MITSUBISHI AUDIO SYSTEMS

SERVICE MANUAL
TURNTABLE
MODEL DP-210

CONTENTS

MITSUBISHI ELECTRIC CORPORATION

SPECIFICATIONS

1. PHONO MOTOR SECTION

Drive	4-pole synchronous motor, belt drive
Platter	
Diameter	303 mm (11-15/16")
Weight	0.65 kg (2-1/5 lb)
Material	Aluminium diecast
Platter speed	33-1/3, 45 rpm
Wow and flutter	0.09% (W rms), ±0.15% (Wp-p)
Signal to noise ratio	
IEC-B	50 dB
DIN-B	65 dB

2. TONE ARM SECTION

Type	S-type universal static balance
Overall length	290 mm (11-7/16")
Effective length	215 mm (8-1/2")
Overhang	11 mm (7/16")
Tracking error (at 30 cm LP)	+3°20' ∿ -2°36'
Offset angle	21°
Possible cartridge weight	4 g to 10 g
Tracking force adjustment	0 to 3 g (0.1 g step)

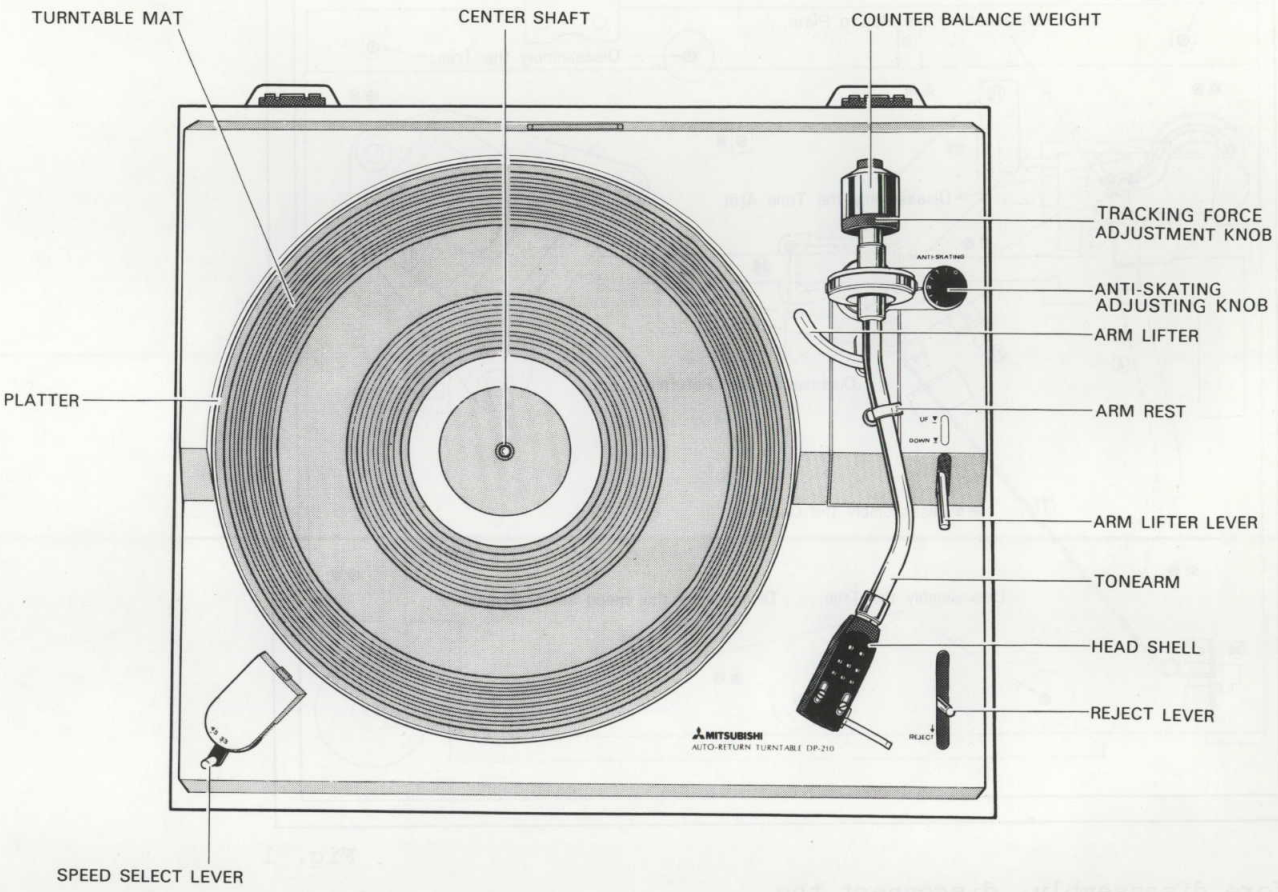
3. CARTRIDGE

Type	Dual magnet (VM type)
Stylus	0.6 mil diamond
Recommended tracking force	2 G
Frequency response	20 Hz to 20 kHz
Output level (at 1 kHz, 5 cm/sec. mono)	3 mV
Channel separation (at 1 kHz)	20 dB

4. GENERAL

Power consumption	10.5 W
Dimensions (W x H x D)	440 x 155 x 345 mm (17-5/16 x 6-1/8 x 13-3/8")
Weight	7.2 kg (15-4/5 lb)

NOMENCLATURE



DISASSEMBLY INSTRUCTIONS

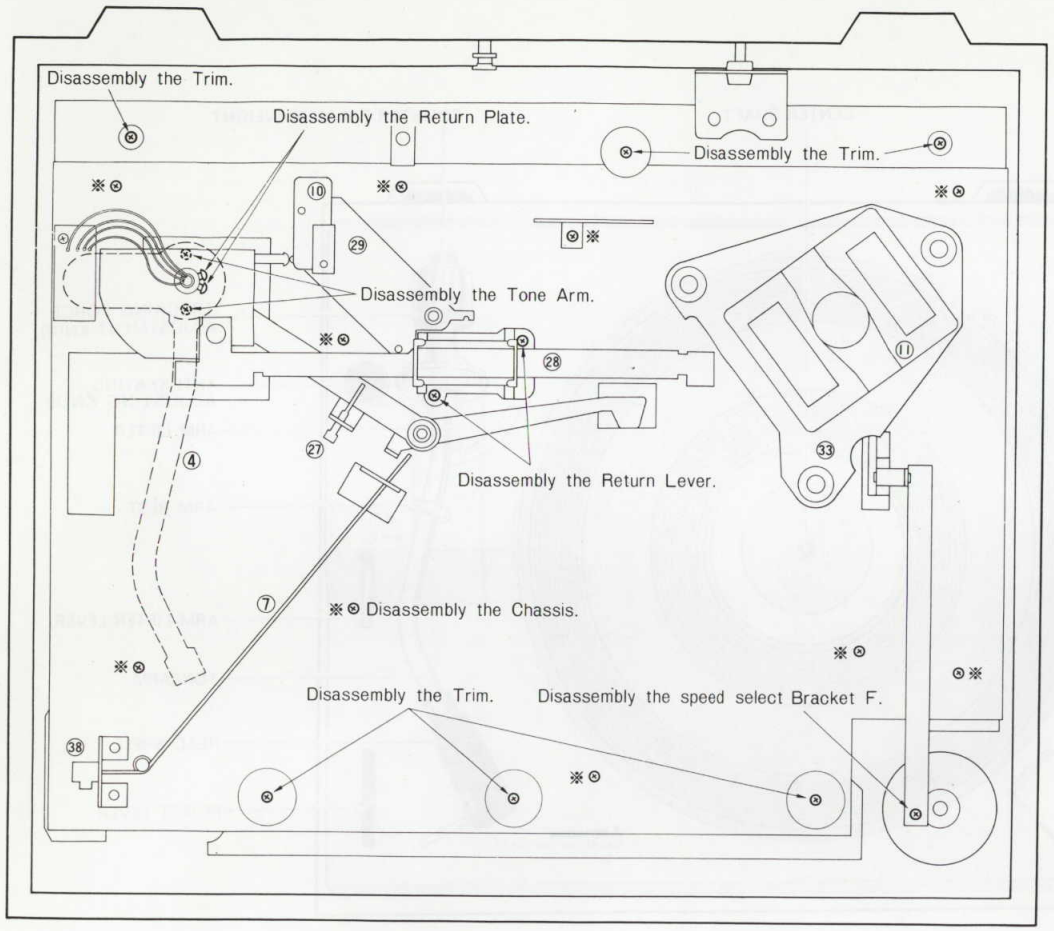


Fig. 1

- Before disassembly, disconnect the power plug and output cords. Remove the chassis from the base as follows:

1. Fasten Tone Arm (4) to the Arm Rest (5).
2. Remove Turntable Mat (20) and remove the Belt from the Pulley (13).
3. Remove Turntable Platter (12).
4. Close Dust Cover (16) and turn the set upside down.
5. Remove board bottom (48).
6. Remove Tone Arm (Figure 1).
   (1) Unsolder tone arm output leads.
   (2) Remove Return Lever port (28-1).
   (3) Remove Return Plate (36).
7. Remove Speed Select Bracket F (37).
8. Remove trim screws.
9. Remove chassis screws marked with ※ in Fig. 1.

Now completely disassemble the chassis base and Cabinet.

REASSEMBLY INSTRUCTIONS

- To reassemble, follow DISASSEMBLY INSTRUCTIONS in reverse.

LUBRICATION

- The motor uses oilless bearings, thus lubrication once a year is sufficient. Apply oil as noted in the following steps:

1. Remove the Turntable Mat and remove the Belt from the Motor Pulley.
2. Remove the Turntable Platter.
3. Apply 2 or 3 drops of high-grade oil to the bearing (under the Pulley). (Figure 2)

Note:
Do not allow oil to get on the Belt or the Pulley. If oil does touch the Belt or Pulley, clean it off with a clean soft cloth dipped in alcohol.
Do not apply oil to the Center Spindle (3).

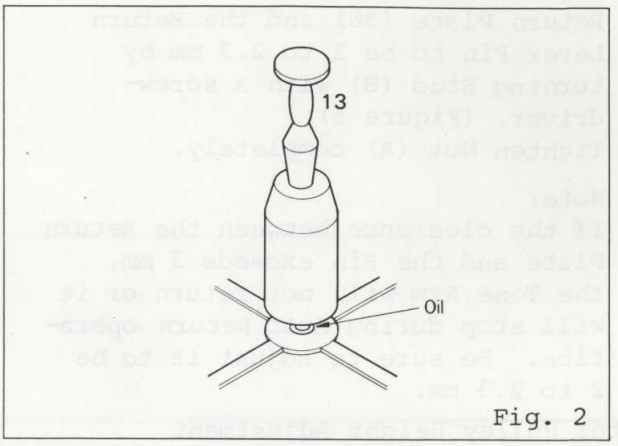


Fig. 2

ADJUSTMENTS

- Stylus Tip Height Adjustment
Adjust the stylus tip height during record playing (when Tone Arm is down).

1. Remove the Turntable Mat.
2. Loosen arm lifter screws (19) and adjust the stylus tip height to the same height as that of the platter surface. (Figure 3)

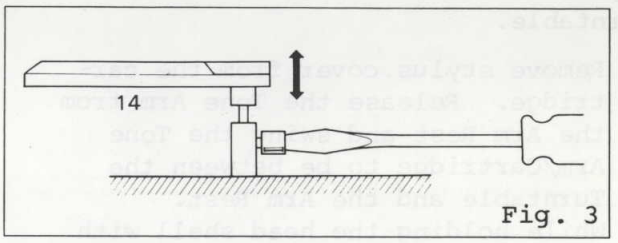


Fig. 3

- Return Adjustment

I. If the Tone Arm returns before or after the run-out grooves, adjust it as follows:

1. If the Tone Arm returns before the run-out grooves, rotate the Return Position Adjusting Screw (27-3) clockwise. (Figure 4)
2. If the Tone Arm does not return with normal run-out grooves, rotate the Return Position Adjusting Screw (27-3) counterclockwise. (Figure 4)

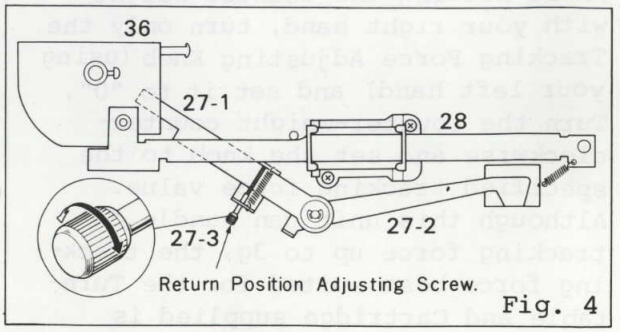


Fig. 4

II. If the Tone Arm stops during Auto Return operation or does not return completely to the arm rest, adjust it as follows:

1. Fasten the Tone Arm to the Arm Rest.
2. Loosen Nut (A) shown in Fig. 5. Adjust the clearance between the Return Plate (36) and the Return Lever Pin to be 2 to 2.3 mm by turning Stud (B) with a screwdriver. (Figure 5)
3. Tighten Nut (A) completely.

Note:
If the clearance between the Return Plate and the Pin exceeds 3 mm, the Tone Arm will not return or it will stop during Auto Return operation. Be sure to adjust it to be 2 to 2.3 mm.

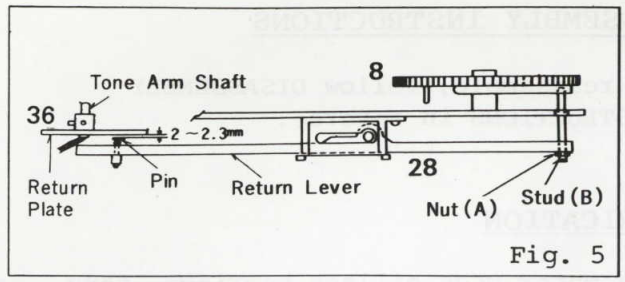


Fig. 5

- Motor Pulley Height Adjustment
Set the Speed Select Lever to 33 rpm and adjust the height of the Motor Pulley. Then align the center of the 33 rpm portion of the Motor Pulley with the center of the Belt Guide Lever (2). (Figure 6)

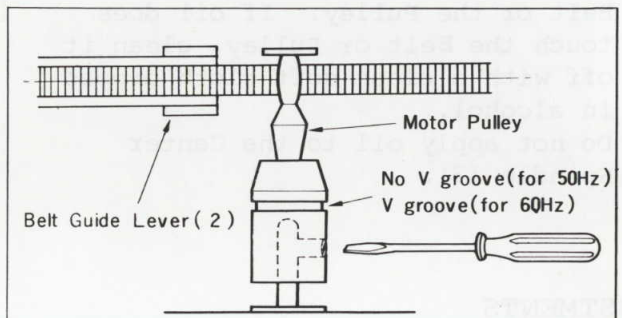


Fig. 6

- Tracking Force Adjustment
During adjustment, be extremely careful not to allow the tip of the stylus to touch the Rubber Pad or Turntable.

1. Remove stylus cover from the cartridge. Release the Tone Arm from the Arm Rest and swing the Tone Arm/Cartridge to be between the Turntable and the Arm Rest.
2. While holding the head shell with your left hand, turn the counterweight using your right hand and balance the Tone Arm to a horizontal position. Then, clamp the Tone Arm in the Arm Rest.
3. While holding the counter-weight with your right hand, turn only the Tracking Force Adjusting Knob (using your left hand) and set it to "0".
4. Turn the counter-weight counterclockwise and set the knob to the specified tracking force value. Although this unit can handle a tracking force up to 3g, the tracking force best suited for the Turntable and Cartridge supplied is 2.5g for USA models and 1.5g for European models.

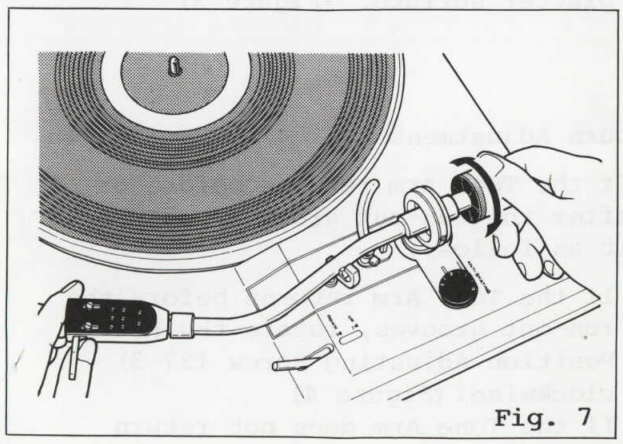


Fig. 7

PARTS REPLACEMENT

- Tone Arm

The Tone Arm assembly is shown in Fig. 8 (with anti-skating device). Remove Tone Arm assembly as noted under step 6 under "DISASSEMBLY INSTRUCTIONS".

Note: Be sure to adjust the following after replacing a Tone Arm.

1. Power ON/OFF Adjustment
   Microswitch lever must be completely pushed in when the Tone Arm is fastened to the Arm Rest. (The microswitch is off.) (Figure 9)
2. Adjustment of the clearance between the Return Plate and the Return Lever Pin.
   See Item II under "Auto Return Adjustment". (Figure 5)

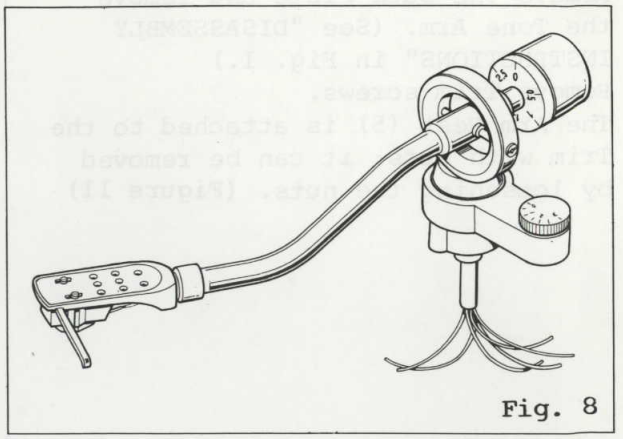


Fig. 8

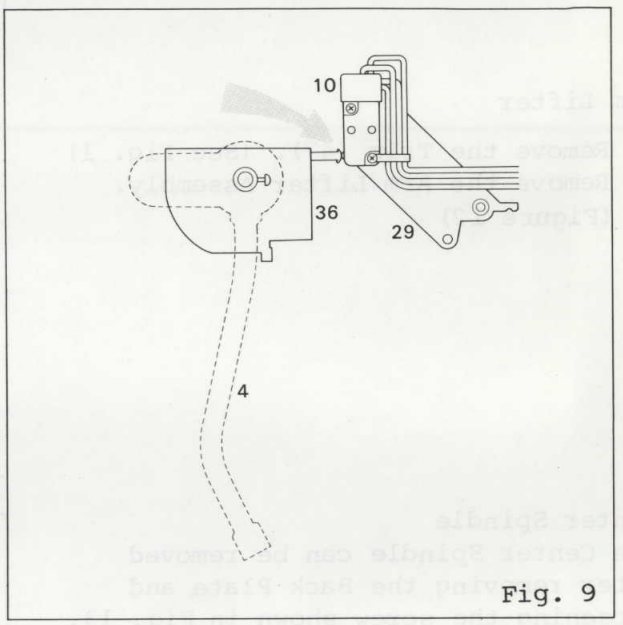


Fig. 9

- Motor

1. Unsolder motor leads.
2. Remove Motor Base (33).
3. Remove the Motor from the Motor Base. (Figure 10)
   To reassemble, reverse the above.

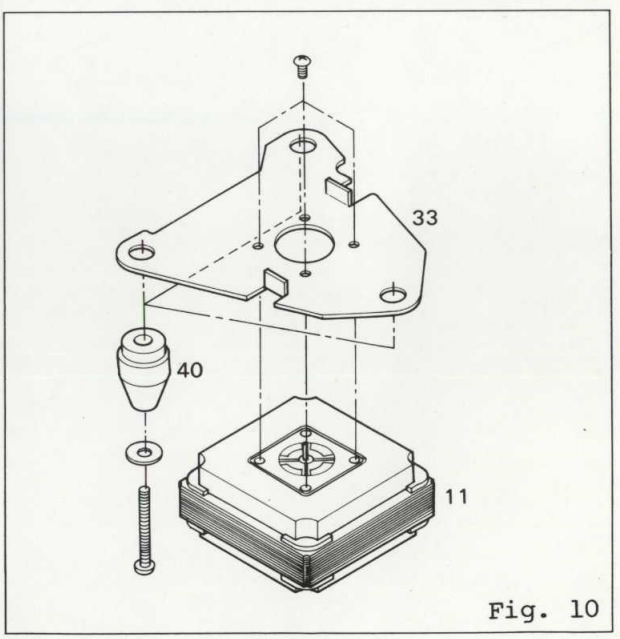


Fig. 10

- Trim (large) and Arm Rest

1. Remove the Back Plate and remove the Tone Arm. (See "DISASSEMBLY INSTRUCTIONS" in Fig. 1.)
2. Remove Trim screws.
3. The Arm Rest (5) is attached to the Trim with nuts: it can be removed by loosening the nuts. (Figure 11)

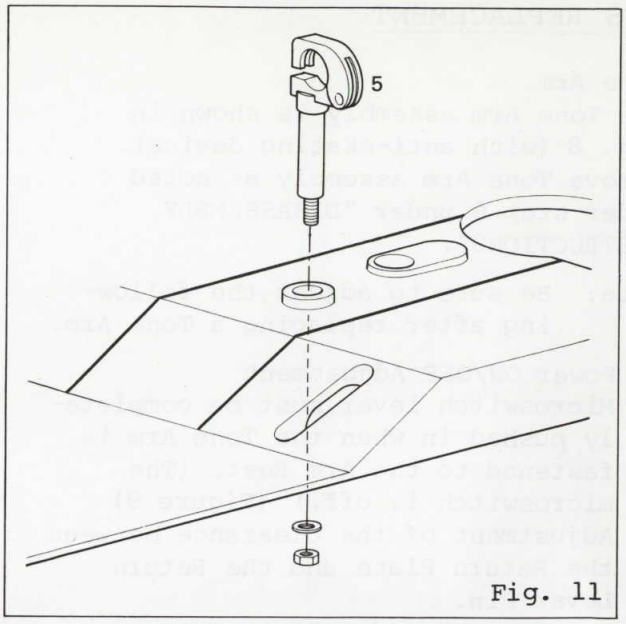


Fig. 11

- Arm Lifter

1. Remove the Trim (47). (See Fig. 1)
2. Remove the Arm Lifter Assembly. (Figure 12)

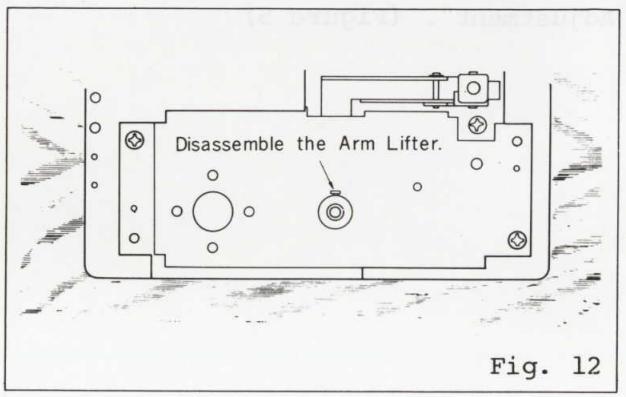


Fig. 12

- Center Spindle

The Center Spindle can be removed after removing the Back Plate and loosening the screw shown in Fig. 13.

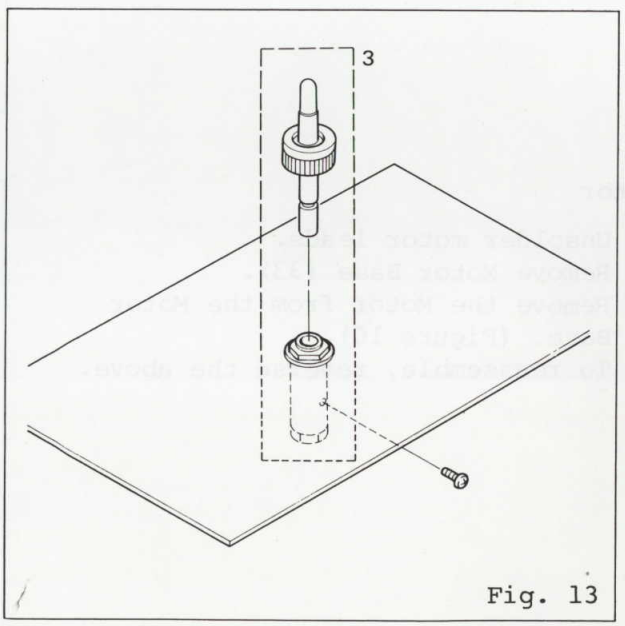


Fig. 13

TROUBLESHOOTING

1. The Tone Arm will not automatically return.
   Remove the Turntable Platter and check to see if the Pinion Gear and the pawl of the ratchet are broken.

   - No: Rotate the Return Adjusting Screw counterclockwise. (Figure 4)
   - Yes: Replace the Ratchet or the Pinion Gear (center spindle). (Figure 13)

2. The Tone Arm returns some seconds after the run-out grooves are reached.
   Rotate the Return Adjusting Screw clockwise. (Figure 4)

3. The Tone Arm returns before the run-out grooves are reached.
   Rotate the Return Adjusting Screw counterclockwise. (Figure 4)

4. The Turntable Platter will not rotate after the Tone Arm is removed from the Arm Rest.
   Check to see that the power plug is securely connected.

   - No: Connect the plug.
   - Yes: Check to see that the Belt is in place on the Pulley.
     - No: Replace the Belt.
     - Yes: Check the voltage being supplied to the Motor.
       - Yes: Motor defective → Replace the motor. (Figure 10)
       - No: Check the wiring (wrong wiring or defective soldering).
         - No: Replace wiring according to the circuit diagram or resolder leads.
         - Yes: Check the microswitch.
           - No: Microswitch defective.
           - Yes: Lead wires defective.

5. The Turntable Platter will not stop rotating.
   Check to see if the microswitch lever is sufficiently pushed by the arm of the Return Plate when the Tone Arm is on the Arm Rest.

   - No: Adjust it in accordance with Tone Arm Replacement instructions of "PARTS REPLACEMENT".
   - Yes: Check the microswitch.
     - No: Microswitch defective.
     - Yes: Capacitor defective.

6. The Turntable Platter turns at incorrect speed.
   Check to see that the supply voltage and frequency are correct for this unit.

   - No: Change the motor and/or pulley according to input condition.
   - Yes: Check to see that the motor transit screws are removed. (If they are not removed, rumble will be excessive.)
     - No: Remove them.
     - Yes: Check the pulley. (Fig. 6: 50 Hz pulley has no V groove; 60 Hz pulley has a V groove).
       - No: Replace the pulley.
       - Yes: Check the position of the belt select lever, pulley and belt. (Figure 6)
         - No: Adjust the position of the pulley. (See "Motor Pulley Height Adjustment" on page 6).
         - Yes: Motor defective.

7. No sound from the system's speakers
Check to see that sound can be heard when the ⊕ side of the cartridge connection pin jack is touched. (Figure 14)
Note: Set amplifier's volume to a low level when touching the HOT side with a small screwdriver.

- Yes: Cartridge defective or the connection pin jack is not properly connected to the cartridge terminal. (Figure 15)
- No: Remove the pin from the cartridge, touch the HOT side of the pin with your finger and check for sound from the speaker.
  - Yes: Short-circuited cartridge pin.
  - No: Perform continuity test between the cartridge pin and end of output cable (pin plugs). (Figure 16)
    - Open: Broken lead between cartridge pin and tone arm output cables.
    - 0Ω: Short-circuited cables between cartridge pin and output plugs.

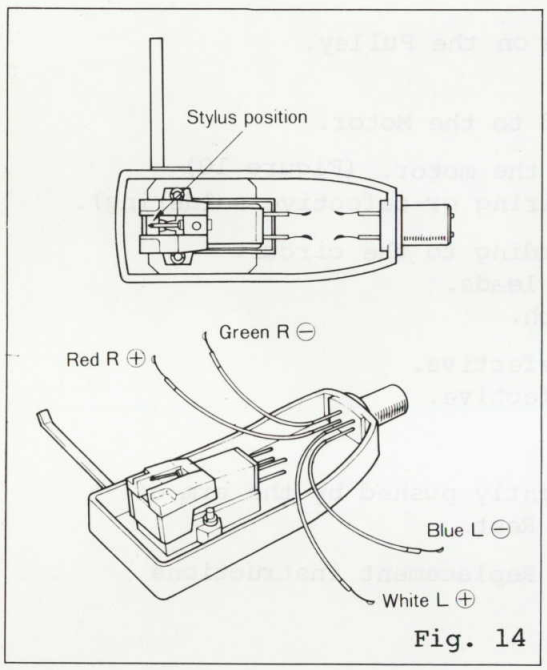


Fig. 14

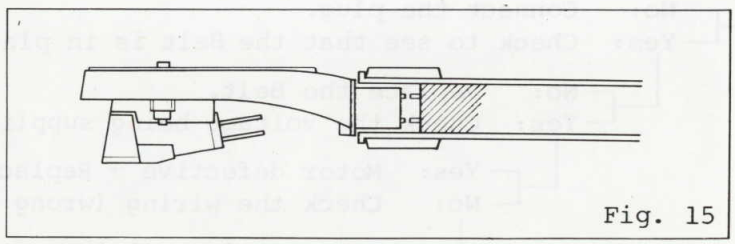


Fig. 15

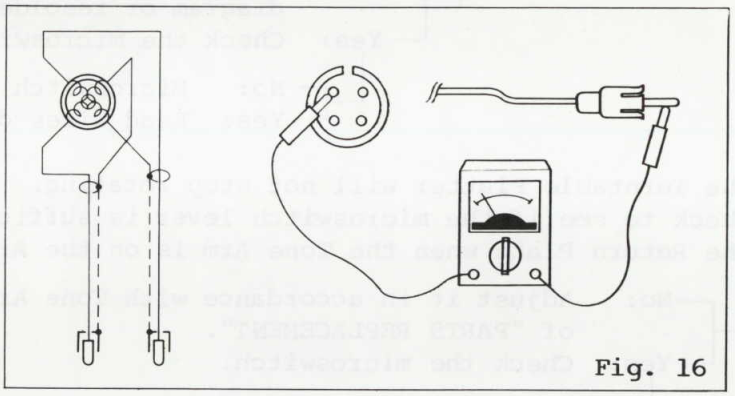


Fig. 16

8. Sound output is distorted.
Check to see that appropriate tracking force is being used.

- No: When the force is too light, high frequencies will be distorted or when force is far too light, the stylus will not stay in the grooves. If tracking force is too heavy, high frequencies will be very weak. - Adjust for tracking force of 1.5g. (for European models) or 2.5g (for USA models)
- Yes: Check to see if both channels distort.
  - Yes: Check for distortion when the stylus is tracking innner grooves on the record.
    - Yes: Overhang improper: Adjust it. A record with an extremely small final diameter of the modulated groove will be distorted.
    - No: (Both channels distort.) - Dust is on the stylus tip or the stylus is worn or the cartridge is defective.

No: (Only one channel distorts.) - Check to see that the turntable is horizontal and that the head shell is not loosened or tilted.

No: Anti-skating adjustment is set too high. (Set the anti-skating scale to be the same as that of the tracking force. Should be 2.5g for USA models and 1.5g for European models). The stylus is worn.

Yes: Correct each item (if any).

9. Excessive hum

Check to see that the ground wire of the turntable is connected to the GND terminal on the Amplifier/Receiver.

No: Connect the wire.

Yes: Turntable output cable and/or tone arm output leads are disconnected or are not properly soldered.

MECHANISM OPERATING PRINCIPLE

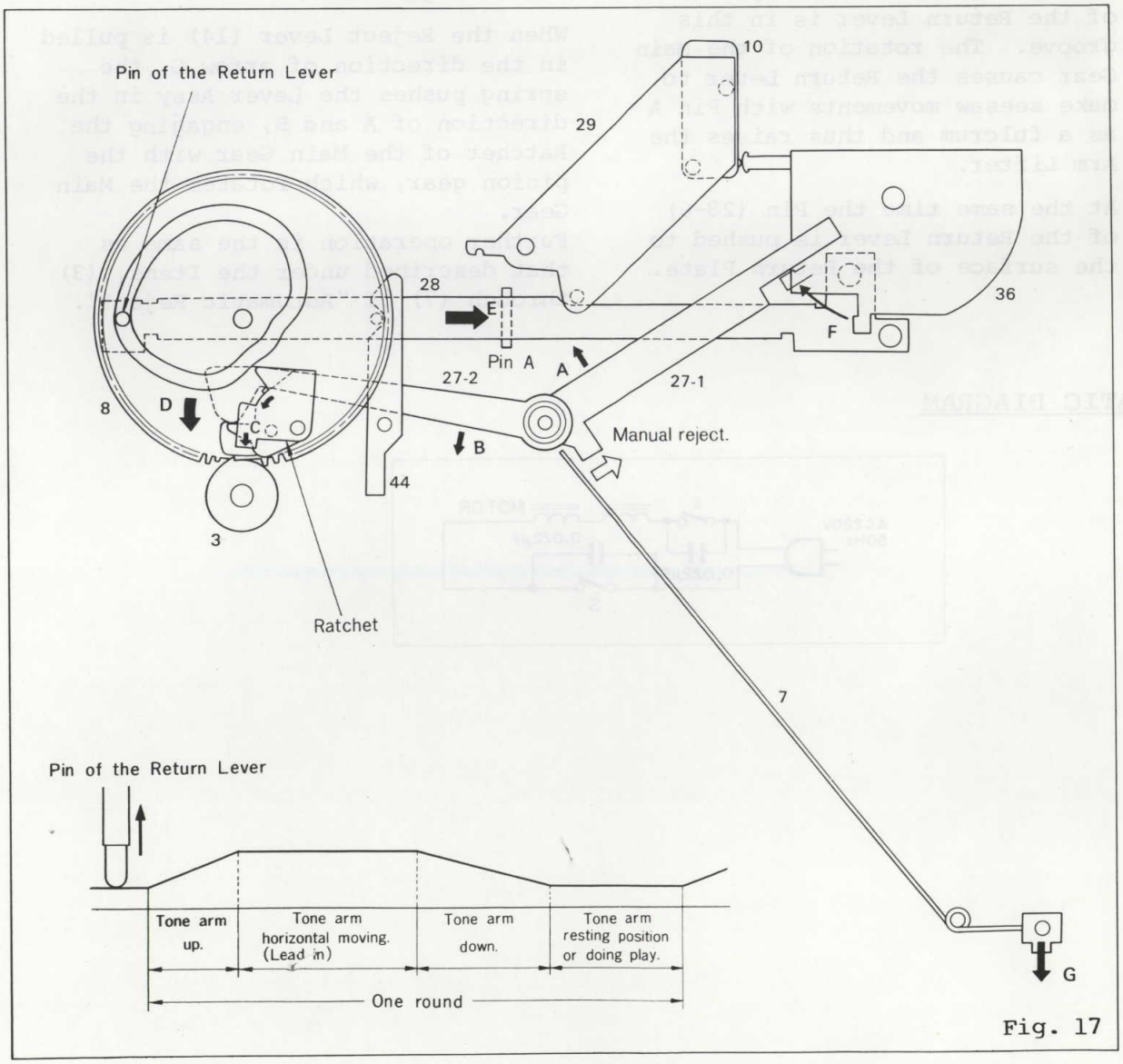


Fig. 17

Automatic Return

1. Automatic Reject (Refer to Figure 17)

(1) When the stylus is tracking to the end of the modulated grooves, the lever Assy (27) moves in the direction of arrows A and B caused by motion of the Return Plate (36).

(2) When the stylus approaches the run-out groove (4 mm pitch groove) of the record, the end of the Lever assembly (27-2) pushes the Ratchet attached to the Main Gear in the direction of the arrow. The pawl of the Ratchet engages that of the pinion gear. The movement of the Ratchet triggers the start of the engagement of the Main Gear.

(3) The rear of the Main Gear has a cam by a groove and the pin (28) of the Return Lever is in this groove. The rotation of the Main Gear causes the Return Lever to make seesaw movements with Pin A as a fulcrum and thus raises the Arm Lifter.

(4) At the same time the Pin (28-6) of the Return Lever is pushed to the surface of the Return Plate.

(5) The Return Lever Assembly (28) moves in the direction of the arrow through rotation of the Main Gear (Refer to Fig. 17: Exploded diagram of the cam). As soon as the Tone Arm returns to the Arm Rest, the Return Plate pushes the Microswitch Lever, turning off power.

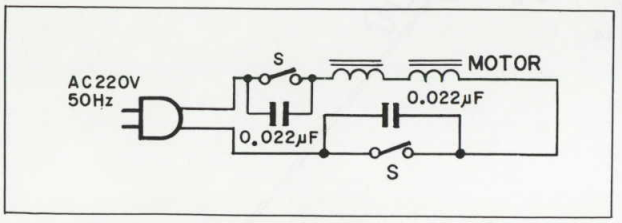
(6) The Main Gear continues revolving because of the inertia of the Platter and the cam lowers the Tone Arm even after the power is off.

(7) As soon as the Return Lever Assembly moves in the direction of arrow F, the Main Gear returns to its original position (the part of the gear without the teeth) and stops rotating.

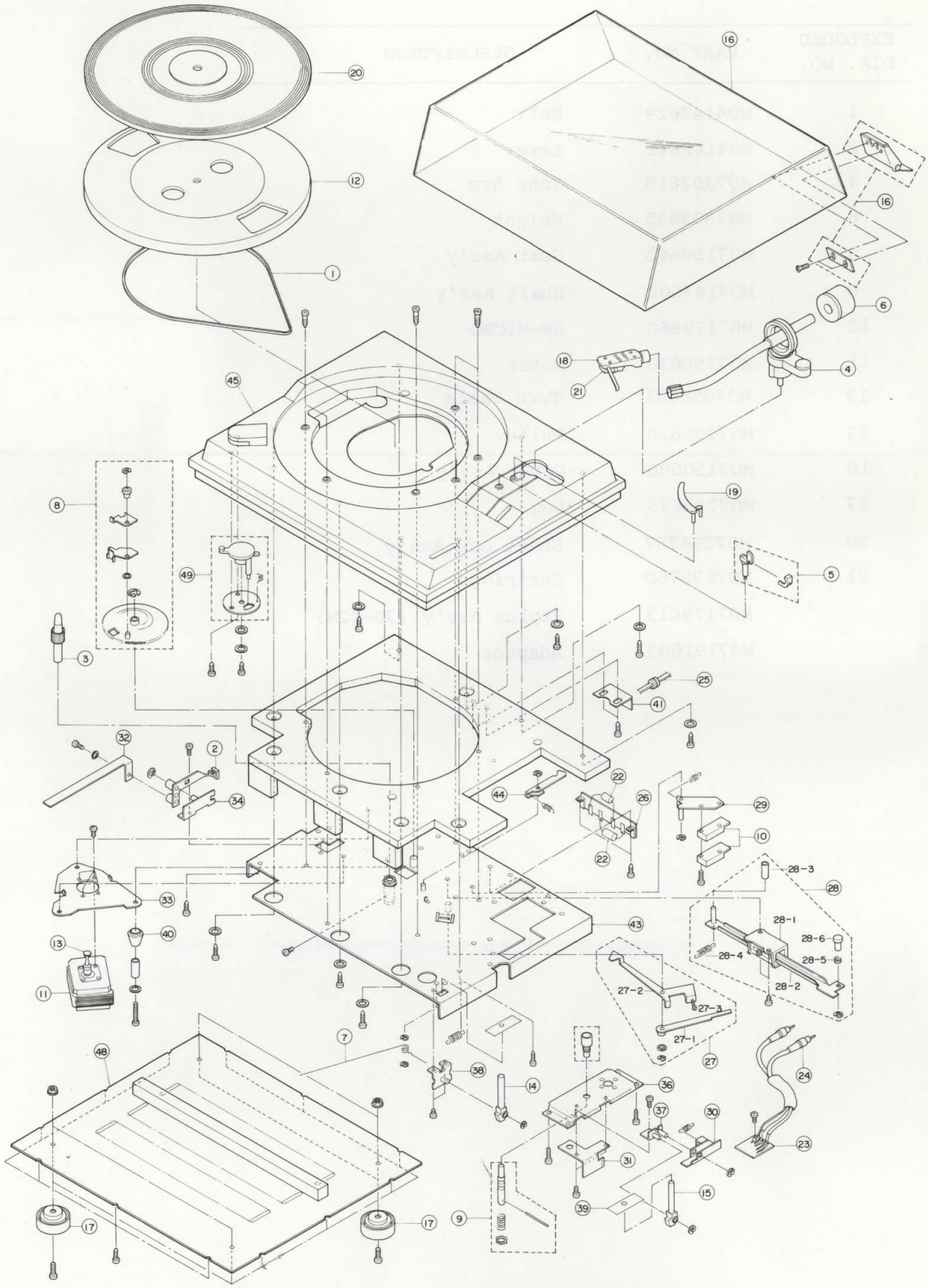
2. Manual Reject

When the Reject Lever (14) is pulled in the direction of arrow G, the spring pushes the Lever Assy in the direction of A and B, engaging the Ratchet of the Main Gear with the pinion gear, which rotates the Main Gear.
Further operation is the same as that described under the Items, (3) through (7) of "Automatic Reject".

SCHEMATIC DIAGRAM



EXPLODED VIEW



PARTS LIST

EXPLODED DIA. NO.	PART NO.	DESCRIPTION
1	M04142629	Belt
2	M04142641	Lever
4	M07302610	Tone Arm
6	M07302635	Weight
8	M07150645	Gear Ass'y
9	M07147602	Shaft Ass'y
10	M07179660	SW-MICRO
11	M07356638	Motor
12	M07356601	Turn Table
13	M07296620	Pulley
16	M07150690	Cover Ass'y
17	M07295695	Leg
20	M07296757	Sheet Gum Ass'y
21	M07179760	Cartridge
	M07179613	Stylus Ass'y (3D-42M)
	M07191603	Adaptor

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: MITSUBISHI DENKI BLDG., MARUNOUCHI, TOKYO 100. TELEX: J24532 CABLE: MELCO TOKYO

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