

Garrard

ZERO 100

AUTOMATIC TRANSCRIPTION TURNTABLE

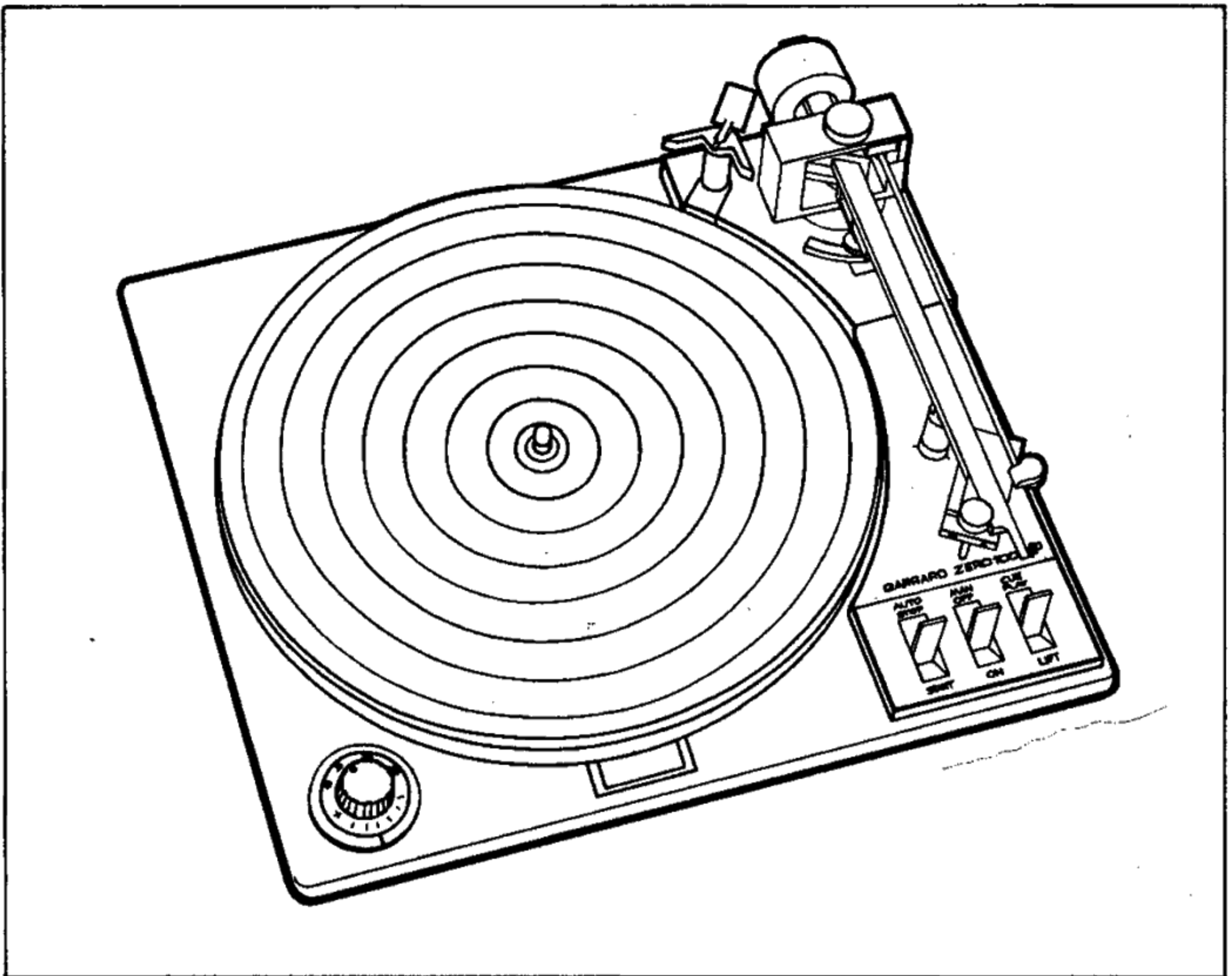
SERVICE MANUAL

HEAD OFFICE :

GARRARD ENGINEERING LTD., NEWCASTLE STREET, SWINDON, WILTS. TEL. SWINDON
(0793) 5381

SERVICE & SPARES DEPT :

GARRARD, KEMBREY STREET, SWINDON, WILTS. TEL. SWINDON (0793) 6211



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DESCRIPTION

The Garrard Zero 100 Automatic Transcription Turntable.

will play

- * single $33\frac{1}{3}$ or 45 rev/min records manually.
The tonearm is lowered by hand or by fluid-damped cue and pause control.
- * six 12" diameter $33\frac{1}{3}$ rev/min records, supported by a platform and released by an angled automatic record spindle.
- * single 12", 10" and 7" diameter records automatically.
When playing a 7" record with $1\frac{1}{2}$ " diameter centre hole, a record spindle adaptor (Part No. 72698) should be used.
- * six 7" diameter records with $1\frac{1}{2}$ " diameter centre holes using a record spindle (Type LRS100) available as an optional extra.
- * six 7" diameter records with $\frac{9}{32}$ " diameter centre holes, using a record platform adaptor (Part No. 75189) available as an optional extra.
- * and replay a single record or the top record of a stack as often as required; it can also reject a record, interrupt play and switch off at the end of play with the tonearm on its rest.

The Garrard Zero 100 Automatic Transcription Turntable

has

- * a constant speed synchronous motor suspended resiliently and magnetically screened.
- * two nominal speeds: $33\frac{1}{3}$ and 45 rev/min, each continuously variable by $\pm 3\%$.
An illuminated stroboscope is viewed from the front of the unit.
- * a mechanically controlled pivoting pickup head, giving minimal lateral tracking error to the cartridge. Adjustment is provided for the vertical angle of the cartridge when playing a single record or a stack of records.

- * a tonearm with adjustable decoupled counterbalance weight and stylus force setting weight. It operates down to 1 gramme stylus force with a suitable cartridge. The slide-in cartridge carrier accepts most modern cartridges.
- * a magnetic tonearm bias compensator calibrated for both conical (spherical) and elliptical styli.
- * a rotating single record spindle to minimise record wear and an interchangeable automatic record spindle.
- * an integral record size and speed control. This can be set for :-
 - 7" diameter, 45 rev/min
 - 12" diameter, $33\frac{1}{3}$ rev/min
 - 10" diameter, $33\frac{1}{3}$ rev/min
 - 7" diameter, $33\frac{1}{3}$ rev/min
- * an $11\frac{1}{2}$ " diameter platter of double construction with a sturdy steel inner driving platter and a non-magnetic outer platter.

- * four foam-damped spring mountings to absorb extraneous vibration and counter-act acoustic feedback.
- * separate automatic, manual and cue/pause controls conveniently grouped together.

Garrard record playing equipment is designed to play records complying with BS1928/1965, IEC Publication 98 and similar standards.

This manual provides instructions for servicing the Garrard Zero 100 Automatic Transcription Turntable as supplied for sale in U.S.A.

PACKING LIST

The carton contains the following accessories in addition to the Zero 100 with its platter.

1. A short record spindle for playing single records.

This is fitted by locating it in the centre of the platter and pressing it down into place. It turns with the record, so minimising record wear.

2. A long record spindle for playing up to six records automatically.

This is fitted by locating it in the centre of the platter and turning the spindle until it can be pressed down to be held in place by a retaining clip. The spindle can be removed again by a straight upward pull.

3. A large centre hole record adaptor.

This fits over the single record spindle to enable records with 1½" (38mm) diameter centre holes to be played singly.

4. A spring clip and wood screw.

The screw is used to fix the spring clip in a convenient place for storing the large centre hole record adaptor when not in use.

5. A tonearm counterbalance weight.

Screw this on to the rear extension of the tonearm, rounded corner first, to secure it.

6. A kit of cartridge fixing parts.

This comprises a range of fixing screws of different lengths, and a clear plastic setting gauge for checking the alignment of the cartridge in the tonearm.

SETTING UP

Preparing the Mounting Board

(These instructions can be disregarded if the unit is to be assembled to a ready-cut base)

1. Lay the paper template on the mounting board in the desired position and secure it to the board using strips of self-adhesive tape. (Glue would distort the template) Then, using a scribe or other pointed instrument, prick around the outline of the cutout, and mark the centre of the spring mounting recesses and the transit screw holes.
2. Remove the template, drill two holes ($\frac{19}{32}$ " diameter) for transit screws and four recesses ($1\frac{1}{16}$ " diameter, $\frac{1}{8}$ " deep) for the spring mountings.
3. Saw around the marked cutout.
4. The mounting board can now be varnished, painted, or covering material applied.

Installation

1. Thread power supply, ground and phono leads through cutout in mounting board, and make sure that the leads to the motor switch and neon lamp are clear of any moving parts under the unit plate.

2. Screw transit screws right down and set locking clips vertical, then place unit on the board, aligning transit screws and mounting springs with their respective holes and recesses. Make sure at this point that the damping pads are in position in the mounting springs.
3. When the unit is in place press it down on its springs, then turn both transit screw locking clips horizontal.

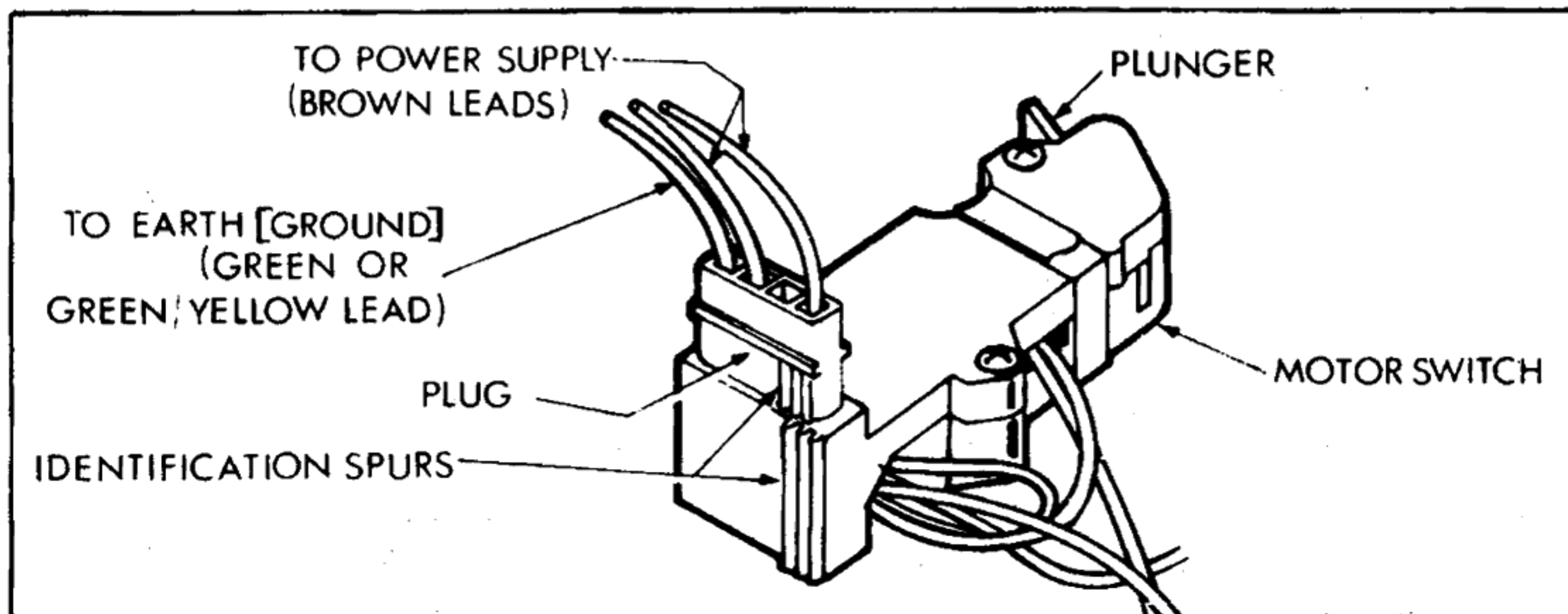
Note: for transportation, the transit screws should be turned counterclockwise to clamp the unit against the board. Release them afterwards for playing by turning the screws clockwise.

A.C. Power Supply and Ground Connections

Make sure that the power supply and ground cable plug is pushed securely into the socket on the motor switch on the underside of the unit plate with the identification spurs aligned.

The brown a.c. power supply cable should be plugged into the power outlet socket on the amplifier or into a wall socket.

The spade terminal on the green (or green and yellow) ground lead should be connected to a grounding point on the amplifier chassis or directly to ground. The amplifier manufacturer's instructions will give more detailed advice.



Combined motor switch, power supply and ground connections

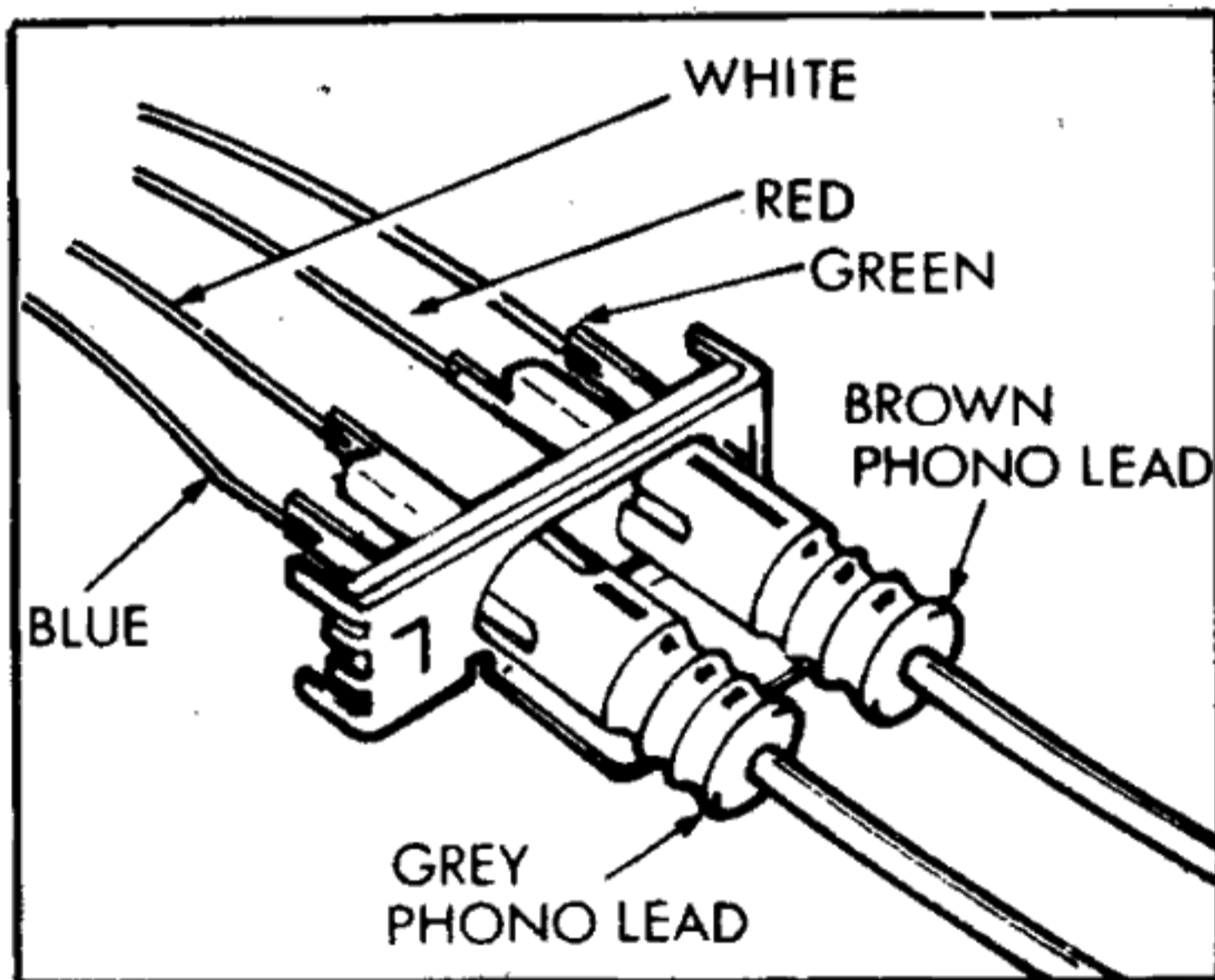
SETTING UP (Continued)

Connecting a stereo cartridge to a stereo amplifier.

Plug the brown phono lead into the phono socket marked R on the underside of the unit plate and into the right-hand channel input socket on the amplifier. Similarly, plug the grey lead into the socket marked L and the left-hand channel input socket.

Connecting a stereo cartridge to a mono amplifier

Plug brown and grey leads from the phono sockets into a 'Y' adaptor to combine the right and left-hand channel signals before feeding them into the input socket of the mono amplifier. An alternative method is to solder two short-circuiting links between the pairs of connections on the back of the phono socket - one between the centre 'signal' terminals and one between the outer 'ground' terminals. The output can then be taken from a phono lead plugged into either R or L socket.



Phono socket connections

Removing the Pickup Cartridge Carrier

Support the tonearm with one hand to avoid strain and withdraw the carrier with the other hand. Turn the carrier over and peel off any adhesive tape used to hold the coloured leads during transit. When removing the carrier with a cartridge fitted, support the tonearm well clear of the operating controls to avoid risk of damage to the cartridge.

Fitting the Pickup Cartridge

The fixing screws provided enable a wide range of high quality cartridges to be fitted to their correct operating position in the carrier.

Great care must be taken when fitting the cartridge since it forms an integral part of the extremely precise tonearm design essential to the exceptional degree of tracking accuracy. A setting gauge is provided so that the cartridge may be assembled in the correct position on the carrier.

To fit the cartridge proceed as follows :-

1. Secure the cartridge to the carrier by passing a pair of screws through the cartridge mounting and the cartridge carrier, then screwing them into the threaded holes in the locking plate which slides in the channel on the carrier. The screws must only just protrude through the far side of the locking plate.
2. Tighten the screws barely sufficiently to hold the cartridge in place, then slide the carrier into the slots in the clear plastic setting gauge, taking care that the stylus does not catch on the gauge as the cartridge enters.
3. The stylus tip must be vertically above the point at which the lines on the gauge cross. If it is not, move the cartridge until it is correctly aligned.
4. When the alignment is satisfactory, tighten both fixing screws, remove the gauge, and connect the insulated leads on the carrier by pushing their tags onto the cartridge output pins. Use the following colour code in conjunction with the cartridge manufacturer's instructions :-

RED	-	Right hand channel signal
GREEN	-	Right hand channel ground
WHITE	-	Left hand channel signal
BLUE	-	Left hand channel ground

NOTE : If a cartridge has only three pins or tags, use the green lead, or green and blue joined together. Insulate and tuck away any lead not required.

SETTING UP (Continued)

Fitting the Pickup Cartridge Carrier

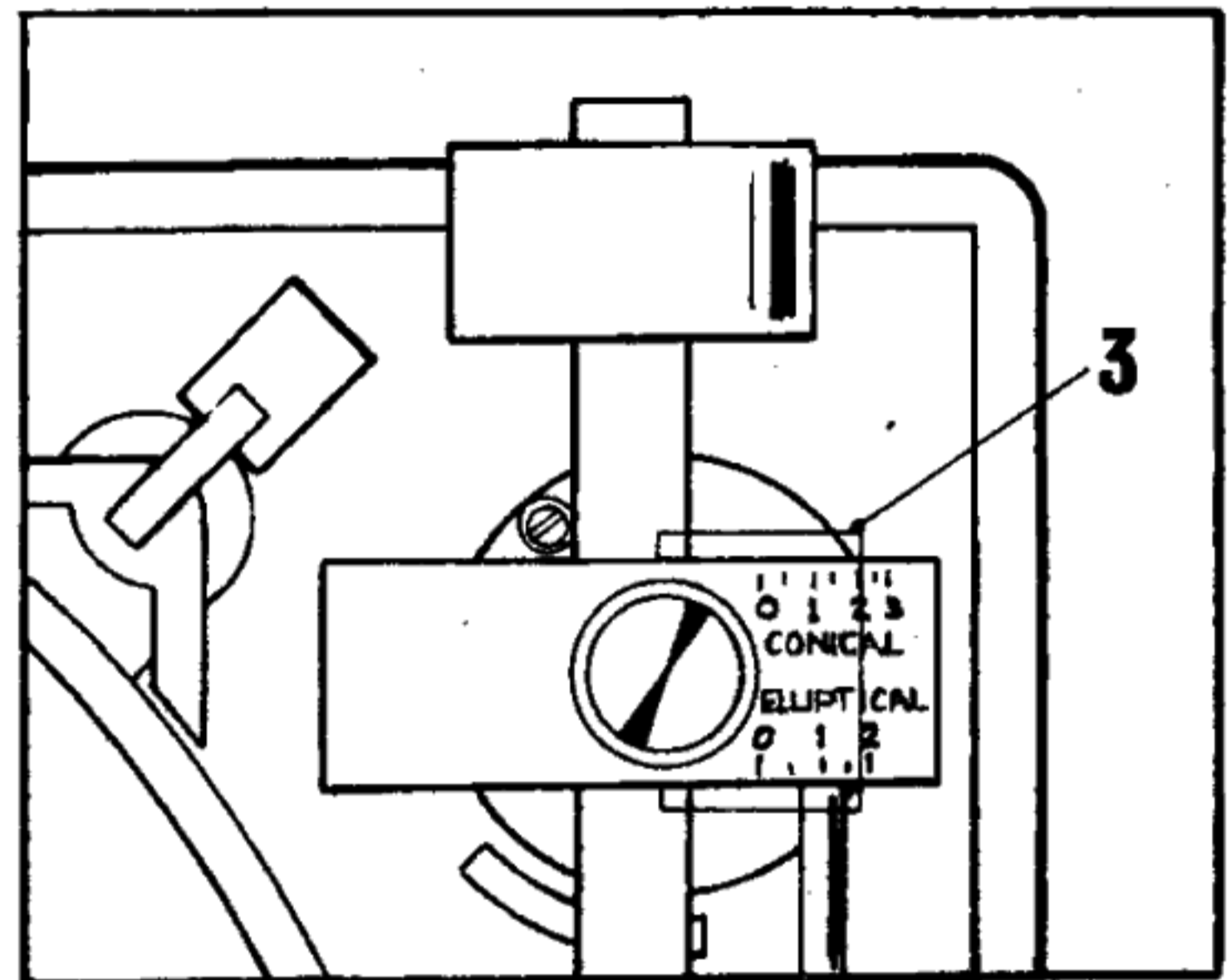
Move the tonearm locking lever to FREE, support the tonearm over the platter away from the operating controls with one hand, to avoid risk of damage to the cartridge, and press the cartridge carrier back into place in its slots in the front of the tonearm.

Setting Stylus Force

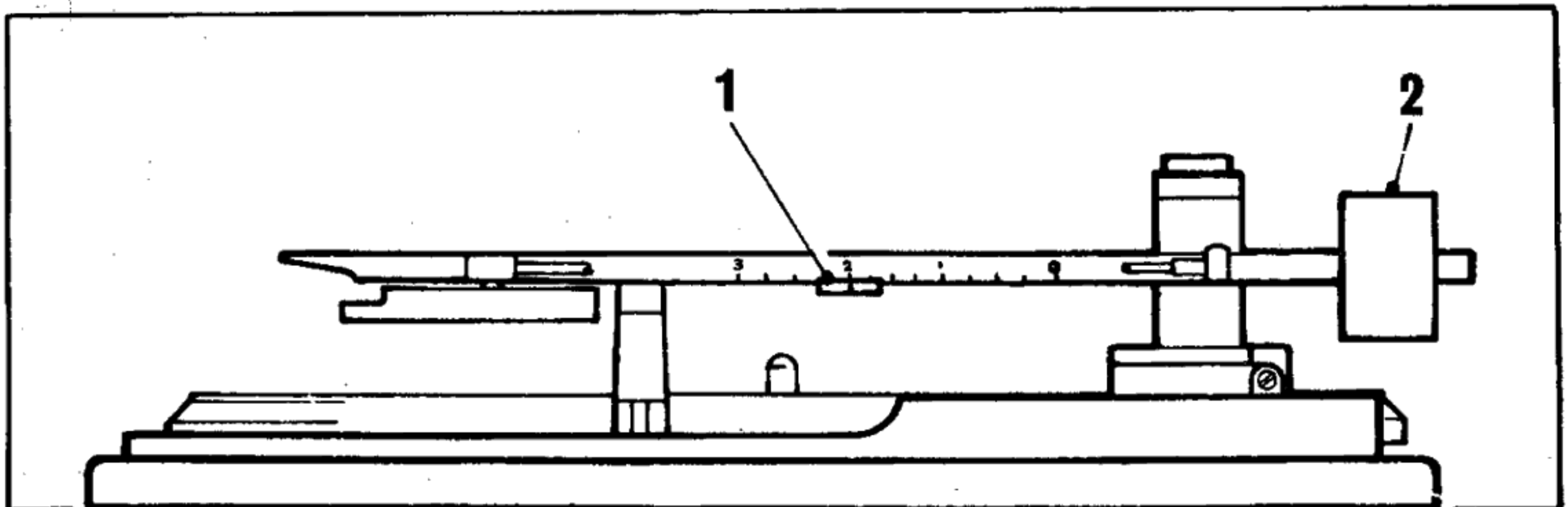
1. Move the stylus force weight (1) so that its centre line is at 0 on the tonearm.
2. With the cartridge fitted, remove the stylus guard, move the tonearm locking lever to FREE and move the tonearm inwards so that it pivots freely. Take care to prevent the stylus from touching the rubber mat.
3. Wind the counterbalance weight (2) backwards or forwards until the tonearm is in balance with the stylus tip at the height of the top face of one record on the platter.
4. Return the tonearm to its rest, and move the locking lever to LOCK.
5. Set the stylus force to that recommended by the cartridge manufacture by moving the stylus force weight forward until its centre line is at the mark on the tonearm scale representing this force. The scale is calibrated up to 3 grammes in steps of $\frac{1}{4}$ gramme.

Setting the Tonearm Anti-skating Device

1. For a cartridge with a conical (spherical) stylus tip. Move the magnet shield (3) along the transparent tonearm mounting bracket until the red calibration line on the shield is at a position on the "conical" scale corresponding to the stylus force. If, say, 2 grammes stylus force has already been set, move the slider to the figure 2 on the scale.
2. For a cartridge with an elliptical stylus tip. Proceed in the same way, but use the "elliptical" scale on the bracket.



Rear of tonearm



Side view of tonearm

OPERATING INSTRUCTIONS

General Advice

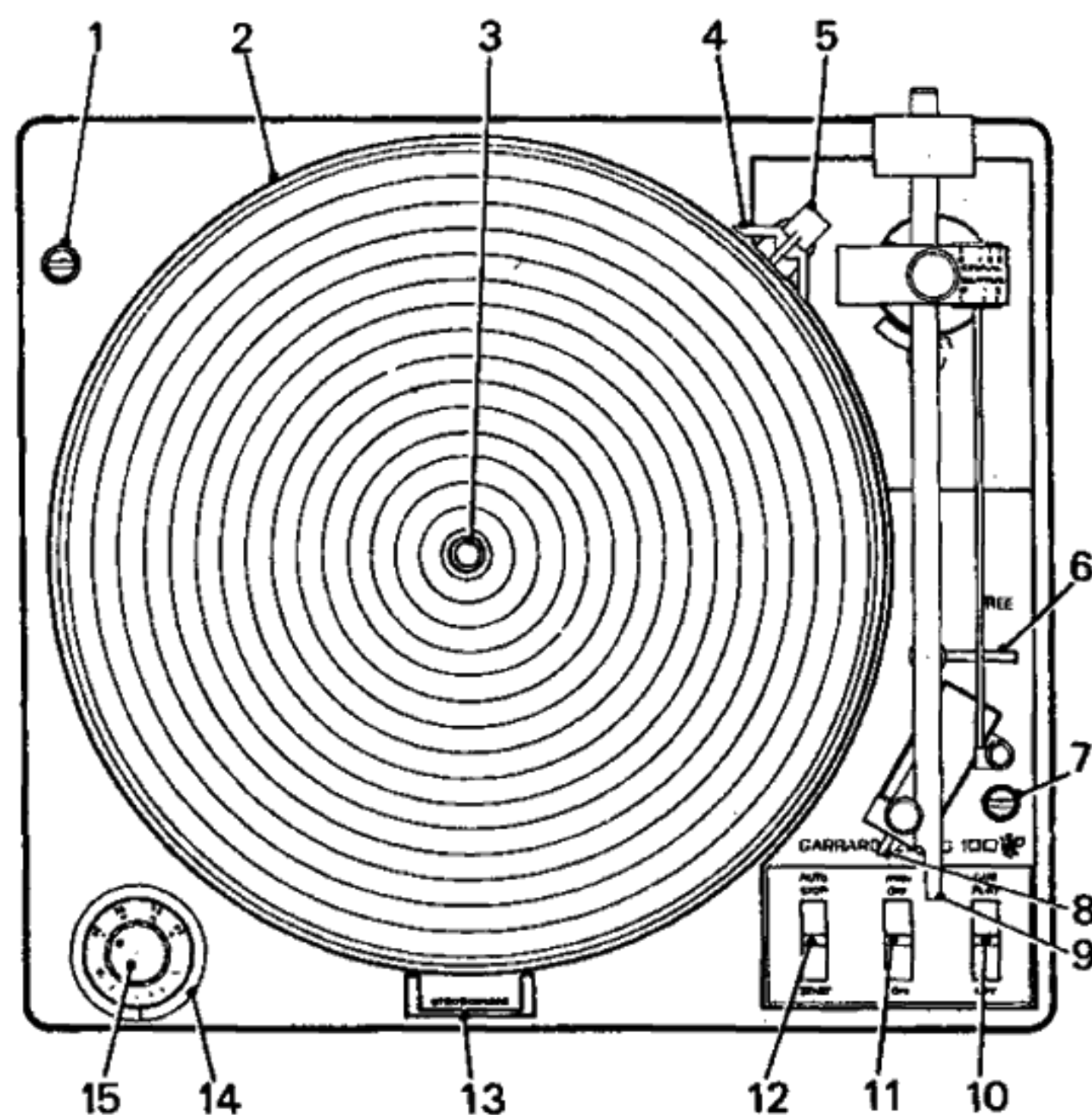
1. Keep the cartridge stylus clean and replace it when worn.
2. Store and clean records as their manufacturers recommend. Do not leave records on the turntable for long periods after use.
3. Do not switch on unless there is at least one record on the turntable.
4. Do not hold or turn the platter (2) counter-clockwise.
5. Always allow the unit to switch itself off, or switch it off manually by one of the operating controls. If the power supply is disconnected during play, the rubber intermediate wheel will remain under pressure and may be deformed after a length of time in this condition.
6. If the cartridge has more than one stylus, make sure that the correct one is presented for the record to be played.

Preparing the Unit for use after transit

1. Remove the stylus guard, if one is fitted.
2. Turn both transit screws (1 and 7) fully clockwise so that the unit floats freely on its spring mountings.
3. Move the tonearm locking lever (6) to FREE. (Reverse these three actions before it is transported again)
4. Check platter speed as described in the next section.
5. Check that all three operating tabs (10, 11 and 12) are upright.

Setting the Fine Speed Control

Set the line on the control ring (14) to the centre of the scale; this is sufficient for most purposes. However, if an even more accurate setting is required, proceed as follows:—



While a record is playing, look at the markings seen through the stroboscopic viewing window (13) at the front of the unit. When playing at the '33' setting, the row of black and red bars further from the platter will appear stationary when speed is exactly $33\frac{1}{3}$ rev/min. Similarly at the '45' setting the row of bars nearer the platter will appear stationary at exactly 45 rev/min.

If the appropriate row of bars appears to move clockwise, move the fine speed control towards the minus sign (-) until the bars appear to stop. If it appears to move counterclockwise, move the control towards the plus sign (+) until the bars appear to stop. The stroboscopic method of measurement is extremely precise.

The degree of control (approximately 3% above and below nominal speed) also enables a user with the faculty of 'absolute pitch' to set record speed to his complete satisfaction, since a total variation of almost a semi-tone is provided.

OPERATING INSTRUCTIONS (Continued)

To play a single record manually

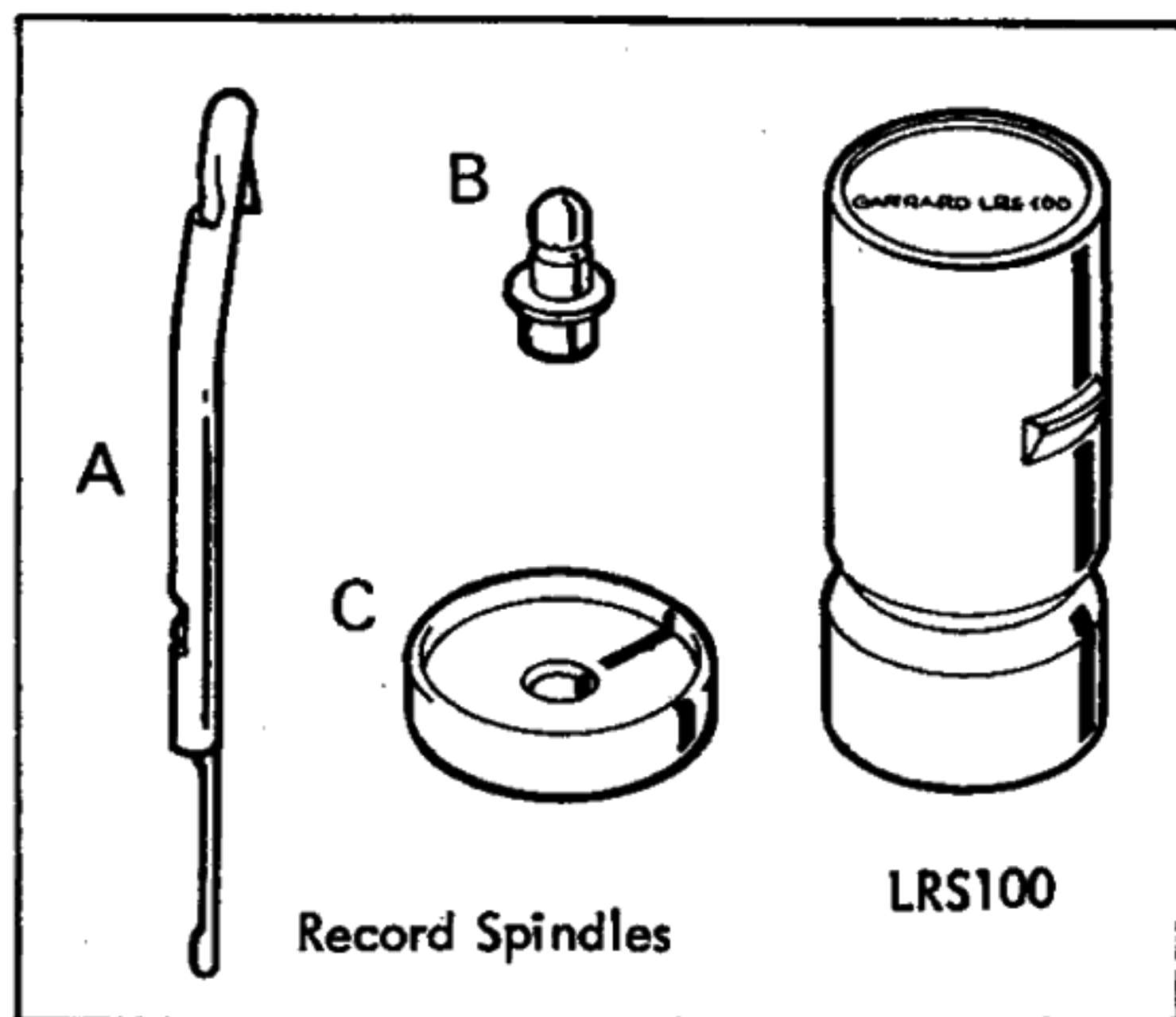
1. Fit the short, single record spindle (B) into the centre of the platter (3) and press it down into place.
2. Place a record on the platter (2), using the adaptor provided if the record has a large centre hole.
3. Set the record speed selector (15) to 33 or 45 rev/min as required by the record to be played, and the cartridge tilting lever (8) to M.
4. Move the manual operating control tab (11) fully to ON.

5. (a) Lower the tonearm on to the record by hand lifting it at the front of the arm (9) - or
(b) Move the cueing control tab to LIFT, then place the tonearm over any desired point on the record and return the control tab towards PLAY to lower the tonearm gently.

After playing the record the tonearm will return to its rest and the unit will switch off.

To play a single record automatically

1. Fit the short, single record spindle (B) and place the record on the platter, using the adaptor (C) provided if the record has a large centre hole.
2. Set the record speed and size selector (15) for the record to be played. For example, $\frac{33}{12}$ for a $33\frac{1}{3}$ rev/min 12" record.
3. Set the cartridge tilting lever (8) to M.
4. Move the automatic operating control (12) fully to START and hold it there for a second or two before releasing it. After playing the record the tonearm will return to its rest and the unit will switch off.



To play a stack of records automatically

1. Fit the long automatic record spindle (A) into the centre of the platter (3) and turn the spindle until it can be pressed down to be held in place.
2. (a) 12" records-load up to six records on to the step on the spindle with the edge of the stack resting on the record platform (4). Pull the record steady (5) upwards then inwards and release it to return to the top of the records to stabilise them.
(b) 7" records with small centre holes. These can be played similarly after fitting an extension to the record platform. This is available as an optional extra (Garrard Part No. 75189).
(c) 7" records with large centre holes. Place the LRS100 large record spindle (available as an optional extra) over the automatic record spindle and load a stack of up to six 7" records level on to its step.

Continued....

3. Set the record speed and size selector (15) for the records to be played. For example, $\frac{33}{12}$ for $33\frac{1}{3}$ rev/min 12" records.
4. Set the cartridge tilting lever (8) to A.
5. Move the automatic operating control tab (12) fully to START and hold it there for a second or two before releasing it. When the records have all been played the tonearm will return to its rest and the unit will switch off.
6. To unload the records - lift them clear of the record spindle, even if they are to be replayed immediately. When using the LR5100 spindle lift the records with the fingers of both hands while pressing down on the top of the spindle with the thumbs.

Additional uses of the Controls

Cue and Pause

The tonearm can be raised while a record is playing by using the cue control tab (10) to LIFT, and lowered again by moving it back to PLAY.

This feature is particularly useful for repeating or passing over any passage of music, and to interrupt play (pause) for a short time without switching off.

Repeat

A single record being played automatically, or the last record of a stack, can be replayed by moving the automatic control tab (12) to START before the tonearm lifts at the end of the record.

Reject

Any record of a stack (except the last), can be rejected by moving the automatic control tab to START. To reject a single record or the last of a stack move the tab to STOP.

Stop

While playing a single record or the last record of a stack, moving the automatic control tab to STOP will return the tonearm to its rest and switch off. While playing a stack of records this will cause the next record to be lowered before switching off. To lower the next record and play it, move the control tab to START.

MAINTENANCE

(Numbers in brackets are those used on the exploded views)

LUBRICATION

The bearings of the intermediate wheel (47), motor (204) and platter (51) are made of oil-retaining material which rarely requires re-lubrication. However if, after long use, the need for oil becomes apparent, remove the platter and lubricate the bearings very sparingly as described below. Apply a trace of thin oil to lever pivots at the same time, except plastic pivots and slides in the automatic trip mechanism which should not be lubricated. A thin, high-grade machine oil such as that used on sewing machines or a non-detergent SAE 20W oil is suitable.

A smear of light grease should be applied at extended intervals as necessary to all cam faces, pins and rollers after cleaning off the original grease. A general purpose calcium or lithium-based grease similar to or lighter than petroleum jelly is suitable.

CAUTION. Take great care to prevent any lubricant from coming into contact with the driving surfaces of the motor pulley, intermediate wheel or platter since this could cause slippage resulting in record speed variation. Do not over-lubricate and wipe off any surplus before running the unit again after maintenance.

The rotation of the cueing cam (154) is retarded by a special viscous damping fluid sealed into a cavity in the lower casting (159) during manufacture: it should not be lubricated with oil or grease.

To remove the platter

Pull out the record spindle (57 or 58), carefully lever up the inside edge of the rubber mat (52) and prise out the plastic centre disc (54) with a small screwdriver. With the same tool, pull off the wire retaining clip (53) - noting its position for re-assembly - and lift off the platter (51) by applying equal pressure on opposite sides.

CAUTION. Do not switch on when the platter has been removed and the speed control is set at 45 rev/min.

When refitting the platter, turn it clockwise for one revolution as soon as it is on the spindle in order to ease the rubber intermediate wheel into place.

Intermediate Wheel Bearing

Remove the spring clip (49), plastic washer (48), intermediate wheel (47) and fibre washer (46) to clean the spindle and bearing before applying a thin smear of oil to their running surfaces and reassembling in reverse order. Make sure that the wheel is pulled freely against the motor pulley when the manual operating control is moved to ON and that it is fully released again when the control is moved to OFF.

Oil must not come into contact with the rubber surface of the wheel.

Motor Bearing

Run a drop or two of oil down a long sewing needle (or similar object) onto the motor spindle below the pulley (209) so that it will flow into the top bearing of the motor. This bearing is concealed below the motor mounting plate. Oil must not come into contact with the motor pulley.

Platter Bearing

Apply a thin smear of oil to the inside bearing surface of the platter (51). Oil must not come into contact with the driving rim.

Platter Spindle Bearing

Apply a thin smear of oil to the spindle and a drop or two of oil to the bearing (254).

CLEANING

Cartridge Stylus

Keep the cartridge clean by periodically removing its carrier (see page 4) and blowing any accumulated dust off the stylus tip or by gently brushing it away with a very soft brush.

Platter Mat

Clean this with a soft brush when necessary.

Platter Drive Mechanism

After a long period of use it may be found worthwhile to wipe the driving surfaces of the motor pulley (209), intermediate wheel (47) and platter rim with a clean lint-free cloth. The stroboscope ring (50) can be wiped at the same time.

ADJUSTMENTS

All adjustments are set during manufacture, (except stylus force) and should only need to be reset in exceptional circumstances.

Setting checks will be simplified if the power supply is switched off, the automatic operating control moved fully to START and the platter rotated clockwise by hand so that the tonearm moves slowly and can be stopped in a convenient position for measurement.

Tonearm Lowering Position

A minor adjustment may be necessary to make certain that the stylus tip lands inside the raised rim of the groove guard to be found on many records. While the tonearm is on its rest, use a small screwdriver to turn the adjusting screw (A) clockwise to move the lowering position inward and counterclockwise to move it outward.

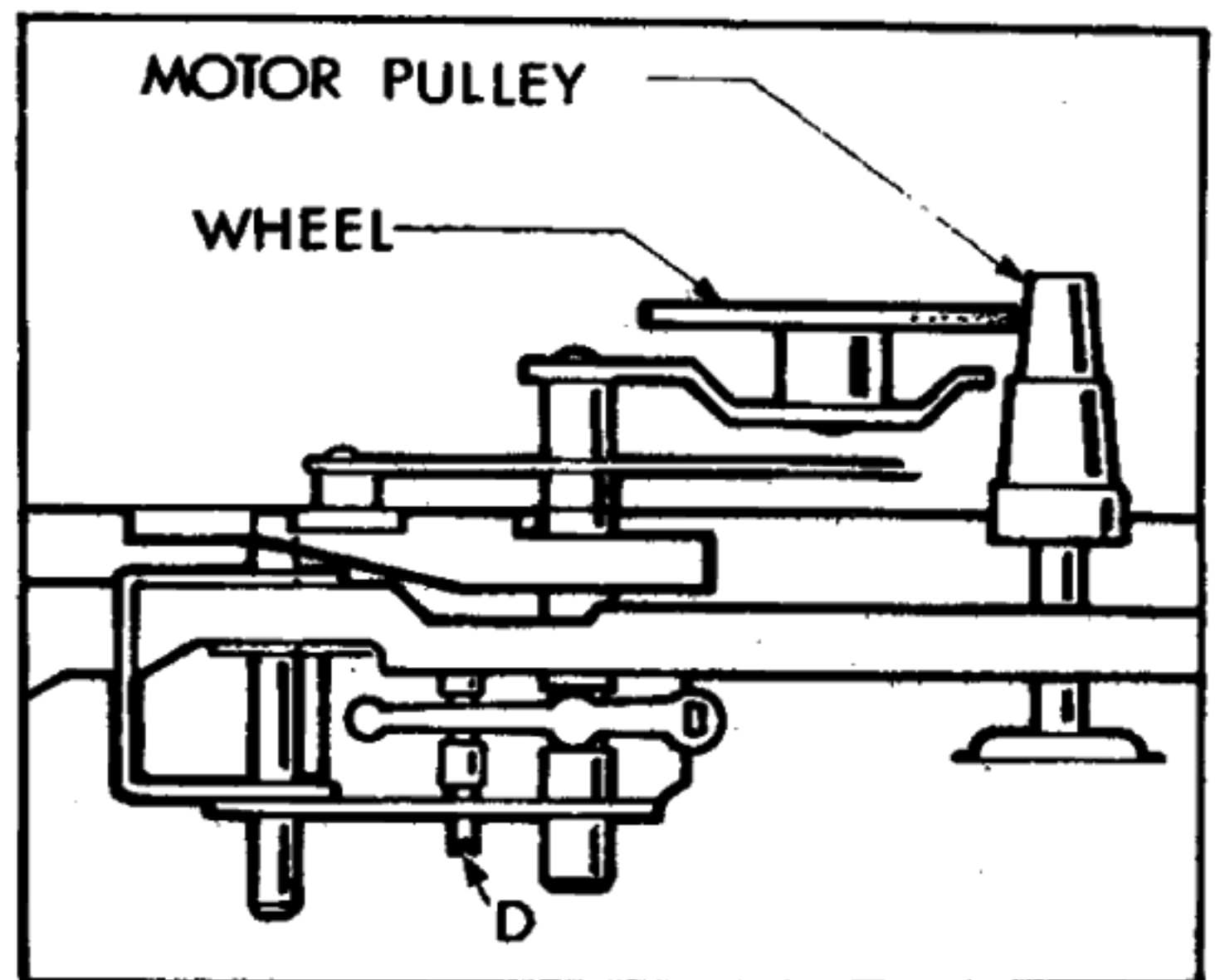
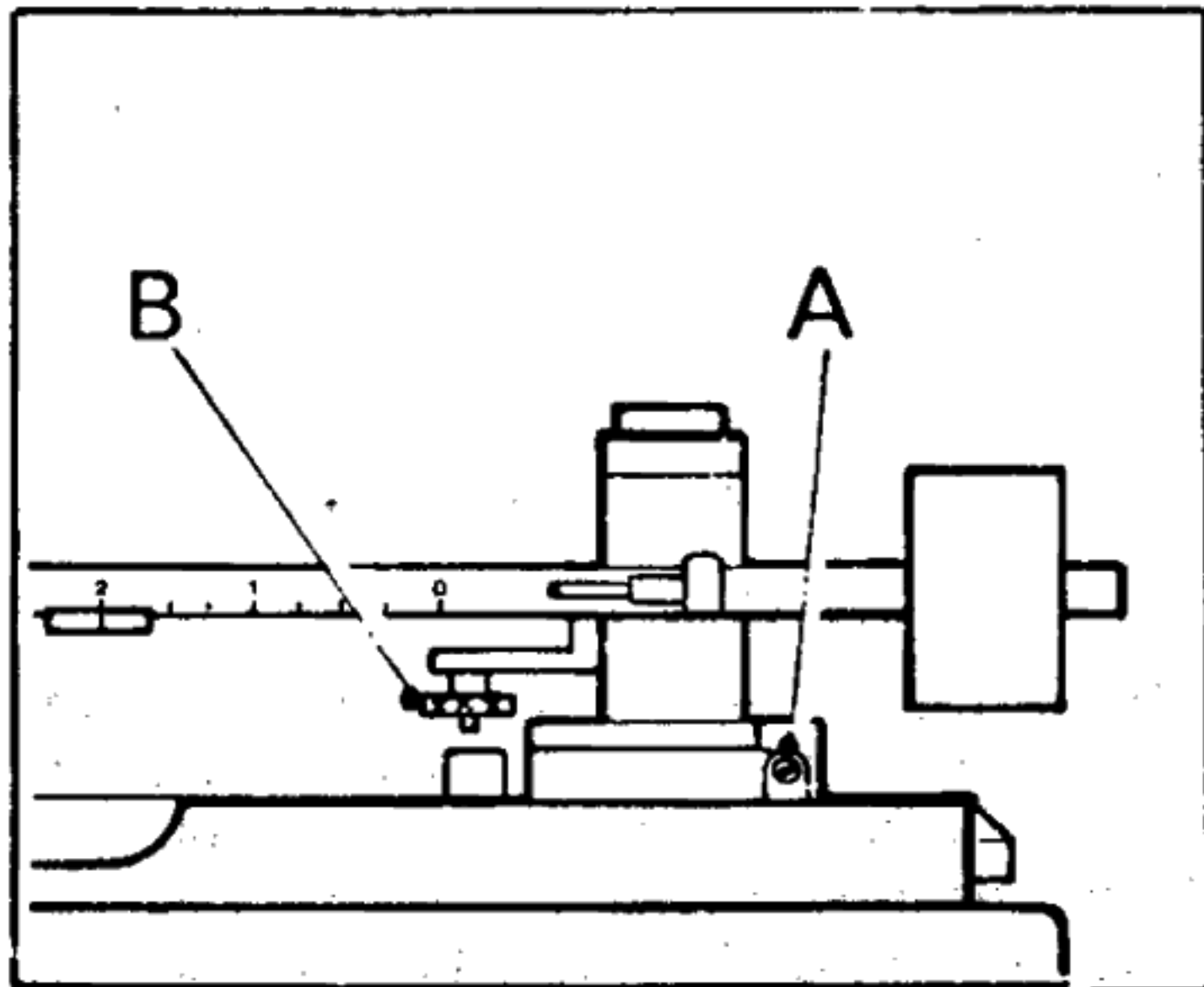
Tonearm Lifting Height

When the tonearm returns to its rest after rising at the end of a record, the top of the finger lift should be $1\frac{13}{16}$ " (46mm) above the top face of one record on the platter.

Turn the adjusting screw (B) clockwise to increase and counterclockwise to reduce lifting height.

Tonearm Lifting Height Restriction

The restrictor should prevent the tonearm from rising more than $\frac{1}{16}$ " (1.5mm) higher than the setting referred to in the previous paragraph. Use a small screwdriver to turn the adjusting screw (C) counterclockwise to increase and clockwise to reduce restriction.



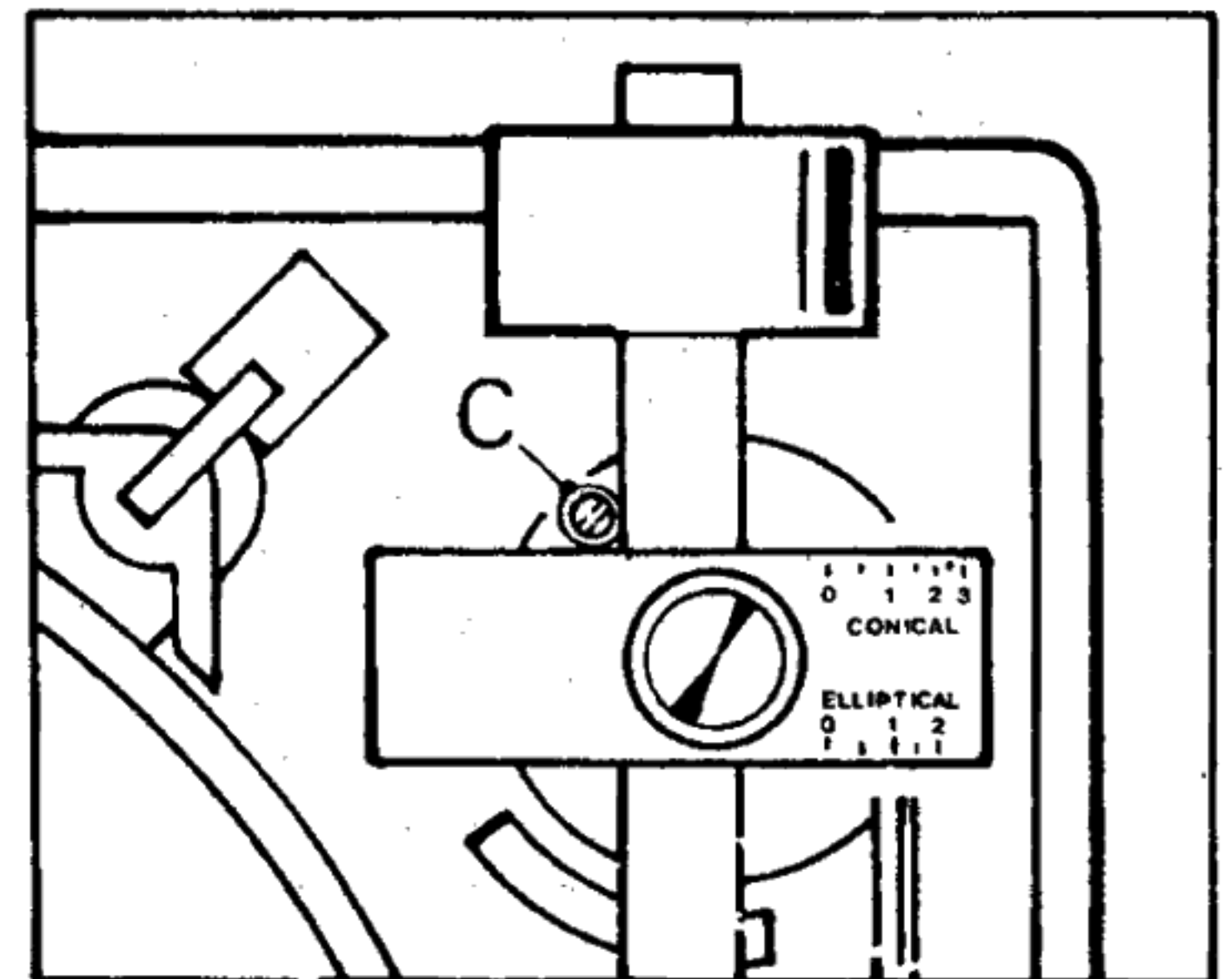
Intermediate Wheel Adjustment

Fine Speed Control

Although this adjustment should not normally be necessary, the height of the intermediate wheel can be raised or lowered in relation to the motor pulley driving steps. This will vary platter speed at the mid-setting of the fine speed control. The percentage speed variation available will of course remain at approximately $\pm 3\%$.

To reduce speed, raise the wheel by turning the adjusting screw (D) clockwise when viewed from the head of the screw.

To increase speed, lower the wheel by turning the screw counterclockwise.



FAULT CHART

The unit should be disconnected from its power supply and the stylus protected before making service adjustments. Numbers in brackets refer to parts shown on the exploded views.

FAULT

No. 1 Turntable Speed

Turntable fails to start, or runs slowly, when switched on.

Cause

1. Oil or dirt on driving surfaces.
2. Faulty intermediate wheel spring (43).
3. Intermediate wheel support lever (45) not free.
4. No power supply, or low voltage.
5. Faulty Motor coil(s).
6. Bearings of motor out of line.
7. Motor pulley (209) or intermediate wheel height set incorrectly.
8. Catch lever (145) not holding switch lever (142).

Correction

1. Take off centre disc (54) and spring clip (53), remove turntable (platter) and clean inside rim, intermediate wheel (47) and motor pulley (209).
2. Check that spring is secured. Move manual control to PLAY - spring should extend. If it does not, fit a new spring.
3. Wheel (47) should engage motor pulley (209) firmly when switched on and retract when switched off. Lubricate spindles; replace parts as necessary.
4. Remove power supply plugs from motor (204), switch on, and check them with a voltmeter. If no power, check back to source outlet, looking for loose connections, faulty switch contacts, etc. If power supply voltage falls below 105v operation can be adversely affected.
5. Remove power supply plugs from motor (204) to check continuity of each coil with ohmmeter. Fit new motor if necessary.
6. If rotor spindle is tight, tap the motor body with a small block of wood (e.g. screwdriver handle) to re-align bearings. Use only thin machine oil on these bearings. See 'Maintenance' section.
7. See 'Adjustments'. Check that both motor pulley screws are tight. The motor pulley should be pressed down on the rotor spindle as far as it can go.
8. Check that catch lever pivots freely under influence of tension springs (141 & 147).

Continued...

<u>Cause</u>	<u>Correction</u>
9. Bearings not free.	9. Check motor, intermediate wheel and turntable bearings for free running. Clean and lightly oil, if necessary - see 'Lubrication'.

No. 2 Record Speed Varies

Wow and Flutter

1. Various	1. See 'Turntable Speed' above, Causes and Corrections 1, 7 and 8.
2. Warped records in stack causing slipping. Record centre holes may be worn or oversize.	2. It is not advisable to play badly warped or 'dished' records automatically, although small strips of adhesive paper on their labels may help adjacent records to key together.
3. Damaged rotor spindle.	3. Fit new motor (204).
4. Flats on driving surface of intermediate wheel (47).	4. If running unit for a while does not cure the fault, fit a new wheel.
5. Wow in intermediate wheel.	5. If the intermediate wheel runs erratically replace it and/or its support lever (45).

No. 3 Record Lowering (a)

Records fail to lower

1. Damaged record spindle (58).	1. Remove spindle and check that its record pushing pawl moves freely. If not, fit new spindle.
2. Moulding flash or label paper in centre hole of new record.	2. Remove carefully with a pen - knife.
3. Non - standard records.	3. Records with over - sized centre holes or more than 0.090" thick at centre hole may fail to drop. Play them singly.
4. Insufficient tension in leaf spring supporting pawl of record spindle (58).	4. Tighten screw (191) to apply light pressure.
5. Record spindle not seated properly.	5. Press it down until a light click is felt as spring clip (53) holds it in position.

No. 4 Record Lowering (b)

Two or more records lower together

1. Damaged record spindle.	1. Check that both latches at the top of the spindle (58) fall freely. Do not oil them. Fit a new spindle, if faulty. Latches should be flush with top of a spindle when records are loaded.
2. Non - standard records.	2. Records less than 0.053" thick at centre holes. Play them singly.

Cause

3. Platform (74) position incorrect or record clip faulty.

Correction

3. Make sure that the clip on the record support platform (74) steadies a stack of records also that the platform (74) supports a record on its rim adequately. Adjust the platform if necessary by loosening screws (76).

No. 5 Tonearm Movement (a)

Pickup tracks incorrectly

1. Dust accumulated around stylus tip.

1. Clean carefully, by blowing or with a camel-hair brush.

2. Stylus force too low.

2. Check that force is not lower than cartridge manufacturer's recommended figure. Adjust if necessary - see 'Setting Up'.

3. Tonearm leads tight or trapped at rear of arm.

3. Make sure leads are slack and check that they are not caught in mechanism below unit plate.

4. Worn or wrong size stylus tip radius.

4. Replace stylus.

5. Groove guard on record.

5. If stylus lands too far out it may slide down the slope of the raised rim and jump the first playing grooves. Set tonearm lowering position so that stylus lands inside the rim - see 'Adjustments'.

6. Automatic trip links (240, 257, 258 & 264) not free.

6. Move tonearm inwards by hand checking for damaged or tight linkage. Reshape, clean or replace, as necessary, but do not lubricate.

7. Damaged spindle bearing (240).

7. Fit new part as necessary.

8. Retainer (2) binding on top of bearing of correcting arm (3).

8. Ease retainer upwards to provide clearance of approximately 0.005" (the thickness of this page) between retainer and bearings.

No. 6 Tonearm Movement (b)

Pickup lands on record too far out or in.

1. Lowering position incorrectly set.

1. See 'Adjustments'.

2. Tails of pickup lever (177) not square.

2. Reshape it or fit a new lever.

No. 7 Tonearm Movement (c)

Tonearm fails to lower.

1. Spring (150) controlling cueing cam (154) disengaged.

1. Anchor spring to cueing cam and trip lever (149) being careful not to over-stretch it.

2. Lifting spindle (22) not free.

2. With tonearm raised, lift platform moulding at top of spindle. It should spring back. If not, check for damage or restriction. Clean and oil if necessary.

Cause

Correction

- | | |
|---|---------------------------|
| 3. Tonearm pivot (95) not free. | 3. Clean or fit new part. |
| 4. Tonearm rest safety catch (23) not released. | 4. Turn it to 'Free'. |
-

No. 8 Tonearm Movement (d)

Tonearm begins to lower, then swings in.

- | | |
|-----------------------------------|--|
| 1. Pickup leads tight or trapped. | 1. Make sure the leads are slack, and see that they are not caught up in mechanism below unit plate. |
|-----------------------------------|--|
-

No. 9 Tonearm Movement (e)

Tonearm fails to lift when Auto control is moved to 'START' or to return at end of record.

- | | |
|------------------------------|--|
| 1. Damaged trip pawl (248). | 1. Reshape vertical lug or fit new pawl. |
| 2. Auto trip rod (264) bent. | 2. Reshape it or fit new link. |
-

No. 10 Tonearm Movement (f)

Tonearm lands on record and immediately or prematurely rejects, next record lowers and fault repeats until normal switch-off at end of stack.

- | | |
|---|--|
| 1. Spring (153) disengaged. | 1. Anchor spring to hole in trip operating lever (151) and to switch-off return lever (158). |
| 2. Automatic operating control remains at 'START'. | 2. Check operation of return spring (153) and free movement of trip operating lever (151). Grease sliding surfaces if necessary. |
| 3. Outer end of auto trip rod (264) bent out of square. | 3. Reshape link. Do not lubricate trip rod or associated levers on main cam (251). |
-

No. 11 Noise (a)

Rumble, heard through speaker(s) while stylus is in unmodulated record groove.

- | | |
|--|---|
| 1. Recorded rumble. | 1. If consistent rumble is heard on one record, but not on others, then the record is faulty. |
| 2. Need for lubrication. | 2. See 'Maintenance'. |
| 3. Intermediate wheel (47) rubbing against step of motor pulley (209) or dirt on running surfaces. | 3. Check heights of wheel and pulley - see 'Adjustments'. Clean periphery of wheel. Intermediate wheel should be level. |
| 4. Driving surface of intermediate wheel dirty, indented or hardened. | 4. If running the unit for a while and cleaning the surface of the wheel does not help, fit a new wheel. |

Cause

5. Faulty installation.
6. Worn platter spindle bearing.
7. Dirty platter thrust bearing (254) spacer (255) or cushion ring (256).
8. Motor mounting grommets (205 & 206) damaged.

Correction

5. Check that unit floats freely on its mounting springs, that the motor hangs freely in its rubber grommets and that no parts of the mechanism except the spring mountings are in contact with the mounting board.
6. Fit new bearing (254) and/or cushion ring (256) as necessary.
7. Clean and oil bearings. Fit a new cushion ring if hard.
8. Fit new grommets. Note that there are two types of grommets with different elasticity. The motor must hang level and free.

No. 12 Noise (b)

Electrical hum, heard through speakers.

1. Faulty grounding (earthing) system.
 1. Check that grounding leads have been connected as described in "Setting Up" section. Check continuity and secureness of grounding leads, particularly the leads connecting the tonearm and the motor frame to the unit plate and the unit plate to the ground point.
 2. Disconnect and remove or secure the second lead, possibly a lead to one of the cartridge's common output terminals.
 3. If this is suspected, the cartridge should be checked by its manufacturer or their service agent. Make certain that the cartridge has been connected as its makers intended, particularly if it has a short-circuiting link or ground strap.
2. "Hum loops" in the grounding system. A point connected to ground by two separate paths (probably in the pickup circuit) can create a "hum loop".
3. Faulty magnetic pickup cartridge.

No. 13 Noise (c)

Interference, heard as crackles etc. through speaker(s).

N.B. DISCONNECT POWER BEFORE OPENING SWITCH

1. Faulty contact in power supply circuit, pick-up circuit or earth.
 1. Examine all leads and connections for damage and check screws for tightness. Remove screws (231) holding motor switch, take off cover and check for good contact between blades. Clean and form blades as necessary.

Cause

Correction

No. 14 Automatic Switch

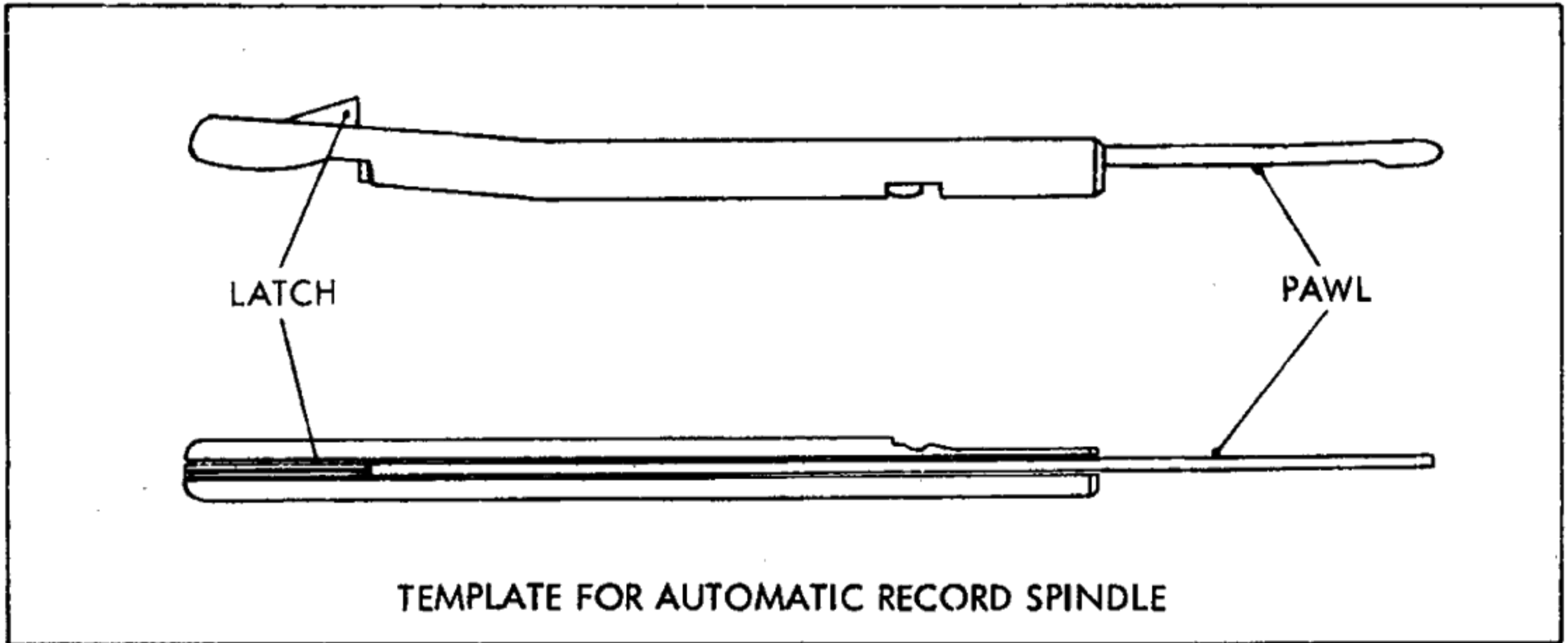
Fails to switch off when last record has played or switches off without playing.

1. Automatic operating control tight.

1. Check operation of return spring (153) and free movement of trip operating lever (151).

2. Damaged record spindle.

2. Check shape to template below.



FITTING NEW PARTS

Motor Pulley

The motor pulley fits closely on the motor spindle to maintain perfectly true running. If the pulley cannot be lifted off without undue difficulty after fixing screws have been slackened, insert a 4 B.A. screw in the top of the pulley to act as an extractor and turn this screw with a screwdriver (while holding the pulley stationary) until the pulley is driven off the spindle. A suitable extractor is provided with the new pulley: it can be discarded after use.

The new pulley should be fitted using moderate pressure to make certain that it is pressed onto the motor spindle as far as it will go. If difficulty is experienced due to the close fit, apply a gentle heat to the base of the pulley for a short time with a clean soldering iron. This will expand the pulley sufficiently to facilitate fitting.

If a new pulley is fitted as a result of a change of power supply frequency then a stroboscopic platter ring for the new frequency must be fitted at the same time.

When frequency is changed from 60 to 50Hz, power supply voltage must not exceed 120V. It is recommended that a high (220/240V) and low (110/125V) voltage range motor with 50Hz pulley and wiring loom with voltage changeover block be fitted in preference.

Neon Lamp for Stroboscope

Disconnect the power supply and remove the fixing screw (226) from the recess in the lens housing to release the clamp (229) and lamp (228). Slide back both insulated terminal covers (A) and ease the press-on lead connectors off the lamp terminals.

Reassemble in the reverse order, pressing the leads firmly onto the terminal tags on the new lamp and refitting the insulated covers securely.

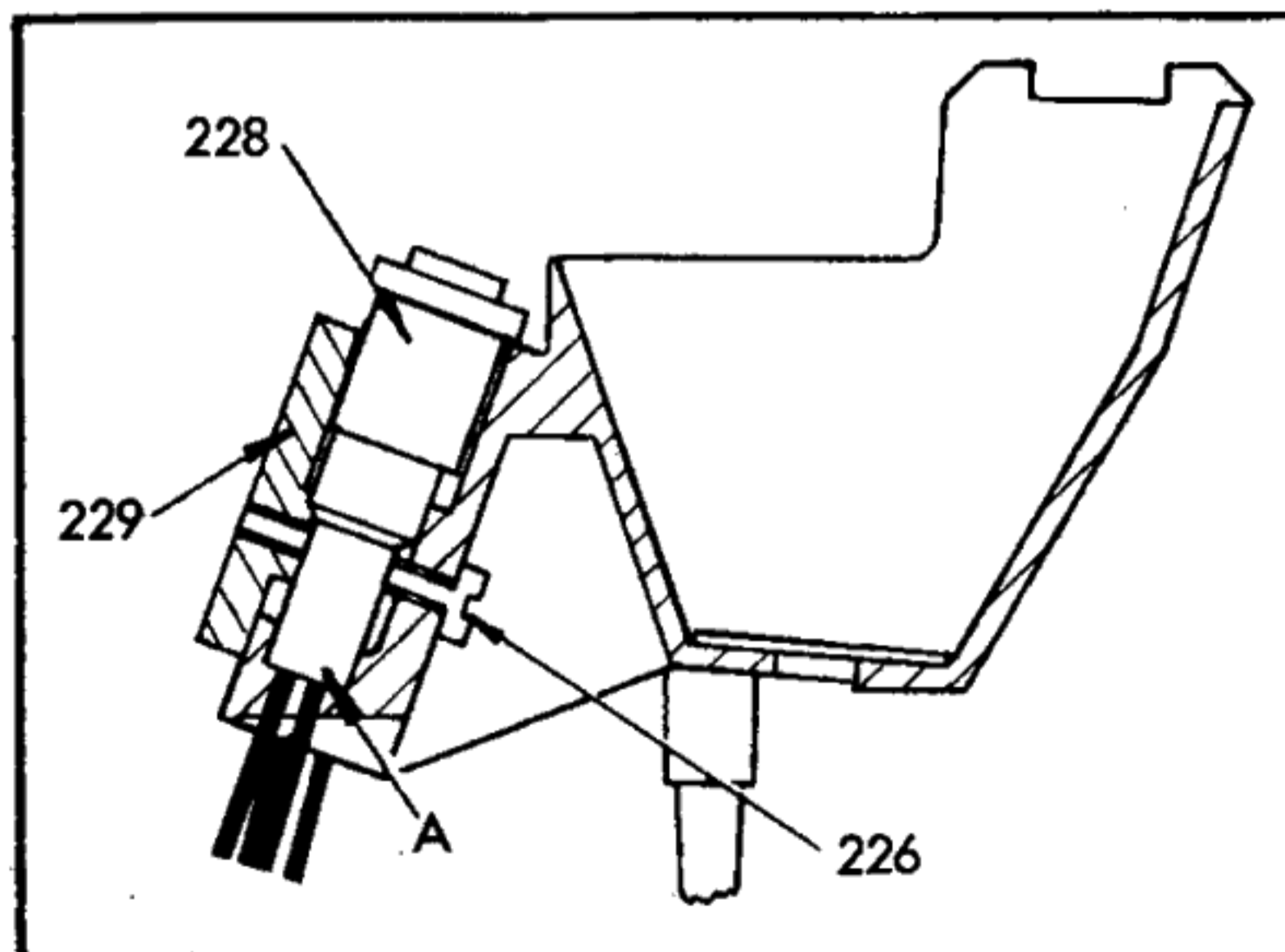
Intermediate Wheel

Lever off spring clip (49 on exploded view), then lift off the plastic washer (48), intermediate wheel (47) and fibre washer (46).

Apply a smear of light machine oil, such as non-detergent SAE 20W oil, inside the bearing of the new wheel before re-assembling. Any trace of oil on the rubber can cause the platter drive to become erratic.

Motor

Disconnect the power supply, pull out both power supply lead plugs and the ground (earth) lead from the body of the motor and remove the three fixing spring clips (36 on the exploded view) and washers (35). The motor can then be pulled out from its rubber mountings (205 and 206). To fit the new motor push it up into the three rubber mountings until it remains suspended evenly when released.



Neon Lamp and Housing

FITTING NEW PARTS (Continued)

Gimbal Surround with Magnet (70)

Being careful to avoid damage to the tonearm (107) or correcting arm (3), proceed as follows:

- A. Lock the tonearm on its rest, unwind the counterbalance weight (1) off the back of the arm and remove the pickup cartridge on its carrier (61) for safety.
- B. Pull off bowed washer (106) and take out the fixing screw (72).
- C. Turn screw (9) fully counterclockwise and screw (14) fully clockwise to increase clearance, then move the tonearm locking lever to FREE.
- D. Guide the gimbal surround clear of the tonearm.

Reassemble in the reverse order. When assembly is complete screw the magnet adjusting knob (71) counterclockwise to release it, ease out the trim disc (73) from underneath and refit the knob. Adjust the knob until there is a gap of 0.075" (± 0.005) between the adjacent faces of the magnets, then place a drop of contact adhesive into the hole in the top of the knob to seal the adjustment. Finally, refit the trim disc and reset tonearm lifting height and restriction as instructed in 'Adjustments' section.

Tonearm

Proceed in the same way as when fitting a gimbal surround. Unsolder the pickup leads from their connecting tags on the phono sockets (193) on the underside of the unit plate and draw them through the lead clip (243) with extreme care to avoid damaging the fine, flexible wires. After pivot screw (95) has been removed the tonearm can be lifted clear complete with its correcting arm.

Reassemble in the reverse order, finally feeding the pickup leads through the clip and resoldering them to the phono sockets.

Due to continuous development specifications are subject to alteration without notice.

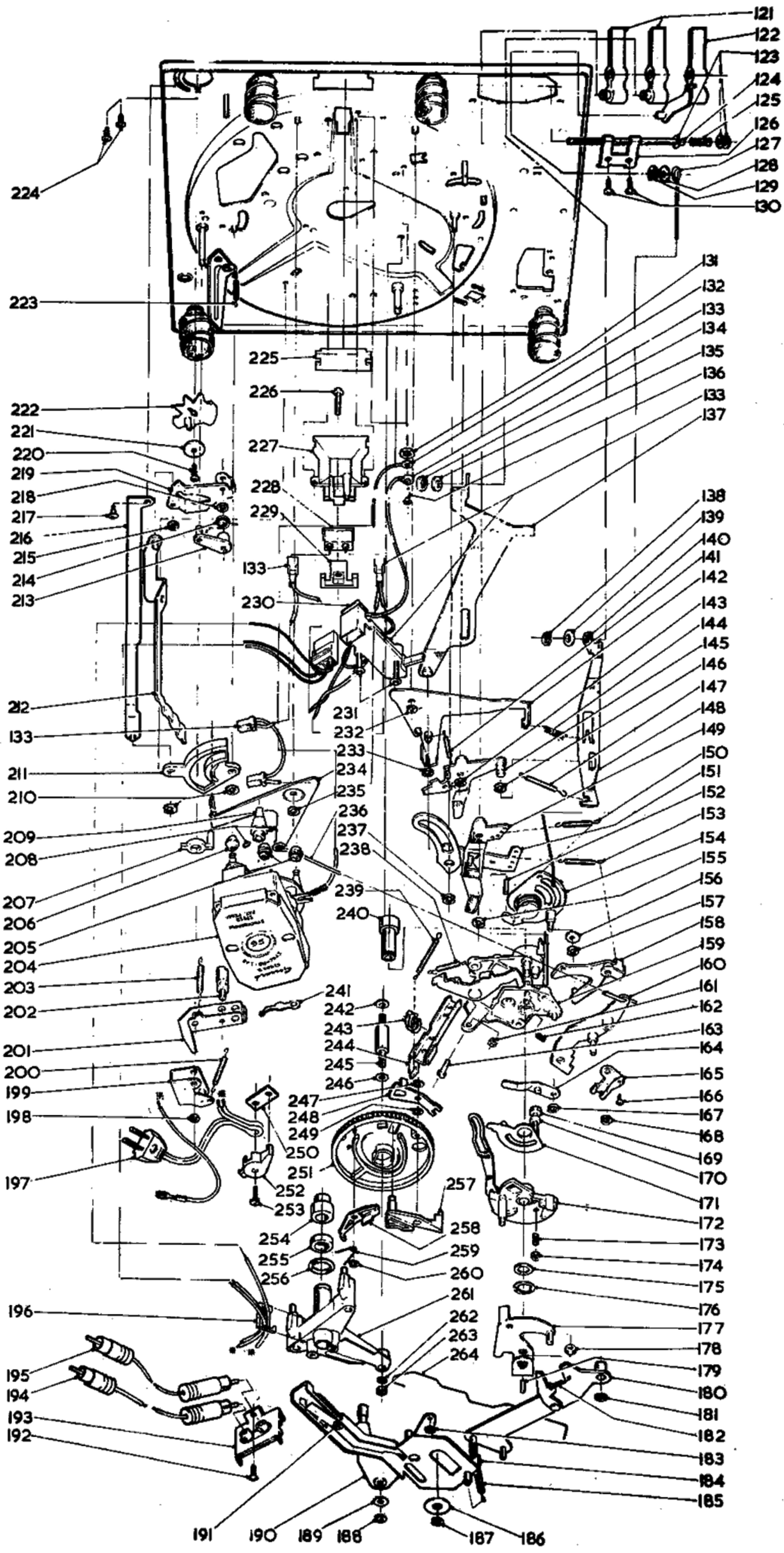
NOTE: When Ordering Parts Please Quote:-

- 1) Zero 100
- 2) Reference Numbers On The Coloured Label Under The Unit Plate (75100/...)
- 3) Garrard Part Number & Description
- 4) Colour Of Part Or Power Supply Rating If Appropriate

PARTS ABOVE UNIT PLATE

Ref. No.	Garrard Part No.	Description	Ref. No.	Garrard Part No.	Description
1	75138	Counterbalance Weight	55	72698	Adaptor, For Large Hole Records (Single)
2	75470	Retainer	56	75155	Type LRS100 Record Spindle (Optional Extra)
3	75117	Correcting Arm	57	75196	Single Record Spindle
4	00525/101	Grub Screw	58	72340	Automatic Record Spindle
5	75112	Weight Guide	59	75291	Setting Gauge
6	01142/005	Screw (2)	60	Various Pairs	6 B.A. Screws
7	75309	Lead Clamp	61	75149	Type C3 Cartridge Carrier
8	44972	Spring	62	44489	Spring Washer
9	75249	Screw	63	41218/077	Washer (1 Only)
10	44495	Spring	64	44356	Screw
11	75152	Stylus Force Weight	65	75259	Trim
12	44356	Screw	66	75234	Magnet
13	75234	Magnet	67	41227	Washer
14	44352	Screw	68	75233	Adjusting Screw
15	40906	Locking Washer (2)	69	44498	Spring
16	00525/105	Grub Screw	70	75230	Gimbal Surround
17	41218/081	Washer	71	75235	Adjusting Knob
18	75467	Pickup Spindle	72	40430	Screw
19	75342	Pickup Lead With Head Insert	73	75154/003	Trim Disc
20	73873	Friction Button	74	75161	Platform With Cover
21	44210	Grub Screw	75	74285/002	Cover
22	75177	Lifting Platform	76	44348	Screw (2)
23	75156	Arm Rest	77	00432/007	Spring Clip
24	44350	Transit Screw	78	44952	Torsion Spring
25	75168	Control Panel Moulding	79	72256	Stop Lever With Spring
26	00245/010	Screw (3)	80	72255	Tension Link
27	43855	Transit Clip	81	00432/007	Spring Clip
28	41218/014	Washer	82	41218/046	Washer
29	44348	Screw	83	72254	Tension Lever
30	71084	Damping Pad (4)	84	00245/010	Screw (2)
31	75251	Window Trim	85	00451/001	Nut
32	44889	Mounting Spring	86	44953	Torsion Spring
33	00245/035	Screw	87	42561	Bowed Washer
34	75101	Unit Plate With Pins & Bushes	88	41218/046	Washer
35	41218/026	Washer (3)	89	44434	Torsion Spring
36	00432/007	Spring Clip (3)	90	75135	Gimbal With Screws & Magnet
37	75205	Bearing Moulding	91	41218/083	Washer
38	43855	Transit Clip	92	41218/077	Washer
39	44519	Spring	93	41129	Nut
40	75240	Speed Control Knob	94	02651/013	Spring Clip
41	44350	Transit Screw	95	74407/002	Pivot Screw
42	75584	Graphics Disc Moulding	96	75125	Pickup Head
43	44819	Spring	97	41227	Washer
44	75207	Speed Selection Knob	98	75342	Head Insert With Leads
45	75264	Support Lever	99	75127	Trim Plate
46	41219/005	Fibre Washer	100		Not Used
47	58220	Intermediate Wheel	101	75121	Pin
48	41219/010	Plastic Washer	102	41218/077	Washer
49	00431/010	Spring Clip	103	41129	Nut
50	75191	60Hz Stroboscope Ring	104	75154/001	Trim Disc
	75445	50Hz Stroboscope Ring	105	75236	Shield
51	75190/001	Platter With Mat & 60Hz Ring	106	00290/003	Spring Clip
	75190/002	Platter With Mat & 50Hz Ring	107	75104	Pickup Arm Complete
52	75193	Mat			
53	43857	Retaining Clip			
54	75194	Centre Disc Moulding			

Ref. No.	Garrard Part No.	Description	Ref. No.	Garrard Part No.	Description
121	75171	Control Paddle (2)	196	73807	Clip For Line Cord
122	75174	Cueing Control Paddle	197	72192/002	Line Cord & Ground (Earth) Lead With Clip
123	41218/073	Washer (3)	198	01166/002	Spring Clip
124	74305	Pivot Spindle	199	58211	Index Bracket
125	44442	Spring	200	41848	Spring
126	74306	Pivot Clamp Plate	201	75266	Support Bracket
127	74304	Cueing Link	202	44353	Adjusting Screw
128	41218/013	Washer	203	44708	Spring
129	00432/007	Spring Clip	204	60810	Series II Synchro-Lob Motor (State Voltage)
130	44348	Screw (2)	205	43129/003	Motor Mounting (2)
131	00852/012	Shakeproof Washer	206	43129/002	Motor Mounting
132	60391/002	Ground (Earth) Lead	207	75423	Speed Control Saddle
133	60365	Loom With Switch Etc. (Quote No. On Tape Around Switch)	208	44052	Screw (2)
134	00432/007	Spring Clip	209	60902	60 Hz Motor Pulley With Screws & Extractor (No Groove Or Chamfer On Base)
135	41218/013	Washer		60903	50 Hz Motor Pulley With Screws & Extractor (Deep Groove & Chamfer On Base)
136	44348	Screw	210	00432/007	Spring Clip
137	74332	Auto Operating Lever	211	75213	Speed Control Cam
138	00432/007	Spring Clip	212	75255	Speed Cam
109	41218/013	Washer	213	72366	Index Lever
140	74302	Manual Operating Lever	214	44927	Torsion Spring
141	41506	Spring	215	00432/007	Spring Clip
142	74331	Switch Lever, With Spring	216	75244	Speed Control Link
143	00432/007	Spring Clip	217	75214	Pivot Screw
144	44445	Spring	218	00432/007	Spring Clip
145	74334	Catch Lever	219	72354	Speed Lever
146	00432/007	Spring Clip	220	01242/035	Screw
147	44444	Spring	221	41218/053	Washer
148	74302	Manual Operating Lever	222	75245	Selector Cam
149	74300	Trip Lever	223	44718	Spring
150	44948	Spring	224	01145/055	Screw (2)
151	74333	Trip Operating Lever	225	75200	Viewing Window
152	74871	Cueing Plunger	226	00245/663	Screw
153	41506	Spring	227	75197	Stroboscope Housing
154	74335	Cueing Cam	228	75327	Neon Lamp, Industrial Devices Type 2340
155	00431/015	Spring Clip	229	75203	Clamp
156	41219/010	Washer	230	73599	Insulating Plate
157	00431/010	Spring Clip	231	01577/006	Screw (2)
158	73494	Switch-Off Return Lever	232	00431/015	Spring Clip
159	75180	Pickup Base, With Levers, Etc.	233	00432/007	Spring Clip
160	75186	Selector Lever	234	72445	Selector Follower, With Rod
161	00446/002	Nut	235	00431/015	Spring Clip
162	00245/058	Grub Screw	236	72249	Selector Rod
163	00245/037	Screw	237	00432/007	Spring Clip
164	72467	Retracting Lever	238	44951	Spring
165	72278	Link Guide	239	44870	Spring
166	01145/028	Screw	240	75496	Tonearm Bearing
167	00432/007	Spring Clip	241	44488	Setting Blade
168	00432/007	Spring Clip	242	41218/013	Washer
169	44266	Screw	243	03037	Clip For Lead
170	40975	Washer	244	74371	Leg
171	72421	Friction Lever	245	72233	Cam Stud
172	74370	Pickup Cam	246	41218/013	Washer
173	44975	Spring	247	00431/002	Spring Clip
174	72435	Nut	248	75228	Trip Pawl
175	41218/054	Washer	249	00431/002	Spring Clip
176	00431/029	Spring Clip	250	73821	Insulating Plate
177	74357	Pickup Lever	251	75222	Main Cam With Levers
178	00451/001	Nut	252	73791	Strain Relief Clip
179	44041	Grub Screw	253	01515/016	Screw
180	73504	Cam Link	254	75371	Bearing
181	00432/007	Spring Clip	255	74870	Spacer
182	44981	Spring	256	58174	Cushion Ring
183	00432/007	Spring Clip	257	75226	Friction Lever
184	75788	Release Lever	258	72404	Cam Index Lever
185	41631	Spring	259	44973	Torsion Spring
186	41218/058	Washer	260	43864	Spring Clip
187	00432/007	Spring Clip	261	75218	Turntable Spindle Housing
188	00290/004	Spring Clip	262	00201/003	Spring Washer
189	41218/039	Washer	263	00451/001	Nut
190	72328	Cam Lever	264	75229	Trip Rod
191	00245/035	Screw			
192	01515/016	Screw			
193	73532	Phono Socket			
194	59029	Phono Lead (Brown)			
195	59028	Phono Lead (Grey)			

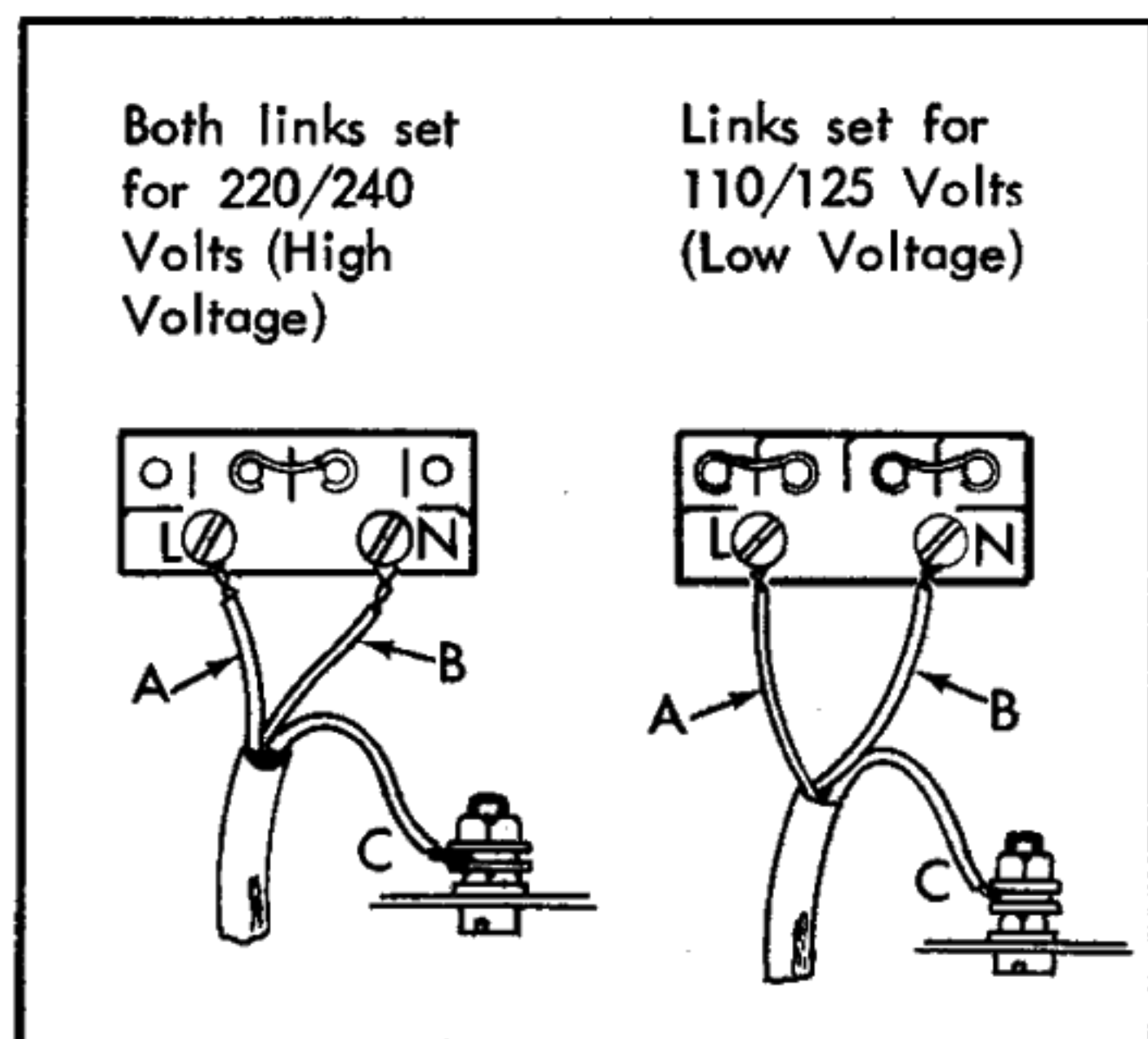


INTERNATIONAL MODELS

These models have a high (220/240V) and low (110/125V) voltage range motor. The 'A. C. Power supply and Ground Connections' section on page 3 should be disregarded and the following instructions carried out instead.

A.C. Power Supply and Earth Connections

1. Remove nut fixing the clear plastic cover from voltage changeover block on underside of unit.
2. Check that both wire links are firmly pressed onto the correct studs for the power supply voltage. See diagram.
3. Attach a length of 3-wire flex from a 3-pin power supply plug, or from a power outlet and earth connection on the amplifier, in the following way
 - (a) Brown wire to terminal screw L (live) on the changeover block.
 - (b) Blue wire to terminal screw N (neutral) on the block.
 - (c) Green/yellow wire between washers on earth terminal screw on unit plate.



Connecting the Cartridge to an Amplifier

If phono leads are to be used, follow the connecting instructions on page 4.

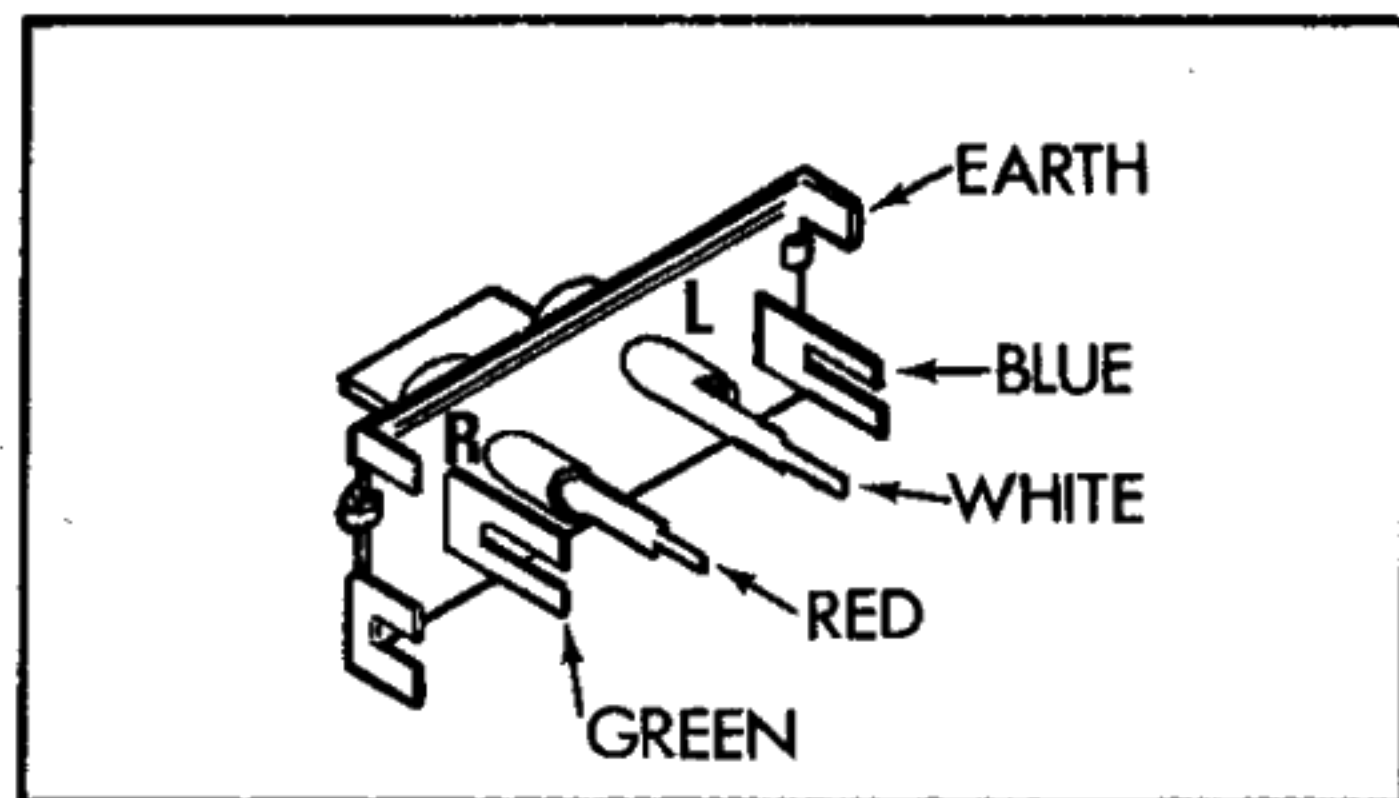
Alternatively, either single- or twin-core screened pickup lead(s) can be soldered to the same 4 tags on the back of the phono socket as the leads from the pickup arm (tonearm). The leads are colour-coded thus

- Red - Right-hand channel.
- Green - Right-hand channel 'earthy' connection.
- White - Left-hand channel.
- Blue - Left-hand channel 'earthy' connection.

Connect the lead(s) to the input sockets of the amplifier as instructed by its manufacturer.

For a mono cartridge use the right-hand channel connections only.

For a stereo cartridge used with a mono amplifier, solder one short-circuiting wire link between the same tags on the phono socket as the red and white leads and another between the same tags as the green and blue leads from the pickup arm. This will parallel both channels, either of which should be connected to the amplifier input socket.



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