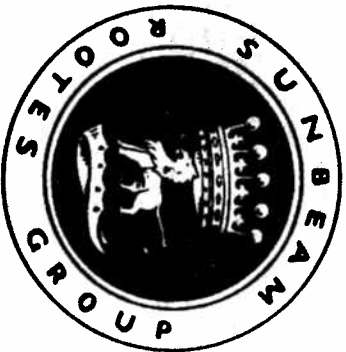


SUNBEAM ALPINE



OWNER'S HANDBOOK

SERIES V

A PRODUCT OF THE ROOTES GROUP

OWNER'S HANDBOOK

THE

SUNBEAM ALPINE

SERIES V

ISSUED BY

ROOTES SERVICE DIVISION
COVENTRY ENGLAND

CENTRAL PARTS ORGANISATION

ROOTES MOTORS (PARTS) LIMITED
COVENTRY ROAD
BIRMINGHAM, ENGLAND

WORLD EXPORTERS

ROOTES MOTORS OVERSEAS LIMITED
PICCADILLY . LONDON . ENGLAND

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FOREWORD

This handbook gives concise information on the running and maintenance of this car. It should be carefully read.

It is not intended to be a service repair manual and, should any work become necessary which is not detailed in it, owners are strongly recommended to contact a dealer, if possible the same dealer who sold the car.

Rootes dealers form the link between the owner and the factory. They are constantly being advised of the latest technical developments and repair methods, and are, therefore, in a position to provide the best servicing facilities and, in addition, any advice or information which may be required.

NEW VEHICLE PREPARATION

New Vehicle preparation is carried out by the dealer who supplies the car. It is designed to ensure that the car reaches its owner in the finest possible condition. Continued efficiency as well as economy in operation, however, depends upon the care it receives during its life.

FREE SERVICE INSPECTION

After completing 500 miles (800 km.) you should, without fail, take advantage of the free service inspection available for your car (in certain countries this service is carried out at different mileages in accordance with locally accepted practice). The manufacturers attach so much importance to this that in the interests of the user, it is an obligation on the part of the dealer responsible for the sale of the car to provide this service free of charge (except for material) subject to the car being presented for this purpose.

LUBRICATION AND MAINTENANCE

Regular lubrication and maintenance are essential for long life and sustained performance.

A book of service vouchers is supplied with all cars sold on the Home market. Voucher books are also available for most Export markets. It is very important that the vouchers should be used in the correct sequence at the appropriate mileage.

IMPORTANT NOTE

Owners should appreciate that the warranty shall not apply to defects arising in any product which has not received the periodical maintenance as detailed in the Owner's Handbook and Service Voucher Book.

THIS WORK SHOULD BE CARRIED OUT BY AN AUTHORISED DEALER.

The counterfoil of the voucher should be dated and stamped by the servicing Rootes Dealer for record purposes.

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

YOUR ROOTES DEALER

Whenever possible, owners are recommended to entrust their servicing to their Rootes Dealer. This is particularly important in the case of guarantee work which should always be carried out by a Rootes Dealer; preferably the dealer from whom the car was bought.

In all correspondence it is imperative that the full chassis number, including the prefix and suffix letters, is quoted and that reference be made to any previous correspondence.

VEHICLE IDENTIFICATION

The chassis number, including prefix and suffix letters will be found on a plate fixed to the bonnet lock platform, and it is visible from inside the bonnet.

The engine number will be found on the right-hand side of the cylinder block, immediately above the fuel pump.

This information may also be required for Customs purposes.

INDEX

NOTE: A list of Rootes Concessionaire Companies throughout the World appears on page 69.

	Page		Page
Accelerator ..	14	Gearbox ..	6, 37
Accessories ..	17	Gear lever ..	13
Air cleaner ..	29	Gearshift mechanism ..	37
Alternator ..	45	General data ..	5
Baggage compartment ..	17	Handbrake ..	14
Battery ..	49	Heating and ventilating ..	57
Bonnet—to open and close ..	16	Hood operating instructions ..	58
Brakes ..	15, 39	Horn ..	12
Bulbs ..	7	Ignition timing ..	5, 28
Capacities ..	7	Instruments ..	12
Carburettor, cleaning and adjustment ..	30	Interior lamp ..	12
Carburettor settings ..	5	Jack ..	19
Chassis number location ..	3	Lamps ..	45
Choke ..	13, 21	Lamp switch ..	10
Clutch ..	15, 44	Locks and keys ..	16
Coachwork ..	51	Lubrication ..	23
Controls ..	13, 15	Oil filter ..	33
Cooling system ..	25	Overdrive ..	11, 38
Crankcase ventilation regulator ..	34	Panel lamp switch ..	12
Dimensions ..	6	Periodical attention ..	54
Dip switch ..	10	Rear axle ..	39
Direction indicators ..	11	Recommended Lubricants ..	23
Distributor ..	50	“Running-in” ..	21
Engine ..	5, 36	Seats ..	16
Foreword ..	2	Spare wheel ..	18
Free Service ..	2	Steering box ..	35
Free service schedule ..	66	Starting procedure ..	20
Front Hubs ..	45	Starter switch ..	10
Front suspensions ..	6	Touring abroad ..	68
Frost precautions ..	26	Tyres ..	6, 43
Fuel gauge ..	12	Valve rocker adjustment ..	5, 27
Fuel pump ..	32	Ventilator ..	14, 15
Fuel system ..	29	Water temperature gauge ..	12
Fuse unit ..	49	Weights ..	6
		Wheels ..	19
		Windscreen wiper switch ..	10

A lubrication chart is inserted between the centre pages of this publication.

GENERAL DATA

ENGINE

Capacity ..	1724 c.c. (105.2 cu. in.)
Type ..	Overhead Valve
Number of cylinders ..	4
Nominal bore ..	81.5 mm. (3.21 in.)
	(subject to grading)
Stroke ..	3.25 in. (82.55 mm.)
Distributor contact gap ..	0.015 in. (0.38 mm.)
Spark plug type ..	Champion N.9.Y.
Spark plug gap ..	0.025 in. (0.63 mm.)
Compression ratio ..	9.2:1
Oil pressure (hot) ..	40 lb. per sq. in. (2.8 kg/cm. ²)
BHP gross ..	99 at 5,500 r.p.m.
net ..	92.5 at 5,500 r.p.m.
Max. Torque lb. ft. (kg. in.) ..	103 (14.2) at 3,700 r.p.m.

IGNITION TIMING—STATIC (at full retard) †

6°—10° B.T.D.C.

The TDC mark is the LAST one to be reached when the engine is turned in the direction of rotation. The other marks are all at 5° progressive intervals B.T.D.C.

Firing Order

1-3-4-2

† The ignition setting given above may require slight variation according to the octane ratings of the fuels available.

VALVE ROCKER CLEARANCES (Hot)

Inlet (Intake) ..	0.012 in. (0.30 mm.)
Exhaust ..	0.014 in. (0.35 mm.)

CARBURETTOR (Twin Stromberg 150 C.D.)

Needle type ..	5.M.
Damper springs ..	(Uncoloured)
	(0.032 in.—0.81 mm.)

GEARBOX (TRANSMISSION)

Overall ratios (All Models).	
O/D Top ..	Standard
Top ..	3.890:1
O/D 3rd ..	4.220:1
3rd ..	5.037:1
2nd ..	7.741:1
1st ..	12.137:1
Reverse ..	13.014:1
	Standard
	3.388:1
	4.220:1
	4.388:1
	5.465:1
	8.397:1
	13.166:1
	14.010:1

FRONT SUSPENSION

Front wheel Camber * ..	±° (plus or minus ½°) positive
Front wheel “Toe-in” † ..	½ in. (3 mm.)

* Car must be fully laden for Camber and Toe-in check.

† As reckoned at the wall of the tyre.

DIMENSIONS

Wheel base	7 ft. 2 in. (218.4 cm.)
Track (Tread)—Front (disc wheels)	4 ft. 3 in. (129.5 cm.)
Track (Tread)—Front (wire wheels)	4 ft. 3½ in. (130.2 cm.)
Track (Tread)—Rear (disc wheels)	4 ft. 0½ in. (123.2 cm.)
Track (Tread)—Rear (wire wheels)	4 ft. 2½ in. (128.3 cm.)
Overall length	12 ft. 11½ in. (394.4 cm.)
Overall height (laden)	4 ft. 3½ in. (130.8 cm.)
Overall width	5 ft. 0½ in. (153.7 cm.)
Ground clearance (laden)	0 ft. 4½ in. (10.8 cm.)

KERB WEIGHT

STD.	2,180 lbs. (989 kg.) or 2,200 lbs. (998 kg.) when overdrive fitted
G.T.	2,230 lbs. (1,012 kg.) or 2,250 lbs. (1,020 kg.) when overdrive fitted

TYRE MAINTENANCE (Dunlop Nylon or Rayon tubeless tyres—tubed on wire wheels)

Size 6.00 × 13 "C41" or 5.90 × 13 "RS.5" (optional)

Pressures (normal driving)

Front and rear	24 lbs. in.2 (1.69 kg. cm.2)
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Pressures (high speed driving)

Front	24 lbs. in.2 (1.69 kg. cm.2)
Rear	26 lbs. in.2 (1.82 kg. cm.2)

CAPACITIES

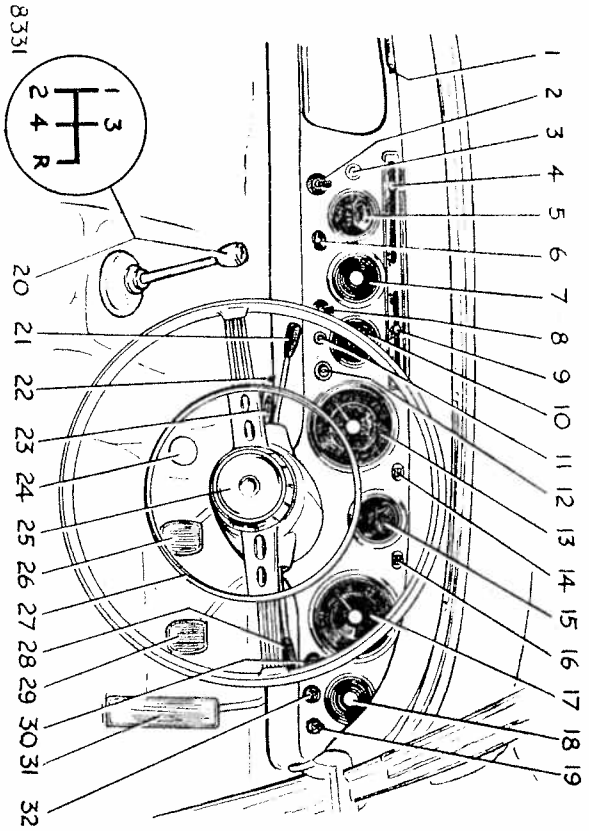
Fuel capacity	11 gallons (13.2 U.S. gallons; 50 litres)
Oil capacity—Engine	8½ pints (including filter and oil cooler) (10 U.S. pints; 4.7 litres)
Oil capacity—Gearbox	3½ pints (4.2 U.S. pints; 1.9 litres)
—with Overdrive	4½ pints (5.4 U.S. pints; 2.5 litres)
Oil capacity—Rear Axle	1½ pints (2.1 U.S. pints; 1 litre)
Water capacity (with heater)	12½ pints (15 U.S. pints; 7.1 litres)
Battery capacity (12 V.) (Negative earth)	38 Amp. hr. normal service 51 Amp. hr. certain export territories
Fuse	2 × 35 Amp.

LAMP BULBS

Head (R.H.D.)	Sealed beam unit
Head (L.H.D.)	410 45/40 W.
Head (France)	411 45/40 W.
Head (U.S.A., Canada)	Sealed beam unit
Side (Fender) lamp (Capless)	501 12 V. 5 W.
Warning lamps	Phillips 12879 12 V. 2 W.
Panel lamp bulbs	987 12 V. 2.2 W.
Stop and tail lamp	380 12 V. 21/6 W.
Rear number plate	989 12 V. 6 W. or 501 12 V. 5 W.
Interior lamp (if fitted)	254 12 V. 6 W. (vestoon)
Front, rear flasher lamps	382 12 V. 21 W.
Map lamp	254 12 V. 6 W. (vestoon)
Tachometer illumination	987 12 V. 2.2 W.

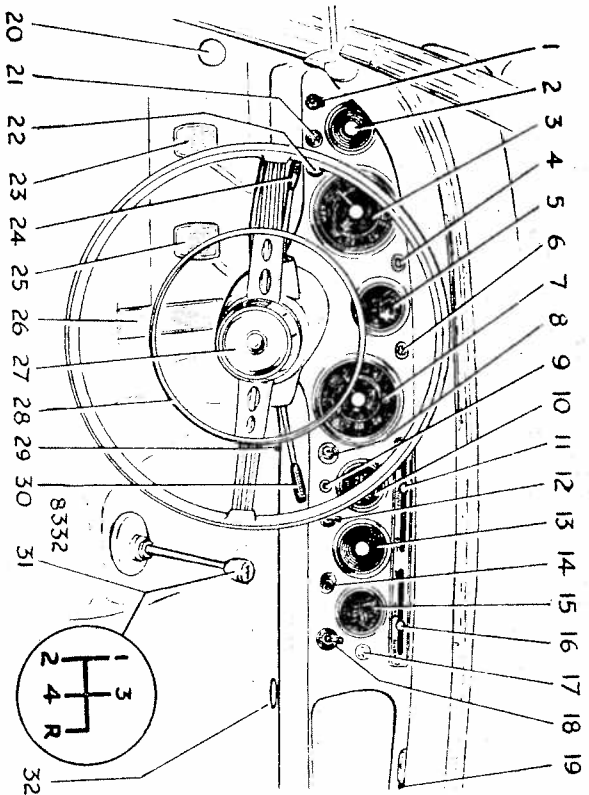
NOTE: It is important that only the bulbs specified for each type of lamp are used, otherwise the maximum anti-dazzle properties will not be obtained.

The Manufacturers
reserve the right to alter specifications
at any time, without notice.



Facia panel and controls—R.H.D. models

- | | |
|---------------------------------------|------------------------------------|
| 1. MAP LAMP SWITCH | 18. AMMETER (IF FITTED) |
| 2. PANEL LAMP SWITCH | 19. HEATER BLOWER SWITCH |
| 3. CIGAR LIGHTER (IF FITTED) | 20. GEAR LEVER |
| 4. HEATER TEMPERATURE CONTROL | 21. OVERDRIVE SWITCH (IF FITTED) |
| 5. FUEL GAUGE | 22. SPEEDOMETER TRIP CONTROL |
| 6. CHOKE | 23. BONNET LOCK RELEASE |
| 7. CLOCK (IF FITTED) | 24. DIP SWITCH |
| 8. LIGHTING SWITCH | 25. STEERING WHEEL ADJUSTMENT LOCK |
| 9. HEATER (SCREEN AND CAR) CONTROL | 26. CLUTCH PEDAL |
| 10. TEMPERATURE GAUGE | 27. HORN RING |
| 11. IGNITION WARNING LAMP | 28. FLASHER SWITCH |
| 12. IGNITION/STARTER SWITCH | 29. BRAKE PEDAL |
| 13. SPEEDOMETER | 30. WINDSCREEN WIPER SWITCH |
| 14. FLASHER WARNING LAMP | 31. ACCELERATOR PEDAL |
| 15. OIL PRESSURE GAUGE | 32. WINDSCREEN WASHER CONTROL |
| 16. HEADLAMP MAIN BEAM WARNING LAMP | |
| 17. REVOLUTION INDICATOR (TACHOMETER) | |



Facia panel and controls—L.H.D. models

- | | |
|--------------------------------------|------------------------------------|
| 1. HEATER BLOWER SWITCH | 18. PANEL LAMP SWITCH |
| 2. AMMETER (IF FITTED) | 19. MAP LAMP SWITCH |
| 3. REVOLUTION INDICATOR (TACHOMETER) | 20. DIP SWITCH |
| 4. HEADLAMP MAIN BEAM WARNING LAMP | 21. WINDSCREEN WASHER CONTROL |
| 5. OIL PRESSURE GAUGE | 22. WINDSCREEN WIPER SWITCH |
| 6. FLASHER WARNING LAMP | 23. CLUTCH PEDAL |
| 7. SPEEDOMETER | 24. FLASHER SWITCH |
| 8. IGNITION/STARTER SWITCH | 25. BRAKE PEDAL |
| 9. IGNITION WARNING LAMP | 26. ACCELERATOR PEDAL |
| 10. TEMPERATURE GAUGE | 27. STEERING WHEEL ADJUSTMENT LOCK |
| 11. HEATER TEMPERATURE CONTROL | 28. HORN RING |
| 12. LIGHTING SWITCH | 29. SPEEDOMETER TRIP CONTROL |
| 13. CLOCK (IF FITTED) | 30. OVERDRIVE SWITCH (IF FITTED) |
| 14. CHOKE | 31. GEAR LEVER |
| 15. FUEL GAUGE | 32. BONNET LOCK RELEASE |
| 16. HEATER (SCREEN AND CAR) CONTROL | |
| 17. CIGAR LIGHTER (IF FITTED) | |

INSTRUMENT PANEL, CONTROLS AND FITTINGS

The positions of all the various instruments, switches and controls are clearly shown in the illustrations. The following notes are given for the guidance of drivers.

SWITCHES

COMBINED IGNITION AND STARTER SWITCH

Turn key to the right to switch on the ignition, and turn further to the right, against spring pressure, to operate the starter. When the engine starts the key should be released, whereupon it will spring back to the "Ignition on position".

If the radio is needed when the engine is not running, the ignition key should be turned to its extreme left position.

COMBINED SIDE AND HEADLAMP SWITCH

The switch is pressed down to the halfway position to switch on the side and tail lamps, and fully down to switch on the headlamps.

DIP SWITCH

On the floor adjacent to the clutch pedal, when depressed, both headlamp beams deflect. Depress again to put the beams to the straight ahead position.

WINDSCREEN WIPER SWITCH

The switch is pressed down to the halfway position to switch on the wipers for slow speed, and fully down for high speed. The wipers will operate only if the ignition switch is in the "on" position.

When the wipers are switched off, the blades will automatically return to the "parked" position.

If the blades are obstructed by ice or packed snow, switch off the wiper motor to prevent damage to the internal mechanism, then with the ignition "ON", lift the wiper arms clear of the obstruction whence they will return to the parked position automatically.

DIRECTION INDICATORS

Flashing type indicators are fitted. The switch is mounted at the side of the steering column. The direction indicators will operate only when the ignition is switched on, and are self-cancelling.

A warning lamp is fitted to show when the indicators are operating. A built-in dimmer in the form of a roll-down lens is incorporated. Simply roll down the lens to dim the light.

The direction indicator switch also incorporates the switch for flashing the headlamps. This is achieved by moving the lever towards the steering wheel so that the headlamps will illuminate and will remain so until upward pressure on the lever is released, whereupon the lamps will be extinguished.

Headlamp flashing can be accomplished irrespective of the lever position, *i.e.*, when using either direction indicator.

OVERDRIVE SWITCH (if fitted)

The overdrive unit is controlled by a manually operated switch on the steering column and by a switch in the gearbox top cover. The switch in the gearbox is automatically operated when either top or third gear is selected so that the overdrive can be engaged only when the gear lever is in either of these gears.

To engage or disengage the overdrive when the gear lever is in either top or third gear, move the manual switch in the appropriate direction. This switch is of the self-cancelling type, which means that, when overdrive or direct drive is selected, the switch will return to the off position.

It is not necessary to move the clutch pedal when making these changes, which should be carried out with the accelerator pedal depressed.

It is generally advisable to disengage the overdrive switch before changing from third to second gear, as this will ensure that the transmission is not subjected to heavy loads due to by-passing direct third gear.

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

PANEL LAMPS SWITCH

Press down to illuminate the instrument panel and lift upwards to turn off.

These lamps will only operate when the side lamps are on.

HORN SWITCH

The horns are controlled from a ring within the steering wheel. Press the ring in any position to operate the horns.

MAP LAMP SWITCH

The map lamp switch is mounted on the side of the lamp body, above the glove box.

INTERIOR LAMP SWITCH (if fitted)

Mounted on the side of the interior lamp. The lamp comes on automatically when either front door is opened. The lamp can be switched on by hand when the doors are shut, but cannot be switched off if the doors are left open.

INSTRUMENTS**IGNITION AND ALTERNATOR WARNING LAMP**

When the ignition key is turned "ON", the RED warning lamp illuminates but, as soon as the engine is started the warning lamp will extinguish and will remain so even at idling speed, assuming that this does not fall below the recommended speed of between 900-950 r.p.m.

In the event of the lamp failing to extinguish, this will at once indicate some fault in the charging circuit or a broken drive-belt. Should a fault occur, investigate the cause and rectify as soon as possible, otherwise the battery will discharge.

OIL PRESSURE GAUGE

Should normally register a pressure of 40 lbs. in.² (2.8 kg. cm.⁻²) at 50 m.p.h. (80 k.p.h.) with the engine at its normal working temperature. The oil pressure gauge does not register the amount of oil in the sump.

If the gauge fails to register, the engine must be stopped at once and the cause sought and rectified before restarting the engine; otherwise serious damage may result.

FUEL GAUGE

Registers only when the ignition is switched on. A few seconds are required for the gauge to give a true reading after the ignition is switched on.

WATER TEMPERATURE GAUGE

This instrument is electrically operated and registers engine temperature only when the ignition is switched on.

A few seconds are required before the temperature is indicated after the ignition has been switched on. The normal running temperature is between 84°C. (183°F.) and 93°C. (200°F.) dependent on ambient temperature.

REVOLUTION INDICATOR (TACHOMETER)

The revolution indicator shows engine speeds in revolutions per minute (r.p.m.).

If the car is driven at engine speeds in the range where maximum torque is developed, the best balance between performance and fuel economy will be obtained, but, if economy is the prime consideration disregarding performance, lower speeds will give better results. Maximum safe engine speed is indicated by the red sector on the dial of the instrument.

HEADLAMP MAIN BEAM INDICATOR

The speedometer, in addition to indicating the road speed, main (high) beam is in use and goes out when the dipped beam is in operation. A built-in dimmer in the form of a roll-down lens is incorporated. Simply roll down the lens to dim the light.

SPEEDOMETER

The speedometer, in addition to indicating the road speed, registers the total mileage and "trip" mileage. To set the "trip" reading to zero operate the knob protruding from behind the facia.

HAND CONTROLS**CHOKE (STRANGLER) CONTROL**

This control is situated on the instrument panel. Instructions for using the choke will be found under "Starting Procedure".

GEARSHIFT LEVER

The gearshift lever is floor mounted and the gear positions are indicated on the lever knob; make certain that the lever is in the neutral position before starting the engine.

USE OF GEARS

The gearbox (transmission) embodies synchromesh on all forward gears. To ensure a quiet change and smooth engagement, exert a steady pressure on the gear lever, in order that the synchromesh is given opportunity to operate smoothly.

A further point which will materially assist in obtaining a smooth change is the synchronisation of engine and road speeds. The engine speed should be allowed to decrease when changing up and increase when changing down.

The gearbox and axle ratios have been carefully chosen to make the best possible use of the engine power in all gears. This ensures progressive acceleration through the gears and effortless motorway cruising in top gear, coupled with maximum fuel economy. It is important, therefore, that the full range of the gearbox is used and the car started from rest in first gear.

HANDBRAKE

The handbrake is located to the right of the front seat. (Left side on left-hand drive vehicles.)

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 is of the fully compensated rod and cable type operating on the rear wheels through levers incorporated in the rear hydraulic brake cylinders; it is independent of the hydraulic system in operation.

VENTILATOR

This control is situated in the top centre of the fascia panel. From the "off" position, move the control progressively to the "Screen" position.

With the control in the "Car" position, a balanced proportion of air will be directed to both the car and the windscreen; with the control in the "Screen" position, maximum air will be directed to the windscreen for demisting purposes.

STEERING WHEEL HEIGHT ADJUSTMENT

The steering wheel can be adjusted for height to accommodate various driving positions.

Unlock the large central boss in the centre of the steering wheel by turning in an anti-clockwise direction. The boss is provided with finger grips to assist the loosening operation.

Pull up (or push down) the steering wheel to the desired position and re-lock the central boss.

Spanners of any description must not be used for locking or unlocking the central boss.

FOOT CONTROLS

ACCELERATOR

Always operate the accelerator smoothly. Jerky movements increase fuel consumption. See also "Starting Procedure".

Provision is made on the accelerator to re-locate the pedal nearer to the driver.

BRAKE PEDAL

Avoid violent braking. Use lower gears when descending steep hills.

After negotiating a ford, water splash or when driving on flooded roads, it may be necessary to dry out the brakes to restore full braking power by a few light applications of the brake pedal. It is also advisable to do this after or during prolonged driving in wet weather, under circumstances where the brakes are not in use, such as may occur on high speed motorways, etc.

Provision is made on the brake pedal to re-locate the pedal nearer to the driver.

CLUTCH PEDAL

When using the clutch press the pedal down fully. If this is not done grating of the gears may result. **DO NOT ALLOW THE FOOT TO REST ON THE PEDAL WHEN NOT USING THE CLUTCH.** Never coast downhill with the clutch disengaged as this will cause clutch wear and possibly other damage to the transmission.

BONNET LOCK

TO OPEN AND CLOSE THE BONNET (HOOD)

Pull the release handle situated below the instrument panel and raise the bonnet lid. Release the bonnet prop and engage it in the bracket provided in the bonnet panel.

To close the bonnet, disengage the prop and insert it firmly in its clip. Lower the bonnet lid and press firmly down until the catch engages.

SEATS

The front seats are adjustable for leg room by pushing the catch located at the front, sideways, and for height by turning the rail on the underside of the frame, either forwards or rearwards.

The seat backs can be adjusted for rake by pulling up the handle located on the outside edge of the seats, moving the seat backs to the desired position, then pushing down the handle to lock.

FOOTWELL VENTILATION

To allow the entry of fresh air into the footwells, operate the knob marked "V" situated below the fascia panel.

This ventilator draws air from the intake on the scuttle grille, and is independent of the existing system operated from the controls on the fascia.

LOCKS AND KEYS

Either door may be locked with a key. When leaving the car one door must be locked from inside, the exit door can then be locked with the key. Both locks are self-cancelling to prevent the owner being locked out.

To lock the doors from the inside, push the interior handle forwards.

Two sets of keys are supplied with the car; one operating the ignition and door lock, and the other the baggage boot and cubby box in the centre armrest.

The ignition and boot keys are differently shaped so as to make them easier to identify in the dark.

To operate the door locks the key is turned a quarter of a turn only, returned to the horizontal position and withdrawn.

Right-hand: Turn the key clockwise to lock, and anti-clockwise to unlock.

Left-hand: Turn the key anti-clockwise to lock, and clockwise to unlock.

If the door locks become too stiff to operate they should be lubricated as described under "coachwork" elsewhere in this book.

IMPORTANT NOTE

There are no key numbers on the face of any of the locks; this is a protection against theft. It is important that owners should make a careful note of key numbers so that replacements may be obtained without difficulty in the event of loss.

DRIVING MIRROR

The driving mirror is adjustable for height by turning through 180°.

WINDSCREEN WASHERS

If windscreen washers are fitted and trouble-free operation is to be ensured, it is important to use only clean sediment-free water in the windscreen washer bottle. The use of soft water will avoid the possibility of lime deposits in the jets and valve mechanism and thus provide maximum life.

The bottle should be removed and thoroughly rinsed out periodically.

Anti-freeze solutions, alcohol or domestic detergents, should not be added to the water in the windscreen washer bottle. Owners who require to use an additive should use only a windscreen washer additive which is available in sachets from any Rootes dealer.

SPECIAL ACCESSORIES

A comprehensive range of special accessories, including radios (of various types and price ranges), are available for this car. These are obtainable from your dealer.

BAGGAGE, SPARE WHEEL AND TOOL COMPARTMENT

BAGGAGE BOOT

BOOT LOCK

A slam type lock is fitted and, if required, it can be locked before closing the boot.

To unlock, turn key anti-clockwise a quarter of a turn; to lock turn a quarter of a turn clockwise.

Do not lift the boot lid by the rear number plate lamp glass; lift it by holding the number plate illumination fairing.

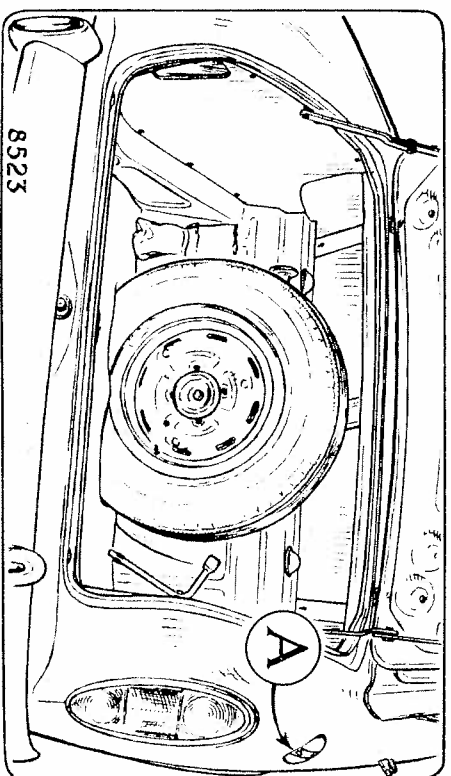
SPARE WHEEL

Mounted in the boot and attached to a mounting bracket by means of a bolt which is turned anti-clockwise to release.

FUEL FILLER CAP

Simply press to release lock, then lift up cap.

When closing, make certain that the cap is fully closed on its seal.



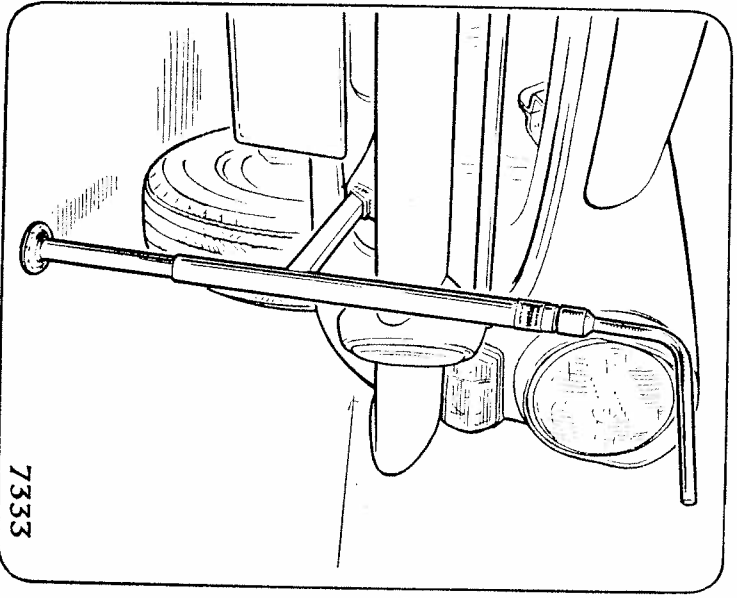
View of baggage compartment showing position of spare wheel and (A), the fuel filler cap

LIFTING JACK

The lifting jack is operated by turning the hexagon nut at the top with the wheel nut wrench.

When fixing the jack either to the front or rear of the car it will be noticed that there is a square section recess just underneath the bumper at each side, front and rear of the car, into which the extension of the jack is fitted.

It is most important to ensure that the jack extension is pushed fully home into the brackets before lifting the car. No attempt should be made to attach the jack in any position other than in the brackets provided. Always jack up the car on a hard surface.



Lifting jack position

Before jacking up the car it is essential always to make quite sure that the handbrake is securely "ON". If the car is on an incline, and one of the rear wheels is being raised, **BOTH** the front wheels must be chocked.

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

ROAD WHEELS

TO REMOVE AND REFIT (Pressed steel type)

Remove the nave plate from the centre of the wheel by inserting the key (supplied in tool kit) between the wheel and the outer edge of the plate, and twisting, holding the plate meanwhile with the other hand.

To remove the nuts, the wheel nut wrench, which is stowed in the baggage compartment, should be used. The nuts of all wheels have right-hand threads, *i.e.*, turn anti-clockwise to remove and clockwise to tighten.

The nuts should be slackened before lifting the car.

When refitting a wheel, make sure that the rounded ends of the nuts are facing the wheels.

Re-tighten the nuts fully and check periodically. This should be done only when the weight of the car is on the wheels, **NOT** when on the jack.

TO REMOVE AND REFIT (Wire type)

The wheels must be removed regularly and cleaned for examination. Wire wheels are fitted to splined hubs and secured by a hub nut. This may be either lug type or octagonal. When the latter type of nut is fitted, a spanner is provided in the tool kit for removal and tightening purposes. Hub nuts on the right-hand side of the car are removed by turning clockwise, those on the left-hand side by turning anti-clockwise. The nuts must be loosened slightly before the car is jacked up, and tightened with the wheel on the ground. Run the car a short distance and re-check the hub nuts. Extreme care must be taken not to damage the "O" ring on the hub when removing and refitting wheels.

SPOKES.—Wire wheels are built with predetermined spoke tension. It is important that this tension is maintained at all times, and wheels must be checked at regular intervals.

Looseness can be corrected and damaged spokes renewed, but care must be taken not to affect the alignment of the rim relative to the hub. Spoke tensioning must be carried out with the tyre and tube removed so that any protruding spoke ends can be filed off flush with the nipple.

If the condition of the wheel is in doubt, a wheel specialist must be consulted.

HUB TAPERS AND SERRATIONS.—Any surface corrosion must be cleaned off, and the extent of any wear noted.

It is important that the tapers and serrations are clean. All dirt and rust must be removed, and the mating faces greased before the wheel is fitted.

STARTING PROCEDURE

STARTING ENGINE WHEN COLD

Place gear lever in neutral and handbrake "on". Switch on the ignition, noting that the generator warning lamp lights up.

Pull out the choke control as far as possible. Operate the starter **WITHOUT MOVING THE ACCELERATOR PEDAL.** The engine should start immediately and continue to run at a fast idle speed. If the engine fails to start do not operate the starter again until both starter and engine have come to rest. A pause of one or two seconds will be sufficient and will obviate risk of damage to the starter mechanism.

When the engine starts and shows signs of uneven running, push in the choke control far enough to obtain even running for driving the car away. Push in the choke control fully as soon as it can be done without stopping the engine.

STARTING ENGINE WHEN PARTLY WARM

Very slightly depress the accelerator pedal, switch on the ignition and operate the starter. In most cases the engine will start immediately and idle correctly as soon as the accelerator is released.

If the engine will not start in this way, pull out the choke control to the halfway position, switch on the ignition and operate the starter **WITHOUT MOVING THE ACCELERATOR PEDAL.** Push in the choke control fully as soon as it can be done without stopping the engine.

STARTING ENGINE WHEN HOT

The choke control must never be used when the engine is hot.

If difficulty is experienced in starting the engine when hot, the accelerator pedal should be slowly fully depressed and the starter operated with the ignition switched on. Release the accelerator as soon as the engine starts to prevent racing of the engine.

"RUNNING-IN" THE NEW CAR

The preliminary and progressive "running-in" of a new car and the method by which it is carried out is of the utmost importance in order that the car may give of its best in durability, sweetness of running, economy and freedom from trouble throughout its life. The process of "running-in" applies not only to the engine, but equally to gearbox (transmission), rear axle and, in fact to the entire chassis. This process should continue, progressively, over the first 1,000 miles (1,600 km.) of the life of the car.

The most important point to be remembered is that at no time must the engine be allowed to labour, particularly at low engine speeds, as when attempting to pull up hills in high gear at low speed, or attempting to accelerate from very low speeds in top gear. Make full use of the gear shift lever in order to avoid overloading the engine.

It is most important that the engine speed should not be excessive during this period and that it is never "raced" in neutral. Adherence to the following instruction with regard to maximum road speeds in top (high) gear and strict observance of the corresponding maximum road speeds in the lower gears—third, second and first—is of equal importance:

Thirty-five miles per hour (55 k.p.h.) to forty miles per hour (65 k.p.h.) should be accepted as the maximum speed in top gear during the first 500 miles (800 km.).

Overdrive top should not be engaged under 35 miles per hour (55 k.p.h.) and a maximum speed of 45 miles per hour (70 k.p.h.) should not be exceeded in this gear.

The speeds in the lower gears—third, second and first—giving the equivalent engine revolutions per minute as when travelling at 35 miles per hour in top (high) gear are:

- 25 m.p.g. (40 k.p.h.) in third gear.
- 15 m.p.h. (25 k.p.h.) in second gear.
- 10 m.p.h. (15 k.p.h.) in first gear.

The engine of this car 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 (8,000 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 car is neither intended nor designed to operate without using a certain amount of oil.

On completion of the first 500 miles (800 km.) and for the second 500 miles, *i.e.*, until 1,000 miles (1,600 km.) have been covered, the "running-in" speed in top (high) gear may be increased progressively subject to favourable conditions.

At the conclusion of 500 miles (800 km.) the car should be taken to the dealer from whom it was purchased, for the free service inspection. A voucher for this purpose is included in the OWNER'S SERVICE BOOK supplied with Home models.

If, for any reason, this work cannot be done by the dealer from whom your car was purchased, it can be carried out by any other Rootes dealer provided that the 500-Mile free service voucher has been stamped by the dealer who supplied the car.

Free service with vehicles delivered in overseas markets is always provided by the dealer in accordance with the recognised practice.

LUBRICATION

REGULAR LUBRICATION

Regular lubrication is essential for long life and sustained performance, and the correct intervals shown should be strictly followed. It is most important that only the type and grade of oil shown under "Recommended Lubricants" is used, otherwise serious damage may result.

SERVICE VOUCHERS

Full use should also be made of the book of service vouchers which is supplied with every car delivered to the Home market. These will be accepted by any authorised Dealer in the United Kingdom or the Republic of Ireland.

ENGINE OIL

The recommended engine oil (and filter) change period is every 6,000 miles (9,600 km.) or at least every 6 months (at seasonal service). However, there are certain cases where this should be done more frequently.

1. Habitual stop/start driving.
2. Operation during cold weather (below 5°C.; 41°F.).
3. When much driving is done under dusty conditions.

For continuous high speed driving use Shell Super Motor Oil or Shell X-100/40. This is particularly important in hot weather.

UPPER CYLINDER LUBRICANT

If an upper cylinder lubricant is used, we recommend Shell Upper Cylinder Lubricant. Half an ounce (15 c.c.) should be added for each gallon of fuel.

RECOMMENDED LUBRICANTS

ADDITIVES

Any addition to the following lubricants which may alter their characteristics sufficiently to affect mechanical efficiency should not be used. Additions must on no account be made to the lubricants specified for the gearbox or overdrive.

ENGINE—Where prevailing climatic temperature is:

	Above 21°C. (70°F.)	Shell Super Motor Oil	
	or	Shell X-100 30	
	27°C. to -7°C. (80°F. to 20°F.)	Shell Super Motor Oil	
	or	Shell X-100 20W	
Sump (Oil pan)	0°C. to -18°C. (32°F. to 0°F.)	Shell Super Motor Oil	
	or	Shell X-100 10W	
Upper Cylinder Lubricant	Below -15°C. (5°F.)	Shell X-100 Multigrade 5W/20	
		Shell Upper Cylinder Lubricant	

DISTRIBUTOR			
Shaft and cam bearing ...	...	...	Engine oil
Contact breaker pivot ...	...	...	Engine oil
Cam profile ...	...	...	Shell Retinax A
Automatic timing (spark) control	...	...	Engine oil
CARBURETTOR DAMPERS	...	...	Shell X-100 20W
BATTERY TERMINALS	...	...	Petroleum jelly
STEERING UNIT ...	...	...	Shell Spirax 90 E.P.
GEAR SHIFT BALL JOINT AND MECHANISM	...	...	Engine oil
ACCELERATOR LINKAGE	...	...	Engine oil
GEARBOX			
All temperatures ...	...	...	Shell Super Motor Oil
REAR AXLE			
Above minus 23°C. (minus 10°F.)	...	...	Shell Spirax 90 E.P.
Below minus 23°C. (minus 10°F.)	...	...	Shell Spirax 80 E.P.
FRONT WHEEL HUB BEARINGS	...	...	Shell Retinax A
HANDBRAKE PULL-OFF SPRINGS	...	...	Shell Retinax A
BRAKE AND CLUTCH PEDAL PIVOTS	...	...	Engine oil
CLUTCH LINKAGE	...	...	Engine oil
BRAKE AND CLUTCH	...	...	Girling Fluid
MASTER CYLINDER	...	...	S.A.E. Spec. 70 R.3
BODY HINGES, LOCKS ...	...	...	Engine oil or Shell silicone compound

COOLING SYSTEM

The radiator drain tap is in the radiator bottom tank and is easily accessible from below the car.

The cylinder block drain is on the left-hand side of the engine and is in the form of a pipe which passes through the front engine mounting support bracket, and terminates in a tap.

TO DRAIN

Remove the radiator cap.

Turn both the radiator and cylinder block drain taps anticlockwise to open.

If a heater is fitted, set the temperature control to "Hot".

TO REFILL

Turn each tap clockwise.

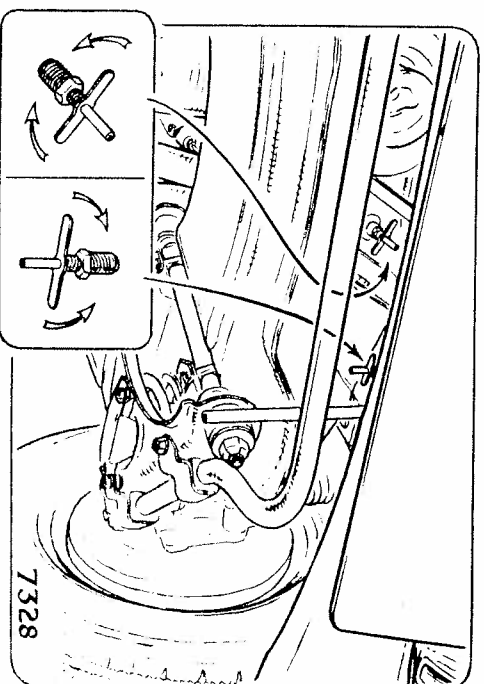
Set heater temperature control to "Hot" if fitted.

Refill the cooling system, but do not over-fill.

Replace the radiator cap.

Check after refilling to ensure that the heater (if fitted) is free of air locks.

If necessary, release the outlet (upper) hose clip to expel air, re-tighten hose clip and top up radiator.



Radiator drain tap and cylinder block drain tap

7328

FROST PRECAUTIONS

To avoid the possibility of the cooling system freezing whilst the vehicle is stationary, or whilst being driven in very cold weather, it is recommended that an anti-freeze obtainable from an authorised Dealer should be used, and added in the quantities stipulated by the anti-freeze manufacturers.

We recommend anti-freeze based on inhibited ethylene glycol. Anti-freeze using alcohol as a base is not suitable, as it is subject to loss by evaporation.

Owing to the difficulty in completely draining the heater system with normal draining of the engine cooling system, *it is essential that anti-freeze is used when cold conditions are anticipated.*

Before putting anti-freeze of any kind in the cooling system, it is imperative that hose connections should be checked for tightness, as anti-freeze has a very searching effect.

If for any reason the cooling system is not protected with anti-freeze when extreme cold is anticipated, the radiator and cylinder block should be drained (2 taps; 1 on the radiator, 1 from the cylinder block).

IMPORTANT NOTE

If there is no anti-freeze in the cooling system and the atmospheric temperature is below freezing point, the radiator should be blanked right off with a rug or muff until the engine has reached its normal working temperature. Care must be taken when travelling under these conditions that the radiator does not freeze, blanking the lower portion of the radiator is advisable. It is equally important that overheating does not occur.

ANTI-FREEZE B.S.3151 or B.S.3152 RECOMMENDATIONS

Solution strength	Against	Safe pump circulation
	frost damage	
25%	—15°F. (—26°C.)	10°F. (—12°C.)
30%	—28°F. (—3°C.)	3°F. (—16°C.)
35%	—33°F. (—3°C.)	—4°F. (—20°C.)
40%	—38°F. (—39°C.)	—10°F. (—23°C.)
50%	—41°F. (—53°F. (—47°C.)	—32°F. (—36°C.)

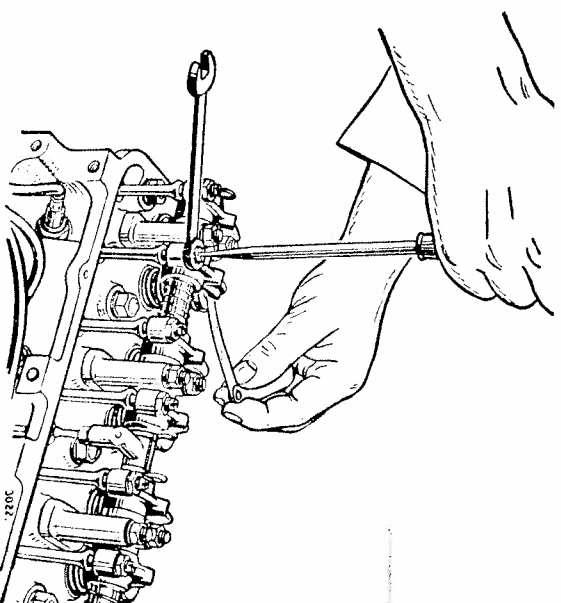
VALVE ROCKER ADJUSTMENT

In order to check the rocker clearance, it is necessary to ensure that the engine is really warm, then:

Remove rocker cover, which is secured by 4 nuts.

The engine must then be turned until the valve, at which the tappet clearance is to be checked, is fully open. A further complete revolution of the engine will ensure that the tappet is fully "down" and resting on the centre of the back of the cam.

Insert a feeler gauge of correct thickness between the valve stem and rocker foot. To adjust clearance, slacken the locknut situated on the rocker and turn the screw with screwdriver until the correct clearance is obtained. At this stage the feeler gauge should drag when moved backwards or forwards.



Valve rocker adjustment

Tighten the locknut and re-check the clearance. Check each valve in this manner and then refit rocker cover, ensuring that its gasket is correctly in position and is not damaged in any way.

Rocker clearance	...	...	(Engine hot)
Inlet valve	...	...	0-012 in. (0-30 mm.)
Exhaust valve	...	...	0-014 in. (0-35 mm.)

ENGINE IGNITION TIMING

It is sometimes noticeable that engine liveliness varies between different fuels of the same grade. For this reason a fine adjustment, called a vernier, is incorporated in the distributor, with arrow heads showing which way to turn the knurled control for advance or retard.

The correct ignition timing is 6° to 10° B.T.D.C. and the following method of checking is given for the owners who may need the information.

1. Turn the engine so that the T.D.C. mark on crankshaft pulley and the pointer on the timing case come exactly opposite. This gives T.D.C. on No. 1 and 4 cylinders. The T.D.C. mark is the LAST one to be reached when the engine is turned in the direction of rotation. The other marks are all at 5° progressive intervals B.T.D.C. This means that the *last but one* mark is 5° B.T.D.C., while the *first* mark is 30° B.T.D.C.
2. Adjust vernier control so that only one division can be seen.
3. Slacken distributor clamping screw and turn distributor in an anti-clockwise direction until vacuum diaphragm casing touches cylinder block.
4. Connect a 12 volt bulb between the low tension terminal and a good earth.
5. Switch on the ignition, remove distributor cap and, applying light finger pressure on the rotor in a clockwise direction, turn the distributor until the bulb just lights, indicating the contact points are opening. Tighten the distributor clamp screw.
6. This gives a firing position at T.D.C. on No. 1 and 4 cylinders. Re-check by turning engine one turn until pointers on pulley and timing case line up, when the bulb should just light.
7. The timing must now be advanced 6° to 10° by turning the knurled nut until a further $1\frac{1}{2}$ to $2\frac{1}{2}$ vernier divisions are visible. One vernier division is equal to 4° of crankshaft movement.

FUEL SYSTEM

AIR CLEANERS AND SILENCERS (Dry element type)

The intervals at which the air cleaner elements should be renewed will vary according to the conditions under which the car is operating.

For town work and areas where the roads and atmosphere are relatively dust free, this should be done every 12,000 miles (19,200 km.), but the filters should be renewed more frequently if the car is used in a smoke or fog laden atmosphere.

Where roads are unmetalled and dust is prevalent it is also recommended that the filters are renewed every 3,000 miles (4,800 km.).

To remove and refit filter element

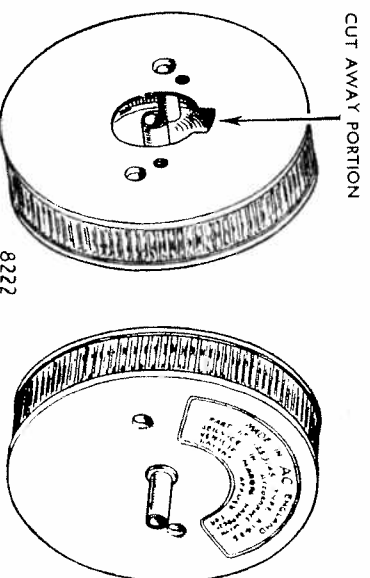
These air cleaners are renewed as complete units. They are used in a DRY condition, and no attempt at cleaning must be made.

To remove, pull off the rubber pipe connected to both air cleaner centres. Remove the four bolts attaching the air cleaners to the carburettor flanges and remove the air cleaners.

When refitting, renew the gaskets between the air cleaners and carburettor flanges.

The cut-away portion must always be fitted uppermost.

Incorrect fitting will cut off the air feed to the carburettor air valve and prevent the carburettor from operating correctly.



8222

