

Technics

by Panasonic

QUARTZ Synthesizer
Direct Drive Automatic Turntable System

SL-1400MK2

OPERATING INSTRUCTIONS



The model number of this product may be found on the back of the unit; and the serial number, on the label at the bottom of the unit. Please note the model and serial numbers of this unit in the space provided and retain this booklet as a permanent record of your purchase to aid identification in the event of theft.

MODEL NUMBER

SERIAL NUMBER

Before operating this set, please read these instructions completely.

We want to thank you for selecting the SL-1400MK2, Quartz Synthesizer Direct Drive Automatic Turntable System. For optimum performance, we recommend that you read these instructions carefully.

Parts identification

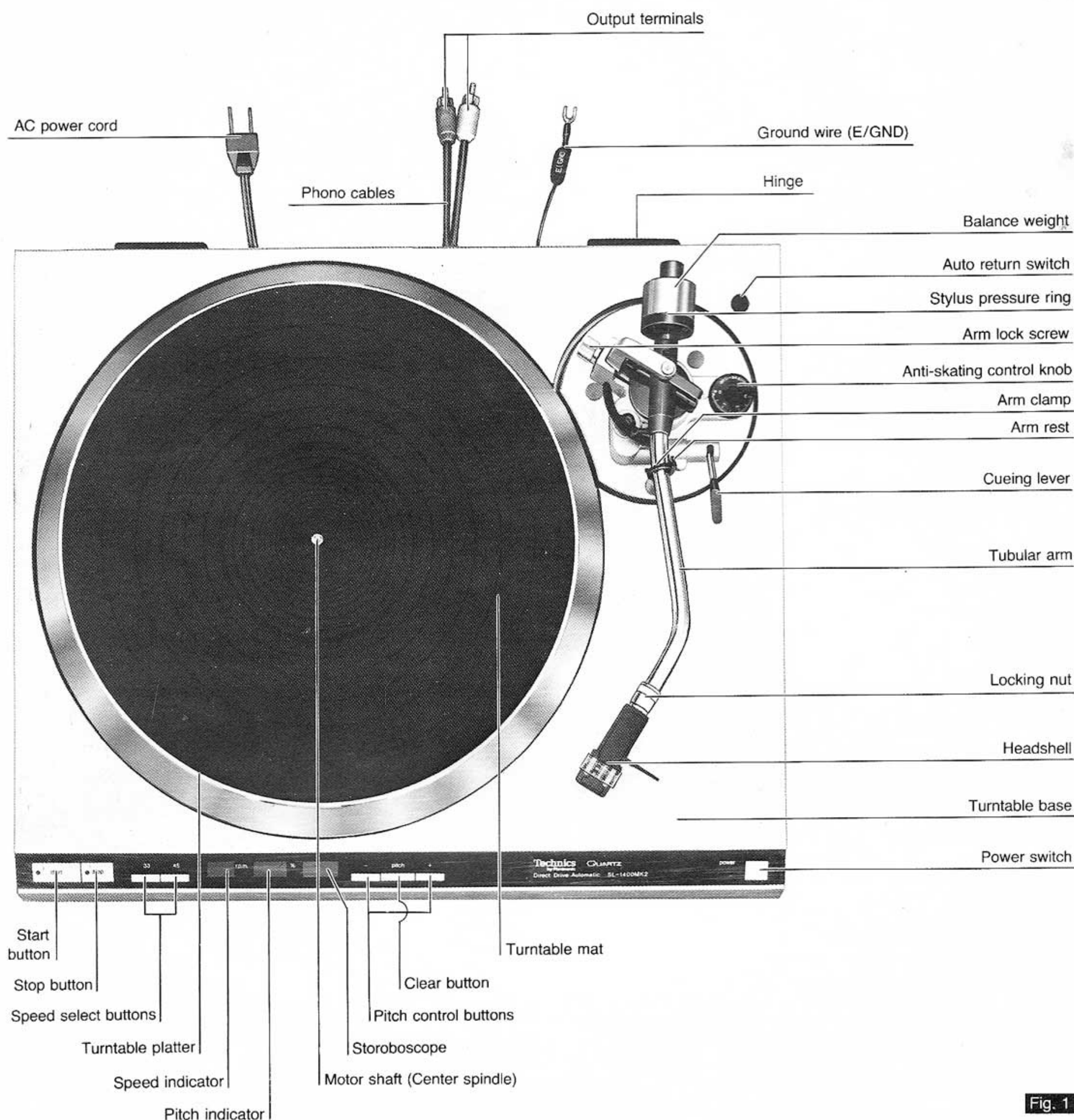


Fig. 1

“Warning: To prevent fire or shock hazard, do not expose this appliance to rain or moisture.”

Assembly and set-up

Caution:

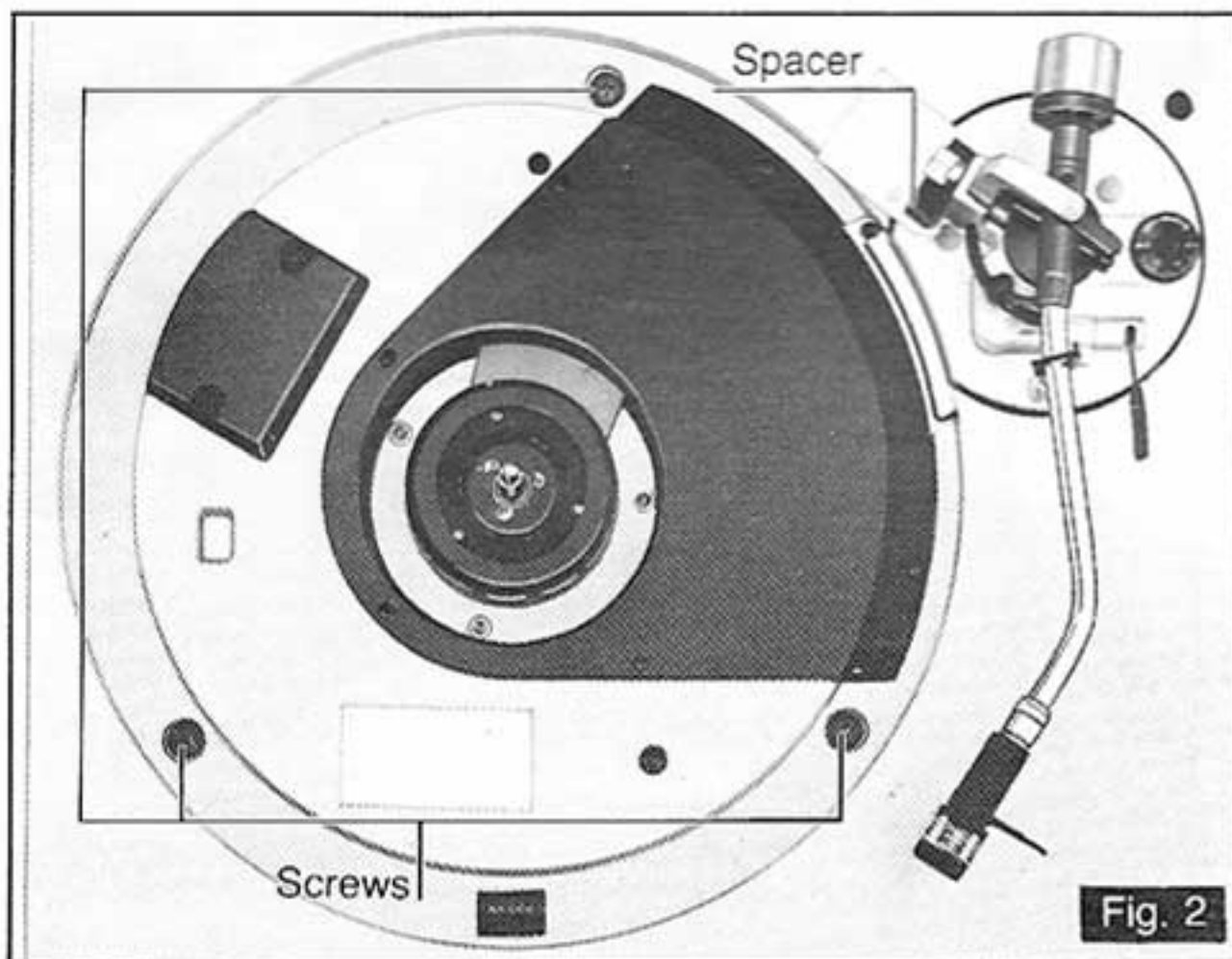
Never connect the AC power plug before the assembly has been completed.
Attach the dust cover last, so that assembly and adjustments can be made efficiently.

1 Check the parts.

Turntable unit	1	Special oil	1
Turntable platter	1	Balance weight	1
Turntable mat	1	Headshell	1
Dust cover	1	Screws for cartridge	4
45 r.p.m. adaptor	1		

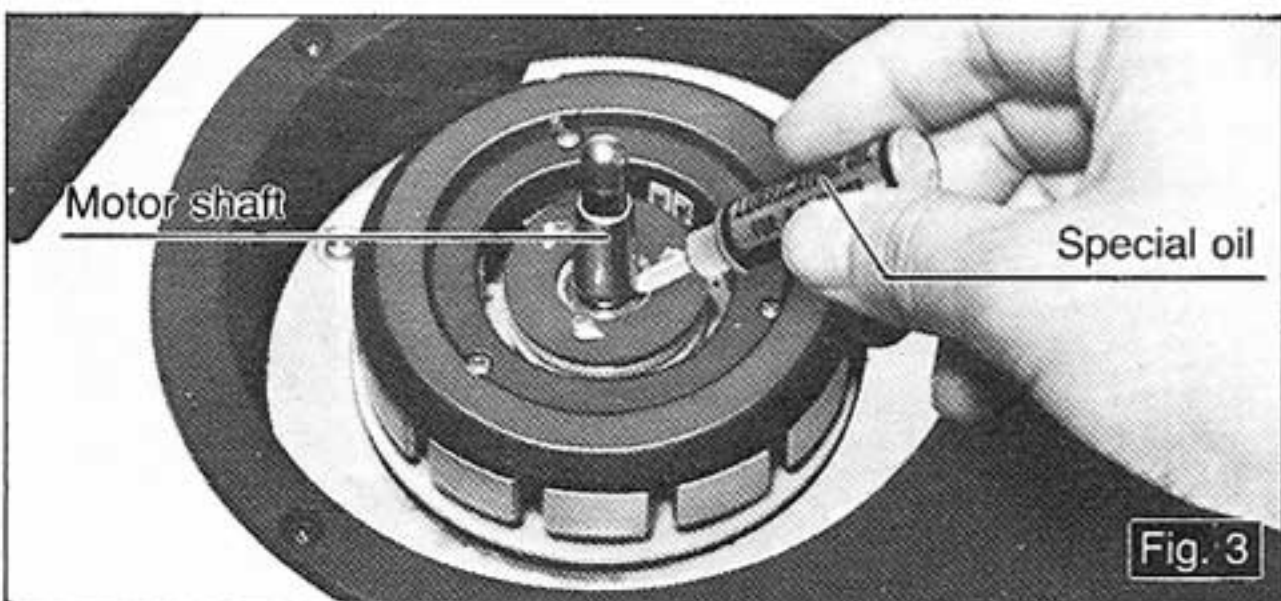
2 Remove the transport screws.

Remove 3 screws and spacer used for transportation. (See Fig. 2).



3 Apply two or three drops of oil to the motor shaft using the furnished special oil. (See Fig.3).

Although the unit has been lubricated before shipping from the factory, apply a few drops of oil to the motor shaft. After that, application of two or three drops of oil once every 2000 hours' of operation or so is sufficient. As the time interval is much longer than that for conventional type motors (200-500 hours), do not apply too much oil, nor more frequently than necessary. Never use any other type of oil.



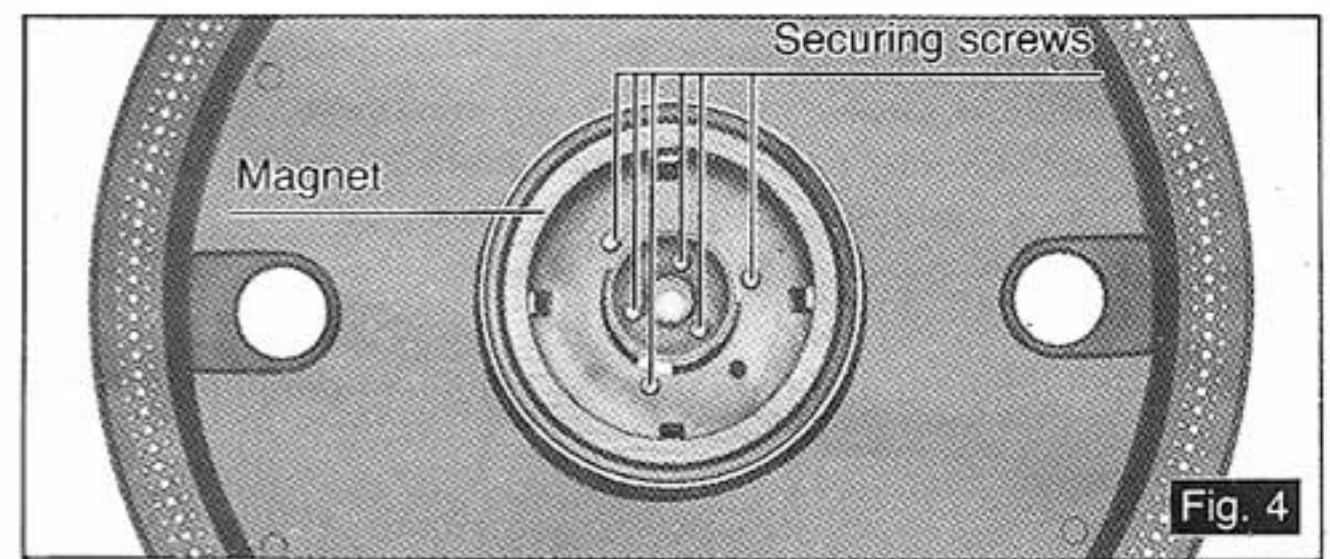
4 Installation of the turntable platter.

1. Place the turntable platter on the motor shaft (center spindle).
2. Place the turntable mat on the platter.

Note:

The rotor is connected to the underside of the turntable platter. (The magnet of the motor is attached to the turntable platter.) To maintain optimum performance, extra care should be taken to prevent adhesion of dust or iron filings to the magnet and not to damage the magnet by dropping it.

Do not remove or loosen the screws. (See Fig. 4).



5 Installation of the cartridge (optional). (See Figs. 5, 6 and 7)

When you install a cartridge, refer to the operation instructions of that cartridge.

1. Connect the lead wires to the cartridge terminals.

The terminals of most cartridges are color coded. Connect each lead wire to the terminal of the same color.

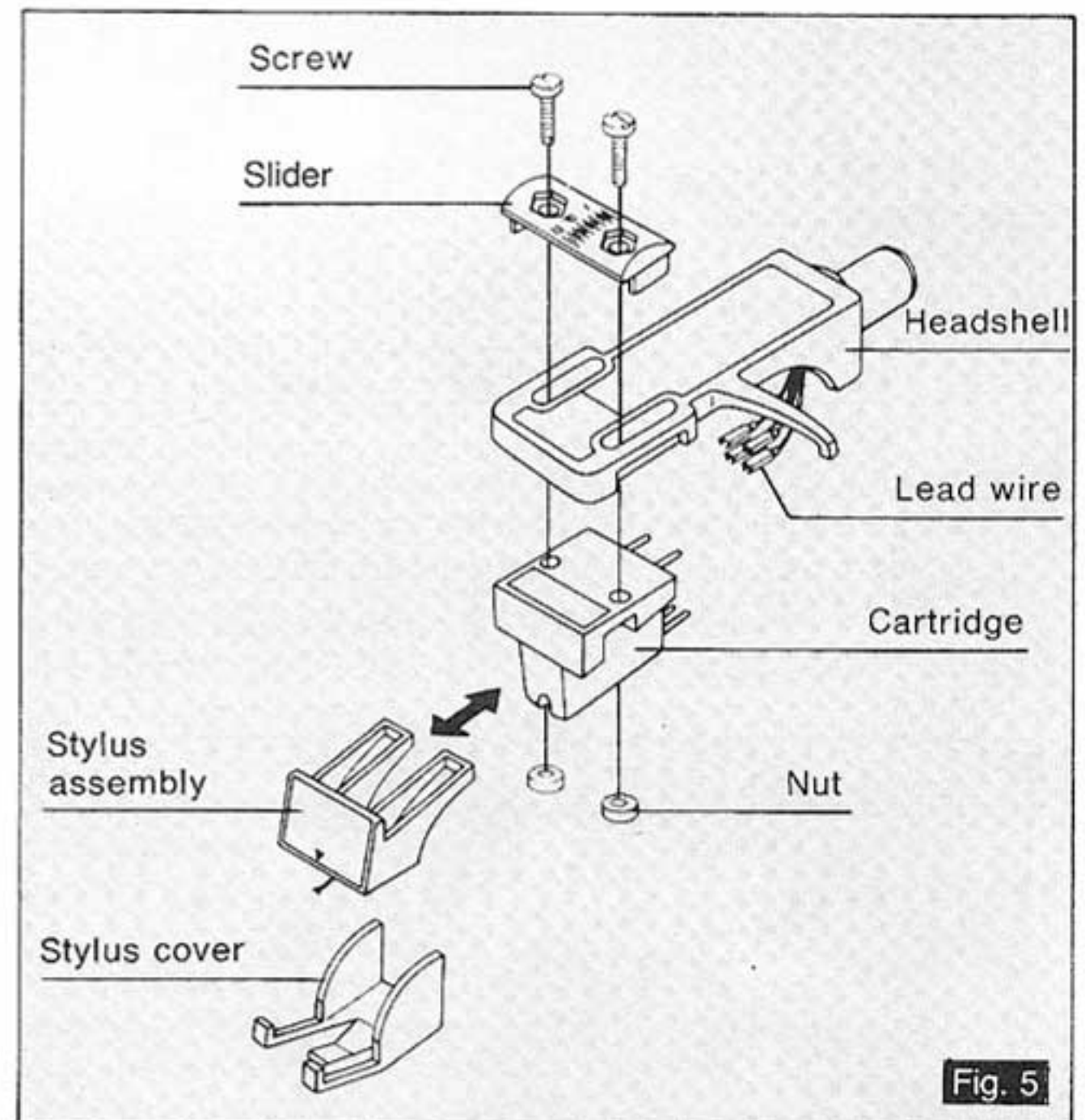
Red → R+ (right channel, (+) terminal)

Green → R- (right channel, ground terminal)

White → L+ (left channel, (+) terminal)

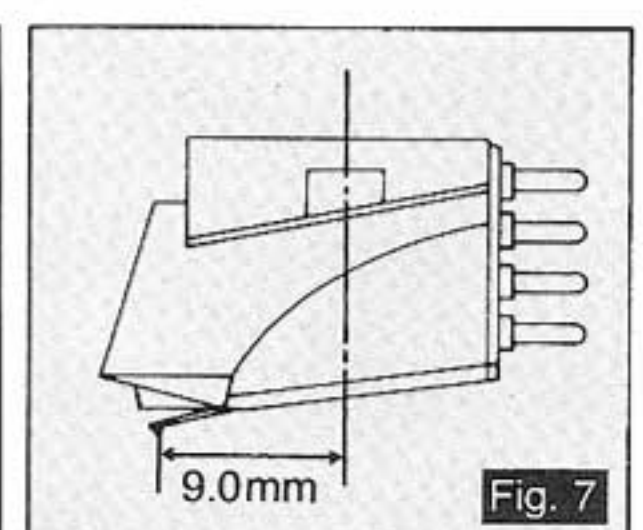
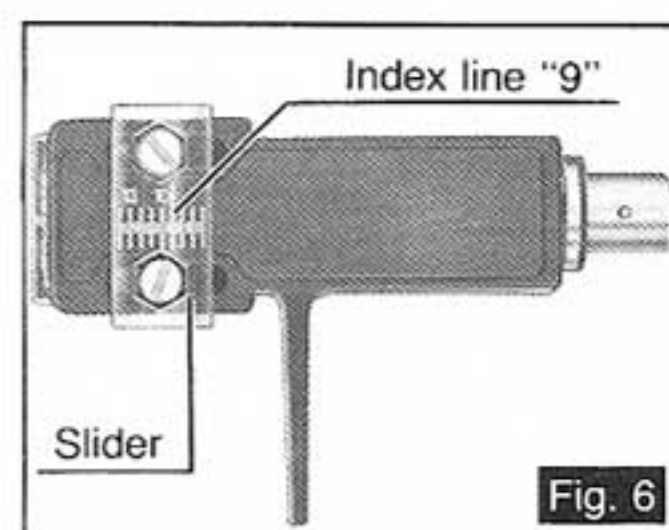
Blue → L- (left channel, ground terminal)

2. Temporarily attach the cartridge to the headshell by using the included screws or the screws supplied with your cartridge. (See Fig. 5). To prevent damage to the delicate stylus tip during installation of cartridge and connection of lead wires remove the stylus from the cartridge temporarily or leave the stylus protection cover in place.



6 Adjustment of the overhang.

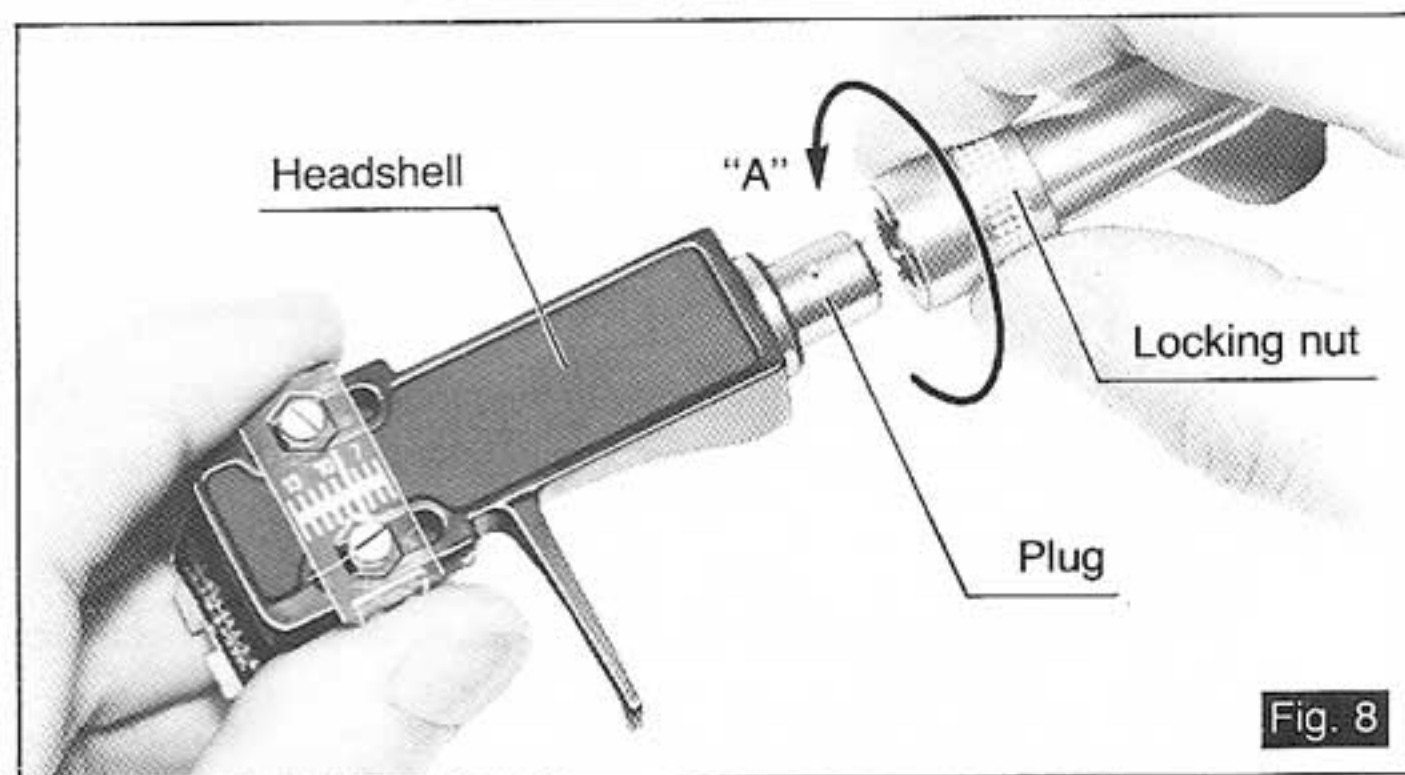
The headshell has a special slider which can be used to easily make the adjustment for correct overhang. Depending upon the dimensions of the cartridge which is to be used, determine the distance (in millimeters) from the position of the screws to the stylus tip; then align the index line mark on the headshell with the calibrated mark (on the slider) for the same numerical value. (See Figs. 6 and 7)



Tighten the screws without moving the cartridge.

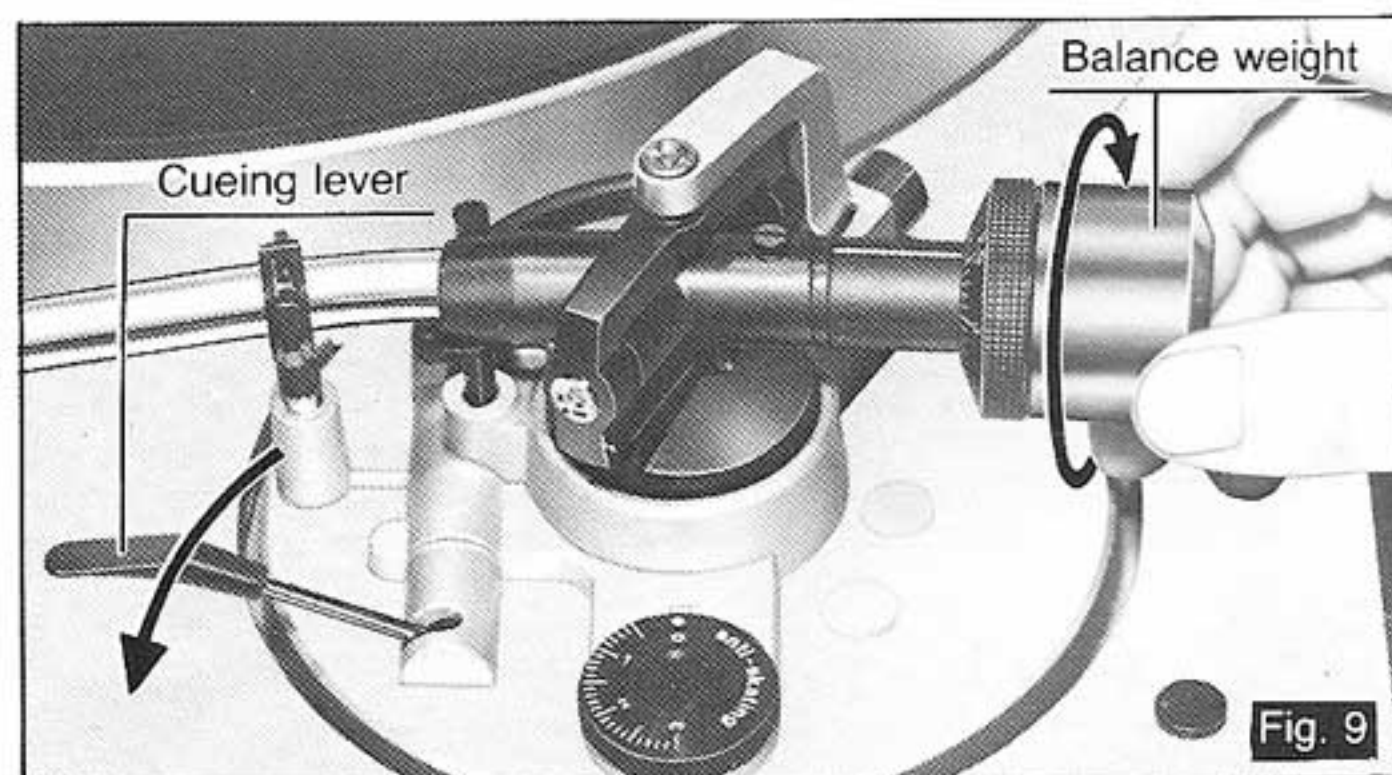
⑦ Installation of the headshell. (See Fig. 8).

Insert the headshell into the front end of the tubular arm, and turn the locking nut clockwise (in the direction shown by the arrow "A"), with the headshell firmly held horizontally.



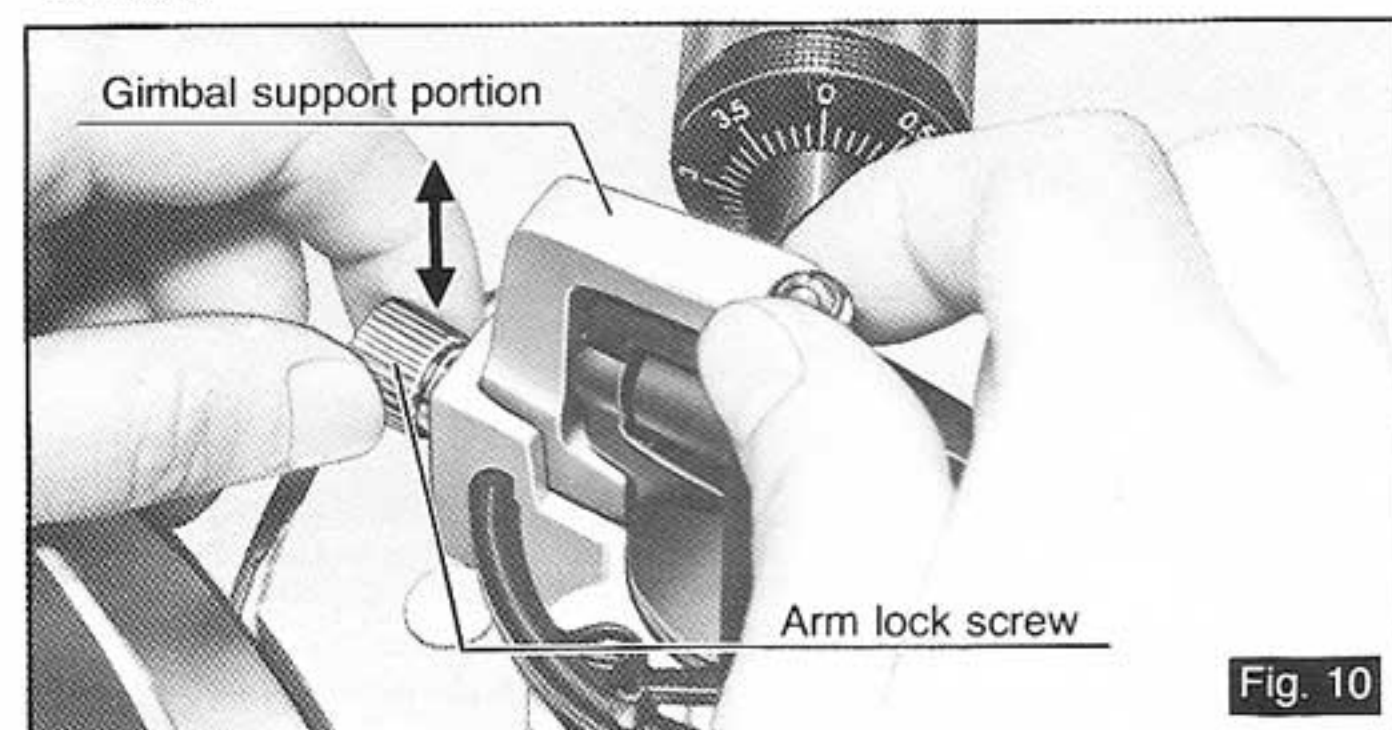
⑧ Installation of the balance weight.

Place the balance weight on the rear shaft of the tonearm. (See Fig. 9).

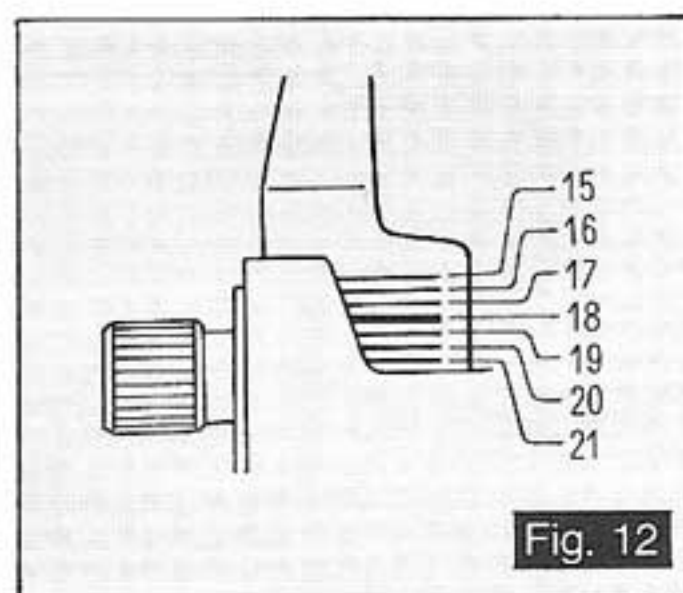
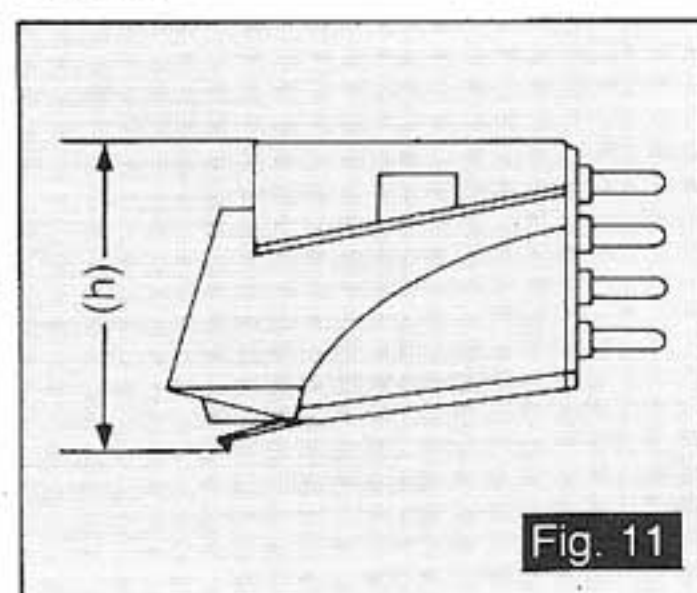


⑨ Adjustment of the arm height. (See Figs. 10, 11 and 12).

- This tonearm has been locked in the "up" position before shipping from the factory, adjust the arm height according to your cartridge height.
- Loosen the arm lock screw and move the arm lock screw and gimbal support portion until the tonearm is parallel with the record surface.



- If the cartridge height is 18 mm as shown in figure 11, align the fourth line ("18") on the gimbal support portion with the arm base edge as shown in the picture. (See Fig. 12).
- The arm height can be adjusted in 1 mm steps over a range of 6 mm.



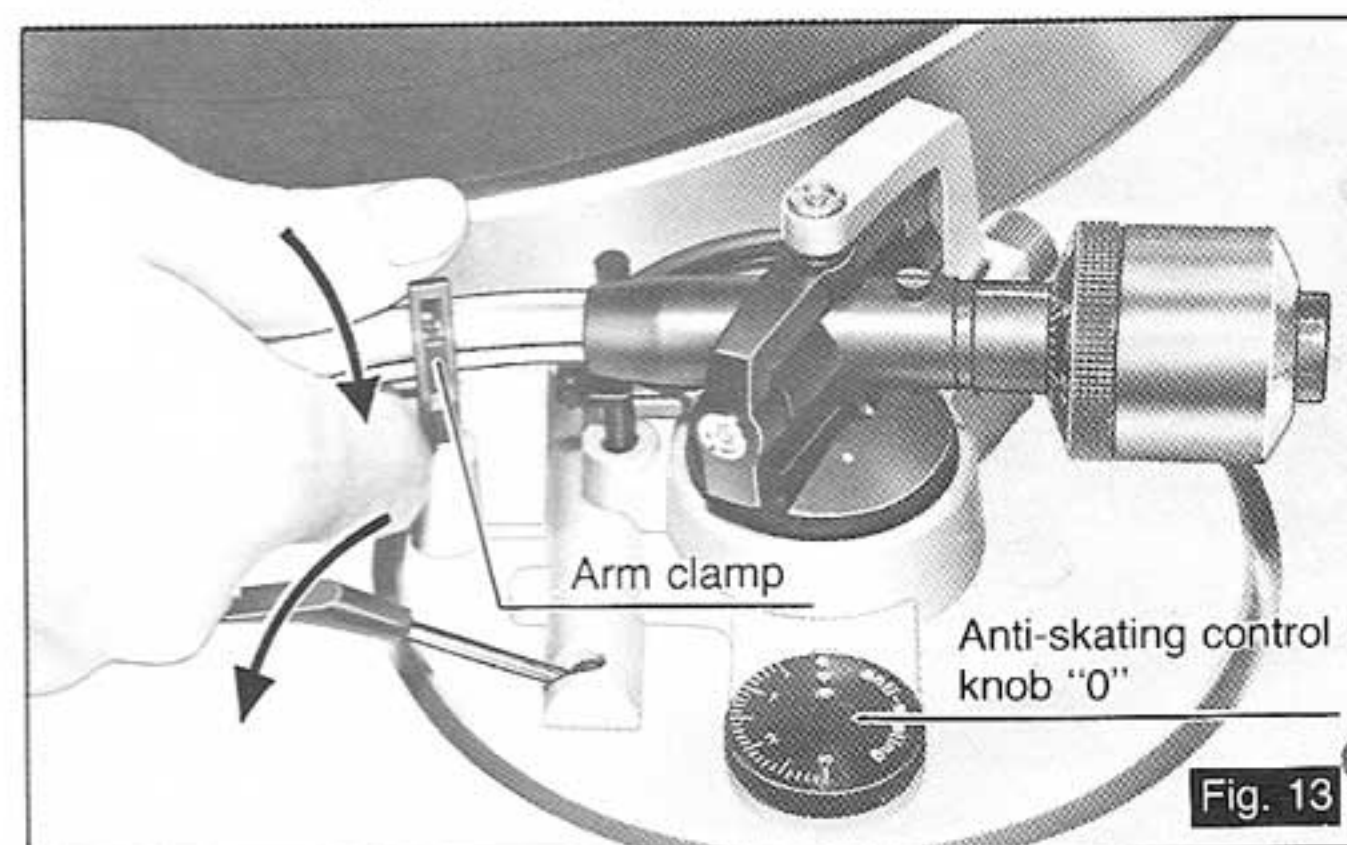
⑩ Adjustments of the horizontal "0" balance and the stylus pressure.

Before adjusting the horizontal "0" balance, check the following:

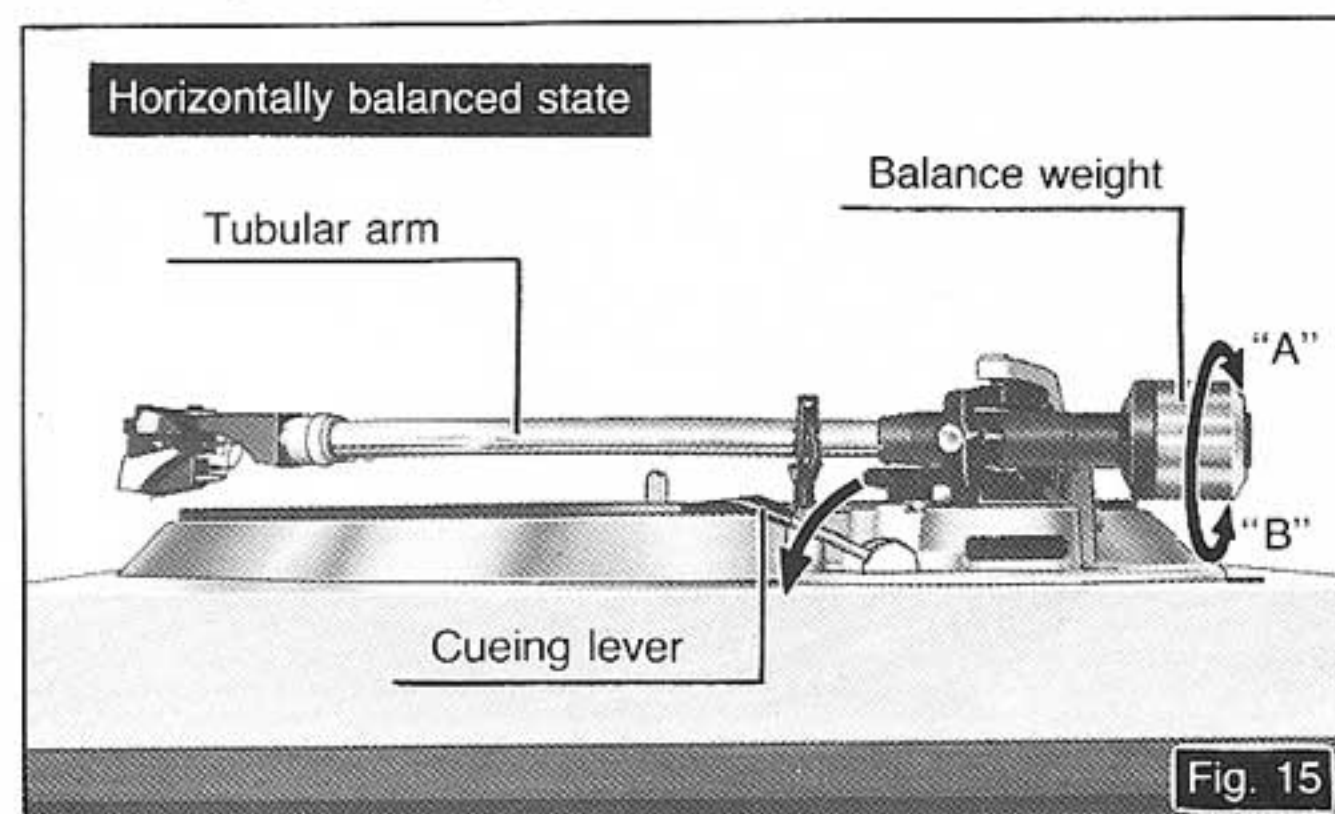
- Make sure that the cueing lever is in the lowered position as shown in Fig. 13.
- Make sure that the anti-skating control knob is at "0" position. (See Fig. 13).

The tonearm may sway or move slightly in the "0" position which is normal.

1. Remove the stylus cover, if your cartridge has a detachable one.
2. Release the arm clamp (Fig. 13) and lift the tonearm from the arm rest to free it. (See Fig. 14).



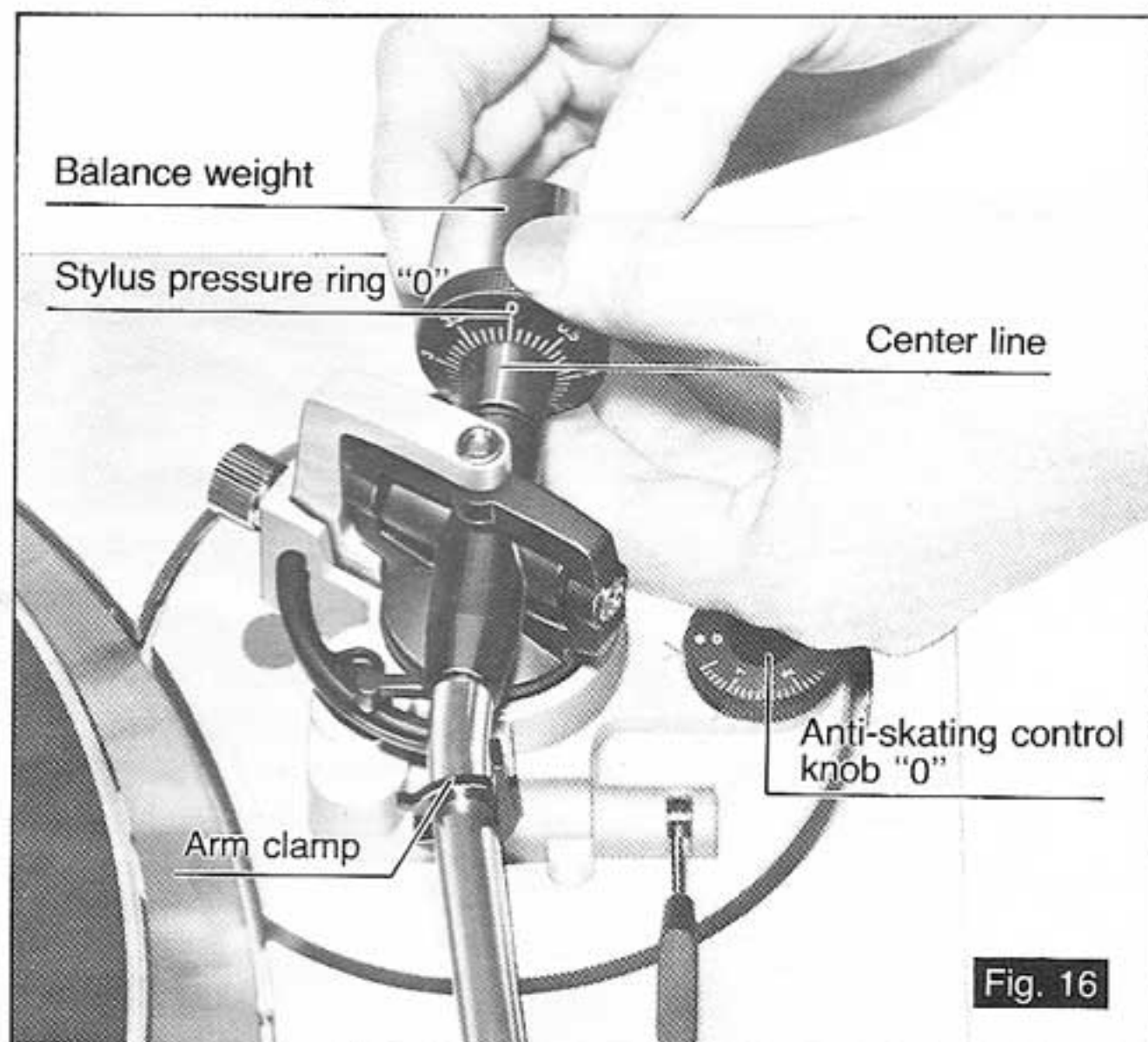
3. Turn the entire balance weight clockwise (indicated by the arrow "A") or counterclockwise (indicated by the arrow "B") until the tonearm is approximately balanced horizontally. (Floats freely.) (See Figs. 14 and 15).



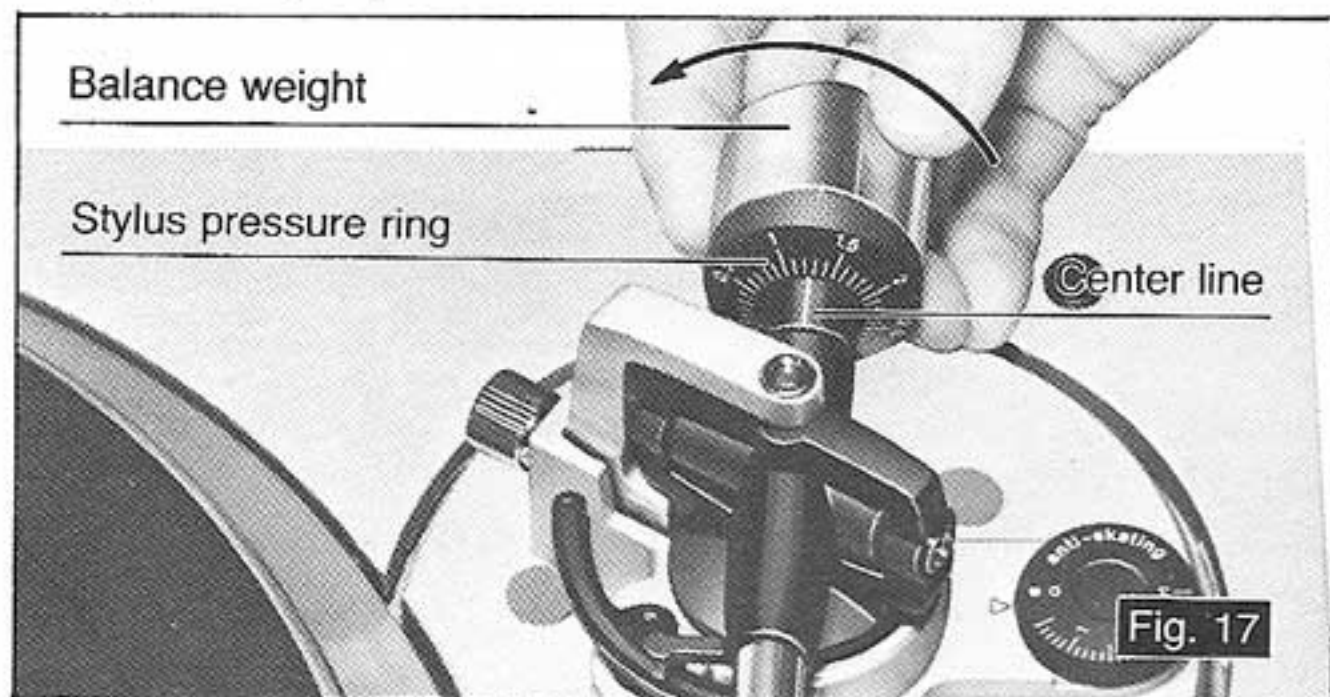
Note:

- If the tonearm pulls toward the arm rest when the tonearm is held in a free state as in Fig. 14, rotate the turntable platter clockwise about 10 times. This will disengage the automatic mechanism from the tonearm gear, which in rare cases may have moved out of its normal position during transportation.
- During the adjustment of the horizontal "0" balance, be careful that the stylus tip of the cartridge does not contact the turntable mat or turntable base.

4. After the tonearm is horizontally balanced, temporarily fasten the tonearm to the arm clamp. (See Fig. 16).
Hold the balance weight stationary with one hand as shown in Fig. 16 and rotate only the stylus pressure ring to bring the numeral "0" of the ring into alignment with the center line on the tonearm rear shaft. (The adjustment of the horizontal "0" balance is now completed.)



5. After adjusting the horizontal "0" balance, turn the balance weight clockwise in the direction of the arrow and align to the correct stylus pressure. (Follow the cartridge manufacturer's recommendation.) (See Fig. 17).

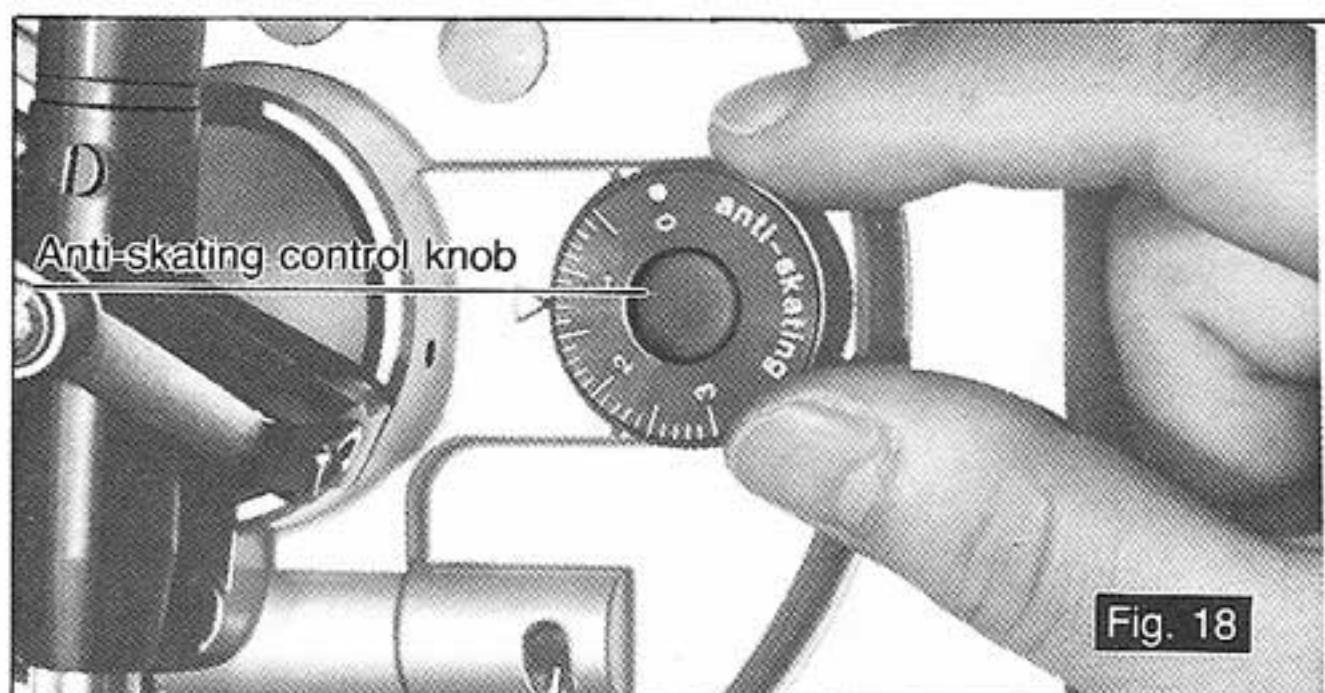


Note:

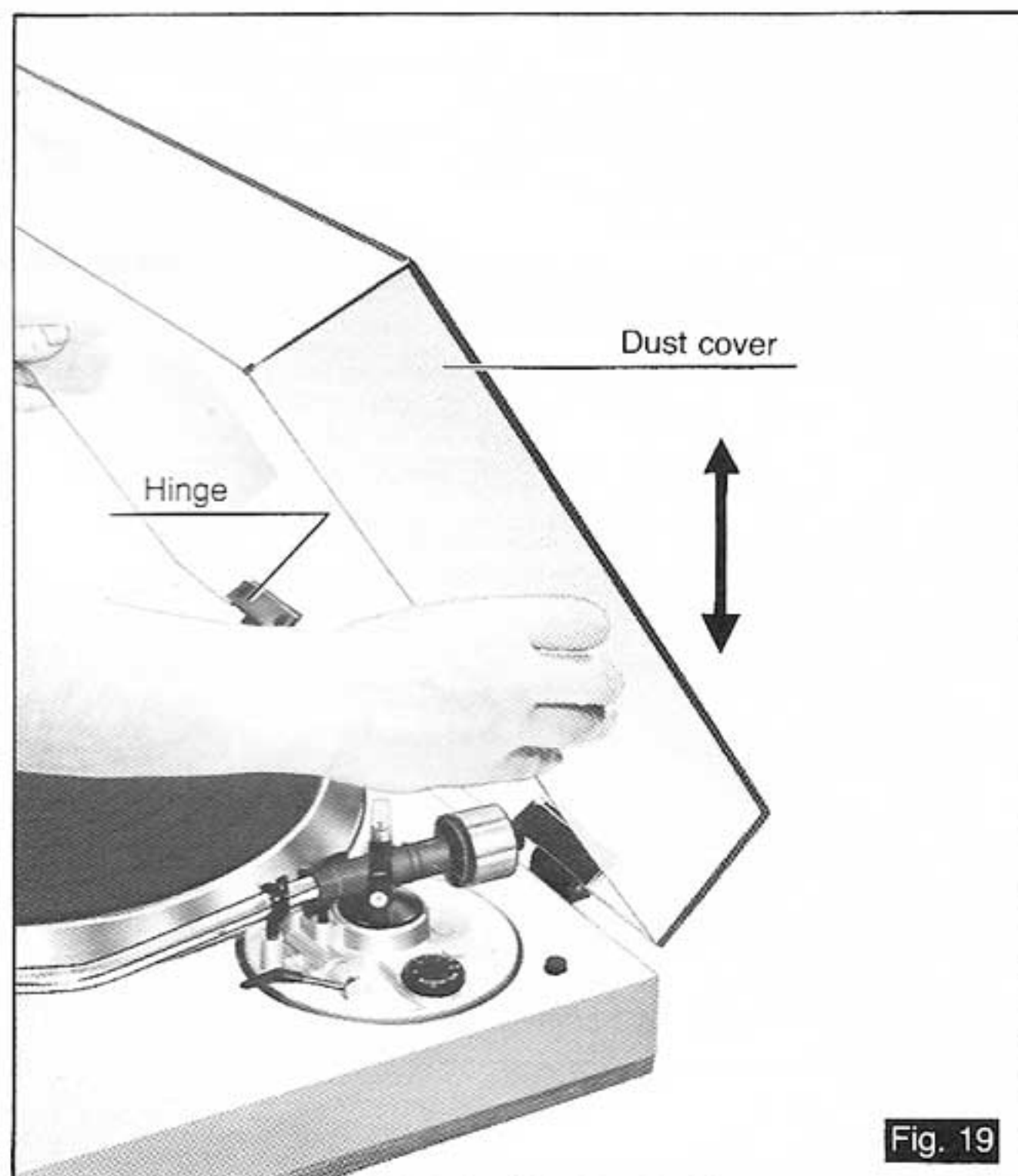
- As the stylus pressure ring moves in step with the balance weight, proper stylus pressure can be selected by directly reading the graduated ring.
- Set the stylus pressure to the maximum recommended value for your cartridge in cases where the record has an extremely high recording level, or where the unit is operated in a room at low temperature or in places in which the unit is subjected to vibrations.

11 Anti-skating force control.

Set the anti-skating control knob to the same value as the stylus pressure. (See Fig. 18).



12 Installation of the dust cover. (See Fig. 19).



Note:

Opening or closing of the dust cover during play should be avoided, since this may not only cause vibrations, but also result in skipping of the stylus.
If you must open it during play, it should be done as gently as possible.

13 Placement.

1. Place the unit in a stable and horizontal position, where there is little or no vibration.
2. Use the unit as far away from the speakers as possible and isolate the unit from sound radiation from them.
3. When a radio, which is placed too close to the turntable, is played while the turntable is in operation interference to the AM reception may result.
4. Do not place the unit where it is exposed to direct sun, dust, moisture or heat.
5. Keep it in a well-ventilated place.

14 Connect the AC power plug.

Connect the AC power plug to any 120 V AC 50 or 60 Hz socket. In cases where the AC power plug is connected to the outlet (AC outlet) of an amplifier or receiver, make sure that the wattage indicated on the outlet meets the turntable's requirements before connecting the power plug.

15 Connect the output terminals.

Output terminals		Amplifier or Receiver
L(White)	→	L Channel
R(Red)	→	R Channel
E(Spade lug)	→	E/GND

Note:

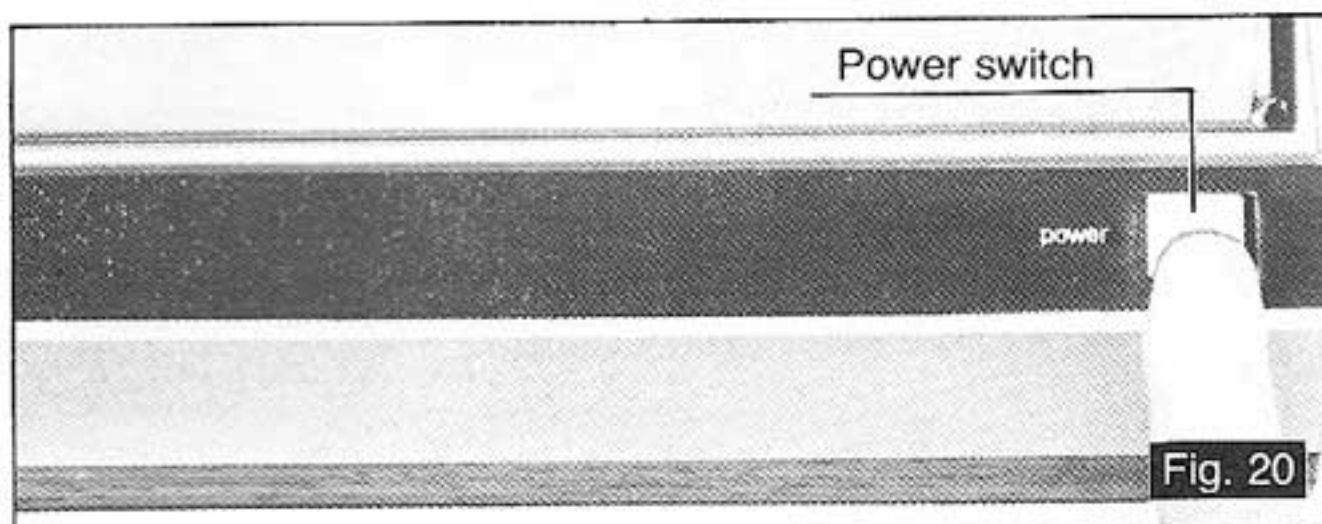
Be sure to connect the ground terminal firmly to the amplifier or receiver. If this connection is not made or is loose, a power source "HUM" will result.

How to play

- 1 Push the power switch to the ON position (■). (See Fig. 20.)
The speed indicator for 33-1/3 rpm, the pitch indicator and the stroboscope will all light up.

Note:

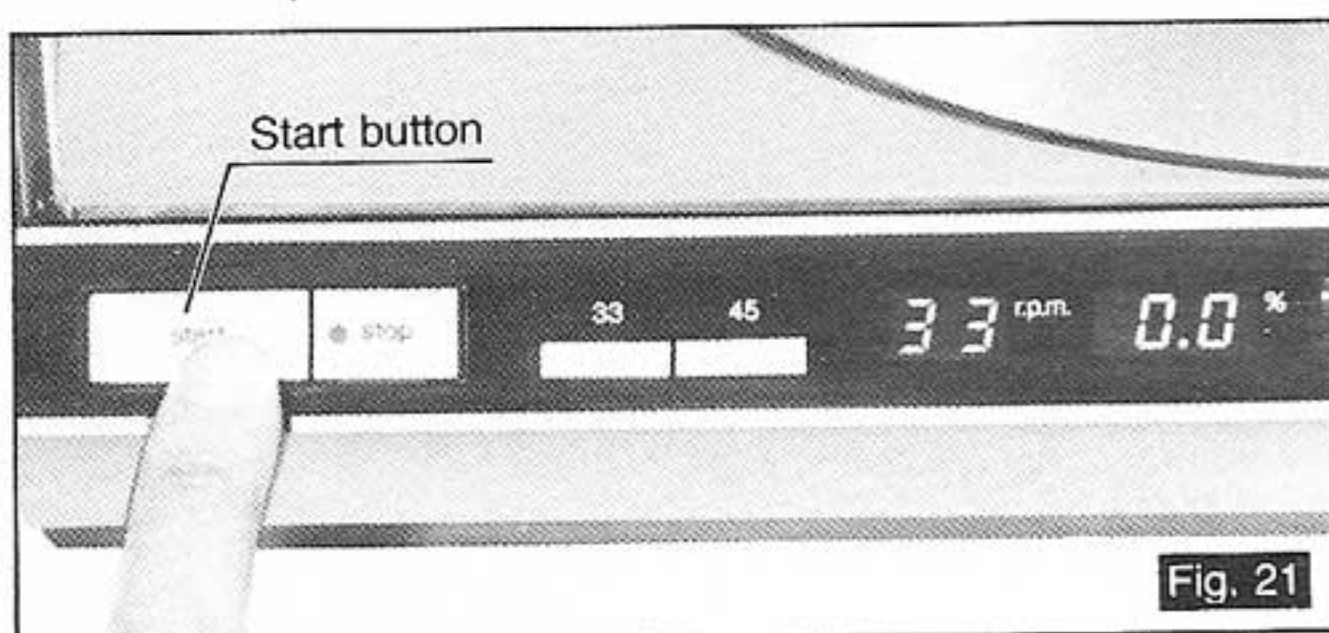
Since the unit has been designed to select 33-1/3 rpm automatically each time you push the power switch on, push the speed select button if you play a 45 rpm record.



- 2 Place a record on the turntable platter.

Push the start button.

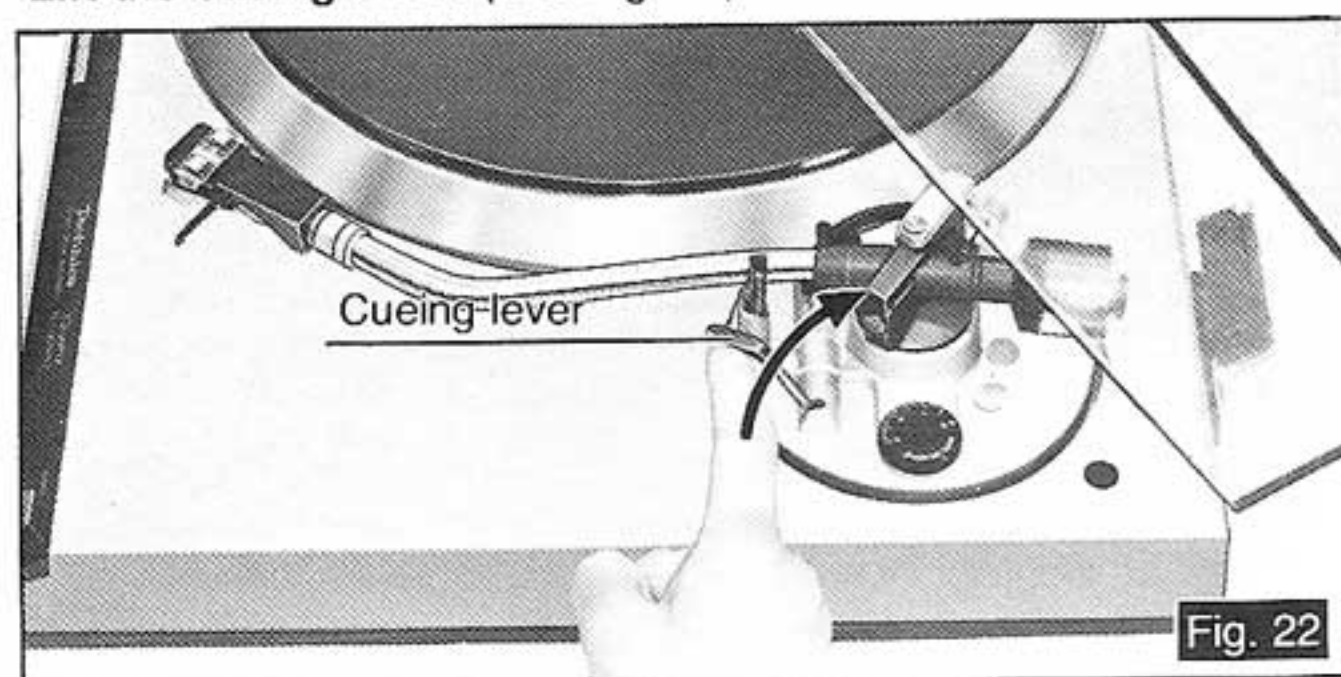
The turntable platter will start to rotate. (See Fig. 21).



- 3 Release the arm clamp.

Remove the stylus cover if your cartridge has one.

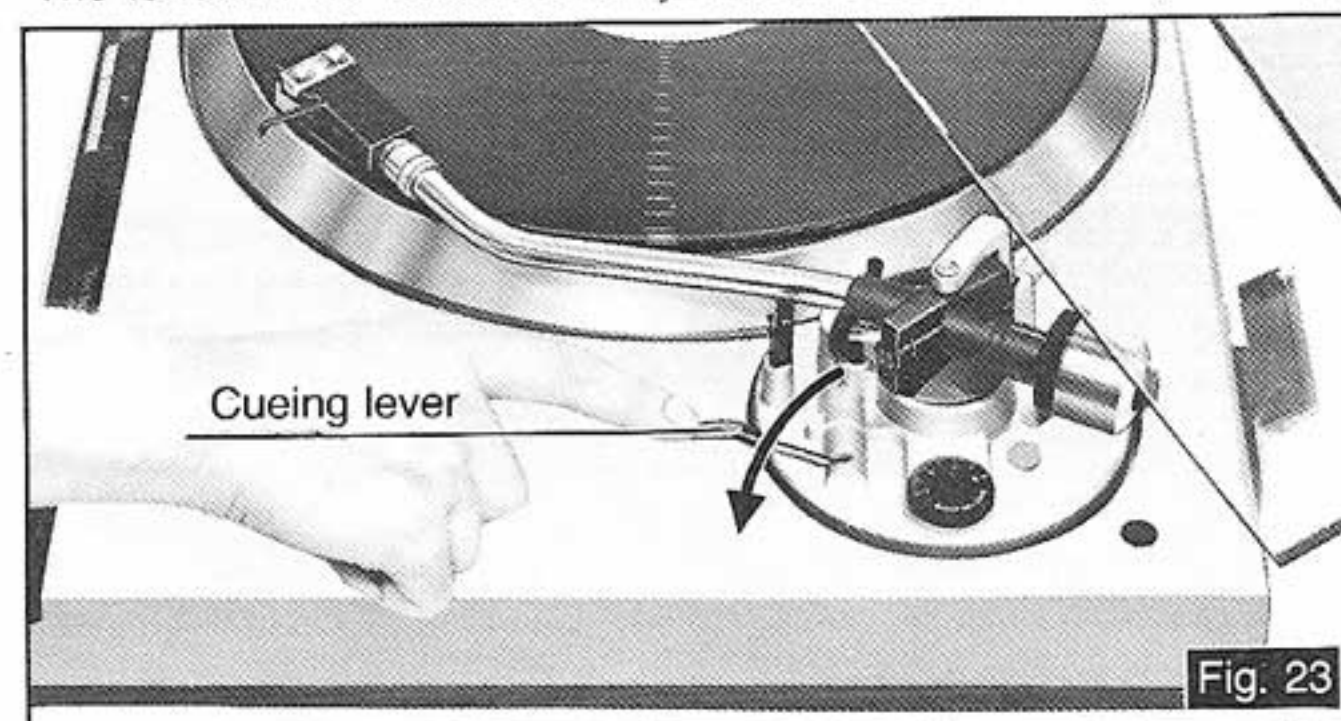
- 4 Lift the cueing lever. (See Fig. 22).



- 5 Move the tonearm manually over the record.

Lower the cueing lever. (See Fig. 23).

The tonearm will descend slowly onto the record and play will begin.



- 6 When play is finished, the tonearm will automatically return to the arm rest (auto return) and the turntable platter will stop rotation.

To shut the power off the power switch must be pushed again to the "OFF" position (■).

Note:

- If you play a 45 r.p.m. record with a large center hole, use the furnished adaptor on the center spindle.

How to use auto return switch

This unit employs a unique "auto return switch".

- Should any phono disc whose central hole is off center be played, the tonearm will automatically return during the course of performance. In such a case, set the auto return switch to the OFF (■) position, (see Fig. 24), and then the phono disc can be played to the final groove.



Note:

For restoring the normal auto return function, set the switch back to the ON (■) position.

How to suspend playing

- For temporary suspension of play, raise the cueing lever, and the stylus tip of the cartridge will lift from the record.
- For suspension of play, push the stop button.
The tonearm automatically returns to the arm rest and the turntable stops rotating.

Note:

The stop button will light up after the tonearm returns to the arm rest.

Adjustments

① Pitch control (turntable speed fine adjustment)

The Quartz Synthesizer system in this unit is being employed for the first time in the world. A high degree of pitch control accuracy over a wide range ($\pm 9.9\%$) in 0.1% increments can be obtained, with the quartz perfectly locked. The pitch variations which are clearly indicated by the LED digital indicator provide you with accurate and easy selection.

- The pitch control can be selected in increments of 0.1% which is below the threshold of human perception. This function can be very effective for minor extension or reduction of broadcasting time in professional applications. (See Fig. 25).
 - The pitch control also enables you to accurately and precisely tune musical instruments, and by varying the pitch slightly to obtain a different musical note from phono discs. (See Fig. 26).
- For a half-tone change:
- +5.9% (#)
 - 5.6% (b)
- Another feature of the variable pitch control over a wide range of $\pm 9.9\%$ is that it makes singing along with a melody easy for a chorus or playing a phono disc for accompaniment only. (See Fig. 27).
- By pressing the clear button which is located between the "+" and "-" pitch buttons, you can quickly return the set to normal playing speed. (See Fig. 28).

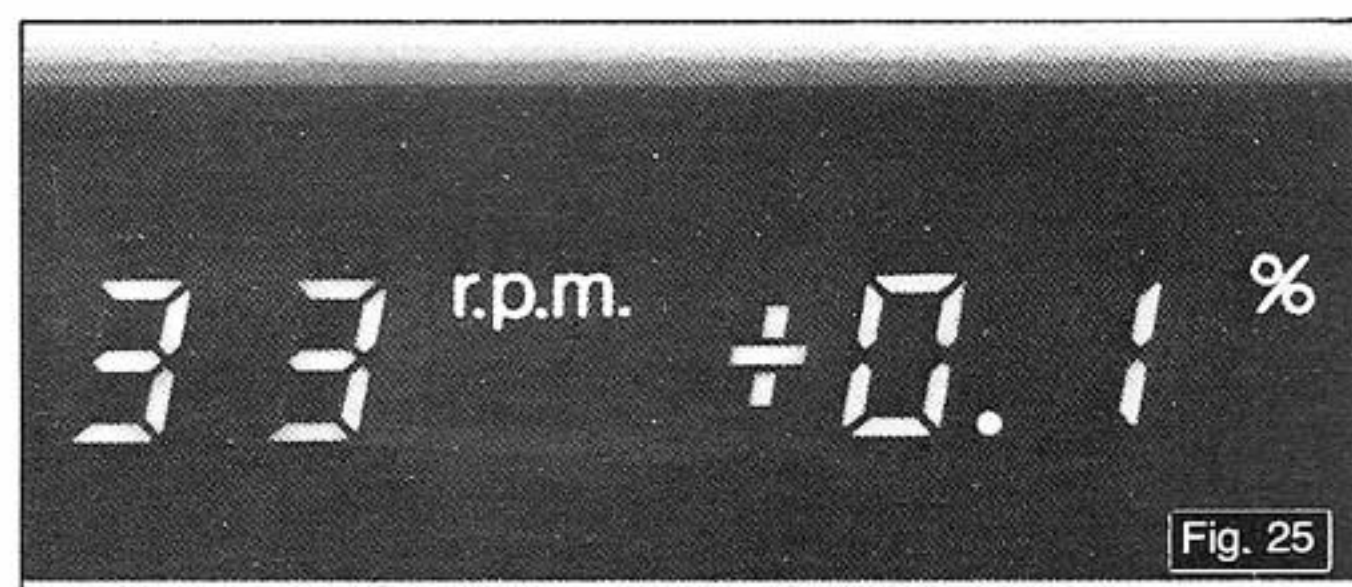


Fig. 25

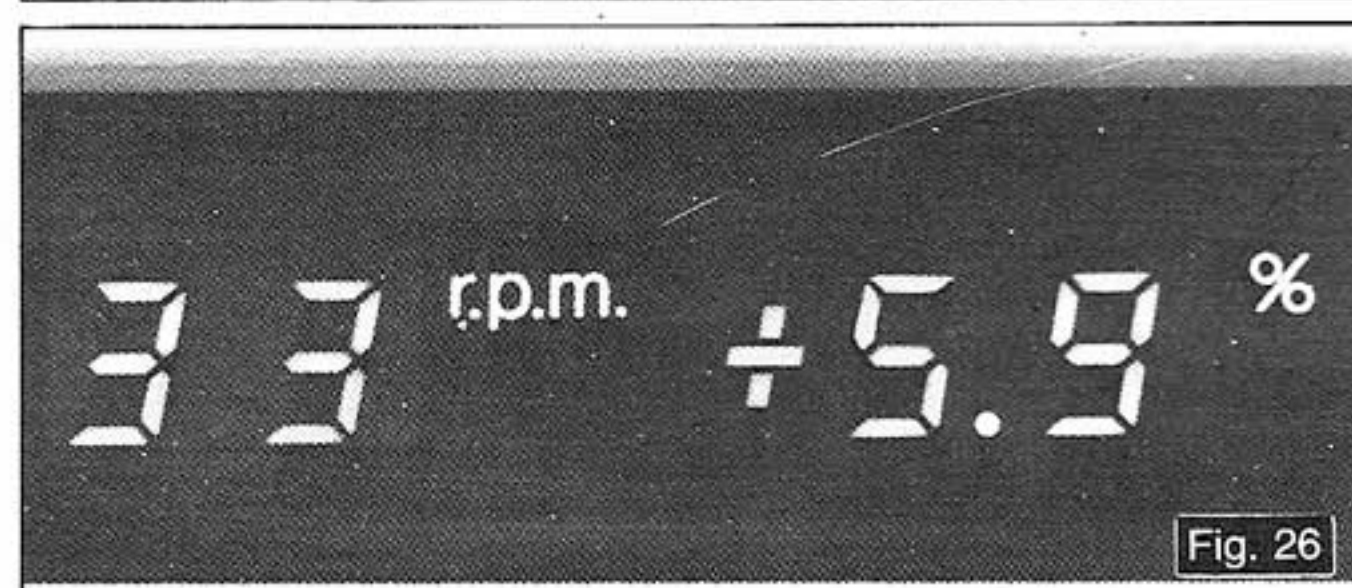


Fig. 26

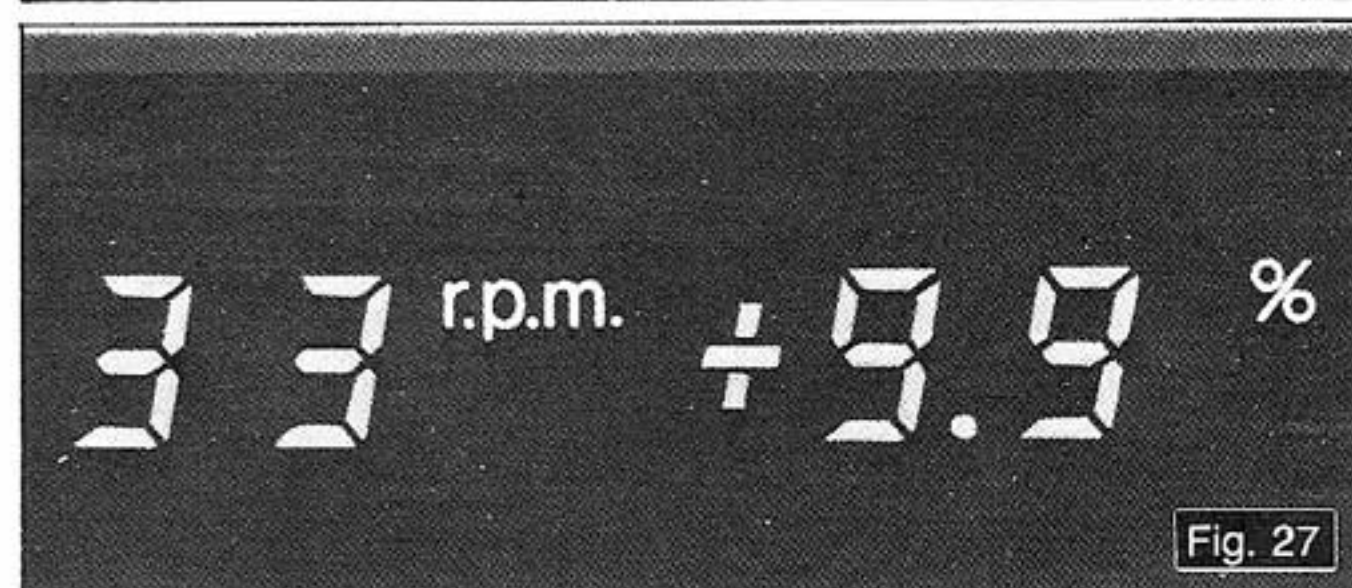


Fig. 27

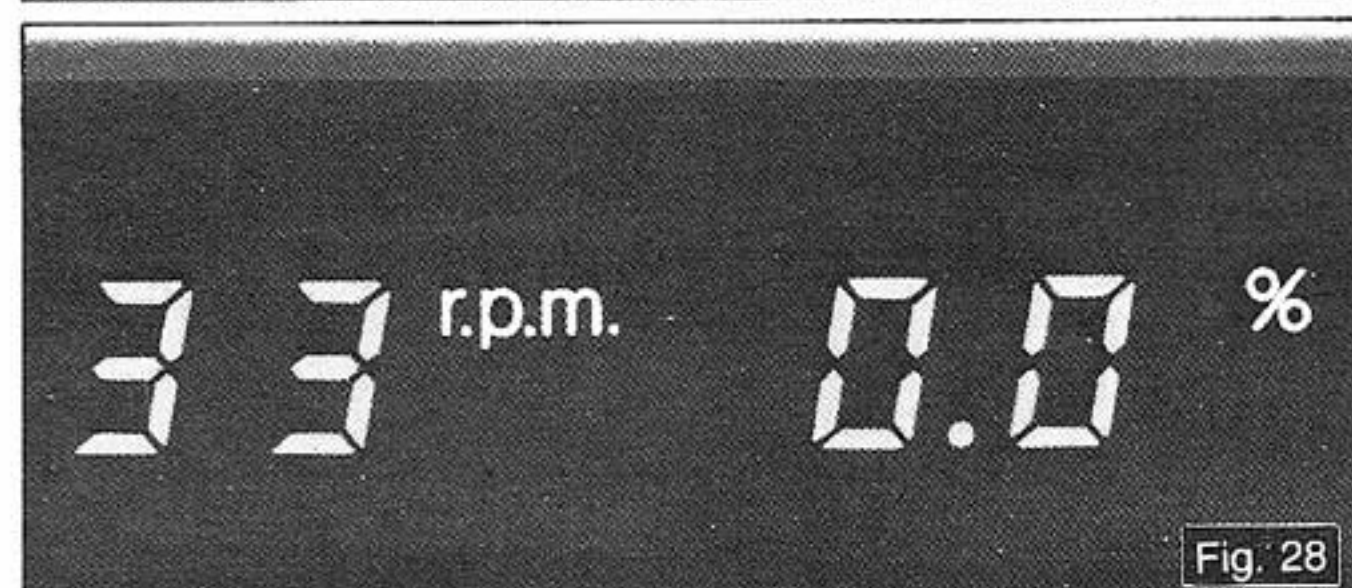


Fig. 28

② Adjustment of the muting time and arm lift height.

(See Figs. 29 and 30).

This unit employs a "muting switch" in combination with arm lift to cut off the noise when the stylus is set down on or lifted up from the record. You can adjust the muting time by adjusting the arm lift height (distance between the stylus tip and record surface when cueing lever is raised).

If the clearance becomes too narrow or too wide because of the physical size of the different cartridges on the market, turn the adjustment screw clockwise or counterclockwise, while pushing the arm lift down.

If the noise is heard. . .

Adjust the arm lift height adjustment screw clockwise to reduce the distance between the record and stylus tip.

If the sound is not heard even after the stylus tip sets down on the recorded groove. . .

Adjust the screw counterclockwise to increase the distance.

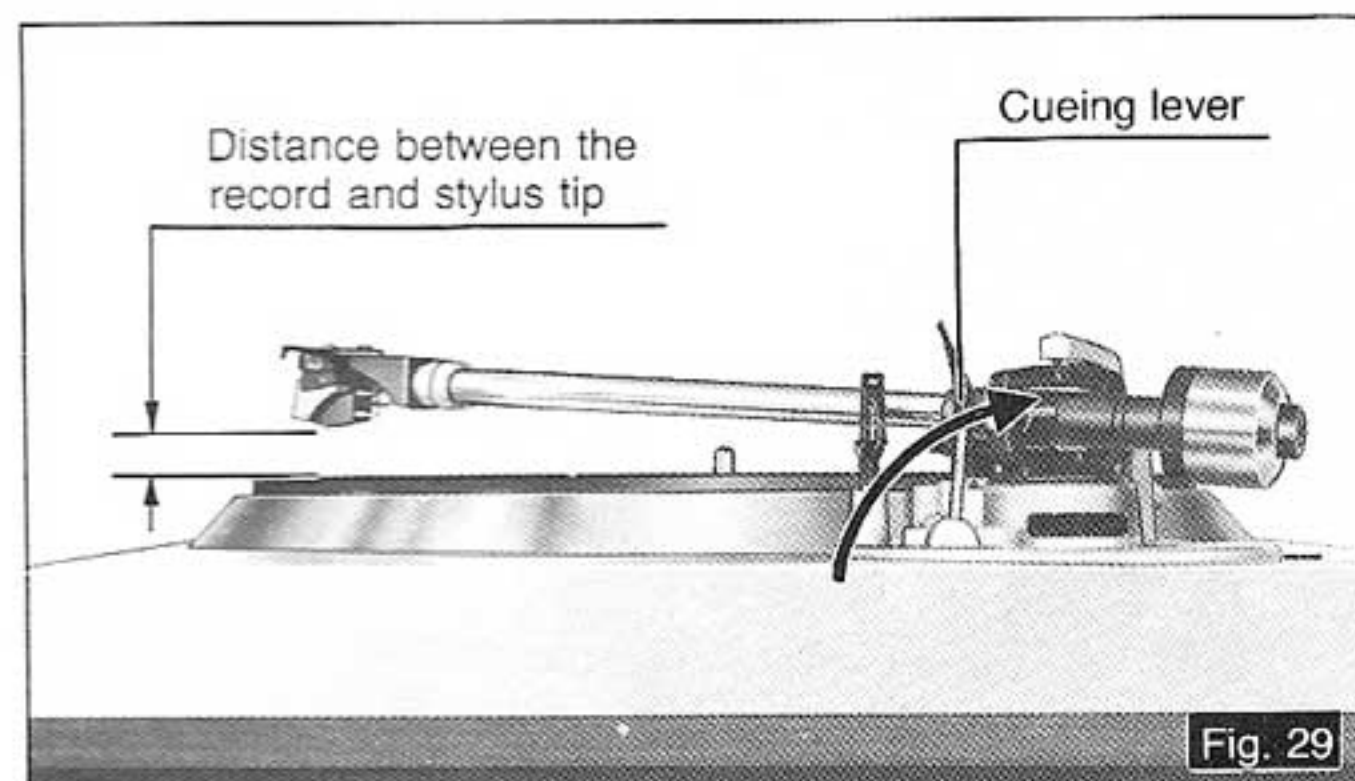


Fig. 29

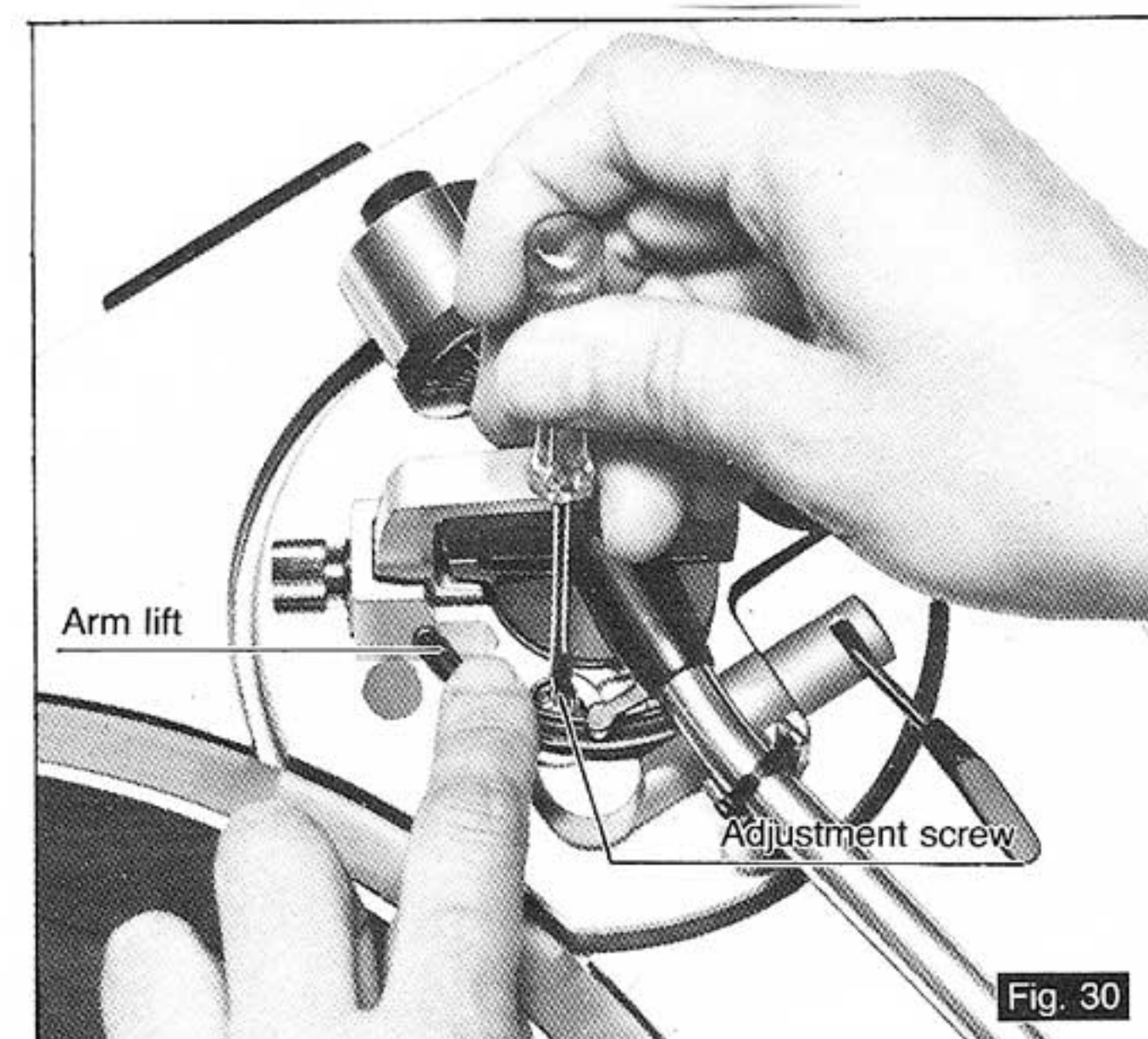


Fig. 30

Note:

As the adjusting screw has a hexagon head, be sure to make the adjustment while depressing the arm lift, and be sure that the hexagon head retracts correctly into the arm lift when released.

Notes and maintenance

③ Adjustment for automatic return position (See Fig. 31).

- 1) Keep the power switch turned OFF (■) to prevent the turntable from rotation.
- 2) Remove the rubber cap.
- 3) Move the tonearm toward the center spindle side, and make the adjustment by gradually turning the adjusting screw.

In cases where the tonearm tends to return before the playing has finished

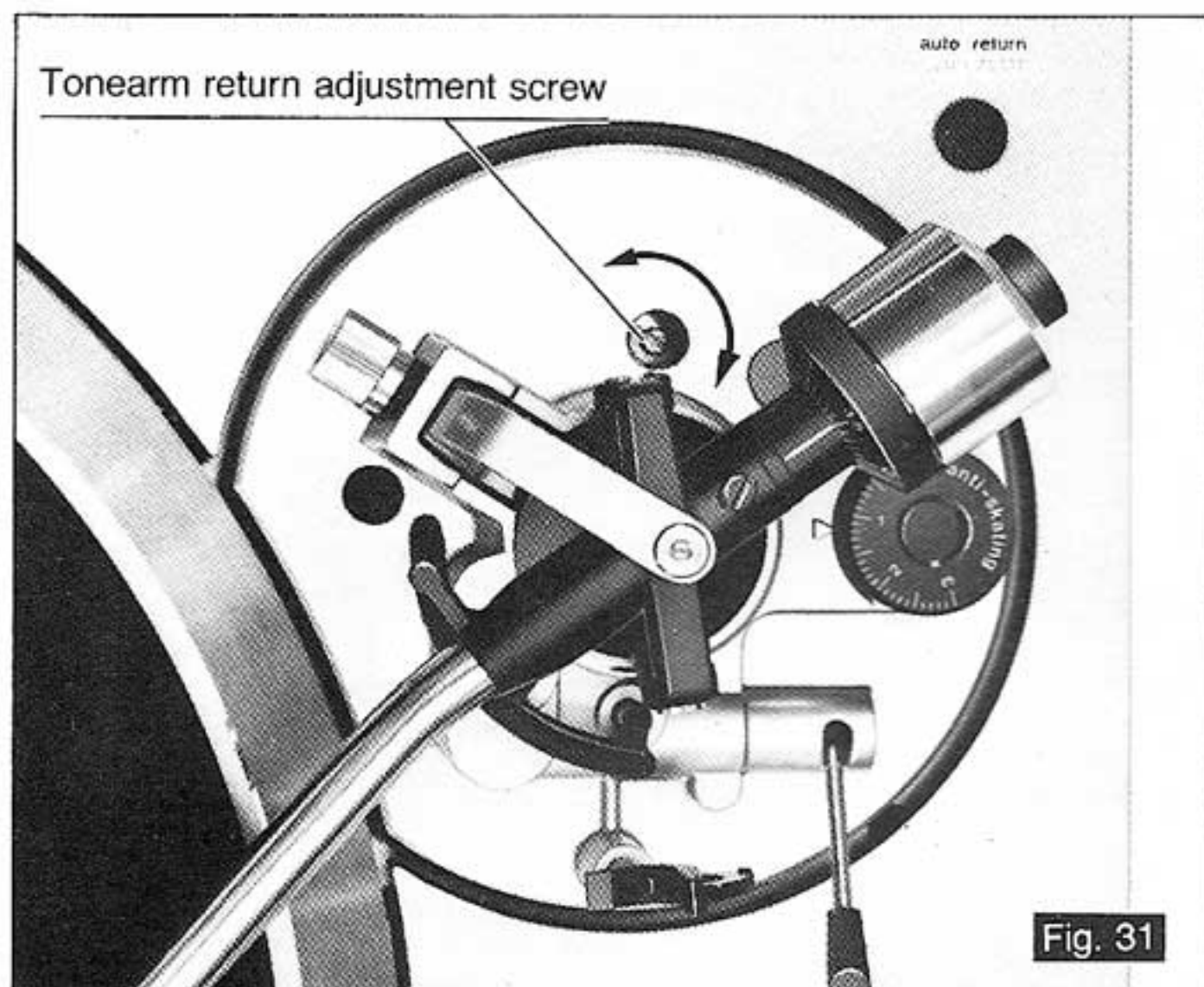
—Move counterclockwise.

In cases where the tonearm fails to return after the last groove of the record

—Move clockwise.

Note:

Never turn the screw over a 180-degree angle.



① Extra care should be taken in handling the turntable platter.

The turntable platter has a rotor (the magnet of the motor) directly connected to it. Therefore, the turntable platter should not be removed from the motor shaft unnecessarily. Should it become necessary to remove the turntable platter, be sure to pull the AC power plug out of the socket.

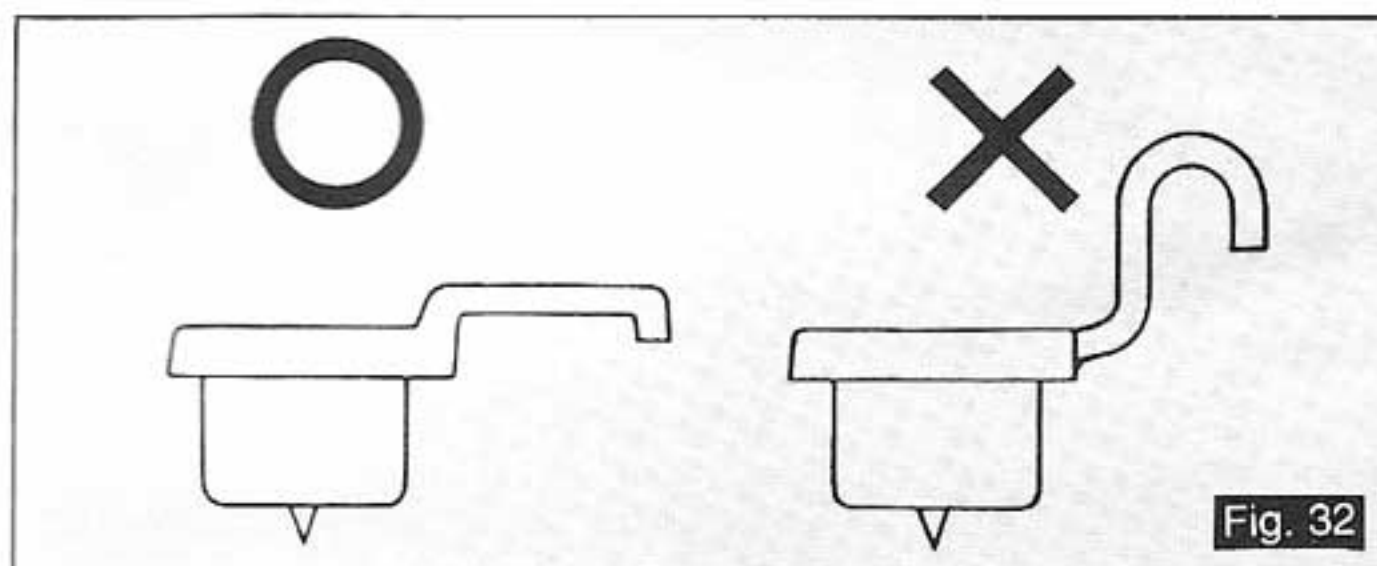
② Before detaching or attaching the headshell, be sure to turn the power of the amplifier or receiver off.

Detaching or attaching of the headshell, with the volume control turned up, may cause damage to the speakers.

③ When using other headshells, make sure about the headshell configuration. (See Fig. 32).

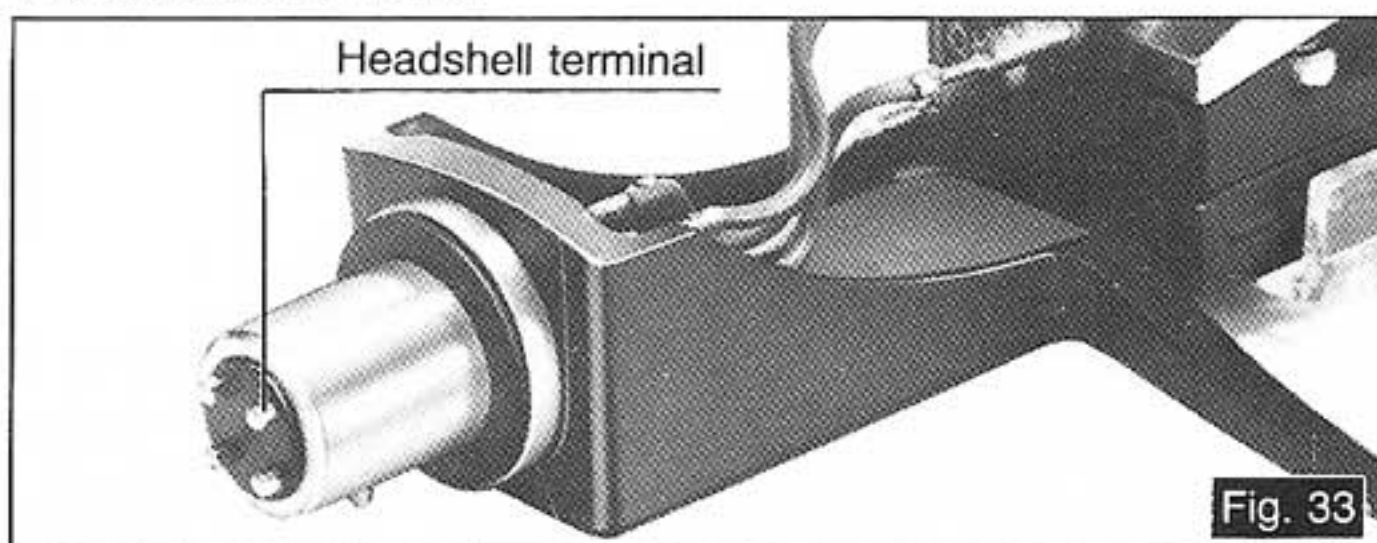
When you use other headshells having high fingerlift handles, the handle portion of the headshell may strike the inner upper surface of the dust cover while the tonearm is in auto return motion.

Therefore, use of such a headshell should be avoided.



④ Wipe the headshell terminals from time to time. (See Fig. 33).

Dust and dirt at the headshell terminals may result in increased "HUM" noise or intermittent sound. Use a soft dry cloth to clean the headshell terminals.



⑤ Use the auto-return switch if the tonearm returns to the arm rest during play.

If an off-center disc is played, the tonearm may automatically return during the course of playing. In such a case, set the auto-return switch to the OFF (■) position, so that the phono disc can be played to the final groove.

⑥ When finished play, be sure to secure the tonearm with the arm clamp.

After finished play, if the unit is not to be used for some time, care should be taken to secure the tonearm to protect the stylus tip. For the same reason, the stylus cover should also be attached.

⑦ Dust and dirt should be carefully removed from stylus tip or records.

Dust and dirt on stylus tip or record may not only result in deterioration of tone quality, but cause undue wear of the record and the stylus tip itself.

Special stylus tip brushes and record cleaners can be purchased in most electronic supply houses.

⑧ Wipe the dust cover and turntable base with a soft, dry cloth.

Never use any cleaners containing alcohol, benzene or thinner.

Use of a chemical dust cloth should also be avoided. Be sure that the dust cover is not exposed to insecticide spray. To remove stubborn finger prints or grease spots detach the dust cover and disconnect the AC power plug. Use a soft cloth slightly moistened with a mild soap and water solution.

Cross section of motor portion and double isolator

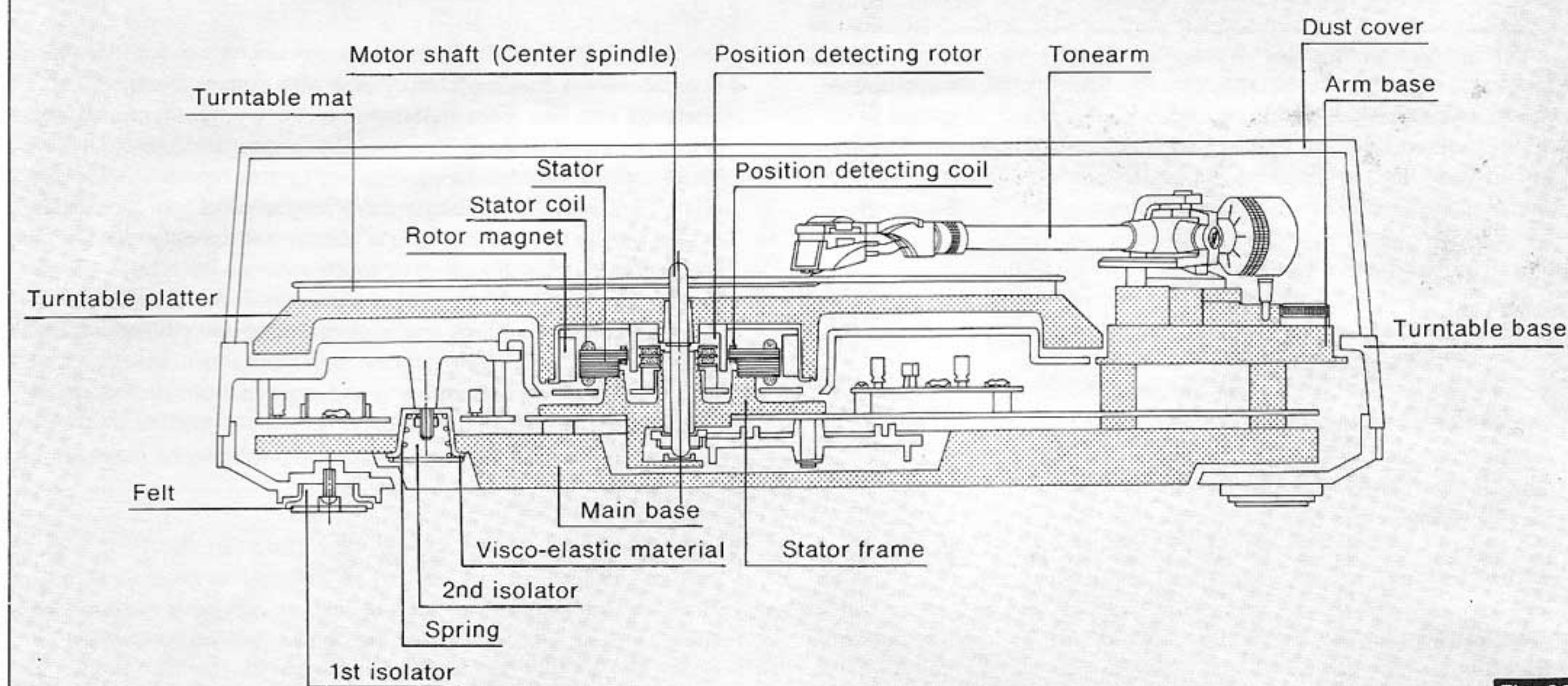


Fig. 36

through its resting surface. The all-important turntable, motor and tonearm assembly are then supported on a second isolation system. These isolators are specially designed with material and springs of calculated, finely-tuned elasticity to absorb external vibrations. Isolation from feedback lets you enjoy clear, transparent sound even at high volume levels.

- **Technics' unique motor construction in which the rotor of the motor is integrally formed with the turntable.**
- **High torque motor delivering 1.5 kg-cm makes it possible to reach 33-1/3 r.p.m. from standstill within 0.7 sec. (1/4 rotation) and to effect instantaneous speed change. (Fig. 37).**
- **Superior load characteristic of 0 rotational deviation even at a stylus pressure of 300 g. (Fig. 38).**
- **High performance with wow and flutter of only 0.025% (JIS C5521) and rumble of -73 dB (DIN 45539B).**
Since the development of the DD turntable, Technics has continually strived for further improvement of player performance and has introduced numerous high performance models on the market. The MK2 is brought into being by a combination of experience and research. The characteristic values of rumble -73 dB (DIN 45539B) and wow and flutter of 0.025% (W.R.M.S JIS C5521) by far exceed the standards to which record albums are made.

■ **Quartz Controlled Rotation Accuracy**

The MK2 utilizes the oscillation of a quartz crystal as a reference signal or source. This oscillation is not affected by temperature change or power fluctuations. By synchronizing the rotation of the turntable platter accurately to the reference signal, speed drift of the MK2 is held within $\pm 0.0001\%$. This means that for a record with a playing time of 30 min. total playing time variation can amount to no more than 0.036 sec. This stable and accurate rotation sets a new standard of precision.

The accuracy under controlled operating conditions as in a listening room is about $\pm 0.00001\%$ as shown in Fig. 39.

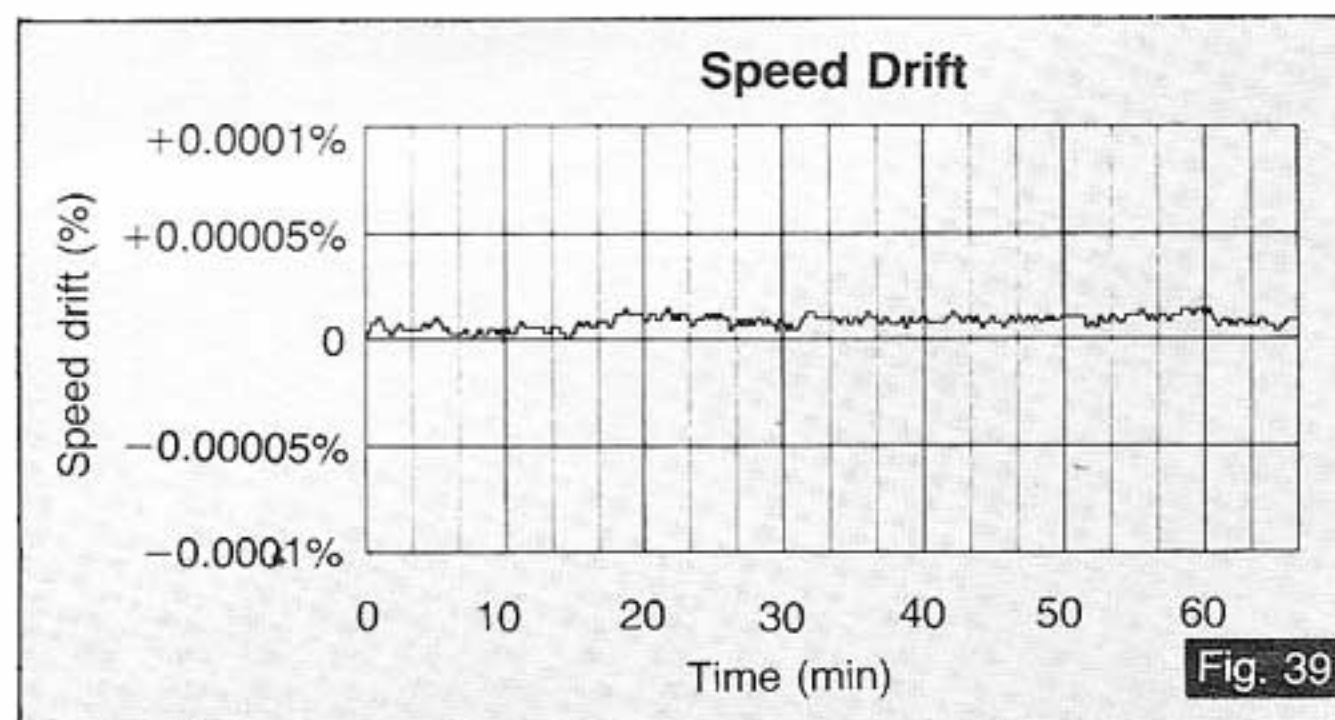


Fig. 39

- **Highly sensitive universal tonearm.**
For the finest tracking sensitivity, the tonearm rests in a gimbal suspension equipped with two pairs of low friction pivot bearings. Gimbal suspension and low tonearm mass means that accurate tracking is possible at tracking forces as low as 0.25 grams. With enhanced rotational sensitivity of 7 mg, the tonearm is allowed free, gyroscopic movement to ensure flawless balance during tracking. The longer-than-usual effective tonearm length (9-1/16" or 230 mm, stylus to pivot) contributes to the arm's low tracking error, and this in turn facilitates the design of the anti-skating control for precise and reliable tracking. With this design, a single precise anti-skating scale counteracts side thrust for all types of styli.
- **Arm height is adjustable within a range of 6 mm to accommodate varying cartridge dimensions.**
- **Resonance dampened headshell with unique overhang adjuster.**
- **Low capacitance phonocables.**

Specifications

General

Power supply	AC 120 V, 50 or 60 Hz
Power consumption	12 W
Dimensions (H×W×D)	14.5×45.3×38.4 cm (5-45/64×17-45/64×15-7/64 inches)
Weight	11.8 kg (26.0 lb)

Turntable section

Type	Quartz-phase-locked control direct drive automatic turntable with quartz synthesizer pitch control, Automatic return and Manual play
Drive method	Direct Drive
Motor	Brushless DC motor
Drive control method	Quartz-phase-locked control
Turntable platter	Aluminum die-cast, diameter 33 cm (13"), weight 2.5 kg (5.5 lb)
Moment of inertia	340 kg·cm ² (116 lb·in ²)
Turntable speeds	33-1/3 and 45 r.p.m.
Turntable speed fine adjustment	Adjustable up to ±9.9% in 0.1% increments by digital indication
Starting torque	1.5 kg·cm (1.3 lb·in)
Build-up characteristics	90° or 1/4 rotation to 33-1/3 rpm
Braking system	Electronic brake
Speed fluctuation due to load torque	0% within 1.5 kg·cm (1.3 lb·in)

Speed drift Wow and flutter

Within ±0.002%
0.025% WRMS (JIS C5521)
±0.035% weighted zero to peak (DIN 45507)

Rumble

−50 dB (DIN 45539A)
−73 dB (DIN 45539B)

Tonearm section

Type	Gimbal suspended universal "S" shaped tubular arm, static-balanced type
Effective length	230 mm (9-1/16")
Overhang	15 mm (19/32")
Tracking error angle	+3° at the outer groove of 30 cm (12") record +1° at the inner groove of 30 cm (12") record
Offset angle	21.5°
Friction	Less than 7 mg (lateral, vertical)
Effective mass	22 g (with a cartridge weighing 6.5 g at 1.25 g stylus pressure)
Tonearm height adjustment	In 1 mm steps to a range of 6 mm
Adjustable stylus pressure range	0–3 g
Cartridge weight range	5–11 g
Cartridge mounting dimensions	12.7 mm (1/2") mounting space
Headshell terminal lug	1.2 mm, for 4-pin terminal
Headshell weight	9.5 g

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