

Service Manual

Compact Disc Player



MASH
multi-stage noise shaping

SL-HD515

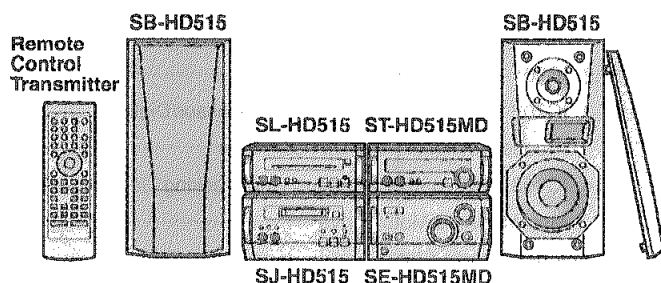
Traverse deck:RAE0152Z-1 Mechanism Series

Colour

(S).....Silver Type

Area

(E).....Europe.



Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

System	SC-HD515MD
Tuner	ST-HD515MD
Amplifier	SE-HD515MD
CD Player	SL-HD515
MD Deck	SJ-HD515
Speakers*	SB-HD515

* : Made in Spain.

Specifications

Digital output terminal:

Opticalx1

Audio section

DA converter:

1 bit 2 DAC MASH

Format

Sampling Frequency:

44.1 kHz

Pickup

Wavelength:

780 nm

General

Dimensions (W×H×D):

200×76×253 mm

Weight:

1.4 kg

Notes: Specifications are subject to change without notice.
Weight and dimensions are approximate.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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1 Note

Refer to the service manual for Model No. SE-HD515MD (ORDER No. AD0003056C2) for information on Accessories and Packaging.

2 Blue LED

- The blue LED mounted to each sides of front panel is very sensitive to static electricity. When handling the LED base plate, be very careful about it.
- Do not replace the blue LED by itself because it may be subject to electrostatic breakdown or deterioration in quality. When replacing the LED base plate, be sure to replace L and R sides simultaneously to adjust the brightness. For configuration at the time of supply of replacement parts, refer to Printed Circuit Board Diagram.

3 Before Repair

This equipment (SL-HD515), which is a component of the system, is supplied with power from the Amplifier (SE-HD515MD) through the Tuner (ST-HD515MD). When repairing this equipment or checking operation of the system, be sure to connect to the amplifier and tuner with it.

This equipment, even in the state of it as a single equipment, permits power supply and operation check. When operating it as a single equipment without the amplifier and tuner, refer to the To Supply Power Source.

4 Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.

So be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

4.1. Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To protect the laser diode against electrostatic breakdown, short the flexible board (FPC board) with a clip or similar object. Refer to Fig. 4-1.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted. Refer to Fig. 4-1.

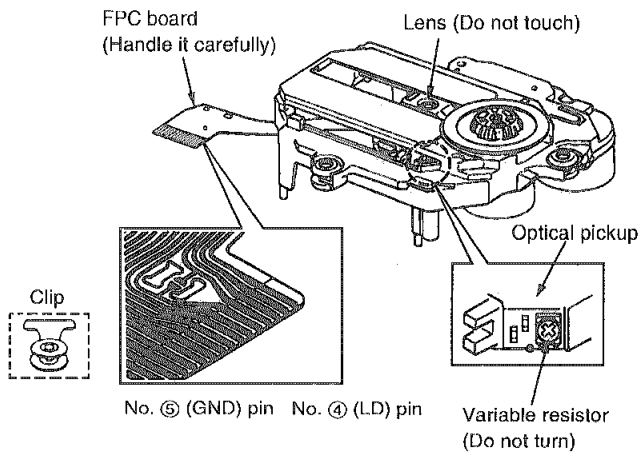


Fig. 4-1.

4.2. Grounding for electrostatic breakdown prevention

4.2.1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body. Refer to Fig. 4-2.

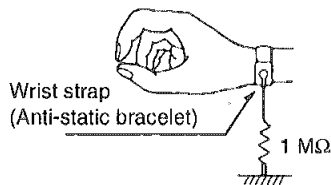


Fig. 4-2.

4.2.2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet. Refer to Fig. 4-3.

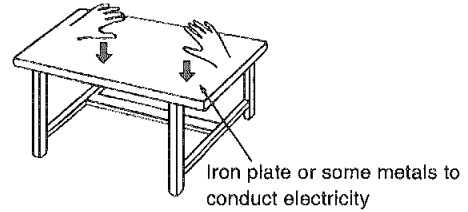


Fig. 4-3.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap.

So take care not to let your clothes touch the traverse deck (optical pickup).

5 Precaution of Laser Diode

CAUTION:

THIS PRODUCT UTILIZES A LASER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780 nm

Maximum output radiation power from pickup: 100 µW/VDE

Laser radiation from the pick up unit is safety level, but be sure the followings:

1. Do not disassemble the pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit adgestrahlt.

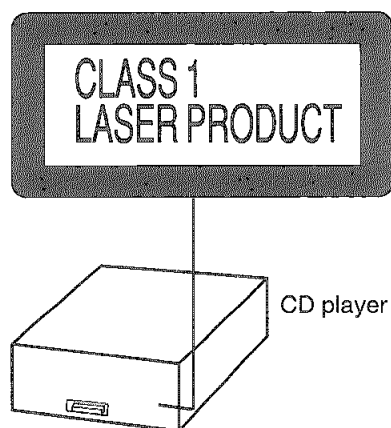
Wellenlänge: 780 nm

Maximale strahlungsleistung der lasereinheit: 100 µW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

(Back of product)



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSÅFBRYDERE ER LØDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINNA NÄKYMÄTÖNTÄ LASERSÄTEILYLLÄ. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLING NÄRDENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRÄHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

(Inside of product)

(Indersiden at apparatet)

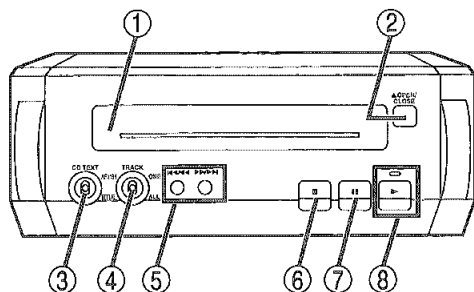
(Tuotteen sisällä)

(Apparatens insida)

(Produktets innsida)

(Im Inneren des Gerätes)

6 Location of Controls



- ① Disc tray
- ② Disc tray open/close button (▲ OPEN/CLOSE)
- ③ CD TEXT switch (CD TEXT)
- ④ One track/all tracks switch (TRACK)
- ⑤ Skip/search buttons (◀◀ / ◀▶, ▶▶ / ▶▶)
- ⑥ Stop button (■)
- ⑦ Pause button (||)
- ⑧ Play button and indicator (▶)

The color of the indicator depends on the operation taking place.

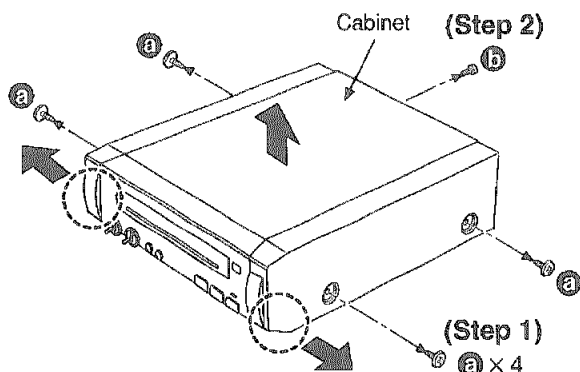
If stopped: orange

If playing: green

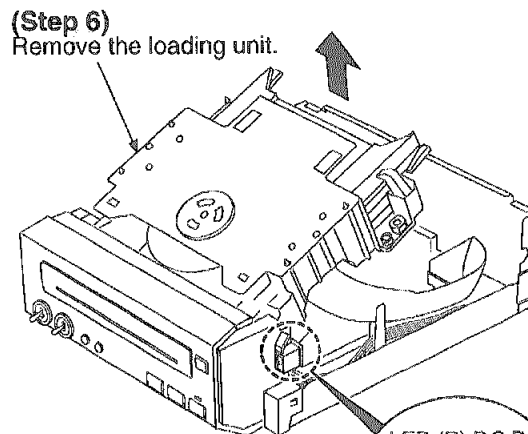
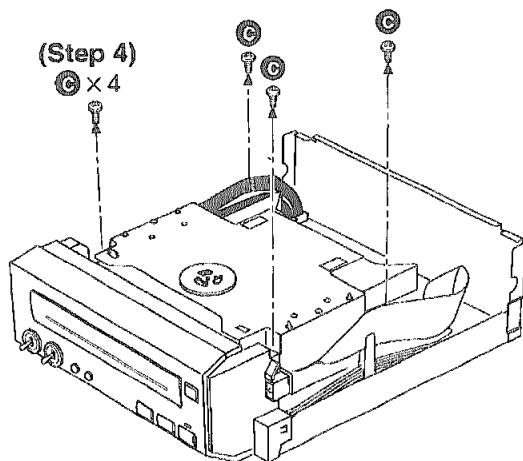
7 Operation Checks and Component Replacement Procedures

- This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
- For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

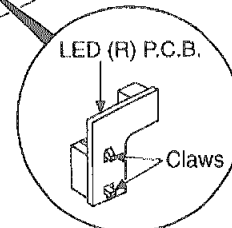
7.1. Checking for the CD servo P.C.B.



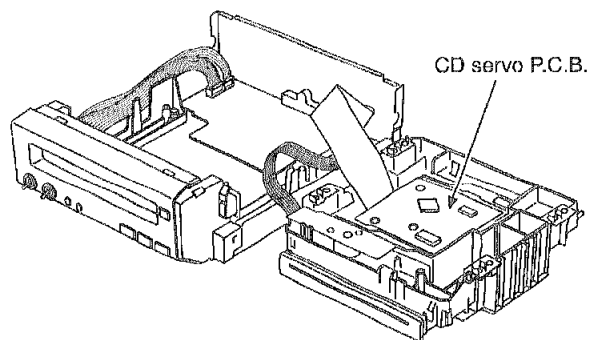
(Step 3)
Spreading the both front tails indicated with (○) of cabinet a small amount, lift up and remove the cabinet in the direction of arrow.



(Step 5)
Release the 2 claws, and then remove the LED (R) P.C.B..

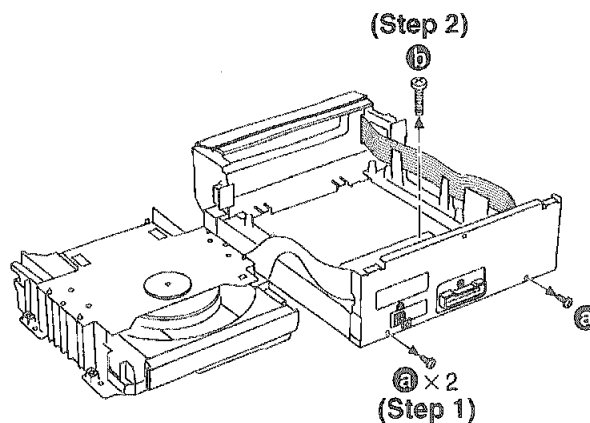


- Check the CD servo P.C.B. as shown below.



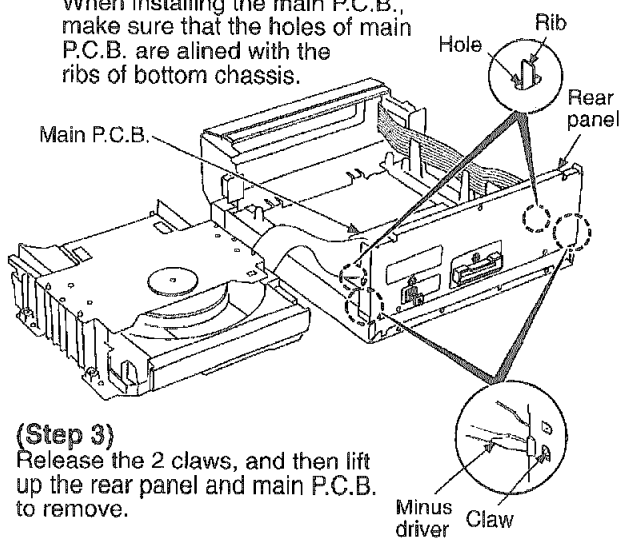
7.2. Checking for the main P.C.B.

- Follow the (Step 1) - (Step 6) of item 7.1.

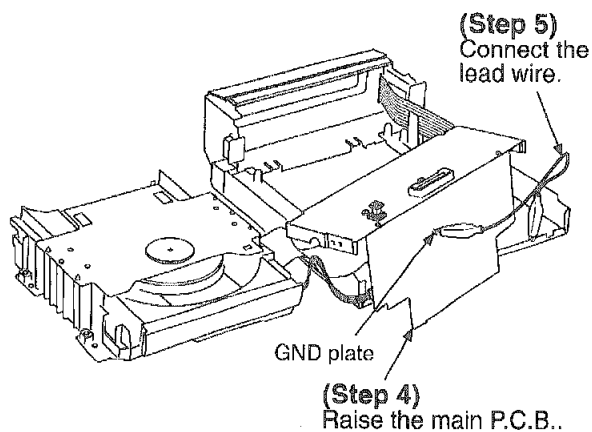


NOTE:

When installing the main P.C.B., make sure that the holes of main P.C.B. are aligned with the ribs of bottom chassis.

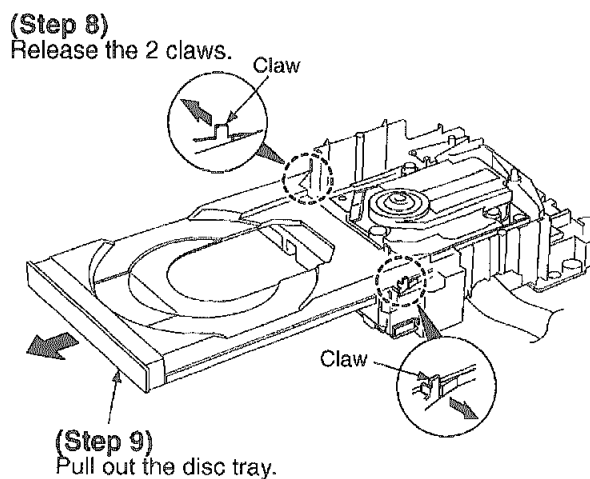
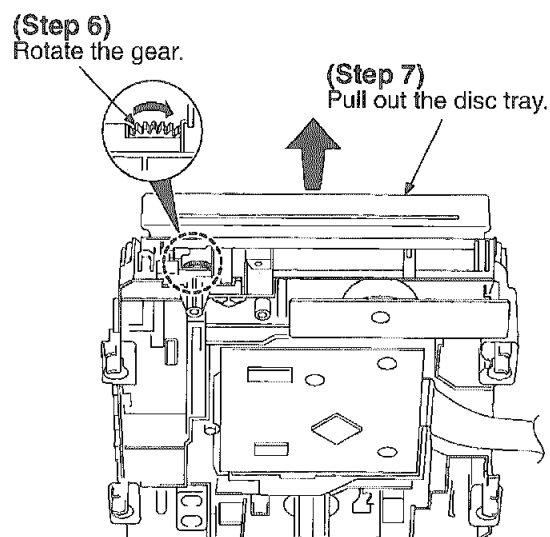
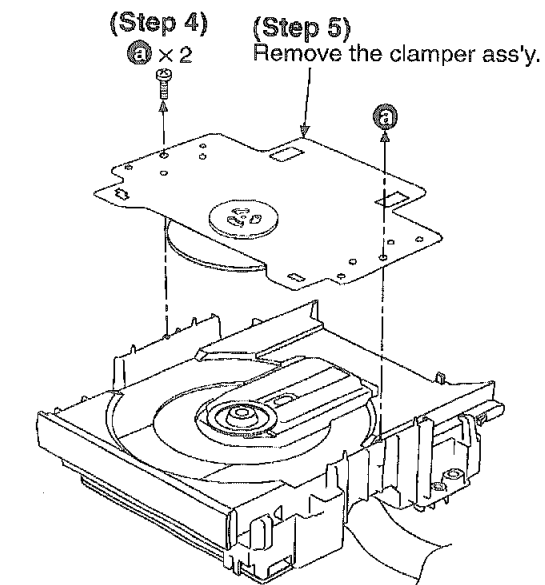
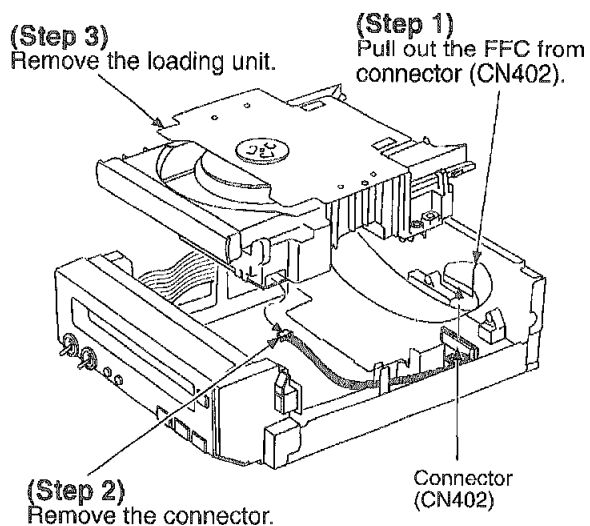


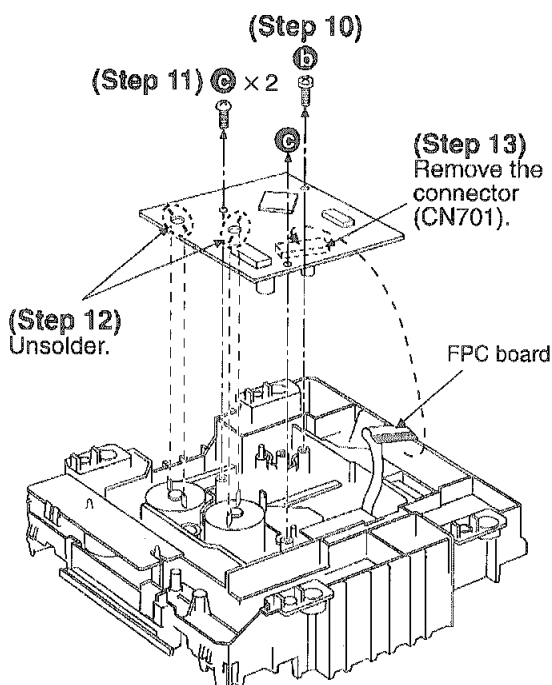
• Check the main P.C.B. as shown below.



7.3. Replacement for the traverse deck ass'y

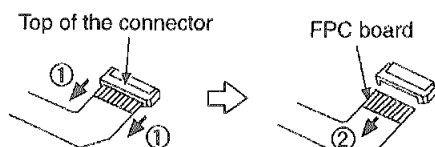
• Follow the (Step 1) - (Step 6) of item 7.1.





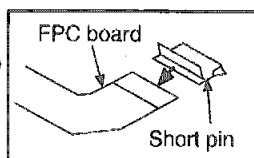
■ Removal of the FPC board

※ Push the top of the connector in the direction of arrow ①, and then pull out the FPC board in the direction of arrow ②.



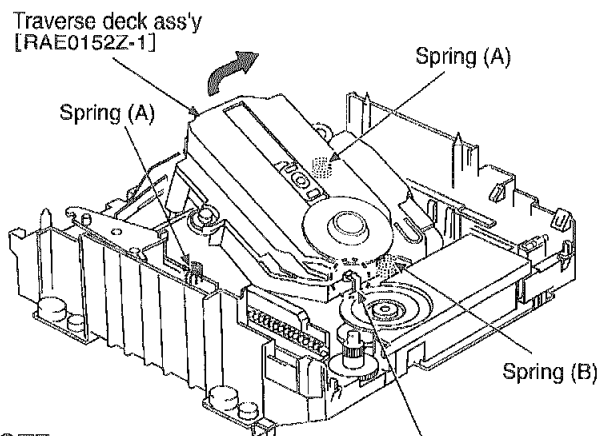
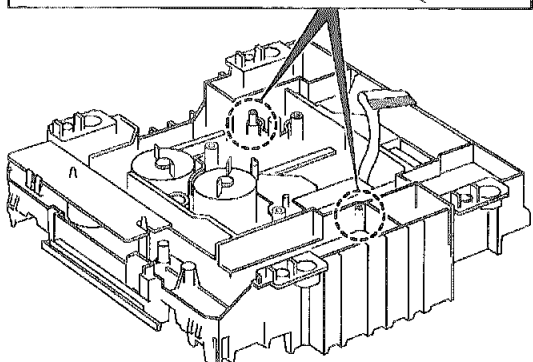
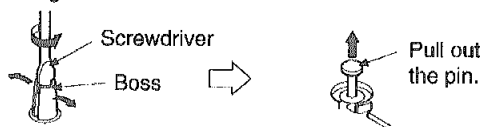
NOTE:

Insert a short pin into the traverse unit FPC board.
(Refer to "Handling Precautions for Traverse Deck".)



(Step 14)

1. Widen the boss using a regular screwdriver.
2. Pull out the pin in the direction of the arrow.



NOTE:

Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

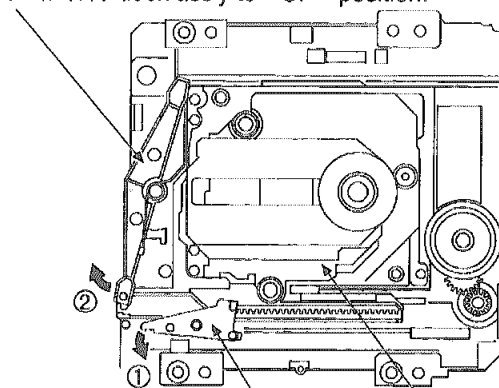
(Step 15)

Remove the claw.

Installation of the disc tray after replacement

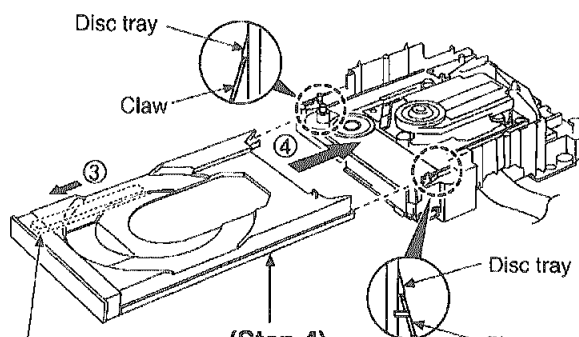
(Step 2)

Operate the conversion lever, and then locate the traverse deck ass'y to "UP" position.



(Step 1)

Release the lock lever.



(Step 3)

Move the drive rack ass'y in the direction of arrow ③.

(Step 4)

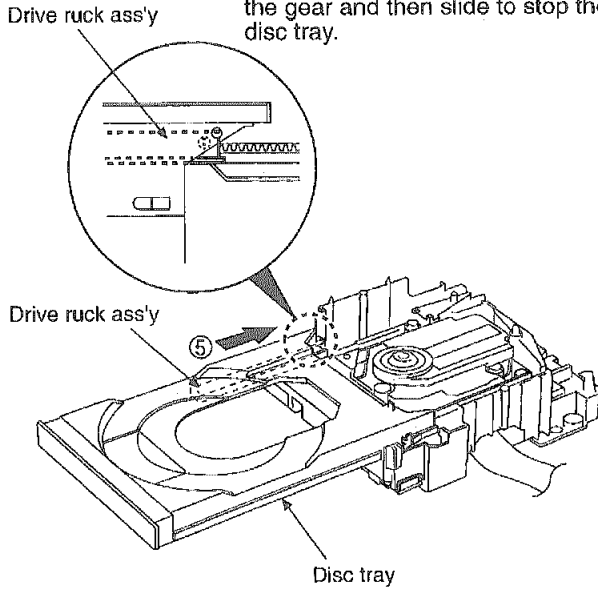
Install the disc tray.

(Step 5)

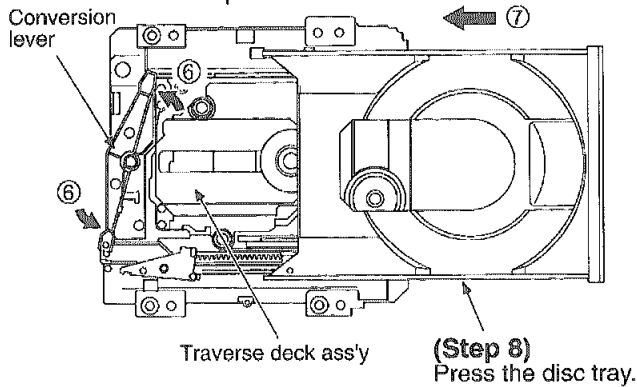
Latch the claw to the disc tray.

(Step 6)

Supporting the disc tray manually, engage the drive ruck ass'y with the gear and then slide to stop the disc tray.

**(Step 7)**

Operate the conversion lever, and then locate the traverse deck to "DOWN" position.

**(Step 8)**

Press the disc tray.

Installation of the CD servo P.C.B. after replacement**(Step 3)****(Step 4)**

(b) × 2

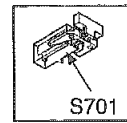
(Step 1)

Connect the FFC board.

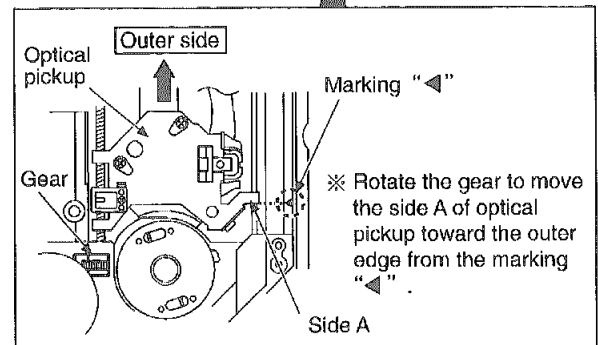
(Step 2)

Install the CD servo P.C.B. in the traverse deck ass'y.

Rest detect switch



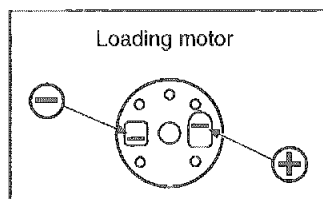
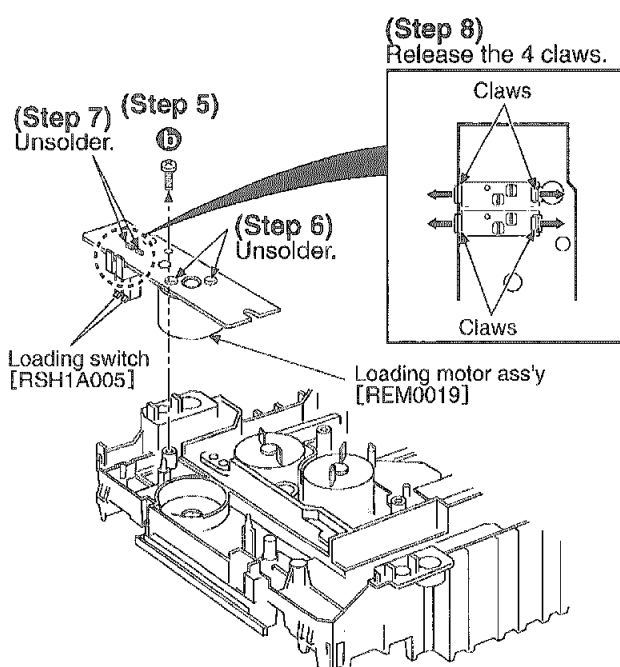
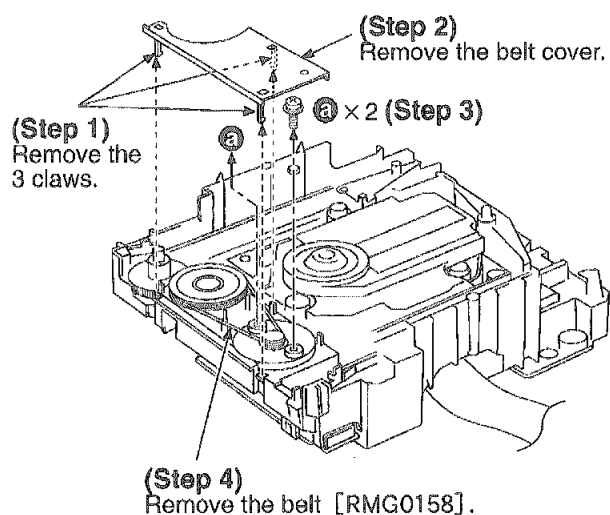
(Step 5)
Solder.

**NOTE:**

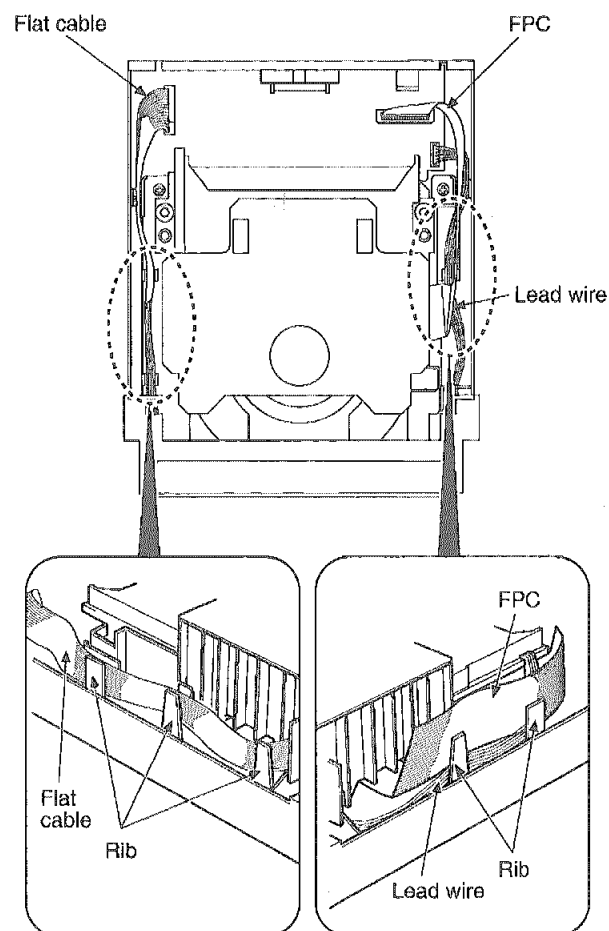
Before installing the CD servo P.C.B., move the optical pickup toward the outer edge from the mark "◀".
[Otherwise, the rest detect switch (S701) mounted on the CD servo P.C.B. may be damaged.]

7.4. Replacement for the belt, loading motor ass'y and loading switch

- Follow the (Step 1) - (Step 6) of item 7.1.
- Follow the (Step 1) - (Step 9) of item 7.3.



7.5. Lead wire and flat cable arrangement



8 Error Code Display and Servo Adjustment Function

This unit has an error code display function, so that if the unit operates incorrectly, the fault is displayed using an error code on the FL display of the Tuner (ST-HD515MD). It also has a servo adjustment function for displaying the status of servo system functions (Focus, Tracking, CLV servo) on the FL display of the tuner. The system control IC and FL display are part of the tuner so make sure the system has been connected properly before using these functions. (This unit can be

operated independently, although the error code display and servo adjustment functions cannot be used.) Use these two functions for guidance during fault diagnosis and repair.

Note:

Check beforehand for scratching or soiling of the test disc (SZZP1054C), and soiling or other problems with the pickup lens.

8.1. Error Code Display Procedure

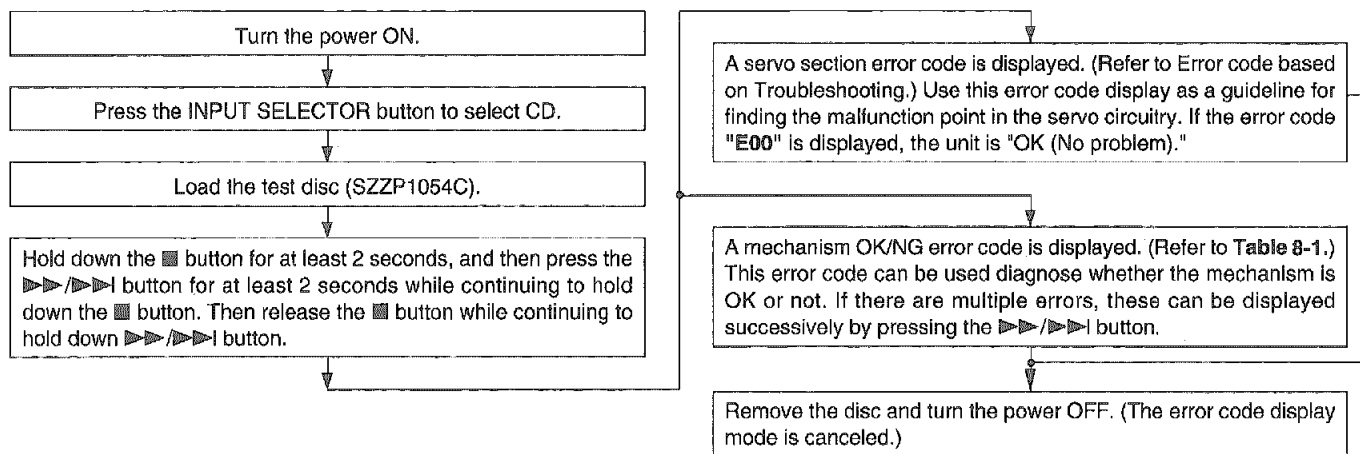
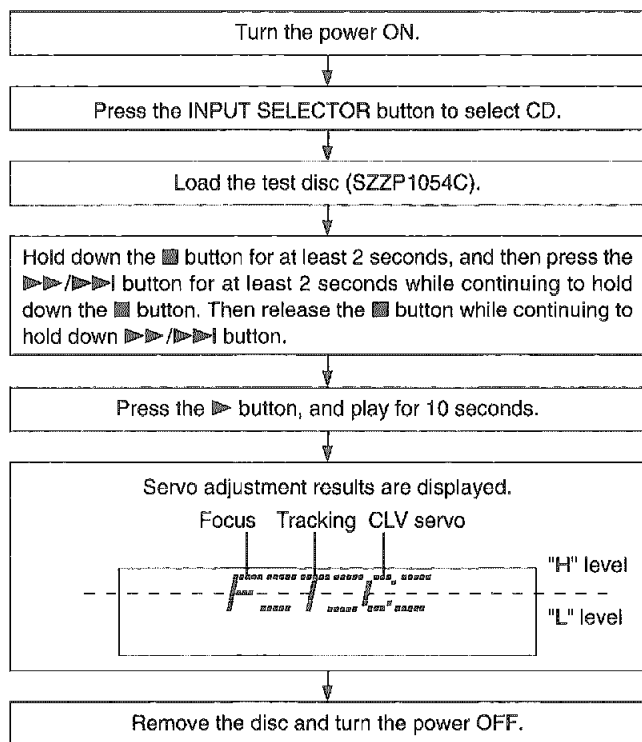


Table 8-1.

FL display	Symptom	Cause
H15	When CD tray opens, it closes by itself.	Disc tray open detect switch (S790) fault.
H16	When CD tray closes, it opens by itself.	Disc tray close detect switch (S791) fault.
F15	Does not play, even when ► button is pressed.	Pickup rest detect switch (S701) fault.
F26	Does not move, even when ► button is pressed.	System control IC and servo processor IC (IC403, IC702) fault.

8.2. Servo Adjustment Procedure



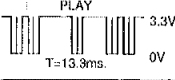
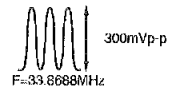
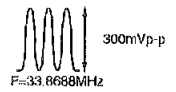
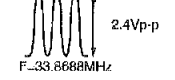
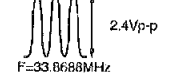
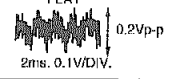
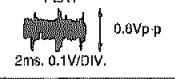
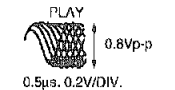
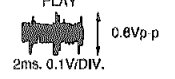
(Example)



	"L" level	"H" level
Focus system	normal	defective
Tracking system	normal	defective
CLV servo system	defective	normal

8.3. Error code based on troubleshooting

- This unit is satisfactory if the error code is E00.
- Before testing, check that the test disc is free of scratches and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E01	Focus and tracking offset adjustments not completed in the specified time period.	Clocks X1 IN and X2 OUT, power supply V_{DD} and reset/RST, all on IC702. MDATA, MCLK and MLD signals to/from IC403.	MDATA	IC702-pin 8		0 V
			MCLK	IC702-pin 7		3.4 V
			MLD	IC702-pin 9		3.4 V
			/RST	IC702-pin 18	3.4 V	3.4 V
			X1 IN	IC702-pin 58		
			X2 OUT	IC702-pin 59		
E02, E04, E06, E0A, E0C, E0E	Disc play unstable.	Scratches or contaminants on disc surface. Focus and Tracking servo circuits. (check waveforms, voltages and part values.) Spindle driver circuit. Optical pickup.	FE	IC702-pin 32		1.7 V
			TE	IC702-pin 33		1.7 V
			FOD	IC702-pin 28	1.7 V	1.7 V
			TRD	IC702-pin 27	1.7 V	1.7 V
			/RFDET	IC702-pin 38	0 V	3.3 V
			RF	TJ701		1.0 V
			STAT	IC702-pin 17	3.3 V	0 V
			FBAL	IC702-pin 30	1.7 V	1.7 V
E08, E0A	Focus or Tracking gain adjustments not completed in specified time period.	Scratches or contaminants on disc surface. Focus and Tracking servo circuit. (check waveforms, voltages and part values.) Optical pickup.	FE	IC702-pin 32		1.7 V
			TE	IC702-pin 33		1.7 V
			OFT	IC702-pin 36	0 V	0 V

9 To Supply Power Source

Caution:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned ON, laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

This unit (SL-HD515) is designed to operate on power supplied from the Amplifier (SE-HD515MD) through the Tuner (ST-HD515MD). When connecting the unit to other system components, do not connect to the Amplifier (SE-HD515MD) directly. When operating the unit (SL-HD515) alone for testing and servicing, without having power supplied from the Amplifier (SE-HD515MD), use the following method.

9.1. Power Supply to This Unit alone

1. Apply 10 V DC power to the section between **TP402** (far side from rear panel of R441) and earth plate (**E401**). Refer to Fig. 9-1.

9.2. To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between **JK401-pin 16** (R ch OUT) and earth plate (**E401**) (GND) as well as the section between **JK401-pin 18** (L ch OUT) and earth plate (**E401**) (GND) and check if the signals are outputting from this unit. Refer to Fig. 9-1.

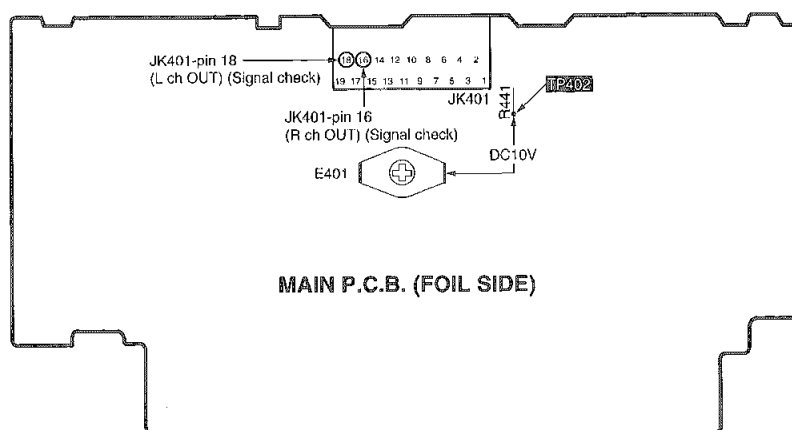


Fig. 9-1.

10 Schematic Diagram Note

- This schematic diagram may be modified at any time with the development of new technology.

Notes:

- S701:** Rest detect switch in OFF position
S790: Disc Tray open detect switch in OFF position
S791: Disc Tray close detect switch in OFF position
S801: Stop switch (■)
S802: Play switch (►)
S803: Pause switch (||)
S804: Disc tray open/close switch (▲ OPEN/CLOSE)
S805: F.Skip/search switch (►►/►►►)
S806: R.Skip/search switch (◀◀/◀◀◀)
S807: CD TEXT switch in TITLE position (CD TEXT)
S808: One track/all tracks switch in ALL position (TRACK)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark : CD Stop

() : CD Play [1 kHz, L+R, 0 dB]

- Important safety notice:

Components identified by △ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

Cover the parts boxes made of plastics with aluminum foil.

Ground the soldering iron.

Put a conductive mat on the work table.

Do not touch the legs of IC or LSI with the fingers directly.

- Voltage and signal line

→ : Positive voltage line
 ⇨ : CD signal line

11 Schematic Diagram

SCHEMATIC DIAGRAM-1

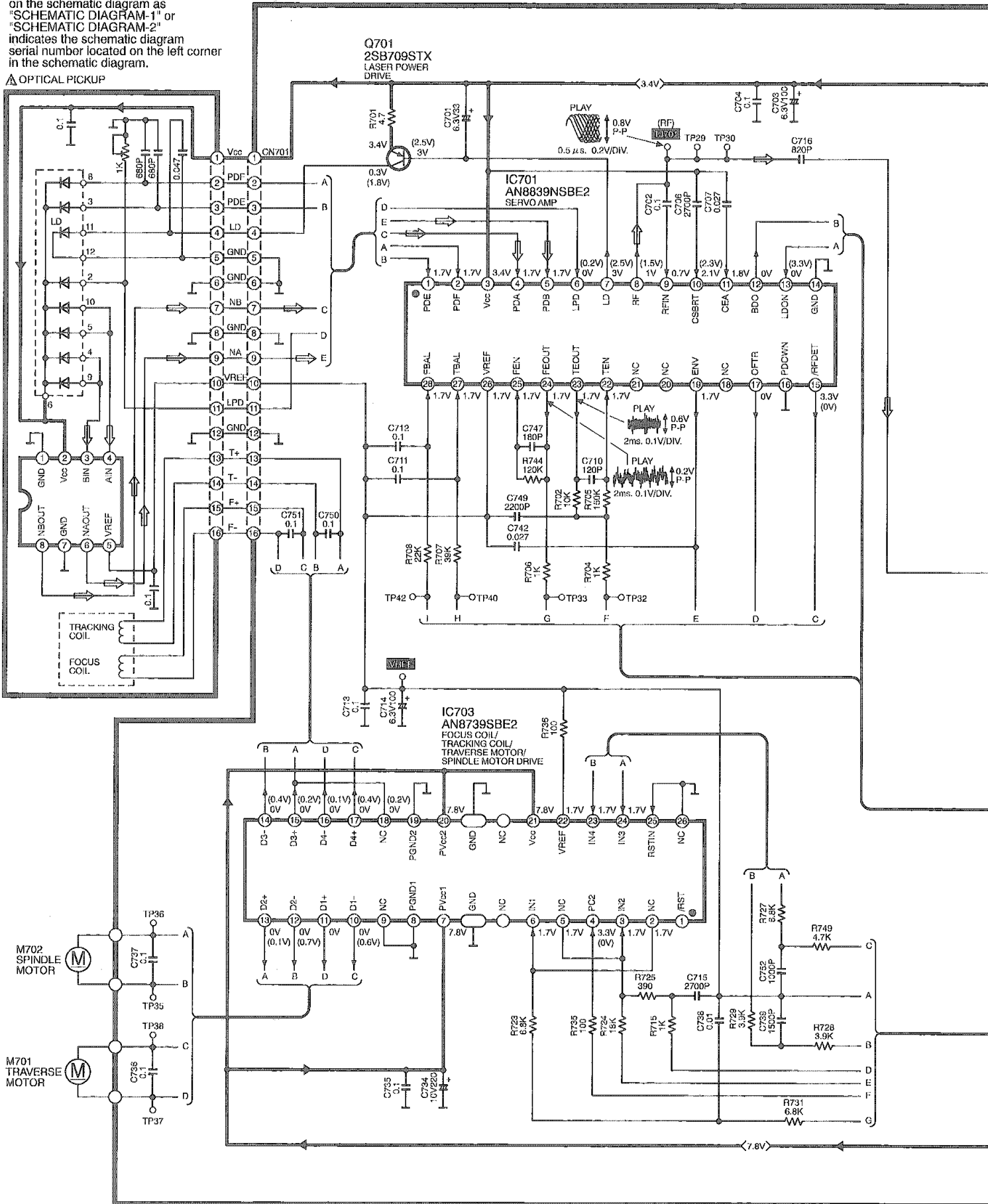
NOTE:

The number which noted at the connectors on the schematic diagram as "SCHEMATIC DIAGRAM-1" or "SCHEMATIC DIAGRAM-2" indicates the schematic diagram serial number located on the left corner in the schematic diagram.

△ OPTICAL PICKUP

A CD SERVO CIRCUIT

→ : POSITIVE VOLTAGE LINE ⇨ : CD SIGNAL LINE

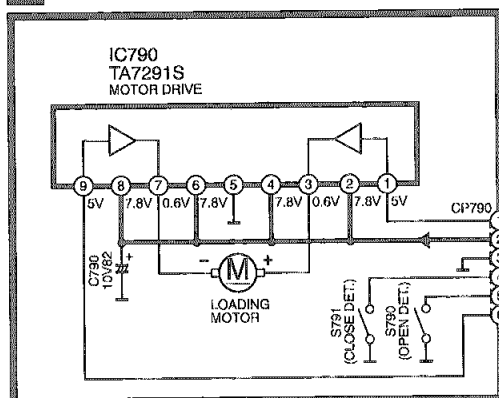


 : POSITIVE VOLTAGE LINE : CD SIGNAL LINE



SCHEMATIC DIAGRAM-3

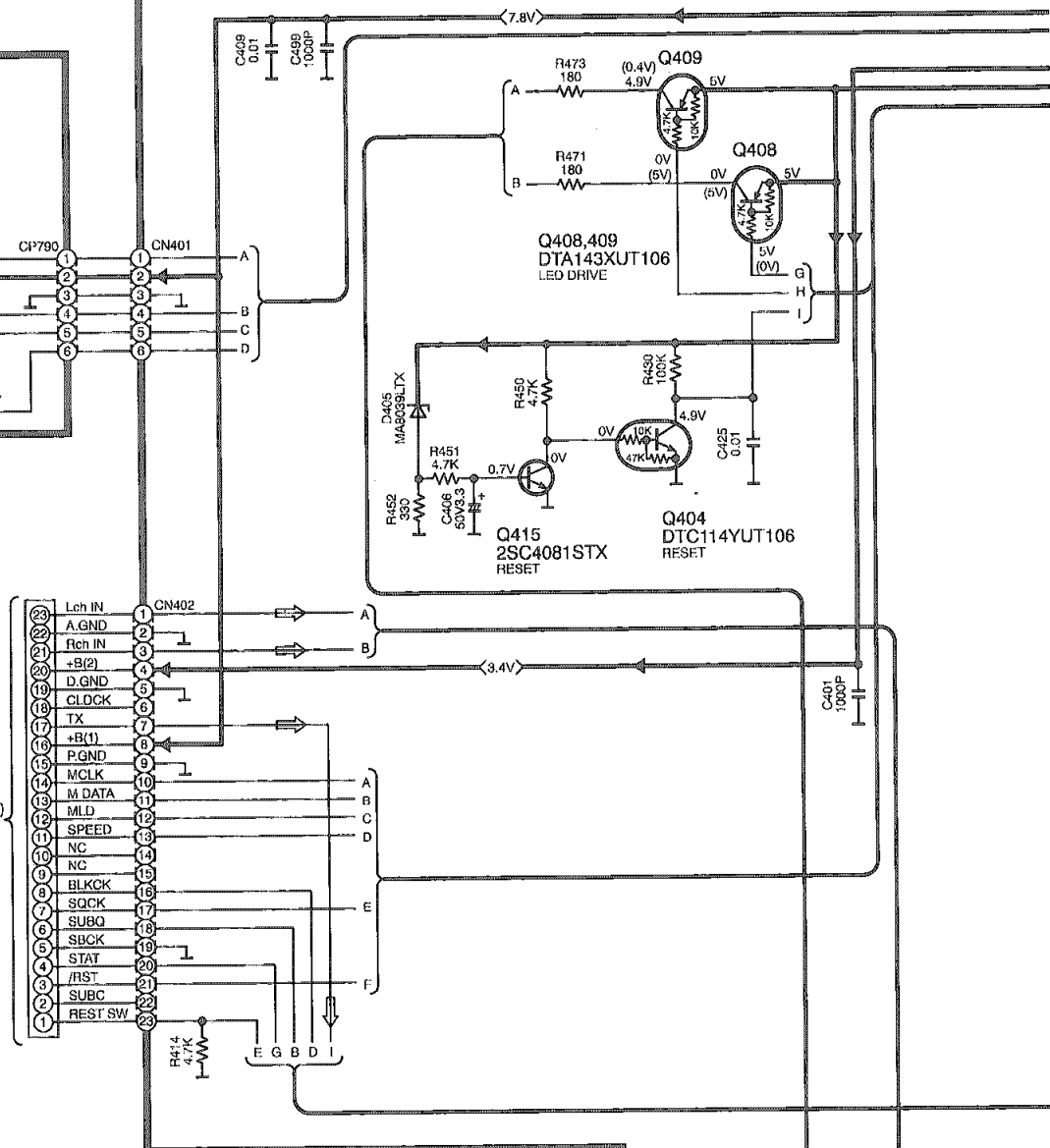
B LOADING MOTOR CIRCUIT



C MAIN CIRCUIT

→ : POSITIVE VOLTAGE LINE ⇨ : CD SIGNAL LINE

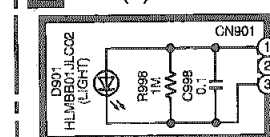
To **A** CD SERVO CIRCUIT(CN702)
on SCHEMATIC DIAGRAM-2



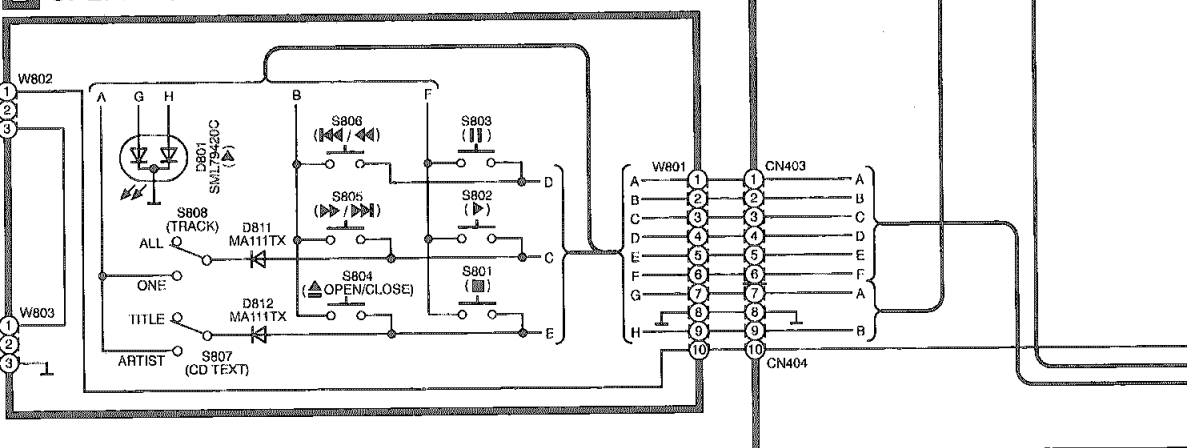
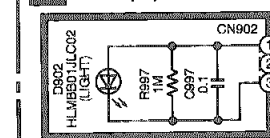
KEEPING TO THE RULE OF UNIT SUPPLY,
WE DO NOT SUPPLY SINGLE PARTS.

OPERATION CIRCUIT

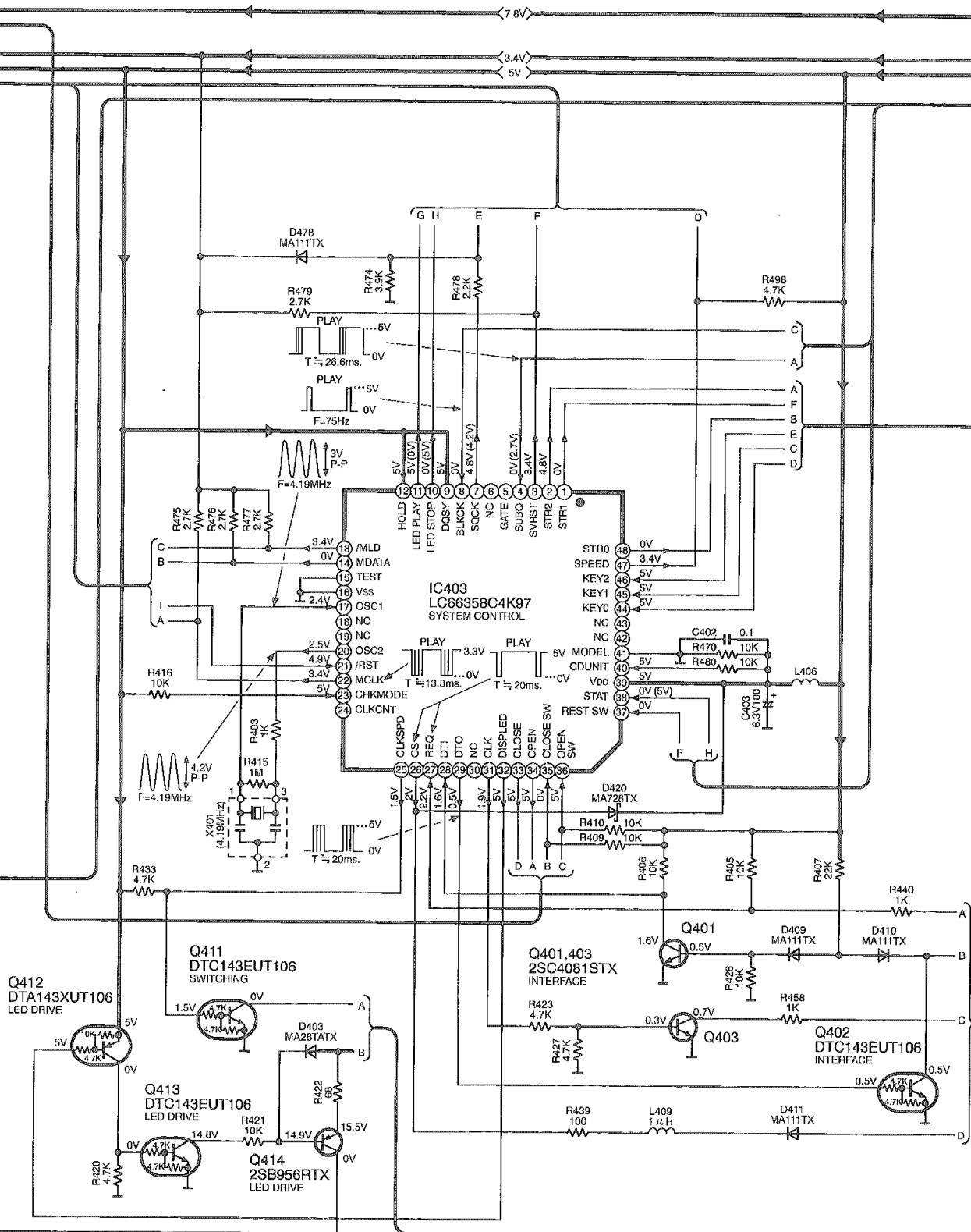
LED(L) CIRCUIT



F LED(R) CIRCUIT



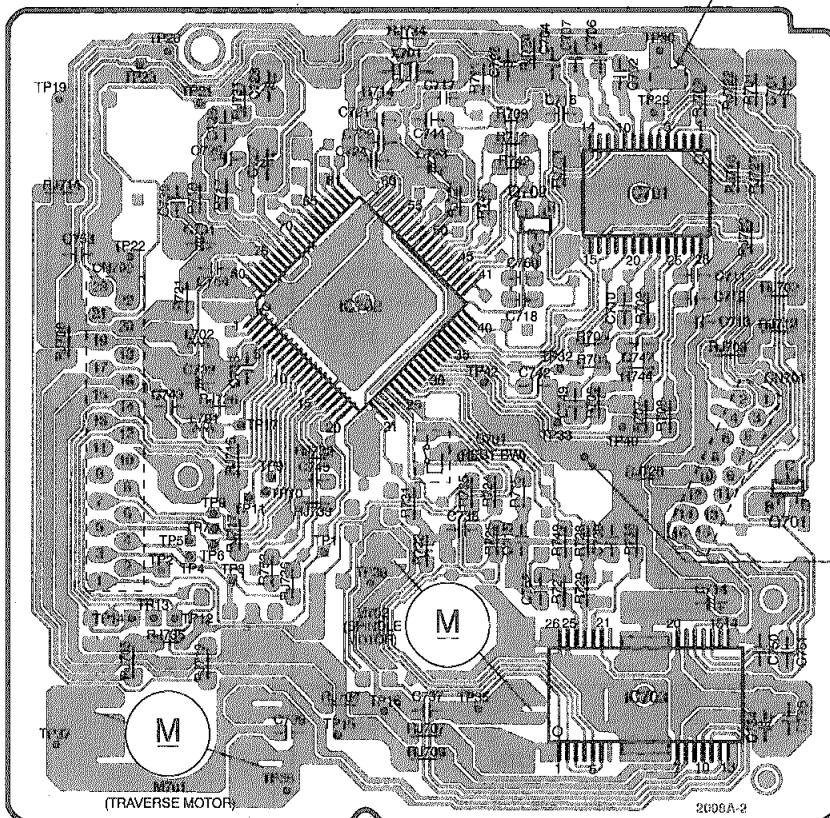
SCHEMATIC DIAGRAM-4

 : POSITIVE VOLTAGE LINE


12 Printed Circuit Board Diagram

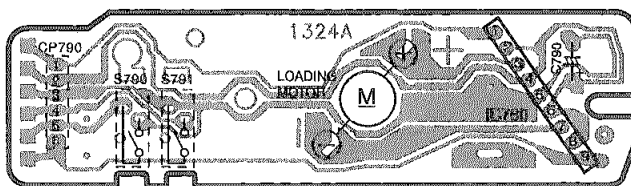
Note: This printed circuit board diagram may be modified at any time with the development of new technology.

A CD SERVO P.C.B.



(REP2772A-N)

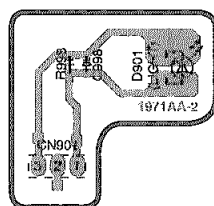
B LOADING MOTOR P.C.B.



(REP1900A)

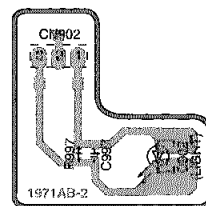
[Keeping to the rule of unit supply, we do not supply single parts.]

E LED(L) P.C.B.



(REP2685B-S)

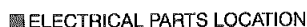
F LED(R) P.C.B.



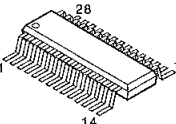
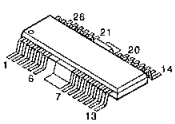
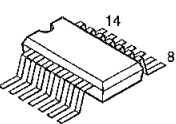
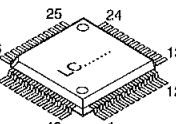
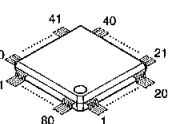
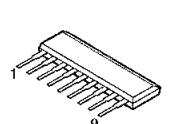
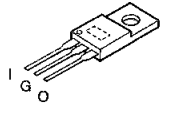
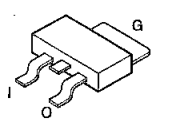
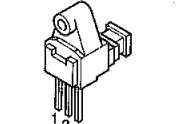
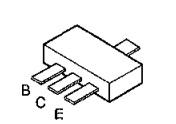
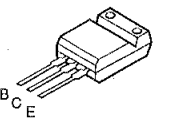
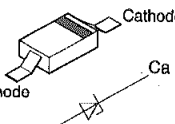
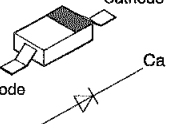
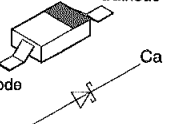
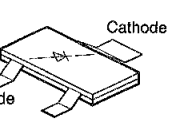
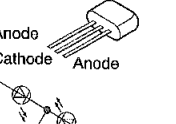
(REP2685B-S)

ELECTRICAL PARTS LOCATION

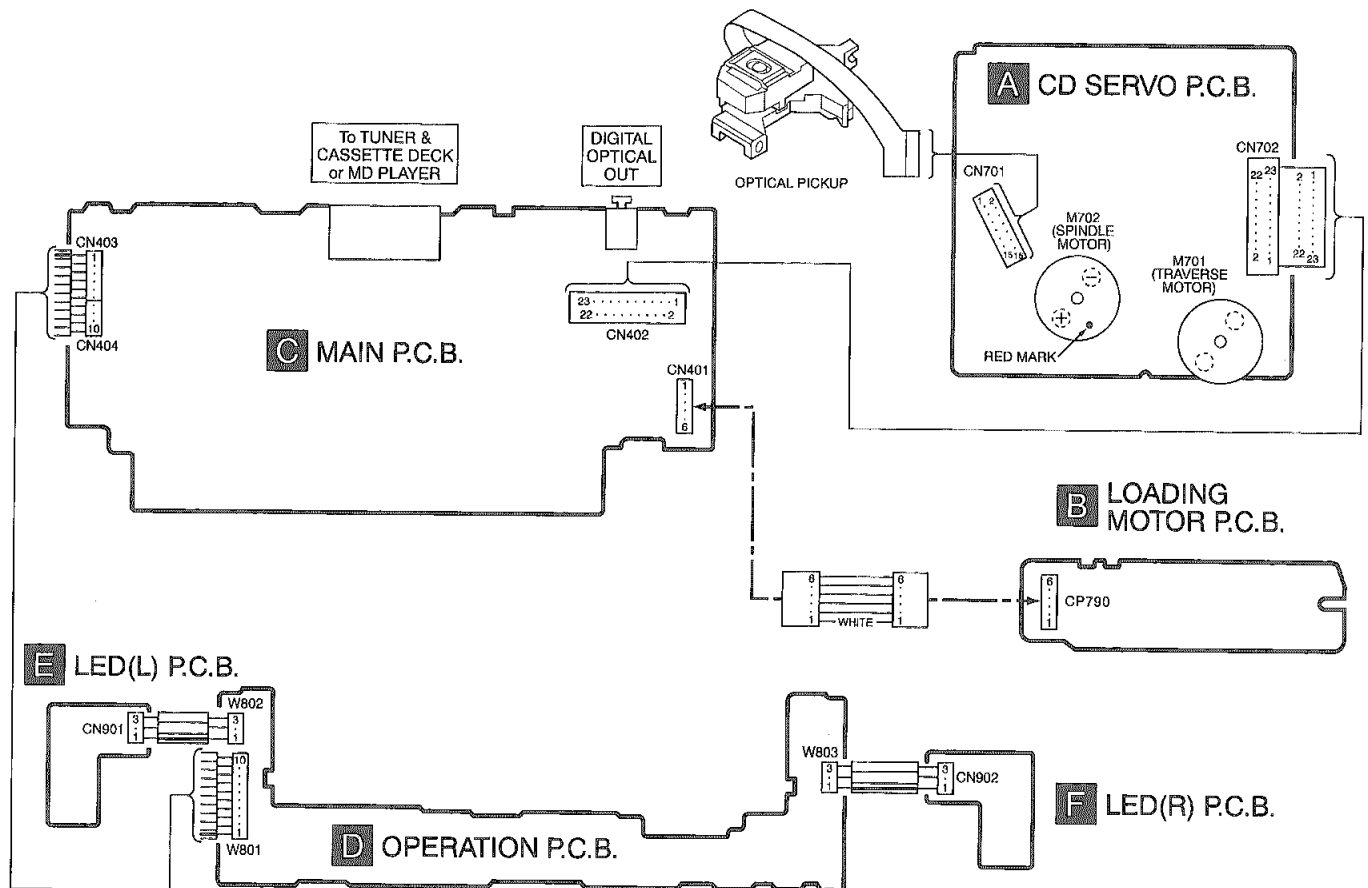
Ref. No.	Lo. No.	Ref. No.	Lo. No.
CD SERVO P.C.B.			
IC701	2D	RJ721	2C
IC702	3B	RJ722	2D
IC703	4D	RJ724	1C
Q701	3D	RJ726	3B
Q702	2C	RJ727	2D
L701	3B	RJ728	3D
L702	3B	RJ731	2B
X701	2C	RJ732	3B
S701	3C	RJ733	3B
CN701	3D	RJ734	1C
CN702	3A	RJ735	4A
M701	4A	RJ736	4B
M702	4C	RJ750	2D
TJ701	2D	C701	2D
R701	2D	C702	2D
R702	3D	C703	1C
R704	3C	C704	1C
R705	3C	C706	1C
R706	3C	C707	1C
R707	3D	C710	3D
R708	3D	C711	2D
R709	2C	C712	3D
R711	2C	C713	3D
R712	2C	C714	4D
R714	2B	C715	4C
R715	3C	C716	2C
R717	2B	C717	2C
R718	2B	C718	3C
R721	3B	C721	2B
R723	4C	C722	2B
R724	3C	C723	2C
R725	4C	C724	2B
R727	4C	C725	2B
R728	4C	C726	2B
R729	4C	C727	2B
R731	3C	C728	2B
R735	3C	C730	2B
R736	4D	C731	2B
R741	2C	C732	3B
R742	2C	C733	3B
R744	3D	C734	4D
R749	4C	C735	4D
R753	4B	C736	4B
RJ701	2C	C737	4C
RJ702	2D	C738	4C
RJ703	3D	C739	4C
RJ704	4B	C742	3C
RJ705	4A	C743	3A
RJ706	3A	C744	2C
RJ707	4C	C746	3B
RJ708	5C	C747	3D
RJ709	2D	C749	3C
RJ710	2D	C750	4D
RJ712	3D	C751	4D
RJ713	4B	C752	4C
RJ714	2A	C753	2A
RJ716	3B	C754	2B
RJ717	4B	C760	2C
LOADING MOTOR P.C.B.			
IC790	6D	CP790	6B
S790	6B	C790	6D
S791	6B		
LED(L) P.C.B.			
D901	7B	R998	7A
CN901	8A	C998	7B
LED(R) P.C.B.			
D902	8D	R997	8C
CN902	7C	C997	8C

19

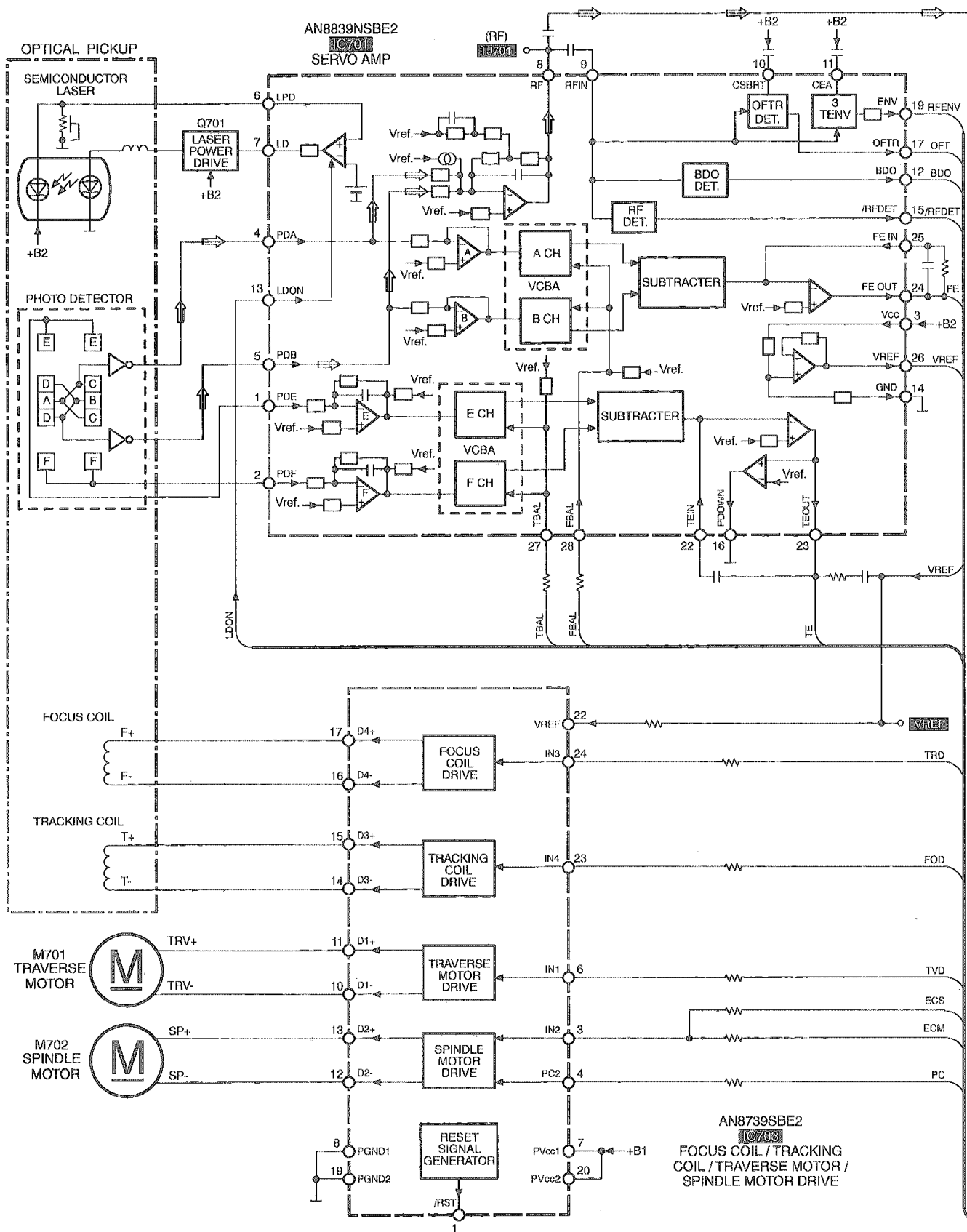
13 Type Illustration of ICs, Transistors and Diodes

AN8839NSBE2 	AN8739SBE2 	TC74HCT7007A 	LC66358C4K97 	MN662790RSC 	TA7291S 
LM2940T5M 	UPC29M33T 	T0TX178 	2SB956RTX 	2SB709STX 2SC4081STX DTA143XUT106 DTC114YUT106 DTC143EUT106 DTC143XUA106	
2SD2137PQTA 	MA8082MTX MA8039LTX 	MA111TX 	MA728TX 	MA28TATX 	SML79420C 

14 Wiring Connection Diagram

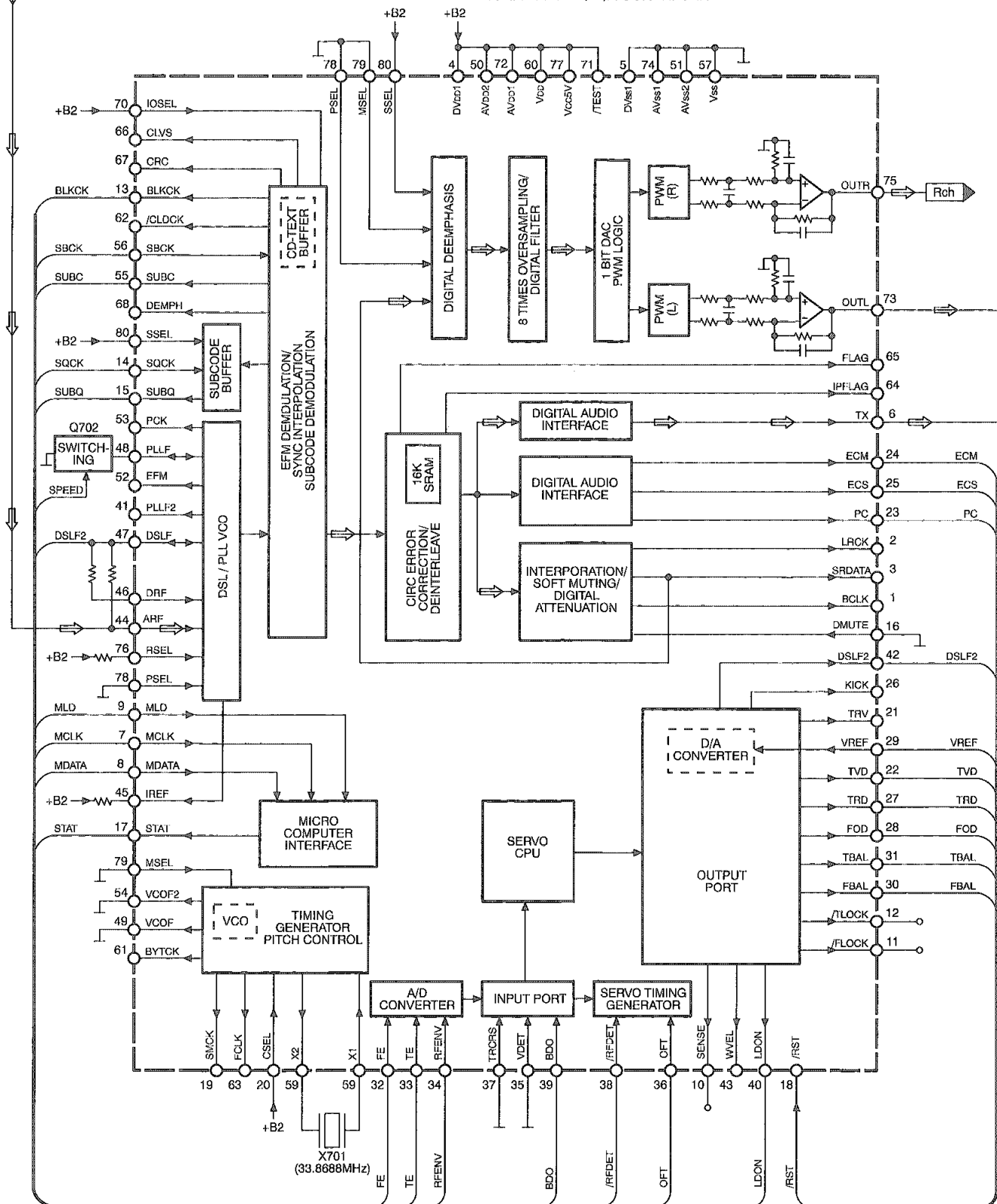


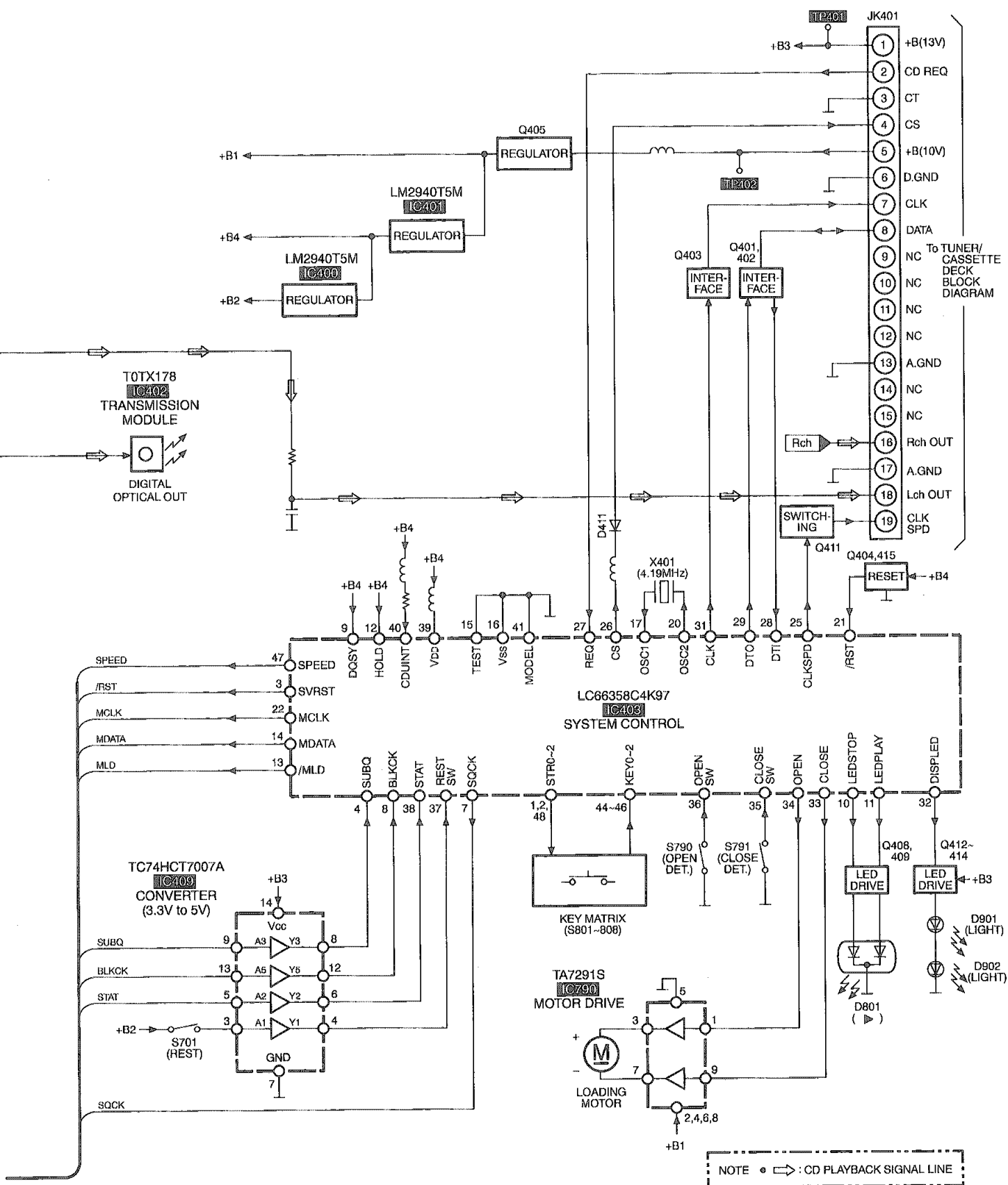
15 Block Diagram



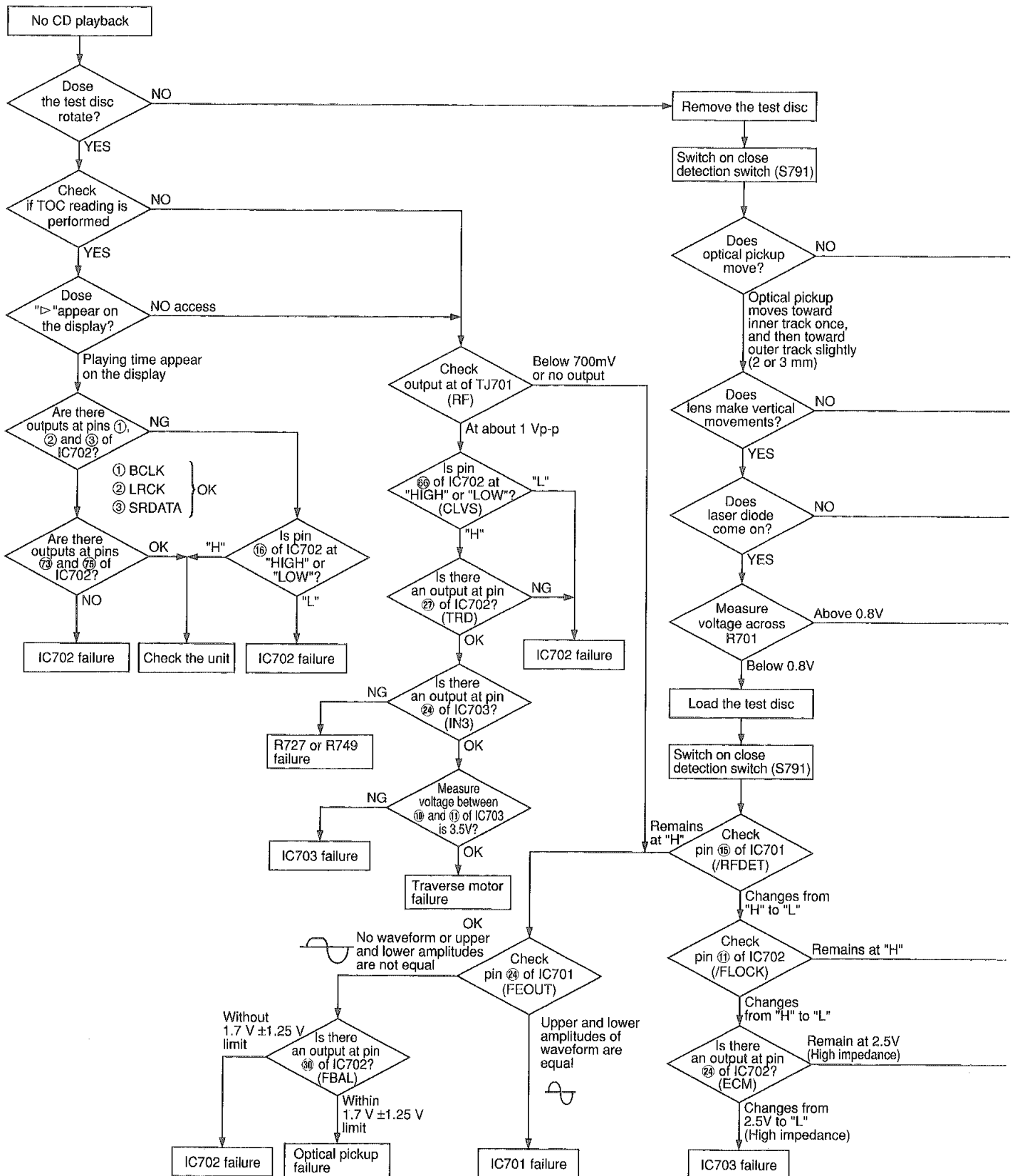
MN662790RSC

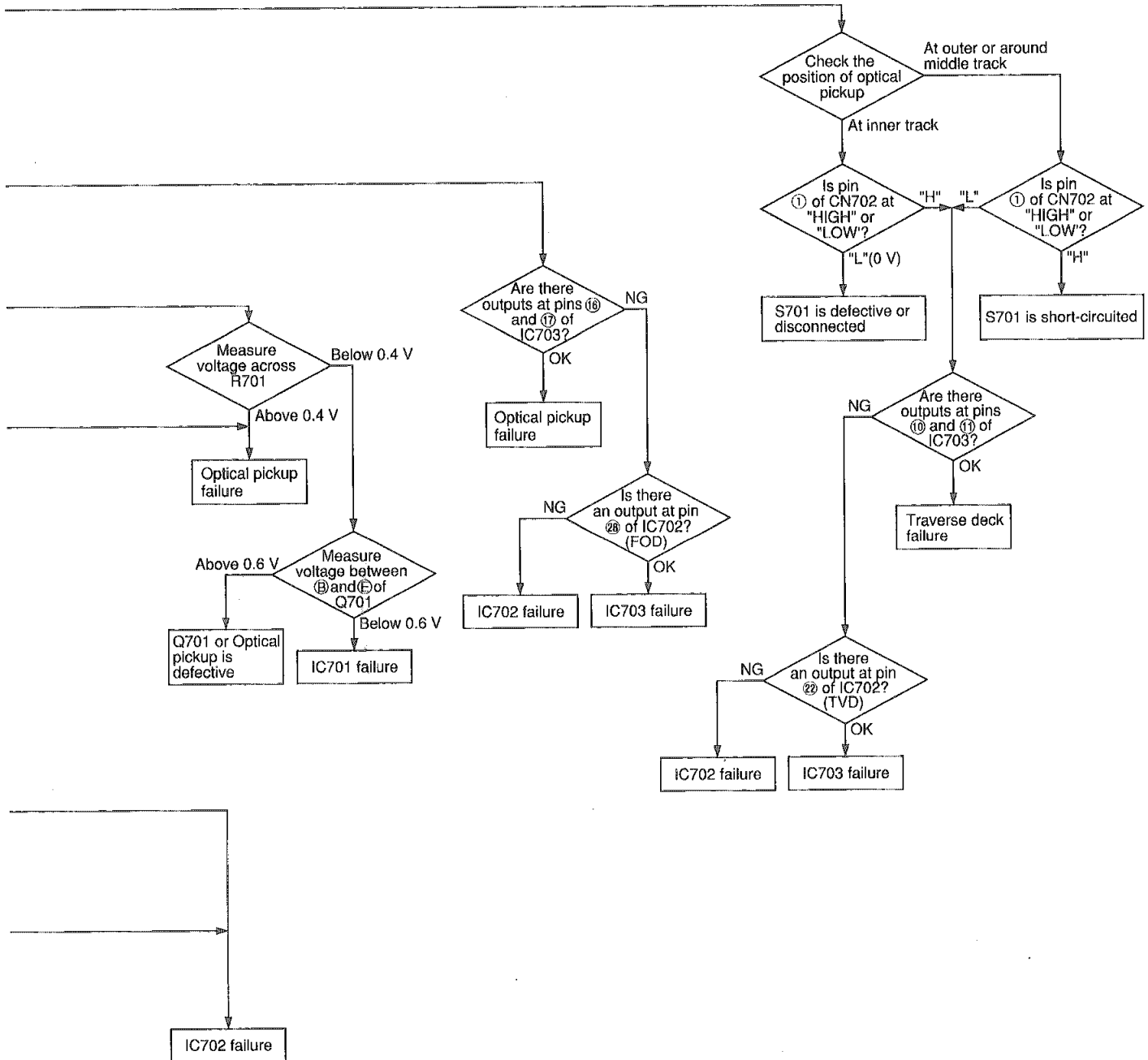
IC702

SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR
DIGITAL FILTER / D/A CONVERTER



16 Troubleshooting Guide





17 Terminal Function of ICs

17.1. IC403 (LC66358C4K97): System Control

Pin No.	Terminal Name	I/O	Function
1	STR1	O	Key switch 1 detect signal output
2	STR2	O	Key switch 2 detect signal output
3	SVRST	O	Reset signal output
4	SUBQ	I	Sub-code Q data signal input
5	GATE	-	Select signal output (Not used, open)
6	NC	-	Not used, open
7	SQCK	O	Sub code Q resistor clock signal output
8	BLKCK	I	Sub code block clock signal input
9	DQSY	I	Reading permission terminal of data (Not used, connected to power supply)
10	LED STOP	O	LED drive signal output
11	LED PLAY		
12	HOLD	I	Not used, connected to power supply
13	/MLD	O	Command load signal output
14	MDATA	O	Command data signal output
15	TEST	-	Not used, connected to GND
16	V _{SS}	I	GND terminal
17	OSC1	I	Crystal oscillator connected terminal (f=4.19 MHz)
18	NC	-	Not used, open
19			
20	OSC2	O	Crystal oscillator connected terminal (f=4.19 MHz)
21	/RST	I	Reset signal input
22	MCLK	O	Command clock signal output
23	CHK MODE	I	Not used, connected to power supply via resistor
24	CLK CNT	-	Clock control signal output (Not used, open)
25	CLK SPD	O	Communication clock velocity select signal output
26	CS	O	Communication request receiving signal output for FL drive/System control IC
27	REQ	I	Communication request signal input from FL drive/System control IC
28	DTI	I	Data signal input from FL drive/System control IC
29	DTO	O	Data signal output for FL drive/System control IC
30	NC	-	Not used, open
31	CLK	O	Clock signal output for FL drive/System control IC
32	DISPLED	O	LED drive signal output
33	CLOSE	O	Loading motor close command signal output
34	OPEN	O	Loading motor open command signal output
35	CLOSE SW	I	Disc tray close detect switch signal input
36	OPEN SW	I	Disc tray open detect switch signal input
37	REST SW	I	Rest detect switch signal input
38	STAT	I	Status signal input
39	V _{DD}	I	Power supply terminal
40	CDUNIT	I	Connected to power supply via resistor
41	MODEL	-	Not used, connected to GND
42	NC	-	Not used, open
43			
44	KEY0	I	Key switch 0 detect signal input
45	KEY1	I	Key switch 1 detect signal input
46	KEY2	I	Key switch 2 detect signal input
47	SPEED	O	PLL filter of CD unit select signal output
48	STR1	O	Key switch 1 detect signal output

17.2. IC701 (AN8839NSBE2): Servo Amp

Pin No.	Terminal Name	I/O	Function
1	PDE	I	Tracking signal input terminal 1 (E ch)
2	PDF	I	Tracking signal input terminal 2 (F ch)
3	V _{cc}	I	Power supply terminal
4	PDA	I	Focus signal input terminal 1 (A ch)
5	PDB	I	Focus signal input terminal 2 (B ch)
6	LPD	I	Laser PD signal
7	LD	O	Laser power auto control output
8	RF	O	RF amp terminal
9	RFIN	I	AGC input terminal
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Dropout detection control
13	LDON	I	LD APC ON/OFF (H: ON)
14	GND	-	GND terminal
15	/RFDET	O	RF detect signal output (L: detect)
16	PDOWN	-	Power down terminal
17	OFTR	O	Off track detection (H: detect)
18	NC	-	Not used, open
19	ENV	O	Envelope signal output
20	NC	-	Not used, open
21			
22	TEN	I	Tracking error signal input
23	TEOUT	O	Tracking error signal output
24	FEOUT	O	Focus error signal output
25	FEN	I	Focus error signal input
26	VREF	O	Reference voltage output
27	TBAL	I	Tracking balance adj. input
28	FBAL	I	Focus balance adj. input

17.3. IC702 (MN662790RSC): Servo Processor/Digital Signal Processor/Digital Filter/ D/A converter

Pin No.	Terminal Name	I/O	Function
1	BCLK	-	Serial bit clock output (Not used, open)
2	LRCK	-	L/R discriminating signal output (Not used, open)
3	SRDATA	-	Serial data signal output (Not used, open)
4	DV _{DD1}	I	Power supply terminal
5	DV _{SS1}	-	GND terminal
6	TX	O	Digital audio interface signal output
7	MCLK	I	Command clock signal input
8	MDATA	I	Command data signal input
9	MLD	I	Command load signal input
10	SENSE	-	Sense signal (Not used, open)
11	/FLOCK	-	Optical servo condition (focus) (Not used, open)
12	/TLOCK	-	Optical servo condition (tracking) (Not used, open)
13	BLKCK	O	Sub-code block clock signal output (f=75 Hz)
14	SQCK	I	Sub-code Q resistor clock signal input
15	SUBQ	O	Sub-code Q data signal output
16	DMUTE	I	Muting input (Not used, connected to GND)
17	STAT	O	Status signal output
18	/RST	I	Reset signal input (L: reset)
19	SMCK	-	System clock (Not used, open)

Pin No.	Terminal Name	I/O	Function
20	CSEL	I	Frequency control terminal of crystal oscillator (Connected to V_{DD})
21	TRV	-	Traverse servo control signal output (Not used, open)
22	TVD	O	Traverse drive signal output
23	PC	O	Turntable motor drive signal output (L: ON)
24	ECM	O	Turntable motor drive signal output (Forced mode)
25	ECS	O	Turntable motor drive signal output (Servo error signal)
26	KICK	-	Kick pulse output (Not used, open)
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drive output normal voltage input
30	FBAL	O	Focus balance adj. output
31	TBAL	O	Tracking balance adj. output
32	FE	I	Focus error signal input
33	TE	I	Tracking error signal input
34	RFENV	I	RF envelope signal input
35	VDET	I	Oscillator detect signal input (H: detect)
36	OFT	I	Off track signal input (H: Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detect signal input (L: detect)
39	BDO	I	Dropout detection signal input (H: dropout)
40	LDON	O	Laser power control signal output (H: ON)
41	PLLF2	-	PLL loop filter terminal (Not used, open)
42	DSLIF2	I/O	DSL loop filter terminal
43	WVEL	-	Double velocity status signal output (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias terminal
47	DSLIF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	-	VCO loop filter terminal (Not used, connected to GND)
50	AV _{DD} 2	I	Power supply terminal
51	AV _{SS} 2	-	GND terminal
52	EFM	-	EFM signal (Not used, open)
53	PCK	-	PLL extract clock (Not used, open)
54	VCOF2	-	VCO loop filter terminal (Not used, connected to GND)
55	SUBC	-	Sub-code serial output clock (Not used, open)
56	SBCK	-	Sub-code serial input data (Not used, connected to GND)
57	V _{SS}	-	GND terminal
58	X1 IN	I	Crystal oscillator terminal (f=33.8688 MHz)
59	X2 OUT	O	
60	V _{DD}	I	Power supply terminal
61	BYTCK	-	Byte clock signal (Not used, open)
62	/CLDCK	-	Sub-code frame clock signal (Not used, open)
63	FCLK	-	Crystal frame clock (Not used, open)
64	IPFLAG	-	Interpolation flag terminal (Not used, open)
65	FLAG	-	Flag terminal (Not used, open)
66	CLVS	-	Turntable servo phase synchro signal (Not used, open)
67	CRC	-	Sub-code CRC check terminal (Not used, open)
68	DEMPH	-	De-emphasis ON signal (Not used, open)
69	RESY	-	Re-synchronizing signal of frame sync. (Not used, open)
70	IOSEL	I	I/O select signal input (Connected to V_{DD})
71	/TEST	I	Test terminal (Not used, connected to power supply)
72	AV _{DD} 1	I	Power supply terminal
73	OUTL	O	L ch audio signal output
74	AV _{SS} 1	-	GND terminal

Pin No.	Terminal Name	I/O	Function
75	OUTR	O	R ch audio signal output
76	RSEL	I	Polarity direction control terminal of RF signal (Not used, connected to power supply)
77	IOV _{DD}	I	Power supply terminal
78	PSEL	I	Test terminal (Connected to GND)
79	MSEL	I	Output frequency select signal input (Connected to GND)
80	SSEL	I	SUBQ output mode select signal input (Not used, connected to V_{DD})

17.4. IC703 (AN8739SBE2): Focus Coil/Tracking Coil/ Traverse Motor/Spindle Motor Drive

Pin No.	Terminal Name	I/O	Function
1	/RST	-	Not used, open
2	NC	-	Not used
3	IN2	I	Motor driver 2 input
4	PC2	I	Turntable motor drive signal input (L: ON)
5	NC	-	Not used
6	IN1	I	Motor driver 1 input
7	PV _{CC} 1	I	Driver power supply terminal 1
8	PGND1	-	Driver GND terminal 1
9	NC	-	Not used, connected to GND
10	D1-	O	Traverse motor driver 1 output terminal (-)
11	D1+	O	Traverse motor driver 1 output terminal (+)
12	D2-	O	Spindle motor driver 2 output terminal (-)
13	D2+	O	Spindle motor driver 2 output terminal (+)
14	D3-	O	Tracking coil signal output terminal (-)
15	D3+	O	Tracking coil signal output terminal (+)
16	D4-	O	Focus coil signal output terminal (-)
17	D4+	O	Focus coil signal output terminal (+)
18	NC	-	Not used
19	PGND2	-	Driver GND terminal 2
20	PV _{CC} 2	I	Driver power supply terminal 2
21	V _{CC}	I	Power supply terminal
22	VREF	I	Reference voltage input terminal
23	IN4	I	Motor driver 4 input
24	IN3	I	Motor driver 3 input
25	RSTIN	I	Reset terminal (Not used, connected to GND)
26	NC	-	Not used, connected to GND

18 Replacement Parts List

Notes:

- Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

- The marking [RTL] indicates that Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

- All parts are supplied by MESA.

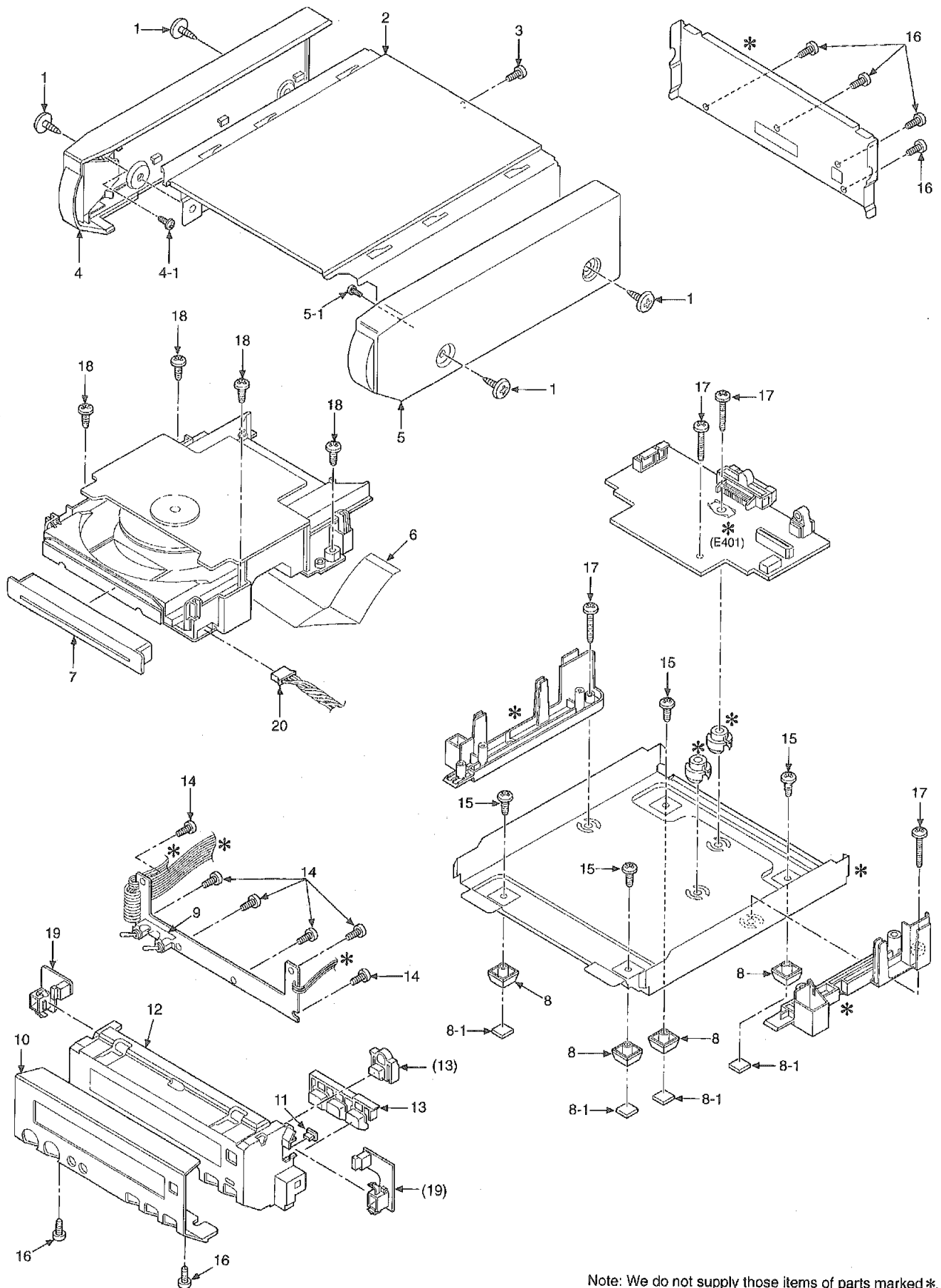
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RHD30007-S	SCREW	4	
2	RKM0363-2S	CABINET	1	
3	XTBS3+8JFZ1	SCREW	1	
4	RYQ0276-S1	SIDE PANEL (L)	1	
4-1	XTBS26+8J	SCREW	1	
5	RYQ0277-S1	SIDE PANEL (R)	1	
5-1	XTBS26+8J	SCREW	1	
6	REZ1056-2	PFC (23P)	1	
7	RGK0974-1S	TRAY ORNAMENT	1	
8	RKA0114-K	FOOT	4	
8-1	RKA0083-K	CUSHION	4	
9	RSC0496A-1	EARTH PLATE	1	
10	RG0146B-S	FRONT PANEL	1	
11	RG0386-Q	PANEL LIGHT	1	
12	RG0641-1S	SUB PANEL	1	
13	RGU1600-1S	BUTTON OPERATION	1	
14	XTBS26+8J	SCREW	6	
15	XTB3+5JFZ	SCREW	4	
16	XTBS3+8JFZ1	SCREW	6	
17	XTB3+12JFZ	SCREW	4	
18	XTB3+8JFZ	SCREW	4	
19	REP2685B-S	LED PCB	1	
20	REX0898	WIRE ASS'Y (6P)	1	
101	RFKJXD707-K	LOADING CHASSIS ASS'Y	1	
101-1	RDG0142	SLADING GEAR	1	
101-2	RDG0193	LOADING GEAR (1)	1	
101-3	RDP0065	PULLEY GEAR	1	
102	REM0019	LOADING MOTOR ASS'Y	1	
104	RGQ0144-K	DISC TRAY	1	
105	RAE0152Z-1	TRAVERSE DECK ASS'Y	1	
105-1	SHGD113-1	FLOATING RUBBER	3	
105-2	SNSD38	SCREW	2	
105-3	RAF0150A-1	OPTICAL PICKUP	1	Δ
105-4	RDG0247	DRIVE GEAR	1	
105-5	RDG0248	INTERMEDIATE GEAR	1	
105-6	RXQ0339	TRAVERSE MOTOR	1	
105-7	RXQ0304-1	PLATE	1	
105-8	XQN17+CG5	SCREW	1	
105-9	XQN2+CG5	SCREW	1	
105-10	XQS17+A35FZ	SCREW	2	
106	RMS0350-1	PIN (B)	1	
107	RMS0627	PIN (A)	1	
108	RME0109	FLOATING SPRING (1)	2	
109	RME0142	FLOATING SPRING (2)	1	
110	RMR0698-K1	TRAVERSE CHASSIS	1	
111	XTV2+6G	SCREW	2	
112	RME0063	LOCK LEVER SPRING	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
113	RMM0079-1	SLIDE PLATE (1)	1	
114	RML0178-1	LOCK LEVER	1	
115	RFKNLPG440-K	DRIVE ASS'Y	1	
116	RHD20009-1	SCREW	1	
117	RME0087	SPRING	1	
118	RML0349	CONVERSION LEVER	1	
119	RMM0059-1	SLIDE PLATE (2)	1	
120	RMR0334	MAGNET HOLDER	1	
121	RHM245ZA	MAGNET	1	
122	RXQ0380	DISC HOLDER	1	
123	XTN26+6G	SCREW	3	
124	RMA0793-1	DISC CLAMPER ASS'Y	1	
125	XYN2+F6FZ	SCREW	2	
126	RMG0158	BELT	1	
127	XTN2+6G	SCREW	1	
C401	ECUV1H102KBN	50V 1000P	1	
C402	ECUVNE104ZFN	25V 0.1U	1	
C403	ECEA0JKS101	6.3V 100U	1	
C405	ECUVNE104ZFN	25V 0.1U	1	
C406	ECEA1HKS3R3	50V 3.3U	1	
C409	ECUV1E103ZFN	25V 0.01U	1	
C410	ECA1CM471	16V 470U	1	
C412,13	ECUV1E103ZFN	25V 0.01U	2	
C416	ECEA1AKS220	10V 22U	1	
C419	ECEA1AKS221	6.3V 220U	1	
C420	ECEA1AKS221	10V 220U	1	
C425	ECUV1E103ZFN	25V 0.01U	1	
C426	ECUV1H101JCN	50V 100P	1	
C428	ECUVNE104ZFN	25V 0.1U	1	
C467	ECUV1C474ZFN	16V 0.47U	1	
C468	ECEA1AKS221	6.3V 220U	1	
C493,94	ECUV1H102KBN	50V 1000P	2	
C499	ECUV1H102KBN	50V 1000P	1	
C701	ECEA0JKA330I	6.3V 33U	1	
C702	ECUVNE104MBN	16V 0.1U	1	
C703	ECEA0JKS101	6.3V 100U	1	
C704	ECUVNE104MBN	16V 0.1U	1	
C706	ECUV1H272KBN	50V 2700P	1	
C707	ECUV1E273KBN	25V 0.027U	1	
C710	ECUV1H121KCN	50V 120P	1	
C711,12	ECUVNE104ZFN	25V 0.1U	2	
C713	ECUVNE104MBN	16V 0.1U	1	
C714	ECEA0JKS101	6.3V 100U	1	
C715	ECUV1H272KBN	50V 2700P	1	
C716	ECUV1H821KBN	50V 820P	1	
C717	ECUVNE104ZFN	25V 0.1U	1	
C718	ECUV1E104KBN	25V 0.1U	1	
C721,22	ECUV1H030CCN	50V 3P	2	
C723	ECEA1AKS221	10V 220U	1	
C724	ECUVNE104MBN	16V 0.1U	1	
C725,26	ECUV1H102KBN	50V 1000P	2	
C727,28	ECEA1HKS010	50V 1U	2	
C730	ECUVNE104ZFN	25V 0.1U	1	
C731,32	ECEA1AKS221	6.3V 220U	2	
C733	ECUVNE104MBN	16V 0.1U	1	
C734	ECEA1AKS221	10V 220U	1	
C735-37	ECUVNE104ZFN	25V 0.1U	3	
C738	ECUV1H103KBN	50V 0.01U	1	
C739	ECUV1H152KBN	50V 1500P	1	
C742	ECUV1E273KBN	25V 0.027U	1	
C743	ECUVNE104ZFN	25V 0.1U	1	
C744	ECUV1E822KBN	25V 8200P	1	
C745	ECUV1E104KBN	25V 0.1U	1	
C747	ECUV1H181KCN	50V 180P	1	
C749	ECUV1H222KBN	50V 2200P	1	
C750,51	ECUVNE104MBN	16V 0.1U	2	
C752	ECUV1H102KBN	50V 1000P	1	
C753	ECUV1H471KBN	50V 470P	1	
C754	ECUV1H471KBN	50V 470P	1	
C760	ECUV1E104KBN	25V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C790	ECA1AKF820	10V 82U	1	
CN401	RJP6G182A	CONNECTOR (6P)	1	
CN402	RJS1A6823	CONNECTOR (23P)	1	
CN403	RJS1A6606	CONNECTOR (6P)	1	
CN404	RJS1A6604	CONNECTOR (4P)	1	
CN701	RJU035T016-1	CONNECTOR (16P)	1	
CN702	RJS1A6723-1Q	CONNECTOR (23P)	1	
CP790	RJP6G17ZA	CONNECTOR (6P)	1	
D403	MA28TATX	DIODE	1	
D404	MA8082M	DIODE	1	△
D405	MA8039LTX	DIODE	1	
D409-11	MA111TX	DIODE	3	
D420	MA728TX	DIODE	1	
D478	MA111TX	DIODE	1	
D801	SML79420C	LED	1	
D811,12	MA111TX	DIODE	2	
IC400	UPC29M33T	IC	1	△
IC401	LM2940T5	IC	1	△
IC402	T0TX178	OPTICAL OUT	1	
IC403	LC66358C4K97	IC	1	
IC409	TC74HCT7007C	IC	1	
IC701	AN8839NSBE2	IC	1	
IC702	MN662790RSA	IC	1	
IC703	AN8739SBE2	IC	1	
IC790	TA7291S	IC	1	
JK401	RJT065K19	SYSTEM(19P)	1	
L402	RLBN300AV-W	COIL	1	
L406	RLBN601V-W	COIL	1	
L408	RLBN601V-W	COIL	1	
L409	RLQP1ROKTL-Y	COIL	1	
L701,02	RLBN102V-Y	COIL	2	
PCB1	REP2773A-M	MAIN P.C.B.	1	[RTL]
PCB2	REP2685B-S	LED P.C.B. (REF.No.19)	1	
PCB3	REP2774A-S	PANEL P.C.B.	1	[RTL]
PCB11	REP1960A	SOADING MOTOR P.C.B.	1	[RTL]
Q401	2SC4081STX	TRANSISTOR	1	
Q402	DTC143EUT106	TRANSISTOR	1	
Q403	2SC4081STX	TRANSISTOR	1	
Q404	DTC114YUT106	TRANSISTOR	1	
Q405	2SD2137PQTA	TRANSISTOR	1	△
Q408,09	DTA143XUT106	TRANSISTOR	2	
Q411	DTC143EUT106	TRANSISTOR	1	
Q412	DTA143XUT106	TRANSISTOR	1	
Q413	DTC143EUT106	TRANSISTOR	1	
Q414	2SB956RTX	TRANSISTOR	1	
Q415	2SC4081STX	TRANSISTOR	1	
Q701	2SB709S	TRANSISTOR	1	
Q702	DTC143XUA106	TRANSISTOR	1	
R403	ERJ6GEYJ102V	1/10W 1K	1	
R405,06	ERJ6GEYJ103V	1/10W 10K	2	
R407	ERJ6GEYJ223V	1/10W 22K	1	
R409	ERJ8GEYJ103V	1/8W 10K	1	
R410	ERJ6GEYJ103V	1/10W 10K	1	
R414	ERJ8GEYJ472V	1/8W 4.7K	1	
R415	ERJ6GEYJ105	1/10W 1M	1	
R416	ERJ6GEYJ103V	1/10W 10K	1	
R420	ERJ6GEYJ472V	1/10W 4.7K	1	
R421	ERJ6GEYJ103V	1/10W 10K	1	
R422	ERJ6GEYJ680V	1/10W 68	1	
R423	ERJ8GEYJ472V	1/8W 4.7K	1	
R427	ERJ6GEYJ472V	1/10W 4.7K	1	
R428	ERJ6GEYJ103V	1/10W 10K	1	
R430	ERJ6GEYJ104V	1/10W 100K	1	
R433	ERJ6GEYJ472V	1/10W 4.7K	1	
R439	ERJ8GEYJ101V	1/8W 100	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R440	ERJ8GEYJ102V	1/8W 1K	1	
R441	ERQ16NKKR22E	1/6W 0.22	1	△
R442	ERDS1FJ181	1/2W 180	1	△
R443	ERD2FCJ6R8	1/4W 6.8	1	△
R450,51	ERJ6GEYJ472V	1/10W 4.7K	2	
R452	ERJ6GEYJ331V	1/10W 330	1	
R455,56	ERJ6GEYJ102V	1/10W 1K	2	
R458	ERJ6GEYJ102V	1/10W 1K	1	
R459,60	ERJ6GEYJ224V	1/10W 220K	2	
R470	ERJ8GEYJ103V	1/8W 10K	1	
R471	ERJ6GEYJ181V	1/19W 180	1	
R473	ERJ6GEYJ181V	1/19W 180	1	
R474	ERJ6GEYJ392V	1/10W 3.9K	1	
R475-77	ERJ6GEYJ272V	1/10W 2.7K	3	
R478	ERJ8GEYJ222V	1/8W 2.2K	1	
R479	ERJ6GEYJ272V	1/10W 2.7K	1	
R480	ERJ8GEYJ103V	1/8W 10K	1	
R498	ERJ6GEYJ472V	1/10W 4.7K	1	
R701	ERJ6GEYJ4R7V	1/10W 4.7	1	
R702	ERJ6GEYJ103V	1/10W 10K	1	
R704	ERJ6GEYJ102V	1/10W 1K	1	
R705	ERJ6GEYJ154V	1/10W 150K	1	
R706	ERJ6GEYJ102V	1/10W 1K	1	
R707	ERJ6GEYJ393V	1/10W 39K	1	
R708	ERJ6GEYJ223V	1/10W 22K	1	
R709	ERJ6GEYJ683V	1/10W 68K	1	
R711	ERJ6GEYJ823	1/10W 82K	1	
R712	ERJ8GEYJ221V	1/8W 220	1	
R714	ERJ6GEYJ682V	1/10W 6.8K	1	
R715	ERJ6GEYJ102V	1/10W 1K	1	
R717,18	ERJ6GEYJ102V	1/10W 1K	2	
R721	ERJ6GEYJ101V	1/10W 100	1	
R723	ERJ6GEYJ682V	1/10W 6.8K	1	
R724	ERJ6GEYJ183V	1/10W 18K	1	
R725	ERJ6GEYJ391V	1/10W 390	1	
R727	ERJ6GEYJ682V	1/10W 6.8K	1	
R728,29	ERJ6GEYJ392V	1/10W 3.9K	2	
R731	ERJ6GEYJ682V	1/10W 6.8K	1	
R735,36	ERJ6GEYJ101V	1/10W 100	2	
R741	ERJ6GEYJ473V	1/10W 47K	1	
R742	ERJ6GEYJ224V	1/10W 220K	1	
R744	ERJ6GEYJ124V	1/10W 120K	1	
R749	ERJ6GEYJ472V	1/10W 4.7K	1	
R753	ERJ6GEYJ100	1/10W 10	1	
RJ501-04	ERJ6GEYOR00V	CHIP JUMPER	4	
RJ508-11	ERJ6GEYOR00V	CHIP JUMPER	4	
RJ513,14	ERJ6GEYOR00V	CHIP JUMPER	2	
RJ601-10	ERJ8GEYOR00V	CHIP JUMPER	10	
RJ614	ERJ8GEYOR00V	CHIP JUMPER	1	
RJ616-19	ERJ8GEYOR00V	CHIP JUMPER	4	
RJ621-23	ERJ8GEYOR00V	CHIP JUMPER	3	
RJ625	ERJ8GEYOR00V	CHIP JUMPER	1	
RJ627-31	ERJ8GEYOR00V	CHIP JUMPER	5	
RJ701	ERJ6GEYOR00V	CHIP JUMPER	1	
RJ702-10	ERJ8GEYOR00V	CHIP JUMPER	9	
RJ712-14	ERJ8GEYOR00V	CHIP JUMPER	3	
RJ716,17	ERJ8GEYOR00V	CHIP JUMPER	2	
RJ721,22	ERJ6GEYOR00V	CHIP JUMPER	2	
RJ724	ERJ6GEYOR00V	CHIP JUMPER	1	
RJ726-28	ERJ6GEYOR00V	CHIP JUMPER	3	
RJ731-36	ERJ6GEYOR00V	CHIP JUMPER	6	
RJ750	ERJ6GEYOR00V	CHIP JUMPER	1	
RJ802,03	ERJ6GEYOR00V	CHIP JUMPER	2	
RJ901-08	ERJ6GEYOR00V	CHIP JUMPER	8	
S701	RSH1A043-U	SW,REST	1	
S790,91	RSH1A005	SW,OPEN/CLOSE DET.	2	
S801-06	EVQ21405R	SW,PUSH	6	
S807,08	RST2A001-2D	SW,CD TEXT/TRACK	2	
X401	EF0EC4194A4	OSCILLATOR	1	
X701	RSXB33M8J01T	OSCILLATOR	1	

19 Cabinet Parts Location



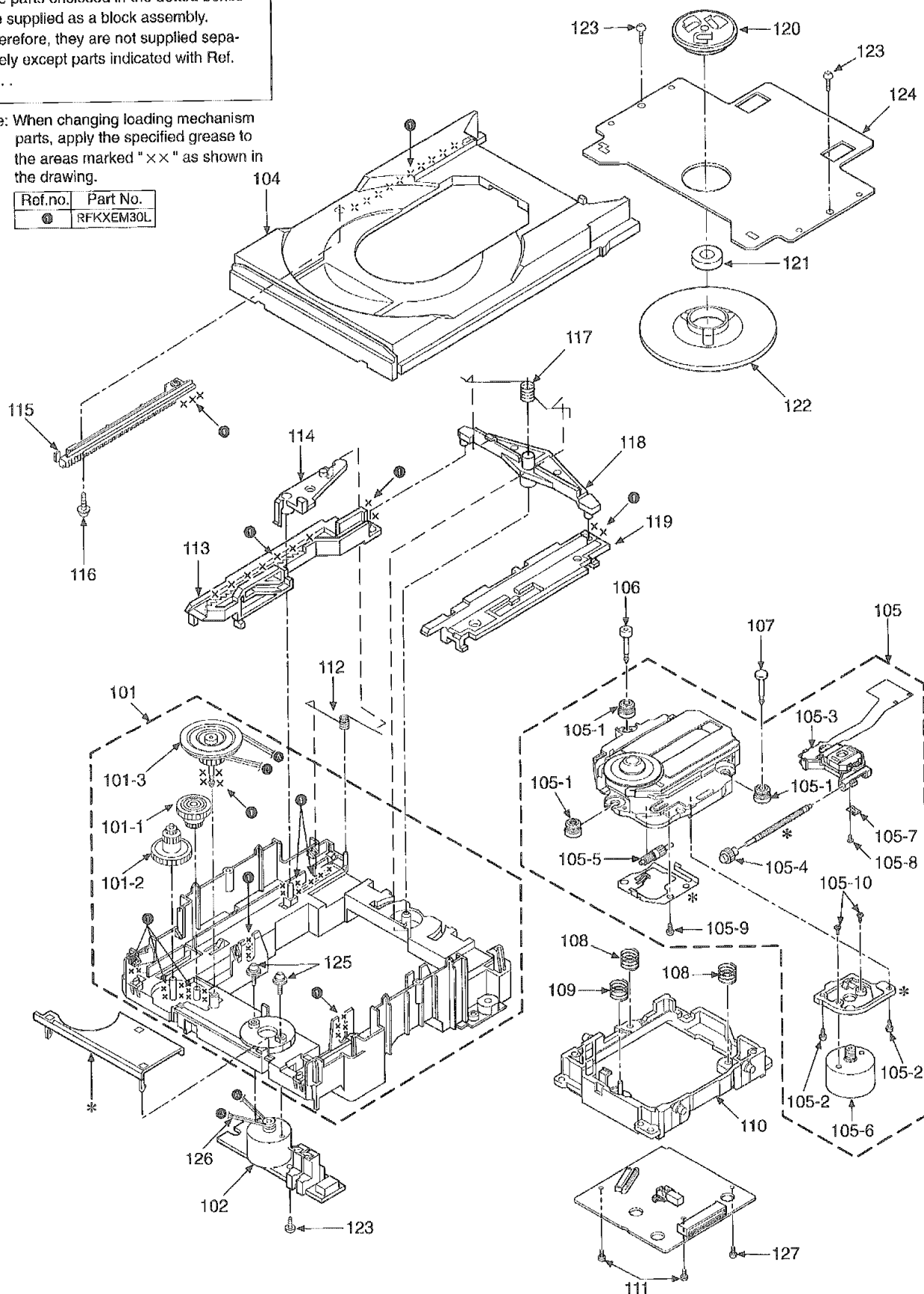
Note: We do not supply those items of parts marked *.

20 Loading Unit Parts Location

The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately except parts indicated with Ref. No. .

Note: When changing loading mechanism parts, apply the specified grease to the areas marked "x x" as shown in the drawing.

Ref.no.	Part No.
①	RFKXEM30L



Note: We do not supply those items of parts marked *.