The home of the turntable

THE VINYL ENGINE®

For more turntable manuals and setup information
please visit www.vinylengine.com

Garrard

SINGLE RECORD PLAYING UNIT

MODEL 4HF

OPERATING INSTRUCTIONS

THE GARRARD ENGINEERING AND MANUFACTURING CO. LTD. – SWINDON – WILTSHIRE – ENGLAND

THE GARRARD MODEL 4HF

SINGLE RECORD PLAYING UNIT

The Garrard Model 4HF Unit is a Single Record Playing Unit designed and manufactured to the high standard which is synonymous with the name of Garrard.

In common with all other Garrard equipment, it is simple and reliable in operation. Extreme accuracy in the machining of components and delicacy of pivots combine to produce a unit which is as free from Wow, Flutter and Rumble as it is possible to achieve.

It is wired for Stereophonic Reproduction, and the Plug-in Pickup Head Moulding will accommodate any Garrard Pickup Cartridge and most of those of other manufacturers including Stereophonic models.

Instructions are given in this manual for installing and operating the unit, but in the case of further information being desired, our Technical Service Department will gladly assist you. In any communication regarding this unit, please quote Model number, Schedule number and type of Pickup Cartridge fitted. The two former will be found on the small square plate at the rear of the Unit and the latter is on the Pickup Cartridge itself.

Address your enquiries to:— The Garrard Engineering & Mfg. Co. Ltd.,
Technical Service Department,
Newcastle Street, Swindon, Wilts.

Telephone No.: Swindon 5381 (5 lines).

Telex: 44271.

If you wish to make enquiries concerning the return of a Unit for repair, or if you require spare parts, address your letter to:— The Garrard Engineering & Mfg. Co. Ltd.,
Service and Spares Department,
Radnor Street, Swindon, Wilts.

Telephone No.: Swindon 22606.

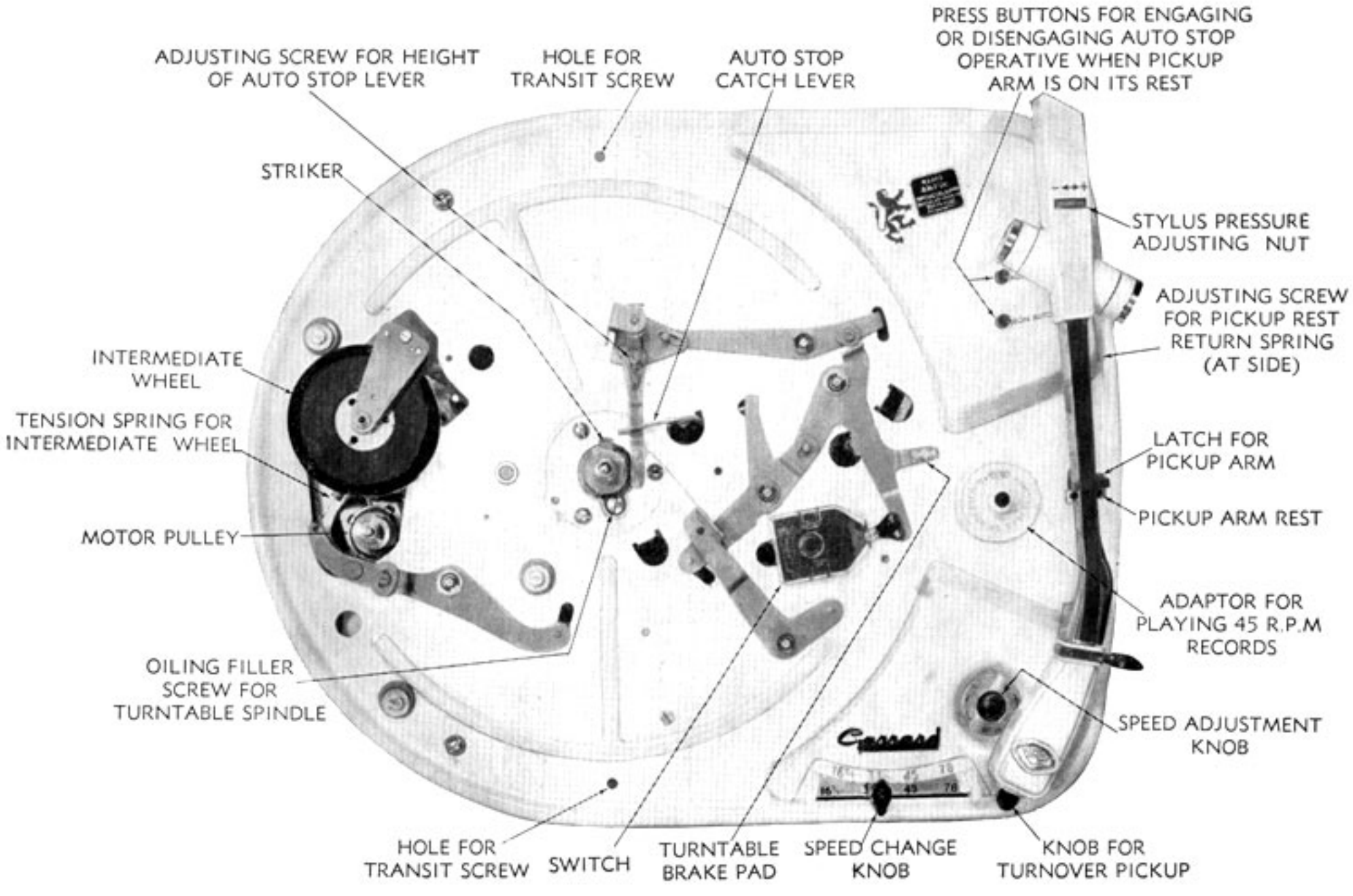

ADJUSTING SCREW FOR HEIGHT OF AUTO STOP LEVER
HOLE FOR TRANSIT SCREW
AUTO STOP CATCH LEVER
PRESS BUTTONS FOR ENGAGING OR DISENGAGING AUTO STOP OPERATIVE WHEN PICKUP ARM IS ON ITS REST
STRIKER
STYLUS PRESSURE ADJUSTING NUT
ADJUSTING SCREW FOR PICKUP REST RETURN SPRING (AT SIDE)
INTERMEDIATE WHEEL
TENSION SPRING FOR INTERMEDIATE WHEEL
LATCH FOR PICKUP ARM
PICKUP ARM REST
MOTOR PULLEY
ADAPTOR FOR PLAYING 45 R.P.M RECORDS
OILING FILLER SCREW FOR TURNTABLE SPINDLE
SPEED ADJUSTMENT KNOB
HOLE FOR TRANSIT SCREW
SWITCH
TURNTABLE BRAKE PAD
SPEED CHANGE KNOB
KNOB FOR TURNOVER PICKUP

Diagram 1

Operating Instructions

The Garrard 4HF Unit will play a Record of any size up to and including 16″ diameter at either $16\frac{2}{3}$, $33\frac{1}{3}$, 45 or 78 r.p.m.

To Operate.

(1) See that the correct Stylus or Pickup Head is in position for the type of Record to be played.

(2) Set the Speed Change Knob to the correct speed for the Record.

(3) Remove the Latch from the Pickup Arm.

(4) Place the Record on the Turntable, lift the Pickup Arm and move it to the right to start the Motor, then gently lower the Pickup on to the Record.

(5) At the end of the Record the Unit will (unless set otherwise) stop automatically. A special feature of the 4HF Unit is, however, the provision for completely disengaging the Automatic Stop, should it be so desired. At the rear of the Unit, and adjacent to the Pickup Base, will be found two red push buttons, one labelled "Auto Stop" and the other "Non Auto." (See Diagram 1). Depression of the latter button, with the Pickup Arm on the Rest, will completely disengage the Auto Stop mechanism from the Pickup Arm. The Unit will then not stop automatically at the end of each Record. It will, however, stop automatically when the Pickup Arm is placed on the Rest. Starting is accomplished as before, by moving the Arm to the right.
Should it be desired to switch off before the end of a Record, the Arm should be gently lifted to raise the Stylus from the Record, and moved over and placed on the Rest. This instruction applies whether the Auto Stop is in engagement or not.
The Automatic Stop can at any time be brought back into operation by pressing the red button marked "Auto Stop" when the Arm is on the Rest.

Records.

To obtain the best results from your Records, always keep them in their respective envelopes when not in use—do not leave them on the Turntable. Preserve the surface by keeping them as free from dust as possible, cleaning occasionally with a soft clean, damp cloth. The Turntable Mat should also be kept as clean and free from dust as possible.

Avoid touching the music grooves, and always keep Records away from heat. Do not on any account play chipped or cracked Records, for they will damage the Stylus point.

Maintenance

The bearings of the Turntable Spindle, the Intermediate Wheel and the Rotor Spindle of the Motor are of special oil retaining material, and these spindles will run for a considerable period without attention. When, however, the need for lubrication becomes apparent, the Turntable should be removed and a small quantity of the special oil which is supplied with the Unit, or of a light grade of sewing machine oil be applied to the parts mentioned above and indicated on Diagram 1. The Intermediate Wheel should be held out of the way when the oil is applied to the Motor Spindle. Should any oil inadvertently be applied to the driving surfaces of either Pulley, Intermediate Wheel or Turntable, it must be removed and the surface thoroughly cleaned before the Turntable is replaced. It is imperative that the surfaces of these three components be kept free from oil at all times, otherwise slipping is liable to occur, resulting in variations in speed of the Turntable.

Removing Turntable.

The Turntable may be removed by taking off the centre Retaining Clip and applying equal upward pressure under diametrically opposite sides of the rim with the fingers. In obstinate cases, or where the Turntable has been in position for a very long period, the above procedure may be augmented by a slight tap on the top of the Turntable Spindle with a small block of wood, or the handle of a screwdriver by a second person, while the Turntable is raised with the fingers.

Fitting Turntable.

Make sure that the Unit is in the switched-off position, so that the Intermediate Wheel is fully retracted, then place the Turntable on its spindle and revolve it clockwise, letting it gently drop into position. The Unit should then be switched on in order to free the Brake Pad. When the Turntable is in position the Unit must again be switched off so as to avoid damaging the Intermediate Wheel.

Voltage and Frequency.

Two models of the 4HF Unit are available, one being for use on 200/250 volts A.C. and the other for 100/130 volts A.C. Either model may be used on a 50 or 60 cycle supply, according to the type of Motor Pulley fitted. (See Page 11).

The Motor should be earthed by connecting a lead from the earthing tag located under one of the Motor Cover screws to a good earth connection.

If the Unit is to be used with a radio set or amplifier which has a Universal (AC/DC) chassis, or if the reproducer is a battery set coupled to a Universal H.T. Battery Eliminator, it is essential to make sure that isolating components (condensers or transformer) are incorporated in the Pickup input circuit in the set, otherwise the Pickup circuit can become "live."

Should these isolating components not be included in the set, they should be fitted externally in series with the Pickup Leads. IF IN ANY DOUBT, CONSULT YOUR LOCAL RADIO DEALER.

The leads from the radio set or amplifier to the Pickup should be kept as short as possible and should be screened.

ALTERNATIVE COLOUR CODING FOR PICKUP LEADS

Channel	Present Colour	Alternative Colour
R.H.	Brown	Red
L.H.	Grey	White
Common	Black or Screen	Black or Screen

CONNECTION FOR 3 PIN/3 WIRE UNITS

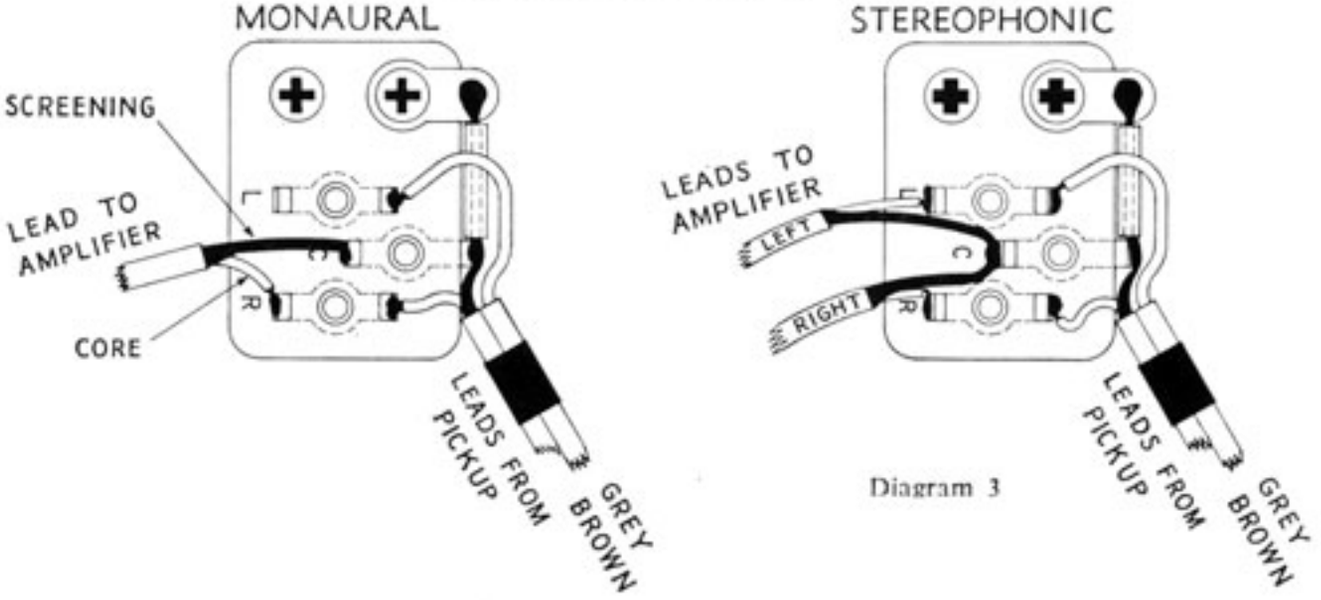


Diagram 3

CONNECTION FOR 4 PIN/4 WIRE UNITS

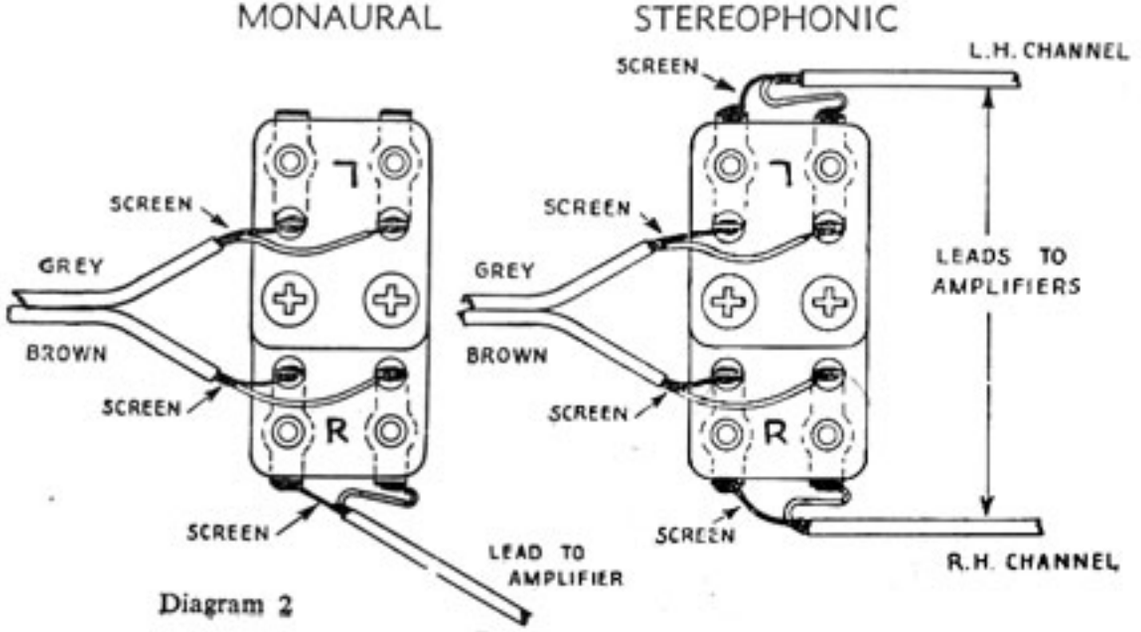


Diagram 2

Installation

Dimensions.

The cabinet space necessary for accommodating the unit is 17¼″ long by 13½″ back to front, with 3½″ clearance above the top of the motor board, and 3⅜″ clearance below the top of the board. These sizes provide adequate clearance for the Unit to float on its spring mountings and will permit the playing of all Records up to and including 12″ diameter. Should it however be desired to accommodate 16″ Records, additional space will be required on three sides of the unit.

Fitting to Cabinet.

Having opened the top of the Carton, the fitting Template, Instruction Manual and Stroboscope will be found underneath the first liner. Remove these and untie the string loop which holds up the Pickup Arm. Lift the Unit out of the Carton and take out the small envelope containing two wood screws and washers (for transit purposes) the Turntable Clip and the small plastic bottle containing oil for the Turntable Spindle. Access to the Turntable is by opening the bottom of the Carton.

The motor board should be cut out in accordance with the Template, and, if not already fitted, suitable flexible leads for the power supply should be connected to the Terminal Block which will be found adjacent to the Motor, underneath the Unit. Screened Pickup Leads if not supplied should also be soldered to the tags of the Pickup Terminal Panel, as shown in Diagrams 2 and 3. The other end of these leads will be attached to the Pickup Terminals of the Amplifier(s) in accordance with its manufacturer's instructions, after the installation of the Unit is complete. The leads should be threaded through the large cut out hole in the board and the unit placed in position with the spring suspensions over the three ¾″ dia. holes. Press down evenly over each spring and the patented clip in Spring Suspensions will push through the three fixing holes and be retained in position. Adjustment to level the Unit is made by turning each or either suspension screw, clockwise to lower and counterclockwise to raise the Unit. The level should be carefully checked by means of a Spirit Level placed on a Record on the Turntable, and both side to side and back to front level should be checked.

Transit Screws.

For transit purposes, two wood screws are provided to clamp the Unit rigidly to the Motor Board. Two small fibre washers are also supplied for use under the screw heads to avoid damage to the enamel of the Unit Plate. The position of these transit screw holes is shown on the Template and on Diagram 1. **THESE SCREWS MUST BE REMOVED BEFORE USING THE UNIT.**

The plug-in Pickup Head is locked in position by means of the small lever which will be found on the right-hand side of the front portion of the Arm. In order to remove the head, this lever should be raised to the vertical position. The head can then easily be pulled out.

After replacing the head, it should be locked securely in position by returning the lever to the horizontal.

A latch is provided on the pickup rest, to hold the arm for transit purposes. Before attempting to switch on the unit, this latch must be swung clear of the arm by turning it in a clockwise direction.

Oiling.

A small plastic bottle of special oil is supplied for use on the Turntable Spindle and upon installation and before the Turntable is fitted it is recommended that a small quantity of this oil be inserted into the oiling hole and into the felt pad, both of which will be found on the top of the Unit Plate (Diagram 1). The amount of oil inserted should be kept to a minimum and since the spindle is running in oil impregnated bearings, the Unit will run for a long time without further attention.

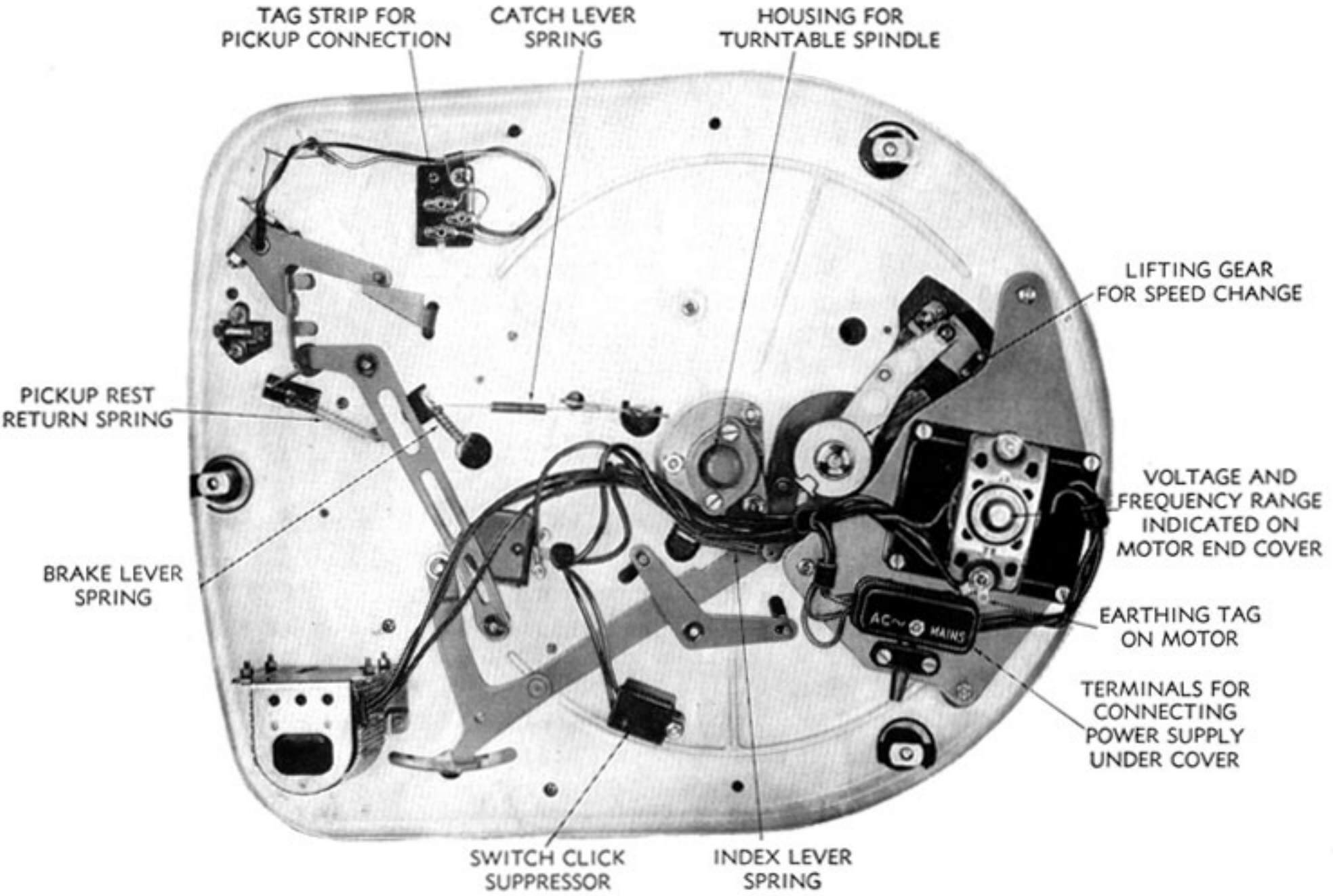

TAG STRIP FOR PICKUP CONNECTION
CATCH LEVER SPRING
HOUSING FOR TURNTABLE SPINDLE
LIFTING GEAR FOR SPEED CHANGE
PICKUP REST RETURN SPRING
VOLTAGE AND FREQUENCY RANGE INDICATED ON MOTOR END COVER
BRAKE LEVER SPRING
EARTHING TAG ON MOTOR
TERMINALS FOR CONNECTING POWER SUPPLY UNDER COVER
SWITCH CLICK SUPPRESSOR
INDEX LEVER SPRING
AC MAINS

Diagram 4

Service Adjustments

These notes are included to help the owner of the Record Player to make any minor adjustments which may become necessary.

Speed.

The Motor on the Model 4HF is designed to give accurate Turntable speeds within very close tolerances. Should the Turntable run excessively fast or slow, the Motor Pulley should be examined in order to ascertain whether or not the correct Pulley is fitted for the frequency of the power supply.

The colour finish of the respective Pulleys is as follows:—

50 cycles — Nickel (White)
60 cycles — Brass (Yellow)

It is possible to vary the nominal speed of the Turntable, by means of the small Black Knob in the recess under the Pickup Head, to the extent of approximately plus 2% and minus 3% of either of the 4 speeds. The speeds should always be checked and set when the Pickup is playing a Record.

Speed Variation.

It is essential that the driving surfaces of the Motor Pulley, the rubber Intermediate Wheel and the Turntable rim, should be kept absolutely free from oil and grease. Should the speed of the Turntable show any variation, this is the first point which should be checked and the various surfaces should be cleaned with a dry, soft cloth if any suspicion of oil is found.

Intermediate Wheel.

The accuracy of the rubber Intermediate Wheel is of supreme importance in maintaining the high standard of performance of this Unit, and any damage to its periphery will result in imperfections in the reproduction in the form of Wow or Flutter. Should the Wheel become damaged in any way it should be replaced with a new one, obtainable from our Spares Department.

Wow or Flutter may also be caused by the side of the rubber tyre on the Intermediate Wheel rubbing on the side of the adjacent step on the Motor Pulley. When correctly adjusted there should be approximately $\frac{1}{32}$" clearance between these faces and if this is not so, the Motor Pulley, which is held on its shaft by two set screws, should be moved downwards to provide the necessary clearance. It is important that the screws should be thoroughly retightened after this adjustment has been made.

Motor.

Should the Motor fail to start when the Unit is switched on, the power supply should first of all be checked, to ascertain whether the current is reaching the motor terminals. If this is correct, the power should be switched off and the Terminal Block examined for loose connections. The Switch Blades should also be examined, to make sure that the contact roller is making good contact when the unit is switched on. Clean and adjust them if necessary.

Thick oil must never be used to lubricate the Motor Bearings, for it will cause the Motor to appear weak and possibly prevent it from starting. Should too thick an oil have been inadvertently used, it will be necessary to dismantle the Motor and clean all traces of it from the bearings and the spindle. It is essential that the only oil used for the Motor bearings should be a good quality thin oil such as that used on sewing machines, etc.

Pickup.

The Pickup Arm of the Model 4HF Unit will accommodate a wide variety of Pickup Cartridges both Monophonic and Stereophonic, and care should be taken that the correct Stylus or Pickup is used for the Record to be played.

Two types of stylus are necessary for playing the different types of Monaural Records, one with a point radius of .0025" for the standard 78 r.p.m. Records (coarse groove) and one with a radius of .001" for Microgroove (fine groove) Records. A special Pickup is required for playing Stereophonic Records, and this is facilitated by the Garrard Plug-in Pickup Head which is fitted to this Unit.

Turnover Pickup Cartridges are correctly set when the speed of the Record to be played appears on the top of the Turnover Knob. If there is an arrow on the Knob, it indicates the direction in which the Knob should be turned when a change is required.

The 4HF Unit is wired for both Monophonic and Stereophonic Reproduction and the correct connections for playing either type of Record is shown in Diagrams 2 and 3.

Stylus Pressure.

Should it be desired to fit a Pickup Cartridge other than that supplied with the unit, or in cases where a unit is supplied without a cartridge, it is essential that the stylus pressure be set to the Cartridge manufacturers' specification before use. It is also desirable that the stylus pressure be checked periodically and any necessary correction made.

Stylus pressure can most conveniently be checked with a Garrard Stylus Pressure Gauge, and adjustment is easily made on the 4HF Unit by means of the small knurled disc which protrudes through the top surface of the rear portion of the Arm. This disc should be turned to the right to increase stylus pressure, and to the left to reduce it. Sufficient adjustment is provided by this means to accommodate most types of cartridge.

Should there be a tendency for a Pickup to track incorrectly, the Stylus pressure should be checked and adjusted accordingly if any deviation from the recommended figure is found. If the Stylus pressure is found to be correct, the Pickup Lead should be examined, in case it has become twisted or held in such a way as to impede free movement of the Pickup Arm or its associated levers.

Should trouble be experienced with the reproduction from a Pickup, the Cartridge should be returned to its manufacturer, for examination and repair. Pickup Cartridges must not be opened, otherwise the manufacturer will disclaim all responsibility.

NOTE.—A Continuity Test cannot be carried out on a Crystal Pickup with an ohmmeter.

Auto Stop Mechanism.

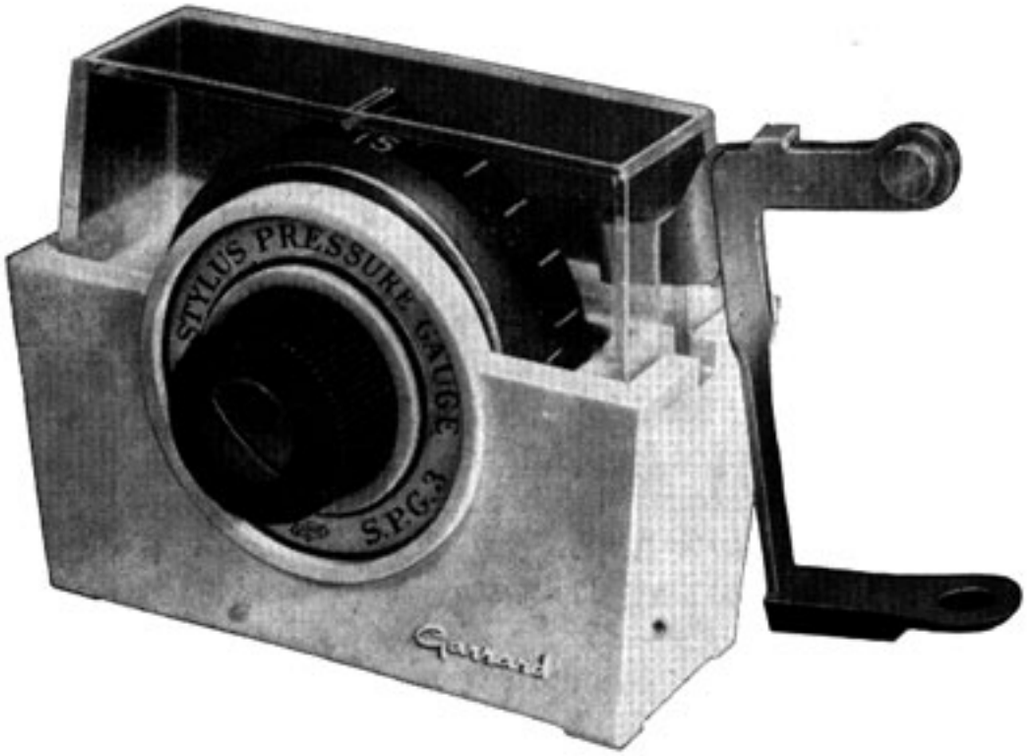
The mechanism for automatically switching off the motor at the end of a Record is of the velocity type, and is of a special design to ensure maximum lightness and sensitivity in operation.

In order to accommodate the majority of Records, the Auto Stop is designed to commence operating when the Stylus reaches a point $2\frac{3}{4}$" from the centre of the Record, but should any trouble be experienced with "banded" or Extended Play Records switching off before the last tune is played, a special feature of this Unit is that the Auto Stop may be disengaged (by pressing the "Non-Auto" button when the arm is on its rest) to accommodate these exceptional circumstances.

Should the stop fail to operate when it is set to do so, a possible cause is that the Operating Lever is touching the underside of the Catch Lever, which prevents it from running in freely. A slight turn of the adjusting screw in a counterclockwise direction will lower the Operating Lever and obviate this fault. Alternatively, it may be that the Lever is not lifting high enough to trip the Catch Lever in which case, the portion of the Operating Lever in front of the Catch Lever should be bent downwards very slightly, in order to increase the amount of lift.

Pickup Rest.

The Pickup Rest mechanism, which automatically switches off the Unit when the Pickup Arm is placed upon it, is set to operate with a very light pressure and it should return readily when the Arm is lifted. Should any adjustment be necessary, a screw is provided at the side of the Pickup Base, adjacent to the point where the rest enters the base for this purpose. The screw should be turned in a clockwise direction to increase the spring tension and counterclockwise to reduce it.



THE SPG3 STYLUS PRESSURE GAUGE

INSTRUCTIONS FOR USE

Place the Gauge on top of the Turntable Mat with the red plastic scale pan overhanging the edge.

Turn the knob of the Gauge until the required stylus pressure is indicated by the line at the top of the plastic window.

Place the Pickup Head into the stirrup of the balance lever with the stylus resting in the hollow of the Scale Pan.

Adjust the stylus pressure of the Pickup Arm by the means provided by the manufacturer, until the red pointer of the balance lever on the Gauge lines up with the line at the top of the plastic window.

ADJUSTMENT

A 5 gramme checking weight is supplied with each Garrard SPG3 Stylus Pressure Gauge. It will be found in a small pocket at the left hand side of the case and is accessible by sliding back the plastic cover.

It is recommended that the Stylus Pressure Gauge be checked for accuracy occasionally, using this weight, and adjustment made if necessary.

TO ADJUST

Set the dial to indicate 5 grammes by turning the black knob and place the checking weight centrally on the scale pan. Then turn the plated screw in the centre of the black knob until the red pointer of the balance lever lines up with the line at the top of the plastic window and with the 5 gramme line on the dial.

PRINTED IN ENGLAND BY THE BOROUGH PRESS (SWINDON) LTD., EASTCOTT HILL, SWINDON.