Confidential NO. 2 D 26

TECHNICAL SERVICE BULLETIN

SERVICE

British Motor Holdings (U.S.A.) Inc.
734 GRAND AVENUE, RIDGEFIELD, NEW JERSEY 07657

November 1, 1968

TO ALL DISTRIBUTORS AND DEALERS

Re: Training Aid #SS 12

MGB MK II and MGC
L.H. Type Overdrive

Attached is one copy of Training Aid #SS 12 giving detailed instructions on the construction, operation and fault finding of the L.H. Type Overdrive as fitted to the MGB MK II and MGC.

Additional copies will be given to each student when attending an Overdrive Service School.

SERVICE DIVISION

DEALER TRAINING

AID NO.: — SS 12

SUBJECT: L. H. TYPE OVERDRIVE

MODEL: MGB MK II, AND MGC

BMC SERVICE

British Motor Holdings (U.S.A.) Inc.

JAGUAR

LAYCOCK OVERDRIVE

MODEL LH

SERVICE AND MAINTENANCE

MANUAL

Working Principles and Notes on Maintenance and Fault Finding

The overdrive is an additional gear unit between the gearbox and propeller shaft. When in operation, it provides a higher overall gear ratio than that given by the final drive crown wheel and pinion.

The primary object of an overdrive is to provide open road cruising at an engine speed lower than it would be in normal top gear. This reduced engine speed gives a considerable reduction in petrol consumption and increase in engine life. Overdrive may also be used on the indirect gears to enhance performance or to provide easy and clutchless gear changing, for example in town traffic.

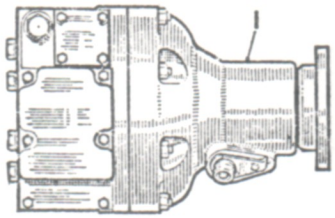


FIG. 1

The overdrive is operated by an electric solenoid controlled by a switch, usually mounted on the steering column or fascia panel. An inhibitor switch is invariably fitted in the electrical circuit to prevent engagement of overdrive in reverse, and some or all of the indirect gears.

Overdrive can be engaged or disengaged at will at any speed, but usually above, say 30 m.p.h. in top gear. It should be operated without using the clutch pedal and at any throttle opening because the unit is designed to be engaged and disengaged when transmitting full power. The only precaution necessary is to avoid disengaging overdrive at too high a road speed, particularly when using it in an indirect gear, since this would cause excessive engine revolutions.

Working Principles

The overdrive gears are epicyclic and consist of a central sunwheel meshing with three planet gears which in turn mesh with an internally toothed annulus. The planet carrier is attached to the input shaft and the annulus is integral with the output shaft.

The unit is shown diagrammatically in Fig. 2.

An extension of the gearbox mainshaft forms the overdrive input shaft. In direct drive Fig. 2a power is transmitted from this shaft A to the inner member of uni-directional clutch N and then to the outer member C of this clutch through rollers B which are driven up inclined faces and wedge between the inner and outer members. The outer member C forms part of the combined annulus H and output shaft D. The gear train is inoperative. A cone clutch E is mounted on the externally splined extension F of the sunwheel and is loaded on to the annulus by a number of springs which have their reaction against the casing of the overdrive unit. The spring load is transmitted to the clutch member through a thrust ring and ball bearing. This arrangement causes the inner friction lining G of the cone clutch to contact the outer cone of the annulus H and rotate with the annulus, whilst the springs and thrust ring remain stationary. Since the sunwheel is splined to the clutch member the whole gear train is locked, permitting over-run and reverse torque to be transmitted. Additional load is imparted to the clutch member, during over-run and reverse, by the sunwheel which, due to the helix angle of its gear teeth, thrusts rearward and has for its reaction member the cone clutch.

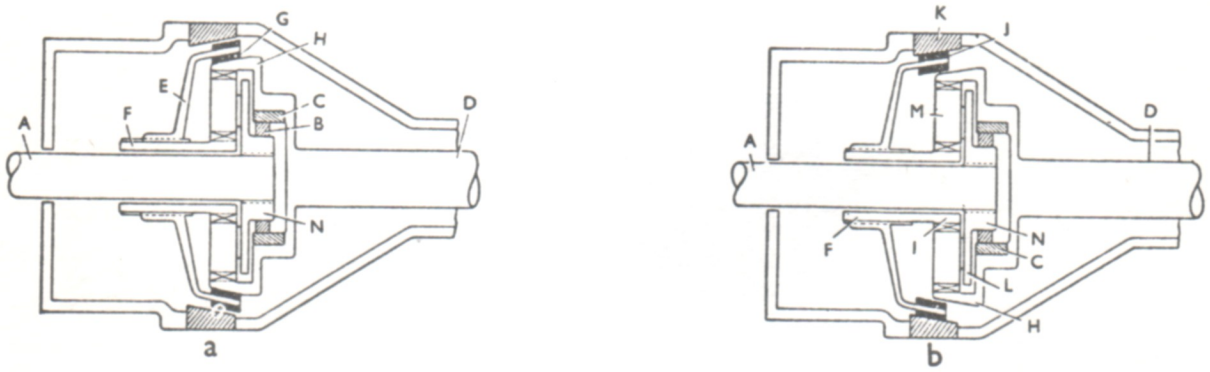
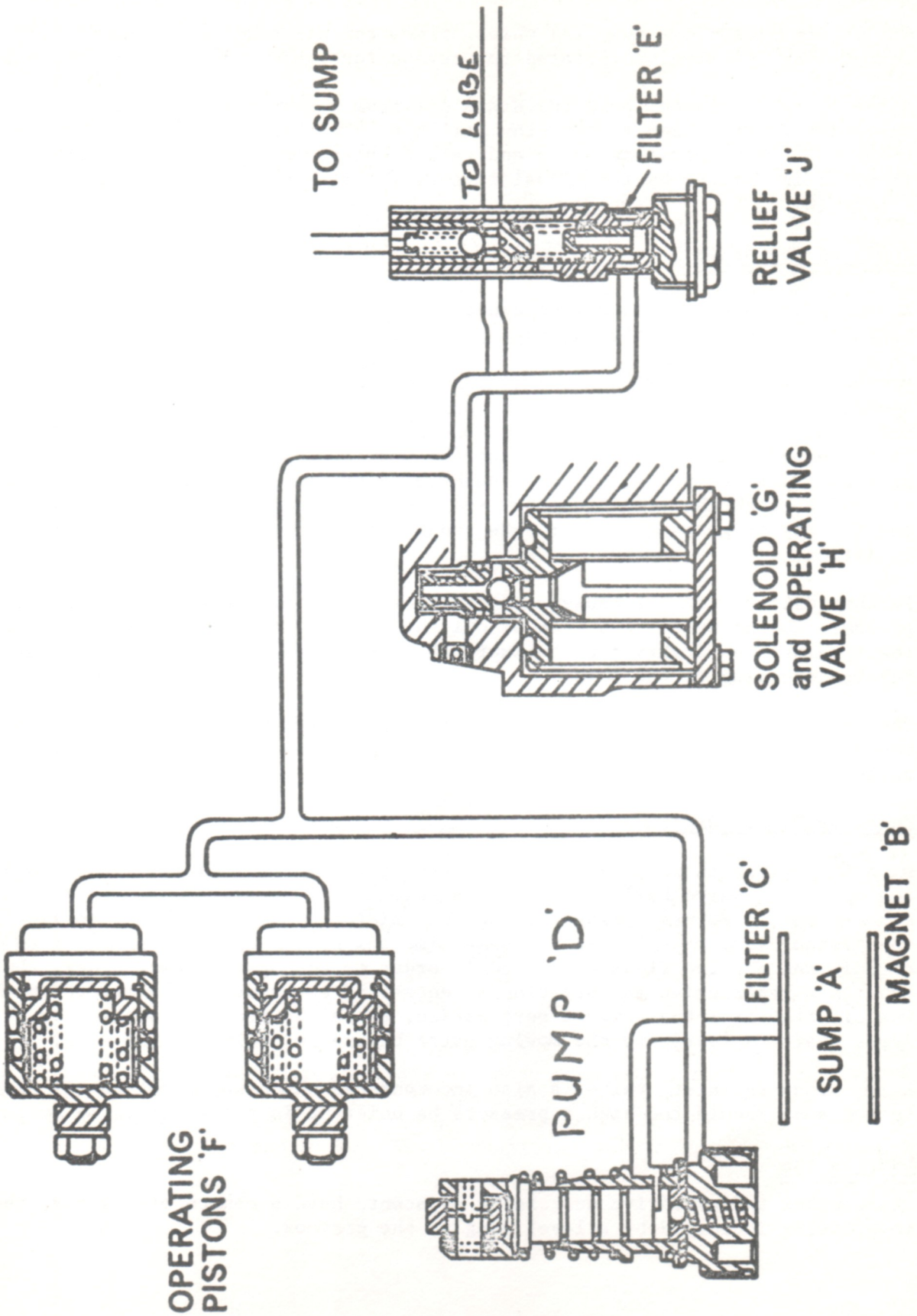


FIG 2

Fig. 2b shows the position of the cone clutch when overdrive is engaged. It will be seen that is is no longer in contact with the annulus but has moved forward so that its outer friction lining J is in contact with a brake ring K forming part of the overdrive casing. The sunwheel I to which the clutch is attached is therefore held stationary. The planet carrier L rotates which the input shaft A and the planet wheels M are caused to rotate about their own axes and drive the annulus at a faster speed than the input shaft. The uni-directional clutch allows this since the outer member C can over-run the inner member.

Movement of the cone clutch in a forward direction is effected by means of hydraulic pressure which acts upon two pistons when a valve is opened, by operating the driver controlled selector switch. This hydraulic pressure overcomes the springs which load the clutch member on to the annulus and causes the clutch to engage the brake ring with sufficient load to hold the sunwheel at rest.

EXPLODED VIEW OF HYDRAULIC CIRCUIT



The Hydraulic Circuit

Oil is contained in a sump (A) which allows for air cooling. A magnet (B) and mesh filter (C) are incorporated to prevent foreign matter entering the system.

A cam operated plunger pump (D) draws oil from the sump and delivers it to the operating piston chambers (F), the ball type operating valve (H) and the relief valve (J). The operating valve and relief valve seats are further protected from foreign matter by individual filters (E) of even finer mesh than the sump filter (C).

Engaging Overdrive

A switch operated by the driver causes the solenoid (G) to become energised by battery current, thus closing the operating valve (H).

Pressure is built up within the system causing the operating pistons (F) to move against the spring which, in direct drive, hold the sliding member onto the annulus. The sliding member is thus moved into contact with the brake ring. Oil continues to be pumped into the system causing the modulator springs inside the operating pistons (F) to compress, giving a cushioning effect by the progressive application of load between the sliding member and the brake ring. The sunwheel is now locked and the planet gears free to rotate about their own axes to give an overdrive condition.

Further delivery of oil causes the relief valve to be opened giving the final pressure to the unit. The flow of oil then passes to, and through the input shaft being then distributed to lubricate the moving parts and planet gears before returning to the sump.

The solenoid operating valve (H) also acts as a safety valve. If the pressure becomes excessive it would blow the ball off its seat against the loading of the solenoid.

Engaging Direct Drive

When the switch is reversed by the driver, the solenoid (G) is de-energised and the operating valve ball blown off its seat by oil pressure, uncovering the exhaust port. Return spring load on the sliding member forces oil to flow from the piston chambers (F). At the same time oil continues to be pumped into the circuit and the two flows are mixed in order to act against each other, thus causing a restriction and creating a controlled movement of the sliding member. The oil flow from the exhaust port passes, as in the previous case, through the input shaft to lubricate the moving parts before returning to the sump.

A low pressure safety valve is also incorporated which would return oil directly to the sump should too high a pressure be built up in the lubricating system.

Lubrication

The gearbox and overdrive unit being adjacent, have a common oil supply, the oil level being indicated by a level plug in the gearbox.

ON NO ACCOUNT SHOULD ANY ANTI-FRICTION ADDITIVES BE USED

The unit has pressure lubrication via a drilling in the mainshaft, the spill oil from the relief valve is directed through drilled passages to a bush in the front casing, and from this into the shaft and along the centre drilling to the rear bearing in the annulus.

From here the oil passes due to contrifugal force through the uni-directional clutch to an oil thrower from which it is picked up by a catcher on the planet carrier and to the planet bearings via the hollow planet bearing pins.

After refilling the gearbox and overdrive, recheck the oil level after the car has been run for a short distance as a certain amount of oil will be distributed round the hydraulic system. It is most important to use clean oil at all times and great care must be taken to avoid entry of dirt, whenever any part of the casing is opened.

Fault Finding

Overdrive Does Not Engage

1. Insufficient oil in gearbox.

2. Electrical system not working.

3. Insufficient hydraulic pressure due to pump non-return valve incorrectly seating, (probably dirt on seat).

4. Insufficient hydraulic pressure due to operating valve ball incorrectly seating, (probably dirt on seat).

5. Pump not working due to choked filter.

6. Damaged parts within the unit requiring removal and inspection.

Overdrive Does Not Disengage

NOTE: If overdrive does not disengage, do not reverse the car otherwise extensive damage may result.

1. Fault in electrical control system.

2. Sticking clutch. This trouble might be experienced on a new unit due to insufficient "bedding in" of the clutch. The clutch can usually be freed by giving the brake ring several sharp blows with a hide mallet. This can be done from underneath the car or where the gearbox cover is removable, it can be done from above.

3. Damaged parts within unit.

Clutch Slip in Overdrive

1. Insufficient oil in gearbox.
2. Insufficient hydraulic pressure due to pump non-return valve incorrectly seating, (probably dirt on seat).
3. Insufficient hydraulic pressure due to relief valve incorrectly seating.
4. Insufficient hydraulic pressure due to operating valve incorrectly seating.
5. Partially block pump or relief valve filter.
6. Worn or glazed clutch lining.

Clutch Slip in Reverse or Free Wheel Condition on Over-Run

1. Worn or glazed clutch lining.
2. Broken circlip in sunwheel.

Testing Hydraulic Pressure

After first ensuring that the oil level in the gearbox/overdrive unit is correct, remove relief valve plug and replace it with the special adaptor tool No. 18G 251E, using the existing copper washer. Then connect the pressure gauge, tool No. 18G 251, Fig. 4. Jack up the rear wheels of the car and secure. Start the engine, engage top gear and run at a speed in excess of 30 m.p.h. on the speedometer with overdrive engaged.

Appendix A gives the correct hydraulic pressure for various overdrive units.

NOTE: No pressure reading will be recorded in direct drive.

Failure to obtain a correct pressure reading would indicate a fault in the hydraulic system, i.e. non-return valve, operating valve, relief valve or pump. To check these components see under the following headings.

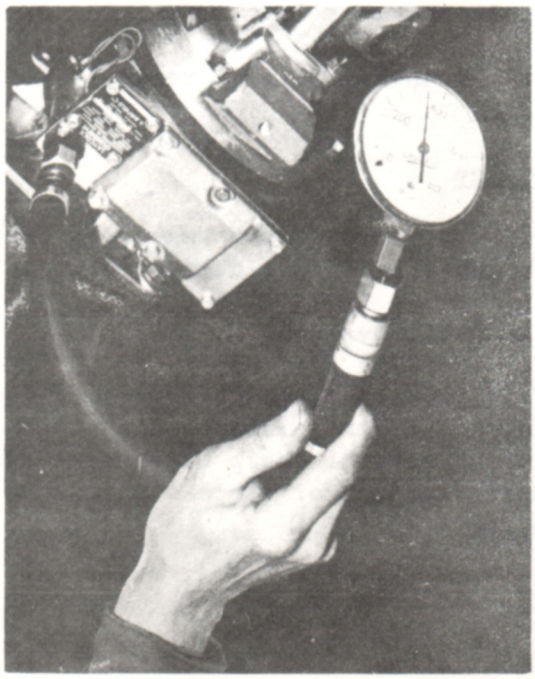


FIG.4

Solenoid and Operating Valve

The solenoid and operating valve are located at the bottom of the unit and are an assembly. To gain access first remove the four setscrews securing the name plate, the assembly can than be removed by gently pulling on the solenoid lead, see Fig. 5.

NOTE: This assembly should be removed as a unit otherwise the 3/16" dia. ball and filter may be displaced.

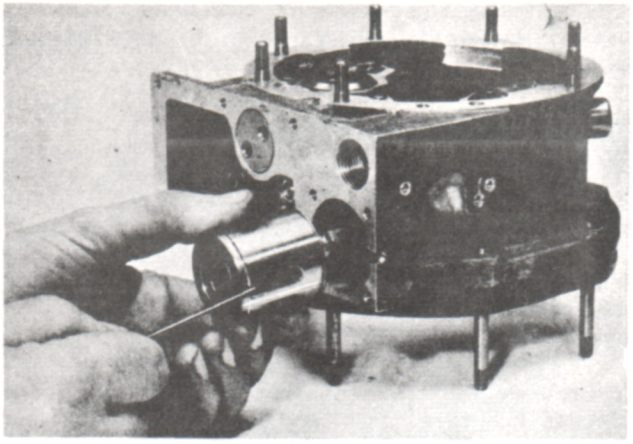


FIG. 5

To dismantle withdraw the plunger and remove the ball. To remove the operating valve body from the solenoid outer case, re-insert the plunger and lightly tap the end with a suitable drift Fig. 6. Next apply slight finger pressure on top of solenoid coil to remove the end plate. The coil can now be withdrawn from the solenoid outer case.

NOTE: Should it be necessary to re-seat the ball, this should be done VERY LIGHTLY using a suitable hammer and drift.

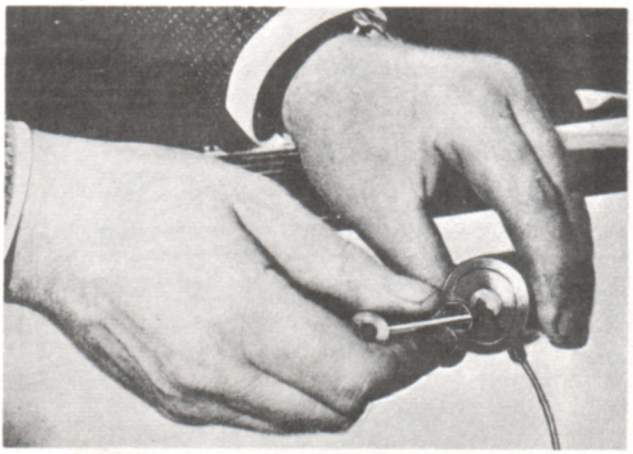


FIG. 6

The Relief and Low Pressure Valve

This valve is located in the bottom of the unit adjacent to the name plate. To gain access, first remove 3/4" A/F plug and the valve assembly can now be withdrawn by hooking a piece of stiff wire into the centre drilling of the valve and pulling down (Fig. 7). Care must be taken not to damage the filter during this operation. Examine the relief valve plunger, spring, 'O' ring and filter. Care must be taken not to lose washer if fitted, as this is to obtain the correct hydraulic pressure.

The low pressure valve is not serviceable as it is a sealed unit and if faulty must be replaced.

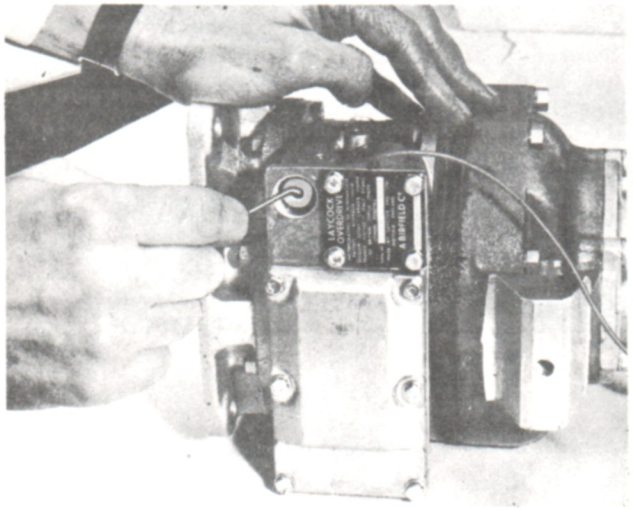


FIG. 7

The Pump and Non-Return Valve

To gain access to the pump and non-return valve first remove the sump and filter from the base of the unit. Next unscrew pump plug using tool No. 18G 1118, see Fig. 8, and then remove the spring and steel ball 7/32.dia. The pump body complete with non-return valve seat and plunger will be forced out of the main casing by the pump plunger spring. The non-return valve seat can now be separated from the pump body by tapping out, using a suitable drift. Care must be taken not to damage the internal bore of the pump body during this operation.

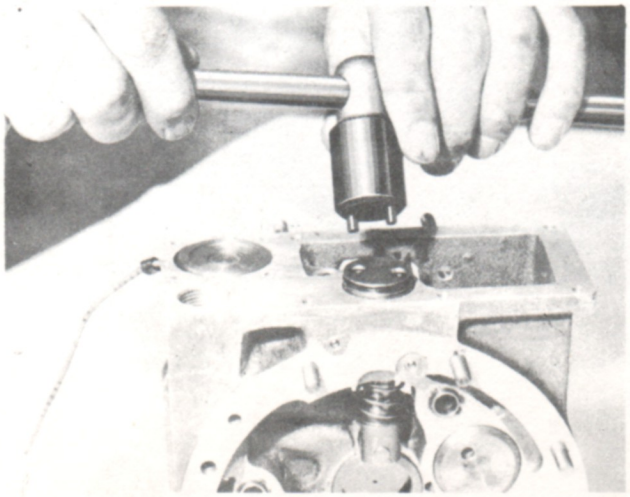


FIG. 8

Examine all parts ensuring that 'O' rings and non-return valve seat are in good condition. Any worn parts are to be renewed as necessary. To re-seat pump non-return valve, lightly tap ball on to its seating using a suitable hammer and drift. (See Fig. 9).

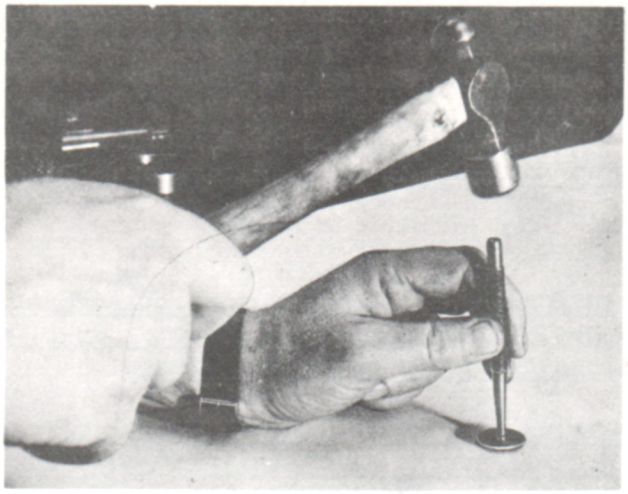


FIG. 9

Assembly of Pump and Non-Return Valve

Insert the pump plunger, spring and body in the main casing, ensuring that the flat machined side of the plunger is towards the rear of the unit. Press the pump body home onto its abutment and hold in position by using tool No. 18G 1117 see Figs. 10 & 11, and then re-fit the non-return valve seat. The non-return valve spring is then positioned in the pump plug and the non-return valve ball is held on to its seat by screwing the plug home and finally tightening using tool 18G 1118. The filter and sump can then be fitted to the main case after cleaning.

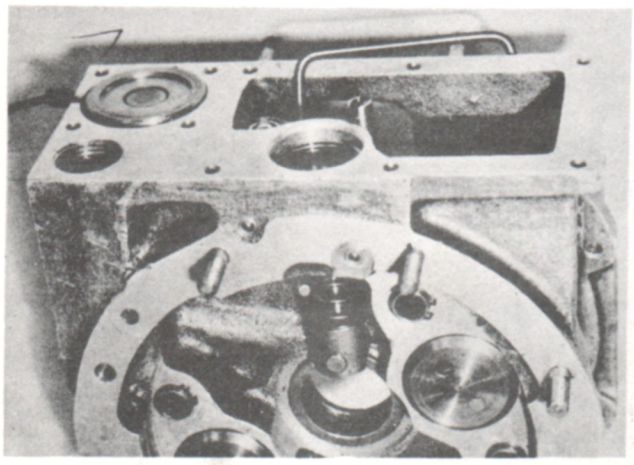


FIG. 10

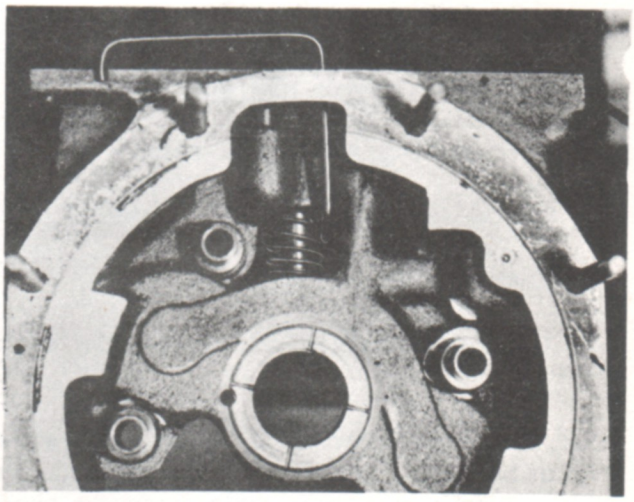


FIG. 11

Overdrive Removal

To separate the overdrive from the gearbox, remove the eight 7/16" A/F nuts securing the unit to the adaptor plate. There is no spring tension to release and after removing the nuts, the overdrive can be withdrawn from the mainshaft, leaving the adaptor plate in position on the gearbox.

Dismantling, Inspecting and Assembling

IMPORTANT

> Scrupulous cleanliness must be maintained throughout all service operations. Even minute particles of dust, dirt or lint from cleaning cloths may cause damage.
>
> As the oil supply is common with the gearbox, it follows that the same high standards of cleanliness must be maintained when servicing the gearbox.

Special Tools

A complete set of special tools can be obtained as listed in Appendix B.

There are two types of overdrive and these can be divided into the following assemblies.

Reverse Spline Type

1. Main casing and brake ring.
2. Clutch sliding member, sunwheel, and planet carrier assembly.
3. Intermediate casing, and annulus.
4. Rear casing.

Fixed Flange Type - MGB and MGC

1. Main casing and brake ring.
2. Clutch sliding member, sunwheel and planet carrier assembly.
3. Rear casing and annulus.

For initial examination, dismantle into four main assemblies, proceeding as follows:

Hold the overdrive on a bench and release the tab washers locking the four 7/16" A/F nuts which retain the operating piston bridge pieces. Next remove the 7/16" A/F nuts securing the main case to the intermediate rear case. These should be done progressively to release the clutch return spring pressure. The main case complete with brake ring can now be tapped and lifted from the intermediate/rear case. The sliding member can now be lifted out, followed by the planet carrier assembly, taking care not to damage the oil catcher which is attached to the under-

Fixed Flange Type (Cont.)

side of the carrier. Next remove the speedometer driven gear from the rear case. On the reverse spline type the intermediate and rear casings can now be separated, taking care not to lose bearing shim. The overdrive is now divided into the main assemblies.

Main Casing and Brake Ring

Tap the brake ring from its spigot in the main case using a suitable hammer and drift. To remove the spring thrust rods position two bolts of suitable length in the rods, place a packing piece on the operating piston, then using the bridge piece as in Fig. 12 tighten the nuts to compress the springs. Remove the circlips then progressively unscrew the nuts to release the spring pressure. Next withdraw the operating pistons.

The removal of the solenoid, operating valve, pump assembly and relief valve are described under their respective headings on pages 7, 8, and 9.

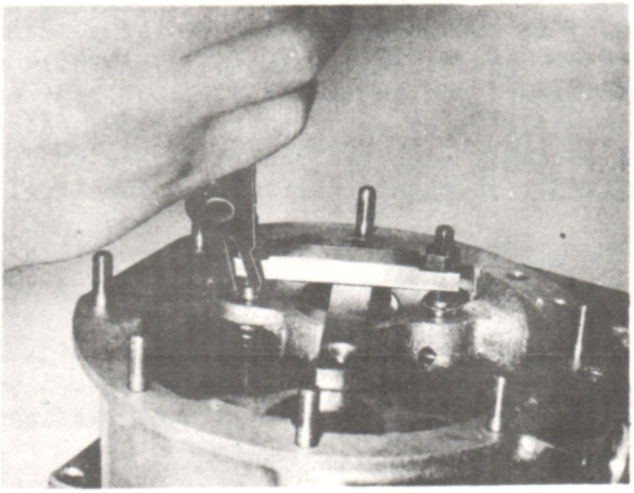


FIG. 12

Clutch Sliding Member Assembly

The four clutch engagement springs should first be removed with the four washers.

NOTE: These washers are selective and should it be necessary, are to be replaced as a set of four. Early production units have eight washers but these also can be replaced by the latest set of four.

Take off the retaining plate. Remove the circlip from the sunwheel extension and take out sunwheel. Next remove the large circlip from its groove on the

cone clutch hub and tap the cone clutch from the thrust ring and bearing using a suitable drift. Care must be taken not to damage the hub splines during this operation. The thrust bearing can now be pressed out of its housing.

Planet Carrier Assembly

At this stage inspect all the gear teeth for any signs of damage or chipping, and assess the fit of the assembled bearing for any excessive clearance.

Should it be necessary to replace planet bearing shafts and bearings, proceed as follows:

IMPORTANT

Remove one gear at a time and mark by scribing each gear and its relative planet hole location in the carrier to ensure that each gear is re-fitted into its original position.

NOTE: Each gear is marked with a dot by the manufacturer. This isfor angular relationship in assembly of the compound gears and is also used to obtain the correct angular position of the planet carrier and gear train before assembly with the annulus. See page 14 for re-assembly of the planet carrier and gear train.

Take the planet carrier and drive the mills pin as far as it will go into the planet bearing shaft. The pin will no longer be located in the planet carrier and by gripping it with a pair of sharp nosed pliers, the planet bearing shaft can be withdrawn. Remove mills pin from planet bearing shaft.

Intermediate/Rear Case and Annulus

Reverse Spline Type

Remove circlip and brass retaining plate which secure the uni-directional clutch, then place the special assembly ring tool 18G 178, centrally over the front face of the annulus and lift the inner member of uni-directional clutch into it. This will ensure that the rollers do not fall out of the retaining cage. If any further dismantling of this component is required, remove the assembly ring and allow the rollers to come out. The inner member can now be removed from the cage, exposing the spring.

Remove the bronze thrust washer which is fitted between inner member of uni-directional clutch and annulus.

Unlock the tab washer and remove the speedometer driving gear securing nut. Next take off gear and remove ball and distance piece. Next press the annulus out of the intermediate casing. Bearing can now be pressed out of the casing.

Fixed Flange Type

Remove uni-directional clutch and bronze thrust washer as described above and then remove coupling flange. Press annulus forward out of the rear casing. The front bearing should remain assembled to the annulus, also spacer, speedometer driving gear and selective spacer. The rear bearing will be left in the casing and can be driven out. Remove the spacers and speedometer driving gear from the annulus and then withdraw the front bearing using a press and suitable spacers. Re-fit speedometer driven gear and bush, taking care to fit a new sealing washer between the flange of the bush and the casing. Secure with retaining clip and set screw.

Rear Casing

Reverse Spline Type

If it is necessary to replace the bearing bush first remove oil seal, then drive the bush out using tool No. P7040. To fit the new bush, first ensure that the oil groove in the bush and the oilway in the rear case (see Fig. 13) are in line, then drive into position using tool No. P7040. Next fit new oil seals using tool No. P7064A.

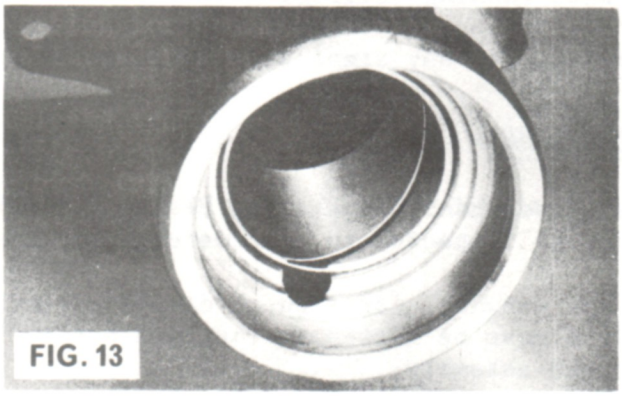


FIG. 13

Inspection

EACH PART SHOULD BE THOROUGHLY CLEANED AND EXAMINED AFTER THE UNIT IS DISMANTLED.

Front Casing and Brake Ring

Inspect the front casing for cracks, damage etc. Examine the bores of the operating cylinders for scores or wear.

Check for signs of leaks from the plugged ends of the oil passages.

Inspect the centre bush for wear or damage.

Check operating pistons for signs of scores and replace sealing ring if there is any sign of damage or distortion.

Check the pump roller and its bronze bush for any undue wear.

Check pump plunger for wear and scores.

Check pump body bore for wear and scores. Check the valve seat and ball to ensure that they are free from nicks and scratches. Check that the 'O' rings fitted to pump body and plug are in good condition.

Check the pump spring for distortion.

Clean the filters thoroughly in petrol. Remove all metallic particles from the magnet.

Check brake ring for signs of wear, scoring or cracks.

The Sliding Member

Inspect the clutch linings on the clutch sliding member for any signs of excessive wear or charring. If there is any sign of this condition the sliding member complete must be replaced. It is not possible to fit only new linings because the faces have to be fine machined to an accurate angle after riveting.

Inspect the ball race and ensure that it rotates smoothly as this can otherwise be a source of noise when running indirect gear.

Inspect the clutch springs for any signs of distortion or collapse.

Planet Carrier and Gear Train

If not previously inspected under Dismantling Planet Carrier Assembly the gears and bearings should now be inspected in accordance with instructions given.

Inspect the teeth on the sunwheel for sign of damage or chips. If the bush is worn a new gear complete must be fitted as the bore has to be machined concentric with gear teeth after sub-assembly.

Free Wheel and Annulus

Ensure that the rollers of the uni-directional clutch are not chipped and that the inner and outer members are free from damage. Check that the case, particularly the two ears, is not damaged. Check that the spring is not distorted or broken.

Inspect the bronze thrust washer fitted between the uni-directional clutch and the annulus.

Inspect the gear teeth of the annulus for damage.

Inspect the conical surface for signs of wear.

A bronze spigot bearing is fitted in the annulus under the uni-directional clutch. Inspect this for wear.

Inspect the output shaft ballrace and confirm that it rotates smoothly.

Inspect the output shaft ballrace and confirm that it rotates smoothly.

Rear Casing

Reverse Spline Type

Inspect the rear oil seal and bearing bush for wear. Inspect the teeth of the speedometer driving and driven gear for wear.

Rear Casing

Fixed Flange Type

Inspect rear oil seal and bearing for wear. Inspect the teeth of the speedometer driving and driven gear for wear.

Re-Assembly Main Casing and Brake Ring

Assemble pump unit, non-return valve, relief valve, operating valve and solenoid into the main casing so described under respective headings on page 9. Smear operating pistons with oil and carefully ease the rubber sealing rings into the cylinder bores.

Re-fit thrust rods in reverse manner to that described in dismantling, renewing circlips if necessary.

Brake ring will be fitted at a later stage in assembly.

Rear Casing, Intermediate Casing and Annulus

Reverse Spline Type

Press the bearing into the intermediate casing. Support the inner race of the bearing then press in the annulus until the bearing abuts on the locating shoulder. Fit distance piece, speedometer driving gear together with locating ball. Next fit tab washer and then tighten securing nut to a torque figure of 42 to 52 lb. ft., taking care not to damage annulus splines during this operation. The rear casing can now be fitted to the intermediate casing, but should any new parts have been fitted and it becomes necessary to assess the thickness of the shims required, proceed as follows:-

Place additional shims into rear casing recess and offer the rear casing to the intermediate casing with the bearing in position. Using a feeler gauge measure the amount by which the rear casing fails to meet the face of the intermediate casing. Remove the rear casing again and measure the thickness of the shims used, subtract the gap already checked by feeler gauge from the total thickness of the shims. The figure obtained will be the thickness of shims required. Next fit the rear casing with the selected shim after smearing the joint faces lightly with a liquid jointing compound. Re-fit speedometer driven gear and bush after first ensuring that the 'O' ring is serviceable and secure with retaining clip and setscrew. If setscrew and washer have been removed from rear casing during dismantling, re-fit using a suitable sealing compound.

Rear Casing and Annulus

Fixed Flange Type

Press the front bearing into the rear casing, ensuring that its outer track abuts against the shoulder in the casing. Support the inner race of the bearing and then press in the annulus until the bearing abuts on the locating shoulder. Fit the spacer, speedometer driving gear and selective spacer to give a clearance of .005" to .010" between the face of the rear bearing and the shoulder of the gear casing. To obtain this clearance a depth gauge should be positioned across the face of the rear casing and readings taken to the face of the selective spacer and the shoulder of the rear casing. The dimension to the shoulder should be .005" to .010" greater than that to the spacer.

NOTE: Selection of the spacer is only necessary when new parts have been fitted.

Press the rear bearing onto the annulus shaft and into the rear casing. Fit the oil seal. Press on the coupling flange and then fit the washer and nut. Tighten to a torque figure of 80 to 130 lb. ft. and then fit split pin.

Uni-Directional Clutch Assembling and Fitting

Fit the spring and inner member of the clutch to the cage, Fig. 14, locating the spring so that the cage is spring loaded in an anti-clockwise direction when viewed from the front. Place this assembly front end downwards into the special assembly ring tool 18G 178 see Fig. 15, and feed the rollers through the slot in the tool turning the clutch in a clockwise direction until all the rollers are in place. Fix the rear casing and annulus vertically in a vice, re-fit the bronze thrust washer in the recess in the annulus, then transfer the uni-directional clutch assembly into its outer member in the annulus Fig. 16, using the special tool to enter the rollers into the outer member and secure by fitting brass retaining plate and circlip. Check that the clutch rotates in an anti-clockwise direction only. (See Fig. 16 on page 17).

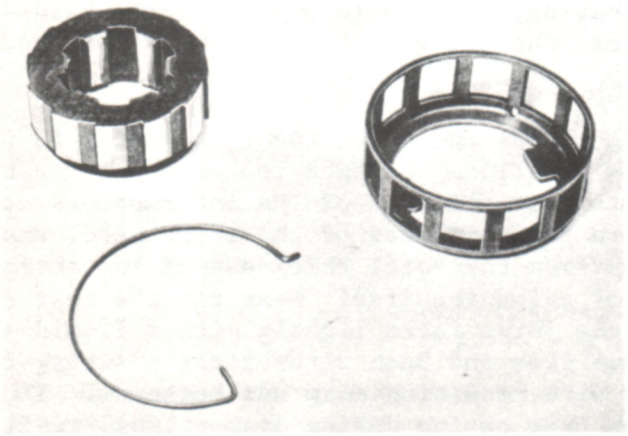


FIG. 14

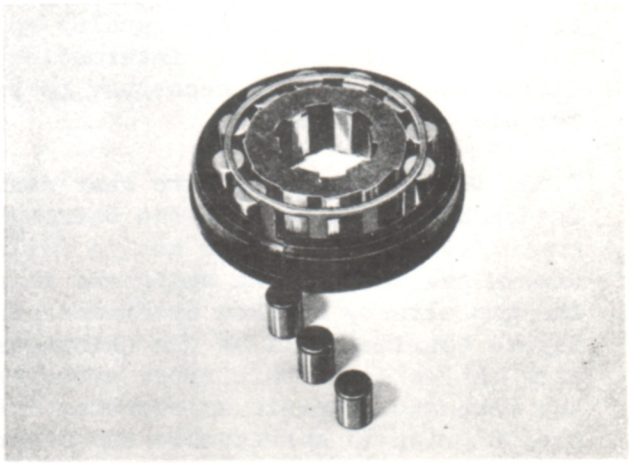


FIG. 15

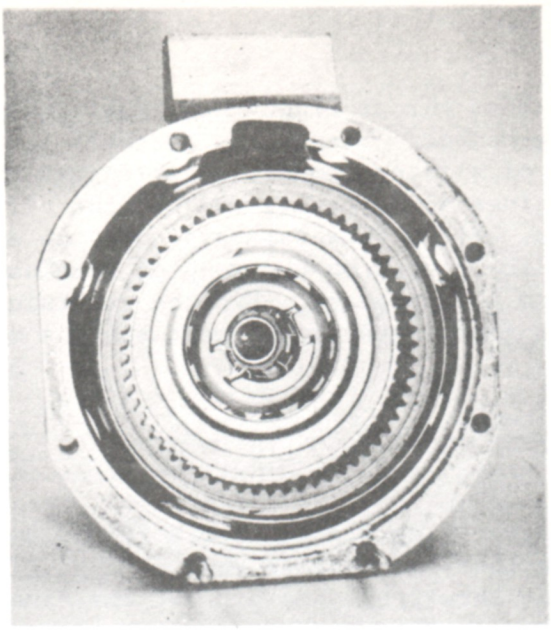


FIG. 16

Planet Carrier and Gear Train

Special care must be taken when re-assembling the planet carrier assembly to the annulus and sunwheel. Rotate planet wheels until the centre punched marked teeth are radially outwards and in line with the planet pins as shown in Fig. 17. Holding the gears in this position, insert the sunwheel into the planet carrier, then install this assembly into the annulus. Re-check radial alignment of the centre punched marks and planet pins. The gears are now correctly timed and the sunwheel may be removed. Next align the planet carrier and uni-directional clutch splines, then insert dummy mainshaft tool 18G 185.

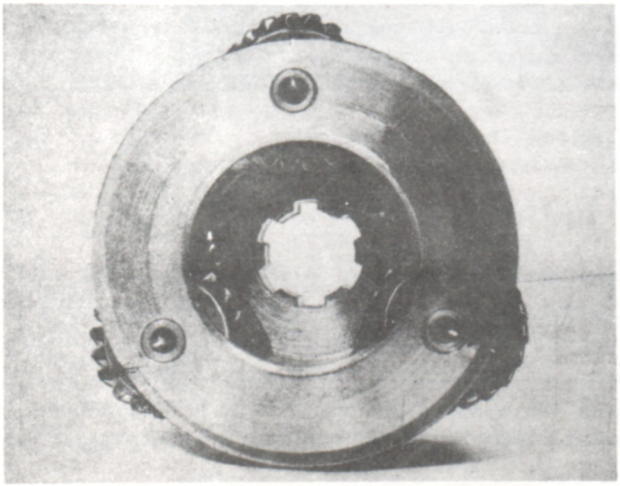


FIG. 17

Clutch Sliding Member

Press the thrust bearing into thrust ring, then press this assembly onto the hub of the clutch sliding member. Secure the assembly in position by fitting the circlip onto the hub of sliding member. Next insert the sunwheel into the hub ensuring that the splines slide easily and fit the circlip into its groove on the sunwheel extension. Place this assembly onto the dummy mainshaft and position inner lining of the clutch on the cone of annulus, at the same time engaging the sunwheel into planet gears. Fit the retaining plate, four selective washers and the four clutch engagement springs onto the thrust housing pins.

Final Assembly

Smear both faces of the brake ring flange with a liquid jointing compound and tap home into position on the intermediate rear casing, Fig. 18. Next place maincase assembly onto the thrust housing pins at the same time entering the studs into the brake ring. At this stage ensure that the clutch release springs are located on the thrust rods. The clutch spring pressure will be felt as the two casings go together and the eight nuts should be progressively tightened until the faces meet. Finally fit the two operating piston bridge pieces, nuts and new tab washers. (Machined ends of bridge pieces "up"). The overdrive is now ready for re-fitting to the gearbox.

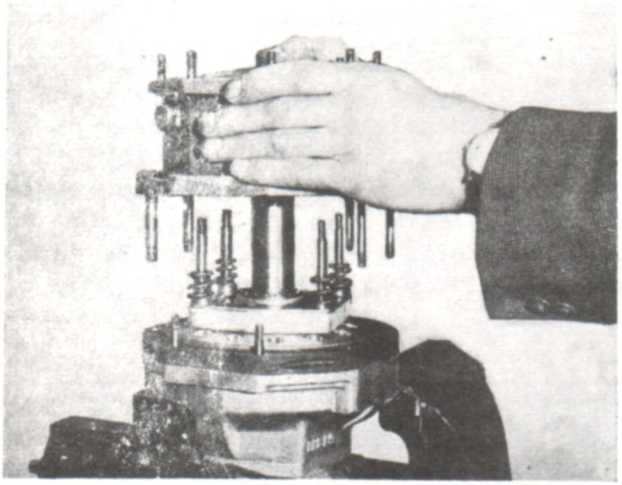


FIG. 18

Re-Fitting to Gearbox

If the overdrive will not meet the adaptor plate face by about 5/8" it means that the planet carrier and the uni-directional clutch splines have become mis-aligned. In this case remove the overdrive again and re-align the splines by rotating the inner member of the uni-directional clutch in an anti-clockwise direction. This can be done with a screwdriver of suitable length. Re-check by inserting dummy mainshaft. Next fit and tighten the eight nuts securing the unit to the adaptor plate.

Check that the cam is in good condition and re-fit with the steel ball onto the extension of the gearbox mainshaft. Rotate the shaft and position cam so that its lowest point will coineide with the pump roller during assembly of the unit to the gearbox. Ensure that the planet carrier retain clip is in position on mainshaft and engage bottom gear to maintain position of cam. Remove the dummy mainshaft from the overdrive. The splines in the planet carrier and uni-directional clutch will now be lined up. Fit a new paper joint to the front face of overdrive and offer unit up to the gearbox. Rotate the output shaft in a clockwise direction only, at the same time applying slight pressure in a forward direction until splines become engaged and ensure that the pump roller rides onto the cam which is chamfered for this purpose and that the overdrive pushes right up to the face of the adaptor plate. No excessive pressure should be used during this operation, and to do so could result in damage to the pump plunger assembly.

APPENDIX 'A'

Hydraulic Pressures

Model	Hydraulic Pressure P.S.I.
MGB	380 - 400
MGC	400 - 420

APPENDIX 'B'

Special Tools for L.H. Type Overdrive Unit

	Tool No.	Description
*+	18G 178	Freewheel Assembly Fixture
*	18G 185	Dummy Drive Shaft
*+	18G 251	Hydraulic Test Equipment
	18G 34A	Flange Wrench
	18G 1118	Oil Pump Plug Spanner
	18G 251E	Hydraulic Adaptor Use with L188
	18G 1117	Pump Body Holder and Seat Remover

* These tools are also suitable for 'A' type overdrive.

\+ These tools are also suitable for 'D' type overdrive.

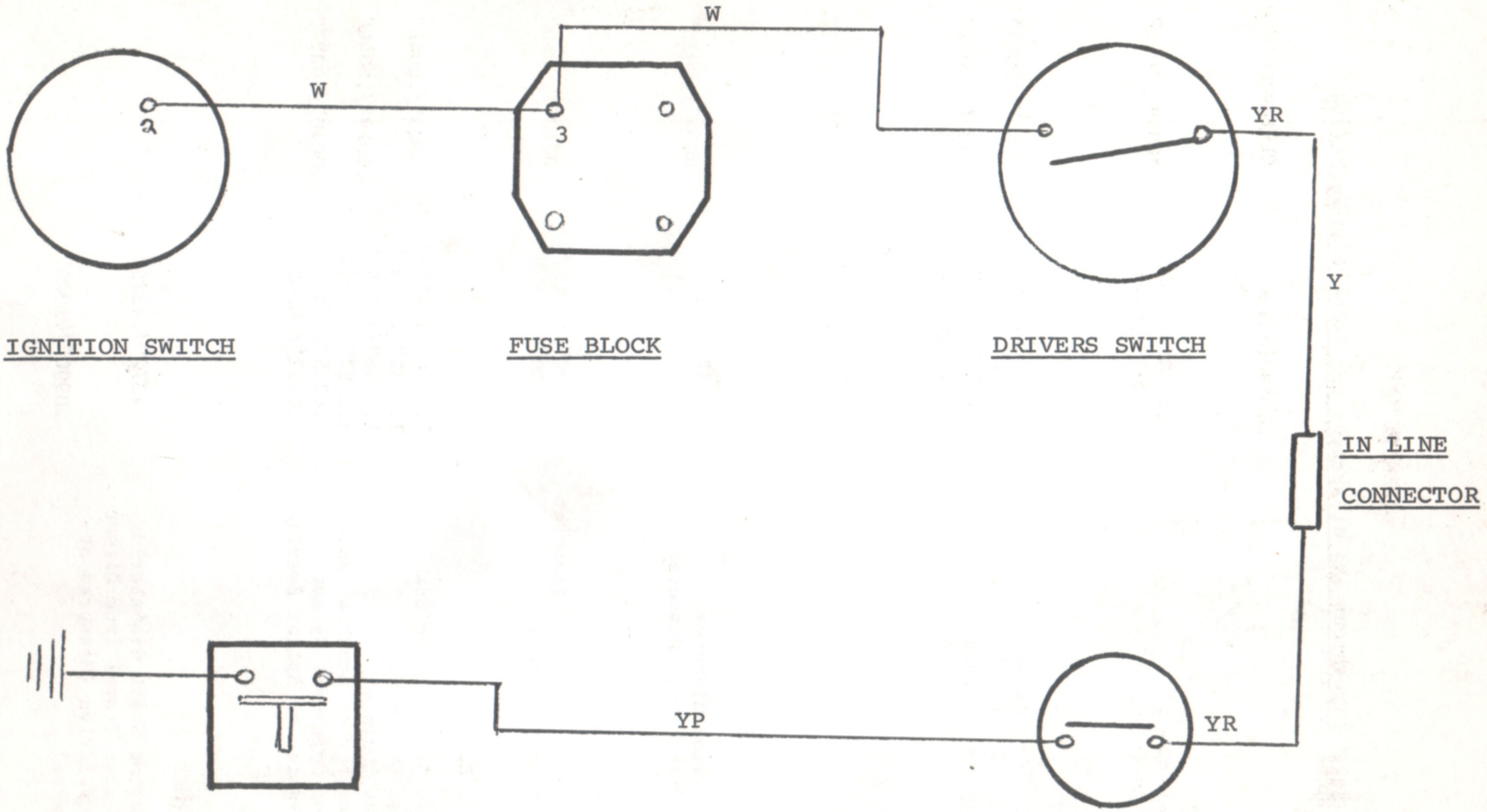
APPENDIX 'C'

Dimensions and Clearances for Parts when New

	DIMENSIONS NEW	CLEARANCES NEW
Pump		
Plunger diameter	.4996"/.5000"	.0003"/.0017"
Pump Body Bore	.5003"/.5013"	
Pump Roller		
Outside diameter of Bush	.3736"/.3745"	.0005"/.0023"
Inside diameter of Roller	.3750"/.3759"	
Inside diameter of Bush	.2510"/.2518"	.0008"/.0021"
Outside diameter of Pin	.2497"/.2502"	
Relief Valve		
Relief Valve Plunger diameter	.2180"/.2185"	.0002"/.0013"
Relief Valve Body Bore diameter	.2187"/.2193"	
Operating Pistons		
Operating Piston diameter	1.3732"/1.3741"	.0004"/.0023"
Operating Piston bore diameter	1.3745"/1.3755"	
Operating Valve		
Operating Valve Body Bore diameter	.2500"/.2510"	.0010"/.0050"
Solenoid Plunger diameter	.2460"/.2490"	
Gearbox Mainshaft		
Diameter at Oil Transfer Bush	1.1544"/1.1553"	.0029"/.0048"
Inside diameter of Bush	1.1582"/1.1592"	
Diameter at Sunwheel	1.1544"/1.1553"	.0029"/.0048"
Inside diameter of Sunwheel Bush	1.1582"/1.1592"	
Diameter of Mainshaft Spigot	.6235"/.6242"	.0010"/.0027"
Inside diameter of Spigot Bearing	.6252"/.6262"	
Miscellaneous		
Planet Bearing Shaft diameter	.4372"/.4375"	
Sliding Member Travel from Direct Drive to Overdrive (Measured at Bridge Pieces)	.0900"/.1000"	

MGB MK II AND MGC L. H. TYPE OVERDRIVE

ELECTRIC CIRCUIT



COLOUR KEY

W = WHITE
Y = YELLOW
YR = YELLOW/RED
YP = YELLOW/PURPLE