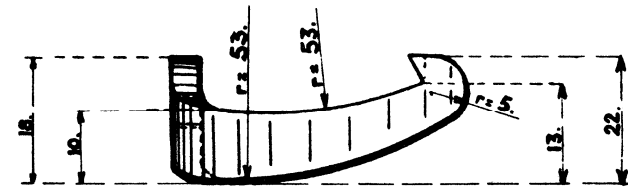
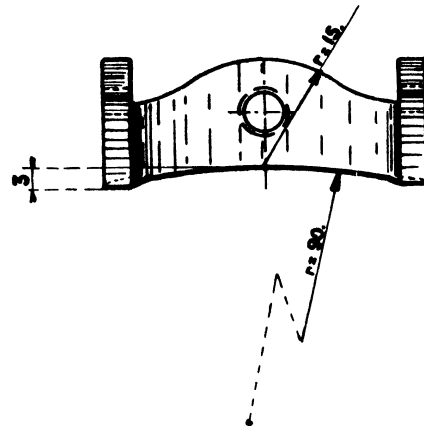
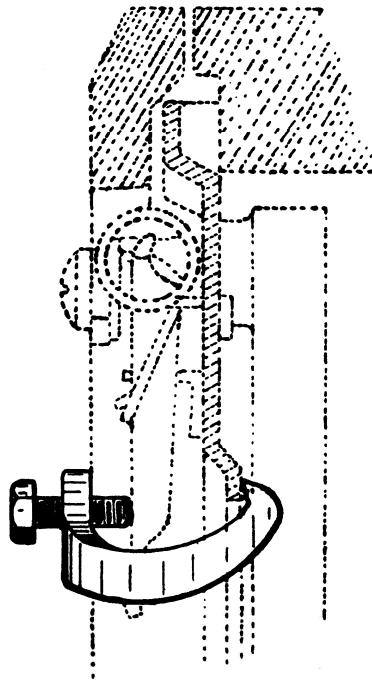


— CLUTCH —  
— REMOVING AND FITTING —

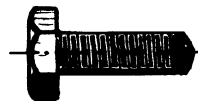
CLAMP MR. 3451

Mild Steel 3,5mm. to 4mm. thick

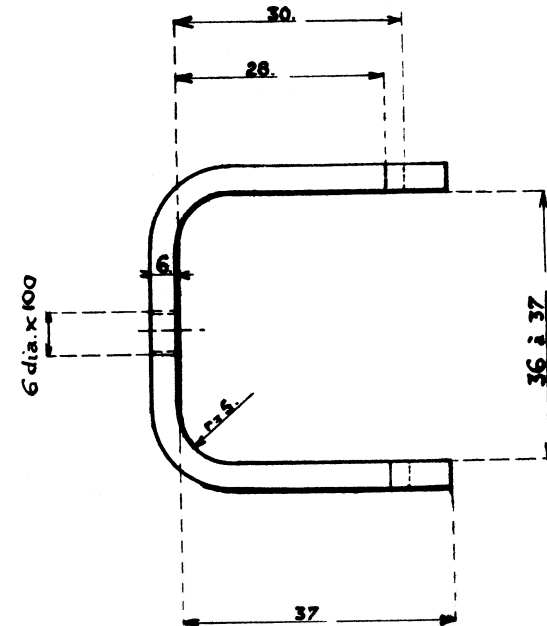
USE OF CLAMP  
MR. 3451



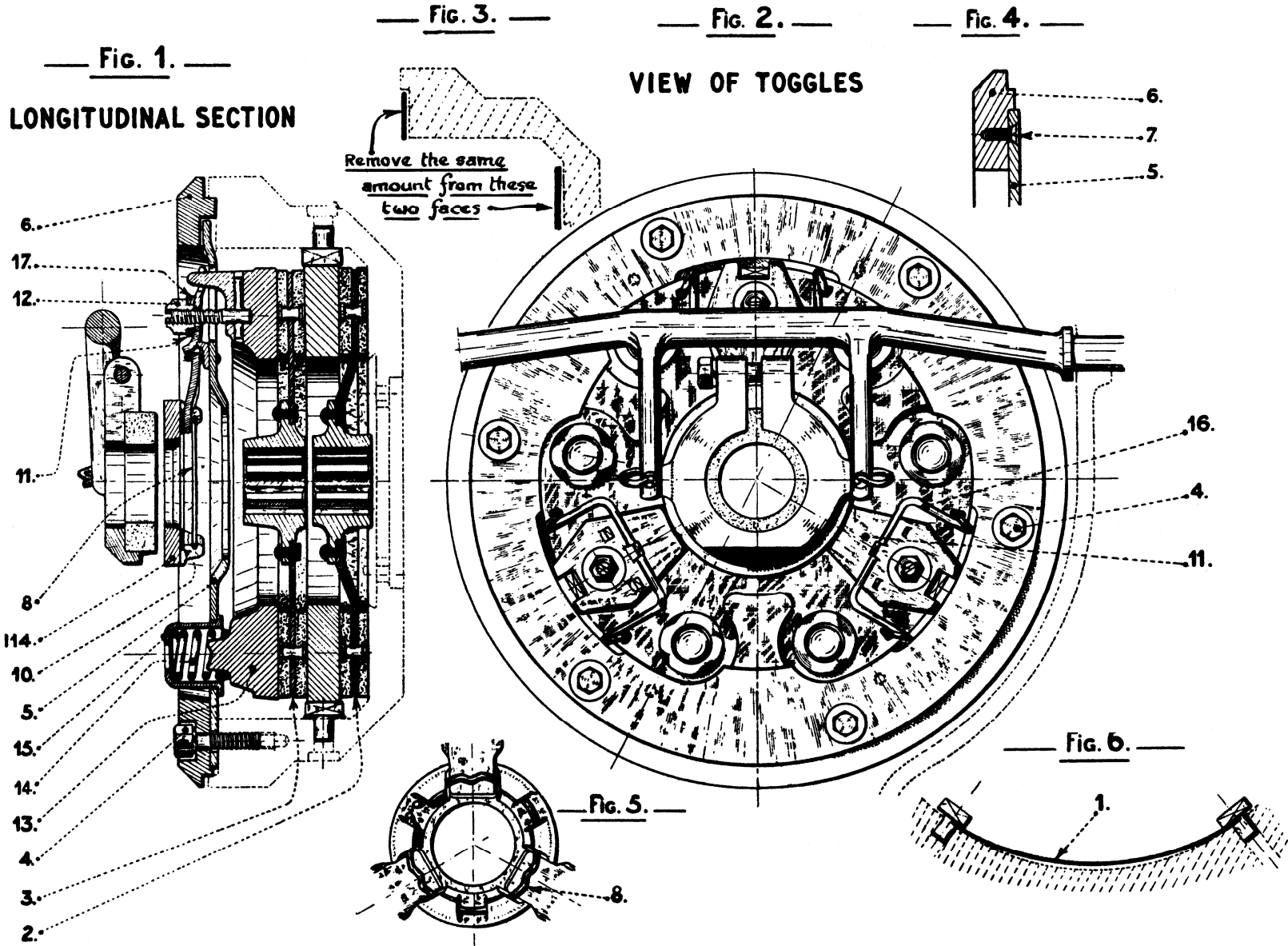
Three clamps and three screws  
are required for one set



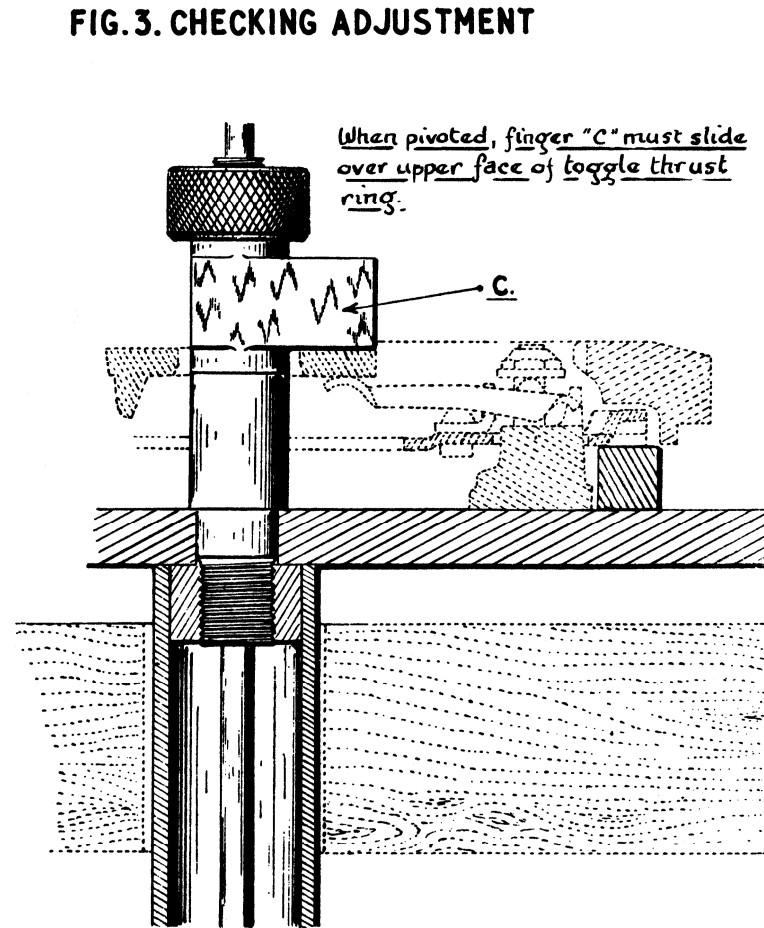
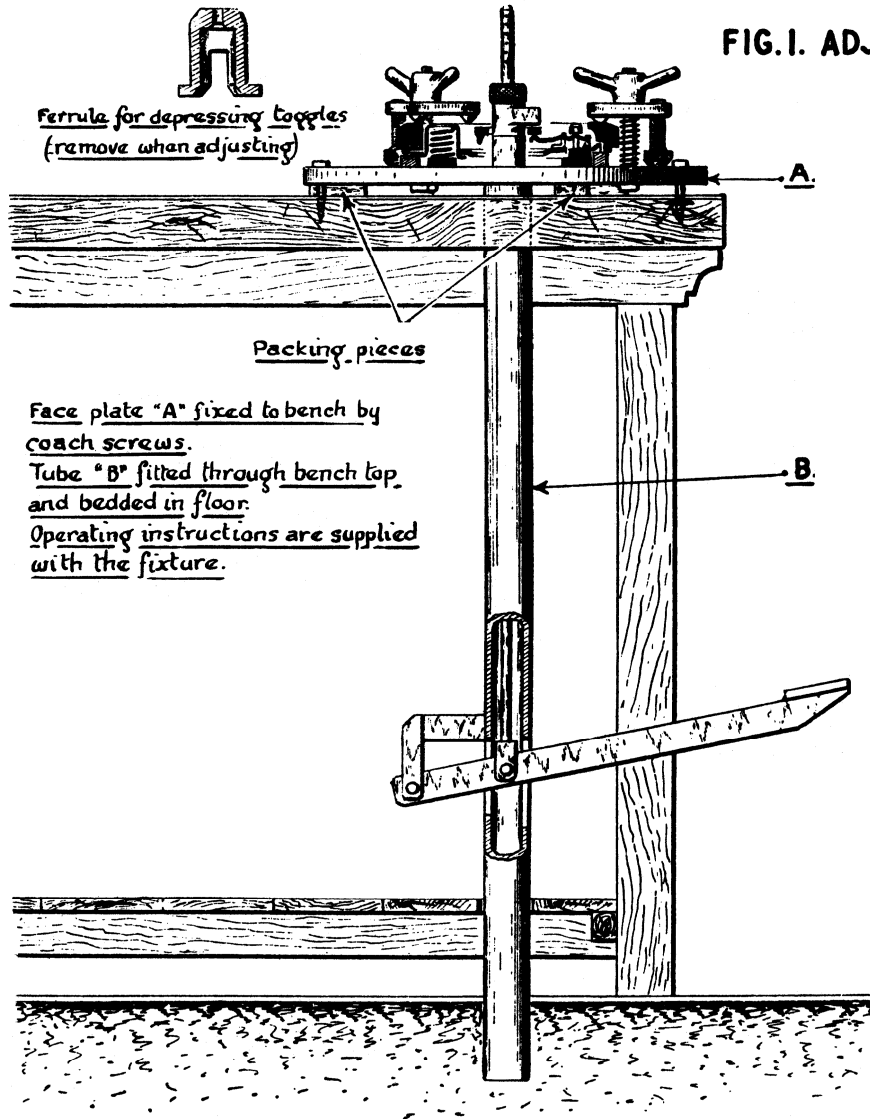
Screw, 6 dia. x 100 pitch, 20 long



# CLUTCH ASSEMBLY



# CLUTCH CLUTCH ADJUSTMENT



CLUTCH  
ASSEMBLY

FIG. 1. LONGITUDINAL SECTION

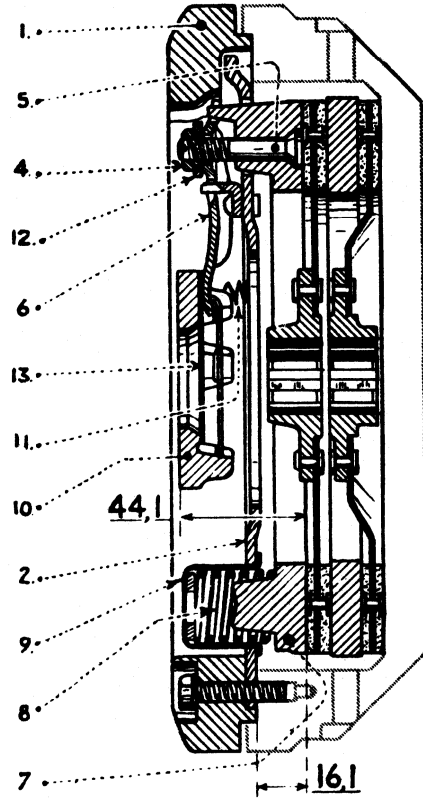


FIG. 2. VIEW OF TOGGLES

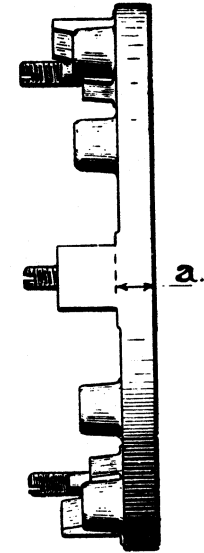
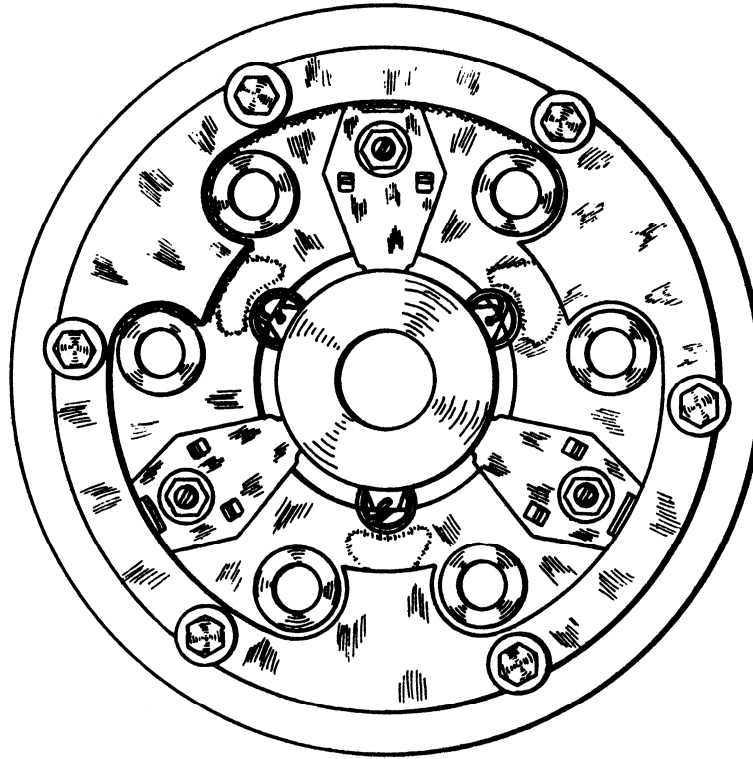
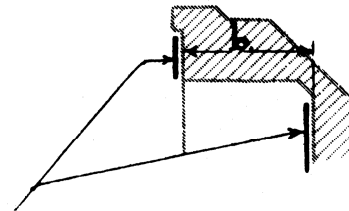


FIG. 3.



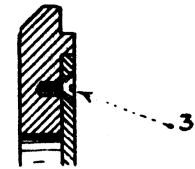
The outer face of the slot for the fulcrum bracket must be chamfered.

FIG. 4.



Remove the same amount from both faces.

FIG. 5.

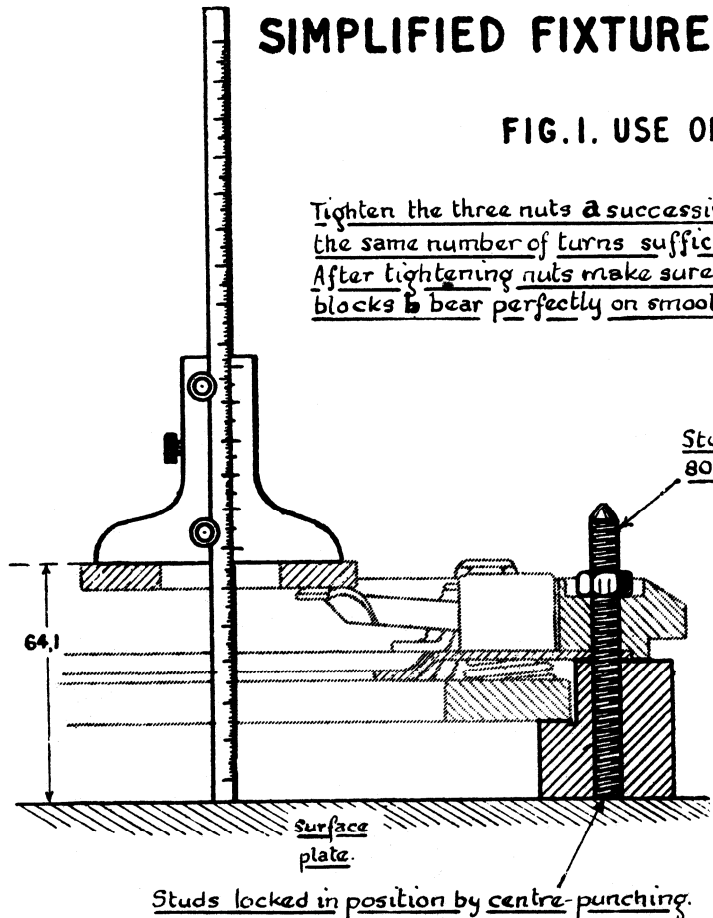


— CLUTCH —

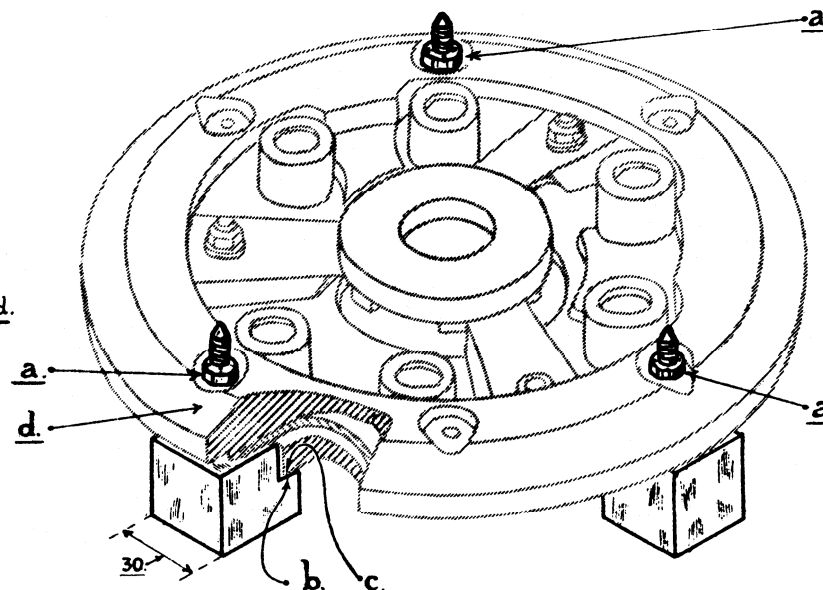
SIMPLIFIED FIXTURE FOR CLUTCH TOGGLE ADJUSTMENT —

FIG. 1. USE OF FIXTURE

Tighten the three nuts **a** successively and with the same number of turns sufficiently to lock.  
After tightening nuts make sure that the blocks **b** bear perfectly on smooth surface **c**.



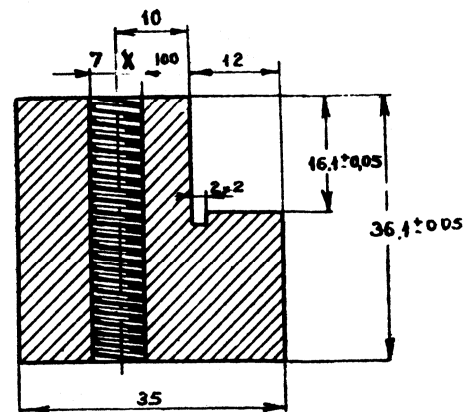
Studs 7 dia., 100 pitch,  
80 long. Ends pointed.



— Fig. 2. — BLOCKS MR. 3457-7

For adjustment the clutch is assembled with the auxiliary flywheel **d**.

3 off.



REMOVING CLUTCH (see Drawings 122 and 126)

- 1 Drain water from radiator. Meanwhile remove the bonnet.
- 2 Remove radiator shell and radiator lower shield.
- 3 Disconnect right and left hand side brackets from radiator. Slacken the bolts fixing brackets to engine suspension tube in order to disengage radiator. Remove lower radiator hose and disconnect upper radiator hose. Remove 'U' bolts fixing radiator to bumper bracket spacing bar. Remove the radiator.
- 4 Remove dynamo without disconnecting leads and place it on right of engine.
- 5 Remove clutch housing cover. Remove front bearing cap (201).  
NOTE. DO NOT DISPERSE ADJUSTING SHIMS (202). Take out circlip (203) retaining spring, with the aid of round nose pliers. Disengage mainshaft (204) by pulling forwards.
- 6 Unhook return spring (210). Take out clutch fork and thrust race assembly.
- 7 Fit clamps to retain clutch toggles. (Use clamps MR.3451, see Drawing 26). Take out the clutch. (Before removing, ascertain the position of the clutch, this being indicated by either a letter or figure. If there is no indication, mark the position of the clutch so that it can be reassembled in the same location and so preserve the balance determined during manufacture.) Take out clutch discs and intermediate pressure plate.

Box spanners 10-12  
Flat spanners 12-14

Box spanner 12  
Universal joint spanner with extension 16  
Flat spanner 17

Brace spanner with extension 12

Clamps MR.3451  
Universal joint spanner 12

REFITTING CLUTCH

- 8 FIT THE CLUTCH (see Drawings 27 and 122)
  - (a) Make sure that the thrust faces of the flywheel, intermediate pressure plate, and clutch plate are in perfect condition. Ensure that the intermediate pressure plate slides freely between the flywheel driving studs. Mark the position giving the best result for re-assembling.
  - (b) Fit clamps to retain toggles. (Use clamps MR.3451. see Drawing 26). Fit pressure plate retaining spring (1) between two flywheel driving studs (see fig. 6).

Fit offset clutch disc (2) in flywheel, positioned as indicated in fig. 1. Fit intermediate pressure plate in position already determined (see paragraph 8a), fit flat clutch plate (3) also according to position indicated in fig.1. Engage a mandrel or spare gearbox mainshaft in order to locate the clutch discs in relation to the crankshaft bearing. Fit the clutch pressure plate assembly by lining up markings on pressure plate and flywheel. Tighten bolts (4), fitted with

Clamps MR.3451  
Shouldered mandrel small dia. 17, length 25,  
large dia. 21, length 300  
Brace spanner 12

spring washers under heads, to a tension of 2 mkg., plus 0.250 mkg., minus 0 mkg. (14½ foot pounds, plus 1¾ foot pounds, minus 0 foot pounds). During tightening make sure that the mandrel (or mainshaft) slides freely, and thus indicates correct centering of discs. Remove mandrel and take off clamps MR.3451.	
9 Fit clutch fork and thrust race assembly WITH THE GRAPHITE BUSH FACING THE TOGGLE THRUST RING. Place the end of the double lever on the clutch fork shaft in front of the outer gear lock control lever.	
10 Fit the gearbox mainshaft and turn by hand to engage splines. With the aid of round nose pliers fit circlip (203) for spring retaining mainshaft.	
11 Fit clutch housing cover. Coat the threads of the three forward fixing screws and the flange face in the corresponding zone with Hermetical. Fit spring washers under heads of bolts, and tighten. MAKE CERTAIN, THAT AFTER TIGHTENING, CLUTCH FORK SHAFT TURNS FREELY.	Universal joint spanner 17
12 Fit front bearing cap (201), AFTER REPLACING SHIMS (202) TAKEN OUT DURING DISMANTLING, Coat paper gaskets with Hermetical and tighten bolts.	Brace spanner with extension 12
13 ADJUST CLUTCH OPERATION (see Drawing 126) (a) Bring clutch fork thrust ring (206) into contact with toggle thrust ring (205) and keep in this position with the clutch fork.  (b) Turn the adjusting screw (207) to obtain a clearance 'a' of 27 mm., plus or minus 1 mm., between the end of the double lever (208) and the stop on plate (209). Tighten lock nut of adjusting screw (207). Hook on return spring (210).	Flat spanner 17
14 Fit the dynamo. Tighten nuts, each fitted with a plain and a spring washer. Adjust tension of driving belt.	
15 Fit the radiator and, after locating in relation with the starting handle sleeve, tighten up fixing. Fit radiator hoses and tighten clips.	
16 Fill radiator with water.	
17 Fit radiator shell and adjust wing piping.	Flat spanners 12-14 Box spanner 10
18 Fit the bonnet.	

## DISMANTLING CLUTCH (see Drawing 120A)

- 1 Uncouple auxiliary flywheel (1) from clutch carrier plate (2) by removing the four bolts (3) (see fig. 5).
- 2 With a hack saw remove metal from the nuts (4) punched into slots of toggle bolts (5). Remove clutch toggles (6) by unscrewing adjusting nuts (4),
- 3 Remove clutch pressure plate (10), springs (8), and cups (9).
- 4 Remove thrust ring (10) from toggles by unhooking springs (11) from the carrier plate and toggles. Remove toggle thrust ring plate (13).

## ASSEMBLING CLUTCH (see Drawing 120A).

- 5 True up surface of clutch plate (7) in a lathe. (It is preferable to use a grinding attachment but the work can be carried out with a finishing tool).

NOTE. 1. Any metal removed from the pressure surface causes a decrease in pressure from the clutch springs. Consequently shims, corresponding in thickness to the amount of metal removed, must be fitted under the springs. On a new plate the dimension at 'a' is 11 mm., minus 0.3 mm., plus 0 mm.

2. CHECK THE DIAMETER OF THE HOLES IN THE PRESSURE PLATE FOR THE TOGGLE BOLTS (5). THESE SHOULD BE 8.6 mm. DIA.,  $\pm 0.1$  mm. IF HOLES ARE UNDERSIZE OPEN OUT WITH AN 8.5 mm. DIA REAMER.

- 6 True up the intermediate pressure plate in a Lathe.

NOTE. We advise against carrying out this operation however. It is essential that the two thrust faces be parallel (within 0.05 mm.) and that the slots for the driving studs be strictly square with the pressure surfaces. These conditions can only be obtained by using a special fixture. If the plate has been rectified, fit washers under the pressure springs equivalent in thickness to the amount of metal removed in order to maintain spring pressure. The original thickness of the plate is 10.5 mm., plus 0.1 mm., minus 0 mm.

- 7 True up engine flywheel (according to instructions in paragraph 5 for the clutch plate).

NOTE. When the flywheel pressure surface is machined in a lathe a corresponding amount of metal must be removed from the face of the flange which the auxiliary flywheel fits against (see fig. 4). Both surfaces must be machined at the same lathe setting in order to preserve the parallelism of both faces. Dimension 'B' must be 44.1 mm", plus 0.2 mm", minus 0 mm.

Box spanner 14



- 8 Carefully clean and polish with emery paper, the inner bore of the flywheel between driving pegs, and also the peg faces.  
This operation is necessary to ensure good sliding of the intermediate pressure plate in the flywheel.  
Offer up the pressure plate in the flywheel and select the position giving the best sliding. Mark this position for reference when finally assembling.
- 9 Check clutch springs. (Use spring testing apparatus 2420-T. see Drawing 11). IT IS NECESSARY ON THIS TYPE OF CAR TO USE ONLY SPRINGS PART NO. 491053 WHICH CARRY A BLACK IDENTIFICATION MARK. These springs have a free length of 44 mm., plus or minus 1 mm. and a length of 29.5 mm., under a load of 68 kg., plus or minus 2 kg. (150 lbs., plus or minus 4½ lbs.). In the absence of suitable checking apparatus the springs should be replaced at each dismantling of the clutch.
- IMPORTANT NOTE.  
TO PREVENT CLUTCH SLIP IT IS ABSOLUTELY ESSENTIAL TO USE ONLY MODIFIED TOGGLES (SOLD EXCLUSIVELY BY OUR SPARE PARTS DEPARTMENT). TO IDENTIFY THESE SEE DRAWING 120A, FIG. 3. IT IS EQUALLY IMPORTANT TO USE THE NEW TYPE CLUTCH CARRIER PLATE, that is to say, the carrier plate with square fulcrum brackets for the modified toggles (see Drawing 120A. fig. 1).
- 10 Hook return springs (11) on carrier plate, fit toggle thrust ring and hook on springs (11). Assemble auxiliary flywheel (1) and carrier plate (2). Tighten screws(3).  
Fit clutch springs (8) on pressure plate (7). Fit lf required on the springs, washers of the thickness established in paragraphs 5 and 6 and the spring cups (9). Offer up the auxiliary flywheel and carrier plate assembly on the springs. Put in place the toggles (6) and fit the plate (13) between toggle thrust ring and the toggles.
- 11 Offer up the whole assembly on an assembly and adjusting fixture. (Use the fixture 1701-T, see Drawing 28, fig, 1). Compress the assembly and fit on the toggle bolts the pivot washers (12). Tighten nuts (4) to bring the toggle thrust ring into contact with the central pivoting finger of the fixture (see Drawing 28, fig. 3). Under these conditions (clutch engaged with engine) the dimensions obtained are, 44.1 mm. between face of thrust ring and face of pressure plate, and 16.1 mm. between face of pressure plate and face of carrier plate (see Drawing 120A, fig.1). Lock the toggle bolt nuts by punching metal from nuts into slots of toggle bolts.  
NOTE. If fixture 1701-T is not available, it is possible to obtain the correct adjustment by using the simplified fixture MR.3457 (see Drawing I20B). It is necessary to ensure correct positioning of toggles. Before locking the adjusting nuts compress and then allow the toggles to return to the normal position. (Use a screw press or drilling machine).

Box spanner 14  
Fixture 1701-T  
Box spanner 14  
Fixture MR.3457

## IMPORTANT NOTE.

THE CLUTCH CAN ONLY BE ADJUSTED WHEN UNDER NORMAL OPERATING CONDITIONS. These conditions are obtained by using the fixtures shown on Drawings 28 and 120B. THE DIMENSIONS INDICATED CAN ONLY BE OBTAINED WITH THE AID OF THE FIXTURES.

When the clutch is not in one of the fixtures, THE TOGGLE THRUST RING MAY REST ON AN UNEVEN SURFACE AND ACCURATE DIMENSIONS WILL NOT BE OBTAINABLE.

Any attempt at adjusting the clutch must not be made when the unit is fitted to the engine.