

tyre pressure = 50.

MAINTENANCE HANDBOOK

COMMER, DODGE and FARGO LIGHT VAN MODELS

ISSUED BY

CHRYSLER UNITED KINGDOM LTD.

COVENTRY

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NOTE

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FOREWORD

Your new light van is designed and built by Chrysler United Kingdom Ltd., a subsidiary Company of the Chrysler Corporation, one of the world's top 10 companies. The Chrysler world-wide standards of quality manufacture have been rigorously applied to ensure that you the operator attain the best possible performance from your new vehicle.

This book describes the driving controls, the manner in which they should be operated, and includes instructions for "running-in" the new vehicle. To maintain satisfactory performance, correct lubrication and other periodical attention is of vital importance and are dealt with in detail in the ensuing pages. A Lubrication and Maintenance Chart together with wiring diagrams for Petrol and Diesel engined vehicles is included at the end of the Handbook.

To obtain the highest measure of satisfaction from your vehicle and ensure low running costs, this handbook should be read with care, and the recommendations and instructions given herein, complied with.

Maintenance

A Certified Maintenance Schedule containing Service Vouchers is supplied with all the vehicles sold to the Home Market. Each voucher gives details of the servicing required at that particular mileage. (Corresponding with that which is listed under "Periodical Attention" on the Lubrication Chart). As each mileage interval is reached, the work listed on that particular voucher must be carried out.

This is a very convenient and easy system for owners and Dealers to follow, because the vouchers, together with the Lubrication Chart, form a ready-made job list for each servicing interval.

Important

Owners should realize that the Protection Plan is invalidated when defects arise in any product which has not received the periodical maintenance as detailed in the Certified Maintenance Schedule.

Free Service Inspection

Advantage should be taken of the Free Service available for your vehicle on the completion of the first 1,000 miles (1,500 km.). (In certain countries this service is carried out at different mileages, in accordance with the locally accepted practice).

Much importance is attached to this by the manufacturers of the vehicle and it is an obligation on the part of the Dealer responsible for the sale of the vehicle, to provide this service free of charge (except for materials used), subject to the vehicle being presented for this purpose. Attention is drawn to the Free Service Voucher in the Certified Maintenance Schedule, supplied with vehicles delivered to the home market. Overseas Dealers will provide a Free Service Voucher on request.

FUEL ECONOMY

Fuel economy can be improved in two ways.

Driving-technique-and the choice of routes.

Maintenance — particularly in respect of engine, transmission and brakes.

The greatest saving however can be achieved by the driver if he observes the following.

DRIVING FOR ECONOMY

If possible plan your route to avoid areas of heavy traffic congestion, town centres or steep hills.

Only start the engine when it is intended to move off immediately. All necessary adjustments (i.e. seat movement, seat belts, closing windows etc.) should be made before starting the engine.

Do not 'blip' your accelerator before moving away from rest or prior to stopping your engine.

On petrol engines push the choke in as soon as practicable.

Avoid high engine speeds. Use the highest gear possible, consistent with reasonable progress, and avoid unnecessary gear changes.

Keep vehicle down to the lowest reasonable speed. A steady speed at constant throttle opening is most economical. Observe speed limits.

Try to drive with increased anticipation. Avoid driving too close to other vehicles as this leads to frequent braking and accelerating.

If, when on the road, there is likely to be a considerable hold up stop the engine.

Hill climbing should be carried out as near maximum torque speed as possible.

MAINTENANCE FOR ECONOMY

Petrol and Diesel Engines

Take immediate action to rectify any fuel leak.

Service your air cleaner as recommended and more frequently if vehicle is operating in extremely dusty areas.

Inlet and exhaust manifold fixings to be kept tight and blowing gaskets replaced.

Ensure valve clearances are checked regularly.

Keep engine tick-over down to specified minimum. .

If engine starts to run cool for longer periods than normal — check or replace thermostat.

Change engine oil at the recommended intervals using the correct grade specified.

If possible check compression pressures. If considerably lower than those recommended investigate and rectify as soon as possible.

Petrol Engines

Keep spark plugs and contact breaker points in good condition and ensure that gaps are set correctly. Fit new parts at recommended intervals.

The ignition timing must be correct and ensure that the vacuum advance operates correctly.

Ensure that choke returns to the fully open position when control pushed fully home.

Check that the carburettor idling mixture is set correctly.

Examine moving parts of carburettor for wear — Renew as necessary.

If replacing jets ensure correct size fitted.

Check operation of governor — if fitted.

Diesel Engines

Ensure that the fuel injection pump is set to the correct delivery setting specified for that particular pump.

Injectors must be kept clean and correctly set.

Static injection timing must be correctly set and automatic advance mechanism must function correctly.

Maximum governed speed must be set to the correct figure specified on the fuel injection pump.

General — Vehicle

Hub bearings must be kept in good condition, correctly lubricated and correctly adjusted.

Steering geometry must be correct.

Brakes must not bind.

Tyre pressures must be maintained at correct pressure.

A damaged or restricted exhaust system must be renewed.

Certain of the above maintenance operations require specialised knowledge. Your Chrysler Dealer has this knowledge and will be pleased to assist you.

IMPORTANT

UNITED KINGDOM LEGISLATION

Power to Weight

The engine b.h.p. figure quoted on the chassis data plate is the factory installed rating complying with the B.S. Au 141 (a) 1971 and takes into account engine powered ancillaries fitted at the time of production (e.g. compressor, steering pump etc.).

Because of this new method of measurement, it will be noted that in certain cases the figure shown on the plate differs from that quoted in the handbook.

Always refer to the data plate for your engine rating

Operators should remember that fitment of additional or alternative equipment which is powered by the engine when the vehicle is travelling will affect the b.h.p. rating and may result in an infringement of the Power to Weight regulations.

Noise Levels

The vehicle's noise levels are kept within the U.K. legal limits by the provision of sound insulation, therefore, it is a statutory duty of the user to ensure that the insulation is kept in a serviceable condition, also, that the governed speed of the engine does not exceed that stated in this handbook.

Smoke Emission and Radio Interference Suppression

To conform to the above stated regulations your vehicle is fitted with the requisite type of carburation and ignition equipment, therefore it is necessary to maintain this type of equipment when replacing components.

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WIRING DIAGRAMS

LUBRICATION CHART in rear cover pocket.

GENERAL DATA

PETROL ENGINE

	<i>Low Compression</i>	<i>High Compression</i>
Type	4-cyl O.H.V.	4-cyl O.H.V.
Capacity	1,724 c.c. (105.2 cu. in.)	1724 c.c. (105.2 cu. in.)
Bore	3.21 in. (81.5 mm)	3.21 in. (81.5 mm)
Stroke	3.25 in. (82.6 mm)	3.25 in. (82.6 mm)
Distributor Contact Gap	0.015 in. (0.38 mm)	0.015 in. (0.38 mm)
Spark Plug Type	Champion N9Y	Champion N9Y
Spark Plug Gap	0.025 in. (0.63 mm)	0.025 in. (0.63 mm)
Firing Order	1-3-4-2	1-3-4-2
Compression Ratio	7.4:1	8.4:1
Nett B.H.P.	52 @ 4,200 r.p.m. (D.I.N.)	59 @ 4,800 (D.I.N)
Nett Torque	82 lb.ft. (111 Nm, 11.34 kgm.) at 2,000 r.p.m. (D.I.N.)	83 lb.ft. (112 Nm, 11.47 kgm.) @ 2,400 r.p.m. (D.I.N.)
Normal Oil Pressure (hot)	41/45 lb.sq.in. (2.8/3.2 kg.sq.cm.)	41/45 lb.sq.in. (2.8/3.2 kg.sq.cm.)

Ignition Timing-Static

Premium Grade Fuel	6°—10° B.T.D.C.	6°—10° B.T.D.C.
Regular Grade Fuel	6°—8° B.T.D.C.	—

The above ignition settings may need SLIGHT variation according to the octane ratings of the fuels available.

Valve Rocker Clearances (hot)

Inlet	0.012 in. (0.30 mm)	0.012 in. (0.30 mm)
Exhaust	0.014 in. (0.36 mm)	0.014 in. (0.36 mm)

Carburettor Specification

Type	Zenith 34 IV	Zenith 34 IV
Main Jet	80	77
Compensator Jet	125	147
Choke	26 mm.	27 mm.
Slow Running Jet	45	45
Full Throttle Air Bleed	150	1.3
Pump Jet	50	55
Needle Valve	1.5 mm	1.5 mm
Washer	2.0 mm	2.0 mm
Slow Running Air Bleed	1.4 mm	1.2 and 1.0

4.108 DIESEL ENGINE

Type	Four-cylinder, four-stroke indirect injection
Capacity	107 cu.in. (1.76 litres)
Bore	3.125 in (79.735 mm)
Stroke	3.5 in (88.9 mm)
B.H.P. (gross)	55 @ 4,000 rev/min (B.S. Au 141a 1971)
B.H.P. (nett)	52 @ 4,000 rev/min (U.K. plated B.S. Au 141a 1971)
Torque	83 lbf.ft (112 Nm, 11.47 kgf.m.) @ 2200 rev/min (B.S. Au 141a 1971)
Maximum Governed (Full Load) Speed	4000 rev/min
Maximum No Load Speed	4480 rev/min
Idling Speed	625 rev/min
Compression Ratio	22:1
Firing Order	1-3-4-2
Valve Clearance—inlet and exhaust (cold)	0.012 in. (0.30 mm)

Injectors

Nozzle type	BDN12SD6236
Holder type	BKB405D5224
Pressure setting, new	150 ats
service	135 ats

Fuel Injection Pump

Type	C.A.V. D.P.A.
Timing, static	18° B.T.D.C.
Lubricating Oil Pressure	30-60 lbf./in ² (2.1-4.2 kgf/cm ²) at maximum speed and normal working temperature.

TORQUE WRENCH READINGS

Petrol Engine

Cylinder Head Bolts	48 lb. ft. (6.6 kg.m.)
Main Bearing Caps	55 lb. ft. (7.6 kg.m.)
Connecting Rod Cap Bolts	24 lb. ft. (3.3 kg.m.)
Flywheel Securing Bolts	40 lb. ft. (5.5 kg.m.)

Diesel Engine

Cylinder Head Nuts	58 lb. ft. (8 kg.m.)
Main Bearing Caps	82 lb. ft. (11.3 kg.m.)
Connecting Rod Cap Bolts	37 lb. ft. (5.1 kg.m.)
Flywheel Securing Bolts	57.5 lb. ft. (8 kg.m.)
Atomiser Securing Nuts	11 lb. ft. (1.5 kg.m.)

Overdrive

Filter plug	16 lb.ft. (2.2kg.m)
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Overdrive (when fitted)

Model	'J' Type
Ratio	0.797:1

Wheel Nuts

All models

Oiled threads	38 lb. ft. (5.3 kg.m.)
Dry threads	48 lb. ft. (6.6 kg.m.)

CLUTCH

Type	Single plate diaphragm drive.
Size	8.5 in. (215.9 mm.)

GEARBOX (MANUAL)

Type	4-Speed Synchromesh
Engagement	Synchromesh on all forward gears. Straight tooth sliding gear on reverse.

Ratios

Top	Direct
Third	1.52
Second	2.33
First (Emergency Low)	4.10
Reverse	3.89

GEARBOX (AUTOMATIC)

Type	Borg Warner 35
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Ratios

Top	Direct
Second	1.44:1
First	2.39:1
Reverse	2.41:1

PROPELLER SHAFT

Type	Balanced Tubular Shaft
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REAR AXLE

Type	Hypoid final bevel drive. Semi-floating axle shafts.
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Ratios	Standard	Optional
Low Compression Engine	*5.125:1	*5.625:1
High Compression Engine	*5.625:1	—
All Models	†4.777:1	†5.125:1

All Manual Models fitted with alternative Salisbury axle from Chassis No. 182878	†4.890:1
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*Vehicles fitted with 15in. wheels

†Vehicles fitted with 14in. wheels

FRONT SUSPENSION

- Independent type, by coil springs and wishbones. Armstrong telescopic shock absorbers.

REAR SUSPENSION

- Semi-elliptic leaf spring with hydraulic lever type shock absorbers

STEERING GEOMETRY

- Front Wheel Camber Angle $\frac{3}{4}^{\circ} \pm \frac{1}{4}^{\circ}$
 Front Wheel Toe-in (cross ply tyres) . . . $\frac{1}{8}$ in. (3 mm)
 (radial tyres) . . . zero
 Toe-in measured at wheel centre height and at extreme outer point of tyre wall.
 Vehicle must be in static laden condition for camber and toe-in check.

TYRE SIZE AND PRESSURES

Tyres sizes (15 in Wheels)

- 1500, K or FK 120 models 6.40-15-6 P.R.
 2000/2500, K or FK 140/160 models . . . 6.70-15-6 P.R. C.V.

14 inch Wheels

- 1500/2000, K or FK 120/140 models . . . 6.50-14
 2000/2500, K or FK 140/160 models . . . 7.00-14
 All models — optional fitting 185-14

Pressures (15 inch Wheel tyres)

	Front		Rear	
	lb. sq. in.	kg. sq. cm.	lb. sq. in.	kg. sq. cm.
1500, K or FK 120 models	36	2.5	36	2.5
2000/2500, K or FK 140/160 models . . .	40	2.8	40	2.8

14 inch Wheel Tyres

1500, K or FK 120 (6.50-14)	40	2.8	40	2.8
1500, K or FK 120 (185-14)	36	2.5	36	2.5
2000, K or FK 140 (6.50-14)	45	3.2	40	2.8
2000, K or FK 140 (7.00-14)	45	3.2	36	2.5
2000, K or FK 140 (185-14)	42	2.9	42	2.9
2500, K or FK 160 (7.00-14)	45	3.2	45	3.2
2500, K or FK 160 (185-14)	42	2.9	42	2.9

MAXIMUM PERMISSIBLE GROSS VEHICLE WEIGHTS

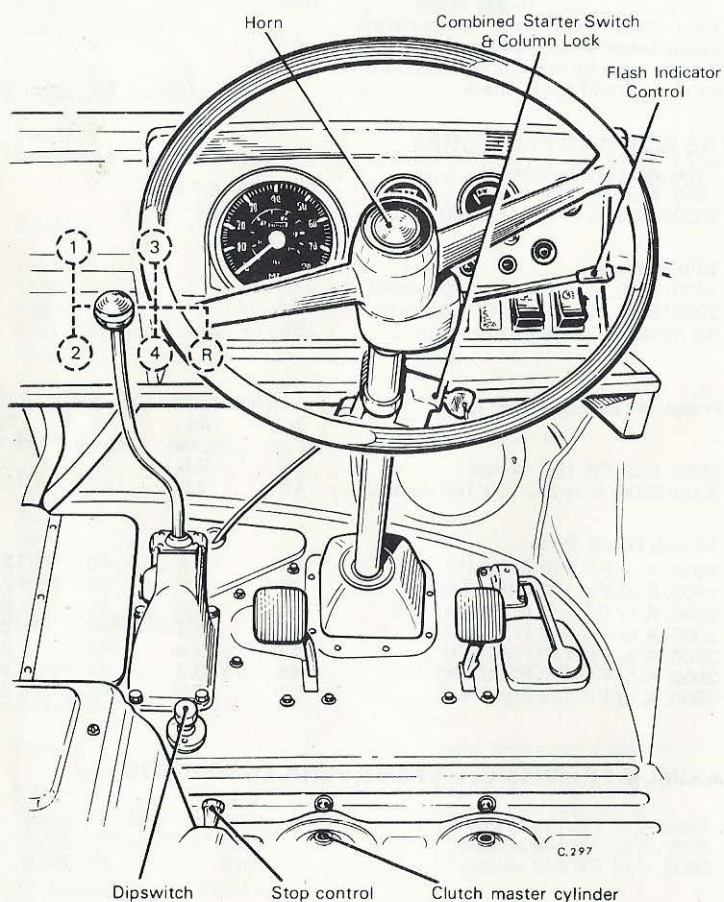
	Tons	Kg.
1500, K or FK 120 models	2.05	2090
2000, K or FK 140 models	2.23	2270
2500, K or FK 160 models	2.43	2468

UNIT CAPACITIES

See lubrication chart in the rear cover pocket.

GENERAL INSTRUCTIONS

INSTRUMENTS & CONTROLS



Instrument Panel and Controls (Right hand Drive Diesel Model)

SWITCHES

Combined Steering Column Lock and Starter Switch (Petrol Models)

The steering lock is incorporated in the ignition/starter switch and is located on the right hand side of the steering column.

The lock face has the following markings:—

- 0 Steering column locked and ignition off
- I Steering column lock released
- II Ignition circuit on
- III Starter Motor engaged

Combined Steering Column Lock and Starter Switch (Diesel Models)

The steering column lock is incorporated in the auxiliary/starter switch and is located on the right hand side of the steering column.

The lock face has the following markings:—

- 0 Steering column locked and auxiliary off
- I Steering column lock released
- II Auxiliary circuit on
- III Starter heater engaged

The starter motor is engaged by further rotation of the switch.

To Unlock Steering Column

Insert key in lock and push right home. Rotate key clockwise to position I. The column is now unlocked.

Note: It will sometimes be found necessary to relieve the load on the lock by rotating the steering wheel slightly before the key will turn. It is therefore advisable not to park with the wheels hard up against the kerb.

Lighting Switch

The lighting switch is a three position tumbler switch located in the bottom right hand corner of the instrument binnacle.

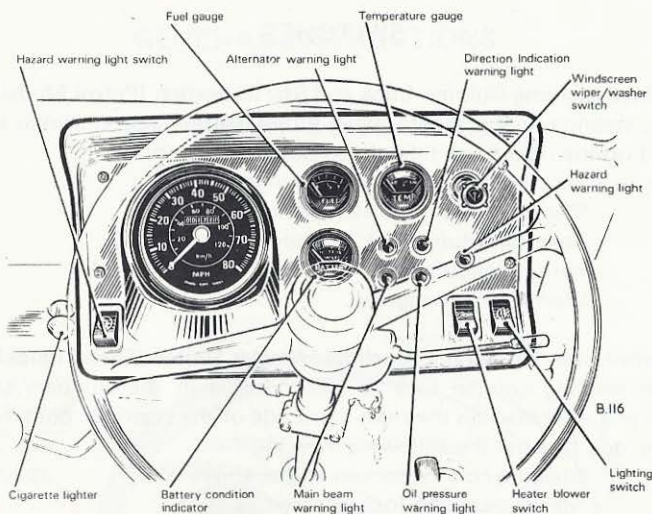
Sidelamps are switched on by depressing the switch down to its first position and headlamps by depressing the switch to its second position.

Interior Light Switch (Passenger Models Only)

The interior light switch is located centrally on the header panel and operates the interior lights.

Dip Switch

The foot operated dip switch is located on the toe panel and converts headlamp beam from dip to main and main to dip.



Instrument Panel (Petrol Models)

Direction Indicator Switch

The self cancelling flashing direction indicator switch is mounted at the side of the steering column. Push upwards to indicate a left-hand turn and down for a right-hand turn.

Heater Blower Switch

The heater blower switch is located on the instrument binnacle and is adjacent to the lighting switch. Depression of the switch operates the heater fan.

Hazard Warning Light Switch (when fitted)

The hazard warning light switch is located on the left hand side of the instrument binnacle and when depressed operates all four flashing indicators simultaneously. It should be used only in an emergency to warn other drivers of an obstruction or emergency. The hazard warning switch operates independent of the ignition circuit.

Windscreen Wiper Switch and Washer Control

The combined windscreen wiper switch and washer control is located at the top right hand corner of the instrument binnacle. To switch on the wipers turn the switch to the right.

Depress the plunger to operate the windscreen washers.

Horn Switch

A push-type switch in the top centre of the steering column operates the horn.

INSTRUMENTS

Speedometer

The speedometer, in addition to indicating the road speed in miles and kilometres, registers the total mileage.

Fuel Gauge

The fuel gauge is located on the instrument binnacle and registers the amount of fuel in the fuel tank. The gauge is electrically operated and will only register when the ignition or auxiliary switch is engaged.

The fuel tank should never be allowed to run too low and it is advisable not to allow the tank to fall below a quarter full. It is especially important not to let the tank empty on diesel engines as the fuel system will become aerated and will need priming before the engine will function properly.

Water Temperature Gauge (When fitted)

The water temperature gauge, when fitted, is located on the instrument binnacle adjacent to the fuel gauge and indicates the temperature of engine coolant.

Under normal running conditions the needle should remain in the middle (white) segment of the temperature indicator band. If the needle should enter the right-hand red segment the vehicle should be stopped and the cause investigated immediately. The fan belt should be checked first followed by the coolant level.

Caution: When removing the radiator cap care should be taken to turn the cap slowly to release cooling system pressure and avoid scalding. Never pour cold water into a hot radiator.

If after several miles of continuous running the needle should remain within the red segment to the left of the temperature indicator band the thermostat should be examined.

Oil Pressure Gauge (When fitted)

The oil pressure gauge is located below the fuel gauge on the instrument binnacle and registers the engine lubricating oil pressure.

The correct oil pressure reading will be found under General Data. It should be noted that this pressure applies to running speeds with the engine at or near its normal working temperature. When idling the oil pressure will drop and, conversely, when running with a cold engine will read higher.

If the oil pressure should fail to reach the correct pressure or suddenly drop when running the engine should be stopped and the cause investigated immediately.

Note: The oil pressure gauge does not indicate the amount of oil in the sump.

Battery Condition Indicator (When Fitted)

The battery condition indicator is located below the fuel gauge on the instrument binnacle and indicates the battery's charged condition.

With the ignition/auxiliary switch engaged the needle will indicate static battery voltage after 45 seconds and should move to the centre (white) segment of the voltage indicator band. A reading in the lower red section when there is little current being taken from the battery, indicates that the battery is undercharged.

If, when the battery is under load and the engine is at idling speed or static, the pointer moves from the white to red portion it is an indication that the battery is fully charged but in poor condition.

When the engine is running above idling speed the needle should enter into the white segment of the voltage indicator and remain there for normal operation.

If the needle should enter the red segment to the right of the instrument, for any length of time, indicating battery overcharge, the fault should be investigated by an authorised Dealer otherwise damage to the battery and charging system may occur.

Similarly if the needle should remain in the red section to the left of the instrument, indicating battery undercharge, the fault should be investigated immediately, checking fan belt tightness in the first instance.

Note: When the engine is at idling speed any fluctuation of the pointer may be ignored as the meter reading will vary with the operation of the battery charge regulator.

WARNING LIGHTS

Warning Lights are incorporated in the instrument binnacle to advise you of the functioning or otherwise of the units to which they refer.

If any light fails to function the cause should be investigated immediately and any faulty bulbs or wiring corrected.

Alternator Warning Light (Red)

The alternator warning light is the top left hand of the warning light cluster and glows red when the ignition switch (petrol models) or auxiliary starter switch (diesel models) is engaged. As soon as the engine is running the light should go out thus indicating that the alternator is charging correctly.

Should the light remain on or come on at normal running speed the cause should be investigated without delay otherwise the battery will become discharged and the charging system eventually damaged. The fan belt tension should be checked in the first instance.

Oil Pressure Warning Light (Amber)

The oil pressure warning light is the bottom right hand light of the warning light cluster and glows amber when the ignition switch (petrol models) or auxiliary starter switch (diesel models) is engaged and should extinguish immediately the engine is running.

If the light fails to extinguish or comes on with the engine running it should be stopped and the cause investigated immediately, checking, in the first instance, the level of oil in the sump.

Note: The warning light does not indicate the oil level in the engine sump.

Direction Indicator Warning Light (Green)

The direction indicator warning light is the top right hand light of the warning light cluster and flashes when the indicator switch is engaged, in either direction.

Main Beam Warning Light (Blue)

The main beam warning light is the bottom left hand light of the warning light cluster and glows blue when the headlamps are switched to main beam.

Hazard Warning Light Indicator (Red) (when fitted)

The hazard warning light indicator is located to the right of the warning light cluster on the instrument binnacle and flashes when the hazard warning light switch is engaged.

HAND CONTROLS

Choke Control (Petrol Models)

This control is situated in the front of the lower engine cover, at the side of the driver. For full details of its use see under heading "Starting Procedure".

Stop Control (Diesel Models)

This spring loaded control is located in the front of the lower engine cover at the side of the driver.

The function of the stop control is to stop the diesel engine from rotating, by cutting off the fuel supply at the fuel injection pump.

To operate, pull forward the knob and hold in this position until the engine ceases to rotate. Ensure that the stop control returns fully home before attempting to re-start the engine.

Note: When the engine is stopped, always return the starter and heater switch to the "OFF" position before leaving the vehicle.

Fresh Air Ventilator

The ventilator control handle which is located immediately beneath the parcel shelf, regulates the flow of fresh air by operating a flap behind the front panel grille. The ventilator also provides the supply of air for the heater when fitted.

Gear Shift Lever

Gearshifting is carried out by a remote, toe-board-mounted lever. The gearbox incorporates positive synchromesh on all forward gears. Gear selection positions are as shown under 'General Instructions' noting that it is necessary to overcome the pressure of the spring loaded plunger when selecting reverse gear.

Note: See special section regarding Automatic Transmission.

Important

A word of warning; when using the engine as a brake make sure that you do not overspeed the engine. Overspeeding the engine can cause serious damage.

The governor, when correctly set, will stop the engine from overspeeding when the engine is pulling the vehicle but NOT when the vehicle is driving the engine—as can happen downhill.

It is best to be in the correct gear before descending a hill and, if necessary, use the brakes now and then to keep the road speed down.

If you find you have to change down whilst travelling downhill—a practice that should be avoided if at all possible—make sure that the road speed is no greater than the maximum speed on a level surface of the gear to be selected.

Therefore, when using the engine to reduce speed

NEVER let the road speed rise above the normal governed speed for that gear.

NEVER change down to a gear that will overspeed the engine.

OVERDRIVE

(when fitted)

Operation

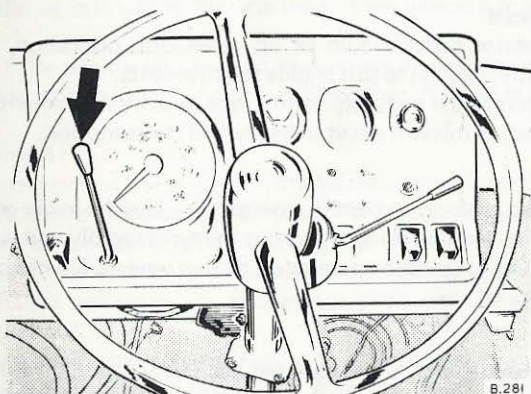
The overdrive is operated by a switch in the left-hand corner of the instrument panel. It can only be operated when either third or top gear is selected.

The switch should be moved down to engage overdrive and up to revert to direct drive. The switch will automatically return to the centre position immediately the gear has been selected.

To engage or disengage overdrive move the switch to the appropriate position without releasing the accelerator or using the clutch.

Always select direct drive before changing from third to second gear to avoid imposing heavy loads on the transmission due to by-passing direct third gear.

Important In the unlikely event of the overdrive failing to disengage reverse gear must on no account be used.



B.281

Overdrive Control Switch

HANDBRAKE

The handbrake is of the fully compensated cable type, operating on the **front** wheels only. It is independent of the hydraulic system in operation.

It is located to the right of the driver's seat on right-hand drive vehicles, on the left of the driver's seat on left-hand drive models.

To release, pull lever slightly upwards (in the same direction as when pulling "on"), at the same time pressing the button in the top of the hand grip with the thumb, then press lever downwards to "off" position.

The handbrake actuates the stop lights via an electrical switch when the ignition/auxiliary key is engaged in an "on" position.

Always ensure that the handbrake is off before setting the vehicle in motion.

CAB FITTINGS

Ashtray

The ashtray is located in the centre of the fascia panel and is operated by pulling on the finger grip. To remove the ashtray press down on the centre spring and the tray can then be pulled out.

Cigarette Lighter (When fitted)

The cigarette lighter is located centrally on the parcel shelf and is operated by pushing the lighter inwards. When the element is heated it will return automatically to the off position and can then be withdrawn for use.

Coat Hook

A coat hook is located on the cantrail immediately behind the drivers seat.

FOOT CONTROLS

Accelerator Pedal

The accelerator pedal should be operated with discretion, using the range of throttle opening to suit engine requirements.

Always operate the pedal smoothly, not in jerky movements. Do not pump the pedal, as this will result in heavy fuel consumption.

Brake Pedal

Avoid severe braking, except in emergencies. Use the lower gears when descending hills. Hard braking wears out the tyres rapidly and is normally unnecessary. The footbrake operates on all four wheels. **Do not coast with the engine stopped.**

Clutch Pedal

The clutch pedal should be operated decisively, using the full range of travel.

Never coast down a hill in lower gears with the clutch disengaged, as this practice may result in damage to the transmission on re-engagement.

DO NOT REST YOUR FOOT ON THE CLUTCH PEDAL WHEN IT IS NOT IN USE.

This practice may cause the clutch to slip, with consequent rapid wear on the clutch withdrawal bearing and the facings on the clutch driven plate.

FUEL FILLER CAP

If it should be necessary to fit a replacement filler cap ensure that a vented type cap is used.

STARTING PROCEDURE

Before starting the engine or driving the vehicle on the road, always check the following:

Engine Oil Level.

Water Level in Radiator.

Amount of Fuel in Tank.

The fuel tank on a diesel engined model must never be allowed to become empty. If this happens, the fuel system will become aerated and will therefore require "priming" before the engine will function properly.

To Start Engine (Petrol Models)

Insert key in steering column lock and unlock as described above.

Rotation of the key to position II will engage the ignition circuit.

To start the engine turn the switch to position III and immediately the engine fires release the key and allow it to return to position II.

If the engine does not start immediately do not keep the starter motor operating for more than 2 or 3 seconds at a time in order to avoid unnecessary discharge of the battery. It is advisable to depress the clutch pedal as this will relieve the load of the gearbox from the starter motor.

Note: If the engine fails to start always ensure that the starter pinion has stopped revolving before operating the starter switch again.

Choke Control

Never start or run the engine on choke more than is necessary.

The amount of choke necessary will be dictated by both climatic and engine temperature. When starting a cold engine in temperatures below freezing it will be found necessary to pull out the choke to its full extent. Do not touch the accelerator pedal when starting with the choke pulled out.

Once the engine has started push in the choke control gradually until the engine is running at a fast idling speed. If the vehicle is going to be

taken on the road immediately leave the choke control in the intermediate position for a few minutes then push in fully when the engine is warm.

If the vehicle is being warmed up when stationary adjust the choke so as to obtain a tick-over slightly faster than normal. After a few minutes, the engine should be warm enough for the choke to be pushed fully home.

When starting with a warm engine it will be found unnecessary to use the choke control. If the engine does not start immediately depress the accelerator pedal slightly during the next attempt.

To Start Engine (Diesel Models)

Ensure that the engine stop control is fully home. Insert the key in the steering column lock and unlock the column as described above.

Further rotation of the key to position II will engage the auxiliary circuit.

The throttle must be fully open for all starts.

When starting with a cold engine turn the switch to the heater position III and hold for 15–20 seconds. Then rotate the switch further clockwise to engage the starter motor. If the engine does not start within 15–30 seconds, (according to temperature) re-engage the heater position for a further 10 seconds before engaging the starter motor once more. If the engine then fires but will not start switch to the heater position for a further ten seconds before engaging the starter for a third time. If the engine still fails to start refer to the fault finding chart.

If the engine is warm it will not be necessary to engage the heater switch.

Note: When the engine is running ensure that the switch is in the auxiliary position II on the lockface.

To Stop Engine, Lock Steering Column and Remove Key

Pull out stop control on diesel models.

Rotate key anti-clockwise. Depress key and barrel into the lock to fullest extent and pull on key to remove at position O. The lock will engage when the steering wheel is rotated to the appropriate position.

Important

The following instructions should be carefully observed:—

1. It is important that the column lock is operated correctly and that the ignition/auxiliary circuit never be separated from the lock and connected to an independent switch. In the event of failure consult an authorised Dealer.
2. If the vehicle is being towed the key must be inserted in the switch and turned to position II. This will enable the direction indicators and stop lamps to be operated.

Replacement keys can only be obtained through an authorised dealer.

4. Coasting is always inadvisable especially with the ignition/auxiliary switch at the O position as the steering will be locked.
3. The steering column lock is incorporated to combat unauthorised use of the vehicle and the following precautions should be taken.
 - (a) The key number is quoted only on the disc attached to the key ring and the disc should therefore be removed and retained in a safe place away from the car.
 - (b) Record the key number in the space provided on the certificate of identification in the service voucher book.

RUNNING-IN THE NEW VEHICLE

The early stage of the vehicle's life is of considerable importance to the subsequent running of the vehicle, and any care taken running it in and maintaining it, will be well repaid by long and satisfactory service. The process of running-in the first 1,000 miles (1,500 km.) applies not only to the engine but equally to other parts such as the gearbox, rear axle and even the chassis.

When climbing hills, do not labour the engine in high gears when it is evident that a change to the next lower gear is required; make the change before it is actually needed.

When descending hills, engage a low gear before commencing the descent, so that the engine can act as a brake. Under this condition however, the speed of the vehicle must be limited to the maximum road speed on a level surface for the gear in use. Always bear in mind that prolonged use of brakes during long descents temporarily reduces their efficiency.

It is also important that the engine speed shall not be excessive during the first 1,000 miles (1,500 km.) and that the engine shall never be "raced" in neutral. It is strongly urged therefore, that the following recommended speeds be strictly observed.

For the first 500 miles (800 km.) the maximum speed in top gear must not exceed 40 m.p.h. (65 k.p.h.) with correspondingly restricted speeds in lower gears.

On completion of the first 500 miles (800 km.) running and for the second 500 miles (800 km.), the running-in speed in top gear, for vehicles operating abroad or on U.K. motorways, may be increased progressively to a maximum of 55 miles (90 km.) per hour, subject to favourable conditions, with correspondingly restricted speeds in lower gears.

Petrol Engine Vehicles Only

The use of Shell Upper Cylinder Lubricant is recommended at all times, particularly during the running-in period, the lubricant being added to the fuel in the quantities recommended by Shell.

COOLING SYSTEM

General Inspection

The following points should be examined at regular intervals to ensure that the system is in perfect order:

1. Check coolant and heater hoses regularly for signs of deterioration. Renew where necessary. Oil-contaminated hoses should be thoroughly cleaned and if found swollen should be renewed. Where there is evidence of chafing the cause should be rectified immediately.
2. Clean the radiator block externally.
3. Examine the cylinder block core plugs for signs of water leaks. If leaks are apparent they must be rectified. Also check the thermostat housing and cylinder head joints for leaks.
4. If the radiator constantly needs topping up, trace the cause of water loss making due allowance for the fact that a certain amount of water is lost through the overflow pipe, due to expansion.

Caution: If the cooling system is to be drained immediately after a journey do not remove the filler cap at once but turn the cap slowly anti-clockwise to allow pressure to be released gradually.

Draining and Flushing the System

When anti-freeze solution is not used, it is advantageous to drain, flush and refill the cooling system from time to time.

To flush out the system, drive the vehicle to a place where there is good drainage and where a length of hose can be connected to the water supply.

Remove the radiator filler cap and open both drain taps.

Place the end of the hose into the radiator and turn on the water, regulating the flow into the radiator until it equals the outflow.

Continue flushing until the outflow is clear of rust or sediment.

Close both drain taps and fill the cooling system with soft water.

Note: When the drain taps are first opened they may be choked with sediment, in which case they will require clearing with a stiff wire.

THE RADIATOR SHOULD BE KEPT FULL OF COOLANT AND THE LEVEL CHECKED FREQUENTLY.

Water Pump and Thermostat

The water pump which is mounted in tandem with the fan is of the impeller type, with the impeller spindle supported by two bearings. These bearings are treated with a special grease before assembly and require no further lubrication.

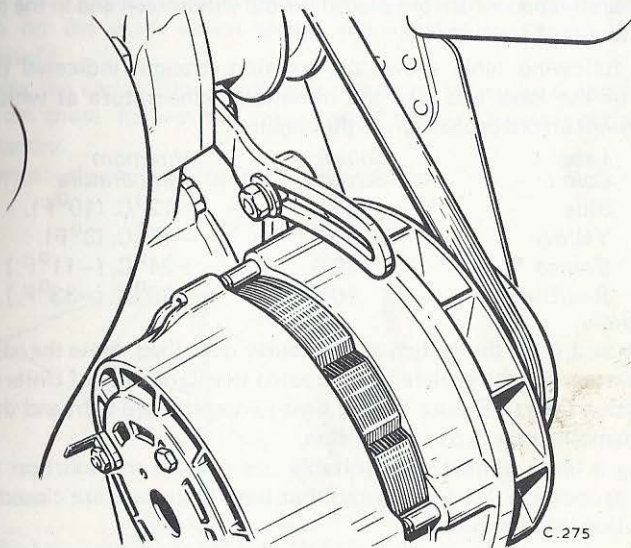
The thermostat is a bellows type and is fitted in the housing which is mounted on top of the cylinder head. This device controls the engine

temperature and requires no maintenance. Should trouble be experienced with the thermostat, it may be removed from the housing and the vehicle operated without it, pending repair or replacement.

Fan Belt Adjustment

An endless rubber belt drives both the alternator and the fan and water pump assembly.

The belt tension should be checked at the intervals stated on the Lubrication Chart, the tension being correct when it is possible to depress the belt (without undue pressure) the correct amount in the centre of the longest run. The correct belt tension adjustments are $\frac{5}{8}$ in. (16 mm.) for the petrol engine and $\frac{3}{8}$ in. (9.5 mm.) for the diesel engine.



Alternator Adjusting Strap

Belt adjustment is effected by altering the position of the alternator in the following manner.

Slacken the bolt and setscrew in the slotted arm, or "adjusting strap", also the locating bolts by which the alternator is secured to the bracket on the cylinder block. Swing the alternator away from the cylinder block to tighten the belt or towards the block to slacken it. When the belt tension is correct, tighten first the set screws in the adjusting strap and then the two bolts in the bottom bracket. Do not tighten the belt excessively as this will cause unnecessary strain on the spindle bearings and tend to damage the fan belt itself.

Note: When adjusting belt tension, leverage must **only** be applied to

the alternator drive end bracket. Leverage applied to the stator or slip ring end bracket will result in serious damage.

Belt Replacement

When fitting a replacement belt to diesel models it is important to note that the adjusting strap bolt must be removed completely to allow the alternator to be moved against the cylinder block.

Under no circumstances must the belt be levered onto the pulley.

Frost Precautions

Every precaution should be taken to ensure that damage is not caused to the engine and cooling system as a result of frost.

Vehicles leaving the factory during the winter months have anti-freeze added to the cooling system. The strength of the solution is indicated by the coloured labels which are placed on the windscreen and in the engine compartment of each vehicle.

The following table shows the solution strength indicated by the colour of the label and also the minimum temperature at which the solution will afford protection to the engine.

<i>Label Colour</i>	<i>Solution Strength</i>	<i>Minimum Temperature</i>
Blue	25%	-12°C. (10°F).
Yellow	30%	-16°C. (3°F)
Orange	40%	-24°C. (-11°F.)
Red/Blue	50%	-36°C. (-33°F.)

Procedure

Drain and flush the system as previously described. Note the capacity of the system for the vehicle being treated (see Capacities of Units on the Lubrication Chart). Ensure that all hose joints, etc., are tight and that the hoses themselves are in good condition.

Using a clean container of suitable size prepare the solution to the correct proportion. Having ensured that both drain taps are closed, pour the solution into the system.

Important

Engines which are not protected by anti-freeze should be drained if the vehicle is to be left standing for any length of time during freezing conditions. Having drained the system, run the engine for a few seconds to disperse any water which may have been left in the water pump unit. When refilling the system, use warm water if possible.

Note: Since it is not possible to drain the heater unit (if fitted), when the rest of the system is drained, anti-freeze **must** be used in the cooling system otherwise serious damage may result to the unit.

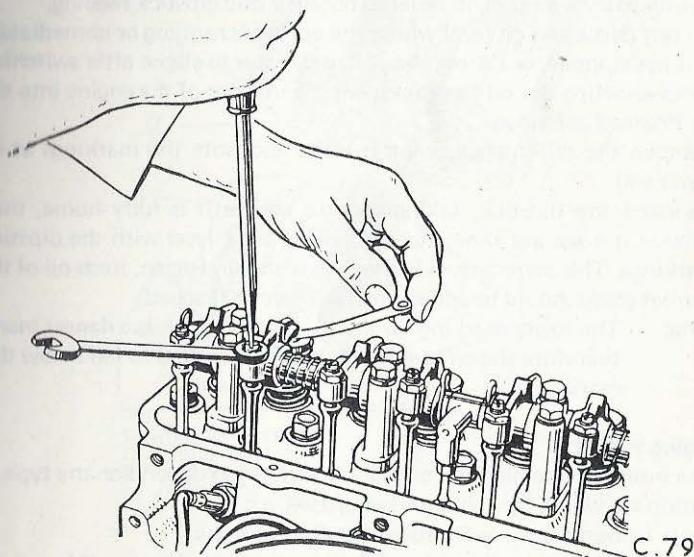
When an anti-freeze other than those recommended is to be used, the manufacturer of the relevant anti-freeze should be contacted to ascertain that their product is suitable for use in the particular engine to be treated.

PETROL ENGINE

General Inspection

The following points should be checked over from time to time, so that if a fault is discovered, immediate steps can be taken to rectify it, before more serious damage can result.

1. Examine the engine generally for oil leaks. It helps if the external parts are kept clean.
2. Examine the cylinder head and rocker cover gaskets to check that they are not blowing or leaking.
3. Inspect the engine rubber mountings. These should be free from oil or grease, and should not show signs of perishing or cracking.
4. Check all inlet and exhaust manifold nuts for tightness. Also, check the nuts on the studs which secure the exhaust pipe to the exhaust manifold.
5. Check the carburettor flange securing nuts, taking care not to over-tighten these. Inspect the mounting of the air cleaner and tighten if necessary.
6. Lubricate the throttle controls with an oil can.



Method of adjusting the Valve Rocker Clearance

Adjusting the Valve Rocker Clearances

This is not normally a regular maintenance operation to be carried out by the driver, but it is recommended that the clearance between the

rocker arm pad and the end of the valve stem be checked during the early stages of the new vehicle's life.

To adjust the clearance of an individual valve, rotate the engine by means of the starting handle until the same valve on a corresponding cylinder is at full lift. (Corresponding cylinders are 1 and 4, 2 and 3).

When the valve to be checked is fully closed, it should be possible to insert the correct feeler gauge between the pad of the rocker arm and the valve stem. For correct clearances, see "General Data" section.

To adjust the clearance, release the locknut under the head of the adjusting screw and turn the screw by means of a screwdriver until the correct clearance is obtained.

Tighten the locknut, holding the adjusting screw in position with the screwdriver, then recheck the clearance with the feeler gauge. Continue the above procedure until all valves have been checked.

LUBRICATING SYSTEM

Checking the Oil Level

The level of the oil in the sump should be checked daily. Drive the vehicle on to level ground, in order to obtain a true dipstick reading.

Do not check the oil level whilst the engine is running or immediately after it has stopped, but allow about five minutes to elapse after switching off, thus enabling the oil to drain from the interior of the engine into the sump. Proceed as follows:

- 1 Remove the oil dipstick, wipe it clean and note the markings at its lower end.
2. Re-insert the dipstick, taking care to ensure it is fully home, then remove it a second time and compare the oil level with the dipstick markings. The correct level is the high mark, and clean, fresh oil of the correct grade should be added until this level is reached.

Note: The lower marking on the oil level dipstick is a **danger mark**; therefore the oil level must not be permitted to fall below this mark.

Changing the Oil

The intervals at which the engine oil is changed depend on the type of operation for which the vehicle is being used, e.g.:

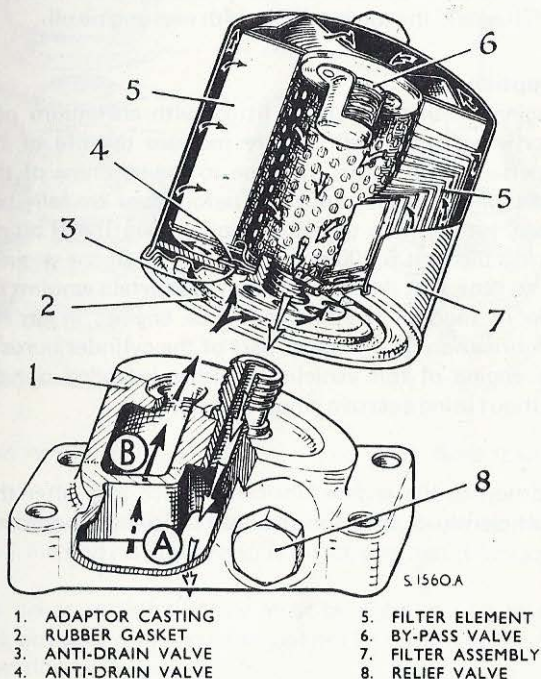
- (a) Long distance operation in good conditions.
- (b) Continual stop/start operation.

Vehicles operating in conditions as in (b) require more frequent oil changes than those operating under conditions as stated in (a).

The intervals at which oil changes should be made for each of these conditions are given in the Lubrication Chart in the rear cover pocket.

To Drain the Sump

1. Run the engine until it is thoroughly warm, thus rendering the oil less viscous, when it will flow more readily.
2. Switch off the engine and remove the drain plug fitted at the side of the sump. Allow the oil to drain into a suitable container.
3. Refit the sump drain plug securely and refill the sump with fresh, clean oil of the correct grade (see "Recommended Lubricants", on the Lubrication Chart).
4. Run the engine at idling speed and check that the oil pressure warning light is functioning correctly.
5. Stop the engine after a minute or two and allow the oil to drain back into the sump. Check the oil level by means of the oil level dipstick.



Full Flow Oil Filter

External Engine Oil Filter

With engine life and reliability so greatly influenced by thorough oil filtration it is essential that the lubricating oil filter element is changed regularly. However, the oil filtering element is confined within a sealed canister and renewal necessitates replacement of the complete canister assembly.

To renew the filter element, unscrew the filter assembly from the adaptor and discard. Before fitting the new filter assembly, ensure that the adaptor joint surface is clean. Coat the new rubber gasket with clean engine oil. Screw the new assembly on to the adaptor until both joint surfaces contact. **Screw the filter a further half of a turn by hand only.** It is essential that a spanner is **not** applied to the hexagon if the filter assembly is provided with a hexagonal protrusion, when fitting a unit, as its purpose is to facilitate removal only of the filter. Run the engine for a short time and check for oil leaks. Check oil level.

Provided that the filter element is changed at every engine oil change, periodic removal and cleaning of the sump is unnecessary. If, however, on removal of the filter element, this appears to have become clogged due to neglect, it is recommended that the sump, and sump oil filter, be removed, cleaned, refitted and the sump refilled with new engine oil.

Oil Consumption

The engine of this vehicle is fitted with chromium plated upper compression rings which will greatly increase the life of the cylinder bores. Experience has shown that due to the hardness of these rings a considerable mileage must be covered before they are fully bedded in. In consequence, rather more than the normal quantity of oil may be consumed during the first 5,000 miles (7,500 km.) of the engine's life. It is important to note that the consumption of a certain amount of engine oil is desirable in modern high performance engines in order to ensure adequate lubrication of the upper part of the cylinder bores and reduce wear. The engine of this vehicle is neither intended nor designed to operate without using a certain amount of oil.

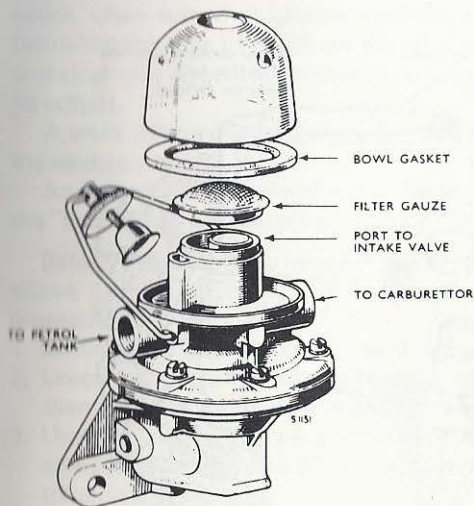
Additives

Any addition to the engine lubricants which may alter their characteristics sufficiently to affect mechanical efficiency should not be used.

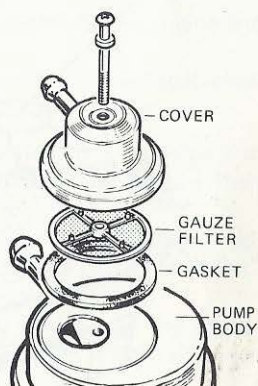
FUEL SYSTEM

Fuel Pump To Clean

The filter cover is removed by unscrewing the retaining stirrup hand screw on the top of the cover and pulling aside the stirrup, when the glass cover can be lifted off. The filter gauze can then be lifted off the pump, and should be washed in clean petrol. Refit carefully and ensure that the filter is pushed fully home.



Fuel Lift Pump (Early Engines)



C. 385

Fuel Pump (Later Engines)

When replacing the filter cover, care must be taken to see that the gasket around the body of the pump is intact and that it lies squarely on its seating.

The filter cover retaining screw must be tight enough to ensure an air-tight joint, but excessive pressure must not be applied as this will cause rapid deterioration of the gasket.

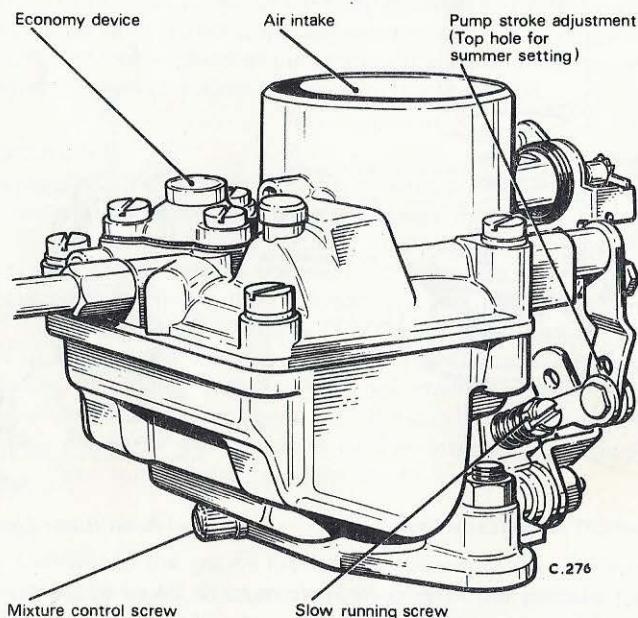
A fuel pump of slightly different design is used on the fuel system of later engines. The unit, being partly sealed, cannot be dismantled but provision is made for removing the filter gauze for cleaning. To remove the gauze filter, unscrew the cover centre screw and lift cover, gasket and gauze from the body. Wash the gauze in clean petrol and refit to body. Ensure that gasket fits snugly in cover, fit cover and tighten cover centre screw to obtain an air-tight joint.

Carburettor

Under normal conditions the carburettor should require little attention other than occasional cleaning of the float chamber.

To Clean the Float Chamber

1. Release the securing clip and remove the air cleaner.
2. Disconnect the choke/accelerator connecting rod at its upper (choke) end.



Carburettor Details

3. Disconnect the accelerator pump connecting link from the pump lever noting to which of the two holes the link is connected.
4. Release the fuel feed pipe union.
5. Release the four cheese headed screws and remove the top half of the carburettor complete with emulsion block and twin float.
6. Clean out the float chamber with a clean fluffless cloth.
7. Renew the gasket, replace the top half of the carburettor and secure all items.

Adjustments

The only adjustments that may be needed are to the slow running and pump stroke. Slow running adjustment is effected by co-ordinating the setting of the slow running adjustment screw with the setting of the mixture control screw.

The **Slow Running Screw** limits the closing of the throttle, thereby determining the idling speed of the engine. Turning the screw in a clockwise direction will increase speed of the engine and vice versa.

The **Mixture Control Screw** is a spring loaded knurled-headed screw which when turned clockwise, weakens the mixture by progressively restricting the flow of fuel from the pilot jet. By turning the screw in an anti-clockwise direction, enrichment is allowed up to the limit of the pilot jet output.

A weak mixture is recognised by irregular running of the engine and the tendency to stall.

An over-rich mixture will cause the engine to "hunt" and stall when the "hunt" becomes excessive.

Before attempting to improve the slow running, it is necessary to ensure that the engine has reached a normal running temperature, then proceed as follows:

1. Screw in the slow running screw slightly, to increase the idling speed.
2. Unscrew the mixture control screw until the engine begins to "hunt" then screw it in progressively until the engine is firing evenly.
3. Unscrew the slow running screw very slowly to decrease the engine speed to approximately 500 r.p.m. Do not attempt to run the engine at too slow a speed.
4. If the engine "hunts" slightly, screw in the mixture control screw a little further. **Under no circumstances must this screw be screwed fully home.**

Accelerator Pump Stroke

The travel of the accelerator pump piston can be adjusted to give a short or long stroke according to prevailing climatic conditions. The adjustment is made by altering the position of the link connection on the pump lever. The top hole is for summer setting.

Fuel Shortage at Carburetter

If the pump should fail to deliver fuel to the carburetter, the following points should be checked:

1. That fuel is available in the tank and that the unions in the pipe connecting the tank to the pump are tight.
2. That the pump filter is clean and that the gasket below the glass bowl is in good condition.

Air Cleaner

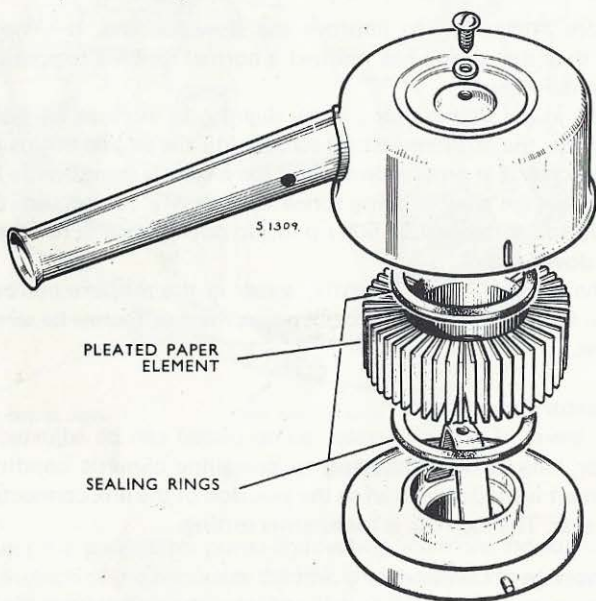
The intervals at which the air cleaner need be serviced, will vary according to the conditions under which the vehicle is operating.

For town work, or areas where roads are good, every 10,000 miles (15,000 km.) can be taken as a guide. In territories where roads are bad and dust is prevalent, servicing should be carried out more frequently.

It is most important, with the paper element type of air cleaner, that the quoted mileage interval between element changes is not exceeded, otherwise poor performance and an increase in fuel consumption may result.

In no circumstances should any attempt be made to service the old element by washing, although in an emergency loose particles of dirt may be removed by the simple expedient of tapping the element itself. This is purely an emergency measure and should not be regarded as restoring the service life of the element.

Note: Low compression engines have a single air intake; high compression engines have a twin air intake.



Paper Element Air Cleaner (Low Compression Engine Models)

To Renew the Element

The following procedure should be adopted to renew the element at the intervals indicated in the preceding section.

1. Remove the retaining screw and washer and lift off top cover.

3. Lift out the pleated paper filter element and remove the two rubber sealing rings.
4. Clean out the top cover and bottom plate ensuring that no foreign matter is allowed to enter the carburettor air intake. Ensure that the hole in the bottom plate is clear.
5. Check the condition of the rubber sealing rings and renew if necessary.
6. Place a new paper element in position on the bottom plate ensuring that the sealing rings are correctly fitted, one either side of the element.
7. Replace the top cover, aligning the slot with the locating peg fitted to the bottom plate.
8. Fit the retaining screw together with its washer.

Flame Trap

The crankcase ventilation flame trap is attached to the engine rocker cover and connected to the air cleaner by a rubber hose. The flame trap should be removed and cleaned every 5,000 miles (8,000 km).

To Clean Flame Trap

1. Raise the engine cover and secure.
2. Slacken the clip retaining screw and detach the rubber pipe from the rocker cover pipe. Ease the flame trap from the rubber hose on the air cleaner side.
3. Soak the flame trap in a paraffin bath and agitate to loosen dirt particles and disperse sludge.

Caution: Petrol must not be used for this operation.

4. Allow the trap to drain and finally dry thoroughly with a low pressure air-line.
5. Check the hoses and pipes for sludge and clean if necessary.
6. Refit the flame trap securely making sure that the metal tubes are pushed well into the hoses. Tighten the clip.

Note: Ensure that the flame trap to air cleaner outlet on the trap is higher than the inlet otherwise there is a possibility of oil entering into the air cleaner.

7. Lower the engine cover and secure.

Inlet Manifold Drain Pipe

If the inlet manifold drain pipe is obstructed, this may cause difficult starting due to petrol accumulating in the bottom of the manifold, which will have an extremely adverse effect on carburation. The inlet manifold drain pipe is removed for checking and cleaning by detaching the union from the manifold. Clear the drilling in the manifold with a piece of wire. The manifold drain pipe itself should then be checked by blowing through from the top end.

General Inspection

All fuel pipe lines should be examined from time to time, as and when a

suitable opportunity arises. Pipes must be free from signs of chafing, fracture or other damage. Check the tightness of all pipe unions, also of the nuts on the straps which secure the fuel tank to the chassis frame. Straps should be tight enough to prevent lateral movement.

IGNITION SYSTEM

Timing

Small adjustments of the ignition are sometimes necessary before the best performance can be obtained from a particular fuel. For this reason a vernier adjustment is incorporated in the type 25D4 distributor. This consists of a knurled wheel which is turned to advance or retard the distributor, and arrow signs A and R cast on the housing indicate which way to turn this control to advance or retard. A vernier scale adjoining the knurled control is provided so that fine adjustments can be made.

Only half a vernier division alteration will sometimes alter the running of the engine. If the engine seems "harsh" or "rough" it should be retarded, and, if "sluggish", it should be advanced. In either case, only small adjustments should be made by the driver.

Each division on the vernier scale (approximately 50 clicks on the knurled adjuster), represents 4 degrees of crankshaft movement.

Before checking or retiming the ignition it is necessary to ensure that the distributor contact breaker gap is correctly set.

To Check the Ignition Timing

1. Ensure that the contact breaker points are set to the correct gap.

Note: It will be seen that there are seven or thirteen timing pointers fixed to the rear of the crankshaft pulley, including the T.D.C. position which is the extreme left-hand pointer (when facing the front of the engine and with the pointers uppermost). Each of the remaining pointers (reading from left to right) advances the ignition by 5 degrees. It is, therefore, a simple matter to adjust the static timing anywhere between T.D.C. and 30 degrees B.T.D.C. when the seven pointer pulley is fitted or between T.D.C. and 60 degrees B.T.D.C. when the thirteen pointer type is fitted.

2. Having determined the correct static timing position for the grade of fuel being used (see "General Data"), turn the engine by means of the starting handle to align the appropriate pointer on the crankshaft pulley with the fixed pointer on the timing case cover, *e.g.* using Premium Grade Fuel the static ignition timing should be 6–10 degrees B.T.D.C., therefore the second pointer to the right of the T.D.C. position should be aligned with the timing cover pointer. Numbers 1 and 4 pistons will now be at 10 degrees B.T.D.C.
3. Adjust the vernier so that only three divisions can be seen, (type 25D4 distributor only).
4. Slacken the distributor clamping screw and turn the distributor a quarter of a turn in an anti-clockwise direction, (type 25D4 and 45D4).

6. Connect a 12-volt test lamp between the low tension terminal on the outside of the distributor and a good earth.
8. Having switched on the ignition and removed the distributor cover, apply finger pressure to the rotor in a direction opposite to that indicated by the arrow and commence to turn the distributor body very carefully in a clockwise direction (back towards its original position). As soon as the test lamp lights, indicating that the contact points are just opening, tighten the distributor clamp screw.
7. Re-check the ignition timing by turning the engine a complete turn. The bulb should just light as the timing pointer on the crankshaft pulley comes opposite to the pointer on the timing case. If the timing is now correct, switch off ignition, remove bulb and replace distributor cap.

Distributor (Type 25D4 and 45D4)

Either one of two types of distributor are fitted to the light van models; earlier models are equipped with type 25D4 while later models are provided with type 45D4.

The latter mentioned type is the slightly smaller unit of the two and is designed to give improved performance and reliability. The basic differences between the two distributors are that the 25D4 is provided with a two-piece contact breaker set and vernier control for timing adjustment but the 45D4 incorporates an integral contact breaker assembly and no vernier control. On this type the ignition timing adjustment is carried out by slackening the distributor clamp bolt and swivelling the distributor body to suit, i.e. clockwise to advance, or anti-clockwise to retard.

Important:

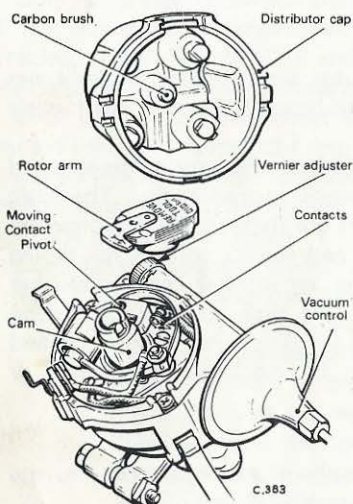
The cover of the 45D4 type is made of a comparatively brittle material and therefore requires careful handling.

Cleaning and Adjusting

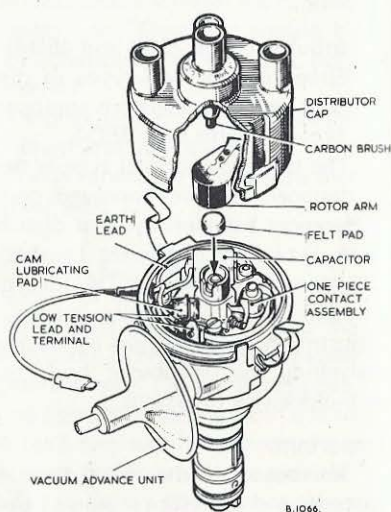
The distributor should be lubricated and the points cleaned and adjusted, at the recommended intervals, as follows:

1. Release the clips securing the distributor cover and remove the cover.
2. Remove the rotor arm from the cam and apply two drops of engine oil to the exposed screw (type 25D4) or to the felt pad in the top of the cam (type 45D4).
3. Remove the nut, insulating piece and capacitor and L.T. connections from the contact breaker post and remove the contact breaker spring lever (type 25D4) or detach the movable contact point by lifting the spring out of its white nylon insulator and the movable point off its pivot post (type 45D4); the L.T. and capacitor leads should now be unhooked from the end of the spring.

4. Apply a thin film of Shell Retinax A to the pivot post.
5. Apply a few drops of engine oil through the aperture at the edge of the contact breaker plate to lubricate the centrifugal timing control (type 25D4).
6. Lightly lubricate the distributor cam and felt wiper pad with Shell Retinax A.
7. Check the contact points for wear or pitting and if necessary clean the faces with a fine grade of emery cloth then wipe with a petrol moistened cloth. Renew contact assembly if points are badly worn. To remove the fixed contact plate, first remove the locking screw, spring washer and plain washer.
8. Refit the contact point assembly.



Distributor Details (Lucas type 25D4)



Distributor Details (Lucas type 45D4)

9. Turn the engine by hand until the contacts show the maximum opening. The gap should be 0.015 in. (0.38 mm.). If adjustment is required, slacken the locking screw and with the aid of a screwdriver placed in the slot in the contact plate move the plate to obtain the correct gap. Tighten the locking screw and recheck the gap.
10. Refit the rotor arm.

The distributor cover should be kept clean internally and externally and the carbon brush must move freely in its holder.

Sparkling Plugs

The sparking plugs should be removed from the cylinder head every 8,000 miles (8,000 km.) and cleaned, and adjusted as required.

The correct gap setting of the sparking plugs is essential for good engine performance. The recommended gap setting is 0.025 in. (0.63 mm.).

Sparking plugs should be renewed every 10,000 miles (16,000 km.).

To remove and Refit Sparking Plugs

1. Disconnect the H.T. leads.
2. Remove all sparking plugs with a well-fitting box spanner, being careful to clean the plug recesses in the cylinder head before the last thread is unscrewed. This prevents the possibility of foreign matter entering the combustion chambers.
3. Examine each plug in turn. If they look oily, wash them in petrol and allow to dry before replacing. If there appears to be an appreciable deposit of carbon inside the plug body, they should be cleaned on a sandblast-type of cleaner. After cleaning, each plug should be compression-tested. Where this type of equipment is not available, scrape as much carbon as possible from the plug interiors; alternatively fit new plugs, saving the original plugs for cleaning at a more convenient time, after which they can be carried as spares.
4. Check the plug gaps. Re-adjust the gaps by bending the earth electrode. Do not attempt to bend the centre electrode, as this will cause the insulator to crack.
5. The plug threads should be wire brushed and the copper washers renewed if badly worn or flattened.
6. Refit sparking plugs.
7. Reconnect the H.T. leads in the correct firing order i.e., 1-3-4-2.

High Tension Leads

The high tension leads to the sparking plugs and to the coil are of the suppressed type.

Periodically examine the leads for signs of perishing or cracking.

Note: These suppressed leads are of special construction and only the specified leads must be used when renewing.

Ignition Coil

The only attention required to the coil is to keep the exterior clean, particularly between the leads, and occasionally check that the terminal connections are clean and secure.

DIESEL ENGINE

General Inspection

The following points should be checked over from time to time, so that if a fault is discovered, immediate steps can be taken to rectify it before more serious damage can result.

1. The importance of regular inspection for leakage and immediate rectification cannot be overstressed. Keep the engine clean so that leaks can be detected quickly.
2. Examine the cylinder head and rocker cover gaskets, to check that they are not blowing or leaking.
3. Inspect the engine rubber mountings. These should be free from oil or grease and should not show signs of perishing or cracking.
4. Check all inlet and exhaust manifold nuts and bolts for tightness. Also, check the nuts on the studs which secure the exhaust pipe to the exhaust manifold.
5. Give the throttle controls oil can lubrication.
6. Inspect the mounting of the air cleaner and tighten if necessary.
7. Check all external nuts and bolts for tightness.

Adjusting the Valve Rocker Clearances

Adjusting the valve clearances is not normally a regular maintenance operation to be carried out by the driver, but it is recommended that the valve clearance be checked at the periods stated on the Lubrication Chart and particularly after the cylinder head nuts have been tightened. For correct clearances, see "General Data" section.

To adjust the clearance of any individual valve, rotate the engine until the same valve or the corresponding cylinder is at full lift. The corresponding cylinders are 1 and 4, and 2 and 3. If, for example, it is desired to adjust No.1 inlet valve clearance, rotate the engine until No.4 inlet valve is fully open. No.1 inlet is then fully closed.

Method of Adjustment

When the valve to be checked is fully closed, it should be possible to insert the correct feeler gauge between the rocker arm and valve stem.

To adjust, release the locknut under the head of the adjusting screw (the ball head of which locates in the top cup of the push rod) and turn the screw with a screwdriver until the correct clearance is obtained.

Tighten the locknut, holding the adjusting screw to prevent it from turning, then re-check the clearance with the feeler gauge. Repeat the above procedure until all eight valves have been checked.

Refit the rocker cover, ensuring that the joint is intact and correctly positioned. Re-connect the breather pipe.

Important: When refitting the valve rocker cover, the rocker cover gasket must be renewed so that an oil tight seal is obtained.

LUBRICATING SYSTEM

Checking the Oil Level

The level of the oil in the sump should be checked daily. Drive the vehicle on to level ground, in order to obtain a true dipstick reading.

Do not check the oil level whilst the engine is running or immediately after it has stopped, but allow about five minutes to elapse after switching off, thus enabling the oil to drain from the interior of the engine into the sump. Proceed as follows:

1. Remove the oil level dipstick, wipe it clean and note the markings at its lower end.
2. Re-insert the dipstick, taking care to ensure that it is fully home then remove it a second time and compare the oil level with the dipstick markings. The correct level is the high mark, and clean, fresh oil should be added until this level is reached.

The oil filler is located on top of the rocker cover.

Note: The lower marking on the dipstick is a **danger mark**: the oil level must never be permitted to fall below this mark.

Changing the Oil

On new engines, the oil should be drained and refilled with fresh lubricant, after the first 1,000 miles (1,500 km.). Subsequently the engine should be drained and refilled as stated on the Lubrication Chart.

To Drain the Sump

1. Run the engine until it is thoroughly warm, thus rendering the oil less viscous, when it will flow more readily.
2. Switch off the engine. Release the six hexagonal nuts securing the undertray to the undertray attachment brackets, and remove the undertray.

Caution: Do not allow oil to contaminate the sound insulation padding. Any pads contaminated with oil should be renewed.

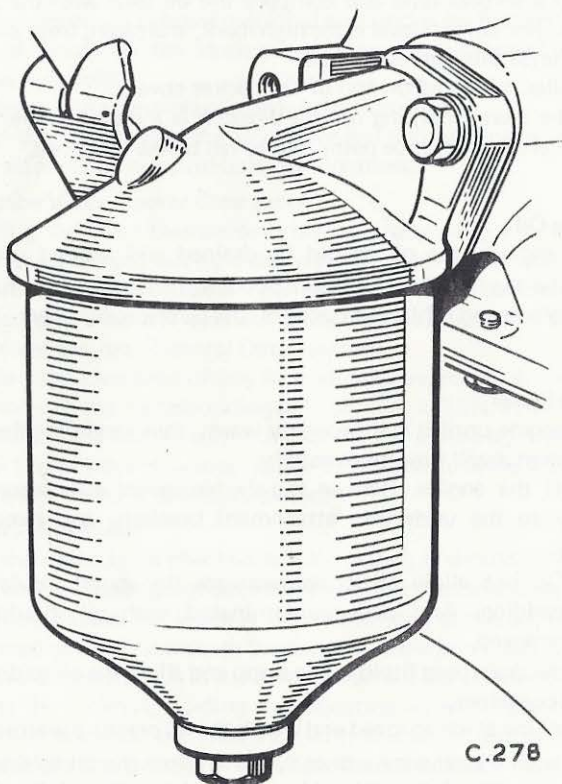
3. Remove the drain plug fitted in the sump and allow the oil to drain into a suitable container.
4. Run the engine at idling speed and watch the oil pressure warning light.
5. Stop the engine after a minute or two and allow the oil to drain back into the sump. Check the oil level by means of the oil level dipstick.
6. Replace the undertray.

Note: Under no circumstances should the vehicle be operated without the undertray.

External Lubricating Oil Filter with Separate Element

This filter is mounted on the side of the crankcase. The oil passes through the filter from the oil pump before it reaches the bearings.

The frequency at which the filter element should be renewed depends largely on operating and engine conditions, a good guide being furnished by the condition of the oil on the dipstick. Evidence of sludge is an indication that the element requires renewal. Under normal service conditions renew the element at the periods stated on the Lubrication Chart.



External Lubricating Oil Filter

To renew the Element

1. Release the undertray as described previously.
2. Clean the exterior of the filter bowl. Release the nut at the bottom of the filter bowl.
3. Remove the filter bowl.
4. Discard the filter element.
5. Clean inside the filter bowl with paraffin or fuel oil and place the new element into the bowl.
6. Ensure that the rubber joint is in good condition, renewing if necessary.
7. Replace the filter bowl and secure. Replace the undertray.

The bolt securing the filter bowl should be checked for tightness after the subsequent 1,000 miles (1,500 km.).

External Lubricating Oil Filter — Spin-Off Type

Later production engines are fitted with spin-off type filters. The filter element is contained within a sealed canister and replacement of the element necessitates renewal of the canister assembly. To renew the filter, unscrew the canister from its adaptor head and discard the filter. Before fitting the new filter assembly clean the adaptor contact surface and coat the new rubber gasket with clean engine oil. Screw the new filter onto the adaptor until both joint surfaces make contact then screw on a further half a turn by hand only. Fill with clean engine oil, run the engine for a short time and check for oil leaks. Check oil level.

FUEL SYSTEMS

Priming and Venting the System

The fuel system must be primed and vented whenever air has been allowed into the pipeline, *i.e.* part of the system dismantled or running out of fuel.

It may be necessary to vent the system at intervals due to the accumulation of tiny air bubbles which could cause difficulty in starting.

The system should be primed by means of the hand priming lever fitted on the fuel lift pump and the air vented in the following manner:

1. Ensure that the lift pump is on the bottom of the operating cam otherwise the maximum movement of the priming lever will not be obtained.
2. Slacken the vent plug of the final fuel filter and operate the hand priming lever until fuel, free from air bubbles, issues from the union. Tighten the union.
3. Slacken the vent screw on the governor housing and hydraulic head locking screw on the pump body. Operate the hand priming lever until air free fuel issues from both vents. Tighten the vent screws.
4. Slacken the unions at the atomiser end of two of the high pressure pipes. Ensure that the stop control is set in the run position, set the accelerator in the fully open position and turn the engine by means of the starter motor until air free fuel issues from the unions and the engine fires on the remaining cylinders. Tighten the unions.

Important

When carrying out this procedure great care must be taken to prevent fuel under pressure from contacting the skin since it will penetrate with ease.

Water and Dirt Trap

Fuel drawn from the tank, by the fuel lift pump, has first to pass through a water and dirt trap situated at the rear of the right-hand side wall of the engine compartment, beneath the cold start fuel reservoir. Fuel from the tank is drawn into the trap where water and/or foreign matter gravitate to the lower part of the glass bowl. Fuel then passes through the gauze filter element at the top of the unit and on to the fuel lift pump, thus extracting any coarse impurities before the fuel reaches the finer element of the main fuel filter.

Attention should be given every 5,000 miles (8,000 km.) to the cleaning of the water and dirt trap.

To Clean

1. Unscrew the knurled nut at the base of the bowl and swing the stirrup to one side, thereby releasing the bowl, gasket and filter gauze.

2. Clean the components in fuel oil.
3. Examine the glass bowl for damage.
4. Examine the filter gauze and renew if necessary.
5. Examine the bowl gasket and renew if necessary.
6. Prime the bowl with clean fuel oil and refit together with the filter gauze and gasket, ensuring that an airtight joint exists between the bowl and the head of the water trap.
7. Complete the operation by priming and venting the system as described previously.

Fuel Oil Filter

The filter element cannot be cleaned and should be renewed every 25,000 miles (40,000 km.), but in certain cases, as fuel conditions dictate, it may be necessary to change the element at more frequent intervals.

To Renew the Element

1. Unscrew the centre bolt securing the filter bowl to the top cover.
2. Drop the filter bowl clear, remove and discard the element.
3. Before putting the new element in position, thoroughly clean out the filter bowl with paraffin or diesel fuel.
4. Ensure that the rubber joints are in good condition, renewing them if necessary.
5. Prime the fuel system as previously detailed.

Fuel Lift Pump

The fuel lift pump is of the diaphragm type, and is equipped with a lever for hand priming. The pump is operated by an eccentric on the engine camshaft. The following inspection should be carried out at regular intervals.

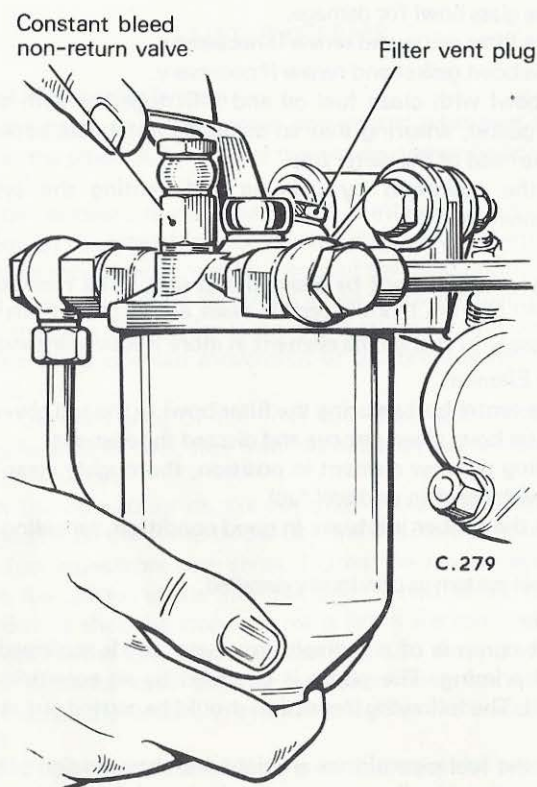
1. Ensure that the fuel pipe unions are tight and show no sign of leaking.
2. Examine the pump body at the exposed edge of the diaphragm, and also the joint between the cap and the pump body. If it is found that fuel is weeping from these joints, carefully tighten the screws.
3. Make sure that the stud nuts, securing the pump to the cylinder block, are properly secure.

Smoke Emission

To ensure that your vehicle complies with the smoke emission regulations the following points must be observed:

1. NEVER attempt to alter the diesel fuel injection pump and governor settings. This work is for the specialist and must only be entrusted to him.
2. NEVER use substitute equipment for the fuel, air or exhaust systems. Only parts to the original specifications may be used.
3. ALWAYS ensure that the fuel, air and exhaust systems are correctly maintained.

Remember, it is an offence for vehicles to give off excessive smoke.



Releasing Fuel Filter Bowl for Element Renewal

Fuel Pipes and Unions

The fuel system should be examined at every service interval for leaks. It helps if the engine is kept clean.

Any leakage must be rectified immediately

Fuel Injection Pump

The fuel injection pump meters and delivers fuel oil to the injectors. It is built to extremely fine limits. Any mishandling or the entry of the smallest particles of dirt could cause expensive damage. It is, therefore, important that clean fuel be used and that attention be only given by experienced personnel.

The pump type and number—as given on a plate on the pump body—should be quoted in all correspondence concerning the pump.

Important No attempt should be made to adjust the governor. Besides invalidating the warranty, alterations to the governor could cause smoke emission and considerable engine damage.

Injectors

Providing that good quality fuel is used and the fuel filtration system is properly maintained the fuel injectors will require minimal attention. Injectors should be cleaned and tested every 12,000 miles (18,000 km).

Cleaning and testing of injectors must only be carried out by trained personnel. However, if a faulty injector is suspected it may be replaced as follows:-

Replacing a Faulty Injector

A faulty injector is indicated by one or more of the following symptoms:-

- (a) Knocking in one or more cylinders
- (b) Engine overheating
- (c) Loss of power
- (d) Smoky (black) exhaust
- (e) Increased fuel consumption

It should be borne in mind that these symptoms may not necessarily indicate an injector fault but could be attributable to other causes e.g. clogged air cleaner element.

Important Absolute cleanliness is essential when dismantling any part of the fuel injection system and every precaution possible should be taken to ensure that no dirt or other foreign matter contaminates pipes or injectors.

1. With the engine running at approximately twice its idling speed slacken off the union nut on the injector end of one fuel pipe. This will prevent fuel from reaching the injector.
2. If this affects engine running re-tighten the fuel pipe and repeat the procedure until the slackening of a union has no effect on the engine, indicating the faulty injector.
3. Stop the engine.

4. With a non-fluffy cloth soaked in paraffin or fuel oil wipe the injector, pipe, unions and surrounding area clean.
5. Uncouple the fuel delivery pipe at both ends and remove the pipe. Uncouple the fuel bleed pipe at both ends and remove. Release the injector securing nuts and withdraw injector and copper washer.

Important: The pipe must be released at both unions and then removed. Failure to do this will result in damage to the unions and subsequent fuel leaks.

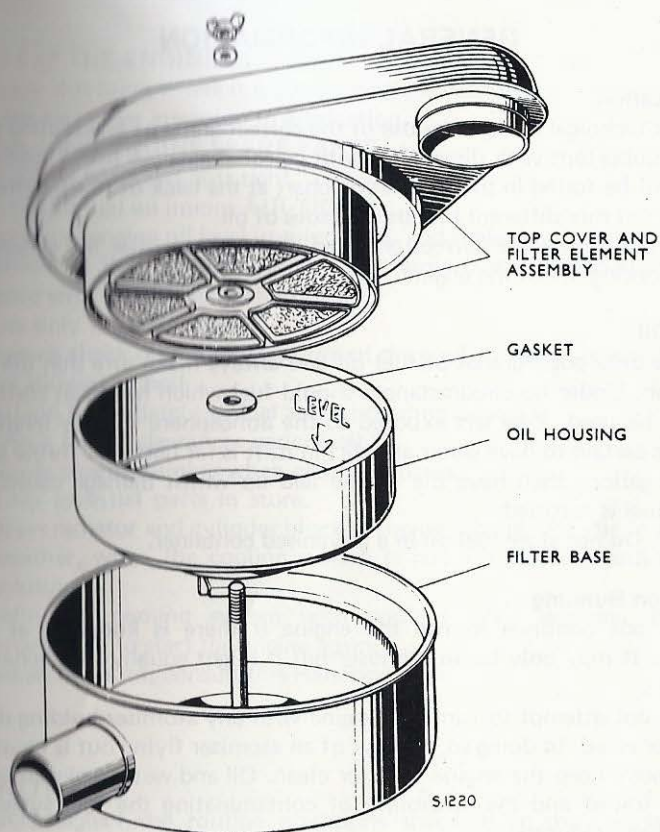
6. Seat a new copper washer in the cylinder head and enter the nozzle of a new injector of the correct type into the hole so that it is central and in line.
7. Tighten the securing nuts alternately and progressively making sure that the flange on the injector is seated squarely. Tighten the nuts to the correct torque making sure that they do not bind.
8. Examine the fuel pipe for cleanliness and thread damage. Clean or renew if necessary.
9. Offer the pipe to the pump and injector unions and ensure that it fits squarely at both ends. Tighten the unions alternately and evenly taking care not to overtighten or damage the nipples.
10. Renew copper washers at the fuel bleed pipe banjo connection and reconnect the pipe.

Caution: Never attempt to start or run the engine with any injector securing nuts removed otherwise the risk of an injector flying out is incurred.

Oil Bath Air Cleaner

The intervals at which the air cleaner needs to be serviced will vary according to conditions under which the vehicle is operating. Cleaning should be carried out every 5,000 miles (8,000 km.). This can be taken as a general guide, but in territories where the roads or operating conditions are extremely dusty servicing should be carried out more frequently.

To clean the air cleaner remove and dismantle the filter. Wash the steel wire element in clean paraffin or fuel oil and allow to drain. The oil container should be emptied, and thoroughly scraped to remove any sludge deposits, and then washer out using either paraffin or fuel oil. Before re-assembling, refill the oil container with engine oil to level indicated (do not overfill).



Oil Bath Air Cleaner

GENERAL INFORMATION

Lubrication

For technical reasons the use of the correct grade of lubricant is even more important with diesel than with petrol engines. A list of approved oils will be found in the lubrication chart at the back of this handbook.

Do not mix different brands or grades of oil.

Failure to use the correct grade of oil will jeopardise the efficiency and working life of the engine.

Fuel Oil

Use only good grades of fuel oil and always make sure that the fuel is clean. Under no circumstances should fuel which has been contaminated be used. Fuel left exposed to the atmosphere for any length of time is certain to have water and dirt in it. It is far better to throw away a few gallons than have the engine laid up whilst damage caused by dirty fuel is rectified.

Note: Do not store fuel oil in a galvanised container.

Hints on Running

Do not continue to run the engine if there is knocking at high speeds. It may only be an atomiser but it might equally be mechanical trouble.

Do not attempt to turn the engine with any atomiser holding down nuts removed. In doing so, the risk of an atomiser flying out is incurred.

Always keep the engine exterior clean. Oil and water leaks are more easily traced and the possibility of contaminating the fuel system is effectively reduced.

If the oil pressure warning light remains on when the engine is speeded up, stop the engine at once and investigate.

Do not continue to run if there is a fuel leak.

Important

Care should be exercised when using the engine as a brake. The normal governed speeds of the engine must not be exceeded as could happen on a long descent resulting in serious damage. On the other hand it is dangerous to coast downhill.

Intelligent use of gears and brakes will provide effective retardation on gradients without harming the mechanical efficiency of the vehicle.

DO KEEP THE ENGINE CLEAN.

- DO keep this book where it is conveniently accessible.
- DO pay particular attention to lubrication.
- DO use only GENUINE SPARE PARTS.
- DO keep all bolts and nuts tight.
- DO keep all fuel oil unions AIR-TIGHT.
- DO examine engine oil level in sump daily and replenish if necessary.
- DO check oil flow to rocker arms and examine valve springs in accordance with "Periodical Attention."
- DO use only filtered fuel oil.
- DO keep a check on the temperature of the cooling water. It should not be allowed to boil.
- DO attend immediately to fuel and lubricating oil leaks.
- DO check tappet clearances periodically.
- DO quote chassis number when ordering spares.
- DO keep essential parts in store.
- DO drain radiator and cylinder block if engine is being left idle in frosty weather, when the cooling system is not protected by anti-freeze solution.
- DO refill the cooling system with coolant, after draining, before attempting to start the engine again.
- DO when in doubt, consult this Handbook.

DO NOT . . .

- DO NOT neglect the routine attentions specified on the Lubrication and Maintenance Chart which accompanies this Handbook.
- DO NOT race the engine in neutral.
- DO NOT run the engine unless the oil pressure warning light becomes extinguished when speeding up the engine.
- DO NOT break the fuel injection pump seal, **remember, if broken, your Guarantee may be void.**
- DO NOT continue to run the engine if the coolant boils.
- DO NOT forget to keep the fan belt adjusted.
- DO NOT continue to run the engine if black smoke is coming from the exhaust.
- DO NOT use fluffy cloth when cleaning.
- DO NOT use any but approved brands of fuel and lubricating oils.
- DO NOT subject any engine or vehicle to continuous overloading.
- DO NOT coast when travelling downhill.
- DO NOT guess. For additional information contact your Dealer.

FAULT DIAGNOSIS

Difficult Starting

No fuel at atomisers

1. No fuel in tank.
2. Fuel lift pump not working.
3. Slack connections in the fuel system.
4. Air in the fuel system. (Trace from suction side).
5. Incorrect function of cold starting equipment.

Go over the whole of the above and make sure that the atomisers are fully primed.

Engine not being turned over quickly enough (particularly in cold weather).

1. Incorrect grade of lubricating oil.
2. Battery not fully charged. Fit fully charged battery.
3. Engine "gummy" due to standing in the cold.

Use the cold starting equipment.

Cold Starting Equipment

If any difficulty in starting is encountered, it should be ensured that the cold starting equipment is functioning correctly by carrying out the following:

1. Ensure that the electrical connection to the cold starting aid heater is correctly made.
2. Check that the fuel from the reservoir is reaching the cold starting aid heater in the air intake of the induction manifold, by unscrewing the inlet union and observing the flow of fuel. If fuel does not flow, check that the fuel reservoir is fully primed and is not leaking.
3. If it has been confirmed that fuel is reaching the cold starting aid heater, it may be that there is a fault in the heater itself. This can be checked by releasing the air cleaner hose at the inlet manifold and observing the action of the cold starting aid heater whilst it is in use. With the starter switch turned to the "H" position, the heater element should become red hot and then, with the engagement of the starter motor, there should be a burst of flame in the manifold.

Note: The diesel engine is fitted with efficient cold starting equipment and no responsibility can be accepted for any damage caused by unauthorised starting aids.

Faulty Atomiser

Test atomiser by removing it from the cylinder head as previously detailed. Disconnect the pipes on the other atomisers whilst making this test.

Sticking Valves

Trouble with sticking valves may be due to overheating, the result of choked atomisers, or the use of unsuitable lubricating oil. Test the atomisers as recommended and fit replacements if necessary.

Sticking Rocker

If the rockers stick, the cause may be; the use of unsuitable oil, shortage of oil, or sludging. Only oil of an approved type should be used. If there is a shortage of lubricant at the rockers, the passages and pipes to the rockers should be cleaned.

Fuel Oil

If the engine tends to run well for a short period and then to die away or stop altogether, the fuel system should immediately be suspected.

Erratic Running (Fuel Leaks)

Leakages in the fuel pipe are of two kinds. There may be:

1. Leakage on the pressure side, between the fuel lift pump and the fuel injection pump, or between the fuel injection pump and the atomisers.
2. Leakage on the suction side, that is, between the fuel tank and the fuel lift pump, allowing air to enter.

Leakage on the pressure side

Wipe the unions clean and watch them whilst the engine is running.

Do not strain the unions on the fuel pipes. If a leakage from a union on a fuel pipe persists after tightening the unions, it may be that one of the "olives" by which the joint is made, has split.

Leakage on the suction side

This may cause misfiring, because air, instead of fuel, is passing to one or more of the atomisers. If serious, so that air passes to all the atomisers, the engine will stop and refuse to start.

There may be other reasons why air has entered the fuel system.

If the engine has been standing for a while, the very small quantity of air that is always in the fuel may have collected to form one or two bubbles, enough to cause trouble.

Leakage on the suction side of the fuel pipe may be suspected if the tank has plenty of fuel in it, and the engine has been running quite well up to the moment when this trouble began. The remedy is:

1. Tighten all the unions on the pipe between the fuel tank and fuel lift pump, missing none of them.
2. Tighten the joint on the top of the fuel lift pump.

3. Tighten the joint on the water and dirt trap.

To expel the air, the fuel system should be primed and vented as previously detailed.

After this has been done, the engine should run. If it does so but soon afterwards begins to give the same trouble, then there is still a leakage on the suction side of fuel lift pump.

The unions and joints should again be examined for tightness.

Smoky Exhaust

Black smoke, indicating incomplete combustion of fuel due to:

1. Excess fuel. Pump setting incorrect. The pump should be examined by the nearest C.A.V. service agent.
2. Injection pump timing retarded. Check as described under "Fuel Injection Pump".
3. Atomiser/s faulty. Check as described under "Atomisers".

Blue smoke, indicating lubricating oil finding its way out of the exhaust ports due to:

1. Worn piston rings and/or cylinder liners.
2. Oil control rings worn.

Engine Does Not Pull

Faulty injection pump timing. Check as described under "Fuel Injection Pump".

Leak on the pressure or suction side of fuel line. See under "Erratic Running".

Misfiring on one or more cylinders. Faulty atomisers. Check as described under "Atomisers".

Faulty Injection Pump or Lift Pump. Have these units examined by the nearest Dealer, or, in the case of the injection pump, by a C.A.V. service agent.

Engine overheating. Refer to "Overheating".

Air intake obstructed. Check for choked air cleaner and if necessary clean and refill with fresh oil.

Choked fuel filter. Renew the filter element.

Excessive carbon deposit in combustion chambers and valve ports. Decarbonize.

Overheating

No water in radiator. Trace cause of water loss then refill with soft water as detailed in the "Cooling Systems" section. Do not refill whilst the engine is still hot, as this can cause extensive damage.

Water pump driving belt slipping. Check tension.

Water pump driving belt broken. Renew.

Radiator blocked. Flush out as described in the "Cooling Systems"

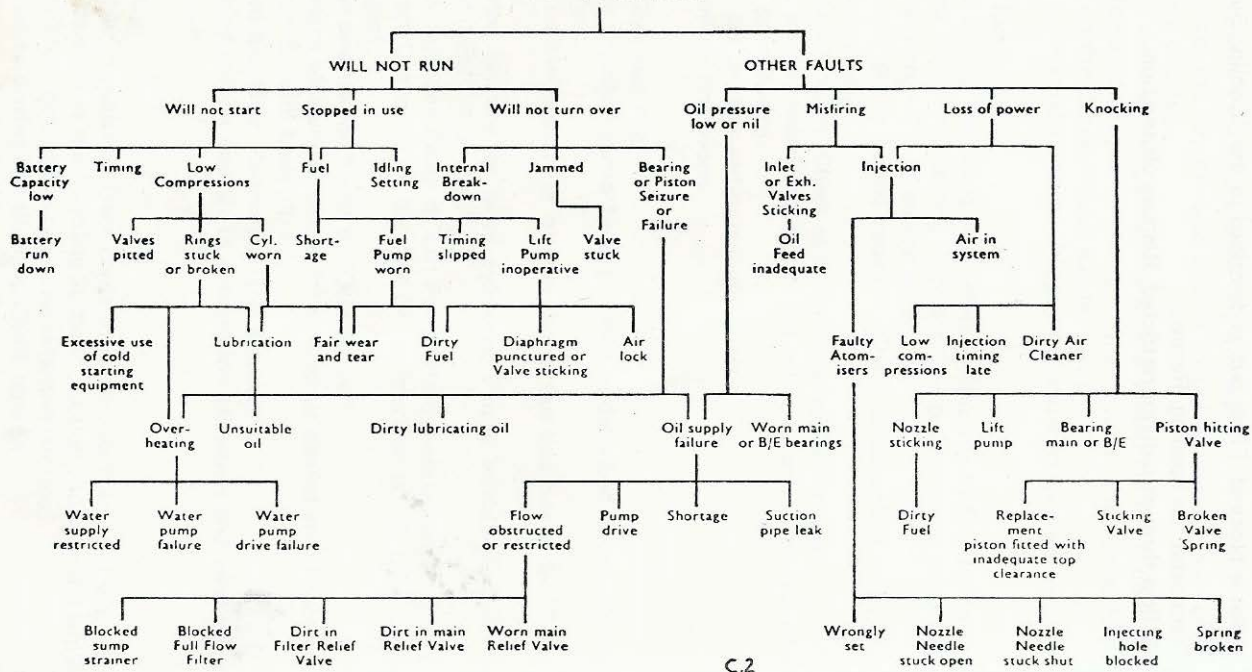
section.

Thermostat not opening. Renew.

Air flow through radiator restricted. Remove obstruction.

DIESEL ENGINE

FAULT DIAGNOSIS



CLUTCH

Clutch Linkage

The clutch release mechanism is of the self-adjusting type and therefore requires no attention except for oil can attention to the withdrawal lever.

Master Cylinder Supply Tank

Hydraulic Fluid is contained in the clutch supply tank, located beneath the cab floor, and accessible after removing the metal cover plate, which is secured by three screws.

Examine the fluid level regularly, and replenish, if necessary to keep the supply tank to within $\frac{1}{2}$ in. (1.25 cm.) of the top. **Do not fill completely.** If the cylinder is overfilled, expansion of the fluid during hot weather may cause the clutch to slip.

The addition of fluid should only be necessary at extremely long intervals and a considerable fall in fluid level would indicate a leak at some point in the system, which should be traced and rectified. **Ensure that the air vent in the filler cap of the supply tank is not choked;** blockage at this point would cause the clutch to slip.

GEARBOX

Checking the Oil Level

The gearbox oil level should be checked regularly every 5,000 miles (8,000 km.). A combined filler/level plug is located on the right hand side of the gearbox and is accessible from beneath the vehicle.

Preferably check the oil level after the vehicle has been standing overnight on a level surface. If replenishment is necessary, the specified grade of oil should be used.

Changing the Oil

Every 25,000 miles (40,000 km.) the gearbox should be drained, and then refilled with the correct lubricant. The best time for carrying out this operation is immediately after the vehicle has returned from a long run, when the oil will be thoroughly warm and flow more easily. Additions must on no account be made to the lubricants specified for the gearbox.

General Inspection

The gearbox should be examined from time to time, to ascertain that there are no leaks. If oil leaks are apparent, rectify at the earliest opportunity by tightening the bolts and setscrews.

If the leakage is suspected at the gearbox front cover, the vehicle should be taken to a Dealer, for attention.

OVERDRIVE

(when fitted)

To Check/Top Up Oil Level

The overdrive unit is an extension to the gearbox and utilises the gearbox oil not only for lubrication purposes but for operating the overdrive hydraulic system. It is therefore doubly important to ensure that the gearbox oil is maintained at the correct level otherwise operation of the overdrive will be affected.

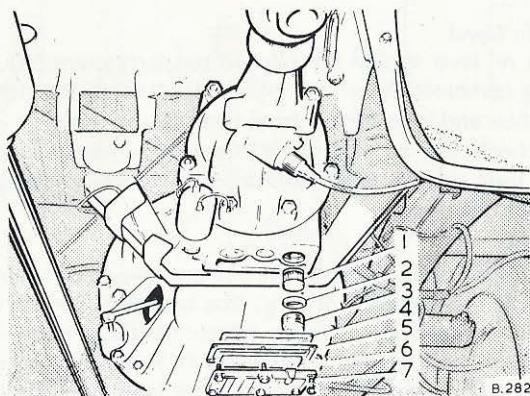
Check and top-up the gearbox in the normal manner.

To Change the Oil

The gearbox and overdrive oil should be renewed every 25,000 miles (40,000 km.) by removing the gearbox drain plug and overdrive sump. At the same time the overdrive filters and magnet should be removed and cleaned. (See below).

After refilling run the engine for a few minutes to allow oil to find its way round the overdrive hydraulic system and then check the level and top up if necessary.

Important Absolute cleanliness must be maintained when filling the gearbox and overdrive as any foreign matter that enters could damage the overdrive hydraulic system.



- | | |
|---------------------------|------------------|
| 1. Pressure Filter | 4. Filter — Sump |
| 2. Washer | 5. Gasket — Sump |
| 3. Plug — Pressure Filter | 6. Magnet — Sump |
| 7. Sump | |

Overdrive Sump and Filter Assembly.

To Clean Filters and Magnet

The sump filter, sump magnet and pressure filter should be removed and cleaned every 25,000 miles (40,000 km.). This work should be entrusted to your dealer, unless special tool VLC L 354A is available.

1. Wipe clean, with a fluffless cloth, the sump and surrounding area.
2. Unscrew the setscrews and remove the sump, magnet, filter and gasket.
3. With the special tool remove the pressure filter plug — the largest of the three plugs and on the left when looking towards the rear of the vehicle.

Do not touch the other two plugs.

4. Remove the aluminium washer and pressure filter.
5. Clean the filters and magnet and blow dry with an air line.
6. Renew the sump gasket.
7. Refitment is a reversal of the removal procedure ensuring that the filter plug is tightened to the correct torque.
8. Refill the gearbox and overdrive with the correct grade of lubricant.

CHANGE SPEED

REMOTE CONTROL MECHANISM

The change speed lever ball and pin in the top of the change speed housing assembly, the reverse plunger and the relay shaft ball socket are lubricated on assembly at the factory and normally should not require periodical lubrication by the driver. These parts should receive attention only during periodical workshop overhaul of the vehicle.

If, however, due to certain operating conditions, stiffness in the remote control mechanism is experienced when selecting gears, the linkage points mentioned above should be checked for lubrication and, if necessary, cleaned and relubricated with the recommended lubricant. As this operation involves partial dismantling of the remote control mechanism the work should be carried out by the nearest Distributor/Dealer.

The lubricating nipple located on the relay shaft trunnion must receive regular lubrication using Shell Retinax A or Shell Spirax 140 E.P. and at the same time the universal joint on the gear change relay shaft should receive oil can attention. (See Lubrication and Maintenance Chart in rear cover of this Handbook).

Under normal operating conditions no lubrication of the ball joints on the gear selector rod or the spherical bushes in the front and rear relay support brackets should be found necessary. If, however, tightness is experienced at these points, then oil can attention is permissible.

PROPELLER SHAFT

In order to transmit power from the gearbox to the rear axle, a tubular propeller shaft fitted with two universal joints, incorporating needle bearings, is utilised.

The universal joints are fitted with greasers and should be lubricated every 5,000 miles (8,000 km.) with the specified lubricant (see Lubrication and Maintenance Chart).

REAR AXLE

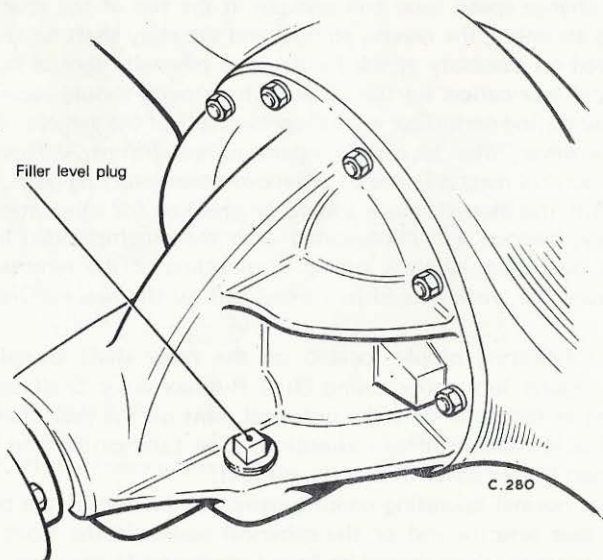
Checking the Oil Level

The rear axle oil level should be checked and topped up if necessary every 5,000 miles (8,000 km.).

Remove the filler/level plug from the axle web. The level is correct when the oil reaches the bottom face of the plug aperture.

Note: Overfilling, caused by failure to observe the correct level may lead to oil seepage at the oil seals and subsequently on to the brake linings.

Periodically check that the breather hole drilled in the top of the axle casing, adjacent to the three way hydraulic pipe connection, is clear from obstruction. Also ensure that the hub oil catcher drain holes are clear. See "Periodical Attentions" on the Lubrication chart.



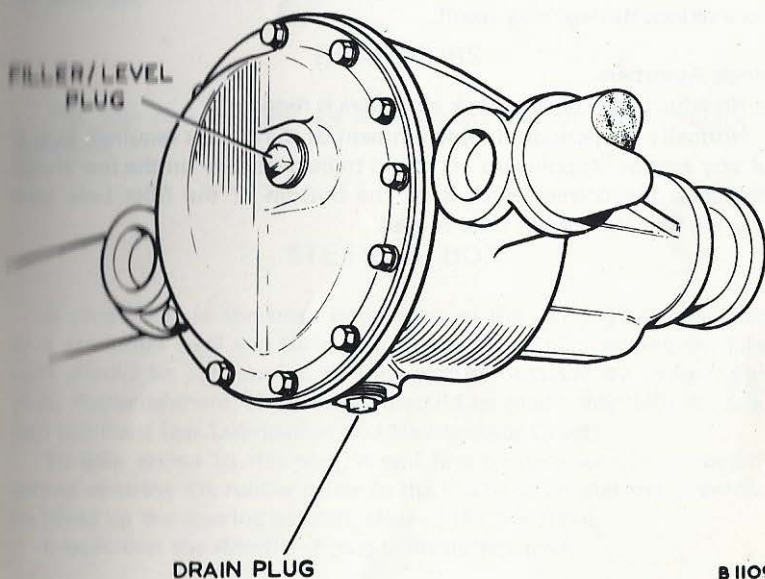
Differential Housing

Changing the Oil

Change the oil every 25,000 miles (40,000 km.) or 12 months whichever is the sooner. This work is best undertaken when the vehicle returns from a run and while the oil is still hot.

Remove the drain plug from the bottom of the axle casing and allow the oil to drain into a suitable container.

Refit the drain plug securely, remove the filler/level plug and refill the axle to the correct level with the recommended grade of lubricant.



B 1109

Oil Drain and Filler points (Salisbury Axle)

ROAD SPRINGS

General Inspection

The springs should be kept as clean as possible, since they are treated with graphite grease between the leaves during initial assembly, and should normally require no further attention.

Periodically check the tightness of the "U"-bolt nuts, when the vehicle is loaded, these must always be kept tight.

Inspect the spring leaves for cracks or breaks. Should any be observed, immediate attention from your Dealer will be necessary, or more serious damage may result.

Shock Absorbers

No adjustment of the shock absorbers is required.

Normally no periodical replenishment of the fluid is required, but, if for any reason "topping-up" is found to be necessary on the rear shock absorbers, the correct level is to the bottom of the filler hole boss ensuring that the correct fluid is used.

FRONT HUBS

Lubrication

Every 25,000 miles (40,000 km.) the hubs must be dismantled, thoroughly cleaned out and repacked with the recommended grade of lubricant.

Do not grease more frequently than recommended. (See Lubrication Chart). **Do not overfill.**

Ensure that the front hub oil catcher drain holes are free from obstruction.

REAR HUBS

The rear hub bearings are sealed units and therefore require no attention.

STEERING BOX

A plug fitted in the front upper part of the steering box casing acts as a combined level and filler plug. When the level is correct, the lubricant should be just level with the aperture obtained by removing the plug. Replenishment, if necessary, should be made only with the specified lubricant (see Lubrication and Maintenance Chart).

To gain access to the plug, it will first be necessary to remove the screws securing the rubber gaiter to the toe panel so that the gaiter may be lifted up the steering column, clear of the toe panel.

Ensure that the filler/level plug is firmly replaced.

BRAKES

Important Notes

In the interest of safety it is imperative that the brake system be maintained at peak efficiency at all times, and it is our recommendation that particular attention be paid to the following points:

Master Cylinder and Wheel Cylinders

Master and wheel cylinders should be examined every 5,000 miles (8,000 km.) for leakage. Any leakage should be rectified immediately. All cup washers and seals must be renewed every 2 years or 50,000 miles (80,000 km.).

Brake Pipes and Hoses

All pipes and hoses should be examined for security, chafing, leakage and corrosion every 5,000 miles (8,000 km.) and any faults rectified immediately. Where chafing is evident action should be taken to stop any recurrence. Brake hoses must be renewed every 2 years or 50,000 miles (80,000 km.).

Brake Linings

Brake linings should be examined every 10,000 miles (16,000 km.) for wear and condition.

CAUTION — The dangers to health caused by inhalation of brake lining dust must always be borne in mind. Never blow dust away by using compressed air — the dust cloud thus created could cause permanent damage to your lungs. Using a brush is little better.

The safest method is to remove the dust with a vacuum brush.

Hydraulic Fluid

At intervals not exceeding 12 months or 25,000 miles (40,000 km.) the hydraulic fluid should be completely renewed taking care that fluid of the correct grade is used. Fluid should be uncontaminated and the system be bled after refilling.

Brake Units

Brake Units including drums, expanders and adjusters, should be examined for condition every 12 months or 25,000 miles (40,000 km.). All units should be overhauled every 2 years or 50,000 miles (80,000 km.) at which period brake drums should be checked for ovality and signs of excessive scoring.

Adjustments to the above mentioned service periods should be considered where vehicles are operating under particularly arduous conditions. Ensure that the periodical attentions as stated on the Lubrication Chart and in the Operator's Service Voucher Book are strictly carried out.

In addition, should any of the following symptoms be experienced by the driver, the vehicle should be taken to a Dealer for attention without delay.

1. Excessive pedal travel.
2. Pedal feels "spongy".
3. Brakes feel less effective than usual.
4. Brakes pulling to one side when applied.

Braking Systems

Footbrake

This braking system is hydraulically operated and consists of a foot-brake pedal, fluid supply tank, master cylinder, pipes, hoses and front and rear brake assemblies.

Handbrake

The handbrake is mechanically operated through cables and a compensating linkage to the front brake assemblies and is quite independent of the hydraulic system.

Brake Fluid Supply Tank

The brake fluid supply tank is accessible on opening the engine cover. Always remember to ensure that when topping up no foreign matter enters the system. It is good practice to wipe off any dirt which may be around the top of the tank before removing the cap.

The brake fluid level must be checked weekly and topped up as necessary to 1 in. (25 mm.) below the filler cap. Do not overfill. Check that the breather hole in the filler cap is free from obstruction.

Note: Use only the brake fluid specified on the Lubrication Chart.

Brake Adjustment

Every 2,500 miles (4,000 km.) brake pedal travel should be checked and the brakes adjusted if necessary.

Front Brakes

1. Place chocks in front of and behind the rear wheels, release the handbrake and jack up the front of the vehicle until the wheels are clear of the ground.
2. Remove the nave plate and turn the wheel so that the hole in the road wheel and brake drum is opposite the serrations of the adjuster.
3. Using a screwdriver, lever the adjuster on to each succeeding serration expanding the adjuster until the shoes are locked in contact with the drum.
4. Release the adjuster only sufficiently to allow the wheel to rotate freely with no indication of rubbing.
5. Repeat the above procedure on the opposite brake assembly.

Rear Brakes

1. Place chocks in front of and behind the front wheels and apply the handbrake.

2. Jack up the rear axle until the wheels are clear of the ground.
3. Remove the nave plate and turn the wheel so that the hole in the wheel and brake drum is opposite the slotted head of the "micram" adjuster.
4. Using a screwdriver, turn the adjuster in a clockwise direction until the brake shoes are in contact with the brake drum.
5. Apply the footbrake hard, to ensure that the wheel cylinder is centralised, and release the brakes. If after doing this the wheel is still locked, turn back the adjuster one notch or, if necessary, two notches, to provide the correct clearance between the shoes and the drum. If, however, the wheel is free to rotate after centralising, turn the adjuster until the shoes are in contact with the drum, then turn the adjuster anti-clockwise one notch.
6. Repeat the above procedure on the opposite brake assembly.

Handbrake Adjustment

Normally the handbrake is adjusted when the footbrake is adjusted. If it is found that excessive handbrake travel is still present after the front brake shoes have been correctly adjusted, it is an indication that the handbrake cable requires adjustment. Adjustment may be required in one or both of the cables, i.e. the handbrake to relay lever cable and/or the secondary cable, relay lever to front brake assemblies.

Proceed with the adjustment as follows:

1. Place chocks in front of and behind the rear wheels, release the handbrake and jack up the front of the vehicle until the wheels are clear of the ground.
2. Remove the front nave plates and turn the serrated brake shoe adjusters until the shoes are locked in contact with the drum.
3. Apply forward pressure to the end of the relay lever, to which the secondary cable equalizer is attached, to eliminate any slack in the handbrake lever cable.
4. With the lever held in this position measure the distance between the centre of the clevis pin securing the handbrake inner cable and the outer cable abutment bracket. This distance should be 3.75 to 4.25 in. (95 to 108 mm.).
5. Should this distance be greater, adjust the outer cable by releasing the locknut on the front of the abutment bracket. Turn the nut on the inside of the bracket in an anti-clockwise direction so that the outer cable can be moved forward. Continue with this adjustment until the correct dimension is obtained. Re-tighten the locknuts and slacken off the brake shoe adjusters so that the shoes just clear the drum.
6. If after applying the handbrake it is found that too much travel still exists, the secondary cable will require adjustment.

7. Turn the serrated brake shoe adjusters until the shoes are locked in contact with the drum.
8. Remove the clevis pin securing the equalizer to the relay lever. Move the equalizer back towards the rear of the vehicle to reduce the amount of slack in the secondary cable and re-insert the clevis pin through the equalizer securing it to the relay lever.
Note: Three holes are provided in the equalizer to facilitate this adjustment, but it should be remembered that a small amount of slack **must** be present.
9. Re-adjust the brake shoes sufficiently to allow the wheels to turn freely.

General Lubrication

The **handbrake lever cable** is enclosed in an outer casing which is fitted with a lubrication nipple. Apply the grease gun to this nipple every 2,500 miles (4,000 km.).

The **handbrake equalizing gear** is mounted on the body underframe above the rear of the gearbox. Every 5,000 miles (8,000 km.) check that the equalizing gear is clean, oil all moving parts lightly and check for correct operation.

Oil can lubrication. A few drops of oil should be applied every 5,000 miles (8,000 km.) to the pedal group shafts and bushes, handbrake ratchet and pawl, and all handbrake equalizing linkage.

LIFTING JACK

Provision for jacking the vehicle is made at the front and rear end of the bottom fairing on each side of the vehicle. By inserting the jack spigot in the jacking recess, and then turning the handle on the top of the jack in a clockwise direction, the front or rear wheel, respectively, on one side of the vehicle, will be lifted off the ground.

To eliminate the risk of a jack sinking in soft ground, it is suggested that a suitable flat piece of wood be placed under the base of the jack. It is important that the jack be fully located in the recess before lifting the vehicle, and that no attempt be made to attach the jack in any position other than the recesses provided.

Before jacking up the vehicle, it is essential always to make quite sure that the handbrake is securely "on", and if the vehicle is on an incline, ensure that all three other wheels are chocked.

After use, it is important that the jack be stowed away correctly, otherwise the mechanism may tend to rattle when the vehicle is being driven.

Caution: Under no circumstances should any work be carried out under the vehicle when it is raised on the jack unless a proper chassis stand is used to support it.

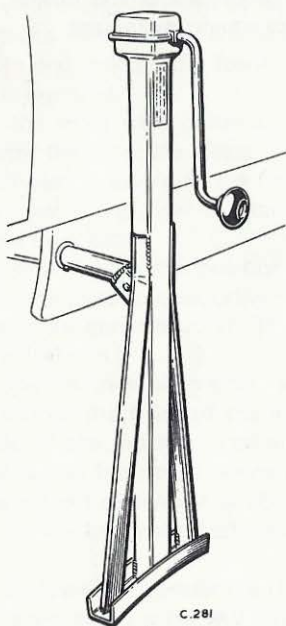


Fig. 14. Lifting Jack

WHEELS AND TYRES

To remove and refit wheels and tyres

1. Apply the handbrake and chock under three wheels.
2. Lever off the nave plate with the nave plate remover (which is provided with the tool kit) whilst holding the nave plate.
3. Loosen the wheel nuts with the wheelbrace noting that all wheel nuts have a right-hand thread, i.e. turn anti-clockwise to remove.
4. Jack up the road wheel, remove wheel nuts and wheel.
5. Smear the studs with a little grease to prevent rusting.
6. Refit the road wheel ensuring that the brake adjustment hole lines up with the corresponding hole in the brake drum.
7. Tighten the wheel nuts, initially, with the wheel off the ground. Tighten each nut a few turns at a time, selecting diametrically opposite nuts in sequence thus ensuring that the wheel is seated squarely and evenly on the hub.
8. Finally tighten the wheel nuts to the correct torque figure as shown in 'General Data' **when the weight of the vehicle is on the road and not when on the jack.**
9. Refit the nave plate by putting the nave plate over two of the locating lips on the wheel and giving the centre of the plate a sharp blow with the side of the fist.

Note: Wheel nuts must be checked every 5,000 miles (8,000 km.) for tightness to the correct torque figure. More frequent checks must be made when the vehicle is new or when the wheels have been changed.

TYRES

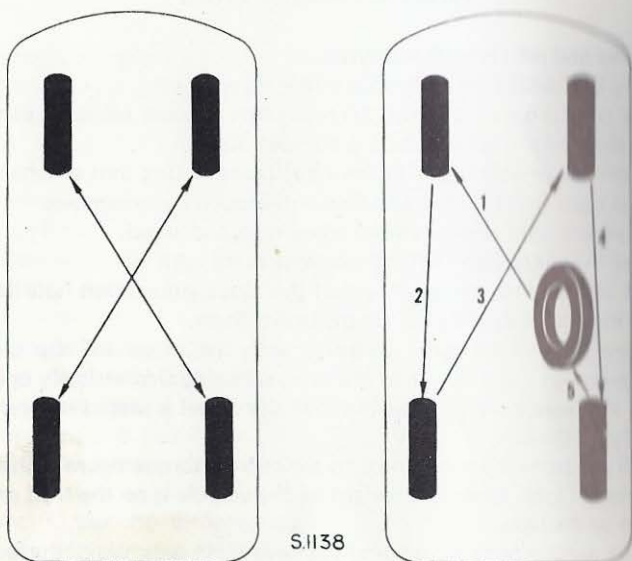
A few minutes every week devoted to checking tyre pressures and the condition of the tyres may not show any immediate benefit—only neglect proves the wisdom of careful tyre maintenance. It is in the interests of your own safety to regularly check your tyres.

New Tyres

It is advisable to run-in new tyres: this is of course taken care of when the vehicle is new and the normal running-in precautions are taken. When tyres are eventually renewed, however, they should be run in at a moderate speed for at least 100 miles (160 km) before driving at higher speeds.

Replacement Tyres

It is recommended that when replacing tyres those of a similar specification be used. Fitting tyres of a different rating will alter the plated weight ratings. Either cross ply or radial ply tyres fitted to all wheels is the correct combination.



S.1138

Change wheels round without removing tyres.

Method of Interchanging Wheels and Tyres

Inflation Pressures

The recommended tyre pressures are given under "General Data".

Maintain the correct pressures by checking weekly and adjusting if necessary. Use a reliable gauge with the tyres cold—if readings are taken after running the vehicle the figures will not be correct. Check all tyres, including the spare, and make sure that the valve caps are replaced.

Improper inflation hastens tyre wear and adversely affects handling and performance.

Examination of Tyres

Examine tyres frequently, including the spare, for wear, cuts, breaks, lumps, bulges, or exposure of ply or cord. Remove any flints or stones from the tyres and check for punctures. Any defects should receive immediate attention.

Important In the United Kingdom a minimum tyre tread depth of 1 mm is required by law.

ELECTRICAL SYSTEM

Descriptions

The electrical equipment forms a 12-volt system, with a negative earth return, in which a single wire is used to distribute the electrical energy to the various points of utilisation, the return path for the current being through the metal parts of the chassis. It is most important, therefore, that all earth connections, such as battery to frame, lamps to frame, etc., be clean and tight.

Important Notes

1. The vehicle battery must never be disconnected while the engine is running.
2. The vehicle battery must be disconnected if either electric arc welding or boost charging operations are to be carried out on the vehicle.
3. Should it become necessary to use a slave battery to aid starting, always ensure that the jumper leads are connected positive to positive and negative to negative.

Failure to comply with these instructions will result in irreparable damage to the transistors on the control unit.

Prior to removing any electrical unit from the chassis, it is advisable to disconnect one of the battery terminals to prevent short-circuiting, which could result in burnt out wiring and equipment.

Keep all terminals clean, tight and free from damp. Take care not to let cables become saturated with oil or petrol as this will cause rapid deterioration. Inspect the cables for signs of rubbing or vibration. Any damage to insulation should be rectified at once.

Alternator

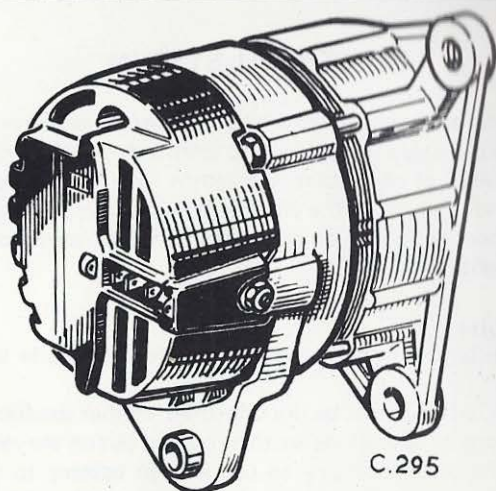
The alternator is belt driven from the crankshaft and its output is controlled by an electronic control unit.

Periodical Attention

Normally the alternator will require very little attention. From time to time, however, it is recommended that the following checks be made.

1. Security of mounting nuts and bolts.
2. The electrical leads and cables for security and chafing.
3. Wipe away any dirt or oil which may collect around the slip ring end cover ventilating apertures.
4. Check tension of drive belt; also inspect for any wear.

Note: When adjusting belt tension, leverage must **only** be applied to the alternator drive end bracket. Leverage applied to the stator or slip ring end bracket will result in serious damage.



C.295

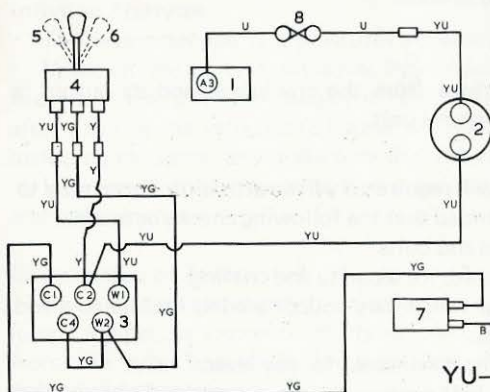
*Alternator***Fuses**

The fuse box is located beneath the instrument panel adjacent to the headlamp.

On models fitted with overdrive a 2 amp in-line fuse is located beneath the facia. To renew the fuse press the two halves of the fuse holder together and twist. The two halves will separate to reveal the fuse.

Should a short-circuit occur in any part of the wiring, a fuse will blow. Before renewing the fuse, the defect in the circuit must be remedied.

Correct spare fuses are retained in the fuse units by spring clips. It is extremely important that only correct replacement fuses be used.

**Key**

1. Fuse Unit
2. Gearbox (Inhibitor) Switch
3. Relay
4. Overdrive Switch
5. Direct Drive
6. Overdrive
7. Solenoid
8. In-line Fuse

Colour Code

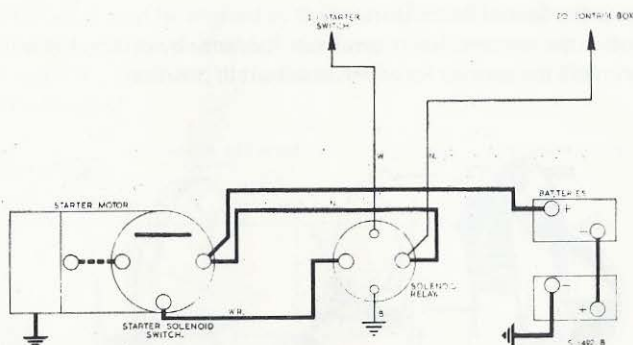
YU—Yellow/Blue Y—Yellow
YG—Yellow/Green U—Blue

Overdrive Wiring Diagram

Starter Motor Type CA. 45D (Optional Fitment-Diesel Models)

A solenoid relay has been incorporated in the electrical circuit of the above heavy duty starter motor.

The illustration shows the revisions necessary to the wiring diagram when this optional equipment is fitted.



CA.45D Starter Motor Wiring Diagram

Battery

Battery maintenance consists mainly of regular inspection and servicing.

1. Keep the battery and its surroundings clean and dry.
2. Remove the vent plugs. Inspect the rubber anti-leak washers, if fitted, for damage and ensure that the vent holes are clear.
3. Check the electrolyte level and top up when necessary. The correct level is to the top of the separator guard. Do not overfill, or the acid will escape through the vent holes, with detrimental effect on the terminals and adjacent parts of the vehicle. The use of a battery filler will be found helpful in the topping-up process, as it ensures that the correct electrolyte level is automatically maintained, and also prevents distilled water from being spilled over the top of the battery.
4. Always keep the terminals and terminal posts smeared with petroleum jelly. This will prevent corrosion and ease terminal removal at a later date. When tightening the self-tapping screw in the top of the terminals use only normal pressure.
5. Examine the earth connection, ensuring that it is clean and free from rust and corrosion.

Note: Never use anything but distilled water for topping-up.

Never use a naked light when examining a battery, as the mixture of oxygen and hydrogen given off by the battery can be dangerously explosive.

Never transfer electrolyte from one cell to another.

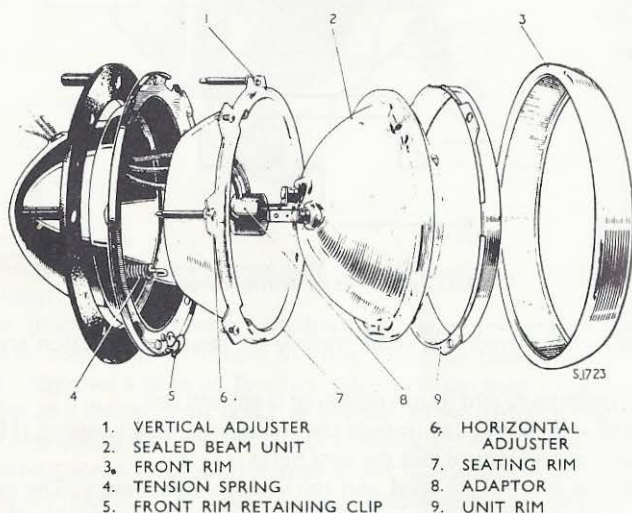
Lamps

Headlamps

The headlamps fitted are of the sealed beam type and therefore bulb replacement is not possible. In the event of the sealed unit becoming damaged the unit must be renewed.

To Renew the Sealed Beam Unit

1. Remove the chrome front rim from the lamp by prising the bottom of the rim off the spring clip which retains it in position.



Headlamp Details

2. Remove the three retaining screws from the unit rim and withdraw the rim. The sealed beam unit may also now be withdrawn and the adaptor removed from the contacts at the rear of the unit.
3. Fit the adaptor to the new unit and place the unit in position on the seating rim, ensuring that the rectangular lugs at the rear of the seating flange of the sealed unit locate in the cut-aways in the seating rim.
4. Refit the rim unit and secure it in position by means of the three screws.
5. Refit the front rim by placing it over the retaining lip at the top periphery of the unit housing and then pressing the bottom of the rim over the spring clip.

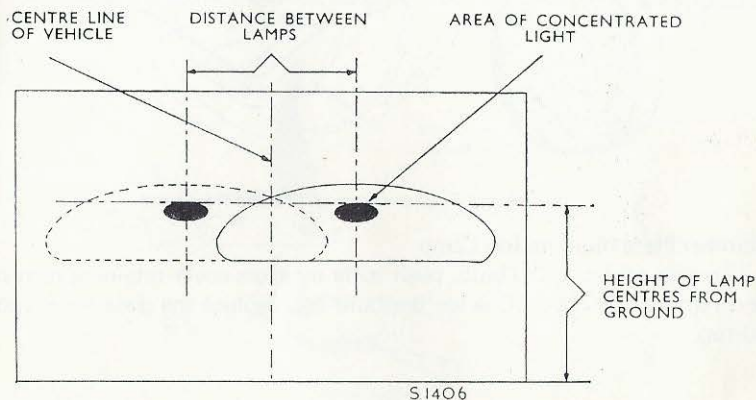
Headlamp Beam Adjustment

It is desirable to use a reputable brand of spirit level type headlamp aligner if the best standards of accuracy are to be obtained.

When this equipment is not available the following method may be used to set the headlamp beams.

Park the fully laden vehicle on a flat surface with the headlamps square to a garage door or wall at a distance of not less than 25 ft. (7.5 m.), the adjustment of alignment can now be carried out very easily without taking the vehicle on the road.

The lamps should be aligned so that the top of the concentrated area of light is level with the centres of the lamps. The vertical axis should be central with the front of the vehicle. For ease of setting, one headlamp should be covered.



Method of Aligning Headlamps

If a lamp appears to be out of alignment, proceed as follows: Remove the headlamp rim and switch on main beam (not dipped). The reflector can now be aligned to the required position by adjusting the horizontal and vertical adjusting screws. The setting should then be cross-checked on the road.

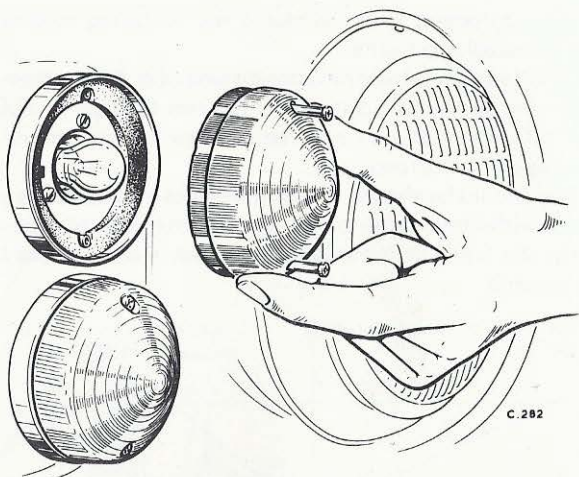
Front, Side and Flasher Lamps

To gain access to the bulb remove the two screws which secure the lens to the back plate. Turn the bulb in an anti-clockwise direction and withdraw it from the holder.

Stop/Tail and Rear Flasher Lamps

The bulbs are accessible from inside the van body, after the protection shield, secured by screws, has been removed.

To replace a bulb, remove the centre fixing screw and withdraw the bulbholder assembly. Turn the bulb half a turn anti-clockwise and withdraw. It is not possible to fit the twin filament bulbs incorrectly, due to offset pins. Refit the bulbholder assembly and the protection shield.



Front Flasher Lamp with Lens Removed

Number Plate Illumination Lamp

To gain access to the bulb, push aside the glass cover retaining stirrup and remove the cover. Change the bulb and replace the glass cover and stirrup.

Instrument Binnacle Illumination and Warning Lights.

Single filament bulbs are used for the instrument binnacle warning lights and instruments. One bulb is utilised for each warning light and instrument except the speedometer which has two.

To remove a bulb from the speedometer or warning lights remove the bulb holder from its location, unscrew and renew the bulb as necessary.

The bulbs on other instruments are of the bayonet type and should be unplugged from their housing at the rear of the instrument.

The speedometer, main beam warning light and instrument bulbs are wired through the lighting circuit. The alternator, oil pressure and flashing indicator lights are wired through the ignition/auxiliary circuit and operated by their associated switches. The hazard warning light is wired independent of both ignition/auxiliary and lighting circuits.

Malfunction of any warning light bulb should be investigated and corrected immediately.

CAB AND BODY

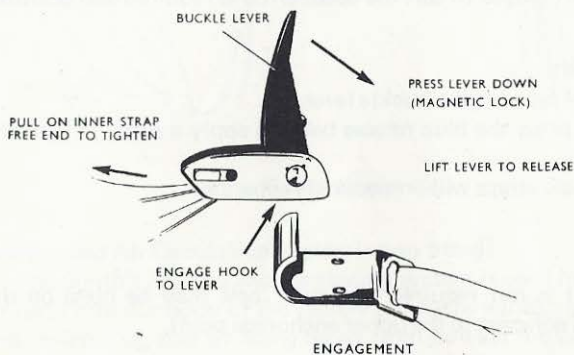
Safety Belts

Safety belts of the front seat lap and diagonal type with three anchorage points are provided for the driver and the passenger furthest from the driver.

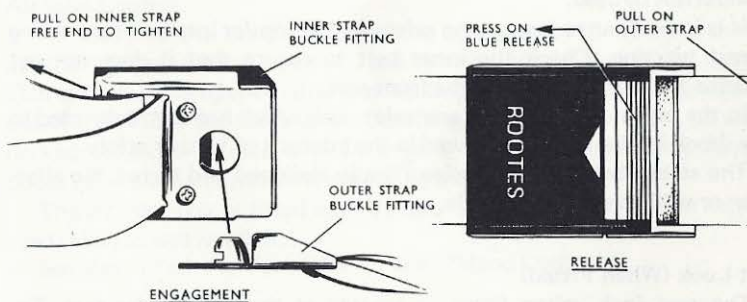
Alternative types are available of Kangol or Irvin manufacture.

Fastening and Adjustment

1. Take the outer belt and pass the portion fixed to the front door rear post over the outer shoulder, across the body and down to the opposite



BUCKLE FASTENING KANGOL TYPE



B.18

BUCKLE FASTENING IRVIN TYPE

Fig. 21. Safety Belt Buckle Fastening

hip. Ensure that the hook (Kangol) or the lock face (Irvin) is facing forward and that the belt is not twisted.

2. Take the buckle of the inner belt and, for the Kangol type, engage the hook on the outer belt lug to the curved underside of the buckle. Press the buckle lever down and the lock is held magnetically. For the Irvin type, position the buckle over the lock face of the connecting lug and press into engagement, locking the belt.
3. To adjust the belt after fastening pull the free end of the inner belt until it is comfortably tight. Correct tension should allow a hand to be inserted between the belt and the body. Make sure that the buckle rests on the hip.

An adjuster buckle is fitted on the outer belt to provide initial adjustment of belt length to suit the occupant and required seat position.

To Release the Belt

For the Kangol type lift the buckle lever.

For the Irvin press the blue release bar and apply a slight pull on the outer strap.

In either type the straps will immediately separate.

Stowage

When the belt is not required the outer belt may be hung on the stowage provided adjacent to the upper anchorage point.

Servicing

1. To clean the belt use a mild soap and warm water solution. Fluids which are harmful to nylon are those containing mineral acids. **These must not be used.**
2. It is important to inspect the safety belt at regular intervals for chafing and twisting. Check the inner belt to ensure that it does not get damaged or trapped under the front seat.
3. In the event of an accident any safety belt which has been subjected to a shock load should be renewed in the interests of further safety.

The safety belt has been scientifically designed and tested. No alteration or additions must be made.

Seat Lock (When Fitted)

The seat lock, when fitted, is located at the rear of the seat. To unlock the seat lift the catch handle and, holding it in that position, raise the seat. The lock will engage automatically when the seat is lowered.

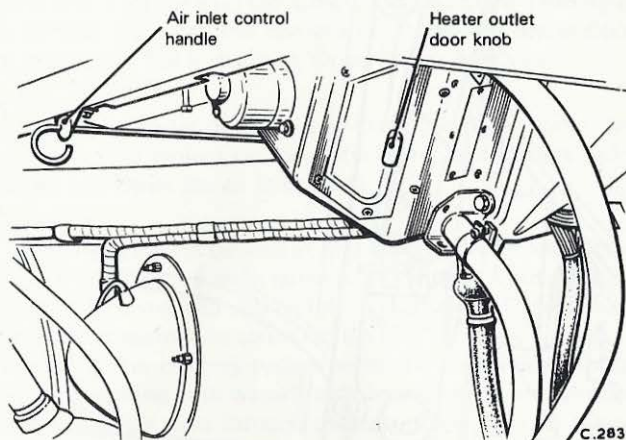


Fig. 22. Heater Unit

Heating and Air Circulation System (when fitted)

The Smith's heating and ventilating system is used for supplying fresh air both into the body of the vehicle and to the windscreen for de-misting and de-frosting, this air being taken from outside the vehicle and heated by hot water from the engine cooling system.

The following notes are provided in order that the driver may become fully conversant with the function of each of the various controls and thus obtain the best results from the heater.

Air Inlet Control

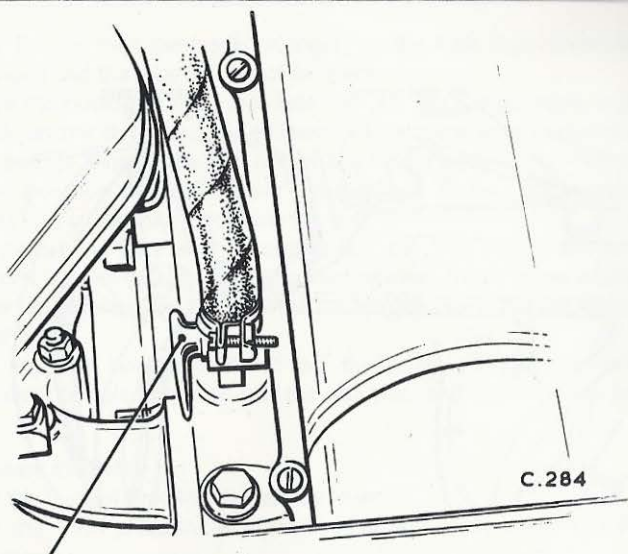
Air entry to the heater is controlled by means of the valve in the air inlet box, operated by a control rod situated on one side of the heater. This valve must be opened whenever heating or ventilating is required. It is possible to close the valve when travelling in congested traffic, or when parked behind a vehicle with its engine running, to prevent offensive odours and exhaust fumes from entering the vehicle.

The air inlet box is fitted with a drain tube, so that the system may be used safely in wet weather.

See also "Fresh Air Ventilator", under "Hand Controls".

Heater Unit

This unit is fitted with two outlet doors, which, when open, direct air on to the driver's and passenger's feet. If the doors are closed, all the air is diverted to the windscreen.



Tap shown in "off" position

Fig. 23. Water Valve (Heater control)

Heater Fan

An electrically driven fan is incorporated in the heater unit, its use greatly increasing the amount of air passed through the heater. The fan may be brought into useful operation when the vehicle is stationary or travelling at low speed. The blower is operated by a switch mounted in the bottom right-hand side of the instrument binnacle.

Operation

The following instructions show the control positions recommended to meet certain basic conditions likely to be encountered.

Water Valve (Heater Control)

A tap is fitted to the cylinder head, and enables the supply of hot water to the heater to be shut off. The heater unit may then be used as a ventilator in warm weather.

Freezing Conditions

To remove ice from the screen, switch on the heater fan and close both outlet doors, thus directing the maximum supply of hot air to the windscreen for de-frosting purposes. Open the air inlet valve.

Cold Weather

To prevent ice from forming on the screen, and to ensure a general circulation of warm air throughout the body interior, open the heater outlet doors, and switch on the heater fan if the vehicle is stationary or travelling at low speed. Open the air inlet valve.

Warm Weather

To prevent mist forming on the screen, and to obtain a supply of cool air at head level, turn off the coolant tap, close the outlet door, and switch on the heater fan if required. Open the air inlet valve.

Hot Weather

When a general circulation of cold air throughout the body interior is required, turn off the coolant tap, open the heater outlet doors and switch on the heater fan. Open the air inlet valve.

Frost Precaution

Anti-freeze must always be used in cold weather on vehicles fitted with heater units. Draining the system during cold weather is not sufficient as a certain amount of water will still be left in the heater. Should this water freeze, serious damage may be caused to the unit

When refilling the cooling system with the anti-freeze mixture (or **when normally refilling with water**), turn on the tap on the cylinder head so that the water may flow through the heater unit, half fill the cooling system with anti-freeze mixture, start the engine, run at tick-over speed, and quickly fill the cooling system with the remainder of the anti-freeze mixture. Replace the radiator filler cap and run the engine at a fast tick-over; if the water hose does not warm up in a few minutes, an airlock may be present in the system, and to clear it the procedure is as follows::

Switch off the engine, remove the heater return hose from the return hose connection and extend with a temporary hose so that the water will flow back into the radiator via the filler cap. Temporarily plug the return connection.

Start the engine and note the water flow into the radiator; when this is smooth and bubble-free, reconnect the outlet hose to the return connection and tighten as quickly as possible.

Coachwork

When washing the vehicle, use plenty of water; the body should be hosed and sponged down lightly. Never remove dust or grit from the paintwork while dry, as this will cause damage. Special preparations of several makes are marketed particularly for adding to the rinsing water when washing vehicle bodies. The use of these will improve and expedite washing. It is imperative, though, that such preparations be of reputable manufacture and shall not contain any chemicals which might be injurious to the body finishes or fittings. After the mud and dust have been removed by water and sponge, the body should finally be dried with a chamois leather.

If, after a period of service, the paintwork loses its gloss, it may be cleaned with a polish which is obtainable from the Parts Organisation, to remove all traces of "traffic film" and old polish, after first washing down the vehicle as described above.

If the vehicle is kept in a clean condition by subsequent washing and leathering, approximately once a week, it will be found that the frequent use of polish is unnecessary.

Body Protection

When a vehicle is to be continuously used under adverse conditions, particularly when parked regularly in the open, or used frequently on loose road surfaces, it will be to the advantage of operators to have the underside of the body and chassis frame treated with a reliable brand of preservative, additional to that applied by the manufacturers when the vehicle is new.

In many countries, salt solutions are applied to the road surface during the winter months to assist in the breakdown of snow and ice. In these circumstances, it is imperative that every Spring the underside of the body structure be thoroughly washed and all deposits of mud removed. The metal surfaces should then be treated with a suitable preservative, or, if preservative has previously been applied, damaged areas should be made good.

The application of the preservative compound should be entrusted to your Dealer, who will be in possession of the latest Factory recommendations.

Chromium Plating

The attractive appearance of chromium-plated parts can be preserved if they are cleaned and treated regularly in the following manner:

Every week the chromium plating should be washed down with a copious supply of water to which a small quantity of detergent has been added. Wipe dry with a chamois leather and polish with a clean, dry cloth.

Monthly, after following the above instructions, any evidence of staining or tarnish can be removed by lightly rubbing with a mild glass or mirror cleaner of a proprietary brand. If the chromium plating is badly stained, then a chromium cleaner may be used, allowing it to dry and then polishing with a clean, dry cloth. Care must be taken to ensure that all the chromium cleaner is removed.

A light application of polish (which is obtainable from the Parts Organisation) will then protect the finish obtained by sealing up the minute pores in the chromium.

Doors, Locks and Hinges

Hinged type doors are fitted to the driver's side on all models except the specified sliding door version, but the driver's sliding door can be provided as optional equipment on other van and bus models.

Lubricate locks and hinges regularly and wipe off all surplus oil to prevent damage to clothing and to stop the accumulation of dust.

During normal service lubrication the use of Shell Spirax 90 EP is recommended. However, in cases where it is necessary to remove and refit these parts, lubricate generously with Shell Retinax A.

Where temperatures fall below minus 26°C (minus 15°F.), the use of Shell Spirax 90 EP is recommended at all times, i.e. service and overhaul.

Windscreen and Wipers

The windscreen wipers are hinged to allow them to be lifted clear of the glass when it becomes necessary to clean the windscreen. Do not push the wipers across the windscreen as this may damage the mechanism.

Efficient wiping is dependent upon a clean windscreen and the wiper blades being in good condition. It is recommended that wiper blades be changed every 12 months or 10,000 miles (16,000 km.).

The windscreen should be cleaned with methylated spirit or a good quality silver plate polish in order to remove tar spots, oil and other contaminations. Silicon or wax polish should not be used.

Note: In the interest of safety, zone toughened windscreens are fitted to these vehicles.

Windscreen Washers

Two nozzles, which are fitted at the base of the windscreen, direct a jet of water on to the windscreen when the pump plunger is pushed inwards. The plunger is mounted on the fascia to the right of the instrument panel on right hand drive models and to the left of the instrument panel on left hand drive models.

Replenishment of container

To refill the plastic water container which is to be found inside the cab forward of the passenger door, pull out the lid and withdraw the tube and valve assembly from the container. Lift the container out of the vehicle and refill. When replacing the tube and valve assembly ensure that the valve reaches the bottom of the container.

It is important that only clean, sediment free water is used in the container if trouble free operation is to be assured. The use of soft water will avoid the possibility of lime deposits in the jets and valves. The container should be thoroughly washed out at regular intervals.

In freezing conditions the addition of methylated spirits (denatured alcohol) to the water in the container will prevent the water from freezing and assist in the dispersal of ice and snow from the windscreen. **Do not use anti-freeze solutions** as these may discolour the paintwork or damage the wiper blades and windscreen sealing rubber.

<i>Percentage of Additive</i>	<i>Provides protection down to:</i>
10%	-6°C (22°F)
20%	-11°C (12°F)
30%	-17°C (2°F)
40%	-22°C (-8°F)
50%	-28°C (-18°F)

Adjustment of jets

The jets are adjusted by moving the jets in the jet heads with the aid of a pin, remembering, when making any adjustment, to allow for wind deflection when the vehicle is in motion.

Upholstery

Clean occasionally by wiping over with a damp cloth. It is important, however, that the cloth should not be wet, but merely damp. If necessary, a little mild soap can be used, but caustic soaps, petrol or spirit should not be used, as these have a very harmful effect.

Sound Insulation (when fitted)

Sound deadening materials are fitted to keep vehicle noise levels within the U.K. legal limits prevalent at the time of production. The insulation consists of a foam lined undertray and foam padding on the inner wing valances and engine cover.

Under no circumstances should the vehicle be operated without these fittings.

Pads and panels must be examined at every service to ensure that they are in a clean and serviceable condition. Particular attention should be paid to the security of pads and corrosion of panels. Check that the pads are not contaminated with oil.

Caution Pads contaminated by oil should be renewed as they can be inflammable. The cause of contamination should be rectified immediately.

Any damaged area of padding should be covered liberally with a coating of PVC/PVA sealing paint.

Pads and panels should be examined every 5,000 miles (8,000 km.) to ensure that they are in a serviceable condition, paying particular attention to the security of pads and corrosion of panels.

To clean the pads wipe over the surface with a soft cloth or sponge soaked in white spirit and then wipe dry with a clean dry cloth. As an alternative to white spirit household soap powder may be used. The use of abrasive materials such as brushes or scouring powder must be avoided.

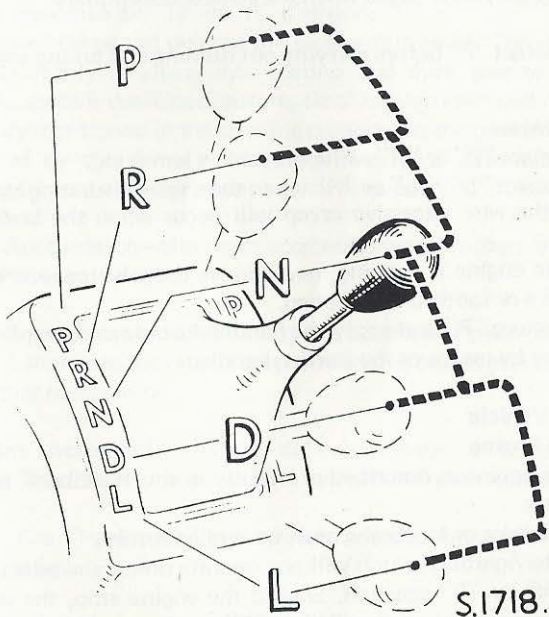
Care must be exercised when painting a vehicle that paint is not applied to or directed over the pads otherwise the sound absorption qualities of the material will be nullified.

AUTOMATIC TRANSMISSION

(When Fitted)

The Borg-Warner 35 Automatic Transmission greatly simplifies driving in that all gear changing is carried out automatically thus eliminating the necessity for a clutch pedal and gear change lever as fitted to vehicles with the conventional type of transmission.

Although it has been stated that gear changes are carried out automatically, it will be seen from the following instructions that the driver of the vehicle may still retain a certain amount of control over the transmission according to his requirements.



Selector Lever Positions

Selector Lever Positions

Lock (L) The selector lever is set in the "lock" position when it is desired to prevent the transmission from changing up into a higher gear. This is advantageous when maximum engine braking is required, e.g. descending long inclines.

Drive (D) This position is used for all normal driving conditions. The transmission starts off in first (low) gear and automatically changes up or down at given road speeds or according to the position of the accelerator pedal.

Neutral (N) With the selector lever in this position, no power is transmitted to the rear wheels.

Reverse (R) This position is selected only when it is found necessary to reverse.

Park (P) This position, as well as providing a neutral, also locks the transmission so that the rear wheels cannot turn, e.g. when parking on a steep gradient.

"P" must only be engaged when the vehicle is stationary.

Always select "P" before carrying out running and tuning adjustments.

Important Notes

1. Do not select "P" or "R" while the vehicle is moving.
2. Do not select "D", "L" or "R" when the engine is running above idling speed otherwise excessive creep will occur when the brakes are released.
3. When the engine is running, never move the selector lever unless the handbrake or footbrake is applied.
4. Always select "P" and apply the handbrake before attempting to start the engine by means of the starting handle.

Driving the Vehicle

Starting the Engine

Start the engine as described previously in this Handbook but noting the following:

1. The handbrake or footbrake must be applied firmly.
2. The starter/ignition switch will not operate unless the selector lever is in the "N" or "P" position. Should the engine stop, the lever must always be returned to the "N" or "P" position before attempting to restart.

Moving the Selector Lever.

Position

Required

Lever Movement from "N" Position

- D** Pull the lever rearwards until it can be moved left into the "D" position.

- R Move the lever to the right far enough to allow it to be pushed forward and then left into the "R" position.
- P Move the lever to the right, then forward as far as possible before moving it left into the "P" position.
- L Pull the lever to the rear as far as the "D" position then right and rearwards again, engaging "L" on the left.

Driving

Starting from rest is always smooth even when the accelerator is pressed down beyond the normal start-off position. This is due to the fluid drive in the torque converter.

Careful control of the accelerator is necessary on slippery roads and to obtain the best fuel consumption.

With the engine idling and the handbrake or footbrake applied, move the selector lever into the "D" or "R" position.

Release the brakes and depress the accelerator pedal. The vehicle will move off smoothly changing into second and third gear as the speed increases. As speed is decreased, automatic changing down occurs.

As already mentioned in the opening paragraphs, the gear changing can be controlled by the driver even though it is made automatically, the determining factor being the amount of throttle opening.

Normal Acceleration—Minimum accelerator pedal movement will provide low speed gear changes.

Increased Acceleration—Depressing the accelerator pedal down to its "hard spot", increases the rate of acceleration and causes gear changing to occur at higher road speeds.

Maximum Acceleration—When the accelerator is pressed down through the "hard spot", gear changing will occur at maximum change-up speeds.

Note: The "hard spot" will be felt at seven eighths of the pedal travel.

Driver Controlled Change Down (Kickdown).

Provided that the vehicle speed is below the maximum change-up speed for first (low) or second (intermediate) gears, an immediate change down may be obtained by kicking down the accelerator through the "hard spot".

This method of changing down will be found very useful and easy to carry out when more pulling power or greater acceleration is required, e.g. hill climbing or overtaking.

Stopping

To stop the vehicle, release the accelerator pedal and apply the footbrake. For stops of long duration and always when leaving the vehicle unattended, move the selector lever into the "N" position and apply the handbrake. "P" may be selected after coming to rest if it is necessary to leave the vehicle parked on an incline.

Use of Lock Position (L)

If "L" is selected before moving from rest, first (low) gear will be maintained thus providing maximum engine braking.

If "L" is selected when in third (high) gear an immediate change down to second (intermediate) will occur at road speeds above approximately 5 m.p.h. (8 k.p.h.) and remain in second gear to provide moderate engine braking on release of the accelerator pedal. When speed is reduced to below 5 m.p.h. the transmission will automatically change down into first gear. If first gear is required earlier, it may be obtained when the speed is less than the maximum change up speed for first gear, approximately 20 m.p.h. (32 k.p.h.) by momentarily depressing the accelerator pedal through its hard spot.

"L" should not be selected at speeds above 40 m.p.h. (64 k.p.h.) except in cases of emergency.

Also, the "L" position may be used as a means of manually obtaining second (intermediate) gear without resorting to the "kickdown" method, i.e. locking the transmission in first until the required speed is obtained then by selecting "D" a change up to second will follow immediately.

Holding the Vehicle on a Hill

Should the vehicle be brought to a halt on an incline, it can be held stationary for short periods by balancing the accelerator in the same way as the clutch is balanced on vehicles with the normal type of transmission, i.e. depress the accelerator enough to prevent the vehicle from moving backwards or forwards.

Hill Starting

To drive away on an up gradient, apply the footbrake with the left foot (or apply the handbrake), and move the selector lever to the "D" position. Depress the accelerator pedal with the right foot and slowly release the brakes. This allows a very smooth take off without any chance of the vehicle running downhill.

Select "R" and follow the same procedure if it is necessary to reverse up a gradient.

Never move the selector lever from the "P" position without first applying the footbrake or handbrake, as movement from "P" releases the transmission and leaves the vehicle free to roll.

General

Emergency Starting

Emergency starts due to a flat battery etc., may be made by towing or push starting. The vehicle should be allowed to reach a speed of approximately 25 m.p.h. (40 k.p.h.), with the selector lever in the "N" position.

Switch on the ignition, set the choke control (if engine is cold) and select "L" to enable the engine to start.

Care must be taken when towing, to avoid collision with the towing vehicle.

Control when Manoeuvring

With "D", "L" or "R" selected and the engine idling, the vehicle will creep forward or backwards, more so particularly when the choke is being used on petrol models.

For this reason, it will be found more convenient when manoeuvring in confined areas, to use the left foot on the brake pedal without the use of the accelerator thus obtaining a high degree of control.

Bearing in mind that the vehicle will "creep" when one of the driving positions is selected, always apply the footbrake when stopping in traffic or when stopping briefly to allow passengers to alight. This will prevent the vehicle from moving forward and avoid the possibility of accidents should the accelerator be depressed by mistake. Whenever appropriate, select "P".

Should the vehicle become stuck in mud or snow etc., it may be rocked backwards and forwards to obtain wheel grip, by alternately selecting the "D" and "R" positions with the accelerator pedal slightly depressed.

Towing may be effected provided the transmission is not damaged and the fluid level is correct. Tow with "N" selected.

If the transmission is defective, the propeller shaft should be removed and the rear end of the transmission sealed to prevent the ingress of dust, mud and water. Alternatively, the vehicle may be towed with the rear wheels lifted.

Maintenance

Transmission Fluid

The transmission is filled with the correct fluid at the factory and subsequent oil changes are not necessary.

The recommended fluid for topping up is SHELL DONAX T7.

Every 5,000 miles (8,000 km.) check the fluid level in the following manner:

1. Run the vehicle until the transmission reaches its normal running temperature.
2. The check should be carried out when the vehicle is parked on level ground. Select "P" and allow the engine to idle for two minutes. With the engine still idling, remove and wipe the dipstick which is attached to the rear of the engine on the right-hand side. Re-insert the dipstick to the fully home position and withdraw it again immediately.
3. Using only the recommended fluid, top up until the level reaches the "high" mark on the dipstick whilst the engine is idling. **DO NOT OVERFILL.**

Note: The difference between the "Low" and "High" marks on the dipstick is 1 pint (0.56 litre).

When checking or topping up the fluid level, great care must be taken to ensure that no dirt enters the filler tube.

Frequent need for topping up indicates leakage which should be rectified immediately to prevent damage to the transmission.

Cooling

The transmission is cooled by air which is admitted through slots in the front of the transmission case and then directed over the converter. The circulated air then passes out through the stone guard grilles at the bottom of the converter housing.

The slots, grilles and transmission fluid pan must not be covered with under-body sealing compound nor must mud and dirt be allowed to accumulate on the oil pan as it will act as a heat insulator.

Cables

The downshift valve cable is impregnated with silicone or molybdenum disulphide lubricant and must not be oiled. Under normal operating conditions no periodic adjustments are necessary.

SERVICE NOTES

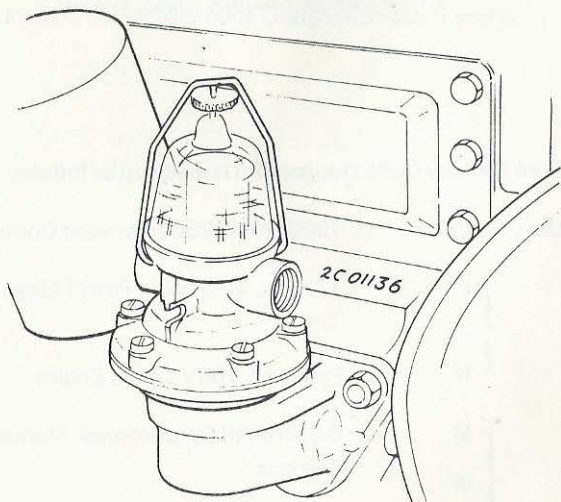
This Handbook is not intended to be a service repair manual, but is written to place in the hands of the driver those instructions which are necessary for the efficient maintenance of the vehicle. If work becomes necessary which is not detailed in this book, it is strongly recommended that contact be made with a Chrysler Dealer, who is continually being advised of the latest technical developments in connection with your vehicle. They also receive information about the latest repair methods and, therefore, will be in a position to give good service.

In order to give the best possible service to users, the Chrysler Dealer Organisation throughout the world forms a link between the operator and the factory. All problems relating to the servicing of vehicles are dealt with through that organisation, the Dealers having behind them the backing of the Factory Service Division.

If advice or information is required concerning your vehicle, your enquiries should be directed to your Dealer. In all correspondence it is imperative that the full chassis number, including prefixed Factory Code Designation, be quoted and that reference be made to any previous correspondence.

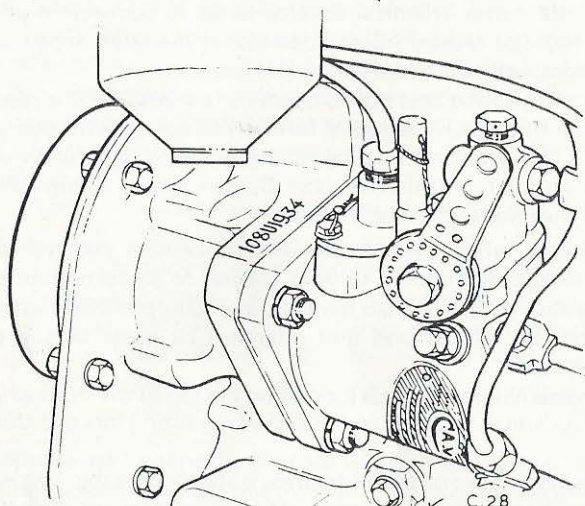
The Chassis Number Plate is located on the top of the front wheel arch, on the driver's side, and will be noticed when tilting forward the driver's seat.

The engine number on petrol engines, is stamped on the right hand side of the engine block adjacent to the fuel lift pump, forward of oil filter.



Engine Number Location (Petrol Engine)

On Diesel engine vehicles the engine number is stamped on the injection pump, drive housing flange situated on the left-hand side of the engine.



Engine Number Location (Diesel Engine)

The Factory Code Designation is made up as follows:

1st two letters	PB	=	1500/2000/2500 Forward Control Model
3rd letter	C	=	1725 cc. 4-Cylinder Petrol Engine
	or		
	R	=	Perkins 4.108V Diesel Engine
4th letter	M	=	4-Speed All Synchromesh Manual Change Gearbox
	or		
	A	=	Borg Warner Automatic Transmission

Basic body design designations are as follows:

DA—Drive Away Front End

CC—Chassis and Cab

VH—Van with Hinged Doors

VT—Van with Hinged Doors and Extra Sliding Door

VS—Van with Sliding Doors

LB—Light Bus

CB—Contractors Bus

Examples

PBCA 1500/VH=	1500 Forward Control Hinged Door Model fitted with a four cylinder petrol engine and automatic transmission.
PBRM 2500/LB=	2500 Forward Control Light Bus Model fitted with a Perkins 4. 108V Diesel engine and manual gearbox.

Note: On Dodge models the factory code Designation has a prefix "D".

On Fargo models the factory code Designation has a prefix "F".

GENUINE PARTS

Every operator should understand the importance of ensuring that only GENUINE CHRYSLER PARTS are used when replacement become necessary.

GENUINE REPLACEMENT PARTS are manufactured to the same specification and are of the same high quality as the parts originally fitted to the vehicle, and they are guaranteed.

INSIST ON GENUINE CHRYSLER PARTS. CHRYSLER DEALERS STOCK THEM.

Central Parts Organisation,
Chrysler United Kingdom Limited,
Coventry Road,
Birmingham, England.

WORKSHOP MANUALS

For Operators who require more detailed technical information than that contained in the Handbook, COMPREHENSIVE WORKSHOP MANUALS are available.

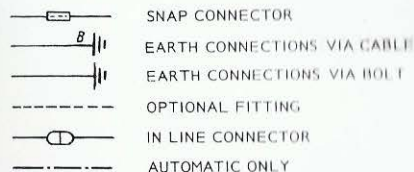
Copies may be obtained from dealers.

OVERSEAS DEALER ADDRESSES

Details of Overseas and Concessionnaire Companies will be supplied upon request from the Export Service Division, Coventry.

4th letter

as fitted to
DIESEL MODELS

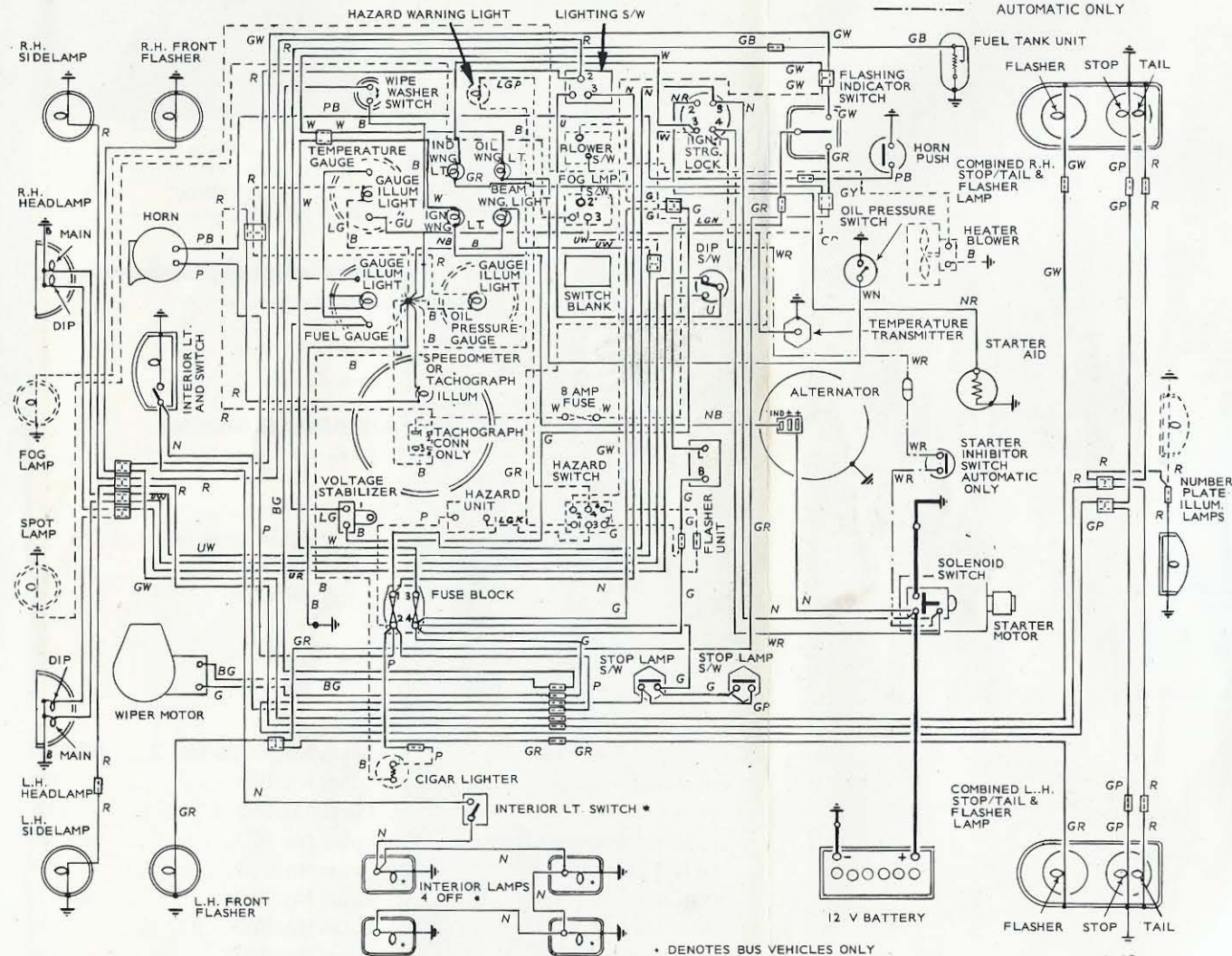


Headlamp (Sealed beam) ...
Side Lamp ...
Front Flasher ...
Panel and Warning Light ...
Interior Lamp ...
Stop/Tail ...
Rear Flasher ...
Rear Number Plate ...

LUCAS 12-VOLT ELECTRICAL EQUIPMENT

as fitted to
DIESEL MODELS

-  SNAP CONNECTOR
-  EARTH CONNECTIONS VIA CABLE
-  EARTH CONNECTIONS VIA BOLT
-  OPTIONAL FITTING
-  IN LINE CONNECTOR
-  AUTOMATIC ONLY



WIRING DIAGRAM No. W05494794

CABLE COLOUR CODE

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

When a cable has two colour code letters, the first denotes the main colour and the second denotes the tracer colour.

SPECIFICATION OF STANDARD EQUIPMENT

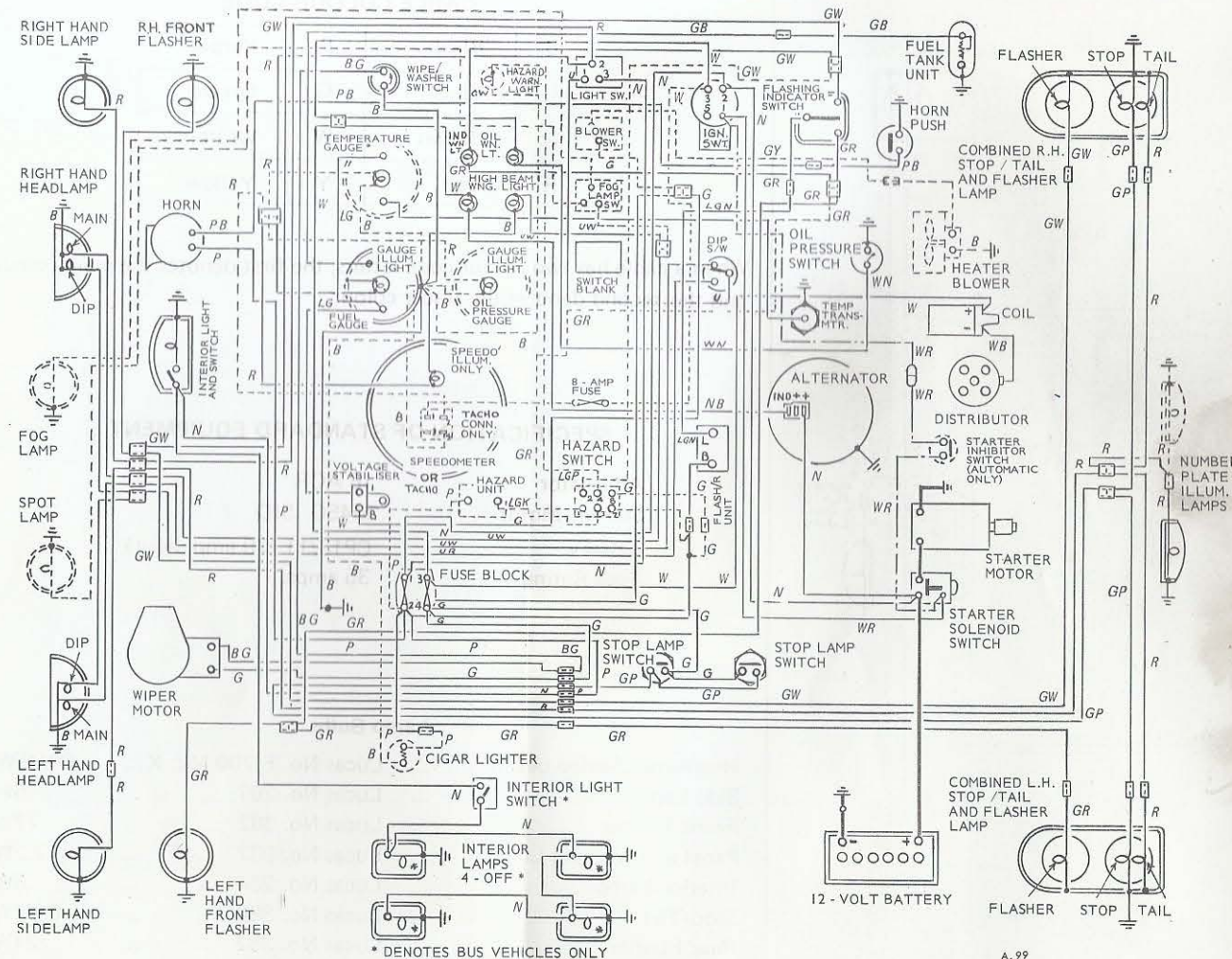
Alternator	16 ACR
Starter Motor	M45G SID
Battery	CP13/11 (70 amp. hour)
Fuse Rating	35 amps.

Lamp Bulbs

Headlamp (Sealed beam)	...	Lucas No. F.700 Mk. X ...	60/45W
Side Lamp	...	Lucas No. 207	6W
Front Flasher	...	Lucas No. 382	21W
Panel and Warning Lights	...	Lucas No. 987	2.2W
Interior Lamp	...	Lucas No. 254	6W
Stop/Tail	...	Lucas No. 380	6/21W
Rear Flasher	...	Lucas No. 382	21W
Rear Number Plate	...	Lucas No. 989	6W

LUCAS 12-VOLT ELECTRICAL EQUIPMENT

as fitted to
PETROL MODELS



WIRING DIAGRAM No. W05494793

CABLE COLOUR CODE

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

When a cable has two colour code letters, the first denotes the main colour and the second denotes the tracer colour.

SPECIFICATION OF STANDARD EQUIPMENT

Alternator	16 ACR
Starter Motor	M35J
Battery	A9(40 amp. hour)
Distributor	25D4
Fuse Rating	35 amps.

Lamp Bulbs

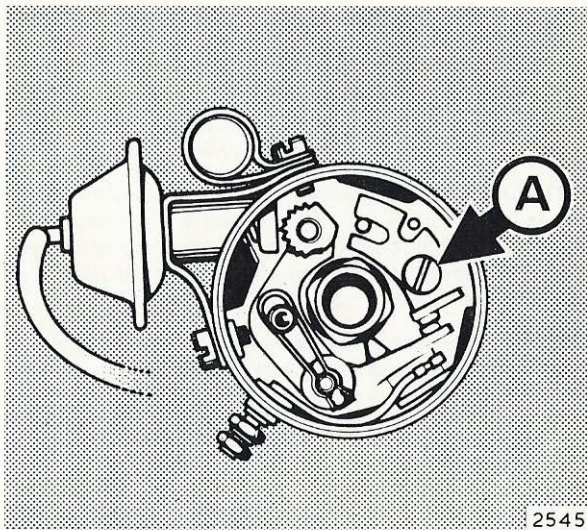
Headlamp (Sealed Beam)	...	Lucas No. F.700 Mk. X ...	60/45W
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Interior Lamp	...	Lucas No. 254	6W
Stop/Tail	...	Lucas No. 380	6/21W
Rear Flasher	...	Lucas No. 382	21W
Rear Number Plate	...	Lucas No. 989	6W

IGNITION SYSTEM

Ducellier Type Distributor

The low compression engine on certain light van models is fitted with a "Ducellier" distributor in place of the "Lucas" type normally fitted as standard equipment.

Although the operating principles of the two types of distributor are similar there are differences in the design characteristics, therefore when servicing the Ducellier type the procedures detailed overleaf must be applied.



Ducellier distributor

Distributor Servicing

1. Release the two spring clips. Remove the distributor cap and rotor arm.
2. Apply two drops of engine oil to the contact breaker pivot and the felt pad in the top of the spindle.
3. Apply a thin smear of the recommended grease to the distributor cam.
4. Wipe the contacts with a soft cloth. The contacts are self-cleaning during their service life and must not be filed or stoned.
5. Thoroughly clean the ignition coil, distributor cap and high tension leads. Refit the rotor and distributor cap.

The contour of the contacts on this type of distributor is critical for correct timing, and for this reason the contacts must not be filed or stoned, but renewed when worn.

The usual practice of setting the contact gap with a feeler gauge is not sufficiently accurate, and it is recommended that renewal of the contact breaker points is entrusted to an authorised dealer, who will have the equipment necessary to set the points.

If absolutely necessary as a temporary measure until the correct adjustment can be made by an authorised dealer, the contact gap can be set by the following method :

- a. Turn the crankshaft until the contact heel is on the peak of the cam.
- b. Loosen the locking screw (A) as illustrated, move the contact base plate with a small screwdriver until the contact gap is 0.016 in. (0.4 mm) and retighten the locking screw. Recheck the gap to ensure the setting has not changed.