SERVICE NOTES

SIGN MAKER CAMM-1 PRO by ROLAND DIGITAL GROUP

Roland DIGITAL GROUP

PNC-1860/1410/1210

Specifications

Mechanism ..... Media-movement method
Driving method ..... Digital control servo motor
Maximum cutting area ..... [PNC-1860] 1195 mm (W) x 24998 mm (L) (47"x 984-1/8")
[PNC-1410] 889 mm (W) x 24998 mm (L) (35"x 984-1/8")
[PNC-1210] 585 mm (W) x 24998 mm (L) (23"x 984-1/8")
Acceptable material widths ..... [PNC-1860] 90 mm—1372 mm (3-1/2"—54")
[PNC-1410] 90 mm—1067 mm (3-1/2"—42")
[PNC-1210] 50 mm—762 mm (1-15/16"—30")
Tools ..... Cutters:Special cutter for CAMM-1 series
Pens:Water-based fiber-tipped pens, 32 color plotter pens (options)
Thick water-based fiber-tipped pens (options)
Max.cutting speed ..... During cutting:850 mm/sec. (in all directions)
During tool-up:1202 mm/sec. (in 45º direction)
Cutting speed ..... 10 mm/sec.— 850 mm/sec. (in increments of 10 mm/sec.)
Blade force ..... 20 gf — 350 gf (in increments of 10 gf)
Software resolution ..... 0.025 mm / step
Distance accuracy ..... Error of less than +/- 0.2% of distance travelled, or 0.1mm, whichever is grater
Repetition accuracy ..... 0.1 mm or less
Interface ..... Parallel (Centronics compatible), Serial (RS-232C)
Buffer size ..... 1 Mbyte (Expandable up to 3 Mbyte)
Instruction system ..... CAMM-GL III (mode1 and mode2)
Switches ..... Power switch
Control switches ..... ◀ ,▶ ,▲ ,▼ , ENTER, MENU, TEST, SETUP
LED ..... POWER LED, SETUP LED
Display ..... Liquid crystal display unit; 16-character by 2 lines
Power consumption ..... [117V] 1.0A, [220-230V] 0.5A, [230-240V] 0.5A, [100V] AC100V+/-10 % 50/60Hz 1.0A
Acoustic noise level ..... [Cutting mode] under 62dB (A), [Standby mode] under 40dB (A) (According to ISO 7779)
Dimensions ..... [PNC-1860] 1575 mm (W) x 300 mm (D) x 286 mm (H) (62-1/16" (W) x 11-13/16" (D) x 11-5/16" (H))
[PNC-1410] 1270 mm (W) x 300 mm (D) x 286 mm (H) (50-1/16" (W) x 11-13/16" (D) x 11-5/16" (H))
[PNC-1210] 965 mm (W) x 300 mm (D) x 296 mm (H) (62-1/16" (W) x 11-13/16" (D) x 11-11/16" (H))
Weight ..... [PNC-1860] 38 kg (83.8 lb.), [PNC-1410] 28.5 kg (62.8 lb.), [PNC-1210] 22.5 kg (49.6 lb.)
Temperature ..... 5—40ºC (41—104ºF)
Humidity ..... 35%—80% (non-condensing)
Accessories ..... [100V Only] MANUAL,USE JP PNC-1860 [26015127], ADAPTER PLUG [13499209] , AC CORD 100V 3P [23495214]
[Others] TOOL,ALIGNMENT [21935110], SHEET SEPARATOR [12569419], TWEEZERS [12569656],
MANUAL,USE EN PNC-1860 [26015128], AC CORD 117V [13499109], AC CORD (220V) [23495125]
AC CORD (240V) [23495124], AC CORD KP-610 240VE, BS [13499111]
Others ..... CARTON PNC-1860 [22605193], CARTON PNC-1410 [22605109], CARTON PNC-1210 [22605192]

Interface Specifications

[Parallel]
Standard ..... In compliance with the specifications of Centronics
Input signals ..... STROBE (1BIT), DATA (8BITS)
Output signals ..... BUSY (1BIT), ACK (1BIT)
Level of input/output signals ..... TTL level
Transmission method ..... Asynchronous

[Serial]
Standard ..... RS-232C specifications
Transmission method ..... Asynchronous, duplex data transmission
Transmission speed ..... 2400, 4800, 9600, 19200 (selected using panel keys)
Parity check ..... Odd, Even, or None (selected using panel keys)
Data bits ..... 7 or 8 bits (selected using panel keys)
Stop bits ..... 1 or 2 bits (selected using panel keys)
Handsheke ..... DTR or Xon/Xoff (selected using panel keys)

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ROLAND DG CORPORATION

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PNC-1860 '02Jan.DE0
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DE0031496SN R1-1

Typographic Conventions

Following marks describes as follows.



: Tips and advice before the adjustment.



: Indicates tightening torque.



: Indicates amout for Pen Pressure and Tension.



: Indicates clearance.



: Electric charge. Do not touch when power is on.

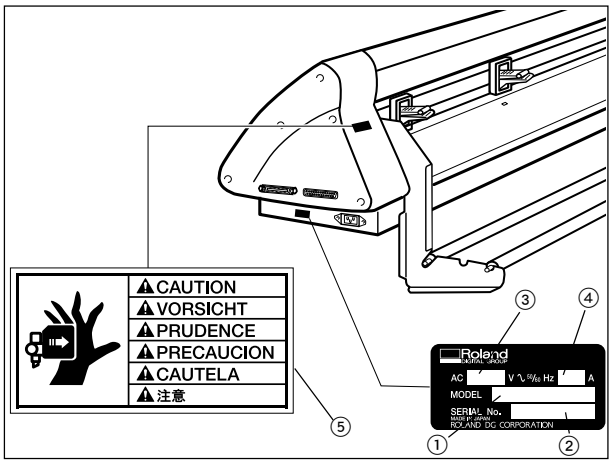


: The wiring terminal intended for connecetiion of the protective earthing conductor associateed with the supply wiring. Do not disconnect the cable of this terminal except the time of replacement.

⚠ About the Labels Affixed to the Unit

These labels are affixed to the body of this product.

①Model Name
②Serial NO.
③Voltage
④Power consumption
⑤CAMM-1 CAUTION LABEL No.453

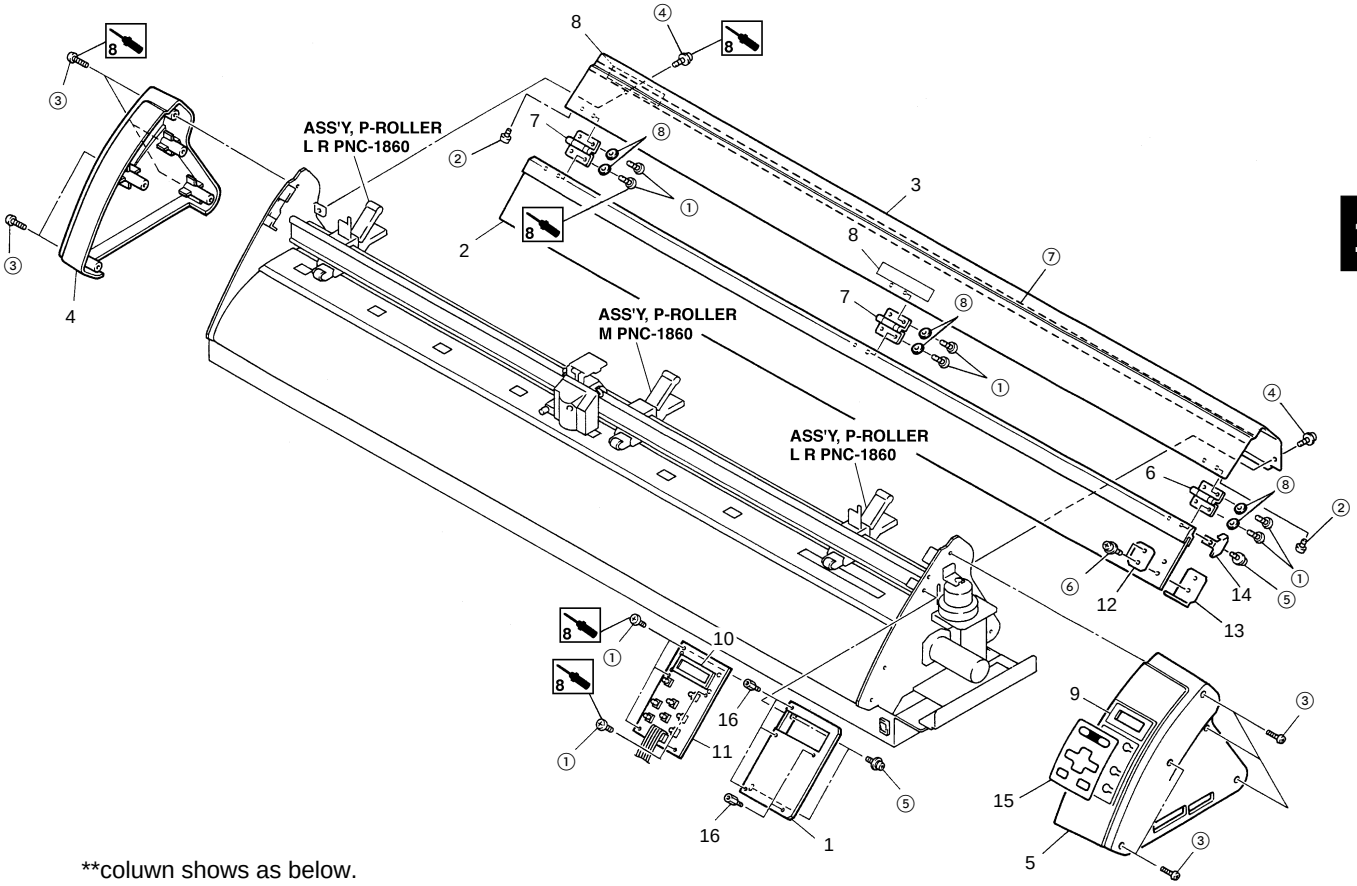


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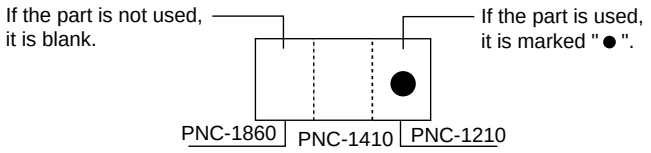
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1 Structure & Spare Parts

1-1 COVERS



**coluwn shows as below.



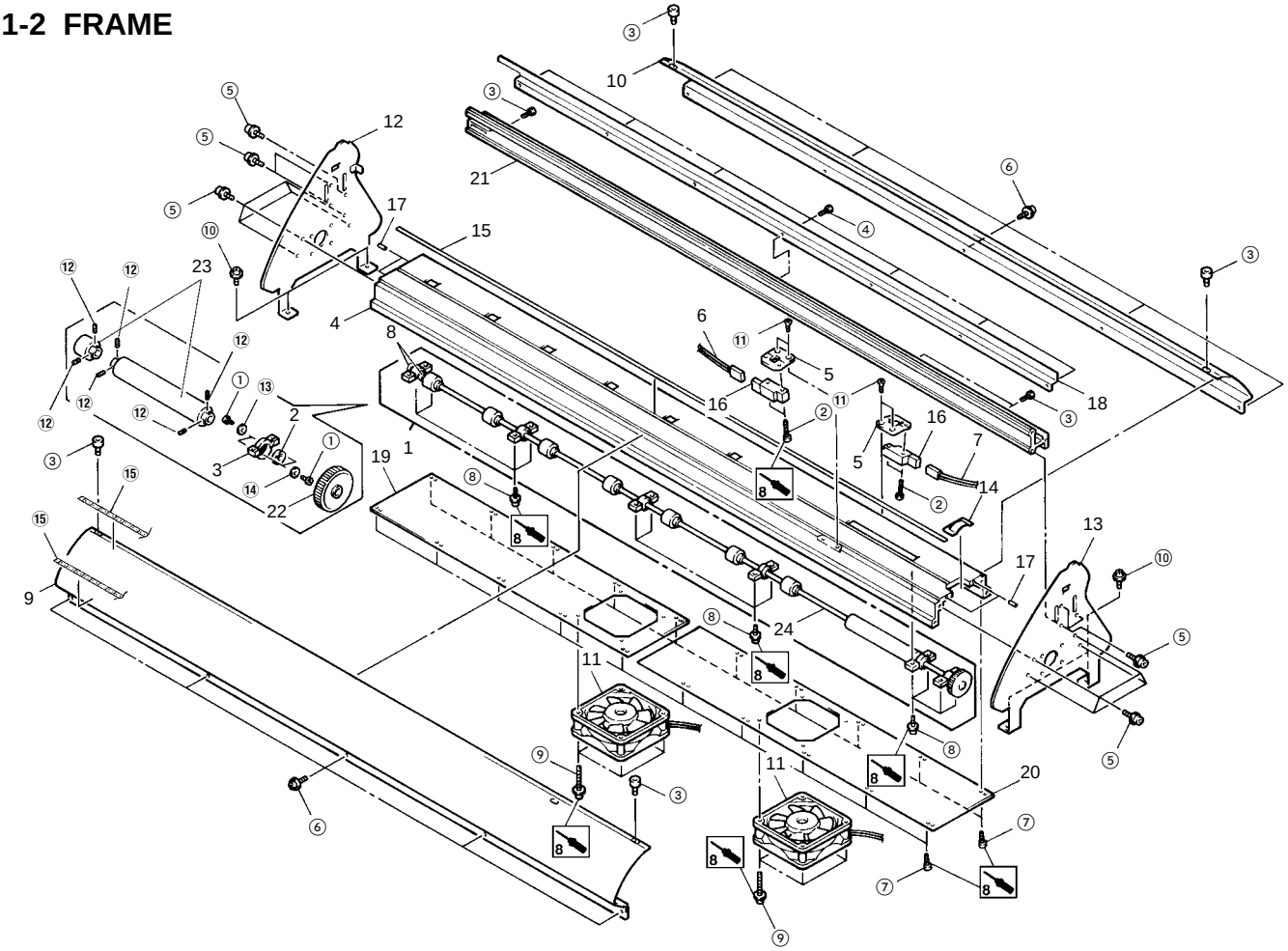
PARTS LIST -Main Parts-

	Parts No.	Parts Name			
1	22355444SZ	BASE OF SW PANEL	•	•	•
2	22025148	COVER,FRONT PNC-1210			•
	22025161	COVER,FRONT PNC-1410		•	
	22025147	COVER,FRONT PNC-1860	•		
3	22025150	COVER,RAIL PNC-1210			•
	22025158	COVER,RAIL PNC-1410		•	
	22025149	COVER,RAIL PNC-1860	•		
4	22065234	COVER,SIDE L PNC-1860	•	•	•
5	22065243	COVER,SIDE R PNC-1860	•	•	•
6	22325106	HINGE,001	•	•	•
7	22325108	HINGE,003	•	•	•
8	22505106	LABEL,CAMM-1 PRO NO.546	•	•	
9	22255302	LCD COVER	•	•	•
10	15029402	LCD RCM2065R-A 16*2	•	•	•
11	7393321010	PANEL BOARD ASS'Y	•	•	•
12	22055272	PLATE,F COVER PNC-1860	•	•	•
13	22055262	PLATE,MAGNET PNC-1860	•	•	•
14	22055180	PLATE,SW COVER PNC-1860	•	•	•
15	22665174	SHEET,SW PANEL PNC-1860	•	•	•
16	22155567	SPACER M3X5	•	•	•

PARTS LIST -Supplemental Parts-

	Parts Name	
①	SCREW BINDING HEAD	Cr 3X4
②	SCREW BINDING HEAD	Cr 3X6
③	SCREW BINDING HEAD	BC 3X8
④	SCREW BINDING HEAD+FW	Ni 3X8
⑤	SCREW DOUBLE SEMS	BC 3X6
⑥	SCREW DOUBLE SEMS	BC 3X8
⑦	TAPE SCOTCH TAPE #250	W=25MM
⑧	WASHER SPRING	Cr M3

1-2 FRAME



PARTS LIST -Main Parts-

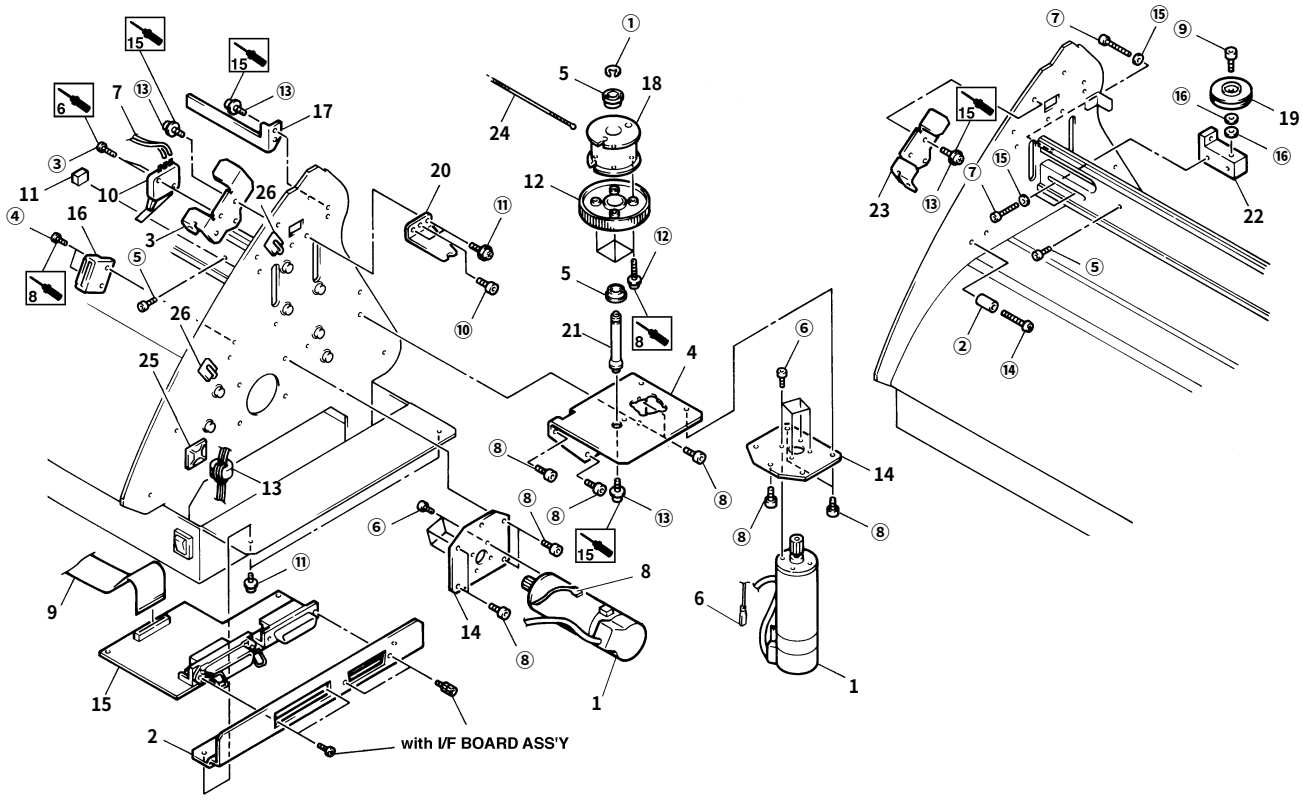
	Parts No.	Parts Name	**		
1	22805134	ASS'Y,GRIT ROLLER PNC-1210			•
	22805135	ASS'Y,GRIT ROLLER PNC-1410		•	
	22805136	ASS'Y,GRIT ROLLER PNC-1860	•		
2	22175870	ASS'Y,GRIT ROLLER PNC-1860	•	•	•
3	22115106	BEARING HOUSING A	•	•	•
4	22005104	BED,PNC-1210			•
	22005106	BED,PNC-1410		•	
	22005105	BED,PNC-1860	•		
5	21985104	BRACKET,SENSOR PNC-1860	•	•	•
6	23465140	CABLE-ASSY PAPERSENS F PNC1860	•	•	•
7	23465139	CABLE-ASSY PAPERSENS R PNC1860	•	•	•
8	22165165	COLLAR	•	•	•
9	22025146	COVER,GUIDE F PNC-1210			•
	22025159	COVER,GUIDE F PNC-1410		•	
	22025144	COVER,GUIDE F PNC-1860	•		
10	22025145	COVER,GUIDE R PNC-1210			•
	22025160	COVER,GUIDE R PNC-1410		•	
	22025143	COVER,GUIDE R PNC-1860	•		
11	22435108SZ	FAN MOTOR	•	•	•
12	22115570	FRAME,L PNC-1860	•	•	•
13	22115569	FRAME,R PNC-1860	•	•	•
14	22045160	GEAR COVER	•	•	•
15	22265102	PAD,CUTTER PNC-1210			•
	22265106	PAD,CUTTER PNC-1410		•	
	22265103	PAD,CUTTER PNC-1860	•		
16	15229754	PAPER SENSOR	•	•	•
17	11539105	PIN 2.5*8 SUS BTYPE H7	•	•	•
18	22055259	PLATE,RAIL PNC-1410		•	
	22055172	PLATE,RAIL PNC-1860	•		
19	22055260	PLATE,SHUTTER L PNC-1410		•	
	22055175	PLATE,SHUTTER L PNC-1860	•		

	Parts No.	Parts Name	**		
20	22055176	PLATE,SHUTTER PNC-1210			•
	22055177	PLATE,SHUTTER R PNC-1860		•	•
21	22185318	RAIL,GUIDE PNC-1210			•
	22185320	RAIL,GUIDE PNC-1410		•	
	22185315SZ	RAIL,GUIDE PNC-1860	•		
22	22175609	ROLL DRIVE GEAR	•	•	•
23	22075106	SET,G-ROLLER PNC-1210			•
	22075107	SET,G-ROLLER PNC-1410		•	
	22075105	SET,G-ROLLER PNC-1860	•		
24	22145381	SHAFT,X-DRIVE PNC-1210			•
	22145387	SHAFT,X-DRIVE PNC-1410		•	
	22145380	SHAFT,X-DRIVE PNC-1860	•		

PARTS LIST -Supplemental Parts-

	Parts Name	
①	SCREW BINDING HEAD	Cr 3X4
②	SCREW BINDING HEAD	Cr 3X12
③	SCREW HEXAGONAL CAP	BC 3X6
④	SCREW HEXAGONAL CAP	BC 4X10
⑤	SCREW HEXAGONAL CAP+FW	Cr 4X12
⑥	SCREW DOUBLE SEMS	BC 3X6
⑦	SCREW TP BINDING HEAD	BC 3X6
⑧	SCREW DOUBLE SEMS	BC 3X12
⑨	SCREW DOUBLE SEMS	BC 3X45
⑩	SCREW DOUBLE SEMS	BC 4X8
⑪	SCREW FLAT HEAD	Cr 3X8
⑫	SCREW SOCKET SET	Cr 3X3
⑬	WASHER FLAT	FIVER M3
⑭	WASHER FLAT	Cr 3X8X0.5
⑮	LABEL TAPE,GUIDE	

1-3 X • Y-DRIVE UNIT **Revised**



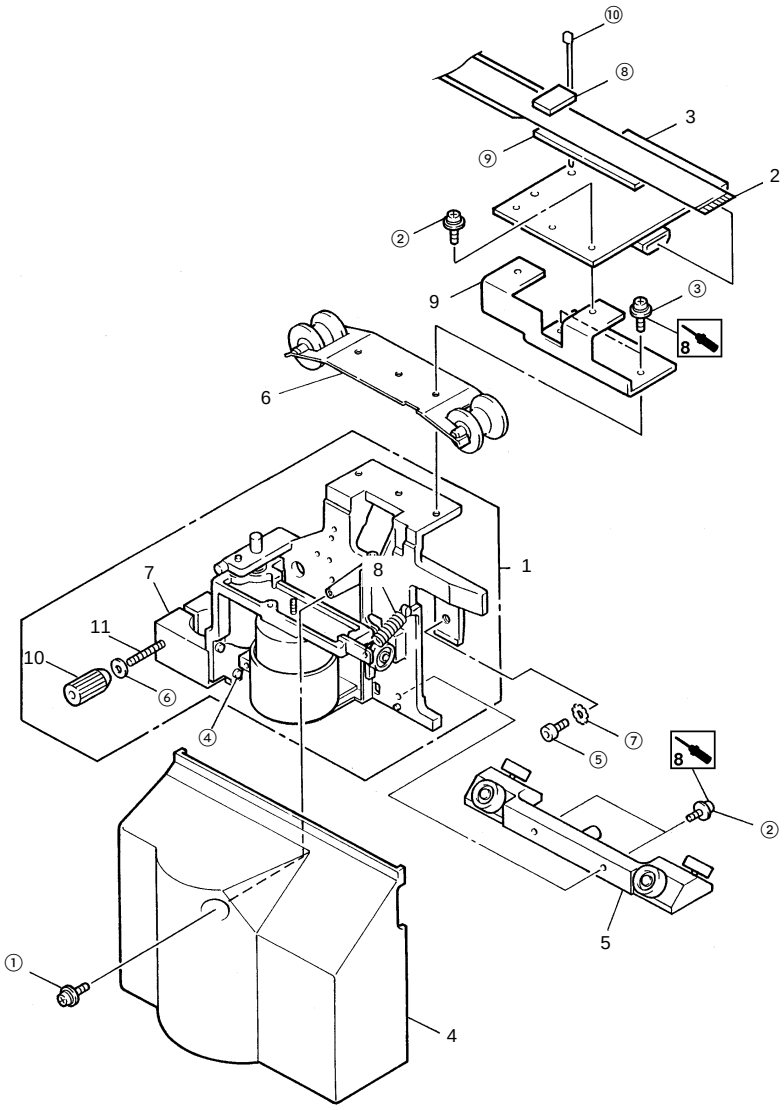
PARTS LIST -Main Parts-

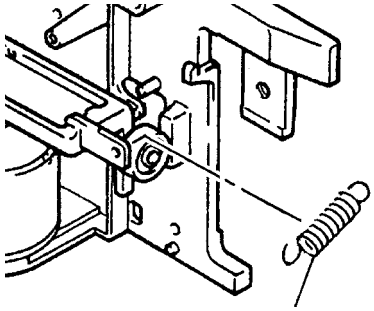
	Parts No.	Parts Name	
1	22805129	ASS'Y,MOTOR PNC-1860	
2	22355318	BASE,I/F BOARD PNC-1860	
3	22355316	BASE,SW COVER PNC-1860	
4	22355315	BASE,Y-MOTOR PNC-1860	
5	22175815	BEARING F8-16ZZ (metal)	
6	23465143	CABLE-ASSY C POWER PNC-1860	
7	23465141	CABLE-ASSY COVER SW PNC-1860	
8	23465144	CABLE-ASSY G POWER PNC-1860	
9	23475120	CABLE-CARD 26P 350L BB	
10	13169102	COVER SW R (AVT3234)	
11	22265295	CUSHION	
12	22175608	DRIVE GEAR	
13	12399313	FILTER(E) TR-20-10-10	
14	21995102	FLANGE,MOTOR PNC-1860	
15	7393321020	I/F BOARD ASS'Y	
16	12399102	MAGNET CATCH TL-105	
17	22055171	PLATE,ORIGIN PNC-1860	
18	21975106	PULLEY HD42.2 S16(B30C35.5)	
19	12179723	PULLEY WITH BEARING	
20	22145122	SHAFT STAY NO.1	
21	22145345	SHAFT,PULLEY PNC-1860	
22	22035318	STAND OF IDLE PULLEY	
23	22145170	STAY,COVER RAIL PNC-1860	
24	21945105	WIRE,Y-DRIVE PNC-1210	
	21945106	WIRE,Y-DRIVE PNC-1410	
	21945104	WIRE,Y-DRIVE PNC-1860	
25	12369428	BINDER BASE KNP-20	
26	12369447	WIRE CLIP CA-14	

PARTS LIST -Supp ementa Parts-

	Parts Name	
①	E-RING ETW-6	Cr M6
②	PIPE	POLY 4X8X10
③	SCREW BINDING HEAD	BC 2X8
④	SCREW BINDING HEAD	BC 3X6
⑤	SCREW HEXAGONAL CAP	BC 3X6
⑥	SCREW HEXAGONAL CAP	Cr 3X8
⑦	SCREW HEXAGONAL CAP	BC 3X16
⑧	SCREW HEXAGONAL CAP	BC 4X6
⑨	SCREW HEXAGONAL CAP	Cr 4X8
⑩	SCREW HEXAGONAL CAP	BC 4X10
⑪	SCREW DOUBLE SEMS	BC 3X6
⑫	SCREW DOUBLE SEMS	BC 3X12
⑬	SCREW DOUBLE SEMS	BC 4X8
⑭	SCREW PAN HEAD	BC 4X14
⑮	WASHER FLAT	BC 3X8X0.5
⑯	WASHER FLAT	Cr 4X8X0.5

1-4 CARRIAGE





SPRING, BACK UP PNC-960

** SPRING, BACK UP PNC-960 should be fixed as in the above figure.

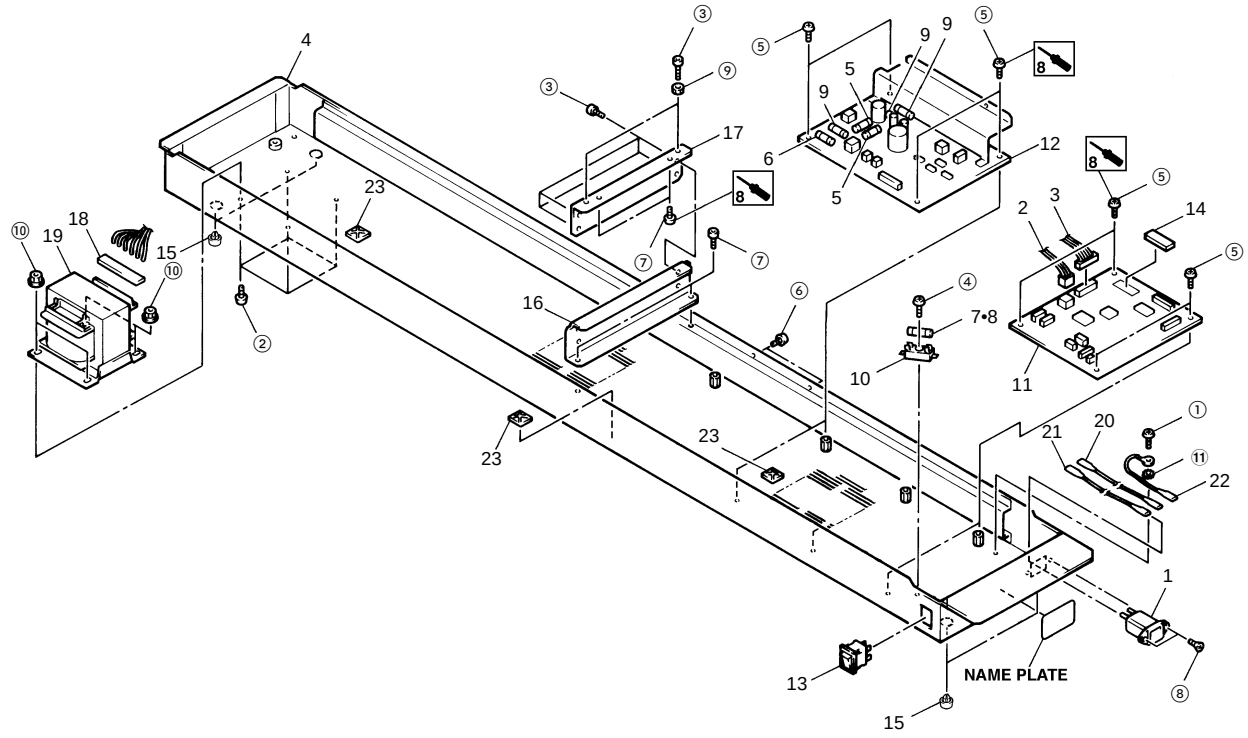
PARTS LIST -Main Parts-

	Parts No.	Parts Name	**		
1	22805133	ASS'Y,CARRIAGE PNC-1860	•	•	•
2	23475119	CABLE-CARD 8P 1630L BB			•
	23475122	CABLE-CARD 8P 1930L BB		•	
	23475121	CABLE-CARD 8P 2230L BB	•		
3	7393321030	CARRIAGE BOARD ASS'Y	•	•	•
4	22045399	CARRIAGE COVER	•	•	•
5	22175828	GUIDE BEARING 2	•	•	•
6	22175343AS	GUIDE BEARING ASS'Y	•	•	•
7	22205134	HOLDER,PEN	•	•	•
8	22175122	SPRING,BACKUP PNC-960	•	•	•
9	22145181	STAY,CARRIAGEBOARD PNC-1860	•	•	•
10	22155586	PEN HOLDER NUT	•	•	•
11	22285352	PEN HOLDER BOLT	•	•	•

PARTS LIST -Supplemental Parts-

	Parts Name	
①	SCREW DOUBLE SEMS	BC 3X6
②	SCREW DOUBLE SEMS	BC 3X8
③	SCREW DOUBLE SEMS	BC 3X10
④	SCREW PAN HEAD	Cr 2X4
⑤	SCREW HEXAGONAL CAP	BC 4X6
⑥	WASHER FLAT	Cr 2X4.3X0.4
⑦	WASHER OUT SIDE TEETH	Cr M4
⑧	CUSHION CABLE HOLD 1	FELT L=10
⑨	CUSHION CABLE HOLD 2	FELT L=40
⑩	BINDER T-18S	

1-5 CHASSIS



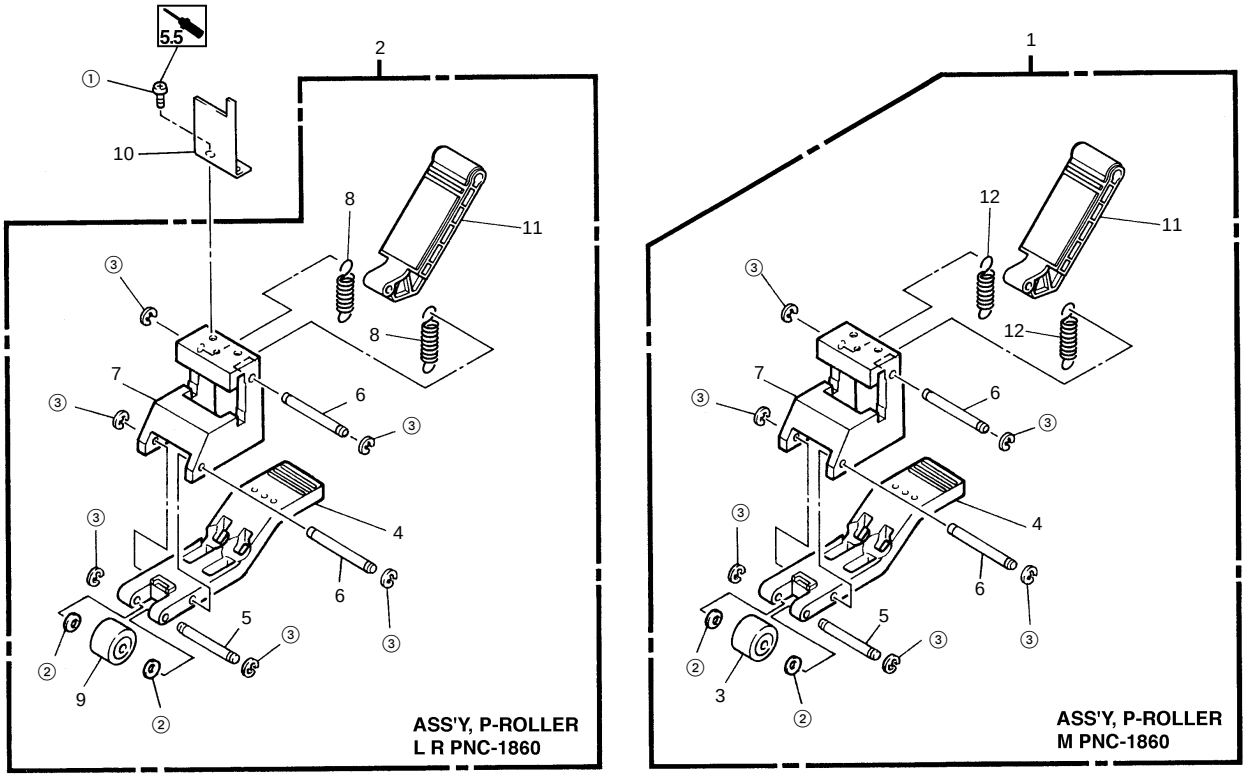
PARTS LIST -Main Parts-

	Parts No.	Parts Name	**		
1	13429746	AC INLET	•	•	•
2	23465132	CABLE-ASSY POWER PNC-1860	•	•	•
3	23465134	CABLE-ASSY POWERSIGNAL PNC1860	•	•	•
4	22815112	CHASSIS,PNC-1210			•
	22815114	CHASSIS,PNC-1410		•	
	22815111	CHASSIS,PNC-1860	•		
5	12559567	FUSE	•	•	•
6	12559574	FUSE	•	•	•
7	12559444	FUSE 5 X 20 SB4 TIME RAG 100/117V	•	•	•
8	12559570	FUSE 5X20 230/240V	•	•	•
9	12559570	FUSE 5X20	•	•	•
10	12189834	FUSE HOLDER FA252B	•	•	•
11	7393315000	MAIN BOARD ASS'Y			•
12	7393318000	POWER BOARD ASS'Y	•	•	
13	13129170	POWER SW AJ7201B	•	•	
14	15449118	ROM A	•	•	•
15	22355168	RUBBER FOOT	•	•	•
16	22165132	SPACER,BED LOWER PNC-1860	•	•	•
17	22165128	SPACER,BED UPPER PNC-1860	•	•	•
18	7393321040	TRANS BOARD	•	•	•
19	22455108U0	TRANSFORMER-PW PNC-1860	•	•	•
20	23465157	CABLE-ASS'Y JUNBIWIRE A PNC-960	•	•	•
21	23505898	WIRE,B GRX-410	•	•	•
22	23505899	WIRE,C GRX-410	•	•	•
23	12369428	BINDER BASE KNP-20	•	•	•

PARTS LIST -Supplemental Parts-

	Parts Name	
①	SCREW BINDING HEAD	SUS 4X5
②	SCREW BINDING HEAD	BC 4X12
③	SCREW HEXAGONAL CAP	BC 4X12
④	SCREW SEMS	Cr 3X10
⑤	SCREW DOUBLE SEMS	BC 3X6
⑥	SCREW DOUBLE SEMS	BC 3X8
⑦	SCREW DOUBLE SEMS	Cr 4X8
⑧	SCREW OVAL HEAD	BC 3X8
⑨	NUT HEXAGONAL	Cr M4
⑩	NUT HEXAGONAL+SPW	Cr M4
⑪	WASHER IN SIDE TEETH	Cr M4

1-6 PINCH ROLLER

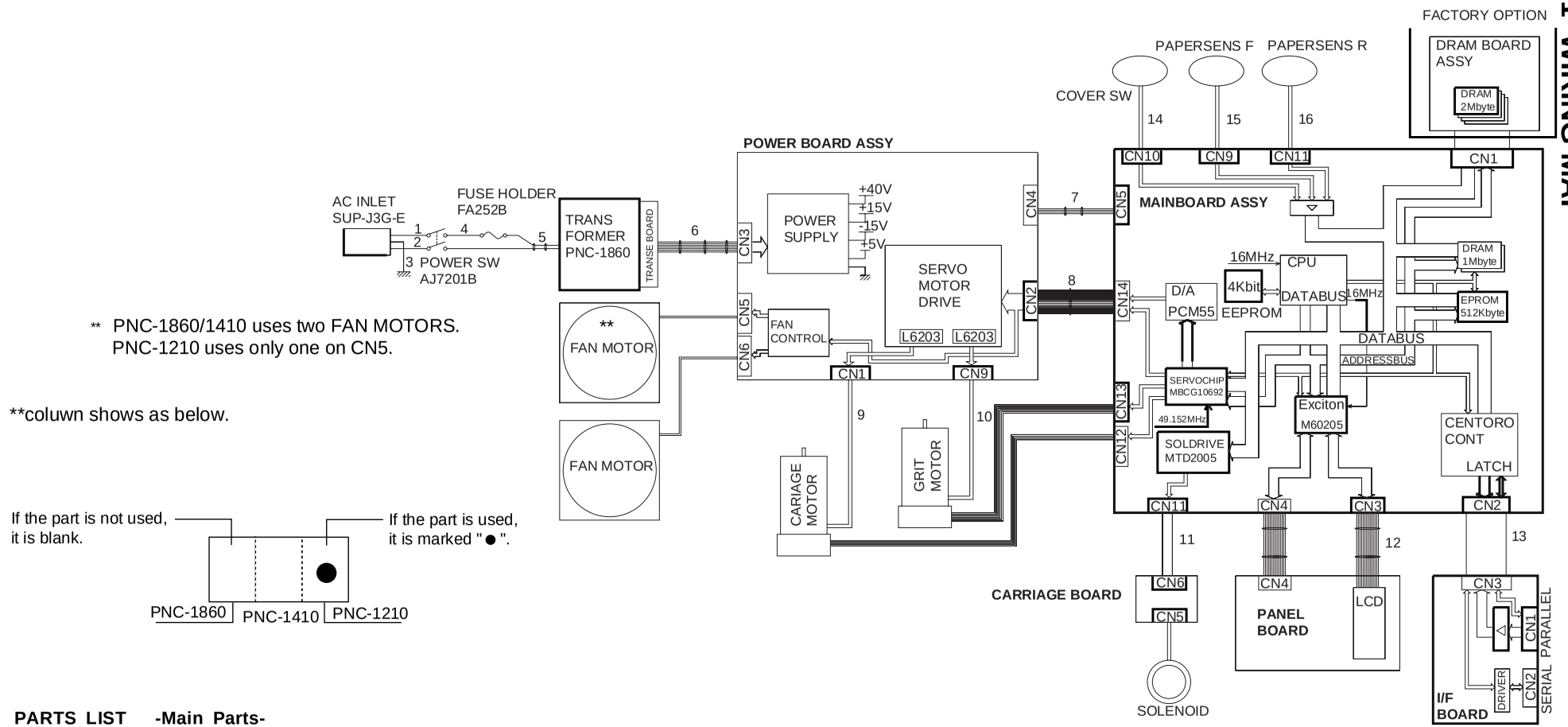


PARTS LIST -Main Parts-

	Parts No.	Parts Name	**		
1	22805130	ASS'Y,P-ROLLER M PNC-1860	•	•	
2	22805131	ASS'Y,P-ROLLER L R PNC-1860	•	•	•
3	22175847	GRX-450 PINCHROLL	•	•	
4	22145404	LEVER OF PINCH ROLL	•	•	•
5	22145831	PIN NO.1	•	•	•
6	22145832	PIN NO.2	•	•	•
7	22115722	PINCH ROLL FRAME	•	•	•
8	22175105	PINCH ROLL SPRING	•	•	•
9	22175877	PINCH ROLLER	•	•	•
10	22055170	PLATE,P-ROLLER PNC-1860	•	•	•
11	22145616	PNC-900 SET LEVER	•	•	•
12	22175128	SPRING,M P-ROLLER PNC-1860	•	•	

PARTS LIST -Supplemental Parts-

	Parts Name	
①	SCREW TP BINDING HEAD	BC 3X6
②	WASHER FLAT	Cr 4X7X0.5
③	ERING ETW-3	Cr M3



** PNC-1860/1410 uses two FAN MOTORS.
PNC-1210 uses only one on CN5.

**coluwn shows as below.

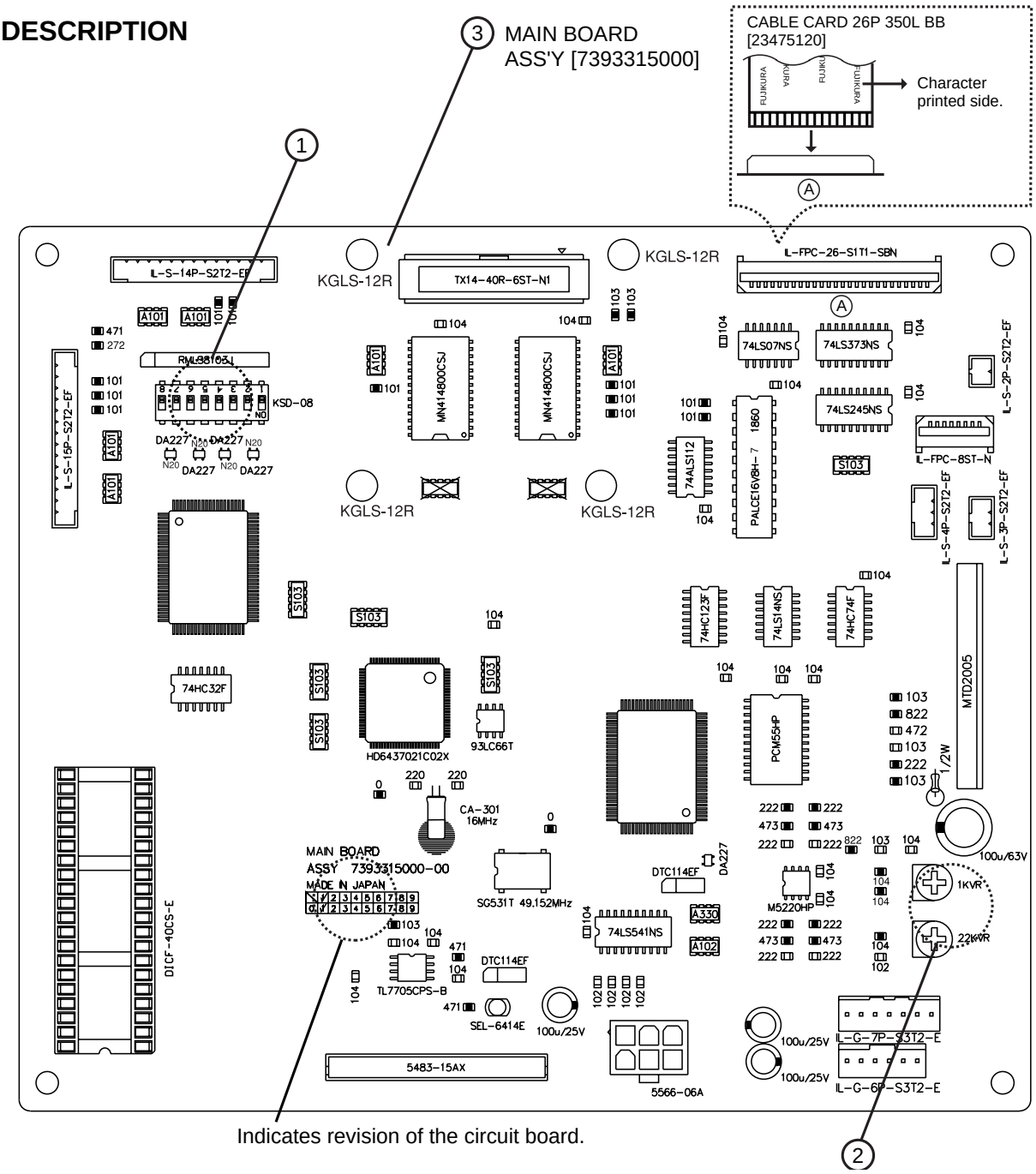
PARTS LIST -Main Parts-

	Parts No.	Parts Name	**		
1	23465157	CABLE ASSY JUNBIWIRE A PNC-960	•	•	•
2	23505898	GRX-410 JUNBIWIRE B	•	•	•
3	23505899	GRX-410 JUNBIWIRE C	•	•	•
4	23465158	CABLE ASSY JUNBIWIRE D PNC-960	•	•	•
5	23465135	CABLE - ASSY JUNBIWIRE E PNC1860	•		
	23465145	CABLE - ASSY JUNBIWIRE E PNC1410		•	
	23465137	CABLE - ASSY JUNBIWIRE E PNC1210			•
6	23465136	CABLE - ASSY JUNBIWIRE F PNC1860	•		
	23465146	CABLE - ASSY JUNBIWIRE F PNC1410		•	
	23465138	CABLE - ASSY JUNBIWIRE F PNC1210			•
7	23465132	CABLE - ASSY POWER PNC1860	•	•	•
8	23465134	CABLE - ASSY POWER SIGNAL PNC1860	•	•	•
9	23465143	CABLE - ASSY C POWER PNC1860	•	•	•

	Parts No.	Parts Name	**		
10	23465144	CABLE - ASSY G POWER PNC1860	•	•	•
11	23475121	CABLE - CARD 8P 1930L BB	•		
	23475122	CABLE - CARD 8P 2230L BB		•	
	23475119	CABLE - CARD 8P 1630L BB			•
12	23465142	CABLE - ASSY LCD PNC-1860	•	•	•
13	23475120	CABLE - CARD 26P 350L BB	•	•	•
14	23465141	CABLE - ASSY COVER SW PNC1860	•	•	•
15	23465140	CABLE-ASSY PAPERSENS F PNC1860	•	•	•
16	23465139	CABLE-ASSY PAPERSENS R PNC1860	•	•	•

2-2 MAIN BOARD ASS'Y

DESCRIPTION



①DIP SW

NO.	FUNCTION	ON	OFF
1	Model Selection	PNC1860	
2	Model Selection	PNC1410	
3	Model Selection	PNC1210	
4	Pen Down Wait	Wait time ON	Wait time OFF
5	Reserved	Always OFF	
6	Reserved		
7	Reserved		
8	Reserved		

BIT#4 is a function to make the pen wait for 0.5 seconds after the pen down before cutting. Set it OFF usually.

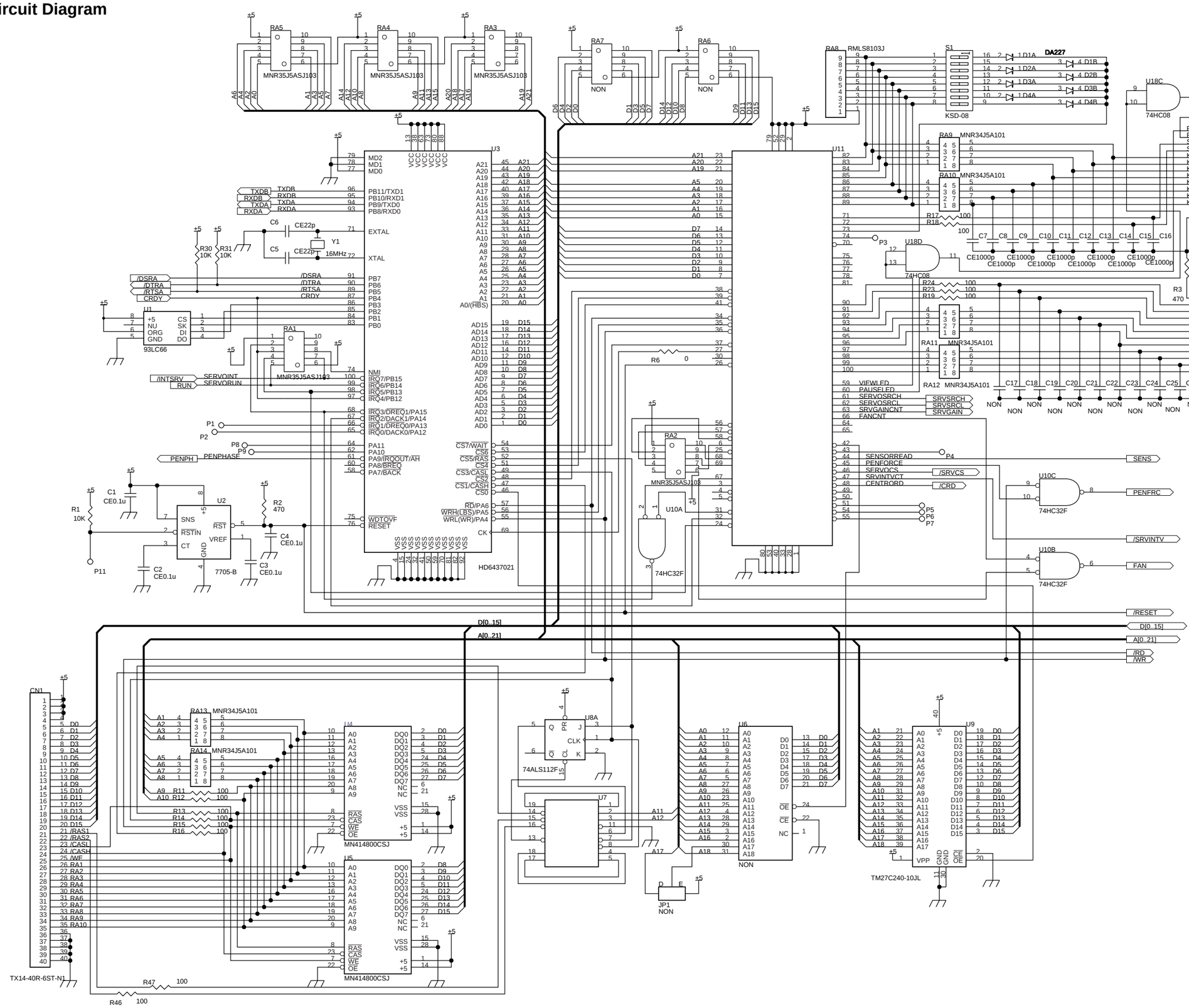
②VR

VR No.	Function
VR1 (1KVR)	Use for Pen Pressure Adjustment.
VR2 (22KVR)	Use for Pen Pressure Adjustment.

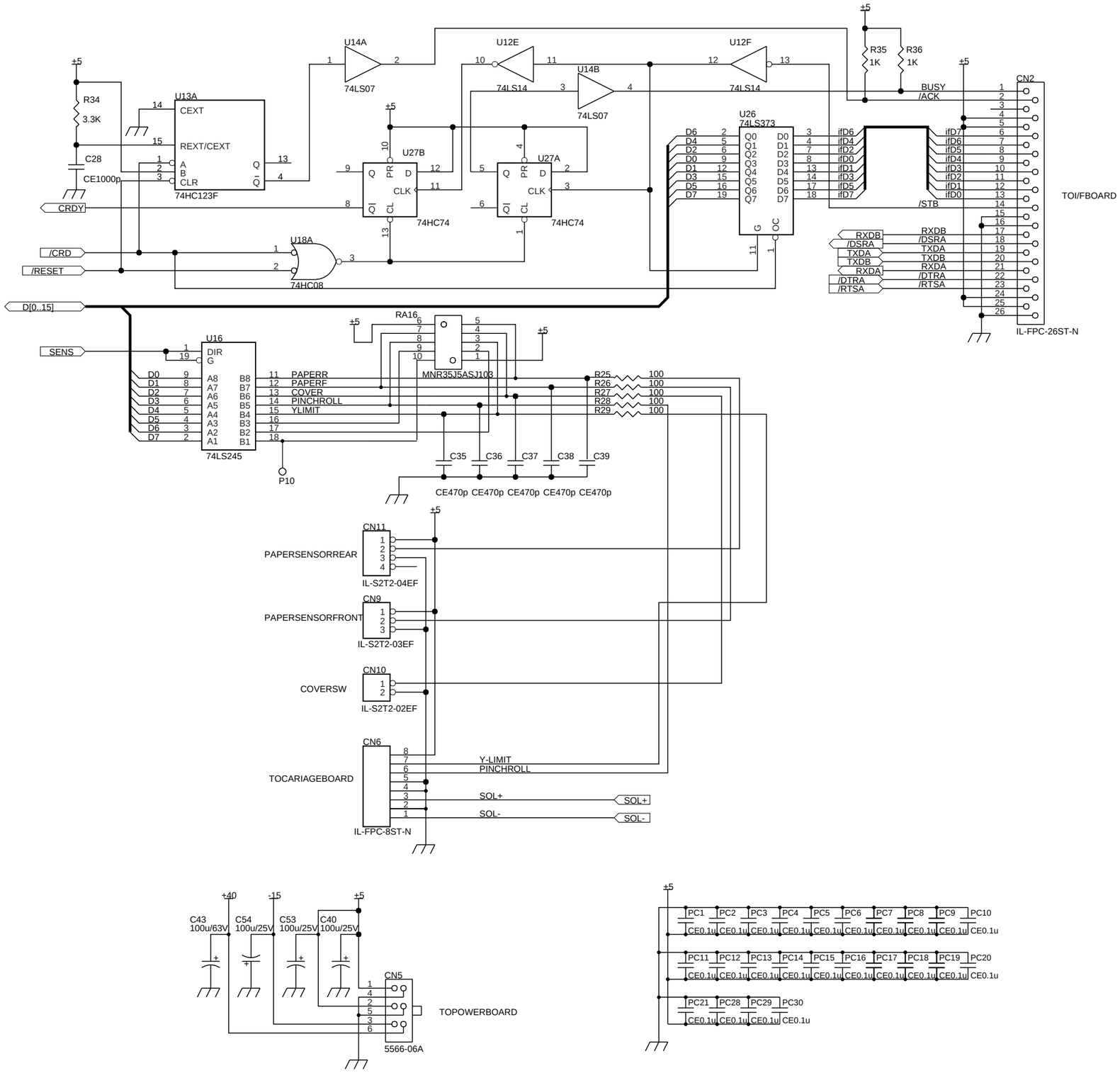
③Electric Maintenance Parts

IC.No.	Parts No.	Description	Function
U31	15189105	MTD2005	Solenoid Driver

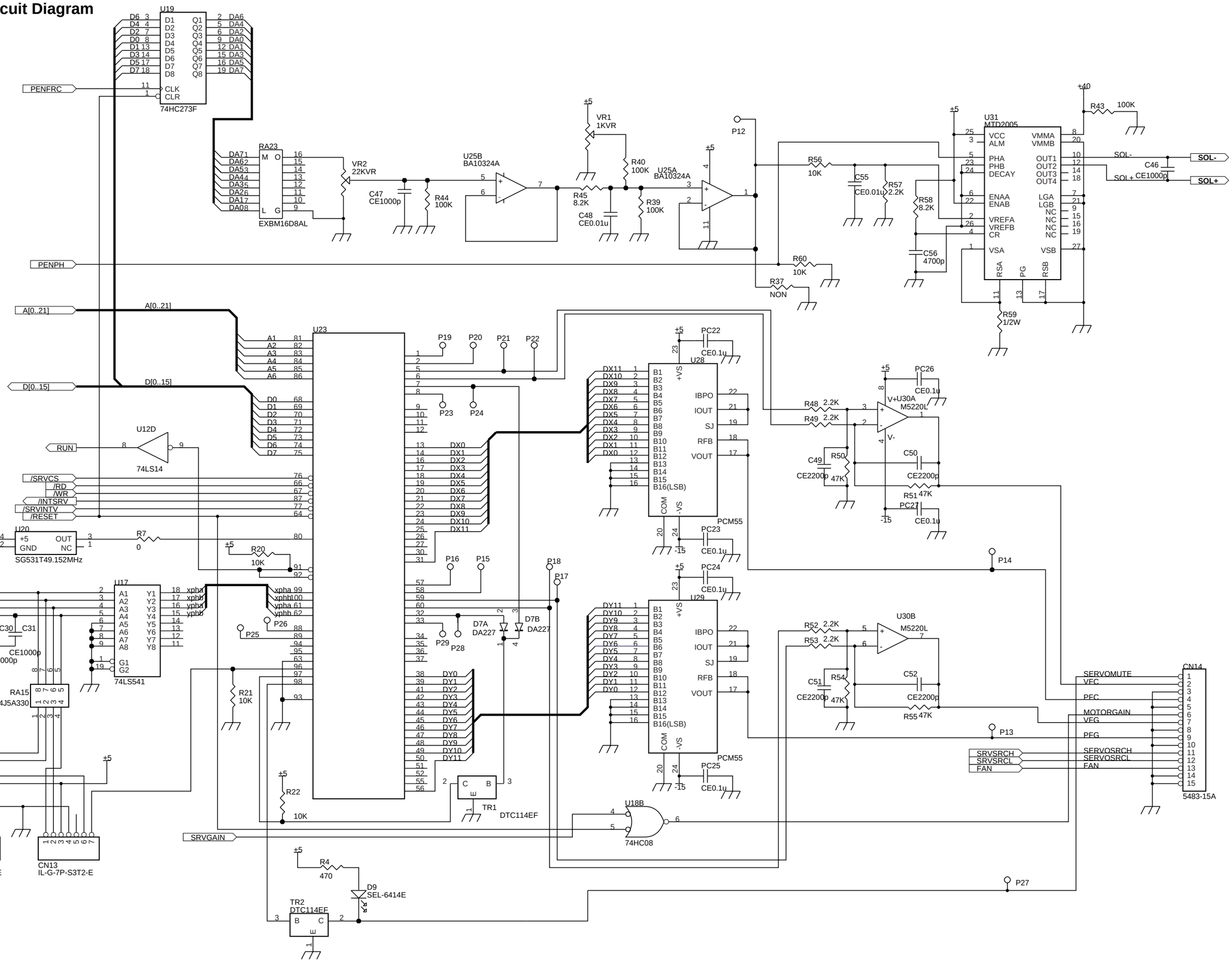
MAIN BOARD_1/3 Circuit Diagram



MAIN BOARD_2/3 Circuit Diagram

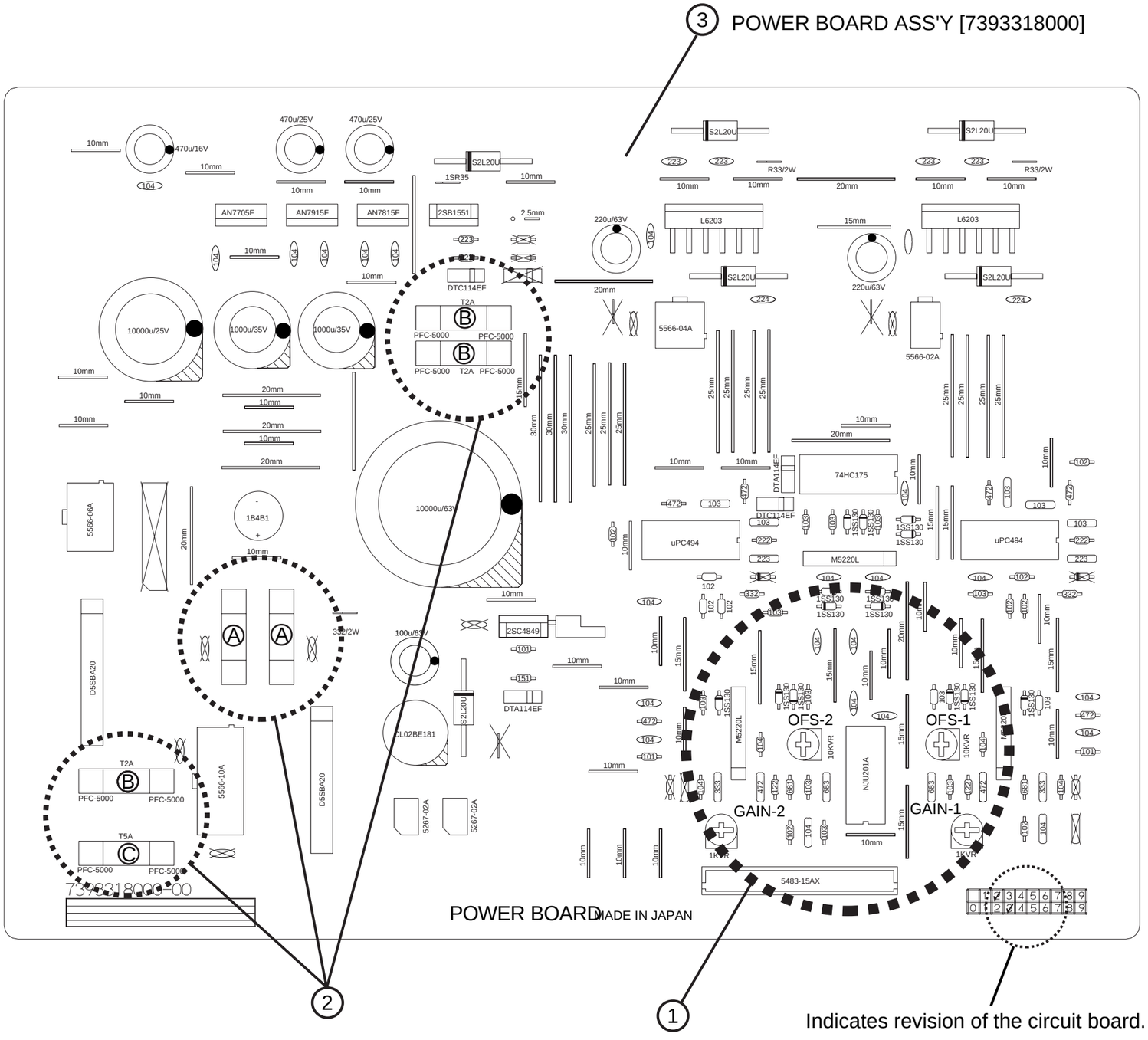


MAIN BOARD_3/3 Circuit Diagram



2-3 POWER BOARD ASS'Y

DESCRIPTION



①VR

VR No.	Function
OFS-1 (10KVR)	Use for Motor Balance Adjustment
OFS-2 (10KVR)	Use for Motor Balance Adjustment
GAIN-1 (1KVR)	Use for Motor Balance Adjustment
GAIN-2 (1KVR)	Use for Motor Balance Adjustment

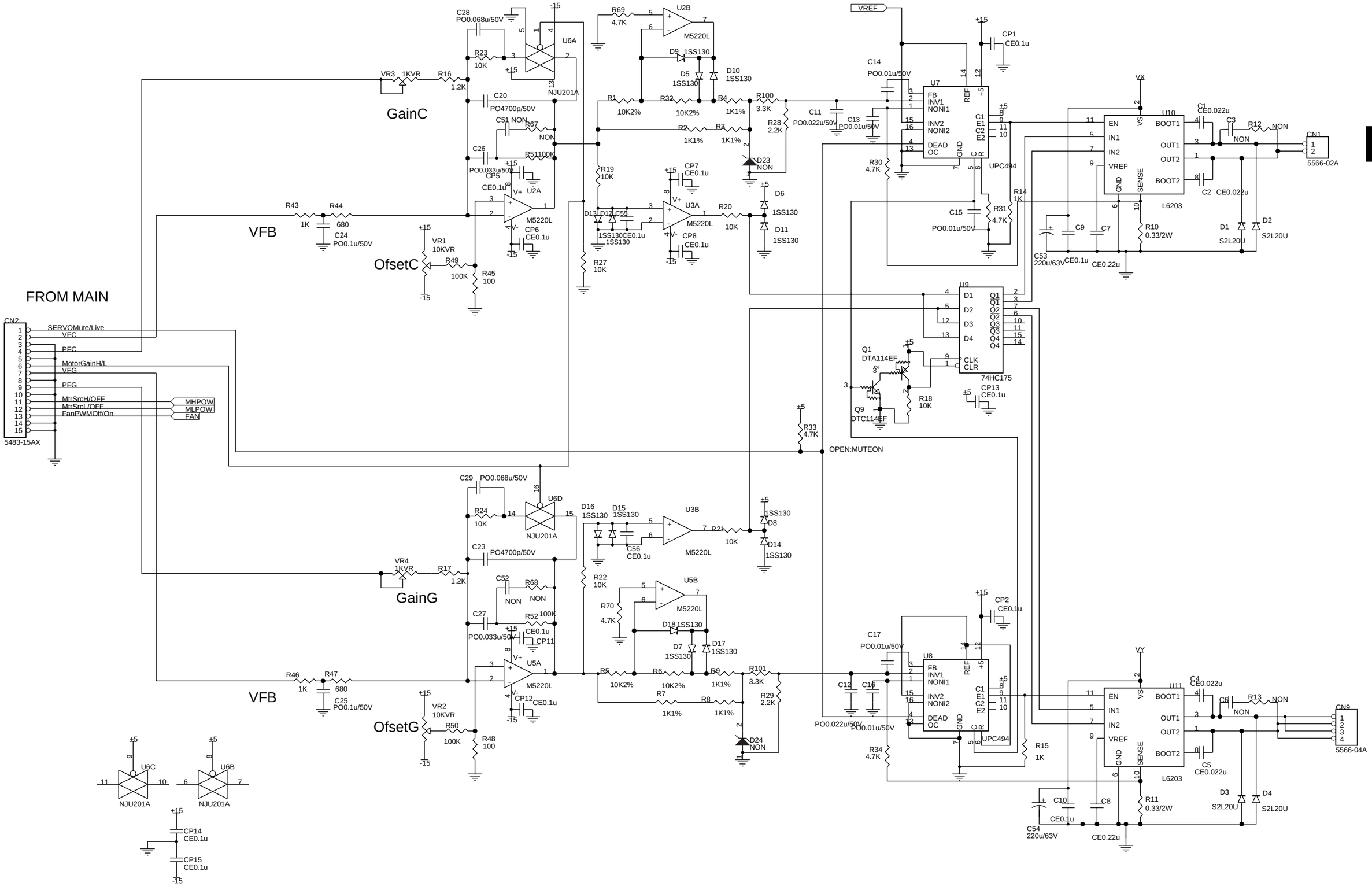
②FUSE

	Parts No.	Description
Ⓐ	12559567	FUSE 5x20 CEE-1AT WICKMANN
Ⓑ	12559570	FUSE 5x20 CEE-2AT WICKMANN
Ⓒ	12559574	FUSE 5x20 CEE-5AT WICKMANN

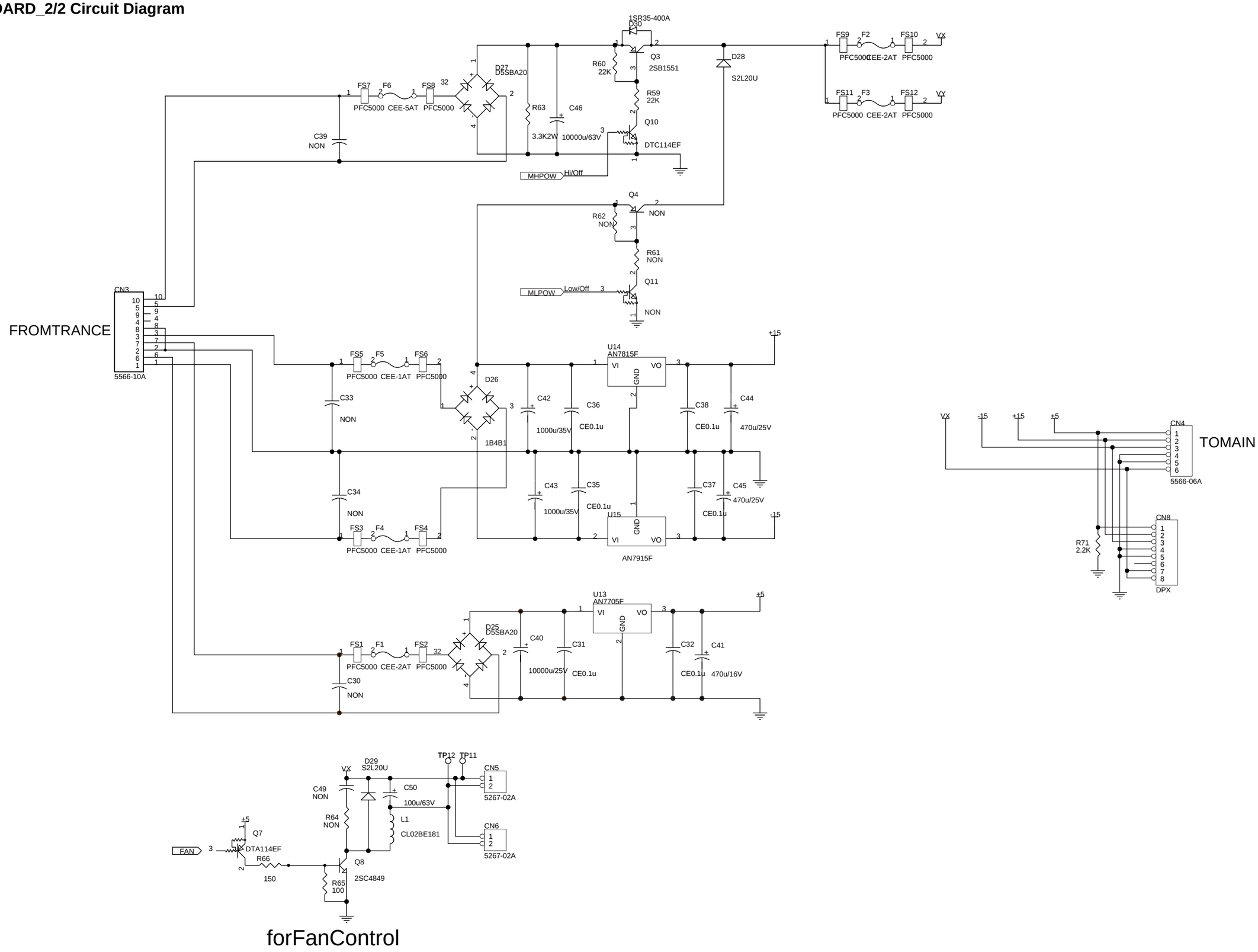
③Electric Maintenance Parts

IC.No.	Parts No.	Description	Function
Q3	15129444	2SB1551	40/20 VSelector
Q8	15119105	2SC4849	Fan Driver
U13	15199294	AN7705F	5V Regulator
U14	15199133	AN7815F	15V Regulator
U15	15199134	AN7915F	-15V Regulator
U6	15219174	NJU201AD	Gain selector
U10	15199952	L6203	Carriage Motor Driver
U11	15199952	L6023	Grit Motor Driver
U7	15199901	micorPC494C	Carriage Motor Controller
U8	15199901	micorPC494C	Grit Motor Controller
U2, U3 & U5	15189106	M5220L	OP Amp for motor

POWER BOARD_1/2 Circuit Diagram



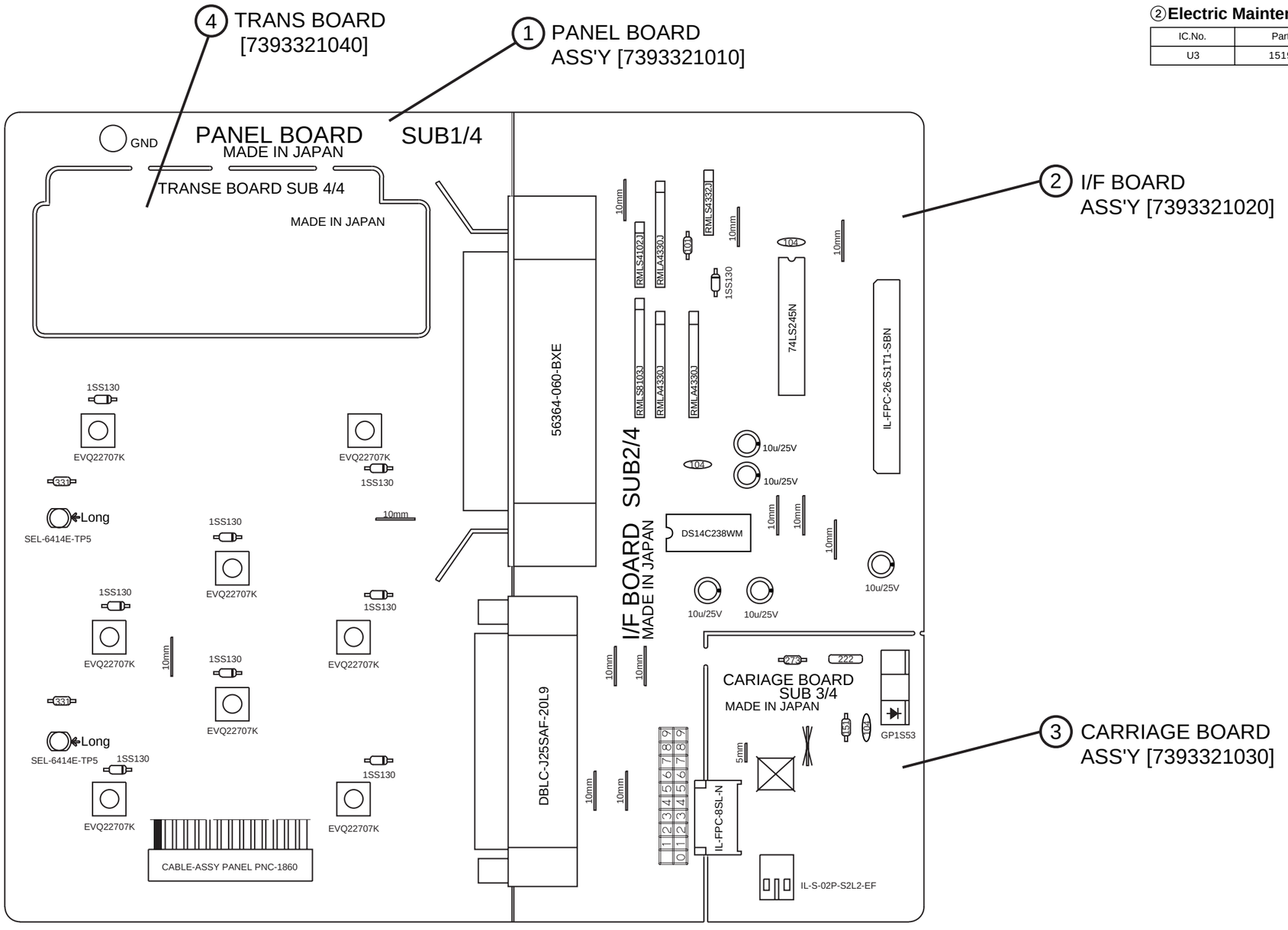
POWER BOARD_2/2 Circuit Diagram



2-4 OTHER CIRCUIT BOARDS

DESCRIPTION

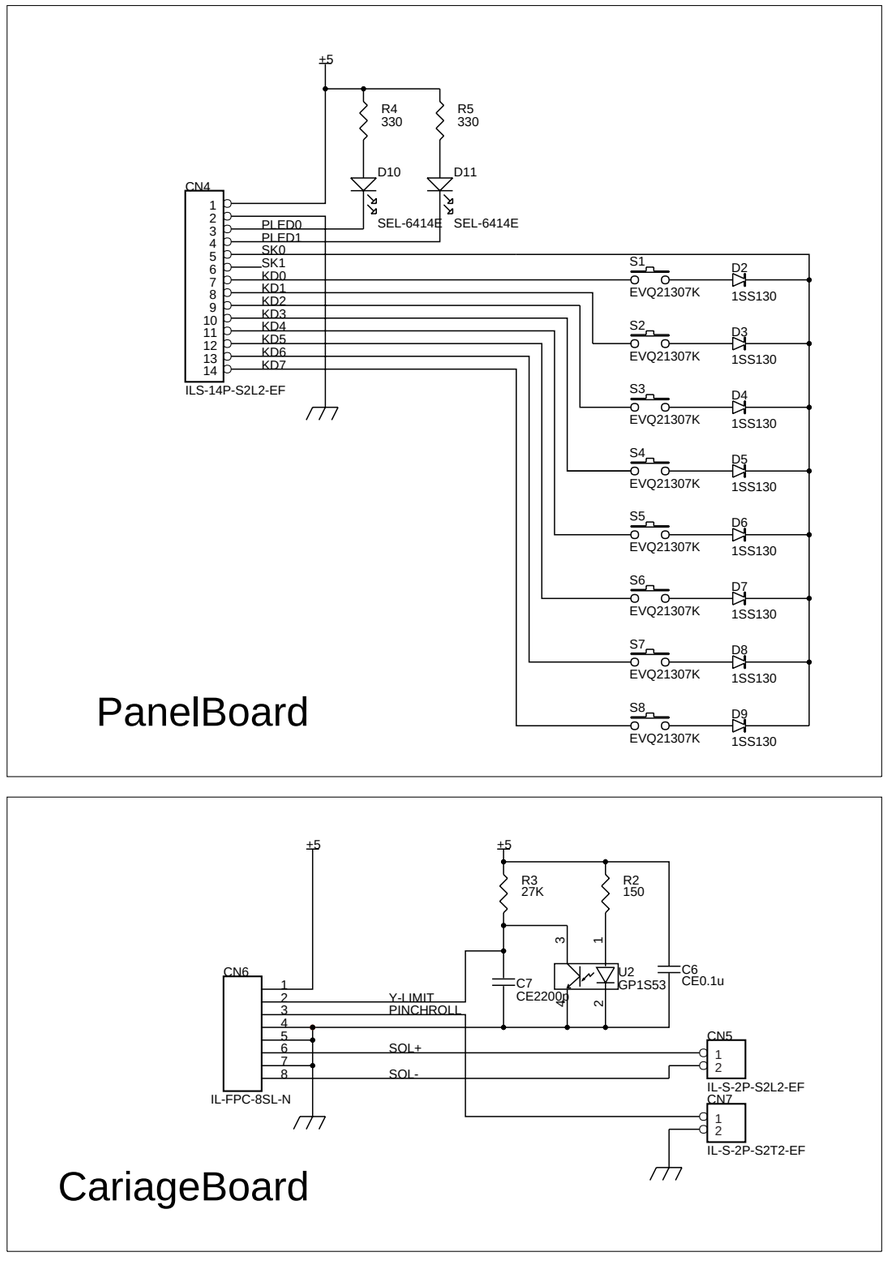
① PANEL BOARD ASS'Y [7393321010]
② I/F BOARD ASS'Y [7393321020]
③ CARRIAGE BOARD ASS'Y [7393321030]
④ TRANS BOARD [7393321040]

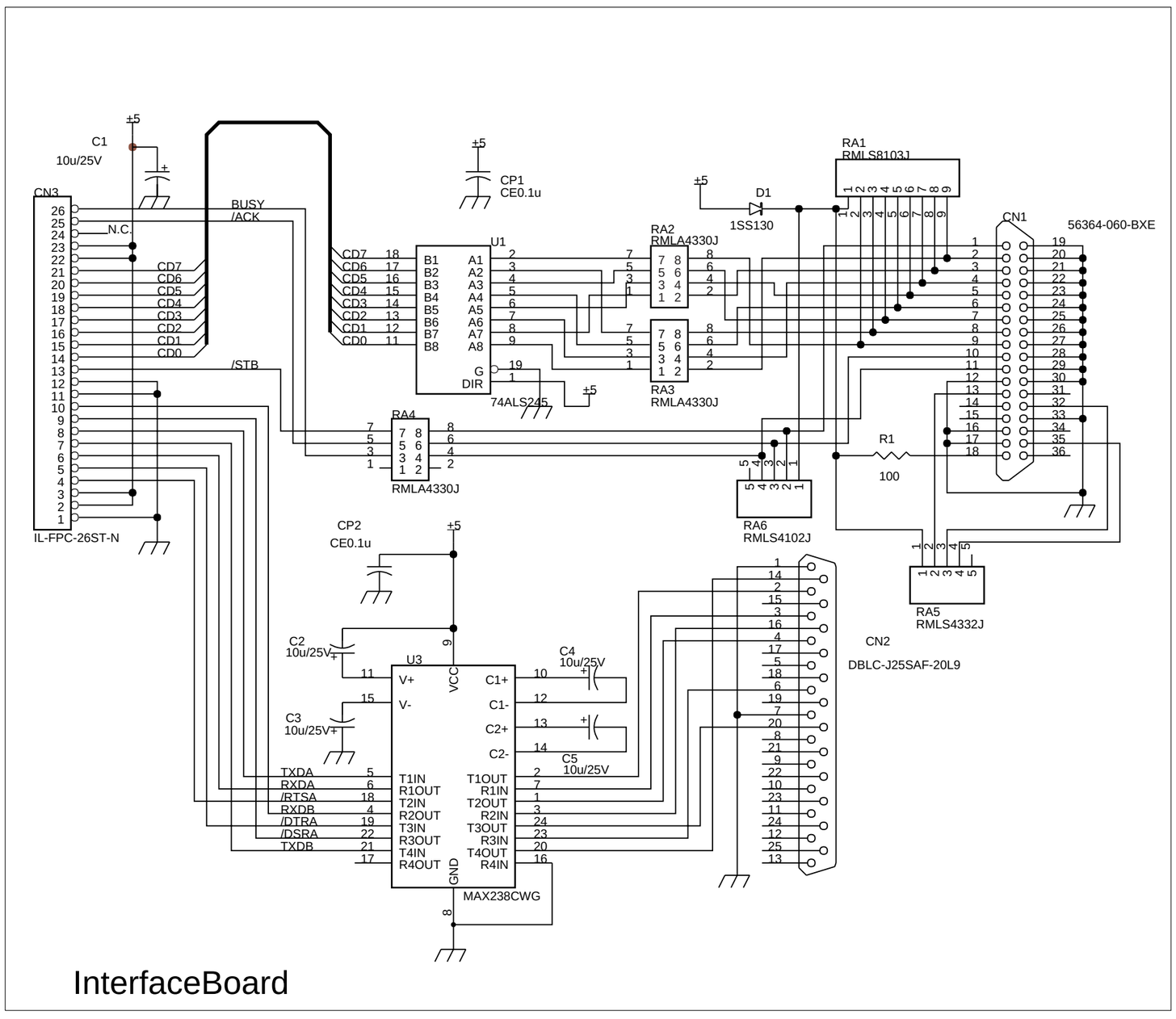


②Electric Maintenance Parts

IC.No.	Parts No.	Description	Function
U3	15199905	DX14C238WMX	RS232C Driver

OTHER CIRCUIT BOARDS_1/1 Circuit Diagram





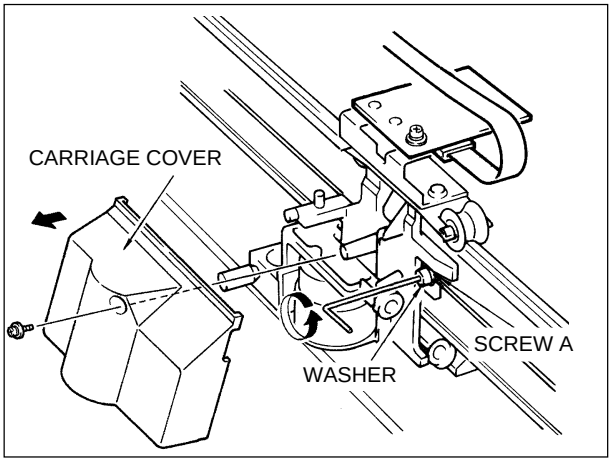
3 Replacement of Main Parts

Following table describes the necessary adjustment after the replacement of each parts.

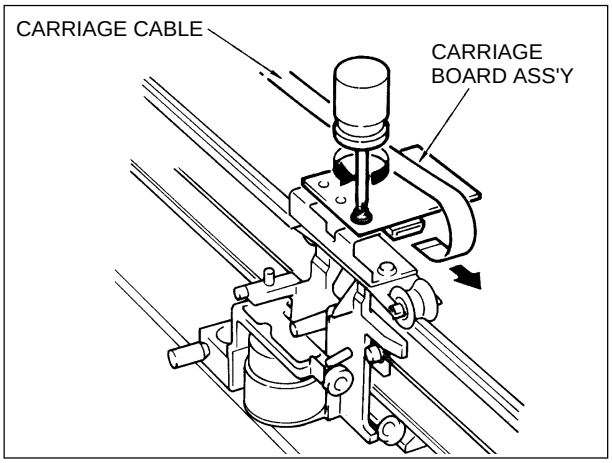
Replacement Parts	Necessary Adjustment
CARRIAGE MOTOR ASSEMBLY	Motor Backlash Adjustment, Wire Tension Adjsutment, Motor Balance Adjustment
DRIVE GEAR	Motor Backlash Adjustment, Wire Tension Adjustment
GRIT MOTOR ASSEMBLY	Motor Backlash Adjustment, Motor Balance Adjustment
ROLL DRIVE GEAR	Motor Backlash Adjustment
CARRIAGE WIRE	Wire Tension Adjustment
PEN CARRIAGE ASSEMBLY	Tool Height Adjustment, Pen Pressure Adjustment
MAIN BOARD ASSEMBLY	Pen Pressure Adjustment
POWER BOARD ASSEMBLY	Motor Balance Adjustment, Calibration

3-1 PEN CARRIAGE ASSEMBLY_REMOVING

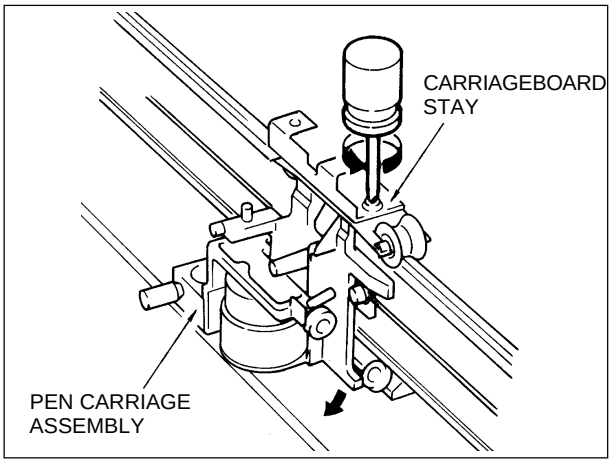
1 Remove the *CARRIAGE COVER*.
Remove *SCREW A* and *WASHER* fixing the wire.



2 Remove the *CARRIAGE CABLE* and the *CARRIAGE BOARD ASS'Y*.

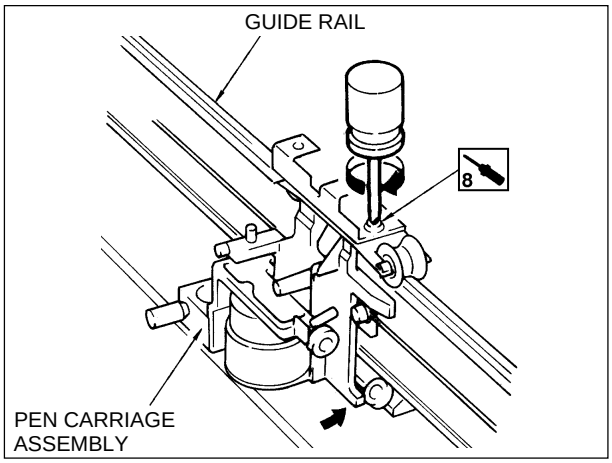


3 Remove the *CARRIAGEBOARD STAY* and take off the *PEN CARRIAGE ASSEMBLY*.

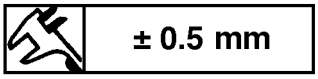


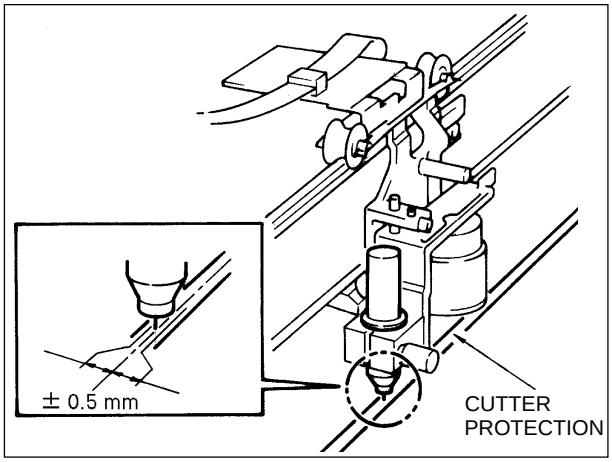
3-1 PEN CARRIAGE ASSEMBLY_FIXING

1 Make sure there is no looseness in the *PEN CARRIAGE ASSEMBLY* when fixing it to the *GUIDE RAIL*.



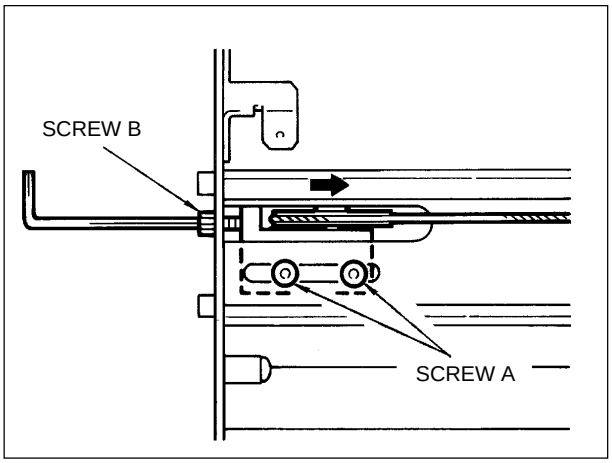
2 Put the 0.25 mm ink pen to the *PEN CARRIAGE ASSEMBLY* and push it down with your finger at the positions shown in the figure. Make sure that the pen tip lands within +/- 0.5 mm from the center of the *CUTTER PROTECTION*. If not, fix the *PEN CARRIAGE ASSEMBLY* again.



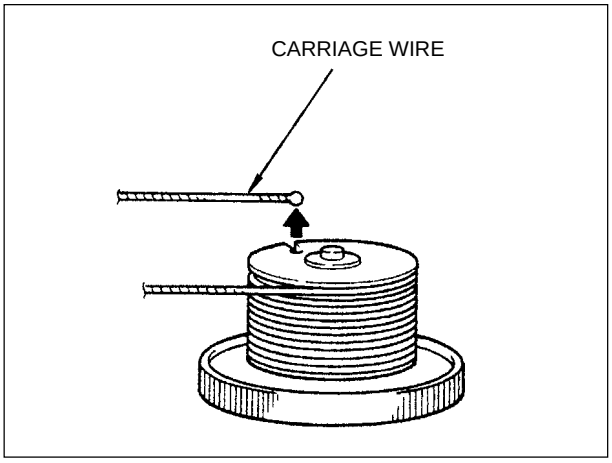


3-2 DRIVE PULLEY ASSEMBLY_REMOVING

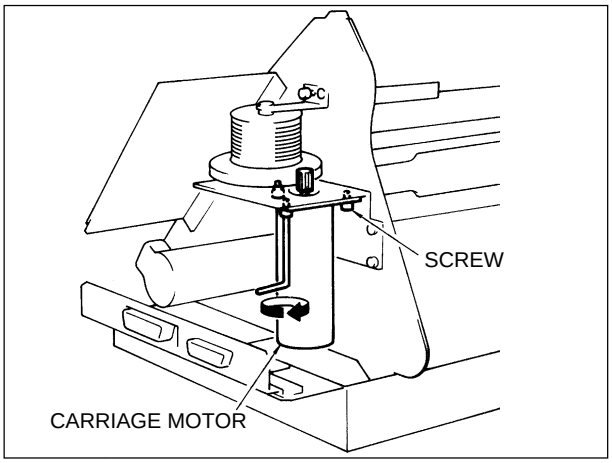
1 Remove the *PEN CARRAIGE ASSEMBLY* (Page 17).
Loosen the *SCREW A* and *SCREW B* in order.



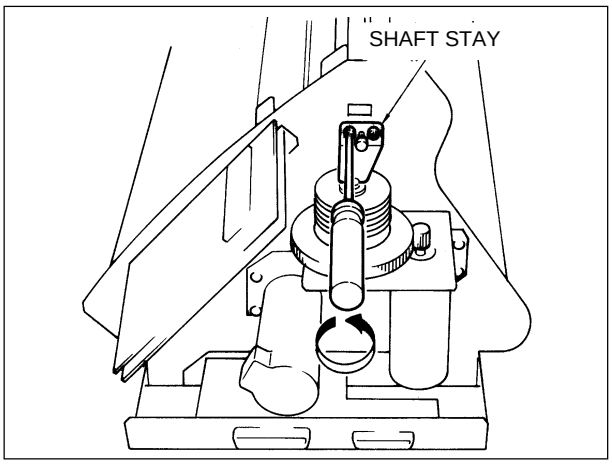
2 Remove the *CARRIAGE WIRE* as shown in the figure.



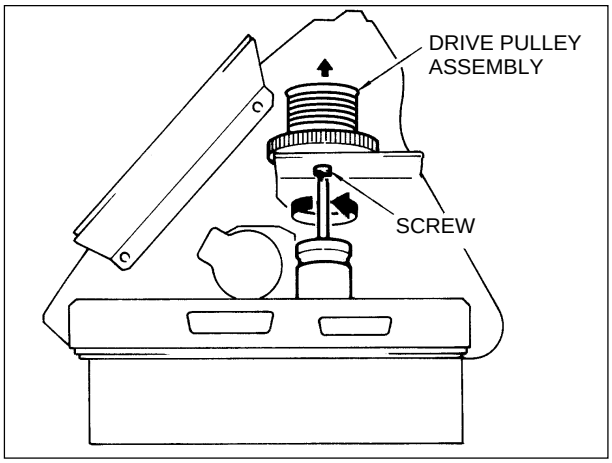
3 Loosen the *SCREW* fixing the *CARRIAGE MOTOR*.



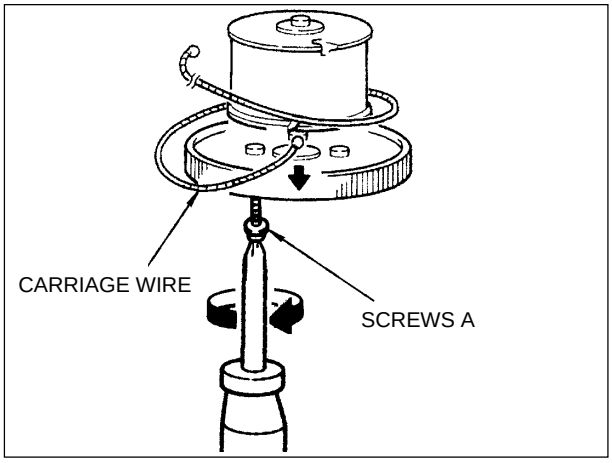
4 Remove the *SHAFT STAY*.



5 Remove the *DRIVE PULLEY ASSEMBLY.*

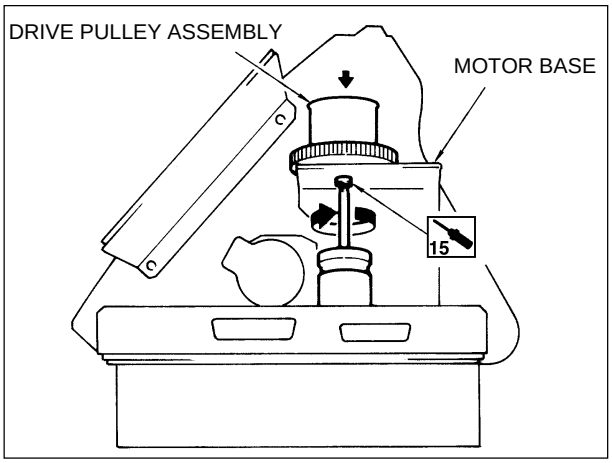


6 Loosen the *SCREWS A* shown in the figure and pull out the *CARRIAGE WIRE*.



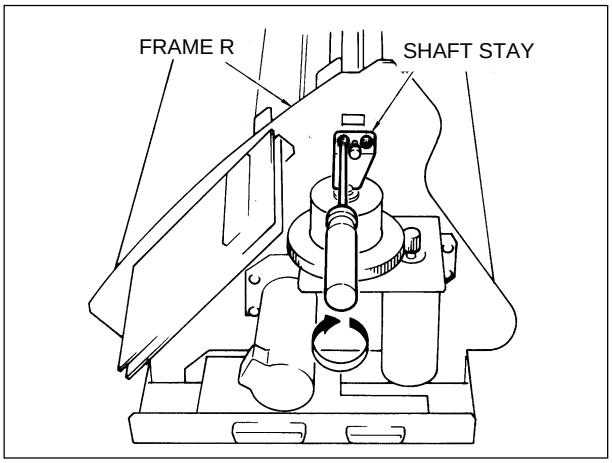
3-2 DRIVE PULLEY ASSEMBLY_FIXING

1 Fix the *CARRIAGE WIRE* to the *DRIVE PULLEY ASSEMBLY* (Page 22).
Fix the *DRIVE PULLEY ASSEMBLY* to the *MOTOR BASE*.

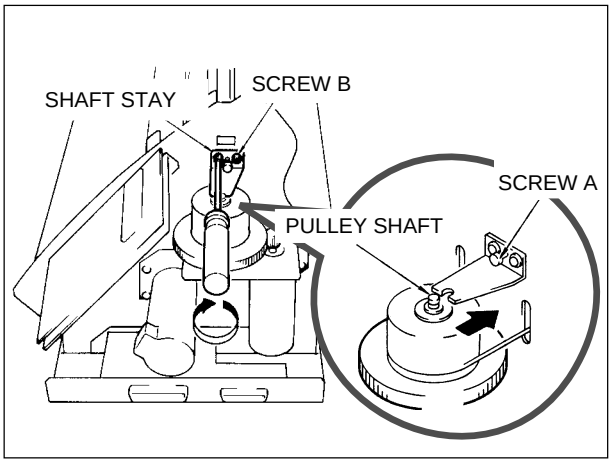


2 Fix the *CARRIAGE MOTOR* by checking the backlash.

3 Fix the *SHAFT STAY* temporary to the *FRAME R*.

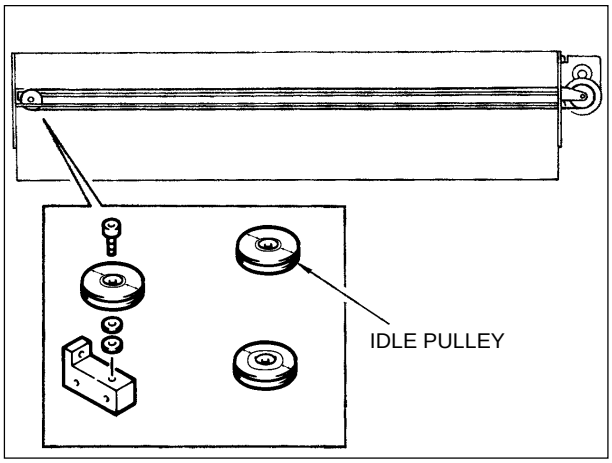


4 Tighten the *SCREW A* for the *SHAFT STAY* until the *PULLEY SHAFT* makes contact with the *SHAFT STAY*.
Tighten the *SCREWS B*.

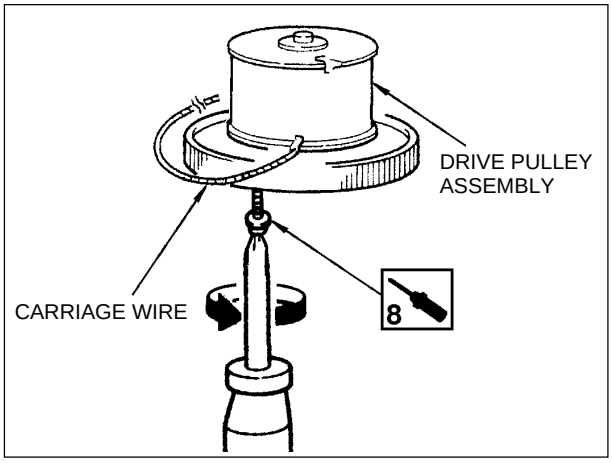


3-3 CARRIAGE WIRE_WINDING

1 Be careful with the direction of the *IDLE PULLEY* in case of removing it.

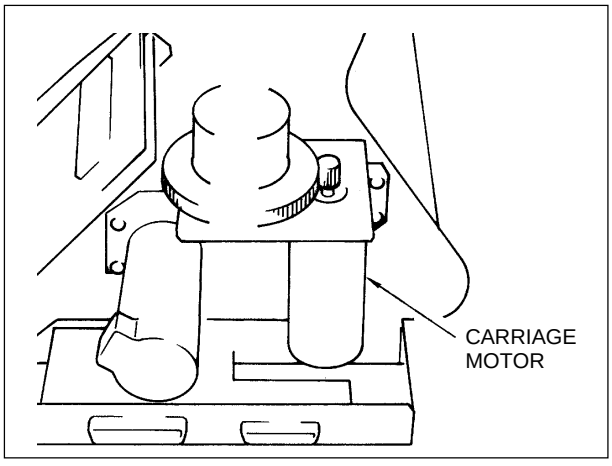


2 Fix the end of the *CARRIAGE WIRE* to the *DRIVE PULLEY ASSEMBLY*.

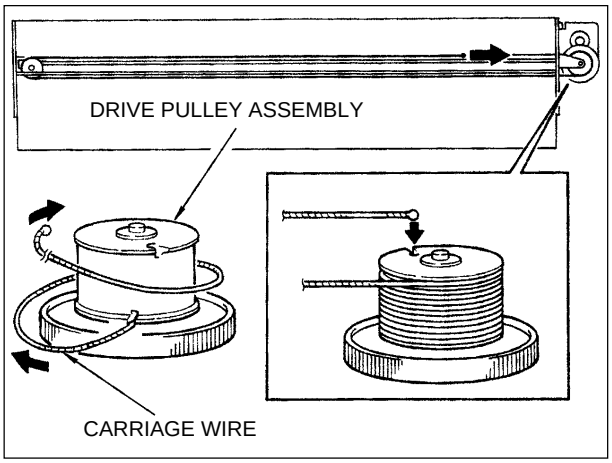


3 Fix the *DRIVE PULLEY ASSEMBLY* to the machine. (Page 21)

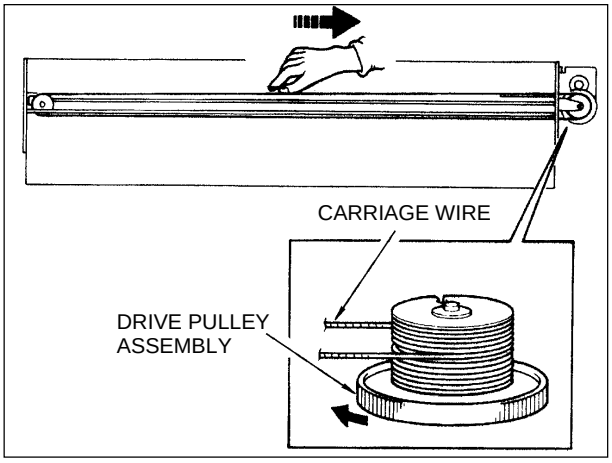
4 Fix the *CARRIAGE MOTOR* by checking the backlash.



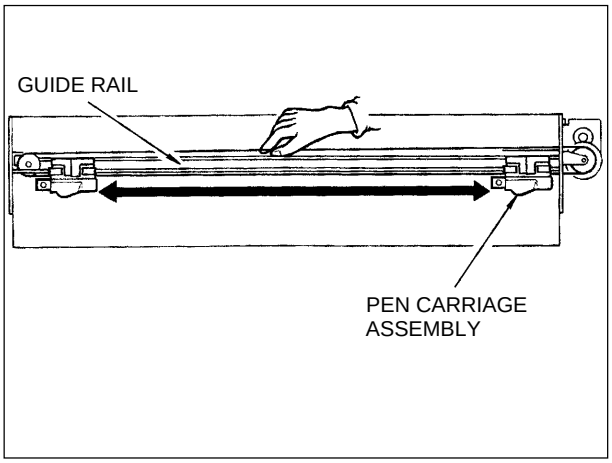
5 Wind the *CARRIAGE WIRE* around the *DRIVE PULLEY ASSEMBLY* from the bottom to the top.
- Make sure the *CARRIAGE WIRE* doesn't cross over.



6 Rotate the *DRIVE PULLEY ASSEMBLY* until the *CARRIAGE WIRE* comes to its center.



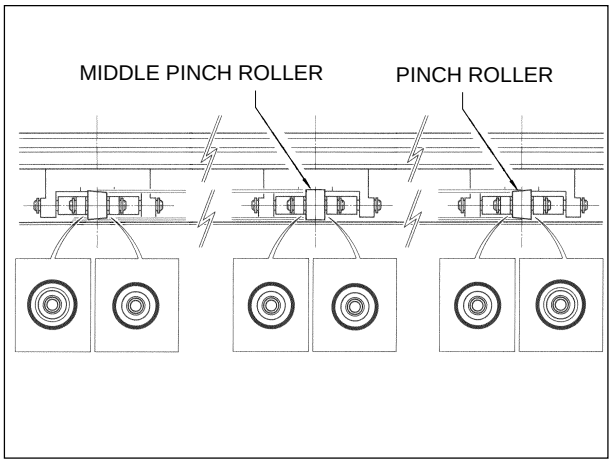
7 Fix the *PEN CARRIAGE ASSEMBLY* at the center part of the *GUIDE RAIL*.
Move the *PEN CARRIAGE ASSEMBLY* back and forward in a whole distance to remove the slack in the *CARRIAGE WIRE*.



8 Adjust the Wire Tension. (Page 37)

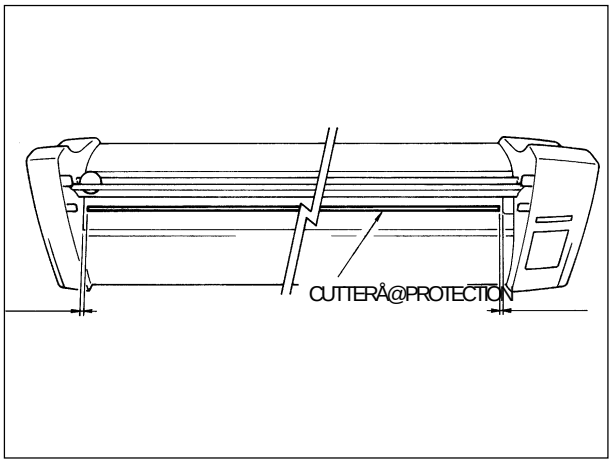
3-4 PINCH ROLLER ASSEMBLIES_FIXING

1 Tapered type is used for left and right *PINCH ROLLERS*. Be careful when replacing them.
Flat type is used for the *MIDDLE PINCH ROLLER* one.



3-5 CUTTER PROTECTION_FIXING

1 Leave the equal space at both ends of *CUTTER PROTECTION*.

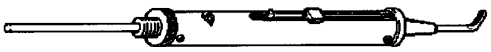


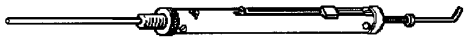
2 Make sure the *CUTTER PROTECTION* is not bumpy by pushing it with your finger.

4 Adjustment

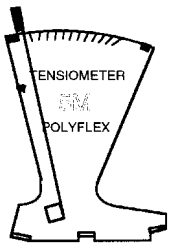
4-1 Special Tool

Table shows a list of special tools recommended by Roland DG Corp.

Tool No.	ST-001	
Tool name	TENSION GAUGE 1500g	
Purpose	Motor backlash	

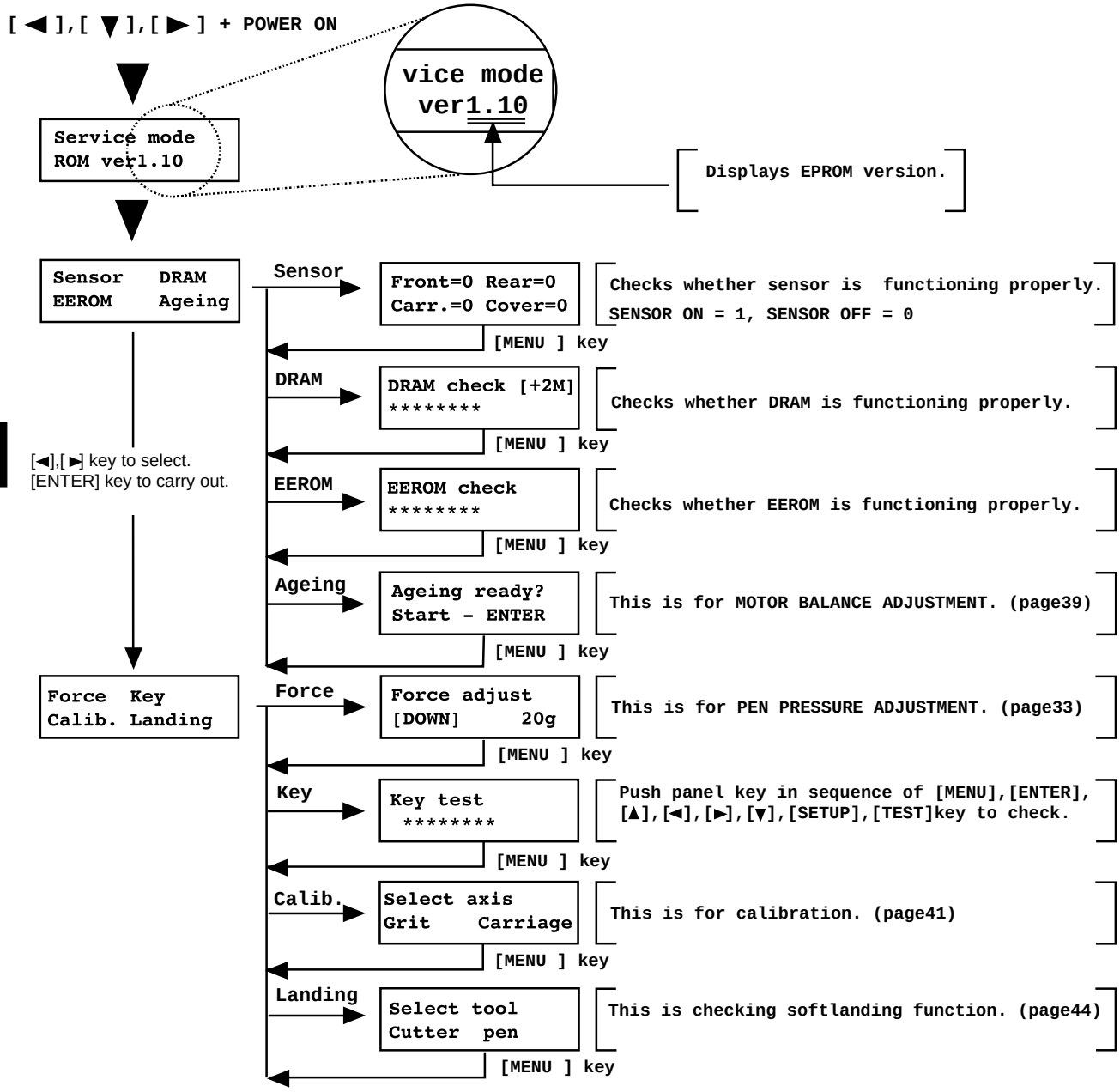
Tool No.	ST-002	
Tool name	TENSION GAUGE 300g	
Purpose	Pen Pressure Adjustment	

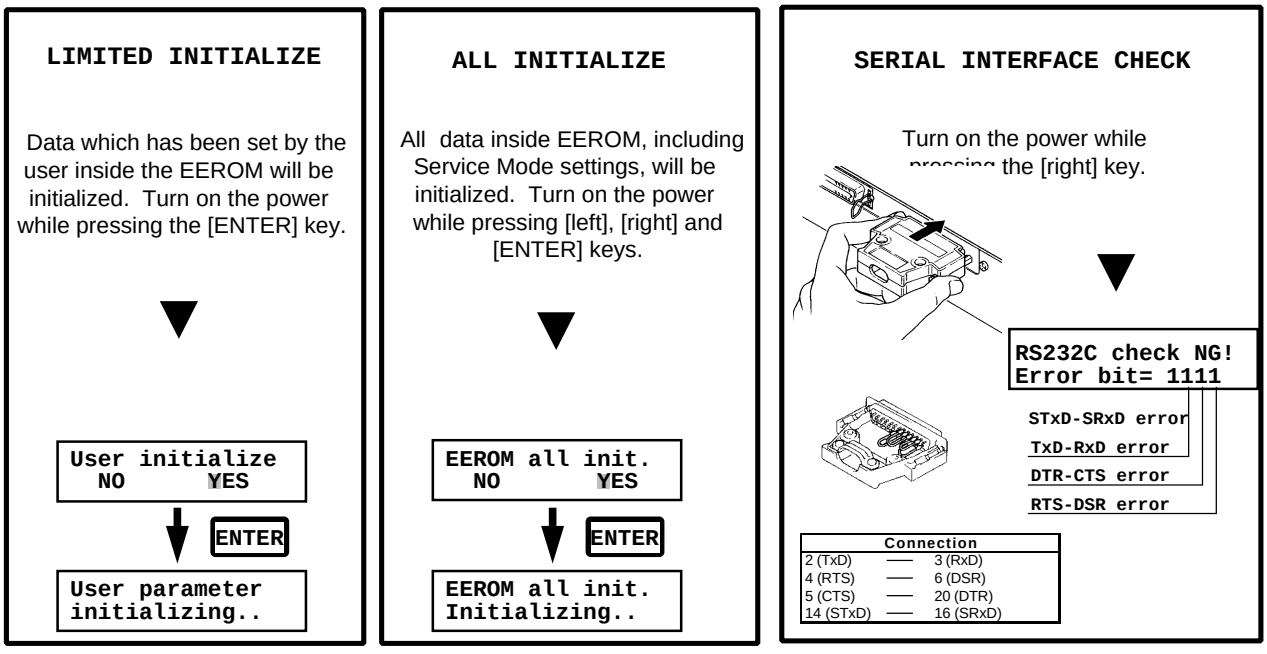
Tool No.	ST-006	
Tool name	WHITE DUMMY PEN	
Purpose	Tool Height Adjustment Spacer Bed Adjustment Pen Pressure Adjustment	

Tool No.	ST-011	
Tool name	TENSION METER	
Purpose	Wire Tension Adjustment	

Tool No.	ST-012	
Tool name	DIAL TENSION METER DT-30 (30g)	
Purpose	Pen Pressure Adjustment	

4-2 Service Mode





4-3 System Report

1 Set the A4 size paper vertically and put the pen to the *PEN CARRIAGE*.

2 Turn on the power while pressing the **[▼]** key to start drawing a system report.

```
PNC1860 SERIES SYSTEM REPORT

MODEL      : 1860
ROM VER    : 1.00
DIPSW      : 00000001
LANDINGWAIT: OFF

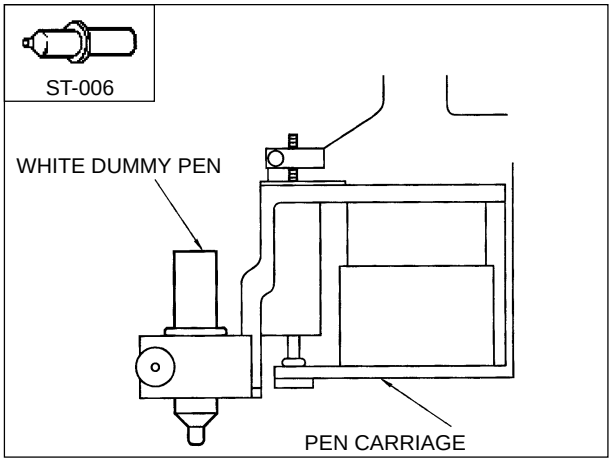
-- FACTORY PARAMETER ---
FACT CALIB.: CARR.= 0.00%  GRIT = 0.00%
LANDINGADJ.: CUT AT  0 BR  0  PEN AT  0 BR  0
LANGUAGE   : ENGLISH

-- USER PARAMETER ---
CURRENT PEN: 1
TOOL SPEC  : No  VS    FS    OFST  UPVS  QUALITY
           : 1   40    70    -     -     -
           : 2   -     -     -     -     -
           : 3   -     -     -     -     -
           : 4   -     -     -     -     -
           : 5   -     -     -     -     -
           : 6   -     -     -     -     -
           : 7   -     -     -     -     -
           : 8   -     -     -     -     -
ROTATE     : OFF       SMOOTHING  : ON
DISP UNIT  : MACHINE   AREA UNIT  : METER
CALIB CARR.: 0.00%     CALIB GRIT : 0.00%
AREA LEN   : 1.5m      PREFEED    : OFF
I/O        : AUTO      PROTOCOL   : 19200
HANDSHAKE  : Xon/Xoff  COMMAND    : AUTO
PEN CHANGE : OFF       VS CMD     : OFF
FS CMD     : OFF       OVER CUT   : OFF

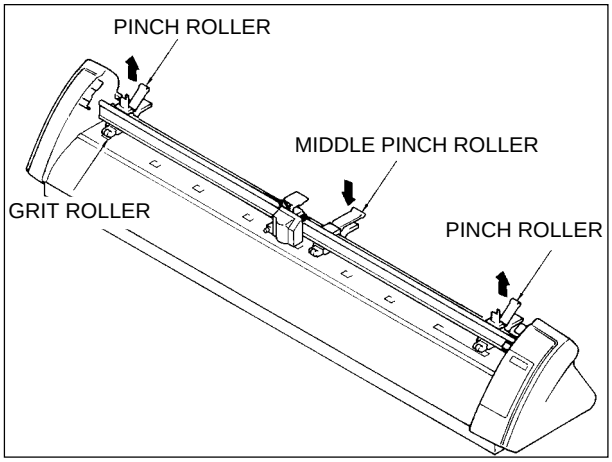
-- END --
```

4-4 Tool Height Adjustment

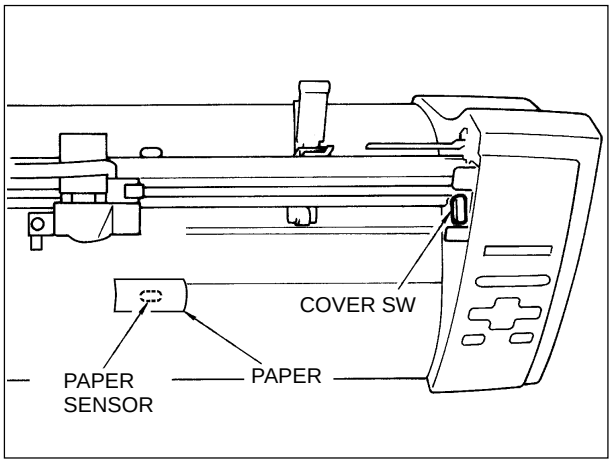
1 Put the WHITE DUMMY PEN (ST-006) to the *PEN CARRIAGE*.



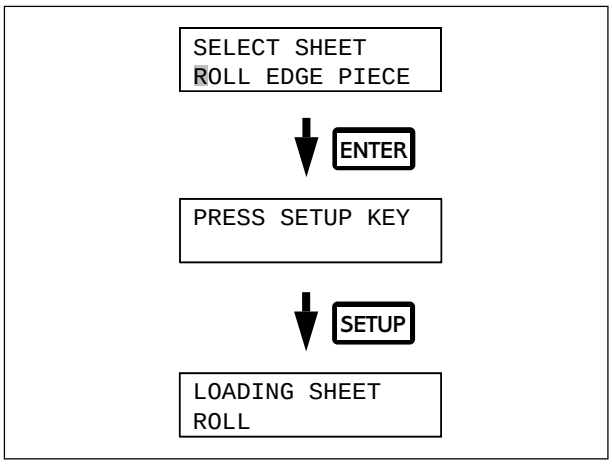
2 Put the *PINCH ROLLERS* DOWN at both left and right ends of the *GRIT ROLLER*. The *MIDDLE PINCH ROLLER* for PNC-1860/1410 should be UP.



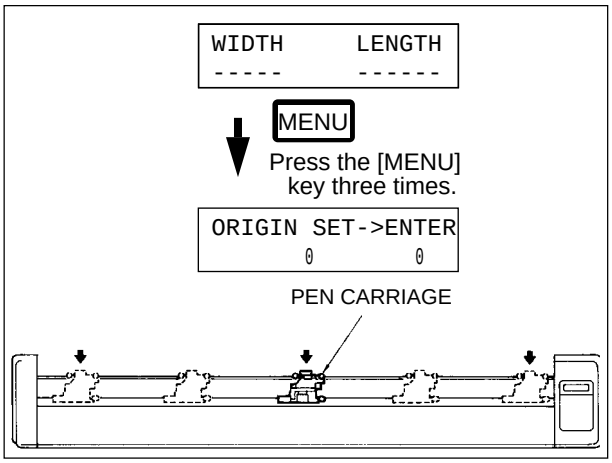
3 Cover the *PAPER SENSOR* with paper and switch on the COVER SW.



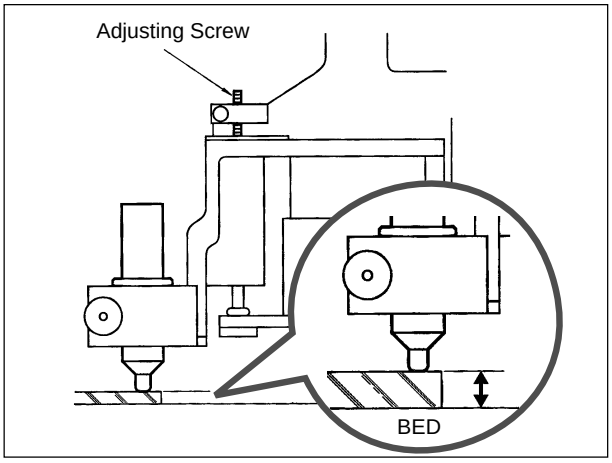
4 Turn on the power and select "ROLL" with **[◀]**, **[▶]** keys. And push **[ENTER]** key, then the **[SETUP]** key.



5 Select "ORIGIN SET" menu by pushing the **[MENU]** key 3 times.
Move the *PEN CARRIAGE* to where the clearance between the pen tip and the *BED* is the smallest among 5 positions (3 positions for PNC-1210 (Directed by arrows)) with the **[◀]**, **[▶]** keys.



6 Adjust the Adjusting Screw so that the clearance between the pen tip and the *BED* would be **2.4 ~ 2.6 mm** at all positions.



2.4 ~ 2.6 mm

7 Make sure the clearance is **2.4 ~ 3.0 mm** at other positions.
If not, proceed to Spacer Bed Adjustment. (Page 30)

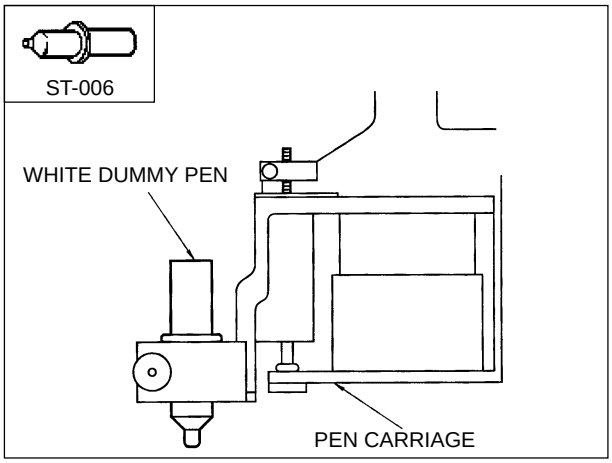
2.4 ~ 3.0 mm

4-5 Spacer Bed Adjustment

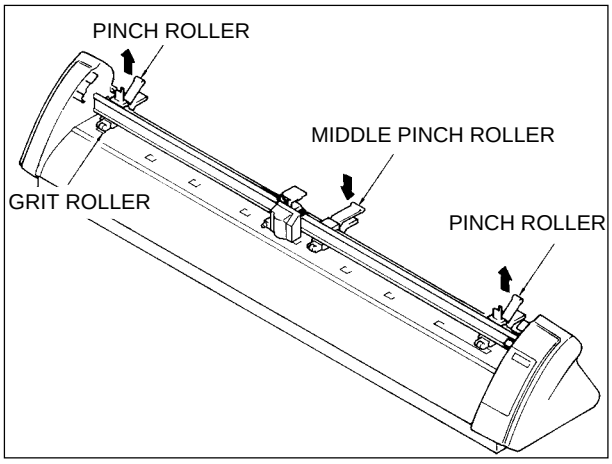
1 This adjustment should be carried out normally.
It should be carried out only when the clearance between the pen tip and the *BED* won't be **2.4 ~ 3.0 mm** at the positions check at 7 of Tool Height Adjustment. (Page 28)

2 Remove both *FRONT* and *REAR COVERS*.

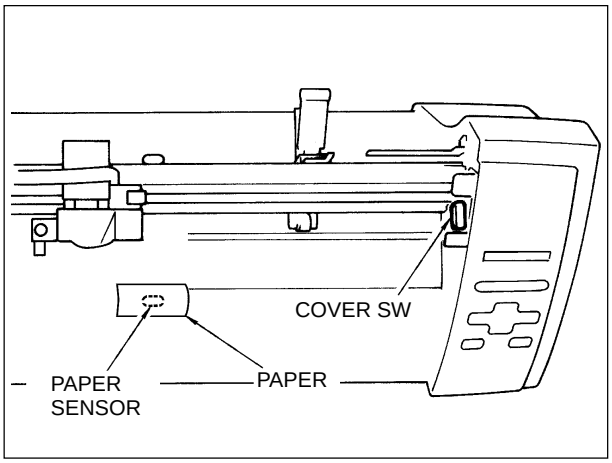
3 Put the WHITE DUMMY PEN (ST-006) to the *PEN CARRIAGE*.



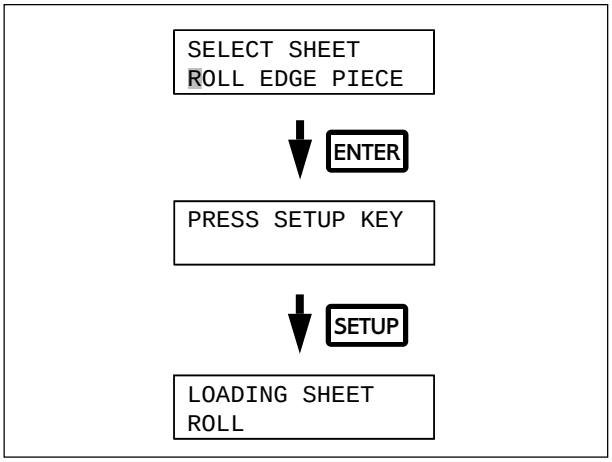
4 Put the *PINCH ROLLERS* DOWN at both left and right ends of the *GRIT ROLLER*. The *MIDDLE PINCH ROLLER* for PNC-1860/1410 should be UP.
Remove both *FRONT* and *REAR APRONS*.



5 Cover the *PAPER SENSOR* with paper and switch on the *COVER SW*.

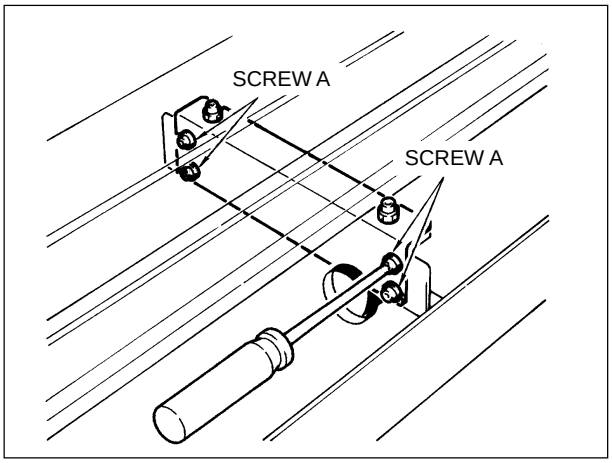


6 Turn on the power and select "ROLL" with **[◀]**, **[▶]** keys and push **[ENTER]** key, then the **[SETUP]** key.

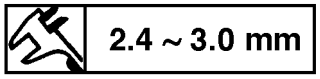


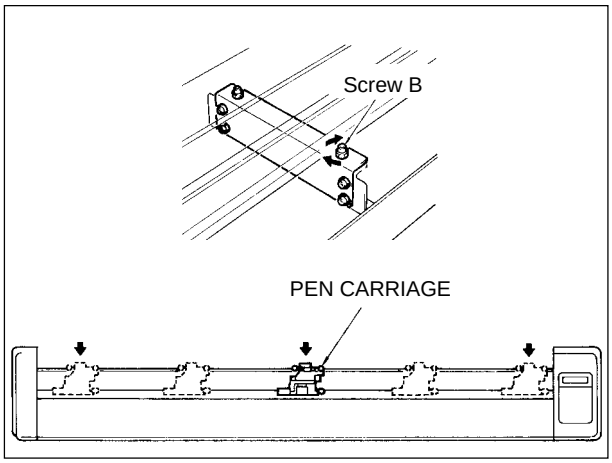
7 Move the *PEN CARRIAGE* to the position where the clearance between the pen tip and the *BED* is the biggest. It can be moved with **[◀]** and **[▶]** keys after selecting "ORIGIN SET" menu.

8 Loosen the *SCREWS A* shown in the figure.

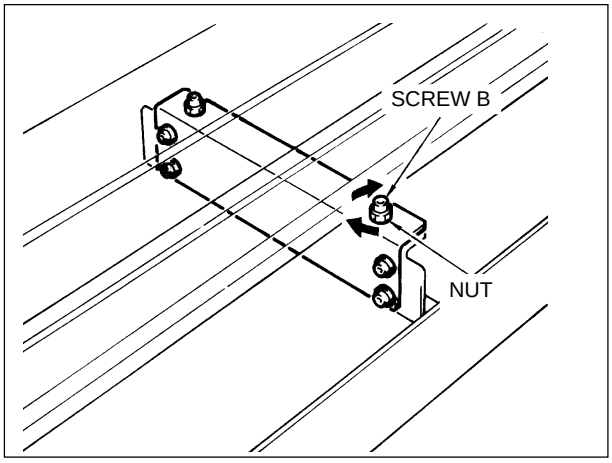


9 Adjust the Screw B so that the clearance between the pen tip and the *BED* would be **2.4 ~ 3.0 mm** at 5 positions (3 positions for PNC-1210 (Directed by arrows)).

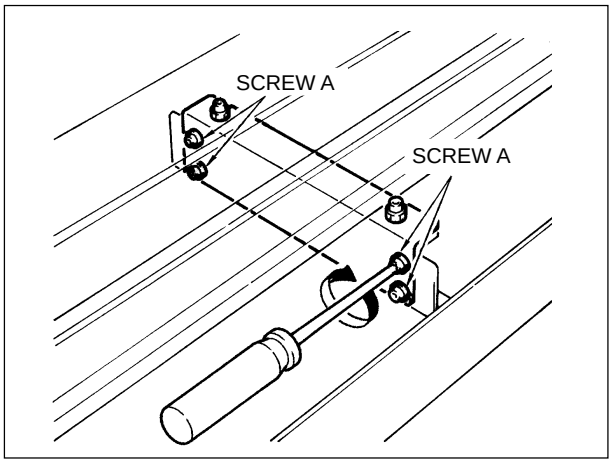




10 Fix the *SCREW B* with a *NUT* .



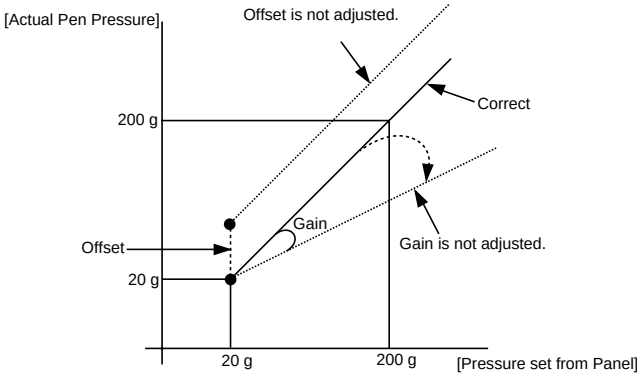
11 Fix the *SCREWS A* at the side.



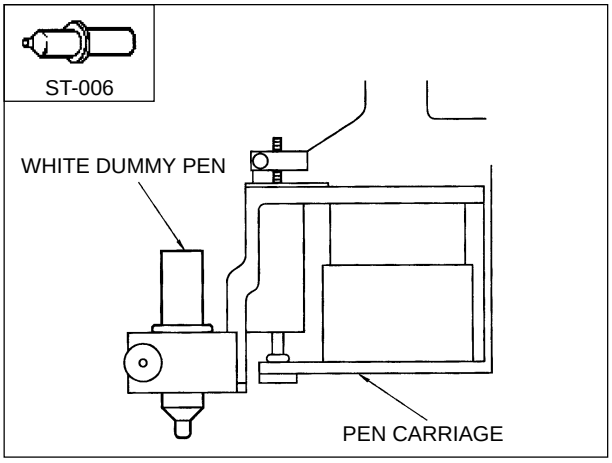
12 Adjust Tool Height again. (Page 28)

4-6 Pen Pressure Adjustment

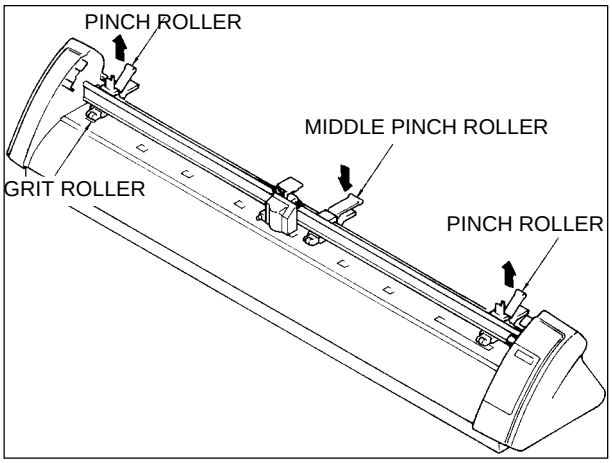
Driver IC [MTD2005] supplies voltage, corresponds to the pen pressure, to the solenoid of the Pen Carriage. Pen Pressure could be set by adjusting the OFFSET with “20 g” adjustment and GAIN with “200 g” adjustment of the Pen Pressure Adjustment.



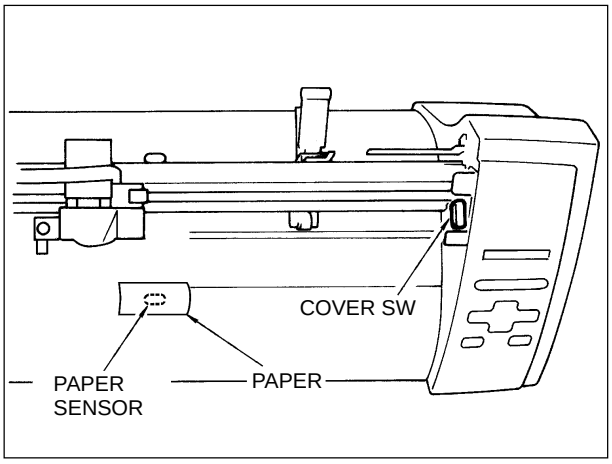
1 Make sure to adjust [Tool Height] before this adjustment. (Page 28)
Put the *PEN CARRIAGE* to the WHITE DUMMY PEN (ST-006).



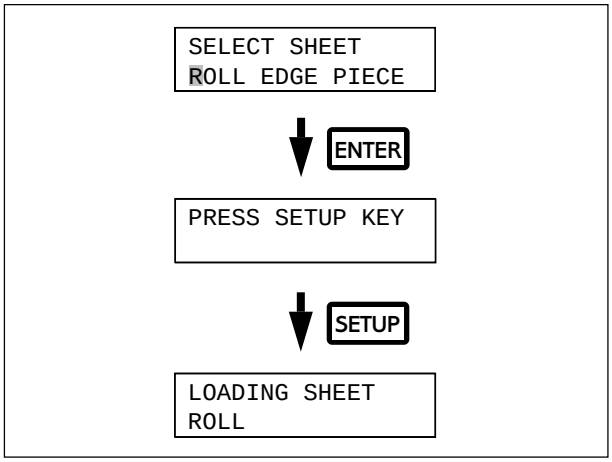
2 Put the *PINCH ROLLERS* DOWN at both left and right ends of the *GRIT ROLLER*. The *MIDDLE PINCH ROLLER* for PNC-1860/1410 should be UP.



3 Cover the *PAPER SENSOR* with paper and switch on the *COVER SW*.



4 Turn on the power and select "ROLL" with **[◀]**, **[▶]** keys and push **[ENTER]** key, then the **[SETUP]** key.

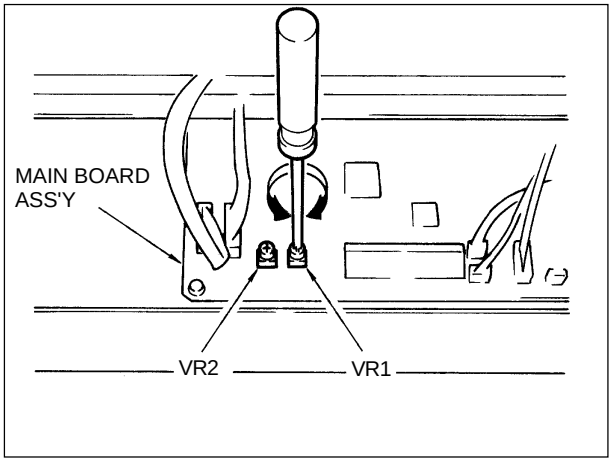


5 Move the *PEN CARRIAGE* to the position where the Tool Height was adjusted.

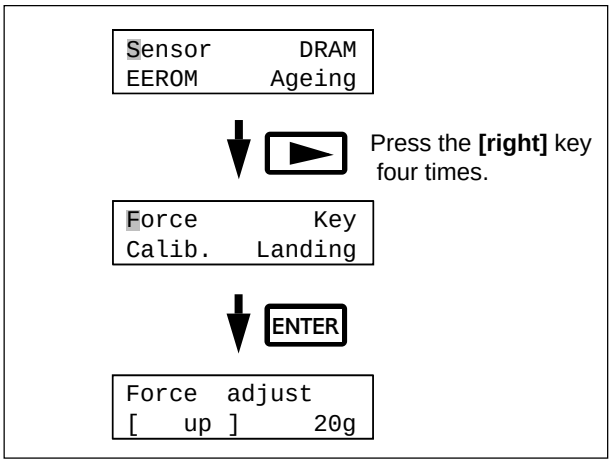
It can be moved with **[◀]** and **[▶]** keys after selecting "ORIGIN SET" menu.

6 Turn off the power.

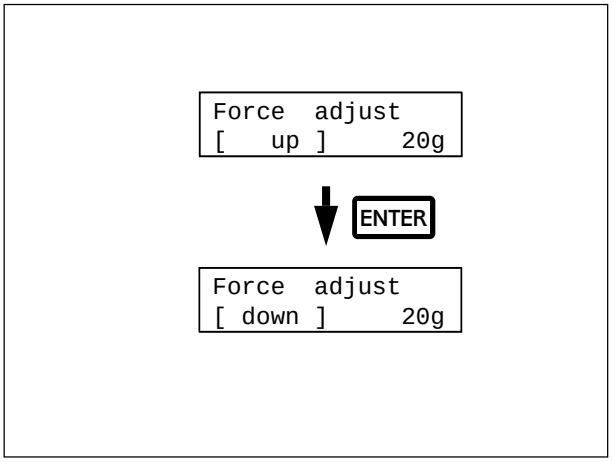
7 Remove the *FRONT APRON* and put VR1 and VR2, which are on the *MAIN BOARD ASS'Y* , at the center.



8 Enter the Service Mode by turning on the power while pressing **[◀]**, **[▼]** and **[▶]** keys. Select "`Force`" with **[◀]**, **[▶]** keys, and push **[ENTER]** key.

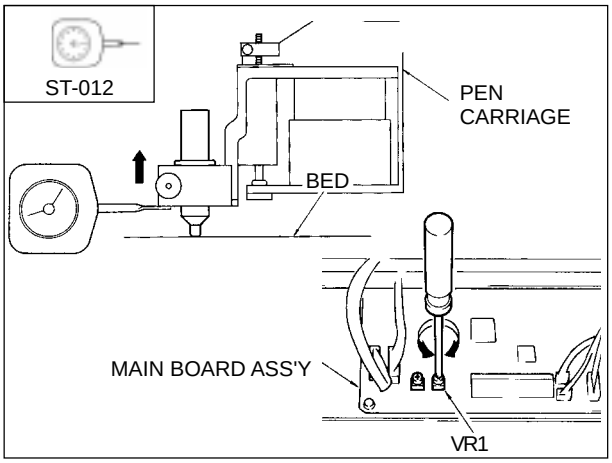


9 Push the **[ENTER]** key.
- Pen will be in DOWN position.

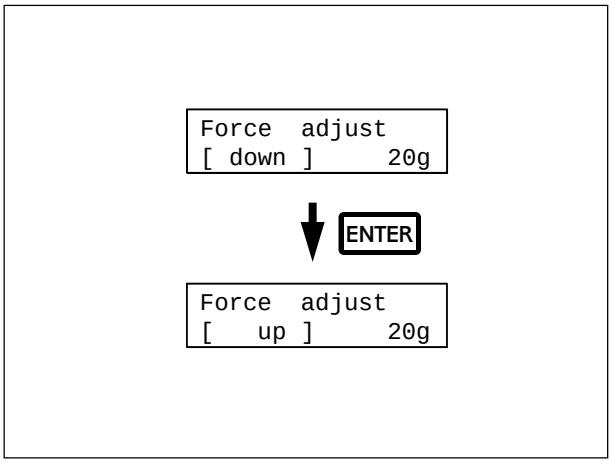


10 Adjust VR1 on the *MAIN BOARD ASS'Y* so that the pressure would be **26 ~ 30 gf** when pen tip leaves the *BED*.

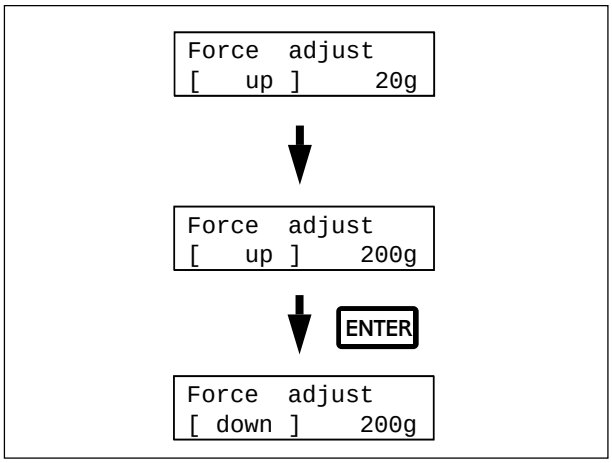
26 ~ 30 gf



11 Push the **[ENTER]** key.
- Pen will be in UP position.

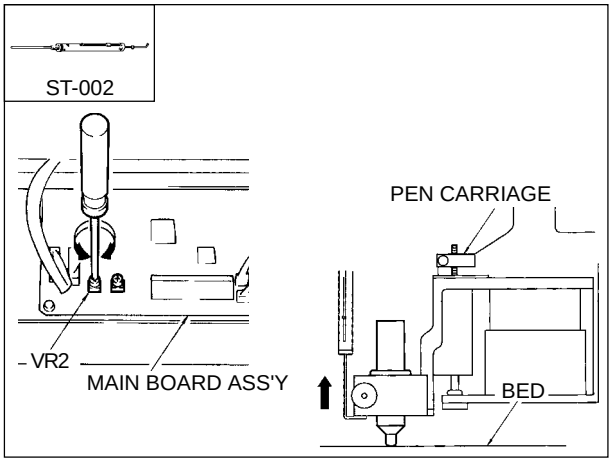


12 Change the pressure to "`200 g`" with the **[▲]** and **[▼]** keys. Push the **[ENTER]** key.
- Pen will be in DOWN position.



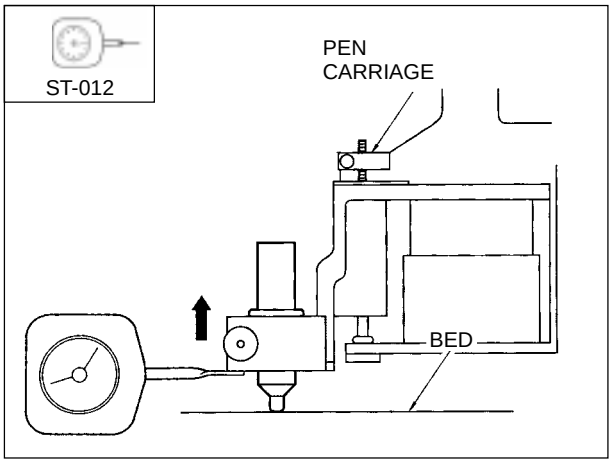
13 Adjust VR2 on the *MAIN BOARD ASS'Y* so that the pressure would be **199 ~ 201 gf** when pen tip leaves the *BED*.

199 ~ 201 gf



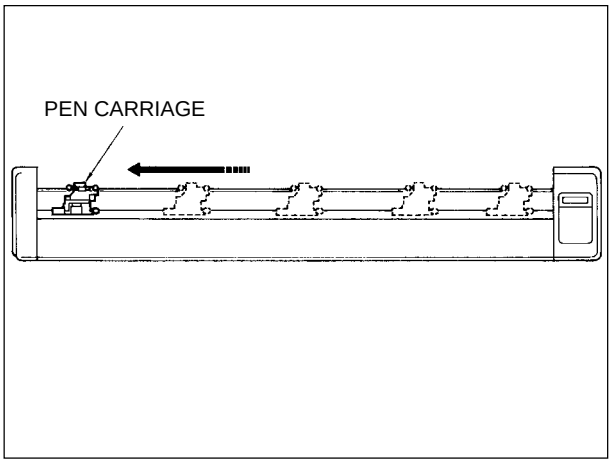
14 Change the pressure to "`20 g`" again and make sure the pressure is **26 ~ 30 gf**.
- If not, re-adjust it.

26 ~ 30 gf

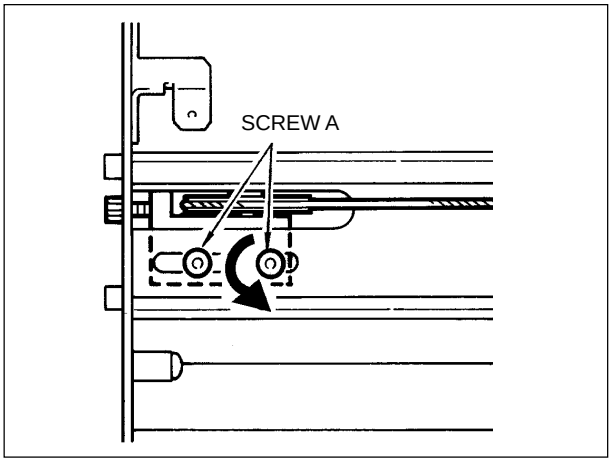


4-7 Wire Tension Adjustment

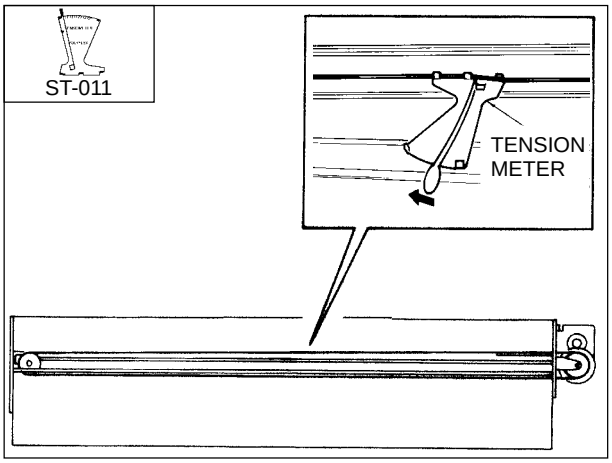
1 Turn off the power and move the *PEN CARRIAGE* to the left end.



2 Loosen the *SCREWS A*.

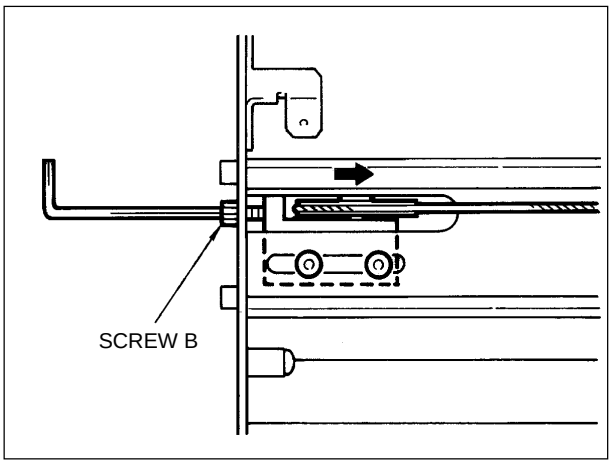


3 Measure the tension with the TENSION METER (ST-011) at the center.

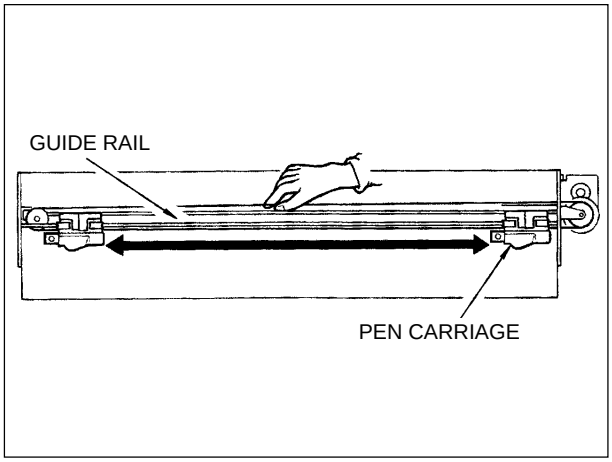


4 Adjust the tension with *SCREW B* so that it will be **12 ~ 14 pounds**.

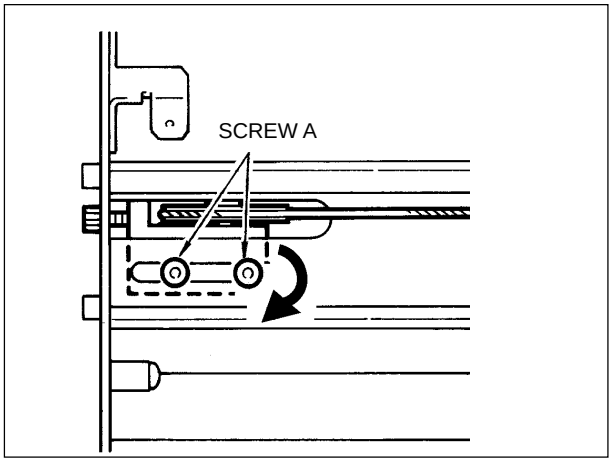
12 ~ 14 lb.



5 Make sure to check the tension again after moving the *PEN CARRIAGE* back and forward in a whole distance.
If the tension changes, re-adjust it.



6 Tighten *SCREW A* after the adjustment.



7 Check the tension again.

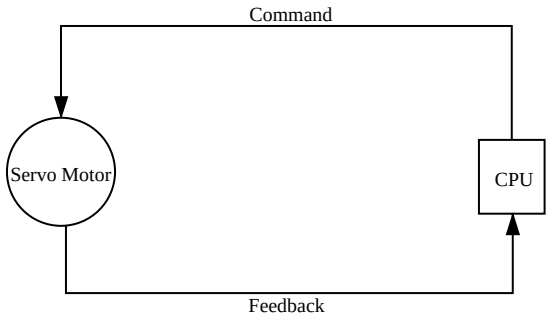
4-8 Motor Balance Adjustment

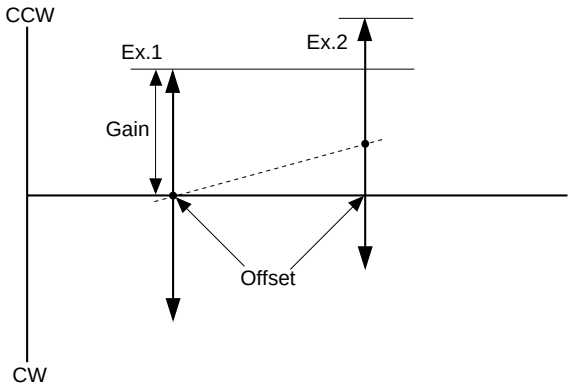
Servo Motor feeds back to the CPU the actual rotation corresponds to the instruction.
Motor tried to follow the instruction from the CPU.
Difference between the actual rotation and the instruction could be adjusted with the Motor Balance (GAIN) Adjustment.

- If the difference is small (= GAIN is small), motor becomes very sensitive. As a result, it vibrates.
- If the difference is big (= GAIN is big), motor becomes dull to the instruction. And as a result, cutting quality will be damaged.

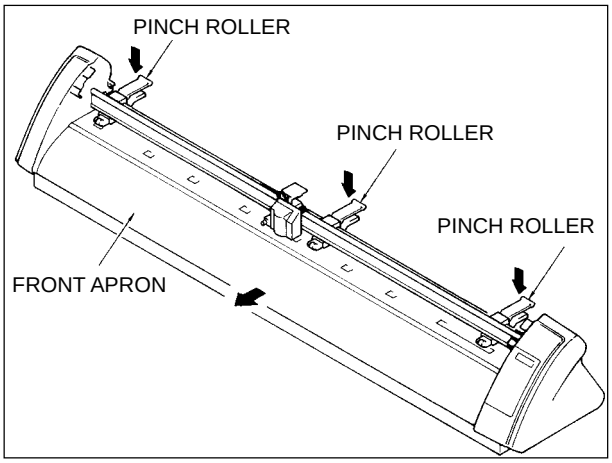
Motor Balance (OFFSET) Adjustment is used to adjust the GAIN for CW and CCW directions to be equal.

- Ex.1 in the figure shows that both the OFFSET and the GAIN is adjusted in both CW and CCW directions.
- Ex.2 shows that the GAIN is adjusted but the OFFSET is shifted. Therefore, the GAIN will be big in CCW direction and small in CW direction. As a result, motor becomes dull in CCW direction and sensitive in CW direction causing problems.

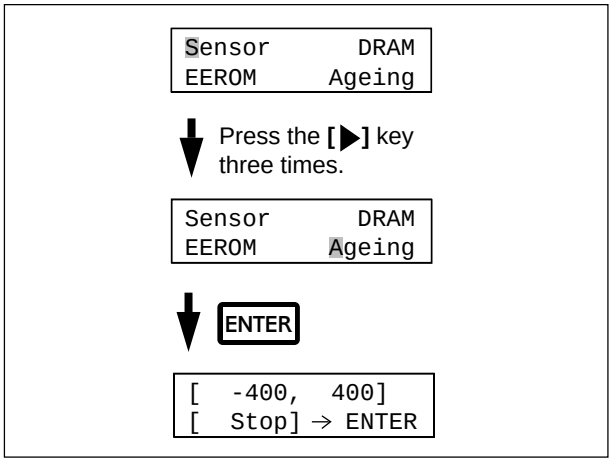




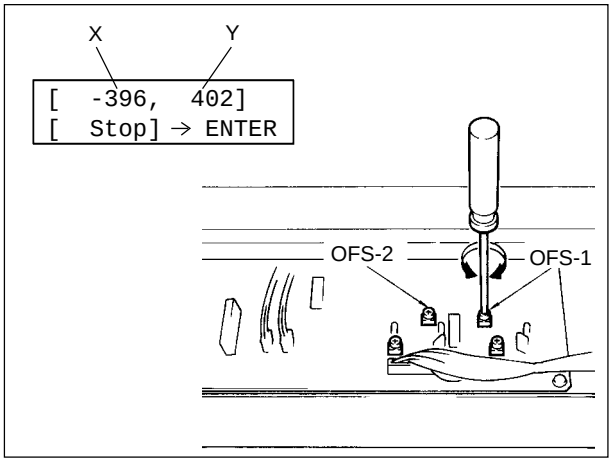
1 Put all three *PINCH ROLLERS* in UP position.
Then remove the *FRONT APRON*.



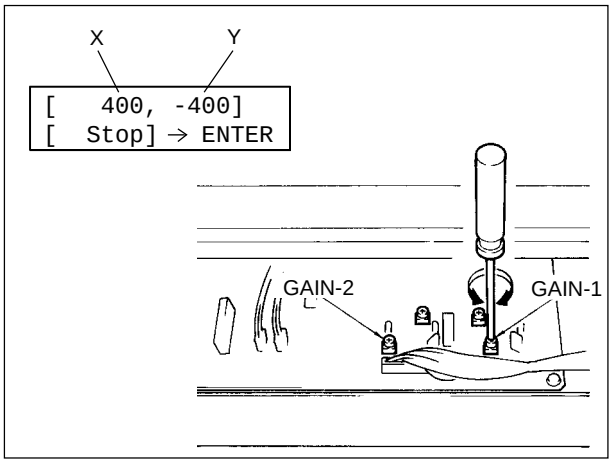
2 Enter the Service Mode by turning on the power while pressing **[◀]**, **[▼]** and **[▲]** keys. Select "Ageing" with **[◀]**, **[▶]** keys, and push the **[ENTER]** key twice.
- Displayed values will change when motors change their directions.



3 Adjust OFS-1 on the *POWER BOARD ASS'Y* so that the difference of the "X" absolute values will be less than **3**. And also adjust OFS-2 for "Y" absolute values.



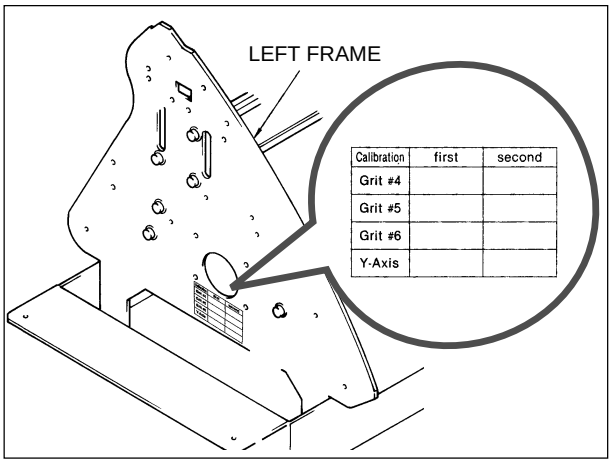
4 Adjust GAIN-1 so that the "X" absolute values will be **400 ~ 404**. And also adjust GAIN-2 for "Y" absolute values.



5 Check the displayed value.
If the difference of the absolute values are more than 3, repeat adjustment from procedure **2** .

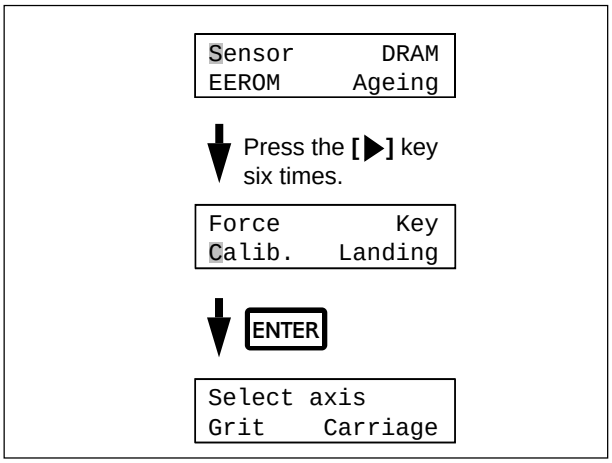
4-9 Calibration

1 Calibration done in the factory is indicated on the sticker put on the *LEFT FRAME*.

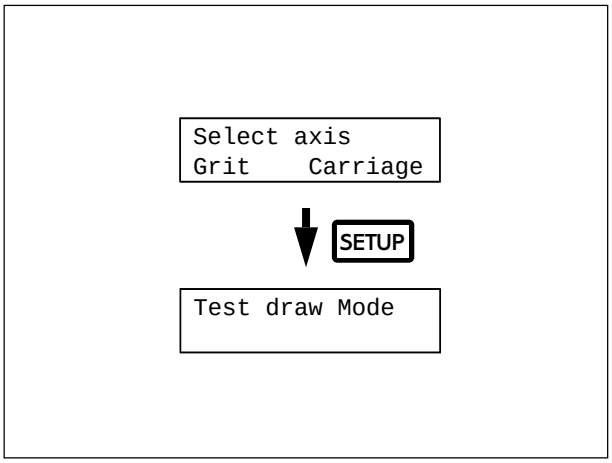


2 Set the A1 size paper and put the 0.25 ink pen to the *PEN CARRIAGE*.

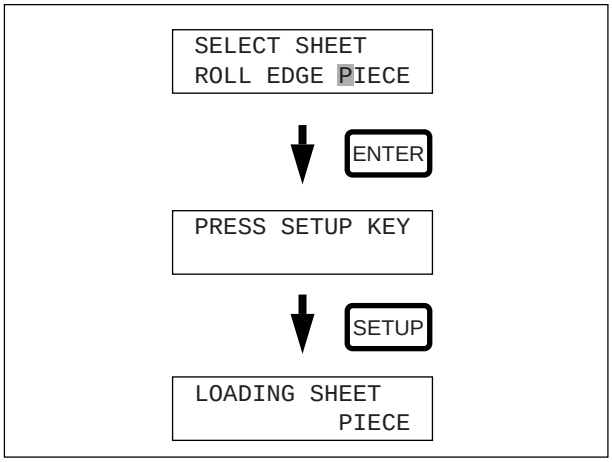
3 Enter the Service Mode by turning on the power while pressing **[◀]**, **[▼]** and **[▶]** keys. Select "`Calib.`" with **[◀]**, **[▶]** keys, and push the **[ENTER]** key.



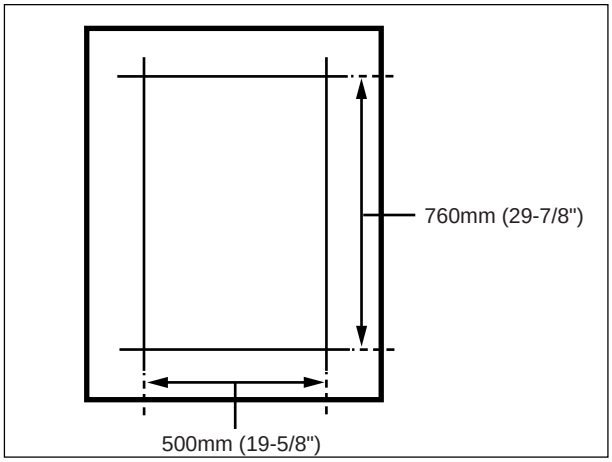
4 Start "`Test Draw Mode`" by pushing the **[SETUP]** key.



5 Select "PIECE" with [◀], [▶] key. And push [ENTER] key, then the [SETUP] key.
- Paper will be loaded.

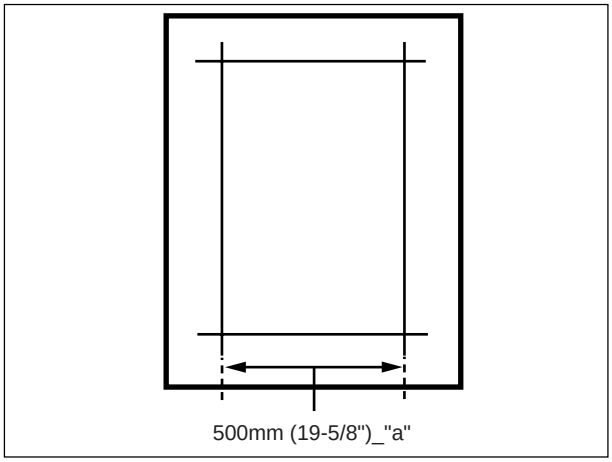


6 Push the [TEST] key.
- PNC starts drawing as shown in the figure.



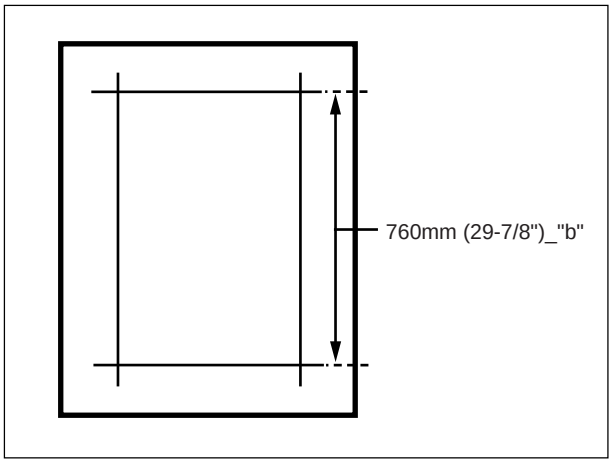
7 Measure the distance "a". Calculate the error(%) of the measured distance corresponds to the fixed distance [500mm (19-5/8")].

$$\frac{500 - \text{Measured Distance}}{500} \times 100$$

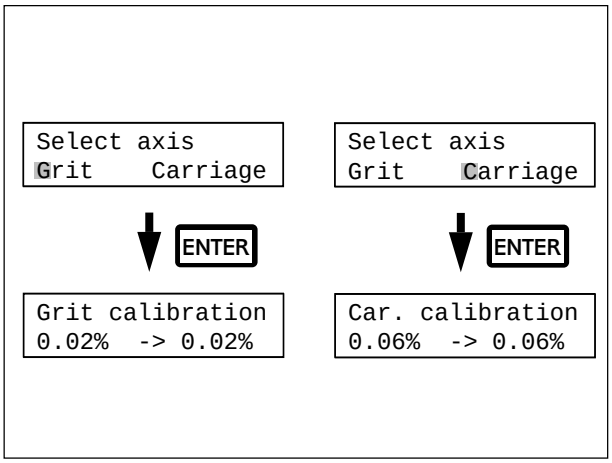


8 Calculate the error(%) of the measured distance "b" corresponds to the fixed distance [760mm (29-7/8")].

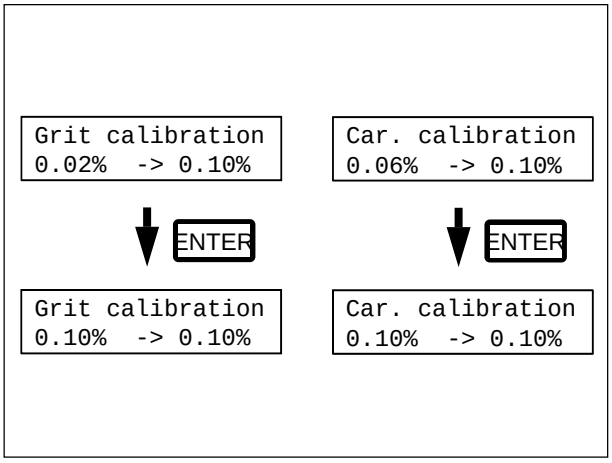
$$\frac{760 - \text{Measured Distance}}{760} \times 100$$



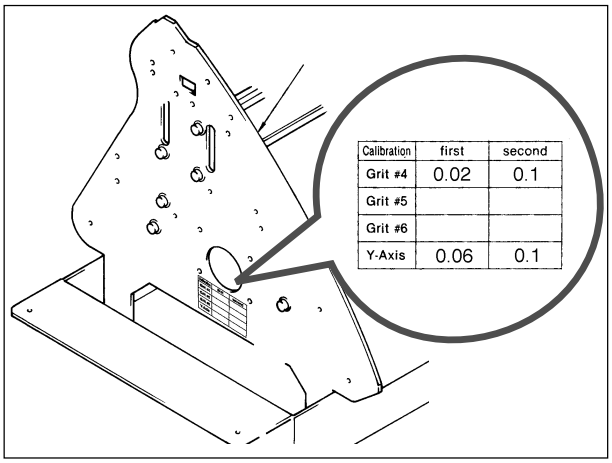
9 If there is an error in “a”, select “`Carriage`” and push the **[ENTER]** key. If “b”, select “`Grit`”.



10 Enter the error with **[▲]** and **[▼]** key and push **[ENTER]** key.

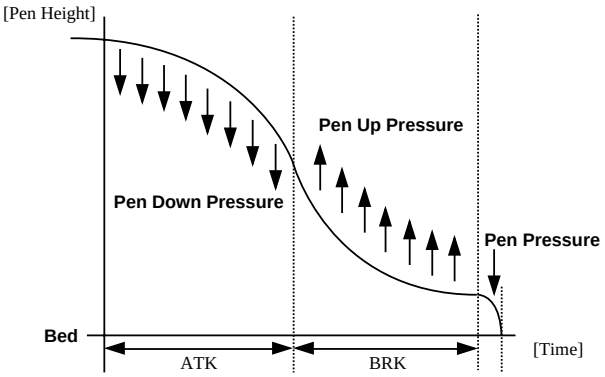


11 Make sure to re-write the amount on the sticker after calibration.



4-10 Softlanding Adjustment

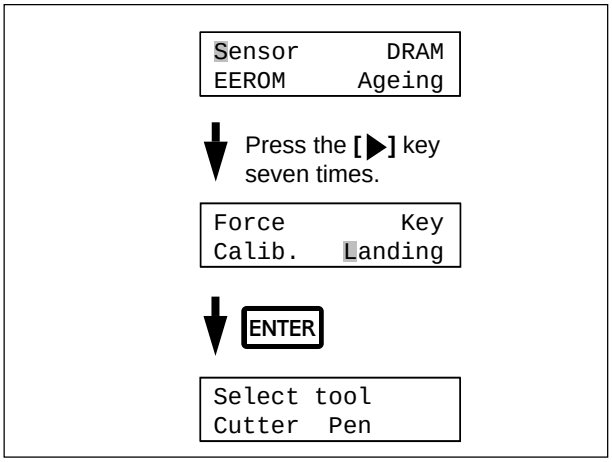
Softlanding function is a system to land the pen smoothly to prevent pen bouncing.
When the machine receives a command to move the pen down, it puts the pressure downwards and starts moving the pen DOWN. Then it puts the pressure upward before putting the pen pressure and lands the pen smoothly.
By using "`Landing`" in Service Mode, time being taken to put the pressure downwards (ATK) and upwards (BRK) can be adjusted.



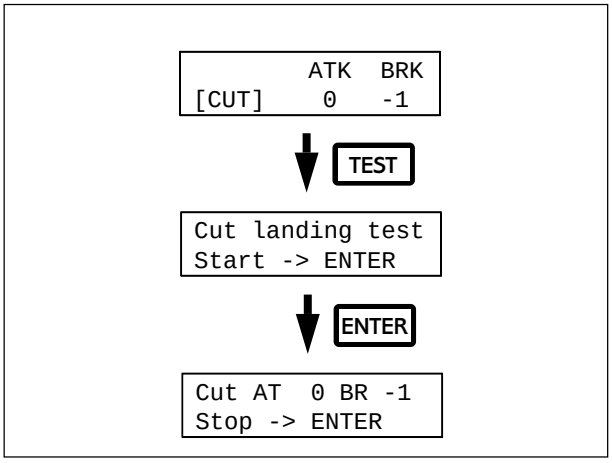
1 Check and make sure that the Tool Height and the Pen Pressure are adjusted.
It is not necessary to adjust softlanding if Tool Height and Pen Pressure are adjusted correctly.
This adjustment should be carried out when pen bouncing problem occurs or timing of the pen down is delayed.

2 Set the vinyl sheet on the machine and put the Blade Holder to the *PEN CARRIAGE*.

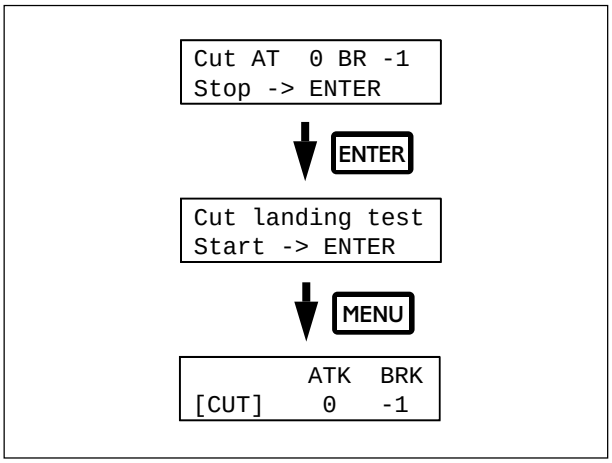
3 Enter the Service Mode by turning on the power while pressing **[◀]**, **[▼]** and **[▶]** keys. Select "Landing" with **[◀]**, **[▶]** keys, and push the **[ENTER]** key.



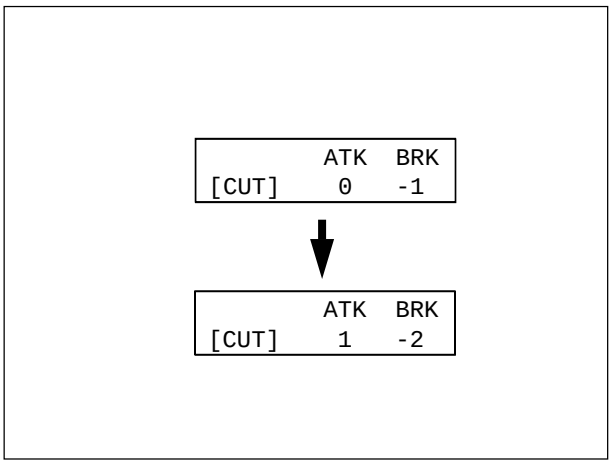
4 Select "Cutter" with **[◀]**, **[▶]** keys, and push the **[ENTER]** key. Push **[TEST]** key and then **[ENTER]** key.
- Landing Cut Test will start.



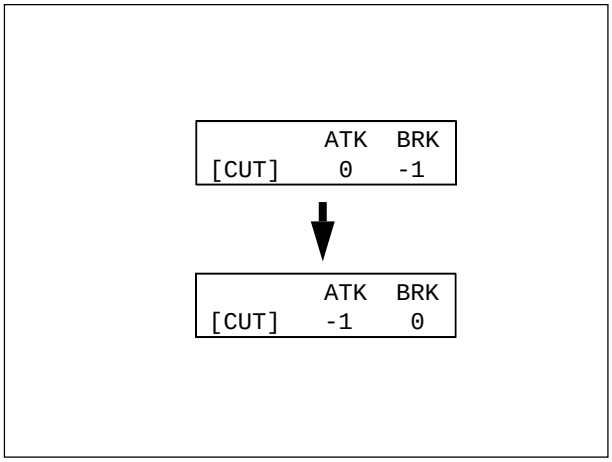
5 Push **[ENTER]** key and then **[MENU]** key.
- Landing Cut Test stops temporary.



6 In case of pen bouncing problem, increase the "ATK" and decrease "BRK" with **[▲]** and **[▼]** keys. Then push the **[ENTER]** key for setting.

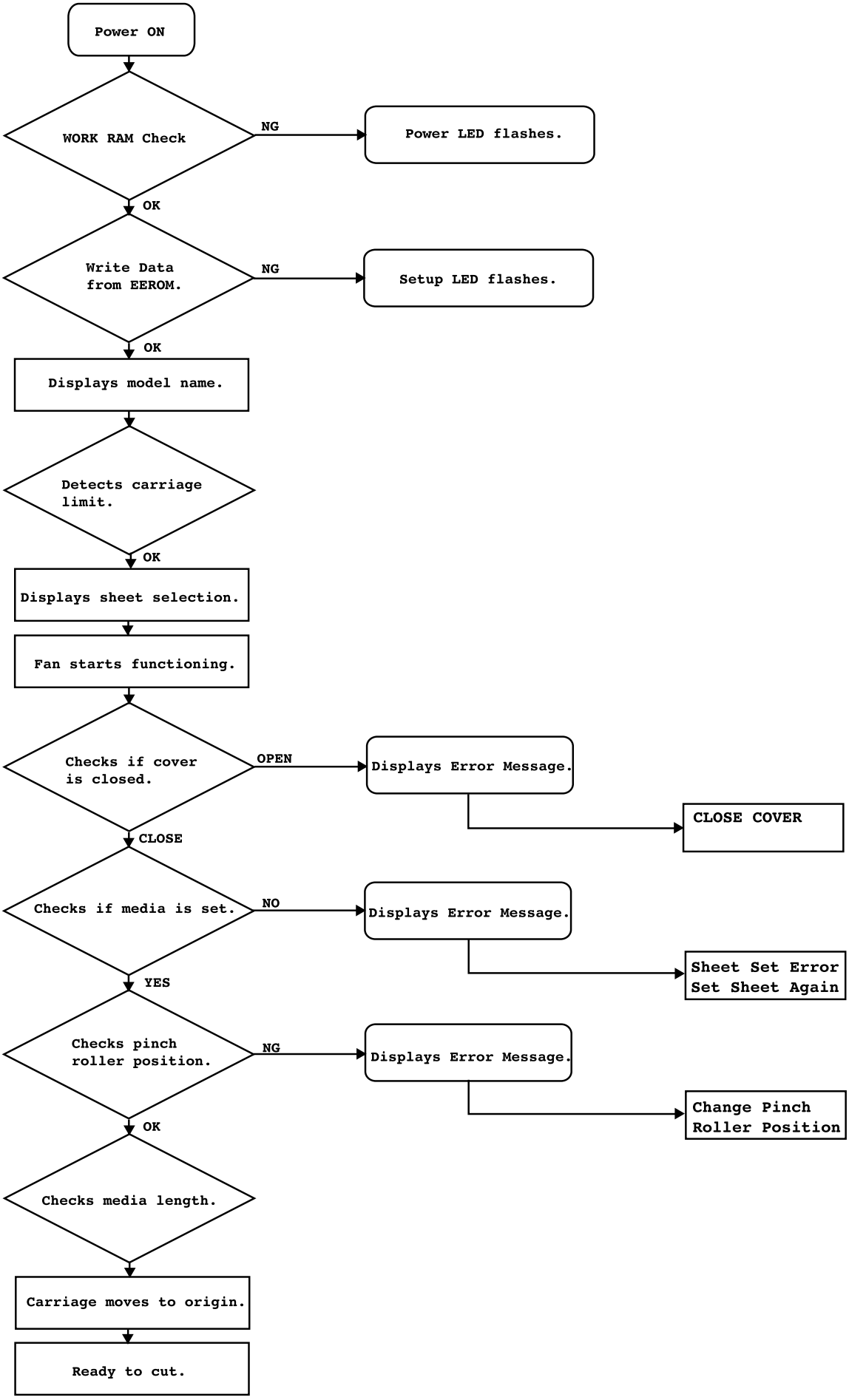


7 In case the timing of the landing is delayed, decrease the parameter of “ATK” and increase “BRK” with **[▲]** and **[▼]** keys. Then push the **[ENTER]** key for setting.



8 Try Landing Cut Test again and check the result.
In case of problem, re-set “ATK” and “BRK”.

5-1 OPERATIONAL SEQUENCE



5-2 SENSOR MAP

Rear Paper Sensor

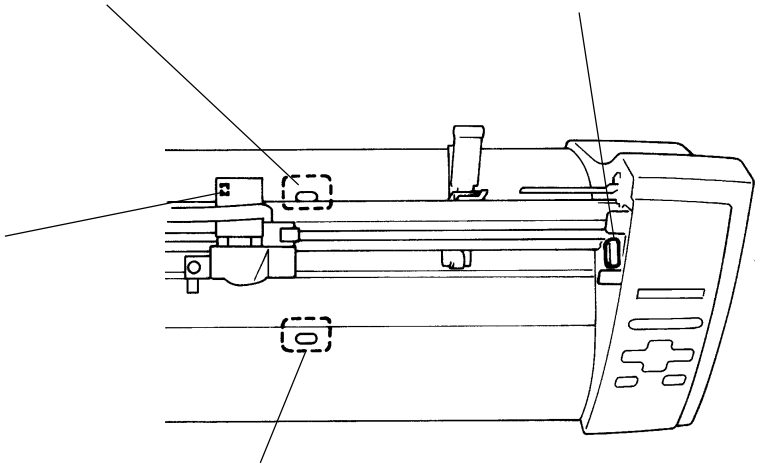
It detects the rear edge of the media and also whether the media is set or not.
When "ROLL" is selected, either one of the Front or Rear Paper Sensor detects whether the media is set or not.

Cover Switch

It detects whether the Front Cover is open or close.

Carriage Sensor

It detects the pinch roller position and the limit of the carriage moving direction.



Front Paper Sensor

It detects the front edge of the media and also whether the media is set or not.
When "ROLL" is selected, either one of the Front or Rear Paper Sensor detects whether the media is set or not.

6 Trouble Shooting

6-1 ERROR MESSAGE

Error Message	Meaning
Er1:Command Not Recognized	Appears if the number of parameters for a device control instruction is more than that permissible.
Er2:Wrong Number of Parameters	Appears if a framing error, parity error, or overrun error occurs at the time of data reception. (There is a problem with one of these settings:Baud Rate, Parity, Stop Bits, or Data Bits. The protocol settings for the PNC-1860/1410/1210 must be made correctly in order to match the settings your computer is set to use.
Er3:Out of Parameter range	Appears if the I/O buffer has overflowed. (There is a problem with the connecting cable, or the settings for Heandshaking. Make sure you are using a cable appropriate for your computer being used.Also, check that the setting for Handshaking is correct.)
Er5:Unknown Character Set	Appears if a communication error other than "Er10" through "Er16", one uninterpretable by the PNC-1860/1410/1210, occurs during data communications.
Er10:Output Request Overlap	Appears if an output instruction is sent from the computer during execution of a previous output instruction. More precisely, there is a certain amount of delay between the moment an output instruction is given and the instant actual output begins. This error message appears if the new output request arrives during this delay time. (The delay time can be set using the [ESC].M instruction.
Er11:Commnd Not Recognized	Appears if a device control instruction that the PNC-1860/1410/1210 cannot interpret is sent.
Er12:Wrong Parameter	Appears if an invalid parameter has been specified for a device control instruction.
Er13:Out of Parameter range	Appears if the value for a device control instruction parameter exceeds the permissible limit.

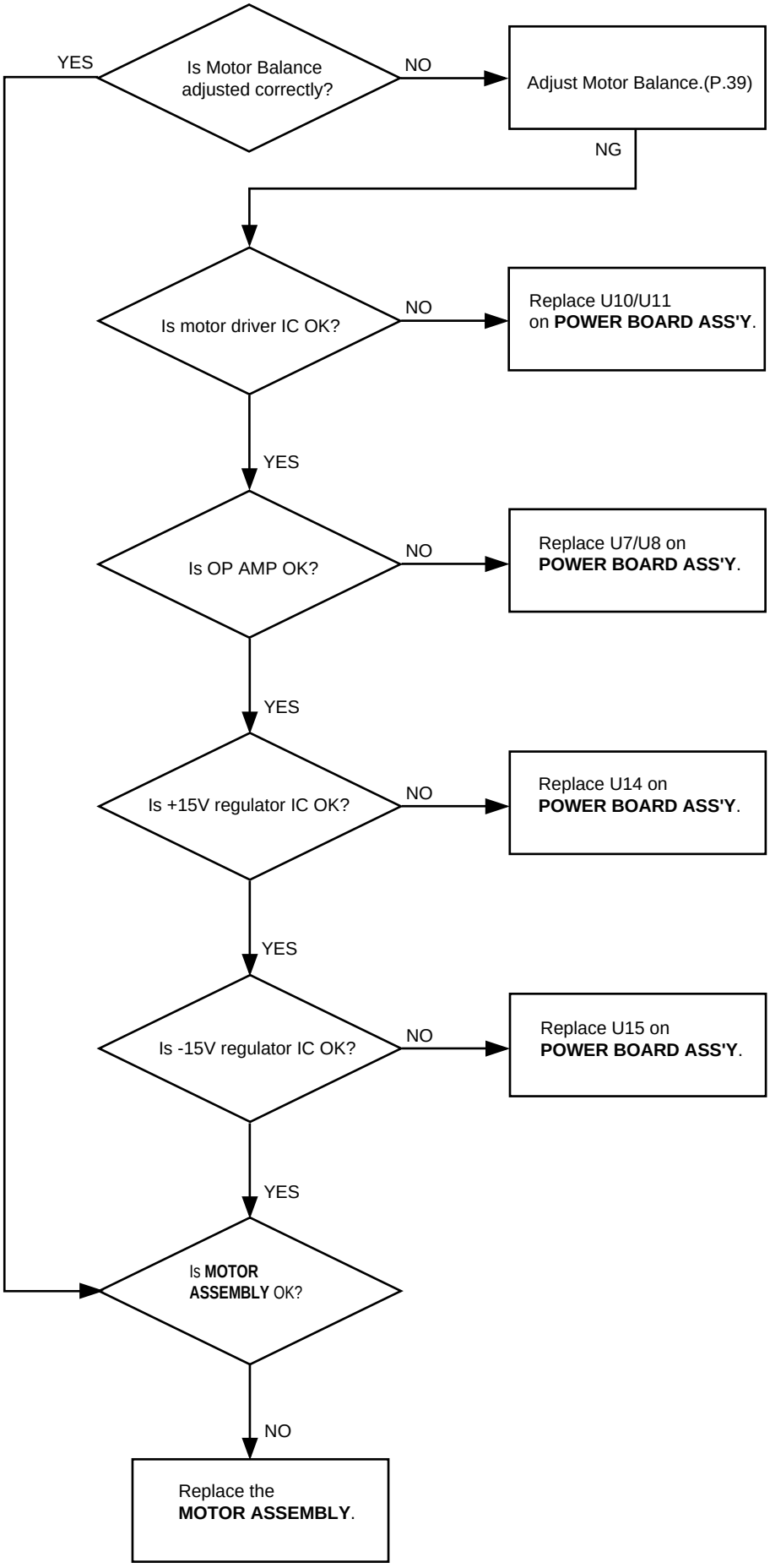
Error Message	Meaning
Er14:Termination Error	Appears if the number of parameters for a device control instruction is more than that permissible.
Er15:Framing/ Parity Error	Appears if a framing error, parity error, or overrun error occurs at the time of data reception. (There is a problem with one of these settings:Baud Rate, Parity, Stop Bits, or Data Bits. The protocol settings for the PNC-1860/1410/1210 must be made correctly in order to match the settings your computer is set to use.
Er16:Buffer Overflow	Appears if the I/O buffer has overflowed. (There is a problem with the connecting cable, or the settings for Heandshaking. Make sure you are using a cable appropriate for your computer being used.Also, check that the setting for Handshaking is correct.)
Er18: Indeterminate	Appears if a communication error other than "Er10" through "Er16", one uninterpretable by the PNC-1860/1410/1210, occurs during data communications.

6-1-1 OTHER MESSAGE

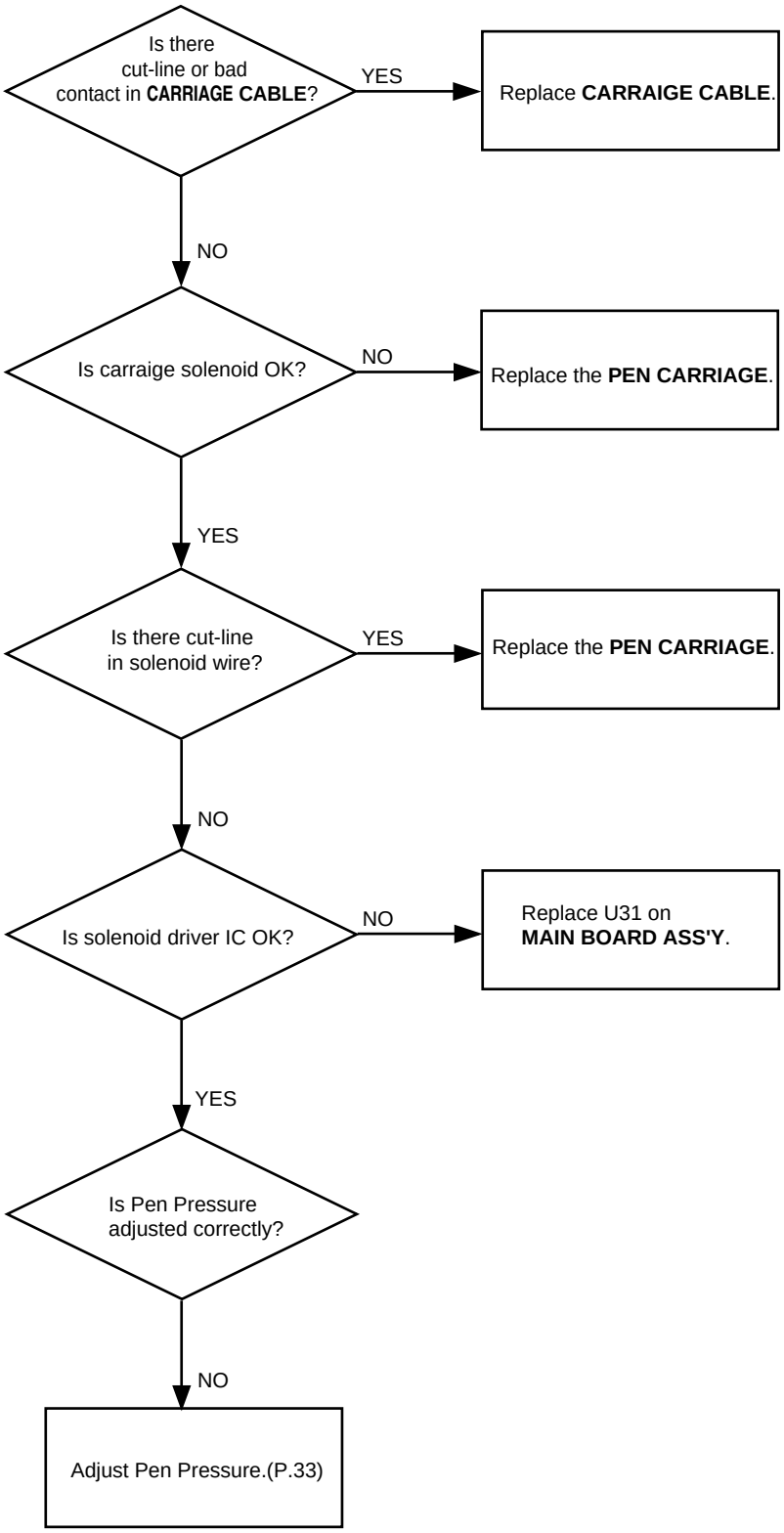
Error Message	Meaning
Change Pinch Roller Position	The location of one or more of the pinch rollers is not correct. If this happens, raise the sheet loading levers and move the pinch rollers to the proper positions above the grit rollers. Reposition the sheet to match this new alignment, then lower the sheet loading levers to hold the sheet in place.
CLOSE COVER	This displayed when the front cover is opened during cutting. Cutting operation is halted, and the message is displayed on the screen. Cutting restarts when the cover is closed.
Sheet Set Error Set Sheet Again	This is displayed when the material has been loaded at a position where the sheet sensor does not function.
Motor Error Power ON Again	Shows motor error status. This is displayed when the PNC-1860/1410/1210 is heavily loaded, such as during a paper jam, when heavy stock is cut across a long distance without initial sheet feed, or when the sheet is abruptly pulled from the roll during cutting.
PAUSE <CONT>STOP VIEW	If the screen shown at lefts is displyed, it means that operation is paused.

6-2 TROUBLE SHOOTING

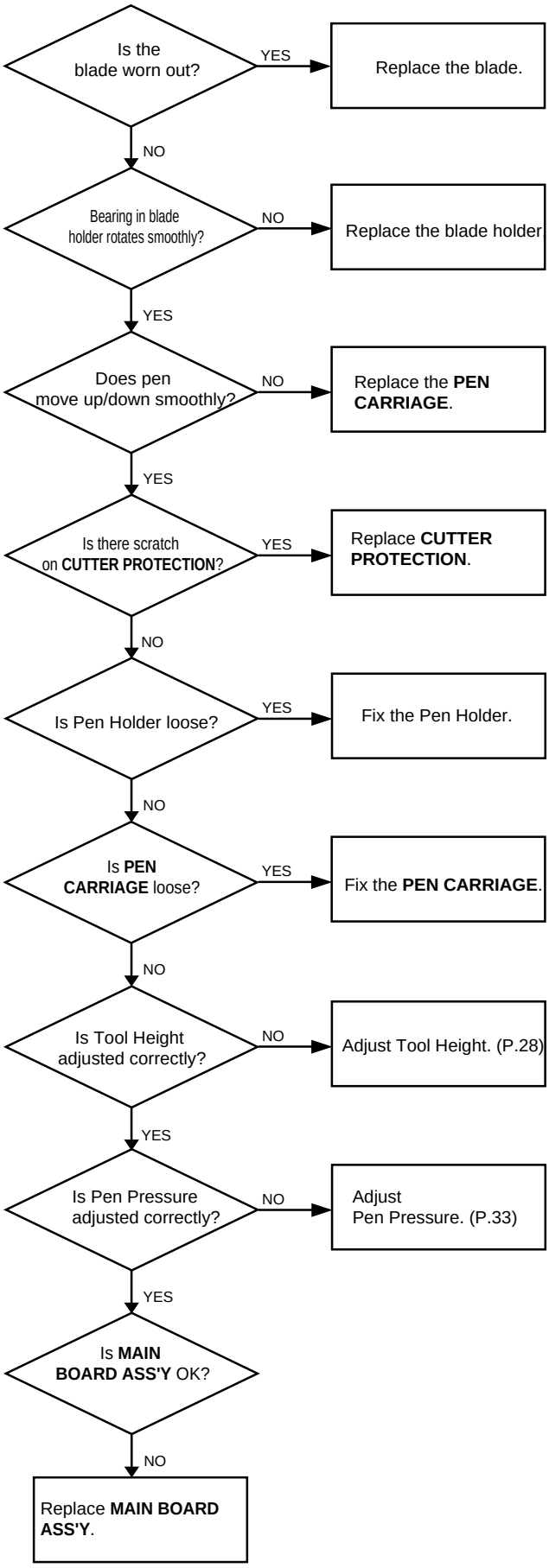
• Motor error



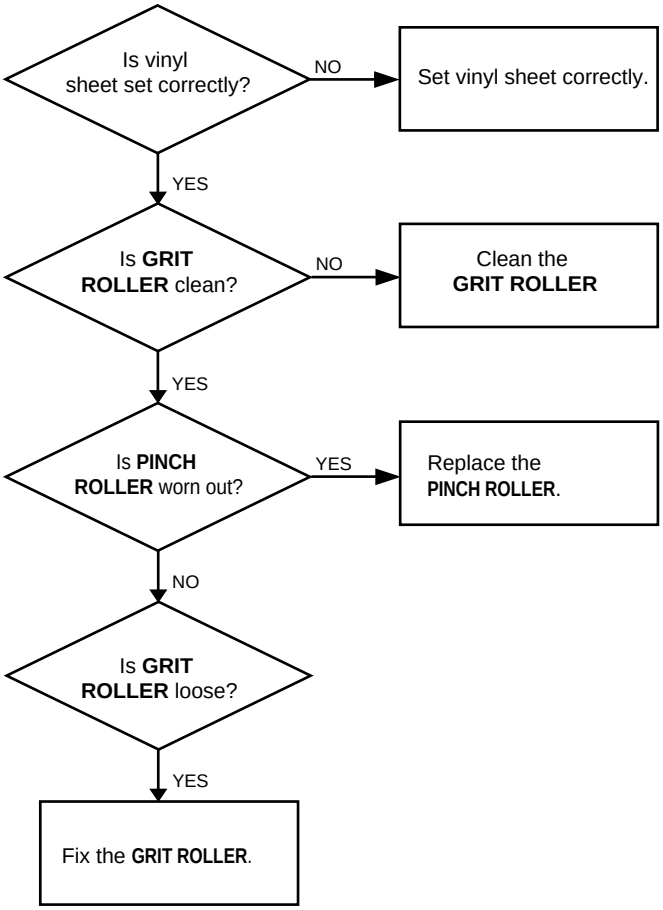
• Pen up/down


Is there cut-line or bad contact in CARRIAGE CABLE?
YES
Replace CARRAIGE CABLE.
NO
Is carraige solenoid OK?
NO
Replace the PEN CARRIAGE.
YES
Is there cut-line in solenoid wire?
YES
Replace the PEN CARRIAGE.
NO
Is solenoid driver IC OK?
NO
Replace U31 on MAIN BOARD ASS'Y.
YES
Is Pen Pressure adjusted correctly?
NO
Adjust Pen Pressure.(P.33)

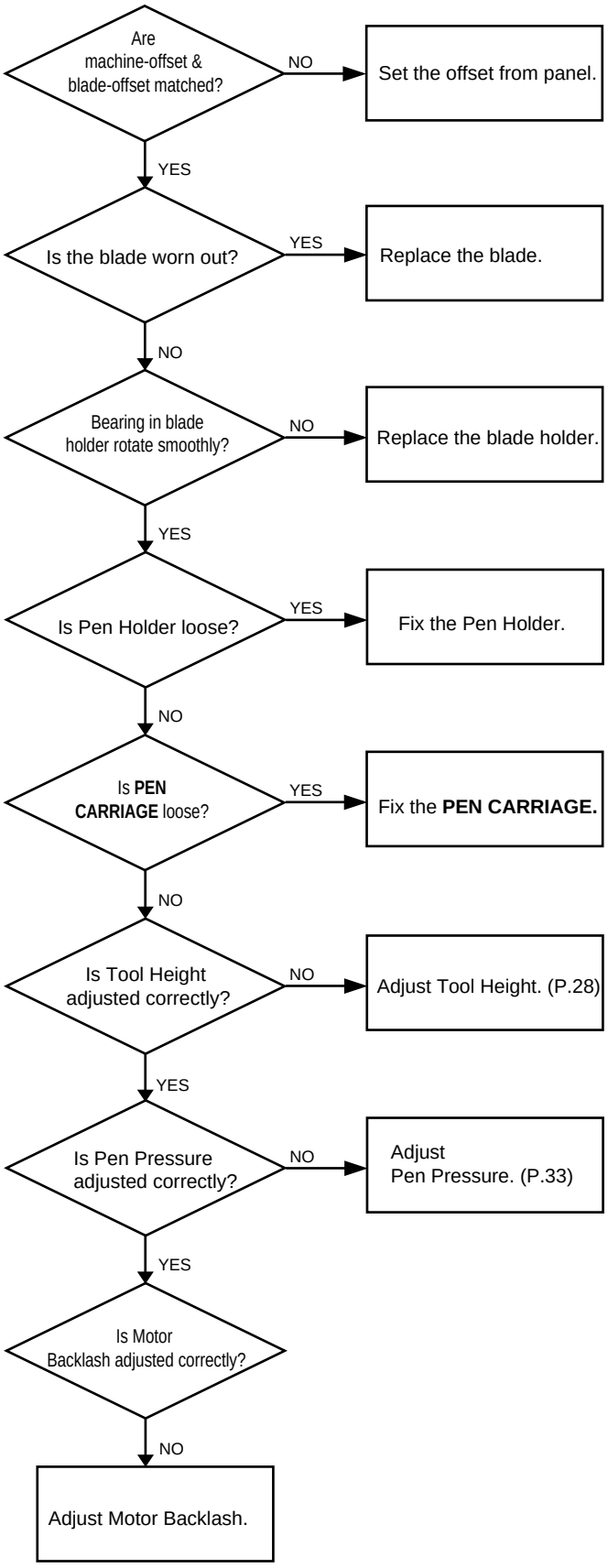
• Pen bounce


Is the blade worn out?
YES
Replace the blade.
NO
Bearing in blade holder rotates smoothly?
NO
Replace the blade holder
YES
Does pen move up/down smoothly?
NO
Replace the **PEN CARRIAGE**.
YES
Is there scratch on **CUTTER PROTECTION**?
YES
Replace **CUTTER PROTECTION**.
NO
Is Pen Holder loose?
YES
Fix the Pen Holder.
NO
Is **PEN CARRIAGE** loose?
YES
Fix the **PEN CARRIAGE**.
NO
Is Tool Height adjusted correctly?
NO
Adjust Tool Height. (P.28)
YES
Is Pen Pressure adjusted correctly?
NO
Adjust Pen Pressure. (P.33)
YES
Is **MAIN BOARD ASS'Y** OK?
NO
Replace **MAIN BOARD ASS'Y**.

• Media shifting



• Circle doesn't close



7 Supplement

7-1 MAINTENANCE CHECK LIST

PNC-1860/1410/1210 MAINTENANCE CHECK LIST

Date : . .

Model	Serial No.
PNC-1860	
PNC-1410	
PNC-1210	

MECHANICAL PARTS

Check Points			Confirmation
Carriage-Drive Part	1. Drive Gear	Dirty/Crack	
	2. Backlash	Looseness	
	3. Wire Tension	Looseness	
Grit Drive Part	1. Grit Roller	Dirty	
	2. Drive Gear	Dirty/Crack	
	3. Backlash	Loosenss	
Bed/Guide Rail	1. Pinch Roller	Rotation/wear down	
	2. Cutter Protection	Dirty/Scratch ** Replacement depend on the scratch	
Pen Carriage	1. Pen Carriage	Looseness	
	2. Cutter Holder	Looseness	
Blade Holder	1. Bearing	Revolution of BEaring	

LUBRICATION

Check Points		Confirmation
Floil G-474C	Carriage Drive Gear	OK•Cleaning & Lubrication
	Grit Drive Gear	OK•Cleaning & Lubrication
	Guide Rail	OK•Cleaning & Lubrication

FUNCTION CHECK

Check Points		Confirmation
1. ROM Version Replace the ROM to the latest version.		
2.Panel Switch		
3.Carriage & Grit Compensation		
4.Cutting Test	• Wavy lines.	
	• Distorted figure.	
	• Pen Bouncing	
	• Noise	
	• Pen Pressure	
	• Media Shifting.	
	• Quality of corners.	
5.Connection check with Customer's PC.		

Roland
DIGITAL GROUP

PNC-1860/
1410/1210