MITSUBISHI MAZATROL T PLUS SERIES

MAINTENANCE MANUAL (SYSTEM)



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Introduction

This manual explains the work and various operations required to service the MAZATROL T-PLUS, and is intended to be used as an aid for maintenance.

This manual focusses only on the maintenance of the MAZATROL T-PLUS, and thus, maintenance of the other systems are not explained.

Chapter 1 outlines the various operations required for work. Additions may be made as required.

Chapter 2 explains the actual enforcement methods of the main operations to be done for maintenance.

Chapter 3 explains the methods for using the diagnosis screens during simple maintenance.

Chapter 1 Basic Operations for Maintenance

Chapter 1 Basic Operations for Maintenance

This chapter outlines the basic operations required for servicing the system.

1. Coded Key Lock/Unlock

Screens that do not need to be operated by the user are locked with coded keys, and are not used normally.

1.1 Prohibited Operations and Screens

- Rewriting of system parameters
- ② Reading/writing data from/to EEROM
- ③ Display of various diagnosis screens
 - HARDWARE ALARM screen
 - SPINDLE MONITOR screen
 - SERVO MONITOR screen
 - MEMORY SCOPE screen
- (4) Display of various parameter screens
 - MACHINE PARAM 2 screen
 - PITCH ERROR screen
 - SERVO PARAM screen
 - SPINDLE PARAM screen
- ⑤ Directory change of file system

1.2 Releasing of Key Lock

The key lock can be unlocked with the following procedure. The unlocked key will automatically be re-locked when the power is turned ON.

- (1) Select the PARAMETER screen.
- 2 Press the menu selector key, and input the keys in the order of 1 1 3 1 INPUT .
- ③ The PARAMETER screen menu display will change, and the hidden PARAMETER screen selection menu will appear.



2. Clearing of All Memory

The entire memory area of the system is cleared when the card with a memory mounted is replaced or added.

2.1 Cards with Memory Mounted

- ① QX141 (CPU card)
- ② QX423, 424, 429 (standard SRAM and large capacity memory)
 - Standard SRAM (QX423)
 - Large capacity memory (QX423, 424, 429)

2.2 Memory Clear Operation

Clear all of the mounted memory with the following procedure.

- 1 Turn the NC power OFF.
- ② Set the DIP switches on the QX141 card. (Turn 1 and 3 ON.)
- ③ Turn the NC power ON. The LED will light when the power is turned ON, and RAM clear will start.

Clearing is completed when all LEDs go out.

- ④ Return the DIP switch settings on the QX141 card.
- ⑤ Turn the power OFF after completion.



3. Changing of System Parameters

The details of the system parameters (O1 to O176) are automatically set when the power is turned ON.



- (1) Can not change even if the coded key lock is unlocked. (Option definition area)
- ② Can be changed if the coded key lock is unlocked.
- Note 1. The option parameters are set from the "Option Cassette".
- Note 2. The option parameters will not be set in systems not having matching manufacturing Nos.
- Note 3. After changing the system parameters, the parameters must be registered into the EEROM.
- Note 4 The automatic setting of the system parameters when the power is turned ON can be inhibited.

QX141 DIP switch 4 = OFF ... System parameter automatic set

- QX141 DIP switch 4 = ON ... Automatic set inhibit
- Note 5. The system parameters can be loaded to or saved in the CMT. Exercise care so that the machine parameters for another machine are not read in by mistake.

3.1 System Parameter Changing Operation

The system parameters are changed with the following procedure.

- 1 Select the PARAMETER screen.
- ② Unlock the coded key lock. (Refer to Section 1.)
- ③ Press the menu key MACHINE PARAM 2 .

→ The system parameters will display.

- ④ Using the cursor keys, move the cursor to the setting item.
- (5) When the target data has been changed, register the changed, details into the EEROM with the EEROM write procedure explained later.

4. Registering/Reading of Parameters to/from EEROM

All parameters used by the MAZATROL T-PLUS can be registered in the EEROM and read out when necessary.

Note that the system parameters will be automatically read from the EEROM when the power is turned ON.

Note 1. The default parameters will be registered in the EEROM before shipping to the YAMAZAKI factory.

4.1 EEROM Application Format



- ① The EEROM details are automatically copied to the SRAM when the power is turned ON.
- ② These parameters are written with the "EEROM register" operation. (Writing is done when the power is turned ON.)
- ③ These parameters are read to the SRAM with the "EEROM read" operation.

4.2 Parameter Register/Read Operation to/from EEROM

The parameters are registered to the EEROM or read out from the EEROM with the following procedure.

- (1) Select the PARAMETER screen, and unlock the coded key lock.
- ② Press the screen selector menu in the following order, and select the "MEMORY MONITOR screen".



5. Backup of Saved Data

Some of the data used by the MAZATROL T-PLUS is saved by the battery backup even when the power is turned OFF.

However, even this saved data will be lost when the memory is cleared.

The data may also be lost if the card is mistakenly contacted during replacement, etc.

Therefore, the saved data must be backed up before starting work in which the saved data may be destroyed.

5.1 Types of Saved Data

	Occurd data trans	Lastian	Ba	ckup meth	Regeneration	
NO.	Saved data type	Location	MDISK	EEROM	FROM	method
1	Machining program	file system	0	×	0	
2	ATC program	file system	O* ²	×	0	
3	Custom macro program	file system	O* ²	×	0	
4	Layout information	file system	0	×	0	
5	Tool data	SRAM	0	×	0	
6	Tool file	SRAM	0	×	0	
7	Tool offset	SRAM	0	×	0	•
8	Cutting conditions	SRAM	0	×	0	
9	Claw shape data	SRAM	0	×	0	
10	Workpiece offset	SRAM	0	×	0	
11	User parameter	SRAM & EEROM	0	0	0	
12	Machine parameter	SRAM & EEROM	0	0	0	
13	System parameter	SRAM & EEROM	0	0	0	
14	Macro variable	SRAM	0	×	0	
15						
16	Ladder latch relay data	SRAM	×	×	0	Automatic
17	Absolute value detection data	SRAM	×	×	0	Zero point return
18	Tool pocket data (ATC unit)	SRAM	O* ¹	×	0	
19	Alarm history	SRAM	×	×	0	
20	Periodic inspection items & time data	SRAM	O* ¹	×	0	
21	Integrated time and operating time	SRAM	O* ¹	×	0	
22	•					

able 5.1	Types	of	saved	data
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Note *1. This data can be loaded/saved with the CMT I/O menu data when the coded key is unlocked. Note *2. Special operations are required to back up this data.

5.2 Backing up Saved Data

(1) Using a micro disk

This is the most commonly used method; however, there may be some data that cannot be backed up or that may require special operations.

1 ATC program

This program is stored in the file system directory 01, and normally cannot be viewed. This program can be input/output with the CMT screen as normal after changing the directory.

2 Custom macro program

This program is stored in the same directory as ①. ATC program, so the same method as the ATC program is used.

③ Periodic inspection item data

There is a menu for data input/output on the PERIODIC INSPECTION screen. Note that this operation cannot be done in the CMT mode, so tape I/O must be used. (The micro disk supports both input and output.)

④ Data that is not backed up

If it is known beforehand that the data will be completely lost by memory clear, etc., save the following data with the "OTHER DATA" menu on the CMT I/O screen.

- Tool pocket data (ATC unit only) ... MAGAZINE CONTROL screen
- Periodic inspection time PERIODIC INSPECTION screen
- Integrated time DIAGNOSIS (ALARM) screen
- Note 1. Refer to Section 7 for how to change the file system's directory.
- Note 2. The MAGAZINE CONTROL screen will not display when the ATC is not used.
- Note 3. Special operations are required to set the time and integrated time on the PERIODIC INSPECTION screen, so refer to Section 7.
- Note 4. The CMT I/O "OTHER DATA" menu is a maintenance menu displayed when the coded key is unlocked.

(2) Using the EEROM

This does not work as a method to back up the data, but can be used when there will be no problem if the machining program data, etc., is lost.

It is necessary to note down the integrated time in this case so that restoration will be possible.

(3) Using the FROM

This method is used to copy the SRAM data to the FROM in card units. This is the most appropriate method for backing up data.

Refer to the "Memory Backup Tool Specifications Manual" for details.

6. File System Configuration

The following configuration is used for the MAZATROL T-PLUS file system.



The file system directory is expressed as Device No. + Directory No. The directory normally viewed is "10" in which the user program is stored.

6.1 File System Format

The size of the MAZATROL T-PLUS file system is determined by the mounted memory capacity and the system parameter values for the No. of programs and No. of tools.

Dementer			Setting	Standard	Large capacity		
Parameter		value	Standard	512KB	1MB	1.5MB	
		32	2	0			
042	No. of programs	256	16		0		
042		512	32			0	
		960	60				· 0
	No. of tools	64	4	0	0	0	0
000		128	8		0	0	0
039		256	16		0	0	0
		512	32		0	0	0

Note 1. The No. of programs indicates the maximum setting value for the mounted memory. The value can be set to a value smaller than the listed value. (This is normally not enforced.)

Note 2. The No. of tools is determined by the machine specifications. The user program capacity will be reduced if this number is set too high.

Note 3. Refer to the section "Initialization of Data" for the actual format operations.

7. Setting Data with Special Operations

The following data requires special operations to prevent unintentional changes by the user.

7.1 Setting of Calendar and Timer

- Select the MANUAL mode.
- ② Select the POSITION screen.
- 3 Hold down the RESET key and press the cursor 1 key.
- (4) The cursor will move to the date data section with step (3).
- (5) Input the date data to be set, and then press INPUT .

Example) To set June 1, 1994:

94	•0	6	0	1	INPUT
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6 The cursor will move to the time data after step (5). Input the time and then press | INPUT |

Example) To set 19:45:

19	• 4	5.	00	INPUT
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7.2 Setting the Integrated Time

Five types of integrated time are displayed on the DIAGNOSIS ALARM screen.

Of these five types, normally the cumulative time cannot be changed, so use the following procedure when changes are required.

- Select the MANUAL mode.
- ② Unlock the coded key lock. (Refer to Section 1.)
- ③ Select the SYSTEM PARAMETER screen, and turn the O30 bit-6 ON.
- ④ Select the DIAGNOSIS (ALARM) screen.
- (5) Using the cursor key, move the cursor to "CUMULATIVE TIME".
- 6 Input the time data to be set, and then press INPUT .

Example) To set 2634: 48'26":



⑦ Select the SYSTEM PARAMETER screen, and turn the O30 bit-6 OFF. (Note 1)

Note 1. The O30 bit-6 will automatically be turned OFF when the data is input correctly.

POWER ON AUTO CUT	0:00'00"	AUTO OPR TOTAL CUT	0:00'00" 0:00'00	TOTAL ON	<u>0:</u> 00'00"
· · · · ·				Curs	or

7.3 Changing of File System Directory

As explained in Section 6, the MAZATROL T-PLUS file system is divided into several directories and controlled. Normally, only part of the directories can be viewed. Note that only the data on the currently selected directory can be input or output.

When backing up the data, it is important not to forget to save the hidden data also.

(1) Directory change procedure

- Select the PARAMETER screen, and unlock the coded key lock.
- ② Select the PROGRAM CONTROL screen.
- 3 DEVICE CHANGE will be added to the PROGRAM CONTROL screen by step 1.
- ④ Press the DEVICE CHANGE menu, and then input the directory to be selected.



Note 1. The directory 01 data must be saved.

- Note 2. The data in directories 10 and 11 can be read with normal program saving operations.
- Note 3. Of the data in directory 00, the MDI data is not saved in the reset state. The system macros do not need to be saved as the source program is in the ROM.
 - The programs in the ROM are automatically copied when the file system is formatted.
- ⑤ Perform the required work according to the selected directory data.
- 6 After completing the work, return to the "10" directory.

Note 4. Directory 10 is preset when the power is turned ON.

8. Initialization of Data

The data must be initialized when all of the memory has been cleared, or when the memory has been destroyed due to running out of the battery backup, etc. The data or file can be used after the data is initialized.

8.1 Initializing Method

The data is initialized on the DIAGNOSIS (ALARM) screen.

When this screen is selected, the DATA ERASE menu will appear. Press this menu key, and the menu for data initialization will appear.



*1. "MAINTEN CHECK" and "SYSTEM PARAM." will appear on the screen only when the coded key lock is unlocked.

Data initialization is executed by selecting the required items from the "DATA ERASE MENU" and then pressing - 9 9 9 10 INPUT.

For the data that is dependent on the parameters during initialization, the parameters must be set beforehand. (Refer to following table.)

Initialized data	Parameter setting	Initialized data	Parameter setting
Tool data *	O39, B01~B11 C01~C11	Program	042, 039
Tool offset	O38	Macro variable	Not required
Tool file *	O39, B01~B11 C01~C11	Periodic inspection	Not required
Cutting conditions	Not required	System program	Not required
Workpiece offset	Not required		
Claw shape	Not required		

Note. Multiple initialization items can be selected simultaneously.

Note* C01 to C11 are required for MULTIPLEX.

8.2 Parameter Settings for Initialization

					Add	itional me	mory	
Parameter			Setting	128KB	512K	1M	1.5M	Remarks
No.	Deta	llis	value	Standard	QX423	QX424	QX429	
		64 sets	. 4	Ø	t	t	t	Determined
038	No. of	128 sets	8		1	t	t	by machine
030	tion sets	256 sets	16		t	t	t	specifica-
		512 sets	32		0	0	0	
	No. of tools	64 sets	4	Ø	t	t	t	Determined
030		128 sets	8		t	t	t	by machine specifica-
035		256 sets	16		t	t	1	
		512 sets	32		0	· O	0	10115.
		32 sets	2	Ø	t	T	t	
		128 sets	8		t	t	t	Standard
042	programs	256 sets	16		Ø	t	t	determined
		512 sets	32		\nearrow	Ø	t	by memory
1		960 sets	60				Ô	capacity.

Note 1. Refer to the following for the symbols used above.

©: Standard setting value

/ : Cannot be set (The data will not be initialized correctly if set.)

O: Maximum setting value

t: Can be set with a value within the maximum setting value

Note 2. Refer to section 3. "Changing the system parameters" for the system parameter settings.

Note 3. The No. of compensations value is the same as the No. of tools value.

Note 4. The actual No. of tools is not set for the No. of tools value, so refer to the machine specifications.

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Parameter No.		Detaile	Sotting value	Evaluation		
HD1	HD2	Details	Setting value	Explanation		
B01 5 B10	C01	Tool No. and No. of tools	According to machine specifications.	Set the too! No. in B01, B03, B05, B07 and B09. Set the No. of tools for each in B02, B04, B06, B08 and B10. The total No. of tools is the total of B02+B04+B06+B08+B10.		
B11	C11	No. of pockets	1	Set the No. of tool pockets. Set to 1 when not using the ATC unit.		

9. Option Configuration

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The option configuration for the MAZATROL T-PLUS is shown below.

No.	Option item	•	Option ROM	H/W	Manufac- turing No.	Display
1	B.G. tool path check		QX812		0	0
2	EIA function		QX812		0	0
3	EIA conversion output		QX812		0	0
4	Data capacity expansion	512 KB		QX423	×	0
5	Data capacity expansion	1.0 MB	— — .	QX424	×	0
6	Data capacity expansion	1.5 MB		QX429	×	0
7	MAZATROL DNC		QX812		0	0
8	No. 2 miscellaneous function		QX812		0	0
9						
10	Manual measurement		QX812		0	0
11	Inclined Y-axis control			Y-axis servo	×	0
12	Mill shaft synchronous tap (+	QX812		0	0	
13						
14	Scale F.B.	QX812		0	0	
15	Drawing dimension direct input	rt	QX812		0	0
16	User macro 100 variable sets	5	QX812		0	0
17	User macro 500 additional va	ariable sets	QX812		0	0
18	User macro Macro interrupt		QX812		0	0
19	Workpiece coordinate system	setting	QX812		0	0
20	Polar coordinates interpolation	1	QX812		0	0
21	Cylinder interpolation		QX812		0	0
22	Polygon machining		QX812		0	0
23	Remote buffer RS-232C			QX731	×	0
24	Remote buffer RS-422			QX732	×	0
25						
26	Additional DIO points	DI: 64 DO: 64		QX539	×	×
27	Absolute position detection			OHA104	×	×
28	PRT02B printer			PRT02B	×	×
29	Language changeover		QX812		×	×

Note 1.

No.	: Indicates the No. displayed on the OPTION screen.
Option ROM	: An option cassette (QX812) is required to validate the option.
H/W	: Hardware is required to validate the option.
Manufacturing No.	: Indicates an option controlled by the manufacturing No.
Display	: Indicates that the relevant option can be confirmed on a screen.

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9.1 Option Mounting Method

(1) Hardware option

Hardware is automatically validated when mounted, so mount the designated card into the specified location beforehand.

Note) All clear must be executed when a memory card has been mounted.

(2) Software option

The software option is supplied with a ROM cassette controlled by the manufacturing No. The option information is registered into the CNC unit's EEROM after the manufacturing No. is checked. If there is language in the ROM cassette, the CNC language will be replaced with the ROM cassette language. Only the second language will be changed.



Qx524 (Color) or Qx521 (Monocro)

option ROM QX812 card for the software option. Registration will be executed automatically when the power is turned ON after the change.

Caution Never turn OFF the NC power during registration as the ROM card may be damaged.

Chapter 2 System Maintenance Work

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Chapter 2 System Maintenance Work

This chapter explains the actual maintenance methods using the basic work and operation explained in Chapter 1.

1. Software Version Upgrade



Note 1. The items in are done when memory clear is indicated.

Note 2. If memory clear is indicated, the MPA has been changed, so the data backed up in the FROM cannot be used.

2. Addition of Large Capacity Memory



No.	Supplementary explanation
1	The memory is cleared for this work, so always register the parameters.
0	The FROM method cannot be used because the layout of the saved data on the memory will change with this work. Always use a micro disk to back up the saved data.
3	Confirm the type of large capacity card, and mount it on the upper mounting space of the IOC card (QX524/QX521). Confirm that the setting pin is ON as the super capacitor will be activated.
4	Confirm that none of the above steps have been skipped, and then proceed to the next step. The additional memory's parity bit is cleared with this work and placed in the operable state.
6	Same as for system version upgrade.
6	Change the parameters to values that conform to the additional memory type. (O38, O39, O42) These values will depend on the No. of compensation sets, No. of tools and No. of programs on the order list, so refer to the list to make correct settings.
6	Same as for system version upgrade.
9	 Confirm that the work has been done correctly. Is the large capacity option correctly recognized? Has the program capacity increased? Confirm operation with manual operation. Confirm operation with automatic operation.

3. Addition of Communication I/F Card



No.	Supplementary explanation
(† (2)	Always perform this step to protect the data as the card is removed and mounted.
3	Mount the target card onto the designated position. Take care not to unintentionally touch the parts on the card.
4	Read the parameters saved in step (1) to create the same environment as before the work was started.
6	 Compare the machining programs and tool data, etc., saved in step ②. If an error is detected in the program, etc., perform all clear (format), and then reload the data. Proceed to the next step if there are no problems.
6	Set the communication related parameters according to the specifications of the mounted card. Refer to the attached Parameter List for details. Note) QX731: 19200bps QX732: 38400bps
Ø	Perform the basic operation confirmation after completing the work. If possible, check the operation of the communication card. Use a personal computer, etc., and confirm that communication is possible.
8	Register the changed parameters in the EEROM.

Parameter settings when communication interface card is mounted

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Protocol B parameter list

Baud rate	11 <dv6></dv6>	0: 19200bps 1: 9600bps 2: 4800bps 3: 2400bps 4: 1200bps 5: 600bps 6: 300bps 7: 110bps 8: 38400bps
Stop bit	12 <dv6></dv6>	1: 1 bit 2: 1.5 bit 3: 2 bit
Parity	13 <dv6></dv6>	0: Invalid 1: Valid - odd 2: Valid - even
Character length	15 <dv6></dv6>	0: 5 bit 1: 6 bit 2: 7 bit 3: 8 bit
Handshake method	16 <dv6></dv6>	1: RTS/CTS 2: None (free flow) 3: DC code method
DC code parity selection	17 <dv6></dv6>	0: Invalid 1: Valid
Time-out time	18 <dv6></dv6>	1~255 sec
Parity V	113	0: ISO invalid 1: EIA invalid 2: ISO valid 3: EIA valid
Setup information added output	157 (bit1)	0: Add 1: Do not add
Start code	162 (bit0)	0: DC1 1: BEL
DC3 code after finish	162 (bit1)	0: Do not output 1: Output
DC1 output after NAK, SYN	162 (bit2)	0: Do not output 1: Output
NC alarm (NAK output)	162 (bit3)	0: Do not output 1: Output
NC reset (SYN output)	162 (bit4)	0: Do not output 1: Output
Data code	162 (bit5)	0: ASCII 1: ISO
Link type	173	2: Protocol B

The boxed section shows the parameters used with this function.

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	<d¥1></d¥1>	<dv3></dv3>	<dv5></dv5>	<dv7></dv7>							
11	1	2	0	0							
12	0	3	0	0	19	0	125	16	[41	157	00000000
13	0	0	0	0	110	1	126	16	142	158	00000000
14	. 0	0	0	0	I11	0	127	1	143	159	00000000
15	0	3	0	0	I12	0	128	30	144	160	00000000
16	0	1	0	0	113	0;	129	16	[45	161	00000000
17	0	0	0	0	114	10	130	30	146	162	00000000
18	0	0	0	0	115	30	131	10	147	163	00000000
					I 16	5	132	10	148	164	00000000
	<dy2></dy2>	<dv4></dv4>	<dv6> ;</dv6>	<dv8></dv8>	117	76	133	3	149	I65	00000010
11	2	2	1	0	I18	13	134	250	150	166	00000010
12	3	3	3	0	I19	109	135	0	I51	167	00000010
13	0	0	0	0	120	122	136	0	152	168	00000000
14	0	0	0	0	I21	91	137	10	153	169	00000000
15	3	3	3	0	122	70	138	10	154	170	00000000
16	3	0	3	0	123	0	139	0	155	171	11111111
17	1	0	0	0	124	0	140	0	156	172	11111110
18	5	0	2	0							
[USEF	R PARAM	ETER N	0.5]								
-CON	D. C-C	OND.	C-COND. MILLING	USER	MACHIN	IE WO	RK	EIA/ MAC.	ISO VAR.		

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2	189	&00	1105	0	I 121	0	1137	0	1153	0
2	190	£00	1106	0	1122	0	I138	0	1154	0
1	191	2 01	1107	0	1123	0	1139	0	1155	0
0	192	£00	1108	0	I124	0	I 14 0	0	1156	0
0	193	\$00	1109	0	1125	0	I141	0	I157	0
0	194	£00	I110	0	1126	0	1142	0	I158	0
0	195	&00	1111	0	1127	0	1143	0	I159	0
0	196	\$00	1112	0	1128	0	I144	0	1160	0
0	197	200	1113	0	1129	0	1145	0	1161	0
0	198	&00	I114	0	1130	0	I1 46	0	1162	0
0	199	&00	1115	0	1131	0	I147	0	I163	0
0	1100	&00	1116	0	1132	0	1148	0	I164	0
0	I 101	&00	1117	0	1133	0	1149	0	1165	0
0	1102	&00	1118	0	1134	0	I 150	0	1166	0
0	1103	\$00	1119	0	1135	0	I 151	0	1167	0
0	I104	&00	1120	0	I136	0	1152	0	1168	0
PARM		0.0]								
li-				1		OPK	E14/150			
TU	RNING	AILLING	USER	MACI	INE	FFSET	MAC.VAR.			
	2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2: 189 2 190 1 191 0 192 0 193 0 194 0 195 0 196 0 197 0 198 0 199 0 190 0 199 0 190 0 199 0 190 0 193 0 194 0 195 0 195 0 196 0 197 0 198 0 199 0 190 0 190 0 197 0 198 0 197 0 198 0 199 0 190 0 190 0 194 0 195 0 194 0 195 0 196 0 197 0 198 0 197 0 198 0 197 0 198 0 199 0 190 0 196 0 197 0 198 0 199 0 190 0 190 0 197 0 198 0 199 0 190 0 190 0 197 0 198 0 199 0 190 0 190 0 190 0 197 0 198 0 199 0 190 0 1100 0 1101 0 1104 PARAMETER N	2: 189 &00 2 190 &00 1 191 &01 0 192 &00 0 193 &00 0 194 &00 0 195 &00 0 195 &00 0 196 &00 0 197 &00 0 198 &00 0 198 &00 0 198 &00 0 198 &00 0 199 &00 0 199 &00 0 199 &00 0 1101 &00 0 1102 &00 0 1104 &00 PARAMETER NO.6]	2: 189 &00 1105 2 190 &00 1106 1 191 &01 1107 0 192 &00 1108 0 192 &00 1108 0 193 &00 1109 0 194 &00 1110 0 195 &00 1111 0 196 &00 1112 0 197 &00 1113 0 198 &00 1114 0 199 &00 1115 0 1100 &00 1116 0 1102 &00 1118 0 1103 &00 1119 0 1104 &00 1120	2: 189 200 1105 0 2 190 200 1106 0 1 191 201 1107 0 0 192 200 1108 0 0 193 200 1109 0 0 193 200 1110 0 0 193 200 1110 0 0 193 200 1111 0 0 195 200 1111 0 0 196 200 1113 0 0 197 200 1113 0 0 198 200 1115 0 0 1100 200 1118 0 0 1102 200 1118 0 0 1104 200 1120 0	2: 189 &00 1105 0 1121 2 190 &00 1106 0 1122 1 191 &01 1107 0 1123 0 192 &00 1108 0 1124 0 193 &00 1109 0 1125 0 194 &00 1110 0 1126 0 195 &00 1111 0 1127 0 196 &00 1112 0 1128 0 197 &00 1113 0 1129 0 198 &00 1114 0 1130 0 198 &00 1115 0 1131 0 1100 &00 1116 0 1132 0 1102 &00 1117 0 1133 0 1102 &00 1118 0 1134 0 1103 &00 1120 0 1135 0 1104 &00	2: 189 400 1105 0 1121 0 2 190 400 1106 0 1122 0 1 191 401 1107 0 1123 0 0 192 400 1108 0 1124 0 0 192 400 1108 0 1124 0 0 193 400 1109 0 1125 0 0 193 400 1110 0 1128 0 0 194 400 1112 0 1128 0 0 195 400 1113 0 1129 0 0 196 400 1113 0 1129 0 0 198 400 1115 0 1131 0 0 1100 400 1117 0 1133 0 0 1102 400 1118	2: 189 &00 1105 0 1121 0 1137 2 190 &00 1106 0 1122 0 1138 1 191 &01 1107 0 1123 0 1139 0 192 &00 1108 0 1124 0 1140 0 193 &00 1109 0 1125 0 1141 0 194 &00 1110 0 1128 0 1142 0 195 &00 1111 0 1127 0 1143 0 196 &00 1112 0 1128 0 1144 0 197 &00 1113 0 1129 0 1145 0 198 &00 1114 0 1130 0 1145 0 198 &00 1115 0 1131 0 1147 0 1100 &00 1117 0 1133 0 1148 <	2: 189 400 1105 0 1121 0 1137 0 2 190 400 1106 0 1122 0 1138 0 1 191 401 1107 0 1123 0 1139 0 0 192 400 1108 0 1124 0 1140 0 0 193 400 1109 0 1125 0 1141 0 0 194 400 1110 0 1128 0 1142 0 0 195 400 1111 0 1127 0 1143 0 0 196 400 1112 0 1128 0 1144 0 0 197 400 1113 0 1129 0 1145 0 0 198 400 1114 0 1130 0 1145 0 0 1100 400 1115 0 1131 0 1148 0 <td>2: 189 &00 1105 0 1121 0 1137 0 1153 2 190 &00 1106 0 1122 0 1138 0 1154 1 191 &01 1107 0 1123 0 1139 0 1155 0 192 &00 1108 0 1124 0 1140 0 1156 0 193 &00 1109 0 1125 0 1141 0 1157 0 194 &00 1110 0 1126 0 1142 0 1158 0 195 &00 1111 0 1127 0 1143 0 1159 0 196 &00 1112 0 1128 0 1145 0 1160 0 197 &00 1113 0 1129 0 1145 0 1162 0 198 &00 1115 0 1131 0 1145 0 116</td>	2: 189 &00 1105 0 1121 0 1137 0 1153 2 190 &00 1106 0 1122 0 1138 0 1154 1 191 &01 1107 0 1123 0 1139 0 1155 0 192 &00 1108 0 1124 0 1140 0 1156 0 193 &00 1109 0 1125 0 1141 0 1157 0 194 &00 1110 0 1126 0 1142 0 1158 0 195 &00 1111 0 1127 0 1143 0 1159 0 196 &00 1112 0 1128 0 1145 0 1160 0 197 &00 1113 0 1129 0 1145 0 1162 0 198 &00 1115 0 1131 0 1145 0 116

- 20 -

4. Addition of Software Option

The method for mounting the software option is explained in Section 9 in Chapter 1, so only the mounting procedure will be explained in this section.



Chapter 3 Appendix

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1. Alarm Display for Spindle and Servo Systems

The spindle and servo system alarms for the MAZATROL T-PLUS are classified into the following 11 types, and displayed.

Error No.	Class	Details
20	Alarm	Drive unit control section error
21	Alarm	Drive unit power section error
22	Alarm	Feedback system error
23	Alarm	Communication system error
24	Alarm	Machine load error
25	Alarm	Power supply unit error
26	Alarm	Parameter error
30	Notice	Feedback system warning
31	Notice	Amplifier internal warning
32	Notice	Parameter error warning
33	Notice	NC emergency stop

Detailed information will be displayed with the error so that the details of the actual alarm can be seen. The detailed information can be confirmed on the DIAGNOSIS ALARM HISTORY screen.



Caution * The error No. for the drive system indicates the same No. as the spindle servo unit's LED. The details of the error are classified by this No., so check the drive system specifications, etc. The drive system error No. and corresponding table are shown on the following page for reference.

Spindle/servo/power supply unit alarm classification list

Vx: Servo/SP: Spindle/CV: Power supply -

(1) Alarm

	NC error display details		Unit error details	Occ	Occurrence site			
No.	Message	No.	Error name	Vx	SP	CV		
20	DRIVE UNIT MALFUNCTION	11	Axis selection error	0		<u> </u>		
		12	Memory error	0	0			
		13	Software process error	0	0			
		88	Watch dog	0				
21	DRIVE UNIT POWER	17	AD converter error	0	0	—		
	MALFUNCTION	23	Speed deviation excessive		0			
		26	Unused axis error	0				
		31	Overspeed	0	0			
		32	Power module overcurrent	0	Ō			
		34	Overcurrent	0				
		3B	Power module overheat	0	0			
22	FEEDBACK SYSTEM	16	Magnetic pole position detection error	0				
	MALFUNCTION	18	Initial communication error	0				
		20	No signal detection 1	0				
		21	No sional detection 2	0	0			
		25	Absolute position lost	0				
		28	Absolute position overspeed	0				
		20	Absolute position detection circuit error	0				
		24	Incremental position detection circuit error					
		28	CPIL in scale error					
		42	Eachack error 1					
		42	Feedback error 2					
00		24	CBC error		0	<u> </u>		
చ		- 34						
		35			0			
		30			0			
				10				
		39		<u> </u>				
		40			0			
		41		+	0			
	OVERI OAD	82	Power supply no signal					
24	OVERLOAD	40			0			
		50			<u> </u>	<u> </u>		
		51						
		52			0			
		53	Excessive error 2			<u> </u>		
25	MAIN POWER SUPPLY	61	Power module overvoitage		<u> </u>			
		63	Auxiliary regeneration error			0		
		65	Rush relay error			0		
		67	Open phase	_				
		68	Watch dog			0		
		69	Ground fault			0		
		6A	Contactor melt			0		
		6 B	Rush relay melt			<u> </u>		
		60	Main circuit error		ļ	<u> 0</u>		
		6E	Memory error		L	10		
		6F	A/D converter error Power supply error	0	0	0		
	1	71	instantaneous/external emergency stop		<u> </u>	0		
		75	Overvoltage			0		
		77	Power module overheat			0		
26	ILLEGAL PARAMETER	37	Parameter error	0	0	1		

Vx: Servo/SP: Spindle/CV: Power supply -

(2) Notice

	NC error display details	Unit error details			Occurrence site				
No.	Message	No.	Error name	Vx.	SP	CV			
30	FEEDBACK PART WARNING	91	Detector communication error	0		·			
		92	Detector serial format error	0					
		93	Absolute position fluctuation	0					
		9F	Battery voltage drop	0					
		E3	Absolute position counter warning	0					
31	AMPLIFIER WARNING	E1	Overload warning	0	0				
32	INCORRECT PARAMETER	E4	Parameter error warning	0					
33	EMERGENCY STOP	E7	NC emergency stop	0	0				

2. Qx141 Dip-switch's Functions

-

8	7	6	5	4	3	2	1	Contents
								Start MTOS debugger
							0	Disable cash memory
								Disable System software loading to DRAM
						0		PLC stop
								All memory clear
								DRAM \$8000~7fff, \$94000~1f ffff
					0		0	SRAM \$4000 0000~\$4007 ffff
								SRAM \$C000 0000~\$C017 ffff
								Disable System parameter auto-loading
								Disable Watch Dog alarm detection
				0				Disable PLC program loading to SRAM
								Disable Servo-axis error check
		0						M3 format FLD auto-loading
	0							Regurus format FLD auto-loading
0	0							Start Off-line monitor

3. DIAGNOSIS Screen Usage Method

There are fifteen types of diagnosis-related screens in the MAZATROL T-PLUS. The screens are arranged as shown below.



Outline explanations of screens thought to be useful for maintenance are given in this section.

3.1 DIAGNOSIS (ALARM screen)

This is the main diagnosis screen. Detailed information is given for up to 10 current alarms.

3.2 MAINTENANCE Screen

The system software, spindle and servo versions, system model name and manufacturing No. are displayed.

3.3 HARDWARE MONITOR Screen

[NC UNIT]				[BOARD]					
SLOT# 0 1 2 3 4 5	SBUS QX141 QX524A QX539	MBUS QX423A	PBUS QX722A	CBUS1 QX818A	CBUS2 QX812B	CARDO1 EX CARD DIO1 DIO2	QY221B		
< Head	1 >			< Hea	.d 2 >				
[SERVO]	[SF	INDLE]	[SERV	0]	[SPI	NDLE]		
1 2 3 4 5		6 7		1 2 3 4 5		6 7			
[HAR	DWARE MONI	TOR]							

The hardware mounted on the control unit, board and spindle servo is displayed.

No.	Screen title					Details		
		BUS	SBUS	MBUS	PBUS	CBUS1	CBUS2	
		SLOT 0	QX141	QX423	QX722	QX818	QX812	The names and sub-
		SLOT 1	QX521	QX423	QX732			numbers of the cards
1	NC UNIT	SLOT 2	QX539					of the control unit are
		SLOT 3	QX539					displayed.
		SLOT 4	QX539					
		SLOT 5	QX539					
		CARD 01	QY221	The name an	id sub-number	of the control	card for the l	board is displayed.
		EX CARD	-	Normally not	used.			
2	BOARD	DIO 1	·	Normally not	used.			
		DIO 2	-	Normally not	used.			
		1	RJ111-02	The name of	the card for th	ne No. 1 axis s	ervo amplifier	is displayed.
		2	RJ111-02	The name of	the card for th	ne No. 2 axis s	ervo amplifier	is displayed.
		3	RJ111-01	The name of	the card for th	ne No. 3 axis s	ervo amplifier	is displayed.
3	SERVO	4		The name of	the card for th	ne No. 4 axis s	ervo amplifier	is displayed.
		5		The name of	the card for th	ne No. 5 axis s	ervo amplifier	is displayed.
		6		The name of	the card for th	ne No. 1 spind	le amplifier is	displayed.
		7		The name of	the card for th	ne No. 2 spind	le amplifier is	displayed.

3.4 SERVO MONITOR Screen

([X]	[2]	[C]	[4]	[5]
GAIN (1/SEC)	0	0	0	0	0
DROOP (i)	0	0	0	0	0
SPEED(min ⁻¹)	0	0	0	0	0
CURRENT (%)	0	0	0	0	0
MAX CUR1 (%)	0	0	0	0	0
MAX CUR2 (%)	0	0	0	0	0
OVER LUAD (%)	0	0	0	0	0
UVER REG (%)	0	0	0	0	0
AMP DISP	00 00 00	00 00 00	00 00 00	00	00
ALARM	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00
CPDCP (mm)	100	100	100	100	100
GRID (mm)	100.	100.	100.	100.	100.
MAC POS (mm)	0	0	0.	0.	0
MOT POS (mm)	0.	0.	0	0	0
SCA FB (mm)	Ő.	0.	0.	0.	0 .
FB ERROR (i)	0	0	0	0	0
DFB COMP (i)	0	0	Ō	Ő	Õ
I SERVO MONITOR]					

No.	Screen title			Details
1	GAIN	(1/sec)	Gain [1/SEC]	The status of the position loop gain is displayed. Position loop gain refers to the following: Feedrate (mm/sec)/tracking delay error (mm)
2	DROOP	(i)	Droop [Command unit]	The error of the actual machine position to the commanded position is called droop. This error is proportional to the commanded speed value.
3	SPEED	(min ⁻¹)	Speed [min ⁻¹]	This is the actual motor speed.
4	CURRENT	(%)	Load current [%]	The motor current is displayed with a continuous current conversion during stalling.
5	MAX CUR 1	(%)	Max. current 1 [%]	The current FB ratio to the current limit is displayed in percentage. The peak value is constantly sampled, and updated every second.
6	MAX CUR 2	(%)	Max. current 2 [%]	The current FB ratio to the current limit is displayed in percentage. The max, value of the current FB peak sampled after the power is turned ON is displayed.
7	OVERLOAD	(%)	Overload [%]	This data is used for monitoring the motor overload.
8	OVER REG	(%)	Regenerative load [%]	This data is used for monitoring the resistance load state when the power supply for resistor regeneration is connected.
9	ANP DISP		Amplifier display	The driver's 7-segment LED display is shown.
10	ALARM		Alam	Alarms or warnings other than those of amplifier is displayed.
11	CYC CNT	(P)	Cycle counter [pulse]	The position per rotation of the encoder detector is displayed. The grid point's value is used as the 0 position and the position per rotation is displayed in the range of 0 to RNG (movement unit) +1000.
12	GRDSP	(mm)	Grid spacing [mm]	The grid spacing for zero point return is displayed.
13	GRID	(mm)	Grid distance [mm]	The distance from the dog off to grid point when dog-type reference point return is displayed. The grid mask distance is not included.
14	MAC POS	(mm)	Machine position [mm]	This is the NC's basic machine coordinate system position
15	MOT POS	(നന്ന)	Motor end FB [mm]	The feedback position for the speed detector is displayed.
16	SCA FB	(mm)	Scale feedback [mm]	The feedback position for the position detector is displayed.
17	FB ERROR	(i)	Feedback error [Command unit]	The deviation between the motor end FB and machine end FB is displayed.
18	DFB COMP	(i)	Dual feedback compensation amount [Command unit]	The compensation pulse amount for dual feedback control is displayed.

3.4.1 ABSOLUTE MONITOR Screen

ARC SVS	[X]	[2]	[C]	[4]	[5]
POF POS (mm.) PON POS (mm.) MAC POS (mm.)	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.
ABSO ABSn	0	0 0	0 0	0 0	0 0
Rn Pn	0 0	0 0	0 0	0 0	0 0
MPOS	0	0	0	0	0
[ABSOLUTE MONIOR]	1				

No.	Screen title	Details			
1	ABS SYS	Detection system	The state of the absolute position detection system on the servo side is displayed. ES: Semi-closed encoder EC: Ball screw end encoder LS: Linear scale MP: MP scale ESS: Semi-closed high-speed serial encoder ECS: Ball screw end high-speed serial encoder INC: Incremental		
2	POF POS (mm)	Power OFF position [mm]	The absolute position at NC power OFF is displayed.		
3	PON POS (mm)	Power ON position [mm]	The absolute position at NC power ON is displayed. This is created from the absolute position when the NC power is turned ON.		
4	MAC POS (mm)	Current position [mm]	The coordinate value at the NC basic machine coordinate system is displayed.		
5	ABSO	Reference position	The absolute position reference position is displayed. This is the FB position memorized during reference point setting.		
6	ABSn	Current position	The current absolute position is displayed.		
7	Rn	Cumulative speed	The cumulative speed of the motor is displayed.		
8	Pn	Phase	The position in one rotation is displayed. Each rotation is divided by 4096. $0^{\sim}4096$		
9	MPOS	Scale offset	The initial offset distance for the MP scale is displayed.		

This screen is the second page of the SERVO MONITOR screen, and is selected with the PAGE key.

3.4.2 SERVO DIAGNOSIS Screen

UNIT TYP UNIT No. S/W VER CONTROL	[X]	[2]	[C]	[4]	[5]
MOT DT MAC DT MOTOR WORK TIME ALM HISTI [00 2 [00 3 [00 4 [00 5 [00 6 [00 7 [00 8 [00 MNT /SYS	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 0 0 0 0 0 0
E SERVO DIAGNO	SIS]				

No.	Screen title		Details
1	UNIT TYP	Amplifier type	This is the servo driver type.
2	UNIT No.	Amplifier manufacturing No.	This is the manufacturing No. of the servo driver.
3	S/W VER.	Software version	This is the version of the servo side software.
4	CONTROL	Control method	SEMI : Semi-closed loop CLOSED: Closed loop DUAL : Dual feedback
5	MOT DT	Motor end detector	This is the motor end detector type.
6	MAC DT	Machine end detector	This is the machine end detector type. The control method is displayed only when the CLOSED or DUAL method is used.
7	MOTOR	Motor	This is the motor type.
8	WORK TIME	Work time	The cumulative ready-ON time is displayed.
9	ALM HIST	Alarm history	The Nos. of the past servo alarms are displayed.
10	MNT/SYS	Maintenance record	The amplifier's maintenance history or NVRAM status is displayed.

This screen is the third page of the SERVO MONITOR screen, and is selected with the PAGE key.

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3.5 SPINDLE MONITOR Screen

	[HD1	SP1]	[HD]	SP2]	(HD2	SP1]	(HD2	SP2]
GAIN (1/SEC))	0		0		0		0
DROOP (i)		0		0		0		0
SPEED(min ⁻¹))	0		0		0		0
LOAD (%))	0		0		0		0
AMP DISP		00		00		00		00
ALARM	00 00	00	00	00 00	00	00 00	00 (00 00
CYC CNT (P))	0		0		0		0
CMD1		000	000000000000000000000000000000000000000	000000	000000000000	00000	000000000000000000000000000000000000000	0000
CMD2	0000000000000000	000	000000000000000000000000000000000000000	00000	00000000000	00000	000000000000000000000000000000000000000	0000
CMD3	000000000000000	000	00000000000	00000	000000000000	00000	00000000000000	0000
CMD4	0000000000000000	000	600000000000	00000	0000000000000	00000	000000000000000000000000000000000000000	0000
STS1	010000000000000000000000000000000000000	000	8100000000	00000	000000000000000000000000000000000000000	00000	0000000000000	0000
STS2	0000000000000000	000	000000000000000000000000000000000000000	00000	500000000000	00000	000000000000000000000000000000000000000	0000
STS3	00000000000000000	000	000000000000000000000000000000000000000	00000	080000000000	00000		0000
STS4	0000000000000000	000	600000000000000000000000000000000000000	00000	000000000000	00000	000000000000000000000000000000000000000	0000
([SPINDLE MO	INITOR]							
I SPINDLE M	DNITOR]							

No.	Screen title		Details
1	GAIN (1/SEC)	Gain	The spindle position loop gain (1/sec) is displayed. Values other than of C axis, synchronous tap, and spindle synchronization are undefined.
2	DROOP (i)	Droop [Command unit]	The feedback tracking delay to the command is displayed. This is valid only during C axis, synchronous tap and spindle synchronization as with item No. 1.
3	SPEED (min ⁻¹)	Speed	The motor speed is displayed.
4	LOAD (%)	Load	The motor load is displayed with a continuous current conversion during stalling.
5	AMP DISP	Amplifier display	The driver's 7-segment display is shown.
6	ALARM	Alarm	This item is displayed when an alarm other than an amplifier alarm occurs simultaneously.
7	CYC CNT	Cycle counter	The angle information from the detector's standard position (Z phase) is displayed.

Spindle command

		-			_	_
C MD 2		Screen title		CMDI		Screen title
NVRAM initialization	I AN	77		in cutting	ទ	F
Alarm history clear	NVC	m				м
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	Γ	A		Torque limit 3	TL3	A
	F	9		Torque limit 2	TL2	9
		~		Torque limit 1	17.	∞
		7		Servo alarm reset command	Ĕ	
	Γ	6		Parameter conversion command	PRM	6
	Γ	5				5
	T	-				-
	T	ω				۵
		2	1			2
	T	-	1	Servo-ON command	SRV	-
	T	0		Ready-ON command	Ŗ	-
		Remarks				Remarks

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	_			-
C MD 3		Screen title		
		ч		
Motor selection command during 1A2M changeover	MSL	m		
L winding selection command	ន	U		
Orient start command	DRC	ი		
Index reverse run start command	WR1	Β		
Index forward run start command	MRN	A		
Spindle reverse run start command	SRI	9		
Spindle forward run start command	SRN	8		
Gear 1 selection command	ទួ	7		
Gear 2 selection command	GR2	6		
Gear 1 selection command	GR 1	S		
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Not used	Remarks		

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Spindle status

	Screen title		STS I		Screen title	
-			In current control	TLN	Ŧ	
	m		In position loop in-position	INP	Ţ	
	J		Z phase passed	ZFN	D	
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-	>	ľ	In torque limit 3	ដ	Þ	
	s	ſ	In torque limit 2	ž	6	'
	∞		In torque limit 1	己	~	'
	7		in servo alarm	È	-	
	σ		In parameter conversion	PR	G	,
_	5				ľ	1
	*		in drive unit warning	NRN	-	
	з					3
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	-		In servo-ON	YXX Y	2 -	-
-	0		In ready-ON	Ē		5
Remarks					Pemarks	

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In gear 1 selection command	R	•	
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in winding changeover.	<u>کی</u>	σ		
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Orient completed	둾	*		
Zero speed	S2	3		
Speed reached	ន	2		
Speed detection	ង	-]	
Current detection	8	•		
		Remarks		

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3.5.1 SPINDLE DIAGNOSIS Screen

UNIT TYP	[HD1 SP1]	[HD1 SP2]	[HD2 SP1]	[HD2	SP2]
UNIT No. S/W VER WORK TIME ALM HIST1 [00] 2 [00] 3 [00] 4 [00] 5 [00] 6 [00] 7 [00] 8 [00] MNT /SYS	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	
C SPINDLE DIAGNOSI	S]				

No.	Screen title		Details
1	UNIT TYP	Amplifier type	This is the spindle type.
2	UNIT No.	Amplifier manufacturing No.	This is the manufacturing No. of the spindle.
3	S/W VER.	Software version	This is the version of the spindle side software.
4	WORK TIME	Work time	The cumulative ready-ON time is displayed.
5	ALM HIST	Alarm history	The Nos. of the past spindle alarms are displayed.
6	MNT	Maintenance record	The maintenance record is displayed.
7	STS	Status	The NVRAM status is displayed.

This screen is the second page of the SPINDLE MONITOR screen, and is selected with the PAGE key.

3.5.2 PS DIAGNOSIS Screen

UNIT TYP UNIT No. S/W VER		[1]	[2]	[3]	[4]	[5]	[6]
WORK TIME ALM HISTI 2 3 4 5 6 7 8 MNT /SYS	[00] [00] [00] [00] [00] [00]	0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00] 0 [00]	0 0 0 0 0 0 0 0
I PS DIAGNO	SIS]						

No.	Screen title		Details
1	UNIT TYP	Unit type	This is the power supply unit type.
2	UNIT No.	Unit manufacturing No.	This is the manufacturing No. of the power supply unit.
3	S/W VER.	Software version	This is the software version.
4			
5	WORK TIME	Work time	The cumulative ready-ON time is displayed.
6	ALM HIST	Alarm history	The Nos. of the past servo alarms are displayed.
7	MNT	MNT	The maintenance history is displayed.
8	SYS	/SYS	The NVRAM status is displayed.

This screen is the third page of the SPINDLE MONITOR screen, and is selected with the PAGE key.

3.6 HARDWARE ALARM Screen

1									
	[EMER	GENCY	FACT	TOR]	[₽	OWER ILLG. MONIT	FOR]	[TEM	PARATURE MONITOR]
	S/W DIO	05V I OP	24V PLC	BOD	# 1	ILLEGAL COUNT	0	1	NC UNIT
					2	ILLEGAL TIME	0	2	OPERATION BOARD
	(EXCE	PTION	INFO	ORMATI	ON]				
	VO SB	201 000	4 0	SR SC	94. 06. 0004 0000	07 11:50'35" PC 5000358C RA 50227832 SSW 0000000	DATA REGISTER D00000000 D0000000 D00000000 D0000000 ADDRESS REGISTER	200000 500001	004 5 00000000 465 5 00012176
	Inst	ructi	on Ad	ldress	;	50003586	B00057900 B00057810 B0001214E B00050200	200050 20005F	690 2 0005F638
l	[HA	RDWAR	E ALA	RM]					

No.	o. Screen title		Details
		S/W	The characters change to yellow when an emergency stop is applied by the system software
		05V	None
		24V	The characters change to yellow when an emergency stop is applied due to a DIO card 24V error.
1	FACTOR	DIO	The characters change to yellow when an emergency stop is input from the DIO card.
		IOP	The characters change to yellow when an emergency stop is input from the EX524 or 521.
		PLC	The characters change to yellow when an emergency stop is applied due to ladder output.
		BOD	The characters change to yellow when an emergency stop is applied due to operation board output.
-	POWER ILLG.	#1	The No. of times that the power error has occurred is displayed.
2	MONITOR	#2	The time of the power error is displayed. Value x 56.8ms
-	TEMPERATURE	1	The characters change to yellow when the NC unit temperature is abnormally high.
3	MONITOR	2	The characters change to yellow when the operation board temperature is abnormally high.
4	4 EXCEPTION INFORMATION		The status of the register, etc., when an exceptional process such as BUS ERROR occurs is displayed.

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> New publication, effective October 1996. Specifications subject to change without notice.