

SME

The best pick-up arm in the world



INSTRUCTIONS

SERIES 300

Introduction

The Series 300 embraces three models, the 309, 310 and 312, which offer differing pivot to stylus distances. Whilst the influence of the classic Series V will be clearly seen, the aim has been to meet the needs of a broader market requiring alternative arm lengths, an interchangeable shell facility and lower cost.

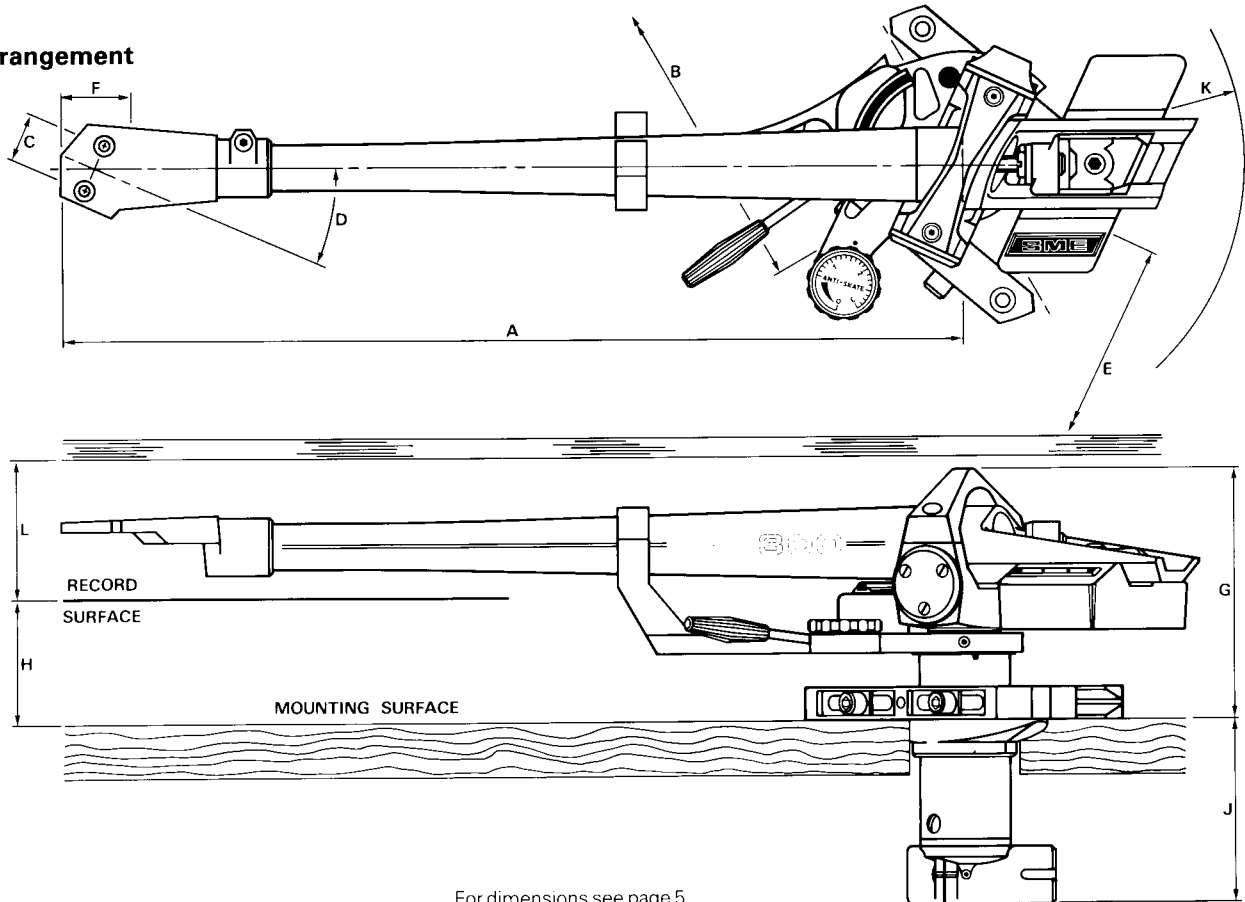
We believe our designers can be justly proud of these models which, although not intended quite to challenge the Series IV or ultimate Series V, owe much to their advanced technology and offer a level of performance and manufacturing excellence otherwise without equal.

The illustrations in this manual show the Model 309 only but the instructions apply also to the Models 310 and 312.

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General arrangement



For dimensions see page 5

Dimensions

	309	310	312
	mm	mm	mm
A – Distance from pivot to stylus	232,2	238,5	308,2
B – Distance from pivot to turntable centre	213,4	222,0	295,6
C – Cartridge fixing centres	12,7	12,7	12,7
D – Offset angle	23,2°	22,6°	17,3°
E – Linear offset	91,54	91,54	91,54
F – Overhang	17,0	16,5	12,6
G – Height above mounting surface	{ max. 87,9 min. 56,4	87,9 56,4	87,9 56,4
H – Height of record surface above mounting surface	{ max. 55,9 min. 24,4	55,9 24,4	55,9 24,4
K – Radial clearance for balance weight	73,0	73,0	73,0
L – Clearance between cabinet lid and record surface assuming cartridge height at 17,0 mm	37,0	37,0	37,0

Specification

		309	310	312
Effective mass	grams	9,5	9,7	12
Cartridge balance range	grams	6-17	6-17	5-14
Vertical tracking force (at min. cartridge weight)	grams	0-2,5	0-3	0-3
Maximum tracking error	degree/mm	0,013	0,013	0,010
Null points:				
Inner	mm radii	63,62	63,62	63,62
Outer		119,46	119,46	119,46
Audio lead:				
Length	mtrs	1,2	1,2	1,2
Capacitance	pF/channel	140	140	140
Resistance	ohms/conductor	0,15	0,15	0,15
Internal wiring:				
Capacitance	pF/channel	15	15	20
Resistance	ohms/conductor	0,54	0,54	0,71
Output plug and socket		D.I.N. 5-pole 240°		
Weight, net	grams	717	720	782

Packing list

This pack is the only one in which your Series 300 precision pick-up arm can be safely transported. Please keep it for possible future use. When re-packing, always detach the headshell and place it in the compartment beneath the internal cover.

The pack contains the following:

Series 300 precision pick-up arm

Series 300 detachable headshell

Instruction book

Mounting template

Shell hardware Finger lift and 2 washers,
set of 8 aluminium alloy screws
and 2 nuts.
2,0 A/F hexagon wrench.

3,0 ball-ended hexagon
wrench with handle and
VTF indicator

Mounting hardware Set of 4 socket cap screws,
4 nuts and 4 washers.
2,5 A/F hexagon wrench.

Audio lead

Alignment protractor

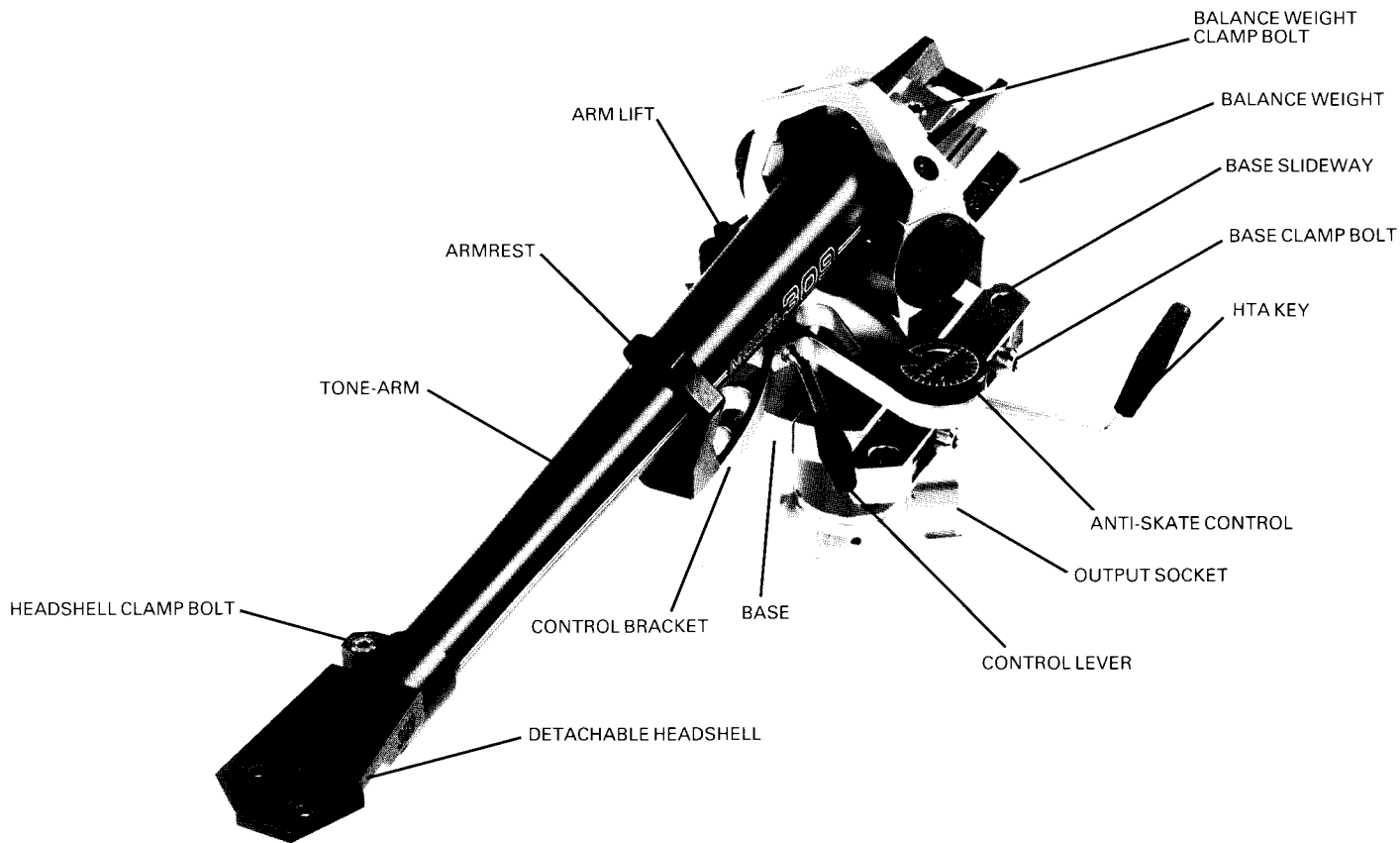
HTA key

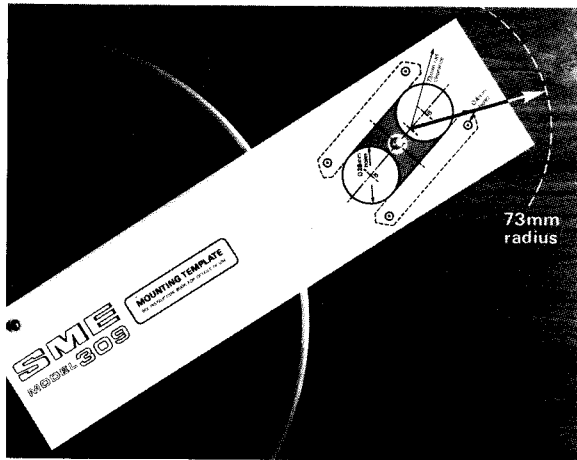
0,89 A/F hexagon wrench

Guarantee card

Sachet of silica gel

Parts identification

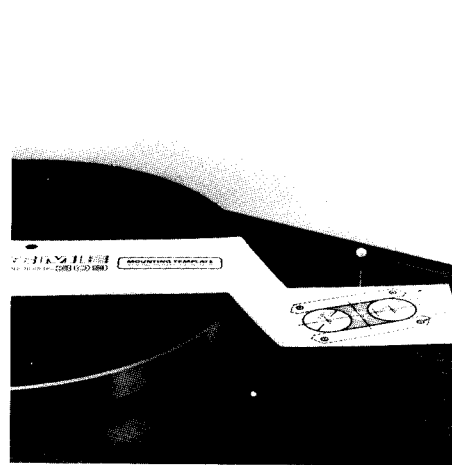




101 Preparing the pick-up mounting board

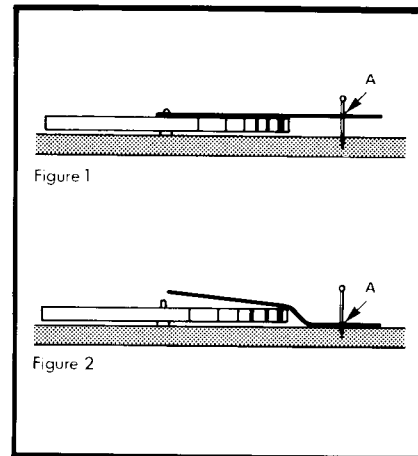
A number of decks have the pick-up mounting board already cut to accept SME arms, others will need to be prepared in accordance with the following instructions:

Pierce the centre point A of the mounting template to accept a pin or needle about 50 mm (2") long. Place the template on the record spindle and keeping it parallel with the surface on which the arm will be mounted pass the pin vertically through the centre point A and spike it into the pick-up mounting board, as 103 – figure 1.

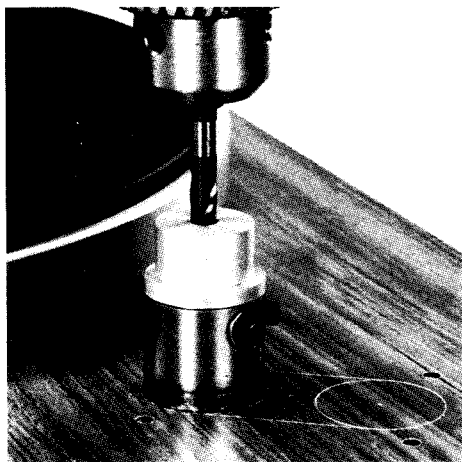


102

Disengage the template from the spindle and maintaining the same alignment slide it down the pin and onto the pick-up mounting board, as 103 – figure 2. This will position the base for maximum effective movement when adjusting the horizontal tracking angle (HTA), see 129-30-31. Anti-clockwise rotation from this position up to approximately 40 degrees can be made to meet individual needs and is not critical provided that the requirements of the alignment protractor can be satisfied. Note that rear overhang requires a 73 mm (2 7/8") radial clearance from the point shown on the template and care should be taken to see that this is available.



103

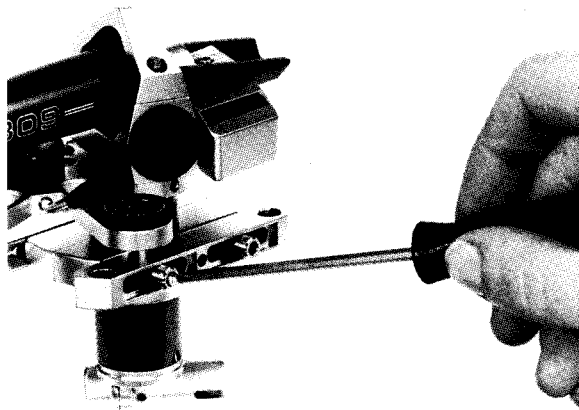


104 Preparing the pick-up mounting board (continued)

Using a scribe or a compass point, spike through the centre of points B and centres of the four fixing holes. Remove the template and with a compass mark two 28 mm (1 1/8") diameter circles about the points B already centred. Join these together with two parallel lines to complete the marking out.

Drill four 4 mm (5/32") diameter fixing holes and two 28 mm (1 1/4") diameter holes. Cut away the remaining area to complete the slot and finish the edges with a file and glasspaper. If a hole saw is not available drill a series of small holes around the inside of the line, saw out and file.

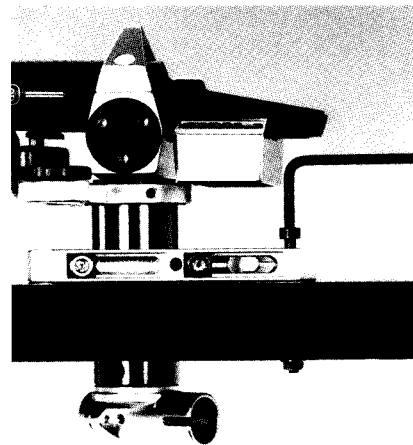
With suitable tools and technique the procedure is similar for materials other than wood.



105 Fitting the arm

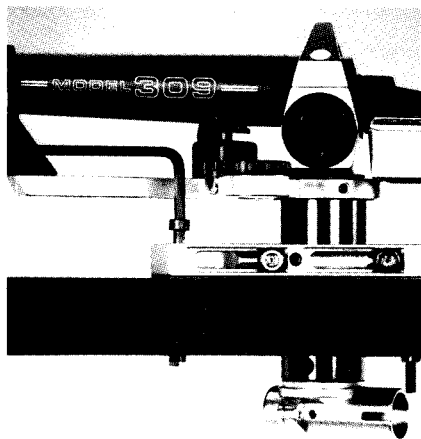
The base can be rotated on the pillar so that the clamp bolts are presented on the side giving the best access. Using the 3 mm A/F ball-ended hexagon wrench, see that both are lightly locked and then released by three-quarters of a turn only. This will enable the base to be moved on the pillar and also the base slideways to be moved in relation to the base.

The clamp bolts must not be re-locked until installation and adjustments have been completed. The movements are internally spring loaded so settings will not be lost in the meantime.



106

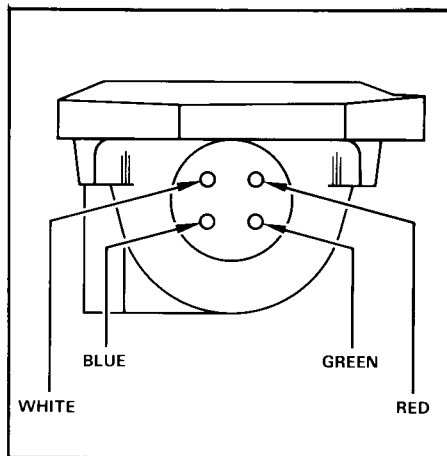
Move the two base slideways fully backwards in relation to the base. Position the arm on the pick-up mounting board and insert two of the M3 socket cap screws into the rear mounting holes. Fit the nuts and washers under the board so that the screws are pulled home but do not fully tighten. The screws are 22 mm (7/8") long and suit the majority of applications. For exceptionally thick mounting boards they should be replaced with M3x35 mm (1 3/8") long socket cap screws. Part No. 5893/35 available direct from us in the event of difficulty.



107 Fitting the arm (continued)

Move the arm into the fully rearward position, either manually or using the HTA key, see 128. Insert the two remaining screws and fit the nuts and washers. The four screws should now be firmly and evenly tightened using the 2,5 mm A/F hexagon wrench. Excessive tightness should be avoided, and care taken that the fine finish of the arm is not marred by the wrench coming into contact with it. It may be more convenient to use the wrench reversed with the long leg engaging the screw.

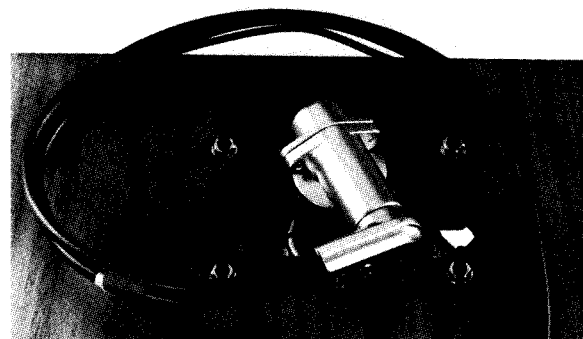
The arm height has been set at the factory to suit the pack. At this point it may be altered as required, see 122-23-24.



108 Cartridge lead replacement

The LCOFC cartridge leads, Part No. 4899, can be replaced and may be obtained from your dealer or direct from us.

They should be fitted with due regard to their colour coding as shown above, see 111.



109 Audio lead

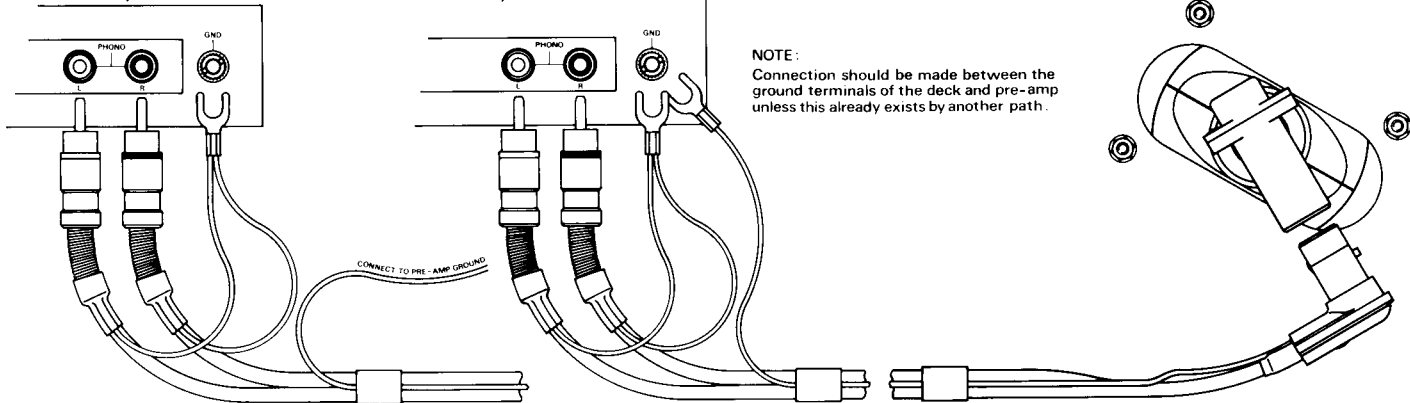
Insert the output plug. The socket rotates through 315 degrees allowing it to be moved into the best position. When using a floating deck a generous loop should be formed in the lead to minimise mechanical coupling.

The ground lead serving the arm should be connected to the ground terminal of the pre-amp and those from the phono plugs to the ground terminal on the piece of equipment to which the plugs are connected, i.e. transformer, head-amp or pre-amp. If the turntable has a ground terminal it should also be connected to the pre-amp but not if an electrical path from the deck already exists via the arm ground, due to a grounded metal mounting board for instance, see 110.

The system has been designed for a high S/N ratio and if this is not achieved, multiple ground paths or the over-proximity of mains equipment will be likely causes.

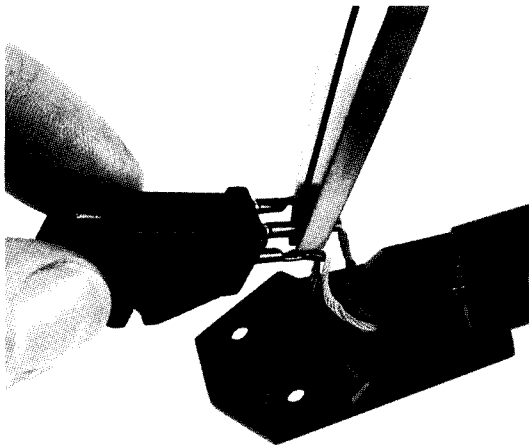
MC HEAD AMP/TRANSFORMER

PRE-AMP/CONTROL UNIT



NOTE:
Connection should be made between the ground terminals of the deck and pre-amp unless this already exists by another path.

110 Audio lead (continued)



111 Fitting the cartridge

Before fitting the cartridge see that the stylus guard is in position as a precaution against accidental damage.

The LCOFC cartridge leads have 1 mm diameter receptacles for the headshell and standard 1,25 mm for the cartridge. The latter may require adjustment with pliers or a screwdriver blade for a snug fit on non-standard terminals.

Connections to the cartridge must never be made by direct soldering.

The coding is:

- Red – right channel signal
- Green – right channel ground
- White – left channel signal
- Blue – left channel ground

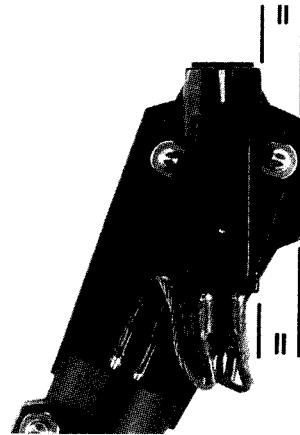


112

Four lengths of alloy screws, nuts and washers are provided for cartridge fixing:

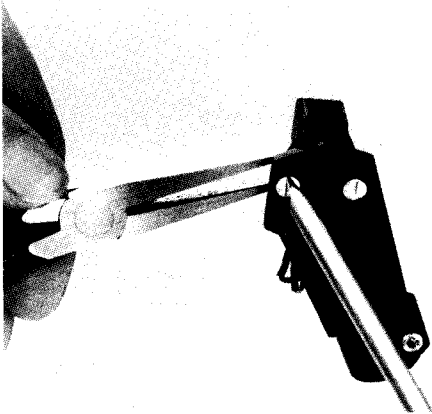
- 6,5 mm ($\frac{1}{4}$ "
- 11 mm ($\frac{7}{16}$ "
- 16 mm ($\frac{5}{8}$ "
- 19 mm ($\frac{3}{4}$ "

Select a pair, using the shorter if more than one length is suitable. For the purist, use without the finger lift is preferred but it is unlikely that the difference will be audible. When used, the two stainless steel washers should first be fitted to the counterbores in the headshell.



113

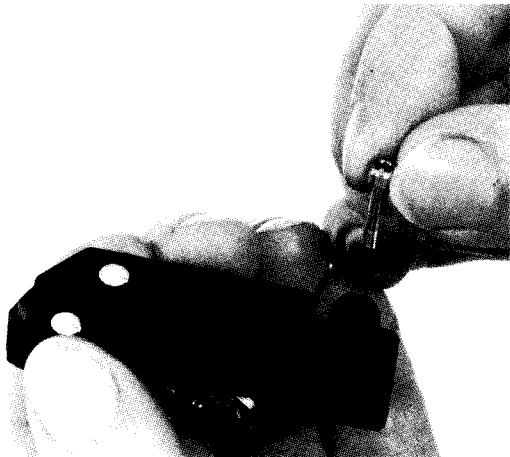
Examine the top of the cartridge. It is important that it presents a good flat face to the underside of the headshell. Before final tightening check that the cartridge is lying parallel to the reference edge of the headshell as shown.



114 Fitting the cartridge (continued)

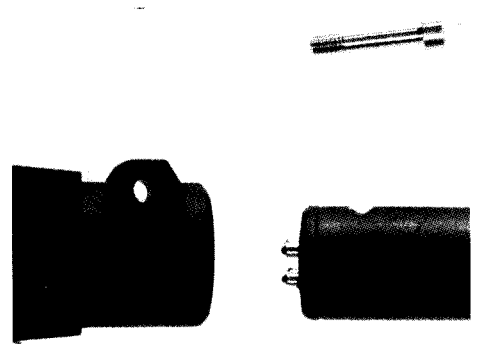
Tighten the cartridge fixing screws securely using a screwdriver which must be a good fit in the screw slots to avoid damage. Hold the nut with pliers if necessary to prevent rotation.

The screws are non-magnetic. Damage can be caused if a screw is snatched by magnetic attraction whilst being offered up to the cartridge. For the same reason do not lay tools down nearby.



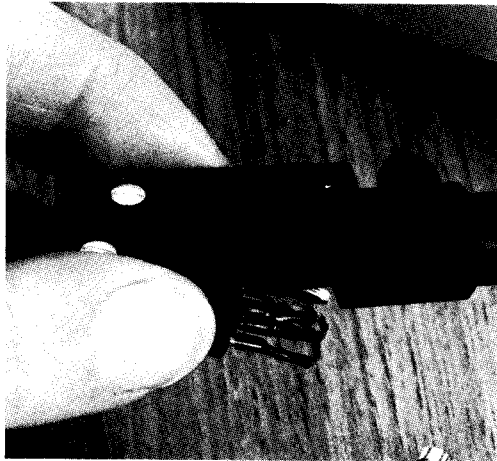
115 Fitting the headshell

Using the 2 mm A/F hexagon wrench release the headshell clamp bolt and remove it. The nut should remain in its housing in the underside of the headshell as it is retained there with adhesive.



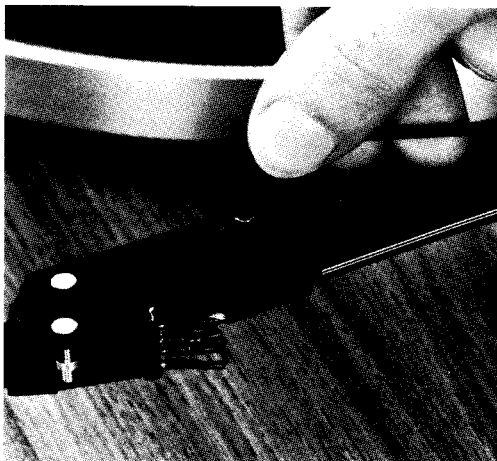
116

Offer up the headshell to the tone-arm identifying the half-round keyway near the front.



117 Fitting the headshell (continued)

As the headshell is pushed onto the tone-arm resistance will be felt as the spring loaded contact pins in the tone-arm plug are compressed.

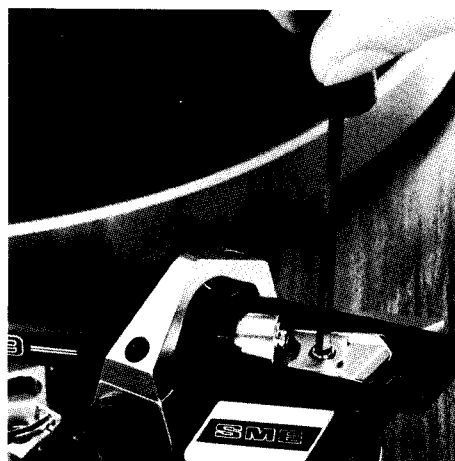


118

Align the bolt hole in the headshell clamp boss with the keyway in the tone-arm and insert the clamp bolt until it contacts the nut. Tighten lightly using the 2 mm A/F hexagon wrench.

Removing the headshell

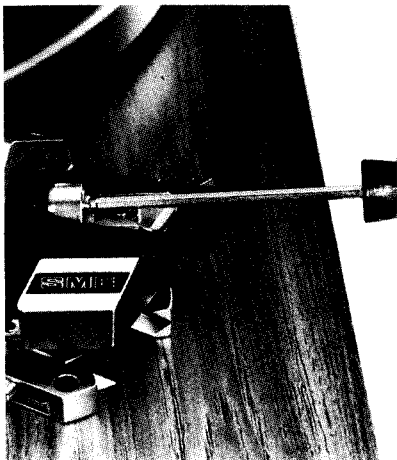
Using the 2 mm A/F hexagon wrench release the clamp bolt and unscrew it. To remove the bolt push the headshell onto the tone-arm using just enough pressure to overcome the spring loaded contact pins in the tone-arm plug. The clamp bolt should then be loose enough to lift out using the long leg of the hexagon wrench and applying slight side pressure so that it does not slip out of the hexagon socket. The nut remains in its housing in the underside of the headshell where it is retained with adhesive.



119 Longitudinal balance

If a detachable stylus guard was used it should now be removed, thereafter handling the arm with suitable caution.

The balance weight is unlocked using the 3 mm A/F ball-ended hexagon wrench. A half turn anti-clockwise is sufficient and for this purpose should not be exceeded.



120 Longitudinal balance (continued)

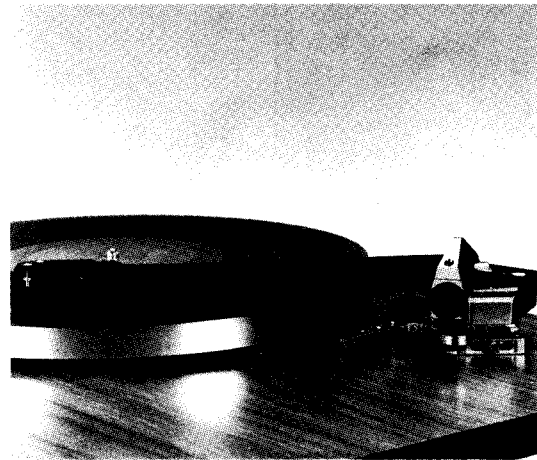
Check that the anti-skate control is set at zero, see 134. Position the arm so that it is clear of the armrest and the cartridge is clear of the turntable. Move the control lever into the lowered position, see 137. Balance the arm by rotating the leadscrew, using the 3 mm A/F ball-ended hexagon wrench. This moves the balance weight backwards or forwards as required. Adjust until the arm with cartridge fitted is either level or slightly low at the front end when the balance weight is re-locked.



121 Vertical tracking force (VTF) adjustment

For safety the lever of the lowering control should now be moved into the raised position, see 138. The front face of the handle of the 3 mm A/F ball-ended hexagon wrench carries arrows and letters A-B-C-D at quarter turn intervals. To apply VTF, unlock the balance weight one quarter turn only, see 119. Note the position of one of the letters, after engaging the wrench with the leadscrew, and rotate in the direction of the arrows. One full turn applies 0,5 gram or 0,125 gram for each letter. For example, to apply 1,5 gram VTF, three complete turns of the wrench will be required.

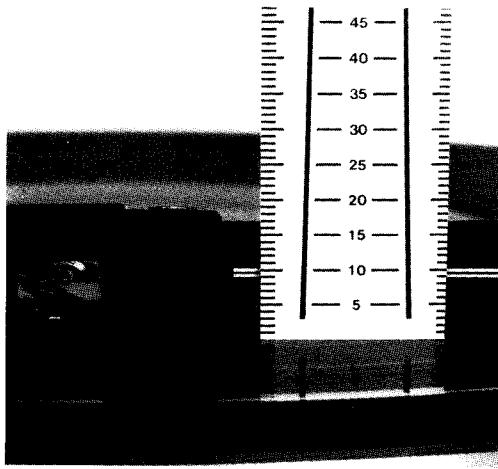
When reducing VTF by opposite rotation of the wrench, move the balance weight slightly further than required so that final adjustment is always made in the forward direction. Re-lock the balance weight. Whilst the foregoing procedure is sufficiently accurate for all normal purposes, VTF can be further checked with a stylus force gauge if one is available.



122 Arm height (VTA) adjustment

Use an old but unwarped record for the following procedures in case of accidental damage. Place the arm about halfway across the record and move the control lever forward to lower it into the playing position, see 137. Arm height is adjusted by moving the main pillar upwards or downwards in the base. It is convenient to do this with one hand on each side of the control bracket. Spring loading ensures that positioning will be maintained until the base is locked at a later stage.

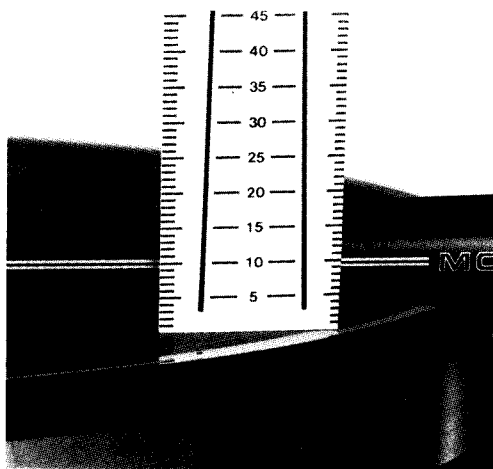
Set visually so there is approximately 5-6 mm clearance between the underside of the tone-arm and the edge of the record for Models 309/310. Set 9-10 mm for Model 312.



123 Arm height (VTA) adjustment (continued)

In standard operation the mounting surface of the cartridge, underside of the headshell and centre line of the tone-arm should all be parallel with the surface of the record.

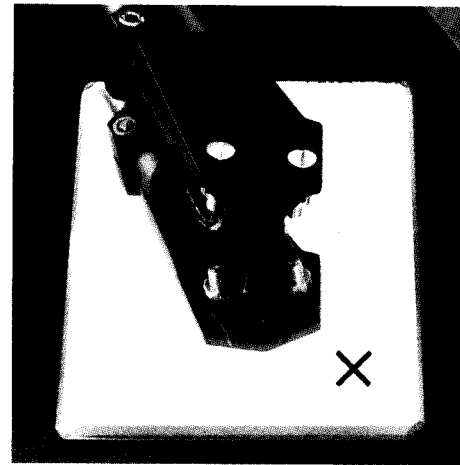
The alignment protractor has been designed to act also as a height gauge in conjunction with the lines printed on the side of the tone-arm. Measure the distance from the surface of the record to the upper of the two lines at the front of the tone-arm using the left-hand scale.



124

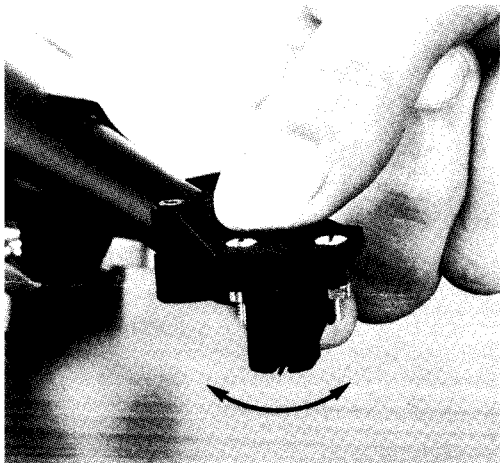
Re-position the protractor about 6 mm (1/4") from the edge of the record. Using the right-hand scale repeat the measurement and compare it with the first. Finally, adjust the height, see 122, until similar readings are obtained, indicating that the tone-arm is parallel with the surface of the record.

Other dispositions can, of course, be accommodated and if the readings are noted, quickly implemented for special needs.



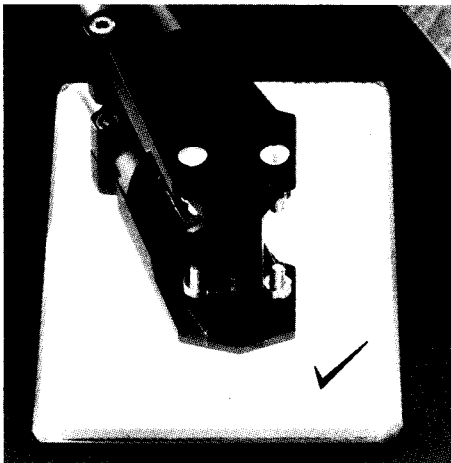
125 Azimuth adjustment

Place a small mirror on the turntable and rest the stylus on it. Viewed in this way any departure from vertical is accentuated and easily visible.



126 Azimuth adjustment (continued)

Holding the headshell close to the tone-arm, rotate it in the required direction. The clamp bolt allows enough movement for this adjustment. If undue resistance is felt release the bolt one quarter turn, see 118. The stylus must be clear of the mirror whilst this is done.



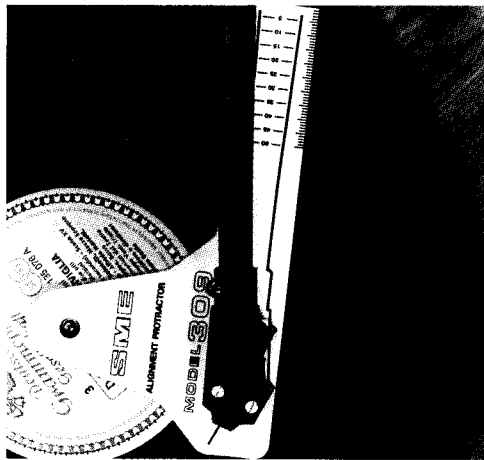
127

Re-check with the mirror and when satisfied tighten the clamp bolt firmly with the 2 mm A/F hexagon wrench but avoid excessive tightness.



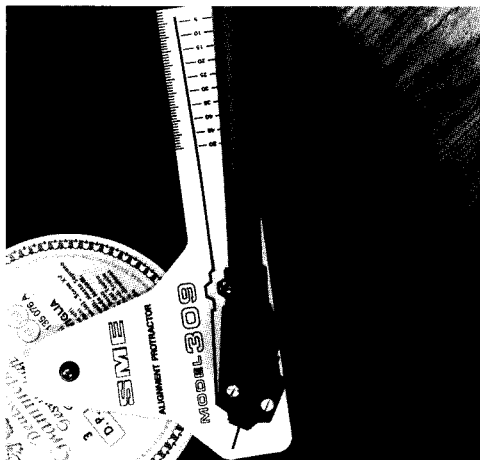
128 Horizontal tracking angle (HTA) adjustment

Place the tone-arm into the armrest and insert the HTA key into either of the sockets situated centrally in the base slideways. Use a light pressure, rocking it slightly to ensure full engagement of the pinion with the toothed rack in the base. Rotation of the key in either direction will now cause the base to move between the slideways. Do not use force. If movement is tight, check that the base clamp bolts are sufficiently released; also that the cut-out in the pick-up mounting board is affording proper clearance. When all is well, rotate the key to traverse the arm into its fully forward position.



129 Horizontal tracking angle (HTA) adjustment (continued)

With the record still on the turntable, place the alignment protractor onto the record spindle. Check that the anti-skate control is at zero and that the VTF has been set to suit the cartridge in use. The stylus position on the protractor is indicated by a small circle. Move the arm out of the armrest and place it so that the stylus enters the indent formed within the small circle, taking utmost care not to touch or knock the tone-arm. Rotate the HTA key to move the tone-arm and protractor backwards until, when viewed directly from above, their outlines coincide.



130

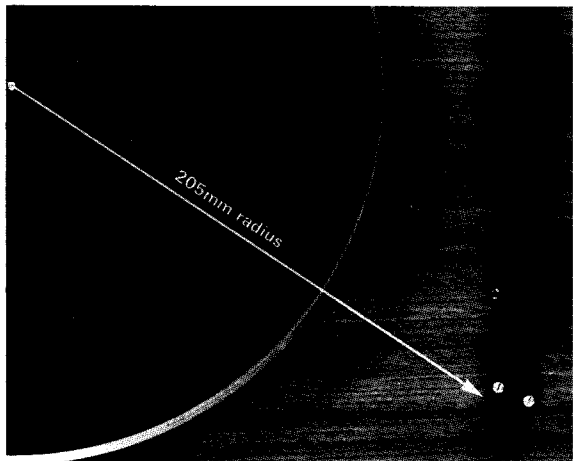
Movement has been made too far and opposite rotation of the HTA key is required to correct it.



131

Most cartridges have a stylus – fixing hole centre distance of 9.5 mm ($\frac{3}{8}$ "'). Correctly adjusted with these, the outlines of the tone-arm and protractor will coincide when viewed directly above the centre line of the tone-arm. With others according to the position of the stylus, it will be necessary to view slightly to the left or right of the centre line; the only requirement for correct HTA being that the outlines appear to coincide along their length as shown.

Replace the arm in the armrest and remove the alignment protractor.



132 Positioning the armrest

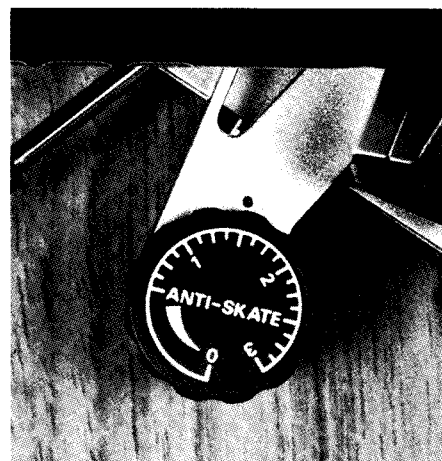
Keeping the tone-arm in the armrest and avoiding any pressure which might disturb the height setting, swing both radially until the left-hand front edge of the headshell is at a radius of 205 mm ($8\frac{1}{16}$ ") from the centre of the record spindle. The measurement is not critical within ± 3 mm ($\frac{1}{8}$ ") but the accuracy of the anti-skate control will be affected if this is exceeded.

Re-check the arm height setting, see 122-23-24.



133 Locking the base

Tighten the two clamp screws evenly and tightly. Excessive force is unnecessary and should be avoided.



134 Anti-skate control

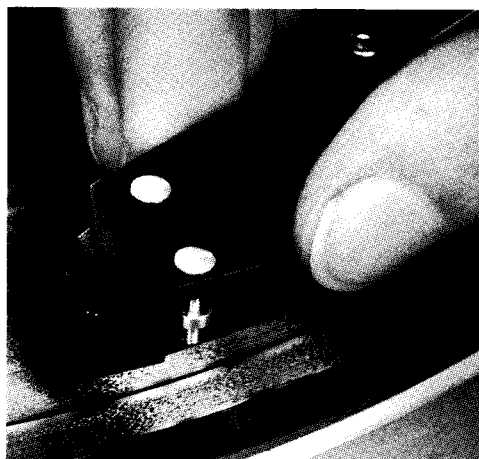
The dial is calibrated and should be set to correspond with the VTF in use. Rotate the dial until the chosen setting coincides with the index point.

Requirements are dependent on a number of variables and the recommended setting will be found a good compromise. The situation lends itself to experiment. Listen for any discrepancy between channels. If the left channel mistracks, reduce the setting and if the right channel mistracks increase it.



135 Operation

With the control lever in the raised position move the tone-arm out of the armrest.



136

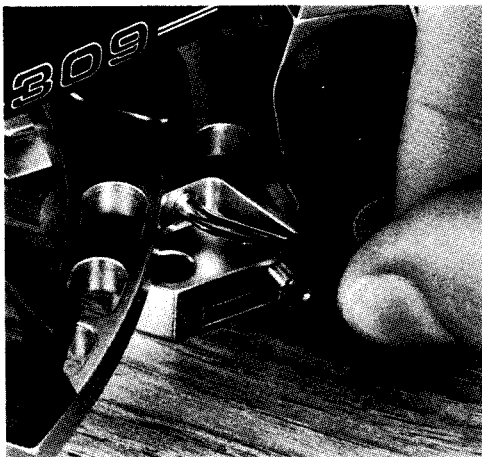
Position the arm so that the stylus is over the selected record groove.



137

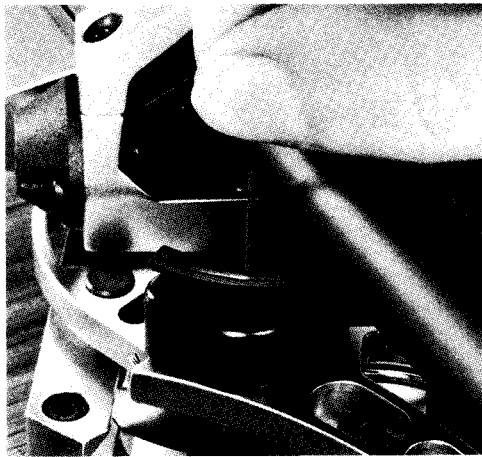
To lower the stylus onto the record move the control lever forward until it is just past top dead centre. This will set the lowering control in motion, at which point it will take over the movement of the lever, giving a smooth, controlled descent.

Note: For the correct descent time the control must be operated exactly as above. The speed will be increased considerably if the lever is pushed down instead of being allowed to fall of its own accord.



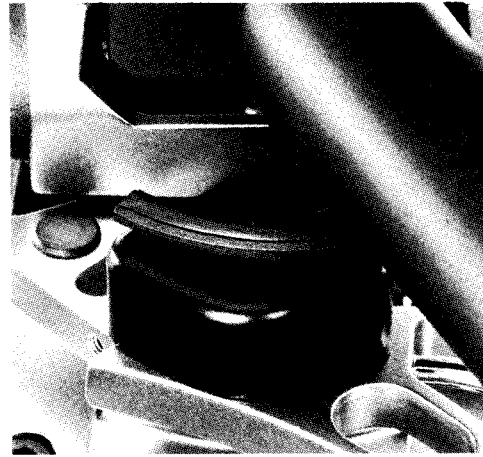
138 Operation (continued)

To raise the stylus from the record move the control lever back to its original position. When the arm is not in use it should always be returned to the armrest for safety.



139 Adjusting height of lift

The raising and lowering control is set to suit the majority of cartridges but the height raised above the record can be changed to meet individual needs. The small hole in the centre of the arm lift provides access to the adjustment screw. Insert the long leg of the 0,89 mm A/F hexagon wrench through this hole to engage the screw. Clockwise rotation will decrease the height of lift; anti-clockwise rotation will increase it. The adjustment is sensitive so the wrench should be turned only a few degrees at a time. Apply firm downward finger pressure to the arm lift after each clockwise rotation of the adjustment screw.



140 Cleaning the arm lift

If the arm drifts outwards during raising or lowering it usually indicates the presence of contaminant on the rubber pad in the arm lift. To restore positive working, wipe the pad with a damp cloth and repeat with a paper tissue until dry. Clean the underside of the tone-arm in the same manner where it contacts the rubber pad.

Appendix

We hope these instructions have made the installation of your Series 300 precision pick-up arm straightforward. Care for it as you would a camera. *Do not* apply oil or other lubricant to any part of it. *Do not* attempt to take it to pieces or interfere with any of the screws except as directed in the instructions. To do so will invalidate the warranty and may occasion costly repairs.

If you have a problem concerning operation or service, contact us at the address overleaf in the first instance, quoting the unit's model and serial numbers. *Do not* send the arm to us unless requested to do so. We provide a quick, efficient service through our agents or direct from the factory to any part of the world.

SERIES 300

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