

SERVICE BULLETINS

Number	Subject
AG. 1.A.	Filling a new Automatic Gearbox
AG. 5	Front and Rear Service
AG. 6	Rear Pump and Services (any)
AG. 7	Summing Points
AG. 8	Removal and replacement of the Automatic Gearbox
AG. 9	Tools. Front BAND SETTING Gauge
AG. 10.	Automatic gearbox front Servo Adjusting Gauge.
AG. 11.	" " Leaks
AG. 12.	" " DISTRICTS
AG. 13.	Loosening of Torus Cover Set Screws. Oil Leaks
AG. 14.	1000 mile service.
AG. 15	Torus Cover Gasket - W/1117
AG. 16	Dipstick Volume modification
AG. 17	Pressure Valve from pump Oil Seal - S2 Care
AG. 18.	Front band setting tool. UR. 3144
AG. 19	Vented Bell Housing Bottom Cover
AG. 19	Addendum. Vented Bell Housing Bottom Cover

FITTING A NEW AUTOMATIC GEARBOX.

Para (iv) of Bulletin No. AG.1 refers to fitting a new gasket between the rear half bell-housing and the gearbox. Retailers are advised that this gasket has now been deleted as it has been found to be unnecessary. Where previously fitted, the gasket need not be replaced.

FRONT AND REAR SERVOS.Gearbox Numbers C1 to C250.

Rolls-Royce automatic gearboxes from Serial Number C251 onwards, are fitted with a second pipe connecting the front and rear servos. This pipe is thin and curled and conveys compensator pressure from the rear servo to the exhaust side of the 4 - 3 timing valve in the front servo, allowing a smoother 2 - 3 change.

Servo units with provision for fitting this pipe are now the only units available as replacements.

The later type units may be fitted to gearboxes bearing Serial Numbers from C1 to C250 but if the existing rear servo is replaced, a new front servo and the compensator pipe must also be fitted. The front servo may be replaced on its own as a single unit.

Part numbers of replacement units are as follows:-

Front Servo Assembly.	UG.1352
Rear Servo Assembly.	UG.1327
Compensator Pipe.	UG.1321

REAR PUMP AND GOVERNOR ASSEMBLY

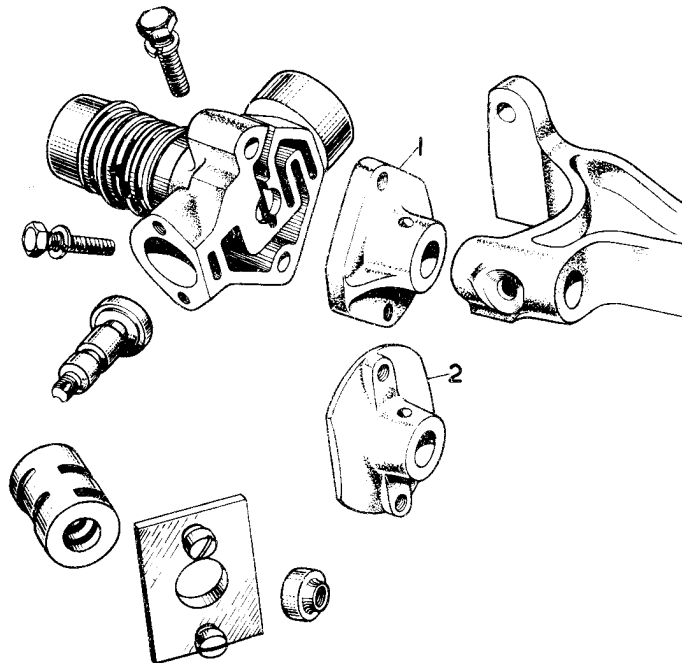
Gearbox Nos: C1 to C384.

The governor driving flange in Automatic Gearboxes bearing the Serial Numbers C1 to C384 is in aluminium and has been superseded by a steel flange.

If it is necessary to service either the governor or the rear pump in these boxes, the complete governor and pump assembly should be changed for one containing a steel flange. It is not practicable to fit a steel flange to an existing shaft without the use of special equipment.

Retailers are asked to keep a stock of the latest assembly, Part Number UG.1426, and to return any displaced assemblies as quickly as possible to the London Service Station for re-working.

The illustration gives an exploded view of the governor assembly and shows both an aluminium and a steel driving flange.



- 1. Aluminium Flange.
- 2. Steel Flange.

EXPLODED VIEW OF GOVERNOR ASSEMBLY.

SERVICING PERIODS.

It has been decided not to include the oil pressure check and stall test as part of the periodic servicing of Automatic Gearboxes owing to their limited value. The final paragraph of the table of 'Servicing Periods' on page 3 of Chapter 2 of the Automatic Gearbox Manual stating that these tests should be carried out at 20,000 mile periods, should therefore be deleted.

The primary object of the road test to be carried out at every 5,000 mile period is to ensure that the changes are taking place smoothly and without slip. It is emphasised that the speeds given in the table of 'Change Points' on page 8 of Chapter 2 are approximate and individual gearboxes may not comply exactly with them. This particularly applies to changes at full throttle which, on some chassis, may take place at speeds a little lower than those quoted. Provided the changes are smooth no attempt should be made to achieve the quoted figures by adjusting the throttle control 'A' rod.

Generally speaking, maladjustment of the 'A' rod may be summarised as follows:

(i) 'A' Rod too Short.

Slipping on the up-shifts, particularly the 2-3 shift.
No or delayed kick-down changes.

(ii) 'A' Rod too Long.

Up-shifts occur late at light throttle and may be harsh.
Kick-down changes occur before the accelerator is fully depressed.

FOR INFORMATION.

REMOVAL AND REPLACEMENT OF
THE AUTOMATIC GEARBOX.

This Bulletin gives a revised and shortened procedure for Removal and Replacement of the Automatic Gearbox and supersedes previous information issued on this subject.

Special jacking arrangements are necessary to ensure the correct alignment of the two dowelled halves of the bell-housing. The "Manzel Trans-lift" has been specifically designed for the purpose but where this equipment is not available normal garage equipment can be adapted for use.

Four steel support trestles are required so that the car may be raised to give a clearance of 2 feet 6 ins. (76 cms) between the bottom of the frame and the floor. A steel support tray for the gearbox is also required and can be made up as shown in Fig.1 for attachment to the normal hydraulic lifting jack.

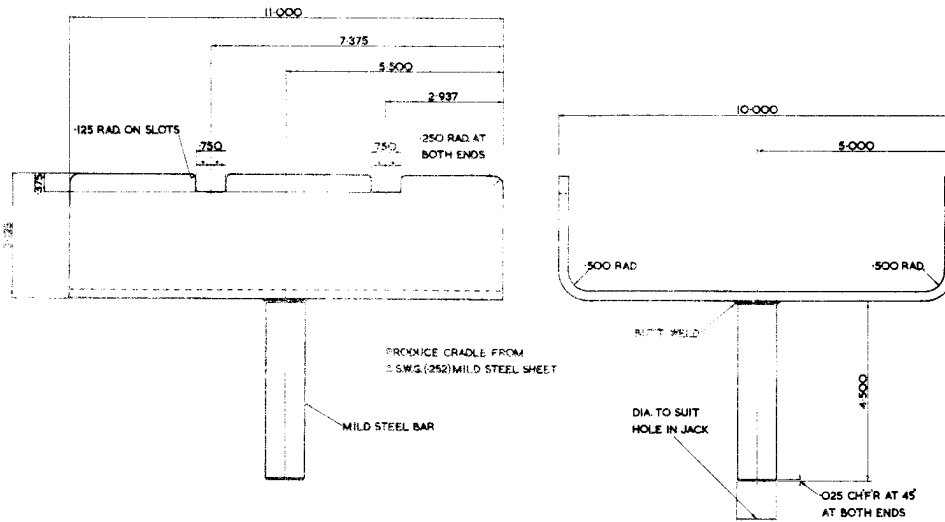


FIG.1 THE SUPPORT TRAY.

REMOVAL.

1. Raise the car on trestles.
2. Lock the Master Switch in the OFF position.
3. Remove the front seats to avoid soiling. Remove the front carpets. Place covers over the rear carpets and seats.

4. Remove all under-shields including the servo protector.
5. Disconnect the front exhaust pipe at the manifold flange and at the flange at the front of the front silencer. Disconnect the front pipe from its support brackets and remove it, collecting the two corrugated flange gaskets.

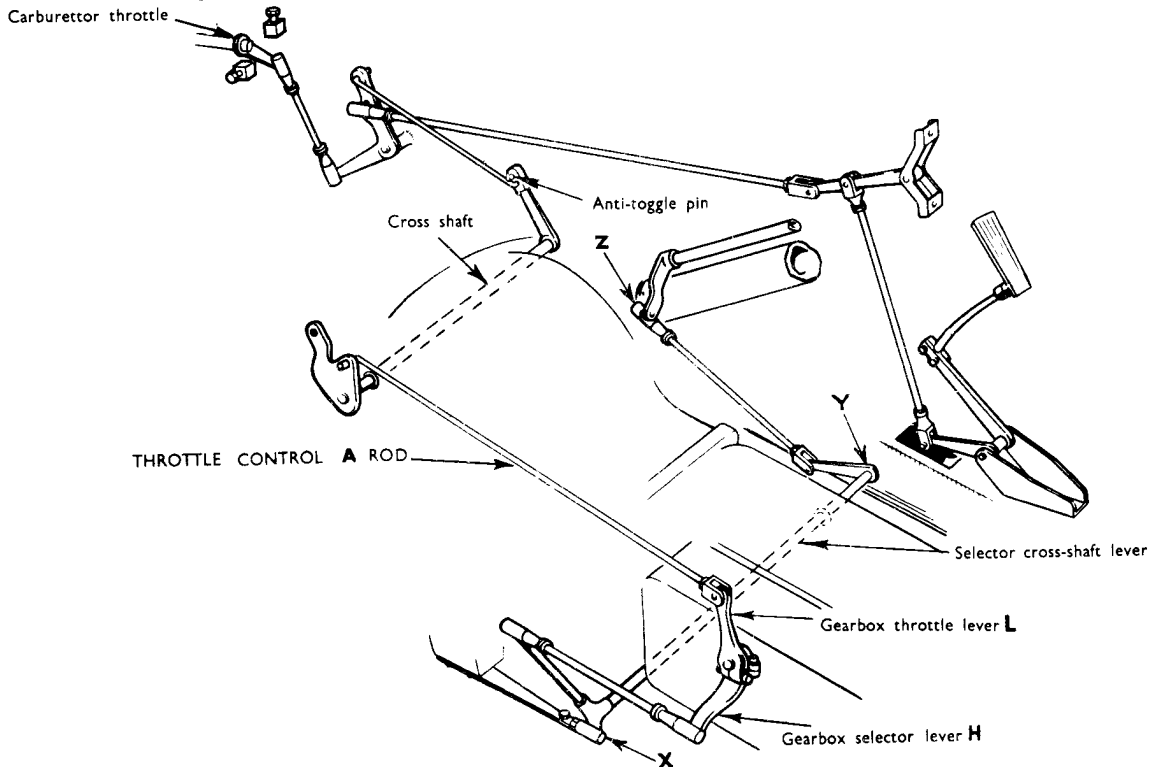


FIG.2 THROTTLE AND MANUAL CONTROL LINKAGE
RIGHT HAND DRIVE CARS.

6. Slacken the pinch bolts and remove levers H and L from the control box shaft. On left hand drive cars the linkage may now be supported clear of the gearbox on the chassis frame. On right hand drive cars disconnect the manual control cross shaft at the ball joints X, Y and Z Fig.2 and remove the cross shaft and selector linkage complete. Allow the throttle 'A' rod to hang clear.
7. Remove the 2BA screw and nut securing the operating lever bracket to the ride control pump at the left hand rear end of the box and remove the lever and bracket complete. On right hand drive cars, disconnect the operating rod from the lever at the base of the steering column and from the bracket at the front end of the fore and aft tie rod. Disconnect the flexible outlet pipe to the rear shock dampers at the pump.

3

8. Disconnect the speedometer drive cable at the gearbox.
9. Remove the six $3/16$ " setscrews and remove the flywheel lower cover.
10. Drain the oil from the gearbox and torus cover, rotating the flywheel to bring the torus drain plug to its lowest position. Collect the oil in clean receptacles and examine for foreign matter.
11. On left hand drive cars only, remove the chassis frame stiffening tube which is retained by two $7/16$ " bolts under the front universal joint.
12. Remove the two $5/16$ " nuts and spring washers securing the fore and aft tie rod flange to the rear of the gearbox. Remove the three setscrews, washers and nuts securing the bracket at the rear end of the tie rod to the cruciform gusset. Remove the tie rod and bracket and collect the triangular packing piece fitted under the bracket. The nuts on the tie rod itself should not be disturbed. On some chassis with rivetted frames the tie rod is retained at the rear end by a flange bolted to a transverse bracket integral with the frame.

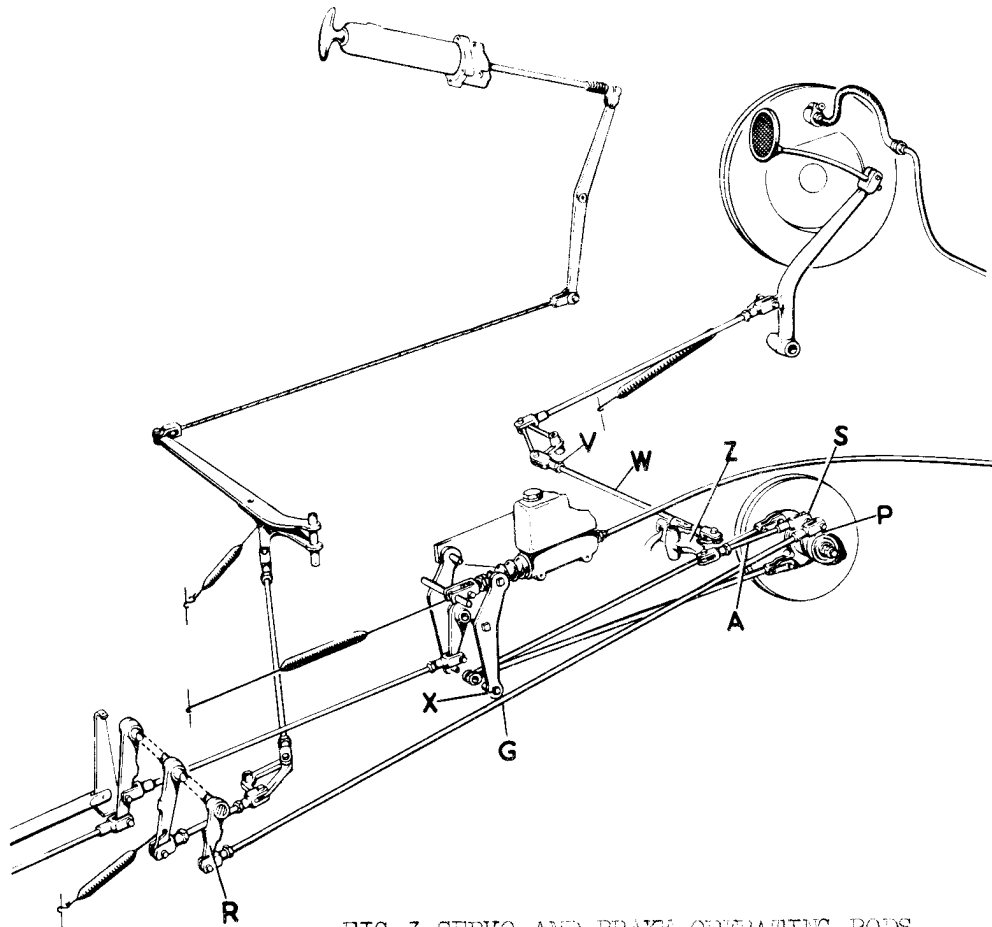


FIG. 3 SERVO AND BRAKE OPERATING RODS.
LEFT HAND DRIVE CARS.

4

13. Disconnect the front propellor shaft at the gearbox and centre flanges. Loosen the jubilee clip retaining the centre bearing and slide the shaft rearwards.
14. Disconnect the rear brake actuating rod G (Fig.3) at joint R and unscrew from joint P to remove. On left hand drive cars disconnect rod A at joint Z and unscrew from joint S to remove. Disconnect the transfer rod W at Z and unscrew from joint V to remove. On right hand drive cars disconnect the rod from the pedal lever to the servo lever in a similar manner.

Disconnect the drag links at joint X, remove the central servo motor bolt and remove the servo motor.
15. Slacken the inner nuts on the torque reaction brackets on the frame and remove the two oval rubbers from their retaining caps. Remove the seven setscrews securing the torque reaction bracket to the rear end of the gearbox and allow the bracket to hang free.
16. Remove the two 5/16" nuts, spring washers and setscrews securing the rear end of the gearbox to the transverse support bracket. The nuts are accessible through holes in the bracket.
17. Remove the starter motor complete.
18. Remove the thirty setscrews securing the torus cover to the flywheel, rotating the flywheel slowly for access. Remove the two dowel cover strips. On later models the dowel cover strips are not fitted as the dowels are retained by the inertia ring.
19. Support the engine with a jack under the sump, interposing a block of wood between the jack head and sump to spread the load. Raise the jack sufficiently to take the load off the gearbox rear support bracket.
20. Remove the four nuts, spring washers and setscrews retaining the gearbox rear transverse mounting bracket to the frame. Remove the bracket.
21. With the special support tray fitted, slide the jack under the gearbox sump (Fig.4). Raise the jack sufficiently to take the weight of the gearbox.
22. Remove the remaining eight setscrews securing the rear half of the bell-housing to the front half. According to the Chassis Series, two or four setscrews are positioned at the top of the bell-housing. To gain access to them, remove the cover from the front floor to which the dipper switch is attached. The cover is retained by seven screws and may be pulled gently to one side to give access without removing the dipper switch.

5

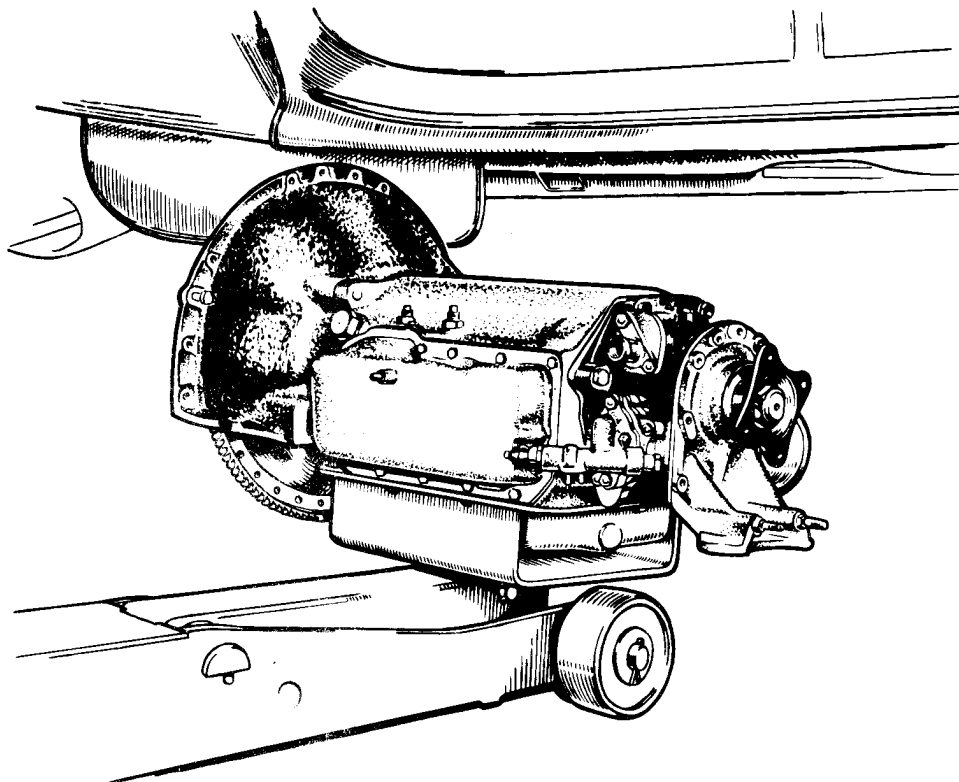


FIG.4 REMOVING GEARBOX FROM UNDERNEATH
SIDE OF CAR.

23. Lower the engine and gearbox approximately $1\frac{1}{2}$ " (38 m/m). Ease the supporting jack under the gearbox gently rearwards to clear the spigot from the spigot bearing. Lower the gearbox and clear from the car. Discard the torus cover sealing gasket.

REPLACEMENT.

NOTE:

Front and rear half bell-housings are paired and must be retained strictly in combination.

If a replacement gearbox is to be fitted, it will be supplied from the London Service Station without bell-housing, torus cover or torus members. The rear half bell-housing, torus cover and torus members should be fitted from the removed gearbox. In this way, the balance of the crankshaft assembly, which includes the flywheel and torus cover, will be retained, and the two halves of the bell-housing kept in combination.

6

1. Inspect all bolting faces for cleanliness and freeness from burrs, paying particular attention to the torus cover and flywheel bolting faces. Thoroughly clean off the gearbox assembly.
2. Rotate the flywheel until the two dowels are horizontal. Where an inertia ring is fitted to the torus cover, the dowels are attached to the ring and dowel holes are in the flywheel. Measure the dowels or holes to determine which is the larger. Place the gearbox torque reaction bracket in position across the frame.
3. Mount the gearbox in its support cradle on a hydraulic jack and position it under the car. Measure the dowel holes in the torus cover, or dowels where an inertia ring is fitted, and position them horizontally to mate with the large and small dowels/holes in the flywheel.
4. Smear the bolting face of the flywheel with Duckham's "Keenol" and position a new flywheel gasket. Remove any surplus grease.
5. Raise the gearbox and align the spigot to the spigot bearing and the dowels to the dowel holes. Ease the gearbox forward and insert the two dowel bolts securing the rear half to the front half of the bell-housing. Slowly tighten the dowel bolts ensuring that the gasket is not buckled or misplaced and that the torus cover and flywheel dowels and dowel holes mate correctly. Insert and lightly tighten two torus cover retaining bolts. Tighten the two bell-housing dowel bolts and insert and tighten the remaining setscrews securing the rear half to the front half bell-housing.
6. Remove the jack from under the engine sump.
7. Refit the gearbox rear transverse mounting bracket to the frame. Lower the gearbox and refit the two setscrews, spring washers and nuts retaining the gearbox rear end to the mounting bracket.
8. Fit the torque reaction bracket to the rear end of the gearbox and fit the oval rubbers in their caps. Tighten the inner nuts on the brackets. If the outer nuts have been disturbed, slacken back all the nuts and tighten the inner nuts evenly two full turns beyond the point at which the rubbers were felt to be clamped. Tighten the outer nuts to lock.
9. Fit the remaining setscrews securing the torus cover to the flywheel. Rotate the flywheel slowly and tighten evenly with a torque wrench to 25 to 30 ft/lbs (3.5 to 4.0 kilogrammetres).

7

10. Place the servo motor fibre washer in position on the gearbox with its inner chamfer towards the gearbox. Fit the servo motor, taking care to locate the driving pins, and tighten the centre retaining bolt.
11. Replace all other removed parts in the opposite sequence to removal, with the exception of the under-shields.
12. Check the adjustment of the servo motor, (See section J of the Workshop Manual.)
13. Check the operation of the starter and reverse light switch at the base of the steering column. Ensure that the actuating lever is between the two contacts.
14. Refill the gearbox with oil. (Chapter 2 Automatic Gearbox Manual.)
15. Bleed the ride control system. Run the engine at idling speed in Range 4 with the ride control lever at 'HARD' and remove the plug from the four way union on the frame just behind the gearbox. Replace the plug when a continuous flow of oil is emitted from the union. Re-check the gearbox oil level.
16. Run the engine with the control lever at 'N' for a few minutes and check the underside of the gearbox for leaks.
17. Check the adjustment of the Manual and Throttle control linkage (Chapter 2 Automatic Gearbox Manual.)
18. Replace the under-shields and jack down the car.
19. Test the car on the road and make final adjustments as necessary.
20. Remove the gearbox sump and check the adjustment of the bands (See Bulletin RB-114 or BB-154.)

FOR INFORMATION.

TOOLS.

FRONT BAND SETTING GAUGE.

The part numbers quoted on page 3 of Chapter 4 for the above tools for "Early Gearboxes" and "Later Gearboxes" have been transposed, and should read as follows:-

Front band setting
gauge

Taper thread
(early gearboxes) 23789/G.1003. J.1693-A.

Parallel thread
(later gearboxes) 27647/G.1002. -

The figures should be amended in ink, pending the issue of an amended page.

CATEGORY 2.

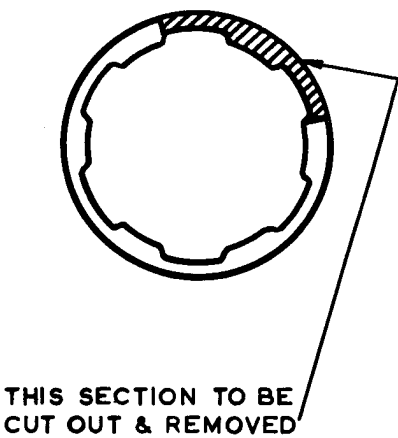
AUTOMATIC GEARBOX LEAKS.

After prolonged running at high speed it may be possible for air pressure inside the gearbox to rise sufficiently to force oil through the normally satisfactory front pump oil seal.

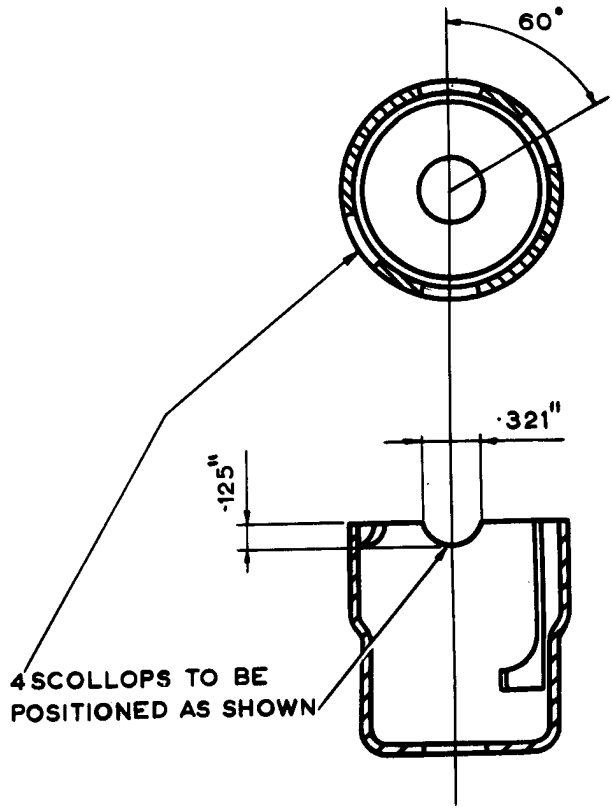
This possibility is overcome by modifying the automatic gearbox oil breather and level indicator so that the pressure is relieved sufficiently to prevent oil leakage.

PROCEDURE.

Take the oil breather and level indicator from the gearbox and carefully remove the retaining device securing the retaining cap to the indicator rod. The retaining device may be either a cee clip, spring clip, or split pin. This will allow the retaining cap, the copper mesh crimp and the serrated washer to be removed from the indicator rod. Cut the serrated washer and file the retaining cap as illustrated. Thoroughly clean and remove all metal particles, re-assemble the components and replace the assembly in the gearbox.



Serrated Washer.



Retaining Cap.

The time permitted for this work is one hour. The modified breather is evidence that these modifications have been incorporated.

CANCELS SERVICE BULLETIN NO. AG.12.
Issued 1.4.57. Ref. SB/VK/TRY.1/RS.

FOR INFORMATION

There are two methods of air breathing incorporated in the automatic gearbox; either through the four scollops machined in the dipstick guide sleeve or through the filter cap past the segment removed from the serrated washer.

It is of the utmost importance that the correct dipstick is fitted into its appropriate guide sleeve to permit adequate breathing. Incorrect matching may result in oil leakage or the ingress of water.

The method of gearbox breathing introduced on production entails the machining of four hemispherical scollops in the top of the dipstick guide sleeve. This machining is carried out prior to assembly to eliminate the possibility of swarf etc. entering the gearbox, only unmodified dipsticks are fitted into this type of scolloped guide sleeve.

Service Bulletin AG 11 details the air breather modification that should be carried out on dipsticks fitted into unscolloped guide sleeves. As can be seen, this entails the removal of a large segment of the serrated washer and the filing of four hemispherical scollops in the retaining cap. All dipsticks modified in this manner must only be fitted into unscolloped guide sleeves.

All unmodified dipstick caps fitted into unscolloped guide sleeves must be modified to conform to the above mentioned specifications.

When automatic gearbox dipsticks are removed ensure that the correct dipstick is returned to its appropriate guide sleeve:

i.e. All modified dipsticks are fitted to unscolloped guide sleeves.

All unmodified dipsticks are fitted to machine scolloped guide sleeves.

Cancels Bulletin No. AG. 13 dated
20.5.57.

FOR INFORMATION.

LOOSENING OF TORUS COVER SETSCREWS AND
CONSEQUENT OIL LEAKAGE FROM AUTOMATIC
GEARBOXES.

Complaints of oil leakage from the torus cover have been found due to incorrect tightening of the cover setscrews. Tightening of the setscrews once or twice in sequence, is insufficient to provide even tensioning of all the setscrews.

Tensioning of the 30 setscrews must be carried out in sequence **THREE times**, to allow for the necessary compression of the cover gasket, and so obtain the correct final torque value (26 lbs.ft.)

As a further precaution these must again be checked for correct tensioning after road test.

APPLICABLE TO:

Rolls-Royce Silver Cloud.
Bentley 'S' Type.
Bentley 'S' Type Continental.
Rolls-Royce Silver Wraith.
Rolls-Royce Phantom IV.
Rolls-Royce Silver Dawn.
Bentley 'R' Type.

This Bulletin cancels Service
Bulletin No. AG. 14 dated 13.8.57.

FOR INFORMATION

DISCONTINUATION OF 1000 MILES SERVICE

A comprehensive review of the servicing requirements of the automatic gearbox has confirmed that the 1000 miles schedule may now be discontinued. This decision has been made possible by the high manufacturing standards attained and by careful attention to the final adjustment of bands and controls prior to the car leaving the factory.

Servicing is now unnecessary before the 2,500 Miles Schedule, but it is considered advisable to check the gearbox for leaks whenever the opportunity occurs.

FOR INFORMATION

TORUS COVER GASKET - UG.134

Torus cover gaskets have been found unserviceable or difficult to fit when required after storage, due to shrinkage. Shrinkage is caused by the loss of moisture content and is accelerated when the gaskets are exposed to adverse atmospheric conditions.

Gaskets are now available from Hythe Road, London; packed in air exhausted, hermetically sealed Polythene bags, which should not be opened until immediately before the gasket is required.

All gaskets should be stored in a cool position away from any source of heat. This applies even to gaskets sealed in protective bags if the maximum protection against shrinkage is to be obtained.

FOR INFORMATION.

AUTOMATIC GEARBOX.

The following modification should be carried out to prevent water entering the gearbox by way of the dipstick aperture, only when the gearbox has already been removed for some other reason and is to be refitted into the chassis. All replacement gearboxes will incorporate this modification.

A small excluder in the form of a semi-circular shield is to be fitted around the dipstick guide, secured by a hammer drive hardened screw and sealed with Bostik to prevent ingress of water.

File a horizontal flat approx. 0.4" deep on the outside of the dipstick housing sufficiently deep to receive the right angled drilled location lip of the water excluder (see Fig. 1).

Locally clean surfaces free from dirt and oil, and remove the dipstick. Liberally coat the bottom of the water excluder and the matching surface of the dipstick housing with Bostik adhesive. Position the excluder over the dipstick sleeve and using the location lip as a guide, drill a 0.062" diam. hole through the dipstick housing and guide sleeve for the hardened hammer drive screw (see Fig.1). Ensure that no swarf enters the gearbox while drilling. Ascertain that the excluder is firmly stuck in place and hammer the hardened screw into position to securely retain the excluder.

Machine the face of the dipstick as shown in figure 2 to allow 0.062" clearance for gearbox breathing. Clearly mark the top of the dipstick with RED paint to indicate that this has been carried out.

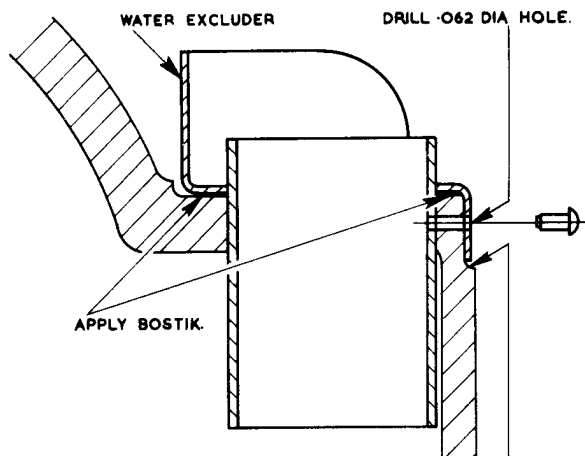


Fig.1.

FILE HORIZONTAL FLAT .400 DEEP
TO RECEIVE EXCLUDER LIP.

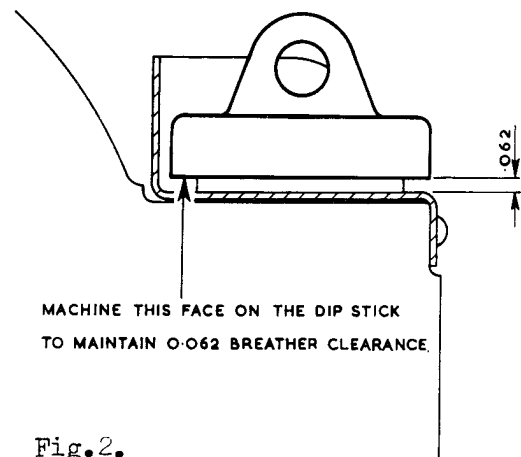


Fig.2.

Material:

- | | |
|---|------------------|
| 1 Nettlefolds Parker-Kalon 'U' Type
hardened hammer drive screw. | Part No. RE14441 |
| 1 Water excluder. | Part No. UG3106 |
| Bostik adhesive No. 252. | |

This Bulletin cancels all previous Service Bulletins No. AG.17.

OIL SEALS - FRONT PUMP

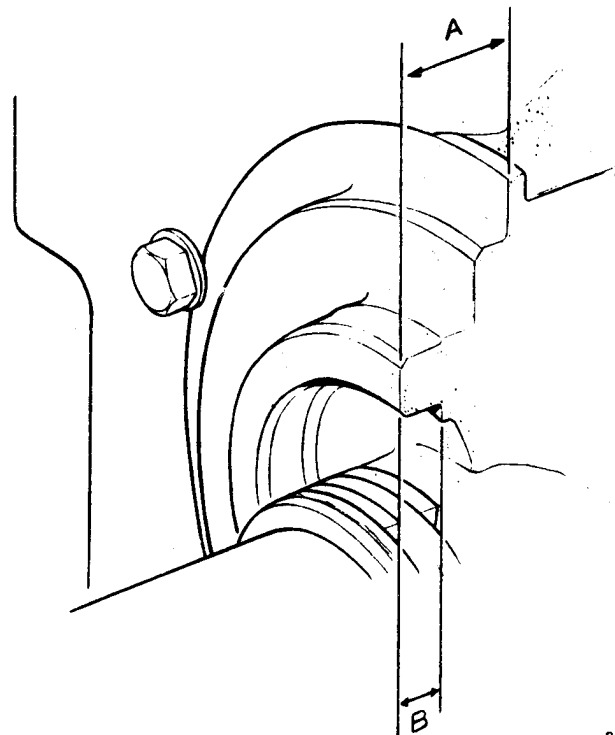
Difficulties have arisen concerning the fitting of the oil seal between the front pump cover and the torus cover. The following is a brief outline of the stages of modification in order of their introduction :

1. The seal fitted to S1 cars was pressed fully home into the annular locating recess. Early S2 cars had an identical seal (UG.3670), but this was not pressed fully into the recess. A modification was then introduced, interposing a washer between the seal and the recess end face in order to more effectively control the seal position.
2. A further modification incorporated the re-positioning of the seal recess on production pump covers so as to obviate the necessity for a packing washer.
3. Current S2 cars are being fitted with a new type of seal (UG.4107) requiring a recess position similar to that of stage 1 pumps. No packing washer is required and the seal is pressed fully into the recess so as to contact the end face.

Seal UG.4107 is to be supplied as a replacement for fitting to S1 and S2 cars. Existing stocks of seal UG.3670 are to be used up.

UG.3670 - PROCEDURE FOR FITTING

Remove the old seal by tapping it outwards, taking care not to damage the adjacent machined faces.



8279

Fig.1. Pump Cover Checking Dimensions.

Using a depth gauge or vernier callipers, measure dimensions 'A' and 'B' given in Figure 1. Subtract dimension 'B' from dimension 'A'. A result which lies between 0.355 in. and 0.400 in. indicates that the cover is not of the modified type and that a washer must be fitted; a result between 0.415 in. and 0.450 in. indicates a modified pump, requiring no action.

Insert the washer UG.3941 into the recess with chamfered face leading, apply a little 'Wellseal' jointing compound to the outer wall of the recess, lubricate the new seal with transmission fluid and tap the seal into position with a hide mallet.

New Parts Required

UG.3941	Washer	1 off
UG.3670	Oil Seal	1 off

UG.4107 - PROCEDURE FOR FITTING

It will be necessary in some cases to carry out a machining operation on the pump cover in order to accommodate the seal. Identification of covers requiring machining is by the dimensional check outlined in the instructions for fitting UG.3670. A check dimension which lies between 0.415 in. and 0.450 in. indicates that the cover must be machined to accept the seal. A result between 0.355 in. and 0.400 in. indicates that the cover will accept the seal without modification. Where a packing washer has been fitted, this should be removed before fitting the new seal.

Pump Cover - to Modify

Extract the old seal from the cover, then remove the pump from the gearbox and dismantle the pump, using the procedure given in Overhaul Section 9 of the Automatic Gearbox Service Manual.

Machine the pump cover to increase the depth (Dimension B., Fig.1) of the seal location bore by .050 in. Thoroughly clean the cover to remove all swarf, and assemble the pump. Refit the unit to the gearbox.

Apply a little 'Wellseal' jointing compound to the outer wall of the recess, lubricate the new seal with transmission fluid and tap the seal into position with a hide mallet.

New Part Required

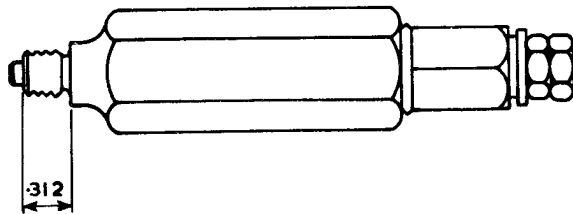
UG.4107	Oil Seal	1 off
---------	----------	-------

FOR INFORMATION.

AUTOMATIC GEARBOX FRONT
SERVO ADJUSTING GAUGE.

It has been found that due to a combination of manufacturing tolerances, that it is possible when using the front servo adjusting gauge for the end of the threaded portion to touch the servo piston, and so make accurate adjustment impossible.

As a guarantee against this happening, Retailers are asked to check that the threaded portion of these gauges (Part No. 27647/G.1002) conform to the dimension .312 as shown in the illustration below, and if not to modify by machining to suit.



Tool No. 27647/G.1002.

FOR INFORMATION

AUTOMATIC GEARBOX

FRONT BAND SETTING TOOL UR.3144.

Service experience has shown that, occasionally, the locknuts, which control the spring loading in the front band setting tool UR.3144, slacken off thereby giving faulty adjustment of the front band.

It is therefore recommended that the front band setting tool should be checked for accuracy every 3 to 6 months, depending on how frequently the tool is used, in the following manner.

Remove the plunger assembly from its housing and check the length of the spring whilst under compression. The correct length is 1.160 in. \pm .003 in. between the two points indicated in figure 1. If the setting is found to be incorrect adjust the lock nuts accordingly. When the length is correctly set, peen over the end of thread to prevent any further slackening.

A small quantity of these tools have been released to Service with the end of the thread already peened over. It is recommended that these tools be checked and adjusted as well.

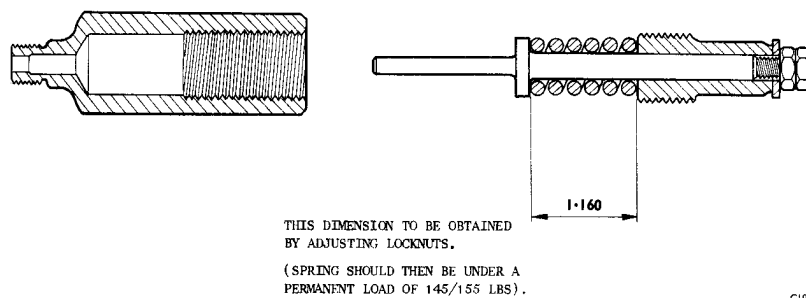


Figure.1. Points between which dimension 1.160 in. is to be measured

ADDENDUM

To be attached at the front of Service Bulletin No. AG/19

CATEGORY 2 - In the London area

FOR INFORMATION - All areas other than London

VENTED BELL HOUSING BOTTOM COVER

Automatic Gearbox Service Bulletin No. AG/19 is issued in order to instruct Retailers to modify the bell housing bottom covers of all cars operating in the London area and to inform all other Retailers of the 'slipping' complaint and the available cure.

However, if the gearbox has run less than 6,000 miles the transmission fluid should not be changed in the course of carrying out the modification. It is essential that the gearbox runs for the first 6,000 miles on Mobil WA 389, the 'factory fill' fluid, which has special running-in properties. Therefore the fluid in these low mileage gearboxes should remain unchanged until the 24,000 mile Service Schedule.

If the gearbox has run more than 6,000 miles it is recommended that, in the course of carrying out the modification, the transmission fluid be changed to any of the other recommended fluids.

CATEGORY 2 - In the London area

FOR INFORMATION - All areas other than London

VENTED BELL HOUSING BOTTOM COVER

APPLICABLE TO:

All S2 and S3 series cars except those used in the following territories.

Central and South America
East and West Indies
Africa
Middle and Far East
All Islands in the Pacific and Indian Oceans

INTRODUCTION

A number of recent complaints of slipping gearchanges and loss of drive in cars used frequently in congested town conditions have been attributed to overheated gearbox oil. It is known that the enormous number of gearchanges coming one after the other in conditions where there is negligible flow of cool air past the gearbox and bell housing, will maintain the gearbox oil at a very high temperature. The oil eventually oxidises, and thus reduces the coefficient of friction between the steel plates and the faced plates in the clutch packs. This causes slip, which heats the oil more and continues the vicious circle until the facing material of the clutch plates is attacked and disintegrates. Total loss of drive will follow. In service, this process of deterioration can first be recognised by slip at the 2-3 change, gradually extending to all the 'up' changes.

To ensure that the gearbox oil temperature remains below an acceptable level, a ventilated bell housing bottom cover will soon be fitted on production cars. This has two inlet ports for cool air close to the torus hub, and an outlet for hot air on the bottom of the cover screened with wire mesh.

Continued

-2-

ACTIONCATEGORY 2 - In the London area

The bell housing bottom covers of all cars operating in and around London should be modified on a Category 2 basis. Retailers should obtain modified bell housing bottom covers from Rolls-Royce Service Depot, Hythe Road, Willesden. It should be noted that there is only a limited quantity of these covers available and there may be a few weeks delay in modifying stocks.

The unmodified covers should be returned on a 'one for one' basis.

FOR INFORMATION - All areas other than London

It is possible that the modification may also be needed on a few cars operating in conditions of extreme traffic density in other cities. Retailers are advised to bear this in mind when dealing with persistent complaints of slipping gear-changes.

A kit of parts will be available shortly, and should be obtained from Messrs. Rolls-Royce Ltd., Spares Central Stores, Pym's Lane, Crewe.

After completing the modification, it is recommended that the gearbox be filled with one of the following oils

Castrol	Castrol TQ
Mobil	Mobil Fluid 200 Type 2320A or 752A
Shell	Donax T6
Esso	Esso Automatic Transmission Fluid
BP	Energol ATF Type A

CATEGORY 2 - London areaPROCEDURE

Drive the car onto a ramp or over a pit.

Continued

Remove the undertrays.

Remove the bell housing bottom cover.

Remove the gear control isolating link and fit it to the modified bottom cover.

Drain the torus and gearbox, and remove the gearbox sump.

Check and if necessary adjust the band settings.

Clean the gearbox filter.

Clean and refit the gearbox sump using a new gasket.

Refit the sump and torus drain plugs using new sealing washers.

Fit the modified bell housing bottom cover obtained from the Rolls-Royce Service Depot, returning the unmodified one on a 'one for one' basis.

Refill the gearbox with one of the previously recommended gearbox oils.

Remove the existing regulator valve pressure control spring and fit the one supplied with the modified bell housing bottom cover from the Rolls-Royce Service Depot.

Refit the undertrays.

Try the car on the road and adjust the gearbox controls if necessary.

MATERIAL REQUIRED

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
RH 2334	Modified bell housing bottom cover	1
UG 3837	Pressure control spring	1

TIME ALLOWANCE - 3 HRS.

Continued

FOR INFORMATION - All areas other than LondonPROCEDURE

Drive the car onto a ramp or over a pit.

Remove the undertrays.

Remove the bell housing bottom cover.

Using the modification kit RH 2322 modify the cover as shown in Figure 1, working in the following order

1. Cut the inlet port in the front of the bell housing bottom cover working to the dimensions in view 'A', shown again pictorially in view 'E'.
2. Cut the inlet port in the rear of the bell housing bottom cover to the dimensions shown in view 'B'.
3. Fabricate a shroud and solder around the rear inlet port. The dimensions for this are shown in views 'B' and 'C', and the finished shroud is shown pictorially in view 'D'. Material should be of a similar thickness as the bottom cover.
4. Working to the dimensions shown in view 'C', cut the outlet slot in the base of the bell housing bottom cover, taking care to leave the timing pointer in position.
5. Solder the wire mesh panel, RH 7583, in position over the outlet port.
6. Drill or cut a 0.75 in. dia. hole as shown in view 'C' to enable the engine to be cranked over for timing purposes. Remove any burrs from the edge of the hole and insert plug RH 7585.
7. When the modifications are complete, paint the bell housing bottom cover assembly with a zinc based paint such as 'Rust-Annode'

Continued

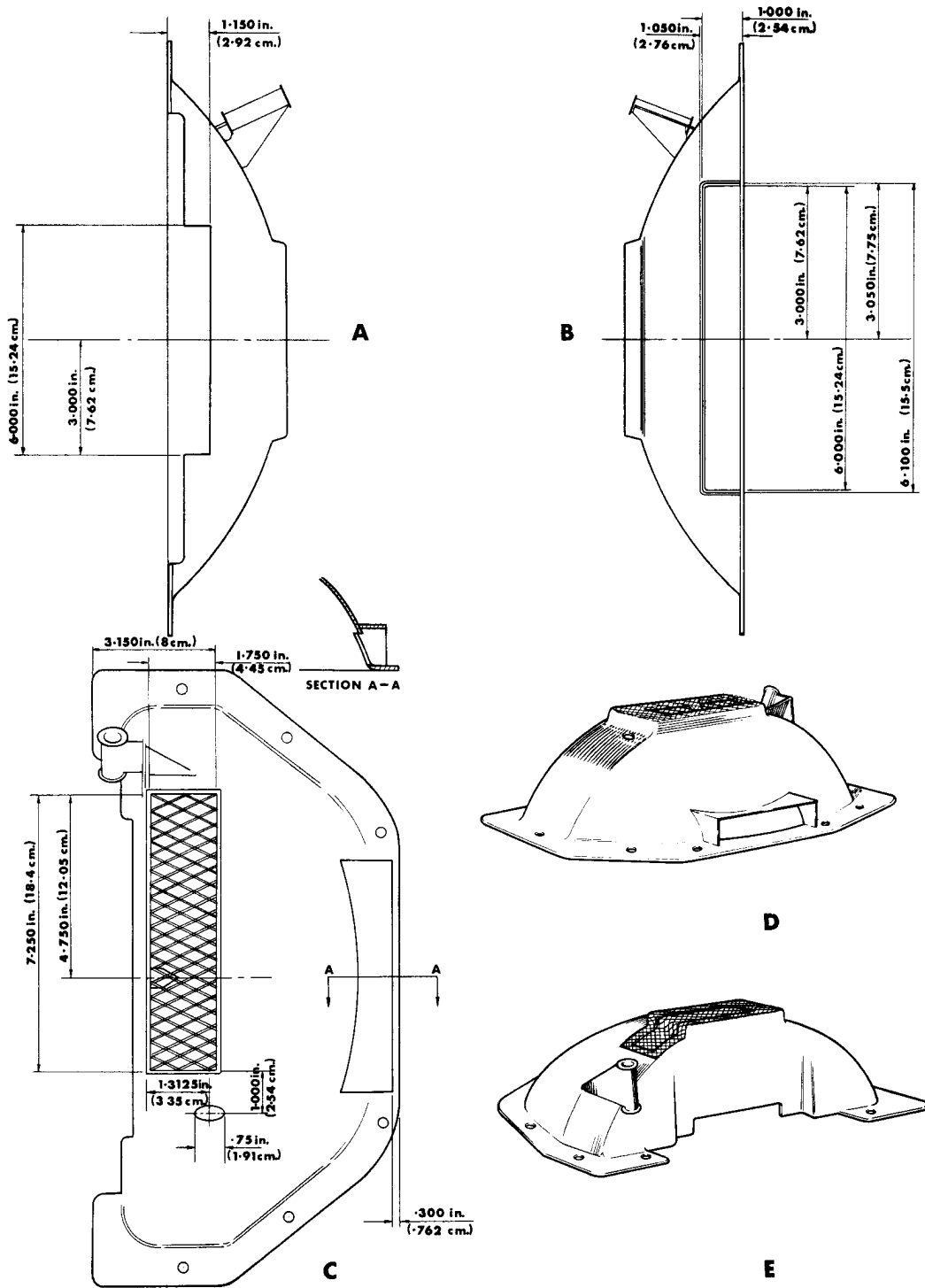


Fig. 1 Modifications to bell housing bottom cover

While the cover is being modified, the gearbox and torus should be drained, and the gearbox sump removed.

Check, and if necessary adjust the band settings.

Clean the gearbox filter.

Clean and refit the gearbox sump using a new gasket.

Refit the sump and torus drain plugs using new sealing washers.

Fit the modified bell housing bottom cover.

Refill the gearbox with one of the previously recommended gearbox oils.

Remove the existing regulator valve pressure control spring and fit the one supplied in the modification kit.

Refit the undertrays.

Try the car on the road and adjust the gearbox controls if necessary.

MATERIAL REQUIRED

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
RH 2322	Bell housing bottom cover modification kit, comprising the following parts	1
RH 7583	Expanded metal panel	1
RH 7585	Plug	1
UG 3837	Pressure control spring	1

TIME ALLOWANCE - 6 HRS.

Circulation - All Distributors
and Retailers other than North
America.

CATEGORY B

PHANTOM VI GEARBOX OIL COOLERS

APPLICABLE TO:

All Rolls-Royce Phantom VI motor cars.

DESCRIPTION

A number of recent complaints of slipping gearchanges in cars used frequently in city conditions have been attributed to overheated gearbox oil. The overheated oil causes slip between the clutch plates on drive take-up resulting in harsh and jerky gear changes.

To overcome this problem, a gearbox oil cooler has been developed and is now available in kit form.

The oil cooler is fitted in the left-hand front wing behind the small grille known as the "snow pack". Using a restrictor, a percentage of oil is taken from the gearbox front pump pressure take-off point and is passed through the oil cooler before being returned to the gearbox sump.

It is important that all Phantom VI motor cars are fitted with these oil coolers at the earliest opportunity, e.g. at the next scheduled service, or in the case of complaint.

Note It should first be ascertained that the gearbox is functioning normally.

PROCEDURE

1. Firmly apply the handbrake, chock the rear wheels and disconnect the battery. Jack up the front of the car and remove the left-hand front wheel.
2. Remove the setscrew from the radiator bracket under the left-hand front wing (see Fig. 1).

Continued...

- 2 -

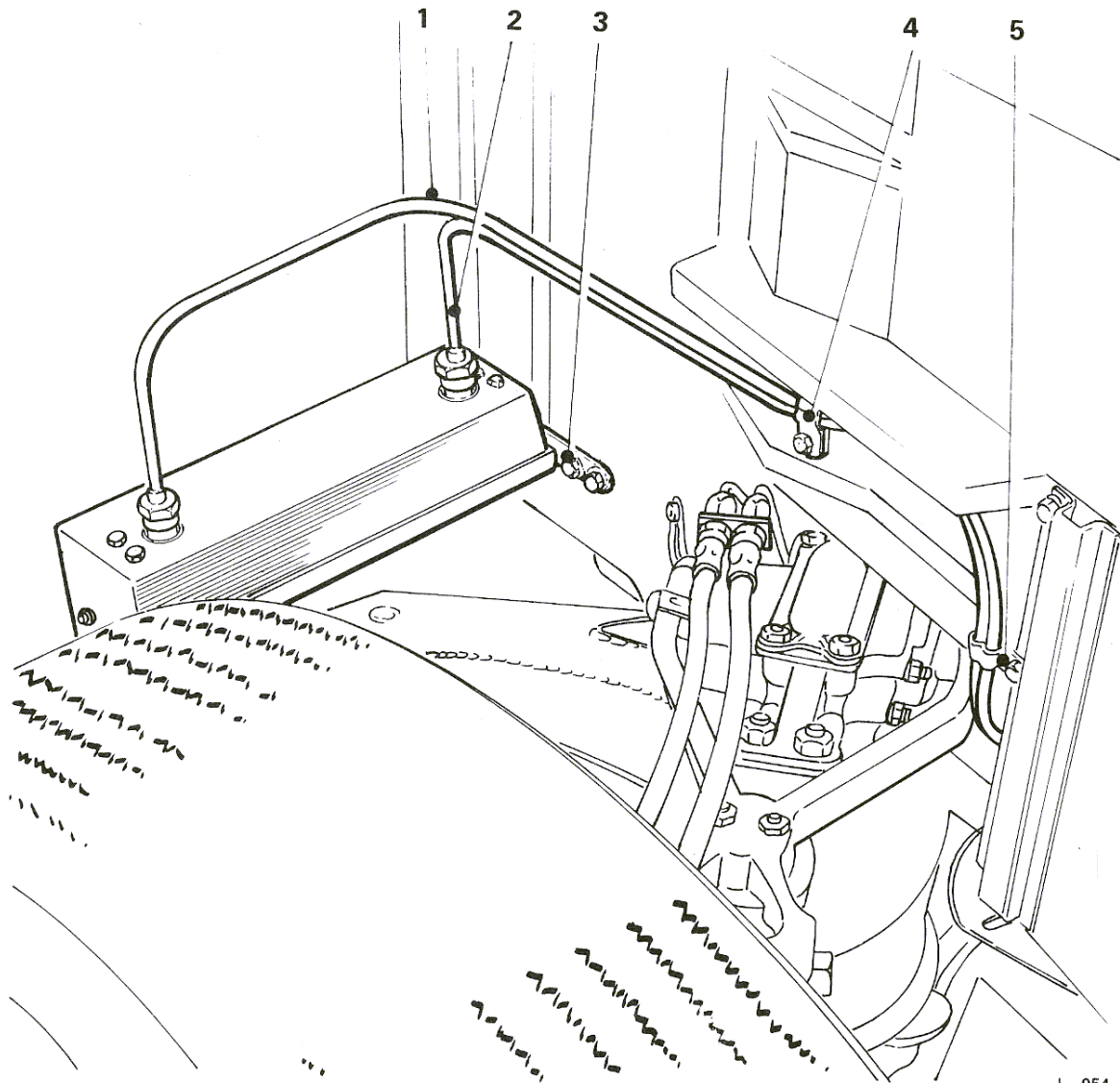
3. Use the setscrew previously removed, locate the mounting plate RH.8360 (Figure 1 (1)) against the valance, and using this as a template, drill a hole 0.281 in. (7,1 mm.) dia. to the rear of the setscrew.
4. Fit the upper cover assembly (Figure 2 (2)) RH.8354, to the oil cooler (Figure 2 (5)) using four 0.250 in. (6,35 mm.) dia. nuts, bolts and washers as shown in Figure 2.
5. Attach the plate RH.8360 (Figure 1 (3)) to the left-hand side of the upper cover (Figure 2 (2)) using two 2B.A. setscrews and washers such that it protrudes horizontally from the rear of the assembly.

Note An exploded view of the oil cooler assembly is shown in Figure 2.

6. Fit the lower cover (Figure 2 (4)) RH.8357 and the right-hand support bracket (Figure 2 (3)) RH.8359 to the assembly with the ears of the lower cover inside the side pieces of the upper cover and the flange on the support bracket towards the front of the assembly. Secure with four 2B.A. setscrews and washers to the weld nuts in the lower cover.
7. Clean the area under the left-hand front wing behind the "snowpack" so that the oil cooler will be tightened and sealed against a clean flat surface.
8. Locate the assembly under the wing using the radiator bracket securing setscrew; check the position of the hole in the body flange below the oil cooler to ensure alignment with the hole in the support bracket (Figure 2 (3)). If alignment is not possible, drill a new hole 0.281 in. (7,10 mm.) dia.

Continued...

- 3 -



L 954

Figure 1 Oil cooler in position behind left-hand "snowpack"

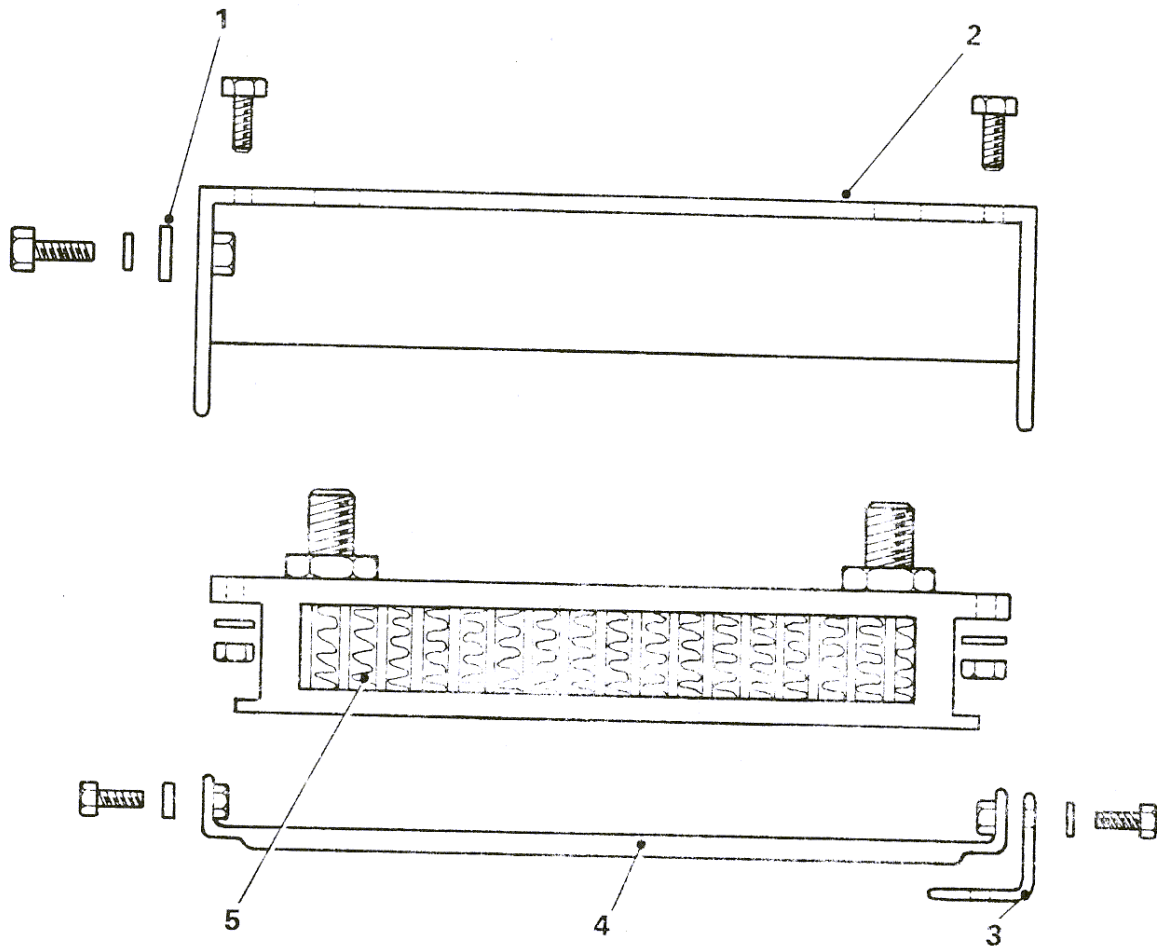
1. Pipe (RH.8367).
2. Pipe (RH.8365).
3. Mounting plate (RH.8360).
4. Clip (UR.14505).
5. Clip (UR.14505).

Continued...

- 4 -

9. Fit the assembly beneath the wing.
10. Fit the pipe RH.8365 (Figure 1 (2)) to the inboard outlet on the cooler and the pipe RH.8367 (Figure 1 (1)) to the outboard outlet. Do not tighten the unions at this stage (see Figure 1).
11. Fit a clip (Figure 1 (4)) UR.14505 to the pipes on the vertical section of their run behind the damper and secure with the lower existing bolt supporting the forward edge of the engine access plate.
12. Fit the second clip (Figure 1 (5)) UR.14505 to the pipes at a point coincident with the alternator clearance indentation in the valance.
13. Using the clip as a template and supporting the pipes horizontally, carefully drill a hole 0.281 in. (7,1 mm.) dia. and secure the clip with a 0.250 in. (6,35 mm.) dia. bolt, nut and washer.
14. Tighten the unions on the oil cooler.
15. Drain the oil from the gearbox.
16. Remove the left-hand side undertray and the gearbox band adjusting screws access plug.
17. Fit the plate (Figure 3 (7)) RH.8376 to the gearbox bell housing using a 0.50 in. (12,7 mm.) dia. setscrew in the position shown in Figure 3.
18. Remove the square headed plug located between the two gearbox band adjusting screws.
19. Fit the pipe (Figure 3 (8)) RH.8371 to the tapping point using the banjo bolt restrictor (Figure 3 - Inset A (1)) RH.8375 and sealing washers as supplied.
20. Fit the adaptor (Figure 3 (4)) RH.8378 in place of the gearbox sump drain plug using sealing washers.
21. Fit the pipe (Figure 3 (3)) RH.8369 to the adaptor RH.8378 using the banjo bolt (Figure 3 (5)) RE.14445 and sealing washers.

Continued...

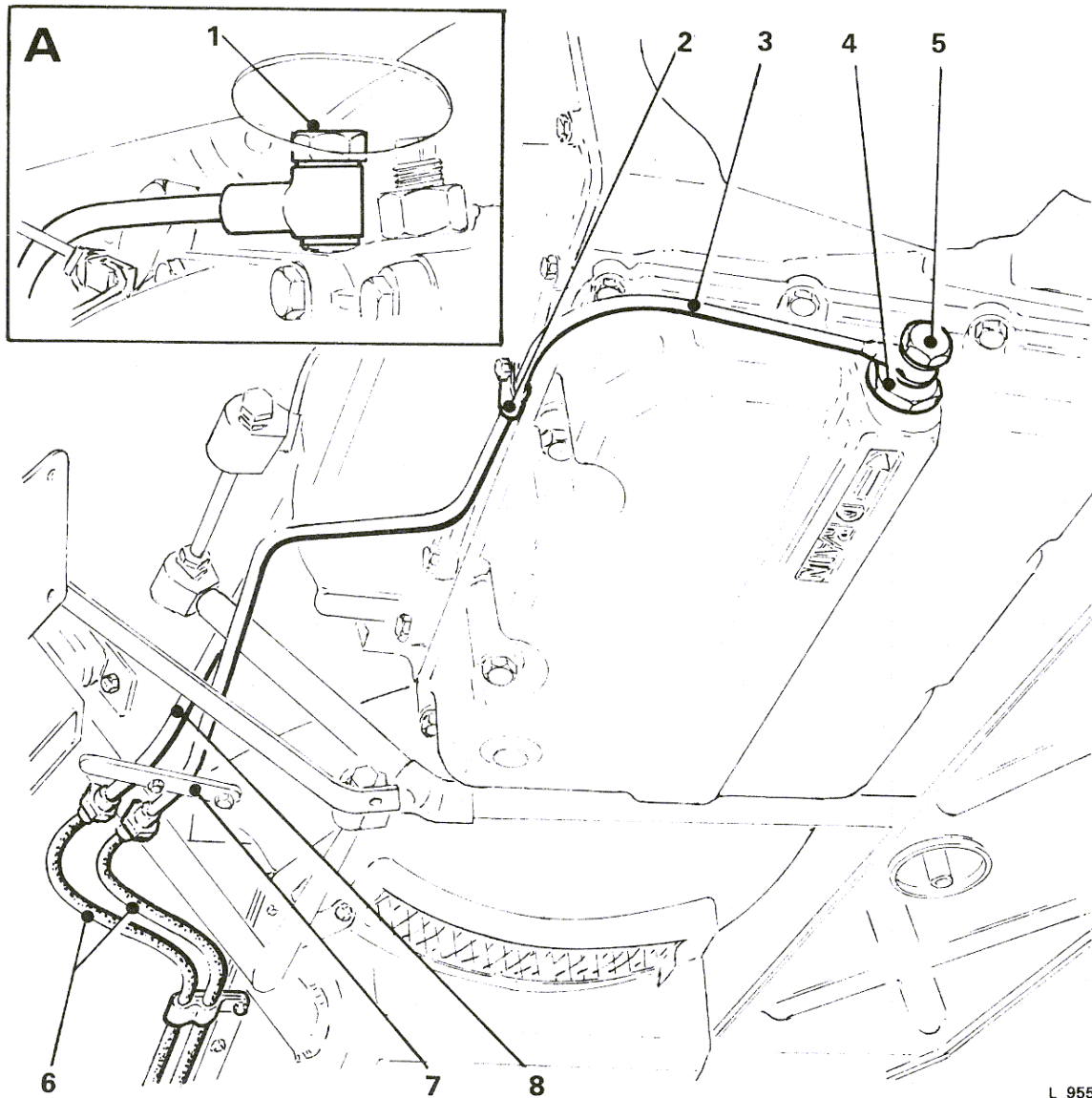


L953

Figure 2 Exploded view of oil cooler assembly

- 1. Plate (RH.8360).
- 2. Top cover (RH.8354).
- 3. Support bracket (RH.8359).
- 4. Lower cover (RH.8357).
- 5. Oil cooler.

Continued....



L 955

Figure 3 Pipes fitted to gearbox

Inset A. Banjo bolt restrictor fitted at the point between the two band adjusting screws.

1. Banjo bolt restrictor (RH.8375).
2. Clip.
3. Pipe (RH.8369).
4. Adaptor (RH.8378).
5. Banjo bolt (RE.14445).
6. Flexible pipes (RH.8379).
7. Plate (RH.8376).
8. Pipe (RH.8371).

Continued...

- 7 -

22. Ensure that the forward ends of both pipes lie on top of the bell housing plate (Figure 3 (7)) and pass either side of the gearbox actuation linkage, the pipe (Figure 3 (3)) from the gearbox sump lying inboard of pipe '8' shown in Figure 3.

Clip the pipe (Figure 3 (3)) to the gearbox control box as shown in Figure 3 (2)).

23. Clip the two pipes to the bell housing plate.
24. Ensure that the gearbox actuation linkage does not foul the pipes.

The run of the pipes may be modified to give adequate clearance.

The gearbox linkage fitted to left-hand drive cars uses a steady bracket in the vicinity of the forward ends of these pipes. Attention must be paid to the run of the pipes at this point to ensure that adequate clearance exists around the bracket and the gearbox linkage in all positions of the gear selector lever. The run of the pipes should be carefully adjusted should this be necessary.

25. Use the two flexible pipes (Figure 3 (6)) RH.8379 to connect the two pairs of copper pipes.

Note The direction of oil flow through the oil cooler is unimportant.

26. Clip the flexible pipes to the sump using a convenient sump setscrew.
27. Ensure that all the unions are correctly tightened.
28. Fill the gearbox with oil, noting that the oil cooler will only require one additional pint (0,5 litre) of oil.
29. Fit the access plug, the undertray and the wheel.
30. A brief test should be carried out to ensure the system is free of leaks.

MATERIAL REQUIRED:
Kit number 15

TIME ALLOWED - 6 hours