

HITEC- TURN 20/25

SEIKI

CNC Turning Center
with Conversational Control

Maintenance : Manual

SYSTEM 10T

AUGUST, 1985

Hitachi Seiki Co., Ltd.

HITEC-TURN 20/25

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HT-25 INSTALLATION PROCEDURE

1. Removing the X- and Z-axis Clampers for Shipping.

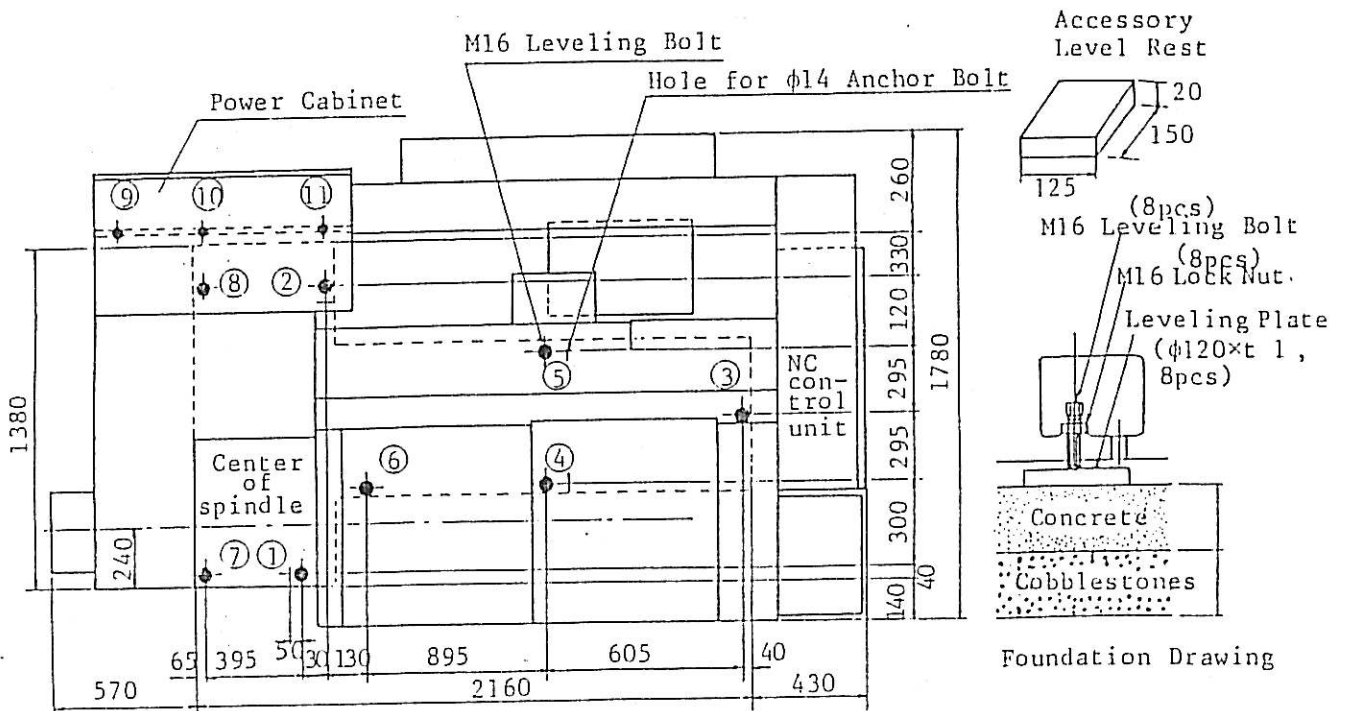
The clampers are painted in yellow.

2. Levelling

The machine does not have a flat slideway on which a level is to be placed. Therefore, after turning on the power supply and hydraulic oil to make the machine ready for operation, set an accessory level rest reset to an OD tool mounting position and place the level on it.

Then, move the Z axis and adjust a twist, etc. Before moving the Z axis, be sure to return the X axis to the zero point in advance.

(This is necessary to prevent the chuck from interfering with the level rest.)



Procedure:

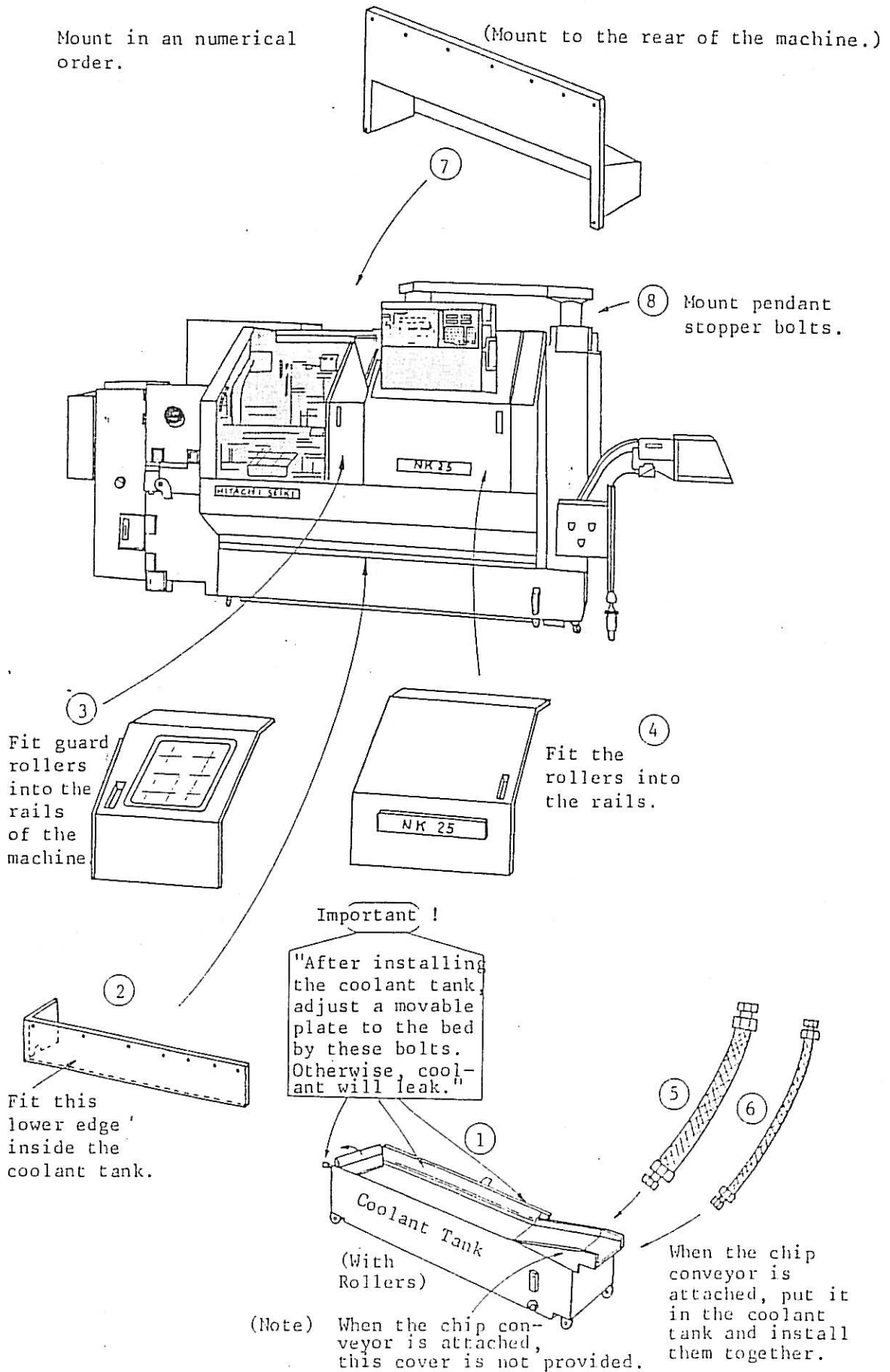
1. Adjust a traverse level by ⑦ and ⑧, and a longitudinal one by ③.
2. Tighten ④ and ⑤, and loosen ③.
3. Check the twist by ⑦ and ⑧, and ④ and ⑤. With Z-axis stroke of about 600 mm, adjust the level of the machine within 0.02 mm/m of an allowable range.
4. Tighten ② and adjust up the machine level by 0.04 mm/m in the traverse direction.
5. Tighten ① and adjust up the machine level by 0.02 mm/m in the traverse direction.
6. Tighten ⑥ and adjust up the machine level by 0.02 mm/m in the traverse direction.
7. Tighten ③, ⑨, ⑩ and ⑪ to such an extent that the leveling plates do not move.
8. Tighten in lock nuts.

Note) The bolts ⑨, ⑩ and ⑪ are provided for supporting the weight of the power control cabinet. If they are tightened too much, the machine level may be affected. Therefore, tighten them, checking the machine level fully.

3. Mounting the Guard (When Using the Side Mounting Type Coolant Tank)

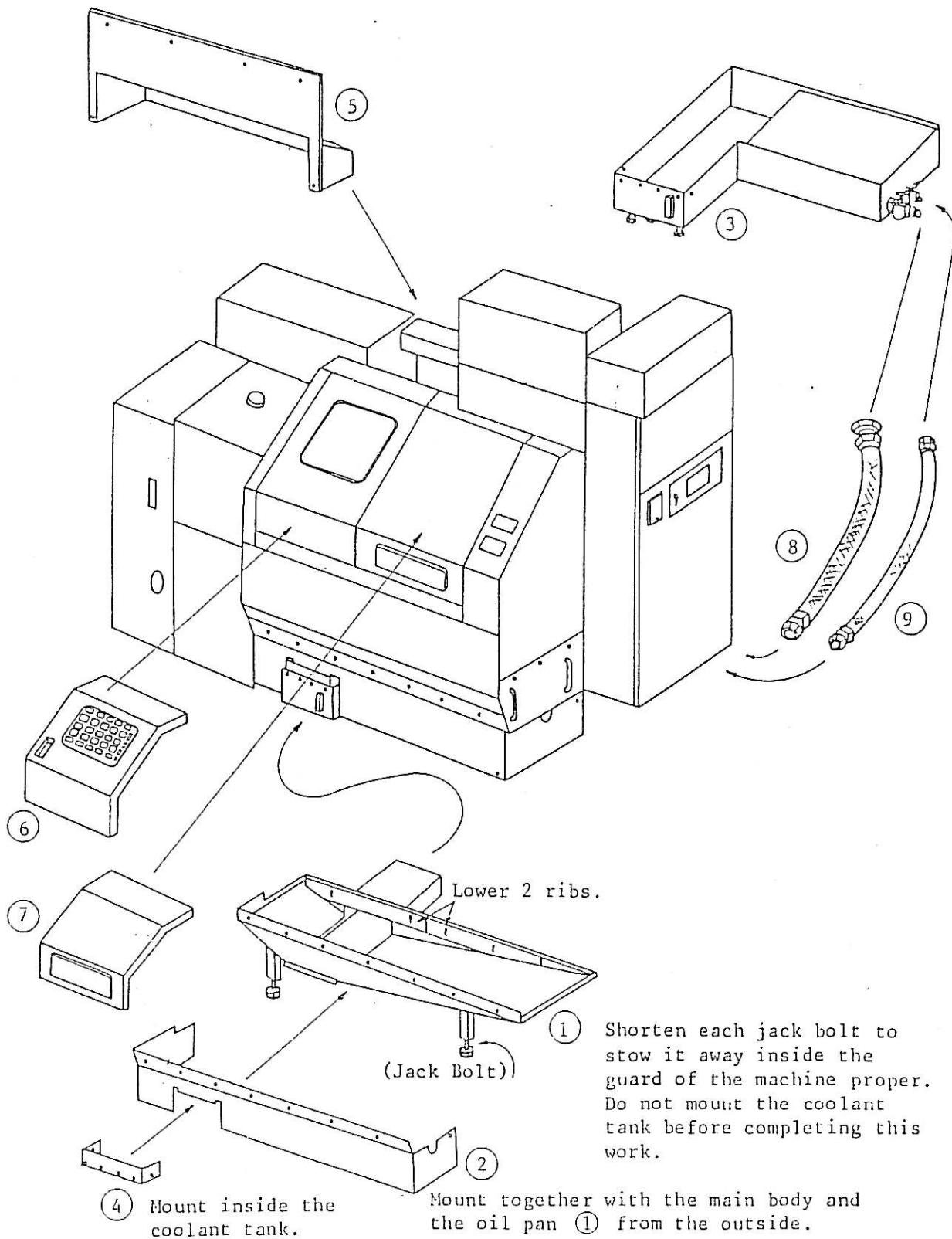
Mount in an numerical order.

(Mount to the rear of the machine.)



4. Mounting the Guard

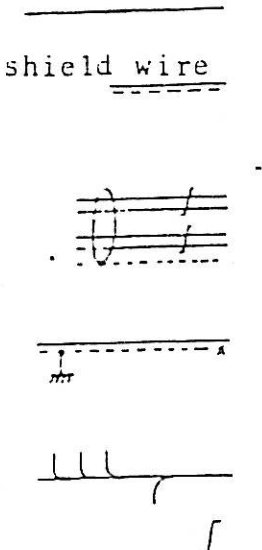
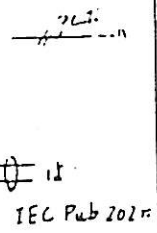
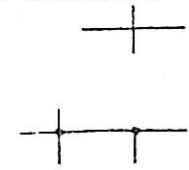
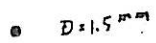
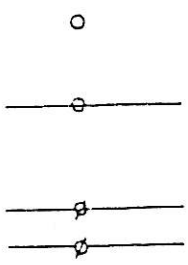
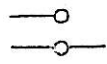

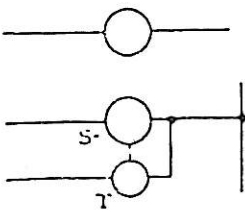
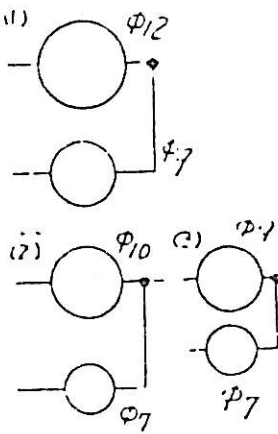
(When Using the Rear Mounting Type Coolant Tank)

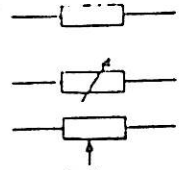



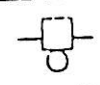
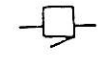
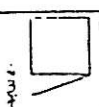
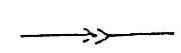
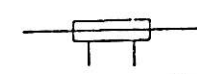
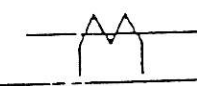

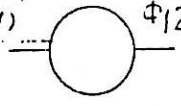
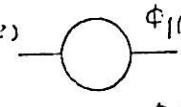
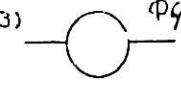
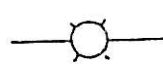
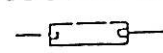
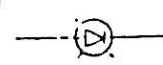
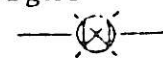
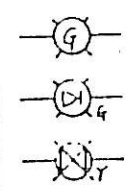
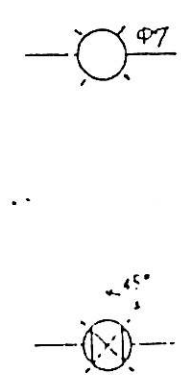


OIL SPECIFICATION

<u>COMPANY</u>	<u>HYDRAULIC OIL</u>	<u>LUBRICATION OIL</u>
American Oil & Supply	PQ ISO VG 32	PQ Way Lube L-40
Amoco	American Indust. #15	Wayyac Oil 31
ashland valvoline	Etc (R&O) 15	Waylube W-30
Atlantic Richfield	Duro S-150	Truslide S-315
B P Oil	Energol HL-C32	Energol HP-68C
Chevron Oil	Chevron O.C. Turbine 9	Chevron Way 15
Cities Service	Pacemaker 15	Sliderite 2
Cook's Industrial Lub.	Albais B	Way Lube 20
Exxon	Teresstic 32 (43)	Febis K-68 (53)
Fiske Bros. Refining	Lubriplate Hydraulic #10	Lubriplate #3V
Gulf Oil	Harmony 44	Gulfway 52
E.F. Houghton Co.	Hydro-Drive HP-150	Way Lubricant 297
A Margolis & Sons	T.E.P. 100-15-7	M.P. 307
Mobil	DTE Light	Vactra 2
Shell	Turbo 32 (25)	Tonna 68 (53)
Stewart Warner	Hydraulic HD #10	Hydraulif HD #2
Sun	Sunvis 706	Lubeway 300, 1754
Texaco	Rando 32 (A)	Waylube D
White & Bagley	Super Hydraulic 150	Medium Way Lubricant

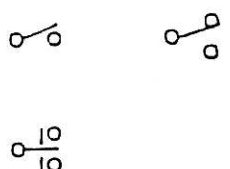
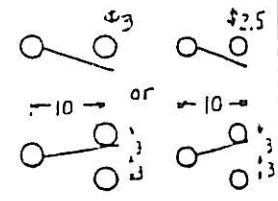
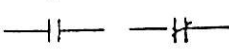
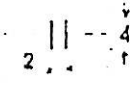
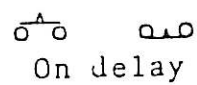
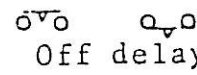
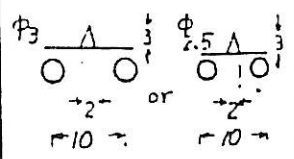
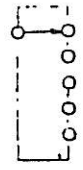
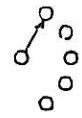
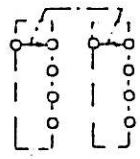
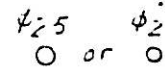


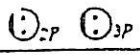
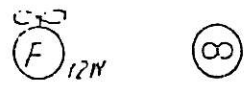
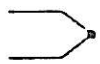

These electric symbols used for all Hitachi Seiki machines.
Also these symbols are same as Japanese Industrial Standards

NO	NAME	DESIGN	OUTLINE	NOTE	SIZE
1	LINE	 <p>shield <u>wire</u></p>		 <p>IEC Pub 202r</p>	
2	CONNECTION	<p>No connect</p> 			 <p>D=1.5mm</p>
3	TERMINAL				<p>φ5 φ25 φ2</p> 
4	COIL		<p>S: set R: reset</p>		

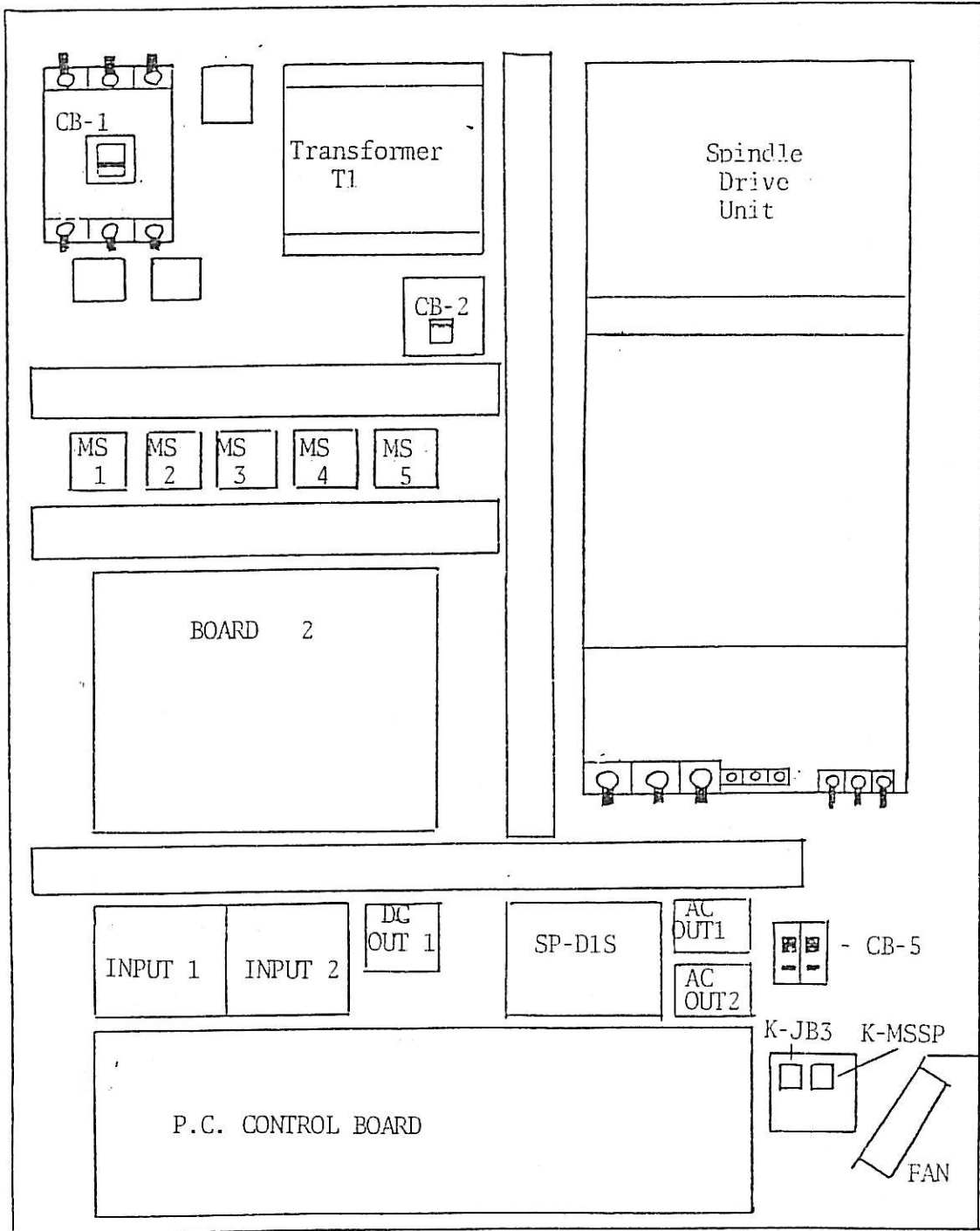
NO	NAME	DESIN	OUTLINE	NOTE	SIZE
11	RESISTOR	 adjustable			
12	FUSE		 <small>(JIS 0301 or JIS 0302)</small>		
13	BELL				$\square_{10 \times \phi 6}$ or $\square_{6 \times \phi 4}$
14	BUZZER				 \square_{10}
15	PLUG				
16					
17					
18	METER		<ul style="list-style-type: none"> (A) amperemeter (V) voltmeter (W) wattmeter (S) speedmeter (N) tachometer (W) thermometer (T) thermometer (H) run hour meter 		(1)  $\phi 12$ (2)  $\phi 10$ (3)  $\phi 9$
19	LIGHT	fluorescent light  LED  pat light  	R: red O: orange G: green BL: blue W: white		

NO	NAME	DESIN	OUTLINE	NOTE	SIZE
20	BATTERY		9P (1.5V x 6) 		
21	GROUND				
22	CONDENSER				
23					
24					
25	UNIT		□ 内は 接続を 表すに 文字 5E, 5F, 5G を 入る。		
26					
27					
28	BREAKER				

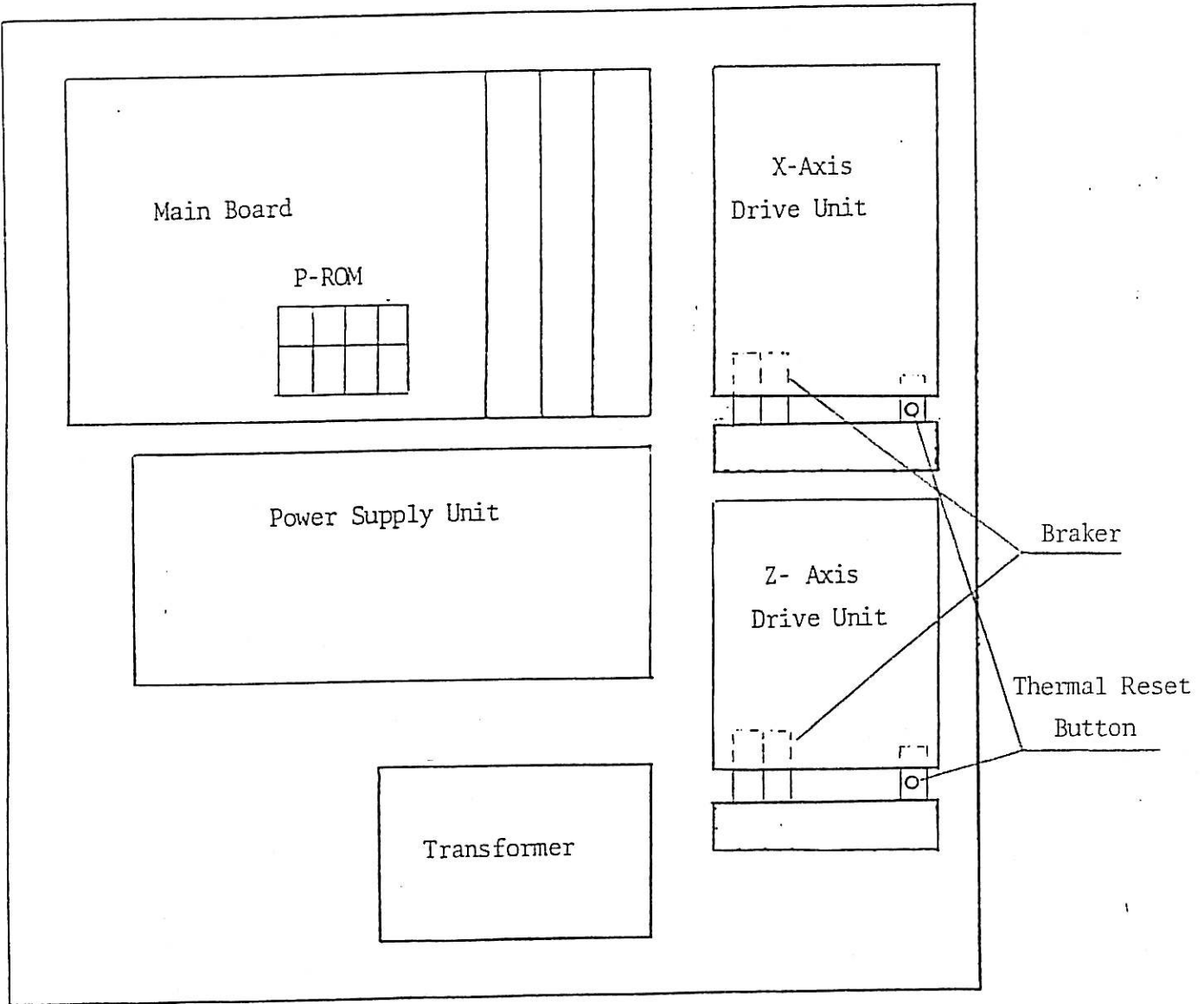
NO	NAME	DESIN	OUTLINE	NOTE	SIZE
29	LIMIT SWITCH	N-Open N-Close			
30	PROXIMITY SWITCH	N-Open N-Close			
31	FLOAT SWITCH	N-Open N-Close			
32	PRESSURE SWITCH	N-Open N-Close			
33	THERMO SWITCH	N-Open N-Close			
34	FLOAT SWITCH	N-Open N-Close		Use Air and Water	
35	PUSH BUTTON	N-Open N-Close		W/Light	
36		N-Open N-Close			
37					

	1	2	3	4	5	
	NO	NAME	DESIN	OUTLINE	NOTE	SIZE
A	38	TOGGLE SWITCH				
B	39	CONTACT	<p>N-Open N-Close</p> 			
C	40	TIMER	<p>N-Open N-Close</p> <p>On delay</p>  <p>Off delay</p> 			
D	41	ROTARY SWITCH				<p>2.5 or 2</p> 
E	42	PLUG				
	43	SOCKET				
F	44	FAN				
	45					
G	46	SPARK KILLER				

CONTROL CABINET



N/C CABINET



How to check PC Ladder

- 1) Turn on power
- 2) Press NC/PC Button two (2) times
- 3) Press PLAD Soft Key (second from left)
- 4) Key in whichever circuit you want to check

Example:

If machine is not in ready condition, you would want to check the machine ready circuit.

Look in the Electrical Manual for machine ready circuit reference number. (In this case, it is R000.0)

- 5) Key in
and press Soft Key
- 6) The PC Ladder Sequence will appear on your screen. If the relay is energized, the line will appear white. If it is not, the line will appear green.

PARAMETER SETTING 10T-F CONTROL

How to Change Parameters:

Machine and N/C power "on"

Press NC/PC Key until following screen appears:

	PROGRAM	
POSITION	PROGRAM	OFFSET
CHECK	SETTING	SERVICE
MESSAGE		CHAPTER
	↑ ↑	

Press Setting Soft Key until Parameter (settings) screen appears.

Set Mode Switch to MDI and Memory Key Switch to WRITE.

Key in 8000 and press Input No. Soft Key.

Parameter 8000 will be displayed. Use Cursor → Key to move Cursor to Bit "0". This Bit is labeled PWE (Parameter Write Enable) and is normally a "0".

Change Bit "0" from "0" to "1" by pressing ON: 1 Soft Key.

Red Alarm Signal will appear at bottom right of screen.

Press Menu Soft Key (first key on left), and then Service Soft Key until Parameter (settings) appears on screen.

Key in desired Parameter number.

Example: Backlash "X" and "Z"

Key in number 1851 and press Input No. Soft Key.

Parameter 1851 will be displayed.

Key in desired number, and then press Input Soft Key.

New data will be displayed in Parameter 1851.

Key in 8000 and press Input No. Soft Key to disable Parameter Write Enable.

Cursor to Bit Zero (PWE) and press Off: 0 Soft Key.

Then press Reset Key to clear alarm.

DIAGNOSTICS 10T-F CONTROL

How to check Diagnostics:

Turn machine and N/C power "on".

Press NC/PC Button until following screen appears:

```
| PC MDI | PC LAD | PC DGN | PC PRM | | | | | |
          ↑
```

Press PC DGN Soft Key, and PC Diagnostics will appear on screen.

Input desired diagnostic.

Example: To check "X" Axis Clutch Alarm

Input X0001 and press Soft Key marked "Search".

Following screen will appear:

```
X0001      7      6      5      4      3      2      1      0
          -----
           1      1      1      1      1      1      1      1
```

X-Clutch Limit Switch Diagnostic Signal from machine to PC is
X-0001, Bit #4.

D	→	Data	1	→	Indicates switch "on"
K	→	Keep Relays	0	→	Indicates switch "off"
R	→	Internal Relays			
G	→	PC to NC Signals			
F	→	NC to PC Signals			
X	→	Input Signal from machine to PC			
Y	→	Output signal from PC to machine			

If Soft OT Alarm Occurs

When the Soft OT Alarm shows on the CRT Screen, after turning on the N/C power, zero returning and moving the Axis, do the following.

Turn off all power.

Turn main power on again.

Turn on N/C power while the Minus key
and the Decimal Point key
are pressed.

Keep those buttons pressed until the following indication
is on the CRT display.

DISPLAY

```
FS10TF 13121
ROM Test: End
(Omitted)
IPL
1. Dump memory
2. ---
3. Clear File
4. Setting
5. --
6. End IPL
```

Press input.

Press input.

Press Stand By

5) Confirming the ON/OFF positions and stepping allowance of the deceleration dog.

• DGN operation

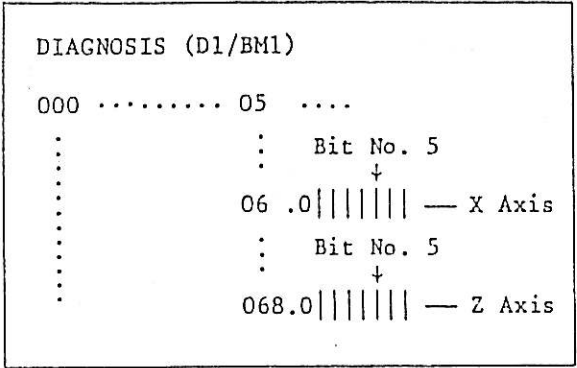
a) Display the initial screen. (Same as MDI operation.)



b) If the SERVICE and CHAPTER keys are pressed in that order, the display will change over.



c) If the DIAGNOSIS key is pressed, the following display will appear.



	DGN NO.	Bit No.								
		7	6	5	4	3	2	1	0	
X Axis	064									
Z Axis	068									

↑
Bit No. 5

- ... Microswitch ON status
- ... Microswitch OFF status

d) Adjust the X-axis dog stepping allowance and OFF position.

- ① Move the X axis by 50 mm in the "-" direction and check that the signal status of the bit No. 5 of DGN No. 064 changes from 0 to 1.
- ② Move the X axis in the "+" direction by the handle and read a counter value when the above-mentioned signal status changes to 0. Move the X axis further in the "+" direction and read the counter value when the signal status changes to 1 this time. A difference of these counter values is a dog stepping allowance. Adjust a clearance between the microswitch and dog sheet so that this difference will stay in a range of 28 mm to 35 mm.
- ③ When moving the X axis in the "-" direction after completing the adjustment of the stepping allowance in ②, adjust a dog position so that the counter value will be 5 mm ± 0.5 when the signal status changes from 0 to 1.

6) Move the X axis by about 100 mm in the "-" direction. Then, return it to the zero point at a rapid traverse rate of 5 % or 25 %, and read a deviation of the counter.

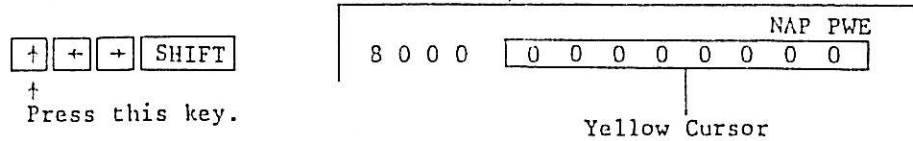
7) Setting the parameter.

a) Rewriting the parameter No. 8000

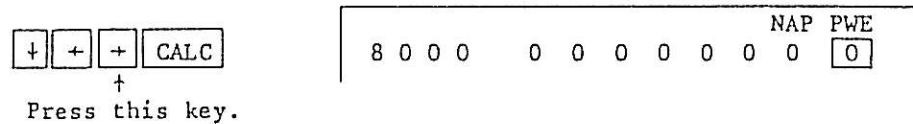
- ① Shift the mode selector switch to **MDI**.
- ② Display the initial screen and press the **SETTING** key 2 to 3 times to make the right display appear.

SETTING		
0000	0020
:		:
0010		0023
0011		

- ③ Press located on the left end of the key on the NC keyboard to display the below-mentioned screen.

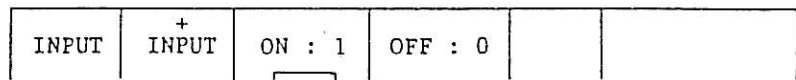


- ④ Keep pressing 7 times located on the right end of the key on the NC keyboard until the yellow cursor comes to a position of ^{PWE}
.

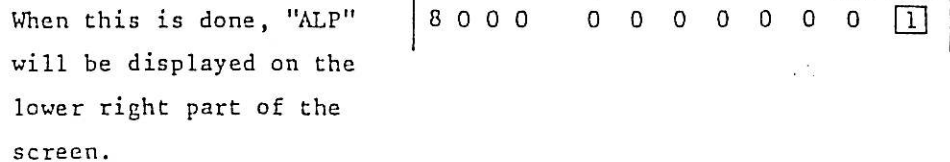


If the cursor passed the position, return it by pressing .

- ⑤ Press the (NEXT) key located on the right end of the screen to display the below-mentioned screen.



- ⑥ Press the to enable the parameter to be rewritten.

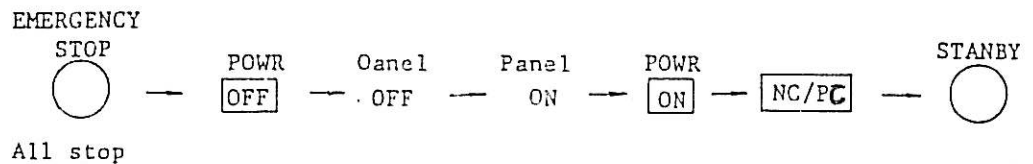


b) Offsetting the shift amount

- ① Press the key located on the lower left end of the screen the display the initial screen.

- ② Display the PARAMETER (SETTINGS) screen by pressing the key. (Keep pressing until it appears.)

- ⑨ Canceling the alarm (power-off → power-on)



- ⑩ Confirming the offset amount.

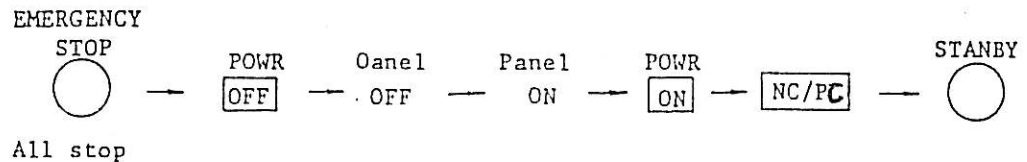
Repeat the above-mentioned steps ① through ④.

- 8) Perform zero return at a rapid traverse rate of 5 %, 25 % and 100 % and check whether or not the zero point is shifted.

II. Z-AXIS OFFSET

- 1) Set an exclusive jig or block gauge to the spindle nose and move the machine to the zero point matching each specified stroke. (Refer to a separate sheet as to each dimension.)
- 2) Reset the Z-axis position display counter to 0. (Same as in case of the ORIGIN operation for the X axis.)
- 3) Confirming the ON/OFF positions and stepping allowance of the deceleration dog.
 - Although the operation of the DIAGNOSIS key is the same as in case of the X axis, the DGN NO. is 068 (bit No. 5).
 - a) Adjust the stepping allowance to about 28 ~ 30 mm. (Shift the mounting position of the stepping allowance adjusting microswitch.)
 - b) Make adjustment so that the OFF position of the dog will be 10 mm ± 0.5.

- ⑨ Canceling the alarm (power-off + power-on)



- ⑩ Confirming the offset amount.

Repeat the above-mentioned steps ① through ④.

- 8) Perform zero return at a rapid traverse rate of 5 %, 25 % and 100 % and check whether or not the zero point is shifted.

II. Z-AXIS OFFSET

- 1) Set an exclusive jig or block gauge to the spindle nose and move the machine to the zero point matching each specified stroke. (Refer to a separate sheet as to each dimension.)
- 2) Reset the Z-axis position display counter to 0. (Same as in case of the ORIGIN operation for the X axis.)
- 3) Confirming the ON/OFF positions and stepping allowance of the deceleration dog.
 - Although the operation of the DIAGNOSIS key is the same as in case of the X axis, the DGN NO. is 068 (bit No. 5).
 - a) Adjust the stepping allowance to about 28 ~ 30 mm. (Shift the mounting position of the stepping allowance adjusting microswitch.)
 - b) Make adjustment so that the OFF position of the dog will be 10 mm \pm 0.5.

4) Move the X axis by about 100 mm in the "-" direction. Then, return it to the zero point at a rapid traverse rate of 5 % or 25 % and read a deviation of the counter.

5) Setting the parameter

Rewriting of the parameter No. 8000 and offsetting of the shift amount conform to the methods for the X axis except the following.

<input type="text" value="INPUT.NUMBER"/>	1850	X	0		The yellow cursor should
		Z	<input type="text" value="0"/>	—————	be located at the position
					of Z.

The rest are the same as in case of the X axis.

F-10TF DISPLAY, SETTING & ALTERATION OF PARAMETERS

A) Display

- ① Set the **NC/PC** selector switch to NC. The below-mentioned screen (initial screen) will appear.

(Initial Screen)

POSITI ON	PROGRA M	OFFSET	PROGRM CHECK	SETTIN G	SERVIC E	MESSAG E			CHAPTE R	
--------------	-------------	--------	-----------------	-------------	-------------	-------------	--	--	-------------	--

- ② Method a) Press the key below the **SERVICE** key, and then, the **CHAPTER** key, and finally, the **PARAM** key. (The PARAMETER (SETTING) screen will appear.)

Method b) Repeat pressing the **SERVICE** key. (ditto)

- ③ Press the soft key (for NEXT) located on the right end. (The next menu will be displayed.)

INPUT	+INPUT	ON : 1	OFF : 0	INPUT NUMBER	HANDBY	GENERA L	OPERAT PANEL	MACRO VAR.		
-------	--------	--------	---------	-----------------	--------	-------------	-----------------	---------------	--	--

- ④ Method a) Enter a desired number and call its display position by pressing the soft key **INPUT NUMBER**.

(The steps ③ and ④ can be replaced by each other. In that case, if the 1st number is entered, the menu will change over as shown in the step ③.)

Method b) Change over the screen by pressing the page feed keys (**↑** and **↓**) and move the cursor to the desired number by pressing the cursor move keys (**←**, **→**, **+** and **-**).

B) Setting and Alteration

- ① Set the NC/PC selector switch to NC. If already so done, this step can be omitted.
- ② Display the initial screen by pressing the soft key (RETURN) located on the left end.

(Initial Screen)

POSITI ON	PROGRA M	OFFSET	PROGRAM CHECK	SETTIN G	SERVIC E	MESSAG E			CHAPTE R
--------------	-------------	--------	------------------	-------------	-------------	-------------	--	--	-------------

- ③ Press the key below the SETTING key to display the following table. (Repeat pressing the key to change over the screen.)

SETTING (SETTINGS)	
0 0 0 0	0 0 2 0
0 0 0 0 0 0 0 0	0 0 2 1
0 0 1 0	0 0 2 2
0 0 0 0 0 0 0 0	0 0 2 3
0 0 1 1	
0 0 0 0 0 0 0 0	
0 0 1 2	
0 0 0 0 0 0 0 0	
0 0 0 0 0 0 0 0	
X	
Z	

B)-1)

- ④ Display the following screen (MENU) by pressing the soft key on the right end.

INPUT	+INPUT	ON : 1	OFF : 0	INPUT NUMBER	HANDY	GENERAL	OPERAT PANEL	MACRO VAR.		
-------	--------	--------	---------	--------------	-------	---------	--------------	------------	--	--

Display in Green Color

- ⑤ Enter "8000" and press the key below the INPUT NUMBER key. The following will be displayed.

(8 0 0 0)
	0 0 0 0 0 0 0 0	NAP PWE

("PWE = Parameter Write Enable" indicates that data can be written in parameters.)

- ⑥ Move the cursor (Yellow display) to PWE by pressing .

- ⑦ Set data "1" by pressing the soft key below ON : 1 . The display will change over as follows:

↑	↑↑	↑↑	SHFT
↓	+	+	CALC
O	F	K	P

(8 0 0 0)
	0 0 0 0 0 0 0 1	

Now, it is ready for parameter writing.

B)-2) Writing and Altering the Data

- ① Display the initial menus by pressing the key (RETURN) on the left end.

POSITI ON	PROGRA M	OFFSET	PROGRM CHECK	SETTIN G	SERVIC E	MESSAG E			CHAPT R
-----------	----------	--------	--------------	----------	----------	----------	--	--	---------

- ① - b) (Another method) Display the screen of 8000 only by pressing the key. Next, display the 2nd menu by pressing the (NEXT) key on the right end.
- ② Move the yellow cursor to PWE by pressing the key.
- ③ Set "0" at the position of PWE by pressing .

F-10TF DIAGNOSIS (SELF DIAGNOSIS)

A) NC Side

Display the initial screen in the same manner as in parameter display.
(Steps ① and ②)

- ③ Method a) Display the following screen by pressing the SERVICE key and CHAPTER key.

PARAMETER	PITCH	DIAGNO	DISPLAY						
TER	ERROR	SIS	MEMORY						

Next, display the DIAGNOSIS(DI = BMI) screen by pressing the DIAGNOSIS key.

- Method b) Repeat pressing the SERVICE key until the above-mentioned screen appears.

- ④ Enter a required number. (Entering one character changes over the screen.)

				INPUT	PARAME	PITCH	DIAGNO	DISPLAY	
				NUMBER	TER	ERROR	SIS	MEMORY	

- ⑤ Press the INPUT NUMBER key to call the number, or display its page by pressing the page feed keys ↑ and ↓.

B) PC Side

- ① Set the **NC/PC** selector switch to PC. The below-mentioned menu will be displayed.

PCMDI	PCLAD	PCDGN	PCPRM						
-------	-------	-------	-------	--	--	--	--	--	--

↑

- ② Display the screen shown on the right by pressing the **PCDGN** key.

- ③ Since PC-DIAGNOSIS has various signs(alphabets), enter a relevant number. (Example: R400)
(Unnecessary as to bits.)

STATUS	7	6	5	4	3	2	1	0
NO.								
G0000	0	0	1	0	0	0	1	1
G0001	-	-	-	-	-	-	-	-
.				.				
.				.				
.				.				
G0009	0	0	0	0	0	0	0	0

- ④ Press the **SEARCH** key.

F-10TF ORIGIN OPERATION

- ① Display the initial screen. (Use the soft key on the left end.)

POSITI ON	PROGRA M	OFFSET	PROGRM CHECK	SETTIN G	SERVIC E	MESSAG E			CHAPTE R
--------------	-------------	--------	-----------------	-------------	-------------	-------------	--	--	-------------

- ② Press the **POSITION** key. →

ACTUAL POSITION									
X	_____								
Z	_____								
F	· (mm/min)			S	· (RPM)				
_ _ _ _ _ _ _ _ _ _									

- ③ If it is pressed again, the display will change over as follows.

ACTUAL POSITION									
(RELATIVE)					(ABSOLUTE)				
X	_____				X	_____			
Z	_____				Z	_____			
(MACHINE)			(DIST. TO GO)			(ACTUAL SPEED)			
X	_____		X	_____		F	_____		
Z	_____		Z	_____		S	_____		
_ _ _ _ _ _ _ _ _ _									

- ④ Press the (NEXT) key on the right end.

ORIGIN	PRESET				OVERAL L	RELATI VE	ABSOLU TE	MACHINE E		
--------	--------	--	--	--	-------------	--------------	--------------	--------------	--	--

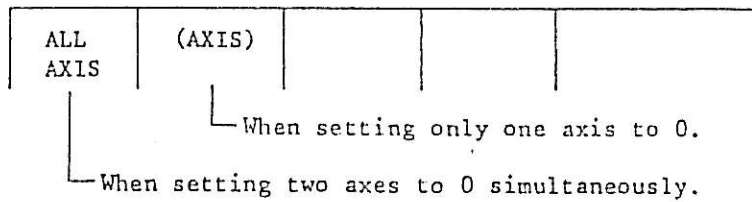
(④ Or, press X or Z in the step ② or ③ .)

- ⑤ Enter a required X or Z axis name. (Unnecessary when the step ④ is taken.)

- ⑥ Press the **ORIGIN** key: ON + An X or Z value will become 0.

Another method:

- ⑤ Press the **ORIGIN** key without pressing neither X nor Z.



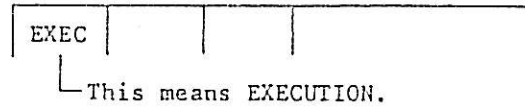
- ⑥ Press the **ALL AXIS** key. Both X and Z values will become 00000.

- ⑥' Press the (AXIS) key.

a) " + KEY IN DATA" will be displayed above characters "ORIGIN".
(This display urges to enter X or Z data.)

b) Press X or Z.

ORIGIN > X (> Z in case of " + Z")



c) Press the **EXEC** key.

└─ Zero(0) will be displayed.

Note: Zero will be displayed only at the position of RELATIVE.

Parameters for Zero Point Adjustment & Diagnose

1) Parameter No. for zero point shift: 1850 X _____
Z _____

Parameter No. for backlash adjustment: 1851 X _____
Z _____



2) Diagnose

X-axis deceleration LS	No. 64	bit 5
Z-axis deceleration LS	No. 68	bit 5
X-axis +OT LS	No. 64	bit 0
X-axis -OT LS	No. 64	bit 1
Z-axis +OT LS	No. 68	bit 0
Z-axis -OT LS	No. 68	bit 1


F-10TF SPECIAL OPERATIONS (FOR ELECTRIC SECTION)

A) Initialization of Symbolic FAPT

(When characters are not displayed or incomplete)

- 1) Press the BS EOB key to turn on the power.
(Until the display appears)
- 2) Press the soft key AUXILIARY . (2nd key from the left)
 "REQUEST" will be displayed.
- 3) Enter "CFINT" and press the INPUT key. (Right key group. Press together with SHIFT .)

Symbolic FAPT will be initialized and there will appear an inquiry whether or not it is all right.
- 4) Enter "1" and press the INPUT key.
("SUB MEMORY INITIALIZED" will be displayed.
- 5) Press the END key. (2nd key from the right)

B) Cancellation of Soft OT

- 1) Press - and . simultaneously to turn on the NC power.
- 2) Enter "4" (to select SETTING) and press the INPUT key.

An inquiry "CHECK SOFT OT AT POWER ON ?" will appear below "6. END IPL". This inquiry means whether or not soft OT is checked upon turning on the power.)

IPL

1.	DUMP MEMORY
2.	—
3.	CLEAR FILE
4.	SETTING
5.	—
6.	END IPL

- 3) Enter "N" and press the key. N means "NO".
(Once again, the IPL list will be displayed.)
- 4) Enter "6" and press the key. (End)
↓
A normal NC display will appear.

C) How to Enter PC Parameter (Impossible to enter by the tape.)

- 1) Set the selector →

PCMDI	PCLAD	PCDGN	PCPRM	
-------	-------	-------	-------	--

switch to PC.
- 2) Press the key. →

TIMER	COUNTER	KEEPRL	DATA	POS
+	+	+	+	
000	CXX	KΔΔ	D ---	Unused
- 3) Shift the MEMORY LOCK/
WRITE switch to WRITE.
- 4) In a certain case, set 1 at the position of PWE. — Timer, Data
(PWE of 8000 of SETTING)

NK25/25S PC PARAMETERS (FOR F-10TF)
(HITEC-TURN)

Timer

1	—	164000	16	—	48
2	—	10000			
3	—	164000			
			25	} —	2000
			28	} —	
9	—	1000	29	} —	3000
10	—	3000	30	} —	
11	—	3000	31	—	10000
12	—	3000	32	} —	3000
13	—	1000	33	} —	
14	—	1000	34	} —	
15	—	10000	35	—	1000

Keep Relay (KEEPRL)

01	K00	—	—	0	—
	K04	—	0 0 1 0 0 0	0 0	
	K05	—			1 0
	(K06	—			1 0)
	K10	—	1 1 1 1 1 1	1 1	
	K11	—	1 1 1 1 1 1	1 1	
15	K14	—	—	0	—

DATA (Enter "10" and press the INPUT key.)

Using the key $\boxed{++}$, enter values in the parameter No. 10 and NO. OF DATA.

	ADDRESS	PARAMETER	NO. OF DATA	OFFSET	SPECIAL	TABLE	
000	D0000		10	0000	0	82	} Automatically input
1	D0002	00000000	6	0000	0	40	
2	10	00000000	4	0000	0	27	
3	18	00000000	21	0000			
4	26	00000000	1				
5	34	00000000	2				
6	42	00000000	2				
7	50	00000000	2				
8	58	00000000	2				
9	66	00000000	2				
10	D0074	00000000	2	0000	0	0	

$\boxed{\downarrow}$ Key

0000	D0082	82
1	84	7460
2	86	1074
3	88	3600
4	90	0
5	D0092	0

$\boxed{\downarrow}$ Key

0000	D0094	20
1	96	40
2	98	40
3	D0100	40

$\boxed{\downarrow}$ Key

D102	—	0	D132	3700
4	10	D134	5200	
6	27	D136	7200	
8	52	D138	10000	
D110	—	100	D140	14000
2	140	D142	20000	
4	200			
6	270			
8	370			
D120	—	520		
2	720			
4	1000			
6	1400			
8	2000			
D180	—	2700		

Jog feed rate values multiplied 10 times.

F-10FT MDI/PROGRAM (AUTOMATIC OPERATION)

A) MDI

- ① Display the following menus by setting the **NC/PC** selector switch to NC.

CANCEL					ALARM	OPERA TOR				
--------	--	--	--	--	-------	--------------	--	--	--	--

- ② Display the initial screen by pressing the soft key (RETURN) on the left end.

(Initial Screen)

POSITI ON	PROGRA M	OFFSET	PROGRM CHECK	SETTIN G	SERVIC E	MESSAGE E			CHAPTE R
--------------	-------------	--------	-----------------	-------------	-------------	--------------	--	--	-------------

- ③ Set the MODE selector switch to MDI.
- ④ Press the **PROGRAM** key.
"PROGRAM(MDI)" will be displayed on the upper part of the screen.
- ⑤ Write required data (command) and pass the **BS EOB** button. The screen will change over.
" ;"
(Example: G00 U-100. ;)

ALTER	INSERT	DELETE	DELETE WORD	BACK EDIT	FRWRD SEARCH	BKWRD SEARCH	REWIND	DECTRY MEMORY		
-------	--------	--------	----------------	--------------	-----------------	-----------------	--------	------------------	--	--

- ⑥ After confirming, press the **INSERT** key to input it. The command will move up.
- ⑦ If all right, press the **START** button on the upper right part or PROGRAM START button on the left side to execute it.
- ⑧ When desiring to cancel it, press the **RESET** button on the upper right part.
(Note: When cancelling it in writing data (step ⑤), use the **CAN** button.)

B) Program Editing

The steps ① and ② are the same as those in A) MDI.

- ③ Set the MODE selector switch to EDIT.
- ④ Press the **PROGRAM** key. If a program exists, it will be displayed, and if not, "**?**" (yellow) will be displayed above.

B)-1)

- ⑤ When newly creating a program, enter "OXXXX" (program No.)

The menu will change over upon entering "0". (Same as in A)-⑤.)
Do not press **BS EOB** (= CR) in this case.
If entered, a format error will be caused.

- ⑥ If written characters are "01:", enter them by pressing the **INSERT** key. The command will move up.
- ⑦ Write "[;] — **BS EOB** — " and press the **INSERT** key.
- ⑧ The program can be edited as usually from the next time.

B)-2) Altering the program (Alteration, Insertion and Deletion of Data)

- ⑤ Write sequence No. command data, etc. and make a search.
 - a) If before a present address (indicated by the yellow cursor);
Press the **BKWRD SEARCH** key.
 - b) If behind the present address (indicated by the yellow cursor);
Press the **FRWRD SEARCH** key.
- ⑤ Or, display a required part of the program by using the page feed keys (**↑** and **↓** and cursor move keys (**←←** , **→→** , **←** and **→**).
- ⑥ After the step ⑤ .

CLUTCH RESETTING PROCEDURE

When the Clutch is disengaged, the alarm light on the Operator Panel is on. Also, the CRT Screen shows "EMG".

1) Check input signal by diagnostics.

X Axis:

DGN. No	bit	7	6	5	4	3	2	1	0
* X001					1				

Z Axis

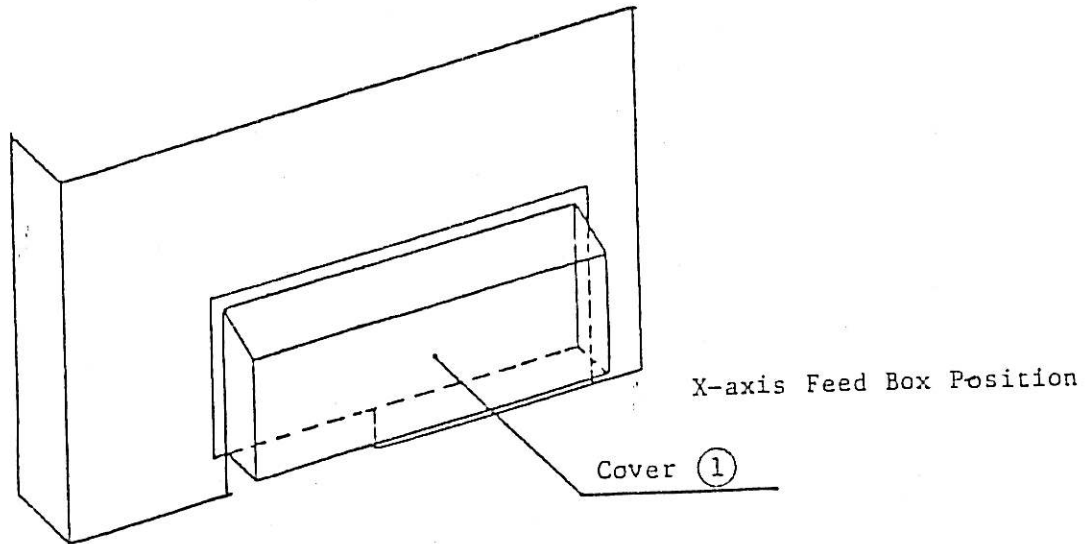
DGN.No	bit	7	6	5	4	3	2	1	0
X003		1							

1: Normal

0: Clutch is disengaged

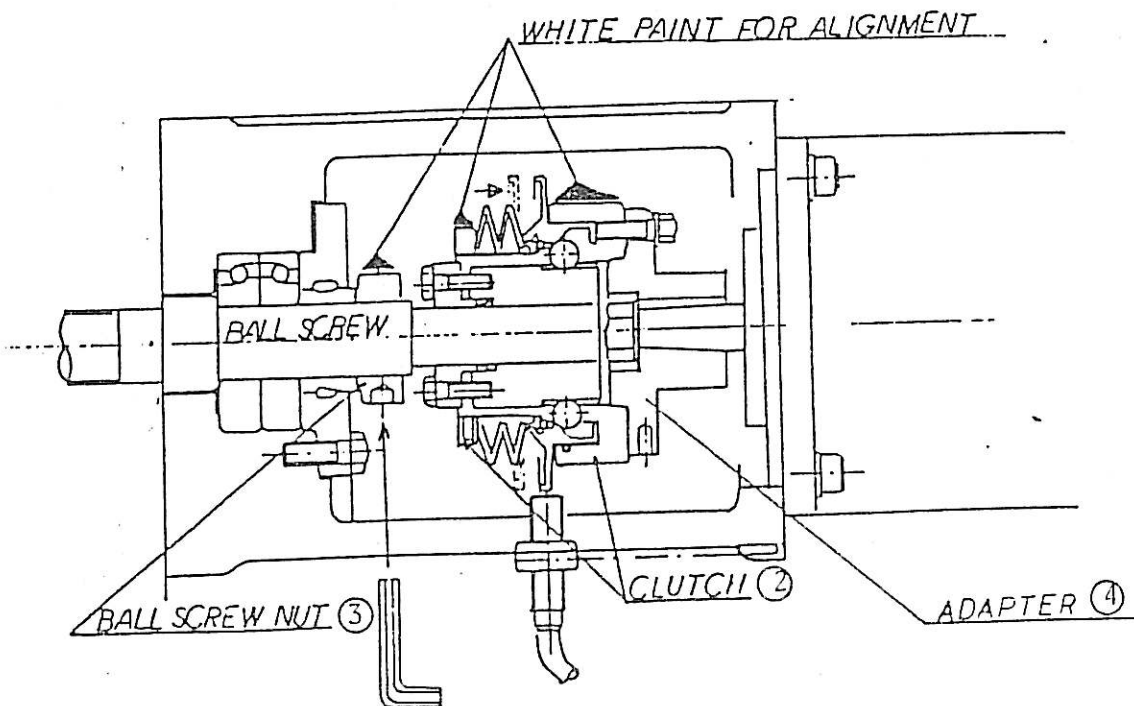
RESETTING THE X-AXIS CLUTCH

- 1 Turn off power
- 2 Remove a cover ① located at the back of the machine.
(14B 6x8 6 pcs.)



- 3, Take white paint line up. White marker on both clutch ② and ball screw nut ③.

If you can't see white paint on clutch ② and ball screw nut ③ insert a 1/8" - 3/16" hex wrench into the hole of the ball screw nut ③ or hole of the adapter ④, then turn up.



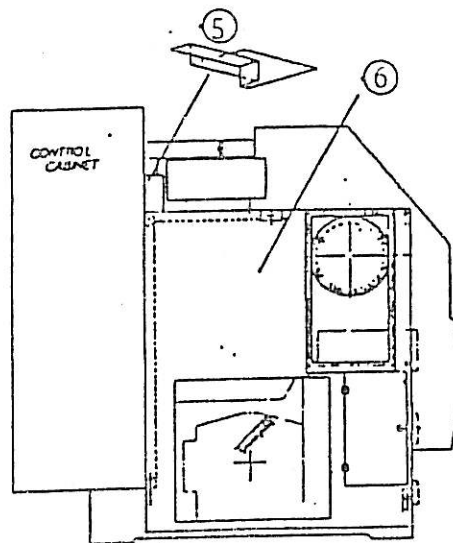
4. Pull a clutch checker plate in the direction indicated by an arrow.
5. If the checker plate is pushed in, resetting is over.
6. After the power is back on make sure alarm signal goes off, and MICON 8 21 INP 080 INP shows up 00.
7. Mount a cover ①

RESETTING THE Z-AXIS CLUTCH

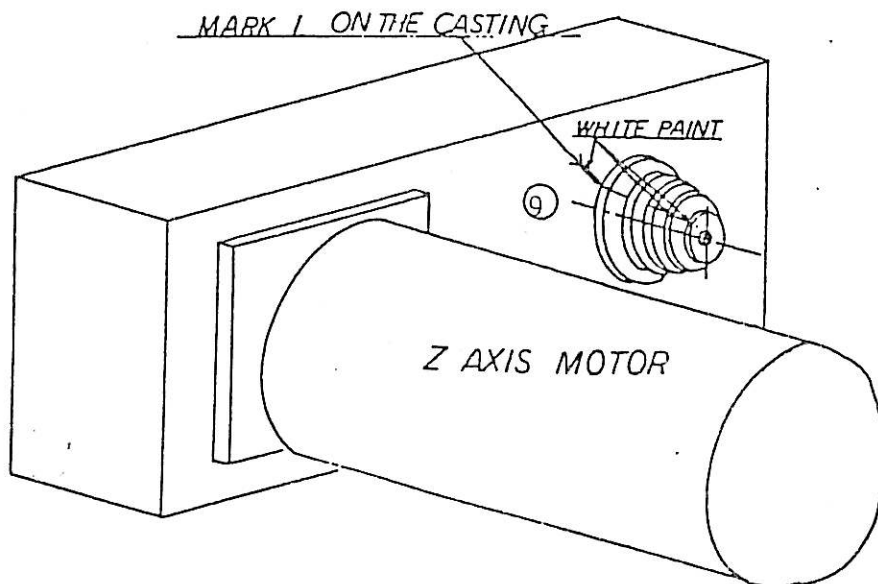
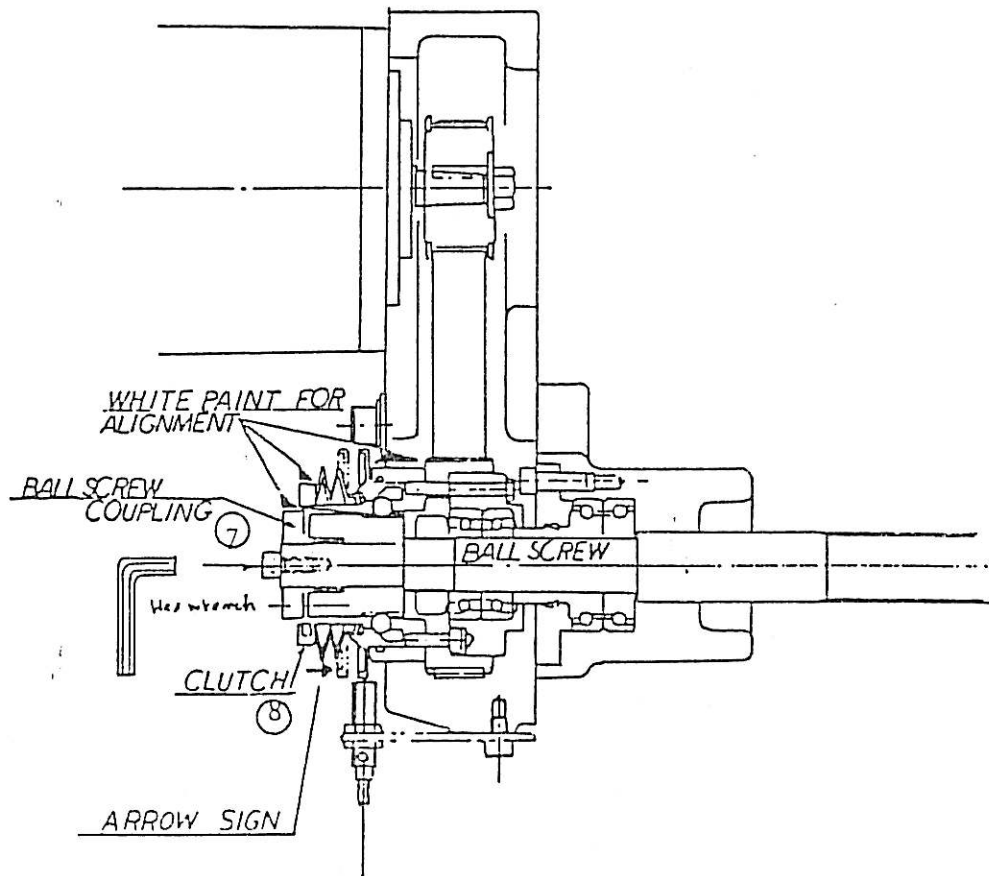
1. Turn off the power
2. Remove the cover (5) (6) of the headstock.
3. Take white paint line up.

White marker on the ball screw coupling (7) clutch (8) and on the casting (9).

If you can't see white paint on the ball screw coupling 7 insert 1/8" - 3/16" hex wrench into the end of ball screw bolt, then turn up.



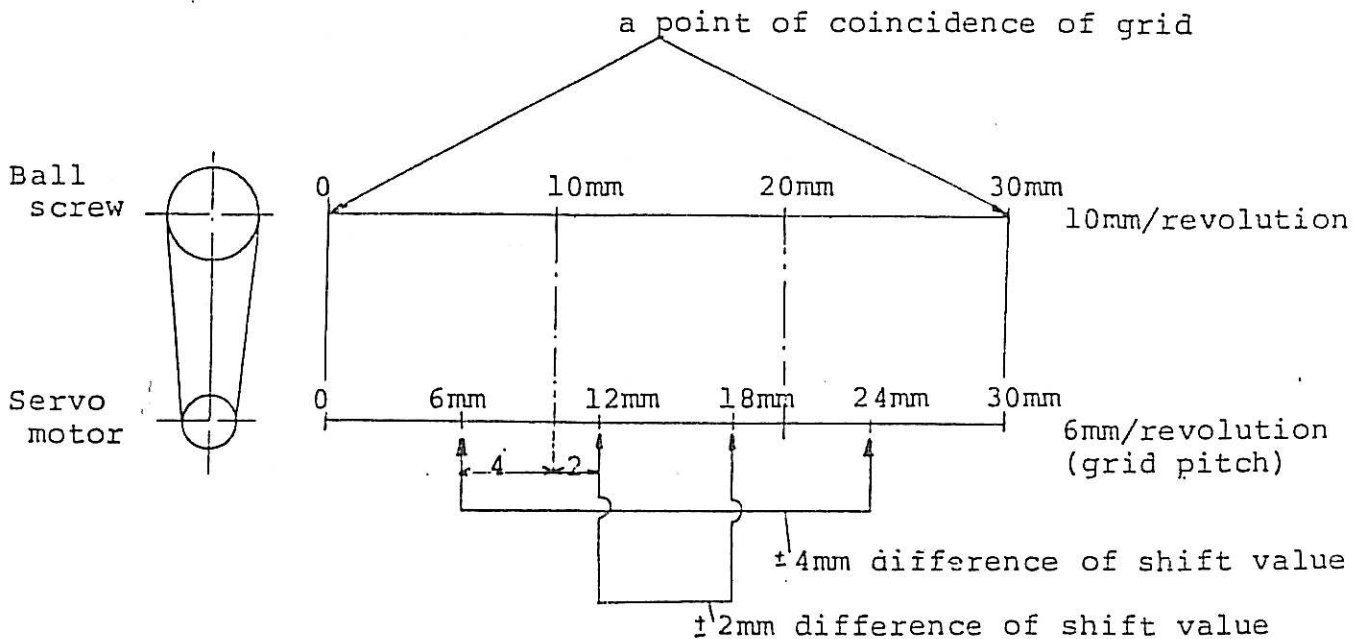
4. Push a clutch checker plate in the direction indicated by an arrow.
5. If the checker plate is pushed in, clutch resetting is over.
6. Turn main power, NC and machine ready on.
7. Try to return to home position.
8. Check the mark 1 and those two are located on the straight line.



9. If you do not, turn off the power, pull check plate and disengage the clutch again.
10. Turn the clutch once or twice ($\pm 360^\circ$ - $\pm 720^\circ$)
A home position will be shifted as follows.
One turn $\pm 4\text{mm}$
Two turns $\pm 2\text{mm}$
11. Repeat steps 3, 4, 5, 6, 7, 8.
12. If the white marks are aligned on a straight line, clutch resetting is over.
13. Mount 1, 2 cover.

NOTE:

Connecting ratio between servo motor and ball screw is 5:3 therefore, a point of coincidence of grid between servo motor and ball screw is one out of every 5 rotation of servo motor.

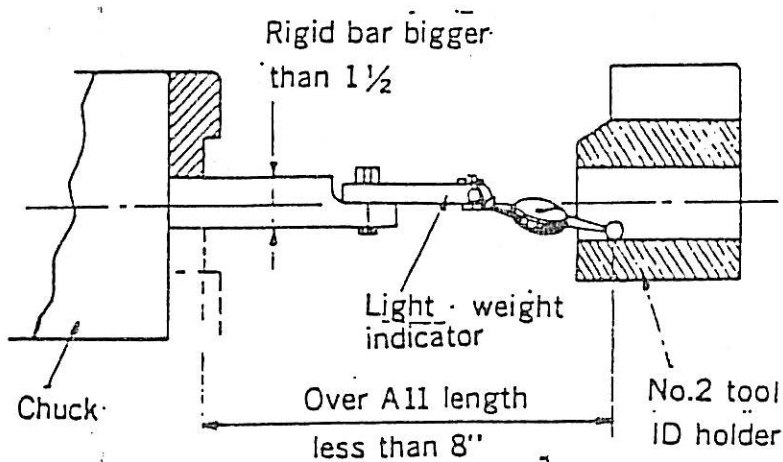


ADJUSTMENT OF TURRET HEAD ALIGNMENT

If the tool is hit with enough power (force) an accident, the curvic coupling on the tool post may move. This may cause the centerline of the tool holder different spindle centerline for vertical direction.

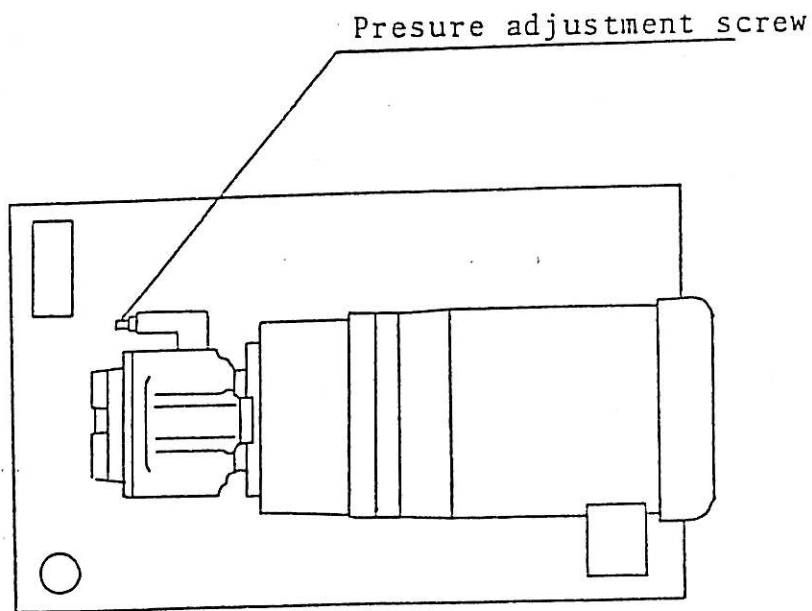
A) Checking Alignment

1. Index tool #2 and take tool out
2. Bring X-axis toward center of the spindle line
3. Set an indicator to align the spindle center and tool holder. DO NOT USE a magnetic indicator to the chuck directly. This means reading error.
4. Make an alignment first for horizontal way by adjusting X-axis move handle, until the indicator reading becomes ZERO.
5. Reading in vertical direction center difference between spindle and tool post within ± 0.002
6. If it is necessary to adjust the alignment for center, following instruction B.

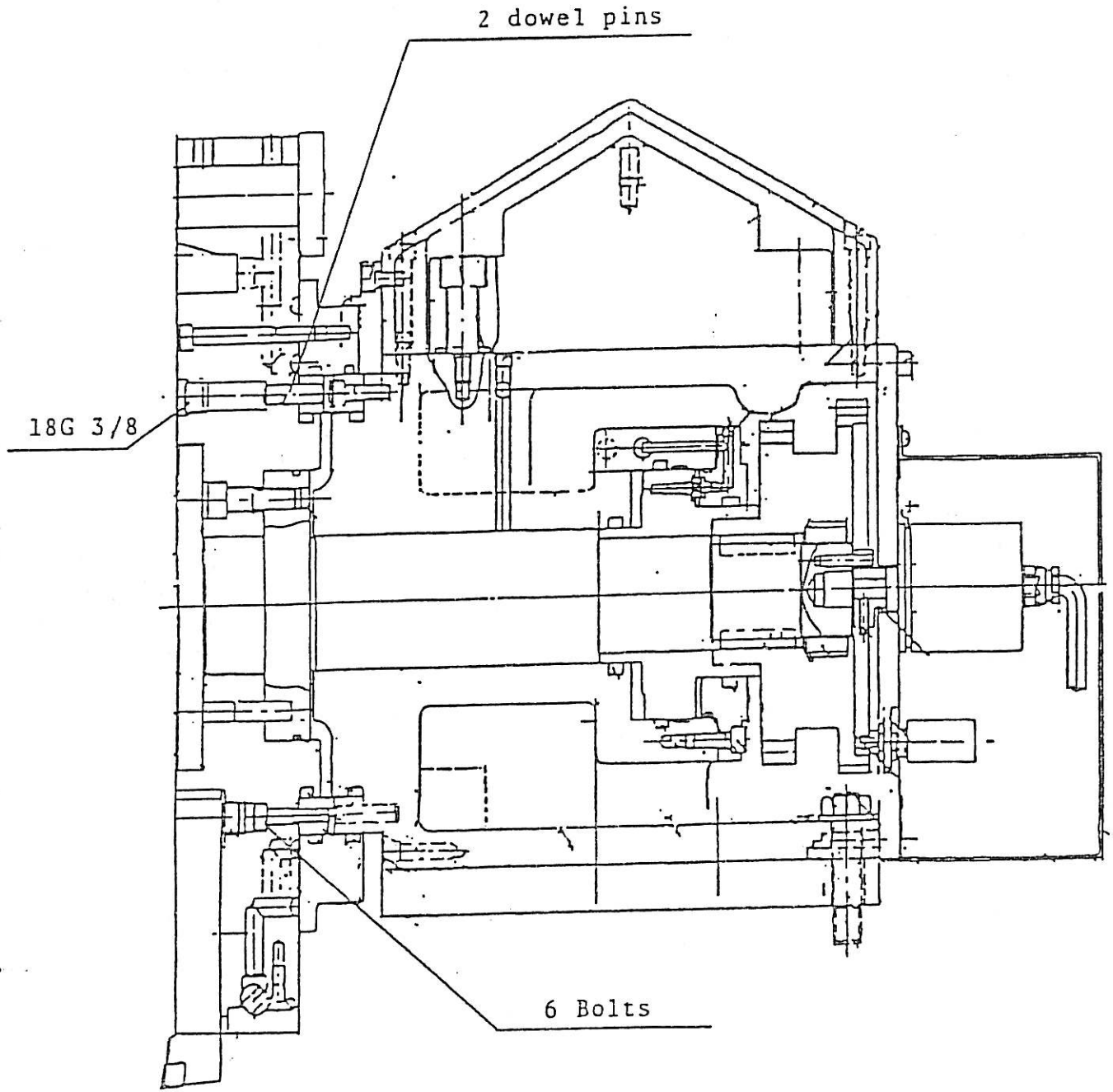


B) How to adjust tool post

1. HYD pressure down to 100 PSI, adjustment on the HYD tank.
2. Remove following parts
8 pieces of plugs (18G 3/8)
2 pieces of dowel pins
6 pieces of bolts just loosen and finger tight.
3. Adjust tool post up or down, use soft hammer.



Hydraulic Unit



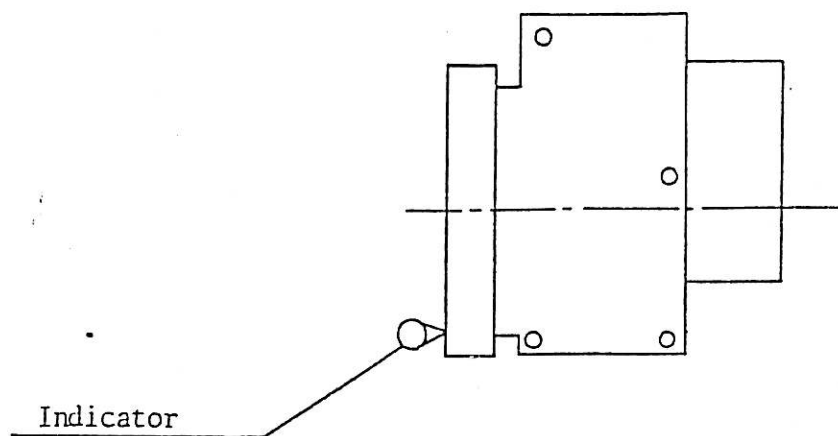
HOW TO ADJUST TURRET HEAD ALIGNMENT

If the tool head runs into the chuck workpiece or tail stock, the turret head may shift.

If the head shifted ID center line will move off, it means the boring bar or drill to cut oversize or break.

1. Checking for parallelism of turret head face by X axis movement.

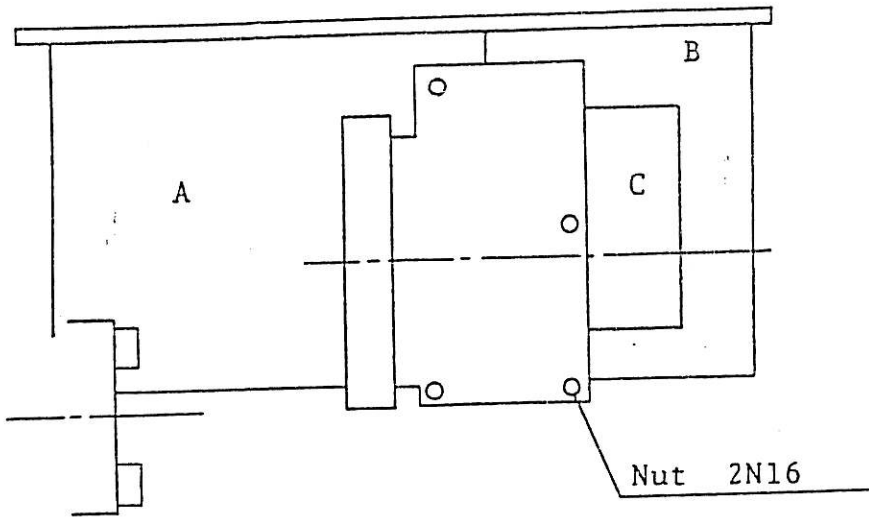
- 1) Index tool #1
- 2) Clean and stone any nicks or burr
- 3) Touch face with indicator (0.001")
- 4) Move X axis (+) or (-) by hand or slow jog feed.
- 5) Tolerance of taper within $\pm 0.0004/4''$



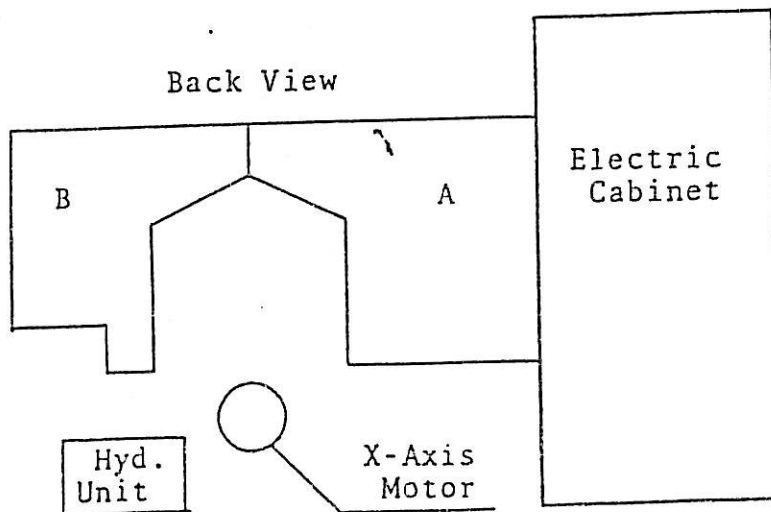
2. How to adjust

- 1) Remove cover A & B & C
- 2) Loosen four nuts (2N16)
- 3) Adjustment for turret head within $\pm 0.0004"/4"$
- 4) Tighten four nuts
- 5) Put back cover

Top View



Back View

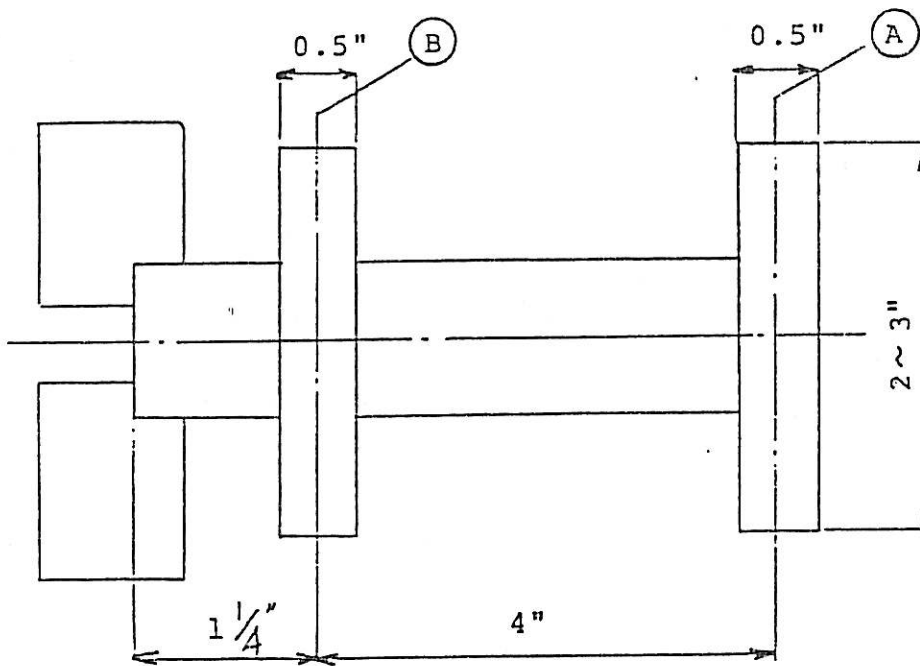


3 OD TURNING ACCURACY TEST (HEAD STOCK ADJUSTMENT)

The head-stock might be a little bent when there has been a crash or interference between tooling and head-stock. As a result it will turn a taper in O.D. turning and I.D. boring.

The following are the sequences to measure the O.D. turning accuracy and adjust the head stock.

- 1) Measure the O.D. turning accuracy
 - a) Prepare "Test Piece" shown below.



Material

Brass (Best)
Aluminum (Better)
or Cast iron

Steel is no good.

- b) Put the test piece on the chuck, and also put O.D. profiling tool. (Better to use 1/64" or less tool nose radius insert).
- c) Turn the spindle (If the material is aluminum use 700 rpm.,

Mode select switch to MDI, press **PRGRM** button select "MDI" on the CRT display by **PAGE** button.

Press **G 9 7** keys and **INPUT** button.

Press **S 8 0 0** keys and **INPUT** button.

Press **M 4 2** keys and **INPUT** button, then press **START** button.

After check the chuck clamp and door switch, press **M 0 3** keys and **INPUT** button, then press **START** button. (Spindle turn).

- d) Turn the O.D. of material **(A)** and **(B)** by "JOG" feed (the case of 800 rpm spindle speed, use 5.0"/min.) also the depth of cut about 0.008" dia. (rough turn).
- e) Turn the O.D. of material again, the depth of cut about 0.005". (light rough turn).
Read out "X" position from CRT display (press **POS** and **PAGE** button).
- f) Change spindle speed for finish turn. (If material is aluminum use 1000 rpm).
Mode select switch to MDI, press **PRGRM** button, select "MDI" on the CRT display by **PAGE** button.
Press **S 1 0 0 0** keys and **INPUT** button, then press **START** button. (Spindle speed change).
- g) Finish turn the O.D. of material **(A)** by "JOG" feed (the case of 1000 rpm spindle speed, use 3"/min). also the depth of cut less than 0.003" from read out of the "X" position at e)
- h) Clear the tool and stop the spindle, then measure the diameter with micrometer.

To clearance in CYLINDRICALITY is 0.0004" in 4" length.

(between **(A)** and **(B)**)

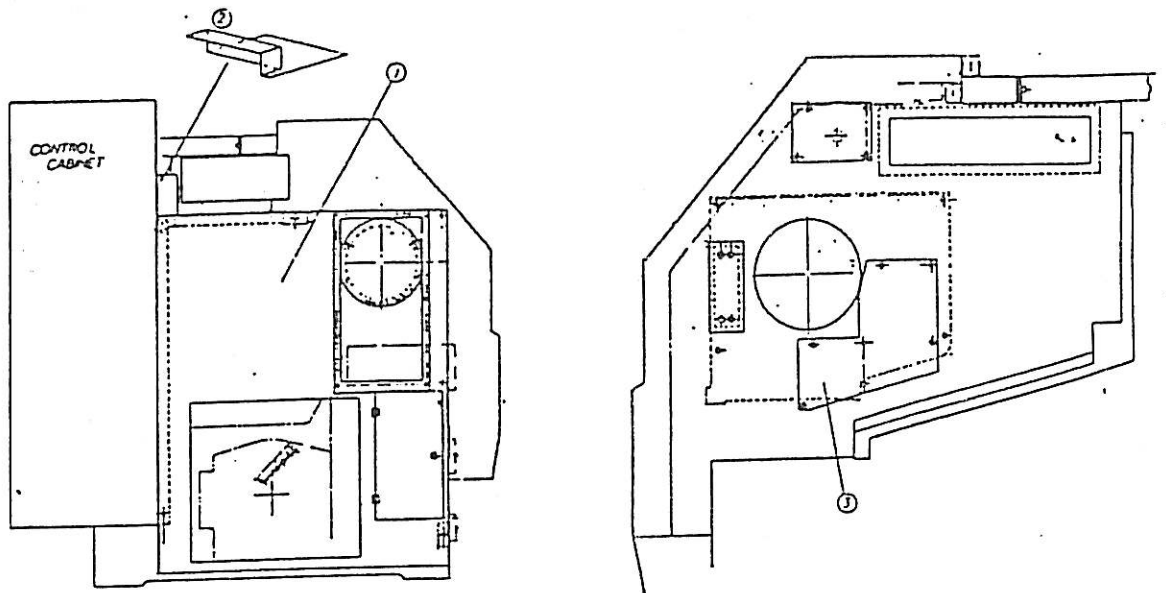
(Test Piece shall not lean on negative side of X axis.)

↓

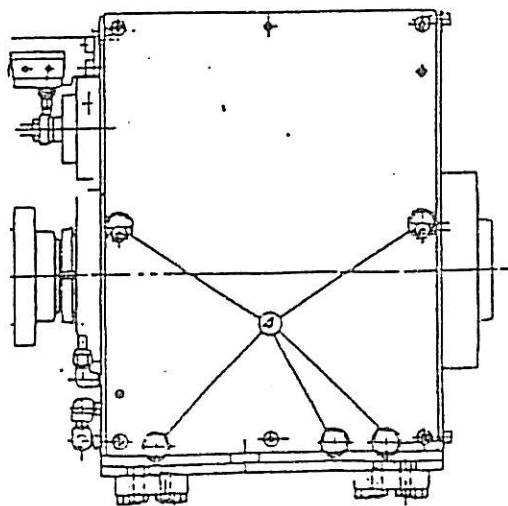
Always Indicator reading **(A)** ≤ Indicator reading **(B)**

2) ADJUST THE HEAD STOCK

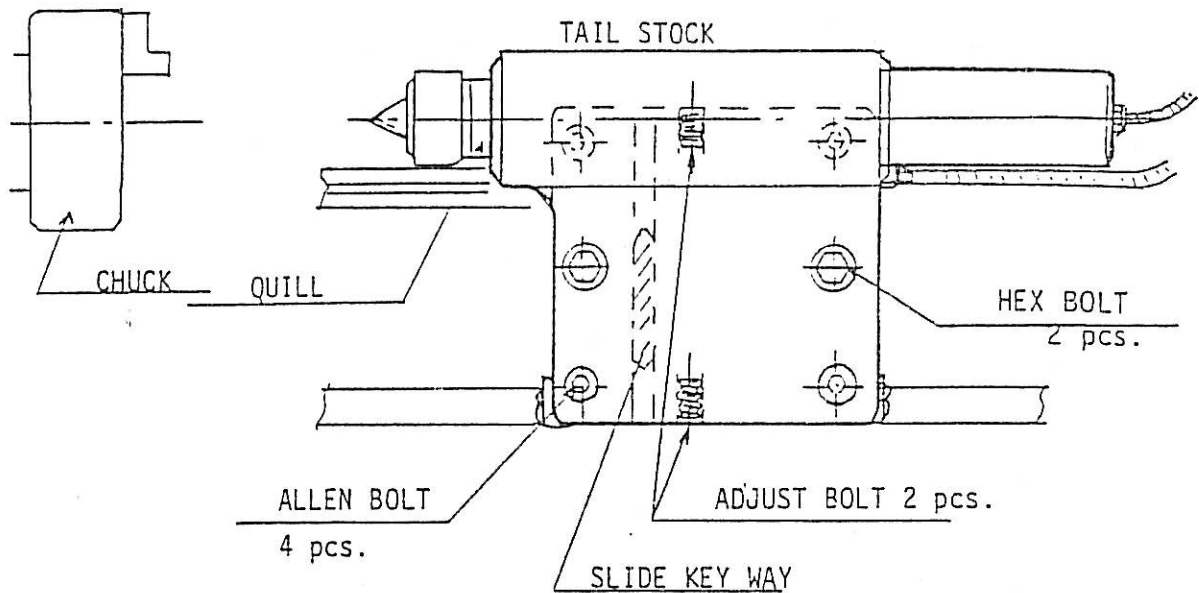
- a) Move tool back to home position "X" and "Z"
- b) Take three covers off shown below.
 - 1) Large cover on left side of head stock.
 - 2) Top cover behind head stock
 - 3) Small cover below right side face of head stock



- c) Prepare 24mm spanner wrench, and loosen five hex head bolts. No. 4
Then loosen No. 7
(Do not touch bolt No. 8 always fixed.)
- d) Pull the head stock by bolt No. 5 or push the headstock by bolt No. 6. (Do not forget to lock the bolts).
- e) Tighten bolts No. 4.



ADJUSTMENT OF TAIL STOCK ALIGNMENT



1. Basic

If the turret head is run into the tailstock or workpiece with live center, the force of the crash may be enough to move the tailstock out of alignment with spindle-centerline.

2. Step by Step

a) Checking Alignment

1. Indicate quill O.D. from chuck.
2. Reading from side to side should be less than $.0005$.

b) Adjustment

1. Loosen two hex bolts.
2. Loosen four allen bolts.

c) Next, adjust the tailstock for alignment by adjust bolt.

d) After adjustment is over, tighten allen bolts and hex bolts.

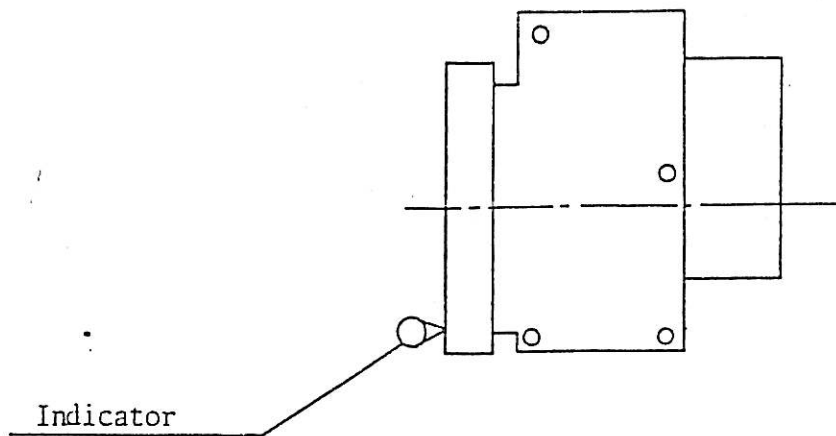
HOW TO ADJUST TURRET HEAD ALIGNMENT

If the tool head runs into the chuck workpiece or tail stock, the turret head may shift.

If the head shifted ID center line will move off, it means the boring bar or drill to cut oversize or break.

1. Checking for parallelism of turret head face by X axis movement.

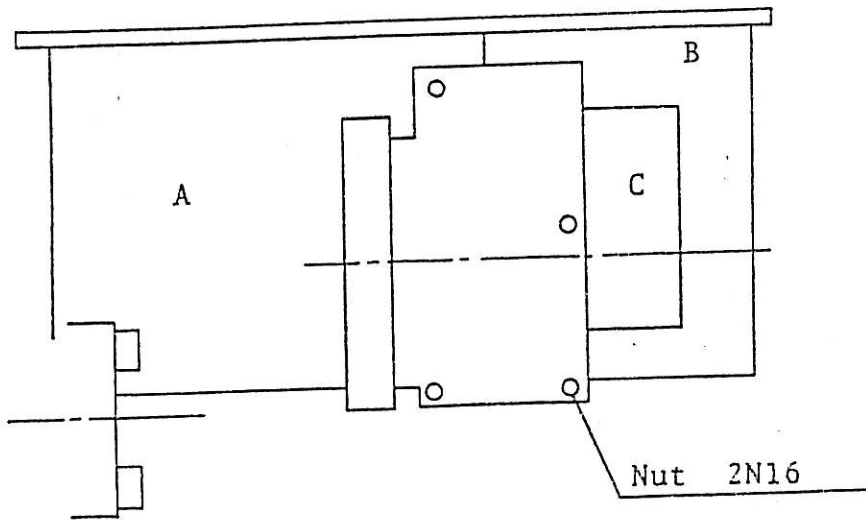
- 1) Index tool #1
- 2) Clean and stone any nicks or burr
- 3) Touch face with indicator (0.001")
- 4) Move X axis (+) or (-) by hand or slow jog feed.
- 5) Tolerance of taper within $\pm 0.0004/4"$



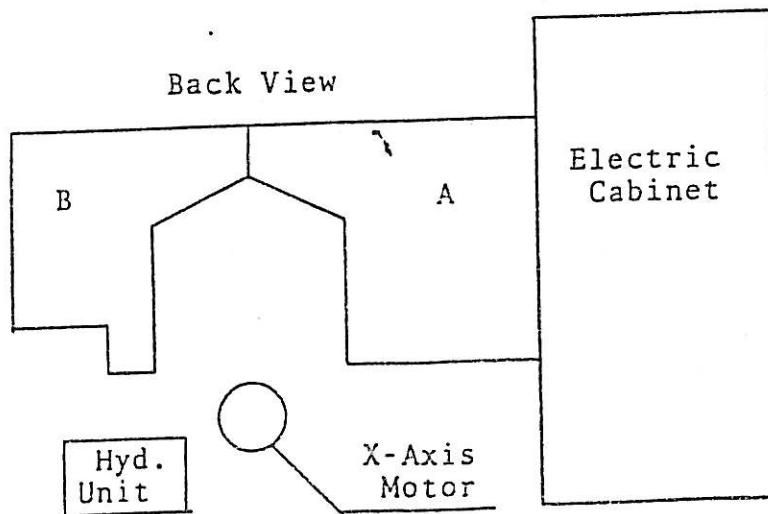
2. How to adjust

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Top View



Back View

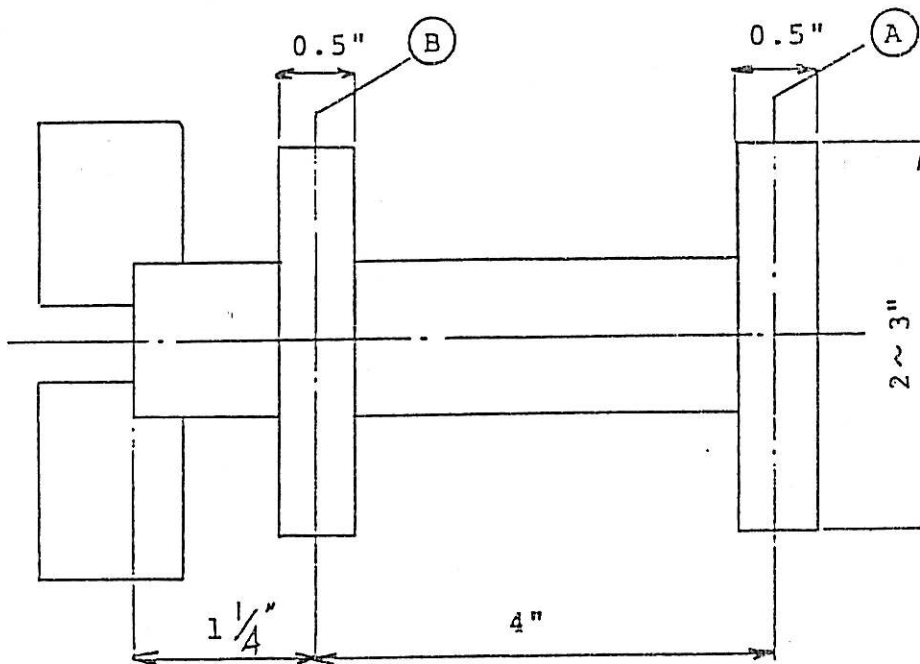


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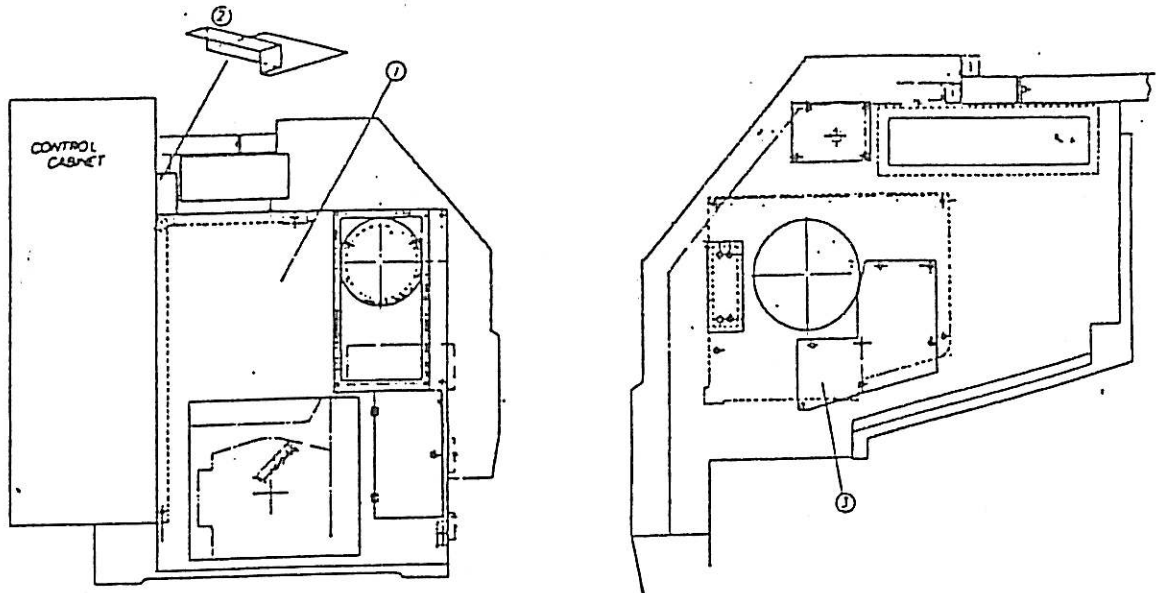
(between (A) and (B))

(Test Piece shall not lean on negative side of X axis.)

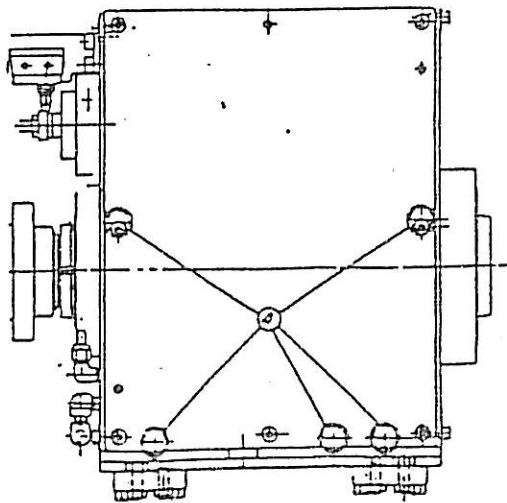
Always Indicator reading (A) \leq Indicator reading (B)

2) ADJUST THE HEAD STOCK

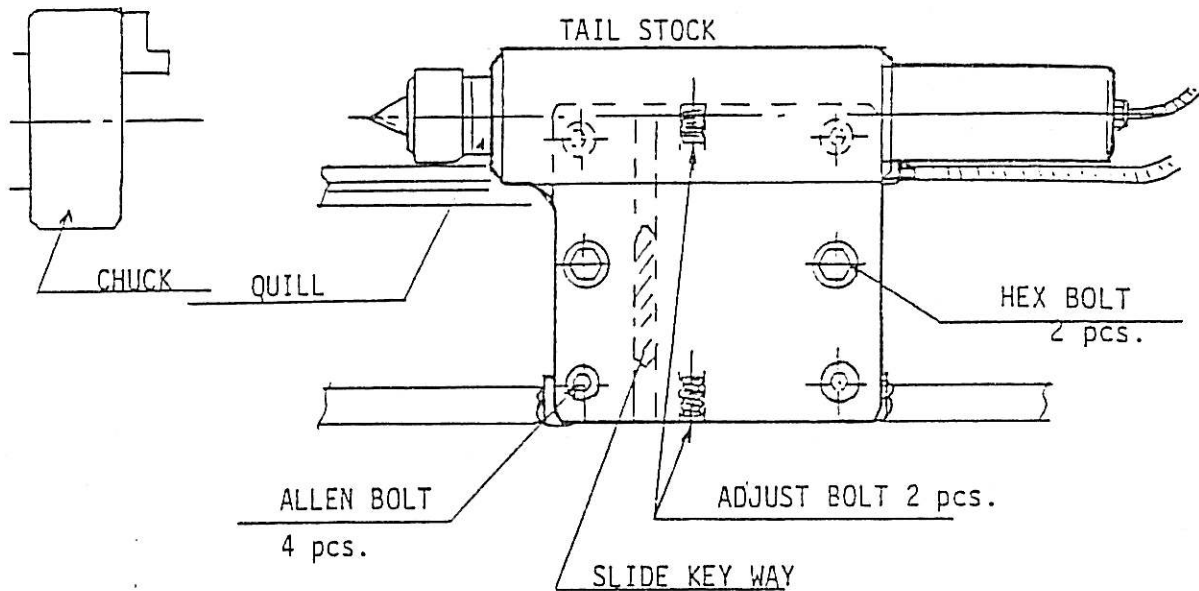
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