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Dual 1228

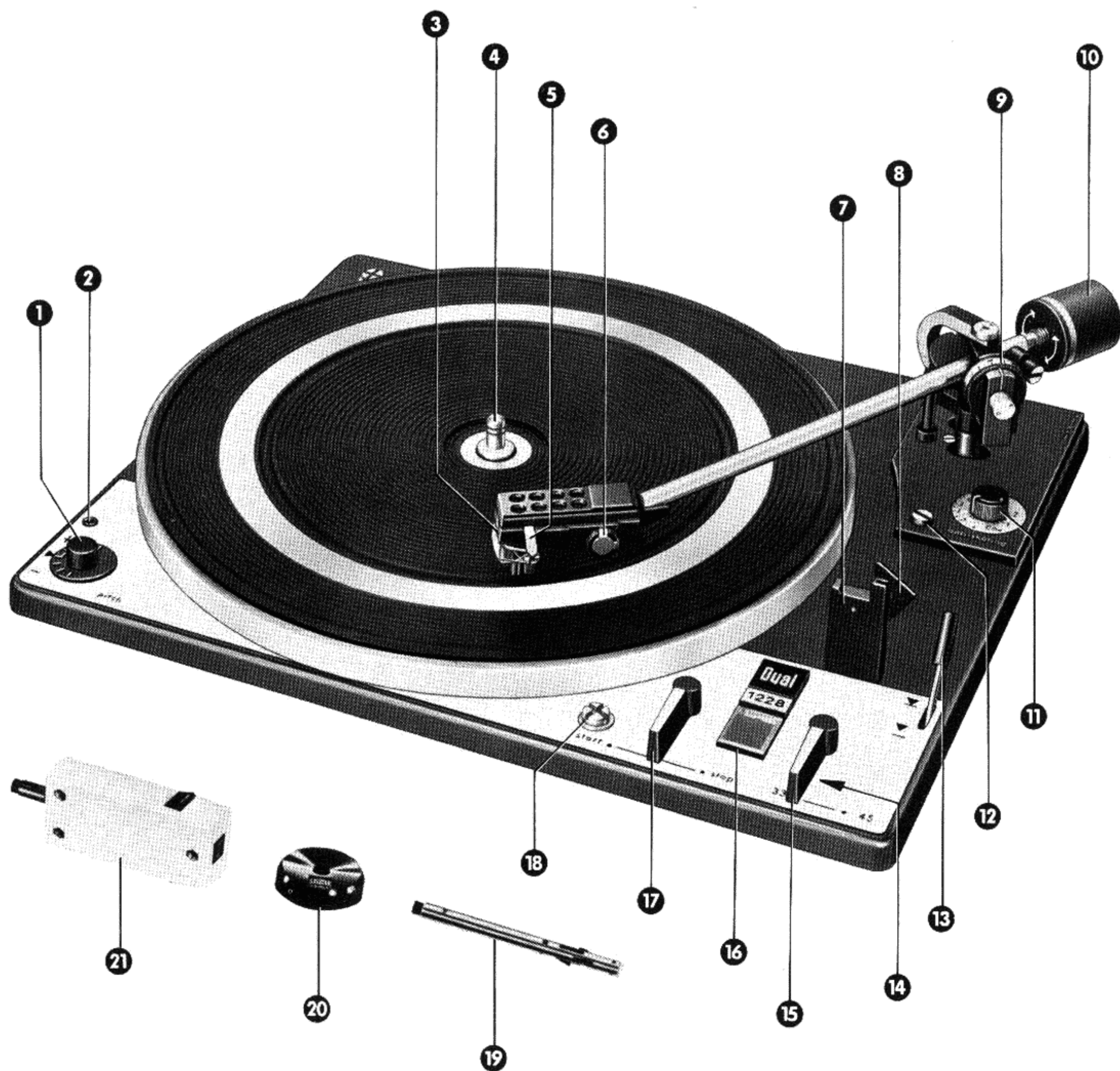
HiFi automatic turntable



Operating instructions

Dual

1228



Dear Record Lover:

Please read these instructions carefully before you set up and operate your new HiFi automatic turntable. By doing so, you will avoid faulty operation or possible damage due to mistakes in installation. Fold out page 2.

Unpacking

Remove all parts used for packing, including the wedges between the chassis and the turntable (Fig. 1B).

Loosen the transit safety screws by turning them clockwise until they slip (about 15 mm), then continue turning them clockwise to lock.

Check that a pick-up cartridge is fitted in the pick-up head and, if necessary, pull off the stylus guard.

If you wish to install a cartridge yourself you will find mounting instructions on page 11. Now check the tonearm balance: with the stylus pressure dial at "0" the tonearm must float horizontally.

Now set the required stylus pressure. The stylus pressure for the factory-mounted cartridge can be found in the cartridge specifications enclosed with this manual.

Balancing the tonearm and setting the stylus pressure is described in detail on pages 11 and 12.

Note: After initial installation and after every transport, allow the automatic mechanism to adjust itself by operating the unit through one change cycle with the tonearm locked on its rest (move the operating lever to "start").

Installation

Where you have purchased the unit as an installation chassis please read the fitting instructions first.

Press the chassis mounting screws toward the edge of the chassis with your thumbs and set the chassis down on the base cutout so that the three spring cups slip into their holes (A). Then turn the mounting screws clockwise. The chassis is spring-mounted (B).

To secure the unit for transport, unscrew the screws, pull them up, then turn them further until the chassis is secured tightly to the mounting board (C).

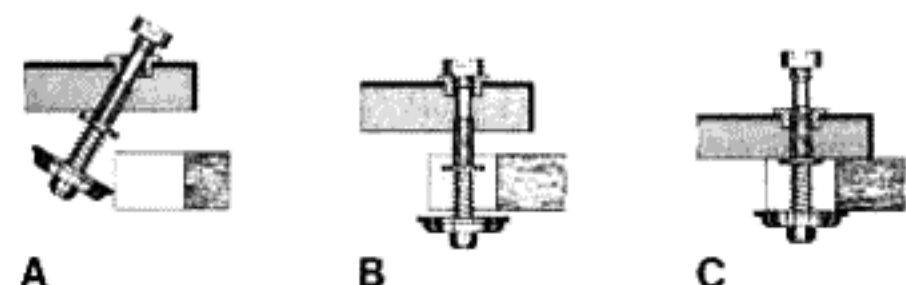


Fig. 1

Power-line connections

If you have a combination unit, please read its instructions in addition to these.

The unit can be used with 50 or 60 Hz alternating current, at 110 - 130 or 220 - 240 volts. It is normally pre-set for 220 volts, 50 Hz.

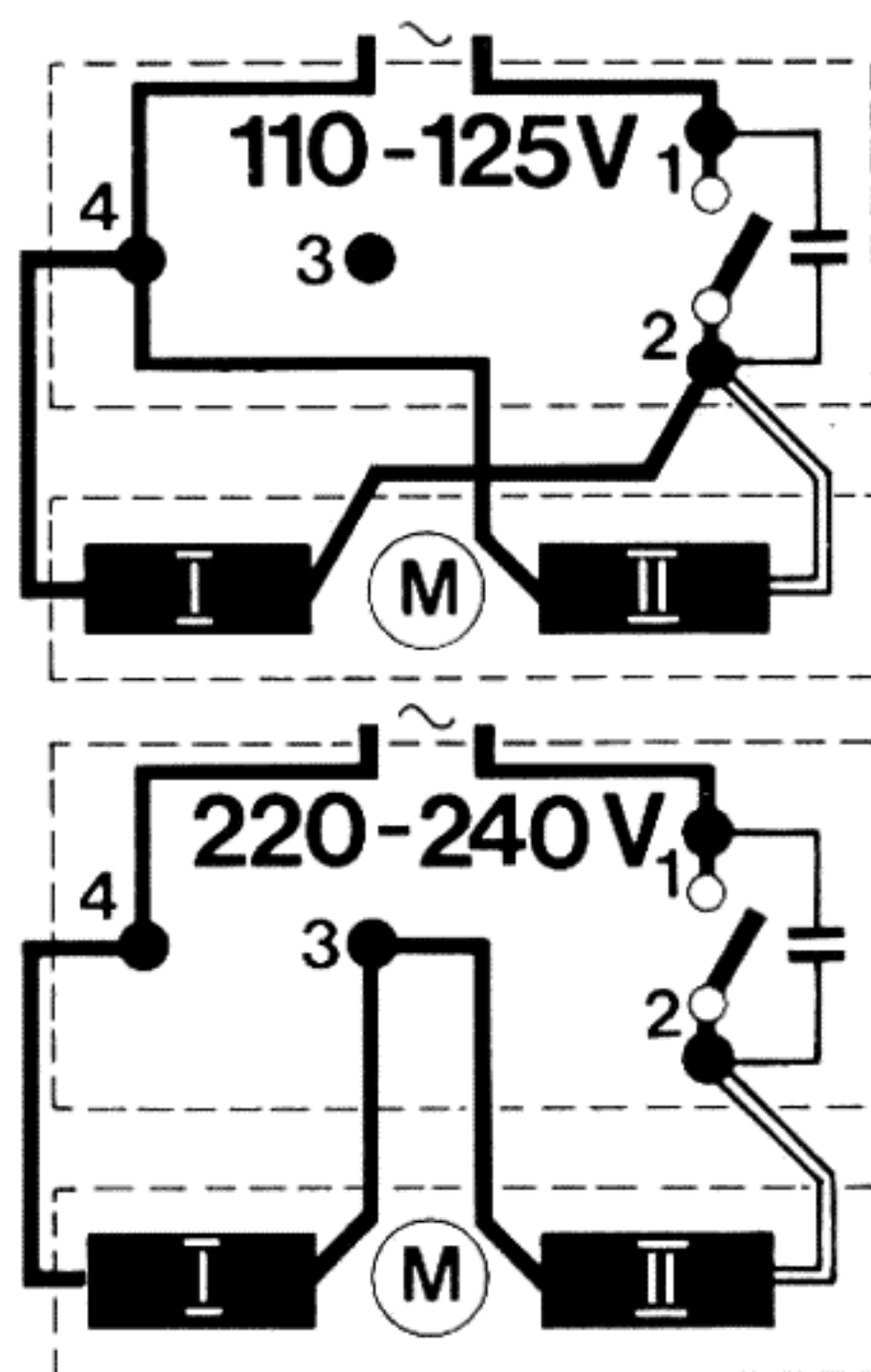


Fig. 2

If a different voltage supply or frequency becomes necessary please consult your dealer or an authorized Dual Service Station.

To change over the voltage, remove the power switch cover.

Changeover is carried out by reconnecting the motor connection lead in accordance with the connection diagram.

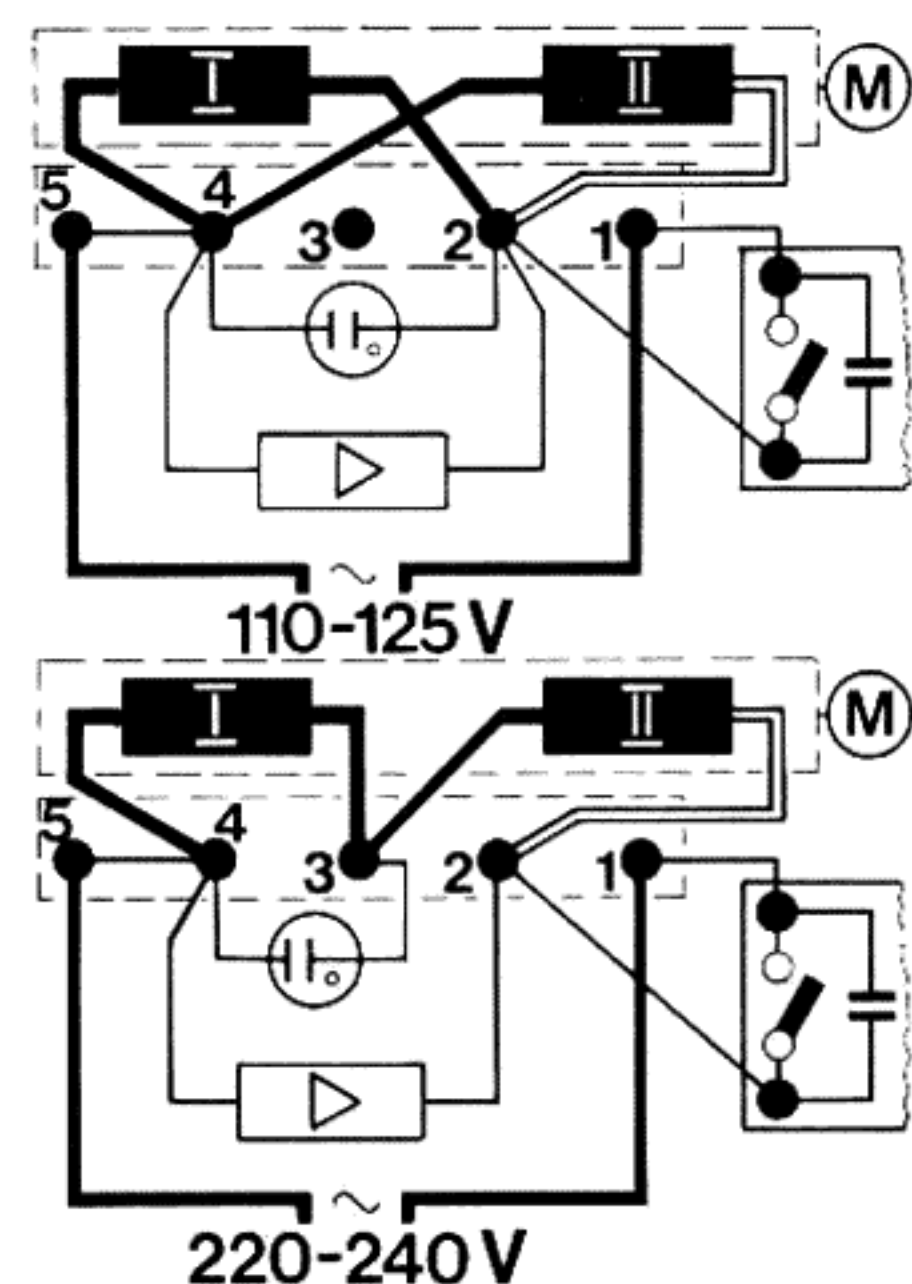


Fig. 3

In units with connection board beside the power switch (Fig. 3) a pre- or output-amplifier can be connected, switching on and off taking place automatically with the record player.

The maximum switching load should not exceed 3 A. It is advisable, of course, only to connect fully transistorized amplifiers which are ready for use immediately without warming-up time.

Connection is carried out at the contacts provided for the purpose on the power switch or the connection board.

The power connection lead of the amplifier concerned should in this case be fitted with AMP connector sleeves:

Catalogue No. 214-602,
Amp No. 925 518/1.

Connection to amplifier

In combination units, i.e. hifi stereograms, the connection of the turntable to the amplifier has already been carried out.

The autochange record player can be fitted with DIN plug (Fig. 4) or RCA (Cynch) plugs (Fig. 5).

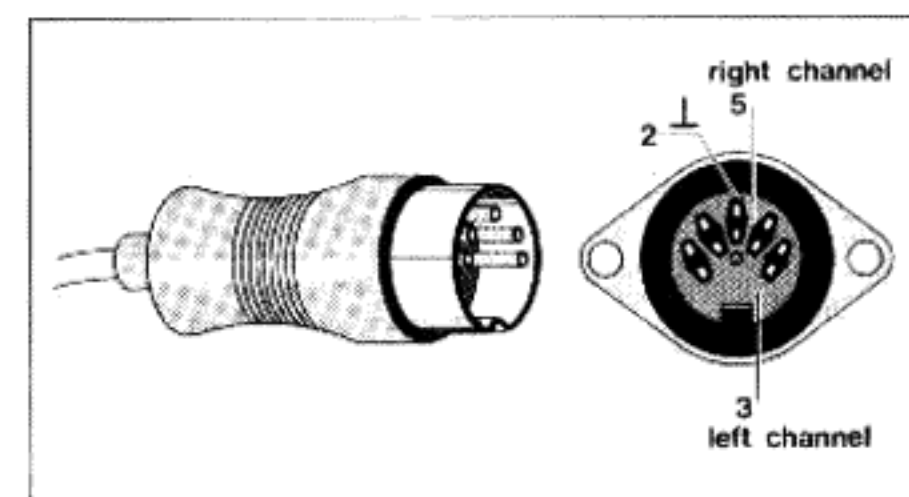


Fig. 4

If the playback amplifier is fitted with a different plug connection adaptors can be used. Your dealer will give you information.

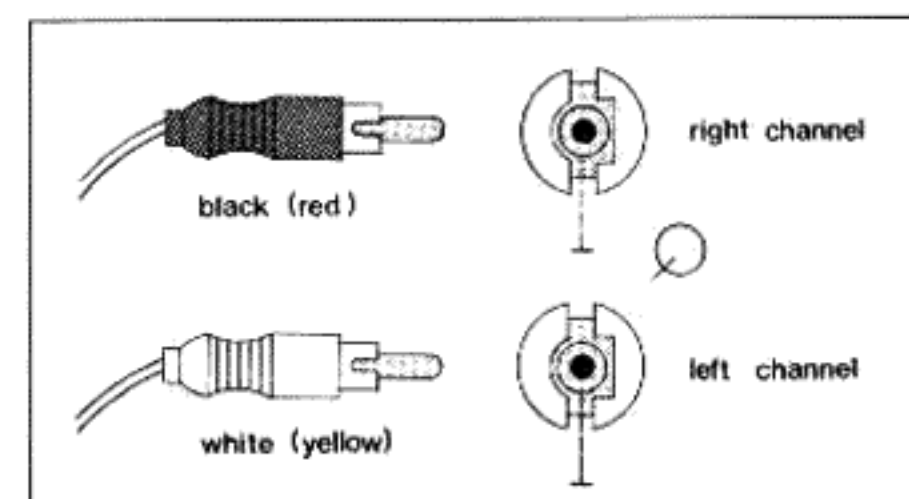


Fig. 5

If your stereo amplifier or tuner has no direct input for magnetic pick-up systems, a deaccentuator preamplifier is necessary.

We recommend the equalizer-preamplifier Dual TVV 47, which has plug-in connections and fits into the base of the player unit.

This player meets international safety standards for radio and related equipment (IEC 65) and is approved by the various national safety organizations (VDE, SEV, SEMKO, CSA, UL, etc.).

Controls

- ① Pitch control knob
- ② Speed fine adjustment knob
- ③ Cartridge holder with cartridge
- ④ Single-play spindle
- ⑤ Tonearm left and lock
- ⑥ Vertical tracking angle selector
- ⑦ Tonearm rest
- ⑧ Tonearm lock
- ⑨ Stylus pressure setting
- ⑩ Tonearm counterbalance
- ⑪ Anti-skating setting
- ⑫ Tonearm cue control height adjustment
- ⑬ Cue-control
- ⑭ Tonearm set-down adjustment
- ⑮ Speed selector
- ⑯ Illuminated strobe for speed control
- ⑰ Start/stop operating switch
- ⑱ Transport safety screw
- ⑲ Multiple-play spindle AW 3
- ⑳ Adapter for large-hole records
- ㉑ Multiple-play spindle AS 12 for large-hole records (special accessory)

Operation in single-play mode

Set tracking angle selector ⑥ to "s". Insert the short, single-play spindle ④, (and, for 45 rpm records, the center-hole adapter) ㉑, then place the desired record on the platter.

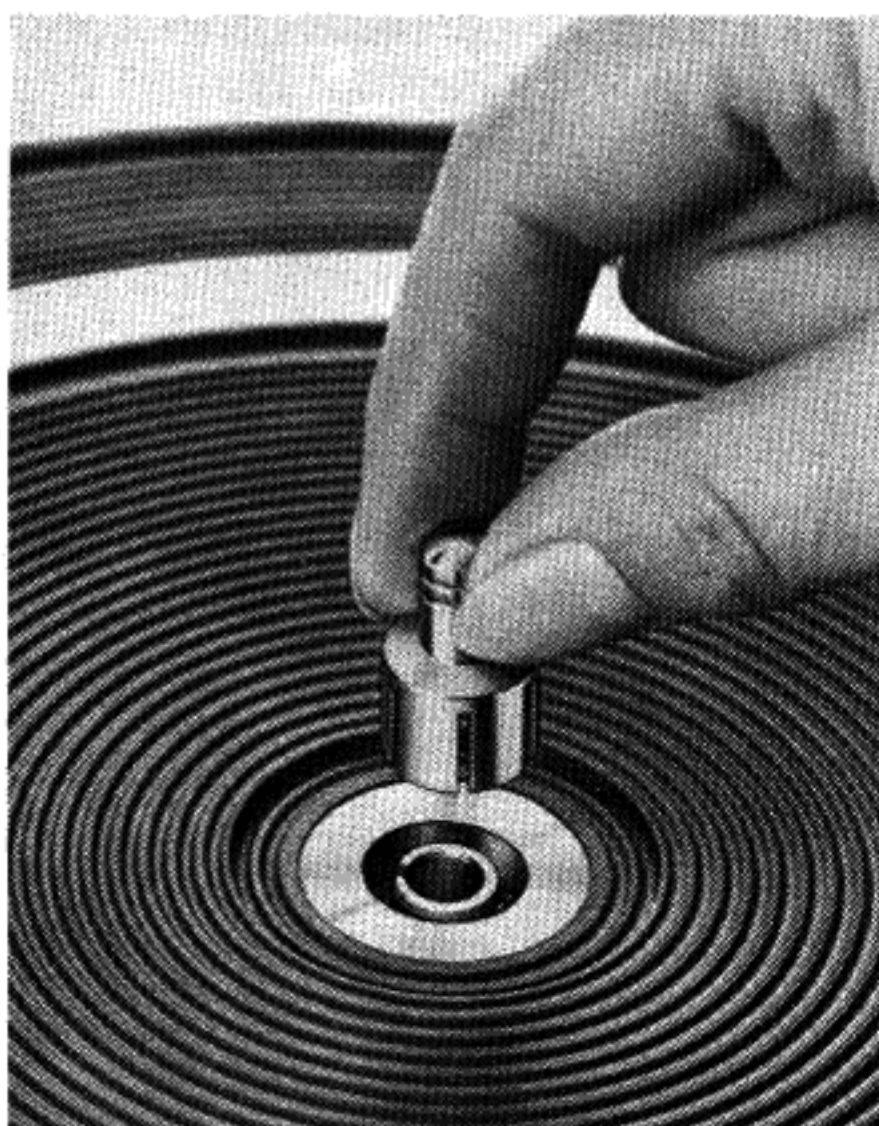


Fig. 6

Select the platter speed (33 1/3 or 45 rpm), release the tonearm (Fig. 7) and raise the stylus guard.

1. Automatic start

Move the operating switch to "Start".

The tonearm is automatically set for indexing 12" (30 cm) records and 7" (17 cm) records. Indexing is interlocked with the speed selector.

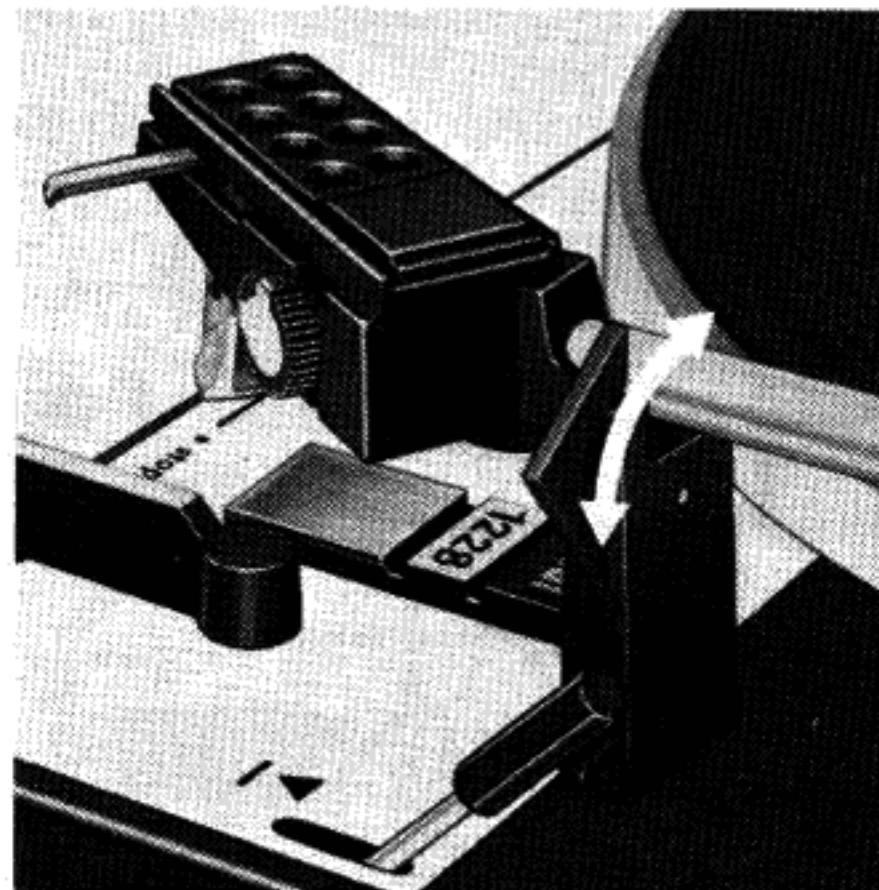


Fig. 7

The tonearm will set down in to the lead-in groove of 12" (30 cm) records when switched to 33 1/3 rpm, and in the lead-in groove of a (17 cm) record when set to 45 rpm. To initiate "start" or "stop" function, press the switch ⑰ all the way. The tonearm lowers very slowly and sets stylus gently in the lead-in groove of the record.

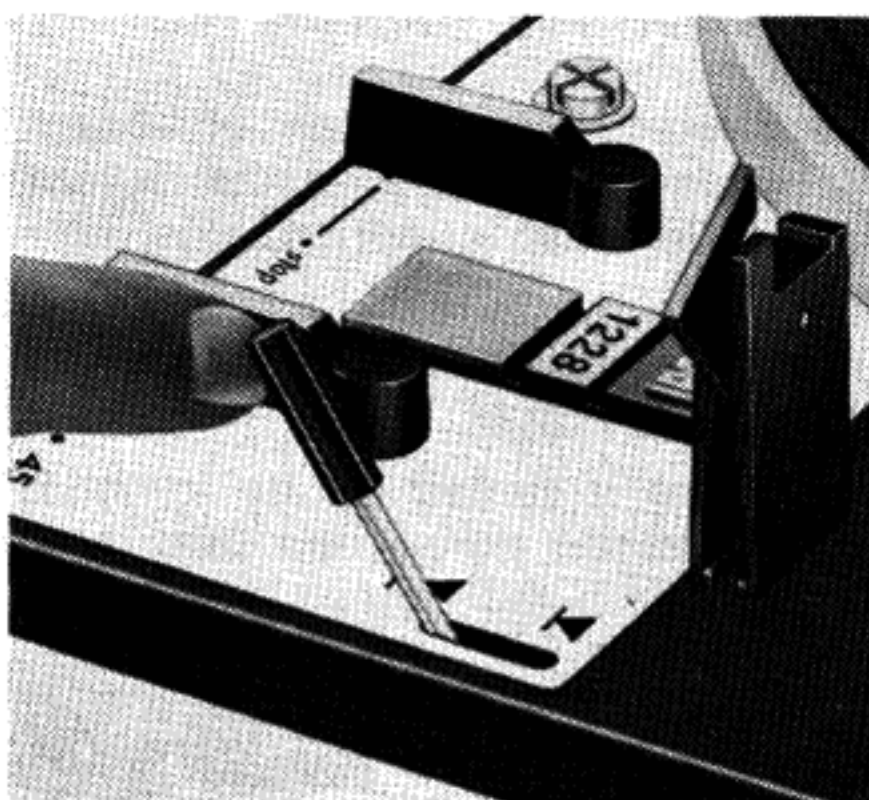


Fig. 8

2. Manual start

With the cue control lever in position ▽ and automatic start, the tonearm moves in set-down position. By moving the control lever, the tonearm will descend to any desired place on the record.

- a) Move cue control lever to position ▽.
- b) Move tonearm by hand over the desired point of the record.
- c) Move control lever to position ▽.

3. To replay record from beginning

Move switch to "start".

4. Interruption of play

Move cue control lever to position ▽. The tonearm will lift and remain over the rotating record. Move the lever to ▽ and the tonearm will set down. The grooves last played will be repeated.

5. Shut-off

Move switch to position "stop". The tonearm will return to its rest position, and the unit will shut off automatically.

Note: For playing records whose diameter and speeds are other than 12"/33 1/3 or 7"/45 rpm, the tonearm must be set down by hand (see Section 2, "Manual Start").

After the record has been played, shut-off and tonearm return is automatic. The tonearm should then be locked (Fig. 7) and the stylus tip protector moved down again.

Automatic record change

Vertical tracking angle selector ⑥ on "m". Insert either the conventional changer (long) spindle ⑲ or the special one for large-hole ㉑, 45 rpm records*, so that the pin slips into the corresponding slot in the shaft. Lock the spindle in place by pressing down on it and turning it to the right, until it stops.

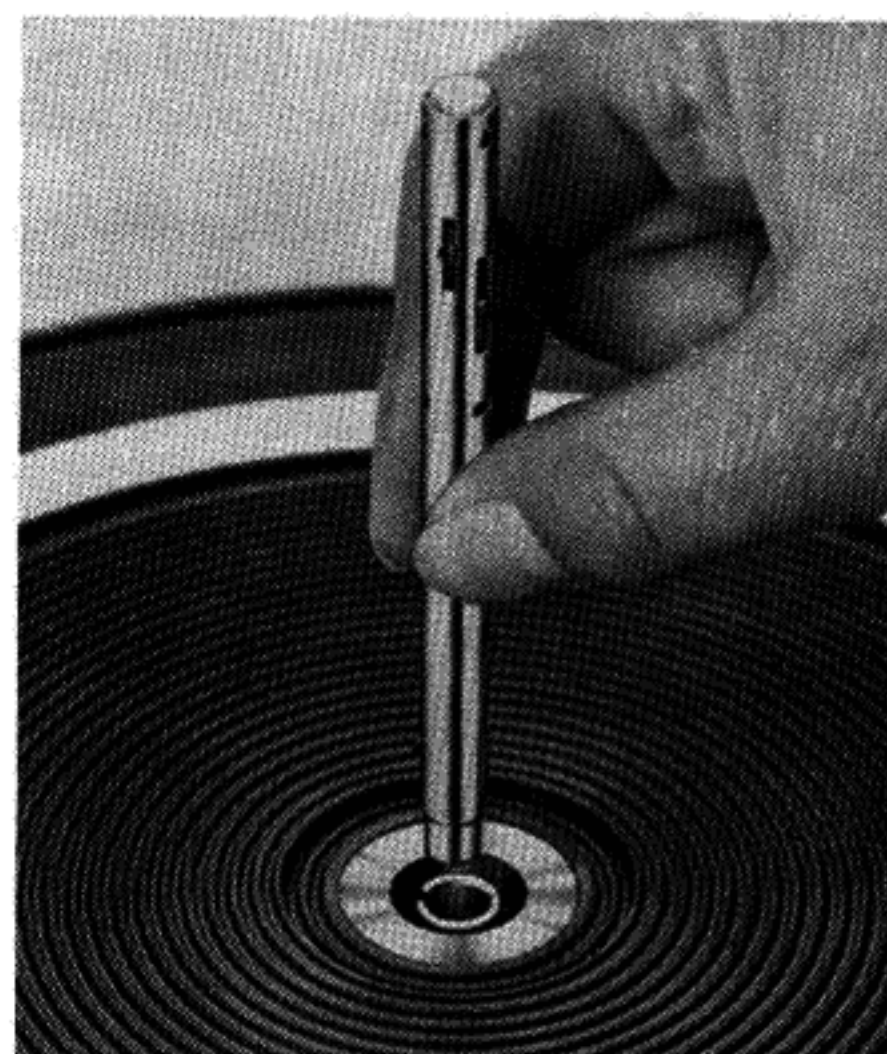


Fig. 9

Place up to six 7", 45 rpm records or 12", 33 1/3 rpm records on the multiple play spindle.

When you move the operating switch to "start", the first record will drop and the tonearm will lift, move to the record, then descend. If you wish to reject a record that is playing and move on to the next, move the operating switch once again to "start".

Note: Records that have been played can be lifted back up the spindle for repeat plays, or removed altogether. There is no need to remove the spindle in either case.

* The 45 rpm record spindle AS 12 is available from radio dealers as an accessory.

Continuous automatic play

Once the record has been placed on the platter, insert the center piece through the multipleplay spindle. It is recommended to place a 45 rpm record on top of the center piece for added weight.

Set platter speed ⑤ and start the unit on automatic or manual.

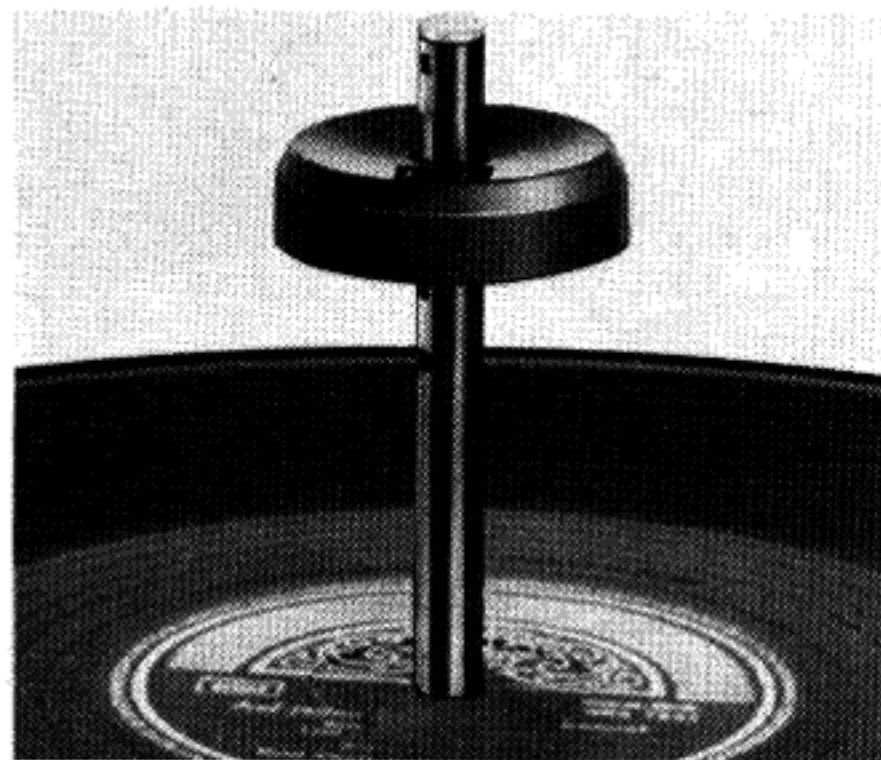


Fig. 10

The record will then play continuously without interruption.

Technical notes

Cartridge

The following instructions are applicable only if you want to install a cartridge of your own choice.

Cartridges for your unit should be installed by your Dual dealer with the exception of cartridges equipped with Dual mounting supports. Use the cartridge holder already mounted on the tonearm, or have the cartridge mounted on an additional cartridge holder (Dual TK 14 Catalogue No. 215 430).



Fig. 11

This model will accept any cartridge weighing from two to ten grams (including mounting hardware) and having 1/2" spaced mounting holes.

1. To mount the cartridge, detach the cartridge holder ③ from the tonearm by pressing the tonearm lift backward ⑤, while holding the cartridge holder with your hand to prevent its falling down when the lock is released.

2. Using the hardware provided, mount the cartridge on the cartridge holder. Use the gauge to make sure that the cartridge is mounted in the geometrically proper place in the cartridge holder (fig. 12).

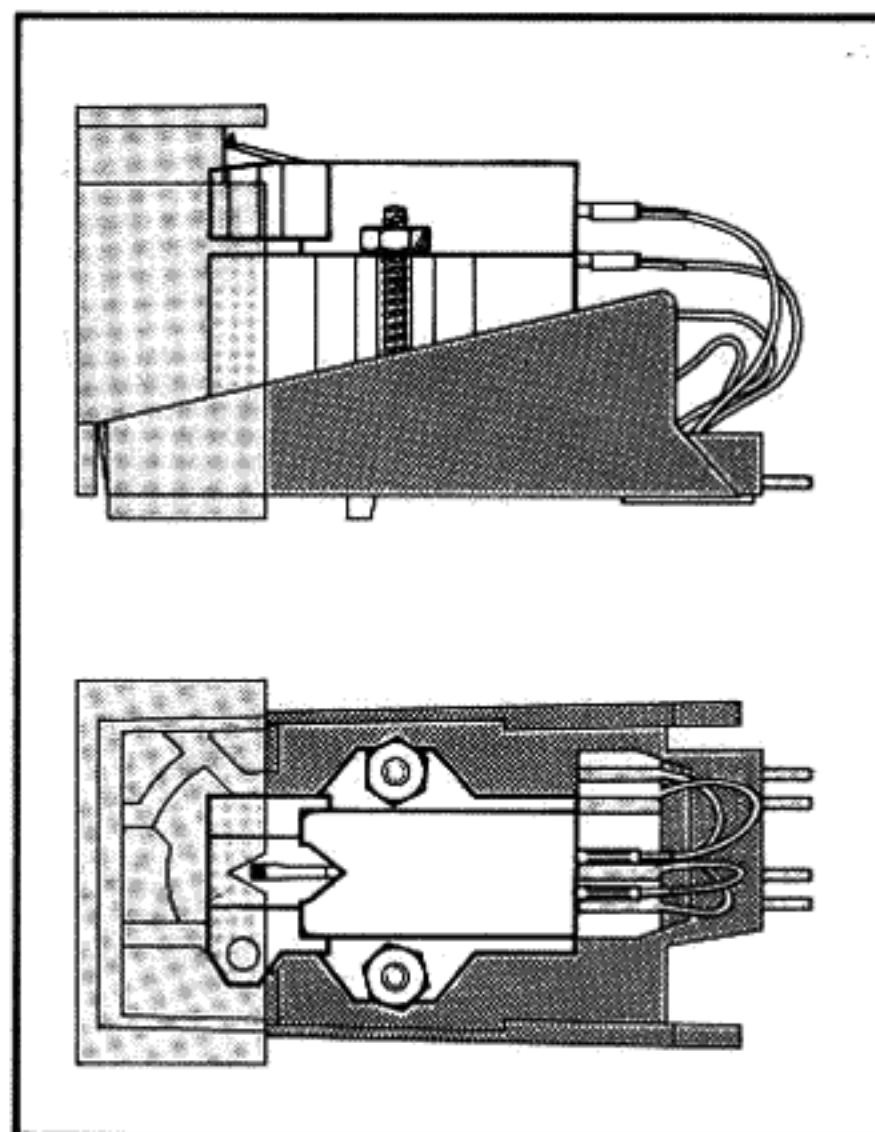


Fig. 12

3. The connection inputs on the cartridge holder and on the cartridge are color coded (Fig. 13). Connect the leads of the cartridge holder to the correspondingly coded connection pins of the cartridge.

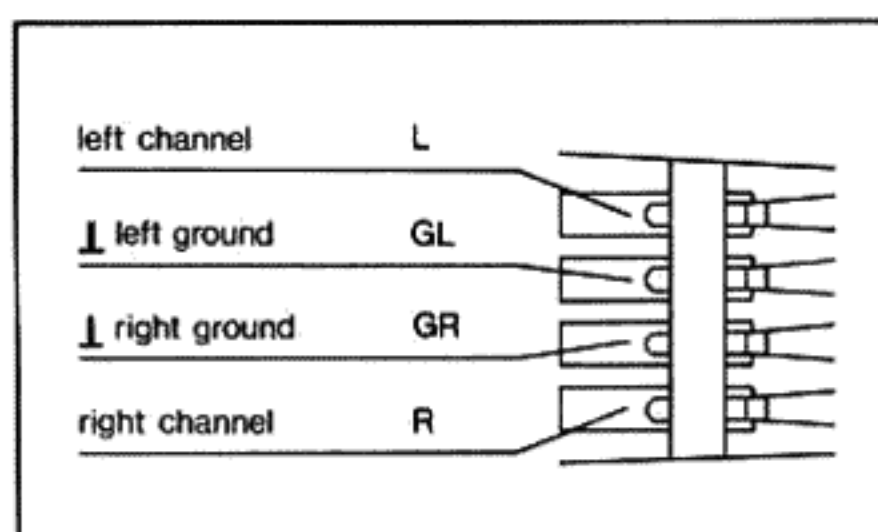


Fig. 13

4. Install the cartridge holder underneath the tonearm head and lock it again to the tonearm by swinging the tonearm lift forward.

After completing the installation of the cartridge, check the height of the stylus with the cue-control in position ▽. Also check the set-down position of the stylus in the lead-in groove of the record. See "Cue Control" on page 12, and "Adjustment of the Tonearm-Set Down-Point" on page 13.

Stylus

In normal use, every stylus is subject to wear and tear. We recommend that it be inspected occasionally, but certainly after approximately 300 playing hours in case of diamond styli. Your Dual dealer will do this without charge. Worn or damaged (chipped) styli will grind the modulation out of the record grooves and damage the records. In case of replacement, obtain only the stylus type recommended in the Technical Data for the cartridge. Imitations cause noticeable loss in sound quality and rapid record wear.

Please keep in mind that the stylus holder with the diamond tip is necessarily very delicate in order to provide quality performance. It is, therefore, extremely sensitive to harsh handling, accidental touch, blows, etc. Take the cartridge in the holder to your Dual dealer for inspection of the stylus. (Removal of cartridge holder is described above).

Balancing the tonearm

Shifting the counterbalances the tonearm coarsely; turning the counterbalance ⑩, balances the tonearm finely.

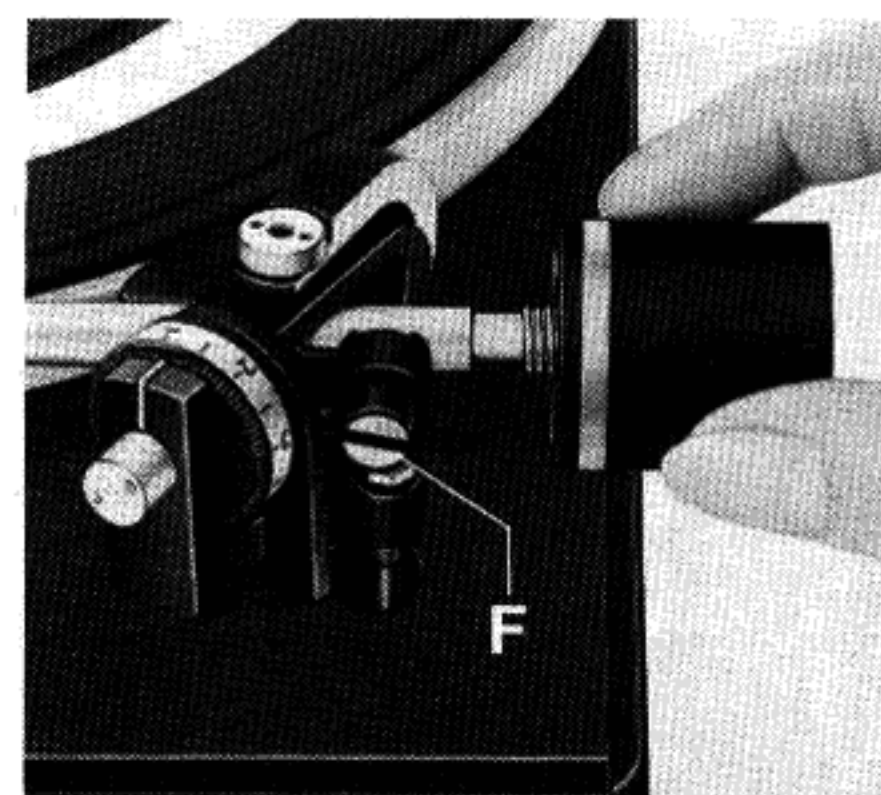


Fig. 14

1. Set stylus pressure dial ⑨ and anti-skating dial ⑪ to "0" (zero).

2. Unlock the tonearm, and lift it off the rest.

3. If the tonearm does not come to rest horizontally, loosen setscrew (F) and slide the counterbalance with its shaft until an approximate balance has been achieved. Then secure the shaft of the counterbalance by tightening the setscrew.

4. Now find the exact balance by turning the counterweight. The tonearm is exactly balanced when edge "A" of the tonearm head profile is at precisely the same height as edge "B" of the tonearm rest (Fig. 15), or when the tonearm, after being tapped into vertical posi-

tion, returns automatically to a horizontal position. When balancing the tonearm, the automatic mechanism must be disengaged. To be sure of this, place the cue control in position **▼** and, turn platter by hand clockwise a few rotations.

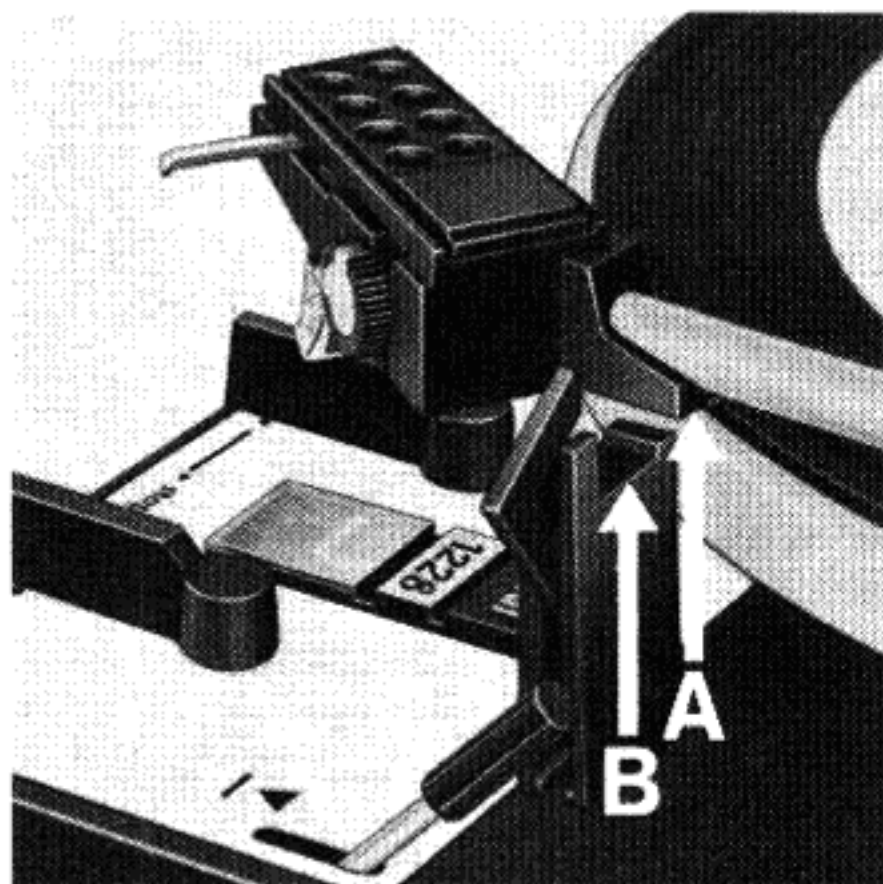


Fig. 15

Precise balance is especially important with cartridges that require a low stylus force. The balancing operation need be done only once, unless you install a different cartridge.

Setting the stylus pressure

Each cartridge has an optimum stylus pressure. See instructions supplied with your cartridge.

Too low a stylus pressure will cause distortion in loud passages. If, however, the stylus force is too high, the stylus and record may both be damaged.

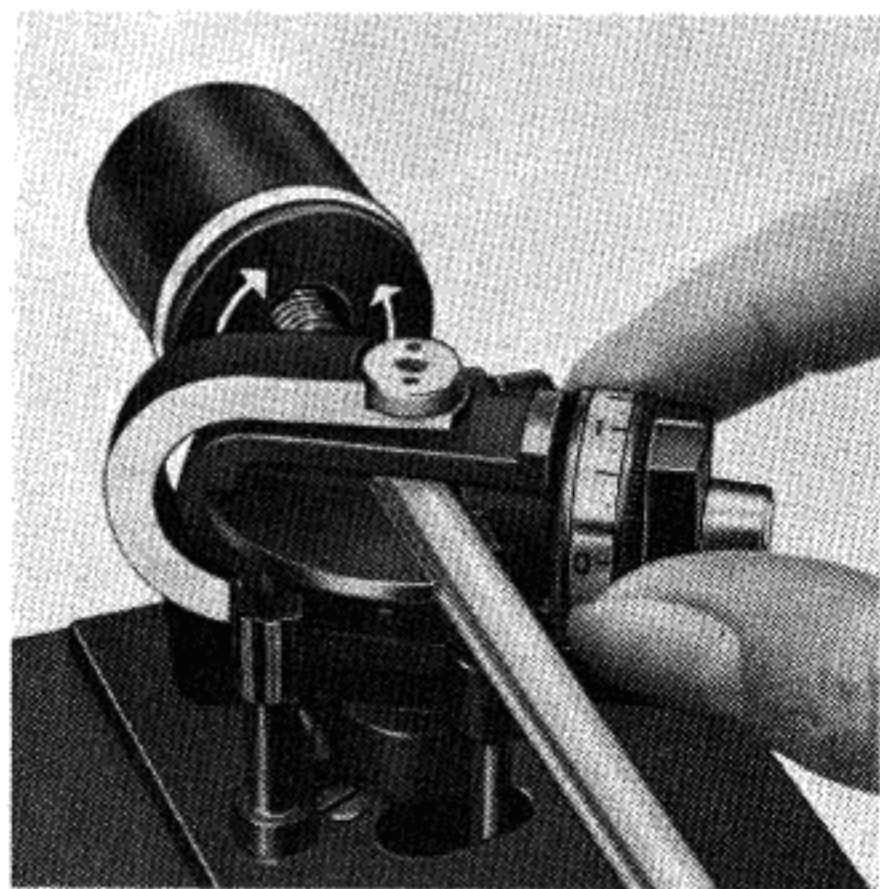


Fig. 16

Once the tonearm is balanced, the stylus pressure is set to the recommended value for the cartridge by turning the stylus pressure scale ⑨. The stylus pressure can be set to any value from 0 to 5 grams. The unit is designed to operate with stylus pressures from 0,5 gram up.

Antiskating

To compensate for skating force, a counterforce, precisely defined in height and direction, must be applied to the tonearm. The anti-skating mechanism of the unit fulfills this requirement. The adjustment knob ⑪ on the chassis allows the change of the skating compensation even while a record is being played, for example, when playing a moistened record after a dry record.

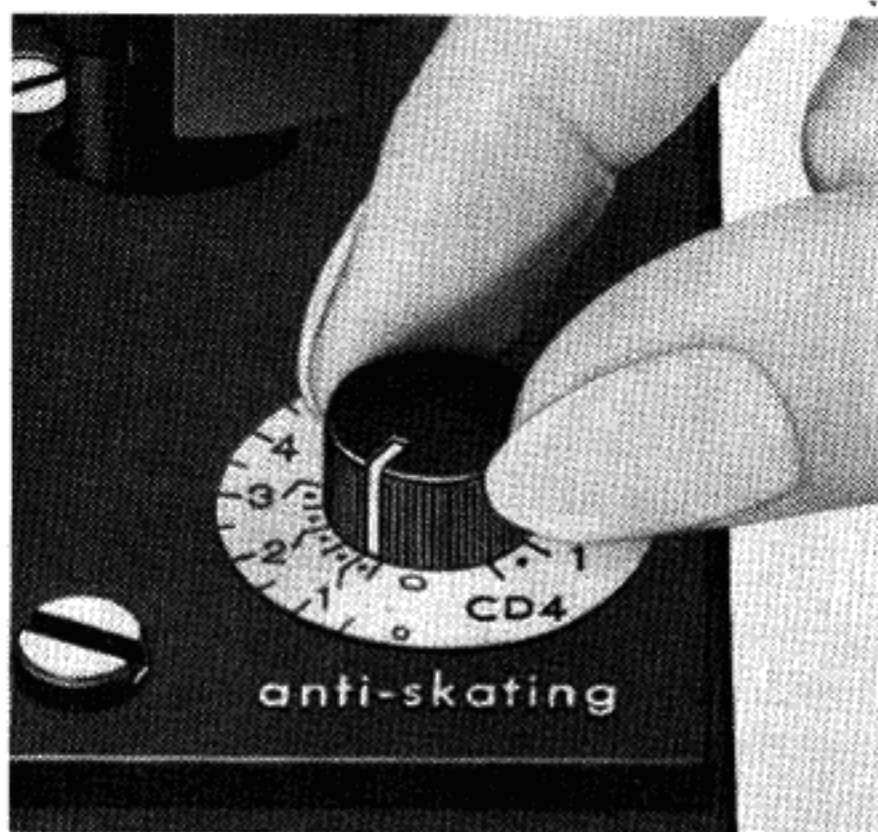


Fig. 17

For the two types of styli commonly in use today, two different adjustment scales are provided, corresponding to the two symbols:

○ = scale: calibrated for spherical styli with $15\ \mu\text{m}$ tips according to DIN 45 500

◌ = scale: calibrated for biradial (elliptical) styli with radii of $5 - 8 \times 18 - 22\ \mu\text{m}$.

If you have fitted the player with a pick-up cartridge for 4-channel playback of CD 4 quadraphonic records, use the black CD 4 scale for anti-skating adjustment.

The setting of anti-skating compensation corresponds to the setting of stylus pressure:

Set the anti-skating knob to the number on the appropriate scale which corresponds to the stylus pressure you have set. That is, for a stylus pressure of 1.5 grams, set the anti-skating knob also at "1.5".

When playing records moistened with a cleaning agent, the skating force is reduced by approximately 10%. In such cases we recommend a corresponding 10% decrease in anti-skating compensation.

Vertical Tracking Angle

To maintain the correct vertical tracking angle when the unit is used in multiple-play as well as when it is used as a single-play turntable, the pick-up head (cartridge holder) is equipped with a changeover device.

Selector Knob on "s"

Position for Single Play.

The cartridge is adjusted for one record on platter so that the tonearm is parallel to the record when playing.



Fig. 18

Selector Knob on "m"

The cartridge is adjusted to the center of a stack of six records.



Fig. 19

The change from "s" (Single Play) to "m" (Multiple Play) must also be made, if the top record of a stack laying on the platter is being played or repeated.

Cue Control

Your unit is equipped with a shock-free cue control silicone damped in both directions. Thus, the tonearm can be lowered to any desired point on the record more gently than by hand. The rate of descent of the tonearm is unaffected by temperature changes. When lifted, the tonearm does not appreciably change its horizontal position.

The lever of the cue control has two positions:

- ▼ playing position
- ▼ selecting position, tonearm raised

A light touch on the lever starts the descent of the tonearm. The height of the stylus tip over the record in the raised tonearm position ▼ can be varied from 0 to 6 mm by turning the adjustment screw ⑫.



Fig. 20

When the cue control is in position ▼ and the operating switch turned to "start", the tonearm moves to the set-down position over the record. Movement of the lever lowers the tonearm to any desired point on the record.

Pitch control

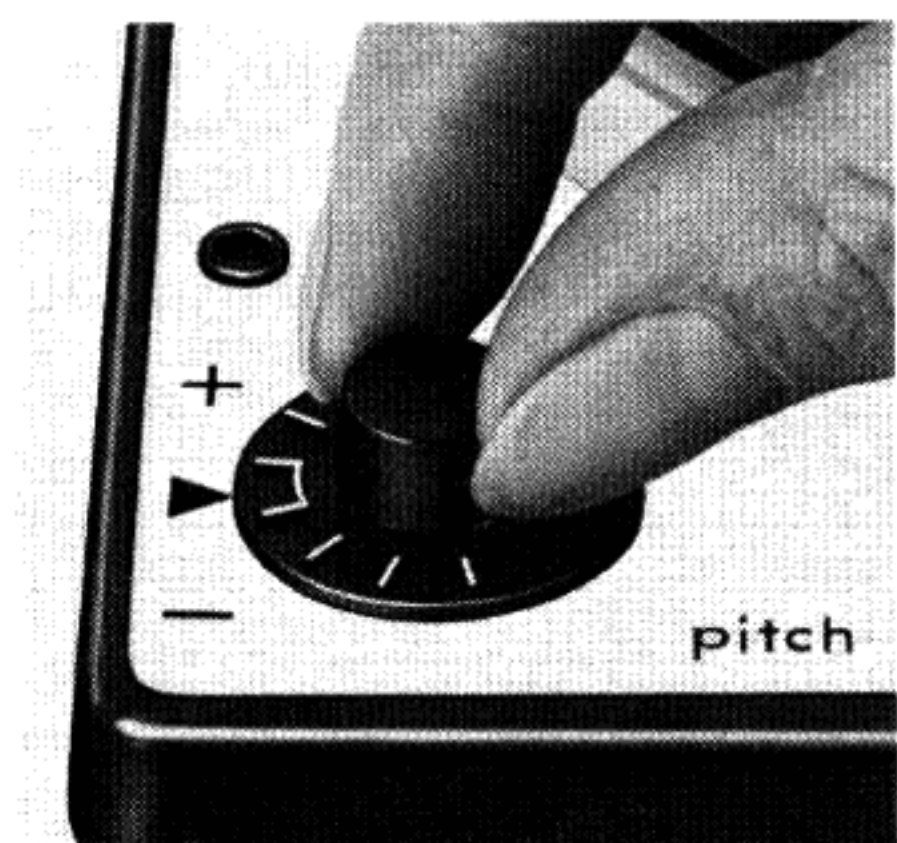


Fig. 21

Each of the two standard speeds (33 1/3 and 45 rpm) can be varied about 6 % (about a semitone) with the pitch control ①. This permits adjusting the pitch and tempo of recorded music.

The speed of the platter can be adjusted even during play by observing the stroboscope. When the platter rotates at ex-

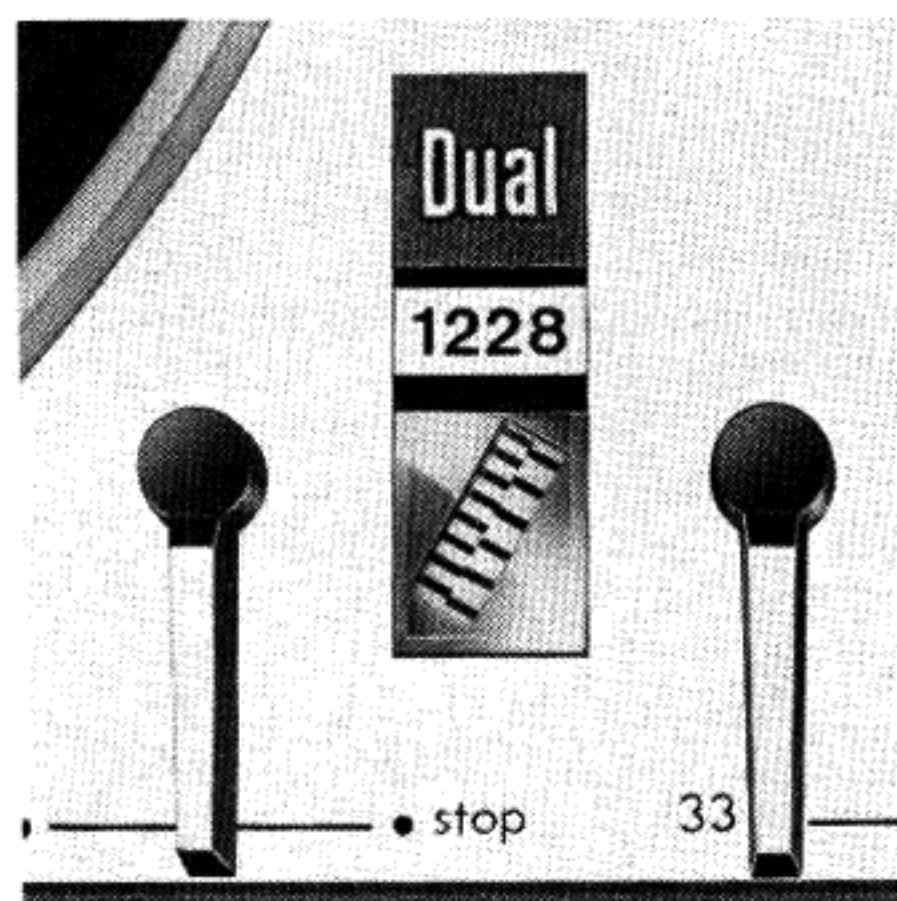


Fig. 22

actly 33 1/3 or 45 rpm, the pattern of lines on the stroboscope appears stationary. If the pattern appears to advance in the same direction as the turntable, the turntable speed is too high. If the pattern appears to retreat, the speed is too slow. Adjustment is made with the pitch control knob ①.

Calibration of Pitch Control

In setting up your player for the first time or after it has been shipped, the pitch control should be adjusted. Proper pitch control adjustment is indicated when the speed control knob is set to 33 1/3 r.p.m. and the stroboscope markings ⑥ remain stationary with the pitch control knob ① within the zero area on the scale.



Fig. 23

Should the pitch control adjustment occur outside of the null area, a correction is required as follows:

1. Set the speed control at 33 1/3 and the pitch control knob ① to the middle of the zero area.
2. Use the enclosed hexagon screwdriver to regulate ② the speed until the stroboscope lines remain stationary. Compensating adjustment is required in the same direction that the strobe markings; if the marks drive to the left corrective rotation is to the left.

50 or 60 Hz line (mains) frequency

Conversion to a different power line frequency is accomplished by changing the motor drive pulley and resetting the stroboscope. To do this, the platter must be removed.

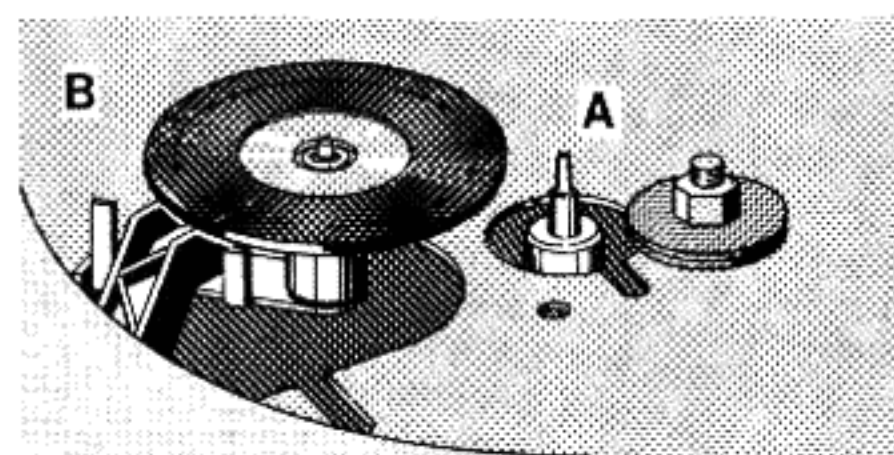


Fig. 24

The motor pulley (Fig. 24A) can be pulled off after loosening its setscrew.

Caution! Handle the pulley carefully. A damaged pulley causes rumble. Part numbers for motor pulleys: 50 Hz, Part no. 232 900 60 Hz, Part no. 232 901

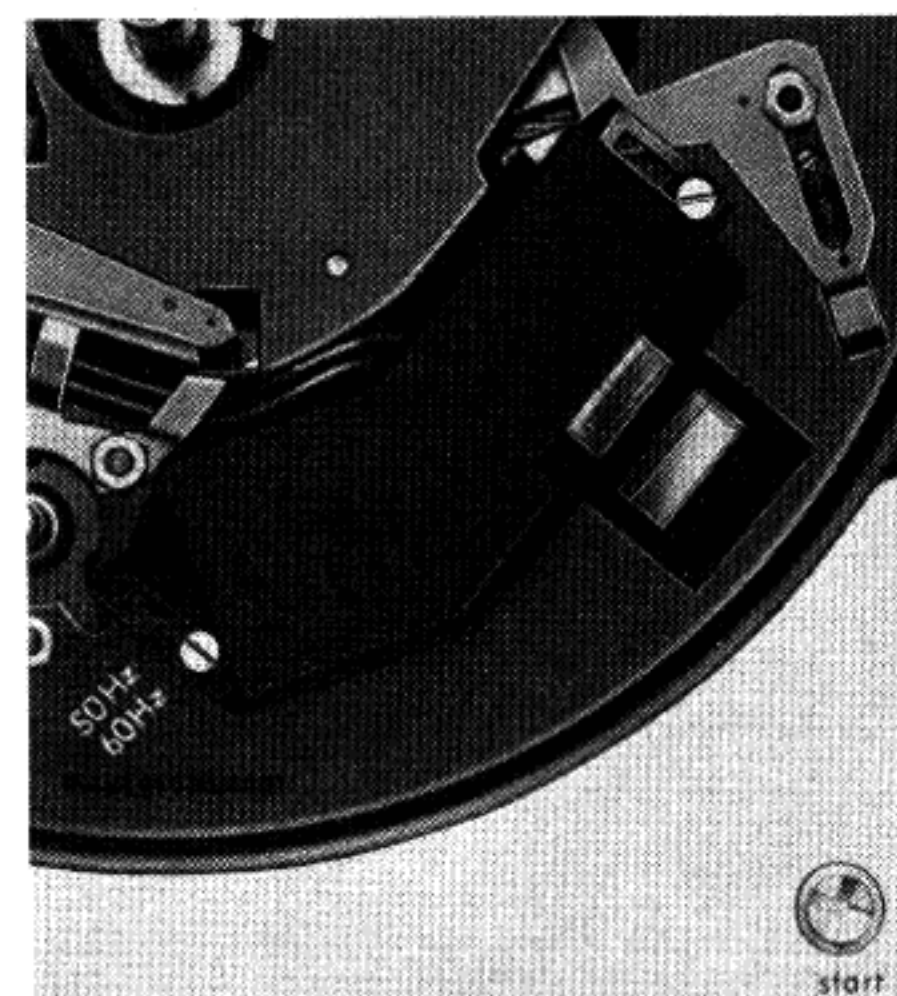


Fig. 25

To reset the stroboscope, loosen the screws, turn the housing to "50" or "60" and retighten the screws.

Removing the platter

The platter is secured by a C-ring seated in a notch on the platter shaft. Use a screwdriver to remove the C-ring, then lift off the platter.

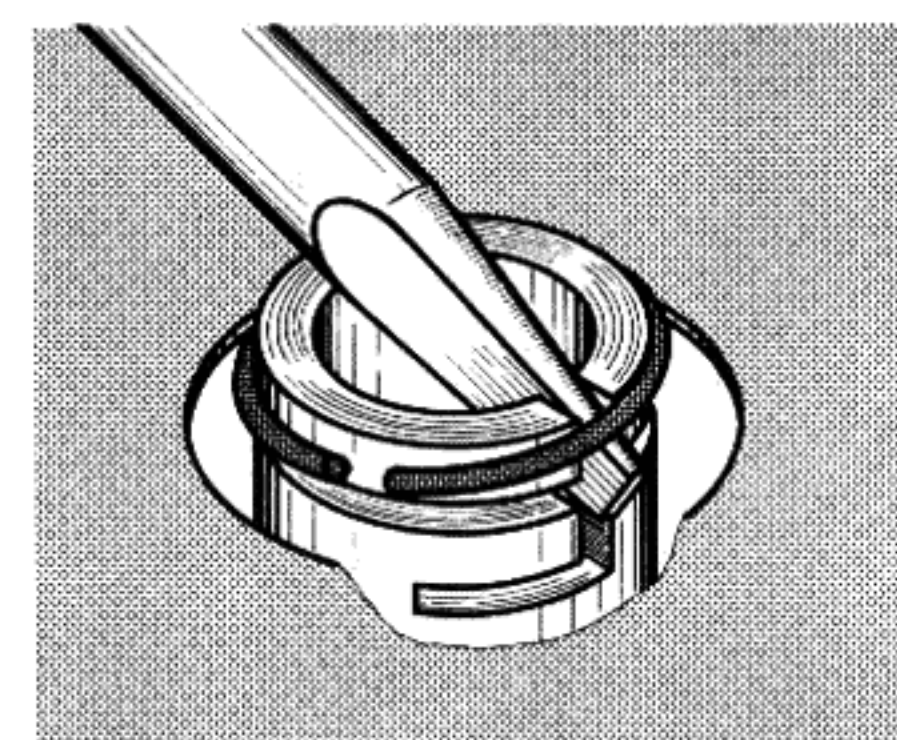


Fig. 26

Important: When handling the platter avoid touching the inner surfaces with your fingers as skin oils can cause slippage (and resulting pitch deviation) between the idler wheel and the driving rim of the platter.

Adjustment of tonearm indexing

When the operating switch ⑦ is moved to "start", the stylus descends automatically and sets down on the lead-in groove of the record. If the stylus of another cartridge, installed later, sets down too far inside or outside the lead-

in groove, adjustment can be made as follows:

Move the speed selector ⑮ to "45". This makes the adjustment screw ⑭ visible. Then place a "7" (17 cm) record on the platter and start your unit. If the stylus tip sets down too far inside the lead-in grooves, turn the adjustment screw to the left. If it sets down too far outside the lead-in grooves turn it accordingly to the right.

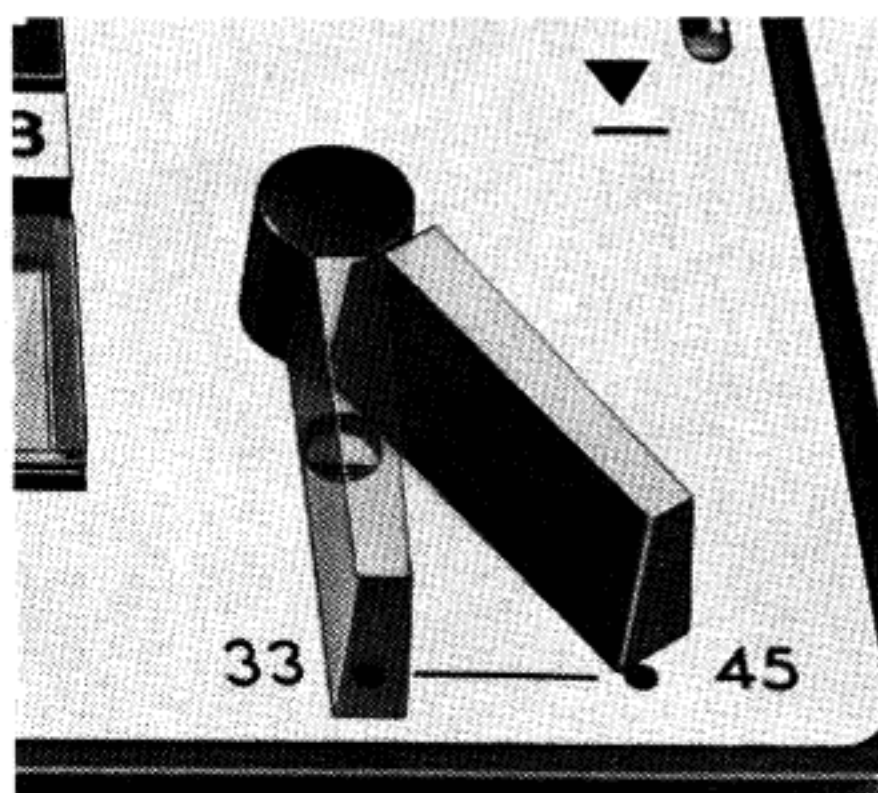


Fig. 27

Service

All lubrication points are adequately supplied with oil prior to delivery to the customer. Under normal conditions, your Dual should function properly for many years; Do not oil any part of your Dual yourself. Should your player ever require service, please take it to your Dual dealer, or ask him for the address of the nearest authorized Dual service station. Please make sure that only original Dual replacement parts are used.

Should shipping of your Dual become necessary, make sure the packing is adequate. Use, if possible, the original packing material in which you received your unit.

Technical data

Power supply

AC, 50 or 60 cycle
changeable by changing motor pulley

Power supply voltage

110 - 130 V and 220 - 240 V, switchable

Drive

4-pole synchronous motor with radial-elastic suspension

Power consumption

< 10 watts

Current drain

64 ma approx. at 220 V, 50 cycle
115 ma approx. at 117 V, 60 cycle

Platter

non-magnetic, 1.8 kg, 270 mm diameter

Platter speeds

33 1/3 and 45 rpm
Automatic tonearm set-down coupled to speed selection.

Pitch control variation

adjustment range of approx. 1 semitone (6 %) at all boths platter speeds

Speed control (monitoring)

with illuminated stroboscope for platter speeds 33 1/3 and 45 rpm, adjustable to 50 or 60 Hz

Total wow and flutter

according to DIN 45 507 (German Industry Standard)
< ± 0.09 %

Rumble (according to DIN 45 500)

Unweighted < 39 dB
Weighted < 59 dB

Tonearm

Torsion-resistant tubular aluminium tonearm in self-adjusting pivot bearing.

Tonearm bearing friction

(related to stylus tip)
vertical < 0.008 gram
horizontal < 0.016 gram

Stylus pressure

from 0 (zero) to 5 grams infinitely variable, operable from 0.5 gram stylus pressure up.

Cartridge holder

removable, accepting any cartridges with 1/2" mounting and a weight from 2 to 10 grams (including mounting hardware).

Cartridge

see separate data sheet

Dimensions

329 x 274 (+ 28 mm tonearm overhang)

Weight

approx. 4.3 kg