OPERATING MANUAL

for

MAZATROL T32B-2

PARAMETER & ALARM LISTS

PUBLICATION NO. : H712SA0140E
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Serial No. :

[PRECAUTIONS]

- Before operating this machine, please read this manual with care and fully understand the contents of the manual so that the machine can exert its performance safely.
- Although the contents of this manual are closely checked for perfection, if there is any ambivalent point, incorrect description, or omission, contact us, please.
- In order to explain the details, all the illustrations contained in this manual do not necessarily show the covers, doors, safety guards, or shields. Therefore, be sure to restore all the specified covers, shields, etc., and observe the contents of the manual when operating this machine. If this precaution is ignored, a serious accident may incur, resulting in damage to the important units of the machine and other accessories.
- This manual is subject to modifications and changes as required for the improvement in, and the change in the specification of, the machine and the CNC equipment, as well as for usability of the manual itself. The modifications and changes are indicated by updating the manual numbers in a revised version.
- When your manual is damaged or lost, and a new material is needed, inform us of the "manual number."
  If the manual number is not identified, inform us of the following:
  1. Name of the machine 2. Number of the machine 3. Name of the manual

☎ Contact the Technical Center (TC) or the Service Center (SC) of Yamazaki Mazak for operations of this machine and replacement of the manual.

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OPERATING MANUAL

for

MAZATROL T32E-2

PARAMETER LIST

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PARAMETER LIST

Parameters are constants and various data required for setting machine and NC equipment operation modes required for machining. When machines are delivered, parameters are set at factory. Some of them can be changed by the user.

If wrong values are set as parameter, operation of machines and NC equipment may be hampered. For changing parameters, their meaning and functions must be well understood.

This parameter list shows important parameters for the user. Those which the user hardly need change settings and those not used are omitted from the list. The meaning and functions of parameters are described in the right hand side column on the list.

If functions of parameters to be changed are not clearly understood, contact our service centers.

How to Use Parameter List

The parameters are listed in a form as shown below.

Title of display	①

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
②	③		⑧
	④	⑤	
	⑥	⑦	

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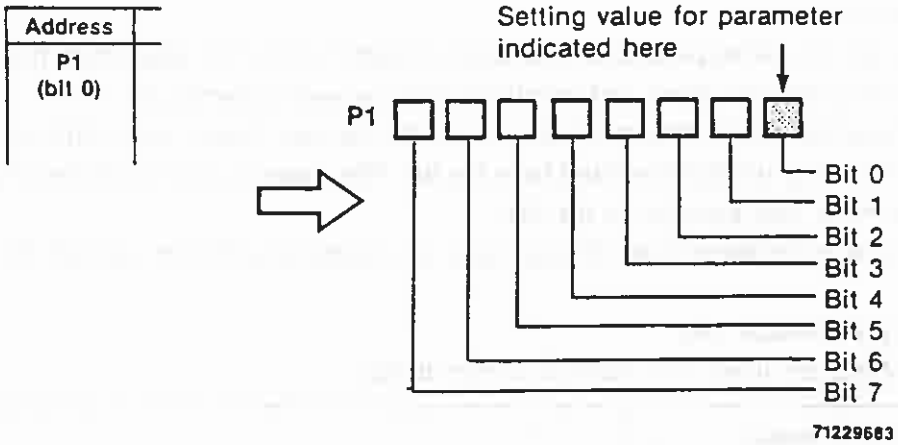
① Title of display showing required paprameter
② Nomenclature (address) of required parameter

- Bit input type parameters have the bit No. shown in the parentheses below address

Example



③ Meaning of required parameter
④ Setting unit for parameter
⑤ Setting value range
⑥ Conditions on which set value is effective

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

Example 2: "Power off-on" designates that new parameter value will become effective after procedure below.

[1] Change parameter setting.
↓ (By procedure similar to changing of ordinary data)
[2] Press power off button on the control panel.
↓
[3] Press power on button on the control panel.

⑦ Applicable program

M ..... Effective only for MAZATROL programs
E ..... Effective for EIA/ISO programs
M, E ..... Effective for MAZATROL programs and EIA/ISO programs

⑧ Description of required parameter
Relevant parameters are indicated in the parentheses at bottom.

Precautions

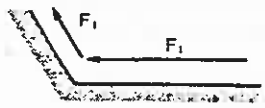
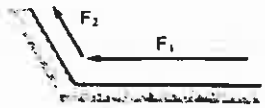
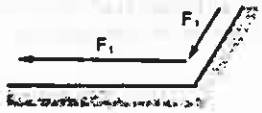
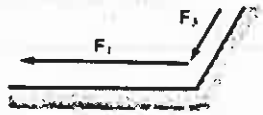
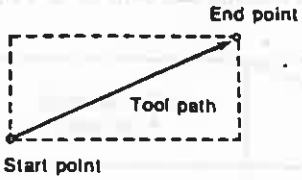
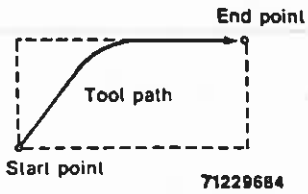
(1) The type and setting value for required parameters may vary according to machine models and or use/disuse of optional equipment and manufacturing time.
Values set for specific machines and NC equipment must not be used for other machines and NC equipment.

(2) The factory set parameters are recorded on separate paper and stored inside the power supply box. This paper must not be lost.

(3) If parameter settings are changed, settings before and after the change must be recorded for storage.

(4) If machines are not operated for a long time, battery backup may be lost and data will be destroyed (battery alarm indicated). In this case, confirm parameter settings by referring to the parameter record paper. If machines are operated with parameters settings lost, error will be caused.

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P1 (bit 0)	Use/disuce of acceleration in up-going slope during rough cutting cycle in bar machining process (BAR)		P1 (bit 0) = 0  No acceleration P1 (bit 0) = 1  $F_2 > F_1$ F_1 = Feedrate for rough cutting cycle F_2 = Feedrate after acceleration 71229684 (⇨ K2, K3)
		0 (disuse)/1 (use)	
	Instant	M	
P1 (bit1)	Use/disuse of deceleration in down-going slope during rough cutting cycle in bar machining process (BAR)		P1 (bit 1) = 0  No deceleration P1 (bit 1) = 1  $F_1 < F_1$ F_1 = Feedrate for rough cutting cycle F_1 = Feedrate after deceleration 71229684 (⇨ K4, K5)
		0 (disuse)/1 (use)	
	Instant	M	
P1 (bit 2)	Selection of rapid traverse (G00) interpolation method between interpolation/independent axis		P1 (bit 2) = 0  Traverse from start point to end point by shortest passage below maximum rapid feedrate of each axis P1 (bit 2) = 1  Traverse from start point to end point at rapid traverse speed for each axis 71229684 Note: Time required is the same whichever is used.
		0 (interpolation)/ 1 (independent axis)	
	Instant	M	

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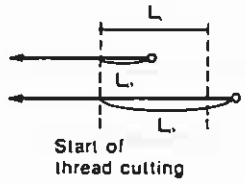
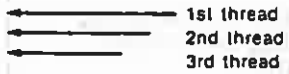
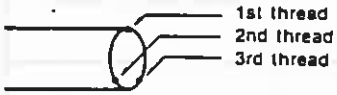
Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P1 (bit 3)	Selection between use/disuse of check acceleration distance at start of thread cutting process (THR)		P1 (bit 3) = 0 Alarm not caused even if acceleration distance at start of thread cutting process exceeds clamp data P1 (bit 3) = 1 Alarm caused when acceleration at start of thread cutting process exceeds clamp data **Example**  Alarm not caused Alarm caused L_0 = Acceleration distance L = Acceleration distance clamp data 71229685 (⇒U38)
		0 (disuse)/1 (use)	
	Instant	M	
P1 (bit 4)	Selection belwen conventional/start angle shift for thread number offset in thread cutting process (THR)		P1 (bit 4) = 0 Thread number offset adjusted by moving thread cutting start position  (Acceleration distance changed according to thread number) P1 (bit 4) = 1 Thread number offset adjusted by moving thread cutting start angle  (Acceleration distance is same for any thread number) 71229685
		0 (conventional)/ 1 (start angle shift)	
	Instant	M	
P1 (bit 5)	Selection between whether or not tool should be returned to tool change position on M code process (M) end		P1 (bit 5) = 0 Tool not moved from the end of the previous process after completing M code process P1 (bit 5) = 1 Tool returned to tool change position after completing M code process (M) (⇒ P17)
		o (no return)/ 1 (return)	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P1 (bit 7)	Selection between whether or not tool should be returned to tool change position at program end for cycles except for final repetition of same program.		Tool will be moved to a next position after executing 1 ~ (N-1)th cycles if the program repetition frequency is represented by N (N ≧ 2). P1 (bit 7) = 0 Tool always returned to tool change position for any location specified for program end process P1 (bit 7) = 1 Tool always returned to position specified for program end process
		0 (return)/ 1 (not return)	
	Instant	M	
P2 (bit 0)	Selection between T-3/T-32 for cutting path method in milling line machining process (MGV, LCT, RGT, LFT)		P2 (bit 0) = 0 T-3 method P2 (bit 0) = 1 T-32 method
		0 (T-3)/1 (T-32)	
	Instant	M	
P2 (bit 1)	Output of automatic spindle rotation		P2 (bit 1) = 0 Output of M3, M4, M5 according to tool Nos. assigned to manual program machining process tools P2 (bit 1) = 1 No output
		0 (output)/ 1 (no output)	
	Instant	M	
P3 (bit 0)	Use/disuse of Z offset check		P3 (bit 0) = 0 Cycle started whether or not value is set for Z offset P3 (bit 0) = 1 Cycle not started if Z offset is not set
		0 (disuse)/1 (use)	
	Instant	M·E	

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Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P7 (bit 0)	Selection between use/disuse of special trace indication		**P7** (bit 0)=0 Ordinary real time graphic shown if **TRACE** display is called during MAZATROL program execution **P7** (bit 0)=1 Tool tip mark (▼) and tool path shown instead of ordinary real time graphic when **TRACE** display is called in MAZATROL execution
		0 (disuse)/1 (use)	
	Instant	M	
P7 (bit 1)	Selection between whether or not stock material should erased for storing **GRAPHIC** display.		**P7** (bit 1)=0 Stock material not erased for storing **TRACE, SIMULATION** display **P7** (bit 1)=1 Stock erased before tracing
		0 (no errasure)/ 1 (erase)	
	Instant	M	
P7 (bit 2)	BAR or CPY infeed point input digit quantity selection		Specify the desired input digit quantity for the BAR or CPY infeed point x-y coordinates by either "0" or "1". 0: 9999.9 (One decimal digit) 1: 999.99 (Two decimal digits) **Note:** Both values shown above are the maximum available ones. You can specify "1" only if your machine model is either Version A6 or its successors (for 2 or 3-axis specifications) or Version A5 or its successors (for 4 or 6-axis specifications).
		0: 9999.9 1: 999.99	
	Instant	M	
P7 (bit 3)	Selection of tool data setting enable condition		**P7** If bit 3=0: Data can be set for all the data items on the **TOOL DATA (1)** display and for "ACT-ϕ./NOSE R" on the **TOOL DATA (2)** display. **P7** If bit 3=1: <With protect SW on> Data can be set only for "TOOL SET", "WEAR COMP." "USED", and "ACT-ϕ, NOSE-R". <During automatic operation> Data can be set for all data items.
		0: Setting always possible 1: Setting limited	
	Instant	M•E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P8 (bit 7)	Selection of use/disuse of tool identification code skip function		P8 (bit 7) = 0 Cursor allowed to be positioned at item for tool identification code setting P8 (bit 7) = 1 Cursor moved by skipping items for tool identification setting
		0 (disue)/1 (use)	
	Instant	M	
P9 (bit 2)	Selection of G code series A		P9 (bit 2) = 1 G code in series A selected
		0 (no select)/ 1 (select)	
	Instant	E	Note: 0 must not be set.

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Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P9 (bit 5)	Selection of decimal command type 2.		P9 (bit 5) = 0 Position command data without decimal point processed by specified minimum input unit (0.01, 0.001, 0.0001 mm or inch) P9 (bit 5) = 1 Position command data without decimal point processed by 1 mm or inch
		0 (no select)/ 1 (select)	
	Instant	E	
P9 (bit 6)	Selection of rapid traverse (G00) interpolation method between interpolation/independent axis.		Refer to P1 (bit 2). P1 (bit 2) for MAZATROL programs P9 (bit 6) for EIA/ISO programs
		0 (interpolation)/ 1 (independent axis)	
	Instant	E	
P9 (bit 7)	Address E specification for thread number/ lead in precision thread cutting command (G32).		P9 (bit 7) = 0 Thread number specified per inch for address E in thread cutting command P9 (bit 7) = 1 Precision lead for address E in thread cutting command
		0 (thread number)/ 1 (lead)	
	Instant	E	
P10 (bit 0)	Selection of initial G16 (YZ cylindrical plane)		P10 (bit 0) = 1 G16 (YZ cylindrical plane) selected as initial plane
		0 (no select)/ 1 (select)	
	Instant	E	
P10 (bit 1)	Selection of initial G19 (YZ plane)		P10 (bit 1) = 1 G19 (YZ plane) selected as initial plane
		0 (no select)/ 1 (select)	
	Instant	E	Note: If 0 or 1 is set for both P10 (bit 0) and P10 (bit 1), G17(XY plane) will be selected as initial plane.

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P10 (bit 2)	Selection of whether or not dwell command (G04)should be specified in time.		P10 (bit 2) = 0 Time specified in asynchronous feed mode (G98), and rotation number specified in synchronous feed mode (G99) P10 (bit 2) = 1 Time specified in asynchronous feed mode (G98) as well as in synchronous feed mode (G99)
		0 (not time)/1 (time)	
	Instant	E	
P10 (bit 4)	Selection of T command digit length		P10 (bit 4) = 0 Specify the T command by a number of 4 digits. Example T01 01 Tool offset number Tool number P10 (bit 4) = 1 Specify the T command by a number of 6 digits. Example T001 001 Tool offset number Tool number
		0(4 digits)/1(6 digits)	
	Instant	E	
P10 (bit 5)	Use/disuse of interruption prevention function.		P10 (bit 5) = 0 Alarm caused if cutting into workpiece is recognized in interruption check during nose R compensation, and relevant block not executed P10 (bit 5) = 1 Tool path automatically changed when cutting into workpiece is recognized by interruption check during nose R compensation
		0 (disuse)/1 (use)	
	Instant	E	
P10 (bit 6)	Selection between return to R point/by escape distance in deep hole drilling cycle (G83/G87)		P10 (bit 6) = 0 Tool tip returned to R point after comleting steps of deep drilling cycle, and next step executed P10 (bit 6) = 1 Tool tip returned by escape distance U45 after completing steps of deep drilling cycle, and next step executed (⇨ U45)
		0 (return to R point)/ 1 (return by escape distance)	
	Instant	E	
P10 (bit 7)	Selection between initial point/R point for tool return position upon end of drilling cycle (G80s)		P10 (bit 7) = 0 Tool tip returned to initial point upon end of drilling cycle P10 (bit 7) = 1 Tool tip returned to R point upon end of drilling cycle
		0 (initial point)/ 1 (R point)	
	Instant	E	

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Title of display	USER PARAMETER No. 1		
Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P11 (bit 0)	Selection of initial G96 (allowed only in G code series A).		P11 (bit 0) = 0 Peripheral speed constant control cancel mode automatically selected upon power on P11 (bit 0) = 1 Peripheral speed constant control mode automatically selected upon power on
		0 (no select)/ 1 (select)	
	Instant	E	
P11 (bit 1)	Selection of initial G99 (allowed only in G code series A)		P11 (bit 1) = 0 Asynchronous feed mode automatically selected upon power on P11 (bit 1) = 1 Synchronous feed mode automatically selected upon power on
		0 (no select)/ 1 (select)	
	Instant	E	
P11 (bit 4)	Use/disuse of high speed processing function during machine lock.		P11 (bit 4) = 0 Processing by time at feedrate specified in program even if program is executed by selecting machine lock function P11 (bit 4) = 1 Feedrate entirely changed to rapid traverse speed when program is executed by selecting machine lock function, and dwell time (G04) ignored
		0 (disuse)/1 (use)	
	Instant	E	
P11 (bit 5)	Selection between whether or not intermediate point should be ignored during execution of reference return command (G28/G30)		P11 (bit 5) = 0 Tool tip returned to reference point by passing intermediate point specified in program P11 (bit 5) = 1 Tool tip returned to reference point by ignoring intermediate point specified in program
		0 (not ignored)/ 1 (ignored)	
	Instant	E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
p12 (bit 0)	Selection between modal or G00 for positioning method during fixed cycle		P12 (bit 0) = 0 Traverse by G00 to drilling position during fixed cycle mode P12 (bit 0) = 1 Traverse by selected modal G code (G00 or G01) to drilling position during fixed cycle mode
		0 (G00)/1 (modal)	
	Instant	E	
P12 (bit 1)	Selection of whether or not G50 is used during G53 mode		P12 (bit 1) = 0 G50 command not used during G53 mode P12 (bit 1) = 1 G50 command used during G53 mode
		0 (disuse)/1 (use)	
	Instant	E	
P12 (bit 2)	Selection of initial G53		P12 (bit 2) = 0 G50 coordinate system selected initially P12 (bit 2) = 1 MAZATROL coordinate system selected initially
		0 (no select)/ 1 (select)	
	Instant	E	
P12 (bit 3)	Selection of initial G00		P12 (bit 3) = 0 G01 mode automatically selected upon power on P12 (bit 3) = 1 G00 mode automatically selected upon power on
		0 (no select)/ 1 (select)	
	Instant	E	

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Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P12 (bit 5)	M output at G84/G88 bottom		P12 (bit 5) = 0 Output of M3 (M203) at bottom P12 (bit 5) = 1 Output of M4 (M204) at bottom (⇒ P12 (bit 7))
		0 (M3)/1 (M4)	
	Instant	E	
P12 (bit 6)	Selection between floating point/fixed point for tapping cycle		P12 (bit 6) = 0 Floating (ordinary) type tapping cycle for G84/G88 P12 (bit 6) = 1 Fixed (synchronous) type tapping cycle for G84/G88 Note: 1 must not be set.
		0 (floating)/1 (fixed)	
	Instant	E	
P12 (bit 7)	Use/disuse of M203/M204 output during tapping cycle		P12 (bit 7) = 0 Output of M03/M04 at hole bottom during tapping cycle (G84/G88) P12 (bit 7) = 1 Output of M203/M204 at hole bottom during tapping cycle (G84/G88)
		0 (disuse)/1 (use)	
	Instant	E	
P13 (bit 0)	Use/disuse of compensation movement during T command		P13 (bit 0) = 0 Compensation movement not made on T command P13 (bit 0) = 1 Compensation movement made on T command
		0 (disuse)/1 (use)	
	Instant	E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P13 (bit 1)	Use/disuse of block stop after restart		P13 (bit 1) = 0 Block stop not used after restart p13 (bit 1) = 1 Block stop used after restart
		0 (disuse)/1 (use)	
	Instant	E	
P13 (bit 2)	Use/disuse of automatic return on resuming program		P13 (bit 2) = 0 Not returned to program start upon program end P13 (bit 2) = 1 Program head automatically called upon program end
		0 (disuse)/1 (use)	
	Instant	E	
P13 (bit 3)	Use/disuse of G00 dry run		P13 (bit 3) = 0 Rapid traverse speed not changed to dry run speed P13 (bit 3) = 1 Rapid traverse speed changed to manually adjusted dry run speed
		0 (disuse)/1 (use)	
	Instant	M·E	
P13 (bit 4)	Use/disuse of dry run during threadcutting		P13 (bit 4) = 0 Disuse of dry run during thread cutting cycle P13 (bit 4) = 1 Use of dry run during thread cutting cycle
		0 (disuse)/1 (use)	
	Instant	M·E	

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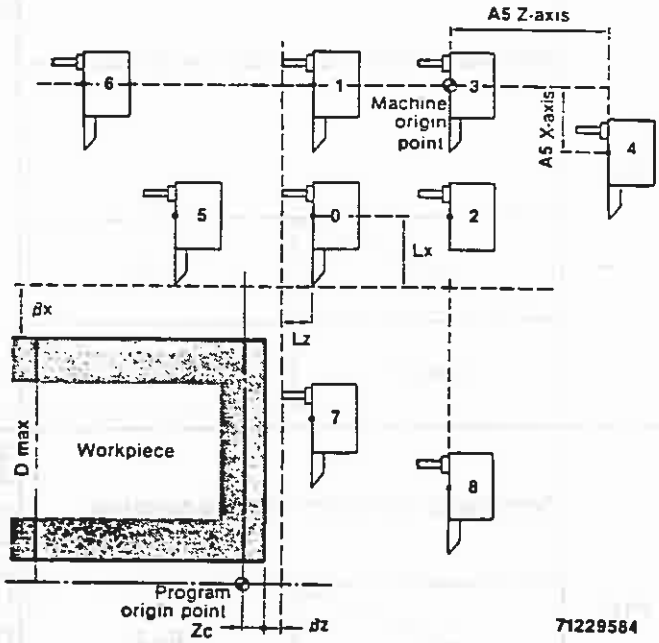
Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P13 (bit 5)	Use/disuse of feed hold during thread cutting		P13 (bit 5) = 0 Disuse of feed hold during thread cutting cycle P13 (bit 5) = 1 Use of feed hold during thread cutting cycle
		0 (disuse)/1 (use)	
	Instant	E	
P13 (bit 7)	Selection of G46 reverse rotation error prevention		P13 (bit 7) = 0 Alarm caused for nose R compensation direction reversal. if nose R compensation is reversed during G46 P13 (bit 7) = 1 Alarm not caused by reversal and nose R direction is reversed
		0 (disuse)/1 (use)	
	Instant	E	
P16 (bit 0)	Use/disuse of in-position check		P16 (bit 0) = 0 In-position check not executed P16 (bit 0) = 1 In-position check executed
		0 (disuse)/1 (use)	
	Instant	M•E	Note: Refer to M51 and M52 of M code.

Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
P17	Selection of tool change position specification code		Specify tool change position from 1 through 8 below.
		0 – 8	
	Instant	M	



Zc = Stock material edge projection length
Dmax = Stock material maximum outside diamter
βx = Tool turning clearance (X-axis)
= U1/2
βz = Tool turning clearance (Z-axis)
= U2
Lx = Length of longest tool in X direction
Lz = Length of longest tool in Z direction

Setting	X-axis	Z-axis
0	Clearance position	Clearance position
1	Machine orgin point	Clearance position
2	Clearance position	Machine origin point
3	Machine origin point	Machine origin point
4	Fixed point	Fixed point
5	Clearance position	End point of previous machining
6	Machine origin point	End point of previous machining
7	End point of previous machining	Clearance position
8	End point of previous machining	Machine origin point

(continued)

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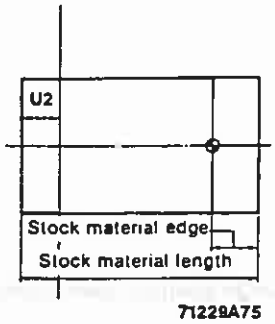
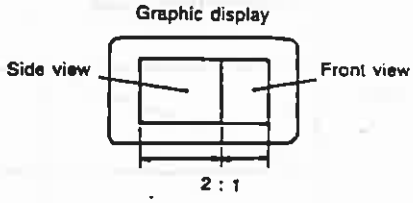
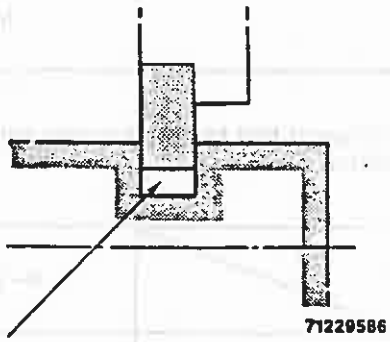
Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P17	Selection of tool change position specification code		**Note:** If P17=5 or 6, Z-axis tool change position is identical with the end point of previous machining. In the case below, however, this may not be applied.  As shown here, if the longest tool comes into the hatched portion, the Z-axis will escape until the tool goes out of the portion. (⇨ U1, U2, A5)
		0 – 8	
	Instant	M	
P18	Selection of spare tool indexing condition.		Select spare tool indexing conditions from 0 through 3 below. Setting / Description 0 — No indexing of spare tool. 1 — Indexing of spare tool when number of machined workpieces has reached limit. 2 — Indexing of spare tool when tool use time has reached limit. 3 — Indexing of spare tool when tool wear has exceeded limit. Note: Setting of 3 cannot be used in EIA.
		0 – 3	
	Instant	M•E	
P19	Selection of unit system between mm/inch.		Specify input data unit system. P19 = 0 Data input in mm Minimum command unit ..... 1/1000 mm P19 = 1 Data input in inch Minimum command unit ..... 1/10000 inch When this parameter is changed, data below must also be changed. • In papameter, unit must be recorded for mm and inch. • Cutting codition data. Mere change of parameter setting will not convert data.
		0 (mm)/1 (inch)	
	Power off ➡ on	M•E	
P20	Measurement retry frequency in C offset measurement process (MES-COF)		Setting of retry frequency when touch sensor is actuated before reaching target point in C offset measurement, set retry frequency. If P20 is set to N (N = 0 – 3), measurement alarm will be indicated when touch sensor is actuated before reaching measurement target point in (N + 1)th retry operation. (⇨ U61)
	Times	0 – 3	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P21	Selection of separating ratio of GRAPHIC display		Selection of separation ratio between side veiw and front view (or rear view) when two split plane indication mode has been selected. P21 = 0 ..... 1:1 P21 = 1 ..... 2:1 P21 = 2 ..... 5:1 **Example: P21=1** 
		0 ~ 2	
	Instant	M•E	
P22	Tool command time for simulation		Setting of T command execution time (tool change time) at 1/20 sec intervals for simulation **Example:** Set 20 for 1 sec, and 20 × X for X sec.
	1/20 sec	0 ~ 255	
	Instant	M	
P23	Auxiliary command time for simulation		Setting of M code and gear change execution time at 1/20 sec intervals for simulation
	1/20 sec	0 ~ 255	
	Instant	M	
P24	Specification of dwell at groove bottom in groove cutting process (GRV) by spindle revolution.		Tool will stop at groove bottom while spindle rotates N times when P24 is set to N (N = 0 ~ 255).  Remaining at groove bottom until the spindle rotates N times.
	rev	0 ~ 255	
	Instant	M	

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Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
P26	Selection of escape pattern from wall in EIA rough cutting cycle		This parameter will be used when wall is vertical in G71, G72. P26 = 0 ..... Identical with ordinary path P26 = 1 ..... Escape at 45° from wall P26 = 2 ..... Feedrate accelerated at wall Accelerated feedrate F is expressed by $F = F_0 \times \frac{K3}{100}$ (where F_0 = Feedrate specified inprogram)
		0 – 2	
	Instant	E	
P27	Specification of first M code for milling axis gear selection		This parameter automatically determines milling axis gear. Output M code will be as shown below If P27 is set to n.
		0 – 255	
		M	

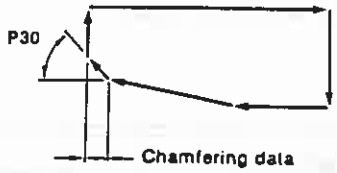
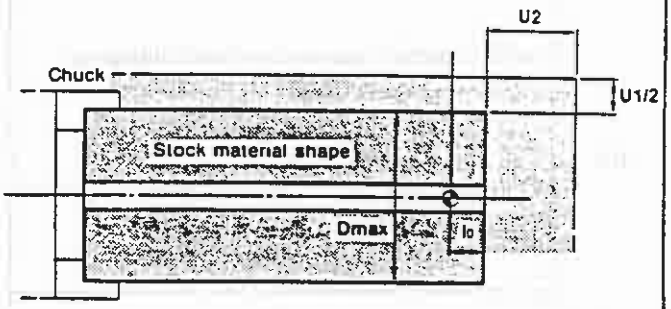
Gear	1st step	2nd step	3rd step	4th step
M code	n	n + 1	n + 2	n + 3

Address	Meaning		Description
P28	Specification of first M code for spindle gear selection		This parameter automatically determines spindle gear. Output M code will be as shown below If P28 is set to n.
		0 – 255	
		M	

Gear	1st step	2nd step	3rd step	4th step
M code	n	n + 1	n + 2	n + 3

Address	Meaning		Description
P29	Setting of first M code for parts catcher control		If parts catcher M code is set for this parameter when GRV process #4, #5 are used, linked operation with parts catcher will be allowed for machining. Output of M code set for this parameter will be made when tool comes to a position determined by start point X + groove cutting clearance (U8). Further after machining end, output of parameter setting + 1 will be made and parts catcher will return when tool comes to a position determined by start point X + groove cutting clearance (U8).
		0 – 255	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit / Effective condition	Setting range / Applicable program	
P30	Threading cutting up angle		Set cutting up angle at thread portion in thread cutting cycle (G76/G92)  71229587 Set 45 or 60. (Cutting up angles are limited to 45° and 60°.)
	Degree	0 – 89	
	Instant	E	
U1	Tool turning clearance (diametral value) in X-axis		Tool turning clearance is required to prevent interference between the tool and stock material during tool change in automatic operation.  71229588 Dmax = Stock material maximum outside diameter l_0 = Stock material edge projection length
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U2	Tool turning clearance (diametral value) in Z-axis		
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U3	Safety contour clearance—Outside diameter clearance (diametral value)		Safety contour clearance is provided for outside of the stock shape specified by common data in program. Tool approach and escape paths for each process will be automatically determined according to set data (outside diameter, inside diameter, front clearance, back clearance) for parameters U3 – U6.
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	

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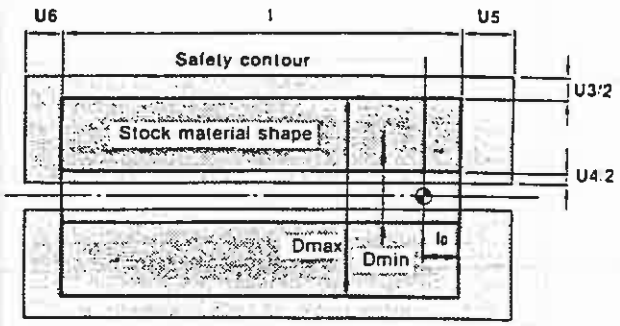
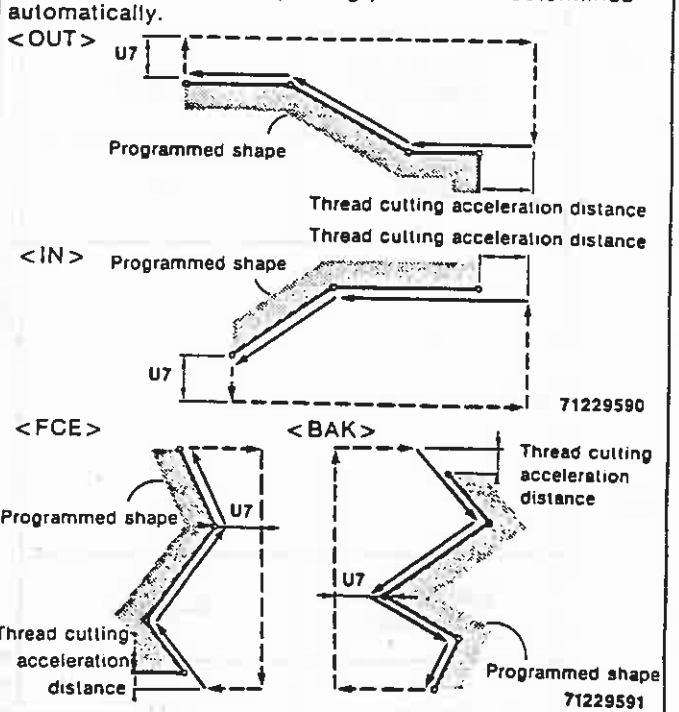
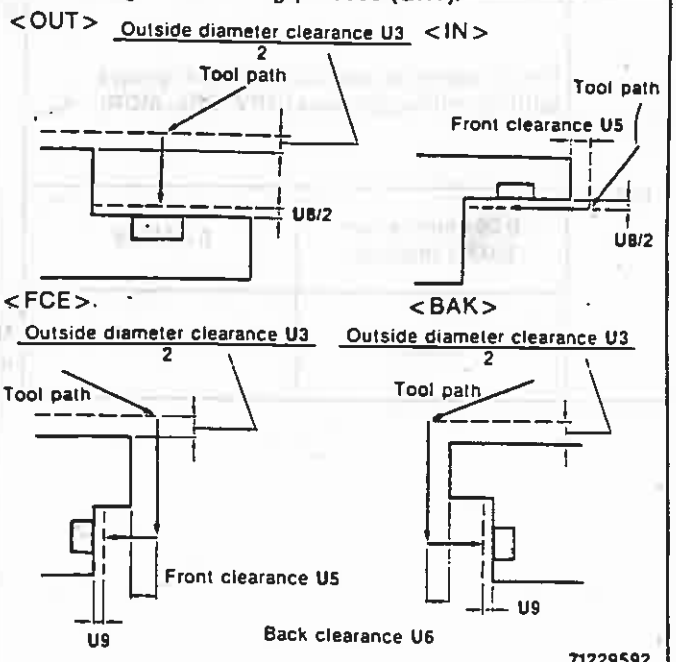
Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U4	Safety contour clearance—Inside diameter clearance (diametral value)		 71229589
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U5	Safety contour clearance—Front clearance		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	Dmax = Stock maximum outside diamter Dmin = Stock minimum inside diameter l_0 = Stock edge projection length l = Stock length
U6	Safety contour clearance—Back clearance		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U7	Thread cutting clearance (radial value)		Thread cuting clearance is provided to specify tool return distance for each cycle in thread cutting process (THR). Thread cutting clearance will be added to the highest portion of thread and repeating path will be determined automatically. 
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U8	Groove cutting clearance (diametral value) in X-axis		Groove cutting clearance is provided at machining start portion in groove cutting process (GRV). 
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U9	Groove cuting clearance (diametral value) in Z-axis		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	

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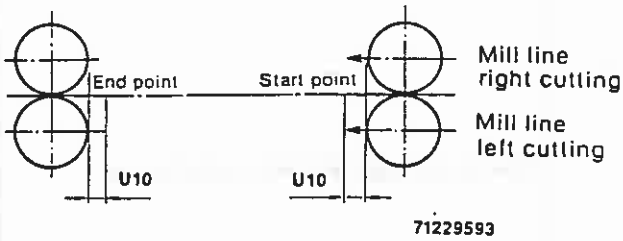
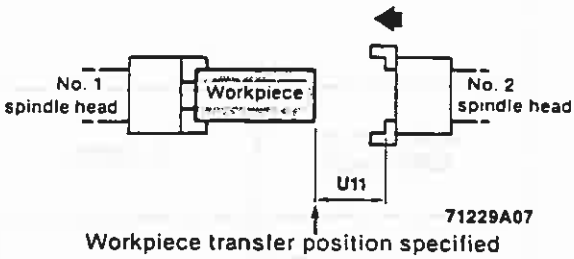
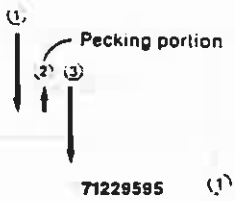
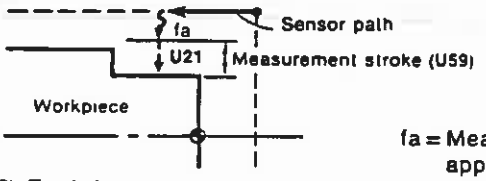
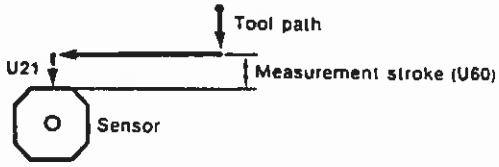
Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U10	Milling line right/left cutting clearance		Miling line right/left cutting clearance is provided to specify tool approach point and escape point in milling line right and left cutting process (LFT, RGT). 
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U11	Workpiece transfer clearance		Workpiece transfer clearance is provided to specify workpiece transfer position in workpiece transfer process (TRS). Example: Workpiece transferred from No. 1 spindle head to No. 2 spindle head.  Workpiece transfer position specified in SET UP DATA (2) display No. 2 spindle head traverse by rapid feedrate from transfer position to position by clearance distance, and then transfer operation initiated. (⇨ U26, U27, U50)
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U18	Return speed at pecking portion in groove cutting, drilling process (GRV, DRL, MDR)		Pecking speed  Feed speed (1) Cutting : (G1) F command data (2) Pecking: (G1) U18 (3) Cutting : (G1) F command data
	0.001 mm/rev or 0.0001 inch/rev	0 – 65535	
	Instant	M	Note: In drilling process DRL, MDR, U18 setting will be used only for #2, #2 type.

Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U19	Feedrate specification reference speed for finish cutting in milling line process (MGV, LCT, RGT, LFT)		This parameter, the roughness code, etc. determine the finishing feedrate. • If the radial-finishing reference feedrate is taken as F_1, then: $F_1 = \begin{cases} U19 \times \dfrac{D}{K32 \times \alpha} \times K_f \times Z & (D < K32 \times \alpha) \\ U19 \times K_f \times Z & (D \geq K32 \times \alpha) \end{cases}$ • If the axial-finishing reference feedrate is taken as F_2, then: $F_2 = F_1 \times \dfrac{K23}{100}$ D: Tool diameter α: 1/10 (for metric specs.) or 1/100 (for inch specs.) K_f: Roughness coefficient (Refer to the list below.) Z: Number of teeth (Roughness code: ▽ 1, ▽ 2, ▽▽ 3, ▽▽ 4, ▽▽▽ 5, ▽▽▽ 6, ▽▽▽▽ 7, ▽▽▽▽ 8, ▽▽▽▽ 9) Kf: $Ko \times 0.8^{-3}$, $Ko \times 0.8^{-2}$, $Ko \times 0.8^{-1}$, Ko, $Ko \times 0.8$, $Ko \times 0.8^{2}$, $Ko \times 0.8^{3}$, $Ko \times 0.8^{4}$, $Ko \times 0.8^{5}$ ko = Standard data 0.5 (⇨ K23, K32)
	0.001 mm/rev or 0.0001 inch/rev	0 ~ 65535	
	Instant	M	
U21	Measurement skip feedrate (X-axis, Z-axis)		(1) Workpiece measurement  fa = Measurement approach speed (U22) (2) Tool tip measurement  71229686 (⇨ U22, U59, U60)
	mm/min or 0.1 inch/min	0 ~ 65535	
	Instant	M	

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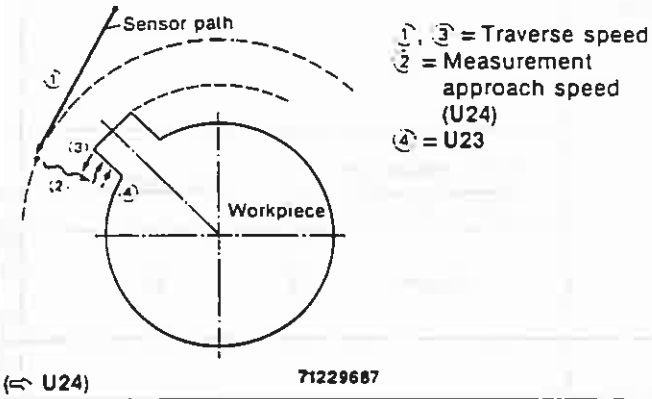
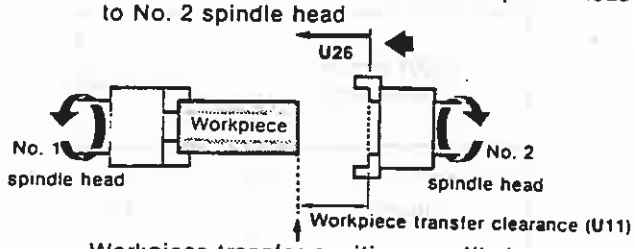
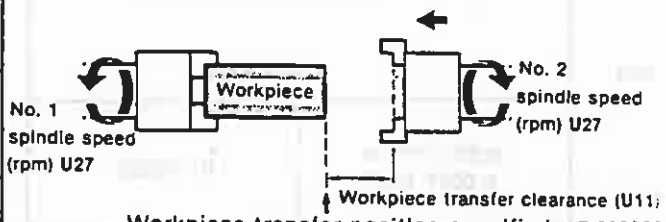
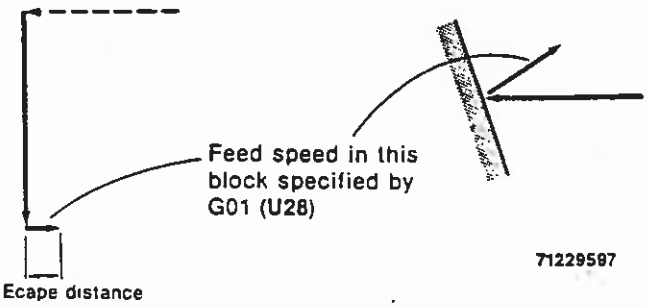
Title of display	USER PARAMETER No. 1		
Address	**Meaning**		**Description**
	Unit	**Setting range**	
	Effective condition	**Applicable program**	
U22	Measurement approach speed (X-axis, Z-axis)		Refer to (1) of U21.
	mm/min or 0.1 inch/min	0 – 65535	
	Instant	M	
U23	Mesurement skip speed (C-axis)		
	mm/min or 0.1 inch/min	0 – 65535	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U24	Measurement approach speed (C-axis)		Refer to U23
	mm/min or 0.1 inch/mm	0 – 65535	
	Instant	M	
U26	Workpiece pressing speed in workpiece transfer process (TRS)		Example: Workpiece transferred from No. 1 spindle head to No. 2 spindle head  Workpiece transfer position specified on SET UP DATA (2) display 71229A08 Note: Set this parameter equal to or as close as possible to its standard value. Excessive or insufficient setting may cause a contact error. (⇨ U11, U50)
	mm/min or 0.1 inch/min	0 – 65535	
	Instant	M	
U27	Speed (rpm) of two spindles in workpiece transfer while the spindles are rotating in workpiece transfer process (TRS)		Example: Workpiece transferred from No. 1 spindle head to No. 2 spindle head  Workpiece transfer position specified on SET UP DATA (2) display 71229A28
	rpm	0 – 65535	
	Instant	M	
U28	Feedrate for escape by short distance		For escape by very short distance, G01 feed speed will be faster than G00 to complete the operation. (If G00 is used, smoothing 0 detection will be made at the end position.) Therefore, for escape very short distance, use G01 command, and set the feed speed of this command as parameter. Example: Escape in finish cutting of EDG process / Escape in rough cutting of BAR process  71229597 (⇨ U33, U34)
	mm/min or 0.1 inch/min	0 – 65535	
	Instant	M	

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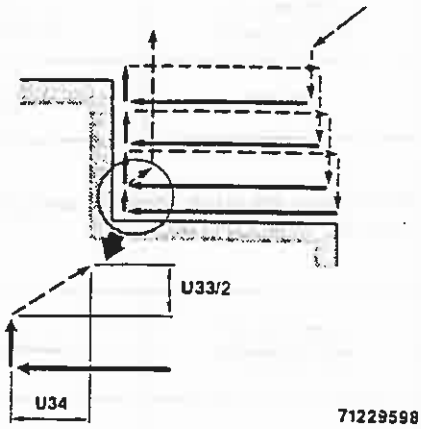
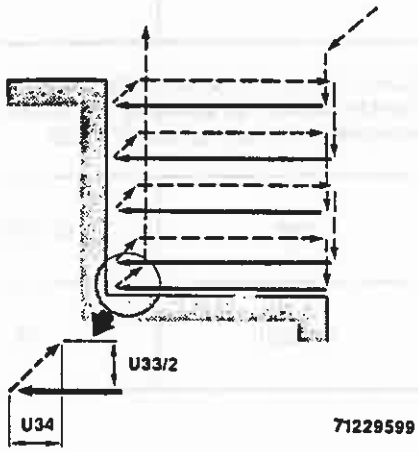
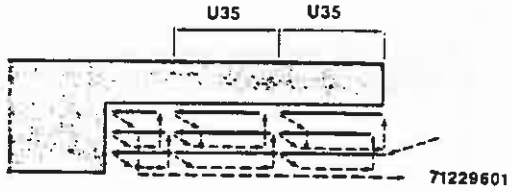
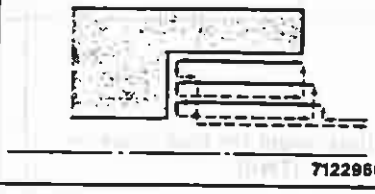
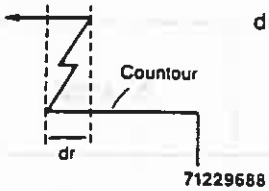
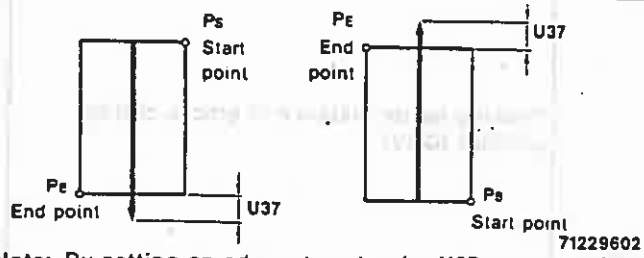
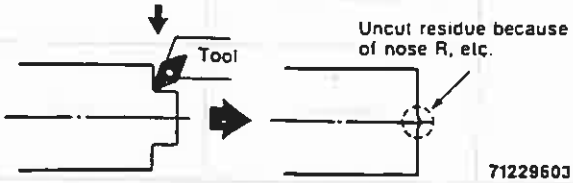
Tille of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U33	Return distance (diametral value) in X-axis at wall during rough cutting in bar cutting process (BAR) or corner machining process (CNR)		Example 1: Conventional type cutting. Prior to cutting up along the wall in the end of final cycle, escape will be made by specified distance. 
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U34	Return distance (diametral value) in Z-axis at wall during rough cutting in bar cutting process (BAR) or corner machining process (CNR)		Example 2: High speed rough cutting. Escape will be made by specified distance during return after reaching the wall. 
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	

Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U35	Cut depth per cycle for machining inside diameter in bar machining process (BAR)		Inside diameter enlarging cycle  Cutting is promoted gradually from the edge, and machining chip removal efficient.  cf. Conventional inside diameter cutting  Cutting to specified depth once through, and machining chip removal not efficient.
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U36	Reverse feed tolerance for contour machining		Example: Outside diameter machining in normal (−Z-axis direction) dr = Reverse feed contour data  dr ≦ U36 ..... No alarm dr > U35 ..... Alarm
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U37	Overtravelling in X-axis direction in edge machining process (EDG)		 Note: By setting an adequate value for U37, uncut residue will not be produced in edge machining 
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	

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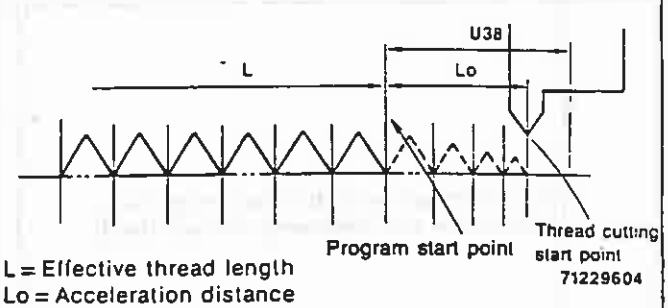
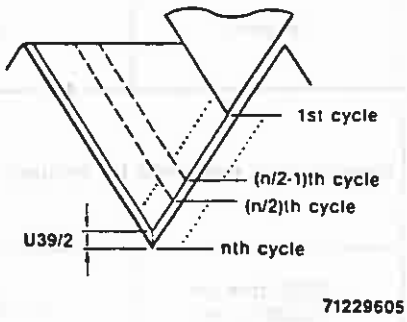
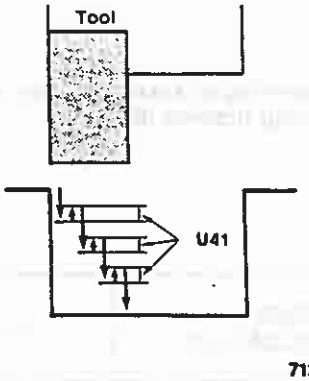
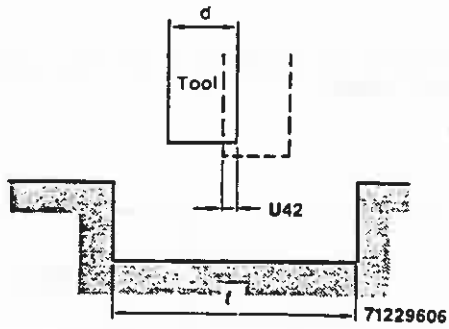
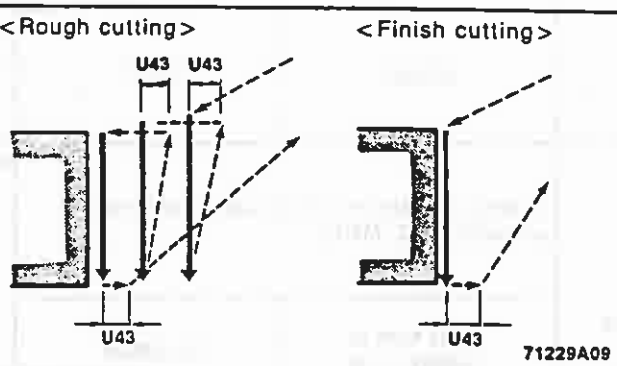
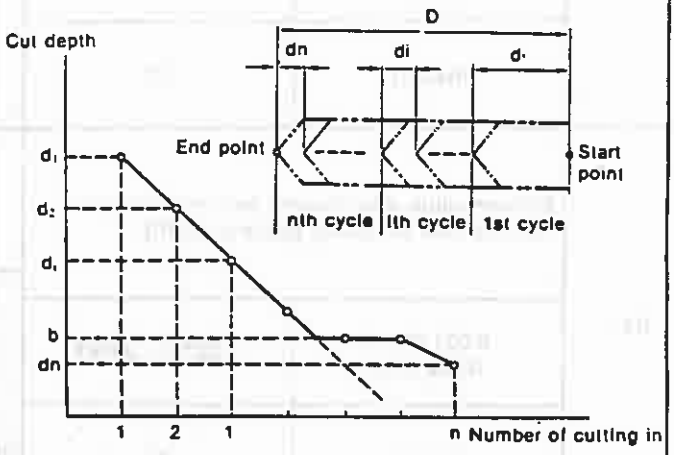
Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U38	Acceleration distance clamp value for thread cutting process (THR)		 L = Effective thread length Lo = Acceleration distance If Lo > U38, alarm will be caused. If,however, P1 (bit 3) = 0, alarm will not be caused.
	Lead/10	0 ~ 65535	
	Instant	M	(⇐ P1 (bit 3))
U39	Cut depth (diametral value) for final cycle in thread cutting process (THR)		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M·E	
U41	Peaking return distance in groove cutting process (GRV)		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M·E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U42	overlap distance for machining wide groove in groove cutting process (GRV)		
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U43	Escape value after machining in edge machining process (EDG)		
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U44	Drilling depth decrement in drilling machining process (DRL, MDR)		 D = Drilling depth d1 = Cut depth in 1st cycle di = Cut depth in Ith cycle di = d_1 – U44* (I – 1) (di ≧ b) di = b (di < b) b = Drilling cut depth clamp value (U46) (⇨ U46)
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	

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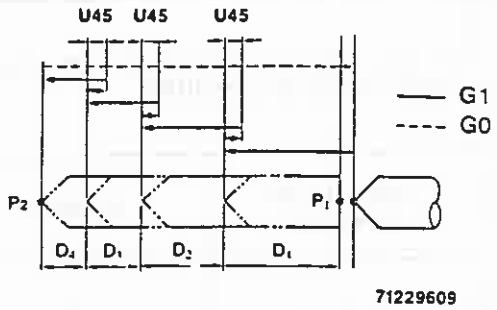
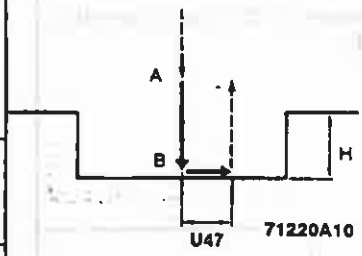
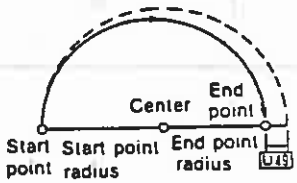
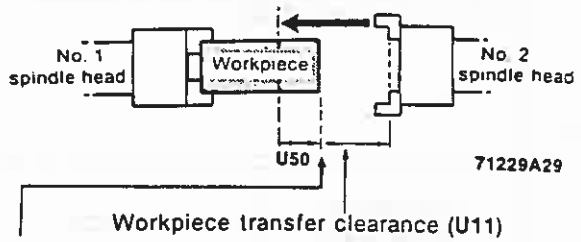
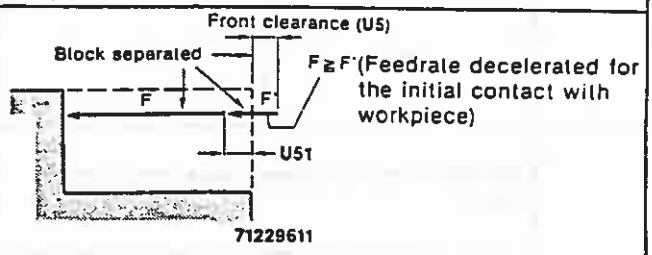
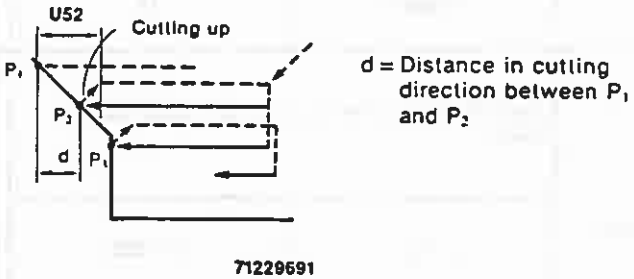
Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U45	Pecking return distance in drilling process (DRL, MDR)		 P_1 = Start point P_2 = End point Dn(n = 1 ~ 4) = Cut depth
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M·E	
U46	Drilling cut depth clamp value in drilling process (DRL, MDR)		Minimum drilling cut depth is set. (∵ U44)
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U47	Escape value after milling axis orienting at hole bottom in boring process (BOR).		 A = Cutting in point B = Milling axis orienting position H = Machining depth
	0.001 mm or 0.0001 inch	−32767 ~ 32767	
	Instant	M	Note: On machines without milling axis orienting function, always set 0.
U49	Tolerance for radial value difference at start and end points in arc command.		
	0.001 mm or 0.0001 inch	0 ~ 100	
	Instant	M·E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U50	Workpiece pressing distance in workpiece transfer process (TRS)		Example: Workpiece transferred from No. 1 spindle head to No. 2 spindle head.  Workpiece transfer position specified in SET UP DATA (2) display
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
U51	Deceleration clearance at start of rough cutting in bar machining process (BAR) and copy machining process (CPY)		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	Note: Using this parameter will reduce load in the initial contact between the tool and workpiece. (⇨ K13)
U52	Tolerance for cutting up operation in high speed rough cutting cycle of bar machining process (BAR)		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	If U52 ≧ d, cutting up operation will be executed. If U52 < d, cutting up operation will not be executed.

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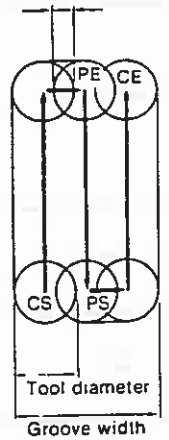
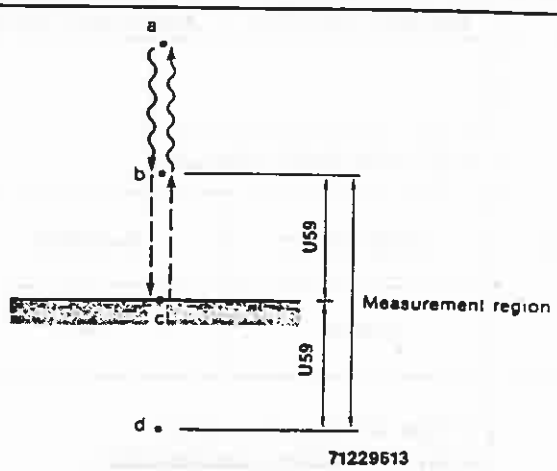
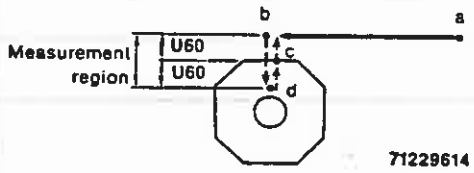
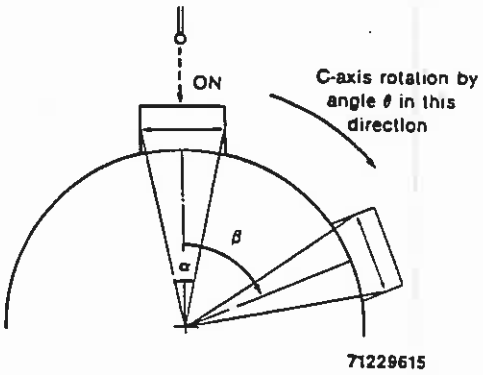
Title of display	USER PARAMETER No. 1

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
U53	Minimum overlap distance in key way groove machining process (MGV)		Overlap data ≧ U53  PS = Programmed start point PE = Programmed end point CS = Actual cutting start point CE = Actual cutting end point 71229612 Note: This parameter can be used only when Y-axis option is provided.
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U54	Spindle revolution clamp value in cutting off cycle.		Revolution number (rpm) clamped by this parameter for #4, #5 of GRV process
	rpm	0 – 65535	
	Instant	M	
U57	Specification of measuring tolerance lower limit.		(1) Tool compensation will be made in cases below. $\frac{\alpha_1-\alpha_2}{100} \times U58 \geqq$ Compensation data $\geqq \frac{\alpha_1-\alpha_2}{100} \times U57$ $-\frac{\alpha_1-\alpha_2}{100} \times U57 \geqq$ Compensation data $\geqq -\frac{\alpha_1-\alpha_2}{100} \times U58$ (2) Tool compensation will not be made in cases below. $\frac{\alpha_1-\alpha_2}{100} \times U57 >$ Compensation data $> -\frac{\alpha_1-\alpha_2}{100} \times U57$ (3) Alarm will be caused in cases below. Compensation data $> \frac{\alpha_1-\alpha_2}{100} \times U58$ $-\frac{\alpha_1-\alpha_2}{100} \times U58 >$ Compensation data where α_1 = Tolerance upper limit α_2 = Tolerance lower limit (Specified in program) Note: U57, U58 are not used in tool tip measurement.
	%	0 – 100	
	Instant	M·E	
U58	Specification of measuring tolerance upper limit.		
	%	0 – 100	
	Instant	M·E	

Title of display	USER PARAMETER No. 1

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U59	Measurement stroke for workpiece measurement		 a = Approach point b = Measurement start point c = Measurement point (target data) d = Measuremetn end point
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U60	Measurement storke for tool tip measurement		 b = Measurement start point c = Measurement point (target data) d = Measurement end point
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	
U61	Measurement retry width in C offset measurement process (MES-COF)		During approach operation to measurement start point, if touch sensor is actuated, the C-axis will rotate by specified percent of the measurement object shape angle. **Example:** CW programmed as measurement direction α = Mesurement object shape angle $\beta = \alpha \times \frac{U61}{100}$ 
	%	0 – 65535	
	Instant	M	

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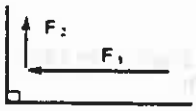
Title of display	USER PARAMETER No. 2

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
U65	M code for the parts catcher Delay timer setting (first head)		Set an operation dwell time for the parts catcher.
	1/1000 second	0 – 65535	
	Instant	M	
U66	M code for the parts catcher Delay timer setting (second head)		Set an operation dwell time for the parts catcher.
	1/1000 second	0 – 65535	
	Instant	M	

Title of display	USER PARAMETER No. 2

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
K1	Cut depth reduction rate for rough cutting in bar machining process (BAR)		Cut depth can be reduced as remaining workpiece thickness becomes less in rough cutting in bar machining process. Reduced cut depth (A) can be expressed by $A = T \times \frac{K1}{100}$ where T = Remaining thickness (raidal value)
	%	0 ~ 100	
	Instant	M	
K2	Accelearation rate in up-going slope for rough cutting in bar machining process (BAR)		 71229692 $F_2 = F_1 \times \frac{K2}{100} \times \left\lvert \frac{b}{a} \right\rvert$ F_1 = Feedrate for rough cutting F_2 = Increased feedrate
	%	0 ~ 500	
	Instant	M	Note: This is effective only when P1 (bit 0) = 1.
K3	Acceleration rate in up-going wall slope (90°) for rough cutting in bar machining process (BAR)		 71229692 $F_2 = F_1 \times \frac{K3}{100}$ F_1 = Feedrate for rough cutting F_2 = Increased feedrate
	%	0 ~ 500	
	Instant	M	Note: This is effective only when P1 (bit 0) = 1.
K4	Deceleration rate in down-going slope for rough cutting in bar machining process (BAR)		 71229693 $F_3 = F_1 \times \frac{K4}{100} \times \left\lvert \frac{a}{b} \right\rvert$ F_1 = Feedrate for rough cutting F_4 = Reduced feedrate
	%	0 ~ 500	
	Instant	M	Note: This is effective only when P1 (bit 1) = 1.

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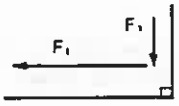
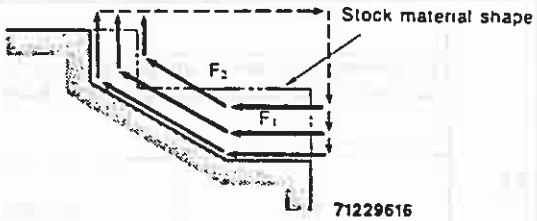
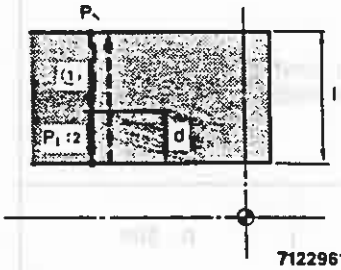
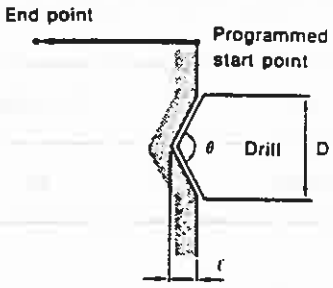
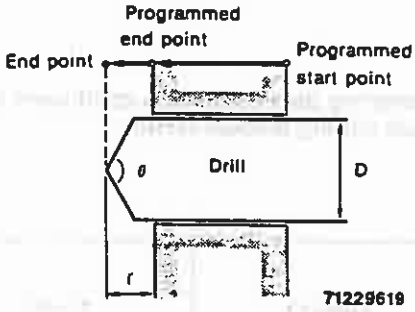
Title of display	USER PARAMETER No. 2	

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
K5	Deceleration rate in down-going wall slope (90°) for rough cutting in bar machining process (BAR)		 71229693 $F_3 = F_1 \times \frac{K5}{100}$ F_1 = Feedrate for rough cutting F_3 = Reduced feedrate Note: This is effective only when P1 (bit 1) = 1.
	%	0 ~ 500	
	Instant	M	
K6	Acceleration rate outside stock contour for rough cutting in copy machining process (CPY)		 71229616 $F_2 = F_1 \times \frac{K6}{100}$ F_1 = Feedrate inside stock contour F_2 = Feedrate outside stock contour
	%	0 ~ 500	
	Instant	M	
K7	Acceleration pitch error ratio in thread cutting process (THR)		Used to calculated acceleration distance in thread cutting process. $L = L_0 [-\ln(\frac{K7}{1000}) - 1 + \frac{K7}{1000}]$ L = Acceleration distance L_0 = Distance over which feedrate become constant
	0.1%	0 ~ 20	
	Instant	M	
K8	Rough cutting residue ratio in cutting off cycle (#4, #5) in groove cutting process (GRV)		 71229617 P_S = Programmed start point P_1 = Programmed end point l = Groove machining depth $l = \overline{P_S P_E}$ d = Rough cutting residue $d = l \times \frac{K8}{100}$
	%	0 ~ 100	
	Instant	M	(1) Rough cutting to a point short of end P_1 by distance d (2) Cutting to end point at feedrate specified for surface finish

Title of display	USER PARAMETER No. 2

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
K10	Cut depth allowable incremental rate for rough cutting in groove cutting process (GRV)		Used to calculate minimum cutting frequency in groove cutting process $d' = d(\frac{100 + K10}{100})$ d = Cut depth per cycle d' = Allowable maximum cut depth
	%	0 ~ 100	
	Instant	M	
K11	Deceleration rate at cutting start time in for drilling process (DRL, MDR)		$F' = F \times \frac{K11}{100}$ F = Specified feedrate F' = Feedrate at cutting in  Feedrate at F' over distance ℓ from the programmed start point $\begin{cases} \ell = \frac{D}{2 \times \tan\theta/2} & (0° < \theta < 180°) \\ \ell = 0 & (\theta \geq 180°) \end{cases}$
	%	0 ~ 100	
	Instant	M	
K12	Deceleration rate at cutting end time in for drilling process (DRL, MDR)		$F' = F \times \frac{K12}{100}$ F = Specified feedrate F' = Feedrate at cutting end  Feedrate at F' to a point short of end point by distance ℓ $\ell = \frac{D}{2 \times \tan\theta/2} + \frac{D}{10} (0° < \theta < 180°)$ $\ell = \frac{D}{10} (\theta \geq 180°)$
	%	0 ~ 100	
	Instant	M	

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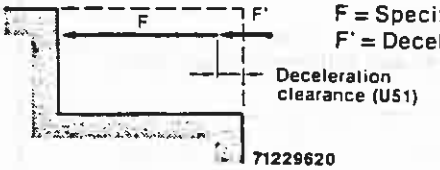
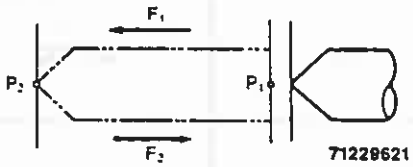
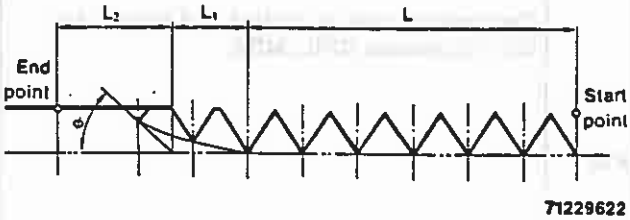
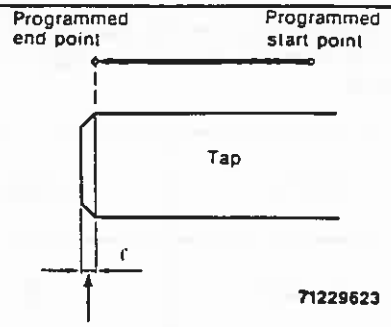
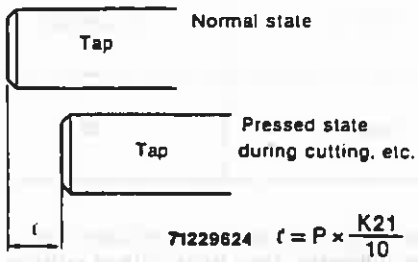
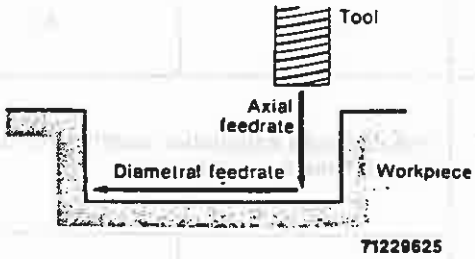
Title of display	USER PARAMETER No. 2		
Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
K13	Deceleration rate at rough cutting in for bar machining process (BAR) and copy machining process (CPY)		 F = Specified feedrate F' = Decelerated feedrate $F' = F \times \frac{K13}{100}$
	%	0 – 100	
	Instant	M	(⇐ U51)
K17	Drilling cut depth calculation coefficient		Used for automatic determination of first cut depth in driling $d_1 = D \times \frac{K17}{100}$ D = Drilling hole diameter d_1 = Cut depth of first cut
	%	0 – 1000	
	Instant	M	
K18	Reamer return speed calculation coefficient		
	%	0 – 999	$F_2 = F_1 \times \frac{K18}{100}$
	Instant	M	F_1 = Specified feedrate F_2 = Return speed P_1 = Start point P_2 = End point
K19	Chamfering data calculation coefficient in thread cutting process (THR)		
	Lead/10	0 – 40	L = Effective thread length L_1 = Same pitch incomplete thread length (copy delay) L_2 = Chamfering data φ = Chamfering angle
	Instant	M•E	$L_2 = L_0 \times \frac{K19}{10}$ L_0 = Thread lead

Title of display	USER PARAMETER No. 2

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
K20	Incomplete threading portion length calculation coefficient for tap tip		 Cutting end point specified farther by this lenngth $\ell = P \times \frac{K20}{10}$ P = Tapping pitch L = Incomplete thread portion length
	Pitch/10	0 ~ 99	
	Instant	M	
K21	Tapper elongation calculation coefficient		 $\ell = P \times \frac{K21}{10}$ P = Tapping pitch L = Tapper elongation
	Pitch/10	0 ~ 99	
	Instant	M	
K22	Calculation coefficient for axial feedrate of rough cutting in milling line machining process (MGV, LCT, PGT, LFT)		Ratio of axial feedrate to diametral feedrate is set. $(\text{Axial feedrate}) = (\text{Diametral feedrate}) \times \frac{K22 \text{ or } K23}{100}$  K22 for rough cutting K23 for finish cutting
	%	0 ~ 999	
	Instant	M	
K23	Calculation coefficient for axial feedrate of finish cutting in milling line process (MGV, LCT, PGT, LFT)		
	%	0 ~ 999	
	Instant	M	

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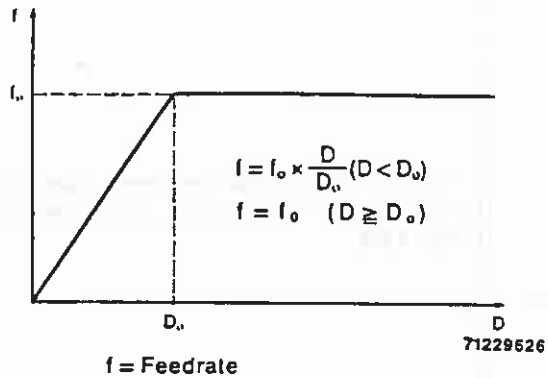
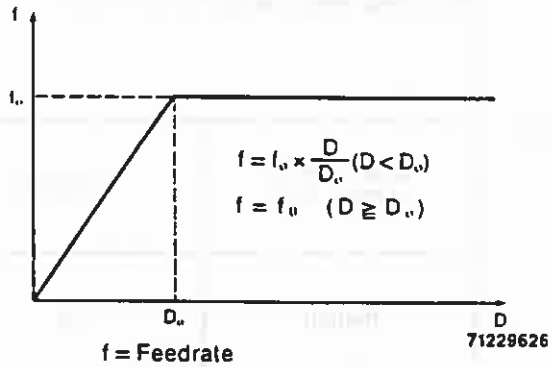
Title of display	USER PARAMETER No. 2		
Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
K24	Thread height calculation coefficient for outside diameter, face (rear) thread cutting (metric)		$h = P \times \frac{K24}{10000}$ h = Thread height P = Thread pitch
	0.01%	0 – 65535	
	Instant	M	
K25	Thread height calculation coefficient for inside diameter thread cutting (metric)		Refer to K24
	0.01%	0 – 65535	
	Instant	M	
K26	Thread height calculation coefficient for outside diameter, face (rear) thread cutting (inch)		Refer to K24
	0.01%	0 – 65535	
	Instant	M	
K27	Thread height calculation coefficient for inside diameter thread cutting (inch)		Refer to K24
	0.01%	0 – 65535	
	Instant	M	

Title of display	USER PARAMETER No. 2

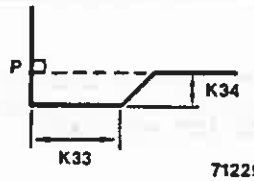
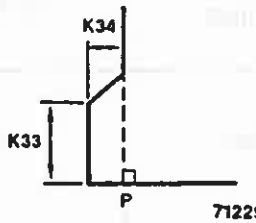
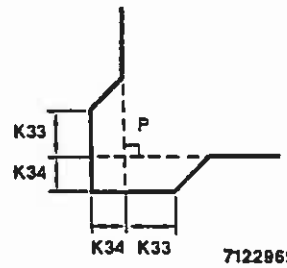
Address	Meaning		Description
	Unit / Effective condition	Setting range / Applicable program	
K29	Feedrate calculation reference diameter in mill drilling process (MDR)		 f = Feedrate f_o = Data depending on cutting conditions D = Hole diameter D_0 = K29 × α D_0 = K30 × α α : 1/10 (for metric specs.) or 1/100 (for inch specs.)
	0.1 mm or 0.01 inch	0 – 65535	
	Instant	M	
K30	Feedrate calculation reference diameter in mill boring process (BOR)		
	0.1 mm or 0.01 inch	0 – 65535	
	Instant	M	
K31	Radial direction feedrate calculation reference diameter for rough cutting in milling line process (MGV, LCT, RGT, LFT)		 f = Feedrate f_o = Data depending on cutting conditions D = Groove width D_0 = K31 × α α : 1/10 (for metric specs.) or 1/100 (for inch specs.)
	0.1 mm or 0.01 inch	0 – 65535	
	Instant	M	

Title of display	USER PARAMETER No. 2

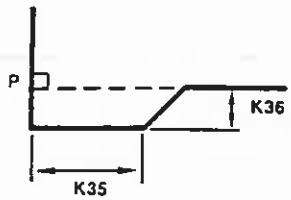
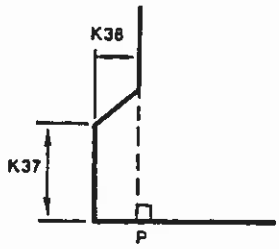
Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
K32	Feedrate specification reference diameter for finish cutting in milling line process (MGV, LCT, RGT, LFT)		This parameter, the roughness code, etc. determine the finishing feedrate. • If the radial-finishing reference feedrate is taken as F_1, then: $F_1 = \begin{cases} U19 \times \dfrac{D}{K32 \times \alpha} \times K_1 \times Z & (D < K32 \times \alpha) \\ U19 \times K_1 \times Z & (D \geqq K32 \times \alpha) \end{cases}$ • If the axial-finishing reference feedrate is taken as F_2, then: $F_2 = F_1 \times \dfrac{K23}{100}$ D: Tool diameter α: 1/10 (for metric specs.) or 1/100 (for inch specs.) K_1: Roughness coefficient (Refer to the list below.) Z: Number of teeth (⇨ U19, K23)
	0.1 mm or 0.01 inch	0 – 65535	
	Instant	M	

Roughness code	▽ 1	▽ 2	▽▽ 3	▽▽ 4	▽▽▽ 5	▽▽▽ 6	▽▽▽▽ 7	▽▽▽▽ 8	▽▽▽▽ 9
KI	$Ko \times 0.8^{-3}$	$Ko \times 0.8^{-2}$	$Ko \times 0.8^{-1}$	Ko	$Ko \times 0.8$	$Ko \times 0.8^{2}$	$Ko \times 0.8^{3}$	$Ko \times 0.8^{4}$	$Ko \times 0.8^{5}$

ko = Standard data 0.5

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
K33	Polishing margin width for #1 – #3		<#1>  71229694
	0.001 mm or 0.0001 inch	0 – 65535	<#2>  71229695
	Instant	M	
K34	Polishing margin depth for #1 – #3		<#3>  71229696
	0.001 mm or 0.0001 inch	0 – 65535	
	Instant	M	P = Program end point

Title of display	USER PARAMETER No. 2

Address	Meaning		Description
	Unit / Effective condition	Setting range / Applicable program	
K35	Polishing margin width for #4		<#4>  P = Program end point
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
K36	Polishing margin depth for #4		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
K37	Polishing margin width for #5		<#5>  P = Program end point
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
K38	Polishing margin depth for #5		
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	

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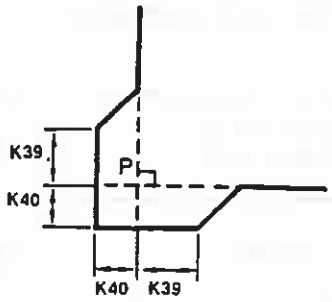
Title of display	USER PARAMETER No. 2

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
K39	Polishing margin width for #6		<#6>  P = Program end point
	0.001 mm or 0.0001 inch	0 ~ 65535	
	Instant	M	
K40	Polishing margin depth for #6		
	0.001 m or 0.0001inch	0 ~ 65535	
	Instant	M	

Title of display	USER PARAMETER No. 4

Parameters (address I) about data transfer are recorded on **USER PARAMETER No. 4** display.
With parameter **I1 — I8**, items about I/O devices represented by <DV1> — <DV8> are specified.
The represented I/O devices are as below.

<DV1> .... CMT (cassette deck)
<DV2> .... PTP/PTR (paper tape punch/reader)
<DV3> .... Printer
<DV4> .... DNC (host CPU)
<DV5> ~ <DV8> } Not used

Parameters and usages of devices are as listed below.

O = Use X = Not used

Parameter	CMT	PTP/PTR	Printer	DNC
I1	O	O	O	O
I2	X	O	O	O
I3	X	O	O	O
I4	X	O	X	X
I5	X	O	O	O
I6	X	O	O	X
I7	X	O	O	X
I8	X	O	X	X

Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I1	Selection of baud rate		Initial setting parameter for RS-232C interface
		0 ~ 7	
	Instant	M•E	

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

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I2	Selection of stop bit digits		Initial setting parameter for RS-232C interface
		0 ~ 3	
	Instant	E	

Setting	Number of stop bit
1	1
2	1.5
3	2

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Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I3	Selection of parity		Initial setting parameter for RS-232C interface
		0 ~ 2	
	Instant	E	

Setting	Parity selection
0	Disuse
1	Use — odd
2	Use — even

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I4	Terminator code 1		This parameter can be used only when the terminator type (I10) is set to 4 or 5 only. The terminator type, however, must be set to 1 to allow paper tape processing. 0 must be used for this parameter in such cases.
		0 ~ 255 (fixed to 0)	
	Instant	E	

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I5	Selection of data bit digits		Initial setting parameter for RS-232C interface
		0 ~ 3	
	Instant		

Setting	Number of data bits
0	5
1	6
2	7
3	8

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I6	Selection of handshaking method		Parameter for selecting handshaking method to control data transfer between NC equipment and I/O units
		0 ~ 3	
	Instant		

Setting	Description
1	RTS/CTS for unit connection
2	No control (free transfer)
3	Control codes DC 1 — 4

Title of display	USER PARAMETER No. 4

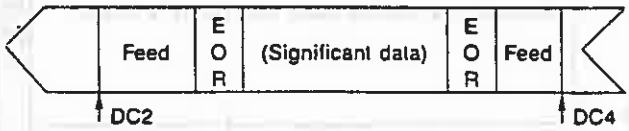
Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I7	Selection of DC code parity	0 ~ 1	Parameter for selection between whether or not parity should be added for DC code output
	Instant		

Setting		DC 3 code								
0	NO				●		○		●	○
1	YES	●			●		○		●	○

Note:
This parameter is used only when I6 is set to 3.

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I8	Time out duration		Waiting time (sec) from response from I/O units is set. When the set time has passed after the last response, alarm will be caused.
	sec	0 ~ 255	
	Instant	E	

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I9	Feed control flag	0 ~ 3	Selection between whether or not DC 2 and DC 4 code outputs should be made to feed section where paper tape punch (PTP) start and end are commanded
	Instant	E	



Setting	Description
0	No output of DC2 or DC4
1	Output of DC2 only
2	Output of DC4 only
3	Output of both DC2 and DC4

Note: This parameter is used only when I6 is set to 3.

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I10	Terminator type	0 ~ 5 (fixed to 1)	Specifying of terminator type
	Instant	E	

Setting	Description
0	No terminator
1	EOB or EOR
2	EOB only
3	EOR only
4	Any one character (character specified by I4)
5	Any two characters (first character specified by I4, second character numeral 0)

Note: Always set to 1 to allow use of paper tape processing.

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Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I11	Use/disuse of CR code output to paper tape punch	0 (disuse)/1 (use)	Selection between whether or not CR code should be used for output to paper tape punch (PTP) Setting: 0 — CR code not used; 1 — CR code used CR code will be removed without conditions at the time of input to NC equipment.
	Instant	E	
I12	Use/disuse of title character to paper tape punch	0 (disuse)/1 (use)	Note: Title characters are not punched at present. Always set to 0. Setting: 0 — No title character output; 1 — Title character output
		E	
I13	Selection of punch code and parity V check	0 ~ 3	Specifying of code to be punched on paper tape punch (PTP) and use/disuse of parity check by paper tape reader (PTR) Setting: 0 — ISO, Disuse; 1 — EIA, Disuse; 2 — ISO, Use; 3 — EIA, Use
	Instant	E	
I14	Number of spaces between work No. and data to be punched on paper tape	1 character	0 ~ 255	Specifying number of space characters (SP) between Q number and program head in punching programs on paper tape Q 1 2 3 4 SP SP SP – SP CR Program portion I14 (Number of characters)
	Instant	E	

Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I15	Number of spaces between programs punched on paper tape		Specifying number of space characters (SP) between different programs in punching programs on paper tape ~ M 0 2 CR SP SP ~ SP CR Q 1 2 3 4 ~ Program — I15 (Number of characters) — Program
	1 character	0 ~ 255	
	Instant	E	
I16	Number of leading and trailing characters of paper tape		Specifying number of NULL (feed) characters on leading and trailing portions of paper tape. Paper tape will be fed for 10 times of the number of characters set for I16. I16×10(number of characters) — I16×10(number of characters) Feed / EOR / (Significant data) / EOR / Feed Tape setting position — Punch ending position
		0 ~ 255	
	Instant	E	
I17	Perforation pattern for [code for EIA		Specifying punching pattern for loading or punching [by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary digits (I/O), and convert the binary number into a decimal number. **Example** [code 71229627 $(0\times2^7)+(1\times2^6)+(0\times2^5)+(0\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(0\times2^0)=76$ Setting value
		0 ~ 255	
	Instant	E	
I18	Perforation for] code for EIA		Specifying punching pattern for loading or punching] by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary digits (I/O), and convert the binary number into a decimal number. **Exemple**] code 71229628 $(0\times2^7)+(0\times2^6)+(0\times2^5)+(0\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(0\times2^0)=13$ Setting value
		0 ~ 255	
	Instant	E	

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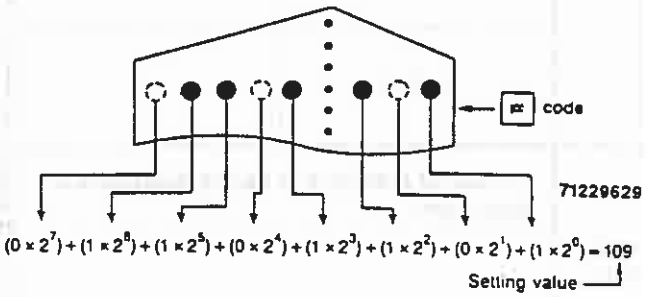
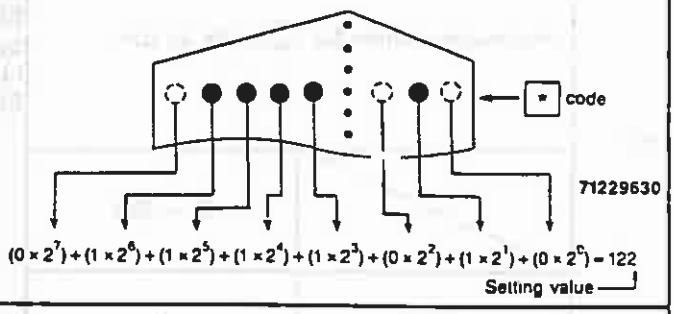
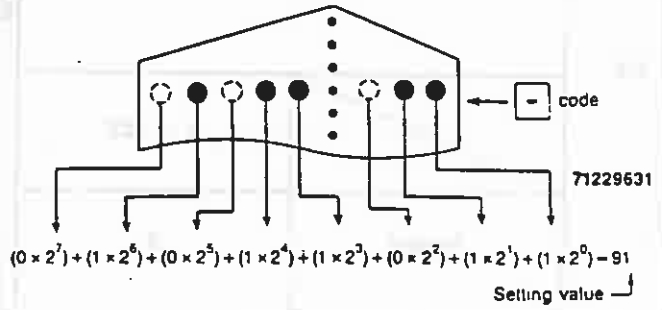
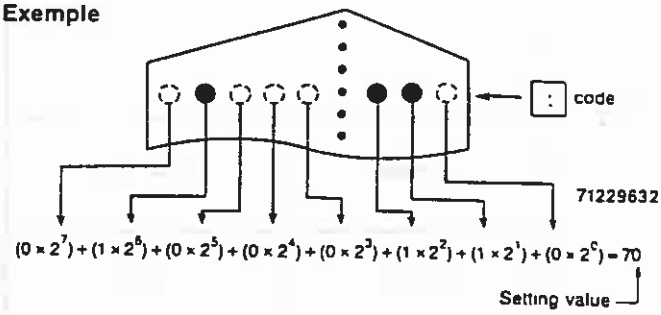
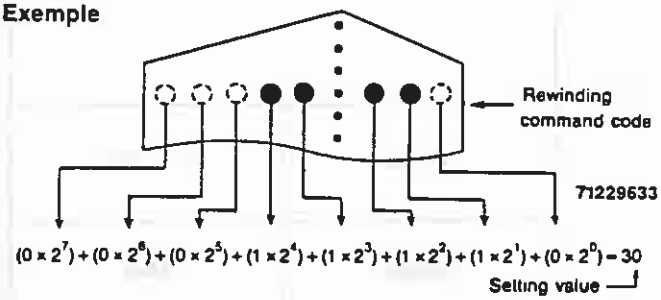
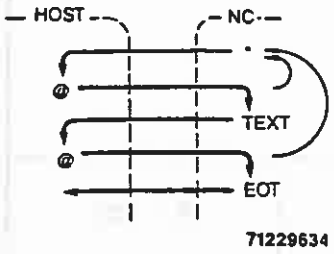
Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I19	Perforation for [#] code for EIA	0 ~ 255	Specifying punching pattern for loading or punching [#] by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary digits (1/0), and covert the binary number into a decimal number. **Exemple** 
	Instant	E	
I20	Perforation for [*] code for EIA	0 ~ 255	Specifying punching pattern for loading or punching [*] by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary digits (1/0), and convert the binary number into a decimal number. **Example** 
	Instant	E	
I21	Perforation for [=] code for EIA	0 ~ 255	Specifying punching pattern for loading or punching [=] by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary digits (1/0), and convert the binary number into a decimal number. **Exemple** 
	Instant	E	

Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I22	Perforation for [:] code for EIA		Specifying punching pattern for loading or punching [:] by EIA code on paper tape reader/punch. Count hole positions by 8 units of binary ditigis (1/0), and convert the binary number into a decimal number. **Exemple** 
		0 ~ 255	
	Instant	E	
I24	Perforation pattern for paper tape rewinding command code		Specifying punching pattern for paper tape rewinding command code for output to tape reader. Count hole positions by 8 units of binary ditigis (1/0), and convert the binary number into a decimal number. **Exemple**  **Note:** Set to 0 for paper tape reader without rewinding function.
		0 ~ 255	
	Instant	E	
I25	Transmission retry frequency for DNC file transfer		Setting how often transmission to be repeated after * or TEXT has been transferred without @ signaled back from HOST within waiting time set for parameter I28  Transmission repeated until @ signaled back
	Times	0 ~ 255	
	Instant	M·E	After repetition as often as the set number of times, alarm will be caused.

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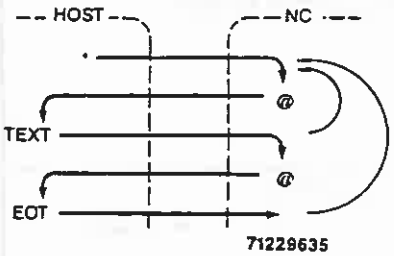
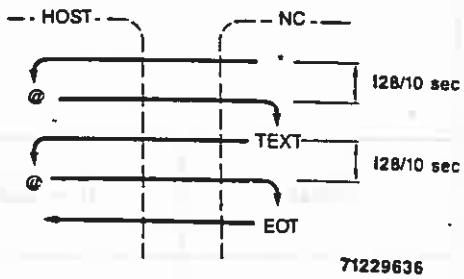
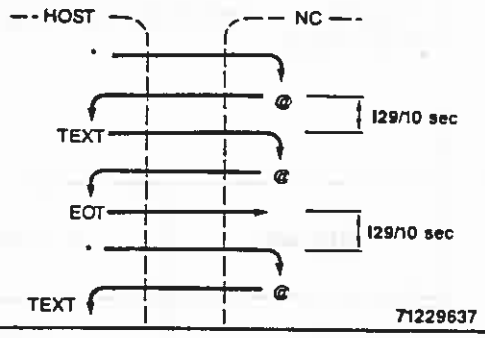
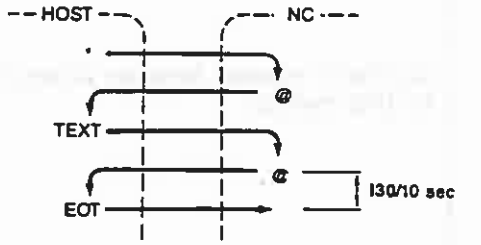
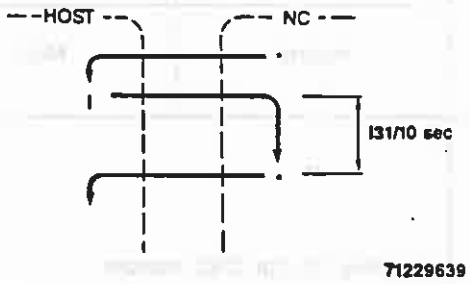
Title of display	USER PARAMETER No. 4

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
I26	Acceptance retry frequency for DNC file transfer		Setting how often return to initial status to be repeated after @ has been transferred without TEXT or EOT signaled back from HOST within waiting time set for parameter I29  Return to initial status repeated until TEXT or EOT signaled back
	Times	0 ~ 255	
	Instant	M•E	After repetition as often as the set number of times, alarm will be caused.
I27	Transmission retry frequency for DNC command message transfer		Refer to I25.
	Times	0 ~ 255	
	Instant	M•E	
I28	@ waiting time for DNC transfer		Setting of waiting time until NC equipment receives @ signaled from HOST after transmission of * or TEXT 
	0.1 sec	0 ~ 255	
	Instant	M•E	(⇨ I25)

Title of display	USER PARAMETER No. 4

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
I29	TEXT, * waiting time for DNC transfer		Setting of waiting time until NC equipment receives TEXT or * signaled from HOST after transmission of @ or reception of EOT  (⇨ I26)
	0.1 sec	0 ~ 255	
	Instant	M•E	
I30	EOT waiting time for DNC transfer		Setting of waiting time until NC equipment receives EOT signaled from HOST after transmission of @  (⇨ I26)
	0.1 sec	0 ~ 255	
	Instant	M•E	
I31	Stop time after acceptance of ! for DNC transfer		Setting of stop time until NC equipment transmits * after reception of ! from HOST 
	0.1 sec	0 ~ 255	
	Instant	M•E	
I32	Reset time after digital out for DNC transfer		Time until internal resetting of NC equipment after reception of digital out command
	0.1 sec	0 ~ 255	
	Instant	M•E	

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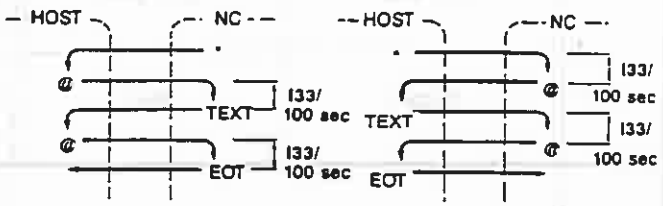
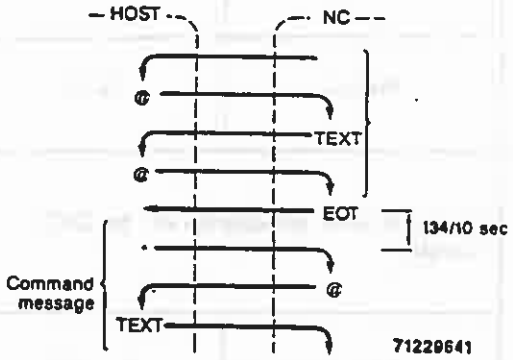
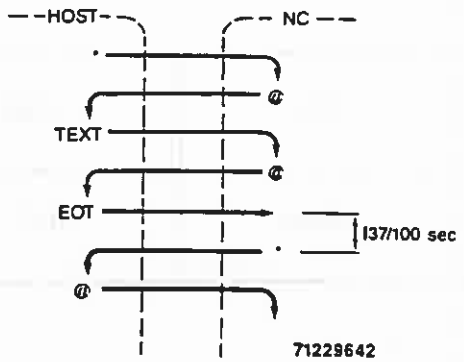
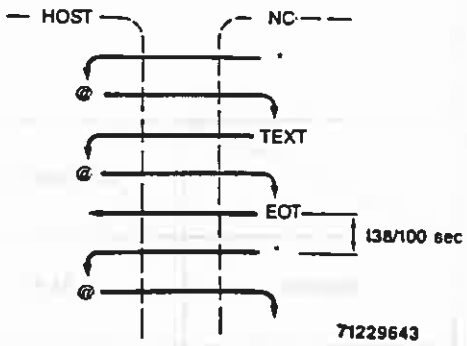
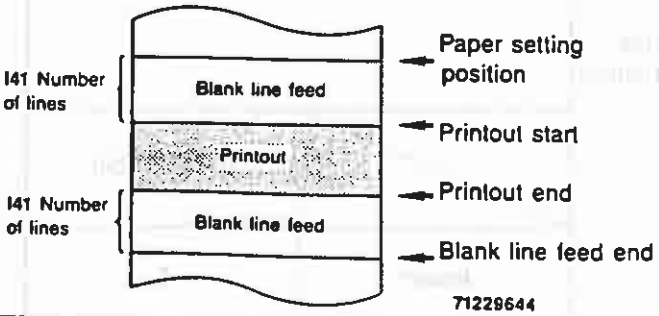
Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I33	Acceptance — transmission switching time for DNC transfer		Setting of time data below <NC equipment signalling> NC equipment waiting time after reception of @ from HOST until transmission of TEXT or EOT <NC equipment receiving> NC equipment waiting time after reception of * or TEXT until transmission of @ 
	0.01 sec	0 ~ 255	
	Instant	M•E	
I34	Command response message waiting time for DNC transfer		Setting of waiting time until NC equipment receives * of command response message signaled from HOST after transmission of EOT of command message 
	0.1 sec	1 ~ 255	
	Instant	M•E	
I35	Machine No. for DNC transfer		Each machine is given its own No. for DNC operation. Tool data and parameters are controlled on the HOST side by these Nos.
		0 ~ 255	
	Instant	M•E	

Title of display	USER PARAMETER No. 4

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
I37	Stop time between EOT acceptance and * transmission for DNC transfer		Setting of waiting time until NC equipment signals * of next message after reception of EOT from HOST 
	0.01 sec	0 ~ 255	
	Instant	M•E	
I38	Stop time between EOT transmission and * transmission for DNC transfer		Setting of waiting time unitl NC equipment signals * of next message after transmission of EOT 
	0.01 sec	0 ~ 255	
	Instant	M•E	
I41	Printing line space		Setting number of line feeds before and after printout operation 
	Line	0 ~ 255	
	Instant	M•E	

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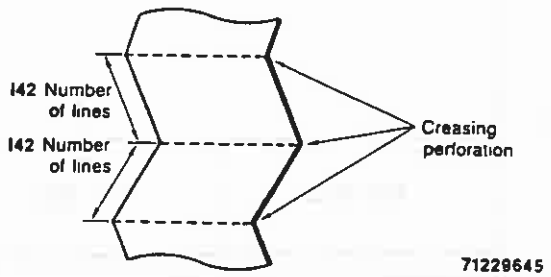
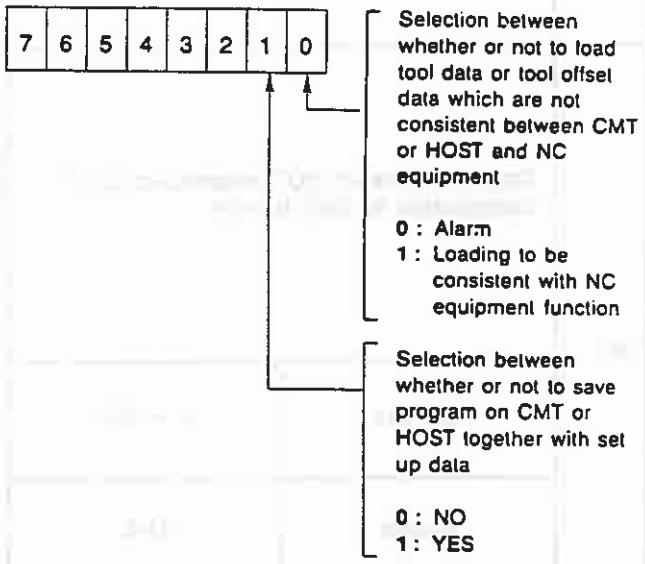
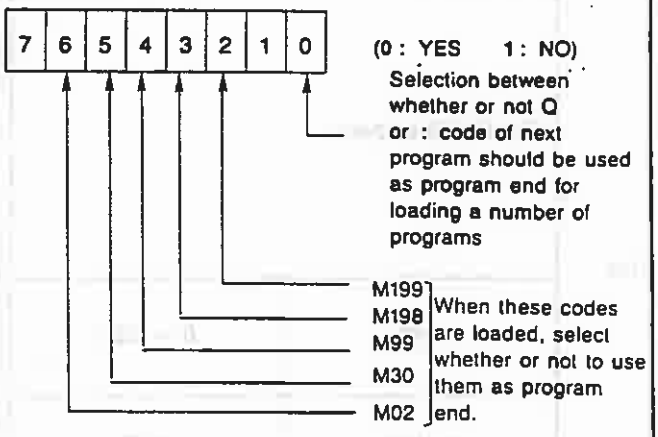
Title of display	USER PARAMETER No. 4

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
I42	Number of lines per printing page		Setting total number of printout lines per page. This parameter is used for printing out programs longer than a page.
	Line	0 ~ 255	
	Instant	M•E	
I57 (bit input)	Selection of special function for CMT and DNC I/O		
		0/1 (each bit)	
	Instant	M•E	
I58 (bit input)	Selection of of program end code		
		0/1 (each bit)	
	Instant	E	



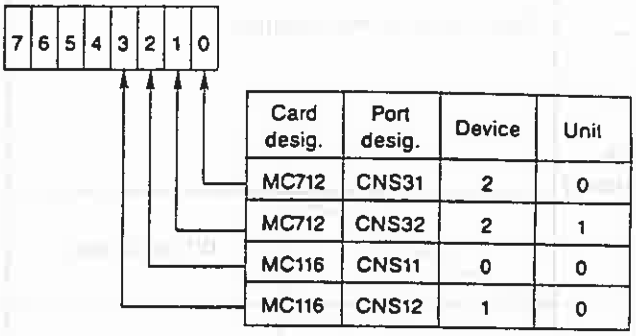
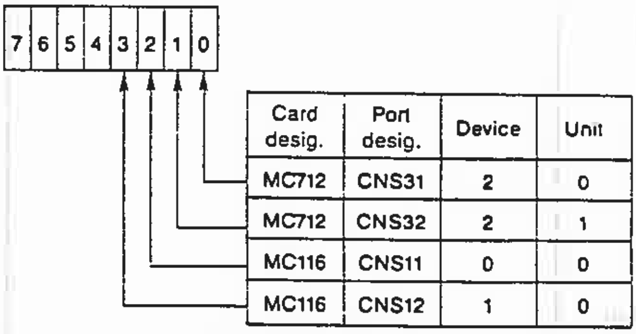
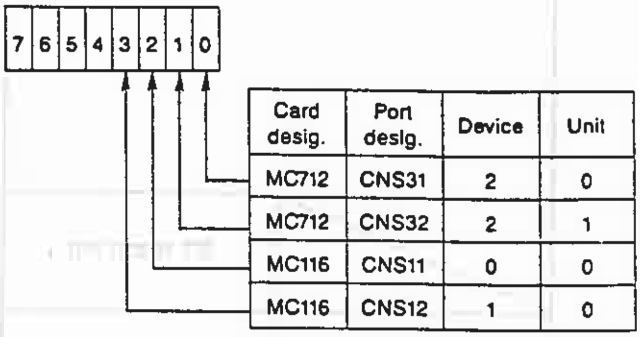




Note :
In tape operation, settings for this parameter will not be used.

Title of display	USER PARAMETER No. 4

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
I59 (bit input)	Selection of printer function		7 6 5 4 3 2 1 0 Selection between whether or not to print out menu along with display hard copy (0 : NO 1 : YES)
		0/1 (each bit)	
	Instant	M•E	
I60 (bit input)	Selection of functions for DNC I/O		7 6 5 4 3 2 1 0 (1 : YES 0 : NO) After program reception, selection between whether or not work No. search for the program should be executed Selection between whether or not alarm caused in DNC should be indicated Selection between whether or not loading programs of stored work No. on NC equipment should be inhibited Selection between whether or not to relieve program rewrite switch function Selection between or not to delete all programs before work No. 9000 at the time or program reception start
		0/1 (each bit)	
	Instant	M•E	

<table>
<tr><td>Title of display</td><td colspan="3">USER PARAMETER No. 4</td></tr>
<tr><td rowspan="3">Address</td><td colspan="2">Meaning</td><td rowspan="3">Description</td></tr>
<tr><td>Unit</td><td>Setting range</td></tr>
<tr><td>Effective condition</td><td>Applicable program</td></tr>
<tr><td rowspan="3">165
(bit input)</td><td colspan="2">Allocation of devices and port for CMT</td><td rowspan="3">CNS31 of MC712 is used if all settings are 0 or several bits are set to 1.
  <table><tr><th>Card desig.</th><th>Port desig.</th><th>Device</th><th>Unit</th></tr><tr><td>MC712</td><td>CNS31</td><td>2</td><td>0</td></tr><tr><td>MC712</td><td>CNS32</td><td>2</td><td>1</td></tr><tr><td>MC116</td><td>CNS11</td><td>0</td><td>0</td></tr><tr><td>MC116</td><td>CNS12</td><td>1</td><td>0</td></tr></table>Note : CNS11 and CNS12 of MC116 are not used at present.</td></tr>
<tr><td></td><td>0/1 (each bit)</td></tr>
<tr><td>Instant</td><td>M•E</td></tr>
<tr><td rowspan="3">MC712
CNS31
1
2
32
166
(bit input)</td><td colspan="2">Allocation of devices and port for PTP/PTR</td><td rowspan="3">CNS31 of MC712 is used if all settings are 0 or several bits are set to 1.
0 0 0 1
0 0 1 0
  <table><tr><th>Card desig.</th><th>Port desig.</th><th>Device</th><th>Unit</th></tr><tr><td>MC712</td><td>CNS31</td><td>2</td><td>0</td></tr><tr><td>MC712</td><td>CNS32</td><td>2</td><td>1</td></tr><tr><td>MC116</td><td>CNS11</td><td>0</td><td>0</td></tr><tr><td>MC116</td><td>CNS12</td><td>1</td><td>0</td></tr></table>Note : CNS11 and CNS12 of MC116 are not used at present.</td></tr>
<tr><td></td><td>0/1 (each bit)</td></tr>
<tr><td>Instant</td><td>E</td></tr>
<tr><td rowspan="3">167
(bit input)</td><td colspan="2">Allocation of devices and port for printer</td><td rowspan="3">CNS31 of MC712 is used if all settings are 0 or several bits are set to 1.
  <table><tr><th>Card desig.</th><th>Port desig.</th><th>Device</th><th>Unit</th></tr><tr><td>MC712</td><td>CNS31</td><td>2</td><td>0</td></tr><tr><td>MC712</td><td>CNS32</td><td>2</td><td>1</td></tr><tr><td>MC116</td><td>CNS11</td><td>0</td><td>0</td></tr><tr><td>MC116</td><td>CNS12</td><td>1</td><td>0</td></tr></table>Note : CNS11 and CNS12 of MC116 are not used at present.</td></tr>
<tr><td></td><td>0/1 (each bit)</td></tr>
<tr><td>Instant</td><td>M•E</td></tr>
</table>

Title of display	USER PARAMETER No. 4

Address	Meaning: Unit	Meaning: Setting range	Meaning: Effective condition	Meaning: Applicable program	Description
I68 (bit input)	Allocation of devices and port for DNC				CNS31 of MC712 is used if all settings are 0 or several bits are set to 1.
		0/1 (each bit)			
			Instant	M•E	Note : CNS11 and CNS12 of MC116 are not used at present.
I71 (bit input)	Selection of measurement data printout items				Selection of printout items in measurement data printout
		0/1 (each bit)			
			Instant	M•E	

7	6	5	4	3	2	1	0

Card desig.	Port desig.	Device	Unit
MC712	CNS31	2	0
MC712	CNS32	2	1
MC116	CNS11	0	0
MC116	CNS12	1	0

7	6	5	4	3	2	1	0

(1 : YES o : NO)

- 0: Work No. process No.
- 1: Tool No. work counter
- 2: Measurement mode
- 3: Target data
- 4: Measurement data
- 5: Offset data
- 6: Tolerance upper/lower
- 7: Measurement data

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Title of display	MACHINE PARAMETER No. 1 (No. 2)

MACHINE PARAMETER No. 1 display and **No. 2** display have identical types of parameters (address A) recorded. Axis 1 ~ axis 5 data are recorded item by item for **MACHINE PARAMETER No. 1**, and axis 6 ~ axis 10 data are recorded item by item for **MACHINE PARAMETER No. 2**.

These axis Nos. represent moving axes as shown below.

MACHINE PARAMETER No. 1 display

No. 1 spindle head

Axis 1 - X-axis
Axis 2 - Z-axis
Axis 3 - C-axis
Axis 4 - Additional axis 1
Axis 5 - Additional axis 2

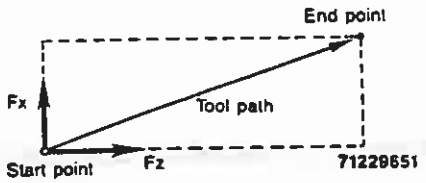
MACHINE PARAMETER No. 2 display

No. 2 spindle head

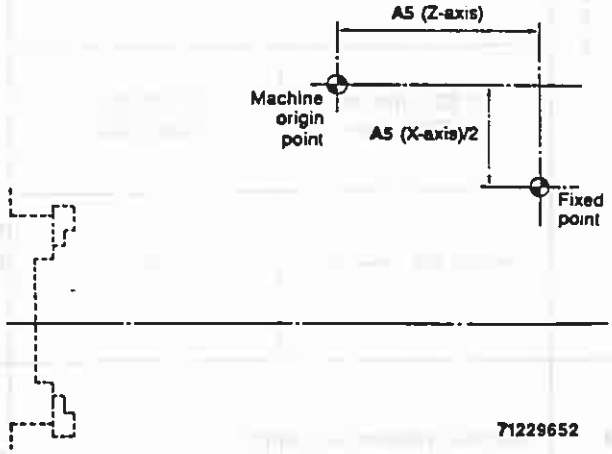
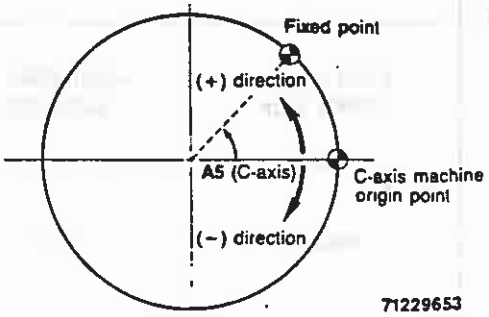
Axis 6 - X-axis
Axis 7 - Z-axis
Axis 8 - C-axis
Axis 9 - Additional axis 1
Axis 10 - Additional axis 2

Following tables show axis Nos. (axis 1 ~ axis 10) requiring data setting in parentheses of **address** column.

Title of display	MACHINE PARAMETER No. 1 (No. 2)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
A1 [Axis 1, 2, 3, 6, 7, 8]	Maximum rapid traverse speed		Traverse speed for each axis is set. For positioning (straight line positioning) by use of interpolation, positioning feed speed must be the maximum value within the limit data set for this parameter in any axis **Example**  Feed speed for each axis will be determined according to vector from start point to end point. Fx or Fz will be corresponding to data set for this parameter, and remaining will be determined according to vector quantity.
	mm/min (0.1 inch/min) or deg/min	0 ~ 12000	
	Instant	M•E	
A2 [Axis 1, 2, 3, 6, 7, 8]			It doesn't operate.

Title of display	MACHINE PARAMETER No. 1 (No. 2)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
A3 [Axis 1 2 3 6 7 8]	Origin return speed		Manual mode rapid traverse will be made at speed set for this parameter. (Manual mode origin return, manual mode traverse)
	mm/min (0.1 inch/min) or deg/min	0 ~ 120000	
	Instant	M•E	
A4 [Axis 1 2 3 6 7 8]	Cutting clamp feedrate		Used only for C-axis in the C-axis line cutting (LCT, RGT, LFT) process. Not used for X, Z-axes.
	mm/min (0.1 inch/min) or deg/min	0 ~ 120000	
	Instant	M•E	
A5 [Axis 1 2 3 6 7 8]	Fixed point return position		(1) X-axis (diametral value), Z-axis Specifying fixed point position. Coordinates determined on the basis of machine origin point as reference on the machine coordinate system.  (2) C-axis Specifying fixed point position. Coordinates are based on the deviation angle from the C-axis machine origin point. 
	0.001 mm (0.0001 inch) or 0.001 deg	−99999999 ~ 99999999	
	Instant	M•E	

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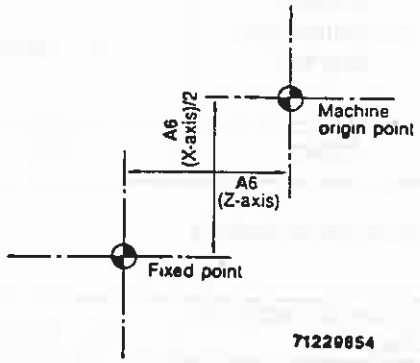
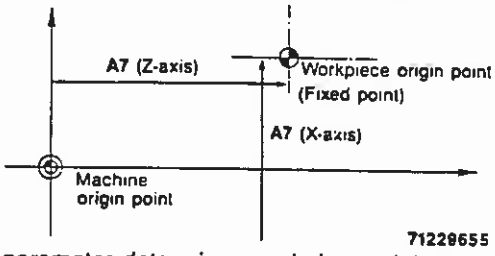
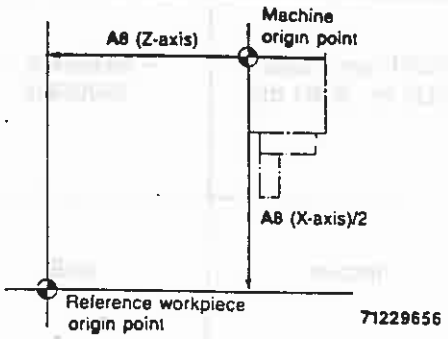
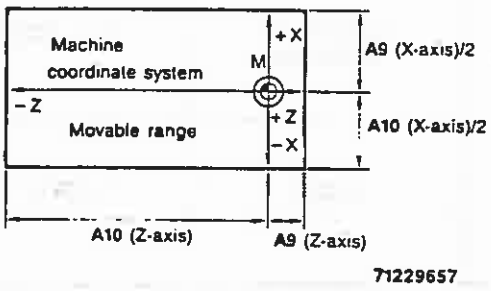
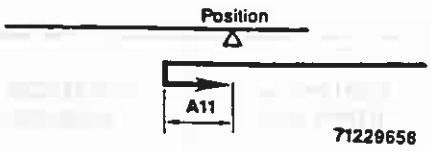
Title of display	MACHINE PARAMETER No. 1 (No. 2)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
A6 [Axis 1 2 6 7]	Tool tip measurement tool change position in X-axis (diametral value), Z-axis		Setting coordinates of tool tip measurement tool change position on the machine coordinate system 
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M•E	
A7 [Axis 1 2 6 7]	Workpiece origin (fixed point) coordinate		Entering workpiece origin point position with respect to machine origin point on the machine coordinate system  (This parameter determines workpiece origin point upon power on. This can be changed by G50 command.)
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Power off → on	E	
A8 [Axis 1 2 6 7]	Machine reference position		Entering reference workpiece origin point position with respect to machine origin point 
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M•E	

Title of display	MACHINE PARAMETER No. 1 (No. 2)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
A9 [Axis 1, 2, 6, 7]	Soft limit upper end		Setting movable range of each axis in (−) and (+) directions from machine origin point
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M•E	
A10 [Axis 1, 2, 6, 7]	Soft limit lower end		
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M•E	
A11 [Axis 1, 2, 6, 7]	Single direction positioning shift distance		Setting of shift distance in single way positioning
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
		M•E	





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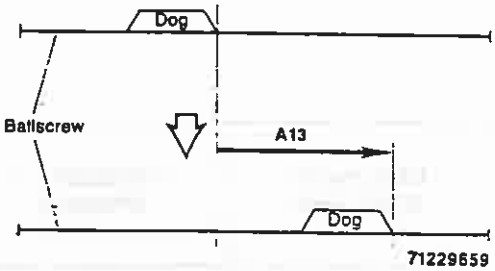
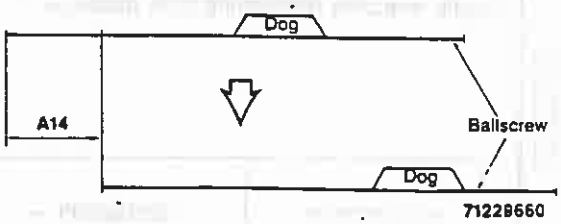
Title of display	MACHINE PARAMETER No. 1 (No. 2)

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
A12 [Axis 1 2 6 7]	Handle interruption clamp data		Maximum data for handle interruption is set. Diametral value is used for X-axis.
	0.001 mm or 0.0001 inch	0 ~ 32767	
	Instant	M•E	
A13 [Axis 1 2 6 7]	Origin point dog shift distance		Setting shift distance of origin point dog  Diametral value is used for X-axis.
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Power off → on	M•E	
A14 [Axis 1 2 6 7]	Machine position shift distance		Setting shift distance of machine position  Diametral value is used for X-axis.
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Power off → on	M•E	

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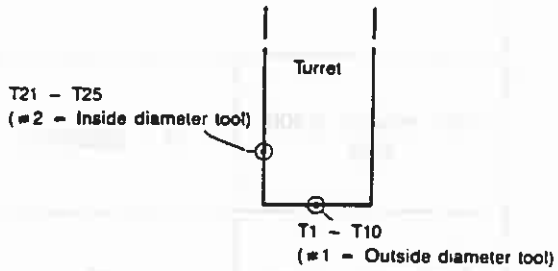
Title of display	MACHINE PARAMETER No. 3 (No. 4)

Parameters of address B are recorded on the **MACHINE PARAMETER No. 3** display, and parameters of address C are recorded on the **MACHINE PARAMETER No. 4** display.
The same parameter Nos. of address B and address C have identical functions. Parameters of address B, however, are used for No. 1 spindle head and parameters of address C for No. 2 spindle head.
The parameters of address C are not valid for 2 or 3-axis specifications.

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
B1 B3 B5 B7 B9 (C1) (C3) (C5) (C7) (C9)	Tool head No. B1(C1) — #1 B3(C3) — #2 B5(C5) — #3 B7(C7) — #4 B9(C9) — #5		Tool Nos. are assigned machine by machine. **Example** If tool Nos. are assigned as below  Data are set by procedure as below. **B1** – 1 (First tool No. of outside diameter tool) **B2** – 10 (Number of outside diameter tools) **B3** – 21 (First tool No. of inside diameter tool) **B4** – 5 (Number of inside diameter tools)
		0 ~ 999	
	Instant	M•E	
B2 B4 B6 B8 B10 (C2) (C4) (C6) (C8) (C10)	Number of tools B2(C2) — #1 B4(C4) — #2 B6(C6) — #3 B8(C8) — #4 B10(C10) — #5		
		0 ~ 999	
	Instant	M•E	

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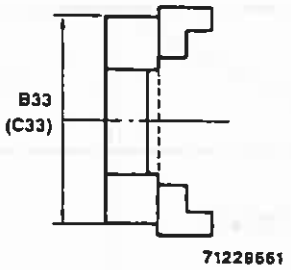
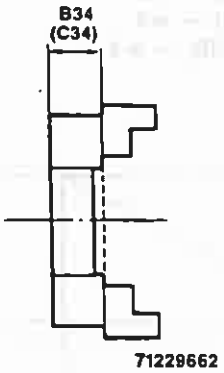
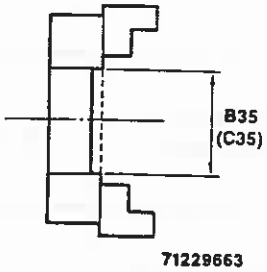
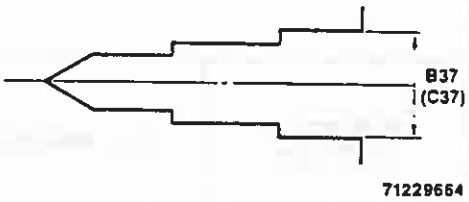
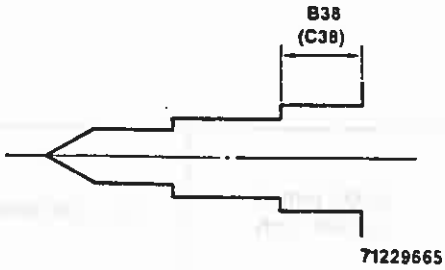
Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B11 (C11)	Number of turret pockets		Number of turret pockets for tool mounting is set.
		0 ~ 999	
		M•E	
B33 (C33)	Chuck outside diameter (for chuck barrier)		Setting of chuck outside diameter 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B34 (C34)	Chuck width (for chuck barrier)		Setting of chuck width 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B35 (C35)	Chuck outside diameter (for chuck barrier)		Setting of chuck inside diameter 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B37 (C37)	Tail body outside diameter (for tail barrier)		Setting of tail body outside diameter 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B38 (C38)	Tail body length (for tail barrier)		Setting of tail body length 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	

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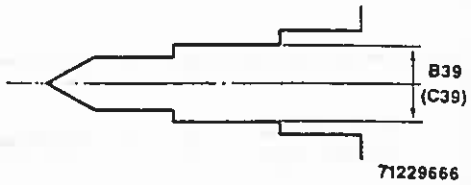
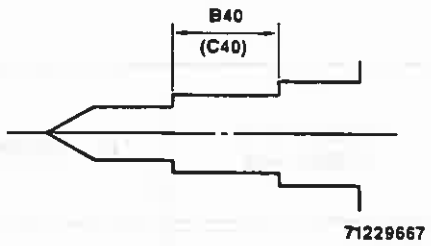
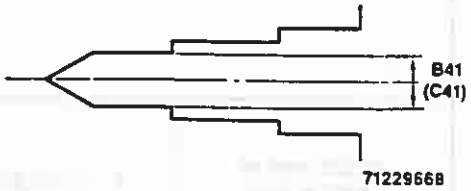
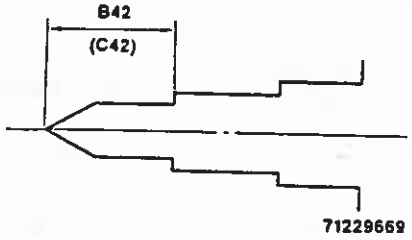
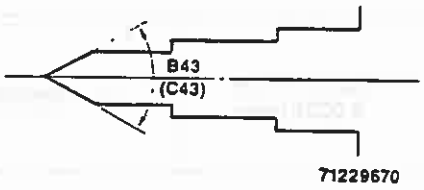
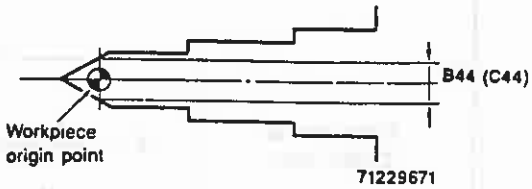
Title of display	MACHINE PARAMETER No. 3 (No. 4)		
Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
B39 (C39)	Tailstock outside diameter (for tail barrier)		Setting of tailstock outside diameter 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B40 (C40)	Length with tailstock at back end (for tail barrier)		Setting of length with tailstock at back position 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B41 (C41)	Tail head outside diameter (for tail barrier)		Setting of tail head outside diameter 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B42 (C42)	Tail head length (for tail barrier)		Setting of tail head length 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B43 (C43)	Tail head taper angle (for tail barrier)		Setting of tail head taper angle 
	0.001 deg	0 ~ 99999999	
	Power off → on	M	
B44 (C44)	Tail head biting diameter (for tail barrier)		Setting of biting diameter when tail head is used 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	

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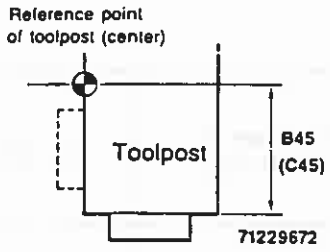
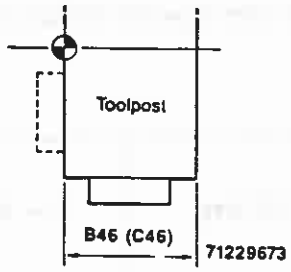
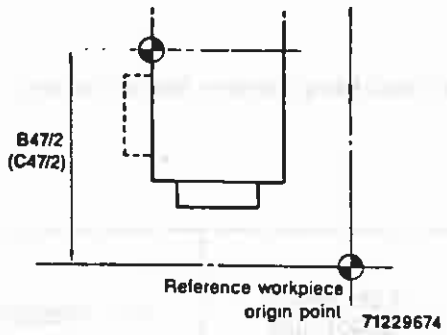
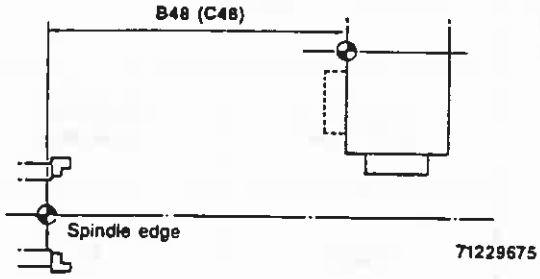
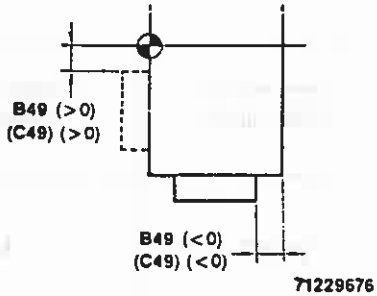
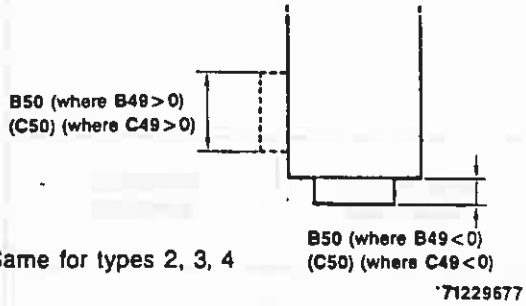
Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
B45 (C45)	Tool post radius		Setting of tool post radius 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B46 (C46)	Toolpost width		Setting of toolpost width 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B47 (C47)	Toolpost reference position in X-axis direction		Tool post position when X-axis is returned to machine origin point is set by diametral value. 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B48 (C48)	Toolpost reference position in Z-axis direction		Tool post position when Z-axis is returned to machine origin point is set by diametral value. 
	0.001 mm or 0.0001 inch	0 ~ 99999999	
	Power off → on	M	
B49 B52 B55 B58 (C49) (C52) (C55) (C58)	Tool holder mounting position B49(C49) — Type 1 B52(C52) — Type 2 B55(C55) — Type 3 B58(C58) — Type 4		Setting of tool holder mounting position. When plus data is used, the tool holder is mounted horizontally, and minus data downward. **Example :** Type 1  Same for types 2, 3, 4
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M	
B50 B53 B56 B59 (C50) (C53) (C56) (C59)	Tool holder width in X-axis direction B50(C50) — Type 1 B53(C53) — Type 2 B56(C56) — Type 3 B59(C59) — Type 4		Setting of tool holder width in X-axis direction **Example :** Type 1  Same for types 2, 3, 4
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M	

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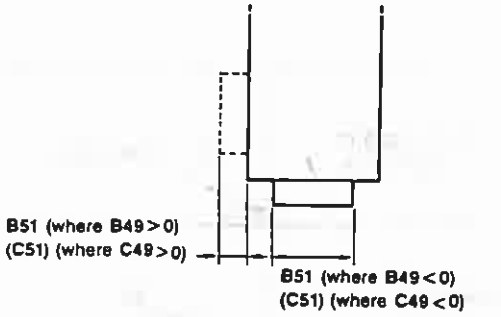
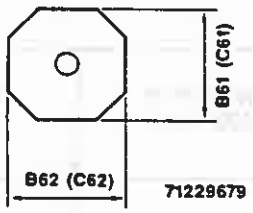
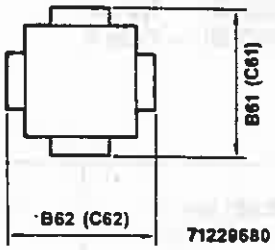
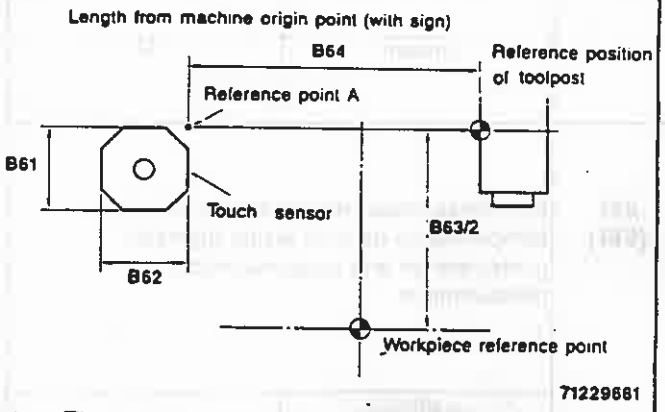
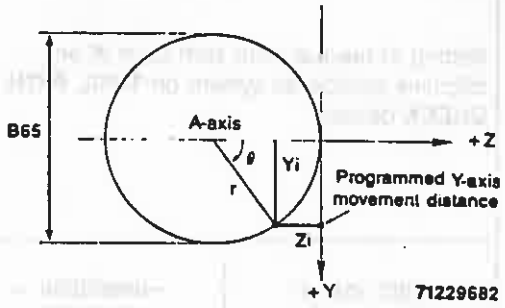
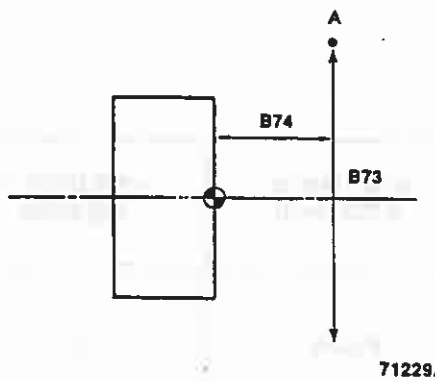
Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B51 B54 B57 B60 (C51) (C54) (C57) (C60)	Tool holder width in Z-axis direction B51(C51) — Type 1 B54(C54) — Type 2 B57(C57) — Type 3 B60(C60) — Type 4		Setting of tool holder width in Z-axis direction **Example :** Type 1  Same for types 2, 3, 4
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M	
B61 (C61)	Tool tip measurement sensor width in X-axis direction		Tool tip measurement sensor dimensions are set. **Example 1:** RENISHAW touch sensor 
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M	
B62 (C62)	Tool tip measurement sensor width in Z-axis direction		**Example 2:** MT pulser 
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning: Unit / Effective condition	Meaning: Setting range / Applicable program	Description
B63 (C63)	Tool tip sensor mounting position X-axis (diametral value)		Tool tip sensor mounting position is set by coordinates of reference workpiece coordinate system. Touch sensor reference point Touch sensor reference point is set for parameter B63, B64 with Z coordinate on the machine coordinate system and X coordinate on the reference workpiece coordinate system. Allow the tool set by tool set to contact the touch sensor by operating the manual handle, and set X and Z present coordinates for parameter B63 and B64. Touch sensor reference point is positioned as shown below.  Note : The touch sensor reference point for No. 2 spindle head must be positioned above left of the touch sensor.
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M	
B64 (C64)	Tool tip sensor mounting position in Z-axis (diametral value)		
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M	
B65 (C65)	Diameter of imaginary Y-axis housing		Imaginary Y-axis is composed of A-axis (rotation axis) and Z-axis as shown below. A-axis movement distance can be calculated from the value set for B65 and programmed Y-axis movement distance.  r = B65/2 θ = A-axis displacement angle Yi = Y-axis movement distance Zi = Z-axis movement distance (compensated displacement)
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
B66 (C66)	Workpiece measurement sensor diameter compensation data for outside diameter measurement and projection width measurement		Values set for these parameters are used to calculate measurement data. Outside diameter measurement $Ax = \left\lvert \frac{\#1 - \#2}{2} \right\rvert - 2R + B66$ Projection width measurement $Az = \lvert \#1 - \#2 \rvert - 2R + B66$ Inside diameter measurement $Ax = \left\lvert \frac{\#1 - \#2}{2} \right\rvert + 2R + B67$ Groove width measuremtn $Az = \lvert \#1 - \#2 \rvert + 2R + B67$ Ax/Az = Measurement data #1/#2 = Sensor ON position R = Touch sensor nose R
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M	
B67 (C67)	Workpiece measurement sensor diameter compensation data for inside diameter measurement and projection width measurement		
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M	
B73 (C73)	Setting of the tool path start point X on machine coordinate system on TOOL PATH CHECK display		The tool path start point starts from the point A in the figure. 
	0.001 mm or 0.0001 inch	−99999999 − 99999999	
	Instant	M•E	

Title of display	MACHINE PARAMETER No. 3 (No. 4)

Address	Meaning		Description
	Unit	Setting range	
	Effective condition	Applicable program	
B74 (C74)	Setting of the tool path start point Z on machine coordinate system on **TOOL PATH CHECK** display		Refer to B73.
	0.001 mm or 0.0001 inch	−99999999 ~ 99999999	
	Instant	M•E	

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APPENDIX

USER PARAMETER No.1

Address	Outline
P1 (bit 0)	Use/disuse of acceleration in up-going slope during rough cutting cycle in bar machining process
P1 (bit 1)	Use/disuse of deceleration in down-going slope during rough cutting cyle in bar machining process
P1 (bit 2)	Selection of rapid traverse interpolation method
P1 (bit 3)	Selection between use/disuse of check acceleration distance at start of thread cutting process
P1 (bit 4)	Selection for thread number offset
P1 (bit 5)	Selection between whether or not tool should be returned to tool change position on M code process end
P1 (bit 6)	
P1 (bit 7)	Selection between whether or not tool should be returned to tool change position at program end for repetition of same program
P2 (bit 0)	Selection for cutting path method in milling line machining process
P2 (bit 1)	Output/no output of automatic spindle rotation in manual program machining process tools
P2 (bit 2)	
P2 (bit 3)	
P2 (bit 4)	
P2 (bit 5)	
P2 (bit 6)	
P2 (bit 7)	
P3 (bit 0)	Use/disuse of Z offset check

Address	Outline
P3 (bit 1)	
P3 (bit 2)	
P3 (bit 3)	
P3 (bit 4)	
P3 (bit 5)	
P3 (bit 6)	
P3 (bit 7)	
P4 (bit 0)	
P4 (bit 1)	
P4 (bit 2)	
P4 (bit 3)	
P4 (bit 4)	
P4 (bit 5)	
P4 (bit 6)	
P4 (bit 7)	
P5 (bit 0)	
P5 (bit 1)	
P5 (bit 2)	
P5 (bit 3)	
P5 (bit 4)	

Address	Outline
P5 (bit 5)	
P5 (bit 6)	
P5 (bit 7)	
P6 (bit 0)	
P6 (bit 1)	
P6 (bit 2)	
P6 (bit 3)	
P6 (bit 4)	
P6 (bit 5)	
P6 (bit 6)	
P6 (bit 7)	
P7 (bit 0)	Selection between use/disuse of special trace indication
P7 (bit 1)	Selection between whether or not stock material should erased for storing GRAPHIC display
P7 (bit 2)	BAR or CPY infeed point input digit quantity selection
P7 (bit 3)	Selection of tool data setting enable conditions
P7 (bit 4)	
P7 (bit 5)	
P7 (bit 6)	
P7 (bit 7)	
P8 (bit 0)	
P8 (bit 1)	

Address	Outline
P8 (bit 2)	
P8 (bit 3)	
P8 (bit 4)	
P8 (bit 5)	
P8 (bit 6)	
P8 (bit 7)	Selection of use/disuse of tool identification code skip function
P9 (bit 0)	
P9 (bit 1)	
P9 (bit 2)	Selection of G code series A
P9 (bit 3)	
P9 (bit 4)	
P9 (bit 5)	Selection of decimal command type2
P9 (bit 6)	Selection of rapid traverse interpolation method
P9 (bit 7)	Address E specification for thread number
P10 (bit 0)	Selection of initial G16
P10 (bit 1)	Selection of initial G19
P10 (bit 2)	Selection of whether or not dwell command should be specified in time
P10 (bit 3)	
P10 (bit 4)	Selection of T command digit length specified.
P10 (bit 5)	Use/disuse of interruption prevention function
P10 (bit 6)	Selection of return method in deep hole drilling cycle

Address	Outline
P10 (bit 7)	Selection for tool return position upon end of drilling cycle
P11 (bit 0)	Selection of initial G96
P11 (bit 1)	Selection of initial G99
P11 (bit 2)	
P11 (bit 3)	
P11 (bit 4)	Use/disuse of high speed processing function during machine lock
P11 (bit 5)	Selection between whether or not intermediate point should be ignored during execution of reference return command
P11 (bit 6)	
P11 (bit 7)	
P12 (bit 0)	Selection for positioning method during fixed cycle
P12 (bit 1)	Selection of whether or not G50 is used during G53 mode
P12 (bit 2)	Selection of initial G53
P12 (bit 3)	Selection of initial G00
P12 (bit 4)	
P12 (bit 5)	Selection of M output at bottom for tapping cycle
P12 (bit 6)	Selection between floating point/fixed point for tapping cycle
P12 (bit 7)	Use/disuse of M203/M204 output during tapping cycle
P13 (bit 0)	Use/disuse of compensation movement during T command
P13 (bit 1)	Use/disuse of block stop after restart
P13 (bit 2)	Use/disuse of automatic return on resuming program

Address	Outline
P13 (bit 3)	Use/disuse of G00 dry run
P13 (bit 4)	Use/disuse of dry run during thread cutting
P13 (bit 5)	Use/disuse of feed hold during thread cutting
P13 (bit 6)	
P13 (bit 7)	Selection of G46 reverse rotation error prevention
P14 (bit 0)	
P14 (bit 1)	
P14 (bit 2)	
P14 (bit 3)	
P14 (bit 4)	
P14 (bit 5)	
P14 (bit 6)	
P14 (bit 7)	
P15 (bit 0)	
P15 (bit 1)	
P15 (bit 2)	
P15 (bit 3)	
P15 (bit 4)	
P15 (bit 5)	
P15 (bit 6)	
P15 (bit 7)	
P16 (bit 0)	Use/disuse of in-position check
P16 (bit 1)	

Address	Outline
P16 (bit 2)	
P16 (bit 3)	
P16 (bit 4)	
P16 (bit 5)	
P16 (bit 6)	
P16 (bit 7)	

Note : P1 ~ P8 : Memory switches to change for MAZATROL program

P9 ~ P16 : Memory switches to change for EIA/ISO program

Address	Outline
P17	Selection of tool change position specification code
P18	Selection of spare tool indexing condition
P19	Selection of unit system between mm/inch
P20	Measurement retry frequency in C offset measurement process
P21	Selection of separating ratio of GRAPHIC display
P22	Tool command time for simulation
P23	Auxiliary command time for simulation
P24	Specification of dwell at groove bottom by spindle revolution
P25	
P26	Selection of escape pattern from wall (90°) in rough cutting cycle
P27	Specification of first M code for milling axis gear selection
P28	Specification of first M code for spindle gear selection
P29	Setting of first M code for parts catcher control

Address	Outline
P30	Threading cutting up angle
P31	
P32	

Address	Outline
U1	Tool turning clearance in X-axis
U2	Tool turning clearance in Z-axis
U3	Safety contour clearance — Outside diamter clearance
U4	Safety contour clearance — Inside diameter clearance
U5	Safety contour clearance — Front clearance
U6	Safety contour clearance — Back clearance
U7	Thread cutting clearance
U8	Groove cutting clearance in X-axis
U9	Groove cutting clearance in Z-axis
U10	Milling right/left cutting clearance
U11	Workpiece transfer clearance
U12	
U13	
U14	
U15	
U16	
U17	
U18	Return speed at pecking portion in groove cutting drilling process
U19	Feedrate specification reference speed for finish cutting in milling line process
U20	
U21	Measurement skip feedrate (X-axis, Z-axis)
U22	Measurement approach speed (X-axis, Z-axis)
U23	Measurement skip speed (C-axis)
U24	Measurement approach speed (C-axis)

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Address	Outline
U25	
U26	Workpiece pressing speed
U27	Revolution number (rpm) of two spindles in workpiece transfer
U28	Feedrate for escape by short distance
U29	
U30	
U31	
U32	
U33	Return distance in X-axis at wall during rough cutting
U34	Return distance in Z-axis at wall during rough cutting
U35	Cut depth per cycle for machining inside diameter
U36	Reverse feed tolerance for contour machining
U37	Overtravelling in edge machining process
U38	Acceleration distance clamp value for thread cutting process
U39	Cut depth for final cycle in thread cutting process
U40	
U41	Pecking return distance in groove cutting process
U42	Overlap distance in groove cutting process
U43	Escape value after machining in edge machining process
U44	Drilling depth decrement
U45	Pecking return distance in drilling process
U46	Drilling cut depth clamp value
U47	Escape value after milling axis orienting at hole bottom in boring process
U48	
U49	Tolerance for radial value in arc command

Address	Outline
U50	Workpiece pressing distance
U51	Deceleration clearance at start of rough cutting
U52	Tolerance for cutting up operation in high speed rough cutting cycle
U53	Minimum overlap distance in key way groove machining process
U54	Spindle revolution clamp value in cutting off cycle
U55	
U56	
U57	Specification of measuring tolerance lower limit
U58	Specification of measuring tolerance upper limit
U59	Measurement stroke for workpiece measurement
U60	Measurement stroke for tool tip measurement
U61	Measurement retry width in C offset measurement process
U62	
U63	
U64	
U65	M code for the parts catcher Delay timer setting (first head)
U66	M code for the parts catcher Delay timer setting (second head)

USER PARAMETER No.2

U65 ~ U96 : Omitted (disuse)

Address	Outline
K1	Cut depth reduction rate for rough cutting in bar machining process
K2	Acceleration rate in up-going slope for rough cutting in bar machining process
K3	Acceleration rate in up-going wall slope (90°) for rough cutting in bar machining process
K4	Deceleration rate in down-going slope for rough cutting in bar machining process
K5	Deceleration rate in down-going wall slope (90°) for rough cutting in bar machining process
K6	Acceleration rate outside stock contour for rough cutting in copy machining process
K7	Acceleration pitch error ratio
K8	Rough cutting residue ratio in cutting off cycle
K9	
K10	Cut depth allowable incremental rate for rough cutting in groove cutting process
K11	Deceleration rate at cutting start time in for drilling process
K12	Deceleration rate at cutting end time in for drilling process
K13	Deceleration rate at rough cutting in for bar machining process
K14	
K15	
K16	
K17	Drilling cut depth calculation coefficient
K18	Reamer return speed calculation coefficient
K19	Chamfering data calculation coefficient in thread cutting process
K20	Incomplete threading portion length calculation coefficient for tap tip
K21	Tapper elongation calculation coefficient

Address	Outline
K22	Calculation coefficient for axial feedrate of rough cutting in milling line machining process
K23	Calculation coefficient for axial feedrate of finish cutting in milling line process
K24	Thread height calculation coefficient for outside diameter, face (rear) thread cutting (metric)
K25	Thread height calculation coefficient for inside diameter thread cutting (metric)
K26	Thread height calculation coefficient for outside diameter, face (rear) thread cutting (inch)
K27	Thread height calculation coefficient for inside diameter thread cutting (inch)
K28	
K29	Feedrate calculation reference diameter in mill drilling process
K30	Feedrate calculation reference diameter in mill boring process
K31	Radial direction feedrate calculation reference diameter for rough cutting in milling line process
K32	Feedrate specification reference speed for finish cutting in milling line process
K33	Polishing margin width for #1 ~ #3
K34	Polishing margin depth for #1 ~ #3
K35	Polishing margin width for #4
K36	Polishing margin depth for #4
K37	Polishing margin width for #5
K38	Polishing margin depth for #5
K39	Polishing margin width for #6
K40	Polishing margin depth for #6
K41	
K42	
K43	
K44	
K45	

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Address	Outline
K46	
K47	
K48	

D1 ~ D16 : Omitted (disuse)

USER PARAMETER No. 3

E1 ~ E64: Omitted (disuse)

USER PARAMETER No.4

Address	Outline
I1	Selection of baud rate
I2	Selection of stop bit digits
I3	Selection of parity
I4	Terminator code 1
I5	Selection of data bit digits
I6	Selection of handshaking method
I7	Selection of DC code parity
I8	Time out duration
I9	Feed control flag
I10	Terminator type
I11	Use/disuse of CR code output to paper tape punch
I12	Use/disuse of title character to paper tape punch
I13	Selection of punch code and parity V check
I14	Number of spaces between work No. and data to be punched on paper tape
I15	Number of spaces between programs punched on paper tape
I16	Number of leading and trailing characters of paper tape
I17	Perforation pattern for [C] code for EIA
I18	Perforation for [J] code for EIA
I19	Perforation for [#] code for EIA
I20	Perforation for [*] code for EIA

Address	Outline
I21	Perforation for [-] code for EIA
I22	Perforation for [:] code for EIA
I23	
I24	Perforation pattern for paper tape rewinding command code
I25	Transmission retry frequency for DNC file transfer
I26	Acceptance retry frequency for DNC file transfer
I27	Transmission retry frequency for DNC command message transfer
I28	@ waiting time for DNC transfer
I29	TEXT, * waiting time for DNC transfer
I30	EOT waiting time for DNC transfer
I31	Stop time after acceptance of ! for DNC transfer
I32	Reset time after digital out for DNC transfer
I33	Acceptance ➡ transmission switching time for DNC transfer
I34	Command response message waiting time for DNC transfer
I35	Machine No. for DNC transfer
I36	
I37	Stop time between EOT acceptance and * transmission for DNC transfer
I38	Stop time between EOT transmission and * transmission for DNC transfer
I39	
I40	
I41	Printing line space
I42	Number of lines per printing page
I43	
I44	
I45	
I46	
I47	
I48	

Address	Outline
I49	
I50	
I51	
I52	
I53	
I54	
I55	
I56	
I57 (bit input)	Selection of special function for CMT and DNC I/O
I58 (bit input)	Selection of program end code
I59 (bit input)	Selection of printer function
I60 (bit input)	Selection of functions for DNC I/O
I61 (bit input)	
I62 (bit input)	
I63 (bit input)	
I64 (bit input)	
I65 (bit input)	Allocation of devices and port for CMT
I66 (bit input)	Allocation of devices and port for PTP/PTR
I67 (bit input)	Allocation of devices and port for printer
I68 (bit input)	Allocation of devices and port for DNC
I69 (bit input)	
I70 (bit input)	
I71 (bit input)	Selection of measurement data printout items
I72 (bit input)	

MACHINE PARAMETER No. 1 (No. 2)

Address	Outline
A1	Maximum rapid traverse speed
A2	
A3	Origin return speed
A4	Cutting clamp feedrate
A5	Fixed point return position
A6	Tool tip measurement tool change position
A7	Workpiece origin (fixed point) coordinate
A8	Machine reference position
A9	Soft limit upper end
A10	Soft limit lower end
A11	Single direction positioning shift distance
A12	Handle interruption clamp data
A13	Origin point dog shift distance
A14	Machine position shift distance
A15	
A16	

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MACHINE PARAMETER No. 3 (No. 4)

Address	Outline
B1 (C1)	Tool head No. (#1)
B2 (C2)	Number of tools (#1)
B3 (C3)	Tool head No. (#2)
B4 (C4)	Number of tools (#2)
B5 (C5)	Tool head No. (#3)
B6 (C6)	Number of tools (#3)
B7 (C7)	Tool head No. (#4)
B8 (C8)	Number of tools (#4)
B9 (C9)	Tool head No. (#5)
B10 (C10)	Number of tools (#5)
B11 (C11)	Number of turret pockets
B12 (C12)	
B13 (C13)	
B14 (C14)	
B15 (C15)	
B16 (C16)	
B17 (C17)	
B18 (C18)	
B19 (C19)	
B20 (C20)	

Address	Outline
B21 (C21)	
B22 (C22)	
B23 (C23)	
B24 (C24)	
B25 (C25)	
B26 (C26)	
B27 (C27)	
B28 (C28)	
B29 (C29)	
B30 (C30)	
B31 (C31)	
B32 (C32)	
B33 (C33)	Chuck outside diameter
B34 (C34)	Chuck width
B35 (C35)	Chuck inside diameter
B36 (C36)	
B37 (C37)	Tail body outside diameter
B38 (C38)	Tail body length
B39 (C39)	Tailstock outside diameter
B40 (C40)	Length with tailstock at back end

Address	Outline
B41 (C41)	Tail head outside diameter
B42 (C42)	Tail head length
B43 (C43)	Tail head taper angle
B44 (C44)	Tail head biting diameter
B45 (C45)	Toolpost radius
B46 (C46)	Toolpostt width
B47 (C47)	Toolpostt reference position in X-axis direction
B48 (C48)	Toolpost reference position in Z-axis direction
B49 (C49)	Tool holder (type 1) mounting position
B50 (C50)	Tool holder (type 1) width in X-axis direction
B51 (C51)	Tool holder (type 1) width in Z-axis direction
B52 (C52)	Tool holder (type 2) mounting position
B53 (C53)	Tool holder (type 2) width in X-axis direction
B54 (C54)	Tool holder (type 2) width in Z-axis direction
B55 (C55)	Tool holder (type 3) mounting position
B56 (C56)	Tool holder (type 3) width in X-axis direction
B57 (C57)	Tool holder (type 3) width in Z-axis direction
B58 (C58)	Tool holder (type 4) mounting position
B59 (C59)	Tool holder (type 4) width in X-axis direction
B60 (C60)	Tool holder (type 4) width in Z-axis direction
B61 (C61)	Tool tip measurement width in X-axis direction
B62 (C62)	Tool tip measurement sensor width in Z-axis direction
B63 (C63)	Tool tip sensor mounting position in X-axis

Address	Outline
B64 (C64)	Tool tip sensor mounting position in Z-axis
B65 (C65)	Diameter of imaginary Y-axis housing
B66 (C66)	Workpiece measurement sensor diameter compensation data for outside diameter measurement and projection width measurement
B67 (C67)	Workpiece measurement sensor diameter compensation data for inside diameter measurement and groove width measurement
B68 (C68)	
B69 (C69)	
B70 (C70)	
B71 (C71)	
B72 (C72)	
B73 (C73)	Setting of the tool path start point X on machine coordinate system on TOOL PATH CHECK display
B74 (C74)	Setting of the tool path start point Z on machine coordinate system on TOOL PATH CHECK display
B75 (C75)	
B76 (C76)	
B77 (C77)	
B78 (C78)	
B79 (C79)	
B80 (C80)	

MACHINE PARAMETER No. 5 ~ No. 11, MACHINE PARAMETER SYSTEM

Omitted

PITCH ERROR COMP. No. 1 ~ No.0 6

Omitted