

Section B — CLUTCH UNIT — ALL MODELS

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Gearbox and transfer box assembly, to remove Operation B/2

1. Remove the hood, hard top or cab, for convenience in working.

2. Remove the front wheel drive control knob, locknut and spring; remove the knob and locknut from the transfer gear change lever.

3. Remove the floor board assembly and gearbox cover. Section R.

4. Remove the seat box complete. Section R.

5. L.H.D. models only. Remove the hand brake lever and linkage. Section H.

6. R.H.D. models only. Remove the hand brake rod and the expander rod from the relay lever.

7. Disconnect the front axle propeller shaft, rear axle propeller shaft and rear power take-off propeller shaft (if fitted) at the gearbox end.

8. Disconnect the clutch operating hose at the slave cylinder, remove the split pin and withdraw the vehicle.

9. Disconnect the speedometer cable at the gearbox and withdraw the cable clear of the gearbox. Disconnect the earth lead at the transfer box.

10. Remove the remaining nuts and plain washers fixing the bell housing to flywheel housing, then remove the gearbox unit bearer bolts, top bearer rubbers, washers, shims and distance tubes.

11. Place a suitable sling around the gearbox unit, raise it approximately 1 inch (25 mm).

12. Place a jack under the rear end of the engine; this prevents any strain being taken on the primary pinion shaft.

13. Withdraw the gearbox unit and remove it from the vehicle.

Clutch unit, to remove

1. Mark the cover plate and flywheel, so that on reassembly the plate may be fitted in the same relative position, to retain the original balance of the unit.

2. Release the self-locking nuts securing the clutch unit to the flywheel, until the spring pressure is relieved; remove the clutch unit and drive plate out of position and result in clutch judder.

The release lever adjustment nuts are correctly set and locked when the clutch is assembled, and should not be altered unless the clutch has been dismantled and new parts fitted. Interference with this adjustment would throw the pressure plate out of position and result in clutch judder.

If the flywheel is excessively worn it must be renewed or refaced.

Flywheel data

2 litre Petrol

Number of teeth 97

Thickness at pressure face 1.093 in. (28 mm)

Maximum permissible run-out on flywheel face002 in. (0,05 mm)

Maximum refacing depth .030 in. (0,75 mm)

Minimum thickness after grinding 1.063 in. (27 mm)

Primary pinion bush: Fit in flywheel001 to .003 in. (0,02 to 0,07 mm) interference

Internal diameter—reamed in position878 in. (22 mm)

Fit of shaft in bush003 to .004 in. (0,07 to 0,10 mm) clearance

2 litre Diesel

Number of teeth 100

Thickness at pressure face 1.375 in. (35 mm)

Maximum permissible run-out on flywheel face002 in. (0,05 mm)

Maximum refacing depth .030 in. (0,75 mm)

Minimum thickness after grinding 1.345 in. (34 mm)

Primary pinion bush: Fit in flywheel001 to .003 in. (0,02 to 0,07 mm) interference

Internal diameter—reamed in position875 in. (22,2 mm)

Fit of shaft in bush001 to .003 in. (0,02 to 0,07 mm) clearance

2½ litre Petrol

Number of teeth 97

Thickness at pressure face 1.515 in. (38 mm)

Maximum permissible run-out on flywheel face002 in. (0,05 mm)

Primary pinion bush: Fit in flywheel001 to .003 in. (0,02 to 0,07 mm)

Internal diameter—reamed in position875 in. (22,2 mm)

Fit of shaft in bush001 to .003 in. (0,02 to 0,07 mm) clearance

Maximum refacing depth .030 in. (0,75 mm)

Minimum thickness after grinding 1.485 in. (37,5 mm)

2. After refacing, a new primary pinion bush may be fitted and reamed to size.

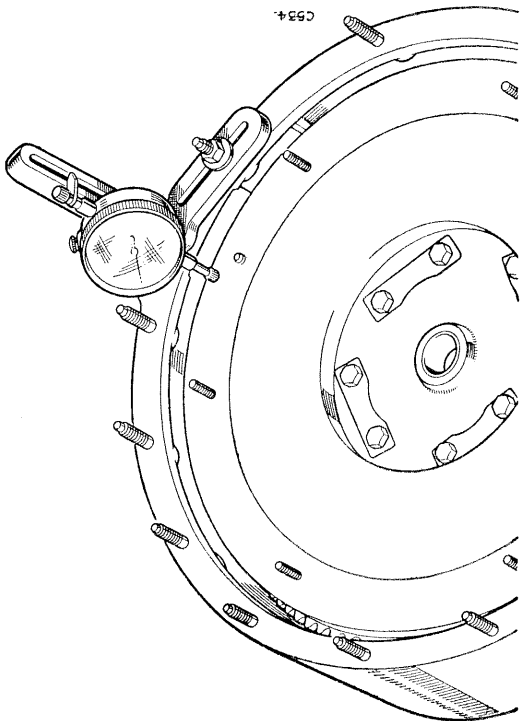


Fig. B-1—Checking run-out on flywheel face

Flywheel, to replace

1. Fit the flywheel and tighten the securing bolts to 50 lb./ft. (7 Kgs/m) torque.

2. Check the run-out on flywheel face as illustrated by Fig. B-1. The run-out on flywheel face must not exceed .002 in. (0,05 mm).

Operation B/8

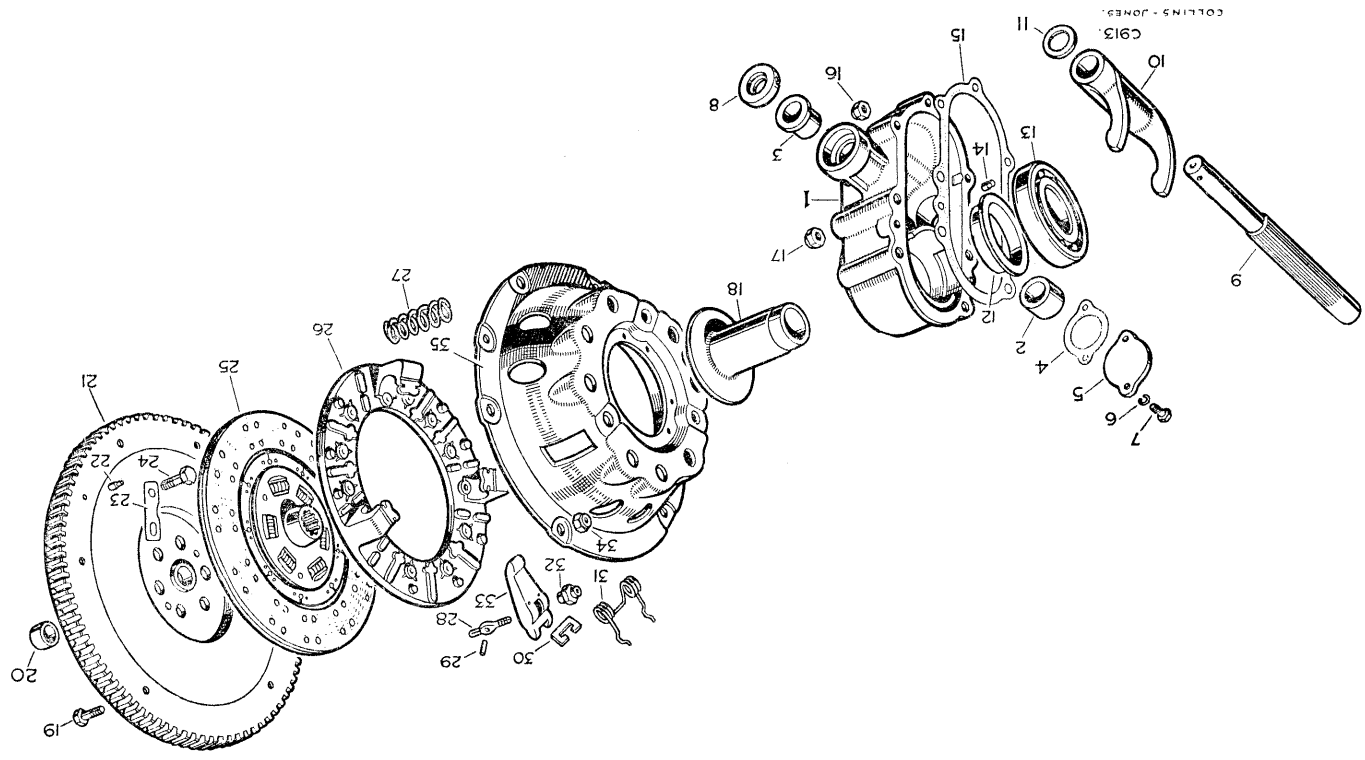


Fig. B-2—Layout of clutch unit

- | | |
|-------|-------------------------------------|
| 1 | Withdrawal housing |
| 2 | Bush, large } For |
| 3 | Bush, small } cross-shaft |
| 4 | Joint washer |
| 5 | Cover plate |
| 6-7 | Fixings for cover plate |
| 8 | Oil seal |
| 9 | Cross-shaft for fork |
| 10 | Operating fork for clutch |
| 11 | Thrust washer for cross-shaft |
| 12 | Bush for sleeve |
| 13 | Thrust bearing |
| 14 | Dowel |
| 15 | Joint washer for housing |
| 16-17 | Fixings for withdrawal race housing |
| 18 | Withdrawal sleeve |
| 19 | Fitting bolt fixing clutch |
| 20 | Bush for primary pinion |
| 21 | Flywheel |
| 22 | Dowel locating clutch unit |
| 23 | Locker } Fixing flywheel to |
| 24 | Special bolt } crankshaft |
| 25 | Clutch driven plate |
| 26 | Clutch pressure plate |
| 27 | Clutch thrust spring |
| 28 | Eyebolt |
| 29 | Fulcrum pin for lever |
| 30 | Strut |
| 31 | Anti-rattle spring |
| 32 | Adjustment nut |
| 33 | Release lever |
| 34 | Nut fixing clutch unit to flywheel |
| 35 | Clutch cover plate |

Clutch, to strip

1. Suitably mark the cover plate, pressure plate plugs and release levers, so that they may be assembled in the same relative position, in order to retain the original balance.

2. Place the cover assembly under a press with the pressure plate resting on wooden blocks, so arranged that the cover can move downwards when pressure is applied. Place a block of wood across the top of the cover, resting on the spring bosses.

3. Press the cover downwards and remove the release lever adjusting nuts; slowly release the pressure to prevent the clutch springs from flying out.
4. Lift off the cover.

5. Remove each release lever by holding the lever and eyebolt between fingers and thumb, so that the inner end of the lever and the threaded end of the eyebolt are as near together as possible, keeping the release lever pin in position in the lever. Lift the strut over the ridge on the lever and remove the eyebolt from the pressure plate.

6. Examine the pressure plate for signs of scoring or burning, and regrind. The limit being thickness is 1.531 in. (.39 mm). The thickness of the plate is measured from the pressure face to the underside of the operating lugs. Discard the plate if it still shows signs of wear when ground to this dimension. Serious shortening of the effective life of the clutch unit will result if the limit for regrinding is exceeded.

The thickness of the pressure plate must always be measured from the underside of the same operating lug and the amount skinned off the plate stamped on the side of the lug in question.

Clutch, to assemble

1. Clean all the components and lay them out for inspection.

2. Renew all parts which show damage or appreciable wear.

3. A very slight smear of high melting-point grease should be applied to the following parts during assembly:

Release lever pins, contact faces of struts, eyebolt seats in cover, drive lug sides on the pressure plate and the plain end of the eyebolts.

4. Check the clutch springs in accordance with the data given and renew as necessary.

5. Assemble the release lever eyebolt and lever pin, holding the threaded end of the eyebolt and the inner end of the lever as close together as possible. With the other hand, insert the

6. Place the pressure plate on the wooden blocks under the press and arrange the thrust springs in a vertical position on the plate, seating them on the bosses provided. Lay the cover over the assembled parts, ensuring that the anti-rattle springs are in position and that the tops of the thrust springs are directly under the seats in the cover. Also ensure that the machined portions of the pressure plate lugs are under the slots in the cover and that the parts marked before dismantling are in their correct relative positions.

7. Place the block of wood across the cover, resting it on the spring bosses, and compress the cover, guiding the eyebolts and pressure plate lugs through the holes in the cover.

8. Screw the adjusting nuts on the eyebolts and operate the clutch a few times by means of the press, to ensure that the working parts have settled into their correct positions.

9. Adjust the operating levers.

Clutch operating levers, to adjust**Operation B/14**

This adjustment must be carried out before the clutch is refitted to the engine, and will always be necessary after complete stripping of the unit, or if any new parts have been fitted.

1. The setting of the clutch release levers is checked, using $\frac{3}{8}$ in. (.95 mm) distance pieces in place of the driven plate. The levers must be adjusted to a dimension of 1.655 in. (.42 mm) from the flywheel face, with a maximum of .010 in. (.25 mm) difference in height between the three levers. (Fig. B-3).

2. Place the flywheel on a surface plate and set the scribe to 1.655 in. (.42 mm) from the flywheel face, using gauge Part No. 262754.

3. Place the three distance pieces on the flywheel in place of the driven plate.

4. Fit the cover assembly to the flywheel by tightening all six securing nuts a turn at a time by diagonal selection, until the unit is fully secured.

5. Check the height of each operating lever and adjust as necessary, by turning the adjustment nut until the top of the lever is exactly level with the scribe. Adjust the two other levers in a similar manner.

6. Secure the adjusting nuts by staking.

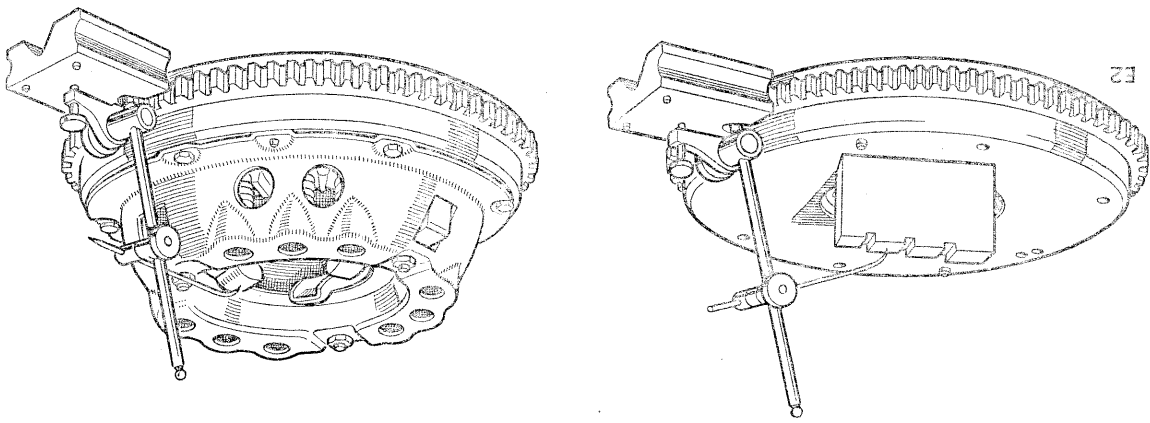


Fig. B-3—Setting the operating levers

3. Place one facing in position with the countersunk holes coinciding with the ones located on the crown or longer side of each segment.
4. Insert the rivets with their heads in the countersunk holes of the facing and roll the shanks over securely against the segments. If a rolling tool is not available, a blunt-ended centre punch will prove satisfactory.
5. Secure the second facing on the opposite side of the plate in a similar manner, matching the countersunk holes with the remaining holes in the segments. The rivet heads should always face outwards.
6. Mount the plate on a suitable mandrel between centres and check for run-out as near the edge as possible; if the error is more than .010 in. (0,25 mm), press over the high spots until the plate is true within this figure.

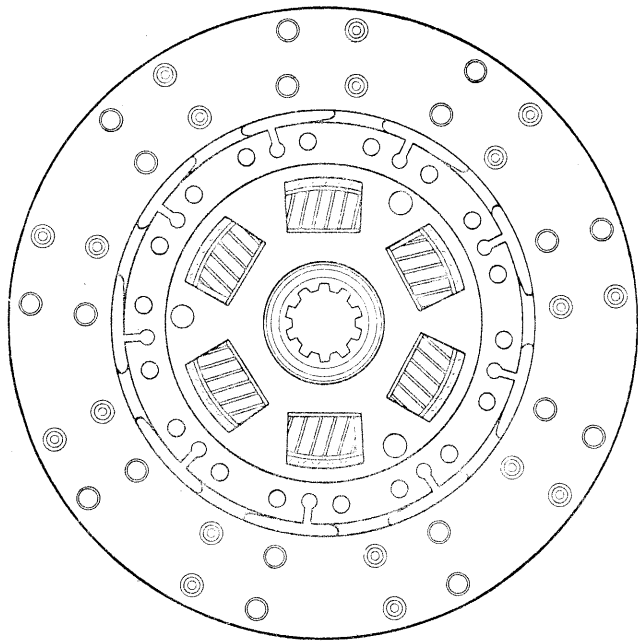


Fig. B-4—Driven plate

7. Slacken the securing nuts a turn at a time by diagonal selection, and remove the clutch unit from the flywheel.
 8. Remove the distance pieces.
- Driven plate, to re-line
Operation B/16
- The driven plate, if appreciably worn, must be renewed or re-lined.
1. Drill out the retaining rivets, using a $\frac{3}{8}$ in. (4 mm) drill inserted through the clearance hole in the opposite lining; each rivet attaches one facing only. The rivets must not be punched out, as serious deformation of the plate would thereby result.
 2. Thoroughly examine the segments for cracks; renew as necessary.



Operation B/22

To strip

1. Remove the cross-shaft cover plate.
2. Drive out the cross-shaft from right to left, thus releasing the withdrawal fork, a thrust washer and a thrust spring.
3. If necessary, remove the oil seal from the withdrawal housing.
4. If necessary, press off the grommet centre from the housing.
5. Remove the bearing from the withdrawal sleeve and remove the sleeve from the front of the housing.

Operation B/24

To overhaul

1. If necessary, renew the two small flanged oilite bushes in the right-hand cross-shaft bore of the housing. The bushes must be a light drive fit in the housing bore. Renew the cross-shaft if badly worn.
2. If necessary, renew the large oilite bush in the left-hand cross-shaft bore of the housing. The bush must be a drive fit in the housing bore; press the bush in flush with the outer face of the housing.
3. If necessary, renew the oilite withdrawal sleeve bush in the housing. The bush must be a drive fit in the housing. The bush should be a sliding fit on the sleeve. Renew the sleeve if a greater clearance than this is obtained in a new bush.

Ensure that the oil scroll machined on the primary pinion is not damaged; a faulty scroll may result in oil reaching the driven plate, thus causing clutch slip.

4. Renew the thrust bearing if badly worn or damaged. The bearing must be a light drive fit on the sleeve; renew the parts as necessary.

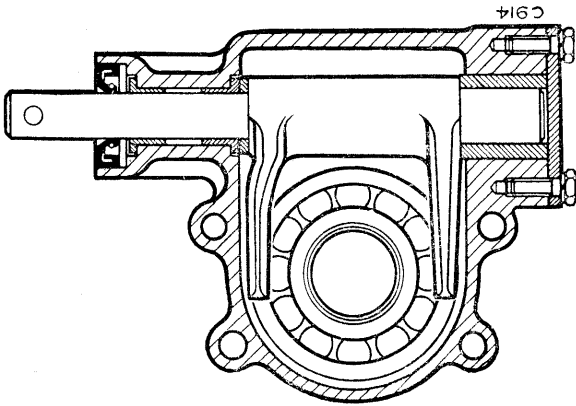


Fig. B-6—Cross-section of withdrawal mechanism

Withdrawal mechanism

To remove

1. Remove the grommets from the bell housing.
2. Remove the clutch withdrawal unit from the bell housing.

4. Remove the centralising shaft.

3. Fit the clutch unit with the identification marking adjacent to that on the flywheel; pull down the securing nuts a turn at a time by diagonal selection to prevent distortion of the unit.

2. Centralise the plate by means of a slave primary pinion.

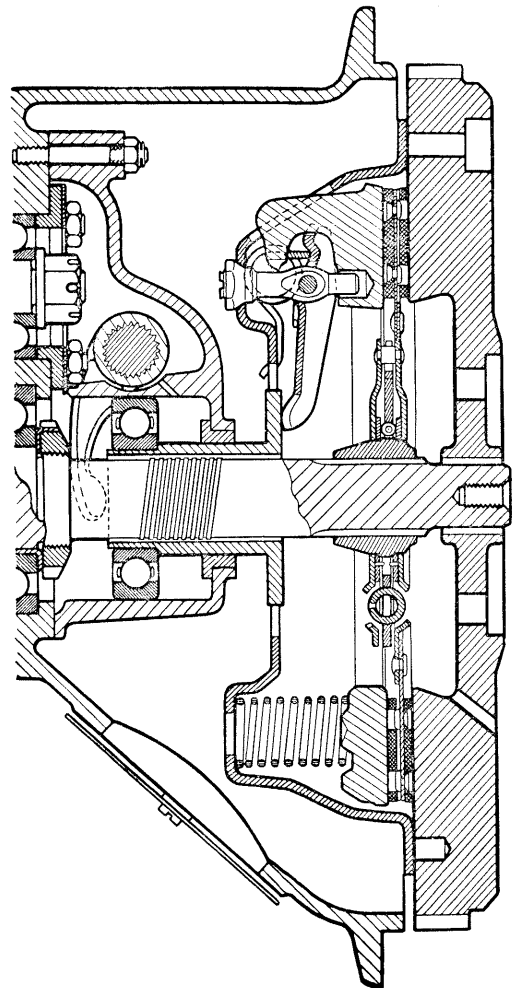
1. Place the driven plate in position on the flywheel with the longer end of the central boss away from the engine.

Ensure that the driven plate will slide on every spline on the primary shaft before refitting.

Operation B/18

Clutch, to replace

Fig. B-5—Cross-section of the clutch unit



2. 2 litre Petrol models only. The nip on the gearbox unit mounting rubber pad is adjusted by the addition or removal of shims on the top of the central distance tube.

The correct setting is with the top shim approximately $\frac{1}{16}$ in. (1.5 mm) below the top face of the upper rubber pad.

All models. The rear mounting brackets are adjustable laterally, to facilitate alignment with the mounting rubbers.

3. If necessary, refill the main gearbox, $2\frac{1}{2}$ pints (1.5 litres) and transfer box, $4\frac{1}{2}$ pints (2.5 litres) with oil.

4. If necessary bleed the clutch system, and adjust the pedal movement as necessary.

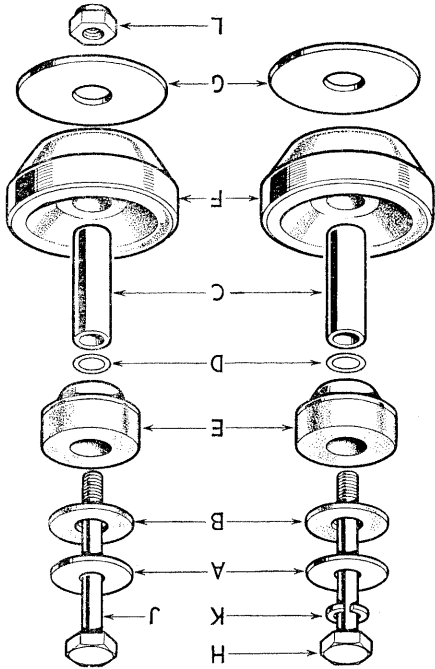


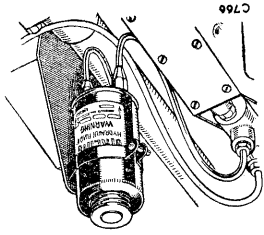
Fig. B-8—Gearbox unit mounting bolts and pads.

2 litre Petrol models only

- A—Plain washer (upper)
- B—Rubber washer
- C—Distance tube
- D—Shim
- E—Top rubber
- F—Bottom rubber
- G—Spring washer
- H—Front bolt
- I—Rear bolt
- J—Self-locking nut
- K—Plain washer (lower)
- L—Self-locking nut

Clutch pedal linkage to overhaul and fluid reservoir to remove
Operation B/32
1. Remove bonnet. (Remove spare wheel if fitted.)

Fig. B-9—
Brake and clutch
fluid reservoir



To assemble

1. Replace the withdrawal sleeve in the housing; fit the thrust bearing.

2. Fit the oil seal in the cross-shaft bore, with its knife edge inwards.

3. Place a $\frac{1}{16}$ in. (1.1 mm) round-section bar between the withdrawal sleeve and the housing. See Fig. B-7.

This will give the required position of the withdrawal fork when the cross-shaft is inserted.

4. Place the withdrawal fork, thrust washer and thrust spring in position in the housing.

5. Ensure the withdrawal fork is in contact with the bearing, and the $\frac{1}{16}$ in. (1.1 mm) round-section bar is still trapped between the withdrawal sleeve and housing, then insert the cross-shaft, with linkage connecting drilling in the horizontal position. See Fig. B-7.

6. Refit the cover plate and joint washer.

Operation B/28

To refit

1. Refit the withdrawal unit (together with a joint washer).

2. Replace the open grommet over the operating end of the cross-shaft and attach it to the centre and bell housing with a suitable adhesive.

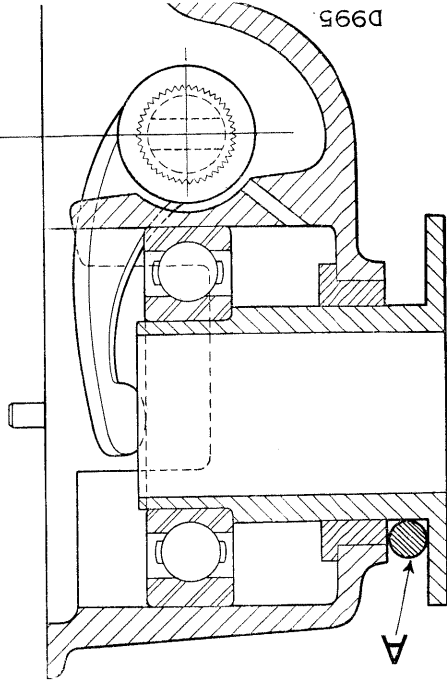


Fig. B-7—Setting withdrawal shaft

- A— $\frac{1}{16}$ in. (1.1 mm) setting bar
- B—Connecting drilling in horizontal position

Gearbox and transfer box, to replace
Operation B/30

1. Reverse the removal procedure.

9. If necessary remove the three nuts and plain washers securing the bracket to the flywheel housing and withdraw the bracket.

Clutch master cylinder and slave cylinder
Operation B/36

1. Remove the locknut and rubber cover from the piston push-rod; remove the circlip and withdraw the push-rod and retaining washer.
2. Apply a low air pressure to the intake orifice in order to expel the piston assembly from the cylinder.

To assemble
Operation B/40

1. Clean all the component parts in Girling Crimson brake fluid.
2. Carefully inspect the seals and rubber dust cover; renew as necessary; smear the seals with Wakefield No. 3 rubber grease.
3. Assemble the unit by reversing the dismantling procedure.

Clutch pedal linkage, cylinders and fluid reservoir, to refit
Operation B/42

1. Reverse the removal procedure, renewing gaskets and any worn parts as necessary.

Bleeding the clutch system
Operation B/44

If the level of fluid in the supply tank is allowed to fall too low, or if any section of the clutch pipe line has been disconnected, the clutch will not operate smoothly and may give place to judder and harshness.

1. Attach a length of rubber tubing to the bleed screw and place the lower end of the tube in a glass jar containing a small amount of fluid.

2. Slacken the bleed screw and pump the clutch pedal, pausing at each end of each stroke, until the fluid issuing from the tube shows no signs of air bubbles when the tube is held below the surface of the fluid in the jar.
3. Holding the tube under the fluid surface, tighten the bleed screw.

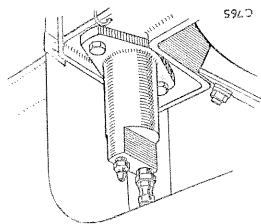


Fig. B-10—
Bleed screw for clutch
slave cylinder

The fluid in the reservoir must be replenished throughout the operation to prevent another air lock being formed.

2. Disconnect the brake and clutch outlet pipe.

3. Remove the securing nut and spring washer and withdraw assembly, complete with clamp.

If necessary, the pedal bracket, complete with master cylinder and pedal, can be removed as one assembly.

4. Remove cover plate and gasket from pedal bracket.

5. Disconnect input and output unions from clutch master cylinder.

6. Remove retaining nut from plunger, and push plunger up into master cylinder.

7. Using a suitable punch, drift out pin from the pedal shaft.

8. Remove pedal shaft.

9. Remove spring, pedal to anchor bracket (inside vehicle) and withdraw pedal.

Clutch master cylinder

To remove
Operation B/34

1. Remove the securing bolts (inside vehicle) and remove pedal bracket, complete with master cylinder.

2. Remove the self-locking nuts, plain washers and bolts, and withdraw the master cylinder.

3. Remove the nut, securing plunger to trunnion, then remove the self-locking nuts, plain washers and bolts, and withdraw the master cylinder.

Clutch slave cylinder and bracket

To remove—cylinder only
Operation B/36

1. Remove floor boards.
2. Disconnect jump hose at slave cylinder.

2 litre Petrol

3. Remove securing bolts.
4. Withdraw slave cylinder, leaving push-rod in position.

2½ litre Petrol, Diesel models

5. Remove the clevis pin, securing the slave cylinder push-rod to the clutch shaft operating lever. Remove the return spring.

6. Remove the cotter fixing the clutch shaft and operating lever to the cross-shaft connecting tube.

7. Remove the securing bolts and split the spherical bearing housing, then pull the clutch shaft and bearing housing, then pull the clutch shaft and rotate the shaft to withdraw the slave cylinder push-rod.

8. Remove the securing bolts and withdraw the slave cylinder, from underneath the bracket.

The total free play is felt in two stages:

- (a) Light movement of approximately $\frac{1}{16}$ in. (8 mm), which takes up the master cylinder free play against the pedal return spring.
- (b) Slightly heavier movement which should be approximately $1\frac{1}{16}$ in. (30 mm) which takes up the slave cylinder free play through the hydraulic system and against the slave cylinder return spring.

- 3. Secure with the locknut.

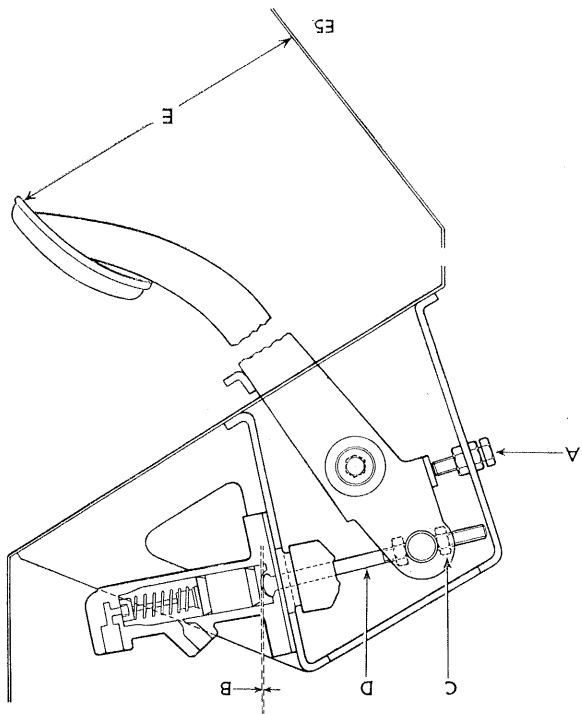


Fig. B-12—Clutch linkage setting

- A—Pedal position setting bolt
- B—Free play master cylinder push-rod $\frac{1}{16}$ in. (1,5 mm)
- C—Master cylinder push-rod locknuts
- D—Master cylinder push-rod
- E—6 in. (152 mm) from pedal pad to toe-board.

Note particularly that the fluid reservoir for the clutch is the small central tube in the combined reservoir, and that the level is correct when the fluid is just above the top of the inner reservoir. Use only Girling Crimson brake fluid.

Clutch linkage adjustment pedal position, to adjust

Operation B/46
The lock-stop bolt located in the pedal bracket back plate, should not be disturbed, but in the event of this being absolutely necessary, it must be reset as follows:—See Fig. B-12.

- 1. Support the pedal pad 6 in. (152 mm) from the toe-board, and screw in bolt A until it touches the pedal shaft stop plate. Tighten the locknut.

Master cylinder free play, to adjust

See Fig. B-12
Operation B/48
1. Check the free play B in the master cylinder push-rod D which should be $\frac{1}{16}$ in. (1,5 mm) at the push-rod and is felt as approximately $\frac{1}{16}$ in. (8 mm) at the pedal pad; if it is less than the given figure:

- 2. Slacken off locknut C and rotate the push-rod D with the fingers, until the correct movement has been attained.

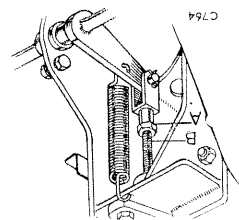
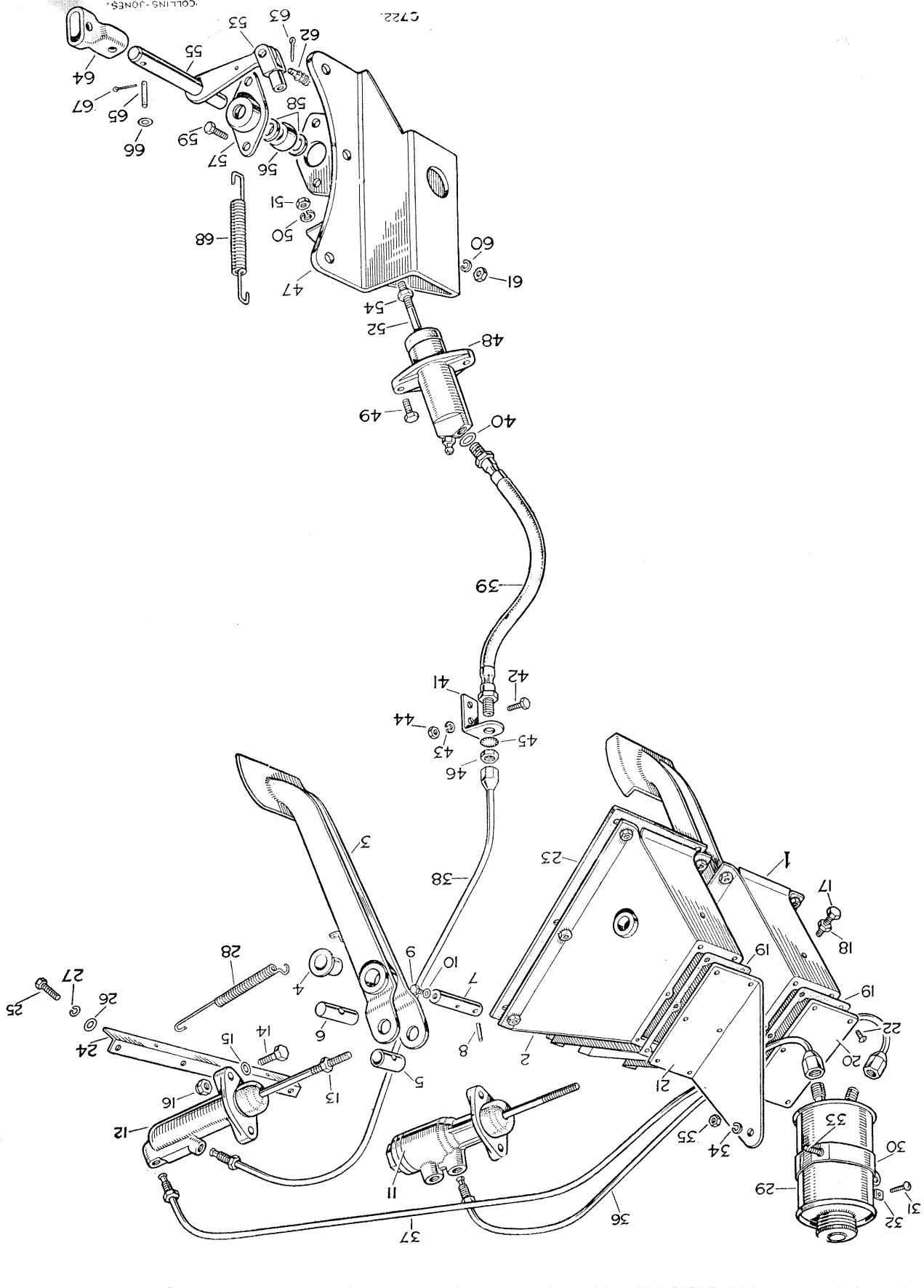


Fig. B-11—
Clutch adjustment
A—Locknut
B—Push-rod

Pedal free play, to adjust

Operation B/50
1. Slacken the push-rod locknut, at the slave cylinder. See Fig. B-11.

- 2. Adjust the push-rod by rotating until the total free movement at the pedal is $1\frac{1}{8}$ in. (38 mm).



Key to Fig. B-13

36	Pipe, reservoir to brake master cylinder	1	Pedal and bracket assembly
37	Pipe, reservoir to clutch master cylinder	2	Clutch pedal bracket
38	Pipe, clutch master cylinder to hose	3	Clutch pedal
39	Hose, pipe to clutch slave cylinder	4	Bush for pedal
40	Gasket for hose at slave cylinder	5	Pedal trunnion distance piece
41	Hose mounting bracket	6	Pedal trunnion
42	Bolt	7	Pedal shaft
43	Spring washer	8	Pin, locating pedal shaft
44	Nut	9	Oil plug
45	Shakeproof washer	10	Joint washer for oil plug
46	Special nut	11	Brake master cylinder
47	Clutch slave cylinder support bracket	12	Clutch master cylinder
48	Clutch slave cylinder	13	Nut for master cylinder push-rod
49	Bolt	14	Bolt
50	Spring washer	15	Plain washer
51	Nut	16	Self-locking nut
52	Clutch slave cylinder push-rod	17	Bolt
53	Push-rod clevis	18	Nut
54	Push-rod locknut	19	Pedal bracket top cover gasket
55	Clutch shaft and operating lever	20	Pedal bracket top cover
56	Spherical bearing	21	Pedal bracket top cover and reservoir tank support
57	Spherical bearing housing	22	Drive screw, fixing top cover to bracket
58	Felt ring for spherical bearing	23	Pedal bracket gasket
59	Bolt	24	Pedal return spring anchor bracket
60	Spring washer	25	Bolt
61	Nut	26	Plain washer
62	Clevis pin, lever to fork end	27	Spring washer
63	Split pin for clevis pin	28	Clutch pedal return spring
64	Clutch cross-shaft connecting tube	29	Combined brake and clutch reservoir
65	Pin	30	Clip for reservoir
66	Plain washer	31	Screw
67	Split pin	32	Nut
68	Return spring for clutch operating lever	33	Bolt
		34	Spring washer
		35	Nut
			Fixing reservoir clip to mounting bracket
			Fixing pedal bracket and anchor to dash
			Fixing clip to reservoir
			Fixing spherical bearing to support bracket
			Fixing master cylinder to pedal bracket
			Fixing hose to bracket
			Fixing bracket to dash

DEFECT LOCATION

(Symptom, Cause and Remedy)

- A—GRABBING CLUTCH**
1. Incorrect release lever adjustment—Adjust.
 2. Oil on the clutch lining—Renew.
 3. Worn clutch plates or flywheel—Renew.
 4. Clutch plate hub sticking on the pinion shaft—Free off the clutch plate and check for wear and distortion. Check the pinion shaft for wear.
 5. Worn or binding operating levers—Wear on levers usually indicates a binding withdrawal race thrust bearing. Free off bearing and renew levers.
 6. Worn or glazed linings—Renew.
 7. Broken or weak pressure springs—Renew.
 8. Sticking clutch pedal—Free off the pedal and check for damaged or bent parts. Check the return spring.
 9. Damaged or deteriorated engine mountings, or engine loose in chassis frame—Re-tighten or renew.
- B—SLIPPING CLUTCH**
1. Slipping the clutch in order to overcome poor engine response—This must never be done—ensure that the engine is in good condition and completely free from carbonation. *flit spots, which may only be noticed under load conditions.*
 2. Weak or broken pressure springs—Renew.
 3. Worn clutch linings—Renew and check plates for scoring.
 4. Incorrect clutch adjustment—Adjust.
 5. Oil on the linings—Renew. Rectify the oil leak. Note—The drain plug must only be used for operating in heavy mud, or when the vehicle is wading. At all other times the plug should be removed.
 6. Warped clutch plate—Renew.
 7. Scored or damaged pressure plate—Skim or renew.
 8. Binding withdrawal lever—Free off the lever and check for wear. Examine the clutch linings, plates and springs for wear or damage and the flywheel for scoring. Renew as found necessary.
 9. Binding clutch pedal mechanism—Rectify or renew.
 10. Insufficient free movement on the clutch pedal—Adjust.
 11. Riding clutch—In the hands of the operator.
 12. Fractured clutch plate—See Item C (6).
- C—DRAGGING OR SPINNING CLUTCH**
1. Oil on the clutch linings—Renew; if necessary rectify oil leak.
 - Note—The drain plug must only be used for operating in heavy mud, or when the vehicle is wading. At all other times the plug should be removed.
 2. Incorrect lever adjustment—Examine and adjust.
 3. Incorrect pedal adjustment—Adjust.
 4. Incorrect master cylinder push-rod free movement—Adjust.
 5. Dust or other foreign matter in the clutch—Clean and renew.
 6. Bent clutch plate—Ascertain reason for damage, check the remainder of the clutch and renew the plate. A plate may be distorted due to the weight of the gearbox being allowed to hang on the clutch plate during erection. When fitting a new plate, take the weight of the gearbox with a jack or by other suitable means.
 7. Clutch plate hub binding on the pinion shaft—Rectify or renew.
 8. Primary pinion bush binding—Rectify.
 9. Clutch withdrawal sleeve sticking—Rectify and examine all mating surfaces for scoring and wear.
- D—RATTLING CLUTCH**
1. Weak or broken operating lever return spring—Renew.
 2. Damaged pressure plate—Ascertain the reason for the damage and rectify. Recondition or renew.
 3. Broken pedal return spring—Renew.
 4. Pinion shaft or clutch plate splines worn—Renew.
 5. Worn primary pinion bush—Renew.
 6. Unequal contact of operating levers—Adjust.
 7. Incorrect free play in pedal lever—Adjust.
 8. Damaged clutch plate, loose or broken springs; warped clutch plate—Renew.
 9. Worn parts in the withdrawal mechanism—Renew.
 10. Excessive backlash in the transmission—Rectify.
 11. Normal wear in clutch—Renew.
- E—SQUEAKING CLUTCH**
1. Primary pinion bush binding—Rectify and renew.
 2. Primary pinion bush turning in the flywheel—Renew.
- F—VIBRATING CLUTCH OR CLUTCH JUDDER**
1. Incorrect clutch balance—Renew.
 2. Clutch pressure plate incorrectly fitted—Refit.
 3. Loose engine mountings—Tighten.
 4. Worn propeller shaft universal joints—Rectify.
 5. Loose flywheel—Tighten. Check run-out on flywheel.
 6. Oil or other foreign matter on the clutch lining—Renew. Note—The drain plug must only be used for operating in heavy mud, or when the vehicle is wading. At all other times the plug should be removed.
 7. Contact area of friction faces not evenly distributed—Rectify or renew.
 8. Bent splined shaft or buckled driven plate—Renew and check for damage.
 9. Pressure plate out of parallel with flywheel face—Rectify.
- G—STIFF CLUTCH OPERATION**
1. Dry or damaged linkage parts—Lubricate and renew, if necessary.
 2. Clutch pedal spindle dry—Lubricate.
- H—CLUTCH TICKS OR KNOCKS**
1. Clutch plate hub splines worn—Rectify and renew.
 2. Worn primary pinion bush—Renew.
- J—FRACTURED CLUTCH PLATE**
1. See Item C (6)—Rectify and renew.
- K—EXCESSIVE LINING WEAR**
- Produced by overloading or by slipping clutch—See B item 1. For maximum payloads and drawbar pull, see Instruction Book.

DATA

Clutch:	Type	Single dry plate, spring drive, self-centralising
	Operation	Hydraulic
Thrust race:	Type	Ball bearing
Thrust springs:	Number off	9
	Free length (2 litre Petrol)	2,680 in. (68 mm)
	Free length (2 1/4 litre Petrol)	2,680 in. (68 mm)
	Free length (Diesel)	2,688 in. (68,5 mm)
	Working length	1,688 in. (43 mm)
	Load at working length (2 litre Petrol)	120-130 lb. (54-59 kg)
	Load at working length (2 1/4 litre Petrol, 2 litre Diesel)	135-145 lb. (61-65 kg)
	Identification (2 litre Petrol)	Cream paint
	Identification (2 1/4 litre Petrol)	Yellow and light green paint
	Identification (2 litre Diesel)	Yellow paint
Pressure plate:	Re-grinding limit	.010 in. (0,25 mm) under-size
	Minimum thickness	1,531 in. (39 mm)
Operating levers:	Height from flywheel face using 3/8 in. (9,5 mm) distance piece in place of the driven plate	1,655 in. (42 mm)
	Driven plate:	Diameter 9 in. (230 mm)
	Thickness of plate, new	.330 in. (8,5 mm)
	Maximum permissible wear	.120 in. (3 mm)
	Identification (2 litre Petrol)	Red and violet springs
	Identification (2 1/4 litre Petrol), springs	3 off—Buff and light green
	Identification (2 litre Diesel), springs	3 off—Buff and light green and violet
Clutch pedal unit:	Clearance of flanged bushes on cross-shaft	.001 to .003 in. (0,02 to 0,07 mm)
	Clearance of L.H. bush on cross-shaft	.002 to .004 in. (0,05 to 0,10 mm)
	Clearance of bush on withdrawal sleeve	.003 to .007 in. (0,07 to 0,18 mm)
	Pedal free movement	3/8 in. (20 mm) measured at pedal pad
	Fit of bush on pedal shaft	.001 to .003 in. (0,02 to 0,07 mm) clearance
	Bush reamed bore	.750 in. (20 mm)
Master cylinder:	Type	Girling c.v.
	Bore	1/2 in. (19 mm)
	Stroke	1 1/8 in. (35 mm)
	Push-rod free movement	1/16 in. (1,5 mm)
Slave cylinder:	Type	Girling
	Bore	3/8 in. (22 mm)
	2 litre Petrol	
Flywheel	Number of teeth	97
	Thickness at pressure face	1,093 in. (28 mm)
	Maximum permissible run-out on flywheel face	.002 in. (0,05 mm)
	Maximum refacing depth	.030 in. (0,75 mm)
	Minimum thickness after grinding	1,063 in. (27 mm)
	Markings:	T.D.C. E.P. F.A.10°
	When opposite pointer, No. 1 piston is at top dead centre	
	When opposite pointer, No. 1 exhaust valve should be fully open.	
	114° before T.D.C.	
	When opposite firing point of No. 1 cylinder,	

2 litre Diesel		2½ litre Petrol		Flywheel	
Primary pinion bush	Fit in flywheel .001 to .003 in. (0,02 to 0,07 mm) interference	Primary pinion bush	Fit in flywheel .001 to .003 in. (0,02 to 0,07 mm) clearance	Flywheel bolt tightening torque	50 lb./ft. (7 kgs/m)
Internal diameter—	reamed in position .875 in. (22 mm)	Internal diameter—	reamed in position .875 in. (22 mm)	Flywheel bolt tightening torque	50 lb./ft. (7 kgs/m)
Fit of shaft in bush	.001 to .003 in. (0,02 to 0,07 mm) clearance	Fit of shaft in bush	.001 to .003 in. (0,02 to 0,07 mm) clearance		
Flywheel bolt tightening torque	50 lb./ft. (7 kgs/m)				
2 litre Diesel					
Number of teeth	100	Number of teeth	97	Thickness at pressure face	1.515 in. (38 mm)
Thickness at pressure face	1.375 in. (35 mm)	Thickness at pressure face	1.515 in. (38 mm)	Maximum permissible run-out on flywheel face	.002 in. (0,05 mm)
Maximum permissible run-out on flywheel face	.002 in. (0,05 mm)	Maximum permissible run-out on flywheel face	.002 in. (0,05 mm)	Primary pinion bush:	Fit in flywheel .001 to .003 in. (0,02 to 0,08 mm)
Maximum refacing depth	.030 in. (0,75 mm)	Maximum refacing depth	.030 in. (0,75 mm)	Internal diameter—	reamed in position .875 in. (22,2 mm)
Minimum thickness after grinding	1.345 in. (34 mm)	Minimum thickness after grinding	1.345 in. (34 mm)	Fit of shaft in bush	.001 to .003 in. (0,025 to 0,075 mm)
Markings:		Markings:		Maximum refacing	
When opposite pointer, No. 1 exhaust valve dead centre		When opposite pointer, No. 1 piston is at top		When opposite pointer, No. 1 exhaust valve should be fully open.	
E.P.		E.P.		When opposite pointer, No. 1 piston is at top dead centre	
16° and 18° marks	See below.	16° and 18° marks	See below.	When opposite pointer, No. 1 piston is at top dead centre	
When opposite pointer, with both valves closed, indicates start of injection		When opposite pointer, with both valves closed, indicates start of injection		When opposite pointer, No. 1 piston is at top dead centre	
88 Diesel, up to engine No. 146900522		88 Diesel, up to engine No. 146900522		When opposite pointer, No. 1 piston is at top dead centre	
109 Diesel, up to engine No. 156900285		109 Diesel, up to engine No. 156900285		When opposite pointer, No. 1 piston is at top dead centre	
Set the pointer exactly between the 16° and 18° marking, i.e. the 17° mark;		Set the pointer exactly between the 16° and 18° marking, i.e. the 17° mark;		When opposite pointer, No. 1 piston is at top dead centre	
88 Diesel, from engine No. 146900523		88 Diesel, from engine No. 146900523		When opposite pointer, No. 1 piston is at top dead centre	
109 Diesel, from engine No. 156900286		109 Diesel, from engine No. 156900286		When opposite pointer, No. 1 piston is at top dead centre	
Set the pointer in line with the 16° mark		Set the pointer in line with the 16° mark		When opposite pointer, No. 1 piston is at top dead centre	
Primary pinion bush:		Primary pinion bush:		When opposite pointer, No. 1 piston is at top dead centre	
Fit in flywheel .001 to .003 in. (0,02 to 0,07 mm) interference		Fit in flywheel .001 to .003 in. (0,02 to 0,07 mm) interference		When opposite pointer, No. 1 piston is at top dead centre	
Internal diameter—	reamed in position .875 in. (22,2 mm)	Internal diameter—	reamed in position .875 in. (22,2 mm)	When opposite pointer, No. 1 piston is at top dead centre	
Fit of shaft in bush	.001 to .003 in. (0,02 to 0,07 mm) clearance	Fit of shaft in bush	.001 to .003 in. (0,02 to 0,07 mm) clearance	When opposite pointer, No. 1 piston is at top dead centre	
Flywheel bolt tightening torque	50 lb./ft. (7 kgs/m)	Flywheel bolt tightening torque	50 lb./ft. (7 kgs/m)	When opposite pointer, No. 1 piston is at top dead centre	