PHILIPS Service

notes

NG1012/01

PHILIPS BATTERY RECORD PLAYER TYPE NG1012/01

October 1960

General and Operation.

Type NG1012/01 record player is a four-speed unit suitable for playing at speeds of 78, 45, 33 1/3, and 16 2/3 r.p.m. It is normally fitted with a dual sapphire stylus, but single sapphire stylus heads can be used for playing both normal and microgroove recordings.

Speed selection is by way of a lever which causes an intermediate rubber shod driving wheel to move to one of four diameters on a stepped driving collar. A fifth position of the speed selection lever, marked "0", is a rest position whereby the intermediate wheel is held away from the driving collar thus preventing indenting of the rubber, due to prolonged resting.

The on/off switch is operated by movement of the pick-up arm. To start the unit, lift the pick-up arm from its rest and turn it outwards. This will engage the switch and cause the turntable to rotate at a speed dependent on the position of the speed selection lever. When the stylus runs into the running-out groove at the end of the record the unit is automatically switched off.

Pick-Up Heads and Styli.

The pick-up heads and their styli are given in the following table:

Head	AG3010	AG3012	AG 3013	AG3015	AG3016
Stylus, normal	946/S08	946/S05	-	-	946/S32
Stylus, micro	946/S09	-	946/S06	946/D07	946/S53

Action of Mains Switch.

In the action of switching on the unit when the pick-up arm is moved over to the right, a bracket coupled to the pick-up arm spindle bears against the switch operating lever and this transfers movement to the switch toggle arm.

During playing of a record, as the pick-up moves toward the centre of the record, it carries with it a bracket which is coupled to its spindle through a friction clutch. This bracket eventually bears against the switch operating lever causing it to turn on its pivot. This causes, at the switch end, a plastic knocking-off piece to move closer to a stud moulded into the underside of the turntable. If the two touch during the time the stylus is in the playing portion of the groove the switch operating lever is "brushed off".

However, when the stylus moves into the run-out groove, the extra movement causes the turntable stud to hit against the short side of the plastic knocking off piece. This imparts a longitudinal movement to the switch operating lever and causes the switch to open.

Adjustment of Mains Switch.

In the case of incorrect operation of the mains switch, there are adjustments provided to correct this. If the switch switches on too soon, the movable bracket at the pick-up end of the switch operating lever should be moved toward the switch end. If the switch comes on too late, the bracket should be moved in the other direction.

If at the end of playing a record the switch opens too soon, the top end of the friction clutch driven bracket should be bent toward the switch operating lever. If switching off is delayed, the bracket should be

3. An open circuit resistor R1 will result in very poor on-load motor speed regulation and excessive arcing at S2. Resultant carbon deposit on contacts should be removed by drawing a dry non-abrasive cleaning agent, e.g., paper or linen between contact surfaces. The loss of conducting surface plating on set screw through the use of abrasives will quickly result in unsatisfactory operation of governor.

4. Slow motor speed or erratic operation can be caused by poor contact between the rotating and fixed arm (C). The careful bending of the fixed arm will ensure constant pressure application (approx. 2 mm. depression of the lower contact. Do not use any other than a suitable grade conductive graphite type lubricant (Shell Barbatia No.3 recommended) between these contacts.

5. Inadequate brush pressure on motor commutator can be responsible for torque reduction accompanied by excessive arcing resulting in a low motor speed and electrical noise reproduction in amplifier. An increase in brush to commutator pressure can be effected by carefully reducing the angle formed by the V-shaped brush contact strip which can be withdrawn from the polystyrene brush holder after removal of electrical tape and the slide fitting brass retention terminal clips.

6. Electrical noise without apparent mechanical defect can be caused by suppression capacitor short circuit to frame following insulation damage to lead at common negative motor entry.

PARTS LIST

MOTOR

Description	Code No.	Description	Code No.
Assembly, motor, complete	49.266.84	Pulley, 4-speed	AE.002.49
Assembly, brush	A9.023.60	Screw, grub, pulley	49.893.40
Cap, aluminium, protective	49.892.07	Screw, motor mounting, x3	999/2.6x8
Clip and fixed governor contact	AE.600.08	Screw, speed adjustment	49.892.43.2
Grommet, motor mounting, x3	975/5x10	Speed governor assembly	AE.600.09
Padding, foam plastic	P7.520.28/319		

MISCELLANEOUS

Bracket, unit mounting,x3	49.935.78	Screw, motor suspension, x3	B054.ED/3x20
Cup,disc,motor suspension, x3	49.935.31	Screw, unit mounting, x3	B054.ED/3x20
Disc, stroboscopic	CS.413.212	Spacer, unit mounting, x3	49.935.79
Friction clutch bracket	49.915.27	Spacer, motor suspension, x3	B001.AC/3.1x5x8
Friction disc	P5.515.19	Speed control bracket assy.	CR.266.414
Grommet, unit mtg. x3	975/5x12.5	Spindle assy., pick-up	49.928.99
Grub screw, pick-up arm	B061.DD/2.6x4	Spindle, turntable	49.935.16
Intermediate wheel	AE.151.44	Split sleeve for speed control bracket	B074.AF/2x24
Knob, speed control bracket	P4.525.13/17	Spring, motor suspension, x3	49.935.30
Lever assy., switch operating	49.928.98	Spring,compression,speed control bracket	49.938.07
Moulded cover	CR.572.145	Spring, pick-up arm retaining	CS.210.610
Muting switch	49.928.97	Spring, tension,intermediate wheel	49.938.54
Nut, motor suspension, x6	993/M3	Switch assembly, A.C.	CZ.210.111
Pick-up arm, complete	49.915.32	Trip lever pivot bracket assy.	CR.266.410
Ring, lever assy.to pivot bracket	P5.515.18	Turntable assembly	CR.381.607
Screw, moulded cover, x3	B054.GL/3x25	Washer, unit mounting, x3	B050.ED/3

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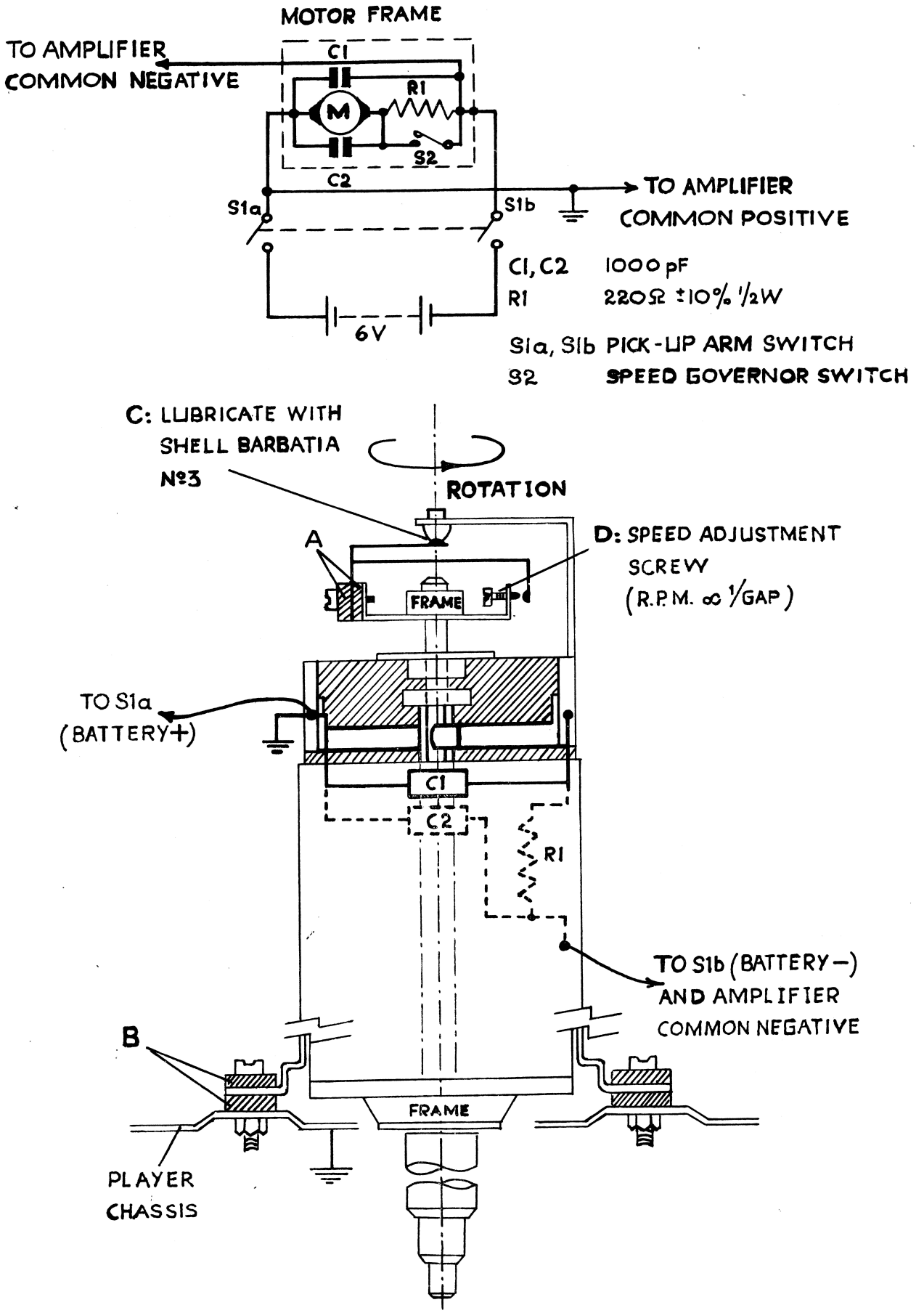
MOTOR FRAME
TO AMPLIFIER COMMON NEGATIVE
C1
R1
M
S2
C2
S1a
S1b
TO AMPLIFIER COMMON POSITIVE
6V
C1, C2 1000 pF
R1 220Ω ±10% 1/2W
S1a, S1b PICK-UP ARM SWITCH
S2 SPEED GOVERNOR SWITCH
C: LUBRICATE WITH SHELL BARBATIA Nº3
ROTATION
A
D: SPEED ADJUSTMENT SCREW (R.P.M. ∝ 1/GAP)
FRAME
TO S1a (BATTERY+)
C1
C2
R1
TO S1b (BATTERY−) AND AMPLIFIER COMMON NEGATIVE
B
FRAME
PLAYER CHASSIS

bent in the opposite direction. Slotted mounting holes facilitate adjustment of the mains switch position relative to switch operating lever.

Adjustment of Friction Clutch.

If the action of the friction clutch should become difficult, the trouble can be remedied by cleaning the two friction surfaces by rubbing lightly with very fine sandpaper and lubricating very sparingly with a very light, preferably watchmakers' oil.

Adjustment of Speed.

Provision to alter the speed of prime mover to effect a relative increase or decrease in all turntable speeds is provided by adjustment of the set screw (D) on centrifugal governor fitted to motor axle. This governor is capable of maintaining motor revolutions constant to within ± 0.5% of nominal speed.

To gain access to motor speed regulator screw, remove the push-fit aluminium cap and temporarily distort the sponge rubber surround. Speed adjustment should be made at 33 1/3 r.p.m. with pick-up on the outer grooves of a 12" record, e.g., test record D99051L, in conjunction with the correctly calibrated 50 cycle stroboscopic disc (Code No. CS.413.212) on which speed tolerance limits are purposely set above the nominal turntable speed to allow for a normal small speed reduction during the life span of battery. A new battery must therefore be fitted prior to any speed adjustment which should select a speed setting providing for a stationary centre pattern (33 1/3 r.p.m. + 0.5%). The inner and outer circles then appear to revolve in opposite directions.

A closed or open position of switch S2 which forms the vital section of governor effects a respective increase or decrease in motor speed by shunting or including in circuit series resistor R1. The speed adjustment process can be simplified by incorporating in circuit an auxiliary switch for battery disconnection in lieu of S1, thus enabling pick-up to remain on record during each trial setting of screw D. When adjustment is correct, seal screw at thread entry to bracket with a suitable paint sealer.

Battery Drain.

Battery drain with turntable rotating at 33 1/3 r.p.m. and stylus in contact with the outer grooves of a 12" microgroove record, should not exceed 50 mA. Current increase when turntable is held stationary should be of the order 100%.

Lubrication.

A record player (33 r.p.m.) battery current in excess of 50 mA can indicate a requirement for lubrication of bearing surfaces directly contributing to the total mechanical load imposed on the motor. Initially remove accumulated dust and old lubricant with a suitable brush and methylated spirits.

Apply recommended lubricant as detailed below:

Location	Lubricant
Turntable, spindle	Shell Alvania No.3
Turntable, cam	Shell Alvania No.3
Intermediate wheel spindle	Clock Oil - Medium
Feeler arm, brass bush	Clock Oil - Medium
Motor spindle bearing	Clock Oil - Medium
Speed governor (c)	Shell Barbatia No.3

The quantity of lubricant applied, particularly at motor bearing, speed governor and intermediate wheel-spindle, must not exceed an adequate minimum. Any surplus must be removed to avert the detrimental effects of splashing during operation.

Possible Motor Faults and Their Remedies.

1. Excessive speed resulting from permanent short circuiting of governor resistor R1 can be caused by failure of fibre washer insulation "A" between the rotating contact arm and frame.

2. Insulation failure of one of the three motor mounting bushes "B" following possible excessive screw tightening or fatigue results in motor and battery short circuit. The battery switch S1 should therefore never be left in the "ON" position if motor will not operate.