 6 |
| 5 | 4 |
| 3 | 2 |
| 1 | 0 |

Invalid
## 2-3-4 User parameter  EIA/ISO (F)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| F1      | Corner deceleration coefficient | When \((L74/L75) \times (F1/100)\) is assigned as the allowable acceleration attained before corner deceleration is started, the theoretical value \(V_o\) of the corner deceleration in G61.1 will be changed to the following \(V_o'\) value:  
\[
V_o' = V_o \times \frac{F1}{100}
\]

**Note:**
- The assigned value is invalid if minus. If 0 is assigned, the deceleration coefficient will be regarded as 100, or if more than 500 is assigned, the deceleration coefficient will be regarded as 500. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | % | |
| Setting range | 0 to 500 | |
| F2      | Arc-clamping speed coefficient | When \((L74/L75) \times (F2/100)\) is assigned as the allowable acceleration attained before arc radius speed clamping is started, the theoretical value \(V_c\) of the arc radius clamping speed in G61.1 will be changed to the following \(V_c'\) value:  
\[
V_c' = V_c \times \sqrt{\frac{F2}{100}}
\]

**Note:**
- The assigned value is invalid if minus. If 0 is assigned, the deceleration coefficient will be regarded as 100, or if more than 500 is assigned, the deceleration coefficient will be regarded as 500. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | % | |
| Setting range | 0 to 500 | |
| F3 | — | High-speed smoothing control
- 0: Invalid
- 1: Valid
- Deceleration at stepped sections in high-speed smoothing control mode
- 0: No deceleration at very slightly stepped sections
- 1: Deceleration at all stepped sections
- Fixed value (0) |
<p>| Program type | E | |
| Conditions | After stop of movement | |
| Unit | — | |
| Setting range | 0, 1 | |
| F4 | Fixed value (0) | — | — | — |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F5</td>
<td>Fixed value (0)</td>
<td>Specify the minimum height of stepped sections at which the axis feed is not to be decelerated in high-speed smoothing control mode.</td>
</tr>
<tr>
<td>F6</td>
<td>Minimum allowable height of stepped sections for deceleration in high-speed smoothing control mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 100</td>
</tr>
<tr>
<td>F7</td>
<td>Fixed value (0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>F8</td>
<td>Corner deceleration speed coefficient for high-speed smoothing control</td>
<td>Corner deceleration speed $V_o$ determined by the optimal corner deceleration function is adjusted using the value set in this parameter. $V_o = V_o \times \frac{F8}{100}$ The speed is not adjusted if 0 is set here. (Setting is handled as 100.) Setting more than 2000 is disposed as 2000.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 2000</td>
</tr>
</tbody>
</table>
### Classification | USER | Display title | EIA/ISO
--- | --- | --- | ---

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **F9** | Circler cutting clamp speed coefficient for high-speed smoothing control | Circler cutting clamp speed \( V_c \) is adjusted using the value set in this parameter. \[
V_c = V_c \times \sqrt{\frac{F9}{100}}
\]
The speed is not adjusted if 0 is set here. (Setting is handled as 100.) Setting more than 500 is disposed as 500. |
| Program type | E | |
| Conditions | Immediate | |
| Unit | % | |
| Setting range | 0 to 500 | |

| **F10** | | Not used. |
| Program type | — | |
| Conditions | — | |
| Unit | — | |
| Setting range | — | |

| **F11** | Vector constant for 3-D tool-diameter compensation | |
| Program type | Next block | |
| Conditions | 0.001 mm/0.0001 inch (0.001°) | |
| Unit | — | |
| Setting range | 0 to 99999999 | |

**Note:**
\[
F11 = \sqrt{I^2 + J^2 + K^2} \quad \text{if this parameter is 0.}
\]

### F12
Return amount of pecking in drill high-speed deep-hole cycle or in G73 tool path

<p>| Program type | M, E | |
| Conditions | Next block | |
| Unit | 0.001 mm/0.0001 inch | |
| Setting range | 0 to 99999999 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F13</strong></td>
<td>Allowance amount of rapid-feed stop in deep-hole drilling cycle or in G83</td>
<td>The allowance amount provided for the tool to stop moving at rapid-feed just in front of the preceding hole during a deep-hole drilling cycle or during G83 tool path</td>
</tr>
</tbody>
</table>

| Program type | M, E |
| Conditions | Next block |
| Unit | 0.001 mm/0.0001 inch |
| Setting range | 0 to 99999999 |

| **F14** | Rotation center of coordinates (axis of abscissa) |
| Program type | — |
| Conditions | At power on |
| Unit | 0.001 mm/0.0001 inch |
| Setting range | 0 to ±99999999 |

| **F15** | Rotation center of coordinates (axis of ordinate) |
| Program type | — |
| Conditions | At power on |
| Unit | 0.001 mm/0.0001 inch |
| Setting range | 0 to ±99999999 |

<p>| <strong>F16</strong> | Horizontal length of coordinate rotation |
| Program type | — |
| Conditions | At power on |
| Unit | 0.001 mm/0.0001 inch |
| Setting range | 0 to ±99999999 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F17</td>
<td>Vertical length of coordinate rotation</td>
<td>Vector of coordinate rotation (axis of ordinate)</td>
</tr>
<tr>
<td>F18</td>
<td>Angle of coordinate rotation</td>
<td></td>
</tr>
<tr>
<td>F19</td>
<td>Maximum permissible difference in arc radius</td>
<td>Maximum radius difference that causes spiral interpolation to be performed when the arc-drawing start point and end point radii that have been specified in the arc command do not agree.</td>
</tr>
<tr>
<td>F20</td>
<td>Fixed value of scaling factor</td>
<td>That fixed value of the scaling factor which becomes valid in the case that no value is set (using the address $P$) in the same block as that of G51.</td>
</tr>
</tbody>
</table>

*Program type:*
- **F17, F18:** Program type — Conditions: At power on
- **F19:** Program type: M, E Conditions: Next block
- **F20:** Program type: E Conditions: Next command

*Unit:* 0.001 mm/0.0001 inch

*Setting range:*
- F17: 0 to ±99999999
- F18: 0 to ±180000
- F19: 0 to 9999
- F20: 0 to 99999999

*Machining pattern:*
- $R \leq F19$: Spiral interpolation
- $R > F19$: Alarm

*Machining pattern with scaling center:*
- $b = \frac{b}{a}$
## EIA/ISO

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F21</td>
<td>Maximum inside-corner angle available with automatic corner override (G62)</td>
<td>The automatic corner override using the G62 code becomes valid when the following condition of the shape angle is met: Shape angle ≤ F21</td>
</tr>
</tbody>
</table>

- **Program type**: E  
- **Conditions**: Next command  
- **Unit**: 1°  
- **Setting range**: 0 to 179

### Deceleration area of automatic corner overriding (G62)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F22</td>
<td>Deceleration area of automatic corner overriding (G62)</td>
<td>The area in which automatic corner overriding using the G62 code occurs happens here.</td>
</tr>
</tbody>
</table>

- **Program type**: E  
- **Conditions**: Next command  
- **Unit**: 0.001 mm/0.0001 inch (0.001°)  
- **Setting range**: 0 to 99999999

### Handling of G92 (spindle speed clamp value) command at restart

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| F27     | Handling of G92 (spindle speed clamp value) command at restart | 0: Only the last G92SsQqRr command is enabled.  
1: All the G92SsQqRr commands are enabled.  
2 to 8: Not used.  
9: The spindle speed clamp value is invalid at restart. |

- **Program type**: E  
- **Conditions**: Immediate  
- **Setting range**: 0 to 9
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F28</td>
<td>Threading chamfering angle</td>
<td>Set chamfering angle at thread portion in thread cutting cycle. G76 and G92 are used for threading cutting cycle, if F30 is set to 0. G276 and G292 are used for threading cutting cycle, if F30 is set to 1.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 45, 60</td>
<td></td>
</tr>
<tr>
<td>F29</td>
<td>Override value of automatic corner overriding (G62)</td>
<td>The override value of automatic corner overriding using the G62 code.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Next command</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 100</td>
<td></td>
</tr>
<tr>
<td>F30</td>
<td>G-code type</td>
<td>Selecting a G-code type. 0: G-code series for machining centers, 1: G-code series for turning machines. Settings other than the above are all handled as 0.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: At power on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: Decimal number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0, 1</td>
<td></td>
</tr>
<tr>
<td>F31 to F39</td>
<td>Invalid</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| F40     | Operating method selection in tape mode | 0: Tape operation  
1: Hard disc operation  
2: IC memory card operation  
3: Ethernet operation |
|         | Program type | E |
|         | Conditions   | Immediate |
|         | Unit         | — |
|         | Setting range | 0 to 3 |
| F41     | Threading termination waiting time processing | Set a threading termination waiting time.  
F41 = 0, 1 or 128 to 255  
No waiting time  
F41 = 2 to 127  
(Setting – 1) × 3.5 msec |
|         | Program type | M |
|         | Conditions   | Immediate |
|         | Unit         | 3.5 ms |
|         | Setting range | 0 to 255 |
| F42     | Deceleration area r during Z-axis measurement | Distance (r) between the starting point of movement at measuring speed and the measuring point.  
This data is used when argument R is omitted in G37 command format.  
G37 Z_ Rr D_ F_; |
|         | Program type | E |
|         | Conditions   | After stop of movement |
|         | Unit         | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 99999999 |
| F43     | Measurement area d during Z-axis measurement | Range (d) where the tool should stop.  
This data is used when argument D is omitted in G37 command format.  
G37 Z_ R_ Dd F_; |
|         | Program type | E |
|         | Conditions   | After stop of movement |
|         | Unit         | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 99999999 |
### Measuring speed f

**Address**: F44  
**Program type**: E  
**Conditions**: After stop of movement  
**Unit**: 1 mm/min / 1 inch/min  
**Setting range**: 0 to 120000

Measuring speed (f)  
This data is used when argument F is omitted in G37 command format.

\[ G37 \ X_ \ R_ \ D_ \ Ff; \]

Standard setting 1 to 60000 mm/min  
1 to 2362 inch/min

### Deceleration area r during X-axis measurement

**Address**: F45  
**Program type**: E  
**Conditions**: After stop of movement  
**Unit**: 0.001 mm/0.0001 inch  
**Setting range**: 0 to 99999999

Distance (r) between the starting point of movement at measuring speed and the measuring point  
This data is used when argument R is omitted in G37 command format.

\[ G37 \ X_ \ Rr \ D_ \ F_; \]

### Deceleration area d during X-axis measurement

**Address**: F46  
**Program type**: E  
**Conditions**: After stop of movement  
**Unit**: 0.001 mm/0.0001 inch  
**Setting range**: 0 to 99999999

Range (d) where the tool should stop  
This data is used when argument D is omitted in G37 command format.

\[ G37 \ X_ \ R_ \ Dd \ F_; \]

### Common variable name

**Address**: F47 to F66  
**Program type**: —  
**Conditions**: —  
**Unit**: —  
**Setting range**: —

The name of the variable specified by the user macro SETVN is displayed (Name display only. No setting is possible on the PARAMETER display.)

- **F47**: Name of #500  
- **F66**: Name of #519
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F67</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>F68</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

**Program type** —

**Conditions** —

**Unit** —

**Setting range** —

---

**EIA/ISO program restart method**

Program type —

**Conditions** —

**Unit** —

**Setting range** 0, 1

This parameter is used to select the method of specifying the EIA/ISO program restarting position. Two methods are available:

0: The whole program, including the subprograms, is subjected to this processing. Set the sequence number, block number and number of times of repetition as searched from the beginning part of the main program.

1: The subprogram including the desired restart position can be specified. After setting the work number of the corresponding program, set the sequence number, block number, and number of times of repetition as searched from the beginning part.

---

**Availability of multiple-machining and designated number of repetitions in the EIA/ISO subprogram**

Program type —

**Conditions** —

**Unit** —

**Setting range** 0, 1

When the EIA/ISO program is called up as a subprogram, this parameter is used to validate/invalidate multiple-machining and the specified number of times to restart the program.

0: Multiple-machining is effective for the EIA/ISO subprogram. Specified number of times to restart the EIA/ISO subprogram is effective.

1: Multiple-machining is ineffective for the EIA/ISO subprogram. Specified number of times to restart the EIA/ISO subprogram is ineffective.

---

**Machining order control**

Program type —

**Conditions** —

**Unit** —

**Setting range** 0, 1

Tool priority and multiple-machining priority selection

0: Identical-tool priority function is executed first.

1: Multiple-machining function is executed first.

**Example:**

Multiple-machining of two workpieces using a spot drill

![Diagram](MPL065.png)

---

2-115
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F72</strong></td>
<td>Selection of the shape correction function of the MAZATROL program</td>
<td>To select whether the shape correction function of the MAZATROL program is always effective or ineffective. 0: Invalid 1: Shape correction function only valid 2: Shape correction function and high-precision true-circle function (reversed type) valid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1, 2</td>
<td></td>
</tr>
</tbody>
</table>

**F73**

M-code execution time for time study

| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 0.01 sec. | |
| Setting range | 0 to 10000 | |

**F74**

S-code execution time for time study

| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 0.01 sec. | |
| Setting range | 0 to 10000 | |

**F75**

T-code execution time for time study

<p>| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 0.01 sec. | |
| Setting range | 0 to 10000 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F76</strong></td>
<td>B-code execution time for time study</td>
<td>The tool-path check time study time that is accumulated each time a B-code is output.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.01 sec.</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 10000</td>
<td></td>
</tr>
</tbody>
</table>

| **F77** | Basis rate for tool life judgment | The basis rate for the NC to judge whether the tool is to be displayed in reverse display mode on the TOOL DATA display to indicate that the life of that tool is approaching expiry. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | %, min | |
| Setting range | 0 to 9999 | |

**Note:**
The above judgment function is invalid if this parameter is set to 0.

| **F78** | Selection of separating ratio of graphic display | Selection of separation ratio between side view and front view (or rear view) when two split plane indication mode has been selected. |
| Program type | M, E | |
| Conditions | Immediate | |
| Setting range | 0, 1, 2 | |

Example: F78 = 1

![Diagram](NM211-00217)  
Side view  
Front view  

2 : 1
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parameters:
- **Program type**: M, E
- **Conditions**: Immediate
- **Unit**: Bit
- **Setting range**: Binary, eight digits

**Description**:
- **Holding of memory monitor address**
  - 0: No
  - 1: Yes
- **Selection of menu display**
  - 0: Menu for machining centers
  - 1: Menu for turning centers
- **Key history function**
  - 0: Yes
  - 1: No
- **Tool search method**
  - 0: In order of TNo.
  - 1: In order of TNo. of tools currently in use
- **Selection of tap gear**
  - 0: M32 system
  - 1: M640M Pro system (M640M/M PLUS system)
- **Display of tools currently in use**
  - 0: No
  - 1: Yes
- **Initial value of synchronous/asynchronous tapping during tapping tool registration**
  - 0: Synchronous tapping
  - 1: Asynchronous tapping
- **Display of a MAZATROL monitor window**
  - 0: Yes
  - 1: No

---

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parameters:
- **Program type**: M, E
- **Conditions**: Immediate
- **Unit**: Bit
- **Setting range**: Binary, eight digits

**Description**:
- **MAZATROL function**
  - 0: Valid
  - 1: Invalid (Only EIA-related displays valid)
- **Automatic display of the navigation window on the occurrence of an alarm**
  - 0: Display off
  - 1: Display on
- **MAINTENANCE CHECK display at power on**
  - 0: Not displayed
  - 1: Displayed
- **Third page of the MAINTENANCE CHECK display**
  - 0: Not displayed
  - 1: Displayed
- **Automatic display of the GRAPHIC MAINTENANCE display on the occurrence of an alarm**
  - 0: Display off
  - 1: Display on
- **Learning of cutting conditions**
  - 0: Invalid
  - 1: Valid
- **Editing on the CUTTING CONDITION LEARN display**
  - 0: Invalid
  - 1: Valid
- **Destination of spare tool correction by the workpiece measurement**
  - 0: Tool length and tool diameter of the TOOL DATA display
  - 1: Tool length and tool diameter correction of the TOOL DATA display
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

Program management function
0: Normal
1: Editing prohibited (in 9000’s)
Program management function
0: Normal
1: Displaying prohibited (in 9000’s)
Fixed value (0)
Add-in MAZATROL
0: Invalid
1: Valid
Program management function
0: Normal
1: Editing prohibited (in 8000, 9000’s)
Program management function
0: Normal
1: Displaying prohibited (in 8000, 9000’s)
Retaining the program transfer settings
0: Invalid
1: Valid
Input error prevention function
0: Invalid
1: Valid

<table>
<thead>
<tr>
<th>F82</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

0: Characteristics estimation result graph display off
1: Characteristics estimation results graph display on
Selection of inch/metric representation in POSITION display, TOOL DATA display, and TOOL OFFSET display modes
0: Invalid
1: Valid
Basis for tool life judgment
0: Whether the rate of the operation time to the estimated life is greater than the setting of the F77 parameter
1: Whether the residual life is less than the setting of the F77 parameter
X-axis diameter display on the POSITION display
0: Invalid
1: Valid
Specify whether the stored tools registration function on the VISUAL TOOL MANAGEMENT display is to be made valid or invalid when the visual tool ID/data management functions are valid
0: Invalid
1: Valid

Note:
Bit 1 in parameter F82 is valid only when an inch/metric unit system change simplifying function (option) is provided.
## Classification

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F83</td>
<td>_</td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

### Output of the alarm history data as text data
- **0**: Valid
- **1**: Invalid

### Operation record function
- **0**: Invalid
- **1**: Valid

### Program conversion type selection 1
- **0**: Based on program conversion type selection 2
- **1**: Conversion of M640MT/M640MT Pro into a Z/C offset scheme or conversion of M640M Pro into a WPC scheme

### Program conversion type selection 2
- **0**: Conversion into the WPC scheme
- **1**: Conversion into the Z/C offset scheme

### CMT/DNC input conversion type selection
- **0**: Input as M640MT
- **1**: Input as M640T

### Note:

Bit 6 in **F83** is used to identify the type of program during input from CMT or DNC.

### Program type
- **M, E**

### Conditions
- **Immediate**

### Unit
- **Bit**

### Setting range
- **Binary, eight digits**
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F84</td>
<td>Tool offset data is taken into account for the current-position counter during execution of EIA programs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fixed cycle (B → J)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spare tool search for EIA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timing to validate new workpiece offset data specified with a system variable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machine coordinate system (G92) selection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incremental/absolute data command in high-speed machining mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tape operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When no tool data has been designated during EIA/ISO program execution with the MAZATROL tool length data validated.</td>
<td></td>
</tr>
</tbody>
</table>

**Program type**: M, E  
**Conditions**: At power on  
**Unit**: Bit  
**Setting range**: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[7:0]</td>
<td></td>
<td>Table rotational machining&lt;br&gt; 0: Always valid 1: Outside the area only&lt;br&gt;Ignorance of radial interference check&lt;br&gt;Type of coordinate system for controlling the tool tip point&lt;br&gt;0: The table coordinate system that rotates according to the particular rotation of the C-axis is defined as the programming coordinate system.&lt;br&gt;1: The work coordinate system is defined as the programming coordinate system.&lt;br&gt;Tool tip point control scheme&lt;br&gt;0: Uni-axial rotation interpolation&lt;br&gt;1: Joint interpolation&lt;br&gt;Fixed value (0)&lt;br&gt;Reset to cancel G68.2&lt;br&gt;0: Valid&lt;br&gt;1: Invalid&lt;br&gt;Display of surface definition θ&lt;br&gt;0: Invalid&lt;br&gt;1: Valid&lt;br&gt;Output of the B-axis unclamping code before B-axis indexing&lt;br&gt;0: To output&lt;br&gt;1: Not to output</td>
</tr>
</tbody>
</table>

- bit 3 = 0

In the case of uni-axis rotational interpolation, the pivot point of the machine moves as denoted by the arrow. The tool attitude vector moves in a plane including R1 and R2. Face horizontal to R1 and R2.

- bit 3 = 1

In the case of joint interpolation, the pivot point of the machine moves as denoted by the arrow. The tool attitude vector moves along a conical surface.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>F86</td>
<td></td>
</tr>
</tbody>
</table>

- **bit 2 = 0**
  - Makes the override function valid for the movement of the tool tip point.

- **bit 2 = 1**
  - Makes the override function valid for the clamping speed at the machine control point.

If the moving speed of the axis exceeds the setting of machine parameter M1 (i.e., the maximum rapid feed rate), the override function will work for that setting.

---

**Program type**: M, E

**Conditions**: At power on

**Unit**: Bit

**Setting range**: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F87</td>
<td></td>
<td>![Binary Diagram]</td>
</tr>
</tbody>
</table>

- **Program type**: M, E
- **Conditions**: At power on
- **Unit**: Bit
- **Setting range**: Binary, eight digits

Gap offset type
- **0**: Moves the machine.
- **1**: Does not move the machine.

Zero point mismatch check
- **0**: Valid (an alarm is output in case of a mismatch)
- **1**: Invalid

Data alteration checking function
- **0**: Invalid
- **1**: Valid
### Address Meaning Description

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F88</td>
<td></td>
<td>Set this parameter to specify functions related to the conversion from MAZATROL program into an EIA program.</td>
</tr>
</tbody>
</table>

#### Conversion of a part of program into sub-program (See Note.)
- Output method of G-code for point machining
  - 0: G-code of fixed cycle
  - 1: G-code in 1 digit
- Output of G10 and G92.5 in conversion of WPC data
  - 0: Not to output
  - 1: To output
- Output of tool diameter correction G-code
  - 0: Not to output G-code
  - 1: To output G-code
- Tool path modification caused by tool diameter correction
  - 0: Correction is not included in path
  - 1: Correction is included in path

#### Fixed value (0)
- Fixed value (1)

#### Note:
- When bit 0 of F88 is set to 1 on converting to the EIA program, the line machining, groove machining, face machining portions in the MAZATROL program are respectively programmed as subprograms.

#### Example:
- Subprograms that can be called out of the MAZATROL program are not reprogrammed as subprograms of the EIA program.
- Manual program mode unit is not programmed as subprogram.
- It can be selected to make a subprogram with parameter.

### Common unit
- [1]: FCE MILL
- [2]: LINE CTR
- [3]: END

### Conversion into EIA program

#### Main program
- (UNo.1001);
- G17G0G40G54G64G90G94;
- G80;
- [1]:
- N1(UNo.2FACE-MILL);
- M98P1001H1;
- G1Z-2;
- M98P1001H1;
- G2X10Y10R5;
- G1X50;
- [4]:
- G9X60, Y60;
- M94;
- N2(UNo.3LINE-CTR);
- M98P1001H2;
- [2]:
- N2(UNo.3LINE-CTR);
- M98P1001H2;
- G2X40Y10R5;
- M99;
- [5]:
- G2X30, Y15, R5;
- M94;
- [2]:
- N3(UNo.4END);
- M30;
- %

#### Subprogram
- N1(UNo.2FACE-MILL);
- G0X5, Y2;
- G1X50;
- [4]:
- G9X60, Y60;
- M94;
- N2(UNo.3LINE-CTR);
- G2X10Y10R5;
- G1X50;
- [5]:
- G2X40Y15R5;
- M94;
- %

### Unit of machining units
- Common unit
- [1]: FCE MILL
- [2]: LINE CTR
- [3]: END

### Program type
- M, E

### Conditions
- Immediate

### Unit
- Bit

### Setting range
- Binary, eight digits

---

2-125
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F89</td>
<td></td>
<td>Set this parameter to specify functions related to the conversion from MAZATROL program into an EIA program.</td>
</tr>
</tbody>
</table>

| Program type | M, E |
| Conditions   | Immediate |
| Unit         | Bit |
| Setting range | Binary, eight digits |

| F90     | Invalid |
|         |         |

| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range | — |
### Address: F91

<table>
<thead>
<tr>
<th>Unit</th>
<th>Setting range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit</td>
<td>Binary, eight digits</td>
<td>In response to move command without decimal point:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Tool moves by 1/1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Tool moves by 10/1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coordinate system shift using a MAZATROL program:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Valid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Stroke inside check before movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Stroke outside check before movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Metric (Initial G20 is valid/invalid)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Inch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In response to move command without decimal point:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Tool moves in 0.0001 mm (0.00001 inch) increments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Tool moves in 1 mm (1 inch) increments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: G00 interpolation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: G00 non-interpolation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: G33E command is for the number of threads per inch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: G33E command is for thread cutting with precise lead</td>
</tr>
</tbody>
</table>

**Note:**
For changing bit 4 (millimeter/inch system), set M18 bit 7 to 0 once for zero point return execution if the simplified software OT function is effective (when machine parameter M18 bit 7 = 1, R2 bit 7 = 0).
(This initialization is required when the simplified OT function is effective even for one axis.)

### Address: F92

<table>
<thead>
<tr>
<th>Unit</th>
<th>Setting range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit</td>
<td>Binary, eight digits</td>
<td>Modal at power-on or at reset (Initial G18)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: G17 or G19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: G18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Modal at power-on or at reset (Initial G19)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: G17 or G18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: G19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0), Dwell command always in time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool-length compensation (G43 or G44) axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Program command axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Z-axis fixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool-diameter compensation (G41 or G42) start up/cancel type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Type A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Type B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool-diameter compensation (G41 or G42) interference check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Alarm stop occurs to prevent overcutting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Tool path is changed to prevent overcutting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed-cycle hole-drilling axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Plane selection using G17, G18 or G19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Z-axis fixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool diameter compensation for an EIA/ISO program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Tool offset fixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Tool data valid</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>F93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F93**

Program type: M, E

Conditions: At power on

Unit: Bit

Setting range: Binary, eight digits

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F94**

Program type: M, E

Conditions: At power on

Unit: Bit

Setting range: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| F95     | —       | Interrupt function using user macro instruction
|         |         | 0: Invalid  |
|         |         | 1: Valid    |
|         |         | Handling of macroprogram interruption and call
|         |         | 0: Handled as interruption |
|         |         | 1: Handled as subprogram call |
|         |         | Automatic return position to restart the program (Fixed to 1) |
|         |         | 0: Manual return |
|         |         | 1: Automatic return |
|         |         | G00 (positioning) command feed rate for dry run
|         |         | 0: Rapid feed rate |
|         |         | 1: Feed rate for dry run |
|         |         | Manual-pulse interrupt amount cancellation with reset key
|         |         | 0: Invalid |
|         |         | 1: Valid |
|         |         | With reset key |
|         |         | 0: Coordinate system corresponding to G54 |
|         |         | 1: Coordinate system unchanged. |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| F96     | —       | Selection of variable number for tool offset amount
|         |         | 0: 16001 to 16512, 17001 to 17512 |
|         |         | 1: 12001 to 12512, 13001 to 13512 |
|         |         | Fairing function
|         |         | 0: Invalid |
|         |         | 1: Valid |
|         |         | Processing for arc command blocks in high-speed machining mode
|         |         | 0: Nonuniform feed |
|         |         | 1: Uniform feed |
|         |         | Selection of a corner judgment criterion in high-speed machining mode
|         |         | 0: Judgment from the angle relative to adjacent blocks |
|         |         | 1: Judgment by excluding the small block (if present between large-angle blocks) |
|         |         | Selection of a cutting feed clamping speed in high-speed machining mode
|         |         | 0: Minimum clamping speed of movable axes |
|         |         | 1: Clamping speed based on the radius of the curvature |
|         |         | Rotational axis shape correction
|         |         | 0: Invalid |
|         |         | 1: Valid |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>
### Address: F97

**Selection of G-code of the coordinates system to be used in the EIA conversion function**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting value</th>
<th>Coordinates system</th>
<th>Setting value</th>
<th>Coordinates system</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>G54</td>
<td>5</td>
<td>G58</td>
</tr>
<tr>
<td>2</td>
<td>G55</td>
<td>6</td>
<td>G59</td>
</tr>
<tr>
<td>3</td>
<td>G56</td>
<td></td>
<td>Others</td>
</tr>
<tr>
<td>4</td>
<td>G57</td>
<td></td>
<td>G54</td>
</tr>
</tbody>
</table>

To select G-code modal of the coordinates system to be used in the EIA conversion function.

### Address: F98

**Number of macro variable to be used in the EIA conversion function**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>100 to 199 500 to 999</td>
</tr>
</tbody>
</table>

To specify the number of a macro variable to be used in the EIA conversion function.

If any macro variable is not used, set to 0.

In case of output with a subprogram in the EIA conversion, the height of cutting face is set with a macro variable. Set to F98 the number of the macro variable to be used.

```
M98 P_H_;
M30;
%
```

Notes:
1. 3D machining cannot be output using subprograms.
2. Subprogram is output in the absolute mode (G90).
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| F99     | Offset amount for the subprogram WNo. to the main WNo. concerned in case of output with subprogram in the EIA conversion function | In case of output with subprogram in the EIA conversion function:  
**Example:**  
WNo. 10  
When F99 is “20”.  
EIA conversion (The WNo. of the converted program is assumed to be 1000.)  
Main WNo. 1000  
Sub WNo. 1020  
Offset amount: 20  
For the subprogram of the EIA conversion function, refer to F88 bit 0. |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 1 to 9999998 |  |

<table>
<thead>
<tr>
<th>F100</th>
<th>Spline cancel length</th>
<th>If the commanded distance in a block exceeds the spline cancel length (F100), spline interpolation is not realized in this block even in the spline interpolation mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 999999</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F101</th>
<th>Spline cancel angle</th>
<th>If the angle formed by two blocks exceeds the value set by the parameter F101, spline interpolation is not realized in these blocks even in the spline interpolation mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1°</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 179</td>
<td></td>
</tr>
</tbody>
</table>
## F102
### Fine spline interpolation curve error
(Block including the point of inflection)

- **Address**: F102
- **Program type**: E
- **Conditions**: Immediate
- **Unit**: 0.0001 mm/0.00001 inch
- **Setting range**: 0 to 99999999

**Description**:
During block checking in the fine spline interpolation mode, if the spline curve of a specific block is judged to include an inflection point and the maximum chord error between the spline curve and the block is larger than the value of F102, the shape of the curve will be modified to reduce the maximum chord error below the value of F102.

![Original and Modified Spline Curves](D735S0001)

If a block whose length is less than the value of F103 is detected during fine spline interpolation, that block will be skipped and integrated (faired) into the preceding and succeeding blocks to create a spline curve.

Suppose that the i-th block in the fine spline interpolation mode has a block length of \( l_i \):

- If \( l_{i-1} \) is greater than \( F103 \times 2 \)
- \( l_i \) is equal to or less than \( F103 \)
- \( l_{i+1} \) is greater than \( F103 \times 2 \)

then the ending point of the \( i - 1 \) th block and the starting point of the \( i + 1 \) th block will be modified to the middle point of the i-th block and this block will be deleted. A spline curve will be created from the sequence of points updated this way.

![After-modification of Relay Points](D735S0002)

If the length of the starting block or ending block in the fine spline interpolation mode is smaller than the value of F103, processing will slightly differ from that described above. Refer to the relevant specification for further details.

This parameter is effective when bit 1 of F96 is 1.

## F103
### Spline interpolation fairing block length

- **Address**: F103
- **Program type**: E
- **Conditions**: Immediate
- **Unit**: 0.0001 mm/0.00001 inch
- **Setting range**: 0 to 99999999

**Description**:
If the length of the starting block or ending block in the fine spline interpolation mode is smaller than the value of F103, processing will slightly differ from that described above. Refer to the relevant specification for further details.

This parameter is effective when bit 1 of F96 is 1.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F104</strong></td>
<td>Fine spline interpolation curve error (Block including no inflection point)</td>
<td>During block checking in the fine spline interpolation mode, if the spline curve of a specific block is judged to include no inflection point and the maximum chord error between the spline curve and the block is larger than the value of F104, the shape of the curve will be modified to reduce the maximum chord error below the value of F104.</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td><strong>F105</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td><strong>F106</strong></td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td><strong>F107</strong></td>
<td>Small block judgment length</td>
<td>In a small-segment machining program, if a small block is present between large-angle blocks, optimum corner deceleration can be achieved by excluding the small block and then judging the total corner angle.</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td><strong>F108</strong></td>
<td>Corner deceleration angle increment value</td>
<td>Specify by what degrees the angle of corner deceleration is to be incremented when the shape correction function is valid.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1°</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Program type</td>
<td>Conditions</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>F109</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>F110</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**F111 (bit 0)**
Selection of display type of tapping tool in solid mode

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
<th>Conditions</th>
<th>Immediate</th>
<th>Unit</th>
<th>Setting range</th>
<th>0, 1</th>
</tr>
</thead>
</table>

In the solid mode of the **TOOL PATH CHECK** display:
- **F111 (bit 0) = 0**: Simplified display of tapping tool
- **F111 (bit 0) = 1**: Detailed display of tapping tool

**F111 (bit 1)**
Use/disuse of dry run during thread cutting

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
<th>Conditions</th>
<th>Immediate</th>
<th>Unit</th>
<th>Setting range</th>
<th>0, 1</th>
</tr>
</thead>
</table>

- **F111 (bit 1) = 0**: Disuse of dry run during thread cutting cycle
- **F111 (bit 1) = 1**: Use of dry run during thread cutting cycle

**F111 (bit 2)**
Use/disuse of feed hold during thread cutting

<table>
<thead>
<tr>
<th>Program type</th>
<th>E</th>
<th>Conditions</th>
<th>Immediate</th>
<th>Unit</th>
<th>Setting range</th>
<th>0, 1</th>
</tr>
</thead>
</table>

- **F111 (bit 2) = 0**: Disuse of feed hold during thread cutting cycle
- **F111 (bit 2) = 1**: Use of feed hold during thread cutting cycle
### PARAMETERS

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **F111** (bit 3) | Direction of rotation of the C-axis during C-axial threading with G01.1 | Select the direction of rotation of the C-axis during C-axial threading based on G01.1.  
**F111** (bit 3) = 0: 
The C-axis rotates CW (forward).  
**F111** (bit 3) = 1: 
The C-axis rotates CCW (backward). |
| Program type | E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |

| **F111** (bit 4) | EIA tool command suffix valid/invalid | Specify whether the assignment of the tool identification code (suffix) by the T-command is valid or invalid.  
**F111** (bit 4) = 0: 
The EIA tool command suffix is invalid.  
**F111** (bit 4) = 1: 
The EIA tool command suffix is valid. |
| Program type | E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |

| **F111** (bit 5) | Tool correction amount selection for EIA/ISO programs | Select whether the wear correction data on the TOOL DATA display is to be added during execution of the EIA/ISO program when using the tool length that has been entered on the TOOL DATA display.  
**F111** (bit 5) = 0: 
Wear correction data is not added  
**F111** (bit 5) = 1: 
Wear correction data is added |
| Program type | E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |

| **F111** (bit 6) | Execution mode selection for a fixed turning cycle | In the fixed turning cycle mode (G290/G292/G294)  
**F111** (bit 6) = 0: 
The fixed turning cycle is executed for each block (G66 type).  
**F111** (bit 6) = 1: 
The fixed turning cycle is executed only for movement blocks (G66.1 type). |
<p>| Program type | E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F111</strong> (bit 7)</td>
<td>Form of single-block stop during a fixed turning cycle</td>
<td>This parameter specifies whether single-block operation during a fixed turning cycle (G290, G292 or G294) is to be stopped after the entire cycle has been executed, or for each block.</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td>F111 (bit 7) = 0: After execution of the cycle</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>F111 (bit 7) = 1: For each block</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F112</strong></td>
<td>Selection of measurement data items to be printed out</td>
<td>Selection of printout items in measurement data printout (0: Not printout  1: Print out)</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F113</strong> (bit 0)</td>
<td>Counting all types of use under the same tool number for the tool life management on the TOOL DATA display executed/not executed</td>
<td>F113 (bit 0) = 0: Counting each type of use under the same tool number individually.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F113</strong> (bit 1)</td>
<td>Data handling on the milling tool of a group that has expired in tool life</td>
<td>F113 (bit 1) = 0: Operation will be continued.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>F113 (bit 2)</td>
<td>Data handling on the turning tool of a group that has expired in tool life</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
</tbody>
</table>

F113 (bit 2) = 0: Operation will be continued.
F113 (bit 2) = 1: Operation will be stopped.

| F113 (bit 3) | Tool life management of the FLASH tool |  |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0, 1 |  |

F113 (bit 3) = 0: The FLASH tool will be included in spare tools.
F113 (bit 3) = 1: The FLASH tool will not be included in spare tools.

| F113 (bit 4) | Tool life management – Life time |  |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0, 1 |  |

F113 (bit 4) = 0: The life time will be included in the life judgment items.
F113 (bit 4) = 1: The life time will not be included in the life judgment items.

| F113 (bit 5) | Tool life management – Maximum available wear offset data X |  |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0, 1 |  |

F113 (bit 5) = 0: The maximum available wear offset data X will be included in the life judgment items.
F113 (bit 5) = 1: The maximum available wear offset data X will not be included in the life judgment items.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F113</strong> (bit 6)</td>
<td>Tool life management – Maximum available wear offset data Y</td>
<td>Select whether the maximum available wear offset data Y on the TOOL DATA display is to be included in the life judgment items listed for the tool life management function. <strong>F113</strong> (bit 6) = 0: The maximum available wear offset data Y will be included in the life judgment items. <strong>F113</strong> (bit 6) = 1: The maximum available wear offset data Y will not be included in the life judgment items.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td><strong>F113</strong> (bit 7)</td>
<td>Tool life management – Maximum available wear offset data Z</td>
<td>Select whether the maximum available wear offset data Z on the TOOL DATA display is to be included in the life judgment items listed for the tool life management function. <strong>F113</strong> (bit 7) = 0: The maximum available wear offset data Z will be included in the life judgment items. <strong>F113</strong> (bit 7) = 1: The maximum available wear offset data Z will not be included in the life judgment items.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td><strong>F114</strong> (bit 0)</td>
<td>Selection of the maximum C-axial cutting feed rate for the inch system</td>
<td>Specify the maximum C-axial cutting feed rate that can be selected for the inch system. <strong>F114</strong> (bit 0) = 0: The maximum selectable C-axial cutting feed rate is $88 \text{ min}^{-1}$ (rpm). <strong>F114</strong> (bit 0) = 1: The maximum selectable C-axial cutting feed rate is $400 \text{ min}^{-1}$ (rpm).</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td><strong>F114</strong> (bit 1)</td>
<td>Selection of the operation occurring during the control of the tool tip point when command G49 is issued (when the tool length offset value is canceled)</td>
<td>Select the type of operation occurring during the control of the tool tip point when command G49 is issued (when the tool length offset value is canceled). <strong>F114</strong> (bit 1) = 0: The axis moves according to the tool length offset value. <strong>F114</strong> (bit 1) = 1: The axis does not move.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>F114</td>
<td></td>
<td>Tool shape check during tool measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 2) = 0:</strong> During measurement for IN and EDGE tools, alarm 653 ILLEGAL TOOL DESIGNATED occurs since the measurements are possible only at 0 degrees of the B-axis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 2) = 1:</strong> The shape of the tool is not checked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Program type: M, E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditions: At power on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit: —</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting range: 0, 1</td>
</tr>
<tr>
<td>F114</td>
<td></td>
<td>Moving axes by using G49 (tool length cancel) in G43 (tool length offset) mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 3) = 0:</strong> Valid</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 3) = 1:</strong> Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Program type: E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditions: At power on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit: —</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting range: 0, 1</td>
</tr>
<tr>
<td>F114</td>
<td></td>
<td>Selecting a rethreading function</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 4) = 0:</strong> Using the rethreading function</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 4) = 1:</strong> Not using the rethreading function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Program type: M, E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditions: Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit: —</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting range: 0, 1</td>
</tr>
<tr>
<td>F114</td>
<td></td>
<td>Output timing of a tool life alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 5) = 0:</strong> At the time of the next tool change</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>F114 (bit 5) = 1:</strong> When the program ends.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Program type: M, E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conditions: Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit: —</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting range: 0, 1</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| F114    | (bit 6) | **F114** (bit 6) = 0: Invalid. Initially, the G50-specified coordinate system is selected.  
**F114** (bit 6) = 1: Valid. Initially, the MAZATROL coordinate system (G53.5) is selected. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |
| F114    | (bit 7) | **F114** (bit 7) = 0: The life of the tool is judged from its machining count.  
**F114** (bit 7) = 1: The life of the tool is not judged from its machining count. |
<p>| Program type | M, E | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |
| F115    | Restart/TPS approach speed | Set the approach speed existing before cutting feed is started in restart/TPS mode. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | mm/min / 0.1 inch/min | |
| Setting range | 0 to 65535 | |
| F116    | Feed rate of the threading runout – X-axis | Specify the X-axial feed rate for the runout of the threading cycle. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 1 mm/min | |
| Setting range | 0 to 240000 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F117</strong></td>
<td>Feed rate of the threading runout – Y-axis</td>
<td>Specify the Y-axial feed rate for the runout of the threading cycle.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 mm/min</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 240000</td>
<td></td>
</tr>
</tbody>
</table>

| **F118** | Feed rate of the threading runout – Z-axis | Specify the Z-axial feed rate for the runout of the threading cycle. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 1 mm/min | |
| Setting range | 0 to 240000 | |

| **F119** | Runout feed rate for the inside diameter threading cycle | Specify the runout feed rate for the inside diameter threading cycle. This parameter is valid only when chamfering is not specified in the inside diameter threading unit of the MAZATROL program. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | 1 mm/min | |
| Setting range | 0 to 240000 | |

<p>| <strong>F120</strong> | Clamping speed for the threading cycle – X-axis | Specify the X-axial clamping speed for the threading cycle. |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 1 mm/min | |
| Setting range | 0 to 99999999 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F121</td>
<td>Clamping speed for the threading cycle – Y-axis</td>
<td>Specify the Y-axial clamping speed for the threading cycle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>F122</td>
<td>Clamping speed for the threading cycle – Z-axis</td>
<td>Specify the Z-axial clamping speed for the threading cycle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>F123</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>F124</td>
<td>Permissible data alteration amount 1 for input error prevention function</td>
<td>The data input in the following items are checked based on the permissible data alteration amount set in this parameter.</td>
</tr>
<tr>
<td></td>
<td>TOOL DATA: LENGTH, ACT-φ, TOOL SET X, TOOL SET Z, LENG COMP., LENG.CO., ACT-φCO.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOOL OFFSET: GEOMETRIC OFFSET</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| F125    | Permissible data alteration amount 2 for input error prevention function | The data input in the following items are checked based on the permissible data alteration amount set in this parameter.  
**TOOL DATA:**  
WEAR COMP. X, WEAR COMP. Y, WEAR COMP. Z  
**TOOL OFFSET:**  
WEAR COMP. |
<p>|         | Program type | M, E                                                                                                                                  |                                                                                                                                            |
|         | Conditions   | Immediate                                                                                                                             |                                                                                                                                            |
|         | Unit         | —                                                                                                                                     |                                                                                                                                            |
|         | Setting range| 0 to 99999999                                                                                                                              |                                                                                                                                            |
|         | F126 to F132 | —                                                                                                                                     | Invalid                                                                                                                                   |
|         | Program type | —                                                                                                                                     |                                                                                                                                            |
|         | Conditions   | —                                                                                                                                     |                                                                                                                                            |
|         | Unit         | —                                                                                                                                     |                                                                                                                                            |
|         | Setting range| —                                                                                                                                     |                                                                                                                                            |
|         | F133         | Pitch of tapping tool for display in detail in solid mode                                                                        | Set the pitch of tapping tool displayed when the tapping tool is displayed in detail (F111 bit 0 = 1) in solid mode on <strong>TOOL PATH CHECK</strong> display. |
|         | Program type | M                                                                                                                                     |                                                                                                                                            |
|         | Conditions   | Immediate                                                                                                                             |                                                                                                                                            |
|         | Unit         | 0.1 mm/0.01 inch                                                                                                                             |                                                                                                                                            |
|         | Setting range| 0 to 65535                                                                                                                                |                                                                                                                                            |
|         | F134         | Thread depth of tapping tool for display in detail in solid mode                                                                  | Set the thread depth of tapping tool displayed when the tapping tool is displayed in detail (F111 bit 0 = 1) in solid mode on <strong>TOOL PATH CHECK</strong> display. |
|         | Program type | M                                                                                                                                     |                                                                                                                                            |
|         | Conditions   | Immediate                                                                                                                             |                                                                                                                                            |
|         | Unit         | 0.1 mm/0.01 inch                                                                                                                             |                                                                                                                                            |
|         | Setting range| 0 to 65535                                                                                                                                |                                                                                                                                            |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F135</td>
<td>Tool-drawing accuracy in solid mode</td>
<td>Specify tool-drawing accuracy in the solid mode of the TOOL PATH CHECK display. As the specified value is greater (maximum value: 9), accuracy increases progressively.</td>
</tr>
<tr>
<td>F136</td>
<td>Amount of offset for dummy workpiece shape in solid mode</td>
<td>It is possible to change the size of the workpiece created automatically when solid mode is selected on the TOOL PATH CHECK display.</td>
</tr>
<tr>
<td>F137</td>
<td>Number of jaws displayed in solid mode for No. 1 turning spindle</td>
<td>Specify for the solid mode of the TOOL PATH CHECK display the number of jaws displayed automatically. If 0 is entered, three jaws will be displayed as standard.</td>
</tr>
<tr>
<td>F138</td>
<td>Number of jaws displayed in solid mode for No. 2 turning spindle</td>
<td>Specify for the solid mode of the TOOL PATH CHECK display the number of jaws displayed automatically. If 0 is entered, three jaws will be displayed as standard.</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>F139</td>
<td>Angle offset for the jaws displayed in solid mode for the No. 1 turning spindle</td>
<td>Specify for the solid mode of the TOOL PATH CHECK display the amount of C-axial angle offset for the jaws displayed automatically.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3599</td>
</tr>
<tr>
<td>F140</td>
<td>Angle offset for the jaws displayed in solid mode for the No. 2 turning spindle</td>
<td>Specify for the solid mode of the TOOL PATH CHECK display the amount of C-axial angle offset for the jaws displayed automatically.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3599</td>
</tr>
<tr>
<td>F141 to F144</td>
<td>—</td>
<td>Not used</td>
</tr>
<tr>
<td>F145</td>
<td>Rapid feed override when data alteration is detected</td>
<td>The rapid feed rate override is reduced to the value set here, when data alteration is detected. This value will be handled as 100 if 0 is set here.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 100</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>F146 to F153</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>F154</td>
<td>—</td>
<td>Parameter for system internal setting</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>F155 to F160</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>F161</td>
<td>Lathing tool offset functions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shape/wear offset number separation</td>
<td>7 6 5 4 3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>0: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shape offset handling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Coordinate shift</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Tool movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tool offset timing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: When move command is executed following T-code command</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: When T-code command is executed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tool offset vector handling if reset function is executed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Vector cleared</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Vector not cleared</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shape offset handling if offset number 0 is entered</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Offset cleared</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Offset not cleared</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simplified wear offset</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Succession of Z/C-offsets when a MAZATROL program is called from an EIA program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Z/C-offsets set in the MAZATROL program are used.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Z/C-offsets set in the EIA program are used.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Succession of Z/C-offsets when an EIA program is called from a MAZATROL program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Z/C-offsets set in the EIA program are used.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Z/C-offsets set in the MAZATROL program are used.</td>
<td></td>
</tr>
</tbody>
</table>

**F161 bit 0:**

TOO□□ command:

- For offset number separation
  - □□ is used for shape offset, □□ is used for wear offset.

- For offset number non-separation
  - Offset number □□ is used for both shape offset and wear offset.

---

Program type: M

Conditions: Immediate

Unit: Bit

Setting range: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>76543210</td>
<td>During independent start of tool tip point control 0: Movement according to the particular amount of offset 1: No movement according to the particular amount of offset Type of passage of tool tip point through singular point Chamfer/corner R-command address selection 0: (I), (K), (R), (.R), (.C), (.A) 1: (R), (C), (.A) Fixed hole-machining cycle return selection 0: Initial point 1: R-point 6 digits in T-command for turning Use of the M Pro scheme as the method of selecting the Length correction axis bit 0: Invalid 1: Valid MAZATROL program check for missing Z-offset 0: Valid 1: Invalid Encoder polarity selection 0: Pulse rate increase for forward rotation command 1: Pulse rate reduction for forward rotation command</td>
<td></td>
</tr>
</tbody>
</table>

**F162 bit 1** - Type of passage of tool tip point through singular point 0: The same primary rotary axis angle sign as that existing during the start of tool tip point control is selected as the angle of the rotary axis for implementing the tool axial vector specified during tool tip point control.

**Example:**

- **B = positive**
  - **C = 0**
- **B = 0**
  - **C = 180**
- **B = positive**

1: The angle that provides a smaller amount of rotational movement of the secondary rotary axis on a singular point is selected as the angle of the rotary axis for implementing the tool axial vector specified during tool tip point control. (Both positive and negative signs are available for the primary rotary axis.)

**Example:**

- **B = positive**
  - **C = 0**
- **B = 0**
  - **C = 0**
- **B = negative**
  - **C = 0**
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F163</td>
<td></td>
<td>76543210</td>
</tr>
<tr>
<td></td>
<td>Bar feeder scheduling function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incorporation of wear offset data into the current position display in EIA/ISO program mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incorporation of wear offset data into the current position display in MAZATROL program mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Position of thread turning tool nose on solid drawing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Tool tip</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Position measured using TOOL EYE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barrier check on solid drawing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Invalid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Menu on the DATA I/O display (floppy disk)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Hidden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Displayed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Menu on the DATA I/O display (tape)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Hidden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Displayed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Menu on the DATA I/O display (CMT)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0: Hidden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Displayed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F164</td>
<td></td>
<td>76543210</td>
</tr>
<tr>
<td></td>
<td>Automatic tool data setting conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>76543210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search for magazine (turret) tool</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No search for invalid tool</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No search for broken tool</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No search for tool that has expired in life</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No search for tool for which life warning has been issued</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
This parameter is used for automatic setting of the following tool data during MAZATROL program editing:
- “Nominal diameter” and “Suffix” in tool sequence of turning tool
- “Suffix” in tool sequence of point machining
### F165

#### High-speed synchronous tapping function
- **0**: Valid
- **1**: Invalid

#### X-axis movement to minus side during polar coordinate interpolation
- **0**: Enabled
- **1**: Disabled

#### C-axis indexing when EIA subprogram is called from MAZATROL program
- **0**: Not executed
- **1**: Executed

#### Modal or non-modal state of Q command in deep hole drilling cycle
- **0**: Modal
- **1**: Non-modal

#### Conversion of tool set data for milling tool based on head swivel angle when G53.5 is commanded
- **0**: Disabled
- **1**: Enabled

#### Behavior of automatic operation of an EIA program when Z-offset is not set
- **0**: Z-offset = 0
- **1**: Alarm stop

#### Setting at CONTI. of the END unit during tool path check
- **0**: Invalid
- **1**: Valid

---

#### Supplemental explanation of F165 Bit 4

This bit is used to select whether the depth of infeed per pass (address Q command) in deep hole drilling cycles (G83, G283, and G287 for G-code series M; G83 and G87 for G-code series A) is modal or non-modal.

0: Modal

The modal value is used if the Q command is not specified. If the modal value of the Q command is 0 (typically, in cases where the Q setting is omitted in the initial deep hole drilling cycle command), or if the Q value is set to 0, an alarm **ILLEGAL NUMBER INPUT** occurs.

1: Non-modal

If the Q setting is omitted, or if the Q value is set to 0, the workpiece is cut to the preset infeed depth in a single pass.

---

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>F166</strong></td>
<td>—</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

**F167 F168**: Invalid
### User parameter  SOFT LIMIT (I)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **I1** | Shift amount of unidirectional positioning (G60) | The amount and direction of shift from the final setting position during unidirectional positioning of the point-machining or during execution of G60.  
I1 < 0: Positioning in minus direction  
I1 > 0: Positioning in plus direction  
**Example:**![Diagram](image)

**Note:**
For the axes which operate in submicrons in the case of submicron machine specifications, the setting unit of this parameter is reduced to 1/10 times.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch (0.0001°)</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

| **I2** | Upper (plus direction) user soft-limit | The parameter used to define the machine working zone in order to prevent machine interference with the workpiece or jigs. Set the coordinate values of the machine coordinate system.  
**Example:**![Diagram](image)

**Notes:**
1. These parameters are valid only when bit 2 of I14 is 0.  
2. These parameters are invalid if I2 = I3.  
3. For the axes which operate in submicrons in the case of submicron machine specifications, the setting unit of this parameter is reduced to 1/10 times.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch (0.0001°)</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

| **I3** | Lower (minus direction) user soft-limit |  
**Notes:**
1. These parameters are valid only when bit 2 of I14 is 0.  
2. These parameters are invalid if I2 = I3.  
3. For the axes which operate in submicrons in the case of submicron machine specifications, the setting unit of this parameter is reduced to 1/10 times.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch (0.0001°)</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>I4</td>
<td>—</td>
</tr>
</tbody>
</table>

Program type: —
Conditions: —
Unit: —
Setting range: —

Function for making the G0 speed variable
Variable override: Minimum value

Override (%)

<table>
<thead>
<tr>
<th>I5</th>
<th>M, E</th>
<th>Immediate</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type:</td>
<td>—</td>
<td>—</td>
<td>0 to 100</td>
</tr>
<tr>
<td>Conditions:</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit:</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range:</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Function for making the G0 speed variable
Variable control area

Override (%)

<table>
<thead>
<tr>
<th>I6</th>
<th>—</th>
<th>—</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conditions:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range:</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I7</th>
<th>M, E</th>
<th>Immediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conditions:</td>
<td>0.0001 mm/0.00001 inch/ 0.0001°</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range:</td>
<td>0 to 99999999</td>
<td></td>
</tr>
</tbody>
</table>

Override (%)

<table>
<thead>
<tr>
<th>Override (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Axis position

Override (%)

<table>
<thead>
<tr>
<th>Override (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Axis position
### Classification | USER | Display title | SOFT LIMIT
---|---|---|---

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I8</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>I9</td>
<td>Function for making the G0 speed variable</td>
<td>Variable control area lower limit</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch/0.0001°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>I10</td>
<td>Function for making the G0 speed variable</td>
<td>Variable control area upper limit</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch/0.0001°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>I11</td>
<td>Rotary center of a workpiece</td>
<td>Set the rotary center of a workpiece at a table angle of 0° for each axis in the machine coordinate system. (Valid only with dynamic offset function and in manual operation)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

**Note:**
For the axes which operate in submicrons in the case of submicron machine specifications, the setting unit of this parameter is reduced to 1/10 times.
# SOFT LIMIT

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I12</td>
<td>Clamping value for the amount of handle interruption</td>
<td>Set the clamping value for the amount of handle interruption.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm, 0.0001 inch, 0.0001 deg</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999999</td>
</tr>
</tbody>
</table>

| I13 | Program type | M, E |
|     | Conditions   | At power on |
|     | Unit         | Bit |
|     | Setting range | Binary, eight digits |

| I14 | Program type | M, E |
|     | Conditions   | After stop of movement |
|     | Unit         | Bit |
|     | Setting range | Binary, eight digits |

- **I12**: Execution of G28 (reference-point return):
  - 0: Memory-type zero-point return
  - 1: Watchdog-type zero-point return
- **I13**: Manual zero-point return operation:
  - 0: Memory-type zero-point return
  - 1: Watchdog-type zero-point return (After power-on, however, watchdog-type zero-point return)
- **I14**: Removal of control axes:
  - 0: No (Not removed)
  - 1: Yes (Removed)
- **I14**: Mirror image with respect to the machine zero-point:
  - 0: Invalid
  - 1: Valid
- **I14**: User software limits (I2, I3):
  - 0: Valid
  - 1: Invalid
- **I14**: Tool-tip relief after spindle orientation during execution of G75, G76, G86 or point-machining (boring or back-boring):
  - 0: Required
  - 1: Not required
- **I14**: Direction of the relief mentioned above:
  - 0: Plus
  - 1: Minus
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I15 to I24</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
### 2-3-6 User parameter SYSTEM (SU)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU1</td>
<td>Reference axis of abscissa for plane selection</td>
<td>Set the reference axis of abscissa.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
</tbody>
</table>

| SU2 | Axis 1 parallel to the axis of abscissa for plane selection | Set axis 1 parallel to the axis of abscissa. |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | — | |
| Setting range | 0 to 255 | |

| SU3 | Axis 2 parallel to the axis of abscissa for plane selection | Set axis 2 parallel to the axis of abscissa. |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | — | |
| Setting range | 0 to 255 | |

<p>| SU4 | Reference axis of ordinate for plane selection | Set the reference axis of ordinate. |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | — | |
| Setting range | 0 to 255 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU5</td>
<td>Axis 1 parallel to the axis of ordinate for plane selection</td>
<td>Set axis 1 parallel to the axis of ordinate.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>SU6</td>
<td>Axis 1 parallel to the axis of ordinate for plane selection</td>
<td>Set axis 2 parallel to the axis of ordinate (cylindrical interpolation).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>SU7</td>
<td>Reference height axis for plane selection</td>
<td>Set the reference height axis.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>SU8</td>
<td>Axis 1 parallel to the height axis for plane selection</td>
<td>Set axis 1 parallel to the height axis.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>SU9</td>
<td>Axis 2 parallel to the height axis for plane selection</td>
<td>Set axis 2 parallel to the height axis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
</tbody>
</table>
### Classification: USER

#### Display title: SYSTEM

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of tool change position specification code</td>
<td>Specify tool change position from [0] through [8] below.</td>
<td></td>
</tr>
</tbody>
</table>

#### SU10

**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** 0 to 8

### Note:

SU10 = 5 or 6, Z-axis tool change position is identical with the end point of previous machining. In the case below, however, this may not be applied.  
As shown here, if the longest tool comes into the hatched portion, the position will escape in Z-axis direction by the distance determined by TC36.

### Table: Setting

<table>
<thead>
<tr>
<th>Setting</th>
<th>X-axis</th>
<th>Z-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Clearance position</td>
<td>Clearance position</td>
</tr>
<tr>
<td>1</td>
<td>Machine zero point</td>
<td>Clearance position</td>
</tr>
<tr>
<td>2</td>
<td>Clearance position</td>
<td>Machine zero point</td>
</tr>
<tr>
<td>3</td>
<td>Machine zero point</td>
<td>Machine zero point</td>
</tr>
<tr>
<td>4</td>
<td>Fixed point</td>
<td>Fixed point</td>
</tr>
<tr>
<td>5</td>
<td>Clearance position</td>
<td>End point of previous machining</td>
</tr>
<tr>
<td>6</td>
<td>Machine zero point</td>
<td>End point of previous machining</td>
</tr>
<tr>
<td>7</td>
<td>End point of previous machining</td>
<td>Clearance position</td>
</tr>
<tr>
<td>8</td>
<td>End point of previous machining</td>
<td>Machine zero point</td>
</tr>
</tbody>
</table>

### Parameters:

- **Zc**: Stock material edge projection length  
- **Dmax**: Stock material maximum outside diameter  
- **βx**: Tool turning clearance (X-axis) TC35  
- **βz**: Tool turning clearance (Z-axis) TC36
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| SU11    | Movement of axes during approach | Specify the types of axes to be simultaneously moved when approaching the tool to the next machining area.  
- 0: Three axes (X, Y, Z) move at the same time.  
- 1: After Z-axis movement, the X-axis and the Y-axis move at the same time.  
<br>**<Supplementary description>**<br>This parameter is valid only when “workpiece scheme” is selected in the common unit. If “initial-point scheme” is selected, three axes move simultaneously, irrespective of setting of this parameter. |
| SU12    | Rotating position specified in the index unit after tool change | Select the rotating position specified in the index unit after tool change.  
- 0: After the tool change, rotation occurs at the position specified in the index unit. For the movement from the completing position of the tool change to the rotating position of the index unit, three axes (X, Y, Z) move at the same time.  
- 1: After the tool change, rotation occurs at the position specified in the index unit. For the movement from the completing position of the tool change to the rotating position of the index unit, the X-axis and the Y-axis move at the same time following completion of Z-axis movement.  
- 2: After the tool change, rotation occurs at the completing position of the tool change. |
| SU13    | Axis name of the transfer axis | Set the axis name of the transfer axis. |
| SU14    | Tool nose mark display color on the TOOL PATH CHECK display/TRACE display | Set the display color for the tool nose marks in each system indicated on the TOOL PATH CHECK and TRACE displays.  
- 0 : Red (default)  
- 1 : Green  
- 2 : Blue  
- 3 : Yellow  
- 4 : Pink  
- 5 : Cyan  
- 6 : White |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU15</td>
<td>Name of thrust axis for W-axis</td>
<td>Specify the name of the axis used as the thrust axis for the W-axis.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>&amp;41 to &amp;5A</td>
</tr>
<tr>
<td>SU16</td>
<td>Movement to C-axis index swivel position when Z-offset scheme is used</td>
<td>0: The tool moves to the approach position set in the machining program, without moving to the indexed swivel position. 1: The tool moves to the index swivel position and after C-axis indexing, it moves to the approach position.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>SU17 to SU48</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>SU49</td>
<td>Delay timer for the parts catcher</td>
<td>Set dwell time for the parts catcher.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 sec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>Classification</td>
<td>USER</td>
<td>Display title</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>---------------</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU50</td>
<td>Tool turning clearance (radial value) in X-axis</td>
<td>Tool turning clearance is required to prevent interference between the tool and stock material during tool change in automatic operation.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>SU51</td>
<td>Tool turning clearance in Z-axis</td>
<td>Stock material shape</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>SU52</td>
<td>Lower-turret retraction function</td>
<td>Set the tool to be retracted to the fixed position for the automatic lower-turret retraction function. Specify the tool number of the lower turret.</td>
</tr>
</tbody>
</table>
| SU53    | Tool number of the retraction tool | SU52: Tool number of Retraction tool 1  
SU53: Tool number of Retraction tool 2 |
|         | Program type | M          |
|         | Conditions   | Immediate  |
|         | Unit         | —           |
|         | Setting range | 0 to 960 |

SU54 to SU96

| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range | — |
### Classification: USER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU97 to SU100</td>
<td>Lower-turret retraction function Fixed point of the retraction position</td>
<td>Set the position where the turret is to be retracted for the turret retraction function. Specify coordinates in the machine coordinate system based on the machine zero point.</td>
</tr>
</tbody>
</table>

#### Program type: M
- Conditions: Immediate
- Unit: 0.001 mm/0.0001 inch
- Setting range: 0 to 99999999

#### SU97
- SU97: X-axis retraction point – Fixed point 1
- SU98: Z-axis retraction point – Fixed point 1
- SU99: X-axis retraction point – Fixed point 2
- SU100: Z-axis retraction point – Fixed point 2

Specify a minus value if the fixed point of the retraction position is located in a minus direction when viewed from the zero point of the machine coordinates.

**Note:**
Set this parameter for the system of the lower turret.

### Classification: SYSTEM

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| SU101 | Return distance (radial value) in X-axis at wall during rough cutting in bar machining or in corner machining of EIA/ISO program | Example 1:
Standard type cutting
Prior to cutting up along the wall in the end of final cycle, escape will be made by specified distance. |

#### Program type: M, E
- Conditions: Immediate
- Unit: 0.0001 mm/0.00001 inch
- Setting range: 0 to 65535

#### Example 2:
High speed rough cutting
Escape will be made by SU101 and SU102 specified distance during return after reaching the wall.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU102</td>
<td>Return distance (radial value) in Z-axis at wall during rough cutting in bar machining or in corner machining of EIA/ISO program</td>
<td>Example 2:</td>
</tr>
</tbody>
</table>

#### Program type: M, E
- Conditions: Immediate
- Unit: 0.0001 mm/0.00001 inch
- Setting range: 0 to 65535
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SU103</td>
<td>Cutting depth in the composite-type fixed cycle (G271/G272, G71/G72)</td>
<td>If a cutting depth has not been specified in the program, operation will occur in accordance with the setting of this parameter.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>SU104</td>
<td>Pecking return distance in groove cutting unit and grooving (G274/G275, G74/G75)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/rev</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>SU105</td>
<td>Cut depth (diametral value) for final cut in thread cutting unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cut depth (diametral value) for final cut in composite-type thread cutting cycle G276, G76</td>
<td>Clamping will follow the setting of SU106 if the calculated value of the cut depth with the threading unit is smaller than the setting of SU106. This parameter is valid only for the infeed operation of the fixed-area scheme.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>SU106</td>
<td>Minimum cut depth clamping value in thread cutting unit and composite-type thread cutting cycle G276</td>
<td>Clamping will follow the setting of SU106 if the calculated value of the cut depth with the composite type thread cutting cycle G276 is smaller than the setting of SU106. This parameter is valid only for the infeed operation of the fixed volume chip production scheme.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>SU107</td>
<td>Safety clamp speed</td>
<td>Set the spindle safety clamp speed of a tool whose diameter (nominal diameter) is not specified in the tool data. This clamp speed is invalid for the tools with tool diameter (or nominal diameter, if diameter cannot be specified) setting in the tool data.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>min$^{-1}$</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 9999999</td>
<td></td>
</tr>
</tbody>
</table>
| SU108   | Safeguarding strength | Set the machine safeguarding strength to be used during the calculation of the safety speed for the spindle. 
Relational expression for maximum allowable spindle speed $N$ and tool diameter $D$ 
$$N = \frac{60 \times 10^3}{\pi D} \sqrt{\frac{2E}{m}} \text{ (rpm)}$$ 
Safeguarding strength: $E$ (J) 
Tool diameter: $D$ (mm) 
Tip mass: $m$ (kg) |
| Program type | M | |
| Conditions | Immediate | |
| Unit | J | |
| Setting range | 0 to 9999999 | |
| SU109   | Tip mass | Set the tip mass used to calculate the spindle safety clamp speed. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | g | |
| Setting range | 0 to 9999999 | |
| SU110 to SU152 | — | Invalid |
### SU153 (bit 0)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| SU153   | —       | - If the command block of G284/G288 (machining G-codes, \( F_{30} = 0 \)) or of G84/G88 (turning G-codes, \( F_{30} = 1 \)) does not contain spindle forward/reverse rotation M-codes, one of the following M-codes will be output, depending on the status of bit 0 in parameter SU153:

<table>
<thead>
<tr>
<th>SU153</th>
<th>BA59 = 3</th>
<th>BA59 = 203</th>
</tr>
</thead>
<tbody>
<tr>
<td>bit 0</td>
<td>BA60 = 4</td>
<td>BA60 = 204</td>
</tr>
<tr>
<td>0</td>
<td>Tapping cycle of turning</td>
<td>Tapping cycle of milling</td>
</tr>
<tr>
<td>1</td>
<td>Inverse tapping cycle of turning</td>
<td>Inverse tapping cycle of milling</td>
</tr>
</tbody>
</table>

- If 0 is set in BA59, 3 will be regarded as having been set, and M03 will be output.
- If 0 is set in BA60, 4 will be regarded as having been set, and M04 will be output.

<table>
<thead>
<tr>
<th>Program type</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

### SU154 to SU168

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range| — |
## USER parameter TURNING (TC)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC1</td>
<td>Cut depth reduction rate for rough cutting in bar machining unit, corner machining unit, and copy machining unit</td>
<td>Cut depth can be reduced as remaining workpiece thickness becomes less in rough cutting in bar machining unit, corner machining unit, and copy machining unit. Reduced cut depth ( A ) can be expressed by ( A = T \times \frac{TC1}{100} ) where ( T ) = Remaining thickness (radial value).</td>
</tr>
<tr>
<td>TC2</td>
<td>Acceleration rate in up-going taper for rough cutting in bar machining unit</td>
<td><img src="NM211-00262" alt="Diagram" /> ( F_2 = F_1 \times \frac{TC2}{100} \times \frac{b}{a} ) ( F_1 ) : Feed rate for rough cutting ( F_2 ) : Increased feed rate This is effective only when TC141 (bit 0) = 1.</td>
</tr>
<tr>
<td>TC3</td>
<td>Acceleration rate in up-going wall slope (90°) for rough cutting in bar machining unit</td>
<td><img src="NM211-00263" alt="Diagram" /> ( F_2 = F_1 \times \frac{TC3}{100} ) ( F_1 ) : Feed rate for rough cutting ( F_2 ) : Increased feed rate Note: Up to 500 % can be set. This is effective only when TC141 (bit 0) = 1.</td>
</tr>
<tr>
<td>TC4</td>
<td>Selection of escape pattern from wall (90°) in rough cutting cycle</td>
<td>This parameter will be used to select escape pattern (0, 1 or 2) when wall is vertical in G71/G72 mode. TC4 = 0: Identical with ordinary path TC4 = 1: Escape at 45° from wall TC4 = 2: Feed rate accelerated at wall Accelerated feed rate ( F ) is expressed as follows. ( F = F_0 \times \frac{TC3}{100} ) (where ( F_0 ) = Feed rate specified in program) (( \neq ) TC3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification</th>
<th>USER</th>
<th>Display title</th>
<th>TURNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>TC1</td>
<td>Cut depth reduction rate for rough cutting in bar machining unit, corner machining unit, and copy machining unit</td>
<td>Cut depth can be reduced as remaining workpiece thickness becomes less in rough cutting in bar machining unit, corner machining unit, and copy machining unit. Reduced cut depth ( A ) can be expressed by ( A = T \times \frac{TC1}{100} ) where ( T ) = Remaining thickness (radial value).</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC2</td>
<td>Acceleration rate in up-going taper for rough cutting in bar machining unit</td>
<td><img src="NM211-00262" alt="Diagram" /> ( F_2 = F_1 \times \frac{TC2}{100} \times \frac{b}{a} ) ( F_1 ) : Feed rate for rough cutting ( F_2 ) : Increased feed rate This is effective only when TC141 (bit 0) = 1.</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC3</td>
<td>Acceleration rate in up-going wall slope (90°) for rough cutting in bar machining unit</td>
<td><img src="NM211-00263" alt="Diagram" /> ( F_2 = F_1 \times \frac{TC3}{100} ) ( F_1 ) : Feed rate for rough cutting ( F_2 ) : Increased feed rate Note: Up to 500 % can be set. This is effective only when TC141 (bit 0) = 1.</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC4</td>
<td>Selection of escape pattern from wall (90°) in rough cutting cycle</td>
<td>This parameter will be used to select escape pattern (0, 1 or 2) when wall is vertical in G71/G72 mode. TC4 = 0: Identical with ordinary path TC4 = 1: Escape at 45° from wall TC4 = 2: Feed rate accelerated at wall Accelerated feed rate ( F ) is expressed as follows. ( F = F_0 \times \frac{TC3}{100} ) (where ( F_0 ) = Feed rate specified in program) (( \neq ) TC3)</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
<td></td>
</tr>
</tbody>
</table>
| TC5     | Deceleration rate in down-going taper for rough cutting in bar machining unit | ![Diagram](NM211-00264)  
  \[ F_3 = F_1 \times \frac{TC5}{100} \times \frac{a}{b} \]  
  \( F_1 \): Feed rate for rough cutting  
  \( F_3 \): Reduced feed rate  
  This is effective only when TC141 (bit 0) = 1. |
| TC6     | Deceleration rate in down-going wall slope (90°) for rough cutting in bar machining unit | ![Diagram](NM211-00265)  
  \[ F_3 = F_1 \times \frac{TC6}{100} \]  
  \( F_1 \): Feed rate for rough cutting  
  \( F_3 \): Reduced feed rate  
  This is effective only when TC141 (bit 1) = 1. |
| TC7     | Acceleration rate on outside stock contour for rough cutting in copy machining unit | ![Diagram](NM211-00266)  
  \[ F_2 = F_1 \times \frac{TC7}{100} \]  
  \( F_1 \): Feed rate inside stock contour  
  \( F_2 \): Feed rate outside stock contour |
| TC8     | Acceleration pitch error ratio in thread cutting unit |  
  Used to calculate acceleration distance in thread cutting unit  
  \[ L = L_0 \left( - \frac{TC8}{1000} \right) - 1 + \frac{TC8}{1000} \]  
  \( L \): Acceleration distance  
  \( L_0 \): Distance over which feed rate become constant |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **TC9** | Rough cutting residue ratio in cutting off cycle in groove cutting unit | ![Diagram](NM211-00267)  
| Program type | M |  
| Conditions | Immediate |  
| Unit | % |  
| Setting range | 0 to 100 |  
| | | \[1\] Cutting at rough cutting feed rate to a point short of end point \(P_E\) by distance \(d\) \[2\] Cutting off at finish cutting feed rate to end point \(P_E\)  
| **TC10** | Cut depth allowable incremental rate for rough cutting in groove cutting unit, edge machining unit and copy machining unit |  
| Program type | M |  
| Conditions | Immediate |  
| Unit | % |  
| Setting range | 0 to 100 |  
| | | \[d' = d \left(\frac{100 + TC_{10}}{100}\right)\] \(d\) : Cut depth per cycle \(d'\) : Allowable maximum cut depth  
| **TC11** | Deceleration rate at cutting start in turning-drilling unit |  
| Program type | M |  
| Conditions | Immediate |  
| Unit | % |  
| Setting range | 0 to 100 |  
| | | \[F' = F \times \frac{TC_{11}}{100}\] \(F\) : Specified feed rate \(F'\) : Feed rate at cutting start  

 ![Diagram](NM211-00268) \( \theta \) : Angle \( \theta \) : Drill  
\[\ell = \frac{D}{2 \times \tan \theta} \quad (0^\circ < \theta < 180^\circ)\] \[\ell = 0 \quad (\theta \geq 180^\circ)\]
### TC12

**Deceleration rate at cutting end in turning-drilling unit**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: %
- **Setting range**: 0 to 100

- **Equation**:
  
  \[ F' = F \times \frac{TC12}{100} \]
  
  - \( F \): Specified feed rate
  - \( F' \): Feed rate at cutting start

- **Diagram**:
  - End point
  - Programmed end point
  - Programmed start point
  - Drill
  - \( \theta \)
  - \( D \)

- **Setting formula**:
  
  \[ \ell = \begin{cases} 
  \frac{D}{2} \times \tan(\theta/2) + \frac{D}{10} & (0^\circ < \theta < 80^\circ) \\
  \frac{D}{10} & (\theta \geq 180^\circ) 
  \end{cases} \]

### TC13

**Deceleration rate at rough cutting start in bar machining unit and copy machining unit**

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: %
- **Setting range**: 0 to 100

- **Equation**:
  
  \[ F' = F \times \frac{TC13}{100} \]
  
  - \( F \): Specified feed rate
  - \( F' \): Feed rate at cutting start

- **Diagram**:
  - Deceleration clearance
  - \( (TC15) \)

\((\Rightarrow TC15)\)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC14</td>
<td>Maximum permissible rate of increase of the initial cutting depth during roughing</td>
<td>This parameter is valid during initial cutting in a bar roughing cycle. If the remainder obtained by dividing the thickness of cutting during the roughing cycle by the corresponding cutting depth stays within the range specified by this parameter, that value will be added to the initial cutting depth to reduce the cutting repeat times. Example 1: TC14 = 0 (R-depth.: 5) Cutting to a depth of 10.1 is executed in 3 rounds of cutting (5, 5, and 0.1). Example 2: TC14 = 10% (R-depth.: 5) Cutting at a depth setting of 5 results in a final cutting depth of 0.1. Since 10% of the depth setting of 5 is 0.5 and this value is larger than the final cutting depth, this final cutting depth is added to the initial cutting depth.</td>
</tr>
</tbody>
</table>

**Note:**
Up to 100% can be set. When a value larger than 100% is set, it is regarded as 0.

| Program type | M |
| Conditions   | Immediate |
| Unit         | % |
| Setting range| 0 to 100 |

| TC15    | Deceleration clearance at start of rough cutting in bar machining unit and copy machining unit | Block separated
|---------|-------------------------------------------------|--------------------------------------------------|

**Note:**
Using this parameter will reduce load in the initial contact between the tool and workpiece.

| Program type | M |
| Conditions   | Immediate |
| Unit         | 0.001 mm/0.0001 inch |
| Setting range| 0 to 65535 |

| TC16    | Tolerance for escape in high speed rough cutting cycle of bar machining unit | If TC16 ≥ d, tool escape from the workpiece. If TC16 < d, tool doesn't escape from the workpiece. |

<p>| Program type | M |
| Conditions   | Immediate |
| Unit         | 0.001 mm/0.0001 inch |
| Setting range| 0 to 65535 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC17</td>
<td>Pitch error correction during threading acceleration</td>
<td>Set the starting pitch error rate of threading. Ideal pitch = Starting pitch of threading ([1]) + TC17</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 40</td>
<td></td>
</tr>
<tr>
<td>TC18</td>
<td>—</td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>TC19</td>
<td>Turning-drilling cut depth calculation coefficient</td>
<td>Used for automatic determination of first cut depth in turning-drilling: $d_1 = D \times \frac{TC19}{100}$</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 1000</td>
<td></td>
</tr>
<tr>
<td>TC20</td>
<td>Reamer return speed calculation coefficient in the turning-drilling unit</td>
<td>$F_2 = F_1 \times \frac{TC20}{100}$</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 999</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>TC21</td>
<td>Incomplete threading portion length calculation coefficient for turning-tap tip</td>
<td>( l = P \times \frac{TC21}{10} )</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>Programmed end point</td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td>Programmed start point</td>
</tr>
<tr>
<td></td>
<td>Unit: Pitch/10</td>
<td>Tap</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 99</td>
<td>Cutting end point specified farther by this length ( l )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NM211-00273</td>
</tr>
<tr>
<td>TC22</td>
<td>Turning-tapper elongation calculation coefficient</td>
<td>( l = P \times \frac{TC22}{10} )</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>Normal state</td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td>Pressed state during cutting, etc.</td>
</tr>
<tr>
<td></td>
<td>Unit: Pitch/10</td>
<td>Tap</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 99</td>
<td>Tap</td>
</tr>
<tr>
<td>TC23</td>
<td>Thread height calculation coefficient for outside diameter, face/rear thread cutting (metric)</td>
<td>( h = P \times \frac{TC23}{10000} )</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>h: Thread height</td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td>P: Thread pitch</td>
</tr>
<tr>
<td></td>
<td>Unit: 0.01%</td>
<td>h: Thread height</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td>P: Thread pitch</td>
</tr>
<tr>
<td>TC24</td>
<td>Thread height calculation coefficient for inside diameter thread cutting (metric)</td>
<td>( h = P \times \frac{TC24}{10000} )</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>h: Thread height</td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td>P: Thread pitch</td>
</tr>
<tr>
<td></td>
<td>Unit: 0.01%</td>
<td>h: Thread height</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td>P: Thread pitch</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| TC25    | Thread height calculation coefficient for outside diameter, face/rear thread cutting (inch) | \[ h = P \times \frac{TC25}{10000} \]  
  \[ h : \text{Thread height} \]  
  \[ P : \text{Thread pitch} \]  
| **Program type** | M |   |
| **Conditions** | Immediate |   |
| **Unit** | 0.01% |   |
| **Setting range** | 0 to 65535 |   |
| TC26    | Thread height calculation coefficient for inside diameter thread cutting (inch) | \[ h = P \times \frac{TC26}{10000} \]  
  \[ h : \text{Thread height} \]  
  \[ P : \text{Thread pitch} \]  
<p>| <strong>Program type</strong> | M |   |
| <strong>Conditions</strong> | Immediate |   |
| <strong>Unit</strong> | 0.01% |   |
| <strong>Setting range</strong> | 0 to 65535 |   |
| TC27    | Recessing width for #1 to #3 |   |
| <strong>Program type</strong> | M |   |
| <strong>Conditions</strong> | Immediate |   |
| <strong>Unit</strong> | 0.001 mm/0.0001 inch |   |
| <strong>Setting range</strong> | 0 to 65535 |   |
| TC28    | Recessing depth #1 to #3 |   |
| <strong>Program type</strong> | M |   |
| <strong>Conditions</strong> | Immediate |   |
| <strong>Unit</strong> | 0.001 mm/0.0001 inch |   |
| <strong>Setting range</strong> | 0 to 65535 |   |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC29</td>
<td>Recessing width for #4</td>
<td><img src="NM211-00280" alt="Diagram" /> P: Programmed end point</td>
</tr>
<tr>
<td>TC30</td>
<td>Recessing depth for #4</td>
<td><img src="NM211-00280" alt="Diagram" /> P: Programmed end point</td>
</tr>
<tr>
<td>TC31</td>
<td>Recessing width for #5</td>
<td><img src="NM211-00278" alt="Diagram" /> P: Programmed end point</td>
</tr>
<tr>
<td>TC32</td>
<td>Recessing depth for #5</td>
<td><img src="NM211-00278" alt="Diagram" /> P: Programmed end point</td>
</tr>
</tbody>
</table>

**TC29**
- Program type: M
- Conditions: Immediate
- Unit: 0.001 mm/0.0001 inch
- Setting range: 0 to 65535

**TC30**
- Program type: M
- Conditions: Immediate
- Unit: 0.001 mm/0.0001 inch
- Setting range: 0 to 65535

**TC31**
- Program type: M
- Conditions: Immediate
- Unit: 0.001 mm/0.0001 inch
- Setting range: 0 to 65535

**TC32**
- Program type: M
- Conditions: Immediate
- Unit: 0.001 mm/0.0001 inch
- Setting range: 0 to 65535
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC33</td>
<td>Recessing width for #6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC34</td>
<td>Recessing depth for #6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC35</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>TC36</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

P: Programmed end point

 NM211-00279

Invalid
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC37</td>
<td>Safety contour clearance (outside diameter clearance)</td>
<td>Safety contour clearance is provided for outside of the stock material shape specified by common data in program. Tool approach and escape paths for each unit will be automatically determined according to set data (outside diameter, inside diameter, front clearance, back clearance) for parameters from TC37 to TC40.</td>
</tr>
<tr>
<td></td>
<td>— Outside diameter clearance (radial value)</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC38</td>
<td>Safety contour clearance (inside diameter clearance)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>— Inside diameter clearance (radial value)</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC39</td>
<td>Safety contour clearance (front clearance)</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC40</td>
<td>Safety contour clearance (back clearance)</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
</tbody>
</table>

Safety contour clearance is provided for outside of the stock material shape specified by common data in program. Tool approach and escape paths for each unit will be automatically determined according to set data (outside diameter, inside diameter, front clearance, back clearance) for parameters from TC37 to TC40.

Dmax: Stock material maximum outside diameter
Dmin: Stock material minimum inside diameter
ɛ₀: Stock material edge projection length
ɛ: Stock material length
### Classification USER Display title TURNING

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC41</td>
<td>Thread cutting clearance (radial value)</td>
<td>Thread cutting clearance is provided to specify tool return distance for each cycle in thread cutting unit. Thread cutting clearance will be added to the highest portion of thread and repeating path will be determined automatically.</td>
</tr>
</tbody>
</table>

**Program type M**
- **Conditions Immediate**
- **Unit** 0.001 mm/0.0001 inch
- **Setting range** 0 to 65535

![Diagram](image1)

OUT
- NM211-00222

IN
- NM211-00223

FCE
- NM211-00224

BAK
- NM211-00225
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC42</td>
<td>Groove cutting clearance (radial value) in X-axis</td>
<td>Groove cutting clearance is provided at machining start portion in groove cutting unit.</td>
</tr>
</tbody>
</table>

**Program type:** M  
**Conditions:** Immediate  
**Unit:** 0.001 mm/0.0001 inch  
**Setting range:** 0 to 65535

<table>
<thead>
<tr>
<th>TC43</th>
<th>Groove cutting clearance in Z-axis</th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Program type:** M  
**Conditions:** Immediate  
**Unit:** 0.001 mm/0.0001 inch  
**Setting range:** 0 to 65535
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC44</td>
<td>Workpiece transfer clearance</td>
<td>Workpiece transfer clearance is provided to specify workpiece transfer position in workpiece transfer unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 2 spindle traverses by rapid feed rate to a position distant from transfer position by clearance distance, and then transfer operation is initiated.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td>Conditions</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TC45</th>
<th>Amount of edge clearance after roughing in the edge-machining unit</th>
<th>After edge-machining unit roughing, this parameter works instead of safety contour clearance FCE parameter TC39. If, however, TC45 is zero, then TC39 is used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M</td>
<td>Conditions</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TC46</th>
<th>Drilling depth decrement in turning-drilling unit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M</td>
<td>Conditions</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
<td></td>
</tr>
</tbody>
</table>
### TC47

**Pecking return distance in turning-drilling unit**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Display title**

Turn: TC47

**Description**

Minimum turning-drilling cut depth is set.

**Diagram**

- **G1**: Start point
- **G0**: End point
- **P1**: Start point
- **P2**: End point
- **D1, D2, D3, D4**: Cut depth

### TC48

**Drilling cut depth clamp value in turning-drilling unit**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Display title**

- TC48

### TC49

**Spindle speed clamp value in cutting off cycle (GRV)**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>min⁻¹ (rpm)</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Display title**

- TC49

**Description**

If 0 or 1 is set up in TC50:
- This value will be used as the spindle speed clamp value in cutting off cycle (#4/#5).

If 2 or more is set up in TC50:
- Immediately before the cutting off area (*) is reached during the cutting off cycle, this value will be used as the spindle speed clamp value. Within the cutting off area, however, machining will be executed at the speed corresponding to this value.

*: Cutting off area = (Starting position X – Ending position X) × TC9/100
### TURNING

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **TC50** | Number of times that the feed rate is to be reduced during the #4 and #5 cutting-off cycles of a grooving unit | The starting feed value for cutting-off is a feed value that has been designated in unit data, and the ending feed value for cutting-off is a feed value that has been designated in sequence data. The feed rate from the start of machining to the end is reduced in steps according to the number of times that has been designated here.  
**Example:**  
Feed rate set at feed item in unit data = 0.5  
Feed rate set at roughness item in sequence data = 0.1  
TC50 = 3  

![Diagram](image)  
When 0 or 1 is set for TC50, the feed rate is unchanged. |
| Program type | M |
| Conditions | Immediate |
| Unit | Times |
| Setting range | 0 to 65535 |

| **TC51** | Dwell at the hole bottom during non-through hole drilling cycle of the turning-drilling unit | Set the number of revolutions of the spindle during dwell time at the bottom of a hole when the #0 - #4 non-through hole drilling cycle is selected in the turning-drilling unit.  
**Tool will stop at groove bottom while spindle rotates N times when TC52 is set to N (N=0 to 255).** |
| Program type | M |
| Conditions | Immediate |
| Unit | Revolutions |
| Setting range | 0 to 255 |

| **TC52** | Dwell (specification of spindle rotation number) at groove bottom in groove cutting unit |  
**Tool will stop at groove bottom while spindle rotates N times when TC52 is set to N (N=0 to 255).**  
**Remaining at groove bottom until the spindle rotates N times.** |
| Program type | M |
| Conditions | Immediate |
| Unit | Revolutions |
| Setting range | 0 to 255 |
### TC53

**Address**: Feed rate for escape by short distance

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>1 mm/min / 0.1 inch/min</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Meaning**: For escape by very short distance, G01 feed speed will be faster than G00 to complete the operation. (If G00 is used, smoothing 0 detection will be made at the end position.) Therefore, for escape very short distance, use G01 command, and set the feed speed of this command as parameter.

**Example:**
- Escape in finish cutting of edge-machining unit
- Escape in rough cutting of bar machining unit

![Diagram of escape distances](NM211-00238)

[TC53] Feed speed in this block specified by G01

### TC54

**Address**: Cut depth per cycle for machining inside diameter in bar machining unit

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Meaning**: Inside diameter enlarging cycle
- Cutting is promoted gradually from the edge, and machining chip removal efficient.
- cf. Standard inside diameter cutting
- Cutting to specified depth once through, and machining chip removal not efficient

![Diagram of inside diameter enlarging cycle](NM211-00241)

![Diagram of cutting efficiency comparison](NM211-00242)
## TC55

**Reverse feed tolerance for contour machining**

**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.001 mm/0.0001 inch  
**Setting range**: 0 to 65535

**Example**:
Outside diameter machining in normal (– Z-axis) direction

![Diagram showing reverse feed tolerance for contour machining](NM211-00243)

- \( dr \leq TC55 \) .... No alarm
- \( dr > TC55 \) .... Alarm

## TC56

**Overtravelling in X-axis direction in edge machining unit**

**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.001 mm/0.0001 inch  
**Setting range**: 0 to 65535

**Note**:
By setting an adequate value for TC56, uncut residue will not be produced in edge machining.

![Diagram showing overtravelling in X-axis](NM211-00244)

- \( Ps \): Start point  
- \( Pe \): End point

- Uncut residue because of nose R, etc.
### TC57

**Address:** Workpiece pressing speed in workpiece transfer unit

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>1 mm/min, 0.1 inch/min</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Example:**

Workpiece transferred from No. 1 spindle to No. 2 spindle

 NM211-00236

Set this parameter equal to or as close as possible to its standard value. Excessive setting may cause a contact error.

\( \Rightarrow \text{TC44, TC59} \)

### TC58

**Address:** Spindle speed (min\(^{-1}\)) of two spindles in workpiece transfer while the spindles are rotating in workpiece transfer unit

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>min(^{-1}) (rpm)</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Workpiece transferred from No. 1 spindle to No. 2 spindle**

 NM211-00237

### TC59

**Address:** Workpiece pressing distance in workpiece transfer unit

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/min, 0.0001 inch/min</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Workpiece transferred from No. 1 spindle to No. 2 spindle**

 NM211-00255
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC60</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>
| TC61    | Simultaneous operation pattern for transfer of workpieces between two unit jobsites  
TC61 = 1: Rotation of the spindle and movement of the Z-axis  
TC61 = 2: Orientation of the spindle and movement of the Z-axis  
TC61 = 4: Positioning of the C-axis and movement of the Z-axis  
Note: To combine patterns, set the sum total of setting numbers corresponding the conditions. |  |
| Program type | M |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0 to 7 |  |
### TC62

**Address**

| Selection of tool change position specification code for FLASH tool |

**Meaning**

When a FLASH tool is used, specify the position for indexing the tool, namely, the tool change position for indexing the tool of the same TNo. at the same B-axis angle during programmed operation.

In all other cases, the tool change position specified by SU10 becomes valid.

**Description**

- **Zc**: Stock material edge projection length
- **Dmax**: Stock material maximum outside diameter
- **βx**: Tool turning clearance (X-axis) TC35
- **βz**: Tool turning clearance (Z-axis) TC36

#### Setting

<table>
<thead>
<tr>
<th>Setting</th>
<th>X-axis</th>
<th>Z-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Clearance position</td>
<td>Clearance position</td>
</tr>
<tr>
<td>1</td>
<td>Machine zero point</td>
<td>Clearance position</td>
</tr>
<tr>
<td>2</td>
<td>Clearance position</td>
<td>Machine zero point</td>
</tr>
<tr>
<td>3</td>
<td>Machine zero point</td>
<td>Machine zero point</td>
</tr>
<tr>
<td>4</td>
<td>Fixed point</td>
<td>Fixed point</td>
</tr>
<tr>
<td>5</td>
<td>Clearance position</td>
<td>End point of previous machining</td>
</tr>
<tr>
<td>6</td>
<td>Machine zero point</td>
<td>End point of previous machining</td>
</tr>
<tr>
<td>7</td>
<td>End point of previous machining</td>
<td>Clearance position</td>
</tr>
<tr>
<td>8</td>
<td>End point of previous machining</td>
<td>Machine zero point</td>
</tr>
</tbody>
</table>

**Note:**

When TC62 = 5 or 6, Z-axis tool change position is identical with the end point of previous machining. In the case below, however, this may not be applied.

As shown here, if the longest tool comes into the hatched portion, the position will escape in Z-axis direction by the distance determined by TC36.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC63</td>
<td>Amount of relief after transfer using the TRANSFER unit (Spindle mode 0 to 5)</td>
<td>Set the amount of relief after executing the TRANSFER unit. Example: Transfer from HD2 to HD1</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>TC64</td>
<td>Amount of relief after transfer using the TRANSFER unit (Spindle mode 6 and 7)</td>
<td>It is a parameter to automatically control the parts catcher. If the set value of TC65 is n, M-code of No. n (parts catcher forward) is outputted at the start of cutting off (#4, #5), and M-code of No. n+1 (Parts catcher backward) is outputted at the end. Note: If 0 is set in TC65 no M-code is outputted.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>TC65</td>
<td>Specification of first M-code for parts catcher control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>TC66</td>
<td>Minimum index angle of the FLASH tool</td>
<td>This parameter is used as the basis for judging whether the index angle entered in TOOL DATA display is acceptable. An alarm will be displayed if the entered value is judged to be unacceptable. (Specify “900” for 4-segment splitting.)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3599</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| TC67    | Return distance (radial value) in X-axis at wall during rough cutting in bar cutting unit or in corner machining unit of MAZATROL programs | **Example 1:** Standard type cutting
Prior to cutting up along the wall in the end of final cycle, escape will be made by specified distance. |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 65535 |
| TC68    | Return distance in Z-axis at wall during rough cutting in bar cutting unit or in corner machining unit of MAZATROL programs | **Example 2:** High speed rough cutting
Escape will be made by TC67 and TC68 specified distance during return after reaching the wall. |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 65535 |
| TC69    | Number of revolutions during dwell for pecking of grooving | Set number of revolutions during dwell for each cutting operation for machining #0, #1, #2, #3, #4, or #5 groove (GRV unit) with pecking return distance (TC74) of 0.
The tool stops moving until the spindle makes revolutions set in this parameter. |
<p>|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | Revolutions |
|         | Setting range | 0 to 255 |
| TC70    | FLASH tool — Number of cutting edges to be used for the tool not registered in the tool file | Number of cutting edges to be used if the tool file data for the corresponding tool is not yet registered during FLASH tool selection. |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | Number of cutting edges |
|         | Setting range | 0 to 99 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TC71</strong></td>
<td>Feed stopping rotation dwell time during the chip cutting cycle (valid only for roughing)</td>
<td>Specify the feed stopping rotation dwell time during the chip cutting cycle. Feed is stopped while the spindle rotates for the specified time. <strong>Note:</strong> If “0” is entered, the dwell time will be handled as “0”. However, the feed rate will be reduced since the dwell function itself will be executed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>Revolutions</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

| **TC72** | Number of times of roughing in the composite-type fixed cycle (G273) | If the number of times of roughing has not been specified in the program, operation will occur in accordance with the setting of this parameter. |

<table>
<thead>
<tr>
<th>Program type</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>Times</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

| **TC73** | Return speed at pecking portion in groove cutting unit and turning-drilling unit | Pecking speed

[1] Cutting: (G1) F command data
[2] Pecking: (G1) TC73
[3] Cutting: (G1) F command data

When executing groove cutting with grooving pattern #0 (only for oblique groove) the tool returns from the groove bottom also at the “G1” feed rate determined by this parameter. **Note:** In turning-drilling unit, TC73 setting will be used only for #2 and [#2] types. |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/rev 0.0001 inch/rev</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>TC74</td>
<td>Pecking return distance in groove cutting unit and grooving (G274/G275, G74/G75)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TC75</td>
<td>Overlap distance for machining wide groove in groove cutting unit</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TC76</td>
<td>Escape value after machining in edge machining unit</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TC77</td>
<td>Acceleration distance clamp value for thread cutting unit</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
</tbody>
</table>

If $L_0 > TC77$, alarm will be caused. If, however, $TC141$ (bit 2) = 0, alarm will not be caused. ($TC141$ (bit 2))
## Classification

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC78</td>
<td>Cut depth (diametral value) for final cut in thread cutting unit</td>
<td>Clamping will follow the setting of TC79 if the calculated value of the cut depth with the threading unit is smaller than the setting of TC79. This parameter is valid only for the infeed operation of the fixed-area scheme. Clamping will follow the setting of TC79 if the calculated value of the cut depth with the composite type thread cutting cycle G276 is smaller than the setting of TC79. This parameter is valid only for the infeed operation of the fixed volume chip production scheme.</td>
</tr>
<tr>
<td>TC79</td>
<td>Minimum cut depth clamping value in thread cutting unit and composite-type thread cutting cycle G276</td>
<td>If, during the composite-type fixed cycle G276 mode, a tool nose angle has not been specified in the program, the setting of this parameter will become the angle of the tool nose. The setting must be either 0, 29, 30, 55, 60 or 80.</td>
</tr>
<tr>
<td>TC80</td>
<td>Angle of the tool nose during the G276 mode</td>
<td>If the number of times of repetition has not been specified in the program, operation will occur in accordance with the setting of this parameter.</td>
</tr>
<tr>
<td>TC81</td>
<td>Final finishing repeat times in the composite-type fixed cycle (G276)</td>
<td></td>
</tr>
</tbody>
</table>

### TC78 Parameters
- **Program type**: M, E
- **Conditions**: Immediate
- **Unit**: 0.001 mm/0.0001 inch
- **Setting range**: 0 to 65535

### TC79 Parameters
- **Program type**: M, E
- **Conditions**: Immediate
- **Unit**: 0.001 mm/0.0001 inch
- **Setting range**: 0 to 65535

### TC80 Parameters
- **Program type**: E
- **Conditions**: Immediate
- **Unit**: 1°
- **Setting range**: 0, 29, 30, 55, 60, 80

### TC81 Parameters
- **Program type**: E
- **Conditions**: Immediate
- **Unit**: Times
- **Setting range**: 0 to 65535
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| TC82    | Chamfering data calculation coefficient in thread cutting unit and thread cutting cycle (G276/G292, G76/G92) | L : Effective thread length  
L₁ : Same pitch incomplete thread length (follow-up delay)  
L₂ : Chamfering data  
ψ : Chamfering angle  

\[
L₂ = L₀ \times \frac{TC82}{10}
\]

L₀ : Thread lead |

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>Lead/10</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 40</td>
</tr>
</tbody>
</table>

During a finishing process based on the standard pattern (#0) of the threading unit, TC78 cutting (final cutting diameter in threading unit) is repeated the number of times that has been specified in TC83.

TC83 = 0 or 1:  
Cutting based on the setting of TC78 occurs once.

TC83 ≥ 2:  
Finish-cutting is repeated the number of times specified in TC83, and with the depth-of-cut setting of TC78/TC83.

<Supplementary description>  
- Parameter TC83 is valid only for #0, [#0]: it does not function for #1, [#1] or #2, [#2].
- If TC78 = 0, TC83 is valid.

For thread refinishing, one cutting operation is performed as before.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC83</td>
<td>Number of cutting operations to be performed on finishing allowance corresponding to standard pattern (#0) of threading unit</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>Times</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>TC84</td>
<td>Feed rate to be auto-set for finishing</td>
</tr>
</tbody>
</table>

**TC84**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

**Specification of the pocket for the long boring bar**

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC85</td>
<td>Pocket No. 1 for long boring bar</td>
</tr>
<tr>
<td>TC86</td>
<td>Pocket No. 2 for long boring bar</td>
</tr>
<tr>
<td>TC87</td>
<td>Pocket No. 3 for long boring bar</td>
</tr>
<tr>
<td>TC88</td>
<td>Pocket No. 4 for long boring bar</td>
</tr>
<tr>
<td>TC89</td>
<td>Pocket No. 5 for long boring bar</td>
</tr>
<tr>
<td>TC90</td>
<td>Pocket No. 6 for long boring bar</td>
</tr>
<tr>
<td>TC91</td>
<td>Pocket No. 7 for long boring bar</td>
</tr>
<tr>
<td>TC92</td>
<td>Pocket No. 8 for long boring bar</td>
</tr>
<tr>
<td>TC93</td>
<td>Pocket No. 9 for long boring bar</td>
</tr>
<tr>
<td>TC94</td>
<td>Pocket No. 10 for long boring bar</td>
</tr>
</tbody>
</table>

**Fixed value**

<table>
<thead>
<tr>
<th>Program type</th>
<th>—</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
</tbody>
</table>

**Type of retraction during workpiece transfer**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 2</td>
</tr>
</tbody>
</table>

Specify the sequence of retraction during workpiece transfer on machines with the lower turret.

- **TC97 = 0:** The upper and lower turrets return simultaneously.
- **TC97 = 1:** The upper turret returns prior to the lower turret.
- **TC97 = 2:** The lower turret returns prior to the upper turret.

The setting is regarded as “0” if out of range.
### Classification: USER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC98</td>
<td>Returning operation after machining specified in the END unit</td>
<td>Specify the sequence of the returning operation set in the ATC and RETURN items in the END unit for machines with the lower turret. TC98 = 0: The upper and lower turrets return simultaneously. TC98 = 1: The upper turret returns prior to the lower turret. TC98 = 2: The lower turret returns prior to the upper turret. The setting is regarded as “0” if out of range.</td>
</tr>
<tr>
<td>TC99</td>
<td>ATC operation after machining when not specified in the END unit</td>
<td>Specify the ATC operation after machining when the ATC item in the END unit is not set. TC99 = 0: The same operation as when the item is set to “0” is followed. (The tool is not returned.) TC99 = 1: The same operation as when the item is set to “1” is followed. (The tool is returned and axes move to the returning position.) TC99 = 2: The same pattern as when the item is set to “2” is followed. (The axes move to the returning position and the tool is returned.) The setting is regarded as “0” if out of range.</td>
</tr>
<tr>
<td>TC100</td>
<td>Selection of droop sampling axis (For detecting imbalance)</td>
<td>Select a droop sampling axis.</td>
</tr>
<tr>
<td>TC101</td>
<td>Selection of droop sampling axis</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>TC102</td>
<td>Selection of cycle counter sampling axis (For detecting imbalance)</td>
<td>Select a cycle counter sampling axis.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 16</td>
</tr>
<tr>
<td>TC103</td>
<td>Amplitude limit of table vibration (For detecting imbalance)</td>
<td>Set the amplitude limit of table vibration.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>TC104 to TC110</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>TC111 to TC113</td>
<td>CUTTING CONDITON LEARN display — Workpiece length range</td>
<td>Specify the workpiece length range displayed on the CUTTING CONDITON LEARN display. Specify the range so that the relational expression of TC111 &lt; TC112 &lt; TC113 is established.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/0.1 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TC114</td>
<td>CUTTING CONDITION LEARN</td>
<td>Specify the maximum outside diameter range of the workpieces displayed on the CUTTING CONDITION LEARN display. Specify the range so that the relational expression of TC114 &lt; TC115 &lt; TC116 is established.</td>
</tr>
<tr>
<td></td>
<td>Max. workpiece outside diameter range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 1 mm/0.1 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC117</td>
<td>Composite-type fixed cycle</td>
<td>The settings of these parameters will be used if the amount of release is not specified in the program.</td>
</tr>
<tr>
<td></td>
<td>G273/G73 amount of X-axial release</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC118</td>
<td>Composite-type fixed cycle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G273/G73 amount of Z-axial release</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 65535</td>
<td></td>
</tr>
<tr>
<td>TC119</td>
<td></td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range —</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>Distance to the front end of the long boring bar</td>
<td>Specify the distance from the B-axis rotational center of the milling spindle to the front end of the long boring bar.</td>
<td></td>
</tr>
</tbody>
</table>

**TC120 to TC137**

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC120</td>
<td>Long boring bar No. 1 - Shift stroke X</td>
</tr>
<tr>
<td>TC121</td>
<td>Long boring bar No. 1 - Shift stroke Y</td>
</tr>
<tr>
<td>TC122</td>
<td>Long boring bar No. 1 - Shift stroke Z</td>
</tr>
<tr>
<td>TC123</td>
<td>Long boring bar No. 2 - Shift stroke X</td>
</tr>
<tr>
<td>TC124</td>
<td>Long boring bar No. 2 - Shift stroke Y</td>
</tr>
<tr>
<td>TC125</td>
<td>Long boring bar No. 2 - Shift stroke Z</td>
</tr>
<tr>
<td>TC126</td>
<td>Long boring bar No. 3 - Shift stroke X</td>
</tr>
<tr>
<td>TC127</td>
<td>Long boring bar No. 3 - Shift stroke Y</td>
</tr>
<tr>
<td>TC128</td>
<td>Long boring bar No. 3 - Shift stroke Z</td>
</tr>
<tr>
<td>TC129</td>
<td>Long boring bar No. 4 - Shift stroke X</td>
</tr>
<tr>
<td>TC130</td>
<td>Long boring bar No. 4 - Shift stroke Y</td>
</tr>
<tr>
<td>TC131</td>
<td>Long boring bar No. 4 - Shift stroke Z</td>
</tr>
<tr>
<td>TC132</td>
<td>Long boring bar No. 5 - Shift stroke X</td>
</tr>
<tr>
<td>TC133</td>
<td>Long boring bar No. 5 - Shift stroke Y</td>
</tr>
<tr>
<td>TC134</td>
<td>Long boring bar No. 5 - Shift stroke Z</td>
</tr>
<tr>
<td>TC135</td>
<td>Long boring bar No. 6 - Shift stroke X</td>
</tr>
<tr>
<td>TC136</td>
<td>Long boring bar No. 6 - Shift stroke Y</td>
</tr>
<tr>
<td>TC137</td>
<td>Long boring bar No. 6 - Shift stroke Z</td>
</tr>
</tbody>
</table>

**Program type**  M, E  
**Conditions**  Immediate  
**Unit**  Micron  0.001 mm  0.0001 inch  
Submicron for rotational axis  0.0001 mm  0.00001 inch  
Submicron for all axes  0.0001 mm  0.00001 inch  
**Setting range**  ±99999999  
**Setting range**  Invalid
### TC141 (bit 0)

**Address**: Use/disuse of acceleration in up-going slope during rough cutting cycle in bar machining unit

**Program type**: M

**Conditions**: Immediate

**Unit**: —

**Setting range**: 0, 1

**Meaning**

- **TC141** (bit 0) = 0: Disuse
  - No acceleration

- **TC141** (bit 0) = 1: Use
  - \( F_2 > F_1 \)
  - \( F_1 \): Feed rate for rough cutting cycle
  - \( F_2 \): Feed rate after acceleration

**Description**

NM211-00208

### TC141 (bit 1)

**Address**: Use/disuse of deceleration in down-going slope during rough cutting cycle in bar machining unit

**Program type**: M

**Conditions**: Immediate

**Unit**: —

**Setting range**: 0, 1

**Meaning**

- **TC141** (bit 1) = 0: Disuse
  - No deceleration

- **TC141** (bit 1) = 1: Use
  - \( F_3 < F_1 \)
  - \( F_1 \): Feed rate for rough cutting cycle
  - \( F_3 \): Feed rate after deceleration

**Description**

NM211-00209
### TC141 (bit 2)

**Selection between use/disuse of acceleration distance check at start of thread cutting unit**

**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** 0, 1

**TC141 (bit 2) = 0:** Disuse  
Alarm not caused even if acceleration distance at start of thread cutting unit exceeds clamp data.

**TC141 (bit 2) = 1:** Use  
Alarm caused when acceleration distance at start of thread cutting unit exceeds clamp data.

**Example:**

![Diagram showing comparison of acceleration distances](image)

- $L_o$: Acceleration distance
- $L_c$: Acceleration distance clamp data

### TC141 (bit 3)

**Selection between start position shift/start angle shift for thread number offset in thread cutting unit**

**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** 0, 1

**TC141 (bit 3) = 0:** Start position shift  
Thread number offset adjusted by moving thread cutting start position.

![Diagram showing start position shift](image)

- 1st thread  
- 2nd thread  
- 3rd thread  

**TC141 (bit 3) = 1:** Start angle shift  
Thread number offset adjusted according to thread cutting start angle.

![Diagram showing start angle shift](image)

- 1st thread  
- 2nd thread  
- 3rd thread  

Acceleration distance is same for any thread number.
### An angle margin for nose shape compensation can be selected by setting data in bits 4 and 5.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(bit 4)</td>
<td>Selecting an angle margin for nose shape compensation</td>
<td>An angle margin for nose shape compensation can be selected by setting data in bits 4 and 5.</td>
</tr>
<tr>
<td>(bit 5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting</th>
<th>Angle margin for nose shape compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit 5</td>
<td>Bit 4</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### CHUCK JAW DATA display name/code selection

<table>
<thead>
<tr>
<th>TC141</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(bit 6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

TC141 (bit 6) = 1
A name can be selected.

TC141 (bit 6) = 0
A code can be selected.

### Whether to make the partition plate and the workpiece barrier valid

<table>
<thead>
<tr>
<th>TC141</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(bit 7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

TC141 (bit 7) = 1
Partition plate and the workpiece barrier valid

TC141 (bit 7) = 0
Partition plate and the workpiece barrier invalid

### Fixed value (0)

<table>
<thead>
<tr>
<th>TC142</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(bit 0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range | — |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC142 (bit 1)</td>
<td>Selecting an inter-unit relief path when a succession of I.D. turning units using the same tool exist and there is no movement to the rotating position of the tool</td>
<td>TC142 (bit 1) = 0: The relationship between the starting position of machining with the next unit and the ending position of machining with the previous unit is examined and if interference is judged to be likely, the tool will escape to a clearance point. TC142 (bit 1) = 1: The tool escapes to the clearance point each time the I.D. turning unit is executed to completion.</td>
</tr>
</tbody>
</table>

**TC142**
Program type: M  
Conditions: Immediate  
Unit: —  
Setting range: 0, 1

| TC142 (bit 2) | Selection of the jaw data reference method | Specify the jaw data reference method. TC142 (bit 2) = 0: Reference using the code number of the jaw. TC142 (bit 2) = 1: Reference using the name of the jaw. |

**TC142**
Program type: M  
Conditions: Immediate  
Unit: —  
Setting range: 0, 1

| TC142 (bit 3) | Using angle tool holder valid/invalid | TC142 (bit 3) = 0: Angle tool holder can not be used. TC142 (bit 3) = 1: Angle tool holder can be used. |

**TC142**
Program type: M, E  
Conditions: Immediate  
Unit: —  
Setting range: 0, 1

| TC142 (bit 4) | Selection of the method of moving axes to the tool change position | TC142 (bit 4) = 0: The X-axis and the Z-axis simultaneously move to the tool change position specified by F141 or TC62. Note: When the tool nose stays within the (workpiece diameter + safety profile clearance), both axes move past the clearance position. TC142 (bit 4) = 1: The X-axis first and then the Z-axis move to the tool change position specified by F141 or TC62. Note: When the tool nose stays within the (workpiece diameter + safety profile clearance), only the X-axis moves past the clearance position and the Z-axis does not move. |

**TC142**
Program type: M  
Conditions: Immediate  
Unit: —  
Setting range: 0, 1
## Classification USER Display title TURNING

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC142 (bit 5)</td>
<td>Selection whether an alarm is to be issued if the ending position of workpiece pressing is reached during transfer of the workpiece</td>
<td><strong>TC142</strong> (bit 5) = 0: An alarm will not be issued even if the ending position of workpiece pressing is reached during the transfer of the workpiece. <strong>TC142</strong> (bit 5) = 1: An alarm will be issued if the ending position of workpiece pressing is reached during the transfer of the workpiece.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>TC142 (bit 6)</td>
<td></td>
<td><strong>TC142</strong> (bit 6) = 0: When the workpiece is transferred as specified in the workpiece transfer unit of the MAZATROL program, the X-axis moves to the machine zero point. <strong>TC142</strong> (bit 6) = 1: When the workpiece is transferred as specified in the workpiece transfer unit of the MAZATROL program, the X-axis moves to the third zero point.</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>TC142 (bit 7)</td>
<td></td>
<td><strong>TC142</strong> (bit 7) = 0: Upper turret retraction during machining with the lower turret (for MULTIPLEX series) <strong>TC142</strong> (bit 7) = 1: Upper turret retraction invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>TC143</td>
<td>Whether the end tool of the long boring bar can be changed</td>
<td>Whether the end tool of the long boring bar can be changed by ATC (1: Changeable, 0: Not changeable)</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

### Long boring bar selection

- Long boring bar No. 1
- Long boring bar No. 2
- Long boring bar No. 3
- Long boring bar No. 4
- Long boring bar No. 5
- Long boring bar No. 6
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC144</td>
<td></td>
<td>76543210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Automatic selection of the relief path for the continuous I.D. machining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Movement of the workpiece transfer axis for opposed turret machine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : Z-axis return to zero point, 1 : Compliant with TC63/TC64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C-axis clamping during workpiece transfer with C-axis positioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : Valid, 1 : Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Automatic output of spindle rotation command when turning tool is used in the MANL PRO unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : Valid, 1 : Invalid</td>
</tr>
</tbody>
</table>

Program type: M  
Conditions: After stop of movement  
Unit: Bit  
Setting range: Binary, eight digits

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC145</td>
<td></td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Program type: —  
Conditions: —  
Unit: —  
Setting range: —
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD1 to SD48</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>Machine coordinate system setting</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>Set the type of coordinate system used for position display.</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>0: MAZATROL coordinate system</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td>1: Machine coordinate system</td>
</tr>
<tr>
<td>SD49</td>
<td>—</td>
<td>Machine coordinate system setting</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>Select a table type for 3D setup display.</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>0: Square table</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>1: Round table</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td>2: Chuck</td>
</tr>
<tr>
<td>SD50</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 2</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>SD97</td>
<td>Distance of the model movement per time</td>
<td>Set the default value for the model’s movement distance per time that is to be displayed in the movement distance assignment dialog box.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
</tbody>
</table>

| SD98    | Amount of model rotation per time | Set the default value for the amount of model rotation per time that is to be displayed in the amount-of-rotation assignment dialog box. |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.0001° |
|         | Setting range | 0 to 3600000 |

| SD99 to SD124 | Invalid |
| Program type | — |
| Conditions | — |
| Unit | — |
| Setting range | — |
## 2-3-9 Machine parameter CALL MACRO (J)

### G-code macroprogram call

<table>
<thead>
<tr>
<th>No.1</th>
<th>No.2</th>
<th>No.3</th>
<th>No.4</th>
<th>No.5</th>
<th>No.6</th>
<th>No.7</th>
<th>No.8</th>
<th>No.9</th>
<th>No.10</th>
<th>Unit</th>
<th>Setting range</th>
<th>Program type</th>
<th>Conditions</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
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<td></td>
<td></td>
<td>100009590</td>
<td>100009599</td>
<td>100009401</td>
<td></td>
<td>0 to 99999999</td>
<td></td>
<td></td>
<td>Work number of the program to be called</td>
</tr>
<tr>
<td>J2</td>
<td>J6</td>
<td>J10</td>
<td>J14</td>
<td>J18</td>
<td>J22</td>
<td>J26</td>
<td>J30</td>
<td>J34</td>
<td>J38</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>136</td>
<td>137</td>
<td>130</td>
<td></td>
<td>0 to 999</td>
<td></td>
<td></td>
<td>The G-code number to be used for program call</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(Fixed value)</td>
<td>(Fixed value)</td>
<td>(Fixed value)</td>
<td></td>
<td>Note: Not possible to set G-codes whose uses are predefined.</td>
<td></td>
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<tr>
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<td>1</td>
<td>2</td>
<td></td>
<td>0 to 3</td>
<td></td>
<td></td>
<td>Calling type 0: M98 2: G66 1: G65 3: G66.1</td>
</tr>
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</table>

### M-code macroprogram call

<table>
<thead>
<tr>
<th>No. 1</th>
<th>No. 2</th>
<th>No. 3</th>
<th>No. 4</th>
<th>No. 5</th>
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<th>Program type</th>
<th>Conditions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J41</td>
<td>100000090</td>
<td>J45</td>
<td>100000091</td>
<td>J49</td>
<td>100000092</td>
<td>J51</td>
<td>100000093</td>
<td>J54</td>
<td>100000094</td>
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<tr>
<td>100000090</td>
<td>(Fixed value)</td>
<td>100000091</td>
<td>(Fixed value)</td>
<td>100000092</td>
<td>(Fixed value)</td>
<td>100000093</td>
<td>(Fixed value)</td>
<td>100000094</td>
<td>(Fixed value)</td>
</tr>
<tr>
<td>J42</td>
<td>90</td>
<td>J46</td>
<td>91</td>
<td>J50</td>
<td>92</td>
<td>J54</td>
<td>93</td>
<td>J58</td>
<td>153</td>
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<td>90</td>
<td>(Fixed value)</td>
<td>91</td>
<td>(Fixed value)</td>
<td>92</td>
<td>(Fixed value)</td>
<td>93</td>
<td>(Fixed value)</td>
<td>153</td>
<td>(Fixed value)</td>
</tr>
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<td>J43</td>
<td>0</td>
<td>J47</td>
<td>0</td>
<td>J51</td>
<td>0</td>
<td>J55</td>
<td>0</td>
<td>J59</td>
<td>0</td>
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<tr>
<td>0</td>
<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
</tr>
<tr>
<td>J44</td>
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<td>J48</td>
<td>0</td>
<td>J52</td>
<td>0</td>
<td>J56</td>
<td>0</td>
<td>J60</td>
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<tr>
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<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
<td>0</td>
<td>(Fixed value)</td>
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<td>(Fixed value)</td>
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<td>(Fixed value)</td>
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<table>
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<tr>
<th>No. 6</th>
<th>No. 7</th>
<th>No. 8</th>
<th>No. 9</th>
<th>No. 10</th>
<th>Unit</th>
<th>Setting range</th>
<th>Program type</th>
<th>Conditions</th>
<th>Description</th>
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<tbody>
<tr>
<td>J61</td>
<td>1000000002</td>
<td>J65</td>
<td>J69</td>
<td>J73</td>
<td>J77</td>
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<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>1000000002</td>
<td>(Fixed value)</td>
<td>J69</td>
<td>J73</td>
<td>J77</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>J62</td>
<td>154</td>
<td>J66</td>
<td>J70</td>
<td>J74</td>
<td>J78</td>
<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>154</td>
<td>(Fixed value)</td>
<td>J70</td>
<td>J74</td>
<td>J78</td>
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<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>J63</td>
<td>0</td>
<td>J67</td>
<td>J71</td>
<td>J75</td>
<td>J79</td>
<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>0</td>
<td>(Fixed value)</td>
<td>J71</td>
<td>J75</td>
<td>J79</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
<tr>
<td>J64</td>
<td>0</td>
<td>J68</td>
<td>J72</td>
<td>J76</td>
<td>J80</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>0</td>
<td>(Fixed value)</td>
<td>J72</td>
<td>J76</td>
<td>J80</td>
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</table>

Note: Not possible to set M-codes whose uses are predefined.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J81 to J90</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>J91 to J107</td>
<td>—</td>
<td>Parameter for system internal setting</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>Setting prohibited</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
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<tr>
<td>Setting range</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>J108 to J144</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td>—</td>
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</table>
### 2-3-10 Machine parameter  MEASURE (K)

<table>
<thead>
<tr>
<th>Classification</th>
<th>MACHINE</th>
<th>Display title</th>
<th>MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>Rotational radius of the C-axis</td>
<td>Distance from the center of the C-axis (spindle) to the nose of the tool</td>
<td></td>
</tr>
</tbody>
</table>

- **Program type**: E
- **Conditions**: Immediate
- **Unit**: 0.0001 mm/0.00001 inch
- **Setting range**: 0 to 99999999

K2

- **Minimum rotational angle**
- **Description**: The minimum rotational angle of the C-axis at shaping block connections
  - Rotational angle of the C-axis at block connections: $\theta$
  - The C-axis does not rotate if $|\theta| < K2$.

- **Program type**: E
- **Conditions**: Immediate
- **Unit**: 0.001 deg
- **Setting range**: 0 to 90000
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K3      | Shaping control axis | Identification number of the shaping control axis. Specify the shaping control axis as follows:  
**Example:**  
Set “4” for a three-axis machine.  
Set “5” for a four-axis machine.  
**Note:**  
Set the type of the axis which has been set on this parameter to the rotational axis (M17 bit 4 = 1). |
|         | Program type | E |
|         | Conditions    | Immediate |
|         | Unit          | Axis |
|         | Setting range | 3 to 13 |
| K4 to K6 |         | Invalid |
|         | Program type | — |
|         | Conditions    | — |
|         | Unit          | — |
|         | Setting range | — |
| K7      | Unbalanced axis | Specify the axis that moves vertically:  
1 : The X-axis acts as the unbalanced axis.  
2 : The Y-axis acts as the unbalanced axis.  
4 : The Z-axis acts as the unbalanced axis. |
<p>|         | Program type | M |
|         | Conditions    | Immediate |
|         | Unit          | — |
|         | Setting range | 1, 2, 4 |
| K8, K9  |         | Invalid |
|         | Program type | — |
|         | Conditions    | — |
|         | Unit          | — |
|         | Setting range | — |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K10</td>
<td>Fixed value (0)</td>
<td>Set this parameter to change the display language.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
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</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>K11</td>
<td>Selection of language to be displayed</td>
<td>Set the language setting (0 to 21)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting</th>
<th>Language</th>
<th>Setting</th>
<th>Language</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>English</td>
<td>11</td>
<td>Korean</td>
</tr>
<tr>
<td>1</td>
<td>Japanese</td>
<td>12</td>
<td>Portuguese</td>
</tr>
<tr>
<td>2</td>
<td>German</td>
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<td>3</td>
<td>French</td>
<td>14</td>
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<td>4</td>
<td>Italian</td>
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<td>5</td>
<td>Spanish</td>
<td>16</td>
<td>Polish</td>
</tr>
<tr>
<td>6</td>
<td>Norwegian</td>
<td>17</td>
<td>Romanian</td>
</tr>
<tr>
<td>7</td>
<td>Swedish</td>
<td>18</td>
<td>Hungarian</td>
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<tr>
<td>8</td>
<td>Finnish</td>
<td>19</td>
<td>Russian</td>
</tr>
<tr>
<td>9</td>
<td>Chinese (traditional character)</td>
<td>20</td>
<td>Slovak</td>
</tr>
<tr>
<td>10</td>
<td>Dutch</td>
<td>21</td>
<td>Chinese (simplified character)</td>
</tr>
</tbody>
</table>

**Note:**
To display Japanese characters, traditional and/or simplified Chinese characters, Korean characters, or Russian characters, the appropriate OS (display language) must be installed in your personal computer.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K13</td>
<td>Measurement skip feed rate (X-axis, Z-axis)</td>
<td>(1) Workpiece measurement</td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1 mm/min / 0.1 inch/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 20000</td>
<td></td>
</tr>
</tbody>
</table>

| K14     | Measurement approach speed (X-axis, Z-axis) | (2) Tool tip measurement |
|         | Program type: M |  |
|         | Conditions: Immediate |  |
|         | Unit: 1 mm/min / 0.1 inch/min |  |
|         | Setting range: 0 to 20000 |  |

| K15     | Measurement skip speed (C-axis) |  |
|         | Program type: M |  |
|         | Conditions: Immediate |  |
|         | Unit: 1°/min |  |
|         | Setting range: 0 to 65535 |  |

<p>| K16     | Measurement approach speed (C-axis) |  |
|         | Program type: M |  |
|         | Conditions: Immediate |  |
|         | Unit: 1°/min |  |
|         | Setting range: 0 to 65535 |  |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K17     | Specification of measuring tolerance (lower limit) | (1) Tool compensation will be made in cases below. 
\[
\frac{a_1 - a_2}{100} \times K18 \geq \text{Compensation data} \geq \frac{a_1 - a_2}{100} \times K17
\]
\[
- \frac{a_1 - a_2}{100} \times K17 \geq \text{Compensation data} \geq - \frac{a_1 - a_2}{100} \times K18
\]
(2) Tool compensation will not be made in cases below. 
\[
\frac{a_1 - a_2}{100} \times K17 \geq \text{Compensation data} > \frac{a_1 - a_2}{100} \times K17
\]
(3) Alarm will be caused in cases below. 
\[
\text{Compensation data} > \frac{a_1 - a_2}{100} \times K18
\]
where \(a_1\) = Tolerance upper limit \(a_2\) = Tolerance lower limit (Specified in program)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K18     | Specification of measuring tolerance (upper limit) | (1) Tool compensation will be made in cases below. 
\[
\frac{a_1 - a_2}{100} \times K18 \geq \text{Compensation data} \geq \frac{a_1 - a_2}{100} \times K17
\]
\[
- \frac{a_1 - a_2}{100} \times K17 \geq \text{Compensation data} \geq - \frac{a_1 - a_2}{100} \times K18
\]
(2) Tool compensation will not be made in cases below. 
\[
\frac{a_1 - a_2}{100} \times K17 \geq \text{Compensation data} > \frac{a_1 - a_2}{100} \times K17
\]
(3) Alarm will be caused in cases below. 
\[
\text{Compensation data} > \frac{a_1 - a_2}{100} \times K18
\]
where \(a_1\) = Tolerance upper limit \(a_2\) = Tolerance lower limit (Specified in program)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K19     | Measurement stroke for workpiece measurement | a : Approach point 
b : Measurement start point 
c : Measurement point (target data) 
d : Measurement end point

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K20     | Measurement stroke for tool nose measurement | a : Approach point 
b : Measurement start point 
c : Measurement point (target data) 
d : Measurement end point

Notes:
1. Up to 100 % can be set.
2. Offset judgement occurs only when L106 bit 6 is set to 1.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **K21** | Coefficient to determine rotation angle when retrying measurement C reference face | During approach operation to measurement start point, if touch sensor is actuated, the C-axis will rotate by angle determined by the measurement object shape angle and setting value K21. **Example:** CW programmed as measurement direction  

\[ \beta = \alpha \times \frac{K21}{100} \]  

C-axis rotation by angle \( \beta \) in this direction. |
| Program type | M |
| Conditions | Immediate |
| Unit | % |
| Setting range | 1 to 1000 |

| **K22** | Measurement retry frequency when retrying reference face C measurement | When touch sensor is actuated before reaching target point in C offset measurement, set retry frequency. When K22 is set to N (N = 0 to 255), measurement alarm will be indicated when touch sensor is actuated before reaching measurement target point in (N+1)th retry operation. |
| Program type | M |
| Conditions | Immediate |
| Unit | Times |
| Setting range | 0 to 255 |

| **K23** | Retry frequency for workpiece measurement | Specify the number of times the workpiece measurement is to be retried if a measurement error occurs. |
| Program type | M |
| Conditions | Immediate |
| Unit | Times |
| Setting range | 0 to 99999 |

| **K24 to K28** | Fixed value | Reserved within the system. Setting prohibited |
| Program type | — |
| Conditions | — |
| Unit | — |
| Setting range | — |
### Address | Meaning | Description
--- | --- | ---
K29 | Simultaneous control: Delay counter for automatic correction of synchronizing errors | 1. Delays master/slave axis position matching during automatic error correction (parameter K103 bit 1 = 0).  
2. Delays pitch error correction data output when the servo is ON.  

| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | \( \times 1.7 \) msec |  |
| Setting range | 0 to 99999 |  |

#### K30 to K33

| Program type | M, E |  |
| Conditions | At power on |  |
| Unit | 1 mm/min / 0.1 inch/min |  |
| Setting range | \( \pm 99999999 \) |  |

**K30** Approach speed for laser tool length measurement  
**K31** Approach speed for laser tool diameter measurement  
**K32** Pre-measuring speed for laser tool length measurement  
**K33** Pre-measuring speed for laser tool diameter measurement  

Specify the approach speed and pre-measuring speed for laser tool length (diameter) measurement.

#### K34 K35

| Program type | M, E |  |
| Conditions | At power on |  |
| Unit | \( \text{min}^{-1} \) |  |
| Setting range | 0 to 65535 |  |

**K34** Pre-measuring spindle speed for laser tool length measurement  
**K35** Pre-measuring spindle speed for laser tool diameter measurement  

Specify the pre-measuring spindle speed for laser tool length (diameter) measurement.

#### K36

| Program type | — |  |
| Conditions | — |  |
| Unit | — |  |
| Setting range | — |  |

Reserved within the system.  
**Setting prohibited**
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K37</td>
<td>External deceleration speed</td>
<td>The upper-limit value of the feed rates available while the external deceleration signal is ON.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1 mm/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 120000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K38</td>
<td>Work number called during S-code macroprogram appointment</td>
<td>The work number of the macroprogram to be called during S-code macroprogram appointment. (Programming of “S0000;” causes execution of the macroprogram whose work number is set using this parameter.)</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999999999</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: This parameter is valid only when bit 2 of parameter K105 is 1.</td>
</tr>
<tr>
<td>K39</td>
<td>Work number called during T-code macroprogram appointment</td>
<td>The work number of the macroprogram to be called during T-code macroprogram appointment. (Programming of “T0000;” causes execution of the macroprogram whose work number is set using this parameter.)</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999999999</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: This parameter is valid only when bit 3 of parameter K105 is 1.</td>
</tr>
<tr>
<td>K40</td>
<td>Work number called during second auxiliary function macroprogram appointment</td>
<td>The work number of the macroprogram to be called during macroprogram appointment using the second auxiliary function.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 999999999</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notes: 3. This parameter is valid only when bit 4 of parameter K105 is 1. 4. See the description of parameter K56 for details of the addresses available with the second auxiliary function.</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>K41</td>
<td>G31 skipping speed</td>
<td>The feed rate during axis movement by G31 (skip function)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the same block as that of G31 contains an F command, then that feed rate becomes valid.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1 mm/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 120000</td>
<td></td>
</tr>
<tr>
<td>K42.1</td>
<td>G31.1 skipping speed</td>
<td>The feed rate during axis movement by G31.1 (multi-step skip function)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the same block as that of G31.1 contains an F command, then that feed rate becomes valid.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1 mm/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 120000</td>
<td></td>
</tr>
<tr>
<td>K43.2</td>
<td>G31.2 skipping speed</td>
<td>The feed rate during axis movement by G31.2 (multi-step skip function)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the same block as that of G31.2 contains an F command, then that feed rate becomes valid.</td>
</tr>
<tr>
<td></td>
<td>Program type: E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 1 mm/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 120000</td>
<td></td>
</tr>
<tr>
<td>K44.3</td>
<td>G31.3 skipping speed</td>
<td>The feed rate during axis movement by G31.3 (multi-step skip function)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the same block as that of G31.3 contains an F command, then that feed rate becomes valid.</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>K45</td>
<td>G31.4 skipping speed</td>
<td>The feed rate during axis movement by G31.4 (skip function) if the same block as that of G31.4 contains an F command, then that feed rate becomes valid.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 120000</td>
</tr>
<tr>
<td>K46</td>
<td>Excessive pressing error spread (Amount of drooping)</td>
<td>Set the excessive pressing error spread (the amount of drooping).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 32767</td>
</tr>
<tr>
<td>K47</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>K48</td>
<td>Spindle FB alarm detection method</td>
<td>0 : Monitoring based on acceleration 1 : Monitoring based on speed 2 : Ignoring alarms</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 2</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| K49     | First number of the standby M-codes | Set the first number of the M-codes to be used for the M-code standby function.  
**Example:**  
To use M950 to M995 as the standby M-codes set “950” in K49 and “46” in K50. |
| K50     | Total number of the standby M-codes | Set the total number of M-codes to be used for the M-code standby function.  
**Example:**  
To use M950 to M995 as the standby M-codes set “950” in K49 and “46” in K50.  
**Note:**  
If “0” is set, the M-code standby function will be invalid. |
| K51     | M-code during workpiece measurement retry operation | Set the M-code to output if workpiece measurement results in an error and is to be retried.  
**Note:**  
If “0” is set, this function will be invalid. |
| K52     | — | Parameter for system internal setting  
**Setting prohibited** |

**Program type:** M, E  
**Conditions:** After stop of movement  
**Unit:** —  
**Setting range:** 31 to 1000 (K49), 0 to 1000 (K50), 0 to 1000 (K51)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| K53     | Language selection (vocal output) | Set the type of vocal output language.  
|         | Program type: M, E |  
|         | Conditions: Immediate |  
|         | Unit: — |  
|         | Setting range: 0 to 21 |  
|         | Setting | Language | Language |  
| 0       | English | 8 | — |  
| 1       | Japanese | 9 | Chinese (traditional character) |  
| 2       | German | 10 | — |  
| 3       | French | 11 | Korean |  
| 4       | Italian | 12 | Portuguese |  
| 5       | Spanish | 13 to 20 | — |  
| 6       | — | 21 | Chinese (simplified character) |  
| 7       | — | — | — |  
| Note: | | | Output will be in English (0) if the selected value is for a language not supported. |

| K54     | Sound level (vocal output) | Set the vocal output sound level.  
|         | Program type: M, E |  
|         | Conditions: Immediate |  
|         | Unit: — |  
|         | Setting range: 0 to 100 |  
| Note: | | | Entry of “0” means no sound level. |

| K55     | Warning reference value (vocal output) | A vocal warning will be output if the value of the load meter exceeds the percentage value set in K55.  
|         | Program type: M, E |  
|         | Conditions: Immediate |  
|         | Unit: % |  
|         | Setting range: 0 to 200 |  

| K56     | Name of second auxiliary function | Select the address name of the second auxiliary function from among the following three types:  
<p>|         | Program type: E |<br />
|         | Conditions: At power on |<br />
|         | Unit: — |<br />
|         | Setting range: Hexadecimal two-digit 0, 41, 42, 43 |<br />
| Address name | Setting (HEX) |<br />
| Invalid | 0 |<br />
| A | 41 |<br />
| B | 42 |<br />
| C | 43 |<br />
| Note: | | Do not use the same address for the axis name and the second auxiliary function. |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K57</td>
<td>Type of S-code macroprogram appointment call</td>
<td>This parameter is used during S-code macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K38 parameter.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3</td>
</tr>
<tr>
<td>K58</td>
<td>Type of T-code macroprogram appointment call</td>
<td>This parameter is used during T-code macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K39 parameter.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3</td>
</tr>
<tr>
<td>K59</td>
<td>Type of second auxiliary function macroprogram appointment call</td>
<td>This parameter is used during the second auxiliary function macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K40 parameter.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3</td>
</tr>
<tr>
<td>K60</td>
<td>Fixed value (4)</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Valid only when bit 2 of K105 is 1.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Calling method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>M98</td>
</tr>
<tr>
<td>1</td>
<td>G65</td>
</tr>
<tr>
<td>2</td>
<td>G66</td>
</tr>
<tr>
<td>3</td>
<td>G66.1</td>
</tr>
</tbody>
</table>

Note:
Valid only when bit 3 of K105 is 1.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Calling method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>M98</td>
</tr>
<tr>
<td>1</td>
<td>G65</td>
</tr>
<tr>
<td>2</td>
<td>G66</td>
</tr>
<tr>
<td>3</td>
<td>G66.1</td>
</tr>
</tbody>
</table>

Note:
Valid only when bit 4 of K105 is 1.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Calling method</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>M98</td>
</tr>
<tr>
<td>1</td>
<td>G65</td>
</tr>
<tr>
<td>2</td>
<td>G66</td>
</tr>
<tr>
<td>3</td>
<td>G66.1</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>K61</strong></td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>K62</strong></td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>K63</strong></td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>K64</strong></td>
<td>Fixed value (2)</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>K65</td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>K66</td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>K67</td>
<td>Fixed value (1)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>K68</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>G31.1 skip conditions</td>
<td>K69</td>
</tr>
<tr>
<td>K70</td>
<td>G31.2 skip conditions</td>
</tr>
<tr>
<td>K71</td>
<td>G31.3 skip conditions</td>
</tr>
<tr>
<td>K72</td>
<td>G31.4 skip conditions</td>
</tr>
</tbody>
</table>

**Program type**
- E

**Conditions**
- After stop of movement

**Unit**
- Bit

**Setting range**
- Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K73</td>
<td>G4 skip conditions</td>
<td>Select the skip signal for G4 command.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td></td>
<td>Setting value</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>(0: Invalid 1: Valid)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>K73 - SKIP-2, SKIP-10, QX721</td>
<td></td>
</tr>
</tbody>
</table>

| K74     | Emergency stop contactor cutoff time | Set the desired time from an emergency stop to the start of cutting off the contactor of the main power to the driving section during the execution of a safety supervisory function when all-axis zero-speed confirmation is impossible. A contactor cutoff signal will be immediately output if all-axis zero-speed confirmation is executable earlier than the set time. |
|         | Program type | M, E |
|         | Conditions | After stop of movement |
|         | Unit | sec |
|         | Setting range | 0 to 60 |

| K75     | Contactor control output device 1 | Specify a remote I/O device that is to output a contactor activating/deactivating signal when the safety supervisory function is executed. |
|         | Program type | M, E |
|         | Conditions | After stop of movement |
|         | Unit | — |
|         | Setting range | &0 to &7F |

<p>| K76     | Contactor control output device 2 | Specify another remote I/O device that is to output the contactor activating/deactivating signal when the safety supervisory function is executed. |
|         | Program type | M, E |
|         | Conditions | After stop of movement |
|         | Unit | — |
|         | Setting range | &amp;0 to &amp;7F |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K77</td>
<td>Door switch input device (Safety supervisory function)</td>
<td>Enter the device number of the remote I/O device to be activated to input a door open/closed status signal. The device of the entered serial device number will be reserved according to the particular setting of K78 (the parameter for setting the number of door switches).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>&amp;0 to &amp;7F</td>
</tr>
<tr>
<td>K78</td>
<td>Number of door switches (Safety supervisory function)</td>
<td>Set the number of doors for which the door open/closed status signal is to be output.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 16</td>
</tr>
<tr>
<td>K79</td>
<td>Supervisory speed filtering time during servo-off (Safety supervisory function)</td>
<td>Set the filtering time for the speed that is to be monitored in a servo-off status during safety speed monitoring.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1.777 msec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 1000</td>
</tr>
<tr>
<td>K80 to K84</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**Note:**
Door switch input will be invalid if "&0" is entered.

**Input of "0" means 200 msec."
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K85</td>
<td>Special linear acceleration/deceleration time constant for threading</td>
<td>If the setting of K85 is from 1 to 3 msec, this setting will be used as the linear acceleration/deceleration time constant for the G32 threading block. If the setting is outside the valid range, however, the normal linear acceleration/deceleration time constant for G01 will be used.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>msec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 300</td>
</tr>
<tr>
<td>K86 to K89</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>K90</td>
<td>Return override during synchronous tapping</td>
<td>The overriding value for return from the hole bottom during a synchronous tapping cycle</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999</td>
</tr>
<tr>
<td>K91</td>
<td>Alternative M-code for M96</td>
<td>Specify an alternative M-code for M96 when user macro interruption is valid.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 127</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>K92</td>
<td>Alternative M-code for M97</td>
<td>Specify an alternative M-code for M97 when user macro interruption is valid.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 127</td>
</tr>
<tr>
<td>K93</td>
<td>Fixed value (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>K94</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>K95</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tool position compensation during T-command execution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Not performed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Performed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coordinate system update during handle pulse interrupt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Not performed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Performed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acceleration/deceleration time constant for handle pulse feed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Time constant for cutting feed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: No time constant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software limits for G30 execution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Valid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-position check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Valid</td>
</tr>
</tbody>
</table>

Program type: M, E
Conditions: After stop of movement
Unit: Bit
Setting range: Binary, eight digits

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G0 command in-position check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Non-check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Timing of manual free feed finish signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Smoothing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Distribution finish (equivalent to DEN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Axis/Cutting interlock alarm display</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Valid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Suppression of lost motion in modes other than the G1 command mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Valid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed G0 inclination</td>
</tr>
</tbody>
</table>

Program type: M, E
Conditions: After stop of movement
Unit: Bit
Setting range: Binary, eight digits
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K97</td>
<td>B-axis misalignment correction&lt;br&gt;Name of parallel axis</td>
<td>Specify the name of the axis to be made parallel with respect to the direction of the spindle when the angle of the B-axis is 0 degrees.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E&lt;br&gt;Conditions Immediate&lt;br&gt;Unit Hexadecimal, two digits&lt;br&gt;Setting range &amp;41 to &amp;5A</td>
<td><strong>Note:</strong> If 0 is entered, the axis will be regarded as the Z-axis (&amp;5A).</td>
</tr>
<tr>
<td>K98</td>
<td>B-axis misalignment correction&lt;br&gt;Name of orthogonal axis</td>
<td>Specify the name of the axis to be made orthogonal with respect to the direction of the spindle when the angle of the B-axis is 0 degrees.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E&lt;br&gt;Conditions Immediate&lt;br&gt;Unit Hexadecimal, two digits&lt;br&gt;Setting range &amp;41 to &amp;5A</td>
<td><strong>Note:</strong> If 0 is entered, the axis will be regarded as the X-axis (&amp;58).</td>
</tr>
<tr>
<td>K99</td>
<td>Dynamic offset&lt;br&gt;Name of rotational axis</td>
<td>Specify the name of the rotational axis to undergo dynamic offset.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E&lt;br&gt;Conditions Immediate&lt;br&gt;Unit Hexadecimal, two digits&lt;br&gt;Setting range &amp;41 to &amp;5A</td>
<td>Specify the name of the axis to be made parallel with respect to the rotational plane of the rotational axis to undergo dynamic offset.</td>
</tr>
<tr>
<td>K100</td>
<td>Dynamic offset&lt;br&gt;Name of parallel axis</td>
<td>Specify the name of the axis to be made parallel with respect to the rotational plane of the rotational axis to undergo dynamic offset.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E&lt;br&gt;Conditions Immediate&lt;br&gt;Unit Hexadecimal, two digits&lt;br&gt;Setting range &amp;41 to &amp;5A</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>K101</strong></td>
<td>Dynamic offset&lt;br&gt;Name of orthogonal axis</td>
<td>Specify the name of the axis to be made orthogonal with respect to the rotational plane of the rotational axis to undergo dynamic offset.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Hexadecimal, two digits</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>&amp;41 to &amp;5A</td>
<td></td>
</tr>
</tbody>
</table>

| K102 | Fixed value (0) | |
| Program type | — | |
| Conditions | — | |
| Unit | — | |
| Setting range | — | |

<p>| K103 | — | |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | Bit | |
| Setting range | Binary, eight digits | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K104</td>
<td>Laser tool length/diameter measurement</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

**Note:** This parameter is valid when K104 bit 1 = 1.

<table>
<thead>
<tr>
<th>K105</th>
<th>Voice Adviser (Vocal output function)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0: Invalid</td>
</tr>
<tr>
<td></td>
<td>1: Valid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of voice</th>
<th>0: Male's voice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Female's voice</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vocal guidance for warm-up operation</th>
<th>0: Invalid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Valid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Setting rapid feed override to 0% when cutting feed override is set to 0%</th>
<th>0: Valid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Invalid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

**Fixed value (1):**
- 0: S-code macro call invalid
- 1: S-code macro call valid
- 0: T-code macro call invalid
- 1: T-code macro call valid
- 0: Second auxiliary function macro call invalid
- 1: Second auxiliary function macro call valid

**Fixed value (0):**
- 0: Input in millimeter
- 1: Input in inch
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K106</td>
<td>—</td>
<td>Execution conditions for user macroprogram interrupt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Edge triggering (Performed just once when the interrupt signal is turned ON)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Status triggering (Repeatedly performed while the interrupt signal is ON)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Start timing for user macroprogram interrupt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: The block under execution is aborted and then the interrupt occurs immediately.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Interrupt occurs after completion of the block being executed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pitch error setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Absolute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Incremental</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td>K107</td>
<td>—</td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deceleration for arc valid/invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fixed value (0)</td>
</tr>
<tr>
<td>K108</td>
<td>—</td>
<td>Specify the maximum permissible error range for the master and slave axes for synchronous control (Tandem driving system).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the specified range is overstepped, the alarm EXCESS SIMULTANEOUS ERROR will be displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error checking will not occur if 0 is set.</td>
</tr>
</tbody>
</table>

**Permissible error range for synchronous control**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>K109</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>K110</td>
<td>Judgment angle near a singular point (Tool tip point control)</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of axis movement</td>
</tr>
<tr>
<td>Unit</td>
<td>deg</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 360</td>
</tr>
<tr>
<td>K111</td>
<td>Clamping speed in safety supervisory mode 3</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of axis movement</td>
</tr>
<tr>
<td>Unit</td>
<td>mm/min</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 1000</td>
</tr>
<tr>
<td>K112</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| K113    | Machine type (Tool tip point control) | Set the type of machine.  
1 : Tool tilt type  
2 : Mixed type  
3 : Table tilt type  
**Example:**  
1 = Tool tilt type  
2 = Mixed type  
3 = Table tilt type |
|         | Program type | M, E  
Conditions | Immediate  
Unit | —  
Setting range | 1 to 3 |
| K114    | Axis number of the horizontal axis in the rectangular coordinate system (Tool tip point control) | Set the axis number of the horizontal axis in the rectangular coordinate system.  
A setting of 0 is invalid.  
**Program type** | E  
**Conditions** | Immediate  
**Unit** | —  
**Setting range** | 0 to 16 |
| K115    | Axis number of the vertical axis in the rectangular coordinate system (Tool tip point control) | Set the axis number of the vertical axis in the rectangular coordinate system.  
A setting of 0 is invalid.  
**Program type** | E  
**Conditions** | Immediate  
**Unit** | —  
**Setting range** | 0 to 16 |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K116</td>
<td>Axis number of the height axis in the rectangular coordinate system (Tool tip point control)</td>
<td>Set the axis number of the height axis in the rectangular coordinate system. A setting of 0 is invalid.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 16</td>
</tr>
</tbody>
</table>
| K117    | Rotational direction of the rotary axis (Tool tip point control) | 12: 2nd rotary axis ...... Rotates about horizontal axis, 1st rotary axis ...... Rotates about vertical axis.  
13: 2nd rotary axis ..... Rotates about horizontal axis, 1st rotary axis ...... Rotates about height axis.  
21: 2nd rotary axis ...... Rotates about vertical axis, 1st rotary axis ...... Rotates about horizontal axis.  
23: 2nd rotary axis ...... Rotates about vertical axis, 1st rotary axis ...... Rotates about height axis.  
31: 2nd rotary axis ...... Rotates about height axis, 1st rotary axis ...... Rotates about vertical axis.  
32: 2nd rotary axis ...... Rotates about height axis, 1st rotary axis ...... Rotates about horizontal axis. |
|         | Program type    | E                                                                                               |
|         | Conditions      | Immediate                                                                                       |
|         | Unit            | —                                                                                               |
|         | Setting range   | —                                                                                               |
| K118    | —                | Invalid                                                                                         |
| K118 to K120 | —                    | Set the axis number of the first rotary axis. A setting of 0 is invalid.                      |
|         | Program type    | —                                                                                               |
|         | Conditions      | —                                                                                               |
|         | Unit            | —                                                                                               |
|         | Setting range   | —                                                                                               |
| K121    | Axis number of the first rotary axis (Tool tip point control) | 12: 2nd rotary axis ...... Rotates about horizontal axis, 1st rotary axis ...... Rotates about vertical axis.  
13: 2nd rotary axis ..... Rotates about horizontal axis, 1st rotary axis ...... Rotates about height axis.  
21: 2nd rotary axis ...... Rotates about vertical axis, 1st rotary axis ...... Rotates about horizontal axis.  
23: 2nd rotary axis ...... Rotates about vertical axis, 1st rotary axis ...... Rotates about height axis.  
31: 2nd rotary axis ...... Rotates about height axis, 1st rotary axis ...... Rotates about vertical axis.  
32: 2nd rotary axis ...... Rotates about height axis, 1st rotary axis ...... Rotates about horizontal axis. |
<p>|         | Program type    | E                                                                                               |
|         | Conditions      | Immediate                                                                                       |
|         | Unit            | —                                                                                               |
|         | Setting range   | 0 to 16                                                                                         |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K122</td>
<td>Horizontal axis rotational center offset of the first rotary axis (Tool tip point control)</td>
<td>&lt;If the first rotary axis rotates for tool control&gt; Set the distance from the rotational center of the tool control rotary axis (at the tool side) in the direction of the horizontal axis to the rotational center of the tool control rotary axis (at the opposite side). &lt;If the first rotary axis rotates for table control&gt; Set the distance from the spindle tip point in the direction of the horizontal axis to the rotational center of the table control rotary axis (at the opposite side) when all axes are in the machine home position.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
<tr>
<td>K123</td>
<td>Vertical axis rotational center offset of the first rotary axis (Tool tip point control)</td>
<td>&lt;If the first rotary axis rotates for tool control&gt; Set the distance from the rotational center of the tool control rotary axis (at the tool side) in the direction of the vertical axis to the rotational center of the tool control rotary axis (at the opposite side). &lt;If the first rotary axis rotates for table control&gt; Set the distance from the spindle tip point in the direction of the horizontal axis to the rotational center of the table control rotary axis (at the opposite side) when all axes are in the machine home position.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
<tr>
<td>K124</td>
<td>Height axis rotational center offset of the first rotary axis (Tool tip point control)</td>
<td>&lt;If the first rotary axis rotates for tool control&gt; Set the distance from the rotational center of the tool control rotary axis (at the tool side) in the direction of the height axis to the rotational center of the tool control rotary axis (at the opposite side). &lt;If the first rotary axis rotates for table control&gt; Set the distance from the spindle tip point in the direction of the height axis to the rotational center of the table control rotary axis (at the opposite side) when all axes are in the machine home position.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
<tr>
<td>K125</td>
<td>Axis number of the second rotary axis (Tool tip point control)</td>
<td>Set the axis number of the second rotary axis. A setting of 0 is invalid.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 16</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>K126</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|         | Horizontal axis rotational center offset of the second rotary axis (Tool tip point control) |  <If the second rotary axis rotates for tool control>  
  Set the distance from the spindle holder end in the direction of the horizontal axis to the rotational center of the tool control rotary axis (at the tool side).  
  <If the second rotary axis rotates for table control>  
  Set the distance from the rotational center of the table control rotary axis in the direction of the horizontal axis to the rotational center of the table control rotary axis (at the workpiece side) when all axes are in the machine home position. |

| Program type | E |
| Conditions   | Immediate |
| Unit         | 0.0001 mm |
| Setting range | ±99999999 |

| K127    | Vertical axis rotational center offset of the second rotary axis (Tool tip point control) |  <If the second rotary axis rotates for tool control>  
  Set the distance from the spindle holder end in the direction of the vertical axis to the rotational center of the tool control rotary axis (at the tool side).  
  <If the second rotary axis rotates for table control>  
  Set the distance from the rotational center of the table control rotary axis in the direction of the vertical axis to the rotational center of the table control rotary axis (at the workpiece side) when all axes are in the machine home position. |

| Program type | E |
| Conditions   | Immediate |
| Unit         | 0.0001 mm |
| Setting range | ±99999999 |

| K128    | Height axis rotational center offset of the second rotary axis (Tool tip point control) |  <If the second rotary axis rotates for tool control>  
  Set the distance from the spindle holder end in the direction of the height axis to the rotational center of the tool control rotary axis (at the tool side).  
  <If the second rotary axis rotates for table control>  
  Set the distance from the rotational center of the table control rotary axis in the direction of the height axis to the rotational center of the table control rotary axis (at the workpiece side) when all axes are in the machine home position. |

| Program type | E |
| Conditions   | Immediate |
| Unit         | 0.0001 mm |
| Setting range | ±99999999 |

| K129 to K144 |         | Invalid |

| Program type | — |
| Conditions   | — |
| Unit         | — |
| Setting range | — |
## 2-3-11 Machine parameter TABLE (L)

### Table:

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Stylus eccentricity of touch sensor (X-component)</td>
<td>The eccentricity of the stylus of the touch sensor with respect to the center of the spindle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L2</td>
<td>Stylus eccentricity of touch sensor (Y-component)</td>
<td>The true radius value of the stylus ball of the touch sensor.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L3</td>
<td>Radius of stylus ball of touch sensor (X-component)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L4</td>
<td>Radius of stylus ball of touch sensor (Y-component)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

**Note:**

These data are automatically set when calibration measurement is performed using the MMS unit.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L5</td>
<td>Z-axis stroke for tip position memory (TEACH function)</td>
<td>The distance from the spindle taper gage line to the table surface, No. 1 turning spindle chuck edge, or the reference block on the pallet existing when the Z-axis is in the machine zero-point position.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="MPL095" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L6</td>
<td>Tool-breakage judgment distance for TBR function</td>
<td>The minimum tool displacement by which the tool is judged to be broken one as a result of execution of the tool breakage detection function. If (registered tool length data) – (tool length data that has been measured during the detecting operation) ≥ L6, then the tool is judged broken.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>![Diagram](Model H, e type) (Model V, e type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L7      | Tool-breakage restoration mode for TBR function | The parameter for selecting the type of restoration to be performed after tool breakage has been detected as a result of execution of the tool breakage detection function.  
1: Single-block stop  
2: Machining restarts from the next process.  
3: Single-block stop occurs in a state where machining can be restarted from the next process. |
<p>|         |         | <img src="Table" alt="Diagram" /> |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L8</td>
<td>Skipping stroke limit for MMS</td>
<td>The maximum skipping movement distance for the measurement with the MMS unit. An alarm message will appear if the touch sensor has not come into contact with the workpiece within this distance.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 99999999</td>
<td></td>
</tr>
<tr>
<td>L9</td>
<td>Selection of random ATC specifications</td>
<td>Set to 1 when the machine of the random ATC specifications is used. 0: Standard machine 1: Machine of random ATC specifications</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions At power on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0, 1</td>
<td></td>
</tr>
<tr>
<td>L10</td>
<td>Interval between magazine pockets</td>
<td>Set the interval between magazine pockets.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 1 mm/0.1 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 999</td>
<td></td>
</tr>
<tr>
<td>L11</td>
<td>Touch sensor’s interference direction</td>
<td>Set the touch sensor’s interference direction. 0: Non-interference (normal diameter) 1: To jut out in the direction of a pocket of higher number (Positive direction of magazine) 2: To jut out in the direction of a pocket of lower number (Negative direction of magazine)</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range 0 to 2</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>L12</td>
<td>Tolerance for manual measurement</td>
<td>Tolerance for Z coordinate value in circle measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="L12" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tolerance for measured coordinate value in face measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="L12" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPL512</td>
</tr>
<tr>
<td>L13</td>
<td>Allowable angle for parallelism and right angle in manual measurement</td>
<td>Set the allowable angle for calculation of parallelism and right angle to be measured manually.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="L13" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td>When error angle is smaller than the setting angle, the parallelism and right angle are calculated.</td>
</tr>
<tr>
<td>L14</td>
<td>Escapement for straightness measurement</td>
<td>Set an escape amount from a measurement point to the next point in straightness measurement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="L14" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**Program type** M, E  
**Conditions** Immediate  
**Unit** 0.0001 mm/0.00001 inch  
**Setting range** 0 to ±99999999

**Program type** M  
**Conditions** Immediate  
**Unit** 0.0001°  
**Setting range** 0 to ±900000

**Program type** M  
**Conditions** Immediate  
**Unit** 0.0001 mm/0.00001 inch  
**Setting range** 0 to ±99999999
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L15</td>
<td>Macro program number for straightness measurement</td>
<td>Set macro program number for straightness measurement. Before shipment, the macro program is numbered “9999” at the factory.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999999</td>
</tr>
</tbody>
</table>

| L16     | Fixed value | Parameter for system internal setting Setting prohibited |
|         | Program type | — |
|         | Conditions   | — |
|         | Unit         | — |
|         | Setting range| — |

| L17     | Presence/absence of tailstock | Invalid |
|         | Program type | — |
|         | Conditions   | — |
|         | Unit         | — |
|         | Setting range| — |

<p>| L18     | Program type | M, E |
|         | Conditions   | Immediate |
|         | Unit         | — |
|         | Setting range| 0, 1 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L19</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>L20</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>L21</td>
<td>—</td>
<td>Select the output type for the angle command of the indexing unit and the end unit of the MAZATROL program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: To select servo axis (4th axis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: To select the code (the second auxiliary function) set by K56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: To select servo axis (4th/5th axis)</td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 2</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>L22 to L25</td>
<td>Data of the tool nose measurement sensor</td>
<td>Use L22 and L23 to set the dimensions of the sensor for tool nose measurement. L24 and L25 are provided to set in machine coordinates the reference point of the sensor (see the diagram below).</td>
</tr>
<tr>
<td>L22 : Sensor width along the X-axis</td>
<td></td>
<td>[INTE IV, INTE e-HII, lathes]</td>
</tr>
<tr>
<td>L23 : Sensor width along the Z-axis</td>
<td></td>
<td>Example 1: For No. 1 turning spindle</td>
</tr>
<tr>
<td>L24 : X-coordinate of the sensor’s reference point</td>
<td></td>
<td>Set the imaginary upper left corner of the sensor as its reference point for No. 2 spindle.</td>
</tr>
<tr>
<td>L25 : Z-coordinate of the sensor’s reference point</td>
<td></td>
<td>[INTE e-VII]</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>M</td>
<td>Example 2:</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>±99999999</td>
<td></td>
</tr>
</tbody>
</table>

| L26 | Tool nose measurement sensor reference position, Y-axis | Setting of sensor reference point Y coordinate |
| **Program type** | M | |
| **Conditions** | Immediate | |
| **Unit** | 0.0001 mm/0.00001 inch | |
| **Setting range** | ±99999999 | |

Note: As shown above, the X- and Z-axes must be replaced with each other between INTEGREX e-HII and e-VII.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>L27</td>
<td>Timer setting for manual TOOL EYE measurement</td>
</tr>
</tbody>
</table>

**Description**
During manual TOOL EYE measurement, even if the sensor turns on for a time shorter than that which has been specified in this parameter, that will not be regarded as sensor-on.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>L28</td>
<td>Amount of Z-axial escape from the approach point after TOOL EYE measurement</td>
</tr>
</tbody>
</table>

**Description**
Under the machine configuration where, after automatic tool measurement with the TOOL EYE, the cover of the TOOL EYE will interfere with the tool if the cover is closed with the tool present at the measuring approach point, enter the distance through which the tool is to be moved in the Z-axial direction before the cover is closed following completion of the measurement.

In the case of MAZATROL programs, when the measurement is completed, the tool will be moved through the L28-specified distance from the approach point before the cover is closed.

In the case of EIA/ISO programs, when execution of the G136 command is completed, the tool will be moved through the L28-specified distance from the approach point. The cover will be closed by execution of M284 in the next block onward.

### Machine efficiency

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>L29</td>
<td>Machine efficiency</td>
</tr>
</tbody>
</table>

**Description**
Set machine efficiency. This value is used as average output calculation data for machining navigation. If the setting is 0, machine efficiency will become 90%.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L30</td>
<td>Selection of machining navigation case introduction messages</td>
<td>Select for each machine model the appropriate case introduction messages on MACHINING NAVIGATION-PREDICTION display. Specific data is preset for each machine model. Do not disturb the presets.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999</td>
</tr>
<tr>
<td>L31 to L36</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>L37</td>
<td>Minimum index angle of index table</td>
<td>For the command to rotate the index table, specify the minimum index angle for angle command by the M-code or B-code.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1°</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 180</td>
</tr>
<tr>
<td>L38</td>
<td>M/B-code for index of index table</td>
<td>For the command to rotate the index table, select the turning direction and the M-code number to be output.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 9999</td>
</tr>
</tbody>
</table>

Notes:
1. This parameter is ineffective for the system with an NC rotary table.
2. Turning direction of the index table can be selected in the indexing unit only when this parameter is set to 1.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **L39** | Selection of execution/non execution of indexing unit | Specify the execution condition of the indexing unit. Execution of the indexing unit just before starting of machining of each tool sequence or at the end of each process:  
0: Won’t be made when the index angle is the same as the preceding indexing unit execution.  
1: Will be made unconditionally. |
| Program type | M | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | 0, 1 | |

| **L40** | Availability of specification of index table angle in end unit | Select availability to specify the index table angle in the end unit.  
0: Enables to specify the angle.  
1: Prohibits to specify the angle. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |

**Note:**  
Set to 0 only for index table specification.

| **L41** | Simultaneous operation of indexing unit with ATC | For execution of the indexing unit, specify the commanding order for movement to turning position, turning of the table and ATC.  
0: Movement to turning position → Table turning → ATC  
1: Movement to turning position → Table turning and ATC  
2: Movement to turning position, table turning and ATC simultaneously take place. |
| Program type | M | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | 0 to 2 | |

**Note:**  
In case of setting to 2, only the X-axis coordinates can be set at turning position of the indexing unit.

| **L42** | Initial value of index table angle | Select setting of the initial value (modal) of the index table angle for cyclic operation.  
0: Actual table angle of the machine  
1: Table angle indexed at present taken as 0° |
<p>| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L43</td>
<td>Indication of index table angle</td>
<td>Select showing or not showing of the index table angle on the POSITION display. 0: Not to show 1: To show</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

Note: Set to 1 for the machine with the index table, or set to 0 for that of the NC rotary table.

<table>
<thead>
<tr>
<th>L44</th>
<th>Selection of automatic setting on/off for nose position correction of a drilling tool</th>
<th>Select whether automatic setting of the amount of tool nose position correction is to be made valid or invalid when entering the length of a drilling tool in the tool data or when measuring the tool length in the MDI mode. 0: Automatic setting valid 1: Automatic setting invalid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L45</th>
<th>Index table angle command</th>
<th>Set the minimum unit of index table angle command for INDEX units, ANGLE in END units and B-codes in MANL PRG unit. 0: 1-deg 1 to 8: 1/1000 deg (MRJ2-CT specifications)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 8</td>
</tr>
</tbody>
</table>

Note: Index table angle display on the POSITION display is valid only when L43 = 1 (index table angle display on). 0: 1-deg index table 1 to 7: Nth axis under MRJ2-CT specs. (N = 1 to 7) 8: Positioning table

<table>
<thead>
<tr>
<th>L46</th>
<th>Maximum number of pallets in pallet changing unit</th>
<th>Select change or no change of the pallet and specify the maximum number of pallets. 0 or 1: Not to change pallet 2 to 255: To change pallet (Numeric value indicates the maximum number of pallets.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
</tbody>
</table>

Note: When this parameter is set to 0 or 1, use of the pallet changing unit is prohibited.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **L47** | To prepare or not to prepare next pallet change | Select preparation of next pallet or not to do so according to the pallet change mechanism.  
0: Not to prepare next pallet  
1: To prepare next pallet  
**Note:**  
When this parameter is set to 1, it is possible to set the number of the next pallet in the pallet changing unit. |
| Program type | M |  |
| Conditions | At power on |  |
| Unit | — |  |
| Setting range | 0, 1 |  |
| **L48** | Number of long boring bars | Specify the number of long boring bars mounted. |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0 to 9 |  |
| **L49** | Simultaneous operation of pallet change with ATC | This parameter is used to select simultaneous operation of pallet change with the next ATC operation in execution of the pallet changing unit and the face definition unit, or not.  
0: To operate ATC after pallet change  
1: To operate pallet change and ATC simultaneously |
| Program type | M |  |
| Conditions | Immediate |  |
| Unit | — |  |
| Setting range | 0, 1 |  |
| **L50** | Rewriting of head number | Rewriting of head number in MDI mode:  
0: Impossible  
1: Possible  
(For five surface machining) |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L51     | Tool command system in MDI operation | Tool command system in MDI operation (Tool on the spindle and next time tool)  
0: Command of pocket number  
1: Command of group number |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |
| L52     | Writing of machining management data with macro variable | Rewriting of machining management data with macro variable (system variable)  
0: Impossible  
1: Possible |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |
| L53     | Showing of program number in PALLET MANAGEMENT display | Select showing or not showing of the work number in the PALLET MANAGEMENT display.  
0: Not to show WNo.  
1: To show WNo. |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0, 1 | |
| L54     | Selection of automatic operation mode |  
0: Invalid  
1: FMS pallet ID operation mode  
2: Pallet management operation mode |
<p>| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | 0 to 2 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L55     | Spindle load meter display type | 0: FR-SF  
1: FR-SE |
|         | Program type | — |
|         | Conditions | At power on |
|         | Unit | — |
|         | Setting range | 0, 1 |

| L56     | Method of measurement of coordinates by tool edge memorizing function (TEACH) | 0: Method by M2 tool edge memorizing function  
1: Method by M32 tool edge memorizing function (for Z-axis only)  
2: Method by M32 tool edge memorizing function (for X-, Y-, Z-axes) |
|         | Program type | M |
|         | Conditions | Immediate |
|         | Unit | — |
|         | Setting range | 0 to 2 |

Example:

```
MPL514
50
+Z
+Y
50
```

- Method by M2  
(distance from the tool tip to the zero point with a sign) .....–50

- Method by M32  
(distance from the zero point to the tool tip with a sign) ............50

| L57     | Rewriting of tool data during automatic operation | Make it possible/impossible to rewrite tool data except on tools on the spindle in automatic operation on an EIA/ISO program.  
0: Impossible  
1: Possible |
|         | Program type | E |
|         | Conditions | Immediate |
|         | Unit | — |
|         | Setting range | 0, 1 |

| L58     | Head index angle indication system | Select a head angle indication system for the five surface machining system.  
0: Indication corresponding to 90° index (0°, 90°, 180°, 270°)  
1: Indication corresponding to 1° (5°) index |
|         | Program type | E |
|         | Conditions | Immediate |
|         | Unit | — |
|         | Setting range | 0, 1 |

(For five surface machining)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L59     | Input selection for **HEAD OFFSET** display | This parameter limits input items on the **HEAD OFFSET** display.  
0: Data just on item **SPDL. CMD** can be input.  
1: All data can be input. |
|         | Program type | M, E |
|         | Conditions  | Immediate |
|         | Unit        | — |
|         | Setting range | 0, 1 |

| L60     | Head quantity | The total number of heads to be mounted in the spindle |
|         | Program type | M, E |
|         | Conditions  | Immediate |
|         | Unit        | — |
|         | Setting range | 0 to 10 |

| L61     | Output timing of AHC and APC | Operation timing of automatic head change (AHC) and automatic pallet change (APC)  
0: AHC first and then APC  
1: APC first and then AHC  
2: Simultaneous |
|         | Program type | M, E |
|         | Conditions  | Immediate |
|         | Unit        | — |
|         | Setting range | 0 to 2 |
### Classification: MACHINE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L62</td>
<td>Head relay point X1</td>
<td>When <strong>FIXED</strong> is selected at the item <strong>RELAY</strong> in the face definition unit, the head arrives at the face for next machining through the point(s) specified by the parameters (to be set in the machine coordinates system). For AGX machines, the relay points (X1, Y1) and (X2, Y2) can be specified in the program (in the face definition sequence). For the five surface machining, the head goes through the four corners of a face where the two specified points are positioned in its diagonal line.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L63</td>
<td>Head relay point Y1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L64</td>
<td>Head relay point X2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>L65</td>
<td>Head relay point Y2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

---

**Diagram:**

![Diagram](attachment:image.png)

**MPL515**

(For five-surface machining)

(For AGX series)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return/No return to head indexing point Z</td>
<td>After EIA/ISO subprogram execution; 0: Return to head indexing point Z (Even if the T-code command is for the same tool.) 1: No return to head indexing point Z</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length between the end surface of the spindle and the center of head rotation</th>
<th>Set the length from the end surface of the spindle to the center of head rotation for respective machines. (100 mm in usual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Head correction value X</th>
<th>Set for respective machines.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Head correction value Y</th>
<th>Set for respective machines.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
<tr>
<td>Classification</td>
<td>MACHINE</td>
</tr>
<tr>
<td>----------------</td>
<td>---------</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L70     | Axis movement from machining face on escapement | Specify the axes that simultaneously move from a machining face to the next machining face or in case of tool replacement.  
0: Two (three) axes simultaneously move to the safety position.  
1: Y-axis (or X- and Y-axes) moves to the safety position after Z-axis moved.  
The X-axis moves when a relay point (RELAY) or a fixed point (FIXED) is selected for the item RELAY in the face definition unit. |
| Program type | M |  |
| Conditions   | Immediate |  |
| Unit         | —   |  |
| Setting range| 1, 0 |  |

| L71     | Shift of basic coordinate for oblique face machining | For execution of the program for oblique face machining, specify to execute or not machining on the coordinate that is turned from the basic coordinate (set in WPC unit or in OFFSET unit) at an angle of the correction value for the B-axis.  
0: Machining on the coordinate that is turned from the basic coordinate at an angle of the correction value for the B-axis  
1: Machining on the basic coordinate specified in the program |
| Program type | M, E |  |
| Conditions   | Immediate |  |
| Unit         | —   |  |
| Setting range| 1, 0 |  |

| L72     | — | Invalid |

| L73     | Time constant for shape correction acceleration/deceleration filter 2 | Set the time constant to be used when shape correction is on.  
A setting of 0 is invalid. |
<p>| Program type | M, E |  |
| Conditions   | After stop of axis movement |  |
| Unit         | msec |  |
| Setting range| 0 to 56 |  |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L74</td>
<td>Cutting feed rate for pre-interpolational acceleration/deceleration control</td>
<td>Set the cutting feed rate for pre-interpolational acceleration/deceleration control.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: mm/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 1 to 999999</td>
<td></td>
</tr>
<tr>
<td>L75</td>
<td>Time constant for pre-interpolational linear control during cutting feed rate acceleration/deceleration</td>
<td>Set the time constant to obtain acceleration/deceleration of the cutting feed rate for pre-interpolational linear control.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: msec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 1 to 5000</td>
<td></td>
</tr>
</tbody>
</table>
| L76     | Acceleration rate for high-speed cutting                               | Set the maximum cutting speed in the G61.1 mode at percentage to the maximum cutting speed in the G64 mode.  
 |         | Program type: M, E                                                      |                                                                                                                                          |
|         | Conditions: —                                                           |                                                                                                                                          |
|         | Unit: %                                                                 |                                                                                                                                          |
|         | Setting range: 0 to 5000                                                |                                                                                                                                          |
| L77     | Angle for deceleration at corner before interpolation                   | Set an angle for decelerating cutting feed rate at a corner.  
<p>|         | Program type: M, E                                                      |                                                                                                                                          |
|         | Conditions: —                                                           |                                                                                                                                          |
|         | Unit: 1°                                                                |                                                                                                                                          |
|         | Setting range: 0 to 30                                                  |                                                                                                                                          |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L78</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

| Program type | —       |
| Conditions   | —       |
| Unit         | —       |
| Setting range| —       |

<table>
<thead>
<tr>
<th>L79</th>
<th>In-position width for changeover of the synchronized-tapping gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L80</th>
<th>—</th>
</tr>
</thead>
</table>

| Program type | —       |
| Conditions   | —       |
| Unit         | —       |
| Setting range| —       |

<table>
<thead>
<tr>
<th>L81</th>
<th>Fixed value (0)</th>
</tr>
</thead>
</table>

<p>| Program type | —       |
| Conditions   | —       |
| Unit         | —       |
| Setting range| —       |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L82</td>
<td>Table thickness</td>
<td>Set the thickness of the tilting table. This parameter is used for the software travel limit function provided to avoid collision between the spindle head and the tilting table (in its angular position from –90° to –120°).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Tilting table" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For machines equipped with a tilting table)</td>
</tr>
<tr>
<td>L83</td>
<td>Spindle head radius</td>
<td>Set the radius of the spindle head. This parameter is used for the software travel limit function provided to avoid collision between the spindle head and the tilting table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Spindle head" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For machines equipped with a tilting table)</td>
</tr>
<tr>
<td>L84</td>
<td>Correction value of alignment deviation X (Upper face)</td>
<td>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4) Note: The data is set automatically by execution of calibration measurement (on the upper face) with the MMS unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Correction deviation" /></td>
</tr>
<tr>
<td>L85</td>
<td>Correction value of alignment deviation Y (Upper face)</td>
<td>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4) Note: The data is set automatically by execution of calibration measurement (on the upper face) with the MMS unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Correction deviation" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For five-surface machining)</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>L86</td>
<td>Correction value of alignment deviation X (0-degree face)</td>
<td><img src="MPL519.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>L86</td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to ±99999999</td>
<td></td>
</tr>
<tr>
<td>L87</td>
<td>Correction value of alignment deviation Y (0-degree face)</td>
<td><img src="MPL519.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>L87</td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to ±99999999</td>
<td></td>
</tr>
<tr>
<td>L88</td>
<td>Correction value of alignment deviation X (90-degree face)</td>
<td><img src="MPL519.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>L88</td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to ±99999999</td>
<td></td>
</tr>
<tr>
<td>L89</td>
<td>Correction value of alignment deviation Y (90-degree face)</td>
<td><img src="MPL519.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td>L89</td>
</tr>
<tr>
<td></td>
<td>Conditions: After stop of movement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to ±99999999</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- ex: Alignment deviation correction value on X-axis
- ey: Alignment deviation correction value on Y-axis
- Mx: Stylus radius in the X-axis direction (The setting of L3)
- My: Stylus radius in the Y-axis direction (The setting of L4)

The data is set automatically by execution of calibration measurement (0-degree face) with the MMS unit.

(For five-surface machining)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meanings</th>
<th>Description</th>
</tr>
</thead>
</table>
| L90     | Correction value of alignment deviation X (180-degree face) | ex: Alignment deviation correction value on X-axis  
ey: Alignment deviation correction value on Y-axis  
Mx: Stylus radius in the X-axis direction (The setting of L3)  
My: Stylus radius in the Y-axis direction (The setting of L4) |
|         |          | Note: The data is set automatically by execution of calibration measurement (180-degree face) with the MMS unit. |
|         |          | (For INTEGREX series) |
|         |          | (For five-surface machining) |
| L91     | Correction value of alignment deviation Y (180-degree face) | |
| L92     | Correction value of alignment deviation X (270-degree face) | |
| L93     | Correction value of alignment deviation Y (270-degree face) | |

Program type: M  
Conditions: After stop of movement  
Unit: 0.0001 mm/0.00001 inch  
Setting range: 0 to ±99999999
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L94     | X/Y travel distance during EIA-programmed tool measurement | The X/Y travel distance can be set during the selection of EIA-programmed fully automatic tool length measurement on the TOOL OFFSET display. 0: Invalid 1: Valid  
**Note:** Valid only when the measuring equipment to be used for the tool measurement is a measuring table (L106 bit 0 = 0). |

| L95     | Offset number auto-setting for EIA-programmed tool measurement | The offset number is auto-set during EIA-programmed tool measurement data setting. 0: Invalid 1: Valid  
**Note:** When making the auto-setting function valid, see the description of L96. |

| L96     | Offset for EIA-programmed tool measurement | The amount of shifting for TNo. during offset number auto-setting for EIA-programmed tool measurement data setting.  
[Offset No.] = [TNo. setting] + [L96 setting]  
**Note:** Valid only when L95 = 1. |

<p>| L97     | — | Invalid |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L98</td>
<td>Max. tool length for laser tool length measurement</td>
<td>Specify the maximum tool length for the MDI laser tool length measurement.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>99999999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L99</td>
<td>Cycle time for saving the operational status management data</td>
<td>Specify the cycle time at which the operational status management data for the day is to be saved as a file on the hard disk.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>–1 to 1439</td>
</tr>
</tbody>
</table>

**Notes:**
1. If the setting is 0, the data will be saved each minute.
2. If the setting is –1, the data will be saved only when the date changes or when NC power is turned off.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L100 to L105</td>
<td>Laser sensor position X</td>
<td>[INTE e-H11] Approach point for tool diameter measurement</td>
</tr>
<tr>
<td>L100</td>
<td>Laser sensor position Y</td>
<td></td>
</tr>
<tr>
<td>L101</td>
<td>Laser sensor position Z</td>
<td></td>
</tr>
<tr>
<td>L102</td>
<td>Approach point X for laser tool diameter measurement</td>
<td></td>
</tr>
<tr>
<td>L103</td>
<td>Approach point Y for laser tool diameter measurement</td>
<td></td>
</tr>
<tr>
<td>L104</td>
<td>Approach point Z for laser tool length measurement</td>
<td></td>
</tr>
<tr>
<td>L105</td>
<td>Approach point for tool length measurement</td>
<td></td>
</tr>
</tbody>
</table>

Program type: M, E  
Conditions: At power on  
Unit: 0.0001 mm/0.00001 inch  
Setting range: ±99999999

![Diagram of setup](image)

**Note:** Set this parameter to 0, if TOOL EYE is used.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| L106 | Measuring equipment selection | 0: Measuring table  
1: Laser |

Program type: M, E  
Conditions: Immediate  
Unit: —  
Setting range: 0, 1
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L106</strong> (bit 1)</td>
<td>Selection of a rotational reference coordinate system for WPC-th</td>
<td>Select a rotational reference coordinate system for WPC-th. &lt;br&gt;0: Workpiece coordinates (Index angle B) &lt;br&gt;1: Machine coordinates</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td><strong>L106</strong> (bit 2)</td>
<td>Selection of measuring equipment</td>
<td>0: Measuring table (see L22 to L26) &lt;br&gt;1: TOOL EYE (see BA95 to BA102)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td><strong>L106</strong> (bit 3)</td>
<td>Selection of whether workpiece measurement and tool measurement results are to be stored into tool data of the lower turret</td>
<td>Select whether workpiece measurement results and tool measurement results are to be stored into tool data of the lower turret. &lt;br&gt;0: Measurement results are stored into lower-turret tool data &lt;br&gt;1: Measurement results are not stored into lower-turret tool data</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td><strong>L106</strong> (bit 4)</td>
<td>_</td>
<td>Specify whether to enable or disable the fixed amount compensation function. &lt;br&gt;0: Disabled &lt;br&gt;1: Enabled</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| L106 (bit 5) | Selection of measurement execution timing | Select the timing to execute the workpiece and tool measurement.  
0: The measurement unit is executed whenever the parts count reaches same or a multiple of the specified measurement interval in addition to the first time.  
1: The measurement unit is executed whenever the program execution count reaches same or a multiple of the specified measurement interval, omitting the first time. |
| L106 (bit 6) | Selection of tool measurement operation | Select the tool measurement operation.  
0: Offset judgement - wear offset invalid  
1: Offset judgement - wear offset valid |
| L107 (bit 0) | Tool path drawing | In AGX machines, the tool locus (on the TRACE or TOOL PATH CHECK display) on the following coordinate is drawn by the EIA/ISO program.  
0: Loft on the standard coordinates system  
1: Loft on the machine coordinates system  
**Note:**  
When 1 (drawing on the machine coordinate) is selected, the loft does not correspond to the form made on the MAZATROL coordinates system. However, 1 makes a loft corresponding to the tool movement of the machine. |
<p>| L107 (bit 1) | | Invalid |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **L107** (bit 2) | Tailstock type | Select whether the tailstock included in the tailstock-equipped machine specifications is of the conventional type or the motor-driven type.  
| | | 0: Conventional type  
| | | 1: Motor-driven type |
| **L107** (bit 3) | Program type | M, E |
| | Conditions | Immediate |
| | Unit | — |
| | Setting range | 0, 1 |
| | Whether tail thrust is also to be displayed in pounds (lbs) | Select whether the tail thrust is also to be displayed in pounds (lbs).  
| | | 0: Display off  
| | | 1: Display on |
| **L107** (bit 4) | LBB No. setting for the grooving I.D. tool, threading I.D. tool, or touch sensor | 0: Invalid  
| | | 1: Valid |
| **L107** (bit 5) | XYZ-axis operation for the first T-command after cycle start | 0: Moves the X-axis to the third zero point and the Y/Z-axes to the respective zero points.  
| | | 1: Moves the X-axis to the third zero point and the Y/Z-axes to the respective second zero points. |
| | Program type | M, E |
| | Conditions | Immediate |
| | Unit | — |
| | Setting range | 0, 1 |

(For AGX series)
### A-axis operation for the first T-command after cycle start

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
</table>
| L107 (bit 6) | A-axis operation for the first T-command after cycle start | 0: Does not operate the A-axis.  
1: Returns the A-axis to its zero point. |

#### Program type
- M, E

#### Conditions
- Immediate

#### Unit
- —

#### Setting range
- 0, 1

*(For AGX series)*

### Fixed value (0)

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th><strong>Meaning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>L108</td>
<td>Fixed value (0)</td>
</tr>
</tbody>
</table>

### Axial direction for checking for interference at software limit 4

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th><strong>Meaning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>L109 (bit 0) to L110 (bit 3)</td>
<td>Axial direction for checking for interference at software limit 4</td>
</tr>
</tbody>
</table>

#### Bit 0: Interference axial direction (1st set)

#### Bit 1: Interference axial direction (2nd set)

#### Bit 2: Interference axial direction (3rd set)

#### Bit 3: Interference axial direction (4th set)

#### Program type
- M, E

#### Conditions
- After stop of movement

#### Unit
- —

#### Setting range
- 0, 1

Specify the relationship between axial directions of the two axes to be used to check for interference.

0: Same direction  
1: Reverse directions

Even if the axes for the interference check are present on the same sliding surface, the axial directions of the two axes may differ as shown below. In this case set 1.

- Opposed-spindle lathe specifications
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L110</strong> (bit 1)</td>
<td>—</td>
<td>Vertically inverted spindle specifications</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>Conditions Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>Setting range 0, 1</td>
</tr>
<tr>
<td><strong>L110</strong> (bit 2)</td>
<td>—</td>
<td>Axis name of the secondary spindle</td>
</tr>
<tr>
<td>0: Z/C-axis</td>
<td>1: W/U-axis</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>Conditions Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>Setting range 0, 1</td>
</tr>
<tr>
<td><strong>L110</strong> (bit 3)</td>
<td>—</td>
<td>Specify whether to disable or enable the display of &quot;section to be machined&quot; in the milling tool sequence.</td>
</tr>
<tr>
<td>0 : Disabled</td>
<td>1 : Enabled</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M</td>
<td>Conditions Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>Setting range 0, 1</td>
</tr>
<tr>
<td><strong>L110</strong> (bit 4)</td>
<td>—</td>
<td>Display of the BUFFER, REMAIN and POSITION information during coordinate conversion.</td>
</tr>
<tr>
<td>0: Real axis display</td>
<td>1: Virtual axis display</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>Conditions Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>Setting range 0, 1</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>------------------------------</td>
</tr>
<tr>
<td><strong>L110</strong></td>
<td>—</td>
<td>2-271</td>
</tr>
<tr>
<td>(bit 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td>Z-axis direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Horizontal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Vertical</td>
</tr>
<tr>
<td><strong>L111</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td><strong>L112</strong></td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td><strong>L113</strong></td>
<td></td>
<td>Set one of the axes to be</td>
</tr>
<tr>
<td>to</td>
<td></td>
<td>used for the interference</td>
</tr>
<tr>
<td><strong>L116</strong></td>
<td></td>
<td>check. Specify the axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number by that of NC. The</td>
</tr>
<tr>
<td></td>
<td></td>
<td>checking function will be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>invalid if the number is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>missing or if an invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number is set.</td>
</tr>
<tr>
<td>Interference check reference axis</td>
<td></td>
<td>Set the interference check</td>
</tr>
<tr>
<td><strong>L113</strong></td>
<td>1st set of axes</td>
<td>target axis with respect to</td>
</tr>
<tr>
<td>to</td>
<td></td>
<td>the interference check</td>
</tr>
<tr>
<td><strong>L116</strong></td>
<td></td>
<td>reference axis. Specify the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axis number by that of NC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The checking function will be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>invalid if the number is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>missing or if an invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number is set.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to</td>
<td>16</td>
</tr>
<tr>
<td><strong>L117</strong></td>
<td></td>
<td>Set the interference check</td>
</tr>
<tr>
<td>to</td>
<td></td>
<td>target axis with respect to</td>
</tr>
<tr>
<td><strong>L120</strong></td>
<td></td>
<td>the interference check</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reference axis. Specify the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axis number by that of NC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The checking function will be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>invalid if the number is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>missing or if an invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number is set.</td>
</tr>
<tr>
<td>Interference check axis</td>
<td></td>
<td>Set one of the axes to be</td>
</tr>
<tr>
<td><strong>L117</strong></td>
<td>1st set of axes</td>
<td>used for the interference</td>
</tr>
<tr>
<td>to</td>
<td></td>
<td>check. Specify the axis</td>
</tr>
<tr>
<td><strong>L120</strong></td>
<td></td>
<td>number by that of NC. The</td>
</tr>
<tr>
<td></td>
<td></td>
<td>checking function will be</td>
</tr>
<tr>
<td></td>
<td></td>
<td>invalid if the number is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>missing or if an invalid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number is set.</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
## PARAMETER

<table>
<thead>
<tr>
<th>Classification</th>
<th>MACHINE</th>
<th>Display title</th>
<th>TABLE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L121 to L124</td>
<td>Interference clearance</td>
<td>Set the machine coordinate of the interference check target axis that is about to cause interference when the interference check reference axis is at its zero point. In the example shown below, if the W-axis and the Z2-axis are defined as the interference check reference axis and the interference check target axis, respectively, set the machine coordinate of the Z2-axis existing at where the lower turret and the secondary spindle are most likely to interfere. If zero is entered, the checking function will be invalid.</td>
</tr>
</tbody>
</table>

| Program type | — |
| Conditions | — |
| Unit | — |
| Setting range | 0 |

| L125 | — |
| Program type | — |
| Conditions | — |
| Unit | — |
| Setting range | — |

| L126 | Positioning direction of the \( \alpha \)-axis for oblique plane indexing specified in ANGLE (plane angle) of the surface definition sequence. 0 : Makes the sign of the plane angle value invalid and positions the \( \alpha \)-axis in its minus direction. 1 : Makes the sign of the plane angle value valid and if the plane angle is plus, positions the \( \alpha \)-axis in its plus direction or if the plane angle is minus, positions the \( \alpha \)-axis in its minus direction. 2 : Makes the sign of the plane angle value invalid and positions the \( \alpha \)-axis in its plus direction. If the setting of this parameter is other than the above, the value of L126 will be handled as 1. |

| Program type | M, E |
| Conditions | Immediate |
| Unit | — |
| Setting range | 0 to 2 |

### Example of operation with 0 assigned to L126 and 45° as a plane angle

Head rotation \( \alpha \)-axis = \(-114.4698^\circ\)  
Table rotation B-axis = \(65.5302^\circ\)  

(For AGX series)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L127</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>L128</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>L129</td>
<td>L129 G1 time constant</td>
<td>Acceleration/deceleration filter (1st stage)</td>
</tr>
<tr>
<td></td>
<td>L130 G0 time constant</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>L131</td>
<td>L131 G1 time constant</td>
<td>Acceleration/deceleration filter (2nd stage)</td>
</tr>
<tr>
<td></td>
<td>L132 G0 time constant</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of axis movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>msec</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 200</td>
<td></td>
</tr>
</tbody>
</table>

This parameter functions as a filter to smoothen the waveform command specified for pre-interpolation acceleration/deceleration.

<Type of feed and acceleration/deceleration>

<table>
<thead>
<tr>
<th>G64 mode</th>
<th>G61.1 mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-</td>
<td>matic</td>
</tr>
<tr>
<td>G0</td>
<td>L</td>
</tr>
<tr>
<td>G1</td>
<td>L</td>
</tr>
<tr>
<td>Manual</td>
<td>Positioning to fixed points (for ATC, APC, etc.)</td>
</tr>
<tr>
<td>Linear acc. &amp; dec.</td>
<td>S-shaped acc. &amp; dec.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear acc. &amp; dec.</td>
<td>S-shaped acc. &amp; dec.</td>
</tr>
</tbody>
</table>

Program type: M, E
Conditions: After stop of axis movement
Unit: msec
Setting range: 0 to 200

Invalid
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L139</strong></td>
<td>Minimum usable tool diameter of the measurable chamfering tool</td>
<td>Used for fully automatic tool measurement with a measuring table.</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 mm/0.01 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99.9 mm/9.99 inch</td>
<td></td>
</tr>
<tr>
<td><strong>L140 to L144</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
## 2-3-12 Machine parameter FEED VEL. (M)

<table>
<thead>
<tr>
<th>Classification</th>
<th>MACHINE</th>
<th>Display title</th>
<th>FEED VEL.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>Rapid feed rate</td>
<td>The feed rate for moving each axis under the G00 command during automatic operation. The feed rate for moving each axis in either the manual rapid feed mode or the zero-point return mode.</td>
<td></td>
</tr>
</tbody>
</table>

**Program type**: M, E  
**Conditions**: After stop of movement  
**Unit**: 1 mm/min (1°/min)  
**Setting range**: 0 to 600000

**Note:**  
Initial zero-point return is performed at the feed rate set in parameter M2.

| M2 | Feed rate for initial zero-point return | The feed rate for moving each axis during initial zero-point return (reference-point return) at power on. |

**Program type**: M, E  
**Conditions**: After stop of movement  
**Unit**: 1 mm/min (1°/min)  
**Setting range**: 0 to 600000

| M3 | Cutting feed rate limit | The limit of cutting feed rate during automatic operation. Even if a feed rate higher than this parameter setting is specified, the latter governs. |

**Program type**: M, E  
**Conditions**: After stop of movement  
**Unit**: 1 mm/min (1°/min)  
**Setting range**: 0 to 600000
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M4</strong></td>
<td>Offset of machine coordinates system</td>
<td>The machine coordinating values of the point to which each axis is to move back under G28 command (first zero-point return).</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>±99999999</td>
<td></td>
</tr>
</tbody>
</table>

| **M5**  | Second zero-point coordinating value | The machine coordinating values of the point to which each axis is to move back under the G30 command (second zero-point return). |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | 0.0001 mm | |
| Setting range | ±99999999 | |

| **M6**  | Third zero-point coordinating value | The machine coordinating values of the point to which each axis is to move back under the G30P3 command (third zero-point return). |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | 0.0001 mm | |
| Setting range | ±99999999 | |

| **M7**  | Fourth zero-point coordinating value | The machine coordinating values of the point to which each axis is to move back under the G30P4 command (fourth zero-point return). |
| Program type | M, E | |
| Conditions | After stop of movement | |
| Unit | 0.0001 mm | |
| Setting range | ±99999999 | |
### FEED VEL.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **M8** | Maximum software limit specified by manufacturer (+ direction) | The maximum moving zone permissible under the machine specifications. Set the machine coordinate values. **Example:**

![Diagram of moving zone](image)

**COMMAND UNIT**

- **M8 (Y-axis)**
- **M9 (Y-axis)**
- **M9 (X-axis)**
- **M8 (X-axis)**

**Note:**
This parameter is invalid when **M8 = M9**.

**M9** | Maximum software limit specified by manufacturer (– direction) | Set the machine coordinate values.

| Program type | M, E |
| Conditions | After stop of movement |
| Unit | 0.0001 mm/0.0001 deg |
| Setting range | ±99999999 |

**COMMAND UNIT**

- **M10** | Command unit | Select a unit of command from the following table and set it.

**Table: Command unit**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>micron system</strong></td>
<td></td>
</tr>
<tr>
<td>1000*</td>
<td>100*</td>
</tr>
<tr>
<td>–</td>
<td>10000</td>
</tr>
<tr>
<td>2° index</td>
<td>20000</td>
</tr>
<tr>
<td>5° index</td>
<td>50000</td>
</tr>
</tbody>
</table>

**Coding of address of axis**

- **M11** | Coding of address of axis | Register the address of each axis in hexadecimal numbers in ASCII code.

**Table: Address name**

<table>
<thead>
<tr>
<th>Address name</th>
<th>X-axis</th>
<th>Y-axis</th>
<th>Z-axis</th>
<th>4th-axis</th>
<th>5th-axis</th>
<th>6th-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set value</td>
<td>&amp;58</td>
<td>&amp;59</td>
<td>&amp;5A</td>
<td>&amp;41</td>
<td>&amp;42</td>
<td>&amp;43</td>
</tr>
</tbody>
</table>

**Fixed value**
## 2 PARAMETER

### MACHINE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12</td>
<td>Coding of incremental axis</td>
<td>Register the incremental axes respectively in hexadecimal numbers of the ASCII code.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions At power on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range &amp;0 to &amp;7F</td>
<td></td>
</tr>
</tbody>
</table>

### AXIS NAME (FOR DISPLAY)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M13</td>
<td>Axis name (for display)</td>
<td>Specify the address name of the axes to be used for display, by the appropriate hexadecimal number of the ASCII code. For reverse display, set up the most significant bit.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range &amp;0 to &amp;7F</td>
<td></td>
</tr>
</tbody>
</table>

### SHUITING DISTANCE OF THE WATCHDOG-LESS HOME POSITION

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M14</td>
<td>Shifting distance of the watchdog-less home position</td>
<td>When the watchdog-less home position is set, it will be shifted through the distance.</td>
</tr>
<tr>
<td></td>
<td>Program type M, E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit 0.0001 mm/0.0001 deg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range ±9999999</td>
<td></td>
</tr>
</tbody>
</table>

#### Example 1:
Reverse display of “C”

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>&amp;0043</td>
<td>Reverse display of “C“: &amp;00C3</td>
</tr>
</tbody>
</table>

#### Example 2:
Reverse display of “X1”

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>&amp;5831</td>
<td>Reverse display of “X1”: &amp;D831</td>
</tr>
</tbody>
</table>

#### Diagrams

- **<If returning to the zero point is not yet executed>**
  - Zero point
  - Signal ON position
  - M14

- **<If returning to the zero point is executed>**
  - New M14
  - Ex-zero point
  - M14 changing position
### Address

**M15**

**Axis name (for axis name changing)**

- **Program type:** E
- **Conditions:** Immediate
- **Unit:** —
- **Setting range:** &0 to &7F

Specify the name of the address to be used for axis name changing (G110), by the appropriate hexadecimal number of the ASCII code.

**Zero-point shift amount**

- **Program type:** M, E
- **Conditions:** Immediate
- **Unit:** 0.0001 mm/0.0001 deg
- **Setting range:** 0 to 99999999

The distance from the grid point to the actual zero point that exists during zero-point return (reference point return) in the initial operation after power-on.

**Axis control flag**

- **Program type:** M, E
- **Conditions:** At power on
- **Unit:** Bit
- **Setting range:** Binary, eight digits

Unit of output from MCP to servo amplifier
- 0: Millimeter
- 1: Inch

Direction of machine zero-point return
- 0: (+) direction
- 1: (−) direction

Error correction schema with servo on
- 0: To correct with motor
- 1: To correct with counter display

Type of axis
- 0: Linear
- 1: Rotational

Rotational direction of servo motor (Note)
(for movement in (+) direction)
- 0: CW
- 1: CCW

If axis is removed:
- 0: Alarm
- 1: No alarm

Note:
Usually, specify the rotational direction for the motor when viewed from the front (the opposite side of the encoder). For “Spindle-Cds control”, however, specify the rotational direction for the motor when viewed from the rear.

---

**MPL527**

---

2-279
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| M18     | Axis control flag | 76543210
|         | Program type | M, E |
|         | Conditions | At power on |
|         | Unit | Bit |
|         | Setting range | Binary, eight digits |
|         | Type of C-axis | 0: Motor type with frame, 1: Built-in type |
|         | Machine zero-point position | 0: Fixed point for zero-point return using watchdogs, 1: Position existing when power was turned on |
|         | Watchdog-less axis | 0: Radius, 1: Diameter |
|         | X-axis current position display | 0: Radius, 1: Diameter |
|         | Automatic/manual simultaneous absolute-value updating | 0: Invalid, 1: Valid |
|         | Absolute-value detection | 0: Invalid, 1: Valid |
| M19     | Axis control flag | 76543210
|         | Program type | M, E |
|         | Conditions | At power on |
|         | Unit | Bit |
|         | Setting range | Binary, eight digits |
|         | Select an in-position checking method | 0: NC, 1: Servo |
|         | Homing operation starting position check | 0: No check, 1: Alarm if returned from the top of the watchdog |
|         | Backlash scheme to be adopted for watchdog-type returning to home position | 0: G01, 1: G0 |
| M20     | Axis control flag | 76543210
<p>|         | Program type | M, E |
|         | Conditions | At power on |
|         | Unit | Bit |
|         | Setting range | Binary, eight digits |
|         | Rotational direction of the rotation axis | 0: Forward, 1: Reverse |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M21</td>
<td>—</td>
<td>0: Invalid 1: Valid&lt;br&gt;Linear acceleration/deceleration&lt;br&gt;First-order lag&lt;br&gt;Second-order lag&lt;br&gt;Exponential acceleration/linear deceleration&lt;br&gt;First-order lag&lt;br&gt;Second-order lag&lt;br&gt;Exponential acceleration/linear deceleration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapid-feed acceleration/deceleration type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cutting-feed acceleration/deceleration type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: Time constants for each type of acceleration/deceleration control must be set using parameters N1 through N6.</td>
</tr>
</tbody>
</table>

Program type: M, E<br>Conditions: At power on<br>Unit: Bit<br>Setting range: Binary, eight digits

| M22     | —       | 0: Parameter N3<br>1: Parameter N3 × 2 |
|         |         | Deceleration time constant for rapid-feed exponential acceleration/linear deceleration |
|         |         | Type of stroke-end stop<br>00: Linear deceleration<br>10: Position-loop stepped stop<br>01: Speed-loop stepped stop<br>11: Position-loop stepped stop |

Program type: M, E<br>Conditions: At power on<br>Unit: Bit<br>Setting range: Binary, eight digits

| M23     | —       | Invalid |
|         |         |         |

Program type: —<br>Conditions: —<br>Unit: —<br>Setting range: —
Set an access inhibition area in the inclined-axis control software limit area consisting of the X-axis and the Yt-axis.

- Parameters M25 and M26 are valid only for the X-axis and the Yt-axis.
- If the X-axial and Yt-axial upper limits (M25) and lower limits (M26) are all zeros, the illegal axis area check function is invalid.
- Use the parameter BA126 to select Type A or B (BA126 bit 1).
- When the selection of whether to make this interference checking function valid or invalid is to be made according to the B-axis angle, specify the interference checking B-axis angle range.

The interference checking function will be valid when the following conditions are satisfied:

1. \( M26 \) (B-axis) ≤ B-axis angle ≤ \( M25 \) (B-axis)
2. \( M25 \) (B-axis) = \( M26 \) (B-axis) = 0

\(<\text{Type A (BA126 bit 1 = 0)}>\)

### Illegal axis area upper limits (Type A)

- **M25** (Type A)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| Illegal axis area upper limits (Type A) | Set an access inhibition area in the inclined-axis control software limit area consisting of the X-axis and the Yt-axis. | - Parameters M25 and M26 are valid only for the X-axis and the Yt-axis.  
- If the X-axial and Yt-axial upper limits (M25) and lower limits (M26) are all zeros, the illegal axis area check function is invalid.  
- Use the parameter BA126 to select Type A or B (BA126 bit 1).  
- When the selection of whether to make this interference checking function valid or invalid is to be made according to the B-axis angle, specify the interference checking B-axis angle range.  
The interference checking function will be valid when the following conditions are satisfied:  
1. \( M26 \) (B-axis) ≤ B-axis angle ≤ \( M25 \) (B-axis)  
2. \( M25 \) (B-axis) = \( M26 \) (B-axis) = 0 |

### Illegal axis area lower limits (Type A)

- **M26** (Type A)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| Illegal axis area lower limits (Type A) | Set an access inhibition area in the inclined-axis control software limit area consisting of the X-axis and the Yt-axis. | - Parameters M25 and M26 are valid only for the X-axis and the Yt-axis.  
- If the X-axial and Yt-axial upper limits (M25) and lower limits (M26) are all zeros, the illegal axis area check function is invalid.  
- Use the parameter BA126 to select Type A or B (BA126 bit 1).  
- When the selection of whether to make this interference checking function valid or invalid is to be made according to the B-axis angle, specify the interference checking B-axis angle range.  
The interference checking function will be valid when the following conditions are satisfied:  
1. \( M26 \) (B-axis) ≤ B-axis angle ≤ \( M25 \) (B-axis)  
2. \( M25 \) (B-axis) = \( M26 \) (B-axis) = 0 |

### Diagram

- **Upper**:
  - Shaded area (A) in the above diagram, determined by parameters M6 (X), M6 (Y), M25 (X), and M25 (Y), is referred to as the illegal axis area.  
  - An alarm will result if an attempt is made to move the machine into the area.

- **Lower**:
  - Shaded area (B) in the above diagram, determined by parameters M9 (X), M9 (Y), M26 (X), and M26 (Y), is referred to as the illegal axis area.  
  - An alarm will result if an attempt is made to move the machine into the area.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M25 (Type B)</td>
<td>Illegal axis area upper limits (Type B)</td>
<td>Set an access inhibition area in the inclined-axis control software limit area consisting of the X-axis and the Yt-axis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Parameters M25 and M26 are valid only for the X-axis and the Yt-axis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- If the X-axial and Yt-axial upper limits (M25) and lower limits (M26) are all zeros, the illegal axis area check function is invalid.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use the parameter BA126 to select Type A or B (BA126 bit 1).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When the selection of whether to make this interference checking function valid or invalid is to be made according to the B-axis angle,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specify the interference checking B-axis angle range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The interference checking function will be valid when the following conditions are satisfied:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. M16 (B-axis) ≤ B-axis angle ≤ M25 (B-axis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. M25 (B-axis) = M26 (B-axis) = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;Type B (BA126 bit 1 = 1)&gt;</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.0001 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>±99999999</td>
<td></td>
</tr>
<tr>
<td>M26 (Type B)</td>
<td>Illegal axis area lower limits (Type B)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.0001 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>±99999999</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of Illegal Axis Area](image-url)
### Classification: MACHINE | Display title: FEED VEL.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **M27** | Optimum acceleration control (Target speed) | Set the value that determines the maximum allowable value (Amax) of the acceleration that occurs between blocks. 
\[
A_{\text{max}} = \frac{M27 \times 60 \times 1000 \times (100 - N26)}{100} \text{ (mm/msec}^2)\]

\[\text{Note:}\]
- If \(M27 = 0\), \(M27\) is regarded as equal to \(M1\) (rapid feed rate).
- If \(N25 = 0\), \(N25\) is regarded as equal to \(N1\) (rapid feed time constant).

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
<th>Conditions</th>
<th>After stop of axis movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>mm/min</td>
<td>Setting range</td>
<td>1 to 5000</td>
</tr>
</tbody>
</table>

| **M28** | — | Invalid |

| Program type | — | Conditions | — |
| Unit | — | Setting range | — |

**M29**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
<th>Conditions</th>
<th>After stop of axis movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>1 mm/min</td>
<td>Setting range</td>
<td>0 to 600000</td>
</tr>
</tbody>
</table>

Rapid feed clamping speed 1 for superposition control

- When both the reference axis and superposition axis move at a rapid feed rate and in the same direction (see Note below), the rapid feed rate for superposition will be clamped in accordance with the setting of \(M30\).
- Set \(M29\) to \(M31\) so that the following conditions are satisfied:
\[
\begin{align*}
M29 (\text{RA}) + M31 (\text{SA}) &\leq M1 (\text{SA}) \\
M31 (\text{RA}) + M29 (\text{SA}) &\leq M1 (\text{SA}) \\
M30 (\text{RA}) + M30 (\text{SA}) &\leq M1 (\text{SA}) \\
M31 (\text{RA}) + M31 (\text{SA}) &\leq M1 (\text{SA})
\end{align*}
\]

\[\text{RA: reference axis}\]
\[\text{SA: superposition axis}\]

\[\text{Note:}\]
Whether the axes move in the same direction or in different directions is judged from the command and polarity (parameter \(N21, \text{bit 6}\)).

**M30**

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
<th>Conditions</th>
<th>After stop of axis movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>1 mm/min</td>
<td>Setting range</td>
<td>0 to 600000</td>
</tr>
</tbody>
</table>

Rapid feed clamping speed 2 for superposition control

- Set the rapid feed clamping speed for superposition control when both the reference axis and superposition axis move at a rapid feed rate and in the same direction (see the Note).
- When both the reference axis and superposition axis move at a rapid feed rate and in the same direction (see Note below), the rapid feed rate for superposition will be clamped in accordance with the setting of \(M30\).
- Set \(M29\) to \(M31\) so that the following conditions are satisfied:
\[
\begin{align*}
M29 (\text{RA}) + M31 (\text{SA}) &\leq M1 (\text{SA}) \\
M31 (\text{RA}) + M29 (\text{SA}) &\leq M1 (\text{SA}) \\
M30 (\text{RA}) + M30 (\text{SA}) &\leq M1 (\text{SA}) \\
M31 (\text{RA}) + M31 (\text{SA}) &\leq M1 (\text{SA})
\end{align*}
\]

\[\text{RA: reference axis}\]
\[\text{SA: superposition axis}\]

\[\text{Note:}\]
Whether the axes move in the same direction or in different directions is judged from the command and polarity (parameter \(N21, \text{bit 6}\)).
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| M31     | Cutting feed clamping speed for superposition control | Set the cutting feed clamping speed for superposition control. (Set value for the reference axis and superposition axis to be used during superposition control.)
|         |         | - Set M29 to M31 so that the following conditions are satisfied:  
|         |         | M29 (RA) + M31 (SA) ≤ M1 (SA)  
|         |         | M31 (RA) + M29 (SA) ≤ M1 (SA)  
|         |         | M30 (RA) + M30 (SA) ≤ M1 (SA)  
|         |         | M31 (RA) + M31 (SA) ≤ M1 (SA)  
|         |         | RA: reference axis  
|         |         | SA: superposition axis  
| M32     | Safety speed (Safety supervisory mode 2) | Set the safety speed to be used in safety supervisory mode 2. If the operating speed of the axis exceeds the set value in safety supervisory mode 2, this will cause a safety supervisory alarm and result in an emergency stop.  
| M33     | Safety speed (Safety supervisory mode 3) | Set the safety speed to be used in safety supervisory mode 3. If the operating speed of the axis exceeds the set value in safety supervisory mode 3, this will cause a safety supervisory alarm and result in an emergency stop. (Assign a value greater than that of parameter M32 to parameter M33.)  
| M34     | Safety clamping speed (Safety supervisory mode 2) | Set the safety clamping speed to be used in safety supervisory mode 2. In safety supervisory mode 2 and while a safety clamping request is in effect, operation decelerates to the set speed. (Assign a value smaller than that of parameter M32 to parameter M34.)  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 600000  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 9999999  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 9999999  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 9999999  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 9999999  

| Programs Type | M, E  
| Conditions   | After stop of axis movement  
| Unit         | 1 mm/min / 1 deg/min  
| Setting range | 0 to 9999999  

2-285
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M35</td>
<td>Safety clamping speed (Safety supervisory mode 3)</td>
<td>Set the safety clamping speed to be used in safety supervisory mode 3. In safety supervisory mode 3 and while a safety clamping request is in effect, operation decelerates to the set speed. (Assign a value smaller than that of parameter M33 to parameter M35.)</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of axis movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/min / 1 deg/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
</tbody>
</table>

| M36     | Speed supervisory door selection (Safety supervisory mode) | Set to which door group the axis belongs in safety supervisory mode. |
|         | Program type | M, E |
|         | Conditions    | After stop of axis movement |
|         | Unit          | — |
|         | Setting range | 0 to 99999999 |

<p>| M37     | Safety clamping speed reduction judgment coefficient (Safety supervisory mode) | A speed clamping signal is output after the axis has decelerated to the clamping speed. This parameter specifies to what additional percentage of the safety clamping speed the axis is to be decelerated as the output timing of the speed clamping signal. If 0 is set, the speed clamping signal will be output when the axis decelerates to a 10% additional speed (i.e., 110% of the safety clamping speed). |
|         | Program type | M, E |
|         | Conditions    | After stop of axis movement |
|         | Unit          | % |
|         | Setting range | 0 to 99999999 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M38</td>
<td></td>
<td>Set the machine interference detection distances for the Intelligent Safety Shield. Set data so that the primary check distance is longer than the secondary check distance.</td>
</tr>
<tr>
<td>M39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interference check distances for Intelligent Safety Shield**

- M38: Primary check distance
- M39: Secondary check distance

**Program type** — M, E

**Conditions** — After stop of movement

**Unit** — 0.0001 mm/0.00001 inch/0.0001 deg

**Setting range** — 0 to 99999999

**Note:**
When inch is set for units of data setting (K105 bit 7 = 1), inch system is also used to set this parameter.

### M40 to M48

- **Program type** — —
- **Conditions** — —
- **Unit** — —
- **Setting range** — —

**Invalid**
## 2-3-13 Machine parameter TIME CONST. (N)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N1</strong></td>
<td>Rapid-feed time constant (linear acceleration/deceleration)</td>
<td>Set the time constant to obtain linear acceleration/deceleration of the rapid feed rate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="MPL523" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 msec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>4 to 1800</td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td>This parameter is valid only when bit 0 of M21 is 1.</td>
</tr>
</tbody>
</table>

| **N2**  | Cutting-feed time constant (linear acceleration/deceleration) | Set the time constant to obtain linear acceleration/deceleration of the cutting feed rate. |
|         | ![Diagram](MPL523) |
|         | Program type | M, E |
|         | Conditions   | Immediate |
|         | Unit         | 1 msec |
|         | Setting range | 4 to 1800 |
|         | Note:        | This parameter is valid only when bit 4 of M21 is 1. |

| **N3**  | Rapid-feed time constant (First-order lag) | First-order lag time constant for rapid-feed acceleration/deceleration (Exponential acceleration/linear deceleration) |
|         | ![Diagram](MPL523) |
|         | Program type | M, E |
|         | Conditions   | Immediate |
|         | Unit         | 1 msec |
|         | Setting range | 4 to 5000 |

**Note:**
- This parameter is valid only when bit 1, 2 or 3 of M21 is 1.
### Time Constants

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N4</strong></td>
<td>Time constant for post-interpolation rapid feed acceleration/deceleration filter</td>
<td>Set the time constant for the filter that further smoothens the speed signal waveform during rapid feed (G0) operation with shape correction off and during rapid feed operation in manual operation mode. The filter will be invalid if 0 is set.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 msec</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 455</td>
<td></td>
</tr>
<tr>
<td><strong>N5</strong></td>
<td>Cutting-feed time constant (First-order lag)</td>
<td>First-order lag time constant for cutting-feed acceleration/deceleration (First-order lag) (Exponential acceleration/linear deceleration)</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 msec</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 5000</td>
<td></td>
</tr>
<tr>
<td><strong>N6</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td><strong>N7</strong></td>
<td>OT time</td>
<td>During external deceleration, the position loop is disconnected for the time interval set using this parameter and, as a result, the speed becomes zero.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 msec</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>1 to 32767</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>N8</td>
<td>Creeping speed during initial zero-point return</td>
<td>The feed rate at which each axis is moved back to the zero-point (reference point) after the zero-point watchdog LS (limit switch) has turned on in the initial operation after power-on.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 mm/min (1°/min)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 60000</td>
</tr>
<tr>
<td>N9</td>
<td>Amount of grid ignorance during initial zero-point return</td>
<td>The spacing at which the grid point is ignored during zero-point return (reference point return in the initial operation after power-on) after the zero-point watchdog LS (limit switch) is turned off. With this parameter, dispersion in position deviations of the zero point can be avoided.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm (0.001°)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>N10</td>
<td>Grid interval</td>
<td>Set the grid interval of the detector. Usually, set the same value as the ball screw pitch. However, set the grid interval of the detector if the grid interval differs from the pitch, as is the case, with a linear scale.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>mm (0.001°)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 32767</td>
</tr>
<tr>
<td>N11</td>
<td>Invalid</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>N12</strong></td>
<td><strong>Rapid-feed backlash</strong></td>
<td>The backlash amount to be corrected after the axis movement direction has been reversed in either the rapid-feed (G00) mode or manual mode (except handle-pulse feed mode).</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.00005 mm/0.00005 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>±9999</td>
<td>Note: Setting conditions: N12 &lt; N13</td>
</tr>
<tr>
<td><strong>N13</strong></td>
<td><strong>Cutting-feed backlash</strong></td>
<td>The backlash amount to be corrected after the axis movement direction has been reversed in either the cutting-feed (G01) mode or manual handle-pulse feed mode.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.00005 mm/0.00005 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>±9999</td>
<td>Note: Setting conditions: N12 &lt; N13</td>
</tr>
<tr>
<td><strong>N14</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>N15</td>
<td>Width to which the machine posture change correction is to be applied</td>
<td><img src="image" alt="Diagram of machine posture change correction value" /></td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td>N15 Machine posture change correction value</td>
</tr>
<tr>
<td></td>
<td>Conditions: At power on</td>
<td>N16 Machine posture change correction value</td>
</tr>
<tr>
<td></td>
<td>Unit: 0.00005 mm/0.00005 deg</td>
<td>N17 Servo amplifier channel number</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 32767</td>
<td>N18 Servo amplifier rotary switch number</td>
</tr>
<tr>
<td>N16</td>
<td>Machine posture change correction value</td>
<td>Specify the channel number of the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td>1: 1 ch</td>
</tr>
<tr>
<td></td>
<td>Conditions: At power on</td>
<td>2: 2 ch</td>
</tr>
<tr>
<td></td>
<td>Unit: 0.00005 mm/0.00005 deg</td>
<td>3: 3 ch</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 65535</td>
<td>Specify the rotary switch number of the servo amplifier.</td>
</tr>
<tr>
<td>N17</td>
<td>Servo amplifier channel number</td>
<td>0: SW0</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td>1: SW1</td>
</tr>
<tr>
<td></td>
<td>Conditions: At power on</td>
<td>2: SW2</td>
</tr>
<tr>
<td></td>
<td>Unit: —</td>
<td>3: SW3</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 3</td>
<td>4: SW4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: SW5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6: SW6</td>
</tr>
<tr>
<td>N18</td>
<td>Servo amplifier rotary switch number</td>
<td>Specify the rotary switch number of the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td>Program type: M, E</td>
<td>0: SW0</td>
</tr>
<tr>
<td></td>
<td>Conditions: At power on</td>
<td>1: SW1</td>
</tr>
<tr>
<td></td>
<td>Unit: —</td>
<td>2: SW2</td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 6</td>
<td>3: SW3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: SW4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: SW5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6: SW6</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| N19     | Axis system number | Set the system number of the axes.  
|         | 0: System 1  
|         | 1: System 2  
|         | 2: System 3  
|         | 3: System 4  |
| Program type | M, E |  
| Conditions | At power on |  
| Unit | — |  
| Setting range | 0 to 3 |  
| N20     | — | Invalid  
| Program type | — |  
| Conditions | — |  
| Unit | — |  
| Setting range | — |  
| N21     | — |  
| Program type | M, E |  
| Conditions | At power on |  
| Unit | Bit |  
| Setting range | Binary, eight digits |  

- Linear-type rotational axis  
- Rotational axis shortcut  
- Fixed value (0)  
- Bi-directional pitch error correction  
- Reference axis for superposition control  
- Superposition axis for superposition control  
- Relative polarity of control axis
### TIME CONST.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N22 to N24</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

#### Program type —

#### Conditions —

#### Unit —

#### Setting range —

### N25

**Time constant for deceleration rate calculation**

- **Program type:** M, E
- **Conditions:** After stop of axis movement
- **Unit:** mm/min
- **Setting range:** 0 to 5000

Set the maximum allowable value, Amax, for the acceleration occurring between blocks.

\[
A_{\text{max}} = M_{27} \times 60 \times 1000 \times \frac{100 - N_{26}}{100} \text{ (mm/msec}^2\text{)}
\]

**Note:**
- If \(M_{27} = 0\), \(M_{27}\) is regarded as equal to \(M_{1}\) (rapid feed rate).
- If \(N_{25} = 0\), \(N_{25}\) is regarded as equal to \(N_{1}\) (rapid feed time constant).

### N26

**Accuracy coefficient for deceleration rate calculation**

- **Program type:** M, E
- **Conditions:** After stop of axis movement
- **Unit:** —
- **Setting range:** ±32768

Set the rapid feed (linear acceleration/deceleration) time constant for superposition control.

**Note:**
Set the same value for all axes.

### N27

**Rapid feed time constant for superposition**

- **Program type:** M, E
- **Conditions:** After stop of movement
- **Unit:** 1 msec
- **Setting range:** 4 to 1800

Set the rapid feed (linear acceleration/deceleration) time constant for superposition control.
### TIME CONST.

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| N28     | Cutting feed time constant for superposition | Set the cutting feed (linear acceleration/deceleration) time constant for superposition control.  
**Note:**  
Set the same value for all axes. |
| Program type | M, E |   |
| Conditions | After stop of movement |   |
| Unit | 1 msec |   |
| Setting range | 4 to 1800 |   |
| N29     | Time constant for shape correction rapid feed acceleration/deceleration filter | Use of this parameter allows further smoothening of the speed signal waveform during rapid feed with shape correction on.  
The filter will be invalid if 0 is set. |
| Program type | M, E |   |
| Conditions | After stop of movement |   |
| Unit | msec |   |
| Setting range | 0 to 455 |   |
| N30 to N35 | Cutting feed time constant for time constant changeover M-code command | Set the cutting feed time constant for a time constant changeover M-code command.  
N30: for M881 command  
N31: for M882 command  
N32: for M883 command  
N33: for M884 command  
N34: for M885 command  
N35: for M886 command |
| Program type | M, E |   |
| Conditions | After stop of movement |   |
| Unit | msec |   |
| Setting range | 0 to 1800 |   |
| N36 to N48 | — | Invalid |

---

**Parameter:**

2-295
## 2-3-14 Machine parameter  ANOTHER (S)

<table>
<thead>
<tr>
<th>Classification</th>
<th>MACHINE</th>
<th>Display title</th>
<th>ANOTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>—</td>
<td>Invalid</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

### S3

Program type: M, E
Conditions: Immediate
Unit: 0.1 %
Setting range: 0 to 1000

Feed forward gain for the MAZAK Precision Rapid Boring Tornado Option

Set for each axis the feed forward gain for acceleration/deceleration before interpolation for the MAZAK Precision Rapid Boring Tornado Option.

### S4

Program type: M, E
Conditions: Immediate
Unit: %
Setting range: 0 to 100

Feed forward gain

Set for each axis the feed forward gain for acceleration/deceleration before interpolation.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S5</td>
<td>Rotational center of the table</td>
<td>Set the position of the rotational center of the table in the machine coordinates system.</td>
</tr>
</tbody>
</table>

**Notes:**
1. Z-axis data are not required for a machine with a tilting table.
2. This parameter is used to execute the automatic program origin calculation function (option) for a machine with a tilting table.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S6</th>
<th>Absolute position detection parameter</th>
<th>When movement is beyond the length set by this parameter during the power off, it activates the alarm mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch/0.0001 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S7</th>
<th>Upper limit (on Z-axis) of machining range for table rotating machining I</th>
<th>This parameter specifies the range of rotating machining for the table rotating machining I (X-B machining). Set the upper limit (on Z-axis) of the machining range in the machine coordinates system. The machine recognizes that it is prohibited to move beyond this limit in the negative direction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>(For HV machining)</td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 mm/0.00001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to ±99999999</td>
<td></td>
</tr>
</tbody>
</table>
### Address | Meaning | Description
--- | --- | ---
S8 | Feed-forward gain G00 | Specify the pre-interpolation acceleration/deceleration feed-forward gain levels for each axis.

- **Program type:** M, E
- **Conditions:** Immediate
- **Unit:** %
- **Setting range:** 0 to 100

S9 | — | Invalid

S10 | Axis of rotation of the tilting table | Specify the axis of rotation of the tilting table in machine coordinates (Y and Z). This parameter is used for the software travel limit function.

- **Program type:** M, E
- **Conditions:** Immediate
- **Unit:** 0.0001 mm
- **Setting range:** 0 to ±99999999

Note: X-axial data are not required.

S11 | Corner position of the tilting table | Specify the corner position of the tilting table in (Y- and Z-axial) distances from its axis of rotation.

- **Program type:** M, E
- **Conditions:** Immediate
- **Unit:** 0.0001 mm
- **Setting range:** 0 to 99999999

Note: X-axial data are not required.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S12</td>
<td>Axis of rotation of the tilting table (Used for the automatic program origin calculation function)</td>
<td>Specify the axis of rotation of the tilting table in machine coordinates (Y and Z). Use this parameter to execute the automatic program origin calculation function (option). Measure and enter data for respective machines. <strong>Note:</strong> X-axial data are not required.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to ±99999999</td>
</tr>
</tbody>
</table>

| S13     | G00 in-position width | Set the in-position width for G00. The in-position check for G00 is effective when the parameter K103 bit 7 is 1. For utilizing the in-position width of G00, set the in-position width of the servo parameter SV024 to 0 to avoid trouble. |
|         | Program type | M, E |
|         | Conditions | At power on |
|         | Unit | 0.001 mm |
|         | Setting range | 0 to 32767 |

| S14     | G01 in-position width | Set the in-position width for G01. The in-position check for G01 is effective when one of G09 (exact stop check), G61 (exact stop check mode) and the error detection is selected with the parameter K103 bit 7 set to 1. For utilizing the in-position width for G01, set the in-position width of the servo parameter SV024 to 0 to avoid trouble. |
|         | Program type | M, E |
|         | Conditions | At power on |
|         | Unit | 0.001 mm |
|         | Setting range | 0 to 32767 |

<p>| S15     | Amount of reference position correction (Only for bidirectional pitch error correction) | Specify by an absolute value the amount of reference position correction to be performed during the valid status of bidirectional pitch error correction when the axis is moved to a reference position from the direction opposite to that of a return to home position. |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.00005 mm |
|         | Setting range | −32768 to 32767 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S16</td>
<td>Unbalanced axis torque offset</td>
<td>Set automatically after estimation of the characteristics.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>S17</td>
<td>Torque limit buffer reduction ratio 1</td>
<td>Specify torque limit buffer reduction ratio 1.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 200</td>
</tr>
<tr>
<td>S18</td>
<td>Torque limit buffer reduction ratio 2</td>
<td>Specify torque limit buffer reduction ratio 2.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 200</td>
</tr>
<tr>
<td>S19</td>
<td>Tool change completion position of the long boring bar end tool</td>
<td>Specify the tool change completion position of the long boring bar end tool by the corresponding machine coordinates.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0001 mm/0.0001 deg</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
</tbody>
</table>

MPL521
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**S20, S21**
- **Program type**: —
- **Conditions**: —
- **Unit**: —
- **Setting range**: —

Specify the critical cutting feed rate to be used during tool tip point control. During tool tip point control, speed is clamped in accordance with parameter S22 or M3 (critical cutting feed rate), whichever is the smaller.

**S22**
- **Program type**: E
- **Conditions**: After stop of movement
- **Unit**: 1 mm/min (1°/min)
- **Setting range**: 1 to 200000

Set the position of a reference workpiece zero point for each axis in the machine coordinate system.

**S23**
- **Program type**: M, E
- **Conditions**: After stop of movement
- **Unit**: 0.0001 mm/0.00001 inch
- **Setting range**: ±99999999

**S24 to S48**
- **Program type**: —
- **Conditions**: —
- **Unit**: —
- **Setting range**: —

Invalid
### 2-3-15 Machine parameter  SPINDLE (SA)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA1 to SA8</td>
<td>Maximum RPM of spindle in each speed range (range 1 to 8)</td>
<td>Number of revolutions per minute of the spindle in each speed range</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Address</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA1</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>SA2</td>
<td>Invalid</td>
<td>H</td>
</tr>
<tr>
<td>SA3</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>SA4</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Output voltage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MAX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Spindle speed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA2</td>
<td></td>
</tr>
</tbody>
</table>

Program type: M, E  
Conditions: At power on  
Unit: 1 min⁻¹ (rpm)  
Setting range: 0 to 99999

<table>
<thead>
<tr>
<th>SA9 to SA16</th>
<th>Constants for calculating each gear speed of the spindle</th>
<th>Constants for calculating each gear speed of the spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Address</td>
<td>Maximum number of speed ranges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SA9</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>SA10</td>
<td>Invalid</td>
<td>H</td>
</tr>
<tr>
<td>SA11</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>SA12</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

Program type: M, E  
Conditions: At power on  
Unit: 1 min⁻¹ (rpm)  
Setting range: 0 to 99999  
(⇒ SA1, SA2, SA3, SA4)
<table>
<thead>
<tr>
<th>Classification</th>
<th>MACHINE</th>
<th>Display title</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum RPM of spindle during tapping cycle (range 1 to 8)</td>
<td></td>
<td>The maximum number of revolutions per minute of the spindle in each speed range during a tapping cycle</td>
</tr>
<tr>
<td>Address</td>
<td>Maximum number of speed ranges</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>SA17</td>
<td>○</td>
<td>L</td>
</tr>
<tr>
<td>SA18</td>
<td>Invalid</td>
<td>H</td>
</tr>
<tr>
<td>SA19</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>SA20</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>Spindle speed during gear shifting (range 1 to 8)</td>
<td></td>
<td>The number of revolutions per minute of the spindle during shifting of gears thru the various ranges</td>
</tr>
<tr>
<td>Address</td>
<td>Maximum number of speed range</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>SA25</td>
<td>○</td>
<td>L</td>
</tr>
<tr>
<td>SA26</td>
<td>Invalid</td>
<td>H</td>
</tr>
<tr>
<td>SA27</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>SA28</td>
<td>Invalid</td>
<td>Invalid</td>
</tr>
<tr>
<td>Acceleration/deceleration time constant for the synchronous tapping (range 1 to 8)</td>
<td></td>
<td>Linear acceleration/deceleration time constant for the synchronous tapping cycle</td>
</tr>
<tr>
<td>SA33: Range 1</td>
<td>SA34: Range 2</td>
<td>SA35: Range 3</td>
</tr>
<tr>
<td>Spindle orientating speed</td>
<td></td>
<td>Specify the spindle orientating speed.</td>
</tr>
<tr>
<td>SA41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Program type | M, E |
| Conditions | After stop of movement |
| Unit | 1 min⁻¹ (rpm) |
| Setting range | 0 to 1800 |

| Address | M, E |
| Conditions | At power on |
| Unit | 1 min⁻¹ (rpm) |
| Setting range | 0 to 32767 |
### SPINDLE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SA42</strong></td>
<td>Minimum spindle speed</td>
<td>Specify the minimum spindle speed.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 32767</td>
<td></td>
</tr>
</tbody>
</table>

| **SA43** | Channel number for the spindle amplifier | Specify the channel number for the spindle amplifier. |
| Program type | M, E | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | 0 to 2 | |

| **SA44** | Spindle amplifier rotary switch number | Specify the rotary switch number of the spindle amplifier. |
| Program type | M, E | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | 0 to 6 | |

1: 1 ch (the setting used when connection to SV1 of the HR353 is established)
2: 2 ch (the setting used when connection to SV3 of the HR353 is established)
### Classification: MACHINE

**Display title:** SPINDLE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA45</td>
<td>Spindle speed range changing method, in relation to switching the torque factors for auto-pecking of the cutting load detection type</td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

1. For the setting of SA45 bit 0 = 1, set the rated torque, viscous & coulombic friction coefficients of the spindle motor in the relevant parameters as tabulated below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L</td>
<td>SA53</td>
<td>SA57</td>
<td>SA61</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>SA54</td>
<td>SA57</td>
<td>SA61</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>SA53</td>
<td>SA58</td>
<td>SA62</td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>SA54</td>
<td>SA58</td>
<td>SA62</td>
</tr>
</tbody>
</table>

2. Bit 1 is valid only when bit 0 = 0.

### Notes:

1. For the setting of SA45 bit 0 = 1, set the rated torque, viscous & coulombic friction coefficients of the spindle motor in the relevant parameters as tabulated below:

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>L</td>
<td>SA53</td>
<td>SA57</td>
<td>SA61</td>
</tr>
<tr>
<td>1</td>
<td>H</td>
<td>SA54</td>
<td>SA57</td>
<td>SA61</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>SA53</td>
<td>SA58</td>
<td>SA62</td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>SA54</td>
<td>SA58</td>
<td>SA62</td>
</tr>
</tbody>
</table>

2. Bit 1 is valid only when bit 0 = 0.
### SPINDLE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| SA46    | 7 6 5 4 3 2 1 0 | Direction of orientation  
00: Shorter route  
01: Forward rotation  
10: Reverse rotation  
C-axis position control changeover type  
00: After return to zero point  
01: After deceleration stop  
Synchronous tapping position control changeover type  
0: After return to zero point  
1: After deceleration stop  
Z-phase detection direction  
0: Forward rotation  
1: Reverse rotation  
C-axis homing direction  
00: Shorter route  
01: Forward rotation  
10: Reverse rotation  
Synchronous tapping command polarity  
0: Forward rotation  
1: Reverse rotation |
|         |         |             |
| SA47    | 7 6 5 4 3 2 1 0 | 0: Ignoring the spindle/motor gear ratio  
1: Considering the spindle/motor gear ratio |
|         |         |             |
| SA48    |         | Specify the encoder signal input destination.  
0: Via the HDLC-connected axis (Spindle AMP feedback data)  
1: Direct connection to encoder 1 (ENC1)  
2: Direct connection to encoder 2 (ENC2) |

| Program type | M, E  |
| Conditions   | After stop of movement |
| Unit         | Bit |
| Setting range | Binary, eight digits |

<table>
<thead>
<tr>
<th>Encoder signal input destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
</tr>
<tr>
<td>Conditions</td>
</tr>
<tr>
<td>Unit</td>
</tr>
<tr>
<td>Setting range</td>
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<td>Address</td>
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<tr>
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</tr>
<tr>
<td>SA49</td>
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<tr>
<td>Address</td>
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<tr>
<td>---------</td>
</tr>
<tr>
<td><strong>SA53</strong></td>
</tr>
<tr>
<td>Program type</td>
</tr>
<tr>
<td>Conditions</td>
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<tr>
<td>Unit</td>
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<tr>
<td>Setting range</td>
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<tr>
<td><strong>SA54</strong></td>
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<tr>
<td>Program type</td>
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<tr>
<td>Unit</td>
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<tr>
<td>Setting range</td>
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<td><strong>SA55</strong></td>
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<td>Conditions</td>
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<tr>
<td>Unit</td>
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<tr>
<td>Setting range</td>
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<td><strong>SA56</strong></td>
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<tr>
<td>Program type</td>
</tr>
<tr>
<td>Conditions</td>
</tr>
<tr>
<td>Unit</td>
</tr>
<tr>
<td>Setting range</td>
</tr>
<tr>
<td>Address</td>
</tr>
<tr>
<td>---------</td>
</tr>
</tbody>
</table>
| SA57    | Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type — Range 1 | If the “fms” value depends on spindle speeds, specify the gradient. Example: If “fms” is 90000 for an “S” value of 5000 and 140000 for S10000:  
\[
\text{Gradient} = \frac{b}{a} \\
\begin{align*}
\text{5000} & \quad \text{90000} \\
\text{10000} & \quad \text{140000}
\end{align*}
\]  
Since “cms” = \( \frac{(140000 – 90000)}{(10000 – 5000)} = 10 \), set “10” in the above example. Note: Set the spindle viscous friction coefficient “cms” when SA45 bit 0 = 1. (Enter, moreover, 1000 times the respective calculation results in this case.) |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | ±99999999 | |
| SA58    | Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type — Range 2 | |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | ±99999999 | |
| SA59    | Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type — Range 3 | |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | ±99999999 | |
| SA60    | Spindle viscous friction coefficient “cms” for auto-pecking of the cutting load detection type — Range 4 | |
| Program type | M | |
| Conditions | Immediate | |
| Unit | — | |
| Setting range | ±99999999 | |
### Address: SA61
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

<table>
<thead>
<tr>
<th><strong>Spindle coulombic friction coefficient “fms”</strong> for auto-pecking of the cutting load detection type — Range 1</th>
</tr>
</thead>
</table>
| **Address:** SA61  
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

**Description:** Set the value where the width of the flat section in the current feedback data matches estimated data.

**Example:** If “fms” is 90000 for an “S” value of 5000 and 140000 for S10000, set “c” in L105.

![Graph showing linear equation](image)

Calculate “c” form the linear equation “y = (b/a) x + c”. Since “c” = 90000 – (10 × 5000) = 40000, set “40000” in the above example.

**Note:** Set the spindle coulombic friction coefficient “fms” when SA45 bit 0 = 1.

### Address: SA62
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

<table>
<thead>
<tr>
<th><strong>Spindle coulombic friction coefficient “fms”</strong> for auto-pecking of the cutting load detection type — Range 2</th>
</tr>
</thead>
</table>
| **Address:** SA62  
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

### Address: SA63
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

<table>
<thead>
<tr>
<th><strong>Spindle coulombic friction coefficient “fms”</strong> for auto-pecking of the cutting load detection type — Range 3</th>
</tr>
</thead>
</table>
| **Address:** SA63  
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

### Address: SA64
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999

<table>
<thead>
<tr>
<th><strong>Spindle coulombic friction coefficient “fms”</strong> for auto-pecking of the cutting load detection type — Range 4</th>
</tr>
</thead>
</table>
| **Address:** SA64  
**Program type:** M  
**Conditions:** Immediate  
**Unit:** —  
**Setting range:** ±99999999
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA65</td>
<td>Cutting force calculation filter for auto-pecking of the cutting load detection type</td>
<td>Set the filter for the data which has been sampled at 3.5-msec intervals. If the entered value is “0”, the data actually used will be $4 \times 3.5$ (msec).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>3.5 msec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>SA66</td>
<td>Maximum permissible speed of milling spindle for polygonal/hobbing machining</td>
<td>If the rotational speed of the milling spindle during polygonal machining exceeds the setting of this parameter, that rotational speed will be clamped at this setting. Also, if the rotational speed of the milling spindle during hobbing exceeds the setting of this parameter, that rotational speed will be clamped at this setting. Note: This parameter is valid only for the milling spindle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 min$^{-1}$ (rpm)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>SA67 to</td>
<td>Revolutions in the following spindle output diagrams:</td>
<td>Output (kW)</td>
</tr>
<tr>
<td>SA73</td>
<td>- MACHINING NAVIGATION-RESULT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MACHINING NAVIGATION-PREDICTION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Monitoring Functions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 min$^{-1}$ (rpm)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999999999999</td>
</tr>
<tr>
<td>SA74 to</td>
<td>Output in the following spindle output diagrams:</td>
<td></td>
</tr>
<tr>
<td>SA80</td>
<td>- MACHINING NAVIGATION-RESULT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MACHINING NAVIGATION-PREDICTION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Monitoring Functions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.01 kW</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999999999999</td>
</tr>
</tbody>
</table>
### Classification | MACHINE | Display title | SPINDLE
---|---|---|---

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SA81</strong> to <strong>SA83</strong></td>
<td>Spindle limit speed selection for spindle position control time constants</td>
<td>Set the spindle limit speed at which the time constant for the spindle position control is to be changed.</td>
</tr>
<tr>
<td><strong>SA81</strong>: Limit speed 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SA82</strong>: Limit speed 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SA83</strong>: Limit speed 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999</td>
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</tr>
<tr>
<td><strong>SA84</strong> to <strong>SA86</strong></td>
<td>Spindle position control time constants</td>
<td></td>
</tr>
<tr>
<td><strong>SA84</strong>: Time constant 1</td>
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<td></td>
</tr>
<tr>
<td><strong>SA85</strong>: Time constant 2</td>
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<tr>
<td><strong>SA86</strong>: Time constant 3</td>
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</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>msec</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999</td>
<td></td>
</tr>
<tr>
<td><strong>SA87</strong> to <strong>SA88</strong></td>
<td>Spindle speed operating time constant changeover revolutions</td>
<td>For gears 2 to 8, <strong>SA87</strong> or <strong>SA88</strong> is internally converted to calculate the changeover revolutions.</td>
</tr>
<tr>
<td><strong>SA87</strong>: Revolutions 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SA88</strong>: Revolutions 2</td>
<td></td>
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</tr>
<tr>
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<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At power on</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>1 min⁻¹ (rpm)</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999</td>
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<tr>
<td><strong>SA89</strong> to <strong>SA91</strong></td>
<td>Spindle speed operating time constant</td>
<td></td>
</tr>
<tr>
<td><strong>SA89</strong>: Time constant 1</td>
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<td></td>
</tr>
<tr>
<td><strong>SA90</strong>: Time constant 2</td>
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<td><strong>SA91</strong>: Time constant 3</td>
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<td>At power on</td>
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</tr>
<tr>
<td>Unit</td>
<td>msec</td>
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<td>Setting range</td>
<td>0 to 99999</td>
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<td>Program type</td>
<td>Conditions</td>
</tr>
<tr>
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<td>------------</td>
</tr>
<tr>
<td>SA92</td>
<td>M, E</td>
<td>Immediate</td>
</tr>
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<tr>
<td>SA93</td>
<td>M, E</td>
<td>After stop of movement</td>
</tr>
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</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
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<td>---------</td>
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<tr>
<td>SA96</td>
<td>Amount of orientation position shifting</td>
<td>Set the amount of shifting from the zero point of orientation control.</td>
</tr>
<tr>
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<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.00005 deg</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±7200000</td>
</tr>
<tr>
<td>SA97</td>
<td>Reduction ratio of the synchronous tapping time constant for high-speed synchronous tapping</td>
<td>The synchronous tapping time constant for high-speed synchronous tapping is reduced with respect to the synchronous tapping time constant set in parameter SA33 to SA40. The value set in SA97 becomes the reduction ratio. Without the high-speed synchronous tapping option or for the axis combination that does not allow high-speed synchronous tapping, normal synchronous tapping is applied, in which case the data setting of SA33 to SA40 is used as it is. High-speed synchronous tapping time constant = ( \text{SA33} \times \frac{100 - \text{SA97}}{100} )</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
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<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
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<td></td>
<td>Setting range</td>
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<td>SA98</td>
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<td>Program type</td>
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<td>Conditions</td>
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<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>SA99</td>
<td>Orientation time constant</td>
<td>Set the time constant for orientation control. If 0 is set, 300 will be regarded as having been specified.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
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<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>msec</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 30000</td>
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<tr>
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<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>SA100 to SA113</td>
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<td>Conditions —</td>
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</tr>
<tr>
<td></td>
<td>Unit —</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range —</td>
<td></td>
</tr>
</tbody>
</table>

| SA114            | Spindle speed supervisory mode 2 for safety supervision | Set the spindle speed to be monitored in safety supervisory mode 2. If the operating speed of the spindle exceeds the set value in safety supervisory mode 2, this will cause a safety supervisory alarm and bring the machine to an emergency stop. |
|                  | Program type M, E                |                                                                             |
|                  | Conditions After stop of movement |                                                                             |
|                  | Unit 1 min⁻¹ (rpm)               |                                                                             |
|                  | Setting range 0 to 10000         |                                                                             |

| SA115            | Spindle speed supervisory mode 3 for safety supervision | Set the spindle speed to be monitored in safety supervisory mode 3. If the operating speed of the spindle exceeds the set value in safety supervisory mode 3, this will cause a safety supervisory alarm and bring the machine to an emergency stop. Assign a value greater than the speed value to be monitored in mode 2 (i.e., specified in SA114). |
|                  | Program type M, E                |                                                                             |
|                  | Conditions After stop of movement |                                                                             |
|                  | Unit 1 min⁻¹ (rpm)               |                                                                             |
|                  | Setting range 0 to 10000         |                                                                             |

<p>| SA116            | Spindle safety clamping mode 2 for safety supervision | Set the spindle safety clamping speed to be monitored in safety supervisory mode 2. In safety supervisory mode 2 and while a safety clamping request is in effect, the spindle is decelerated to the set speed. Assign a value smaller than the speed value to be monitored in mode 2 (i.e., specified in SA114). |
|                  | Program type M, E                |                                                                             |
|                  | Conditions After stop of movement |                                                                             |
|                  | Unit 1 min⁻¹ (rpm)               |                                                                             |
|                  | Setting range 0 to 10000         |                                                                             |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA117</td>
<td>Spindle safety clamping mode 3 for safety supervision</td>
<td>Set the spindle safety clamping speed to be monitored in safety supervisory mode 3. In safety supervisory mode 3 and while a safety clamping request is in effect, the spindle is decelerated to the set speed. Assign a value smaller than the speed value to be monitored in mode 3 (i.e., specified in SA115). Assign a value greater than the speed value to be monitored in mode 2 (i.e., specified in SA116).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>1 min⁻¹ (rpm)</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 10000</td>
</tr>
<tr>
<td>SA118</td>
<td>Selecting the spindle door of the spindle whose speed is to be monitored</td>
<td>Select the door group to which the spindle belongs in safety supervisory mode. If SP129: SFNC9/bit F is OFF, speed monitoring will not be conducted, irrespective of the setting of this parameter. [Examples of setting] 0000: The spindle does not belong to any door. 0001: The spindle belongs to the door-1 group. 0002: The spindle belongs to the door-2 group. 0003: The spindle belongs to the door-1/2 group.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>SA119</td>
<td>Deceleration judgment coefficient on safety speed clamping of the spindle to be supervised for safety</td>
<td>For safety speed clamping in safety supervisory mode, when a clamping request is input, a clamping signal will be output after the spindle has decelerated to a safety clamping speed. This parameter specifies to what additional percentage of the safety clamping speed the spindle is to be decelerated as the output timing of the speed clamping signal. If 0 is set, the speed clamping signal will be output when the spindle decelerates to a 10% additional speed (i.e., 110% of the safety clamping speed).</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 100</td>
</tr>
<tr>
<td>SA120</td>
<td>PLG pulse rate for spindle index gear tooth correction</td>
<td>Set the number of PLG teeth per revolution. If a value less than zero is set, 1024 will be regarded as having been set.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Teeth</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>−99999999 to 99999999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SA121 to</td>
<td>Amount of branching point correction for spindle index gear tooth</td>
<td>Set the amount of correction at the branching point where one PLG gear tooth is split into eight equal segments.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.0001 deg</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>–99999999 to 99999999</td>
<td></td>
</tr>
<tr>
<td>SA129 to</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>SA137</td>
<td>Number of gears</td>
<td>Set the number of gears.</td>
</tr>
<tr>
<td>SA138</td>
<td>SA139: Number of spindle gears SA139: Number of motor gears</td>
<td>0 : No gears</td>
</tr>
<tr>
<td>SA139</td>
<td></td>
<td>1 or more : Actual number of gears</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td>SA140</td>
<td>Turret indexing gear ratio</td>
<td>Set the gear ratio for turret indexing.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>SA141 to SA143</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| SA144 | — | Spindle gear changeover valid  
Turret indexing valid. |
| Program type | M, E | |
| Conditions | At power on | |
| Unit | Bit | |
| Setting range | Binary, eight digits | |
### 2-3-16 Machine parameter  BARRIER (BA)

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA1</strong></td>
<td>Chuck outside diameter (for chuck barrier) — No. 1 turning spindle</td>
<td>Setting of chuck outside diameter of the No. 1 turning spindle</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
</tbody>
</table>

| **BA2** | Chuck width (for chuck barrier) — No. 1 turning spindle | Setting of chuck width of the No. 1 turning spindle |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 0.001 mm/0.0001 inch | |
| Setting range | 0 to 99999999 | |

<p>| <strong>BA3</strong> | Chuck inside diameter (for chuck barrier) — No. 1 turning spindle | Setting of chuck inside diameter of the No. 1 turning spindle |
| Program type | M, E | |
| Conditions | Immediate | |
| Unit | 0.001 mm/0.0001 inch | |
| Setting range | 0 to 99999999 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA4</strong></td>
<td>EIA program workpiece outside diameter</td>
<td>Specify the workpiece outside diameter to be used for the EIA program.</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td><strong>BA5</strong></td>
<td>Chuck outside diameter (for chuck barrier)</td>
<td>Setting of chuck outside diameter of the No. 2 turning spindle</td>
</tr>
<tr>
<td>— No. 2 turning spindle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** For single turning-spindle specifications, this parameter is invalid.

| **BA6** | Chuck width (for chuck barrier) | Setting of chuck width of the No. 2 turning spindle |
| — No. 2 turning spindle | | |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | 0.001 mm/0.0001 inch |  |
| Setting range | 0 to 99999999 |  |

**Note:** For single turning-spindle specifications, this parameter is invalid.

| **BA7** | Chuck inside diameter (for chuck barrier) | Setting of chuck inside diameter of the No. 2 turning spindle |
| — No. 2 turning spindle | | |
| Program type | M, E |  |
| Conditions | Immediate |  |
| Unit | 0.001 mm/0.0001 inch |  |
| Setting range | 0 to 99999999 |  |

**Note:** For single turning-spindle specifications, this parameter is invalid.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA8</td>
<td>Tail body outside diameter (for tail barrier)</td>
<td>Setting of tail body outside diameter</td>
</tr>
<tr>
<td>BA9</td>
<td>Tail body length (for tail barrier)</td>
<td>Setting of tail length</td>
</tr>
<tr>
<td>BA10</td>
<td>Tail spindle outside diameter (for tail barrier)</td>
<td>Setting of tail spindle outside diameter</td>
</tr>
<tr>
<td>BA11</td>
<td>Length with tail spindle at back end (for tail barrier)</td>
<td>Setting of length with tail spindle at back end</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>BA12</td>
<td>Tail head outside diameter (for tail barrier)</td>
<td>Setting of tail head outside diameter</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
</tbody>
</table>

| BA13    | Tail head length (for tail barrier) | Setting of tail head length |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 99999999 |

| BA14    | Tail head taper angle (for tail barrier) | Setting of tail head taper angle |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.001 deg |
|         | Setting range | 0 to 180000 |

<p>| BA15    | Tail head biting diameter (for tail barrier) | Setting of biting diameter when tail head is used |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 99999999 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| BA16 to BA18 | EIA tail barrier<br>Tail dimensions | Set the dimensional data for forming tail barriers using an EIA/ISO program.  
<During tail operation>  
[Diagram showing BA16 and BA17 dimensions]  
<During tail reversing>  
[Diagram showing BA16 and BA18 dimensions]  
BA16: Tail extruding length  
BA17: Workpiece length  
BA18: Distance from the machine zero point to the leading edge position during tail reversing  
Notes:  
1. ±999999999 for BA18.  
2. BA17 is valid for MAZATROL programs as well, when ONLY MILL is specified for the common unit of the MAZATROL program. |
| BA19 | Distance from the Z-axis machine zero point to the spindle edge<br>No. 1 turning spindle | Specify the distance from the machine zero point of the Z-axis to the edge of the No. 1 turning spindle.  
[Diagram showing BA19 and spindle edge]  
Note:  
Enter the distance with minus sign for the machine zero point in the minus direction with respect to the spindle edge. |
| BA20 | Distance from the Z-axis machine zero point to the spindle edge<br>No. 2 turning spindle | Specify the distance from the machine zero point of the Z-axis to the edge of the No. 2 turning spindle.  
[Diagram showing BA20 and spindle edge]  
Note:  
Enter the distance with minus sign for the machine zero point in the minus direction with respect to the spindle edge. |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA21</td>
<td>Jaw number for EIA program barrier — No. 1 turning spindle</td>
<td>Specify the jaw number that has been registered on the CHUCK JAW DATA display to be referred to in the EIA program when forming a jaw barrier for the No. 1 turning spindle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 44</td>
</tr>
<tr>
<td>BA22</td>
<td>Jaw number for EIA program barrier — No. 2 turning spindle</td>
<td>Specify the jaw number that has been registered on the CHUCK JAW DATA display to be referred to in the EIA program when forming a jaw barrier for the No. 2 turning spindle.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 44</td>
</tr>
<tr>
<td>BA23 BA24</td>
<td>Turret dimensions</td>
<td>Set the turret dimensions.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>BA25 BA26</td>
<td>Turret reference position</td>
<td>Specify the turret reference position from the machine zero point.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>BA27</td>
<td>Tool holder mounting position</td>
<td>Setting of tool holder mounting position. When plus data is used, the tool holder is mounted horizontally, and minus data downward.</td>
</tr>
<tr>
<td>BA30</td>
<td>BA27 - Type 1</td>
<td></td>
</tr>
<tr>
<td>BA33</td>
<td>BA30 - Type 2</td>
<td></td>
</tr>
<tr>
<td>BA36</td>
<td>BA33 - Type 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BA36 - Type 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: ±99999999</td>
<td></td>
</tr>
</tbody>
</table>

*Example:* Type 1

![Diagram](NM211-00327.png)

Same for types 2, 3, 4

<table>
<thead>
<tr>
<th>BA28</th>
<th>Tool holder width in X-axis direction</th>
<th>Setting tool holder width in X-axis direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA31</td>
<td>BA28 - Type 1</td>
<td></td>
</tr>
<tr>
<td>BA34</td>
<td>BA31 - Type 2</td>
<td></td>
</tr>
<tr>
<td>BA37</td>
<td>BA34 - Type 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BA37 - Type 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 99999999</td>
<td></td>
</tr>
</tbody>
</table>

*Example:* Type 1

![Diagram](NM211-00328.png)

Same for types 2, 3, 4

<table>
<thead>
<tr>
<th>BA29</th>
<th>Tool holder width in Z-axis direction</th>
<th>Setting tool holder width in Z-axis direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA32</td>
<td>BA29 - Type 1</td>
<td></td>
</tr>
<tr>
<td>BA35</td>
<td>BA32 - Type 2</td>
<td></td>
</tr>
<tr>
<td>BA38</td>
<td>BA35 - Type 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BA38 - Type 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type: M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conditions: Immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit: 0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting range: 0 to 99999999</td>
<td></td>
</tr>
</tbody>
</table>

*Example:* Type 1

![Diagram](NM211-00329.png)

Same for types 2, 3, 4
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| BA39 to BA41 | EIA tool barrier, Holder dimensions | Set the holder shape data for forming tool barriers using an EIA/ISO program.  
**<Holder-under type>**  
Input BA39 with a minus sign.  

![Diagram](https://via.placeholder.com/150)  

**<Holder-side type (0° type)>**  
Input BA39 with a plus sign.  
Input BA41 with a plus sign.  

![Diagram](https://via.placeholder.com/150)  

**<Holder-side type (180° type)>**  
Input BA39 with a plus sign.  
Input BA41 with a minus sign.  

![Diagram](https://via.placeholder.com/150)  

- **BA39**: EIA tool barrier, Holder mounting position  
- **BA40**: EIA tool barrier, X-axial width of the holder  
- **BA41**: EIA tool barrier, Z-axial width of the holder  

**Note:**  
0 to 99999999 for BA40.

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
</tbody>
</table>

Select the type of barrier to be made valid.  
0: Type with head B-axis (tool rotational B-axis) [INTEGREX type]  
1: Type without head B-axis (tool rotational B-axis)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA43</td>
<td>First tool number (in the 1st set of tools)</td>
<td>Set the first tool number assigned to the first set of tools.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 4000</td>
</tr>
<tr>
<td>BA44</td>
<td>Number of tools (in the 1st set of tools)</td>
<td>Set the number of tools assigned as the first set of tools.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 960</td>
</tr>
<tr>
<td>BA45</td>
<td>First tool number (in the 2nd set of tools)</td>
<td>Set the first tool number assigned to the second set of tools.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 4000</td>
</tr>
<tr>
<td>BA46</td>
<td>Number of tools (in the 2nd set of tools)</td>
<td>Set the number of tools assigned as the second set of tools.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At power on</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>1 to 960</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| **BA47** | Turret type | Set the type of turret:  
0: ATC  
1: Turret  
2: Lower turret  
3: Opposed turret  
4: Work rest |

| Program type | M, E |
| Conditions | At power on |
| Unit | — |
| Setting range | 0 to 4 |

| **BA48** | Axis name of the head to be rotated | Set the axis name of the head axis to be rotated.  
Set "&42" if the head axis to be rotated is the B-axis. |

| Program type | M, E |
| Conditions | After stop of movement |
| Unit | — |
| Setting range | &41 to &5A |

| **BA49** | Axis number of the inclined axis (Inclined-axis control) | Set the axis number of the Y-axis to be controlled using inclined-axis control functions.  
The inclined-axis control is invalid when this parameter is set to 0. |

| Program type | M, E |
| Conditions | At power on |
| Unit | — |
| Setting range | 0 to 16 |

| **BA50** | Fundamental axis number (Inclined-axis control) | Set the axis number of the X-axis to be controlled using inclined-axis control functions.  
The inclined-axis control is invalid when this parameter is set to 0. |

<p>| Program type | M, E |
| Conditions | At power on |
| Unit | — |
| Setting range | 0 to 16 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| **BA51** | Vector of virtual Y (Inclined-axis control) | Specify one of the vectors created by the triangles formed by inclination angles.  
**BA51**: Vector of the inclined axis (virtual Y) in the rectangular coordinate system  
**BA52**: Vector of the fundamental axis (X-axis) corresponding to the inclined axis  
**BA53**: Vector of the real axis corresponding to the inclined axis  
Set the value of **BA51/BA52** assuming that 10000000 is assigned to **BA53**. |
| Program type | M, E | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | ±99999999 | |
| **BA52** | Vector of real X (Inclined-axis control) | |
| Program type | M, E | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | ±99999999 | |
| **BA53** | Vector of real Y (Inclined-axis control) | Set the axis number of the work spindle to be used for hobbing.  
The hobbing is invalid when this parameter is set to 0. |
<p>| Program type | M, E | |
| Conditions | At power on | |
| Unit | — | |
| Setting range | ±99999999 | |
| <strong>BA54</strong> | Selection of work spindle for hobbing | |
| Program type | E | |
| Conditions | After stop of movement | |
| Unit | — | |
| Setting range | 0 to 16 | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA55</td>
<td>Turning spindle number for polygonal machining (D1)</td>
<td>Set the turning spindle to be used in the D1 command mode of polygonal machining. 0: Turning spindle No. 1 1: Turning spindle No. 2 2: Turning spindle No. 3 3: Turning spindle No. 4 −1: Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>−1 to 3</td>
</tr>
<tr>
<td>BA56</td>
<td>Turning spindle number for polygonal machining (D2)</td>
<td>Set the turning spindle to be used in the D2 command mode of polygonal machining. 0: Turning spindle No. 1 1: Turning spindle No. 2 2: Turning spindle No. 3 3: Turning spindle No. 4 −1: Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>−1 to 3</td>
</tr>
<tr>
<td>BA57</td>
<td>Turning spindle number for polygonal machining (D3)</td>
<td>Set the turning spindle to be used in the D3 command mode of polygonal machining. 0: Turning spindle No. 1 1: Turning spindle No. 2 2: Turning spindle No. 3 3: Turning spindle No. 4 −1: Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>−1 to 3</td>
</tr>
<tr>
<td>BA58</td>
<td>Turning spindle number for polygonal machining (D4)</td>
<td>Set the turning spindle to be used in the D4 command mode of polygonal machining. 0: Turning spindle No. 1 1: Turning spindle No. 2 2: Turning spindle No. 3 3: Turning spindle No. 4 −1: Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>−1 to 3</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BA59</td>
<td>Spindle forward rotation M-code for tapping cycle</td>
<td>- If the command block of G284/G288 (machining G-codes, F30 = 0) or of G84/G88 (turning G-codes, F30 = 1) does not contain spindle forward/reverse rotation M-codes, one of the following M-codes will be output, depending on the status of bit 0 in parameter SU153:</td>
</tr>
</tbody>
</table>
|         | Program type: M, E                           | BA59 = 3  
BA60 = 4  
BA59 = 203  
BA60 = 204  
SU153 Bit 0  

| Setting range | 0 to 255                                      | Tapping cycle of turning  
Tapping cycle of milling  
Inverse tapping cycle of turning  
Inverse tapping cycle of milling |
|---------------|-----------------------------------------------|----------------------------------------------------------------------------------|
|               | Spindle reverse rotation M-code for tapping cycle | - If 0 is set in BA59, 3 will be regarded as having been set, and M03 will be output.  
- If 0 is set in BA60, 4 will be regarded as having been set, and M04 will be output. |
<p>|               | Program type: —                              |                                                                                  |
|               | Conditions: —                                |                                                                                  |
|               | Unit: —                                       |                                                                                  |
|               | Setting range: —                             |                                                                                  |
| BA61          | Amount of runout of the B-axis center         | Enter the distance from the rotational center of the B-axis to the tool center. |
|               | Program type: M, E                           |                                                                                  |
|               | Conditions: Immediate                        |                                                                                  |
|               | Unit: 0.001 mm                                |                                                                                  |
|               | Setting range: –1000 to 1000                 |                                                                                  |
| BA62          | Amount of offset for the B-axis — spindle distance | Enter the distance from the rotational center of the B-axis to the spindle edge. |
|               | Program type: M, E                           |                                                                                  |
|               | Conditions: Immediate                        |                                                                                  |
|               | Unit: 0.0001 mm/0.00001 inch                 |                                                                                  |
|               | Setting range: ±9999999                     |                                                                                  |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
</table>
| BA63    | Holder angle of angle tool holder | Set the holder angle of the angle tool holder. According to the value set in this parameter, the holder angle is set in HLD.TYP on the TOOL DATA display.  
\[ \text{BA63} = 45 \] |
|         | Program type | M |
|         | Conditions |  |
|         | Unit | 1° |
|         | Setting range | 0 to 90 |
| BA64    | B-axis tool reference position X |  |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | ±99999999 |
| BA65    | B-axis tool reference position Z |  |
|         | Program type | M, E |
|         | Conditions | Immediate |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | ±99999999 |
| BA66, BA67 | G37 deceleration area  
G37 measuring area | Set the deceleration area and measuring area in the G37 command.  
\[ \text{BA66}: \text{Set the distance between the starting point of movement at the measuring rate, and the measuring point. This value will be used when argument R is omitted from the G37 command.} \]  
\[ \text{BA67}: \text{Set the moving distance in measuring feed mode. This value will be used when argument D is omitted from the G37 command.} \] |
|         | Program type | E |
|         | Conditions | After stop of movement |
|         | Unit | 0.001 mm/0.0001 inch |
|         | Setting range | 0 to 99999999 |
## Classification | MACHINE | Display title | BARRIER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA68</td>
<td>G36 deceleration area</td>
<td>Set the deceleration area and measuring area in the G36 command.</td>
</tr>
<tr>
<td>BA69</td>
<td>G36 measuring area</td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>After stop of movement</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td>Distance between the reference points on both turrets (radius value)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 99999999</td>
<td></td>
</tr>
<tr>
<td>System number to be used when argument L is omitted from G112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>Immediate</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 3</td>
<td></td>
</tr>
</tbody>
</table>

### BA68
- **BA68**: Set the distance between the starting point of movement at the measuring rate, and the measuring point. This value will be used when argument R is omitted from the G36 command.

### BA69
- **BA69**: Set the moving distance in measuring feed mode. This value will be used when argument D is omitted from the G36 command.

### BA70
- Workpiece zero point:
  - Workpiece edge center
- Tool position reference point:
  - Reference point on the turret
- Turret clearance:
  - Distance between the reference points on both turrets (radius value)
- Workpiece offset:
  - Workpiece zero point – Reference point of reference turret tool position
- Tool position:
  - Tool position reference point – Tool nose position

### BA71
- System number to be used when argument L is omitted from G112:
  - 0: System 1
  - 1: System 2
  - 2: System 3
  - 3: System 4
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA72</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
</tbody>
</table>

**Barrier valid/invalid 1** (chuck, sub-chuck, tailstock)

- Program type: M, E
- Conditions: Immediate
- Unit: —
- Setting range: 0 to 3

0: Chuck, sub-chuck and tailstock invalid
1: Chuck valid
2: Sub-chuck valid
3: Tailstock valid

**Barrier valid/invalid 2** (Lower turret, work rest)

- Program type: M, E
- Conditions: Immediate
- Unit: —
- Setting range: 0 to 2

0: Lower turret and work rest invalid
1: Lower turret valid
2: Work rest valid
### Parameter 2: Machine Display Title - BARRIER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA75</strong> to <strong>BA78</strong></td>
<td>Barrier setup turret reference position</td>
<td>Set the reference position when it is viewed from the machine zero point.</td>
</tr>
</tbody>
</table>

- **Program type:** M, E  
- **Conditions:** Immediate  
- **Unit:** 0.001 mm/0.0001 inch  
- **Setting range:** ±99999999

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA79</strong> to <strong>BA82</strong></td>
<td>Barrier setup chuck reference position 1</td>
<td>Set the reference position when it is viewed from the machine zero point.</td>
</tr>
</tbody>
</table>

- **Program type:** M, E  
- **Conditions:** Immediate  
- **Unit:** 0.001 mm/0.0001 inch  
- **Setting range:** ±99999999

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA83</strong> to <strong>BA86</strong></td>
<td>Barrier setup chuck reference position 2</td>
<td>Set the reference position within a jaw barrier area not having a specified jaw number.</td>
</tr>
</tbody>
</table>

- **Program type:** M, E  
- **Conditions:** Immediate  
- **Unit:** 0.001 mm/0.0001 inch  
- **Setting range:** ±99999999
## Classification: MACHINE

### Display title: BARRIER

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA87 to BA90</td>
<td>Tail barrier reference position</td>
<td>Set the reference position within a tail barrier area. The reference position here refers to the position when viewed from the machine zero point of the upper turret of the tailstock being not used for machining. When the tailstock is used, the barrier will be provided at the position shifted through the distance of R10366 (lower-order)/R10367 (higher-order) in the Z-axis direction, from the position specified above. Only parameters for HD1 are used.</td>
</tr>
<tr>
<td>BA91</td>
<td>Distance from spindle edge to partition plate</td>
<td>Set the reference position of the partition plate.</td>
</tr>
<tr>
<td>BA92</td>
<td>Central position X when viewed from machine zero point (Barrier function)</td>
<td>Set the central position X when viewed from the machine zero point.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td>0.001 mm/0.0001 inch</td>
</tr>
<tr>
<td>Setting range</td>
<td>±99999999</td>
</tr>
</tbody>
</table>

![Diagram of BA87 to BA90](image1)

![Diagram of BA91](image2)

![Diagram of BA92](image3)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA93</td>
<td>Upper/lower turret tool angle difference (HD1)</td>
<td></td>
</tr>
<tr>
<td>BA94</td>
<td>Upper/lower turret tool angle difference (HD2)</td>
<td></td>
</tr>
</tbody>
</table>

When using the C-axes of the HD1/HD2 in the lower turret system, set the offset angle with respect to the upper turret, for the lower turret system.

![Diagram](image1)

**Program type**: M, E  
**Conditions**: Immediate  
**Unit**: 0.0001 deg  
**Setting range**: 0 to ±99999999

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA95</td>
<td>Sensor width along the X-axis</td>
<td>Use BA95 and BA96 to set the dimensions of the sensor for tool nose measurement.</td>
</tr>
<tr>
<td>BA96</td>
<td>Sensor width along the Z-axis</td>
<td></td>
</tr>
<tr>
<td>BA97</td>
<td>X-coordinate of the sensor’s reference point</td>
<td></td>
</tr>
<tr>
<td>BA99</td>
<td>Z-coordinate of the sensor’s reference point</td>
<td></td>
</tr>
<tr>
<td>BA103</td>
<td>Sensor width along the X-axis (for lower turret/HD2)</td>
<td></td>
</tr>
<tr>
<td>BA104</td>
<td>Sensor width along the Z-axis (for lower turret/HD2)</td>
<td></td>
</tr>
<tr>
<td>BA100</td>
<td>X-coordinate of the sensor’s reference point (for lower turret/HD2)</td>
<td></td>
</tr>
<tr>
<td>BA102</td>
<td>Z-coordinate of the sensor’s reference point (for lower turret/HD2)</td>
<td></td>
</tr>
</tbody>
</table>

**Program type**: M  
**Conditions**: Immediate  
**Unit**: 0.0001 mm/0.00001 inch  
**Setting range**: ±99999999

Use BA95 and BA96 to set the dimensions of the sensor for tool nose measurement. BA97 and BA99 are provided to set in machine coordinates the reference point of the sensor (see the diagram below).

**Example 1**: For horizontal type

![Diagram](image2)

**Example 2**: For vertical type

![Diagram](image3)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA98</td>
<td>Y-coordinate of the sensor's reference point</td>
<td>Setting of sensor reference point Y coordinate</td>
</tr>
<tr>
<td>BA101</td>
<td>Y-coordinate of the sensor’s reference point (for lower turret/HD2)</td>
<td>Machine zero point</td>
</tr>
</tbody>
</table>

- **Program type**: M
- **Conditions**: Immediate
- **Unit**: 0.0001 mm/0.00001 inch
- **Setting range**: ±99999999

- **Adjustment “FdT” for W-axis thrust hold**

<table>
<thead>
<tr>
<th>BA105</th>
<th>Set adjustment “FdT” for holding the thrust of the W-axis.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Set a value less than BA108 × BA106/100.</td>
</tr>
<tr>
<td></td>
<td>If any other value is set, the thrust may be unstable.</td>
</tr>
</tbody>
</table>

- **Program type**: M, E
- **Conditions**: After stop of movement
- **Unit**: 0.0005 mm/0.000005 inch
- **Setting range**: 0 to 99999999

- **Dead zone**

<table>
<thead>
<tr>
<th>BA106</th>
<th>Set the dead zone for the drooping level of the W-axis thrust.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A drooping level change less than BA108 × BA106/100 is ignored.</td>
</tr>
</tbody>
</table>

- **Program type**: M, E
- **Conditions**: After stop of movement
- **Unit**: %
- **Setting range**: 0 to 99999999

- **Filter**

| BA107   | Set the monitoring time for changes in the drooping level of the W-axis thrust. |

- **Program type**: M, E
- **Conditions**: After stop of movement
- **Unit**: 1/3.5 msec
- **Setting range**: 0 to 99999999
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA108</td>
<td>W-axis thrust hold droop</td>
<td>Set the drooping level for holding the W-axis thrust. This drooping level is held during the application of the W-axis thrust.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.0005 mm/0.000005 inch</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 99999999</td>
</tr>
<tr>
<td>BA109</td>
<td>Offset amount (X) during automatic tool setting value calculation</td>
<td>Specify the axis offset amount applied during automatic calculation of the tool setting value for the backface tool, which is difficult to measure using the TOOL EYE. This automatic calculation is done based on the tool setting value for the target tool measured in the opposite position.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
<tr>
<td>BA110</td>
<td>Offset amount (Z) during automatic tool setting value calculation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>±99999999</td>
</tr>
<tr>
<td>BA111 to BA116</td>
<td>Pre-interpolation acceleration/deceleration time constant for time constant changeover M-code command</td>
<td>Set the pre-interpolation acceleration/deceleration time constant for a time constant changeover M-code command. If zero is assigned to this parameter, the pre-interpolation acceleration/deceleration time constant will not be changed, even when a time constant changeover M-code command is assigned. The pre-interpolation acceleration/deceleration time constant existing before the time constant changeover M-code command is assigned will be held.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>After stop of movement</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>mm/min</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 999999</td>
</tr>
</tbody>
</table>

![Image of tool setting value calculation](image-url)
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Set the types of tailstock, tool holder and chuck for which the EIA barriers are to be activated.

- **Tailstock usage valid/invalid (Note 1)**
  - 0: Invalid
  - 1: Valid
- **Tailstock present/absent (Note 2)**
  - 0: Absent
  - 1: Present
- **Tool holder present/absent**
  - 0: Absent
  - 1: Present
- **Barrier tool nose position**
  - 0: Tool length correction
  - 1: Current tool nose
- **Setting of BA11** is handled as tailstock extruding length
- **Execution of spindle revolution M-code** specified in same block as synchronous tapping
  - 0: Invalid
  - 1: Valid

**Notes:**

1. "Tailstock usage invalid" does not mean cancelling the tail barriers; it means that the tail will move away prior to machining.
2. Bit 1 in this parameter is valid for the MAZATROL program as well. If bit 1 is set to 0, the tailstock function itself will become invalid. For a machine having a tailstock, be sure to set up 1 at bit 1.
### Classification: MACHINE

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA126</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="" alt="Diagram" /></td>
</tr>
</tbody>
</table>

#### Note:

T-command operation is defined as follows by the setting of bit 3:

- If the setting of bit 3 is 0
  - T[0]: Replaces the current tool with \( \varnothing \) and indexes \( \varnothing \) as the next tool.
  - T[0]: Replaces the current tool with \( \varnothing \).
  - T[0]: Indexes \( \varnothing \) as the next tool.

- If the setting of bit 3 is 1
  - T[0]: Replaces the current tool with \( \varnothing \) and set \( \varnothing \) as the tool offset number.

<table>
<thead>
<tr>
<th>Program type</th>
<th></th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td></td>
<td>Immediate</td>
</tr>
<tr>
<td>Unit</td>
<td></td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td></td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BA127 to BA132</th>
<th></th>
<th>Invalid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>Conditions</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>Unit</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td></td>
<td>—</td>
</tr>
</tbody>
</table>
2-3-17 Data I/O parameter  CMT parameter (CMT)

Parameter setting

<table>
<thead>
<tr>
<th>Classification</th>
<th>DATA I/O</th>
<th>Display title</th>
<th>CMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BAUDRATE
- **Program type:** M, E
- **Conditions:** At I/O startup
- **Unit:** —
- **Setting range:** 110 to 19200

<table>
<thead>
<tr>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>4800</td>
</tr>
<tr>
<td>300</td>
<td>9600</td>
</tr>
<tr>
<td>1200</td>
<td>19200</td>
</tr>
<tr>
<td>2400</td>
<td></td>
</tr>
</tbody>
</table>

Type of processing to be executed if the machining program of an existing work number is to be loaded

### SAME WNo.
- **Program type:** M, E
- **Conditions:** At I/O startup
- **Unit:** —
- **Setting range:** —

<table>
<thead>
<tr>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARM</td>
<td>Issues an alarm if the work number already exists.</td>
</tr>
<tr>
<td>LOAD</td>
<td>Overrides the program if the work number already exists.</td>
</tr>
<tr>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>PORT</td>
<td>CMT port selection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program type</th>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M, E</td>
<td>COM1</td>
<td>CF22 serial ch1</td>
</tr>
<tr>
<td></td>
<td>COM2</td>
<td>CF22 serial ch2</td>
</tr>
<tr>
<td></td>
<td>COM3</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>COM4</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Unit</th>
<th>Setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td>At I/O startup</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>CMT1 to CMT32</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
## 2-3-18 Data I/O parameter TAPE parameter (TAP)

### Parameter setting

#### DATA I/O

| BAUDRATE | 110 | CMT1 | 0 | CMT17 | 0 | CMT2 | 0 | CMT8 | 0 | CMT12 | 0 | CMT16 | 0 | CMT22 | 0 | CMT27 | 0 | CMT31 | 0 | CMT32 | 0 |
| DATA BITS | ♦ | CMT2 | 0 | CMT18 | 0 | CMT9 | 0 | CMT24 | 0 | CMT29 | 0 | CMT31 | 0 | CMT32 | 0 |
| PARITY | ♦ | CMT3 | 0 | CMT19 | 0 | CMT10 | 0 | CMT26 | 0 | CMT28 | 0 | CMT30 | 0 | CMT32 | 0 |
| STOP BITS | ♦ | CMT4 | 0 | CMT20 | 0 | CMT11 | 0 | CMT27 | 0 | CMT28 | 0 | CMT31 | 0 | CMT32 | 0 |
| HAND SHAE | ♦ | CMT5 | 0 | CMT21 | 0 | CMT12 | 0 | CMT28 | 0 | CMT30 | 0 | CMT31 | 0 | CMT32 | 0 |
| WAIT TIME | ♦ | CMT6 | 0 | CMT22 | 0 | CMT13 | 0 | CMT29 | 0 | CMT31 | 0 | CMT31 | 0 | CMT32 | 0 |
| FORMAT | ♦ | CMT7 | 0 | CMT23 | 0 | CMT14 | 0 | CMT30 | 0 | CMT31 | 0 | CMT31 | 0 | CMT32 | 0 |
| SAME WHO. ALARM | CM1 | CMT9 | 0 | CMT25 | 00000000 | CMT10 | 0 | CMT26 | 00000000 | CMT11 | 0 | CMT27 | 00000000 | CMT12 | 0 | CMT28 | 00000000 |
| PORT | COM1 | CMT15 | 0 | CMT31 | 0 | CMT16 | 0 | CMT32 | 0 | |

#### TAPE

| BAUDRATE | 110 | TAP1 | 0 | TAP17 | 0 | TAP2 | 0 | TAP18 | 0 | TAP3 | 0 | TAP19 | 0 | TAP4 | 0 | TAP20 | 0 | TAP5 | 0 | TAP21 | 0 | TAP6 | 0 | TAP22 | 0 |
| DATA BITS | 8 | TAP7 | 0 | TAP23 | 0 | TAP7 | 0 | TAP23 | 0 | TAP7 | 0 | TAP23 | 0 | TAP7 | 0 | TAP23 | 0 | TAP7 | 0 | TAP23 | 0 | TAP7 | 0 | TAP23 | 0 |
| PARITY | NONE | TAP9 | 0 | TAP24 | 0 | TAP9 | 0 | TAP24 | 0 | TAP9 | 0 | TAP24 | 0 | TAP9 | 0 | TAP24 | 0 | TAP9 | 0 | TAP24 | 0 | TAP9 | 0 | TAP24 | 0 |
| STOP BITS | 1 | TAP10 | 0 | TAP25 | 00000000 | TAP10 | 0 | TAP25 | 00000000 | TAP10 | 0 | TAP25 | 00000000 | TAP10 | 0 | TAP25 | 00000000 |
| HAND SHAKE | NONE | TAP11 | 0 | TAP27 | 00000000 | TAP11 | 0 | TAP27 | 00000000 | TAP11 | 0 | TAP27 | 00000000 | TAP11 | 0 | TAP27 | 00000000 |
| WAIT TIME | 0 | TAP12 | 0 | TAP28 | 00000000 | TAP12 | 0 | TAP28 | 00000000 | TAP12 | 0 | TAP28 | 00000000 | TAP12 | 0 | TAP28 | 00000000 |
| FORMAT | ISO | TAP13 | 0 | TAP29 | 0 | TAP13 | 0 | TAP29 | 0 | TAP13 | 0 | TAP29 | 0 | TAP13 | 0 | TAP29 | 0 | TAP13 | 0 | TAP29 | 0 | TAP13 | 0 | TAP29 | 0 |
| SAME WHO. ALARM | TAP14 | 0 | TAP30 | 0 | TAP14 | 0 | TAP30 | 0 | TAP14 | 0 | TAP30 | 0 | TAP14 | 0 | TAP30 | 0 | TAP14 | 0 | TAP30 | 0 | TAP14 | 0 | TAP30 | 0 |
| PORT | COM1 | TAP15 | 0 | TAP31 | 0 | TAP15 | 0 | TAP31 | 0 | TAP15 | 0 | TAP31 | 0 | TAP15 | 0 | TAP31 | 0 | TAP15 | 0 | TAP31 | 0 | TAP15 | 0 | TAP31 | 0 |
| PORT | COM1 | TAP16 | 0 | TAP32 | 0 | TAP16 | 0 | TAP32 | 0 | TAP16 | 0 | TAP32 | 0 | TAP16 | 0 | TAP32 | 0 | TAP16 | 0 | TAP32 | 0 | TAP16 | 0 | TAP32 | 0 |

### Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>DATA I/O</th>
<th>TAPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program type</td>
<td>M, E</td>
<td>---</td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td>---</td>
</tr>
<tr>
<td>Unit</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Setting range</td>
<td>110 to 19200</td>
<td>---</td>
</tr>
</tbody>
</table>

### Description

#### BAUDRATE

- **Baud rate for RS-232C interface**
- **Set values**
  - 110 4800
  - 300 9600
  - 1200 19200
  - 2400

#### DATA BITS

- **Number of data bits (parameter for RS-232C interface initialization)**
- **Set values**
  - 7
  - 8
<table>
<thead>
<tr>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARITY</strong></td>
<td>Parity check (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td></td>
<td><strong>Set values</strong></td>
</tr>
<tr>
<td></td>
<td>NONE</td>
</tr>
<tr>
<td></td>
<td>ODD</td>
</tr>
<tr>
<td></td>
<td>EVEN</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>STOP BITS</strong></td>
<td>Number of stop bits (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td></td>
<td><strong>Set values</strong></td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>HAND SHAKE</strong></td>
<td>This parameter is used to select the method of handshaking to control the</td>
</tr>
<tr>
<td></td>
<td>state of data transfer between the NC system and connected device.</td>
</tr>
<tr>
<td></td>
<td><strong>Set values</strong></td>
</tr>
<tr>
<td></td>
<td>NONE</td>
</tr>
<tr>
<td></td>
<td>No control</td>
</tr>
<tr>
<td></td>
<td>DC CONTROL</td>
</tr>
<tr>
<td></td>
<td>Complies with control code DC1 through DC4</td>
</tr>
<tr>
<td></td>
<td>RTS/CTS</td>
</tr>
<tr>
<td></td>
<td>Complies with device connection RTS/CTS.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td><strong>WAIT TIME</strong></td>
<td>The waiting time for replies from the connected device during inputting or</td>
</tr>
<tr>
<td></td>
<td>outputting. An alarm occurs if this time elapses following the final reply.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Classification</td>
<td>DATA I/O</td>
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<tr>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meaning</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
</tr>
<tr>
<td><strong>FORMAT</strong></td>
<td></td>
</tr>
<tr>
<td>Selection of paper tape puncher output code</td>
<td></td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>ISO</td>
<td>Paper tape punching in ISO code</td>
</tr>
<tr>
<td>EIA</td>
<td>Paper tape punching in EIA code</td>
</tr>
<tr>
<td>ASCII</td>
<td>Paper tape punching in ASCII code</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>M, E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>SAME WNo.</strong></td>
<td></td>
</tr>
<tr>
<td>Type of processing to be executed if the machining program of an existing work number is to be loaded</td>
<td></td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>ALARM</td>
<td>Issues an alarm if the received work number already exists.</td>
</tr>
<tr>
<td>LOAD</td>
<td>Overrides the program if the received work number already exists.</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>M, E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>PORT</strong></td>
<td></td>
</tr>
<tr>
<td>Tape port selection</td>
<td></td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>COM1</td>
<td>CF22 serial ch1</td>
</tr>
<tr>
<td>COM2</td>
<td>CF22 serial ch2</td>
</tr>
<tr>
<td>COM3</td>
<td>Invalid</td>
</tr>
<tr>
<td>COM4</td>
<td>Invalid</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>M, E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>—</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>TAP1</td>
<td>Type of terminator</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
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<td>Unit</td>
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<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TAP2</td>
<td>Terminator code 1</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TAP3</td>
<td>Terminator code 2</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
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<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>TAP4</td>
<td>Output of CR during ISO code punching</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>TAP5</td>
<td>DC code parity</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
</tr>
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<td>Unit</td>
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<td>Setting range</td>
</tr>
<tr>
<td></td>
<td>Set values</td>
</tr>
<tr>
<td></td>
<td>Parity</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
</tbody>
</table>

| TAP6    | Feed section DC code output | Select whether or not DC2 and DC4 codes are to be output to the feed sections which will be generated at the beginning and end of paper tape punching. |
|         | Program type | M, E |
|         | Conditions   | At I/O startup |
|         | Unit         | — |
|         | Setting range| 0 to 3 |
|         | Example      | ![Feed EOR (Significant information) EOR Feed](image) |
|         | Set values   | Description |
|         | Description  | 0: Neither DC2 nor DC4 is output, 1: Only DC2 is output, 2: Only DC4 is output, 3: Both DC2 and DC4 are output. |
|         | Note:        | This parameter is valid only when HAND SHAKE is set to DC CONTROL. |

| TAP7    | — |
|         | Program type | — |
|         | Conditions   | — |
|         | Unit         | — |
|         | Setting range| — |

Note: Invalid
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP9</td>
<td>&quot;[&quot; code for paper tape reader/puncher for EIA</td>
<td>This parameter is used to set a hole-punching pattern for the character code &quot;[&quot; onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. <strong>Example:</strong> <img src="image1" alt="Diagram" /> <strong>Set value</strong> $76_{10} = 0001001001_2$</td>
</tr>
<tr>
<td>TAP10</td>
<td>&quot;]&quot; code for paper tape reader/puncher for EIA</td>
<td>This parameter is used to set a hole-punching pattern for the character code &quot;]&quot; onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. <strong>Example:</strong> <img src="image2" alt="Diagram" /> <strong>Set value</strong> $13_{10} = 00001101_2$</td>
</tr>
<tr>
<td>TAP11</td>
<td>&quot;#&quot; code for paper tape reader/puncher for EIA</td>
<td>This parameter is used to set a hole-punching pattern for the character code &quot;#&quot; onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. <strong>Example:</strong> <img src="image3" alt="Diagram" /> <strong>Set value</strong> $109_{10} = 00001101101_2$</td>
</tr>
<tr>
<td>TAP12</td>
<td>&quot;∗&quot; code for paper tape reader/puncher for EIA</td>
<td>This parameter is used to set a hole-punching pattern for the character code &quot;∗&quot; onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. <strong>Example:</strong> <img src="image4" alt="Diagram" /> <strong>Set value</strong> $122_{10} = 00001111010_2$</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| TAP13   | "=" code for paper tape reader/puncher for EIA | This parameter is used to set a hole-punching pattern for the character code "=" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: Hole to be punched 

```
(0 \times 2^7)+(1 \times 2^6)+(0 \times 2^5)+(1 \times 2^4)+(1 \times 2^3)+(0 \times 2^2)+(1 \times 2^1)+(1 \times 2^0) = 91
```

MPL072 |

Set value |

TAP14   | ":" code for paper tape reader/puncher for EIA | This parameter is used to set a hole-punching pattern for the character code ":" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: Hole to be punched 

```
(0 \times 2^7)+(1 \times 2^6)+(0 \times 2^5)+(0 \times 2^4)+(0 \times 2^3)+(1 \times 2^2)+(1 \times 2^1)+(0 \times 2^0) = 70
```

MPL073 |

Set value |

TAP15   | "(" code for paper tape reader/puncher for EIA | This parameter is used to set a hole-punching pattern for the character code "(" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: Hole to be punched 

```
(0 \times 2^7)+(0 \times 2^6)+(0 \times 2^5)+(1 \times 2^4)+(1 \times 2^3)+(0 \times 2^2)+(1 \times 2^1)+(0 \times 2^0) = 26
```

MPL074 |

Set value |

TAP16   | ")" code for paper tape reader/puncher for EIA | This parameter is used to set a hole-punching pattern for the character code ")" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: Hole to be punched 

```
(0 \times 2^7)+(1 \times 2^6)+(0 \times 2^5)+(0 \times 2^4)+(0 \times 2^3)+(1 \times 2^2)+(1 \times 2^1)+(0 \times 2^0) = 74
```

MPL075 |

Set value |
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP17 to TAP24</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>TAP25</td>
<td>Paper tape puncher parity-V check</td>
<td>76543210</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
<tr>
<td>TAP26</td>
<td>Bit parameter related to paper tape reader/puncher</td>
<td>76543210</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>
### TAP27

Bit parameter related to program end code (M) for paper tape reader

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP27</td>
<td></td>
<td><img src="#" alt="Binary Diagram" /></td>
</tr>
</tbody>
</table>

- To specify whether or not M99 is to be set as the program end code in reading of paper tape
  - 0: Set as program end
  - 1: Not set as program end

- To specify whether or not M02 is to be set as the program end code in reading of paper tape
  - 0: Set as program end
  - 1: Not set as program end

- To specify whether or not M30 is to be set as the program end code in reading of paper tape
  - 0: Set as program end
  - 1: Not set as program end

- To recognize the code "O" (or ":") as the program end in reading of multiple programs (on one paper tape)
  - 0: Yes
  - 1: No

### TAP28

Invalid

### TAP29

The number of characters in NULL (feed) that are to be punched at the beginning and end of paper tape

**Example:**

```
MPL078 TAP29 characters TAP29 characters
  Feed EOR (Significant information) EOR Feed
Tape setting position End of punching

MPL078
```

Number of characters in feed section for paper tape puncher

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP29</td>
<td></td>
<td><img src="#" alt="Diagram" /></td>
</tr>
</tbody>
</table>

- Program type: E
- Conditions: At I/O startup
- Unit: 1 character
- Setting range: 0 to 65535
### TAP30

**Address**: Program type

- **Program type**: E

**Conditions**: At I/O startup

**Unit**: 1 character

**Setting range**: 0 to 65535

**Description**: The total number of space-characters that are punched out between O-number and program section.

```
O 1 2 3 4 SP SP SP ~ SP CR
```

**Diagram**: TAP30 characters

**MPL079**

### TAP31

**Address**: Number of characters in the space between programs for paper tape puncher

**Program type**: E

**Conditions**: At I/O startup

**Unit**: 1 character

**Setting range**: 0 to 65535

**Description**: The total number of space-characters that are punched out between programs when more than one program are punched onto paper tape.

```
~ M 0 2 CR SP ~ SP CR O 1 2 3 4 ~
```

**Diagram**: Program ← TAP31 characters → Program

**MPL080**

### TAP32

**Address**: —

**Program type**: —

**Conditions**: —

**Unit**: —

**Setting range**: —

**Description**: Invalid
### Data I/O parameter

#### DNC parameter (DNC)

**Parameter setting**

<table>
<thead>
<tr>
<th>Classification</th>
<th>DATA I/O</th>
<th>Display title</th>
<th>DNC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meaning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BAUDRATE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baud rate for RS-232C interface</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Set values**

- 110: 4800
- 300: 9600
- 1200: 19200
- 2400

**Program type**: M, E

**Conditions**: At I/O startup

**Unit**: —

**Setting range**: 110 to 19200
<table>
<thead>
<tr>
<th>Classification</th>
<th>DATA I/O</th>
<th>Display title</th>
<th>DNC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA BITS</td>
<td>Number of data bits (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>7, 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PARITY</td>
<td>Parity check (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td></td>
</tr>
<tr>
<td>NONE</td>
<td>ODD</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP BITS</td>
<td>Number of stop bits (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td><strong>Set values</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>WAIT TIME</td>
<td>The waiting time for replies from the connected device during inputting or outputting. An alarm occurs if this time elapses following the final reply.</td>
</tr>
<tr>
<td><strong>Program type</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Conditions</strong></td>
<td>At I/O startup</td>
</tr>
<tr>
<td><strong>Unit</strong></td>
<td>0.1 sec.</td>
</tr>
<tr>
<td><strong>Setting range</strong></td>
<td>0 to 65535</td>
</tr>
<tr>
<td>Classification</td>
<td>DATA I/O</td>
</tr>
<tr>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SAME WNo.</strong></th>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type of processing to be executed if the machining program of an existing work number is to be loaded</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARM</td>
<td>Issues an alarm if the received work number already exists.</td>
</tr>
<tr>
<td>LOAD</td>
<td>Overrides the program if the received work number already exists.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PORT</strong></th>
<th><strong>Meaning</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DNC port selection</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM1</td>
<td>CF22 serial ch3</td>
</tr>
<tr>
<td>COM2</td>
<td>CF22 serial ch4</td>
</tr>
<tr>
<td>COM3</td>
<td>Invalid</td>
</tr>
<tr>
<td>COM4</td>
<td>Invalid</td>
</tr>
</tbody>
</table>
## DNC

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DNC1</strong></td>
<td>Type of terminator</td>
<td>Effective only when <strong>DNC1</strong> is set to 4 or 5.</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 5</td>
<td></td>
</tr>
<tr>
<td>Terminate code 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Set values

<table>
<thead>
<tr>
<th>Set values</th>
<th>Terminator</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Without terminator</td>
</tr>
<tr>
<td>1</td>
<td>EOB or EOR</td>
</tr>
<tr>
<td>2</td>
<td>EOB only</td>
</tr>
<tr>
<td>3</td>
<td>EOR only</td>
</tr>
<tr>
<td>4</td>
<td>One character of your choice</td>
</tr>
<tr>
<td>5</td>
<td>Two characters of your choice</td>
</tr>
</tbody>
</table>

| **DNC2** | Terminator code 2 | Effective only when **DNC1** is set to 5. |
| Program type | E | |
| Conditions | At I/O startup | |
| Unit | — | |
| Setting range | 0 to 255 | |

<p>| <strong>DNC3</strong> | Invalid |
| Program type | — | |
| Conditions | — | |
| Unit | — | |
| Setting range | — | |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNC5</td>
<td>DC code parity</td>
<td>This parameter is used to specify whether or not a parity bit is to be assigned to the DC code to be output. Set values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Program type</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0, 1</td>
<td></td>
</tr>
<tr>
<td>DNC6 to DNC8</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>DNC9</td>
<td>Number of NC transmission retries during DNC file transfer</td>
<td>This parameter is used to set the number of times that the @ code or TEXT is to be repeatedly transmitted to a host system in case that the @ code is not sent from the host system within the waiting time which has been set at WAIT TIME.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Number of times</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
<tr>
<td>DNC10</td>
<td>Number of NC reception retries during DNC file transfer</td>
<td>This parameter is used to set the number of times that the @ code is to be repeatedly transmitted to a host system in the case that the EOT-code or TEXT from the host system is not received within the waiting time which has been set at WAIT TIME.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Number of times</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
</tbody>
</table>

![Parity Hole-punching pattern of DC3 code](image)  

An alarm occurs if the transmission operation is repeated up to the number of times set with this parameter. MPL081

![Parity Hole-punching pattern of DC3 code](image)  

An alarm occurs if the transmission operation is repeated up to the number of times set with this parameter. MPL082
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNC11</td>
<td>Number of NC transmission/reception retries during DNC command message transfer</td>
<td>This parameter is used to set the number of times that transmission/reception of command messages is to be repeated in the case that it is not correctly performed. This parameter has almost the same meaning as that of parameters DNC9 and DNC10, except that command messages are interchanged in the case of DNC11 and files are interchanged in the case of DNC9 and DNC10.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Number of times</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC12</td>
<td>@ waiting time during DNC transmission</td>
<td>The NC waiting time from transmission of * or TEXT to reception of @ from the host system.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC13</td>
<td>&quot;*&quot;, TEXT waiting time during DNC transmission</td>
<td>The NC waiting time from transmission of @ or reception of EOT to reception of * or TEXT from the host system.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC14</td>
<td>EOT waiting time during DNC transmission</td>
<td>The NC waiting time from transmission of @ to reception of EOT from the host system.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>DNC15</strong></td>
<td>NC stop time after reception of !</td>
<td>The NC stop time from reception of ! from the host system to transmission of *. Code * is transmitted to the host system if the time that has been set with DNC15 elapses following reception of !.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 sec.</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
<tr>
<td><strong>DNC16</strong></td>
<td>NC reset time after digital-out</td>
<td>The time from the moment the NC receives the digital-out command to the moment the NC internally resets this command.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.1 sec.</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
<tr>
<td><strong>DNC17</strong></td>
<td>NC stop time from reception</td>
<td>For NC transmission: The NC stop time from reception of @ from the host system to transmission of EOT or TEXT. For NC reception: The NC stop time from reception of * or TEXT from the host system to transmission of @.</td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>0.01 sec.</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>0 to 255</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>DNC18</td>
<td>DNC command reply message waiting time</td>
<td>The NC waiting time from transmission of command message EOT to reception of command reply message from the host system.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC19</td>
<td>DNC machine number</td>
<td>The numbers to be assigned to various machines in order to manage on the host system the tool data, parameters etc. that are specific to the machines being used</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC20</td>
<td>NC transmission stop time of DNC (from reception to transmission)</td>
<td>The NC stop time from reception of EOT from the host system to transmission of * of the next message</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.01 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>DNC21</td>
<td>NC transmission stop time of DNC (from transmission to transmission)</td>
<td>The NC stop time from transmission of EOT to the host system to transmission of * of the next message</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.01 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
<tr>
<td>Address</td>
<td>Meaning</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>—</td>
<td></td>
<td>Invalid</td>
</tr>
<tr>
<td>DNC22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to DNC24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>DNC25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
<td></td>
</tr>
<tr>
<td>DNC26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program type</td>
<td>M, E</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
<td></td>
</tr>
</tbody>
</table>

**DNC25**

Select the type of processing to be executed if the tool quantity data within the NC memory mismatches that which has been transferred from the DNC memory.

- 0: Issues an alarm if the tool quantity data mismatches.
- 1: Executes loading forcibly, even if the tool quantity data mismatches.

Handling of tool data and tool files in the M PLUS format

- 0: Valid
- 1: Invalid

**DNC26**

(1: Valid, 0: Invalid)

1: After program reception, a search is made for the work number of that program.
1: Details of an alarm occurring in DNC are displayed.
1: Loading of programs having the same work number as that of the registered program in NC becomes impossible.
1: The function of the PROGRAM LOCK/ENABLE switch is released.
1: Three digit G-format and G10 format codes input/output for MAZAK data transfer protocol
1: Binary to ASCII format input/output of MAZAK data transfer protocol
1: All programs having work numbers smaller than No. 9000 are erased at the start of program reception.

**Note:**

When both bit 5 and bit 6 are set to 1 (enable), this functions for three digit G-format and G10 format codes input/output.
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNC27</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>DNC28</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>DNC29</td>
<td>Number of retry times with detection of a physical error</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>Number of times</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
<tr>
<td>DNC30</td>
<td>Tool data/tool file message format</td>
<td>Select a tool data/tool file message format.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 3</td>
</tr>
<tr>
<td>DNC31</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>DNC32</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
</tbody>
</table>
### 2-3-20 Data I/O parameter OTHER (IOP/DPR/IDD)

#### Classification

<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IOP1</strong> to <strong>IOP4</strong></td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**Program type** —

**Conditions** —

**Unit** —

**Setting range** —

#### IOP5

<table>
<thead>
<tr>
<th>Program type</th>
<th>M, E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td>Unit</td>
<td>Bit</td>
</tr>
<tr>
<td>Setting range</td>
<td>Binary, eight digits</td>
</tr>
</tbody>
</table>

Valid for loading a program(s) of the same work number as that of the program(s) registered in the NC unit by hard disk, floppy disk, or memory card input/output.

- 0: Alarm without overwriting
- 1: Overwriting
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP6</td>
<td>—</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**Program type** —
**Conditions** —
**Unit** —
**Setting range** —

**IOP7**

Data entry for communication with the magazine-side display unit.

**Address**

<table>
<thead>
<tr>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>Not used</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>Used</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Invalid</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

**Program type** M, E

**Conditions** At power on

**Unit** Bit

**Setting range** Binary, eight digits

Specify the serial port number of the NC unit that is to be used for communication with the magazine-side display unit.

<table>
<thead>
<tr>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Serial port</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>COM1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>COM2</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>COM3</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>COM4</td>
</tr>
</tbody>
</table>

**Program type** —

**Conditions** —

**Unit** —

**Setting range** —

Invalid

Specify the type of ID amplifier.

<table>
<thead>
<tr>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>EUCHNER</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>Invalid</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Invalid</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Invalid</td>
</tr>
</tbody>
</table>

Specify whether the timing of the R-register is to be made valid during tool removal or mounting.

**Program type** —

**Conditions** —

**Unit** —

**Setting range** —

Invalid
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP8</td>
<td>Number of pitch error axes during text output</td>
<td>Specify the number of pitch error axes during machine parameter output using the text input/output functions. <strong>Note:</strong> If 0 is entered, machine parameter output will be valid for all axes (14 axes).</td>
</tr>
<tr>
<td>IOP9</td>
<td>Program type M, E</td>
<td>Invalid</td>
</tr>
<tr>
<td>IOP10 to IOP16</td>
<td>Program type —</td>
<td>Baud rate for RS-232C interface</td>
</tr>
<tr>
<td>DPR1</td>
<td>Baud rate</td>
<td>Set values</td>
</tr>
<tr>
<td></td>
<td>110</td>
<td>4800</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td>DPR2</td>
<td>Stop bit</td>
<td>Number of stop bits (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Program type M, E
Conditions At I/O startup
Unit Number of axes
Setting range 0 to 13

Program type M, E
Conditions At I/O startup
Unit —
Setting range 0 to 6
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR3</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>DPR4</td>
<td>Data bit</td>
<td>Number of data bits (parameter for RS-232C interface initialization)</td>
</tr>
<tr>
<td></td>
<td>Set values</td>
<td>Data bit</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
<tr>
<td>DPR5 to DPR7</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>—</td>
</tr>
<tr>
<td>DPR8</td>
<td>ISO code CR output and the output file size</td>
<td>This parameter specifies whether &quot;CR&quot; is to be inserted at the beginning of LF (block delimiter) in ISO code output when the output destination is a serial port (DPR14 = 0 or 1). 0: No &quot;CR&quot; insertion 1: &quot;CR&quot; insertion This parameter specifies the maximum permissible file size to be used for hard disk output using an external output command macro when the output destination is the hard disk (DPR14 = 4). Maximum permissible file size: Entered value × 100K bytes However, this file size is 100K bytes if the entered value is 0.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 255</td>
</tr>
</tbody>
</table>
### DPR9
**Address:** DPR9  
**Program type:** M, E  
**Conditions:** At I/O startup  
**Unit:** —  
**Setting range:** 0 to 2

**Method of handshaking**

This parameter is used to select the method of handshaking to control the state of data transfer between the NC system and connected device.

<table>
<thead>
<tr>
<th>Set values</th>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>No control</td>
</tr>
<tr>
<td>1</td>
<td>DC control</td>
<td>Complies with control code DC1 through DC4</td>
</tr>
<tr>
<td>2</td>
<td>RTS/CTS</td>
<td>Complies with device connection RTS/CTS.</td>
</tr>
</tbody>
</table>

### DPR10
**Address:** DPR10  
**Program type:** M, E  
**Conditions:** At I/O startup  
**Unit:** —  
**Setting range:** 0, 1

**DC code parity**

This parameter is used to specify whether or not a parity bit is to be assigned to the DC code to be output.

<table>
<thead>
<tr>
<th>Set values</th>
<th>Parity</th>
<th>Hole-punching pattern of DC3 code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No assignment</td>
<td>• • • • •</td>
</tr>
<tr>
<td>1</td>
<td>Assignment</td>
<td>• • • • •</td>
</tr>
</tbody>
</table>

**Note:**  
This parameter is valid only when the handshaking method is set to DC control (DPR9 is set to 1).

### DPR11
**Address:** DPR11  
**Program type:** M, E  
**Conditions:** At I/O startup  
**Unit:** —  
**Setting range:** 0 to 3

**Feed section DC code output**

Select whether or not DC2 and DC4 codes are to be output to the feed sections.

**Example:**

<table>
<thead>
<tr>
<th>Feed</th>
<th>EOR</th>
<th>(Significant information)</th>
<th>EOR</th>
<th>Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC2</td>
<td></td>
<td></td>
<td>DC4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Neither DC2 nor DC4 is output.</td>
</tr>
<tr>
<td>1</td>
<td>Only DC2 is output.</td>
</tr>
<tr>
<td>2</td>
<td>Only DC4 is output.</td>
</tr>
<tr>
<td>3</td>
<td>Both DC2 and DC4 are output.</td>
</tr>
</tbody>
</table>

**Note:**  
This parameter is valid only when the handshaking method is set to DC control (DPR9 is set to 1).
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR12</td>
<td>Waiting time</td>
<td>The waiting time for replies from the connected device during inputting or outputting. An alarm occurs if this time elapses following the final reply.</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>0.1 sec.</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0 to 65535</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DPR13</th>
<th>Output format</th>
<th>Selection of output code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Set values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DPR14</th>
<th>Selection of an output destination port</th>
<th>Port selection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Set value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Program type</td>
<td>M, E</td>
</tr>
<tr>
<td></td>
<td>Conditions</td>
<td>At I/O startup</td>
</tr>
<tr>
<td></td>
<td>Unit</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Setting range</td>
<td>0, 1, 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DPR15</th>
<th>Number of characters or the number of lines in feed section</th>
<th>This parameter denotes the number of characters in NULL (feed) when the output destination is a serial port (DPR14 = 0 or 1). Example:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DPR15 characters</td>
<td>DPR15 characters</td>
</tr>
<tr>
<td></td>
<td>Feed</td>
<td>EOR</td>
</tr>
<tr>
<td></td>
<td>Feed</td>
<td>EOR</td>
</tr>
<tr>
<td></td>
<td>This parameter denotes the number of lines fed when the output destination is a hard disk (DPR14 = 4).</td>
<td></td>
</tr>
</tbody>
</table>

<p>|         | Program type | M, E |
|         | Conditions   | At I/O startup |
|         | Unit         | 1 character |
|         | Setting range| 0 to 65535 |</p>
<table>
<thead>
<tr>
<th>Address</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR16</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>IDD1 to IDD16</td>
<td>—</td>
<td>Invalid</td>
</tr>
<tr>
<td>Program type</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Conditions</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
3  ALARM

If machine failures occur or if erroneous operations are carried out, appropriate alarm numbers and messages will be displayed in the alarm display section of the screen. If alarm display appears, refer to the alarm list to locate and eliminate the cause of the alarm. More than one alarm may be raised at once, depending on the particular status of alarm occurring. In the event of alarm display, therefore, it is highly recommended that the operator should call the DIAGNOSIS (USER) - ALARM display on the screen and make sure of the type of alarm.

Alarm display area

Diagram of DIAGNOSIS (USER) - ALARM display
3-1 Outline

1. Scope of this chapter
   This chapter describes all the alarms displayed on the screen of NC unit. Always refer to this chapter for eliminating an alarm.

2. Precautions on this chapter
   This chapter also lists alarms related to machine model-dependent functions and optional functions. These alarms may therefore include ones not displayed for your machine. Check the type of machine purchased by you and its specifications before you read this chapter.

   **Note 1:** The contents of this list are subjected to change without notice, for NC unit or machine improvement.

   **Note 2:** Any questions about the contents of this list should be communicated to Mazak Technical Center or Technology Center.

3-1-1 Alarm display

1. Machine-status indicator lamps
   In the event of alarm, the machine-status indicator lamp ?ALARM on the operation panel will light up.

2. Display on the screen of NC unit
   An alarm will be displayed on the **DIAGNOSIS (USER) - ALARM** display in the following format:

   650  CHAMFERING IMPOSSIBLE  (1234, 56, 78)

   For the **DIAGNOSIS (USER) - ALARM** display, refer to Part 3 OPERATING NC UNIT AND PREPARATION FOR AUTOMATIC OPERATION, 10-1 **DIAGNOSIS (USER) - ALARM** Display of the Operating Manual.

3. Color of alarm display and its elimination
   Alarm display is presented in either red or blue.

<table>
<thead>
<tr>
<th>Display color</th>
<th>Alarm elimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Press the reset key.</td>
</tr>
<tr>
<td>Blue</td>
<td>Press the clear key.</td>
</tr>
</tbody>
</table>
3-1-2 Precautions

1. If program-related alarm display appears, that portion of the program in which the alarm has occurred will be displayed within the parentheses next to the alarm message. The meaning of each code in parentheses on the alarm list is listed in the table below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>WNo.</td>
<td>Work number (MAZATROL or EIA/ISO)</td>
</tr>
<tr>
<td>UNo.</td>
<td>Unit number (MAZATROL)</td>
</tr>
<tr>
<td>SNo.</td>
<td>Tool sequence number (MAZATROL)</td>
</tr>
<tr>
<td>NNo.</td>
<td>Sequence number (EIA/ISO)</td>
</tr>
<tr>
<td>BNo.</td>
<td>Block number (EIA/ISO)</td>
</tr>
<tr>
<td>blank</td>
<td>No display, or intra-system alarm processing code</td>
</tr>
</tbody>
</table>

2. The stopped status, clearing procedure, and display color for some types of alarm depend on whether the alarm-encountered program is on the foreground (program selected on the POSITION display) or on the background (program selected on the PROGRAM display). The above mentioned three types of information for the latter case are indicated with parentheses in the alarm list.

3. The table for an alarm which does not exist remains blank.

4. An alarm may not be displayed for certain machine models or versions of NC-software.
### 3-2 Detailed Description

#### 3-2-1 Structure of the alarm list

This alarm list is written in the following format:

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Cause |       | [6]          |                |                     |         |

| Action |       | [7]          |                |                     |         |

1. Alarm number
2. Alarm message
3. Type of error

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Operation</td>
<td>A wrong key has been pressed. Or the machine has been operated incorrectly.</td>
</tr>
<tr>
<td>B</td>
<td>Registered data</td>
<td>The program or tool data includes an error(s).</td>
</tr>
<tr>
<td>C</td>
<td>Servo</td>
<td>Malfunctioning of the servo control mechanism</td>
</tr>
<tr>
<td>D</td>
<td>Spindle</td>
<td>Malfunctioning of the spindle control mechanism</td>
</tr>
<tr>
<td>E</td>
<td>NC equipment</td>
<td>System (hardware/software) error</td>
</tr>
<tr>
<td>F</td>
<td>Machine (PLC)</td>
<td>Machine failure</td>
</tr>
<tr>
<td>G</td>
<td>External I/O unit</td>
<td>Malfunctioning of external I/O unit</td>
</tr>
</tbody>
</table>

4. Stopped status

<table>
<thead>
<tr>
<th>Code</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Emergency stop</td>
</tr>
<tr>
<td>I</td>
<td>Reset stop</td>
</tr>
<tr>
<td>J</td>
<td>Single-block stop</td>
</tr>
<tr>
<td>K</td>
<td>Feed stop (hold)</td>
</tr>
<tr>
<td>L</td>
<td>Operation continued</td>
</tr>
</tbody>
</table>

5. Clearing procedure

<table>
<thead>
<tr>
<th>Code</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Power off → Eliminate cause → Power back on</td>
</tr>
<tr>
<td>N</td>
<td>Eliminate cause → Power off → Power back on</td>
</tr>
<tr>
<td>O</td>
<td>Eliminate cause → Press reset key</td>
</tr>
<tr>
<td>P</td>
<td>Press reset key</td>
</tr>
<tr>
<td>Q</td>
<td>Eliminate cause → Press clear key</td>
</tr>
<tr>
<td>S</td>
<td>Press clear key</td>
</tr>
</tbody>
</table>

6. Cause of alarm
7. Action to be taken to eliminate the cause.

**Note:** The list for alarms related to PLC machine control (No. 200 to 399 and No. 1200 to 1399) has a different format.
### 3-2-2 No. 1 - No. 99, No. 1000 - No. 1099 (System/Drive error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMERGENCY STOP</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EMERGENCY STOP</td>
<td>( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>Trouble has occurred in the hardware.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Turn power off and then back on. If this does not clear the alarm status, require Mazak Technical Center or Technology Center to replace the defective hardware or cables.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>EMERGENCY STOP</td>
<td>( , , )</td>
<td>A</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>The emergency stop button on the operating panel has been pressed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Release the pressed state of the emergency stop button and reset the NC unit to its initial state.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>— —</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SYSTEM SOFTWARE ERROR</td>
<td>( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>The contents of the system software and/or custom software have been destroyed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>REMOTE I/O ERROR</td>
<td>( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SRAM MALFUNCTION</td>
<td>( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>The S-RAM mounted on the CPU card has become abnormal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>RAM MALFUNCTION</td>
<td>( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>The RAM mounted on the CPU card has become abnormal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>ABSOLUTE POSITION MALFUNCTION</td>
<td>(Alarm No., Axis, )</td>
<td>E</td>
<td>H</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>The absolute position detection system has lost absolute position data.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Require Mazak Technical Center or Technology Center to re-set the absolute position data.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td>10</td>
<td>DETECTOR MALFUNCTION (Alarm No., Axis, )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The absolute position detection system has detected its detector error(s).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Require Mazak Technical Center or Technology Center to replace the encoder or battery.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>POSITION REFERENCE MALFUNCTION (Alarm No., Axis, )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The absolute position detection system has detected an error(s) by cross-checking the absolute position of its detector and the internal coordinate data of the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Require Mazak Technical Center or Technology Center to re-set the absolute position data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>ABSOLUTE POSITION WARNING (Alarm No., Axis, )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The battery is running down. Require Mazak Technical Center or Technology Center to replace the battery.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Require Mazak Technical Center or Technology Center to re-write the NC system data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>PRE-PROCESSOR MALFUNCTION ( , , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The software is not correctly working.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Require Mazak Technical Center or Technology Center to re-write the NC system data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>SYSTEM ERROR (Alarm No., Sub No., )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trouble has occurred during communication with the amplifiers or during communication data processing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center with the information of the numbers (Alarm No. and Sub No.) displayed in parentheses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>AMPLIFIER NOT EQUIPPED (Axis, , )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amplifier power is not yet turned on. Or no signals are transferred yet. There is a discrepancy between the channel and rotary switch Nos. of the amplifier and the parameters concerned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check for an incorrectly connected cable, an incorrectly attached connector, an inadequate input supply voltage to the amplifier, an incorrect axis-number switch setting, etc. Check the settings of parameters N17, N18, SA43, and SA44 for incorrectness.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>—</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>—</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3-6
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>SAFE OPERATION SYSTEM ALARM (Alarm No., Axis/Door, )</td>
<td>E</td>
<td>H</td>
<td>N</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>There occurred an alarm in the safe operation system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Discrepancy between parameters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The parameters stored in the NC memory for the safe operation system differ from those which are sent to the drive units.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Abnormal speed command.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the mode of safety-speed operation a command was given for a speed exceeding the speed limit that is specified in the parameter concerned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Abnormal position feedback.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the mode of safety-speed operation an excessive error was detected between the position of the command given to the servo drive unit and the feedback position received from there.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Abnormal speed feedback.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the mode of safety-speed operation the engine speed exceeded the safety limit specified in the parameter concerned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Discrepancy between input signals of door state.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A difference was detected between the input signal of the door state on the NC side and that on the drive unit side. Probable causes are as follows:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Break in the cables,</td>
<td></td>
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<td></td>
<td>- Defect in the door switch,</td>
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<td></td>
<td>- Defect in the NC or servo drive unit.</td>
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<tr>
<td>6</td>
<td>Abnormal input signal of door open state in the normal mode.</td>
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<tr>
<td></td>
<td>Door open state was detected in the normal mode of operation.</td>
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<td></td>
<td>In addition to the same probable causes as for item 5 above, the user PLC might be defective.</td>
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<tr>
<td>7</td>
<td>Discrepancy between parameters for speed monitoring.</td>
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<tr>
<td></td>
<td>During start-up of the mode of safety-speed operation a discrepancy was detected between two parameters concerned.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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</tr>
<tr>
<td>26</td>
<td>SPINDLE SAFE OPER. SYSTEM ALARM (Alarm No., Axis, )</td>
<td>E</td>
<td>H</td>
<td>M</td>
<td>Red</td>
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<tr>
<td></td>
<td>Trouble has occurred for the spindle in the mode of safety-speed operation.</td>
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<tr>
<td></td>
<td>See the description of No. 25 above for the details of probable causes.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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<tr>
<td>31</td>
<td>SERVO MALFUNCTION 1 ( , , )</td>
<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>The servo (power-off level) is abnormal.</td>
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<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Require Mazak Technical Center or Technology Center to replace the servo amplifier.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td></td>
<td>SERVO PARAMETER MALFUNCTION</td>
<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td>32</td>
<td>(Alarm No., Axis, )</td>
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</tr>
<tr>
<td>Cause</td>
<td>The parameters that have been transferred from the NC unit to the servo amplifier during NC power-on are not correct.</td>
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<tr>
<td>Action</td>
<td>Require Mazak Technical Center or Technology Center to re-set the servo parameters.</td>
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<tr>
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<td>SERVO MALFUNCTION 2</td>
<td>C</td>
<td>H</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td>33</td>
<td>(Alarm No., Axis, )</td>
<td></td>
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<tr>
<td>Cause</td>
<td>The servo (NC reset level) is abnormal.</td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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<td>SERVO MALFUNCTION 3</td>
<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
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<tr>
<td>34</td>
<td>(Alarm No., Axis, )</td>
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<tr>
<td>Cause</td>
<td>The servo (amplifier power-off level) is abnormal.</td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<tr>
<td></td>
<td>OVERLOAD</td>
<td>C</td>
<td>H</td>
<td>N</td>
<td>Red</td>
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<tr>
<td>35</td>
<td>(Alarm No., Axis, )</td>
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<tr>
<td>Cause</td>
<td>An extraordinary overload has been detected.</td>
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<tr>
<td>Action</td>
<td>Check if any collision has occurred on the machine and perform the corresponding recovery, or check and reduce the cutting conditions. If other measures other than the above should be taken, contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
<td></td>
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<tr>
<td></td>
<td>SPINDLE MALFUNCTION 1</td>
<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td>41</td>
<td>(Alarm No., Axis, )</td>
<td></td>
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<tr>
<td>Cause</td>
<td>The spindle (power-off level) is abnormal.</td>
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</tr>
<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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<tr>
<td></td>
<td>SPINDLE PARAMETER MALFUNCTION</td>
<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
</tr>
<tr>
<td>42</td>
<td>( , , )</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Cause</td>
<td>The parameters that have been transferred from the NC unit to the spindle amplifier during NC power-on are not correct.</td>
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<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Require Mazak Technical Center or Technology Center to re-set the spindle parameters.</td>
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</tr>
<tr>
<td></td>
<td>SPINDLE MALFUNCTION 2</td>
<td>C</td>
<td>H</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td>43</td>
<td>(Alarm No., Axis, )</td>
<td></td>
<td></td>
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<tr>
<td>Cause</td>
<td>The spindle (NC reset level) is abnormal.</td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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<tr>
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<td>C</td>
<td>H</td>
<td>M</td>
<td>Red</td>
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<td>44</td>
<td>(Alarm No., Axis, )</td>
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<tr>
<td>Cause</td>
<td>The spindle (amplifier power-off level) is abnormal.</td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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</tbody>
</table>

### Cause

- **51** E2ROM MALFUNCTION
  - **Cause**: Trouble has occurred during communication with MR-JT-C2. Parameters cannot be correctly written into the E2ROM.
  - **Action**: Require Mazak Technical Center or Technology Center to replace the MR-JT-C2 amplifier.

- **52** BATTERY ALARM
  - **Cause**: The battery provided to retain parameters, machining programs and other types of data within the NC unit has reached the minimum voltage level permissible or has run down.
  - **Action**: It is required that the machining data is rechecked for possible loss or that the battery is recharged or replaced. For battery recharging or replacement, refer to the relevant description given in the Maintenance Manual.

- **53** NC TEMPERATURE WARNING
  - **Cause**: The temperature of the control unit or operation board has increased above the required level. **(Note 1: Location of the temperature alarm, Note 2: Type of temperature alarm, Note 3: On-alarm temperature value)**
  - **Action**: Reduce the temperature by turning off the NC power or by mounting a cooling unit.

- **54** DIO5V MALFUNCTION
  - **Cause**: —
  - **Action**: Contact Mazak Technical Center or Technology Center.

- **55** REMOTE I/O ERROR
  - **Cause**: Contact Mazak Technical Center or Technology Center.

### Note

- **56** SYSTEM SOFTWARE CHECKING
  - **Cause**: The ROMs mounted in the system ROM card are currently being checked for abnormalities.
  - **Action**: Wait for a while. Contact Mazak Technical Center or Technology Center if the alarm is not cleared.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
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<tbody>
<tr>
<td>57</td>
<td>NO PLC</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The user PLC is not stored in the NC unit.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<tr>
<td>58</td>
<td>CORRUPT PLC</td>
<td>F</td>
<td></td>
<td>N</td>
<td>Red/Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Trouble has occurred with the PLC.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center with the information of the second item (Status) displayed in parentheses.</td>
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<tr>
<td>59</td>
<td>PLC STOPPED</td>
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<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The PLC has ceased running.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<tr>
<td>66</td>
<td>PARAMETER MALFUNCTION</td>
<td>E</td>
<td></td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<tr>
<td>67</td>
<td>ILLEGAL HI-SPEED SYNCTAP AXIS</td>
<td>E</td>
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<td>O</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A servo with a system not applicable to high-speed synchronous tapping is connected in spite of the high-speed synchronous tapping option being valid.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<td>68</td>
<td>ILLEGAL HI-SPEED SYNCTAP SPDL</td>
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<td><strong>Cause</strong></td>
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<td></td>
<td>A servo with a system not applicable to high-speed synchronous tapping is connected in spite of the high-speed synchronous tapping option being valid.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<td>Clearing procedure</td>
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<tr>
<td>71</td>
<td>ILLEGAL SERVO PARAMETER</td>
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<td>M</td>
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<tr>
<td></td>
<td>(Alarm No., Axis, )</td>
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<tr>
<td>Cause</td>
<td>The parameters that have been transferred from the NC system to the servo amplifier during NC power-on are not correct.</td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<td>72</td>
<td>SERVO WARNING</td>
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<td>O</td>
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<td>(Alarm No., Axis, )</td>
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</tr>
<tr>
<td>Cause</td>
<td>The servomotor is loaded abnormally.</td>
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</tr>
<tr>
<td>Action</td>
<td>Turn off the NC and the machine, remove the cause of the abnormal load, and then turn on the machine and the NC. Contact Mazak Technical Center or Technology Center if the alarm is not cleared.</td>
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<tr>
<td>81</td>
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<td>O</td>
<td>Blue</td>
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<td>(    ,    ,    )</td>
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</tr>
<tr>
<td>Cause</td>
<td>The parameters that have been transferred from the NC system to the spindle amplifier during NC power-on are not correct.</td>
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<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
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<td>82</td>
<td>SPINDLE WARNING</td>
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<td>H</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>(    ,    ,    )</td>
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<tr>
<td>Cause</td>
<td>The spindle amplifier is loaded abnormally.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Turn off the NC and the machine, remove the cause of the abnormal load, and then turn on the machine and the NC.</td>
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</table>

3-11
### 3-2-3 No. 100 - No. 199, No. 1100 - No. 1199 (CNC machine control error)

<table>
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<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
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<td>100</td>
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<td>( , , )</td>
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<td>101</td>
<td>SOFT LIMIT (Axis, , )</td>
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<td>K</td>
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<tr>
<td>113</td>
<td>OVER TRAVEL (Axis, , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
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<tr>
<td>125</td>
<td>ILLEGAL AXIS EXISTS ( , )</td>
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<td>H</td>
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<tr>
<td>126</td>
<td>AXIS HAS NOT PASSED Z PHASE ( , )</td>
<td>E</td>
<td>H</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td>127</td>
<td>ILLEGAL DIR. FOR ORIGIN RETURN ( , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td>128</td>
<td>OUTSIDE INTERLOCK AXIS ( , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
<td>Red</td>
</tr>
</tbody>
</table>

**Cause**
- 100: ——
- 101: Some mistake in operations during the automatic operation has caused the tool tip to overstep the area specified in the software limit parameters in the direction of the axis corresponding to the displayed axis name.
- 113: The tool tip has reached stroke limit in the direction of the axis corresponding to the displayed axis name.
- 125: During reference-point return, the proximity-point detection limit switch has overrun the position in which the watchdog is mounted.
- 126: During initial reference-point return following the power-on action, an axis has not passed through the Z phase of the corresponding detector.
- 127: The axis-movement direction selected with the axis selector button is not correct for the reference-point return in manual operation mode.
- 128: An axis is interlocked because the interlock function has become active (input signal has turned off).

**Action**
- 100: ——
- 101: Modify the program so that the tool tip may move within the area specified in the software limit parameters.
- 113: Move the tool tip away from the end in manual operation mode.
- 125: Either extend the length of the proximity-point watchdog or reduce the reference-point returning speed. After that, carry out the zero-point returning operation once again.
- 126: First actuate the handle for manual pulse feed to move the axis back in the opposite direction to the zero-point, and then carry out the zero-point returning operation once again.
- 127: Set the correct direction (+, –) using the axis selector buttons.
- 128: Clear the active state of the interlock function.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>INSIDE INTERLOCK AXIS</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>The very direction in which the manual skip function has become effective is specified in the axis-movement command. Or the servo-off function is active.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Deactivate the servo-off function.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>NO OPERATION MODE</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>This message is displayed in the event of incorrect mode selection or a mode selector switch malfunction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>CUTTING FEED OVERRIDE ZERO</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>The cutting-feed override value is set to 0 on the machine operating panel.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Change the cutting-feed override value to one greater than 0. If this alarm message is displayed when the cutting-feed override value is not 0, check the signal line for a short-circuit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>FEEDRATE ZERO</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to execute an axis movement in the cutting feed mode or dry-run in the automatic operation mode, with the manual feedrate remaining set to 0 on the machine operating panel.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Change the manual feedrate to a value greater than 0. If this alarm message is displayed when the manual feedrate is not 0, check the signal line for a short-circuit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>STOP SPINDLE</td>
<td>( , , )</td>
<td>D</td>
<td>K</td>
<td>N</td>
</tr>
<tr>
<td>Cause</td>
<td>Spindle rotation did not start when the spindle rotation start command was issued during automatic operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>The spindle amplifier and the encoder must be checked for normal operation. Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>SPINDLE ROTATION EXCEEDED</td>
<td>( , , )</td>
<td>D</td>
<td>K</td>
<td>N</td>
</tr>
<tr>
<td>Cause</td>
<td>The spindle-speed limit has been exceeded.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Reduce the spindle speed. The spindle amplifier must be checked for normal operation. Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>BLOCK START INTERLOCK</td>
<td>( , , )</td>
<td>B</td>
<td>K</td>
<td>N</td>
</tr>
<tr>
<td>Cause</td>
<td>The interlock signal to lock the start of the program block has been input.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>The sequence program needs checking for normal functioning. If this alarm should occur seemingly without cause, contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>136</td>
<td>CUTTING BLOCK START INTERLOCK</td>
<td>( , , )</td>
<td>B</td>
<td>K</td>
<td>N</td>
</tr>
<tr>
<td>Cause</td>
<td>The interlock signal to lock the start of the cutting program block has been input.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>The sequence program needs checking for normal functioning. If this alarm should occur seemingly without cause, contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>DYNAMIC COMPENSATION EXCEEDED</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>Dynamic compensation amount exceeded 3 mm (0.12 in.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Make sure that the workpiece coordinate zero point is centrally positioned in the workpiece, and set the difference between the center of the workpiece and the rotary center of the table to 3 mm (0.12 in.) or less.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td>138</td>
<td>CANNOT ROTATE TABLE</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>There are areas where the machining with table rotation cannot be executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Modify the approach point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>PRE-INTERP ACCEL/DECEL ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>M</td>
</tr>
<tr>
<td>Cause</td>
<td>Trouble has occurred during pre-interpolation acceleration/deceleration.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>ILLEGAL REFERENCE RETURN No.</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>Returning to the second reference point has been commanded in spite of the fact that returning to the first reference point has not yet occurred.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Return the axis to the first reference point first.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>EXCESS SIMULTANEOUS ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>The synchronization error between the master axis and the slave axis during synchronous control has overstepped a predetermined allowable value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Move either axis in the direction that the error decreases. Reduce the allowable value to zero (checking invalid), or increase the allowable value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>142</td>
<td>NONE OR DUPLICATE OPERAT. MODE</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>An operation mode has not been selected, or more than one operation mode have been selected. The operation mode selector switch is malfunctioning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check for incorrect wiring of the input mode switch.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>143</td>
<td>ILLEGAL HANDLE FEED AXIS</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>A nonexistent axis has been designated as the handle feed axis. Or a handle feed axis has not been designated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the handle feed axis selection signal line for incorrect wiring. Or check the maximum number of axes that can be used under the current specifications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td>144</td>
<td>ILLEGAL CYCLE START</td>
<td>A</td>
<td>I</td>
<td>O</td>
<td>Red</td>
</tr>
</tbody>
</table>

It was attempted to start automatic operation under the following conditions:

<table>
<thead>
<tr>
<th>Alarm No.</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 × 101</td>
<td>During axis movement</td>
</tr>
<tr>
<td>0 × 102</td>
<td>READY lamp OFF.</td>
</tr>
<tr>
<td>0 × 103</td>
<td>Reset state not yet cleared.</td>
</tr>
<tr>
<td>0 × 104</td>
<td>–</td>
</tr>
<tr>
<td>0 × 105</td>
<td>Hardware overtravel not yet cleared.</td>
</tr>
<tr>
<td>0 × 106</td>
<td>Software overtravel not yet cleared.</td>
</tr>
<tr>
<td>0 × 107</td>
<td>–</td>
</tr>
<tr>
<td>0 × 108</td>
<td>Two or more operation modes selected.</td>
</tr>
<tr>
<td>0 × 109</td>
<td>During change in operation modes.</td>
</tr>
<tr>
<td>0 × 110</td>
<td>–</td>
</tr>
<tr>
<td>0 × 111</td>
<td>During search on the tape data.</td>
</tr>
<tr>
<td>0 × 112</td>
<td>–</td>
</tr>
<tr>
<td>0 × 113</td>
<td>Abnormality in temperature.</td>
</tr>
<tr>
<td>0 × 114</td>
<td>During selection of the foreground program. During editing on the EIA MONITOR display</td>
</tr>
<tr>
<td>0 × 115</td>
<td>A door opened.</td>
</tr>
<tr>
<td>0 × 116</td>
<td>During compensation in tandem control.</td>
</tr>
<tr>
<td>0 × 117</td>
<td>An alarm related to polygonal machining or hob milling not yet cleared.</td>
</tr>
<tr>
<td>0 × 118</td>
<td>An alarm related to safety barrier not yet cleared.</td>
</tr>
</tbody>
</table>

**Action**

Remove the cause, if possible, to (re)start the automatic operation. If not, contact Mazak Technical Center or Technology Center with the information of the first item (Alarm No.) displayed in parentheses.

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>REQUIRE ABSOLUTE RECOVERY</td>
<td>C</td>
<td>K</td>
<td>P</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**Cause**
The absolute position data has become lost. Trouble has occurred in the absolute position detector.

**Action**

Require Mazak Technical Center or Technology Center to restore the normal conditions for the zero-point return.

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>146</td>
<td>NOT AUTO MODE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cause**
The cycle start button was pressed when the machine was not in the automatic mode.

**Action**

Change the mode to the automatic and then restart the machine.

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>147</td>
<td>C AXIS TURNING ANGLE OVER</td>
<td>A</td>
<td>K</td>
<td>P</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**Cause**

1. The rotational angle limit at the shaping block connections has been exceeded.
2. The radius of the arc is less than the rotational radius of the C-axis.

**Action**

1. Review the program.
2. Review the setting of parameter K1 (rotational radius of the C-axis).

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>148</td>
<td>CHUCK BARRIER</td>
<td>A</td>
<td>K</td>
<td>O</td>
<td>Red</td>
</tr>
</tbody>
</table>

**Cause**
The tool entered in the chuck barrier. **Note:** Turning spindle number where alarm has occurred is displayed.

**Action**

Modify the barrier-related parameters or, for automatic operation, review and correct the program.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td>TAILSTOCK BARRIER</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The tool entered in the tail barrier.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correct the machining program. If the program is correct, review the tool data and the parameters related to the barrier.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>WORK PIECE BARRIER</td>
<td>( , , )</td>
<td>A, B</td>
<td>H</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interference is occurring between the workpiece of the No. 1 turning spindle side and the workpiece of the No. 2 turning spindle side.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correct the machining program. If the program is correct, review the parameters related to the barrier.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>151</td>
<td>NO TANDEM CONTROLLING OPTION</td>
<td>( , , )</td>
<td>B</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Executing the tandem driving function has been attempted despite a tandem driving option not being present.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The tandem driving function can be used only for a special machine. If this alarm occurs in a special machine that allows the use of the tandem driving function, contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>152</td>
<td>ILLEGAL SYNCHRONIZED AXIS NAME</td>
<td>( , , )</td>
<td>B</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. The setting of the slave axis name in parameter M11 is not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The name of the master axis that is specified for synchronous control does not correspond with the setting of the axis naming parameter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Set the name of the slave axis with a small letter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. With reference to the parameter, specify the correct axis as the master one for synchronous control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>153</td>
<td>TRANSFER/PUSH UNFINISHED</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. The axis reached its pressing completion position before a skipping signal was generated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The drooping amount during pressing operation cannot overstep the setting in parameter K46.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Check whether the pressing completion position in the program is correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Modify the K46 setting as appropriate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>154</td>
<td>ZERO RET. NOT ALLOWED (G68 MODE)</td>
<td>( , , )</td>
<td>E</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>Zero-point return mode has been selected during three-dimensional coordinate conversion.</td>
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<td></td>
<td><strong>Action</strong></td>
<td></td>
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<tr>
<td></td>
<td>1. Select an operation mode other than the zero-point return mode.</td>
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<tr>
<td></td>
<td>2. To execute manual zero-point return, cancel three-dimensional coordinate conversion mode.</td>
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<td></td>
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</tr>
<tr>
<td>155</td>
<td>BARRIER TURRET/TOOL HEAD</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The barriers of the upper and lower turrets interferes with each other.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Correct the machining program. If the program is correct, review the parameters related to the barrier.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>ILLEGAL MEASURING SENSOR SIGNAL</td>
<td>( , , )</td>
<td>E</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The sensor signal for tool measurement turned on during preparation for measurement.</td>
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<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Start the measurement after the preparation.</td>
<td></td>
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</tr>
<tr>
<td>157</td>
<td>MEASURED RESULT MALFUNCTION</td>
<td>( , , )</td>
<td>E</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>All the results of repeated measurements did not fall within the tolerance for compensation.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check the program.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Check if the sensor tool length registered on the TOOL DATA display is correct.</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Check the mounting status of the sensor.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>158</td>
<td>ILLEGAL COMMAND CROSS MACHINING ( , , )</td>
<td>A</td>
<td>K</td>
<td>Q</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**Cause**: It was attempted to manually control an axis currently under the control for cross machining.

**Action**: The axes under the cross machining control cannot be controlled manually.

| 159   | CROSS MACHINING IMPOSSIBLE (Alarm No, , ) | E             | I             | P                  | Red     |

- **Cause**
  - Alarm No. 0 × 0001: The specified axis does not exist in the counterpart system.
  - Alarm No. 0 × 0002: The self-system is specified as the system to be cross-controlled.
  - Alarm No. 0 × 0004: The cross machining control is specified for an axis which is already under the control in question.
  - Alarm No. 0 × 0010: A command for cross machining control is given from the counterpart system.
  - Alarm No. 0 × 0040: In the mode of inclined-axis control a cross-control command is given for the fundamental axis (X-axis) without positioning of the inclined axis (Y-axis) in its zero point. In the mode of inclined-axis control a cross-control command is given for the inclined axis (Y-axis).

- **Action**: Review and correct the program.

| 160   | ILLEGAL NUMBER OF CROSS AXIS ( , , ) | E             | I             | P                  | Red     |

**Cause**: The number of axes in the remote system has become zero as a result of crossing command execution.

**Action**: Review and correct the program.

| 161   | SUPERPOSITION CTRL IMPOSSIBLE (WNo., UNo., SNo. ) | E             | I             | P                  | Red     |

**Cause**: It was attempted to start superposition control with an unavailable axis. It was attempted to start superposition control under incompatible modal conditions.

**Action**: Check the parameters related to the type of acceleration & deceleration and to the motion speed during superposition control.

| 162   | ILLEGAL SUPERPOSITION PARAMETER (WNo., UNo., SNo. ) | E             | I             | P                  | Red     |

**Cause**: Incorrect parameter settings do not allow the superposition control to be started.

**Action**: Check the parameters related to the type of acceleration & deceleration and to the motion speed during superposition control.

| 163   | BARRIER WORK (WNo., UNo., SNo. ) | A             | K             | O                  | Red     |

**Cause**: There is a danger that one workpiece will interfere with the other. There is a danger that the partition plate will interfere with the workpiece or the lower turret.

**Action**: Correct the machining program. If the program is correct, review the parameters related to the barrier.

| 164   | ILLEGAL CMD SAFE OPER SYS ALARM ( , , ) | A             | J             | Q                  | Blue    |

**Cause**: With the machine under the control for safety speed, a command for the following was given: Threading, Synchronous tapping, Cross machining, Superposition control.

**Action**: Close the door to operate the machine.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>CANNOT MAKE SAFE OPER SYS ACTIVE</td>
<td>A</td>
<td>L</td>
<td>Q</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The command signal for the control for safety speed was turned on in the following modes of machining: Threading, Synchronous tapping, Cross machining, Superposition control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Close the door to operate the machine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>166</td>
<td>LOWER TURRET ALREADY ASSIGNED</td>
<td>A</td>
<td>K (O)</td>
<td>O (S)</td>
<td>Red</td>
</tr>
<tr>
<td>Cause</td>
<td>An M810 command was given from one HD side to operate the lower turret that was currently used on the other HD side.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Give the M810 command after the use of the lower turret on the other side.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>167</td>
<td>ILLEGAL OPER TOOL TIP PT CTRL</td>
<td>A</td>
<td>K (O)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>In the mode of tool tip point control an unavailable operation (e.g. manual interruption) was attempted.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Manual interruption cannot be performed in the mode of tool tip point control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>168</td>
<td>ILLEGAL OPER 5X RADIUS COMP.</td>
<td>A</td>
<td>K (O)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>In the mode of tool radius compensation for five-axis machining an unavailable operation (e.g. manual interruption) was attempted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Manual interruption cannot be performed in the mode of tool radius compensation for five-axis machining.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>169</td>
<td>HIGH SMOOTHING CTR. ILLEGAL OPE</td>
<td>A</td>
<td>K (O)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>In the mode of high-speed smoothing control an unavailable operation (e.g. manual interruption) was attempted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Manual interruption cannot be performed in the mode of high-speed smoothing control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>170</td>
<td>W AXIS THRUST FORCE SHORTAGE</td>
<td>E</td>
<td>J</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td>Cause</td>
<td>W-axis thrust has not been obtained.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review and correct the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171</td>
<td>W AXIS THRUST SUPPLYING</td>
<td>E</td>
<td>J</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td>Cause</td>
<td>W-axis operation was programmed during the application of the W-axis thrust.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review and correct the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>B AXIS NOT AVAILABLE</td>
<td>B</td>
<td>I</td>
<td>N</td>
<td>Red</td>
</tr>
<tr>
<td>Cause</td>
<td>The head (B) axis is used without the B-axis control option.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Purchase the B-axis control option.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>173</td>
<td>2ND SPDL C AXIS NOT AVIALABLE</td>
<td>B</td>
<td>I</td>
<td>N</td>
<td>Red</td>
</tr>
<tr>
<td>Cause</td>
<td>The No. 2 spindle/C-axis is used without the No. 2 spindle/C-axis option.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Purchase the No. 2 spindle/C-axis option.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
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</tr>
<tr>
<td>174</td>
<td>2ND SPDL 1/1000 N/A</td>
<td>( , , )</td>
<td>B</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The No. 2 spindle/C-axis is used without the No. 2 spindle high-precision indexing option.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Purchase the No. 2 spindle high-precision indexing option.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>175</td>
<td>TABLE UNBALANCE CHECK N/A</td>
<td>( , , )</td>
<td>B</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Vibration detection is used without the rotary table vibration detection option.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Purchase the rotary table vibration detection option.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>176</td>
<td>CANNOT CHANGE TIME CONSTANT</td>
<td>(System No., , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Changing the cutting feed time constant in the system has been attempted during synchronous tapping, threading, or control axis superposition.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Review and correct the program.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>177</td>
<td>ILLEGAL COMMD TIME CONST. CHANGE</td>
<td>(System No., , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The inertia estimation has been attempted by G297 during movement of the axis whose inertia was to be estimated. The G298 parameter setup command has been set during movement of the parameter setup reference axis or of some axis assigned to the parameter data development system. The G298 parameter setup command has been set during cutting feed time constant changeover or control axis superposition. The G298 parameter setup command has been set during axis rotation.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Review and correct the program.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>178</td>
<td>INERTIA TOO LARGE</td>
<td>(System No., , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The estimated inertia has exceeded the maximum inertia specified in the TSVC parameter or the TSPC parameter.</td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the settings of the TSVC parameter or the TSPC parameter.</td>
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</tr>
<tr>
<td>179</td>
<td>CANNOT AUTO MEASURE INERTIA</td>
<td>(System No., , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Resonance has not been reduced during inertia estimation. The minimum inertial is not specified in TSVC or TSPC. The inertia estimation itself has failed.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the settings of the TSVC parameter or the TSPC parameter.</td>
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<td></td>
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</tr>
<tr>
<td>191</td>
<td>FILE SYSTEM I/O ERROR</td>
<td>(WNo., UNo., SNo.)</td>
<td>E</td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An internal error(s) has occurred during program data change by the function of VFC, MMS etc.</td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>After checking the entire data of the program being executed, tool data, tool file, parameters, etc., save the data using the data I/O operation and then contact Mazak Technical Center or Technology Center.</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
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</tr>
<tr>
<td>192</td>
<td>EXECUTION IMPOSSIBLE (WNo., UNo., SNo.)</td>
<td>E</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>An internal error(s) has occurred during execution of the MMS unit.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>After checking the entire data of the program being executed, tool data, tool file, parameters, etc., save the data using the data I/O operation and then contact Mazak Technical Center or Technology Center.</td>
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<td></td>
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</tr>
<tr>
<td>193</td>
<td>NO TOOL IN MAGAZINE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>Tool data that correspond to the pocket numbers being displayed in the “TNo.” item of the POSITION display are unregistered.</td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td>Register the tool data.</td>
<td></td>
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</tr>
<tr>
<td>194</td>
<td>NO TOOL DATA IN PROGRAM (WNo., UNo., SNo.)</td>
<td>E</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>An internal error(s) has occurred when circumferential speed or feedrate changing by VFC function was under way.</td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>After checking the entire data of the program being executed, tool data, tool file, parameters, etc., save the data using the data I/O operation (floppy disk) and then contact Mazak Technical Center or Technology Center.</td>
<td></td>
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</tr>
<tr>
<td>195</td>
<td>WRONG MEASURING DIRECTION ( , , )</td>
<td>A</td>
<td>I</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>During the second or subsequent rounds of manual measurement, an attempt has been made to perform skipping in a direction not available for measurement.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>Perform measurements in the correct direction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>196</td>
<td>WRONG MEASURING POINT ( , , )</td>
<td>A</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>During the second or subsequent rounds of manual measurement, an attempt has been made to measure an illegal point.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>Measure correct points.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>197</td>
<td>UNREGISTERED HEAD DATA ( , , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>Head data of the head number being used during MMS, MDI MMS or manual measurement does not exist.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>198</td>
<td>NO HEAD DATA ( , , )</td>
<td>B</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>Head data of the head number being used during MMS, MDI MMS or manual measurement is partly missing.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>199</td>
<td>DIVISION BY ZERO ( , , )</td>
<td>I</td>
<td>P</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>An attempt has been made to carry out divisions by zero inside the NC unit during measurement of the degree-of-straightness on the MEASURE display.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Check the touch sensor for abnormalities. Carry out measurements once again if the touch sensor is normal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>1101</td>
<td>INTERFERE ( , , )</td>
<td>A</td>
<td>K</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Interference occurs between &lt;Interfering section 1&gt; and &lt;Interfering section 2&gt;.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Press the cancel key to clean the alarm.</td>
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</tr>
<tr>
<td>1102</td>
<td>INTERFERE ( , , )</td>
<td>A</td>
<td>I</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
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<tr>
<td></td>
<td>Interference occurs between &lt;Interfering section 1&gt; and &lt;Interfering section 2&gt;.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Press the reset key to clean the alarm.</td>
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</tr>
<tr>
<td>1103</td>
<td>INTERFERE CHECK DATA OVERLOAD ( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>The Intelligent Safety Shield process was not in time.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Set a simple workpiece model or a fixture model or a tool model.</td>
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</tr>
</tbody>
</table>
3-2-4  No. 200 - No. 399, No. 1200 - No. 1399 (PLC machine control error)

For alarms related to PLC machine control (No. 200 to No. 399 and No. 1200 to No. 1399) refer to the Operating Manual of the machine.
### 3-2-5  No. 400 - No. 499, No. 1400 - No. 1499 (CNC screen operation error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>——</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<td></td>
<td>——</td>
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</tr>
<tr>
<td>401</td>
<td>ILLEGAL FORMAT</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The format of the input data is not an available one.</td>
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<tr>
<td></td>
<td><strong>Example:</strong> Negative data has been input to an item that rejects negative data input.</td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Press the data cancellation key and then input correct data.</td>
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</tr>
<tr>
<td>402</td>
<td>ILLEGAL NUMBER INPUT</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>1. The work number of a display inhibiting program was specified.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. The numeric value that has been input is out of the allowable range.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>1. The operation concerned cannot be performed for the program of display inhibition (Program management function).</td>
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</tr>
<tr>
<td></td>
<td>2. Press the clear key and then input correct data.</td>
<td></td>
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</tr>
<tr>
<td>403</td>
<td>PROGRAM TOO LARGE</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The limit of 2000 lines per program has been exceeded.</td>
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<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Recreate the program so that it consists of 2000 lines or less.</td>
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</tr>
<tr>
<td>404</td>
<td>MEMORY CAPACITY EXCEEDED</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1. Additional creation of a machining program is no longer possible since the memory has already been filled up to its machining-program data storage capacity.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>2. Additional preparation of process control data is no longer possible since 100 sets of such data have already been stored.</td>
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<tr>
<td></td>
<td>3. Additional preparation of program layout data is no longer possible since 4000 sets of such data have already been stored.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Make an available storage area by either erasing an unnecessary machining program from the memory or saving a machining program onto an external storage, and then create a new machining program.</td>
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</tr>
<tr>
<td>405</td>
<td>PROGRAM No. NOT FOUND</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>An attempt has been made to select a program whose work number has not been registered.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Select a program whose work number has been registered.</td>
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</tr>
<tr>
<td>406</td>
<td>MEMORY PROTECT</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Inhibiting operation (editing, erasing, renumber of work number and entry of names) has been performed for the edit-inhibiting program.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. PROGRAM LOCK/ENABLE switch on the operating panel is set to the LOCK position.</td>
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<td></td>
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<tr>
<td></td>
<td>3. An attempt has been made to carry out “TOOL NAME ORDER” operation on the TOOL DATA display while a tool remains set in the spindle.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>1. The operation concerned cannot be performed for the edit-inhibiting program (program management function).</td>
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<tr>
<td></td>
<td>2. Set the PROGRAM LOCK/ENABLE switch to the ENABLE position.</td>
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<td></td>
<td>3. Remove the tool from the spindle, and then carry out the operation once again.</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
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</tr>
<tr>
<td>407</td>
<td>DESIGNATED DATA NOT FOUND</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The number or character string that has been designated does not exist in the program.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Designate an existent number or character string.</td>
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</tr>
<tr>
<td>408</td>
<td>PROGRAM ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The memory contents in the machining-program data storage area have been destroyed.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Delete the corresponding program.</td>
<td></td>
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</tr>
<tr>
<td>409</td>
<td>ILLEGAL INSERTION</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Program data insertion is not possible.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>It is not possible to insert data before the common unit.</td>
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</tr>
<tr>
<td>410</td>
<td>ILLEGAL DELETION</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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</tr>
<tr>
<td></td>
<td>Program deletion is not possible.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>It is not possible to delete the common unit.</td>
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<tr>
<td></td>
<td>- Edit the program only after moving the cursor to the position where the data exists.</td>
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</tr>
<tr>
<td>411</td>
<td>POWER OFF DURING PROGRAM EDIT</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>A portion of the program may have been destroyed because power has been turned off during program editing.</td>
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<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Check the corresponding program for incorrect data, and correct the program data if an error(s) exists in it.</td>
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</tr>
<tr>
<td>412</td>
<td>SUB PROGRAM NESTING EXCEEDED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The number of repeats of subprogram nesting has exceeded nine times.</td>
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<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Correct the program so that the total number of repeats of subprogram nesting becomes nine or less.</td>
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</tr>
<tr>
<td>413</td>
<td>MAX. No. OF REGIST PROG EXCEEDED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>The program registration has exceeded its maximum value available (Standard: 256 programs).</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Reduce the total number of registered programs by deleting unnecessary programs or moving them to the backup area or by saving unnecessary programs in an external storage unit and then deleting them.</td>
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</tr>
<tr>
<td>414</td>
<td>AUTO CALCULATION IMPOSSIBLE</td>
<td>(Note, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Automatic calculation of circumferential speed and feedrate is not possible.</td>
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</tr>
</tbody>
</table>

**Note:** The sub-error codes displayed when the [NAVIGATE] menu function is selected on the MACHINING NAVIGATION–PREDICTION display are listed below.

-1: MAZATROL program file-opening error
-2: MAZATROL program file-reading error
-3: Tool materials mismatch error (when tool materials numbers are acquired)
-4: Surface velocity auto-setting error
-5: File-opening error relating to the basic coefficients of the workpiece materials upper-limit values
-6: Workpiece materials mismatch error
-7: File-opening error relating to surface velocity data tables
-8: Tool materials mismatch error
2: Navigation file missing

**Action** Check and correct the tool sequence data or machining unit of the program.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>415</td>
<td>MIS-SET G CODE</td>
<td>( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>A G-code not covered by the specifications has been designated.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check and correct the G-code addresses within the program.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>416</td>
<td>AUTO PROCESS IMPOSSIBLE</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Tools cannot be automatically developed because of errors of the machining-unit data.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check and correct the machining-unit data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>417</td>
<td>EDITING PROHIBITED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to modify a program whose editing is prohibited.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Modify the data only after canceling the parameter setting of prohibition of editing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>418</td>
<td>EIA/ISO CONVERTING</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>During EIA/ISO conversion, an attempt has been made to perform erasure, work number change or editing of the conversion source program. Or an attempt has been made to select the TOOL PATH CHECK display.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>During EIA/ISO conversion, erasure, work number change or editing of the conversion source program cannot be done. The TOOL PATH CHECK display cannot be selected.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>419</td>
<td>AUTO TAP PROCESS IMPOSSIBLE</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>1. The pitch or other data cannot be automatically set because of incorrectness of the tap nominal diameter in the tapping-unit data.&lt;br&gt;2. Although the text file is referred to for the pipe tap auto-setting (D95 bit 0 = 1), the auto-setting function cannot be executed since the auto-setting text file (Pipescdt.txt) is incorrect or contains no data.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>1. Check and correct the tapping-unit data and tapping-tool sequence data of the program.&lt;br&gt;2. Check and correct the auto-setting text file (Pipescdt.txt).</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>420</td>
<td>SAME DATA EXISTS</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to input the same data as that which has already been registered.&lt;br&gt;1. Pocket number in the TOOL LAYOUT display.&lt;br&gt;2. Machining-program number (changed)&lt;br&gt;3. Machining priority number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check and correct the data settings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>421</td>
<td>DATA NOT FOUND</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to designate the data that does not exist.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check whether the designated data exists.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>422</td>
<td>MEMORY PROTECT (I/O BUSY)</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to edit or input the machining program, tool data, etc. during I/O operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Wait until the I/O operation is completed, and then repeat the editing or input operation from the beginning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>423</td>
<td>MAX NUMBER OF TOOLS EXCEEDED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: During tool layout, the number of tools used in the designated program has exceeded the maximum available number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Check and correct the corresponding machining program so that the maximum available number of tools is not exceeded.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>424</td>
<td>ALL POCKET NUMBERS NOT ASSIGNED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: It is not possible to finish the tool layout operation because the pocket number has not yet been assigned to all the required tools.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Assign the pocket number(s) and then finish the tool layout operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>425</td>
<td>DATA MISSING ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: Processing is not possible because of lack of data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Saving or loading has been attempted without designating any data (such as work numbers, etc.) on the DATA I/O display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The data to be input for restart operation is wanting.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action: Input data correctly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>426</td>
<td>PROGRAM DATA MISSING ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The tool sequence data cannot be automatically developed because of partial lack of the machining-unit data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Fill up all the machining-unit data items with data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>427</td>
<td>MEMORY PROTECT (AUTO MODE) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: An attempt has been made to input unallowable data in the automatic operation mode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Change the mode over to the manual operation mode, and then input the data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>428</td>
<td>MEMORY PROTECT (AUTO OPERATION) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: An attempt has been made to input unallowable data on a display (such as the TOOL DATA display) during automatic operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Input allowable data only after placing the NC unit in its reset state or after changing the current mode over to another mode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>429</td>
<td>CANNOT PERFORM MEASUREMENT ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The following conditions were not satisfied:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coordinate measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Automatic operation must not be in progress.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The spindle must have a tool mounted on it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. The tool data of the tool mounted on the spindle must have already been input.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tool-length measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Automatic operation must not be in progress.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action: Set the specified conditions and then make the measurement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>430</td>
<td>ILLEGAL TOOL DESIGNATED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: During creation of a machining program, an attempt has been made to input a tool name not available for the particular program unit, in the tool sequence.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action: Designate a correct tool name.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>431</td>
<td>ILLEGAL PALLET No.</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>A nonexistent pallet number has been designated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate a correct pallet number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>432</td>
<td>ILLEGAL TOOL No.</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>A nonexistent tool number has been designated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate a correct tool number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>433</td>
<td>SAME PROGRAM EXISTS</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The number of the machining program that has been designated for program reading from an external unit already exists within the NC memory.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the number of the machining program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>434</td>
<td>NO ASSIGNED TOOL IN TOOL FILE</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The milling tools (face-mills, end-mills, chamfering cutters, and ball end-mills) that have been designated on the machining program include a one(s) that is not yet registered in the TOOL FILE display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Register the corresponding tools in the TOOL FILE display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>435</td>
<td>PROGRAM CHECK NOT ALLOWED</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to restart on the TOOL PATH display during checking of the tool path.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Interrupt the tool path checking operation before restarting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>436</td>
<td>UNREGISTERED TNo.</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An unmeasurable tool number has been designated in the automatic tool-length (diameter) measurement mode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate a measurable tool number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>437</td>
<td>NO NOM-∅ DATA IN PROGRAM</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>It has been found during tool layout that there is a tool without a nominal diameter in the designated program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check if nominal diameters have been assigned to all tools registered in the designated program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>438</td>
<td>END UNIT NOT FOUND</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The end unit is not included in the machining program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Create the end unit at the end of the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>439</td>
<td>MAZATROL PROGRAM DESIGNATED</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>A MAZATROL program has been designated for copying purposes during EIA/ISO program editing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>No MAZATROL programs can be designated for copying purposes during EIA/ISO program editing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------------------</td>
<td>---------------</td>
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<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td>440</td>
<td>EIA/ISO PROGRAM DESIGNATED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
</tbody>
</table>
|      | Cause 1. The machining program that has been designated on the TOOL LAYOUT, PROCESS CONTROL or SET UP RECORD display is an EIA/ISO program.  
|      | 2. An EIA/ISO program has been designated for copying purposes during MAZATROL program editing.  
|      | 3. An EIA/ISO program has been designated as the source program of EIA/ISO conversion.  
<p>|      | 4. An EIA/ISO program has been designated when writing coordinate values on the MEASURE display. |
|      | Action No EIA/ISO programs can be designated for operation on the TOOL LAYOUT, PROCESS CONTROL, SET UP RECORD or MEASURE display or during EIA/ISO conversion or MAZATROL program editing. |
| 441  | UNREGISTERED HEAD DATA                                        | ( , , )       | B              | L                  | S       | Blue    |
|      | Cause The head number that has been designated during MDI-MMS setting does not exist in the head data. |
|      | Action Review the designated head number.                     |
| 442  | DATA RENEWAL NOT ALLOWED                                      | ( , , )       | A              | L                  | S       | Blue    |
|      | Cause No updates can be made to the machining program.         |
|      | Action This message may also be displayed when the NC unit is busy processing data. Press the clear key and then carry out the operation once again. |
| 443  | HELP IS NOT AVAILABLE                                         | ( , , )       | A              | L                  | S       | Blue    |
|      | Cause No help display is prepared for the line on which the cursor is placed. |
|      | Action Refer to the Programming Manual (MAZATROL).             |
| 444  | EDITING PROHIBITED AREA                                       | ( , , )       | A              | L                  | S       | Blue    |
|      | Cause During automatic operation based on the EIA MONITOR display, an attempt has been made to move the cursor to the program section whose editing was prohibited. |
|      | Action The cursor cannot be moved to the area where editing is prohibited. |
| 445  | ILLEGAL UNIT                                                  | ( , , )       | B              | L                  | S       | Blue    |
|      | Cause An attempt has been made to set tool layout data in a MAZATROL program containing an illegal unit(s). |
|      | Action Review the program.                                   |
| 446  | RESTART TIMES EXCEEDED                                        | ( , , )       | A              | L                  | S       | Blue    |
|      | Cause The block to be searched for at the time of restart of the EIA/ISO program does exist, but the designated number of times of reappearance of the block is too large. |
|      | Action Check the number of times of reappearance of the block. |
| 447  | PROGRAM ERROR                                                 | ( , , )       | A              | L                  | S       | Blue    |
|      | Cause A program error(s) has occurred during EIA/ISO restart search. |
|      | Action The program being searched for includes an error(s). Perform a tool-path check upon the program contents. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>448</td>
<td>RESTART SEARCH UNFINISHED</td>
<td>( , , , )</td>
<td></td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>EIA/ISO restart searching has not been executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate the restart position and press the [EIA/ISO SEARCH] button to search the intended restart position.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>449</td>
<td>RESTART SEARCH FINISHED</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to carry out another search operation when EIA/ISO restart searching had already been finished.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Press the reset key and then carry out the restart operation once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>TOUCH SENSOR NOT IN SPINDLE</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The spindle did not have a mounted touch sensor when an attempt was made to set MAZATROL coordinate measurement data on the PROGRAM (MAZATROL) display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Mount a touch sensor in the spindle before setting the data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>451</td>
<td>SAME MATERIAL ENTERED</td>
<td>( , , , )</td>
<td>B L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The materials name that has been designated on the CUTTING CONDITION - W.-MAT/T.-MAT. display already exists.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate a new materials name.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>452</td>
<td>NO SHAPE DATA IN UNIT</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>No shape data exists in the program unit that has been designated in an attempt to make a copy of shape data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the contents of the program unit for which shape copying is to be made.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>453</td>
<td>NO SHAPE DATA TO COPY IN UNIT</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to copy shape data whose type is not available for the particular program unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>It is not possible to copy shape data of the pallet-changing unit, index unit, or other units that do not have a shape sequence.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>454</td>
<td>CURSOR POSITION INCORRECT</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Processing not permissible for the current cursor position has been attempted. Example 1: An attempt has been made to carry out a shape copying operation with the cursor on the tool sequence line. Example 2: The SHAPE CHECK display has been selected on a shape sequence line not actually executed during automatic operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Example 1: No shape data can be copied on the tool sequence line. Example 2: Review the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>455</td>
<td>SAME PROGRAM No. DESIGNATED</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The machining program currently being edited has been appointed for the particular program copying operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Copying within the same program is not possible. Check the designated program number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>456</td>
<td>NO TOOL IN SPINDLE</td>
<td>( , , , )</td>
<td>A L S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The spindle does not currently have a tool mounted on it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>After mounting a tool on the spindle, carry out the particular operation once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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</tr>
<tr>
<td>457</td>
<td>DATA ADDRESS NOT FOUND ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>During creation of manual program mode unit, data setting has been attempted without addressing.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>During creation of the manual program mode unit, designate an address before setting data.</td>
<td></td>
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</tr>
<tr>
<td>458</td>
<td>INTERFERING TOOL REGISTERED ( , , )</td>
<td></td>
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</tr>
</tbody>
</table>
| **Cause** | An attempt has been made to register a tool most likely to interfere with an adjacent pocket.  
Example 1: An attempt has been made to register tool data or tool change data on the TOOL DATA display.  
Example 2: An attempt has been made to set such a tool on the TOOL LAYOUT display that is likely to interfere with an adjacent pocket. |
| **Action** | Select a pocket that does not cause interference with an adjacent one. |
| 459 | DISPLAY PROTECT ( , , ) | A | L | S | Blue |
| **Cause** | An attempt has been made to display a program whose display is prohibited. |
| **Action** | Display the program only after canceling the parameter setting of prohibition of display. |
| 460 | PRINTER IN OPERATION ( , , ) | A | L | S | Blue |
| **Cause** | An attempt was made on the TRACE display to perform display scaling change, material shape and tool path drawing while the hard copy is being made. |
| **Action** | After finishing the hard copy, carry out the operations. |
| 461 | PRIORITY No. OVERLAP (WNo., UNo., SNo.) | A | L | S | Blue |
| **Cause** | The same priority number is assigned to different tools. |
| **Action** | Within one process, the same priority number must not be assigned to different tools.  
Change the priority number. |
| 462 | ILLEGAL PRIORITY NUMBER (WNo., UNo., SNo.) | A | L | S | Blue |
| **Cause** | The priority numbering order within a unit is not correct. |
| **Action** | The machining order within one unit has been reversed by the incorrect priority numbering.  
Change the priority numbers. |
| 463 | PRIORITY No. OVERFLOW ( , , ) | A | L | S | Blue |
| **Cause** | A priority number exceeding 99 has occurred because an attempt has been made to move a priority number(s) on the PROGRAM LAYOUT display. |
| **Action** | Set priority numbers in the correct order, and then move the desired priority number(s). |
| 464 | ILLEGAL ADDRESS INPUT ( , , ) | A | L | S | Blue |
| **Cause** | An address not covered by the specifications has been designated during input of subprogram unit addresses on the PROGRAM (MAZATROL) display. |
| **Action** | Check and correct the address.  
Check the specifications. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>465</td>
<td>EIA SHAPE DATA NOT FOUND ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Although an attempt has been made to draw a workpiece shape using the selected EIA/ISO program, shape data is not present in that program.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review the program. If the program is that which has been obtained by EIA/ISO conversion output, change the setting of the bit 0 of parameter F89 to 1 and then carry out the converting operation once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>466</td>
<td>INCORRECT EIA SHAPE DATA ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Although an attempt has been made to draw a workpiece shape using the selected EIA/ISO program, the corresponding shape data is not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>467</td>
<td>MEMORY PROTECT (SAMPLING) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt was made during load sampling to change the axis to be monitored or the sampling time.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Perform the required change after the current sampling.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>468</td>
<td>MAINTENANCE CHECK WARNING ( , , )</td>
<td>L</td>
<td>S</td>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The target time of the items which had been set on the MAINTENANCE CHECK display has been exceeded.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Action</td>
<td>Carry out periodic checks, and then after completion of the checks, reset the current time of the check items of the MAINTENANCE CHECK display to zero (0).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>469</td>
<td>TPC DATA EDIT IMPOSSIBLE ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The TPC data setting is not possible for the designated unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>470</td>
<td>ILLEGAL TPC DATA ( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The TPC data for the unit is not correct. After setting the TPC data, the unit machining mode has been changed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Delete the TPC data and set correct TPC data once again whenever required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>471</td>
<td>TPC DATA NOT FOUND ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>While the cursor was on a line of unit not containing TPC data on the display, the [TPC] menu key was pressed during the program list mode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Press the [TPC] menu key after shifting to the programming mode.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>472</td>
<td>CALCULATION ERROR ( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>1. The calculation expressions displayed in the desk calculator window includes expressions that result in a calculation failure. 2. Calculating tool lengths A and B has been attempted in spite of tool nose position storage not being completed.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>1. Review the calculation expressions, and correct nonexecutable sections, such as those which may include division by 0 or result in a negative number in SQRT. 2. Store the position of the tool nose.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Cause</td>
<td>Action</td>
<td></td>
<td></td>
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<tr>
<td>-----</td>
<td>---------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>473</td>
<td>FINAL POINT DATA NOT FOUND ( , , )</td>
<td>Although the end-point data of the preceding line was not yet set in the BAR or CPY unit, the [NEXT] menu key was pressed.</td>
<td>Press the [NEXT] menu key after setting the end-point data of the preceding line.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>474</td>
<td>NO PROGRAM DISPLAY (TAPE MODE) ( , , )</td>
<td>1. During tape operation mode, an attempt has been made to select the EIA MONITOR display. 2. An attempt has been made to change the operation mode to tape operation mode when the EIA MONITOR display is selected.</td>
<td>1. During tape operation mode, programs cannot be displayed on the EIA MONITOR display. 2. Select a display other than the EIA MONITOR display before changing the operation mode to tape operation mode.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>475</td>
<td>NO-EIA/ISO OPTION ( , , )</td>
<td>An attempt has been made to use an EIA/ISO-option related function in spite of the absence of an EIA/ISO option.</td>
<td>An EIA/ISO-option related function cannot be used since the system has no EIA/ISO option.</td>
<td></td>
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</tr>
<tr>
<td>476</td>
<td>NO OPTION ( , , )</td>
<td>An attempt has been made to use an optional function in spite of the absence of that option.</td>
<td>This function cannot be used since the system does not have the option for the function.</td>
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<tr>
<td>477</td>
<td>—— ( , , )</td>
<td>——</td>
<td>——</td>
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<tr>
<td>478</td>
<td>MEMORY PROTECT (MEASURING) ( , , )</td>
<td>An attempt has been made to copy the coordinates data in WRITE DATA column of the MEASURE display into the designated position, while measurement using the MEASURE display is in progress.</td>
<td>Copy the coordinates data only after the measurement has been completed.</td>
<td></td>
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<tr>
<td>479</td>
<td>—— ( , , )</td>
<td>——</td>
<td>——</td>
<td></td>
<td></td>
</tr>
<tr>
<td>480</td>
<td>CARD NOT READY ( , , )</td>
<td>Executing the memory card I/O function in DATA I/O display mode has been attempted when a memory card was not set.</td>
<td>Set a memory card before using the memory card I/O function. If a memory card has been set, confirm the insertion direction of the memory card and set it again. If the alarm recurs even so, the memory card is likely to be damaged; replace the memory card and re-execute the I/O function.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>481</td>
<td>DIRECTORY NOT FOUND ( , , )</td>
<td>Input/output operations on a directory not present in the memory card have been attempted during memory card I/O in DATA I/O display mode.</td>
<td>Check whether the specified directory is present.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>482</td>
<td>——</td>
<td>( , , )</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td>——</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>——</td>
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</tr>
<tr>
<td>483</td>
<td>SOLID DESCRIP. IMPOSSIBLE UNIT (WNo., UNo., )</td>
<td>B</td>
<td>I</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Checking the program including the units or conditions (such as the case that angle B is set in the index unit of the initial-point scheme) that do not allow graphics to be drawn in SOLID mode has been attempted in the SOLID mode of the TOOL PATH CHECK display.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Before checking the tool path, cancel the SOLID mode or delete the unit that cannot be drawn in the SOLID mode.</td>
<td></td>
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</tr>
<tr>
<td>484</td>
<td>INCORRECT SPINDLE TOOL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The [LENG-OFS TEACH] menu key has been pressed in spite of the fact that a tool not having its “Length Offset Data” item displayed in TOOL DATA display mode (for example, a turning tool) was mounted in the spindle.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check the tool mounted in the spindle.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>485</td>
<td>INCORRECT HEAD INDEX ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Executing the tool nose position storage function (TEACH) has been attempted when the head index angle displayed in TOOL DATA display mode was neither 0 degrees, 90 degrees, nor 180 degrees.</td>
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<td></td>
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<tr>
<td>Action</td>
<td>Execute the tool nose position storage function (TEACH) when the head index angle is either 0 degrees, 90 degrees, or 180 degrees.</td>
<td></td>
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</tr>
<tr>
<td>486</td>
<td>ILLEGAL JAW DATA ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The use of the jaw shape that has been specified for the program results in interference between adjacent jaws as a result of the SOLID mode PATH CHECK.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review the jaw data or the workpiece-gripping diameter value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>487</td>
<td>LONG BORING BAR ADAPTER EXISTS (Pocket No. , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Assigning a tool other than an inside-diameter turning tool to the magazine pocket holding the adapter for the long boring bar has been attempted.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review the pocket number or the type of tool to be assigned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>488</td>
<td>MEMORY PROTECT (MAGAZINE SETUP) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Tool data updating operations (such as editing tool data, completing the layout of tools, or downloading data on the DATA I/O display) have been performed during magazine setup.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Perform tool data updating operations after completing the magazine setup operations. Release the reverse display mode of the [MAGAZINE SETUP] menu item relating to visual tool data management.</td>
<td></td>
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</tr>
<tr>
<td>489</td>
<td>CANNOT SET THREAD POSITION ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt was made to store the current position for re-threading (using the [THR. POS. TEACH] menu function) without the turning spindle having been rotated through at least one full turn.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Rotate the turning spindle at least through one full turn beforehand to use the above menu function.</td>
<td></td>
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</tr>
<tr>
<td>490</td>
<td>REGISTRATION NUMBER EXCEEDED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The data registration has exceeded its maximum value available. An attempt was made on the TOOL FILE display to register the ninth data item of workpiece material.</td>
<td></td>
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<tr>
<td>Action</td>
<td>Delete unnecessary items to register the desired one.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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</tr>
<tr>
<td>491</td>
<td>ITEM NOT SETUP</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Data registration is not yet complete.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check if all the data items are set as required.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>492</td>
<td>CANNOT EDIT 3D DATA</td>
<td>( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Editing the CAD tool model has been attempted.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>The CAD tool model cannot be edited.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>493</td>
<td>SELECT JAW TYPE</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt was made to set jaw dimensions without having selected the jaw type (OUT1/IN/OUT2).</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Action</td>
<td>Select the jaw type beforehand.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>494</td>
<td>NO TOOL SELECT (NOT MGZN TYPE)</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt was made to use the MDI tool selection function on the machine with a turret-type tool-post.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>495</td>
<td>INCORRECT CAD MODEL DATA</td>
<td>(Note, , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Registered tool model data contains imperfections (a tool model cannot be drawn with the entered data).</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
| Action | Correct the data in the corresponding section. **Note:**
| | During Parametric model entry..............................The alarm-causing section is displayed.
| | During rotating/extruding tool model entry.....Causes are displayed.
| | 11: The entered shape has overlapping elements.
| | 12: The entered shape is clockwise (CW).
<p>| | 13: The line connecting the starting and ending points overlaps some other element. |
| 496 | —— | ( , , ) | | | |
| Cause | —— |
| Action | —— |
| 497 | HEAD ANGLE INCORRECT | ( , , ) | A | L | S | Blue |
| Cause | An attempt has been made to storage the tool tip position with the head not in its horizontal machining position (TOOL DATA or TOOL OFFSET display only). 1. Tool tip position storage (tool length measurement) is possible only with the head in its horizontal machining position. 2. MDI-MMS is possible only with the head in its horizontal or vertical machining position. |
| Action | 1. Tool tip position storage (tool length measurement) is possible only with the head in its horizontal machining position. 2. MDI-MMS is possible only with the head in its horizontal or vertical machining position. |
| 498 | NO HEAD DATA | ( , , ) | A | L | S | Blue |
| Cause | Offset data for the selected head is not registered on the HEAD OFFSET display. |
| Action | Check if the selected head data is registered on the HEAD OFFSET display. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>499</td>
<td>ILLEGAL HEAD TYPE</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
</tbody>
</table>

**Cause**
An attempt has been made to perform tool tip position storage on the TOOL DATA or TOOL OFFSET display during use of the horizontal type of head.

**Action**
To perform tool tip position storage for tool length measurement, mount a vertical head or a cover.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>SYSTEM ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An internal trouble has occurred in the system.</td>
<td></td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
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</tr>
<tr>
<td>1401</td>
<td>FILE OPEN ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Trouble has occurred in opening a file from the hard disk.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>The file in question might be currently being accessed by another application. Wait for a while to repeat the same operation. If the alarm is not cleared, contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
<td></td>
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</tr>
<tr>
<td>1402</td>
<td>FILE READ ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Trouble has occurred in reading a file on the hard disk.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>The file in question might be currently being accessed by another application. Wait for a while to repeat the same operation. If the alarm is not cleared, contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
<td></td>
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</tr>
<tr>
<td>1403</td>
<td>FILE WRITE ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Trouble has occurred in writing a file on the hard disk.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>The file in question might be currently being accessed by another application. Wait for a while to repeat the same operation. If the alarm is not cleared, contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1404</td>
<td>MEMORY PROTECT (DATA IN USE)</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>It was attempted to edit jaw shape data of the machining program currently selected.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Change the selection of the program to edit the required data.</td>
<td></td>
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</tr>
<tr>
<td>1405</td>
<td>FILE SIZE ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>The size of the loaded file is not correct.</td>
<td></td>
<td></td>
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<tr>
<td>Action</td>
<td>The file in question might be destroyed. Contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
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</tr>
<tr>
<td>1406</td>
<td>LOW MEMORY</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Memory size currently available is too small.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Exit all the unnecessary applications to make the best of the NC ones. If the alarm is caused again, contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
<td></td>
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</tr>
<tr>
<td>1407</td>
<td>FILE CREATION ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Creating a file and folder on the hard disk was not successful.</td>
<td></td>
<td></td>
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<tr>
<td>Action</td>
<td>Contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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<tr>
<td>1408</td>
<td>DATA TRANSFER ERROR (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Data transfer to the NC was not successful.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
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<tr>
<td>1409</td>
<td>MILLING ONLY SELECTED (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The designated function is not available for a program of initial-point scheme (ONLY MILL).</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Use the function for a program of another scheme.</td>
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<tr>
<td>1410</td>
<td>MILL &amp; TURN (WPC) SELECTED (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The designated function is not available for a program of workpiece scheme (MILL &amp; TURN) with WPC setting.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Use the function for a program of another scheme.</td>
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<tr>
<td>1411</td>
<td>MILL &amp; TRN (Z-OFS) SELECTED (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The designated function is not available for a program of workpiece scheme (MILL &amp; TURN) with Z-offset setting.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Use the function for a program of another scheme.</td>
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<tr>
<td>1412</td>
<td>INCORRECT G-CODE (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The designated function is not available for the G-code system selected by the F30 parameter.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Correct the program, or change the F30 setting.</td>
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<tr>
<td>1413</td>
<td>INCORRECT RUNNING MODE (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The designated function is not available for the current mode of operation.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Change the operation mode.</td>
<td></td>
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<tr>
<td>1414</td>
<td>PROGRAM WRITING (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Storing a program on the hard disk was not successful.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>The file in question might be currently being accessed by another application. Wait for a while to repeat the same operation. If the alarm is not cleared, contact Mazak Technical Center or Technology Center with the information of the particular operation causing the alarm, and of the codes displayed in parentheses.</td>
<td></td>
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<tr>
<td>1415</td>
<td>ZERO CALCULATED TOOL LENGTH (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The LENGTH A item of the tool is set to zero (0).</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the settings of tool length or tool set data and, if required, measure the tool in question again.</td>
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<tr>
<td>1416</td>
<td>CANNOT INDEX TOOL (, , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The tool currently indexed on the turret is not appropriate.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Index an appropriate tool beforehand.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>1417</td>
<td>PARAMETER ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
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<tr>
<td></td>
<td>The setting in a parameter is not correct.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Check and correct the parameter setting with reference to the codes displayed in parentheses.</td>
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</tr>
<tr>
<td>1418</td>
<td>CANNOT USE LOWER TURRET</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>The current selection of the headstock to which the lower turret is subordinate is not correct.</td>
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<td></td>
<td>Action</td>
<td></td>
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<tr>
<td></td>
<td>Change over the headstock selection concerned.</td>
<td></td>
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<tr>
<td>1419</td>
<td>— —</td>
<td>( , , )</td>
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<td></td>
<td>Cause</td>
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<td>Action</td>
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<tr>
<td>1420</td>
<td>FILE SIZE LIMIT EXCEEDED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>The size of the file is too large for new data to be written in it.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Delete the file, or rename the file.</td>
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<tr>
<td>1421</td>
<td>— —</td>
<td>( , , )</td>
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<td></td>
<td>Cause</td>
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<td>Action</td>
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<tr>
<td>1422</td>
<td>PROGRAM LAYOUT ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
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<tr>
<td></td>
<td>Creating the data for turret-by-turret display of program layout was not successful.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Change the display mode.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1423</td>
<td>TOOL PATH CHECK NOT COMPLETE</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
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<tr>
<td></td>
<td>Since the program has not yet undergone tool path check, the VISUAL TOOL MANAGEMENT display cannot perform calculations for indicating the spare tools to be additionally provided for the machining operation with the program.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Execute the function for tool path check on the program.</td>
<td></td>
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</tr>
<tr>
<td>1424</td>
<td>BARRIER INFORMATION NOT SET</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
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<tr>
<td></td>
<td>In the program-listing mode the [BARRIER INFORM.] menu function is selected without any barrier data being registered.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Select the program-creating mode before pressing the [BARRIER INFORM.] menu key.</td>
<td></td>
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</tr>
<tr>
<td>1425</td>
<td>ILLEGAL SETUP DATA</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The setup data are not correct.</td>
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<td></td>
<td>Action</td>
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</tr>
<tr>
<td></td>
<td>Make a copy of the program in question on the PROGRAM FILE display, and prepare the setup data for the program copied.</td>
<td></td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>1426</td>
<td>NO PROG LAYOUT FOR THIS PROCESS ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The current process has no program layout information provided.</td>
<td></td>
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<tr>
<td>Action</td>
<td>Press the menu selector key to select a process with program layout data, or select the display mode for all processes. Alternatively, select a process with program layout data on the PROGRAM (MAZATROL) display or PROCESS CONTROL display and then call up the PROGRAM LAYOUT display from there.</td>
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</tr>
<tr>
<td>1427</td>
<td>3D INTERFRNCE CHECK MODEL ERROR ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>3D remodeling of the workpiece, fixture, or tool has failed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Modify the entered data. Confirm the model.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1428</td>
<td>NOT POCKET FOR LONG BORING BAR ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Assigning the long boring bar to a section not defined as a special pocket for the long boring bar has been attempted during the “Layout Completion” operations on the VISUAL TOOL MANAGEMENT display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Assign the long boring bar to the special pocket.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1429</td>
<td>INCORRECT SELECT TOOL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Tool setup auto-setting for a tool not capable of using the tool setup auto-setting function (e.g., a magazine tool or a tool facing the No. 1 turning spindle) has been attempted on the TOOL DATA display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Apply the tool setup auto-setting function only to a turret tool facing the No. 2 turning spindle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1430</td>
<td>NOT ACTIVE PROGRAM ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>This alarm indicates that the machine-operating program and the program selected on the PROGRAM (MAZATROL) display differ during execution of the workpiece transfer storage function on the PROGRAM (MAZATROL) display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Match the machine-operating program and the program selected on the PROGRAM (MAZATROL) display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1431</td>
<td>AUTO SET ERROR ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Tool data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1432</td>
<td>NO SELECT TOOL MODEL ( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The tool model to be copied/erased/renamed is not selected.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Select the appropriate tool model before performing the copy/erasure/name change.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1433</td>
<td>SAME TOOL MODEL EXISTS ( , , )</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>A registered tool model has been specified during the copy/name change.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Specify an unregistered name.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3-2-6 No. 500 - No. 599, No. 1500 - No. 1599 (I/O error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>-----</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>501</td>
<td>ILLEGAL FORMAT</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An external storage medium that contains data other than MATRIX data has been set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the contents of the external storage medium for appropriateness to the MATRIX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502</td>
<td>CANNOT LOAD (PROG SIZE EXCEED)</td>
<td>(WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>The contents of the external storage medium are not correct. (Loading of a MAZATROL program of more than 2000 lines of data has been attempted.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Either use another external storage medium, or save the program data once again. After that, carry out the load operation once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>503</td>
<td>CANNOT LOAD (TOO MANY PROGRAMS)</td>
<td>(WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to load more machining programs than the maximum number of programs that can be registered within the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Delete unnecessary programs, or save the programs onto an external storage and then delete them. After that, load the particular program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>504</td>
<td>CANNOT LOAD (AUTO OPERATION)</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made during automatic operation to load data other than machining programs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Load the data only after completion of automatic operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>505</td>
<td>CANNOT LOAD (MISMATCH)</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>Loading has been attempted although the data within the external storage medium does not match to the NC unit (Mismatching in data size, etc.).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check if the data saved on the external storage medium is the data to be used for the machine currently in operation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>506</td>
<td>SAME PROGRAM No. DESIGNATED</td>
<td>(WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to load the machining program that has the same work number as that of a machining program registered within the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check for an overlapping work numbers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>507</td>
<td>NO DESIGNATED PROGRAM</td>
<td>(WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>The machining program whose saving has been attempted does not exist in the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check if the machining program with the specified work number exists in the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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<td>---------</td>
</tr>
<tr>
<td>508</td>
<td>MEMORY CAPACITY EXCEEDED (WNo., , )</td>
<td>A (G)</td>
<td>L (L)</td>
<td>S (S)</td>
<td>Blue (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. An attempt has been made to load machining program data that exceeds the maximum available area for program registration within the NC unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. In the middle of saving onto the external storage medium, data saving exceeding the memory capacity has been made, or the end-of-tape (or end-of-disk) code has been detected.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Delete unnecessary programs, or save the programs onto an external storage and then delete them. After that, load the particular program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Split the data into segments according to the particular size of the free saving area within the external storage medium, and then carry out the saving operations once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>509</td>
<td>MEMORY PROTECT ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loading has been attempted when the PROGRAM LOCK/ENABLE switch setting was LOCK.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Set the switch to ENABLE, and then carry out the loading operation.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>510</td>
<td>DATA DO NOT MATCH (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparison between the external storage medium contents and the NC memory contents has shown disparities in data size, type of file information, etc.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Locate those disparities on the PROGRAM FILE display and correct them, and then make the comparison once again.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. If the disparities exist in data other than machining program data, check if the data is for the machine being used.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>511</td>
<td>PROGRAM DATA NOT SAME (WNo., UNo., SNo.)</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparison between the cassette tape or floppy disk contents and the NC data has shown several disparities.</td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. After correcting the disparities within the machining program, make the comparison once again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. If the disparities exist in data other than machining program data, locate those disparities on each display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This alarm message may be displayed if data is saved prior to automatic operation and then subjected to comparison with that after automatic operation. This is because execution of automatic operation may cause automatic data overriding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>512</td>
<td>NO EIA/ISO OPTION (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An attempt has been made to load an EIA/ISO program in spite of the absence of an EIA/ISO option.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>An EIA/ISO program cannot be loaded since the system has no EIA/ISO option.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>513</td>
<td>PROGRAM DATA TYPE INCORRECT ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>An attempt has been made to load a machining program different in structure from the programs within the NC memory.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check the contents of the external storage medium for appropriateness to the MATRIX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>514</td>
<td>DATA TYPE INCORRECT ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>An attempt has been made to load data (other than machining program data) that differs in structure from the NC memory data.</td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check the contents of the external storage medium for appropriateness to the MATRIX or the machine being used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>515</td>
<td>INCORRECT DESIGNATED DATA ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. During I/O operation with a memory card, an attempt has been made to load data the structure of which is not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. During I/O operation with a floppy disk, an attempt has been made to load data the structure of which is not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Check if the data saved during I/O operation with a memory card is for MATRIX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Check if the data saved during I/O operation with a floppy disk is for MATRIX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
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<td>----------------</td>
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<td>--------</td>
</tr>
<tr>
<td>516</td>
<td>SYSTEM ERROR</td>
<td>( , , )</td>
<td>E</td>
<td>L</td>
<td>S</td>
</tr>
</tbody>
</table>

**Cause**
1. When program loading was attempted, there was not a comment file (C:\MC_MachinePrograms\index.tbl).
2. An error has occurred within the system.

**Action**
1. Enter any comment on the **PROGRAM FILE** display, and load the program. Do not edit or delete "index.tbl" since it is the management file for NC.
2. Contact Mazak Technical Center or Technology Center. (At this time, also please notify them of what kind of operating procedure you had carried out before the alarm message appeared and what values were displayed in parentheses.)

| 517 | PROG. OPERATION NOT ALLOWED | (WNo., , ) | A | L | S | Blue |

**Cause**
1. An attempt has been made to save a display inhibiting program. (Program management function)
2. An attempt has been made to save the program being edited or the program being loaded using another I/O unit.

**Action**
1. Check if the specified work number is for the program of display inhibition.
2. Carry out a saving operation only after completion of the program editing operation (or the program loading operation using another I/O unit).

| 518 | DATA OPERATION NOT ALLOWED | ( , , ) | A | L | S | Blue |

**Cause**
1. An attempt has been made during automatic operation to load data other than machining program data.
2. An attempt has been made to save the data being loaded using another I/O unit.
3. An attempt has been made to load the data being saved using another I/O unit.

**Action**
Wait until automatic operation has been completed (or until the loading or saving operation using another I/O unit has been completed).

| 519 | DATA SIZE EXCEEDED | (WNo., Note, ) | A | L | S | Blue |

**Cause**
The EIA/ISO machining program includes a block that consists of more than 256 characters. (EOB or EOR does not appear within 256 characters.)

**Note:** The number displayed next to the work number is a line number, which corresponds to the number displayed in the lower right section of the **PROGRAM** display.

**Action**
Correct the EIA/ISO machining program. (Insert EOB within 256 characters.)

| 520 | EIA/ISO CONVERT ERROR | (WNo., , ) | B | L | S | Blue |

**Cause**
Nonconvertible sections have been found when an attempt was made to convert the MAZATROL program into an EIA/ISO program.

**Action**
Review the MAZATROL program.

| 521 | —— | ( , , ) |

**Cause**
——

**Action**
——

| 522 | SAME SET No. EXISTS | ( , , ) | B | L | S | Blue |

**Cause**
An attempt has been made to load the GL setup data that has the same GL setup number as that of setup data registered within the NC unit.

**Action**
——

| 523 | —— | ( , , ) |

**Cause**
——

**Action**
——
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>524</td>
<td></td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>525</td>
<td>HDD I/O ERROR</td>
<td>(Cause, , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>An error has occurred during output of data of the measurements results print-out function to the hard disk drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>Check if the available space within the hard disk drive is sufficient for the purpose.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>530</td>
<td>CMT MIS-CONNECTED</td>
<td>G L S Blue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>This message implies incorrect cable connection between CMT (cassette magnetic tape unit) or microdisk unit and the NC unit, or implies a power-off status or an incorrect baud-rate setting. In the case of microdisk unit, this message also implies incorrect setting of a floppy disk.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|     | Action                                   | 1. Check for correct cable connections.  
2. Check if power is turned on.  
3. Check for correct baud-rate setting. (Parameter for the NC unit: Baud rate)  
4. For microdisk unit, check if the floppy disk is correctly set. | | | |
<p>| 531 | DESIGNATED FILE NOT FOUND                 | A L S Blue    |                |                    |         |
|     | Cause                                    | The machining program or another data that has been designated for the LOAD or COMPARE operation does not exist within the cassette tape or floppy disk. | | | |
|     | Action                                   | Carry out a DIRECTORY operation to check what type of data is stored on the cassette tape or floppy disk. | | | |
| 532 | CMT NOT CONNECTED                        | A L S Blue    |                |                    |         |
|     | Cause                                    | A cassette tape or floppy disk drive has not been mounted. | | | |
|     | Action                                   | Correctly mount a cassette tape or floppy disk drive. | | | |
| 533 | NO OPERABLE DATA IN CMT                  | A L S Blue    |                |                    |         |
|     | Cause                                    | The current M640-use disk does not contain a saved machining program (only machining programs can be loaded from M640-use disks). | | | |
|     | Action                                   | The disk that has been registered for M640 use does not contain a registered machining program. Perform checks using the NC unit M640. | | | |
| 534 | CMT I/O ERROR                            | G L S Blue    |                |                    |         |
|     | Cause                                    | A hardware error has occurred in the CMT or microdisk unit. | | | |
|     | Action                                   | Check the CMT or microdisk unit baud rate setting (RS-232C setting parameter), and replace the cassette tape or floppy disk. | | | |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>535</td>
<td>CMT WRITE PROTECT</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Data saving onto a write-protected cassette tape or floppy disk has been attempted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>The cassette tape or floppy disk is protected against data writing. Release the write-protected state. (For cassette tape, fill in the hole on the tape surface with tape.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>536</td>
<td>POWER OFF DURING CMT OPERATION</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Power has been turned off during operation of the CMT or microdisk unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the machining program being transferred. If an anomaly is found, repeat the desired operation. If this alarm state has occurred during loading of a machining program, erase the loaded portion of the program and then execute the loading again.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>537</td>
<td>CMT MALFUNCTION</td>
<td>G</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Data cannot be read because of the presence of check sum errors, for example, within the cassette tape or floppy disk contents.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Reread the data only after setting a new cassette tape or floppy disk or after saving the corresponding data.</td>
<td></td>
<td></td>
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<tr>
<td>538</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Cause</td>
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<td>Action</td>
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<td>539</td>
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<tr>
<td>Cause</td>
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<tr>
<td>Action</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>540</td>
<td>TAPE READER MIS-CONNECTED</td>
<td>G</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>This message implies incorrect cable connection between tape reader or microdisk unit and the NC unit or implies a power-off state. In the case of microdisk unit, this message also implies incorrect setting of a floppy disk.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Action | 1. Check for correct cable connections.  
2. Check if power is turned on.  
3. In the case of microdisk unit, check if the floppy disk is correctly set. |
| 541 | TAPE PUNCHER MIS-CONNECTED                   | G             | L              | S                   | Blue   |
| Cause | This message implies incorrect cable connection between tape puncher or microdisk unit and the NC unit or implies a power-off state. In the case of microdisk unit, this message also implies incorrect setting of a floppy disk. |
| Action | 1. Check for correct cable connections.  
2. Check if power is turned on.  
3. In the case of microdisk unit, check if the floppy disk is correctly set. |
<p>| 542 | NO TAPE READER PUNCHER OPTION                | A             | L              | S                   | Blue   |
| Cause | An attempt has been made to carry out a tape I/O operation although the tape reader/puncher option is not provided. |
| Action | Provide the NC unit with a tape reader/puncher option. (Only with this option, tape I/O operations can be carried out.) |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>543</td>
<td>WNo. NOT FOUND ON PAPER TAPE ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loading or comparing is not possible since no O numbers (work numbers) are stored on the paper tape or floppy disk.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Call the DATA I/O display (TAPE) and designate a work number(s).</td>
<td></td>
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</tr>
<tr>
<td>544</td>
<td>SET NEW PAPER TAPE ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. The tape reader/puncher is not correctly loaded with paper tape.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Differences in baud-rate or other parameter settings for RS-232C exist between the tape reader/puncher (or microdisk unit) and the NC unit.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>1. Check if the tape reader/puncher is correctly loaded with paper tape.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2. Check for differences in RS-232C parameter settings between the I/O unit and the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>545</td>
<td>POWER OFF TAPE READ/PUNCH OPER. ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power has been turned off during operation of the tape reader/puncher or microdisk unit.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
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<tr>
<td></td>
<td>If power has been turned off during loading, check the machining program loaded. If an error(s) is found, delete the loaded data and then reload the program. If power has been turned off during punching, re-punch the tape.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>546</td>
<td>TAPE READER ERROR ( , , )</td>
<td>G</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A hardware error has occurred in the tape reader or the microdisk unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Before operating the tape reader or microdisk unit, check that no differences in RS-232C parameter settings exist between the tape reader or microdisk unit and the NC unit and replace the paper tape or floppy disk.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>547</td>
<td>TAPE PUNCHER ERROR ( , , )</td>
<td>G</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A hardware error has occurred in the tape puncher or the microdisk unit.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before operating the tape puncher or microdisk unit, check that no differences in RS-232C parameter settings exist between the tape puncher or microdisk unit and the NC unit and replace the paper tape or floppy disk.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>548</td>
<td>MAZATROL PROGRAM DESIGNATED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designate an EIA/ISO program. (Only EIA/ISO programs can be punched on paper tape.)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>An attempt has been made to punch a MAZATROL program onto paper tape.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>549</td>
<td>DESIGNATED DATA NOT FOUND ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The designated data was not found on the paper tape or floppy disk.</td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Select another set of data or make a search once again from the beginning of the paper tape or floppy disk.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>550</td>
<td>PARITY H ERROR ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The contents of the paper tape or floppy disk cannot be read since they include a parity-H error(s). (The number of holes on tape must always be even for ISO; it must be odd for EIA).</td>
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<td></td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reading must be carried out only after replacing the paper tape or floppy disk or after re-punching the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------</td>
<td>---------------</td>
<td>---------------</td>
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<td>---------</td>
</tr>
<tr>
<td>551</td>
<td>PARITY V ERROR</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The contents of the paper tape or floppy disk cannot be read since they include a parity-V error(s).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Parity V Error" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of sprocket holes in this area must be even.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Make reading possible by making bit 1 of parity V-check valid/invalid parameter TAP25 invalid.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>552</td>
<td>PROGRAM END NOT FOUND</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|     | A machining program in which EOR precedes the end M-code (M02, M30 or M99) or the next O number (work number) was loaded.  
The end-of-program condition can be changed by varying the settings of the parameter (TAP27). |
|     | **Action**                       |               |               |                    |         |
|     | Since the machining program has already been loaded, the PROGRAM display must be called and then one of the above three end M-codes must be inserted in the program. |
| 553 | WORK No. UNITS EXCEEDED          | ( , , )       | B             | L                  | S       | Blue    |
|     | **Cause**                        |               |               |                    |         |
|     | An attempt has been made to load the program of a work number of more than four digits in spite of the fact that the maximum allowable number of digits in one work number is set to four. |
|     | **Action**                       |               |               |                    |         |
|     | Check bit 3 of parameter TAP26.  |
| 554 | POWER OFF IN EIA/ISO CONVERT     | ( , , )       | A             | L                  | S       | Blue    |
|     | **Cause**                        |               |               |                    |         |
|     | Power has been turned off during EIA/ISO conversion. |
|     | **Action**                       |               |               |                    |         |
|     | Check the EIA/ISO program being converted. If an anomaly is found, erase the program and repeat the conversion. |
| 555 | — —                             | ( , , )       |               |                    |         |
|     | **Cause**                        |               |               |                    |         |
|     | — —                             |               |               |                    |         |
|     | **Action**                       |               |               |                    |         |
|     | — —                             |               |               |                    |         |
| 556 | — —                             | ( , , )       |               |                    |         |
|     | **Cause**                        |               |               |                    |         |
|     | — —                             |               |               |                    |         |
|     | **Action**                       |               |               |                    |         |
|     | — —                             |               |               |                    |         |
| 557 | DESIGNATED DIRECTORY NOT FOUND   | ( , , )       | B (A)         | I (L)              | O (S)   | Red (Blue) |
|     | **Cause**                        |               |               |                    |         |
|     | The designated directory does not exist. |
|     | **Action**                       |               |               |                    |         |
|     | Check if the designated directory exists. |

**Note:** The table above contains a list of alarms and their respective causes and actions. Each alarm is identified by a number (No.) and a message that describes the error. The table also includes columns for the type of error, stopped status, clearing procedure, and display. The cause and action sections provide detailed explanations and instructions for resolving each error. The alarms are color-coded in the display column, with red and blue indicating different levels or types of alerts.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>563</td>
<td>PRINTER I/O ERROR</td>
<td>(Cause, , )</td>
<td>G</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td>Cause</td>
<td>An error in printer communications has occurred during measurement result printing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Action | - Check the printer for correct connection.  
- Check for differences in the RS-232C parameter settings between the printer and NC unit. |
| 564 | — — | ( , , ) | | | |
| Cause | — — |
| Action | — — |
| 565 | ID MIS-CONNECTED | ( , , ) | G | L | S | Blue |
| Cause | Erroneous cable connection has occurred during connection of the ID unit and the NC unit, or power has remained turned off. |
| Action | Check for incorrect cable connections.  
Or check if the power is turned on. |
<p>| 566 | POWER STOPPED DURING ID OPER. | ( , , ) | A | L | S | Blue |
| Cause | Power has been turned off during the operation of the ID unit. |
| Action | Check the current tool data, and if errors are found, operate the unit once again. |
| 567 | ID I/O ERROR | ( , , ) | G | L | S | Blue |
| Cause | Communication between the NC unit and the ID unit has become interrupted because of hardware trouble (such as line noise). |
| Action | Contact Mazak Technical Center or Technology Center. |
| 568 | — — | ( , , ) | | | |
| Cause | — — |
| Action | — — |
| 569 | — — | ( , , ) | | | |
| Cause | — — |
| Action | — — |
| 570 | NO DNC OPTION | ( , , ) | A | L | S | Blue |
| Cause | DNC operation was attempted although DNC option is not provided. |
| Action | Provide the NC unit with a DNC option. (Only with this option, DNC operation can be carried out.) |
| 571 | ILLEGAL FORMAT | ( , , ) | A | L | S | Blue |
| Cause | Data other than MATRIX use data has been transmitted from the host system. (The format of the transmitted data is not correct.) |
| Action | Check the transmitted data for appropriateness to the MATRIX. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>572</td>
<td>CANNOT LOAD (PROG SIZE EXCEED) (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The contents of the transmitted machining program from the host system are not correct. (More than 2000 lines of MAZATROL program data have been transmitted.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the size of the program which has been transmitted from the host system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>573</td>
<td>CANNOT LOAD (TOO MANY PROGRAMS) (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to load more machining programs than the maximum number of programs that can be registered within the NC unit.</td>
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<tr>
<td>Action</td>
<td>Delete unnecessary programs, or save the programs onto an external storage and then delete them. After that, load the particular program.</td>
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<tr>
<td>574</td>
<td>CANNOT LOAD (AUTO OPERATION) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made during automatic operation to load data other than machining program data.</td>
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<tr>
<td>Action</td>
<td>Load such data only after completion of automatic operation.</td>
<td></td>
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<tr>
<td>575</td>
<td>CANNOT LOAD (MISMATCH) ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Loading has been attempted when the transmitted data from the host system does not match to the data or other parameter settings within the NC unit (mismatching in data size, etc.).</td>
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</tr>
<tr>
<td>Action</td>
<td>Check if the data that has been transmitted from the host system is that which is to be used for the machine being used.</td>
<td></td>
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</tr>
<tr>
<td>576</td>
<td>SAME PROGRAM No. DESIGNATED (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to load the machining program that has the same work number as that of a machining program registered within the NC unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check for an overlapping work number. This alarm message also implies that the parameter (DNC26, bit 2) is set for the priority of the old program over a new one. If the parameter is set to 0, the old data will automatically be deleted in such a case as mentioned above and the new program data can be loaded with the specified work number.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>577</td>
<td>NO DESIGNATED PROGRAM (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>- The machining program whose transmission from the NC unit to the host system has been attempted does not exist within the NC unit. - The machining program that has been designated using a control command (work number search or program deletion) does not exist within the NC unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check if the machining program with the specified work number exists in the NC unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>578</td>
<td>MEMORY CAPACITY EXCEEDED (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to load more machining programs than the maximum number of programs that can be registered within the NC unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Delete unnecessary programs, or save the programs onto an external storage and then delete them. After that, load the particular program.</td>
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<tr>
<td>579</td>
<td>MEMORY PROTECT ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Loading has been attempted when the PROGRAM LOCK/ENABLE switch setting was LOCK.</td>
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<td></td>
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<tr>
<td>Action</td>
<td>Set the switch to ENABLE, and then carry out the loading operation. This alarm message also implies that the setting of the parameter (DNC26, bit 3) is OFF (0). Change this parameter setting to ON (1). Data loading will then become possible.</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
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<tr>
<td>580</td>
<td>CARD NOT READY</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>A memory card has not been correctly mounted in the NC unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Action</td>
<td>Check if the memory card is correctly mounted.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>581</td>
<td>DISK NOT READY</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>A disk has not been correctly mounted.</td>
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<tr>
<td></td>
<td>Action</td>
<td>Correctly mount a disk in the disk drive.</td>
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<tr>
<td>582</td>
<td>DESIGNATED FILE NOT TRANSFERED</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>A file different from the one that has been requested from NC unit to the host system was transferred from the latter.</td>
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<tr>
<td></td>
<td>Action</td>
<td>Check the details of the file that has been transferred from the host system.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>583</td>
<td>PROGRAM DATA TYPE INCORRECT</td>
<td>( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>An attempt has been made to load a machining program that is different in structure from those stored within the NC unit.</td>
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</tr>
</tbody>
</table>
|     | Action  | - Check if the program that has been transferred from the host system is for use with MATRIX.  
- Check if the contents of the file transfer message (header block) are correct. |
| 584 | RECEIVED DATA TYPE INCORRECT | ( , , ) | A | L | S | Blue |
|     | Cause   | - An attempt has been made to load data other than machining program data and also different in structure from the data stored within the NC unit.  
- The contents of the header block or data block in the file transfer message (including machining programs) are not correct.  
- Check if the data that has been transferred from the host system is for use with MATRIX or for use with the machining being operated.  
- Check the contents of the header block (version number, etc.) or data block (sequence number, etc.) in the file transfer message. |
<p>|     | Action  | |
| 585 | CABLE MIS-CONNECTED | ( , , ) | G | L | S | Blue |
|     | Cause   | This message implies incorrect cable connection between the host system and the NC unit or implies a power-off status. |
|     | Action  | |
| 586 | SYSTEM ERROR | ( , , ) | E | L | S | Blue |
|     | Cause   | An error has occurred within the system. |
|     | Action  | Contact Mazak Technical Center or Technology Center. (At this time, also please notify them of what kind of operating procedure you had carried out before the alarm message appeared and what values were displayed in parentheses.) |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>587</td>
<td>PROG. OPERATION NOT ALLOWED (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>1. An attempt has been made to transmit a</td>
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<td></td>
<td>display inhibiting program to the host</td>
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<tr>
<td></td>
<td>system. (Program management function)</td>
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<td></td>
<td>2. An attempt has been made to transmit to</td>
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<tr>
<td></td>
<td>the host system the program being edited</td>
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<td></td>
<td>(or the program being loaded using another</td>
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<tr>
<td></td>
<td>I/O unit).</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>1. Check if the specified work number is</td>
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<td></td>
<td>for the program of display inhibition.</td>
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<td>2. Carry out the transfer operation only</td>
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<td>after completion of the program editing</td>
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<td></td>
<td>(or program loading using another I/O unit).</td>
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<tr>
<td>588</td>
<td>DATA OPERATION NOT ALLOWED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>- An attempt has been made during automatic</td>
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<td></td>
<td>operation to load data other than machines</td>
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<td></td>
<td>ing program data.</td>
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<td></td>
<td>- An attempt has been made to transmit to</td>
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<td></td>
<td>the host system the data being loaded using</td>
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<td></td>
<td>another I/O unit.</td>
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<tr>
<td></td>
<td>- An attempt has been made to load the data</td>
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<td>being saved using another I/O unit.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Wait until automatic operation has been</td>
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<td></td>
<td>completed (or until the loading or saving</td>
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<td>operation using another I/O unit has been</td>
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<td></td>
<td>completed).</td>
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<tr>
<td>589</td>
<td>DATA SIZE EXCEEDED (WNo., Note, )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The EIA/ISO machining program includes a</td>
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<tr>
<td></td>
<td>block that consists of more than 256</td>
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<tr>
<td></td>
<td>characters. (EOB or EOR is not present</td>
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<td></td>
<td>within 256 characters.)</td>
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<td></td>
<td><strong>Note:</strong> The number displayed next to the</td>
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<tr>
<td></td>
<td>work number is a line number, which</td>
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<td></td>
<td>corresponds to the number displayed in the</td>
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<tr>
<td></td>
<td>lower right section of the PROGRAM display.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Correct the machining program. (Insert</td>
<td></td>
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<tr>
<td></td>
<td>EOB within 256 characters.)</td>
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</tr>
<tr>
<td>590</td>
<td>DNC COMMAND IMPOSSIBLE ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The particular status of the NC unit</td>
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<td></td>
<td>disables execution of the control command</td>
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<tr>
<td></td>
<td>that has been requested from the host</td>
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<tr>
<td></td>
<td>system.</td>
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<tr>
<td></td>
<td>- A request for work number search has</td>
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<td></td>
<td>been made during automatic operation.</td>
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<td></td>
<td>- During automatic operation, a request for</td>
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<td>deleting the machining program being used</td>
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<td>for the automatic operation has been</td>
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<td>made.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Wait until the NC unit becomes ready for</td>
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<td></td>
<td>processing or until the automatic operation</td>
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<td></td>
<td>is completed, and then make the request</td>
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<td></td>
<td>once again.</td>
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</tr>
<tr>
<td>591</td>
<td>NO OPTION (WNo., , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to load (save)</td>
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<tr>
<td></td>
<td>the data not supported by the current</td>
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<tr>
<td></td>
<td>option of the DNC unit.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Only data supported by the option can be</td>
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<tr>
<td></td>
<td>processed.</td>
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</tr>
<tr>
<td>592</td>
<td>ILLEGAL COMMAND RECEIVED ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>- The control command or file transfer</td>
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<td></td>
<td>command that has been requested from the</td>
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<tr>
<td></td>
<td>host system is a nonexistent command.</td>
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<tr>
<td></td>
<td>- The machine number that has been</td>
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<td></td>
<td>designated for the loading of data other</td>
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<td></td>
<td>than machining program data does not</td>
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<td></td>
<td>agree with any of the machine numbers</td>
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<tr>
<td></td>
<td>within the NC unit.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>- Check the details of the command message</td>
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<td></td>
<td>that has been sent from the host system.</td>
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<td></td>
<td>- Check if the machine number is the same</td>
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<tr>
<td></td>
<td>as that registered within the NC unit (parameter DNC19).</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>------</td>
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<td>----------------</td>
<td>---------------------</td>
<td>---------</td>
</tr>
<tr>
<td>593</td>
<td>DNC I/O ERROR</td>
<td>( , , )</td>
<td>G</td>
<td>L</td>
<td>S</td>
</tr>
</tbody>
</table>

**Cause**
- During use of DNC, processing has been aborted by line noise or other hardware factors.
- RS-232C communication parameter settings (such as those of the baud-rate, etc.) between the host system and NC unit differ.
- Timer, number-of-retries or other settings are not correct.

**Action**
- Make line checks and hardware checks of the host system and NC unit.
- Match the RS-232C communication parameter settings between the host system and NC unit.
- Set the timer, number-of-retries or other settings to those of the host system. (Parameters for the NC unit: DNC parameters)

| 594  | SEND-RECEIVE ERROR              | ( , , )       | G              | L                   | S       | Blue    |

**Cause**
- The preset number of retries has been exceeded during transmission/reception of command messages.
- RS-232C communication parameter settings (such as those of the baud-rate, etc.) between the host system and NC unit differ.
- Timer, number-of-retries or other settings are not correct.

**Action**
- Make line checks and message checks of the host systems.
- Match the RS-232C communication parameter settings between the host system and NC unit.
- Set the timer, number-of-retries or other settings to those of the host system. (Parameters for the NC unit: DNC parameters)

| 595  | FILE TRANSFER ERROR             | ( , , )       | G              | L                   | S       | Blue    |

**Cause**
- The preset number of retries has been exceeded during transmission/reception of the messages.
- RS-232C communication parameter settings (such as those of the baud-rate, etc.) between the host system and NC unit differ.
- Timer, number-of-retries or other settings are not correct.

**Action**
- Make line checks and message checks of the host systems.
- Match the RS-232C communication parameter settings between the host system and NC unit.
- Set the timer, number-of-retries or other settings to those of the host system. (Parameters for the NC unit: DNC parameters)

| 596  | DNC MALFUNCTION                 | ( , , )       | G              | L                   | S       | Blue    |

**Cause**
An irretrievable hardware error has occurred during reception of the first message (ENQ) from the host system.

**Action**
After making hardware checks of the NC and host systems and line checks, turn the NC unit power back on and then restart the receiving operation.

| 597  | POWER OFF DURING DNC OPERATION | ( , , )       | A              | L                   | S       | Blue    |

**Cause**
Power has been turned off during DNC operation.

**Action**
Check for errors in the machining program being used, and if errors are found, carry out the DNC operation once again. Note, however, that if the machining program is being loaded, then loading must be carried out once again after erasing the loaded contents of the program.

| 598  | NO EIA/ISO OPTION              | ( , , )       | A              | L                   | S       | Blue    |

**Cause**
An attempt has been made to transfer EIA/ISO program although the NC unit is not provided with an EIA/ISO option.

**Action**
Without an EIA/ISO option, EIA/ISO program processing is not possible.

| 599  | DESIGNATED DATA NOT FOUND       | ( , , )       | A              | L                   | S       | Blue    |

**Cause**
The host system has issued a request for transmission/reception of data not existing within the NC unit.
- A drum-tool data transfer request has been issued to the NC unit though it is not provided with a drum.
- A request for transfer of a larger volume of data than the control data stored within the NC unit has been made.

**Action**
Check the contents of the command messages that have been sent from the host system.
### 3-2-7 No. 600 - No. 699, No. 1600 - No. 1699 (MAZATROL program error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>——</td>
<td>( , , )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>SYSTEM ERROR</td>
<td>( , , )</td>
<td>E</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>602</td>
<td>PROG. OPERATION NOT ALLOWED</td>
<td>( , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>603</td>
<td>NO DESIGNATED PROGRAM</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>604</td>
<td>NO PITCH IN MULTI WORKPIECES</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>605</td>
<td>NO TOOL DATA IN PROGRAM</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>606</td>
<td>NO FIGURE IN PROGRAM</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>607</td>
<td>MISSING INPUT DATA (POINT)</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>608</td>
<td>MISSING INPUT DATA (LINE)</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
</tbody>
</table>

**Cause**

- A processing error has occurred within the NC unit.
- A processing error has occurred within the NC unit.
- Using data I/O operation, save the program data, tool data, tool file data, parameters, etc. that are currently being used. After that, contact Mazak Technical Center or Technology Center.
- An attempt has been made to start the program being transferred.
- The program having the work number that has been set in the subprogram unit does not exist within the memory.
- No work number has been set in the subprogram unit.
- The work number that has been designated as the restart position does not exist within the memory.
- Pitch X is not yet set in spite of the fact that multi-piece machining in the direction of the X-axis is to take place.
- Pitch Y is not yet set in spite of the fact that multi-piece machining in the direction of the Y-axis is to take place.
- The point-, line- or face-machining (including 3-D) unit does not contain any tool sequences.
- The point-, line- or face-machining (including 3-D) unit does not contain any shape data.
- A point-machining unit lacks data.
- A line-machining unit lacks data.

**Action**

- After the transfer operation is completed, start the program.
- Review the machining programs to see if the designated program exists.
- Review the particular machining program and then set an appropriate multi-piece machining pitch in the common unit.
- Review the particular machining program to see if there are units that do not contain necessary tool sequences.
- Review the particular machining program to see if there are units that do not contain necessary shape data.
- Review the particular machining program, and set data if a point-machining unit lacks data.
- Review the particular machining program, and set data if a line-machining unit lacks data.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>609</td>
<td>MISSING INPUT DATA (FACE) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>A face-machining unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if a face-machining unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>MISSING TOOL DATA FOR POINT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>A point-machining tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if a point-machining tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>611</td>
<td>MISSING TOOL DATA FOR LINE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>A line-machining tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if a line-machining tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>612</td>
<td>MISSING TOOL DATA FOR FACE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>A face-machining (including 3-D) tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if a face-machining tool sequence lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>613</td>
<td>DATA MISSING IN WPC UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The WPC unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if the WPC unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>614</td>
<td>SUB PROGRAM NESTING EXCEEDED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The maximum permissible number of repeats of MAZATROL program nesting has been exceeded nine.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review and correct the particular machining program so that the total number of repeats of nesting does not exceed nine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>615</td>
<td>DATA MISSING IN OFFSET UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The offset unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and set data if the offset unit lacks data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>616</td>
<td>DATA ERROR IN M CODE UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The M-code unit contains no data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the particular machining program, and input data to the M-code unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>617</td>
<td>EXECUTION IMPOSSIBLE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The data processing operation cannot be performed because of contradiction in data. This condition occurs if an attempt is made to start automatic operation when the specified work number is an unregistered number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Search out the contradictory data making reference to WNo., UNo., SNo. (which are displayed together with the alarm message), and then correct the data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>618</td>
<td>POINT CUTTING PARAMETER ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The point-machining parameter setting(s) is out of its permissible range.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>——</td>
</tr>
<tr>
<td>619</td>
<td>LINE/FACE CUTTING PAR. ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The line- or face-machining parameter settings are out of their permissible ranges.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The parameter E13 is set to “0”; change it to a value other than “0”.</td>
</tr>
<tr>
<td>620</td>
<td>CUTTING SPEED ZERO (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Of tool sequence data (except for chip removal), the circumferential speed (C-SP) is unset or set to “0”.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review the machining program and set the desired circumferential speed (C-SP).</td>
</tr>
<tr>
<td>621</td>
<td>FEEDRATE ZERO (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Of tool sequence data (except for chip removal), the feedrate (FR) is unset or set to “0”.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review the machining program and set the desired feedrate (FR).</td>
</tr>
<tr>
<td>622</td>
<td>DESIGNATED UNIT NOT FOUND ( , , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The unit that has been designated as the restart position is not present in the program with the specified work number.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review the machining program and designate the correct unit number.</td>
</tr>
<tr>
<td>623</td>
<td>DESIGNATED SNo. NOT FOUND ( , , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The tool sequence that has been designated as the restart position is not present in the unit of the specified work number; two or more lines of tool sequence data are present in the line-machining chamfering unit.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review the machining program and designate the correct tool sequence number.</td>
</tr>
<tr>
<td>624</td>
<td>RESTART IMPOSSIBLE ( , , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- The unit that has been designated as the restart position is the end unit. - The designated number of times of reappearance (L) is too large and the corresponding restart position is not present. - The restart data is incomplete.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Check the contents of the restart data or the program.</td>
</tr>
<tr>
<td>625</td>
<td>ENDMILL DIAMETER EXCEEDED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- The value of “(groove width) – (finish allowance R) × 2” of the endmill groove unit is smaller than the “tool diameter” value of the rough-machining tool. - The “groove width” value of the endmill groove unit is smaller than the “tool diameter” value of the finishing tool.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>——</td>
</tr>
<tr>
<td>626</td>
<td>NO TOOL IN MAGAZINE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The tool(s) specified in the program is not registered in the tool data.</td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Carry out a tool layout operation and register the necessary tool(s) on the TOOL DATA display.</td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------</td>
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<td>----------------</td>
<td>---------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>627</td>
<td>TOOL DATA INPUT PROCESS ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The data of the tool length or tool diameter is not yet input on the TOOL DATA display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the tool data and input the tool length or tool diameter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>628</td>
<td>NO ASSIGNED TOOL IN TOOL FILE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The tool specified in the program is not registered on the TOOL FILE display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Register the tool data that is to be used in the program into the tool file.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>629</td>
<td>TOOL FILE INPUT PROCESS ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The tool file lacks of data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the data on the TOOL FILE display and fill in any empty items with data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>630</td>
<td>Z DEPTH OF CUT TOO LARGE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Of the line- or face-machining tool sequence data, the value of the Z depth of cut is in excess of the depth of cut on the TOOL FILE display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review the machining program and correct the value of the Z depth of cut.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>631</td>
<td>STOCK REMOVAL R TOO LARGE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The value of &quot;(removal allowance R) – (finish allowance R)&quot; in the line-machining unit is larger than the value of the tool diameter of the rough-cutting tool. The value of removal allowance R in the line-machining unit is larger than the value of the tool diameter of the finishing tool.</td>
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</tr>
<tr>
<td>Action</td>
<td>Review the machining program and correct the values of removal allowance R and finishing allowance R in the line-machining unit.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>632</td>
<td>RADIAL DEPTH OF CUT ZERO (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Of line- or face-machining tool sequence data, the radial depth of cut is set to zero or smaller.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review the machining program and set the radial depth of cut to the correct value.</td>
<td></td>
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</tr>
<tr>
<td>633</td>
<td>Z DEPTH OF CUT ZERO (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Of line- or face-machining tool sequence data, the Z depth of cut is set to zero or smaller.</td>
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</tr>
<tr>
<td>Action</td>
<td>Review the machining program and set the Z depth of cut to the correct value.</td>
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</tr>
<tr>
<td>634</td>
<td>FINISH DEPTH OF CUT ZERO (WNo., UNo.. SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The finish allowance value in the line- or face-machining unit is set to zero in spite of the fact that a finishing tool is registered.</td>
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<tr>
<td>Action</td>
<td>Review the machining program and set data in the finish allowance data item.</td>
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<tr>
<td>635</td>
<td>TOOL DIAMETER ZERO (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Of tool data, the tool diameter setting is zero.</td>
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<tr>
<td>Action</td>
<td>Review the data on the TOOL DATA display and set data in the tool diameter item.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>636</td>
<td>STOCK REMOVAL Z TOO SMALL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>In the line- or face-machining unit, removal allowance Z is smaller than finish allowance Z.</td>
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<tr>
<td>Action</td>
<td>Review the line- or face-machining unit and increase removal allowance Z to a value greater than that of finish allowance Z.</td>
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<tr>
<td>637</td>
<td>STOCK REMOVAL R TOO SMALL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>In the line- or face-machining unit, removal allowance R is smaller than finish allowance R.</td>
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<tr>
<td>Action</td>
<td>Review the line- or face-machining unit and increase the value of removal allowance R to a value greater than that of finish allowance R.</td>
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<tr>
<td>638</td>
<td>R DEPTH OF CUT TOO LARGE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Of the face-machining tool sequence data, the setting of the radial depth of cut is smaller than the tool diameter setting on the TOOL DATA display.</td>
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<tr>
<td>Action</td>
<td>Review the machining program and increase the radial depth of cut to a value greater than the tool diameter setting in the tool data.</td>
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<tr>
<td>639</td>
<td>DESIGNATED PALLET NOT FOUND (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The pallet number that has been set in the pallet changing unit is larger than the maximum allowable number of pallets set in the parameter L46.</td>
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<tr>
<td>Action</td>
<td>Review the machining program and set an allowable pallet number.</td>
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<tr>
<td>640</td>
<td>ILLEGAL INDEX ANGLE INPUT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The data that has been set in the angle item of the indexing unit is that which cannot be divided by the parameter L37 setting (minimum allowable angle of index).</td>
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<tr>
<td>Action</td>
<td>Review the machining program and set an allowable angle of index.</td>
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<tr>
<td>641</td>
<td>MISSING INPUT DATA (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The pallet changing unit or the indexing unit lacks of unit data. Initial point Z is not yet set in the common unit.</td>
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<tr>
<td>Action</td>
<td>Review the machining program and set all the necessary values in the unit.</td>
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<td>642</td>
<td>ILLEGAL NEXT PALLET No. INPUT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The same pallet number as the current pallet number has been set as the next one.</td>
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<tr>
<td>Action</td>
<td>Review the machining program and make sure of the pallet numbers.</td>
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<td>643</td>
<td>DATA ERROR IN MAN. PROG. UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The manual program mode unit contains a sequence that has no data.</td>
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<tr>
<td>Action</td>
<td>Review the machining program, and fill in any incomplete sequence with data or erase such sequences.</td>
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<td>644</td>
<td>NOMINAL DIAMETER NOT FOUND (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The nominal diameter item of the tool sequence data is not complete. The nominal diameter item of the MMS unit or the manual program mode unit (when a tool is set) is not complete.</td>
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<tr>
<td>Action</td>
<td>Review the machining program, and set data in the nominal diameter item of the MMS unit or the manual program mode unit (when a tool is set) or erase the corresponding portion.</td>
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<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>645</td>
<td>PRIORITY No. OVERLAP (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td>Cause</td>
<td>The same priority number is assigned to different tools.</td>
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<tr>
<td>Action</td>
<td>Within one process, the same priority number must not be assigned to different tools. Change the priority number.</td>
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<td>646</td>
<td>ILLEGAL PRIORITY NUMBER (WNo., UNo., SNo.)* (LNo. 1, LNo. 2, ***)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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</tbody>
</table>
| Cause| The priority numbering order within a unit is not correct.  
  * During setting the priority numbers on the PROGRAM display.  
  ** During setting the priority numbers on the PROGRAM LAYOUT display - data in the layout lines LNo. 1 and LNo. 2 are not correct. |
| Action| The machining order within one unit has been reversed by the incorrect priority numbering. Change the priority numbers. |
| 647  | END UNIT NOT FOUND (WNo., UNo., SNo.)        | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| The end unit is not present in the program. |
| Action| Review the machining program and set the end unit at the end of the program. |
| 648  | MULTI OFFSET DATA TOO LARGE (WNo., UNo., SNo.) | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| More than 10 sets of offset data have been input for multi-piece machining. |
| Action| The machining program is in an abnormal state. If the program is already saved onto cassette tape, floppy disk or other media, erase the program and then reload it. If the program is not yet saved, make corrections with the editing function and fully scan for more data errors. |
| 649  | MEASURING SEQUENCE INCOMPLETE (WNo., UNo., SNo.) | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| The measurement sequence lacks of data. |
| Action| Review the machining program, and input data to the measurement sequence to make it complete. |
| 650  | CHAMFERING IMPOSSIBLE (WNo., UNo., SNo.)    | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| Cutting is impossible because the chamfering cutter is likely to come into contact with the wall or bottom of the workpiece during chamfering. The data of the specified chamfering cutter on the TOOL DATA or TOOL FILE display is not appropriate. |
| Action| Review the machining program or the tool file, and correct inappropriate data. |
| 651  | GEAR PARAMETER ERROR (WNo., UNo., SNo.)      | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| An attempt has been made to execute the point-, line- or face-machining MAZATROL program when the setting of parameter SA51 was “5” or more. |
| Action| Change the setting of parameter SA51 to a value between 0 and 4. |
| 652  | GEAR SHIFT DATA ERROR (WNo., UNo., SNo.)     | B             | I (L)          | O (S)            | Red (Blue) |
| Cause| The tool sequence data contains an unavailable milling spindle gear-shift M-code(s). |
| Action| Change the corresponding code(s) to an available one(s).  
  2-gear H : M39  L : M38  
  3-gear H : M39  M : M38  
  4-gear H : M39  MH : M38  
  4-gear L : M37  ML : M37  
  L : M36 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>653</td>
<td>ILLEGAL TOOL DESIGNATED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong> Tools that cannot be used have been designated.</td>
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<td></td>
<td><strong>Action</strong> Review the machining program and designate tools that are usable.</td>
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<td>654</td>
<td>TOOL DATA ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong> The tool length and tool diameter settings on the TOOL DATA display are negative.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Action</strong> Set positive tool length and tool diameter values.</td>
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<tr>
<td>655</td>
<td>PROGRAM DATA CORRUPT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong> The program is destroyed.</td>
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<td></td>
<td><strong>Action</strong> Erase a part of the program and then re-create the destroyed part; or erase the entire program and then carry out a loading operation using the data I/O operation once again.</td>
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<tr>
<td>656</td>
<td>MASURING SEQ. DATA NOT FOUND (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong> The measurement units include one that has no sequence data.</td>
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<td><strong>Action</strong> Create one or more lines of sequence data in the corresponding measurement unit, or erase the unit.</td>
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<tr>
<td>657</td>
<td>ILLEGAL NUMBER INPUT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong> The program contains incorrect data.</td>
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<td></td>
<td><strong>Action</strong> Review the machining program and make data corrections.</td>
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<tr>
<td>658</td>
<td>INITIAL Z &lt; MATERIAL DEPTH (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong> The setting of the material height in the 3-D machining unit is greater than that of initial point Z in the common unit.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Action</strong> Change the program to give a material height value smaller than the initial point Z value.</td>
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<tr>
<td>659</td>
<td>NO TOOL PATH CHECK (I/O BUSY) (WNo., UNo., SNo.)</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
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<tr>
<td></td>
<td><strong>Cause</strong> The tool path check cannot be performed since I/O operation (loading) is in progress.</td>
<td></td>
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<td></td>
<td><strong>Action</strong> Make the tool path check after the I/O operation has been completed.</td>
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<tr>
<td>660</td>
<td>CANNOT MOVE DESIGNATED AXIS ( ) ( ) ( )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong> The Y-axis or Z-axis of the index position has been appointed using the indexing unit when the parameter L41 is set to “2”.</td>
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<td></td>
<td><strong>Action</strong> Using the data cancellation key, erase the Y-axis or Z-axis data of the index position.</td>
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<tr>
<td>661</td>
<td>ILLEGAL M CODE (WNo., UNo., SNo.)</td>
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<td></td>
<td><strong>Cause</strong> M195 (tool breakage detection start command code) has been set for the M-code unit or for the manual program mode sequence.</td>
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<td><strong>Action</strong> M195 cannot be executed on MAZATROL programs. Delete that command code from the program.</td>
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<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>662</td>
<td>NO INCLINED PLANE OPTION (WNo., UNo., )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause: An attempt has been made to execute</td>
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<td>the inclined-plane machining program in the</td>
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<td>absence of an inclined-plane machining</td>
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<td>option.</td>
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<td>Action: Inclined-plane machining is not</td>
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<td>possible because of the absence of an</td>
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<td>inclined-plane machining option.</td>
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<td>663</td>
<td>WRONG HEAD ANGLE (WNo., UNo., )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause: 1. A corner-face unit or plane</td>
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<td>inclination measurement has been</td>
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<td>designated in unit data other than</td>
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<td>inclined-plane machining unit data.</td>
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<td>2. Table rotational machining has</td>
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<td>been designated in spite of the fact that</td>
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<td>the facial angle data in the face</td>
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<td>definition sequence is not for the top</td>
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<td>plane.</td>
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<td>3. Calibration measurement has been</td>
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<td>designated for the top plane or an inclined</td>
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<td>plane.</td>
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<td>4. Groove center, hole center, boss center,</td>
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<td>and step width measurements have been</td>
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<td>designated for an inclined plane.</td>
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<td>Action: 1. A corner-face unit and plane</td>
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<td>inclination measurement can be designated</td>
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<td>only for an inclined plane.</td>
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<td>2. Table rotational machining can be</td>
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<td>executed only for the top plane.</td>
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<td>3. Calibration measurement is possible only</td>
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<td>for the side.</td>
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<td>4. Only reference plane measurement and</td>
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<td>plane inclination measurement are possible</td>
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<td>for inclined planes.</td>
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<td>664</td>
<td>3-D UNIT NOT FOUND IN PROGRAM (WNo., UNo.,</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td>SNo.)</td>
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<td></td>
<td>Cause: A 3-D machining unit has been set</td>
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<td>in the program in spite of the fact that</td>
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<td>3-D machining option is not provided.</td>
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<td>Action: Erase the 3-D machining unit from</td>
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<td>the machining program.</td>
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<tr>
<td>665</td>
<td>ILLEGAL DATA IN 3-D UNIT (WNo., UNo., SNo.</td>
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<td>I (L)</td>
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<td>Cause: The 3-D machining unit lacks of</td>
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<td>unit data.</td>
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<td>Action: Review the machining program and</td>
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<td>set necessary data in the 3-D machining</td>
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<td>unit.</td>
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<td>666</td>
<td>PLANE DATA NOT FOUND IN PROGRAM (WNo., UNo.</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause: The 3-D machining unit lacks of</td>
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<td></td>
<td>plane definition data.</td>
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<td>Action: Review the machining program and</td>
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<td>set plane definition data in the 3-D</td>
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<td>machining unit.</td>
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<td>667</td>
<td>CHECK SURFACE DATA NOT FOUND (WNo., UNo., S</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td>Cause: The 3-D machining unit lacks of</td>
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<td></td>
<td>check surface data.</td>
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<td>Action: Review the machining program and</td>
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<td>set check surface data in the 3-D</td>
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<td>machining unit.</td>
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<td>668</td>
<td>ILLEGAL PLANE DATA IN PROGRAM (WNo., UNo.,</td>
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<td>SNo.)</td>
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<td></td>
<td>Cause: The plane definition data in the 3-D</td>
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<td>machining unit is not complete.</td>
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<td>Action: Review the machining program and</td>
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<td></td>
<td>set data in the plane definition data item.</td>
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<td>669</td>
<td>ILLEGAL TOLERANCE DATA INPUT (WNo., UNo., S</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td>Cause: The value of the tolerance parameter</td>
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<td>that has been designated in the tool</td>
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<td></td>
<td>sequence is “0”.</td>
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<td>Action: Check the parameters E67 through E7</td>
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<td>5, and set a value other than “0” in the</td>
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<td></td>
<td>parameter whose setting is “0”.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>670</td>
<td>ILLEGAL SEQUENCE DATA IN PRG. (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The tool sequence in the 3-D machining unit lacks of data.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the machining program and input data to the tool sequence.</td>
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<td>671</td>
<td>ILLEGAL MOVE SURFACE DATA (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The coordinate conversion data in the 3-D machining unit is not complete.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Review the machining program and make the coordinate conversion data complete.</td>
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<td>672</td>
<td>ILLEGAL AREA DATA INPUT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>In the check surface data of the 3-D machining unit, the setting of the maximum value is smaller than that of the minimum value.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Review the check surface data, and make corrections so that the setting of the maximum value is equal to or greater than that of the minimum value for each axis.</td>
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<td>673</td>
<td>FL NUMBER EXCEEDED (3-D UNIT) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>In the ruled-surface unit, the number of FLs is in excess of 20, or in the line- or face-machining unit, the number of defined figures is in excess of 2.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Review the machining program and correct the shape data.</td>
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<tr>
<td>674</td>
<td>NO 5FACE CUTTING OPTION (WNo., UNo., )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>An attempt has been made to execute a five-surface machining program when the five-surface machining option was not present.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Set the five-surface machining option to execute a five-surface machining program.</td>
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<tr>
<td>675</td>
<td>ILLEGAL CUTTING FACE DESIGNATED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>A face that cannot be cut with the selected head has been designated.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Change either the selected face or the head.</td>
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<td>676</td>
<td>ILLEGAL UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>An attempt has been made to execute a five-surface machining program when the five-surface machining option was not present.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Set the five-surface machining option to execute a five-surface machining program.</td>
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<tr>
<td>677</td>
<td>UNREGISTERED HEAD DATA (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>Head data corresponding to the head of the designated head number does not exist.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Review the designated head number.</td>
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<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>678</td>
<td>NO INTERSECTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>In the line- or face-machining unit, the coordinates of the intersection point of figures cannot be obtained because of shortage of, or contradiction, in the free-shape data.</td>
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<td>Action</td>
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<tr>
<td>679</td>
<td>CONNECTING CORNER IMPOSSIBLE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>The figures cannot be connected smoothly at corner R because of contradiction in the data of corner R or in the data of the figures in front and rear of corner R.</td>
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<td>Action</td>
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<tr>
<td>680</td>
<td>NUMBER OF HOLES EXCEEDED (&gt;500)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td>Cause</td>
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<td></td>
<td>The point-machining units include one(s) that has more than 500 holes defined in it.</td>
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<td>Action</td>
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<tr>
<td>681</td>
<td>CORNER R/C DEFINED AT SPT/FPT</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>Corner rounding or corner chamfering has been set at the starting or ending point of a figure when defining figures in the central linear machining, right-hand linear machining, left-hand linear machining, right-hand chamfering or left-hand chamfering units.</td>
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<td>Action</td>
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<tr>
<td>682</td>
<td>ILLEGAL REPEAT FIGURE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>Contradiction presides in the figure rotation or figure shift data that has been set during defining free figures in the line- or face-machining unit.</td>
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<td>Action</td>
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</tr>
<tr>
<td>683</td>
<td>UNDEFINED CORNER</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td>The value of designated corner rounding or corner chamfering is not appropriate.</td>
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<td></td>
<td>Action</td>
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</tr>
<tr>
<td>684</td>
<td>POINT CUTTING PATTERN ERROR</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The point-machining shape definition data is not appropriate.</td>
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<td></td>
<td>Action</td>
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<tr>
<td>685</td>
<td>SQUARE CANNOT BE DEFINED</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>When the shape pattern is “square”, the input data cannot be used to make shape definitions.</td>
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<td></td>
<td>Action</td>
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</tr>
<tr>
<td>686</td>
<td>NO STARTING POINT</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>During input of free-shape data (open-figure data) to the line-machining unit, “?” has been set as the definition of the starting point.</td>
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<td></td>
<td>Action</td>
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</tr>
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</table>

3-61
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>687</td>
<td>NO FINISH POINT</td>
<td>During input of free-shape data (open-figure data) to the line-machining unit, “?” has been set as the definition of the ending point.</td>
<td>Review the machining program and set the coordinates of the ending point of the free shape.</td>
</tr>
<tr>
<td>688</td>
<td>INSUFFICIENT INPUT DATA</td>
<td>The coordinates of the intersection point cannot be calculated since the free-shape input data in the line- or face-machining unit is incomplete.</td>
<td>Review the corresponding shape data and set data that is wanting.</td>
</tr>
</tbody>
</table>
| 689 | INPUT DATA TOO MANY                          | 1. The line- or face-machining unit contains too much free-shape input data, and there is contradiction between overlapping data.  
2. Too many tool sequences have been set for the line- or face-machining unit. | 1. Review the corresponding shape data and erase either one of the overlapping data sets.  
2. Reduce the number of tool sequences.                                              |
<p>| 690 | ILLEGAL RADIUS                               | Contradiction exists in the free-shape data that have been set to define arc in the line- or face-machining units. | Review the corresponding shape data and set correct data.                                  |
| 691 | MOUNT (VALLEY) SHAPE ERROR                   | The second figures (inside figures) are not yet defined in the endmilling-mountain (STEP), pocket milling-mountain or pocket milling-valley unit. | Review the machining program, and define the second shape in the endmilling-mountain (STEP), pocket milling-mountain or pocket milling-valley unit. |
| 692 | MAX POINT NUMBER EXCEEDED (&gt;200)             | The number of points which are necessary to define the shapes designated in the line- or face-machining unit exceeds 200. | Review the machining program, and reduce the number of shapes within one line- or face-machining unit. |
| 693 | NUMBER OF SHAPES TOO LARGE                   | Among the line- or face-machining units is one(s) that contains more shapes than allowable within one unit. | Review the corresponding shape data and check the number of shapes.                        |
| 694 | FIXED FIGURE DESIGNATED ERROR                | Fixed shapes are included in the shape data (open figures) of the central linear machining, right-hand linear machining, left-hand linear machining, right-hand chamfering, left-hand chamfering or endmilling-groove units. | Change the fixed shapes to free ones.                                                      |
| 695 | POINT INSIDE CIRCLE                          | It is not possible to draw a tangent line from point P1 since it is inside the arc.         | Review the machining program and check the free-shaped data.                              |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>696</td>
<td>ILLEGAL DIRECTION (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>“Left” or “right” is set for the crossing point (P), though “up” or “down” should have been set.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the machining program and check the value of the crossing point (P).</td>
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<tr>
<td>697</td>
<td>DATUM &lt;P&gt; REQUIRED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The crossing point (P) is not yet input in spite of the fact that there are more than two points of intersection with the arc.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the machining program and set the crossing point (P).</td>
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<tr>
<td>698</td>
<td>TWO POINTS OVERLAP (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The coordinate values of the start point and end point are the same.</td>
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<tr>
<td><strong>Action</strong></td>
<td>For the pattern of straight line, the data of X/Y are set to exactly the same end point coordinate values as X/Y present on the preceding line of the program; delete these data.</td>
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</tr>
<tr>
<td>699</td>
<td>PARALLEL LINE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The two straight lines are parallel to each other, and thus the coordinates of their intersection point cannot be obtained.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the corresponding shape data and set correct data.</td>
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</tbody>
</table>
### 3-2-8  No. 700 - No. 799, No. 1700 - No. 1799 (MAZATROL program error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
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</thead>
<tbody>
<tr>
<td>700</td>
<td>---</td>
<td>(, , )</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>Action</td>
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</tr>
<tr>
<td>701</td>
<td>DEFINED SHAPE TOO SMALL</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The shape compensation clearance with respect to the shape of the endmilling-top is too large; or the tool diameter with respect to the size of the line-inside machining is too large.</td>
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<td></td>
<td>Action: Change the shape compensation clearance (parameter E13) to an appropriate value; or use a tool of smaller diameter.</td>
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<tr>
<td>702</td>
<td>FIGURE DEFINITION ERROR</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The input shape is contradictory to logic, that is, the radius of the arc, for example, does not agree with the distance from the center.</td>
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<td></td>
<td>Action: Such contradiction usually results from arithmetic errors. Change the radial depth of cut by some micro, or use a tool of smaller diameter.</td>
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<tr>
<td>703</td>
<td>PROCESS DEFINITION ERROR</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
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<tr>
<td></td>
<td>Cause: The machining conditions are incorrect (for example, the radial depth of cut is zero).</td>
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<td></td>
<td>Action: Change the machining conditions to correct ones.</td>
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<tr>
<td>704</td>
<td>TOOL INTERFERENCE</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
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<tr>
<td></td>
<td>Cause: In area machining, the tool diameter with respect to the figure is too large.</td>
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<td></td>
<td>Action: Replace the tool with one that has a smaller diameter; or select the M2 mode endmilling-mountain (STEP) machining pattern with setting bit 7 of parameter E91 if this error occurs in the outside machining endmilling-mountain (STEP).</td>
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<tr>
<td>705</td>
<td>APPROACH POINT ERROR</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The approach point cannot be obtained.</td>
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<td></td>
<td>Action: Reduce the tool diameter, the approach amount (parameters E1, E2) and/or the overlap amount (parameter E21).</td>
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<tr>
<td>706</td>
<td>ILLEGAL FIGURE DATA</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: - The shape has been separated into three segments or more as a result of offsetting. - The inside form does not contain the center of the outside form for outside-related fixed path. - The outside form is concave for inside-related fixed path. - The inside form is not adequate since it contains a concave or an intersection.</td>
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<td></td>
<td>Action: Change the machining pattern (from inversed type to fixed type, for example); or divide the machining shape in advance so that it will not be separated by offsetting.</td>
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<tr>
<td>707</td>
<td>CHAMFER CUTTER INTERFERENCE</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The chamfering tool interferes with the side wall or bottom.</td>
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<td></td>
<td>Action: Use a tool which does not interfere with the side wall or bottom.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>708</td>
<td>BLOCK DATA LIMIT EXCEEDED  (WNo., UNo., SNo.)</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>In the EIA program, the total number of characters within one block is in excess of 248.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Divide the block so that one block contains 248 characters or less.</td>
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<tr>
<td>709</td>
<td>CHECK DEPTH-R (WNo., UNo., SNo.)</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>No automatic calculations of intersection were obtained since there is no or too short a distance between end points of the shape.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Change the radial depth of cut in the tool sequence by some micro.</td>
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<tr>
<td>710</td>
<td>CORNER Rounding CUTTER Dia ERR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The programmed amount of round chamfering differs from the following: ((\text{NOM-}\phi - \text{MIN-}\phi)/2). where (\text{NOM-}\phi) and (\text{MIN-}\phi) are the setting values of the selected tool on the TOOL FILE display.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Select a tool appropriate to the chamfering amount.</td>
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</tr>
<tr>
<td>711</td>
<td>UNIT DATA NOT FOUND (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Unset unit data exists for the unit you have made an attempt to execute.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Set all data.</td>
<td></td>
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<tr>
<td>712</td>
<td>ILLEGAL UNIT DATA (WNo., UNo., SNo.)</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>Sequence data for the unit you have made an attempt to execute does not match to the unit data.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Delete the sequence data, and then set correct sequence data.</td>
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<tr>
<td>713</td>
<td>SEQUENCE DATA NOT FOUND (WNo., UNo., SNo.)</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>No sequence data exists for the unit you have made an attempt to execute.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Set sequence data.</td>
<td></td>
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<tr>
<td>714</td>
<td>ILLEGAL SEQUENCE DATA (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Data out of the allowable setting range exists in the sequence data of the unit you have made an attempt to execute.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Correct the sequence data.</td>
<td></td>
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<tr>
<td>715</td>
<td>ILLEGAL CUTTING POINT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The specified infeed point is outside the profile of the workpiece (approximate workpiece shape designated by common unit).</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Move the infeed point into the profile of the workpiece.</td>
<td></td>
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</tr>
<tr>
<td>716</td>
<td>ILLEGAL CUTTING START POINT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The relative position of the starting or ending point specified by the sequence data with respect to the specified infeed point is not appropriate.</td>
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<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Change the position of the starting or ending point of the sequence data, or change the position of the infeed point.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>717</td>
<td>SHAPE EXCEEDS MATERIAL SIZE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The starting or ending point is outside the profile of the workpiece (approximate workpiece shape specified by common unit).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Change the starting or ending point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>718</td>
<td>CUTTING DIRECTION NOT DEFINED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The direction of machining (forward/backward) cannot be determined using the specified infeed point and sequence data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Change the position of the starting or ending point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>719</td>
<td>REVERSE SHAPE CONTOUR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Part of the defined shape is opposite in direction of machining with respect to the reference axis movement direction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the position of the starting or ending point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>720</td>
<td>DOUBLE SHAPE CONTOUR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The defined workpiece shape has overlaps.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the position of the starting or ending point.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>721</td>
<td>ILLEGAL RADIUS (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Arc-drawing data you have specified is illegal. That is, the relationship between the starting point, ending point, and radius of the arc is incorrect. It is impossible to define an arc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the starting-point data, ending-point data, or radius data of the arc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>722</td>
<td>ILLEGAL CORNER DEFINITION (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>There are the following errors related to the designated corner C data: &lt;BAR, CPY, CORNER&gt; The arc length of the block present before or after corner C is smaller than that of corner C. &lt;T. GROOV&gt; Added corner C is outside the workpiece profile.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct either the length of corner C or the sequence data set before or after corner C.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>723</td>
<td>EXCEEDS NUMBER OF SHAPES (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Defined shape of machining or of the workpiece is too complicated to be processed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Simplify the shape of the machining or of the workpiece.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>724</td>
<td>EXCEEDS NUMBER OF VALLEY SHAPES (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The total number of valleys in the machining shape is in excess of 16.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Divide the machining shape in multiple units.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>725</td>
<td>ILLEGAL COMMON DATA (RADIAL) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>OD-MAX and ID-MIN in the common unit do not satisfy the following condition: OD-MAX (&gt;) ID-MIN (\geq) 0</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set correct data to OD-MAX, or ID-MIN.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>726</td>
<td>ILLEGAL COMMON DATA (AXIAL) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>LENGTH, WORK FACE and FIN-LENGTH do not satisfy the following condition: LENGTH (&gt;) WORK FACE + FIN-LENGTH (&gt;) 0</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set correct data to LENGTH, WORK FACE and FIN-LENGTH.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>727</td>
<td>MATERIAL SHAPE CROSSING (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>There is a data overlap between the inside diameter side (IN) and outside diameter side (OUT) of the workpiece shape which has been designated in the MATERIAL unit.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Change the IN or OUT shape data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>728</td>
<td>EXCESSIVE FINISH ALLOWANCE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The area to be rough-cut does not exist since the designated finishing allowance is larger than the shape defined by the sequence data.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Either change the finishing allowance or cancel rough-cutting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>729</td>
<td>ILLEGAL SHAPE DESIGNATED (CNR) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>In the CORNER unit data, the relationship between the starting point and the ending point is wrong.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set the correct data to SPT and FPT.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>730</td>
<td>ILLEGAL SHAPE DESIGNATED (EDG) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>In the FACING unit data, the relationship between the starting point and the ending point is wrong.</td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set the correct data to SPT and FPT.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>731</td>
<td>ILLEGAL NUM. OF PATHS (THR) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The designated number of cutting times for #0, #3 thread type is less than 3.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Change the number of cutting times to 3 or more, or change the thread type.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>732</td>
<td>ACCELERATION DISTANCE EXCEED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The calculated distance of threading acceleration is in excess of the allowable value.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Change the related parameter setting value or reduce the peripheral velocity to its minimum permissible value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>733</td>
<td>ILLEGAL SHAPE DESIGNATED (GRV) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>In the T. GROOV unit data, the relationship between the starting point and the ending point is wrong.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set the correct data to SPT and FPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
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<td>--------------</td>
</tr>
<tr>
<td>734</td>
<td>ILLEGAL SHAPE EXCEEDS MTRL SIZE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>For machining of multiple grooves, the second and subsequent grooves are outside the workpiece profile defined by common unit.</td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce the number of grooves.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>735</td>
<td>ILLEGAL DESIGNATED TL WID (GRV) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The designated tool width does not match to the groove shape specified in the T. GROOV unit.</td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designate some other tool, or correct the width of the designated tool.</td>
<td></td>
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</tr>
<tr>
<td>736</td>
<td>ILLEGAL OVERLAP (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>The parameter-set amount of grooving overlap is larger than the width or diameter of the designated tool.</td>
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<td></td>
<td>Action</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Either designate some other tool, correct the width or diameter of the designated tool, or change the parameter setting (TC75).</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>737</td>
<td>ILLEGAL DRILLING DIRECTION (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the T-DRILL or T-TAP unit data, the relationship between the starting point and the ending point is wrong.</td>
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<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set the correct data to SPT-Z and FPT-Z.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>738</td>
<td>CORNER (R/C) DESIGNATED OVERLAP (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the unit (BAR, CPY, etc.), different types of corners (R and C) have been designated for portions that are identical in shape.</td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check the designated corner portions and delete one of the corners.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>739</td>
<td>ILLEGAL FINISHING ALLOWANCE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the #0, #1 type of THREAD unit data, the following condition exists:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(Finishing allowance) &gt; (First depth-of-cut/4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculated from the height (HGT) and the number of times (NUMBER) in unit data.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Specified by parameter TC78.</td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change either the thread height or the setting of parameter TC78.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>740</td>
<td>ILLEGAL ANGLE IN FIRST SEQUENCE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The relationship between the thread shape and threading angle that are defined by the first sequence data of the THREAD unit is incorrect.</td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change the threading angle, or change the coordinates of the starting or ending point of the first sequence.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>741</td>
<td>ILLEGAL THREAD ANGLE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the machining type that requires the designation of a threading angle, the following condition is not satisfied. (Tool tip angle) ≤ (Threading angle)</td>
<td></td>
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<tr>
<td></td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change either the threading angle or the data of the tool to be used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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<td>---------</td>
</tr>
<tr>
<td>742</td>
<td>ILLEGAL THREAD HEIGHT</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>743</td>
<td>INTERSECTION NOT FOUND</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>744</td>
<td>DATA MISSING (INTERSECTION)</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>745</td>
<td>INTERSECTION CALCULATE IMPOSS.</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>746</td>
<td>NO DEPTH OF CUT INFO.</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>747</td>
<td>NO CHIP CUTTING CYCLE OPTION</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>748</td>
<td>CUT AREA EXCEEDED</td>
<td>(WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
</tbody>
</table>

### Cause of ALARM 3-69

#### 742 ILLEGAL THREAD HEIGHT

In the THREAD unit data, the following condition is not satisfied.

(Finishing allowance) ≤ (Thread height)

Designated in the unit data.

Set using parameter TC78.

**Action**

Change the thread height or the setting of parameter TC78.

#### 743 INTERSECTION NOT FOUND

No automatic calculations of intersection were obtained since there are shape sequence data disparities.

**Action**

Correct the shape sequence data.

#### 744 DATA MISSING (INTERSECTION)

No automatic calculations of intersection were obtained since there are lack of data to automatically calculate a point of intersection.

**Action**

Correct the unit data or the sequence data.

#### 745 INTERSECTION CALCULATE IMPOSS.

No automatic calculations of intersection were obtained since there are illegal data in the program.

**Action**

Correct the unit data or the sequence data.

#### 746 NO DEPTH OF CUT INFO.

A cutting depth cannot be determined for the tool since the DEPTH or CUT ANGLE data item on the TOOL DATA display is left blank.

**Action**

Set data in DEPTH or CUT ANGLE, or use some other tool.

#### 747 NO CHIP CUTTING CYCLE OPTION

Executing the chip-cutting cycle program has been attempted in spite of the chip-cutting cycle option being absent.

(3 or 4 has been assigned to PAT. in the roughing tool sequence.)

**Action**

The chip-cutting cycle option must be present before the chip-cutting cycle program can be executed.

(Assign either 0, 1, or 2 to PAT. in the roughing tool sequence.)

#### 748 CUT AREA EXCEEDED

1. A normal path cannot be created since the cutting area is wider than twice the depth of cut per pass.
2. When the cutting area is equal to the clearance, a normal path cannot be created since the cutting area is wider than the depth of cut per pass.
3. A normal path cannot be created since the cutting area overlaps the deceleration distance and is wider than the depth of cut per pass.

**Action**

1. Increase the cutting depth to be set in the tool sequence, or narrow down the cutting area.
2. Increase the cutting depth to be set in the tool sequence, or reduce the clearance.
3. Two overlapping areas must not be present. Narrow down PRE-DIA (deceleration distance) to be set in the tool sequence, or narrow down the cutting area, or increase the cutting depth to be set in the tool sequence.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>749</td>
<td>——</td>
<td>——</td>
<td>——</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>750</td>
<td>CURVE DEFINITION ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>751</td>
<td>CURVE DEFINITION ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>752</td>
<td>DESIGNATED AREA DATA IMPOSSIBLE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>753</td>
<td>SMALL TOOL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Blue</td>
</tr>
<tr>
<td>754</td>
<td>LARGE TOOL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>755</td>
<td>R DIRECTION PITCH SMALL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>756</td>
<td>Z DIRECTION PITCH SMALL (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>

**Cause**

- **749**

- **750**
  - A curved surface that cannot be machined has been defined.

- **751**
  - A curved surface that cannot be machined has been defined.

- **752**
  - The check surface values are incorrect.
    1. For rough-machining 1 or 2: Check surface Z min. ≥ material height
    2. For finishing: Check surface Z min. > initial Z
    3. Check surface X min. > X max., or Y min. > Y max., or Z min. > Z max.

- **753**
  - In rough-machining 2, the tool diameter is extremely small in comparison with the dimensions of the defined 3-D figure.

- **754**
  - Tool interference has occurred.

- **755**
  - In rough-machining 2, the pitch in the radial direction is extremely small in comparison with the dimensions of the defined 3-D figure.

- **756**
  - In rough-machining 2, the pitch in the Z direction is extremely small in comparison with the dimensions of the defined 3-D figure.

**Action**

- **749**

- **750**
  - No corrective actions can be taken against this error; define a curved surface that can be machined.

- **751**
  - No corrective actions can be taken against this error; define a curved surface that can be machined.

- **752**
  - Set the check surface values as follows:
    1. For rough-machining 1 or 2: Check surface Z min. < material height
    2. For finishing: Check surface Z min. ≤ initial Z
    3. Check surface X min. ≤ X max., and Y min. ≤ Y max., and Z min. ≤ Z max.

- **753**
  - Use tools whose diameters are no less than 1/100 of the distance between the maximum and minimum dimensions of the 3-D figure.

- **754**
  - Set the approach path and the tool size so that the interference does not occur.

- **755**
  - Set the radial-direction pitch to a value no less than 1/200 of the distance between the maximum and minimum dimensions of the 3-D figure.

- **756**
  - Set the Z-direction pitch to a value no less than 1/250 of (material height – height of the Z bottom of the 3-D figure).
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>757</td>
<td>CURVE DEFINITION LARGE (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
| **Cause** | 1. For rough-machining 2 with designation of workpiece size, the dimensions of the defined figure are larger than those of the workpiece.  
2. For rough-machining 2, a material height smaller than \((\text{height of the Z bottom of the 3-D figure}) + (\text{height of a machining area outside the figure})\) [parameters E84, E89] has been set irrespective of designating the offset amount or the workpiece size. | | | | |
<p>| <strong>Action</strong> | Change the E84 and E89 parameter settings so that: for the offset amount designation, ((\text{height of the bottom of the 3-D figure}) + E84 &lt; \text{material height}) , and; for the workpiece size designation, ((\text{height of the bottom of the 3-D figure}) + E89 &lt; \text{material height}). | | | | |
| 758 | INITIAL POINT SET ERROR (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | In rough-machining 1 or 2, initial (Z \leq \text{material height}). | | | | |
| <strong>Action</strong> | Change settings to give initial (Z &gt; \text{material height}). | | | | |
| 759 | WPC UNIT NOT FOUND (MILL &amp; TURN) (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | The workpiece shape cannot be defined since, in a program of workpiece scheme (MILL &amp; TURN) with WPC setting, no WPC unit is prepared before machining units. | | | | |
| <strong>Action</strong> | Create a WPC unit before the machining units and then enter the correct data. | | | | |
| 760 | NO T. CENTER POINT IN WPC UNIT (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | In a program of workpiece scheme (MILL &amp; TURN) with WPC setting, the workpiece origin specified in the WPC unit which precedes C-axis point/line machining or turning units does not correspond to the axis of turning. | | | | |
| <strong>Action</strong> | Before creating C-axis machining or turning unit, create a WPC unit with reference to the axis of turning. | | | | |
| 761 | HEAD ANGLE INCORRECT (C-AXIS) (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | In a program of workpiece scheme (MILL &amp; TURN) with WPC setting, the machining section specified in a C-axis point/line machining or turning unit does not correspond to the B-axis angle specified in an index unit. | | | | |
| <strong>Action</strong> | Before creating C-axis machining or turning unit, create an index unit to specify the B-axis angle appropriate for the section to be machined. | | | | |
| 762 | PROGRAM IS NOT MILL &amp; TURN TYPE (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | It was attempted to set a turning or C-axis point/line machining unit in a program of initial-point scheme (ONLY MILL). | | | | |
| <strong>Action</strong> | Delete the turning or C-axis point/line machining unit, or set it in a program of workpiece scheme (MILL &amp; TURN) with WPC setting. | | | | |
| 763 | START PROCESS ILLEGAL (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | It was attempted to execute restart operation from, or single-process operation of, an unsuitable unit. | | | | |
| <strong>Action</strong> | Specify an appropriate unit for the desired mode of operation. | | | | |
| 764 | MAIN PRG/SUB PRG TYPE MISMATCH (WNo., UNo., SNo.) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | There are programming units of workpiece scheme with WPC settings of and of the same scheme with Z-offset setting prepared in one and the same program. | | | | |
| <strong>Action</strong> | Delete the incompatible units to create a program of the required scheme. | | | | |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>765</td>
<td>Z-OFFSET NOT FOUND (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The indispensable Z-offset is not yet set for a program of workpiece scheme (MILL &amp; TURN) with Z-offset setting.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Set the Z-offset item externally in the setup data page.</td>
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<tr>
<td>766</td>
<td>MAXIMUM NO. OF LAYOUTS EXCEEDED (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>It was attempted to run a program which contains a process with more than 4000 layout data items. The number of repetitions exceeds 9999990 for a program (CONTI. = 1 in the END unit) without workpiece transfer unit.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Reduce the number of layout data items for one process to no larger than 4000. Modify the program to reduce the number of repetitions to no larger than 9999990.</td>
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<tr>
<td>767</td>
<td>ILLEGAL ESCAPE TOOL No. (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The setting in the parameter for the retraction tool is not correct.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the parameter concerned.</td>
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</tr>
<tr>
<td>768</td>
<td>4 AXIS MACHINING PROGRAM ERROR (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The setting for simultaneous machining is not correct. (Example: Only the upper or the lower turret is specified for simultaneous machining.)</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the program and perform corrections as required (e. g. to change the turret to be used for the particular tool sequence of the unit concerned).</td>
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<tr>
<td>769</td>
<td>ILLEGAL TOOL DIRECTION/SPDL ROT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The specification of the direction of turning spindle rotation differs between those tools on the upper and lower turrets which are to be used for simultaneous machining.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Select another tool, or change the specification in question, on either side for the same direction of turning spindle rotation as for the other tool.</td>
<td></td>
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</tr>
<tr>
<td>770</td>
<td>FIN LEN ERROR (CHECK COM UNIT) (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>For the execution of a composite program on a MULTIPLEX machine: The settings in the common unit do not satisfy the following condition: ( \text{FIN-LENGTH} \leq \text{LENGTH} - \text{WORK FACE} ).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Reduce the FIN-LENGTH setting to satisfy the above condition.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>771</td>
<td>ILLEGAL LOW TUR COMMON UNIT (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>For a MULTIPLEX machine: A unit of machining with the lower turret (or including a command for its retraction) is created within a program whose common unit declares (under LOW TURR) that the lower turret is “not used”.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Change over the LOW TURR setting, or modify the machining unit concerned in the turret selection.</td>
<td></td>
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</tr>
<tr>
<td>772</td>
<td>NO HEAD UNIT IN PROGRAM (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>For the execution of a composite program on a MULTIPLEX machine: Machining units are not preceded by a head selection unit.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Set a HEAD unit to specify the turning spindle to be used for the succeeding machining units.</td>
<td></td>
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</tr>
<tr>
<td>773</td>
<td>TRANSFER UNIT IN PROGRAM (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>For the execution of an independent program on a MULTIPLEX machine: A workpiece transfer unit (TRANSFER) is erroneously set in a program to be run independently on either HD side.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Delete the inappropriate TRANSFER unit from the program.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>774</td>
<td>HEAD UNIT IN PROGRAM</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>For the execution of an independent program on a MULTIPLEX machine: A head selection unit (HEAD) is erroneously set in a program to be run independently on either HD side.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Delete the inappropriate HEAD unit from the program.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>775</td>
<td>TOOL CANNOT PERFORM FACING</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>For tool selection on a turret-type tool-post: The section to be machined by the selected tool differs from the corresponding setting in the unit data line.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Change the setting in the unit data line with respect to the tool, or select another tool as required.</td>
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</tr>
<tr>
<td>776</td>
<td>NO Y-AXIS</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A Y-axis machining unit is created for a turret not correspondingly executed.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Delete the inappropriate machining unit from the program, or describe the particular machining process without using the Y-axis control.</td>
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</tr>
<tr>
<td>777</td>
<td>RESTART IMPOS. LO-TURRET</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The restarting function has been started from the balanced-cutting with the lower turret.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Specify the upper turret to execute the restarting function from balanced cutting.</td>
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<tr>
<td>778</td>
<td>SINGLE PROCE. IMPOS. LO-TURRET</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The single-process function has been applied to the balanced-cutting with the lower turret.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Specify the upper turret to execute the single-process function for balanced cutting.</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td>780</td>
<td>APPROACH PATH INTERFERENCE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
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<tr>
<td></td>
<td>The programmed shape of the approach path and/or retraction path interferes with the workpiece (programmed machining shape + machining allowance).</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Reduce the amount of approach and/or the amount of overlap or the tool diameter.</td>
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<tr>
<td></td>
<td>Or specify another position as the approach point.</td>
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</tr>
<tr>
<td>781</td>
<td>DBL SPDL OPER ILLEGAL TUR ASIGN</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>In a 2 WORKPC unit the selection of the turret in the tool sequence does not correspond to the selection of the spindle (SP1 or SP2) in the unit data line.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Select the correct turret in the tool sequence data in question.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>782</td>
<td>DBL SPDL OPER NO TRANS UNIT</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>The 2 WORKPC machining unit is not preceded by a workpiece transfer unit.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Set a TRANSFER unit as required.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>783</td>
<td>DBL SPDL OP ILLEGAL SIMUL OP (WNo., UNo., SNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>

**Cause**
There is an instruction of simultaneous machining given in the flow of “2 Workpiece” machining.

**Action**
Clear the tool sequence concerned of the instruction of simultaneous machining.

| 784 | DBL SPDL OP ILLEGAL BALANCE CUT (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
There is an instruction of balanced cutting given in the flow of “2 Workpiece” machining.

**Action**
Clear the tool sequence concerned of the instruction of balanced cutting.

| 785 | DBL SPDL OPER ILLEGAL TUR ESC (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
There is an instruction of retraction given in the flow of “2 Workpiece” machining.

**Action**
Clear the tool sequence concerned of the instruction of retraction.

| 786 | DBL SPDL OPER ILLEGAL MEASUREMENT (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
There is a measurement unit inserted in the flow of “2 Workpiece” machining.

**Action**
Temporarily cancel the mode of “2 Workpiece” machining to execute the required in-process measurement.

| 787 | DBL SPDL OPER ILLEGAL TRANSFER (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
There is a workpiece transfer unit inserted in the flow of “2 Workpiece” machining.

**Action**
Temporarily cancel the mode of “2 Workpiece” machining to execute the required workpiece transfer.

| 788 | DBL SPDL OPER ILLEGAL HEAD UNIT (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
The head selection unit in the mode of “2 Workpiece” machining has another setting than SINGLE under TYPE.

**Action**
Temporarily cancel the mode of “2 Workpiece” machining to execute synchronous rotation of both spindles (by selecting SYNCH.).

| 789 | DBL SPDL OPER UNIT ERROR (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
For a flow of “2 Workpiece” machining an end instruction is given before the start instruction. For a flow of “2 Workpiece” machining a restart instruction is given before the end instruction.

**Action**
Set the “2 Workpiece” machining units in correct order.

| 790 | ILLEGAL BALANCE CUT (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
Only a single line of tool sequence is created for balanced cutting.

**Action**
Add another tool sequence line to use the other turret symmetrically for balanced cutting.

| 791 | ILLEGAL CUTTING SPEED (WNo., UNo., SNo.) | B             | I (L)          | O (S)              | Red (Blue) |

**Cause**
The peripheral speed data set in the tool sequence contains an invalid value.

**Action**
Set correct peripheral speed data in the tool sequence.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>792</td>
<td>ILLEGAL FEEDRATE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The feed data set in the tool sequence contains an invalid value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Set a correct feed data in the tool sequence.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>793</td>
<td>ILLEGAL MILL AXIS RPM</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
| Cause | If DRILL is selected as the turning drilling unit tool:  
1. The milling spindle speed is less than the turning spindle speed when the rotation direction set in the tool sequence is the same as that of the milling spindle.  
2. The milling spindle speed has exceeded the maximum rotation speed (SA1 to SA8) when the rotation direction set in the tool sequence is the same as that of the milling spindle.  
3. The milling spindle speed is set to a negative value when the rotation direction set in the tool sequence is opposite to that of the milling spindle. |
| Action | 1. Reduce the spindle speed for the turning spindle.  
2. Set the milling spindle speed to a value lower than its maximum spindle speed.  
3. Increase the spindle speed for the turning spindle. |
| 794 | HEAD ANGLE INCORRECT | B | I (L) | O (S) | Red (Blue) |
| Cause | When M Pro system is used in ATC (BA47 = 0) turret type machines with B-axis (BA48 = B), the direction of “part to be machined” set with the turning drilling unit does not match with the B-axis angle set with the index unit. |
| Action | Reset the B-axis angle for the index unit defined prior to setting the turning drilling unit to either 0 or 180 degrees. |
| 795 | — | — | — | — | — |
| Cause | — | — | — | — | — |
| Action | — | — | — | — | — |
| 796 | NO LO-TURRET MAZATROL OPTION | B | I (L) | O (S) | Red (Blue) |
| Cause | An attempt was made to execute a MAZATROL program with lower turret control enabled although the MAZATROL lower turret control option is unavailable. |
| Action | The MAZATROL program cannot be executed because the MAZATROL lower turret control option is unavailable. |
| 797 | BARRIER CANCEL ON | B | I (L) | O (S) | Red (Blue) |
| Cause | The "Cancel Barrier" setting is enabled with the Prohibit Startup when Barrier is Disabled function enabled. |
| Action | Disable the "Cancel Barrier" setting. |
| 798 | JAW NO NOT FOUND | B | I (L) | O (S) | Red (Blue) |
| Cause | The jaw No. setting does not exist although the Prohibit Startup when Barrier is Disabled function is enabled. |
| Action | Set the jaw No. |
| 799 | — | — | — | — | — |
| Cause | — | — | — | — | — |
| Action | — | — | — | — | — |
### 3-2-9 No. 800 - No. 899, No. 1800 - No. 1899 (EIA/ISO program error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>————</td>
<td>( , , )</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Cause</td>
<td>———</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>———</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 801 SIMULTANEOUS AXIS EXCEEDED
(WNo., NNo., BNo.)

**Cause**
The number of axis motion commands given in one block is in excess of the number of simultaneously controllable axes.

**Action**
Modify the program with respect to the specification concerned.

#### 802 ILLEGAL AXIS NAME
(WNo., NNo., BNo.)

**Cause**
1. The axis address names assigned in the program are different from those which have been parametrized.
2. Bit 4 of parameter M17 for the shaping control axis (the axis specified in parameter K3) is set to ‘0’ (linear axis).

**Action**
1. Correct the axis address names in the program.
2. Set bit 4 of parameter M17 for the shaping control axis (the axis specified in parameter K3) to ‘1’ (rotational axis).

#### 803 DIVIDED COMMAND ERROR
(WNo., NNo., BNo.)

**Cause**
A distance of axis movement that cannot be divided by the preset command unit has been assigned.

**Action**
Review the program.

#### 804 PARITY H ERROR
(WNo., NNo., BNo.)

**Cause**
On paper tape, the number of holes per character is even for EIA code or odd for ISO code.

**Action**
Check the paper tape and the tape reader.

#### 805 PARITY V ERROR
(WNo., NNo., BNo.)

**Cause**
On paper tape, the number of holes per block is odd.

**Action**
Make even the hole quantity per block on the paper tape; or turn off the bit 1 of the parameter TAP25 used for parity-V selection.

#### 806 ILLEGAL ADDRESS
(WNo., NNo., BNo.)

**Cause**
An address that is not covered in the specifications has been used.

**Action**
Check and correct the corresponding address in the program, and also check the specifications.

#### 807 ILLEGAL FORMAT
(WNo., NNo., BNo.)

**Cause**
The format in which the data has been designated in the program is incorrect.

**Action**
Review the program.

#### 808 MIS-SET G CODE
(WNo., NNo., BNo.)

**Cause**
A G-code that is not covered in the specifications has been designated.

**Action**
Check and correct the corresponding G-code address in the program.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>809</td>
<td>ILLEGAL NUMBER INPUT (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The assigned data for the address is out of the allowable setting range.</td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Review the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>810</td>
<td>PROGRAM END NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>“EOR” has been detected during tape or memory operation.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>For the main program, set M02 or M30 at the end of the program. For subprograms, set M99 at the end of the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>811</td>
<td>ILLEGAL O/N NUMBER (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Zeros have been designated as program or sequence numbers.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Delete zero from N (sequence) or O (program) numbers of the program; or change O-No. (program numbers) to between 1 and 99999999, N-No. (sequence numbers) to between 1 and 99999.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>812</td>
<td>ERROR IN BUFFER BLOCK (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An error has been found to exist in the pre-read block during execution of tool diameter offset.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Review the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>813</td>
<td>INCH/METRIC OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The inch/metric selection command has been issued using the G-code although a G-code inch/metric selection function is not provided.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>814</td>
<td>INTERPOLATION OVERFLOW (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The specified moving distance is too long.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Specify a shorter distance.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>815</td>
<td>G60 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Program command G60 has been designated although a unidirectional positioning function is not provided.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Check the software specifications and change the program command G60 to G00.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>816</td>
<td>FEEDRATE ZERO (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The feedrate command has not been input.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Specify feedrate F for the movement command. (Since modal move command G01 is automatically set at power-on, axis movement in the modal mode is started by input of a move command, even if G01 is not designated in the program).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>817</td>
<td>INCORRECT ARC DATA (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The relationship between the starting and ending points of the arc and the center of the arc is not appropriate.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Check the values of the starting/ending points and the address values of center of the arc in the program, and check the address values for the correct direction (minus or plus).</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>818</td>
<td>MISSING CENTER (NO DATA) (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For arc interpolation by R designation, the coordinates of the center of the arc cannot be calculated.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Correct the value of each address in the program.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>819</td>
<td>HELICAL OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<tr>
<td></td>
<td>The helical interpolation command has been issued although such an interpolation function is not provided.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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</tr>
<tr>
<td></td>
<td>Check the specifications, and if such an interpolation function is not available, correct the data of the block in which the arc interpolation command has been issued with designation of three axes.</td>
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<td></td>
</tr>
<tr>
<td>820</td>
<td>G02.1, G03.1 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The spiral interpolation command (G02.1 or G03.1) has been issued although such an interpolation function is not provided.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delete the G02.1 or G03.1 command.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>821</td>
<td>G07 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>The virtual-axis command (G07) has been issued although there are not virtual-axis specifications.</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the specifications, and then change the G07 command.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>822</td>
<td>ILLEGAL MODAL</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A G-code command has been specified in illegal modal data.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>823</td>
<td>G17 - G19 COMMAND IN M98 (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I</td>
<td>O</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A plane selection command (G17, G18 or G19) has been issued during figure rotation.</td>
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</tr>
<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delete the plane selection command (G17, G18 or G19) from the figure rotation subprogram.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>824</td>
<td>G17 - G19 COMMAND IN G68 (WNo., NNo., BNo.)</td>
<td>E</td>
<td>I</td>
<td>O</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A plane selection command (G17, G18 or G19) has been specified in the coordinates rotation command (G68).</td>
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<tr>
<td></td>
<td><strong>Action</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>IF G68 has been issued, execute the coordinates rotation cancel command (G69) before specifying the plane selection command (G17, G18 or G19).</td>
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</tr>
<tr>
<td>825</td>
<td>G17 - G19 COMMAND IN G38 - G42 (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A plane selection command (G17, G18 or G19) has been specified during tool diameter offset (G41 or G42).</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Specify the plane selection command after the tool diameter offset command has been canceled by G40.</td>
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<tr>
<td>826</td>
<td>G95 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The synchronous feed command (G95) has been specified although such feed specifications are not provided.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>After checking the specifications, change the synchronous feed command (G95) to the feed-in-minutes command (G94). Also change the F command value.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>827</td>
<td>F0 COMMAND IN G02, G03</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The F 1-digit rapid-feed command (F0) has been specified during arc interpolation (G02 or G03).</td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Since rapid feed cannot be ordered for arc interpolation, specify an F 1-digit command other than F0. Specify G0 or G1 if the type of interpolation is not arc interpolation.</td>
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<tr>
<td>828</td>
<td>NO AUTO CORNER OVERRIDE OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The automatic corner override command (G62) has been specified although such an override function is not available.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications, and delete the G62 command from the program.</td>
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<tr>
<td>829</td>
<td>ILLEGAL 2ND M CODE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The secondary auxiliary function address that has been specified in the program is different from the corresponding address that has been parameterized.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Check and correct the secondary auxiliary function address that has been specified in the program.</td>
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<tr>
<td>830</td>
<td>G96 OPTION NOT FOUND</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The constant circumferential speed command (G96) has been specified although such specifications are not provided.</td>
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<td></td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Check the specifications and change the constant circumferential speed command (G96) to the speed command (rpm).</td>
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</tr>
<tr>
<td>831</td>
<td>G45,46,47,48 OPTION NOT FOUND</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A tool-position compensation command (G45 to G48) has been specified although such specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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<td></td>
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</tr>
<tr>
<td>832</td>
<td>G45 - G49 COMMAND IN G98</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Tool-position compensation has been specified during figure rotation or coordinates rotation.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the program.</td>
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<td></td>
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</tr>
<tr>
<td>833</td>
<td>1/4, 3/4 CIRCLES IN G45 - G48</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An arc command that is not available for tool-position compensation has been specified.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the program.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>834</td>
<td>G40, G41, G42 OPTION NOT FOUND</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A tool diameter offset command (G41 or G42) has been specified although such specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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</tr>
<tr>
<td>835</td>
<td>G41, G42, FORMAT ERROR</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A compensation command (G40, G41, G42) has been specified during the arc mode (G02 or G03 command).</td>
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<tr>
<td><strong>Action</strong></td>
<td>Set either the linear command (G01) or the rapid-feed command (G00) into the compensation command block or the cancellation block. (That is, set the modal status to linear interpolation).</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>836</td>
<td>NO INTERSECTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td><strong>Cause</strong></td>
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<td></td>
<td>In tool diameter offset (G41 or G42), the coordinates of the intersection point existing when a block was skipped in processing of interference blocks cannot be calculated.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program.</td>
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<tr>
<td>837</td>
<td>TOOL OFFSET INTERFERENCE ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An interference error has occurred during execution of tool diameter offset (G41 or G42).</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program.</td>
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<tr>
<td>838</td>
<td>3-D OFFSET OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td><strong>Cause</strong></td>
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<td></td>
<td>The three-dimensional compensation command has been designated although such compensation specifications are not provided.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the specifications.</td>
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<tr>
<td>839</td>
<td>ILLEGAL OFFSET No. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A compensation command (G41 or G42) has been designated without a compensation number (D); or the compensation number is larger than the maximum number of sets of compensation numbers available in the specifications.</td>
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<tr>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the maximum available number of sets of compensation numbers, and designate a compensation number smaller than that.</td>
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<tr>
<td>840</td>
<td>CANNED CYCLE OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td><strong>Cause</strong></td>
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<td></td>
<td>A fixed-cycle G-code has been designated although fixed-cycle specifications are not provided.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the specifications and correct the program.</td>
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<tr>
<td>841</td>
<td>DESIGNATED TOOL NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I</td>
<td>O</td>
<td>Red</td>
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<tr>
<td><strong>Cause</strong></td>
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<td></td>
<td>The tools that are not yet registered on the TOOL DATA display are specified using T-code command in an EIA/ISO program.</td>
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<tr>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the program and register the necessary tools on the TOOL DATA display.</td>
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<tr>
<td>842</td>
<td>SUB PROGRAM NESTING EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
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</tr>
</tbody>
</table>
| | 1. The total number of sequential calls of subprogram has exceeded eight.  
| | 2. Executing a program that includes an “M99” command has been attempted in the direct operation mode of HD, IC memory card or the Ethernet.  
| | 3. Invoking a program stored within the HD, IC memory card or the host has been attempted from the HD, IC memory card or the host. |
| **Action** | | | | | |
| | 1. Check the number of subprogram calls, and correct the program so that the number of calls does not exceed eight.  
| | 2. Do not include an “M99” command in the main program to be executed in the direct operation mode.  
<p>| | 3. Do not invoke any subprograms of the HD, IC memory card or host from the main program of the HD, IC memory card or the host. |
| 843 | DESIGNATED SNo. NOT FOUND (WNo., NNo., BNo.) | B | K | S | Blue |
| <strong>Cause</strong> | | | | | |
| | The sequence number for subprogram call, for return from a subprogram or for the GOTO designation is not yet set. |
| <strong>Action</strong> | | | | | |
| | Set the sequence number in the appropriate block. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
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</thead>
<tbody>
<tr>
<td>844</td>
<td>PROGRAM No. NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>K</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: An attempt was made to call a subprogram which was not yet registered.</td>
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<td></td>
<td>Action: Register the subprogram.</td>
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<tr>
<td>845</td>
<td>ILLEGAL VARIABLE COMMAND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>K</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: A variables number has been designated although variables number (#OO) specifications are not provided.</td>
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<td></td>
<td>Action: Check the specifications.</td>
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</tr>
<tr>
<td>846</td>
<td>DESIGNATED NUMBER NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>K</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: The designated variables number is larger than the maximum variables number permitted by the specifications.</td>
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<td></td>
<td>Action: Check the specifications and the variables numbers in the program.</td>
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<tr>
<td>847</td>
<td>NO &quot;=&quot; CODE IN PROGRAM (WNo., NNo., BNo.)</td>
<td>B</td>
<td></td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: &quot;=&quot; was not designated in the definition of a variable.</td>
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<td></td>
<td>Action: Set &quot;=&quot; in the variables definition.</td>
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<tr>
<td>848</td>
<td>M98 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: A figure rotation command has been designated although figure rotation specifications are not provided.</td>
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<tr>
<td></td>
<td>Action: Check the specifications.</td>
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<tr>
<td>849</td>
<td>FIGURE ROTATE NESTING EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>K</td>
<td>O</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Cause: One figure rotation command has been designated during execution of another such command.</td>
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<td></td>
<td>Action: Check the program.</td>
<td></td>
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<tr>
<td>850</td>
<td>G68 AND M98 COMMANDS SAME BLOCK (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause: A figure rotation command and a coordinates rotation command are designated at the same time.</td>
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<td></td>
<td>Action: Check the program.</td>
<td></td>
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<tr>
<td>851</td>
<td>G68 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
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<td></td>
<td>Cause: The coordinates rotation command (G68) has been designated although coordinates rotation specifications are not provided.</td>
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<tr>
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<td>Action: Check the specifications.</td>
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<tr>
<td>852</td>
<td>USER MACRO OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause: Macro specifications have been designated although such specifications are not provided.</td>
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<td>Action: Check the specifications.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>-------------------------------------------------------------------------</td>
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<td>853</td>
<td>EXTERNAL MACRO OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A user macro interruption command has been designated although such interruption specifications are not provided.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Check the specifications.</td>
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<tr>
<td>854</td>
<td>INCORRECT USERMACRO PROGRAMMING (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>An NC statement and a macro statement are present in one block.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Review the program and give the NC statement and the macro statement in separate blocks.</td>
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<td>855</td>
<td>USER MACRO NESTING EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The maximum permissible degree of multiplicity of user macro calls has been exceeded.</td>
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<td><strong>Action</strong></td>
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<td></td>
<td>Review the program and correct it so that the number of user macro calls does not exceed the maximum number of calls permitted by the specifications.</td>
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<tr>
<td>856</td>
<td>USER MACRO ARGUMENT EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The number of sets of user macro call arguments of type II is too large.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program.</td>
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<tr>
<td>857</td>
<td>INCORRECT USER MACRO G67 PROG. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>Command G67 has been designated when G66 command modal state was not yet set.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>The G67 command is the call cancellation command; after reviewing the program, designate firstly the G66 command and then the G67 command.</td>
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<td>858</td>
<td>USER MACRO &quot;[&quot; NESTING EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
<td></td>
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<td></td>
<td>The total number of &quot;[&quot; and &quot;]&quot; within one block has become more than five.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Review the program, and correct it so that the total number of &quot;[&quot; and &quot;]&quot; within one block does not exceed five.</td>
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<tr>
<td>859</td>
<td>NUMBER OF PARENTHESIS MIS-MATCH (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The total number of &quot;[&quot; and &quot;]&quot; within one block differ.</td>
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<td></td>
<td><strong>Action</strong></td>
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<td></td>
<td>Review the program, and correct it so that the total number of &quot;[&quot; and of &quot;]&quot; become the same.</td>
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<tr>
<td>860</td>
<td>CALCULATION IMPOSSIBLE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>The operation expression is not correct.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program and correct the operation expression.</td>
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<tr>
<td>861</td>
<td>DIVISION BY ZERO (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>The denominator in the division expression is zero.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program and correct it so that the denominator in the division expression does not become zero.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>862</td>
<td>INTEGER VALUE OVERFLOW (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<td></td>
<td>The integral value has overstepped $-2^{31}$ ($2^{31} - 1$) in the operation process.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the operation expression written in the program, and correct it so that after operation, the value of the integer does not overstep $-2^{31}$.</td>
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</tr>
<tr>
<td>863</td>
<td>REAL VALUE OVERFLOW (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<td></td>
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<tr>
<td></td>
<td>The variables data is overflowing.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the variables data in the program.</td>
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<tr>
<td>864</td>
<td>&quot;IF&quot; STATEMENT ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<td></td>
<td>The statement of IF [&lt;conditional expression&gt;] GOTO is wrong.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the program.</td>
<td></td>
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<tr>
<td>865</td>
<td>&quot;WHILE&quot; STATEMENT ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<td></td>
<td>The statement of WHILE [&lt;conditional expression&gt;] DO ~ END is wrong.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the program.</td>
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<tr>
<td>866</td>
<td>&quot;SETVN&quot; STATEMENT ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The SETVN statement containing the variables name is wrong.</td>
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<td></td>
<td>Action</td>
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<td></td>
<td>Review the program and correct it so that the variables name in the SETVN statement consists of seven characters or less.</td>
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<tr>
<td>867</td>
<td>DO-END NESTING EXCEEDED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>Of WHILE [&lt;conditional expression&gt;] DO ~ END, DO ~ END has appeared more than 27 times (degree of multiplicity).</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the program and correct it to reduce the degree of multiplicity of DO ~ END to no larger than 27 (27 times).</td>
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<tr>
<td>868</td>
<td>DO-END MIS-MATCH (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The DO's and END's are not formed in pairs.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Review the program and correct it to give DO's and END's in pairs.</td>
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<tr>
<td>869</td>
<td>NO USER MACRO IN TAPE MODE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>During tape operation, macro command (WHILE, DO, END, IF, GOTO, POPEN, PCLOS, BPRNT or DPRNT) has been found to exist in the tape contents.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Execute the program in the memory operation mode since blocks containing a macro command (WHILE, DO, END, IF, GOTO, POPEN, PCLOS, BPRNT or DPRNT) cannot be executed during tape operation.</td>
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<tr>
<td>870</td>
<td>ILLEGAL VARIABLE NAME (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The designated variables name is not correct.</td>
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<td></td>
<td>Action</td>
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<td></td>
<td>Review the variables names in the program and correct the corresponding variables name.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<tr>
<td>871</td>
<td>VARIABLE NAME EXISTS (WNo., NNo., BNo.)</td>
<td>A</td>
<td>K (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>There are overlapping variables names.</td>
<td></td>
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<tr>
<td><strong>Action</strong></td>
<td>Correct the program so that variables names do not overlap.</td>
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</tr>
<tr>
<td>872</td>
<td>G51 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A scaling command (G50 or G51) has been designated although scaling specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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</tr>
<tr>
<td>873</td>
<td>G51.1 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A mirror image command (G50.1 or G51.1) has been designated although programmable mirror image specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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<td></td>
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</tr>
<tr>
<td>874</td>
<td>CORNER R/C OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Corner chamfering or corner rounding I/II has been designated although such specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications and delete corner rounding or corner chamfering from the program.</td>
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</tr>
<tr>
<td>875</td>
<td>NOT FOUND GEOMETRIC OPTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The geometric command has been designated although geometric specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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<tr>
<td>876</td>
<td>NOT FOUND GEOMETRIC OPTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The geometric setting format is wrong.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Review the program.</td>
<td></td>
<td></td>
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<tr>
<td>877</td>
<td>G15 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The polar coordinates command (G16) has been designated although such command specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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<td></td>
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</tr>
<tr>
<td>878</td>
<td>ADDRESS CHANGE OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Absolute/incremental axis address conversion has been designated although such conversion specifications are not provided.</td>
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<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
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<td></td>
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</tr>
<tr>
<td>879</td>
<td>G10 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Program data input has been designated although such input specifications are not provided.</td>
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</tr>
<tr>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>880</td>
<td>AXIS NOT ZERO RETURNED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td><strong>Action</strong></td>
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<td>881</td>
<td>G30 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
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<td><strong>Action</strong></td>
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<td>882</td>
<td>ILLEGAL COMMAND CROSS MACHINING (WNo., NNo., BNo.)</td>
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<td>O (S)</td>
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<td><strong>Action</strong></td>
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<tr>
<td>883</td>
<td>ILLEGAL CROSS MACHINING COMMAND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
|     | **Cause** | | | | | 1. A G110 command is given under modal conditions not suitable to cross machining control.  
2. An unsuitable axis (since it cannot be used successfully for the counterpart) is specified for cross machining control. |
|     | **Action** | | | | | Review the program. |
| 884 | REFERENCE POINT RETURN CHECK (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |
|     | **Cause** | | | | | An axis had not returned to the zero-point when the zero-point check command (G27) was executed. |
|     | **Action** | | | | | Review the program. |
| 885 | G22 OPTION NOT FOUND (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |
|     | **Cause** | | | | | The before-movement stroke check function (G22) has been designated although such function specifications are not provided. |
|     | **Action** | | | | | Check the specifications. |
| 886 | BEYOND AREA OF G22 (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |
|     | **Cause** | | | | | This alarm message is displayed before execution of a movement block to indicate that the ending point of the axis movement designated in the block is likely to enter the forbidden area which has been designated using the before-movement stroke check function (G22). |
|     | **Action** | | | | | Review the axis-address coordinate values in the program. |
| 887 | TAPE I/O ERROR (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |
|     | **Cause** | | | | | 1. Errors have occurred in the tape reader or printer errors have occurred during macroprogram data printing.  
2. Host computer program used for Ethernet operation has failed. |
|     | **Action** | | | | | 1. Check for parameter errors.  
2. Check for improper connection between the host computer containing the designated program, and the NC unit. |
<p>| 888 | FILE I/O ERROR ( ) | B | I (L) | O (S) | Red (Blue) |
|     | <strong>Cause</strong> | | | | | The machining program file cannot be read. |
|     | <strong>Action</strong> | | | | | Contact Mazak Technical Center or Technology Center. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
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<tr>
<td>889</td>
<td>G37 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The automatic tool-length measurement command (G37) has been designated although such measurement specifications are not provided.</td>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>890</td>
<td>G31 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The skip command (G31) has been designated although skip specifications are not provided.</td>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>891</td>
<td>G31.1 - G31.3 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A multi-step skip command (G31.1, G31.2 or G31.3) has been designated although such skip specifications are not provided.</td>
<td><strong>Action</strong></td>
<td>Check the specifications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>892</td>
<td>AUTO PROGRAMMING FAILURE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>A trouble has occurred with the software of auto program during the operation.</td>
<td><strong>Action</strong></td>
<td>Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>893</td>
<td>PROGRAM DATA MISSING ( , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Argument P was not designated in the macro call command (G65, G66, G66.1).</td>
<td><strong>Action</strong></td>
<td>Review the program and set the number of the macro program to be called to argument P.</td>
<td></td>
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<tr>
<td>894</td>
<td>MAZATROL PROGRAM DESIGNATED ( , , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>1. An attempt has been made to call a MAZATROL program from an EIA/ISO program which was designated as a subprogram of MAZATROL program. 2. A MAZATROL program has been specified using G65 command (subprogram call) in the manual program mode unit of the MAZATROL program.</td>
<td><strong>Action</strong></td>
<td>In cases 1 and 2 above, a MAZATROL program cannot be called as a subprogram. Review the program.</td>
<td></td>
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</tr>
<tr>
<td>895</td>
<td>IC CARD I/O BUSY ( , , )</td>
<td>A</td>
<td>I</td>
<td>O</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An attempt has been made to execute the IC memory card operation during data I/O operation with an IC memory card.</td>
<td><strong>Action</strong></td>
<td>Execute the IC memory card operation after stop or completion of the data I/O operation with an IC memory card.</td>
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</tr>
<tr>
<td>896</td>
<td>ILLEGAL CHAMFERING ( , , )</td>
<td>B</td>
<td>J</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>In the thread cutting cycle command, designation for chamfering is incorrect.</td>
<td><strong>Action</strong></td>
<td>Set chamfering data that ensures termination of the operation of the tool within the cycle.</td>
<td></td>
<td></td>
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<tr>
<td>897</td>
<td>LAP CYCLE BLOCK NUMBER EXCEED ( , , )</td>
<td>B</td>
<td>J</td>
<td>P</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The number of blocks in the shape data of the turning fixed-cycle (G270 through G273) exceeds 100 blocks.</td>
<td><strong>Action</strong></td>
<td>Reduce below 100 the number of blocks in the shape data of the turning fixed-cycle (G270 through G273).</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>898</td>
<td>LAP CYCLE ILLEGAL SHAPE DESIGN.</td>
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<td>J</td>
<td>P</td>
<td>Red</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>The shape defined in the turning fixed-cycle (G270 through G273) is not the shape for correct cutting.</td>
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<td></td>
<td>Action</td>
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<td></td>
<td>Recheck the shape data specified by the turning fixed-cycle (G270 through G273).</td>
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<td>899</td>
<td>ILLEGAL TAPER LENGTH</td>
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<td>P</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>In the fixed-cycle (G290, G294), designation for the taper length or the taper height is incorrect.</td>
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<td>Action</td>
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<td></td>
<td>Set the taper length or the taper height for the fixed-cycle (G290, G294) smaller than the travel of the axis.</td>
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<td>Stopped status</td>
<td>Clearing procedure</td>
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<td>1800</td>
<td>CANNOT CHANGE TIME CONSTANT</td>
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<td>P</td>
<td>Red</td>
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<td>(WNo., NNo., BNo.)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td>The G-command has been set in the block</td>
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<td>containing a time constant</td>
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<td>changeover/cancellation command.</td>
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<td>The time constant changeover/cancellation</td>
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<td>command has been set in the fixed cycle.</td>
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<td>The time constant changeover/cancellation</td>
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<td>command has been set during MAZATROL</td>
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<td>programmed simultaneous</td>
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<td>machining or MAZATROL programmed</td>
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<td>“2 workpiece” machining.</td>
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<td><strong>Action</strong></td>
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<td>Review and correct the program.</td>
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<td>ILLEGAL COMMD TIME CONST. CHANGE</td>
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<td><strong>Cause</strong></td>
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<td>The G10 command has been set during</td>
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<td>time constant changeover (non-M880 mode).</td>
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<td><strong>Action</strong></td>
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<td>Review and correct the program.</td>
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<td>ILLEGAL STARTUP CONDITION G12.1</td>
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<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td>(WNo., NNo., BNo.)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>1. The G12.1 command is set when the</td>
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<td>current position of the No. 1 axis (linear</td>
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<td>axis) on the plane is present on the</td>
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<td>negative side.</td>
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<td>2. The No. 2 axis (rotational axis) on the</td>
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<td>plane is not a rotating type of rotational</td>
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<td></td>
<td>axis.</td>
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<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>1. Move the current position of the No. 1</td>
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<td>axis (linear axis) on the plane into the</td>
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<td>positive side before setting the G12.1</td>
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<td></td>
<td>command.</td>
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<td>2. Specify a rotating type of rotational</td>
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<td>axis as the No. 2 axis on the plane. Example:</td>
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<td>G17X_C_; G12.1; ...</td>
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<td>( , , )</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td><strong>Action</strong></td>
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### 3-2-10 No. 900 - No. 999, No. 1900 - No. 1999 (EIA/ISO program error)

<table>
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<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
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<td>Cause</td>
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<td>Action</td>
<td>—</td>
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<tr>
<td>901</td>
<td>INCORRECT FIXED CYCLE COMMAND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The fixed-cycle command has been set in the program during the tool diameter offset (G41 or G42) modal status.</td>
<td></td>
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<tr>
<td>Action</td>
<td>Set the tool diameter offset cancellation command (G40) before the fixed-cycle command.</td>
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<tr>
<td>902</td>
<td>G10 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The G10 command has been designated although this command is not available with the system.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Check the specifications.</td>
<td></td>
<td></td>
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<tr>
<td>903</td>
<td>ILLEGAL G10 L NUMBER (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>An unallowable L number has been designated during input of G10 program command.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Correct the L number in the program.</td>
<td></td>
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<tr>
<td>904</td>
<td>ILLEGAL G10 OFFSET No. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Compensation numbers other than the number of sets permitted by the specifications have been designated during input of G10.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>After checking the number of compensation sets permitted by the specifications, change the setting of address P to a value smaller than the permissible number of sets.</td>
<td></td>
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<tr>
<td>905</td>
<td>G11 OPTION NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td>Cause</td>
<td>The G11 command has been designated although this command is not available with the system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the specifications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>906</td>
<td>NO S DIRECTIVE IN FIXED CYCLE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The spindle speed for the fixed cycle has not yet been set in the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Program the spindle speed command in the block which precedes the block with the fixed cycle command.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>907</td>
<td>DIFFERENT SPINDLE TYPE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to machine the workpiece using the synchronous tapping method in spite of the spindle controller being an SE type.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Use the appropriate tapping method for the particular type of the spindle controller.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>908</td>
<td>NO PITCH IN FIXED CYCLE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The pitch or the number of threads has not been designated for the tapping cycle (G74 or G84) of the drilling fixed cycles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate the pitch using address F or E.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
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</tr>
<tr>
<td>909</td>
<td>ILLEGAL PITCH IN FIXED CYCLE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>

**Cause**
The pitch or the number of threads designated for the tapping cycle (G74 or G84) of the drilling fixed cycles is wrong.

**Action**
Check and correct the pitch or the number of threads.

| 911 | CORNER R/C OPTION NOT FOUND (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |

**Cause**
Corner chamfering/corner rounding has been designated although such specifications are not provided.

**Action**
Check the specifications and delete corner rounding or corner chamfering from the program.

| 912 | NO MOTION COMMAND AFTER R/C (WNo., NNo., BNo.) | B | J (L) | P (S) | Red (Blue) |

**Cause**
The block that is to succeed the corner rounding or corner chamfering command does not consist of a move command.

**Action**
Give the G01 command in the corresponding block.

| 913 | INCORRECT R/C COMMAND (WNo., NNo., BNo.) | B | J (L) | P (S) | Red (Blue) |

**Cause**
The length of the corner rounding or corner chamfering that has been designated in the corner rounding or chamfering command is larger than the distance of movement.

**Action**
Reduce the length of the corner rounding or chamfering to a value smaller than the distance of movement.

| 914 | INCORRECT COMMAND AFTER R/C (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |

**Cause**
The movement distance designated in the next block is shorter than the length of the corner rounding or corner chamfering.

**Action**
Reduce the length of the corner rounding or chamfering to a value smaller than the moving distance of the next block.

| 915 | ANGLE < 1 DEGREE (WNo., NNo., BNo.) | B | I (L) | O (S) | Red (Blue) |

**Cause**
In the geometric command, the difference in angle between the two straight lines which intersect with each other is less than 1 degree.

**Action**
Increase the angle difference in the geometric command.

| 916 | GEOMETRIC COMMAND NOT ABSOLUTE (WNo., NNo., BNo.) | B | K | O | Red (Blue) |

**Cause**
The second block of the geometric command is an incremental command.

**Action**
The second block must always consists of absolute data. Program it in units of absolute coordinates.

| 917 | NO LINEAR COMMAND IN 2ND BLOCK (WNo., NNo., BNo.) | B | J (L) | P (S) | Red (Blue) |

**Cause**
The second block of the geometric command is not given the linear command (G1).

**Action**
Correct the program so that the linear command (G1) and the feedrate command (F) are given to the second block.
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>918</td>
<td>INCORRECT ANGLE DATA (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>In address designation of the geometric command, the angle in the first block, ending point coordinates and angle in the second block are incorrectly given.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check and reprogram the corresponding data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>919</td>
<td>INCORRECT PLANE SELECTION CMD. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>A plane selection command (G17, G18 or G19) was given in the geometric command block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Program the plane selection command (G17, G18 or G19) in the block that precedes the geometric command block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>920</td>
<td>G27, M COMMANDS SAME BLOCK (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>An M independent command (M0, M1, M2 or M30) has been programmed in the same block as the G27 command.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Correct the program so that the G27 command and the M independent command are contained in separate blocks.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>921</td>
<td>G29, M COMMANDS SAME BLOCK (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>An M independent command (M0, M1, M2 or M30) and the G29 command (start-position return) have been programmed in the same block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Correct the program so that the G29 command and the M independent command are contained in separate blocks.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>922</td>
<td>SKIP SPEED ZERO (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The feedrate F has not been programmed in the G31 (skip) command block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Set the skip feedrate F into the G31 program block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>923</td>
<td>ILLEGAL COMMAND G37 AXIS (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>No axis settings are included in the automatic tool-length measurement block; or more than one axis setting have been made.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Designate only one axis.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>924</td>
<td>G37, H COMMANDS SAME BLOCK (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The H-code is in the same block as the automatic tool-length measurement command.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Set the H-code into a block preceding the automatic tool-length measurement block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>925</td>
<td>H CODE REQUIRED (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The H-code is not yet set for automatic tool-length measurement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Set an H-code into a block preceding the automatic tool-length measurement block.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>926</td>
<td>ILLEGAL G37 SIGNAL (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The signal of measuring-position arrival has been turned on before the tool reaches the area designated through either a D-code or the parameter for deceleration area &quot;d&quot;; or the signal has not been turned on at all.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the program and parameters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>927</td>
<td>SKIP COMMAND IN CORRECTING DIA (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The skip command (G31) was given during tool diameter offset (G41 or G42).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Correct the program so that the skip command is executed only after the cutter-diameter compensation cancellation command (G40) has been executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>928</td>
<td>ILLEGAL HEAD DATA No. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The offset number that has been designated in the program is outside the range from 0 to 10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Review the machining program and set an allowable offset number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>929</td>
<td>HEAD DATA No. NOT FOUND (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An “H_” number is missing in the “G45.1H_” part of the EIA/ISO program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Review the machining program and set an allowable offset number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>930</td>
<td>ILLEGAL HEAD TYPE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The head type does not match to the face that has been designated in the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Review the machining program and set the correct head type.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>931</td>
<td>NO HEAD DATA (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>The head number that has been designated in the program is not registered on the HEAD OFFSET display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>1. Review the designated head number. 2. Check if the designated head number is registered on the HEAD OFFSET display.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>932</td>
<td>RETURN R POINT IN CUTTING SIDE (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Return to reference point has been designated during the surface-machining mode (G17.2 to G17.5) of the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Return to reference point cannot be executed during the surface-machining mode (G17.2 to G17.5). Review the cutting program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>933</td>
<td>NO 5FACE CUTTING OPTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An attempt has been made to execute a five-surface machining program when the five-surface machining option was not present.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Set the five-surface machining option to execute a five-surface machining program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>934</td>
<td>NO HIGH-SPEED MODE OPTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An attempt has been made to execute the high-speed mode program when the high-speed mode option was not set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Without the high-speed mode option, the high-speed mode program cannot be executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>935</td>
<td>NO PRE-INTERP ACCEL/DECEL OPT. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>An attempt has been made to execute the high-accuracy mode program when the high-accuracy mode option was not set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>Without the high-accuracy mode option, the high-accuracy mode program cannot be executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>936</td>
<td>OPTION NOT FOUND</td>
<td>(WNo., 0, 0)</td>
<td>E</td>
<td>I (L)</td>
<td>O</td>
</tr>
<tr>
<td>Cause</td>
<td>Either of the following seven options is missing (identify the corresponding option from the work number displayed in parentheses): 1. NURBS interpolation option 2. Shaping option 3. Planet tapping option 4. MAZAK precision rapid boring tornado option or shape correction control option 5. Auto pecking cycle of the cutting load detection type 6. Ethernet operation 7. Cylinder interpolation option</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the specifications.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>937</td>
<td>ILLEGAL TOOL DESIGNATED</td>
<td>(WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>The designated tool cannot be used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Check the TOOL DATA display to see if the designated tool is an unusable one.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>938</td>
<td>NO IC CARD MODE OPTION</td>
<td>( , , )</td>
<td>A</td>
<td>K</td>
<td>P</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to execute the IC memory card operation although the optional function of IC memory card operation is not available.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>This operation cannot be executed because the optional function of IC memory card operation is not available.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>939</td>
<td>NO THREAD CUTTING OPTION</td>
<td>(WNo., NNo., BNo.)</td>
<td>A (A)</td>
<td>K (L)</td>
<td>P (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to execute operation or tool path check of the program that contains G33 command (threading), although G33 option is not provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Without G33 option, G33 threading command cannot be used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>940</td>
<td>NO INVERSE TIME OPTION</td>
<td>(WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>Inverse time feed program was attempted although inverse time feed option is not provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Inverse time feed program cannot be executed because inverse time feed option is not provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>941</td>
<td>G93 MODE</td>
<td>(WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>G-code of inhibition during G93 mode has been designated.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Review the program and delete G-code of inhibition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>942</td>
<td>NO 3-D CONVERSION OPTION</td>
<td>(WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>An attempt has been made to execute the three-dimensional coordinate conversion program in the absence of a three-dimensional coordinate conversion option.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Three-dimensional coordinate conversion is not possible because of the absence of a three-dimensional coordinate conversion option.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>943</td>
<td>CONVERTING IN 3-D COORDINATES</td>
<td>(WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>An illegal G-code in the G68 mode has been designated.</td>
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<tr>
<td>Action</td>
<td>Review the program, and delete the illegal G-code.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
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<td>-----</td>
<td>----------------------------------------------</td>
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<tr>
<td>944</td>
<td>WRONG CMD. IN 3-D COORDINATES (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>A G68 command has been designated during the modal information that does not permit G68 to be set.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Review the program, and modify the modal information existing when the G68 command was designated.</td>
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<tr>
<td>945</td>
<td>NO HV MACHINING FUNC. OPTION (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to execute A-axis/B-axis automatic, sequential control or A-axis direct programming in the absence of an HV machining option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Neither A-axis/B-axis automatic, sequential control, nor A-axis direct programming is possible because of the absence of the option.</td>
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<tr>
<td>946</td>
<td>NO MAZ. SUB PROGRAM OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to call up a MAZATROL program from the EIA/ISO program in spite of the absence of a MAZATROL call option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Since a MAZATROL call option is not present, MAZATROL programs cannot be called up from EIA/ISO programs using the subprogram call function.</td>
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<tr>
<td>947</td>
<td>NO BLOCK SKIP OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>An attempt has been made to carry out block skip operations in spite of the absence of a block skip option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Block skipping is not possible because of the absence of a block skip option.</td>
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<tr>
<td>948</td>
<td>NO G54.1 OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<td></td>
<td>An attempt has been made to use a G54.1 code in spite of the absence of a G54.1 (additional workpiece coordinate system) option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>A G54.1 code cannot be used because of the absence of a G54.1 (additional workpiece coordinate system) option.</td>
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<tr>
<td>949</td>
<td>NO G52 IN G54.1 MODE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to use an additional workpiece coordinate system and a local workpiece coordinate system at the same time.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>An additional workpiece coordinate system and a local workpiece coordinate system cannot be used at the same time.</td>
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<tr>
<td>950</td>
<td>NO SPLINE CUTTING OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to specify a spline interpolation command in spite of the absence of a spline interpolation option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>A spline interpolation command cannot be used because of the absence of a spline interpolation option.</td>
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<tr>
<td>951</td>
<td>NO CORNER C/R COMMAND IN G0/G33</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>A corner chamfering/rounding command has been designated in the G0 or G33 mode.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>A corner chamfering/rounding command cannot be designated in the G0 or G33 mode.</td>
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<tr>
<td>952</td>
<td>NO SYNCHRONIZED TAP OPTION</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td><strong>Cause</strong></td>
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<tr>
<td></td>
<td>An attempt has been made to perform synchronized tapping in spite of the absence of a synchronized tapping option.</td>
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<td></td>
<td><strong>Action</strong></td>
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<tr>
<td></td>
<td>Synchronized tapping cannot be performed because of the absence of a synchronized tapping option.</td>
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<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>953</td>
<td>TOOL DATA INPUT PROCESS ERROR</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>During the execution of EIA/ISO program or of MDI, the tool data was found not to include LENGTH or ACT-φ (NOM-φ) (this, however, applies only if bit 7 of parameter F84 is set to &quot;1&quot; for the use of MAZATROL tool length and tool diameter data).</td>
<td></td>
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<tr>
<td>Action</td>
<td>Recheck the tool data and set missing values. (Related parameters: F84 bit 7, F92 bit 7, F93 bit 3)</td>
<td></td>
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</tr>
<tr>
<td>954</td>
<td>SCREW PITCH ERR</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The thread lead (thread pitch) that has been designated in the threading command data is not correct.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Set the correct thread lead in the threading command data.</td>
<td></td>
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</tr>
<tr>
<td>955</td>
<td>START AND END POINT NOT AGREE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>The ending point of the block immediately preceding the G06.2 command data, and the command data in the starting block of G06.2 do not match.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Modify the program so that the coordinate command data in the starting block of G06.2 matches the ending point of the immediately preceding block.</td>
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</tr>
<tr>
<td>956</td>
<td>RESTART OPERATION NOT ALLOWED</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Restarting from the block containing the G06.2 mode data has been attempted.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Restart from a block not containing G06.2 mode data.</td>
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</tr>
<tr>
<td>957</td>
<td>MANUAL INTERRUPT NOT ALLOWED</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td>Cause</td>
<td>Manual handle or MDI interruption from the block containing the G06.2 mode data has been attempted.</td>
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<tr>
<td>Action</td>
<td>Perform manual interruptions only at blocks not containing G06.2 mode data.</td>
<td></td>
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</tr>
<tr>
<td>958</td>
<td>AUTO PECKING IMPOSSIBLE</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
| Cause | 1. The threshold value for load detection-based auto-pecking is not set to 0 or no such value is set.  
2. The parameter is not set appropriately. |
| Action | 1. Set the appropriate threshold value either in the drill monitoring mode of the MACHINING-MONITORING display or on the TOOL DATA display.  
2. For parameter setting, contact Mazak Technical Center or Technology Center. |
<p>| 959 | WORKPIECE COORDINATE ERROR                                           | B             | I (L)          | O (S)              | Red (Blue) |
| Cause | The origin of the workpiece coordinate system does not lie on the axis of rotation of the table. |
| Action | Review the settings on the WORK OFFSET display. |
| 960 | SUPERPOSIT CTRL ILLEGAL COMMAND                                      | B             | I (L)          | O (S)              | Red (Blue) |
| Cause | The program section under the mode of superposition control contains an incompatible G-code. |
| Action | Review the program. |
| 961 | ILLEGAL COMMAND 5X RADIUS COMP.                                      | B             | I (L)          | O (S)              | Red (Blue) |
| Cause | A preparatory function which is incompatible with the mode of tool diameter offset for five-axis machining has been designated. |
| Action | Review the program, and delete the illegal G-code. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>962</td>
<td>CANNOT USE 5X RADIUS COMP. (WNo., NNo., BNo.)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
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<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>A command of tool diameter offset for five-axis machining has been designated under incompatible modal conditions.</td>
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<td></td>
<td>Action</td>
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</tr>
<tr>
<td></td>
<td>Review the program, and delete the illegal G-code.</td>
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<td></td>
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</tr>
<tr>
<td>963</td>
<td>TURRET MIRROR IMAGE N/A ( , , ) B I (L) O (S) Red (Blue)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
<tr>
<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The optional mirror image function for the opposed turret is not provided.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Provide the NC unit with the mirror image option.</td>
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<tr>
<td>970</td>
<td>TOOL TIP CTRL PARAMETER ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>The parameter settings on the composition of controlled axes for tool tip point control are not correct.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>Correct the parameter settings concerned.</td>
<td></td>
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<tr>
<td>971</td>
<td>CANNOT USE TOOL TIP PT CONTROL (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>1. A command of tool tip point control is given under incompatible modal conditions.</td>
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<tr>
<td></td>
<td>2. A G43.5 command is given in spite of the selection of the workpiece coordinate system for programming.</td>
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<tr>
<td></td>
<td>3. Under selection of the G-code system for turning machines, a command of tool tip point control is given with the parameter setting ( F161 \ bit 1 = 0 ) (Geometric offset by logically shifting the coordinate system).</td>
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<td></td>
<td>4. A command of circular interpolation is given under the mode of G43.5 or with the table coordinate system selected for programming.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>1. Check the current modal conditions and cancel the unsuitable mode.</td>
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<tr>
<td></td>
<td>2. Use the other preparatory function G43.4, or select the table coordinate system for programming.</td>
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<td></td>
<td>3. Set ( F161 ) bit 1 to &quot;1&quot; (Geometric offset by physically shifting the tool).</td>
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<tr>
<td></td>
<td>4. To use circular interpolation, give a G43.4 command, or select the workpiece coordinate system for programming.</td>
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<tr>
<td>972</td>
<td>ILLEGAL CMD TOOL TIP PT CTRL (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<tr>
<td></td>
<td>An unavailable command (of preparatory or tool function) is given in the mode of tool tip point control.</td>
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<td></td>
<td>Action</td>
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<td></td>
<td>Temporarily cancel the mode of tool tip point control to give the required command with G- or T-code.</td>
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<tr>
<td>973</td>
<td>ILLEGAL TOOL AXIS VECTOR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
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<td></td>
<td>Cause</td>
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<td></td>
<td>An inappropriate command relevant to the vector of tool axis is given in the mode of tool tip point control.</td>
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<tr>
<td></td>
<td>1. In the mode of G43.4 with single-axis interpolation selected, the resulting tool path will not pass through the singular point although the sign of the angular position of the primary rotary axis is to be reversed.</td>
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<tr>
<td></td>
<td>2. The command of the vector of tool axis is not correct (as it will reverse the direction of the tool).</td>
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<td>3. With single-axis interpolation selected, the command in a single block will cause a motion through more than 180° on the rotary axis of linear type.</td>
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<td></td>
<td>Action</td>
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<tr>
<td></td>
<td>1. Modify the program for a tool path through the singular point, or select joint interpolation.</td>
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<tr>
<td></td>
<td>2. Divide the command block concerned in order that the resulting rotation of the tool direction per block will not exceed 180°.</td>
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<td></td>
<td>3. Modify the program for a per-block motion angle of 180° or less on the rotary axis of linear type, or select joint interpolation.</td>
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</tr>
<tr>
<td>No.</td>
<td>Message</td>
<td>Type of error</td>
<td>Stopped status</td>
<td>Clearing procedure</td>
<td>Display</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>974</td>
<td>TOOL TIP PT CTRL FORMAT ERROR (WNo., NNo., BNo.)</td>
<td>B</td>
<td>J (L)</td>
<td>P (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
| **Cause** | | 1. Arguments I, J, and K are specified in the mode of G43.4, or a command of rotary axis motion is given under G43.5.  
2. The code G49 is given in a block with other commands.  
3. A rotary axis is specified in the mode of circular interpolation. | | | |
| **Action** | | 1. The attitude of the tool cannot be specified with I, J, and K in the G43.4 mode, nor can a rotary axis be explicitly specified in the G43.5 mode.  
2. Give the cancellation command G49 in a single-command block.  
3. A rotary axis cannot be specified in the mode of circular interpolation. | | | |
<p>| 975 | TOOL TIP PT CTRL N/A (WNo., NNo., BNo.) | B | J (L) | P (S) | Red (Blue) |
| <strong>Cause</strong> | | The optional function for tool tip point control is not provided. | | | |
| <strong>Action</strong> | | The program with a command for tool tip point control can only be executed on a correspondingly executed machine. | | | |
| 979 | MACRO USER ALARM | ( , , ) | | | |
| <strong>Cause</strong> | | #3000 = n (alarm message) in the user macroprogram was executed. n ≥ 21 | | | |
| <strong>Action</strong> | | Refer to the relevant user macroprogram instruction manual to check the alarm. | | | |
| 980 | MACRO USER ALARM 1 | ( , , ) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | | #3000 = 1 (alarm message) in the user macroprogram was executed. | | | |
| <strong>Action</strong> | | Refer to the relevant user macroprogram instruction manual to check the alarm. | | | |
| 981 | MACRO USER ALARM 2 | ( , , ) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | | #3000 = 2 (alarm message) in the user macroprogram was executed. | | | |
| <strong>Action</strong> | | Refer to the relevant user macroprogram instruction manual to check the alarm. | | | |
| 982 | MACRO USER ALARM 3 | ( , , ) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | | #3000 = 3 (alarm message) in the user macroprogram was executed. | | | |
| <strong>Action</strong> | | Refer to the relevant user macroprogram instruction manual to check the alarm. | | | |
| 983 | MACRO USER ALARM 4 | ( , , ) | B | I (L) | O (S) | Red (Blue) |
| <strong>Cause</strong> | | #3000 = 4 (alarm message) in the user macroprogram was executed. | | | |
| <strong>Action</strong> | | Refer to the relevant user macroprogram instruction manual to check the alarm. | | | |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>984</td>
<td>MACRO USER ALARM 5</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 5 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>985</td>
<td>MACRO USER ALARM 6</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 6 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>986</td>
<td>MACRO USER ALARM 7</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 7 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>987</td>
<td>MACRO USER ALARM 8</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 8 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>988</td>
<td>MACRO USER ALARM 9</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 9 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>989</td>
<td>MACRO USER ALARM 10</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
<tr>
<td>Cause</td>
<td>#3000 = 10 (alarm message) in the user macroprogram was executed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Refer to the relevant user macroprogram instruction manual to check the alarm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>990</td>
<td>MACRO MEASUREMENT ALARM 1</td>
<td>(, , )</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
</tr>
</tbody>
</table>
| Cause | 1. During execution of the MMS unit, the touch sensor has not come into contact with the workpiece (the skip signal has not turned on) when the maximum feed distance available at the skipping speed is exceeded.  
2. #3000 = 11 (alarm message) in the user macroprogram was executed. |
| Action | 1. Check the machining program.  
2. Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 991 | MACRO MEASUREMENT ALARM 2 | (, , ) | B | I (L) | O (S) | Red (Blue) |
| Cause | 1. During execution of the MMS unit, the touch sensor came into contact with the workpiece (the skip signal turned on) when another feeding than that at the skipping speed was taking place.  
2. #3000 = 12 (alarm message) in the user macroprogram was executed. |
| Action | 1. Check the machining program. Also check the touch sensor for proper mounting on the spindle.  
2. Refer to the relevant user macroprogram instruction manual to check the alarm. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>992</td>
<td>MACRO MEASUREMENT ALARM 3</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>
| Cause| 1. Correct signals were not output because of trouble with the touch sensors, receivers or other such MMS unit components.  
2. #3000 = 13 (alarm message) in the user macroprogram was executed. |
| Action| 1. Contact Mazak Technical Center or Technology Center.  
2. Refer to the relevant user macroprogram instruction manual to check the alarm. |
<p>| 993  | MACRO MEASUREMENT ALARM 4       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 14 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 994  | MACRO MEASUREMENT ALARM 5       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 15 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 995  | MACRO MEASUREMENT ALARM 6       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 16 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 996  | MACRO MEASUREMENT ALARM 7       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 17 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 997  | MACRO MEASUREMENT ALARM 8       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 18 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 998  | MACRO MEASUREMENT ALARM 9       | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 19 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |
| 999  | MACRO MEASUREMENT ALARM 10      | B             | I (L)          | O (S)              | Red (Blue) |
| Cause| #3000 = 20 (alarm message) in the user macroprogram was executed. |
| Action| Refer to the relevant user macroprogram instruction manual to check the alarm. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>NOT POSSIBLE CROSS MACHINING (WNo., NNo., Cause)</td>
<td>B</td>
<td>I (L)</td>
<td>O (S)</td>
<td>Red (Blue)</td>
</tr>
</tbody>
</table>

**Cause**

During the tool path check, the system in which the crossing command was set and/or the remote system for which the crossing command was to be executed has been set to the following status:

1: The specified axis does not exist in the remote system.
2: The local system is specified as the system for which the crossing command was to be executed.
4: A crossing control command is set for the axis currently undergoing the crossing command.
16: The G110 command is set when the local system/remote system is in the modal environment that does not allow crossing control.
32: The crossing control command is set under the prohibited status of recalculation.

**Action**

Review and correct the program.

<table>
<thead>
<tr>
<th>1992</th>
<th>ILLEGAL AXES QTY. FOR CROSS (WNo., NNo., BNo.)</th>
<th>B</th>
<th>I (L)</th>
<th>O (S)</th>
<th>Red (Blue)</th>
</tr>
</thead>
</table>

**Cause**

The number of axes in the remote system became zero during the tool path check when the crossing command was executed.

**Action**

Review and correct the program.
### No. 2100 - No. 2199 (Interference error)

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>2100</td>
<td>MACN INTRF (WNo., UNo., SNo.)</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>Execution of the machining program results in the interference occurring between &lt;Interfering section 1&gt; and &lt;Interfering section 2&gt;.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review and correct the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2101 | NEAR MISS (WNo., UNo., SNo.) | A             | L              | S                  | Blue    |
| Cause| Execution of the machining program results in <Interfering section 1> and <Interfering section 2> being present within the specified interference distance. |
| Action| Review and correct the program. |

| 2102 | WORK INTRF (WNo., UNo., SNo.) | A             | L              | S                  | Blue    |
| Cause| Execution of the machining program results in the interference occurring between <Interfering section 1> and <Interfering section 2>. |
| Action| Review and correct the program. |

| 2110 | ILLEGAL FORMAT ( , , ) | A             | L              | S                  | Blue    |
| Cause| The entered data is incorrect. |
| Action| Review the range of the data to be entered. |

| 2120 | RESTART PT SEARCH INTERRUPTED ( , , ) | A             | L              | S                  | Blue    |
| Cause| The restart position search function has been aborted. |
| Action|

<p>| 2121 | RESTART POINT NOT FOUND ( , , ) | A             | L              | S                  | Blue    |
| Cause| The restarting point is not found. |
| Action| Review the restrictions on the restart or review the machining program itself. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Type of error</th>
<th>Stopped status</th>
<th>Clearing procedure</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>2130</td>
<td>CANNOT DISPLAY WORKPIECE MODEL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>1. Lack of available memory space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Arithmetical incapability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Entered data imperfections</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>1. Divide the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Confirm parameters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Confirm tool data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2140</td>
<td>CANNOT DISPLAY MACHINE MODEL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>1. Lack of available memory space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Arithmetical incapability</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3. The machine model file is missing.</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>1. Divide the program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Confirm parameters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Contact Mazak Technical Center or Technology Center.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2150</td>
<td>CANNOT DISPLAY TOOL MODEL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The shape cannot be created since the entered tool data is insufficient or incorrect.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Review and correct the tool data.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2151</td>
<td>CANNOT DISPLAY TAILSTOCK MODEL ( , , )</td>
<td>A</td>
<td>L</td>
<td>S</td>
<td>Blue</td>
</tr>
<tr>
<td>Cause</td>
<td>The shape cannot be created since the entered machine parameters on the tailstock shape are incorrect.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Modify the data settings of machine parameters BA12 to BA14.</td>
<td></td>
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</tr>
</tbody>
</table>
4 M-CODE LIST

For description of M-codes, refer to the Operating Manual of the machine.