



2000 SPIDER VELOCE

OWNER'S MANUAL

1976 MODEL YEAR VERSION «49 STATES»

FUEL REQUIREMENTS



The Alfa Romeo injection engine has a rather low octane requirement considering its performance and fuel economy. For your 2000 you can use a high quality 91 R.O.N. (research octane number) gasoline performance and information system. Your engine is quite insensitive to lead content and you may use «no» or «low» lead fuels. Always refuel from pumps displaying one of the symbols shown at left. Gasolines of a number higher than 2 can be used. Never use gasoline with antiknock ratings lower than 2 or 91 R.O.N. otherwise damaging detonation or «knock» may occur. This «knock» occurs mainly at full throttle. This characteristic metallic rapping noise is audible only at low RPM. It cannot be heard at high RPM, in the range where piston damage occurs quickly. Because anti-knock ratings are not always significant of actual road octane requirements, you may experience «knock»; if so, try another brand of gasoline. In case of prolonged or persistent «knock» go to your dealer immediately. Alfa Romeo cannot warranty damage due to «knock» since it is misuse.

WARNING

The Clean Air Act, as amended, provides in sect. 203 that tampering with emission related components or specifications is prohibited.

«Tampering» can be defined as any operation performed that causes any change in the specifications contained within this owner's manual and in the maintenance manual.

All Alfa Romeo vehicles are certified and are controlled to insure that they meet these specifications when they leave the factory. Vehicles being out of specification due to maladjustment or modification will usually exceed established emission standards for that vehicle, as well as consume excessive fuel. The specifications contained in this manual have been furnished to Federal and State Environmental Control Agencies, and are those which are used in surveillance programs to determine the vehicles conformity to its certified configuration.

The operation and maintenance instructions contained in this manual, particularly as far as the efficiency of the fuel injection system is concerned,

MUST BE CAREFULLY OBSERVED

by every owner who desires to get the best from his vehicle and to ensure a long life for every component.

Owners are recommended, in their own interest, to entrust all maintenance and repair work to an authorized Alfa Romeo Dealer as such Dealers are equipped with the proper tools and staffed by specially trained mechanics.

Owners are reminded that Alfa Romeo cannot be responsible for any errors made by unauthorized service stations or for any damage resulting from the use of nongenuine spare parts and/or lubricants other than those indicated.

ALFA ROMEO

CUSTOMER SERVICE

The data relating to weights, consumptions and speeds are approximate only: Alfa Romeo reserves the right to change without notice any features and data given in this book. Some of the equipments are optional extras. Refer to price list for a comprehensive list of optionals.

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ALFA ROMEO NEW CAR LIMITED WARRANTY

INTRODUCTION

Please read this booklet completely so that you will be aware of the coverage provided by your Alfa Romeo New Car Warranty.

In order to obtain warranty service, the registered owner may hand the Routine Maintenance Book to any authorized Alfa Romeo Dealer in the world. Where possible, it is recommended to go to the selling Dealer.

The terms of the limited warranty are those set out below. Not included are items such as expenses for towing, car rentals, living expenses, etc.

To be eligible for warranty coverage the owner must operate and maintain his vehicle according to instructions in the owner's manual.

It is always recommended that owners service and maintain their cars at authorized Alfa Romeo Dealers who carry genuine Alfa Romeo parts and have trained technicians who use factory approved tools and methods.

TERMS OF LIMITED WARRANTY

Alfa Romeo, Inc., Englewood Cliff, N.J., (herein referred to as Alfa Romeo), warrants to the Owner only each vehicle to be free from defects in material and workmanship under normal use and service during the time limits and subject to all other provisions and limitations hereinafter set forth. Subjecting the vehicle either to misuse, accident, negligence, lack of reasonable and proper maintenance, and alteration shall not be considered normal use. For purposes of this warranty, the term « vehicle » means each new and unused Alfa Romeo passenger car including all factory installed equipment and accessories (except tires) manufactured or supplied by Alfa Romeo.

ALL IMPLIED WARRANTIES APPLICABLE TO THIS ALFA ROMEO AUTOMOBILE, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXTENDS FROM ALFA ROMEO S.p.A. (THE MANUFACTURER OF THIS AUTOMOBILE) OR ALFA ROMEO INC., ARE LIMITED TO THE DURATION OF THIS WARRANTY WHICH IS TWELVE (12) MONTHS OR TWELVE THOUSAND (12,000) MILES, WHICHEVER OCCURS FIRST, FROM THE DATE OF DELIVERY. THIS WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THIS AUTOMOBILE EXCEPT FOR THE WARRANTY COVERING THE EMISSION CONTROL SYSTEM WHICH IS SET OUT HEREINAFTER, AND THE WARRANTY COVERING TIRES WHICH IS PROVIDED BY THE TIRE MANUFACTURER, AND IS EXPRESSLY IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF ALFA ROMEO S.p.A. OR ALFA ROMEO INC., INCLUDING LIABILITY FOR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY DEFECT IN THIS AUTOMOBILE.

EMISSION CONTROL SYSTEM WARRANTY

Alfa Romeo warrants to the ultimate purchaser and each subsequent purchaser that the vehicle is designed, built, and equipped so as to conform at the time of sale with all U.S. emission standards applicable at the time of manufacture and that it is free from defects in materials and workmanship which would cause it not to meet these standards, within the period of 5 years or 50,000 miles, whichever occurs first. Failures, other than those resulting from defects in material or workmanship, which arise solely as a result of owner abuse and/or lack of proper maintenance, are not covered by the warranty.

Federal Law prohibits manufacturers and dealers from knowingly removing or rendering an emission control system inoperative or ineffective.

TIRE INFORMATION

Tires are covered by the tire manufacturer's warranty. While the warranties of the various tire manufacturers vary in language, they provide in general that passenger car tires installed as original equipment at the factory are warranted to the owner to be free from defects in material and workmanship for the life of the original tread, as follows:

- The tire manufacturer will, at its option, repair the tire without charge or make a pro rata allowance based on the amount of wear on the original tread toward the purchase of a new tire at the tire manufacturer's current Adjustment Base Price for any tire which is found by the tire manufacturer to be defective. Transportation costs and taxes must be paid by the Owner and service charges may be made in some instances.

Tire warranties are issued only by the tire manufacturers, and they specifically provide that consequential damages are not covered by them.

Any authorized Alfa Romeo dealer will assist you in requesting an adjustment if this becomes necessary.

OWNER'S OBLIGATION

The owner has the following responsibilities.

1. a) Have the prescribed maintenance performed at the correct time or mileage periods as shown in the Maintenance Program.
- b) Have the receipt stub in the routine maintenance book stamped at the completion of each coupon maintenance.
- c) Retain your validated routine maintenance book and maintenance receipts. These records may be needed for future use to establish evidence of the required maintenance services.

WHAT IS NOT COVERED

- Repairs and service adjustments required because of misuse, negligence, alteration, accident, or lack of

reasonable and proper maintenance are not covered, nor are the replacement of maintenance items (such as spark plugs, wiper blades, valves, filter, brake and clutch linings) made in connection with normal maintenance services.

- Loss of time, inconvenience, loss of use of the car or other matters not specifically included are not covered.
- Any car registered and normally operated outside the United States. The warranty for these cars shall be that authorized for the country in which the car is registered and normally operated.

SERVICE NETWORK

The Alfa Romeo Services are listed in the Guide supplied with every vehicle. In any event rely on your Alfa Romeo Dealer displaying the shield with the Alfa Romeo emblem and name.

ROUTINE MAINTENANCE BOOK

Alfa Romeo take steps to ensure the optimum performance of their cars by providing Owners with special service during the entire life of their vehicles.

The **Routine Maintenance Book**, supplied with every new vehicle, explains the conditions that govern the provision of Alfa Romeo Services and the replacement of damaged parts during the period covered by the warranty. Every Owner of an Alfa Romeo vehicle is supplied with two coupons covering certain free maintenance during the warranty period, and they **must use these coupons on completion of the mileage as stated thereon.**

It is important that the Routine maintenance book be filled in properly following each routine service. It is a log of maintenance performed on your Alfa Romeo and is subject to inspection.

The labor cost of the maintenance work listed on the 1000 mile and 5000 mile coupons is free, but the lubri-

cants and the filtering elements used are at the Owner's expense. Any work not covered by free coupons but found necessary during the inspection will be subject to the General Terms of Warranty. The coupons should be used whenever possible at the shop of the Dealer that sold the car during his normal working hours.

ANY QUESTIONS ABOUT YOUR LIMITED WARRANTY?

Your dealer is the most important link between you and Alfa Romeo. You are his customer and he is vitally interested in you. Even so, it is possible that a misunderstanding may arise regarding service. If it happens that you have a problem with your dealer you should:

- **First:** Talk it over with the general manager or owner of the dealership. Chances are the problem will be resolved right away.

- **Second:** If your dealer can't solve the problem phone the Alfa Romeo divisional office nearest your and ask for the Service Representative calling on your dealer. He'll work with you and the dealer together... in person, if necessary.
- **Third:** If for some reason there still has been no solution, contact Owner Relations at either Alfa Romeo divisional office.

EASTERN DIVISION

Alfa Romeo, Inc.
250 Sylvan Avenue
Englewood Cliffs
New Jersey 07632
(201) 871-1234

WESTERN DIVISION

Alfa Romeo, Inc.
215 Douglas Street South
El Segundo
California 90245
(213) 772-4414

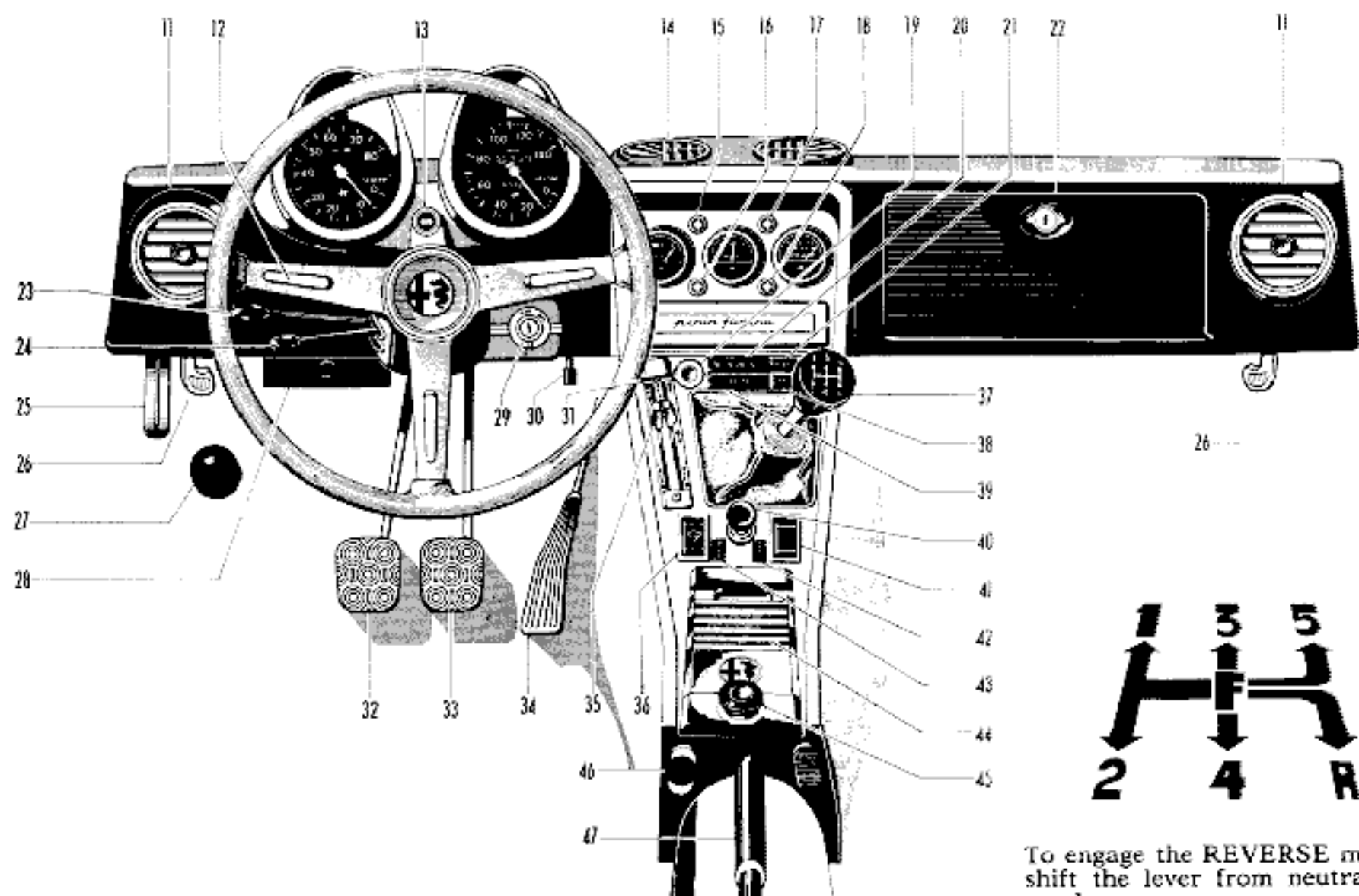


Alfa Romeo

HOW TO USE YOUR CAR

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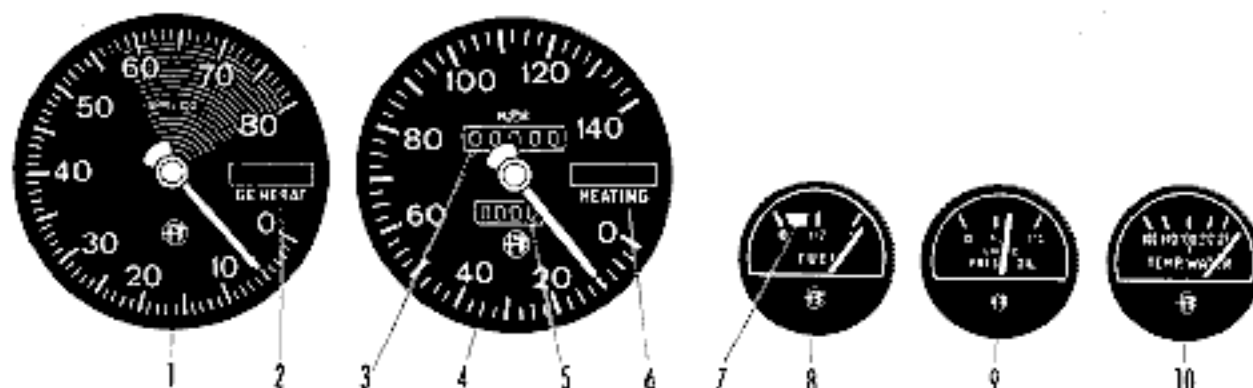
CONTROLS AND INSTRUMENTS



To engage the REVERSE merely shift the lever from neutral (F) as shown.

CONTROLS

- 11 Ventilating air outlet
- 12 Horn
- 13 Direction indicator warning light
- 14 Windshield demisting outlet
- 15 Low fuel pressure warning light
- 16 Parking light warning
- 17 Low oil pressure warning light
- 18 Headlamp high beam warning light
- 19 Hazard flasher push button switch with built in warning light
- 20 «Fasten seat belts» light
- 21 Warning light for service brake pressure, fluid level and parking brake
- 22 Glove compartment (with interior lighting that comes on when lid is opened)
- 23 Headlamp, dimmer & flashing switch
- 24 Direction indicator switch
- 25 Hood release
- 26 Side outlet lever
- 27 Windshield washer: when the control is pressed the windshield wiper also comes into action
- 28 Fusebox (at its left there is an additional fuse holder with a fuse for the fuel pump and a spare fuse)
- 29 Ignition switch antitheft & buzzer
- 30 Tripmeter reset knob (push knob up and turn clockwise to reset)
- 31 Heater control panel light (operates when parking lights are on)
- 32 Clutch



- 33 Brake
- 34 Accelerator
- 35 Heating, ventilating and demisting (control panel lit when parking lights are on)
- 36 Windshield wiper switch (two-speed)
- 37 Gearshift lever
- 38 Throttle warning light
- 39 «Hazard» light (operates when parking lights are on)
- 40 Dimmer for HAZARD-WIPE-DEF lights and heater control panel light
- 41 Blower switch (two-speed)
- 42 «Def» light (operates when parking lights are on)
- 43 «Wipe» light (operates when parking lights are on)
- 44 Ash tray (removable)
- 45 Cigarette lighter: insert a cigarette, then push the knob in: this brings into operation an

electric element which lights the cigarette

- 46 Hand throttle
- 47 Hand brake (for emergency and parking)

INSTRUMENTS

- 1 Tachometer
- 2 Alternator warning light
- 3 Odometer
- 4 Speedometer
- 5 Tripmeter
- 6 Heater blower warning light (glows brighter when blower operates on high speed)
- 7 Fuel reserve warning light
- 8 Fuel level indicator
- 9 Oil pressure gage
- 10 Coolant temperature indicator

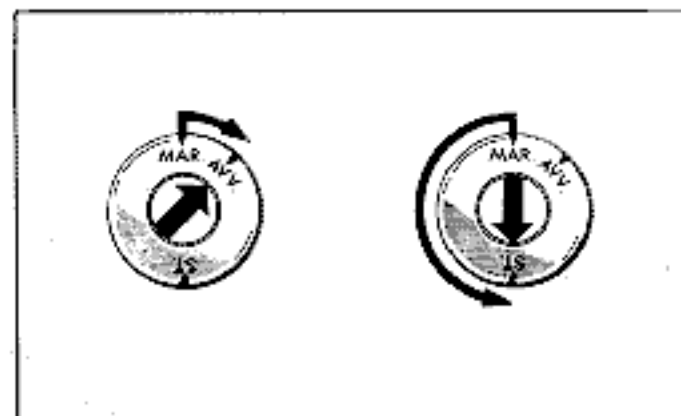
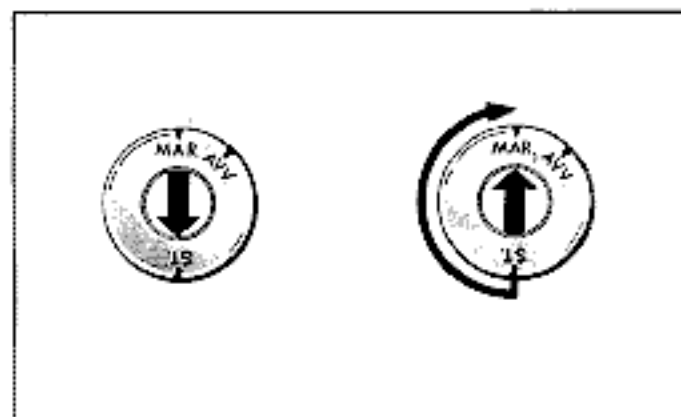
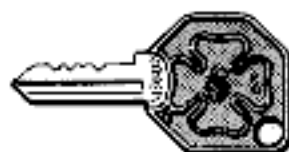
Ignition and
antitheft key

Symbol _____

Symbol _____

Key to driver's and
passenger's door, glove
compartment, trunk lid.

KEYS



Keep a record of the symbol stamped on the key handle. Write it here, and also on the back of your owner service card.
When ordering duplicate keys, **please quote the symbol.**

STARTING THE ENGINE

Place the gearlever in neutral. Fasten the seat belts. Failure to fasten the driver's seat belt will activate the reminder buzzer.

Insert the key in the ignition switch and turn it clockwise to the **MAR.** position (ignition « on »); make sure the low fuel pressure warning light goes off after having flashed on.

Also make sure that « Fasten Seat Belts » (20) and brake warning lights (21) come on and stay lit for a few seconds (this means that the above indicating devices are operating properly). If all or any of the warning lights should not come on and stay on for a few seconds have the lights and/or the relevant circuit or components checked immediately.

Wait a few moments and then turn the ignition key further clockwise to **AVV.** to operate the starter.

As soon as the engine fires release the key.

If the engine fails to start, the key must be returned to **STOP** and the operation repeated.

NOTE

If the low fuel pressure warning light does not flash on this is an indication of failure of the indicating device or fuel feed system: therefore have them checked as soon as possible by an authorized Alfa Romeo Dealer.

STOPPING THE ENGINE

Return the key counterclockwise to **STOP**. In such a position the ignition is « off ». The key can be withdrawn only in **STOP** position. When the key is withdrawn it is no longer possible to rotate the steering wheel.

Never withdraw the key before the car has come to a complete stop as the « steering lock » condition may occur.

ANTITHEFT - STEERING LOCK

By withdrawing the key (when in **STOP** position and steering wheel spokes balanced for straight ahead direction), the steering is locked; to release the lock easier slightly rotate the wheel in both directions, after having inserted the key.

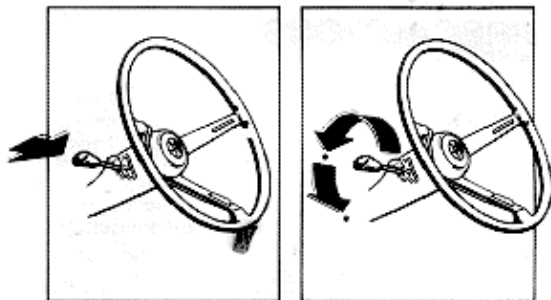
LIGHTING

Flashing

Press in the knob irrespective of the position of the switch.

Parking lights and license plate light

Irrespective of the position of the lever, turn the knob to the first notch. The instrument lights, the green warning light on the instrument panel, the HAZARD, WIPE, DEF lights and the heater control panel light (light brilliance is controlled by dimmer on console) will come on. Flashing is still possible by pressing the knob.



HEADLAMP HIGH/LOW BEAMS

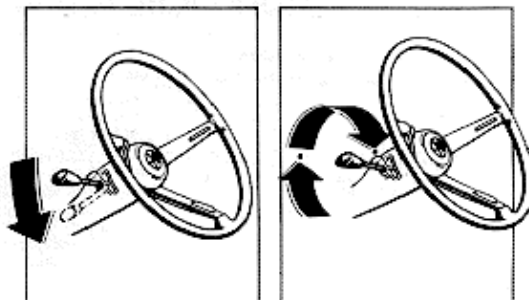
Turn the knob forward to the second notch.

If the lever is up, the low beams come on (no flashing).

If on the other hand, it is down, the high beams and the blue warning light come on (flashing possible).

The movement of the lever up and down allows the light to be dimmed or returned to high beam.

The lights are extinguished by turning the knob back over the notches.



DIRECTION INDICATORS

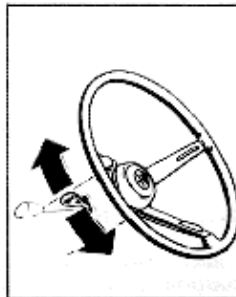
Direction indicators are controlled by the lever shown.

Move the lever:

— up, to signal a right turn;

— down, to signal a left turn.

The warning light between speedometer and tachometer will flash on-and-off.



PRECAUTIONS

BREAKING IN

To allow the various parts of the car, particularly the engine, transmission and differential, to settle in gradually, a breaking in period is necessary, during which maximum performance must not be demanded of the car.

RECOMMENDATIONS FOR THE FIRST 1000 MILES		
Maximum engine speed during breaking in period		Cold starting: - before using the vehicle, run the engine for a few minutes at low revs. While driving: - do not drive at max. recommended speeds for long periods; - never fully depress the accelerator pedal; - now and then release the accelerator pedal; - avoid full and extended braking during the first 600 miles.
Mileage reading	r.p.m.	
Up to 300	3500	
from 301 to 1000	4500	
Note: The same recommendations apply also in the case of engine reconditioning involving replacement of cylinder barrels, pistons, piston rings and bearings.		

1,000 MILE FREE SERVICE COUPON

Have the lubrication and maintenance operations of 1000 mile free service coupon in the routine maintenance book carried out by an Alfa Romeo Dealer.

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STARTING ENGINE FROM COLD

When starting from cold in winter, it is necessary to press the clutch pedal down fully.

Automatic devices, besides doing away with the conventional choke, facilitate the initial running of engine after a cold start, allow faster warming up of the engine and improve driveability.

As an aid in starting from cold, depress, partially and progressively, the accelerator pedal. After a cold start and particularly when the ambient temperature is below freezing point, wait 3 minutes at 1500 RPM before getting away so as to warm up properly all engine parts and allow the oil to reach all points requiring lubrication.

Do not accelerate the engine until it has warmed up, since when the engine is cold the oil cannot reach all points requiring lubrication.

Top performance must never be demanded of the car until coolant temperature is at least 160°F.

STARTING ENGINE WHEN HOT

When the engine is already hot or with very high ambient temperatures (above 77 °F) slowly depress the accelerator pedal to facilitate starting.

ENGINE DOES NOT START

If the engine fails to start, look for the cause as follows:

- the battery charge may be too weak to rotate the starter sufficiently fast to start the engine;
- the ignition equipment may be defective (dirty plugs, oxidized contact-breaker points, wet or cracked distributor cap, damaged distributor or coil);
- the solenoid-actuated cold start device may fail to operate;
- electric circuits may be broken or fuses blown.

PRIOR TO GET AWAY

Check the fuel pressure warning light (15). If the light remains on this may be attributable to the inertia switch that, in the event the car comes into collision, cuts off feed to electric fuel pump. The warning light should therefore be tested by pushing the inertia switch reset button. If warning light still remains lit, contact an Alfa Romeo Dealer. Check brake warning light 21 for proper operation.

With engine running and ignition on this light should:

- Stay on for a few seconds after starting.
- Stay lit until handbrake is engaged.
- Go off when brake is disengaged. If the warning light still remains on after having released the handbrake stop the car and have the level of fluid in brake fluid reservoir checked by an Alfa Romeo Dealer.



WHILE DRIVING

- Take care not to run the engine beyond the maximum RPM range shown as a red area on tachometer dial.
- When shifting gears, take care to depress the clutch pedal fully; this will ensure smooth operation and save synchronizers from excessive wear. Do not rest your foot on clutch pedal when not actually using it.
- Do not drive at high speed until the oil in the engine, transmission and differential has warmed up properly.

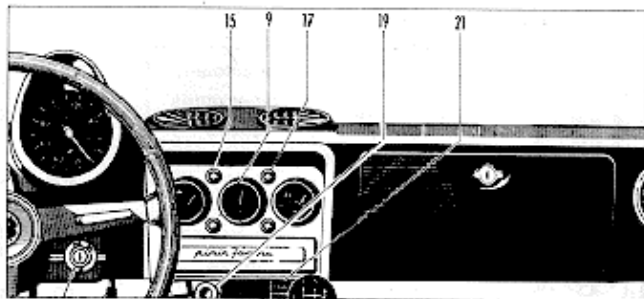
- Check the oil pressure gauge 9 from time to time and stop the engine if the pressure with a hot engine and at maximum revolutions should fall below limits shown.

Oil pressures with hot engine-psi

Engine idling	minimum 7
Engine running fast	minimum 50 maximum 65-70

- Check the low oil pressure warning light 17: if on it is an indication of a trouble in the lubricating system: in this case, stop the car and have the lubricating system checked by an authorized Dealer.

However, it is possible for the warning light to come on when the car is cornering: this may be caused by



a low level of oil in the pan which can be easily remedied by topping up.

No trouble exists if the warning light comes on while the engine is idling, specially when hot.

- Check that the low fuel pressure warning light 15 is off; when on, it means that either the inertia switch has cut off feed to the fuel pump or the feed system is developing troubles; therefore, have it checked by your Dealer.

Do not coast downhill with the engine stopped; there will be no suction in the brake boosters and a greater pressure will be needed with the brake pedal to obtain comparable braking effect.

WHILE PARKING

NEVER REMOVE THE RADIATOR CAP UNLESS ABSOLUTELY NECESSARY; IN ANY CASE, TO AVOID SEVERE INJURIES, WAIT THAT THE LIQUID IS COOLED DOWN TO OUTSIDE TEMPERATURE.

Never leave the key in the **MAR.** position (ignition « on ») to prevent battery discharge and coil damage. Apply the hand brake and, when parking the car uphill or downhill, shift into a low gear and steer the front wheels in such a direction as to cause the car, should the parking brake disengage accidentally, to move toward the curb. When opening driver's door, a suitable buzzer will alert you, if the key has been left in the ignition switch.

	ALFA ROMEO ANTIFREEZE Std. no. 3681-69958	For ambient temperatures above -20 °C (-4 °F)
	ALFA ROMEO Concentrated antifreeze Std. no. 3681-69956	For ambient temperatures below -20 °C (-4 °F)

Temperature		Amount of Alfa Romeo Antifreeze to be replaced with an equal quantity of Alfa Romeo Concentrated Antifreeze.		
f	C	Radiator	Reservoir	Total
-16	-26	800 cc.	200 cc.	1.000 cc.
-30	-35	1.600 cc.	400 cc.	2.000 cc.
-48	-44	2.400 cc.	600 cc.	3.000 cc.

WARNING

Switch on the road hazard lights when required. To operate the hazard flashers, push the switch (19, page 13) mounted on the console near the heater control panel.

IMPORTANT

Under no circumstances must towing be attempted by attaching chain or cables to the bumpers. The bumpers are mounted on energy absorbing units that can easily be damaged by towing and render ineffective their low speed protective characteristics.

TIRE CHAINS

The tire chains are to be fitted to the drive wheels.

FOR VERY LOW AMBIENT TEMPERATURES

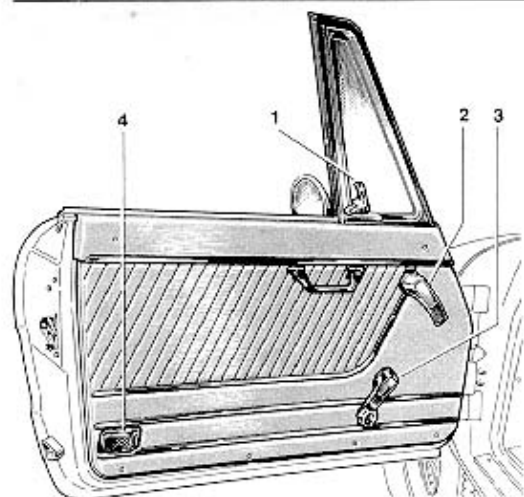
The **Alfa Romeo Antifreeze** gives full protection against freezing down to -20 °C (-4 °F).

In places where the temperature falls below -20 °C, the antifreeze mixture can be made stronger by varying its concentration.

To this end, a certain amount of mixture should be drained off the circuit and replaced with the same quantity of Alfa Romeo concentrated Antifreeze drawn from suitable containers available by Alfa Romeo Dealers.

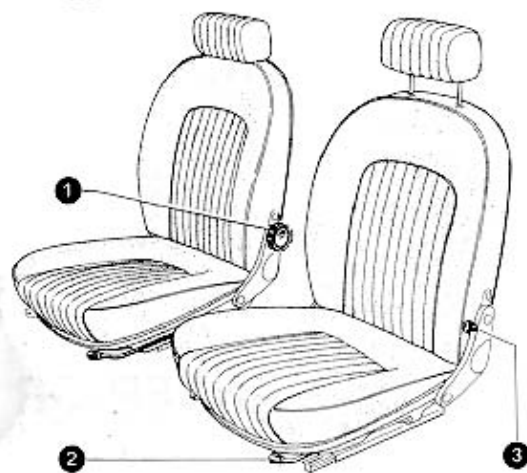
It is recommended that this operation should be entrusted to an authorized Dealer.

INTERIOR



DOORS

- 1 Vent window control (with a safety catch).
- 2 Lever to open and lock the doors (pull the lever backward to open)
Both doors can be locked from the outside with the key.
When doors are shut, pushing the lever forward will lock the doors.
When so locked the doors cannot be opened from the outside unless the key is used.
- 3 Window regulator handle.
- 4 Reflector for signalling opening of the door.
On the passenger's door there is a hand grip.



SEATS

- The handwheels 1 at the inboard sides of the seats control the angle of the backrests. Pushing down the levers 3 at the outboard sides of the seats will unlock the backrests for tipping forward.
- The positioning of the seats is controlled by the lever 2 on the front edge of each seat: by freeing the lever the seat may be moved to the position desired.
- The bucket seats are provided with vertically-adjustable head restraints.

SEAT BELTS

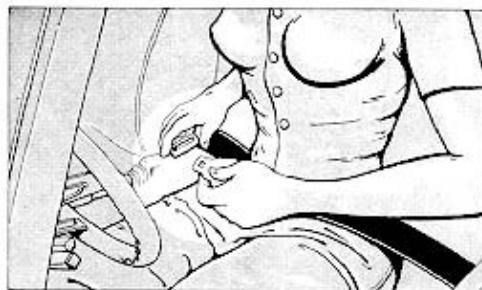
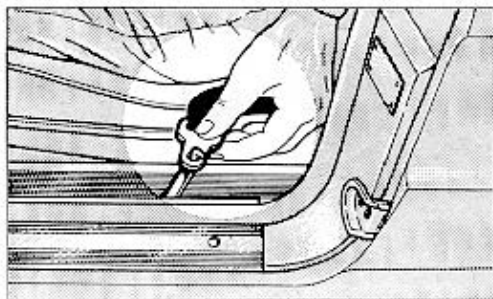
The car is fitted with safety belts of lap type. The belts are provided with automatic retractors.

Fasten seat belts before getting away.

Note. When belt is retracted in its storage position the belt tongue is at its storage hook on the outboard side of seat. Pull out the belt until it is extended sufficiently to connect the belt tongue to the buckle on tunnel. If the retractor locks while the belt is being pulled out return the belt fully and then repeat the operation.

Warning: if the driver fails to wear his seat belt, as the ignition key is turned to «MAR» position the «Fasten Seat Belts» warning light and a buzzer will be activated for a few moments.

Furthermore, even if the driver has properly fastened the seat belt, the «Fasten Seat Belts» light will remain lit for a few seconds.

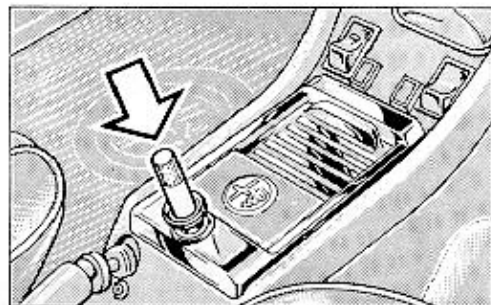


To unfasten the belts push the button on buckle taking care not to let the belt twist while being rewound on its reel. Attach the belt tongue to its storage hook.



REARVIEW MIRROR / INTERIOR LIGHTING

- The rearview mirror, which disengages automatically in the event of a crash, has a day/night antiglare device operated by the lever 1 shown at the illustration.
- Internal lighting is provided by a lamp in the rearview mirror; the switch 2 has two positions: light always on and courtesy light automatically operated when opening doors.

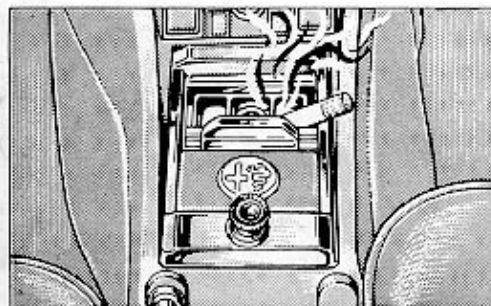


CIGARETTE LIGHTER

Push the black plastic knob in and insert a cigarette; this brings into operation an electric element which lights the cigarette then turns itself off automatically.

If excessive carbon deposits may have formed on the cigarette lighter element remove them as follows:

- Immerse the lighter in alcohol for about two/four hours according to the thickness of carbon deposits.
- Get rid of any residual deposit by blowing.



ASH TRAY

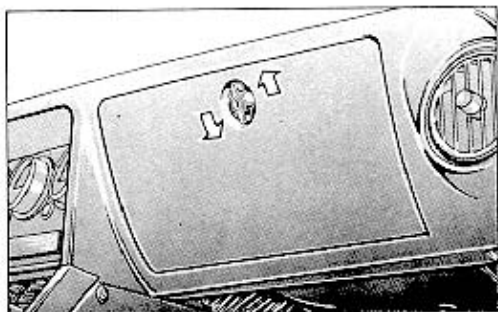
It is at the center of console.

Slide the cover backward. For emptying withdraw the inner tray. When partially filled and lit, a light comes on as an aid in locating the tray.

Alfa Romeo

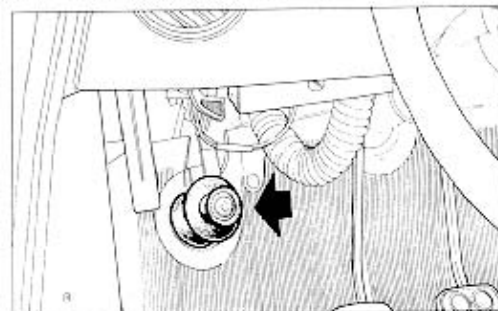
GLOVE BOX

To open the glove box door rotate the lock handwheel counterclockwise; the lock uses the same key as the door. Lighting is provided by a bulb which is automatically switched off when closing the glove box door.



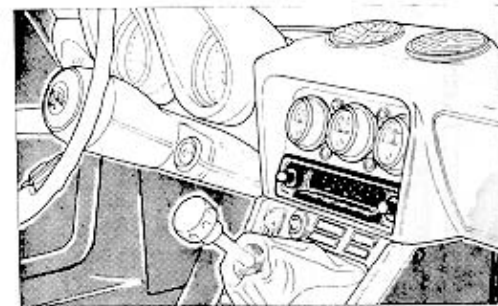
WINDSHIELD WASHER PUMP

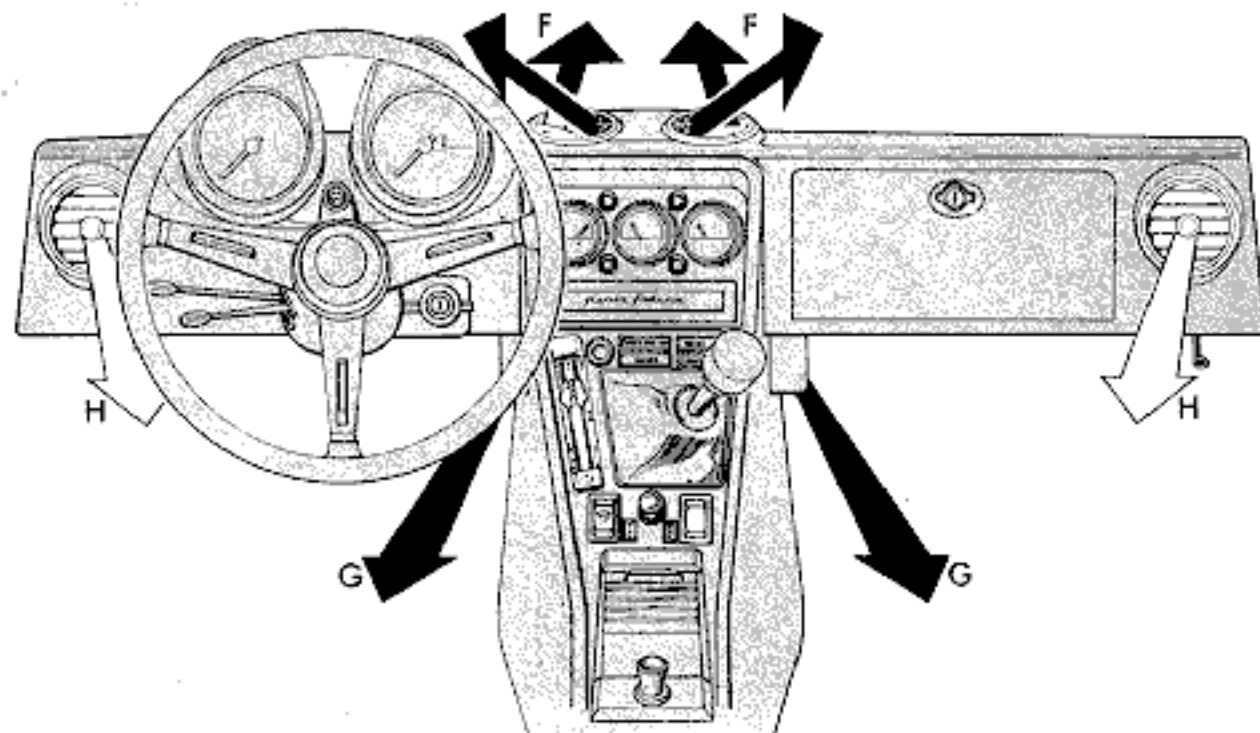
To operate the washer pump depress the pedal actuated device shown at the illustration; by depressing and at once releasing the pedal, the wiper blades will operate automatically thru a complete cycle wiping the windshield clean with the liquid sprayed. If pedal is kept depressed the wipers operate continuously.



RADIO

Provision is made in the instrument panel for the installation of the radio. To install it, remove the ornament from the instrument panel.





VENTILATION-DEMISTING AND HEATING

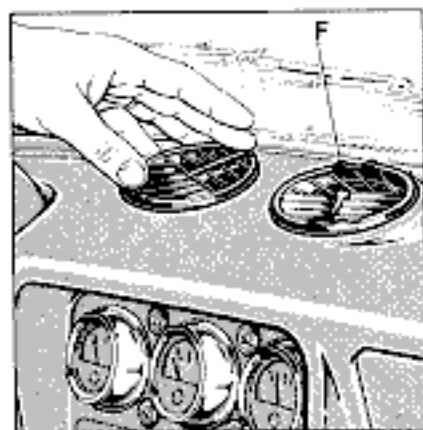
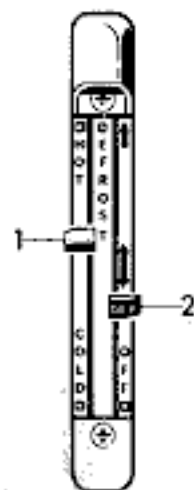
Air enters through:

- **F** for windshield demisting (warm and fresh air)
- **G** for ventilation and heating
- **H** for ventilation

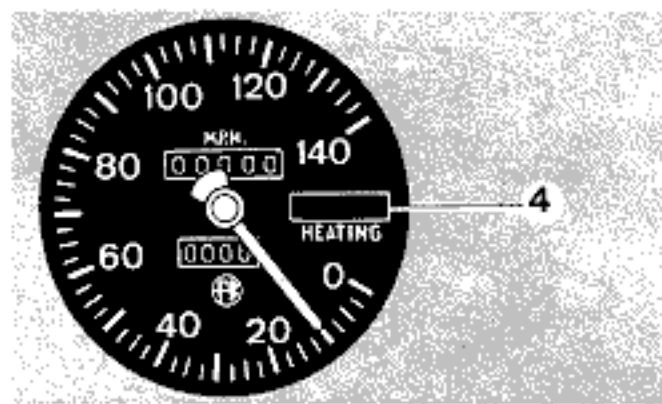
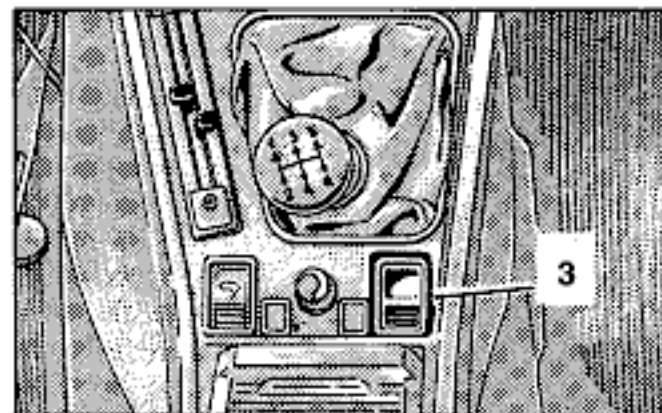
CONTROLS

- The air admitted to the car can be gradually heated by the movement of the lever 1 (operate this lever only when engine is warmed up).
- The movement of the lever 2 gradually regulates the flow of air through the openings **F** and **G**. Specifically:

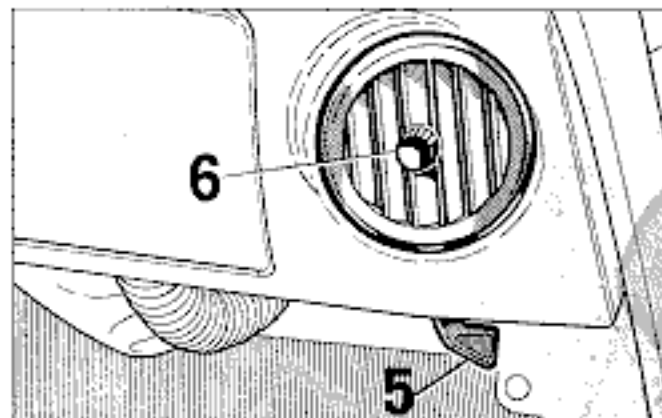
With the lever all the way down (OFF) the flow to vents **F** and **G** is cut off; moving the lever upward part of the air will be directed to vent **F** and part to vent **G**; with the lever all the way up all the air will flow out of vent **F** for maximum demisting of windshield (or both windshield and side windows according to the direction of grilles of vents **F**).



- In order to produce a satisfactory flow of air into the car at low speeds, switch on the electric blower by means of switch 3. Warning light 4 indicates that this has been done.



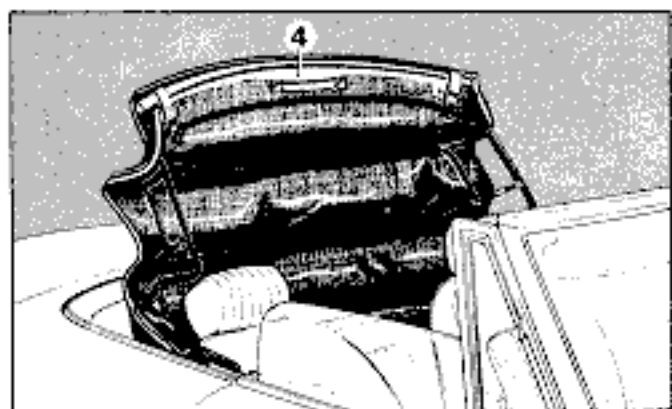
- To open the outlets **H** push the lever 5 toward the inside of car. The flow of air can then be directed as desired by rotating the knob 6.



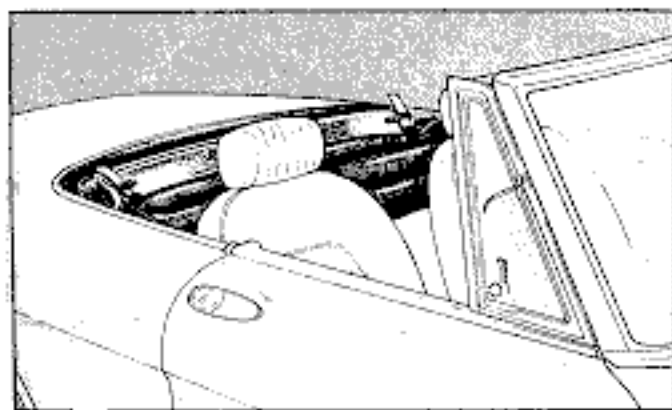


FOLDING THE TOP

Lower the side windows and sun visors. Slacken the straps 1 and release the toggle clamps 2 securing the top to the windshield bow.



Slacken the two rubber belts 3 and, with handle 4, push the top frame backward. As the top is lowered make sure that the window folds evenly by guiding it with your hand.

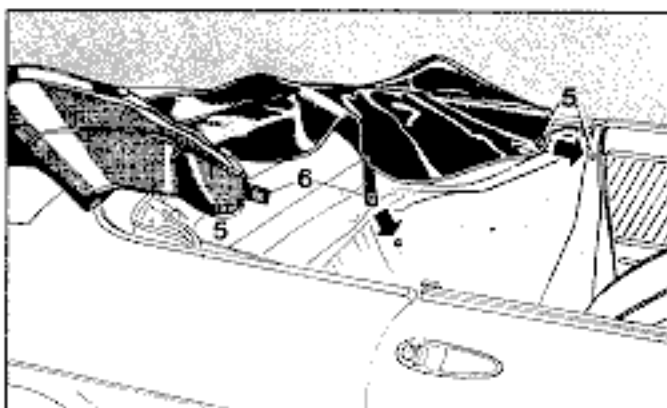


In order to prevent chafing of the top while in the down position the corners of the last fold should be tucked in. Lock the toggle clamps in place with the straps 1.

Attach the hooks of the rubber straps 3 to the frame of the top as shown to prevent excessive movement.



Spread the top cover on to the top and secure the cover with the fasteners 5 and the belts 6.

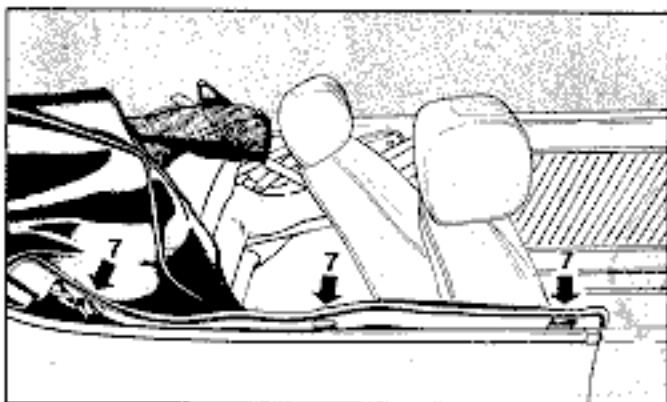


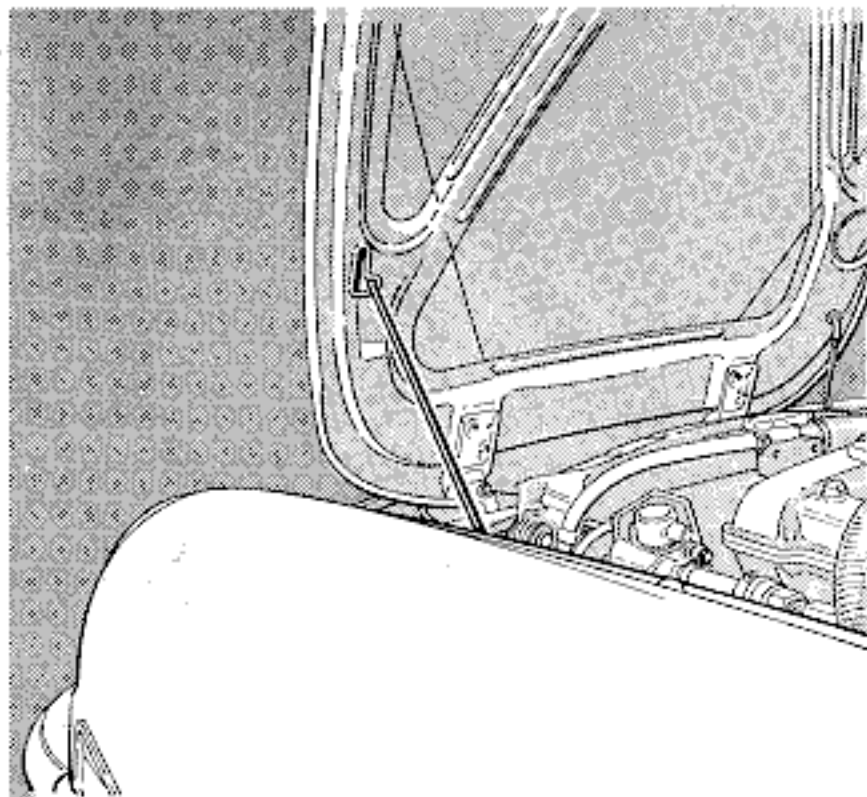
Finally, insert the plastic clips 7 into the chrome moulding.

Note: to raise the top reverse the folding procedure.

HARD TOP

Provision is already made for the installation of a hard top. It is a Dealer installed option.



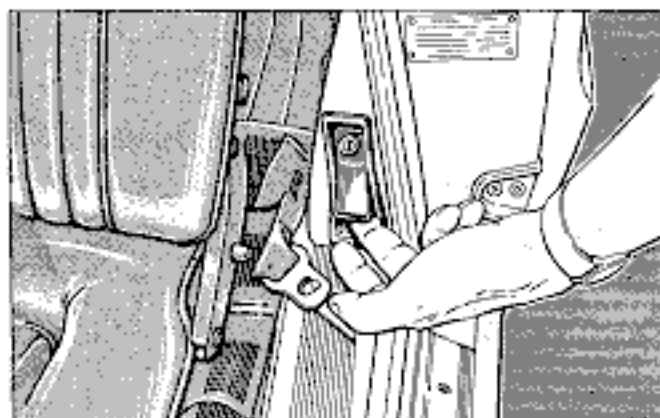


ENGINE HOOD

The hood opens opposite travel direction; to release the catch, pull the lever under the instrument panel.

The hood is held in open position by the rod. Illumination of the engine compartment is by a light under the hood. It operates automatically when the hood is raised and the parking lights are on.

Prior to close the hood withdraw the support rod from lug and secure it to the plastic retainer on wheelhouse.



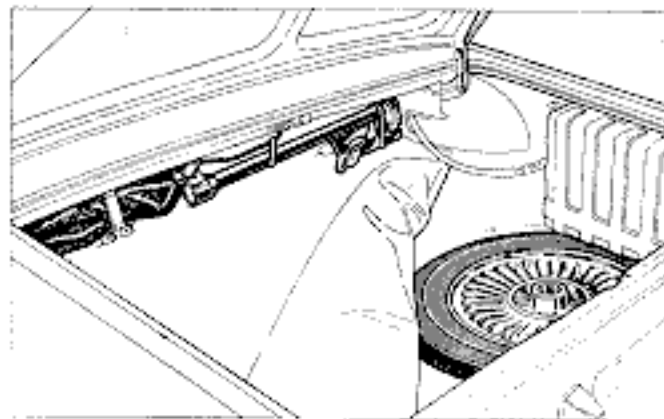
TRUNK LID

To open, lift the lever situated on the door jamb on the driver's side. The lock uses the same key as the doors.

Lighting of the trunk is provided by a suitable lamp. It operates automatically when the lid is raised and the parking lights are on.

Caution - When closing the trunk lid, to avoid deforming the lid panel, apply pressure with both hands to the rear lid edge only, never to the center of lid panel.

In the trunk there are the jack secured with a wingnut, the tool kit secured with a rubber strap, the battery at the right behind the protection shield and the spare tire under the carpeting.



WHEEL CHANGE CAUTION

before operating the jack apply the parking brake and chock the wheels.

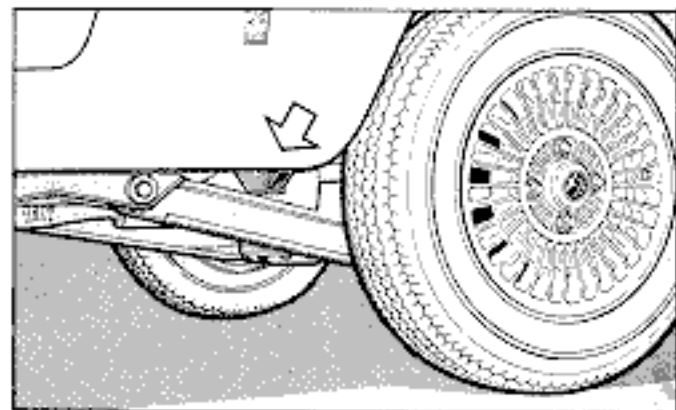
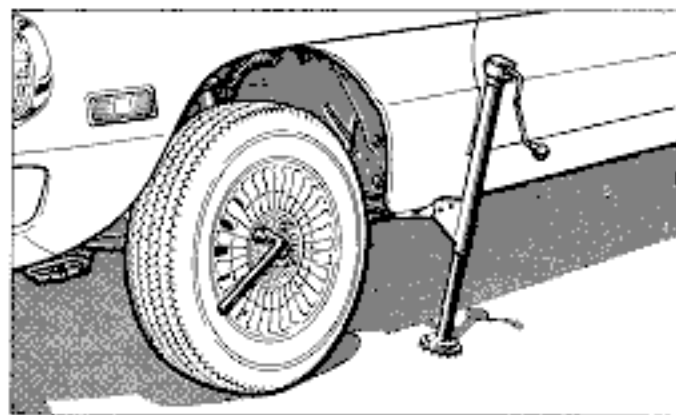
If necessary, switch on the road hazard lights.

Wheel removal

- Slacken wheel nuts by one turn with the wheel wrench.
- Turn the nuts counterclockwise to unscrew.
- Remove jack from trunk.
- Raise the car by inserting the jack arm in the special socket in the body rocker panel.
- Fully unscrew the nuts and remove the wheel.

Reinstallation

- Tighten the nuts carefully in diagonal order.
- Check again tightness of nuts after lowering the jack. Turn the nuts clockwise to tighten.
- Release the parking brake.
- As soon as possible, check that the inflation pressure is as specified (refer to inside backcover).



CONSUMER INFORMATION

LOW SPEED

ACCELERATION AND PASSING ABILITY

Description of vehicle to which this table applies:

SPIDER 2000

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below.

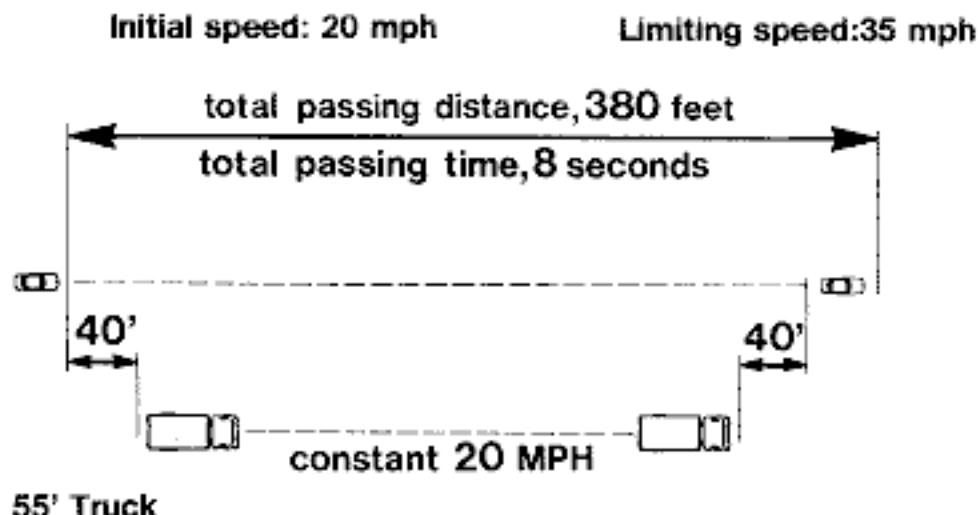
The low-speed pass assumes an initial speed of 20 mph and a limiting speed of 35 mph. The high-speed pass assumes an initial speed of 50 mph and a limiting speed of 80 mph.

Notice: the information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

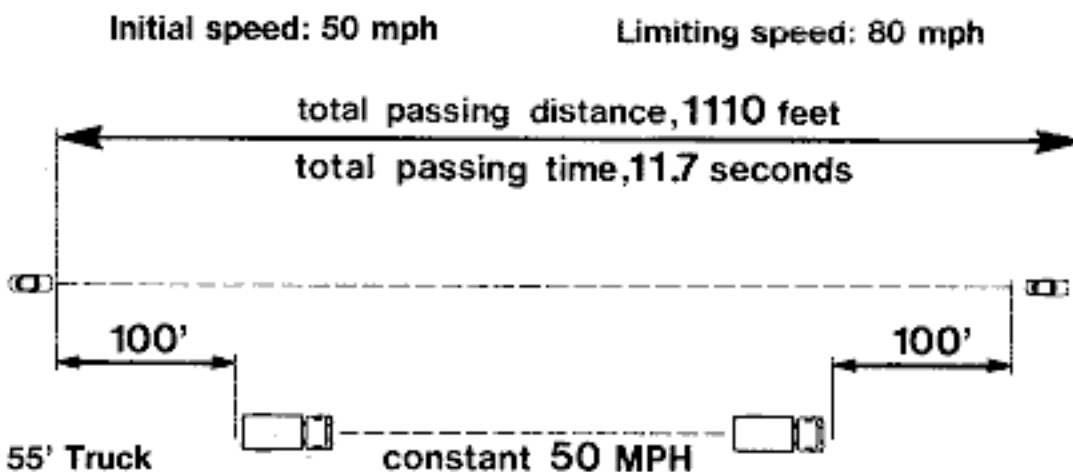
Summary table:

Low speed pass 380 feet; 8 seconds

High-speed pass 1110 feet; 11.7 seconds



HIGH SPEED



VEHICLE STOPPING DISTANCE

Description of vehicle to which this table applies:

SPIDER 2000

A. Fully Operational Service Brake

Load {
Light
Maximum



B. Emergency Service Brakes (with Partial Service Brake System Failure)



C. Brake Power Unit Failure Maximum Load



0 100 200 300 400 500

Stopping Distance in Feet from 60 mph

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

TIRE RESERVE LOAD

Description of vehicle to which this table applies:

SPIDER 2000

This table lists the Tire Size Designations recommended by the manufacturer for use on the vehicles to which it applies, with the recommended inflation pressure for maximum loading and the tire reserve load percentage for each of the tires listed. The tire reserve load percentage indicated is met or exceeded by each vehicle to which the table applies.

WARNING - Failure to maintain the recommended tire inflation pressure or increase tire pressure as recommended when operating at maximum loaded vehicle weight, or loading the vehicle beyond the capacities specified on the tire placard affixed to the vehicle, may result in unsafe operating conditions due to premature tire failure, unfavorable handling characteristics, and excessive tire wear. The tire reserve load percentage is a measure of tire capacity not of vehicle capacity. Loading beyond the specified vehicle capacity may result in failure of other vehicle components.

Recommended tire size designations		165 HR 14		
		Ceat Continental Firestone Good-year Pirelli	Kleber	Michelin
Recommended cold inflation pressure for maximum loaded vehicle weight (psi)	Front	24	24	21
	Rear	26	29	26
Tire reserve load percentage (1)		26,1	30,3	25,3

(1) The difference expressed as a percentage of tire load rating, between (a) the load rating of a tire at the vehicle manufacturer's recommended inflation pressure at the maximum loaded vehicle weight and (b) the load imposed upon the tire by the vehicle at that condition.

LUBRICATION AND MAINTENANCE

Alfawiki.nl

ROUTINE SERVICING

DURING EACH REFUELLING: check engine oil level
AT THE FIRST 1,000 MILES: have the free servicing of 1,000 miles free coupon carried out by an Alfa Romeo Dealer.

AFTER 5,000 MILES: have the free servicing of 5,000 mile free coupon carried out by an Alfa Romeo Dealer.



EMCON MAINTENANCE



ITEMS NOT RELATED TO EMCON MAINTENANCE

		EVERY 5,000mi.					EVERY 10,000mi.					EVERY 15,000mi.					EVERY 25,000mi.																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
MILEAGE COVERED	10,000							△	△	△	△	△	△			△	△	△	△																							
	15,000							△	△	△	△													△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
	20,000							△	△	△	△	△	△			△	△	△	△																							
	25,000							△	△		△	△	△																												△	
	30,000							△	△	△	△					△	△	△	△					△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
	35,000							△	△	△	△	△	△																													
	40,000							△	△	△	△	△	△			△	△	△	△																							
	45,000							△	△		△													△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
	50,000							△	△		△	△	△				△	△	△	△																						△

EVERY 5,000 MILES

- 1 Check level of clutch fluid and top up, if necessary
- 2 Check level of gearbox and differential oil and top up if necessary
- 3 Check level of brake fluid and top up, if necessary
- 4 Check tire pressures
- 5 Check battery electrolyte level and top up with distilled water, if necessary (more frequently in summer months); clean terminals and grease, if necessary



- 6 Check brake pads and hydraulic system components; change as necessary
- 7 Change engine oil filter (or every six months whichever occurs first)
- 8 Change engine oil (or every 6 months whichever comes first)
- 9 Check engine coolant level and top up, if necessary
- 10 Adjust timing chain tension
- 11 Clean air pump filter
- 12 Clean air cleaner elements

EVERY 10,000 MILES



- 13 Grease drive shaft slip yoke
- 14 Check level of steering box oil and top up, if necessary



- 15 Change tank fuel filter and main fuel filter element
- 16 Check hoses, connections, seals, thermostat of engine cooling system and heater; replace if necessary
- 17 Check brake booster vacuum hose and check-valve; change as necessary
- 18 Change injection pump oil filter

EVERY 15,000 MILES



- 19 Clean, check and lubricate accelerator cable
- 20 Change brake fluid (or every 12 months whichever occurs first)
- 21 Change gearbox and differential oil
- 22 Test vehicle



- 23 Check alternator drive belt tension and adjust as necessary-change belt, if necessary
- 24 Check engine bolts and cylinder head nuts for tightness
- 25 Check valve clearance and adjust, if necessary
- 26 Change spark plugs
- 27 Clean and check crankcase ventilation system components; change as necessary
- 28 Clean and check fuel evaporative system components; change as necessary
- 29 Check fuel tank, filler cap and gasket, lines and connections; change as necessary
- 30 Clean throttle throats and adjust control linkage

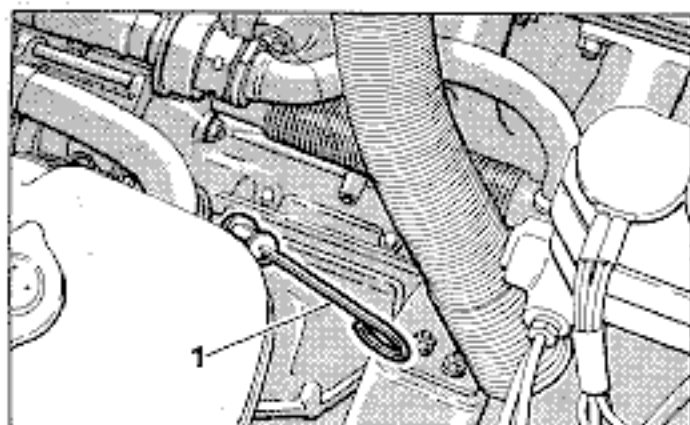


- 31 Change air pump filter
- 32 Change air cleaner elements
- 33 Check air pump and check-valve; change as necessary-clean air injection nozzles, if necessary
- 34 Check baffle control linkage, vacuum actuator, thermal sensor; adjust or change as necessary
- 35 Check and adjust dwell angle and ignition advance; lubricate cam
- 36 Check, adjust or change, if necessary, coil, condenser, rotor arm, cap, spark plug wiring, rubber protections and connectors; change contact breaker
- 37 Check, adjust and change, if necessary, cold start device solenoid and thermostatic actuator
- 38 Check fuel cut-off solenoid and microswitch; change as necessary
- 39 Check and adjust control linkage stop screws, idle exhaust emissions

EVERY 25,000 MILES



- 40 Change engine coolant mixture (or every two years whichever occurs first)



CHECK ENGINE OIL LEVEL

When checking (with car on a level surface and the engine stopped) push the dipstick 1 all the way down. Never allow the oil to fall below the minimum or, while topping up, to exceed the maximum level.

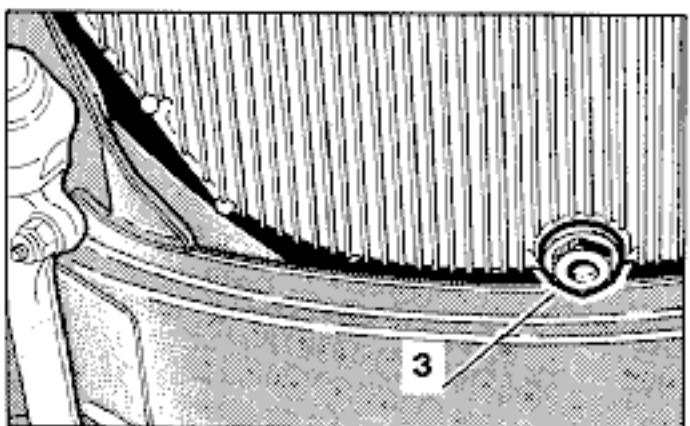


IMPORTANT NOTE

The lubricants used for the first filling, shown by the plate in the engine compartment (see page 75) and the table « Lubricants » on inside back cover, are factory tested for meeting completely the operation requirements.

These lubricants can be used both for topping up and changing. **When topping up**, it is recommended to use exclusively the same type of oil as already filled in the engine or the main unit.

In countries where the above mentioned lubricants are not available, **and when absolutely necessary**, it is possible to replace them with products of other leading makes provided that in accordance with the grades given in the table; in such a case, however, it is essential to renew all the lubricant in the circuit.



CHANGE ENGINE OIL

With the engine warmed up and stopped remove drain plug 3 from oil pan and drain off old oil; refit drain plug and tighten it to the specified torque.

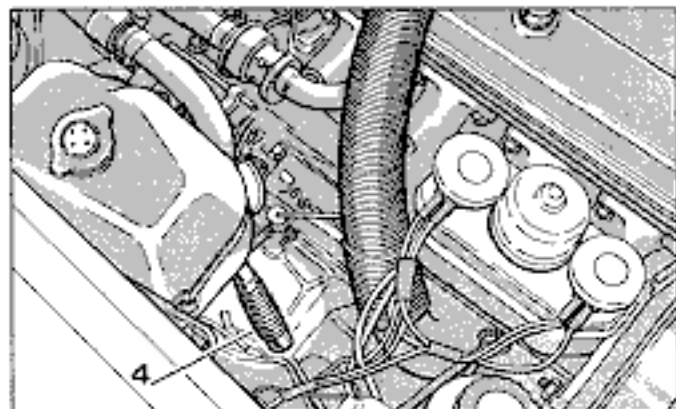
Replace the oil filter (4, page 33) whenever engine oil is changed. Replenish with new oil, of quantity and type as specified, thru the filler port 2.



CHANGE ENGINE OIL FILTER

To remove the filter 4 slacken it with the suitable wrench then unscrew the filter by hand. To facilitate this, remove the hot air snorkel tube.

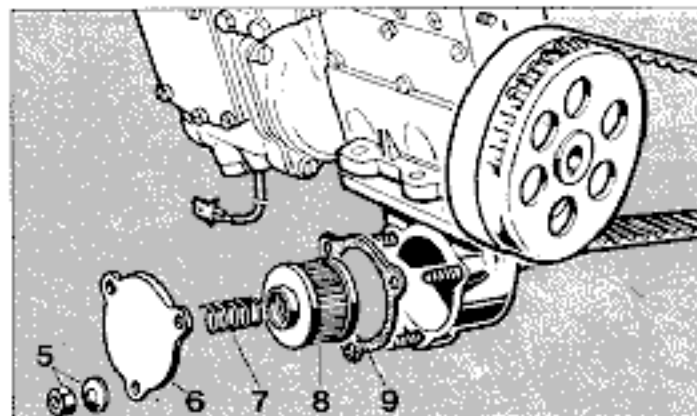
On refitting, smear the gasket with oil then screw in the oil filter and lock hand tight or to the specified torque with a wrench. After having replenished the engine pan with oil, start the engine, run it at idle to fill the filter housing and check for no oil leaks. Refit the hot air snorkel tube.



CHANGE INJECTION PUMP OIL FILTER

At the prescribed intervals (or in the event the engine oil has to be renewed due to contamination by water or other foreign substances) change the oil filter, located in the injection pump support, by proceeding as follows:

- clean very carefully the filter housing cover 6 and the surrounding areas with gasoline;
 - unscrew the three nuts 5 and remove the cover 6, the spring 7 and the filter 8;
 - clean thoroughly the filter housing and insert the new filter and the spring in such a way that the spring faces the cover, renew the cover gasket 9 if necessary.
- Slightly tighten the two upper cover retaining nuts and lock securely the nut at the bottom. Run engine at idle for a few minutes until the oil just oozes out; then lock the nuts fully.

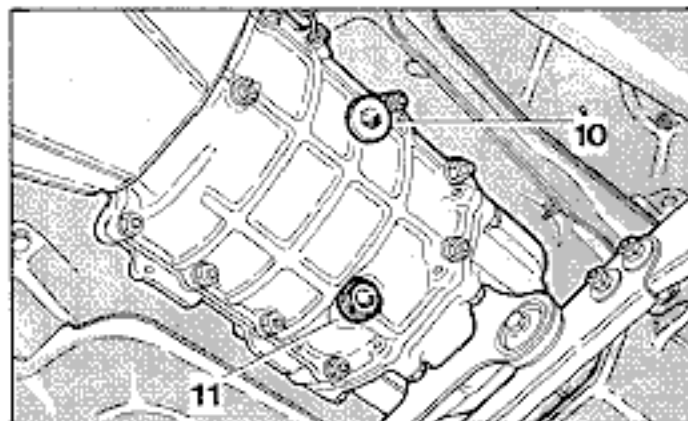


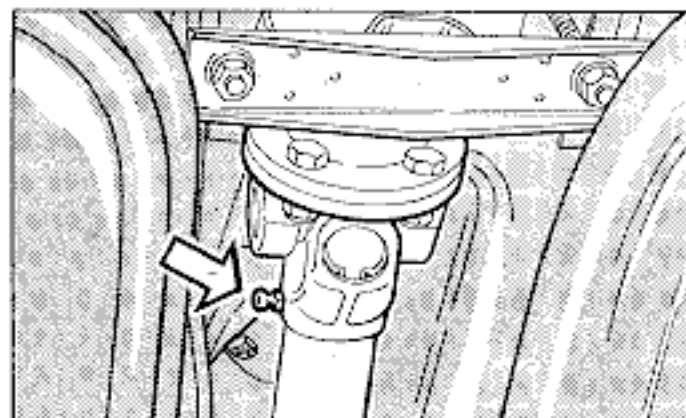
CHECK LEVEL OF GEARBOX OIL

Remove filler plug 10; oil level should be at the edge of filler orifice. Replenish as necessary with oil of the specified type. Clean and refit filler plug 10.

CHANGE GEARBOX OIL

Drain off old oil by removing filler plug 10 first, then drain plug 11. Clean and refit drain plug 11. Replenish with new oil, of quantity and type as specified, thru the filler port. Check that oil level is at the edge of filler orifice; clean and refit filler plug 10.

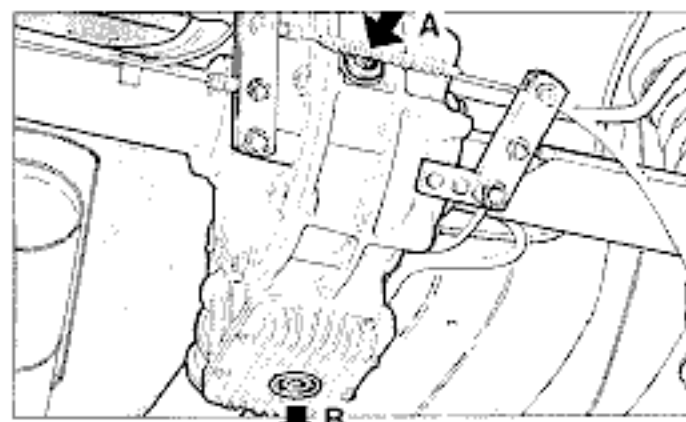




GREASE DRIVE SHAFT SLIP YOKE

The drive shaft is in two sections and has an intermediate flexible support attached to the body.

The front section is provided with a rubber coupling at the transmission end; a universal joint is provided at each end of the rear section. Grease the slip yoke at the scheduled intervals.



CHECKING AND CHANGING DIFFERENTIAL OIL

To check differential oil level at the prescribed intervals, remove filler plug A; oil level should be at the edge of filler orifice.

To change oil proceed as follows (with hot engine):

- Drain off old oil by removing drain plug B and filler plug A;
- Clean drain plug B and refit it;
- Replenish with oil of the prescribed type (refer to inside back-cover) through filler plug A. Check that oil level is at the edge of filler orifice; clean filler plug and fit it.

Check that **limited-slip differential** is full of oil to the edge of the filler hole.

STEERING GEAR AND LINKAGE

This model is produced alternatively with steering of the worm and roller or recirculating ball type.

C - Recirculating ball steering.

At the prescribed intervals check:

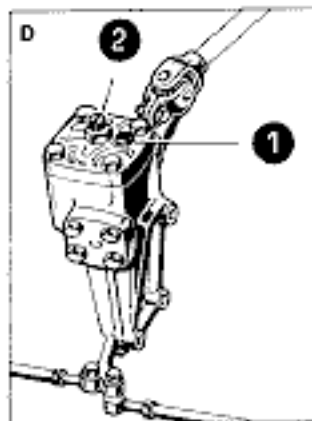
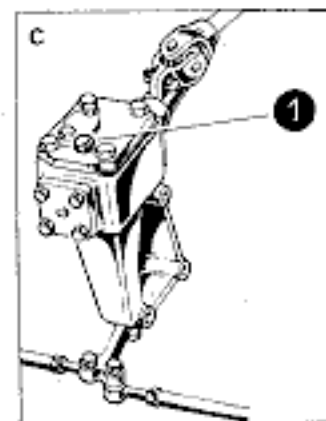
- the oil level in the steering box (by removing the plug 1 shown in the figure);
- the steering linkage joints for play.

The steering of the recirculating ball type does not require any regular adjustment.

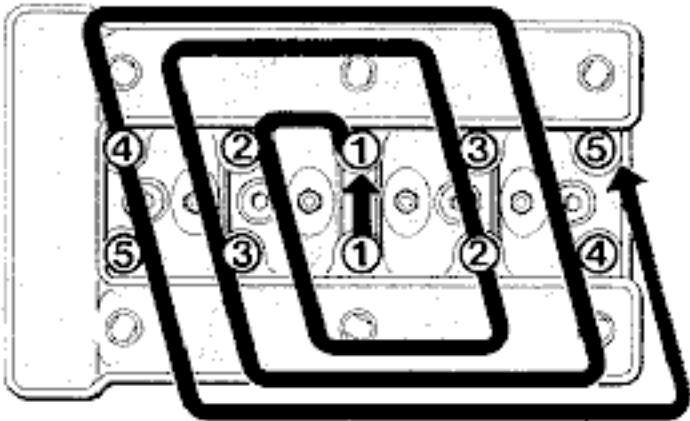
D - Worm-and-roller steering.

At the prescribed intervals check:

- the oil level in the steering box (by removing the plug 1 shown in the figure);
 - the steering linkage joints for play;
 - the worm and roller for play (adjust with screw 2, if necessary).
- The ball and socket joints of the rods do not require any lubrication.

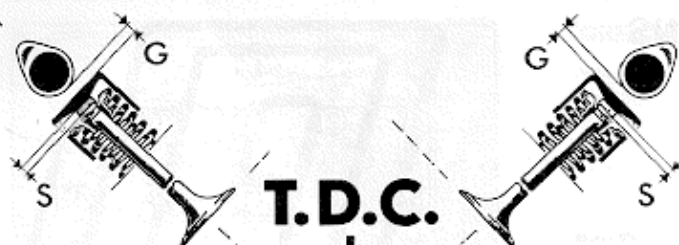


TIGHTENING TORQUE SPECIFICATIONS



To avoid stressing the metal, tighten as follows with a torque wrench set to the prescribed torque.
The illustration shows the tightening sequence of cylinder head nuts.

 CYLINDER HEAD NUTS	N m	kg _f m	lb-ft
	78-79	7.9-8.1	57.1-58.6
After reconditioning tighten, when cold and in proper sequence, with lube between washer and nut to	82-83	8.4-8.5	60.7-61.5
Then warm up the engine by actually driving the car and when hot retighten without unscrewing to	78-79	7.9-8.1	57.1-58.6
After tested the car, slacken, when cold and in proper sequence, the nuts by one and one half turn and torque , with lube between washer and nut to			
MISCELLANEOUS ITEMS			
Engine oil filter	17-20	1.7-2	12.3-14.5
Oil pan drain plug	69-78	7.0-8	50.6-57.8
Spark plugs (with graphite grease)	25-34	2.5-3.5	18.1-25.3
Injectors	28-31	2.8-3.2	20.2-23.1
Injection pipe fittings (and check for leaks)	abt. 25	abt. 2.5	abt. 18



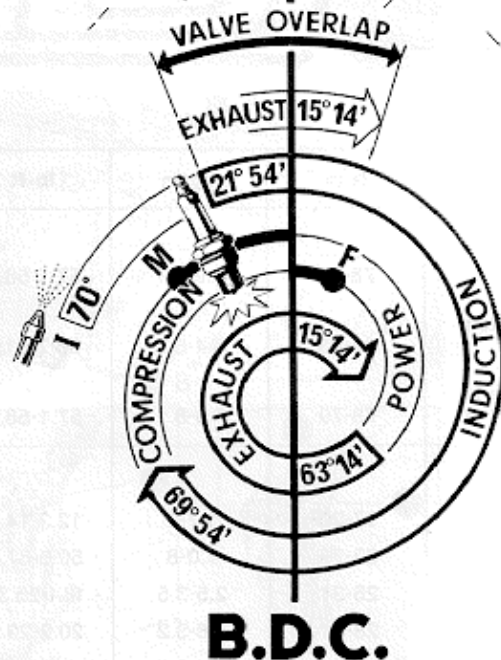
CHECK AND ADJUST VALVE CLEARANCE

When the engine is cold, carefully measure the clearance G with a feeler gage.

G = Intake: 0,475 — 0,500 mm (.0187 — .0197 in.)
Exhaust: 0,525 — 0,550 mm (.0206 — .0216 in.)

If the clearance is not as specified, remove camshafts and valve cups; measure the thickness S of the adjusting pad on each valve stem and replace it with another of proper thickness so that the clearance is the correct one shown in the diagram.

To facilitate this adjustment the pads are made available in a series of thicknesses ranging from 1,3 - 3,5 mm. (0.051 to 0.138 in.) in increments of 0,025 mm. (0.001 in.).



VALVE TIMING DIAGRAM

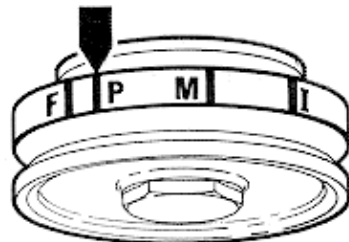
REFERENCE MARKS ON CRANKSHAFT PULLEY

M IGNITION TIMING
AT 5000 RPM

F IGNITION TIMING
AT IDLE

I TIMING OF INJECTION
START

P T.D.C. OF FIRST
CYLINDER PISTON

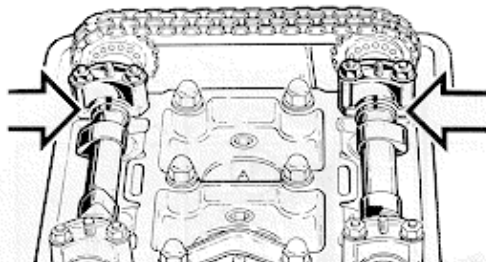
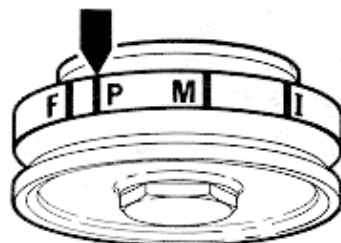




CHECK VALVE TIMING

The valve timing is correct when:

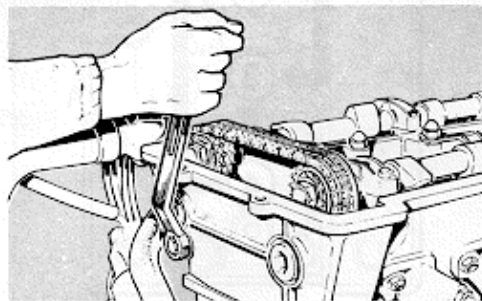
- with valve clearance as specified
 - no. 1 piston on compression stroke, the timing mark cut in the crankshaft pulley and marked P, is in line with the reference plate and...
 - ...when the timing marks cut on the camshaft front journals are in line with those on the journals bearings.
- No 1 cylinder cams must be positioned as shown in the illustration, i.e. **POINTING OUTWARD**.



ADJUST CHAIN TENSION

Proceed as follows:

- run engine at idling speed; while performing the following adjustment any revving up of the engine must be absolutely avoided;
- slacken off the setscrew securing the chain tensioner; wait a few minutes to allow the tensioner to tighten the chain, then lock the chain tensioner setscrew firmly.



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SPARK PLUGS

The standard plugs fitted to the engine are **LODGE HL**. A decal, giving the specifications for these plugs, is attached under the hood. Below, the text of the decal is repeated.

In order to comply with the Federal rule regarding the control of air pollution the engine is fitted with **LODGE-HL** spark plugs. These plugs are completely adequate when the automobile is driven at speeds not exceeding the limits specified by speed regulations. If the automobile is driven at sustained speeds higher than the said speed limits, **LODGE-2HL** spark plugs must be used.

The spark plugs are of the surface gap type with four points and a central electrode. The only maintenance required is occasional cleaning with a brush of the central electrode and points. No routine adjustment is necessary of the gap between the electrode and points. If the ceramic insulator is cracked or the electrodes are excessively worn away, the spark plugs must be replaced.

Under no condition can substitute spark plugs be used, unless they are specifically advised and approved by Alfa Romeo. **Use of other plugs can promote serious engine damage, as well as alter emission levels.**

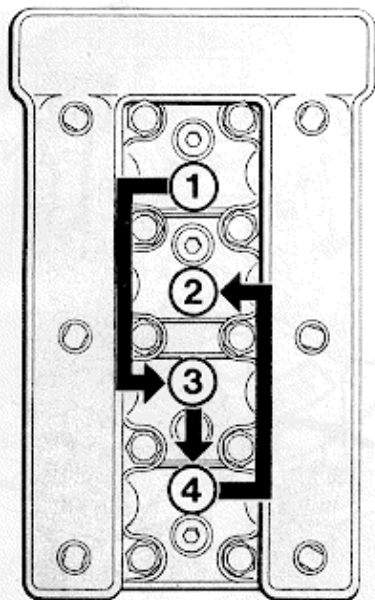
FIRING ORDER

1 - 3 - 4 - 2

The ignition system is of the battery and coil type with a centrifugal advance governor.

The ignition distributor is protected by two half-jackets fastened together with a retainer.

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IGNITION DISTRIBUTOR

At the prescribed intervals:

Check with a feeler gage the contact-breaker point gap.

Distributor gap (S):	0.017 – 0.019"
Dwell:	60° ± 3°

To adjust, loosen the screws 1 and 2, insert a screwdriver in the adjustment slot 3 and pry the stationary-point plate back or forth as required.

If contacts are burned or pitted, they may be smoothed with a very fine file and then cleaned with gasoline.

If the contacts show excessive wear, replace them with new ones and have the condenser checked.

Lightly smear the distributor cam with grease.

Check the inside of the distributor cap for any sign of moisture, carbon deposits or cracks. Check also the central power electrode for free movement in its seat, and that spring action is effective. At last, check the rotor arm for proper insulation and terminals on brush and cap for good operating conditions.

Replace the defective parts.

At the prescribed intervals change the contact-breaker and check coil condenser, rotor arm, cap, spark plug wiring, rubber protections and connectors; change as necessary.

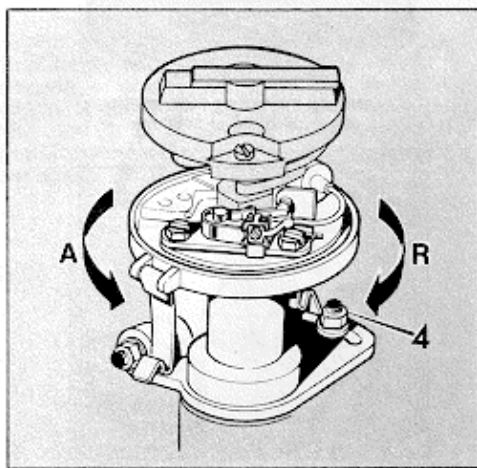
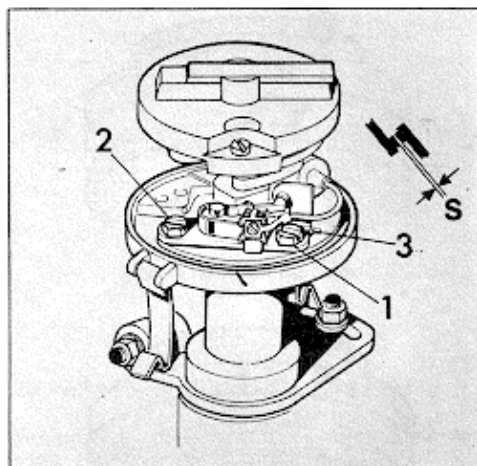


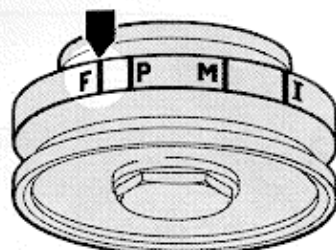
IGNITION ADVANCE AND RETARD

If the timing requires adjustment, proceed as follows:

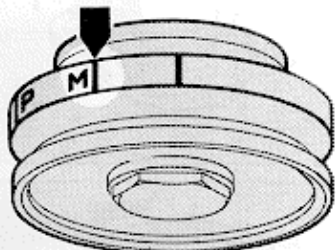
- unscrew the distributor securing nut 4 on the stud so as to allow the distributor to be rotated together with its supporting clamp;
- rotate the distributor body counter-clockwise or clockwise according to whether it is necessary to respectively advance (A) or retard (R) the ignition setting;
- retighten the nut, taking care not to move the distributor body;
- recheck timing.

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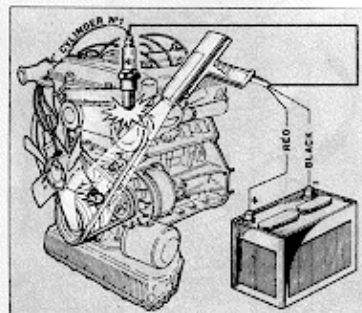




IGNITION TIMING AT IDLE
 $6^{\circ} \pm 1^{\circ}$ ATDC



IGNITION TIMING AT HIGH SPEED
 $30^{\circ} \pm 3^{\circ}$ BTDC at 5000 rpm



CHANGE THE DISTIBUTOR

When reinstalling or replacing the distributor, perform the following procedure:

- rotate the crankshaft to bring no. 1 cylinder piston to the compression stroke that is with both valves closed;
- by slightly rotating the crankshaft bring the advance mark F on pulley into line with the reference pointer;
- fit the supporting clamp into the distributor body and tighten the clamp just snug;
- remove distributor cap and rotate the drive shaft by hand to bring the rotor arm in line with the contact for no. 1 cylinder;
- as a trial installation place the distributor on engine and move the supporting clamp so that the stud is centered in the clamp slot **when the contact-breaker points are about to open for no. 1 cylinder;**
- then, remove the distributor with its supporting clamp, taking care not to disturb the distributor body/clamp setting and lock the clamp in place;
- reinstall the distributor and adjust timing as directed.



CHECK THE IGNITION TIMING

To check the ignition timing, proceed as follows:

- rotate the crankshaft to bring no. 1 cylinder piston to the compression stroke, that is with both valves closed;
- by slightly rotating the crankshaft, bring the advance mark F cut in the drive pulley into line with the reference plate;
- remove the distributor cap and check that the contact-breaker points begin to open when the engine is turned further in its normal direction of rotation.

A more accurate check should be made with a stroboscopic timing light as follows:

run the engine at about 5000 rpm and direct the light from the timing light onto the pulley; if the timing is correct, the M mark on the pulley will be seen in line with the reference plate.

WARNING

Timing light should not be connected to vehicle's battery system.

A separate power source should be used.

Timing at idle speed must be adjusted with special care as it affects more greatly the emission levels.

ALFA ROMEO-SPICA FUEL INJECTION AND EMISSION CONTROL SYSTEMS

Fuel is supplied to the engine by injection into the intake port of each cylinder in quantities exactly metered in accordance with the opening of throttles and RPM range.

The metering device, or «control unit», consists mainly of a barrel shaped cam which slides automatically lengthwise as the RPM varies and rotates about its axis exactly timed with the opening of throttles.

The lift of a follower, moving closely against the cam contour, controls the delivery of the injection pump, without any lag in respect to the demand of power.

On deceleration, the fuel delivery is automatically cut off not only to eliminate the unburned gases in a condition remarkably critical for exhaust emission levels, but also to reduce the fuel consumption.

The control unit also includes compensating devices which give automatically proper corrections for atmospheric pressure, engine and ambient temperature, cold starting and initial running ensuring the optimum under all operating conditions.

WARNING

Never tamper with the control unit, it is prohibited by law.

AIR INTAKE TEMPERATURE CONTROL SYSTEM

The system is designed to maintain the temperature of intake air entering the engine at approximately 40 °C (104 °F).

The sensor element (7, page 45) is a bimetallic bleed unit, modulating the vacuum from the engine, and controlling the position of the valve 1 in the intake air mixer. The position of the valve controls the amount of hot air entering the inlet manifold, maintaining the correct air temperature under all engine temperature and driving conditions.

AIR INDUCTION SYSTEM

The filtered air enters the engine thru four intake ports each with a throttle 27.

The idling air (throttle valves closed) is fed thru a separate circuit which, starting from the air cleaner connects to the intake ports downstream of the throttle valves and includes the idle air equalizer 8.

The accelerator pedal is mechanically linked thru the rods and the relay crank to the throttle valve lever and the control unit lever. Therefore, any position of the accelerator pedal corresponds to an exact position of throttle valve and control unit levers.

FUEL FEED SYSTEM

Inserting the key in the ignition switch and rotating clockwise to the first click will operate the electric pump 21. The gasoline flows from the tank thru tank filter 20 and filter 6 and feeds the injection pump 13.

In the case the car comes into collision an inertia switch cuts off the feed of current to the electrical pump thus blocking the supply of fuel.

The excess fuel, acting also as a coolant for the injection pump, before returning to the tank, passes thru a calibrated orifice which regulates the fuel pressure within the injection pump. A pressure switch 5 inserted in the delivery pipe will switch on the warning light on dashboard if a pressure drop occurs in fuel lines.

A pressure relief valve limits the fuel pump outlet pressure bypassing fuel to the recovery pipe.

FUEL VAPOR RECOVERY SYSTEM AND TANK VENTILATION

Vapors, emanating from fuel tank both during engine operation and hot soak period after engine shutdown, are collected in the expansion tank which acts also as a vapor liquid separator returning the condensate to the fuel tank via the pipe located at the bottom of expansion tank.

The pipe serves to make a proper connection between the fuel tank, when fully replenished, and the expansion tank.

To prevent fuel vapors from escaping to the open air, a sealed filler cap is provided.

Fuel vapors coming from the expansion tank flow out of the separator from the top and, passing thru the pipes, enter the cam cover and then flow into the crankcase: during the hot soak period, the crankcase is used for storage while during engine operation the crankcase is purged of vapors by the action of the ventilation system.

Should the pressure in the expansion tank decrease as a result of decreasing temperature, fuel vapors will flow back to it from the engine to maintain both it and the fuel tank at atmospheric pressure. A valve permits a constant supply of fuel to the engine if an obstruction should occur in the pipe between the expansion tank and the engine.

CRANKCASE VENTILATION SYSTEM

The exhaust gases and the oil vapors developed during engine operation collect in the camshaft cover; from here they are sucked in the combustion chambers and burned as well as the fuel tank vapors.

The crankcase ventilation system controls gases both at high engine RPMs and at idling speed when the throttles are closed.

When the throttles are fully opened the vapors flow thru the hoses to the oil separator 3 and to the manifold chamber communicating with the intake ports.

When the throttles are partially closed, the secondary circuit comes into operations; such a circuit starts from the oil separator 3 and conveys unburned gases and vapors directly into the intake ports downstream of the throttles by means of the idle air system provided with calibrated orifices. The oil collected in the separator returns to the pan via a suitable hose.



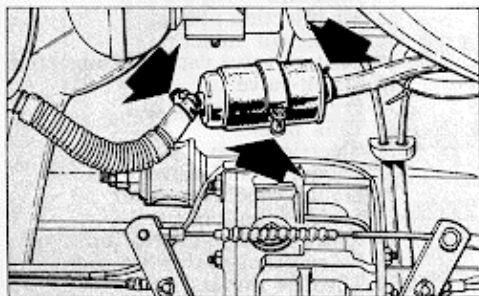
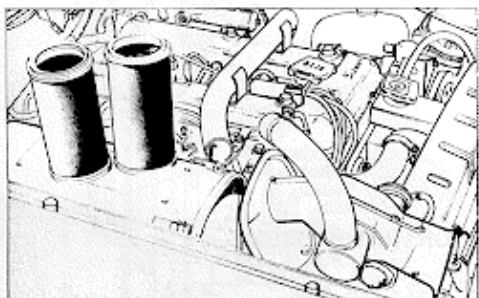
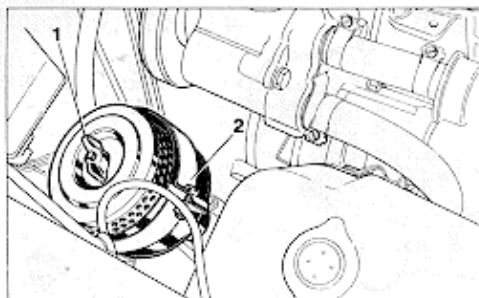
At the prescribed periods have the hoses of crankcase ventilation system checked for sound conditions and leaks and the connections for tightness; clean and change as necessary.

AIR INJECTION SYSTEM

The system has been designed to inject air into the exhaust manifold so as to obtain a combustion of the exhaust gas. The air is supplied by a vane type pump 12 through a check valve 18 to an air manifold that distributes the air to four injection nozzles located near the exhaust ports. The check valve is provided in the system to stop gas flowing back into the air pump when air pressure drops for any reason, such as drive belt failure.

WARNING

Any adjustment or servicing of the injection and emission control systems must be entrusted only to an Alfa Romeo Dealer.



CLEAN/CHANGE AIR PUMP FILTER ELEMENT

Unscrew the wingnut 1 securing cover to filter housing. Remove the element and clean the inside of filter housing. Clean the filter element and fit it again into its housing. Cleaning should be performed every 5000 miles. Every 15000 miles replace the element with a new one. To prevent dust particles from entering the hose while cleaning the inside of filter housing it is advisable to loosen the fastening clamp 2 and remove the filter assembly.



CLEAN/CHANGE AIR CLEANER ELEMENTS

The air cleaner is equipped with two pleated elements offering the maximum filtering surface.

To remove the elements proceed as follows:

- Loosen the two fasteners at the top and the one at the bottom securing the front cover of cleaner;
- Disconnect the hot air snorkel tube and the pipe across cylinder head and separator;
- Remove the front cover assembly and the two elements. Make sure not to disconnect the hose connecting sensor on cleaner body to cleaner cover.

Clean the elements blowing them through from the inside with low pressure compressed air or replace the elements with new ones.

On refitment, check the outer element for proper centering and the seal stuck to the cleaner body for proper positioning; secure the cover with its three fasteners and reconnect the pipes.

Air filtering elements should be replaced at shorter intervals if vehicle is used in dusty areas.



REPLACE THE TANK FUEL FILTER

At the prescribed periods, replace as follows the tank filter located at the rear underbody of the car;

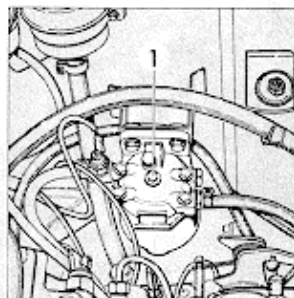
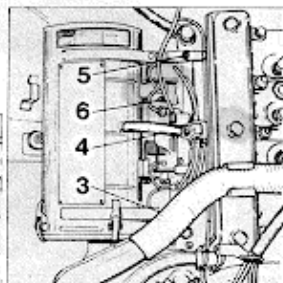
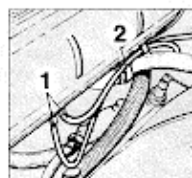
- slacken the nut on the clamp securing the filter to the underbody;
- loosen the clamps securing the hoses to the filter inlet and outlet adapters; it is advisable to blank out temporarily the pipe from fuel tank;
- remove the filter and replace it with a new one by proceeding in reverse order of removal; take care to fit the hoses properly.



CHANGE THE MAIN FUEL FILTER ELEMENT

At the prescribed periods replace the main fuel filter element. To provide room for this operation, the air cleaner must be removed.

- disconnect the control damper sensor hoses 1;
- loosen clamp and disconnect duct 2 from oil separator;
- disconnect hot air snorkel tube 3;
- disconnect idle air system hose 4;
- detach two upper anchoring straps 5 at manifold side;
- loosen at the engine side the four clamps 6 on the intake hoses.
- **disconnect the battery negative terminal and the positive starter cable;**
- clean carefully the outside of filter body and nearby lines to make sure no foreign matter could enter the filter on reassembly (for an easier refitting, loosen the two screws securing filter bracket to car's body);
- Slacken and withdraw the screw 1 (with its copper washer 2) securing filter housing to bracket and remove the filter housing 6 by pushing it downward;
- Withdraw the filter element;
- Get rid of foreign matter that may have collected in the housing; replace the following items, if damaged:
 - ☐ Bottom gasket 5 (between element and housing bottom);
 - ☐ Top gasket 4 and sealing ring 3 between bracket and element
 - ☐ Copper washer 2 (lubricate washer prior to tighten screw 1).



VACUUM RELIEF VALVE

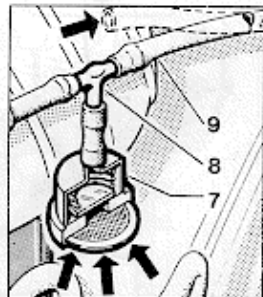
If, with freezing weather, performance and driveability are impaired or the low fuel pressure warning light comes on, the cause may be vacuum taking place in the fuel tank owing to a stuck closed relief valve 7 and/or an obstruction of the pipe 9 both occurring at the same time.

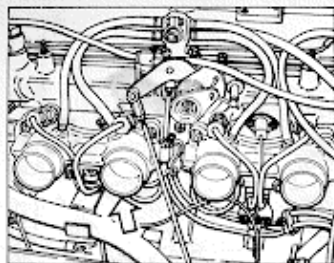
To remedy this trouble, remove the relief valve from the T-adapter 8 and blow the valve through to clear it from foreign matter (if the valve is instead defective, replace it with a new one). The vent pipe 9 must also be disconnected from the T-adapter and blown through to clear it from any obstruction which may have formed.

Refit all parts.

At the prescribed intervals perform the following:

- Clean and inspect the lines, connections and vacuum relief valve of fuel evaporative system; replace as necessary;
- Inspect fuel tank, filler cap and gasket pipes and connections for sound conditions; change filler cap gasket, if necessary.



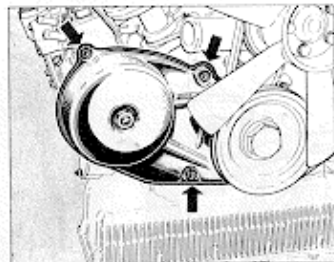


CLEAN THE THROTTLE THROATS

Remove the air cleaner (see page 47)

Clean the throttle throats at the areas of contact of throttle edges with throat bore by holding the throttles in full open position and using a brush soaked in gasoline; the cleaning can be completed by rubbing repeatedly the affected areas with a lint-free cloth. Then, clean in a similar way the throttle edges taking care not to strain the spindles.

Refit the air cleaner (see page 47)



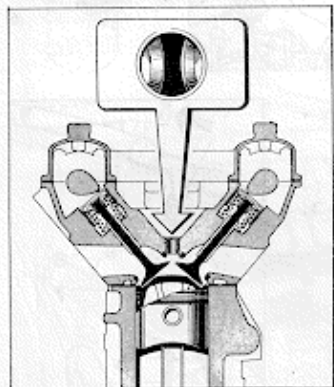
TIMING THE INJECTION PUMP

To check the injection pump timing, proceed as follows:

- unscrew the attaching nuts and remove the pump drive belt cover
- turn the crankshaft over (by shifting into fourth and pushing the car either forward or backward) so as to **bring the reference mark 1 in line with the pointer**; remove the spark plug from cylinder no. 1 and **check that the exhaust valve is still open** (if closed, turn the crankshaft over by one more revolution).
- check that the reference mark on the splined pulley and the pointer on the pump body are aligned.

Note: reference mark and pointer can be out of alignment within a tolerance of about ± 5 mm. (0.2") corresponding to half pitch of the pulley splines.

If the pump is out of timing, time it according to the same procedure as for drive belt replacement.

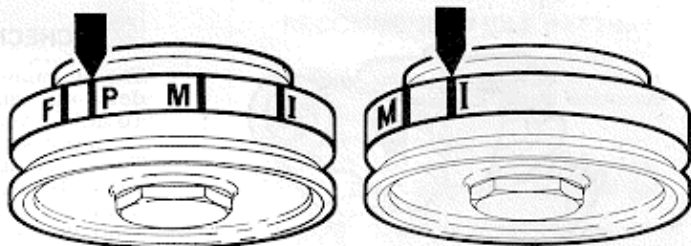


REPLACE THE INJECTION PUMP DRIVE BELT

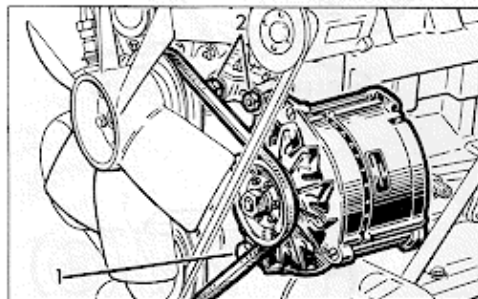
Should the injection pump drive belt need replacement, proceed as follows:

- Remove the air pump drive belt (see page 50)
- Unscrew the three attaching nuts and remove the pump drive belt cover.
- Turn the crankshaft over (by shifting into fourth and pushing the car either forward or backward) so as to bring the no. 1 piston to the T.D.C.; remove the spark plug from cylinder no. 1 to check that both valves, intake and exhaust, are in the open position (overlap stage).
(If the valves are closed, turn the crankshaft over by one more revolution).

- In this condition, the mark **P** on the crankshaft pulley shall line up with the pointer.
- Push the car slowly backward so as to rotate the crankshaft counterclockwise by 70 degrees, i.e. in such a way that mark **I** on crankshaft pulley and pointer line up.



- Loosen the bolt 1 and the nuts 2, move alternator toward the crankcase and take the alternator drive belt off.
- Replace the injection pump drive belt with a new one; to install the new drive belt first mount it onto the crankshaft splined pulley.

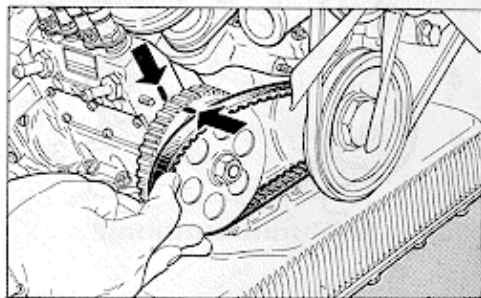


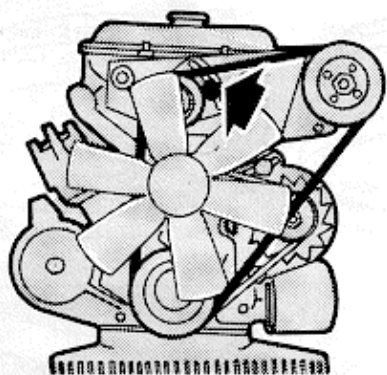
- Then, rotate the injection pump splined pulley by hand to align the reference mark on the pulley with the pointer on pump body and mount the toothed belt onto the pump pulley; slightly turn the pulley in either direction to engage the nearest splines.

N.B. Reference mark and pointer can be out of alignment within a tolerance of about ± 5 mm (0,2") corresponding to half pitch of splines.

Refit:

- The spark plug.
- The alternator drive belt (and adjust tension refer to page 50).
- The pump drive belt cover.
- The air pump drive belt (see page 50).





CHECK AND/OR CHANGE THE AIR PUMP DRIVE BELT

The air pump drive belt tension is correct when on pressing the belt down the amount of play is approximately $\frac{1}{2}$ in.

To adjust belt tension, loosen the nut on the tensioner and adjust the latter so as to obtain the proper belt tension.

To change the belt, loosen nut, move the tensioner and take the belt away. To refit, pass the new belt between fan blades and shroud. Gaining access from the bottom, fit the belt to the front face of crankshaft pulley; then, from the top, fit the belt to air pump pulley and tensioner. Prior to tighten the tensioner nut, make sure belt tension is as specified.



CHECK AND/OR CHANGE COOLANT PUMP AND ALTERNATOR DRIVING BELT

If the tension is insufficient, the belt will slip and wear prematurely; furthermore:

- the cooling action will be affected because of the reduced speed of the fan and pump;
- the battery charging current will be reduced owing to the slower alternator speed.

If the tension is excessive, the alternator and pump bearings will be overloaded with the consequent risk of damage.

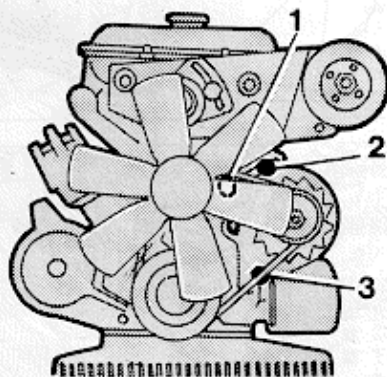
The tension is correct when on pressing the belt down the amount of play is approximately $P = 10-15$ mm.

To adjust belt tension:

- loosen the nuts 1 and 2 on the link; also loosen the bolt 3;
- then, move the alternator so as to obtain the proper belt tension.
- After adjusting, tighten the nut 2 and check for proper tension;
- tighten nut 1 and bolt 3;
- check again tension.

Change the belt at the prescribed periods. Prior to do so, it is necessary to remove the air pump drive belt as outlined in the preceding paragraph. To remove the old belt take it away from pulleys and pass it between fan blades and shroud. To refit, pass the new belt, from top, between fan blades and shroud. Gaining access from the bottom, fit the belt to the rear face of crankshaft pulley; then, from top, fit the belt to the pulleys of fan and alternator.

Adjust belt tension as above outlined. Refit the air pump drive belt (refer to the preceding paragraph).





IDLE ADJUSTMENT

Usually, idle speed is adjusted only when regular maintenance operations as set out on the coupons of Routine Maintenance Book are performed. However, if a pressing need for idle adjustment should arise, warm up the engine, inspect the ignition system for proper operation, then proceed as follows:

■ Idle too slow but even

(engine runs smoothly)

This is due to too rich a mixture fed to the engine.

To correct this trouble, remove the hose 4 connecting the idle equalizer to the air cleaner, loosen the bolt 5 and **gradually unscrew** the adjuster 6 with a coin until the engine is idling at as fast a speed as possible yet with no roughness. Back up the adjuster by one third of the amount it was previously unscrewed, then retighten the bolt 5 and refit the hose 4.

■ Idle too slow and rough

(engine runs unevenly)

One of the hoses 7 connecting idle equalizer to throttle throats is obstructed (by buckling) cracked or disconnected from a fitting. Reconnect or replace the hose, if necessary.

■ Idle too fast and rough

(engine runs unevenly; hunting also takes place)

This is caused by too lean a mixture fed to the engine due to air leaking through one of the hoses 7 connecting idle equalizer to throttle throats. Check the four hoses 7 for sound conditions and leaks.

If this does not correct the trouble, remove the hose connecting idle equalizer to air cleaner, loosen the bolt 5 and **gradually screw** in the adjuster 6 **with a coin** until the engine is idling smoothly and sufficiently high. Then, back up the adjuster by one third of the amount it was previously screwed in; retighten the bolt 5 and refit the hose 4. **Performing the above adjustments will also keep exhaust emission at the normal levels.**

Should difficulties arise in adjusting the idle, entrust the adjustment to an Alfa Romeo Dealer.

RECOMMENDED IDLE SETTING

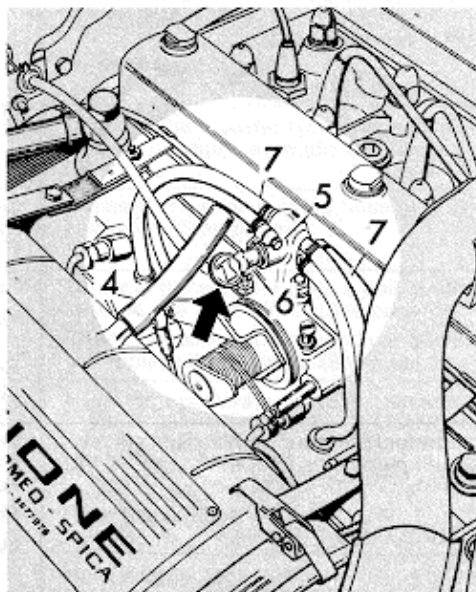
Idle speed must be 700 ± 100 RPM with hot engine, transmission in neutral and accessories, if any, disengaged.

IDLE EXHAUST EMISSIONS

carbon monoxide: below 1.2%

unburned hydrocarbons: below 300 ppm

Important note: the reading of values of carbon monoxide and unburned hydrocarbons must be taken exclusively with **NDIR** instrumentation.



ENGINE TROUBLE DIAGNOSTIC CHART

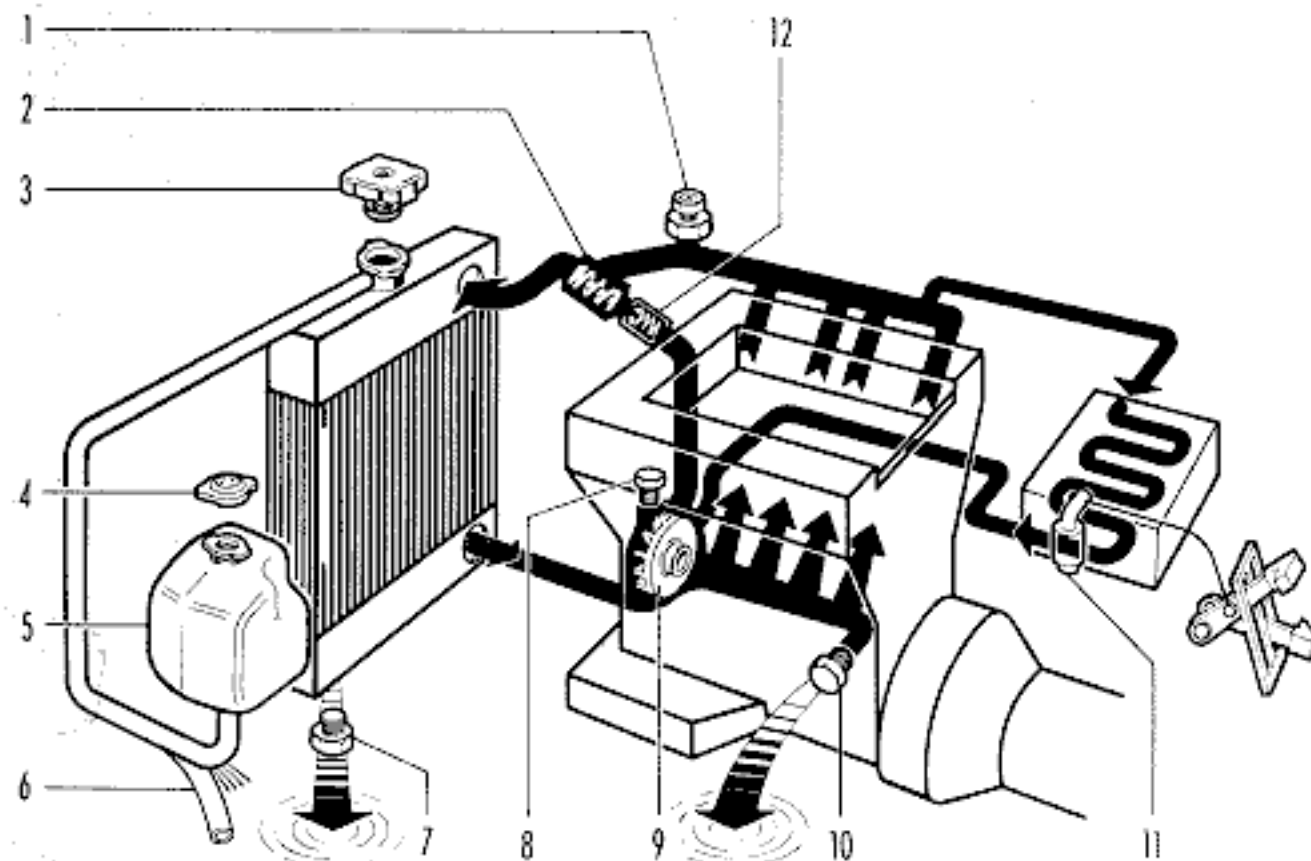
SYMPTOM	POSSIBLE CAUSE	CORRECTION
Low fuel pressure warning light does not flash on when ignition key is turned.	Fuse no. 6 blown. Warning light bulb burnt out. Pressure switch faulty (jammed open).	Replace fuse. Replace bulb. Have switch checked and replaced if necessary. <i>DEALER OPERATION</i>
Low fuel pressure warning light stays on (fuel pump operates: a light buzzing can be heard).	Fuel tank empty. Pressure switch faulty (jammed closed). Fuel pump outlet pressure too low (warning light comes on while running at high speed): - tank to pump lines clogged or air seeping thru them - tank fuel filter clogged - main fuel filter clogged - pump pressure relief valve defective or stuck open. Fuel pump delivery too low. Relief valve of liquid/vapor separator stuck closed (in winter).	Refuel it. Have switch checked and replaced if necessary. <i>DEALER OPERATION</i> Have fuel lines inspected. <i>DEALER OPERATION</i> Replace filter Clean filter and replace element Have pump valve checked and replaced, if necessary. <i>DEALER OPERATION</i> Have fuel pump checked or replaced. <i>DEALER OPERATION</i> Remove valve and check it for proper operation; replace, if necessary. (See page 47).
Low fuel pressure warning light stays on (fuel pump fails to operate).	Inertia switch open Fuse no. 1 blown. Electric wires to pump disconnected. Fuel pump faulty.	Reset switch Replace fuse. Check and reconnect. Have the pump checked or replaced. <i>DEALER OPERATION</i>

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Engine will not start from cold.	Solenoid-actuated cold start device fails to operate.	Check electric connections. Have the device checked or replaced. <i>DEALER OPERATION</i>
Smoky exhaust after starting.	Cold start solenoid plunger stuck.	Have the plunger checked. <i>DEALER OPERATION</i>
Engine misfires; rough idle.	One injector defective. Injection pipe fittings leaking. Injection pipes cracked. Ignition system faulty	Have the injector replaced, if necessary. <i>DEALER OPERATION</i> Have fittings tightened <i>DEALER OPERATION</i> Have the pipes checked and replaced, if necessary. <i>DEALER OPERATION</i> Have it inspected <i>DEALER OPERATION</i>
Idle too slow but even.	Idle air equalizer out of adjustment (adjuster too much screwed in).	Unscrew the adjuster (with a coin) until a faster but again even idle is obtained. (See page 51).
Idle too slow and rough (engine runs unevenly).	Idle air hose(s) disconnected from equalizer or throttle throat fittings or even obstructed or damaged.	Connect, clear or replace hose(s) respectively. (See page 51).
Idle too fast and rough (engine runs unevenly hunting also takes place).	Idle air equalizer out of adjustment (adjuster too much screwed out). Air seeping into an idle air hose.	Screw in the adjuster (with a coin) until an even idle is obtained. (See page 51). Check idle air hose for sound condition and replace if necessary. (See page 51).
Idle too fast; engine does not slow down to idle on deceleration	Accelerator linkage fails to return fully.	Have the accelerator linkage checked. <i>DEALER OPERATION</i>
Idle CO and HC too high.	Idle speed incorrect; ignition system faulty. Air injection system defective	Have them inspected. <i>DEALER OPERATION</i> Have it inspected <i>DEALER OPERATION</i>
Too fast an idle and smoky exhaust.	Faulty thermostatic actuator.	Have it inspected. <i>DEALER OPERATION</i>

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Engine keeps running at idle but stops on accelerating.	Altitude compensator faulty. Excessive vibrations of injection pump and control unit.	Have the altitude compensator replaced. <i>DEALER OPERATION</i> Have the injection pump and control unit brackets checked. <i>DEALER OPERATION</i>
Unsatisfactory driveability, hesitations; unsatisfactory road performance.	Control linkage out of adjustment. Fuel pump outlet pressure too low (warning light comes on while running at high speed). Injector defective. Injection pump or control unit defective. Ignition system faulty Air induction clogged. Air intake temperature control system defective Relief valve of liquid/vapor separator stuck closed (in winter).	Have the throttle/control unit linkage checked. <i>DEALER OPERATION</i> Check and replace, if necessary, tank fuel filter and/or main filter element. Refer to corrections as under "Engine misfires, rough idle". <i>DEALER OPERATION</i> Have them checked and replaced, if necessary. <i>DEALER OPERATION</i> Have it inspected <i>DEALER OPERATION</i> Check and replace air cleaner elements, if necessary. Have it inspected <i>DEALER OPERATION</i> Remove valve and check it for proper operation; replace, if necessary, (See page 47).
Excessive fuel consumption.	Fuel feed circuit leaks. Thermostatic actuator defective; also refer to causes as under "Too fast an idle". Defective carburation.	Check pipes, fittings, seals and replace defective parts. Have the thermostatic actuator checked and replaced, if necessary. <i>DEALER OPERATION</i> Have the injection pump adjusted. <i>DEALER OPERATION</i>

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Engine stalls flat.	Injection pump driving belt broken.	Have belt replaced. <i>DEALER OPERATION</i>
Detonations in the exhaust pipe on deceleration.	Fuse no. 1 blown. Feed wire disconnected at fuel cut off solenoid. Loose junction of fuel cut off device feed wire disconnected. Defective fuel cut off solenoid. Defective fuel cut off device microswitch.	Replace fuse. Re-connect wire. Re-connect junction. Have the fuel cut off solenoid checked and replaced, if necessary. <i>DEALER OPERATION</i> Have the fuel cut off device checked. <i>DEALER OPERATION</i>
Engine stops: - wholly or occasionally on deceleration in neutral - occasionally or wholly when reaccelerating after a deceleration. Engine fires again suddenly and with delay when reaccelerating after a deceleration.	Fuel cut off solenoid stuck in cut off position or sluggish in backing up.	Have the fuel cut off solenoid checked and replaced, if necessary. <i>DEALER OPERATION</i>
Noisy electric fuel pump.	Line between pump and main filter distorted or forced in the rubber mounting or against the recovery pipe. Tank filter and hoses improperly fitted.	Have the line reset. <i>DEALER OPERATION</i> Have the filter and hoses checked. <i>DEALER OPERATION</i>

COOLING SYSTEM



The cooling system is provided with a compensating reservoir containing a special **Alfa Romeo Antifreeze** which gives full protection against freezing down to -20°C (-4°F).

At the prescribed periods have the hoses, connections and filler cap of cooling system and the heater hoses checked for sound conditions and leaks.

- 1 Air bleed valve on manifold
- 2 Thermostat
- 3 Radiator cap, 10 p.s.i.
- 4 Reservoir filler cap
- 5 Reservoir
- 6 Supply line from reservoir to radiator
- 7 Radiator drain plug
- 8 Air bleed screw on pump
- 9 Water pump
- 10 Drain plug on crankcase
- 11 Heater valve
- 12 By-pass control valve



CHECK LEVEL OF COOLANT MIXTURE

To ensure the efficient operation of the cooling system, the following procedure should be observed.

WARNING

Never remove the radiator cap unless absolutely necessary; in any case, to avoid severe injuries, wait that the liquid is cooled down to outside temperature.

Every 5000 miles check level of coolant in the reservoir: this should be done exclusively with a cold engine as with a hot engine the level may increase remarkably, even after stopping the engine.

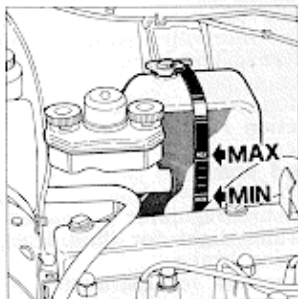
The level of mixture in the reservoir should never fall below the « Min » nor exceed the « Max » marks.

To top up use Alfa Romeo Antifreeze drawn from suitable containers available from **Alfa Romeo Dealers**.

In the event this would not be feasible, distilled water may be used provided the concentration is not altered to prevent impairing the efficiency of the Antifreeze.

Topping up with fresh water actually alters the characteristics of the Antifreeze and should be avoided.

If as a provisional measure, fresh water has been added, the whole circuit must be thoroughly drained as soon as possible and replenished with Alfa Romeo Antifreeze.



IMPORTANT NOTE

The mixture in the cooling circuit gives full protection against freezing down to -20°C (-4°F).

In places where the temperature falls below -20°C the mixture can be strengthened as directed.

It is recommended that this operation be entrusted to an Alfa Romeo Dealer.

Should an excessive consumption of coolant mixture be experienced check for no sign of leaks. Inspect the radiator filler cap to make sure that valves, springs and seals are in sound conditions and properly operating; if doubt exists, it is advisable to replace them with new ones.

CHANGE COOLANT MIXTURE

Every 25.000 miles (or every two years whichever occurs first) have the coolant mixture renewed by an Alfa Romeo Dealer after the circuit has been flushed with a suitable descaling compound.

DUAL BRAKE SYSTEM

The brake unit consists of a dual power braking system. Each one of the separate circuits, front and rear, is servo assisted and controlled by a tandem master cylinder, with one cylinder operating the front brakes and the other cylinder the rear brakes.

The friction pads of the front and rear brakes are directly actuated by the cylinders integral with the calipers.

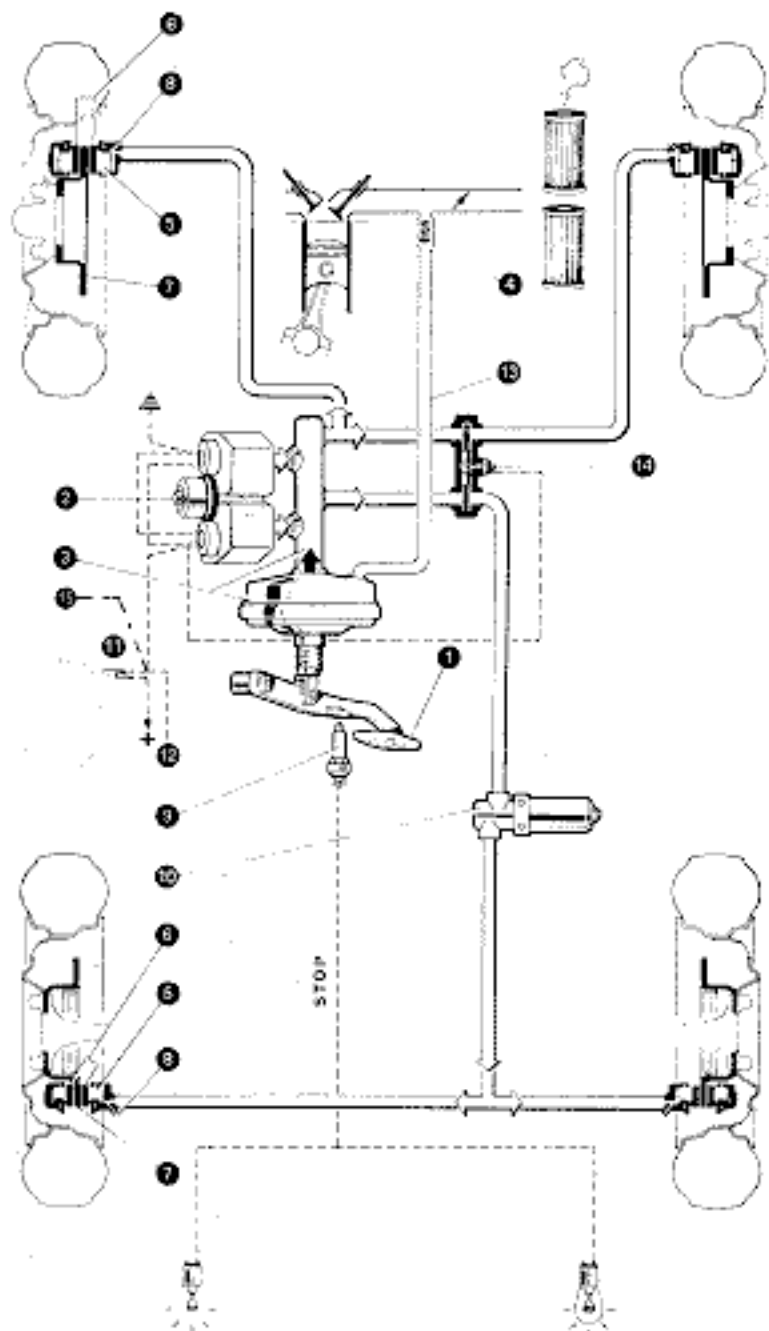
The brakes are self-adjusting.

A valve, inserted in the rear brake circuit, regulates the pressure between front and rear brakes to provide balanced braking action.

WARNING

the pressure regulator must never be tampered with; specifically, do not attempt to act on the adjusting nut as it is factory sealed.

The stop light switch is directly operated by the brake pedal.



DUAL BRAKE SYSTEM

- 1 Brake pedal
- 2 Fluid reservoirs (with warning light switches)
- 3 Power cylinder
- 4 Suction port
- 5 Pistons
- 6 Friction Pads
- 7 Discs
- 8 Bleed screws
- 9 Stop light switch
- 10 Pressure regulator
- 11 Warning light for fluid level, service brake pressure and parking brake
- 12 Connection for the switch of parking brake
- 13 Vacuum connection for booster
- 14 Pressure switch unit for brake pressure warning light
- 15 Connection for brake warning system control unit

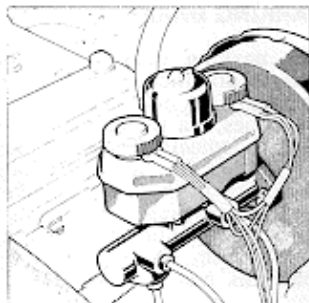
CHECK BRAKE FLUID LEVEL

The two brake reservoirs have suitable markings for maximum and minimum levels; the reservoirs are provided with a baffle, which prevents fluid from interflowing between each other; however, the reservoirs are replenished thru a single filler port common to both.

Two microswitches, located at the top of reservoirs, light up a red warning light on instrument panel when the level of fluid in the reservoirs is too low.

This warning light serves also as a warning for a drop in service brake pressure and for the parking brake when applied.

Therefore, should the warning light come on, first make certain the parking brake is fully released; if warning light still remains on, stop the car and check the fluid level in the service brake reservoirs; if the level is too low, have the circuit checked for possible failure by an Alfa Romeo Dealer.



To maintain the brakes in good operating condition, follow the servicing instructions given below:

- Take care to prevent the **minimum** level of fluid in the reservoir from falling below the **maximum** level by more than 1/4 inch.
- For renewal or topping up, it is absolutely essential to use only fluids meeting requirements of U.S. FMVSS 116 with the container marked «D.O.T. Grade 3» with minimum wet boiling point of at least 140 °C (284 °F). Always buy fresh fluid by checking container date.
Container must be sealed.
When adding fluid, leave the strainer in place so as to filter the fluid.

Disc brake and clutch fluids



Alfa Romeo

std. no. 3681.69903

Ate «Blau S»

For effective and reliable operation of the brake system, the pipes must always be full of fluid and free of air bubbles.

Excessive and spongy brake pedal action is an indication of the presence of air bubbles in the system. Compressed air must not be used for replenishing the system.

CLEANING OF BRAKES

Flushing the circuit.

Should flushing of the brake circuit be required, use exclusively fluid of the specified type.

Compressed air or alcohol must on no account be used to dry a flushed system.

Washing the outside.

To clean the outside of brake assemblies use suitable detergents mixed with hot water; then thoroughly dry all components with compressed air.

Never use gasoline, trichloroethylene or similar solvents to clean the outside of brakes as these substances are detrimental to the rubber seats.

While servicing the car, be careful not to let lubricants come in contact with the discs and friction pads.

When cleaning the car, it is advisable to mask off the brakes to avoid damaging the brake components with jets of water.



BRAKE BOOSTER

In case of accident or damage to the chassis check that the vacuum booster is undamaged, since even slight superficial body damage may seriously impair the functioning of the brakes.

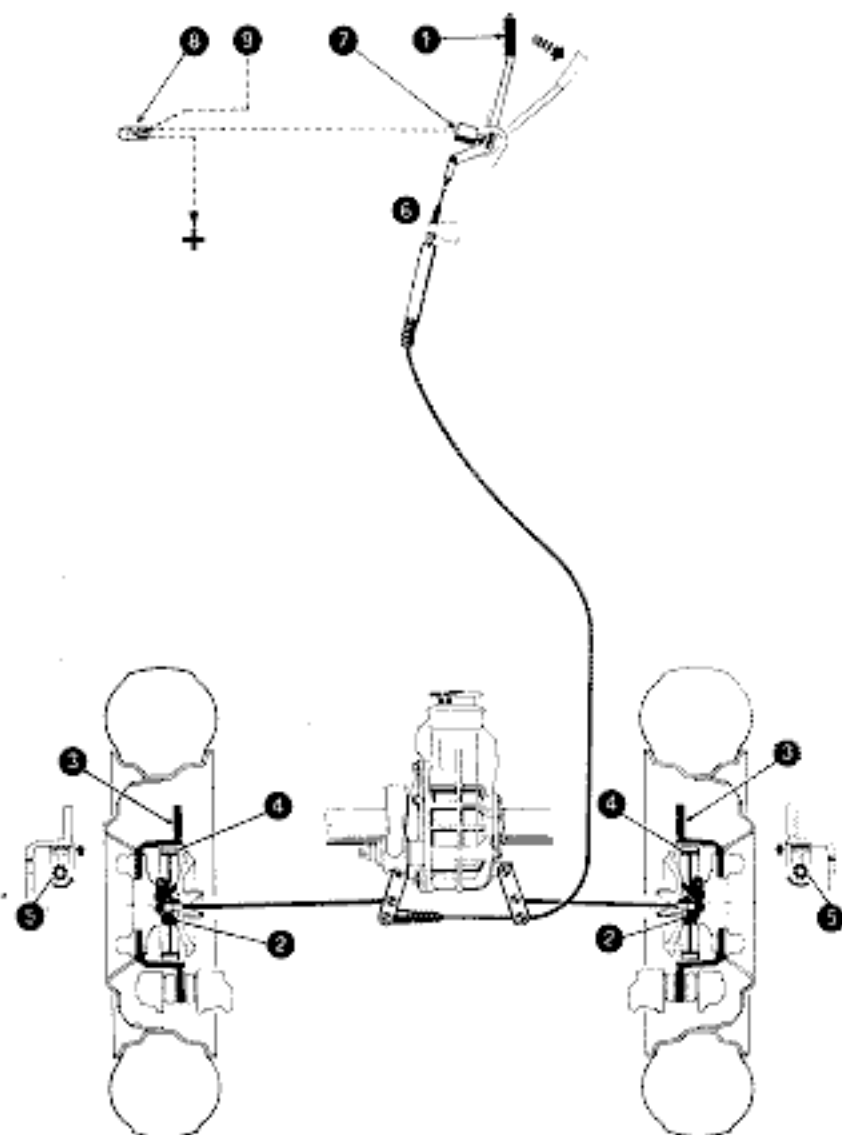
At the prescribed periods have the brake booster vacuum hose, check-valve and connections checked for sound conditions and leaks.

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PARKING BRAKE

The parking brake is mechanically-operated; the rear wheels are locked thru shoes 4 acting against a drum machined in the disc casting. Pulling the lever causes the shoes, via the operating levers 2, to expand thus locking the wheels. The slack adjuster 6 allows to take up any slackening in the linkage. If an excessive running clearance is the cause for linkage slackening, the shoes can be adjusted by means of the running clearance adjusters 5. When the parking brake is applied, a warning light on the instrument panel comes on to indicate that this has been done.

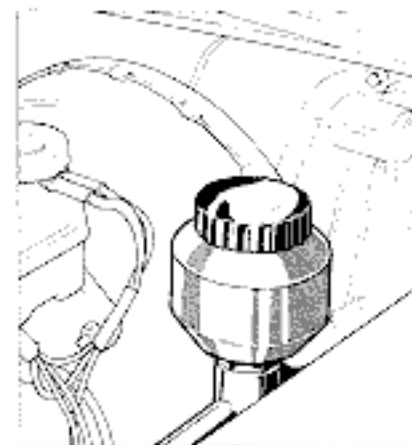
- 1 Hand lever
- 2 Operating levers
- 3 Discs
- 4 Shoes
- 5 Running clearance adjuster
- 6 Slack adjuster
- 7 Parking brake warning light switch
- 8 Warning light for fluid level, service brake pressure and parking brake
- 9 Electrical connection to brake pressure switch unit and fluid level switches



CLUTCH

The clutch is of the self-adjusting, hydraulically-operated, single-plate dry type. At the prescribed periods check that level of fluid in clutch reservoir is between MIN. and MAX. marks. Top up if necessary.

When topping up, use the same type of fluid as specified for brake system (see page 59).



SUSPENSIONS

FRONT SUSPENSION

The front wheels are independently suspended and connected to the body by A-arms.

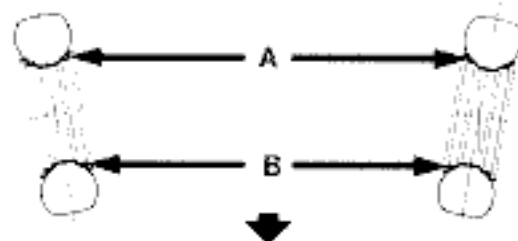
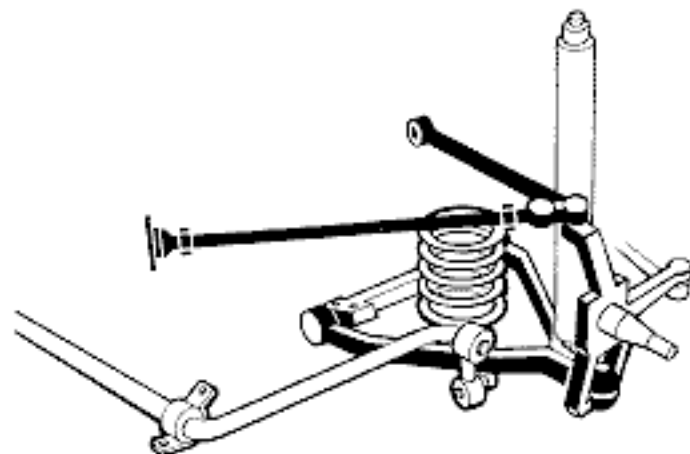
Coil springs and double-acting hydraulic telescopic shock absorbers are located between the lower arms and the body.

The suspension system is completed by a trasverse stabilizer rod which improves the stability of the vehicle when cornering

Upward movement of the arm is restricted by bumper pads situated near the springs. Downward movement is restricted by pads attached to the cross member.

Suspension components require no regular lubrication.

Whenever the damping action of the shock absorbers is uneven, have them checked by an Alfa Romeo Dealer.



FRONT WHEEL TOE-IN

To avoid uneven and premature tire wear, and to ensure positive and stable steering, front wheel toe-in must be set to the prescribed values.

Toe-in $A=B+.12''$

To adjust toe-in lock steering wheel in the central position, i.e. with the spokes symmetrically disposed in relation to the vertical;

starting with the rod 2 on the steering box side, place the corresponding wheel so that the toe-in is .06 in.;

measure the length thus obtained of the rod on the steering box side and shorten by .2 in. the rod 1 on the other side;

bring the right-hand wheel to .66 in. toe-in by adjusting the center track rod 3;

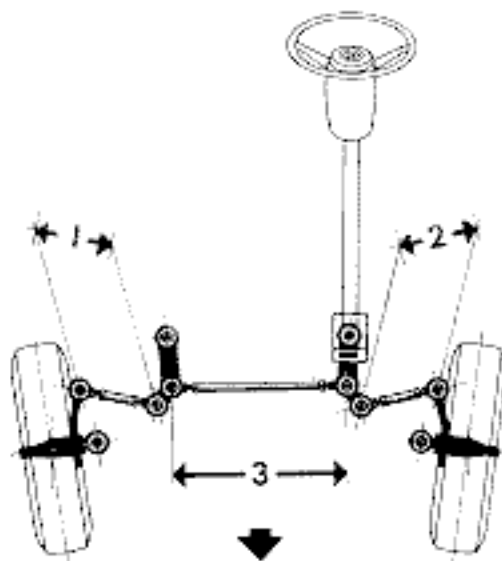
Length of track rods

As measured between ball joint centers, the length should fall within the following limits:

① ② $10.71 \pm .3$ in.

③ $21.26 \pm .4$ in.

If these values cannot be restored, the cause will probably be attributable to distortion of the body resulting from a collision.

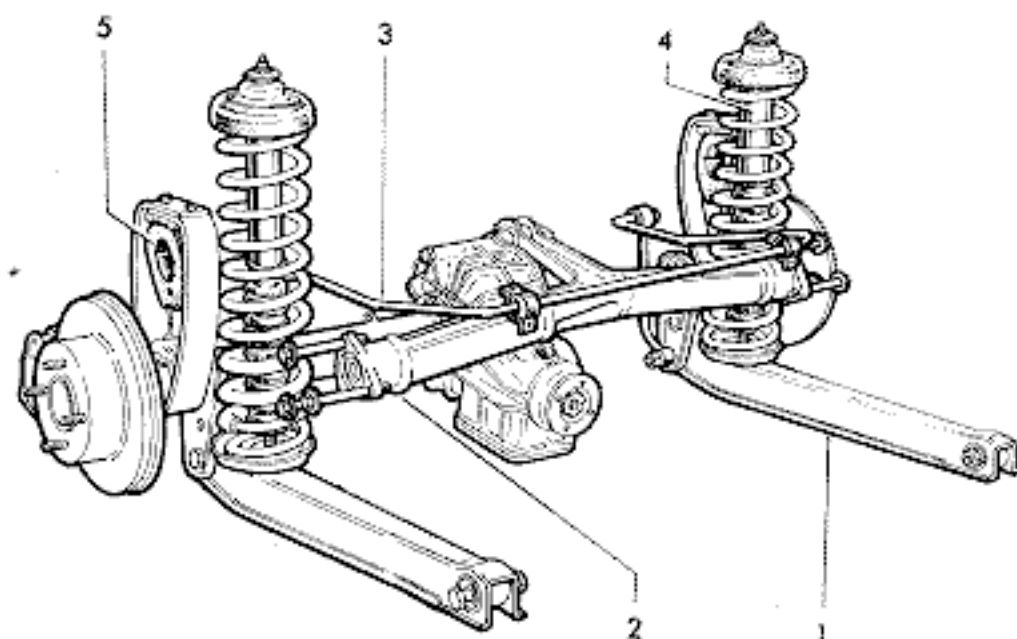


Overall ratios with 41:9 final drive

1st	15.049:1
2nd	9.055:1
3rd	6.172:1
4th	4.555:1
5th	3.603:1
Rev.	13.710:1

REAR AXLE

The live axle is attached longitudinally to the supporting structure by means of two trailing arms with rubber bushes at the ends; transverse attachment is effected by means of a T-arm hinged to the body and to the rear axle thru rubber bushes. The final drive is of the hypoid type.



REAR SUSPENSION

The rear suspension consists of coil springs and large diameter telescopic shock absorbers coaxial with the springs.

The suspension system is completed by a transverse stabilizer rod linked to the trailing arms and the body.

1 Trailing arm

2 T-arm

3 Stabilizer rod

4 Shock absorber

5 Rubber buffer and rebound strap.

The rebound of rear axle is limited upward by rubber pads and downward by fabric and rubber straps.

The suspension units do not require any regular lubrication. Whenever the damping action of the shock absorbers is uneven, have them checked by an Alfa Romeo Dealer.

TIRES

TIRE MAINTENANCE

Note

New tires, including the spare, should be broken in for at least 50 miles at speeds not to exceed 60 miles per hour.

- Check pressure regularly.
- Slow down when rounding corners or sharp curves.
- Avoid fast acceleration and prolonged periods of high speed driving.
- Avoid extreme and unnecessary braking.
- Avoid sharp objects and chuck holes in pavement.
- Maintain wheels in balance and front suspension in alignment.

HOW INFLATION PRESSURE AFFECTS TIRE PERFORMANCE



Correct. The tire gives optimum performance, the tread works over its entire width, thus ensuring uniform tire wear and long life.



Too low. The tire will over-heat: the sides of the tread will wear quickly and the tire plies will tend to separate.



Too high. Riding comfort will be reduced, and the tire will suffer from excessive wear in the center of the tread and vulnerability to knocks.

WHEEL BALANCING

Whenever a tire is changed or repaired the wheel must be rebalanced.

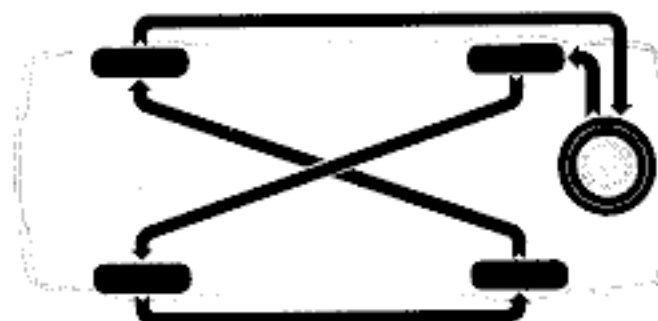
It should be remembered that unbalanced wheels cause unstable steering, abnormal steering gear wear and uneven tire wear.

To balance the rear wheels both tires must be raised from ground.

TIRE ROTATION

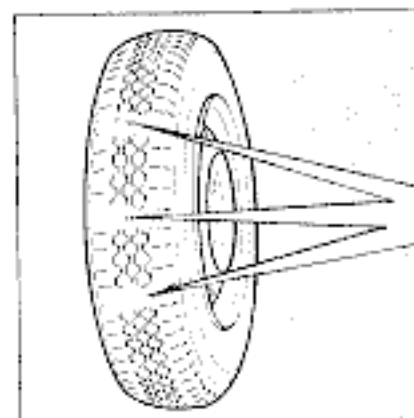
To ensure even and uniform tire wear and long tire life, front and rear wheels and the spare should be changed over regularly.

On completion of rotation inflate tires as specified.



TREAD WEAR INDICATORS

Tread wear indicators are built into the original equipment tires on your car to assist you in determining when your tires have been worn to the point of needing replacement. These indicators are molded into the bottom of the tread grooves and will appear as $\frac{1}{2}$ inch wide bands when tire tread depth becomes $\frac{1}{16}$ of an inch. When the indicators appear in two or more adjacent grooves, tire replacement is recommended (see illustration).



BODY

WASHING THE CAR

The body should be washed frequently, depending on the use of the car, the environmental conditions and the state of the roads. Moreover the lighter is the finish paint shade the more frequent the car should be washed.

Avoid washing the car in the sun and proceed as follows:

- first flush the car all over with jets of water to remove the dust;
- prepare a solution of suitable detergent in water (2% in weight);
- with the solution and a sponge wipe down the whole body;
- rinse thoroughly with plenty of water;
- dry with compressed air, if possible, then with chamois leather.

POLISHING

Note: for cleaning the outside of brakes refer to page 59.

To put fresh gloss on the paintwork, polish once or twice a year with a polish suitable for synthetic or nitrocellulose paint, according to the type of paintwork on the car. On the chromework use gasoline to remove grease and a suitable compound to take out any scratches.

Use only woollen cloth for polishing.

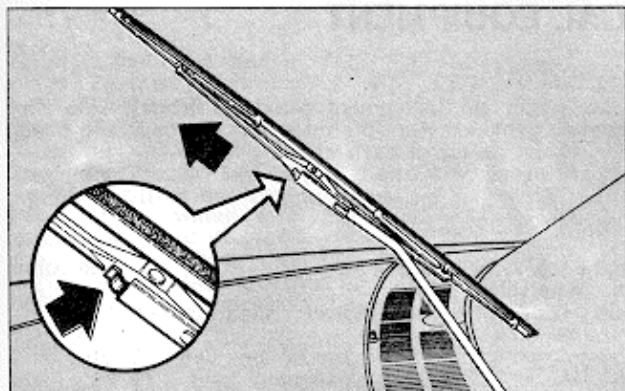
Do not use gasoline or solvents on rubber mouldings and weatherstrips. When refuelling or lubricating, be careful not to splash gasoline or hydraulic fluid on the paintwork.

UPHOLSTERY

Periodically dust the inside upholstery using a vacuum cleaner if possible.

To remove oil and grease stains, use diluted ammonia on the cloth parts and vaseline on the leather.

Use trichloroethylene or neutral soap to remove stains from the carpets. The steering wheel and control knobs may be cleaned with gasoline.



CHANGING WINDSHIELD WIPER BLADES

Never attempt to force by hand the wiper arms in their normal directions of operation to avoid straining them and the drive mechanisms.

To remove the blade:

- turn wiper arm over forward
- Press the tip of locking spring 1 toward the blade; withdraw the blade from arm by keeping the spring depressed.

Caution: take care not to let the locking pin get out of its seat; make sure it is properly seated.

To refit the blade position it on the wiper arm and push in until locking pin engages.

STORING THE CAR

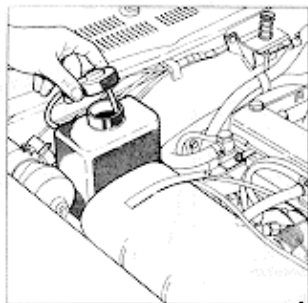
If the car will be left unused for any length of time the following protective steps should be taken:

- add engine oil to the fuel in the tank in such quantity as to get a 2-3 per cent mixture, then run the engine at idle for about 5 minutes to protect the fuel feed system.
- empty the fuel tank; clean the oil filter and the main fuel filter;
- inject a little engine oil into the cylinders thru the spark plug holes and rotate the crankshaft by hand several times in order to spread a film of oil over the cylinder walls;
- remove the battery, store it away from frost, and recharge it once a month; never allow it to become fully discharged or plate sulfation will result;
- jack up the car, clean the tires and slightly deflate them; if tires are removed, dust them internally (and their tubes) with talcum powder; store them in a dark and airy but dry place;
- dust the seats and upholstery with moth preventive;
- cover the car with a dust sheet. To avoid serious damage to the paintwork, do not use polyvinyl-type tarpaulins.

WINDSHIELD WASHER LIQUID

According to environmental conditions replenish the windshield washer container with suitable liquid (better if an antifreeze mixture).

In winter, never add water.



ELECTRICAL EQUIPMENT

FUSEBOXES

The fuseboxes are under the instrument panel, at the left side. The additional fusebox is provided near the main one. To open the boxes loosen the screw at the center of each cover.

Two spare fuses are provided at the center of main box. The circuits protected by fuses, identified by item numbers are as listed below:

MAIN BOX:

- | | |
|---|---------|
| 1 - Courtesy light - Seat belt device | 16 Amp. |
| 2 - Stop lights - Windshield wiper | 8 " |
| 3 - Flasher unit - Glovebox light - Blower - Cigar lighter | 8 " |
| 4 - | 8 " |
| 5 - Instrument light - Engine compartment light - Parking light and telltale - Warning lights | 8 Amp. |
| 6 - Backup lights - Pump solenoid | 8 Amp. |
| 7 - L.H. high Beam - H. B. Warning light | 8 Amp. |
| 8 - R.H. high beam | |
| 9 - L.H. low beam | |
| 10 - R.H. low beam | |

ADDITIONAL BOX

- | | |
|--------------------|--------|
| 1 - Fuel feed pump | 8 Amp. |
| 2 - | " " |

N.B. - Black fuses: 8 Amp. rating
Green fuses: 16 Amp. rating

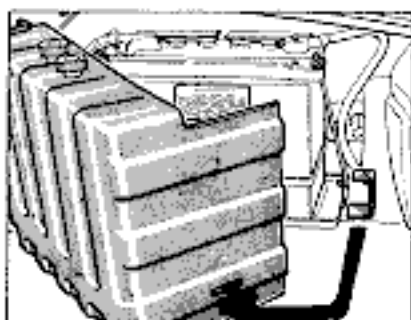
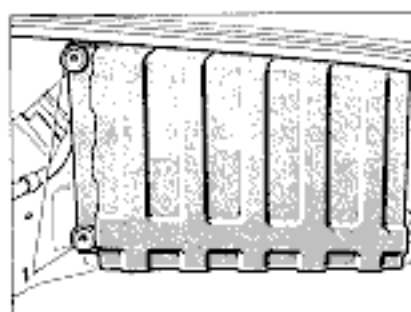
SPARE FUSES

BATTERY

It is at the right side of trunk. To take the protection shield away fully unscrew the knobs 1 and remove the shield from the two threaded pins and the retainer at the rear.

The battery water level should be more than 4.5 mm. (3/16") above the plates. When filling up the battery, use only distilled water; **never add acid.** Make sure that terminals are tight and are sufficiently coated with pure vaseline. Furthermore, the following should be born in mind:

- In summer, check frequently the electrolyte level.
- When recharging the battery, completely disconnect it from the system.
- Never reverse the battery polarity or the alternator diodes will be damaged.
- When electric weldings are carried out on car, disconnect battery making sure the positive terminals is properly insulated. **The engine must be stopped.**
- Do not connect timing lights to the battery-alternator system.



ALTERNATOR

The alternator requires some special cares.

- **It should not be tampered with.**
- Never disconnect the battery terminal of alternator-to-battery cable while the engine is running.
- Avoid overloading the alternator bearings (refer to page 50).
- It is recommended to entrust any inspection or repair work to Alfa Romeo Dealers.

STARTER

Regularly:

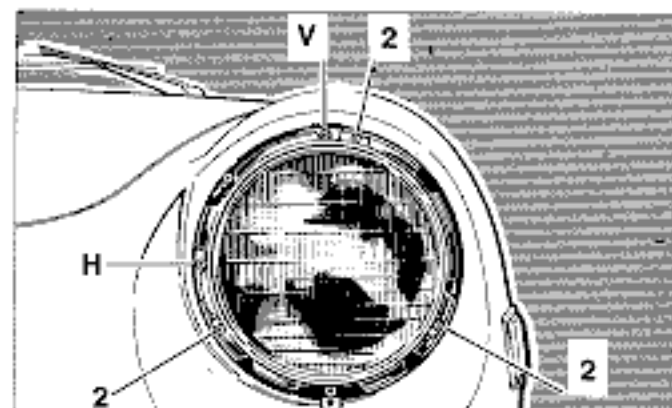
Inspect commutator and brushes.

The brushes must be clean and must slide freely in their holders; brush working face must be cleaned with a cloth soaked with gasoline; the brush spring must apply effective pressure.

When one brush has to be replaced, it is a good rule to replace the other at the same time. Always fit new original brushes of the prescribed type.

After replacing the brushes, run the starter with no load and for such time as is necessary to bed the brush working face to the commutator.

If the commutator is burned or elongated, it must be reworked on a lathe taking care to decrease the diameter of the minimum required only; after machining, undercut the mica between the segments.



HEADLAMP BEAM SETTING

Warning: distance between centers of light beams and level ground **must not** be lower than 619.76 mm (24.4"). For setting the beams it is recommended to use a mechanical aiming device meeting the SAE J 602 requirements.

H - screw for horizontal adjustment of headlamp beams

V - screw for vertical adjustment of headlamp beams

REPLACING SEALED BEAM UNITS

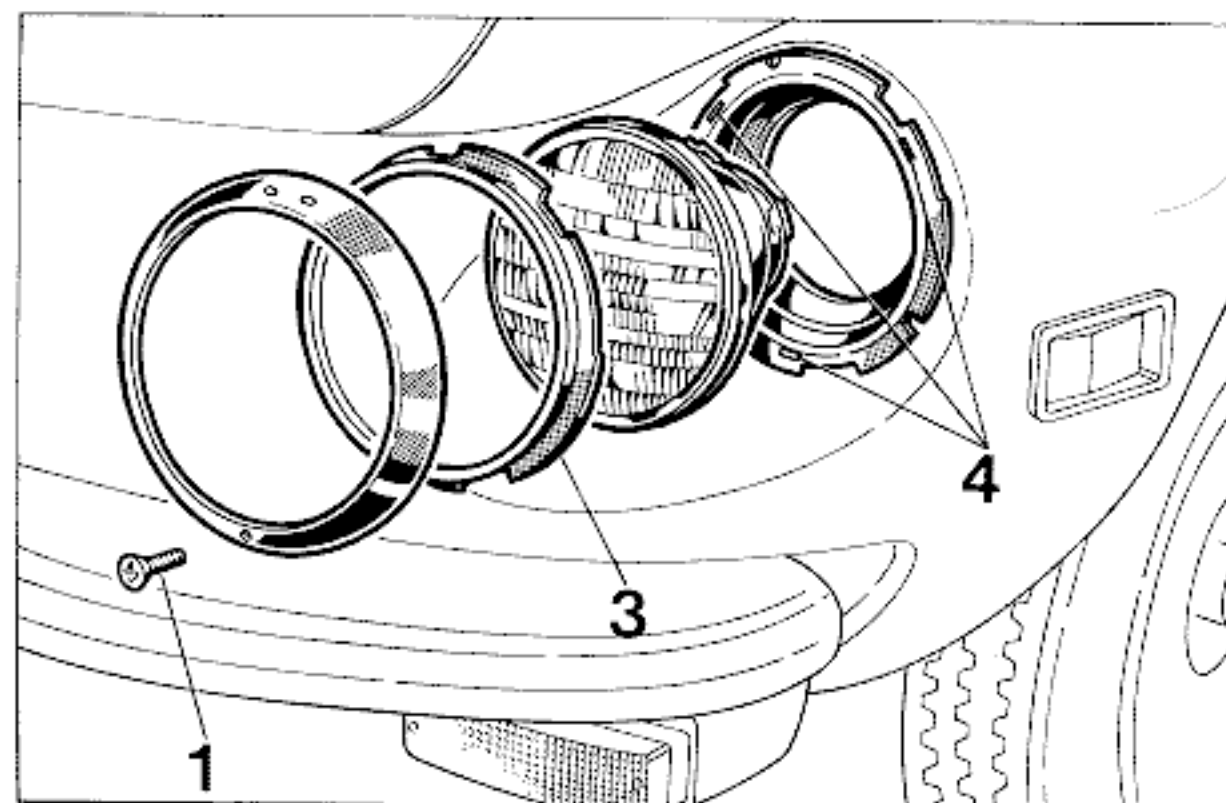
Loosen the outer trim ring attaching screw 1 and remove the trim ring by bending slightly forward the ring bottom. Loosen the three screws 2 securing the ring 3 (take care not to disturb the setting of adjusting screws V and H); rotate ring 3 counterclockwise and remove it. Hold the sealed beam unit firmly to prevent it from dropping out.

Disconnect the feed wire connector from sealed beam unit. Fit the connector to the new sealed beam unit. Mount the unit in such a way that the glass «bosses» seat properly into the notches 4 in the unit support.

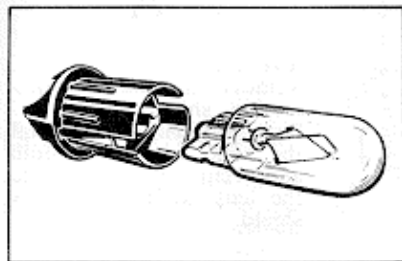
Note: the sealed beam unit can be fitted only if correctly positioned. Therefore, if difficulties arise, rotate the unit by 120 degrees clockwise or counterclockwise until it is properly fitted to its support.

Place the ring 3 in position onto the support and rotate the ring clockwise; then, tighten screws 2.

Fit the two retainers at the trim ring top to their seats and retighten the attaching screw 1.

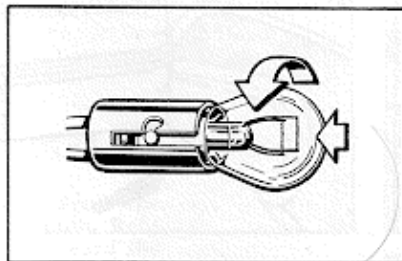


REPLACING BULBS



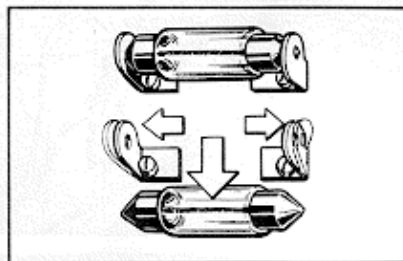
A

All glass type:
to remove, grasp the bulb socket with the fingers and withdraw the bulb.



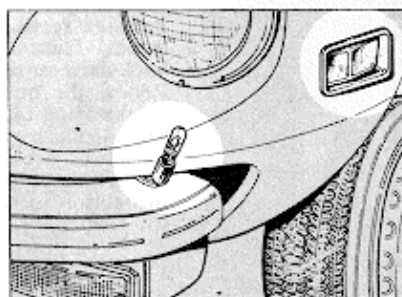
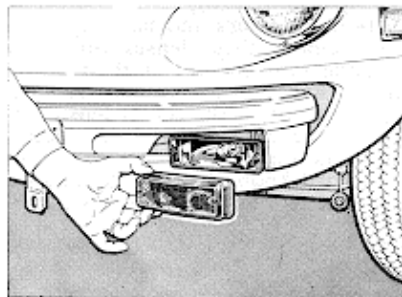
B

Bayonet type mount:
push the bulb in rotate it counter-clockwise and withdraw the bulb.



C

Cylindrical type:
snap the bulb off putting the terminal springs apart.



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B

Front direction indicators and parking lights

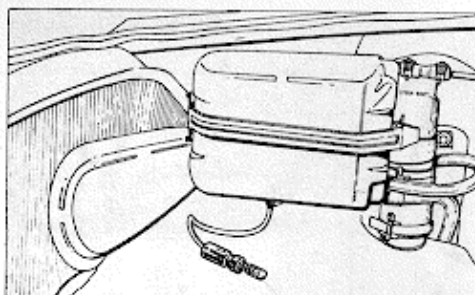
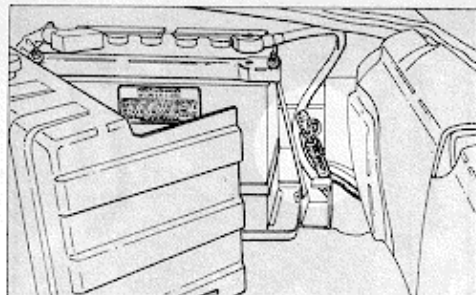
Slacken the lens attaching screws and remove the lens. Renew the bulb and refit lens.

A

SIDEMARKER LIGHTS

Front

From inside, the wheelhouse, snap the bulb socket off the lens; renew the bulb and refit the socket to the lens.

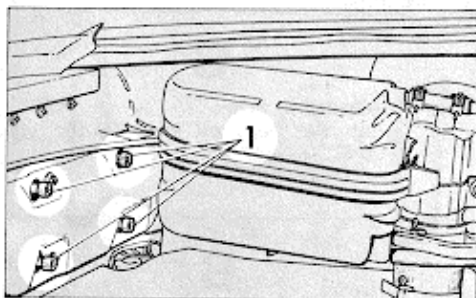


A

R.H. rear

Remove the battery protection shield.

Snap the bulb socket off the lens; renew the bulb and refit the socket to the lens. Refit the battery shield.



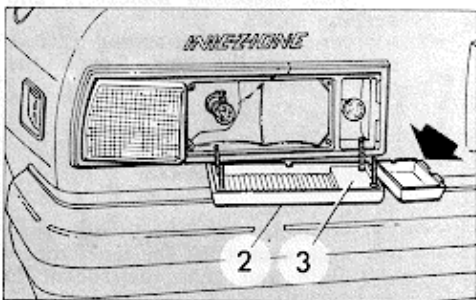
L.H. rear

Remove the bulb socket (from under the liquid/vapor separator) and renew the bulb. Refit the socket to the lens.

B

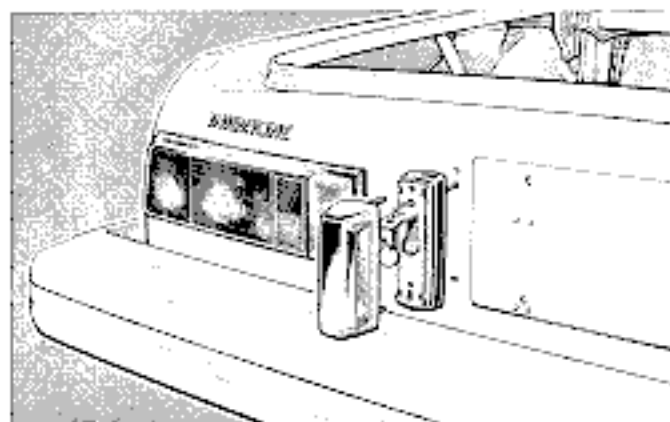
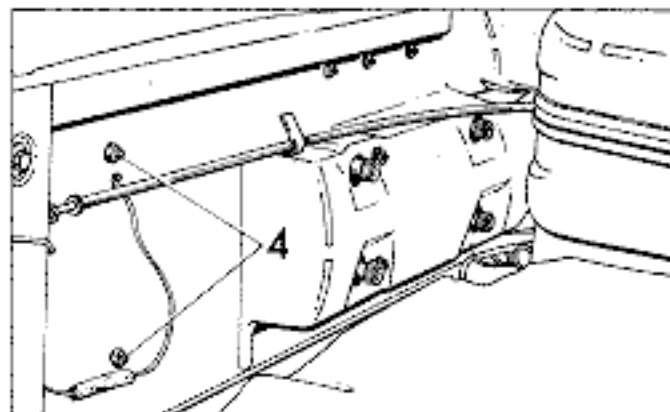
Tail direction indicators, parking and stop lights - Back up lights.

Raise the trunk back panel rubber protection. Unscrew the four knurled knobs 1 and, from the outside, remove the center lens 2 of the light unit taking care to prevent the side sections (direction indicators and back up light lenses) from falling. To remove these lenses tilt them backward until the locating tabs get out of their seats. Renew the bulb. Refit the two side lenses making sure the locating tabs seat properly. Refit the center lens carefully (reflector 3 nearer to the center of the car). Keep all lenses pressed against the tail panel and from inside the trunk tighten the knurled knobs 1. Refit the rubber protection in such a way that its bottom edge fits under the carpet.



LICENSE PLATE LIGHTS

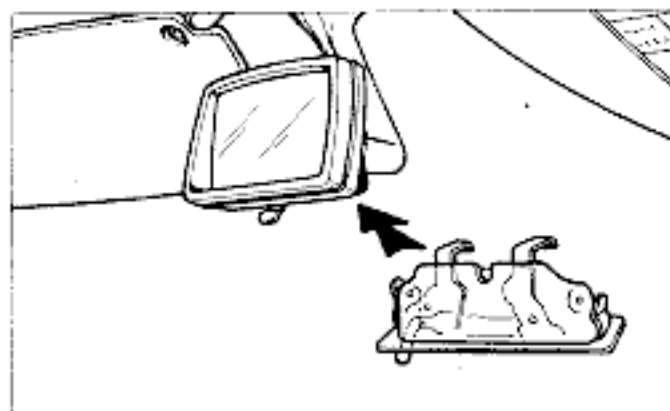
Raise the trunk back panel rubber protection. Loosen nuts 4 securing housing to car's body. From the outside remove the housing and renew the bulb. Refit the housing making sure the lens is pointing toward the license plate and the seating gasket fits properly against body panel. Retighten the two nuts 4 and lower the rubber protection in such a way that its bottom edge fits under the carpet.

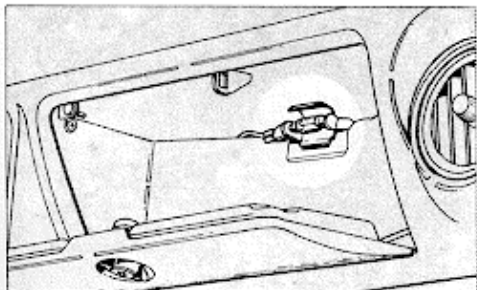
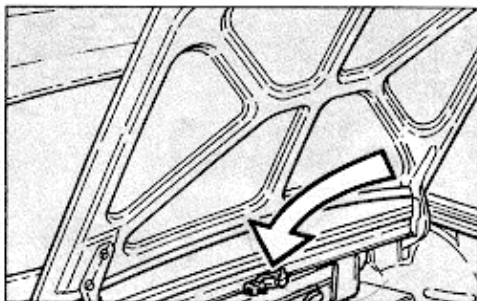
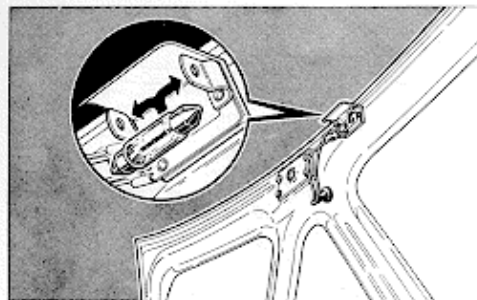


C

COURTESY LIGHTS

Snap off the light unit. Renew the bulb and reht the unit, making sure it is properly positioned (the bent ends of terminal springs should be pointing toward the front of the car).



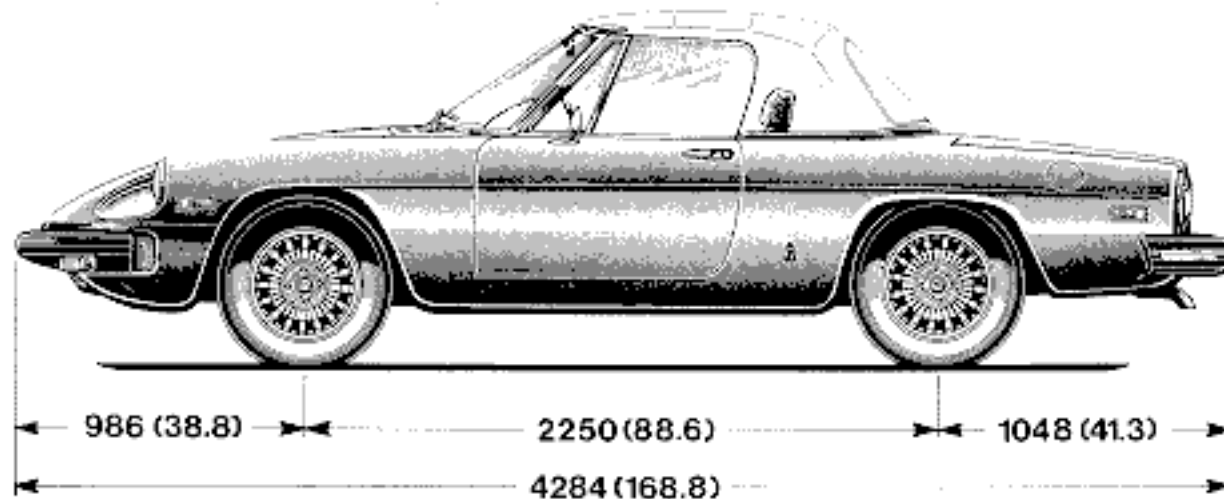
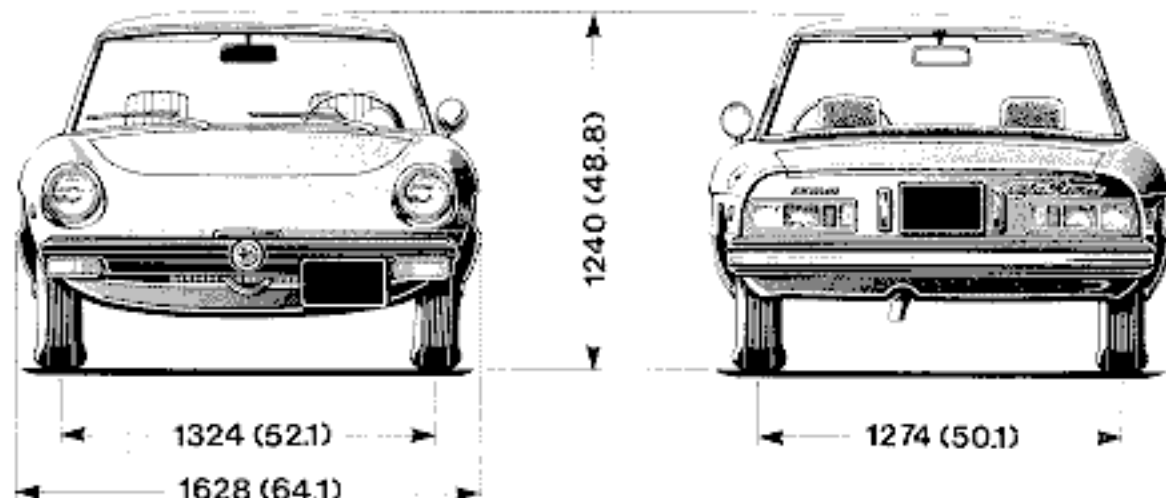


C

Engine glove and baggage compartment lights
Remove bulb and change it.

GENERAL DATA

Alfawiki.nl



Dimensions in millimeters (and inches). Height under static load.

SPECIFICATION

ENGINE

Number and layout of cylinders 4 in line

Bore and stroke 84×88.5 mm

Total displacement 1962 cc

CHASSIS

Turning circle (10,400 mm) 34.5 ft

Designated seating capacity 2

Tires 165 HR 14

Curb weight kg 1114 (2455 lbs)

Trunk capacity dm³ 300 (cu. ft. 10)

Towing gross weight kg 800 (1764 lbs)

PERFORMANCE (WITH 41:9 FINAL DRIVE)

AFTER BREAKING IN maximum speeds						
GEAR	1st	2nd	3rd	4th	5th	Rev.
mph.	27	45	66	88	115	29

The performances given are related to the use of the vehicle in average travelling conditions.

IDENTIFICATION

Identification and/or specification labels and stampings are located as follows:

Vehicle identification number

- 1 Firewall
- 2 Windshield plate
- 3 D.O.T. certification label

Production date

- 3 D.O.T. certification label

Gross vehicle weight

- 3 D.O.T. certification label

Engine number

- 4 Left rear side of engine block

Exhaust emission data - Compliance with air pollution regulations

- 5 Emission data label

Useful load - Seating capacity - Tire pressure

- 6 Label on inner side of glove compartment lid

Break in data

- 7 Label on passenger's sun visor

Lubrication data

- 8 Lubrication data label

Spark plug data

- 9 Spark plug data label

Fuel requirements

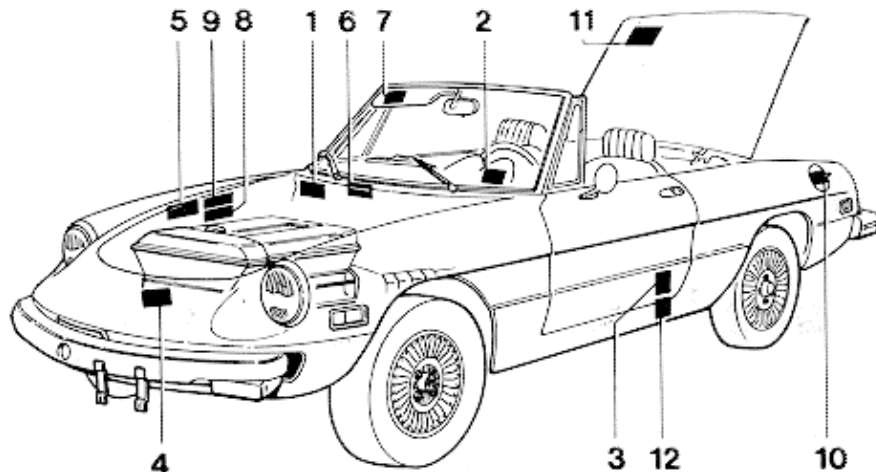
- 10 Label on fuel tank filler port cover

Paint

- 11 Paint label

Compliance with air pollution regulations

- 12 Label on jamb



When contacting a Member of our Service Organization please state: car model no., Vehicle identification number, registration date, distance covered and car's purchase data.

ELECTRICAL EQUIPMENT ITEMS

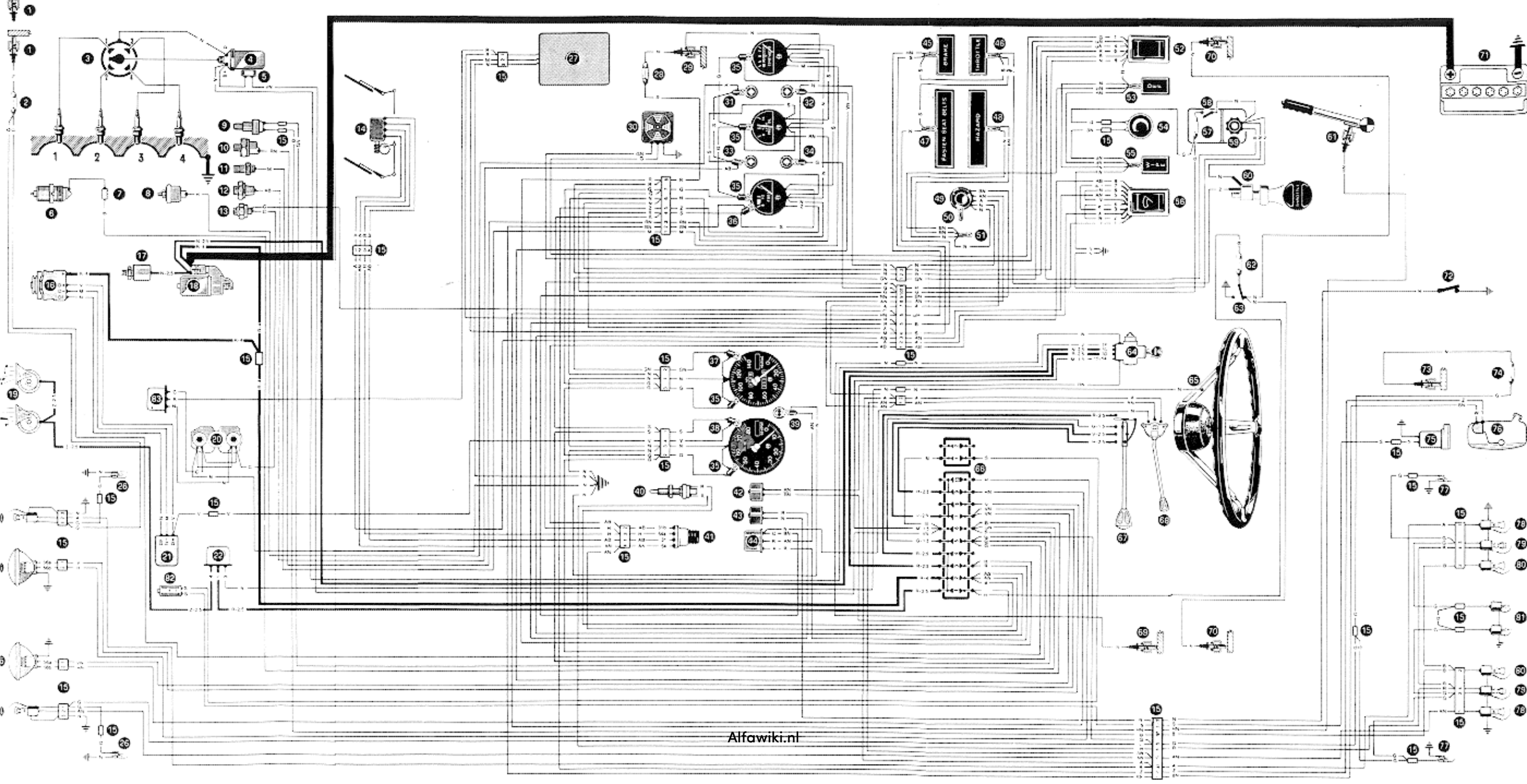
- | | |
|---|--|
| 1 Engine compartment light switch | 34 Parking light warning |
| 2 Engine compartment light - 5 W | 35 Instrument lights |
| 3 Ignition distributor | 36 Fuel reserve warning light |
| 4 Coil | 37 Blower warning light (two brightness levels) |
| 5 Resistance (off during starting) | 38 Alternator warning light |
| 6 Fuel cut-off solenoid | 39 Direction indicators warning light |
| 7 Microswitch | 40 Stop lights switch |
| 8 Low fuel pressure warning light switch | 41 Windshield washer switch foot operated |
| 9 Back up light switch | 42 Key-remind buzzer |
| 10 Oil pressure gage sender | 43 Safety belt buzzer |
| 11 Coolant thermometer sender | 44 Flasher unit |
| 12 Low fuel pressure warning light switch | 45 Warning light for fluid level, service brake pressure and parking brake |
| 13 Service brake pressure warning light switch | 46 Hand throttle warning light |
| 14 Windshield wiper (two speed) | 47 FASTEN SEAT BELTS light |
| 15 Junction boxes and connectors | 48 HAZARD light |
| 16 Alternator | 49 Emergency flashers switch |
| 17 Cold start device solenoid | 50 Emergency flasher pushbutton warning light |
| 18 Starter | 51 Heater control panel light |
| 19 Horn | 52 Blower switch |
| 20 Brake fluid level warning light switches | 53 DEF light |
| 21 Voltage regulator | 54 Dimmer for HAZARD, DEF, WIPE lights and heater control panel light |
| 22 Horn relay | 55 WIPE light |
| 24 Front direction indicators-emergency flashers and parking lights | 56 Windshield wiper switch |
| 25 Headlamp Hi/Low - Sealed beam | 57 Ash tray light - 5 W |
| 26 Side marker lights, front - 3 W | 58 Ash tray light switch |
| 27 Safety belt device | 59 Cigarette lighter |
| 28 Glove compartment light | 60 Hand throttle warning light switch |
| 29 Glove compartment light switch | 61 Parking brake warning light switch |
| 30 Blower motor (two speed) | 62 Courtesy light - 5 W |
| 31 Low oil pressure warning light | 63 Courtesy light switch (in mirror) |
| 32 High beam warning light | 64 Ignition and starting switch |
| 33 Low fuel pressure warning light | |

- 65 Horn control
- 66 Fuseboxes
- 67 Parking lights, headlamps and flashing switch
- 68 Direction indicators switch
- 69 Key-reminder buzzer switch
- 70 Courtesy light switch on door jambs
- 71 Battery - 12 V / 60 Ah
- 72 Belt switch (driver's side)
- 73 Trunk light switch
- 74 Trunk light
- 75 Electric fuel pump
- 76 Fuel level sender
- 77 Side marker lights, rear - 3 W
- 78 Rear direction indicators - 21 W
- 79 Parking and stop lights-emergency flashers - 5/21 W
- 80 Back-up lights - 21 W
- 81 License plate lights - 5 W
- 82 Inertia switch
- 83 Brake warning light relay

CABLE COLOR CODE

A	blue	AB	blue/white
B	white	AN	blue/black
C	orange	BN	white/black
G	yellow	GN	yellow/black
H	grey	HN	grey/black
M	brown	RN	red/black
N	black	SN	pink/black
R	red	VN	green/black
S	pink	ZN	violet/black
V	green	N-R	red-striped black
Z	violet	N-V	green-striped black

The figure following the color code on the diagram shows the wire gauge in mm².
Where not shown the wire gauge is 1 mm².



RECOMMENDED LUBRICANTS

PART	Classification	Commercial equivalents	
		 Agip	Shell
Engine	10 W/50 API SE ASTM SE SAE SE	AGIP SINT 2000 SAE 10 W/50	SHELL Super Motor Oil 10 W/50
Transmission Gearbox Steering box and differential	SAE 85 W/90 API GL 5	AGIP F.1 Rotra MP SAE 85 W/90	SHELL Spirax 90 HD
Spline on propeller shaft slip yoke	SAE NLGI 1	AGIP F.1 Grease 15	SHELL Retinax G
Front wheel bearings	SAE NLGI 2/3	AGIP F.1 Grease 33 FD	SHELL Retinax AX
API - American Petroleum Institute ASTM - American Society for Testing Materials SAE - Society of Automotive Engineers NLGI - National Lubricating Grease Institute		In the event the above lubricants would not be available refer to the directions given under «lubrication» on p. 32.	

RECOMMENDED TIRE PRESSURE (COLD)

Make		FRONT		REAR	
		PSI	kg/cm ²	PSI	kg/cm ²
Ceat	D 2				
Continental	Conti TT 714				
Firestone	Cavallino Sport 200	24	1,7	26	1,8
Good Year	G 800 Grand Prix				
Pirelli	Cinturato HR				
Kebler Colombes V 10 GT		24	1,7	29	2
Michelin XAS		21	1,5	26	1,8

CAPACITIES

Coolant		U.S.A.	METRIC	Oil		U.S.A.	METRIC
Alfa Romeo Antifreeze . . . abt.		2.5 gals	9,7 l	Engine when full* abt.		7.1 qts	6,6 l
Fuel*				danger level abt.		4,75 qts	4,4 l
Tank capacity abt.		12 gals	46 l	Transmission abt.		3.8 pts	1,85 l
Reserve abt.		1.3-2.1 gals	5 - 8 l	Differential abt.		3.0 pts	1,4 l
* Fuel requirements (refer to inside front cover)				Steering box abt.		.8 pt	0,4 l
				* This quantity is that needed for regular changing. The total amount of oil in the circuit (pan, filter and passages) is abt.		7.8 qts	7,16 l

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