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Garrard

SERVICE SHEETS

MODEL RC 210



GARRARD ENGINEERING LIMITED

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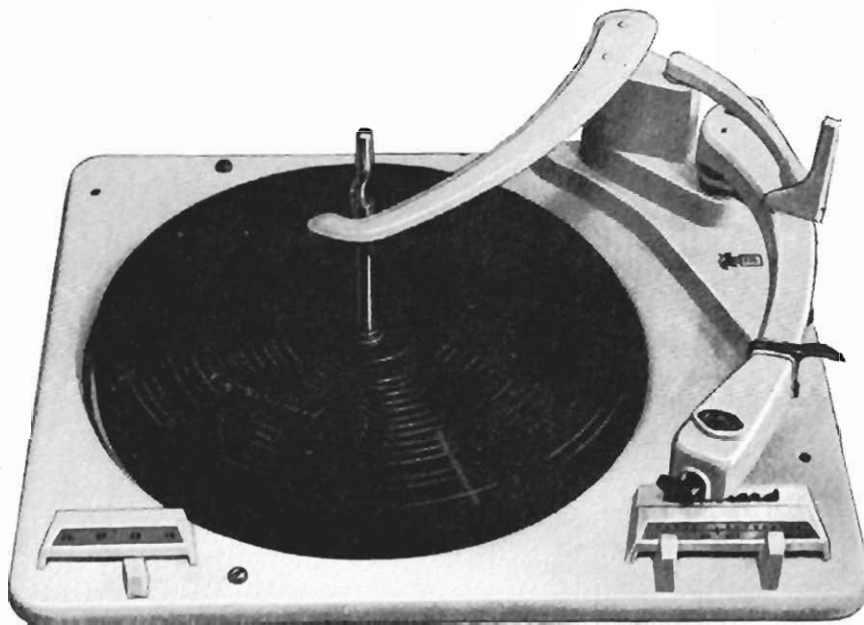
Garrard Service Sheet – Number 200

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

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..... 214

Subject: Index



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Garrard Service Sheet – Number 201

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

Subject: Operation

DESCRIPTION

The Model 210 has a plug-in pickup head the case moulding of which is designated M54. Model 209 has the pickup head integral with the arm; other than this difference both units are similar.

The Model 210 record changer will play automatically any number of records up to 8, either 7", 10" or 12" diameter at a speed of $16\frac{2}{3}$, $33\frac{1}{3}$, 45 or 78 r.p.m. 10" and 12" records of the same speed can be mixed in any order. No setting for record size is required, the selection being fully automatic. Records of all the sizes mentioned may, if they are the same speed, be played at one loading providing the smaller diameter records are placed above the larger ones. 7" 45 r.p.m. records having the large centre hole may be played using the Garrard large record spindle Type LRS4/W, available as an optional extra. Clip-in centre hole adaptors may also be used and are available from record stores. Records may be rejected, played manually, or the changer stopped and restarted without rejecting the record being played. A new feature is that the pickup arm can be locked on its rest by moving the locking lever at base of rest, it is automatically released on operating the changer.

TO OPERATE

- (1) See that correct stylus is in position for type of record to be played.
- (2) Move speed change control to desired speed.
- (3) Place records horizontally on record spindle, lift and move overarm inward.
- (4) Switch on by moving the Automatic Control to "on."

TO UNLOAD

- (1) Lift overarm, move to right hand side and lower.
- (2) Lift records off spindle, if replaying the same records, lift clear of spindle before replacing.

MANUAL OPERATION

- (1) Place record on turntable by threading over record spindle, moving record horizontally over step on spindle.
- (2) Switch on by moving Manual control to "on" and place pickup on record. On completion of playing the record, the pickup will return to its rest and the motor switch off.

REJECT

A record being played may be rejected by moving the automatic control to "Reject."

STOP

The changer automatically stops on completion of playing the records placed on it. If it is desired to stop while playing a record, move the manual control to "Off," the motor will then stop with the pickup remaining on the record. Restart by moving the manual control to "On" and the same record will continue playing. To stop for a period, move the Automatic control to "Off," the pickup will then return to its rest and the motor switch off. The pickup arm may be locked on its rest by moving the pickup arm locking lever to the left. It is automatically disengaged when switching on either Automatic or Manual.

Note:

The pickup arm will not automatically move from its rest unless one or more records are loaded on the record spindle. This is a safety measure to prevent damage to the pickup by inadvertently switching on.

7" 45 r.p.m. RECORDS

To play 7" 45 r.p.m. records having $1\frac{1}{2}$ " diameter centre hole, using the large record spindle type LRS4/W, Diagram 1, proceed as follows:—

- (1) With the record changer in the rest position, that is, with the pickup arm on its rest, place the LRS4/W spindle, with the arrow pointing to the front of the changer, over the existing fixed record spindle, and push down firmly.
- (2) Load records, any number up to 8 on spindle and move record overarm inward, allowing it to rest on top of the spindle instead of one of the records. This is essential to ensure correct changer operation and record selection.
- (3) To remove records, wait until changer has stopped automatically, then swing record overarm outward. Take the records off the spindle by placing the thumbs on the spindle top and lifting the records with the fingers as shown on diagram 2.
- (4) To remove the LRS4/W record spindle, first make sure that the changer is in its rest position with the overarm moved to the right, then lift off the spindle.



Type LRS4/W Record Spindle

Diagram 1



Unloading records from LRS4/W
Record Spindle

Diagram 2

Garrard Service Sheet – Number 202

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

Subject: Installation

DIMENSIONS

The above record changer is $13\frac{1}{4}$ " long by $11\frac{3}{8}$ " back to front by $27\frac{1}{8}$ " below and $47\frac{1}{8}$ " above top of motor board. Clearance must be allowed for 12" records; also $\frac{1}{4}$ " on the height and at least $\frac{1}{4}$ " all round to allow unit to float freely on its suspension springs.

CHANGER ALREADY IN CABINET

Carry out the instructions given by the manufacturers of the complete radiogramophone, which may include those appertaining to the record changer, but in any case, the following points should be checked.

First see that all string and cardboard, etc., used for packing purposes is removed, then remove the two copper plated transit screws which hold the unit down secure to the motor board; the unit should then float quite freely on its spring suspensions. Check the level of the unit when the cabinet is finally installed by placing a spirit level on a record on the turntable. If incorrect, the unit can be adjusted by turning the suspension screws—clockwise to lower the unit and counter-clockwise to raise it. On dual range models check that the voltage changeover links in the power supply connection block are correctly set to correspond to the voltage of the power supply, diagram 4, also check that the motor driving pulley is correct for the supply frequency. The pulleys are colour coded as follows to be more easily distinguishable—Nickel 50 cycles—Brass 60 cycles.

See that the record selector arm is in a vertical position, for transit purposes it may be horizontal or inverted, if so, it should be turned so that it is vertical as shown in Diagram 3.

TRANSIT SCREWS

Two copper plated wood screws are supplied for use in clamping the record changer rigid to the motor board for transit purposes. The small bakelite washers should be fitted under the screw heads to prevent marking the unit plate. These screws must be removed before using the record changer and their position is shown on Diagram 11.

FITTING TO CABINET

The motor board should be drilled and cut out to the template supplied. A dimensional drawing of it is given in Diagram 5 in case it has been mislaid or already used.

Having opened the carton, remove the cardboard packing and lift out unit with the fingers under back and front edge of unit plate. Remove all string and elastic bands and turn the record selector arm to a vertical position as shown in Diagram 3.

Before assembling into cabinet, the power supply, pickup and earthing leads should be connected, if not already fitted. The power supply terminal block is on rear of motor. The voltage changeover clips, if dual voltage range model, should be set as indicated on the cover and as shown on Diagram 4 for the voltage of the power supply. If required for monaural reproduction, the pickup lead should be connected as shown in Diagram 6; if for stereophonic reproduction as Diagram 7, also connect a lead from a good earth point to the earthing tag on the motor. Place changer in position on motor board and push downward, pressing the snap-in spring suspensions down through the holes in motor board as shown in Diagram 10. The spring suspensions are already assembled to the unit plate, the assembly is shown on Diagram 8, they are designed for motor boards up to $\frac{1}{2}$ " in thickness, but should a thicker board be used, the fixing holes in the board should be recessed underneath $1\frac{1}{4}$ " diameter. The unit should be levelled by turning the suspension screws, clockwise to lower and counterclockwise to raise the unit. The changer should be checked for level by placing a spirit level on a record on the turntable. Should it be necessary to remove the changer from its cabinet, disconnect all leads and unscrew the three spring mounting screws. On lifting out the changer, the clip-in spring mountings will be left in the board. They can be taken out if required by lifting them at an angle, using a screwdriver blade to bend one side of the flat spring so that it clears the hole as shown in Diagram 9.

Before connecting the record changer, 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, condensers or transformers to be incorporated in the pickup circuit. When using a crystal pickup, a 0.1 mfd condenser in each lead may be found suitable. The value of the condensers should be as low as possible in order to maintain the pickup response while giving the minimum of hum. 0.1 mfd condensers are usually satisfactory, but 0.01 mfd may be more suitable if hum is not introduced. The condenser should have a working voltage of at least 1,000 volts. The screening and braiding of the record changer pickup lead must be connected to a true earth and not to the amplifier chassis; it should also be kept as short as possible to avoid hum pickup.

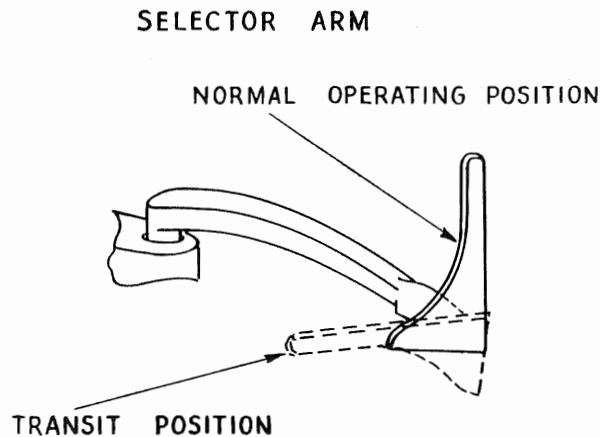


Diagram 3

Dual Voltage Range Model

Connect both clips thus
for 200/250 volts A.C.

Connect clips thus for
110/130 volts A.C.

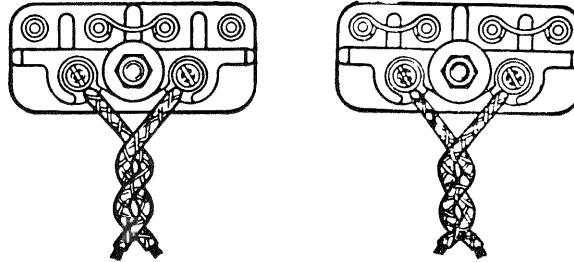


Diagram 4

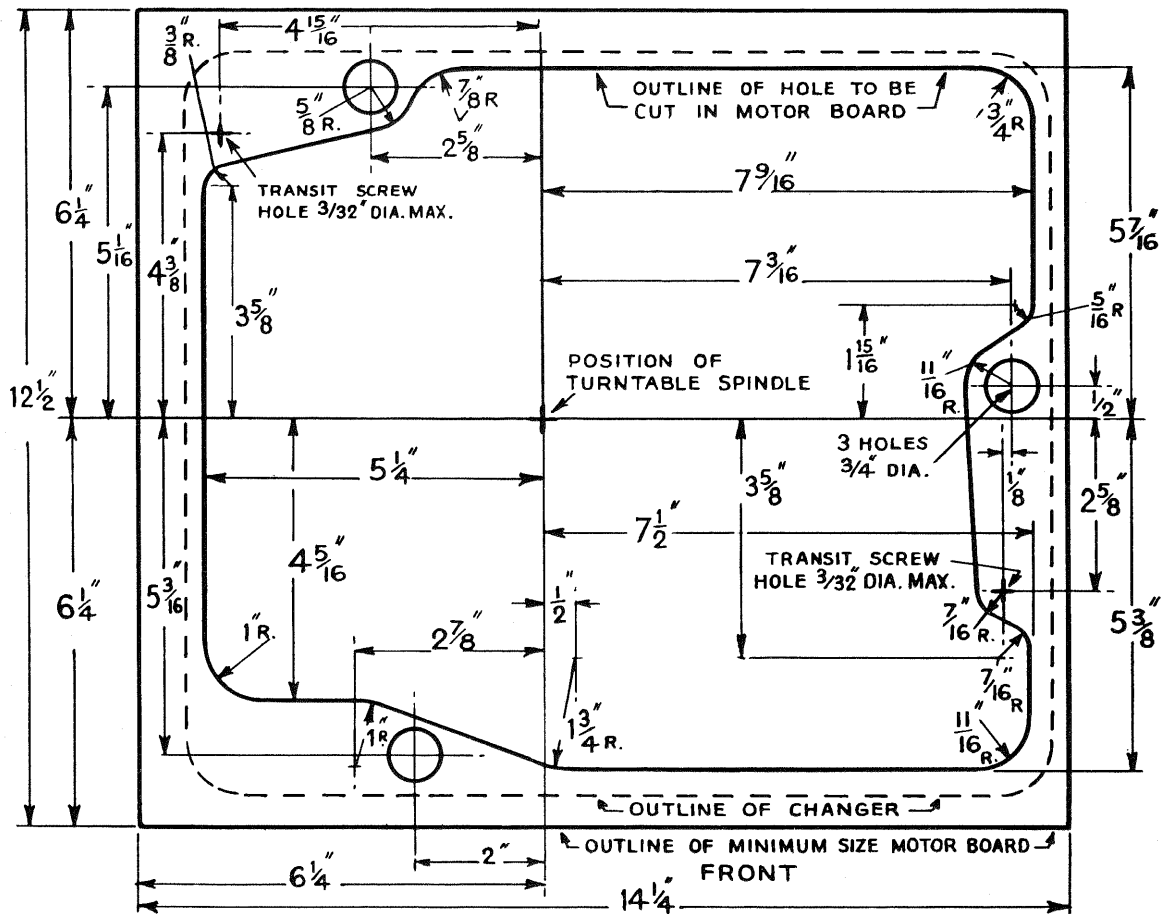
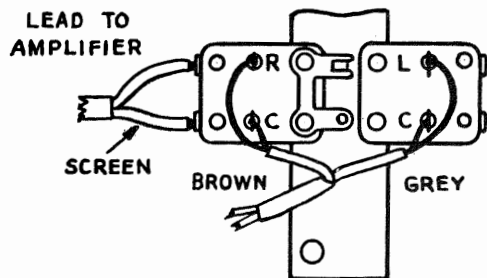


Diagram 5

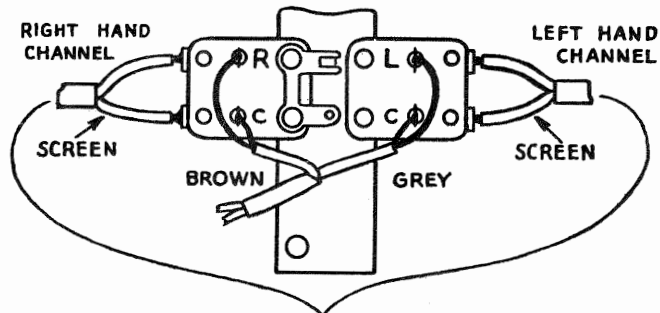
CONNECTIONS FOR AUDIO LEADS



MONAURAL

P.U. Tag Strip Connection for Monaural Reproduction.

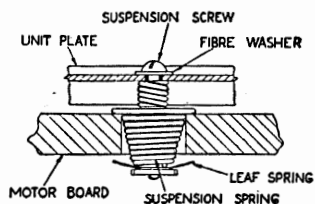
Diagram 6



LEADS TO AMPLIFIER(S) STEREOPHONIC

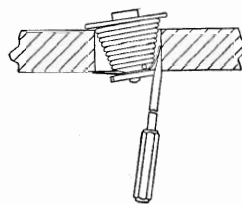
P.U. Tag Strip Connection for Stereophonic Reproduction.

Diagram 7



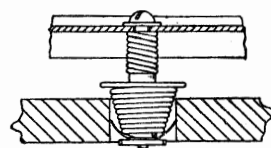
Assembly of Snap-in Spring Suspension.

Diagram 8



Removing Snap-in Spring Suspension from Motor Board.

Diagram 9



Snap-in Spring Suspension being pressed into position.

Diagram 10

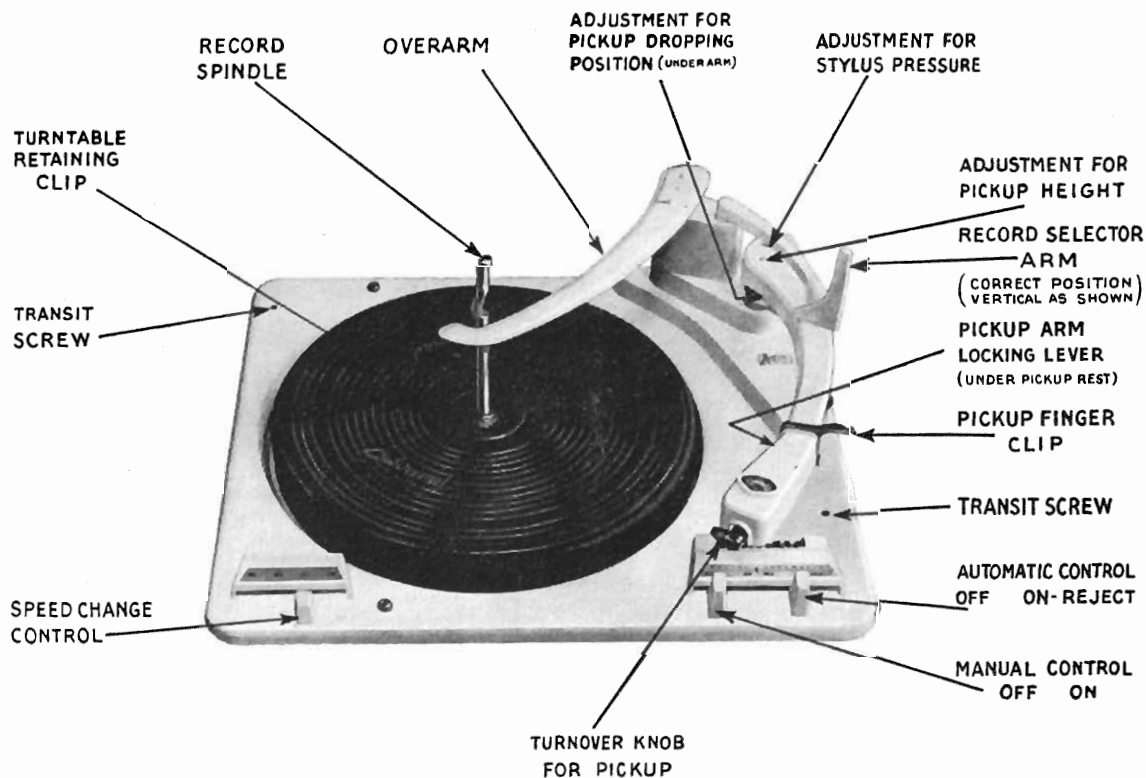


Diagram 11

Garrard Service Sheet – Number 203

Model: Record Changer 210
Record Changer 209

Complementary to
Sheets No.

..... 204

Subject: Maintenance

LUBRICATION

The bearings in the motor, turntable spindle and intermediate wheel are of the oil retaining type and so rarely need lubricating. However, when the need for oil is apparent, they should be lubricated very sparingly, particularly the intermediate wheel bearing. The main oiling points are indicated on Diagram 12 and after lubrication, remove all traces of surplus oil before running the unit. It is essential that the rubber intermediate wheel, the motor pulley and inside rim of the turntable be kept free from oil or grease to prevent slipping. A smear of light grease should be applied to all cam faces, pins and rollers and a spot of oil on all lever pivots. Oil of similar consistency to that used for sewing machines and grease similar to, or lighter than, vaseline is suitable for lubrication.

CHECKING ADJUSTMENTS

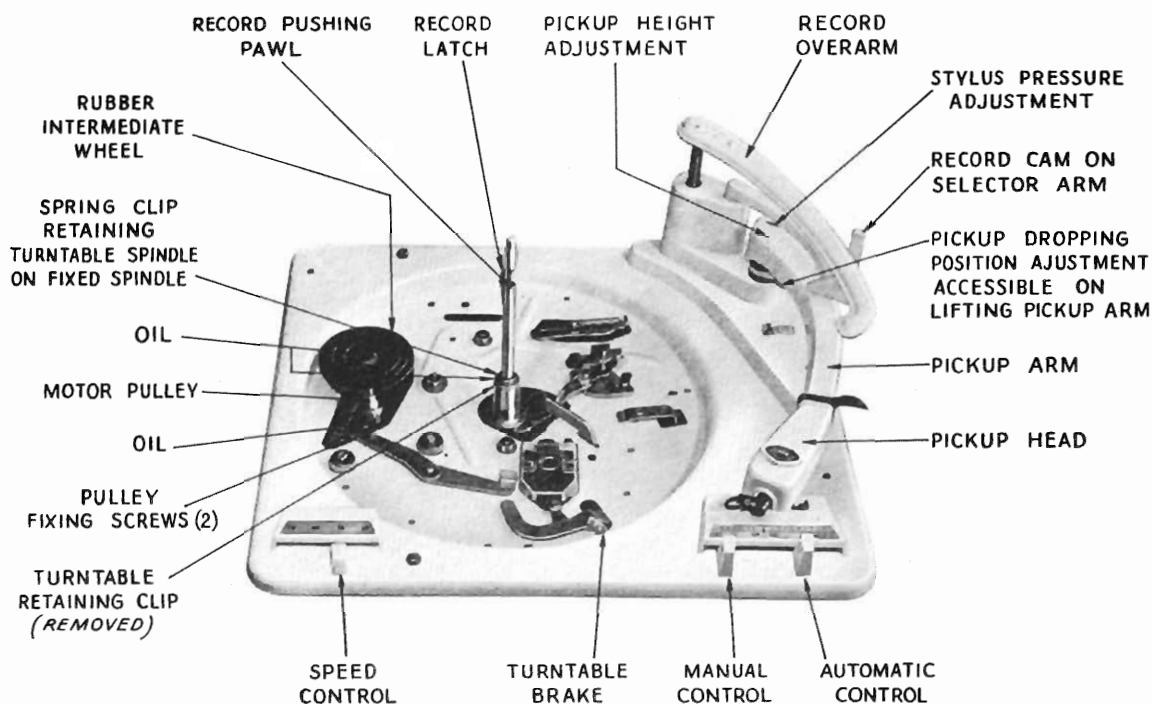
After a period of use, check the stylus pressure also the lifting and dropping position of pickup arm as described on Sheet No. 204.

REMOVING TURNTABLE

To gain access to the mechanism on top of the unit plate for lubrication and service purposes, the turntable must be removed. First remove the turntable retaining clip, Diagram 12, then remove the turntable by carefully lifting with equal pressure on diametrically opposite sides. If difficulty is found in removing the turntable, an assistant should give the record spindle a light downward tap with a piece of wood, such as the handle of a screw-driver, while lifting the turntable.

FITTING TURNTABLE

Replace turntable with Changer in the switched off position, then switch on to release brake.



VIEW OF CHANGER WITH TURNTABLE REMOVED

Diagram 12

Garrard Service Sheet – Number 204

Complementary to
Sheets No.
.....
.....

Model: Record Changer 210
Record Changer 209

Subject: Adjustments

DESCRIPTION

The adjustments described on this sheet are those for which provision is made on the unit. Should these not be sufficient, see sheet relating to the fault occurring.

PICKUP ARM DROPPING POSITION

When the pickup lowers on to a record the stylus point should land approximately in the centre of the plain record edge and be picked up by the run-in groove and so guided into the playing grooves.

Should this not be so, as may be the case if the pickup arm has been strained or a new pickup fitted, the arm should be adjusted as follows:—

Place a record, say 10", on the record spindle, place overarm in position and switch on; when the record drops, immediately switch off by means of the manual control. Slowly rotate the turntable by hand until the stylus point is about $\frac{1}{8}$ " above the record. By viewing from the front, the position of the stylus in relation to the record can be seen.

To adjust, lift the pickup arm which will reveal a horizontal screw covered by a spring. The slotted head of this screw should be turned to obtain adjustment, clockwise to move arm inward and counterclockwise to move arm outward.

PICKUP LIFT

The distance the pickup lifts on completion of a record is adjusted by turning with a screwdriver the small grub screw located on top of the rear of the pickup arm. Turn clockwise to raise and counter clockwise to lower the pickup. The height should be adjusted so that the pickup stylus point is 1" above the turntable surface as the pickup returns to its rest.

STYLUS PRESSURE

The stylus pressure should be that recommended by the pickup manufacturer but in any case should not exceed 10 grammes. It is recommended that a periodical check be made, preferably with a Garrard stylus pressure gauge, to see that the correct pressure is maintained. To adjust the stylus pressure, turn the serrated projection on top of the rear of the pickup arm, clockwise to increase and counterclockwise to reduce stylus pressure.

Garrard Service Sheet – Number 205

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

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Subject: Automatic Trip

DESCRIPTION

The automatic trip is the velocity type which operates when the inward motion of the pickup arm is accelerated when the pickup reaches the run-off groove in the centre of a record.

The trip is set to commence operation when the pickup reaches a radius of $2\frac{9}{16}$ " and should operate on an accelerated movement of not less than $\frac{3}{32}$ " with a minimum of one revolution of a record.

The trip mechanism is accessible on removing the turntable (Sheet Number 203) with the changer in its playing position.

Symptoms	Fault
Pickup remains in centre of record	(1) No run off groove on record. (2) Pitch of record run off groove less than $\frac{3}{32}$ ". (3) Auto Trip operating lever incorrect for height. (4) Operating Lever not free.
(1) Check that record has a run off groove.	
(2) The auto trip is designed to operate on records made to B.S. 1928:1955 and similar standards in other countries. There are, however, a few old records where the run off groove has a very small pitch and this may not be sufficient to give enough acceleration to the pickup to operate the trip.	
(3) With the changer in the playing position remove the turntable (Sheet No. 203) and check the position of the auto trip operating lever in relation to the cam face, on the striker. Move the pickup arm inward to do this. The operating lever is correctly set when the underneath face of the felt pad in the end of the operating lever engages approximately half way up the cam face on the striker as it revolves. To obtain the correct setting, turn the adjusting screw for height of operating lever, Diagram 13, to raise or lower the lever as required. See also that the felt pad in the end of the operating lever is projecting a small amount from the lever face, $\frac{3}{64}$ " maximum and that its surface is clean and free from ragged edges. If not projecting enough, it can be pushed or prised to project the correct amount.	
(4) Examine the operating lever to ensure that it is perfectly free on its pivot by lifting it off the friction plate. The surface of the friction plate should be perfectly clean and the use of oil at this point is not recommended, as it may produce a sticky surface and make the action of the auto trip heavy.	

Symptoms

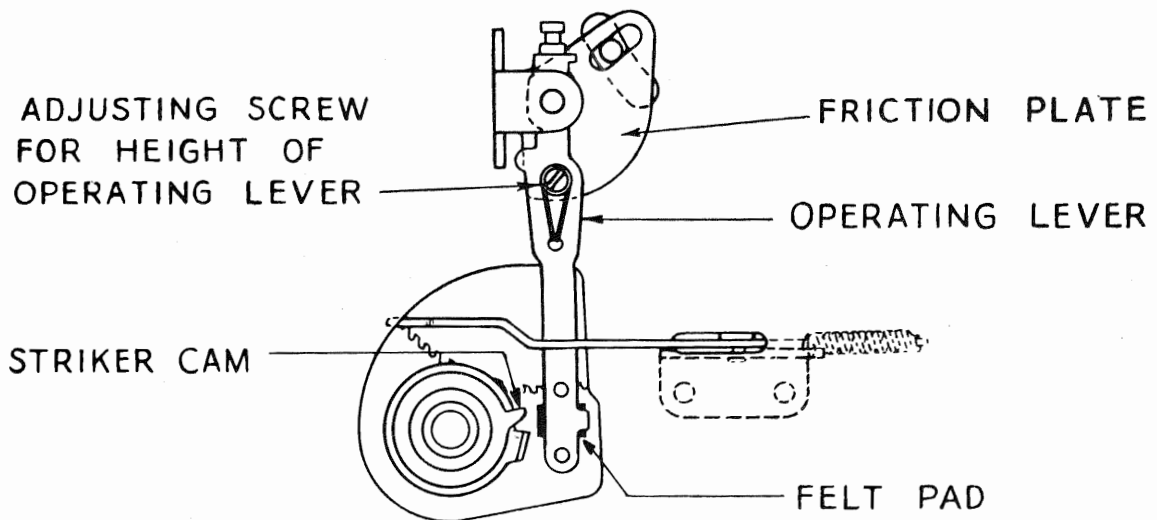
Pickup repeats in record groove when nearing centre of record.

Fault

- (1) Worn Stylus.
- (2) Stylus Pressure too light.
- (3) Stylus leads strained tight or in wrong position.
- (4) Operating lever incorrectly set.
- (5) Levers not free.

- (1) Check stylus for wear, replace if worn.
- (2) Check stylus pressure (Sheet Number 204), adjust to 10 grammes for monaural and 7 grammes for stereo pickup or as recommended by the cartridge manufacturer.
Also see that the pickup arm is free, loosen screw, remove cross pin, clean and replace after lubricating with fine machine oil. Tighten screw just sufficient to hold the pivot pin in place.
- (3) Check that the pickup leads at rear of pickup arm are not strained in any way and move freely in the slot of the pickup base. Should the leads touch the end of the slot as the pickup nears the centre of the record, move them so that they are clear and do not bias the free movement of the pickup arm.
- (4) Refer to Fault 4 under "Pickup remains in centre of record."
- (5) Check the freeness of the auto trip levers and pickup arm by moving it inward slowly as if playing a record by hand. Should any stiffness be felt, carefully check all associated levers for freeness and see that they are not obstructed by any leads.

TOP VIEW OF AUTO TRIP



FRONT VIEW OF AUTO TRIP

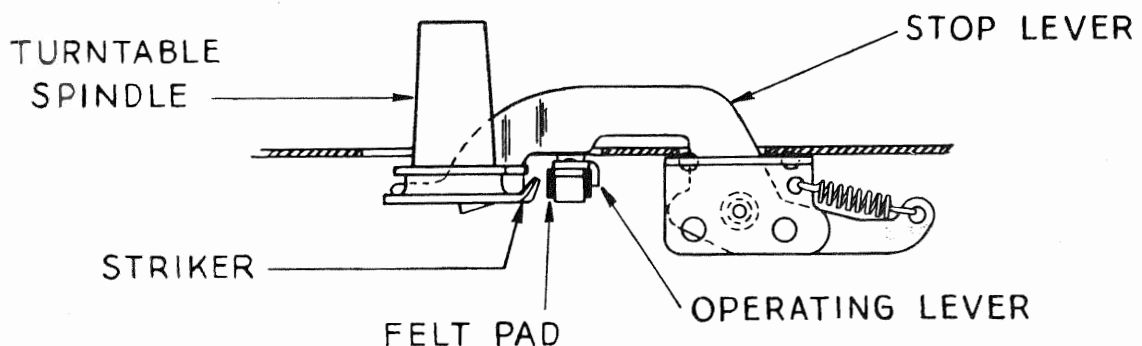


Diagram 13

Garrard Service Sheet – Number 206

Model: Record Changer 210
Record Changer 209

Subject: Turntable Speed

Complementary to
Sheets No.

..... 203

..... 212

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DESCRIPTION

The four speeds $16\frac{2}{3}$, $33\frac{1}{3}$, 45 and 78 r.p.m. are obtained by means of a stepped pulley fixed to the motor shaft by two screws and the drive is transmitted to the turntable by a rubber tyred idler called the intermediate wheel.

- | Symptoms | Fault |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Turntable runs excessively fast or slow. | (1) Incorrect size motor pulley.
(2) Voltage range of motor set incorrectly.
(3) Wrong stroboscope being used. |
| (1) Remove turntable (Sheet Number 203) and check the motor pulley. For 50 cycles it should be nickel plated and for 60 cycles, brass. If incorrect, change it for one obtained from our Spares Department. Please give Model number and frequency of power supply when ordering. | |
| (2) Disconnect the power supply and if dual voltage range check the connections inside the voltage change over block, they should be as shown on the block cover corresponding to the voltage of the power supply. Also check that the links are tight and making good contact. If single voltage range, check that the voltage is correct for the motor. | |
| (3) When checking the turntable speed, the pickup should be playing a record. Check that the stroboscope is the correct one for the frequency of the power supply. | |

Speed slightly too fast or slow.

(1) Pulley Size.

Should it not be found possible to obtain the correct turntable speed within reasonable limits by the preceding instructions, carefully check the speed of the turntable with a watch while playing a record. Write to our Technical Service Department giving the Model number of the unit, the speed of the turntable and returning the existing pulley which will be replaced with one to give the correct speed.

Speed varies erratically.

- (1) **Oil on driving surfaces.**
- (2) **Loose motor pulley.**
- (3) **Motor pulley out of position.**
- (4) **Motor shaft tight.**

- (1) Remove turntable (Sheet Number 203) and with a clean rag wipe the motor pulley, rubber intermediate wheel and inside rim of turntable, also remove any surplus oil which may be observed, especially from the face of the intermediate wheel.
- (2) The motor pulley is held on the shaft by two small screws and both of these screws should be tight. Check that the motor pulley is in its correct position as described below before tightening both screws.

- (3) The position of the motor pulley on the motor shaft should be such that when the intermediate wheel is in contact with it on either the 16 $\frac{1}{2}$, 33 $\frac{1}{2}$, or 45 r.p.m. steps, the lower face of the intermediate wheel is about 1/64" clear of the adjacent pulley step. As the hole in the motor pulley is blind, there may be a tendency for it to rise on the shaft due to air in the hole being unable to escape; this will be so if oil is present. Clean the shaft and hole in pulley and on assembly push it right down on the motor shaft to exclude the air, then raise it and fasten in its correct position. Tighten the two screws equally.
- (4) If the motor shaft is tight in its bearings, it will not spin freely when spun with the fingers. This will be caused by too heavy a lubricating oil having been used, or the motor bearings being out of alignment. Instructions for correcting these points are given on Sheet Number 212.

Symptoms	Fault
Speed varies consistently. (Wow and Flutter).	<ol style="list-style-type: none"> (1) Dirt on inside of turntable rim. (2) Tight turntable spindle. (3) Flats on intermediate wheel. (4) Loose motor pulley. (5) Bent motor shaft or unbalanced rotor.
(1)	Consistent speed variation, if at turntable speed, may be caused by dirt on the running surface of the turntable rim. Remove turntable (Sheet Number 203) and run the fingers round the inside rim and remove any roughness or dirt that may be felt.
(2)	Revolve turntable spindle with the fingers; without the mechanism in engagement it should run freely and smoothly. If rough or sticky, the spindle assembly should be removed and thoroughly cleaned. The fixed spindle is held in position by two screws at the bottom of the spindle housing, Diagram 14. Loosen these two screws and lift out the spindle assembly, being careful not to lose any of the ball bearings; there are five ball bearings, $\frac{3}{32}$ " diameter. Clean the fixed spindle and the bearings in the revolving spindle with a clean rag and lubricate with thin machine oil before reassembly. The bearing and spindle assembly is shown on Diagram 14 and on reassembly check the correct location of the thrust washers and see that the tail of record pawl passes through square aperture in release lever. Also see that the top retaining screw locates in the hole in the turntable spindle shaft. If the changer is fitted in a cabinet, an alternative to removing the complete turntable spindle assembly is to remove the spring retaining clip at the top of the fixed spindle and carefully lift off the turntable spindle which can be cleaned, lubricated and replaced without disturbing the thrust race.
(3)	A fast rate of speed variation (Flutter) can be caused by flats on the periphery of the rubber intermediate wheel. With normal conditions of use it is not possible for flats to appear on the running surface of the intermediate wheel as it is retracted from contact with the turntable rim and motor pulley on switching off. If, however, the unit is switched off from say the power supply point with its own switch left in the "on" position, then the stationary intermediate wheel will remain in contact with the motor pulley and turntable rim and be indented at the points of contact. If this has occurred, try running the unit for a few hours; this will roll out the indents if not too severe. If this is not effective a new intermediate wheel should be fitted. On fitting the new intermediate wheel, clean its periphery with a clean rag and make sure that it spins freely on its bearings when not in contact with the motor pulley. It may be necessary to re-set the motor pulley position on fitting a new wheel and this is described in item 3 under "Speed varies erratically."
(4)	Check the motor pulley and tighten both its screws; it is important that both are equally tightened. If one screw is loose it may cause the pulley to run out of truth and so produce flutter in the reproduction.

- (5) A bent motor shaft or out of balance rotor could only be caused by bad handling in transit or installation. Should the motor shaft with pulley removed be more than .0005" out of truth total indicator reading or the motor vibrate badly, the rotor and shaft assembly should be replaced. The rotor and shaft are integral and no attempt should be made to separate them.

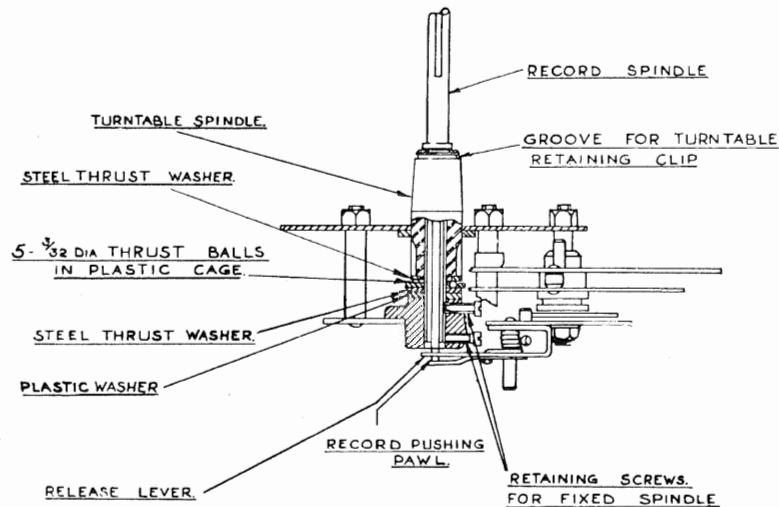
Symptoms

Turntable does not revolve when motor is running.

Fault

- (1) Oil on driving surfaces.
- (2) Intermediate wheel bracket not free.

- (1) Refer to Fault 1 "Speed varies erratically."
- (2) With the turntable removed (Sheet Number 203) check that the intermediate wheel and its pivot is free to swing on its supporting bracket. The intermediate wheel should firmly engage with the motor pulley on switching on and freely retract on switching off. Check that the motor leads are not touching the intermediate wheel bracket and preventing its free movement. Also put a drop of fine machine oil on the bracket pivot and move the wheel sideways to allow the oil to work into the bearing.



Turntable Spindle Assembly.

Diagram 14

Garrard Service Sheet — Number 207

Model: Record Changer 210
Record Changer 209

Subject: Automatic Switch

Complementary to
Sheets No.

..... 208

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DESCRIPTION

The automatic switching off of the changer when the last record has played is operated by the record selector arm. On each cycle of the changer mechanism, the selector arm moves inward to measure the size of the next record to drop. If the last record has already dropped or there is no record on the step of the record spindle, the selector arm, not meeting with any obstruction will move inward to its maximum extent and set the mechanism so that the changer will automatically switch off when the pickup arm reaches its rest — if it is not already there, as may be the case if the unit is set on manual.

Symptoms

Fails to switch off when last record has played.

Fault

- (1) Lubrication required.
- (2) Levers out of position.
- (3) Selector arm setting incorrect.
- (4) Excessive gap between overarm and record spindle.
- (5) Levers rubbing.
- (6) Excessive friction on switch off lever.

- (1) Lightly grease the working face of lever number 80, Diagram 15, and the roller in contact with it.
- (2) Check that all levers move freely and are in their correct position. Should a lever be bent, possibly due to transit or handling, remove it to correct.
- (3) Check setting of record selector arm as given on Sheet Number 208.
- (4) When the record overarm is in its centre position there should not be more than $\frac{1}{8}$ " gap between it and the $\frac{9}{32}$ " diameter of the record spindle. If in excess of $\frac{1}{8}$ " remove the rear cover on the pickup base, loosen the screws retaining the bracket and whilst holding the overarm against the record spindle, retighten the screws.
- (5) With changer in switched off position, with the pickup arm on its rest, and no records on the record spindle, the record selector should move with a slight resistance toward the record spindle. If excessive stiffness is felt, examine its associated levers under the changer and make sure they are not rubbing or caught in one another. Also put a spot of light lubricating oil on the pivot of the selector arm immediately under the rear of arm.
- (6) Turn the brass friction adjusting screw on lever Number 80, Diagram 15, a small amount to reduce friction.

Symptoms

Switches off without playing record.

Fault

- (1) Record cam not in vertical position.
 - (2) Control knob not free.
- (1) The record selector arm should be in a vertical position as shown on the illustrations and Diagram 15. It is turned to a horizontal position for transit purposes and should be rotated and remain in a vertical position for use.
 - (2) Check that the movement of the automatic Control Knob is perfectly free, also the levers associated with it. Put a drop of fine machine oil on the pivot points and the places where the levers slide, particularly the long lever reaching into the mechanism.

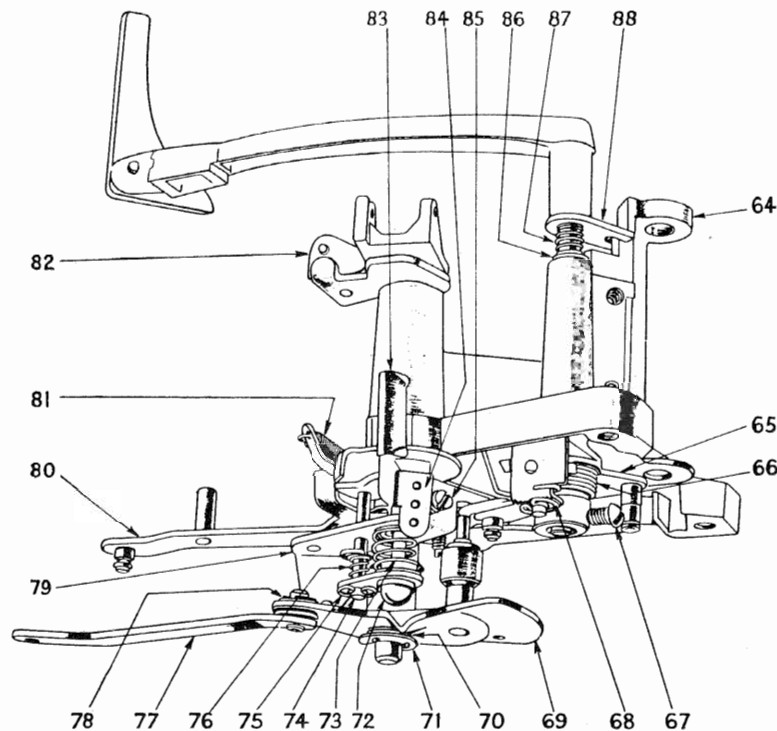


Diagram 15

Garrard Service Sheet – Number 208

Model: Record Changer 210
Record Changer 209

Subject: Record Selection

Complementary to
Sheets No.

..... 203
..... 204
.....

DESCRIPTION

Records are selected for size by means of a record selector arm which moves inward on each cycle of the changer and measures the size of the record, thus setting the mechanism for the pickup arm to lower in the correct position. Also by means of the shaped cam attached to it, 10" and 12" records are selected, allowing these two sizes to be mixed in any order.

It will also select batches of up to 8 records of 7", 10" or 12" diameter; these sizes may be played at one loading providing the smaller ones are placed above the larger and are of the same speed.

The record selector arm also operates the mechanism to switch off when the last record has played.

Symptoms

Pickup consistently lands too far in or out.

Fault

- (1) Dropping position requires adjustment.**
- (2) Damaged or unattached springs.**
- (3) Selector arm out of adjustment.**

- (1) If pickup lands within $\frac{1}{4}$ " of its correct position, adjust its dropping position as described on Sheet Number 204.
- (2) Check that all springs are attached to their respective levers and are undamaged; replace if necessary.
- (3) Check the position of selector arm. Place one 10" record on record spindle and place record overarm in position on it. Switch on by Auto Control. When record drops and selector arm has moved outward, switch off by means of the manual "off" control as soon as the pickup commences to play the record. Move the selector arm in an outward direction until spring resistance is felt. At this point the vertical face of the plastic cam should be $6\frac{1}{8}$ " to $6\frac{3}{16}$ " radius from the centre of the record spindle.

To adjust, hold the selector arm in the position as described, and by inserting a screwdriver through the hole in rear cover, engage the adjusting screw head and turn it a small amount in one direction, check the position and if found to be worse, rotate screw in opposite direction.

Symptoms

Erratic selection of records.

Fault

- (1) Lubrication.**
- (2) Record selector arm cam not vertical.**
- (3) Record selector touching inside of cabinet lid.**

- (1) Lubricate with fine machine oil all bearings and pivots associated with the record selector arm.
- (2) The cam of the record selector arm should be in a vertical position. Check that it is firmly located in a vertical position as shown on the illustrations.
- (3) See that the top of the Record Selector cam is clear of the cabinet and not touching. Sometimes where insufficient clearance has been left, the top of the cam just touches the underside of the cabinet lid, especially if the lid has warped slightly. Adjustment of the mounting springs to lower the unit will generally give enough clearance to correct this.

Garrard Service Sheet – Number 209

Model: Record Changer 210
Record Changer 209

Subject: Record Dropping

Complementary to
Sheets No.

..... 202

DESCRIPTION

Records are loaded on to the record spindle and the record overarm is placed in position on them to hold them square with the spindle. A step on the record spindle holds the records which are pushed off the step through a gap, one at a time, by means of a spring-loaded pawl inside the spindle. The gap formed by the step and lower face of the record latch through which each record passes, is 0.100" wide.

Symptoms

Records do not drop.

Fault

- (1) Record overarm tight.
- (2) Damaged record spindle.
- (3) Non standard records.
- (4) Records not flat.
- (5) New records.

- (1) The record overarm, Diagram 11, Sheet No. 202, should be perfectly free, and follow the stack of records downwards as dropping occurs. Clean the vertical shaft of the overarm and lubricate with thin machine oil after which vigorously move up and down to spread the oil.

If the overarm is still not free, examine the slot in the bracket at the rear of changer in which the pin in the overarm shaft slides; the slot must not be damaged or burred and should be well lubricated with light grease.

- (2) Carefully examine the record spindle for damage; it should not be bent. Press the record pushing pawl into the spindle against its spring tension; it should readily return. If it sticks, the spindle has been damaged and should be replaced. When making any adjustment to the underside of the changer it should not be turned upside down resting on the record spindle, but placed on a box or three supports to avoid damage to the record spindle.
- (3) Non-standard records. See "Two records drop together," see over.
- (4) Examine the records for flatness by placing a straight edge across them. Should they be concave or convex this could cause dropping trouble. Badly warped records can also give trouble by erratic dropping; these records should be avoided, not only due to dropping trouble, but also in many cases the effect of the warp can be heard in the reproduction.
- (5) New records may be reluctant to fall due to burrs in the hole from the label. Carefully remove these burrs and the ragged edges of the label with a penknife.

Symptoms

Two records drop together.

Fault

(1) Record latch not free.

(2) Non standard records.

- (1) At the top of the record spindle is the record latch which comprises two pressings placed together. The purpose of this latch is to form a gap with the spindle step to allow one record at a time to pass. The latch is also free to move upward and retract into the spindle to allow records to be lifted off. It is essential that this latch be perfectly free and after being raised by the removal of records, should drop readily to its correct position.

Should the latch stick, it could be due to the presence of dirt which may be removed by sharply moving the latch up and down to free it. The latch should be perfectly clean and kept free from oil or grease. The latch could also be bent by the changer having been turned over and rested on the record spindle; if this has occurred, try straightening the latch with a pair of pliers.

- (2) Record playing equipment is made to accommodate records complying with B.S.I. 1928:1955 and corresponding specifications in other countries. There are, however, a few records which do not comply with these specifications which may give trouble when used. Should a record persistently fail to drop or two consistently drop together, examine their thickness round the centre hole. The thickness should not exceed 0.100" or it will not pass through the gap in the record spindle nor should they be thinner than .053" or two records can pass through the gap together. Records having oversize centre holes may also give trouble in dropping.

Garrard Service Sheet – Number 210

Model: Record Changer 210
Record Changer 209

Subject: Noise

Complementary to
Sheets No.

..... 203
..... 206
.....

Symptoms

Mechanical noise.

- (1) Lubricate all bearings, cam faces and operating pins, as described on Sheet Number 203.
- (2) Check intermediate wheel for indents, Sheet Number 206.
- (3) A buzz or chattering noise when the unit is playing could be caused by a loose lever which can be located by touching the levers in turn with a finger. When the offending lever is found, a spot of fine machine oil on its pivot and points of contact usually clears the trouble.

Rumble.

- (1) Lubricate all bearings as described on Sheet Number 203, paying particular attention to the bearings of the turntable spindle, interwheel and motor.
- (2) If, after years of use, rumble becomes noticeable, the cause may be the hardening of the resilient motor mountings. If this is suspected, fit new mountings.
- (3) Check that the motor is perfectly free on its suspensions and is not biased in any way by the attachment of heavy power supply cable. The cable from the motor connecting block should not be the heavy type and should have plenty of slack.
- (4) Examine the running face of the intermediate wheel and remove any obvious dirt; it may be necessary to scrape the surface lightly to remove it.
- (5) Should the rubber appear to have hardened, evidence of this may be a crack or cracks on the running surface; the wheel should be replaced.
- (6) Rumble may be caused by the side of the intermediate wheel rubbing on a step on the motor pulley. Check the motor pulley position as described in paragraph 3, "Speed varies erratically" Sheet Number 206.
- (7) Reducing the tension of the spring which pulls the intermediate wheel into engagement will reduce rumble, try stretching the spring a very small amount, if stretched too much it will not hold the wheel in engagement, in which case a new spring will be required.
- (8) The motor pulley may not run true due to its fixing screws not being equally tightened. Make sure that they are both tightened up an equal amount. Should the truth of the rotor shaft be suspected, a new rotor assembly should be obtained and fitted.

Fault

- (1) Lack of lubrication.
- (2) Indented intermediate wheel.
- (3) Loose lever.

- (1) Lack of lubrication.
- (2) Motor mountings.
- (3) Power supply cable.
- (4) Dirt on rubber tyre of interwheel.
- (5) Rubber tyre perished.
- (6) Motor pulley out of position.
- (7) Excessive tension on intermediate wheel.
- (8) Bent rotor shaft or out of true motor pulley.

Garrard Service Sheet – Number 211

Model: Record Changer 210
Record Changer 209

Complementary to
Sheets No.

Subject: Pickup

DESCRIPTION

The Model 210 has a plug-in pickup head the case moulding of which is designated M54. Model 209 has the pickup head integral with the arm; other than this difference both units are similar.

The plug-in pickup moulding supplied with the Model 210 will accommodate practically all makes of pickup cartridges, both monaural and stereophonic. If the unit is supplied without a pickup cartridge, a set of fixing screws, collars, etc., is supplied with the pickup mouldings enabling most types of pickup cartridge to be assembled. Details are shown on diagram 16.

A knock out is provided in the front of the pickup moulding to give clearance for the knob of turnover type pickup cartridges and in the top is a hole accessible on removing the name plate, for the knob of turn round styli type of cartridge. The Garrard plug-in feature is particularly useful if it is desired to play Stereophonic records with a separate pickup, and for those wishing to use this feature, the connections are given on diagram 17.

The plug-in pickup moulding is held in the pickup arm by a spring-loaded ball, locating in a groove in the shank of the pickup moulding. If the lower face of the pickup moulding is not parallel with the surface of a record on the turntable, the pickup position can be biased enough to correct this by loosening the screw underneath the pickup arm, diagram 18, which holds the plug-in socket, turning the head to its correct position and re-tightening the screw.

The plug-in pickup head may be locked into position for transit by tightening up the pickup transit screw located underneath the pickup arm; this screw should also remain tightened up if the plug-in feature is not used, but removed if it is.

The pickup arm of the Model 209 is in one piece and will only accommodate certain pickup cartridges. Should a replacement cartridge be required, one of a similar type should be used.

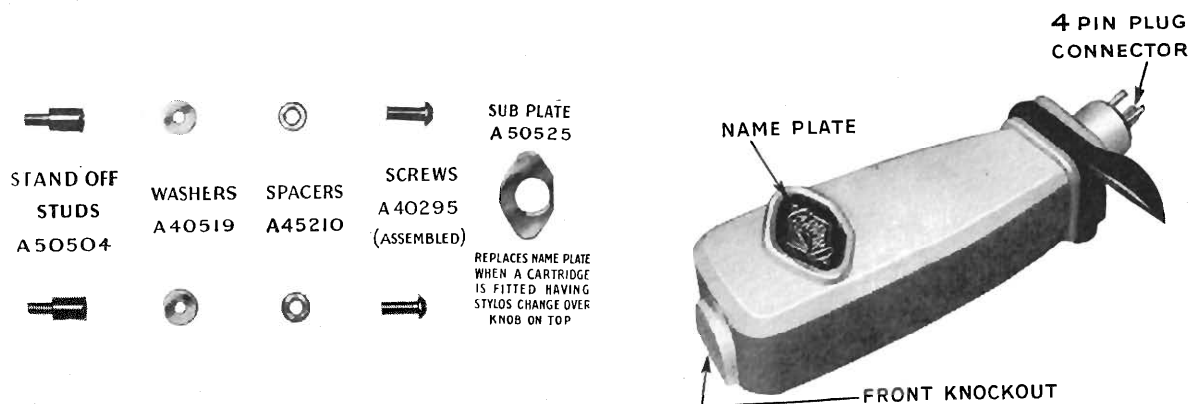
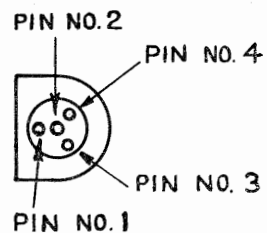
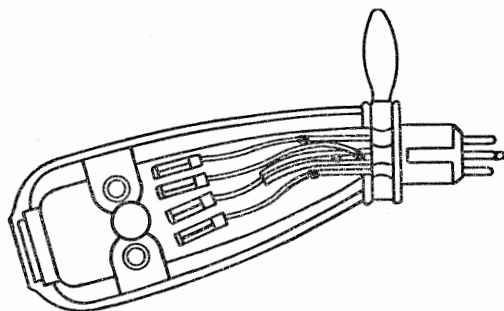


Diagram 16



GREY LEAD TO PIN NO 1 — L.H. CHANNEL
 BLUE LEAD & SLEEVE TO PIN NO 2 — EARTHY L.H. CHANNEL
 BLACK LEAD TO PIN NO 3 — EARTHY R.H. CHANNEL
 BROWN LEAD TO PIN NO 4 — R.H. CHANNEL

SINGLE CHANNEL CONNECTION. BROWN AND BLACK

Diagram 17

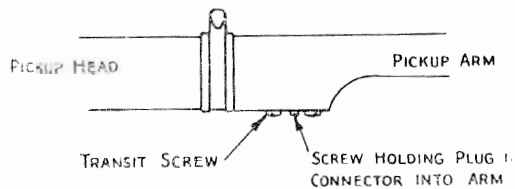


Diagram 18

Garrard Service Sheet – Number 212

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

..... 203

Subject: Motor

.....
.....

Symptoms

Fault

Motor will not start.

- (1) No power supply.
- (2) Loose connections.
- (3) Bad switch contact.
- (4) Open circuit coils.

- (1) Check that the current is reaching the terminals in the power supply block by removing its cover and applying a test lamp or voltmeter.
- (2) Examine all connections, tighten the power supply terminals and see that the voltage change over links are tight and making good contact on the studs; scrape the studs with a penknife to remove any tarnish or flux which may be preventing good contact with the links.
- (3) Remove turntable, Sheet Number 203 also the switch cover and see that both switch contacts are clean and move outward when the contact roller moves between them on switching on. Clean the blades and roller and adjust if necessary by bending the blades. Disconnect from the power supply to do this.
- (4) Check the coils for continuity. When connected for high voltage range the total resistance should be 780 ohms and for low range 195 ohms. The motor coils can be replaced by dismantling the motor, noting the lead connections, and the faulty bobbin removed from the stator pack by tapping out the two brass pins locating the pole piece on which the bobbin is assembled.

Motor runs slow.

- (1) Motor lubrication.
- (2) Motor bearings out of line.
- (3) Motor coils incorrect polarity.
- (4) Motor coil open circuit.

- (1) It is important that only fine machine oil be used to lubricate the motor bearings. If a thick oil or one that congeals has been inadvertently used, then the motor shaft will not spin freely; as a result the motor will run slow.

The motor should be dismantled, the bearings and shaft thoroughly cleaned, lubricated with thin machine oil and reassembled. Should the motor shaft still not spin freely, see next paragraph.

- (2) Should the motor shaft not spin freely when spun with the fingers, this may occur after reassembly or mishandling. Give the body of the motor a sharp blow with a piece of wood, such as the handle of a screwdriver, this should shock the self-aligning bearings into line and free the shaft.

Should this treatment prove ineffective, the spring in one of the bearing housings which holds the bearings in place may have broken. Check this by removing the bearing covers and moving each bearing with a circular motion by means of the rotor shaft. Should the bearing feel tight in some positions, replace the whole cover and its bearings assembly with a new one.

- (3) On the type of motor used, the polarity of the poles on which the coils are assembled should be the same, that is, both north or south, the opposite polarity being induced in the poles between the coils. Should a coil have been replaced and the motor runs slow, check the polarity and correct if necessary by changing over the leads to one coil.
- (4) When connected to run on the low voltage range, 100/130 volts on the dual range model, the two coils are in parallel and should one become open circuit, the motor will still run, but slowly. Check coils for continuity as advised in paragraph 4, "Motor will not start." On the single voltage range model the coils are connected in series.

Symptoms	Fault
Motor runs hot.	<ol style="list-style-type: none"> (1) Normal running conditions. (2) Short circuit in coils. (3) Incorrect voltage. (4) Insulation leakage to earth.
<ol style="list-style-type: none"> (1) It may be found that after running for long periods the motor becomes rather hot to the touch. Provided the current does not exceed 15 watts this would be its normal running temperature. The motor is designed to run under unventilated conditions although as much ventilation as possible is beneficial. (2) Check the windings for short circuit with an ohmmeter; the correct resistance readings are given in paragraph 4, "Motor will not start." (3) Check that the voltage changeover links are correctly set for the voltage of the power supply. Should the links be set on the low voltage range and the motor be connected to a higher voltage, then it would become extremely hot and the coils possibly burn out. (4) Test the insulation between the coil windings and frame with a 500 volt insulation test meter, it should not be less than 2 megohms. An earthing tag is provided under one of the motor cover fixing nuts and it is recommended that this tag be used to connect the motor frame to a good earthing point. 	

Garrard Service Sheet – Number 213

Model: Record Changer 210
Record Changer 209

Subject: Miscellaneous

Complementary to
Sheets No.

..... 202

..... 204

..... 205

..... 207

Symptoms

Pickup lands on record and jumps the first few grooves.

- (1) Check that the stylus is correct for the type of record being played. A stylus for 78 r.p.m. coarse groove records may jump if inadvertently used on fine groove (L.P.) records.
Check stylus for wear or damage, replace if suspect.
- (2) Check level of changer as described on Sheet Number 202. Adjust if necessary.
- (3) See that pickup lead is free in the slot in unit plate at rear of pickup arm base and is not strained tight and so biasing the free movement of the pickup arm.
- (4) Some records are now made with the playing surface below that of the remainder of the record; this leaves a raised rim around the outer edge. This is known as a groove guard and should the pickup land on this and is not immediately picked up by the run in groove, the pickup can slide down the slope and jump the first few grooves. To prevent this, set the dropping position of the pickup so that the stylus lands just inside the raised rim. Instructions for this adjustment are given on Sheet Number 204.

Pickup does not lower on to record.

- (1) Check the stylus pressure, it should be that recommended for the particular cartridge fitted. Adjust as described on Sheet Number 204.
- (2) See that the pickup arm is perfectly free in a vertical direction; if not, remove the pickup arm pivot pin, clean and lubricate as advised on Sheet Number 205.
- (3) Check that the pickup lifting rod, down the centre of the pickup arm vertical pivot, is free; put a spot of thin oil on the top and move it up and down against the tension of its spring to spread the oil. Also put a little thick grease on the cam plate which lifts this rod.

Pickup begins to lower then swings inward.

- (1) Well grease the face of Lever Number 69, Diagram 15, Sheet Number 207, under the pickup arm lifting pin, also oil the roller rivetted to it, which moves the pickup arm outward. Also grease the edge of the pickup lever which the roller contacts.
- (2) Check that there is not an excessive amount of end play in the vertical pivot of the pickup arm, it should not exceed .005". If excessive, loosen the screw in the U shaped lever underneath the pivot, move it upward on the spindle and retighten the screw. Make sure that the movement of the pickup arm is perfectly free after making any adjustment.

Fault

- (1) Worn or wrong size stylus.
- (2) Changer not level.
- (3) Pickup lead biasing movement of arm.
- (4) Groove guard on record.

- (1) Stylus pressure too light.
- (2) Tight Pickup arm pivot.
- (3) Lubrication.

- (1) Lubrication.
- (2) Excessive play in pickup arm vertical pivot.

Garrard Service Sheet – Number 214

Complementary to
Sheets No.

Model: Record Changer 210
Record Changer 209

Subject: Spare Parts List

DESCRIPTION

When ordering spare parts the Drawing Number as given in this list should be quoted, also the colour should the part required be enamelled or a moulding visible from the top of the unit.

Items without diagram numbers are associated with the parts shown by diagram number immediately above.

No. on Diagram	Drawing Number	Description	No. on Diagram	Drawing Number	Description
1	B.56406	Overarm Assembly	21	A.41848	Selector Spring
	A.56384	Overarm Collar	22	A.56373	Friction Plate
	A.44074	Screw Fixing Collar		A.56616	Operating Lever Unit
2	C.56451	Pickup Base Cover (Rear)		A.41723	Spring Clip
3	A.56417	Selector Arm Assembly	23	A.56319	Control Arm Unit
4	A.41853	Pickup Arm Counterbalance Spring (hidden from view)		B.56393	Knob
5	A.56710	Record Cam	24	A.56325	Manual Control Arm Unit
6	A.44085	Screw for Record Cam		B.56393	Knob
7	C.56450	Pickup Base Cover (Front)	25	A.40343	Screw fixing Cover
8	A.56965	Latch	26	A.51327	Cover for Switch Block
	A.56436	Cap for Front Cover and Latch	27	B.51322	Switch Block
9	B.57250	Pickup Arm Assembly		A.40130	Screws fixing Switch Block (2 per set)
	B.57550	Pickup Arm Assembly (Model 209)		A.41008	Nuts fixing Switch Block (2 per set)
	A.54734	Pivot Spindle		A.42526	Spring Washers (2 per set)
	A.40040	Screw fixing Pivot Spindle		A.41686	Contact Spring Blades (2 per set)
10	A.56804	Pickup Head MPM5 (Closed Front)	28	A.56368	Tension Lever
	A.56802	Pickup Head MPM5 (Open Front)		A.40695	Washer
11	A.40480	Wood Screw		A.41723	Spring Clip
12	A.56317	Control Cover Front		A.41792	Spring Tensioning Inter Wheel
	A.43816	Spring Clip fixing Cover (2 per set)	29	B.53883	Inter Wheel Unit
13	A.56969	Spring Mounting Assembly (3 per set)		A.40774	Presspahn Washer (2 per set)
	A.40053	Screw (3 per set)		A.40773	Washer
	A.40777	Presspahn Washer (3 per set)		A.41723	Spring Clip
	A.41724	Compression Spring (3 per set)	30	B.54638	Record Spindle Assembly
14	A.56318	Speed Cover Unit		A.56344	Main Spindle Unit
	A.43816	Spring Clip fixing Cover (2 per set)		A.51224	Cage for Ball Race
15	B.53394	Turntable Unit		A.43201	Ball Bearings (5 per set)
16	A.53176	Turntable Retaining Clip		A.40789	Thrust Washer
17	C.54848/B	Turntable Mat		A.40804	Thrust Washer
18	C.56303	Unit Plate with Pins	31	A.40183	Fixing Screw for Pickup Base Short (2 per set)
	A.56374	Stop Lever Assembly		A.56460	Connector Assembly
18A	A.41759	Spring for Stop Lever Assembly	32	A.40018	Fixing Screw for Pickup Base. Long. Hidden from view
	A.42179	Rivets fixing Stop Lever Assembly to Unit Plate. (2 per set)	34	A.56425	Cam Selector Lever Unit
19	A.40480	Wood Screw		A.40795	Washer (2 per set)
20	A.56401	Selector Link		A.43800	Spring Clip
			35	B.56388	Cam Assembly
			36	C.56362	Bridge Sub Assembly

No. on Diagram	Drawing Number	Description	No. on Diagram	Drawing Number	Description
	A.40695	Washer (4 per set)		A.55643	Pulley 50 cycle
	A.41006	Nut (4 per set)		A.55644	Pulley 60 cycle
37	A.40488	Fixing Screw Upper		A.44052	Screw fixing Pulley (2 per set)
	A.40155	Fixing Screw Lower	43	A.43123	Flexible Motor Mount (3 per set)
38	A.56651	Leg		A.40828	Washer for Motor Mount (3 per set)
	A.42179	Rivets fixing Legs (2 per set)		A.43800	Circlip for Motor Mounting (3 per set)
39	A.56306	Index Lever Unit			
	A.40695	Washer (2 per set)			
	A.41723	Circlip	44	A.56314	Speed Lever Unit
	A.41630	Index Lever Spring		A.56315	Speed Lever
40	A.56453	Support Lever Assembly		B.56316	Knob
	A.41841	Lifting Spring		A.40695	Washer
	A.40867	Lifting Spring Washer		A.41723	Spring Clip
	A.56381	Support Bracket Unit	45	B.56309	Speed Cam Lever Unit
	A.40773	Washer	46	A.56312	Inter Speed Lever Unit
	A.41723	Spring Clip		A.40695	Shim Washer (2 per set)
	A.56570	Spindle Unit		A.41723	Spring Clip (2 per set)
	A.40512	Washer	47	B.56350	Switch Lever Assembly
	A.41006	Nut		A.45064	Brake Pad
	A.43813	Spring Clip		A.40695	Shim Washer
41	B.54982	Cover for Changeover Block		A.41723	Spring Clip fixing Switch Lever Assembly
	A.41012	Nut fixing Cover	48	A.56380	Switch Link
	A.54926	Connector Link (2 per set)		A.40537	Washer (2 per set)
42	B.56440	Dual Range Motor—Complete		A.41723	Spring Clip (2 per set)
	B.56440/A	Low Range Motor—Complete	49	A.56322	Control Lever Unit
	A.56443	Bobbin Assembly Front — Dual Range Motor		A.44076	Screw fixing Control Lever Unit
	A.56446	Bobbin Assembly Rear — Dual Range Motor	50	A.56329	Control Link
	A.56809	Bobbin Assembly Front — Low Range Motor		A.40695	Shim Washer
	A.56810	Bobbin Assembly Rear — Low Range Motor		A.41723	Spring Clip
	A.56442	Stator Assembly Complete—Dual Range Motor	51	A.41630	Spring for Start and Return Levers hidden from view by Control Lever
	A.56808	Stator Assembly Complete—Low Range Motor	52	A.56408	Start Lever Unit
	B.53962	Motor Cover Top Complete with Bearing	53	A.56331	Return Lever
	B.53963	Motor Cover Bottom Complete with Bearing	54	A.41631	Spring for Control Link
	A.43209	Thrust Ball for Bottom Cover	55	B.56332	Catch Lever
	A.54929	Rotor Assembly complete with Shaft		A.40836	Separating Washer
	A.40436	Stud fixing Motor Covers (2 per set)		B.56625	Stop Cam Lever
	B.56445	Motor Plate		A.40864	Washer
	A.55398	Pillar Assembly (2 per set)		A.43800	Spring Clip
	A.54756	Spacer (3 per set)	56	A.41503	Spring for Stop Cam Lever
	A.40118	Screw	57	B.56439	Latch Release Lever
	A.41012	Nut (3 per set)		A.40537	Washer (2 per set)
	A.42501	Spring Washer (3 per set)		A.41723	Spring Clip (2 per set)
	A.54981	Voltage Changeover Block Assem- bly, with Connector Bushes, Eyelets and Terminal Nuts.	58	A.42517	Spring Washer for Latch
	A.40443	Fixing Stud for Changeover Block		A.40537	Washer for Latch
	A.41012	Nuts for fixing Changeover Block (2 per set)		A.43334	Split Pin
	A.42501	Spring Washer	59	A.56334	Cam Lever Unit
	A.40515	Washer		A.40503	Shim Washer
	A.51333	Insulation Plate		A.41788	Spring Clip
				A.41852	Spring for Cam Lever
			60	A.54656	Release Lever Assembly (Also supplied on Bridge Sub Assembly)
				A.40695	Shim Washer
				A.41696	Spring Clip
			61	A.54662	Stop Link
				A.40537	Washer (2 per set)
				A.41723	Spring Clip (2 per set)
			62	A.56376	Inter Lever Unit

No. on Diagram	Drawing Number	Description	No. on Diagram	Drawing Number	Description
	A.56359	Fixing Plate		A.44084	Adjusting Screw for Friction Spring (hidden from view)
	A.56627	Stop Catch Lever Unit		A.40503	Shim Washer (hidden from view)
	A.43800	Spring Clip for Stop Catch Lever		A.41788	Spring Clip retaining K.O. Lever Unit (hidden from view)
63	A.41845	Spring	81	A.41506	Spring for Inter Selector Lever
	A.44034	Fixing Screws for Pickup Base Covers (4 per set)	82	A.56353	Pickup Spindle Unit
64	B.56412	Pickup Base Unit		A.40843	Washer (2 per set)
	A.51345	Thrust Race		A.40852	Leatheroid Washer
	A.56358	Inter Selector Lever		A.40220	Screw
	A.54675	Lower Bush		A.41850	Spring
	A.43204	Steel Balls (15 per set)		A.42548	Spring Washer
65	A.56339	Selector Lever Assembly		A.43814	Retaining Clip
66	A.41846	Spring for Selector Lever Assembly	82A	A.56357	Pivot Bracket
67	A.44076	Screw fixing Selector Lever Assembly		A.54734	Pivot Spindle
68	A.43803	Spring Clip	83	A.56708	Lead Guide
69	A.56584	Pickup Cam Assembly	84	A.56642	Anchor Bracket
	A.54714	Roller	85	A.44041	Screw fixing Pickup Lever Assembly
	A.41723	Spring Clip		A.41006	Nut
70	A.40503	Washer	86	A.40698	Steel washer
71	A.41788	Spring Clip fixing Pickup Cam	87	A.41869	Spring
72	A.56667	Lifting Spindle Unit	88	A.40859	Tab Washer
73	A.41833	Friction Spring		A.40777	Presspahn Washer (Hidden from view)
74	A.54685	Lifting Pin		A.56338	Guide Plate (not shown) for Over-arm
75	A.43803	Spring Clip (3 per set)		A.40000	Screws fixing Guide Plate (2 per set)
76	A.41796	Return Spring		A.42501	Spring Washers (2 per set)
	A.40831	Washer	No.	A.53571	Switch Click Suppressor Unit (Not shown)
77	A.56513	Cam Link Unit			
78	A.40537	Washer (4 per set)			
	A.41723	Spring Clip fixing Cam Link Unit (2 per set)			
79	A.56414	Pickup Lever Assembly			
80	A.56342	K.O. Lever Unit			
	A.41844	Friction Spring for K.O. Lever Unit (hidden from view)			

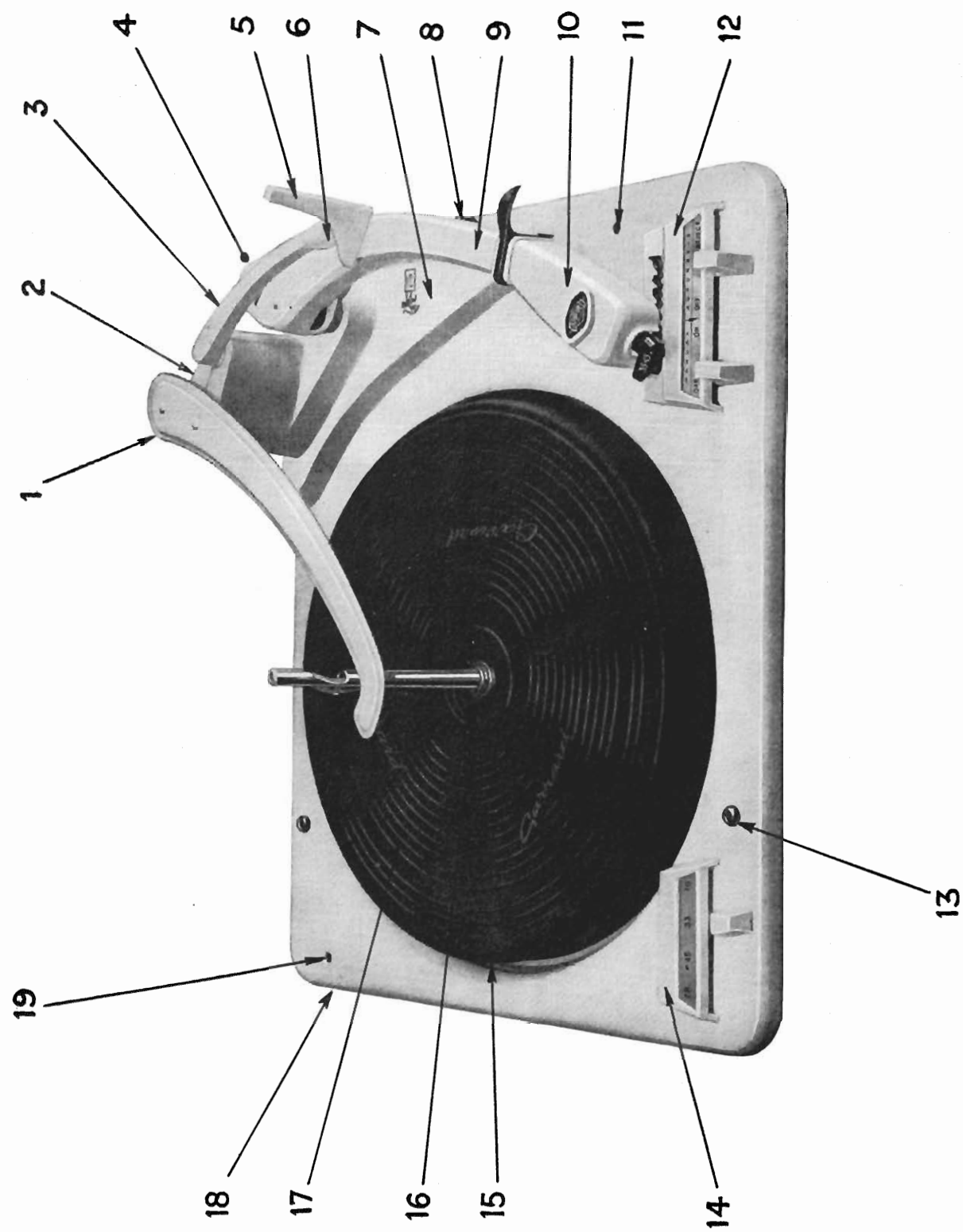


Diagram 19

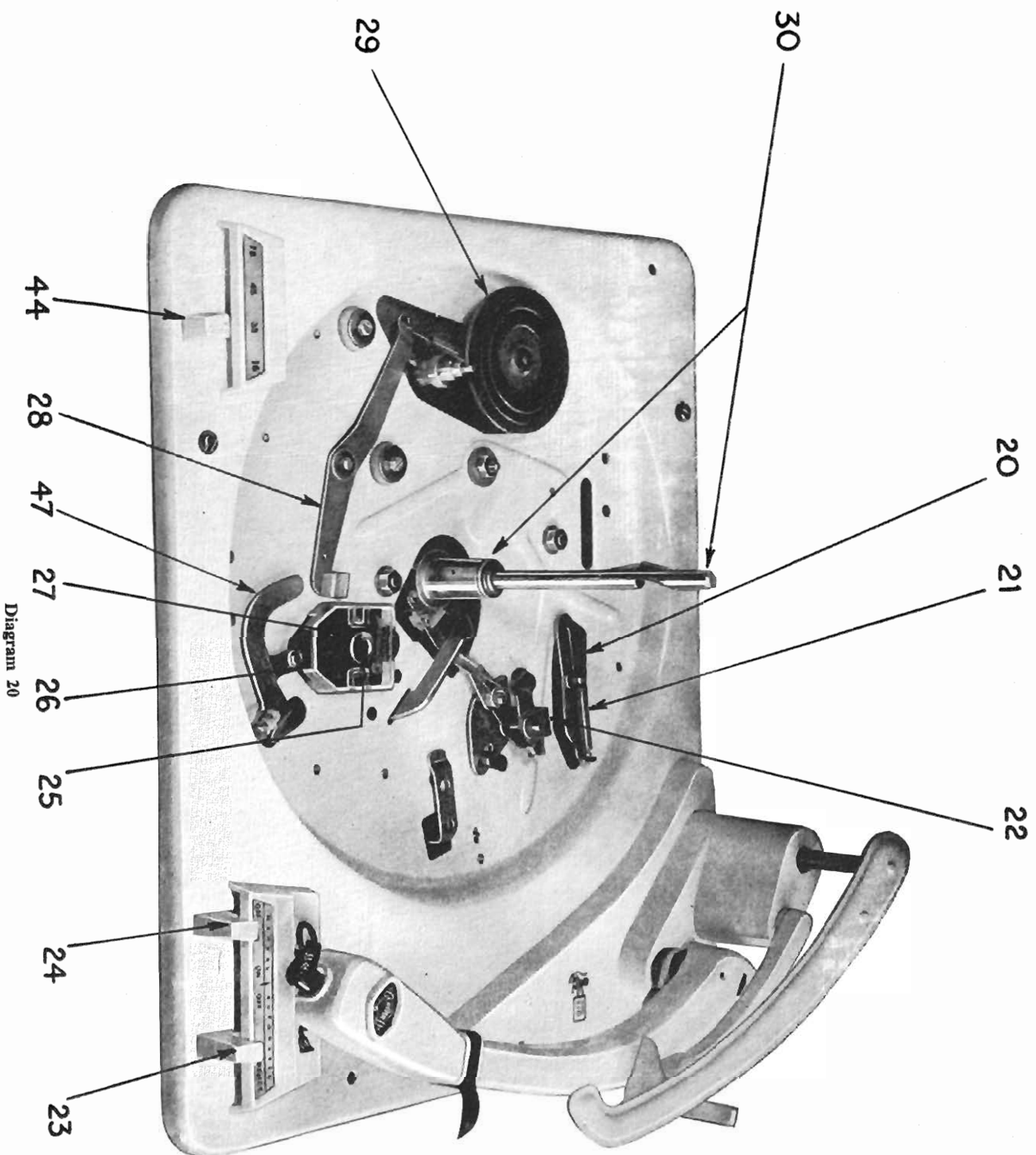


Diagram 20

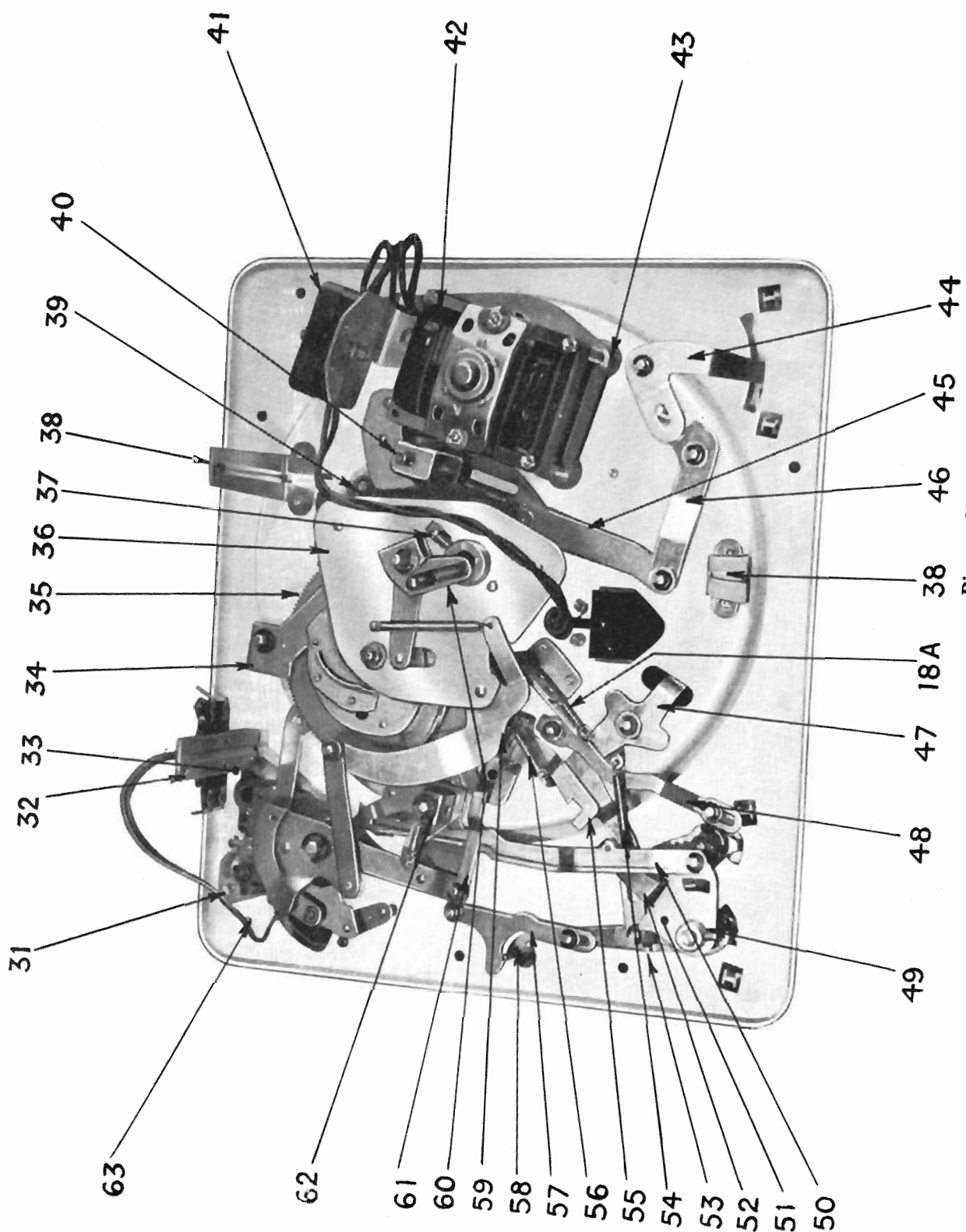


Diagram 21

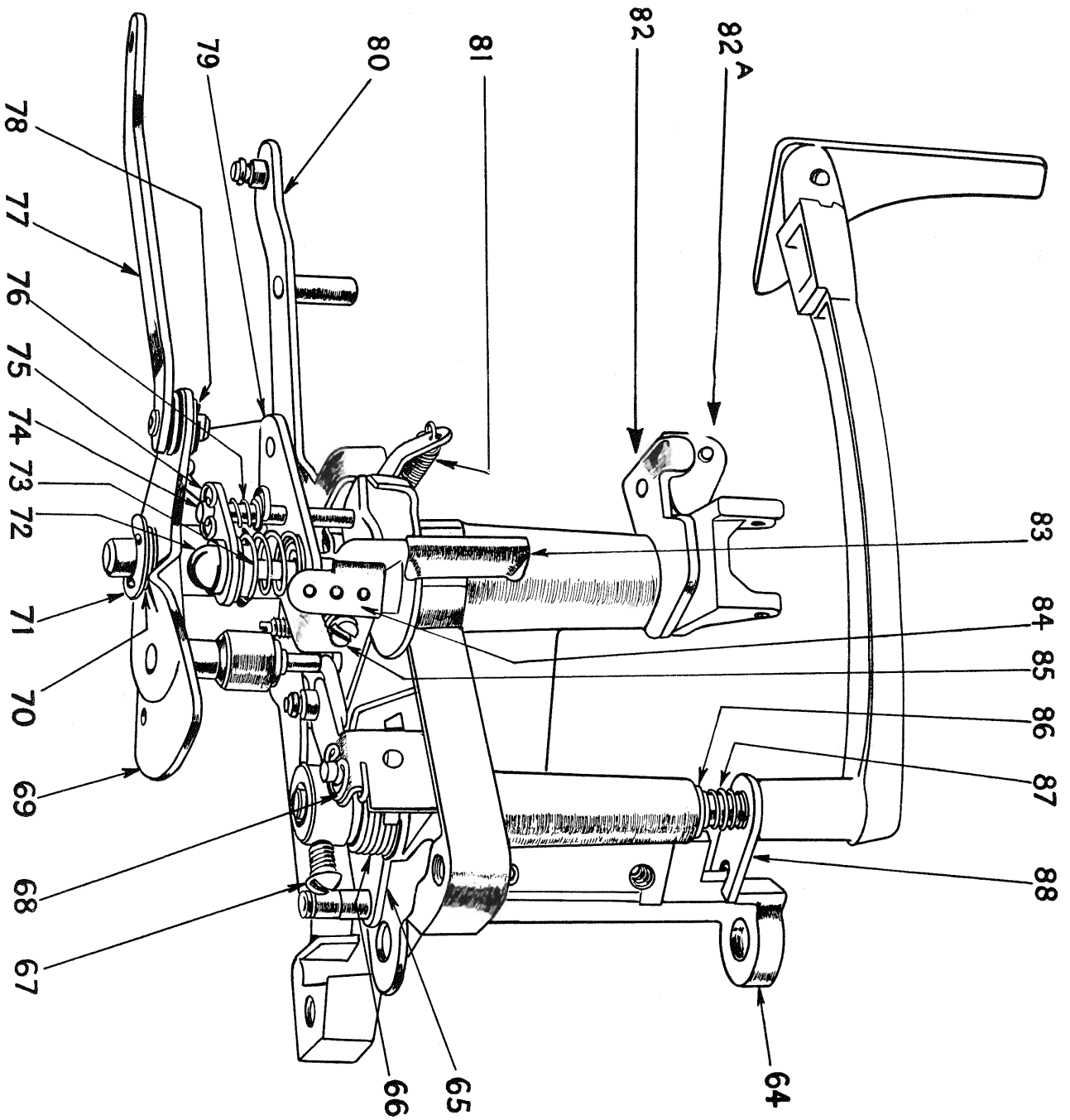


Diagram 22

Garrard Service Sheet – Number 215

Complementary to
Sheets No.

Model: Record Changer 210

..... 202

Record Changer 209

..... 204

Subject: Additional service information
and modifications.

..... 211

Reference to Sheet Number 202

Under the heading "Fitting to Cabinet," instructions are given to connect a lead from a good earth point to the earthing tag on the motor. For convenience, the earthing tag is now assembled under the rear fixing nut of the power supply connecting block, Diagram 23, and not on the motor. This facilitates connecting the power supply cable when the third lead is used for the earth connection.

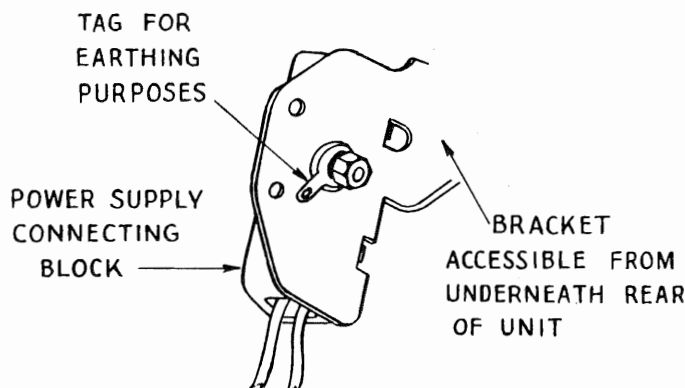


Diagram 23

Reference to Sheet Number 204

Under the heading "Stylus Pressure," instructions are given for adjusting the stylus pressure by means of the serrated projection on top of the rear of pickup arm. This adjustment may not give enough variation to accommodate some of the heavier pickup cartridges and additional adjustment is provided at the lower end of the pickup arm counterbalance spring anchorage, Diagram 24. The spring can be anchored in one of the three holes provided, according to the tension required, the lower hole giving the maximum tension. Final adjustment should be made by means of the serrated projection on top of the rear of pickup arm as previously described.

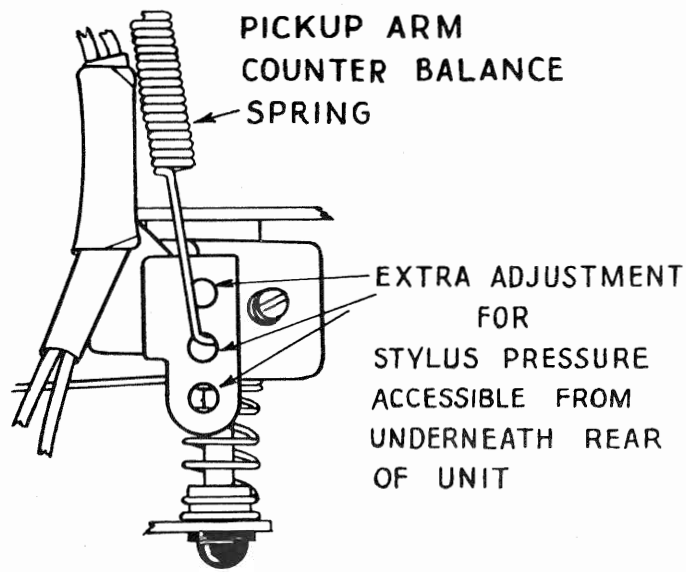


Diagram 24

Reference to Sheet Number 211

In place of the pickup arm transit screw shown in Diagram 18, a positive lever clamp is now provided as shown in Diagram 25. To remove a plug-in pickup head, turn the clamp lever to the vertical position, shown dotted on diagram. To lock pickup head in arm turn clamp to the horizontal position; do not use excessive force.

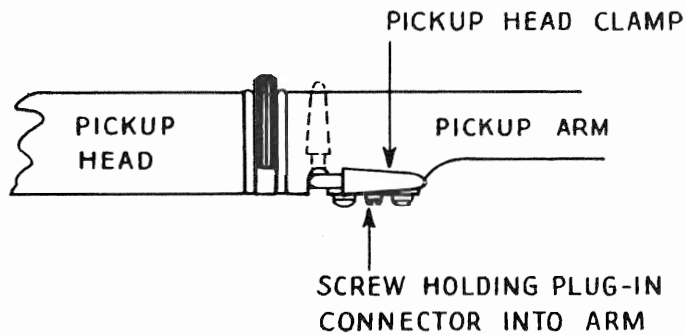


Diagram 25