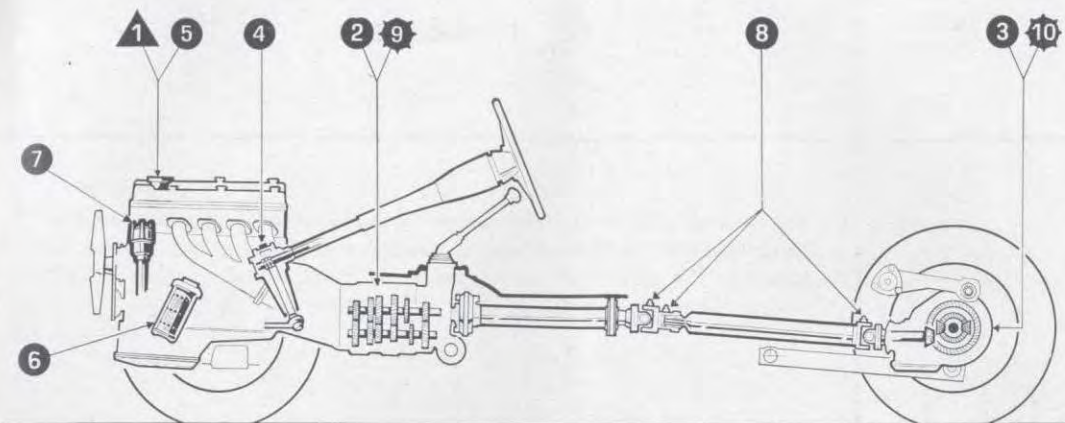




RECOMMENDED LUBRICANTS

PART	Classification	Commercial equivalents	
		AGIP	Shell
Engine	SAE 20 W/40 API MS	AGIP F.1 Supermotoroil Multigrade 20 W/40	SHELL Super Motor Oil " 100 "
Gearbox Steering box and differential	SAE 90 API EP	AGIP F.1 Rotra Hypoid SAE 90	SHELL Spirax 90 EP
Propeller shaft universal joints and sliding yoke	NLGI 1	AGIP F.1 Grease 15	SHELL Retinax G
Front wheel bearings (see maintenance schedule)	NLGI 2/3	AGIP F.1 Grease 33 FD	SHELL Retinax AX

SAE - Society of Automotive Engineers
 API - American Petroleum Institute
 NLGI - National Lubricating Grease Institute

In Countries where the recommended lubricants are not available, it is possible to replace them with products of other leading makes provided that in accordance with the prescribed specifications and grades.

**ENGINE
LUBRICATION**

Lubrication

The engine is pressure lubricated by a gear pump mounted on the front cover of crankcase and driven by a spindle through a pinion keyed to the crankshaft front end.
The oil pressure is adjusted by a relief valve.

Oil level

When checking push the dipstick all the way down. Never allow the oil to fall below the minimum or, while topping up, to exceed the maximum level.

It is recommended to top up with the same type of oil as that in the engine.

**Oil change
(engine
warmed up)**

With the engine stopped, drain off old oil thoroughly.
Remove the filter body and clean the inside of it.
Replace the filter element.
Refill with new oil.

**Oil replacement
after engine
reconditioning**

With a reconditioned engine follow the instructions given for the **running in period**.

The oil pressure is adjusted by a valve in the pump body. **If the pressure falls below the minimum values**, an authorized Alfa Romeo Service Station must be consulted to trace and remedy the fault. Lubricating circuit faults are indicated by a red warning light, too (see page 16).

Maintenance

Oil pressures with hot engine		
Engine running fast	min. 50 psi	3.5 Kg/cm ²
	max. 65-70 psi	4.5-5 Kg/cm ²
Engine idling	min. 7-14 psi	.5-1 Kg/cm ²



Maintenance

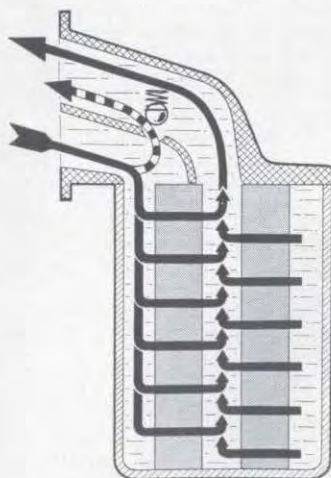
To remove impurities the engine oil is filtered by a full-flow filter in series with the delivery circuit. The filter is fitted with a valve that bypasses the element if it should become clogged.

When replacing the filter element thoroughly clean the case.

It should be remembered that the periodical replacement of the element, perfect cleaning and careful assembly of the filter are essential for best engine performance.

On reassembling the filter, always replace the seal with a new one.

After refitting the filter to the engine, make sure that there are no oil leaks.



OIL FILTER

Oil flow with normal operation

Oil flow in an emergency

AT THE FIRST**450-750 mi.**

700/1200 Km

3100-3750 mi.

5/6000 Km

— **Coupon A** from the Service Coupon Book.— **Coupon B** from the Service Coupon Book.**EVERY****300 mi**

500 Km

1

Check tyre inflation pressures.

2

Clean air filter element (more frequently when driving on dusty roads usually).

3

Check battery electrolyte level.

4

Check tension of generator & fan driving belt.

5

Check timing chain tension.

6

Check contact-breaker point gap. Check timing.

7

Clean wire gauze of crankcase ventilation system.

8

Check brake pads.

9

Clean carburettor strainers & jets

10

Check spark plugs.

11

Check level of fluid in brake & clutch reservoir.

12

Check clutch pedal free travel.

13

Check valve clearances and adjust, if necessary.

—

Check hoses of cooling circuit and heating system and replace, if necessary.

14

Change brake fluid-or once a year whichever comes first.

15

Check steering linkage for play.

16

Replace air filter element (more frequently when driving on dusty roads usually).

17

Check front wheel toe-in and caster.

18

Replace engine coolant mixture-or once a year whichever comes first.

—

Inspection of brake system.

—

Tighten all bolts and nuts.

19

Adjust front wheel bearing clearance & repack with grease.

EVERY**3750 mi.**

6000 Km

EVERY**7,500 mi.**

12,000 Km

EVERY**11,250 mi.**

18,000 Km

EVERY**15,000 mi.**

24,000 Km

EVERY**18,750 mi.**

30,000 Km

EVERY**22,500 mi.**

36,000 Km

EVERY**30,000 mi.**

48,000 Km

OCCASIONALLY

Check level of coolant in engine cooling system reservoir.

7,500
12,000 Km.

11,250
18,000 Km.

15,000
24,000 Km.

18,750
30,000 Km.

22,500
36,000 Km.

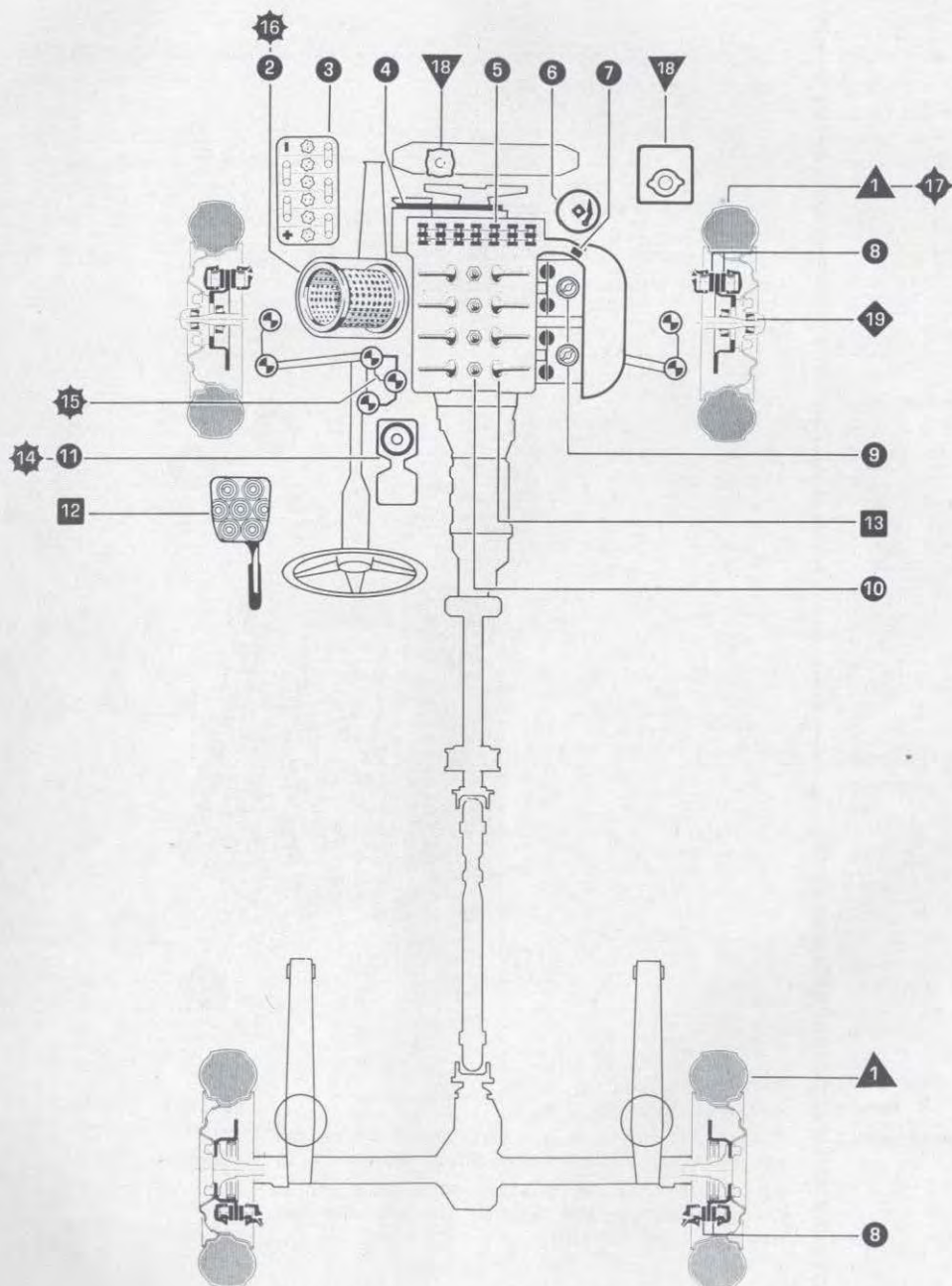
26,250
42,000 Km.

30,000
48,000 Km.

MILEAGE COVERED

TICK EACH ITEM AT THE RESPECTIVE MILEAGE

MAINTENANCE



NUT TIGHTENING

Engine maintenance

Tightening torque specifications

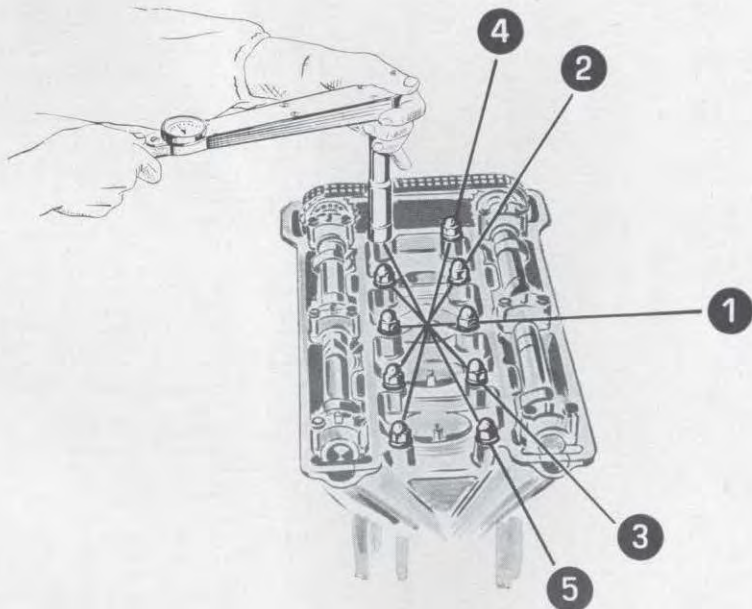
To avoid stressing the metal, tighten as follows **with a torque wrench set to the prescribed torque.**

Main bearing caps: lubetorque to . . .
Connecting rod bearing caps:
lubetorque to
Camshaft journal caps: lubetorque to .

lb-ft	Kgm
34-36	4.7-5
36-38	5-5.3
15-16	2-2.25

Cylinder head nuts

Tightening sequence



Tightening torque specifications

After reconditioning:

lubetorque when cold to

Then warm up the engine by actually driving the car and when hot **retighten without unscrewing to**

After tested the car, slacken, **when cold** and in proper sequence, the nuts **by one and one half turn and lubetorque to**

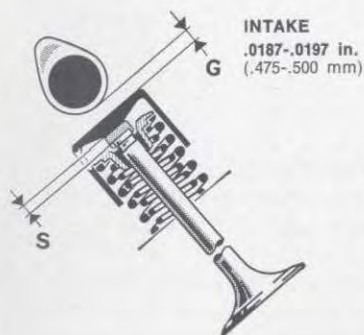
lb-ft	Kgm
52.1-53.5	7.2-7.4
55-55.7	7.6-7.7
52.1-53.5	7.2-7.4

The V-mounted overhead valves are directly operated by two camshafts acting through oil bath cups.

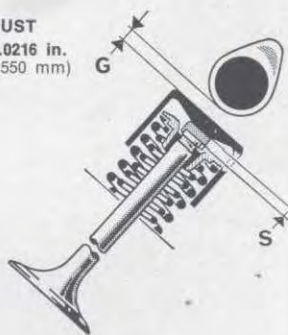
When the engine is cold, carefully measure the clearance **G** with a feeler gauge. If the clearance is not as specified, remove camshafts and valve cups; measure the thickness **S** of the adjusting pad on each valve stem and replace it with another of proper thickness so that the clearance is the correct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

To facilitate this adjustment the pads are made available in a series of thicknesses ranging from **1.3 to 3.5 mm** (.05 to .14 in.) in increments of **.025 mm** (.001 in.).

Valve clearance adjustment

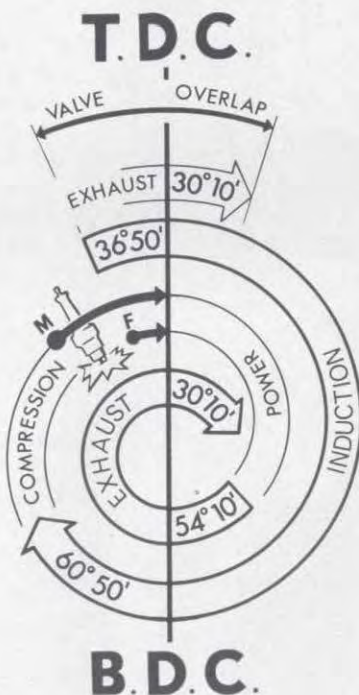


EXHAUST
 .0206-.0216 in.
 (.525-.550 mm)



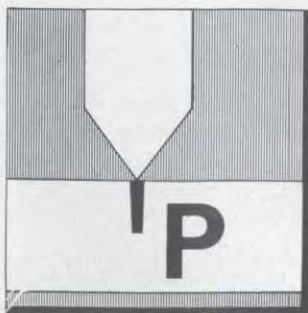
M
 MAXIMUM
 ADVANCE

F
 FIXED
 ADVANCE



Checking and
timing

Top dead centre



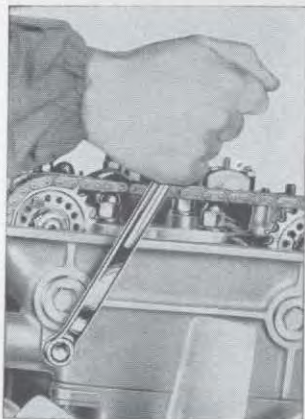
The valve timing is correct when:

- 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 journal bearings.

No. 1 cylinder cams must be positioned as shown in the illustration, i.e. **POINTING OUTWARD**.

Chain tension
adjustment

Proceed as follows:

- slacken off the setscrew securing the chain tensioner;
- run engine at idling speed to allow the tensioner to tighten the chain;
- lock the chain tensioner set-screw firmly.

Air filter

The air filter is equipped with a pleated element offering the maximum filtering surface. At the prescribed intervals remove the cover of the filter, withdraw the element and clean it carefully from inside with low pressure compressed air. Moreover at the prescribed intervals change the element.

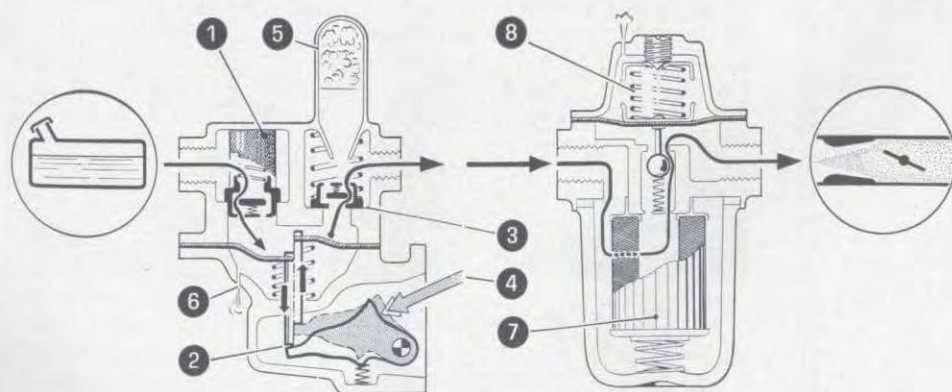


The fuel supply is effected by a mechanical pump located on the right-hand side of the engine and actuated by the distributor drive shaft. The fuel sucked by the fuel pump reaches the carburettor through a bowl filter on the right-hand side of the engine compartment. The filter incorporates a device which regulates the outlet pressure of the fuel.

At the prescribed intervals clean or change the filter element, if necessary.

Fuel pump

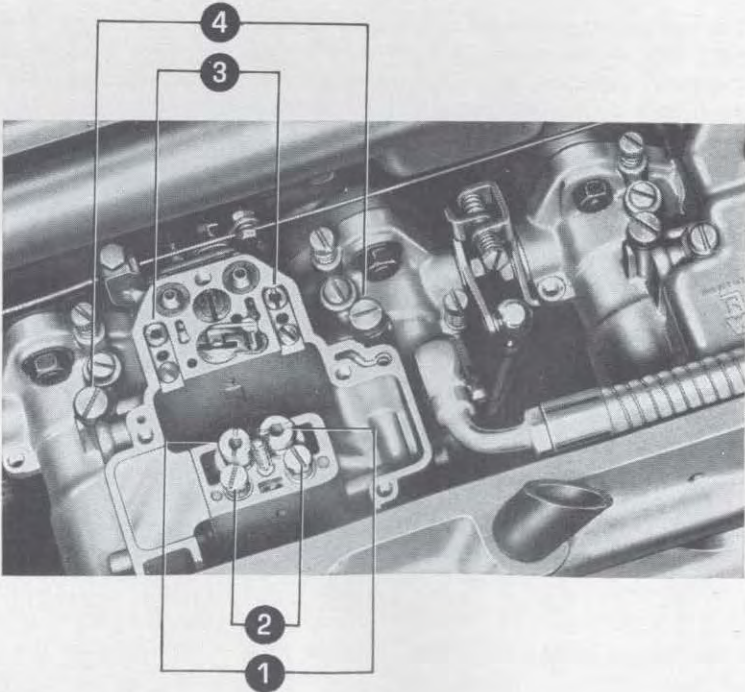
- 1 Filter and inlet valve
- 2 Diaphragm control
- 3 Outlet valve
- 4 Push rod operating the pump
- 5 Vapour trap
- 6 Vent hole
- 7 Filter element
- 8 Pressure regulating device



Rating

1	Main jets	125
	Main air restrictor jets	200
2	Idling jets (axial passage 170)	50 F 14
	Air restrictor	120
3	Choke jets	65 F 5
4	Acceleration pump jets	35
	Venturis (mm)	32

2 CARBURETTORS
WEBER
40 DCOE 32

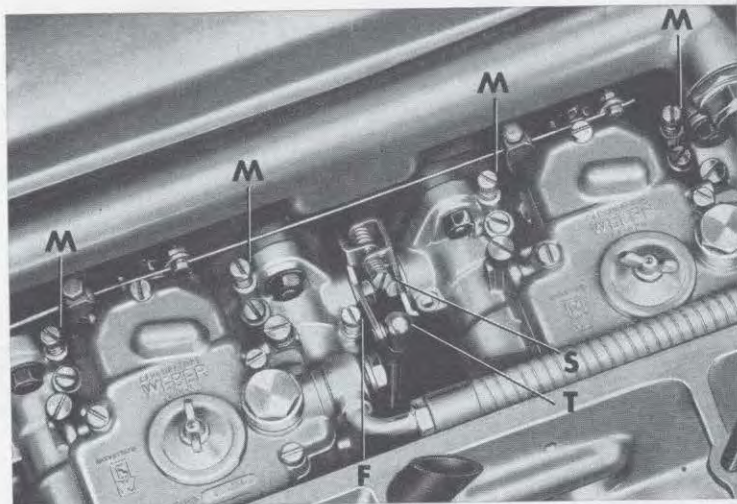


F Adjusting screw for minimum opening of throttle

M Idling mixture adjusting screw

S Screw for synchronizing throttles of the two carburettors

T Joint for control linkage (to pedal)



Check the ignition timing and inspect the electric system (spark plugs, distributor, coil etc.) for proper operation.
Remove the air filter element and clean thoroughly.
Check the flexible mounts between carburetors and intake manifold for tightness.

Detach the control linkage **T** from carburetors.
Slacken the screws **F** and **S** almost fully.
Operate the throttles a few times, making sure that there is no binding.
Fully depress the throttle control lever of rear carburettor so that the throttles are fully closed; then screw in the screw **S** until contact is made.

Back off the screws **M** half a turn from closed position.
Tighten the screw **F** to contact, then screw it in **one more turn** to ensure feeding to engine.
Connect the control linkage **T** to carburetors.
Start the engine and warm it up. If necessary, back off the screw **F** very slowly until the engine runs at about 600-700 r.p.m.

Preparatory steps

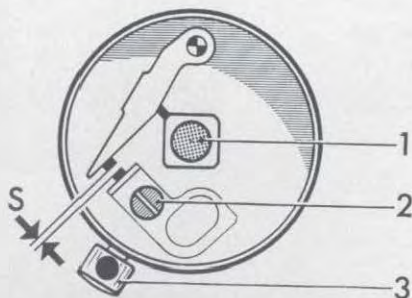
Aligning the throttle valves

Idle

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

Firing order: 1 - 3 - 4 - 2

Ignition distributor



At the prescribed intervals :

Check with a feeler gauge the contact-breaker point gap:

$$S = .0138 \text{ to } .0157 \text{ in. } (.35-.40 \text{ mm})$$

Adjust by means of screw 2 if necessary.

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

Soak the felt 1 with oil.

Apply some drops of oil through the lubricator 3.

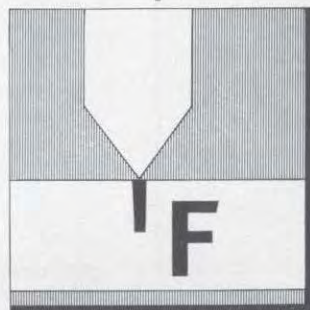
Lightly smear the distributor cam with grease.

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.

Checking the ignition timing

To check the ignition timing, proceed as follows:

- 1 rotate the crankshaft to bring no. 1 cylinder piston to the compression stroke, that is with both valves closed;
- 2 by slightly rotating the crankshaft, bring the fixed advance mark **F** cut in the drive pulley into line with the reference plate;
- 3 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.



FIXED ADVANCE

2° / 4° BTDC

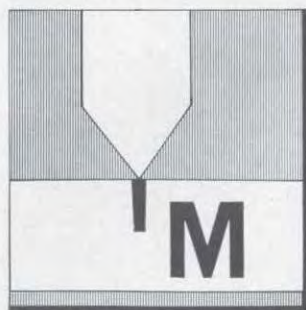
A more accurate check can be made with a **stroboscopic gun** as follows:

run the engine at about 5300 rpm and direct the light from the stroboscopic gun onto the pulley: if the timing is correct, the **M** (max. advance) stamped on the pulley will be seen in line with the reference plate.

If it is found that the max. advance is greater or less than the prescribed value, adjust the fixed advance accordingly, as it is better to have correct timing at high speeds.

MAX. ADVANCE

40° / 43° at 5300 rpm



**Timing
adjustment**

If the timing requires adjustment proceed as follows:

- 1 unscrew the nut on the bolt securing the distributor body;
- 2 rotate the distributor body anti-clockwise or clockwise according to whether it is necessary to advance (**A**) or to retard (**P**) the ignition setting;
- 3 retighten the nut, taking care not to move the distributor body.

**Timing after
removal
of distributor
from engine**

To re-set the timing after the distributor has been removed from the engine proceed as follows:

- rotate the crankshaft to bring No. 1 piston to the compression stroke, that is with both valves closed;
- by slightly rotating the crankshaft, bring the fixed advance mark **F** into line with the reference plate;
- remove the distributor cap and rotate the drive shaft by hand to bring the rotor arm in line with the contact for No. 1 cylinder.
- make sure that in this position the contact-breaker points are about to open;
- then without disturbing the drive shaft, mount the distributor on its bracket and tighten the distributor bracket bolt.
- check the ignition timing as described in the previous page.

The spark plugs are of the type with four points and a central electrode.

The only maintenance required is occasional cleaning with a brush of the central and earth electrodes.

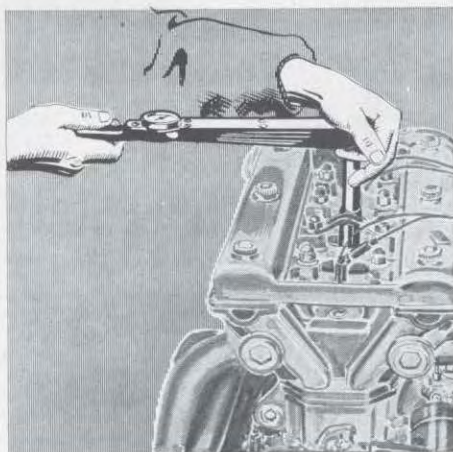
No routine adjustment is necessary of the gap between the electrode and points.

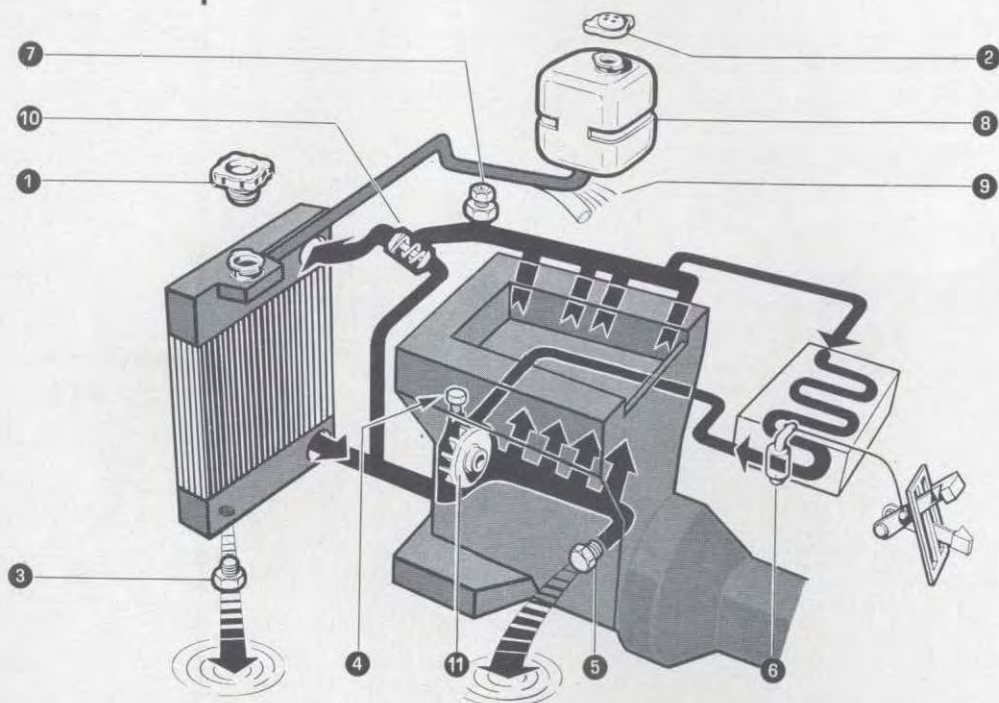


Spark plugs LODGE

2 HL

The spark plugs should be tightened when cold to a torque of **18-25.3 lb-ft** (2.5-3.5 kgm); lubricate the threads with graphite grease before fitting.





Diagram

- 1 Radiator filler plug
- 2 Reservoir filler plug
- 3 Radiator drain plug
- 4 Bleed screw on pump
- 5 Drain plug on crankcase
- 6 Heater cock
- 7 Bleed screw on manifold
- 8 Reservoir
- 9 Supply line from reservoir to radiator
- 10 Thermostat
- 11 Centrifugal pump.

The cooling circuit is provided with a compensating reservoir containing a special **Alfa Romeo Coolant Mixture** which gives full protection against freezing down to -20°C (-5°F).

Cooling circuit

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

Occasionally, 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 ».

To top up use Alfa Romeo Coolant Mixture drawn from suitable containers available by **Alfa Romeo Service Stations**.

If too frequent a topping up is required, have the cooling system checked by an Authorized Workshop.

Should sudden and excessive leaks be experienced from the system, the use of fresh water is allowed provided that the specified mixture is restored and trouble remedied **as soon as possible** by an Authorized Workshop.



WARNING

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

Changing the
coolant
mixture

Every 18,750 mi - 30,000 Kms (or once a year whichever comes first) get the coolant mixture renewed by an Alfa Romeo Service Station after the circuit has been flushed with a suitable descaling compound.

Refilling
the system

Proceed as follows: (refer to the illustration on page 44):

Draining:

- Remove radiator filler plug 1.
- Unscrew the drain plug 3 and the bleed screw 7 on manifold.
- Turn on the heater cock 6.
- Remove the drain plug 5 on crankcase; let liquid drain off and empty the reservoir 8 by detaching the pipe 9.
Reinstall drain plugs 3 and 5 and reconnect the pipe to the reservoir.

Replenishing:

- Remove radiator and reservoir filler plug and turn on the heater cock.
- Open the bleed screw 7 on manifold and 4 on pump.
- Pour coolant mixture through radiator filler port until coolant escapes from bleed screw 4; then screw in the latter. Go on in adding mixture until it appears at the bleed screw 7 on manifold.
- With the bleed screw on manifold opened and no plug on filler port of radiator start the engine and keep it running for a few seconds in order to bleed air completely.
- Close the bleed screw on manifold.
- Add mixture to radiator filler port until full.
- Add mixture also to reservoir until « Max » level is reached.
- Put plugs on reservoir and radiator.

Engine maintenance

COOLING SYSTEM

The mixture in the cooling circuit gives full protection against freezing down to -20°C . (-5°F .).

In places where the temperature falls below -20°C , the mixture can be strengthened as directed on page 17.

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

IMPORTANT NOTE

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.

Therefore it is necessary to check the belt tension at the prescribed intervals.

Adjusting the tension of fan, coolant pump and alternator driving belt

The tension is correct when on pressing the belt down the amount of play is approximately $\frac{1}{2}$ in. (10-15 mm).

To tighten the belt unscrew the nut on the adjusting arm and move the alternator outwards.

Carefully retighten the nut after adjusting the belt tension.

