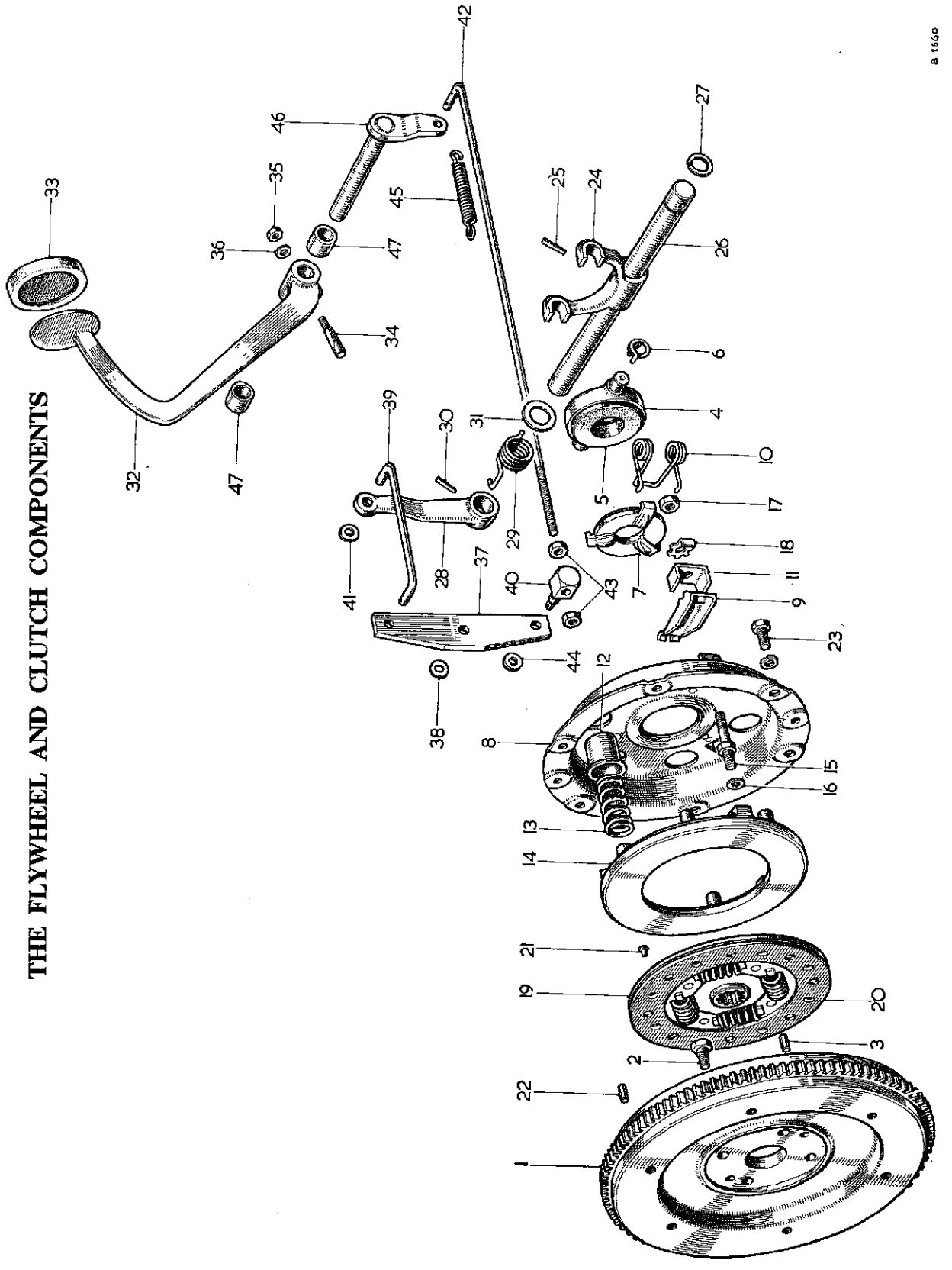
SECTION E

THE CLUTCH

OF THE MORRIS MINOR (Series MM)

Description and functioning.

THE FLYWHEEL AND CLUTCH COMPONENTS



KEY TO THE FLYWHEEL AND CLUTCH COMPONENTS

No.	*Description*
1.	Flywheel and starter ring assembly.
2.	Bolt—flywheel to crankshaft.
3.	Dowel pin.
4.	Thrust ring assembly.
5.	Carbon ring—thrust.
6.	Retainer—thrust ring.
7.	Plate—thrust.
8.	Cover-plate—clutch.
9.	Release lever—clutch.
10.	Retaining spring—release lever.
11.	Anchor plate—release lever
12.	Thimble—pressure plate thrust spring.
13.	Spring—pressure plate thrust.
14.	Pressure plate.
15.	Stud—pressure plate.
16.	Lock washer—stud to plate.
17.	Nut—stud.
18.	Lock washer—stud nut.
19.	Plate—driven (assembly).
20.	Lining—clutch plate.
21.	Rivet—lining.
22.	Dowel—clutch to flywheel.
23.	Bolt—clutch to flywheel.
24.	Fork—clutch withdrawal.
25.	Taper pin—fork retaining.
26.	Shaft—withdrawal fork.
27.	Circlip—fork shaft.
28.	Lever—clutch withdrawal.
29.	Spring—clutch withdrawal lever.
30.	Taper pin—clutch withdrawal lever retaining.
31.	Washer—clutch withdrawal lever.
32.	Pedal—clutch.
33.	Pad—clutch pedal.
34.	Cotter—pedal retaining.
35.	Nut—pedal retaining cotter.
36.	Washer—pedal retaining cotter.
37.	Lever—clutch relay.
38.	Washer—anti-rattle—relay lever.
39.	Link—relay to clutch lever.
40.	Trunnion—rod to relay lever.
41.	Washer—anti-rattle—lever linkage.
42.	Connecting rod—pedal to relay lever.
43.	Locknut—rod to trunnion.
44.	Washer—trunnion to lever.
45.	Spring—pedal return.
46.	Shaft—clutch and brake pedal.
47.	Bush—pedal shaft to frame.

GENERAL DESCRIPTION

The clutch is of the single-plate dry-disc type, no adjustment for wear being provided in the clutch itself. Individual adjustment is provided for locating each lever during manufacture. The adjusting nut is locked in place by means of a special tag lock washer and should not be disturbed unless the clutch is dismantled for the renewal of parts.

The general construction may be followed by reference to Fig. E.1 and the following description.

Driven plate assembly

This consists of a splined hub and flexible steel driven plate (C) to the outer diameter of which are fixed the annular friction facings. The disc is attached to the splined hub by a spring coupling which acts as a torsional cushion.

Withdrawal bearing assembly

This comprises the graphite release bearing (G), which is mounted in a cup (H) attached to the throw-out fork, and a release plate (K) attached to the inner ends of the release levers (N). Release is accomplished by moving the release bearing forward into contact with the release plate and applying pressure to the inner ends of the levers.

Cover assembly

The release levers are pivoted on knife-edge fulcrums (O) mounted upon the clutch cover (D), and shoulder studs (Q) extend through holes at their outer ends. The studs are fitted with adjusting nuts (R) which locate each lever in its correct position. The outer or shorter ends of the release levers engage the bearing plate (S) carried upon the shoulder studs attached to pressure plate lugs, and thus the pressure plate (T) is pulled away from the driven plate (C), compressing the six thrust springs (E) which are assembled between the pressure plate and the clutch cover.

When the foot pressure is removed from the clutch pedal the thrust springs force the pressure plate forward against the driven plate, gradually and smoothly applying the power of the engine to the rear wheels.

Section E.1

RUNNING ADJUSTMENTS

As the clutch facings on the driven plate (C) wear, the pressure plate (T) moves closer to the flywheel face (A) and the outer or shorter ends of the release levers follow. This causes the inner or longer ends of the levers to travel farther towards the gearbox and decreases the clearance between the release lever plate (K) and the release bearing (G). The effect on the clutch pedal is to decrease the clearance or free travel; in other words, it reduces the distance the clutch pedal moves forward before the release bearing comes in contact with the release lever plate. Some free movement must always be maintained here to prevent the clutch pedal riding against the under side of the toeboard and applying pressure on the release bearing, thus causing the clutch

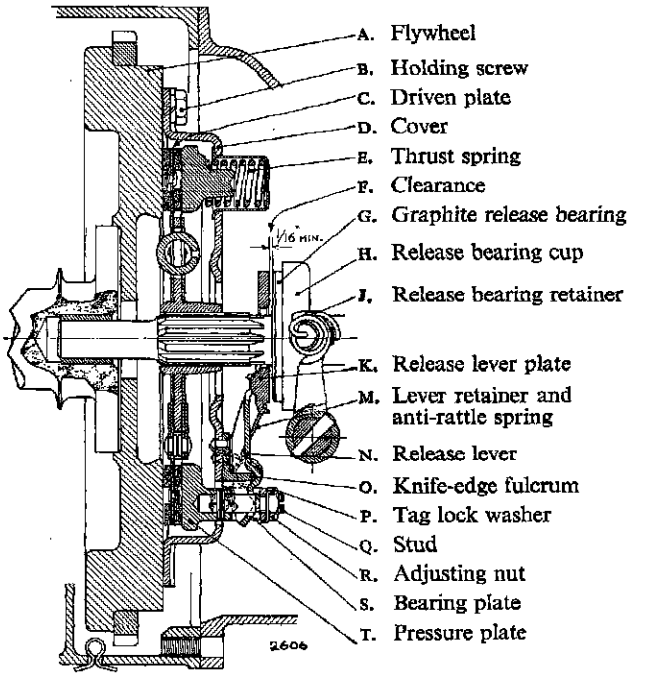


Fig. E.1

The clutch unit in section

to slip, and to prevent excessive travel of the withdrawal mechanism leading to coil binding of the clutch springs. This essential free movement is restored by adjusting the locknuts on the forward end of the clutch operating rod.

Insufficient pedal backlash or free movement will cause clutch slip. Excessive pedal movement causes the clutch springs to become compressed solid or 'coil-bound', which imposes an undue load on the release bearing, causing excessive wear.

The required pedal travel is the sum of:

(1) *The free movement* or travel produced by the clearance between the release bearing and the release lever plate necessary to ensure that the clutch is fully engaged when the foot is removed from the pedal.

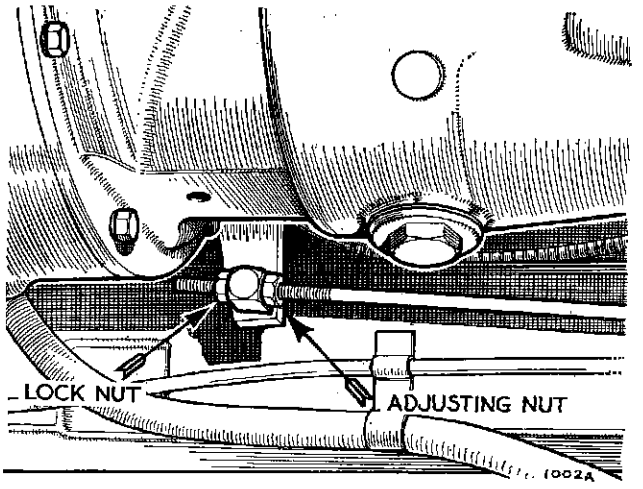


Fig. E.2

The clutch is adjusted by releasing the locknut on the clutch operating rod and screwing the adjusting nut in the required direction

(2) *The effective movement* or travel necessary to release the clutch, i.e. the amount of effective pedal movement necessary to move the release lever plate the distance required to free the clutch completely.

The free pedal movement, measured at the pedal pad must be at least ¾ in. (20 mm.). It is essential that this clearance be adhered to in order to allow the clutch to be completely released and at the same time prevent the possibility of damage to the clutch release bearing due to over-travel.

If any difficulty is experienced in freeing the clutch when the correct free pedal movement is provided, on no account should efforts be made to improve matters by attempting to increase the effective pedal travel. The actual cause must be ascertained and rectified.

Section E.2

REMOVAL OF THE CLUTCH

Remove the gearbox as in Section F.1

The clutch cover-plate assembly is removed by extracting the six bolts locating it to the flywheel. These should be slackened, part of a turn at a time to prevent distortion of the flanged edge of the cover by the pressure of the thrust springs, until the spring pressure is completely released.

The complete clutch may now be lifted off the two dowel pins, all components except the driven plate remaining assembled to the cover.

Section E.3

DISMANTLING THE CLUTCH

After removal from the engine, and before stripping down, mark the parts in such a manner that they can be reassembled in the same relative position to each other to ensure that correct balance is maintained; this applies particularly to the cover, pressure plate, and release levers. Failure to follow these instructions may result in excessive vibration at high revolutions. When a new pressure plate is fitted it is essential that the complete cover and pressure plate assembly be accurately balanced, for which reason it is not a practical proposition to fit new pressure plates unless balancing facilities are available.

If it is found necessary to renew any of the components of the cover assembly this unit can be dismantled, reassembled, and adjusted with the aid of an arbor press or drill press in the following manner.

First straighten the bent-up lobes of the tag lock washers (P) (Fig. E.1), then place the cover on the bed of the press with the pressure plate resting on wood blocks so arranged that the cover is left free to move down. Place three blocks of wood to form a bridge, the legs of which should rest on the outer rim of the clutch cover as shown in Fig. E.3.

Compress the cover with the spindle of the press, and, holding it under compression, remove the adjusting nuts (R) (Fig. E.1) and then slowly release the pressure to prevent the thrust springs from flying out.

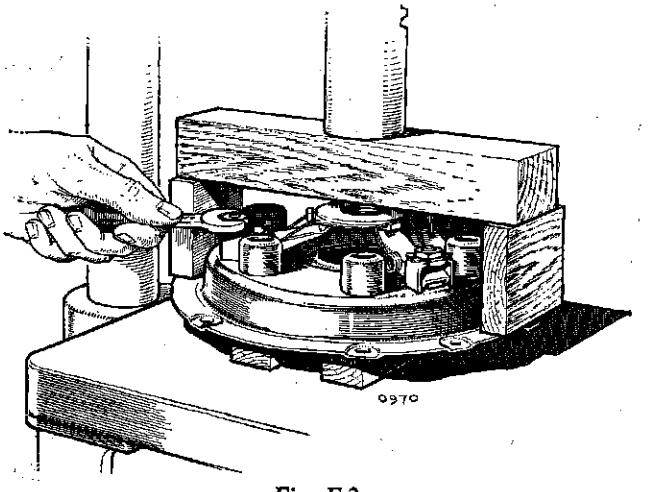


Fig. E.3

The correct procedure to adopt when dismantling the clutch cover assembly. Note the two wood blocks supporting the pressure plate on the bed of the press. These must not project beyond the pressure plate, to ensure that they do not foul the cover-plate when this is depressed by the press

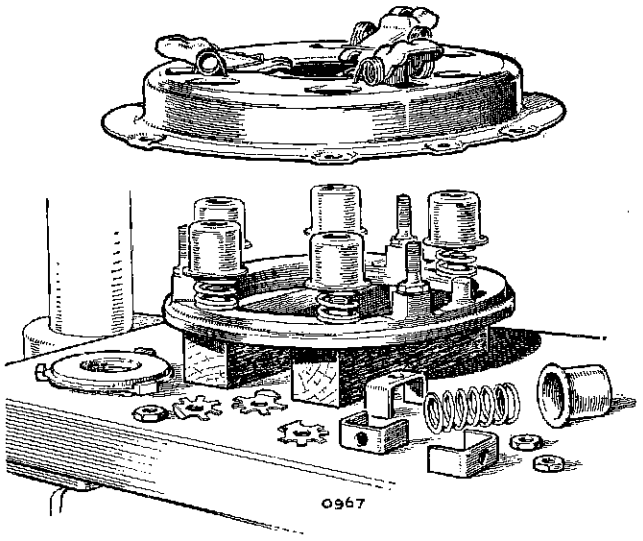


Fig. E.4

The components of the clutch ready for assembly. Note that the pressure plate is again supported on wood blocks and that the springs and their cups have to be correctly located, as shown, before the cover-plate is placed in position

The cover can then be lifted off and all parts will be accessible for inspection. It is advisable to renew any parts which show signs of wear.

Section E.4

ASSEMBLING THE CLUTCH

When reassembling the clutch it is essential that the components should be replaced in exactly the same positions as they were before removal to ensure that the clutch assembly remains in balance. This is most important, and the parts should have been marked before dismantling so that their correct positions can be identified, as indicated in Section E.3.

When new components are fitted it is essential that the complete cover and pressure plate assembly be accurately balanced. It is therefore inadvisable to fit new components unless adequate balancing facilities are available.

(1) Lay the pressure plate (T) on the wood block in the press and place the springs on it in a vertical position, seating them on the small locating bosses on the pressure plate. Now place the spring cups over their outer ends, as shown in Fig. E.4.

(2) The levers (N) can then be mounted on the knife-edge fulcrums (O) by slipping the inner ends of the release levers under the retainer springs (M), taking care that the release levers are properly seated. It is advisable to wipe the short ends of the levers and the knife-edge fulcrums with a little graphite moistened with oil, as this will help to eliminate friction at this point.

(3) The cover can now be laid on top of the assembled parts as shown in Fig. E.4, taking care that the machined portions of the pressure plate lugs are directly underneath the slots formed in the clutch cover.

(4) Place three blocks of wood to form a bridge, the legs of which should rest on the outer rim of the clutch cover (as used in the dismantling operation). The assembly is then slowly compressed, the pressure plate lugs being guided through the slots formed in the clutch cover. Care must be taken that the thrust springs remain correctly on their seats on the pressure plate.

(5) Holding the clutch under compression, the bearing plate (S) and tag lock washers (P) are then placed in position on the shoulder studs (Q). The adjusting nut (R) can then be screwed down on the shoulder stud until the nut is flush with the top of the stud.

(6) The clutch unit may now be removed from the arbor or drill press and the final setting of the release levers carried out by use of the special Service tool (No. 38446) as detailed in Section E.5.

(7) The release lever plate (K) should then be assembled to the release levers, taking care that the projecting portions engage properly in the slots formed in

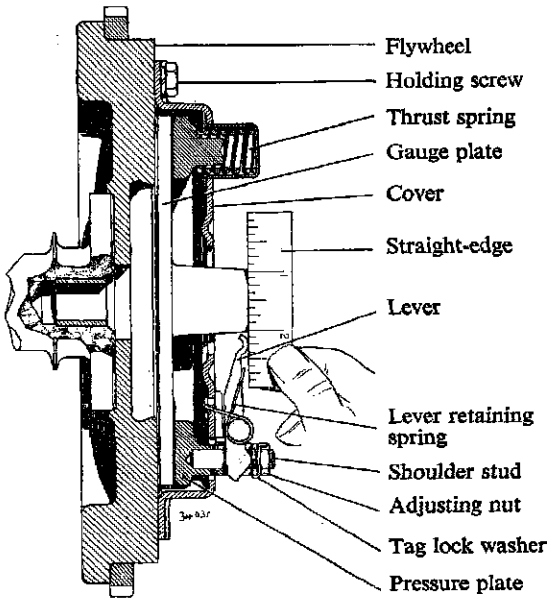


Fig. E.5

Shows how the release levers are set by means of a short straight-edge or rule placed across the boss of the special Borg & Beck gauge plate

the release lever ends. Finally, the retaining springs (M) should be fitted into the grooves formed in the release lever plate as indicated in Fig. E.1.

Section E.5

ADJUSTING THE RELEASE LEVERS

The method of adjusting the levers with the universal gauging fixture is given in Section E.10

Satisfactory operation of the clutch is absolutely dependent on accurate adjustment of the release levers so that the pressure plate face is perfectly parallel to the flywheel face. This cannot be accomplished satisfactorily by setting the ends of the release levers parallel to the face of the release bearing after the clutch has been assembled to the flywheel because of likely variation in the thickness of the driven plate. The only accurate method is to adjust the release levers while the pressure plate is held parallel to the flywheel by means of the Borg & Beck lever adjustment gauge. This special tool (Part No. 38446) is shown in Fig. E.6.

Place this gauge on the flywheel in the position normally occupied by the driven plate and mount the cover assembly on the flywheel in the same position as before dismantling. Tighten the holding screws a turn or two at a time when taking up the spring pressure, otherwise the cover will be distorted. Before the cover is tightened down be sure the gauge is correctly centred. The clutch release lever plate is attached to the release levers by the anti-rattle springs and must be taken off to set the levers.

After the cover assembly has been mounted in position a short straight-edge can then be laid across the centre boss and the bearing surface of one lever, and the nut adjusted until they are the same height. The other levers can then be set in turn by the same method. If carefully done this setting will be within ·005 in. (·13 mm.), which is the permissible tolerance. After this adjustment is completed loosen the clutch cover holding screws a turn

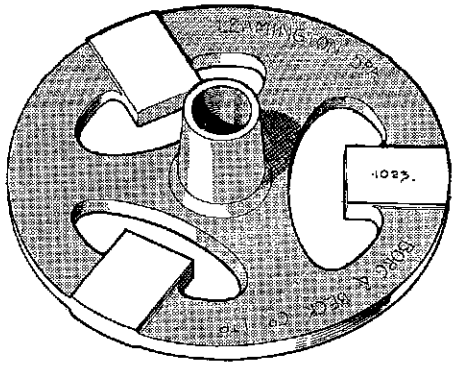


Fig. E.6

The special gauge plate necessary for setting the release levers correctly

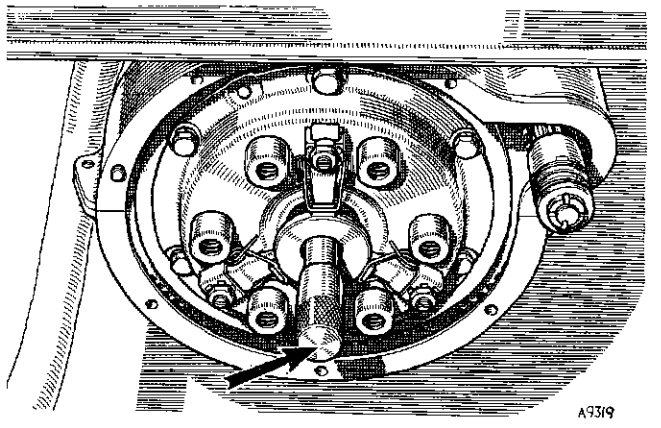


Fig. E.7

When reassembling the clutch the use of Service tool 18G 275 is necessary

at a time until the spring pressure is released, allowing the clutch assembly and the gauge plate to be removed.

Two or more lobes of the tag lock washers should then be bent flat against the adjacent side of the adjusting nut, thereby definitely locking it in position. When carrying out this operation take care not to upset the adjustments previously made.

On some clutches a different type of stud is employed, having no shoulder. It is held in position in the pressure plate by a pin passing through it and through the boss on the pressure plate. The outer end of the stud is screwed and slotted for the adjusting nut and locking split pin. If adjustment has taken place it will be necessary to redrill the nut for the split pin so that it registers with the slot in the stud.

Section E.6

REPLACEMENT OF THE CLUTCH

Adjust the release levers as in Section E.5.

Refit the release lever plate as in paragraph (7), Section E.4.

Assemble the driven plate and clutch assembly loosely to the flywheel with the chamfered end of the driven plate hub facing the gearbox, i.e. the rear of the car.

Line up the driven plate and pilot bearings with a dummy shaft (Service tool 18G 275).

Tighten the clutch cover holding screws in sequence, a turn at a time, to take up the clutch spring tension evenly and avoid distortion. When all the screws are quite tight withdraw the dummy shaft.

CAUTION.—Do not under any circumstances let the gearbox hang in the clutch assembly during the removing or refitting of the gearbox to the engine. On no account allow oil, grease, or paraffin to get on the clutch surfaces. Keep the faces dry and absolutely free of all oil.

Section E.7

SERVICING THE CLUTCH

After removal from the engine, and before stripping down, mark the parts in such a manner that they can be reassembled in the same relative position to each other to ensure that correct balance is maintained; this applies particularly to the cover, pressure plate, and release levers. Failure to follow these instructions may result in excessive vibration at high revolutions. When a new pressure plate is fitted it is essential that the complete cover and pressure plate assembly be balanced accurately, for which reason it is not a practical proposition to fit new pressure plates unless balancing facilities are available.

Spring pressure

A tolerance of from 10 to 15 lb. (4·5 to 6·8 kg.) pressure is allowable on the compression load of the operating springs when at their assembled height; all clutch springs are tested for this before assembly.

Lubrication of the splines of the driven plate is provided at assembly only. CS881 graphite grease or Duckham's Keenol must be used.

The clutch operation springs are not normally submitted to high temperatures, as the pressure plate absorbs heat rapidly and the springs make only line contact with it. In addition, a draught is continuously passing them when the engine is running.

Tolerances

Wear on the working faces of the driven plate is approximately ·001 in. per 1,000 miles (·015 mm. per 1000 km.) under normal running conditions. The alignment of the face of the driven plate must be within ·015 in. (·38 mm.) for satisfactory results.

Driven plates

It is most important that the clutch facings are not touched with greasy hands, nor any oil or grease allowed to come into contact with them.

It is essential to install a complete driven plate assembly when renewal of the friction linings is required. If the linings have worn to such an extent as to warrant renewal, then slight wear will have taken place in the splines, and also on the torque reaction springs and their seatings. The question of balance and concentricity is also involved. Under no circumstances is it satisfactory to repair or rectify faults in clutch-driven plate centres, and we do not countenance this as manufacturers.

Condition of clutch facings in service

It is natural to assume that a rough surface will give a higher frictional value against slipping than a polished one, but this is not necessarily correct. A roughened surface consists of small hills and dales, only the 'high-spots' making contact. As the amount of friction available for the purpose of taking up the drive is dependent upon the actual surface area in contact, it is obvious that a perfectly smooth face is required to transmit the maximum amount of power for a given surface area.

Since non-metallic facings of the moulded asbestos type have been introduced in service a polished surface is common, but it must not be confused with a glazed surface, which is sometimes encountered due to conditions which will be discussed subsequently.

The ideally smooth or polished condition, therefore, provides proper surface contact, but a glazed surface does not, as it entirely alters the frictional value of the surface, which will result in excessive clutch slip. These two conditions might be simply illustrated by the comparison between a piece of smoothly finished wood and one with a varnished surface. In the former the contact is made directly by the original material, whereas in the latter instance a film of dried varnish is interposed between the contact surfaces and actual contact is made by the varnish.

Thus the conditions encountered are:

(1) After the clutch has been in use for some little time under satisfactory conditions the surface of the facings assumes a high polish through which the grain of the material can be seen clearly. This polished facing is of light colour when in perfect condition.

(2) Should oil in small quantities gain access to the clutch and find its way onto the facings, it will be burnt off as a result of the heat generated by the slipping occurring under normal starting conditions. The burning of this small quantity of lubricant has the effect of gradually darkening the faces, but, provided the polish of the facing remains such that the grain of the material can be distinguished clearly, it has little effect on clutch performance.

(3) Should increased quantities of oil obtain access to the facing, then one of two conditions, or a combination of them, may arise, depending upon the nature of the oil.

(*a*) The oil may burn off and leave a carbon deposit on the surface of the facings, which assume a high glaze and cause further slip. This is a very definite, though very thin, deposit, and in general it hides the grain of the material.

(*b*) The oil may partially burn and leave a resinous deposit on the facings. This has a tendency to produce a fierce clutch, and may also cause excessive 'spinning' on clutch release, due to the tendency of the face linings to adhere to the surface of the flywheel or pressure plate.

(c) There may be a combination of conditions (a) and (b) which produces a tendency to 'judder' on clutch engagement.

(4) Still greater quantities of oil produce a dark and soaked appearance of the facings, and the result will be still further slip, accompanied by fierceness or 'juddering' on engagement, according to the severity of the condition.

If the conditions under (3) or (4) are experienced the clutch driven plate should be replaced by a new one. **The cause of the presence of the oil must be traced and removed.** It is, of course, necessary for the clutch and flywheel to be thoroughly cleaned out before reassembly.

Release bearing

Where the graphite release bearing ring is badly worn in service a complete replacement assembly should be fitted, returning the old assembly for salvage of the metal cup. These graphite rings are shrunk into their metal cups by heating the metal cup to a cherry red before forcing the graphite ring into position. This is a specialized job, but can be carried out provided care is exercised. Immediately the ring is forced into position the whole should be quenched in oil. Alignment of the thrust pad in relation to its face and the trunnions should be within ·005 in. (·13 mm.).

In almost every case of rapid wear on the splines of the clutch driven plates misalignment is responsible.

Looseness of the driven plate on the splined shaft results in noticeable backlash in the clutch. Misalignment also puts undue stress on the driven member, and may result in the hub breaking loose from the plate, with consequent total failure of the clutch. It may also be responsible for a fierce chattering or dragging of the clutch.

In cases of persistent difficulty it is advisable to check the flywheel for truth with a dial indicator to determine any possible misalignment. The dial reading should not vary more than ·003 in. (·08 mm.) anywhere on the flywheel face.

Clutch lever return spring

Should it be necessary to renew a weak or broken clutch lever return spring, this may be accomplished without removal of the clutch shaft or the operating lever.

Unhook the spring end from the lever and lift the locating spigot on the inner end of the spring from its seat in the clutch housing.

The spring may now be unscrewed from the shaft over the operating lever if rotated clockwise.

Section E.8

STARTER RING

Normally the starter ring is serviced as a complete unit with the flywheel. In overseas countries where this is not convenient arrangements have been made to supply the starter rings separate for fitting to the existing flywheel, but as they have to be shrunk on at the right temperature special precautions have to be taken, and these are covered by special instructions obtainable on application to the Nuffield Distributor in the country concerned. No attempt should be made to replace the starter ring on a flywheel unless the special instructions are available and carried out.

Ring and flywheel **assemblies only** are available for the Home market.

Section E.9

CLUTCH JUDDER

In order to eliminate the development of clutch judder later models are fitted with a relay lever (Part No. 182097) with the distance between the hole centres increased to $5\frac{3}{16}$ in. (131·76 mm.) from the original dimension of $4\frac{3}{4}$ in. (120·65 mm.).

The new lever can be substituted for the original lever in cases of persistent clutch judder.

A special engine tie-rod has also been introduced to minimize this trouble and in persistent cases of judder this should be fitted (see Section AA.37).

Section E.10

UNIVERSAL CLUTCH GAUGING FIXTURE

Remove from the box the gauge finger, the pillar, and the actuator, and consult the code card to determine the reference of the adaptor and the spacers appropriate to the clutch which is being serviced.

Rest the base plate on a flat surface, wipe it clean, and place the spacers upon it in the positions quoted on the code card.

Place the clutch on the spacers, aligning it with the appropriate tapped holes in the base, arranging it so that the release levers are as close to the spacers as possible.

Screw the actuator into the centre hole in the base plate and press the handle down to clamp the clutch. Then screw the set bolts provided firmly into the tapped holes in the base plate, using the speed brace; remove the actuator.

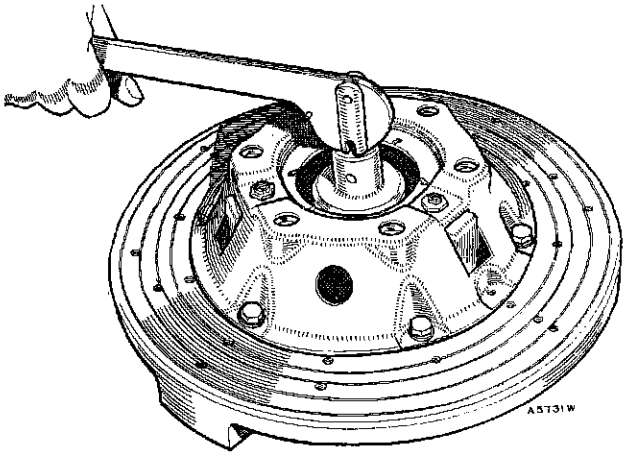


Fig. E.8

Using the actuator to compress the clutch springs for dismantling or setting the assembly

Remove the adjusting nuts and gradually unscrew the set bolts to relieve the load of the thrust springs. Lift the cover off the clutch and carry out whatever additional dismantling may be desired.

After carrying out the necessary servicing of the clutch components, reassemble the parts on the clutch pressure plate, place the cover upon it, and transfer the assembly to the base plate resting on the spacers and aligned correctly.

Carefully bolt the cover to the base plate and screw the adjusting nuts onto the eyebolts until flush with the tops of the latter.

Screw the actuator into the base plate (Fig. E.8) and pump the handle a dozen times to settle the clutch mechanism. Remove the actuator.

Screw the pillar firmly into the base and place upon it the appropriate adaptor, recessed face downwards, and the gauge finger (Fig. E.9).

Turn the adjusting nuts until the finger just touches the release levers, pressing firmly downwards on the finger assembly to ensure that it is bearing squarely on the adaptor.

Remove the finger, adaptor, and pillar, replace the actuator, and operate the clutch a further dozen times. Replace the pillar and check the lever setting, making any final corrections.

Finally, lock the adjusting nuts.

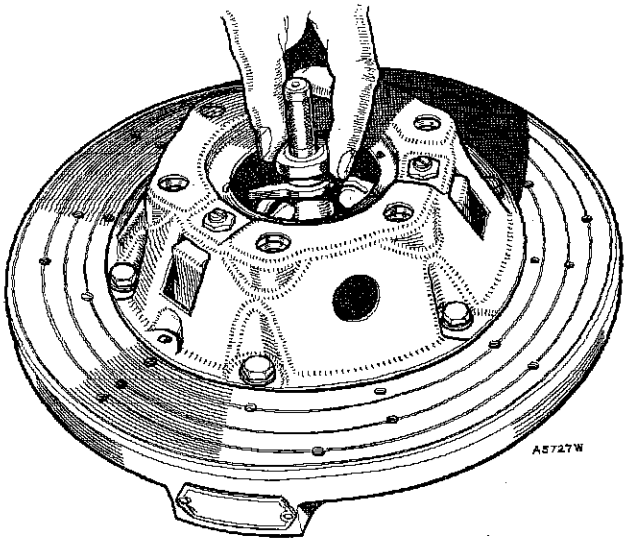


Fig. E.9

Checking the setting of the release levers

SECTION EE

THE CLUTCH

OF THE MORRIS MINOR (Series II) AND MORRIS MINOR 1000

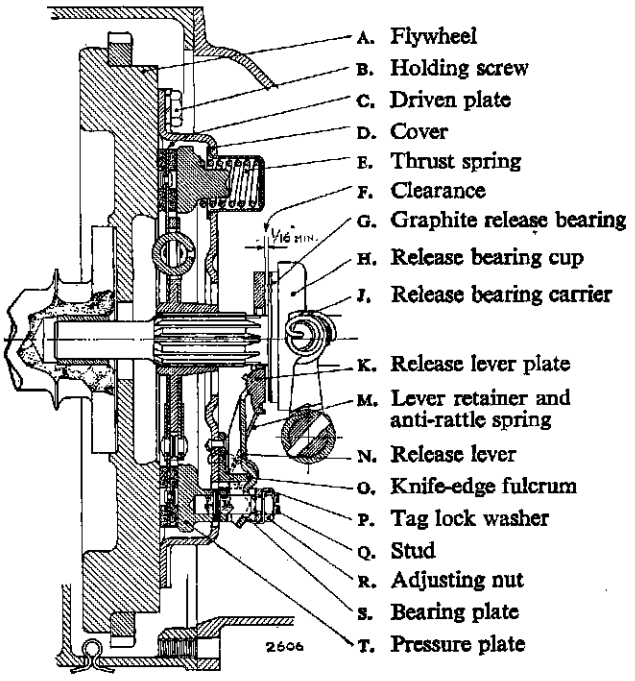


Fig. EE.1

The clutch unit in section (earlier cars)

Section EE.1

GENERAL DESCRIPTION

The clutch fitted to the Morris Minor (Series II and earlier 1000) is of the same type as that fitted to the Morris Minor (Series MM), and the instructions given in Section E may be followed when dealing with both models. It should be noted, however, that the clutch linkage mechanism is not the same, and when dealing with the Morris Minor (Series II and 1000) the appropriate paragraphs of Section EE.2 should be referred to.

Section EE.2

RUNNING ADJUSTMENTS

As the clutch facings on the driven plate (C) wear, the pressure plate (T) moves closer to the flywheel face (A) and the outer or shorter ends of the release levers follow. This causes the inner or longer ends of the levers to travel farther towards the gearbox and decreases the clearance between the release lever plate (K) and the release bearing (G). The effect on the clutch pedal is to decrease the clearance or free travel; in other words, it reduces the distance the clutch pedal moves forward before the release bearing comes into contact with the release lever plate. Some free movement must always be maintained here to prevent the clutch pedal riding against the under side of the toeboard and applying pressure on the release bearing, thus causing the clutch to slip, and to prevent excessive travel of the withdrawal mechanism leading to coil binding of the clutch springs. This essential free movement is restored by adjusting the locknuts on the forward end of the clutch operating rod.

Insufficient pedal backlash or free movement will cause clutch slip. Excessive pedal movement causes the clutch springs to become compressed solid or 'coil-bound', which imposes an undue load on the release bearing, causing excessive wear.

The required pedal travel is the sum of:

(1) *The free movement* or travel produced by the clearance between the release bearing and the release lever plate necessary to ensure that the clutch is fully engaged when the foot is removed from the pedal.

(2) *The effective movement* or travel necessary to release the clutch, i.e. the amount of effective pedal movement necessary to move the release lever plate the distance required to free the clutch completely.

The free pedal movement, measured at the pedal pad, is given in the **'GENERAL DATA'**. It is essential that this clearance be adhered to in order to allow the clutch to be completely released and at the same time prevent the possibility of damage to the clutch release bearing due to over-travel.

The clutch is adjusted by releasing the locknut on the clutch operating rod. The spherical adjusting nut may then be screwed in the required direction. If the backlash is insufficient it will be increased by moving

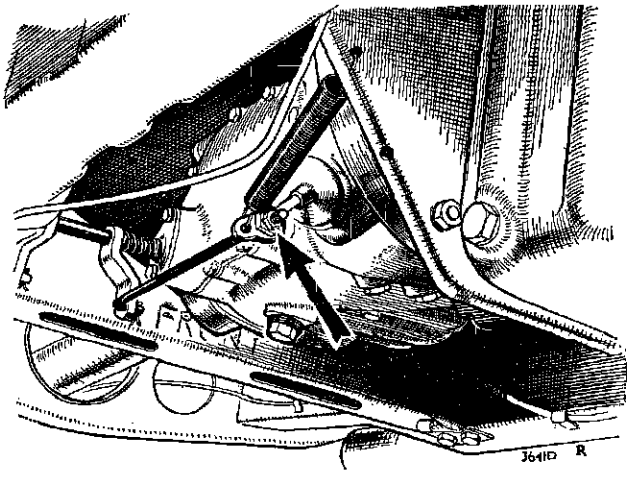


Fig. EE.2

The clutch is adjusted by releasing the locknut on the clutch operating rod and screwing or unscrewing the spherical adjusting nut

the adjusting nut towards the front of the car, and vice versa. Do not forget to retighten the locknut.

If any difficulty is experienced in freeing the clutch when the correct free pedal movement is provided, on no account should efforts be made to improve matters by attempting to increase the effective pedal travel. The actual cause must be ascertained and rectified.

Section EE.3

REMOVAL OF THE CLUTCH

Remove the gearbox as in Section FF.1.

The clutch cover-plate assembly is removed by extracting the six bolts locating it to the flywheel. These should be slackened, part of a turn at a time to prevent distortion of the flanged edge of the cover by the pressure of the thrust springs, until the spring pressure is completely released.

The complete clutch may now be lifted off the two dowel pins, all components except the driven plate remaining assembled to the cover.

Section EE.4

CLUTCH OPERATING ROD

Cars from No. 198690 onwards are fitted with modified clutch operating rods which are $\frac{5}{16}$ in. diameter as compared with the $\frac{1}{4}$ in. diameter of the earlier type.

This increase in diameter also necessitates the use of modified pedal and relay shafts, and when replacement parts are supplied for cars prior to No. 198690 they will be of the new type and the remaining parts of the clutch operating mechanism will also be supplied.

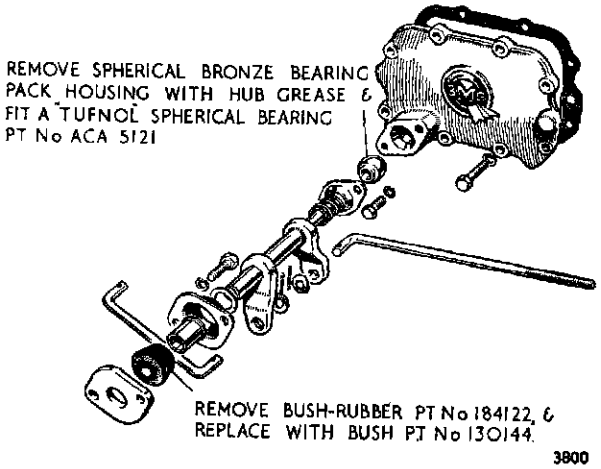


Fig. EE.3

The location of the spherical bearing and rubber bush on the relay clutch shaft

Section EE.5

CLUTCH RELAY SHAFT ASSEMBLY

In order to cure any tendency to rattle in the clutch relay shaft assembly a Tufnol spherical bearing (Part No. ACA 5121) has been introduced which is interchangeable with the existing bronze bearing (Part No. 184123) on the inner end of the shaft.

At the outer end of the shaft a harder rubber bush (Part No. 130144) replaces the original bush (Part No. 184122) and both these modified parts should be fitted at the same time.

Section EE.6

RESPACED PEDALS

On later R.H.D. cars a new clutch pedal assembly is introduced together with a new gearbox cover with a separate master cylinder cover-plate. The new clutch pedal and shaft are now fitted outside the right-hand longitudinal member with a pedal spacer inside the member in place of the original clutch pedal. The brake pedal and clutch linkage remains unchanged and the new pedal assembly is retained by a locating washer, plain washer, slotted nut, and split pin.

On L.H.D. cars the current-type R.H.D. brake pedal replaces the original brake pedal, the clutch pedal pad has been repositioned to the left-hand side of the clutch lever, and a modified accelerator pedal is introduced.

Individual parts are not interchangeable but the assembly can be fitted to earlier cars in its complete form.

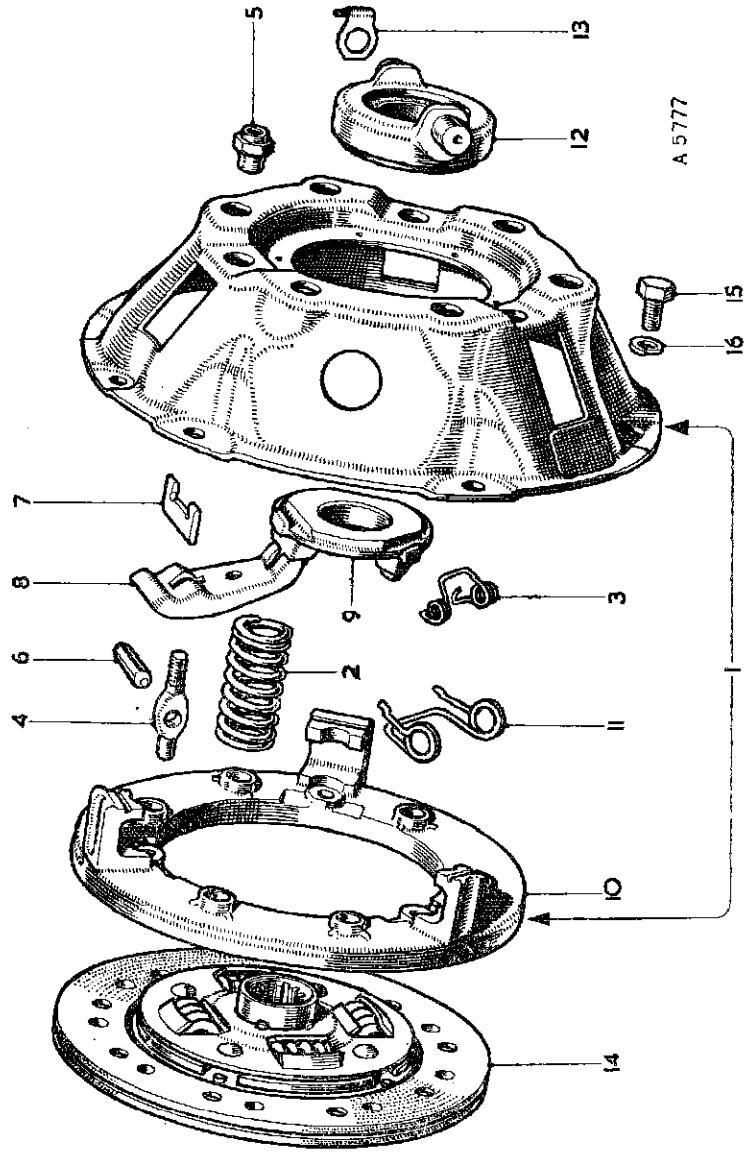
The new parts for R.H.D. cars are as follows:

Description	*Part No.*
Combined clutch pedal and shaft ..	ACA 5222
Pedal spacer	133582
Locating washer	ACA 5228
Plain washer	PWZ 106
Slotted nut	FN 406
Split pin	ZPS 0206
Pedal sealing pad	ACA 5226
Gearbox cover	ALA 834
Master cylinder cover-plate	ALA 832

The new parts for L.H.D. cars are as follows:

Accelerator pedal assembly	ACA 5227
Gearbox cover	ALA 835
Master cylinder cover-plate	ALA 833
Brake pedal	128641

THE CLUTCH COMPONENTS
(Later Cars)



KEY TO THE CLUTCH COMPONENTS
(Later Cars)

No.	*Description*	*No.*	*Description*	*No.*	*Description*
1.	Clutch assembly.	7.	Strut.	12.	Release bearing.
2.	Thrust spring.	8.	Release lever.	13.	Retainer.
3.	Release lever retainer.	9.	Bearing thrust plate.	14.	Driven plate assembly.
4.	Eyebolt.	10.	Pressure plate.	15.	Clutch to flywheel screw.
5.	Eyebolt nut.	11.	Anti-rattle spring.	16.	Spring washer.
6.	Release lever pin.				

Section EE.7

MODIFIED CLUTCH LINKAGE

Commencing at Car Nos. 577816 (R.H.D.), 578027 (L.H.D.), and Traveller Cars 572278 (R.H.D.), 572832 (L.H.D.), connecting plates (Part No. ACA 5437) are introduced to strengthen the clutch linkage. They are interchangeable with the original rod linkage, but only as a complete assembly, i.e. clutch pedal assembly, clutch relay shaft, and the new connecting plates.

Section EE.8

CLUTCH
(Later Cars)

Removing

Remove the clutch as described in Section EE.3.

Dismantling

The clutch tool 18G 99 A proves an efficient and speedy means of dismantling, reassembling, and adjusting the clutch with a high degree of accuracy. The tool is universal and a chart detailing the sizes of spacing washers and distance pieces for particular types of clutch is provided on the inside of the metal container lid.

Consult the code card to determine the correct spacers for the particular clutch. Place the spacers on the base plate in the positions indicated on the code card and place the clutch on the spacers. Screw the actuator into the central hole in the base plate and press the handle to clamp the clutch. Screw the set bolts firmly into the base plate. The clutch can now be compressed or released as required.

Compress the clutch with the actuator and remove the adjusting nuts gradually to relieve the load of the thrust springs. Lift the cover off the clutch and carry out whatever additional dismantling may be necessary.

Reassembling

Parts not being replaced by new ones must be refitted in their original positions.

Reassembly is the reverse of the dismantling procedure.

Adjusting the clutch

The clutch must now be adjusted, still using the clutch assembly tool. With the clutch bolted to the tool base plate, as on completion of assembly, proceed as follows. Screw the actuator into the base plate and pump the handle a dozen times to settle the clutch mechanism. Remove the actuator. Screw the tool centre pillar into the base plate and select a distance piece, as shown on the chart. Place the distance piece over the centre pillar with its recessed face downwards. Place the gauge height finger over the centre pillar. Adjust the height of the release levers by tightening or loosening the adjusting nuts until the height finger, when rotated, just contacts the highest point on the tip of each release lever. Press downwards on the height finger to ensure that it bears squarely on the adaptor while rotating. Remove the height finger and pillar, and screw the actuator into the base plate. Operate the clutch several times to enable the components to settle on their knife-edges. Remove the actuator and replace the centre pillar, distance piece, and height finger. Readjust the release levers if necessary. Repeat the procedure to ensure that the release levers are finally seated, and gauge once more. Remove the centre pillar, distance piece, and height finger and secure the adjusting nuts. Fit the release lever plate on the tips of the release levers and secure it by the three retaining springs. Release the tool set screws in diagonal sequence a little at a time, relieving pressure slowly and evenly. Remove the clutch assembly from the base plate.

Refitting

Refitting is a reversal of the removal procedure. Use Service tool 18G 139 for clutch centralization.