

Bulletin
Number 5011

Issue 1

Date 16/6/48

Sheet 1 of 2 Sheets

MODELS AFFECTED

1948 LAND-ROVER

UNIT AFFECTED

NUMBERING

COMPLAINT

SUBJECT

1948 LAND-ROVER AND UNIT NUMBERS

INFORMATION IN THIS BULLETIN SHOULD BE MADE AVAILABLE TO EVERYONE CONCERNED, SO THAT OUR SERVICE ORGANISATION MAY WORK TO THE GREATEST DEGREE OF EFFICIENCY.

The system of serial numbering 1948 Land Rovers and units is similar to that used for the cars, and is explained in the tables on Sheet 2 of this bulletin.

All vehicles use the same series of numbers, but bear the prefix letter " R " or " L " on the vehicle and chassis numbers, " R " indicating a right-hand drive model and " L " left-hand drive. Unit numbers (engine and front axle) carry the prefix " L " on left-hand drive vehicles as they differ in design from the right-hand drive pattern.

It is most essential that the prefix letter be quoted in addition to the vehicle number on spare parts orders for all models, as it is the only indication to our Spares Department that the vehicle design is to the right or left-hand specification, as the case may be.

THE VEHICLE NUMBER should be quoted in all correspondence. It will be found stamped on a PLATE ON THE ENGINE SIDE OF THE SCUTTLE ON THE LEFT-HAND SIDE, exposed when the bonnet top panel is lifted.

THE CHASSIS NUMBER is stamped on the top of the left-hand front engine bearer bracket. It is the same as the vehicle number.

THE ENGINE NUMBER is stamped at the top front of the cylinder block on the left-hand side, adjacent to the water pump.

THE MAIN GEARBOX NUMBER is stamped on the right-hand side of the gearbox casing.

THE TRANSFER CASE NUMBER is stamped on top of the casing.

THE TRANSFER BOX NUMBER is stamped on top of the casing.

THE REAR AXLE NUMBER is stamped on top of the axle casing on the left-hand side.

THE FRONT AXLE NUMBER is stamped on top of the axle casing on the left-hand side.

The purpose of the engine, gearbox and axle serial numbers is to enable our Spares Department to determine at what point mid-season alterations have taken place, if any. They should not be quoted when ordering spare parts unless specially asked for, as we can identify them from Vehicle Records, providing the VEHICLE NUMBER IS GIVEN.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a lower issue number. The old copy should be removed and destroyed.

Bulletin
 Number 5011

Issue 1

Date 16/6/48

Sheet 2 of 2 Sheets

MODELS AFFECTED

1948 LAND-ROVER

UNIT AFFECTED

NUMBERING

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SUBJECT

1948 LAND-ROVER AND UNIT NUMBERS

EXPLANATION OF VEHICLE NUMBERING SYSTEM

EXAMPLE.

| | | | | | | | |
|----------------|-----------|-------------|------------|------------|---|---|---|
| LAND-ROVER No. | L | 8 | 6 | 1 | 0 | 2 | 5 |
| | | | | | | | |
| | Left-hand | Year of | Land Rover | Actual | | | |
| | drive | manufacture | | Vehicle | | | |
| | model | (1948) | | Serial No. | | | |

It will be seen from the example that in the vehicle number the prefix "R" or "L" denotes a right- or left-hand drive model; the first figure is constant (8) and indicates year; the second figure is constant and denotes "Land-Rover"; and the last four figures indicate the actual serial number of the vehicle.

ALWAYS GIVE THE COMPLETE VEHICLE NUMBER WHEN ORDERING SPARE PARTS.

| Model. | Vehicle No. | Engine No. | Gearbox No. | Rear Axle No. | Front Axle No. |
|----------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| R.H.D. Land-Rover | R860001 onwards | 860001 onwards | 860001 onwards | 860001 onwards | 860001 onwards |
| L.H.D. Land-Rover | L860001 onwards | | L860001 onwards | | L860001 onwards |

EXTRA EQUIPMENT

Extra units supplied with the vehicle, such as rear power take-off, front winch, etc., are each numbered in the series 860001 onwards.

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Bulletin
Number 5005

Issue 3

Date 22.9.48

Sheet 1 of 4 Sheets

MODELS AFFECTED

1948 "60" AND "75"
1948 "LAND-ROVER"

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TIMING

Firing order.

"60" AND "LAND-ROVER" 1, 3, 4, 2.

"75" 1, 5, 3, 6, 2, 4.

Tappet clearance.

The correct tappet clearance is .010 in. (0,25 mm.) on the inlet valves and .012 in. (0,30 mm.) on the exhaust valves, with the engine COLD.

Adjustment for this clearance is provided by a set-screw and locknut on the rocker. (See Figs. 1 and 2). When adjustment is required, slacken the lock-nut and rotate the set-screw to give the correct clearance by means of a screwdriver. The lock-nut should be securely tightened after adjustment, great care being taken to ensure that this operation does not upset the clearance.

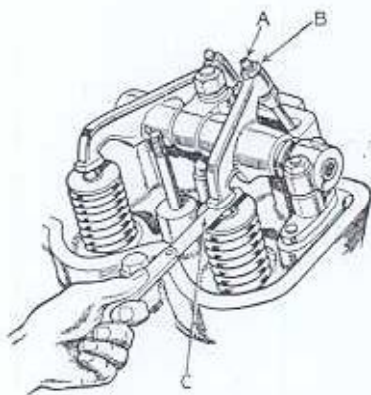


Fig. 1 Inlet tappet adjustment.
A—Tappet adjusting screw.

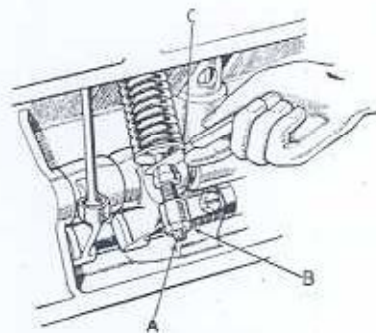


Fig. 2 Exhaust tappet adjustment.
B—Locknut.
C—Feeler gauge.

The tappet clearance should be set with the engine cold and it is essential to ensure that the valve to be adjusted is really closed. To do this, set the valve receiving attention fully open and then move the engine one complete turn, to bring the tappet on to the back of the cam.

It cannot be emphasized too strongly that the clearances must be correct. If anything less than the indicated clearance is used, a fall in power output will follow and any greater clearance will mean noisy tappets.

Notation.

Throughout the text which follows, "No. 1" cylinder is that at the front of the engine.

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Bulletin
Number 5005

Issue 3

Date 22.9.48

Sheet 2 of 4 Sheets

MODELS AFFECTED

1948 "60" AND "75"

1948 "LAND-ROVER"

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TIMING

Flywheel markings.

The flywheel markings and timing pointer are exposed when the inspection cover on the right-hand side of the flywheel housing is removed.

The markings and their meanings are as follows:—

(1) The line against which the letters T.D.C. are stamped, when brought dead opposite the pointer, means that No. 1 piston is on Top Dead Centre, i.e., at the top of its stroke.

(2) There are three ignition timing markings on the flywheel: F.A. 7° for high-compression car engines (see Service Bulletin 5003); F.A. 11° for low-compression car engines (see Service Bulletin 5003) and F.A. 15° for Land-Rover engines.

Some early flywheels have only a single T.D.C./F.A. line and it will therefore be necessary in such cases, to set the ignition timing 2 flywheel teeth B.T.D.C. for high-compression car engines, 3 teeth B.T.D.C. for low-compression car engines and 4 teeth B.T.D.C. for Land-Rover engines.

The correct F.A. mark, when set opposite the pointer, indicates the firing-point of No. 1 cylinder when the octane selector on the distributor is set in the standard position, e.i., the point at which the distributor points should be just opening, with the rotor in the firing position, for No. 1 or No. 4 cylinder ("60" and Land-Rover) or No. 6 cylinder ("75").

(3) The line against which the letters E.P. are stamped, when set opposite the pointer, indicates the point at which No. 1 exhaust valve should be at the peak of its lift (fully open). It is 114° after T.D.C. (31 flywheel teeth).

Valve timing.

If the timing chain and hydraulic tensioner should have been removed, the procedure to re-time the engine is as follows (See Fig. 3).

(1) Set the exhaust tappets to .012 in. (0.30 mm.) clearance (See Sheet 1 of this bulletin) and slacken the inlet tappet adjusting screws as far as possible.

(2) Rotate the camshaft in the running direction until No. 1 exhaust valve is fully open.

The use of a dial indicator is the only reliable method of determining this point. It should be mounted on a stud adjacent to No. 1 exhaust rocker and with its aid the possibility of an error in determining the exhaust peak is eliminated. It is possible to do the job correctly without a dial indicator, but much time is wasted and the possibilities of an error very much magnified.

(3) Rotate the engine in the running direction until the E.P. mark on the flywheel is in line with the pointer.

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Number 5005

Issue 3

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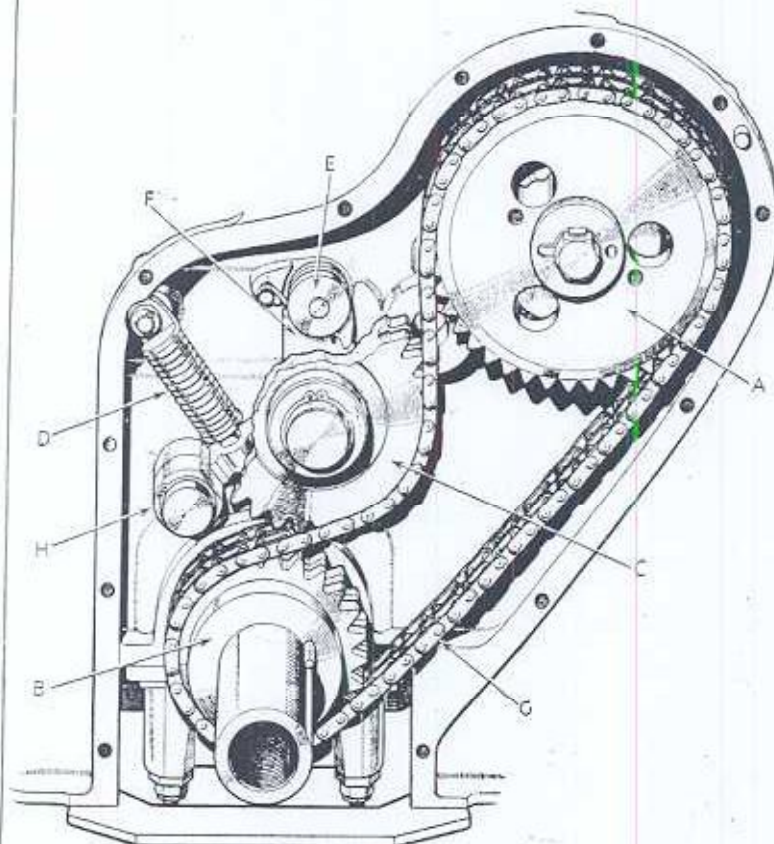
MODELS AFFECTED
1948 "60" AND "75"
1948 "LAND-ROVER"

UNIT AFFECTED
ENGINE

COMPLAINT

SUBJECT

ENGINE TIMING



- A—Camshaft chainwheel.
- B—Crankshaft chainwheel.
- C—Jockey pulley.
- D—Hydraulic tensioner.
- E—Pawl.
- F—Ratchet.
- G—Timing chain (driving side).
- H—Jockey pulley arm.

Fig. 3 Timing gears.

4. Fit the timing chain, ensuring that there is no slack on the driving side (G).
5. Hold the ratchet pawl (E) clear and replace the complete jockey pulley (C, F and H), meshing the pulley with the chain.
6. Check the timing and correct if necessary. The camshaft chainwheel (A) is made with three irregularly spaced keyways, so that if the timing will not come correct in the first position tried, alternatives are provided.
7. Replace the hydraulic tensioner (D) comprising cylinder, piston and spring; these items must be assembled dry to prevent the formation of an air lock. Retain at its upper end with a split pin. Fit the circlip at (H), retaining the jockey pulley assembly. Engage the ratchet (E, F).
8. Set the inlet tappets to .010 in. (0,25 mm.) clearance (see Sheet 1 of this bulletin).

Ignition timing.

1. Check the contact breaker clearance and adjust if necessary. The correct gap with the points fully open is .012 in. (0,30 mm.).

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Bulletin
Number 5005

Issue 4

Date 22.9.48

Sheet 4 of 4 Sheets

MODELS AFFECTED

1948 "60" AND "75"

1948 "LAND-ROVER"

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TIMING

2. Rotate the engine in the running direction until the *correct* F.A. line on the flywheel is in line with the pointer, with both valves on No. 1 cylinder closed. (See Sheet 2 of this bulletin).

On early engines the common T.D.C./F.A. mark should be disregarded for ignition setting and the firing point set at either 2, 3 or 4 teeth before the T.D.C. line, depending upon the type of engine.

3. The distributor rotor will now correspond with No. 1 cylinder high tension lead terminal.

4. Set the octane selector to the standard position on the sliding scale.

5. Set the distributor points just breaking by slackening the pinch-bolt at the base of the distributor head and rotate the distributor bodily in the required direction. Do not forget to re-tighten the pinch bolt.

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Bulletin
Number 5022

Issue 1

Date 14.10.48

Sheet 1 of 1 Sheet

MODELS AFFECTED

1948 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

LUBRICATION

COMPLAINT

SUBJECT

OIL PUMP FILTER PART No. 09071

The oil sump filter used on the above models, is so constructed that the inner end is required to locate in the oil pump body; it is possible however, to assemble the filter to the sump in such a manner that this does not occur, with the result that the filter, as it is being screwed in, produces a side thrust on the oil pump, thereby creating a possibility of subsequent fracture of the oil pump body and/or shaft.

In order that it will be easier to locate the filter an alteration has been introduced reducing the number of threads at the outer end from 5 to 3.

All engines from R8210951, R8414100, L8413781 and 860645 onwards will be so modified prior to despatch. All engines in the series L8210001 onwards are UNMODIFIED.

As it is essential that all current models be modified, will you please take the necessary action as promptly as possible, on all vehicles passing through your hands and remove the two threads as necessary, care being taken not to damage the gauze.

When this modification is carried out, please stamp the letter "O" on the head of the filter plug, thus avoiding unnecessary inspection of the threads at a future date.

When replacing the filter, ensure that it is spigoted in the oil pump before screwing home.

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Bulletin
Number 5021

Issue 1

Date 20.10.48

Sheet 1 of 1 Sheet

MODELS AFFECTED

1948 "60" and "75"
1948 "LAND-ROVER"

UNIT AFFECTED

ROCKER GEAR (TOP)

COMPLAINT

SQUEAKS FROM INLET ROCKER MECHANISM

SUBJECT

**CAUSE. LACK OF LUBRICATION TO THE PUSH ROD CUPS
AND/OR ROCKER BUSHES.**

Oil should flow through a drilling in the inlet rockers and along the thread securing the tappet adjusting screw. Lack of oil at the push rod cups may be due to:

- (a) Rockers tight on the shaft.
- (b) A burr or a slightly raised portion on the rocker shaft, around the individual rocker lubrication holes.
- (c) The direction of load "blanking off" the hole in the bush, on rockers which are drilled from the tappet screw end.

REMEDY. Remove, strip and polish the rocker shaft; ease out any rocker bushes which appear tight.

Grind a very small flat around each hole.

If the rockers are of the type mentioned in para. (c) above, grind a flat on the rocker shaft, opposite the hole in the rocker bush. The flat should be $\frac{1}{8}$ " (12 mm.) long by $\frac{1}{8}$ " (3 mm.) wide; on no account must it break out at the sides of the rocker bush when the rocker is in position.

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Bulletin
Number 5023

Issue 1

Date 27.10.48

Sheet 1 of 1 Sheet

MODELS AFFECTED

1948 "60" and "75"

1948 Land-Rover

UNIT AFFECTED

ENGINE

COMPLAINT

EXCESSIVE WEAR OF FAN BELT

SUBJECT

Excessive wear of fan belts is invariably due to malalignment of the pulleys, chiefly that on the dynamo. In some instances, however, initial slackness in the belt may be the cause.

When changing a fan belt, check for malalignment. A suitable tool for this purpose can be made from $\frac{1}{8}$ " (3 mm.) mild steel strip $\frac{3}{8}$ " (16 mm.) wide and 24" (610 mm.) long; bend a radius at one end to suit the dynamo pulley, the end to finish past the pulley centre line, thus forming a hook.

To correct any misalignment reduce the length of the distance pieces or add suitable shims at the dynamo mountings.

It is advisable to check the belt adjustment at frequent intervals and take up any slackness by adjusting the dynamo.

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Bulletin
Number 5025

Issue 1

Date 10.11.48

Sheet 1 of 1 Sheet

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

DECARBONISING AND VALVE GRINDING

Contrary to advice in the Car Instruction Manual and the first edition of the Land-Rover Operation Manual, experience has proved that the initial decarbonising and valve grinding operation should be carried out fairly early in the life of the engine, if possible as early as 2,000 miles (3,500 Km).

At this and every subsequent decarbonising operation, special attention should be given to the valve seats :

WIDTH OF VALVE SEATING should not be less than 1/16 in. (1,60 mm), nor more than 1/8 in. (3,20 mm). If the seat width proves to be outside these recommended dimensions, proceed as follows :

INLET VALVES.

Re-cut the inlet valve seats in the cylinder head to 30° ; face the valves to 30° and lap into their respective seats.

EXHAUST VALVES.

The exhaust valve seats, inserted in the cylinder block, are manufactured from "Brimochrome". This material cannot be cut in the normal way, but can be ground using "Vibro-centric" grinding equipment. The only suitable stone we have found for this operation is D1144E ; should difficulty be experienced in obtaining this stone, our Service Department will be able to help you.

Grind the insert seat to 45°. Should there be eccentricity between the valve seat and guide it may be necessary to grind to, or beyond the limit of 1/8 in. (3,20 mm) seat width on one side in order to obtain the minimum width of 1/16 in. (1,60 mm) diametrically opposite. If the 1/8 in. (3,20 mm) limit is exceeded at any point, grind back the 30° angle which forms the "crown" of the seat, so reducing the seat width on that side.

Face the exhaust valves to 45° and lap into their respective seats.

Further decarbonising should not again be necessary until there is a "fall off" in performance, but as this condition is not always readily detected, it may be advisable to depend on mileage as a guide and decarbonise at every 10,000 miles (15,000 Km), regrinding the valve seats as described, only where necessary.

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Bulletin
Number 5019

Issue 2

Date 24.11.48

Sheet 1 of 6 Sheets

MODELS AFFECTED
1948 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

TOOLS

COMPLAINT

SUBJECT

SPECIAL WORKSHOP TOOLS

The majority of maintenance and overhaul operations on 1948 models can be carried out using the tools normally available in the workshop.

For certain operations however, special tools are advisable and, in some instances, essential; this Bulletin gives details of all such tools. With one or two exceptions, these can be readily made from the dimensioned sketches which follow, either by garage staff or by local workshops; the few exceptions are items which should be bought complete.

ESSENTIAL TOOLS.

1. Jig-block for engine re-boring.

To enable standard cylinder boring equipment to be used on the inclined head faces of the cylinder blocks fitted to the "60" and "75" engines, special wedge blocks have been designed. They are stocked by our Spares Department, the part numbers being T1287 for the "60" 4-cylinder pattern and T1288 for the "75" 6-cylinder type, and will be supplied on application at cost price to Rover Agents.

2. Spreader for rear springs. (Except Land-Rover.)

Some form of spreader is required when removing or replacing rear springs owing to their large static deflection; a suitable pattern is shown in Fig. 1.

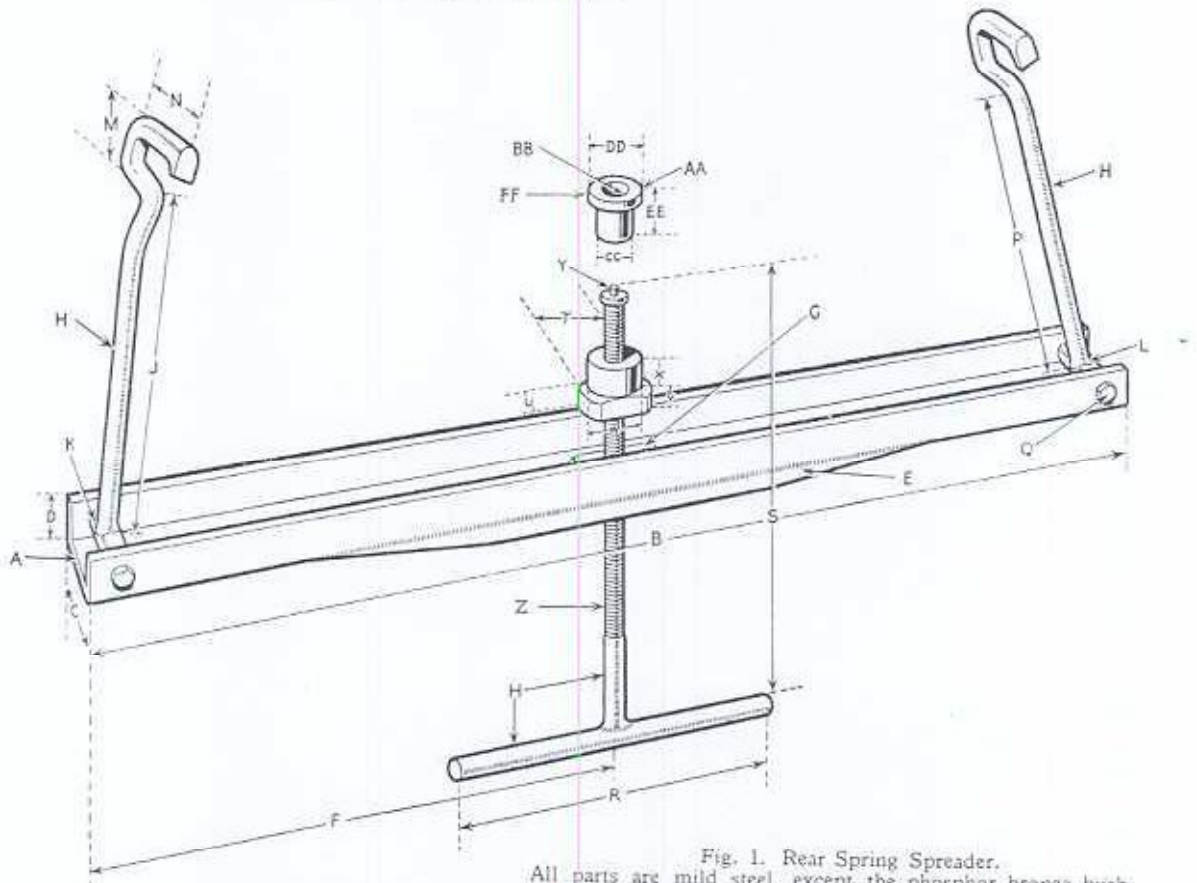


Fig. 1. Rear Spring Spreader.
All parts are mild steel, except the phosphor bronze bush.

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Bulletin
Number 5019

Issue 1

Date 2.9.48

Sheet 2 of 6 Sheets

MODELS AFFECTED

1948 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

TOOLS

COMPLAINT

SUBJECT

SPECIAL WORKSHOP TOOLS

| | | | |
|---|--|----|---------------------------|
| A | — ½ in. (6 mm.) channel section | R | — 12 in. (300mm.) |
| B | — 40 in. (1,02 m.) | S | — 15½ in. (395 mm.) |
| C | — 2½ in. (65 mm.) | T | — 2¼ in. (70 mm.) diam. |
| D | — 1½ in. (38 mm.) | U | — 1½ in. (50 mm.) |
| E | — Two stiffening webs, ¼ in. (6 mm.) plate, welded to channel | V | — ¾ in. (19 mm.) |
| F | — 21 in. (535 mm.) | W | — 1¼ in. (44,5 mm.) diam. |
| G | — Slot ⅝ in. (22 mm.) wide x 2¼ in. (57 mm.) long | X | — 1¼ in. (28,5 mm.) |
| H | — ½ in. (19 mm.) round bar | Y | — ⅞ in. (11 mm.) diam. |
| J | — 13 in. (330 mm.). Crank slightly inwards | Z | — ½ in. Whit. thread |
| K | — Tube ½ in. (19 mm.) O/D x 1¼ in. (50 mm.) long | AA | — Phosphor bronze bush |
| L | — Weld | BB | — ⅞ in. (11 mm.) bore |
| M | — 1¼ in. (45 mm.) | CC | — 1 in. (25 mm.) diam. |
| N | — 2½ in. (66 mm.) | DD | — 1¼ in. (28,5 mm.) diam. |
| P | — 11½ in. (290 mm.). Crank slightly inwards | EE | — 1 ⅞ in. (49 mm.) |
| Q | — ⅝ in. (9,5 mm.) bolts and nuts | FF | — ⅝ in. (8 mm.) flange |

The two arms hook over the extremities of the main leaf adjacent to the shackle bushes, while the phosphor bronze bush bears on the underside of the bottom plate, locating on the centre dowel.

3. Clip for hydraulic plunger assembly.

The hydraulic plunger assembly for the timing chain jockey wheel, comprising the cylinder, piston and spring must be fitted as a unit, as there is insufficient room and the spring is too strong for the components to be fitted separately.

The illustration shows the clip in position and also gives dimensions for its manufacture.

| | |
|---|--------------------------------|
| A | — 15/32 in. (11,9 mm.) |
| B | — ¼ in. (9,5 mm.) |
| C | — ⅝ in. (15,9 mm.) |
| D | — 3 27/32 in. (105 mm.) |
| E | — ½ in. (12,7 mm.) |
| F | — 1 1/8 in. (17,5 mm.) |
| G | — 2 5/8 in. (58,7 mm.) |
| H | — 14 S.W.G. (2 mm.) mild steel |

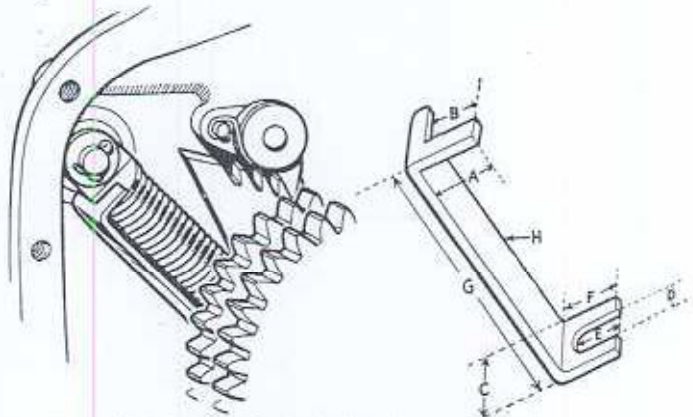


Fig. 2. Clip for hydraulic plunger assembly.

4. Extractor for water pump impellor.

The water pump impellor is a press fit on its spindle, thus making the use of extractor essential.

The extractor illustrated in Fig. 3 is of a common design and the method of using should be clear from the sketch.

Later impellers have ½ in. B.S.F. tapped holes for extraction, whereas the holes in those fitted to early models are 2 B.A. When it is desired to remove this type, the extraction holes should first be enlarged, as the smaller threads are liable to strip.

| | |
|---|--|
| A | — ⅞ in. (20,64 mm.) centres |
| B | — Two bolts ½ in. B.S.F. x ½ in. (19 mm.) long |
| C | — ½ in. (6 mm.) mild steel plate |
| D | — ⅝ in. (8 mm.) set bolt x 2 in. (50 mm.) long |

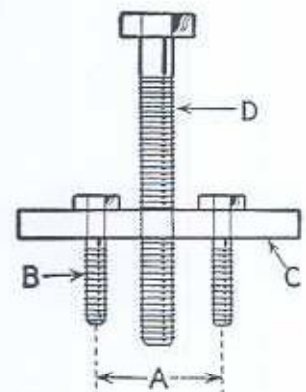


Fig. 3. Extractor for water pump impellor.

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MODELS AFFECTED
1948 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

TOOLS

COMPLAINT

SUBJECT

SPECIAL WORKSHOP TOOLS

5. Extractors for bottom (exhaust) rocker shafts.

Removal of the exhaust rocker shafts can be effected from the rear of the cylinder block with the engine either in or removed from the vehicle. With the engine in position on early "75" models, the toe-board must first be removed; later models incorporate a hole in the toe-board, covered with a removable plate. On "60" models the shafts can be withdrawn without removing the toe-board, whilst on Land-Rover, the gearbox cover must first be removed.

A suitable extractor which screws into the end of the shaft is shown at Fig. 4; in addition a second shorter extractor will be necessary for Model "60" (with the engine in position) and a cylinder head bolt will be found suitable for this purpose.

This extractor is for early engines having threads provided in the rocker shafts; later shafts have plain bores and to effect removal a similar tool will be required, having a No. 4 Easy-Out stud extractor in place of the $\frac{7}{32}$ " B.S.F. thread.

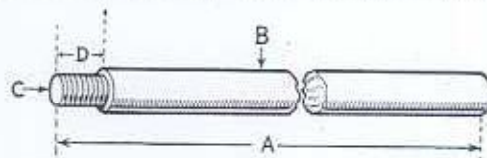


Fig. 4. Extractor for exhaust rocker shafts.

- A — 13 in. (330 mm.)
- B — $\frac{1}{2}$ in. (12,5 mm.) round bar
- C — $\frac{7}{32}$ in. B.S.F. thread
- D — $\frac{1}{2}$ in. (12,5 mm.)

6. Packing block for front road spring removal (Except Land-Rover)

When removing a front coil spring by jacking under the spring support plate and removing the six bolts securing the plate to the bottom suspension link, a packing block between the jack pad and plate is essential, to ensure that the plate remains square with the link members. A suitable tapered wooden block for use with the normal garage Hi-Lift jack is illustrated at Fig. 5.

- A — $2\frac{1}{2}$ in. (64 mm.) radius
- B — 3 in. (75 mm.)
- C — $1\frac{1}{4}$ in. (31,7 mm.)
- D — $1\frac{1}{2}$ in. (41,3 mm.)

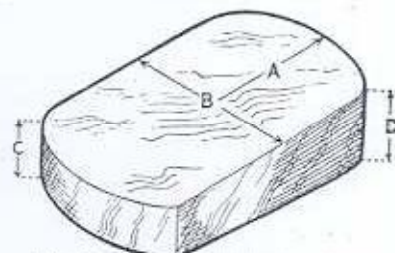


Fig. 5. Packing block for front road spring removal.

7. Collar for assembly of swivel pin (Except Land-Rover)

To ensure correct end-float on the swivel pin thrust bearing, it is essential that the swivel pin be pulled well home into the swivel column. To assist in this operation the collar shown in Fig. 6 should be fitted and the pin tightened up with the $\frac{3}{4}$ " fixing nut, before fitting the thrust bearing and shims.

- A — $\frac{11}{16}$ in. (23,8 mm.)
- B — $1\frac{1}{2}$ in. (38 mm.) diam.
- C — 1 in. (25 mm.) diam.

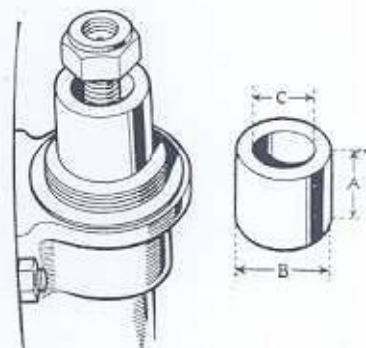


Fig. 6. Collar for swivel pin assembly.

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|--|---------|-------------------------------|---------------------|
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| MODELS AFFECTED 1948 "60" and "75" 1948 Land-Rover | | UNIT AFFECTED TOOLS | |
| COMPLAINT | | | |
| SUBJECT SPECIAL WORKSHOP TOOLS | | | |

8. Reamer for stub axle bushes (except Land-Rover).

Owing to the fact that the top and bottom stub axle bushes have different internal diameters, normal straight reamers cannot be used when fitting replacement bushes. Dimensional details have been supplied to a few tool manufacturing firms and will be given to other firms on request, to enable special reamers to be designed and marketed. Rover agents in need of this reamer should therefore apply to any tool manufacturer advertising in the Trade Press.

TOOLS ADVISABLE.

The tools listed below are not absolutely essential, but each will be found to greatly assist in its respective application, with consequent long-term savings in both time and labour involved.

9. Extractor for camshaft chainwheel.

Easy removal of the camshaft chainwheel can be effected by utilising the two $\frac{3}{8}$ " Whit. threads provided in the chainwheel, in conjunction with the extractor illustrated in Fig. 7.

- A — 2½ in. (57,15 mm.) centres
- B — Two bolts ½ in. Whit. x 3 in. (75 mm.) long
- C — Mild steel block 1¼ in. (32 mm.) x ¾ in. (19 mm.) x 3½ in. (89 mm.)
- D — ½ in. (11 mm.) round bar threaded into block
- E — 3 in. (76 mm.) thread minimum.

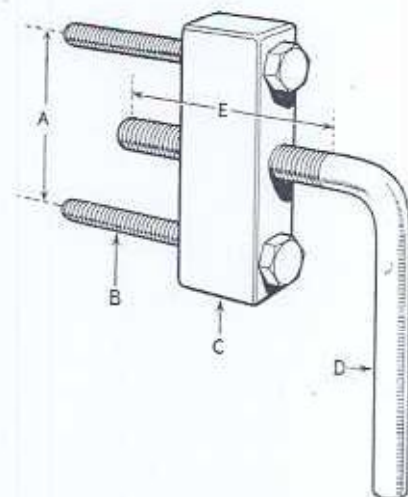


Fig. 7. Extractor for camshaft chainwheel.

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Number 5019

Issue 1

Date 2.9.48

Sheet 5 of 6 Sheets

MODELS AFFECTED

1948 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

TOOLS

COMPLAINT

SUBJECT

SPECIAL WORKSHOP TOOLS

10. Brackets for use with dial test indicator.

We recommend the use of a dial test indicator when carrying out three operations and for this purpose special brackets will be required.

(a) Valve timing.

The bracket shown in Fig. 8 is designed to allow a dial test indicator to be used on No. 1 exhaust rocker, thus facilitating the accurate location of the E.P. position.

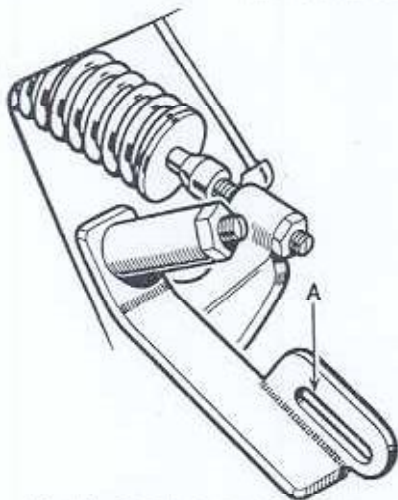


Fig. 8. Bracket for valve timing.
A — Secure dial test indicator here.

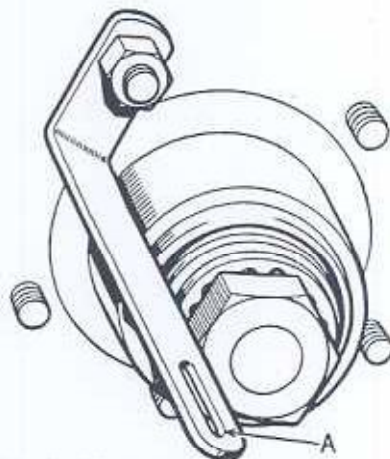


Fig. 9. Bracket for front hub end-float.
A — Secure dial test indicator here.

(b) Front hub end-float.

The front hub end-float must be accurately set to .003 in.-.004 in. (0,08 mm.-0,1 mm.), and the use of a dial test indicator in conjunction with the bracket shown at Fig. 9 is the best method of ensuring the correct setting.

(c) Differential crownwheel backlash.

The differential crownwheel backlash must be set accurately to .007 in. (0,18 mm.); the use of a dial test indicator clamped to the crownwheel by means of the bracket illustrated and bearing on the housing flange is the only reliable method of setting to this figure.

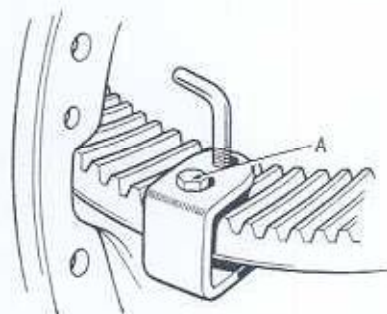


Fig. 10. Bracket for crownwheel backlash.
A — Secure dial test indicator with this bolt.

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| MODELS AFFECTED 1948 "60" and "75" 1948 Land-Rover | UNIT AFFECTED TOOLS |
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| COMPLAINT |
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SUBJECT
SPECIAL WORKSHOP TOOLS

11. Extractor for drop arm (except Land-Rover).

The drop arm on "60" and "75" models is pulled on to a tapered spline on the steering rocker shaft and removal may therefore prove difficult unless the extractor shown at Fig. 11 is employed. To effect removal disconnect the drag link ($\frac{7}{16}$ " self-locking nut), remove the $\frac{7}{8}$ " nut securing the drop arm, turn the road wheels on to full right lock and fit the extractor over the lugs on the drop arm boss from the front.

- A — 1 in. (25 mm.) x $\frac{5}{16}$ in. (8 mm.) mild steel strip.
- B — $\frac{1}{4}$ in. (6 mm.) mild steel plate cut to shape and inserted and welded inside piece A.
- C — 2 in. (50,8 mm.)
- D — 1 $\frac{1}{4}$ in. (44,5 mm.)
- E — 1 $\frac{1}{2}$ in. (38 mm.)
- F — $\frac{1}{2}$ in. (12,7 mm.)
- G — $\frac{1}{2}$ in. (13 mm.) nut welded on
- H — $\frac{1}{2}$ in. (13 mm.) set bolt x 2 in. (50 mm.) long.

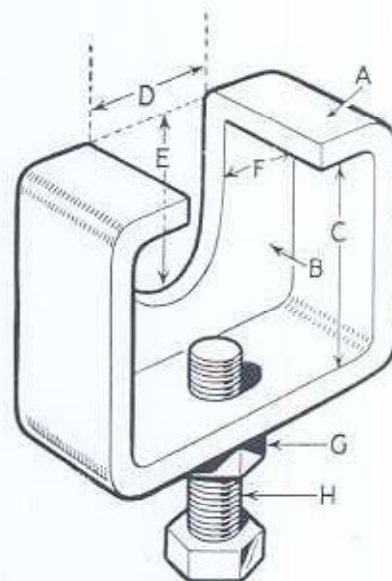


Fig. 11. Extractor for drop arm.

12. Bar Spanner for differential serrated locking nuts.

The illustration shows a bar spanner designed for adjustment of the serrated locking nuts securing the crownwheel.

- A — 15 in. (380 mm.)
- B — $\frac{3}{8}$ in. x 1 in. (25 mm. x 5 mm.) T-section mild steel.
- C — $\frac{1}{4}$ in. (9,5 mm.)
- D — $\frac{1}{2}$ in. (12,7 mm.)
- E — 1 $\frac{1}{4}$ in. (28,6 mm.)
- F — $\frac{1}{2}$ in. (12,7 mm.)
- G — $\frac{3}{4}$ in. (9,5 mm.)
- H — $\frac{1}{4}$ in. (9,5 mm.)

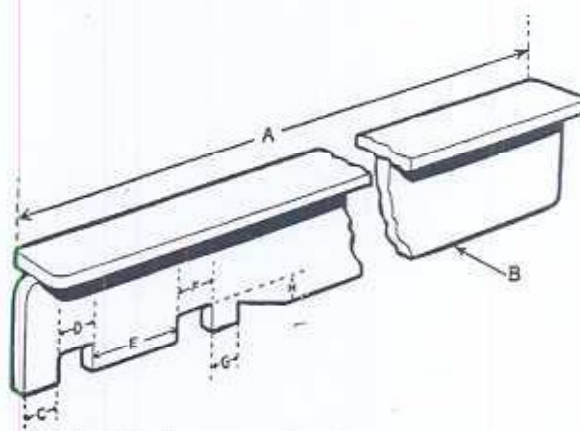


Fig. 12. Bar spanner for crownwheel adjustment.

13. Spanner for carburettor removal.

For easy removal of the carburettor it will be found advisable to employ a standard $\frac{1}{4}$ " side open-ended spanner, i.e., one having the jaw at right-angles to the shank.

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Number 5026

Issue 1

Date 25.11.48

Sheet 1 of 4 Sheets

MODELS AFFECTED
1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

CLUTCH

COMPLAINT

SUBJECT

CLUTCH DATA AND SETTING

Changes introduced on clutch units fitted to 1948-49 models are such that they cannot be used on any previous model. For information concerning all 1934-47 clutches, consult Service Bulletin 4611.

PART 1. Clutch Springs.

Clutch spring Part No. 216600 is used on "60", "75" and Land-Rover. Its characteristics are as follows:—

Number of coils $5\frac{1}{2}$

Solid height 1.040 in. (26,4 mm.)

Free length 1.554 in. (39,5 mm.)

Identification Orange paint.

Load 130 lb. ± 4 (59 Kg. $\pm 1,8$) at Working length 1.164 in. (29,6 mm.)

PART 2. Clutch Plates.

Two alternative types of clutch plate will be found on 1948-49 cars and Land-Rovers, but to facilitate stocking and supply, only one of these, the Borg and Beck pattern, is supplied as replacement by our Spares Department. The part numbers to be used are 217179 for "60" and Land-Rover and 217180 for "75" models.

PART 3. Checking the alignment of the clutch operating levers.

To ensure correct operation of the clutch withdrawal mechanism it is essential that the faces of the operating levers ("toggles") are set equidistant from the flywheel face.

Contrary to any different information which may be in your possession, the correct dimension for 1948-49 models is 1.729 in. $+0,010$ (43,90 mm. $+0,25$)
 $-0,000$ $-0,00$.

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Bulletin
Number 5026

Issue 1

Date 25.11.48

Sheet 2 of 4 Sheets

MODELS AFFECTED
1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

CLUTCH

COMPLAINT

SUBJECT

CLUTCH DATA AND SETTING

Owing to the number of accumulated tolerances affecting this dimension, it is unlikely that the setting will be correct on initial assembly and the following method should be employed to check and rectify any inaccuracy present.

The equipment required is shown in Fig. 1 and comprises :—

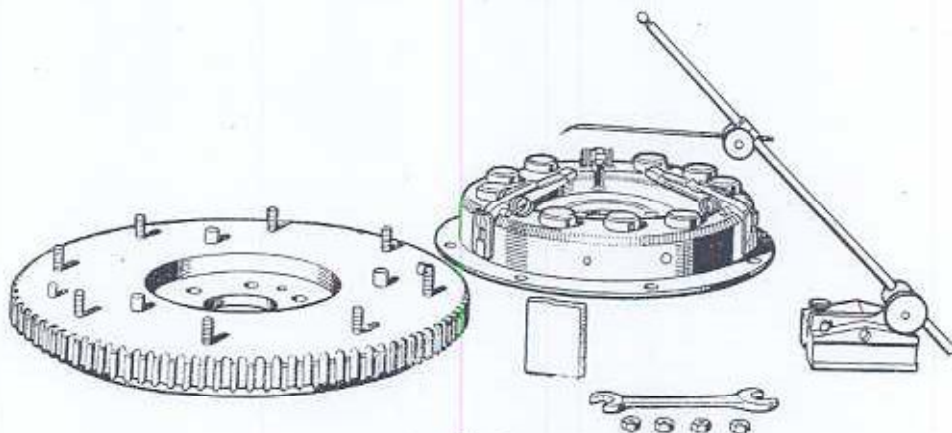


Fig. 1

1. Clutch to be checked.
2. Flywheel.
3. Surface plate.
4. Scribing block.
5. Setting gauge with steps at 1.729 in. (43,90 mm.) and 1.739 in. (44,15 mm.). This can be made from a piece of flat $\frac{1}{2}$ in. (6 mm.) steel plate.
6. Three $\frac{3}{8}$ in. (9,5 mm.) distance pieces. $\frac{3}{8}$ in. (9,5 mm.) Hoffmann rollers are suitable.

The complete clutch assembly should be bolted down to the flywheel with eight nuts, with the clutch plate replaced by the three distance pieces. The clutch plate is not used for the checking operation as it has an allowable "run-out" of .010 in. (0,25 mm.).

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Issue 1

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Sheet 3 of 4 Sheets

MODELS AFFECTED
1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

CLUTCH

COMPLAINT

SUBJECT

CLUTCH DATA AND SETTING

The flywheel and clutch assembly should then be placed on the surface plate and the scribe set to 1.729 in. (43,90 mm.) from the flywheel face, by using the gauge as in Fig. 2.

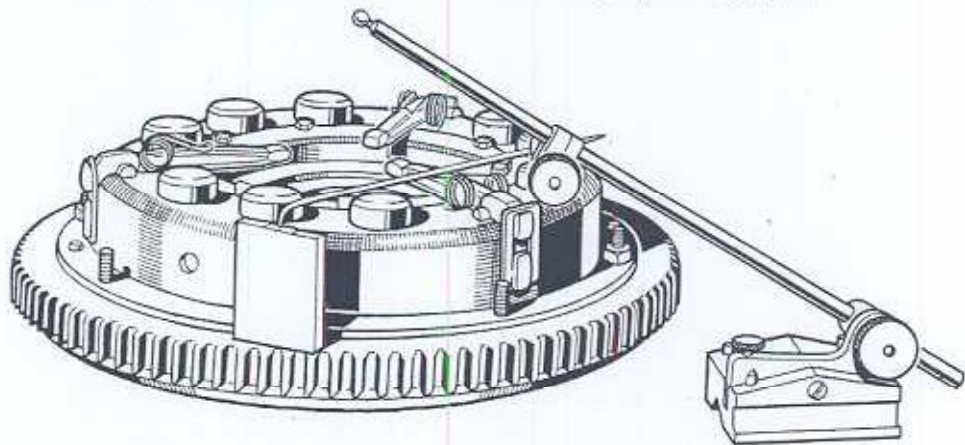


Fig. 2

Check the heights of the three operating levers (Fig. 3) and if any of them does not come between 1.729 in. (43,90 mm.) and 1.739 in. (44,15 mm.), it must be brought into line as described below:—

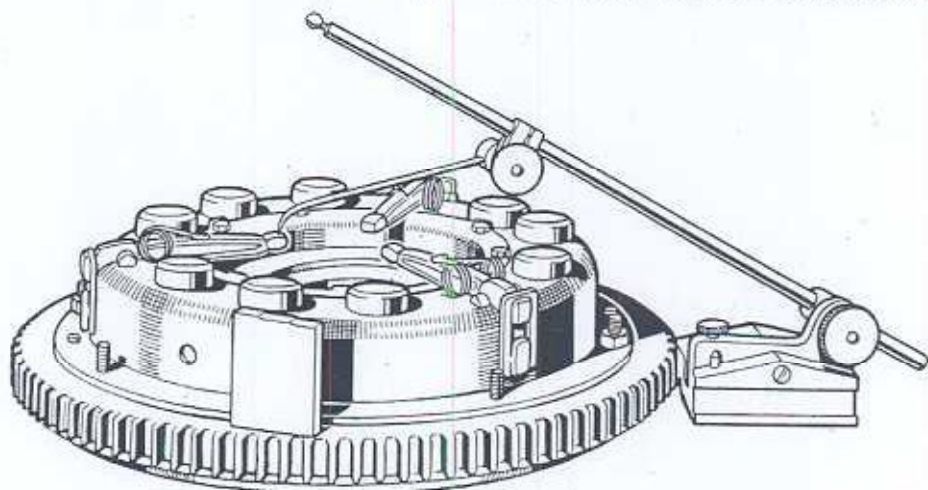


Fig. 3

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Sheet 4 of 4 Sheets

MODELS AFFECTED
1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

CLUTCH

COMPLAINT

SUBJECT

CLUTCH DATA AND SETTING

1. If the lever is too high :—

(a) By selective assembly of levers, necessitating a fairly large stock, or :—

(b) By filing a very small amount from the flat end of the slot in the operating link. As the ratio of the distances of the two ends of a lever from the fulcrum pin is roughly 5 to 1, it will be seen that the removal of .002 in. (0,05 mm.) from the link will lower the operating face of the lever approximately .010 in. (0,25 mm.).

2. If the lever is too low :—

This means that wear is present in the toggle and/or link and the worn parts must therefore be replaced.

NOTE. The lever return springs must be in position each time a check is made ; in addition, care should be taken to ensure that the toggle pivot pins are well seated in the cover plate.

Having obtained the required setting, remove the nuts, lift off the clutch assembly and refit the clutch plate in place of the distance pieces, with the longer end of the central boss away from the flywheel.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

Bulletin
Number 5027

Issue 1

Date 26.11.48

Sheet 1 of 1 Sheet

MODELS AFFECTED
1948 LAND-ROVER

UNIT AFFECTED
FRONT AXLE

COMPLAINT

SUBJECT

SETTING OF LOCK STOP BOLTS

In order to cater for variations in tyre sizes, it has been necessary to provide adjustable lock stops. These are correctly set at the factory to suit the size of tyre originally fitted. Should any change in tyre size be made, re-adjustment of the lock stops is called for. This adjustment is obtained as follows:—

LOCK STOP ADJUSTMENT is by means of a special bolt and locknut located at the rear of each swivel pin housing, which is one of a series securing the large oil seal retainer to the flange of the housing. On full lock this bolt abuts a bolt head on the front axle casing flange.

The adjustment is carried out by setting the distance from the face of the oil seal retainer to the outer face of the bolt head to:—

7/16 in. (11 mm.) for 6.00/16 tyres.

23/32 in. (18,25 mm.) for 7.00/16 tyres.

SPECIAL NOTE. Early models are not fitted with this adjustment, a fixed stop suitable only for 6.00/16 tyres being provided. Such vehicles can be converted to the latest practice by using stop bolt Part No. 230437 and locknut Part No. 2823.

Should tyres of any other size be used, the setting can be obtained by experiment so that on full lock in either direction, the tyres just fail to foul the chassis frame.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

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Number 5029

Issue 1

Date 30.11.48

Sheet 1 of 1 Sheet

MODELS AFFECTED
1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

WHEELS

COMPLAINT

SUBJECT

ROAD WHEEL BALANCING

All well-base type road wheel, tube and tyre assemblies for the models listed above are balanced on initial assembly. It is therefore necessary to check and correct the balance each time a tyre is removed and refitted.

Proceed as follows :—

1. Fit the inner tube and tyre to the wheel with the yellow marking on the tyre adjacent to the tube valve and inflate to the correct pressure.
2. Mount the assembly on a dummy hub, securing it firmly with at least three nuts. An old hub from a 1948 or earlier model can be used as the dummy; fitted with three or five wheel holding studs and nuts it must itself be in complete balance.
3. Any out-of-balance of the wheel assembly should be corrected by attaching appropriate balance weights (see below) to the ventilation slots on the inner side of the wheel, securing them with cone-pointed screws. When the balance of the wheel is adjusted correctly, it will remain stationary when turned to any position of a complete revolution. Usually two or three weights are required for each wheel.
4. Remove the assembly from the hub and install it on the vehicle.

For "60" and "75" roadwheels, use balance weight Part No. 218153 with screw Part No. 77321.

For Land-Rover well-base wheels, use balance weight Part No. 230602 with screw Part No. 77808.

This Bulletin does not apply to Land-Rover divided pattern wheels.

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Bulletin
Number 5030

Issue 1

Date 1.12.48

Sheet 1 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

BRAKES, FRONT

COMPLAINT

- A. OIL OR GREASE ON FRONT BRAKES.
- B. BRAKES "PULL".
- C. BRAKES POOR.
- D. OIL LEAKS FROM FRONT AXLE.

SUBJECT

Any one or all of the complaints A, B, C and D may be present on the vehicle in question. Whichever complaint is received, proceed as follows:—

1. Check for oil leaks and determine their source; it will be one of the following:—
 - (a) From the brake wheel cylinder; in this case it would be brake fluid leaking and the brake linings would be affected.
 - (b) From the front hub bearings; in which case it would be grease ("60" and "75") or axle oil and/or grease (Land-Rover) and would affect the brake linings.
 - (c) From the swivel pin ("60" and "75" only); from the swivel pin housing seal (Land-Rover only); from the joint face between the swivel pin housing and the stub axle (Land-Rover only). In all these cases it is unlikely that the brakes will be affected.

Having located the oil leak, deal with it as detailed below:—

Remedy (a). Renew the brake wheel cylinder piston cups as necessary. (See OPERATION A, Sheet 2). If the brake linings are badly affected, re-line the shoes; if there is only slight damage, de-grease the linings.

Remedy (b). Check the hub oil seal; it may have been pressed too far into the hub and therefore fails to register on the shoulder of the stub axle when the hub is in position.

The correct position for the seal is as follows:—

"60" and "75" 3/32 in. (2.40 mm.) proud of the rear face of the hub.
LAND-ROVER. Flush with the rear face of the hub.

In either case, if the seal is incorrectly positioned, it must be removed, carefully inspected for damage and replaced to the correct dimension. A damaged seal must be renewed. (OPERATION B, Sheets 2-3).

LAND-ROVER ONLY.

Before replacing the hub, remove the steel ring on which the oil seal registers from the stub axle; check it for the following defects:—

- (i) Poor machine finish on the outside diameter. The effects of this will have been discovered when examining the seal.
- (ii) Excessive clearance between the steel ring and the stub axle, thus allowing oil to pass between the two parts. The ring should be a push fit on the stub axle.

If either of the two defects is present, the ring must be renewed.

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Issue 1

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Sheet 2 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

BRAKES, FRONT

COMPLAINT

- A. OIL OR GREASE ON FRONT BRAKES.
- B. BRAKES "PULL".
- C. BRAKES POOR.
- D. OIL LEAKS FROM FRONT AXLE.

SUBJECT

Remedy (c). All defects under this heading can be corrected as detailed under OPERATION C, Sheets 4-5.

2. Having cleared up all possible causes of complaints (a), (b) and (c) as far as oil leaks are concerned, there remains one more possible source of trouble at the brake units (Land-Rover only).

Where the vehicle is operating in very wet and/or muddy conditions, a complaint of "BRAKES PULL" may be reported as a result of mud on the brake linings or corrosion and consequent seizure of the brake wheel cylinder.

Remedy. Remove and thoroughly clean the affected parts (OPERATION A).

INSTRUCTIONS FOR RECTIFYING DEFECTS DETAILED ABOVE.

OPERATION A. To remove and replace front brake components.

1. Jack up the front of the vehicle.
2. Remove the road wheel.
3. Remove the brake drum.
4. Slacken the bleed screw on the back of the anchor plate and drain off the fluid into a suitable receptacle. Push the foot pedal right down and wedge it in that position to prevent losing fluid from the supply tank.
5. Disconnect the flexible feed pipe to the wheel cylinder.
6. "60" and "75" only.—Remove the two shoe pivot bosses at the bottom of the anchor plate.
7. Disconnect the bias reducing and/or shoe pull-off springs and remove the brake shoes.
8. Remove the wheel cylinder complete and remove the two rubber dust covers, pistons, cups and spring from the cylinder.
9. Inspect and rectify or renew components as required. Should it be necessary to renew the brake linings it should be noted that the Land-Rover leading shoe lining is split. Replacement linings are supplied in one piece and must be cut through just below the spring-loaded plunger, after riveting to the brake shoe.
10. Assemble the brake unit by reversing the sequence of operations 1-8. Bleed the brake system at all four wheels.

OPERATION B. To remove and replace the front hub oil seal.

- (i) "60" and "75".
 1. Jack up the front of the car.
 2. Remove the road wheel.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

Bulletin
Number 5030

Issue 1

Date 1.12.48

Sheet 3 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

BRAKES, FRONT

COMPLAINT

- A. OIL OR GREASE ON FRONT BRAKES.
- B. BRAKES "PULL".
- C. BRAKES POOR.
- D. OIL LEAKS FROM FRONT AXLE.

SUBJECT

3. Remove the brake drum.
4. Remove the hub cap.
5. Prise up the locking tab and remove the outer hub nut. This has a left-hand thread on the left-hand hub and a right-hand thread on the right-hand hub.
6. Remove the key washer and peg and the inner hub nut. (Left-hand thread on the left-hand hub and right-hand thread on the right-hand hub).
7. Remove the front hub, together with the inner and outer roller bearings and the hub oil seal.
8. Renew the oil seal if necessary; the new seal should be fitted $\frac{3}{32}$ in. (2,40 mm.) proud of the rear face of the hub.
9. Assemble the hub by reversing the sequence of operations 6-7. Fill the hub with grease (see Service Bulletin 5004).
10. Adjust the inner nut so that the hub has .003 in.-.004 in. (0,08 mm.-0,10 mm.) end-float. (See Service Bulletin 5019 for the use of a dial test indicator to obtain this setting.)
11. Complete the assembly, taking care that tightening the outer nut does not destroy the end-float. The tab washer must be renewed.

(ii) Land-Rover

1. Jack up the front of the vehicle.
2. Remove the road wheel.
3. Remove the brake drum.
4. Remove the hub cap.
5. Remove the split pin, nut and plain washer from the driving shaft.
6. Remove the driving member squarely from the driving shaft and hub.
7. Prise up the tab washer; remove the lock nut, tab washer and adjusting nut.
8. Remove the thrust washer from the stub axle.
9. Remove the outer roller bearing from the hub.
10. Remove the hub, together with inner roller bearing and oil seal.
11. Renew the oil seal if necessary; the new seal should be fitted flush with the rear face of the hub.
12. Assemble the hub by reversing the sequence of operations, renewing the tab washer and split pin.
The hub nut must be adjusted so that the hub has .003 in.-.004 in. (0,08 mm.-0,10 mm.)

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Issue 1

Date 1.12.48

Sheet 4 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

BRAKES, FRONT

COMPLAINT

- A. OIL OR GREASE ON FRONT BRAKES.
- B. BRAKES "PULL".
- C. BRAKES POOR.
- D. OIL LEAKS FROM FRONT AXLE.

SUBJECT

end-float. (See Service Bulletin 5019 for the use of a dial test indicator to obtain this setting.) If not originally fitted, insert joint washer Part No. 231505 between the hub and driving member.

- 13. Check the oil level in the Tracta joint housing and replenish as necessary (see Service Bulletin 5013).

OPERATION C.

- (i) "60" and "75". To remove and replace the swivel pin oil seals.
 1. Strip the front hub as detailed in OPERATION B (i), Sheets 2-3.
 2. Remove the brake anchor plate complete with brake gear, at the same time releasing the oil thrower ring, joint washer and steering arm.
 3. Remove the top cap and joint washer from the stub axle.
 4. Remove the nut, distance collar, shims and thrust bearing. The shims should be preserved.
 5. Remove the bottom cap and joint washer from the stub axle.
 6. Remove the cotter and tap out the swivel pin towards the bottom. The pin is a light drive fit.
 7. If necessary renew the two oil seals in the stub axle. They should be positioned with the edges of the seals away from the swivel column boss. It will be found advantageous to insert the lower thrust washer into the upper oil seal, afterwards pushing them together into the stub axle.
 8. Remove all sharp edges from the swivel pin and assemble the stub axle to the swivel column, driving in the swivel pin from the bottom until the shoulder on the pin abuts the swivel column boss. (See Service Bulletin 5019 for the use of a special collar to ensure that the swivel pin is drawn well home.)
 9. Fit the cotter; replace the thrust bearing shims, distance collar and nut. Adjust the number of shims so that the stub axle is free to rotate with the minimum of end-float, which must not exceed .004 in. (0.10 mm.).
 10. Replace the top and bottom caps with their joint washers. Unscrew the filler plug in the top cap and POUR in oil of the correct grade (Service Bulletin 5004). Replace the plug.
 11. Complete the assembly as detailed in OPERATION B (i), Sheets 2-3.

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Number 5030

Issue 1

Date 1.12.48

Sheet 5 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
1948 Land-Rover

UNIT AFFECTED

BRAKES, FRONT

COMPLAINT

- A. OIL OR GREASE ON FRONT BRAKES.
- B. BRAKES "PULL".
- C. BRAKES POOR.
- D. OIL LEAKS FROM FRONT AXLE.

SUBJECT

(ii) **Land-Rover. To remove and replace the swivel pin housing oil seal.**

1. Jack up the front of the vehicle.
2. Remove the road wheel.
3. Disconnect the flexible brake pipe from the wheel cylinder.
4. Disconnect the track rod and drag link (if applicable) ball-joints from the steering lever.
5. Remove the bolts securing the swivel pin bearing housing to the front axle casing.
6. Remove the complete stub axle and half shaft assembly from the axle casing, taking care not to damage the seal in the end of the casing.
7. Remove the five bolts and the lock stop bolt securing the swivel pin housing oil seal retainer and remove the retainer.
8. Renew the oil seal if necessary.
9. Re-assemble by reversing the sequence of operations.
10. Set the lock stop bolt as instructed in Service Bulletin 5027.
11. Bleed the brakes at all four wheels.

(iii) **Land-Rover. To rectify an oil leak at the jointing face between the stub axle and the swivel pin housing.**

1. Dismantle the front hub as detailed in OPERATION B (ii), Sheet 3.
2. Remove the bolts and lock plates or shakeproof washers securing the brake anchor plate to the stub axle. If lock plates were originally fitted, they should now be discarded.
3. Swing the anchor plate back to rest on the road spring, thus obviating bleeding the brakes on re-assembly.
4. Remove the stub axle, complete with the driving shaft and Tracta joint.
5. Clean the joint faces of the stub axle, brake anchor plate and swivel pin housing.
6. Replace the stub axle and brake anchor plate, securing them with set bolts and shakeproof washers. (Part No. 70823.)
7. Complete the assembly by reversing the sequence of the stripping operations.

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Bulletin
Number 5031

Issue 1

Date 1.12.48

Sheet 1 of 1 Sheet

MODELS AFFECTED
LAND-ROVER

UNIT AFFECTED
NUMBERING

COMPLAINT

SUBJECT

LAND-ROVER STATION WAGON SERIAL NUMBERING

INFORMATION IN THIS BULLETIN SHOULD BE MADE AVAILABLE TO EVERYONE CONCERNED, SO THAT OUR SERVICE ORGANISATION MAY WORK TO THE GREATEST DEGREE OF EFFICIENCY.

Standard Land-Rover vehicles produced during the 1949 season will continue in the range of serial numbers 860001 onwards, as detailed in Service Bulletin 5011.

LAND-ROVER STATION WAGON.

Land-Rovers produced with Station Wagon bodies will bear chassis and vehicle numbers in the series 8670001 onwards, with the prefix "R" for a right-hand drive model or "L" for left-hand drive. The serial numbers of units such as the engine, gearbox, etc., will be in the same series (i.e. 860001 onwards) as those for the standard version of the vehicle as described in Service Bulletin 5011.

SERVICE BULLETINS.

The following Service Bulletins will apply to all Land-Rover vehicles produced during the 1948 and 1949 seasons, instead of merely to 1948 models as indicated at the head of each sheet :—

Nos. 5011, 5012, 5013, 5014, 5019, 5023, 5025, 5026, 5027, 5029 and 5030.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

Bulletin
Number 5034

Issue 1

Date 2.12.48

Sheet 1 of 1 Sheet

MODELS AFFECTED
1948-49 LAND-ROVER

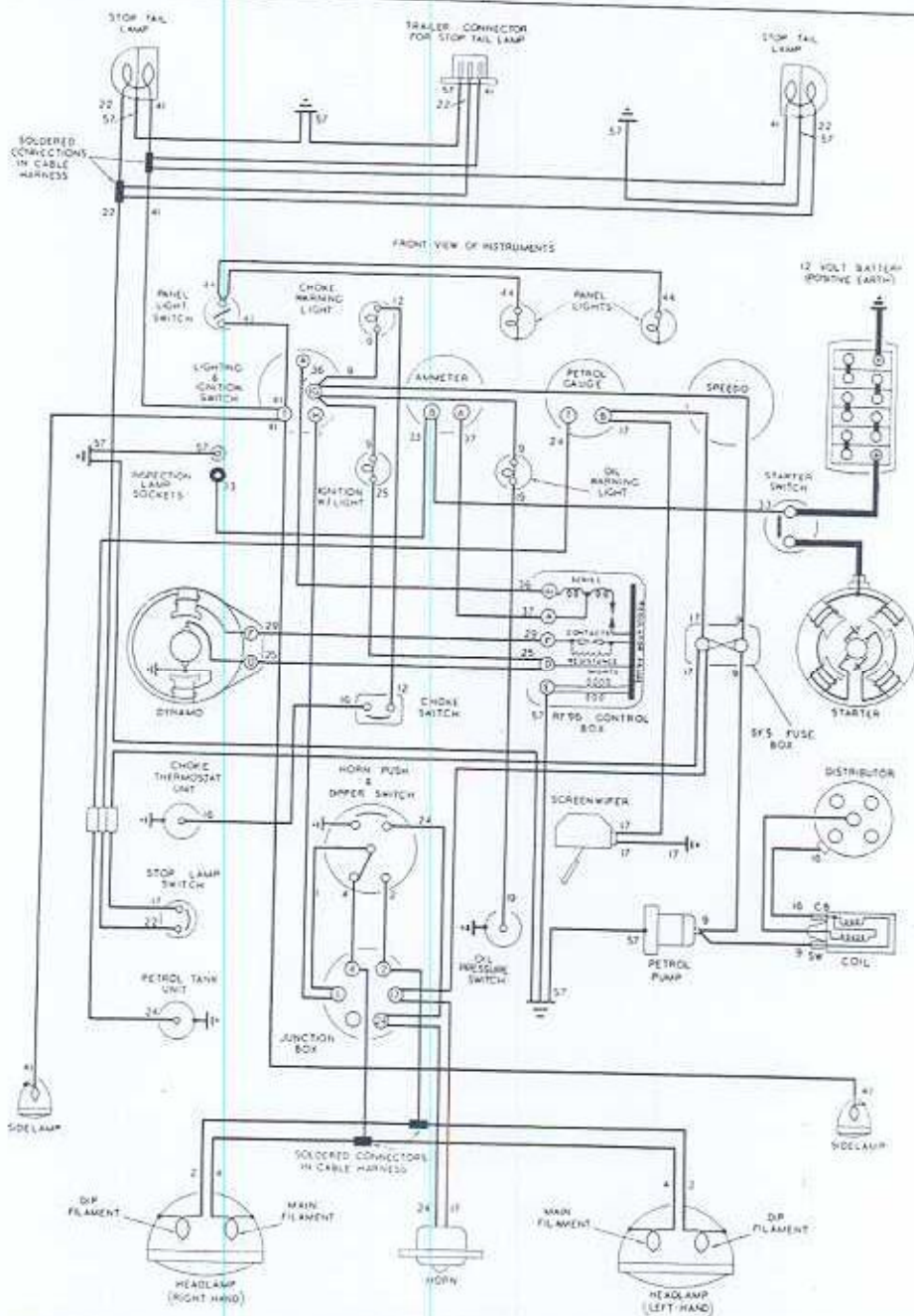
UNIT AFFECTED
ELECTRICAL SYSTEM

COMPLAINT

SUBJECT

WIRING DIAGRAM

| KEY TO CABLE COLOURS | | | |
|----------------------|-------------------|-----|-------------------|
| 1 | RED | 13 | GREEN WITH BROWN |
| 2 | RED WITH BLACK | 14 | GREEN WITH BROWN |
| 3 | RED WITH YELLOW | 15 | YELLOW |
| 4 | RED WITH WHITE | 16 | YELLOW WITH RED |
| 5 | RED WITH GREEN | 17 | YELLOW WITH BLUE |
| 6 | RED WITH BLACK | 18 | YELLOW WITH GREEN |
| 7 | RED WITH BROWN | 19 | YELLOW WITH WHITE |
| 8 | RED WITH BLACK | 20 | YELLOW WITH BLACK |
| 9 | WHITE | 21 | YELLOW WITH BROWN |
| 10 | WHITE WITH RED | 22 | BROWN |
| 11 | WHITE WITH YELLOW | 23 | BROWN WITH BLUE |
| 12 | WHITE WITH BLUE | 24 | BROWN WITH VIOLET |
| 13 | WHITE WITH GREEN | 25 | BROWN WITH RED |
| 14 | WHITE WITH PURPLE | 26 | BROWN WITH WHITE |
| 15 | WHITE WITH BROWN | 27 | BROWN WITH BLACK |
| 16 | WHITE WITH BLACK | 28 | BROWN WITH GREEN |
| 17 | WHITE WITH BLUE | 29 | BROWN WITH YELLOW |
| 18 | WHITE WITH GREEN | 30 | BROWN WITH WHITE |
| 19 | GREEN | 31 | BROWN WITH RED |
| 20 | GREEN WITH RED | 32 | BROWN WITH BLACK |
| 21 | GREEN WITH BLUE | 33 | BROWN WITH GREEN |
| 22 | GREEN WITH YELLOW | 34 | BROWN WITH WHITE |
| 23 | GREEN WITH BLACK | 35 | BROWN WITH BLACK |
| 24 | GREEN WITH BLUE | 36 | BROWN WITH GREEN |
| 25 | GREEN WITH WHITE | 37 | BROWN WITH YELLOW |
| 26 | GREEN WITH PURPLE | 38 | BROWN WITH WHITE |
| 27 | GREEN WITH PURPLE | 39 | BROWN WITH BLACK |
| 28 | RED WITH BLUE | 40 | BROWN WITH GREEN |
| 29 | RED WITH YELLOW | 41 | BROWN WITH YELLOW |
| 30 | RED WITH BLACK | 42 | BLACK WITH RED |
| 31 | RED WITH WHITE | 43 | BLACK WITH YELLOW |
| 32 | RED WITH BLUE | 44 | BLACK WITH GREEN |
| 33 | RED WITH YELLOW | 45 | BLACK WITH PURPLE |
| 34 | RED WITH BLACK | 46 | BLACK WITH WHITE |
| 35 | RED WITH GREEN | 47 | BLACK WITH BLACK |
| 36 | RED WITH BROWN | 48 | BLACK WITH RED |
| 37 | RED WITH BLACK | 49 | BLACK WITH YELLOW |
| 38 | RED WITH GREEN | 50 | BLACK WITH GREEN |
| 39 | RED WITH YELLOW | 51 | BLACK WITH PURPLE |
| 40 | RED WITH BLACK | 52 | BLACK WITH WHITE |
| 41 | RED WITH GREEN | 53 | BLACK WITH BLACK |
| 42 | RED WITH BROWN | 54 | BLACK WITH RED |
| 43 | RED WITH BLACK | 55 | BLACK WITH YELLOW |
| 44 | RED WITH GREEN | 56 | BLACK WITH GREEN |
| 45 | RED WITH YELLOW | 57 | BLACK WITH PURPLE |
| 46 | RED WITH BLACK | 58 | BLACK WITH WHITE |
| 47 | RED WITH GREEN | 59 | BLACK WITH BLACK |
| 48 | RED WITH YELLOW | 60 | BLACK WITH RED |
| 49 | RED WITH BLACK | 61 | BLACK WITH YELLOW |
| 50 | RED WITH GREEN | 62 | BLACK WITH GREEN |
| 51 | RED WITH YELLOW | 63 | BLACK WITH PURPLE |
| 52 | RED WITH BLACK | 64 | BLACK WITH WHITE |
| 53 | RED WITH GREEN | 65 | BLACK WITH BLACK |
| 54 | RED WITH YELLOW | 66 | BLACK WITH RED |
| 55 | RED WITH BLACK | 67 | BLACK WITH YELLOW |
| 56 | RED WITH GREEN | 68 | BLACK WITH GREEN |
| 57 | RED WITH YELLOW | 69 | BLACK WITH PURPLE |
| 58 | RED WITH BLACK | 70 | BLACK WITH WHITE |
| 59 | RED WITH GREEN | 71 | BLACK WITH BLACK |
| 60 | RED WITH YELLOW | 72 | BLACK WITH RED |
| 61 | RED WITH BLACK | 73 | BLACK WITH YELLOW |
| 62 | RED WITH GREEN | 74 | BLACK WITH GREEN |
| 63 | RED WITH YELLOW | 75 | BLACK WITH PURPLE |
| 64 | RED WITH BLACK | 76 | BLACK WITH WHITE |
| 65 | RED WITH GREEN | 77 | BLACK WITH BLACK |
| 66 | RED WITH YELLOW | 78 | BLACK WITH RED |
| 67 | RED WITH BLACK | 79 | BLACK WITH YELLOW |
| 68 | RED WITH GREEN | 80 | BLACK WITH GREEN |
| 69 | RED WITH YELLOW | 81 | BLACK WITH PURPLE |
| 70 | RED WITH BLACK | 82 | BLACK WITH WHITE |
| 71 | RED WITH GREEN | 83 | BLACK WITH BLACK |
| 72 | RED WITH YELLOW | 84 | BLACK WITH RED |
| 73 | RED WITH BLACK | 85 | BLACK WITH YELLOW |
| 74 | RED WITH GREEN | 86 | BLACK WITH GREEN |
| 75 | RED WITH YELLOW | 87 | BLACK WITH PURPLE |
| 76 | RED WITH BLACK | 88 | BLACK WITH WHITE |
| 77 | RED WITH GREEN | 89 | BLACK WITH BLACK |
| 78 | RED WITH YELLOW | 90 | BLACK WITH RED |
| 79 | RED WITH BLACK | 91 | BLACK WITH YELLOW |
| 80 | RED WITH GREEN | 92 | BLACK WITH GREEN |
| 81 | RED WITH YELLOW | 93 | BLACK WITH PURPLE |
| 82 | RED WITH BLACK | 94 | BLACK WITH WHITE |
| 83 | RED WITH GREEN | 95 | BLACK WITH BLACK |
| 84 | RED WITH YELLOW | 96 | BLACK WITH RED |
| 85 | RED WITH BLACK | 97 | BLACK WITH YELLOW |
| 86 | RED WITH GREEN | 98 | BLACK WITH GREEN |
| 87 | RED WITH YELLOW | 99 | BLACK WITH PURPLE |
| 88 | RED WITH BLACK | 100 | BLACK WITH WHITE |



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Bulletin
Number 5035

Issue 1

Date 6.12.48

Sheet 1 of 2 Sheets

MODELS AFFECTED

1934-47 10 and 12 H.P.
1937-47 14, 16 and 20 H.P.
1948-49 "60" and "75", Land-Rover

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

PISTON IDENTIFICATION AND FITTING

The only pistons now supplied by us for the models listed above are :—

| <i>Model</i> | <i>Type of piston</i> |
|---------------------|------------------------------|
| 10, 12 and 14 H.P. | Nelson Bohnalite |
| 16 H.P. | Nelson Bohnalite or Lo-Ex |
| 20 H.P. | Nelson Bohnalite |
| "60" and Land-Rover | Specialloid or Lo-Ex |
| "75" | Lo-Ex |

} These are similar in appearance; the method of fitting is the same.

Nelson Bohnalite pistons have split skirts, while the Lo-Ex and Specialloid have solid skirts.
See Figs. 1—4.

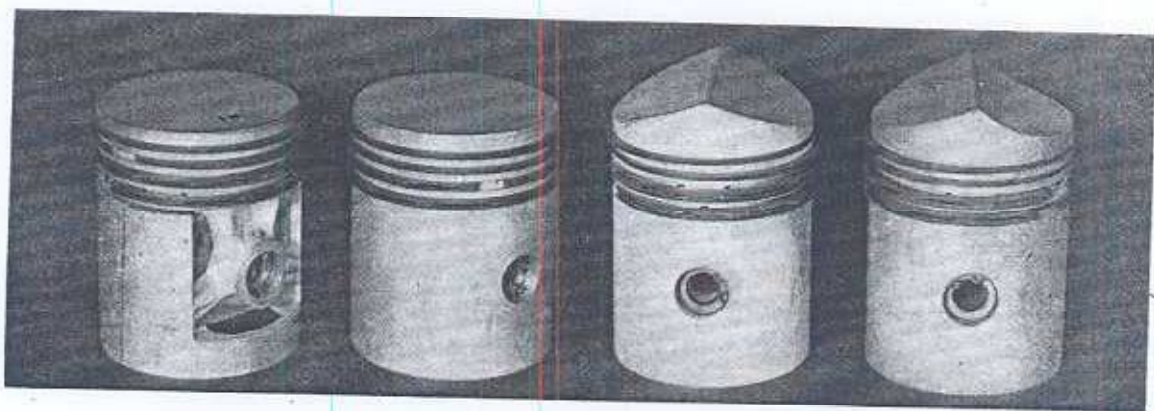


Fig. 1. Nelson Bohnalite
10, 12, 14, 16 and 20 H.P.

Fig. 2. Lo-Ex
16 H.P.

Fig. 3. "60" and "75"
(High compression)

Fig. 4. "60", "75" and
Land-Rover
(Low compression)

Change of compression ratio (1948-49 models only)

A reduction in compression ratio during the 1948 season on "60" and "75" car engines was made by fitting pistons having a different crown pattern (Figs. 3 and 4). For full details of this change, see Service Bulletin 5003.

All Land-Rover engines have low-compression pistons.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

| | | | |
|----------------------|---------|--------------|---------------------|
| Bulletin Number 5035 | Issue 1 | Date 6.12.48 | Sheet 2 of 2 Sheets |
|----------------------|---------|--------------|---------------------|

MODELS AFFECTED

1934-47 10 and 12 H.P.
 1937-47 14, 16 and 20 H.P.
 1948-49 "60" and "75", Land-Rover

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

PISTON IDENTIFICATION AND FITTING

PISTON FITTING

Pistons for all the models listed at the head of this bulletin should be fitted to a clearance of 0.0013 in. \pm 0.0001 (0.033 mm. \pm 0.0025) between the piston thrust face at the bottom of the skirt and the cylinder bore. This figure is obtained on production engines by a process of selective assembly; a similar scheme may be employed after re-boring, by making full use of the stock of pistons available.

As a general rule, and especially in cases where only a small stock of pistons is held, a practice should be made of boring the cylinder block to the individual pistons to be fitted.

Before fitting the pistons after boring the cylinder block, check that the clearance is correct in the following manner.

Insert each piston, without the gudgeon pin and rings, upside down into the top of its respective cylinder bore with a length of .0015 in. (0.04 mm.) strip feeler inserted between the plain thrust face and the cylinder wall. If the piston becomes tight with approximately $\frac{1}{8}$ in. (12 mm.) of skirt still protruding from the bore diameter, it can be accepted as a satisfactory fit.

Nelson Bohnalite pistons should be fitted with the slot in the skirt to the camshaft side of the engine, i.e., on the opposite side to the thrust; it is immaterial which way the plain Lo-Ex and Specialoid types are fitted.

GUDGEON PIN FITTING

When piston assemblies are supplied by us, the gudgeon pin is already correctly fitted; in cases where pistons and gudgeon pins are supplied as separate items, proceed as follows:—

1. Nelson Bohnalite (1934-47 models).

In this case, one only of the gudgeon pin bores has to be reamed out by the fitter to allow a light drive fit of the pin at that end. When using new pistons, as assistance in subsequent removal and replacement of the gudgeon pin, the top of the piston should be stamped with a "X" immediately above the bore so reamed. When stripping, production pistons will be found already marked in this way; on some pistons "IN" may be substituted for "X" (Fig. 1).

After the reaming operation, the piston should be immersed in water at 70° C. (158° F.) for five minutes to expand the other bore. Remove from the bath and immediately fit to the connecting rod by lightly driving home the gudgeon pin.

2. Lo-Ex or Specialoid (1937-47 16 H.P.; 1948-49 "60" and "75", Land-Rover).

With this type of piston, both the gudgeon pin bores should be reamed out until the gudgeon pin, while not falling through either bore under its own weight when dry, can be easily pressed in by hand.

OVERSIZE GUDGEON PINS

Piston assemblies supplied by us which have oversize gudgeon pins fitted are stamped on the crown with the appropriate identification letter:—

- B — .001 in. (0.025 mm.) oversize
- C — .003 in. (0.075 mm.) "
- D — .005 in. (0.13 mm.) " (Nelson Bohnalite only)

Such assemblies should only be fitted as complete engine sets.

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

Bulletin
Number 5036

Issue 1

Date 8.12.48

Sheet 1 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
LAND-ROVER

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TUNING

Points to which attention should be paid when dealing with engine tuning may be classified under two headings, i.e., General Tuning and Carburettor Adjustment.

Unsatisfactory engine performance is too often attributed to poor carburation, where in actual fact the trouble is caused by other defects in the engine. For this reason carburettor adjustment must only be undertaken after it has been established that the engine is otherwise in a satisfactory condition.

This Bulletin sets out the diagnosis and remedy of the more common engine defects.

PART I. GENERAL ENGINE TUNING.

1. LOSS OF COMPRESSION.

Crank the engine by hand, with the ignition switch "off", and test the compression on each cylinder in turn. If any cylinder feels weaker on compression than the others, it must receive attention before proceeding with the diagnosis.

Loss of compression may be due to one of the following causes:—

(a) **Incorrect tappet clearance.** The correct clearance is .010 in. (0.25 mm.) on the inlet valves and .012 in. (0.30 mm.) on the exhaust valves, with the engine either cold or fully warmed up; the tappets should not be set with the engine slightly warm. See Service Bulletin 5005 for method of adjustment.

If the tappet clearances are in order, remove the cylinder head and check:—

(b) **Valves and seatings.** If the inlet or exhaust valves or valve seats are pitted, they should be refaced and lapped in accordance with the instructions in Service Bulletin 5025.

Occasionally the trouble may be due to:—

(c) **Faulty cylinder head gasket.** A damaged gasket may allow the cylinder contents to escape on the compression stroke.

NOTE. A reduction in compression ratio was made midway during the 1948 season on "60" and "75" engines; high compression engines may be recognised either from the serial number (see Service Bulletin 5003) or by the piston crown shape (see Service Bulletin 5035).

Low compression "60" engines have a Corrijoint gasket.

High compression "60" engines have a copper and asbestos gasket.

All "75" engines have a copper and asbestos gasket.

All Land-Rover engines have a copper and asbestos gasket.

2. MISFIRING.

The cause of misfiring should be located by investigation in the order set out below.

First of all check the number of cylinders affected:—

(i) **Misfiring on some cylinders only.** Disconnect the H.T. lead from the sparking plug or plugs concerned, start the engine and hold the lead about 1/4 in. (7 mm.) away from a metal part of the engine.

If the SPARKS are REGULAR:—

(a) Check for condensation in the sparking plug cover. Remove and clean the cover and check that it has a 1/16 in. (1.5 mm.) hole drilled through one side; rectify as necessary. Check that the rubber sealing ring for the cover is properly fitted and in good condition.

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Bulletin
 Number 5036

Issue 1

Date 8.12.48

Sheet 2 of 5 Sheets

MODELS AFFECTED
 1948-49 "60" and "75"
 LAND-ROVER

UNIT AFFECTED
ENGINE

COMPLAINT

SUBJECT

ENGINE TUNING

(b) Remove the sparking plug; if it is found to be oily or fouled, clean thoroughly.

(c) Check the sparking plug gap. Early 1948 "60" and "75" engines were fitted with Lodge HL14P plugs, while later car and all Land-Rover engines have Lodge HLNK plugs.

The correct gap is:—

HL14P type018 in. (0.45 mm.)

HLNR type023 to .026 in. (0.60 to 0.65 mm.).

If the misfiring is still present on the cylinder in question, fit a new sparking plug.

If NO SPARK is present:—

(a) Check that the distributor contact breaker is opening on the cam concerned. Check, clean and re-set the contact points to .012 in. (0.30 mm.) gap as necessary.

(b) Check the sparking plug leads for faulty insulation and moisture. If the plug lead is "earthing", a spark will be seen jumping to earth; this can sometimes be heard as a "click". Replace the faulty leads as necessary.

(c) Carefully examine the distributor cap for cracks which can be seen upon close examination; carbon will have formed in the crack and "tracked" to earth via the distributor body. Renew the cap if necessary.

(ii) **Misfiring on all cylinders.**

(a) Loose or faulty L.T. leads to the coil and distributor. Replace the leads as necessary.

(b) Distributor contact breaker. Check, clean and re-set the contact points to .012 in. (0.30 mm.) gap as necessary. If the points show signs of "blueing", a faulty distributor condenser should be suspected; this will be confirmed if the sparks are weak and yellow. Renew the condenser as necessary.

(c) Cracked distributor cap. Renew if necessary.

(d) Check the sparking plugs as described under MISFIRING (i) (Sheet 1).

(e) Check the security and quality of the joint washers between the carburettor and inlet manifold and between the manifold and cylinder head. Replace as necessary.

(f) Re-set the slow-running adjustment. SEE "CARBURETTOR ADJUSTMENT" (Sheet 4).

3. LOSS OF POWER.

(i) When dealing with complaints of this nature on "60" and "75" models, first road test the car and check the figures obtained against the standard performance:—

| Model | Top gear acceleration 10—30 M.P.H. (15—50 K.P.H.) | Maximum speed |
|-------|--|------------------------|
| "60" | 13.5 secs. | 72 M.P.H. (116 K.P.H.) |
| "75" | 10.5 secs. | 75 M.P.H. (121 K.P.H.) |

These performance figures should be obtained after the engine has been run-in, i.e., after about 3,000 miles (5,000 Km.).

This sheet replaces that already in your file which bears the SAME bulletin and sheet numbers, but of a LOWER issue number. The old copy should be removed and destroyed.

Bulletin
Number 5036

Issue 1

Date 8.12.48

Sheet 3 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
LAND-ROVER

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TUNING

- (ii) If the car performance is below standard or when dealing with similar complaints on Land-Rover, pay attention to the following points:—
- (a) Compression. See "LOSS OF COMPRESSION" (Sheet 1).
 - (b) Ignition system. See "MISFIRING" (Sheet 1).
 - (c) Ensure that the carburettor throttle butterfly is opening fully.
 - (d) Check that a carburettor jet is not blocked. See "CARBURETTOR ADJUSTMENT" (Sheet 5).
 - (e) Fuel supply. Check that the flow from the S.U. pump is unrestricted; the pump should deliver a maximum of 8 gallons per hour (36 litres per hour). Clean the pump and carburettor intake filters as necessary. In addition, on the Land-Rover, the sediment bowl should be stripped and cleaned if necessary; ensure that the glass bowl seats firmly on the cork sealing washer.
 - (f) Check that the carburettor accelerator pump is functioning correctly. See "CARBURETTOR ADJUSTMENT" (Sheet 5).
 - (g) Ignition timing. See Service Bulletin 5005.
 - (h) Valve timing. See Service Bulletin 5005.
 - (i) See para (vii) of "EXCESSIVE FUEL CONSUMPTION" (Sheet 4).
 - (k) The engine may need decarbonising. See Service Bulletin 5025.

PART II. CARBURETTOR ADJUSTMENT.

1. EXCESSIVE FUEL CONSUMPTION.

When dealing with complaints of excessive fuel consumption, before any adjustments are made, the vehicle should be subjected to a consumption check on the road with a test tank of known size. The fuel consumption should be:—

| | | |
|------------|---|--------------------------------------|
| "60" | 30 M.P.G. (9.25 litres per 100 Km.) | } At 30—40 M.P.H. (50—65 K.P.H.). |
| "75" | 25 M.P.G. (11 litres per 100 Km.) | |
| LAND-ROVER | 25 M.P.G. (11 litres per 100 Km.) at 30 M.P.H. (50 K.P.H.). | |

If the consumption proves to be below average, proceed as follows:—

- (i) Ensure that the carburettor jet sizes are standard in accordance with the table:—

| | "60" | LAND-ROVER | "75" |
|-----------------------|------------------|-----------------------------|------|
| Choke size | 23 | 23 | 21 |
| Main jet(s) | 139 c.c. (102.5) | 139 c.c. (102.5) or 107.5 † | 97.5 |
| Air correction jet(s) | 160 | 160 | 240 |
| Slow-running jet(s) | 45 | 45 | 60 |
| Pump or speed jet(s) | 55 | 50 | 65 |
| Economy jet | 55 | 50 | 60 |

† See Service Bulletin 5037.

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Bulletin
Number 5036

Issue 1

Date 8.12.48

Sheet 4 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
LAND-ROVER

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TUNING

- (ii) Check compression. See "LOSS OF COMPRESSION" (Sheet 1).
- (iii) Check ignition. See "MISFIRING" (Sheet 1).
- (iv) Check performance. See "LOSS OF POWER" (Sheet 2).
- (v) Ensure that the engine reaches a satisfactory working temperature. Enquiries should be made regarding this point, to ascertain under what conditions the car is normally used and advice given as follows:—
In cold weather, all models will benefit if the lower half of the radiator is blanked off with a baffle or muff. On vehicles used for short runs only, a complete muff is advantageous.
- (vi) Adjust the carburettor to give an even "tick-over". The carburettor is fitted with an accelerator pump and for this reason the idling speed should be set rather higher than normal practice, i.e., 500—600 R.P.M. in the case of "60" and Land-Rover, and 500—700 R.P.M. on "75" engines. There will be a tendency for stalling to result if lower idling speeds are used.

The slow-running mixture strength is adjusted by means of the volume screw or screws and the operation must be carried out with the engine at normal running temperature.
Adjust as follows:—

(a) "60" and Land-Rover.

1. Screw the volume screw in an anti-clockwise direction until the engine begins to "hunt".
2. Screw it carefully clockwise until the hunting just disappears.

(b) "75".

1. Screw both volume screws fully home, then unscrew them one turn each, when the screwdriver slots should lie at the same angle.
2. If the engine now "hunts", screw in carefully both adjustments the same amount, so that the slots remain parallel. If on the other hand, the engine fires erratically, the mixture is too weak and the screws must be turned slightly anti-clockwise until it runs evenly.

The engine is very sensitive to these adjustments and great care should be taken to turn the screws in unison.

Now road test the vehicle again under the same conditions as at first.
If the consumption is still too high:—

- (vii) Check the speed jet diaphragm for signs of perforation. To do this, remove the air cleaner and float chamber cover and fully open the throttle. If fuel seeps into the inlet manifold from the depression channel outlet just below the throttle butterfly, the diaphragm is faulty and the accelerator pump complete must be renewed.
- (viii) Fit new calibrated main jets, obtainable from our Spares Department.

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Bulletin
Number 5036

Issue 1

Date 8.12.48

Sheet 5 of 5 Sheets

MODELS AFFECTED

1948-49 "60" and "75"
LAND-ROVER

UNIT AFFECTED

ENGINE

COMPLAINT

SUBJECT

ENGINE TUNING

2. STALLING.

- (i) Check the carburettor idling. See "EXCESSIVE FUEL CONSUMPTION". (Sheet 4).
- (ii) Remove and clean the slow-running jet(s) and the main jet(s), which feed(s) fuel to the slow-running jet(s).
- (iii) Check that the fuel level in the float chamber is correct, i.e. 5/8 in. \pm 1/8 (16 mm. \pm 3) below the top of the chamber. The level is best measured by screwing a glass sighting-tube into the main jet tapping in the carburettor body; switch on the ignition and measure the level in the tube from the top of the chamber.
- (iv) See para. (vii) of "EXCESSIVE FUEL CONSUMPTION" (Sheet 4).

3. POOR ACCELERATION.

- (i) See "LOSS OF COMPRESSION" (Sheet 1).
- (ii) See "MISFIRING" (Sheet 1).
- (iii) Check that the accelerator pump is functioning correctly. To do this, open the throttle two or three times with the engine stationary, when a fuel discharge from the manifold drain pipe should be produced.

If there is no discharge :—

(a) Check that the accelerator pump jet is not blocked. This jet is also known as the speed jet or injector calibration; on "60" and Land-Rover engines it is located externally to the left of the pump unit. "75" engines have two jets located under the injector nozzles at the top of the choke tubes; access to them is gained by removing the air cleaner, float chamber cover and injector nozzles, when the jets will be found screwed into the base of the injector tubes.

(b) If the pump jet(s) appear to be satisfactory, examine the exterior of the pump body for signs of fuel leakage; fuel leaking down the pump operating arm will indicate that the pump diaphragm is perforated and a new pump unit must be fitted.

If there is an adequate discharge from the manifold :—

- (a) Remove and clean the slow-running jet and the main jet(s).
- (b) Remove and clean the economy jet; this is located to the right of the pump unit on "60" and Land-Rover engines, and on top of the pump unit on "75" engines.
- (c) See para. (vii) of "EXCESSIVE FUEL CONSUMPTION" (Sheet 4).
- (iv) See "EXCESSIVE FUEL CONSUMPTION" (Sheet 3).

4. INCORRECT IDLING.

See para. (vi) of "EXCESSIVE FUEL CONSUMPTION" (Sheet 4).

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