

AKD1174C

AKD1175C

The

AUSTIN

**Taxi
and
Hire Car**

DRIVER'S HANDBOOK



DRIVER'S HANDBOOK

for the

AUSTIN

Taxi (FX4: FX4D)
and
Hire Car (FL2: FL2D)

A copy of this Driver's Handbook is sent out with every Taxi and Hire Car. Additional copies are obtainable only from your Austin Distributor and Part No. AKD1175C should be quoted when ordering



THE AUSTIN MOTOR COMPANY LIMITED
LONGBRIDGE · BIRMINGHAM
BOX 41 G.P.O.

FOREWORD

IN producing this book the object has been to confine the contents to information essential to the proper running and operation of the vehicle. Nevertheless, the operator will find all the guidance necessary to maintain the vehicle in first-class condition and to ensure trouble-free service. Every vehicle leaving the Factory is capable of giving absolute satisfaction if the maintenance instructions detailed in the following pages are carefully carried out.

Remember that an authorized Distributor/Dealer is better equipped to provide routine and repair service than any other operator; he is at your service and should be consulted if you encounter trouble. When emergency work has been undertaken by other than a franchise holder the vehicle should be submitted to a Distributor/Dealer for checking.

All Warranty work must be carried out by a Distributor/Dealer.

When communicating with your Distributor or Dealer always quote the chassis and engine numbers; the registration number is of no use and is not required.

For those requiring information of a more detailed and technical nature than is contained in this Handbook a Workshop Manual is available at a reasonable price from your Distributor/Dealer.

IDENTIFICATION

Car number. Stamped on a plate fixed to the chassis side-member adjacent to the right-hand-side front mudwing valance.

Body number. Stamped on a plate fixed to the radiator mounting panel.

Engine number. Stamped on a plate fixed to the right-hand side of the cylinder block.

Automatic gearbox number. Stamped on a plate fixed to the left-hand side of the gearbox.

Synchromesh gearbox number. Stamped on the top face of the gearbox case.

Rear axle number. Stamped on the rear face of the right-hand-side axle tube.

IMPORTANT

1. WARRANTY DOCUMENT

Retention of the Certificate or Passport to Service signed by the Distributor or Vendor, in a safe place **in the vehicle** will (by quickly establishing the date of sale) help to expedite any adjustments under Warranty if such adjustments are required to be carried out by an authorized Distributor or Dealer other than the supplier of your vehicle.

2. CLAIMS UNDER WARRANTY

Claims for the replacement of material or parts under Warranty must be submitted to the supplying Distributor or Dealer or, when this is not possible, to the nearest Distributor or Dealer, informing them of the Vendor's name and address.

Except in cases of emergency, Warranty work should always be carried out by a franchise holder, since this ensures that no doubt can arise in connection with circumstances of the vehicle history when claims are put forward.

3. PREVENTIVE MAINTENANCE

A Passport to Service containing Service Vouchers (applicable in the United Kingdom only) is provided with every new vehicle, and the regular use of the Vouchers in sequence is the best safeguard against the possibility of abnormal repair bills at a later date. Replacement Passport to Service Books are obtainable free of charge from Distributors and Dealers. **Prevent rather than cure.**

Regular servicing, proved by the presentation of completed Voucher counterfoils, could well enhance the value of your vehicle in the eyes of a prospective buyer.

4. REPLACEMENT PARTS

When Service Parts are required insist on B.M.C. GENUINE PARTS as these are designed and tested for your vehicle and in addition are warranted for 12 months by the British Motor Corporation. ONLY WHEN GENUINE PARTS ARE USED CAN B.M.C. ACCEPT RESPONSIBILITY.



When purchasing replacement parts or having repairs done owners are requested to see that a label similar to the one illustrated here is attached to the invoice rendered. These labels are issued by B.M.C. Service Limited and constitute a guarantee that B.M.C. Genuine Parts are supplied.

Our world-wide network of Distributors and Dealers is at your service.

B.M.C. SERVICE LIMITED

Proprietors: The British Motor Corporation Ltd.

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GENERAL DATA

Diesel engine

Types	22E, 22EA (Automatic), 22K, 22KA (Synchromesh).
Number of cylinders	4
Bore	3.25 in. (82.6 mm.)
Stroke	4.0 in. (101.6 mm)
Capacity	132.7 cu. in. (2178 c.c.)
Valve rocker clearance (cold) .. .. .	.012 in. (.31 mm.)
Compression ratio	20 : 1
Injection order	1, 3, 4, 2
Static injection timing	28° B.T.D.C.
Oil pressure: Idling (550 r.p.m.)	15 lb./sq. in. (1.05 kg./cm. ²)
Normal running	45 to 50 lb./sq. in. (3.16 to 3.51 kg./cm. ²)

Petrol engine

Types	22Z and 22ZA
Number of cylinders	4
Bore	3.125 in. (79.4 mm.)
Stroke	4.375 in. (111.1 mm.)
Capacity	134.1 cu. in. (2199 c.c.)
Valve rocker clearance (cold) .. .. .	.012 in. (.31 mm.)
Compression ratio	6.8 : 1
Firing order	1, 3, 4, 2
Static ignition timing	6° B.T.D.C.
Distributor points gap .. .. .	.014 to .016 in. (.36 to .40 mm.)
Sparking plugs	Champion N5
Points gap .. .. .	.025 in. (.64 mm.)
Oil pressure: Idling	15 lb./sq. in. (1.05 kg./cm. ²)
Normal running	45 to 50 lb./sq. in. (3.16 to 3.51 kg./cm. ²)

Cooling system

Radiator	Pressurized
Circulation	Centrifugal pump
Cooling control	Thermostat in the cylinder head

Fuel system (diesel models)

Lift pump	A.C. mechanical
Venturi control unit	C.A.V. BEP.K42.42.111S
Fuel injection pump:	
'In-line' type	C.A.V. BPE.4 A.65. U210.S6355EL or BPE.4A.65. U210.S6565EL
Distributor type	C.A.V. DPA.3243760.A
Fuel injector nozzles:	
Engine with 'in-line' injection pump	C.A.V. Pintaux BDN.12.SP6A
Engine with 'distributor' injection pump	C.A.V. Pintaux BDN.12.SPC6290

GENERAL DATA

Fuel injector nozzle holders:

Engine with 'in-line' injection pump	C.A.V. BKB.35.S668
Engine with 'distributor' injection pump	C.A.V. BKB.35.S5136
Fuel filter	C.A.V. Type F2/9, F2B9, or FS5836020
Heater plugs	Lodge DD2/3 or Champion AG4

Fuel system (petrol models)

Lift pump	A.C. mechanical
Carburetter (down draught)	Zenith, 42 V.I.S. (22Z), 30V.M6.(22ZA)
Choke tube	31 mm. 23 mm.
Main jet	102 95
P.T. bleed	4 mm. —
Slow-running jet	55 45
Compensating jet	95 60
Pump jet	50 —
Full-throttle bleed	1.6 mm. —
Needle seating	2.5 mm. 1.5 mm.
Progression jet	2 × 100

Air cleaner A.C. oil bath

Clutch

Type Borg & Beck, single dry plate, operated hydraulically

Gearbox

Type Borg-Warner automatic transmission, or four-speed synchromesh gearbox

Rear axle

Type Hypoid, three-quarter-floating

Brakes

Type Girling hydraulic
Hand brake Mechanical on rear wheels only

Steering

Type Cam and lever
Ratio: Early models 20 : 1
Late models 24 : 1
Turning circle 25 ft. (7.62 m.)

Tyres

Size: Taxi 5.75—16 (6-ply)
Hire Car 6.00—16 (6-ply)
Recommended pressures 32 lb./sq. in. (2.3 kg./cm.²)

GENERAL DATA

Principal dimensions	Taxi	Hire Car
Length overall ..	14 ft. 11 $\frac{7}{16}$ in. (4.56 m.)	14 ft. 11 $\frac{13}{16}$ in. (4.58 m.)
Width overall ..	5 ft. 8 $\frac{5}{8}$ in. (1.74 m.)	5 ft. 8 $\frac{5}{8}$ in. (1.74 m.)
Height overall ..	5 ft. 9 $\frac{1}{2}$ in. (1.76 m.)	5 ft. 9 $\frac{3}{4}$ in. (1.77 m.)
Ground clearance	7 $\frac{1}{2}$ in. (.19 m.)	5 $\frac{3}{4}$ in. (.15 m.)
Turning circle ..	.. .. 25 ft. 0 in. (7.62 m.)	
Front wheel toe-in	.. .. $\frac{1}{8}$ in. (1.6 mm.)	

Capacities

Diesel engine oil (including filter)	9 $\frac{1}{4}$ pints (5.25 litres)
Petrol engine oil (including filter)	11 $\frac{1}{4}$ pints (6.38 litres)
Engine oil filter	1 $\frac{1}{4}$ pints (.71 litre)
Fuel tank (diesel models) ..	11 $\frac{1}{2}$ gal. (52.3 litres)
Fuel tank (petrol models) ..	12 $\frac{3}{4}$ gal. (58.1 litres)
Cooling system	19 pints (10.8 litres)
Automatic gearbox and converter	15 pints (8.5 litres)
Synchromesh gearbox	3 $\frac{1}{2}$ pints (2 litres)
Rear axle	3 pints (1.7 litres)
Air cleaner	1 $\frac{3}{4}$ pints (1 litre)

CONTROLS AND INSTRUMENTS

Brake hand lever

Pull the hand lever upwards and backwards to operate the rear brakes when parking. To release the hand brake pull the lever slightly, squeeze the trigger lever to release the lever ratchet, and push the lever downwards and forwards into its fully off position.

Brake pedal

The pedal operates the hydraulic brakes on all four wheels and will also operate the twin stop warning lamps when the master switch is on.

Accelerator pedal

The smallest of the pedals forward of the driver which completely control the car.

Engine stop control (diesel models)

Pull the control handle fully out to cut off the fuel supply to the injection pump, when the engine will cease firing. When starting the engine return the handle to the fully closed position before operating the heater plug switch and the starter control.

Bonnet release lock

The bonnet is hinged at the rear and the lock is released by sliding the catch on the front bumper apron towards the left-hand side of the car.

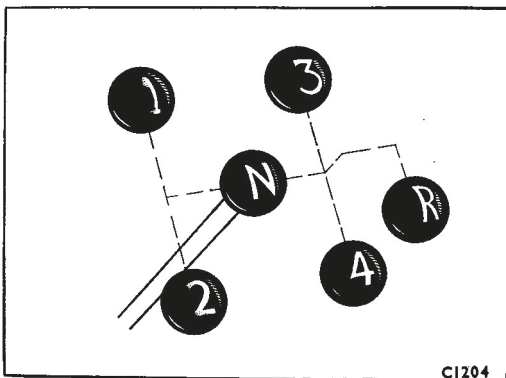
The bonnet is still held by the safety catch, which must be released before the bonnet can be raised.

To relock the bonnet in the fully closed position after opening press downwards on the front of the bonnet until the lock is heard to engage.

Seat adjustment

A lever is provided at the front of the driver's seat and this must be pressed downwards to release the catch and allow the seat to slide. The seat will lock in the desired position as the lever is released.

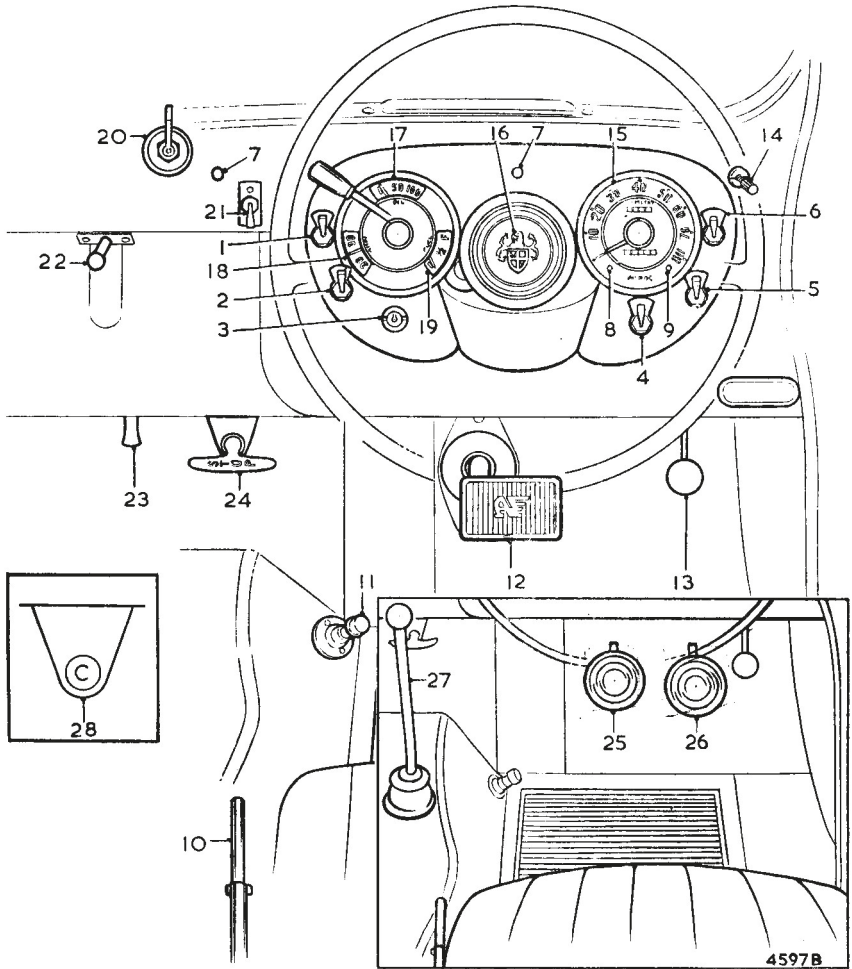
A winding gear is provided on the side of the seat to adjust it for height.



The synchromesh gearbox gear change lever positions

C1294

CONTROLS AND INSTRUMENTS



- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Panel lamp switch. 2. Wiper switch. 3. Ignition master switch. 4. Main lighting switch. 5. Interior lamp switch. 6. Fog lamp switch. 7. Direction indicator warning lamp. 8. Main-beam warning lamp. 9. Ignition master switch warning lamp. 10. Hand brake. 11. Headlamp dipper switch. 12. Brake pedal (automatic gearbox). 13. Accelerator pedal. 14. Speedometer trip control. | <ol style="list-style-type: none"> 15. Speedometer. 16. Horn-push. 17. Oil gauge. 18. Ammeter. 19. Fuel gauge. 20. Direction indicator switch. 21. Heater switch. 22. Ventilator control. 23. Heater door control. 24. Diesel engine stop control. 25. Clutch pedal. 26. Brake pedal. 27. Gear change lever. 28. Petrol engine choke control. |
|--|---|

CONTROLS AND INSTRUMENTS

Radiator blanking blind control

Pull the control cable ring to position the blind, and to release it pull forwards the locking button, when the blind will return to its rolled position.

Ventilator

Push down the lever in the centre of the fascia panel to open the scuttle ventilator, thereby allowing cool air into the driver's compartment.

Heater controls

With the master switch on, press down the switch marked 'HEATER' mounted on the fascia panel to operate the air blower, which blows cool air onto the windscreen and into the driver's compartment when the door below the fascia is opened. By turning the tap which is mounted on the rear of the cylinder head in an anti-clockwise direction warm water will be circulated to the heater unit, thus allowing warm air to be blown onto the windscreen for defrosting and into the driver's compartment. A switch in the passengers' compartment controls the temperature therein.

Oil pressure gauge

The gauge indicates the pressure (in lb./sq. in.) of oil being delivered by the pump. The gauge should register within 30 seconds of starting the engine.

Ammeter

The meter will register the rate at which the batteries are being charged (+) or discharged (-).

Fuel gauge

The gauge will indicate the quantity of fuel in the tank when the master switch is operated.

Speedometer

In addition to indicating the speed of the car, the speedometer records the trip and total distances. The trip recorder enables the distance of a particular journey to be recorded and is reset to zero by pushing the knurled knob on the fascia panel and turning it anti-clockwise until the figures read zero.

Main lighting switch

The switch is mounted on the instrument panel and is marked 'HEAD/SIDE'. When the switch is pressed downwards to the first position the side and tail lamps are illuminated, and when pressed to the next position the headlamps are also brought into circuit.

Headlamp beam dip switch

This is situated to the left of the brake pedal and is foot-operated. The switch will dip the headlamp beams on one depression and raise them on the next.

To give the driver clear indication that the headlamp beams are in the raised position a warning light glows in the speedometer dial.

CONTROLS AND INSTRUMENTS

Horn-push

Press the hub cover in the centre of the steering-wheel to sound the horn(s).

Master switch (diesel models)

The 'Yale'-type key in the instrument panel. If the engine is to be started, push in the stop control. Turn the key in an anti-clockwise direction and hold it for 15 seconds against the spring tension; the heater plug elements will then warm up and assist starting in cold weather.

Turn the key in a clockwise direction to bring the dynamo into circuit; the warning lamp will glow. Turn the key again in a clockwise direction and hold it against the spring tension to operate the starter motor. As soon as the engine fires release the key.

Ignition/master and starter switch (petrol models)

The switch is operated by a removable key. When the key is turned in a clockwise direction to the first position the battery and dynamo are brought into circuit. Further movement in the same direction will operate the starter motor. Release the key immediately the engine starts. If the engine fails to start first time, wait until the starter motor has come to rest before operating the switch again. The switch must not be left on when the engine is not running or the battery will discharge itself through the coil should the contact points be closed.

Carburettor choke control (petrol models)

When starting the engine from cold pull out the control marked 'C' before operating the starter switch.

Fog lamp switch

The switch on the instrument panel marked 'FOG'; press downwards to switch on.

Panel lamp switch

The switch on the instrument panel marked 'PANEL LTS.'; press downwards to switch on.

Windscreen wiper switch

The switch on the instrument panel marked 'WIPERS'; press downwards to switch on; return it to stop the wipers when they reach the end of a stroke.

Passenger's interior lamp switch

The switch on the instrument panel marked 'PASS. INT. LT.'; press downwards to switch on. A push-button type switch in the passengers' compartment is also in the circuit.

CONTROLS AND INSTRUMENTS

Direction indicator switch

The lever-type switch in the centre of the fascia panel controls the flashing indicator unit. The unit will operate only while the ignition/master switch is on and flashes the lamp on the side of the car to which the switch lever is moved until it is automatically switched off.

While the flashing unit is switched on the warning light will show green.

Driver's compartment lamp switch

The switch on the partition behind the driver and adjacent to the lamp; press downwards to switch on.

Headlamp main-beam warning lamp

When the main beams are in operation the warning lamp will glow, but will go out when the headlamps are dipped.

Dynamo warning lamp

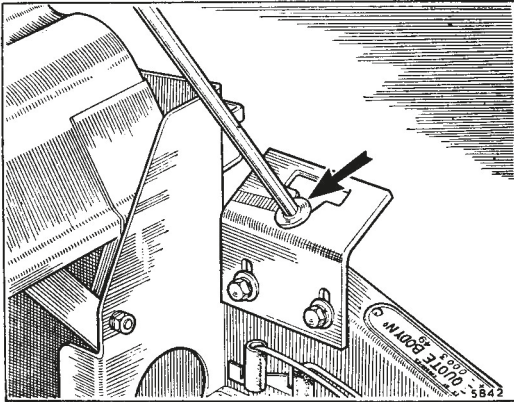
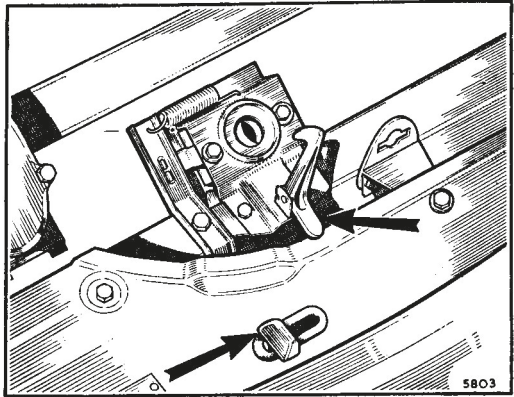
When the ignition/master switch is operated the lamp will glow, but will go out as soon as the engine speed is high enough to enable the dynamo to generate sufficient current to charge the battery.

BONNET LOCK AND SPARE WHEEL

Bonnet lock and safety catch

Release the bonnet lock by sliding the spring-loaded lever mounted in the front bumper apron, when the bonnet will spring slightly open. Press downwards on the safety catch which can be seen below the front of the bonnet and lift the bonnet to its fullest extent, when a distinct click can be heard from the supporting strut. The bonnet is now in the fully open and locked position. To release, lift the bonnet slightly, lower, and press into the fully closed position.

The bonnet lock release and safety catch



The bonnet may be locked in the open position by means of a hinged strut

Spare wheel

The spare wheel is housed in the boot and is secured by a plate and wing nut. Maintain the pressure in the spare wheel tyre to that recommended for those in use.

RUNNING INSTRUCTIONS

Running-in speed

The treatment given to a new vehicle will have an important bearing on its subsequent life and engine speeds during this early period must be limited. The following instructions must be strictly adhered to.

During the first 500 miles (800 km.) or 25 hours' running

DO NOT exceed 28 m.p.h. (45 km.p.h.).

DO NOT operate at full throttle in any gear.

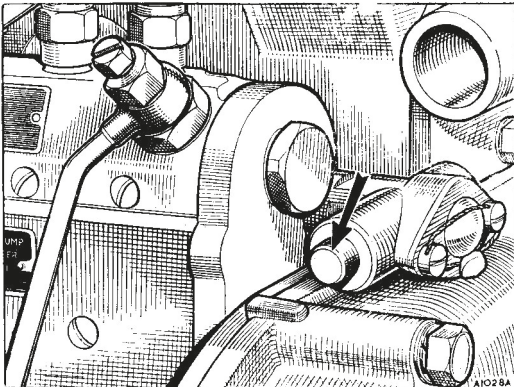
DO NOT allow the engine to labour in any gear.

Warming up

Research has proved that the practice of warming up an engine by allowing it to idle slowly is definitely harmful. The correct procedure is to let the engine run fairly fast, at approximately 1,000 r.p.m., so that it attains its correct working temperature as quickly as possible. Allowing the engine to work slowly in a cold state leads to excessive cylinder wear, and far less damage is done by driving the vehicle straight on the road from cold than by letting the engine idle slowly until warm.

Wet brakes

After the vehicle has been washed or driven through water the brake linings may become wet. To dry them, apply the brakes several times with the vehicle moving slowly. Driving with wet brakes is extremely dangerous and is to be avoided.



Location of the excess fuel button on the 'in-line' fuel injection pump (early models)

Starting the engine in normal conditions (diesel models)

Switch on the master switch and turn on the fuel tap located in the injection pump feed pipe. Make sure that the charging warning light glows, that the fuel gauge registers, and that the stop control is fully home.

Operate the starter and at the same time slightly open the throttle by depressing the accelerator pedal; release the starter as soon as the engine starts.

RUNNING INSTRUCTIONS

On later engines, which are fitted with a 'distributor' fuel injection pump, the accelerator pedal should be fully depressed until the engine starts, when the pedal should be released to allow the governor to bring the engine under control.

If the engine fails to start within five or six seconds release the starter switch and allow the engine to come to rest before making a further attempt.

Check the engine oil pressure on the gauge, which should register within 30 seconds of the engine starting. Also check that the charging warning light goes out when the engine is running above idling speed, indicating that the dynamo is charging.

Starting the engine in cold conditions (diesel models)

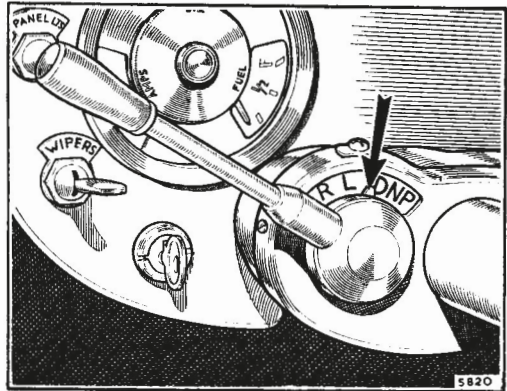
To assist starting in cold conditions each combustion chamber is fitted with a heater plug controlled by a switch in the driver's compartment, and the 'in-line' fuel injection pump is fitted with an excess fuel device.

To start the engine proceed as for '**Starting the engine in normal conditions (diesel models)**', but before operating the starter motor set the 'in-line' injection pump to deliver excess fuel by depressing the excess fuel button, or operating the excess fuel control, and switch on the heater plugs for a period of 15 seconds.

Never operate the heater plug switch when the engine is running as this will result in the rapid destruction of the heater plug elements.

Automatic transmission

The automatic transmission incorporates a fluid torque converter coupling in place of the usual clutch and an hydraulically operated epicyclic gearbox



The gear selector indicator panel

in which all ratio changes are performed automatically in accordance with the position of the accelerator pedal and the speed of the car. Thus there is no need for a clutch pedal or for the conventional gear change lever and driving in normal conditions becomes a matter involving the use of the accelerator and brake pedals only.

RUNNING INSTRUCTIONS

Selector lever

The selector lever is mounted below the steering-wheel on the left-hand side of the column in a right-hand-drive car and on the right-hand side in a left-hand-drive car.

Five settings of the transmission may be manually selected by movement of the lever, the position of the lever for any selection being indicated by letters on the quadrant. The letters are 'P', 'N', 'D', 'L', and 'R' and the transmission settings corresponding to the letters are detailed below. All normal driving is done with the lever at 'D'.

'P' (Park)

The transmission is in neutral and the car is mechanically locked against movement by a parking pawl engaging a gear on the output shaft. The pawl will not engage at speeds above 3 to 5 m.p.h. (5 to 8 km.p.h.) should the lever be moved to 'P' accidentally. The pawl allows the car to be stopped on a hill without fear of running away, though it is advisable to apply the hand brake in such conditions to prevent overloading the mechanism.

Always move the lever to this position when the car is parked. The engine may be idled or run for tuning.

'N' (Neutral)

The transmission is in neutral as in 'P', but the parking pawl has been disengaged so that the car may be coasted, towed, or pushed. The hand brake should be applied when the car is at rest with the lever in this position. The engine may be idled or run for tuning. Do not move the control lever to 'N' when travelling at speeds above 35 m.p.h. (56 km.p.h.).

'D' (Drive)

The position for all normal driving including starting from rest. Three ratios are available—low, intermediate, and direct—all of which are selected automatically according to the engine speed and torque demand. A free-wheel is operative in low and intermediate (**not** in manually engaged low).

'L' (Low)

The transmission is in low, the same ratio as that obtained automatically in certain conditions when the lever is at 'D', but when manually selected as at 'L' the transmission will not change out of this ratio until 'D' is again selected. This position is used for ascending or descending long, steep gradients or in other conditions necessitating lengthy periods in low gear.

'R' (Reverse)

A free wheel is operative when the transmission is in reverse.

Starter

The starter will only operate if the lever is at 'P' or 'N'. Move the lever to one of these positions and start the engine in the usual way. If 'N' is used, make sure the hand brake is applied to prevent the car creeping.

RUNNING INSTRUCTIONS

Starting-handle

As a safety precaution, no starting-handle as such, is provided on Austin vehicles fitted with the automatic transmission, the handle provided is for turning the engine when making adjustments.

Emergency starting

It is better to push the car rather than to tow it when the batteries are flat or an emergency start is necessary for any reason. If the car is towed there is always a danger that it may run forward onto the towing vehicle when the engine starts. Put the transmission in neutral ('N') and push the car until the road speed reaches approximately 18 m.p.h. (29 km.p.h.), switch on the master switch and push in the stop control, then select 'D'. Do not tow the car at speeds above 30 m.p.h. (48 km.p.h.) with the control lever at 'N'.

Moving away from rest

After starting the engine move the lever to 'D', depress the accelerator pedal, and release the hand brake. As the speed of the car increases, intermediate and then direct top gear will be engaged progressively and automatically and thereafter all ratio changes will be made to suit the car speed and torque demand. Direct top gear will be engaged when the speed is between 15 and 33 m.p.h. (24 and 52 km.p.h.), depending on the accelerator position and car speed.

Engine as brake

Engine braking is available for the descent of steep hills and is obtained by the engagement of the manual low gear ratio ('L'); **no free-wheel is operative in manually engaged low ratio.** Do not engage manual low if the car speed is above 18 m.p.h. (29 km.p.h.) owing to the possibility of damage to the engine by over-revving.

Reversing

A free-wheel is operative when the transmission is in reverse, which considerably simplifies backing the car. It is recommended that the left foot should be used on the brake pedal when manoeuvring the car in confined spaces, while the right foot is used on the accelerator in the usual manner.

If the lever is moved to 'R' while the car is travelling forward at more than 3 to 5 m.p.h. (5 to 8 km.p.h.) the effect is to change into neutral, and a reverse interlock prevents the engagement of reverse above these speeds.

Stopping

Stop the car in the normal way by applying the foot brake, leaving the control lever at 'D' until the car is stationary; move the lever to 'N' or 'P' and apply the hand brake. When a temporary stop is made in traffic or to allow a passenger to alight there is no need to move the control lever from 'D', but it is necessary to hold the foot brake and prevent the car from moving if the accelerator should be accidentally depressed.

RUNNING INSTRUCTIONS

Soft road surfaces

When the rear wheels fail to grip the road in snow, mud, or sand the car may be rocked backwards and forwards until sufficient grip is obtained to drive away. Hold the accelerator pedal so that the engine speed corresponds to a road speed of between 3 and 5 m.p.h. (5 and 8 km.p.h.) and move the selector lever quickly from 'R' to 'L' and back. It is important to move from 'L' to 'R' while the car is moving forward and vice versa. If the forward speed rises above 5 m.p.h. (8 km.p.h.) no reverse will be obtained, since the reverse interlock will operate, as mentioned above.

Starting from rest on hills

If the car is parked on a hill with the lever at 'P' it may creep slightly downhill against the brakes so that the parking pawl becomes tightly engaged. To free the transmission, apply the foot brake lightly, slightly depress the accelerator and release the hand brake; engage **reverse** if the car is facing **downhill** or move the selector lever to 'D' if facing **uphill**. Depress the accelerator pedal slowly until the pawl is heard to click out of engagement and immediately apply the foot brake fully. The car should not move during this operation; it may then be driven away.

COOLING SYSTEM

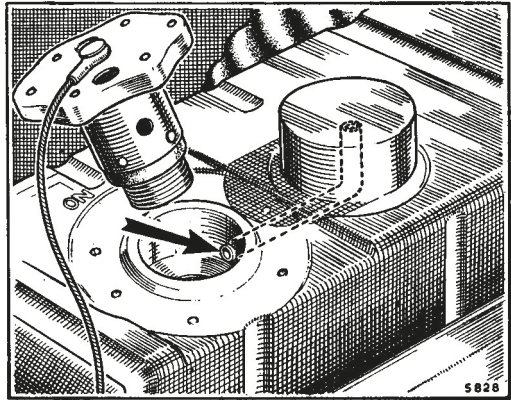
Frost precautions

When frost is expected or when the car is to stand idle in an unheated place care should be taken to prevent damage to the cylinder block and radiator. In these circumstances the water in the cooling system should be mixed in suitable proportions with anti-freeze liquid, or the cooling system should be drained completely.

As a heater unit is fitted, under no circumstances resort to draining the cooling system as an alternative to the use of an anti-freeze solution, due to the fact that it is not possible to completely drain the heater unit by means of the cylinder block and radiator drain taps.

Only anti-freeze solutions of the ethylene glycol type incorporating the correct type of corrosion inhibitor are suitable and owners are recommended to use Bluecol or any anti-freeze solution conforming to Specification B.S.3151 or B.S.3152.

The cooling system is filled through the radiator header tank, which also houses the expansion chamber



Before introducing anti-freeze mixture to the radiator it is advisable to clean out the cooling system thoroughly by swilling out the passages with a hose inserted in the filler neck, keeping the drain taps open. Only top up when the cooling system is at its normal running temperature in order to avoid losing anti-freeze due to expansion.

Make sure that the cooling system is water-tight and examine all joints, replacing any defective rubber hose with new.

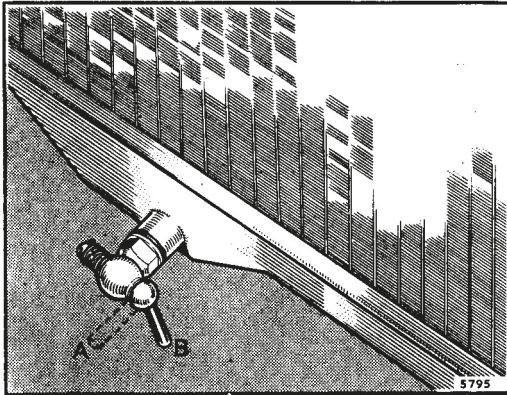
Anti-freeze liquids should be added in the following proportions:

Quantity	Absolute safe limit	Commences to freeze
4 pints (2.3 litres)	-19° C. (-3° F.)	20% solution -9° C. (16° F.)
5 pints (2.8 litres)	-26° C. (-15° F.)	25% solution -12° C. (10° F.)
6 pints (3.4 litres)	-33° C. (-28° F.)	30% solution -16° C. (1° F.)

It is advisable for vehicles with an anti-freeze solution in the cooling system to have an indication mark in a suitable prominent position (all new vehicles leaving the Factory during the winter months are so marked). The following precautions are necessary on vehicles using an anti-freeze solution.

COOLING SYSTEM

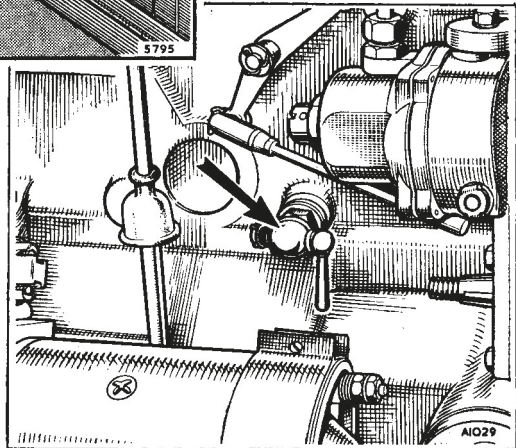
Make sure that the strength of the mixture is that recommended on the container of the particular anti-freeze liquid used. The strength of the mixture must be maintained by topping up with anti-freeze liquid at the correct strength when the system is warm. Topping up with water only gradually reduces the degree of protection provided. If the cooling system has to be emptied, run the mixture into clean containers and strain ready for use again. If for any reason the mixture is lost and the system is filled with water, remove the anti-freeze indication mark. In extreme cold conditions use a greater proportion of anti-freeze liquid. Consult your local agent for the correct quantity.



The radiator drain tap is accessible when the bonnet is raised

- A. Open.
- B. Closed.

The cylinder block drain tap is located on the right-hand side of the diesel engine



Filling the radiator

Close the two drain taps and fill the system with clean soft water or an anti-freeze mixture up to the bottom of the filler neck threads when cold. The coolant should be slowly poured into the radiator filler to allow air to escape past the thermostat valve in the cylinder head, otherwise check the level and top up when the system is sufficiently warmed up to fully open the thermostat valve.

Replace the radiator filler cap and tighten it securely.

COOLING SYSTEM

Radiator drain tap

This tap is located on the front of the radiator bottom tank on the right-hand side and is accessible when the bonnet is raised. To drain the cooling system completely the engine drain tap must also be opened.

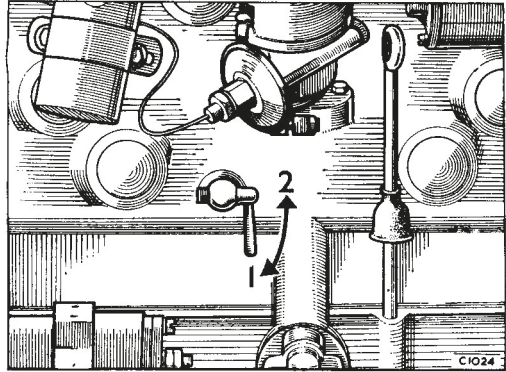
Engine drain tap

To drain the water from the engine open the tap on the right-hand side of the cylinder block.

To drain the cooling system completely the radiator drain tap also must be opened.

The cylinder block drain tap is located on the right-hand side of the petrol engine

1. Closed.
2. Open.

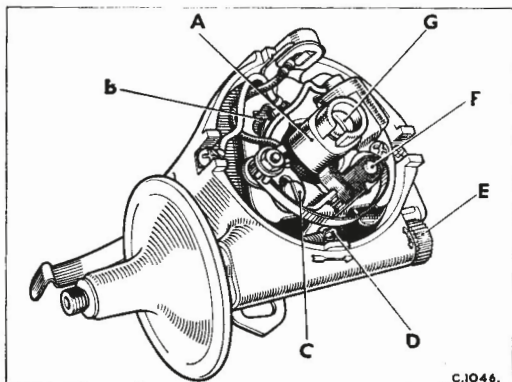


IGNITION EQUIPMENT (Petrol Models)

Ignition adjustment

Adjustment is provided for the ignition point to enable the best setting to be attained to suit varying fuels. The adjusting nut is indicated by the letter (E) in the illustration, and turning the nut in a clockwise direction retards the ignition. Turning it in an anti-clockwise direction advances the ignition.

The barrel of the screwed spindle has graduations to indicate the settings.



The distributor

- A. Cam.
- B. Adjusting slot.
- C. Contact locking screw.
- D. Lubricating point.
- E. Adjusting nut.
- F. Lubricating point.
- G. Lubricating point.

Static ignition setting

The normal static ignition setting is with the spark taking place at 6° B.T.D.C. The ignition point can be reset if necessary by adjusting the knurled nut on the distributor body. Each graduation on the barrel is equal to approximately 5° of timing movement and one graduation is equal to 55 clicks on the knurled nut. Do not disturb the pinch clip at the base of the distributor unless absolutely necessary.

FUEL SYSTEM (Diesel Models)

'In-line' fuel injection pump pneumatic governor

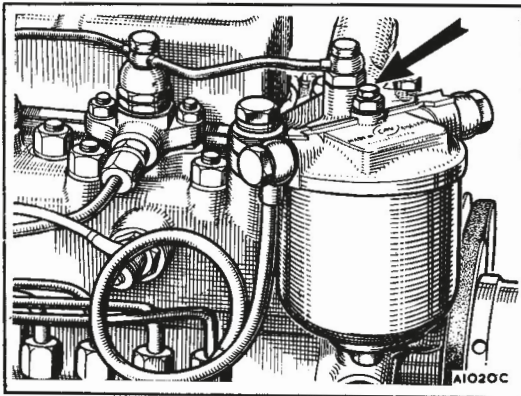
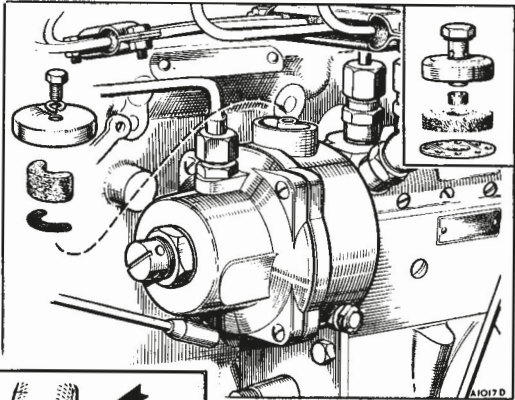
If the engine is to be operated continuously in very dusty conditions periodic cleaning and re-oiling of the governor breather filter pad is necessary.

Dismantle the governor breather and wash the breather filter pad in petrol. Dip the filter pad in clean engine oil and allow it to drain for half an hour before reassembling.

Eliminating air from the fuel system (bleeding)

Failure to start or erratic engine acceleration can be the result of air in the fuel system. This can be caused by allowing the fuel tank to become empty,

The pneumatic governor breather filter fitted to the 'in-line' fuel injection pump. Shown inset is the breather filter fitted to the early-type pump



Location of the air bleed plug on the early-type main fuel filter

by a leaking joint, or by dismantling any part of the fuel system. If this condition is suspected, and after every occasion when part of the fuel system has been dismantled, the fuel system should be bled of air as follows.

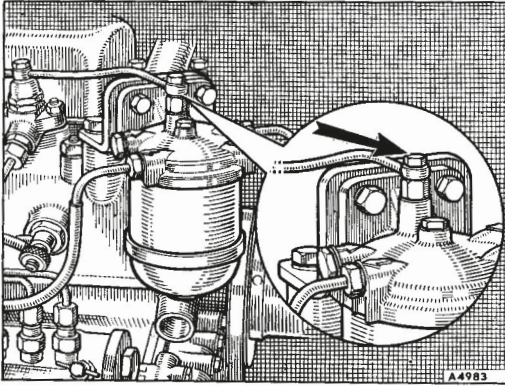
Engine with 'in-line' fuel injection pump

First bleed the main fuel filter. Slacken the bleed plug (leak-off pipe banjo bolt on the later bowl-less type filter) on the filter head and operate the hand priming lever on the fuel lift pump. When the fuel flowing from the filter is completely free from air bubbles tighten the bleed plug.

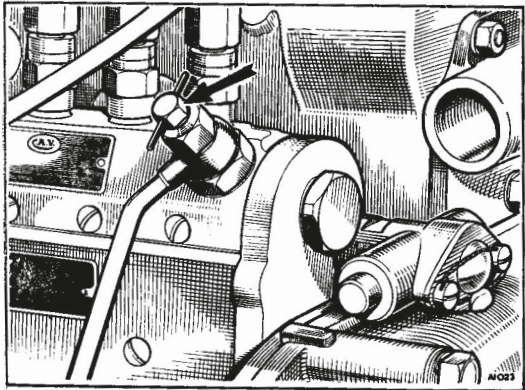
FUEL SYSTEM (Diesel Models)

Secondly, bleed the fuel injection pump. Slacken the bleed tap on the injection pump and again operate the fuel lift pump priming lever. When the fuel flowing from the injection pump is completely free from air bubbles tighten the bleed tap.

Finally, start the engine and bleed each injector nozzle feed pipe in turn. With the engine idling, slacken the feed pipe union nut at the injector end sufficiently to allow the fuel oil to seep past the threads of the union without frothing. When the fuel flowing from the injector feed pipe is completely free from air bubbles tighten the union nut.



Location of the air bleed point on the later bowl-less-type main fuel filter



The 'in-line' fuel injection pump air bleed tap

Engine with 'distributor' fuel injection pump

First bleed the main fuel filter and the injection pump. Unscrew by two or three turns the banjo bolt attaching the fuel leak-off pipe to the main fuel filter head casting and slacken the two air bleed valves on the injection pump. One bleed valve is located on the governor housing, while the other is incorporated in the hydraulic head locking screw situated immediately above the pump nameplate. Operate the hand priming lever, and when the fuel flowing from each

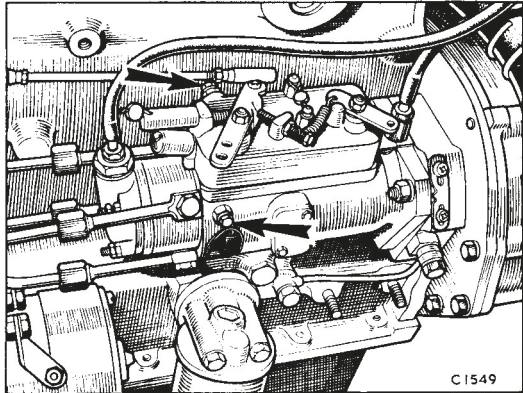
FUEL SYSTEM (Diesel Models)

bleed point is free from air bubbles tighten the fuel filter banjo bolt, hydraulic head bleed valve, and governor housing bleed valve, in this order.

Secondly, crank the engine, by hand, through one complete revolution and again bleed the fuel injection pump, tightening the hydraulic head bleed valve, followed by the governor housing bleed valve, when the fuel flowing from both bleed points is free from air bubbles.

Finally, bleed the fuel injector high-pressure feed pipes. Slacken the union nuts at the injector ends of the high-pressure pipes to the injectors. The nuts must be slackened sufficiently to allow fuel at injection pressure to pass the

Location of the two air bleed valves on the 'distributor' injection pump



threads without frothing. Ensure that the stop control is in the 'run' position and set the accelerator in the fully open position. Crank the engine until the fuel flowing past any two of the pipe unions is free from air bubbles and tighten the union nuts for these two pipes. Start the engine, and as the two remaining pipes are bled tighten their union nuts.

WARNING—Lubrication of the injection pump mechanism is effected by fuel oil under pressure, therefore no attempt should be made to bleed the fuel system by towing the vehicle in gear as this may result in serious damage to the injection pump.

Roadside injection adjustment

On no account should the injectors or any part of the injection pump be dismantled at the roadside. It is recommended that a spare injector be carried, and renewing an injector is the only servicing of this nature that should be carried out at the roadside.

It is often possible to locate an injector which is not working correctly by slackening the feed pipe union nut of the suspect injector and allowing the fuel to leak past the union whilst the engine is running slowly. If there is no change in the engine performance or if a faulty condition, such as a smoky exhaust, has disappeared, it is reasonable to assume that the injector nozzle is faulty.

FUEL SYSTEM (Diesel Models)

To renew a faulty injector disconnect the high-pressure feed pipe from the injector nozzle holder and the leak-off pipe from all the injector cap nuts, noting the seal washers located on each side of the pipe banjo-type unions.

Remove the two nuts securing the faulty injector to the cylinder head and withdraw the injector.

Ensure that the injector nozzle holder joint washer in the cylinder head is in good condition and will make a gas-tight joint. Place the new injector in position and tighten the securing nuts evenly half a turn at a time to ensure even seating. A torque wrench set to 12 lb. ft. (1.6 kg. m.) should be used whenever possible.

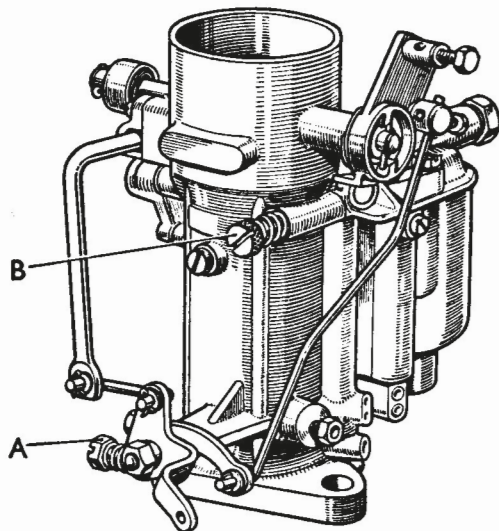
Reconnect the fuel pressure pipe and leak-off unions, ensuring that the joint washers are fitted on each side of the leak-off pipe banjo unions.

FUEL SYSTEM (Petrol Models)

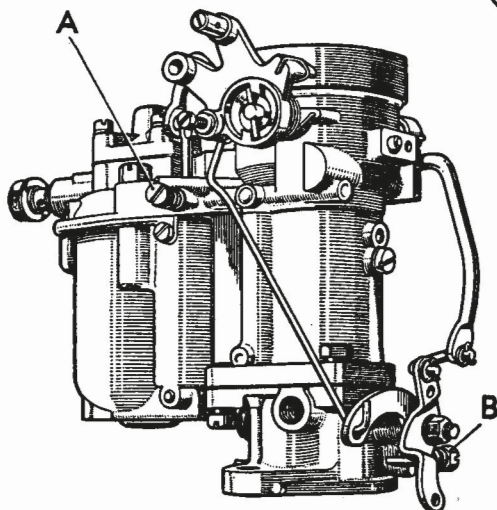
Carburettor slow-running adjustment

When the engine is fully run in, the slow-running adjustment may need a little attention. The adjustments should be made only after the engine has reached its normal running temperature.

A. Slow-running and B. throttle stop screws, Zenith 30 V.M.6 type carburettor



C1660A



A. Throttle stop and B. Slow-running screw, Zenith 42 V.I.S. type carburettor

C1659A

The slow-running screw is the spring-loaded screw mounted on the throttle lever abutment plate which limits the closing of the throttle and thus fixes the idling speed of the engine. Turn the screw in a clockwise direction to increase the engine speed and in an anti-clockwise direction to decrease the speed.

FUEL SYSTEM (Petrol Models)

The volume control screw is provided to vary the slow-running mixture. When it is screwed in it weakens the mixture and when unscrewed the mixture is enriched by the progressive reduction in air flow.

Weak mixture is recognized by irregular behaviour of the engine and the tendency to stall. Rich mixture will cause the engine to 'hunt' and tend to stall when the 'hunt' becomes excessive.

Set the slow-running adjustment screw so that the engine speed is slightly on the high side. Adjust the volume control screw until the engine runs evenly, firing on all cylinders regularly. This operation will generally alter the engine speed and will permit readjustment of the slow-running screws.

Check the adjustment by speeding up the engine momentarily and releasing the accelerator quickly. If the engine stalls, the slow-running adjustment has been overdone and the idling speed should be increased slightly by screwing in the slow-running adjustment screw.

CLUTCH

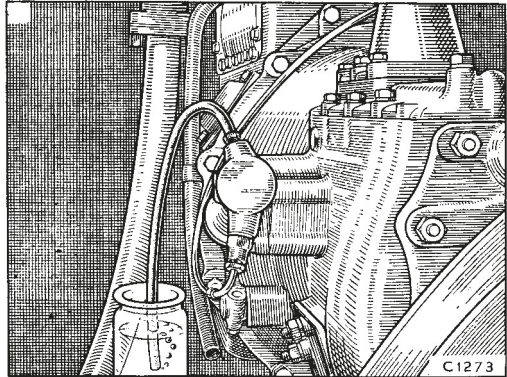
To bleed air from the hydraulic system

Bleeding the system is not a routine maintenance operation, and should only be necessary if some component of the hydraulic system has been disconnected or the fluid drained off.

Unlike the hydraulic fluid, air is compressible, and its effect when present in the system is to give a 'spongy' feel on the pedal and produce excessive travel, making gear selection difficult.

During the bleeding operation maintain the fluid level in the reservoir to within $\frac{1}{2}$ in. (13 mm.) below the bottom of the filler neck and ensure all union and pipe connections are tight and leakproof.

Bleeding the clutch hydraulic system at the slave cylinder



The slave cylinder provides the only bleeding point, as shown in the illustration, and access to the bleeder screw is from underneath the vehicle. Clean off all dirt from and around the bleeder screw and attach the bleeder tube to the bleeder screw nipple, allowing the other end of the tube to hang into a glass jar filled with sufficient hydraulic fluid to immerse the end of the tube. Slacken the screw one complete turn. Instruct an assistant to depress the clutch pedal with a slow full stroke and allow the pedal to return unassisted, repeating this pumping action with a pause before each depression of the pedal. Watch the flow of fluid into the glass jar, and when all bubbles cease to appear tighten the bleeder screw during a down stroke of the pedal. Remove the tube and jar.

NOTE.—Clean fluid bled from the system should be allowed to stand until it is clear of all air bubbles before being used again. Used fluid, if not contaminated, may be filtered and used again. Use **CASTROL GIRLING BRAKE AND CLUTCH FLUID CRIMSON** or fluid to Specification S.A.E. 70.R3.

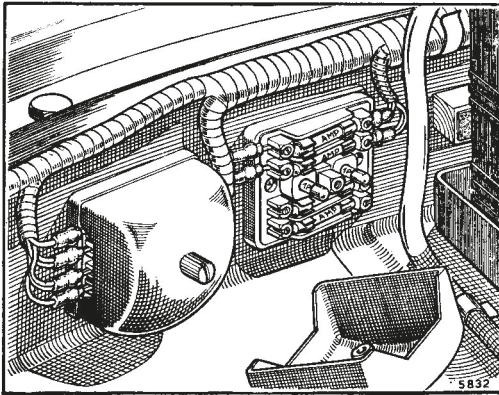
ELECTRICAL EQUIPMENT

Fuses

There are two fuseboxes located under the bonnet, the front one protecting the side, tail, head, and fog lamps, and the rear one protecting the horn, regulator, and the auxiliaries which are connected through the ignition master switch (stop lamps, heaters, etc.).

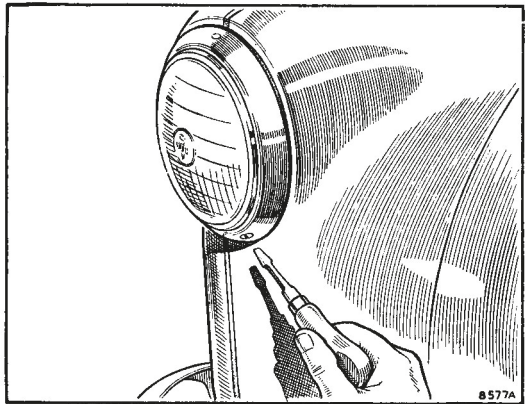
Spare fuses

Spare fuses are provided in the fuseboxes and it is important to use only the correct replacement fuse. The fusing value is marked on a coloured paper slip



The fuseboxes. A blown fuse must be immediately re-newed

Remove the headlamp rim for access to the light unit



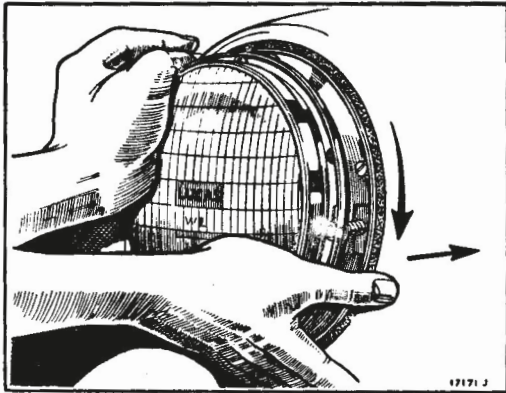
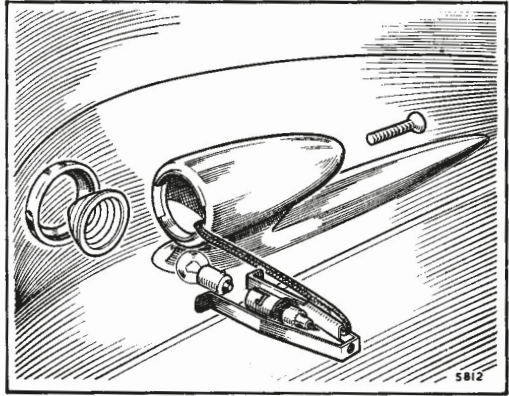
inside the glass tube of the fuse. If the new fuse blows immediately and the cause of the trouble cannot be found, have the equipment examined at a Lucas Service Depot.

Sidelamps

To reach the bulb remove the screw from the rear of the lamp body and pull forward the glass and rim. Remove the glass and rim by squeezing the two metal strips of the body together; the bulb will then be readily accessible.

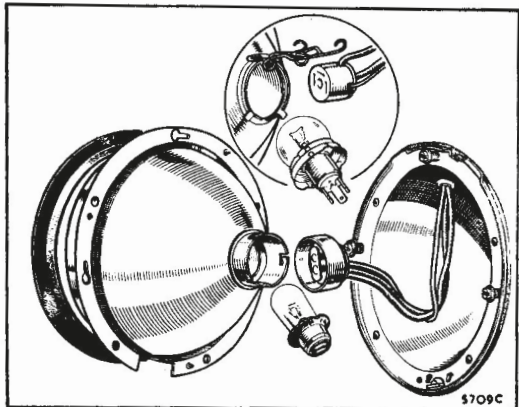
ELECTRICAL EQUIPMENT

Sidelamp components, showing access to the bulb



Push in the light unit and turn in an anti-clockwise direction to remove. Push in and turn clockwise (as shown when replacing types 'A' and 'B')

The headlamp unit removed. Inset, alternative bulb fitting, types 'A' and 'B'



ELECTRICAL EQUIPMENT

Headlamps

Remove the rim after extracting the retaining screw from the under side, push the lamp reflector and glass assembly inwards against the springs, turn it in an anti-clockwise direction until the locating screws register with the enlarged ends of the slots, and withdraw the light unit.

Type 'A'

Depress the back-shell and turn it to release the bulb. When replacing the bulb ensure that the slot in the bulb flange engages the keyway in the holder.

To replace the back-shell push it home against the spring pressure and turn it to engage the bayonet attachment.

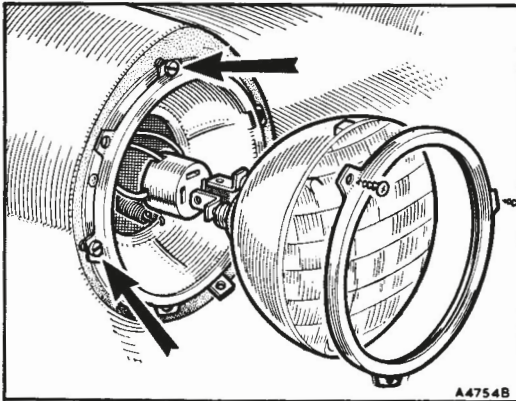
Type 'B'

The bulb is released from the reflector by withdrawing the three-pin socket and pinching the two ends of the wire retaining clip to clear the bulb flange. When replacing the bulb care must be taken to see that the rectangular pip on the bulb flange engages the slot in the reflector seating for the bulb.

Replace the spring clip with its coils resting in the base of the bulb flange and engaging the two retaining lugs on the reflector seating.

Refit the lamp unit by positioning it so that the heads of the adjusting screws pass through the slotted holes in the flange, press the unit inwards, and turn it in a clockwise direction as far as it will go.

Refit the front rim, locking it in position with the retaining screw.



The headlamp unit removed, showing the light unit type 'C' and adjusting screws

Type 'C'

Sealed-beam headlamps consist of a light unit into which the lamp filaments are sealed, and in the event of failure the complete light unit must be renewed. To remove a light unit remove the rim, after extracting the retaining screw from the under side and the three Phillips screws securing the light unit plate.

Remove the plate, lift the light unit forward, and disconnect the three-pin socket at the back of the unit.

To replace the unit reverse the above procedure, but ensure that the lugs moulded on the back of the unit engage in the slots in the back-shell before fitting the rim.

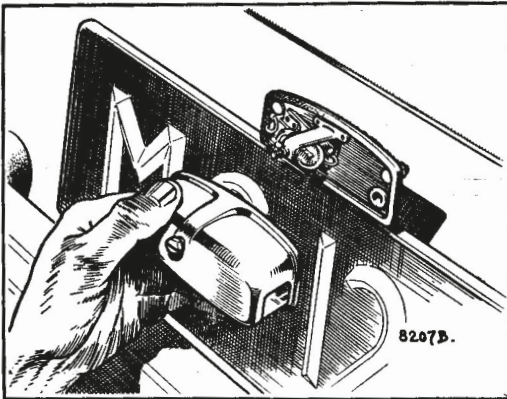
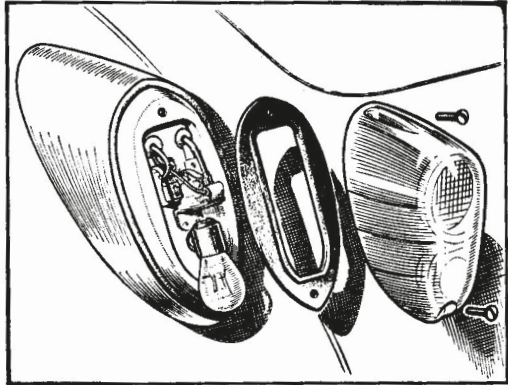
ELECTRICAL EQUIPMENT

Tail and stop lamps

Each lamp cover is secured by two screws and the bulb is accessible after the cover and rubber seal are removed.

The dual-filament tail and stop lamp bulb must provide the brighter light for stop indication, and to ensure this the bulb has offset pegs and can only be fitted in one position.

To gain access to the tail lamp bulb remove the two screws securing the cover and pull off the cover and rubber seal



Slacken the small retaining screw in the centre of the number-plate lamp to remove the cover and gain access to the bulb

Number-plate lamp

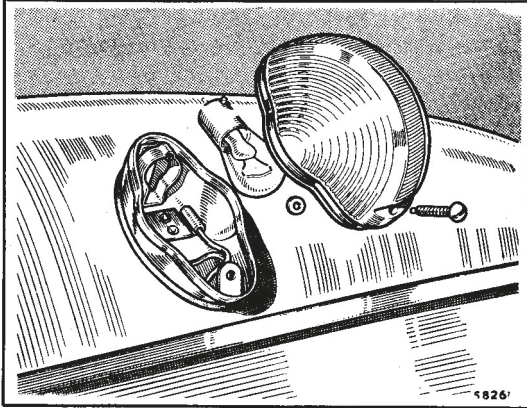
The number-plate lamp only operates when the sidelamps and tail lamps are switched on.

A single bayonet-fixing bulb is fitted and the cover may be removed after slackening the small retaining screw.

Direction indicators

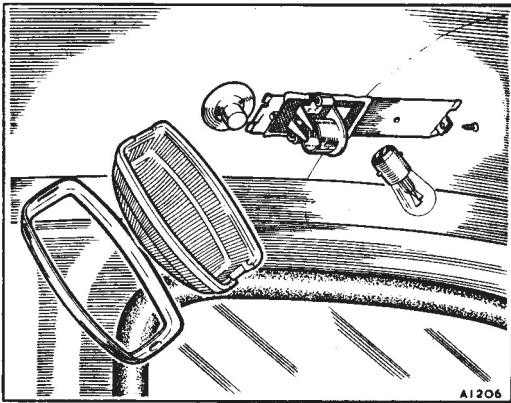
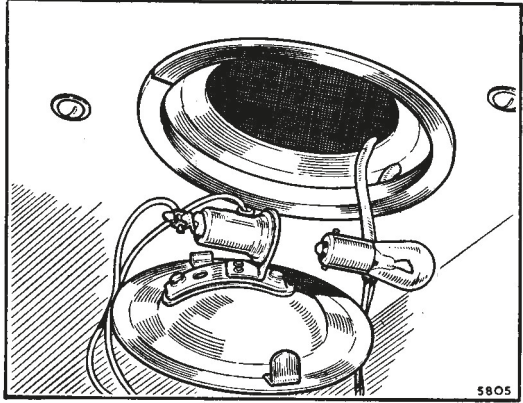
A single bayonet-fixing bulb is fitted and the cover may be removed after unscrewing the small retaining screw.

ELECTRICAL EQUIPMENT



Remove the lamp cover to gain access to the direction indicator bulb

Prise out the light unit to gain access to the Taxi roof lamp bulb



Remove the glass and bezel to gain access to an interior lamp bulb

Interior lamps (driver's and passengers')

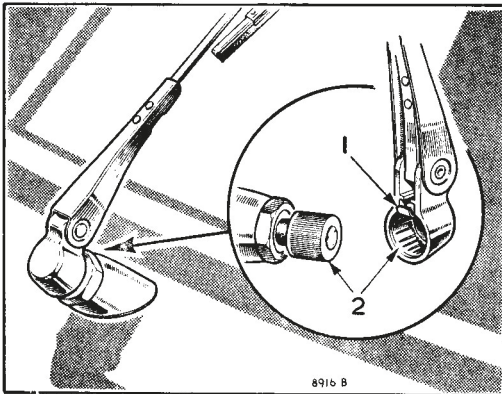
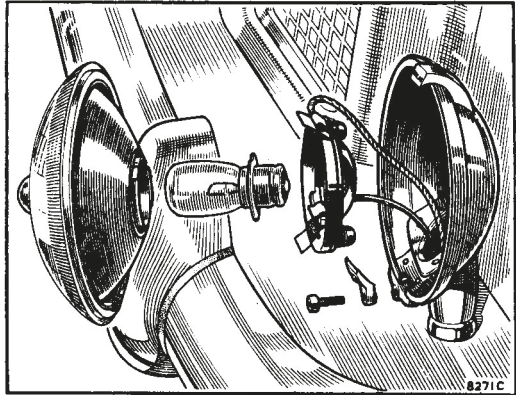
A single bayonet-fixing bulb is fitted and the glass and bezel may be removed after screwing the small retaining screw out of the bezel.

ELECTRICAL EQUIPMENT

Fog lamp

Remove the screw from the bottom of the lamp rim and lift off the light unit. Unscrew the contact unit from the rear of the light unit and lift out the bulb for renewal.

To gain access to the fog lamp bulb remove the light unit



To reposition the wiper arm press the spring clip (1), withdraw the arm, and refit on another spline (2)

Windscreen wiper blades

To reposition the wiped area on the glass the arm must be withdrawn from the spindle after pressing the spring retaining clip and then refitted on another spline.

To disengage a blade pull the arm away from the windscreen and pivot the blade upwards.

ELECTRICAL EQUIPMENT

Replacement bulbs

					<i>Watts</i>	<i>B.M.C. Part No.</i>
Headlamp, dip left (R.H.D.)	..	..	..	..	50/40	BFS414
Headlamp, dip left (R.H.D.)	..	..	..	..	42/36	BFS354
Headlamp, dip right (L.H.D.)	..	..	..	..	42/36	BFS355
Headlamp, vertical dip (Sweden, R.H.D.)	..	..	..	..	42/36	BFS354
Headlamp, vertical dip (not U.K., L.H.D.)	..	..	..	..	45/40	BFS410
Headlamp, vertical dip (France, L.H.D.)	..	..	..	..	45/40	BFS411
Sidelamps	..	..	..	..	6	BFS989
Tail and stop lamps	..	..	..	..	21/6	BFS380
Rear number-plate lamp	..	..	..	..	6	BFS989
Fog lamp	..	..	..	..	36	BFS323
Interior lamp	..	..	..	..	21	BFS382
Direction indicator warning lamp	..	..	..	..	2.2	BFS987
Flasher lamp	..	..	..	..	21	BFS382
Ignition/master switch warning lamp	..	..	..	..	2.2	BFS987
Main-beam warning lamp	..	..	..	..	2.2	BFS987
Oil pressure warning lamp	..	..	..	..	2.2	BFS987

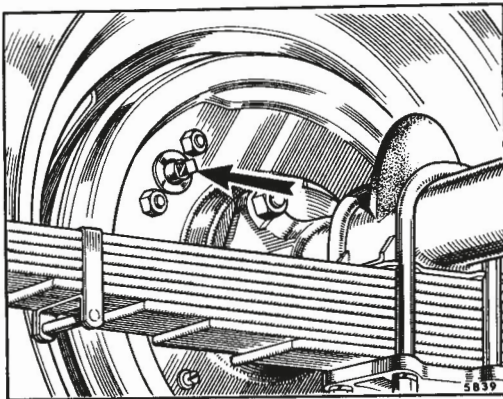
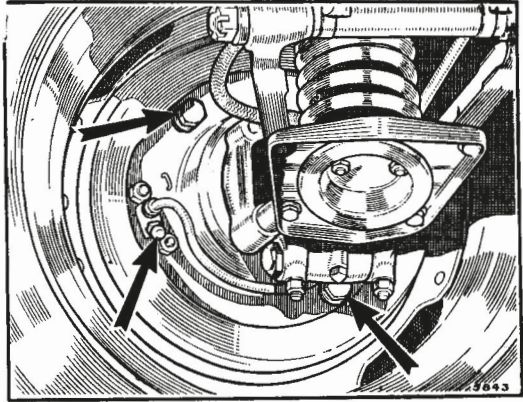
BRAKE ADJUSTMENTS

Brake-shoe adjustment

Brake adjustment consists of adjusting the shoe adjusters which control the 'off' position of the brake-shoes and thus their working clearance from the brake-drum. The adjustment will reduce brake pedal travel produced by brake lining and drum wear, or will relieve brake drag caused by lack of clearance due to bad adjustment between the brake-shoe linings and the drum.

Do not adjust the brake-shoes when the brake-drums are hot because the drums will contract as they cool and thereby cause the brakes to drag.

The front brake-shoes are adjusted independently by means of the two hexagon-headed bolts indicated



The rear brake-shoes are adjusted by means of the squared end of the wedge-type adjuster

Adjustment will not effect a cure to bad braking where brake fluid or grease has contaminated the brake linings.

Jack up the front of the car if possible until the wheels are free to rotate. Fully release the two hexagon-headed bolts of the knurled, eccentric-type adjusters on the outside of the backplate by turning them in an anti-clockwise direction with an open-ended spanner. Turn one of the adjuster bolts in a clockwise direction until the brake-shoe concerned touches the brake-drum, then

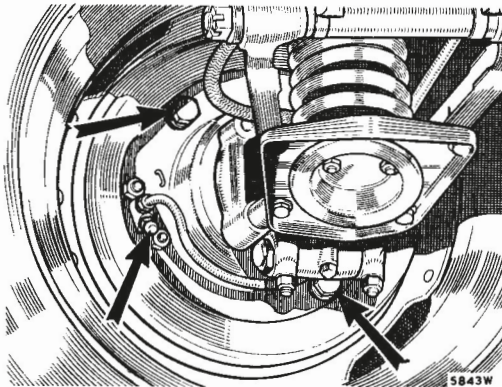
BRAKE ADJUSTMENTS

back off the adjuster until the shoe is just free of the drum. Repeat this operation for the second adjuster and shoe. Spin the wheel to ensure that the brake-shoes are quite free of the drum. Adjust the other front brake in the same manner and then release the jack.

With the front wheel scotched, jack up the rear of the car if possible so that the wheels are free to rotate with the hand brake fully released. Using an open-ended spanner, turn the squared end of the wedge-type adjuster in a clockwise direction until resistance is felt, i.e. both brake-shoes are touching the brake-drum. Back off the adjuster two 'clicks', which can be felt or heard, when the wheel should rotate freely. It should be noted that only one adjuster is provided for both shoes. Apply the foot brake to centralize the shoes and check that the wheel is free to rotate when the pedal pressure is relieved. Lightly oil the adjusting stems to prevent seizure of the threads. Carry out the same operations for the other rear wheel, apply the hand brake, and release the jack.

When jacking by means of the jack supplied with the car front and rear wheels must be adjusted alternately on each side of the car.

NOTE.—On no account must the brake-rods be used as a means of taking up brake lining or drum wear as they are correctly set at the Works on erection. All adjustment is automatically dealt with by the rear brake-shoe adjustment described in the foregoing instructions.



The front brake bleeder screw is located on the front cylinder body

To bleed air from the hydraulic system

Bleeding the system is not a routine maintenance operation and should only be necessary if some component of the hydraulic system has been disconnected, a leak has developed, or the fluid level has fallen too low in the supply tank.

Unlike the hydraulic fluid, air is compressible, and its effect when present in the system is to give a 'spongy' feel on the pedal and produce excessive travel. **During the bleeding operation the fluid reservoir must be kept at least a quarter full** and all union and pipe connections must be tight and leakproof.

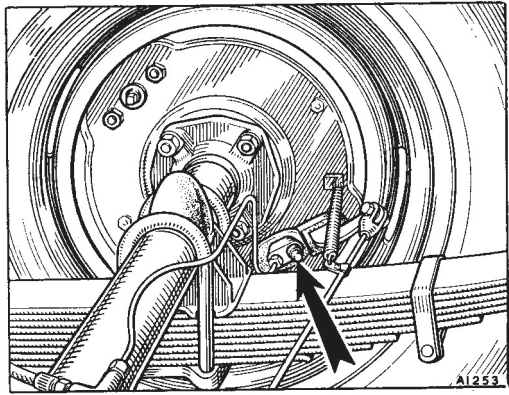
There are two master cylinders, one for the front brakes and one for the rear brakes. Disconnect the rod between the two cylinders so that one cylinder only

BRAKE ADJUSTMENTS

can be operated by the pedal in turn, or, alternatively, one front and one rear wheel cylinder can be bled simultaneously without disconnecting the operating rod.

There are four bleeding points, one on each brake backplate, as shown in the illustrations. The bleeding operation should commence at the wheel cylinder farthest away from the master cylinder and finish at the one nearest to it.

Clean off all dirt from and around the bleeder screw, attach the bleeder tube to the bleeder screw nipple, allowing the other end of the tube to hang into a glass jar filled with sufficient hydraulic fluid to immerse the end of the tube. Slacken the screw one complete turn. Instruct an assistant to depress the brake pedal with a slow full stroke and allow the pedal to return unassisted, repeating this pumping action with a pause before each depression of the pedal. Watch



The rear brake bleeder screw is located on the cylinder body

the flow of fluid into the glass jar, and when all air bubbles cease to appear tighten the bleeder screw during a down stroke of the pedal. Remove the tube and jar.

NOTE.—Clean fluid bled from the system should be allowed to stand until it is clear of all air bubbles before being used again. Used fluid, if not contaminated, may be filtered and used again.

Adjust the brake-shoes if necessary and top up the master cylinder, using Castrol Girling Brake and Clutch Fluid Crimson or fluid to Specification S.A.E. 70.R3.

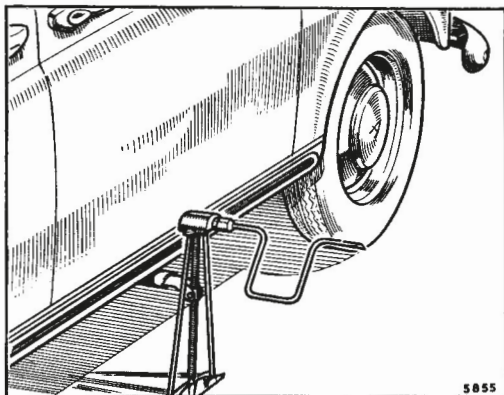
WHEELS AND TYRES

Jacking up

There are two jacking sockets, one on each side of the cab below the running-board at the front door position. Ensure that the spigot of the jack is fully home in the socket before screwing up the jack with the handle provided.

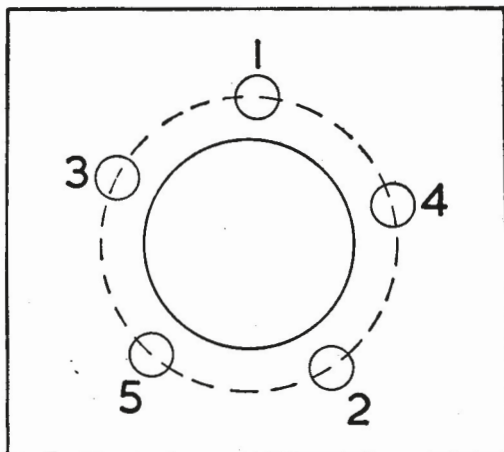
Removal and replacement of a road wheel

Apply the hand brake and scotch one of the wheels. Prise off the hub cover, using the flattened end of the wheelbrace. Do not lever the cover from the wheel



The use of the jack provided with the car will lift one side of the car so that two wheels are off the ground

Tighten the wheel nuts in the order shown to prevent distortion



centre but give a sideways twist with the tool provided. Slacken the wheel nuts half a turn, i.e. turn anti-clockwise to loosen all nuts on the vehicle. Jack up the vehicle sufficiently to enable a wheel with a fully inflated tyre to be removed. Remove the wheel nuts and lift off the wheel.

When replacing the wheel first **lightly** screw on the nuts, ensuring that their conical faces seat correctly in the recesses of the wheel stud holes. Lower the

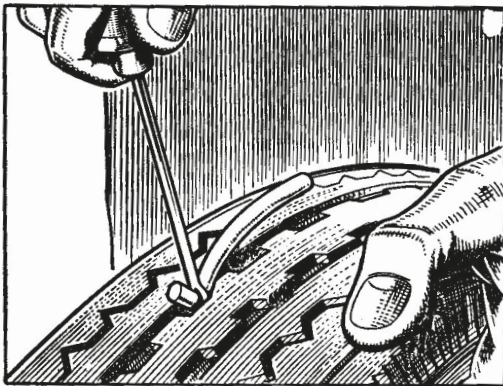
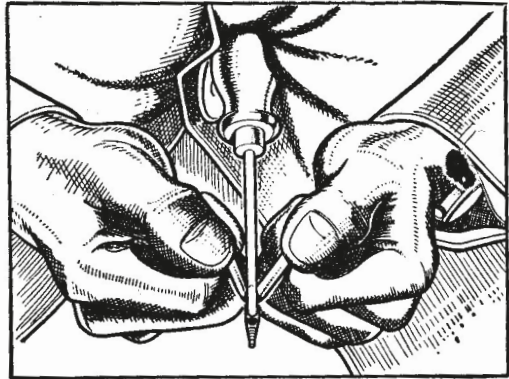
WHEELS AND TYRES

jack and fully tighten the wheel nuts in the order shown in the illustration. A torque wrench set to 65 lb. ft. (9.0 kg. m.) should be used to tighten wheel nuts whenever possible. Place the rim of the hub cover over two of the studs on the wheel centre and give the outer face of it a sharp blow with the fist over the third stud. Remove the jack and scotches.

Repairing simple tyre penetrations

Normally a tubeless tyre will not leak as the result of penetration by a nail or other normal puncturing object, provided that it is left in the tyre, but a repair should be effected at the earliest convenient time.

Pull the repairing plug into the eye of the needle



Insert the plug and needle through the hole in the tyre

In the case of a nail penetrating the tyre a repair can be carried out externally without removing the tyre from the rim, provided the special repair kit is available. If the hole fails to seal, mark the spot and extract the nail, taking note of the direction of penetration. If the tyre is leaking and the puncturing object cannot be located by sight it is necessary to remove the wheel from the vehicle and immerse the wheel and tyre in water.

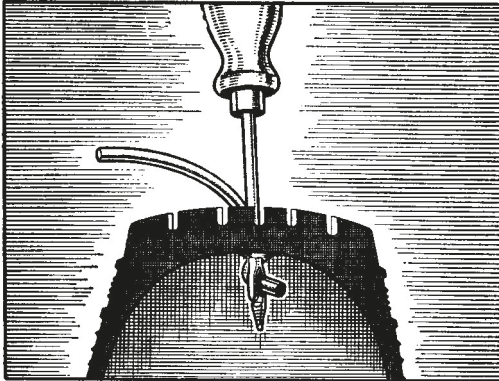
Insert the needle of the repair kit through the hole in the tyre, in the same direction as the penetration, to free it from road grit. Dip the needle into the

WHEELS AND TYRES

rubber solution and reinsert it through the hole, repeating this operation until the hole is well lubricated with the solution.

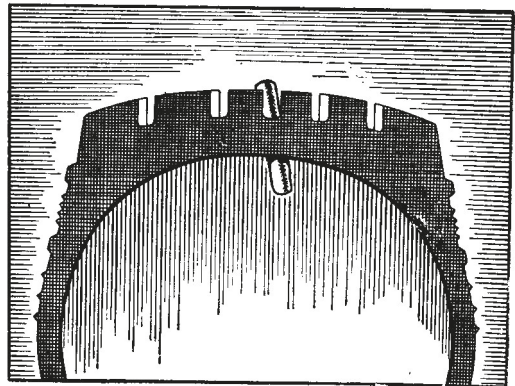
Select a repair plug of about twice the diameter of the puncturing object, stretch it, and roll it into the eye of the needle about $\frac{1}{4}$ in. (6 mm.) from its end. Dip the plug into the rubber solution and insert the needle through the hole in the tyre so that the end of the rubber plug passes through the hole into the interior of the tyre. Withdraw the needle, leaving the plug in the tyre, and cut off the plug about $\frac{1}{8}$ in. (3 mm.) from the surface of the tread.

Inflate the tyre (see 'Inflation after tyre fitting'), and when satisfied that there



The inserted plug prior to withdrawing the needle

The plug inserted into the tyre and cut off to the correct length



are no air leaks adjust to the recommended working pressure, when the tyre can be used immediately.

If the tyre deflates due to an unusually large penetration whilst on the road a normal inner tube may be fitted until it is convenient for the necessary repair to be effected. In such cases the valve used for the tubeless tyre must be removed.

Removal of a tyre

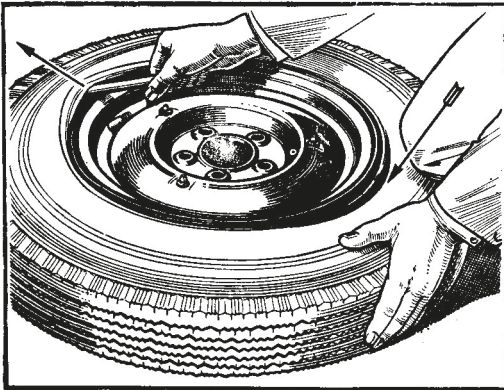
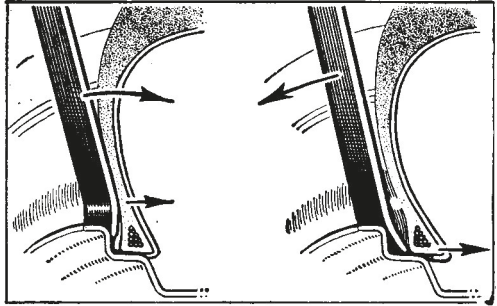
Removal of a tubeless tyre should be carried out in a similar manner to re-

WHEELS AND TYRES

moving a conventional tyre with tube, except that there is no tube and valve to remove. However, extra care should be taken when separating the tyre from the rim flange and lifting the bead over the rim flange in order that the bead is in no way damaged. When using ordinary tyre levers or bead-breaking tools ensure that they are in good condition and used properly so that they will not damage the bead rubber and so cause air leaks. **Keep the levers moistened with water** and proceed as follows.

Remove the wheel as previously described and deflate the tyre, if not already deflated. Inextensible wires are incorporated in the edges of the tyres—do not attempt to stretch the edges over the rim. The wire edges should be pushed into the rim base, using a tyre lever with its curved end as shown at the first position

Method of using the tyre levers to remove the tyre bead off the wheel rim



With the bead of the tyre held in the base of the rim, insert a lever close to the valve and lift the tyre bead over the rim

in the illustration. Insert the second tyre lever, with its curved end as shown at the second position in the illustration, into the space between the tyre and the rim and pull the lever away from and over the edge of the rim. Continue these operations until both edges of the beads are in the base of the rim. With the wheel flat on the ground and the bead of the tyre held in the base of the rim at a point diametrically opposite the valve insert a lever close to the valve and carefully lift the tyre bead over the rim. Using two levers at intervals of about 6 in. (15 cm.) apart, continue to lift the tyre bead over the rim until this bead is entirely free. Stand the tyre and wheel upright, keeping the bead in the base of

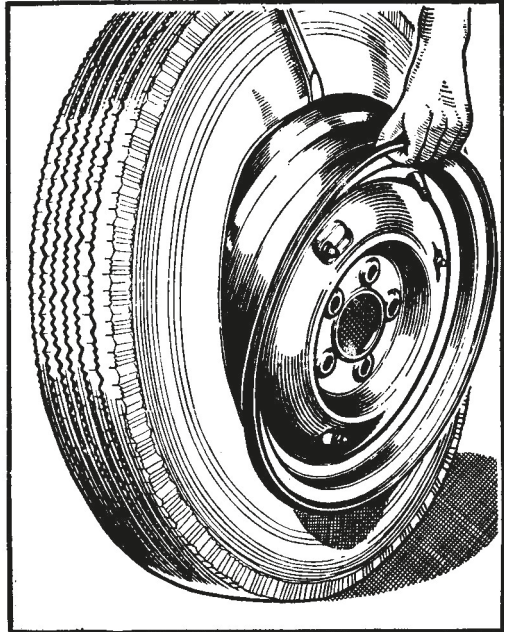
WHEELS AND TYRES

the rim. Lever the bead over the rim flange, and at the same time push the wheel away from the tyre with the other hand.

Repairing severe tyre penetrations

Severe penetrations which are outside the scope of the small repair kit can be repaired in a similar manner to conventional covers, which will necessitate the removal of the tyre.

Inspect the tyre for damage, removing any puncturing objects. Clean the area around the hole on the inside of the tyre, roughen with a scratch brush, and apply a rubber solution to the surface to receive an ordinary tube patch such as the Dunlop Vulcafix patch, or preferably use an uncured rubber patch and vulcanize it in position. In the event of more serious damage the tubeless tyre can



With the bead of the tyre in the base of the rim, the upper part of the tyre can be levered off the wheel

undergo a major vulcanized repair in the same way as a normal tyre. The tubeless tyre can also be retreaded.

Preparing the rim before fitting the tyre

Before fitting a tubeless tyre it is essential that the wheel flange and rim sea are perfectly smooth, otherwise an air-tight seat cannot be obtained. Rust, burrs and rubber may be removed with wire wool or emery, but if the rim is cracked or dented or if any rivets are loose the wheel should be removed to the workshop for attention.

To renew a valve

A valve should never be refitted once it has been removed from the rim, and it should be renewed every time a new tyre is fitted.

WHEELS AND TYRES

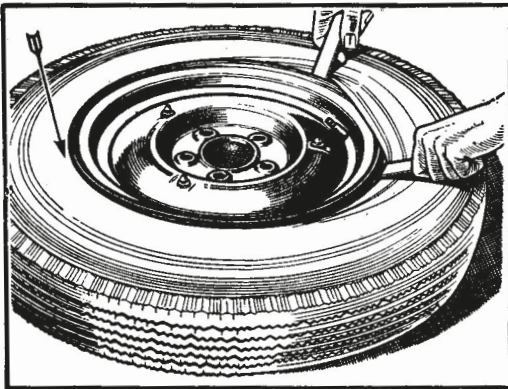
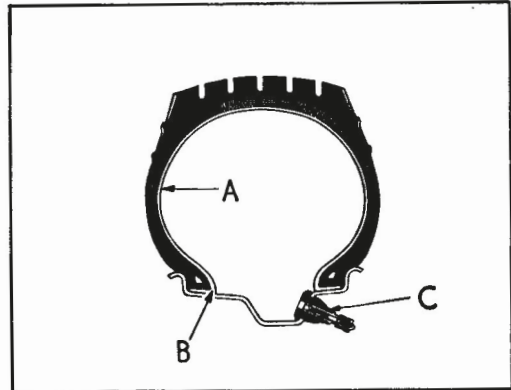
Cut out or pull outwardly the old valve from the rim.

Lubricate a new valve with soap solution and pull it through the rim hole from the inside. The valve should be pulled until the flange on the rubber base of the valve is in full contact with the inner rim surface. If the valve is pulled too far the base will be damaged and another new valve will have to be fitted.

The use of the Schrader valve mounting tool No. 553 is recommended so as to avoid damage.

A section through the tubeless tyre, showing the valve in position

- A. Air-retaining liner.
- B. Rubber air seal.
- C. Rubber-sealed valve.



With the tyre bead held in the base of the rim, opposite the valve, the final fitting can be carried out without undue force

Replacement of a tyre

When replacing the tyre a similar technique has to be employed to that used for removal, still exercising care not to damage the tyre beads. Wipe clean and moisten the beads of the tyre, the rim flanges, and the tyre levers with clean water. **Do not use petrol.** Do not attempt to use undue force: the tyre will pass over the rim quite easily if the opposite edge of the tyre is kept in the base of the rim. The valve interior should be removed before finally finishing the fitting of the tyre at the valve position.

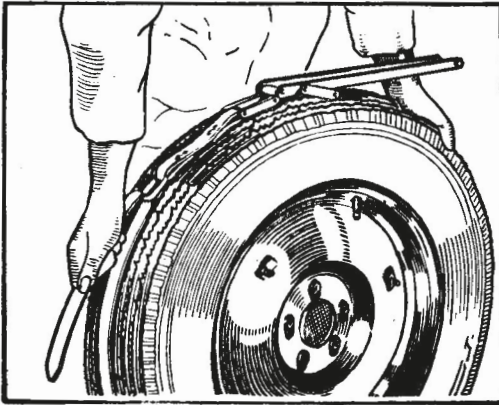
WHEELS AND TYRES

Inflation after tyre fitting

Before inflating the tyre bounce the crown of the tyre on the ground at various points round its circumference to snap the beads home against the rim. This will provide a partial seal. Connect an air-line to the valve, with its interior plunger omitted, and inflate the tyre with the wheel in an upright position. If a seal cannot be effected by the first rush of air bounce the tyre on its crown at various points round the circumference with the air-line still attached. In cases of difficulty apply the special tourniquet, consisting of a strap incorporating a lever, but a suitable strong cord or rope around the circumference of the tread and a twisting bar or stick will also serve. If no air-line is available and the tyre has to be inflated by a foot- or hand-pump, then the use of a tourniquet is essential to force the beads outwards against the rim flanges to effect a seal.

When the initial seal has been effected remove the air-line, insert the valve interior, and re-inflate for test purposes to 50 lb./sq. in. (3.5 kg./cm.²).

Allow the tyre to stand for a few minutes so that any free air trapped between the flange and the bead clinch can escape. Test the complete wheel in a water-



The use of a tourniquet will assist in sealing the tyre beads against the wheel rim

tank to check for leaks, special attention being paid to the areas at the beads, valve, and wheel rivets. Should leakage occur at the valve base, this can only be rectified by renewing the valve, which can be pulled out of the rim. If leakage occurs around the bead seat and flange rivets or the valve, mark the positions of the leaks and report for workshop attention.

When satisfied that there are no air leaks and that the tyre is correctly fitted adjust the tyre to the correct working pressure and replace the wheel on the vehicle.

Care of the tyres

The life of the tyres depends largely upon the load and inflation. Test the pressures in the tyres regularly and restore any air pressure that has been lost. After the tyre pressures have been checked see that all valve caps are securely in place. The tyre valve is the actual seal, but the valve cap acts as a secondary sealing unit.

An underinflated tyre causes the cords to pull loose and break as well as

WHEELS AND TYRES

producing excessive and irregular tread wear. When a tyre is grossly overinflated only the centre of the tread comes into contact with the road; wear is then more rapid because it is concentrated on a small section of the tread. The wheels will also bounce more and spin unnecessarily.

Do not allow oil or grease to contact the tyres unnecessarily.

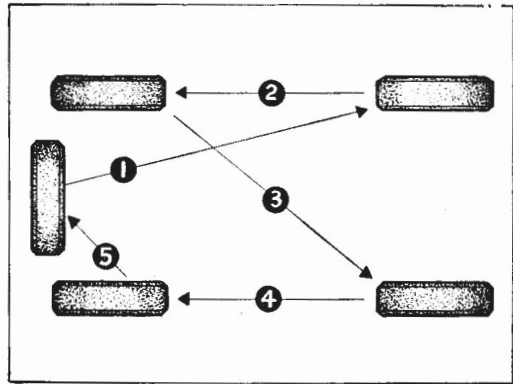
Prompt repairs will save tyres that might otherwise be ruined in a short distance.

Valve interiors

It is advisable always to have spare interiors handy, and these are procurable suitably packed in small metal containers. A small extracting and fitting tool is available for this.

Always make sure that valve interiors are screwed well home on replacement.

The running positions of the tyres should be changed at the recommended intervals so as to regularize tyre wear



Tyre valves

The air-tightness of the valve depends upon the proper functioning of its interior. It may be tested for air-tightness by rotating the wheel until the valve is at the top and inserting its end in an eggcup full of water. If bubbles appear the interior is faulty and should be replaced by a new one.

Checking tyre pressures

The tyre pressures should be checked and, if necessary, adjusted at least once a week. Gauges for testing tyre pressures can be bought from all reputable motor dealers.

The correct tyre pressures are given under 'GENERAL DATA'.

Valve caps

The valve caps should be kept firmly tightened to prevent dust and water entering and damaging the valve seats. The caps also act as an additional air seal.

When they are removed for tyre inflation or removal they should always be placed in a clean place.

MAINTENANCE ATTENTIONS

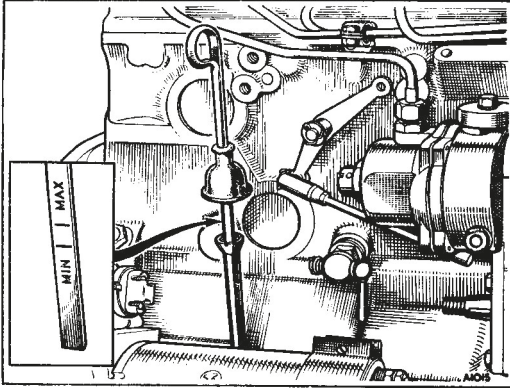
WEEKLY

Radiator

Check the level of the water in the radiator, and top up if necessary.

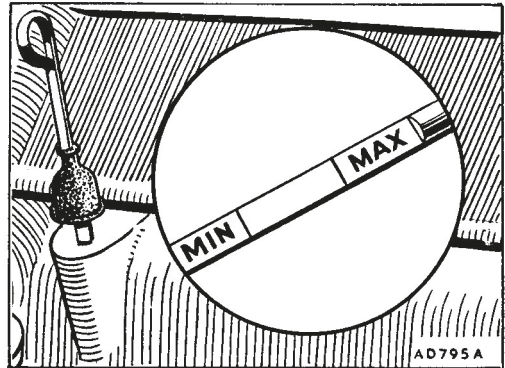
Checking the engine oil

Check the oil level in the engine sump with the car on level ground and the engine switched off, otherwise an accurate reading will not be possible. Top up



The diesel engine oil dipstick with the markings shown in the inset

The petrol engine oil level dipstick

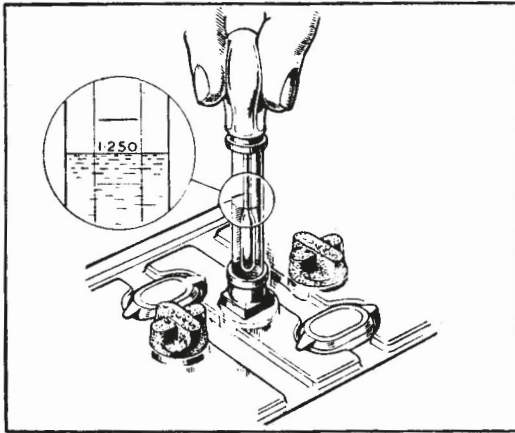


if necessary through the filler on the valve gear cover. The dipstick is marked to show the maximum and minimum permissible oil levels, and these levels should never be exceeded. If the engine has been running give the oil time to settle down before checking.

Batteries

Raise the bonnet for access to the batteries. Remove the battery cell filler plugs and add sufficient **distilled** water to bring the surface of the electrolyte level **with the top of the separators**. Take care not to overfill the cells and do not use a

naked flame when examining them. Tap-water must not be used. Always clean the battery top before removing the filler plugs.



The correct use of the hydrometer, which may also be used for topping-up purposes

Tyre pressures

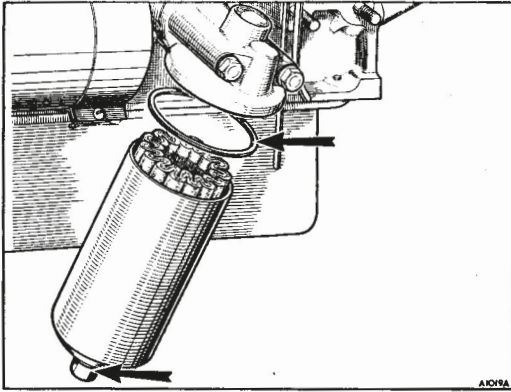
Check all tyre pressures with a gauge and, if necessary, inflate to the recommended pressures. Ensure that the valves are fitted with screw caps and, inspect the tyres for possible damage. Wipe off any oil or grease.

EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

External oil filter (diesel models)

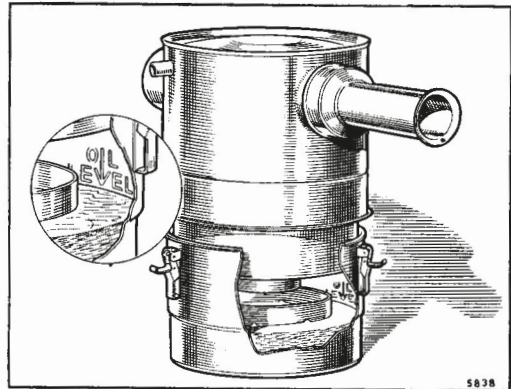
The engine oil filter element must be renewed at the same time as the engine oil change is carried out.

Release the filter bowl by unscrewing the centre-fixing bolt securing the bowl to the filter head. Remove and discard the filter element, wash the filter bowl in petrol, and allow to dry. Install a new element in the filter bowl, ensure that the joint washer in the filter head is positioned correctly and in good condition, and reassemble the filter. Start the engine, ensure that the oil pressure gauge registers within 30 seconds, allow the engine to warm up thoroughly, and then check the filter for oil leaks.



The diesel engine oil filter, showing the joint washer and fixing bolt

The oil-bath-type air cleaner (diesel models)



Air cleaner (diesel models)

Servicing must be carried out at the recommended intervals, or more often if excessively dusty conditions are experienced.

Remove the nuts and bolts securing the air cleaner strap and disconnect the hoses. Remove the air cleaner from the car, taking care to keep it level to avoid spilling the oil.

Release the three clips and withdraw the filter element from the container.

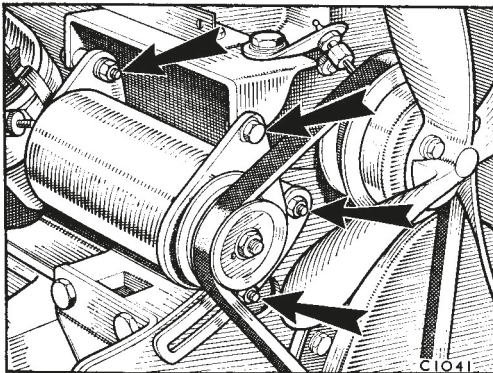
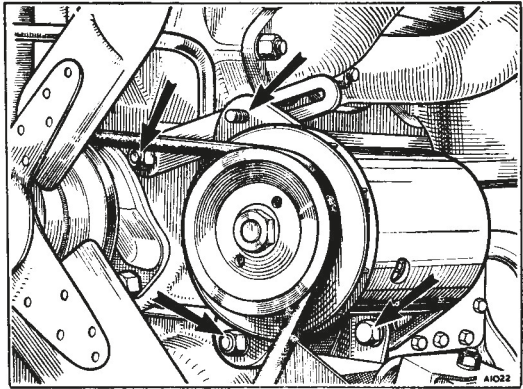
EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

Wash the filtering end of the air cleaner in petrol and allow it to drain and dry out. Empty the container base and clean out all oil and sludge. Refill the base with new oil to Ref. A up to the shoulder indicated by an arrow on the wall of the container. Reassemble the air cleaner and refit it to the car.

Fan belt adjustment

Fan belt adjustment is effected by slackening the two dynamo pivot bolts and the bolts securing the dynamo to the slotted link and the link to the engine. Using a hard hand pressure, press the dynamo downwards, thereby taking up any slackness in the belt.

The diesel engine fan belt adjusting bolts



The petrol engine fan belt adjusting bolts

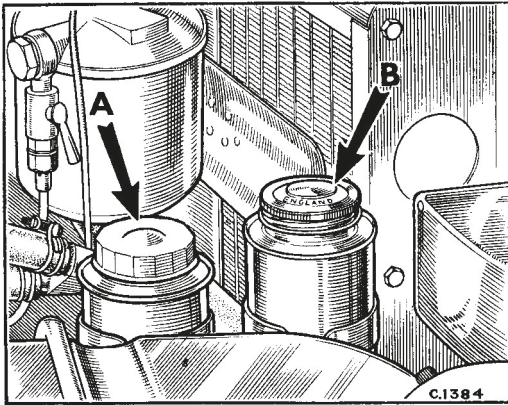
The belt must be adjusted so that when the securing bolts are finally tightened the vertical run of the belt can be pressed in $\frac{1}{2}$ in. (13 mm.) at the centre by normal thumb pressure. It is important that the fan belt is always run taut as any slackness will cause slip and rapid wear of the belt. Care should also be taken to avoid overtightening the belt, otherwise undue strain will be thrown on the dynamo bearings.

EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

Clutch and Brake fluid

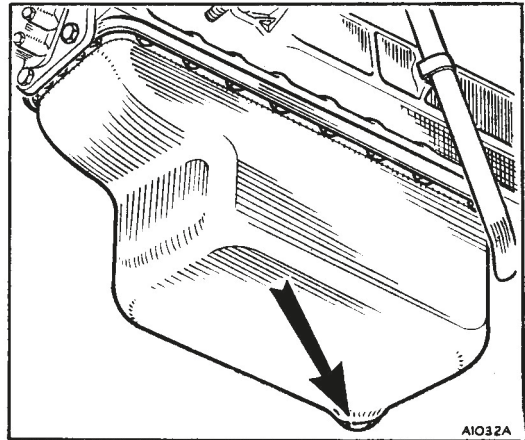
Normally very little fluid is required for topping-up purposes, therefore a considerable or rapid fall in the fluid level indicates a leak in the system which must be traced and rectified. An indication that the fluid level is abnormally low or that bleeding is necessary will be given when the pedal has a 'soft' or a 'spongy' action. If the pedal has to be pumped in order to apply the brakes it indicates that bleeding is necessary.

The fluid reservoirs are located under the bonnet on the mudwing valance. Wipe away any dirt from and around the filler caps, as it is most essential that no dirt enters the reservoirs, and remove the filler caps. Top up the reservoirs



The clutch (A) and brake (B) fluid reservoirs

The engine oil sump drain plug



with the recommended fluid until the level is within $\frac{1}{2}$ in. (13 mm.) of the bottom of the filler neck. Do not overfill or there will be a tendency to leak, due to splash. Replace the filler caps. Use only **Castrol Girling Brake and Clutch Fluid Crimson** or fluid to Specification S.A.E. 70.R3.

EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

Draining the sump

The oil in the sump should be drained to clear the sump of any impurities that may have accumulated and then refilled with the appropriate grade of lubricant. This operation is best carried out when the oil is warm.

The hexagon-headed drain plug in the bottom of the sump should be removed to release the contents of the sump. After carefully cleaning the drain plug it should be replaced and screwed up firmly.

Refill the sump with fresh oil to Ref. A.

Synchromesh gearbox

Open the cover in the cab floor; clean around the gearbox combined filler plug and dipstick. With the vehicle on level ground, take a dipstick reading and add sufficient oil to Ref. F to bring the level up to the indicated mark on the dipstick.

Checking the rear axle oil

With the car standing on level ground clean away all dirt from and around the oil filler plug and remove the plug.

Top up if necessary to the level of the bottom thread in the oil plug aperture with oil to Ref. C and replace the plug.

Steering-box, idler, and column

Wipe away all dirt from and around the oil level plug and inject oil to Ref. C to bring the level up to the filler plug aperture. A graphite-impregnated felt bush is fitted at the top of the steering-column, but should a squeak develop at this point this may be cured by introducing a few drops of oil into the top of the column tube.

Steering gear connections

Lubricating nipples are provided at the top and bottom of each swivel pin and on the steering tie-rods. Wipe away all dirt from the nipples and inject lubricant to Ref. D giving three or four strokes of the gun to each nipple.

Hand brake rods

Lubricate all clevis pins by means of the oilcan. Wipe away all dirt from the nipple on the brake rod compensator on the rear axle and inject lubricant to Ref. D giving three or four strokes of the gun.

Clutch operating shaft

There are two lubricating nipples, one at each end of the shaft. Wipe away all dirt from nipples before lubricating to Ref. D.

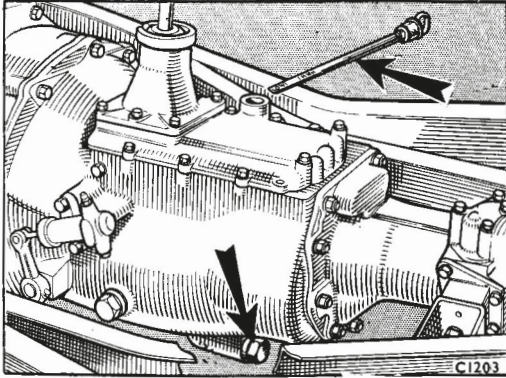
Propeller shaft

There are three lubricating nipples, one on each of the universal joints and one on the sliding sleeve. Wipe away all dirt from the nipples and inject lubricant to Ref. D giving three or four strokes of the gun to each nipple.

Brake pedal

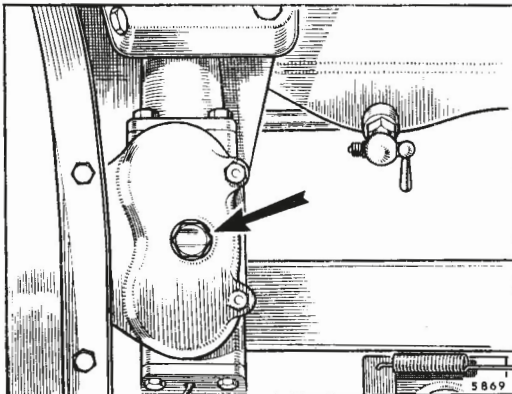
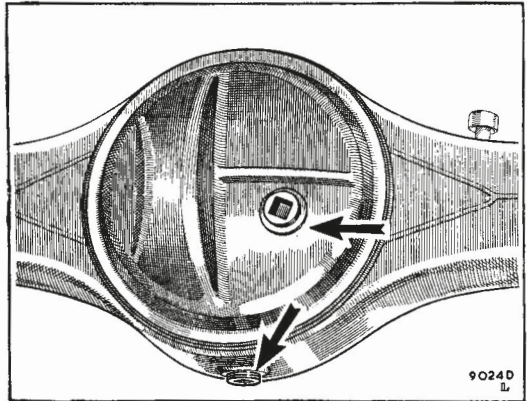
Wipe away any dirt from and around the brake pedal shaft nipple and inject lubricant to Ref. D giving three or four strokes of the gun. Apply oil to the master cylinder compensating lever pivot.

EVERY 3,000 MILES (5000 Km.) OR 150 HOURS



The synchromesh gearbox oil filler and drain plugs

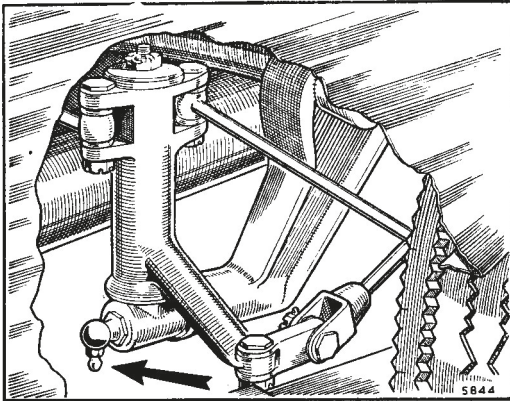
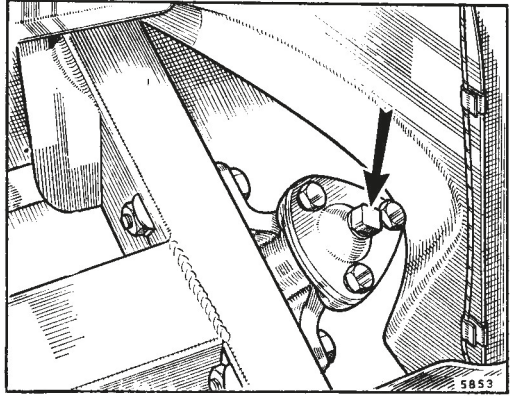
The oil filler and level plug is the upper one indicated here and is screwed into the rear face of the rear axle



The steering-box filler plug

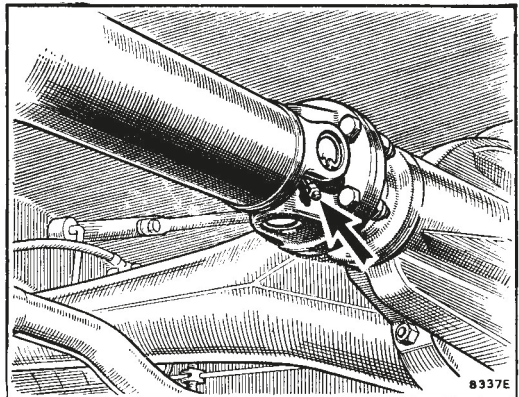
EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

The steering idler filler plug

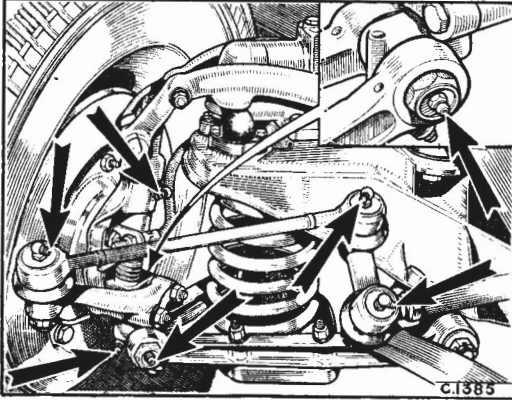


The brake-rod compensator lubricating nipple on the rear axle

The lubricating nipple for the rear universal joint

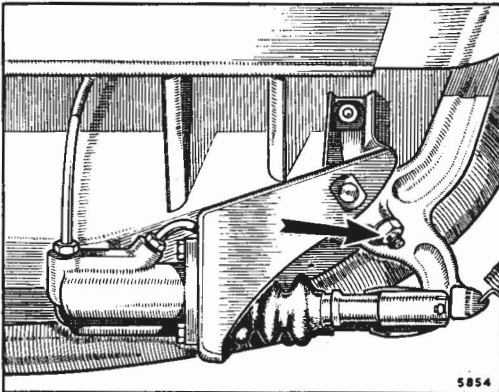
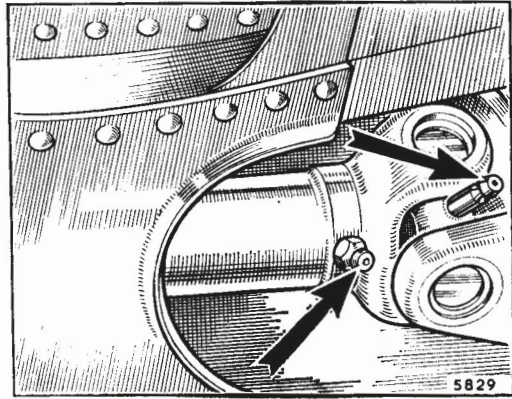


EVERY 3,000 MILES (5000 Km.) OR 150 HOURS



The front suspension and steering connection lubricating nipples which require regular attention. This illustration shows the right-hand side only

The lubricating nipples for the front universal joint and sliding sleeve



The brake pedal lubricating nipple

EVERY 3,000 MILES (5000 Km.) OR 150 HOURS

Rear spring leaves

A lubricating nipple is provided on each rear spring. Lubricate to Ref. D.

Automatic gearbox and converter

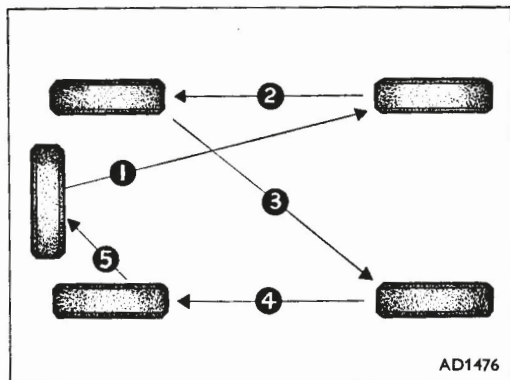
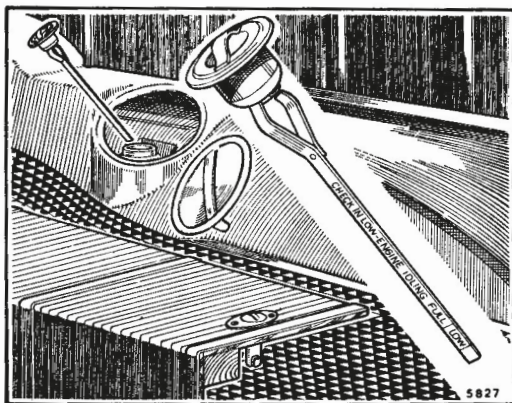
Run the car onto a level surface and apply the hand brake.

Place the selector lever at 'L' and allow the engine to idle until it reaches its normal running temperature.

Open the cover in the floor and clean around the gearbox dipstick.

With the engine still running take a dipstick reading and add sufficient fluid to Ref. B to bring the level to the 'FULL' mark on the dipstick. Do not overfill.

The gearbox and converter oil filler, showing the markings on the dipstick



The running positions of the tyres should be changed at the recommended intervals so as to regularize tyre wear

Tyres—running position

Change the running position of the tyres as shown in the illustration. This will equalize the tyre wear of the front and rear wheels and prolong the life of the tyres. Check the tyre pressures after the wheels have been changed round.

Inspect the tyres frequently and remove any pieces of flint, stone, or glass which have become embedded in the covers.

For a complete summary of the attentions to be given every 3,000 miles (5000 km.) or 150 hours see page 68.

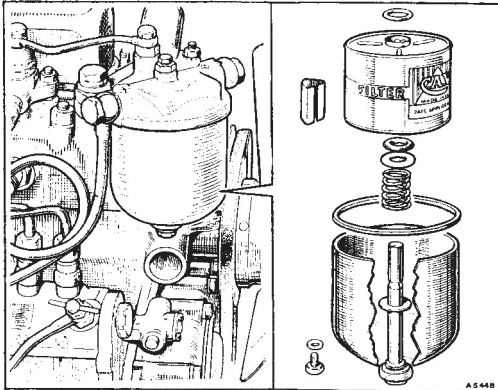
EVERY 6,000 MILES (10000 Km.) OR 300 HOURS

'In-line' fuel injection pump cambox (diesel models)

Top up the level of the lubricant in the 'in-line' fuel injection pump cambox.

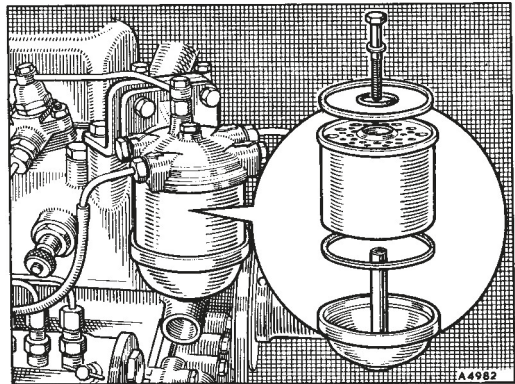
Clean off the exterior of the injection pump and unscrew the two securing screws to release the inspection cover from the side of the pump. Top up the spring chamber with oil to Ref. A until it flows from the leak-off pipe on the cambox.

Refit the inspection cover, ensuring that its joint washer will make an oil-tight joint.



Components of the early-type diesel main fuel filter

Components of the later bowl-less-type diesel main fuel filter



Main fuel filter (diesel models)

Renew the main fuel filter element, which is of the paper type and is not intended to be cleaned.

To renew the element of the early-type filter unscrew the bleed plug and the drain plug a few turns and drain the fuel in the filter bowl into a suitable receptacle. Unscrew the centre cap nut or bolt in the filter head and withdraw the filter bowl complete with element. Discard the element, thoroughly wash the bowl in petrol, and allow it to dry. Install a new filter element in the bowl with

EVERY 6,000 MILES (10000 Km.) OR 300 HOURS

its perforated end facing downwards and refit the filter bowl and element, ensuring that the bowl seats properly on the sealing washer in the filter head.

The latest-type main fuel filter is of the bowl-less type, the element being clamped between the filter head and base castings.

To renew the element support the base and unscrew the retaining bolt located in the centre of the head casting. Detach the base casting and, using a twisting movement, separate the element from the head casting. Remove the three sealing rings from their locations in the head and base castings.

Thoroughly wash the base casting in petrol and, when dry, remove any residue.

Bleed the fuel system.

Fuel lift pump (petrol models)

The fuel lift pump is located on the left-hand side of the engine. Unscrew the central cap bolt and remove the cap and gauze. Clean the gauze in petrol, using a stiff brush or an air jet to dislodge particles. Clean out the fuel chamber and reassemble the gauze and cap, ensuring that the cork (or rubber) gasket is in good condition. Tighten the cap bolt sufficiently to make a fuel-tight joint. **Do not overtighten.**

Sparking plugs (petrol models)

Plugs should be cleaned and tested, preferably by a service garage with a special 'air-blast' service unit. The gap between the points should be set at $\cdot 025$ in. ($\cdot 64$ mm.).

When adjusting the gap move the side wire—never bend the centre electrode.

A combined setting tool and gauge can be obtained from the Champion Sparking Plug Co. or from your Distributor or Dealer.

Distributor (petrol models)

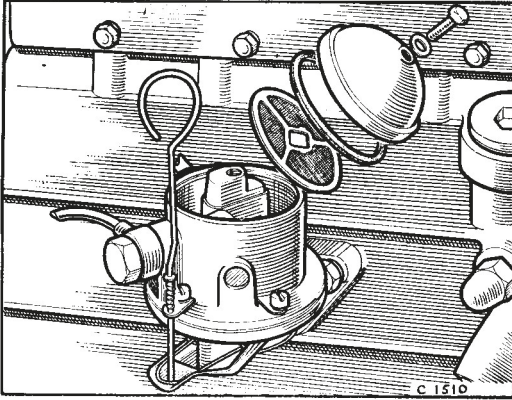
Remove the distributor cap and turn the engine by hand until the contacts are fully opened. Check the gap with a $\cdot 014$ to $\cdot 016$ in. ($\cdot 36$ to $\cdot 40$ mm.) feeler gauge: the gauge should be a sliding fit in the gap. If the gap varies appreciably from the gauge slacken the contact plate securing screw and adjust the contact gaps by moving the contact plate by means of a screwdriver inserted in the notched hole. Tighten the securing screw.

If the contact breaker points are burned or blackened, clean them with a fine carborundum stone or with very fine emery-cloth.

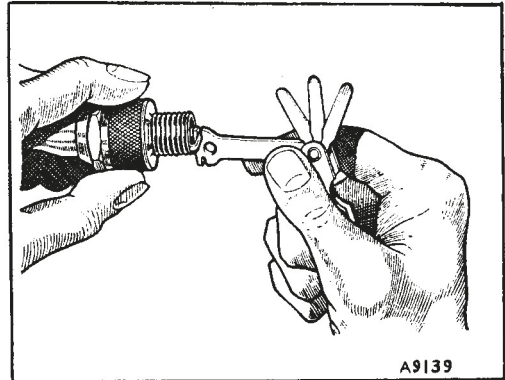
Cleaning of the contacts is made easier if the contact breaker lever carrying the moving contact is removed. To do this unscrew the nut securing the end of the spring, remove the spring washer, flat washer, and both wire terminals, and lift off the lever complete with spring. After cleaning, check the contact breaker setting on replacement.

Check the functioning of the automatic retard and advance device, and lubricate as indicated before replacing the distributor cap.

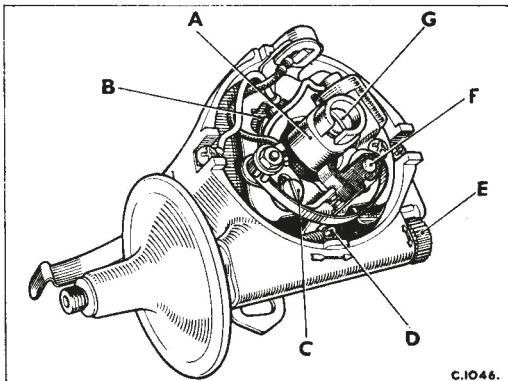
EVERY 6,000 MILES (10000 Km.) OR 300 HOURS



The petrol engine fuel lift pump



Using the Champion spark-plug gauge and setting tool



The lubrication points of the distributor are indicated at (A), (D), (F), and (G)

EVERY 6,000 MILES (10000 Km.) OR 300 HOURS

External oil filter (petrol models)

The external oil filter is of the renewable element type and is located on the right-hand side of the cylinder block. Unscrew the central casing bolt, remove the casing, and discard the filter element. Wash out the casing with petrol and dry it before replacing it with a new element.

Valve rockers

The clearance between the valve rockers and valves must be .012 in. (.30 mm.) for both inlet and exhaust valves when the engine is cold.

To reach the rocker gear the air cleaner and rocker cover must be removed. Instructions for removing the air cleaner are given on pages 50 and 61. Lift off the valve rocker cover after removing the cap nuts and two lifting brackets.

Test the clearance between the rocker arms and the valve stems by inserting a .012 in. (.30 mm.) feeler gauge between them. The gauge should be a sliding fit when the valves are tested in the following order:

Check No. 1 valve with No. 8 fully open.

”	”	3	”	”	”	3	”	”
”	”	5	”	”	”	4	”	”
”	”	2	”	”	”	7	”	”
”	”	8	”	”	”	1	”	”
”	”	6	”	”	”	3	”	”
”	”	4	”	”	”	5	”	”
”	”	7	”	”	”	2	”	”

To adjust the clearance slacken the adjusting screw locknut on the opposite end of the rocker arm and rotate the screw in a clockwise direction to reduce the clearance or in an anti-clockwise direction to increase it. Retighten the locknut when the clearance is correct, holding the screw against rotation with a screw-driver.

Refit the rocker cover, ensuring that the cork gasket is correctly positioned beneath it.

Air cleaner (petrol models)

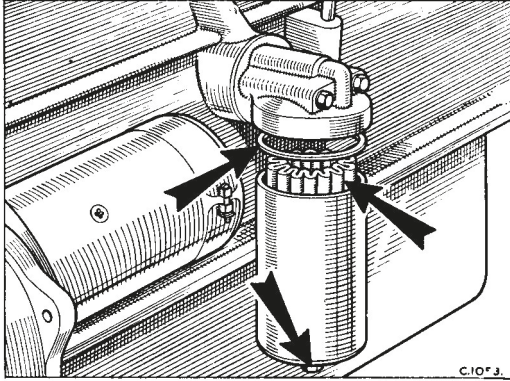
Servicing must be carried out at the recommended intervals, or more often if excessively dusty conditions are experienced.

Remove the nuts and bolts securing the air cleaner straps and disconnect the hoses. Remove the air cleaner from the vehicle, taking care to keep it level to avoid spilling the oil. Unscrew the hand-nut or centre-fixing bolt and withdraw the filter element from the container. Wash the filtering end of the air cleaner in petrol and allow it to drain and dry out. Empty the container base and clean out all oil and sludge. Refill the base with new engine oil up to the shoulder indicated by an arrow on the wall of the container. Reassemble the air cleaner and refit it to the engine.

Dynamo

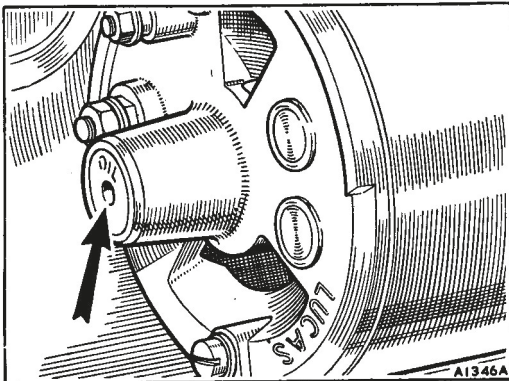
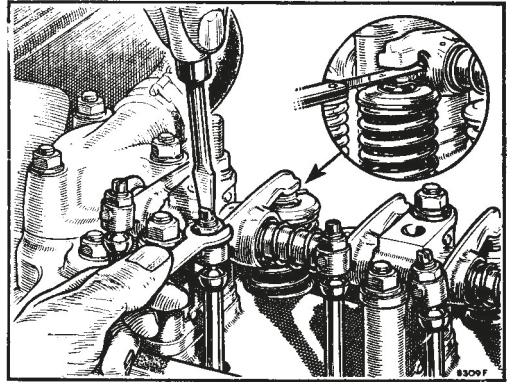
Add two or three drops of engine oil to the lubricating hole for the dynamo end bearing on the commutator end bracket. Avoid over-lubrication.

EVERY 6,000 MILES (10000 Km.) OR 300 HOURS



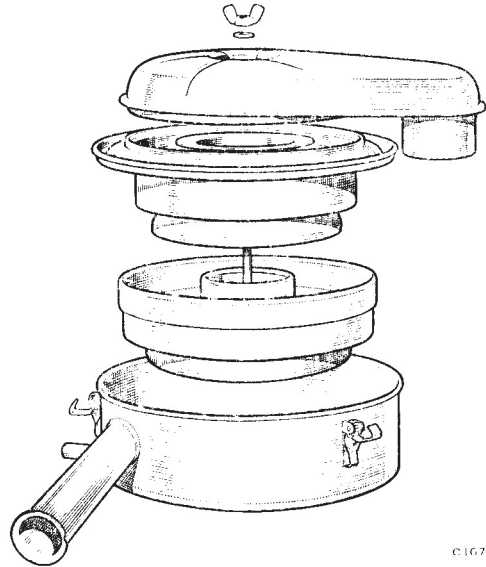
The petrol engine oil filter, showing the joint washer, element, and fixing bolt

The method of adjusting the valve rocker clearance and the correct position for measuring it



Lubricate the dynamo through the hole indicated

EVERY 6,000 MILES (10000 Km.) OR 150 HOURS



The petrol engine air cleaner

C1670A

Synchromesh gearbox oil change

To facilitate draining, the oil should preferably be warm (immediately after a run).

Clean off all dirt from and around the filter and drain plugs, and with the vehicle on level ground place a suitable receptacle under the drain plug and remove the plugs.

After the oil has drained completely replace the drain plug and refill the gearbox with new oil to Ref. F up to the level indicated on the dipstick.

Draining and refilling the rear axle

The rear axle drain plug is located in the bottom of the centre case and is accessible from underneath the rear of the car. To facilitate draining, the oil should preferably be warm (immediately after a run).

Clean off all dirt from and around the filler and drain plugs, and with the car on level ground place a suitable receptacle under the drain plug and remove the filler and drain plugs.

After the oil has drained completely from the axle replace the drain plug and refill the axle with new oil to Ref. C up to the level of the filler plug aperture. Replace the filler plug.

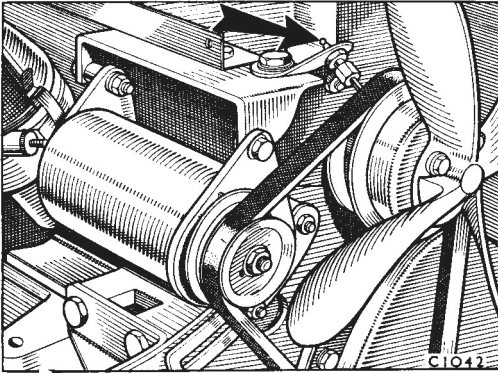
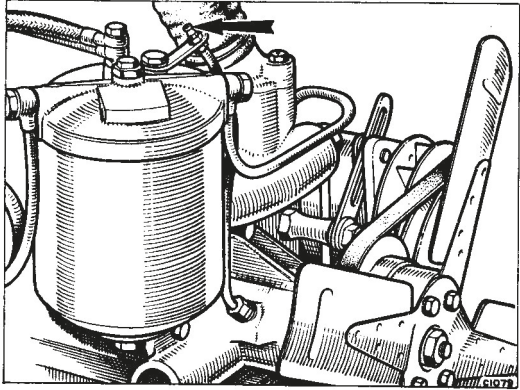
For a complete summary of the attentions to be given every 6,000 miles (10000 km.) or 300 hours see page 50.

EVERY 12,000 MILES (20000 Km.) OR 600 HOURS

Engine sump

Owing to the varying conditions under which engines operate 'sludge' forms in the engine oil and progressively chokes the gauze strainer mounted on the base of the oil pump. We recommend that the engine sump and oil strainer should be removed, cleaned thoroughly and replaced. At the same time the crankcase should be cleaned internally. This work should be entrusted to your workshop or Authorized Distributor or Dealer.

The water pump lubricating nipple on the diesel engine



The water pump lubricating nipple on the petrol engine

Water pump lubrication

Inject a small quantity of lubricant to Ref. 'D'. The lubrication of the pump must be done very sparingly, otherwise the lubricant will leak past the bearings onto the face of the seal and impair its efficiency.

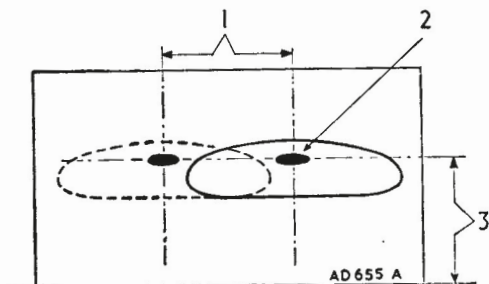
EVERY 12,000 MILES (20000 Km.) OR 600 HOURS

Headlamp beam-setting adjustment

Remove the headlamp rim and dust excluder to expose the beam-adjusting screws. Drive the loaded vehicle to a position facing a screen at a distance of approximately 25 ft. (7.6 m.), compare the illumination of each lamp individually with that shown in the illustration, and adjust if necessary or in accordance with with local regulations.

Headlamp beam-setting screen

1. Distance between centres of lamps.
2. Concentrated area of light
3. Height of centres of lamps from the ground.



For a complete summary of the attentions to be given every 12,000 miles (20000 km.) or 500 hours service see page 69.

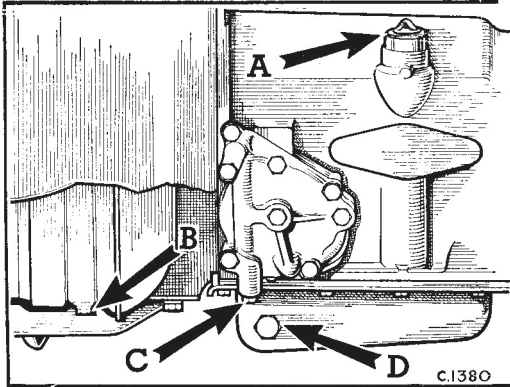
EVERY 24,000 MILES (40000 Km.) OR 1,200 HOURS

Automatic gearbox and converter

Run the car onto a level surface, stop the engine, and apply the hand brake. Remove the drain plug in the left-hand side of the gearbox and allow the fluid to drain.

Turn the engine until the converter drain plug is at the bottom; remove the plug and drain the converter.

Remove the converter pressure take-off plug from the bottom of the reverse servo cylinder.



The automatic gearbox and converter fluid drain plugs

- | | |
|--------------------------|----------------------------------|
| A. Dipstick and filler. | C. Converter pressure take-off. |
| B. Converter drain plug. | D. Transmission case drain-plug. |

When all the fluid has drained away refit the three drain plugs after thoroughly cleaning them.

Remove the dipstick and pour in 10 pints (5.7 litres) of the recommended fluid.

Start the engine and allow it to idle for one minute with the selector lever at 'L' to make sure that the converter is filled with fluid from the gearbox case.

With the engine idling and the lever at 'L', slowly add fluid to bring the level to the 'FULL' mark on the dipstick.

BODYWORK

Coachwork

Regular care of the body finish is necessary if the new appearance of the vehicle exterior is to be maintained against the effects of air pollution, rain, and mud.

Wash the bodywork frequently, using a soft sponge and plenty of water containing a mild detergent. Large deposits of mud must be softened with water before using the sponge. Smears should be removed by a second wash in clean water, and with the sponge if necessary. When dry, clean the surface of the vehicle with a damp chamois-leather. In addition to the regular maintenance, special attention is required if the vehicle is driven in extreme conditions such as sea spray, or on salted roads. In these conditions and with other forms of severe contamination an additional washing operation is necessary which should include underbody hosing. Any damaged areas should be immediately covered with paint and a complete repair effected as soon as possible. Before touching-in light scratches and abrasions with paint thoroughly clean the surface. Use petrol/white spirit (gasoline/hydrocarbon solvent) to remove spots of grease or tar.

The application of B.M.C. Car Polish is all that is required to remove traffic film and to ensure the retention of the new appearance.

Bright trim

Never use an abrasive on stainless, chromium, aluminium, or plastic bright parts and on no account clean them with metal polish. Remove spots of grease or tar with petrol/white spirit (gasoline/hydrocarbon solvent) and wash frequently with water containing a mild detergent. When the dirt has been removed polish with a dry cloth or chamois-leather until bright. Any slight tarnish found on stainless or plated components which have not received regular washing may be removed with B.M.C. Chrome Cleaner. An occasional application of mineral light oil or grease will help to preserve the finish, particularly during winter when salt may be used on the roads, but these protectives must not be applied to plastic finishes.

Windscreen

If windscreen smearing has occurred it can be removed with B.M.C. Screen Cleaner.

A razor blade will remove transfers from the window glass.

The B.M.C. approved products mentioned above are obtainable from your Distributor or Dealer.

MAINTENANCE SUMMARY

Periodic servicing—vehicles in use

The servicing instructions given in the following table show in a clearly arranged and concise manner the attentions required to maintain the vehicle in an efficient condition under normal conditions of work and climate.

Extreme climatic conditions may, however, necessitate alterations to the intervals at which some of the attentions are given, and it must be left therefore to the discretion of operators on the spot to vary these intervals to suit local conditions.

Where the actual distance run in a given period is small it may be advisable to apply the instructions on a 'time' instead of on a 'distance' basis.

When checking nuts which are split-pinned or secured by tab washers examine for signs of movement or leakage before attempting to tighten them with a spanner. Only hand pressure should be used when checking for tightness with a spanner, and a torque wrench used when called for in the instructions. **Do not overtighten.**

Weekly service

Check the oil level in the engine sump, and top up if necessary.

Check the water level in the radiator, and top up if necessary.

Check the battery electrolyte level, and top up if necessary.

Check the tyre pressures, and correct if necessary.

3,000 miles (5000 km.) or 150 hours service

Carry out the weekly service, with the following additions:

Diesel models

Fit a new engine oil filter element.

Drain, clean, and re-fill the air cleaner.

Check the maximum engine speed under light load conditions.

Petrol and diesel models

Check the fan belt tension, and adjust if necessary.

Check the clutch pedal free travel, and adjust if necessary. Check the fluid reservoir level, and top up if necessary.

Check the brake pedal and hand brake travel, and adjust if necessary.

Make a visual inspection of brake pipes.

Check the fluid level in the brake master cylinder reservoir, and top up if necessary.

Drain the engine sump and refill with new oil.

Check the oil level in the synchromesh gearbox, rear axle, steering-box, and idler, and top up if necessary.

Lubricate all chassis nipples, and accelerator, hand brake, and pedal linkages.

Check the oil level in the automatic transmission and converter, and top up if necessary.

Lubricate the gear selector linkage.

Change the road wheels round diagonally.

Change the road wheels round diagonally (including spare) to regularize tyre wear.

MAINTENANCE SUMMARY

6,000 miles (10000 km.) or 300 hours service

Carry out the 3,000 miles (5000 km.) or 150 hours service, with the following additions:

Diesel models

Top up the oil level in the 'in-line' fuel injection pump cambox.

Renew fuel filter on the engine.

Petrol models

Clean the fuel lift pump filter.

Clean the carburetter float-chamber and set the slow running.

Clean and adjust the sparking plugs.

Check the functioning of the automatic retard and advance mechanism.

Clean the distributor contact points, and adjust if necessary.

Lubricate the distributor.

Petrol and diesel models

Fit a new engine oil filter element.

Check the valve clearances, and adjust if necessary.

Drain, clean, and refill the oil bath air cleaner.

Lubricate the dynamo bearing.

Drain the synchromesh gearbox and rear axle, and refill with new oil.

Check all steering connections, and adjust or tighten as necessary.

Check the track, and adjust if necessary.

Check the chassis frame for loose bolts or rivets.

Check and tighten nuts on engine, gearbox, axle 'U'-bolts, universal joints, spring shackles, fuel tank, exhaust pipe, and spare wheel carrier.

Tighten the screws on door locks, catches, striker plates, and hinges, and lubricate as necessary.

Check the battery specific gravity and top up.

Check the battery mountings and connections.

Check the operation of all instruments, lamps, etc.

Check the wheel nuts for tightness.

Road-test the vehicle and report.

12,000 miles (20000 km.) or 600 hours service

Carry out the 6,000 miles (10000 km.) or 300 hours service, with the following additions:

Diesel models

Remove, clean, and test the injectors for spray.

Petrol models

Fit new sparking plugs.

Petrol and diesel models

Remove and clean the sump, crankcase, and oil pump strainer, refill the sump, and refill with new oil.

Lubricate the water pump.

Drain the cooling system, flush out, and refill.

Check the steering-box for play.

Check the headlamp beam setting.

24,000 miles (40000 km.) service or 1,200 hours service

Carry out the 12,000 miles (20000 km.) or 600 hours service, with the following additions:

Drain the automatic gearbox and converter and refill with new oil.

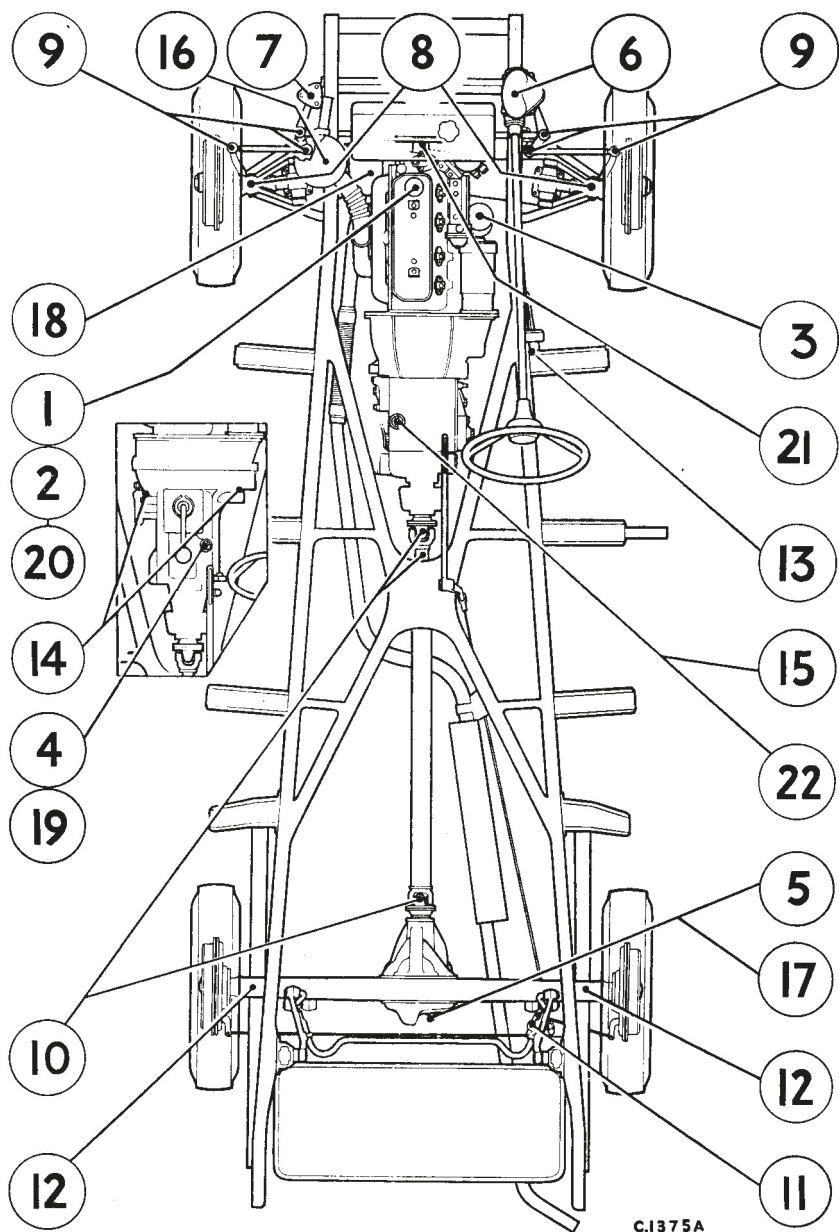
KEY TO RECOMMENDED LUBRICANTS (Diesel Models)

Component	A		B	C		D	E	F
	Engine and Air Cleaner			Automatic Gearbox and Converter	Steering-box, Idler and Rear Axle (Hypoid Gears) (a)				Water Pump and Lubricating Nipples
Climatic conditions	Above 32° C. (90° F.)	32° C. (90° F.) down to -12° C. (-10° F.)	All conditions	All conditions down to -12° C. (10° F.)	Arctic conditions consistently below -12° C. (10° F.)	All conditions	All conditions	All conditions
	-12° C. (10° F.)	Below -12° C. (10° F.)						
CASTROL	Castrol C.R. 30	Castrol C.R. 20	Castrol T.O.	Castrol Hypoy	Castrol Hypoy Light	Castrol L.M.	Castrolite	Castrol X.L.
ESSO	Esso Extra Motor Oil 20W/30 or Essofleet H.D. 30	Esso Extra Motor Oil 10W or Essofleet H.D. 10W	Esso Automatic Transmission Fluid 55	Esso Gear Oil G.P. 90	Esso Gear Oil G.P. 80	Esso Multipurpose Grease H	Esso Extra Motor Oil 20W/30	Esso Extra Motor Oil 20W/30
MOBIL	Delvac Oil 930	Delvac Oil 920	Mobilfluid 200	Mobilube G.X. 90	Mobilube G.X. 80	Mobilgrease M.P.	Mobiloil Arctic	Mobiloil A
BP	Energol D.D. 30	Energol D.D. 20W	Energol A.T.F. Type A	Energol S.A.E. 90 E.P.	Energol S.A.E. 80 E.P.	Energol L. 2	Energol S.A.E. 20W	Energol S.A.E. 30
SHELL	Shell Rotella 30	Shell Rotella 20/20W	Shell Donax T. 6	Shell Spirax 90 E.P.	Shell Spirax 80 E.P.	Shell Retimax A	Shell X-100 20W	Shell X-100 30
FILTRATE	Filtrate Diesel 30	Filtrate Diesel 20	Filtrate Automatic Transmission Fluid Type A	Filtrate Hypoid Gear 90	Filtrate Hypoid Gear 80	Filtrate Super Lithium Grease	Filtrate Zero 20/20W	Filtrate Medium 30
STERNOL	Auto Deso H.D. 30	Auto Deso H.D. 20	Sternol Lynx	Ambroleum E.P. 90	Ambroleum E.P. 80	Ambroline L.H.T. Grease	Sternol W.W. 20	Sternol W.W. 30
DUCKHAM'S	Duckham's NOL Diesel Thirty	Duckham's NOL Diesel Twenty	Duckham's Nolmatic A.T.F. Type A	Duckham's Hypoid 90	Duckham's Hypoid 80	Duckham's L.B. 10 Grease	Duckham's NOL Twenty	Duckham's NOL Thirty

KEY TO RECOMMENDED LUBRICANTS (Petrol Models)

Component	A		B	C		D	E	F
	Engine and Air Cleaner			Automatic Gearbox and Converter	Steering-box, Idler and Rear Axle (Hypoid Gears) (a)				Water Pump and Lubricating Nipples
Climatic conditions	Tropical and temperate down to 0° C. (32° F.)	Extreme cold down to -12° C. (10° F.)	All conditions	All conditions down to -12° C. (10° F.)	Arctic consistently below -12° C. (10° F.)	All conditions	All conditions	All conditions
CASTROL	Castrol X.L.	Castrolite	Castrol T.O.	Castrol Hypoy	Castrol Hypoy Light	Castrol L.M.	Castrolite	Castrol X.L.
ESSO	Esso Extra Motor Oil 20W/30	Esso Extra Motor Oil 20W/30	Esso Automatic Transmission Fluid 55	Esso Gear Oil G.P. 90	Esso Gear Oil G.P. 80	Esso Multipurpose Grease H	Esso Extra Motor Oil 20W/30	Esso Extra Motor Oil 20W/30
MOBIL	Mobiloil A	Mobiloil Arctic	Mobilfluid 200	Mobilube G.X. 90	Mobilube G.X. 80	Mobilgrease M.P.	Mobiloil Arctic	Mobiloil A
BP	Energol S.A.E. 30	Energol S.A.E. 20W	Energol A.T.F. Type A	Energol S.A.E. 90 E.P.	Energol S.A.E. 80 E.P.	Energrease L. 2	Energol S.A.E. 20W	Energol S.A.E. 30
SHELL	Shell X-100 30	Shell X-100 20W	Shell Donax T. 6	Shell Spirax 90 E.P.	Shell Spirax 80 E.P.	Shell Retinax A	Shell X-100 20W	Shell X-100 30
FILTRATE	Filtrate Medium 30	Filtrate Zero 20	Filtrate Automatic Transmission Fluid Type A	Filtrate Hypoid Gear 90	Filtrate Hypoid Gear 80	Filtrate Super Lithium Grease	Filtrate Zero 20/20W	Filtrate Medium 30
STERNOL	Sternol W.W. 30	Sternol W.W. 20	Sternol Lynx	Ambroleum E.P. 90	Ambroleum E.P. 80	Ambroline L.H.T. Grease	Sternol W.W. 20	Sternol W.W. 30
DUCKHAM'S	Duckham's NOL Thirty	Duckham's NOL Twenty	Duckham's Nolmatic A.T.F. Type A	Duckham's Hypoid 90	Duckham's Hypoid 80	Duckham's L.B. 10 Grease	Duckham's NOL Twenty	Duckham's NOL Thirty

LUBRICATION CHART (Diesel and Petrol Models)



C.1375A

