KRIESLER TELEVISION RADIO

KRIESLER AUSTRALASIA PTY. LIMITED. 12 - 30 CAWARRA ROAD, CARINGBAH. P.O. BOX 107 CARINGBAH. TELEPHONE 5-2044

Please circulate to your Service Department.

SERVICE NOTES No. 32

June, 1964

CARRYGRAM MODEL 41-31

TECHNICIANS GUIDE FOR MAINTENANCE OF RECORD PLAYER UNIT 90-4390

Model 41-31 Carrygram has been widely sold throughout Australia in climates ranging from the snow country to the tropics of the far North. On performance, it has established itself as the market leader in its class.

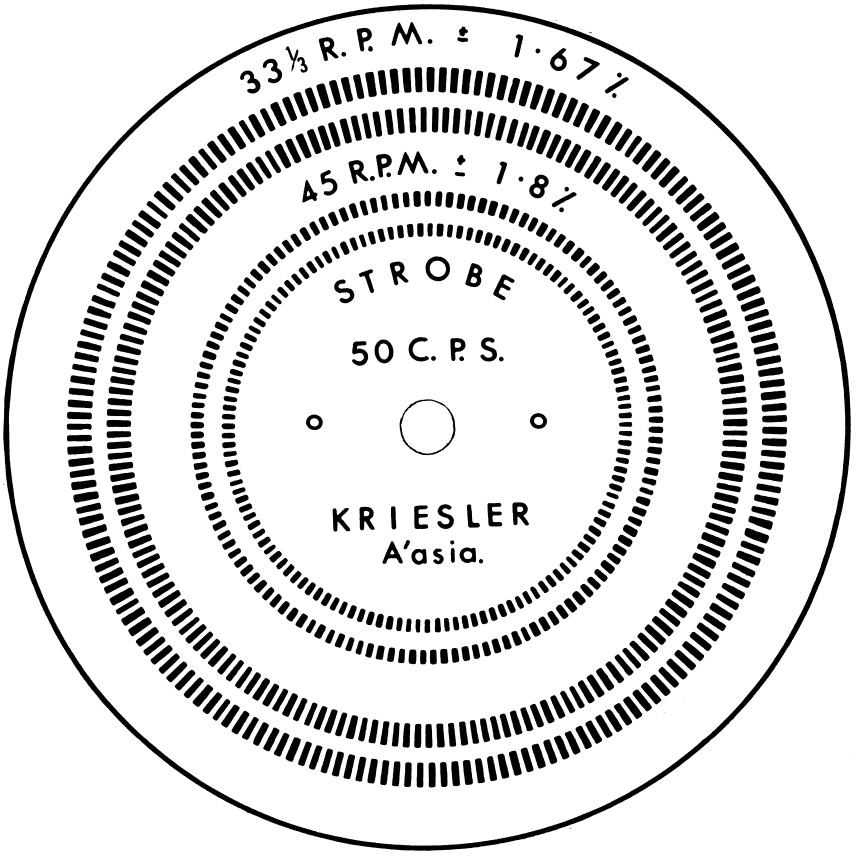
Portable radiograms are subjected to more misuse and bumps than the average user appreciates. Nevertheless, this equipment can provide entertainment and education under conditions where mains-powered equipment is inoperable or its use is inconvenient. Under these circumstances, the Carrygram, due to its compactness, good performance and low operating cost, represents a good investment.

The portable battery-powered record player generally requires a little more maintenance than its A.C. mains-operated counterpart. Because of the more recent innovation of battery-powered record players, they are not as well understood by most technicians. To assist in overcoming this situation, the following guide has been prepared.

SYMPTOM	PROBABLE CAUSE	TREATMENT
Speed fast on all four rates.	a) Speed adjustment screw incorrectly set.	Adjust with $\frac{1}{8}$" screwdriver through hole near speed selector knob. Remove turntable and check tightness of adjusting screw locknuts. See Removal Instructions 1.
	b) Motor governor contact jammed closed.	Repair or replace motor. Remove turntable and motor deck to gain access. See Removal Instructions 1 and 2 below. See 'Motor Servicing Details', or 'Motor Exchange Service'.
Speed slow on all four rates.	a) Battery voltage low.	Check batteries. Minimum voltage 6.5 volts under full load (motor and amplifier).
	b) Speed adjustment screw incorrectly set.	Adjust with $\frac{1}{8}$" screwdriver through hole near speed selector knob. Remove turntable and check tightness of adjusting screw locknuts. See Removal Instructions 1.
	c) Lubrication (rare).	Idler wheel and turntable bearings are pre-lubricated sintered alloy and should not require further lubrication; however, if the turntable bearing has become gritty, clean thoroughly with a dry cloth and lubricate with a smear of Molykiron S.A.E. 5 oil.
	d) Governor contact jumped out of position. (this was a batch problem which has since been rectified).	Replace motor. See 'Motor Exchange Service' below. The governor may be inspected for this fault through the hole provided in the motor casing.
	e) Motor pulley loose.	See instructions 'To Refit Motor Pulley' below.
Speed correct on some rates but incorrect on others.	a) Motor slide sticking. ($16\frac{2}{3}$ and $33\frac{1}{3}$ only affected by this)	Turn to $16\frac{2}{3}$ speed, hold idler wheel away from motor pulley and check that motor will slide freely on the tie bars. If not, clean tie bars and, if necessary, adjust them. Smear tie bars with Molykiron S.A.E. 5 oil, and the cam with Moly 500 grease.
	b) Speed indexing faulty. (When $16\frac{2}{3}$ only is incorrect).	The speed adjustment for $16\frac{2}{3}$ is independent from the other speeds. Refer to section 'Speed Adjustment' for $16\frac{2}{3}$ RPM below.

CODE	DESCRIPTION		Qty.
1)			
2)			
5)	Motor sub-assembly	90-4375	1
6)			
3	Motor mounting spacer	26-4350	3
4	Rubber grommet	40-4372	3
7	Motor mounting bracket	36-4369	1
8	Rocker arm	36-4363	1
9	Idler wheel spindle	26-4353	1
10	Idler wheel assembly	90-4377	1
11	Stop plate, idler	16-4436	1
12	Screw, speed adjustment	26-4357	1
13	Bush, speed adjustment	26-4355	1
14	Front end plate	16-4332	1
15	Nut, speed adjustment	26-4352	1
16	Lever, rocker arm	36-4365	1
17	Bearing (cam shaft)	26-4358	1
18	Retaining bracket	16-4335	1
19	Bearing (turntable)	36-4368	1
20	Rear end plate	16-4331	1
21	Switch lever	36-4370	1
22	Cam shaft	26-4359	1
23	Spring anchor	16-950	1
24	Ball Bearing	1/4" dia.	1
25	Tie bar	26-4356	3
26	Cam	36-4367	1
27	Indexing button	26-4344	1
28	Clamp bracket	16-4330	1

Continued Over



TO DISMANTLE MOTOR.

1. Remove motor pulley, brush springs and brushes.
2. Remove the three P.K. end plate retaining screws.
3. Ease out end plate and armature assembly noting the number and position of fibre spacing washers on the spindle.
4. Inspect governor, wiring, commutator and shaft for evidence of wear or damage.
5. Clean out motor housing to remove any foreign matter with compressed air.

TO OVERHAUL MOTOR.

1. Polish governor contacts to remove any pits which may have developed, taking care not to distort the governor spring.
2. Check that spring pressure is such that motor governs at 1800 rpm with the adjusting screw 1 to 2 turns undone.
3. Check that in this position there is adequate clearance between the contact arm and the throwout stop to allow proper movement of the arm.
4. Check that governor assembly is reasonably tight on shaft (it is friction mounted) and that the associated wiring is not over taut.
5. Polish out all abberations on commutator using small buffing wheel and very fine abrasive. Clean out slots with celluloid film to avoid burring edges and air hose to remove all foreign matter.
6. Clean both brush guides.

ASSEMBLY.

1. Assemble washers on motor shaft as removed. A smear of watch oil to the porous bearings is advantageous in reducing bearing friction, but excess oil, or oil of an inferior grade is liable to seriously reduce the trouble-free life of the re-conditioned motor.
2. Assemble shaft in motor housing and replace P.K. screws. Do not overtighten or stripped threads will result. Ensure that fibre brush guide insulators are in place.
3. Before replacing brushes, ensure that –
   a) they are at least $\frac{5}{32}$" long.
   b) no ridges are apparent.
   c) they are clean and dry and slide freely in the brush guides.
   d) the contact surface is flat and smooth
   e) inspect brush springs for distortion or damage.
4. Insert brushes and springs, position retaining tags and clamp securely. Caution: Solder battery leads to long tag only and avoid resin flow into the brush springs.
5. Adjust motor RPM using stroboscopic light at 18000 rpm and check governor action over the recommended voltage range 5.7 to 9.4 volts.

SPECIAL NOTES.

1. The armature assembly must be free in housing. The average free end play is approximately $\frac{1}{32}$". (The magnet is positioned in the housing to retain the rotor hard against the back bearing).
2. Where necessary, re-position fibre shaft spacers to ensure centre of commutator lies opposite brush guides.
3. If armature assembly appears stiff after assembly, it is usually due to improperly seated rubber bush rings around the bearings. Gentle manipulation of the motor shaft will correct this.

TO REFIT MOTOR PULLEY.

1. Fit pulley on shaft $\frac{3}{64}$" to $\frac{1}{16}$" from the motor housing.
2. Holding the motor so that the point of the pulley is uppermost and with the two locking screws facing you, tighten the left-hand screw first, then the right-hand screw.
3. Connect motor to voltage supply and check eccentricity of pulley by touching it with the point of a lead pencil and noting the vibration. If excessive, rotate pulley 90 degrees on shaft and re-tighten screws.

SPEED ADJUSTMENT FOR $16\frac{2}{3}$ RPM.

The speed adjustment for $16\frac{2}{3}$ RPM is carried out by adjusting the relative positions of the cam shaft and the switch lever at the switch stop plate.

To set $16\frac{2}{3}$ RPM, remove the turntable and loosen the two screws in the stylus playing on a record, turn the speed selector knob slowly until $16\frac{2}{3}$ RPM is reached (as indicated on a strobe dis). Remove the turntable again and, taking care not to turn the speed selector knob (cam shaft), turn the switch lever (item 21 on drawing) gently by hand until the stop on the switch lever bears against the stop on the cam (item 26 on drawing.) Tighten the hexabonal head screw with an appropriate spanner. Detach the return spring on the switch rotor, turn the speed selector to the 'Radio' position, check that the switch rotor is in the correct position for radio operation, then tighten the round head screw in the switch stop plate. Return the switch spring to its previous position. Re-check the speed in the $16\frac{2}{3}$ position and indexing of the switch rotor when the speed selector is turned back to the Radio position.

CAUTION.

When handling the motor, avoid applying any force which may distort the motor plate, die-cast mounting bracket, tie bars, etc.

The Company has exercised its right to introduce design modifications without notification.

SYMPTOM	PROBABLE CAUSE	TREATMENT
Speed irregular (fluctuation or 'wow').	a) Battery voltage low.	Check batteries. Minimum voltage 6.5 volts under full motor and amplifier load.
	b) Turntable, turntable mat or record rubbing on motor deck. (may be due to cabinet ageing).	Check that turntable is level. If not, remove turntable (see Removal Instructions 1) and insert a smooth burr-free ¼" dia steel rod into the turntable bearing. (A ¼" Turner Phillips Head screwdriver is ideal). Tighten the turntable clamp bracket screw. Carefully lever the bearing until the turntable is level. Do not attempt to level by levering the turntable. If the turntable is too low, insert a $\frac{1}{16}$" thick washer between the Earth terminal bracket and the cabinet baseboard. To remove the motor deck, see Removal Instructions 1 and 2. As an additional precaution, remove the foam plastic strip (if fitted) from the motor deck under the rim of the turntable. If the turntable is off-centre in the motor deck cut-out, it may be adjusted by moving either or both the chassis or the motor deck by loosening the respective mounting screws, adjusting to the correct position, then re-tightening. In some early models, the motor deck may be warped on the rear right-hand corner. This may be remedied by removing the motor deck (see Removal Instructions 1 and 2) and cutting away the foam plastic mat over the wood block below the battery compartment. (This has been done in more recent production.) The record playing unit may be sufficiently loose on its rubber mounts to make difficult the centering of the turntable. This may be overcome by removing each of the three unit mounting screws in turn and covering the brass studs with a short length of 5 mm PVC tubing, thus reducing the clearance between the studs and the rubber suspension grommets.
	c) Loose locking nuts on Speed Adjusting screw.	Remove turntable. See Removal Instructions 1. Check and tighten nuts if necessary. Re-seal the nuts with lacquer.
	d) Grease or oil on driving surface of turntable, idler wheel or motor pulley.	Remove turntable and visually inspect. See Removal Instructions 1. Clean with dry cloth. If idler wheel has been improperly lubricated, it will probably become saturated with oil and require replacement.
	e) Idler wheel pivot loose or incorrectly seated.	Move the idler wheel up and down to check if the vertical play is excessive. If so, adjust the pivot bearing screw. When correctly adjusted, vertical play should be minimal consistent with complete freedom of movement laterally. Re-seal the locknut. The best way to determine if the pivots are correctly seated, is to loosen the top pivot screw slightly. If seated correctly, the idler wheel will merely become loosely pivoted. If seated incorrectly, the wheel will fall out completely.
	f) Distorted turntable.	A distorted turntable can introduce 'wow' and this condition is not always evident by visual inspection. Replacing the turntable with one from a known wow-free unit is the most satisfactory way of checking a suspect turntable. Handle the turntable with care - never press down on one side. When removed from the cabinet, stand it mat-side down. Keep dust off the spindle and avoid transferring oil to the driving face. Do not remove or replace turntable by holding the rubber mat as the turntable is liable to fall off.
	g) Intermittent supply to motor.	Check continuity of filter chokes, switch, leads and battery contacts. Note that if the large filter choke winding is open-circuit, the resistor on which it is wound may tend to give a false indication of continuity.
	h) Faulty motor. (Flux or solder clogging brush springs)	Most of the above symptoms have been falsely attributed to the motor. Before deciding that a motor is faulty, it is very advisable to check for other causes. For those who wish to repair motors themselves, see 'Motor Servicing Details' below. If you wish to return the motor for service, see 'Motor Exchange Service' below.
	i) Motor pulley loose.	See instructions 'To Refit Motor Pulley' below.
'Thump' or 'Knock' at each turn of idler wheel (approx. 4 per rev of turntable).	Flat spot or dent formed on idler wheel.	This is caused when the idler wheel is left engaged for a long period with the motor switched off at the Off-on/Volume control. The flat spot will usually disappear after about 10 minutes running. If the trouble persists, replace the idler wheel. (Part No. 90–4377). When replacing an idler wheel, lubricate with a smear of Molykiron SAE 5 oil. Check adjustment of pivot bearings (see Section (e) above).
Microphony.	Pick-up arm bearing cushion too rigid.	Remove turntable and motor deck. See Removal Instructions 1 and 2. Slightly loosen nut on underside of pick-up arm bearing. If the nut is not particularly tight to begin with, it may be loosened from above by turning the bearing post anti-clockwise.

REMOVAL INSTRUCTIONS.

1. TURNTABLE. Remove rubber mat. Rotate turntable until one of the four holes is nearest the edge of the battery compartment. The turntable clamp bracket screw is accessible through this hole. Loosen screw and swing bracket out of slot in bearing housing. Lift off turntable by pulling on centre spindle and rotating slightly. Stand turntable upside down. When handling, avoid transferring oil from the spindle to the driving face. Never hold the turntable by the mat when removing or replacing it.

2. MOTOR DECK. Remove PK screws on motor deck and two in battery compartment. Lift off motor deck.

MOTOR EXCHANGE SERVICE.

This service is available to the trade through the Kriesler Service Division, 12–30 Cawarra Rd., Caringbah and your nearest Kriesler Distributor. Take care when packing motor for shipment to prevent the shaft from being bent. Damaged motors are not acceptable for exchange. When returning a motor, it should be complete with motor pulley, rubber cover, filter choke and mounting plate. The fee for motor exchange service is 30/- plus freight.

MOTOR SERVICING DETAILS.

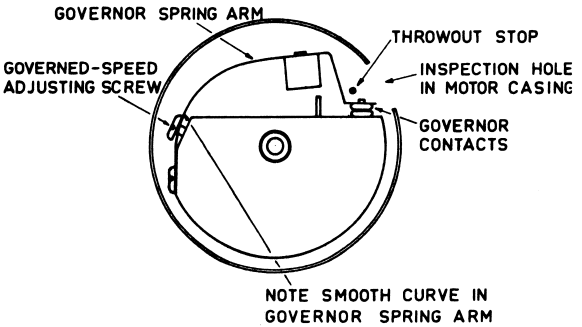
Investigation has revealed that of the few motors returned to the factory, most of them can be made serviceable by spending a few minutes on adjustment.

Cleaning of the governor contacts with a strip of light card (through motor inspection hole), brush replacement or commutator cleaning may be well worth trying before ordering a fully reconditioned exchange motor. A diagram of the governor assembly is shown below.

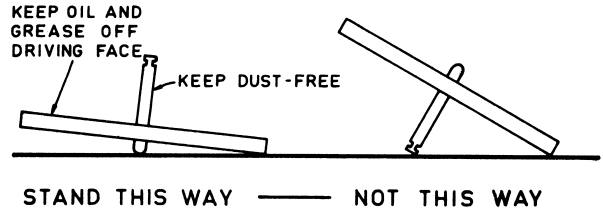
Following, is the recommended procedure for fully reconditioning a motor. This should not be attempted unless the facilities are available and the technician has been factory trained.

CODE	DESCRIPTION		Qty.
29	Base plate	36-4366	1
30	Turntable (not shown)	36-4362	1
31	Turntable mat (not shown)	40-4373	1
32	Switch (not shown)	17-4325	1
33	Stop plate, switch	16-4897	1
34	Screw, switch lever (short) $\frac{1}{8}$" whit x $\frac{1}{4}$" Ch. Hd.		1
35	Screw, switch lever (long)	26-4900	1
36	Turntable cap (not shown)	16-4333	1
37	Motor sheath (not shown)	40-4894	1
A	Screw $\frac{1}{8}$" whit x $\frac{3}{8}$" Rnd.Hd.		6
B	Screw 8 B.A. x 3/16" Ch. Hd.		5
C	Screw 8 B.A. x 1/4" Ch. Hd.		1
D	Screw, short	26-4361	1
E	Screw, long	26-4360	1
F	Screw No. 4 x $\frac{1}{4}$" S.T. Type Z		1
G	Nut 8 B.A. Hex brass		1
H	Nut (One on switch assembly not shown).	26-4050	2
J	Washer .128" x .285" x 20G		3
K	Washer 8 B.A. Std.		6
L	Washer 3/8" I.D. single coil spring		1
M	Washer 1/8" Inter. Star		2
N	Circlip Simmonds SCO/1916/17		1
O	Circlip Simmonds SCO/8211/17		1
P	Spring, loading	16-4329	1
Q	Spring, speed adjustment	16-4347	1
R	Spring, rocker arm	16-4328	1
S	Spring, motor return	16-4327	1
T	Spring, indexing	16-4336	1
U	Nut 5 B.A. Hex brass		1
V	Washer .160" x .312" x .010"		2
Spacer, ball bearing (not shown)		26-4672	1

GOVERNOR ASSEMBLY



TURNTABLE



MOTOR ASSEMBLY
PART No. 90-4390