INSTRUCTIONS FOR FITTING DE NORMANVILLE OVERDRIVE UNIT

TO TWO-LITRE MODELS

STANDARD MOTOR COMPANY LIMITED
COVENTRY . . . ENGLAND

INDEX

ILLUSTRATIONS

DE NORMANVILLE OVERDRIVE UNIT

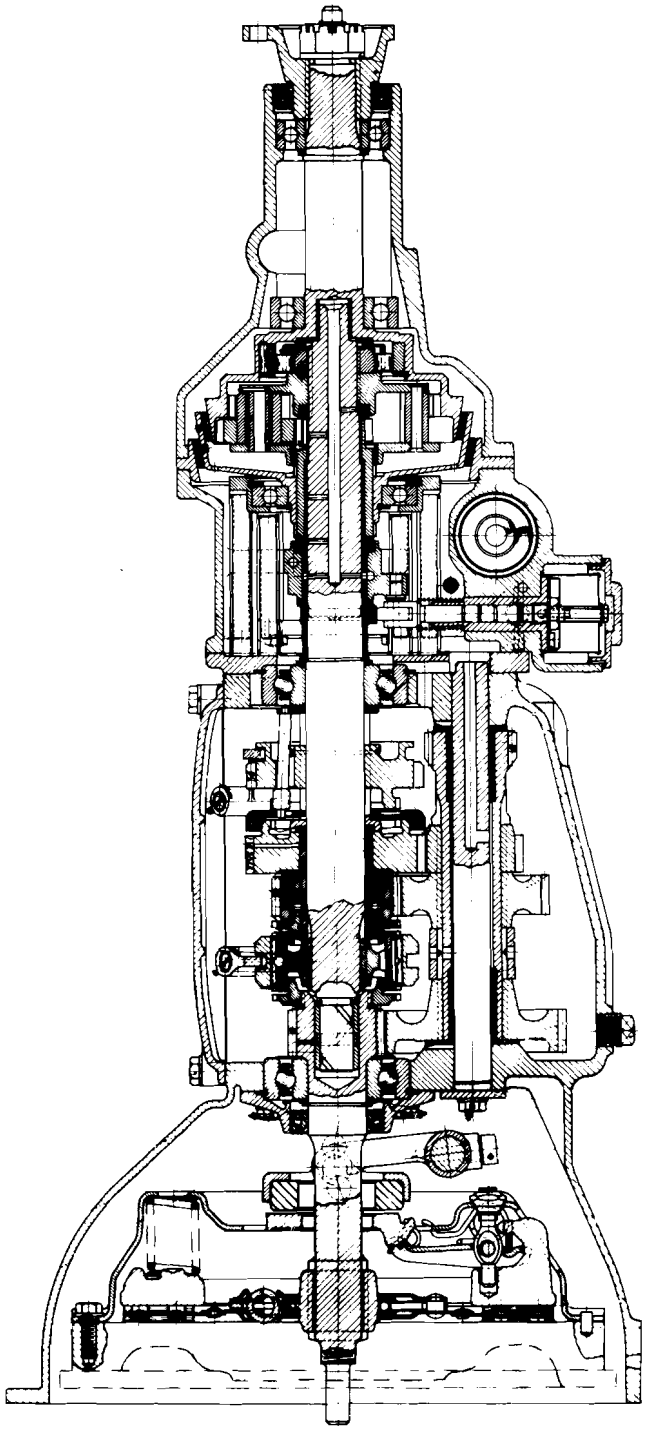

Fig. 1. Showing De Normanville Overdrive Unit and gearbox.

TO FIT THE DE NORMANVILLE OVERDRIVE UNIT TO RIGHT OR LEFT HAND TWO LITRE MODELS.

The introduction of this Unit into the transmission of the 1949 (not Triumph) and 1950 Two Litre Models is a comparatively straightforward operation, but entails a reasonable amount of detail work and, in addition to the Overdrive Unit itself, requires replacement of a number of parts. In the case of the 1949 Models the older type of gear change complicates the issue somewhat.

With the latest Models, certain chassis and body alterations are being incorporated with a view to facilitating the addition of this Overdrive Unit, subsequent to a Car's release from the Factory.

This modification is not possible with Triumph Models earlier than the "Renown," which is fitted with a somewhat similar chassis to that used with the Standard Models.

When ordering Overdrive Unit for any particular Car from our Spares Department it is particularly important that the Commission No. is given, to enable that Department to send the correct details to enable the conversion to be made.

To Fit Overdrive Unit to Gearbox. (See Fig. 1).

1. Remove the gearbox, leaving the engine in position. The removal of this Unit, without the engine, is described in the Gearbox Section of the "Vanguard" Service Manual. The installation of the Gearbox, with the Overdrive Unit fitted, will necessitate certain body and chassis modifications, but the extent of these will depend on the date of the manufacture of the Car and will be described in detail later in these instructions.
2. The existing gearbox mainshaft and gears, together with the countershaft assembly should next be removed from the casing. Removal of all gears is necessary by reason of a drilling operation which is required to the casing.
3. The mainshaft ball race should now be removed from the existing shaft, if this has not already been done when dismantling the gearbox.
4. Fit baulk pin and race into position on the special mainshaft supplied with the Overdrive.
5. Gripping the mainshaft suitably, assemble the gears on to this shaft up to the main locating circlip ensuring that the recess for this circlip is free for its eventual entry by checking with half the circlip previously used (a new one should be used for reassembly). Where a new "First" or "Second" Mainshaft Gear is to be fitted, ensure that .004"—.006" end float on the respective bushes is permitted. Check Second and Top Synchro Unit for free movement on all splines. Do not yet fit the Mainshaft Assembly into casing.
6. Fit Gearbox rear end paper packing and assemble adaptor plate, supplied with the Overdrive Unit, on to the Gearbox Casing, securing temporarily with holding bolts supplied with conversion set.
7. Drill oil transfer hole indicated in Fig. 2 through paper packing (all these packings now being issued are provided with the extra hole).
8. Remove adaptor plate and paper packing and carefully clean the casing and joint facings.
9. Drop in Countershaft Gear Assembly and leave in position with thrust washers and a retainer tube inside the countershaft to locate its needle rollers (24 at each end).
10. Remove the mainshaft gears, assembled on to this shaft, leaving the centre ball race and baulk pin plate in position.
11. Enter mainshaft with centre race and baulk pin plate into the gearbox casing and

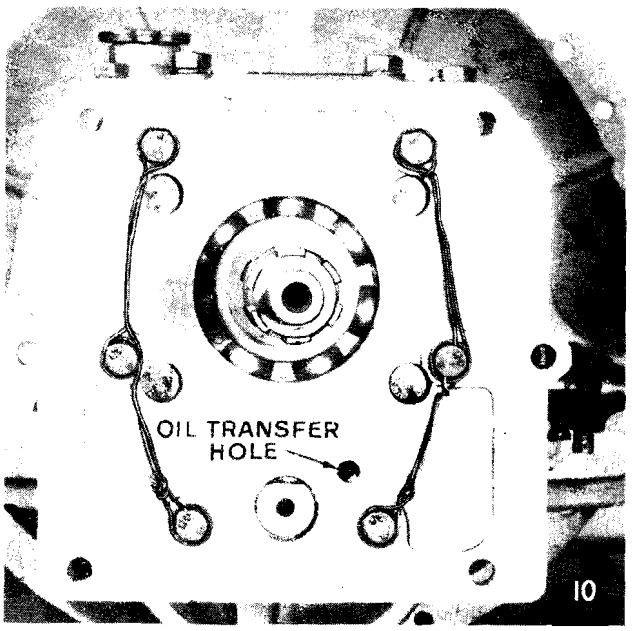

Fig. 2. Showing oil transfer hole and correct wiring of bolts.

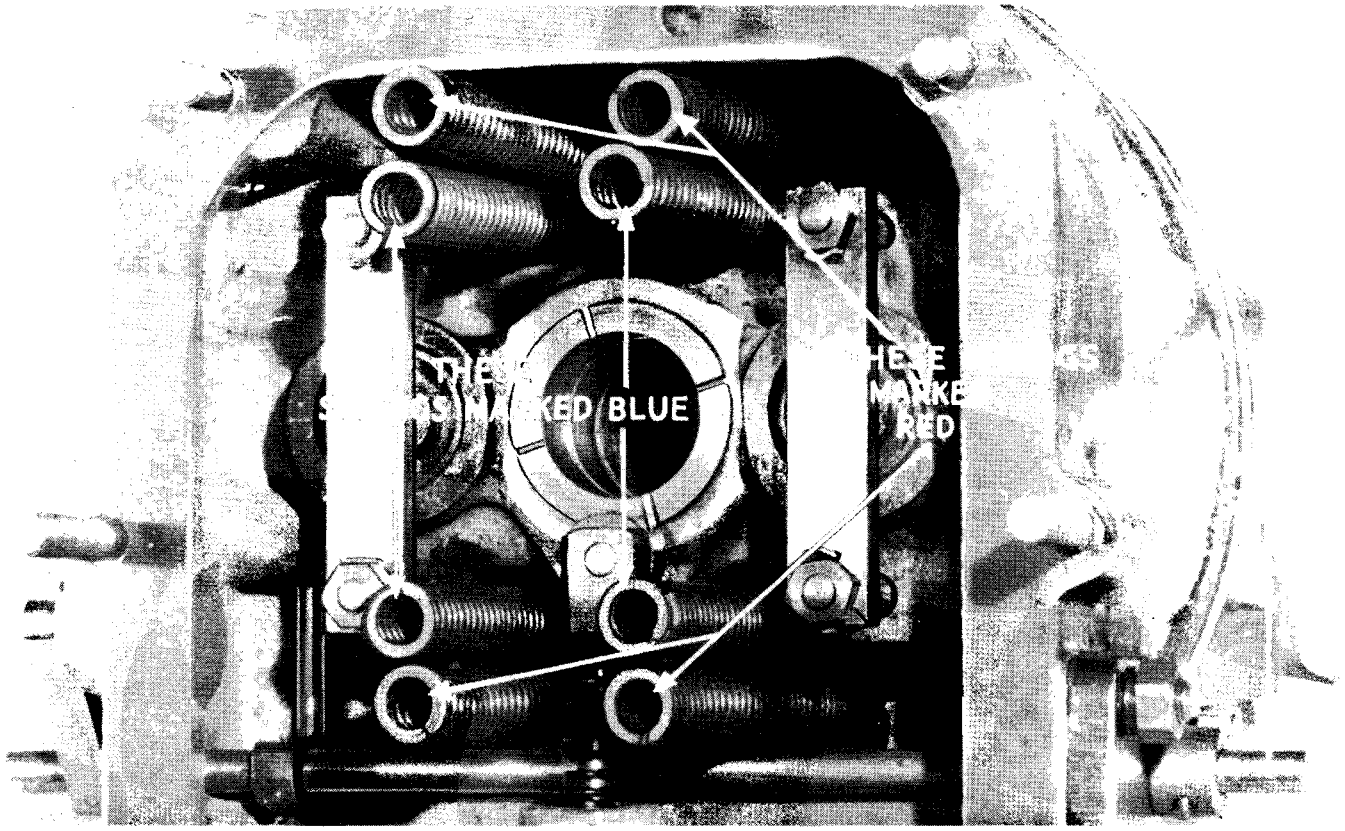

Fig. 3. Showing correct positioning of eight springs.

reassemble gears on to shaft and fit main locating circlip, with sleeved installing tool and adaptor.

12. Withdraw the gearbox mainshaft with gears assembled sufficiently to the rear and tilt upwards to enable the "Second" and "Top" synchro unit to be fitted.

13. Tap Mainshaft assembly into position and fit constant pinion.

14. Raise Countershaft gear assembly and fit Countershaft Spindle and complete reassembly of this unit.

15. Fit adaptor plate and packing on the gearbox casing using jointing compound. Wire the heads of the six securing bolts as shown in Fig. 2. The correct positioning of the locking wire is important to ensure proper working clearance for the assembled overdrive unit.

16. Ensure that the eight springs in the overdrive unit are correctly located as shown in Fig. 3. The colouring of these springs, indicated in this illustration, is scheduled to be discontinued at a fairly early date, but the centre springs will then be readily recognized by the fact that they are appreciably shorter than the outer ones.

17. Fit the gearbox assembly to the overdrive unit, holding the latter vertically in the vice as shown in Fig. 4. Whilst carrying out

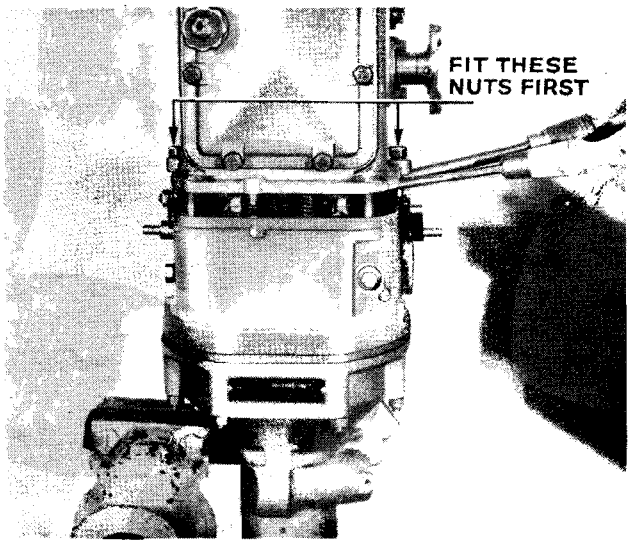

Fig. 4. Fitting gearbox to Overdrive Unit.

this operation it is necessary to depress the pump plunger with a screwdriver to allow it to pass over the operating cam. Having engaged the plunger on the cam and fitted the nuts and spring washers on the two long studs, the cam can be pushed downwards with the second screwdriver and and both screwdrivers thereafter discarded whilst finishing off the bolting together of the two units. The original nuts and the spring washers used, with the extension now discarded, will be used to secure the Overdrive Unit.

Modification of Gear Shift Mechanism and preparation of Overdrive Unit.

1. Remove existing hand change speed lever from control shaft, after withdrawal of fulcrum pin. When converting a 1949 Model the old hand lever will be replaced by that fitted to the 1950 Models.
2. After disconnecting the two rods which couple the levers on the steering column to those on the selector cross shafts, the remainder of the steering column mechanism can be discarded together with the steering column stay. With 1950 Models onwards, the existing connecting rods fitted between the selector cross shafts and column levers, together with these cross shafts (suitably modified), are used with the Overdrive Unit. In the case of 1949 Models the coupling rods will be replaced by those used with the 1950 Models, and the selector cross shafts modified as explained later.
3. Remove the selector shaft flanges from the side of the gearbox and discard. (These flanges will be replaced by those sent with the overdrive unit, these being tapped to receive the bolts supplied. The nuts are thus dispensed with and the necessary clearance on the cable permitted. Originally this clearance was provided by reversing the bolts and fitting the nuts on the other side of the coupling).

Note: The foregoing instructions apply equally to both Right and Left Hand Steering Models.

Right Hand Steering Models (Standard).

4. Remove the two bolts at the rear of the "first" and "reverse" selector shaft bush and assemble abutment bracket as shown in Fig. 5, securing the bottom end of the abutment bracket with a special $\frac{5}{16}$" N.F. × $\frac{5}{8}$" bolt, supplied with the Overdrive Unit.
5. Fit the two selector flanges, which are provided with the Overdrive Unit and are tapped to receive the shorter coupling bolts supplied with the Overdrive Unit as stated in operation 3.
6. Fit overdrive selector lever, leaving the clamping bolt slack.
7. Fit the spring and pawl taking care not to trap any coils of the spring. Fully tighten nut marked P and then slacken back half a turn and fit split pin.
8. Fit cable abutment, leaving the nut slack for the time being.

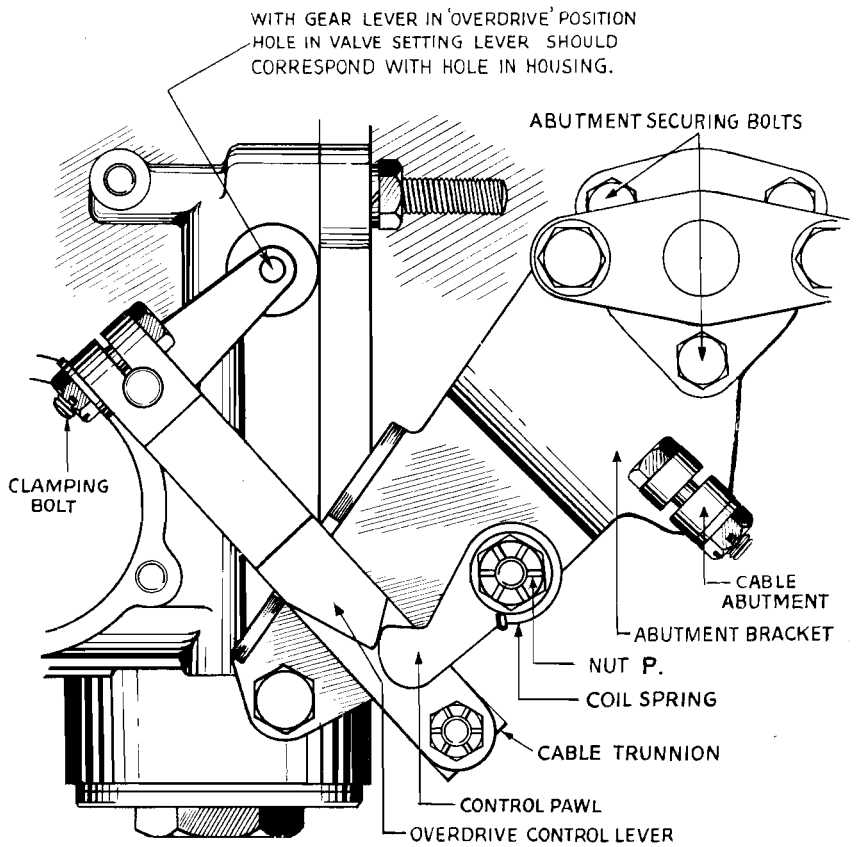

Fig. 5. Showing attachment of control and setting of operating lever.

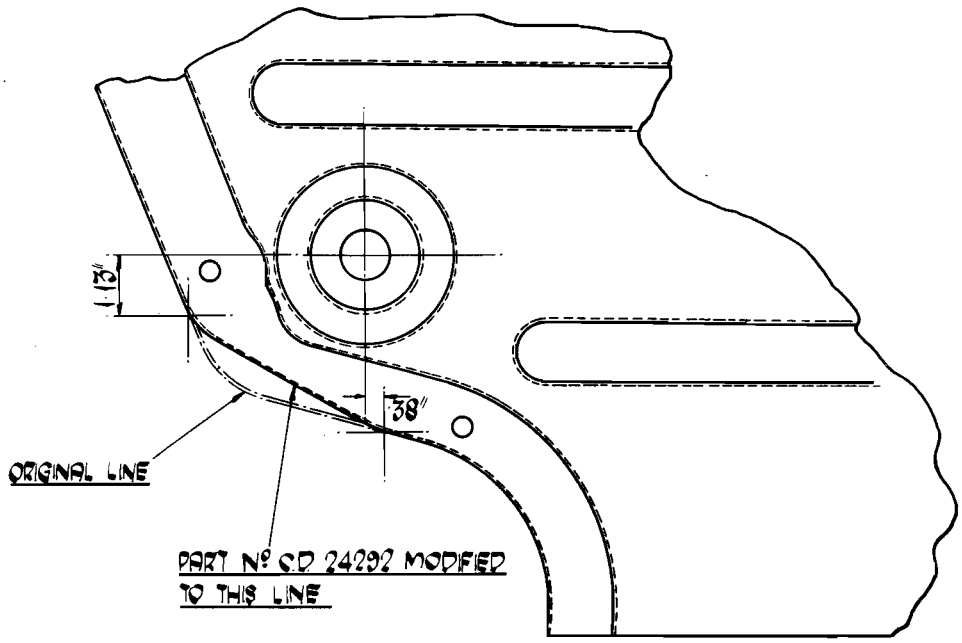

Fig. 6. Showing cut-away portion of floor pressing. This modification is scheduled to be introduced into normal production.

9. Assemble cable trunnion leaving adjuster nut slack.
10. On the right hand side of the Unit and pinned to the control spindle is a lever with a $\frac{3}{16}$" diameter hole. In the casting adjacent to this lever is also another $\frac{3}{16}$" dia. hole. The operating lever should be rotated with its spindle until the two $\frac{3}{16}$" holes coincide and then a $\frac{3}{16}$" diameter pin inserted through the lever and into the casting, thus locking the control spindle. (See Fig. 5).
11. Position the large operating lever against the bottom stop on its abutment bracket, as shown in Fig. 5 and tighten clamping bolt at the upper end of this lever and withdraw $\frac{3}{16}$" diameter bar. The gearbox is now ready to be installed in the chassis.
12. A portion of each side of the floor pressing should be cut away, as indicated in Fig. 6, to provide the necessary clearance on the additional width of the Overdrive Unit.
13. The turret cover, which is an integral portion of the toe-board pressing, must be modified in shape and an additional hole added to allow access to the operating valve in the Overdrive Unit. The operating valve inspection hole should be sealed off with a spare gearbox dipstick grommet. Details for carrying out these alterations are shown in Fig. 7.
14. To facilitate the entry of the gearbox and overdrive assembly into the chassis, a portion of the floor pressing should be cut out, as indicated in Fig. 8, and then extension pieces of equivalent gauge plate butt welded on to the three sides shown.
15. The cut away piece of floor pressing should now be fitted into its original position, the welded on extensions being located underneath the floor pressing and the floor strengthening cross strap.
16. Drill the eight $\frac{5}{16}$" diameter holes shown, through the floor pressing strengthening strap and adaptor plate. After this drilling operation, withdraw the adaptor plate and weld $\frac{1}{4}$" N.F. Nuts underneath each of the eight $\frac{5}{16}$" diameter holes.
17. The chassis cross member, to which the overdrive unit is attached, may have to be drilled, as shown in Fig. 9, to accommodate the speedometer drive. If the Car is a recent release this provision will have already been made.
18. The gearbox and overdrive unit should now be fitted into the chassis.

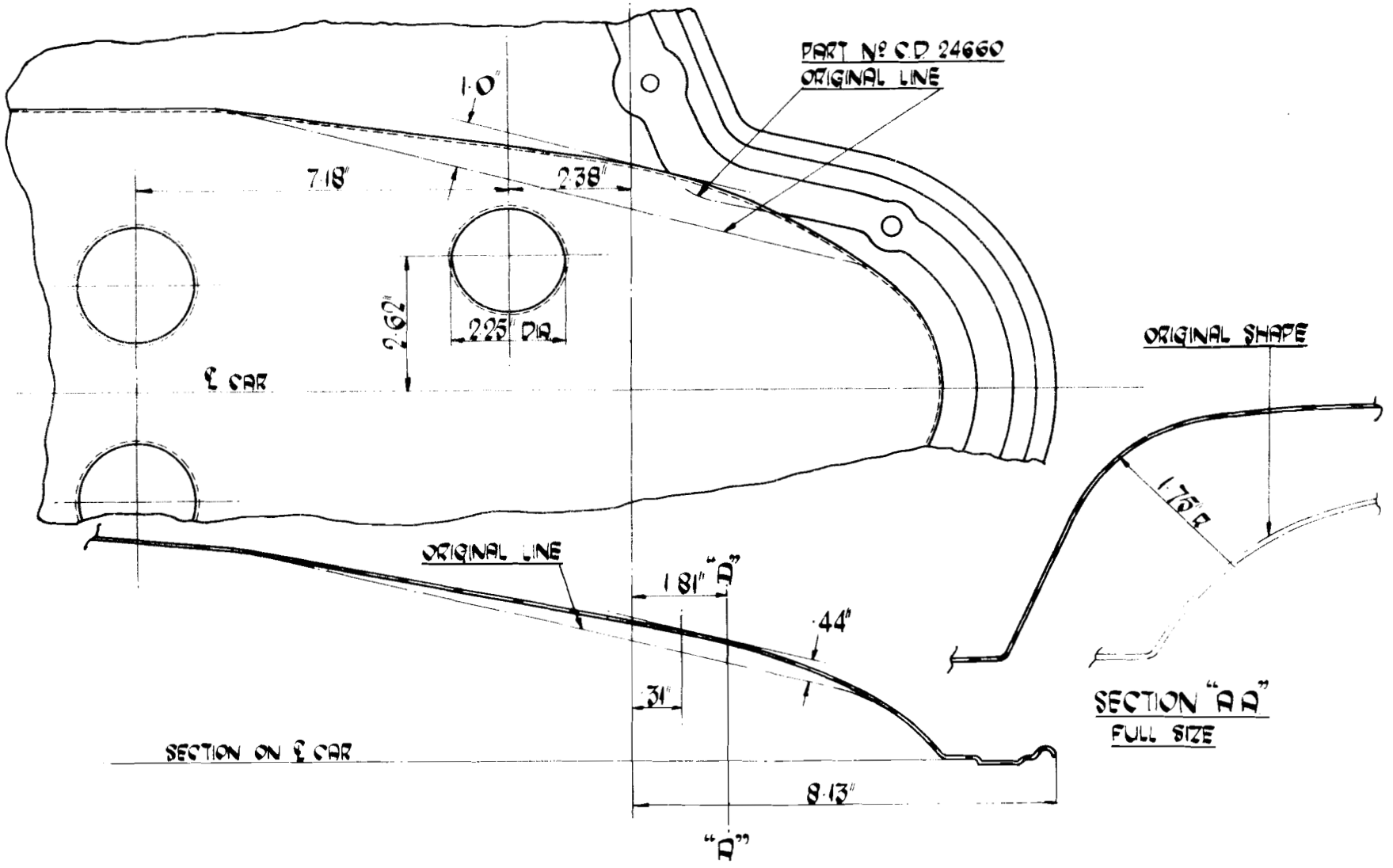

Fig. 7. Showing alteration to toe-board pressing over gearbox. This alteration is now included with all cars leaving the assembly lines.

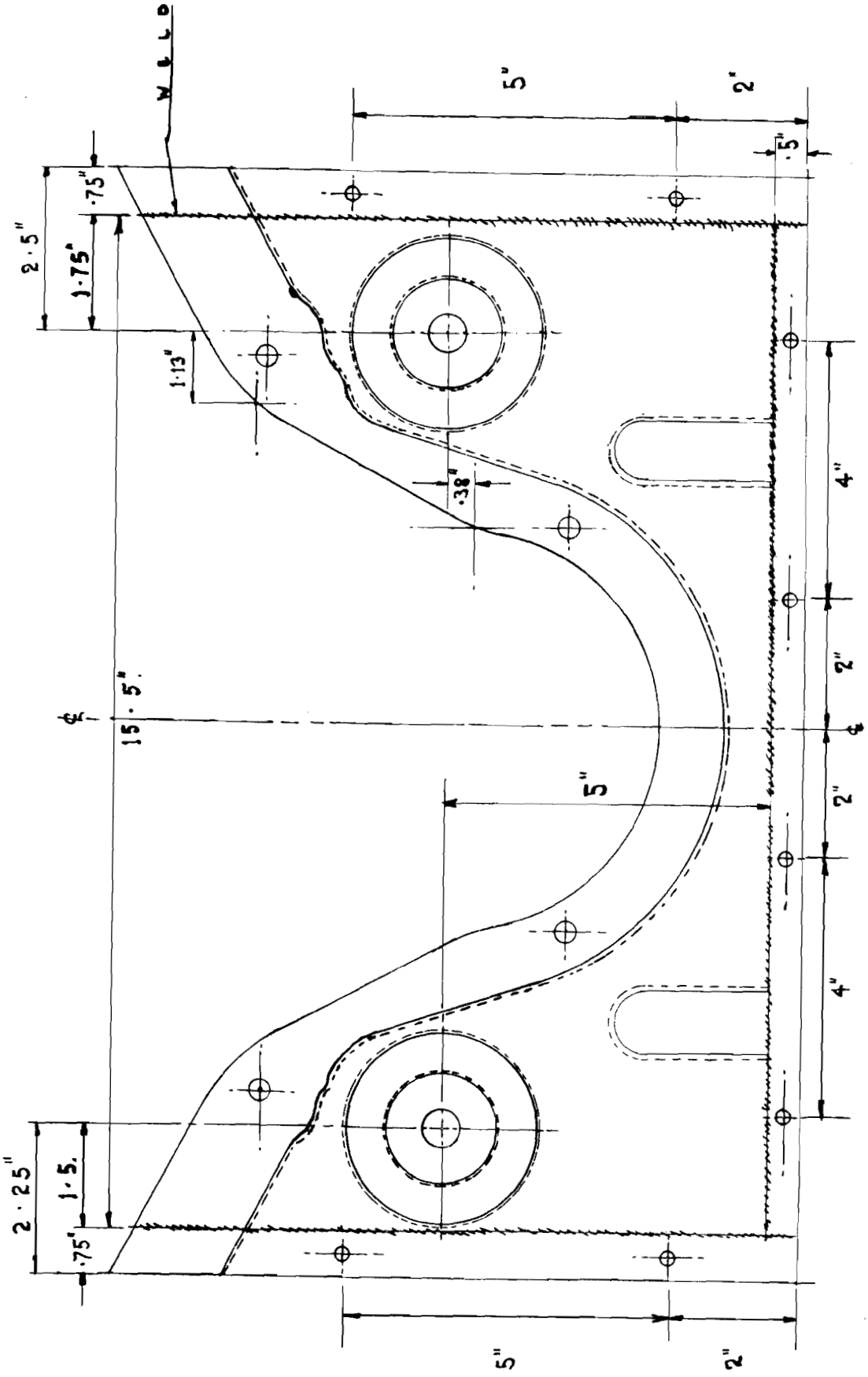

Fig. 8. Description of alterations to floor for fitting Overdrive Unit.

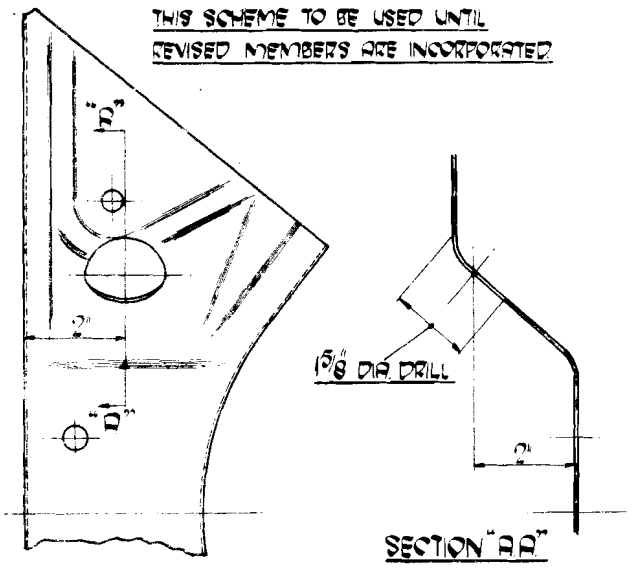

Fig. 9. Showing position of speedometer drive hole in chassis membe-. Chassis now being manufactured include this hole.

19. Refit detachable plate and secure to floor pressing and strengthening strap with $\frac{1}{4}$" N.F. countersunk screws and dished washers (plain washers may be used if dished type are not available).
20. Fit the new control spindle to the steering column top bracket and assemble hand lever.
21. Position hand lever to bring fork end against its stop, as shown in Fig. 10.
22. Rotate hand lever until it is in approximately 1st Gear position as shown in Fig. 10. In this position, move the whole top bracket assembly until a dimension of 1.$\frac{3}{8}$" to 1.$\frac{7}{16}$" is obtained between the gear lever knob and the rim of the steering wheel, as shown in illustration. Place the bracket in a vertical position and secure clamping bolt. Pass an elastic band round the steering wheel and hand lever to maintain position.
23. Remove reverse switch bracket and the dowel shown in Fig. 11 so that the overdrive selector shaft can be rotated.
24. Feed the intermediate bracket on to the steering column, passing the control shaft through the interlock lever (See Fig. 11). Insert taper pins and secure. Placing this assembly in a vertical plane tap it into position until there is a clearance of .010—.015" between the "Second" and "Top" quadrant and interlock key as shown in Fig. 11. Secure the clamping bolts shown in illustration.
25. Remove elastic band from the steering wheel and place the gear lever in its lowest neutral position.
26. Lead operating cable through supporting clip on clutch housing bolt and connect to bottom bracket, adjusting so that the inner nut is flush with the end of the cable as shown in Fig. 12 and leave the outer nut slack.
27. Feed the bracket and cable on to the Steering Column passing the control shaft through its plunger assembly (see Fig. 12.) Screw inner cable into the overdrive selector shaft until the end of the cable is flush with the face of the selector shaft marked X, as shown in illustration.
28. Fit clamping bracket to bottom bracket and move bracket until the plunger enters the dimple on the lower face of the interlock lever and the circlip just touches the bracket, as shown in Fig. 12. Any space between the circlip and this bracket indicates excessive spring pressure. Tighten up the clamping bracket in such a way that the control shaft moves freely up and down the column. Replace selector dowel and lock up cable outer nut shown in illustration. It is important that the overdrive selector shaft should now move freely.
29. Fit steering column stay rod to chassis bracket and adjust nuts at the upper end,

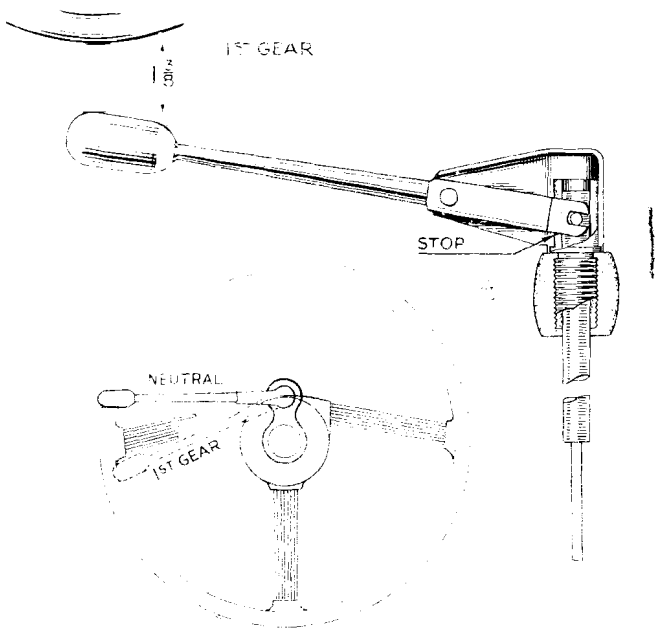

Fig. 10. Position of change-speed lever when setting intermediate bracket's position.

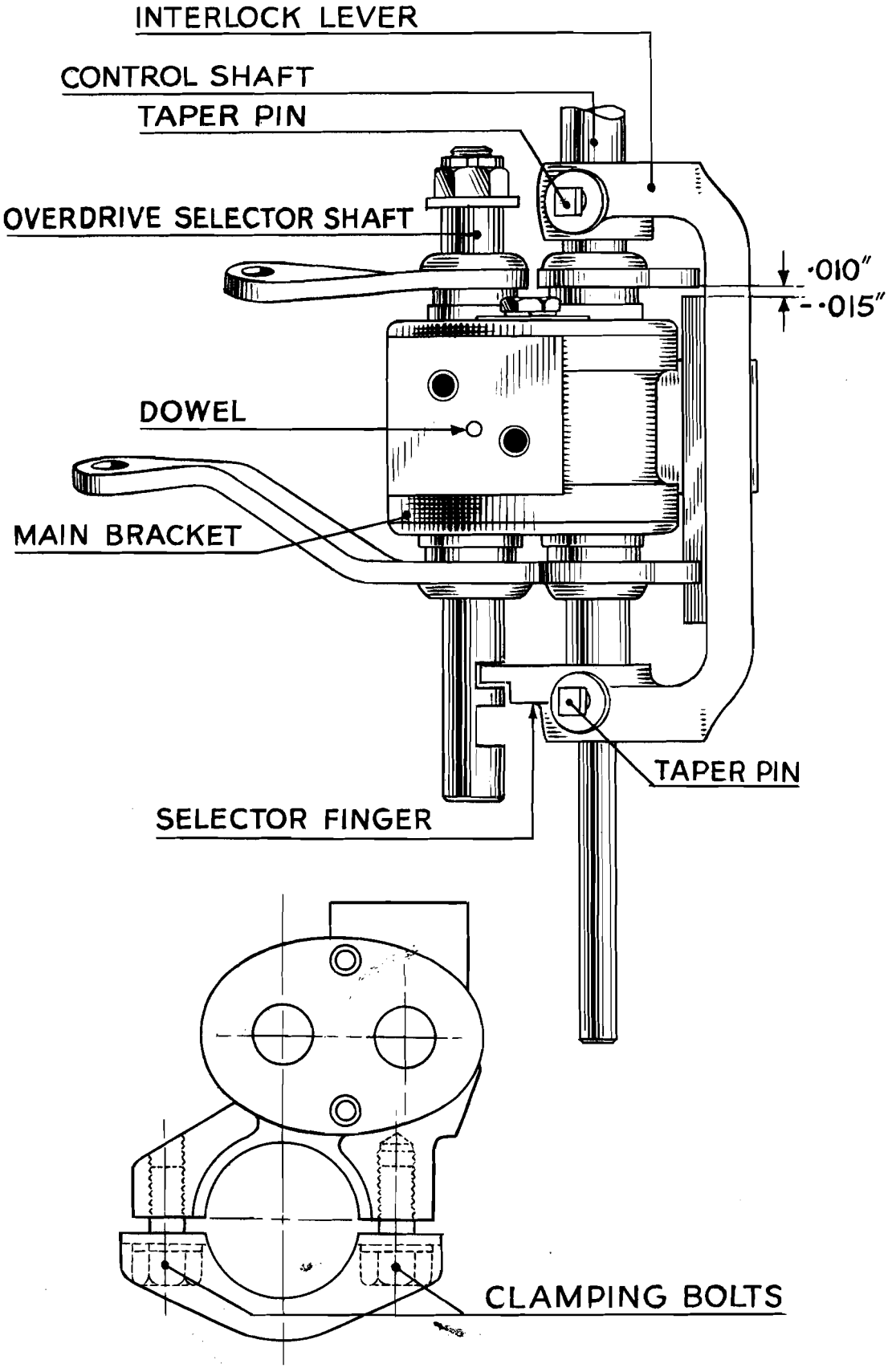

Fig. 11. Showing correct clearance on interlock lever spline with hand lever held (as shown in Fig. 10).

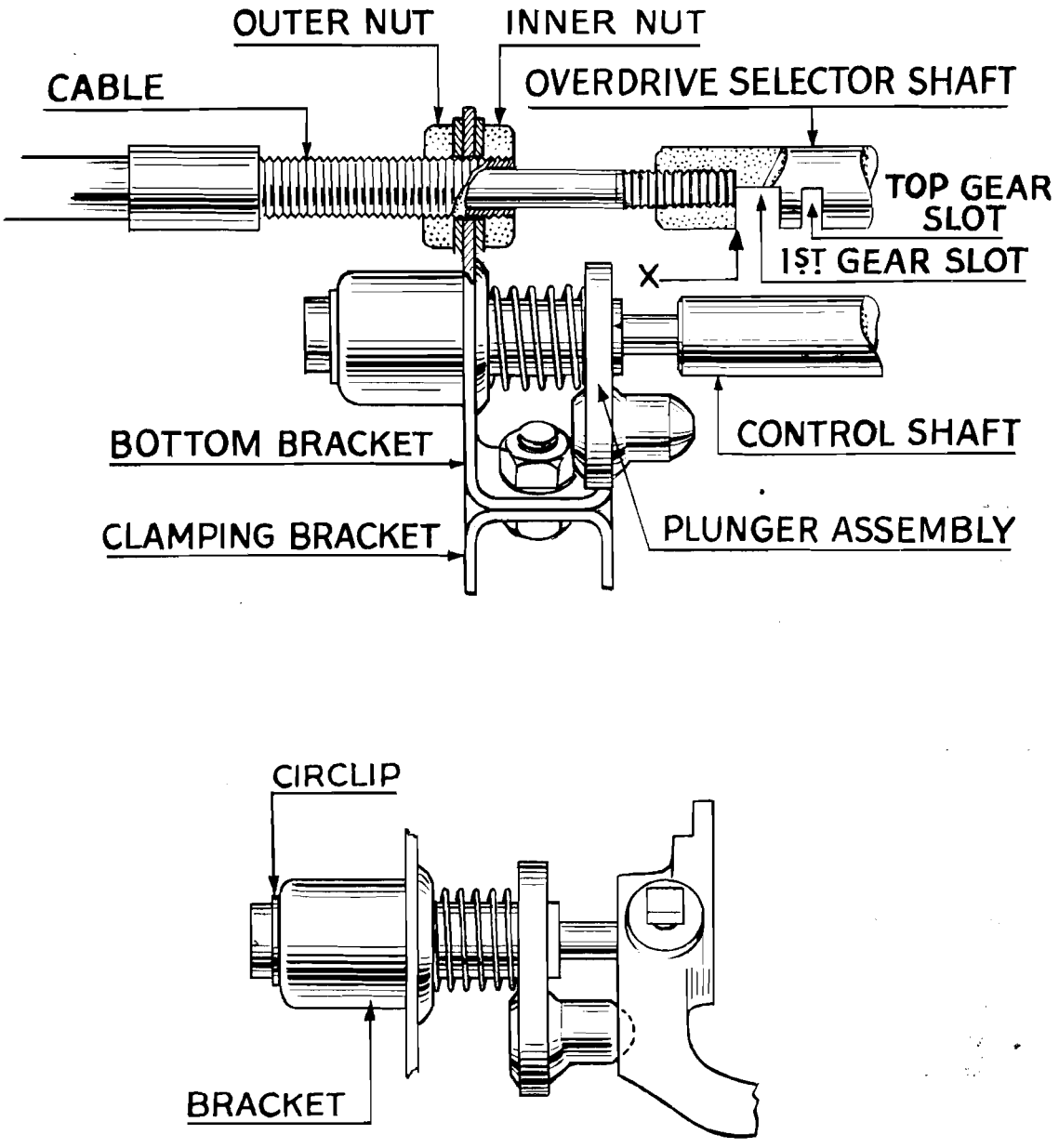

Fig. 12. Showing correct attachment of overdrive cable to selector shaft (R.H.S.).

but without placing any strain on the steering column.

30. Fit " Top " and " Second " gear shift rod and adjust length so that the gear lever assumes a horizontal position.
31. Fit " First " and " Reverse " gear shift rod and adjust its length so that the gear lever moves freely through the gate to its horizontal position.
32. Move Overdrive Selector Shaft so that the " Top " Gear cut-out is aligned with the finger on the selector lever, as illustrated in Fig. 11 and then engage " Top " Gear by moving the hand lever.
33. Move the control lever on the overdrive unit until it reaches the top stop on its abutment bracket. Fig. 5 shows this lever against the bottom stop on the abutment. Feed in overdrive cable and adjust nuts. Fit cable support clip on convenient housing bolt.
34. Move hand lever into the overdrive position (raised upwards as far as it will go in " Top " Gear position). The control lever on the

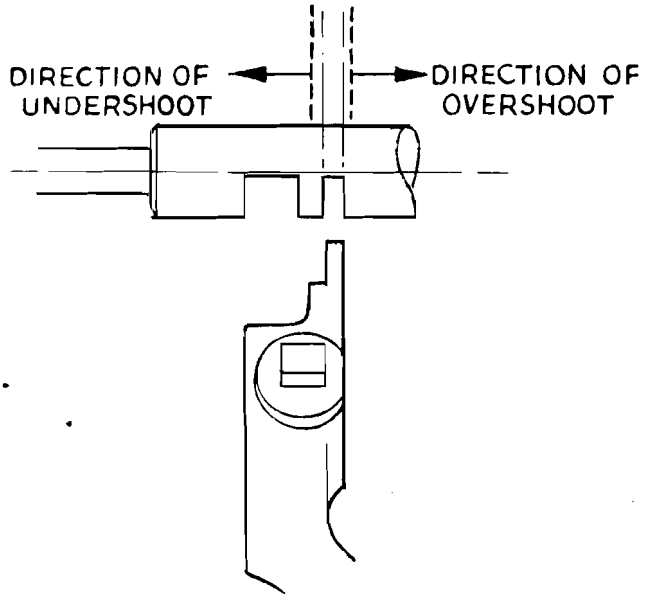

Fig. 13. Showing the correct method of accommodating back lash in cable operation.

side of the overdrive unit should now be against the bottom stop on the abutment bracket. A check should now be made by passing a piece of $\frac{3}{16}$" dia. bar through the hole in the small lever, adjacent to the control lever, and into the casting. Alignment of these $\frac{3}{16}$" dia. holes ensures correct valve lift. Withdraw bar.

15. Owing to the necessity for a clearance between the inner and outer cables, a slight amount of backlash will be noticed in the overdrive selector shaft. The cable should therefore be adjusted in such a way that the selector shaft overshoots and undershoots the finger on the interlock lever by an equal amount, as shown in Fig. 13.

Left Hand Steering Models.

Proceed as instructed above, up to and including Operation 3 under " Modification of Gear Shift Mechanism and Preparation of Overdrive Unit " and then continue as follows :—

1. Remove the two bolts marked X in Fig. 14, and assemble abutment bracket as shown under the two bolts marked X and the nut marked Y.
2. Fit the two selector flanges supplied with the Overdrive Unit utilizing the special bolts marked Z in Fig. 14.
3. Proceed as directed above, under " Modifications to Gear Shift Mechanism " etc., in operations 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 (regarding different positon of hand lever relative to Steering Column), 22.
4. Feed the intermediate bracket on to and along the steering column until a clearance of .010"—.015" is obtained as shown in Fig. 15. Set the bracket in a vertical position and tighten clamp bolts.
5. Slide the overdrive selector shaft (see Fig. 16) into its innermost position in the bottom bracket and screw the inner portion of the control cable into this shaft approximately $\frac{1}{2}$".
6. Screw the outer cable of the control into the bottom bracket (Fig. 17) until it just begins to move the Selector Shaft outwards. Leave the lock nut slack.
7. Feed the bottom bracket on to the steering column threading the control shaft (Fig. 16) through the plunger assembly.
8. Fit the bottom clamping bracket (Fig. 16) loosely and tap bracket upwards until the plunger just enters the dimple on the lower face of the interlock lever and the circlip just touches the bracket (see Fig. 16). Any space between the circlip and the bracket indicates too much spring pressure.
9. Fit " Top " and " Second " Gear Coupling Rod and adjust length so that the hand lever assumes a horizontal position.
10. Fit " First " and " Reverse " Gear shift Rod and adjust length so that the gear lever moves freely through the gate and assumes a horizontal position.
11. Move the overdrive selector shaft until the small cut-out is opposite to the finger on the interlock lever. Engage " Top " Gear and move the gear shift lever into the Overdrive position.
12. Screw the outer cable into the bottom bracket Fig. 17, until the end of this cable butts against the end of the overdrive selector shaft, in which position the outer cable acts as a stop for selector shaft. Tighten lock nut and move the gear shift into " Top " Gear. Fit cable supporting clip on convenient clutch housing bolt, open eye and pass over cable.
13. Move the control lever on the side of the overdrive unit against the top stop on its abutment bracket. Feed in the overdrive cable and adjust nuts.
14. Move the hand lever into the overdrive position (upward from normal top position).

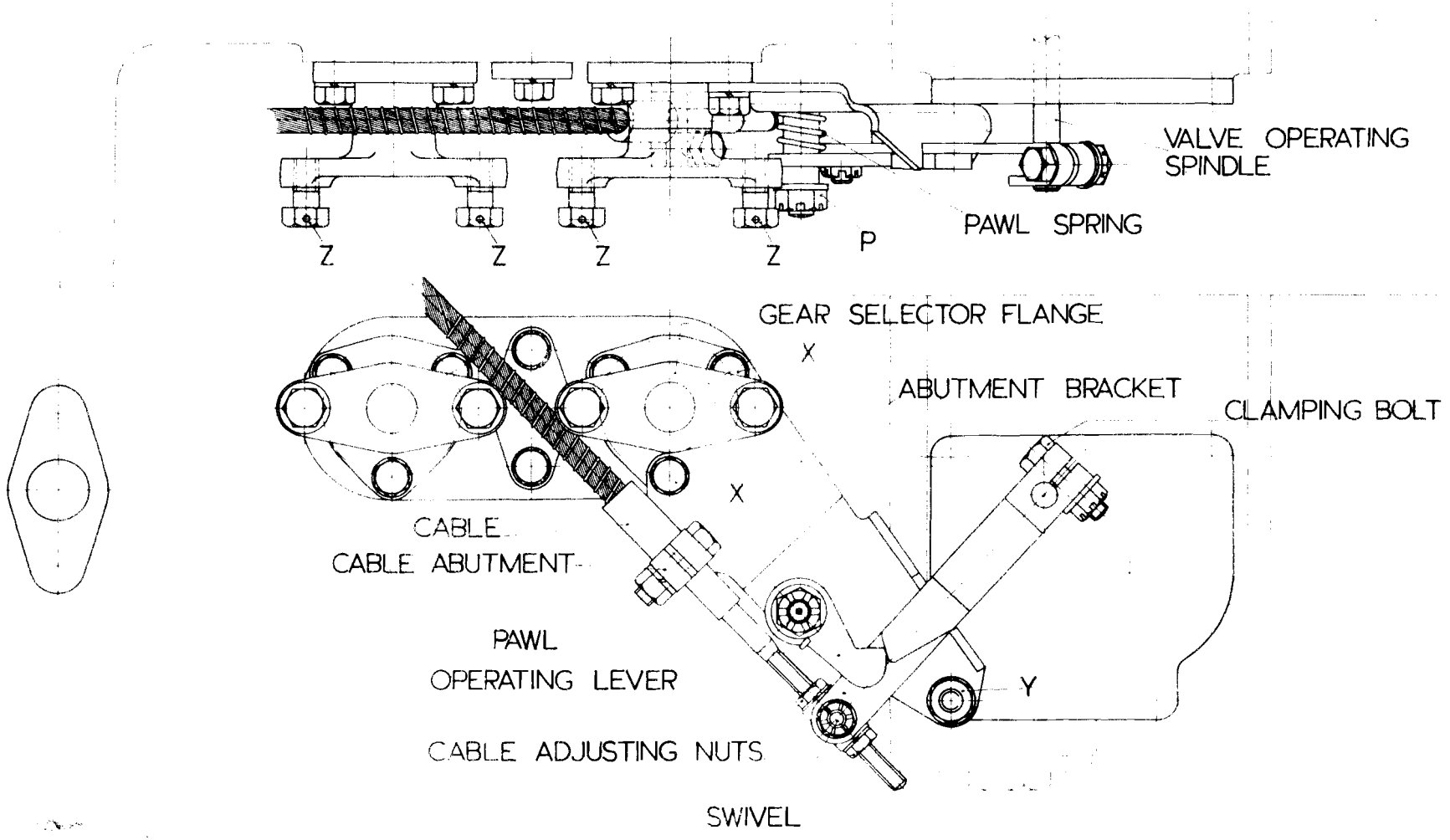

Fig. 14. Showing attachment of overdrive cable, lever and abutment to gearbox (L.H.S.).

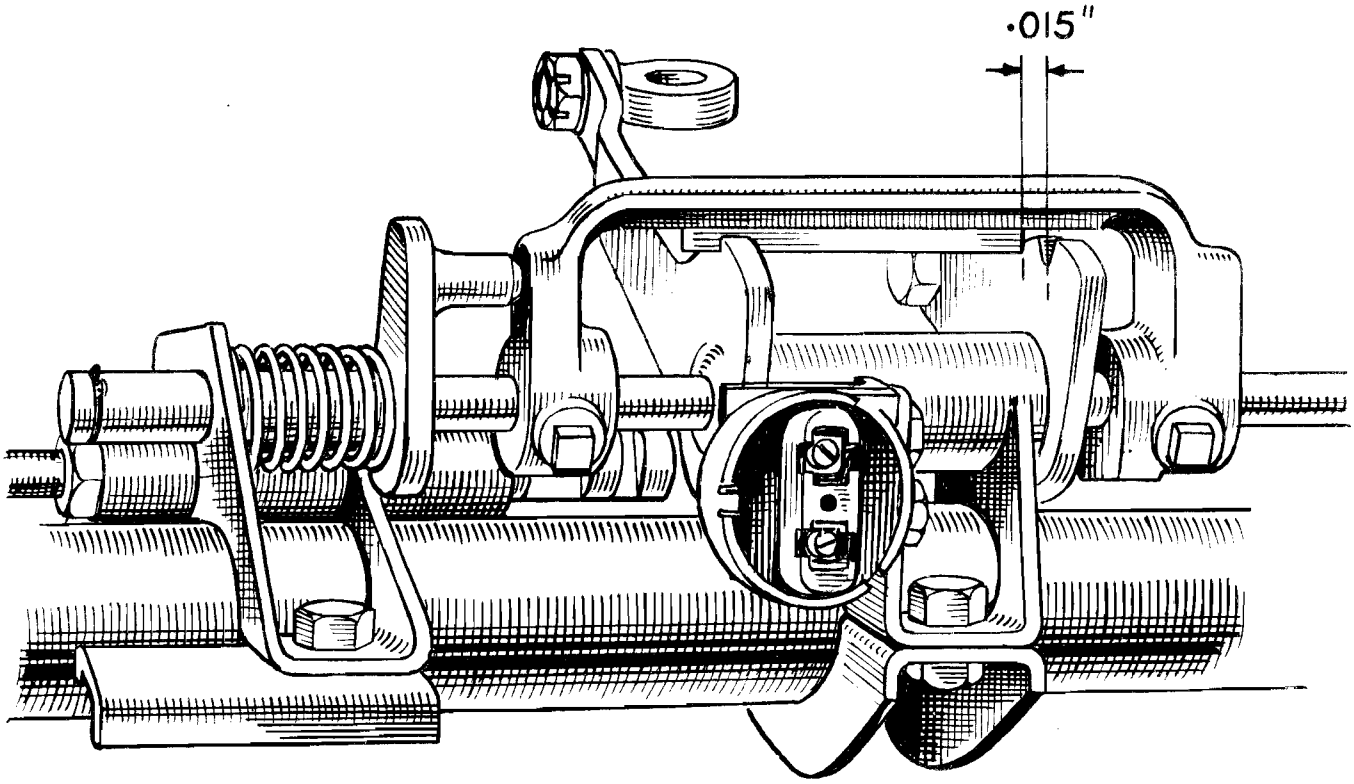

Fig. 15. **Correct clearance between interlock spline and quadrant, with change-speed lever held as shown in Fig. 10.**

In this position of the hand lever the control arm on the overdrive unit should be against the bottom abutment stop and the $\frac{3}{16}$" dia. hole on the checking lever aligned with the hole in the casting (see Fig. 5). Check the alignment of these holes. The correct alignment of these holes ensures correct operating valve lift in overdrive unit.

Triumph Renown Models.

It is not possible to fit an Overdrive Unit to Triumph Models earlier than the "Renown" Model owing to the construction of this chassis.

Where it is wished to fit an Overdrive Unit to a "Renown" the instructions given for the Left Hand Steering Models, with certain reservations set out below, should be followed. The following differences in procedure should be noted :—

1. There will be no necessity to cut the floor boards nor to drill the chassis cross member to receive the speedometer drive.
2. The cross member must be modified as indicated in Fig. 18 and the floor board brackets changed and re-located as shown in this illustration. These alterations have now been introduced in normal production.

POSSIBLE DEFECTS IN OPERATION OF OVERDRIVE UNIT.

Locked in First Gear.

This may be explained by :—

(a) Due to plunger leaving the lower face of the interlock lever.

(b) The bottom bracket incorrectly aligned, thus improperly positioning plunger in relation to dimple.

(c) The plunger assembly fouling the key on the bottom bracket.

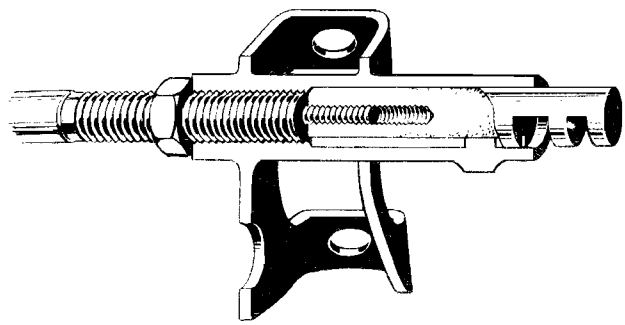

Fig. 17. **Attachment of Overdrive cable to selector shaft (L.H.S.).**

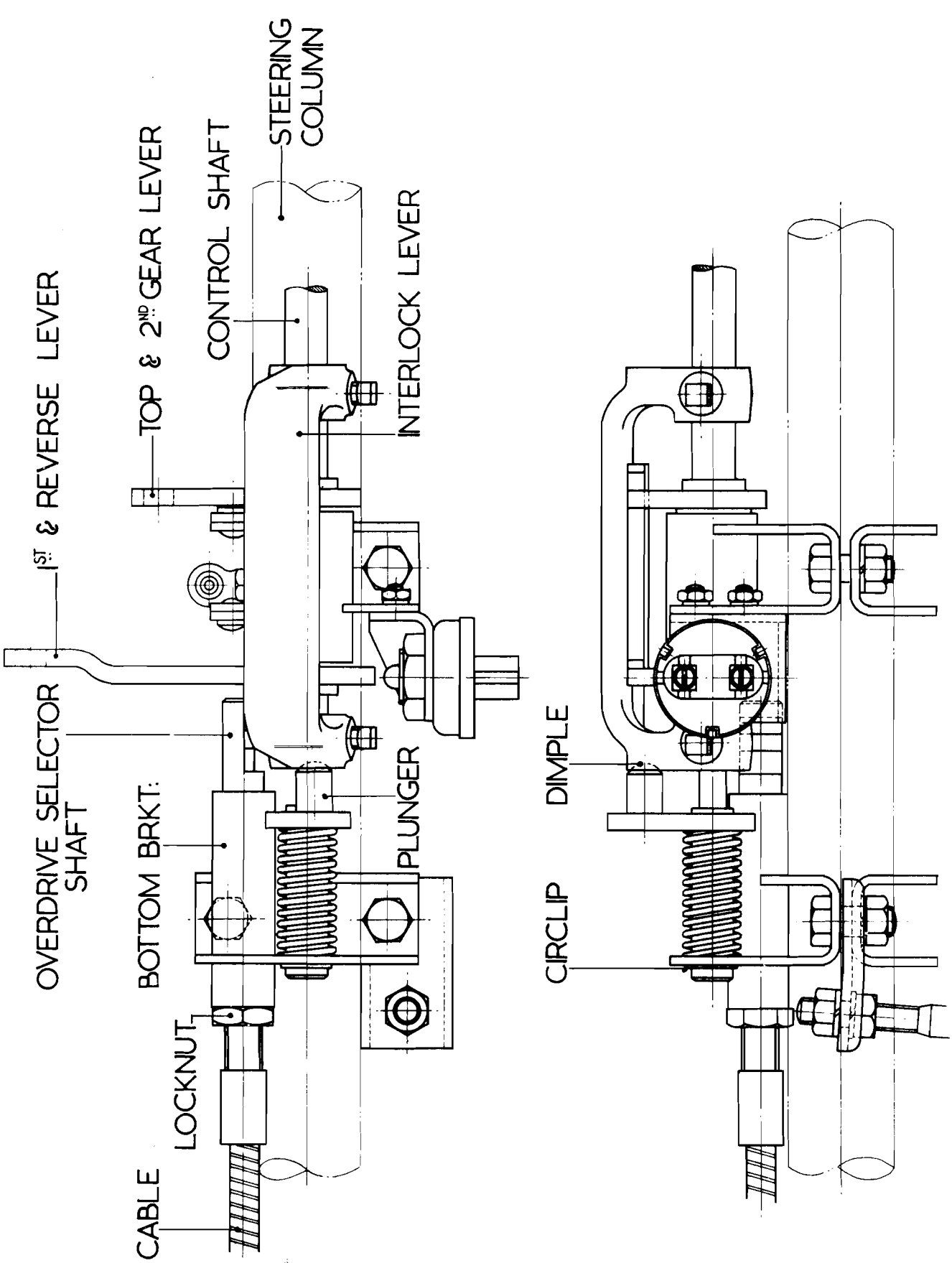

Fig. 16. Showing interlock and plunger assembly for L.H. steering models.

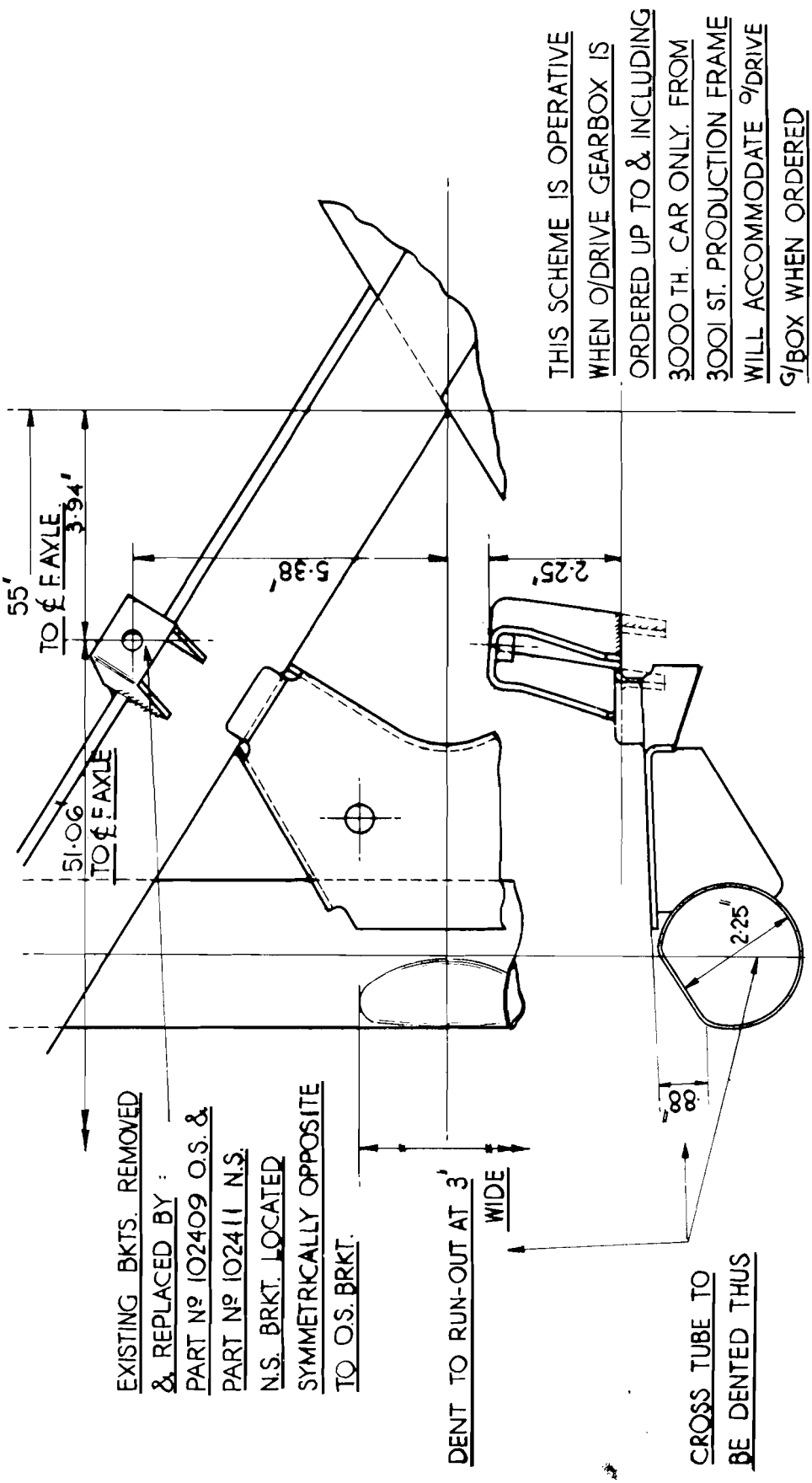

Fig. 18. Showing alteration which may be required on "Renown" chassis.

Unable to engage " Top " Gear.

(a) Cable improperly adjusted.
(b) The finger on the interlock lever rubbing against the overdrive selector shaft and moving the slots out of position. This is caused by insufficient clearance in " Neutral " between finger and the Selector Shaft.
(c) Bad cable run allowing the engine " rock " to move the inner cable.

Unable to engage " Top " or " Second " Gear.

(a) Due to " First " and " Reverse " operating rod having been adjusted too short, The interlock lever is thus unable to return to " Neutral."

Gradually working out of Overdrive.

(a) Due to insufficient spring pressure on pawl.
(b) Bad Cable run.

Gradually working into Overdrive.

(a) Insufficient pawl spring pressure.

No Spring Pressure in Neutral.

(a) Disengagement of plunger from dimple in interlock lever.

Difficult to pass through neutral.

(a) Incorrectly adjusted rods.
(b) Brackets misaligned.
(c) Steering Stay Rod too tight and bending steering column.

Stiffness in Overdrive Control.

(a) Bottom Cable Abutment misaligned.
(b) Cable and pawl require lubrication.