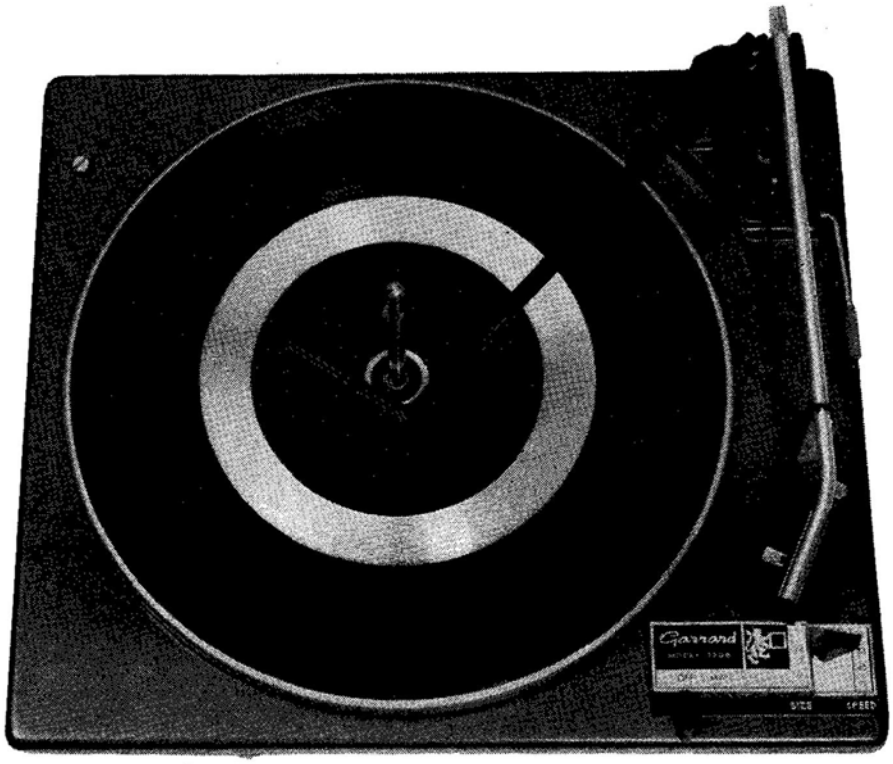
Garrard



MODEL 3500

ENGINEERS SERVICE MANUAL AND SPARE PARTS LIST

GARRARD ENGINEERING LIMITED
Service and Spares Department:
NEWCASTLE STREET - SWINDON - WILTSHIRE - ENGLAND
Telephone: Swindon 5381

Operating Instructions

Before use:

1. Check that transit screws are screwed down clockwise so that the unit floats freely on its mounting springs.
2. Set record speed/size control to required position.
3. Check that the cueing lever is down.
4. Remove stylus-guard if fitted and check that stylus is correct for record to be played.
5. Free the pickup arm by releasing its clip.

For Automatic Play

(a) Fit the auto record spindle in the turntable centre, turning it until it can be pushed down into place.

(b) Lift the overarm and swing it counterclockwise to the right, then place up to eight records – of the same size and speed as selected – on the record spindle step. Swing the overarm into the centre to hold the records level.

(c) Switch on by moving the operating control to 'Auto', pause while the mechanism engages, then release the control, which will return to the 'Manual' position. At least one record should be on the record spindle step before switching on.

(d) After playing all the records, the pickup will return to its rest and the unit will switch off. Lift the overarm and swing it to the right, then withdraw the records clear of the spindle even if they are to be replayed.

For Manual Play

(a) Fit short record spindle.

(b) Lift the overarm and swing it clockwise to park it along the rear of the unit.

(c) Place the chosen record on the turntable.

(d) Switch on by moving the operating control to 'Manual'.

(e) Use the pickup finger lift to place the pickup on the record. The pickup will return to its rest and the unit will switch off after the record has played.

Cue and Pause

The cueing device may be used to assist placing the pickup on a record, as an alternative to the Manual Play method described. It permits the pickup to be raised from or lowered on to any part of a record, and can be used as a 'pause' control.
Lift the cueing lever to raise the pickup, which can then be positioned as required. Steadily lower the cueing lever to lower the pickup on to the record.

Repeat

To repeat a single record, or the last of a stack, leave the overarm to the right as when loading records. The record will repeat until the overarm is swung into its centre position during the last desired playing.

Reject

A record being played can be rejected by moving the operating control to 'Auto'.

Stop

When the operating control is moved to 'Off', the power supply to the unit is switched off, leaving the pickup on the record. Turn the control to 'Manual' to recommence playing the same record.

Note: Records should be handled, stored and cleaned as recommended by makers. Remove records from the unit when not in use and keep the stylus clean.

Installation and Wiring

Cabinet Space

Model 3500 is $13\frac{13}{16}$″ (351 mm) wide by $11\frac{3}{8}$″ (289 mm) front to rear by $4\frac{5}{8}$″ (117.5 mm) above and $2\frac{3}{4}$″ (70 mm) below lower edge of unit plate when a 4-pole motor is fitted. The latter figure is $2\frac{1}{8}$″ (54 mm) when a 2-pole motor is fitted.
An additional $\frac{5}{16}$″ (8 mm) is required on the front to rear dimension to allow for overhang of the overarm when it is parked along the rear of the unit plate.
Clearances of $\frac{1}{2}$″ (12 mm) should be added to the dimensions given in order to give $\frac{1}{4}$″ (6 mm) all round the edge of the unit and $\frac{1}{2}$″ (12 mm) above and $\frac{1}{2}$″ (12 mm) below, allowing unit to float freely and be clamped for transit.
According to the design of the cabinet or case, additional clearance may be required around the control area and for record handling, also as clearance for 12″ records and removal of record spindle.

Unpacking

When unpacking a unit from its carton, follow the instructions printed on the carton. Never lift the unit by its pickup arm or overarm. Carefully remove all packing ties, rubber bands, polythene sleeves and cardboard fitments – including any wedges found between the motor and the unit plate. Accessories are found in the cavities of the polyfoam pack.
Support the unit on its mountings and fit the chosen record spindle. The spindle is located in the turntable centre by the retaining clip, therefore take care to position a record spindle correctly when fitting by turning the spindle until its location is felt, then pressing it down.

Preparing Mounting Board

If it is necessary to prepare a mounting board, do so by drilling and cutting out the board to the paper template supplied with the unit. Do not moisten the template but fix it to the board with adhesive tape. Recommended board thickness is between $\frac{3}{8}$″ and $\frac{1}{2}$″. Should a thicker board be used, it may be necessary to recess the $\frac{9}{16}$″ diameter holes from the underside to $1\frac{1}{8}$″ diameter, to clear the transit screw clips.

Motor Wiring

Before assembling the unit into the cabinet, connect a power supply lead. On some units the connection is made to a voltage changeover block, while other units may be fitted with a connector plug and socket. Certain units (only as supplied to some manufacturers) have flying motor leads.
Connect an earth lead to the earthing tag of the motor, or if a line cord socket is fitted make sure its connector plug is earthed through the green lead terminal.
See diagrams 1 and 2 for power supply connections. Diagram 3 shows the circuit when a line cord is fitted.

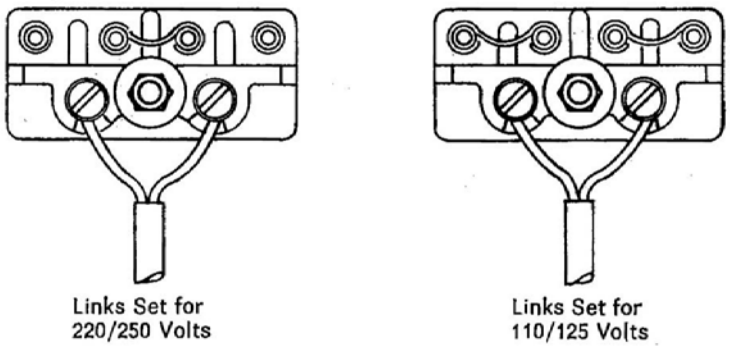


Diagram 1

Switch Click Suppressor

Some units may have a switch click suppressor incorporated in the motor switch, consisting of a capacitor, 10,000PF + 80% − 20%, wired across the switch blades. The suppressor forms part of the plug-in loom assembly.

Pickup Wiring

Screened leads should be connected to the pickup tag strip, or on some units the tags on the muting switch, suitable for connection to the amplifier, as shown on diagrams 4 and 5. Certain units have phono sockets fitted to which phono leads may be connected as shown in diagram 6. When a stereo pickup is used with a mono amplifier, parallel the right and left channels.
Before connecting the record changer to the amplifier, make sure that the pickup circuit of the radio set or amplifier to which it is to be connected, is isolated from the power supply. If it is not, then it is essential for isolating components to be incorporated in the pickup circuit.
The pickup lead should be kept as short as possible and its screening connected to a good earth.

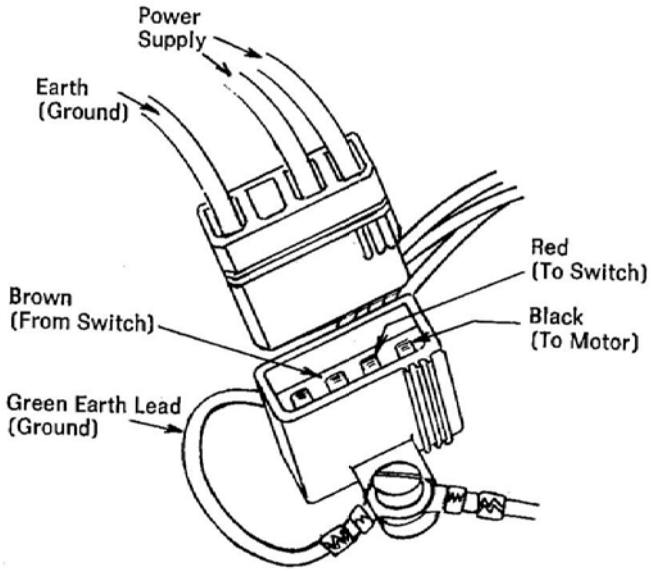
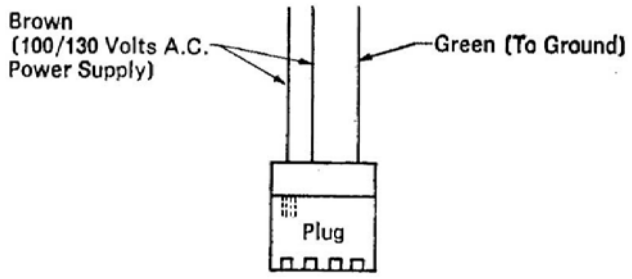


Diagram 2



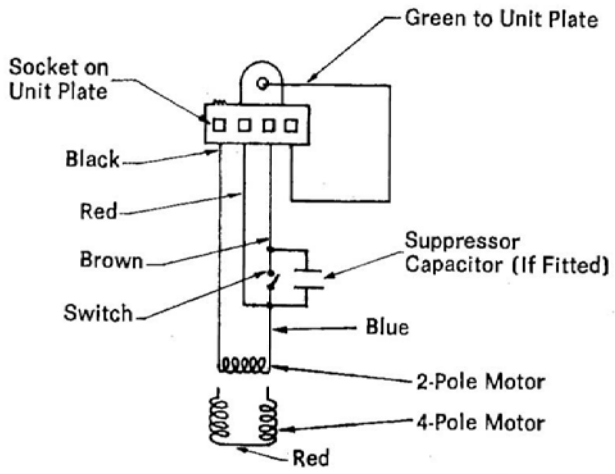


Diagram 3

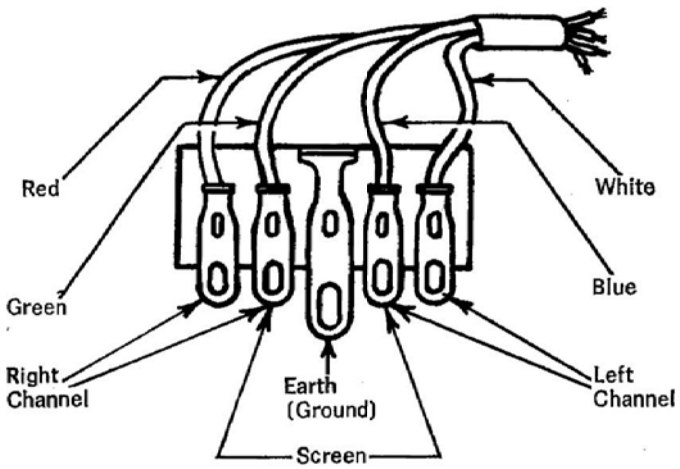


Diagram 4

Fitting Pickup Cartridge

A range of high compliance cartridges may be fitted to Model 3500 and in cases where a unit is supplied less cartridge or a new cartridge is to be fitted, information on its connections is usually supplied with the chosen cartridge. Garrard pickup hardware kit, part number 59048, supplies items required to fit a cartridge; components in this kit may vary according to the type of cartridge.

Model 3500 accepts cartridges with a single hole, central fixing arrangement, and normally the cartridge is held by a single screw threaded into the pickup arm trim. Do not try to raise the pickup arm beyond its stop position when assembling a cartridge.

When connecting the colour-coded leads in the pickup head to the connection tags on the cartridge, do not solder directly as this may damage the cartridge elements. (Remove the tags.) If the cartridge terminations are sockets, a special connector must be used.

Garrard units are made with pickup wiring colour coded as follows:—

Red — Right Channel Signal
Green — Right Channel Ground
White — Left Channel Signal
Blue — Left Channel Ground

For cartridges having 3 connections, use the green lead as the common connection or join the green and blue leads together and use these as the common connection. For mono cartridges use the red and green leads. Insulate and tuck away any leads not required.

Fitting Unit in Cabinet

The unit should be placed on the board so that the spring mountings locate in the recesses with the transit screws through their respective holes. When in position, the spring locks on the ends of the transit screws should be turned through 90° so that they lie parallel to the mounting board, as in diagram 7.

In use, check that the two transit screws are screwed down clockwise and that the unit is floating freely on its mounting springs. Before transit, turn the transit screws counterclockwise so that the unit is held against the mounting board as in diagram 7.

Setting-up for Play

Fit the auto or short record spindle in the turntable spindle, taking care in locating it, as it is held in position by the turntable retaining clip.

As a check on the mechanism, revolve the turntable slowly clockwise by hand. Use an unvalued record for setting up purposes and with power supply disconnected, operate the 'Auto' control to see that the mechanism cycles correctly. It may be necessary, especially when fitting a cartridge, to reset the adjustment of the pickup arm, including stylus force – if so, refer to Service Adjustments section.

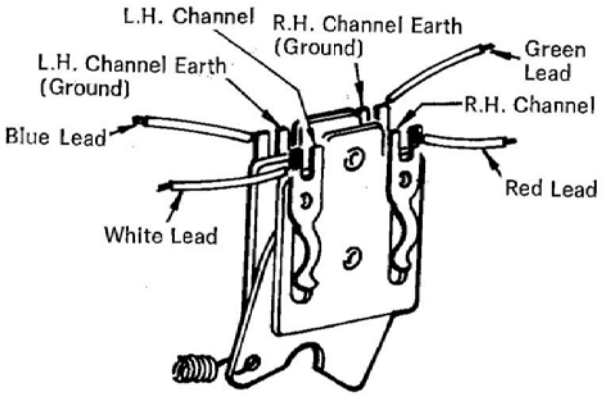


Diagram 5

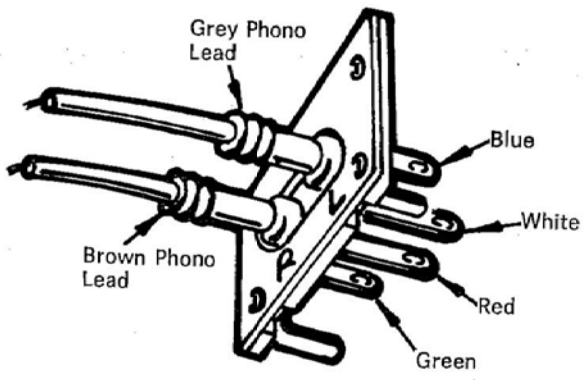


Diagram 6

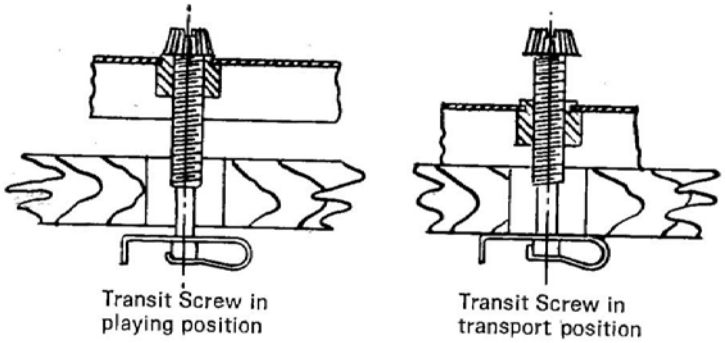


Diagram 7

Maintenance

Disconnect the power supply and protect the pickup before carrying out maintenance. Numbers in brackets refer to the exploded view.

To remove turntable

Pull out the record spindle from its location, then prise out the centre disc from its locating groove in the centre of the turntable mat, taking care not to damage the mat or bend the disc. Remove the turntable retaining clip using a small screwdriver and noting the clip's location for correct reassembly – small hole facing rear, left. Now lift the turntable with equal pressure on diametrically opposite sides.

When replacing the turntable, check that the tooth gap on the cam gear (74) is adjacent to the turntable spindle and that the trip pawl (72) on the cam gear is pushed clear of the turntable spindle. Replace the turntable retaining clip taking care that it is positioned correctly to locate the record spindle, when fitted.

The Overarm

When swung fully inwards, or parked in its manual play position along the rear of the unit, the overarm must drop freely in its location. If stiff, remove spring clip (155), washer (154) and spring (153) on the overarm spindle (beneath unit), withdraw the overarm and clean and oil its spindle. Check that spring (153) assists in the positive dropping of the overarm.

Lubrication

The bearings of the motor, turntable spindle and rubber intermediate wheel (49) are of the oil retaining type and rarely need lubricating. When the need for oil is apparent, remove the turntable and lubricate these bearings with a fine grade of machine oil. Carefully remove excess oil, particularly from the motor pulley, rubber intermediate wheel (49) and inside turntable rim by wiping these driving surfaces with a clean cloth.

If stiffness of operation becomes noticeable, pivot points such as pivot pins, spindles, rollers and spring anchors, also working faces can be lubricated sparingly with fine oil or grease if appropriate (see diagrams 8, 9 and 10).

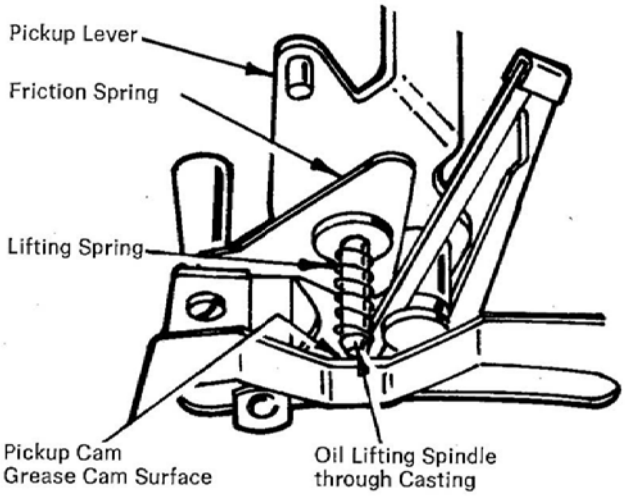


Diagram 8

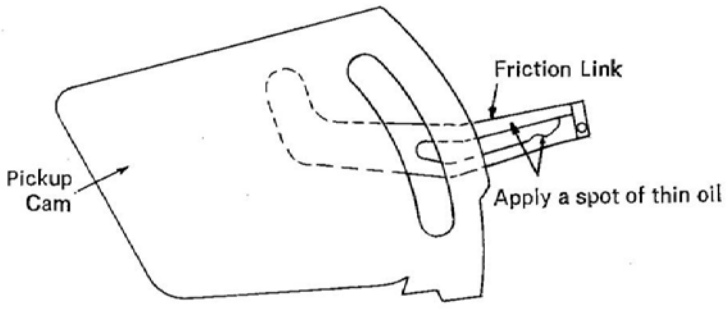


Diagram 9

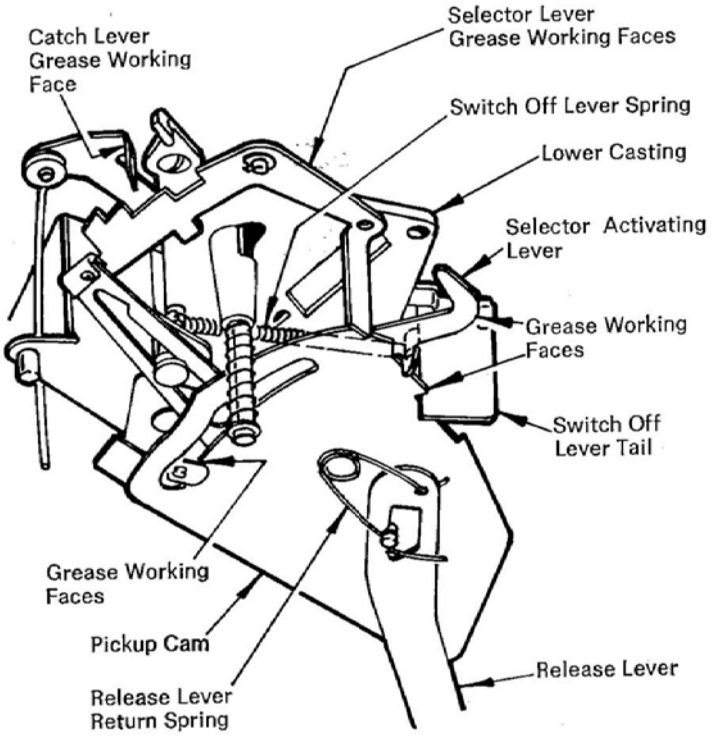


Diagram 10

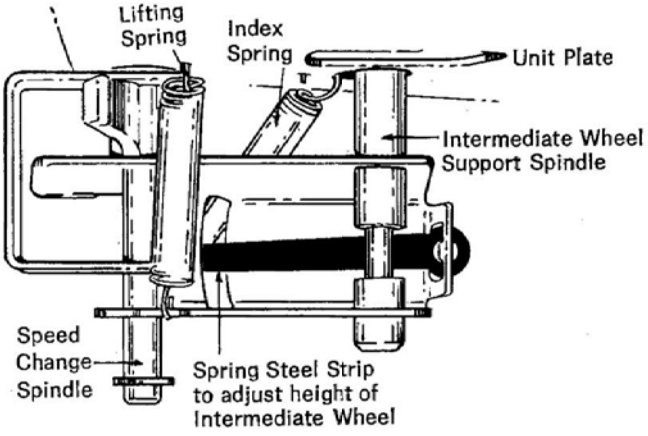


Diagram 11

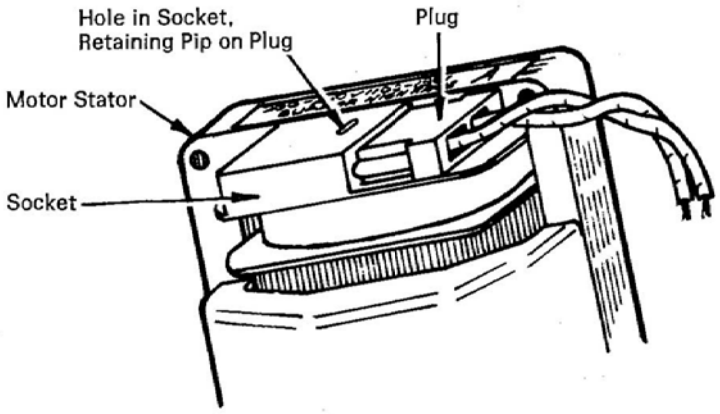


Diagram 12

Service Adjustments

Before making any adjustments, always disconnect the power supply and protect the stylus. If necessary, operate the controls and rotate the turntable clockwise by hand to actuate the mechanism.

Speed

If the turntable speed varies other than because of warped records slipping, remove the turntable and clean the driving surfaces as stated under 'Maintenance'. Should the turntable run fast or slow consistently, check that the motor and motor pulley match the power supply. The motor is marked with its power supply details and the motor pulley is colour finished for identification, nickel for 50Hz and brass for 60Hz power supply. If a 4-pole motor pulley (112) check that its grub screws are tight. (The 4-pole motor pulley is removable, but if tight on shaft with fixing screws loosened, apply heat to the pulley base for about 30 seconds with a warm, clean soldering iron, should the pulley need to be removed.) The 2-pole motor pulley is integral with the shaft and is not removable.

Check that the rubber intermediate wheel (49) runs in the centre of the appropriate pulley step and is not rubbing the side of the adjacent step. If necessary, adjust the intermediate wheel height setting blade. This blue spring steel blade adjusts the position of the spindle on which the rubber intermediate wheel (49) is mounted. See diagram 11.

Disconnecting the Motor

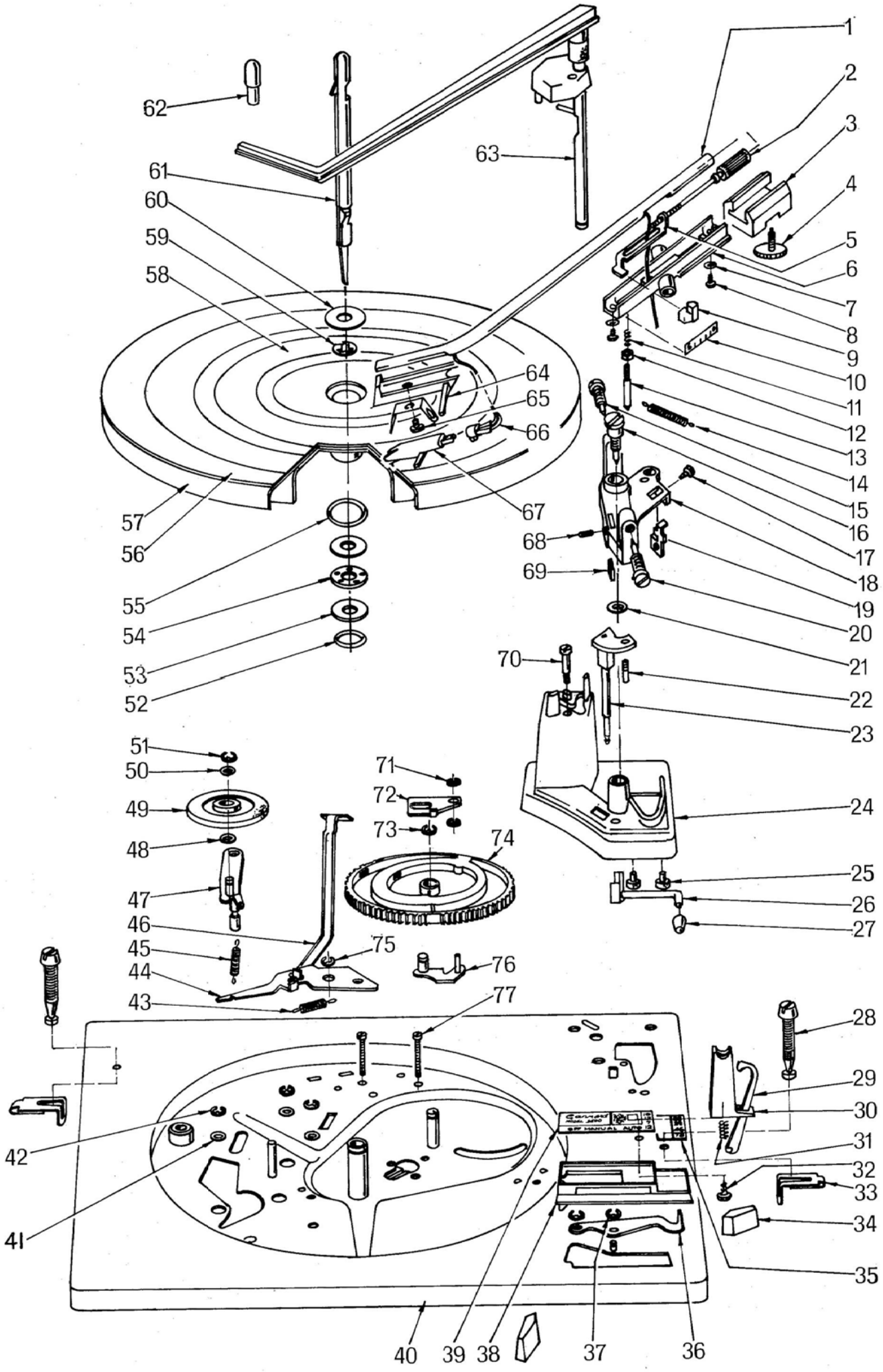
If there is need to change the motor, then nearly all Garrard units are fitted with a plug-in wiring loom which facilitates disconnecting the motor. The two plugs connecting the loom are each held in their respective sockets on the motor bobbin flange by a retaining pip. Carefully slide the tip of a thin screwdriver between the mated faces of plug and socket to separate them by about $\frac{1}{64}$", and at this time the plug can be withdrawn by gently pulling it from the socket. See diagram 12.

Pickup Tracking

Should there be a tendency for the pickup to track incorrectly, check that the correct stylus is in use and clean off any dust build-up from the stylus. Make sure the stylus force is correct for the cartridge fitted and see that the leads from the pickup are free and not rubbing any mechanism. Also see that the unit is reasonably level.

Pickup Muting Switch

Depending on the specification of the unit, a muting switch may be fitted which short circuits the pickup connections only during the time that the changing mechanism is in action. If this fails to operate, check that the contacts are making and breaking correctly and that the wiring is secure. See that the bracket on which the muting switch is mounted is correctly positioned against the two small, half-pierced lugs in the unit plate. If it is not, loosen the bracket fixing screw and position the switch correctly.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PARTS SHOWN ABOVE UNIT PLATE

Spare Parts List Model 3500

When referring to this unit **it is essential to quote the model type and code number.** The code number is overstamped on the inspection label taped to the underside of the unit plate.

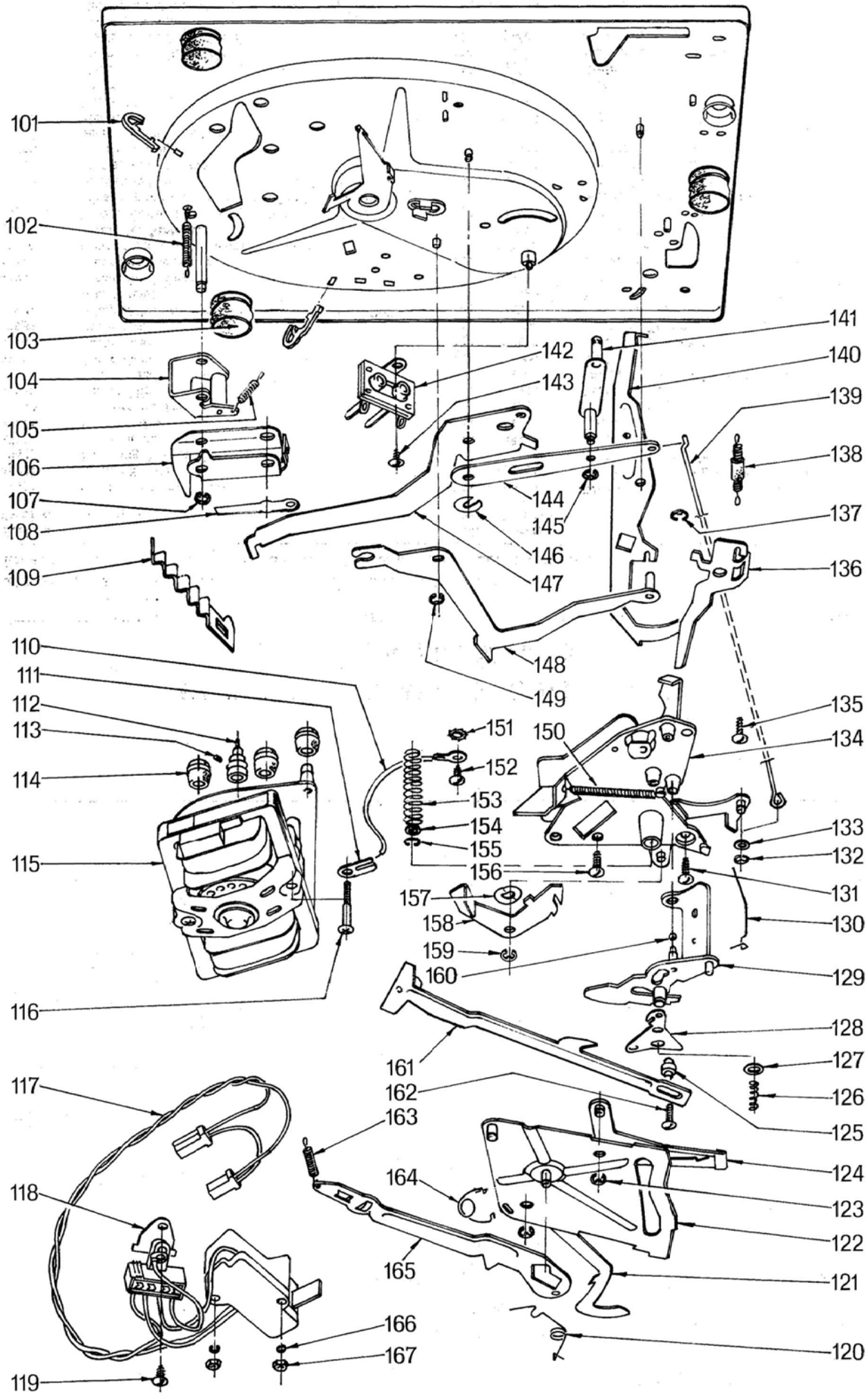
On Model 3500 the code number is 72900 plus its following 3-figure stroke number.

In addition when ordering spares, quote the part number and colour or voltage range, if applicable.

Ref. No.	Garrard Part No.	Description
1	73048	Pickup Arm, with Cartridge
2	73047	Adjusting Knob
3	73096	Counterbalance Weight, with Screw
4	72942	Screw for Weight
5	72914	Slider
6	73039	Pickup Arm Body Casting
7	42512	Washer, Shakeproof (2)
8	44295	Screw, for Body (2)
9	72923	Pointer, for Scale
10	72937	Scale, Stylus Force
11	44716	Spring
12	~~41048~~	Nut, Locking - 41039/003
13	44292	Adjusting Screw
14	44938	Spring, Stylus Force
15	72947	Pivot Screw, Left-Hand
16	72999	Pivot Screw, Vertical
17	44279	Screw, Self-Tapping
18	72905	Pickup Bracket Casting
19	72921	Adjuster, Stylus Force
20	72979	Pivot Screw, Right-Hand
21	40984	Washer, for Pivot Screw
22	44293	Adjusting Screw
23	73097	Lifting Platform with Spindle
24	73042	Upper Casting, with Pivot Bearing
25	72997	Bearing Pad, for Cueing Lever (2)
26	73031	Cueing Lever
27	72748	Knob, for Cueing Lever
28	44120	Transit Screw (2)
29	72920	Clip, for Pickup Rest
30	72919	Pickup Rest Body

Ref. No.	Garrard Part No.	Description
31	44940	Spring, for Pickup Rest (2)
32	44125	Screw, for Pickup Rest
33	43855	Clip, for Transit Screw (2)
34	72918	Knob for Control Lever (2)
35	72992	Small Escutcheon Plate
36	73044	Record Size and Speed Control Lever with Knob
37	41723	Spring Clip, for Control Lever
38	72907	Control Cover Moulding
39	73035	Large Escutcheon Plate
40	73087	Unit Plate, with Pins, Bushes, etc.
41	40695	Washers, for Motor (3)
42	41723	Spring Clips, for Motor (3)
43	41503	Spring, for Tension Lever
44	71357	Tension Lever
45	44819	Spring, for Support Lever
46	71824	Tension Link
47	71545	Support Lever, for Intermediate Wheel
48	40826	Fibre Washer
49	58220	Intermediate Wheel
50	40985	Nylon Washer
51	43818	Spring Clip
52	58749	Cushion Ring
53	40894	Thrust Washer (2)
54	58229	Ball Race
55	73139	'O' Ring
56	73008	Turntable Mat
57	73066	Turntable, with Mat and Trim Ring
58	73030	Small Trim Ring
59	43834	Spring Clip, for Turntable
60	73033	Centre Disc, for Turntable

Ref. No.	Garrard Part No.	Description
61	70932	Automatic Record Spindle
62	59830	Manual Record Spindle
63	73001	Overarm, with Upper Casting Cover
64	72932	Pickup Shell
65	40454	Screw, for Cartridge
66	73034	Lead, for Pickup Arm (please state Cartridge type)
67	—	Pickup cartridge – not made by Garrard
68	40268	Adjusting Screw
69	40906	Locking Washer
70	44291	Screw, for Cover
71	41723	Spring Clip (2)
72	58335	Trip Pawl
73	41788	Spring Clip
74	58328	Main Cam, with Pawl and Plate
75	41723	Spring Clip
76	58331	Pivot Plate
77	44220	Screws, for Switch (2)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PARTS SHOWN BELOW UNIT PLATE

Spare Parts List Model 3500

When referring to this unit **it is essential to quote the model type and code number.** The code number is overstamped on the inspection label taped to the underside of the unit plate.

On Model 3500 the code number is 72900 plus its following 3-figure stroke number.

In addition when ordering spares, quote the part number and colour or voltage range, if applicable.

Ref. No.	Garrard Part No.	Description
101	71971	Guide, for Motor Lead
102	44708	Lifting Spring
103	70447	Damping Pad (3)
104	58211	Index Bracket
105	41848	Index Spring
106	58209	Support Bracket
107	43858	Spring Clip
108	58210	Setting Blade
109	72990	Speed Cam
110	60391	Earth Lead
111	42932	Earth Tag
112	58921	60 c.p.s. Pulley, with Screw (58920 – 50 c.p.s. Pulley, with Screw)
113	44052	Screw, for Pulley (2)
114	43129	Mounting, for Motor (3)
115	60350	Motor (please quote details on motor)
116	44242	Screw, for Motor (2)
117	60365	Wiring Loom, for Motor, with Switch, Plugs, etc. (please quote number on tape binding switch)
118	59310	Insulation Plate
119	44154	Screw, for Connector
120	71362	Return Spring
121	73128	Selector Actuating Lever
122	73632	Pickup Cam
123	41723	Spring Clip (2)
124	58348	Friction Link
125	58316	Collar
126	41986	Spring, for Lifting Spindle
127	40514	Washer, for Lifting Spindle
128	41985	Friction Spring
128A	45210	Collar, not shown (between 128 and 129)
129	73141	Pickup Lever
130	44935	Spring, Overload
131	44154	Screw, for Lower Casting
132	41723	Spring Clip
133	40537	Washer
134	73154	Lower Casting, with Levers and Spring
135	44288	Screw for Lower Casting
136	58327	Reject Lever
137	41723	Spring Clip
138	71138	Return Spring
139	72993	Selector Link
140	73045	Operating Control Lever, with Knob
141	73009	Link
142	73532	Twin Phono Socket
143	44126	Screw for Socket
144	72910	Speed Inter Lever
145	41723	Spring Clip
146	43821	Spring Clip
147	58274	Speed Lever
148	58310	Switch Lever
149	41723	Spring Clip
150	44825	Spring
151	42500	Washer, Shakeproof, for Earth Lead
152	44124	Screw, for Earth Lead
153	44855	Spring, for Overarm
154	40967	Washer, for Overarm
155	43813	Spring Clip, for Overarm
156	44288	Screw, for Lower Casting
157	42561	Spring Washer
158	72982	Selector Lever
159	43821	Spring Clip
160	43200	Ball, for Lower Casting
161	72681	Auto Stop Link
162	44133	Screw
163	41759	Pawl Spring
164	44943	Loop Spring
165	71637	Release Lever
166	42526	Spring Washer (2)
167	41008	Nut (2)

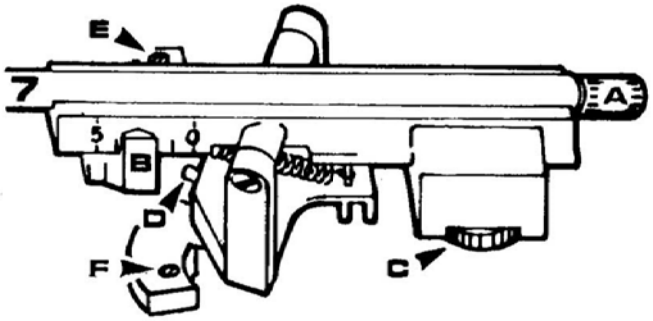

Diagram 13

Pickup Lowering Position
The settings for the standard record sizes (7″, 10″ and 12″) are made with the speed/size control. If adjustment is necessary – such as to prevent the pickup from lowering on to the slope of the groove guard on the edge of some records – then see diagram 13. Turn screw D clockwise to move the pickup arm inwards, counterclockwise to move it outwards. This adjustment is best carried out with the power supply disconnected. Load one record and actuate the mechanism while rotating the turntable clockwise slowly. Make the adjustment with the pickup just above the record surface.

Pickup Height
When on auto cycle, the pickup must clear a full stack of records on the turntable while returning to its rest, also the underside of any record on the record spindle step. For this condition, turn screw E shown on diagram 13, clockwise to raise or counterclockwise to lower pickup height, so that the stylus tip is $\frac{3}{4}$″ above a single record on the turntable as the arm returns to its rest.
Again, this adjustment is best carried out with power supply disconnected and mechanism actuated slowly by hand.

Pickup Cueing Height
When the cueing lever is lifted, the pickup (unclipped from its rest and with the mechanism out of cycle) should normally be raised so that the stylus tip is $\frac{3}{4}$″ above a single record on the turntable, when the pickup is swung over the record. A degree of adjustment on this setting is obtained by turning screw F shown on diagram 13, clockwise to raise or counterclockwise to lower pickup cueing height.

Stylus Force
With the mechanism out of cycle, leaving the pickup arm free and unclipped from its rest, set pointer B to zero on scale by turning milled knob A. See diagram 13. Release the pickup counterbalance weight by loosening milled nut C, and slide the weight in the direction which balances the arm. Retighten nut C when the arm is balanced then turn knob A so that pointer B is set to the required stylus force on the gram-calibrated scale.
The stylus force should be that recommended for the pickup cartridge.

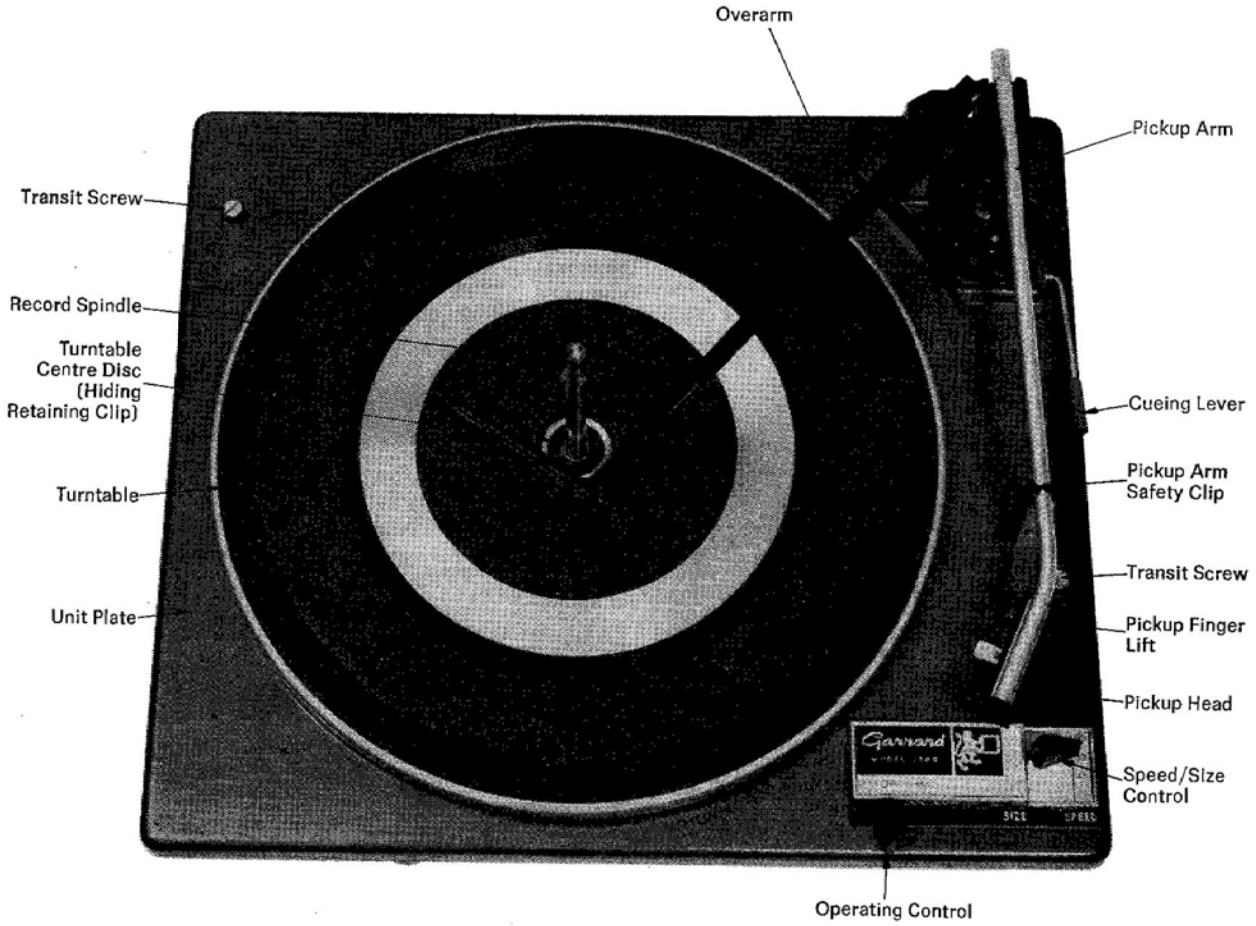

Diagram 14

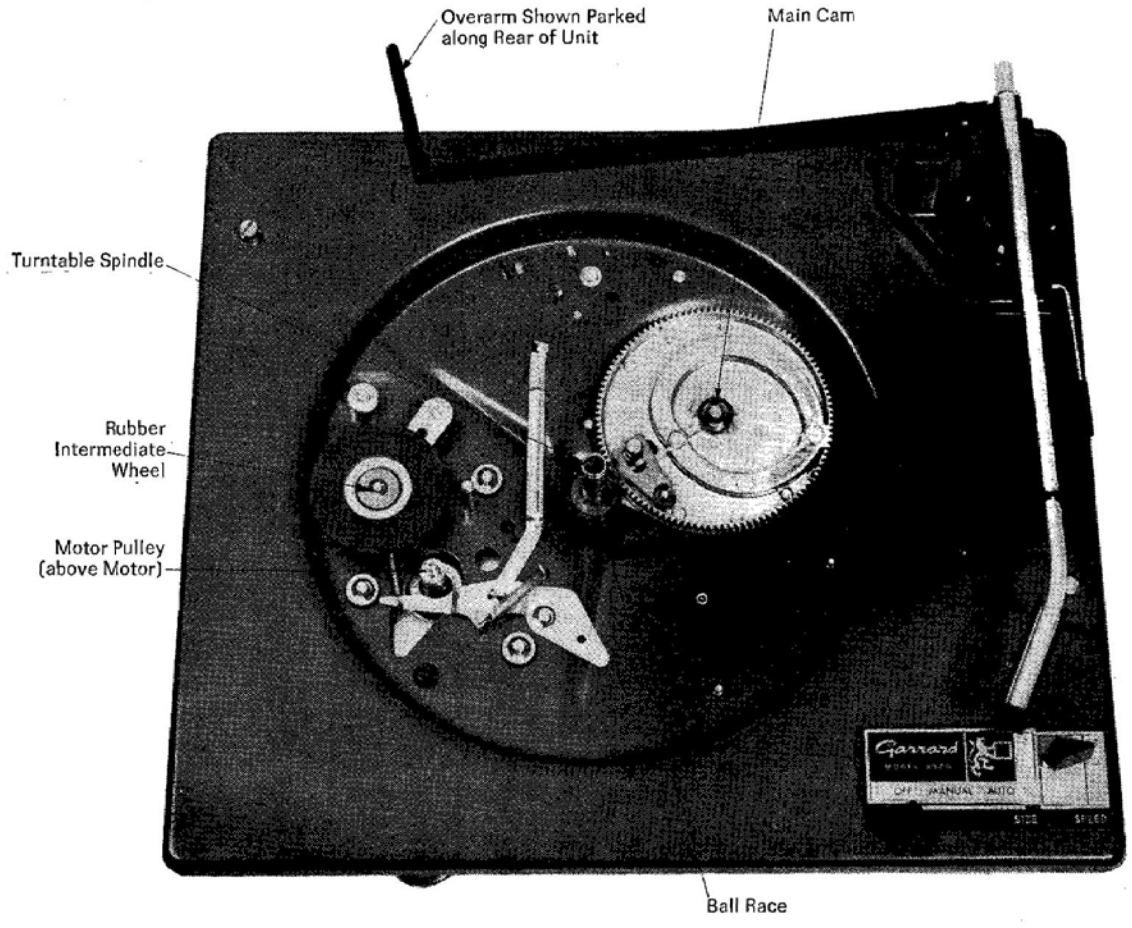

Diagram 15

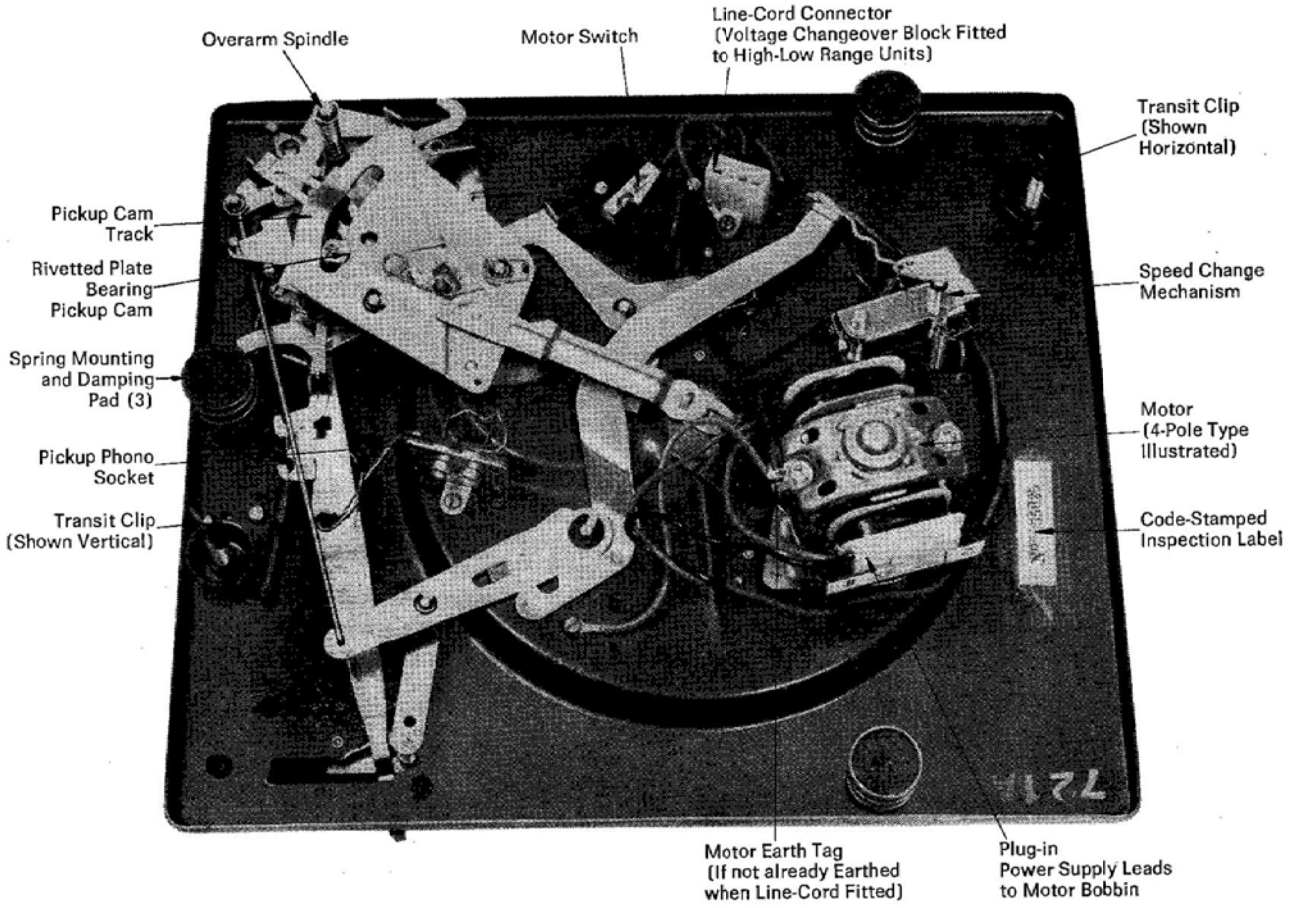

Diagram 16

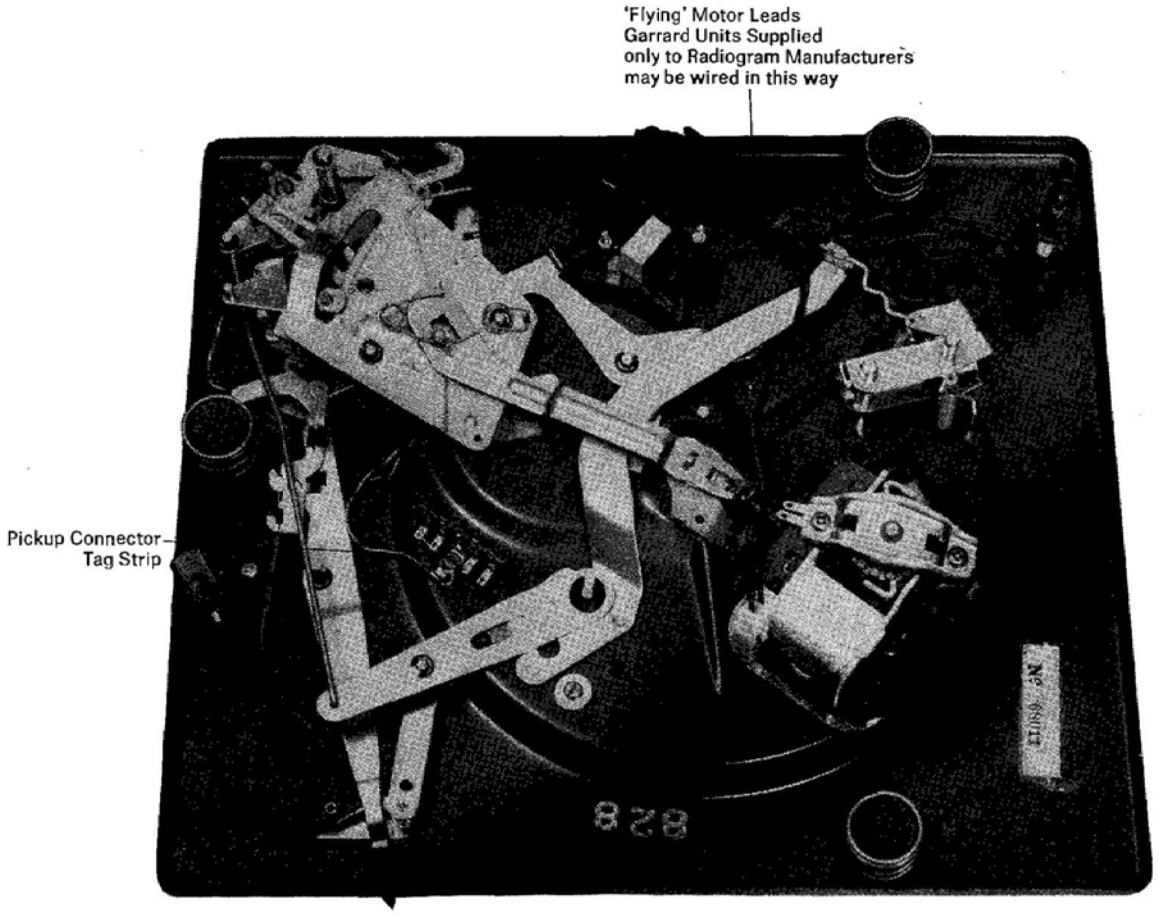

Diagram 17

DISCONNECT THE POWER SUPPLY BEFORE SERVICING A UNIT

The unit should be disconnected from its power supply and the stylus protected before servicing, whenever possible.

Numbers in brackets refer to parts shown on the exploded view.

References to "Motor Pulley" apply only to units with 4-pole motors.

FAULT	CAUSE	CORRECTION
Turntable Speed.		
A. Turntable fails to start, or runs slowly when switched on.	1. Oil or dirt on driving surfaces.	Remove turntable (57) and clean inside rim, intermediate wheel (49) and motor pulley (112).
	2. Faulty intermediate wheel spring (45).	Check that spring is secured. Move operating control to 'Manual' – spring should stretch. If it does not, replace it.
	3. Intermediate wheel support bracket (106) not free.	Wheel (49) should engage motor pulley (112) firmly when switched on and retract when switched off. If not, replace damaged parts or lightly oil spindles.
	4. No voltage or low voltage at motor (115).	Remove plugs from motor, switch on, and check with voltmeter. If no power, check back to source outlet, looking for loose connections, faulty switch contacts, etc. Voltage should not be lower than 100V for 100/130 volt A.C. motor or 200V for 200/250 volt A.C. Motor.
	5. Faulty motor coil(s).	Remove plugs from motor (115) to check continuity of coil, with ohm-meter. Replace motor if necessary.
	6. Bearings of motor (115) out of line.	If rotor does not spin freely, 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; thick oil will clog them.
	7. Motor pulley (112) or intermediate wheel (49) height set incorrectly.	See 'Service Adjustments'. Check that both motor pulley screws are tight.
	8. Bearings not free.	Check motor, intermediate wheel and turntable bearings. Clean and lightly oil, if necessary – see 'Maintenance'.
B. Turntable speed varies (wow and flutter).	1. Various.	See Fault A, Causes and Corrections 1, 7 and 8.
	2. Warped records in stack slipping.	If strips of adhesive tape on labels does not help, play warped records singly.
	3. Damaged rotor shaft.	Replace motor (115).
	4. Flats on driving surface of intermediate wheel (49).	If running for a few hours does not cure the fault, replace wheel.
Record Dropping.		
C. Records fail to drop.	1. Damaged record spindle (61).	Remove spindle and check that it is straight and that its record pushing pawl moves freely. If not, replace spindle.
	2. Record overarm (63) not free.	This should fall freely under its own weight. It should rest flat on top of record stack. Clean and lightly oil its spindle if necessary – see 'Maintenance'.
	3. Label paper in centre hole of new record.	Remove it carefully with a pen knife or ream hole with pencil.
	4. Non-standard records.	Records with oversized centre holes or more than 0.090" thick at centre hole may fail to drop. Play them manually.
	5. Release lever return spring (120) or pawl spring (163) weak or disengaged.	Replace or re-secure.

FAULT	CAUSE	CORRECTION
D. Two or more records drop together.	1. Damaged record spindle.	Check that both latches at the top of the spindle (61) fall freely. Do not oil them. Replace spindle, if necessary.
	2. Non-standard records.	Records less than 0.053" thick at centre holes. Play them singly.
Pickup Arm Movement.		
E. Pickup tracks incorrectly.	1. Stylus force too low.	Check that force is not lower than recommended. Reset if necessary – see 'Service Adjustments'.
	2. Dust accumulated around stylus tip.	Clean carefully.
	3. Pickup leads (66) tight or trapped.	Slacken them and check that the leads are not caught in mechanism below unit plate.
	4. Worn or wrong stylus.	Replace stylus.
	5. Groove guard on record.	If stylus lands too far out it may slide down the slope of the raised rim and jump the first playing grooves. Set lowering position so that stylus lands well inside the raised rim. See 'Service Adjustments'.
	6. Excessive friction in friction link (124).	Apply a spot of thin oil inside slot. See diagram 9.
	7. Automatic trip links (72, 76, 161) not free.	Move pickup inwards by hand checking for damaged linkage. Reshape or replace, as necessary.
	8. Damaged pickup pivots or bearing (15, 16, 20).	Replace, as necessary.
	9. Body of cartridge (67) touches record.	Tighten fixing screw (65) or reshape cartridge bracket.
F. Pickup lands on record too far out and/or in.	1. Lowering position incorrectly set.	See 'Service Adjustments'.
	2. Tail of selector lever (158) or tail of catch lever attached to selector link (139), not square.	Reshape or replace.
	3. Friction link (124) requires lubrication.	Apply a spot of thin oil inside slot. See diagram 9.
G. Pickup arm fails to lower.	1. Cueing lever (26) not lowered.	Lower the cueing lever.
	2. Lifting spindle (23) not free.	With pickup arm raised, lift the platform moulding at the top of the spindle. It should spring back. If not, check for damage or restriction. Clean and oil if necessary.
	3. Pickup arm pivots (15 and 20) not free.	Check for damage.

FAULT	CAUSE	CORRECTION
H. Pickup begins to lower, then swings in.	1. Pickup leads (66) tight or trapped.	Slacken if necessary and see that they are not caught in mechanism, below unit plate.
	2. Lifting spring (126) or friction spring (128) binding.	Check that lifting spring is secure and moves freely. With lifting spring held clear, deflect friction spring away from pickup cam (122); it should spring back when released. Replace damaged spring(s).
I. Pickup fails to lift and return at the end of the record.	1. Damaged trip pawl (72).	Reshape vertical lug, or replace pawl.
J. Pickup lands on record and immediately rejects, next record drops and fault repeats until normal switch off at end of a stack.	1. Return spring (120) disengaged.	Attach it to hole in release lever (165) and pin on pickup cam (122).
	2. Operating control lever (140) jammed.	Check operation of return spring (138) and grease sliding surfaces of control lever and unit plate. Lightly oil pivot of lever.
	3. Trip pawl (72) bent into turntable mesh.	Straighten trip pawl (72) or replace.
Noise.		
K. Rumble, heard through speaker(s) while stylus is in blank record groove.	1. Lack of lubrication.	See 'Maintenance'.
	2. Intermediate wheel (49) side rubbing against motor pulley (112).	Check heights of wheel and pulley – see 'Service Adjustments'.
	3. Driving surface of intermediate wheel (49) dirty, indented or hardened.	If cleaning the surface of the wheel and running the unit for a few hours does not help, replace it.
	4. Faulty installation.	Check that unit floats freely on its mounting springs, that the motor hangs freely in its rubber grommets and that no part of the mechanism is in contact with the mounting board.
	5. Worn turntable bearings.	Replace thrust washers (53), ball race (54) and/or cushion ring (52), as necessary.
L. Electrical interference, heard as crackles, etc. through speaker(s).	1. Faulty contact in power supply circuit, pickup circuit or earth connections.	Examine all leads and connections for damage and check screws for tightness. Remove screws (77) holding motor switch, take off cover and check for good contact between blades. Also, if a voltage changeover block is fitted, check that changeover links make good contact.
	2. Faulty suppressor.	Open switch (see Correction 1) and replace suppressor capacitor (10,000pF + 80% − 20%, 1500 volts D.C.).
Automatic Switch.		
M. Fails to switch off when last record has played or switches off without playing.	1. Record overarm (65) not free.	Check that overarm falls freely, and make sure that rubber sleeve is against overarm casting. Remove spring clip (155), washer (154) and spring (153) to withdraw overarm and lightly oil spindle, if necessary. With overarm inward in operating position and no records on spindle (61) check that end of overarm is not more than $\frac{1}{32}$" below spindle step. Overarm should not tilt record stack. Reshape or replace overarm, as necessary.
	2. Switch-off lever on lower casting (134), controlled by spring (150), stiff or bent.	Check that it moves freely and returns under control of its spring. Lightly grease between lever and unit plate if necessary. If tail of lever is bent out of square, reshape it.
	3. Operating control lever (140) jammed.	See Fault J, correction 2.

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