MAZATROL M32 PARAMETERS

Introduction

This text describes the meaning and setting of various parameters used for the MAZATROL M-32. Read this list carefully in order to make the best use of the possibilities of the MAZATROL M-32.
It is advisable to consult the Operating manual as required.

Notes:
1. It is prohibited to partially or completely transcribe, reproduce or modify this manual.
2. This manual will be subject to change without notice.
3. In the case where you find a doubtful point, an error or omission in this manual which was prepared with careful attention, please send your suggestions to our service center.

Documents that accompany the product

Standard
- Operating manual for MAZATROL M-32
- Programming manual for MAZATROL M-32
- Parameter list (This Text)
- Alarm list

Option
- Programming manual for MAZATROL M-32 EIA/ISO
- Programming manual for 3-D processing
- Programming manual for five-surface machining
- CPU-LINK communication software preparation procedure
- Operating manual for MAZATROL CAM32-A system
- Operating manual for MAZATROL EDITOR

Preliminary remarks

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:

(1) Cutting condition parameters
Cutting condition parameters are the constants that are used to automatically set the cutting conditions (circumferential speed and feed rate) during program creation.

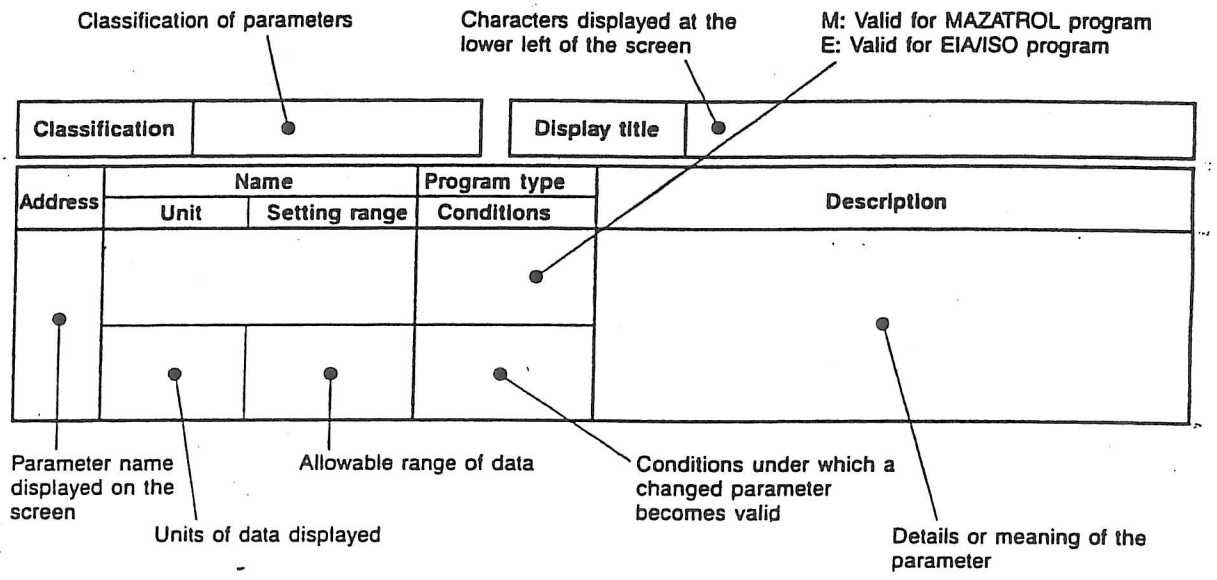
(2) User parameters
The data needed for point-, line-, and face-machining data, constants related to data input/output etc. are registered.

(3) Machine parameters
Constants related to the servo motors and spindle motors, machine status data etc. are registered.

See 4-8 PARAMETER display of the Operating Manual for the procudure for calling up the 19 displays used for the display and setting of parameter data.

Format of parameter tables

Each parameter table is written in the following format:



[IF ANY PORTION OF ADDRESS MARKED WITH (*) IT IS ONLY FOR M-32A MODEL]

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 external machines.

② The parameter list is supplied in the form of data sheets within the NC heavy-duty power panel 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.

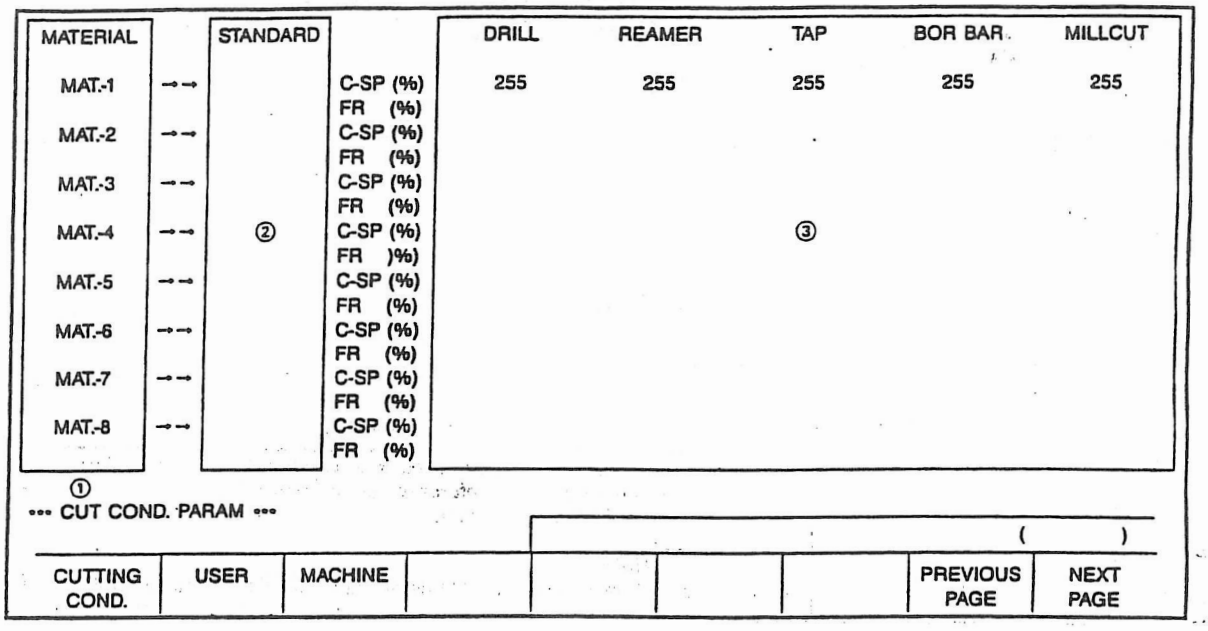
④ If details of the parameter to be changed cannot be clearly understood, contact your MAZAK service center before making the changes.

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 Machine Operating Manual for details of PLC-related parameters and the PLC Parameter List accompanying the electric wiring diagram.

Cutting condition parameters:
When the PARAMETER display is selected, the CUT COND. PARAM display will appear as shown below. On this display, set the data that should be used for automatical setting of the cutting conditions according to special materials which have been specified for the common unit on the WK PROGRAM display.



Note: Values shown above denote the maximum value of each type of data.

Description of display data

No.	Data name	Unit	Description
1	MATERIAL		This data corresponds to OTHERS No. 1 through 8, which are to be set for MAT of the common unit.
2	STANDARD		Select one of CST IRN, DUC-CI, CBN STL, ALY STL, STAINLS, ALMINUM and CPR-ALY. that best matches the material of the work to be machined.
3	DRILL REAMER TAP BOR BAR (BACK BORING) MILL CUT (FACEMILL ENDMILL)	%	Set the rate (%) of the cutting conditions most appropriate for the special material to the cutting conditions which are automatically set for the selected material code. Example MATERIAL STANDARD = DRILL MAT.-1 →→ CBN STL C-SP (%) 120 FR (%) 80 When setting is done as shown above, the program will automatically set the cutting conditions as follows: UNO 0 MAT CBN STL SNO 1 TOOL DRILL C-SP 20 FR 0.2 UNO 0 MAT MAT.-1 $(20 \times \frac{120}{100})$ $(0.2 \times \frac{80}{100})$ SNO 1 TOOL DRILL C-SP 24 FR 0.16 Note: If cutting condition calculation is performed irrespectively of the material of the work, then this data will become invalid for software reasons.

Classification	Cutting conditions	Display title	CUT COND. PARAM NO. 1

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
A1	—		M	Arithmetic constant used to automatically set the cutting conditions (circumferential speed and feed rate) for MAZATROL program.
⟩				
A108	—	—	Immediate	Note: Details of these parameters are not released to the public.

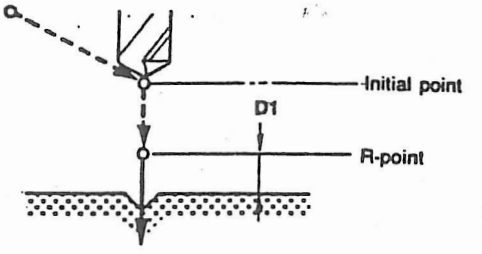
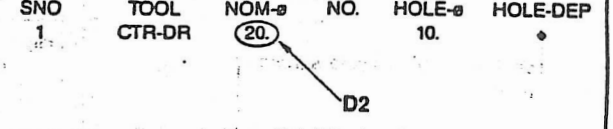
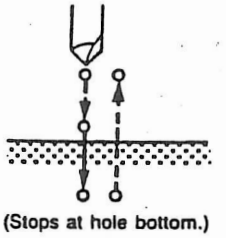
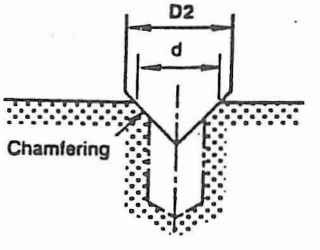
Classification	Cutting conditions	Display title	CUT COND. PARAM NO. 2

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
B1	—		M	Arithmetic constant used to automatically set the cutting conditions (circumferential speed and feed rate) for MAZATROL program.
⟩				
B108	—	—	Immediate	Note: Details of these parameters are not released to the public.

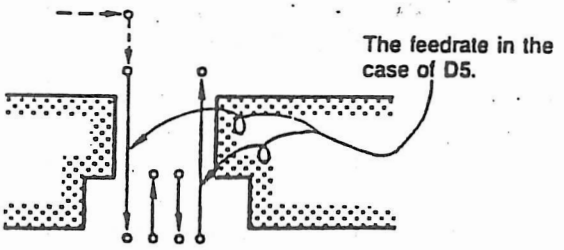
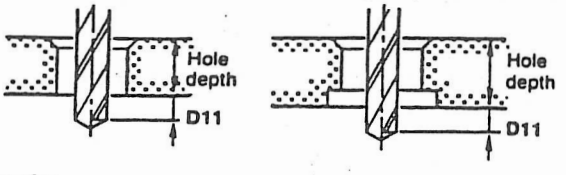
Classification	Cutting conditions	Display title	CUT COND. PARAM NO. 3

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
C1	—		M	Arithmetic constant used to automatically set the cutting conditions (circumferential speed and feed rate) for MAZATROL program.
⟩				
C52	—	—	Immediate	Note: Details of these parameters are not released to the public.
C53	—		M	Arithmetic constant used to automatically set thrust (THR.) and horsepower (HP) on the TOOL DATA display.
⟩				
C108	—	—	Immediate	Note: Details of these parameters are not released to the public.

Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D1	Height of the second R-point of the drill		M	Height of the next R-point of the drill after pilot-drilling with a spot-machining tool or a drill.  **Note:** Valid only when bit 6 of D91 is 1.
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
D2	Nominal diameter of spot-machining tool		M	The nominal diameter of a spot-machining tool that is automatically set during automatic tool development. **Example:** 
	1 mm 0.1 inch	0 ~ 99	Immediate	
D3	Spot-machining hole bottom dwell element		M	Z-axis feed dwell time at the hole bottom in a spot-machining cycle. Set this time in spindle revolutions.  (Stops at hole bottom.) 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 feedrate.
	1 revolution	0 ~ 9	Immediate	
D4	Maximum allowable spot-chamfering hole diameter element		M	Element used to set the maximum spot-chamfering hole diameter (d) during automatic tool development.  Spot-chamfering occurs if d ≦ D2 − D4. If d > D2 − D4, the chamfering cutter is developed automatically.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	

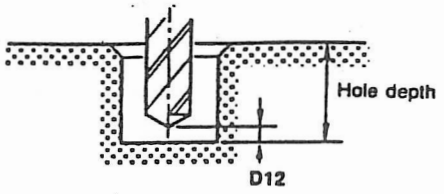
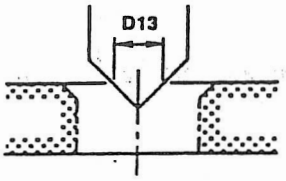
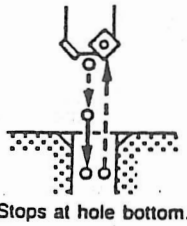
Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D5	Prehole through speed during inversed spot-facing		M	The feedrate 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. 
	100 mm/min 10 inch/min	0 ~ 99	Immediate	
D6	Drill-machining cycle setting element		M	Element used to automatically set drill-machining cycles during automatic tool development.
	—	0 ~ 9	Immediate	
D7	Drill-machining cycle setting element		M	
	—	0 ~ 9	Immediate	
D8	Maximum diameter of holes machinable on one drill		M	Element used to automatically set the number of drills which are automatically developed according to the bore diameter of the drill unit.
	1 mm 0.1 inch	0 ~ 99	Immediate	
D9	Maximum diameter of holes machinable on two drills		M	
	1 mm 0.1 inch	0 ~ 99	Immediate	
D10	Maximum diameter of holes machinable on three drills		M	
	1 mm 0.1 inch	0 ~ 99	Immediate	
D11	Through-hole/tap-prehole machining overshoot		M	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 1 — TOOL DRILL — NOM-ø 10. — NO. — HOLE-ø 10. — HOLE-DEP (21.) (Hole depth + D11) Note: See also parameter D30 for tapping units.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	

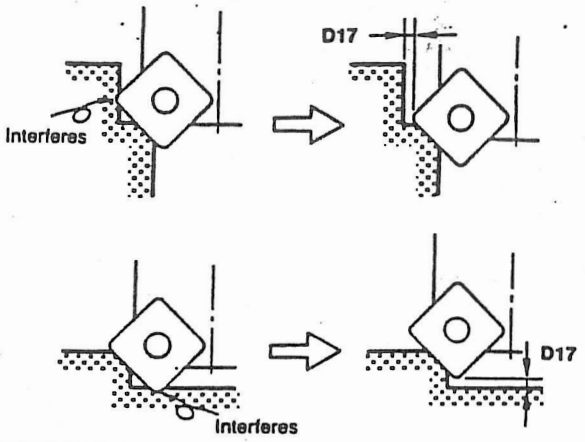
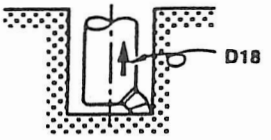
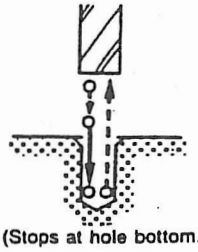
Machining cycle	Conditions
Drilling cycle	$\frac{\text{Hole depth}}{\text{Hole diameter}} \leqq$ D6
High-speed deep-hole drilling cycle	D6 $<$ $\frac{\text{Hole depth}}{\text{Hole diameter}} \leqq$ D7
Deep-hole drilling cycle	D7 $<$ $\frac{\text{Hole depth}}{\text{Hole diameter}}$

Number of drills developed	Conditions
1	Bore diameter $\leqq$ D8
2	D8 $<$ Bore diameter $\leqq$ D9
3	D9 $<$ Bore diameter $\leqq$ D10
Alarm	D10 $<$ Bore diameter

Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D12	Stop-hole machining hole-bottom clearance		M	Element used to automatically set the hole-drilling depth during automatic tool development of stop-hole counter-boring and stop-hole boring units.  Example: SNO 1 / TOOL DRILL / NOM-ø 10. / NO. / HOLE-ø 10. / HOLE-DEP (19.) (Hole depth – tool tip compensation – D12)
	0.1 mm 0.01 inch	0 – 99	Immediate	
D13	Spot-machining hole diameter (fixed value)		M	Hole diameter is automatically set during automatic tool development when spot-chamfering is not to be performed.  Example: SNO 1 / TOOL CTR-DR / NOM-ø 20. / NO. / HOLE-ø (10.) / HOLE-DEP ◆ D13
	1 mm 0.1 inch	0 – 99	Immediate	
D14	Depth-of-cut setting element for drilling (ALMINUM)		M	Element used to automatically set the depth-of-cut per drilling operation during automatic tool development. HOLE-ø × D14 : (when the material of the stock work is aluminum) HOLE-ø × D15 : (when the material of the stock work is other than aluminum)
	0.1	0 – 10	Immediate	
D15	Depth-of-cut setting element for drilling (except ALMINUM)		M	
	0.1	0 – 10	Immediate	
D16	Hole-bottom dwell setting element for chamfering cutter		M	Z-axis feed dwell time at the hole bottom in a chamfering cutter machining cycle. 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 feedrate. Note: This parameter is invalid for chamfering with true-circle processing. (Stops at hole bottom.)
	1 revolution	0 – 9	Immediate	

Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D17	Interference clearance of chamfering cutter		M	The clearance to ensure the tool not contact with a wall of the work or with the hole bottom during a chamfering cycle. 
	0.1 mm 0.01 inch	0 ~ 99	Immediate	
D18	Return feedrate for reaming or boring (cycle 3)		M	The feedrate at which the tool is returned from the hole bottom during reaming or boring.  Notes: 1. Valid only when the setting for the depth of cut by the reamer (tool sequence) is G01. 2. Valid only when the setting for prehole diameter of the boring (tool sequence) is CYCLE 3. 3. If this parameter is 0, the tool is returned at the same feedrate as that of cutting.
	100 mm/min 10 inch/min	0 ~ 9	Immediate	
D19	Hole-bottom dwell setting element for endmilling		M	Z-axis feed dwell time at the hole bottom in an endmilling cycle. Set this time in spindle revolutions.  (Stops at hole bottom.) When the endmilling tool 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 feedrate. Note: This parameter is invalid for true-circle processing.
	1 revolution	0 ~ 9	Immediate	
D20	Radial depth-of-cut setting element for endmilling		M	Element used to automatically set the radial depth-of-cut per endmilling operation. Depth-of-cut = nominal diameter × D20 Depth-of-cut is automatically set according to the value of this parameter when nominal diameter of the endmilling tool is input. Example:
	1%	0 ~ 100	Immediate	

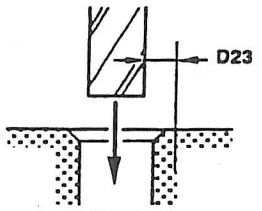
SNO	TOOL	NOM-ø	NO.	HOLE-ø	HOLE-DEP	PRE-DIA	PRE-DEP	RGH	DEPTH
1	E-MILL	20.		40.	10.	30.	0	0.	(12.)
									(NOM-ø × D20)

Classification	USER	Display title	POINT CUTTING PARAMETER

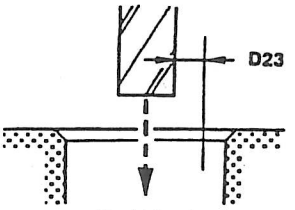
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D21	Reference bottom-finishing allowance for endmilling		M	The reference value for calculation of a bottom-finishing allowance which corresponds to the roughness of the endmilling (tool sequence). The finishing allowance in the 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.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	

Roughness	Bottom-finishing allowance
0 (3	0.0
4	D21
5	D21 × 0.7
6	D21 × 0.7 ×0.7
7	D21 ×0.7 ×0.7 ×0.7
8	D21 × 0.7 × 0.7 × 0.7 × 0.7
9	D21 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D22	Tapping-cycle dwell time		M	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 of tapping (tool sequence) is FIX.
	0.01 sec.	0 ~ 99	Immediate	
D23	Prehole clearance for endmilling		M	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 feedrate or at a cutting feedrate during true-circle processing with the endmill.
	1 mm 0.01 inch	0 ~ 99	Immediate	

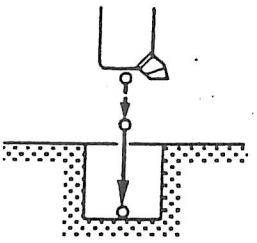


Cutting feed



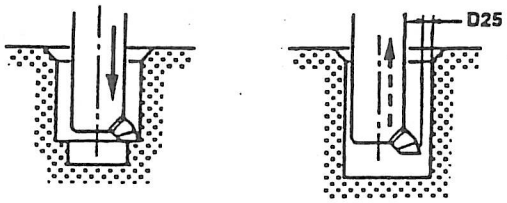
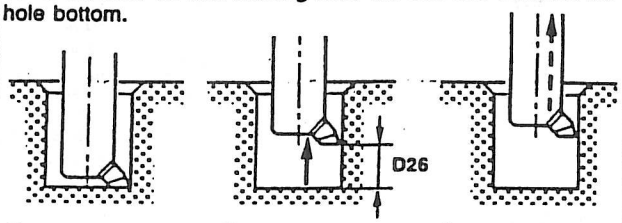
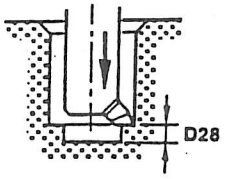
Rapid feed

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D24	Hole-bottom dwell setting element for boring		M	Z-axis feed dwell time at the hole bottom in a boring cycle. Set this time in spindle revolutions.
	1 revolution	0 ~ 9	Immediate	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.

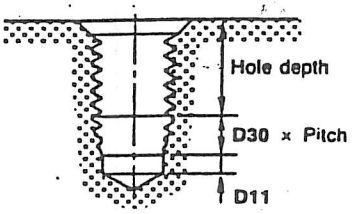
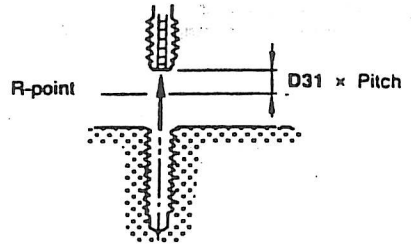
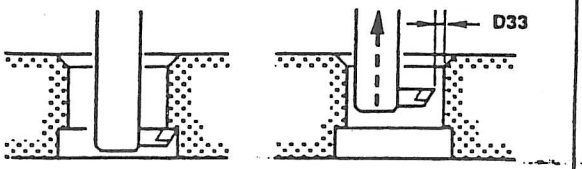

(Stops at hole bottom)

Note:
This parameter is invalid if the roughness of the boring (tool sequence) is 0.

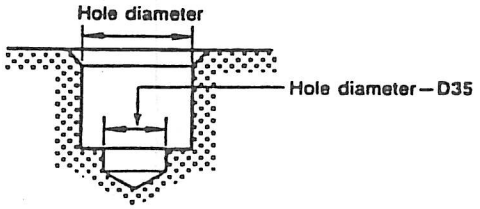
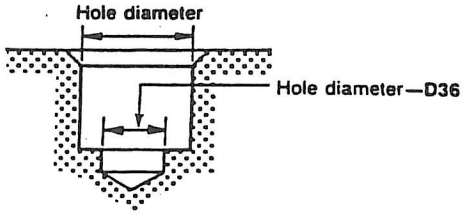
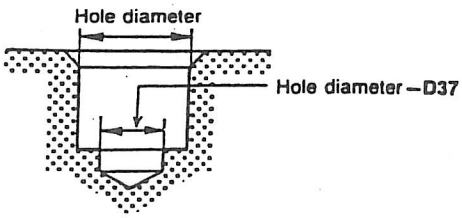
Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
D25	Boring-bar tip relief		M	The amount of relief provided for the tip of a boring bar to be kept clear of the hole wall after spindle orientation.  During boring During returning **Notes:** 1. Valid only when the setting for the prehole diameter of the boring (tool sequence) is CYCLE 1. 2. For the relief direction of the tool tip, see the description of bit 3 and bit 4 of I14.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	
D26	Boring or back-boring hole-bottom return		M	The distance the boring or back-boring tool is returned at the same feedrate as that existing after the tool has reached the hole bottom.  ① Has reached the hole bottom. ② Returned at the same feedrate. ③ Returned at a rapid feedrate. **Note:** Not valid if the setting for the roughness of the boring (tool sequence) is 1.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	
D27				Invalid
D28	Bottom-finishing amount of boring		M	The distance the boring bar is fed in at 70% of the original feedrate to finish the hole bottom. 
	0.1 mm 0.01 inch	0 ~ 99	Immediate	The feedrate is reduced to 70% of the original value before the hole bottom is reached. **Note:** Not valid if the setting for the roughness of the boring (tool sequence) is 1.
D29	Chip removal time		M	The time required for a chip removal tool to complete a chip removal operation after the tool has been positioned at the hole bottom.
	1 sec.	0 ~ 99	Immediate	

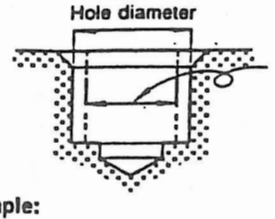
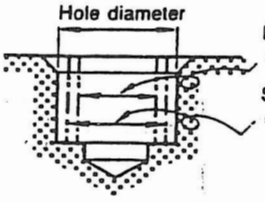
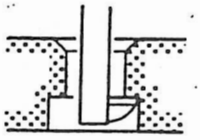
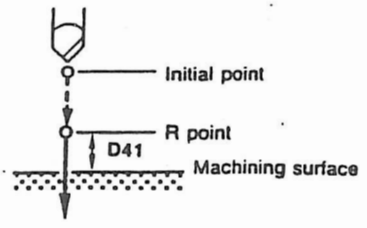
Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D30	Number of incomplete threads in tapping cycle		M	Element used to automatically set the hole-drilling depths during automatic tool development for tapping unit.  **Example:** SNO 1 / TOOL DRILL / NOM-ø 10. / NO. / HOLE-ø 10. / HOLE-DEP 19. {Hole depth + D11 + (D30 × pitch)}
	1 thread	0 ~ 9	Immediate	
D31	Tapper elongation amount of tap		M	Excess amount of tool return due to elongation of the tapper during a tapping cycle. Set this value in spindle revolutions. 
	1 revolution	0 ~ 9	Immediate	
D32	Number of spindle revolutions until spindle CCW rotation begins in tapping cycle		M	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.
	1 revolution	0 ~ 99	Immediate	
D33	Back-boring tool tip relief		M	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.  ① During back-boring ② During passage **Note:** For the relief direction of the tool tip, see the description of bit 3 and bit 4 of I14.
	0.1 mm 0.01 inch	0 ~ 99	Immediate	
D34				Invalid

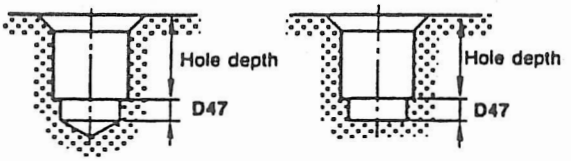
Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
D35	Prehole-drilling diameter setting element for reamer drilling		M	Element used to automatically set the prehole-machining diameter during automatic tool development of the reamer unit. (When the pre-machining process is drilling)  Example: SNO 1 TOOL DRILL NOM-ø 10. NO. HOLE-ø (10.) (Hole diameter – D35)
	0.1 mm 0.001 inch	0 – 999	Immediate	
D36	Prehole-drilling diameter setting element for reamer boring		M	Element used to autoamtically set the prehole-machining diameter during automatic tool development of the reamer unit. (When the pre-machining process is boring)  Example: SNO 1 TOOL DRILL NOM-ø 10. NO. HOLE-ø (10.) (Hole diameter – D36)
	0.1 mm 0.001 inch	0 – 999	Immediate	
D37	Prehole-drilling diameter setting element for reamer endmilling		M	Element used to automatically set the prehole-machining diameter during automatic tool development of the reamer unit. (When the pre-machining process is endmilling)  Example: SNO 1 TOOL DRILL NOM-ø 10. NO. HOLE-ø (10.) (Hole diameter – D37)
	0.01 mm 0.001 inch	0 – 999	Immediate	

Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D38	Reamer-prehole diameter setting element for boring or endmilling		M	(1) In automatic tool development of the reamer unit, if the pre-machining process is boring:  **Example:** SNO 1 TOOL BOR BAR NOM-ø 10. NO. HOLE-ø (10.) (Hole diameter – D38)
	0.01 mm 0.001 inch	0 ~ 999	Immediate	
D39	Reamer-prehole diameter setting element for endmilling		M	(2) In automatic tool development of the reamer unit, if the pre-machining process is endmilling:  **Example:** SNO 1 TOOL E-MILL NOM-ø 15. NO. HOLE-ø (20.) ← (Hole diameter – D39) SNO 2 TOOL E-MILL NOM-ø 10. NO. HOLE-ø (21.) ← (Hole diameter – D38)
	0.01 mm 0.001 inch	0 ~ 999	Immediate	
D40	Spot-faced hole bottom dwell element for inversed spot-facing		M	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.)
	1 revolution	0 ~ 9	Immediate	
D41	R-point height during point-machining		M	R-point height of each tool in the point-machining unit. **Example:** 
	1 mm 0.1 inch	0 ~ 99	Immediate	Notes: 1. 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. 2. For the drilling unit, see **D1** also.

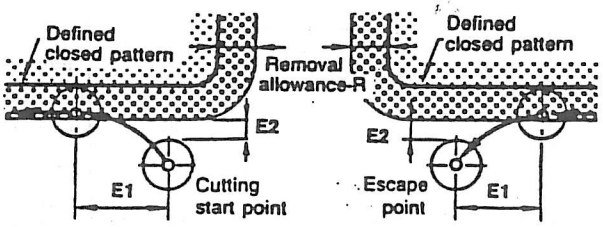
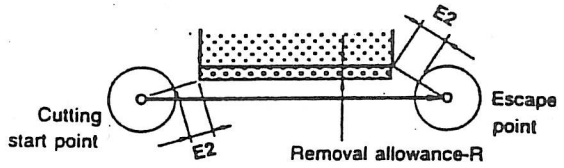
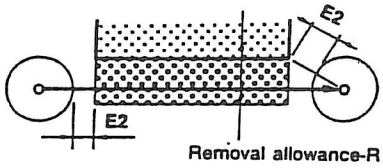
Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D42 ⟆ D46				Invalid
D47	Reamer-prehole machining overshoot		M	Element used to automatically set the hole depth of drilling, endmilling and boring during automatic tool development of the reamer unit.  For drilling For endmilling or boring Example: SNO 1 TOOL DRILL NOM-ø 10. NO. HOLE-ø 10. HOLE-DEP 21. (Hole depth + D47)
	0.01 mm 0.001 inch	0 – 999	Immediate	
D48 ⟆ D90				Invalid
D91	—		M	7 6 5 4 3 2 1 0 (1: Execution, 0: No execution) 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. The finishing tool path is shortened during a true-circle processing cycle (endmilling). The tool path is shortened during a true-circle processing cycle (chamfering). The R-point height of the drill is set as D1.
	Bit	Binary eight digits	Immediate	

Classification	USER	Display title	POINT CUTTING PARAMETER

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
D92	—		M	7 6 5 4 3 2 1 0 (1: Execution, 0: No execution) └ During a true-circle processing (endmilling) cycle, E17 is used for axial feed.
	Bit	Binary	Immediate	
D93	—		M	Unidirectional positioning for point-machining 7 6 5 4 3 2 1 0 (1: Execution, 0: No execution) CTR-DR (Spot-machining tool) DRILL (Drill) REAM (Reamer) TAP (Tap) BK FACE (Inversed spot-facing tool) BOR BAR (Boring tool) B-B BAR (Back-boring tool) CHF-M (Chamfering cutter)
	Bit	Binary eight digits	Immediate	
D94	—		M	Unidirectional positioning for point-machining 7 6 5 4 3 2 1 0 (1: Execution, 0: No execution) E-MILL (Endmilling tool)
	Bit	Binary eight digits	Immediate	
D95 ~ D108				Invalid

Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E1	Closed-pattern cutting start point and escape point setting element		M	Element used to set the cutting start point and escape point for closed-pattern line- or face-machining. **Example:**  [Applicable units] • LINE OUT, LINE IN, CHMF OUT and CHMF IN • Wall finishing of STEP, POCKET, PCKT MT and PCKT VLY
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E2	Cutting start point and escape point setting element		M	Element used to set the cutting start point and escape point for line- or face-machining. **Example:** Tool diameter/2 ≧ Removal allowance-R  Tool diameter < Removal allowance-R  [Applicable units] • All line-machining units • Face-machining units other than FACE MIL, TOP EMIL, and SLOT **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.
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E3				Invalid

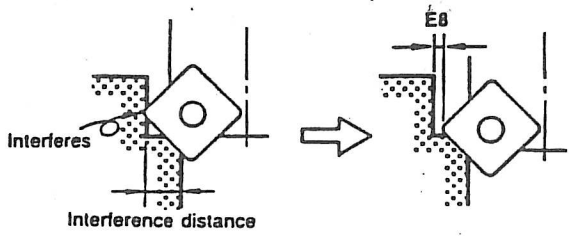
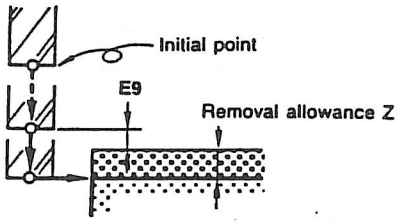
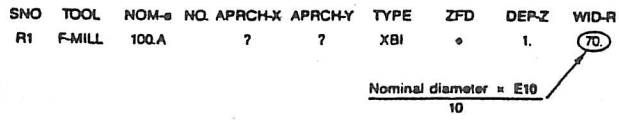
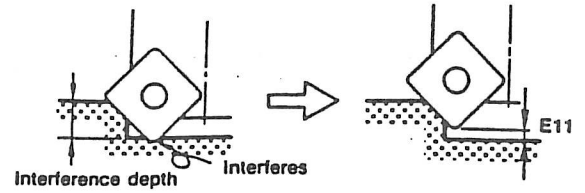
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E4	Reference allowance of finish in radial direction		M	The reference value of each finish allowance R which is automatically set when the roughness levels of the line- or face-machining units have been set. The finish 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.
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E5				Invalid
E6	Reference allowance of finish in axial direction		M	The reference value of each finish allowance Z which is automatically set when the roughness levels of the line- or face-machining units have been set. The finish 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.
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E7				Invalid

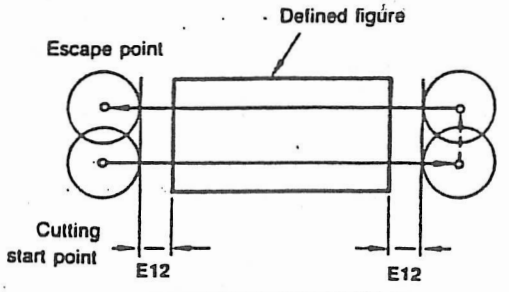
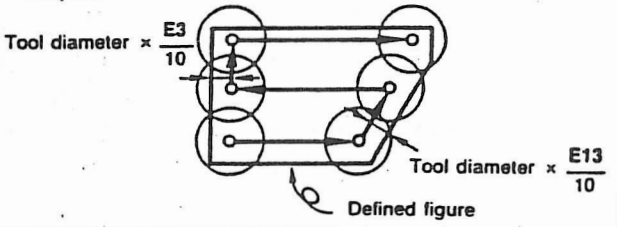
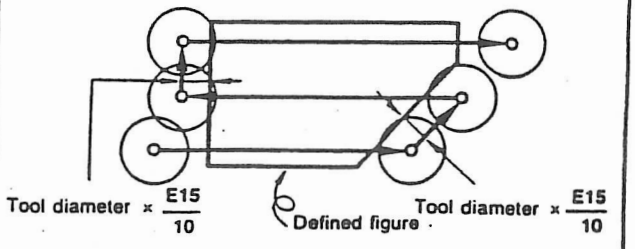
Roughness	Finish allowance R
0 ∫ 3	0.0
4	E4
5	E4 × 0.7
6	E4 × 0.7 × 0.7
7	E4 × 0.7 × 0.7 × 0.7
8	E4 × 0.7 × 0.7 × 0.7 × 0.7
9	E4 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7

Roughness	Finish allowance Z
0 ∫ 3	0.0
4	E6
5	E6 × 0.7
6	E6 × 0.7 × 0.7
7	E6 × 0.7 × 0.7 × 0.7
8	E6 × 0.7 × 0.7 × 0.7 × 0.7
9	E6 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7

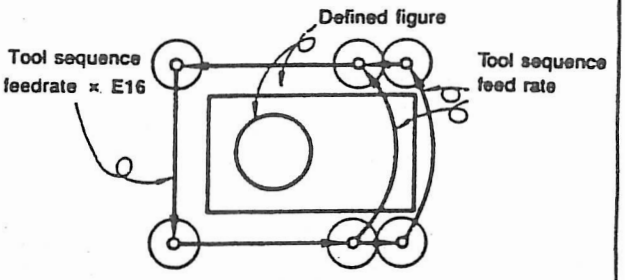
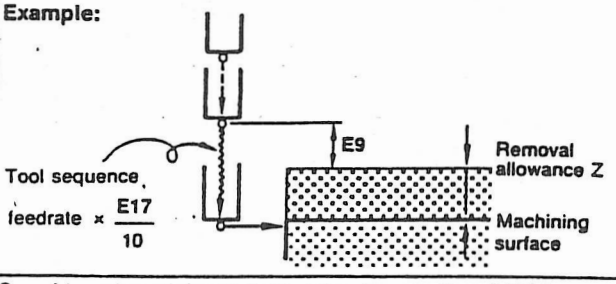
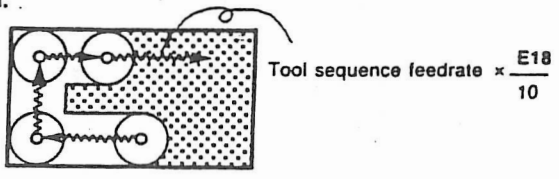
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E8	Radial interference clearance of chamfering cutter		M	The amount of clearance that ensures no interference of the chamfering cutter with the hole walls during face-machining. 
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E9	Allowance of axial-cutting start position		M	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 work at a rapid feedrate. **Example:** 
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E10	Depth-of-cut-R automatic setting element (Face milling, Endmilling-top, Endmilling-relief)		M	Element used to automatically set the radial depth-of-cut of the tool sequence in FACE MIL, TOP EMIL or STEP unit. Radial depth-of-cut = $\frac{\text{Nominal diameter} \times \text{E10}}{10}$ **Example:** 
	10%	0 ~ 9	Immediate	
E11	Axial interference clearance of chamfering cutter		M	The amount of clearance that ensures no interference of the chamfering cutter with the hole bottom during chamfering. 
	0.1 mm 0.01 inch	5 ~ 40	Immediate	

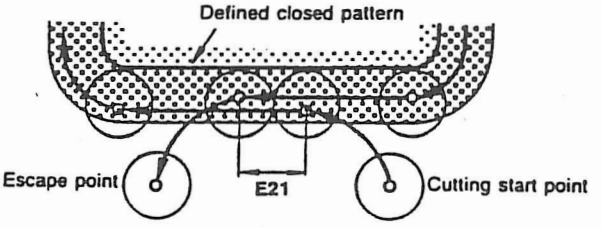
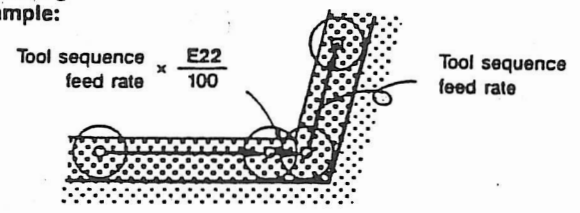
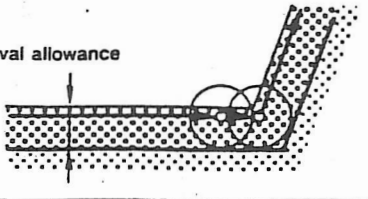
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E12	Radial interference clearance of face milling unit		M	The amount of clearance that ensures no contact between the tool and the figure during face milling. **Example:** 
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E13	Tool path setting element for endmilling-top unit		M	Element used to set the tool path internal to the figure for endmilling-top unit. **Example:** 
	10%	1 ~ 9	Immediate	
E14	Depth-of-cut-R automatic setting element (Pocket milling, Pocket milling-relief, Pocket milling-hollow)		M	Element used to automatically set the radial depth-of-cut of the tool sequence in POCKET, PCKT MT or PCKT VLY unit. $\text{Radial depth-of-cut} = \frac{\text{Nominal diameter} \times \text{E14}}{10}$ **Example:** SNO TOOL NOM-ø NO. APRCH-X APRCH-Y TYPE ZFD DEP-Z WID-R R1 E-MILL 20.A ? ? CW G01 10. (12.) Nominal diameter × E14 / 10
	10%	0 ~ 9	Immediate	
E15	Tool path setting element for face milling unit (reciprocating short)		M	Element used to set the tool path external to the defined figure for reciprocating-short machining with face milling unit. **Example:** 
	10%	1 ~ 9	immediate	

Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

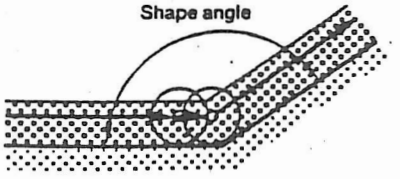
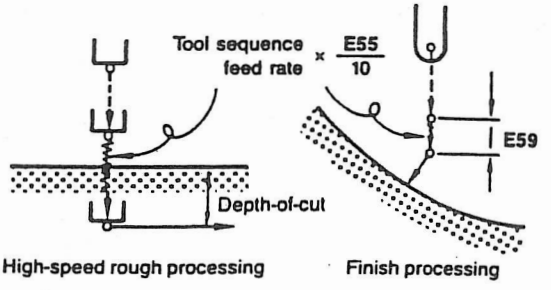
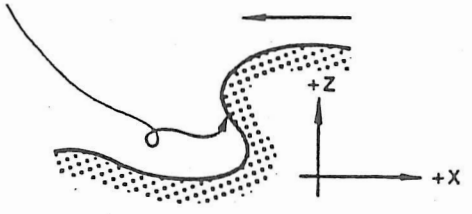
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E16	Peripheral-cutting feedrate override for endmilling-relief unit		M	Override value of the idle-cutting feedrate at which tool of endmilling-relief unit is to be moved around the outer form of the work. **Note:** Valid only when bit 0 of E91 is 1 and bit 7 is 0. **Example:** 
	—	1 ~ 20	Immediate	
E17	Axial-cutting feedrate override		M	Override value of the feedrate 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:** 
	10%	0 ~ 9	Immediate	
E18	Pocket-machining across-the-width override		M	Override value of the tool diameter (across-the-width) to which the pocket-machining radial depth-of-cut becomes equal. 
	10%	0 ~ 9	Immediate	**Note:** Across-the-width overriding is not valid when this parameter is 0. [Applicable units] Rough-machining of POCKET, PCKT MT, PCKT VLY and STEP

Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

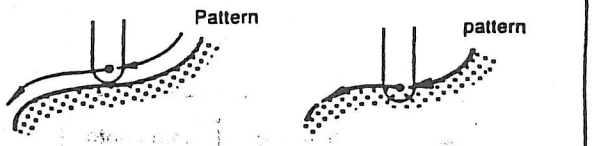
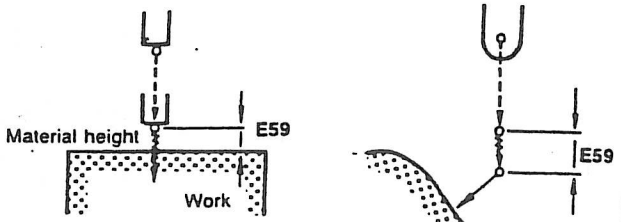
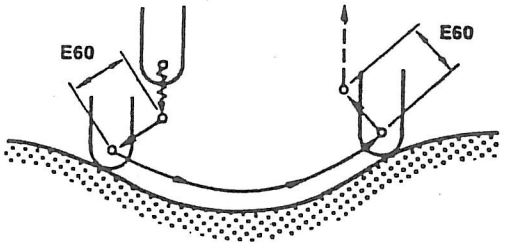
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E19 E20				Invalid
E21	Wall-cutting overlap in closed figure		M	The amount of overlap of the wall-cutting start and end areas in closed-pattern line- or face-machining. **Example:** 
	0.1 mm 0.01 inch	0 – 999	Immediate	[Applicable units] • LINE OUT, LINE IN, CHMF OUT and CHMF IN • Wall finishing of STEP, POCKET, PCKT MT, PCKT VLY and SLOT
E22	Override value of automatic corner overriding		M	Override value of automatic corner overriding in line- or face-machining **Example:** 
	1%	0 – 99	Immediate	**Note:** Automatic corner overriding is invalid when this parameter is 0. [Applicable units] LINE RGT, LINE LFT, LINE OUT, LINE IN, STEP, POCKET, PCKT MT and PCKT VLY
E23	Effective removal allowance (upper limit) of automatic corner overriding		M	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: $\text{Tool diameter} \times \frac{E24}{100} \leqq \text{Removal allowance} \leqq \text{Tool diameter} \times \frac{E23}{100}$
	1%	1 – 99	Immediate	[Removal allowance] 
E24	Effective removal allowance (lower limit) of automatic corner overriding		M	
	1%	1 – 99	Immediate	

Machining	Removal allowance
Line-roughmachining	(Radial removal allowance) – (Radial finish allowance)
Face-roughmachining	(Radial depth-of-cut)

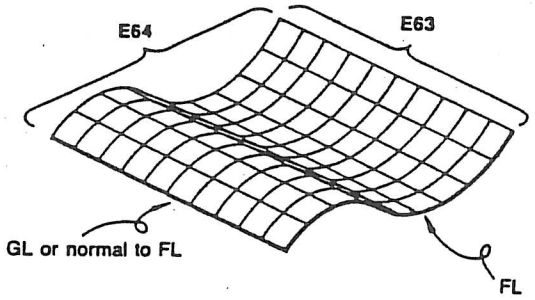
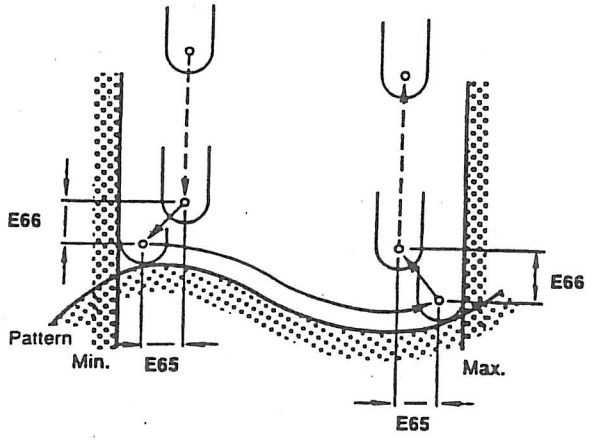
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E25	Effective angle (upper limit) of automatic corner overriding		M	The shape angle range (upper limit). The automatic corner overriding becomes valid when the following line- or face-machining conditions are met: Shape angle ≦ E25 
	1°	1 ~ 179	Immediate	
E26 ~ E54				Invalid
E55	3-D Axial cutting-feed overriding		M	Feed overriding for cutting a work in an axial direction using a 3-D unit. **Example:**  **Note:** Feed overriding is invalid when this parameter is 0.
	10%	0 ~ 9	Immediate	
E56	3-D Inversion check of curved-surface pattern		M	The parameter 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). **0:** No alarm **1:** Alarm **Example:** The curved surface of a defined pattern points in the −Z direction.  **Note:** This parameter is invalid during high-speed rough processing.
	—	0, 1	Immediate	

Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E57	3-D Severity check of cutting pitch		M	The parameter used to select whether or not processing is to be performed in strict accordance with the tool-sequence pitch data setting. 0: The pitch setting is not strictly observed. 1: The pitch setting is strictly observed. **Notes:** 1. This parameter is invalid during high-speed rough processing. 2. The operation time becomes long if this parameter is set to 1.
	—	0, 1	Immediate	
E58	3-D Tool-diameter compensation		M	The parameter 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. 0: Diameter compensation made 1: Diameter compensation not made **Example:**  Diameter compensation made Diameter compensation not made
	—	0, 1	Immediate	
E59	3-D Allowance of axial-cutting start position		M	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 work at a rapid feedrate. **Example:**  Normal-speed or high-speed rough processing Finish processing
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E60	3-D Normal cutting allowance		M	The 3-D finish processing (cutting) allowance in the direction of the normal with respect to the defined pattern of the curved surface. **Example:** 
	0.1 mm 0.01 inch	0 ~ 999	Immediate	

Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

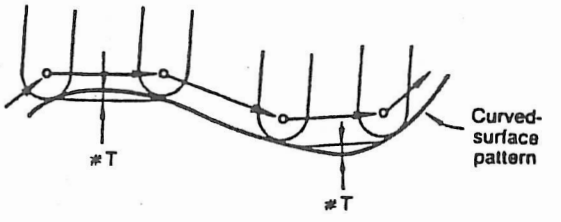
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E61	3-D Search length for parallel cutting		M	The length of a short line segment which determines the next approximation point for tool-path creation. Depending on the tool-sequence method selected: E61 is applicable for //-1 or //-2; or . E62 is applicable for _|-1 or _|-2.
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E62	3-D Search length for right-angle cutting		M	
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E63	3-D Pattern display division segments (FL direction)		M	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 PATH CHECK display. **Example:**  **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.
	—	0 ~ 999	Immediate	
E64	3-D Pattern display division segments (GL direction)		M	
	—	0 ~ 999	Immediate	
E65	3-D Radial cutting allowance for area check		M	The allowance of cutting a work along the wall of the area which has been set using the area check function. **Example:** 
	0.1 mm 0.01 inch	0 ~ 999	Immediate	
E66	3-D Axial cutting allowance for area check		M	
	0.1 mm 0.01 inch	0 ~ 999	Immediate	

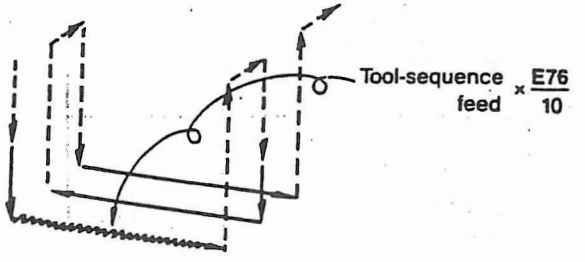
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

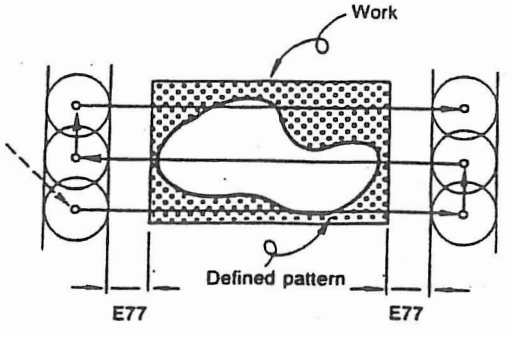
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E67 ∫ E75	3-D Processing error tolerance		M	That processing error tolerance with respect to a curved-surface pattern which corresponds to a #T setting (1 through 9) of the tool sequence.
	0.01 mm 0.001 inch	0 – 999	Immediate	
E76	3-D Entire-width override		M	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.
	10%	0 – 9	Immediate	Note: Entire-width overriding is not valid when this parameter is 0.
E77	3-D Radial cutting allowance for high-speed rough processing (work size appointment)		M	The clearance of high-speed rough processing (work size appointment) between the tool and the figure.
	0.1 mm 0.01 inch	0 – 999	Immediate	
E78 ∫ E82				Invalid

#T	1	2	3	4	5	6	7	8	9
Address	E67	E68	E69	E70	E71	E72	E73	E74	E75

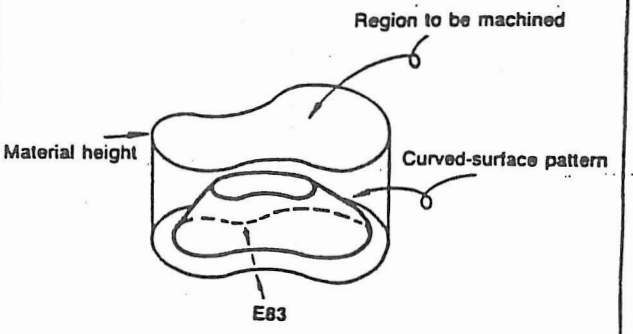
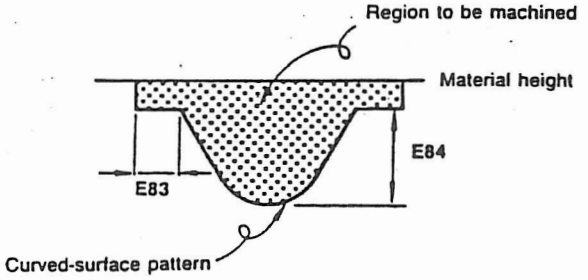
Example:





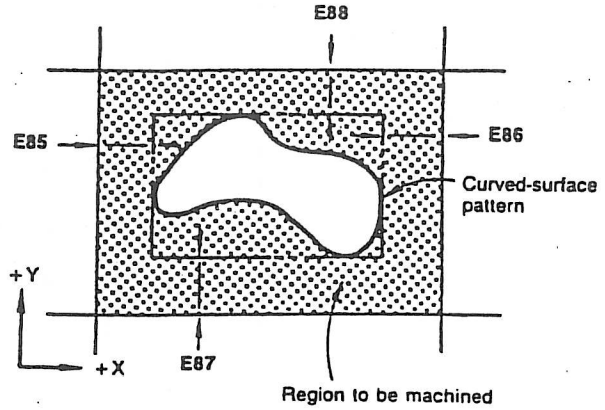


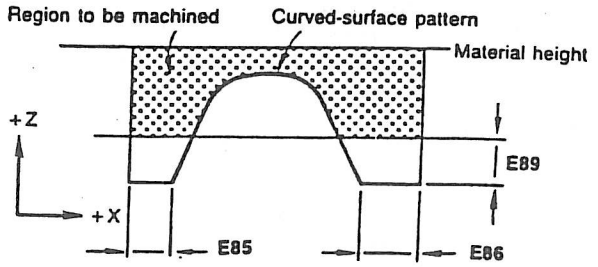
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
E83	3-D Region of radial machining during high-speed rough processing (offset appointment)		M	That amount of offset from a curved-surface pattern which determines the region of high-speed rough processing (offset appointment) in a radial direction. 
	0.1 mm 0.01 inch	0 – 9999	Immediate	
E84	3-D Region of axial machining during high-speed rough processing (offset appointment)		M	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:** 
	0.1 mm 0.01 inch	0 – 9999	Immediate	

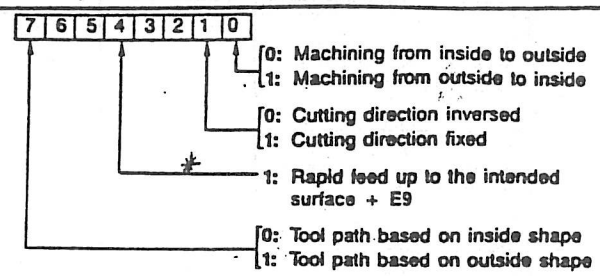
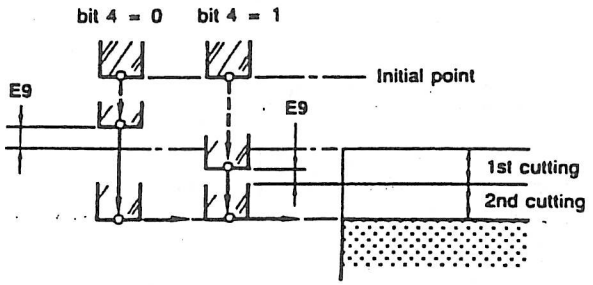
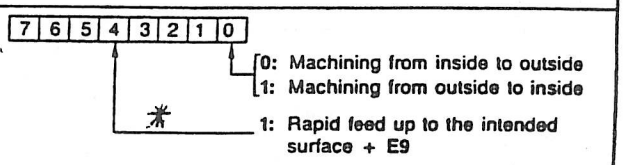
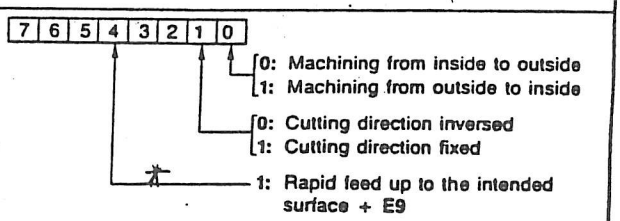
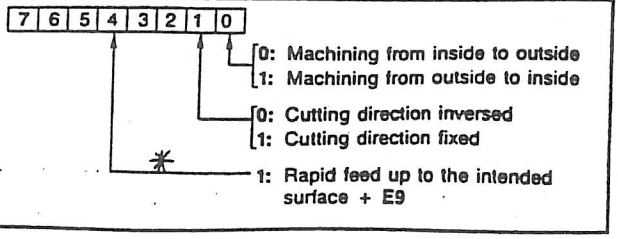
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
E85	3-D Region of radial machining during high-speed rough processing: −X (work size appointment)		M	The factor that determines the region of high-speed rough processing (work size appointment) in a radial direction.
	0.1 mm 0.01 inch	0 ~ 9999	Immediate	
E86	3-D Region of radial machining during high-speed rough processing: +X (work size appointment)		M	
	0.1 mm 0.01 inch	0 ~ 9999	Immediate	
E87	3-D Region of radial machining during high-speed rough processing: −Y (work size appointment)		M	
	0.1 mm 0.01 inch	0 ~ 9999	Immediate	
E88	3-D Region of radial machining during high-speed rough processing: +Y (work size appointment)		M	
	0.1 mm 0.01 inch	0 ~ 9999	Immediate	
E89	3-D Region of axial machining during high-speed rough processing (work size appointment)		M	That distance from the bottom of a curved-surface pattern which determines the region of high-speed rough processing (work size appointment) in an axial direction. **Example:**
	0.1 mm 0.01 inch	0 ~ 9999	Immediate	
E90				Invalid





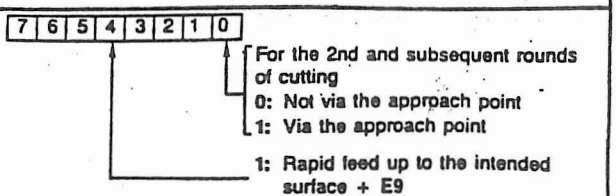
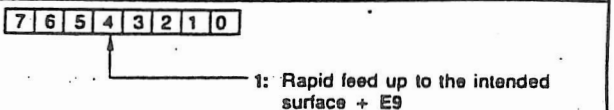
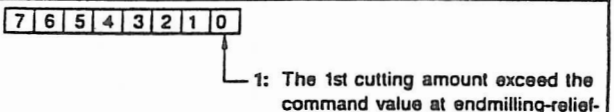
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E91	Tool-path pattern selection for endmilling-relief unit		M	 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. 
	Bit	Binary eight digits	Immediate	
E92	Tool-path pattern selection for pocket milling unit		M	
	Bit	Binary eight digits	Immediate	
E93	Tool-path pattern selection for pocket milling-relief unit		M	
	Bit	Binary eight digits	Immediate	
E94	Tool-path pattern selection for pocket milling-hollow unit		M	
	Bit	Binary eight digits	Immediate	

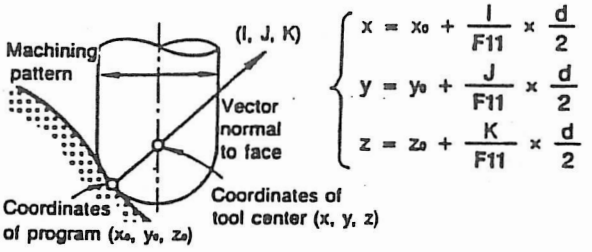
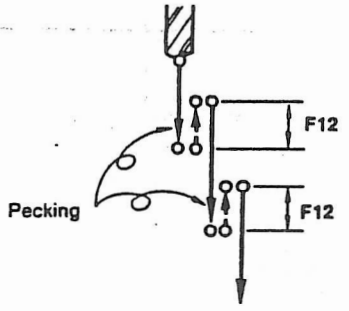
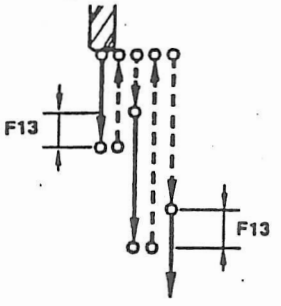
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E95	Tool-path pattern selection for line-machining unit	Bit	M	7 6 5 4 3 2 1 0 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 toward the Z-axis 1: Rapid feed up to the intended surface + E9 1: Escape to a position where the workpiece and the tool do not interfere • Bit 2 bit 2 = 1 bit 2 = 0 Initial point 1st removal allowance 2nd removal allowance Approach point Cutting start point • Bit 3 Approach point Escape point bit 3 = 0 Initial point 1st removal allowance bit 3 = 1 2nd removal allowance • Bit 5 bit 5 = 0 bit 5 = 1 E2 Escape point Removal allowance-R E2 Note: Bit 3 is valid only for inside/outside linear machining unit.
		Binary eight digits	Immediate	

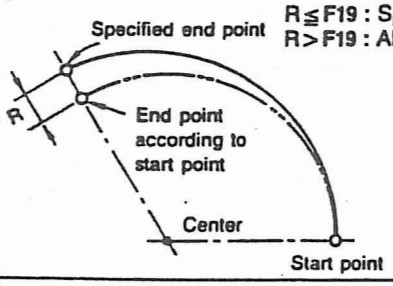
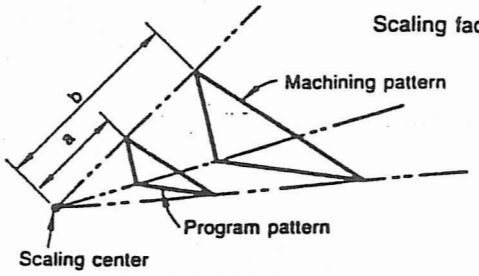
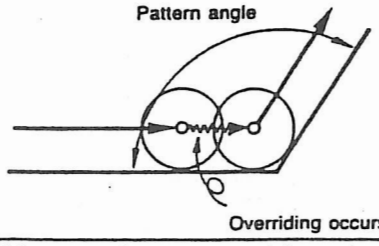
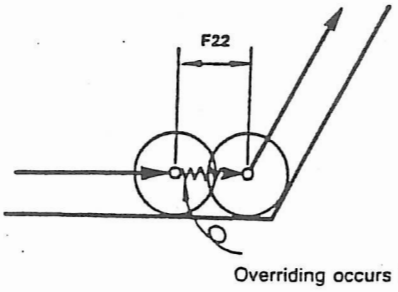
Classification	USER	Display title	LINE/FACE/3-D CUTTING PAR

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
E96	Tool-path pattern selection for endmilling-groove unit		M	
	Bit	Binary eight digits	Immediate	
E97	Tool-path pattern selection for endmilling-top unit		M	
	Bit	Binary eight digits	Immediate	
E98	Cutting method selection for endmilling-relief, pocket milling-hollow unit		M	
	Bit	Binary eight digits	Immediate	
E99 ~ E108				Invalid

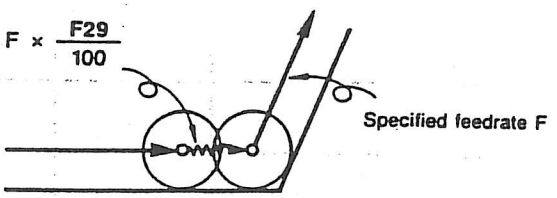
Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F1 ⟆ F10				Invalid
F11	Vector constant for 3-D tool-diameter compensation			 Note: F11 = $\sqrt{I^2+J^2+K^2}$ if this parameter is 0.
	0.001 mm 0.0001 inch (0.001°)	0 ~ 99999999	Next block	
F12	Return amount of pecking in drill high-speed deep-hole cycle or in G73		M · E	Return amount of pecking in drill high-speed deep-hole cycle or in G73 tool path 
	0.001 mm 0.0001 inch	0 ~ 99999999	Next block	
F13	Allowance amount of rapid-feed stop in deep-hole drilling cycle or in G83		M · E	The allowance amount provided for the tool to stop moving just in front of the preceding hole during a deep-hole drilling cycle or during G83 tool path. 
	0.001 mm 0.0001 inch	0 ~ 99999999	Next block	
F14 ⟆ F18				Invalid

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
F19	Maximum permissible difference in arc radius		M · E	Maximum radius difference that causes spiral interpolation to be performed when the arc-drawing start point and end point radius that have been specified in the arc command do not agree. R≦F19 : Spiral interpolation R>F19 : Alarm 
	0.001 mm 0.0001 inch (0.001°)	0 ~ 9999	Next block	
F20	Fixed value of scaling factor		E	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. Scaling factor = $\frac{b}{a}$ 
	1/1000000	0 ~ 99999999	Next command	
F21	Maximum inside-corner angle available with automatic corner override (G62)		E	The automatic corner override using the G62 code becomes valid when the following condition of the pattern angle is met: Pattern angle ≦ F21 
	1°	0 ~ 179	Next command	
F22	Deceleration area of automatic corner overriding (G62)		E	The area in which automatic corner overriding using the G62 code occurs. 
	0.001 mm 0.0001 inch (0.001°)	0 ~ 99999999	Next command	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F23 ∫ F26				Invalid
F27	Fixed value		—	
	—	1	—	
F28	Fixed value		—	
	—	1	—	
F29	Override value of automatic corner overriding (G62)		E	The override value of automatic corner overriding using the G62 code. 
	1%	0 ~ 100	Next command	Note: The automatic corner overriding is invalid when this parameter is 0.
F30	Fixed value		—	
	—	88	—	
F31	Fixed value		—	
	—	85	—	
F32	Fixed value		—	
	—	65	—	
F33	Fixed value		—	
	—	89	—	

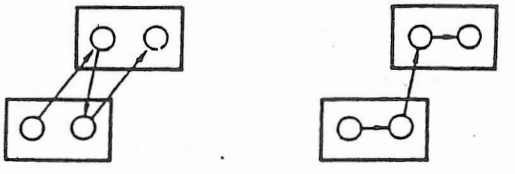
Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
F34	Fixed value		—	
	—	86	—	
F35	Fixed value		—	
	—	66	—	
F36	Fixed value		—	
	—	90	—	
F37	Fixed value		—	
	—	87	—	
F38	Fixed value		—	
	—	67	—	
F39	Fixed value		—	
	—	1	—	
F40				Invalid
F41	Fixed value		—	
	—	1	—	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
F42	Deceleration area r		E	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__; (G37)
	0.001 mm 0.0001 inch	0 ~ 99999999	After stop of movement	
F43	Deceleration area d		E	Range (d) where the tool should stop is commanded. This data is used when argument D is omitted in G37 command format. G37 Z__ R__ Dd F__; (G37)
	0.001 mm 0.0001 inch	0 ~ 99999999	After stop of movement	
F44	Measuring speed f		E	Measuring speed (f) This data is used when argument F is omitted in G37 command format. G37 Z__ R__ D__ Ff; Standard setting: 1 ~ 60000 mm/min 1 ~ 2362 inch/min (G37)
	1 mm/min 1 inch/min	0 ~ 120000	After stop of movement	
F45 \ F66				Invalid
	-			
F67	Tool-life integration display during EIA/ISO program execution		M • E	This parameter is used to specify whether or not the TOOL DATA display is to be used for integration of tool operation time existing during EIA/ISO program execution. 0: Only the TOOL LIFE INDEX display is used for integration. 1: Both the TOOL LIFE INDEX display and the TOOL DATA display are used for integration.
	-	0, 1	Immediate	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F68	Fixed value		—	
	—	0	—	
F69	EIA/ISO program restart method		E	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 counted 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 counted from the beginning part.
	—	0, 1	Immediate	
F70				Invalid
F71	Machining order control		M	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. F71 = 0 F71 = 1 
	—	0 ~ 255	Immediate	
F72				Invalid
F73	M code execution time for time study		M · E	The tool-path check time study time that is accumulated each time a M code is output.
	0.01 sec.	0 ~ 10000	Immediate	
F74	S code execution time for time study		M · E	The tool-path check time study time that is accumulated each time a S code is output.
	0.01 sec.	0 ~ 10000	Immediate	
F75	T code execution time for time study		M · E	The tool-path check time study time that is accumulated each time a T code is output.
	0.01 sec.	0 ~ 10000	Immediate	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
F76	B code execution time for time study		M • E	The tool-path check time study time that is accumulated each time a B code is output.
	0.01 sec.	0 ~ 10000	Immediate	
F77 \ F81				Invalid
F82	Total erasing of programs		M • E	0: Erasing of programs other than protected ones 1: Total erasing of programs (Format) If you want to protect programs with 8000 number mark and 9000 number mark by program management function (parameter H91), set 0. (Standard setting) (Program management function)
	–	0, 1	Immediate	
F83				Invalid

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F84	Tool tip position display during EIA program execution		E	1: Tool offset data is taken into account for the current-position counter during execution of EIA programs.
	—	0 ~ 255	Immediate	
F85 ~ F90				Invalid
F91	—		M · E	7 6 5 4 3 2 1 0 In response to move command without decimal point: 0: Tool moves by 1/1. 1: Tool moves by 10/1. Note: Valid only when bit 5 = 0 Coordinate system shift using a MAZATROL program 0: Invalid 1: Valid 0: Metric 1: Inch In response to move command without decimal point: 0: Tool moves in 0.001 mm (0.0001 inch) increments. 1: Tool moves in 1 mm (1 inch) increments. Note: Valid only when parameter M10 = 10 0: G00 interpolation 1: G00 non-interpolation 0: Stroke inside check before movement 1: Stroke outside check before movement
	Bit	Binary eight digits	At power-on	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F92	—		M · E	7 6 5 4 3 2 1 0 Modal at power-on or at reset 0: G17 or G19 1: G18 Modal at power-on or at reset 0: G17 or G18 1: G19 Fixed value [0] Tool-length compensation (G43 or G44) axis 0: Program command axis 1: Z-axis fixed Tool-diameter compensation (G41 or G42) start up/cancel type 0: Type A 1: Type B Tool-diameter compensation (G41 or G42) interference check 0: Alarm stop occurs to prevent overcutting. 1: Tool path is changed to ensure no overcutting. Fixed-cycle hole-drilling axis 0: Plane selection using G17, G18 or G19. 1: Z-axis fixed Tool diameter compensation using an EIA/ISO program 0: Tool offset fixed 1: Tool data valid
	Bit	Binary eight digits	At power-on	
F93	—		M · E	7 6 5 4 3 2 1 0 Modal at power-on or at reset 0: G94 (Feed in minutes) 1: G95 (Feed in revolutions) Modal at power-on or at reset 0: G91 (Incremental-value command) 1: G90 (Absolute-value command) 1: Tool length of tool data becomes valid with EIA/ISO Feedrate during machine lock 0: Specified feedrate 1: Rapid feedrate Middle point during reference-point return 0: Return through middle point to reference point 1: Return directly to reference point User macro operation instruction in single-block state 0: Single-block stop does not occur. (For operation) 1: Single-block stop occurs. (For test) Fixed value [0]
	Bit	Binary eight digits	At power-on	

Classification	USER	Display title	USER PARAMETER NO. 1

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
F94	—		M · E	7 6 5 4 3 2 1 0 Movement to hole-drilling position in fixed-cycle mode 0: Depends on modal state (G00 or G01). 1: Fixed at rapid feedrate (G00) 0: External deceleration signal valid 1: External deceleration signal invalid Tool length offsetting during G28/G30 execution 0: Offsetting is canceled. 1: Offsetting is performed. Modal at power-on or at reset 0: G01 (Linear interpolation) 1: G00 (Positioning) Tool command method using T codes 0: Assignment of group number on TOOL LIFE INDEX display 1: Pocket number assignment Spare-tool selection method for EIA/ISO program 0: Natural order of pocket number 1: Order of least tool operation time first 0: Incomplete synchronous tapping cycle 1: Complete synchronous tapping cycle Fixed value [1]
	Bit	Binary eight digits	At power-on	
F95	—		M · E	7 6 5 4 3 2 1 0 Interrupt function using user macro instruction 0: Invalid 1: Valid Handling of interrupt macroprogram 0: Handled equally to interrupt call. 1: Handled equally to subprogram call. Fixed value [0] G00 (positioning) command feedrate for dry run 0: Rapid feedrate 1: Feedrate 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 that had been used until resetting was done
	Bit	Binary eight digits	At power-on	
F96 ~ F108				Invalid

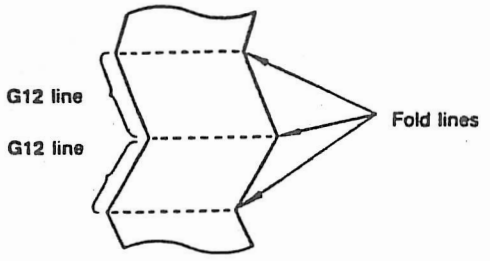
Classification	USER	Display title	USER PARAMETER NO. 2

<table>
<tr><th rowspan="2">Address</th><th colspan="2">Name</th><th>Program type</th><th rowspan="2">Description</th></tr>
<tr><th>Unit</th><th>Setting range</th><th>Conditions</th></tr>
<tr><td rowspan="2">G1</td><td colspan="2">CMT baud rate</td><td>M • E</td><td rowspan="2">CMT baud rate
(Parameter for RS-232C interface initialization)
<table><tr><th>Setting</th><th>Baud rate</th></tr><tr><td>0</td><td>19200</td></tr><tr><td>1</td><td>9600</td></tr><tr><td>2</td><td>4800</td></tr><tr><td>3</td><td>2400</td></tr><tr><td>4</td><td>1200</td></tr><tr><td>5</td><td>600</td></tr><tr><td>6</td><td>300</td></tr><tr><td>7</td><td>110</td></tr></table></td></tr>
<tr><td>–</td><td>0 ~ 7</td><td>At I/O startup</td></tr>
<tr><td>G2
↓
G8</td><td colspan="2"></td><td></td><td>Invalid</td></tr>
<tr><td rowspan="2">G9</td><td colspan="2">–</td><td>M • E</td><td rowspan="2">7 6 5 4 3 2 1 0
Forced loading of tool data (Common to CMT and DNC)
0: When loading conditions are not in agreement, forced loading is not performed.
1: When loading conditions are not in agreement, forced loading is performed.
Superscription of program data (Common to CMT and PTP)
0: When receiving a program of the same work number, an alarm shall be given.
1: When receiving a program of the same work number, the superscription shall be made.
(I/O superscription)</td></tr>
<tr><td>Bit</td><td>Binary eight digits</td><td>At I/O startup</td></tr>
</table>

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G10	Printer baud rate		M · E	Printer baud rate (Parameter for RS-232C interface initialization) Setting / Baud rate: 0 — 19200; 1 — 9600; 2 — 4800; 3 — 2400; 4 — 1200; 5 — 600; 6 — 300; 7 — 110
	—	0 – 7	At I/O startup	
G11	Number of printer paper feed lines		M · E	The number of lines through which printer paper is to be fed at the start and end of printing. G11 line — Idle feed ← Paper setting position Printout ← Printing start G11 line — Idle feed ← Printing end ← End of idle feed
	1 line	0 – 255	At I/O startup	

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G12	Total number of lines per page of printer paper		M · E	The maximum total number of lines per page that can be printed out on printer paper. This parameter becomes valid when printing a program with a length of more than one page. 
	1 line	0 ~ 255	At I/O startup	
G13 ∫ G18				Invalid
G19	Baud rate for paper tape reader/puncher		E	Baud rate for paper tape reader/puncher (Parameter for RS-232C interface initialization)
	—	0 ~ 7	At I/O startup	
G20	Number of stop bits for paper tape reader/puncher		E	Number of stop bits for paper tape reader/puncher (Parameter for RS-232C interface initialization)
	—	1 ~ 3	At I/O startup	
G21	Type of parity for paper tape reader/puncher		E	Type of parity for paper tape reader/puncher (Parameter for RS-232C interface initialization)
	—	0,1	At I/O startup	Note: This parameter is valid only when G22 is 1.

Setting	Baud rate
1	9600
(2)	4800
3	2400
4	1200
5	600
6	300
7	110

Setting	No. of stop bits
1	1
2	1.5
(3)	2

Setting	Type of parity
(0)	Even
1	Odd

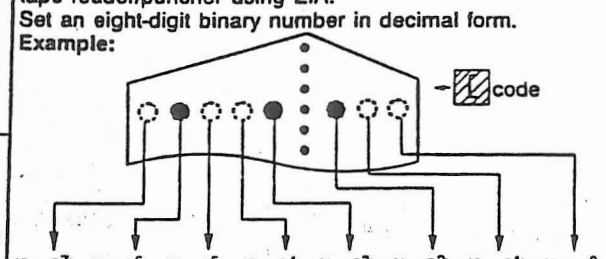
Classification	USER	Display title	USER PARAMETER NO. 2

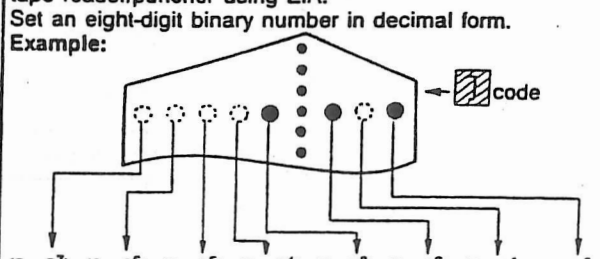
Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G22	Parity check of paper tape reader/puncher		E	Parity check of paper tape reader/puncher (Parameter for RS-232C interface initialization) 0: Invalid 1: Valid Note: If this parameter is set to 1 (valid), then select whether even or odd parity is to be set using the G21 parameter.
	—	0,1	At I/O startup	
G23	Number of data bits for paper tape reader/puncher		E	Number of data bits for paper tape reader/puncher (Parameter for RS-232C interface initialization) 0: 5 1: 6 2: 7 3: 8
	—	0 – 3	At I/O startup	
G24	Fixed value		—	
	—	1	—	
G25	Fixed value		—	
	—	0	—	
G26	Fixed value		—	
	—	0	—	
G27	Output of CR during ISO code punching		E	This parameter is used to specify whether or not CR is to be placed in front of LF (separation of blocks) during ISO code punching. 0: No placement of CR 1: Placement of CR
	—	0, 1	At I/O startup	
G28	Fixed value		—	
	—	0	—	
G29	Paper tape reader/puncher handshaking method		E	This parameter is used to select the method of handshaking to control the state of data transfer between the NC system and tape reader/puncher. 1: Complies with device connection RTS/CTS. 2: No control 3: Complies with control code DC1 through DC4.
	—	1 – 3	At I/O startup	

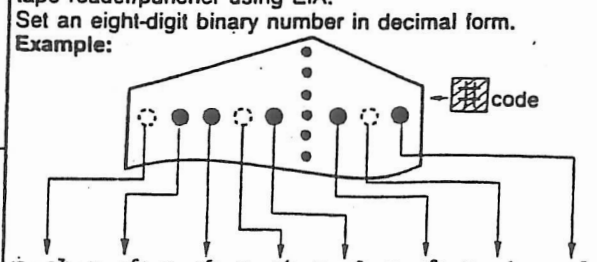
Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
G30	Paper tape reader/puncher DC code parity		E	This parameter is used to specify whether or not a parity bit is to be assigned to the DC code to be output.
	—	0,1	At I/O startup	**Note:** This parameter is valid only when G29 is 3.
G31	" ["code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code " [" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. **Example:**
	—	0 ~ 255	76 At I/O startup	$(0 \times 2^7)+(1 \times 2^6)+(0 \times 2^5)+(0 \times 2^4)+(1 \times 2^3)+(1 \times 2^2)+(0 \times 2^1)+(0 \times 2^0)$ = 76 Set value
G32	"] " code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code "] " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. **Example:**
	—	0 ~ 255	13 At I/O startup	$(0 \times 2^7)+(0 \times 2^6)+(0 \times 2^5)+(0 \times 2^4)+(1 \times 2^3)+(1 \times 2^2)+(0 \times 2^1)+(1 \times 2^0)$ = 13 Set value
G33	" # " code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code " # " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. **Example:**
	—	0 ~ 255	109 At I/O startup	$(0 \times 2^7)+(1 \times 2^6)+(1 \times 2^5)+(0 \times 2^4)+(1 \times 2^3)+(1 \times 2^2)+(0 \times 2^1)+(1 \times 2^0)$ = 109 Set value

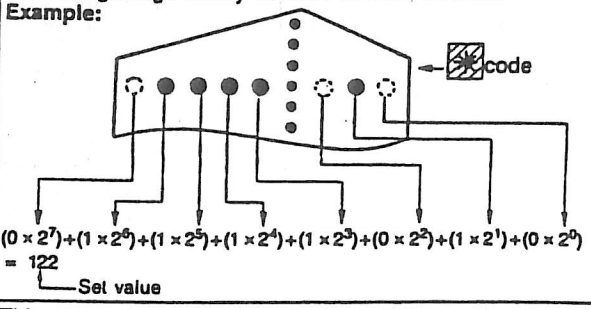
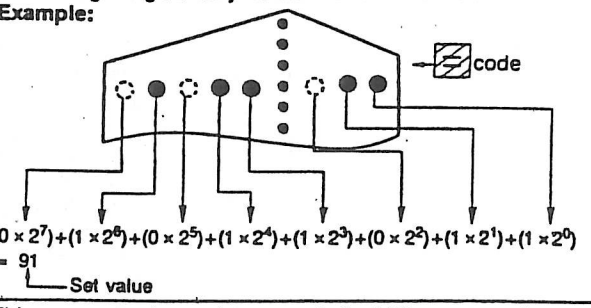
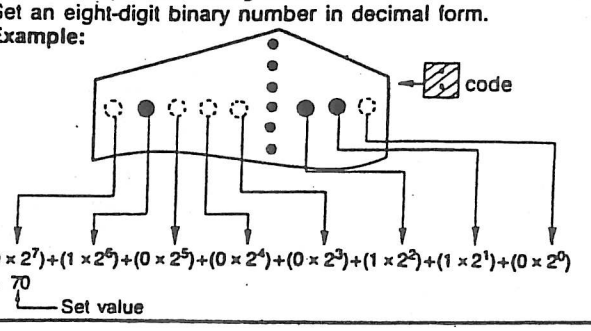
Setting	Parity	DC3 code								
0	No assignment				●		○		●	○
1	Assignment	●			●		○		●	○



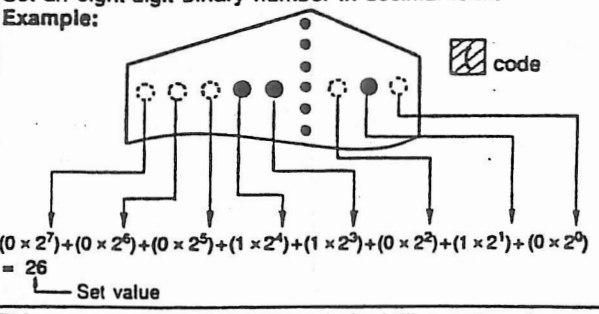
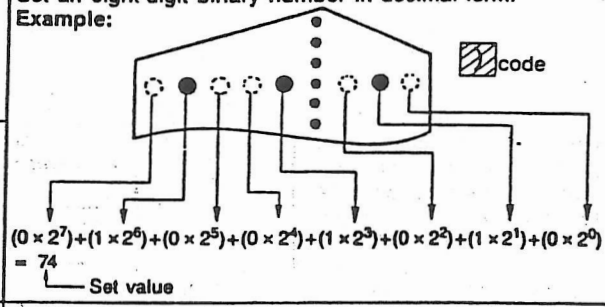
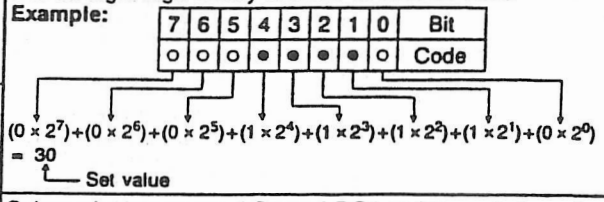
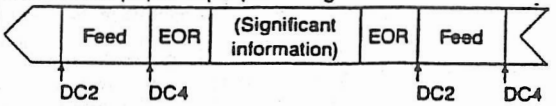




Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G34	" ★ " code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code " ★ " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example:  $(0\times2^7)+(1\times2^6)+(1\times2^5)+(1\times2^4)+(1\times2^3)+(0\times2^2)+(1\times2^1)+(0\times2^0)$ = 122 Set value
	—	0 ~ 255	At I/O startup (122)	
G35	" = " code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code " = " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example:  $(0\times2^7)+(1\times2^6)+(0\times2^5)+(1\times2^4)+(1\times2^3)+(0\times2^2)+(1\times2^1)+(1\times2^0)$ = 91 Set value
	—	0 ~ 255	At I/O startup (91)	
G36	" : " code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code " : " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example:  $(0\times2^7)+(1\times2^6)+(0\times2^5)+(0\times2^4)+(0\times2^3)+(1\times2^2)+(1\times2^1)+(0\times2^0)$ = 70 Set value
	—	0 ~ 255	At I/O startup (70)	

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G37	"(" code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code "(" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: 
	—	0 – 255	At I/O startup	
G38	")" code for paper tape reader/puncher for EIA		E	This parameter is used to set a hole-drilling pattern for reading or punching the character code ")" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: 
	—	0 – 255	At I/O startup	
G39	Rewind code for paper tape reader		E	The paper-tape rewind command code that is output onto a tape reader. This code is output either when M30 is executed in tape run mode or when a paper-tape load or compare operation is performed with parameter G48 set to 1. Set an eight-digit binary number in decimal form. Example: 
	—	0 – 255	At I/O startup	
G40	Feed-section DC code output onto paper tape puncher		E	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.  Setting / Description 0 – Neither DC2 nor DC4 is output. 1 – Only DC2 is not output. 2 – Only DC4 is not output. 3 – Both DC2 and DC4 are output. Note: This parameter is valid only when G29 is 2.
	—	0 – 3	At I/O startup	

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G41	Number of characters in feed section for paper tape puncher		E	The number of characters in NULL (feed) that are to be punched at the beginning and end of paper tape. G41 characters — Feed, EOR, (Significant information), EOR, Feed — G41 characters Tape setting position — End of punching
	1 character	0 ~ 65535	At I/O startup	
G42	Paper tape reader/puncher reply waiting time		E	The waiting time for replies from the paper tape reader or puncher during paper tape reading or punching. An alarm occurs if this time elapses following the final reply.
	0.1 sec.	0 ~ 65535	At I/O startup	
G43	Paper tape puncher EIA/ISO output selection and parity-V check		E	7 6 5 4 3 2 1 0 0: Paper tape punching in ISO code 1: Paper tape punching in EIA code 0: No parity-V check during paper tape reading 1: Parity-V check during paper tape reading
	Bit	Binary eight digits	At I/O startup	
G44	Number of characters in the space between O-number and program for paper tape puncher		E	The total number of characters that are punched out between O-number and program section. O 1 2 3 4 SP SP SP – SP CR — Program section G44 characters
	1 character	0 ~ 65535	At I/O startup	
G45	Number of characters in the space between programs for paper tape puncher		E	The total number of characters that are punched out between programs when more than one program are punched onto paper tape. – M 0 2 CR SP SP – SP CR O 1 2 3 4 ~ Program — G45 characters — Program
	1 character	0 ~ 65535	At I/O startup	
G46	Program-name tape input/output		M·E	Select whether program name tape input/output is to be made valid or invalid during paper tape reading/punching. 0: Program name tape input/output is made invalid. 1: Program name tape input/output is made valid.
	–	0, 1	At I/O startup	
G47	Program end code for paper tape reader 0 (or:) code		E	This parameter is used to specify whether or not character code 0 (or:) is to be set as the program end code when paper tape containing more than one program is read. 0: Code 0 (or:) is not set as the program end code. 1: Code 0 (or:) is set as the program end code.
	—	0, 1	At I/O startup	
G48	Presence/absence of paper tape reader rewind function		E	The parameter that is used to specify whether or not the paper tape reader has a rewind function. If 1 is set (rewind function present), then the code of parameter G39 will be output onto the reader at the completion of a paper tape load or compare operation. 0: Rewind function absent 1: Rewind function present
	—	0, 1	At I/O startup	

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G49	All-loading enable or disable of M2 all punched tape		E	The parameter used to select whether all-loading of the paper tape onto which the M2 program has been all-punched is to be enabled or to be disabled. 0: All-loading disabled 1: All-loading enabled
	–	0, 1	At I/O start	
G50	Program end code (M) for paper tape reader		E	The parameter that is used to specify whether or not M02, M30 and M99 are to be set as the program end codes for paper tape reading. 7 6 5 4 3 2 1 0 (0: Set as program end, 1: Not set as program end) M99 M02 M30
	Bit	Binary eight digits	At I/O startup	
G51 ~ G53	Program end code of MAZATROL program DC control function		M	For paper tape reader/puncher, set a character string output to the program end of MAZATROL program by hexadecimals of ASCII code. For example, when a character string of END is output to the program end:
	ASCII	Hexadecimal number	At I/O startup	

	G51	G52	G53
Character string	E	N	D
Set value	45	4E	44

(MAZATROL program DC control)

Address				Description
G54				Invalid
	–			

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G55	Baud rate for DNC		M · E	Baud rate for DNC. (Parameter for RS-232C interface initialization)
	—	0 ~ 7	At I/O startup	
G56	Number of stop bits in DNC		M · E	Number of stop bits in DNC. (Parameter for RS-232C interface initialization)
	—	1 ~ 3	At I/O startup	
G57	Type of parity of DNC		M · E	Type of parity of DNC. (Parameter for RS-232C interface initialization)
	—	0, 1	At I/O startup	**Note:** This parameter is valid only when G58 is 1.
G58	Parity check of DNC		M · E	Parity check of DNC. (Parameter for RS-232C interface initialization)
	—	0, 1	At I/O startup	**Note:** If this parameter is set to 1 (valid), then select even or odd parity using the G57 parameter.

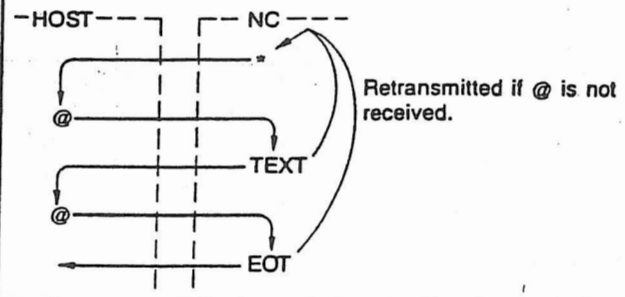
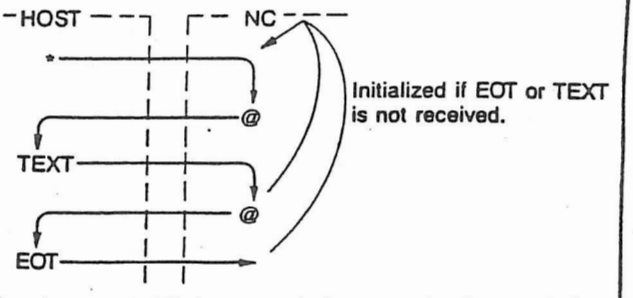
Setting	Baud rate
0	19200
1	9600
2	4800
3	2400
4	1200
5	600
6	300
7	110

Setting	No. of stop bits
1	1
2	1.5
3	2

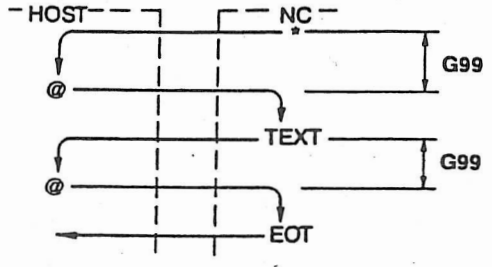
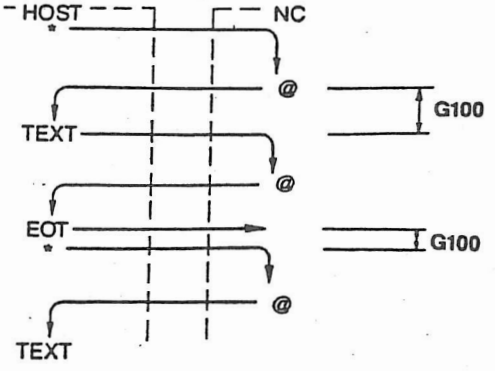
Setting	Type of parity
0	Even
1	Odd

Setting	Parity check
0	Invalid
1	Valid

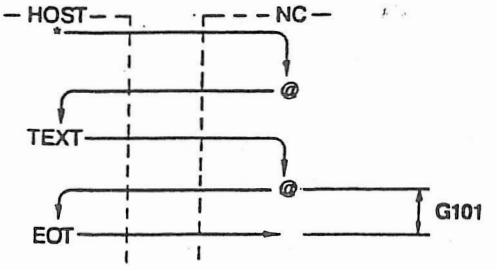
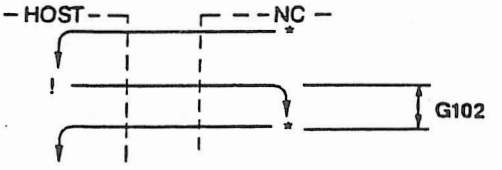
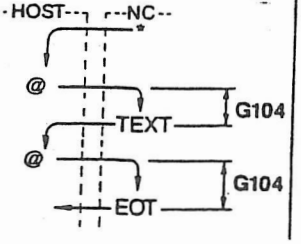
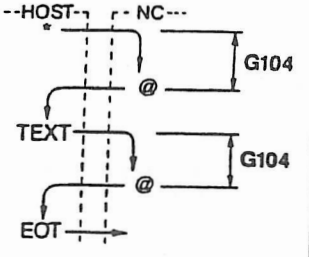
Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G59	Number of data bits in DNC		M · E	Number of data bits in DNC. (Parameter for RS-232C interface initialization) 0: 5 bits, 1: 6 bits, 2: 7 bits, 3: 8 bits
	—	0 – 3	At I/O startup	
G60 ∫ G90				Invalid
G91	Number of NC transmission retries during DNC file transfer		M · E	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 the case that the @ code is not sent from the host system within the waiting time which has been set using the G99 parameter.  An alarm occurs if the transmission operation is repeated up to the number of times set with this parameter.
	Once	0 – 255	At I/O startup	
G92	Number of NC reception retries during DNC file transfer		M · E	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 using the G100 parameter.  An alarm occurs if the transmission operation is repeated up to the number of times set with this parameter.
	Once	0 – 255	At I/O startup	
G93	Number of NC transmission/ reception retries during DNC command message transfer		M · E	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 G91 and G92, except that command messages are interchanged in the case of G93 and files are interchanged in the case of G91 and G92.
	Once	0 – 255	At I/O startup	

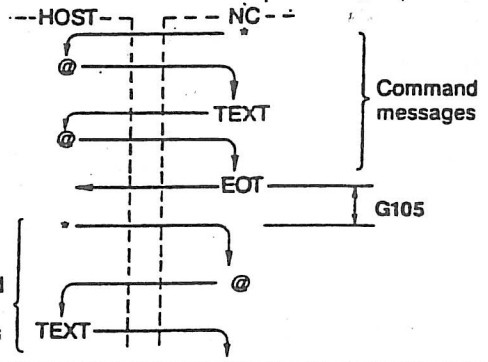
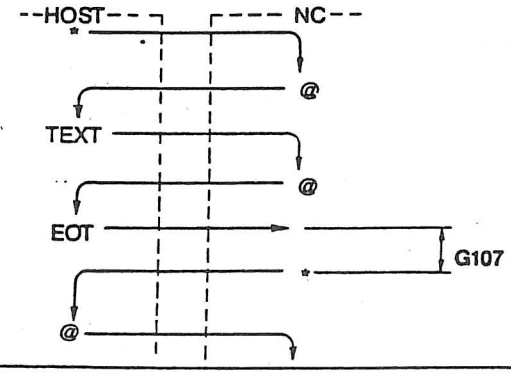
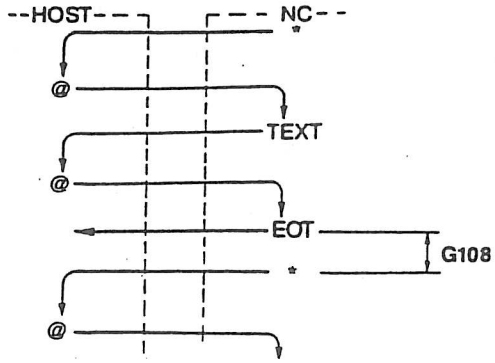
Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G94 ~ G97				Invalid
G98	—		M · E	7 6 5 4 3 2 1 0 (1: Valid, 0: Invalid) After program reception, a search is made for the work number of that program. Details of an alarm occurring in DNC are displayed. Loading of programs having the same work number as that of the registered program in NC becomes impossible. The function of the PROGRAM LOCK/ENABLE switch is released. All programs having work numbers smaller than No. 9000 are erased at the start of program reception.
	Bit	Binary eight digits	At I/O startup	
G99	@ waiting time during DNC transmission		M · E	The NC waiting time from transmission of * or TEXT to reception of @ from the host system.  Note: See the description of parameter G91.
	0.1 sec.	1 – 255	At I/O startup	
G100	* /TEXT waiting time during DNC transmission		M · E	The NC waiting time from transmission of @ or EOT to reception of * or TEXT from the host system.  Note: See the description of parameter G92.
	0.1 sec.	1 – 255	At I/O startup	

Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
G101	EOT waiting time during DNC transmission		M · E	The NC waiting time from transmission of @ to reception of EOT from the host system.  Note: See the description of parameter G92.
	0.1 sec.	1 – 255	At I/O startup	
G102	NC stop time after reception of !		M · E	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 G102 elapses following reception of !.
	0.1 sec.	0 – 255	At I/O startup	
G103	NC reset time after digital-out		M · E	The time from the moment the NC receives the digital-out command to the moment the NC internally resets this command.
	0.1 sec.	0 – 255	At I/O startup	
G104	NC stop time from reception		M · E	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 @. 
	0.01 sec.	0 – 255	At I/O startup	

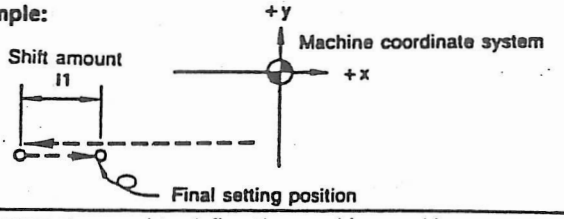
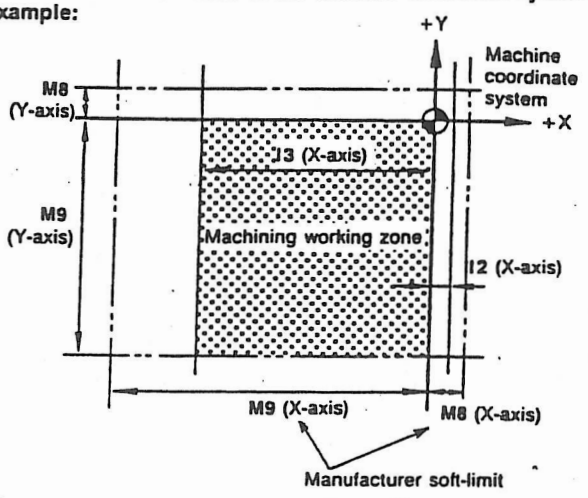
Classification	USER	Display title	USER PARAMETER NO. 2

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
G105	DNC command reply message waiting time		M · E	The NC waiting time from transmission of command message EOT to reception of command reply message * from the host system. 
	0.1 sec.	1 ~ 255	At I/O startup	
G106	DNC machine number		M · E	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.
	—	0 ~ 255	At I/O startup	
G107	NC transmission stop time of DNC (From reception to transmission)		M · E	The NC stop time from reception of EOT from the host system to transmission of * of the next message. 
	0.01 sec.	0 ~ 255	At I/O startup	
G108	NC transmission stop time of DNC (From transmission to transmission)		M · E	The NC stop time from transmission of EOT to the host system to transmission of * of the next message. 
	0.01 sec.	0 ~ 255	At I/O startup	

Classification	USER	Display title	USER PARAMETER NO. 3

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
H1 ∫ H90				Invalid
H91	Program management function		M ° E	7 6 5 4 3 2 1 0 — Program management function Edit inhibition (9000 number mark) Display inhibition (9000 number mark) Edit inhibition (8000 number mark and 9000 number mark) Display inhibition (8000 number mark and 9000 number mark) (Program management function)
	Bit	Binary eight digits	At power on	
H92 ∫ H108				Invalid

Classification	USER	Display title	USER PARAMETER NO. 4

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
I1	Shift amount of unidirectional positioning (G60)		M · E	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:** 
	0.001 mm 0.0001 inch (0.001°)	0 – ±99999999	After stop of movement	
I2	Upper (plus direction) user soft-limit		M · E	The parameter used to define the machine working zone in order to prevent machine interference with the work or jigs. Set the coordintae values of the machine coordinate system. **Example:** 
	0.001 mm 0.0001 inch (0.001°)	0 – ±99999999	After stop of movement	
I3	Lower (minus direction) user soft-limit		M · E	If the machine is likely to overstep its working zone, an alarm will occur and the machine will stop. **Notes:** 1. These parameters are valid only when bit 2 of I14 is 0. 2. These parameters are invalid if I2 = I3.
	0.001 mm 0.0001 inch (0.001°)	0 – ±99999999	After stop of movement	
I4 ~ I10				Invalid

Classification	USER	Display title	USER PARAMETER NO. 4

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
I11	Rotary center of a workpiece		E	Set the rotaty center of a workpiece at a table angle of 0° for each axis in the machine coordinate system. (Valid only in manual operation)
	0.001 mm 0.0001 inch	0 ~ ±99999999	After stop of movement	(Dynamic compensation)
I12				Invalid
I13	-		M • E	7 6 5 4 3 2 1 0 Upon execution of G28 (reference-point return): 0: Memory-type zero-point return 1: Watchdog-type zero-point return Upon manual zero-point return operation: 0: Memory-type zero-point return (At power-on, however, watchdog-type zero-point return) 1: Watchdog-type zero-point return Removal of control axes 0: No (Not removed) 1: Yes (Removed)
	Bit	Binary eight digits	After stop of movement	

Classification	USER	Display title	USER PARAMETER NO. 4

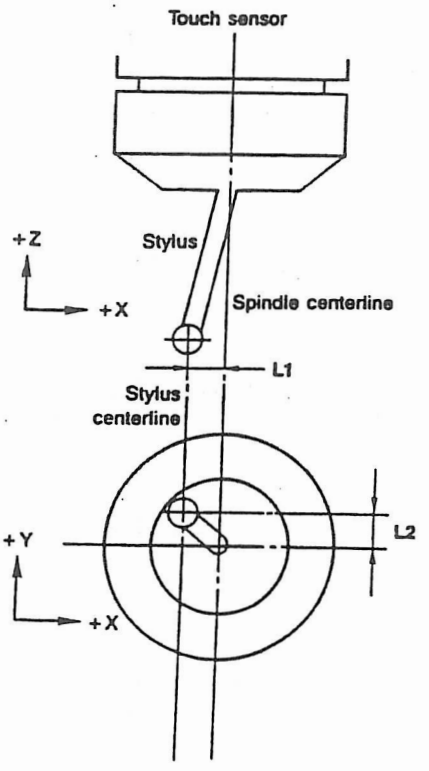
Address	Name		Program type	Description
	Unit	Setting range	Conditions	
I14	—		M · E	7 6 5 4 3 2 1 0 Mirror image with respect to the machine zero-point 0: Invalid 1: Valid User software limits (I2, I3) 0: Valid 1: Invalid Tool-tip relief after spindle orientation during execution of G75, G76, G86 or point-machining (boring or back-boring) 0: Required 1: Not required Direction of the relief mentioned above 0: Plus 1: Minus
	Bit	Binary eight digits	After stop of movement	
I15				Invalid
I16				

Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 2

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
K72	G37 skip condition		E	7 6 5 4 3 2 1 0 (1: Valid 0: Invalid) X178 Touch sensor skip signal X179 X17A X17B X17C Decelerating signal of measuring table X17D Skip signal of measuring table X17E X17F Standard setting: Fixed value 00100000 (G37)
	Bit	Binary eight digits	After stop of movement	

Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 3

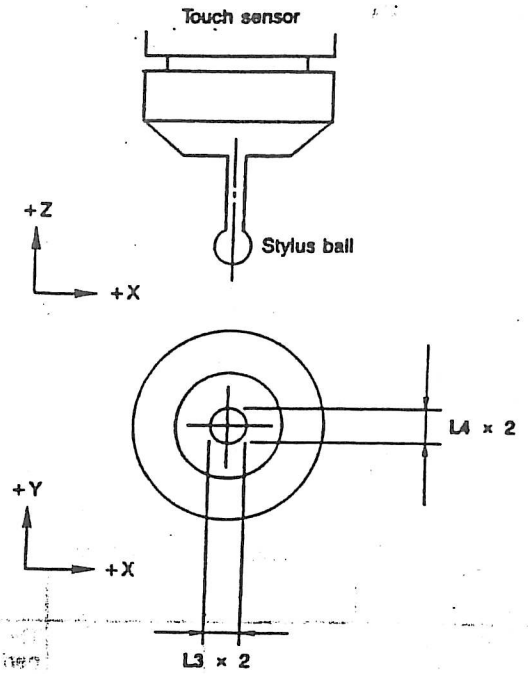
Address	Name		Program type	Description
	Unit	Setting range	Conditions	
L1	Stylus eccentricity of touch sensor (X-component)		M	The eccentricity of the stylus of the touch sensor with respect to the center of the spindle.
	0.0001 mm 0.00001 inch	0 – ±99999999	At power-on	
L2	Stylus eccentricity of touch sensor (Y-component)		M	
	0.0001 mm 0.00001 inch	0 – ±99999999	At power-on	



Note:
These data are automatically set when calibration measurement is performed on the MMS unit.

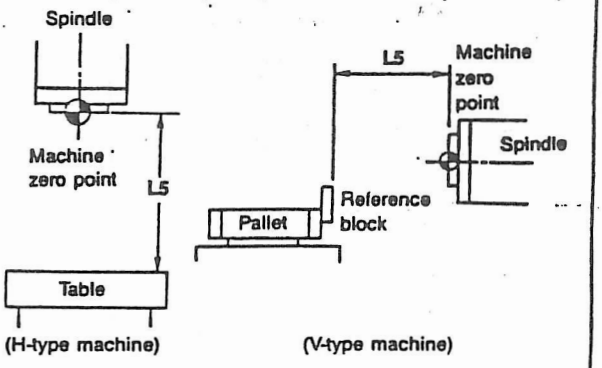
Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 3

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
L3	Radius of stylus ball of touch sensor (X-component)		M	The true radius value of the stylus ball of the touch sensor.
	0.0001 mm 0.00001 inch	0 – ±99999999	At power-on	
L4	Radius of stylus ball of touch sensor (Y-component)		M	
	0.0001 mm 0.00001 inch	0 – ±99999999	At power-on	



Note:
These data are automatically set when calibration measurement is performed on the MMS unit.

Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 3

Address	Name: Unit	Name: Setting range	Program type: Conditions	Description
L5	Z-axis stroke for tip position memory (TEACH function)		M・E	The distance from the spindle endface to the table surface (or the reference block on the pallet) existing when the Z-axis is in the machine zero-point position. 
	0.0001 mm 0.00001 inch	0 – ±99999999	Immediate	
L6	Tool-breakege judgment distance for TBR		M	The minimum tool displacement by which the tool is judged to be a 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.
	0.0001 mm 0.00001 inch	0 – ±99999999	Immediate	
L7	Tool breakage restoration mode for TBR.		M	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.
	—	1 – 3	Immediate	
L8	Skipping stroke limit for MMS.		M	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.
	0.0001 mm 0.00001 inch	0 – ±99999999	Immediate	

Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 3

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
L51	Tool command system by MDI		M	Tool command system in MDI operation (Tool on the spindle and next time tool) 0: Command of pocket number 1: Command of group number (MDI tool command)
	–	0, 1	Immediate	
L57	Rewriting to tool data during automatic operation		E	Data of tools other than a tool on the spindle shall be capable of rewriting during automatic operation with an EIA/ISO program. 0: Invalid 1: Valid (Rewriting of tool data)
	–	0, 1	Immediate	

Classification	MACHINE	Display title	MACH CONSTANT PAR NO. 8

Address	Name		Program type	Description
	Unit	Setting range	Conditions	
S5	Rotational center of the table		M • E	Set for each axis the position of the rotational center of the table in the machine coordinate system. Also, set those positions for each machine. (Dynamic compensation)
	0.001 mm 0.0001 inch	0 ~ ±99999999	At power on	