Section P
ELECTRICAL EQUIPMENT — ALL MODELS

INDEX

LIST OF ILLUSTRATIONS

Batteries

Two batteries fitted to Diesel models—see Data section.

To remove **Operation P/2**

1. Disconnect the leads, remove the securing frame and lift battery clear (when removing one battery only—Diesel models—always remove the inter-connecting battery lead completely from both batteries).

To refit **Operation P/4**

1. Reverse removal procedure, taking care to smear the battery terminals with petroleum jelly.

The drive screws securing the battery leads are manufactured from a special non-corrosive metal and must never be replaced with ordinary drive screws, which may cause serious corrosion of the battery terminals.

Starter motor

To remove **Operation P/6**

1. **Petrol models**—disconnect the positive lead from the battery.

   Diesel models—disconnect the negative L.H. battery lead from the battery and the leads from the starter solenoid.
2. **2¼ litre Petrol, Diesel models**—remove the inlet and exhaust manifolds, and the dipstick and tube.
3. **Petrol models**—disconnect the cable from starter.
4. Remove the securing bolts and withdraw starter.

To refit **Operation P/8**

1. Reverse the removal procedure.
2. Check the operation of the starter motor.

To dismantle **Operation P/10**

1. Remove the cover band, hold back the brush springs and lift the brushes from their holders.

Petrol models

2. Remove the starter drive, by withdrawing split pin from retaining nut on end of driving shaft and unscrewing the nut.
3. Remove the driving-end bracket, by unscrewing the two through bolts.
4. Withdraw the armature from the starter yoke.

Diesel models

5. Disconnect the copper link between the lower solenoid terminal and the starter motor casing.
6. Remove the solenoid securing bolts. Withdraw the solenoid from the drive-end bracket casting, carefully making sure that the solenoid plunger is free from the starter drive engagement lever.
7. Unscrew and withdraw the two through bolts from the commutator end bracket, and remove bracket from the starter motor yoke.
8. Remove the rubber seal from the drive-end bracket.
9. Remove the nut securing the eccentric pin, on which the drive engagement lever pivots, and withdraw pin.
10. Split the armature and intermediate bracket assembly from the drive-end bracket.
11. Slide the drive assembly and engagement lever off the shaft, first removing the washer from the end of the armature shaft extension.
12. Slide the intermediate bracket and brake assembly off the shaft, first removing the retaining ring from the armature shaft extension.

To overhaul **Operation P/12**

Brushes

1. Check that the brushes move freely in their holders by holding back the brush spring and pulling gently on the flexible connectors. Any tendency to stick should be corrected by cleaning with a petrol-moistened cloth, or in extreme cases by the **light** use of a smooth file. If a brush is damaged or worn so that it does not make good contact on the commutator, all the brushes must be renewed.

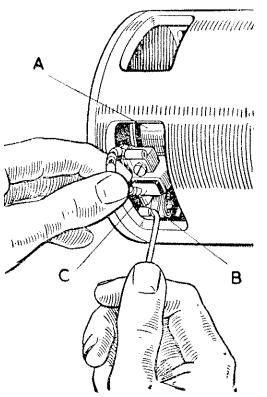


Fig. P-1—Checking brushes
A—Commutator
B—Brush spring
C—Brush

2. Check the tension of the brush springs with a spring balance. The correct tension is 30 to 40 ozs. (850 to 1.134 grammes) and new springs must be fitted if the tension is low.
3. The flexible connectors are soldered to terminal tags; two are connected to brush boxes, and two are connected to the free ends of the field coils. These flexible connectors must be removed by unsoldering, and the flexible connectors of the new brushes secured in their places by soldering.

   The new brushes being pre-formed, "bedding" to the commutator is unnecessary.

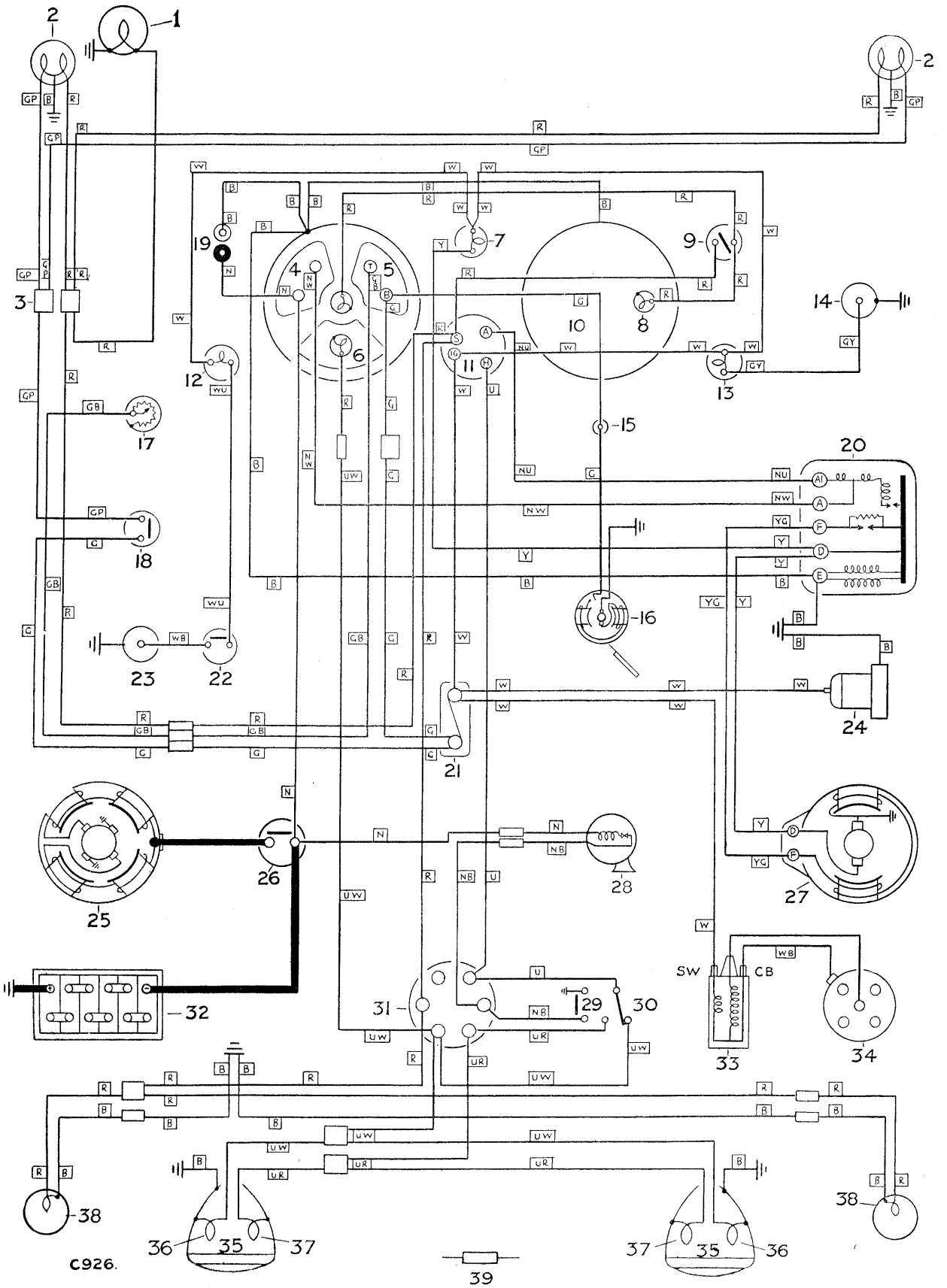


Fig. P-2—Wiring diagram—2 litre Petrol models

Wiring diagrams

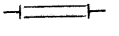
NOTE: On vehicles to the North American specification, the connections at the lighting switch are such that the sidelamps are extinguished when the headlamps are in use.

Key to cable colours

B—Black	N—Brown	R—Red	W—White
G—Green	P—Purple	U—Blue	Y—Yellow

RN—Red with brown, and so on.

Key to Fig. P-2

1 Rear number plate light
2 Stop tail lamps
3 Snap connectors for number plate light
4 Ammeter
5 Fuel level gauge
6 Headlamp main beam warning light
7 Dynamo warning light
8 Panel lights
9 Panel light switch
10 Speedometer
11 Ignition and lighting switch
12 Mixture control warning light
13 Oil pressure warning light
14 Oil pressure switch
15 Windscreen wiper plug and socket
16 Windscreen wiper
17 Fuel tank level unit
18 Stop lamp switch
19 Inspection lamp sockets
20 Voltage control box
21 Fuse box (35 amp. fuse)
22 Mixture control switch (at control)
23 Mixture control thermostat switch (at cylinder head)
24 Petrol pump
25 Starter
26 Starter solenoid switch
27 Dynamo
28 Horn
29 Horn push
30 Headlamp dipper switch
31 Junction box
32 12-volt battery (positive earth)
33 Ignition coil
34 Distributor
35 Headlamps
36 Main beam
37 Dip beam
38 Side lamps
39 Snap connectors shown thus 

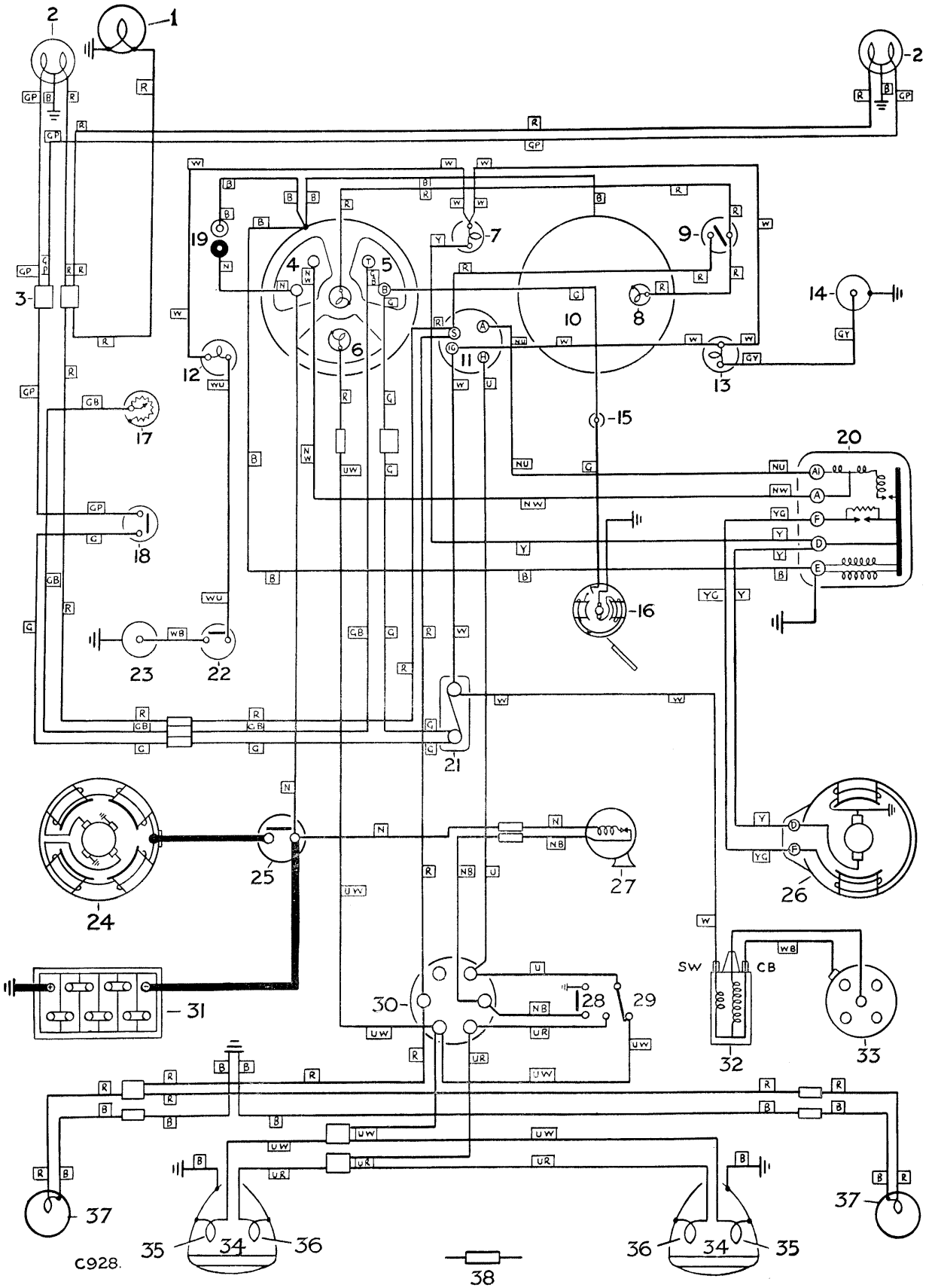


Fig. P-3—Wiring diagram—2¼ litre Petrol models

Wiring diagrams

NOTE: On vehicles to the North American specification, the connections at the lighting switch are such that the sidelamps are extinguished when the headlamps are in use.

Key to cable colours

B—Black	N—Brown	R—Red	W—White
G—Green	P—Purple	U—Blue	Y—Yellow

RN—Red with brown, and so on.

Key to Fig. P-3

1 Rear plate illumination lamp
2 Stop, tail lamps
3 Snap connectors for number plate light
4 Ammeter
5 Fuel level gauge
6 Headlamp beam warning light
7 Dynamo warning light
8 Panel lights
9 Panel light switch
10 Speedometer
11 Ignition and lighting switch
12 Mixture control warning light
13 Oil pressure warning light
14 Oil pressure switch
15 Windscreen wiper plug and socket
16 Windscreen wiper
17 Fuel tank level unit
18 Stop lamp switch
19 Inspection lamp sockets
20 Voltage control box
21 Fuse box (35 amp. fuse)
22 Mixture control switch (at control)
23 Mixture control thermostat switch (at cylinder head)
24 Starter
25 Starter solenoid switch
26 Dynamo
27 Horn
28 Horn push
29 Headlamp dipper switch
30 Junction box
31 12-volt battery (positive earth)
32 Ignition coil
33 Distributor
34 Headlamps
35 Main beam
36 Dip beam
37 Side lamps
38 Snap connectors shown thus 

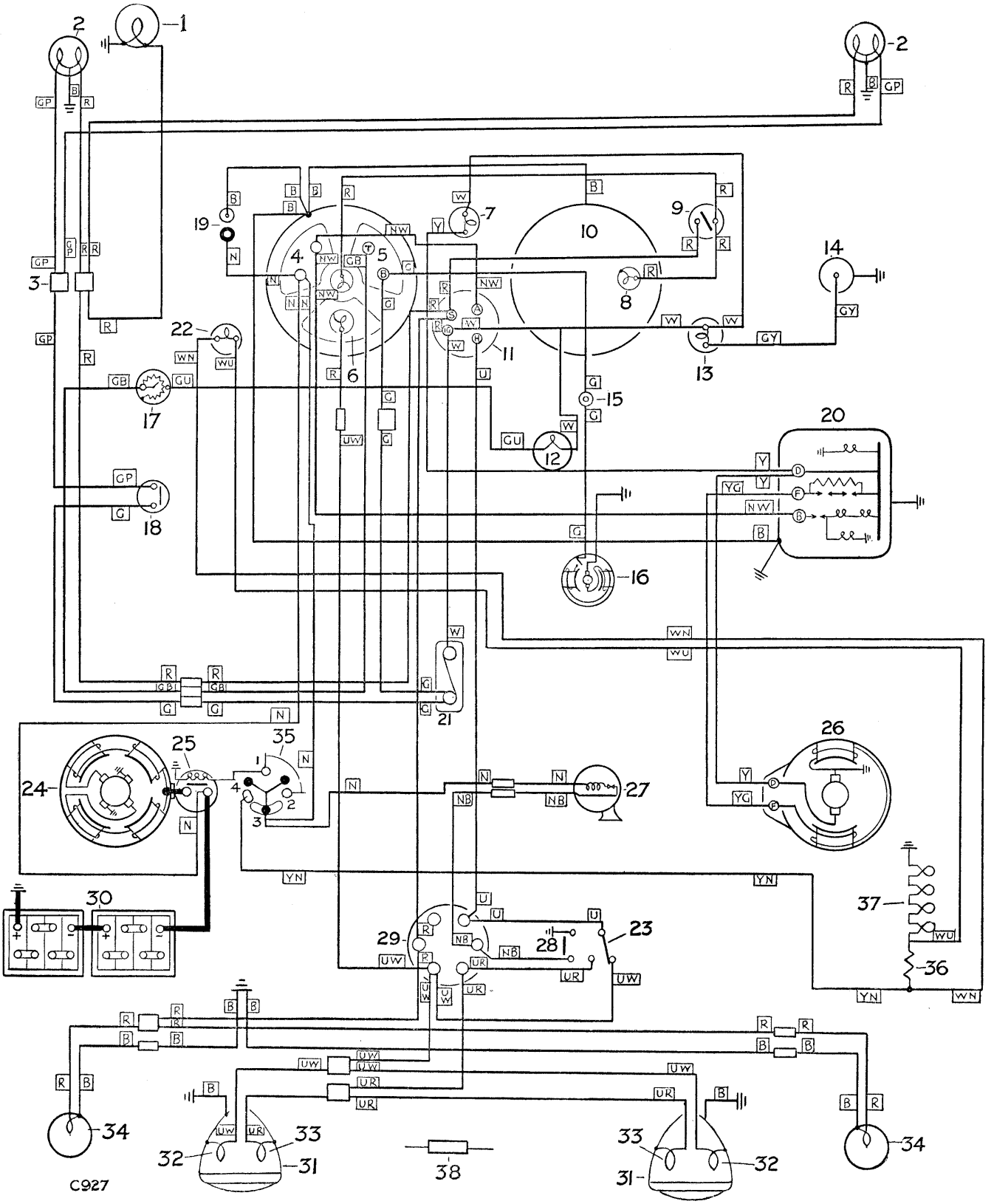


Fig. P-4—Wiring diagram—2 litre Diesel

Wiring diagrams

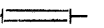
NOTE: On vehicles to the North American specification, the connections at the lighting switch are such that the sidelamps are extinguished when the headlamps are in use.

Key to cable colours

B—Black	N—Brown	R—Red	W—White
G—Green	P—Purple	U—Blue	Y—Yellow

RN—Red with brown, and so on.

Key to Fig. P-4

1 Rear number plate light
2 Stop tail lamps
3 Snap connectors for number plate light
4 Ammeter
5 Fuel level gauge
6 Headlamp main beam warning light
7 Dynamo warning light
8 Panel lights
9 Panel light switch
10 Speedometer
11 Electrical services and lighting switch
12 Fuel level warning light
13 Oil pressure warning light
14 Oil pressure switch
15 Windscreen wiper plug and socket
16 Windscreen wiper
17 Fuel tank level unit
18 Stop lamp switch
19 Inspection lamp sockets
20 Current control box
21 Fuse box (35 amp. fuse)
22 Heater plug warning light
23 Headlamp dipper switch
24 Starter
25 Starter solenoid switch
26 Dynamo
27 Horn
28 Horn push
29 Junction box
30 6-volt batteries (positive earth)
31 Headlamps
32 Main beam
33 Dip beam
34 Side lamps
35 Starter and heater plug switch
36 Resistance for heater plug
37 Heater plugs
38 Snap connectors shown thus 

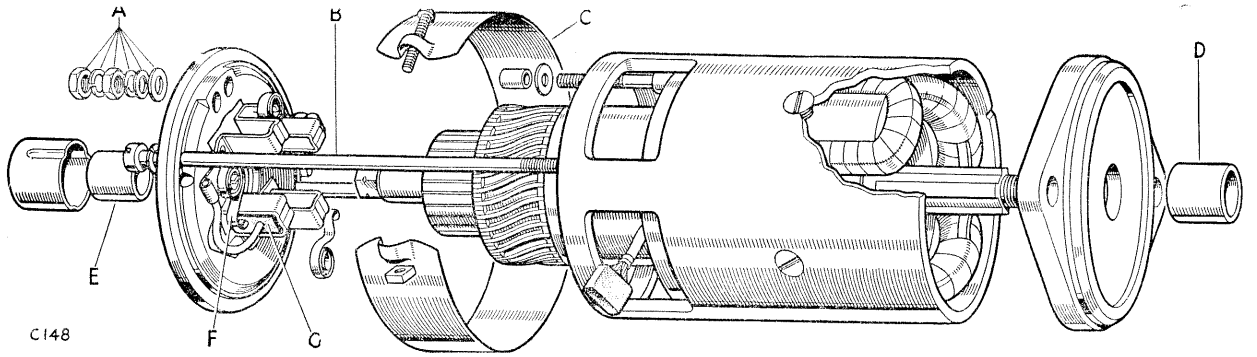


Fig. P-5—Exploded view of starter motor—Petrol models

A—Terminal nuts and washer
B—Through bolt
C—Cover band
D—Bearing bush
E—Bearing bush
F—Brush spring
G—Brush

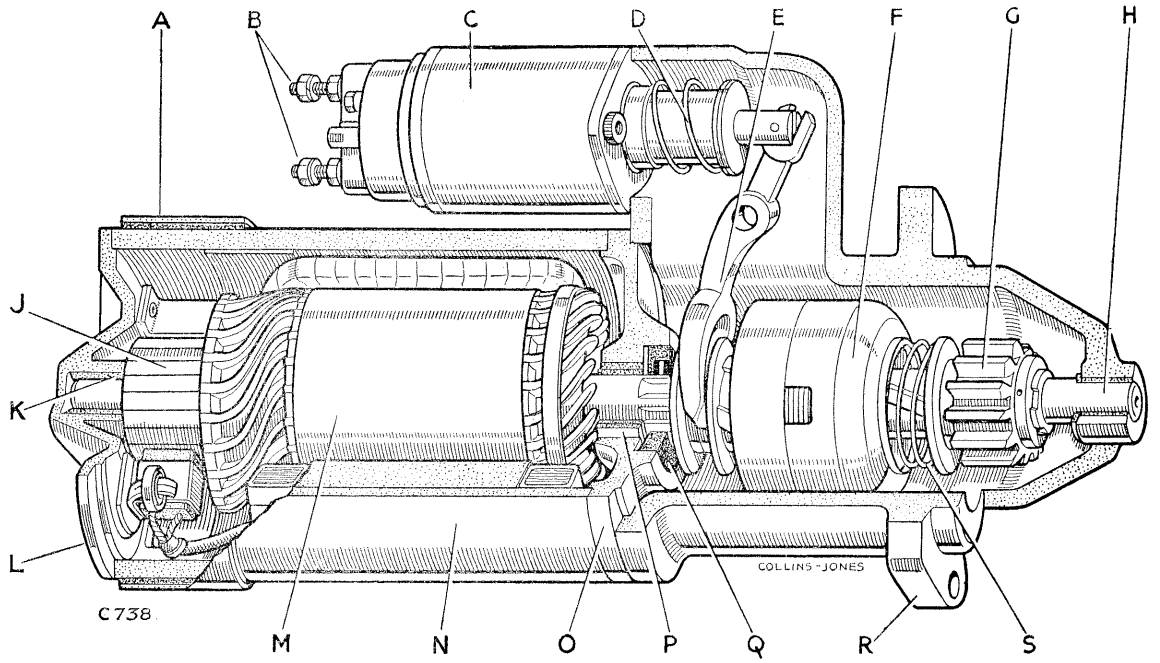


Fig. P-6—Sectioned view of starter motor—Diesel models

A—Commutator cover band
B—Solenoid terminals
C—Solenoid
D—Solenoid return spring
E—Engagement lever
F—Clutch assembly
G—Driving pinion
H—Porous bronze bush
J—Commutator
K—Porous bronze bush
L—Commutator end bracket
M—Armature
N—Yoke
O—Intermediate bracket
P—Impregnated brass bush
Q—Brake ring
R—Drive-end bracket
S—Cushion spring

Commutator

4. Clean the commutator with a petrol-moistened cloth. If necessary, rotate the armature and, using fine glass-cloth, remove pits and burned spots from commutator; remove abrasive dust with a dry air blast. If the commutator is badly worn, mount in a lathe, and, using a very sharp tool, take a light cut, taking care not to remove any more metal than necessary. The insulators between the commutator segments **must not be undercut.**

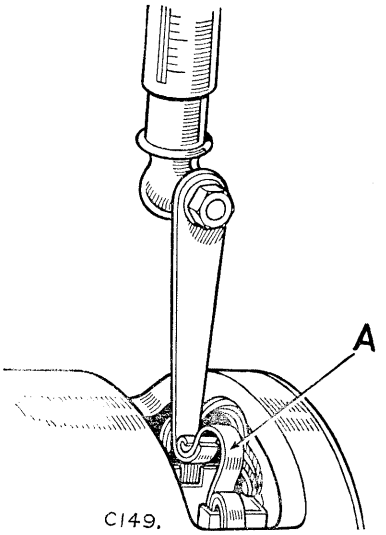


Fig. P-7—Testing brush spring tension
A—Brush spring

Armature

5. If the armature is damaged, i.e. "lifted" conductors, or distorted shaft, it must be replaced. Never attempt to machine the armature core, or true a distorted armature shaft.

To assemble — Operation P/14

1. Reverse the removal procedure.

Diesel models

2. To facilitate fitting the solenoid to the drive-end bracket, ease the drive assembly forward along the armature shaft.
3. Before tightening the eccentric pivot pin securing nut, set the pinion movement as detailed below. After re-assembly of the starter motor, connect the small centre terminal on the solenoid to a six-volt supply, using a switch. Connect the other side of the battery to a solenoid fixing stud. Close the switch, thus throwing the drive assembly forward into the engaged position, and measure the distance between the pinion and the washer on the armature shaft extension.
4. This measurement should be made with the pinion pressed lightly towards the armature to take up any slack in the engagement linkage. This setting should be 0.20 in.-0.30 in. (0,5-0,7 mm).

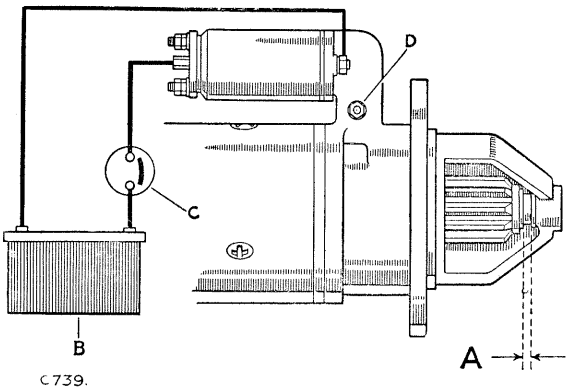


Fig. P-8—Setting pinion movement, when solenoid is energised

A—0.20 in.-0.30 in. (0,5-0,7 mm)
B—6-volt battery
C—Switch
D—Eccentric pivot pin

To adjust the setting, slacken the eccentric pivot securing nut and turn the pin until the correct setting is obtained.

The adjustment arc is 180° and the head of the arrow, as marked on pivot pin, should be set only between the arrows on the arc described on the drive-end bracket casting.

After setting, tighten the securing nut, in order to hold the pin in position.

Starter drive—Petrol models

To strip — Operation P/16

1. Withdraw split pin from nut on end of driving shaft and unscrew nut.
2. Remove main spring, washer, pinion and sleeve assembly, collar, push-off spring and spring restraining sleeve.

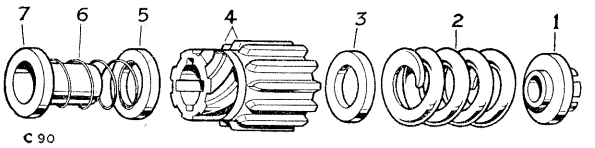


Fig. P-9—Layout of starter drive—Petrol models

1 Shaft nut
2 Main spring
3 Washer
4 Screwed sleeve and pinion
5 Collar
6 Pinion restraining spring
7 Spring retaining sleeve

To assemble — Operation P/18

1. Examine parts for excessive wear and replace as necessary. Assemble by reversing the removal procedure.

Starter drive—Diesel models

To strip — Operation P/20

1. Remove the drive assembly from the armature shaft.
2. Remove the lock ring from the driving sleeve.

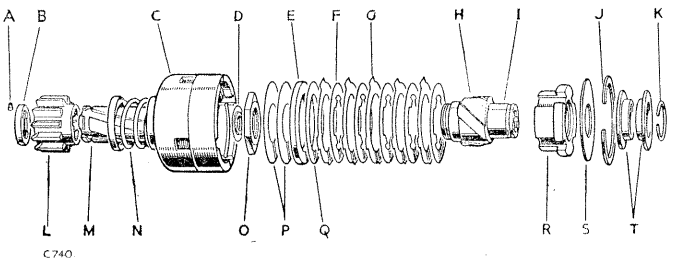


Fig. P-10—Exploded view of starter drive assembly, Diesel models

A—Rivet
B—Pinion retaining ring
C—Barrel unit
D—Thrust washer
E—Backing ring
F—Clutch inner plate
G—Clutch outer plate
H—Helical splines
I—Driving sleeve
J—Circlip
K—Lock ring
L—Pinion
M—Helical splined sleeve
N—Cushion spring
O—Ring nut
P—Pressure plates
Q—Shim
R—Moving member
S—Retaining washer
T—Engagement bush

3. Lift the two halves of the engagement bush off the driving sleeve.

4. Using a suitable circlip extractor, remove the clutch retaining circlip from the barrel unit and withdraw the driving sleeve and clutch unit.

5. The clutch assembly can now be dismantled by removing all the parts from the driving sleeve—excepting the two pressure plates which are held in position by the ring nut. To remove the ring nut, slide the driving sleeve on to the splined armature shaft and, using soft metal jaw plates, clamp the armature in a vice, file away the peened rims and remove ring nut. This locknut should only be removed if absolutely necessary. If removed, fit a new nut and peen the rim over the notch in the driving sleeve.

6. To remove the pinion from the helically splined sleeve, knock out the pinion retaining ring securing rivet. The retaining ring, pinion, cushion spring with cup washers and sleeve can now be separated.

To assemble **Operation P/22**

1. Reverse the stripping procedure.

   The correct cushion spring tension is 11 lb. (5 Kg.) measured with the spring compressed to $\frac{7}{8}$ in. (22 mm) length and 16 lb. (7 Kg.) with the spring compressed to $\frac{1}{2}$ in. (12 mm) length.

2. Check the slipping torque of the clutch as follows; fit the drive assembly on the splined armature shaft and clamp the armature between soft metal jaw plates in a vice.

   Apply an anti-clockwise torque to the pinion with a suitable "torque wrench" fastened to the pinion teeth. The clutch should slip between 800-950 lb./in. (142 to 169 Kg/cm).

   If the clutch slips at too low a torque figure, dismantle again, and add shims one at a time until the correct figure is obtained.

   If the clutch does not slip between the torque limits given, again remove the circlip—dismantle and remove shims one at a time until the torque test gives correct figures.

3. The assembled clutch unit and lever mechanism must be capable of being pushed to the full extent of the set travel. The assembly must move along the armature shaft extension smoothly and freely, but without slackness.

4. Before fitting the drive assembly to the armature shaft, lightly smear the shaft and pack the space between the indented bearings inside the pinion sleeve, with a bentonite-based grease.

Solenoid (Diesel models)—to test

The solenoid is composed of two coils, namely, a closing coil, by-passed when the plunger is fully home, and a hold-on coil to retain the plunger in the fully home position.

To test individually, remove existing connections and with the use of a 4-volt DC supply (constant voltage), proceed as below:

Closing coil

Connect the supply between the solenoid terminal marked 'S T A' and the smaller centre terminal. This should cause a current of 14.8 amps. to 17.4 amps. to pass.

Hold-on coil

Connect the supply between the solenoid body and the small centre terminal. This should cause a current of 4.5-5.6 amps. to pass.

These tests should not be carried out while the solenoid is hot. Do not attempt to repair a faulty solenoid, it should always be replaced.

Starter switch—Petrol models

To remove **Operation P/24**

1. Disconnect the battery.
2. Disconnect the three leads from the switch.
3. Screw off the switch knob and the locking nut from the switch spindle.
4. Remove the switch from the dash panel.

To refit **Operation P/26**

Reverse the removal procedure, connecting the wires in accordance with the appropriate wiring diagram.

Starter switch—Diesel models

See Operation P/108.

Dynamo

To remove **Operation P/28**

1. Disconnect the positive lead from the battery.

   Diesel only: completely detach the lead connecting both batteries, disconnect the negative lead from the L.H. battery and remove L.H. battery.

   2 litre Petrol: remove the air cleaner.
2. Disconnect the leads from dynamo.
3. Remove the bolts securing the dynamo to adjusting and anchor brackets.
4. Remove the belt from pulley and withdraw dynamo.

To refit **Operation P/30**

1. Reverse the removal procedure.
2. Adjust the driving belt tension—2 litre Petrol: $\frac{1}{2}$ to $\frac{3}{4}$ in. (12-19 mm); and $2\frac{1}{4}$ litre Petrol, 2 litre Diesel: $\frac{5}{16}$ to $\frac{7}{16}$ in. (8-11 mm).

To strip **Operation P/32**

1. Take off the driving pulley.
2. Unscrew and withdraw the two through bolts.
3. The commutator end bracket can now be withdrawn from the dynamo yoke. Do not lose the fibre thrust washer.
4. The driving end bracket together with the armature can now be lifted out of the yoke.

To overhaul **Operation P/34**

Brushes

1. Lift the brushes up into the brush boxes and secure them there by positioning the brush spring at the side of the brush.
2. Fit the commutator end bracket over the commutator and release the brushes.
3. Check that the brushes move freely in their holders by holding back the brush spring and pulling gently on the flexible connectors. Any tendency to stick should be corrected by cleaning with a petrol-moistened cloth, or in extreme cases by the **light** use of a smooth file. If a brush is damaged or worn so that it does not make good contact on the commutator, all the brushes must be renewed.
4. Check the tension of the brush springs with a spring balance. The correct tension is 22 to 25 oz. (624 to 709 grammes). In service it is permissible for this value to fall to 15 oz. (425 grammes). New springs must be fitted if the tension is low.
5. The new brushes being pre-formed, "bedding" to the commutator is unnecessary.

Commutator

6. Clean the commutator with a petrol-moistened cloth. If necessary, rotate the armature and, using fine glass-cloth, remove pits and burned spots from the commutator; remove abrasive dust with a dry air blast. If the commutator is badly worn, mount in a lathe, and, using a very sharp tool take a light cut, taking care not to remove any more metal than necessary. Undercut the insulators between the segments to a depth of $\frac{1}{32}$ in. (0,7 mm) with a hacksaw blade ground to the thickness of the insulator.

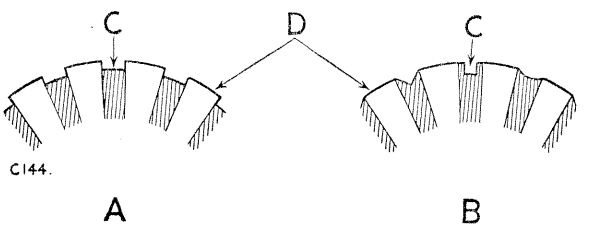


Fig. P-11—Undercutting commutator insulators

A—Right B—Wrong

To assemble **Operation P/36**

1. Lift the brushes up into the brush boxes and secure them in that position by positioning the brush spring at the side of the brush.
2. Fit the commutator end bracket on the armature shaft until the brush boxes are partly over the commutator. Place a thin screwdriver on top of each brush in turn and press the brush down on the commutator. The brush springs should then position themselves on top of the brushes.
3. Fit the commutator end bracket to the yoke so that the projection on the bracket locates in the yoke.
4. Refit the two through bolts.
5. Inject a few drops of any high quality medium viscosity (SAE 30) engine oil into the hole marked "Oil" at the end of the commutator bearing housing.

To check **Operation P/38**

1. Check the driving belt tension, ensure that it is neither too tight nor too loose; Operation P/30. Adjust if necessary by slackening the pivot and adjusting link bolts, then move the dynamo outwards from the engine to tighten belt or inwards to loosen. Re-tighten the securing bolts.

2. Disconnect the cables from terminals of dynamo and connect the two terminals with a short length of wire.

3. Start the engine and run at normal idling speed. Clip the negative lead of a moving coil voltmeter, calibrated 0-20 volts, to one dynamo terminal and the other lead to a good earthing point on the yoke.

4. Gradually increase the engine speed; the voltmeter reading should rise rapidly and without fluctuation. Do not allow the voltmeter reading to reach 20 volts nor race the engine in an attempt to increase the voltage output. An engine speed of 1,000 r.p.m. should not be exceeded.

5. If there is no reading, check the brush gear as described in Operation P/8. A low reading of approximately $\frac{1}{2}$-1 volt indicates a possibly faulty field winding. Readings of 4 to 5 volts are probably attributable to faulty armature windings.

   If a radio suppression capacitor is fitted between the output terminal and earth, disconnect this capacitor and re-test the dynamo before dismantling. If a reading is now given on the voltmeter, the capacitor is defective and must be replaced.

6. The dynamo being found serviceable, remove the link connecting the terminals and fit them to the respective connections. Ensure that the larger terminal is connected to control box terminal marked "D" and the smaller dynamo terminal to the control box terminal marked "F".

Voltage regulator—Petrol engines

To remove **Operation P/40**

1. Disconnect the battery.

2. Disconnect all wires from the control box.

3. Remove the control box complete from the mounting plate.

To refit **Operation P/42**

1. Reverse the removal procedure, connecting the wiring in accordance with the appropriate wiring diagram.

To check **Operation P/44**

1. Place a piece of paper between the cut-out contacts and connect a moving-coil voltmeter to the "D" terminal on the regulator and to a good earth (not the one on the regulator box). Start the engine and increase R.P.M. until the voltage remains constant, i.e. the regulator is controlling; the voltmeter reading should be 15.8 to 16.4 volts. If the regulating voltage is not correct, the vehicle should be examined by a qualified electrician. Should the regulator be reading correctly at the commencement of this test, the earth lead of the voltmeter should be transferred to the "E" connection on the regulator box ; the reading should be the same as that obtained with the previous earth. If there is any difference, i.e. the "E" connection on the regulator gives a lower reading, it will indicate a bad earth on the regulator box.

Current voltage regulator—Diesel models

Locating faults on charging circuit

Ensure that the dynamo is functioning correctly (Page P-14) and that the batteries are in order, then proceed as follows:—

(*a*) Ensure that the wiring between battery and control box is in order by disconnecting the wire from control box terminal B and connecting the end of the wire removed to the negative terminal of a voltmeter Connect the positive voltmeter terminal to an earthing point on the chassis. If a voltmeter reading is observed, the wiring is in order and the control box must be examined.

(*b*) If there is no reading, examine the wiring between battery and control box for defective cables or loose connections.

(*c*) Re-connect the wire to terminal B.

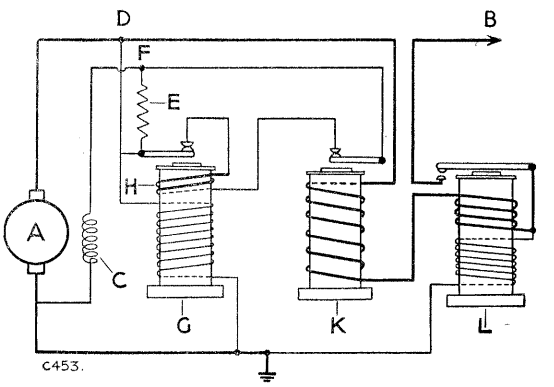


Fig. P-12—The charging circuit

A—Armature
B—Terminal on control box—to ammeter and battery
C—Field windings
D—Terminal on control box
E—Resistor
F—Terminal on control box
G—Voltage regulator
H—Bucking coil
K—Current regulator
L—Cut-out relay

Regulator adjustments

The regulators are carefully set during manufacture to suit the normal requirements of standard equipment and, in general, further adjustments should not be necessary. However, if the battery does not keep in a charged condition, or if the dynamo output does not fall when the battery is fully charged, it may be advisable to check the settings and re-adjust if necessary.

Before disturbing any settings, it is important to check that a fault in the charging system is not due to a slipping dynamo belt or to a defective battery.

Electrical setting of voltage regulator

Operation P/46

1. Disconnect control box terminal B. Connect a first-grade moving coil 0-20 voltmeter between terminal D and earth.

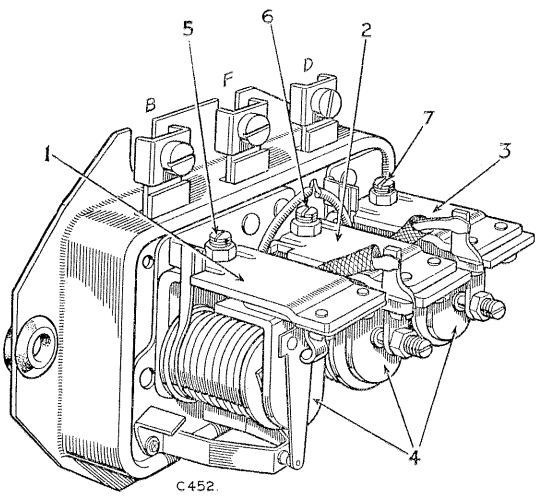


Fig. P-13—Current voltage regulator

1 Cut-out	6 Current adjusting screw
2 Current regulator	7 Voltage adjusting screw
3 Voltage regulator	B—Terminal
4 Armature	F—Terminal
5 Cut-out adjusting screw	D—Terminal

2. Slowly increase the speed of the engine until the voltmeter needle flicks and steadies. This should occur at a reading between 14.2 and 14.8 volts. If it does not, stop the engine and remove the control box cover.

3. Slacken the adjustment screw locking nut (see Fig. P-14) and turn the screw in a clockwise direction to raise the voltage setting, or anti-clockwise to lower the setting. Turn the screw a fraction of a turn only at a time and re-tighten the locknut.

4. Repeat this open-circuit voltage test until the correct setting is obtained.

   Re-make the original connections.

   When the dynamo is run at a high speed on open circuit, it builds up a high voltage. Therefore, when adjusting the regulator, do not run the engine up to more than half throttle or a false voltmeter reading will be obtained. The adjustment should be completed within 30 seconds, otherwise heating of the regulator winding may cause an inaccurate setting to be made.

Electrical setting of current regulator on vehicle

Operation P/48

1. When setting the current regulator on the vehicle, the dynamo must be made to develop its maximum rated output, whatever the state of charge of the battery might be at the time of setting. The voltage regulator must therefore be rendered inoperative. To do this, the voltage regulator contacts should be short-circuited with a clip large enough to bridge the outer armature assembly securing screw and the insulated fixed contact bracket, as shown in Fig. P-14.

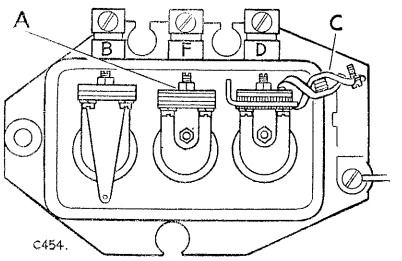


Fig. P-14—Short-circuiting voltage regulator contacts

A—Current regulator adjusting screw	D—Terminal
B—Terminal	F—Terminal
C—Clip—short-circuiting	

2. Disconnect the cable from control box terminal B and connect a first-grade moving coil 0-40 ammeter between this cable and terminal B. Switch on all lamps and accessories. This will prevent the voltage of the system rising when the engine is started.

   There are two types of dynamo and current voltage regulator fitted to Diesel models.

   Early Diesel models:

   Dynamo type C45.PV5, maximum output 22 amp.

   Current voltage regulator type RB3.

   Late Diesel models:

   Dynamo type C45.PV6, maximum output 25 amp.

   Current voltage regulator type RB310.

   The latest type dynamo can be used on earlier models, but the latest type current voltage regulator must not be used with the C45.PV5 dynamo, otherwise there is a danger of burning out the dynamo.

3. With the dynamo running at approximately 4,000 r.p.m., the ammeter needle should be steady and indicate a current of 22 amp with a type C45.PV5 dynamo or 25 amp with a type C45.PV6 dynamo. If it does not, the unit must be adjusted in a manner similar to that described for the voltage regulator.

   Re-make the original connections.

Electrical setting of cut-out relay

Operation P/50

1. Connect a first-grade moving coil 0-20 voltmeter between control box terminal D and earth. Switch on the headlamps and slowly increase the engine speed from zero. Closure of the contacts, indicated by a slight drop in the voltmeter reading, should occur between 12.7 and 13.3 volts. If it does not, the unit must be adjusted in a manner similar to that described for the voltage regulator.

   When setting the cut-in voltage at a test bench, a suitable load resistor passing about 6 amperes should be connected between control box terminal B and earth. This will cause the voltmeter needle to flicker at the instant of contact closure.

2. Disconnect the cable from control box terminal B. Connect a first-grade moving coil 0-20 voltmeter between this terminal and earth. Run the engine up to speed and then slowly decelerate, noting the instant when the voltmeter reading drops to zero. This should occur between 9.5 and 10.5 volts. If it does not, adjust by carefully bowing the legs of the fixed contact post. Repeat the test and, if necessary, re-adjust until the armature releases at the voltage specified.

Cleaning contacts — Operation P/52

When cleaning the voltage or current regulator contacts, use fine carborundum stone or silicon carbide paper, followed by methylated spirits (denatured alcohol).

When cleaning the cut-out contacts, use a strip of fine glass paper—never carborundum stone or emery cloth.

Mechanical setting of air gaps—Voltage and current regulators — Operation P/54

All air-gap settings are accurately adjusted before the units leave the factory, and should require no further attention. If, however, an armature is removed for any reason, care must be taken to obtain the correct air-gap settings on re-assembly.

1. Slacken the two armature assembly securing screws so that the armature is loosely attached to the regulator frame.

2. Slacken the fixed contact locking nut and unscrew the fixed contact adjustment screw until it is well clear of the armature moving contact.

3. Slacken the voltage (or current) adjustment screw locking nut and unscrew the adjustment screw until it is well clear of the armature tension spring.

4. Using a 0.015 in. thick flat steel gauge, wide enough to cover completely the core face, insert the gauge between the underside of the armature and the copper disc. Take care not to turn up or damage the edge of this disc.

5. Press the armature squarely down against the gauge and re-tighten the two armature assembly securing screws.

6. With the gauge still in position, screw in the fixed contact adjustment screw until it just touches the armature moving contact. Re-tighten the locking nut.

7. Carry out the electrical settings, Operation P/48 or 50 as applicable.

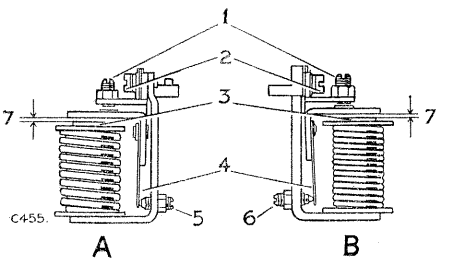


Fig. P-15—Voltage and current regulators

A—Voltage regulator
B—Current regulator
1—Fixed contact adjustment screws
2—Armature assembly securing screws
3—Cores
4—Armature tension springs
5—Voltage adjustment screws
6—Current adjustment screws
7—.015 in. (0,40 mm)

Setting cut-out relay air gap — Operation P/56

1. Slacken the two armature assembly securing screws so that the armature is loosely attached to the cut-out frame.

2. Slacken the adjustment screw locking nut and unscrew the adjustment screw until it is well clear of the armature tension spring.

3. Press the armature squarely down against the copper-sprayed core face and re-tighten the two armature assembly securing screws. No gauge is necessary.

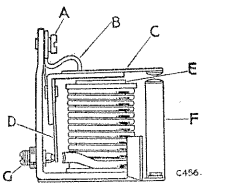


Fig. P-16—Cut-out relay

A—Armature assembly securing screw
B—Armature back stop
C—Contact blade
D—Armature tension spring
E—Core
F—Fixed contact post
G—Adjustment screw

4. Press the armature down against the core face and adjust the armature back stop so that a .018 in. (0,5 mm) gap is obtained between the tip of the back stop and the contact blade.
5. Insert a .010 in. (0,25 mm) thick flat steel gauge between the underside of the armature and the copper-sprayed core face. The gauge should be inserted from the side of the core nearest the fixed contact post. The leading edge of the gauge should not be inserted beyond the centre line of the core face. Press the armature down against the gauge and check the cut-out contacts. These should be just touching. If necessary adjust the height of the fixed contact by carefully bowing the legs of the fixed contact post.
6. Reset the cut-in voltage (Operation P/50) and lock the adjustment screw.

To remove **Operation P/58**

1. Disconnect the positive lead of R.H. battery and the leads to regulator box.
2. Remove the securing bolts and withdraw the regulator unit.

To refit **Operation P/60**

1. Reverse removal procedure, connecting wiring in accordance with the appropriate wiring diagram.

Headlamp

To remove **Operation P/62**

1. Disconnect the leads at the snap connectors and remove them from supporting clips.

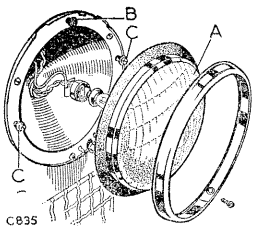


Fig. P-17—Headlamp

A—Lens B—Vertical adjustment screw
C—Horizontal adjustment screw

2. Remove the securing screw from the lower side of rim and ease the rim off from the bottom.
3. Withdraw the dust-excluding rubber.
4. Press the light unit against the compression springs of the adjusting screws and turn anti-clockwise to release.
5. Release the bulb contact housing and remove the bulb.
6. Remove the securing screws and withdraw the lamp body complete with leads and rubber gasket.

To refit and adjust **Operation P/64**

1. Reverse the removal procedure.
2. Adjustment in a vertical plane is effected by turning the spring loaded screw at the top of the lamp body.
3. Adjustment on a horizontal plane is made by means of a screw at each side of the lamp body.

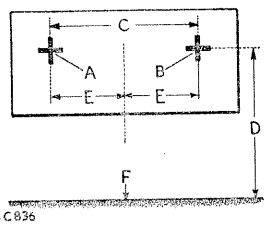


Fig. P-18—Headlamp beam setting board

A—Concentrated area of light—L.H. headlamp
B—Concentrated area of light—R.H. headlamp
C—21⅜ in. (543 mm)
D—37½ in. (952 mm)—88 models
—39½ in. (1002 mm)—109 models
E—10 11/16 in. (271 mm)
F—Ground level

To adjust, using beam setting board **Operation P/66**

1. Mark on a board the dimensions given in Fig. P-19 and position the vehicle unladen, on level ground.

Bulbs

Position	*Make and Type*	*Voltage*	*Wattage*
Headlamps—R.H.D. models	Lucas No. 414	12	50/40 Double filament (dip to left)
Headlamps—L.H.D. models (except Europe)	Lucas No. 415	12	50/40 Double filament (dip to right)
Headlamps—L.H.D. models (Europe except France)	Lucas No. 410	12	45/40 Double filament (duplo) (vertical dip)
Headlamps—France	Lucas No. 411	12	45/40 Double
Headlamps—North America	Sealed beam unit	12	—
Side lamp	Lucas No. 207	12	6
Stop, tail lamp	Lucas No. 380	12	21/6 Double filament
Rear number plate lamp	Lucas No. 222	12	6
Instrument panel lights	Lucas No. 987	12	2.2 M.E.S.
Warning lights	Lucas No. 987	12	2.2 M.E.S.
Flasher equipment (where fitted)	Lucas No. 382	12	21

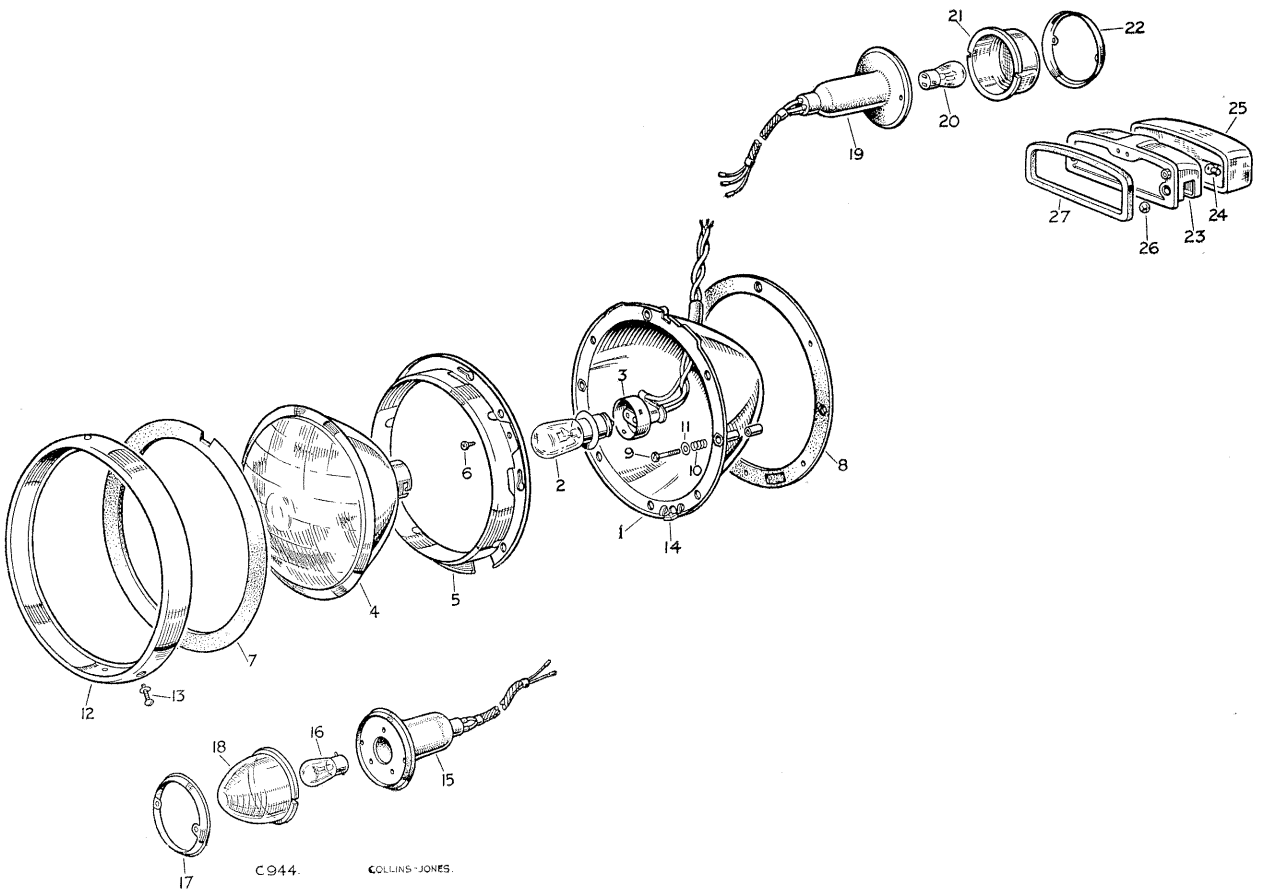


Fig. P-19—Layout of lamps

1 Body for headlamp
2 Bulb for headlamp
3 Adaptor for bulb, double contact
4 Light unit
5 Rim complete for light unit
6 Special screw for light unit rim
7 Rubber gasket for headlamp rim
8 Gasket for body
9 Special screw
10 Spring for screw } Light unit adjustment
11 Cup washer for screw
12 Rim for headlamp, chrome
13 Screw } Retaining
14 Spire nut } rim
15 Side lamp body
16 Bulb for side lamp
17 Bezel
18 Lens
19 Stop tail lamp body
20 Bulb for stop tail lamp
21 Glass
22 Bezel
23 Number plate lamp
24 Bulb for number plate lamp
25 Glass
26 Rubber grommet
27 Rubber gasket

2. Place the board 12 ft. (365 cm) in front of the headlamps, ensuring that it is at right angles to the vehicle centre line and that the centre line on board is in the same plane as vehicle centre line.
3. Adjust the beam by turning the adjusting screws indicated in Fig. P-18 until the area of concentrated light corresponds with the marks on beam setting board.

Side lamp

To remove **Operation P/68**

1. Disconnect the leads at the snap connectors, alongside the radiator cowl.
2. Withdraw the rim and lens by removing the securing screws.
3. If required, remove the bulb.
4. Remove the lamp from the wing, by removing the retaining screws, spring washers and nuts.

To refit **Operation P/70**

1. Reverse the removal procedure, connecting the wiring in accordance with the wiring diagram.

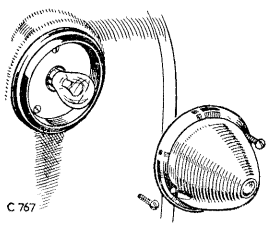


Fig. P-20—Side and tail lamp replacement

Stop and tail lamp

To remove **Operation P/72**

1. Disconnect the tail lamp harness at the snap connectors located beneath the wheel box, adjacent to the chassis frame side member.
2. Remove the screws, washers and nuts, and withdraw the rear lamp cover plate (inside vehicle).
3. Withdraw the tail lamp harness through the rubber grommet in the wheel box.
4. Withdraw the rim and glass by removing the securing screws. If required, remove the bulb.
5. Remove the lamp and harness complete by removing the securing screws.

To refit **Operation P/74**

1. Reverse the removal procedure, connecting the harness in accordance with the wiring diagram.

Number plate illumination lamp

To remove **Operation P/76**

1. Disconnect the leads at the snap connectors located beneath the wheel box, adjacent to the chassis frame side member.
2. Remove the screws, washers and nuts and withdraw the rear lamp cover plate (inside vehicle).
3. Withdraw the leads—through the wheel box grommet.
4. Remove the securing screw and withdraw lamp cover. If required remove the bulb.
5. Withdraw the lamp by removing the securing nuts (inside vehicle).

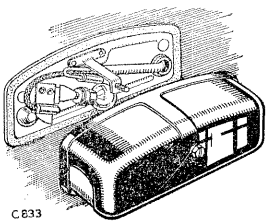


Fig. P-21—Number plate lamp

To refit **Operation P/78**

1. Reverse removal procedure, connecting the wiring in accordance with the wiring diagram.

Horn button

To remove **Operation P/80**

Bracket mounted type

1. Remove the securing screws and withdraw the horn button and leads.
2. Disconnect the leads if necessary.

Centre type

3. Gently prise out the centre complete from the steering wheel. Disconnect the lead at the snap connector on the centre.
4. Remove the horn button from the centre if necessary.

To refit **Operation P/82**

1. Reverse the removal procedure.

Horn

The horn is adjusted on initial assembly and should not require attention for some considerable time.

Ascertain that horn failure or faulty note is not due to some outside source, such as a discharged battery, loose connections or loose horn mounting, before carrying out any adjustment.

Adjustment of horn **Operation P/84**

Lucas

1. Disconnect the leads at the snap connectors adjacent to the horn, then remove the securing bolts and withdraw the unit.

2. Remove the dome and dome securing clip, clean the points and adjust them until they are almost touching, then turn the adjusting screw **half** a turn to increase the gap.
3. If adjustment of the horn does not produce satisfactory results, the horn should be returned to the makers.

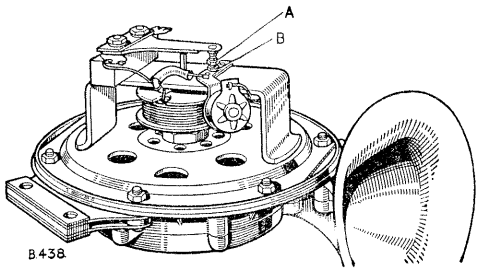


Fig. P-22—Horn adjustment. Lucas
A—Adjustable contact B—Locknut

Clear Hooters

4. Remove the horn—Item 1, Operation P/84, then remove the dome and dome clip.
5. Connect the horn leads to a 12-volt battery and adjust nut (A) until maximum volume is obtained, then lock in position with nut (B). See Fig. P-23
6. Adjust the air gap between armature (C) and the magnet core face (D) to .045 to .050 in. (1,0 to 1,25 mm) by slackening nut (E) and turn the armature (C) clockwise or anti-clockwise until the recommended distance is obtained, then tighten nut (E). The current consumption with horn correctly adjusted is 9 amperes.

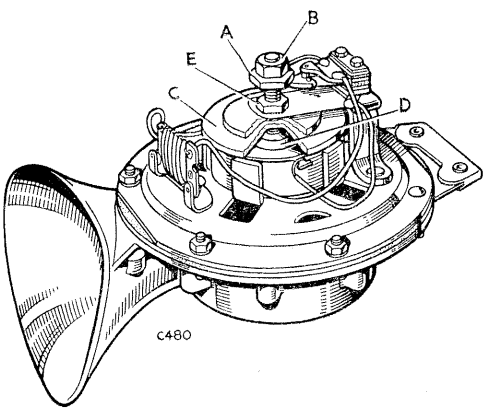


Fig. P-23—Horn adjustment. Clear Hooters
A—Adjusting nut C—Armature
B—Locknut D—Magnet core
E—Locknut—armature

Dipswitch

To remove **Operation P/86**

1. Disconnect the dipswitch leads at junction box.
2. Remove the securing screws and withdraw the switch from toe board.

To refit **Operation P/88**

1. Reverse removal procedure, connecting leads in accordance with the wiring diagram.

Ignition—Petrol models

Distributor

To remove **Operation P/90**

1. Pull off the sparking plug covers and detach the plug leads; disconnect the vacuum pipe, L.T. and H.T. leads.
2. Remove the set bolt securing the distributor clamp to the distributor mounting plate.
3. Remove the distributor complete with clamp.

To refit **Operation P/92**

1. Reverse the removal procedure; set the contact breaker gap to .014 to .016 in. (0,35 to 0,40 mm). The driving spigot on the distributor drive shaft is offset, so eliminating any possibility of mistiming the engine on replacement.

Coil

To remove **Operation P/94**

1. With the ignition switched off, disconnect the high and low tension leads from the coil.
2. Remove the coil from the dash panel.

To refit **Operation P/96**

1. Reverse the removal procedure.

Stop lamp switch

To renew **Operation P/98**

The hydraulic switch is located on the brake pipe five-way piece, at the front R.H. chassis side member.

1. Disconnect the leads, unscrew switch and remove.
2. Replace by reversing the removal procedure, connecting wires in accordance with the wiring diagram. Minimise loss of brake fluid by fitting new switch immediately.
3. Bleed the brake system—Section H.

Heater plugs—Diesel models

The heater plugs do not require any maintenance. However, if at any time when the heater plugs are in use, the warning light glows very brightly, a short circuit in the system is indicated. No light will indicate an open circuit.

Great care must be taken not to twist the centre terminal when removing heater plug leads.

Fault location on heater plug circuit **Operation P/100**

(*a*) Examine the fuse at terminal A3 and replace if "blown".

(*b*) Failure of the warning light bulb will not affect the heater plug circuit, but the bulb should be replaced when conveniently possible—Section Q.

(*c*) Connect one lead of the test lamp to the earth lead terminal on No. 1 heater plug and the other lead to the L.H. battery negative terminal, whereon the bulb should light. If the bulb remains unlit, a corroded, loose, or disconnected heater plug earth lead is indicated.

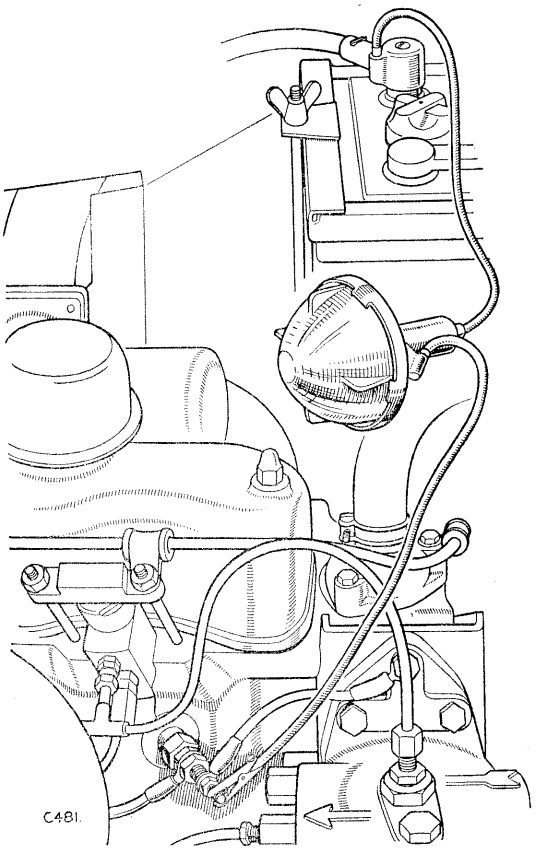


Fig. P-24—Checking heater plug circuit

Move the test lamp lead from the earth terminal on No. 1 heater plug, to the terminal also on No. 1 plug, to which the inter-connecting lead is attached. If the plug is serviceable the bulb will light but a broken heater plug filament will be indicated by the lamp remaining unlit.

Check the remaining plugs in the same manner until the fault is located.

If the heater plugs are found serviceable check each terminal of the resistance unit in the same way.

Removal, cleaning and inspection of heater plugs. Operation P/102

The shape of the heater plug element and its position in relation to the plug body is important and care must therefore be taken when fitting, removing or cleaning the plug, to avoid distortion or damage to the element.

1. Disconnect the leads from plugs, using two spanners at each terminal to prevent the central rod or insulating tube twisting.
2. Remove carbon from base of heater plug to avoid possible short circuiting of the element. Do **not** sandblast.
3. Examine the element for signs of fracture or severe heat attack and the seating for scores. Plugs with fractured elements must be replaced. Where scoring of the seating is sufficient to allow gas leakage or erosion of the element such that a fracture is likely to occur, then a replacement plug must be fitted.
4. Test the plug internal circuit for continuity, by connecting it **and** a 12 volt side-lamp bulb in circuit, to a 12 volt battery.

   The inclusion of a bulb in circuit is **essential.**

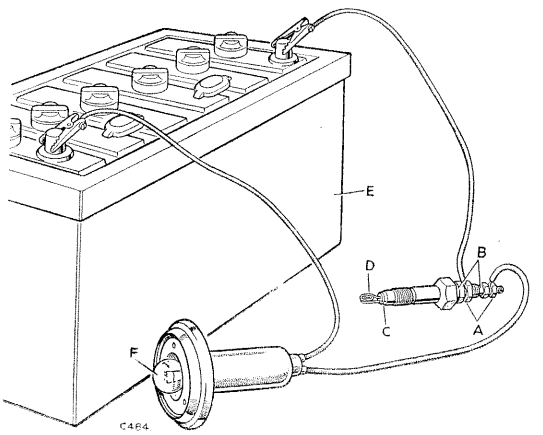


Fig. P-25—Testing heater plug circuit

A—Terminal nuts	D—Element
B—Insulation	E—12 volt battery
C—Seating	F—Bulb (12 v.)

5. Ensure that the terminal nuts and threads are clean and that the thread at base of plug is free of carbon, then refit the plugs and tighten.

   Make sure the shakeproof washers are fitted under the terminal in order to maintain good electrical contact.

Refit the heater plugs and tighten to 25 lb/ft. (3,4 kg/m).

Replace the leads in accordance with the wiring diagram and tighten the terminals, using two spanners to each terminal.

Resistance—heater plugs

To remove Operation P/104

1. Disconnect the leads from resistance.
2. Remove the securing screws and withdraw the unit.

To refit Operation P/106

1. Reverse removal procedure.

Starter and heater plug switch—Diesel models

To remove **Operation P/108**

1. Disconnect the positive lead from the right-hand battery.
2. Disconnect the leads from the back of the starter switch.
3. Remove the large securing nut from facia side of panel.
4. Withdraw switch.

To refit **Operation P/110**

1. Reverse removal procedure, connecting leads in accordance with the appropriate wiring diagram.

Fuel gauge tank unit

No adjustment or repair is permissible to the fuel contents gauge tank unit. If the gauge reads wrongly or—Diesel models—the fuel level warning light does not glow when two or less gallons only remain in the tank, the lead(s) at the tank unit should be checked for security. If the fault is not corrected by tightening the terminal(s), remove and test the warning light and check the tank unit by substitution.

To renew **Operation P/112**

1. Disconnect the battery.
   Diesel—disconnect the positive lead from R.H. battery.
2. Remove the special bolts, bracket to squab, and remove squab.
3. Remove seat cushion, remove securing screws and lift cover plate clear.
4. Remove remaining fixing bolts and lift off extension panel complete with squab mounting bracket.
5. Remove lead(s) and securing screws from tank gauge unit and withdraw unit from tank.
6. Fit the new unit and cork washer; complete the assembly by reversing the removal procedure, connecting lead(s) in accordance with the appropriate wiring diagram.

Fuse and junction boxes

To remove **Operation P/114**

1. Disconnect the battery.
   Diesel—Disconnect the positive lead from the R.H. battery.
2. Remove the cover and disconnect the leads.
3. Remove the securing screws and withdraw the unit.

To refit **Operation P/116**

1. Reverse removal procedure and reconnect the leads in accordance with wiring diagram.

Windscreen wiper motor

To remove **Operation P/118**

1. Slacken the wiper arm fixing nut and tap sharply to release the clamp collet, then remove the wiper arm and blade.
2. With the key in lamp switch turned "off", disconnect the leads from wiper motor.
3. Remove the securing nuts, washers, grommets, wiper blade stop, rubber mounting block and brass bushes, then withdraw the motor.

To refit **Operation P/120**

1. Reverse removal procedure, but do not lock the wiper arm blade until the sweep is correctly adjusted.

Mixture control thermostat switch—Petrol engines

To renew **Operation P/122**

1. Disconnect the wire from the thermostat switch.
2. Remove the switch from the cylinder head (2 litre Petrol—located in the rear cover plate; $2\frac{1}{4}$ litre Petrol—located in the cylinder head, front L.H.).
3. Check the switch: Contact is made at 51-54°C (124-129°F); contact is broken at 47-53°C (117-127°F).
4. Fit the new switch by reversing the removal procedure.

   Renewal of the second switch in the mixture control warning light circuit (at the manual control) is dealt with in Section Q.

DEFECT LOCATION

(Symptom, Cause and Remedy)

A—BATTERY DISCHARGED

1. Battery unserviceable—*Renew.*
2. Battery leads corroded or loose—*Clean and tighten.*
3. Voltage or current voltage regulator faulty—*Rectify or renew.*
4. Dynamo faulty—*Rectify.*

B—DYNAMO NOT CHARGING OR CHARGING AT REDUCED RATE

1. Slipping fan belt—*Tighten.*
2. Dynamo loose on mounting—*Tighten.*
3. Continuity of circuit broken—*See Pages P-14 to P-15 inclusive.*
4. Brushes excessively worn—*Renew.*
5. Commutator burnt or worn unevenly—*Skim the surface in lathe.*
6. Commutator glazed—*Clean with fine glass paper.*
7. Voltage or current voltage regulator faulty—*Rectify or renew.*
8. Dynamo internal circuit faulty—*Dismantle and check.*

C—LAMPS DIM WHEN ENGINE REVOLUTIONS ARE LOW

1. Faulty earth—*Check earthing points of lamps affected.*
2. Battery in a low state of charge—*See Symptom* A.

D—BULBS FAIL FREQUENTLY

1. Battery in a low state of charge—*See Symptom* A.
2. Voltage or current voltage regulator faulty—*Rectify or renew.*
3. Loose connections—*Tighten.*
4. Wrong type of bulb used—*See bulb chart.*

E—HORN FAILURE

1. Loose connections—*Tighten.*
2. Burnt or loose contact points—*Clean and adjust. See Page P-19.*

F—INSTRUMENT PANEL LIGHTS FAIL—*See Section Q.*

Ga—STARTER FAILS TO OPERATE—PETROL MODELS

1. Stiff engine, indicated by inability to turn by hand—*Locate and remedy.*

   If the engine can be turned by hand, the trouble may be due to:—
2. Battery discharged—*Start by hand. Charging the battery either by a long period of daylight running, or from independent electrical supply.*
3. Broken or loose connection in starter circuit—*Check and tighten all battery, starter and starter switch connections and check the cables connecting these units for damage.*
4. Greasy, charred or glazed commutator—*Clean.*
5. Brushes worn, not fitted correctly or wrong type—*Renew.*
6. Brushes sticking in holders or incorrectly tensioned—*Rectify.*
7. Starter pinion jammed in mesh with flywheel—*Rotate the squared end of the starter shaft with a spanner to free the pinion.*

Gb—STARTER FAILS TO OPERATE—DIESEL MODELS

1. Batteries discharged—*Re-charge.*
2. Starter/heater switch unserviceable—*Renew.*
3. Wiring at starter/heater switch loose—*Tighten.*
4. Solenoid unserviceable—*Renew.*
5. Wiring at solenoid loose—*Tighten.*
6. Brushes unduly worn—*Renew.*
7. Brush springs fatigued—*Renew.*
8. Commutator greasy or dirty—*Clean with petrol-moistened cloth.*
9. Commutator burnt or worn unevenly—*Remove armature, and skim.*
10. Fault in internal circuit—*Dismantle and check.*
11. Starter solenoid badly earthed—*Clean and tighten connections.*

H—STARTER OPERATES BUT ENGINE IS NOT CRANKED

1. Petrol models: Starter drive pinion not engaging with the flywheel, due to dirt on the screwed sleeve—*Clean.*

   Diesel models: Plate clutch pinion faulty—*Remove starter and dismantle to ascertain cause.*

J—STARTER PINION WILL NOT DISENGAGE FROM FLYWHEEL

1. Petrol models: Starter pinion jammed in mesh with the flywheel—*Rotate squared end of starter shaft with a spanner until pinion flies off. On no account run the engine or serious damage to the starter will result.*

   Diesel models: Return spring in starter broken—*Dismantle starter and renew.*

K—ENGINE WILL NOT FIRE—PETROL MODELS

1. The starter will not turn the engine due to a discharged battery—*Start the engine by hand. The battery should be recharged by running the car for a long period during daylight or from an independent electrical supply.*
2. Sparking plugs faulty, dirty or incorrect plug gaps—*Rectify or renew.*
3. Defective coil or distributor—*Remove the lead from the centre distributor terminal and hold it approximately* $\frac{1}{4}$*in. from some metal part of the engine while the engine is being turned over. If the sparks jump the gap regularly, the coil and distributor are functioning correctly. Renew a defective coil or distributor.*
4. A fault in the low tension wiring is indicated by no ammeter reading when the engine is turned slowly with the ignition on, or no spark occurs between the contacts when separated quickly with the fingers with the ignition on—*Examine all the ignition cables and check that the battery terminals are secure and not corroded.*
5. Dirty or pitted contacts—*Clean.*
6. Contact breaker out of adjustment—*Adjust.*
7. Controls not set correctly or trouble other than ignition—*See Instruction Manual "STARTING PROCEDURE".*

M—ENGINE MISFIRES—PETROL MODELS

1. See items (2), (5) and (6) under "Engine will not fire", and refer to Section A.

N—ENGINE FAILS TO START FROM COLD—DIESEL MODELS

1. Heater plug circuit broken—*See Operation* P/100.

P—IGNITION AND MIXTURE DEFECTS—PETROL MODELS—DEFECTIVE DISTRIBUTOR

1. Contact breaker gap incorrect or points burned and pitted—*Clean and adjust.*
2. Distributor cap cracked—*Renew.*
3. Condenser failure—*Renew.*
4. Weak or broken contact breaker spring—*Renew.*
5. Excessive wear in distributor shaft bushes, etc.—*Renew.*
6. Rotor arm pitted or burned—*Clean or renew.*

Q—MIXTURE CONTROL WARNING LIGHT FAILS TO APPEAR WHEN ENGINE REACHES RUNNING TEMPERATURE

1. Mixture control already pushed in—*In the hands of the operator.*
2. Broken connection in warning light circuit—*Rectify.*
3. Faulty thermostat switch (at cylinder head)—*Renew.*
4. Faulty manual switch (at mixture control)—*Renew. Section Q.*
5. Broken operating mechanism at manual switch—*Rectify.*

R—MIXTURE CONTROL WARNING LIGHT REMAINS ON WITH ENGINE AT RUNNING TEMPERATURE

1. Mixture control out—*Push control right in.*
2. Faulty manual switch—*Renew. Section Q.*
3. Broken operating mechanism at manual switch—*Rectify.*

DATA

Batteries

Petrol models	Single 12 volt, positive earth
Capacity	51 A.H.
Diesel models	Two 6 volt, series connected, positive earth
Capacity	120 A.H.

Starter motor

Petrol models	
Nominal voltage	12
Starting shaft end-float	Zero
Diesel models	
Nominal voltage	12
Starting shaft end-float	Zero
Lock torque	32.5 lb./ft. (4,50 mKg)
Torque at 1,000 r.p.m.	15 lb./ft. (2 mKg)

Starter motor drive

Petrol models	Spring-loaded pinion and sleeve
Diesel models	Multi-plate clutch
Slip load	800 to 950 lb./in. (142 to 169 Kg/cm)

Dynamo

Petrol models	
Maximum output	19 amps.
Diesel models	
Type	C45.PV5
Maximum output	22 amps
Late Diesel models	
Type	C45.PV6
Maximum output	25 amps

Control box

Petrol models	Compensated voltage control

Control box

Early Diesel models	Compensated current voltage control
Voltage regulator—open circuit setting 20°C (68°F) at 2,000 r.p.m.	14.2 to 14.8 volts
Current regulator—Contact opening amperage	19
Cut-in voltage	12.7 to 13.3 volts

Control box

Late Diesel models	Compensated voltage control
Voltage regulator—open circuit setting 20°C (68°F) at 2,050 r.p.m.	14.9 to 15.5 volts
Current regulator—Contact opening amperage	19
Cut-in voltage	12.7 to 13.3 volts
Drop-off voltage	9.5 to 11.0 volts

Distributor

Contact breaker gap	.014 to .016 in. (0,35 to 0,40 mm)
Distributor rotation	Clockwise, at drive end
Advance mechanism	Centrifugal/vacuum

Fuse	Protects the horn and windscreen wiper
Amperage	35

Heater plugs

Type	K.L.G. coil element—1.7 volts 36/40 amps.

Stop lamp switch

Type	Hydraulic

Mixture control thermostat switch

Contact made at	51-54°C (124-129°F)
Contact broken at	47-53°C (117-127°F)

Section Q
INSTRUMENTS AND CONTROLS — ALL MODELS

INDEX

LIST OF ILLUSTRATIONS

Instruments and switches

To remove **Operation Q/2**

1. Disconnect the battery.
   Diesel—disconnect the positive lead of R.H. battery.
2. Remove the panel from the dash.
3. Disconnect the speedometer drive cable.
4. Remove the panel light bulb and holder from the speedometer. If necessary, unscrew the bulb from its holder.
5. Remove the speedometer retaining bracket (this action will also release an earth wire) and withdraw the speedometer.
6. Disconnect the wiring from the panel light switch.
7. Unscrew the knob and securing nut from the switch and remove the panel light switch from the panel.
8. Disconnect the wires from the mixture or heater plug warning light.
9. Compress the retaining spring, remove the circlip and withdraw the mixture or heater plug warning light. If necessary, unscrew the bezel from the warning light bakelite holder and withdraw the bulb.
10. Disconnect the wires from the dynamo warning light.
11. Compress the retaining spring, remove the circlip and withdraw the dynamo warning light. If necessary, unscrew the bezel from the warning light bakelite holder and withdraw the bulb.
12. **Diesel**—disconnect the wires from the fuel level warning light, unscrew the lens from the front of instrument panel and withdraw the unit. The bulb may be removed if necessary by easing the smaller diameter of the lamp body from the larger section.
    Diesel—fuel level warning lamp bulb replacement can only be effected by removing the instrument panel.
13. Disconnect the wires from the ignition or auxiliary services and lamp switch.
14. Release the retaining clip and withdraw the ignition or auxiliary services and lamp switch complete.
15. Withdraw the headlamp main beam warning light bulb and holder from the multiple gauge unit. If necessary, unscrew the bulb from its holder.
16. Disconnect the wiring to the ammeter and fuel gauge and withdraw the multiple gauge illumination bulb and holder. If necessary, unscrew the bulb from its holder.
17. Remove the multiple gauge from the panel (this action will also release two earthing wires). The sections of the gauge can be removed separately.
18. Disconnect the wires from the two inspection lamp sockets and withdraw the sockets.
19. Disconnect the wires from the oil pressure warning light.
20. Compress the retaining spring, remove the circlip and withdraw the oil pressure warning light. If necessary, unscrew the bulb from its holder.

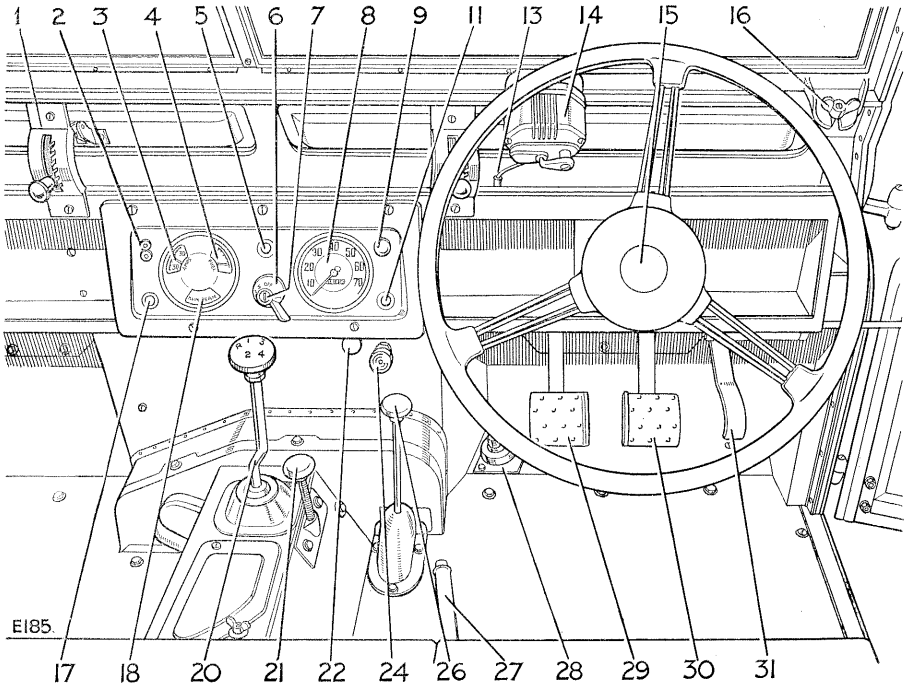


Fig. Q-1—Layout of instruments and controls—Petrol models

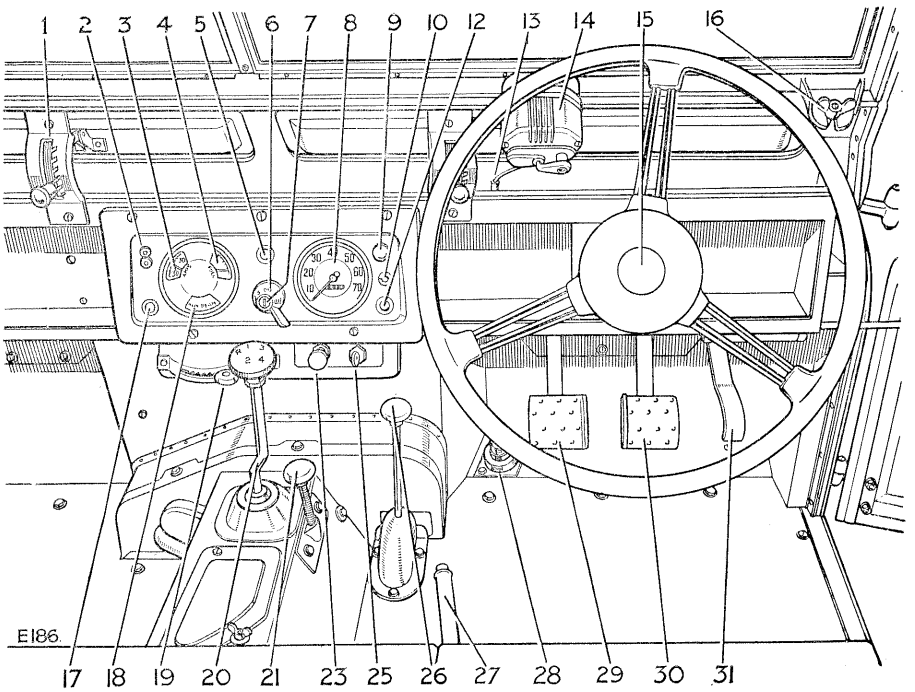


Fig. Q-2—Layout of instruments and controls, Diesel models

Key to instruments and controls

1 Windscreen ventilator
2 Lead lamp socket
3 Ammeter
4 Fuel level gauge
5 Oil pressure warning light
6 Lamp switch
7 Electrical services or ignition switch
8 Speedometer
9 Instrument panel light switch
10 Fuel tank warning light (Diesel)
11 Cold start control warning light (Petrol)
12 Heater plug warning light (Diesel)
13 Wiper lead plug
14 Windscreen wiper
15 Horn button
16 Wingnut securing windscreen
17 Charging warning light
18 Headlamp warning light
19 Engine hand speed control (Diesel)
20 Main gear change lever
21 Front wheel drive control
22 Cold start control (Petrol)
23 Engine stop control (Diesel)
24 Starter switch (Petrol)
25 Switch for starter and heater plugs (Diesel)
26 Transfer box lever
27 Hand brake
28 Headlamp dipper switch
29 Clutch pedal
30 Brake pedal
31 Accelerator pedal

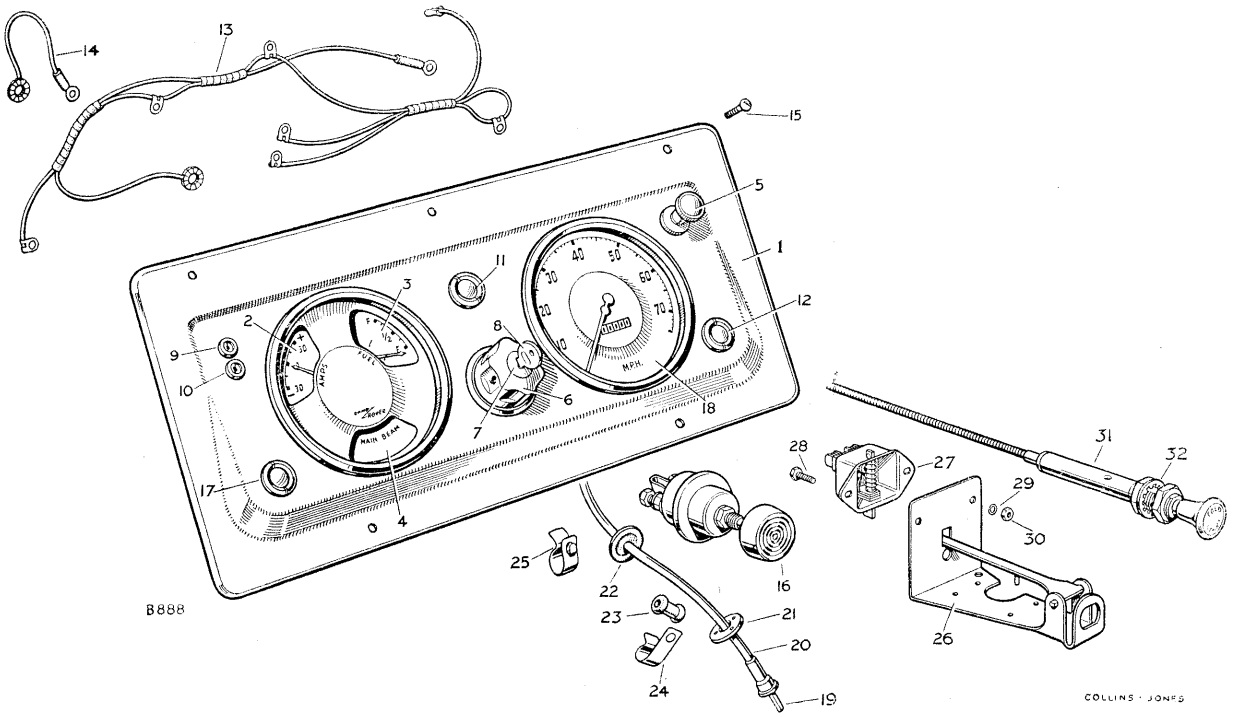


Fig. Q-3—Exploded view of instrument panel

1 Instrument panel
2 Ammeter
3 Fuel gauge
4 Warning light for headlamp beam
5 Switch for panel lights
6 Switch for lamps
7 Barrel lock for ignition or electrical services
8 Key for lock
9 Socket for inspection lamp, black
10 Socket for inspection lamp, red
11 Warning light, dynamo
12 Warning light, mixture or heater plugs
13 Panel harness
14 Lead, ammeter to inspection socket
15 Fixings for instrument panel
16 Starter switch—Petrol models
17 Warning light, oil
18 Speedometer
19 Cable, inner
20 Cable, outer
21 Retaining plate for cable
22 Rubber grommet, in dash } For speedo meter cable
23 Rubber grommet, on cable }
24 Clip } For speedometer cable
25 Clip }
26 Bracket for mixture control } Petrol models
27 Switch for mixture warning light
28–30 Fixings for switch
31 Mixture control complete
32 Shakeproof washer for control

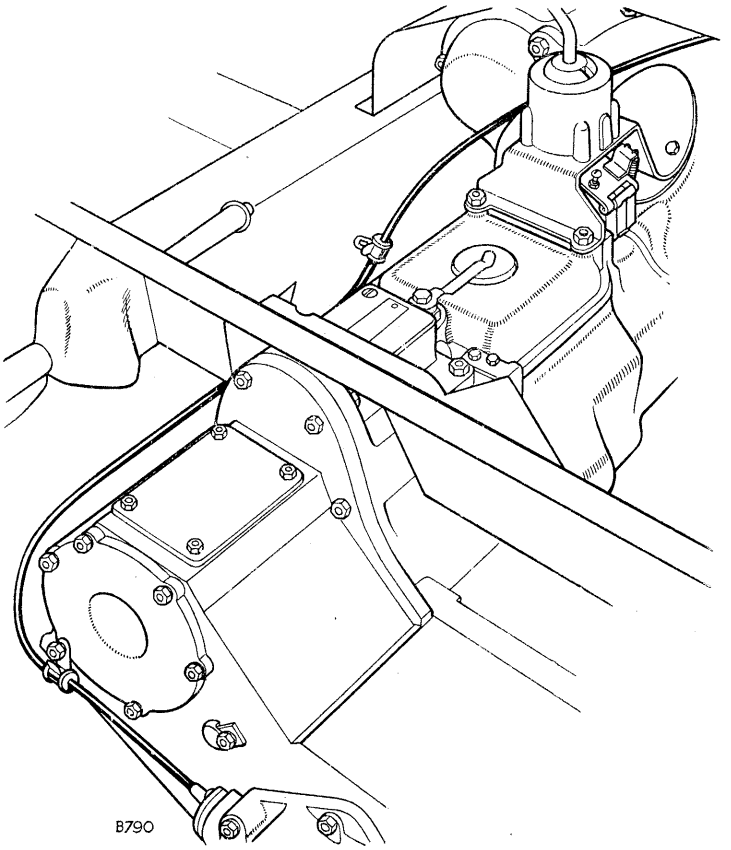


Fig. Q-4—Correct position of speedometer drive cable

To refit **Operation Q/4**

Reverse the removal procedure, connecting the wiring in accordance with the appropriate wiring diagram, Section P. Replacement bulbs are listed in Section P.

Note: Care should be taken when re-connecting the lamp switch wiring on North American vehicles, as it is so arranged that the sidelamps are extinguished when the headlamps are switched on.

Speedometer drive cable

To remove **Operation Q/6**

1. Disconnect the battery.

   Diesel—disconnect the positive lead of R.H. battery.

2. Withdraw the instrument panel clear of the dash.

3. Disconnect the speedometer drive from the speedometer head.

4. Free the cable by withdrawing the end from the dash and pushing the three rubber grommets from the securing clips on the flywheel housing, chassis side member and transfer casing.

5. Disconnect the speedometer cable at the gearbox end. (If necessary, remove the centre seat panel).

6. Withdraw the inner cable from the outer casing.

To replace **Operation Q/8**

1. Thoroughly clean the inner cable and smear suitable grease over its entire length.

2. Insert the cable in the outer casing.

3. Replace the speedometer drive by reversing the removal procedure, care being taken to avoid acute curves. The inner shaft end must be located in the square or slot of the speedometer pinion before the drive is secured to the housing.

4. If the clips holding the securing grommet have been moved, the drive should be correctly positioned before these clips are tightened.

Speedometer drive

To overhaul **Operation Q-9**

1. Remove the centre inspection panel from the seat box.

2. Drain the transfer box.

3. Disconnect the brake expander rod from the bell crank lever.
4. Disconnect the rear propeller shaft from the transfer box output shaft.
5. Remove the securing nut, withdraw the brake drum and rear drive output flange. Remove the brake drum from the flange, if necessary.
6. Disconnect the speedometer cable.
7. Remove the speedometer drive housing complete with brake assembly and shims, which should be preserved. If necessary, remove the front output shaft oil seal from the housing.
8. Remove the speedometer drive pinion unit. Withdraw the pinion from the sleeve. If necessary, remove the oil seal from the pinion sleeve. Remove rubber 'O' ring.
9. Withdraw the speedometer drive worm from the transfer box output shaft; this is a *sliding fit* on the shaft, and is clamped securely in position by the rear drive output flange nut.
10. If necessary, renew the oil seal in the speedometer drive pinion sleeve; the seal should be fitted with the knife edge inwards. Fit the pinion in the sleeve and fit the assembly to the drive housing, with the "flat" on the sleeve to the bottom. The pinion should be a *sliding fit* in the sleeve. Check that the drive functions correctly. Replace rubber 'O' ring.
11. Slide the speedometer drive worm over the transfer box output shaft with its conical end inwards and fit the dowel-located speedometer drive housing to the transfer casing, complete with shims and brake assembly.
12. Ensure that the drive flange abuts the speedometer drive worm and the securing nut fully tightened and split pinned.
13. Fit the transmission brake drum. Adjust the brake—Section H.

Accelerator controls

To remove—see Figs. Q-4-5 and 6. **Operation Q/10**

1. Remove the throttle return springs.
2. Detach the control rods from the shaft levers.
3. Loosen the clamping bolt, securing lever on accelerator pedal shaft, then withdraw the lever.
4. Remove the accelerator shaft and pedal stop housing.
5. Detach the pedal shaft support bracket from the toe-box and remove the shaft and pedal complete.

   On L.H.D. models, the accelerator pedal, pedal shaft and distance piece may be withdrawn without removing the support bracket.
6. Remove the cross-shaft, bracket(s) and distance washers.
7. If necessary, remove the two levers from the cross-shaft.

88—2¼ litre petrol only.

8. Remove the accelerator restrictor, if fitted.

   On late 88 2¼ litre petrol models an accelerator restrictor is fitted which allows the pedal to be pressed down for three-quarters of its travel with normal pressure, thereafter requiring greater pressure to obtain full throttle.

   This device gives a considerable improvement in fuel consumption, and may be fitted to early 88 2¼ litre petrol models if necessary.

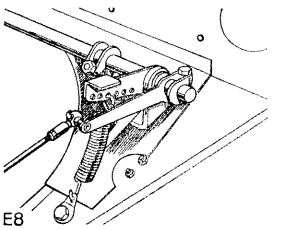


Fig. Q-5—Accelerator restrictor

To refit **Operation Q/12**

1. Reverse the removal procedure. If disturbed, adjust the lengths of the control rods as necessary.

Hand throttle control—Diesel models

To remove—see Fig. Q-7 **Operation Q/14**

1. Disconnect the control rod, quadrant to cross-shaft, at the quadrant ball joint, inside vehicle.
2. Remove the securing bolts, quadrant to scuttle.
3. Remove instrument panel and remove securing bolts, quadrant upper bracket to dash bottom centre panel.
4. Withdraw complete unit.

To refit **Operation Q/16**

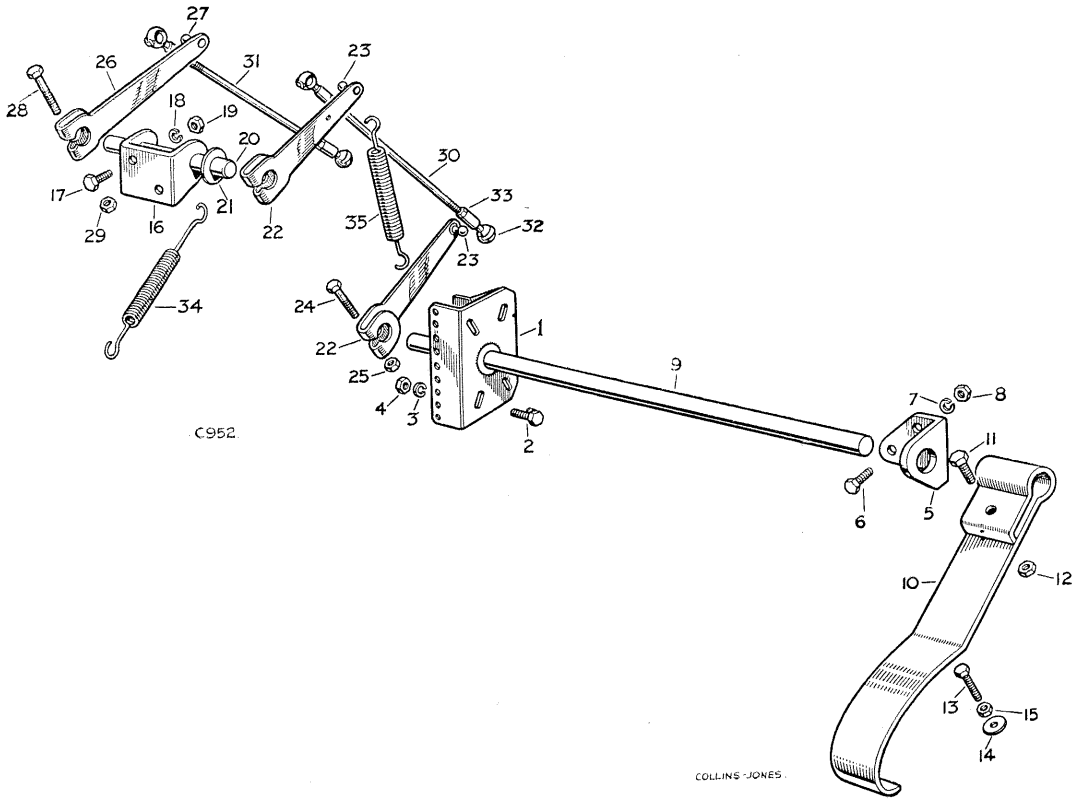
1. Reverse removal procedure.
2. Check for correct functioning and set the hand speed lever as necessary by adjusting the operational lengths of the control rod, quadrant to cross-shaft.

Mixture control—Petrol models

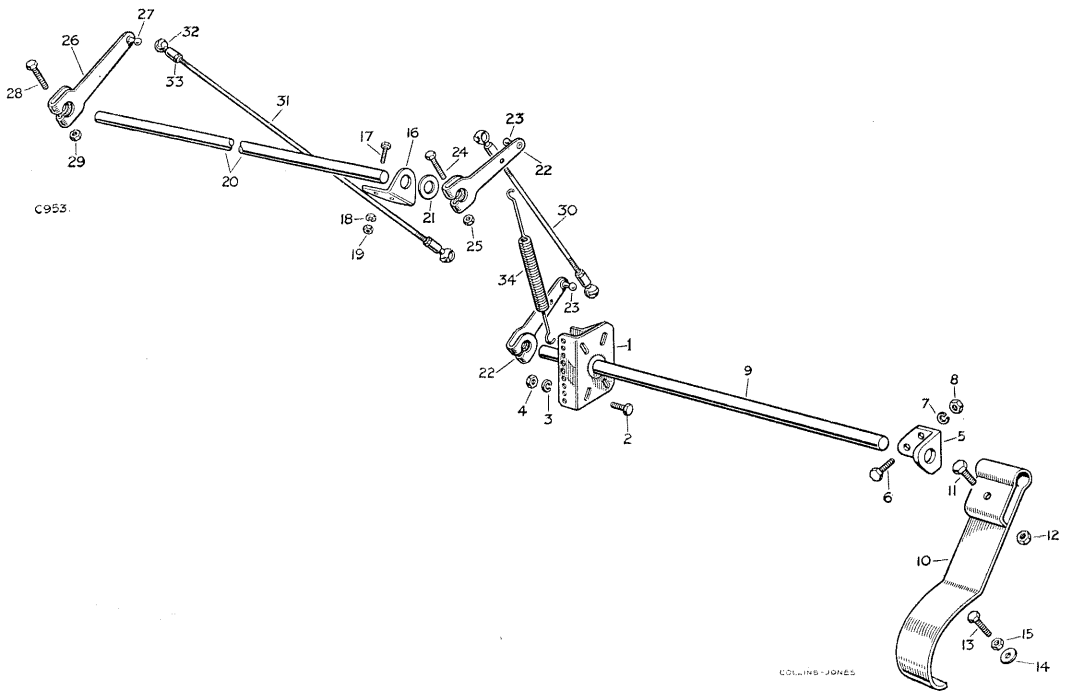
To remove **Operation Q/18**

A plunger switch is incorporated in the mixture control; it is wired in series with a bi-metal thermostat switch at the rear of the cylinder head and the amber warning light on the instrument panel.

1. Disconnect the battery.



2 litre Petrol



2¼ litre Petrol

Fig. Q-6—Accelerator controls—Petrol models

Key to Fig. Q-6

1 Accelerator shaft and pedal stop housing

2–4 Fixings—housing and pedal stop to dash

5 Accelerator pedal shaft bracket

6–8 Fixings—bracket to dash

9 Accelerator pedal shaft

10 Accelerator pedal

11–12 Fixings—pedal to shaft

13–15 Pedal stop, in floor

16 Accelerator cross shaft bracket

17–19 Fixings—bracket to dash

20 Accelerator cross shaft

21 Lever distance washer

22 Accelerator lever assembly

23 Lever ball end

24–25 Fixings—levers and stop clip to shaft—2 litre; levers to shaft—2¼ litre

26 Cross shaft lever assembly

27 Lever ball end

28–29 Fixings—lever to cross shaft

30 Control rod, pedal shaft to cross shaft

31 Control rod, cross shaft to engine

32 Ball joint socket for rods

33 Locknut for socket

34 Return spring for throttle—2 litre
Return spring for pedal—2¼ litre

35 Return spring for pedal—2 litre

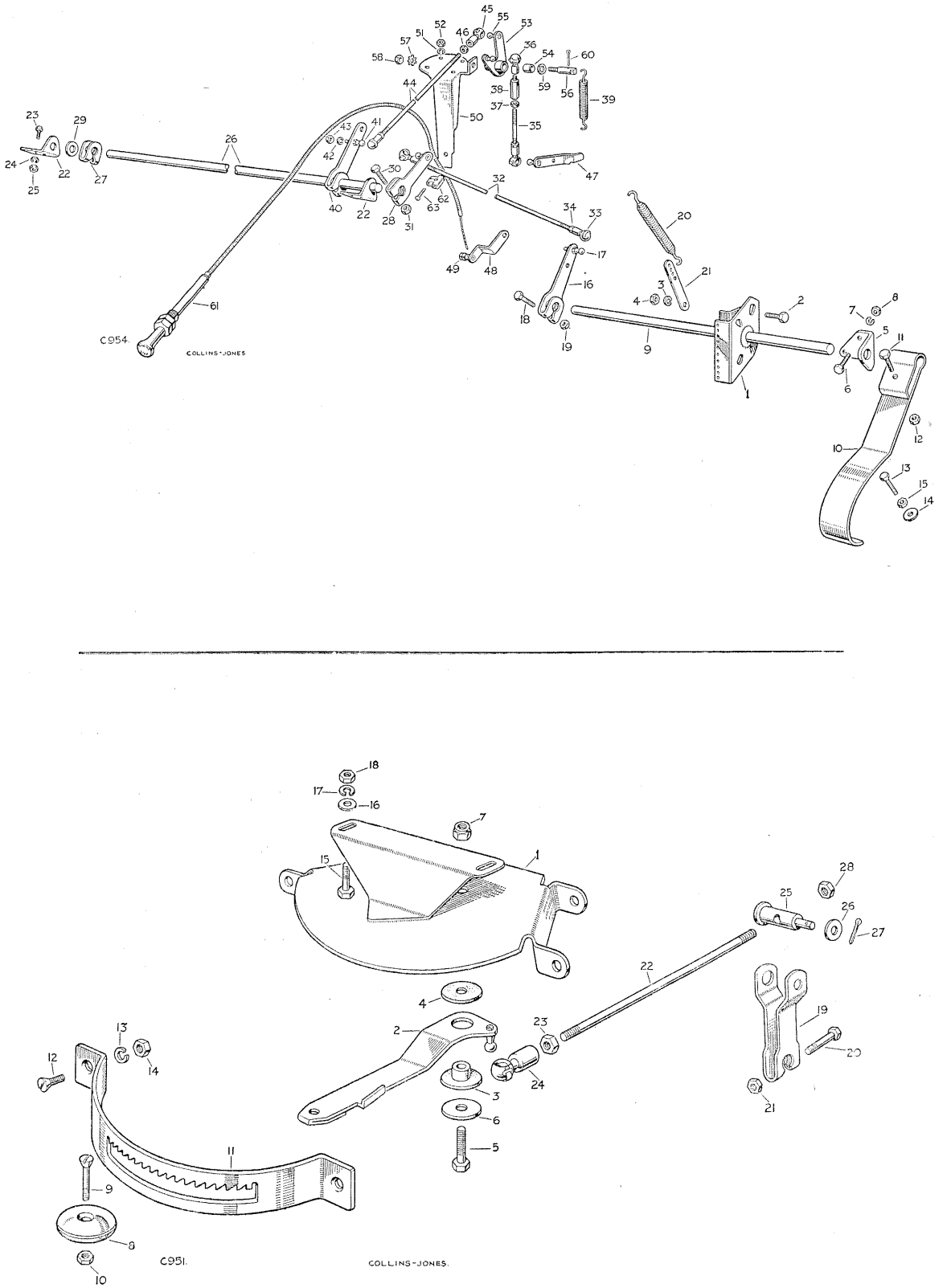


Fig. Q-7—Accelerator and hand speed controls—Diesel models

Key to Fig. Q-7

1 Accelerator shaft and pedal stop housing
2–4 Fixings—housing and pedal stop to dash
5 Accelerator pedal shaft bracket
6–8 Fixings—bracket to dash
9 Accelerator pedal shaft
10 Accelerator pedal
11–12 Fixings—pedal to shaft
13–15 Pedal stop, in floor
16 Accelerator lever assembly, pedal shaft
17 Lever ball end
18–19 Fixings—lever to shaft
20 Pedal return spring
21 Return spring anchor
22 Accelerator cross shaft bracket
23–25 Fixings—bracket to dash
26 Accelerator cross shaft
27 Cross shaft stop clip
28 Accelerator lever assembly, cross shaft
29 Cross shaft distance washer
30–31 Fixings—levers and stop clip to cross shaft
32 Control rod, pedal shaft to cross shaft
33–34 Ball joint socket and locknut—for rod
35 Control rod, bell crank to accelerator lever
36–38 Ball socket, nut and adjusting nut—bell crank control rod
39 Distributor levers return spring
40 Lever cross shaft to engine
41–43 Fixings—ball end to accelerator lever
44 Control rod, cross shaft to bell crank
45–46 Ball joint and locknut for control rod
47 Distributor pump accelerator control lever
48 Distributor stop lever
49 Stop lever swivel clamp
50 Distributor pump bell crank bracket
51–52 Fixings—bracket to distributor pump
53 Distributor pump bell crank
54 Bell crank bush
55 Bell crank ball end
56 Bell crank pin
57–58 Fixings—pin to bell crank bracket
59–60 Fixings—bell crank lever to pin
61 "Engine stop" control
62–63 Fixings—control outer cable to pump abutment bracket

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1 Housing for governor control quadrant
2 Control lever and ball end
3 Lever bush
4 Lever washer
5–7 Fixings—control lever to housing
8 Lever knob
9–10 Fixings—knob to lever
11 Quadrant plate
12–14 Fixings—quadrant plate to housing
15–18 Fixings—control to dash
19 Hand engine speed control operating lever
20–21 Fixings—operating lever to accelerator cross shaft
22 Control rod for engine speed control
23 Nut } For
24 Ball socket } control rod
25–27 Fixings—engine speed control rod
28 Nut—fixing control rod to joint pin

2. Disconnect the wiring from the mixture control warning light switch.
3. Disconnect the operating wire from the lever at the carburetter.
4. Withdraw the inner wire and knob from the driver's side of the dash. See Fig. Q-2.
5. Loosen the screw holding the outer cable at the carburetter.
6. Remove the cold start control outer cable, bracket and switch from the dash by removing the securing nut on the driver's side of the dash.
7. If necessary, remove the warning light switch from the bracket.
8. If necessary, remove the control outer cable from the bracket by unscrewing the cable through the securing locknut.

To refit **Operation Q/20**

Reverse the removal procedure, taking care that the carburetter cold start lever is fully closed when the control knob is pushed right in, and that, on 2 litre models, the three positions of the control knob are definite. 2¼ litre models have a progressive cold start action.

Note: For further details of the mixture control warning light system, see Section P.

Cut-off control—Diesel models

To remove **Operation Q/22**

1. Disconnect the control cable from the injection pump cut-off lever and outer cable support.
2. Unscrew the securing nut from the engine side of scuttle and withdraw the cut-off control cable complete.

To refit **Operation Q/24**

1. Secure the control to the scuttle and the outer cable to the clamping clip on injection pump; locate the inner cable in the cut-off lever clamping screw, then, pressing the lever firmly downward, tighten the clamping screw.

DEFECT LOCATION

(Symptom, Cause and Remedy)

A—SPEEDOMETER NEEDLE ERRATIC

1. Rear drive output flange and speedometer drive securing nut loose—*See Operation* Q-9.
2. Speedometer cable damaged or position of cable incorrect —*See Operation* Q-8.
3. Faulty speedometer head—*Renew*.

Section R
BODY — ALL MODELS

INDEX

LIST OF ILLUSTRATIONS

General body repairs

With the exception of the dash panel, which is steel, the body panels are constructed throughout from Birmabright, with steel cappings and corner brackets; all steel parts are galvanised.

Riveting

Three types of rivet are used on the body:—

1. Aluminium pop or "blind" rivets are used only on box sections or where it is difficult or impossible to use any other type because of limited working

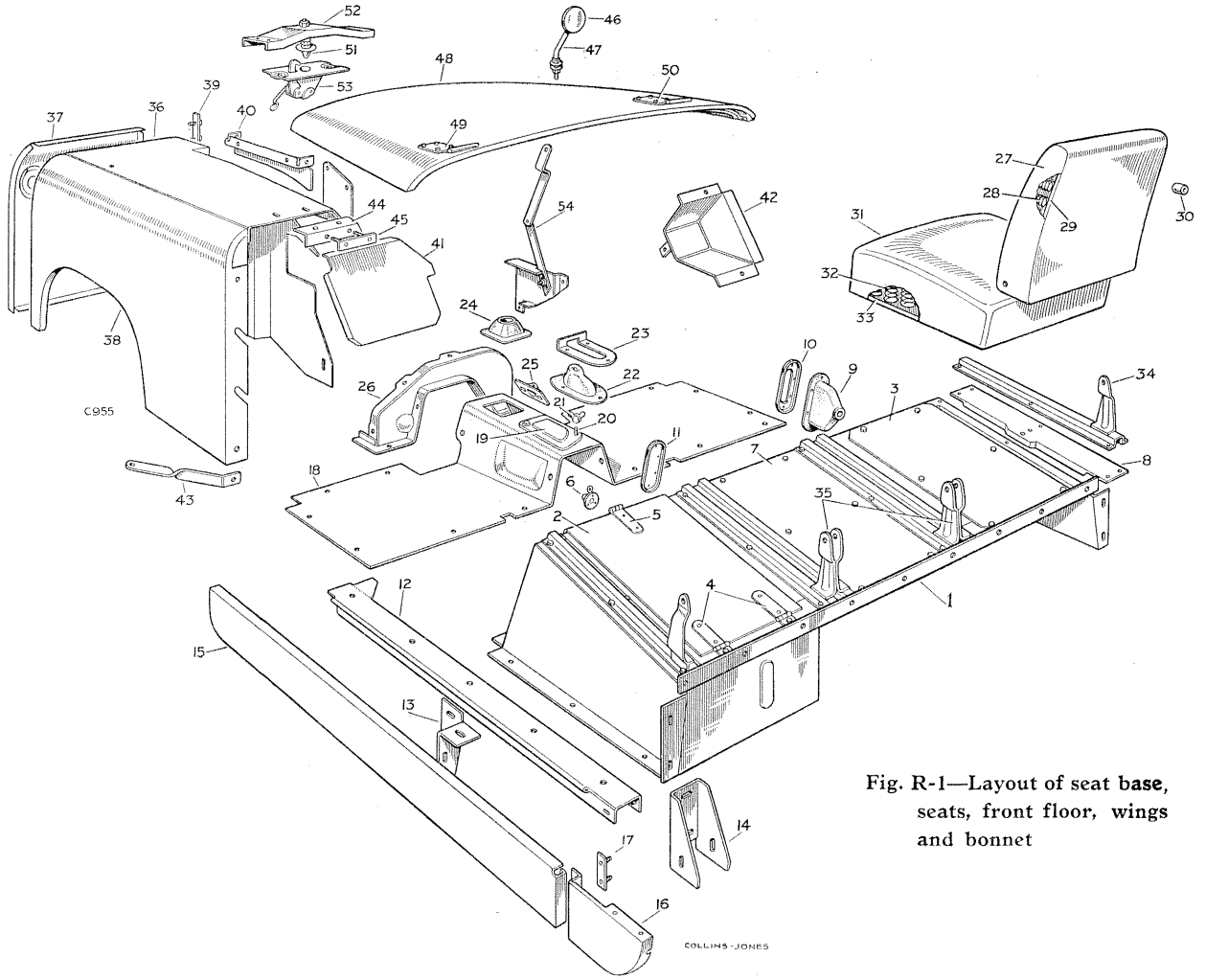

Fig. R-1—Layout of seat base, seats, front floor, wings and bonnet

1 Seat base and floor assembly
2 Tool locker lid
3 Fuel tank cover panel
4 Lid hinge
5 Locker lid hasp
6 Locker lid turnbuckle
7 Centre cover panel
8 Extension panel, at seat base ends
9 Handbrake rubber cover
10 Retainer for rubber cover
11 Handbrake slot cover plate
12 Sill channel L.H. front
13 Sill channel securing bracket
14 Sill channel mounting bracket, to rear body
15 Front sill panel
16 Rear sill panel
17 Fixing plate for sill panels
18 Front floor complete
19 Inspection cover, for front floor
20 Stud plate for inspection cover wing nut
21 Wing nut, fixing inspection cover
22 Transfer gear lever seal
23 Transfer lever seal retainer
24 Gear lever rubber seal
25 Operating rod cover plate
26 Gearbox cover complete
27 Seat squab
28 Squab spring case
29 Squab frame
30 Buffer, for seat back rest on bracket
31 Seat cushion
32 Cushion spring case
33 Cushion frame
34 Cushion support, outer
35 Seat support, centre
36 Front wing
37 Front panel and registration plate
38 Front wing outer panel
39 Fixing plate, wings to grille panel
40 Wing valance bottom panel
41 Mudshield, front wing
42 Steering unit cover box
43 Front wing stay
44 Bracket, for rear of wing
45 Fixing plate—brackets to dash
46 Mirror
47 Arm for mirror
48 Bonnet top panel
49–50 Bonnet hinges
51 Bonnet catch striker pin
52 Bonnet striker bracket
53 Bonnet control
54 Bonnet prop rod

space; these rivets are "snapped-up" from one side only. The setting is controlled by the breaking of a headed steel mandrel which passes through the tubular rivet; the mandrel break occurs only when the thicknesses being riveted have been pulled together tightly and the rivet head on the blind side fully formed. The mandrels are either of the break stem or break head type, the latter being used in positions where the mandrel head is free to fall away after the rivet head is set. Where it is required to retain the broken-off portion of the mandrel within the headed-up part of the rivet, as for example in box sections (where a loose mandrel head would rattle) or for sealing the rivet with filler or stopper, the break stem type is used. Either a mechanical or pneumatic hand tool can be used for fixing pop rivets.

2. Bifurcated or "split" rivets are used for securing rubber and canvas together or to metal. The rivet is passed through the materials to be joined, a boss cap is placed over the tongues of the rivet, and these tongues then spread with a suitable drift.
3. Various sizes and lengths of round head rivets are used, and for these a suitably indented dolly is needed for the rivet head, while the tail of the rivet is peened over with a hammer, operated manually, electrically, or by compressed air.

Paint touching-up process for body panels

Body panels are finished in stoving synthetic enamel and a special technique, detailed below, must be followed when touching up the paint finish after repair work.

Preparatory work

Thoroughly clean the damaged portion; all traces of wax polish, etc., should be removed with a suitable solvent such as White Spirit.

The surrounding edges of the paint film must be correctly feather edged, using a wooden block and suitable paper.

Colour

(*a*) Small damaged areas—
Prepare the correct colour finish by thinning to 40 parts finish to 60 parts thinner by volume.
Apply a built-up coat by spray and allow to air dry for four to six hours.

(*b*) Large damaged areas (complete wings or panels)–
Prepare the correct colour finish by thinning 50/50 with thinner.
Apply one or two full spray coats; allow 15 to 30 minutes between coats and four to six hours (or preferably overnight) after the final application.

Half-hour air drying colour finish and thinners are obtainable from our Spares Department.

Polishing

After the recommended drying period, lightly polish with any good smooth polishing compound and finally clear, if necessary, with any good quality wax polish.

Notes

1. When spraying in small areas and in order to minimise dry spray, it is recommended that the air pressure for spraying be reduced to 30-40 lb/sq.in. (2,1-2,8 kg/cm^2).
2. When touching up stoved synthetic finishes, no advantage is to be gained by mist-coating the patch. Instead, the edges of the patch should be faded out during application and any resultant dry spray removed during polishing with any good polishing compound.
3. It is not always easy to blend a patch or touch-up; to do so successfully and lose the edges requires practice by a skilled operator. In cases where the damage is on a conspicuous part of the vehicle, it is recommended that the operator sprays out the entire damaged part, e.g., door panel, wing, etc.
4. In certain instances, the materials listed are available locally. We can furnish additional information in this respect on demand, providing the serial numbers of vehicles concerned are quoted.

Bonnet

To remove **Operation R/2**

1. If fitted, remove spare wheel and lift bonnet.
2. Remove the split pin and washer and disconnect the bonnet prop rod.
3. Lift the bonnet to its highest position and slide out from hinges.
4. As necessary, remove the bonnet strike pin and bracket by removing the securing bolts and washers; remove the pin from the bracket; remove the hinges by removing the bolts, washers and nuts; if fitted, remove the spare wheel carrier, Section T.

To refit **Operation R/4**

Reverse the removal procedure.

Radiator grille panel

To remove **Operation R/6**

1. Disconnect the battery.
Diesel—disconnect the lead coupling both batteries.
2. Disconnect the side lamp leads at snap connectors at each side of the grille panel assembly and the front lamp harness from the junction box at R.H. side of scuttle, then pull the wiring clear to front of engine.
3. Remove the grille and name-plate; if fitted, remove the chaff guard.
4. Remove the securing bolts and lift the front apron clear.
5. Remove the bolts securing the grille panel to the front cross member.
6. Remove the bolts securing the grille panel to the wings and radiator block.

7. Lift off the grille panel complete with headlamps and wiring.
8. If necessary, remove the headlamp and harness, Section P; remove the bonnet control by removing the securing set bolts and spring washers.

To refit **Operation R/8**

1. Reverse the removal procedure, connecting the wiring in accordance with the wiring diagram.

Front wings

To remove **Operation R/10**

1. Remove the bonnet. Operation R/2.
2. Disconnect the side lamp harness at the snap connectors in the engine compartment.
3. Remove the securing bolts and lift the mudshield (see Fig. R-1) out from under the wing. Driver's side: remove the steering box mudshield.

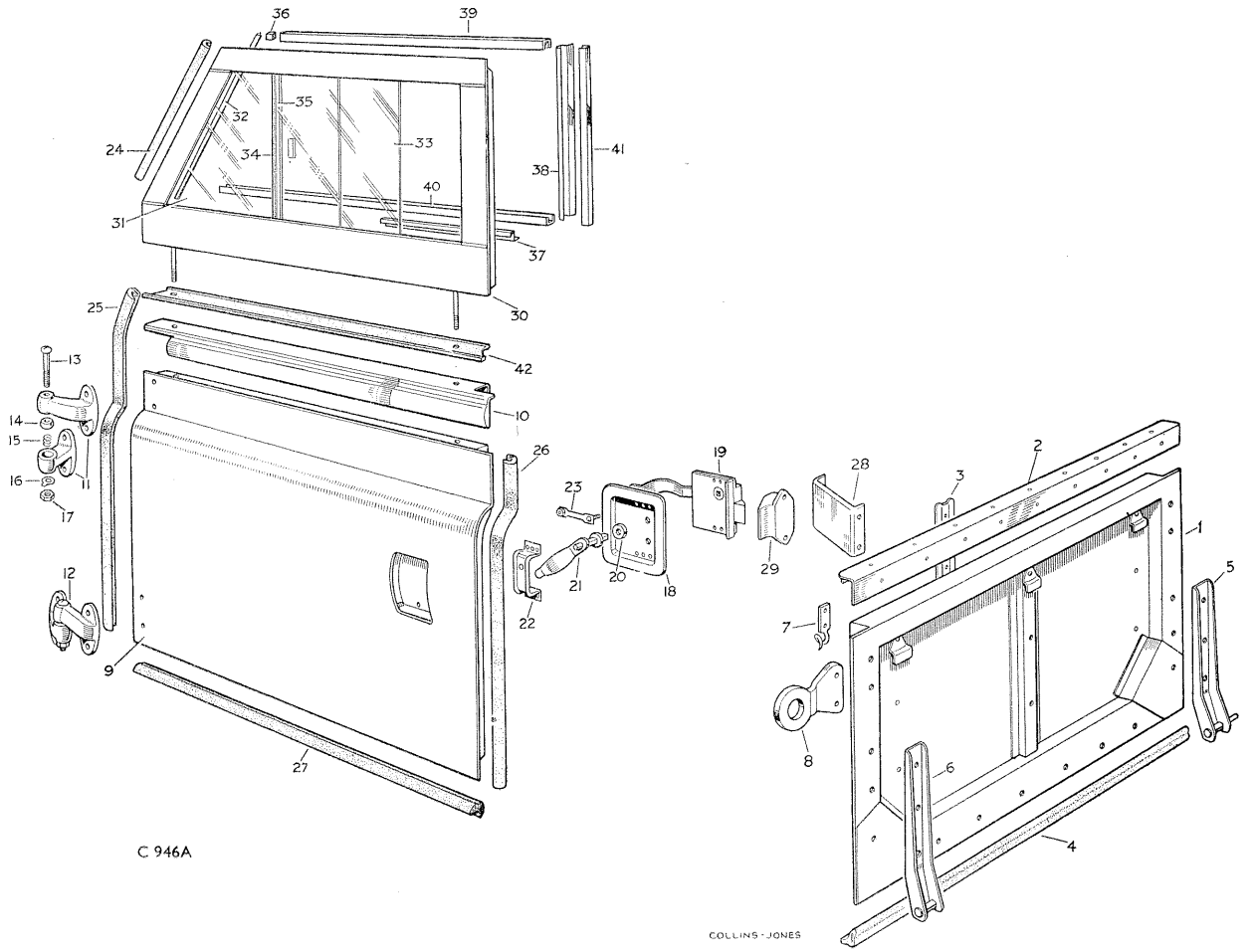

Fig. R-2—Layout of tailboard, doors and side screens

1 Tailboard assembly
2 Tailboard top capping
3 Tailboard tread plate
4 Tailboard sealing rubber, bottom
5 Tailboard hinge, R.H.
6 Tailboard hinge, L.H.
7 Tailboard chain hook
8 Tailboard locking plate
9 Front door assembly
10 Door top capping
11 Hinge complete, upper
12 Hinge complete, lower
13–17 Fixings for door hinge
18 Door lock mounting plate
19 Door lock
20 Washer, handle to cover
21 Handle
22 Door handle bracket
23 Captive plate, door lock mounting to door
24 Seal for door, front upper
25 Seal for door, front lower, dash
26 Seal for door, rear lower
27 Seal for door, bottom, sill
28 Support bracket at door striker
29 Door lock striking plate
30 Side screen assembly
31 Front fixed window
32 Window retainer
33 Rear sliding window
34 Sealing rubber for front edge of sliding window
35 Sealing rubber channel
36 Buffer for sliding window, at top
37–38 Filler strip for windows
39 Top channel
40 Bottom channel
41 Rear channel
42 Sidescreen sealing strip

4. Using a box spanner, remove the bolts securing the wing to the scuttle pillar.
5. Remove the bolts securing the wing stay and the wing to the sill panel.
6. Remove the bolts securing the wing to the rear wing upper mounting bracket.
7. Remove the bolt securing the wing to the steering column support plate.
8. Remove the bolts securing the wing to the grille panel (on R.H. wings, this action also releases the bonnet prop bracket).

To refit **Operation R/12**

1. Reverse the removal procedure.

Sidescreen windows

Sliding window

To renew **Operation R/14**

1. Move the sliding window to allow access to the screws securing glass run channel—top and bottom—then remove the screws from inside channel.
2. Withdraw the top run channel and sliding window.
3. Renew the bottom run channel if necessary.
4. Fit new parts as necessary and assemble by reversing the removal procedure.

Fixed window

To renew **Operation R/16**

1. See Operation R/14, items 1-3 inclusive.
2. Remove the screws securing front retainer and ease the fixed glass clear of frame.
3. Apply new Prestik sealing strip to window frame, renewing parts as necessary and assemble by reversing the removal procedure.

   Two-piece door only—if necessary, the complete assembly can be removed by removing the nuts, plain washers and spring washers securing the assembly to the door.

Front door

(Two-piece and full length)

To remove **Operation R/18**

1. Remove the bolts, washers and nuts securing the hinges to the door.
2. Remove the door.

To refit **Operation R/20**

1. Reverse the removal procedure, renewing sealing rubbers as necessary.

Hinge

To remove **Operation R/22**

1. The hinges may be stripped by prising back the lock washer tab and removing the special nut and bolt. Care must be taken to ensure that the cone and spring are not lost.

To refit **Operation R/24**

1. Fit a new lock washer and assemble by reversing the removal procedure.

   Adjust by increasing or lessening the load on the spring by tightening or slackening the special nut, and bend lock tab over to secure assembly.

Door lock

To renew **Operation R/26**

1. Remove the door lock from the door.
2. If required, remove the striking plate from its support bracket.
3. Renew the lock and plate as necessary and refit by reversing Items 1 and 2.
4. Adjust the position of the striking plate as necessary, so that the door draught excluders are slightly compressed.

Front floor

To remove **Operation R/28**

1. Remove the transfer lever knob and dust excluder.
2. Remove the four wheel drive lever knob, spring and ferrule.
3. Remove the floor board securing bolts and lift off the front floor complete.
4. If necessary, remove the gearbox cover from the dash panel.

To refit **Operation R/30**

1. Reverse the removal procedure.
2. Adjust the four wheel drive lever. Section C.

Windscreen

To remove **Operation R/32**

1. Remove the doors and sidescreens complete. Operation R/18.
2. Remove the hard top or cab, Operation R/60 or R/48; if a soft hood is fitted, release the front straps from the support stays at the top of the windscreen and disconnect the top drain channels from the windscreens.
3. Remove the windscreen wiper positive lead plug from the socket on the dash panel.
4. Slacken the wing nuts at the bottom corners of the windscreen.
5. Remove the windscreen pivot bolts and remove the windscreen complete.

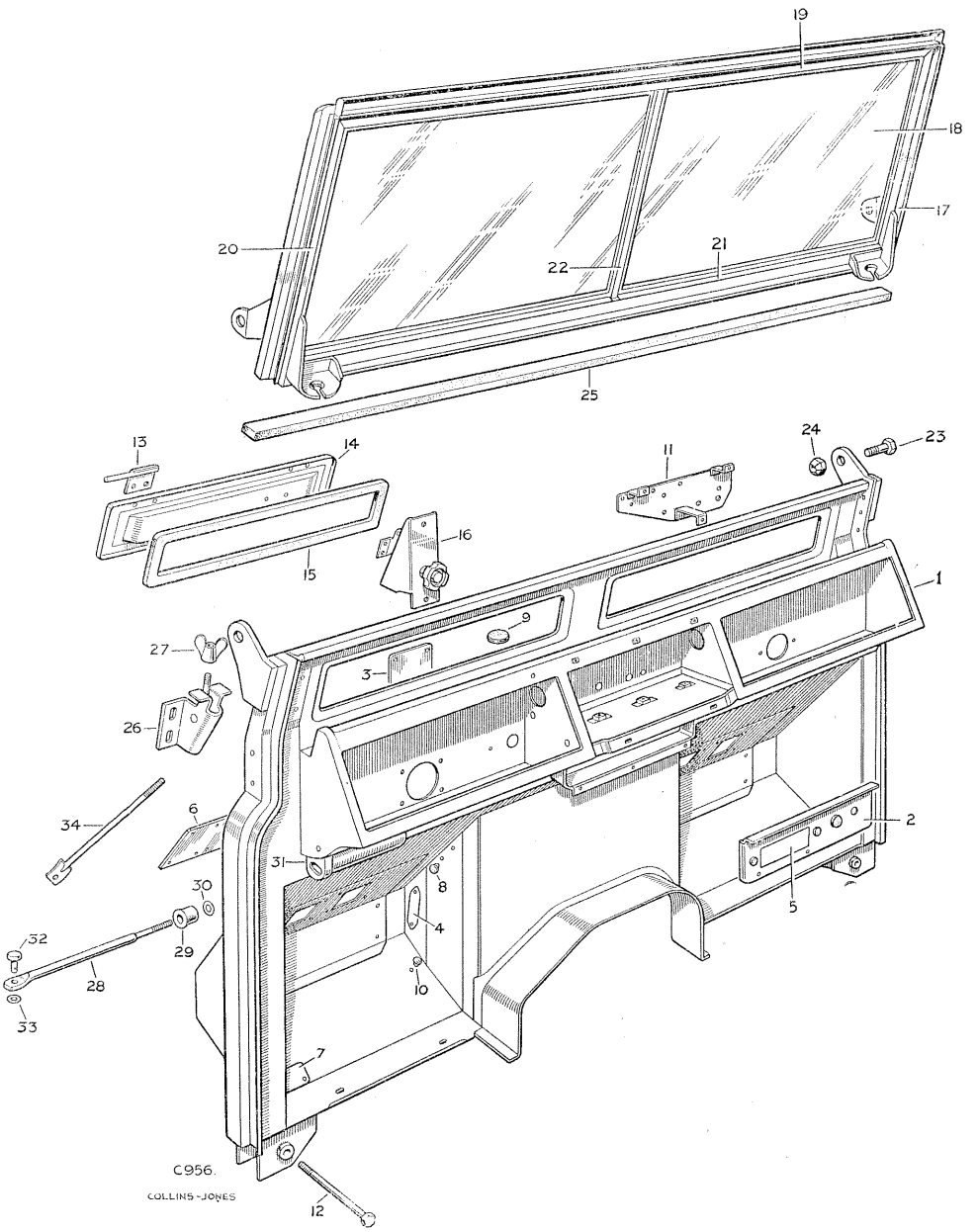

Fig. R-3—Layout of dash panel, windscreen and ventilators

1 Dash complete
2 Panel for controls
3 Cover panel for steering cut-out
4 Cover plate for accelerator pedal hole
5 Cover panel for governor cut-out in dash—Petrol models
6 Cover plate for pedal holes
7 Cover plate for dipswitch hole
8 Rubber plug, redundant accelerator holes
9 Rubber grommet for demister holes
10 Rubber plug, redundant accelerator stop holes
11 Mounting plate for pump
12 Tie bolt
13 Ventilator hinge
14 Ventilator lid for dash
15 Sealing rubber for ventilator lids
16 Ventilator control mechanism complete
17 Windscreen complete assembly
18 Glass for windscreen
19 Retainer for windscreen glass, top
20 Retainer for windscreen glass, side
21 Retainer for windscreen glass, bottom
22 Cover for centre strip
23–24 Fixings for windscreen to dash
25 Rubber sealing strip for windscreen
26 Fastener for windscreen, R.H.
27 Wing nut for fastener
28 Check strap rod
29 Check strap buffer
30 Fixings—buffer to rod
31 Check strap mounting bracket
32–33 Fixings—check strap rod to front door
34 Tie rod

To refit **Operation R/34**

1. Reverse the removal procedure, renewing the windscreen sealing strip if necessary.

Windscreen glass

To renew **Operation R/36**

1. If necessary, remove the windscreen wiper blade; disconnect the wiper motor earth wire and remove the wiper motor from the windscreen.
2. Withdraw the drive screws securing the retainers round the glass and prise away the retainers; remove the glass or glasses as necessary. Apply "Prestik" strip $\frac{1}{2}$ in. (12 mm) wide, round the outside on both faces of the new glass and fit the glass by reversing the stripping procedure.

Ventilator lid

To remove **Operation R/38**

1. Remove the securing screws and remove one of the ventilator hinges.
2. Remove the securing bolts and disconnect the ventilator panel from the operating control.
3. Withdraw the ventilator. The same procedure applies to either ventilator.
4. If necessary, remove remaining hinges.
5. If necessary, remove the ventilator control.

To refit **Operation R/40**

1. Reverse the removal procedure, renewing sealing rubbers as necessary.

Dash panel

To remove **Operation R/42**

1. Remove the front floor, gearbox cover, doors, windscreen, bonnet and wings, Operations R/28, R/18, R/32, R/2 and R/10.
2. Disconnect the battery.
   Diesel models—disconnect the lead coupling both batteries.
3. **Petrol models**—disconnect the starter motor lead from the terminal on the switch.
   Diesel models—disconnect the starter/heater plug switch leads from the switch.
4. **Petrol models**—disconnect the high tension wire and the distributor wire from the coil.
5. Disconnect the oil warning light wire from the oil pressure switch.
6. **Petrol models**—disconnect the mixture warning light wire from the switch on the cylinder head.
7. Remove the pipe complete, three-way piece, on dash panel to five-way piece on chassis frame.
8. Disconnect the clutch jump hose at the bracket on dash.
9. **2 litre Petrol**—disconnect the petrol pipe (pump to carburetter) at the pump. Disconnect the petrol pipe (tank to sediment bowl) at the bowl.
10. Disconnect the accelerator linkage by disconnecting the control rod, at the carburetter or injection pump.
11. **2 litre Petrol**—if fitted, disconnect the engine governor operating rod at the quadrant.
12. **Diesel models, or if fitted, $2\frac{1}{4}$ litre Petrol**—disconnect the engine hand speed control rod at the cross-shaft by removing the retaining nut and locknut.
13. If fitted, disconnect the heater water pipe hoses, disconnect the leads and remove the heater unit complete.
14. Disconnect the dynamo leads.
15. **2 litre Petrol**—if fitted, disconnect the hand throttle wire from the bracket on the cylinder head and the hand throttle lever.
16. Disconnect the speedometer drive from the transfer box; release the cable from the clips on the transfer box, the chassis and the flywheel housing.
17. **R.H.D. models**—remove the drop arm from the steering rocker shaft, using extractor, Part No. 262776.
18. Disconnect the headlamp and horn wires at the junction box on the dash.
19. Part the frame and dash section of the main harness at the snap connectors.
20. **Diesel L.H.D.**—disconnect the additional filter pipes at the filter.
21. Remove the bolt securing the steering box support bracket to the chassis; remove the two tie bolts, plain washer and nuts fixing the dash to the chassis; remove the nuts and bolts securing the extremities of the sill panels to the dash. Lift off the dash panel complete.
    L.H.D. models: remove the steering column and box complete, Operation G/2, Section G.

To renew **Operation R/44**

1. Remove the dash panel. Operation R/42.
2. Lift off the junction box and disconnect the wiring; remove the junction box from the dash.
3. Remove the clutch and brake pedal assemblies, master cylinders, pipes, return springs, fluid reservoir and three-way piece. Sections B and H.

   R.H.D. models
4. Disconnect the clamp securing the horn button bracket to the steering outer column, then remove assembly complete with leads.

5. Unscrew the clamp bolt and withdraw the steering wheel.
6. Remove the steering column clip and rubber strip; remove the steering column support bracket; remove the steering column rubber seal.
7. Remove the bolts and nuts securing the steering column to its support bracket and withdraw it from the dash.
8. **All models**—remove the steering column support brackets and tie rod from the dash.
9. **2 litre Petrol**—disconnect and remove the petrol pipe (pump to sediment bowl).
   Disconnect the wiring from the petrol pump, voltage control box and the fuse box; remove the mounting plate complete with pump, voltage control box and the fuse box.
10. **2¼ litre Petrol—Diesel models.** Disconnect the wiring from the control box and the fuse box; remove the mounting plate complete with control box and fuse box.
11. **Petrol models**—disconnect the wiring from the mixture control warning light switch and remove the bracket, switch and mixture control. Section Q.
12. **Diesel models**—disconnect the wires and remove the heater plug resistance.
13. **2 litre Petrol**—if fitted, remove the hand throttle control; if fitted, remove the engine governor control quadrant assembly.
14. **Diesel models**—remove the engine hand speed control. Section Q.
15. **Petrol models**—disconnect the wiring from the coil and remove the coil from the dash; after disconnecting the cables from the starter switch, screw off the starter knob and locknut. Withdraw the switch from the dash.
16. **Diesel models**—disconnect the leads and remove the starter/heater plug switch by removing the large securing nut from facia side of panel.
17. Remove accelerator linkage, Section Q; detach the clutch jump hose bracket from the dash.
18. **R.H.D. models**—detach the pedal shaft bracket from the dash panel complete with shafts and pedals.
    L.H.D. models—withdraw the pedal shafts complete with pedals and distance pieces.
19. **Diesel L.H.D.**—remove the additional filter from the dash panel.
20. Disconnect the speedometer drive from the speedometer head and withdraw it from the dash; disconnect all the wiring from the instruments and controls on the instrument panel, Section Q, and remove the main harness.
21. Remove the dip switch, complete with leads.
22. Remove the windscreen sealing strip. Remove the windscreen fastener catches from the dash panel.
23. Remove the transfer lever instruction plates; remove the rocker shaft access plate.
24. Remove the governor cut-out panel and the pedal hole covers.
25. Remove the ventilators and operating controls. Operation R/38.
26. Remove the harness clip.
27. Remove all remaining rubber grommets and plugs; remove the steering column blanking plate and refit it on the new dash panel.
28. Transfer all the dash fittings to the new panel by reversing the removal procedure, referring to appropriate sections and connecting the wiring in accordance with the appropriate wiring diagram. Section P.

To refit **Operation R/46**

1. Reverse the removal procedure.
2. Connect the wiring in accordance with the appropriate wiring diagram.
3. Adjust the accelerator, mixture or cut-off control and throttle linkage by reference to appropriate sections.
4. Set the road wheels straight ahead and the steering wheel in the midway position between full lock in each direction before securing the drop arm to the steering box rocker shaft.
5. Bleed the clutch and brake systems. Sections B and H.

Seat base

To remove **Operation R/48**

1. Lift out the seat cushions, withdraw securing bolts and remove the seat squabs.
2. Remove front floor. Operation R/28.
3. Remove the bolts securing the seat base to the back rest and to the sill panels.
4. Lift off the seat base, manoeuvring the hand lever grip carefully through the rubber draught excluder in the front of the seat base.
5. As necessary: remove the set bolts and lift off the locker lid and hinges; remove the set bolts and lift off the fuel tank cover, the centre cover panel and the extension panels; shear the rivets and remove locker lid hasp and remove the turnbuckle by removing the securing nuts and screws.

Note that an adjustment for driver's seat cushion inclination on 88 models can be provided, as follows:

1. Cut two triangular corner plates, using 16 s.w.g. (1,6 mm) steel, as illustrated.
2. Drill four .204 in. (5 mm) diameter holes (drill No. 6) and one 21/64 in. (8,5 mm) diameter hole as shown at Fig. R-4.

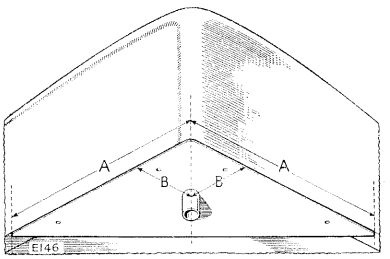

Fig. R-4—Fitting corner plate to bottom front corners of seat cushion

A—5 in. (127 mm) B—1½ in. (38 mm)

3. Insert a clevis pin or bolt $\frac{5}{16}$ in. x $\frac{11}{16}$ in. (8 mm x 17 mm) in the centre hole and weld it in position.
4. Using the plate as a template, drill four .204 in. dia. (5 mm) holes (drill No. 6) in the seat cushion frame at both front corners.
5. Fix one plate to each front corner of the cushion and secure with pop rivets or drive screws.
6. Obtain a suitable block of black rubber and drill three holes $\frac{9}{32}$ in. (7,0 mm) diameter and $\frac{3}{4}$ in. (19 mm) deep as shown.

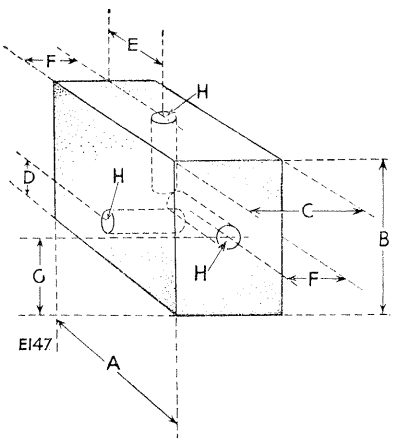

Fig. R-5—Drilling rubber block

A—$2\frac{1}{8}$ in. (54 mm)	E—$1\frac{1}{16}$ in. (27 mm)
B—$1\frac{5}{8}$ in. (41 mm)	F—$\frac{9}{16}$ in. (14 mm)
C—$1\frac{1}{8}$ in. (28,5 mm)	G—$\frac{13}{16}$ in. (21 mm)
D—$\frac{9}{16}$ in. (14 mm)	H—Alternative adjustment holes

7. Push rubber blocks over the pin on the corner plates, using one of the three holes to give the required inclination of the seat cushion.

To refit **Operation R/50**

1. Reverse the removal procedure.

Cab

To remove **Operation R/52**

1. Remove the nuts and bolts securing the cab at the windscreen and the nuts securing the cab at the hood sockets.

   88 models: remove the bolts, nuts and washers securing the cab to the cab mounting rail, at the rear body.

   109 models: remove the set bolts and washers securing the cab to the cab mounting brackets, at the rear body.
2. Lift off the cab complete, then remove the roof panel and sealing rubber from the rear panel.
3. Remove the draught excluders and retaining strips from the top of the front door apertures.
4. Remove the rear upper front door seals and the draught pads from the front edge of the side panels.
5. If necessary, remove the rear bottom sealing strip from the back rest panel capping.
6. If necessary, remove the sealing rubber from the front edge of the roof.
7. If necessary, remove all mounting brackets.

To refit **Operation R/54**

1. Reverse the removal procedure.
2. Renew the back and quarter lights as necessary, Operations R/56 and R/58.

Cab back lights

Sliding light

To renew **Operation R/56**

1. Withdraw the drive screws securing the bottom channel to the cab rear panel (the drive screws are inside the channel).
2. Remove the "Phillips" screw, distance piece (two on R.H. light), special washers and tapped plate securing the catch to the back light.
3. Remove the bottom run channel and sliding back light.
4. If necessary, remove the top run channel.
5. If necessary, remove the catches from the back lights.
6. Renew the rubber sealing strips, fittings and sliding lights as necessary. Refit by reversing the removal procedure.

Quarter light

To renew **Operation R/58**

1. Prise out the rubber filler strip from the glass weather strip; push the glass and weather strip from the panel aperture.
2. Square off one end of the rubber weather strip, and, starting at the bottom centre, fit the narrow groove of the strip to the panel aperture with the locking groove to the weather side.

3. Force the strip well into the aperture corners, and, allowing about one inch (25 mm) overlap, square off the other end of the moulding. Compress the moulding around its length until the ends can be joined. (This overlap is important, as otherwise a gap will appear between the moulding ends when the glass is fitted).

4. Fit the glass into the moulding, using a flat piece of metal to pull the lip over the glass.

5. Square off one end of the filler strip, and, starting opposite the joint in the moulding, insert the filler strip in the groove in the weather strip by means of the special tool, Part No. 262771. Allowing about $\frac{1}{4}$" (6 mm) overlap, square off the end of the filler strip, and force the overlap into the weather strip groove.

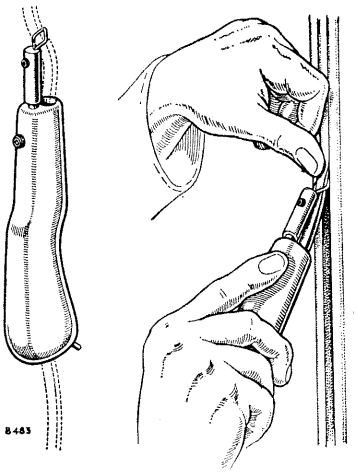

Fig. R-6—
Fitting filler strip in window weather strip

Cab tropical roof

To remove **Operation R/60**

1. Remove the screws, spring and plain washers, nuts, distance pieces and rubber washers securing each side of the panel to the roof.

2. Remove the screws, spring, plain and rubber washers and nuts securing the tropical panel stiffeners to the cab roof both at the front and at the back, then lift off the tropical roof panel.

To refit **Operation R/62**

1. Reverse the removal procedure.

Hard top

To remove **Operation R/64**

1. Remove the nuts, bolts and washers securing the hard top to the windscreen.
2. Remove the set bolts securing the hard top to the front mounting bracket.
3. Remove the nuts, bolts and washers securing the hard top to the centre mounting bracket.
4. Remove the nuts and washers securing the hard top to the rear hood sockets.
5. Remove the nuts, bolts and washers securing the rear mounting brackets to the body. Lift off the hard top complete.

Rear lid

Early type

6. Remove the rear lid by removing the nuts, bolts and washers securing the stays to the side panels, withdraw the split pins and remove the hinge pins. Lift off lid.
7. Remove stays and hinge leaves by removing the securing bolts and washers; if necessary, remove glass, Operation R/58; to remove the lid lock, remove the inner handle by depressing the spring-loaded boss and push out the locking pin.

Late type

8. Remove the rear lid by withdrawing the hinge pins. If necessary remove the split pins securing the stays and remove.
9. If necessary, remove the stay support mounting brackets from the side panels. To remove the lid lock, remove the inner handle by depressing the spring-loaded boss and push out the locking pin.
10. Remove the handle, boss, cap and spring. Withdraw the screws, spring and plain washers and nuts securing the lock to the lid panel; remove the bolts and plain washers securing the bolt guides to the lid panel; remove the outer handle and lift off the lock complete.
11. If necessary, remove the lock bolt sockets from the side panels by removing the securing nuts and bolts. If necessary, remove the rubber seal and retainer from the lower edge of the lid.

Roof panel

8. Remove the roof panel by removing the nuts, bolts and washers securing it to the side panels. If necessary, remove the rubber seal.

Side panels

9. If necessary, remove the glasses. Operation R/58.
10. If necessary, remove the seals and retaining strips.

To refit **Operation R/66**

1. Reverse the removal procedure.
2. If removed, replace or renew the seals and retaining strips.
3. If removed, replace or renew the glasses. Operation R/58.
4. On assembly of the door handle, it will be necessary to adjust the position of the bolts by slackening the locking nuts, to obtain adequate entry into the sockets.

Hard top window glass

To renew **Operation R/68**

As some difficulty may be experienced in carrying out this operation, it will be found advantageous,

where possible, to remove the panel in which the glass is to be fitted, and lay it flat on a suitable bench or stand.

1. See Operation R/58.

Hard top tropical roof

To remove **Operation R/70**

1. Remove the screws, spring and plain washers, nuts, distance pieces and rubber washers securing each side of the panel to the roof.
2. Remove the screws, spring, plain and rubber washers and nuts securing the tropical panel stiffeners to the hard top roof, both at the front and at the back.
3. Remove the drive screws or shear the pop rivets securing the panel to the hard top stiffeners, and lift off the tropical roof panel.

To refit **Operation R/72**

1. Reverse the removal procedure.

Tailboard

To remove and refit **Operation R/74**

1. Release the tailboard keys and drop the tailboard.
2. Unhook the tailboard chains; remove the plain washer, spring washer and split pin from the R.H. hinge pin and slide out the tailboard to the left.
3. If necessary, remove the tailboard hinges and the chain hooks.
4. Refit by reversing items 1 to 3.

Rear body

To remove **Operation R/76**

1. Remove the hood and hood sticks or the hard top.
2. Remove the spare wheel if fitted in the rear body.
3. **88 models:** remove the seat cushions.
4. **109 models:** tilt forward the squabs.
5. Disconnect the fuel filler and breather hoses.
6. Remove the bolts, washers and nuts securing the rear body to the seat base.
7. Remove the bolts securing the sill channel mounting bracket to the seat base and rear body.
8. Detach the nuts and bolts securing the rear sill panel to the body.
9. **88 models:** detach the wing stays from the chassis members.
10. Remove the nuts and bolts securing the body to the rear cross-member mounting brackets.
11. Remove the rear body complete.
12. If necessary, remove all serviceable parts for fitment to new body.

To refit **Operation R/78**

1. Reverse the removal procedure.

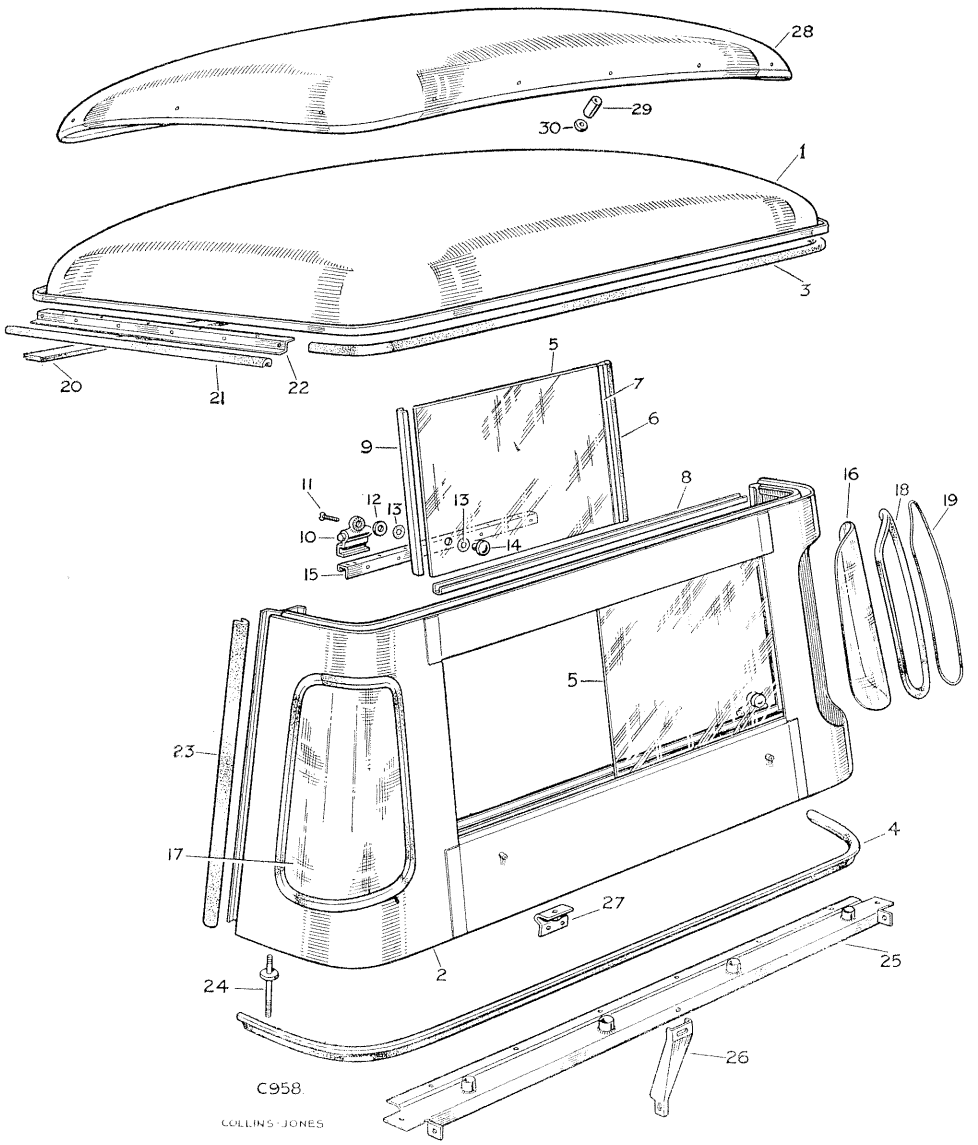

Fig. R-7—Layout of cab and tropical roof

1 Cab roof
2 Cab rear panel assembly
3 Rubber seal, roof to back panel, top
4 Rubber seal back panel to rear body
5 Sliding back light
6 Sealing rubber for back light
7 Channel for rubber
8 Channel, top and bottom } For back light
9 Channel, sides } For back light
10 Back light catch
11–14 Fixings for catches
15 Runner for sliding back light catch
16 Cab quarter light, R.H.
17 Cab quarter light, L.H.
18 Weather strip } For quarter light
19 Sealing strip } For quarter light
20 Sealing rubber, windscreen to roof
21 Sealing rubber, door top
22 Retainer for seal
23 Sealing rubber, door side
24 Mounting stud
25 Mounting rail for cab
26 Mounting rail support bracket
27 Cab mounting distance piece
28 Cab tropical roof panel
29 Distance piece } Fixing tropical roof panel to cab roof
30 Rubber } Fixing tropical roof panel to cab roof

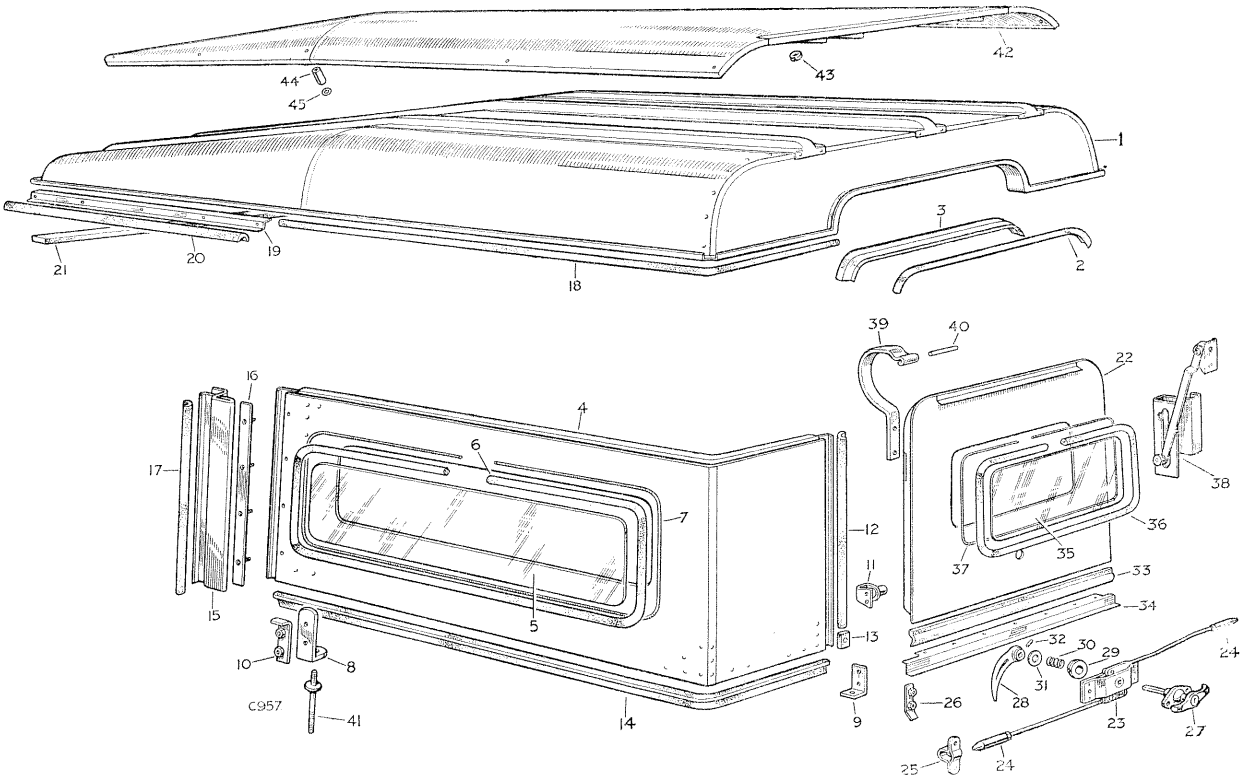

Fig. R-8—Layout of hard top and tropical roof, fixed windows, showing early type lid

1 Cab roof assembly
2 Rubber seal for roof
3 Seal retainer
4 Side panel assembly
5 Glass for side window
6 Weather strip for glass
7 Filler strip for weather strip
8 Front mounting bracket
9 Rear mounting bracket
10 Nut plate
11 Rear lid lock bolt socket
12 Rubber seal for rear lid
13 Rubber buffer for rear lid
14 Rubber sealing strip, lower edge to body
15 Front door rear seal capping
16 Stud plate
17 Seal for front door, upper, side
18 Rubber seal, roof to side
19 Door top seal retainer
20 Door top sealing rubber
21 Sealing rubber, windscreen to roof
22 Rear lid assembly
23 Rear lid lock
24 Lock bolt end
25 Rear lid lock guide
26 Nut plate
27 Handle for rear lid, outer
28 Handle for rear lid, inner
29–32 Fixing for handles
33 Rear lid rubber seal, bottom
34 Bottom seal retainer
35 Rear lid glass
36 Back light weather strip
37 Filler strip for weather strip
38 Stay for rear lid
39 Hinge leaf for rear lid
40 Pin for rear lid hinge
41 Mounting stud
42 Tropical roof panel assembly
43 Rubber washer
44 Distance piece
45 Rubber washer

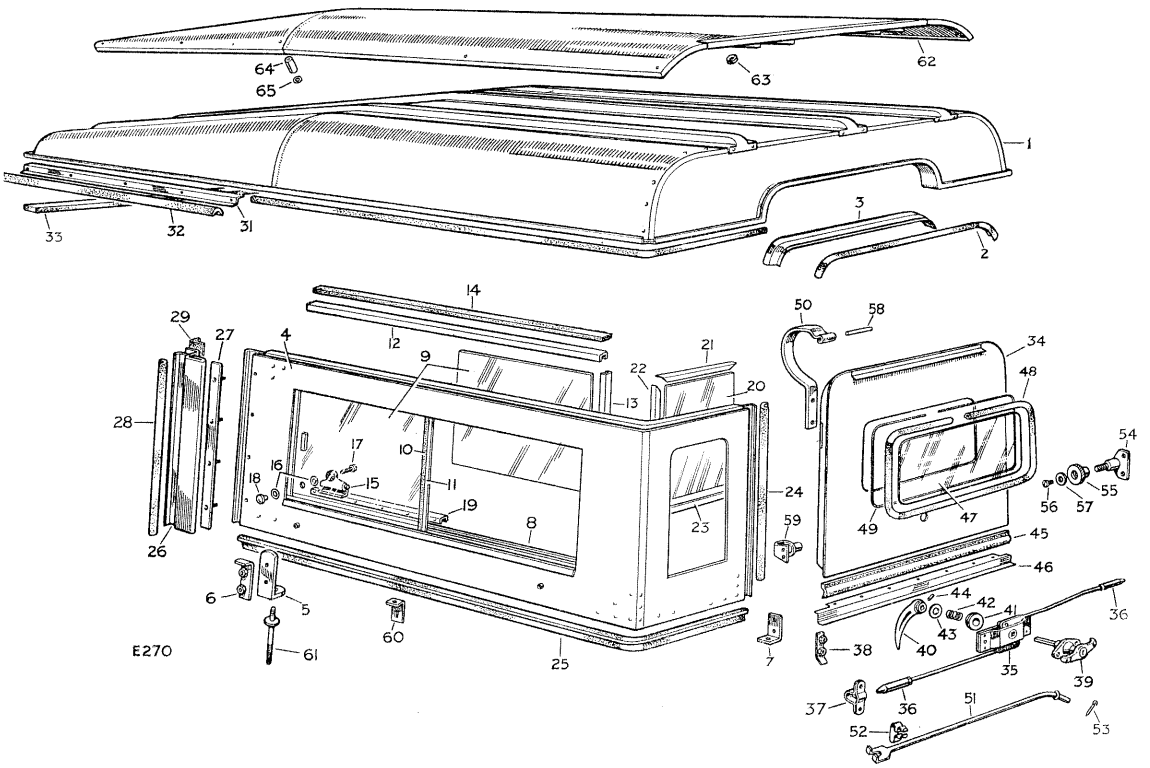

Fig. R-9—Layout of hard top with sliding windows, showing late type lid

1 Cab roof assembly
2 Rubber seal for roof, rear
3 Seal retainer for roof, rear
4 Side panel assembly, L.H.
5 Mounting bracket front
6 Nut plate—fixing mounting bracket to body
7 Support bracket at tail board
8 Drain channel complete for side windows
9 Glass for side window, sliding
10 Sealing rubber for sliding light
11 Channel for sliding light rubber
12 Channel for sliding light, top
13 Channel for sliding light, sides
14 Packing strip for top channel
15 Catch for sliding glass, front
16 Washer for catch
17 Screw fixing front catch
18 Cupped plate for catch
19 Runner for sliding catch
20 Glass for rear end window
21 Retainer for rear end glass upper L.H.
22 Retainer for rear end glass inner and outer
23 Retainer for rear end glass lower L.H.
24 Rubber seal for rear lid, side
25 Rubber sealing strip, lower edge to body
26 Capping for front door rear seal, L.H.
27 Stud plate—fixing cappings to side panel
28 Seal for front door, upper, side
29 Rubber seal at door pillar top and bottom
30 Rubber seal, roof to side
31 Seal retainer for door top, L.H.
32 Sealing rubber for door top
33 Sealing rubber, windscreen to roof
34 Rear lid assembly
35 Lock complete for rear lid
36 Bolt end for lock
37 Guide for rear lid lock
38 Nut plate
39 Handle for rear lid, outer, locking
40 Handle for rear lid, inner
41 Boss
42 Coil spring
43 Cup for coil spring
44 Locking pin
(41–44: Fixing handle)
45 Rubber seal for rear lid, bottom
46 Retainer for bottom seal
47 Glass for rear lid
48 Weather strip for back light
49 Seal strip for weather strip
50 Hinge leaf for rear lid
51 Stay for rear lid, R.H.
52 Spring clip for rear lid stay
53 Split pin fixing rear lid stay to support
54 Mounting bracket for stay support
55 Locking nut for mounting bracket
56 Screw
57 Plain washer
(56–57: Retaining locking nut)
58 Pin for rear lid hinge
59 Socket for rear lid lock bolt, L.H.
60 Support bracket, centre, body side
61 Mounting stud—fixing hard top to body
62 Tropical roof panel
63 Rubber washer—fixing panel to roof at end of stiffener
64 Distance piece
65 Rubber washer
(64–65: Fixing roof to panel at sides)

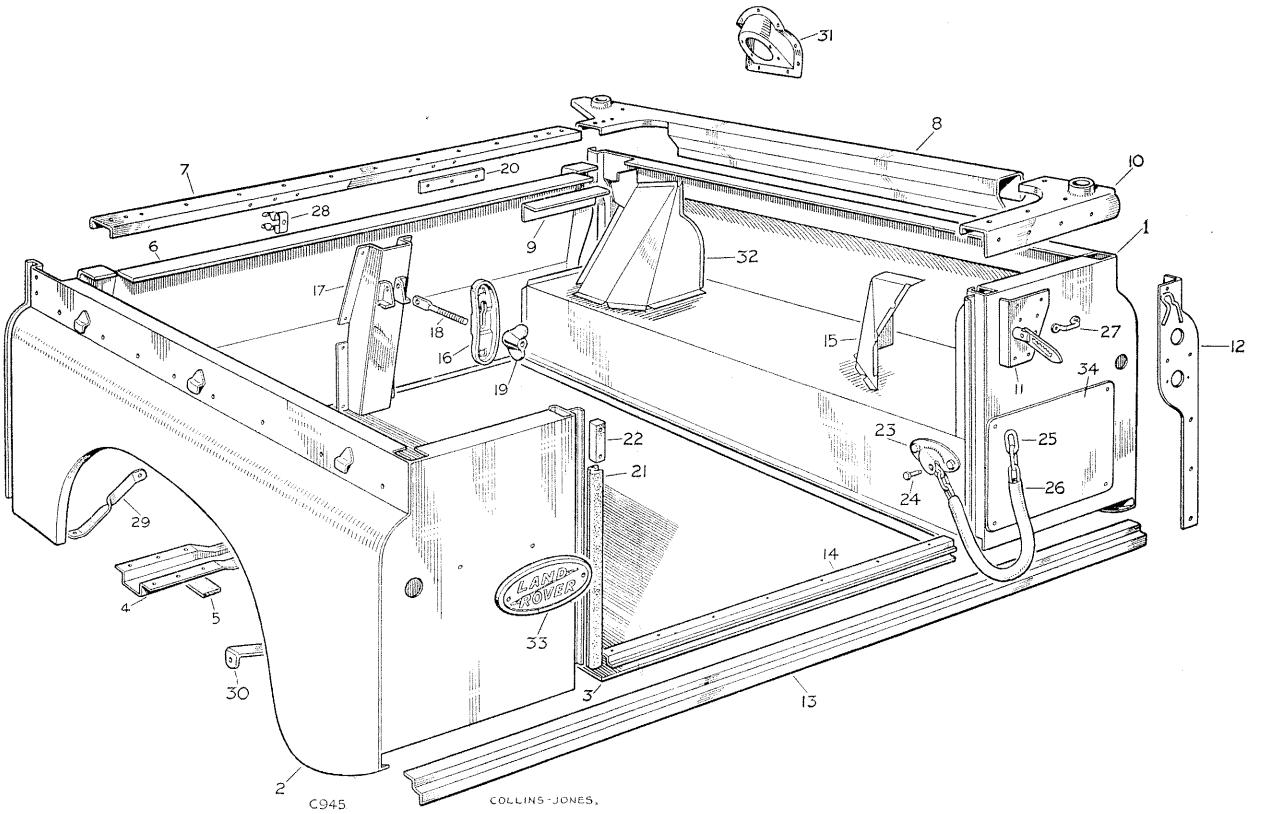

Fig. R-10—Layout of rear body unit—88

1 Side and wheelarch complete R.H.
2 Side and wheelarch complete L.H.
3 Rear floor complete
4 Rear floor cross-member and pads
5 Rear floor cross-member mounting pad
6 Rear body front panel
7 Body front panel capping
8 Body top side capping
9 Corner strengthening angle
10 Hood socket complete, rear corner
11 Corner bracket and tailboard cotter
12 Rear protection angle
13 Rear mounting angle
14 Protecting strip at rear of floor
15 Cover panel for rear lamps
16 Spare wheel clamp
17 Clamp reinforcement bracket
18 Spare wheel clamp tie bar
19 Wing nut, fixing spare wheel clamp
20 Spare wheel rubbing strip
21 Tailboard sealing rubber
22 Tailboard rubber buffer
23 Tailboard chain bracket
24 Pin, fixing tailboard chain to bracket
25 Tailboard chain
26 Sleeve for chain
27 Hood strap staple
28 Starting handle and jack handle clip
29 Rear wing stay, front
30 Rear wing stay, rear
31 Fuel filler cowl
32 Fuel filler cover plate
33 'Land-Rover' name plate
34 Registration plate

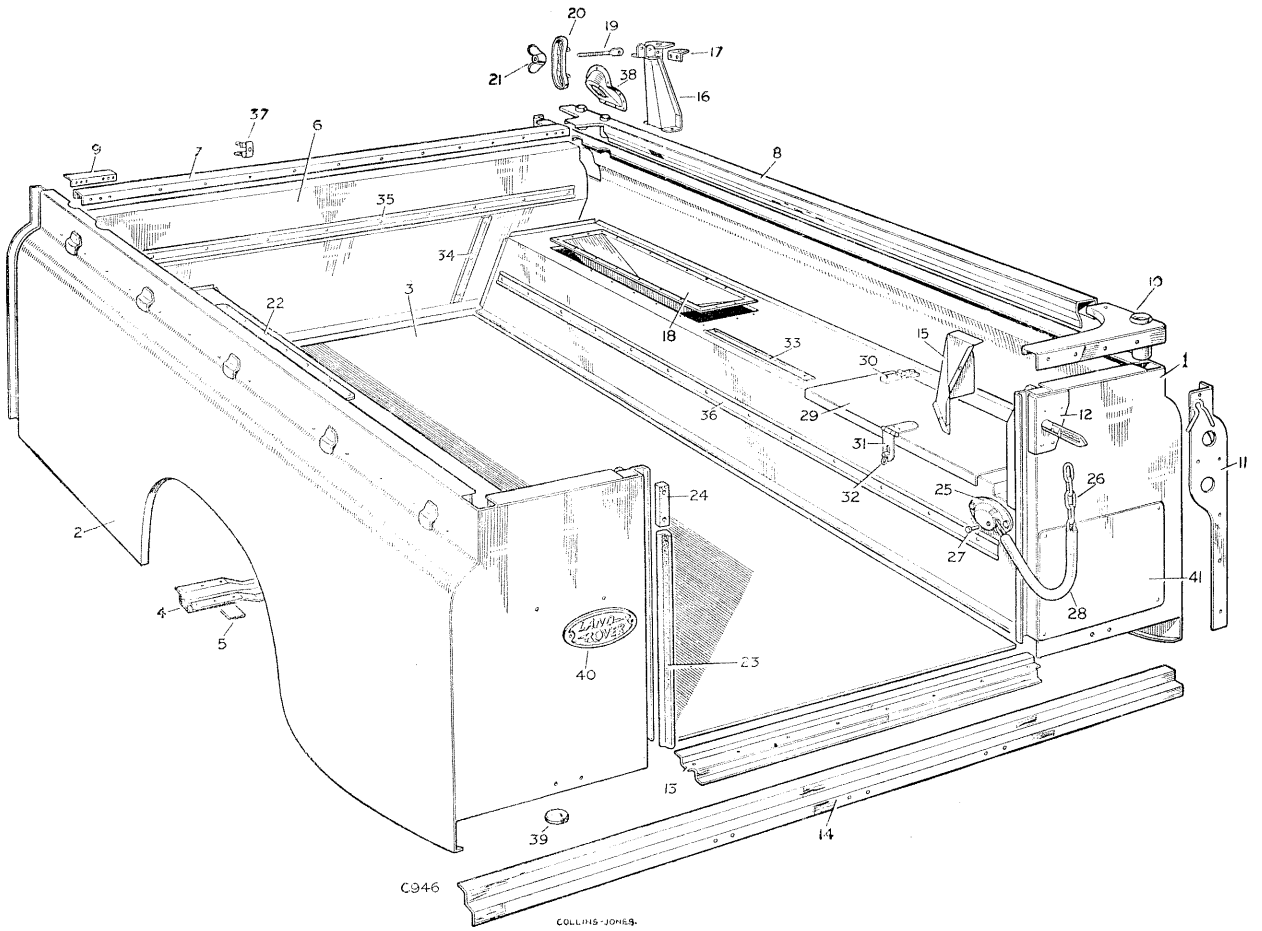

Fig. R-11—Layout of rear body unit—109

1 Side and wheelarch complete R.H.
2 Side and wheelarch complete L.H.
3 Rear floor complete
4 Rear floor cross-member and pads
5 Rear floor cross-member mounting pad
6 Rear body front panel
7 Rear body front panel capping
8 Body top side capping
9 Corner strengthening angle
10 Hood socket complete, rear corner
11 Rear protection angle
12 Corner bracket and tailboard cotter
13 Protecting strip at rear of floor
14 Rear mounting angle
15 Rear lamp cover panel
16 Spare wheel mounting strengthening member
17 Nut plate
18 Spare wheel housing
19 Spare wheel clamp tie bar
20 Spare wheel clamp
21 Wing nut, fixing spare wheel clamp
22 Cover plate
23 Tailboard sealing rubber
24 Tailboard rubber buffer
25 Tailboard chain bracket
26 Tailboard chain
27 Clevis pin, fixing chain to bracket
28 Sleeve for chain
29 Wheelarch box locker lid
30 Locker lid hinge
31 Locker lid hasp
32 Locker lid turnbuckle
33 Tread plate, wheelarch box top
34 Tread plate, vertical, front panel
35 Tread plate, horizontal, front panel
36 Tread plate for rear floor and wheelarch box sides
37 Starting handle and jack handle clip
38 Fuel filler cover plate
39 Rubber grommet, wheelarch, locker access hole
40 'Land-Rover' nameplate
41 Registration plate