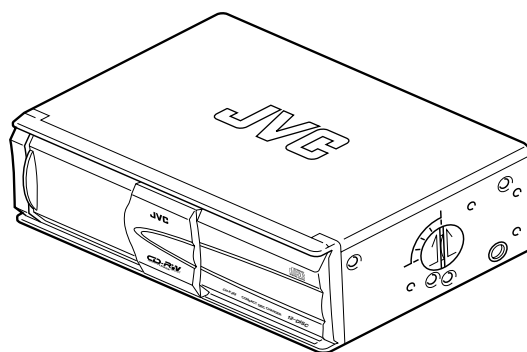


JVC

SERVICE MANUAL

CD CHANGER

CH-X488



COMPACT
disc
DIGITAL AUDIO

CD-RW
PLAYBACK


Area Suffix

UF China

Contents

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Safety precaution

 **CAUTION** Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of performing repair of this system.

 **CAUTION** Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.

Preventing static electricity

1. Grounding to prevent damage by static electricity

Electrostatic discharge (ESD), which occurs when static electricity stored in the body, fabric, etc. is discharged, can destroy the laser diode in the traverse unit (optical pickup). Take care to prevent this when performing repairs.

2. About the earth processing for the destruction prevention by static electricity

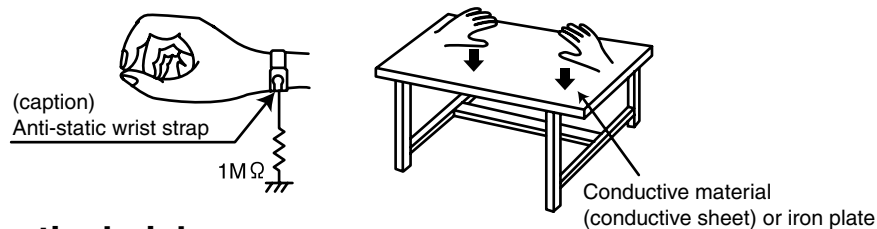
Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as CD players. Be careful to use proper grounding in the area where repairs are being performed.

2-1 Ground the workbench

Ground the workbench by laying conductive material (such as a conductive sheet) or an iron plate over it before placing the traverse unit (optical pickup) on it.

2-2 Ground yourself

Use an anti-static wrist strap to release any static electricity built up in your body.



3. Handling the optical pickup

1. In order to maintain quality during transport and before installation, both sides of the laser diode on the replacement optical pickup are shorted. After replacement, return the shorted parts to their original condition. (Refer to the text.)
2. Do not use a tester to check the condition of the laser diode in the optical pickup. The tester's internal power source can easily destroy the laser diode.

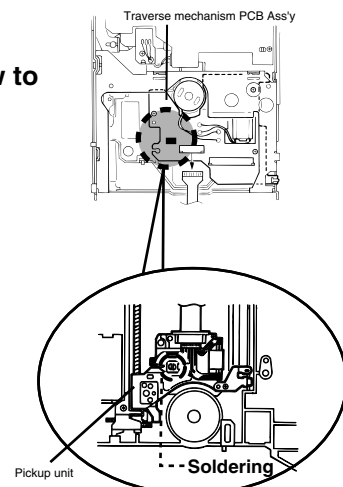
4. Handling the traverse unit (optical pickup)

1. Do not subject the traverse unit (optical pickup) to strong shocks, as it is a sensitive, complex unit.
2. Cut off the shorted part of the flexible cable using nippers, etc. after replacing the optical pickup. For specific details, refer to the replacement procedure in the text. Remove the anti-static pin when replacing the traverse unit. Be careful not to take too long a time when attaching it to the connector.
3. Handle the flexible cable carefully as it may break when subjected to strong force.
4. It is not possible to adjust the semi-fixed resistor that adjusts the laser power. Do not turn it

Attention when traverse unit is decomposed

***Please refer to "Disassembly method" in the text for pick-up and how to detach the substrate.**

1. Solder is put up before the card wire is removed from connector on the CD substrate as shown in Figure.
(When the wire is removed without putting up solder, the CD pick-up assembly might destroy.)
2. Please remove solder after connecting the card wire with when you install picking up in the substrate.

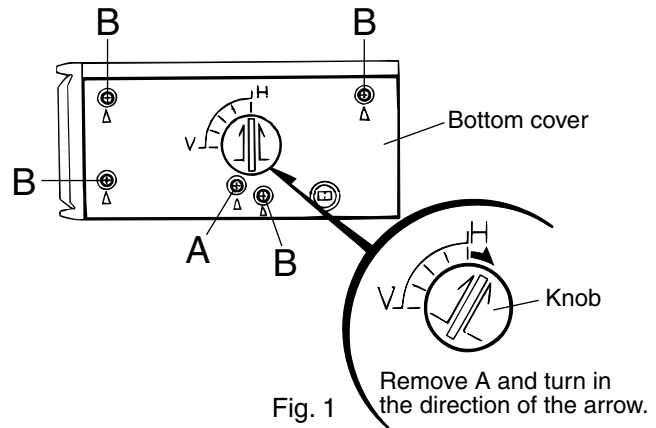


Disassembly method

- Perform operations according to the items to be disassembled.

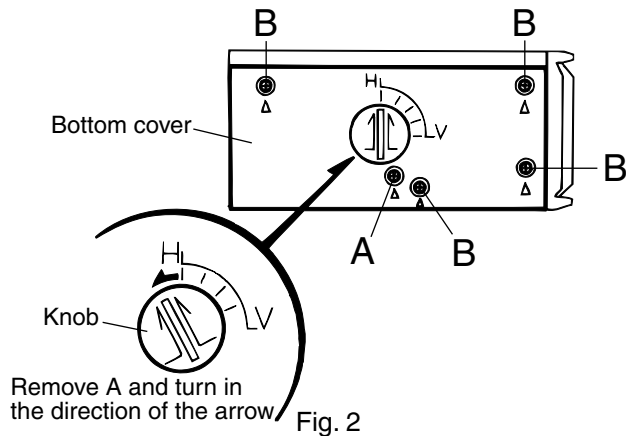
<Replacement of the pickup>

- After removing the exterior (top and bottom).
- Proceed to the pickup replacement section.
- When applying grease, refer to the exploded view.
Use new grease.



<Mechanism section>

- Remove the exterior (required section only).
- The mechanism section is designed so that each unit can be removed separately.
- When reassembling, refer to the assembling precautions. (Use new grease when applying grease.)

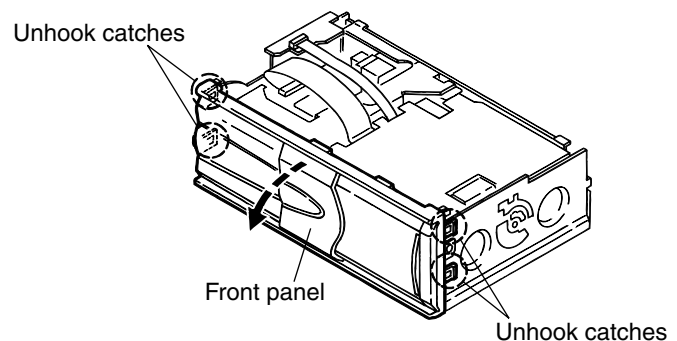
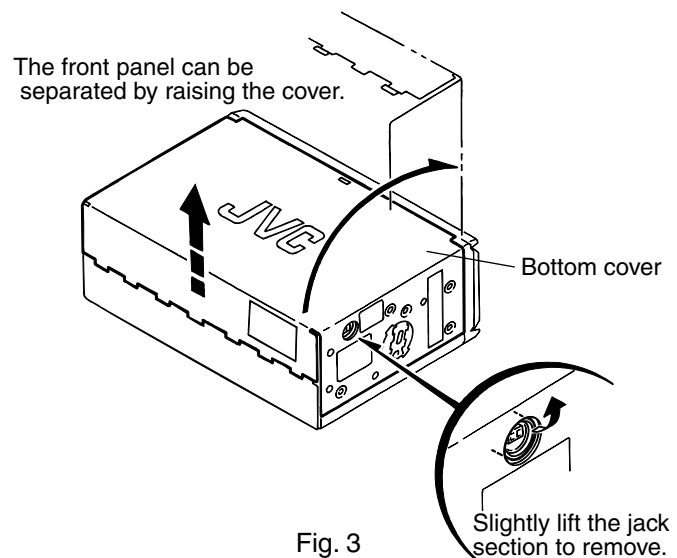


<Exterior section>

■ Removing the bottom cover and front panel assembly

(See Fig.1 to 4)

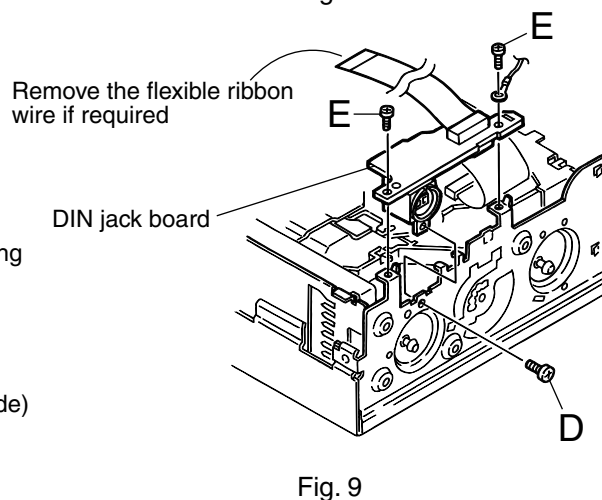
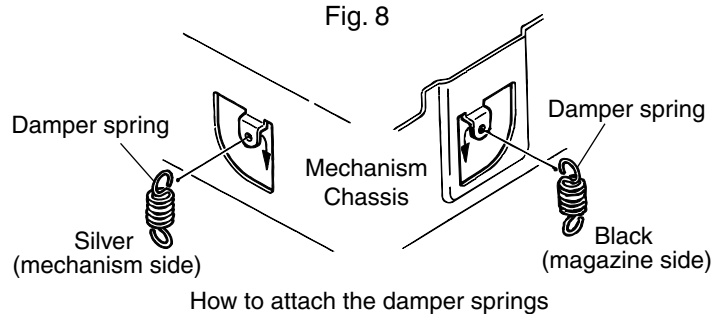
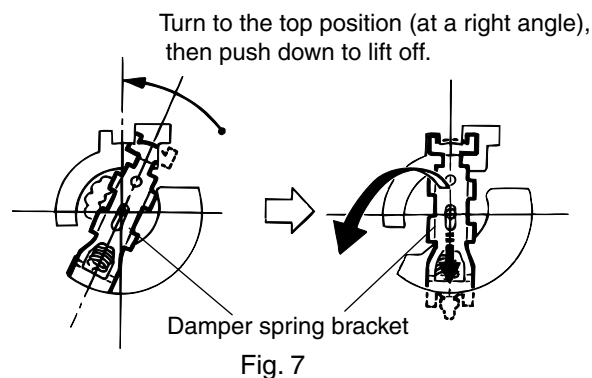
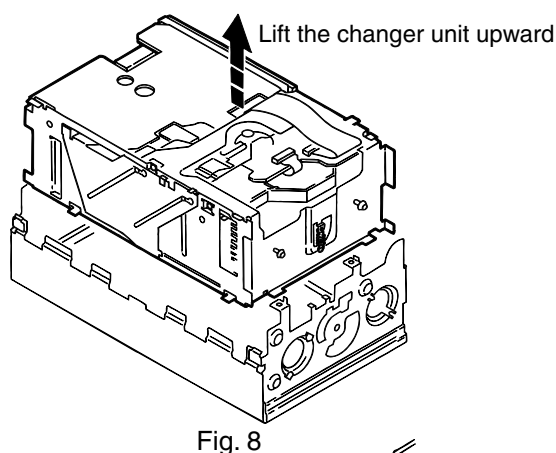
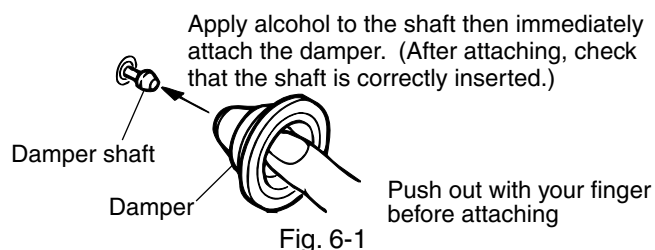
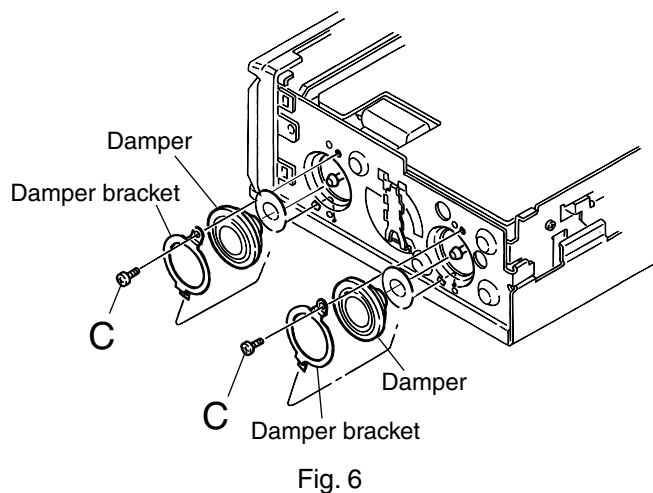
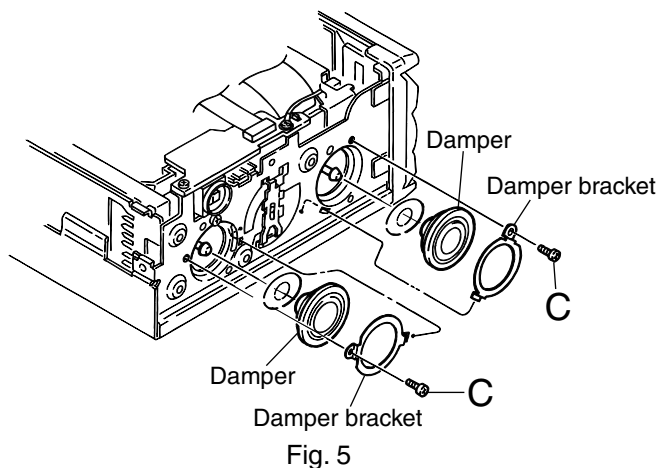
- Remove the two screw **A** to unlock the mounting direction knob located on the side of the main unit.
- Turn the mounting direction knob in the direction of the arrow using a coin, etc. to remove it. (The knob can be removed only when it is set to this position.)
- Remove the four top cover fixing screws **B** at the triangle Δ marks on the side of the main unit. (Perform the same operation on both sides.)
- Turn the unit upside down so the bottom surface is facing upward.
- Lift the rear edge of the bottom cover slightly and lift the side by grasping the DIN jack section on the side panel, then turn it toward the front (raise upward) to remove the bottom cover.
- Unhook the four catches located on both sides of the front panel, and turn the front panel toward the top cover (lower down) to remove the front panel.



■ Removing the top cover

(See Fig.5 to 9)

1. Remove the four damper bracket fixing screws **C** to remove the damper brackets.
2. Pull out the dampers, being careful not to damage them.
When reattaching a damper, insert your finger to push out the center of the damper to mount it on the damper shaft, as shown in Fig. 6-1.
3. Turn the damper spring bracket toward the top at a right angle as shown in Fig. 7, then push down the lower side of the damper spring bracket to lift it off.
4. Remove the three fixing screws **D** and **E** on the DIN jack board assembly.
5. Lift the changer unit upward.
6. Remove the damper springs from the mechanism chassis if required. To reassemble, refer to the diagram below.



■ Removing the fittings (See Fig.10)

1. Remove the fixing screw **F**.
2. Unhook the two catches **a** on the top edge of the fitting, then unhook the two catches **b** at the left / right bottom edges.

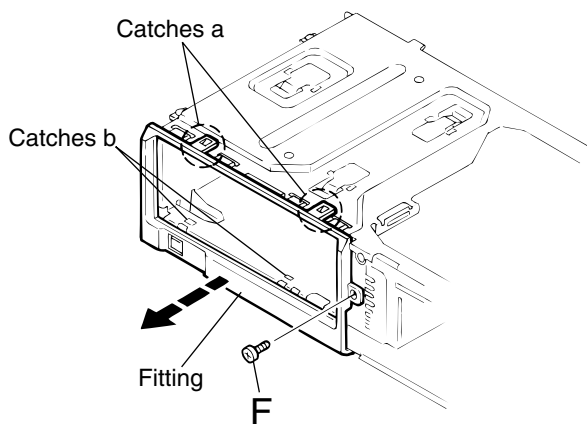


Fig. 10

■ Removing the main PCB assembly (See Fig.11)

1. Remove the power IC fixing screw **G**.
2. Remove the four screws **H** securing the main board assembly.
3. Disconnect position motor wire connector **CN504** from the main board assembly.
4. Disconnect sensor board assembly wire connector **CN601** from the main board assembly.
5. Remove the flexible ribbon wire from **CN502** on the traverse mechanism board assembly. When reinstalling the board boards, refer to the reassembling procedures for protecting switches, etc.

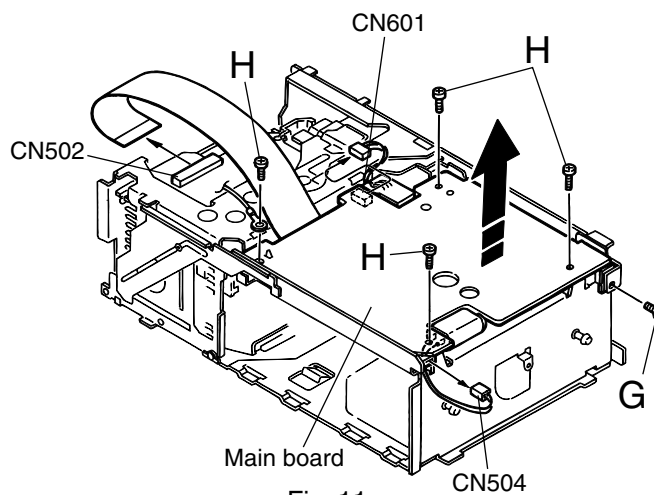


Fig. 11

<Changer mechanism section>

■ Sensor assembly unit (See Fig.12)

1. Remove the two screws **I** securing the sensor assembly unit.
2. Unhook the spring on the back of the sensor assembly unit from the holes on the chassis.

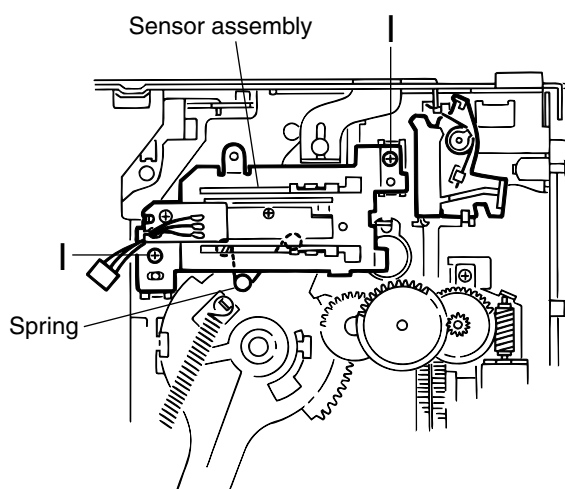


Fig. 12

■ Magazine lock arm (See Fig.12 and 13)

1. Remove the magazine lock spring from the front side of the chassis.
2. Remove the poly-washer **c** securing the magazine lock arm.
3. Turn the magazine lock arm in the direction of the arrow until the notch is at the **d** position to remove it from the chassis.

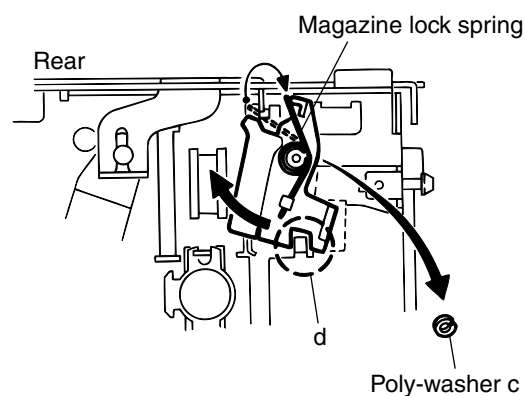


Fig. 13

■ Positioning motor assembly (See Fig.14)

1. Remove the two screws **J** securing the positioning motor.
2. Slightly lift the positioning motor assembly to remove it from the two burrs on the chassis.

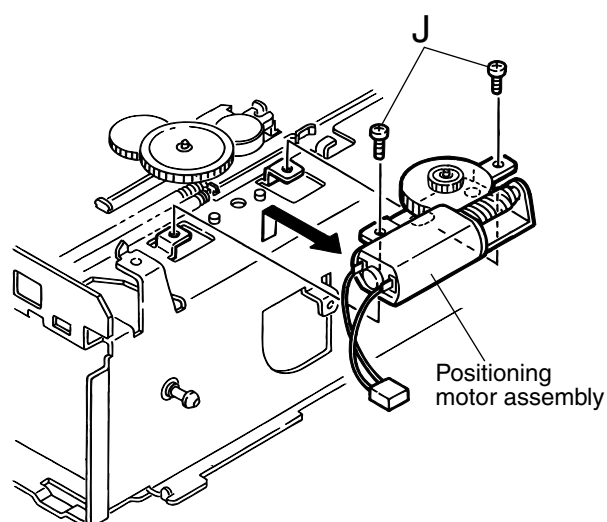


Fig. 14

■ **Rear slider (See Fig.15)**

1. Position the unit with the front section facing down. Rotate the third gear located on the back of the main unit in the direction of the arrow (clockwise).
2. Shift the rear slider in the direction of the arrow and remove it at the rear slider mounting position (at the widest hole).

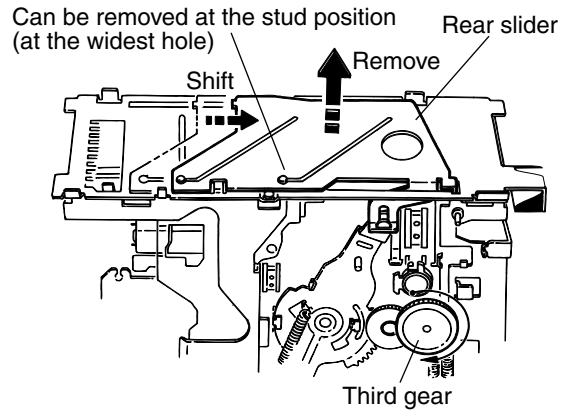


Fig. 15

■ **Front slider (See Fig.16)**

1. Position the unit with the rear section facing down. Rotate the third gear located on the bottom of the unit in the direction of the arrow (clockwise) until the front slider is shifted to the outermost position.
2. Remove the E-washer securing the front slider to remove the front slider from the chassis

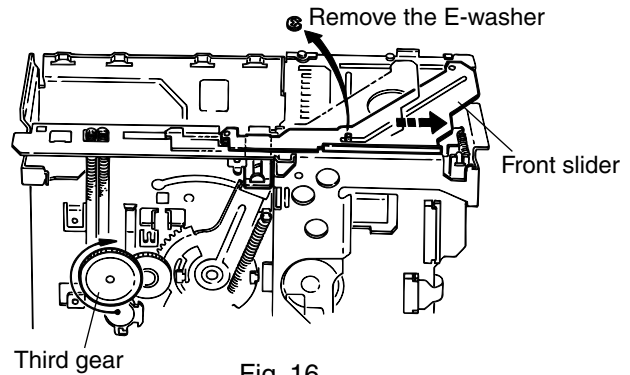


Fig. 16

■ **Top plate (See Fig.17 and 18)**

1. Remove the nine screws **K** securing the top plate.
2. Disconnect the section **e** attached to the rear of the unit, then lift the top plate slightly.
3. Slide the top plate toward the rear of the unit to remove the upper rod from the top plate.

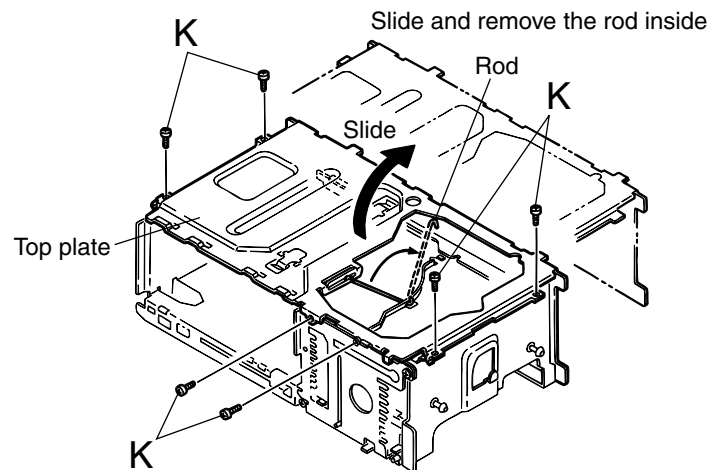


Fig. 17

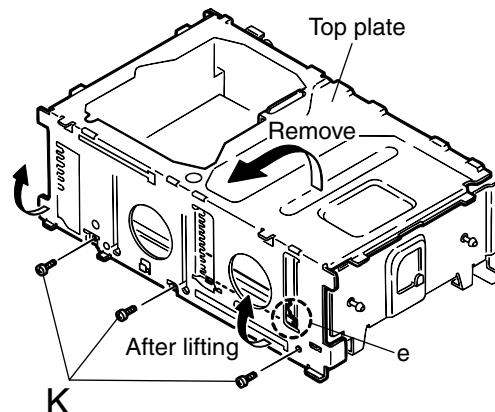


Fig. 18

■ Lifter unit (See Fig.19 and 20)

1. Unhook the elevator spring located on the front side of the unit. (Be sure to first unhook the spring from the lifter side as shown in the upper part of the diagram.)
2. Lift the lifter unit upward, then remove the lower rod to remove the lifter unit from the chassis.

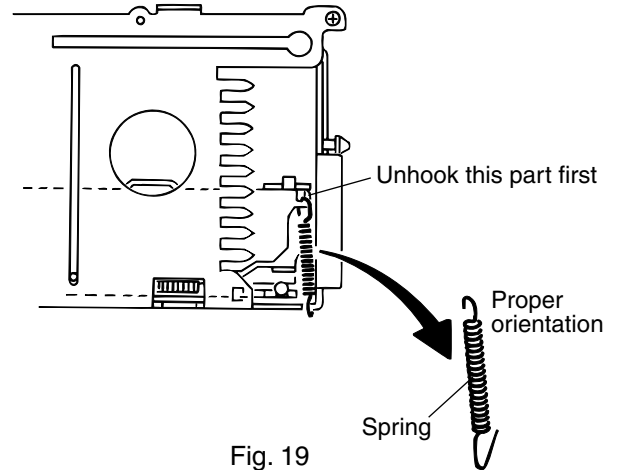


Fig. 19

■ Lifter bracket (See Fig.21)

1. Remove the two lifter bracket fixing screws **L** located on the back of the lifter unit.
2. Remove the lower rod.

■ Side bracket and traverse mechanism assembly (See Fig.22)

1. Remove the two side bracket unit fixing screws **M** to disconnect the side bracket unit from the lifter unit.
2. Remove the three shafts on the traverse mechanism assembly from the lifter unit.

CAUTION: For reassembling, refer to the reassembling procedures.

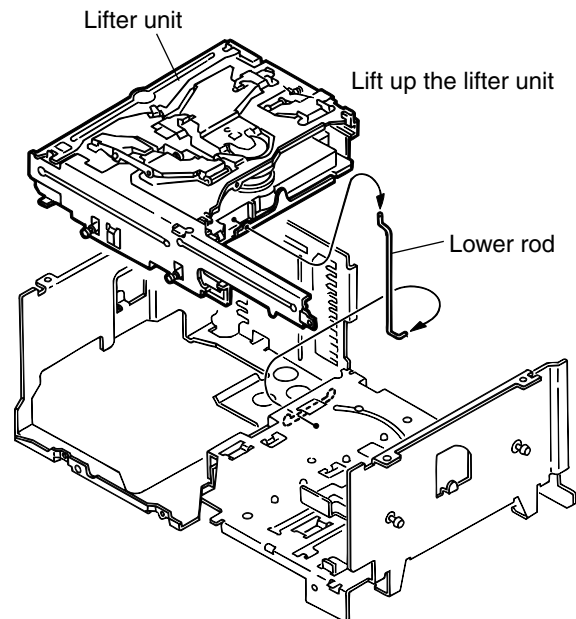


Fig. 20

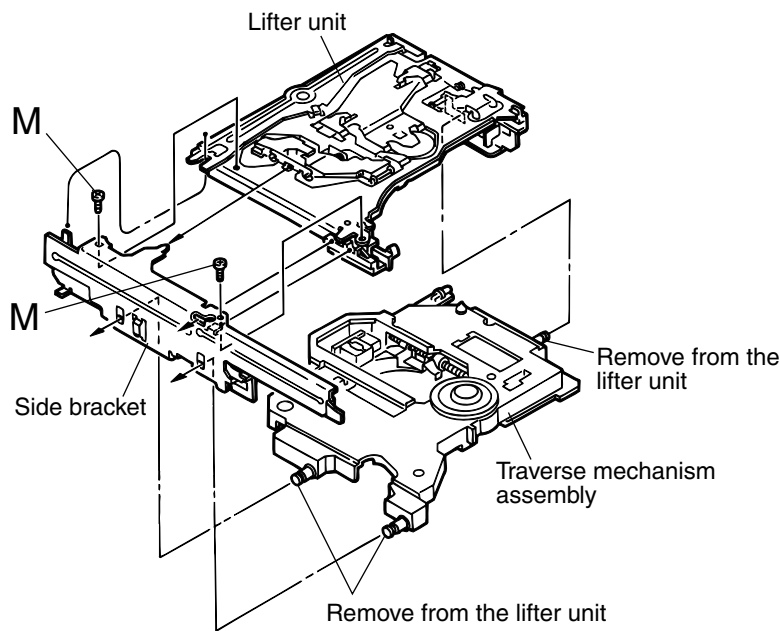


Fig. 22

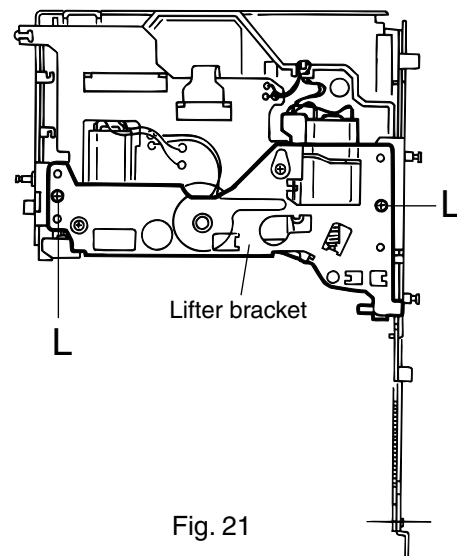


Fig. 21

■ **Removing the mechanism board / pickup assembly (See Fig.23 to 26)**

1. Remove the three screws **N** fixing the mechanism board on the back of the traverse mechanism.
2. Disconnect the two feed motor wires (blue and white), two spindle motor wires (red and black) and two tray motor wires (brown and black) that are soldered to the mechanism board.
3. Short-circuit the grounding point on the mechanism board. Move the mechanism board without disconnecting the wire from connector CN501. Solder the short circuit round on the pickup assembly.
4. Disconnect the wire from connector CN501 on the mechanism board.
5. Remove the screw **O** to remove the feed motor assembly.
6. Remove the screw **P** to remove the shaft holder retaining the feed slide shaft assembly and the middle gear.
7. Move the middle gear.
8. Move the pickup assembly upward from the gear section and remove it from the traverse chassis assembly.
9. Remove the two screws **Q** to remove the rack arm.
10. Pull out the feed slide shaft assembly.
11. Remove the screw **R** to remove the spring.

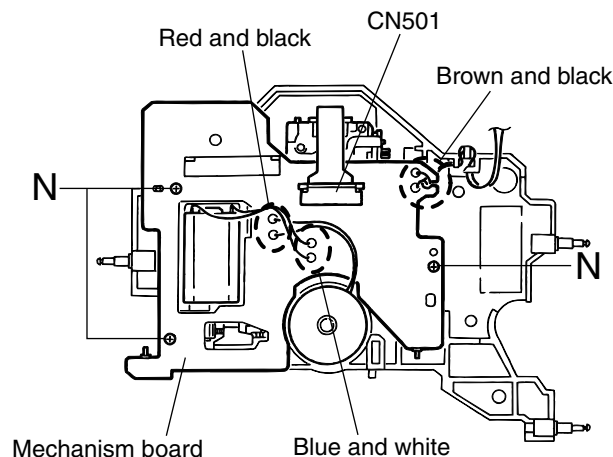


Fig. 23

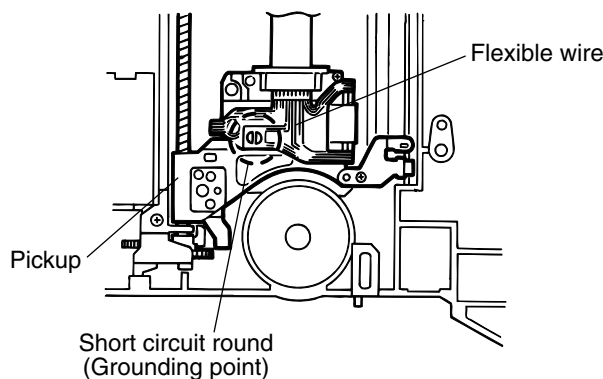


Fig. 24

CAUTION: To reattach the mechanism board, connect the pickup flexible wire to connector CN501 on the mechanism board before unsoldering the short circuit round. Subsequently, fix the mechanism board using screws.

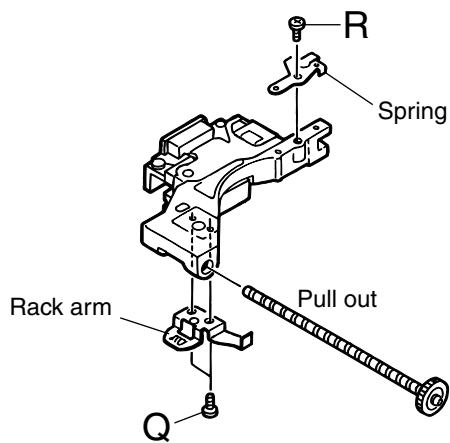


Fig. 26

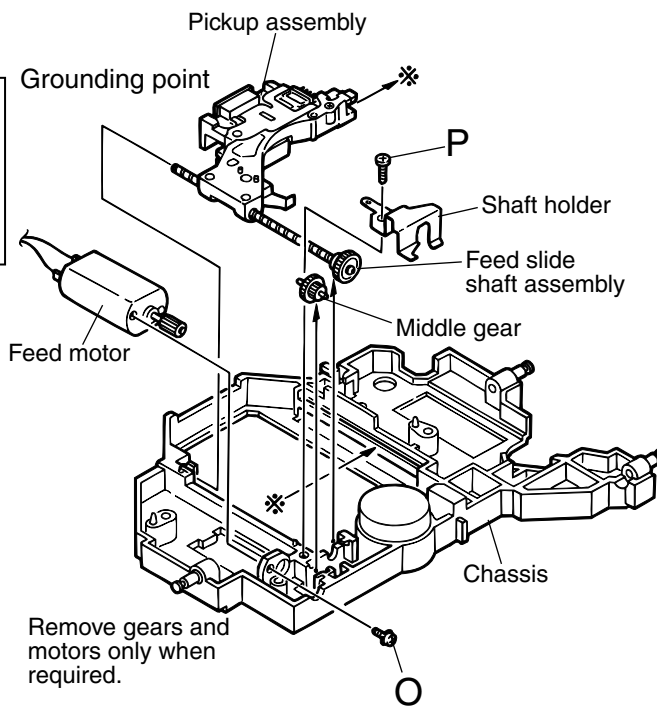


Fig. 25

■ Tray motor (See Fig.27 and 28)

1. Remove the two screws **S** securing the tray motor.
2. Remove the two screws **T** to remove the tray motor assembly from the tray motor holder.

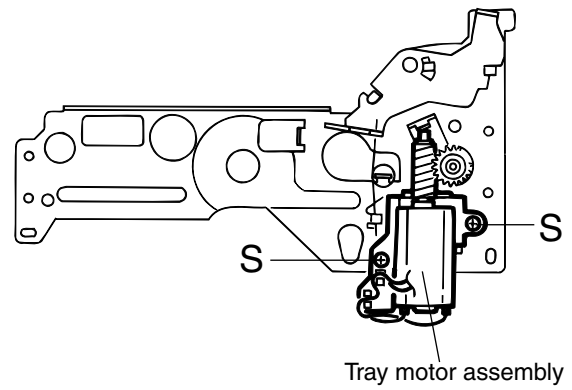


Fig. 27

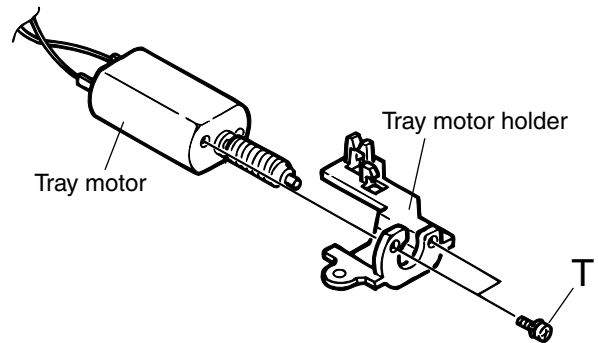


Fig. 28

■ Separation of the chassis (L) assembly and chassis (R) assembly (See Fig.29)

1. Remove the two screws **U** retaining the chassis (L) and (R) assemblies.
2. Slide the chassis (L) assembly toward the front and detach it, then remove the chassis (L) upward.

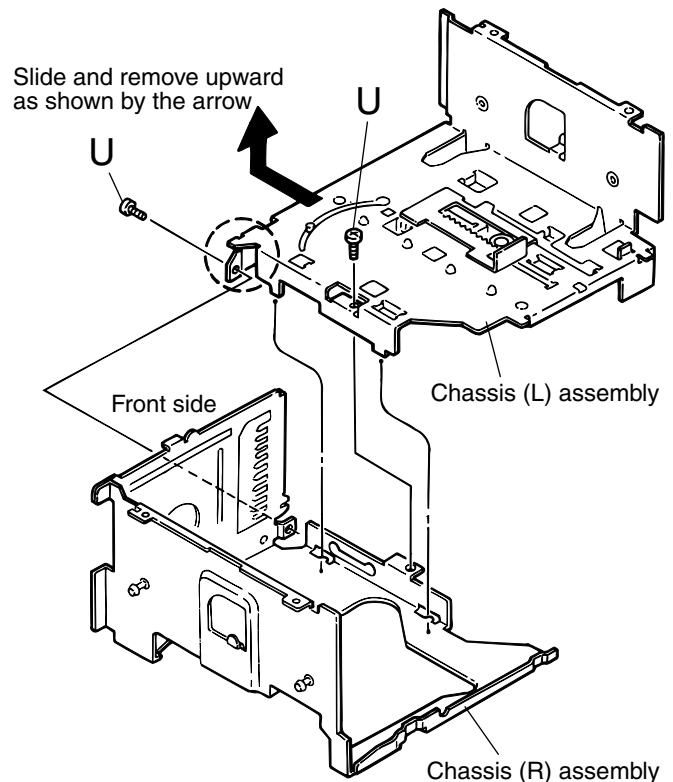


Fig. 29

<Precautions on reassembling>

CAUTION: When reassembling, also refer to the disassembling procedures.

■ Mounting the traverse mechanism (See Fig.30 to 34)

1. When mounting the pickup assembly, attach the feed slide shaft assembly to the traverse chassis. Apply E-JC-525 grease to the shaft.
2. Mount the middle gear and the feed slide shaft to the traverse chassis and secure them with the screw **P** through the shaft holder.
3. Before mounting the mechanism board, move the pickup to the outer edge position, then secure the board assembly using the screw **N**. At this time, check that the rest switch is correctly placed.
4. To mount the rack arm, first move the pickup to the middle position and secure it with the screws **Q**.

CAUTION: To reattach the mechanism board, connect the pickup flexible wire to connector CN501 on the mechanism board before unsoldering the short circuit round. Subsequently, fix the mechanism board using screws.

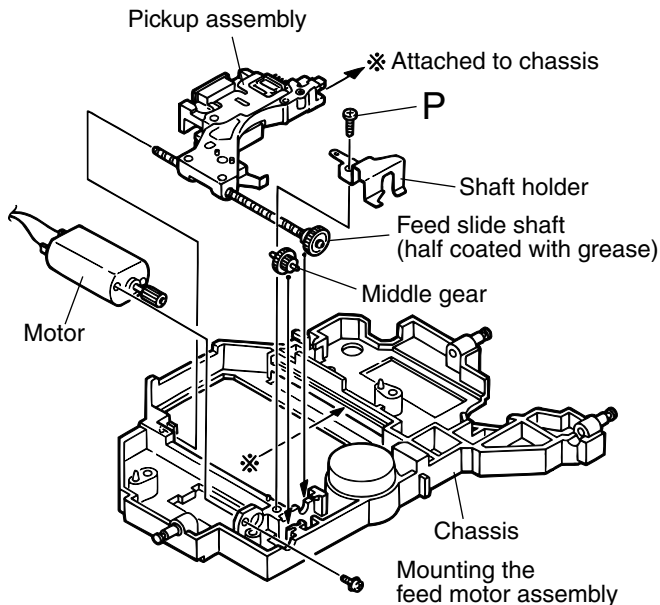


Fig. 30

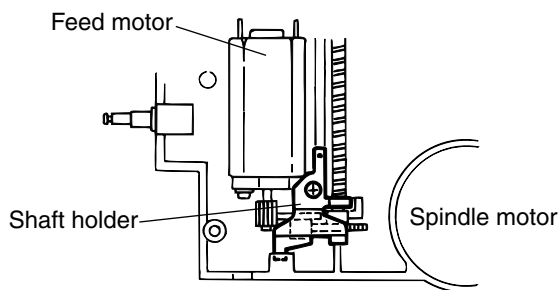


Fig. 31

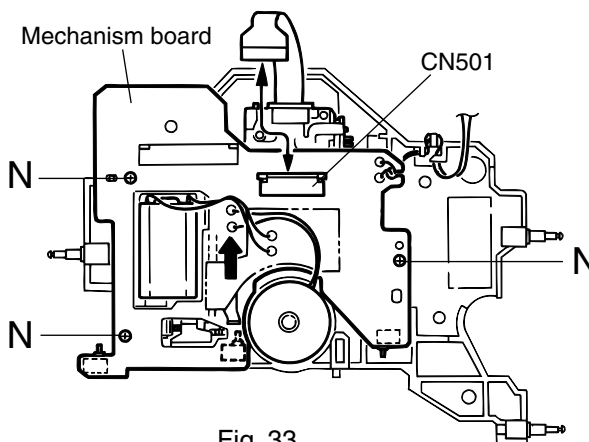


Fig. 33

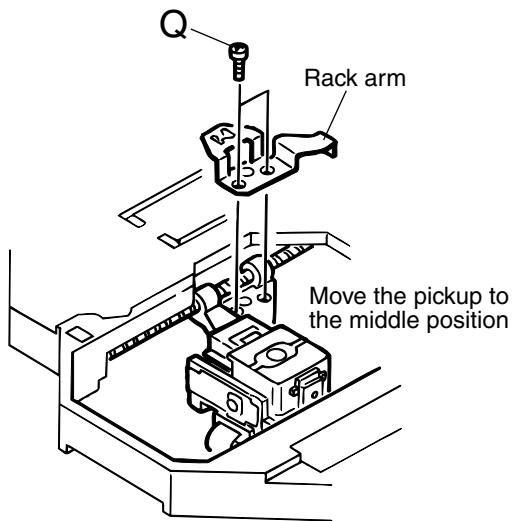


Fig. 32

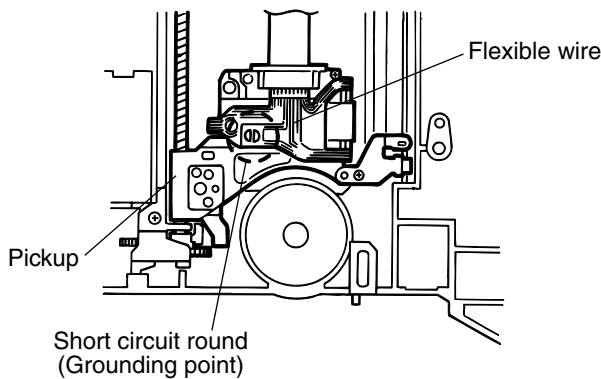


Fig. 34

■ Mounting the lifter unit

(See Fig.35 to 37)

1. Insert the shafts **f** of the traverse mechanism assembly into the slide grooves **g** on the lifter unit.
2. Shift the hook of the lifter unit to the edge, and shift the sliding lever inside the side bracket unit to the edge as well.
3. With each hole and lever shifted to the edge, mount the lifter unit and side bracket unit from the side.
(Check each attached section, and check that the two shafts **h** of the lifter unit are correctly inserted into the holes **i** of the side bracket unit. After mounting, check that the levers move together.)
4. Turn the lifter unit upside down.
As shown in Fig. 35, slide the lever 30 mm away from the edge, then mount the lifter bracket assembly.

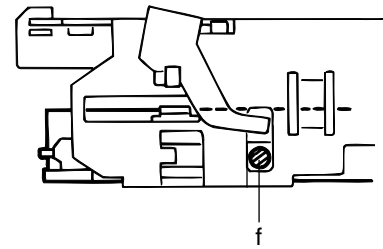


Fig. 35

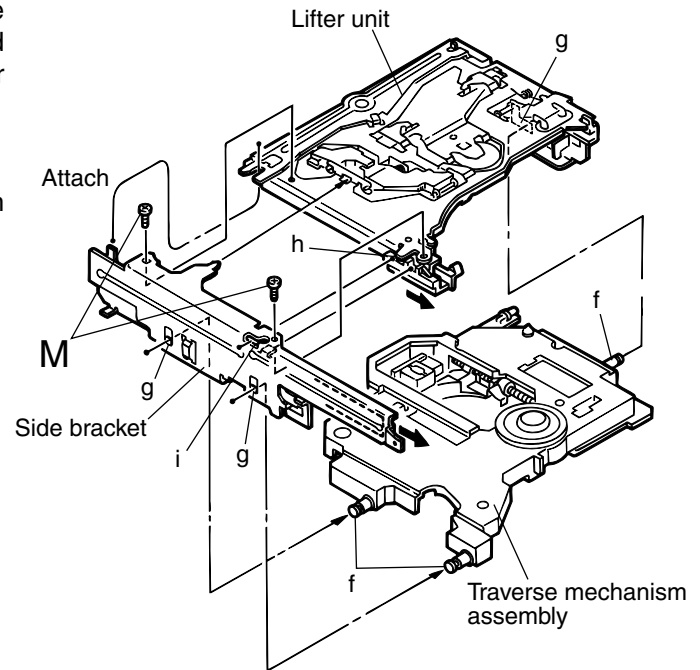


Fig. 36

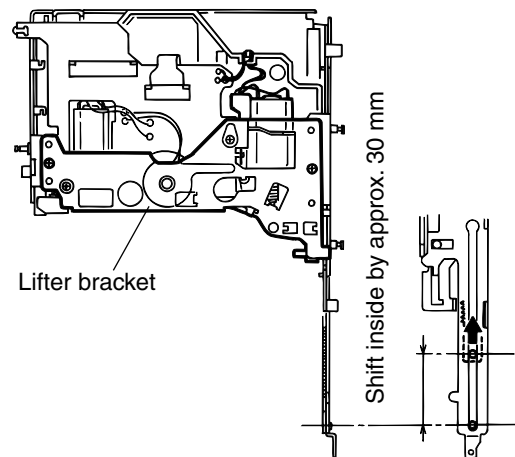


Fig. 37

■ Connection of the chassis (L) assembly and chassis (R) assembly
(See Fig.38 to 40)

1. Attach the lower rod to the chassis (R) assembly. While shifting the rod toward the front side, mount the rod on the lifter unit. With the rod mounted, place the lifter unit on the chassis (R) assembly.
2. Combine the chassis (L) and (R) assemblies so that the hook section **j** of the chassis (L) assembly is inserted into the notch of the chassis (R) assembly by sliding it from the front side.
3. After engaging, secure with the two screws **U**.
4. Attach the tension spring between the lifter unit and the chassis.

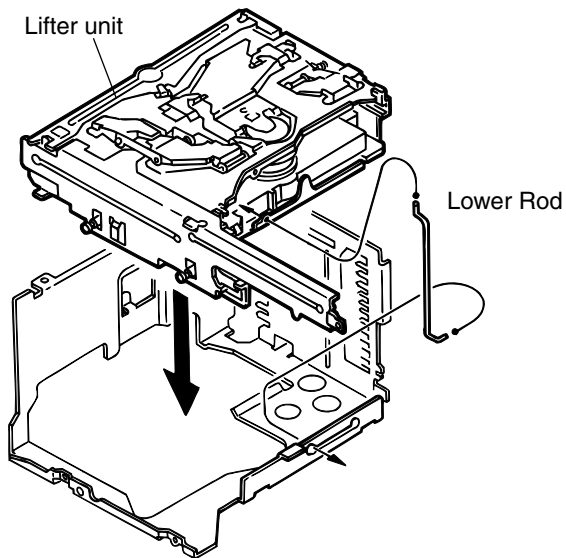


Fig. 38

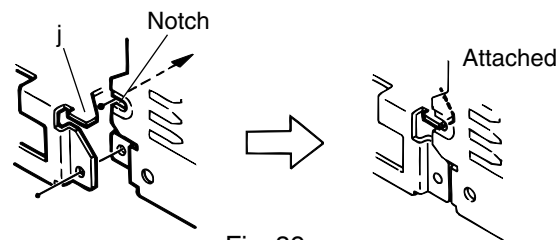


Fig. 39

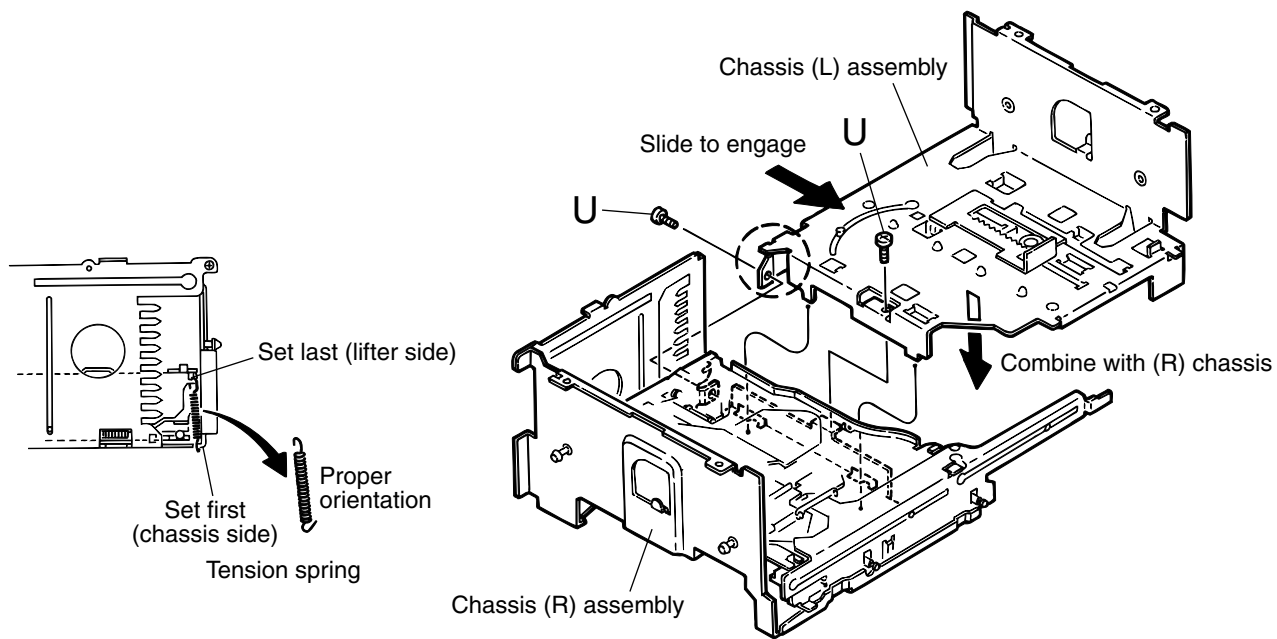


Fig. 40

■ Mounting the top plate
(See Fig.41 to 44)

1. Mount the upper rod on the lifter side **l** and set it on the rear of the top plate, then mount the other end of the upper rod to **m**.
2. Check that the five points (**n**, **o**, **p**, **s** and **r**) are correctly positioned.
 When mounting section **s**, set it so that section **t** of the lifter unit is pinched by the bending section of the top plate.
3. Secure the top plate with six fixing screws **K**.

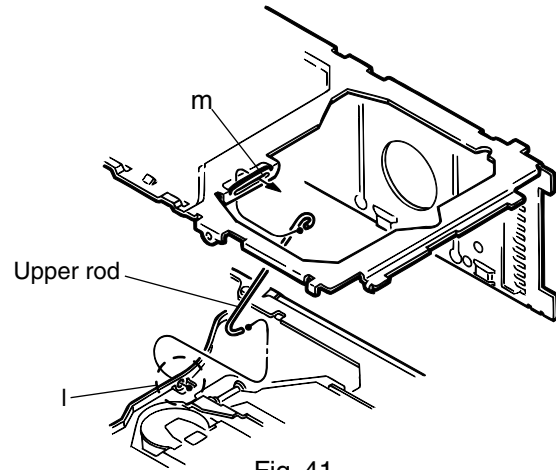


Fig. 41

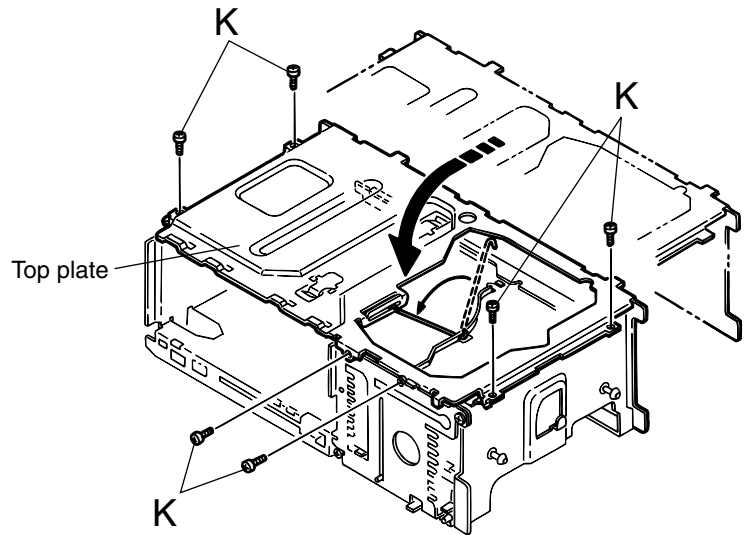


Fig. 42

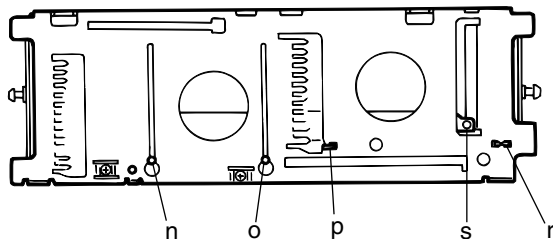


Fig. 44

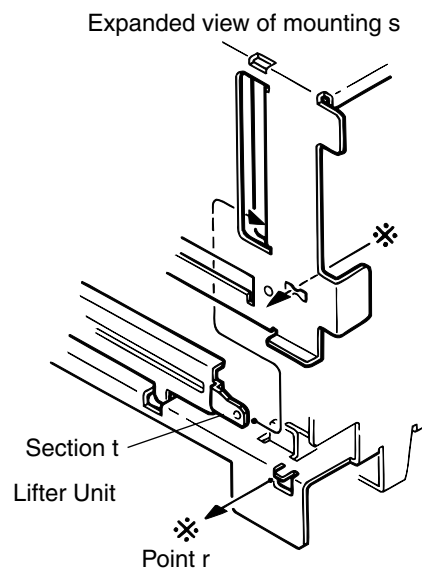
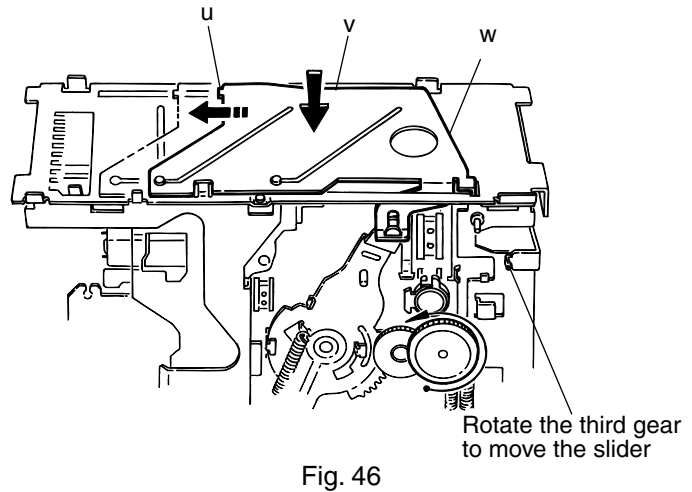
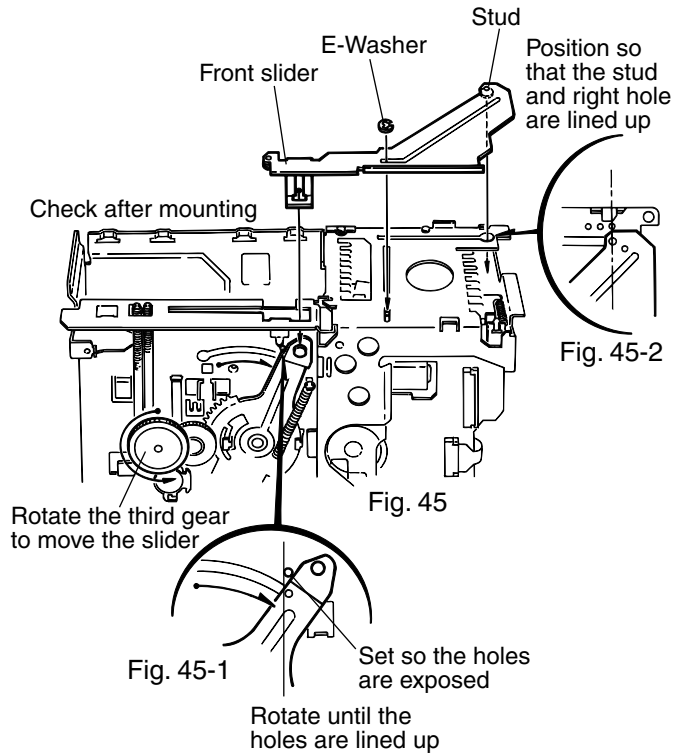


Fig. 43

■ **Mounting the front slider and rear slider**
(See Fig.45 and 46)

1. Position the unit with the rear side facing down, then rotate the third gear in the direction of the arrow (clockwise) until the lift arm comes to the position at which the holes are exposed, as shown in Fig. 45-1.
2. Mount the front slider from the top.
 Rotate the third gear counterclockwise until the hole of the slider is lined up with the right hole of the stud, as shown in Fig. 45-2.
3. Mount the E-washer on the shaft.
4. Position the unit with the front side facing down, then mount the rear slider. Check that the **u**, **v** and **w** positions are correctly mounted as shown in Fig. 46.
5. Rotate the third gear in the direction of the arrow (counterclockwise) until the lifter unit is at the top position.



■ Mounting the sensor board assembly (See Fig.47)

1. Attach the longer spring to the white resin, and attach the shorter spring temporarily to the sensor assembly bracket.
2. Mount the sensor assembly so that the shaft of the lift arm is inserted into the longer hole on the white resin located on the back of the sensor board assembly.
3. Attach the shorter spring to the hook of the lift arm.

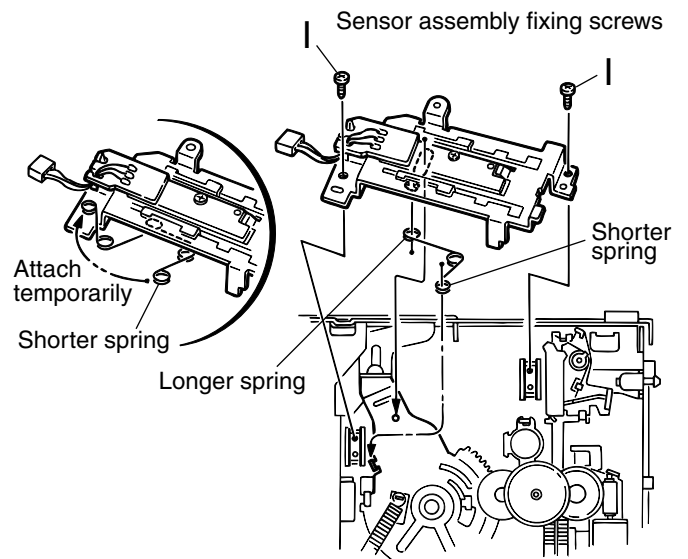


Fig. 47

■ Mounting the main PC board assembly (See Fig.48)

1. Rotate the third gear clockwise until section **x** of the front slider and the third hole from the right are lined up.
(Be sure to set properly. If incorrectly set, the switches on the board assembly may be damaged.)
2. After they are correctly positioned, mount the main board assembly.

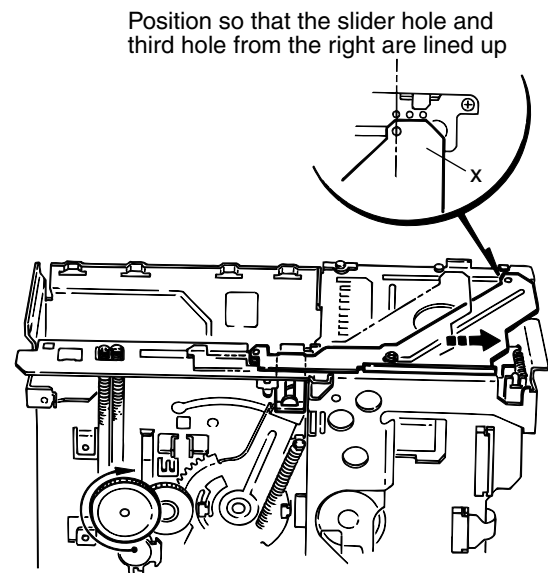


Fig. 48

■ Pickup replacement procedure (See Fig.49 to 55)

1. Remove the bottom cover, front panel and top cover from the exterior section.
2. Unplug the flexible ribbon wire from connector CN502 on the traverse mechanism PC board assembly.
3. Turn the rear slider and third gear in the lifter section counterclockwise until the traverse mechanism assembly is in the lowermost (bottom) position.
4. Unsolder the two wires (black and brown) connected to the tray motor.
5. Remove the two screws **M** from the round holes on the chassis (R) assembly to remove the lifter bracket (L).
6. Remove the lower rod.
7. Disconnect the two feed motor wires (blue and white), two spindle motor wires (red and black) and two tray motor wires (brown and black) that are soldered to the mechanism board.
8. Short-circuit the grounding point on the mechanism board. Move the mechanism board without disconnecting the wire from connector CN501. Solder the short circuit round on the pickup assembly.
9. Disconnect the wire from connector CN501 on the mechanism board.
10. Remove the three fixing screws **N** from the round holes on the chassis (R) assembly to remove the traverse mechanism board assembly.
11. Remove the pickup shaft holder fixing screw **P** to remove the pickup assembly.

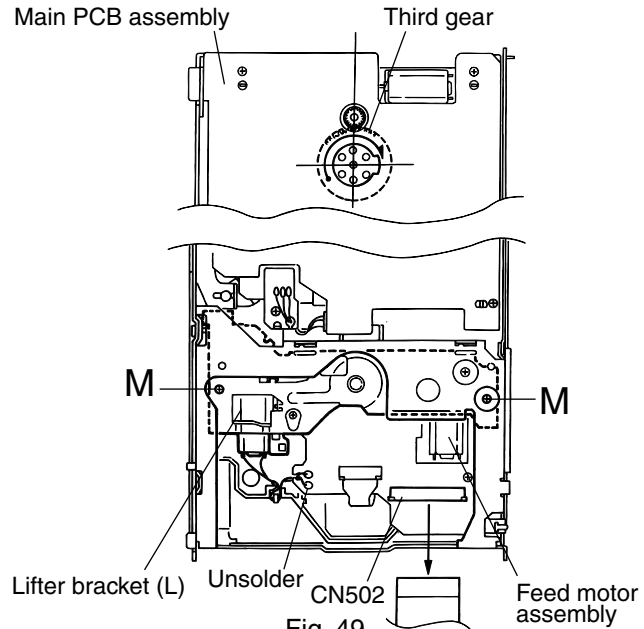


Fig. 49

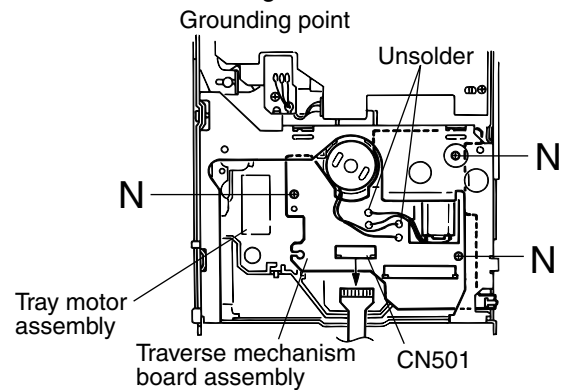


Fig. 50

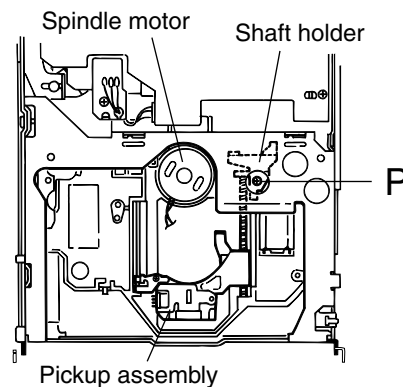


Fig. 51

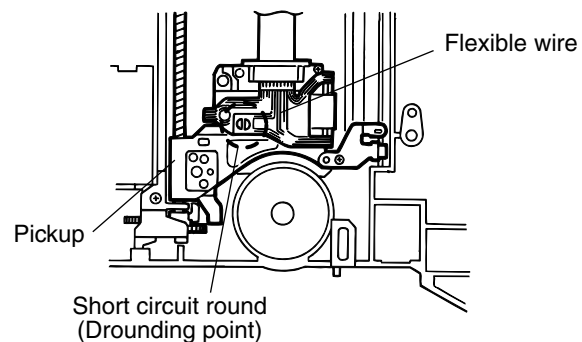


Fig. 52

CAUTION: When replacing the pickup, be sure to apply countermeasures against static electricity (grounding the operation table, wrist band and soldering iron). To remove it, first short-circuit the grounding point on the mechanism board, then lift the mechanism board assembly with CN501 connected. Next, short-circuit the grounding point on the pickup main unit, then unplug the pickup flexible board from connector CN501.

CAUTION: When reassembling, perform in the reverse order.

12. Remove the two rack arm fixing screws **Q**.
 Pull out the feed slide shaft.
 Remove the shaft holder fixing screw **R**.

13. When mounting the lifter bracket after replacing the pickup, shift the lifter unit lever approx. 30 mm towards the inside, then mount the lifter bracket.

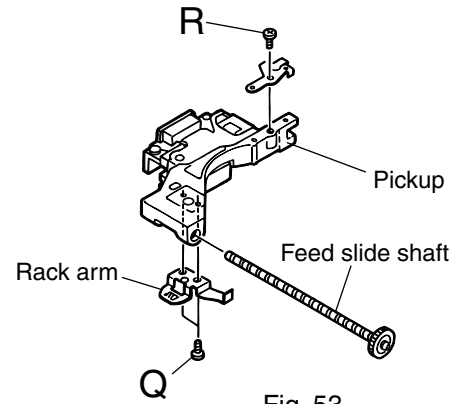


Fig. 53

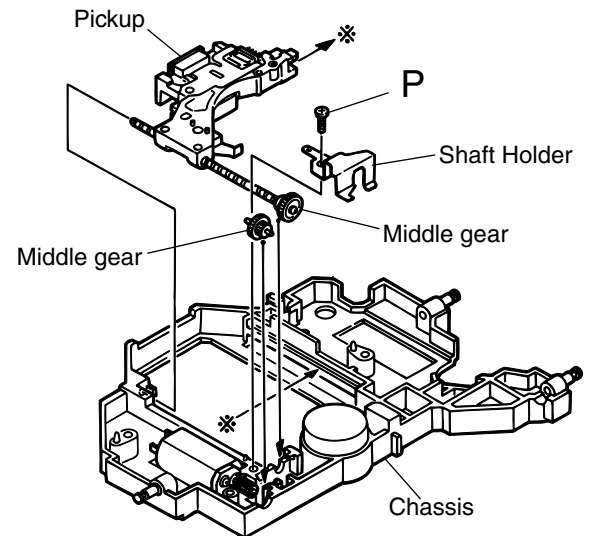


Fig. 54

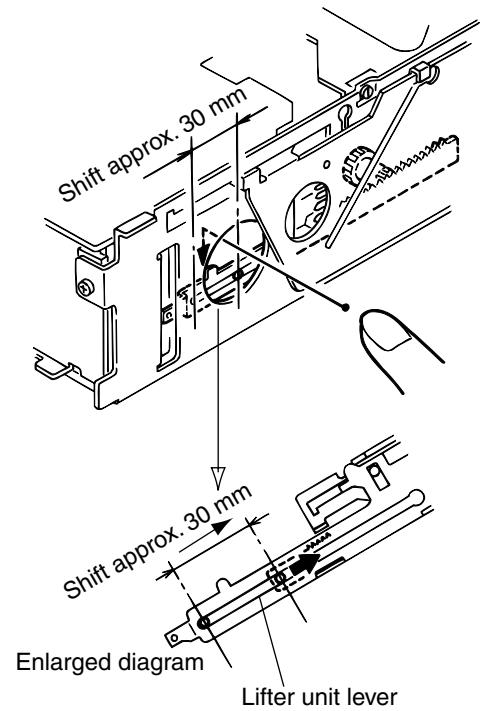
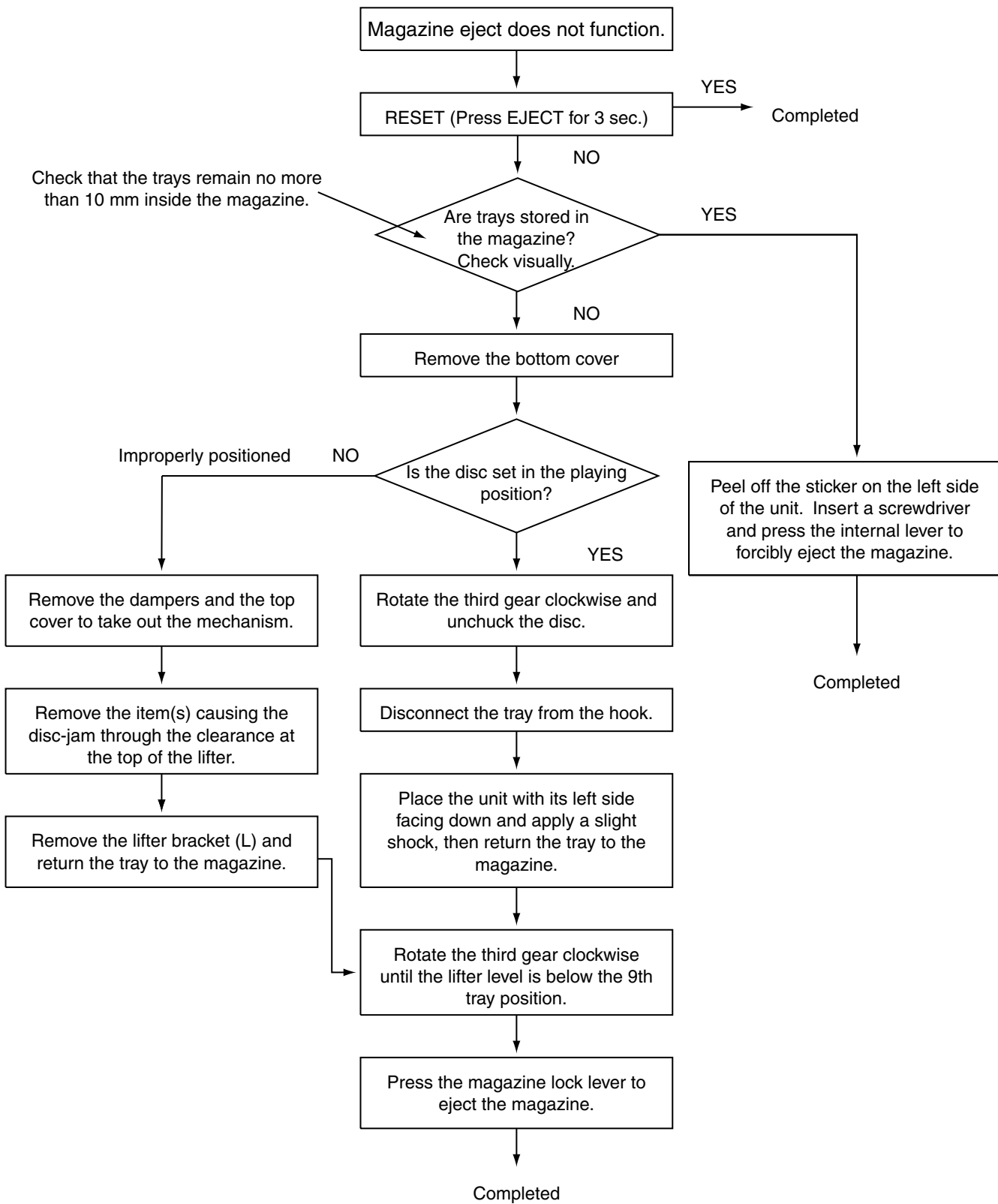


Fig. 55

Forced eject procedures



Troubleshooting

■ Servicing procedures for CH-X488 error displays

Error display	Servicing procedure
E1: Eject error	<p>The magazine cannot be ejected until S601 (magazine switch) turns off. Can the magazine be ejected? YES → 1, NO → 2</p> <p>1 The magazine switch (S601) does not turn off even though the magazine is completely ejected. 2 Check that the magazine is not engaged with the mechanism assembly.</p>
E2: Position motor error	<p>The lifter does not move up and down when exchanging or ejecting discs. After resetting, check whether or not the lifter moves. YES → 3, NO → 4</p> <p>3 If the lifter exceeds the required disc position, check the lift position input. (IC601 pin 76) If the lifter does not reach the required disc position, check the mechanism (mainly the lifter elevation mechanism)</p> <p>4 Check that voltage is present at the motor terminal. If voltage is present, check the lifter elevation mechanism. If voltage is not present, separate the motor from the circuit and check again whether or not voltage is present. If voltage is present, next check that the armature resistance of the position motor (resistance between motor terminals) is approx. 12 Ω. If the resistance is excessively low (1 - 2 Ω), the motor is defective.</p>
E3: Tray motor error	<p>Trays cannot be opened or closed when exchanging or ejecting discs. Does the tray move when changing or ejecting discs? YES → 5, NO → 6</p> <p>5 Check that TRAY OUT SW (S602) and TRAY IN SW (S603) function correctly.</p>

	S602 & IC601 pin (46)	S603 & IC601 pin (45)
When opening	H	L
When closing	L	H

6 Check that the drive voltage is applied to the motor terminal.
If the voltage is present, check the tray mechanism.
If the voltage is not present, separate the motor from the circuit and check again whether or not the voltage is present.

E4: Pick returning error	<p>Does the feed (pickup unit) return to the inner area of the disc when ejecting? YES → 7, NO → 8, 9</p> <p>7 Check the rest switch. 8 If the feed gear is rotated, check the feed transfer mechanism 9 If the feed gear is not rotated, check the motor driver and the pattern.</p>
--------------------------	---

Other errors occurring in the receiver or controller.

E8: Connection error	<p>When selecting the CD Changer mode using function keys, etc., the unit does not enter the CD changer mode, or the E8 error display appears. This signifies trouble relating to communications.</p> <p>a Check the connection cables between the CD changer and the receiver (CD changer controller). b Check the CD changer power cord and the fuse (including F901 on the PC board). c Check IC651 and its peripheral circuits.</p>
----------------------	---

★ The E1~E8 error displays described above may appear as E-1~E-8, 1E1~1E8, R-1~R-8, or RST1~RST8, depending on the product.

CH-X488 Error code

The following error codes can be displayed and stored in up to 3 memories when the KD-MX3000 is used with the controller. Refer to the KD-MX3000 service manual regarding error code indication.

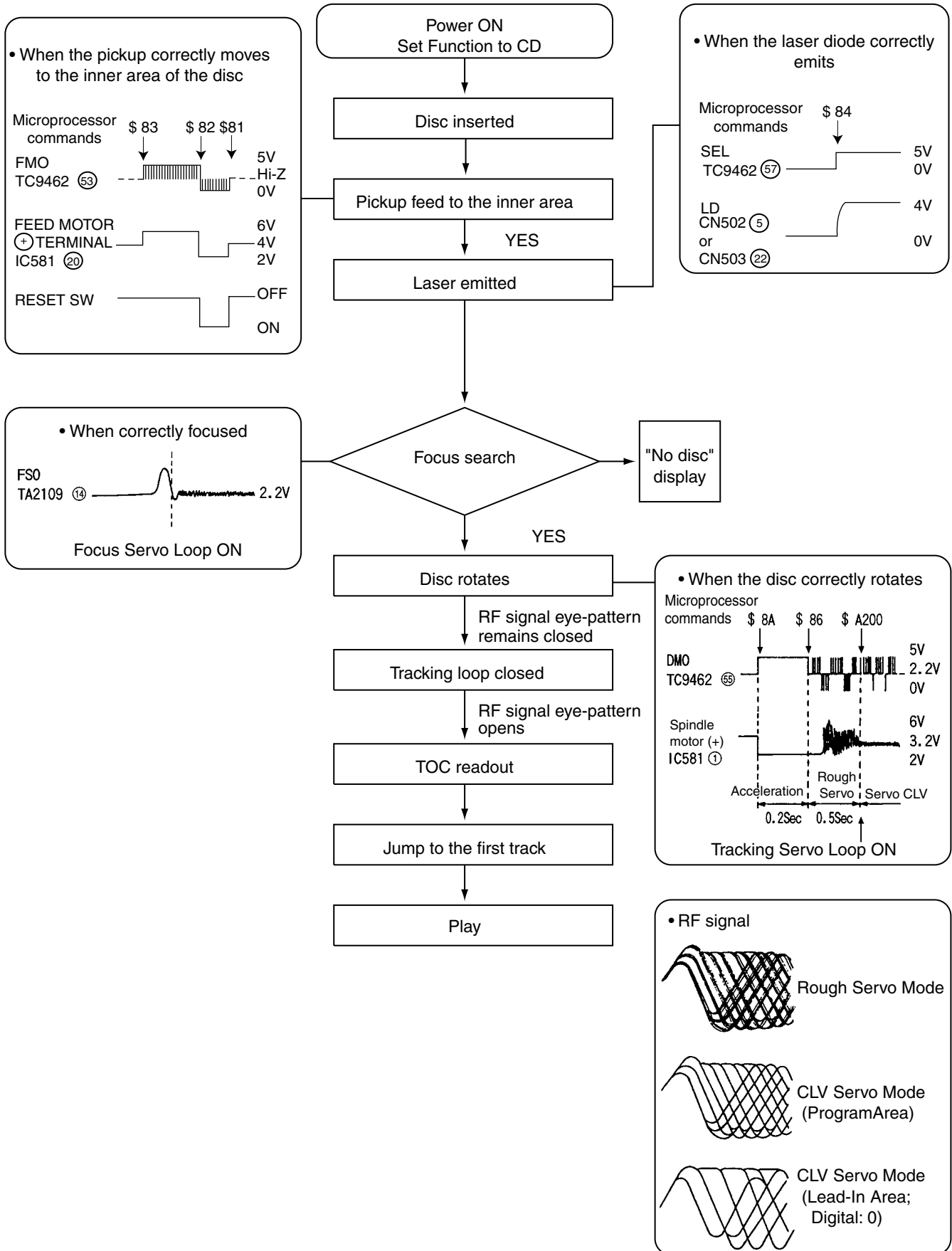
The error code indication when using the earlier controller is the same as the CH-X99, KD-MK88 and other 12CD changer models.

CH-1 error code table

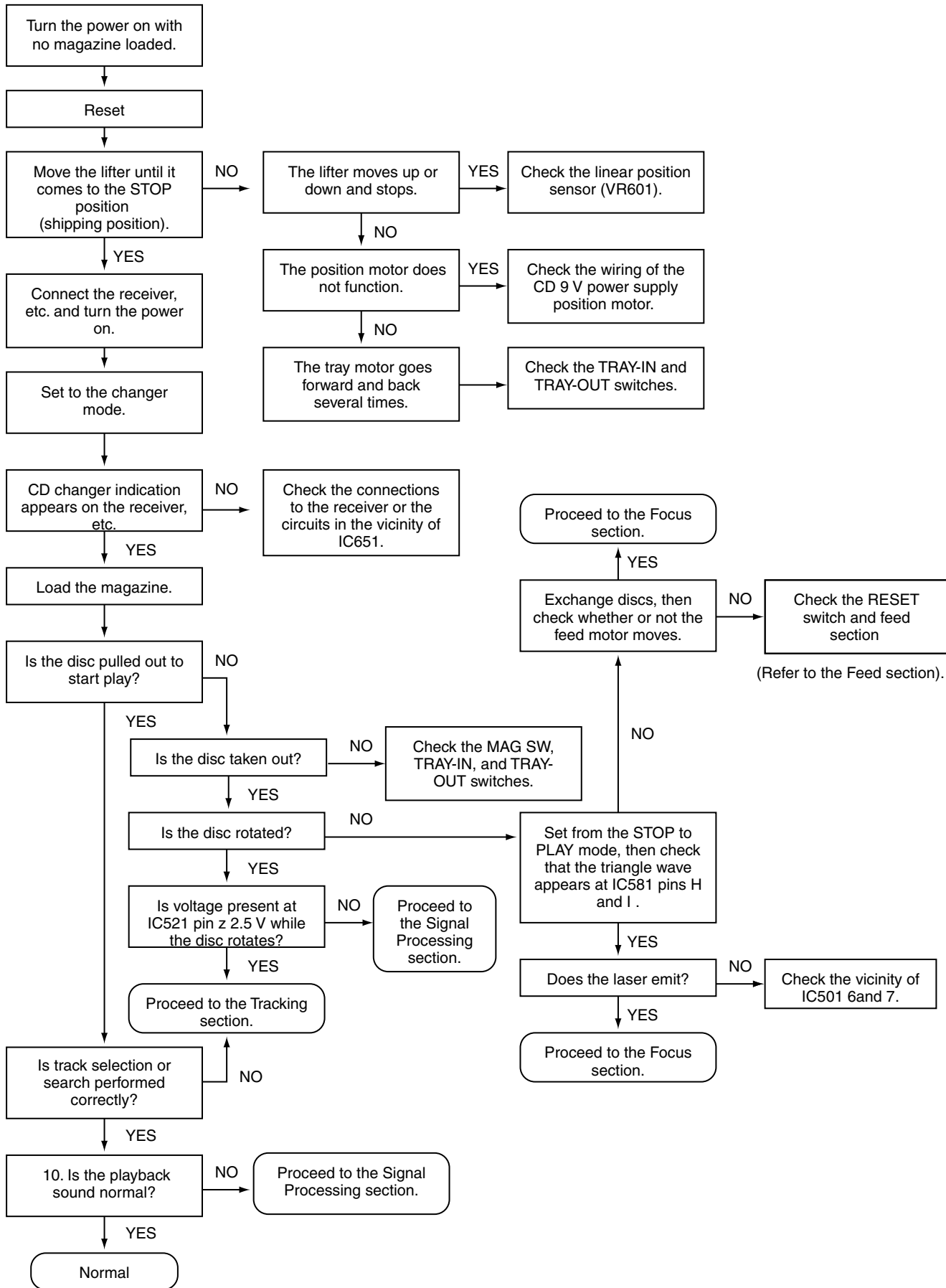
Generating condition		Description	Error code
Tray extension error	Tray-in switch time out (Tray-in switch Low, Tray-out switch High)	Tray stops part way	E1 03 00 11
	Tray-out switch time out (Tray-in switch High, Tray-out switch High)	Tray stops part way	E1 03 00 12
	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray-in switch faulty or other defect	E1 03 00 13
	MAG-in switch Low to High	Magazine removed when tray partly extends	E1 03 00 14
Tray retraction error	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray motor inoperative	E1 03 00 16
	Tray-out switch time out (Tray-in switch High, Tray-out switch High)	Tray retraction stops part way	E1 03 00 17
	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray-in switch faulty or other defect	E1 03 00 18
	MAG-in switch Low to High	Magazine removed when tray partly retracted	E1 03 00 19
Lifter raise error	Wait position time out	Position motor inoperative	E1 02 00 21
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 22
	Wait position time out	Other fault	E1 02 00 23
Lifter lower error	Wait position time out	Position motor inoperative	E1 02 00 26
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 27
	Wait position time out	Other fault	E1 02 00 28
Chuck error	Play position time out	Position motor inoperative	E1 02 00 31
	Play position time out	Position not stable in fine adjust mode	E1 02 00 32
	Play position time out	Other fault	E1 02 00 33
Unchuck error	Wait position time out	Position motor inoperative	E1 02 00 36
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 37
	Wait position time out	Other fault	E1 02 00 38
Eject error	Eject position time out	Position motor inoperative	E1 02 00 41
	Eject position time out	Eject position not attained	E1 02 00 42
	MAG in switch time out	Magazine not ejected	E1 02 00 43
Initialize error	Mechanism switch time out	Both Tray-in and Tray-out Low	E1 03 00 46
	Absolute position time out	Not stable at absolute position	E1 03 00 47

Note: The 1st error code is indicated by E1, while the 2nd and 3rd error codes are respectively indicated by E2 and E3.

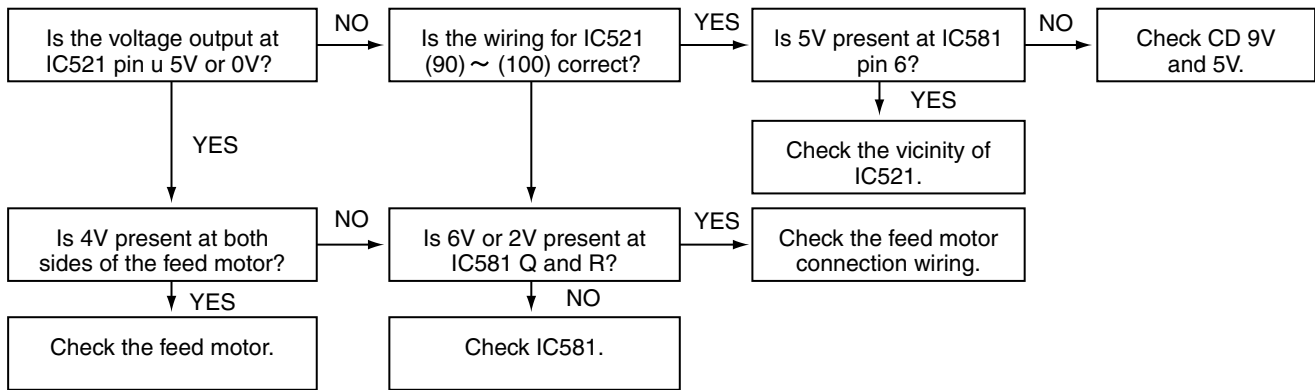
Flow of functional operation until TOC read



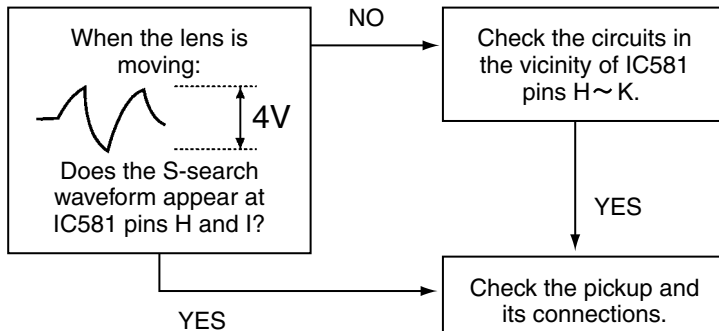
■ General section



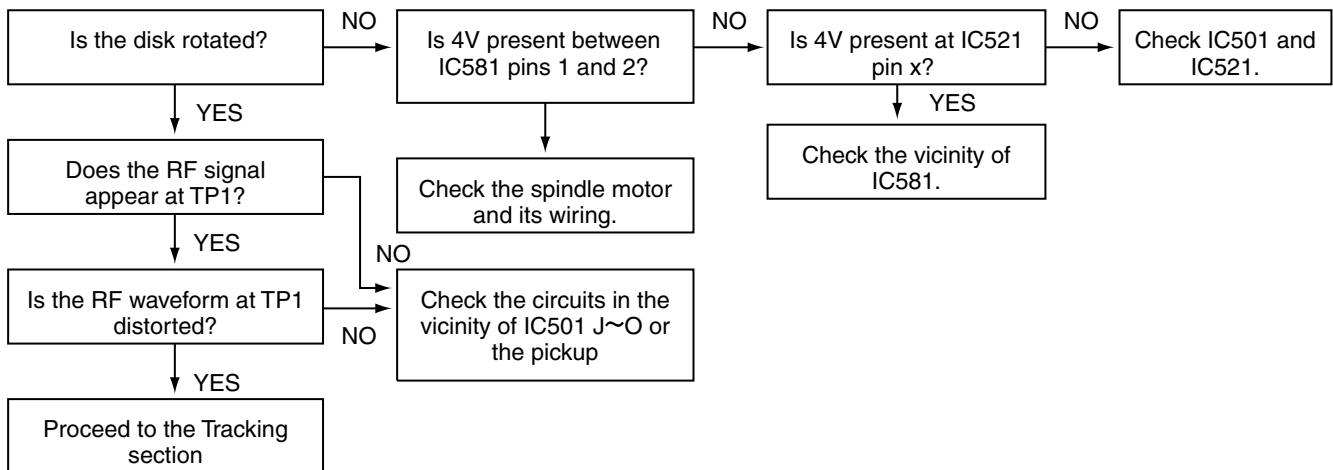
Feed section



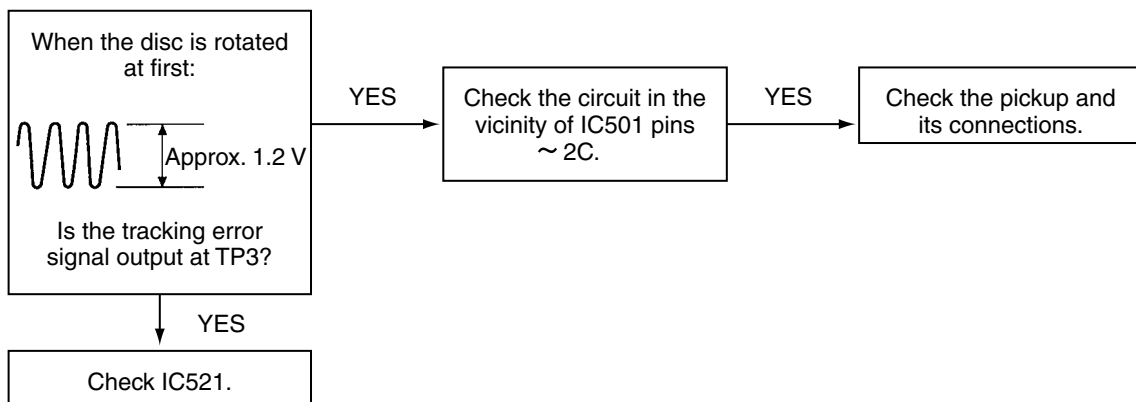
Focus section



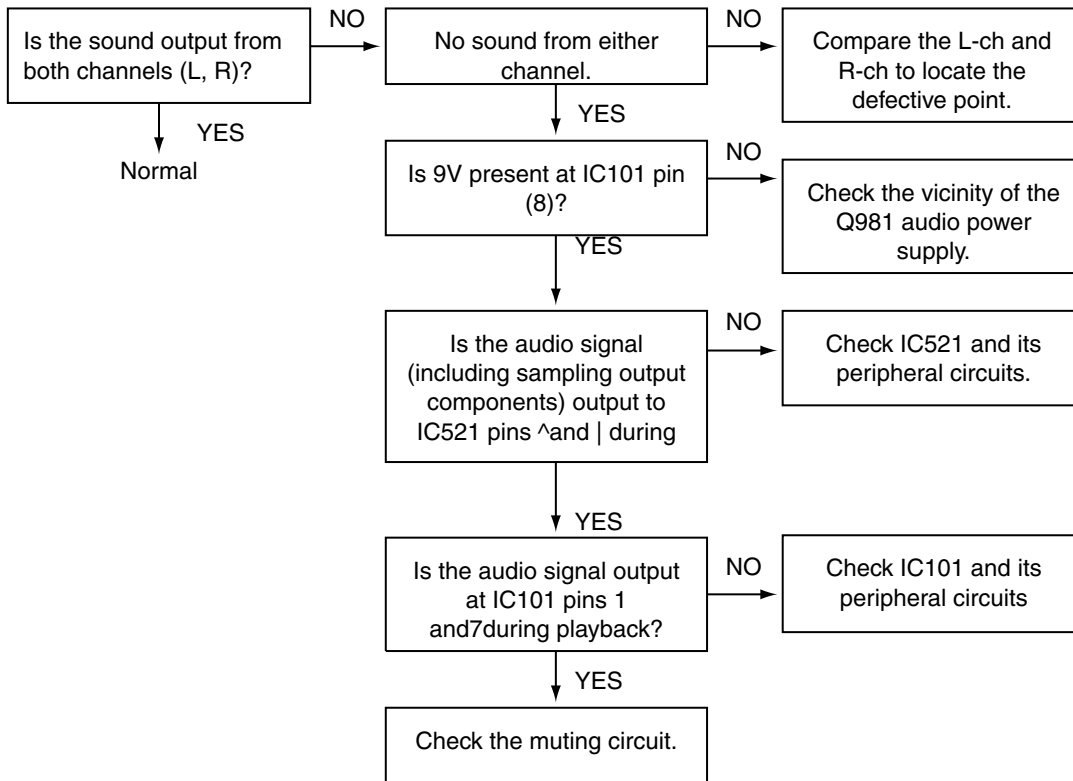
Spindle section



Tracking section



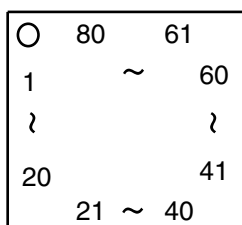
■ Signal processing section



Description of major ICs

■ UPD780058GC-291(IC601):CPU

1. Terminal layout

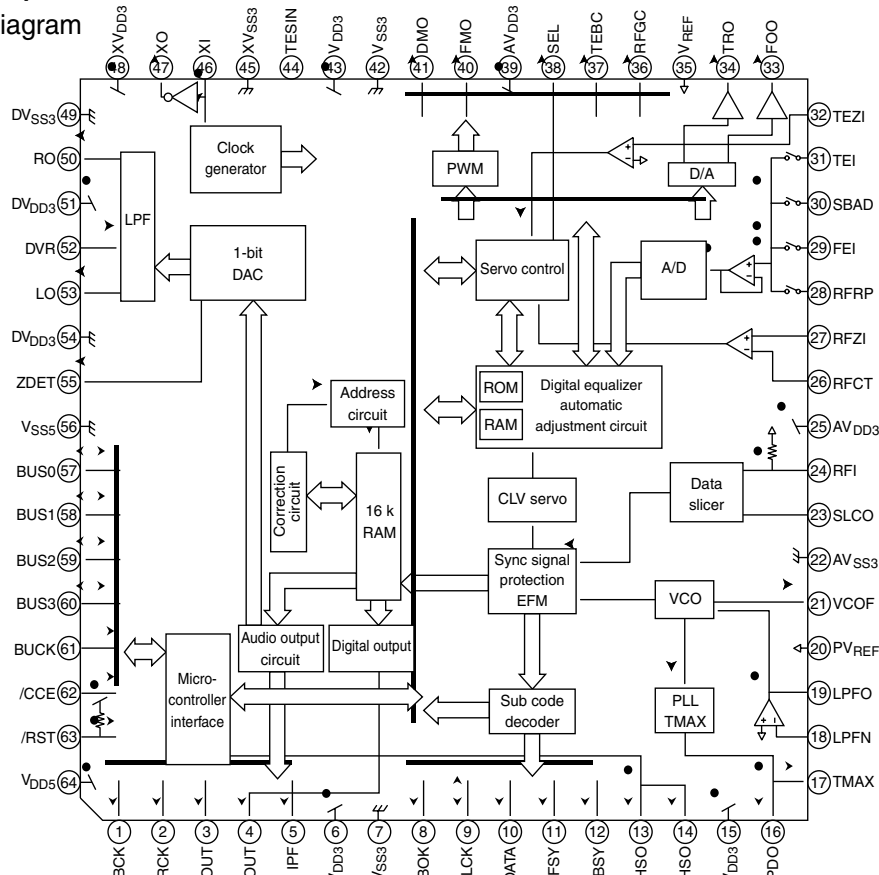


2. Pin function

Pin No.	PORT Name	I/O	Function	Pin No.	PORT Name	I/O	Function
1	LCDDA	O	LCD driver data output	41	CD RW	O	CD-RW Detect signal output
2	LCDCLK	O	LCD driver clock output	42	NC	-	Unused output port
3	LCDCE	O	LCD driver chip enable output	43	NC	-	Unused output port
4	GND	-	Connect to ground	44	MAG IN	-	Magazine switch Lo:magazine inserted
5	VREF	-	Reference voltage output	45	TRAY OUT	O	Tray extend switch Lo:extension complete
6	POSCON	O	Position control output	46	TRAY IN	O	Tray retract switch Lo:retraction complete
7	AVREF1	-	Connect to 5V	47	REST	I	Resr switch
8	NC	-	Unused output port	48	DISC SEL	O	Disc select output
9	NC	-	Unused output port	49	EMPH	O	Emphasis select output Hi:on
10	CDCHECK	I	CD check mode input. Reset only.	50	NC	-	Unused output port
11	EPROMDI	I/O	EEPROM data input	51	OE	-	Unused output port
12	EOROMDO	O	EEPROM data output. Hi durring input.	52	SHOCK SW	I	Shock proof switch signal input
13	EPROMCK	I/O	EEPROM clock input/output	53	SHOCK	O	Shock proof output
14	NC	-	Unused output port	54	NC	-	Unused output port
15	BUS I/O	O	JVC bus input/output control(Lo:input)	55	A.MUTE	-	Unused output port
16	BUS SI	I	JVC bus data input	56	MUTE PWR	O	Power supply for mute
17	BUS SO	O	JVC bus data output				
18	BUS SCK	I/O	JVC bus clock input/output	57	STAGE	I	LCD,AD key,remote inhibit selector Low:inhibit
19	NC	-	Unused output port	58	STAGE2	-	Unused output port
20	NC	-	Unused output port	59	EPROM CLR	I	EEPROM clear input Functional only durring reset
21	NC	-	Unused output port	60	RESET	I	Reset input (includes flash write in function)
22	NC	-	Unused output port	61	REMOCON	I	Remote controller signal input
23	NC	-	Unused output port	62	PWR DET	I	Memory power detect input
24	NC	-	Unused output port	63	PWR SW	I	CRTL+B detect input
25	NC	-	Unused output port	64	BUS INT	I	JVC bus com start interrupt input
26	CD ON	O	CD power control Hi:on	65	EJECT	I	Eject key input
27	PWR CONT	O	Power supply control output Hi:on	66	NC	-	Unused output port
28	POSMO+	O	Position motor control output	67	GND	-	Connect to ground
29	POSMO-	O	Position motor control output	68	VDD0	-	Conneto to VDD
30	TRAYMO+	O	Tray motor control output	69	X2	O	Oscillater (4.19430 MHz)
31	TRAYMO-	O	Tray motor control output	70	X1	I	Oscillater (4.19430 MHz)
32	BUCK	-	CD LSI data clock	71	GND	-	Connect to ground
33	GND	-	Connect to ground	72	XT2	O	Open
34	LSI RESET	O	CD LSI reset	73	XT1	I	Connect to VDD
35	CCE	I/O	CD LSI chip enable	74	VDD	-	Connect to 5V
36	BUS0	I/O	CD LSI data 0(open drain)	75	AVREF0	-	Connect to ADCONT
37	BUS1	I/O	CD LSI data 1 (open drain)	76	L SENSOR	I	Linear sensor input(8 bit A/D input)
38	BUS2	I/O	CD LSI data 2 (open drain)	77	KEY1	I	Key input 1 (8 bit A/D input)
39	BUS3	O	CD LSI data 3 (open drain)	78	KEY2	I	Key input 2 (8 bit A/D input)
40	NC	-	Unused output port	79	KEY3	I	Key input 3 (8 bit A/D input)
				80	KEY0	I	Key input 0 (8 bit A.D input)

■ TC9490FA (IC521) : DSP

1. Pin layout & Block diagram



2. Pin function (1/2)

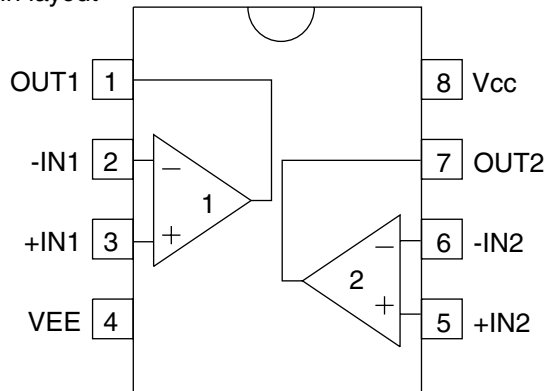
No.	Symbol	I/O	Function
1	BCK	O	Bit clock output pin. 32fs, 48fs, or 64fs selectable by command.
2	LRCK	O	L/R channel clock output pin. "L" for L channel and "H" for R channel.
3	AOUT	O	Audio data output pin. MSB-first or LSB-first selected by command.
4	DOUT	O	Digital data output pin. Outputs up to double-speed playback.
5	IPF	O	Correction flog output pin.
6	VDD3	-	Digital 3.3V power supply voltage pin.
7	VSS3	-	Digital GND pin.
8	SBOK	O	Subcode Q data CRCC result output pin. "H" level when result is OK.
9	CLCK	I/O	Sub-code P-W data read clock I/O pin. I/O polarity selectable by command.
10	DATA	O	Sub-code P-W data output pin.
11	SFSY	O	Playback frames sync signal output pin.
12	SBSY	O	Sub-code block sync output pin.
13	/HSO	O	Playback speed mode flag output pin.
14	/UHSO	O	Playback speed mode flag output pin.
15	PVDD3	-	PLL-only 3.3V power supply voltage pin.
16	PDO	O	EFM and PLCK phase difference signal output pin.
17	TMAX	O	TMAX detection result output pin.
18	LPFN	I	Inverted input pin for PLL RF amp.
19	LPFO	O	Output pin for PLL LPF amp.
20	PVREF	-	PLL-only VREF pin.
21	VCOF	O	VCO filter pin.
22	AVSS3	-	Analog GND pin.
23	SLCO	O	DAC output pin for data slice level generation.
24	RFI	I	RF signal input pin.
25	AVSS3	-	Analog 3.3V power supply voltage pin.

2. Pin function (2/2)

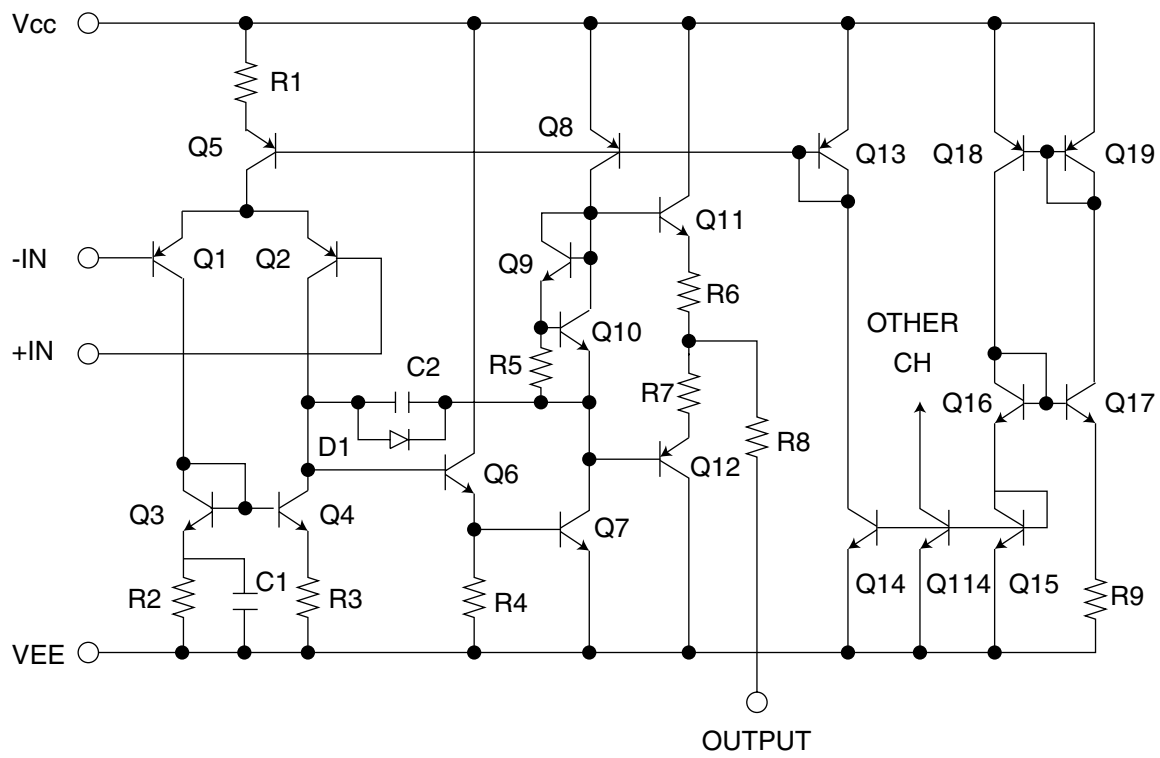
No.	Symbol	I/O	Function
26	RFCT	I	RFRP signal center level input pin.
27	RFZI	I	RFRP signal zero-cross input pin.
28	RFRP	I	RF ripple signal input pin.
29	FEI	I	Focus error signal input pin.
30	SBADTEI	I	Sub-beam adder signal input pin.
31	TEI	I	Tracking error input pin. Inputs when tracking servo is on.
32	TEZI	I	Tracking error signal zero-cross input pin.
33	FOO	O	Focus equalizer output pin.
34	TRO	O	Tracking equalizer output pin.
35	VREF	-	Analog reference power supply voltage pin.
36	RFGC	O	RF amplitude adjustment control signal output pin.
37	TEBC	O	Tracking balance control signal output pin.
38	SEL	O	APC circuit ON/OFF signal output pin.
39	AVDD3	-	Analog 3.3V power supply voltage pin.
40	FMO	O	Feed equalizer output pin.
41	DMO	O	Disc equalizer output pin.
42	VSS3	-	Digital GND pin.
43	VDD3	-	Digital 3.3V power supply voltage pin.
44	TESIN	I	Test input pin.
45	XVSS3	-	System clock oscillator GND pin.
46	XI	I	System clock oscillator input pin.
47	XO	O	System clock oscillator output pin.
48	XVDD3	-	System clock oscillator 3.3V power supply voltage pin.
49	DVSS3	-	DA converter GND pin.
50	RO	O	R-channel data forward output pin.
51	DVDD3	-	DA converter 3.3V power supply pin.
52	DVR	-	Reference voltage pin.
53	LO	O	L-channel data forward output pin.
54	DVSS3	-	DC converter GND pin.
55	ZDET	O	1 bit DA converter zero data detection flag output pin.
56	VSS5	-	Microcontroller interface GND pin.
57	BUS0	I/O	Microcontroller interface data I/O pins.
58	BUS1	I/O	Microcontroller interface data I/O pins.
59	BUS2	I/O	Microcontroller interface data I/O pins.
60	BUS3	I/O	Microcontroller interface data I/O pins.
61	BUCK	I	Microcontroller interface clock input pin.
62	/CCE	I	Microcontroller interface chip enable signal input pin.
63	/RST	I	Reset signal input pin.
64	VDD5	-	Microcontroller interface 5V power supply pin.

■ **BA15218F-XE (IC101) : Dual operation amplifier**

1. Pin layout

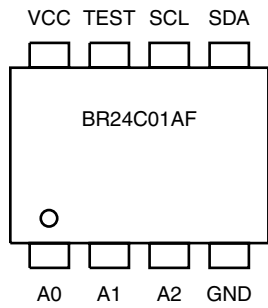


2. Block diagram

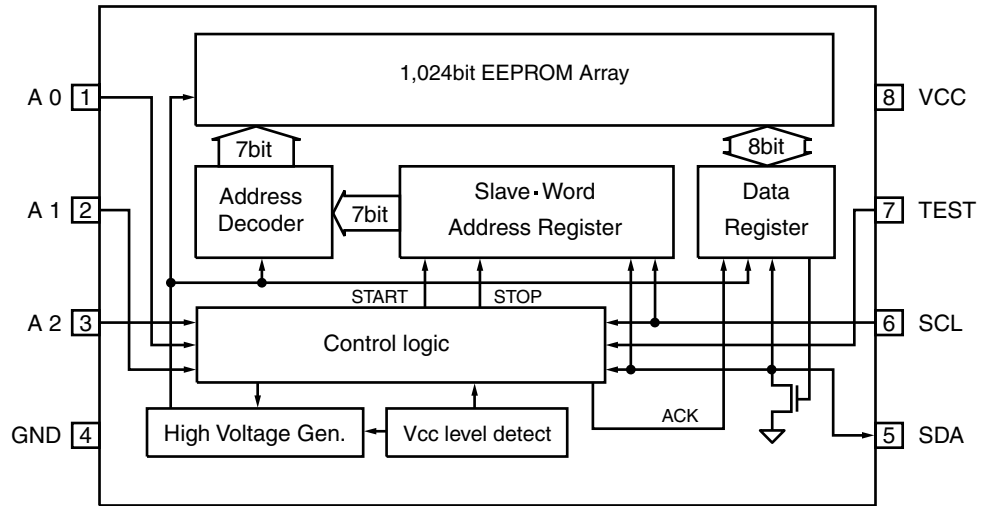


■ BR24C01AF-X-W(IC604):EP ROM

1.Terminal Layout



2.Block Diagram



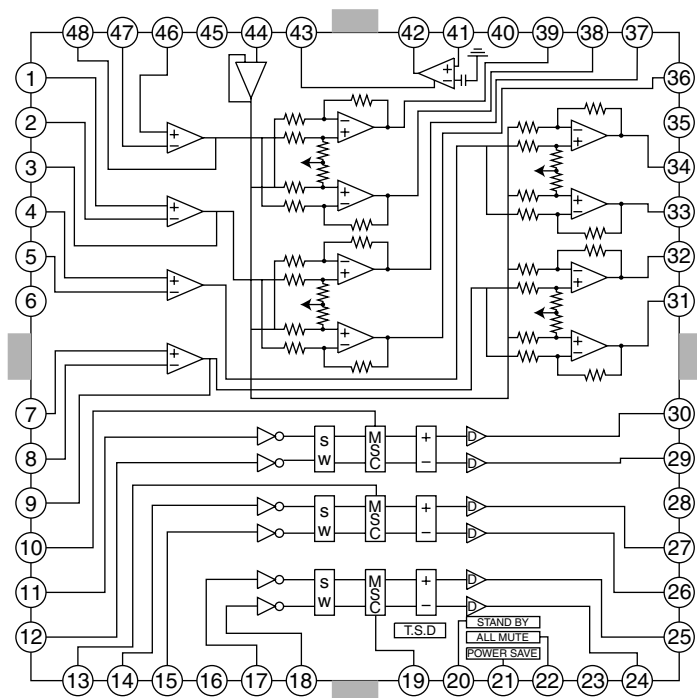
3.Pin Function

Symbol	I/O	Function
VCC	-	Power Supply
GND	-	Ground(OV)
A1·A2·A3	I	Slaves Address Set(Pin)
SCL	I	Serial Clock Input
SDA	I/O	Slaves and Word Address,Serial Data Input, Serial Data Output(*)
TEST	I	Ground

(*)An open drain output requires a pull-up resistor.

■ FAN8037 (IC581) : CD driver

1. Pin layout & Block diagram

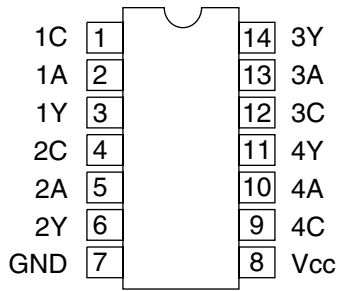


2. Pin function

Pin No.	Symbol	I/O	Function	Pin No.	Symbol	I/O	Function
1	IN2+	I	CH2 op-amp input(+)	25	DO7+	O	CH7 drive output(+)
2	IN2-	I	CH2 op-amp input(-)	26	DO6-	O	CH6 drive output(-)
3	OUT2	O	CH2 op-amp output	27	DO6+	O	CH6 drive output(+)
4	IN3+	I	CH3 op-amp input(+)	28	PGND2	-	Power ground2
5	IN3-	I	CH3 op-amp input(-)	29	DO5-	O	CH5 drive output(-)
6	OUT3	O	CH3 op-amp output	30	DO5+	O	CH5 drive output(+)
7	IN4+	I	CH4 op-amp input(+)	31	DO4-	O	CH4 drive output(-)
8	IN4-	I	CH4 op-amp input(-)	32	DO4+	O	CH4 drive output(+)
9	OUT4	O	CH4 op-amp output(+)	33	DO3-	O	CH3 drive output(-)
10	CTL1	I	CH5 motor speed control	34	DO3+	O	CH3 drive output(+)
11	FWD1	I	CH5 forward input	35	PGND1	-	Power ground1
12	REV1	I	CH5 reverse input	36	DO2-	O	CH2 drive output(-)
13	CTL2	I	CH6 motor speed control	37	DO2+	O	CH2 drive output(+)
14	FWD2	I	CH6 forward input	38	DO1-	O	CH1 drive output(-)
15	REV2	I	CH6 reverse input	39	DO1+	O	CH1 drive output(+)
16	SGND	-	Signal ground	40	PVCC1	-	Power supply voltage
17	FWD3	I	CH7 forward input	41	REGOX	I	Regulator feedback input
18	REV3	I	CH7 reverse input	42	REGX	O	Regulator output
19	CTL3	I	CH7 motor speed control	43	RESX	I	Regulator reset input
20	SB	I	Stand by	44	VREF	I	Bias voltage input
21	PS	I	Power save	45	SVCC	-	Signal supply voltage
22	MUTE	I	All mute	46	IN1+	I	CH1 op-amp input(+)
23	PVCC2	-	Power supply voltage	47	IN1-	I	CH1 op-amp input(-)
24	DO7-	O	CH7 drive output(-)	48	OUT1	O	CH1 op-amp output

■ HD74HC126FP-X (IC651) : Buffer

1. Terminal layout

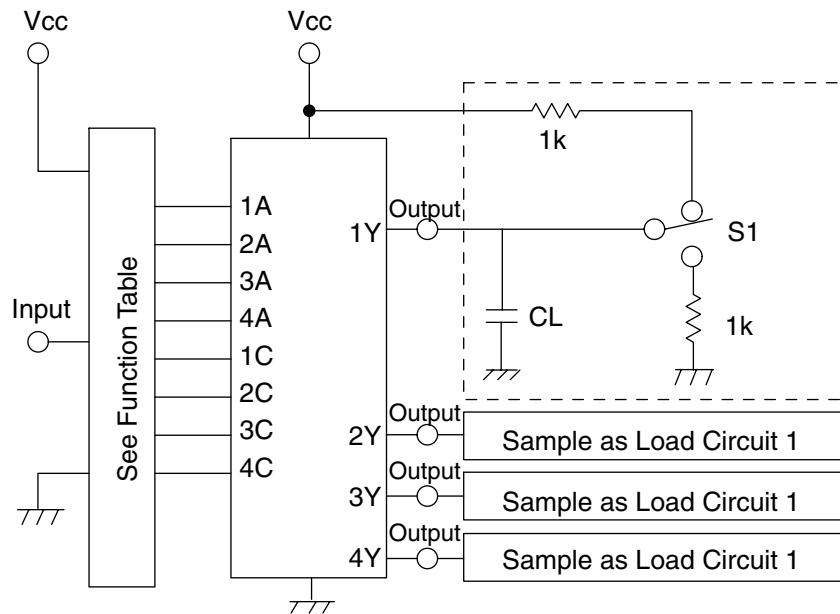


3. Pin function

Input		Output
C	A	Y
L	X	Z
H	L	H
H	H	L

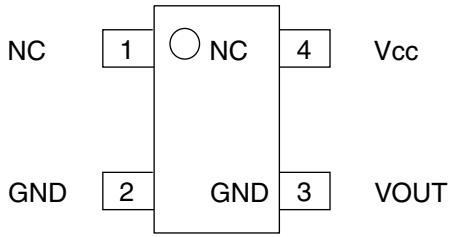
Note: H : High
 L : Low
 X : H and L
 Z : H.L.X

2. Block diagram

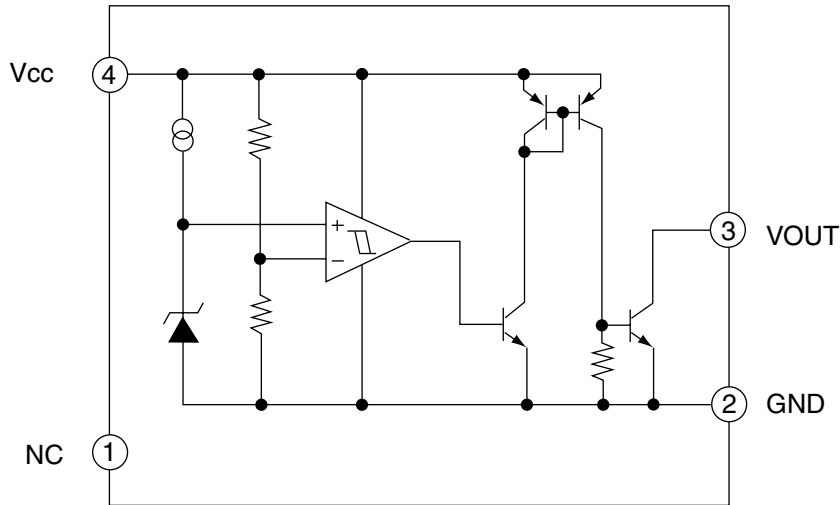


■ IC-PST9333U-X (IC602) : Reset IC

1. Pin layout



2. Block diagram

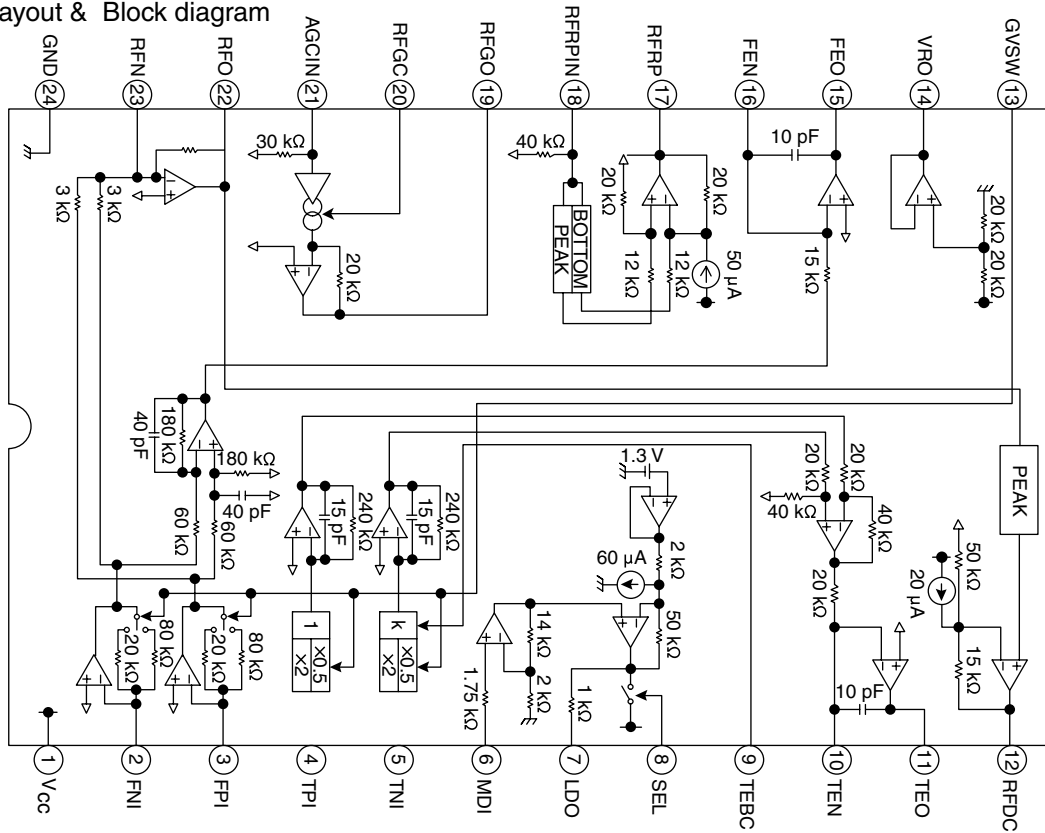


3. Pin function

Pin No.	Symbol	Function
1	NC	Non connect
2	GND	GND terminal
3	VOUT	Reset signal output terminal
4	Vcc	Power supply terminal

■ TA2147F-X (IC501) : RF amp

1. Pin layout & Block diagram



2. Pin function

Pin No.	Symbol	I/O	Function
1	Vcc	-	3.3V power supply pin
2	FNI	I	Main-beam amp input pin
3	FPI	I	Main-beam amp input pin
4	TPI	I	Sub-beam amp input pin
5	TNI	I	Sub-beam amp input pin
6	MDI	I	Monitor photo diode amp input pin
7	LDO	O	Laser diode amp output pin
8	SEL	I	APC circuit ON/OFF control signal, laser diode control signal input or bottom/peak detection frequency change pin
9	TEBC	I	Tracking error balance adjustment signal input pin
10	TEN	I	Tracking error signal generation amp negative-phase input pin
11	TEO	O	Tracking error signal generation amp output pin
12	RFDC	O	RF signal peak detection output pin
13	GVSW	I	AGC/FE/TE amp gain change pin
14	VRO	O	Reference voltage output pin
15	FEO	O	Focus error signal generation amp output pin
16	FEN	I	Focus error signal generation amp negative-phase input pin
17	RFRP	O	Signal amp output pin for track count
18	RFRPIN	I	Signal generation amp input pin for track count
19	RFGO	O	RF signal amplitude adjustment amp output pin
20	RFGC	I	RF amplitude adjustment control signal input pin
21	AGCIN	I	RF signal amplitude adjustment amp input pin
22	RFO	O	RF signal generation amp output pin
23	RFN	I	RF signal generation amp input pin
24	GND	-	GND pin



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