

## WARNINGS

To keep the car in good operating conditions, the following recommendations should be adhered to carefully:

**Every 500 kms** (or when refuelling) check:

- the engine oil level;
- the level of the fluid in the coolant circuit;
- the level of the brake/clutch fluid;
- the presence of water in the fuel filter (turbodiesel versions only);
- the level of the fluid in the windscreen wiper/washer system.

## Engine oil and filter

To be changed at the specified intervals.  
At all events, they must be changed once a year.

## Air cleaner

If the car is habitually used on dusty roads, the air cleaner should be changed more often than specified.

## Fuel filter (TD versions only)

The different degree of purity of the fuel may make it necessary to change the filter at shorter intervals than those foreseen.

Irregular functioning of the engine or reduced performance levels may indicate the need to change the fuel filter.

## Brake pads

Wear of the front brake pads is indicated by the turning on of a warning light on the instrument cluster. When changing the front pads, also check the rear ones.

However, depending on the use of the car, the rear pads might not need to be changed immediately, in which case, you are recommended to check them at a later stage.

## Brake and clutch fluid

The brake fluid is hygroscopic, i.e. it absorbs moisture.

To avoid braking faults, the brake fluid must be changed every two years, regardless of the mileage.

## Battery

During hot weather, check the electrolyte level frequently.

## Dust and/or pollen filter (if fitted)

Once a year, preferably at the beginning of warm weather, check the conditions of the pollen filter. If the vehicle is used mainly in town, on motorways or dusty roads it is advisable to check the filter more frequently. Failure to change the filter can considerably reduce the performance of the air conditioner system.

## Anti-freeze

It is advisable to top up with Alfa Romeo Climaf fluid Super Permanent -40°C Alfa Romeo to conserve the protective properties of the mixture.

## Checking exhaust smoke

For the turbodiesel versions, this check must be carried out every 10,000 km.

## Notes

Under special driving conditions (e.g. on roads sprinkled with antifreeze salt and/or corrosive substances, rough road surfaces, etc.) often check the boots of the axle shafts and steering box, and clean and lubricate joints, hinges, door catches, bonnet catch, etc.)

When forced to use fuel, lubricants and/or fluids in general with characteristics other than those specified by the manufacturer (in emergencies), replace the fluids and corresponding filters at the earliest opportunity.

**WARNING:**

THE FOLLOWING MAINTENANCE TABLE IS VALID FROM JULY 1996.

Operations to have carried out at the km shown	km x 1.000								
	20	40	60	80	100	120	140	160	180
Check tyre conditions and wear	●	●	●	●	●	●	●	●	●
Check operation of front disk brake pad wear indicator	●	●	●	●	●	●	●	●	●
Check conditions of rear disk brake pad wear		●		●		●		●	
Check conditions and wear of rear drum brake linings			●			●			●
Check intactness of boots for axle shafts, power steering, joint caps and check tightness of brake and fuel pipes	●	●	●	●	●	●	●	●	●
Check the tension and if necessary adjust accessories drive belt (except engines with automatic tensioners)		●		●		●		●	
Visually check conditions of trapezoidal and/or Poly-V accessory drive belts		●		●		●		●	
Check handbrake lever stroke		●		●		●		●	
Check/adjust valve clearance (Specific for turbodiesel engine)	●	●		●		●		●	
Check exhaust emissions (petrol engines)		●		●		●		●	
Check smoke opacity (Turbodiesel engines)		●		●		●		●	
Check operation of evaporative system				●				●	
Change the fuel filter (petrol engines)				●				●	
Change the fuel filter (Turbodiesel engines)		●		●		●		●	
Change the air cleaner cartridge (petrol engines)		●		●		●		●	
Change the air cleaner cartridge (Turbodiesel engines)	●	●	●	●	●	●	●	●	●
Check and if necessary top up fluid levels (brake, hydraulic clutch, power steering, windscreen wiper, battery, engine coolant, etc.)	●	●	●	●	●	●	●	●	●
Change the timing gear drive belt (at 80,000 km for Boxer engines)						●			
Change the spark plugs (T. Spark 16V and Boxer 16V engines)					●				
Change the spark plugs (Boxer 8V engines)		●		●		●		●	
Check operation of engine control system (through diagnosis socket)		●		●		●		●	
Check the gearbox and differential oil level				●				●	
Change the engine oil (*) (every 10,000 km for turbodiesel engines)	●	●	●	●	●	●	●	●	●
Changing the engine oil filter (every 10,000 km for turbodiesel engines)	●	●	●	●	●	●	●	●	●
Change the brake fluid (or every 24 months)			●			●			●
Change the pollen filter (or every 12 months)	●	●	●	●	●	●	●	●	●
Check conditions of timing gear belt (chloroprene rubber belts only)				●					

(\*): In any case every 18 months in the event of lower mileage.

**WARNING**

Perfect performance and the life of every car are strictly linked to the use made of it and above all to the care with which normal maintenance operations are carried out, for which, as a result of product evolution, new programming criteria have been adopted.

The interval between scheduled maintenance coupons is 20.000 km; 10.000 km for Turbodiesel versions.

It is however wise to remember that the car needs routine care such as for instance systematically checking and if necessary topping up the level of fluids, checking the tyre pressure, etc.

You are reminded that correct vehicle maintenance is certainly the best way to keep the car's performance levels and safety features unchanged over the years while respecting the environment and at low running costs.

**Engine oil**

If the car is used in one of the following particularly exacting conditions:

- trailer towing
- dusty roads
- short (less than 7-8 km) repeated journeys with an outside temperature below zero
- engine frequently run at idle speed or long distance driving at low speed (or in the case of prolonged inactivity); it is advisable to change the engine oil more frequently than specified.

**Battery**

It is advisable to have the battery charge checked preferably at the onset of winter to avoid the possibility of freezing of the electrolyte.

This check should be carried out if the car is prevalently used for short journeys, or if it is fitted with services that absorb current permanently when the ignition key is engaged, especially if fitted in the after market.

**Fuel oil filter  
(only Turbodiesel versions)**

The differing degree of purity of fuel oil in commerce may make it necessary to change the fuel oil filter more frequently than specified.

**Dust and/or pollen filter (if fitted)**

If the vehicle is used frequently in dusty or heavily polluted environments it is advisable to change the filtering element more frequently.

The failure to change the filter may considerably reduce the effectiveness of the climate control system.

**Antifreeze**

Topping up is recommended with Climafluid Super Permanent -40°C Alfa Romeo in order to preserve the protective characteristics of the mixture.



**WARNING:**  
THE FOLLOWING SERVICE PLAN IS VALID FROM APRIL 1997  
FOR T. SPARK 16V AND 1929 TD VERSIONS.

Operations to be performed at the km shown	km x 1.000								
	20	40	60	80	100	120	140	160	180
Check tyre wear and conditions	●	●	●	●	●	●	●	●	●
Check front disc brake pad wear sensor operation	●	●	●	●	●	●	●	●	●
Check rear disc brake pad conditions		●		●		●		●	
Check rear drum brake seal conditions are wear			●			●			●
Check intactness of drive shaft protective bellows, power steering and steering joint caps and check tightness of brake and fuel feed system pipes	●	●	●	●	●	●	●	●	●
Check and, if required, adjust accessory belt tension (excluding engines with automatic take-up devices)		●		●		●		●	
Check counter-rotating shaft belt conditions (where relevant)		●		●				●	
Inspect accessory belt conditions		●		●		●		●	
Check handbrake stroke		●		●		●		●	
Check/adjust tappet clearance (specific for turbodiesel engine)		●		●		●		●	
Check exhaust emissions (petrol engines)		●		●		●		●	
Check smokiness (turbodiesel engine)		●		●		●		●	
Check evaporation system operation				●				●	
Replace fuel filter (petrol engines)				●				●	
Replace fuel filter (turbodiesel engine)		●		●		●		●	
Replace air cleaner cartridge (petrol engines)		●		●		●		●	
Replace air cleaner cartridge (turbodiesel engine)	●	●	●	●	●	●	●	●	●
Check and, if required, top up fluid levels (brakes, hydraulic clutch, power steering, windscreen washer, battery, engine coolant, etc.)	●	●	●	●	●	●	●	●	●
Check timing belt conditions				●					
Replace timing belt						●			
Replace counter-rotating shaft belt (where relevant)						●			
Replace spark plugs					●				
Check engine control system operation (by means of diagnostic socket)		●		●		●		●	
Check gearbox and differential oil level				●				●	
Change engine oil (*) (every 10.000 km for turbodiesel version)	●	●	●	●	●	●	●	●	●
Change engine oil filter (every 10.000 km for turbodiesel version)	●	●	●	●	●	●	●	●	●
Change brake fluid (or every 24 months)			●			●			●
Replace pollen filter (or every 12 months)	●	●	●	●	●	●	●	●	●

(\*): Or every 18 months in the event of lower mileage.

## WARNINGS

Attain to the following instructions integrating the Service Schedule to ensure correct vehicle operation:

**Every 500 km** (or when refuelling) check:

- engine oil level;
- coolant level;
- brake/clutch fluid level;
- powered steering fluid level;
- battery electrolyte level;
- tyre pressure;
- windscreen washer, rear window washer and headlight washer (where relevant) liquid level;
- the presence of water in the fuel filter (TD versions only); if required, bleed the filter.

## Engine oil

If the vehicle is mainly used in any of the following especially demanding circumstances:

- towing a trailer
  - dusty roads
  - short repeated trips (less than 7-8 km) with outside temperature below zero
  - frequent engine idling or driving long distances at low speed (or long vehicle storage)
- we recommend you change the oil more frequently than shown in the Service Schedule.

## Air cleaner

If the vehicle is used mainly on dusty roads, the air cleaner will need to be replaced more frequently than prescribed.

## Brake pads

Worn brake pads are signalled by means of a warning light on the instrument panel.

In vehicles equipped with a front brake pad wear sensors only, check the rear brake pads when the front pads are replaced. According to the vehicle use, however, the rear brake pads may not require immediate replacement. In this case, we recommend checking the rear brake pads later in time.

## Brake/clutch fluid

The brake fluid is hygroscopic, i.e. it absorbs moisture. To avoid braking problems, change the brake fluid every 24 months, regardless of the mileage.

## Battery

Check battery charge at the beginning of winter to avoid electrolyte freezing. Check the level more frequently if the vehicle is mainly used for short trips or if it is equipped with units which run off the battery when the ignition key is removed, especially if these unit were installed after-market.

## Climate control system (where relevant)

### Climate control system efficiency

To keep the system ship-shape, just turn it on once a fortnight, even in winter, for a few minutes.

For vehicles equipped with ECON function automatic climate control systems, turn the system off occasionally, as this system works without starting the compressor. In this way, operation will be ensured in summer or in hot weather with normal vehicle use. In intermediate seasons, check the ECON function is not on and press the TEMP button until the message LO appears on the display indicating the temperature required in the passenger compartment.

In the summer and before correct climate control system, check system efficiency.

**Have the climate control system serviced and the coolant gas circuit recharged at an Alfa Romeo Dealership exclusively. The use of different types of gasses, in fact, can damage the system components beyond repair and is an environmental hazard.**

**Pollen and/or dust filters  
(where fitted)**

If the vehicle is used mainly in built-up areas or on dusty roads, the filter may need to be replaced more often than shown in the Service Schedule.

The climate control system efficiency can be compromised if the filter is not replaced adequately.

**Diesel fuel filter  
(turbo diesel versions only)**

The various degrees of purity of diesel fuel on the market may lead to replacing the diesel oil filter more frequently than shown in the Service Schedule.

**Anti-freeze**

We recommend you top up with Climafluid Super Permanent -40°C Alfa Romeo to preserve the protective features of the mixture.

**Notes**

In certain conditions of use (e.g. roads sprinkled with ice melting salt and/or corrosive substances, badly surfaced roads, etc.), check the drive shaft and steering unit bellows often. Also check lubrication of joints, hinges, door and lid locks, etc. If, in the event of an emergency, lubricant and/or fluids not responding to the manufacturer's specifications are used, we recommend changing the fluid and filters in the specific circuit as soon as possible.

**ATTENTION:**

THE FOLLOWING MAINTENANCE GRID IS TO BE APPLIED STARTING FROM 98 MODELS  
FOR THE FOLLOWING VERSIONS : T. SPARK 16V AND 1910 JTD

Operations to be performed at the kms shown	Km X 1.000								
	20	40	60	80	100	120	140	160	180
Check tyres' conditions and wear	•	•	•	•	•	•	•	•	•
Check functioning of wear sensor for front brake pads	•	•	•	•	•	•	•	•	•
Check conditions of rear brake pads		•		•		•		•	
Check conditions and wear of rear drum brake shoes			•			•			•
Check integrity of half shafts'bellows,power steering, joint's caps and pipes' seal of braking and fuel system	•	•	•	•	•	•	•	•	•
Visual check of belts' conditions and accessories' controls			•						•
Check of the handbrake lever stroke		•		•		•		•	
Check/Adjustment of valves' play (Specific for turbodiesel engines)		•		•		•		•	
Check of exhaust emissions (petrol engines)		•		•		•		•	
Check of smoke grade (turbodiesel engines)		•		•		•		•	
Check functioning of the antievaporative system				•				•	
Replacement of fuel filter (turbodiesel engines)		•		•		•		•	
Replacement of the air filter cartridge(petrol engines)		•		•		•		•	
Replacement of the air filter cartridge(turbodiesel engines)	•	•	•	•	•	•	•	•	•
Check and refill the fluids' level (brakes, hydraulic clutch, power steering, wipers, battery, engine cooling, etc.)	•	•	•	•	•	•	•	•	•
Replacement of the driving belt						•			
Replacement of the control belt of the counterrotating shafts (if foreseen)						•			
Replacement of spark plugs					•				
Check of functioning of engine control systems		•		•		•		•	
Check gearbox/differential oil level				•				•	
Replacement of engine oil (*) (every 10,000 km for turbodiesel engines)	•	•	•	•	•	•	•	•	•
Replacement of engine oil filter (every 10,000 km for turbodiesel engines)	•	•	•	•	•	•	•	•	•
Replacement of brakes' fluid (or every 24 months)			•			•			•
Replacement of anti-pollen filter (or every 12 months)	•	•	•	•	•	•	•	•	•

(\*): However every 18 months in case of lower km covered.

**WARNING**

To achieve the best performance of the car it is necessary to comply with the maintenance agenda shown in the Scheduled Maintenance Plan and, besides, to stick to the following recommendations:

Every 1,000 km or before long travels it is advisable to check and eventually to refill:

- the engine oil level;
- the cooling fluid level;
- the brakes/clutch fluid level;
- the power steering fluid level;
- the battery fluid level;
- the tyres' pressure;
- the fluid level of the wipers, rear window, etc.;
- the possible presence of water in the fuel filter (only for TD versions); if necessary, the filter should be drained.

**Engine oil**

In case the car is mainly used under just one of the following severe conditions:

- trailer towing
  - dusty roads
  - short (less than 7-8 km) but repeated tracts at an outside temperature below 0°
  - frequently running slow engine or long-distance driving at low speed (or in case of long lasting inactivity)
- it is advisable to replace the engine oil more frequently than shown in the Scheduled Maintenance Plan.

**Air filter**

If usually driving onto dusty roads, the replacement of the air filter should be performed more frequently than shown.

**Brake pads**

Brake pads are subjected to a different grade of utilisation and wear according to using conditions and driving approach.

In case the pilot lamp of the front brake pads is on, check immediately the thickness of the pads.

As the car is equipped with a wear sensor scanning only the front lefthand brake pad, it is important to check also the front righthand brake pad and the rear brake pads as well.

Maybe the latter do not require immediate replacement; so it is advisable to check them again after a short range of time.

**Brakes/Clutch fluid**

The brakes' fluid is hygroscopic, i.e. it does absorb humidity.

In order to avoid braking failures it is important to replace it every 24 months apart from the km covered.

**Battery**

It is advisable to check the charging status of the battery especially at the beginning of the cold season so to avoid the freezing of the electrolyte.

This check is to be performed more frequently if the car is mainly used for short-range driving or if equipped with continuous absorption users with the key out, especially if applied in after market.

**Air-Conditioner (if foreseen)****Efficiency of the air-conditioning system**

In order to keep the air-conditioning system at its best, it is sufficient to let it work every 15 days, even during winter time, by starting the compressor for a few minutes.

Before summertime, it is advisable to have the system checked for its efficiency.

**For the maintenance of the air-conditioning system and for the possible refilling of the cooling gas circuit, please refer exclusively to the Authorized Alfa Romeo Assistance Centers, as the use of a different gas could cause unrepairable damage to the system's parts and hurts the environment.**

**Anti-dust/Anti-pollen filter**

(only for cars equipped with air-conditioning system)

Check the filter's conditions at least once a year, better at the beginning of the summer, at your Authorized Alfa Romeo Assistance Center.

In case of frequent use of the car in dusty / polluted environment, it is advisable to check the system more frequently than prescribed by the Scheduled Maintenance Plan; more precisely, the filtering part must be replaced if there is a decreased air quantity flowing into the passenger compartment.

In case of non-replacement, the efficiency of the air-conditioning system could be remarkably diminished.



### Diesel fuel filter (only for turbodiesel versions)

The variety of the purity of the marketed Diesel fuel could require the replacement of the Diesel fuel filter at more frequent intervals than prescribed by the Scheduled Maintenance Plan.

### Antifreeze

It is advisable to perform the refilling with Climaf fluid Super Permanent -40°C Alfa Romeo so to preserve the protecting features of the mixture.

### Rubber hoses

The flexible rubber hoses of the braking system, the power steering, the fuel system, the feeding system, etc. must be carefully checked.

### Wheels

Check the tyres' pressure (including the spare wheel's) periodically and before long travels.

The pressure check should be performed before starting the car.

Check periodically that the tread's depth complies with the minimum value envisaged by the law.

**WARNING:** Some tyres are equipped with wear indicators; their replacement must be performed as soon as the indicators are perceivable on the tread.

Check periodically that the tyres do not have or show cuts, blowings or uneven wear of the tread.

In case of accidental puncture, stop the car immediately and replace the tyre so to avoid damage to the tyre itself, its rim, the suspensions and the steering.

The wheels (rims and tyres) supplied by the manufacturer are the most appropriate for the car's features and do guarantee the highest safety and comfort standard under normal driving conditions.

Before replacing the rims or the tyres, refer to the table showing the types allowed.

In any case, stick to the rim-tyre matching of the original supply.

In case of replacement, use only new tyres and avoid uncontrolled ones.

### Remarks

Under particular using conditions (e.g. on roads with anti-ice salt on, in case of ravelled roads, etc.) check the bellows of the half shafts and the steering box frequently; besides, perform the cleaning and the lubrication of joints, hinges, locking hooks, etc.

In case of use of lubricants and/or fluids without the required properties specified by the manufacturer, it is advisable to replace the filter and the fluids concerned as soon as possible.

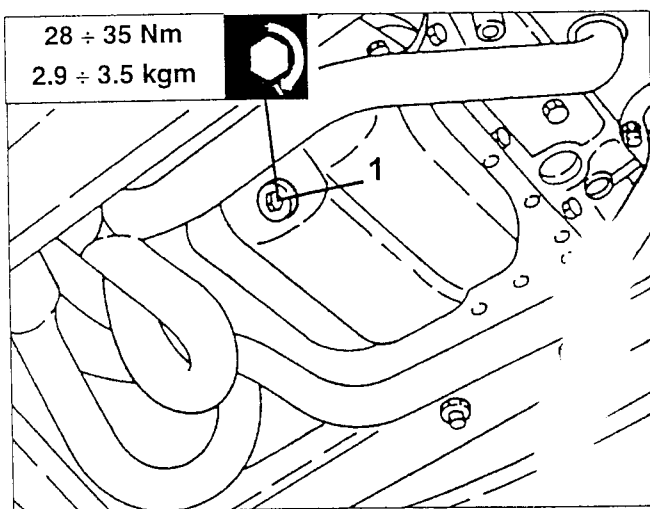
**BOXER ENGINES' MAINTENANCE****REPLACEMENT OF ENGINE OIL  
AND FILTER****ATTENTION:**

Engine oil can hurt the skin : avoid direct contact as much as possible. Should contact occur, wash thoroughly with soap and water.

- With warm engine, remove the refilling cap.
  - Pull out the control indicator of oil level.
  - Lift the car.
1. Unscrew the discharge cap and let the oil drain out completely into a proper container.

**ATTENTION:**

During the cap removal, be cautious: the oil could be hot.

**ATTENTION:**

Do not waste the oil into the environment: it cause pollution.

- Operating from underneath the car with the proper wrench, unblock the oil filter and remove it.
- Clean the discharge cap and screw it with its own gasket according to the prescribed torque.
- Damp with oil the gasket of the new filter and screw it by hand.
- Lower the car.
- Supply the engine with the oil as prescribed.
- Check with the oil indicator the correct oil level.

**ATTENTION:**

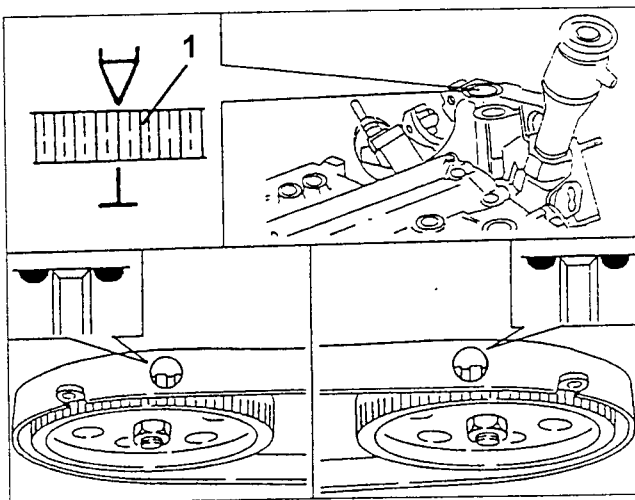
The check of the oil level is to be performed with the car in flat position. An oil level surpassing the MAX notch can cause excessive evaporation of the oil itself and hence a pressure loss.

- Mount the refilling cap again and let the engine run for about 2 minutes; stop the engine and wait for a few minutes.
- Check the oil level and be sure there are no leakages.

**ATTENTION:** During refilling operations be careful to avoid accidental oil leaking in the alternator's louvers; this may cause severe damage and fire danger.

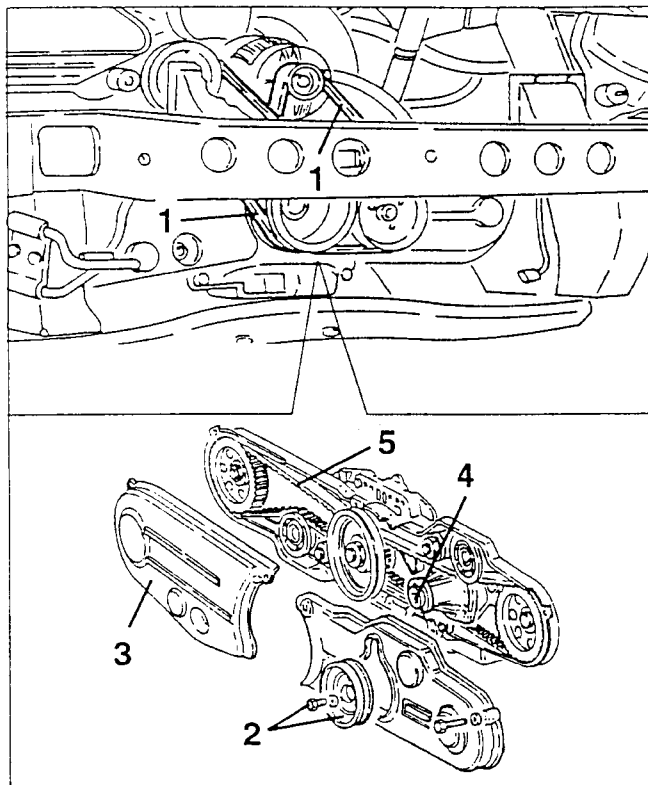
**REPLACEMENT OF THE TRANSMISSION  
CONTROL BELTS**  
Specific for Boxer 8V engine

- Disconnect the battery terminal (-).
  - Remove the electrofan for the engine cooling (see GROUP 10).
  - Remove the sleeve for filter's air intake.
  - Disconnect the wires from the spark plugs and remove the plugs.
1. Check the engine timing.

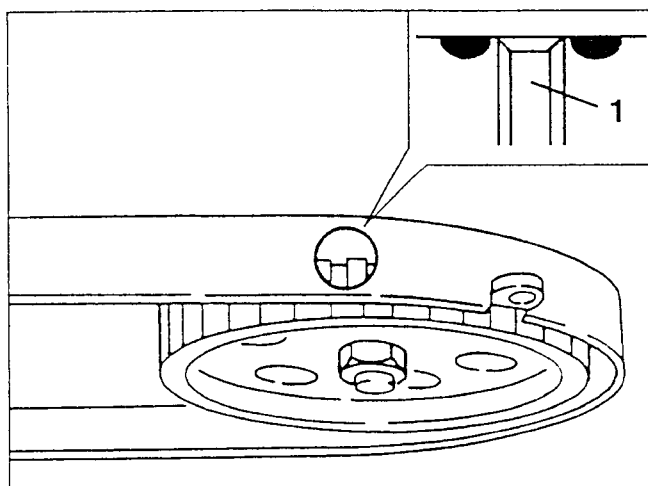


1. Loosen the clamping screws and bolts concerned, hence remove the control belt of the hydrodrive pump and the control belt of the alternator-water pump group.
2. Unscrew the clamping screws and remove the pulley of the water pump.
3. Unscrew the clamping screws and remove the covers of the transmission belts.
4. Loosen the clamping nut of the righthand belt-tightener, hence press onto the guide pulley so to win against the spring's load and block the clamping nut.

5. Remove the right timing belt firstly from the camshaft pulley and then from the crankshaft pulley. - Repeat the above procedure to remove the left-hand belt.



1. Turn the camshaft so that the tooth and the two adjacent milling marks on the timing pulley can be seen through the special hole on the rear cover.



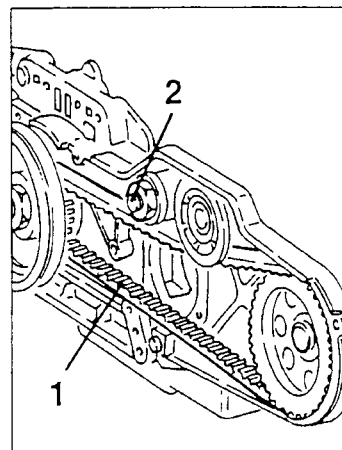
- Turn the crankshaft until the notch "T" on the flywheel is aligned with the fixed reference.

1. Fit the left-hand timing belt.

#### WARNING:

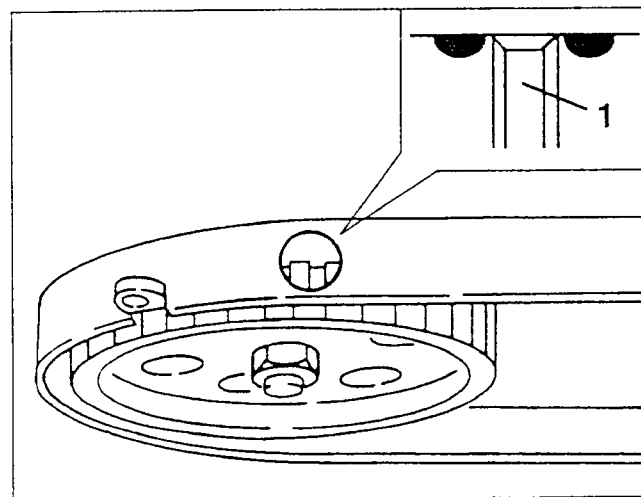
The belt should be keyed with the belt drive section opposed to the tensioned tensioners.

2. Slacken the nut fastening the belt tensioner so that it can exert the pressure impressed by the spring on the belt, then tighten the nut.



1. Turn the right camshaft until the tooth and the two adjacent marks milled on the timing pulley can be seen through the special hole on the rear cover.

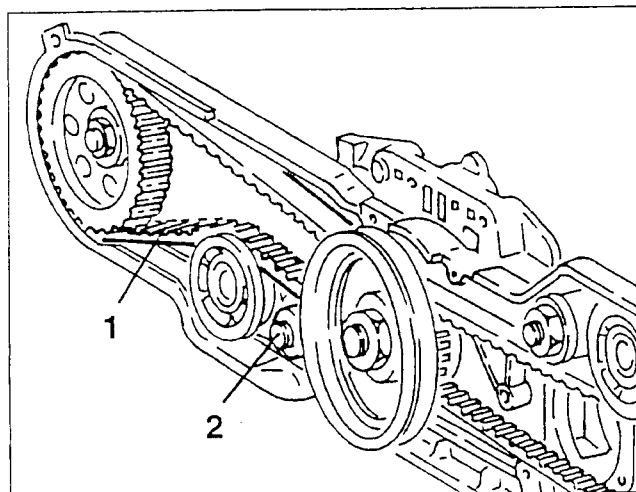
- Turn the crankshaft to take the piston in cylinder no.



1 to the T.D.C. in the bursting stroke.

1. Fit the right-hand timing belt.

2. Slacken the nut fastening the belt tensioner so that it can exert the pressure impressed by the spring on the belt, then tighten the nut.



**WARNING:**

The pulley tends to turn away from the correct position as the camshaft interacts with the inlet valve of cylinder no. 3.

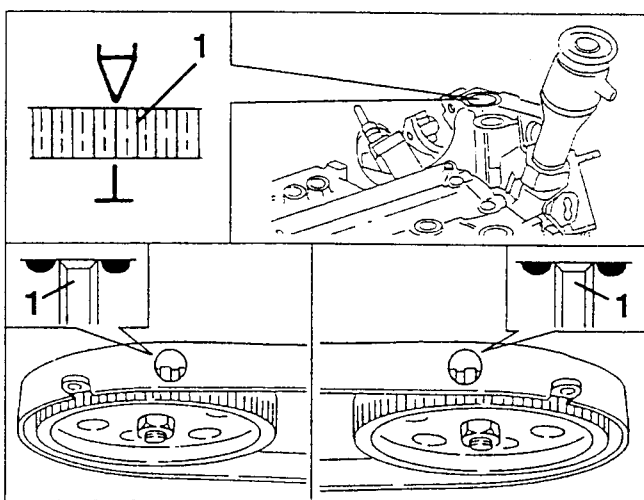
For this reason, use the special ratchet wrench N° 1.822.008.000 (A.5.0195) to keep the pulley in the correct position for fitting the belt.

**WARNING:**

During this operation do not exert pressure on the belt tensioner to avoid changing the load foreseen for it.

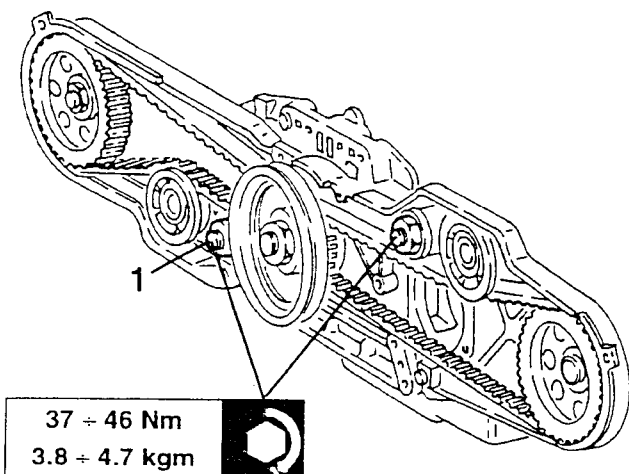
- Upon completion of the operations described, check that the timing reference marks coincide.
- Complete refitting operations reversing the sequence described for removal.

- Turn the crankshaft a few times in its direction of rotation to allow the belts to take their final position.
- 1. Check the engine timing.



- Turn the crankshaft by 90° in its direction of rotation, until the notch "●" on the flywheel is aligned with the fixed reference.

1. Slacken the right-hand belt tensioner nut, then tighten it to the specified torque.



- Turn the crankshaft by 360° in its direction of rotation until the notch "●" on the flywheel is aligned with the fixed reference.

- Proceed as described for tightening the left-hand belt tensioner.

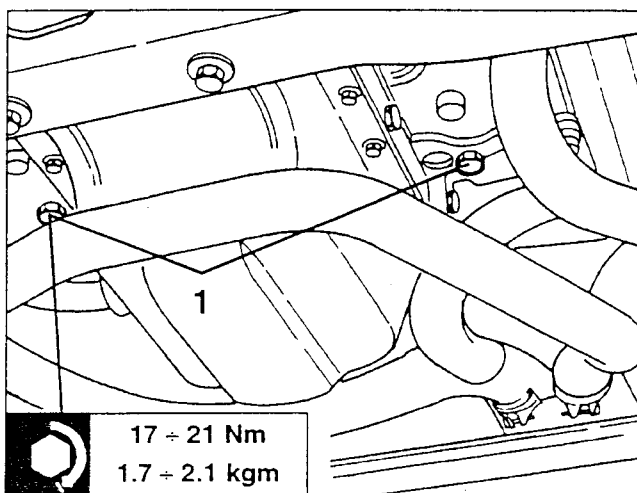
## CHANGING THE TIMING GEAR DRIVE BELTS

### Specific for 16V

- Disconnect the battery (-) terminal.
- Drain the fluid from the air conditioning system (see GROUP 50).

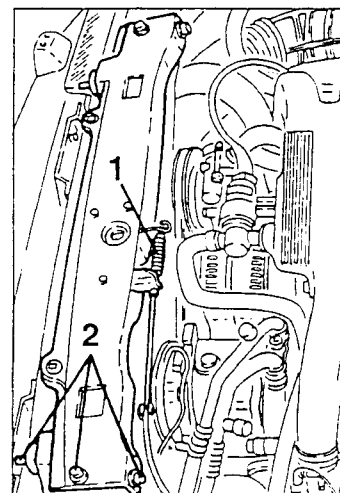
1. Unscrew the two plugs under the crankcase and drain the coolant fluid into a suitable recipient.

The anti-freeze mixture used as coolant fluid can damage the paintwork: therefore avoid touching painted components.

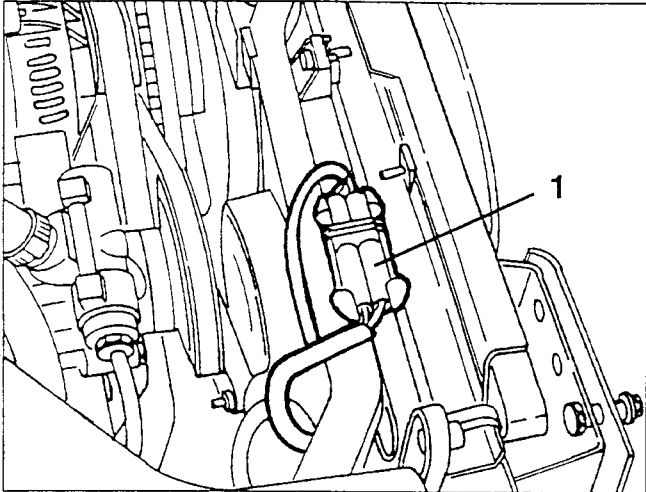


- Remove the radiator grille and the front bumper (see GROUP 70).

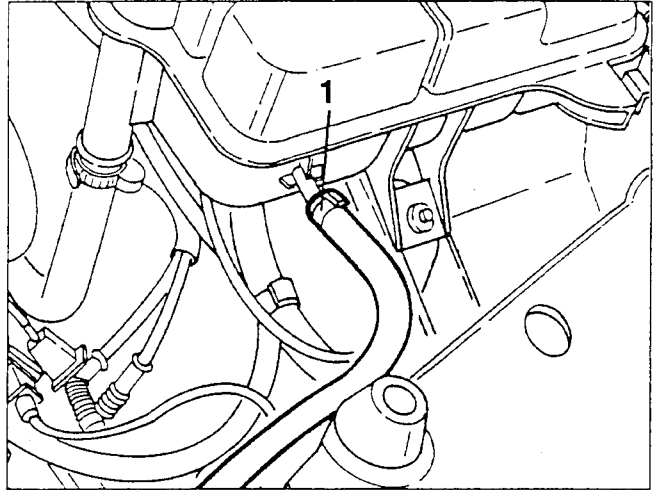
1. Disconnect the bonnet opening cable from the lock.
2. Slacken the fastening screws and remove the radiator upper cross-member.



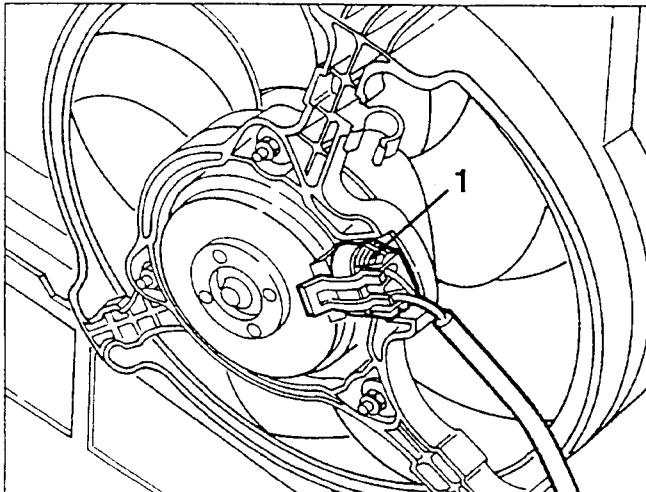
1. Remove the electrical connection withdrawing it from the support above the cooling radiator.



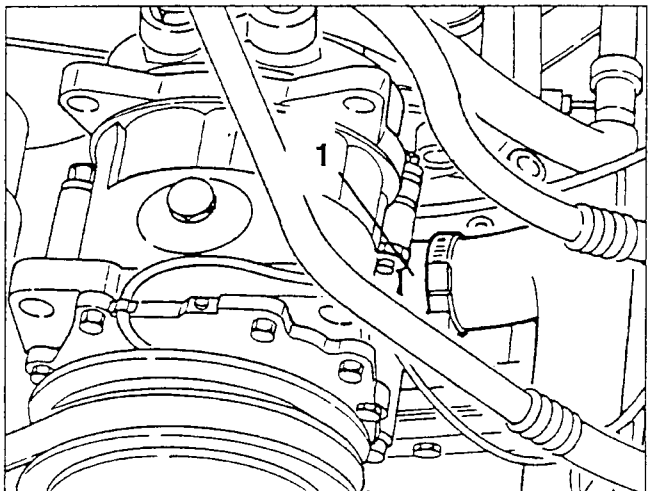
1. Disconnect the radiator connection pipe from the header tank.



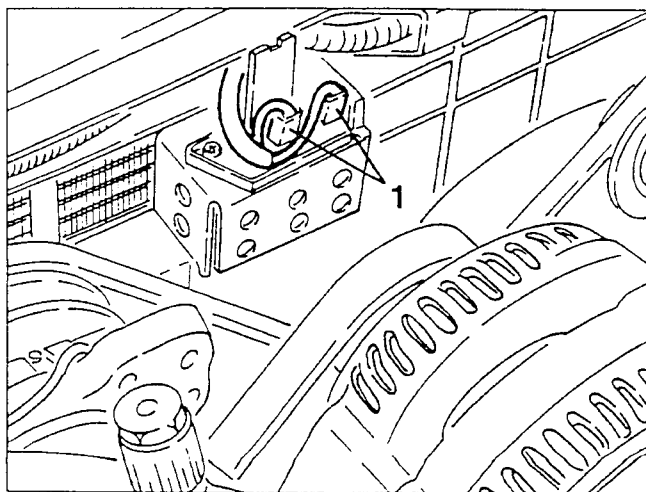
1. Disconnect the electrical connections supplying the cooling fans.



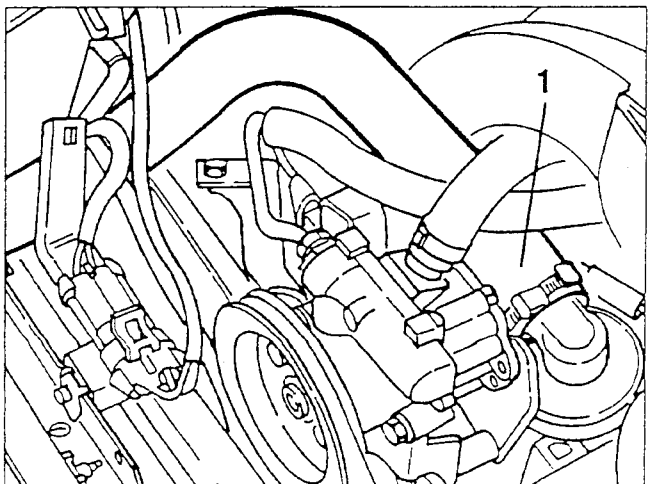
1. Disconnect the radiator coolant outlet sleeve from the connection on the crankcase.



1. Disconnect the electrical connections from the cooling fan speed coil.

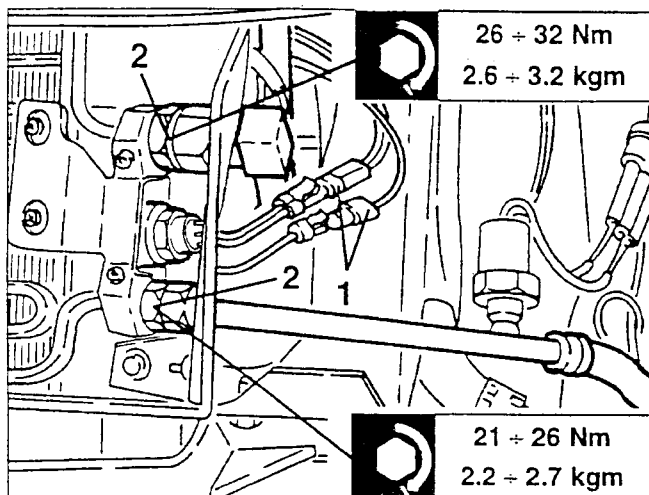


1. Disconnect the radiator coolant delivery pipe from the thermostatic cup.

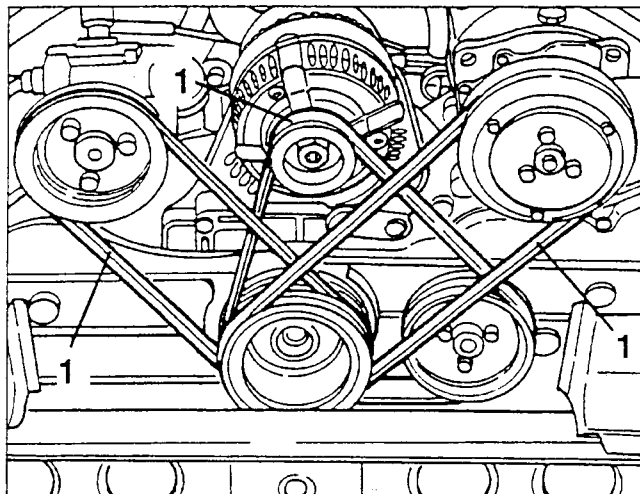


- Free the electrical cables from the radiator.

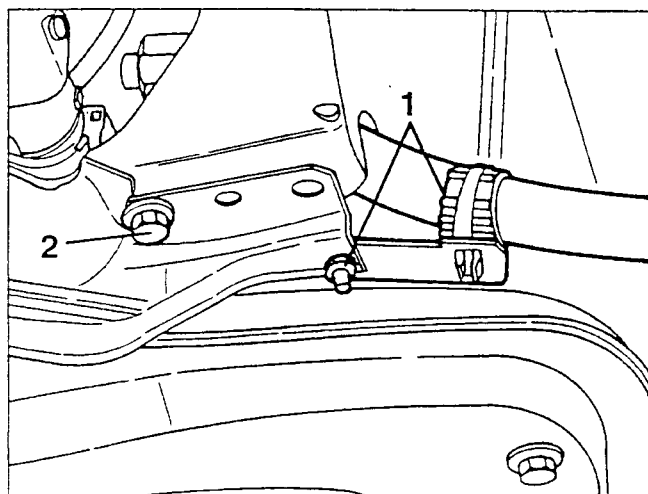
1. Disconnect the two electrical connections of the fan control thermal contact.
2. Disconnect the fluid inlet and outlet hoses from the conditioner condenser.



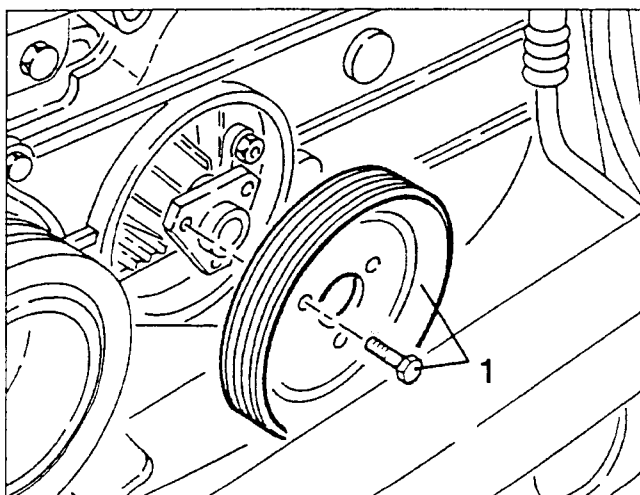
1. Slacken the fastening screws and bolts concerned, then remove the conditioner compressor drive belt, the power steering pump drive belt and the alternator - water pump drive belt.



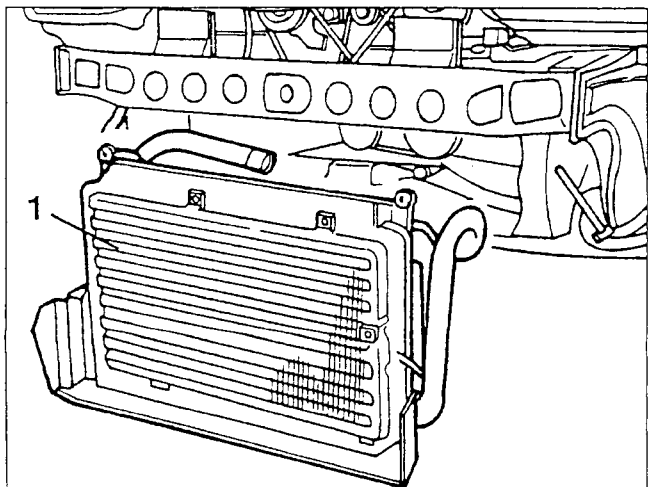
1. Free the R134A hose from the lower crossmember.
2. Slacken the screws fastening the lower crossmember.



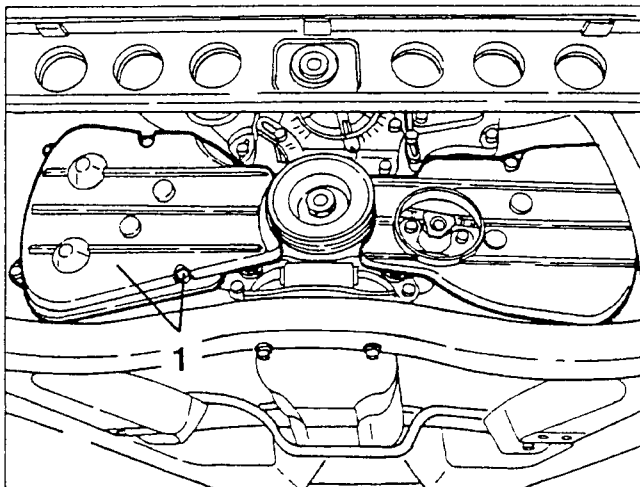
1. Slacken the three fastening screws and remove the water pump pulley.



1. Remove the crossmember complete with radiator, condenser and electric fans.

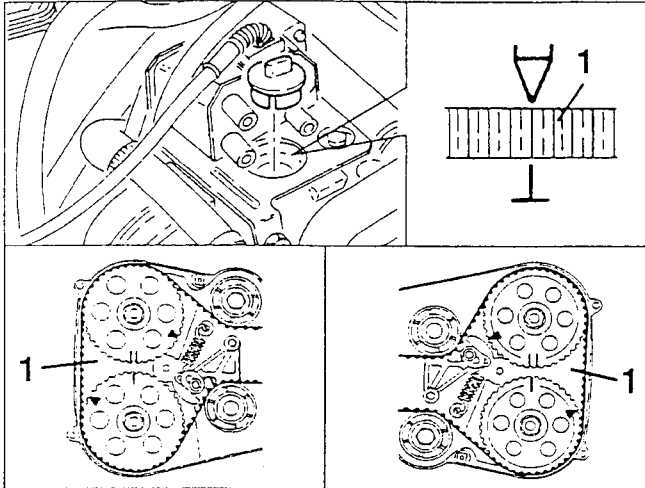


1. Slacken the fastening screws and remove the timing belt covers.

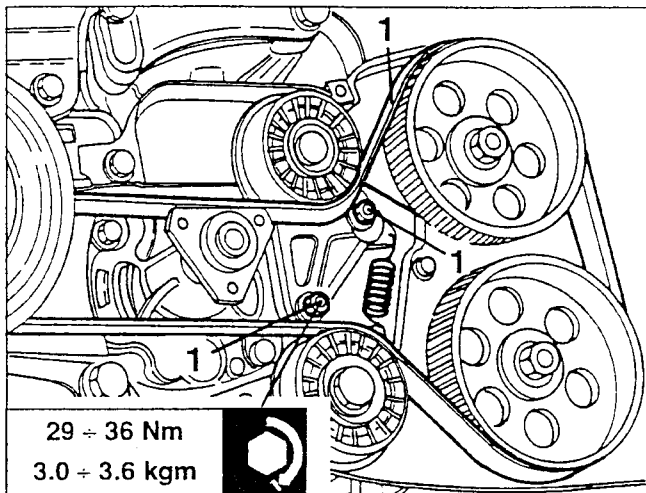


- Remove the spark plugs.

1. Check the valve gear timing.



1. Slacken the nuts fastening the belt tensioner and remove the timing belts.

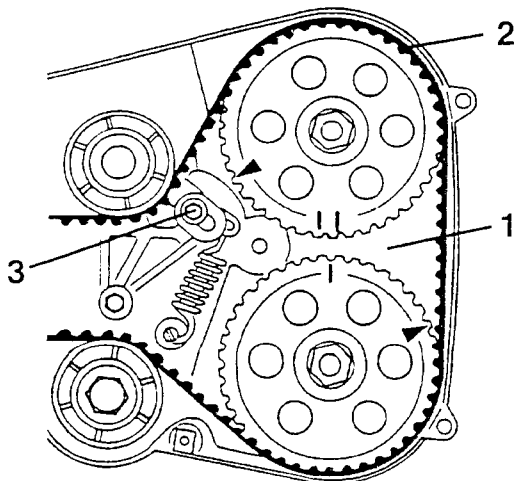


1. Turn the left head camshafts until the notches coincide.

- Turn the crankshaft until the notch "T" on the flywheel is aligned with the fixed reference.

2. Fit the left-hand timing belt.

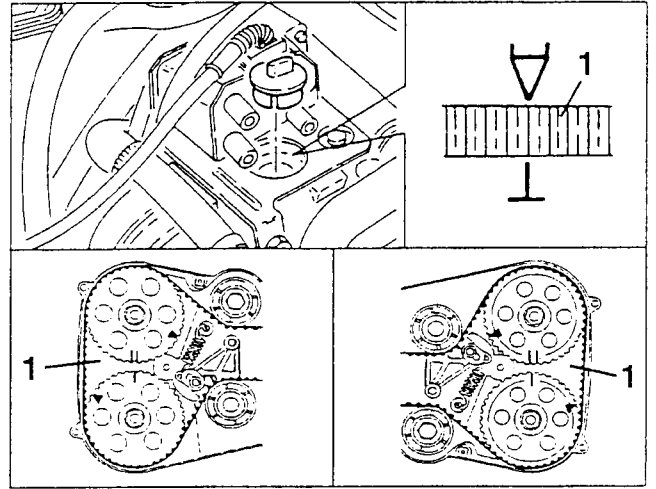
3. Slacken the belt tensioner fastening nut so that it exerts the the load impressed by the spring on the belt.



- Repeat the previous operations for assembling and timing the right-hand belt.

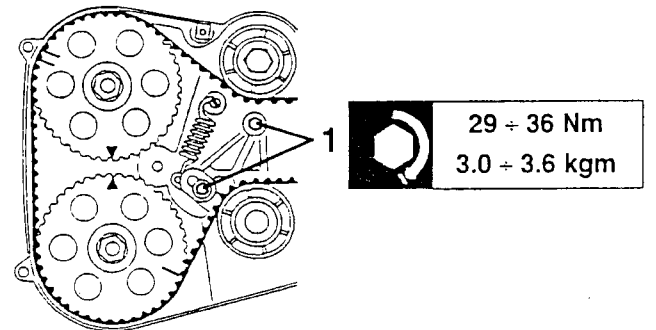
- Turn the crankshaft a few times in its direction of rotation, to all the belt to take its final position.

1. Check the valve gear timing.



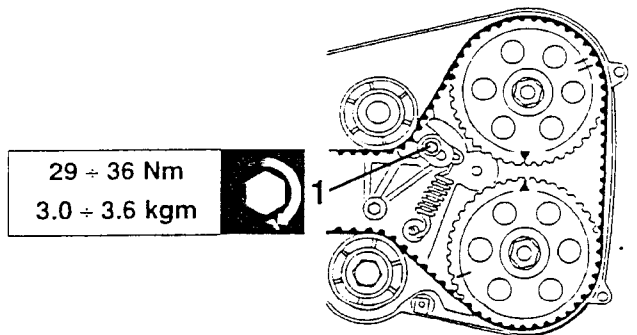
- Turn the crankshaft by 90° until the notch "●" on the flywheel is aligned with the fixed reference and the notches "▲" on the right head timing pulley are aligned.

1. Slacken the nuts fastening the right belt tensioner to settle it, then tighten them to the specified torque.

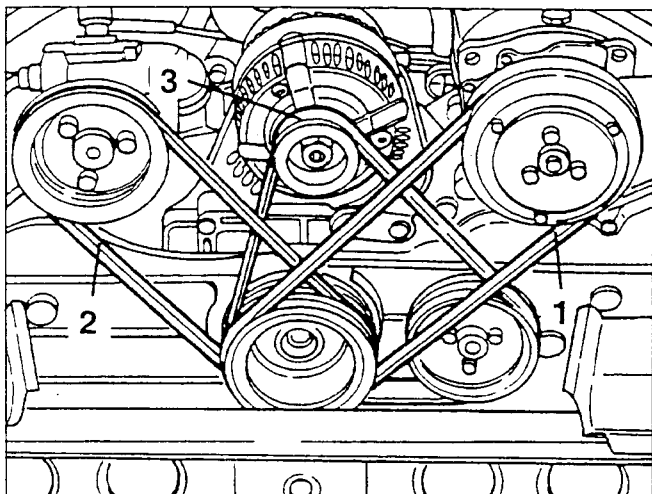


- Turn the crankshaft by 360° until the notch "●" on the flywheel is aligned with the fixed reference and the notches "▲" on the left head timing pulleys are aligned.

1. Slacken the nuts fastening the left belt tensioner to settle it, then tighten them to the specified torque.



- Turn the crankshaft a few times then check again that the timing references coincide.

**AUXILIARY COMPONENT BELTS**

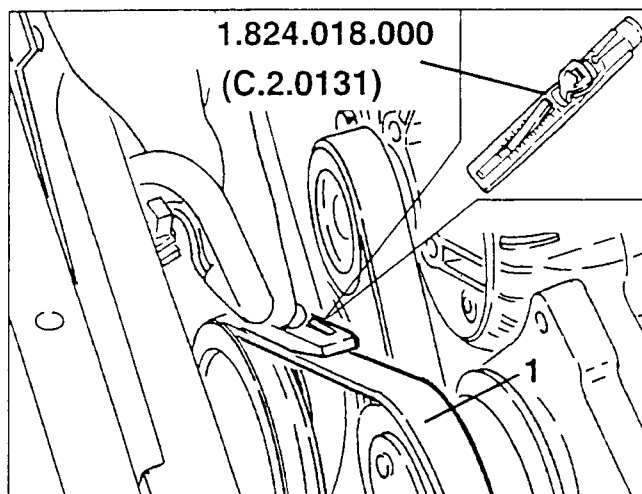
1. Conditioner compressor drive belt
2. Power steering drive belt
3. Alternator - water pump drive belt

**NOTE:** When checking the belt tension, check that the belts are intact, and that they are free of:

- cuts
  - cracks
  - material surface wear (smooth and shiny)
  - dry or stiff parts (lack of adherence).
- In the event of one of the above defects, change the belt.

The contact of the belts with oil or solvents can damage the elasticity of the actual belt rubber and reduce its adherence.

1. Working as illustrated, measure the belt tension using tool N° 1.824.018.000 (C.2.0131).



- Check that the tensioning values measured with the tool are within the specified limits.

**Tensioning of trapezoidal drive belt "AV13" for conditioner compressor**

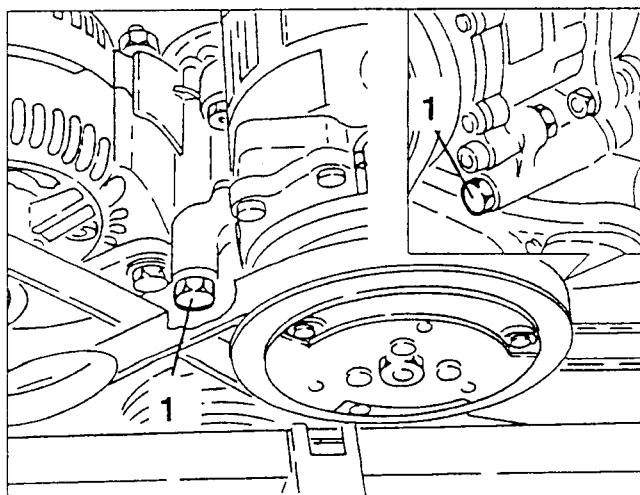
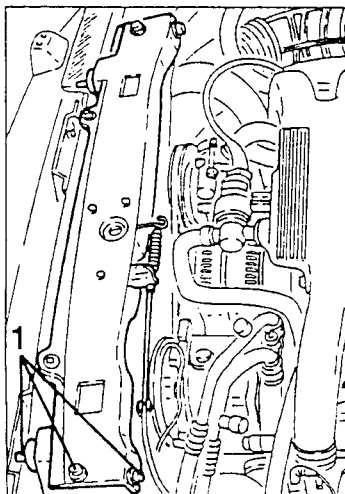
At assembly	500 ÷ 650 N
Retensioning	350 ÷ 450 N

**NOTE:** The belt may be retensioned after a brief running- in period, proceeding as follows:

- bring the engine to the normal operating temperature
- turn the engine off and allow it to cool down
- retension the belt to the specified limit.

**Conditioner compressor drive belt****Checking and tensioning**

- Remove the radiator grille (see GROUP 70).
- 1. Slacken the screws fastening the upper radiator crossmember, then move it to one side without disconnecting the lock control cable.



- If the belt tensioning is incorrect, proceed as follows:
- 1. Slacken the two bolts fastening the conditioner compressor.

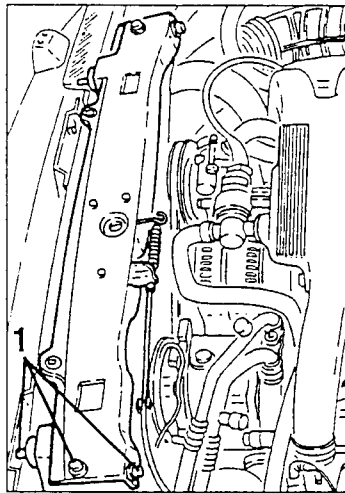


- Move the compressor to one side and tighten the fastening bolt from the slotted side and check the belt tension.
- If the tension is correct also tighten the remaining fastening bolt.
- Adapt the procedure suitably when changing the conditioner compressor belt.

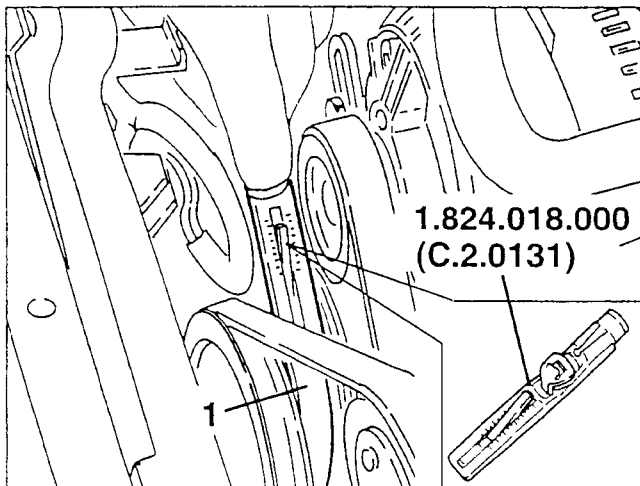
## Power steering pump drive belt

### Checking and tensioning

- Remove the radiator grille (see GROUP 70).
- 1. Slacken the screws fastening the upper radiator crossmember, then move it to one side without disconnecting the lock control cable.



- Working as illustrated, measure the tension of the belt using tool N° 1.824.018.000 (C.2.0131).



- Check that the tensions measured using the tool are within the specified limits.

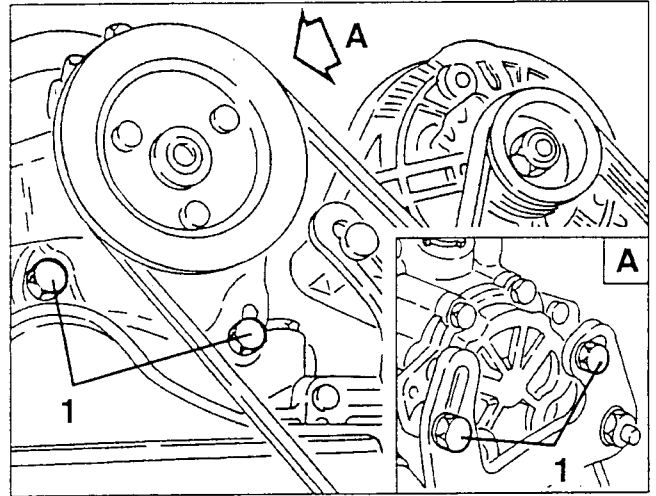
#### Tensioning of trapezoidal drive belt "AV10" for power steering pump

At assembly	400 ÷ 550 N
Retensioning	280 ÷ 370 N

The belt may be retensioned after a brief running-in period, proceeding as follows:

- bring the engine to the normal operating temperature
- turn the engine off and allow it to cool down
- retension the belt to the specified limit.

- If the tension found is incorrect, proceed as follows:  
1. Slacken the four screws fastening the power steering pump.

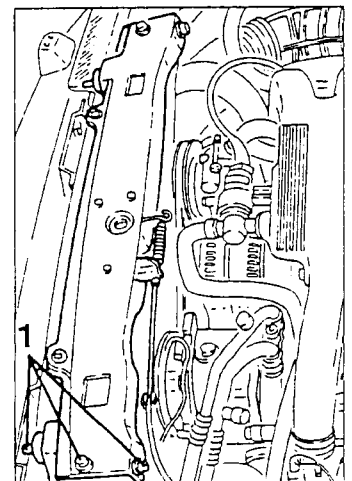


- Move the compressor to one side and temporarily tighten the fastening screws on the slots and check the belt tension.
- If the tension is correct, definitively tighten all the power steering pump fastening screws.
- Suitably adapt the above procedure to change the power steering pump drive belt.

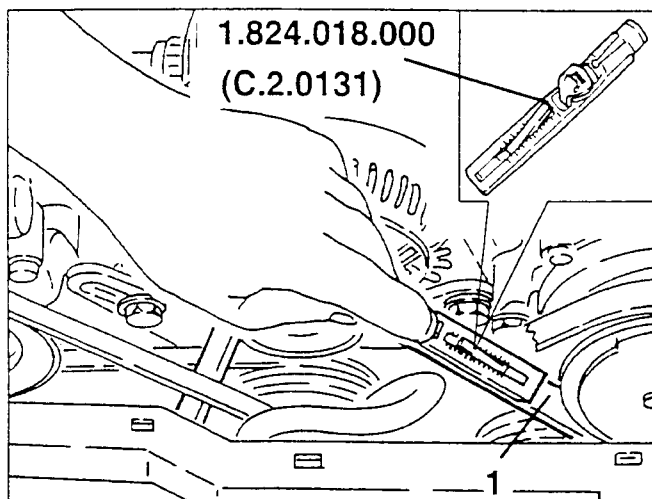
## Alternator - water pump drive belt

### Checking and tensioning

- Remove the radiator grille (see GROUP 70).
- 1. Slacken the screws fastening the upper radiator crossmember, then move it to one side without disconnecting the lock control cable.



1. Working as illustrated, measure the tension of the belt using tool N° 1.824.018.000 (C.2.0131).



- Check that the tensions measured using the tool are within the specified limits.

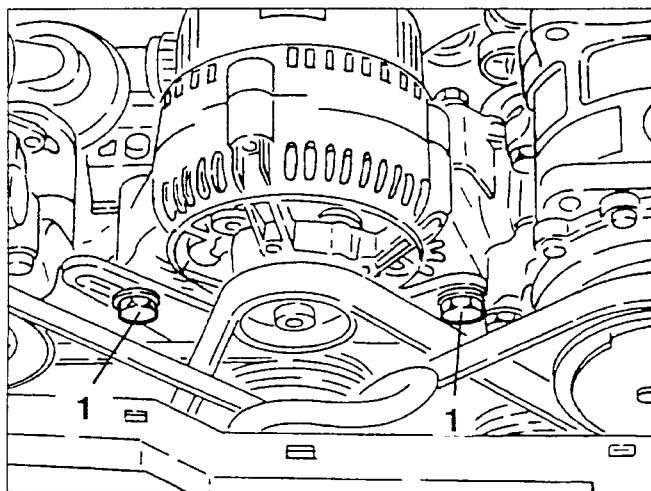
#### Tensioning the drive belt "Poly V" for alternator & water pump

At assembly	520 ÷ 670 N
Retensioning	300 ÷ 450 N

The belt may be retensioned after a brief running-in period, proceeding as follows:

- bring the engine to the normal operating temperature
- turn the engine off and allow it to cool down
- retension the belt to the specified limit.

- If the tension found is incorrect, proceed as follows:  
1. Slacken the two alternator fastening bolts.

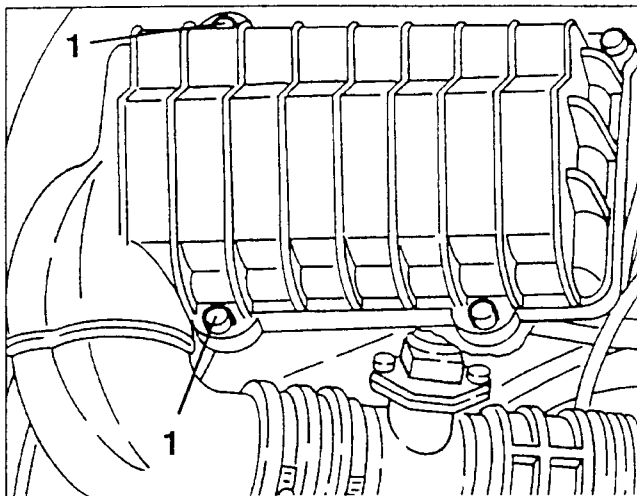


- Move the alternator to one side and tighten the fastening bolt from the slotted side and check the belt tension.

- If the tension is correct also tighten the remaining fastening bolt.
- Suitably adapt the above procedure to change the alternator - water pump drive belt.

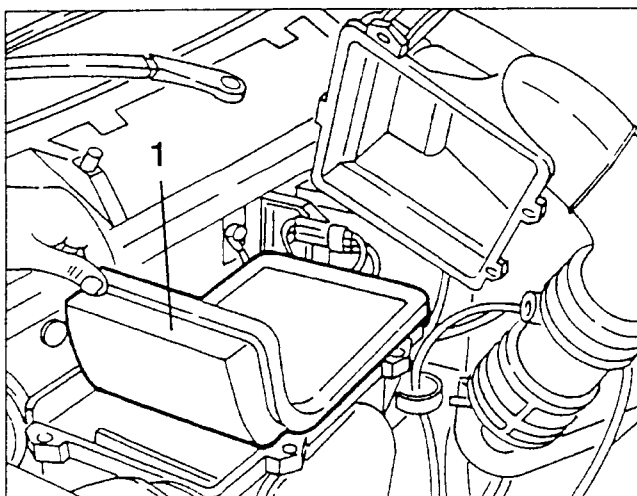
## CHANGING THE AIR CLEANER CARTRIDGE

1. Slacken the four screws fastening the air cleaner cover.



1. Raise the air cleaner cover just enough to remove the filtering element.

Any filter cleaning operation might damage it, thereby jeopardising the correct operation of the engine supply system.



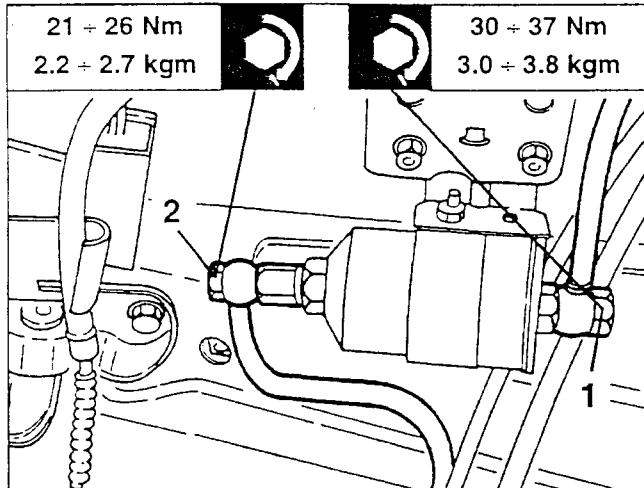
- Carefully clean the air cleaner cartridge container.
- Install a new air cleaner cartridge.
- Refit the cover and fasten with the corresponding screws.

**NOTE:** If the cleaner shows traces of oil, check for possible leaks in the entire air circuit.

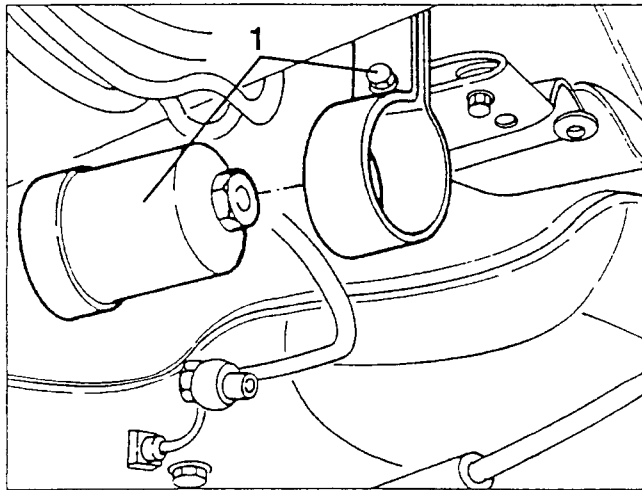
## CHANGING THE FUEL FILTER

- Set the car on a lift and raise it.

1. Disconnect the fuel inlet pipe connection from the filter.
2. Disconnect the fuel outlet pipe connection from the filter.



1. Slacken the fastening clamp and remove the fuel filter.

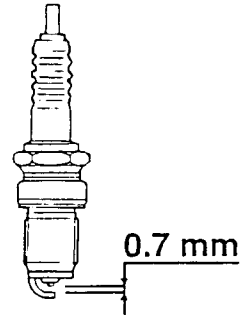


- Install the new filter reversing the sequence described for removal and taking care to:
- change the copper gaskets of the connections;
- assemble the filter with the arrow stamped on it pointing in the direction of the flow of the fuel.

## CHECKING AND CHANGING SPARK PLUGS

The standard spark plugs fitted to the engine are of the surface discharge type with four points and a centre electrode, for the 8 Valve engines and with one point and centre electrode, for the 16 Valve engine.

The former requires no routine gap adjustment, while the gap to be adhered to for the latter is shown in the table.



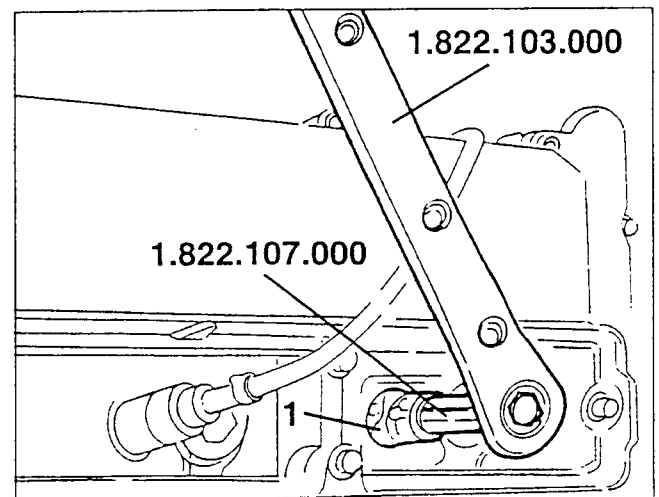
### Spark plugs

8 valves	LODGE 25 HL
16 valves	NGK PFR 6B

- With the engine cold disconnect the spark plug cables.
- Blow inside the spark plug openings to remove any impurities.

1. Slacken and remove the spark plugs.

For the 1712 16 Valve engine use tools N° 1.822.103.000 and N° 1.822.107.000.



- Check the spark plugs for dirt and the ceramic insulation for cracks. In this case, replace the spark plugs.

### WARNING:

The use of spark plugs with different characteristics or sizes than those specified can cause serious damage to the engine and change the level of harmful emission at the exhaust.

### WARNING:

A dirty or worn out spark plug is often the sign of a failure in the engine supply system.

For example:

- Traces of carbon dust: incorrect mixture, air cleaner very dirty.
- Spots of oil: oil leaking from the piston rings.
- Formation of ash: presence of aluminium materials, contained in the oil.

- Burnt electrodes: overheating due to unsuitable fuel, defects in the valves;
- High electrode wear: harmful additives in the fuel or in the oil, pinging in the cylinder head, overheating.

- When installing, lubricate the thread with engine oil and tighten the spark plugs to the following torque:

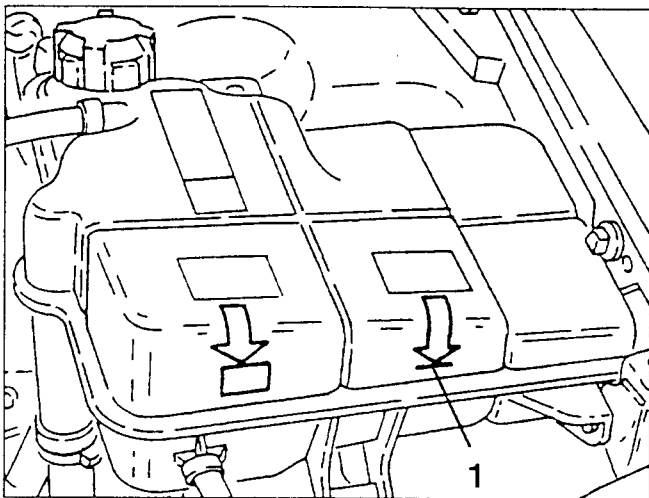


25 ÷ 30 Nm  
2.5 ÷ 3.1 kgm

## CHECKING THE LEVEL AND CHANGING THE COOLANT

### Checking

1. With the engine cold, check that the level of the coolant in the header tank is between the MIN and MAX marks.



### Draining and replenishing

- Set the car on a lift.
- Slacken and remove the header tank plug.

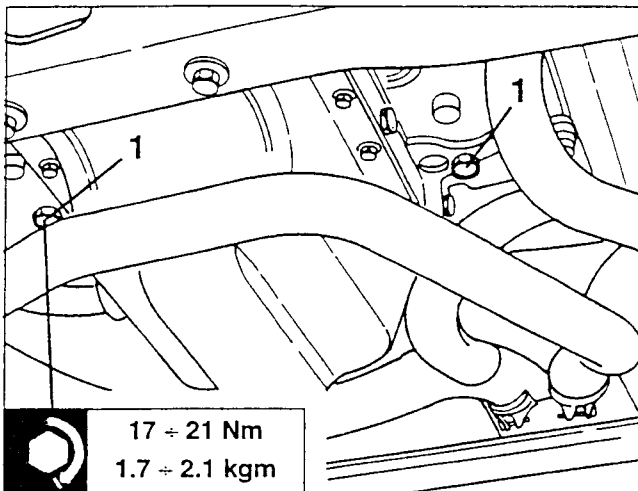


**WARNING:**  
Absolutely never remove the header tank plug when the engine is warm!

- Raise the car.
- 1. Slacken the two plugs under the crankcase and drain the coolant into a suitable recipient.



**WARNING:**  
The anti-freeze mixture used as coolant can harm the paintwork: therefore avoid any contact with painted components.



17 ÷ 21 Nm  
1.7 ÷ 2.1 kgm

- Refit the drain plugs and check that all the fastening clamps of the engine cooling system hoses are firmly tightened.
  - Fill the header tank up to the MAX mark.
- The type and indicative quantity of the coolant are given in the table below:

Alfa Romeo Climafluid Permanent -40°C	6.7 litres
---	------------

- Start the engine and bring it to normal operating temperature so that the thermostat opens to release the amount of residual air in the circuit.
- With the engine cold, top up to the level indicated on the header tank.
- Retighten the pressurised cap on the header tank.

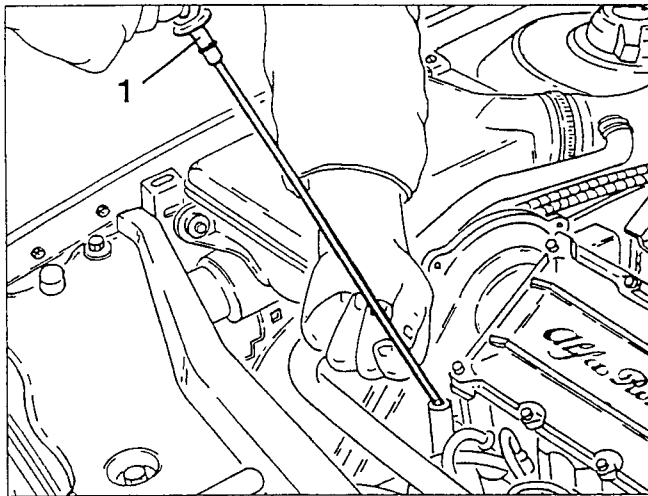


**WARNING:**  
It is unwise to mix anti-freeze fluids of different types or brands!  
Never use antirust additives: this might not be compatible with the anti-freeze in use!.

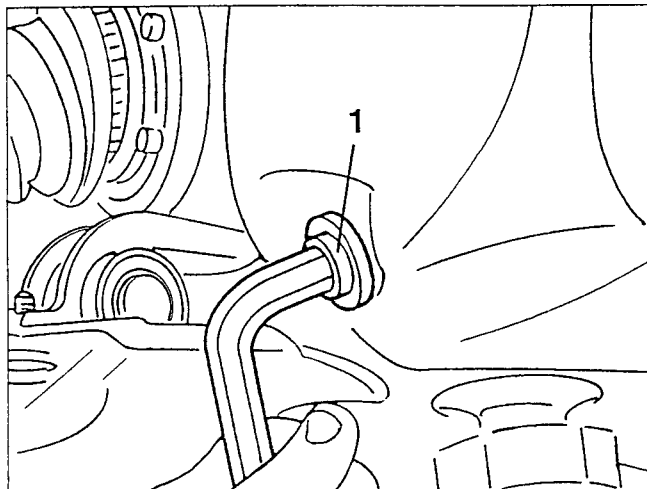
**TURBODIESEL 1929 ENGINE  
SERVICING****CHANGING ENGINE OIL AND FILTER****IMPORTANT:**

Engine oil is harmful: avoid all contacts with your skin. In the event of contact, wash the effected part with soap and water.

- When the engine is hot, remove the filler cap.
- 1. Remove the dipstick.

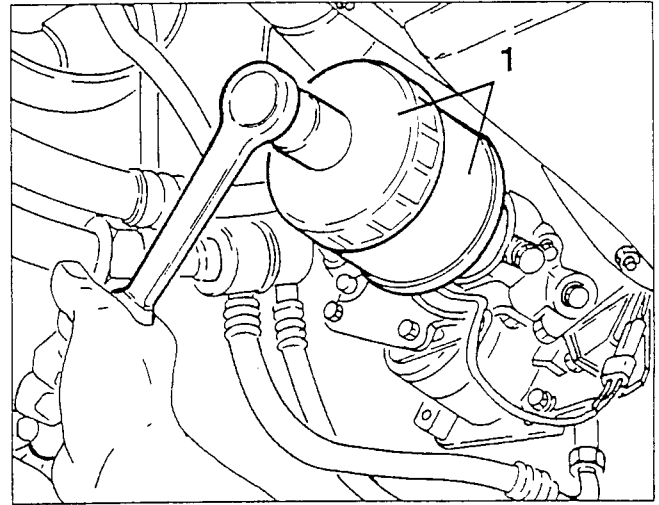


- 1. Remove the drain cap and drain completely collecting the oil in a suitable container.

**IMPORTANT:**

Dispose of oil appropriately. Waste oil is an environmental hazard.

- 1. Remove the oil filter with a suitable tool.

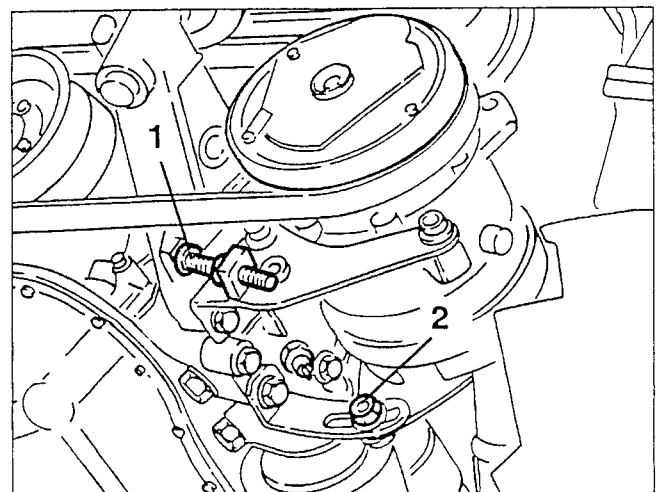


- Clean the drain cap and screw it back with its seal.
- Dampen the new filter seal with oil and screw it back by hand.
- Fill the engine with oil of the prescribed type and in the prescribed quantity.
- Check the oil level with the vehicle standing on level ground.**
- Oil level over the MAX notch can cause excessive oil evaporation and drops in oil pressure.**
- Refit the filler cap and idle the engine for approximately 2 minutes. Wait for a few minutes.
- Check the oil level. Check there are no leaks.

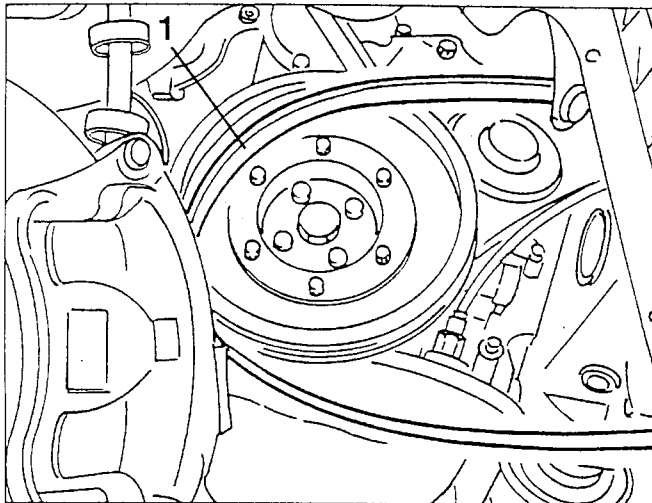
**IMPORTANT:** When topping up, be careful not to drip oil on the alternator ventilation slots. This could seriously damage the alternator and be a fire risk.

**REPLACING TIMING BELT  
(To engine no. 1762797)**

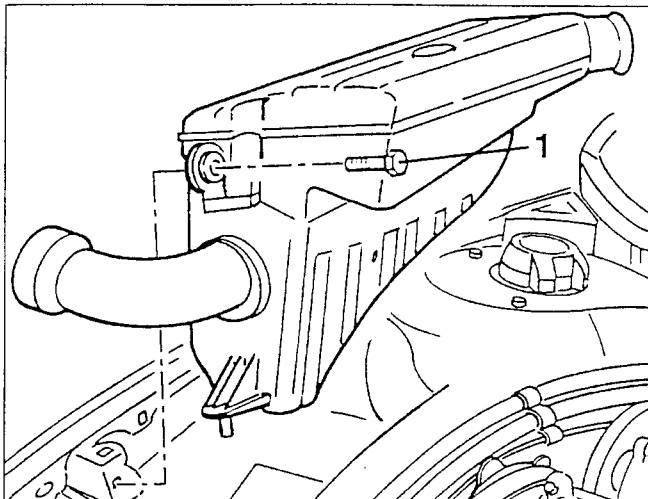
- Remove the front right-hand wheel and spray guard.
- 1. Turn the micro-metric tension device to release belt tension.
- 2. Remove the compressor fastening screws.



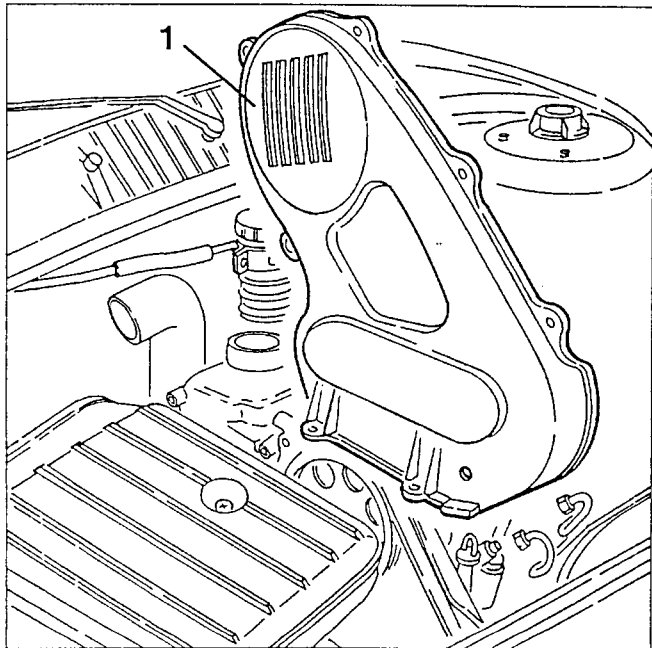
1. Remove the compressor drive belt from the auxiliary components driving pulley.



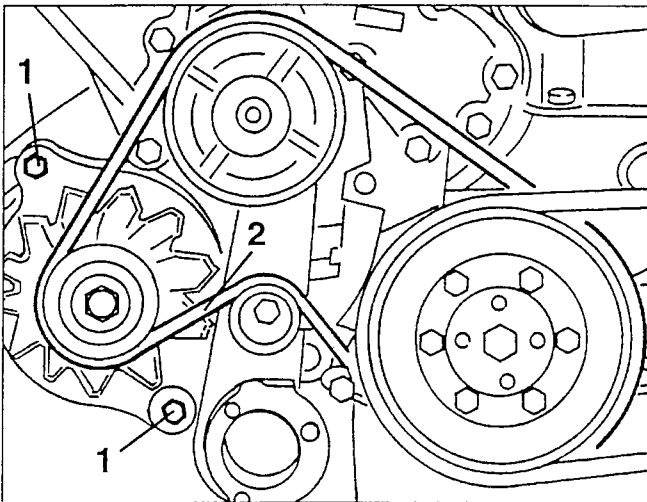
1. Slacken the fastening screws and remove the complete air cleaner.



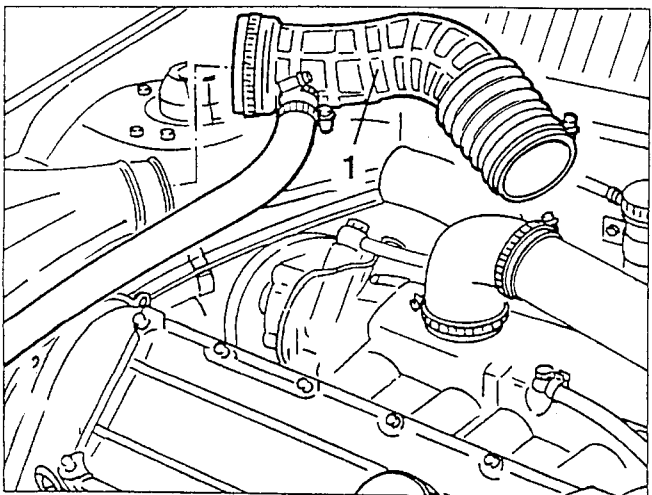
1. Remove the timing belt front cover.



1. Slacken the two alternator fastening bolts.
2. Remove the alternator - water pump drive belt.

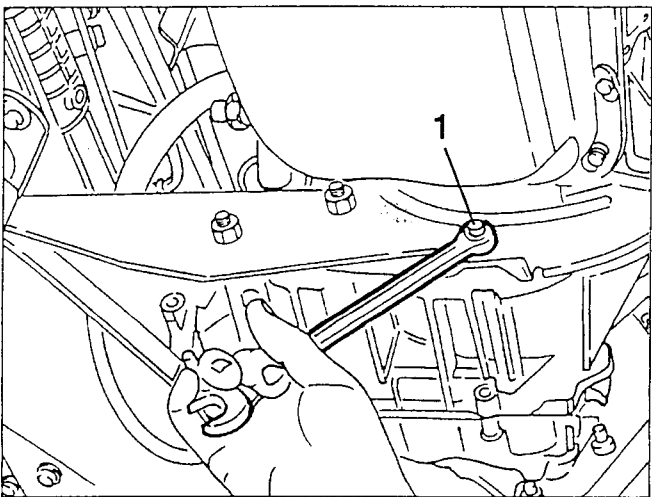


1. Remove the air intake corrugated sleeve and move it to one side without disconnecting the oil vapour recirculation hose.

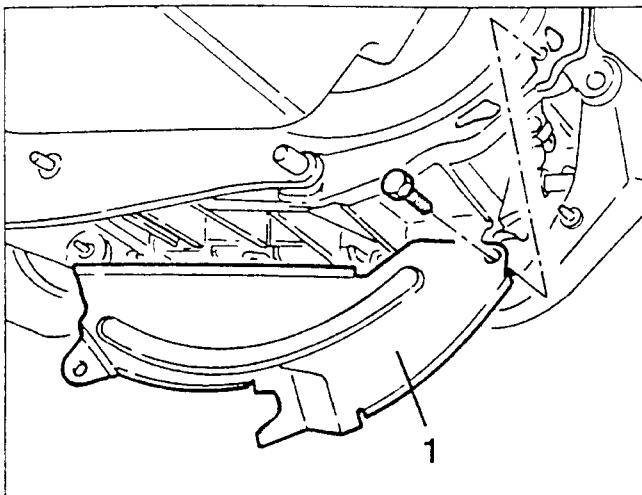


- Raise the car.

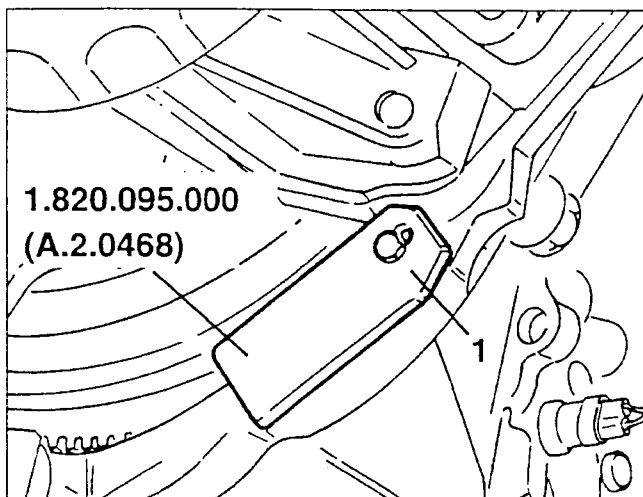
1. Slacken the front nut fastening the gearbox to its support bracket.



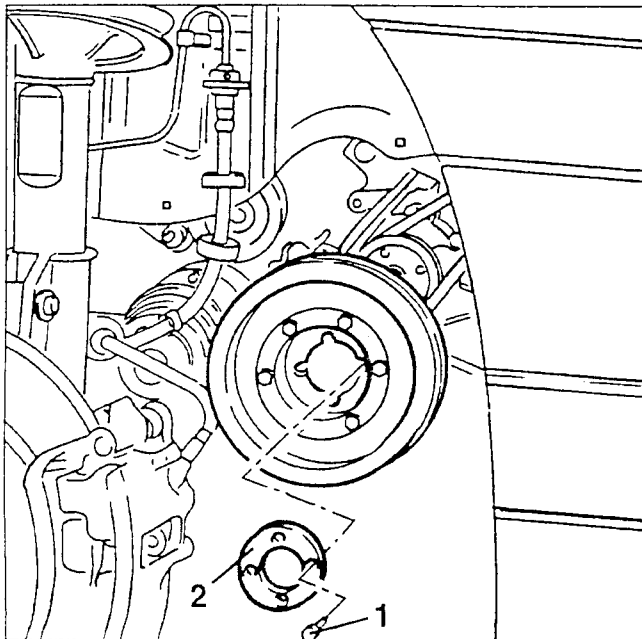
1. Slacken the fastening screws and remove the flywheel cover.



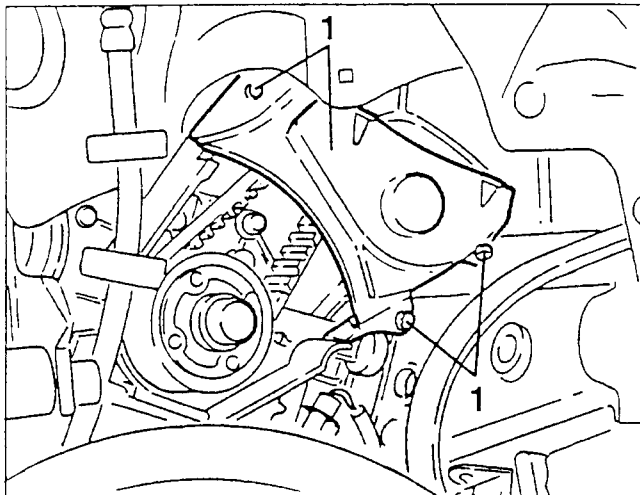
1. Install the tool for holding the flywheel N° 1.820.095.000 (A.2.0468).



1. Slacken the fastening screws and remove the auxiliary components belt driving pulley.
2. Retrieve the spacer.

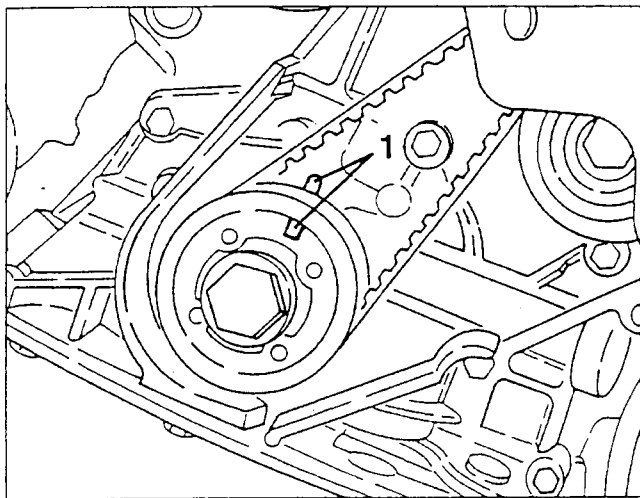


1. Slacken the fastening screws and remove the timing belt lower cover.

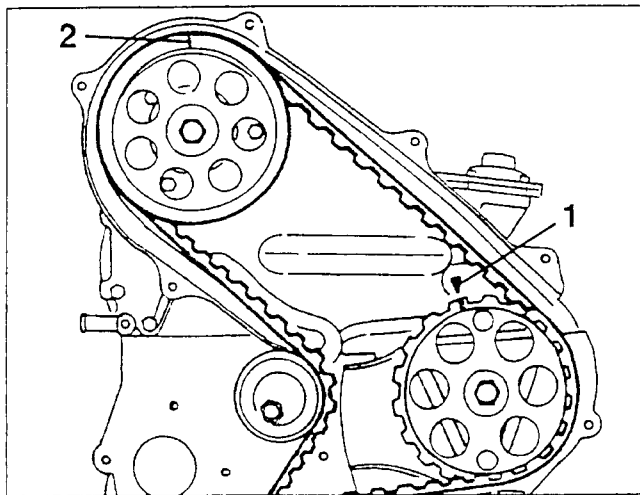


- Remove the tool for holding the flywheel installed previously.

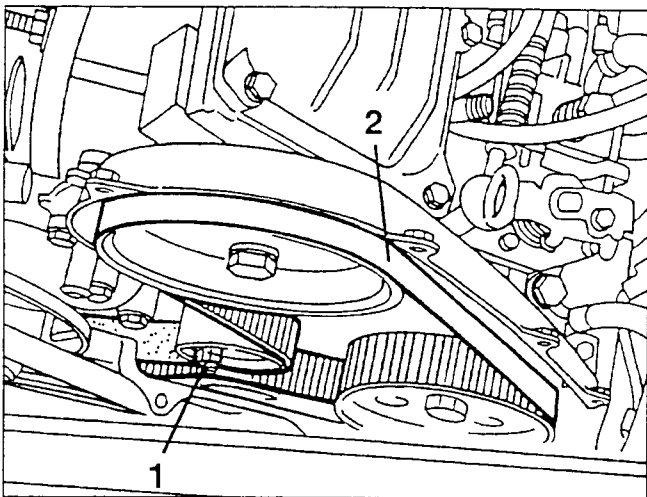
1. Check that the notch on the pulley is aligned with the relief on the front cover.



1. Check that the notch etched on the pulley is aligned with the relief on the rear cover.
2. Check that the notch etched on the pulley is aligned with the hole on the rear cover.



1. Slacken the screw fastening the timing belt guide pulley.
2. Remove the timing belt.



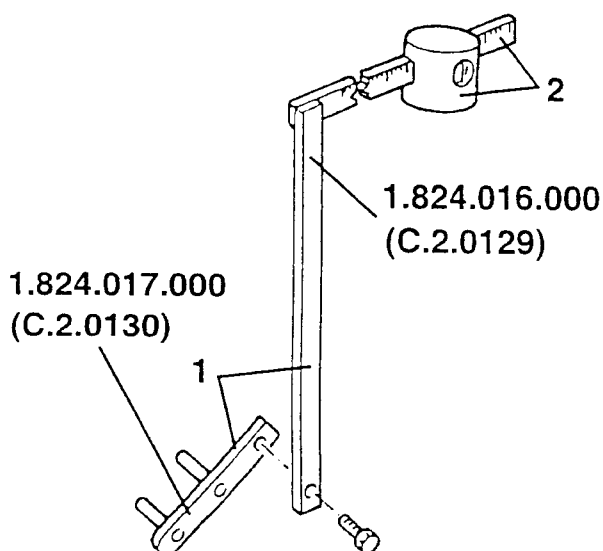
**Refit reversing the sequence described for removal and observing the following instructions:**

- Make sure that the first cylinder is in the bursting stroke, checking the alignment of the notches on the timing belt pulleys with the corresponding references.
- Install the timing belt making sure that the teeth are correctly coupled on all the pulleys.



**WARNING:**  
To avoid harming the structure of the fibres forming the belt, never bend it sharply when assembling.

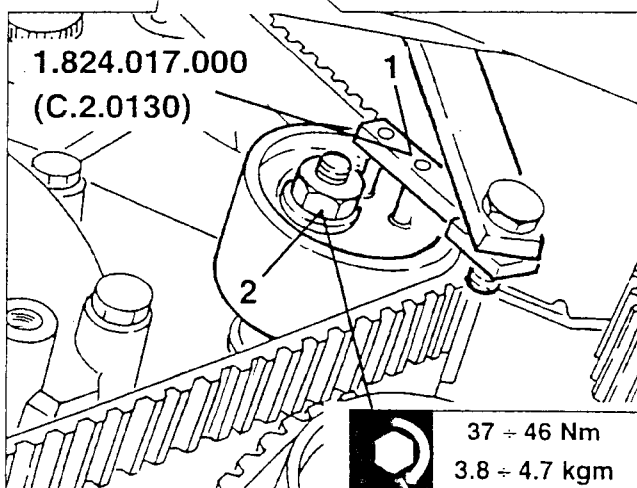
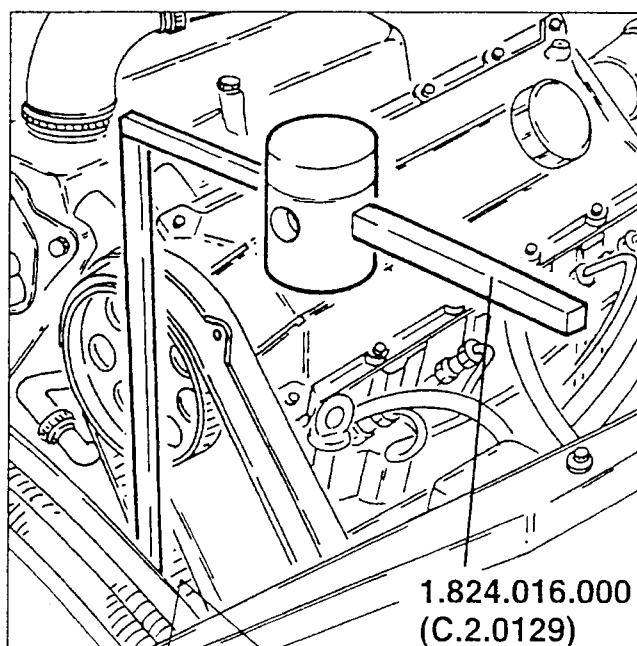
1. On tool N° 1.824.016.000 (C.2.0129) install support N° 1.824.017.000 (C.2.0130).
2. Position the weight with the knurled part, at a distance of 120 mm on the millimetred rod and lock it.



1. Install the resulting tool on the belt tensioner, as illustrated, and adjusting the joint, set the millimetred rod to horizontal.
- Settle the toothed belt turning the crankshaft twice in its direction of rotation.
2. Tighten the belt tensioner fastening nut to the specified torque.



**WARNING:**  
During the last phase, the millimetred rod might move from its horizontal position; in this case, working on the belt tensioner, it is necessary to restore the original position of the millimetred rod and repeat the operation.



**37 ÷ 46 Nm**  
**3.8 ÷ 4.7 kgm**

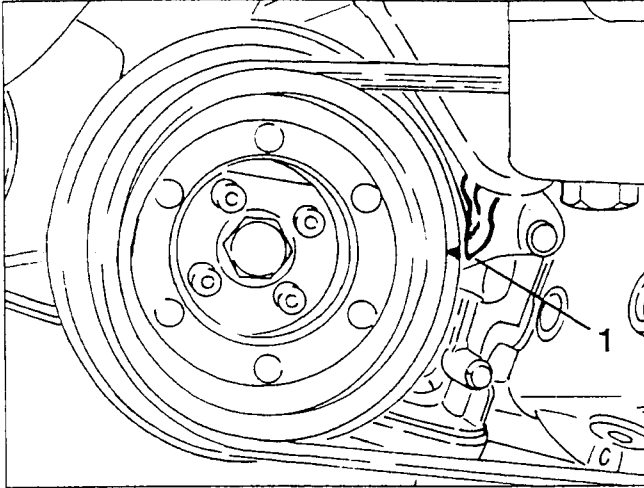
- Remove the belt tensioning tools.
- Tension the auxiliary component drive belts (see specific paragraphs).



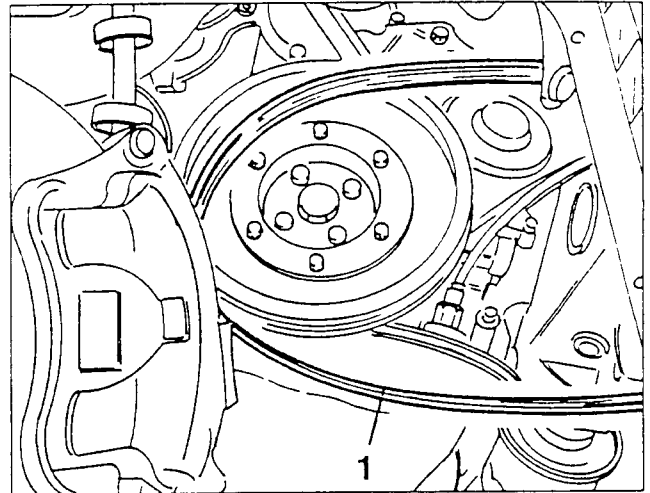
## CHANGING THE TIMING GEAR DRIVE BELT (From engine no.1762798)

- Remove the right front wheel and mud flap.

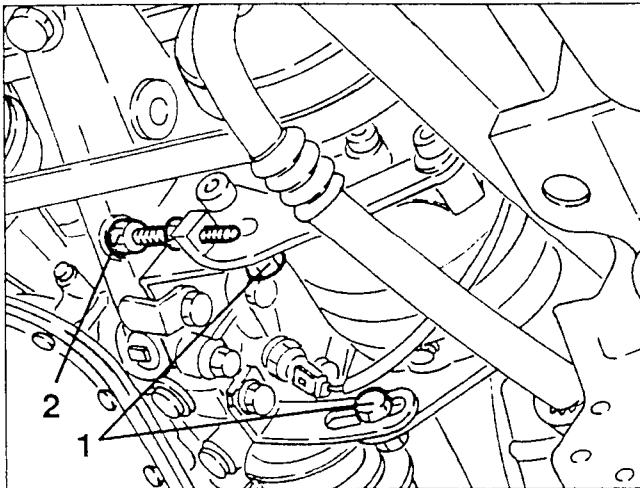
1. Turn the engine in its direction of rotation until the notch on the auxiliary components drive pulley coincides with the relief on the timing gear belt lower cover (engine timed).



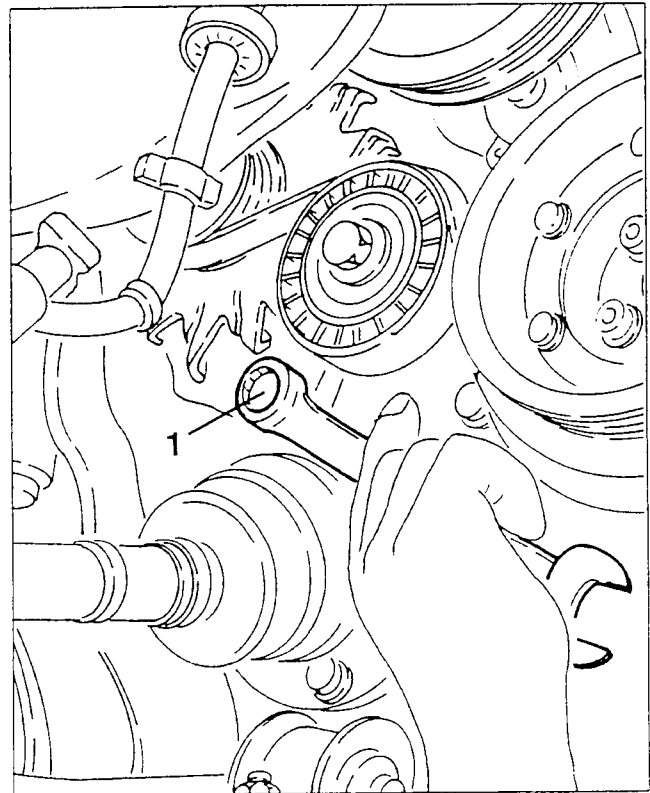
1. Prise conditioner compressor drive belt off the auxiliary components drive pulley.



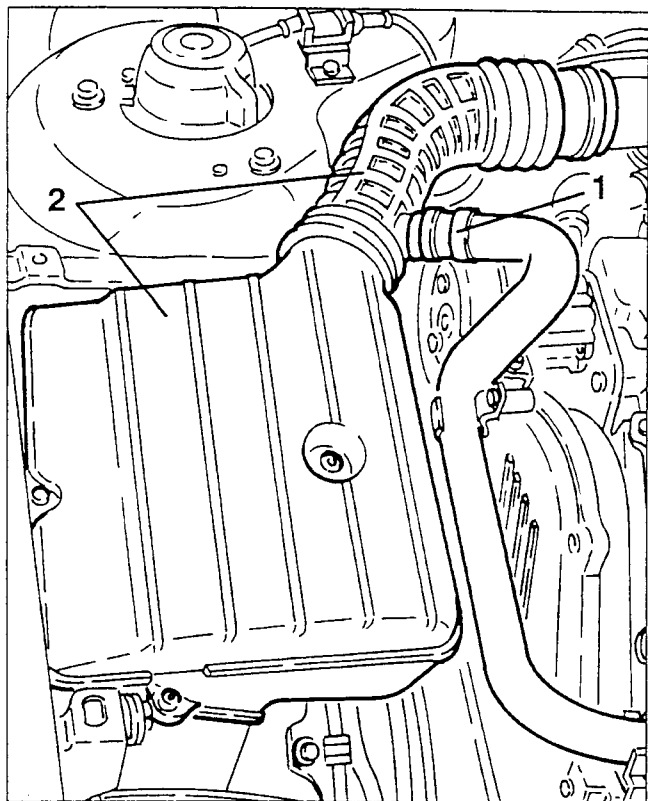
1. Loosen the two conditioner compressor fastening screws.  
2. Working on the micrometric tensioner, slacken the tension of the conditioner compressor drive belt.



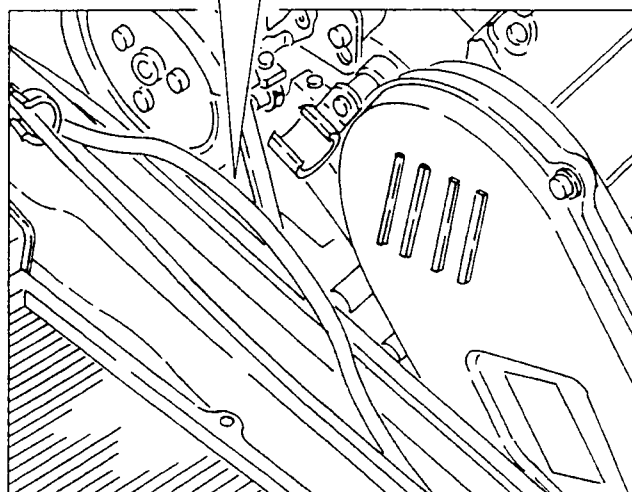
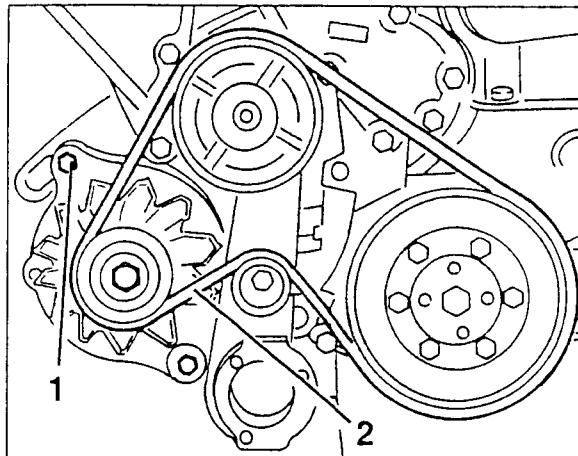
1. Loosen the alternator lower fastening bolt.



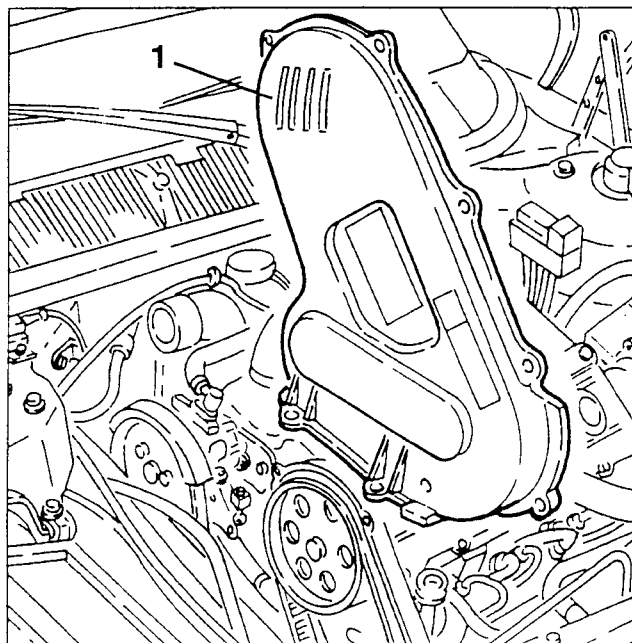
1. Lower the car, then disconnect the oil vapour recirculation pipe from the air intake corrugated sleeve.
2. Slacken the fastening screws, loosen the clamp, then remove the air cleaner cover complete with corrugated sleeve.



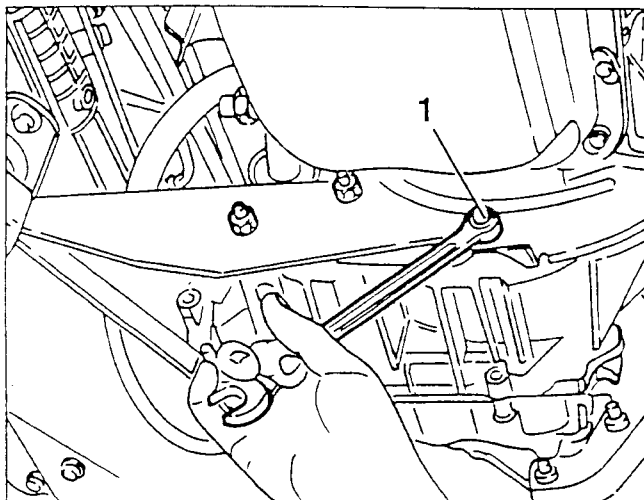
1. Loosen the upper alternator fastening screw.
2. Prise and remove the alternator - water pump drive belt.



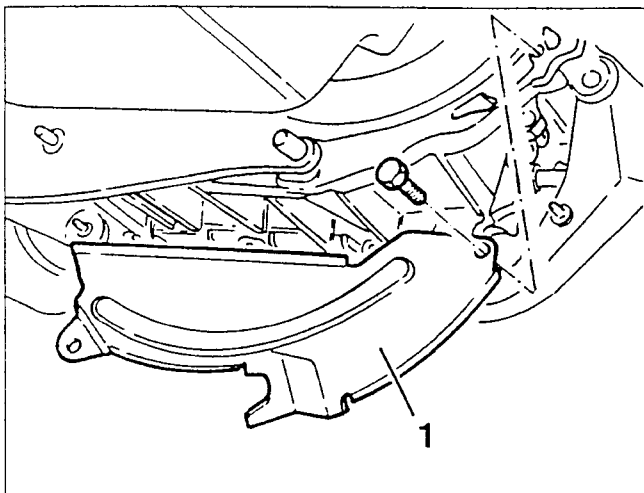
1. Slacken the fastening screws and remove the timing gear belt cover.



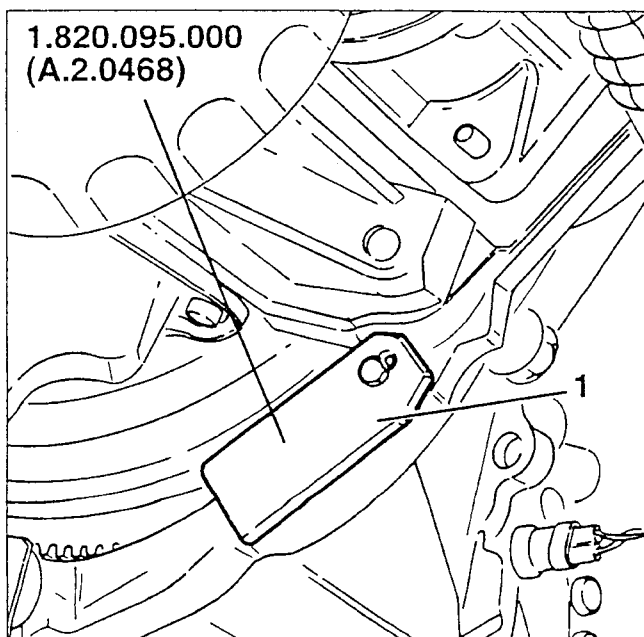
1. Raise the car and slacken the front nut fastening the gearbox to its support bracket.



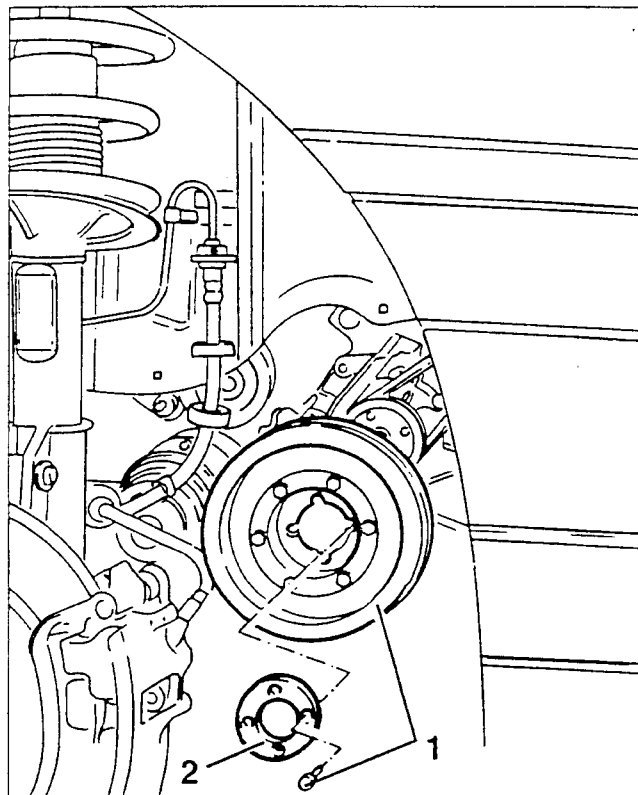
1. Slacken the fastening screws and remove the flywheel guard.



1. Install flywheel stopper tool no. 1.820.095.000 (A.2.0468).

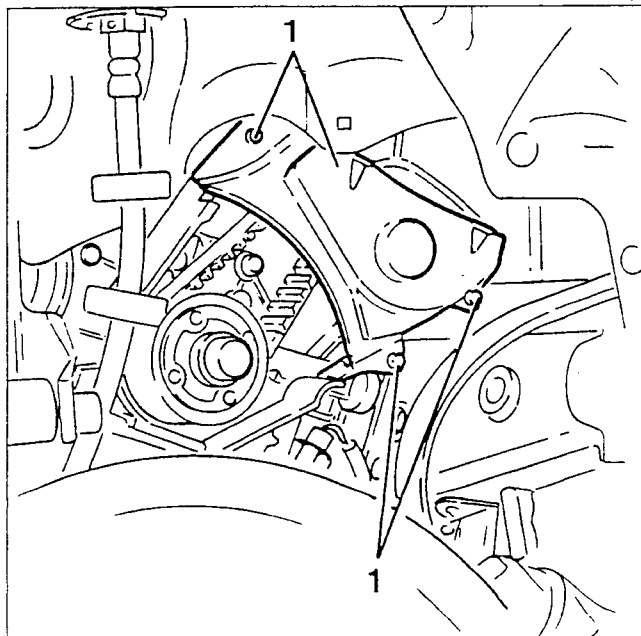


1. Slacken the fastening screws and remove the auxiliary components belt drive pulley.
2. Retrieve the spacer.



- Remove the flywheel stopper tool no. 1.820.095.000 (A.2.0468) installed previously.

1. Slacken the fastening screws and remove the timing gear belt lower cover.

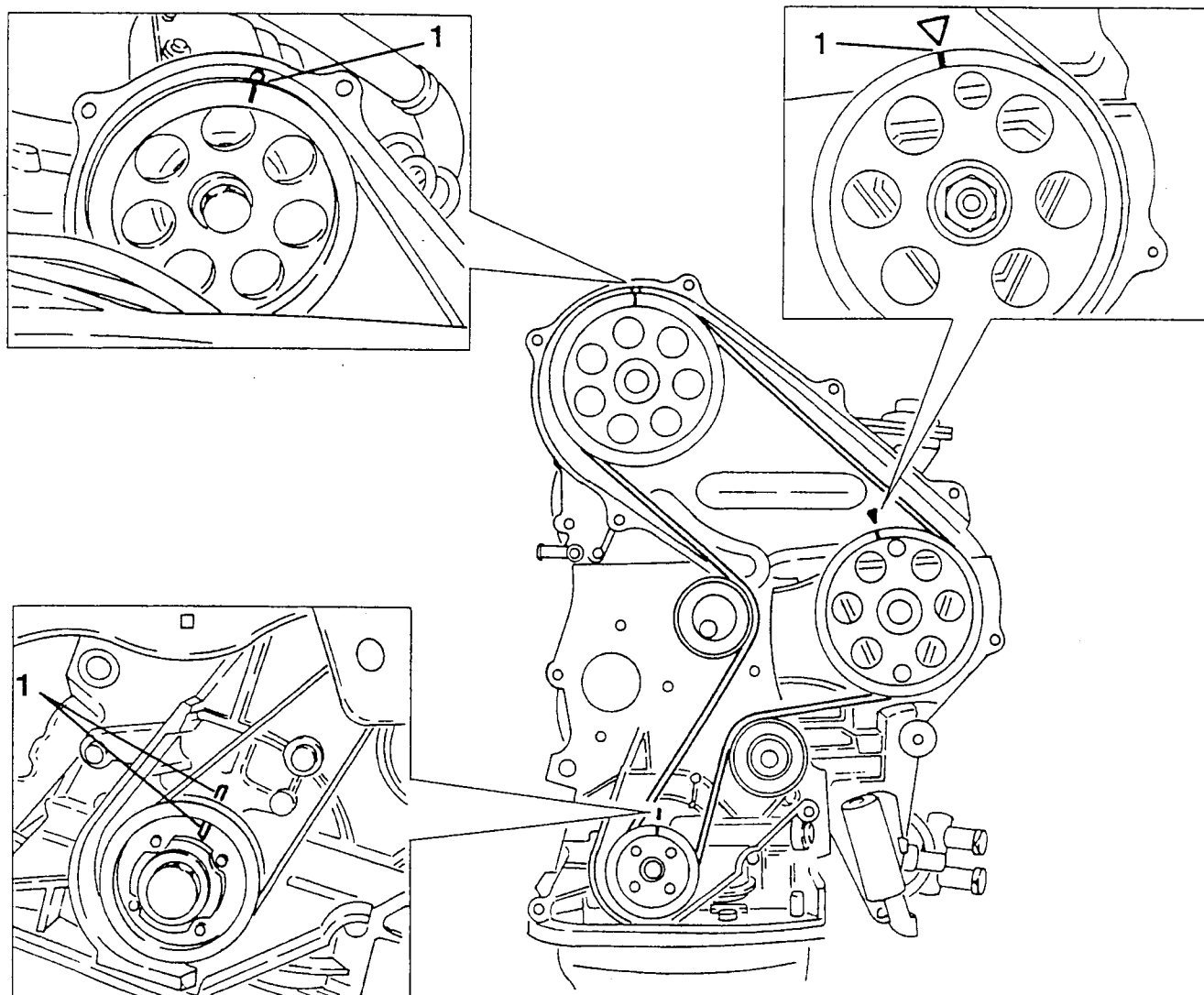


1. Check that the notches on the three pulleys coincide with the three fixed notches on the engine as illustrated.

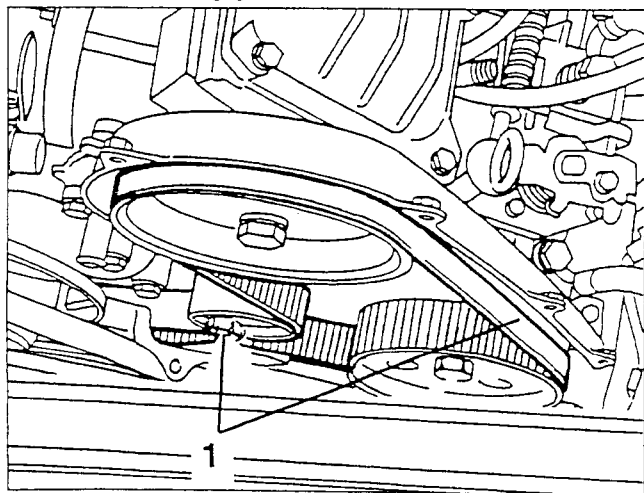
This way the engine is in the T.D.C. position on the 1st cylinder and the camshaft is in the bursting stroke also on the 1st cylinder.

**NOTE:** - The camshaft pulley is slotted, therefore in this condition, the notch on it does not necessarily coincide with the fixed one.

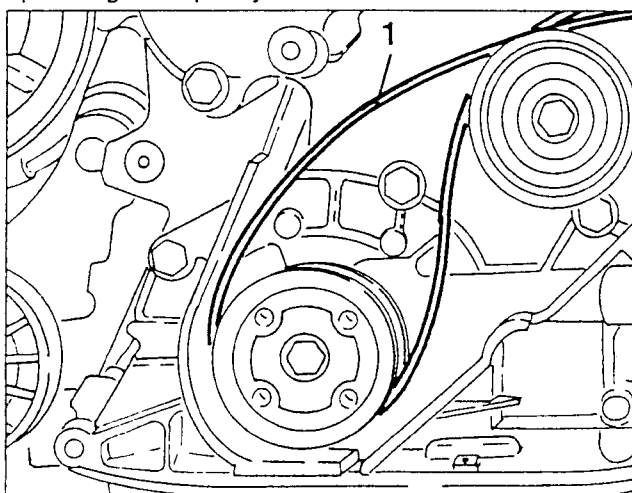
- There are two notches stamped on the injection pump drive pulley, for timing check alignment with the yellow notch.



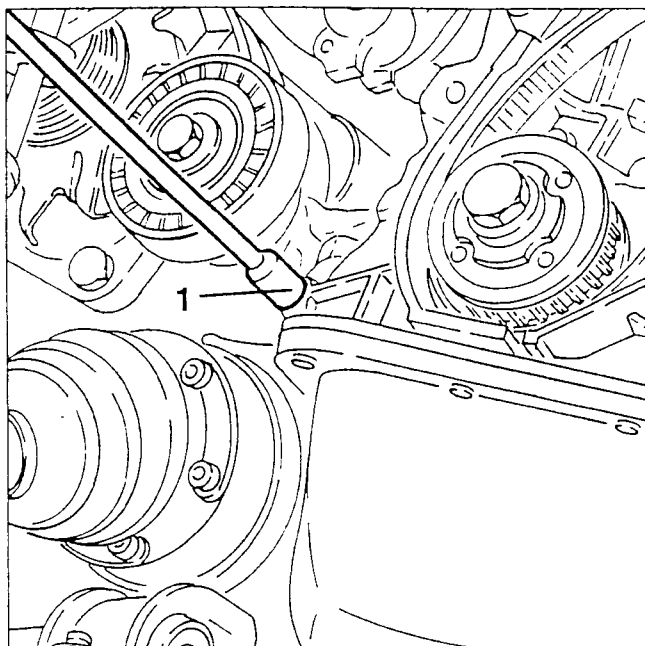
1. Loosen the belt tensioner nut, then prise and remove the timing gear drive belt.



1. Install a new timing gear drive belt on the corresponding drive pulley.

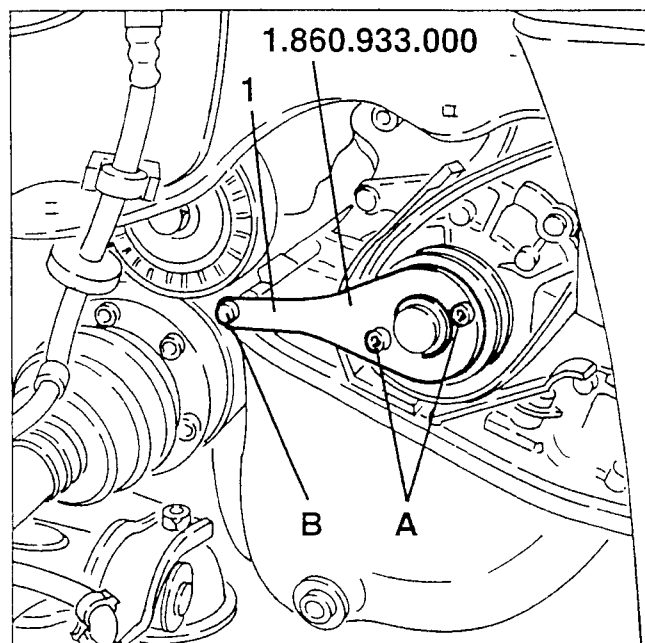


1. Slacken and remove the screw fastening the front cover to the crankcase.



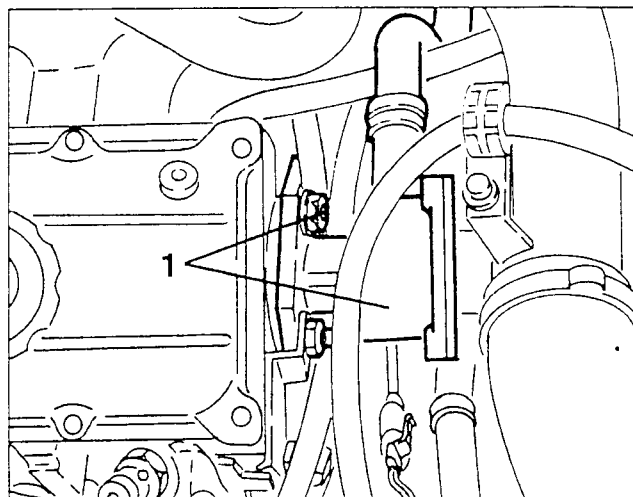
1. Position tool no. 1.860.933.000 for positioning the 1st cylinder at T.D.C.

The tool must be coupled to the timing gear belt drive pulley and fastened to it using screws (A). Using screw (B) it should also be positioned at the front crankcase cover (this way the angular position of the tool guarantees positioning of the 1st cylinder at T.D.C. in the bursting stroke).



- Re-check that the timing notches are still aligned as described previously.

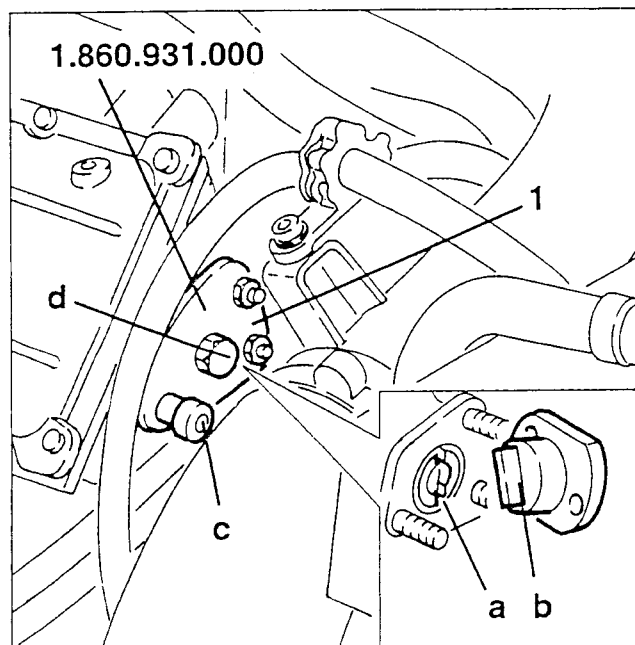
1. Lower the car, slacken the fastening nuts and remove the servobrake vacuum pump from the cylinder head.



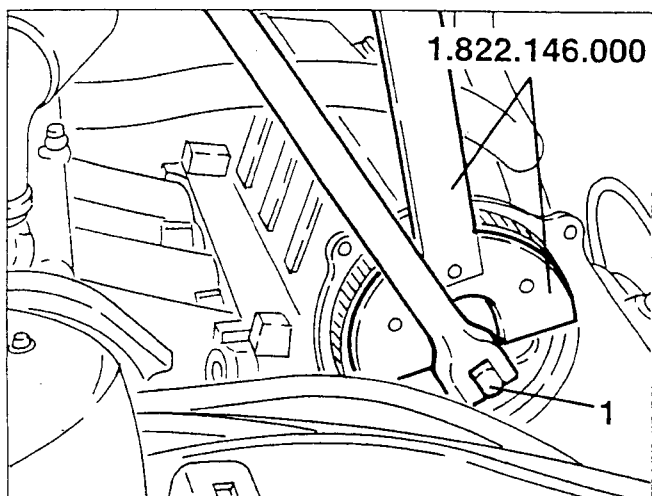
1. Position tool no. 1.860.931.000 for timing the camshaft, coupling groove (a) of the camshaft with relief (b) of the tool.

- Fasten the tool to the cylinder head positioning dowel (c) as illustrated.

**NOTE:** The dowel must be centred on the tool, if not, use a wrench on the hexagon (d) and centre the dowel on the tool with tiny movements.

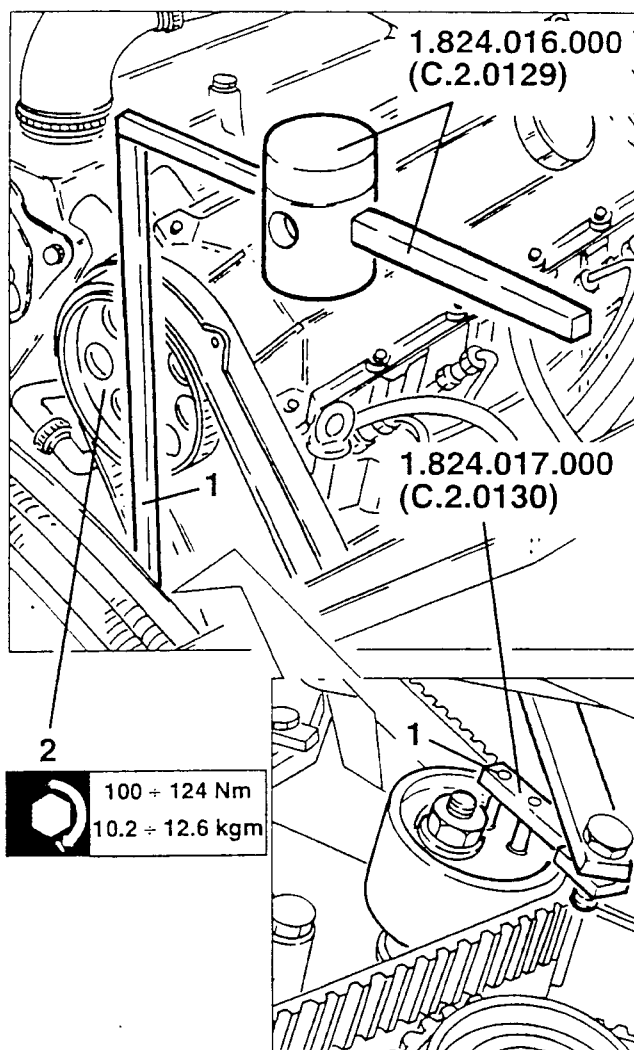


1. Using tool no. 1.822.146.000 slacken the screw fastening the camshaft drive pulley.



- Complete assembly of the camshaft drive pulley starting from camshaft drive pulley and continuing counter-clockwise.

**NOTE:** Check that the injection pump notch coincides with the fixed one on the rear cover.



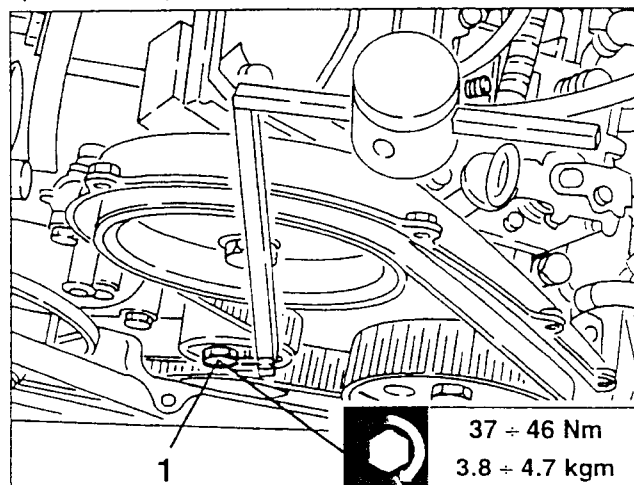
- Remove the tools installed previously for timing and locating the T.D.C.

- Settle the toothed belt turning the crankshaft twice in its direction of rotation.

1. Tighten the belt tensioner fastening nut to the specified torque.

1. Install tools no. 1.824.017.000 (C.2.0130) and no. 1.824.016.000 (C.2.0129) on the belt tensioner for tensioning timing gear belt as illustrated positioning the weight, complete with knurled piece, at a distance of 120 mm on the graduated rod.

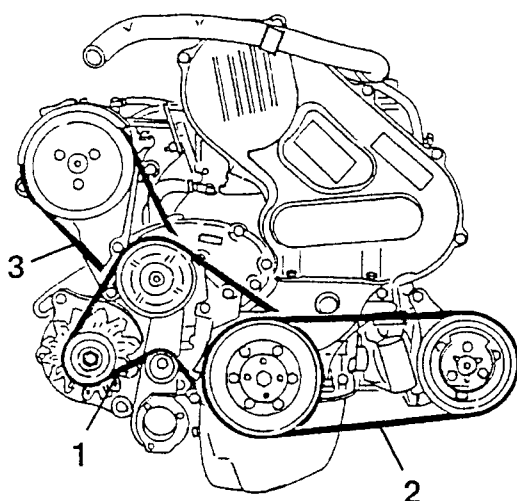
2. Tighten the camshaft drive pulley fastening screw to the specified torque using the same tools as previously.



- Remove the tools used for tensioning the belt.

- Complete refitting reversing the sequence followed for removal.

## AUXILIARY COMPONENT BELTS



1. Alternator - water pump drive belt
2. Conditioner compressor drive belt
3. Power steering pump drive belt

**NOTE:**

When checking the belt tension, also check that the belt is intact and free of:

- cuts
- cracks
- material surface wear (smooth and shiny).
- dry or stiff parts.

In the event of one of the above defects, change the belt.

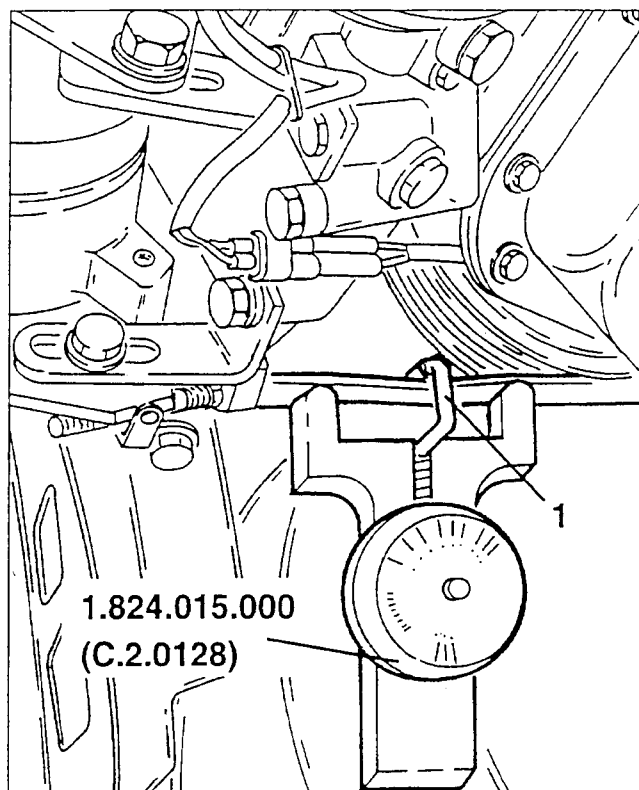
**WARNING:**

The contact of the belts with oil or solvents can damage the elasticity of the actual belt and reduce its adherence.

## Conditioner compressor drive belt

## Checking and tensioning

- Set the car on a lift and raise it.
- 1. Working as illustrated, measure the belt tension using tool N° 1.824.015.000 (C.2.0128).



- Check that the tensioning values measured with the tool are within the specified limits.

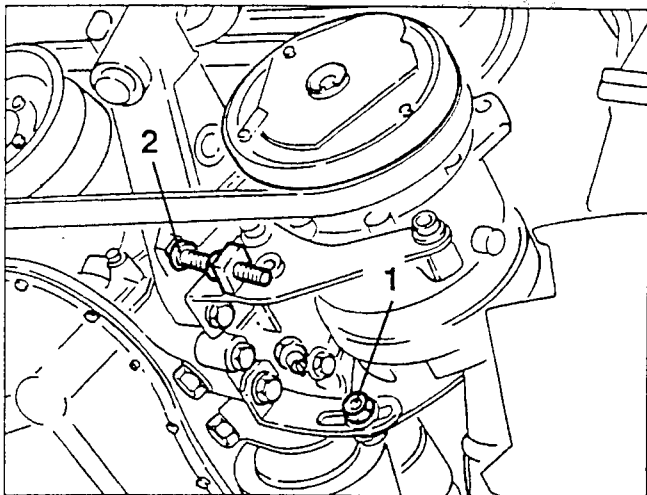
Tension of trapezoidal belt "AV10" for conditioner compressor drive	
At assembly	400 ÷ 550 N
Retensioning	280 ÷ 370 N

**NOTE:** The belt may be retensioned after a brief running-in period, proceeding as follows:

- bring the engine to normal operating temperature
- turn off the engine and wait for it to cool down
- retension the belt to the specified value.

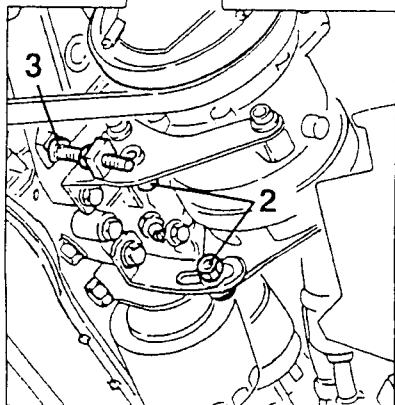
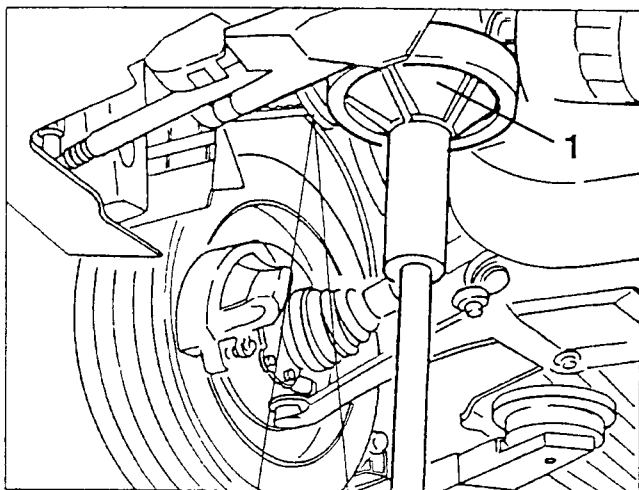
- If the belt tensioning is incorrect, proceed as follows.

1. Slacken the conditioner compressor fastening screws.
  2. Tension the belt correctly using the micrometric tensioner.
- Tighten the conditioner compressor fastening screws.

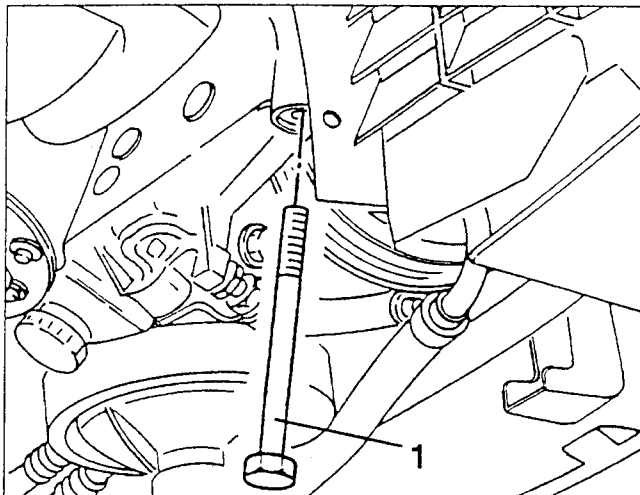


### Changing the belt

1. Set a hydraulic jack underneath the engine as illustrated.
2. Slacken the conditioner compressor fastening screws.
3. Slacken the belt tension using the micrometric tensioner.



1. Slacken the screw fastening the oil filter support and injection pump to the engine flexible mount on the timing gear side.

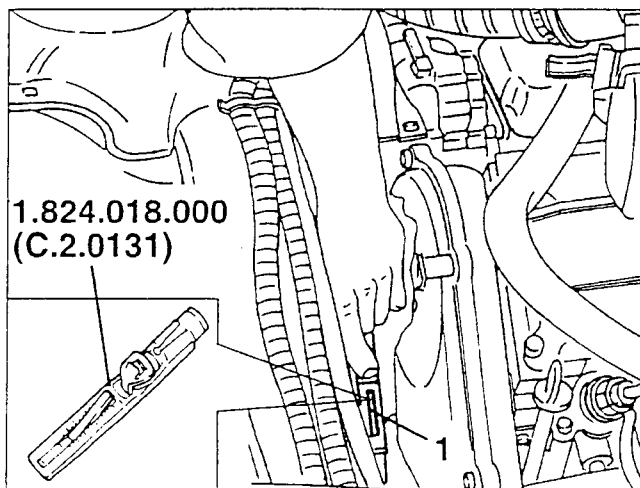


- Lower the hydraulic jack just enough to bring the compressor belt out from the engine mount and remove it.
- Install a new belt reversing the procedure described for removal and tension it following the procedure given in the previous paragraph.

### Alternator - water pump drive belt

#### Checking and tensioning

- Slacken the screws fastening the air cleaner and turn it over without disconnecting the sleeves.
- 1. Working as illustrated, measure the tension of the belt using tool N° 1.824.018.000 (C.2.0131).



#### Tension of belt "POLY-VK5" for alternator - water pump drive

At assembly	400 ÷ 450 N
Retensioning	300 ÷ 350 N

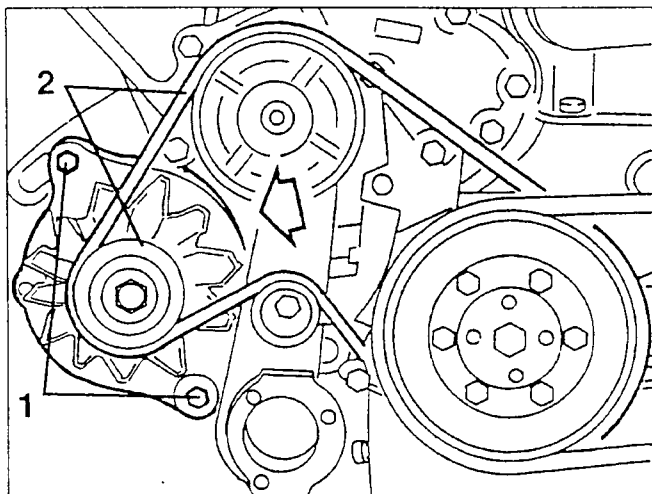


**NOTE:**

The belt may be retensioned after a brief running-in period, proceeding as follows:

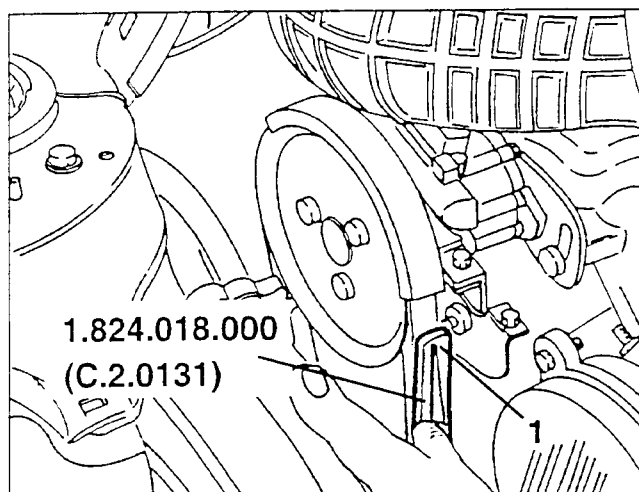
- bring the engine to normal operating temperature
- run the engine for about 10 minutes
- turn off the engine and wait for it to cool down
- retension the belt to the specified value.

- If the tension found is incorrect, proceed as follows:
  1. Slacken the two alternator fastening bolts.
  2. Move the alternator to one side to increase the belt tension.
- Tighten the upper alternator fastening bolt and check the belt tension.
- If the belt tension is correct also tighten the lower bolt fastening the alternator to the support bracket.
- Refit the air cleaner.

**Power steering pump drive belt**

- Slacken the air cleaner fastening screws and turn it over without disconnecting the sleeves.

1. Working as illustrated, measure the belt tension using tool N° 1.824.018.000 (C.2.0131).

**Tension of belt "POLY-VK5" for power steering drive**

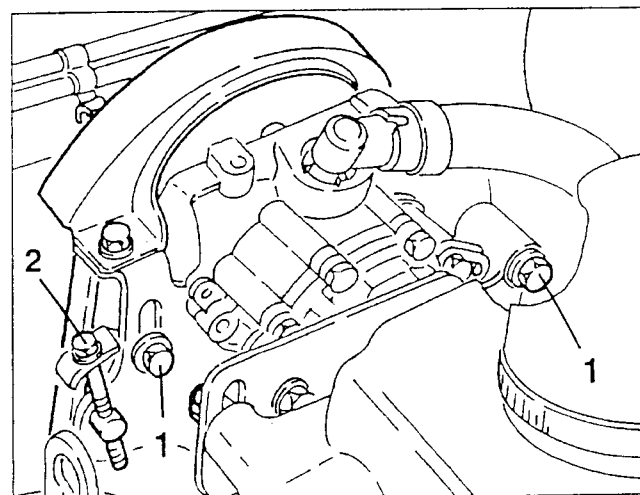
At assembly	400 ÷ 450 N
Retensioning	300 ÷ 350 N

**NOTE:**

The belt may be retensioned after a brief running-in period, proceeding as follows:

- bring the engine to normal operating temperature;
- run the engine for about 10 minutes;
- turn off the engine and wait for it to cool down;
- retension the belt to the specified value.

- If the tension found is incorrect, proceed as follows:
  1. Slacken the power steering pump fastening screws.
  2. Tension the belt correctly using the micrometric tensioner.

**Replacement**

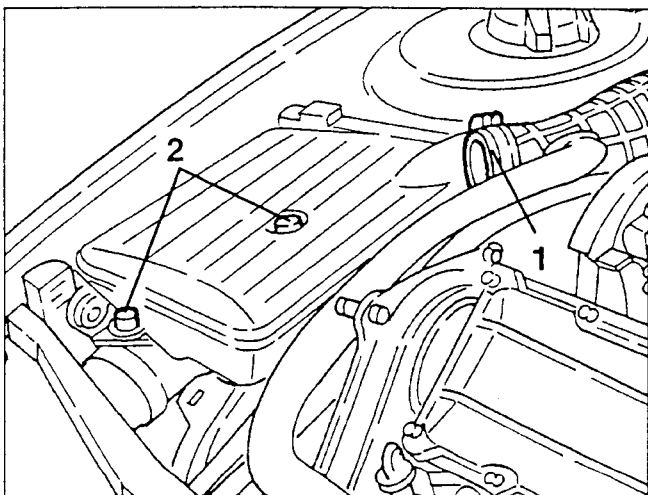
- Set the car on a lift and raise it.
- Slacken the fastening screws and remove the lower engine guard.
- Remove the conditioner compressor drive belt from the pulley.
- Lower the car.
- Slacken the screws fastening the air cleaner and turn it over without removing the sleeves.
- Slacken the two alternator fastening bolts (See "Checking and tensioning") and remove the belt.
- Install a new belt reversing the procedure described for removal and tension it following the procedure given in the previous paragraph.
- Complete re-assembly taking care to tension the conditioner compressor belt (see specific paragraph).

**Replacement**

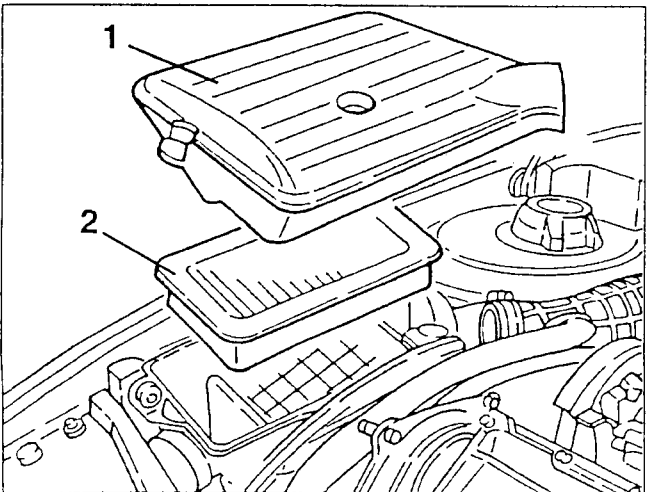
- Remove the alternator - water pump drive belt (see specific paragraph).
- Remove the power steering pump cover.
- Slacken the power steering pump fastening screws (see "Checking and tensioning").
- Lessen the tension of the power steering pump drive belt using the micrometric tensioner screw, then remove it.
- Install a new belt reversing the procedure described for removal and tension it following the procedure given in the previous paragraph.
- Complete refitting operations and tension the alternator - water pump drive belt and the conditioner compressor drive belt (see specific paragraphs).

**CHECKING/CHANGING THE AIR CLEANER CARTRIDGE**

1. Disconnect the corrugated sleeve from the air cleaner cover.
2. Slacken the air cleaner cover fastening screws.



1. Remove the air cleaner cover.
2. Remove the air cleaner cartridge.

**WARNING:**

Any filter cleaning operation might damage it, thereby jeopardising the correct operation of the engine supply system.

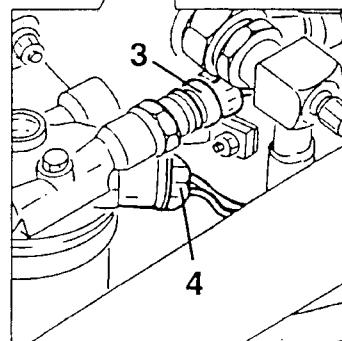
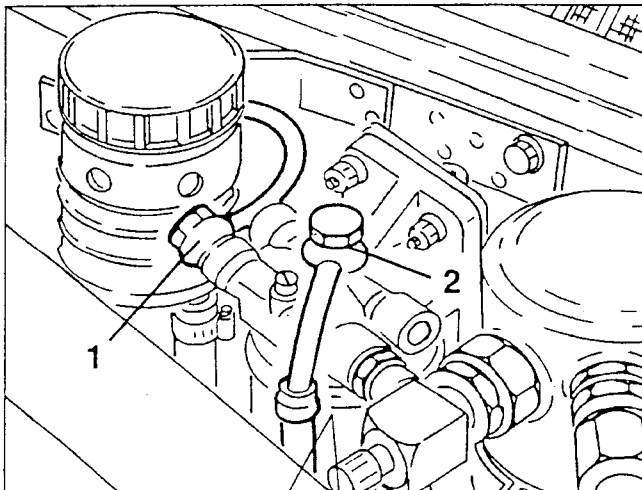
- Carefully clean the air cleaner cartridge container.
- Check the conditions of the cartridge and if necessary install a new one.
- Refit the cover and fasten with the corresponding screws.
- Connect the corrugated sleeve to the air cleaner cover.

**NOTE:**

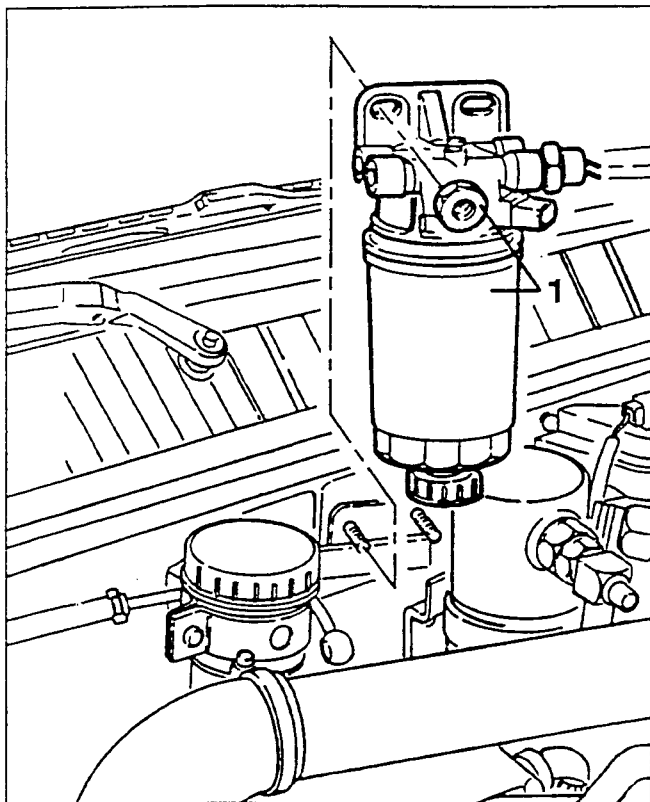
If the cleaner shows traces of oil, check for possible leaks in the entire air circuit.

**CHANGING THE FUEL FILTER CARTRIDGE**

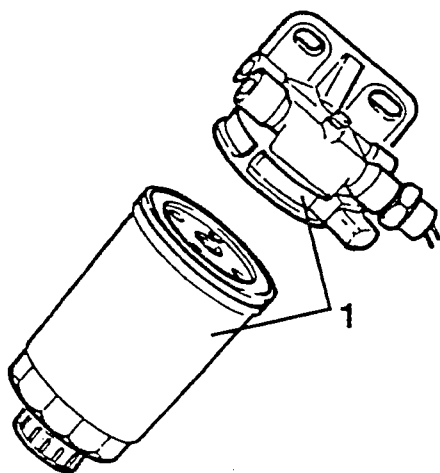
- Disconnect the battery (-) terminal.
1. Disconnect the connection of the tank fuel delivery hose from the filter.
  2. Disconnect the connection of the fuel delivery hose to the injection pump from the filter.
  3. Disconnect the electrical connection from the fuel warming device control sensor.
  4. Disconnect the electrical connection for supplying the fuel warming device.



1. Slacken the two fastening nuts and remove the complete fuel filter.



1. On the bench slacken the fuel cartridge together with its support seal.



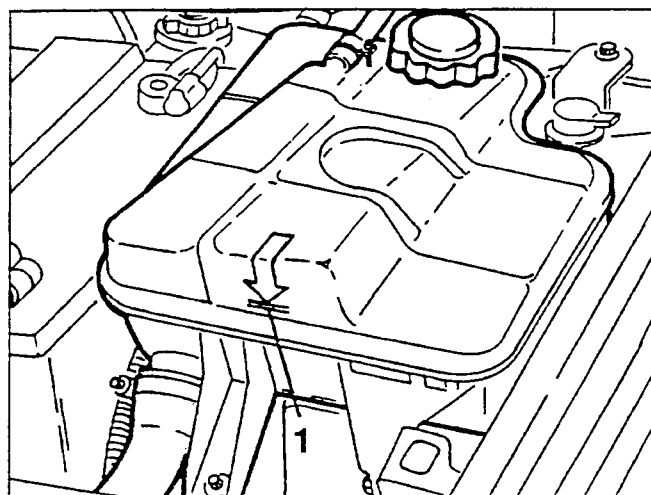
- Install a new cartridge with seal on the fuel filter support.
- Refit by reversing the procedure followed for removal.

- Purge air from the fuel supply system (see GROUP 10).

## CHECKING THE LEVEL AND CHANGING THE ENGINE COOLANT FLUID

### Checking

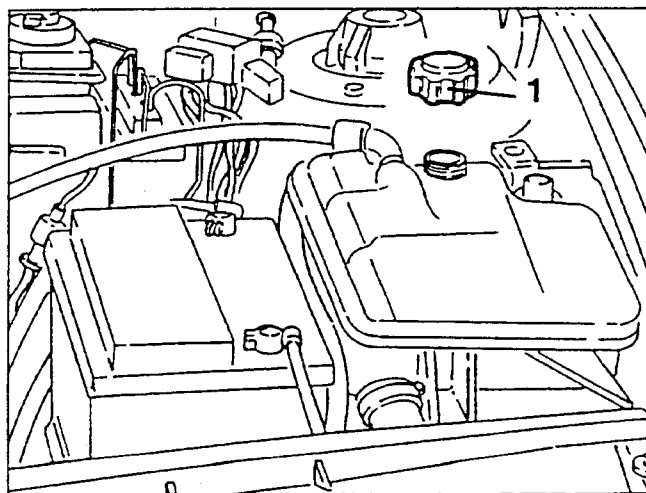
1. With the engine cold check that the level of the coolant in the header tank reaches the notch marked by the arrow and if necessary, top up with the specified fluid.



### Draining and replenishing

1. Slacken and remove the header tank plug.

**Absolutely never remove the header tank plug when the engine is warm!**



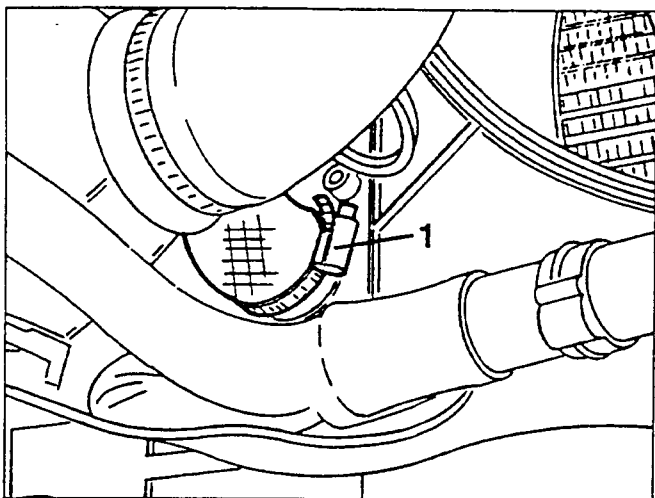
- Raise the car.

1. Drain the engine coolant fluid into a suitable recipient disconnecting the fluid outlet sleeve from the radiator.



**WARNING:**

The anti-freeze mixture used as coolant can harm the paintwork: therefore avoid any contact with painted components.



- Reconnect the sleeve to the radiator and any pipes that have been disconnected, checking that all the hose clamps are firmly tightened.

- Fill the header tank up to the mark.

- The type and indicative quantity of the coolant are given in the table below:

Alfa Romeo Climafluid Permanent -40°C	8.9 litres
---	------------

- Start the engine and bring it to normal operating temperature so that the thermostat opens to release the amount of residual air in the circuit.

- With the engine cold, top up to the level indicated on the header tank.

- Retighten the pressurized cap on the header tank.



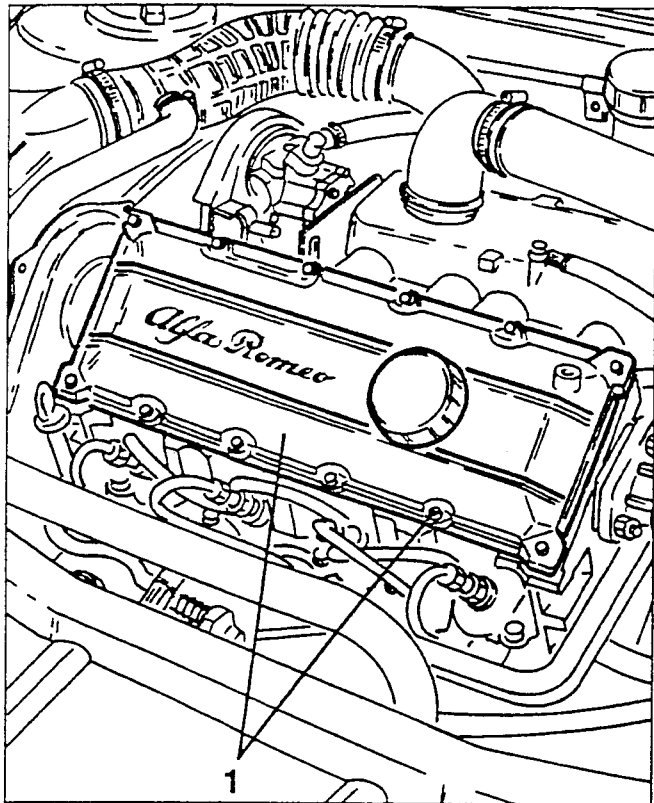
**WARNING:**

It is unwise to mix anti-freeze fluids of different types or brands!

Never use antirust additives: this might not be compatible with the anti-freeze in use!

## CHECKING AND ADJUSTING VALVE CLEARANCE

1. Unscrew the screws and remove the timing cover.
- Remove the gasket.



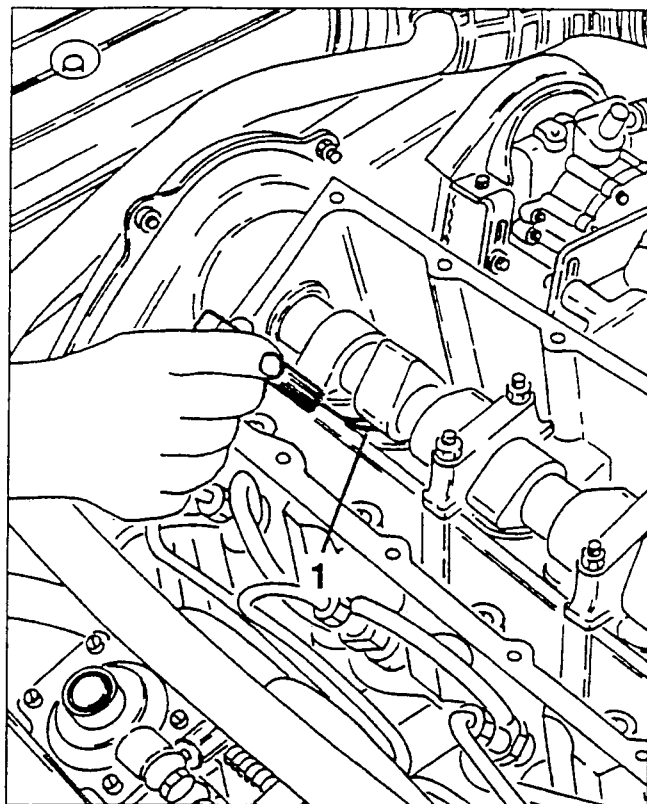
- Rotate the camshaft so that the intake and exhaust valves are in the closed position.

1. When the engine is cold, check that the clearance between the cam heel radius and the tappet falls within the prescribed limits.



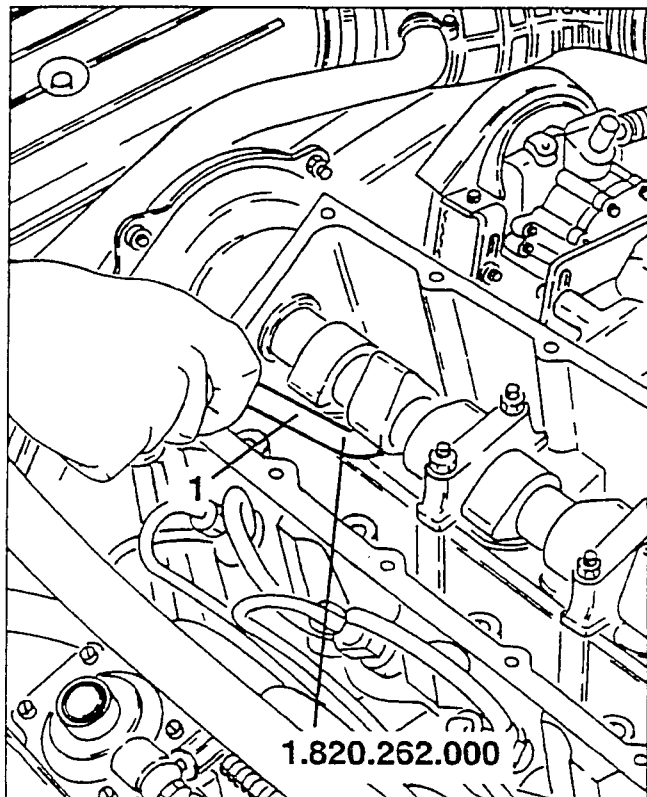
### Operating valve clearance (when engine is cold)

Intake	$0.30 \pm 0.05$ mm
Exhaust	$0.35 \pm 0.05$ mm

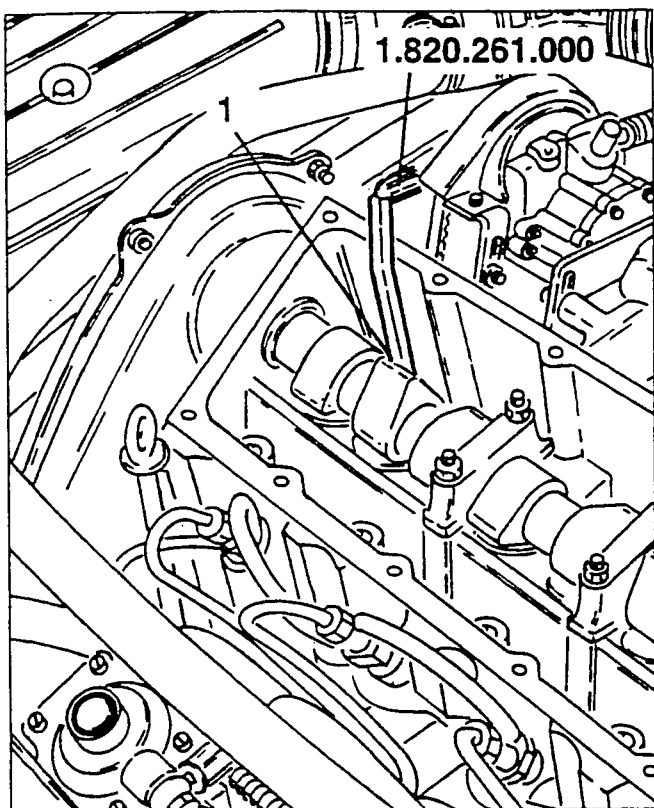


- If the valve clearance does not fall within the prescribed limits, proceed as follows:

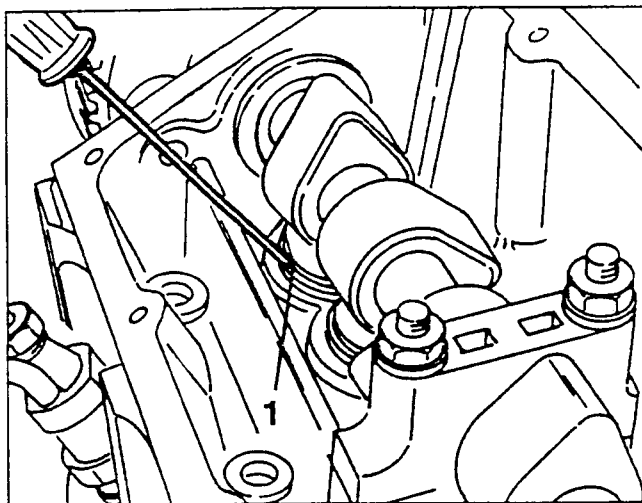
1. Using the pressure lever N° 1.820.262.000 lower the tappets.



1. Position tappet support tool N° 1.820.261.000 and turn the notches on the edge of the tappet to facilitate the subsequent extraction of the regulating plate to be replaced.



1. Extract and remove the tappet regulating plate.

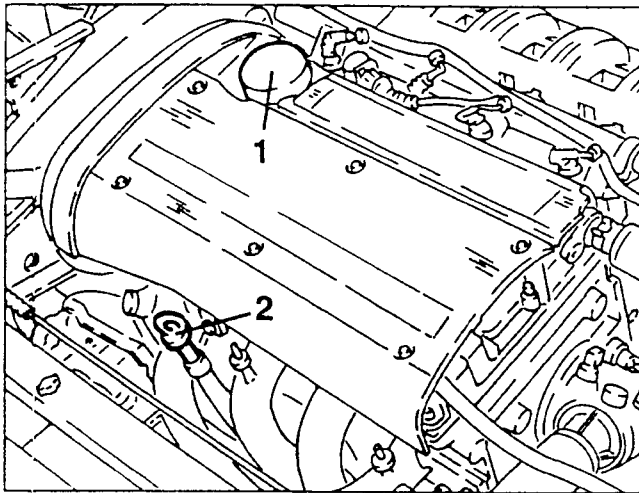


- Replace the plate removed beforehand with another which has the correct thickness to reset the correct valve clearance, then repeat the above mentioned operations for the remaining valves.

**MAINTENANCE****1970 T. SPARK 16V ENGINE****CHANGING THE ENGINE OIL AND FILTER****WARNING:**

Engine oil is harmful to the skin: minimise contact of the oil with the skin; if this does occur wash with soap and water.

1. With the engine warm, remove the filler cap.
2. Withdraw the dipstick.

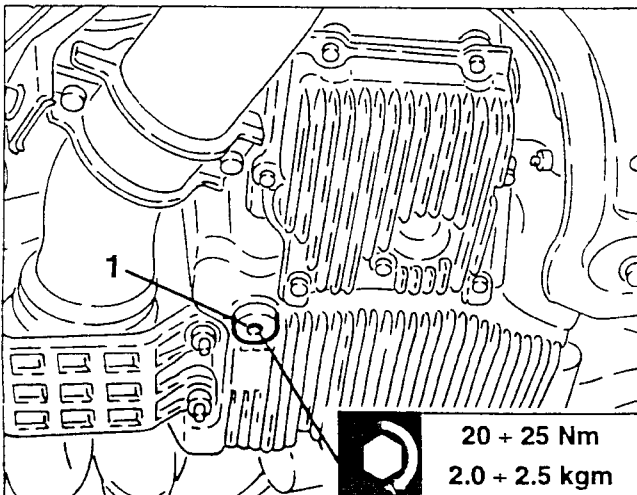


- Raise the car.

1. Remove the drain plug and drain off all the oil into a suitable recipient.

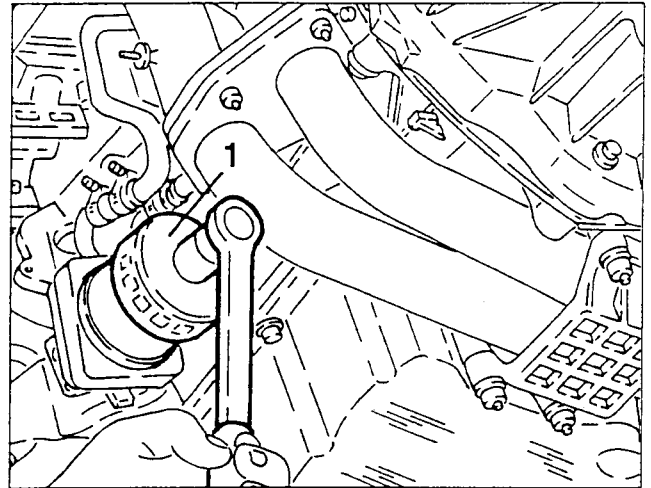
**WARNING:**

Be very careful when removing the drain plug; the oil might be very hot.

**WARNING:**

Never discard the oil in the environment as indiscriminate dumping causes pollution.

1. Working from underneath the car with the appropriate wrench, release the oil filter and remove it.



- Clean the drain plug and tighten it with the seal to the specified torque.
- Moisten the seal of the new filter and screw it on tightening fully by hand.
- Lower the car.
- Replenish the engine with oil of the type and in the quantity specified.
- Check that the oil level is correct with the dipstick.

**WARNING:**

The oil level should be checked with the car on level ground.

The oil level above the MAX mark can cause the oil to evaporate and loss of pressure.

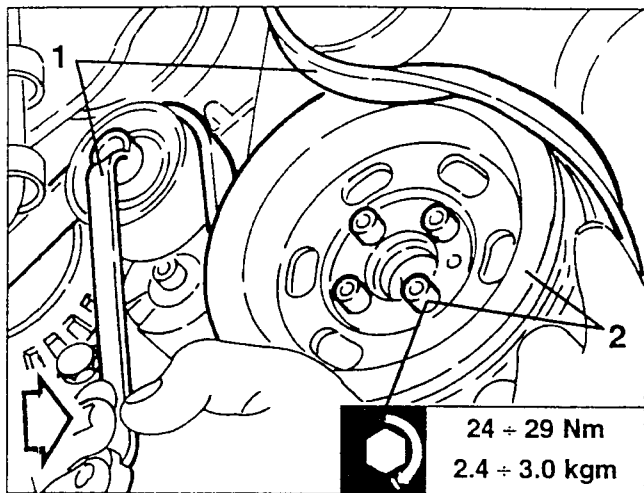
- Refit the filler cap, run the engine for appr. 2 minutes at idle speed, turn off the engine and wait for a few minutes.
- Check the oil level and make sure there are no leaks.

**WARNING:**

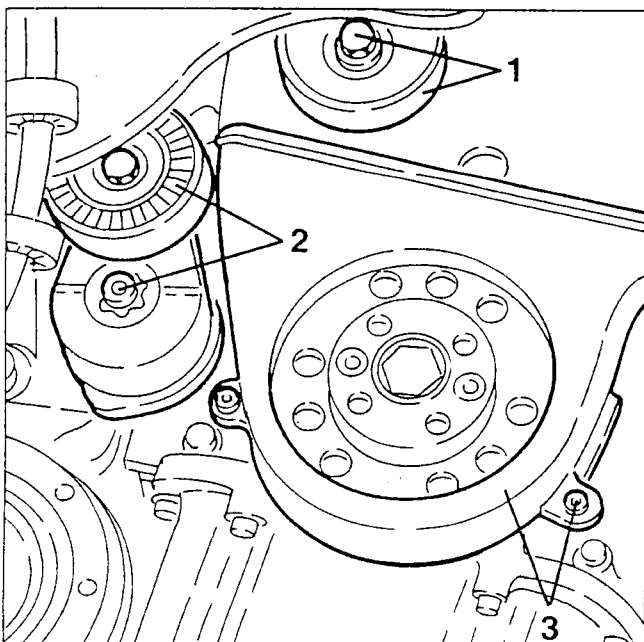
When refilling with oil, great care should be taken to prevent engine oil dripping into the alternator ventilation holes, as this could seriously damage the alternator and may cause fire.

## CHANGING THE TIMING GEAR BELT (For engines with counter-rotating shafts)

- Set the car on a lift.
  - Disconnect the battery (-) terminal.
  - Remove the right front wheel and mud flap.
1. Working as illustrated on the guide pulley, slacken the tension of the auxiliary components control belt and remove it.
  2. Slacken the four fastening screws and remove the auxiliary components control belt.

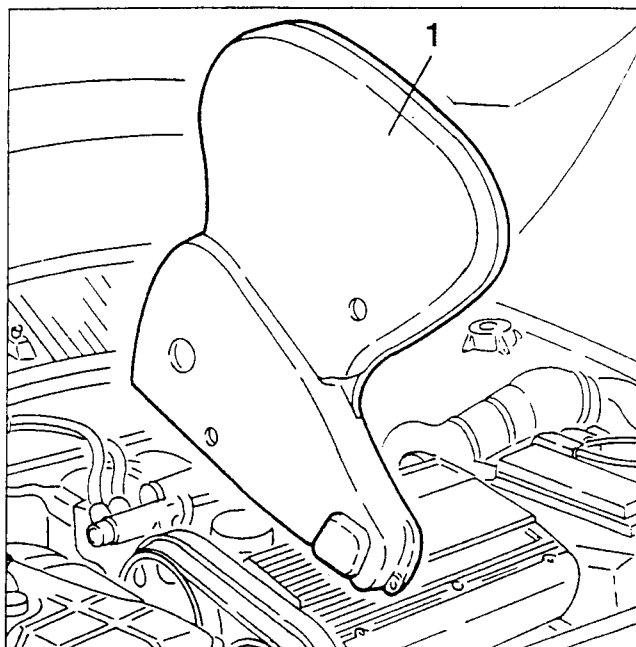


1. Slacken the fastening screw and remove the auxiliary components control belt guide pulley.
2. Slacken the fastening screw and remove the auxiliary components belt tensioner.
3. Slacken the fastening screws and remove the timing belts and counter-rotating shafts lower guard.

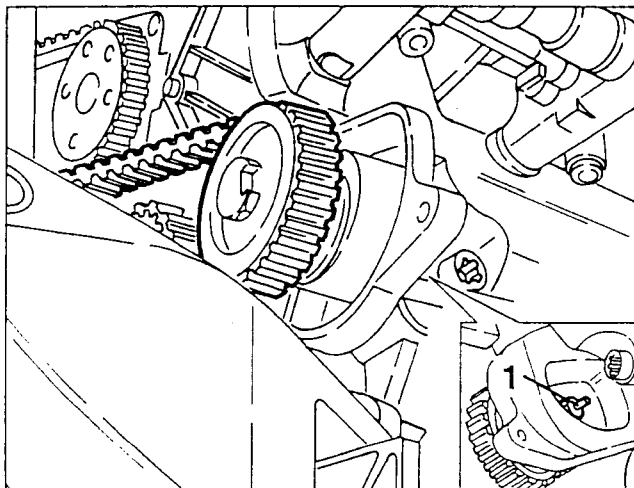


- Slacken the lower screws of the timing belts and counter-rotating shafts upper guard.

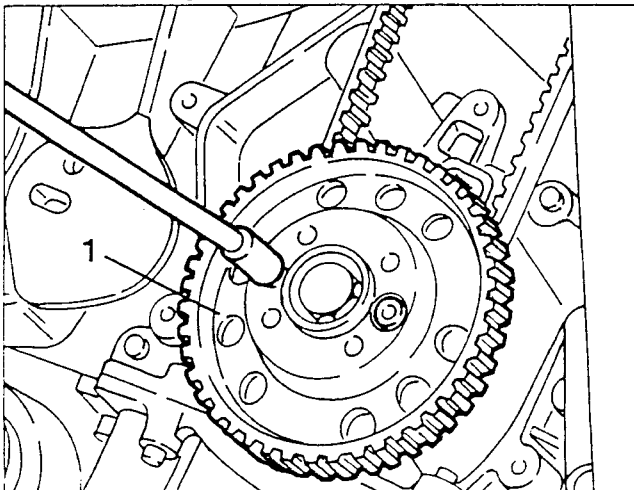
1. Lower the car, slackening the remaining fastening screws and remove the upper guard.



1. Slacken the tension of the counter-rotating shafts belt loosening the nut fastening the corresponding belt tensioner, then remove the belt.

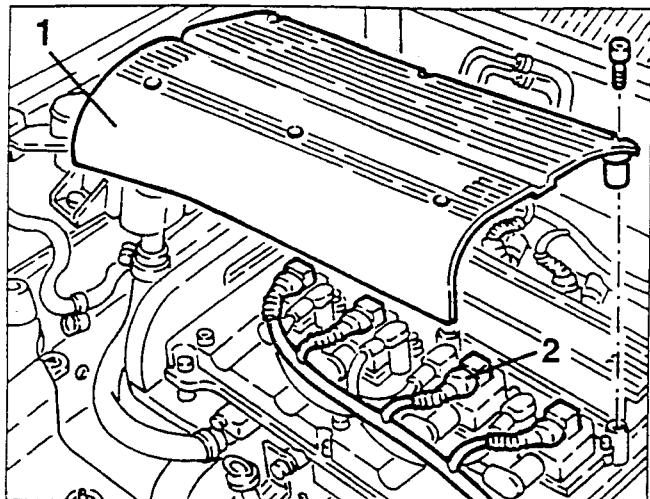


1. Slacken the two fastening screws and remove the counter-rotating shafts driving pulley.

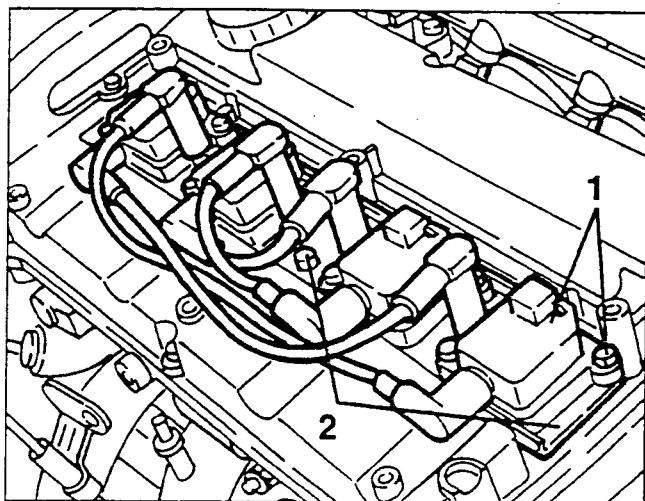




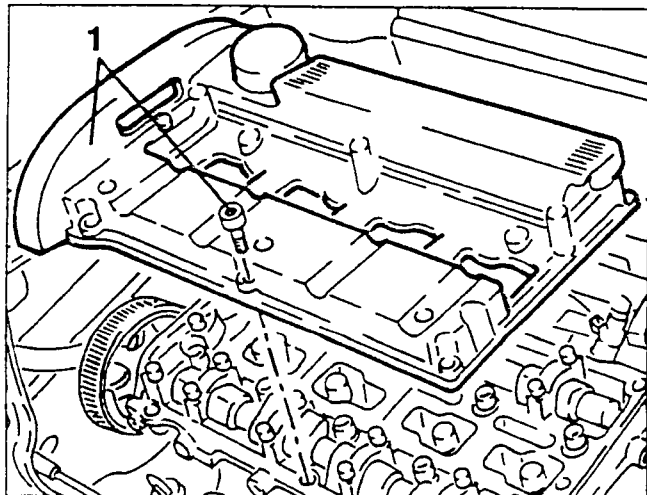
1. Slacken the fastening screws and remove the cover of the ignition coils.
2. Disconnect the electrical connections from the ignition coils.



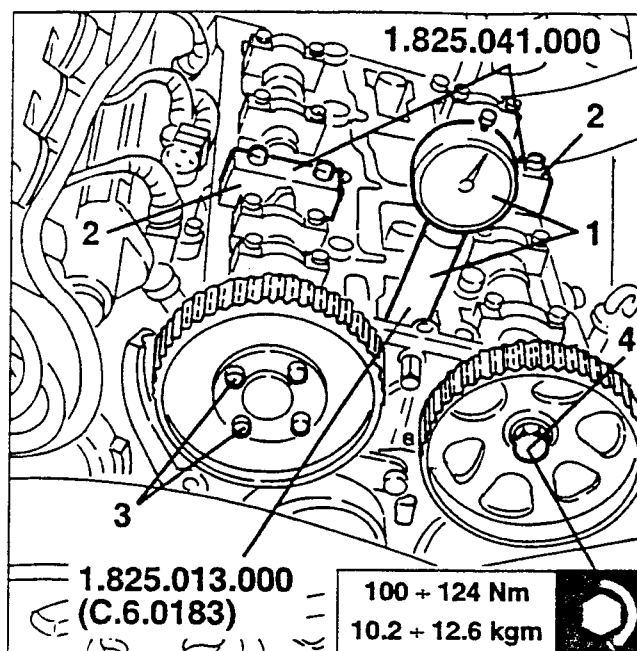
1. Slacken the fastening screws and remove the ignition coils.
2. Slacken the fastening screws and remove the ignition coils support bracket.



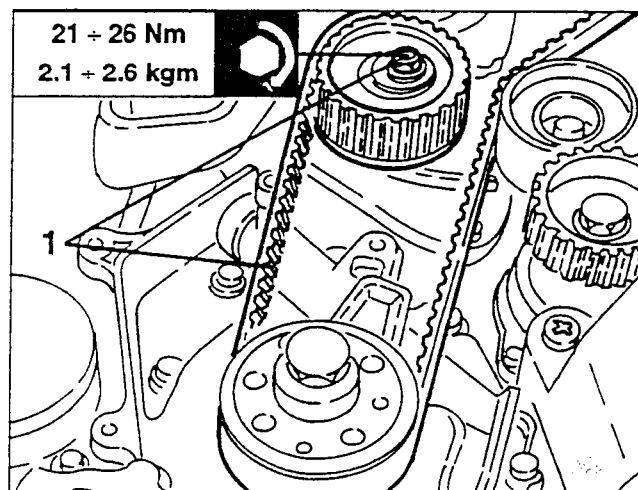
1. Slacken the fastening screws and remove the cylinder head cover complete with seal.



1. Install tool no. 1.825.013.000 (C.6.0183) fitted with dial gauge in the seat of the first cylinder spark plug.  
- Turn the crankshaft in its direction of rotation, until the piston of the 1st cylinder reaches the T.D.C. in the bursting stroke.
2. Remove the camshaft caps illustrated and in their place install templates no. 1.825.041.000 tightening the fastening screws to a maximum torque of 10 Nm (1 kgm) and ensuring correct coupling with the cams.
3. Slacken the four screws fastening the camshaft pulley on the intake side.
4. Slacken the screw fastening the timing pulley on the exhaust side.



1. Working on the timing belt tensioner slacken the tension of the belt, then remove it.

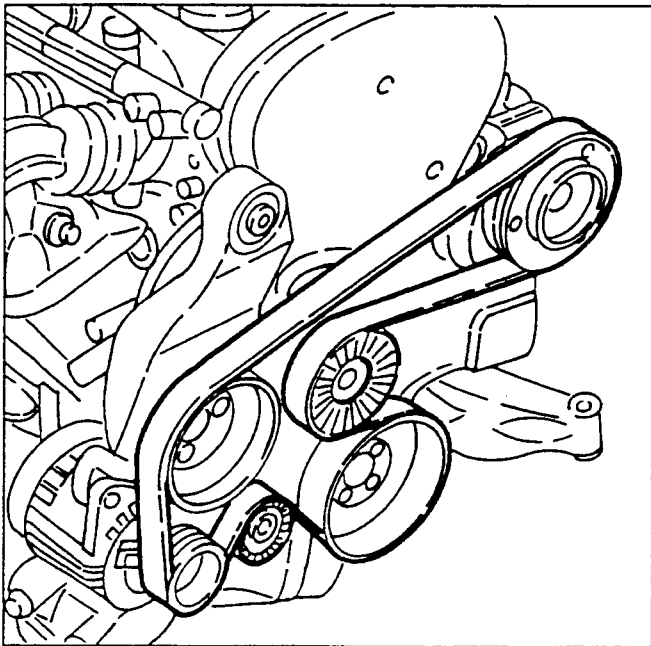


- Install a new timing belt proceeding as described in GROUP 10 - ENGINE OVERHAULING paragraph "Assembly of timing belt and checking timing".

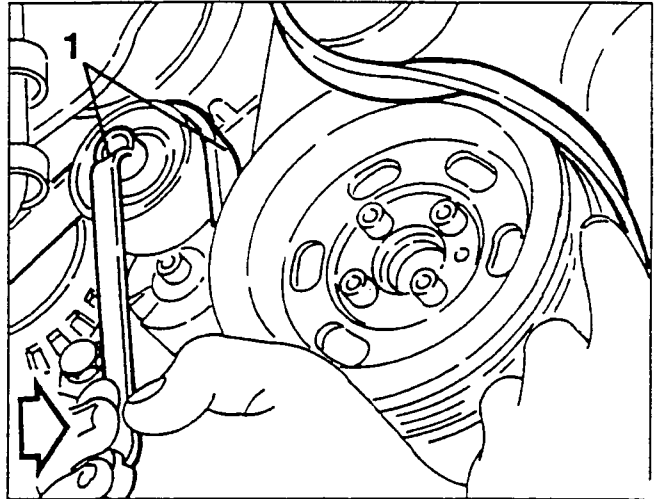
- Install the counter-rotating shafts control belt proceeding as described in GROUP 10 - ENGINE OVERHAULING paragraph "Assembly of counter-rotating shafts control belt and timing".
- Complete re-assembly reversing the sequence followed for removal.

## AUXILIARY COMPONENT BELT

The auxiliary components of the engine are driven by a single Poly V belt. This belt is tensioned by an automatic tensioner; therefore checking the tension is unnecessary.



1. Proceeding as illustrated on the guide pulley, slacken the tension of the auxiliary components drive belt and remove it.



- Install a new belt reversing the sequence followed for removal.

## CHANGING THE AIR CLEANER CARTRIDGE



### WARNING:

Any filter cleaning operation might damage it, thereby adversely affecting the correct operation of the engine.

## Replacement

- Set the car on a lift.
- Remove the right front wheel and mud flap.
- Check visually that the belt is intact and that it is free of:
  - cuts
  - cracks
  - material surface wear (smooth and shiny)
  - dry or stiff parts (lack of adherence).

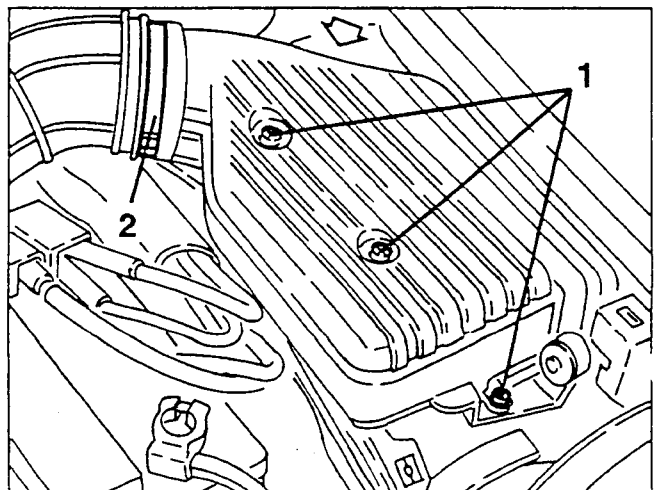
In the event of one of the above defects, change the belt.



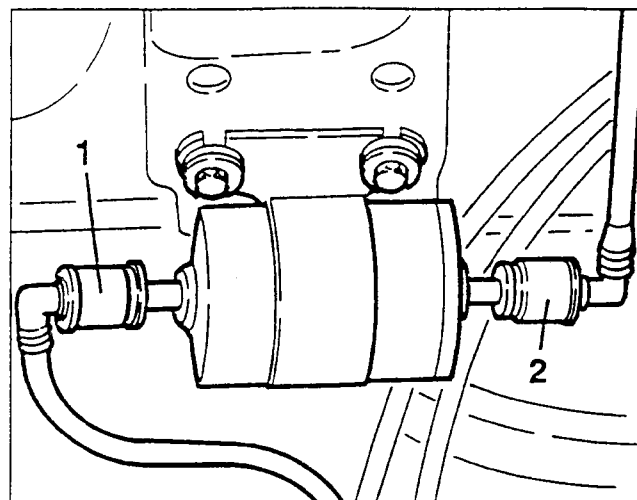
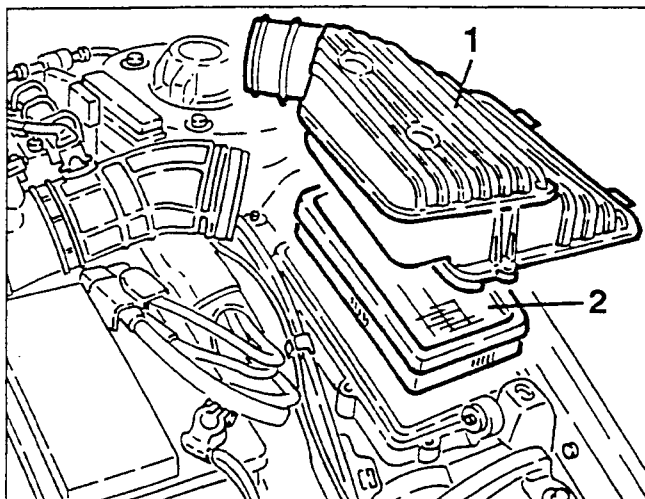
### WARNING:

The contact of the belt with oil or solvents can damage the elasticity of the actual belt rubber and reduce its adherence.

1. Slacken the four air cleaner cover fastening screws.
2. Slacken the clamp fastening the air cleaner cover to the corrugated sleeve.



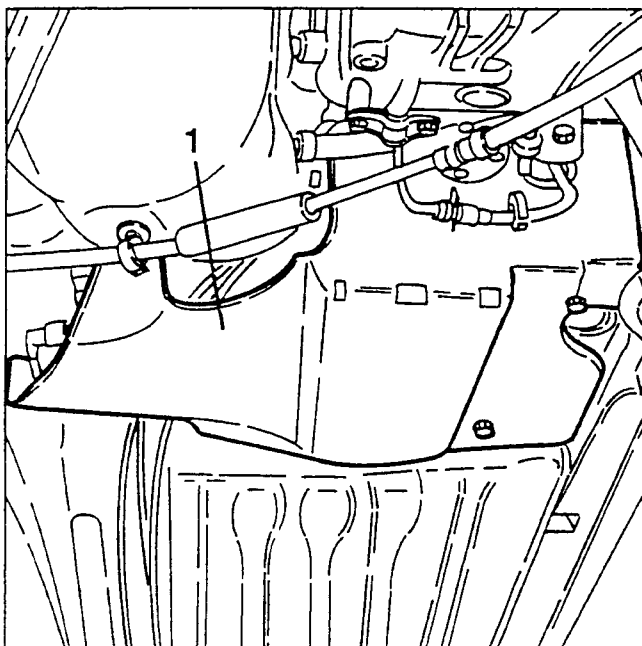
1. Remove the air cleaner cover.
2. Remove the air cleaner cartridge.



- Install the new filter so that the arrow stamped on it points in the direction of the flow of fuel.

## REPLACEMENT THE FUEL FILTER

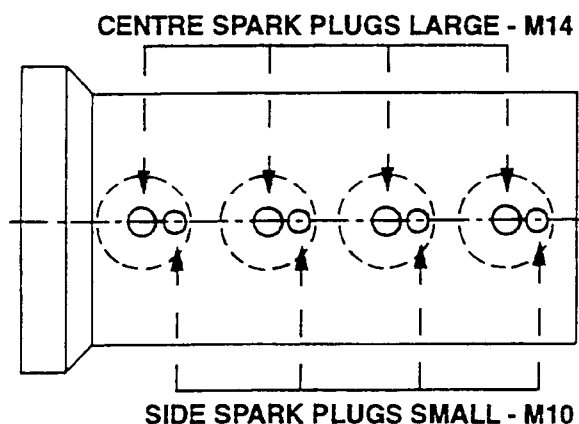
- Set the car on a lift and raise it.
- 1. Slacken the fastening screws and remove the plastic cover to gain access to the fuel filter.



1. Disconnect the connections of the fuel inlet and outlet pipes from the filter (for disconnecting operations see specific paragraph).
  2. Slacken the two screws fastening the support bracket, then remove it complete with fuel filter.
- Separate the fuel filter from the support bracket on the bench.

## CHECKING AND CHANGING SPARK PLUGS

The standard spark plugs are of the surface discharge type with one point and a centre electrode. In order to operate correctly, the gap between the electrodes must be correct. The spark plugs are positioned in the bursting chamber asymmetrically and they differ in size as illustrated below.



Spark plugs	
Centre spark plugs (large - M14)	NGK PFR6B
Side spark plugs (small - M10)	NGK PMR7A

- With the engine cold, remove the spark plugs, firstly blowing inside the spark plug openings to remove any impurities and traces of dirt.

- Check the spark plugs for dirt and the ceramic insulation for breaks. In this case replace the spark plugs.

**WARNING:**

The use of spark plugs with different characteristics or sizes than those specified can cause serious damage to the engine and change the level of harmful emission at the exhaust.

**WARNING:**

A dirty or worn out spark plug is often the sign of a failure in the engine supply system.

For example:

- Traces of carbon dust: incorrect mixture, air cleaner very dirty.
- Spots of oil: oil leaking from the piston rings.
- Formation of ash: presence of aluminium materials, contained in the oil.
- Burnt electrodes: overheating due to unsuitable fuel, defects in the valves.
- High electrode wear: harmful additives in the fuel or in the oil, pinging in the cylinder head.
- Etc.

- When installing, tighten the spark plugs to the following torque:

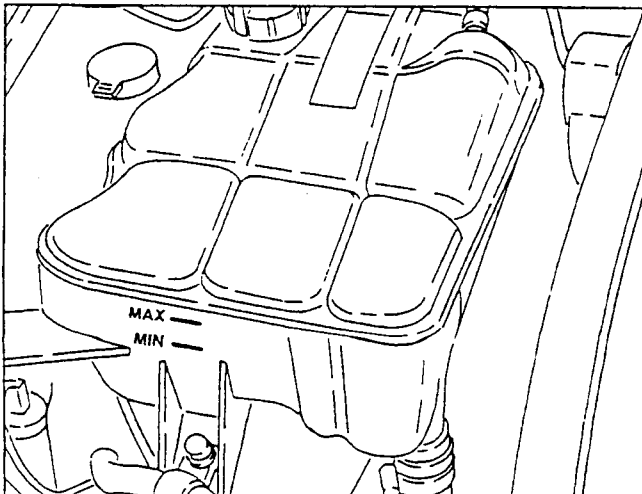


Centre spark plugs (large)	25 + 35 Nm 2.5 ÷ 3.6 kgm
Side spark plugs (small)	10 + 12 Nm 1 + 1.2 kgm

## CHECKING THE LEVEL AND CHANGING THE ENGINE COOLANT FLUID

### Checking

- With the engine cold, check that the level in the coolant in the header tank is between the MIN and MAX marks.



### Draining and replenishing

- Set the car on a lift.
- Slacken and remove the header tank plug.



**WARNING:**

Absolutely never remove the header tank plug when the engine is hot!

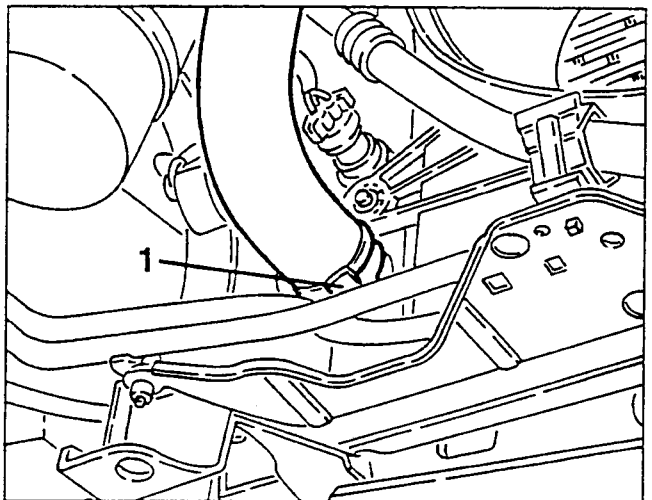
- Raise the car.

1. Slacken the radiator outlet hose and drain the coolant into a suitable recipient.



**WARNING:**

The anti-freeze mixture used as coolant can harm the paintwork: therefore avoid any contact with painted components.



- Reconnect the sleeve to the radiator and any disconnected pipes, checking that all the clamps are firmly tightened.
- Fill the header tank to the MAX mark with fluid of the specified type and quantity.
- Start the engine and bring it to normal operating temperature so that the thermostat opens to release the amount of residual air in the circuit.
- With the engine cold, top up to the MAX mark on the header tank.
- Retighten the pressurised cap on the header tank.



**WARNING:**

It is unwise to mix anti-freeze fluids of different types or brands!  
Never use antirust additives: they might not be compatible with the anti-freeze in use!

**ENGINES MAINTENANCE**

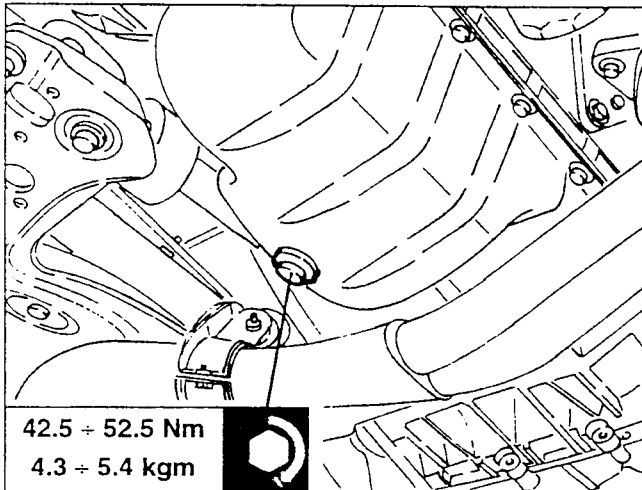
T.SPARK 16V

Below the differences compared with the 1970 T.Spark 16V are given.

Reference should be made to the above engine for items not mentioned here.

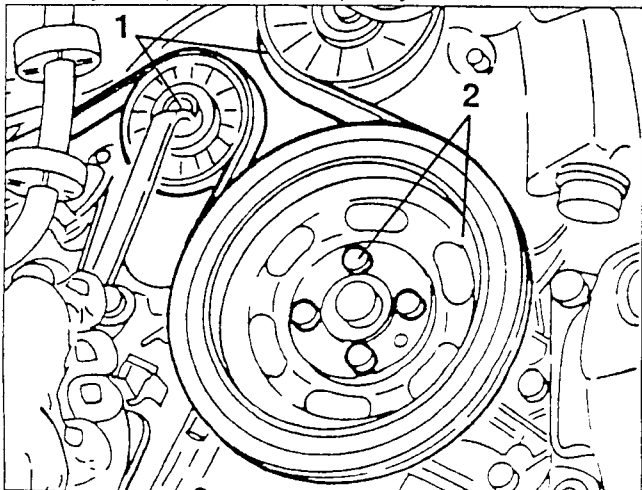
**CHANGING THE ENGINE OIL AND FILTER**

Proceed as described for the 1970 T.Spark 16V engine bearing in mind that for the 1370 T.Spark 16V engine a sheet metal oil sump has been used instead of the aluminium one, as illustrated.

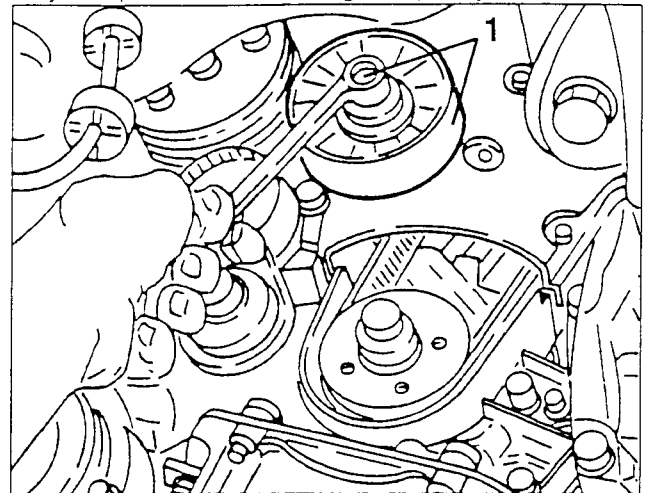
**CHANGING THE TIMING GEAR DRIVE BELT (For engines without counter-rotating shafts)**

- Set the car on a lift.
- Disconnect the battery (-) terminal.
- Remove the right front wheel and mud flap.

1. Working as illustrated on the guide pulley, slacken the tension of the auxiliary components drive belt and prise it off.
2. Slacken the four fastening screws and remove the auxiliary components drive pulley.

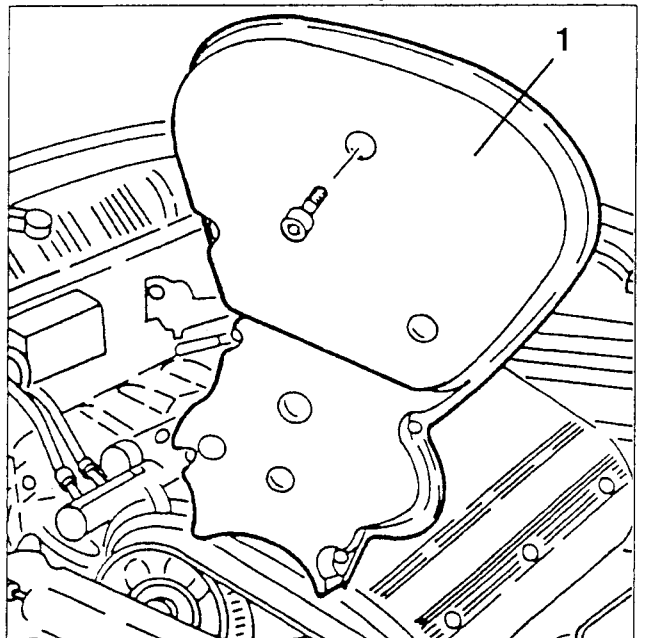


1. Slacken the fastening screw and remove the auxiliary components drive belt guide pulley.

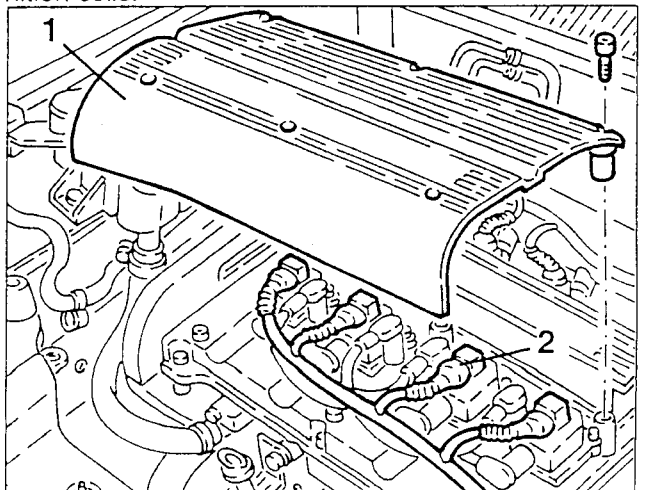


- Slacken the lower fastening screws of the timing gear drive belt guard.

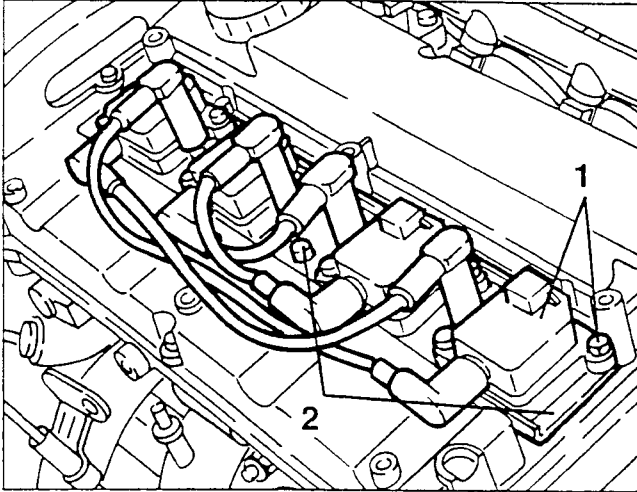
1. Lower the car, slacken the remaining fastening screws and remove the upper guard.



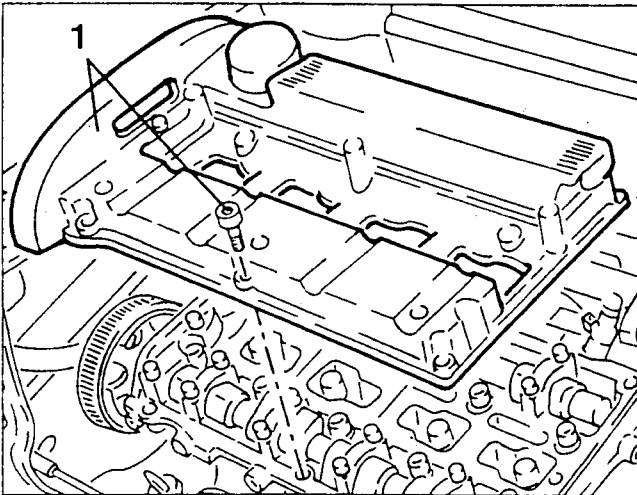
1. Slacken the fastening screws and remove the ignition coil cover.
2. Disconnect the electrical connections from the ignition coils.



1. Slacken the fastening screws and remove the ignition coils.
2. Slacken the fastening screws and remove the ignition coil support bracket.

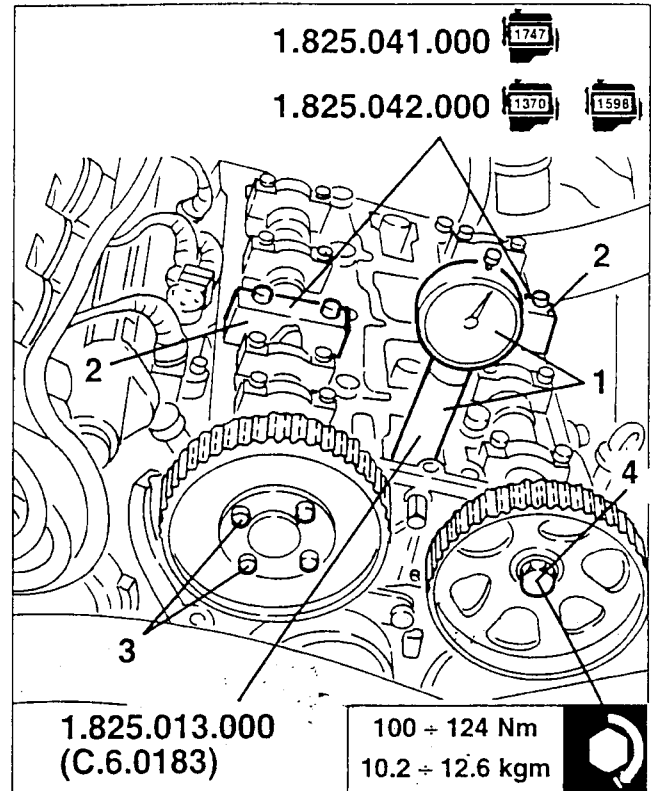


1. Slacken the fastening screws and remove the cylinder head cover complete with seals.

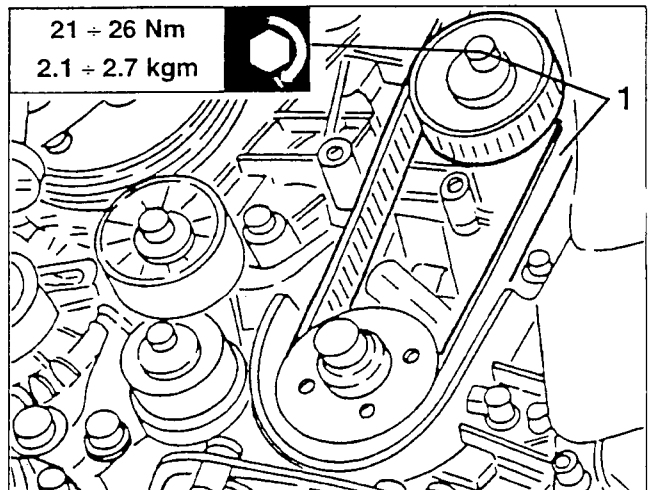


1. Install tool no. 1.825.013.000 (C.6.0183) fitted with dial gauge in the spark plug adaptor of the first cylinder.  
- Turn the crankshaft in its normal direction of rotation, until the piston of the 1st cylinder reaches T.D.C. in the bursting stroke.
2. Remove the camshaft caps illustrated and in place of them install the templates, tightening the fastening screws to a maximum torque of 10 Nm (1 kgm) and making sure they mate correctly with the cams.

3. Slacken the four screws fastening the intake side timing gear pulley.
4. Slacken the screw fastening the exhaust side timing gear pulley.



1. Working on the timing gear belt tensioner, slacken the tension of the belt, then remove it.

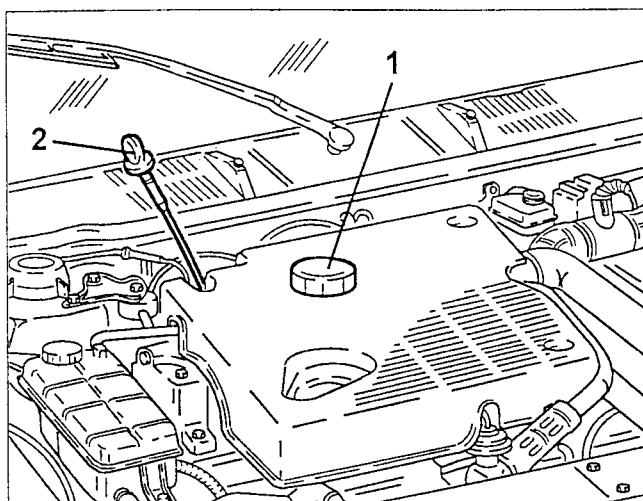


- Install a timing gear drive belt as described in the volume "ENGINE OVERHAULING" in paragraph "Assembling the timing gear drive belt and checking valve gear timing".
- Complete reassembly reversing the sequence followed for removal.

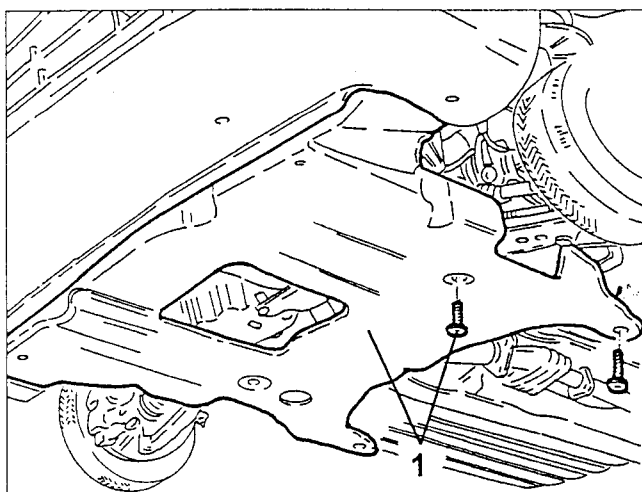
**ENGINE MAINTENANCE**  
**1910 JTD****REPLACEMENT OF ENGINE OIL  
AND FILTER**

**ATTENTION:** The engine oil hurts the skin. Avoid contact as much as possible. Should contact occur, wash thoroughly with soap and water.

- Place the car onto the carlift.
- 1. At warm engine, remove the refilling cap.
- 2. Pull out the level indicator of the engine oil.



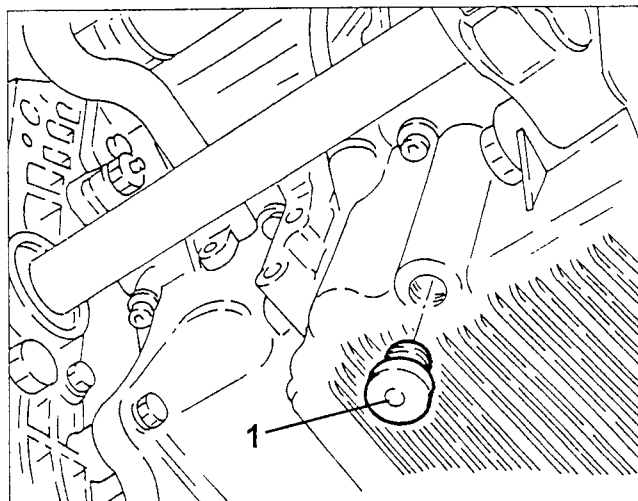
- Lift the car.
- 1. Unscrew the clamps and remove the under-engine protection.



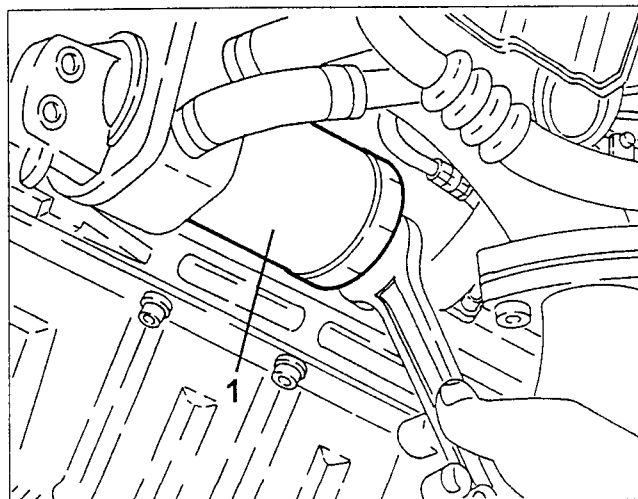
1. Unscrew the discharge cap and let the oil drain out completely into a proper container.

**ATTENTION:** During the removal of the discharge cap be cautious: the oil could be hot.

**ATTENTION:** Do not waste the oil into the environment: it causes pollution.



1. Operating from underneath the car and with the appropriate wrench, unblock the oil filter and remove it.



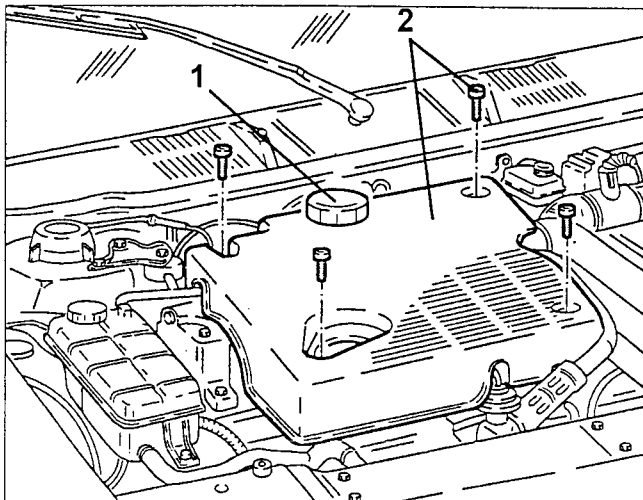
- Clean the discharge cap and screw it with its gasket according to the prescribed torque.
- Damp with the engine oil the gasket of the new filter and screw it by hand.
- Lower the car.
- Supply the engine with oil of the prescribed type and quantity.

**ATTENTION:** During refilling operations, be careful to avoid accidental oil leaking into the alternator's louvers; this may cause severe damage and fire danger.

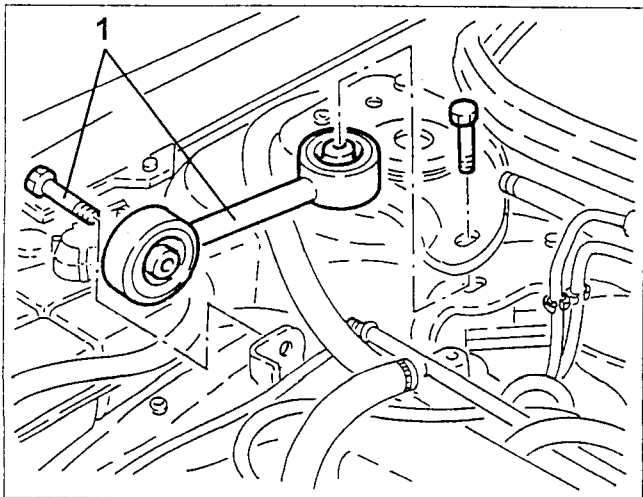
- Check the correct oil level with the oil indicator.
- NOTICE:** The check of the oil level is to be performed with the car in flat position.
- The oil level surpassing the MAX notch may cause excessive evaporation of the oil itself and hence a pressure loss.
- Mount the refilling cap back, let the engine run for about 2 minutes, stop the engine and wait for a few minutes.
  - Check the oil level and be sure there are no oil leakages.
  - Mount the under-engine protection and clamp it.
  - Move the car from the carlift.

## REPLACEMENT OF THE TRANSMISSION CONTROL BELT

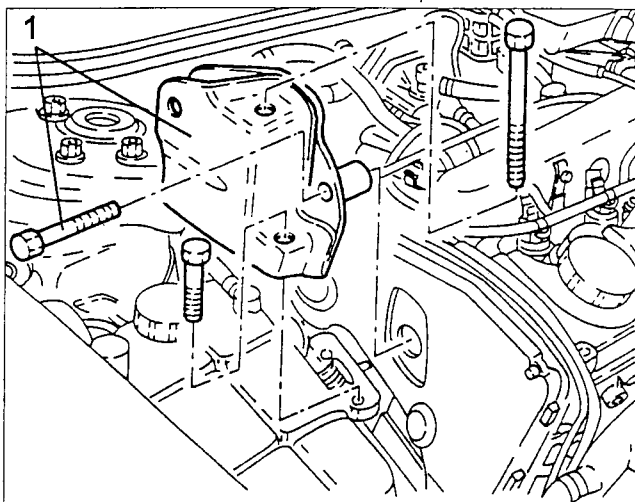
- Place the car onto the carlift.
1. Remove the supply cap of the engine oil.
  2. Unscrew the clamping screws and remove the engine cover.
- Mount the supply cap of the engine oil back.



1. Unscrew the clamping screws and remove the reaction tightener of the motor propeller group.

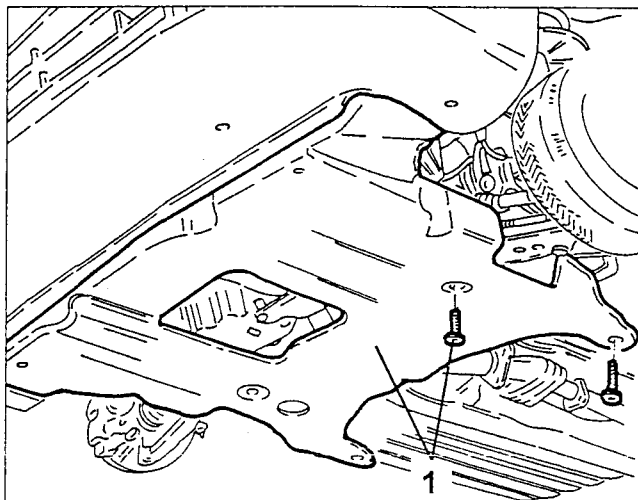


1. Unscrew the clamping screws and remove the bracket onto the engine's side which supports the reaction tightener.

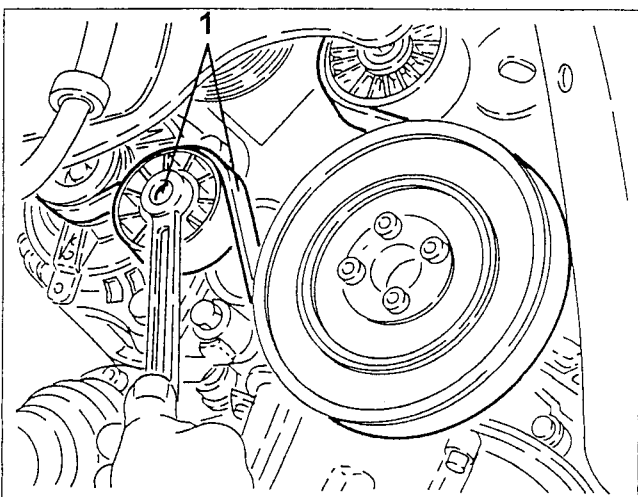


- Remove the front righthand wheel and the corresponding fender.

1. Unscrew the clamps and remove the under-engine protection.

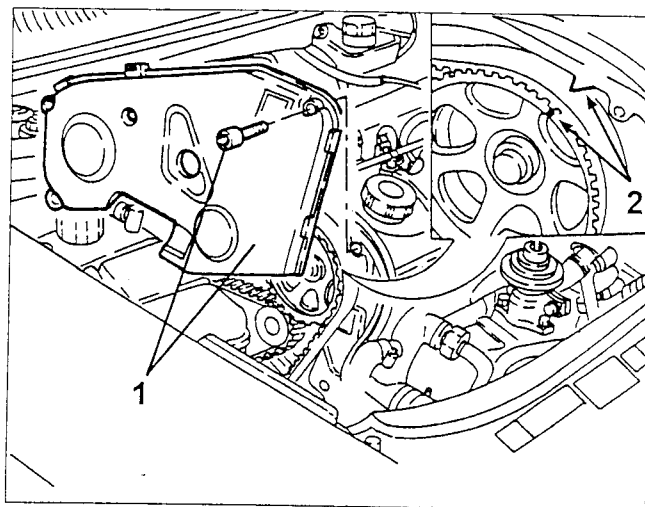
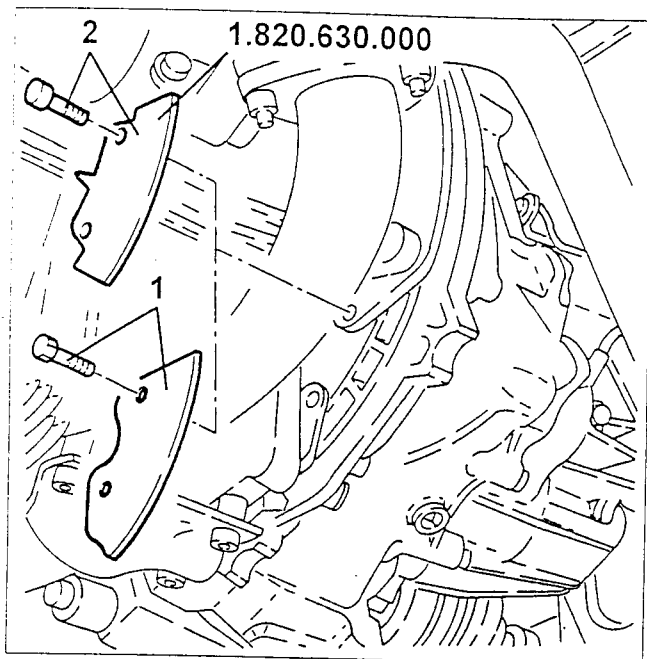


1. By acting on the tightener as shown in the figure, loosen the tension of the engine belt and remove it.

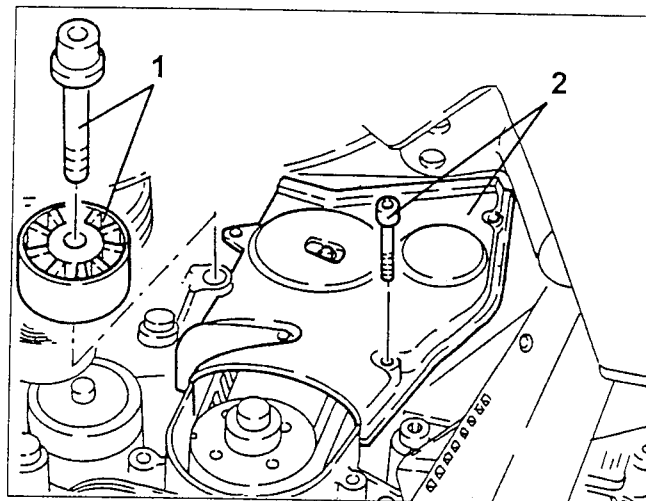




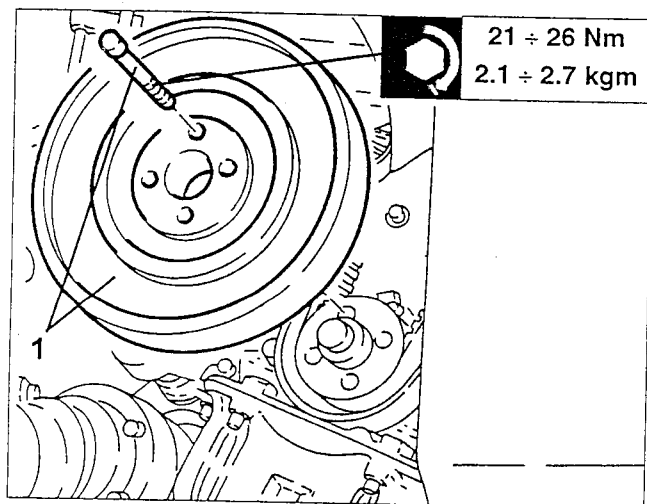
1. Unscrew the screws and remove the lower protection of the engine flywheel.
2. Mount the tool to stop the flywheel N° 1.820.630.000.



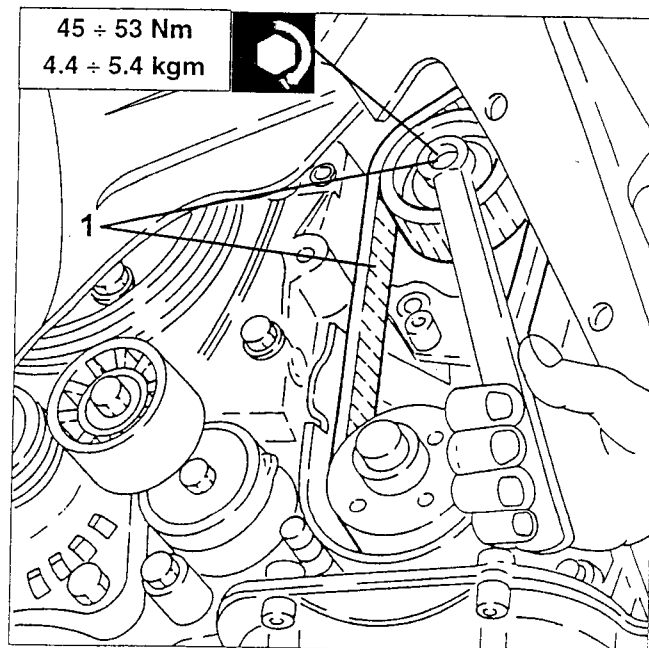
1. Unscrew the clamping screw and remove the fixed tightener of the engine belt.
2. Unscrew the clamping screws and remove the lower protection of the transmission belt.



1. Unscrew the clamping screws and remove the driving shaft pulley.

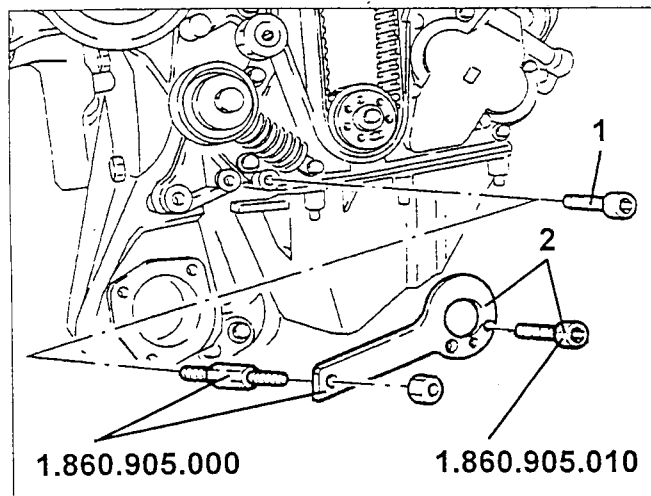


1. Loosen the clamping nut of the tightener of the transmission belt and hence remove the transmission belt itself.

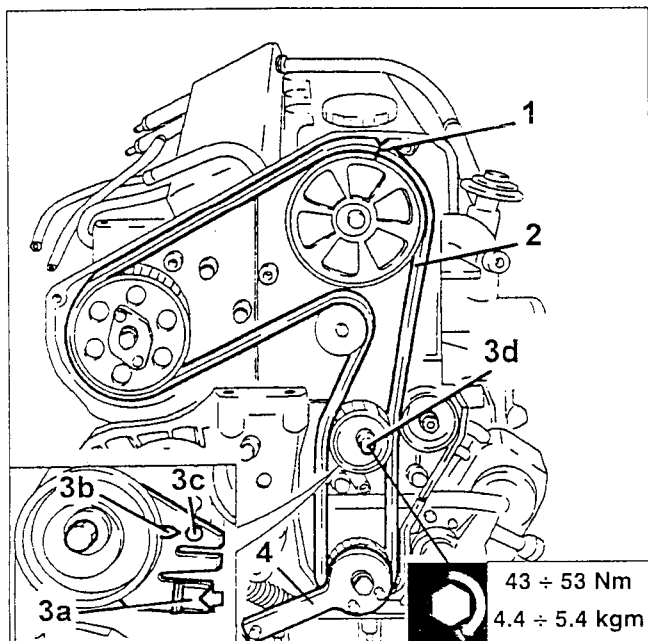


1. Unscrew the clamping screws and remove the upper protection of the transmission belt.
2. By acting onto the screw of the transmission pulley, make the driving shaft rotate till the timing references are aligned (1° cylinder at the TDC).

1. Remove the clamping screw of the front cover of the cylinder block as shown in the figure.
- Mount provisionally a new transmission belt onto the pulley.
2. Mount the tool N° 1.860.905.000 and clamp it with the calibrated screw N° 1.860.905.010.



1. Check the collimation of the timing references.
2. Insert the transmission belt completely.
3. With a screwdriver in the hole (3a) move the pointer of the tightener (3b) till to the reference hole (3c) and in this position block the nut (3d) of the tightener according to the prescribed torque.
4. Remove the tools for the engine timing.
- Tighten the screw of the cylinder block front cover which had been previously removed.

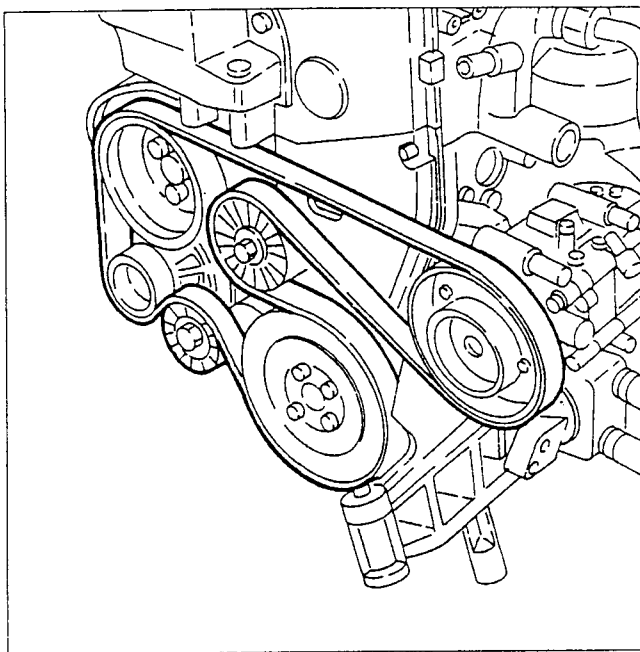


- Make the driving shaft perform two revs.
- Check again the collimation of the timing references and the tightening references onto the transmission tightener.
- Complete the reattachment by performing the reverse procedure applied for the detachment.

### AUXILIARY MEMBERS' BELT

The command to the auxiliary members of the engine is transmitted through a single belt of the Poly V type.

The tightening of the above-mentioned belt occurs through an automatic tightener: therefore the tightening check is not required.

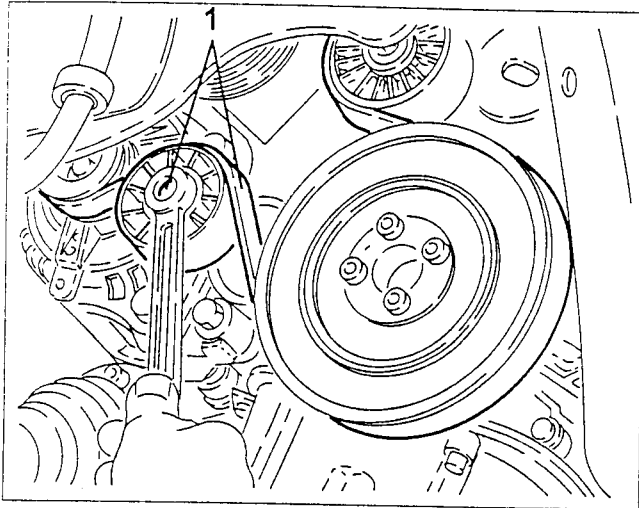


### Replacement

- Place the car onto the carlift.
- Remove the front righthand wheel and corresponding fender.
- Visually check the integrity of the belt and in particular the absence of cuts, cracks, surface wear and tear of the material and of dried and stiffened parts. In case just one of the above-mentioned defects may occur, replace the belt.

**ATTENTION:** The contact of the belt with oil or solvents can damage the elasticity of the belt rubber and reduce its adhesion.

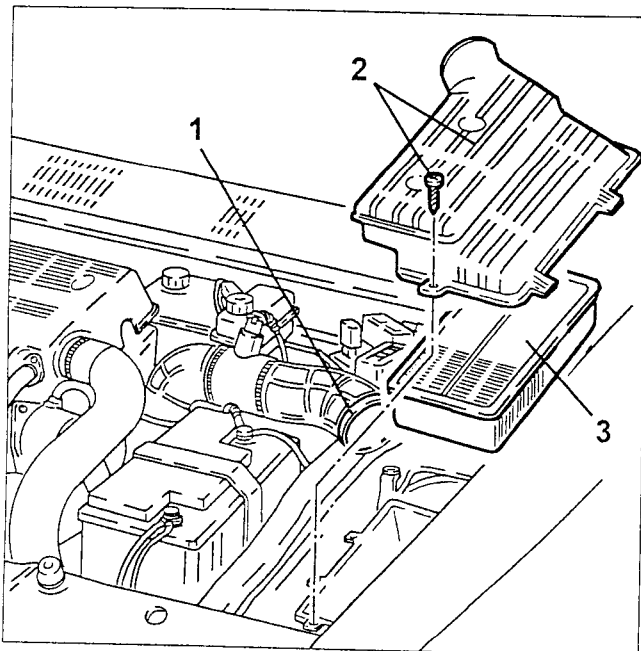
1. By acting onto the tightener as shown in the figure, loosen the tightening of the belt of the engine members and remove it.



- Mount a new belt following the reverse procedure.

### REPLACEMENT OF THE AIR FILTER CARTRIDGE

1. Loosen the hose clamp of the corrugated sleeve to the air filter cover.
2. Unscrew the clamping screws and remove the air filter cover.
3. Remove the air filter cartridge.



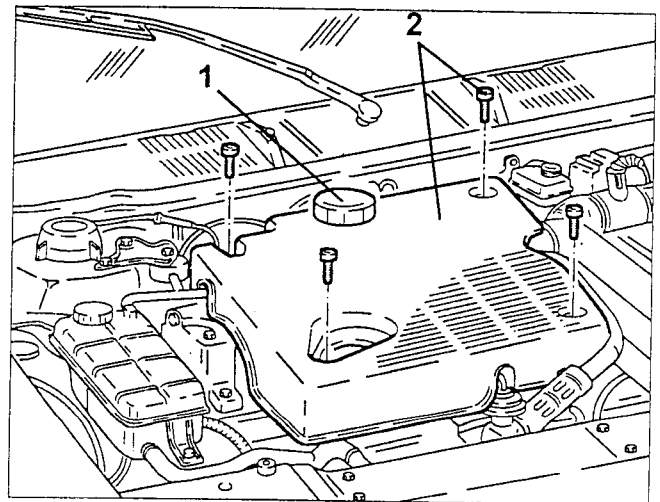
**WARNING:** Any cleansing operation of the filter can damage it and hurt the correct functioning of the engine feeding system.

- Clean thoroughly the container of the air filter cartridge.
- Check the conditions of the cartridge and, if necessary, replace it.
- Mount the cover of the air filter and fix it with the corresponding screws.
- Tighten the hose clamp of the corrugated sleeve to the cover of the air filter.

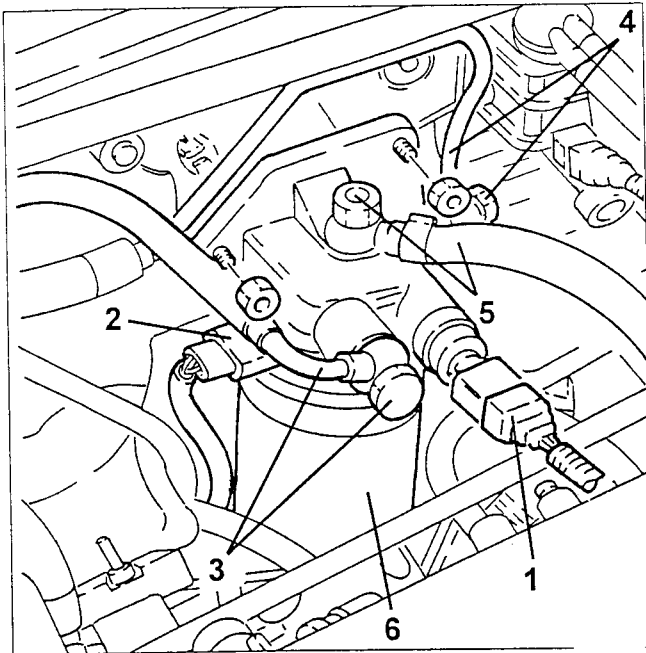
### REPLACEMENT OF THE FUEL FILTER CARTRIDGE

- Be sure the key is onto the "STOP" position, hence disconnect the battery terminal (-).

1. Remove the supply cap of the engine oil.
2. Unscrew the clamping screws and remove the engine cover.



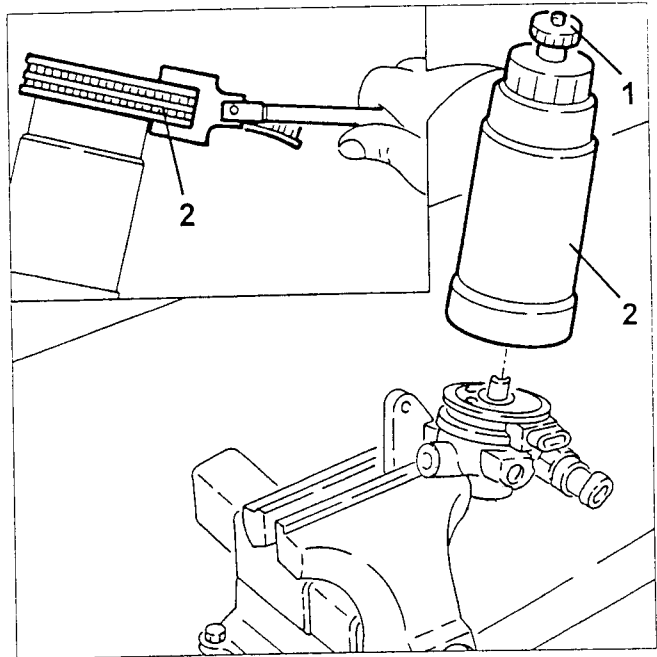
1. Disconnect the electrical connection from the thermal switch for the fuel heater.
2. Disconnect the electrical connection from the fuel pre-heating device.
3. Unscrew the pipe and disconnect the fuel pipe from the fuel filter.
4. Unscrew the pipe and disconnect the pipe to the pressure pump from the fuel filter.
5. Unscrew the pipe and disconnect the pipe to the return manifold from the fuel filter.
6. Unscrew the clamping nuts and remove the complete fuel filter.



- Place the complete fuel filter with the corresponding protection jaws.

1. Remove the water discharge cap from the fuel filter.
2. Unscrew and remove the filtering element of the fuel filter by means of the correct tool.

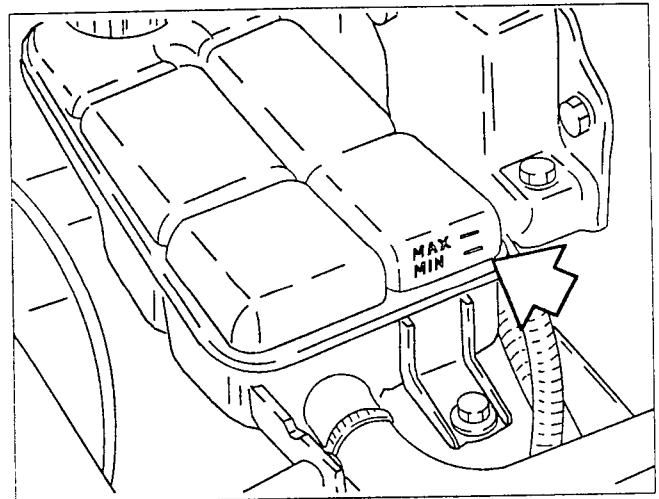
**WARNING:** While re-mounting, tighten the filtering element completely by hand.



## LEVEL CHECKING AND REPLACEMENT OF THE ENGINE COOLING FLUID

### Check

- Visually check that the level of the cooling fluid is included between the MIN and MAX values.

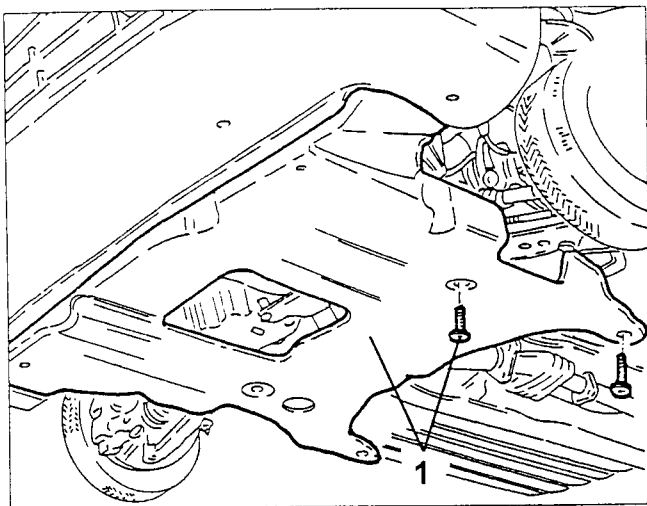


### Replacement

- Place the car onto the carlift.
- Unscrew and remove the cap of the expanding tank.

**ATTENTION:** Do not remove the cap of the expanding tank if the engine is still warm.

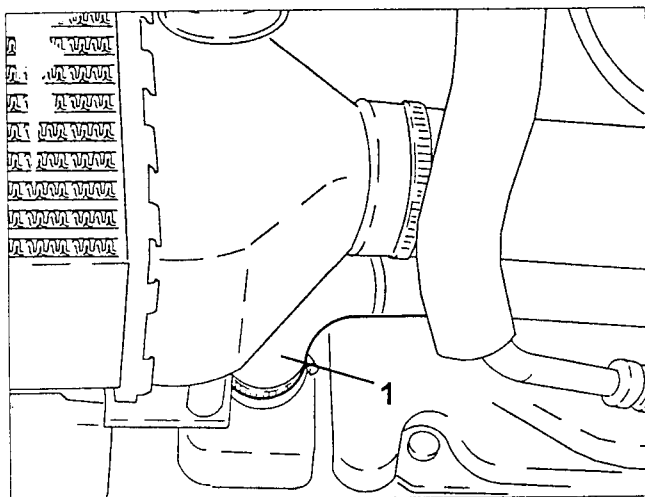
1. Unscrew the clamps and remove the under-engine protection.



1. Drain the engine cooling fluid by disconnecting the fluid outlet manifold from the radiator.

**NOTICE:** Collect the engine cooling fluid into a container.

**WARNING:** the anti-freezing mixture used as engine cooling fluid damages the paint: avoid contact with painted parts.



- Connect the manifold to the radiator back as well as all pipes disconnected; check the tightening of all hose clamps.

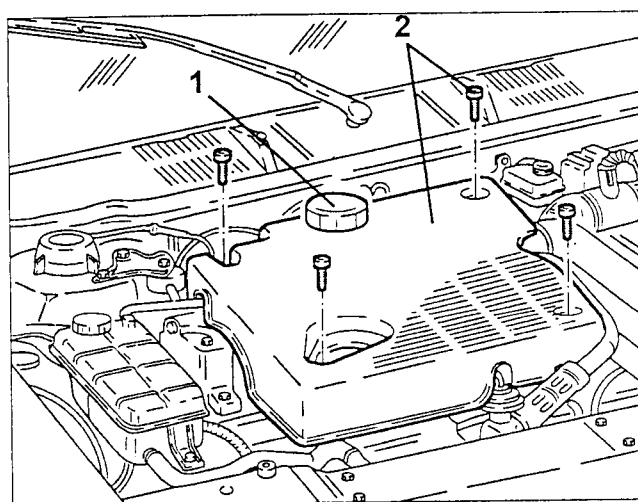
- Supply with the fluid prescribed and according to the type and quantity shown up to the MAX notch of the expanding tank.
- Start the engine and bring it to the running temperature so that the thermostat's opening may release the residual air quantity left in the circuit.
- At cold engine, refill up to the MAX notch of the expanding tank.
- Screw the cap of the pressurized expanding tank.

**WARNING:** Do not mix anti-freezing fluids of different kind or brand.

Do not use anti-rust additives: they may be incompatible with the anti-freeze used.

## CHECK AND ADJUSTMENT OF THE VALVES' PLAY

- Place the car onto the carlift.
- Remove the front righthand wheel and the corresponding fender.
- 1. Remove the supply cap of the engine oil.
- 2. Unscrew the clamping screws and remove the engine cover.
- Mount the supply cap of the engine oil back.



1. Unscrew the clamping screws and remove the tappets' cover.

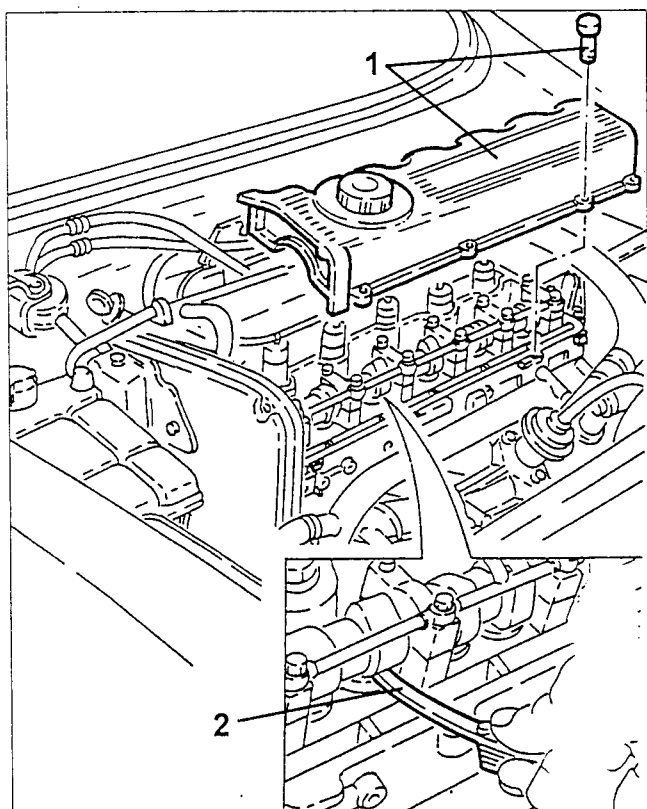
- Act onto the clamping screw of the transmission pulley with the right wrench so to close the valves.

2. At cool engine, check with a thickness gauge that the valves' play is included among the prescribed values (valves are in the closed position).



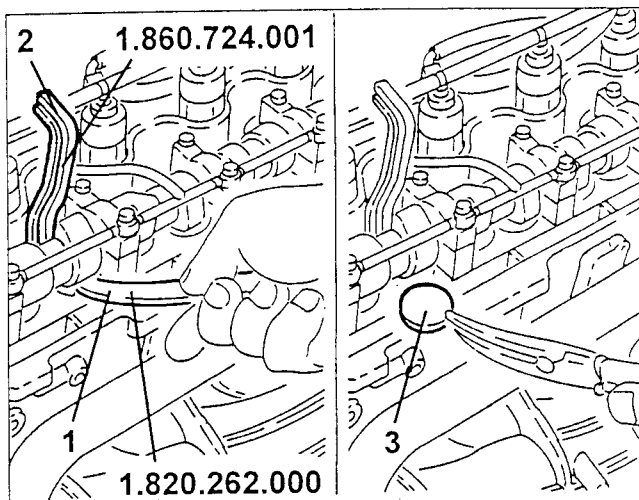
#### Valves' play (at cool engine)

Intake	$0.25 \div 0.35 \text{ mm}$
Exhaust	$0.30 \div 0.40 \text{ mm}$



- Remove the tool to hold the tappet lowered.

- Repeat the same procedure as to the remaining valves.



- If the valves' play is not included, act as follows :

1. Lower the tappet concerned with the lever N° 1.820.262.000.

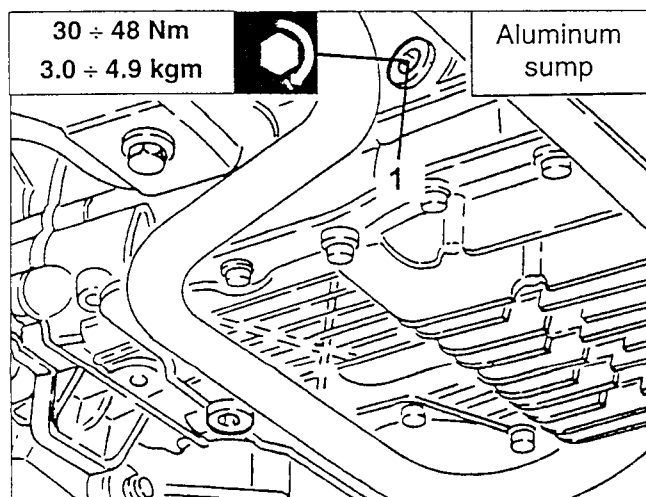
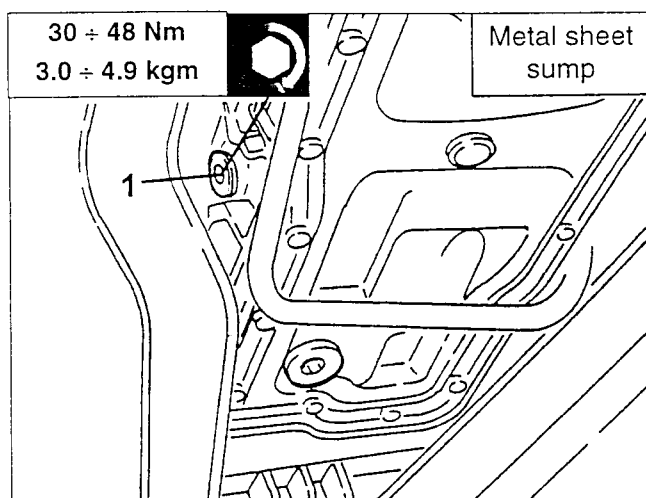
2. Mount the tool N° 1.860.724.001 to hold the tappet lowered, hence remove the lever.

**NOTICE:** Move the notches on the tappet's edge so to ease further adjustment of the plug nut to be replaced.

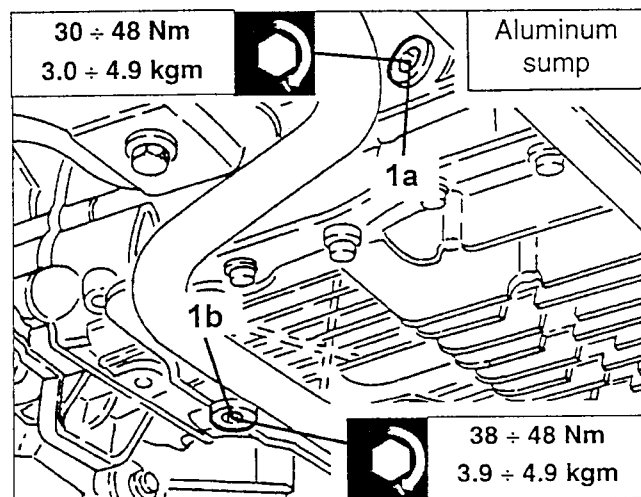
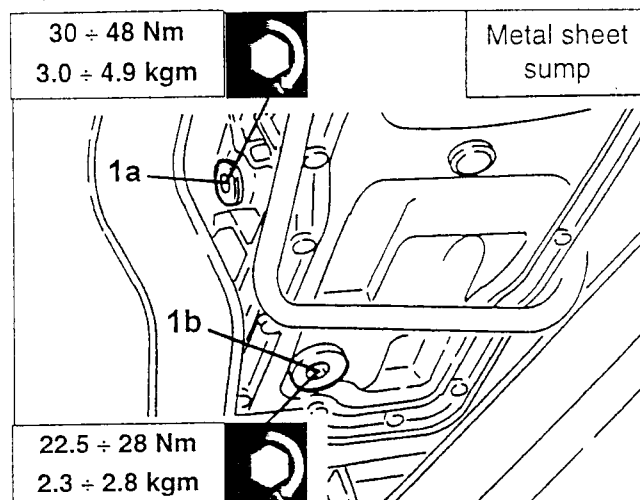
3. Remove the plug nut for the adjustment of the valves' play and replace it with a new one of the correct thickness.

**MAINTENANCE OF MECHANICAL GROUPS****OIL LEVEL CHECKING  
AND OIL REPLACEMENT  
OF THE GEARBOX-DIFFERENTIAL****Oil level checking  
(Specific for Boxer engines)**

- Place the car onto the carlift.
- 1. Unscrew the supply cap and check that the oil level touches the lower edge of the hole.
- If necessary, refill up to the prescribed level.
- Screw the supply cap tightening it according to the prescribed torque.

**Oil replacement  
(Specific for Boxer engines)**

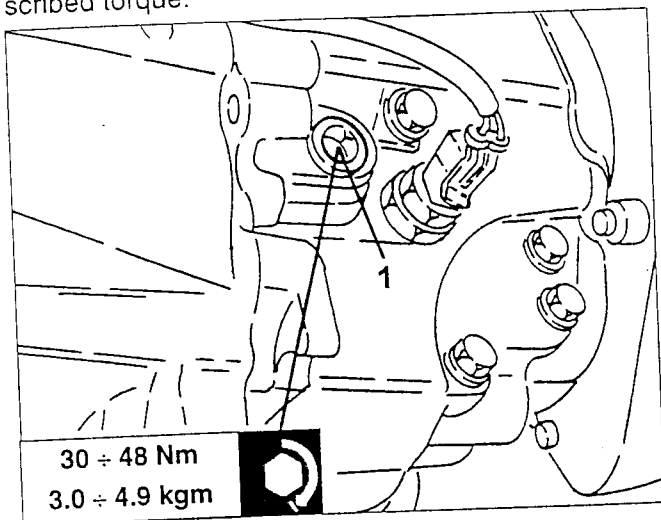
- Place the car onto the carlift.
- 1. Unscrew the supply cap (1a) and the discharge cap (1b), hence let the oil drain out completely.



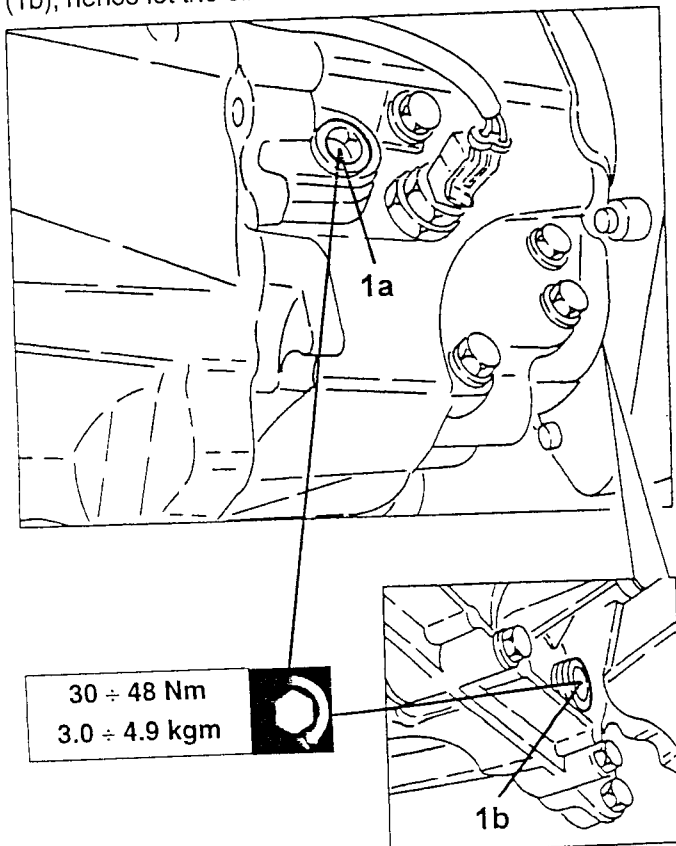
- Clean the discharge cap and screw it back according to the prescribed torque.
- Introduce oil of the type and in the quantity prescribed through the filling hole.
- Check that the level touches the lower edge of the hole, hence clean the supply cap and screw it back according to the prescribed torque.

**Oil level checking (Specific for 1929 Turbodiesel and T.Spark 16V engines)**

- Place the car onto the carlift.
- 1. Unscrew the supply cap and check that the oil level touches the lower edge of the hole.
- If necessary, refill up to the prescribed level.
- Screw the supply cap back according to the prescribed torque.

**Oil replacement (Specific for 1929 Turbodiesel and T. Spark 16V engines)**

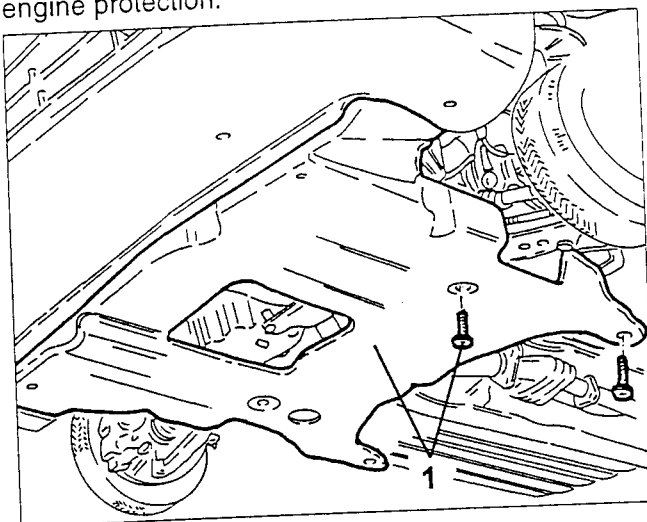
- Place the car onto the carlift.
- 1. Unscrew the supply cap (1a) and the discharge cap (1b), hence let the oil drain out completely.



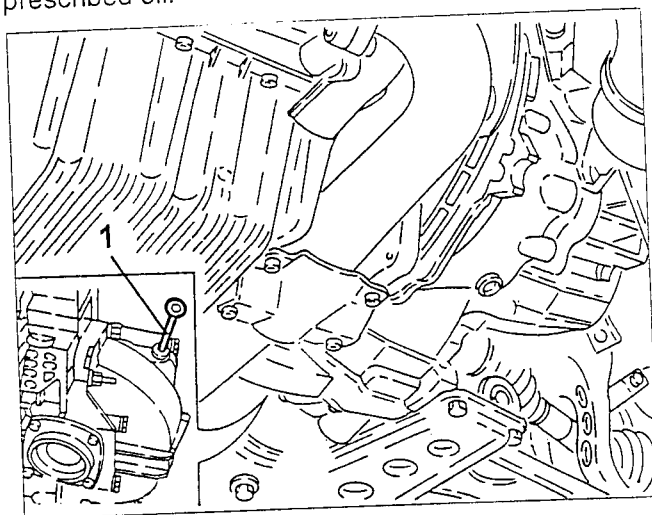
- Clean the discharge cap and screw it back according to the prescribed torque.
- Introduce oil of the type and the quantity prescribed through the filling hole.
- Check that the level touches the lower edge of the hole, hence clean the supply cap and screw it back according to the prescribed torque.

**Oil level checking (Specific for 1910 JTD engine)**

- Place the car onto the carlift.
- 1. Unscrew the clamps and remove the under-engine protection.



- 1. With the appropriate stem, check that the oil level of the mechanical gearbox with differential matches with the reference value on the stem itself.
- If necessary, refill the oil level by introducing the prescribed oil.

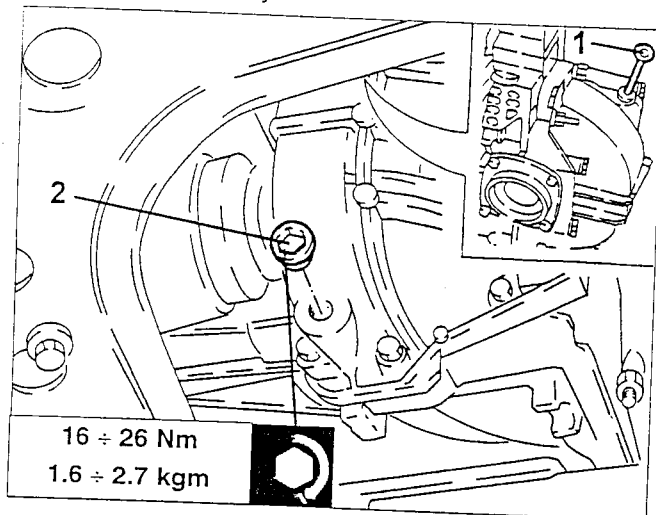


- Check the oil level again, hence insert the checking stem.
- Mount the under-engine protection and clamp it.
- Remove the oil from the carlift.



## Oil replacement (Specific for 1910 JTD engines)

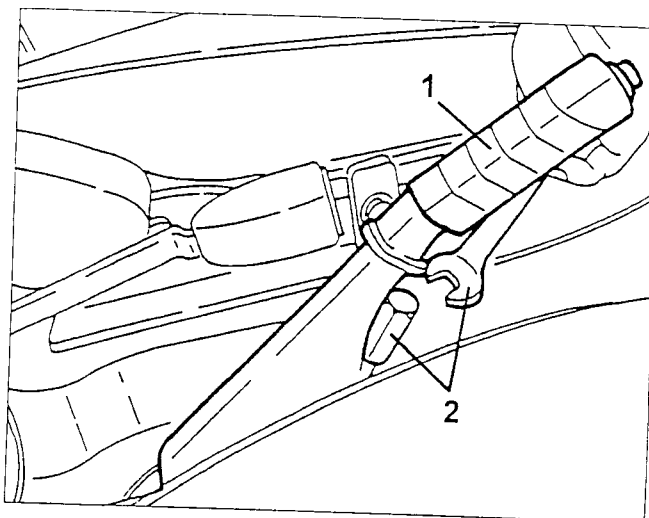
- Place the car onto the carlift.
- Unscrew the clamps and remove the under-engine protection.
- 1. Remove the oil checking stem.
- 2. Unscrew the discharge cap, hence let the oil drain out completely.



- Clean the discharge cap and crew it back according to the prescribed torque.
- Supply with oil of the type and in the quantity prescribed.
- Check with the stem that the oil level of the mechanical gearbox with differential matches with the reference values shown on the stem.
- Insert the checking stem back.
- Mount the under-engine protection and clamp it.
- Remove the car from the carlift.

## CHECKING OF THE PARKING BRAKE STROKE

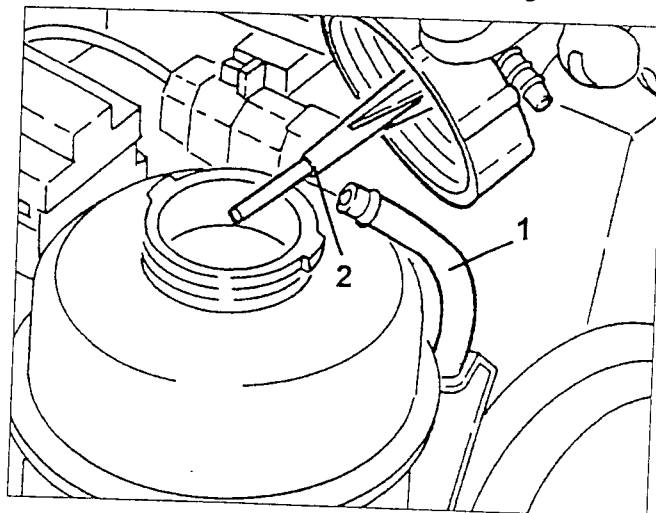
1. Shift the control lever onto the third/fourth release of the the toothed sector and holding the lever in this position, check if the wheels are blocked.
  2. In case they are not, screw the adjustment nut till the rear wheels are blocked.
- By acting onto the control lever with a force of about 27 Kg, check that the number of releases onto the toothed sector is equal to 3.
  - Check that the wheels are loosened if the lever is not inserted.



## CHECKING OF THE OIL LEVEL OF THEHYDRAULIC TORQUE CONVERTER (Specific for Boxer engines)

**ATTENTION:** The oil level checking is to be performed with the car in flat position.

- With the engine off, clean the cover of the hydro-drive tank and the surrounding area.
- 1. Disconnect the breather pipe from the tank cover.
- 2. Remove the cover and check that the level matches the upper notch on the checking stem.

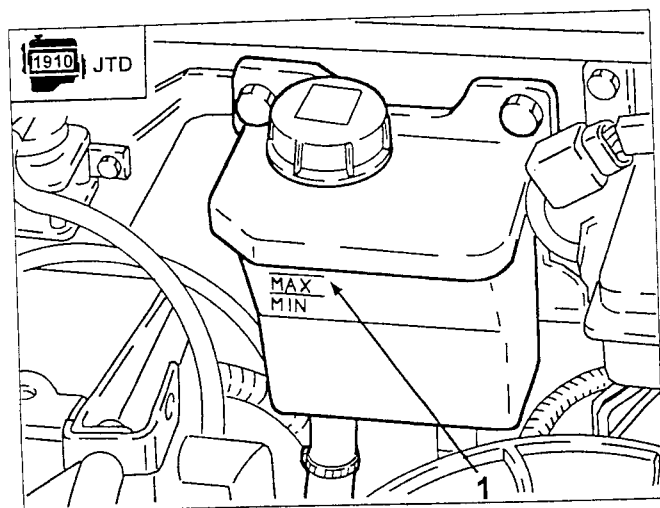
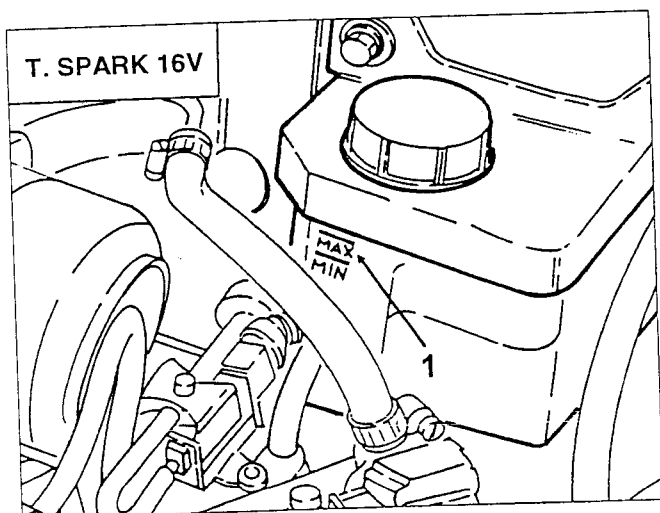
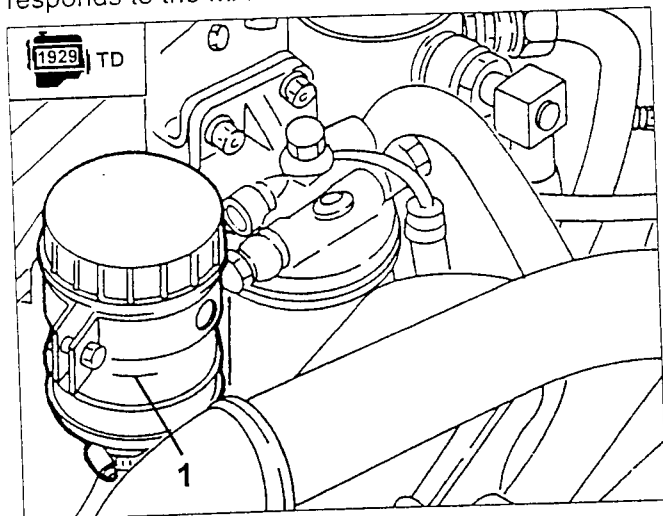


- If necessary, refill with the prescribed oil and as follows:

- Start the engine and wait for the oil level to stabilise.
- With running engine, rotate the steering wheel more times and completely.
- Refill till the level corresponds to the MAX level, hence screw the cover back and insert the breather pipe.

## CHECKING OF THE OIL LEVEL OF THE HYDRAULIC TORQUE CONVERTER (Specific for Turbodiesel and T. Spark 16V engines)

1. With the engine off, check that the oil level corresponds to the MAX notch shown onto the tank.



- If necessary, refill with the prescribed oil and as follows:

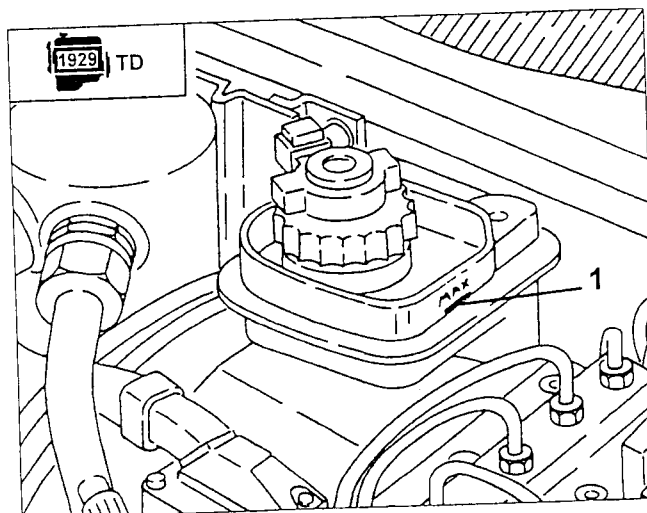
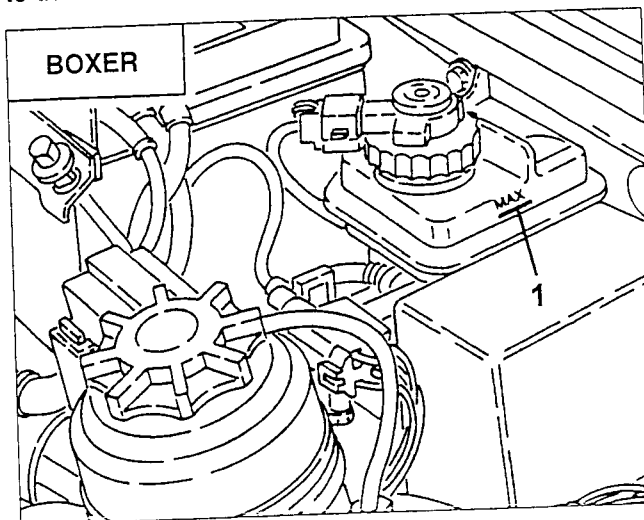
- Start the engine and wait for the oil level to stabilise.
- With running engine, rotate the steering wheel more times and completely.
- Refill till the level corresponds to the MAX level, hence screw the cover back.

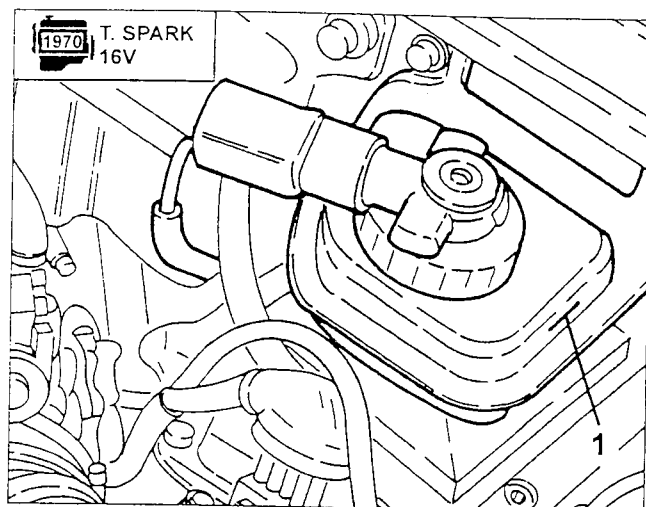
## CHECKING OF THE LEVEL AND REPLACEMENT OF THE BRAKES-CLUTCH FLUID

### Oil level checking

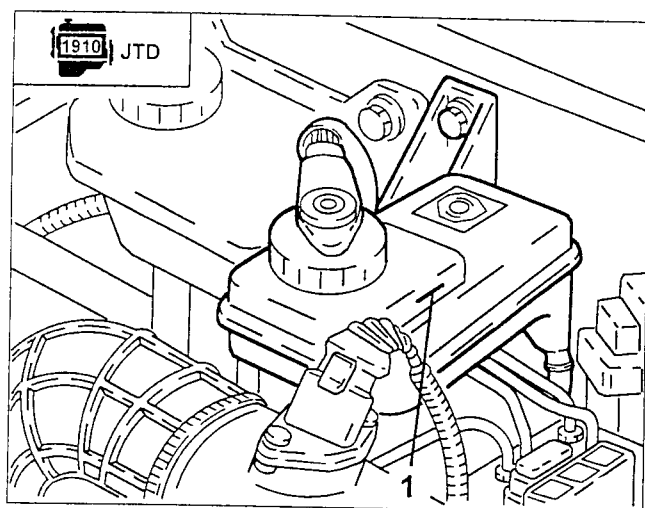
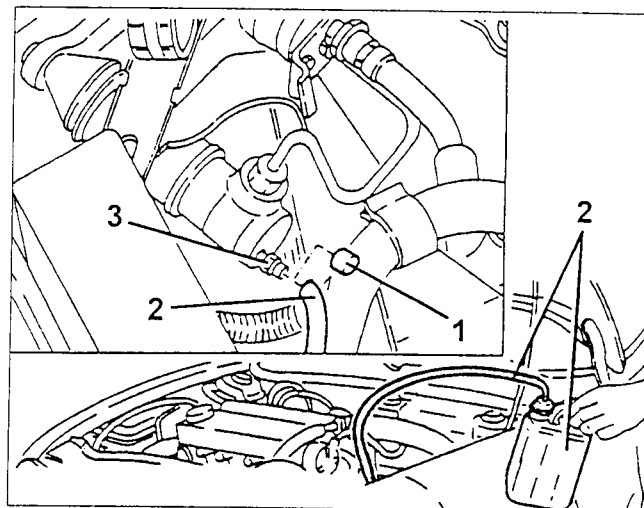
**ATTENTION:** The checking is to be performed with the car in flat position.

1. Check that the oil level in the tank corresponds to the MAX reference notch shown on the tank.





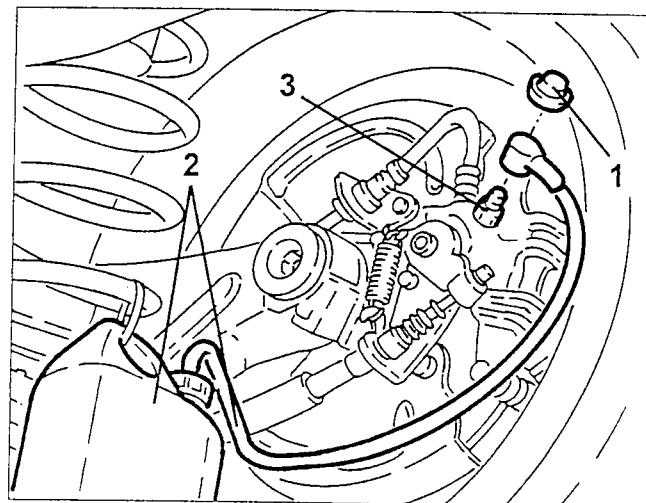
3. Open the drain valve onto the cylinder.
- Press the clutch pedal till to empty the circuit completely.



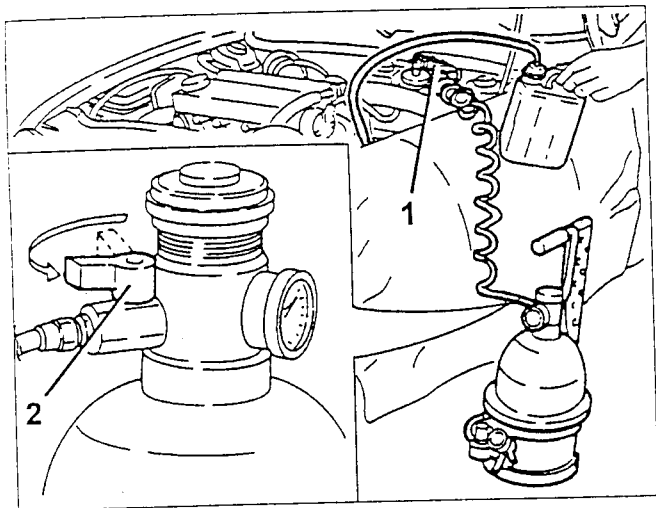
1. Remove the protection cover from the drain valve on the caliper.
2. Connect the recovery device (pipe and tank), to the drain valve on the caliper.
3. Open the drain valve onto the caliper
- Press the brake pedal till to discharge the whole fluid.
- Repeat the procedure for the remaining calipers.

## Oil replacement

- Place the car onto the carlift.
- Remove the battery (see GROUP 55).
- Remove the battery basket (see GROUP 55).
- Suck the brakes-clutch fluid from the tank by means of a syringe.
- 1. Remove the protection cap from the drain valve on the cylinder.
- 2. Connect the recovery device (pipe and tank) to the drain valve onto the cylinder.



1. Connect the equipment to the tank of the brakes-clutch fluid.
2. Slowly open the tank tap and supply the brakes-clutch with the fluid prescribed.



- Wait till the air contained in the hydraulic systems of brakes-clutch goes out completely.
- Close the drain valves and mount the corresponding protection caps.
- Remove the devices for fluid recovery.
- Remove the equipment.
- Mount the battery basket (see GROUP 55).
- Mount the battery (see GROUP 55).
- Remove the car from the carlift.

## IDENTIFICATION OF CAR VERSIONS

Commercial name	146 1.3/1.4	146 1.6	146 1.7 16V	146 TD	146 JTD
Equipment	5-door saloon				
Version (on identification plate)	930 B3	930 B2 930 B2A □	930 B1	930 B4 930 B4A ▲	930 B4B
Chassis (in the engine compartment, aside the upper connection of right shock absorber)	930000	930000	930000	930000	930000
Chassis ' number	2.001.001 4.001.001	2.001.001 4.001.001	2.001.001 4.001.001	2.001.001 4.001.001	-
Engine (code)	AR 33501	AR 33201	AR 33401	AR 67501 AR 33601 ▲	AR 32302
Engine's symbol			16V	TD	JTD
Gearbox (code)	C.802.5.16.00	C.802.5.16.02 C.802.5.16.03□	C.802.5.18.00	C.510.5.17.63	C.530.5

(□): Only for certain markets

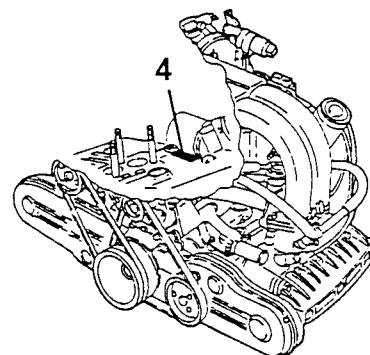
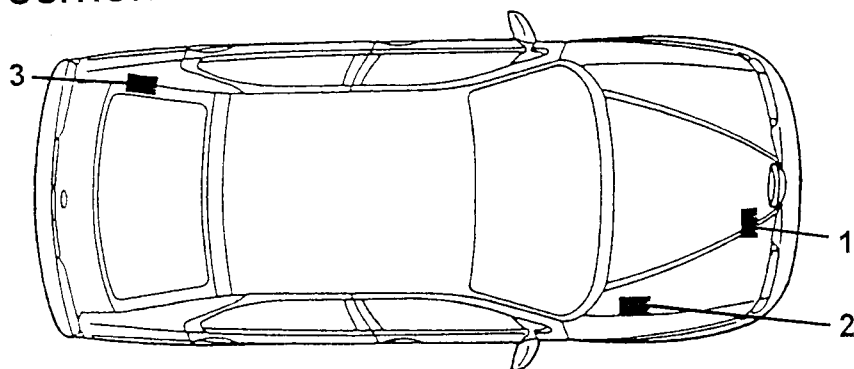
(▲): Version with catalyst, only for certain markets.

Commercial Name	146 2.0 <i>ti</i>	146 1.4 T. Spark	146 1.6 T. Spark	146 1.8 T. Spark
Equipment	5-door saloon			
Version (on identification plate)	930 B5	930 B3A	930 B2B 930 B2C□	930 B1A
Chassis (in the engine compartment, aside the upper attachment of the right shock absorber)	930000	930000	930000	930000
Chassis Number	2.001.001 4.001.001	-	-	-
Engine (code)	AR 67204 AR 32301	AR 33503	AR 67601	AR 67106 AR 32201
Engine symbol	T. SPARK 16V	T. SPARK 16V	T. SPARK 16V	T. SPARK 16V
Gearbox (code)	C.510.5.21.13 C.510.5	C.510.5.18.03 C.513.5.14.02 (1)	C.510.5.18 C.510.5.17.96 □	C.510.5.17.93

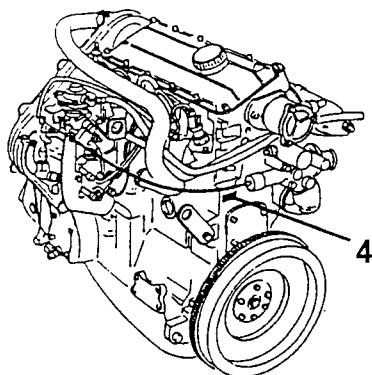
(□): Only for certain markets

(1): Starting from the chassis n° .....

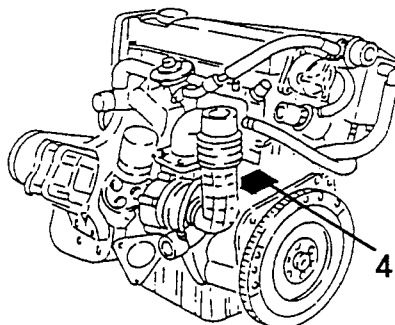
## POSITIONING OF THE ID PLATES



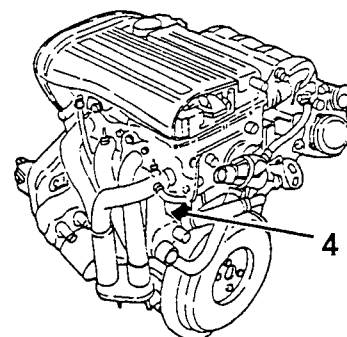
Boxer engines



1929 TD engine



1910 JTD engine

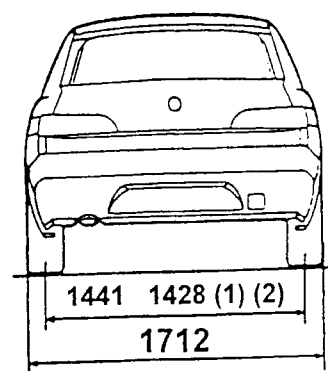
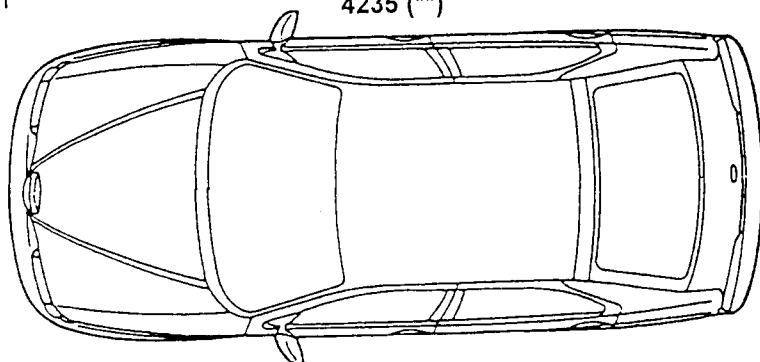
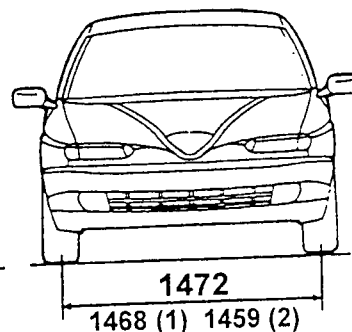
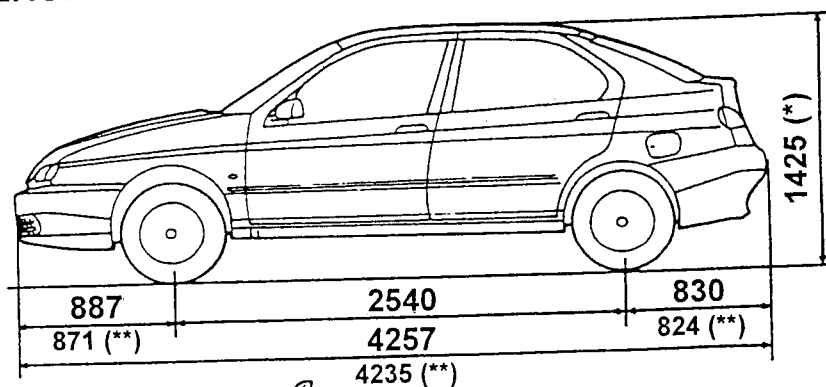


T. Spark 16V engines

- 1. ID plate
- 2. Bodywork punching

- 3. ID Plate of bodywork paint
- 4. Engine punching

## DIMENSIONS



(\*): Unloaded car (\*\*) : For 99s models

(1): For 1.8 T. Spark and 20 *ti* versions (2): For sporting equipment

## WEIGHTS AND LOADS

Unit: kg

Features \ Versions		930 B3	930 B2 930 B2A	930 B1	930 B4 930 B4A	930 B4B
Weight in running order (without driver)		1175	1175	1225	1245	1245
Maximum weight allowed		1705	1705	1745	1765	1765
Payload		530	530	520	520	520
Maximum weight allowed per axle	front	930	930	930	930	930
	rear	870	870	870	870	870
Towable weight	with braked trailer	1100	1100	1200	1300	1300 1300 (*)
	With non-braked trailer	350	350	350	350	350
Maximum load onto the ball		50	50	50	50	50

(\*): Homologated for Switzerland only.

Features \ Versions		930 B5	930 B3A	930 B2B 930 B2C	930 B1A
weight in running order (without driver)		1275	1160	1190	1215
Maximum weight allowed		1800	1680	1710	1735
Payload		525	520	520	520
Maximum weight allowed per axle	front	950	950	950	950
	rear	900	900	900	900
Towable weight	with braked trailer	1200 1200 (*)	1100 800 (*)	1200 900 (*)	1200 900 (*)
	with non-braked trailer	350	350	350	350
Maximum load onto the ball		50	50	50	50

(\*): Homologated for Switzerland only.

## WHEELS AND TYRES

CAR	DIMENSIONS Rims Tyres		PRESSURES (bar)			
			REDUCED LOAD (2 people)		FULL LOAD	
			FRONT	REAR	FRONT	REAR
930 B3	Standard equipment	5.5J x 14" 175/65 R14" 82T	2.2	2	2.5	2.5
	Optional equipment	5.5J x 14" 185/60 R14" 82H				
930 B2	Standard equipment	5.5J x 14" 175/65 R14" 82T	2.2	2	2.5	2.5
	Optional equipment	5.5J x 14" 185/60 R14" 82H (*)				
930 B2A	Standard equipment	5.5J x 14" 185/65 R14" 86T	2.2	2	2.5	2.5
930 B1	Standard equipment	5.5J x 14" 185/60 R14" 82H	2.2	2	2.5	2.5
930 B4 930 B4A	Standard equipment	5.5J x 14" 175/65 R14" 82T	2.2	2.1	2.5	2.5
	Optional equipment	5.5J x 14" 185/60 R14" 82H				
930 B4B	Standard equipment	5.5J x 14" 6J x 15" (▲) 185/60 R14" 82H 195/55 R15" 84V (▲)	2.2	2.0	2.5	2.5
930 B5	Standard equipment	6J x 15" 195/55 R15" 84V	2.3	2.1	2.5	2.5
930 B3A	Standard equipment	5.5J x 14" 185/60 R14" 82H	2.2	2	2.5	2.5
		6J x 15" 195/50 R15" 82V 195/55 R15" 84V (▲)				
930 B2B	Standard equipment	5.5J x 14" 185/60 R14" 82H	2.2	2	2.5	2.5
930 B2C		6J x 15" 195/55 R15" 84V (▲)				
930 B1A	Standard equipment	6J x 15" 195/55 R15" 84V	2.2	2	2.5	2.5
ALL	SPARE SMALL WHEEL		4.2			
	4J x 15" (in steel)					
	4.00B x 15" (in alloy) - 115/70 R15" 90M					

(\*) : Standard equipment for certain markets

(▲) : For sporting equipment (for versions/markets if envisaged)

**WARNING:** In case of continuous running at high speed, pressures are to be increased by 0.3 bar.



## SUPPLY QUANTITIES

Supply Quantity		Versions		930 B3	930 B2 930 B2A	930 B1	930 B4 930 B4A	930 B4B	930 B5	930 B3A 930 B2B 930 B2C 930 B1A	
Fuel tank		51 liters					51/61 liters (*)				
Fuel stock		5 ÷ 8 liters									
Engine oil	Total capacity: pan + filter + sumps + radiator	4.7 liters			5.2 liters	6 liters	(**)		5.0 liters		
	Pan + filter (for periodic replacement)	4 liters			4.5 liters	5 liters	4.2 liters		4.4 liters		
Gearbox-differential oil		2.4 liters				2 liters			2 liters		
Hydraulic torque converter oil		1.1 liters						900 gr		1.3 liters	
Brakes/clutch oil		0.4 kg				0.5 kg	0.4 kg (▲)		0.5 kg		
Engine cooling fluid		7.8 liters				8.9 liters	6.1 liters		8.3 liters	8.4 liters	
Conditioning compressor oil		240 ± 15 cm <sup>3</sup>				236 ± 15 cm <sup>3</sup>	130 g		150 ± 20 cm <sup>3</sup>		
Conditioning system fluid		0.700 kg						(**)		0.700 kg	

(\*) : For versions /Markets

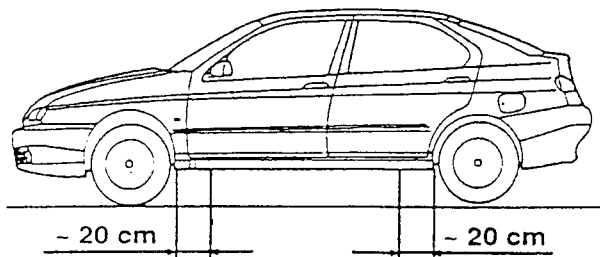
(\*\*): Data which are not available while printing

(▲): With A.B.S. = 0.54 kg

## CAR'S LIFTING POINTS

Either with a bridge or with a carlift.

- The car is to be lifted as shown.



## CAR'S TOWING POINTS

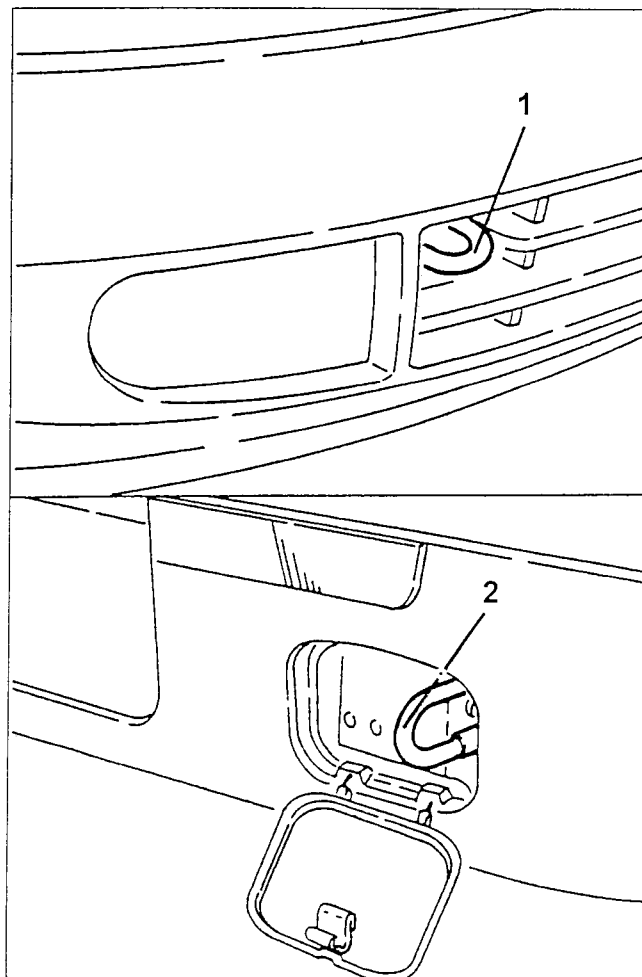
The car is equipped with two rings, one on the front and one on the back, located on the righthand side of the bumper.

the rear ring is covered by a door that can be opened by pressing on its edge.

Comply with the law provisions disciplining towing operations.

**Before towing, the key is to be turned onto MAR position and hence turned back onto STOP position without taking it out; in this way the steering blocking is avoided.**

It is necessary to remember that, in case of towing, there is no depression in the servo brake and it is therefore necessary to press the brake pedal more strongly.



1. Front pintle

2. Rear pintle

**GEARBOX****RATIOS (Specific for Boxer and Turbodiesel engines)**

	Gearbox	Ratio	Inserted gearshift	Gearbox ratio	Total ratio
930 B3 (before mod.)	C.802.5	9/37 1 : 4.111	1^	1 : 3.545	1 : 14.576
930 B2 (before mod.)			2^	1 : 2.050	1 : 8.428
			3^	1 : 1.323	1 : 5.437
930 B1 (before mod.)			4^	1 : 1.027	1 : 4.222
			5^	1 : 0.854	1 : 3.509
			RM	1 : 3.091	1 : 12.707
930 B3 (after mod.)	C.802.5	10/43 1 : 4.3	1^	1 : 3.545	1 : 15.246
			2^	1 : 2.050	1 : 8.815
			3^	1 : 1.323	1 : 5.687
			4^	1 : 1.027	1 : 4.416
			5^	1 : 0.854	1 : 3.671
			RM	1 : 3.091	1 : 13.291
930 B2 (after mod.)	C.802.5	11/45 1 : 4.091	1^	1 : 3.545	1 : 14.503
			2^	1 : 2.050	1 : 8.387
3^			1 : 1.323	1 : 5.412	
4^			1 : 1.027	1 : 4.201	
930 B1 (after mod.)			5^	1 : 0.854	1 : 3.494
			RM	1 : 3.091	1 : 12.645
930 B2A	C.802.5	9/35 1 : 3.888	1^	1 : 3.545	1 : 13.782
			2^	1 : 2.050	1 : 7.970
			3^	1 : 1.323	1 : 5.143
			4^	1 : 1.027	1 : 3.992
			5^	1 : 0.854	1 : 3.320
			RM	1 : 3.091	1 : 12.017
930 B4	C.510.5	18/57 1 : 3.166	1^	1 : 3.909	1 : 12.376
			2^	1 : 2.238	1 : 7.085
3^			1 : 1.440	1 : 4.559	
4^			1 : 1.029	1 : 3.258	
930 B4A			5^	1 : 0.794	1 : 2.514
			RM	1 : 3.909	1 : 12.376

## RATIOS (Specific for T. Spark engines)

	Gearbox	Ratio	Inserted Gearshift	Gearbox ratio	Total ratio
930 B5	C.510.5	17/57 1 : 3.353	1^ 2^ 3^ 4^ 5^ RM	1 : 3.545 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.946 1 : 3.909	1 : 11.886 1 : 7.504 1 : 5.096 1 : 3.876 1 : 3.172 1 : 13.107
930 B3A	C.510.5	15/58 1 : 3.866	1^ 2^ 3^ 4^ 5^ RM	1 : 3.909 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.919 1 : 3.909	1 : 15.112 1 : 8.652 1 : 5.876 1 : 4.469 1 : 3.553 1 : 15.112
930 B3A	C.513.5	15/59 1 : 3.933	1^ 2^ 3^ 4^ 5^ RM	1 : 3.909 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.919 1 : 3.909	1 : 15.374 1 : 8.802 1 : 5.978 1 : 4.546 1 : 3.614 1 : 15.374
930 B2B	C.510.5	16/57 1 : 3.562	1^ 2^ 3^ 4^ 5^ RM	1 : 3.909 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.971 1 : 3.909	1 : 13.924 1 : 7.972 1 : 5.414 1 : 4.118 1 : 3.459 1 : 13.924
930 B2C	C.510.5	17/57 3 : 3.353	1^ 2^ 3^ 4^ 5^ RM	1 : 3.909 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.971 1 : 3.909	1 : 13.107 1 : 7.504 1 : 5.096 1 : 3.876 1 : 3.256 1 : 13.107
930 B1A	C.510.5	16/57 1 : 3.562	1^ 2^ 3^ 4^ 5^ RM	1 : 3.909 1 : 2.238 1 : 1.520 1 : 1.156 1 : 0.971 1 : 3.909	1 : 13.924 1 : 7.972 1 : 5.414 1 : 4.118 1 : 3.459 1 : 13.924

---

RATIOS (Specific for 99s models)

TO BE PUBLISHED SOON

**TORQUE WRENCH SETTINGS****Group 70 - Bodywork**

Part	Nm	kgm
Clamping nut for front safety belts	34 ÷ 42	3.5 ÷ 4.3
Clamping screws for rear bumper	16 ÷ 20	1.6 ÷ 2.0

---

**SPECIFIC EQUIPMENT****Group 70 - Bodywork**

1.822.152.000	Wrench to align the rear bumper
1.823.008.001	Tool for the gasket guide of the rear window