Clio

N.T. 3069A

CB0H - CB0T

SPECIAL NOTES FOR VEHICLES EQUIPPED WITH THE K4M ENGINE

For the sections not dealt with in this Technical Note, refer to MR 337.

77 11 202 675 **OCTOBER 1998** **Edition Anglaise**

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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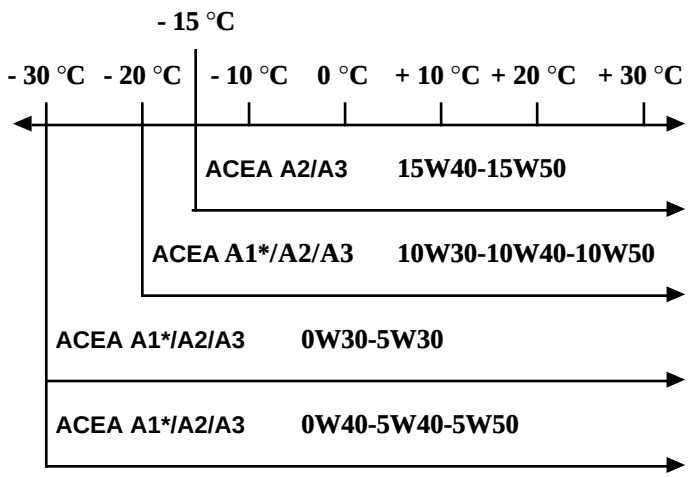
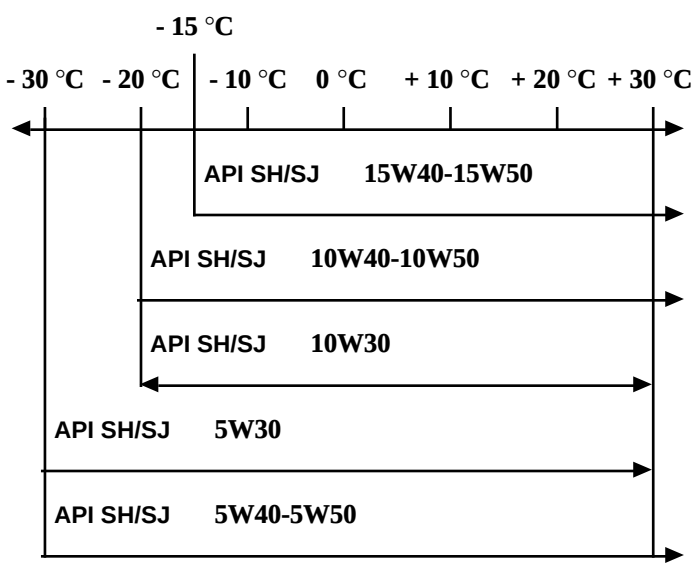
Contents

Contents

<table>
<tr><th>Components</th><th>Capacity in litres (approx) *</th><th>Grade</th></tr>
<tr><td>Petrol engine (oil)</td><td>For oil change</td><td>E.E.C. countries and Turkey
PETROL
 

ACEA standard A1-98
* Oil for fuel economy</td></tr>
<tr><td>K4M</td><td>4.25
4.75 (1)</td><td>Other countries
When lubricants specified for E.E.C. countries are not available, the following specifications must be taken into consideration:
PETROL
 

Oil for fuel economy:
API SJ-IL SAC GF2 standard</td></tr>
</table>

* Adjust using dipstick
(1) After replacing the oil filter

Components	Capacity in litres	Grade	Special notes
JB3 gearbox	3.4	All countries: TRANSELF TRX 75 W 80 W (API GL5 or MIL-L 2105 standard for left or right hand drive)	
K4M cooling circuit	5.7	Glacéol RX (type D)	Protection down to - 20 °C ± 2 °C for hot, temperate or cold climates. Protection down to - 37 °C ± 2 °C for extreme cold climates.

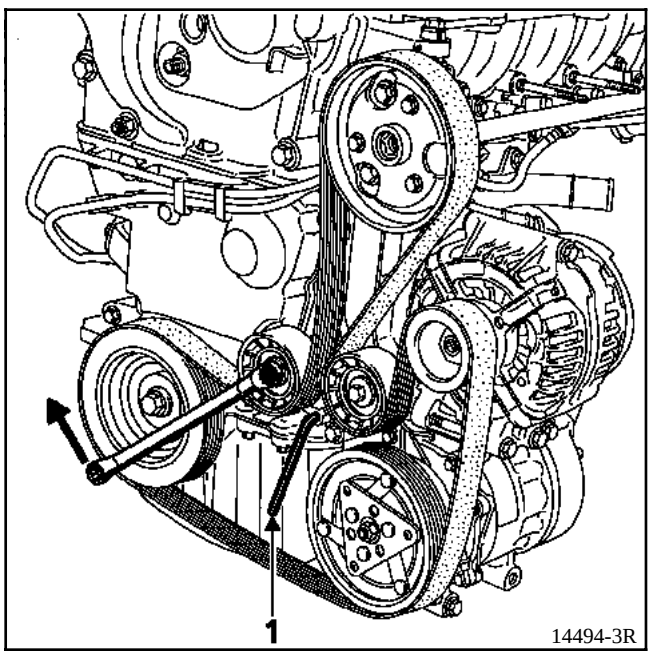
REMOVAL

Place the vehicle on a two post lift.

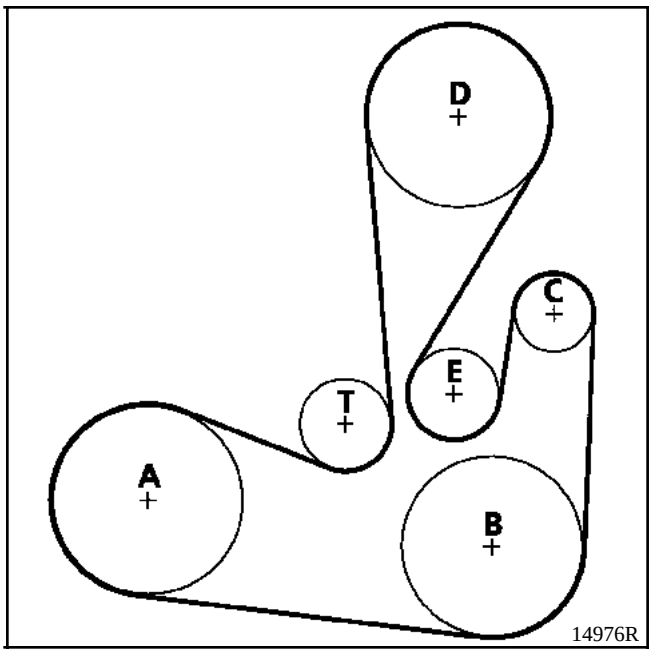
Disconnect the battery.

Remove:
- the front right hand mud guard,
- the radiator grille,
- the front right hand headlight unit.

Turn the automatic tensioner for the belt in the direction indicated below using a **13 mm offset ring wrench**. Secure the pulley using a **6 mm allen key (1)**.



ALTERNATOR, POWER ASSISTED STEERING AND AIR CONDITIONING



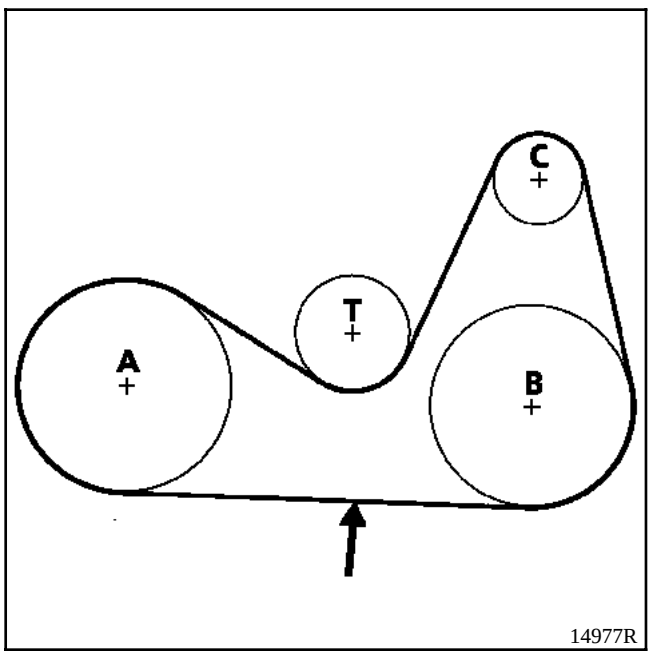
A Crankshaft
B Air conditioning compressor
C Alternator
D Power assisted steering pump
E Pulley
T Automatic tension wheel

REFITTING

Refitting is the reverse of removal.

SPECIAL TOOLING REQUIRED		
Mot.	**1273**	**Tool for checking belt tension**

ALTERNATOR AND POWER ASSISTED STEERING

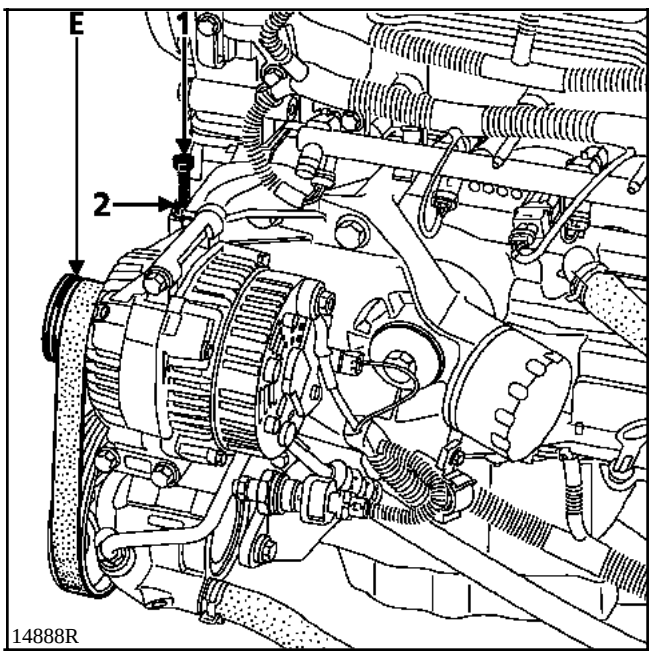


Belt tensioning is carried out using bolt (1) (having slackened the two mounting bolts for the tensioner) then tighten the nut (2).

Tension (US = SEEM unit)	**Multi-toothed power assisted steering belt**
Fitting	108 ± 6
Minimum for operation	60

A Crankshaft
B Power assisted steering pump
C Alternator
T Tension wheel

→ Tension checking point



NOTE : the accessories belt has five teeth whilst the alternator, PAS pump and crankshaft pulleys have six; it is therefore essential to ensure that the tooth at the end of the pulleys (E) remains "free" when refitting the belt.

SPECIAL TOOLING REQUIRED	
Mot. 799 -01	**Tool for immobilising sprockets for toothed timing belt**
Mot. 1368	**Tool for tightening the timing pulley**
Mot. 1489	**Top Dead Centre pin**
Mot. 1490	**Tool for immobilising camshaft pulleys**
Mot. 1496	**Tool for setting camshafts**
EQUIPMENT REQUIRED	
Angular tightening wrench	

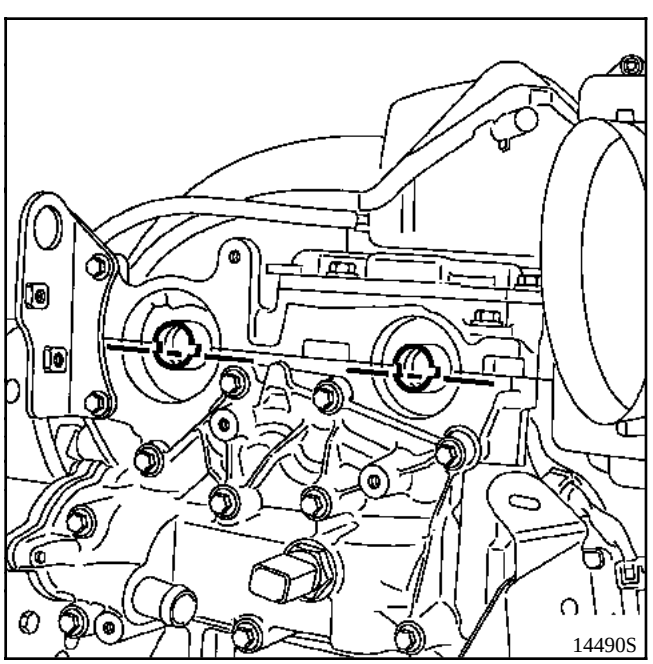
There are two distinct procedures for setting the timing.

The first procedure applies when replacing any components in the timing area which does not require slackening of one or more camshaft pulleys.

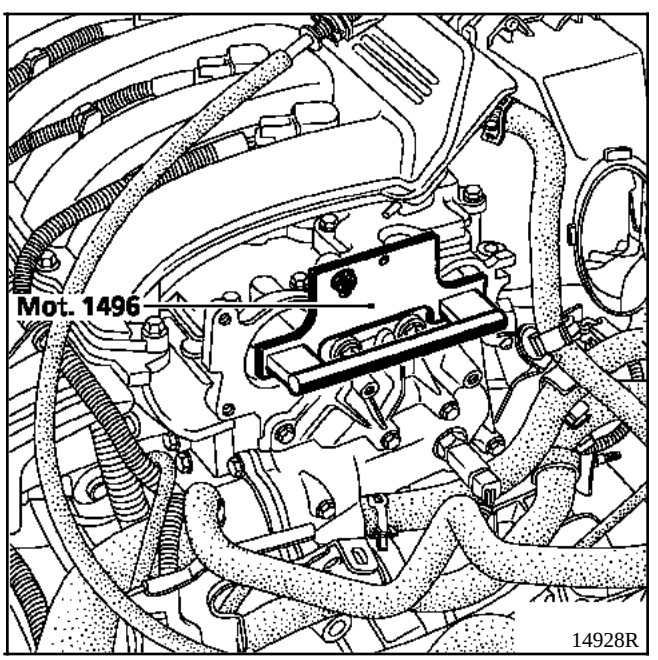
Setting the timing

IMPORTANT: all oil must be removed from the head of the crankshaft, the timing sprocket bore and the pressure surfaces of the crankshaft pulley to avoid sliding between the timing belt and the crankshaft which could cause damage to the engine.

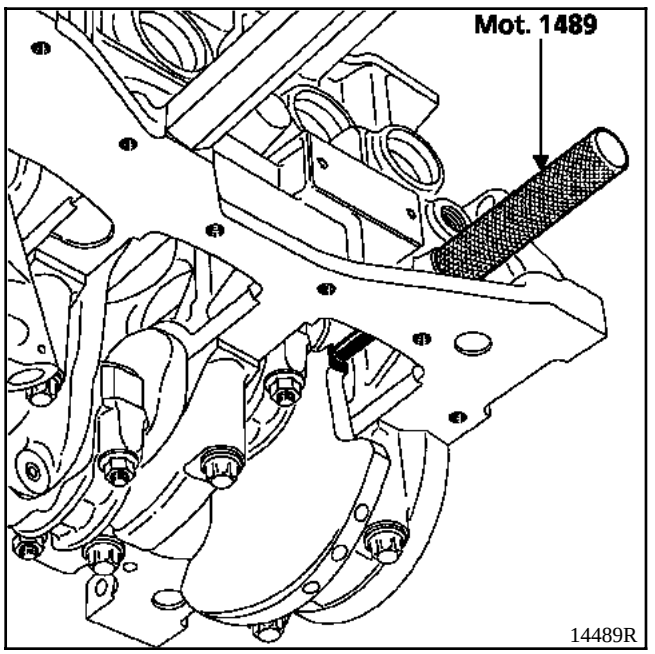
Position the camshaft grooves using **Mot. 799-01** as indicated on the diagram below.

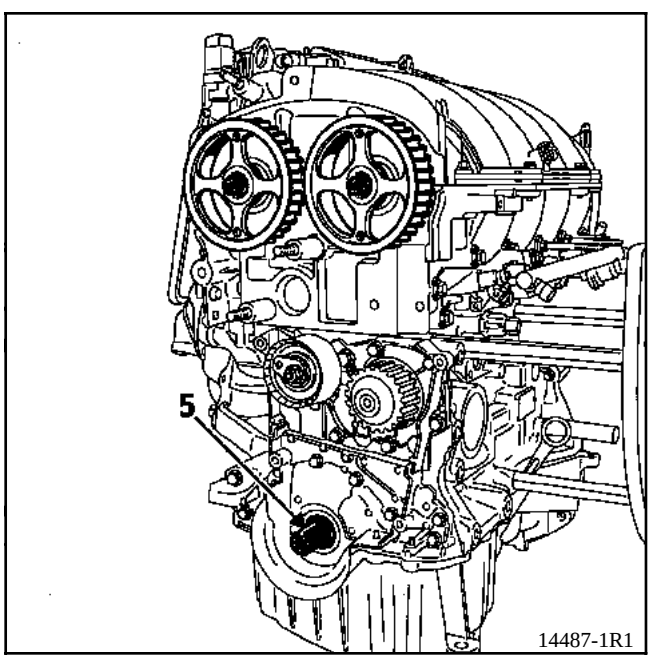


Position tool **Mot. 1496** and fix it to the end of the camshafts.



Check that the crankshaft is resting against the TDC pin **Mot. 1489** (crankshaft groove (5) to the top).

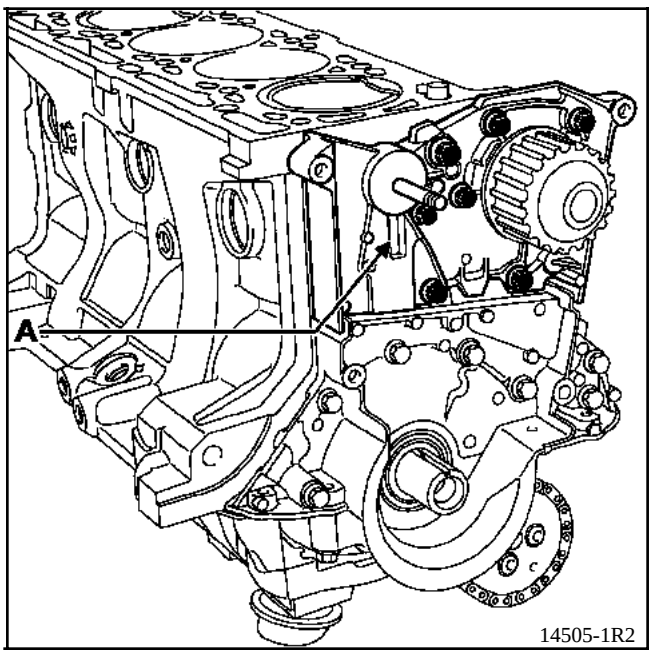




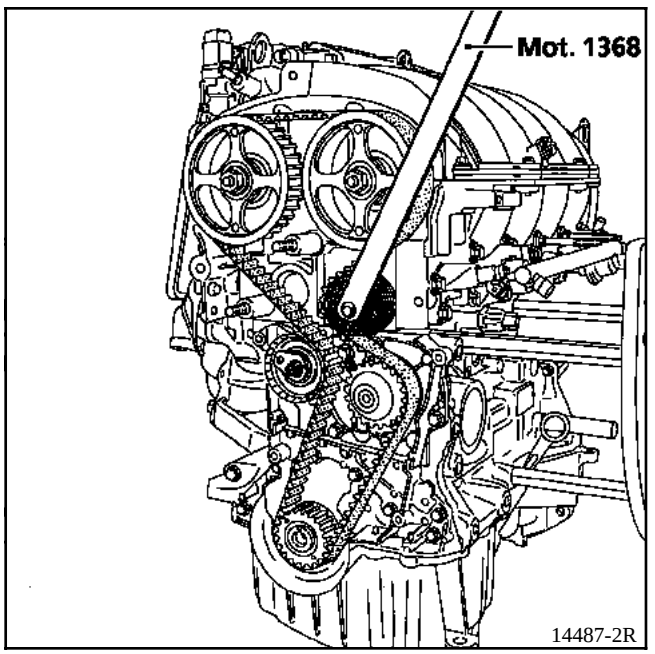
Fitting the belt

When replacing the timing belt, the tension wheel and the timing pulley must be changed.

When refitting the tension wheel, ensure that the wheel lug is correctly positioned in the groove (A).



Refit:
- the timing belt,
- the pulley by tightening the mounting bolt using **Mot. 1368** (to a torque of **4.5 daN.m**),



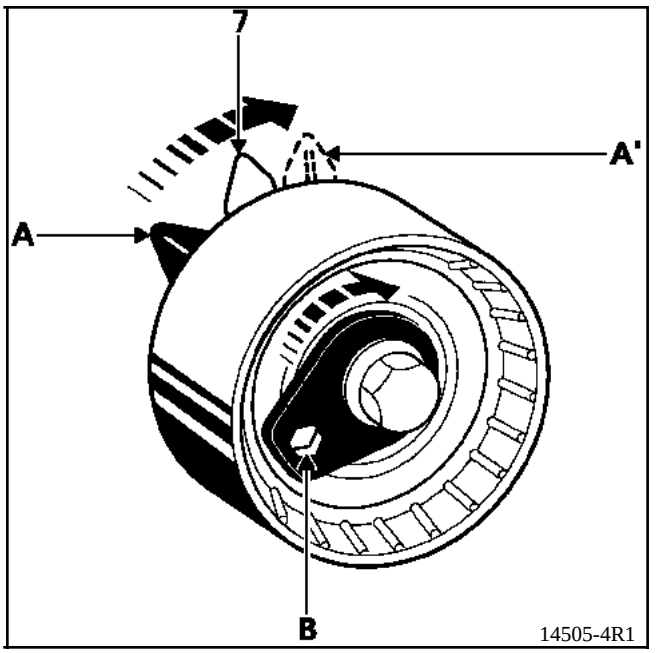
- the accessories crankshaft pulley by adjusting the bolt without touching the pulley (play of **2** to **3 mm** between the bolt and the pulley).

NOTE:
- the accessories crankshaft pulley bolt can be reused if its length below the head does not exceed **49.1 mm** (if this is not the case, change it),
- do not lubricate the new bolt. However, if a bolt is being reused, it MUST be lubricated.

Belt tension

Move the mobile index (A') of the tension wheel **7** to **8 mm** past the fixed index (7), using **6 mm** allen key (at B).

NOTE: position (A) corresponds to the mobile index at rest.



Pre-tighten the tension wheel nut to a torque of **0.7 daN.m**.

Tighten the crankshaft pulley bolt to a torque of **2 daN.m** then to an angle of **135° ± 15°** (crankshaft touching the Top Dead Centre pin).

Remove **Mot. 1496**, the camshaft immobiliser and **Mot. 1489**, the TDC pin.

Turn the crankshaft clockwise twice (timing side), before the end of the two revolutions, screw pin **Mot. 1489** into the cylinder block and slowly and without jerky movements, adjust the crankshaft until it touches the pin.

Remove the TDC pin.

Slacken the tension wheel nut by a maximum of one revolution, using a **6 mm** allen key to hold it.

Align the mobile index with the fixed index and tighten the nut to a torque of **2.7 daN.m**.

Checking the setting and tension

Checking the tension

Turn the crankshaft clockwise twice (timing side), before the end of the two revolutions, screw pin **Mot. 1489** into the cylinder block and slowly and without jerky movements, adjust the crankshaft until it touches the pin.

Remove the TDC pin.

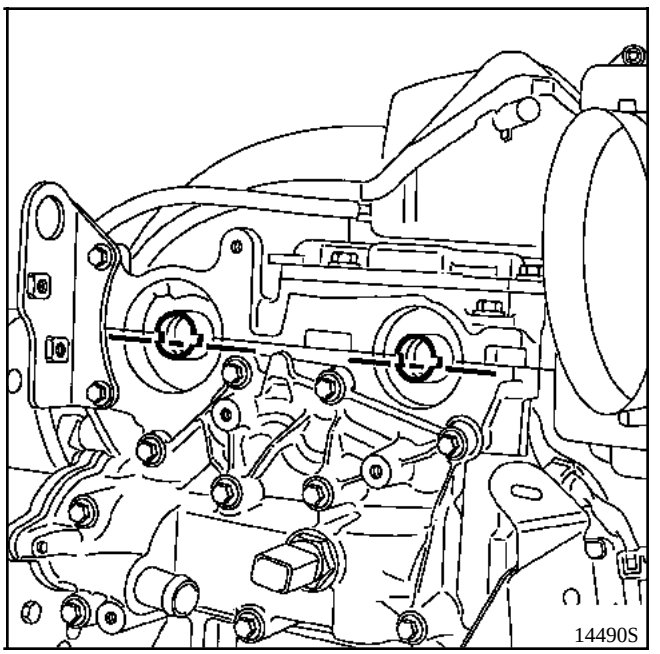
Check that the pulleys indices are aligned. If they are not, carry out the procedure for tensioning again.

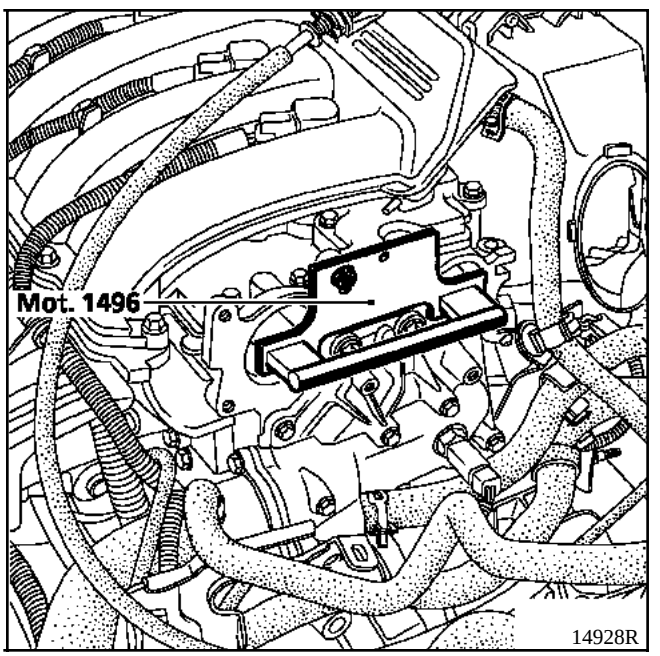
Checking the setting

Ensure that the tension wheel indices are correctly positioned before checking the setting of the timing.

Screw pin **Mot. 1489** into the cylinder block then slowly and without jerky movements, adjust the crankshaft until it touches the pin.

Fit (without forcing) tool **Mot. 1496** for setting the camshafts (the camshaft grooves must be horizontal). **If the tool does not engage, the timing must be reset and the tension adjusted.**



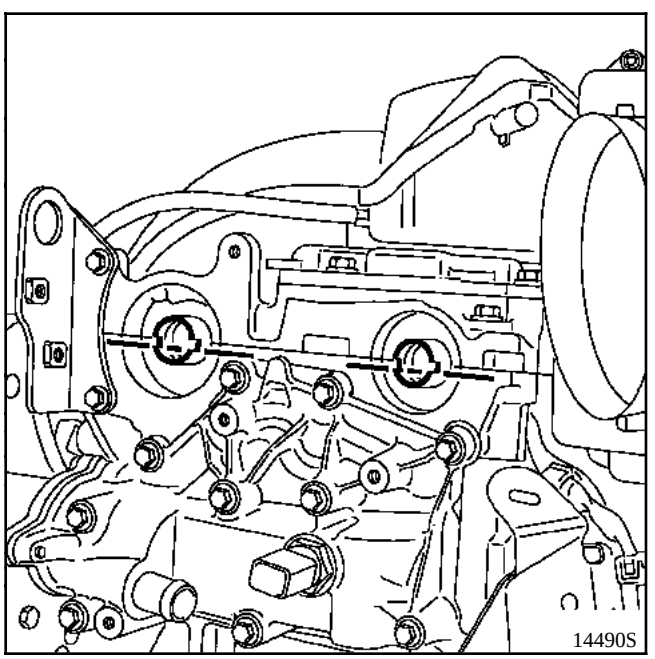


The second procedure applies when changing any components which require one or more of the timing camshaft pulleys to be slackened.

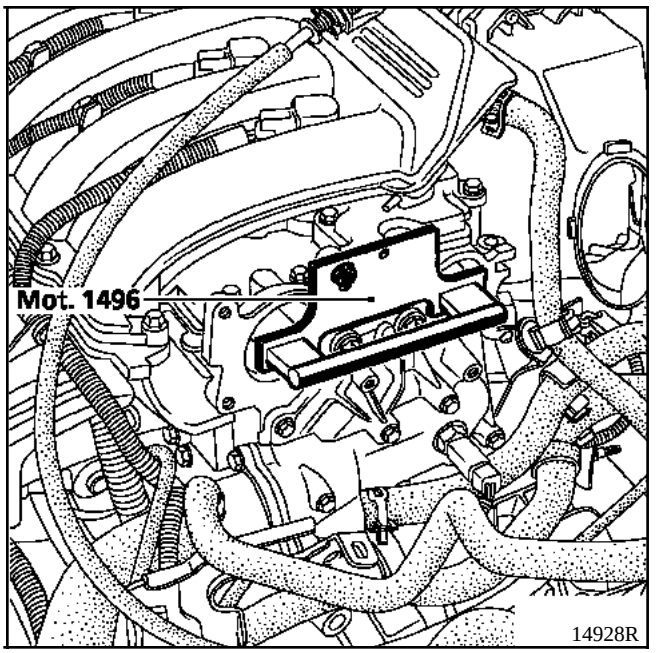
Setting the timing

IMPORTANT: all oil must be removed from the head of the crankshaft and the timing sprocket bore, the pressure surfaces of the crankshaft pulley and the camshaft ends (timing side) and the camshaft pulley bores to avoid sliding between the timing belt, the crankshaft and the camshaft pulleys which could cause damage to the engine.

Position the camshaft grooves as indicated in the diagram below by tightening respectively the two old camshaft sprocket nuts onto the studs at the ends of the camshafts.

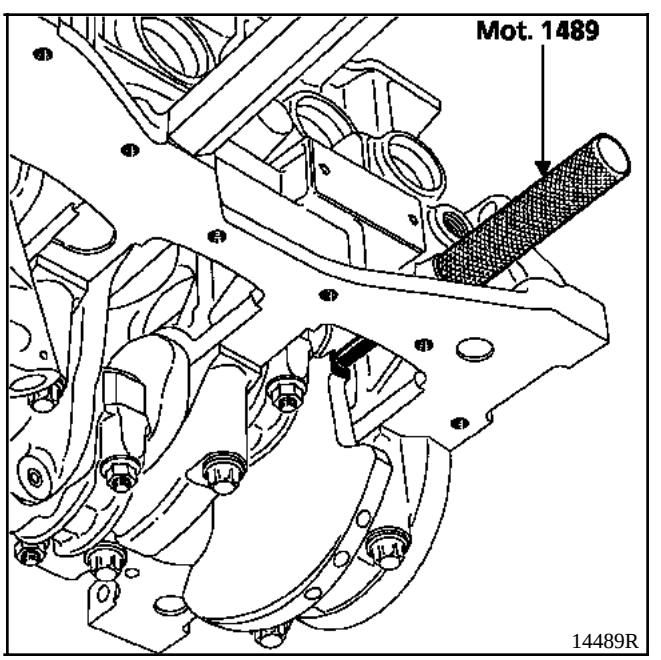


Fit tool **Mot. 1496** to the end of the camshafts.



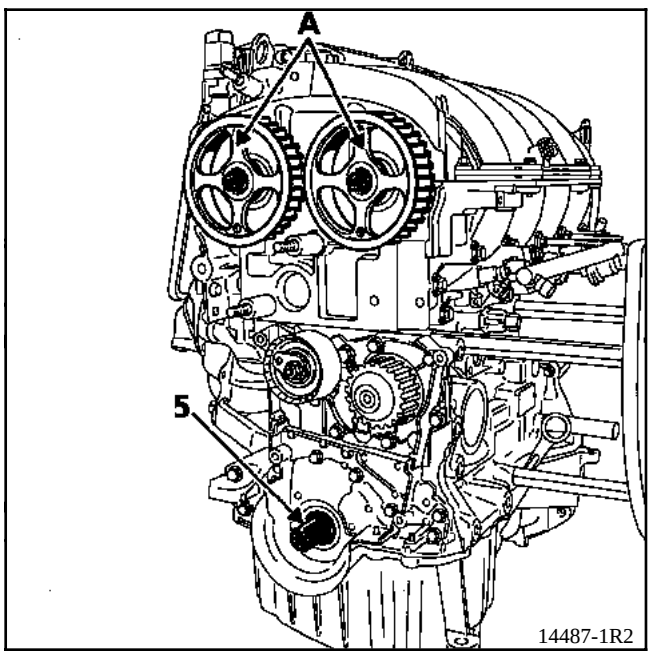
Fit the camshaft pulleys in place by pre-tightening the new nuts - the old ones must be replaced(**without locking the nuts, play of 0.5 to 1 mm between nut and pulley**).

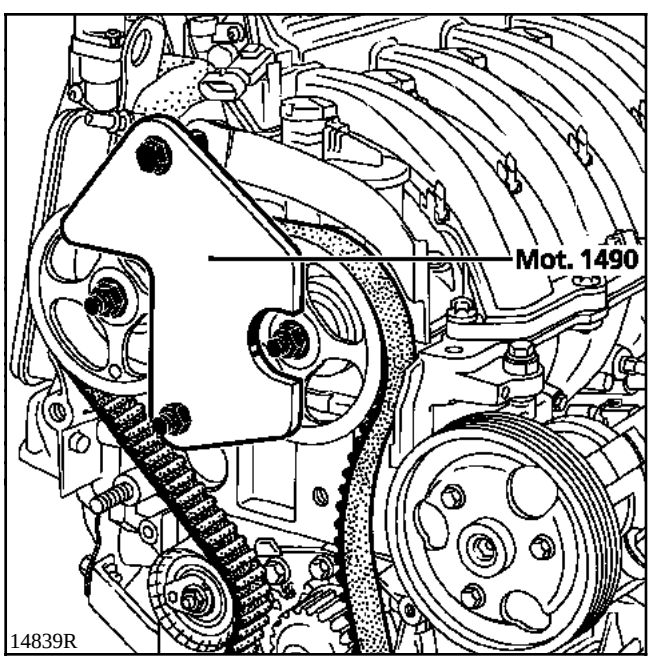
Check that the crankshaft is touching the TDC pin (crankshaft groove (5) to the top).



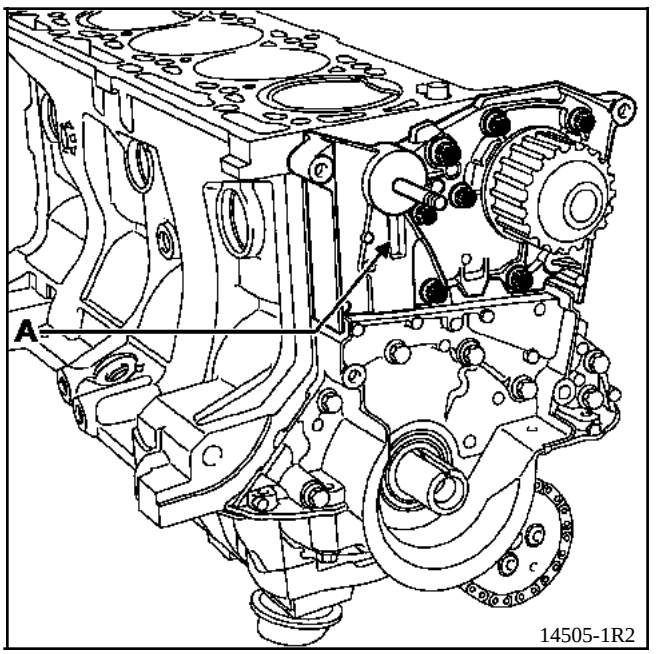
When changing a timing belt, the tension wheels and timing pulley must be changed.

Position the **Renault** logo engraved on the camshaft pulley spokes vertically upright (A), fit the timing belt onto the camshaft pulleys then fit the tool for immobilising the camshaft pulleys **Mot. 1490** (use the timing cover mountings to secure tool **Mot. 1490**).

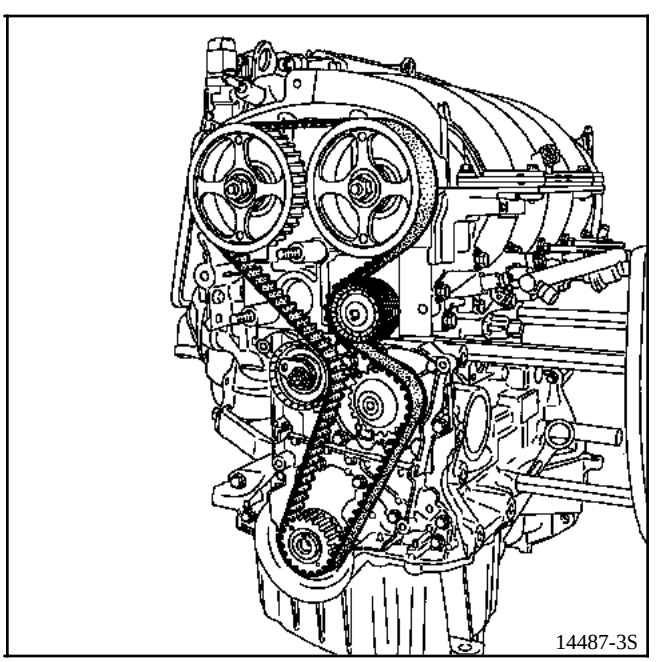




When refitting the tension wheel, ensure that the wheel lug is correctly positioned in the groove (A).



Refit:
- the timing belt,
- the pulley by tightening the mounting bolt using **Mot. 1368** (to a torque of **4.5 daN.m**).



Fit the crankshaft accessories pulley by pre-tightening the bolt (**without locking the bolt, play of 2 to 3 mm between the bolt and the pulley**).

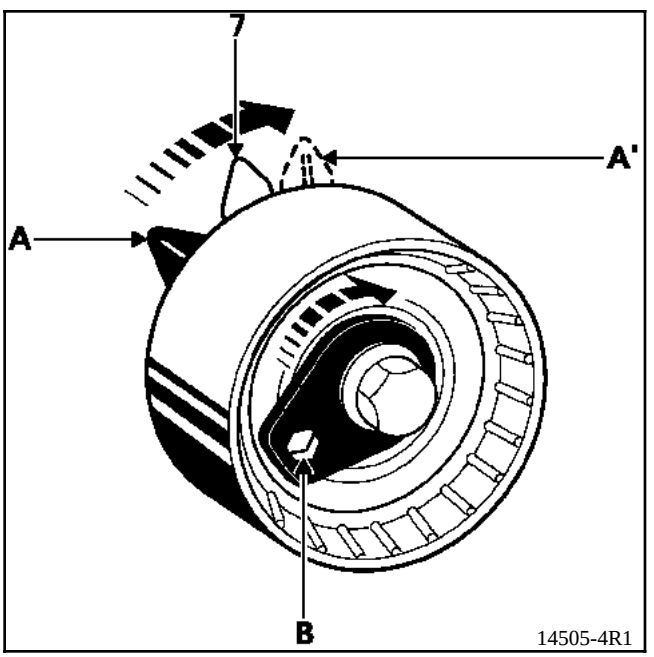
NOTE:
- the accessories crankshaft pulley bolt can be reused if its length under the head does not exceed **49.1 mm** (if this is not the case, change it),
- do not lubricate the new bolt. However, if a bolt is reused, it must be lubricated.

Tensioning the belt

Check that there is always play of 0.5 to 1 mm between nuts and camshaft pulleys.

Move the mobile index (A') of the tension wheel **7** to **8 mm** past the fixed index (7) using a **6 mm** allen key (at B).

NOTE: position (A) corresponds to the mobile index at rest.



Pre-tighten the tension wheel nut to a torque of **0.7 daN.m**.

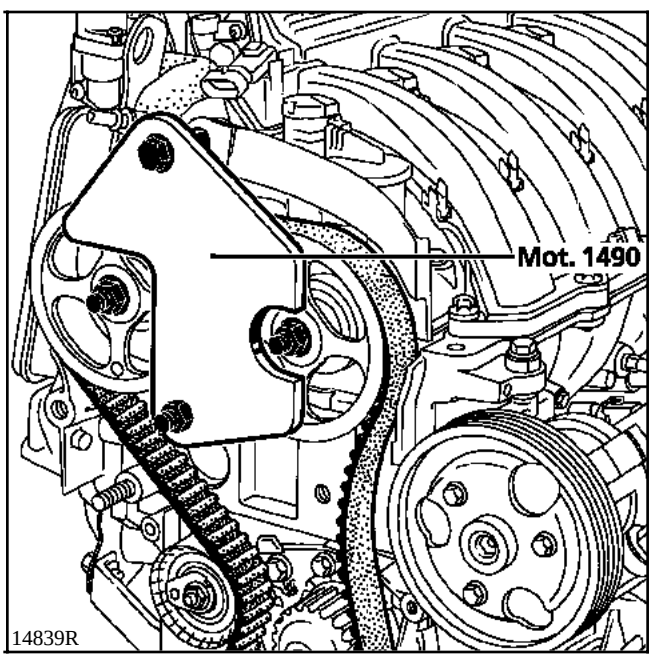
Remove the tool for immobilising the camshaft pulleys **Mot. 1490**.

Rotate the timing six times by the exhaust camshaft pulley using **Mot. 799-01**.

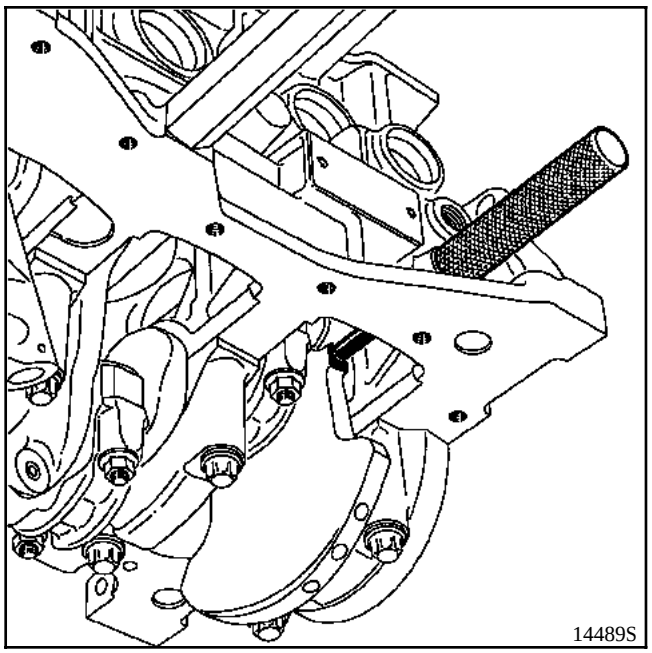
Slacken the tension wheel nut by a maximum of one rotation using a **6 mm** allen key to hold it.

Align the mobile index (A') with the fixed index (7) and tighten the nut to a torque of **2.7 daN.m**.

Fit tool **Mot. 1490** for immobilising the camshaft pulleys.



Check that the crankshaft is touching the pin **Mot. 1489**.



Tighten the accessories crankshaft pulley bolt to a torque of **2 daN.m**, then to an angle of **135°** ± **15°** (crankshaft touching the TDC pin).

Tighten the inlet camshaft pulley nut to a torque of **3 daN.m** then to an angle of **84°**.

Tighten the exhaust camshaft pulley nut to a torque of **3 daN.m** then to an angle of **84°**.

Remove **Mot. 1496** for setting the camshafts, **Mot. 1490**, the tool for immobilising the camshaft pulleys and **Mot. 1489,** the TDC pin.

Checking the setting and tension

Checking the tension

Turn the crankshaft clockwise twice (timing side), before the end of the two revolutions, screw pin **Mot. 1489** into the cylinder block and slowly, without jerky movements, adjust the crankshaft until it touches the pin.

Remove the TDC pin.

Check that the pulley indices are aligned, if not, carry out the tensioning procedure again. Slacken the tension wheel nut by a maximum of one revolution using a **6 mm** allen key to hold it.

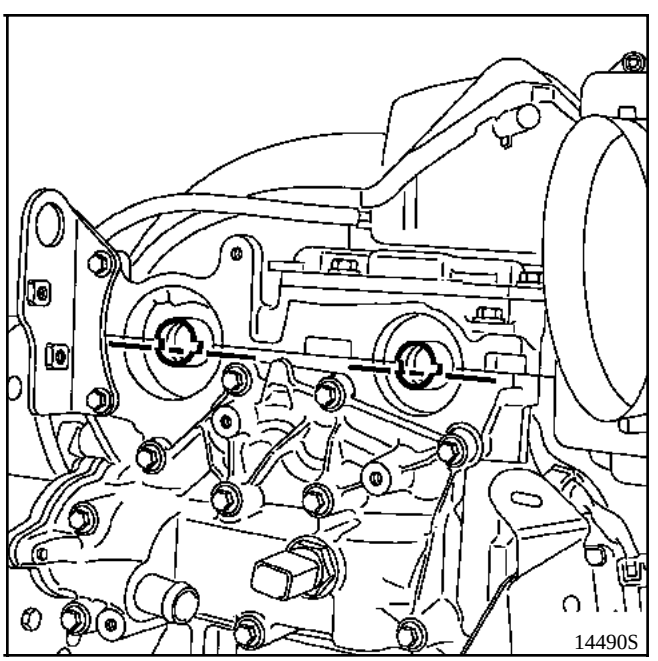
Align the mobile index with the fixed index and tighten the nut to a torque of **2.7 daN.m**.

Checking the setting

Ensure that the tension wheel index is correctly positioned before checking the setting of the timing.

Screw pin **Mot. 1489** into the cylinder block then position and hold the crankshaft so it touches the pin.

Fit (without forcing) **Mot. 1496**, the tool for setting the camshaft pulleys (the camshaft grooves must be horizontal). If the tool does not engage, the timing must be reset and the tension adjusted.



METHOD FOR TIGHTENING THE CYLINDER HEAD

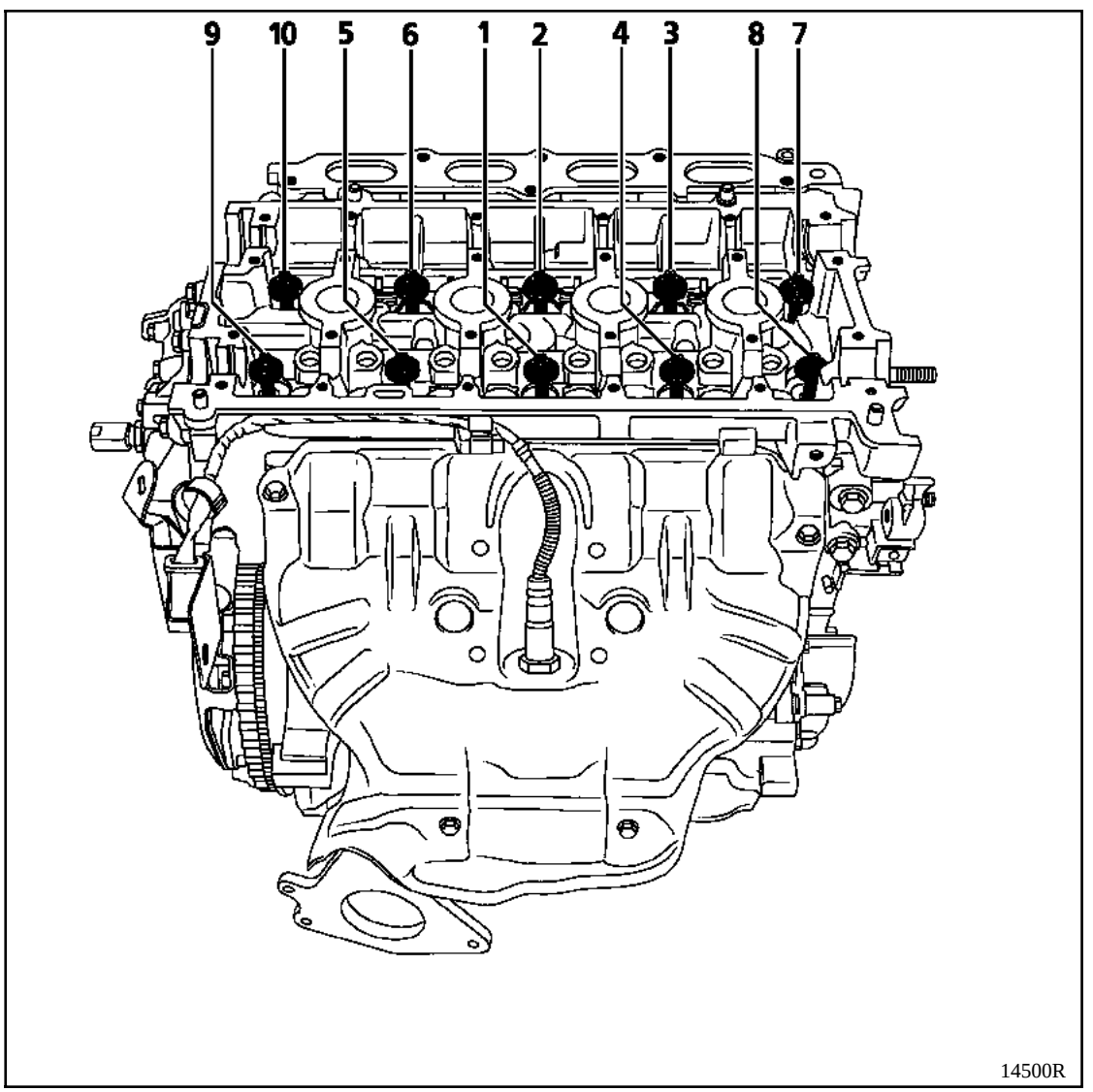
Bolts may be reused if the length below the head does not exceed 117.7 mm (otherwise change all the bolts).

Method for tightening the cylinder head

REMINDER: to obtain correct tightening of the bolts, use a syringe to remove any oil which may be in the cylinder head mounting holes.

Do not lubricate new bolts. However, if bolts are being reused, they must be lubricated.

Tighten all bolts to **2 daN.m** in the order indicated below.



Check that all bolts are tightened to a torque of **2 daN.m** then angle tighten (bolt by bolt) to **240**° ± **6**°.

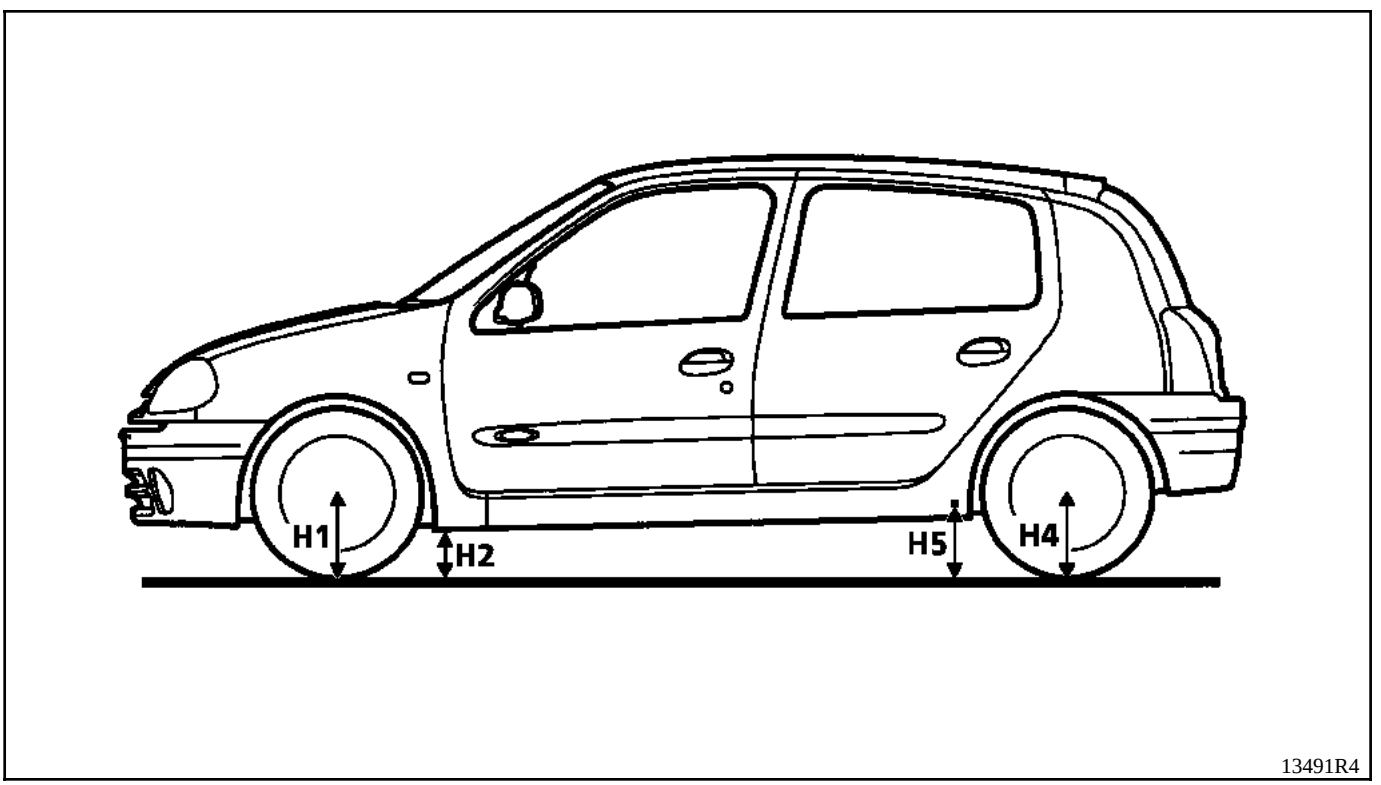
Do not retighten the cylinder head bolts after this procedure has been applied.

Vehicle	At the front H1 - H2 = ... mm	At the rear H4 - H5 = ... mm	Dimension X (in mm) RH and LH side
CB0H CB0T	92.2 ± 7.5	8 ± 5	-

The gap between the left hand side and the right hand side on the same axle on a vehicle should not exceed **5 mm**, the driver's side always being the higher.

Any operation affecting the underbody height will necessitate adjustment of the braking limiter and the headlights.

MEASURING POINTS



NOTE: dimension **H5** is measured from the rubber bush axis.

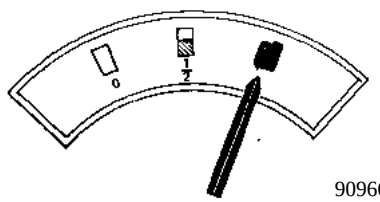
H2 = dimension measured between the lower surface of the sub-frame on the right of the wheel axis and the ground.

Vehicle	Rim	Tyres	Inflation pressure (in bar) (1)	
			Front	Rear
CB0H CB0T	6 J 14	185 / 60 R 14 H	2.3	2.1

(1) Fully laden and motorway use.

Tightening torque of wheel nuts: **9 daN.m**
Rim run-out: **1.2 mm**

BRAKING PRESSURE

Vehicle	Fuel tank level (driver aboard)	Test pressure (1) (in bar)	
		Front	Rear
CB0H CB0T	 90966S	100 →	56 $^{0}_{-18}$

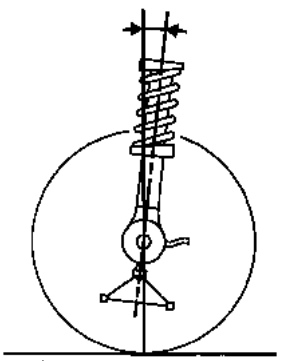
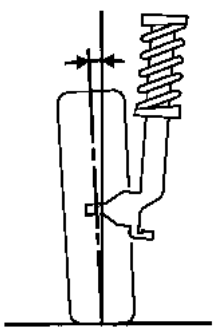
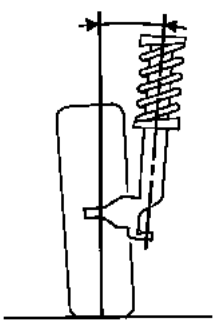
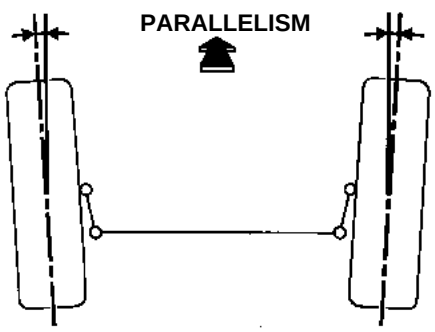
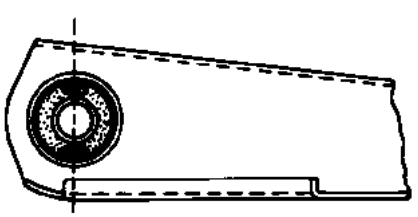
(1) The checking is carried out with two pressure gauges arranged in an X formation.

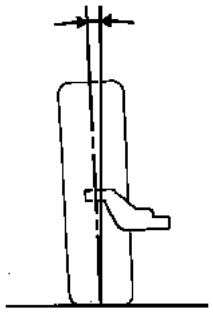
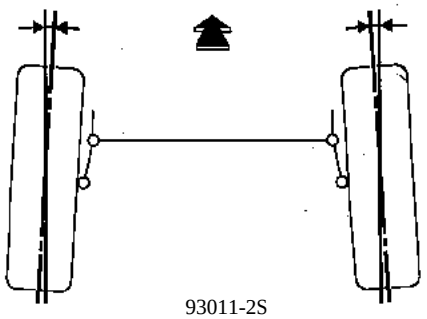
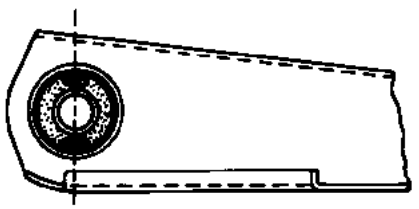
Vehicle	Drum diameter or disc thickness (in mm)				Maximum disc run-out (in mm)	
	Front		Rear			
	Normal	Minimum	Normal	Maximum (1)	Front	Rear
CB0H CB0T	20.6	17.6	203.2	204.5	0.07	-

(1) Drum: Maximum wear diameter

Vehicle	Lining thickness (in mm) (including backing plate)				Brake fluid
	Front		Rear		
	New	Minimum	New	Minimum	
CB0H CB0T	18.2	6	4.6 (1) 3.3 (2)	2	SAE J1703 DOT 4

(1) Primary lining.
(2) Secondary lining

ANGLES	VALUES	POSITION OF FRONT AXLE	ADJUSTMENT
CASTOR  93012-1S	4° 3°30' 3° 2°30' } ±30' Maximum difference between right and left= 1°	H5-H2 = 32 mm H5-H2 = 51 mm H5-H2 = 70 mm H5-H2 = 89 mm	NOT ADJUSTABLE
CAMBER  93013-1S	0°54' - 0°25' - 0°34' 0°05' } ±30' Maximum difference between right and left = 1°	H1-H2 = 17 mm H1-H2 = 89 mm H1-H2 = 115 mm H1-H2 = 179 mm	NOT ADJUSTABLE
KINGPIN  93014-1S	8°30' 10°50' 11°20' 12°00' } ±30' Maximum difference between right and left = 1°	H1-H2 = 17 mm H1-H2 = 89 mm H1-H2 = 115 mm H1-H2 = 179 mm	NOT ADJUSTABLE
PARALLELISM  93011-1S	(For 2 wheels) toe-out + 0°16' ± 20' + 1.6 mm ± 2 mm	UNLADEN	Adjustable by rotating track rod sleeves. 1 rotation = 30' (3 mm)
RUBBER BUSHES  81603S1	-	UNLADEN	-

ANGLES	VALUES	POSITION OF REAR AXLE	ADJUSTMENT
CAMBER  93013-2S	- 0°57' ± 20'	UNLADEN	NOT ADJUSTABLE
PARALLELISM  93011-2S	(For 2 wheels) Toe-in - 0°41' ± 30' - 4 mm ± 3 mm	UNLADEN	NOT ADJUSTABLE
RUBBER BUSHES  81603S1	-	UNLADEN	-

Vehicle type	Engine	Gearbox	Capacity (cm^3)	Bore (mm)	Stroke (mm)	Ratio
CB0H CB0T	K4M 748	JB3	1 598	79.5	80.5	10 / 1

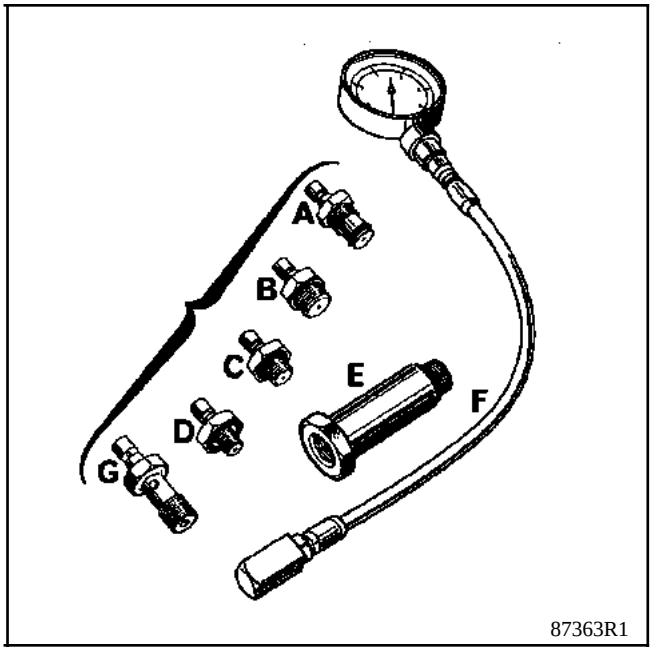
Section to consult: **Mot. K4M**.

SPECIAL TOOLING REQUIRED
Mot. 836 -05 Oil pressure measuring kit
EQUIPMENT REQUIRED
22 mm long socket or tube wrench

CHECKING

The oil pressure should be checked when the engine is warm (approximately **80 °C**).

Contents of kit **Mot. 836-05**.



USE

B + F

Connect the pressure gauge in place of the oil pressure switch.

Oil pressure

Idle	**1 bar**
3 000 rpm	**3 bars**

SPECIAL TOOLING REQUIRED	
Mot. 1040-01	**Dummy sub-frame for removal-refitting of the engine and transmission assembly**
Mot. 1159	**Tool for holding the engine on the sub-frame**
Mot. 1202	**Hose clip pliers**

TIGHTENING TORQUES (in daN.m)	
Sub-frame front mounting bolt	**6.2**
Sub-frame rear mounting bolt	**10.5**
Front right hand suspended engine mounting cover mounting bolt on engine	**6.2**
Front right hand suspended engine mounting cover mounting nut	**4.4**
Mounting nut for the rubber pad on the front left hand side member support	**6.2**
Shock absorber base mounting bolts	**18**
Brake caliper mounting bolts	**4**
Steering shaft yoke mounting bolt	**3**
Wheel bolt	**9**

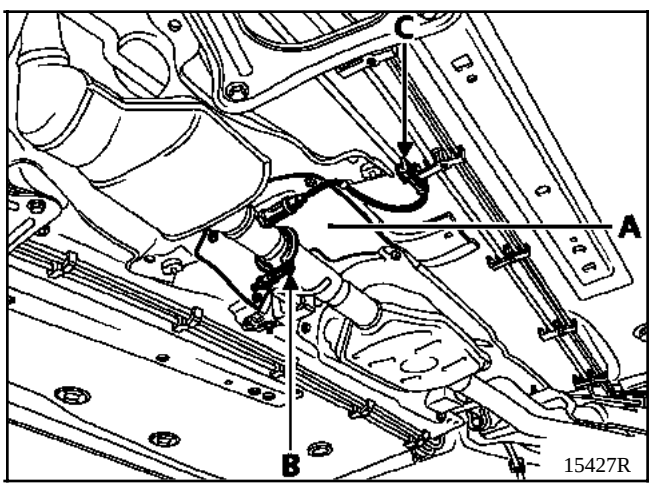
REMOVAL

Place the vehicle on a two post lift.

Remove the battery and the engine undertray.

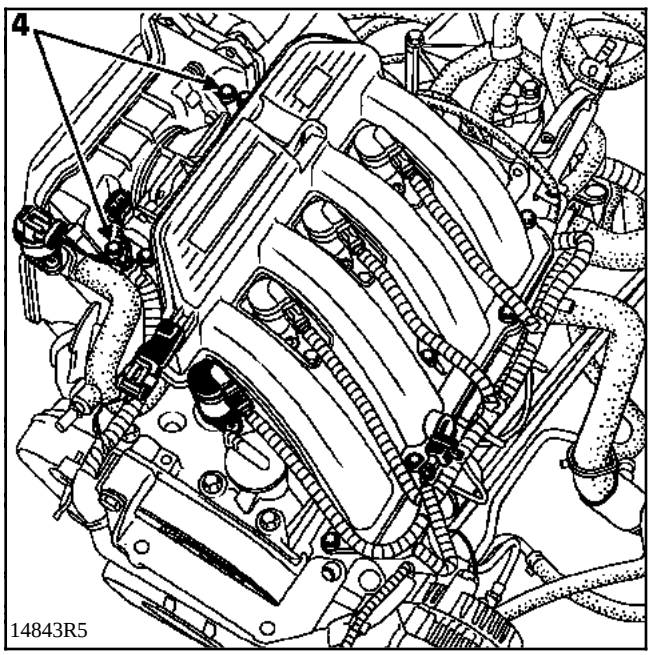
Drain:
- the cooling circuit via the lower radiator hose,
- the gearbox and the engine (if necessary),
- the air conditioning circuit (if equipped) using a filling station.

Remove:
- the front wheels and the mud guards,
- the radiator grille,
- the front bumper,
- the sub-frame / body tie rods,
- the brake calipers (and the **ABS** sensors if fitted) and attach them to the suspension springs,
- the shock absorber base bolts,
- the heat shield (A) and the gearbox control,



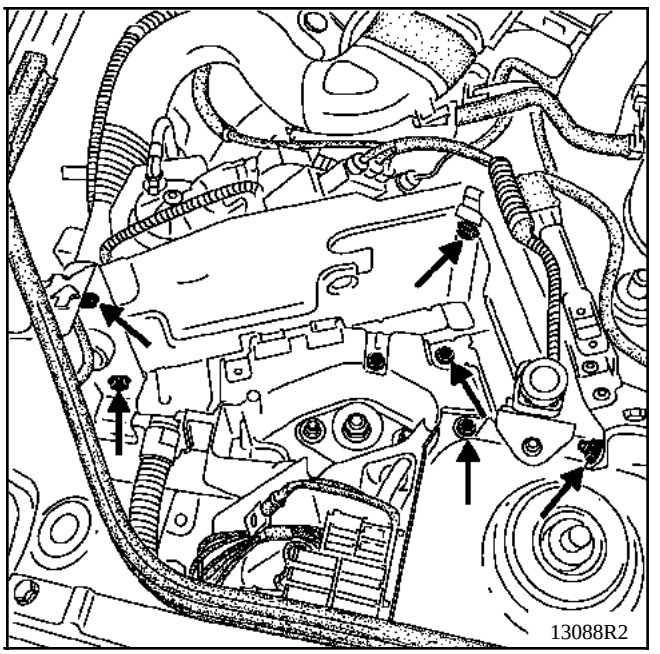
- the exhaust pipe clamp (B) between the catalytic converter and the expansion box and disconnect the oxygen sensor connector (C),
- the earth strap on the gearbox,
- the front bumper,
- the air resonator,

- the expansion bottle mountings and move it to one side,
- the catalytic converter mountings on the manifold and attach it to the exhaust pipe then move the assembly to one side,
- the vacuum pipe on the manifold,
- the air unit at (4).

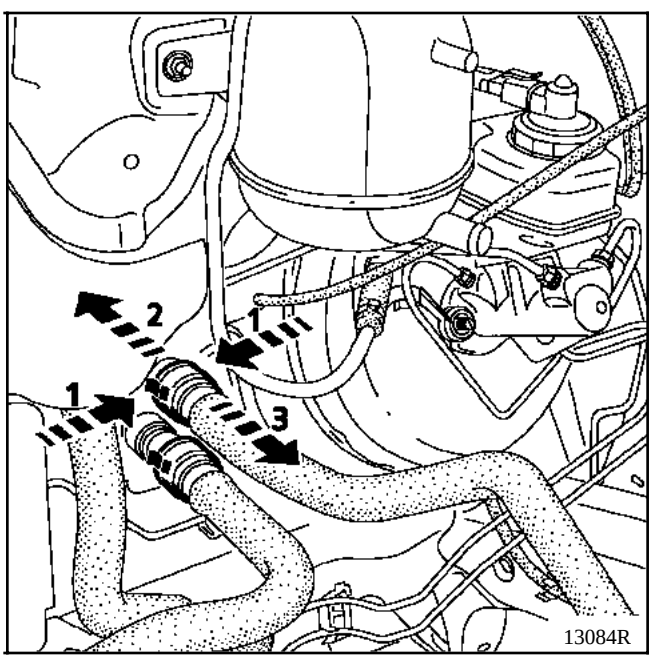


NOTE: be careful with the vacuum outlet from the inlet manifold to the brake servo. If this outlet gets broken the manifold will have to be changed.

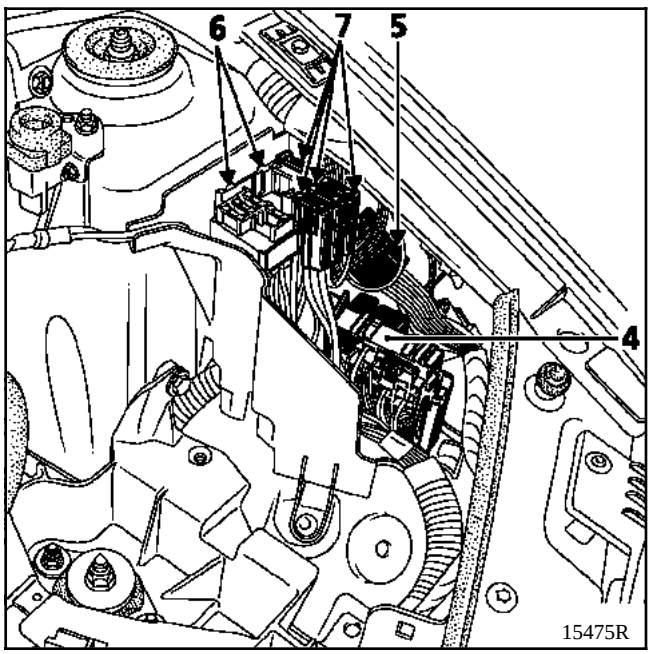
Remove:
- the injection computer support once the **90 track** connector and the impact switch connector have been disconnected.



Disconnect:
- the brake servo pipe,
- the heating pipes,



- the fuse board (4), the connector (5), the fuse mounting (6) and remove the fuse holders (7) which are on the mounting,

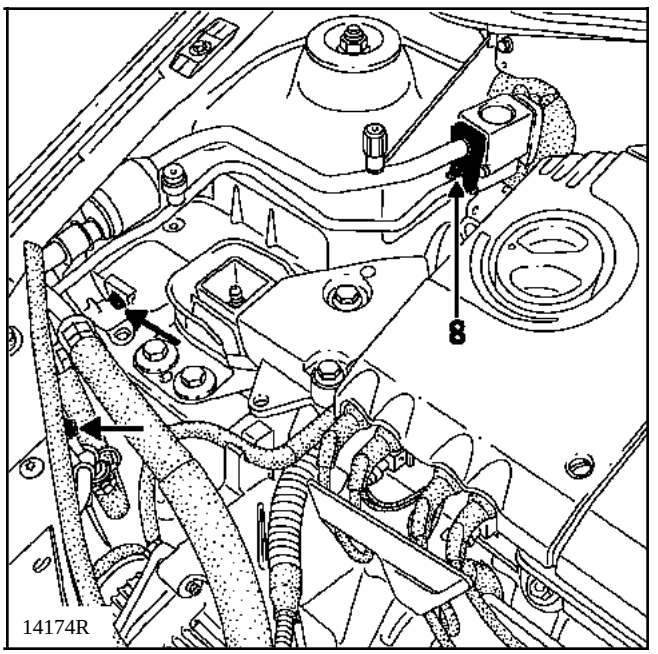


- the connector on the canister,
- the canister pipe on the inlet manifold,
- the accelerator and clutch cables.

Unclip the power assisted steering reservoir and set it on the engine.

Remove:
- the upper mountings for the radiator,
- the **AC** pipe mountings (if equipped) and flange (8) and rest the assembly on the engine,

NOTE: the pipes and the expansion valve must be plugged to prevent humidity entering the circuit.



- the steering shaft yoke nut and eccentric bolt after pushing the protector back.

SPECIAL NOTES FOR VEHICLES EQUIPPED WITH A DRIVER'S AIR BAG

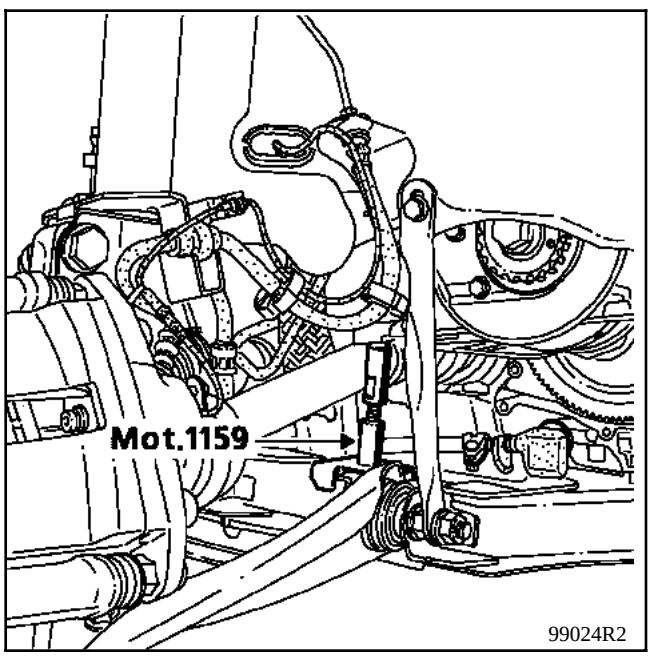
IMPORTANT

To prevent all risk of damage to the rotary switch under the steering wheel, please observe the following notes:

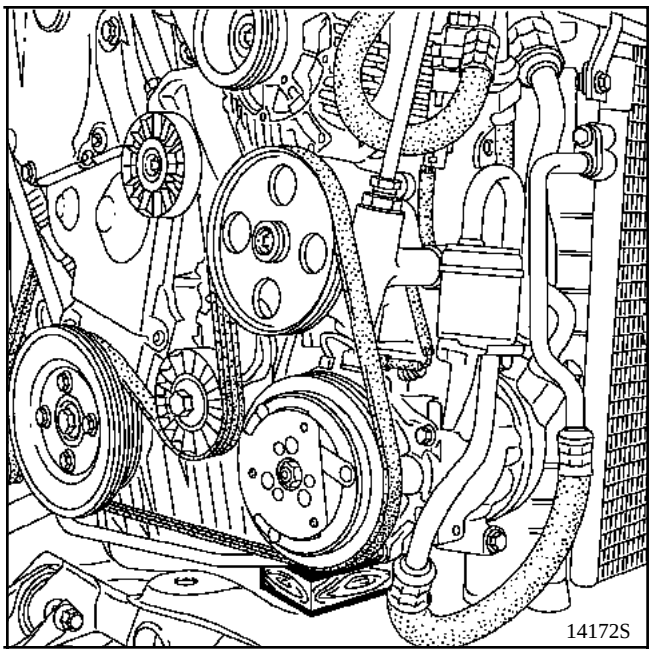
- **Before uncoupling the steering column and the steering rack, the steering wheel MUST be immobilised with the wheels straight for the entire operation using a "steering wheel immobilising tool".**
- **If there is any doubt regarding the correct centring of the rotary switch, the steering wheel must be removed so that the centring method described in section 88 "Air bag" can be applied.**

REMINDER: in this case, only qualified, trained personnel can carry out the operation.

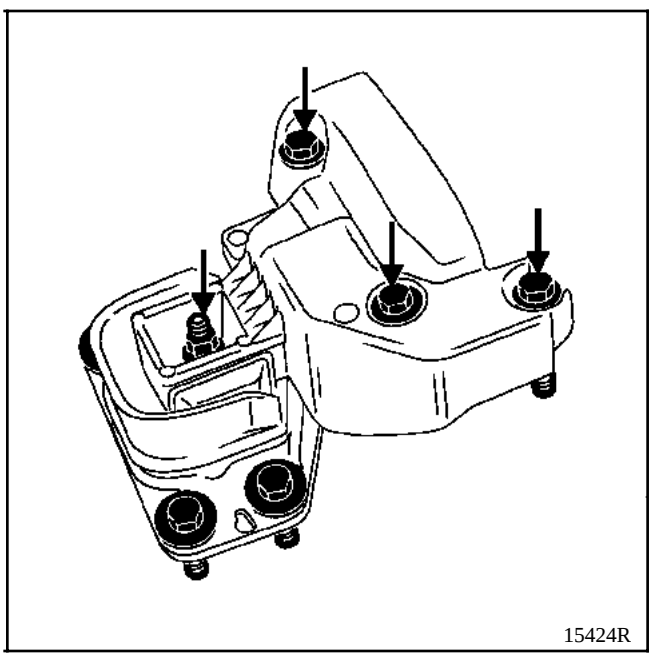
Fit **Mot. 1159** between the sub-frame and the cylinder block.



Fit a block between the multipurpose mounting and the sub-frame.

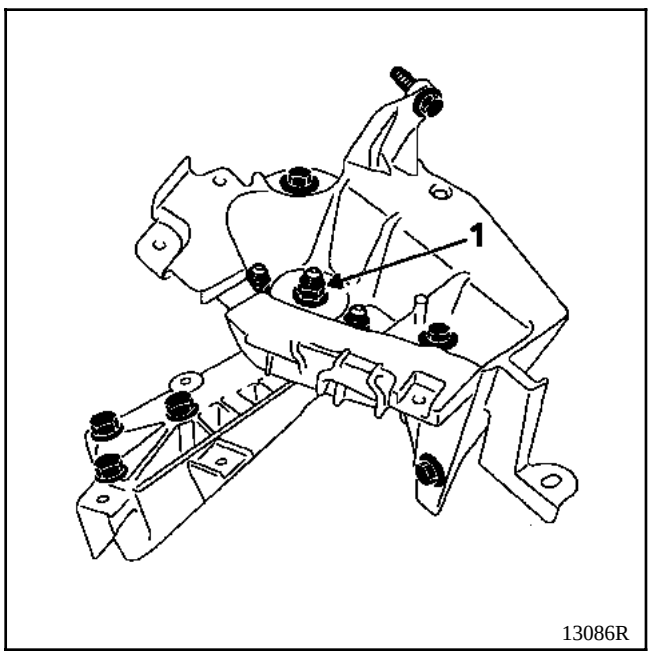


Remove the suspended engine mounting cover.

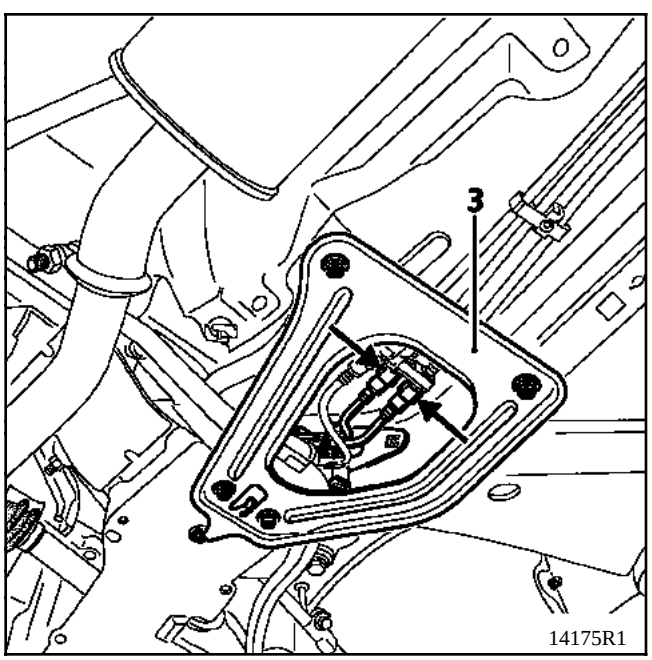


Place a block between the gearbox and the sub-frame.

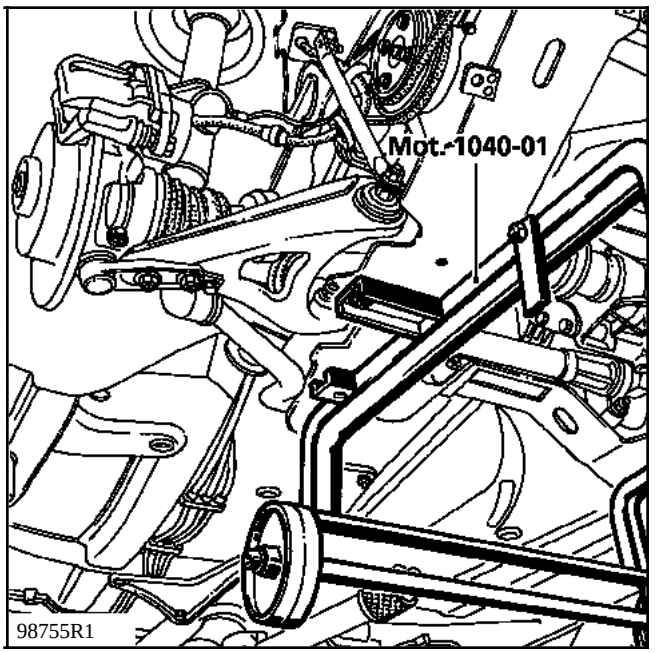
Remove:
- the nut (1), then tap it with a copper hammer to release the suspended engine mounting stud,



- the tie rods (3),
- the fuel supply and return pipes.



Secure tool **Mot. 1040-01** under the sub-frame.



Lower the lift until the tool touches the ground.

Remove the sub-frame mounting bolts and remove the engine and transmission assembly by lifting the body.

NOTE: for an operation requiring separation of the engine - gearbox - sub-frame assembly, take care to mark the position of **Mot. 1159** on the sub-frame.

REFITTING

Two threaded rods **Mot. 1233-01** can be used to make it easier to align the sub-frame with the body by positioning them in the two front mountings of the sub-frame on the body.

Tighten the sub-frame mounting bolts to a torque of:
- **6.2 daN.m** at the front,
- **10.5 daN.m** at the rear.

Refitting is the reverse of removal

Correctly fit the heat shields.

Fit the caliper mounting bolts using **Loctite FRENBLOC** and torque tighten them.

Press the brake pedal several times to bring the pistons in contact with the pads.

Carry out the following operations:
- fill the engine and gearbox with oil (if necessary),
- fill and bleed the cooling circuit (see section **19** "**Filling and bleeding**").

SPECIAL TOOLING REQUIRED	
Mot. 1233-01	**Threaded rods for lowering the sub-frame**

TIGHTENING TORQUES (in daN.m)	
Sub-frame front mounting bolt	**6.2**
Sub-frame rear mounting bolt	**10.5**
Sump bolt	**1.4**
Steering shaft yoke mounting bolt	**3**
Engine tie-bar bolt	**6.2**
Wheel bolt	**9**

REMOVAL

Place the vehicle on a two post lift.

Disconnect the battery.

Drain the engine.

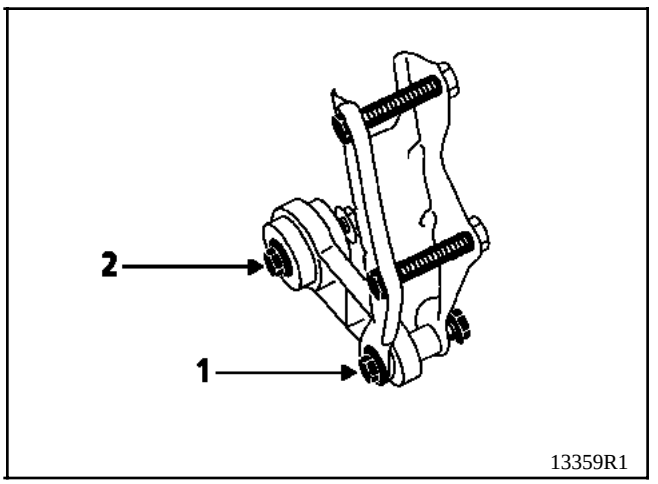
Remove:
- the front wheels and the right hand mud guard,
- the steering shaft yoke nut and eccentric bolt after pushing the protector back,

IMPORTANT

To prevent all risk of damage to the rotary switch under the steering wheel, please observe the following notes:
- **Before uncoupling the steering column and the steering rack, the steering wheel MUST be immobilised with the wheels straight for the entire operation using a "steering wheel immobilising tool".**
- **If there is any doubt regarding the correct centring of the rotary switch, the steering wheel must be removed so that the centring method described in section 88 "Air bag" can be applied.**

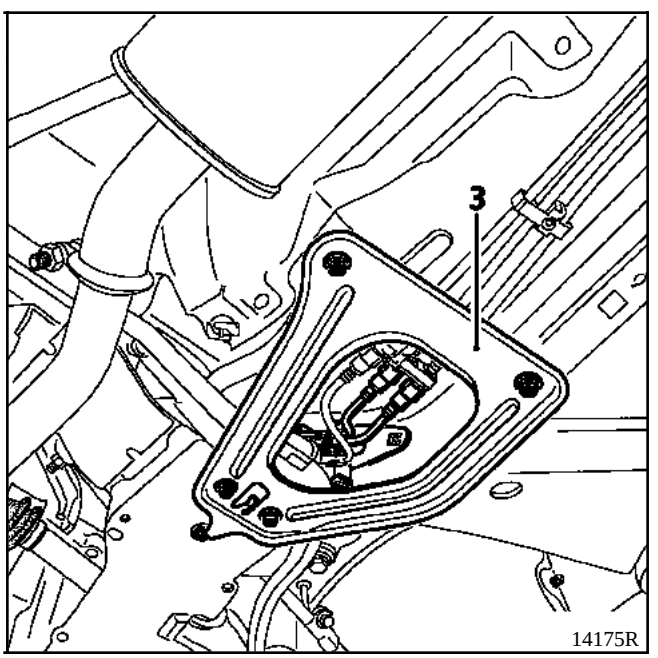
REMINDER: in this case, only qualified, trained personnel can carry out the operation.

- the lower ball joint and track rod end mountings,
- the sub-frame - body tie rods,
- the gear control, gearbox side,
- bolt (1) and slacken the engine tie bar bolt (2) without removing it,



13359R1

- the bumper lower mountings,
- the tie rod mountings (3),
- the sub-frame mounting bolts inserting threaded rods **Mot. 1233-01** as you go.



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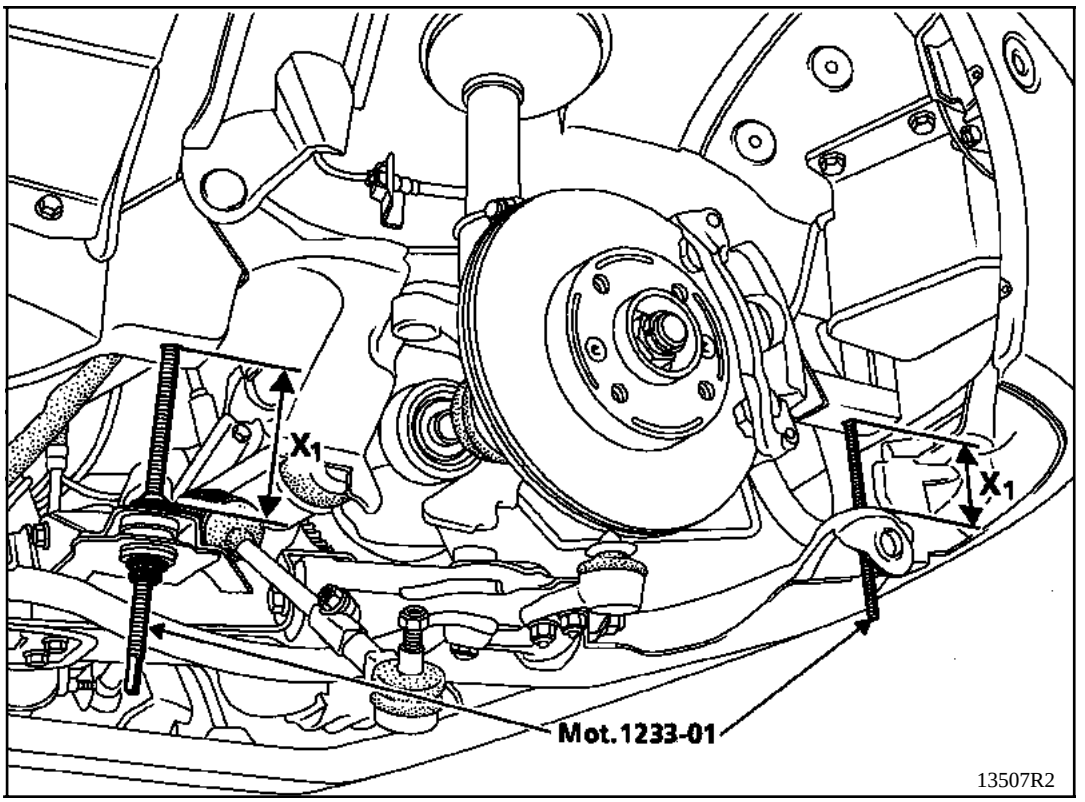
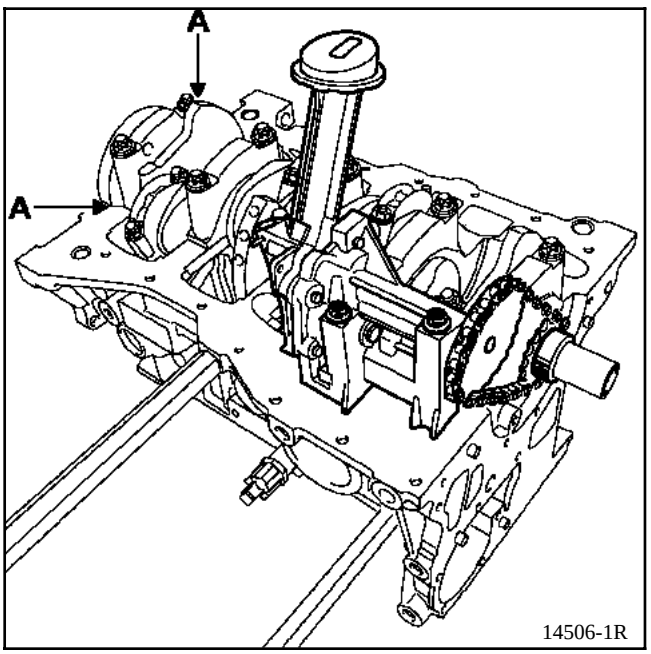
Gradually lower the sub-frame using threaded rods **Mot. 1233-01** until dimension X_1 **= 9 cm** is reached, approximately.

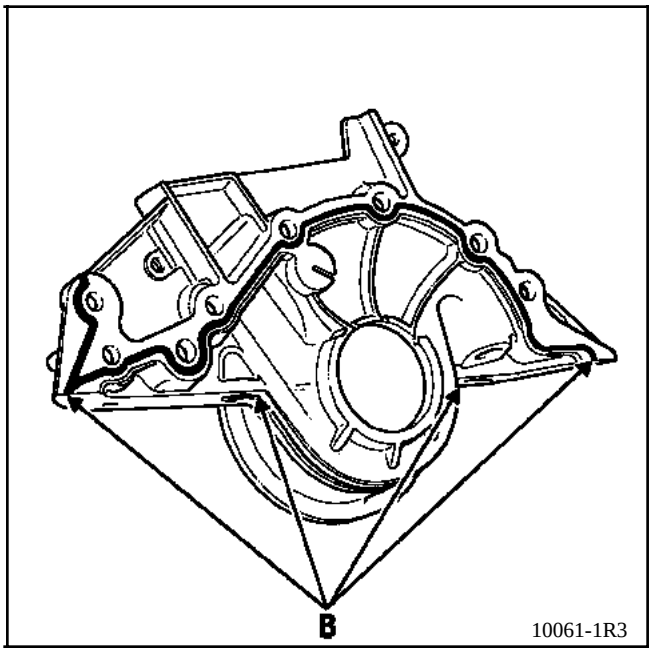


Remove:
- the wiring loom mounting on the sump,
- the sump.

REFITTING

Apply **RHODORSEAL 5661** at (A) on each side of bearing N° 1 and at (B) on the crankshaft closure cover.





Refit the sump using a new gasket and pretighten it to a torque of **0.8 daN.m,** then tighten in a spiral pattern to a torque of **1.4 daN.m**.

REMOVAL

Place the vehicle on a two post lift.

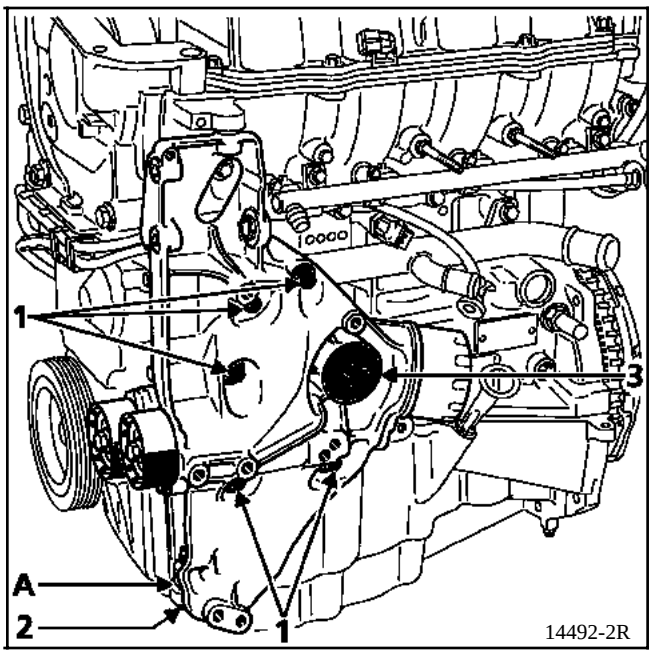
Disconnect the battery.

Remove:
- the left hand mud guard and the bumper,
- the alternator (see **section 16** "**Alternator**"),
- the air conditioning compressor mountings and attach it to the body,
- the wiring loom mounting on the multipurpose mounting and disconnect the pressostat connector on the PAS pump,
- the multipurpose mounting.

REFITTING

Refit the multipurpose mounting (check that it is touching the sump (at A) before tightening it) then torque tighten the bolts (see the table below).

Order of tightening	Tightening torque
1	**5.3 daN.m**
2	**2.1 daN.m**
3	**11 daN.m**



For refitting the accessories belt, refer to section **07** "**Accessories belt tension**".

Refitting is the reverse of removal

SPECIAL TOOLING REQUIRED		
Mot.	799 -01	Tool for immobilising sprockets for toothed timing belt
Mot.	1273	Tool for checking belt tension
Mot.	1368	Tool for tightening timing pulley
Mot.	1487	Tool for fitting inlet camshaft sealing plug
Mot.	1488	Tool for fitting exhaust camshaft sealing plug
Mot.	1489	Top Dead Centre pin
Mot.	1490	Tool for immobilising camshaft pulleys
Mot.	1496	Tool for setting camshafts

EQUIPMENT REQUIRED
Engine support tool Angular tightening wrench

TIGHTENING TORQUES (in daN.m and/or °)	
Wheel bolts	9
Pulley bolt	4.5
Crankshaft pulley bolt	2 + 135° ± 15°
Tension wheel nut	2.7
Mounting bolt on engine for front right suspended engine mounting cover	6.2
Mounting bolt for front right suspended engine mounting movement limiter	6.2

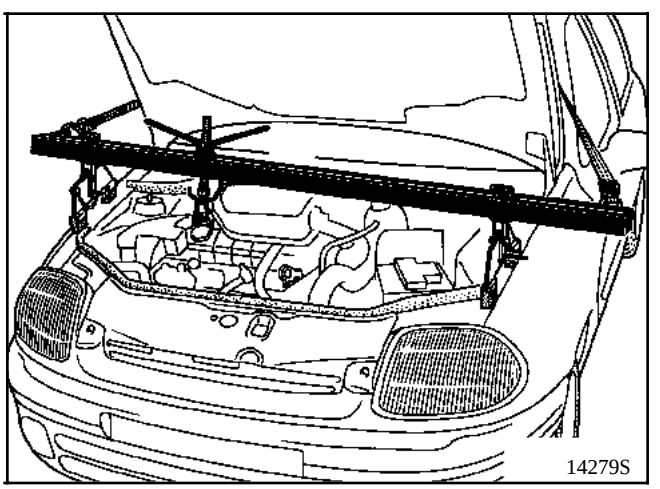
REMOVAL

Place the vehicle on a two post list.

Disconnect the battery.

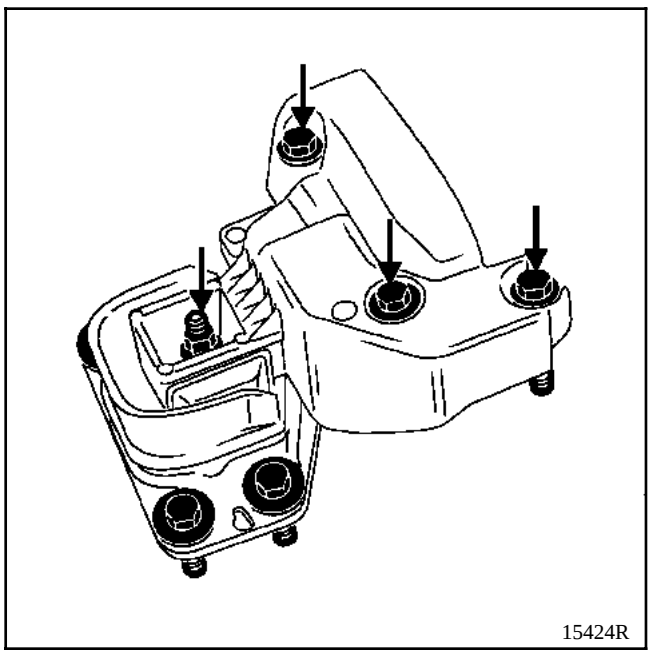
Remove the front right wheel and the wheel arch.

Fit the engine support tool.



NOTE: when carrying out this operation, ensure that the engine support tool pads are placed on the rigid part of the wings.

Remove:
- the suspended engine mounting cover and the movement limiter,

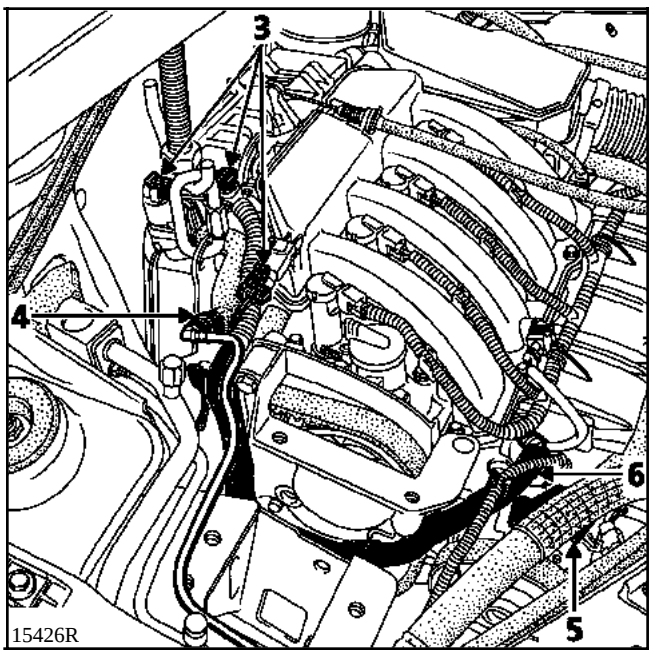


- the accessories belt (see section **07** "**Accessories belt tension**").

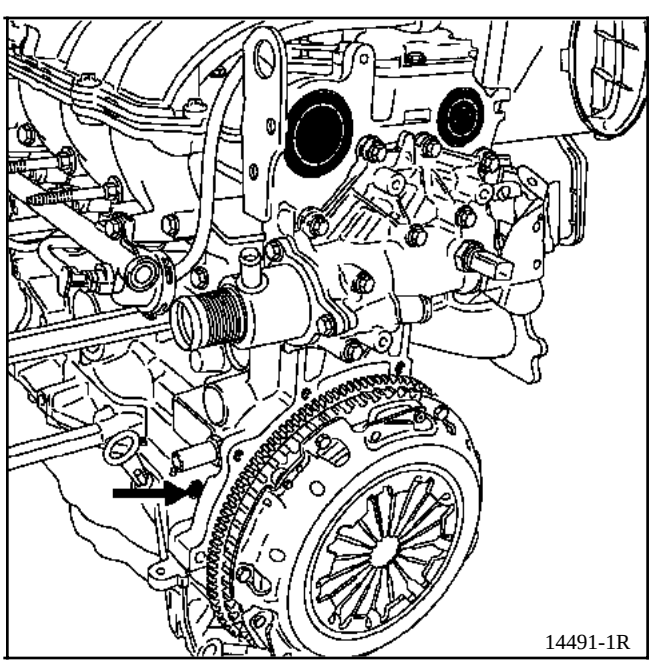
Disconnect the connectors (3) and the pipe (4).

Remove the bracket (5) and the wiring loom mounting bolt at (6).

Unclip:
- the wiring loom on the upper timing cover and move the assembly to one side,
- the fuel pipes on the lower timing cover.

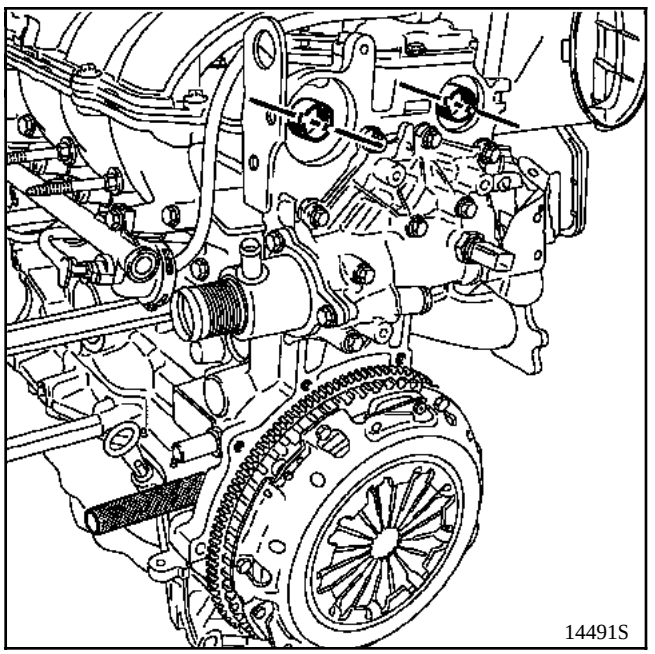


Remove:
- the air resonator,
- the camshaft sealing plugs by piercing the centre of the plug with a screwdriver,
- the **TDC** pin plug.

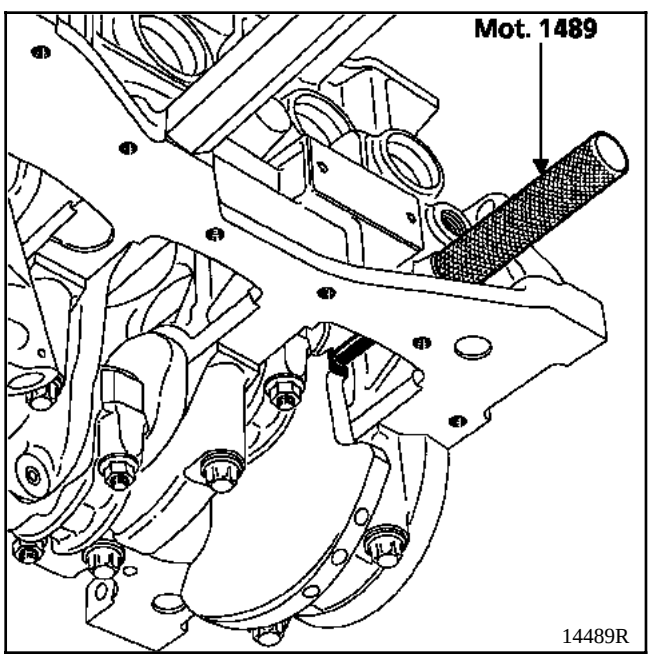


Setting the timing

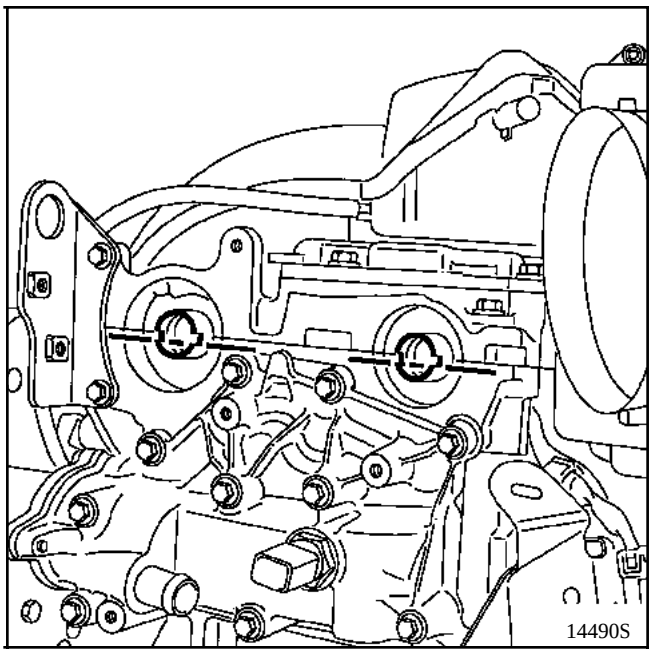
Position the camshaft grooves towards the bottom as indicated in the diagram below.



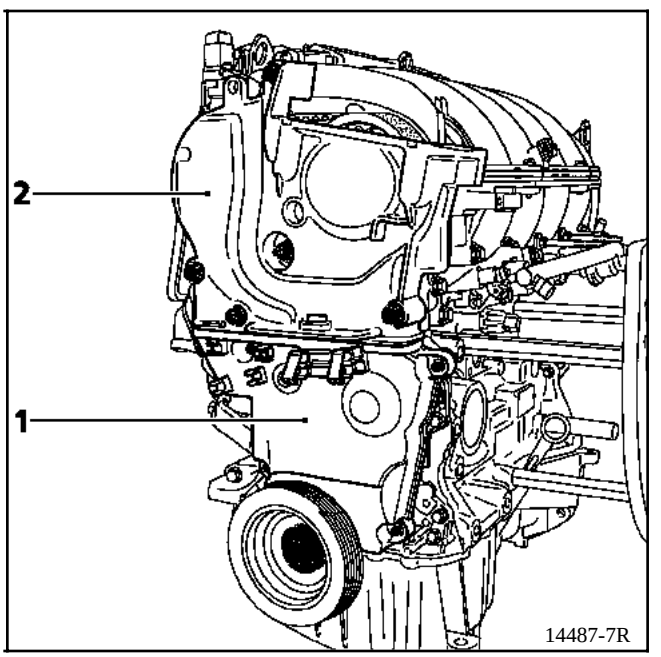
Insert the Top Dead Centre pin **Mot. 1489** then rotate the engine clockwise (timing side) to slowly and without jerky movements, bring the crankshaft into contact with the pin.



Check that the position of the camshaft grooves is identical to that in the diagram below.



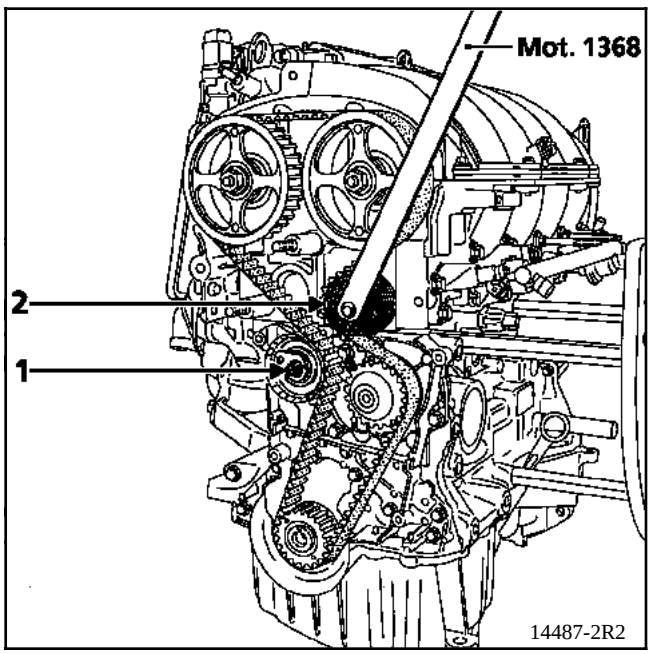
Remove:
- the crankshaft pulley by immobilising the flywheel using a screwdriver,
- the lower timing cover (1),
- the upper cover (2).



Slacken the timing belt by slackening the tension wheel nut (1).

NOTE: as the crankshaft sprocket is not keyed in place, ensure that it does not fall when the timing belt is being removed.

To remove the timing belt, remove the pulley (2) using **Mot. 1368**.

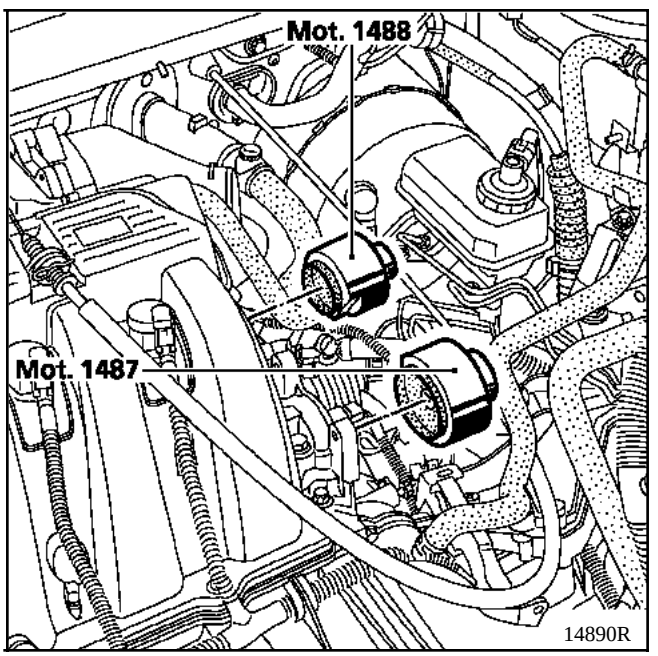


IMPORTANT: all oil must be removed from the head of the crankshaft and the timing sprocket bore and the pressure surfaces of the crankshaft pulley to prevent slip between the timing and the crankshaft which could cause damage to the engine.

REFITTING

When changing the timing belt, the tension wheels and the timing pulley must be changed.

Refit:
- the timing belt (the method described in section **07** "**Procedure for tensioning the timing belt**" MUST be observed),
- the accessories belt (see section **07** "**Procedure for tensioning the accessories belt**),
- the new sealing plugs :
  - for the inlet camshaft **(Mot. 1487)**,
  - for the exhaust camshaft **(Mot. 1488)**,



- the right hand suspended engine mounting and the engine tie bar, tightening them to the recommended torque (see section **19** "**Suspended engine mounting**").

SPECIAL TOOLING REQUIRED	
Mot. 799 -01	Tool for immobilising sprockets for toothed timing belt
Mot. 1202	Hose clip pliers
Mot. 1273	Tool for checking belt tension
Mot. 1311 -06	Tool for removing the fuel pipe
Mot. 1368	Tool for tightening timing pulley
Mot. 1448	Hose clip pliers with extension
Mot. 1487	Tool for fitting inlet camshaft sealing plug
Mot. 1488	Tool for fitting exhaust camshaft sealing plug
Mot. 1489	Top Dead Centre pin
Mot. 1490	Tool for immobilising camshaft pulleys
Mot. 1491	Tool for fitting camshaft seals
Mot. 1496	Tool for setting camshafts

EQUIPMENT REQUIRED
Engine support tool
Angular tightening wrench

TIGHTENING TORQUES (in daN.m and/or °)	
Wheel bolts	9
Pulley bolt	4.5
Accessories pulley bolt	2 + 135° ± 15°
Tension wheel nut	2.7
Camshaft pulley nuts	3 + 84°
Cylinder head cover bolts	1.2
Oil decanter bolt	1.3

REMOVAL

Place the vehicle on a two post lift.

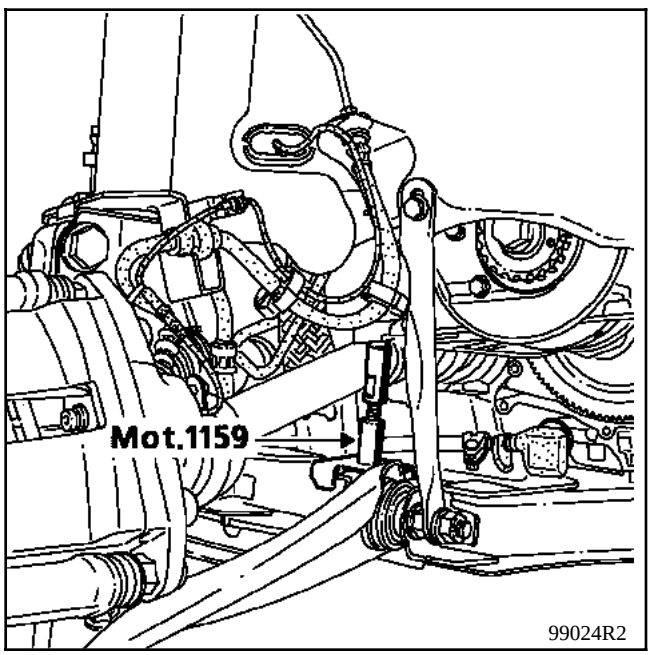
Disconnect the battery.

Remove the undertray below the left hand side of the engine.

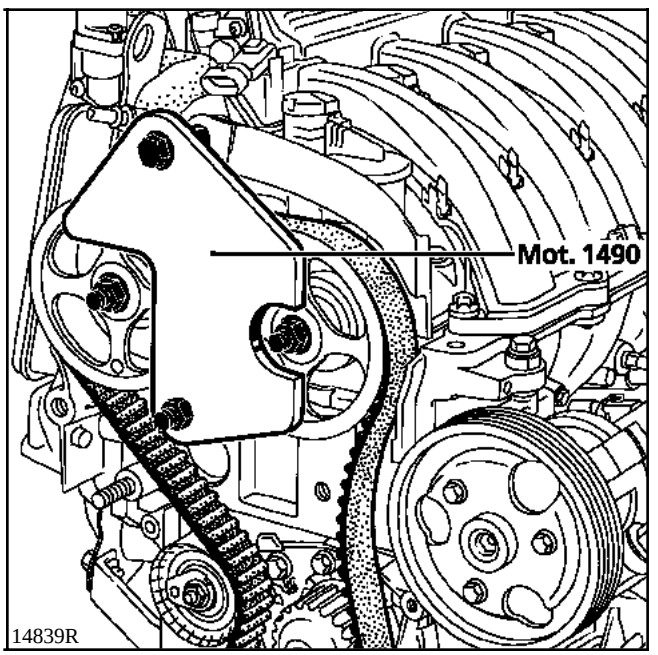
Drain the cooling circuit (via the lower radiator hose).

Remove the timing belt (see the method described in section **11** "**Timing belt**").

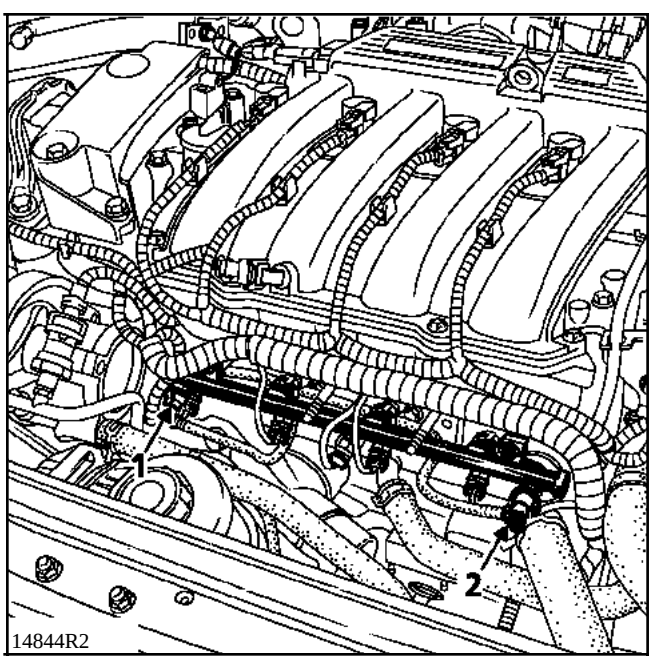
Fit **Mot. 1159** between the sub-frame and the cylinder block then remove the engine support tool.



Remove:
- the accelerator cable,
- the injector gallery protector,
- the camshaft pulleys using **Mot. 1490** (use the timing cover mountings to secure **Mot. 1490**),

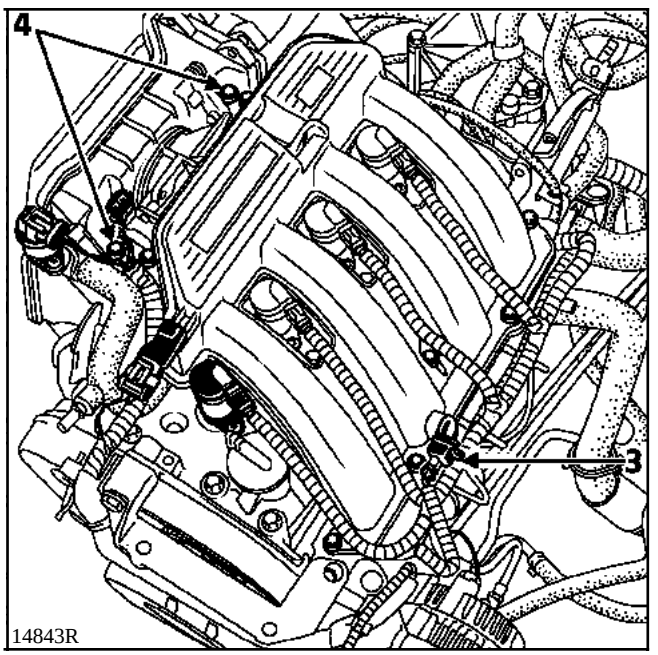


- the fuel supply and return pipes (1) and (2) using **Mot. 1311-06 and** move them to one side.

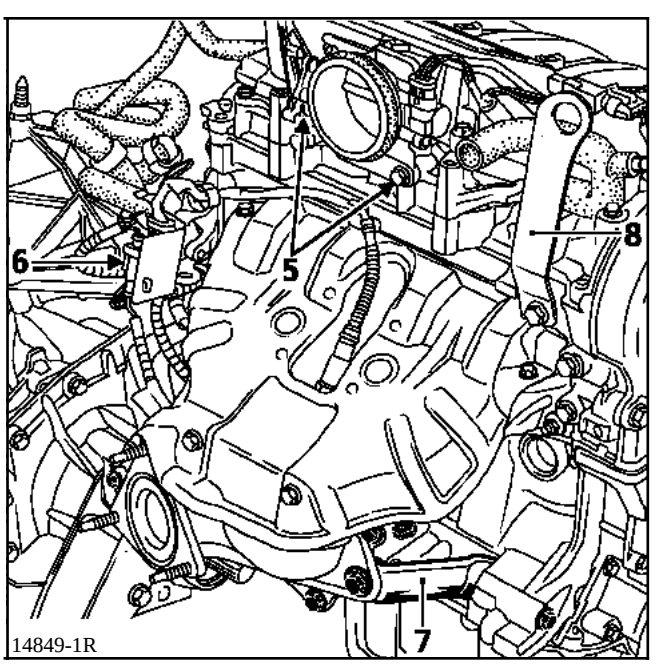


Disconnect connector (3) and the coil and injector connectors.

Remove:
- the air unit (4) (to do this remove the expansion bottle mountings and move it to one side),

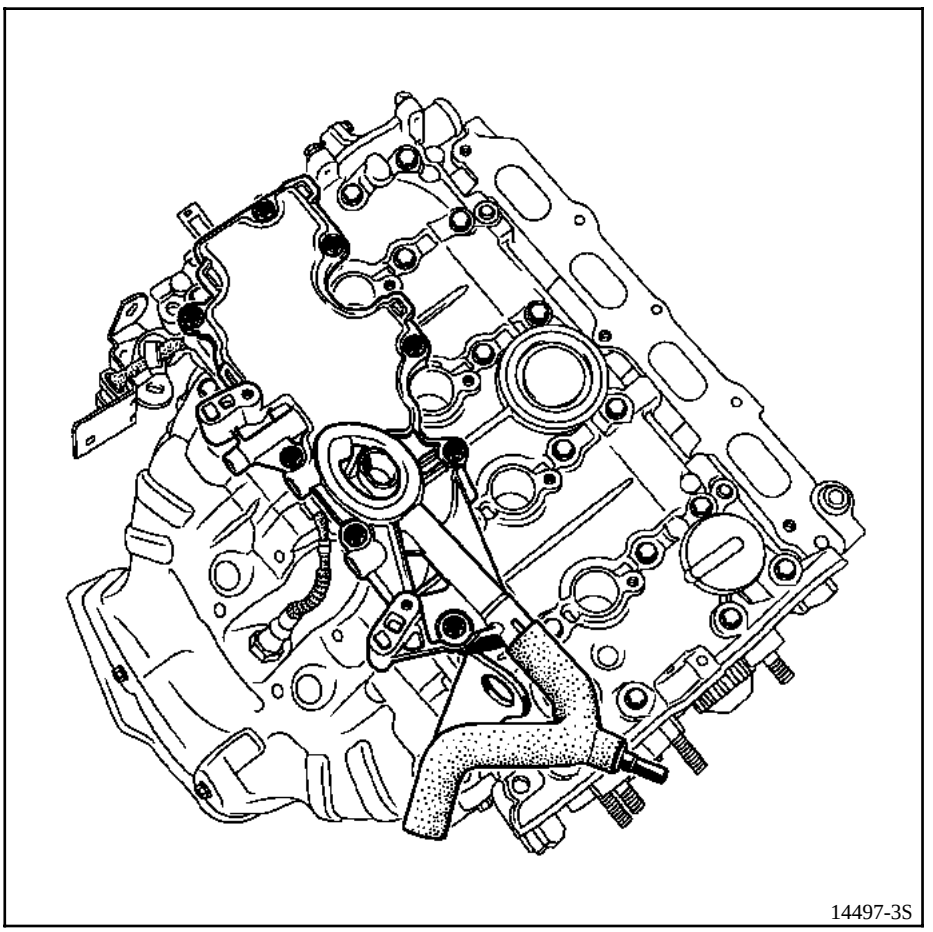


- the catalytic converter mountings, detach it from the exhaust manifold and attach it to the exhaust pipe,
- the throttle body (5),
- the oxygen sensor connector (6),
- the strut (7) and the lifting bracket (8),

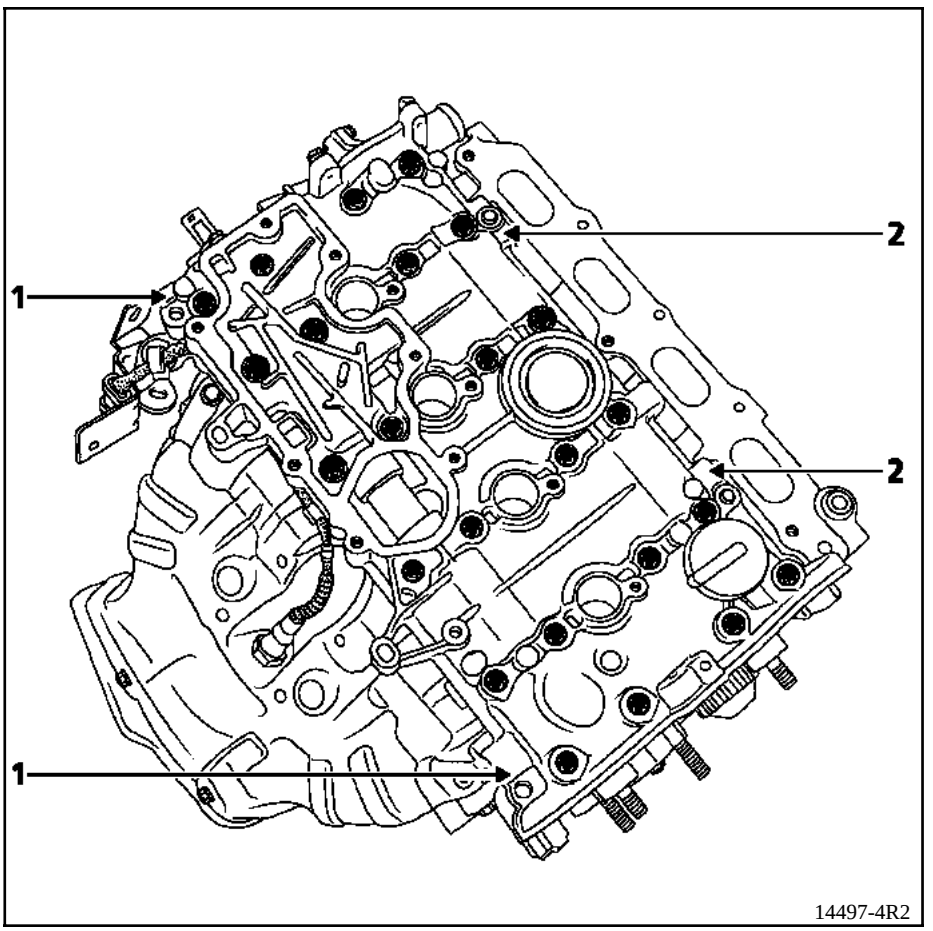


- the brake servo vacuum pipe,

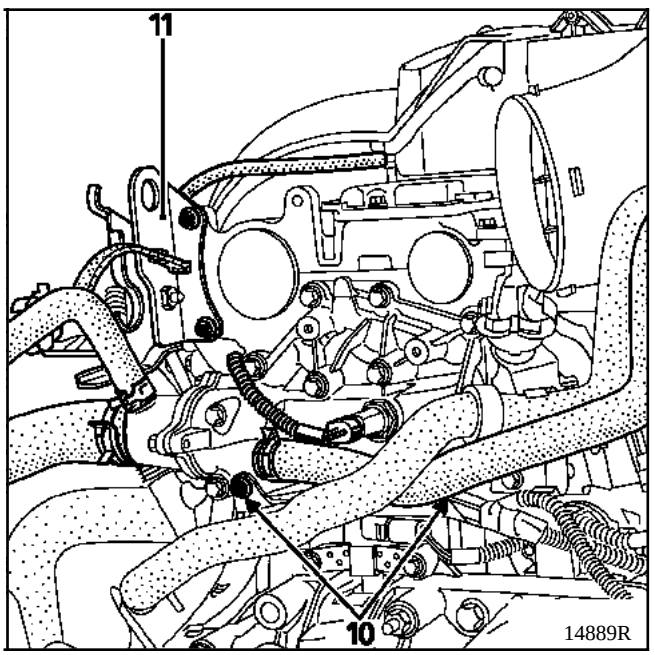
- the air distributor,
- the coils,
- the oil decanter,



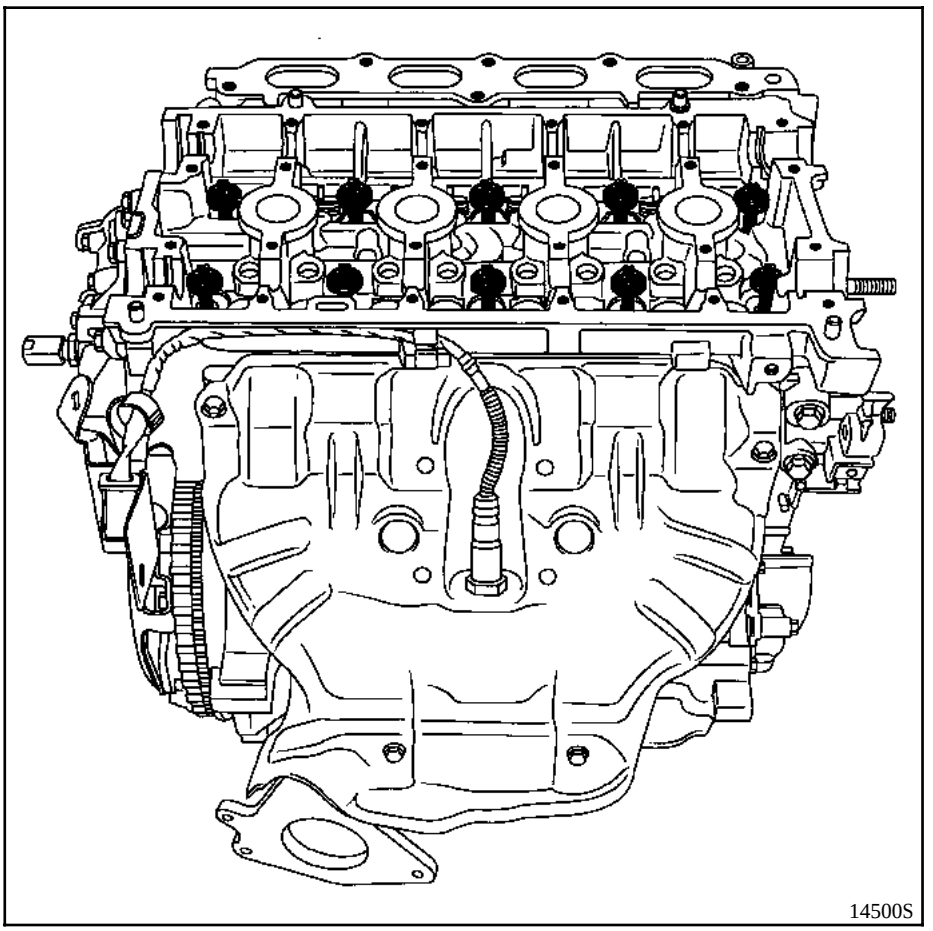
- the cylinder head cover bolts then loosen it vertically by tapping on the "**lugs**" at (1) using a copper hammer and lever it using a screwdriver at (2) (cover the screwdriver to prevent damage to the aluminium surfaces),



- the camshafts and the valve rockers,
- the hoses on the cylinder head coolant outlet and the coolant temperature sensor connector,
- the wiring loom mountings at (10),
- the lifting bracket (11),



- the cylinder head.



CLEANING

It is very important not to scratch the gasket faces of the aluminium components.

Use the **Décapjoint** product to dissolve any part of the gasket which remains attached.

Gloves should be worn during this operation.

Remember that this operation should be carried out with extreme care to avoid the risk of foreign bodies being introduced into the oilways bringing oil under pressure to the rocker shaft (oilways are located in both the cylinder head and the cylinder block).

CHECKING THE GASKET FACE

Use a straight edge and a set of shims to check for gasket face deformation.

Maximum bow **0.05 mm.**

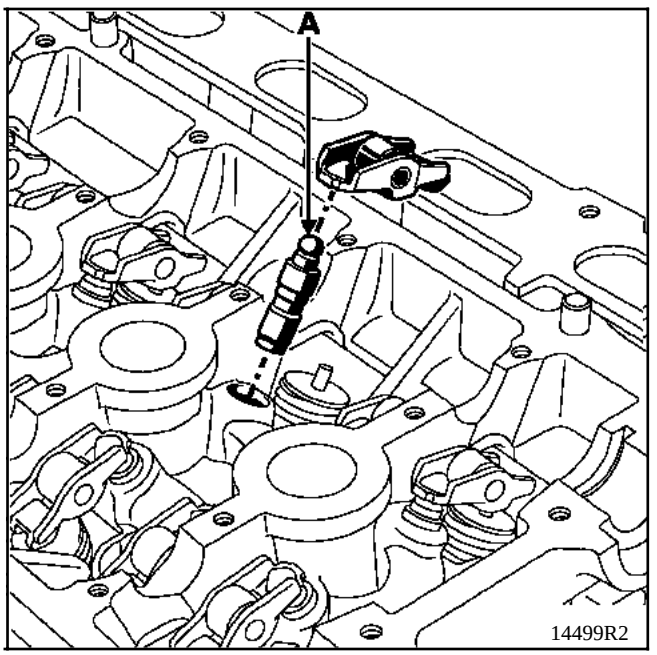
The cylinder head may not be re-ground.

Check the cylinder head to see if there are any cracks.

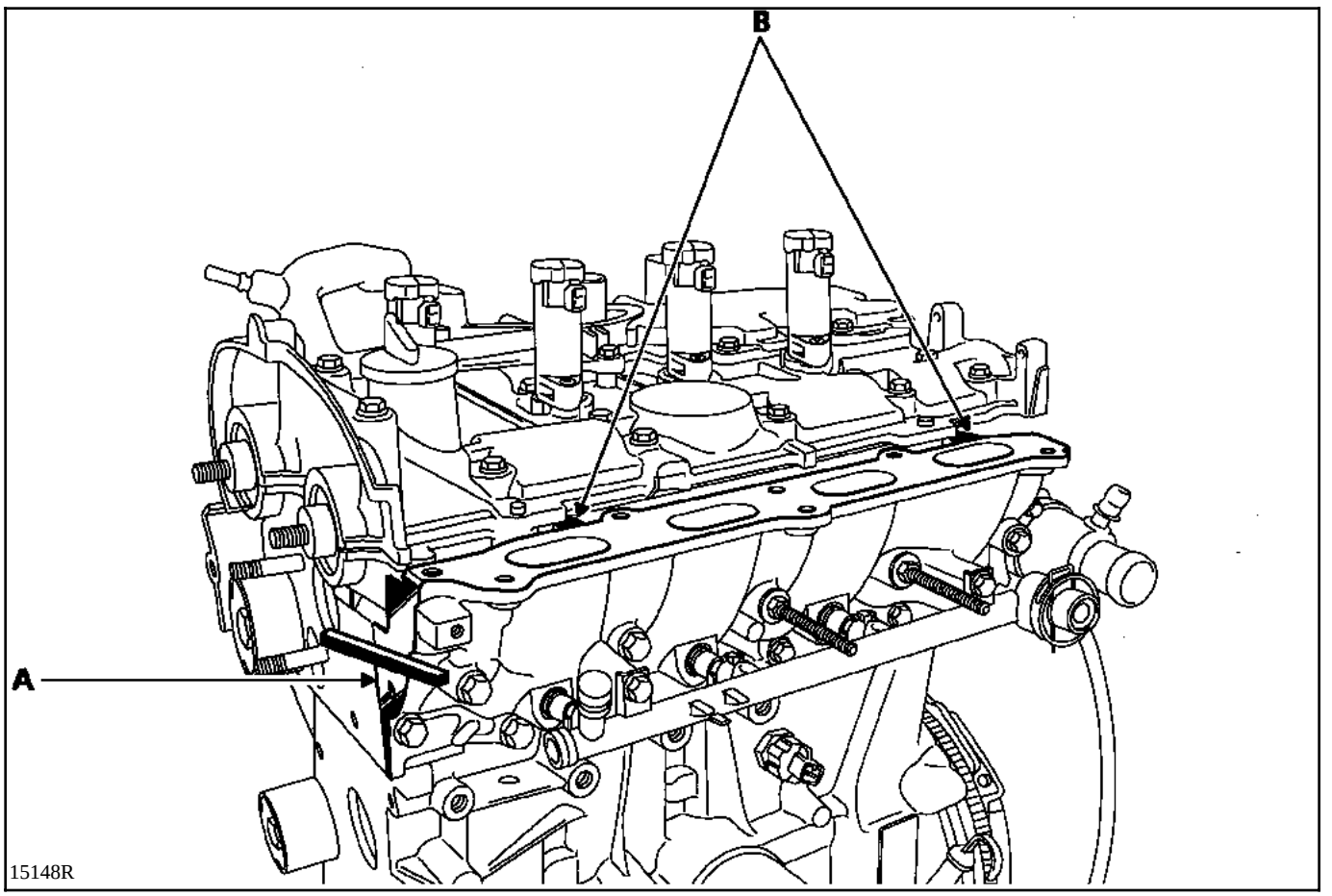
REFITTING

When removing - refitting the cylinder head, please observe the following points :

- **After a certain time, the hydraulic tappets will drain and must be reprimed.**
  To check whether they need to be reprimed, press on the top of the stop at (A) with a thumb. If the stop piston goes down, immerse it in a container of diesel, then refit them.



- **Check :**
  - **that the exhaust heat shield is correctly positioned between the oxygen sensor and the manifold (to prevent a chimney effect which could destroy the upstream sensor connections),**
  - **the alignment (A) between the lower inlet distributor unit and the cylinder head (timing side), ensuring that the tabs (B) are in contact with those on the cylinder head cover**

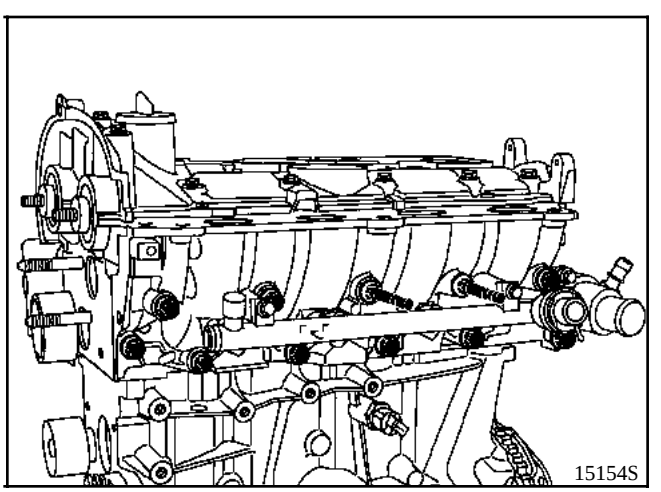


The lower inlet distributor is tightened to a torque of **2.1 daN.m**.

Set the pistons at half height to prevent contact with the valves when refitting the camshafts.

Fit the cylinder head gasket then the cylinder head.

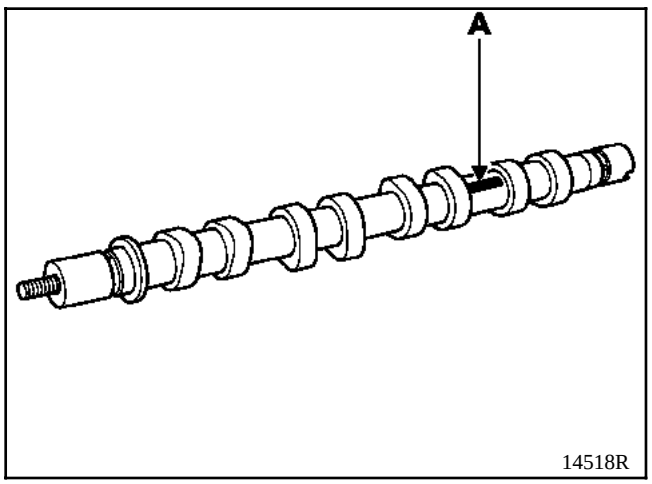
Check the bolts then tighten the cylinder head (see section 07 "Tightening the cylinder head").



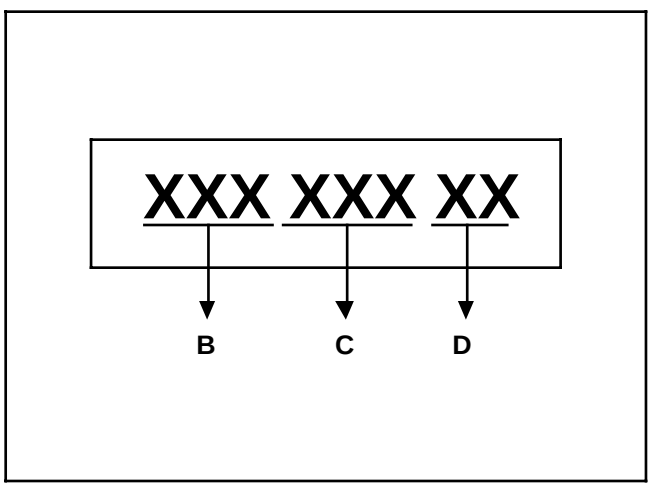
Refit:
- the valve rockers,
- the camshafts after oiling the bearings.

IMPORTANT: do not put oil on the cylinder head cover gasket face.

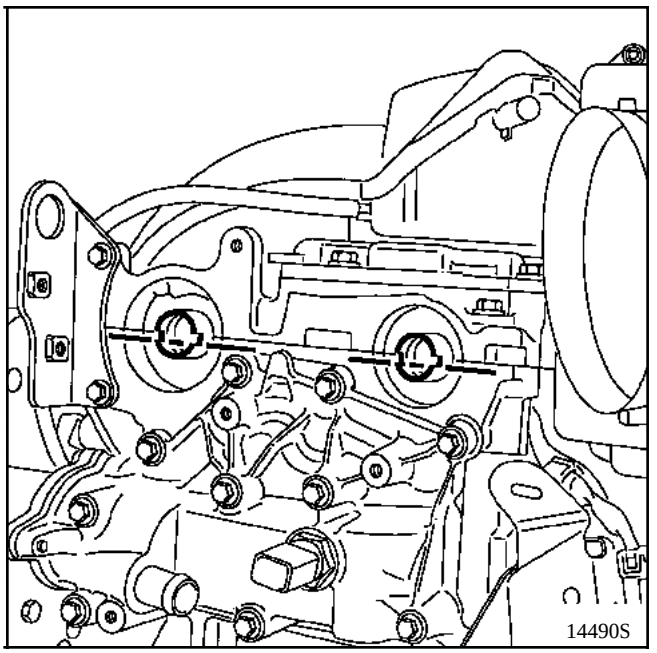
NOTE: the camshafts can be identified by mark (A).



Details of marking:
- marks (B) and (C) are for the supplier only,
- mark (D) is for identifying the camshafts:
  AM = Inlet
  EM = Exhaust

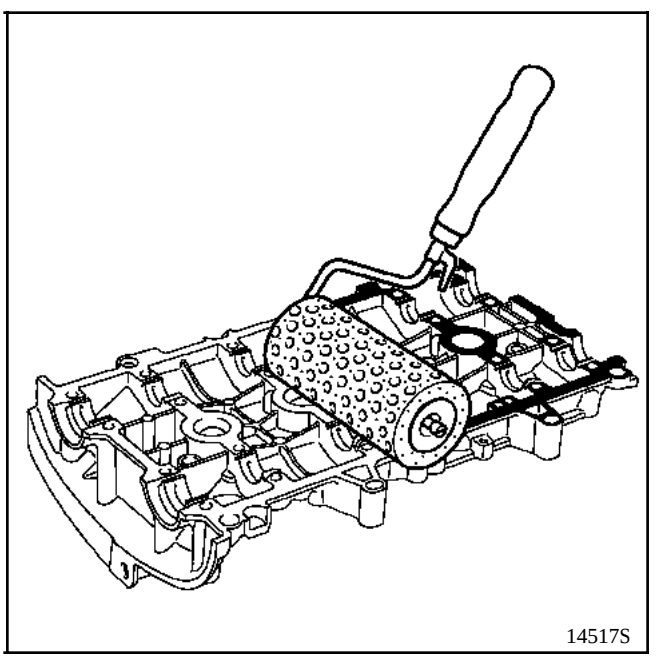


Position the camshaft grooves as indicated in the diagram below.



NOTE : the gasket faces must be clean, dry and free of grease (avoid finger marks).

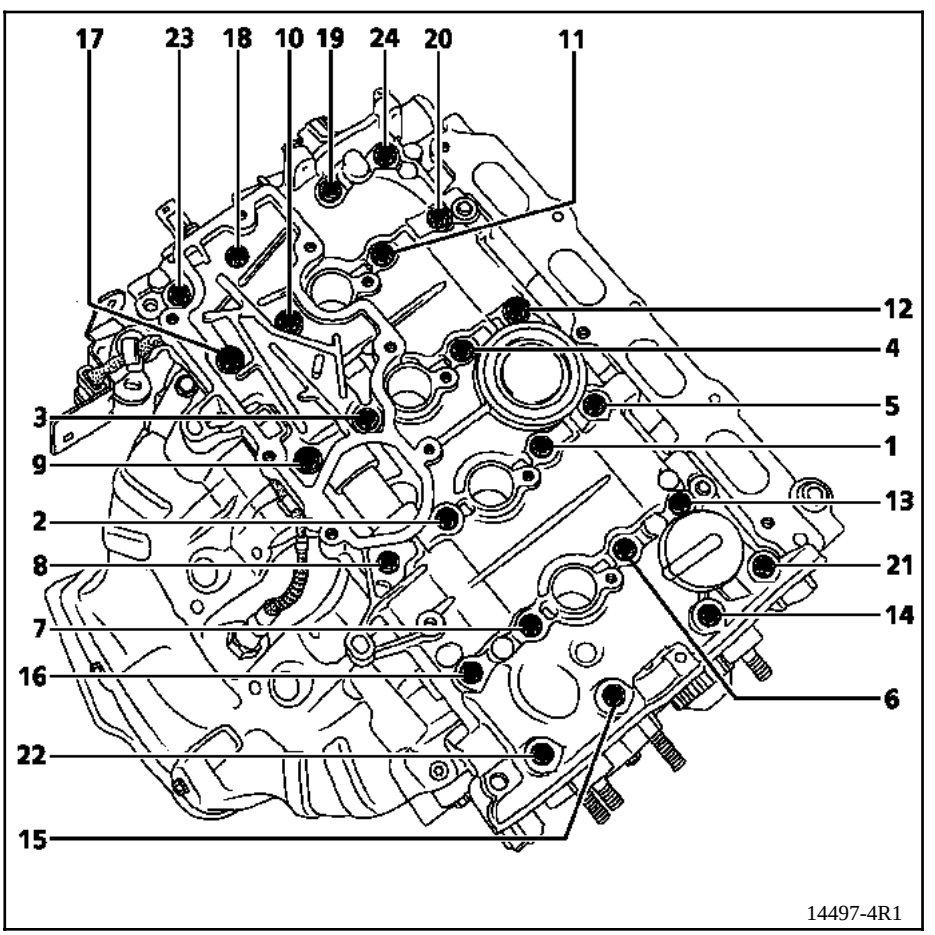
Use a roller to apply **Loctite 518** to the gasket face of the cylinder head cover until it is **reddish** in colour.



Refit the cylinder head cover and torque tighten it.

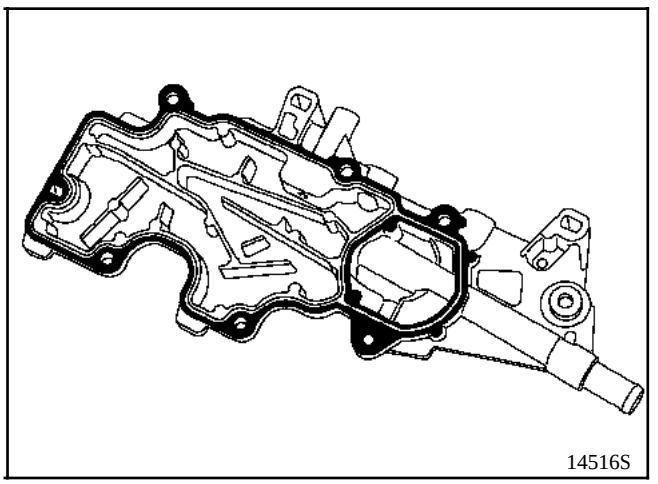
Tightening method

Fitting	Bolt tightening order	Bolt slackening order	Tightening torque (in daN.m)
Operation n° 1	22-23-20-13	-	0.8
Operation n° 2	1 to 12 14 to 19 21 and 24	-	1.2
Operation n° 3	-	22-23-20-13	-
Operation n° 4	22-23-20-13	-	1.2

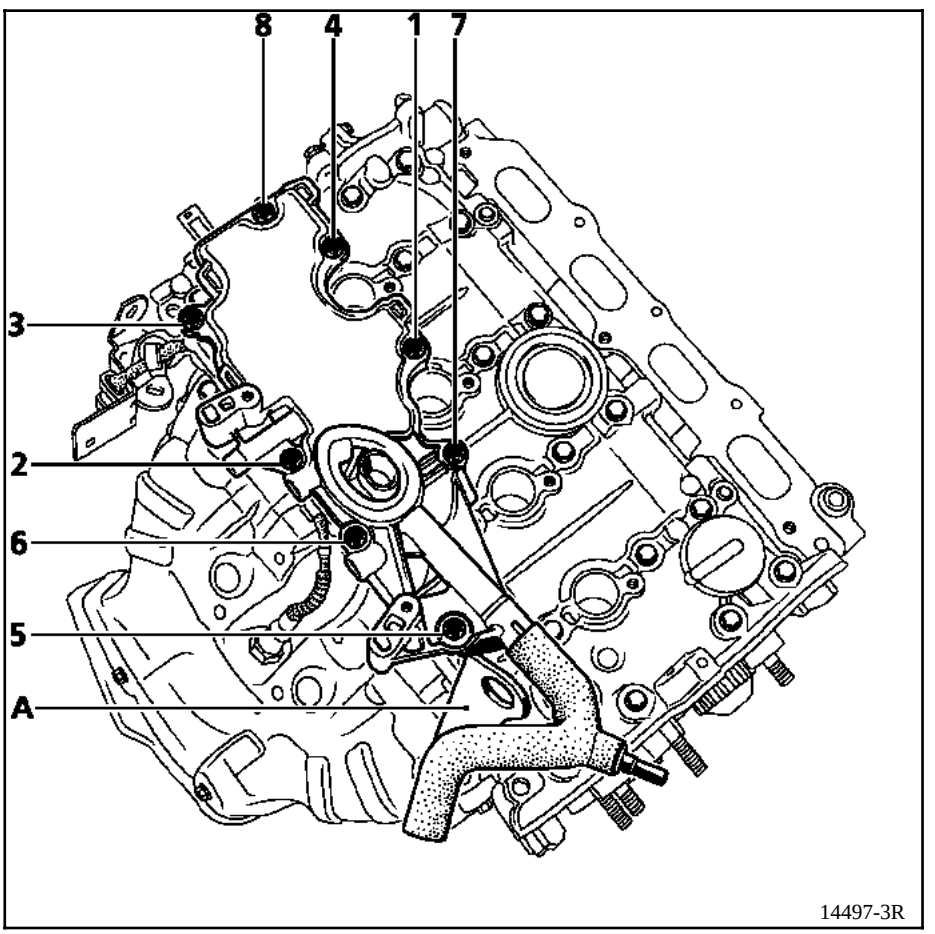


NOTE : the gasket faces must be clean, dry and free of grease (avoid finger marks).

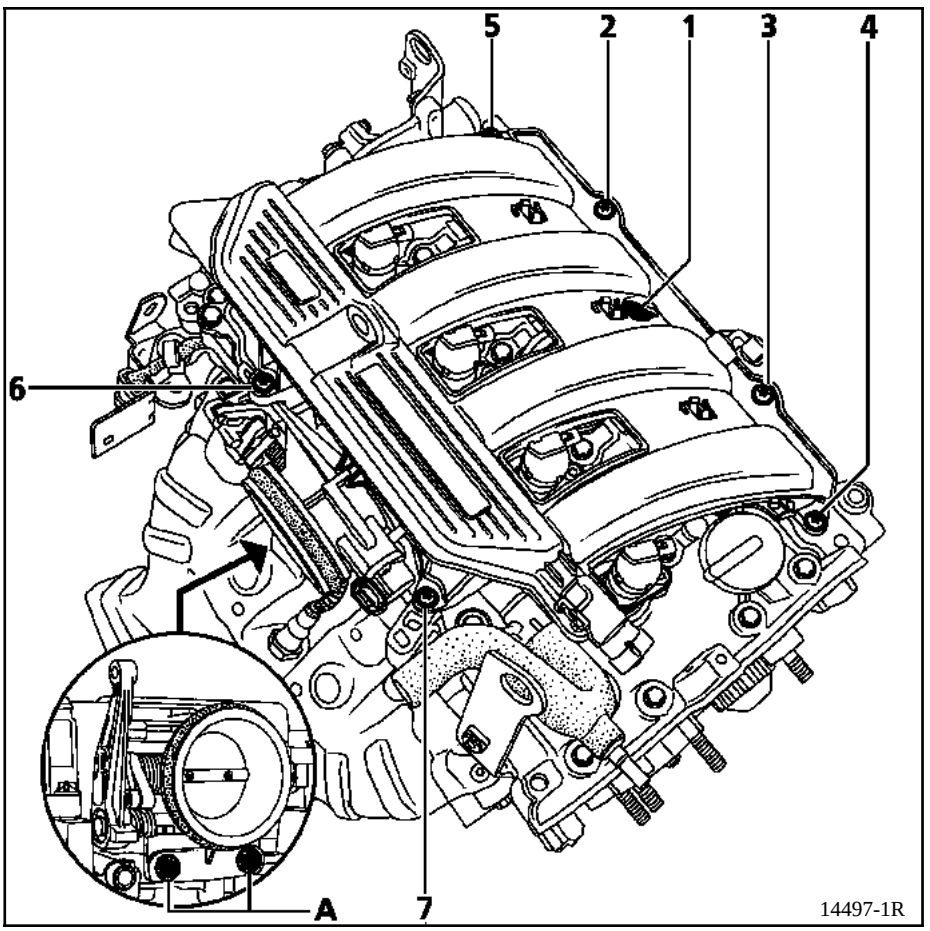
Use a roller to apply **Loctite 518** to the gasket face of the oil decanter until it is **reddish** in colour.



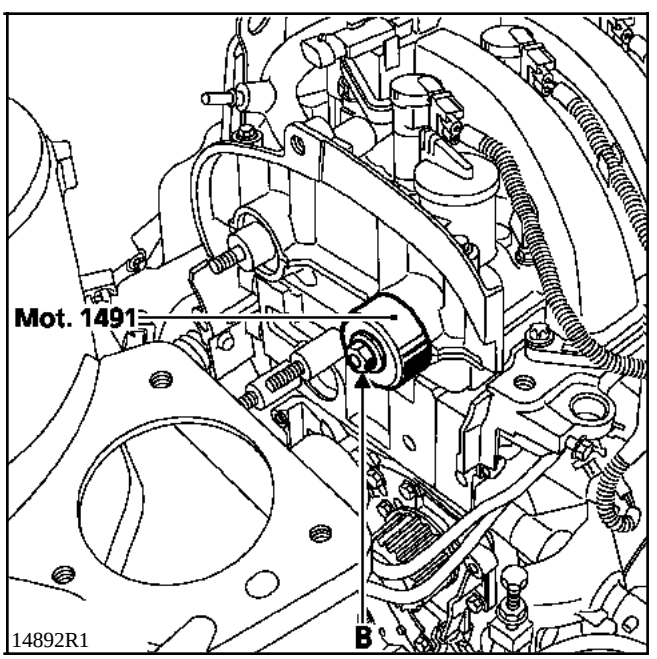
Refit the oil decanter and tighten it to a torque of **1.3 daN.m** in the recommended order.



Refit:
- the coils, tightening them to a torque of **1.3 daN.m,**
- the inlet distributor (fitted with new seals), tightening it to a torque of **0.9 daN.m** and in the recommended order,



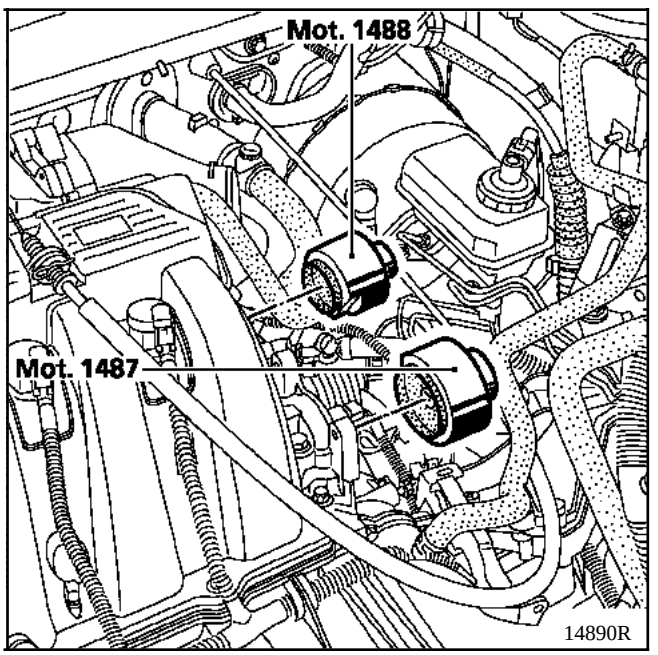
- the throttle body, tightening the bolts (A) to a torque of **1.3 daN.m**,
- the air filter unit, tightening the bolts to a torque of **0.9 daN.m**,
- the camshaft seals using **Mot. 1491** (use the old nuts (B)).



Setting the timing

IMPORTANT:all oil must be removed from the crankshaft, the timing sprocket bore, the pressure surfaces of the crankshaft pulley, the ends of the camshafts (timing end) and the camshaft sprocket bores to prevent slip between the timing, the crankshaft and the camshaft pulleys which could cause damage to the engine.

Refit:
- the timing belt (the method described in section **07** "**Procedure for tensioning the timing belt**" MUST be observed),
- the accessories belt (see section **07** "**Accessories belt**"),
- the new sealing plugs :
  - for the inlet camshaft **(Mot. 1487)**,
  - for the exhaust camshaft **(Mot. 1488)**,



- the right hand suspended engine mounting and the engine tie bar, tightening them to the recommended torque (see section **19** "**Suspended engine mounting**").

Refitting is the reverse of removal.

Fill and bleed the cooling circuit (see section **19** "**Filling - Bleeding**").

Vehicle	Gear-box	Engine								Injection type
		Type	Suffix	Bore (mm)	Stroke (mm)	Capacity (cm^3)	Ratio	Catalytic converter	Depollution standard	
CB0H CB0T	JB3	K4M	748	79.5	80.5	1598	10 / 1	◊ C75 ◊ C79	EU 96	Sequential multipoint Static ignition

Temperature in °C	0	20	40	80	90
CTN type air sensor CTN type resistance in Ohms	5290 to 6490	2400 to 2600	1070 to 1270	-	-
CTN type coolant sensor CTN type resistance in Ohms	-	3060 to 4045	1315 to 1600	300 to 370	210 to 270

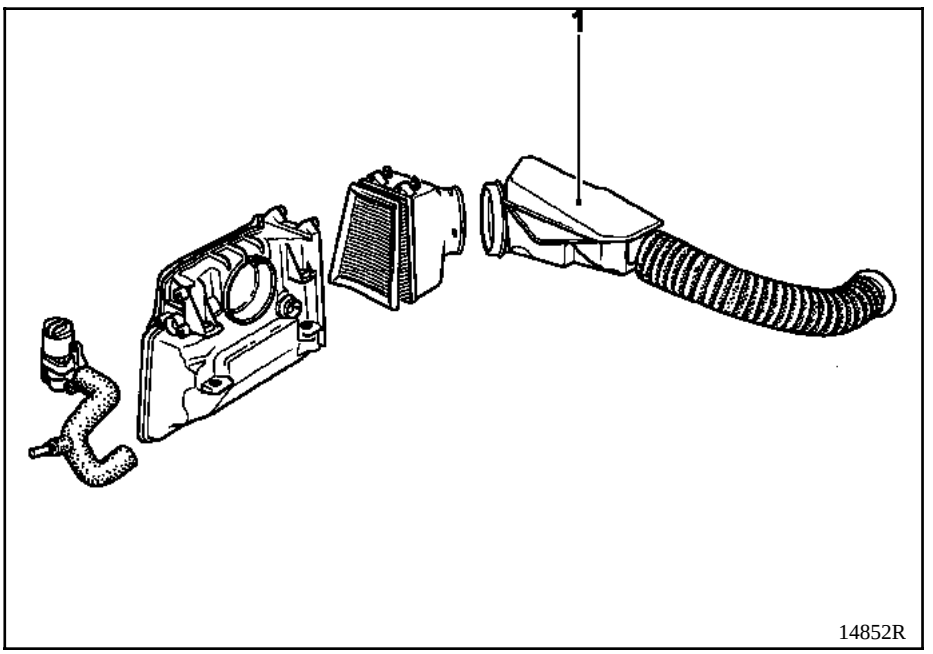
Checks made at idle speed*					Fuel*** (Minimum octane rating)
Speed (rpm)	Emission of pollutants**				
	CO (%) (1)	C02 (%)	HC (ppm)	Oxygen (λ)	
750 ± 50	0.5 maximum	14.5 minimum	100 maximum	$0.97 < \lambda < 1.03$	Super unleaded (OR 95)

(1) at 2500 rpm, the CO should be 0.3 maximum
* For a coolant temperature greater than **80 °C** and after the engine has been stabilised at **2 500 rpm** for approximately **30 seconds**.
** For the legislative values, refer to the specifications for individual countries.
*** Compatible with **OR 91** unleaded fuel.

<table>
<tr><th>DESCRIPTION</th><th>MAKE/TYPE</th><th>SPECIAL NOTES</th></tr>
<tr><td>Computer</td><td>SIEMENS "SIRIUS"</td><td>90 tracks</td></tr>
<tr><td>Injection</td><td>-</td><td>Sequential multipoint</td></tr>
<tr><td>Ignition</td><td>-</td><td>Static with four coils</td></tr>
<tr><td>Stepping motor + support</td><td>MAGNETI MARELLI</td><td>Resistance : 53 ± 5 Ω at ambient temperature</td></tr>
<tr><td>Throttle potentiometer</td><td>CTS</td><td>Integrated in the throttle body
Track resistance: 1 200 ± 240 Ω
Slide contact resistance < 1 050 Ω
<table>
<tr><th>Track</th><th>No load</th><th>Full load</th></tr>
<tr><td>A - B
A - C
B - C</td><td>1 250 Ω
1 245 Ω
2 230 Ω</td><td>1 250 Ω
2 230 Ω
1 245 Ω</td></tr>
</table></td></tr>
<tr><td>Magnetic sensor
(TDC and engine speed)</td><td>ELECTRIFIL
or
SIEMENS</td><td>Integrated connector
Resistance = 200 to 270 Ω</td></tr>
<tr><td>Canister solenoid valve</td><td>SAGEM</td><td>Integrated in the canister
Resistance : 26 ± 4 Ω at 23 °C</td></tr>
<tr><td>Injector</td><td>WEBER</td><td>Resistance : 14.5 Ω
rate of flow: 0.7 cm³ / min maximum</td></tr>
<tr><td>Fault finding</td><td>NXR fault finding tool</td><td></td></tr>
<tr><td>Air sensor</td><td>JAEGER</td><td>CTN (see table)
Resistance : 2 500 Ω at 20 °C</td></tr>
<tr><td>Coolant sensor</td><td>JAEGER</td><td>CTN (see table)
Resistance : 3 500 Ω at 20 °C</td></tr>
<tr><td>Pressure sensor</td><td>DELCO ELECTRONICS</td><td>Piezo electric type
Change the seal whenever this is removed</td></tr>
<tr><td>Pinking sensor</td><td>SAGEM</td><td>Piezo electric type
Tightening torque: 2 daN.m</td></tr>
<tr><td>Upstream oxygen sensor</td><td>BOSCH</td><td>Tracks 80 (earth) and 45 (computer signal)
Heating resistance
R = 9 Ω at ambient temperature
Rich mixture = 840 mV ± 70
Lean mixture = 20 mV ± 50</td></tr>
<tr><td>Downstream oxygen sensor</td><td>BOSCH</td><td>Tracks 76 (earth) and 44 (computer signal)
Heating resistance
R = 3.4 Ω at ambient temperature
Full load voltage = 840 mV ± 70
Voltage under deceleration = 20 mV ± 50</td></tr>
</table>

DESCRIPTION	MAKE/TYPE	SPECIAL NOTES
Ignition coil	NIPPONDENSO	Pencil-type coil. One per cylinder. Primary resistance: **0.5 Ω ± 0.02** Secondary resistance: **7 500 Ω ± 1 100**
Plugs	BOSCH RFC 50L2ZE	**6 kΩ ± 1.5** Tightening: **2.5 ± 5 daN.m**
Inlet manifold pressure	-	At idle speed: **320 ± 40 mb**
Exhaust counter pressure	-	before pre-catalytic converter / after pre-cat. converter 1 500 rpm: 30 / 23 3 000 rpm: 108 / 84 4 500 rpm: 211 / 153 5 500 rpm: 321 / 266
Submerged fuel pump	WALBRO	Pressure: **3 bars ± 0.2** at **80 l/h**
Pressure regulator	-	Regulated pressure Under zero vacuum: **3 ± 0.2 bars** Under vacuum of **500 mbars : 2.5 ± 0.2 bars**
Fuel filter	-	Fixed to the front of the fuel tank

The inlet circuit is equipped with an air resonator (1) allowing certain pressure waves to be absorbed and inlet noise to be reduced.



TIGHTENING TORQUE (in daN.m)	
Air filter unit bolt	**0.9**

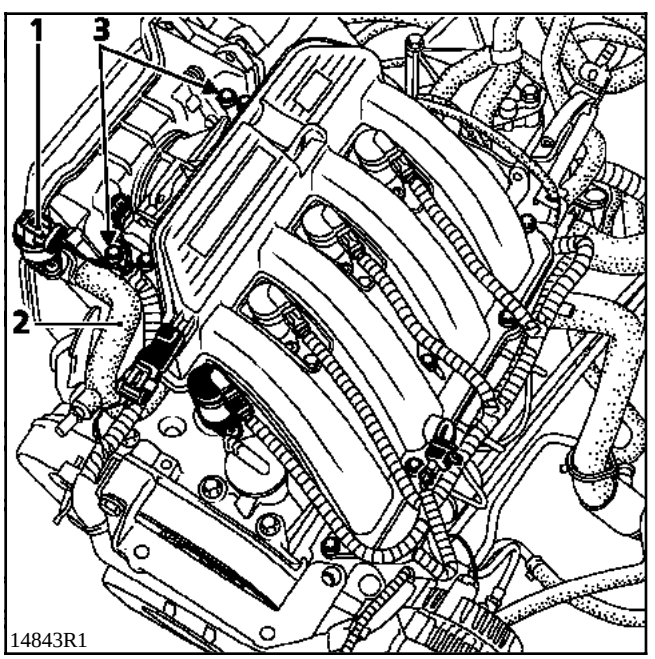
REMOVAL

Disconnect:

- the battery,
- the brake servo vacuum pipe (manifold side),
- the actuator (1),
- the fuel vapour rebreathing pipe (2).

Loosen the coolant reservoir, but do not remove it.

Remove:
- the air resonator,
- the air filter unit mounting bolts (3).



Move the air unit to the right to remove it. The air unit may go between the windscreen aperture, the engine and the brake servo.

REFITTING

Refitting is the reverse of removal.

NOTE: be careful of the vacuum outlet from the exhaust manifold to the brake servo. The inlet manifold will have to be changed if this outlet is broken.

TIGHTENING TORQUES (in daN.m)	
Throttle body	**1.3**
Air filter unit	**0.9**

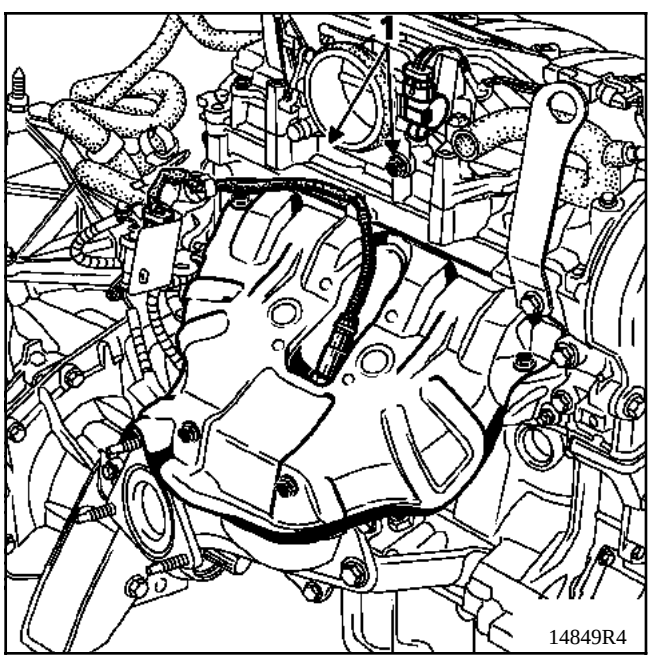
REMOVING THE THROTTLE BODY

Disconnect the battery.

Remove the air filter unit (see section **12** Fuel mixture "**Air filter unit**").

Disconnect :
- the accelerator cable,
- the throttle potentiometer.

Remove the two throttle body mounting bolts (1).



REFITTING

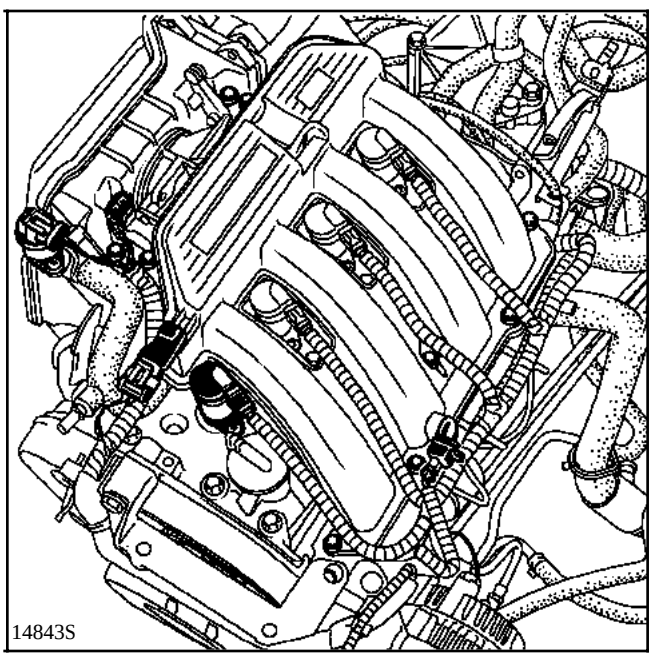
Refitting is the reverse of removal.

Change the seal each time the throttle body is removed.

Use lubricant if necessary to make it easier to fit.

REMOVING THE IDLE ACTUATOR

Remove:
- the stepping motor connector,
- the gas circulation pipe,
- the three mounting bolts.



Refitting is the reverse of removal. Observe the tightening torques for the three mounting bolts. Ensure that the O-ring seal is in good condition and that it is correctly fitted.

TIGHTENING TORQUES (in daN.m)	
Manifold bolt	**1**
Air filter unit bolt	**0.9**
Throttle body bolt	**1.5**

REMOVAL

Disconnect the battery.

Remove the air filter unit (see section **12** Fuel mixture "**Air filter unit**").

Disconnect:
- the throttle potentiometer,
- the pressure sensor,
- the pencil-type coils,
- the air temperature sensor,
- the accelerator cable.

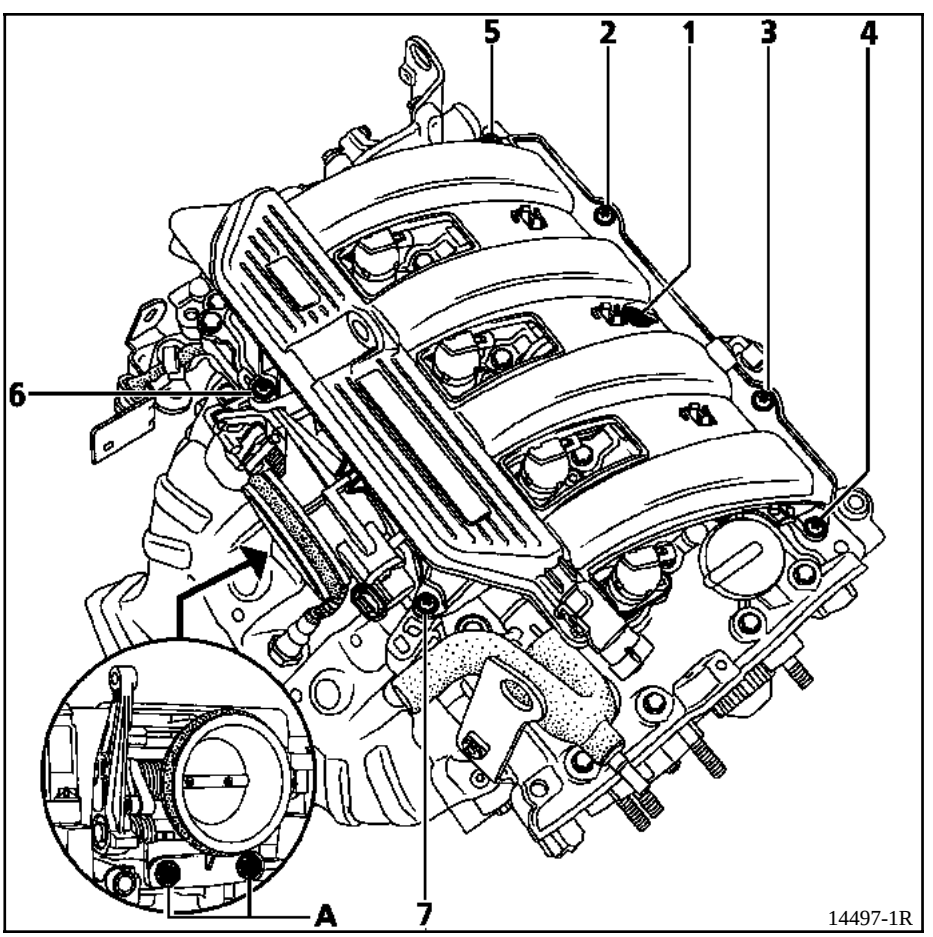
Remove:
- the two throttle body mounting bolts (A),
- the inlet manifold bolts.

REFITTING

Refitting is the reverse of removal.

NOTE: observe the recommended tightening order and torques for the inlet manifold and throttle body bolts.

If necessary, replace the manifold and throttle body seals.



TIGHTENING TORQUE (in daN.m)	
Injector mounting shim	**2.1**
Gallery bolts	**0.9**

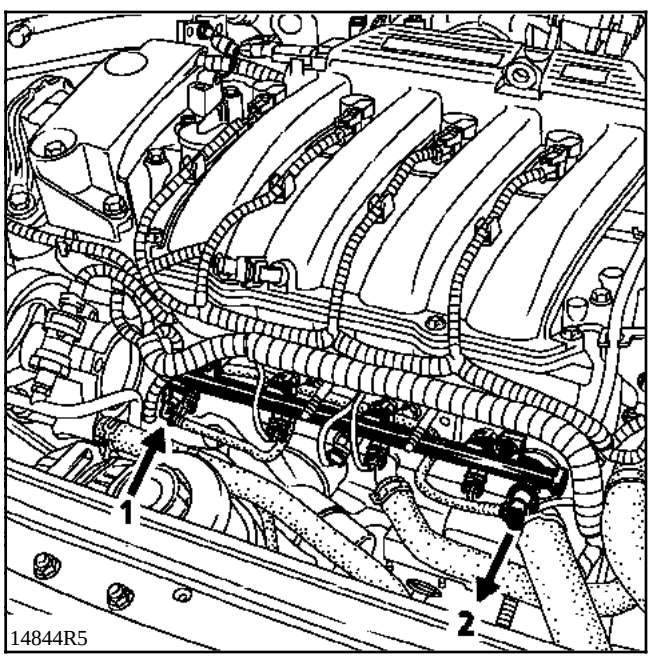
Method for removing the injector mounting shim

REMOVAL

Disconnect the battery.

Remove:
- the injector gallery protective cover.
- the injection wiring loom clip.

Disconnect:
- the fuel supply and return pipes (1) and (2),
- the regulator vacuum pipe,
- the injectors.



Remove the front right hand mud guard.

Clip the accessories belt automatic tensioner.

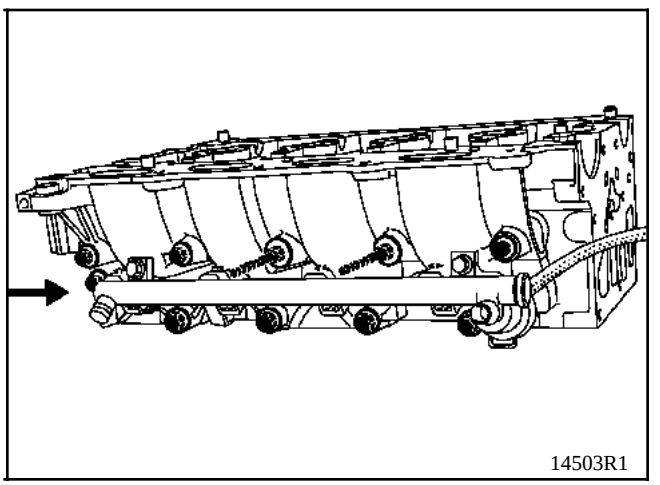
Remove the belt.

IMPORTANT: if a belt is removed, it MUST be changed. To do this, consult the method in **section 07** "**Accessories belt tension**".

Remove:
- the power assisted steering pump pulley,
- the three power assisted steering pump mounting bolts.

Loosen the power assisted steering pump without removing the pipes.

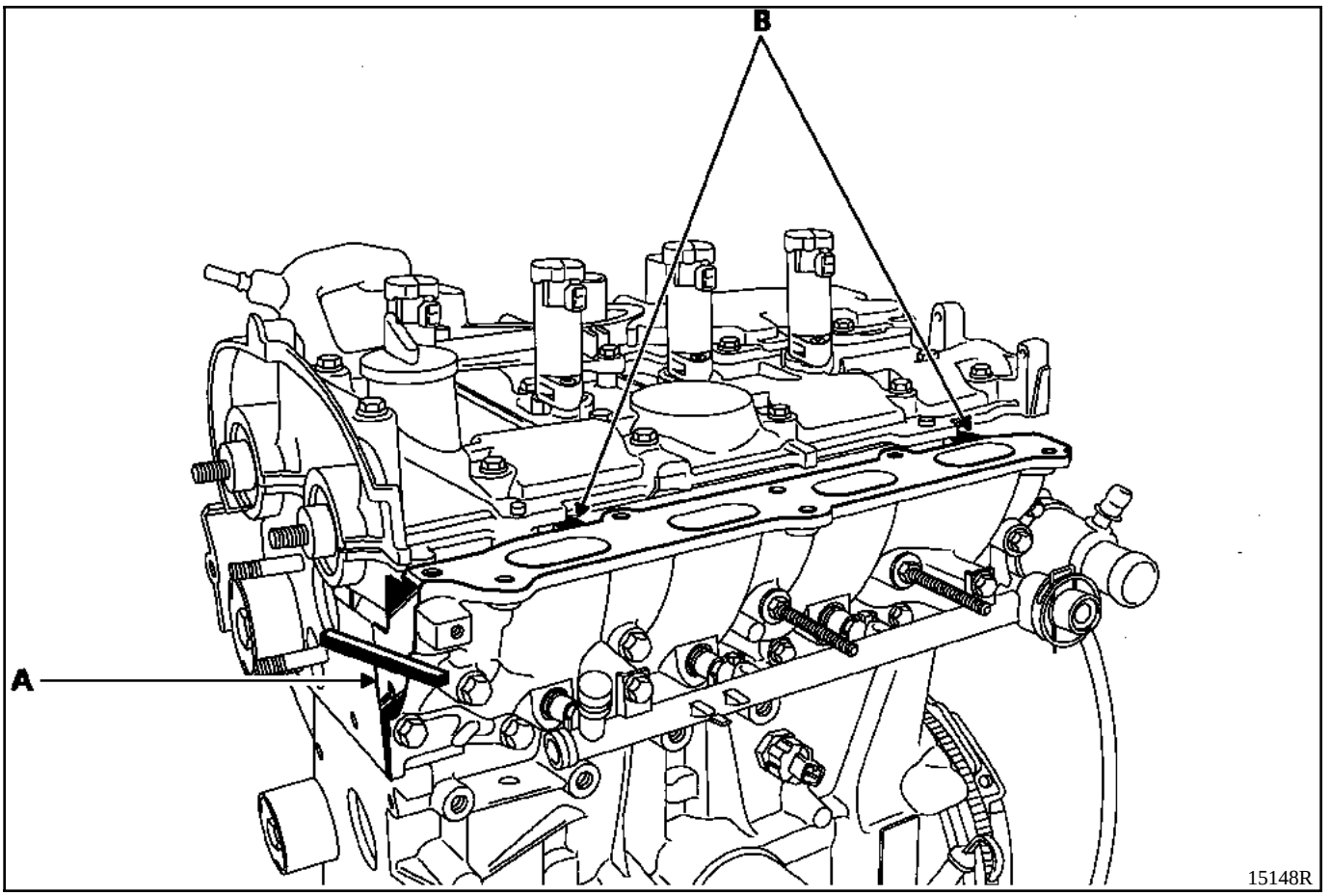
Remove the mounting bolts and the injector mounting shim.



REFITTING

Change the seal.

Check the alignment (at A) between the lower inlet distributor and the cylinder head, ensuring that the distributor is touching (at B) the cylinder head cover.



Refitting is the reverse of removal.

Observe the recommended tightening torques for the shim mounting nuts and bolts.

Change the accessories belt. To do this, refer to **section 07** "**Accessories belt tension**".

SPECIAL TOOLING REQUIRED	
Mot. 1495	**Tool for removal and refitting of upstream oxygen sensor**

TIGHTENING TORQUES (in daN.m)	
Upstream oxygen sensor	**4.5**
Manifold nuts	**1.8**
Nuts for the three point flange	**2**
Heat shield bolts	**1**

REMOVAL

Place the vehicle on a two post lift.

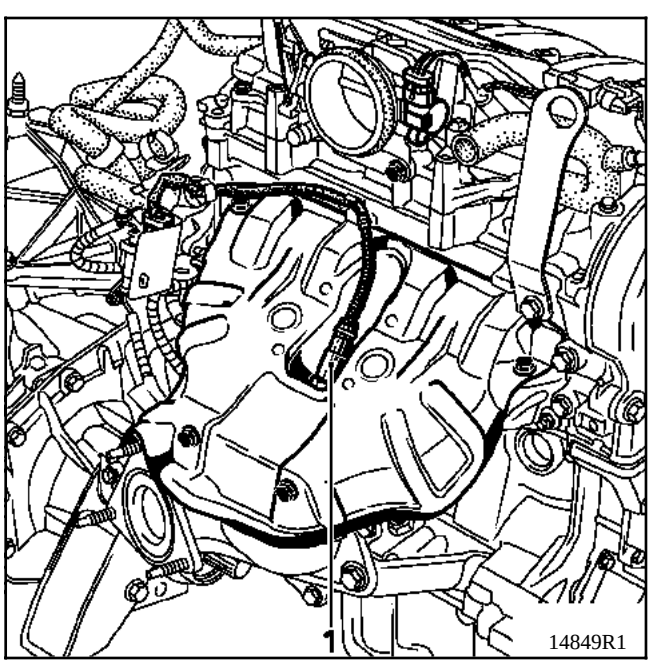
Disconnect the battery.

Remove the air filter unit (see section **12** Fuel mixture "**Air filter unit**").

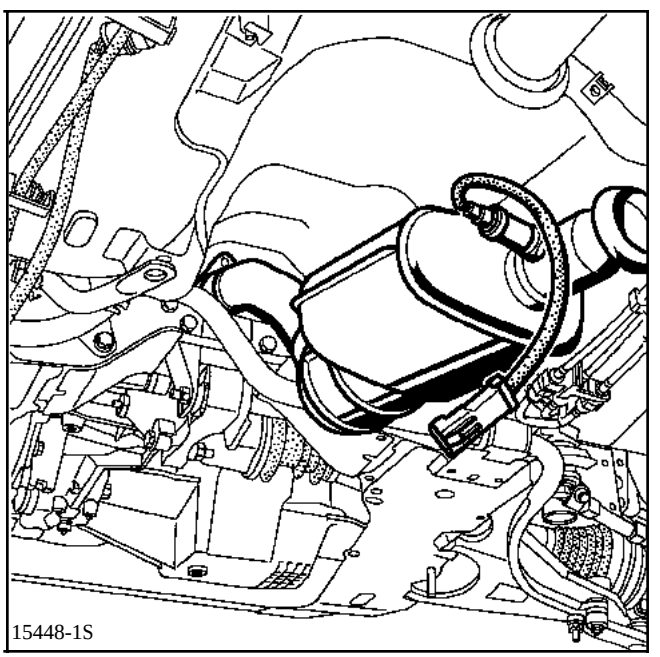
Disconnect and remove the oxygen sensor (1) using **Mot. 1495**.

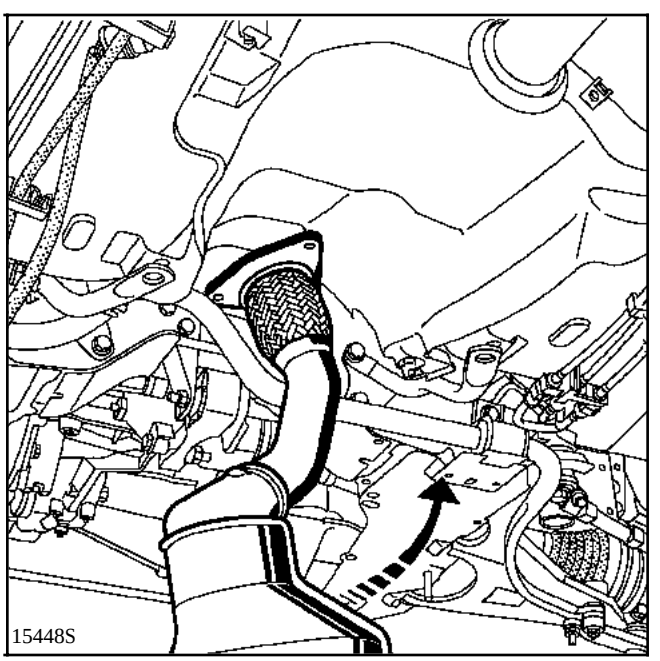
Remove the upper exhaust manifold heat shield and the sub-frame heat shield.

Release the exhaust downpipe.

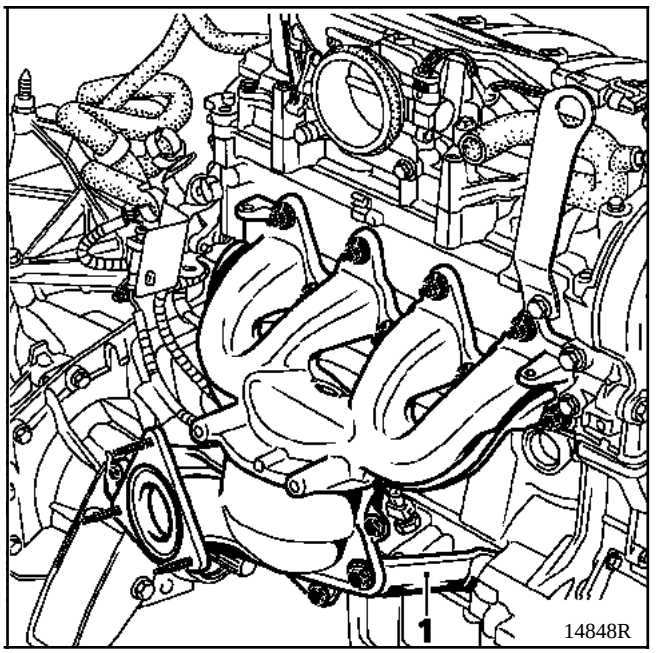


Remove the catalytic converter. It is possible to lower the sub-frame by a few millimetres to make it easier to take the catalytic converter out between the sub-frame and the body (refer to section 31 of MR 337).
Take care not to damage the catalytic converter hose and the heat shield under the body.





Remove the strut (1) between the exhaust manifold and the cylinder block.



Detach the manifold by turning it approximately **45**°, then remove it to the right hand side.

REFITTING

Refitting is the reverse of removal.

NOTE: check that the heat shield is correctly positioned between the oxygen sensor and the manifold (to prevent a chimney effect which would lead to destruction of the oxygen sensor connections).

Change the gaskets for the manifold and the three point mounting.

Also change the mounting nuts.

IMPORTANT: if a heat shield is damaged, it MUST be changed to prevent any risk of fire.

TIGHTENING TORQUE (in daN.m)	
Injector gallery bolts	**0.9**

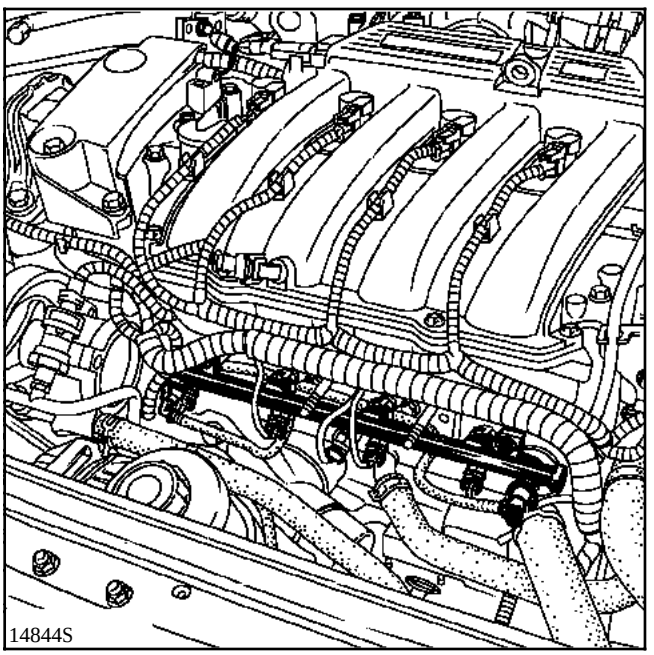
The injectors fitted to the **K4M** engine are of the **WEBER** type.

They are secured to the injector gallery using clips.

The fuel permanently circulates around the injector body. This sweeping motion of the fuel prevents the formation of fuel vapour bubbles and favours warm starting.

REMOVAL

IMPORTANT: when removing the injectors, be careful of the amount of fuel which is in the gallery and connectors. Protect the alternator.


14844S

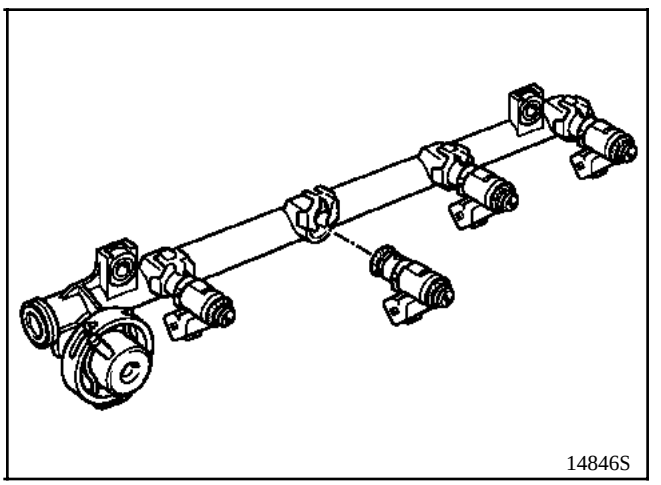
Disconnect the battery.

Remove:
- the cover protecting the gallery,
- the fuel supply and return pipe unions on the gallery without clamping the pipes,
- the pressure regulator vacuum pipe,
- the gallery mounting bolts,
- the injector connectors,
- the injector clips.

REFITTING

The injector O-ring seals must be changed.

Observe the tightening torques for the gallery bolts.

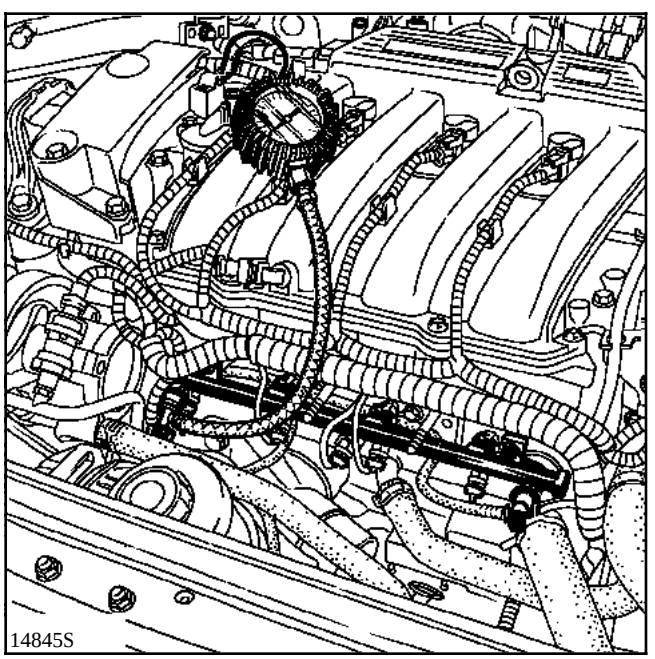

14846S

CHECKING THE FUEL SUPPLY PRESSURE AND THE PUMP FLOW

SPECIAL TOOLING REQUIRED	
Mot. 1311 -04	**Pressure measuring socket**
Mot. 1311 -01 and Mot. 1311 -02	**Fuel pressure test kit with pressure gauge and sockets**
EQUIPMENT REQUIRED	
2 000 ml measuring cylinder	

Disconnect the fuel supply pipe and fit the "**T**" with the pressure gauge in its place.

Disconnect the fuel return pipe. Fit a pipe which flows into a measuring cylinder.


14845S

Turn the pump over by activating the starter motor.

Note the pressure and the quantity of fuel in the cylinder.

When a vacuum is applied to the pressure regulator using a vacuum pump, there is a drop in the fuel supply pressure.

Pressure read : **3 bars ± 0.2**

Minimum calculated flow : **1.3 litre/minute**

Check the pump safety valve.

Supply the fuel pump while blocking the fuel return outlet. The pressure gauge reading should stabilise around **5 bars**.

OPERATING PRINCIPLE

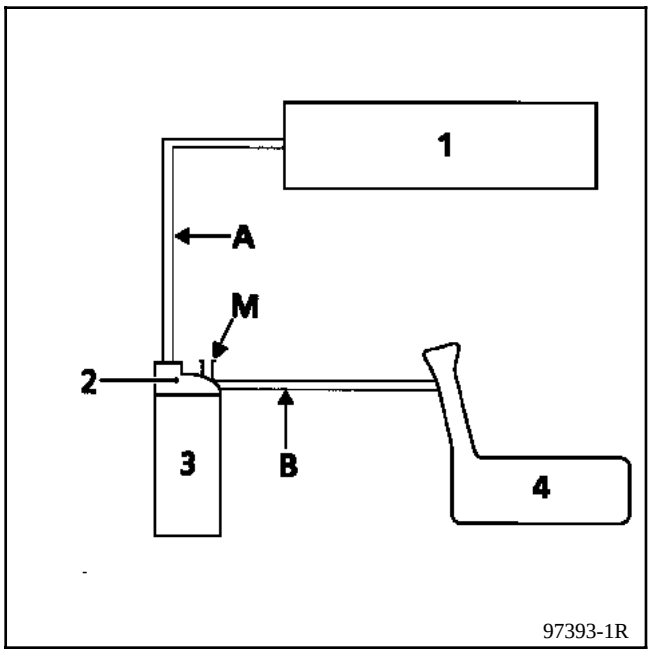
The anti-percolation system is controlled directly by the injection computer.

Coolant temperature is measured by the injection coolant temperature sensor (see section **17 Centralised Coolant Temperature Management**")

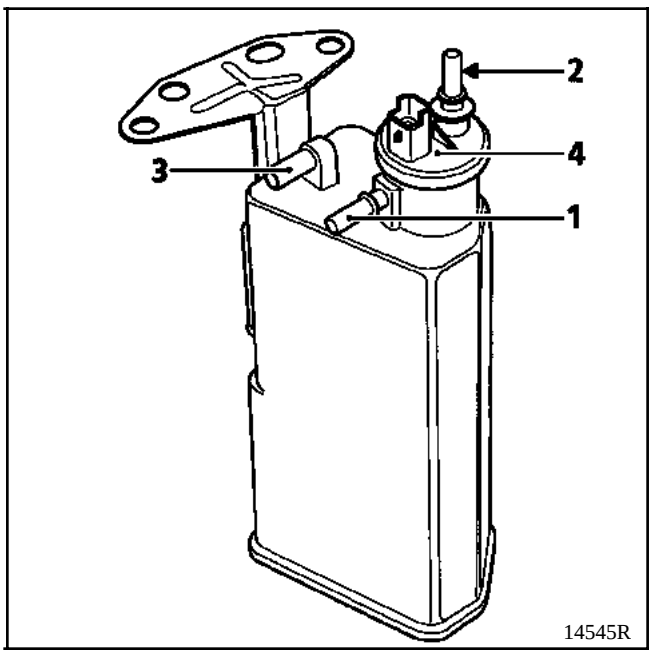
After the ignition is switched off, the injection computer goes into monitoring mode. If the engine coolant temperature exceeds the threshold of 103 °C during the five minutes after the engine stops, the slow speed relay for the engine cooling fan is fed.

If the temperature falls below **100 °C**, the **engine cooling fan** relay is cut (the engine cooling fan can not operate for longer than 12 minutes).

CIRCUIT OPERATING DIAGRAM



1 Inlet manifold
2 Recycling solenoid valve
3 Fuel vapour absorber with solenoid valve
4 Fuel tank
M Breather



1 Rebreathing of fuel vapour from the fuel tank (quick release connector)
2 Rebreathing of fuel vapour to the engine
3 Fuel tank canister breather
4 Canister solenoid valve

IMPORTANT: under normal operating conditions, the breather should not be blocked. No pipes are to be connected here.

OPERATING PRINCIPLE

The fuel tank breathes through the fuel vapour absorber (canister).

Fuel vapour is retained by the active carbon in the absorber (canister).

The fuel vapours contained in the canister are eliminated and burned by the engine.

To do this, a pipe connects the canister and the inlet manifold. A solenoid valve is located on the canister to authorise bleeding of the canister.

The operating principle for the solenoid valve is to give a variable passage diameter (depending on the **RCO** signal sent by the injection computer).

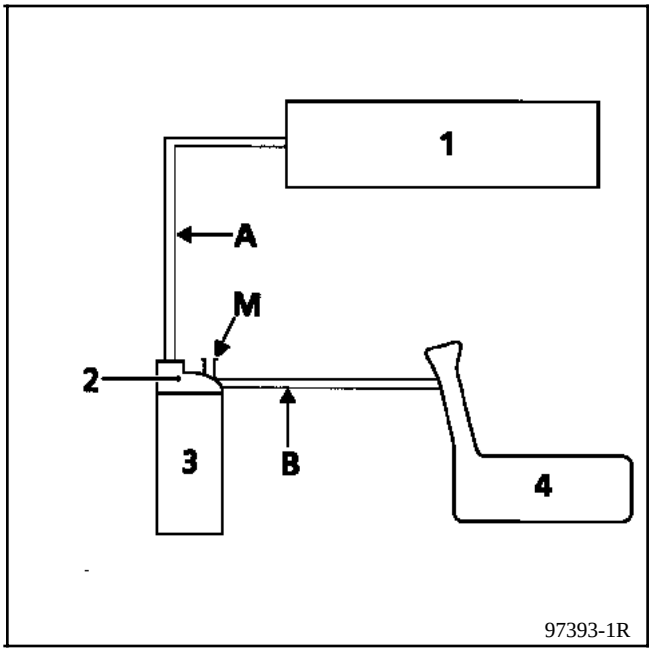
The variation in the selection of passage diameter for the fuel vapour in the solenoid valve results from the balance between the magnetic field created by the feed to the coil and the force of the return spring ensuring the valve remains closed.

CHECKING THE OPERATION OF THE CANISTER BLEED VALVE

A malfunction in the system could cause the idle speed to be unstable or the engine to stall.

Check the circuit conforms (see operating diagrams).

Check the condition of the pipes up to the fuel tank.



1 Inlet manifold
2 Integrated canister bleed solenoid valve
3 Canister (with solenoid valve)
4 Fuel tank
M Breather

CONDITIONS FOR BLEEDING THE CANISTER

The canister bleed solenoid valve is controlled by **track 4** of the computer when :
- the coolant temperature is greater than **60 °C**,
- the air temperature is greater than **10 °C**,
- the engine is not at idle speed,
- a given load threshold is reached,
- the throttle potentiometer is not in the No Load position.

The cyclical opening ratio for the canister bleed solenoid valve may be seen using the NXR fault finding tool with reference to the "RCO canister bleed solenoid valve" parameter.

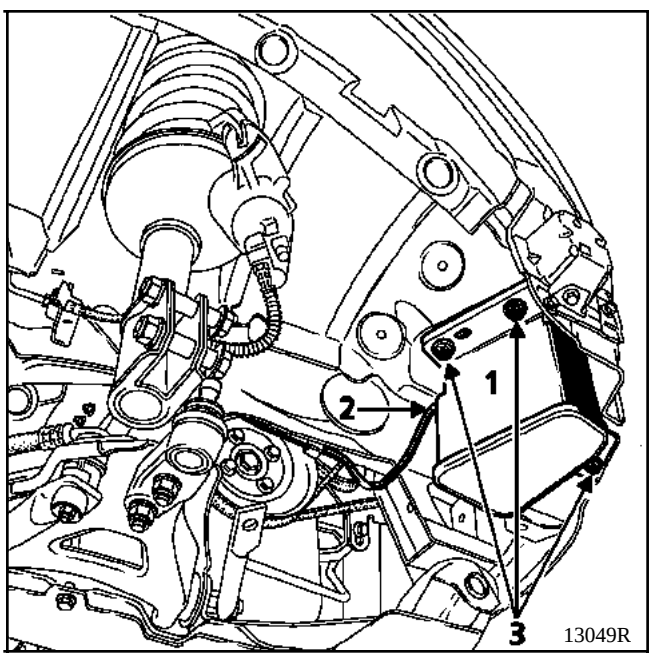
The solenoid valve is closed for a value which is less than **0.7 %**.

REMOVING THE ABSORBER

The absorber (1) is located in the front right hand wheel arch.

Disconnect:
- the vapour supply pipe from the fuel tank (2) and the pipe which circulates towards the manifold.
- the solenoid valve control connector.

Remove:
- the mud guard and wheel arch.
- the mounting bolts (3).



Check :
- at idle speed,
- by plugging the circuit (B) on the canister from the fuel tank,
- by connecting a pressure gauge (**- 3 / + 3 bars**) (**Mot. 1311-01**) on the canister breather outlet (M),

that there is no vacuum (in the same way, check that the command value on the NXR for the parameter: "RCO canister bleed solenoid valve" remains at a minimum of **X ≤ 0.7 %**).

Is there a vacuum?

YES Ignition off, use a vacuum pump to apply a vacuum of **500 mbars** to the solenoid valve at (A). This should not vary by more than **10 mbars** in **30 seconds**.

Does the pressure vary ?

YES The solenoid valve is faulty, replace the canister solenoid valve assembly.

NO There is an electrical fault, check the circuit.

NO Under bleeding conditions (see conditions for bleeding), there should be an increase in the vacuum (at the same time there should be an increase in the parameter value on the NXR).

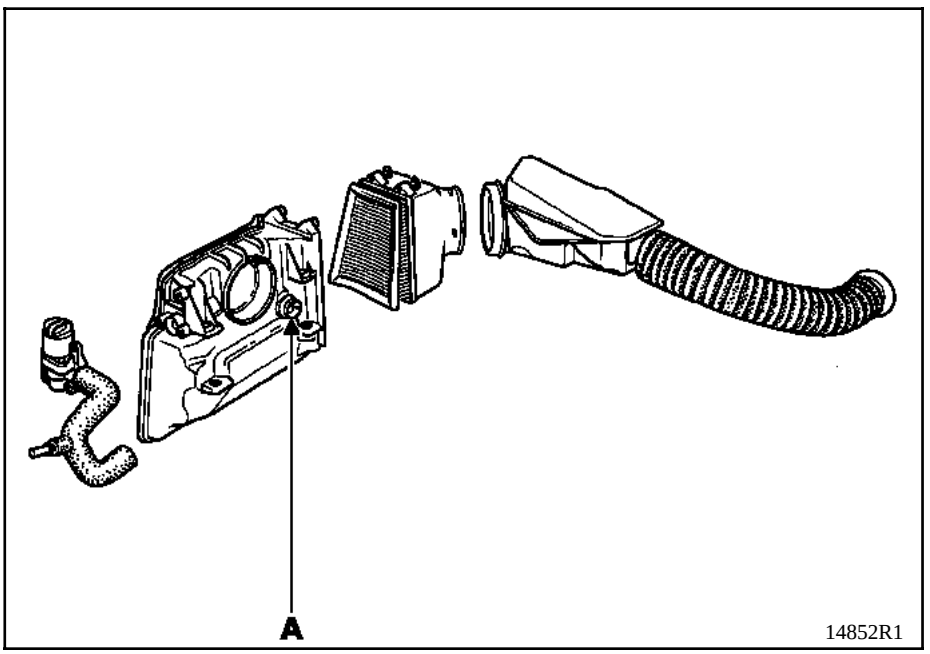
CHECKING THE FUEL TANK / CANISTER CONNECTION

This connection may be checked by :
- lifting the rear right hand wheel using a jack,
- removing the fuel tank filler cap,
- connecting a vacuum pump to the pipe (B).

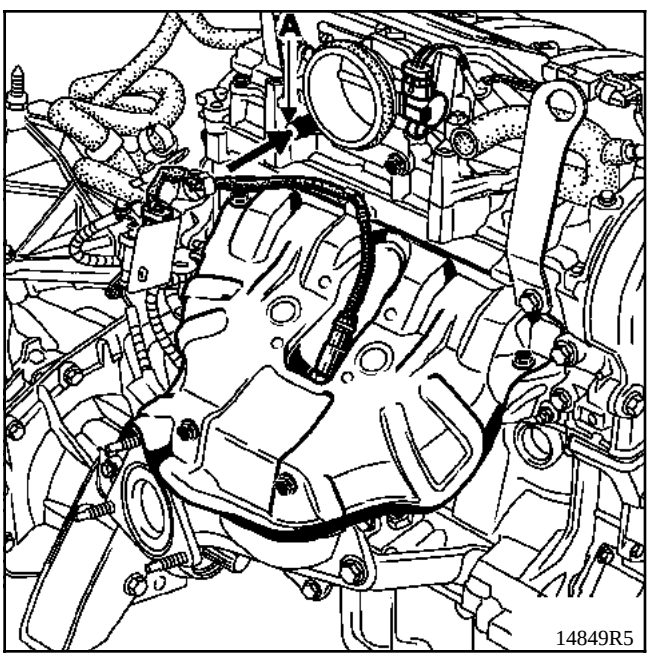
The system is correct if a vacuum cannot be maintained on the pipe.

PRESENTATION OF COMPONENTS

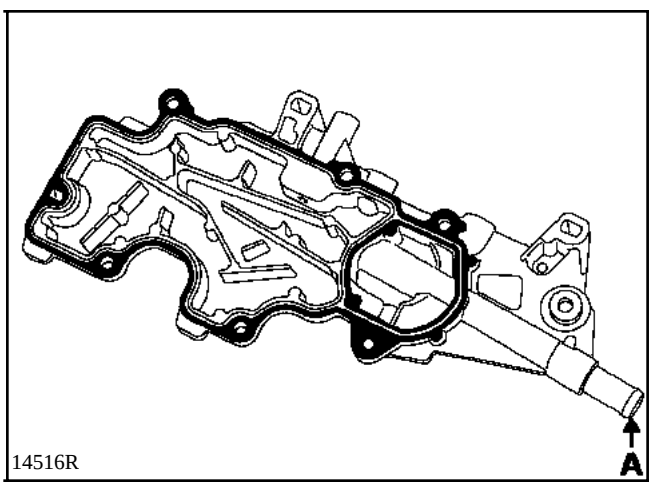
Oil vapour intake (A).



Oil vapour outlet.



Oil vapour recuperation plate located on the cylinder head cover.



For removal, refer to **section 11** "**Top and front of engine**".

IDENTIFICATION

Vehicle	Engine	Alternator	Currency
CB0H CB0T	K4M 748	BOSCH 0120 416 020 (CA)	100 A

CHECKING

After **15 minutes** of warming up under a voltage of **13.5 volts**.

rpm	100 Amps
2 000	63 A
3 000	86 A
4 000	95 A

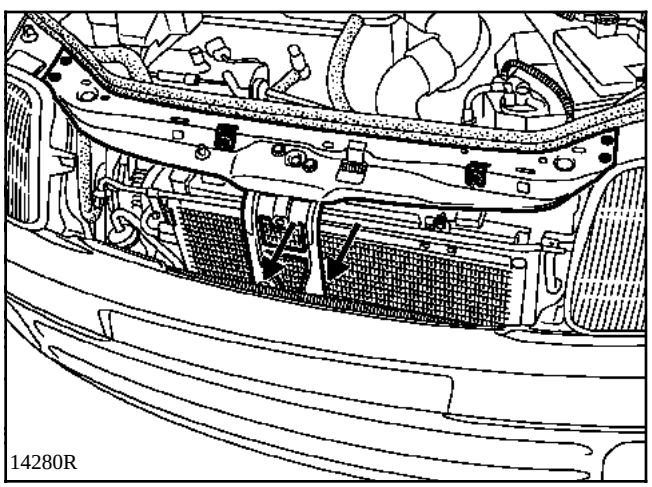
SPECIAL TOOLING REQUIRED	
Mot. 1273	**Tool for checking belt tension**
Mot. 1311 -06	**Tool for removing the fuel pipe**

REMOVAL

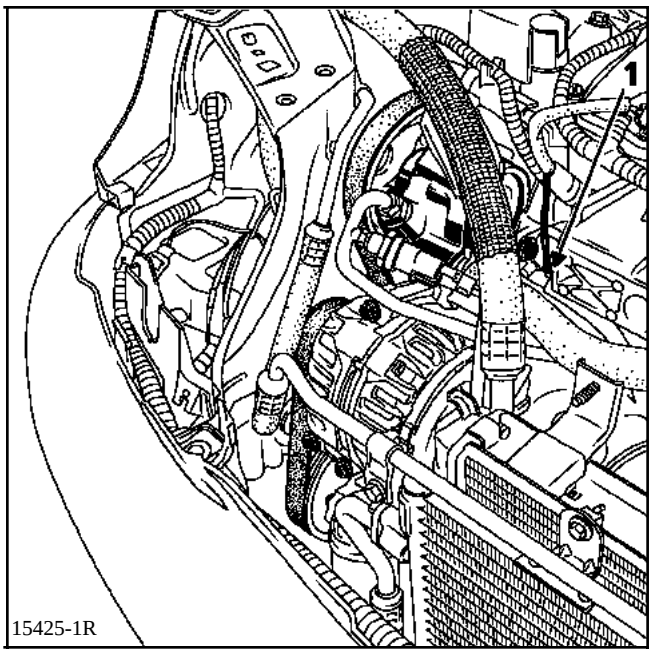
Place the vehicle on a two post lift.

Disconnect the battery.

Remove:
- the front right wheel and the mud guard,
- the radiator grille,
- the upper cross member (by slackening the two lower mounting bolts) and rest it on the engine,


14280R

- the injector gallery protective cover,
- the front right hand headlight unit,
- the accessories belt (see section **07** "**Accessories belt tension**"),
- the PAS pump pulley,
- the supply pipe on the injector gallery using **Mot. 1311-06** and disconnect connector (1) from the injector,
- the PAS pump mountings on its support,



15425-1R

- the PAS pipe mounting on the multipurpose mounting,
- the alternator by moving the PAS pump to one side.

REFITTING

Refitting is the reverse of removal.

Refer to section **07** "**Accessories belt tension**" for the tensioning procedure.

IDENTIFICATION

Vehicle	Engine	Starter motor
CB0H CB0T	K4M 748	VALEO D7E6

REMOVAL

Place the vehicle on a two post lift.

Disconnect the battery.

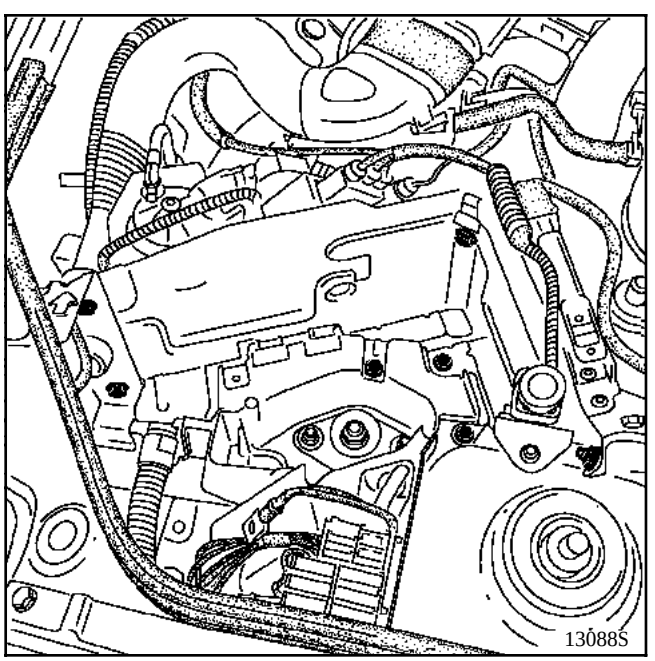
Remove:
- the front right hand wheel,
- the air resonator.

Right hand side of vehicle

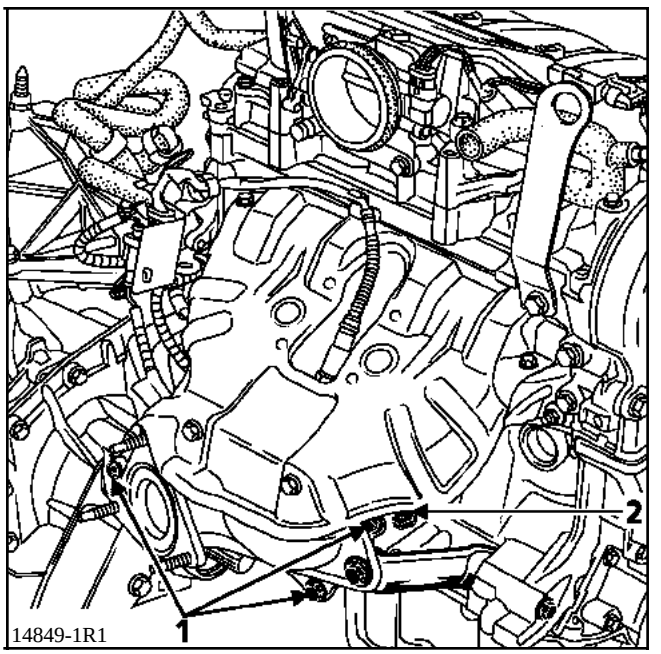
Remove :
- the driveshaft roll pin using punches **B.Vi. 31-01**,
- the track rod end using tool **T.Av. 476**,
- the upper shock absorber base mounting bolt and slacken the lower bolt.

Tilt the stub axle carrier and detach the driveshaft.

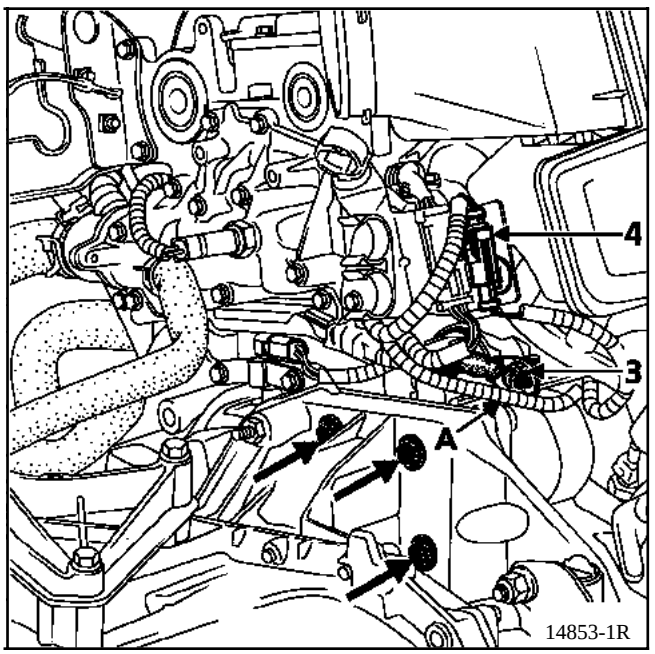
Remove:
- the battery,
- the injection computer mounting once the computer connector and the impact sensor connector have been disconnected,



- the priming catalytic converter heat shield (at 1),
- the oil level sensor connector (2) and move the wiring loom to one side,



- the nut (3) for the starter motor feed wire and disconnect the solenoid connector (4),
- the starter motor mounting bolts and take it out from below.



REFITTING

Refitting is the reverse of removal.

Check that the centring dowel is in position (at A).

Correctly refit the heat shields.

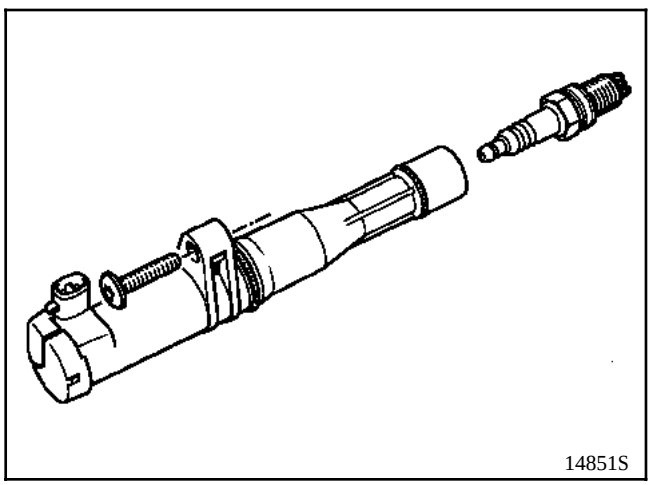
TIGHTENING TORQUES (in daN.m)	
Ignition coil bolts	**1.5**
Plugs	**2.1**

DESCRIPTION

Static ignition is a system which allows the amount of energy available to the spark plugs to be increased as there is nothing between the plug and the coil.

This system also allows all moving components for the ignition to be suppressed.

The power module is integrated in the injection computer. The ignition therefore uses the same sensors as the injection.



There are four ignition coils and they are mounted directly on the plug by a bolt on the cylinder head cover.

The coils are fed in series, two at a time, by **tracks 1 and 32** of the injection computer :
- **track 1** for cylinders **2 and 3**,
- **track 32** for cylinders **1 and 4**.

PLUGS

The plugs have three electrodes (two outer electrodes and the earth electrode).

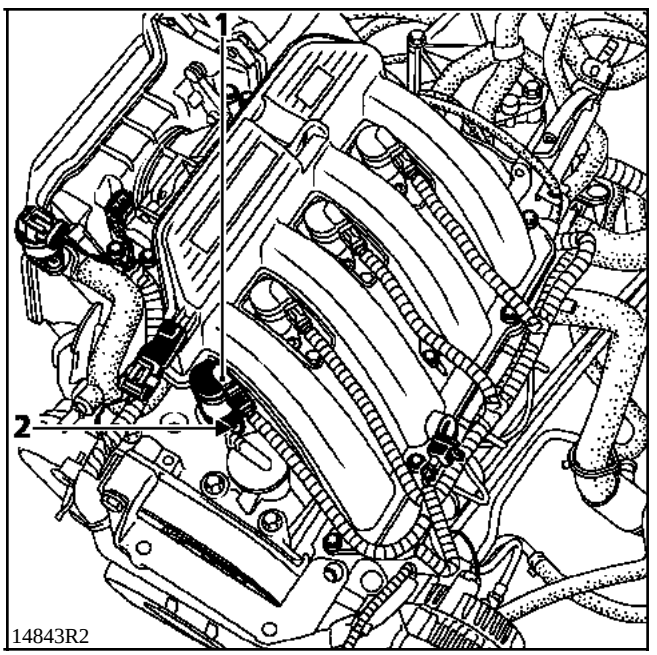
REMOVING A COIL

Disconnect the battery.

Disconnect the ignition coils.

IMPORTANT: be careful not to damage the connectors (1); if this happens, change them.

Remove the coil mounting bolts (2).



REFITTING

Refitting is the reverse of removal. Replace the coil O-ring seals if necessary.

SPECIAL NOTES ON THE K4M 748 MULTIPOINT INJECTION

- **90 track SIEMENS** "**SIRIUS 32**" computer which controls the injection and the ignition.

- Use of the NXR after sales fault finding tool.

- Multipoint injection operating in sequential mode without cylinder and camshaft position marking sensor. Because of this, timing is carried out logically, based on the TDC sensor.

- Static ignition with four plugs controlled two by two in series.

- Injection warning light on the instrument panel not operational.

- Special precautions relating to the engine immobiliser.
  Adaptation of a second generation type engine immobiliser for which there is a special method for changing the computer.

- Idle speeds
  - nominal idle speed . . . . . **750 rpm**

- Idle speed correction depending on:
  - air conditioning,
  - heated windscreen,
  - electrical balance,
  - battery voltage.

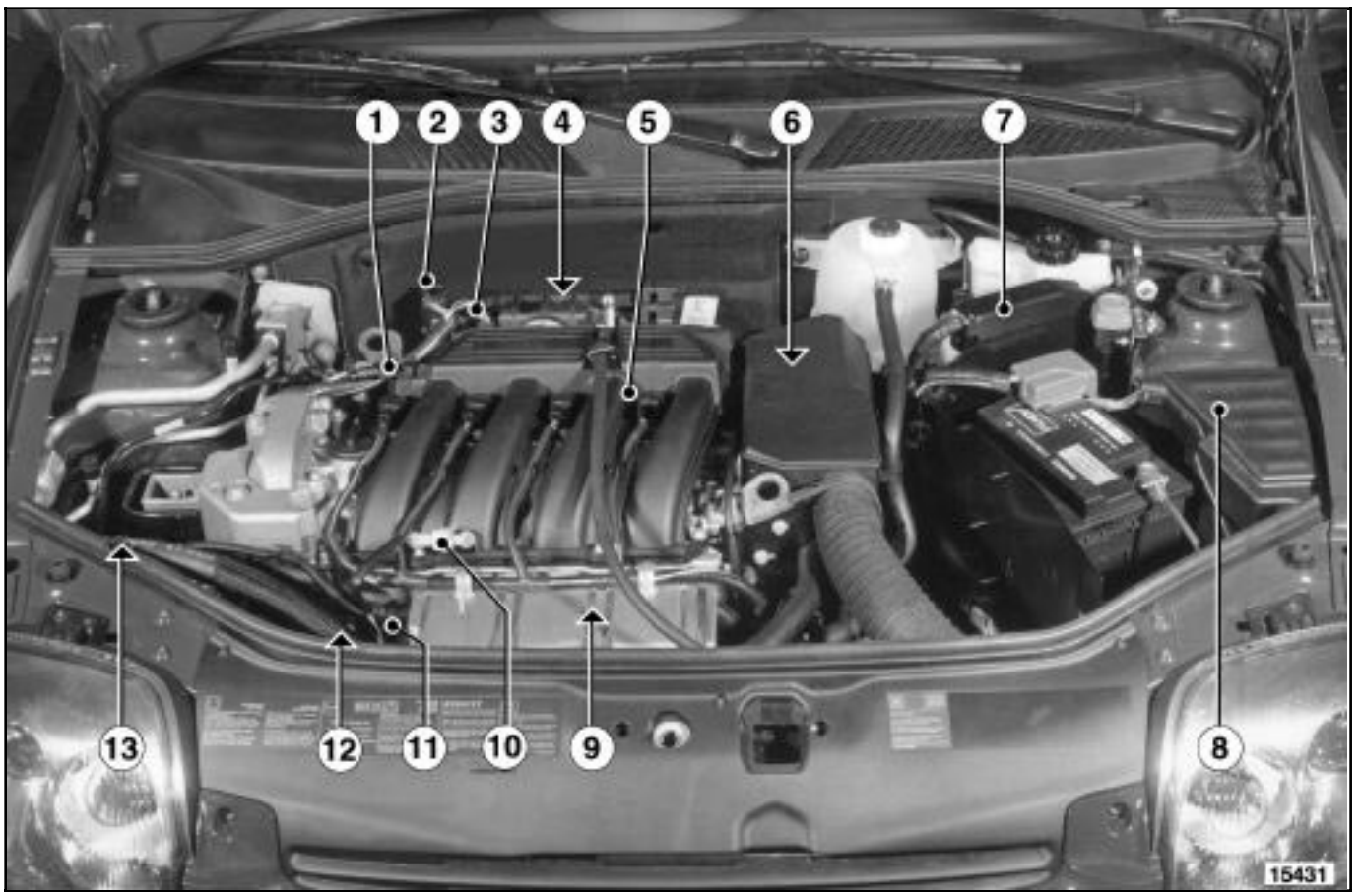
- Maximum speeds
  - maximum speed when coolant temperature is less than **60 °C** . . . . . **5800 rpm**
  - maximum speed for **T > 60 °C** . . . . . **6500 rpm**

- Canister bleed solenoid valve controlled by the cyclical opening ratio (**RCO**) depending on the engine speed and operating conditions.

- Use of two oxygen sensors located upstream and downstream from the catalytic converter.

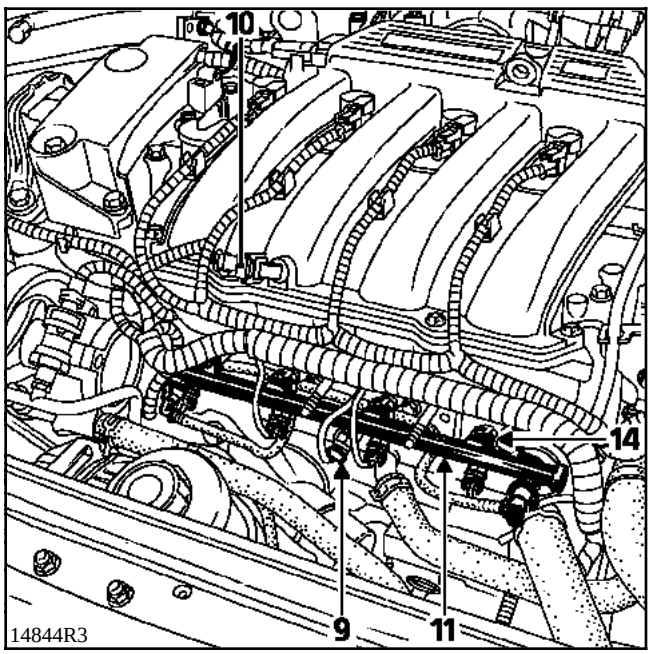
- Automatic configuration for AC operation via an exchange of signals between the computers. However, it is impossible to de-configure it (even using the after sales fault finding tool).

- Control of engine cooling fan assembly and of the coolant temperature warning light on the instrument panel by the injection computer (centralised coolant temperature management).

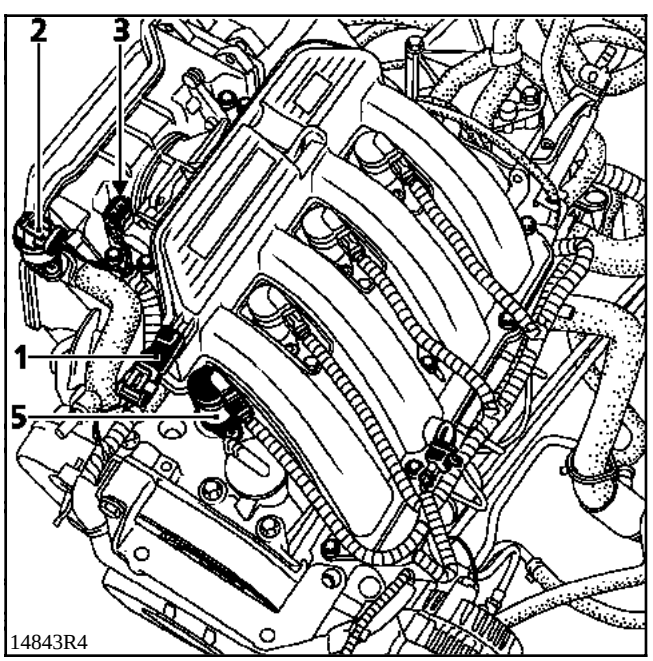


1 Pressure sensor
2 Idle speed stepping motor
3 Throttle position potentiometer
4 Oxygen sensor (upstream)
5 Ignition coil and plug
6 Coolant temperature sensor and TDC sensor
7 Injection computer
8 Supply relays
9 Pinking sensor
10 Air temperature sensor
11 Injector gallery with pressure regulator
12 Power assisted steering pressostat
13 Fuel vapour absorber with solenoid valve

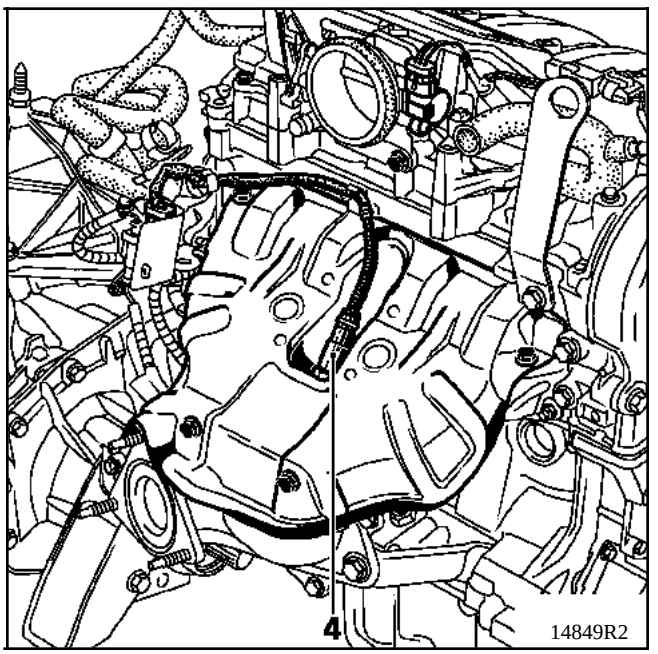
9 Pinking sensor
11 Injector gallery
14 Injector



2 Idle speed stepping motor
10 Air temperature sensor
5 Ignition coil



3 Throttle position potentiometer
1 Pressure sensor
4 Upstream oxygen sensor



PRESENTATION

The **K4M 748** engine is equipped with a sequential-type injection system.

In normal operation, fuel is injected cylinder by cylinder when they are at the beginning of the inlet phase.

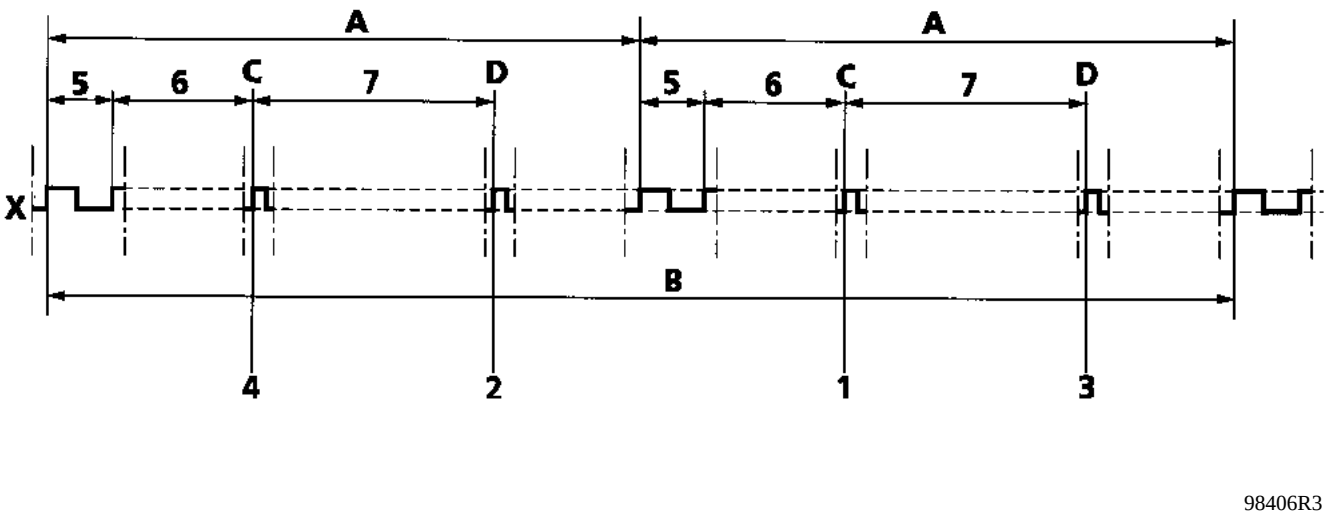
To do this, it is necessary that:
- each injector is controlled independently by the computer (injector n° **1** engine flywheel side),
- the computer knows which cylinder is at the inlet phase.

To determine which cylinder is at the inlet phase, the computer uses a single sensor, the **TDC** sensor (and engine speed) which can indicate that:
- cylinders **1** and **4** are at Top Dead Centre,
- cylinders **2** and **3** are at Top Dead Centre.

To determine on which of the two cylinders it should inject, the computer uses two strategies:
- each time the engine stops, it remembers which injector it was controlling. Each time the engine is started again, it uses this cylinder as its reference point.
- if the reference cylinder is not correct, the computer carries out a software check.

When the ignition is switched off, the idle speed regulation stepping motor command is maintained for a minimum of 10 seconds, so that systematic programming of the "bottom stop" is carried out. This period is called "resetting".

If the computer is changed, it must be programmed during a road test lasting for at least **25 minutes** under normal operating conditions and the idle speed stepping motor must be reset.



A 1 turn of the crankshaft
B 1 turn of the camshaft

C Top Dead Centre 1-4
D Top Dead Centre 2-3

1 Cylinder 1 at inlet phase
2 Cylinder 2 at inlet phase
3 Cylinder 3 at inlet phase
4 Cylinder 4 at inlet phase

5 long tooth
6 84° or 14 teeth
7 30 teeth

X Engine flywheel target.

NOTE: all values are expressed in TDC degrees.

This vehicle is equipped with a second generation engine immobiliser system. The injection computer **MUST** be programmed with the engine immobiliser code for it to operate.

CHANGING THE INJECTION COMPUTER

Computers are supplied uncoded. After changing one, it has to be programmed with the vehicle code then checked to see whether the engine immobiliser function is operational.

To do this, switch the ignition on for a few seconds then switch it off again.

CHECKING THE ENGINE IMMOBILISER FUNCTION

Remove the key from the ignition switch. After 10 seconds the red engine immobiliser tell-tale light should flash (to check that it is not possible to start the engine, refer to MR 337 section 8).

TESTING AN UNCODED INJECTION COMPUTER BORROWED FROM THE STORE (you are strongly advised not to carry out this operation)

IMPORTANT: before trying an injection computer, it must have been programmed with the vehicle's engine immobiliser code in order for it to work. After the test, the computer **must be decoded** before it is returned to the store. If this is not done, the computer will be **unusable.** This operation must be carried out by adequately trained personnel. To decode the computer, consult section 8 of MR 337.

IT IS NOT POSSIBLE TO BORROW A CODED COMPUTER FITTED TO A VEHICLE WITH AN ENGINE IMMOBILISER TO CARRY OUT A TEST ON ANOTHER VEHICLE WHICH DOES OR DOES NOT HAVE AN ENGINE IMMOBILISER.

THE COMPRESSOR IS OF THE VARIABLE CAPACITY TYPE

INJECTION COMPUTER/AC COMPUTER CONNECTION

The injection computer is connected to the **AC** computer by two wires:
- one injection computer wire to the **AC** computer, track **10**. Only compressor operation authorisation or prevention information is transmitted on this wire.
- one wire from the **AC** computer to the injection computer, track **23**. This is a power consumed information signal.

When the **AC** switch is pressed, the **AC** computer requests compressor operation.
The injection computer authorises or prevents operation of the compressor clutch and imposes a modified idle speed.

PROGRAMMING FOR COMPRESSOR OPERATION

During certain operating phases, the injection computer prevents operation of the compressor.

Starting the engine

The compressor is prevented from operating for **10 seconds** after the engine has been started.

Return of performance and acceleration

If full load is recognised, if engine speed is less than **2 000 rpm** or if vehicle speed is less than **9.9 mph** (16 km / h), the compressor is prevented from operating for a maximum of **9 seconds**. It begins to operate if the full load position is no longer recognised, if engine speed reaches **2 000 rpm** and if the vehicle speed reaches **16.2 mph** (26 km / h).

Stalling protection

If the engine speed falls to less than **600 rpm**, the compressor is prevented from operating for a maximum of **9 seconds**. It begins to operate again when the engine speed becomes greater than **1900 rpm.**

Thermal protection

The compressor does not operate when the coolant temperature is greater than **115 °C**.

Over-revving protection

The compressor is prevented from operating if engine speed is greater than **6 500 rpm.**

POWER ASSISTED STEERING PRESSOSTAT - INJECTION COMPUTER CONNECTION

The injection computer receives information from the power assisted steering pressostat (displayed on the fault finding tool). This depends on the pressure in the hydraulic circuit and the fluidity of the power assisted steering fluid. The higher the pressure, the more energy is consumed by the power assisted steering pump.

The injection computer does not modify the engine's idle speed. It uses the information to anticipate loss of speed.

ELECTRICAL CORRECTION DEPENDING ON BATTERY VOLTAGE AND ELECTRICAL BALANCE

The aim of this correction is to compensate for the drop in voltage due to the operation of a consumer when the battery has a low charge. To do this, the idle speed is increased, thereby allowing the alternator rotation to be increased and, as a result, the battery voltage.

The lower the voltage, the greater the correction. Speed correction is therefore variable. It begins when voltage is less than **12.8 volts**. Correction starts at idle speed and can reach a maximum of **900 rpm.**

NOTE: after cold starting and a long period of operation at idle speed, a rapid drop in speed of **150 rpm** can be noted. This drop in speed is due to the progressive closure of the idle valve.

PRINCIPLE

Under normal, warm operating conditions, the **RCO** idle speed value varies between a high value and a low value to obtain the nominal idle speed.

It may be that the **RCO** idle speed value is nearer the higher or lower value under different operating conditions (running in, engine contamination...).

Adaptive correction for the **RCO** allows for compensations to be made for slow variations in the engine's air requirement.

This correction is only effective if the coolant temperature is greater than **80 °C**, **20 seconds** after the engine is started and if the engine is in the nominal idle speed regulation phase.

RCO IDLE SPEED AND ADAPTIVE CORRECTION VALUES

PARAMETER	K4M 748 engine
Nominal idle speed	X = 750 rpm
RCO idle speed	6 % ≤ X ≤ 22 %
RCO adaptive idle speed	Threshold: - minimum : - 4 % - maximum : + 4 %

Each time the engine is stopped, the computer resets the stepping motor by positioning it at the lower threshold.

INTERPRETATION OF THESE PARAMETERS

If there is excess air (air leak, throttle stop incorrectly set...), the idle speed increases, the **RCO** idle speed value decreases to return to nominal idle speed; the **RCO** idle speed adaptive value decreases to recentre the operation of idle speed correction.

If there is a lack of air (contamination, etc.), the strategy is reversed, the **RCO** idle speed value increases and the adaptive correction also increases, to recentre the operation of idle speed regulation.

IMPORTANT: after the computer memory is erased the engine MUST be started then stopped to allow resetting of the potentiometer. Start the engine again and allow it to run at idle speed so that adaptive correction can reset itself.

K4M 748 engines using the "**SIRIUS 32**" computer are equipped with two oxygen sensors known as the upstream sensor and downstream sensor.

These two sensors have different part numbers and cannot be interchanged under any circumstances.

SENSOR HEATING

The sensors are heated by the computer:
- from starting for the upstream sensor.
- after a certain length of mapping operation depending on engine TDC and coolant temperature outside No Load conditions for the downstream sensor.

Sensor heating is stopped:
- if vehicle speed is greater than **90.63 mph** (145 km / h), (value given for information only),
- depending on engine load.

UPSTREAM SENSOR VOLTAGE

Parameter reading: "upstream sensor voltage" on the NXR fault finding tool: the value read represents the voltage sent to the computer by the oxygen sensor upstream from the catalytic converter. It is expressed in millivolts.
When the engine is in loop mode, the voltage should fluctuate rapidly between two values:
- **100 mV** ± **100** for a lean mixture,
- **800 mV** ± **100** for a rich mixture.

The smaller the difference between minimum and maximum, the less accurate the sensor information (this difference is generally at least **500 mV**).

NOTE: if the difference is small, check the sensor heating.

DOWNSTREAM SENSOR VOLTAGE

Parameter reading: "downstream oxygen sensor voltage" on the NXR fault finding tool: the value read represents the voltage supplied to the computer by the oxygen sensor downstream from the catalytic converter. It is expressed in millivolts.

The function of this sensor is to identify catalytic converter faults and carry out a second, more accurate check of the richness (slow regulation loop). This function is activated only after a certain period of engine operation.

When the engine is in loop mode, at a stable speed, the voltage should vary around **600 mV** ± **100**.
When decelerating, the voltage should be less than **200 mV**.

Ignore the voltage reading on the fault finding kit at idle speed.

RICHNESS CORRECTION

The value read on the NXR fault finding tool under the "richness correction" parameter represents the average of the richness corrections made by the computer depending on the richness of the burnt mixture as detected by the oxygen sensor located upstream from the catalytic converter (the oxygen sensor actually analyses the oxygen content of the exhaust gases).

The correction value has a centre point of **128** and thresholds of **0** and **255**:
- value lower than **128**: request for fuel mixture to be made leaner,
- value greater than **128**: request for mixture to be made richer.

ENTRY INTO RICHNESS REGULATION MODE

The entry into richness regulation mode is effective after a timed starting period if the coolant temperature is greater than **10 °C** in the No Load position and if the upstream sensor is ready (warm enough).

The timed starting period depends on the coolant temperature:
- at **20 °C**, the period is between **18 and 72 seconds**,
- at **60 °C**, the period is between **20 and 80 seconds.**

If richness regulation has not yet started, the parameter value is **128**.

Loop phase

When richness regulation is occurring, the operating phases during which the computer ignores the voltage supplied by the sensor, are:
- in Full Load position: = variable and greater than **128**,
- sharp acceleration: = variable and greater than **128**,
- when decelerating with No Load position information (injection cut-out): **= 128**,
- if there is an oxygen sensor fault: **= 128**.

DEFECT MODE IN THE EVENT OF AN OXYGEN SENSOR FAULT

When the voltage supplied by the oxygen sensor is incorrect (varying little or not at all) during richness regulation, the computer will only enter defect mode if the fault has been recognised as present for **10 seconds**. Only in this instance will the fault be memorised. In this case, the parameter: "richness correction" is **128**.

If an oxygen sensor fault is detected and the fault has already been memorised, the system goes directly to the open loop phase.

PRINCIPLE

In the loop mode (see section **17** "**Richness regulation**"), richness regulation corrects the injection timing to give fuel metering as close as possible to a richness of **1**. The correction value is close to **128**, with thresholds of **0** and **255**.

However, variations may affect the components of the injection system causing the correction to alter towards **0** or **255**, to obtain richness **1**.

Adaptive correction allows the injection mapping to be adjusted to recentre the richness regulation to **128** and ensure a constant correction authority to make it richer or leaner.

Adaptive correction of richness regulation has two parts:
- adaptive correction for average and high engine loads (parameter: operating adaptive richness),
- adaptive correction for idle speed and low engine loads (parameter: idle speed adaptive richness).

Adaptive corrections use **128** as an average value after initialisation (memory erasure) and have threshold values:

PARAMETER	K4M 748 engine
Operating adaptive richness	$64 \leq X \leq 160$
Idle adaptive richness	$64 \leq X \leq 160$

Adaptive correction only takes place when the engine is warm, in the loop phase and when the manifold pressure is at a certain level.

The engine has to have operated in loop mode over several pressure zones before the adaptive correction will begin to compensate for variations in engine richness operation.

Following initialisation of the computer (return to **128** of adaptive richnesses), a special road test must be carried out.

ROAD TEST

Conditions:
- engine warm (coolant temperature **> 80 °C**),
- do not exceed an engine speed of **4000 rpm**.

For this test, it is recommended to begin at a relatively low engine speed, in 3rd or 4th gear, accelerating gradually, **to stabilise the desired pressure for 10 seconds in each operating zone** (see table).

Pressure zones to be covered during the test
Parameter: computer pressure on NXR

	Range n° 1 (mbars)	Range n° 2 (mbars)	Range n° 3 (mbars)	Range n° 4 (mbars)	Range n° 5 (mbars)
K4M 748	260 ---------- 457	---------- 535	---------- 613	---------- 691	-------- 813
	Average 358	Average 496	Average 574	Average 652	Average 752

Following this test, the corrections will be operational.

The idle speed adaptive richness parameter varies more significantly for idle speeds and low loads and the adaptive richness parameter for average and high loads, but both are operational over all manifold pressure ranges.

The test should be followed by a normal, varied drive, covering **3 to 6 miles** (5 to 10 km).

After the test, read the operating adaptive values. Initially at **128**, they should have changed. If not, repeat the test, taking care to observe the test conditions.

INTERPRETATION OF VALUES COLLECTED AFTER A ROAD TEST

If there is a lack of fuel (injectors contaminated, fuel pressure and flow too low, ...), richness regulation increases to obtain a richness as close as possible to **1** and adaptive richness corrections increase until richness correction begins to fluctuate around **128**.

If there is excess fuel, the strategy is reversed: richness regulation decreases and adaptive correction also decreases to recentre richness correction around **128**.

NOTE: the analysis which can be made regarding idle adaptive richness remains tricky as this correction mainly operates for idle speed and low loads and is also very sensitive.

Therefore, hasty conclusions should not be drawn from these parameters, rather the position of the operating adaptive value should be analysed.

The information supplied by these two parameters gives an idea of the richness for engine operation and may therefore be used as a guide for fault finding. So that these can be useful for fault finding, conclusions can only be drawn from their value if they are at the minimum or maximum correction threshold and if both parameters have drifted in the same direction.

IMPORTANT: adaptive richness values should only be used and analysed following a customer complaint, an operating fault or if they are at the threshold value with offsetting of the parameter : richness correction varying above 175 or below 80).

SPECIAL TOOLING REQUIRED	
Mot. 1495	**Socket for removing and refitting oxygen sensor**

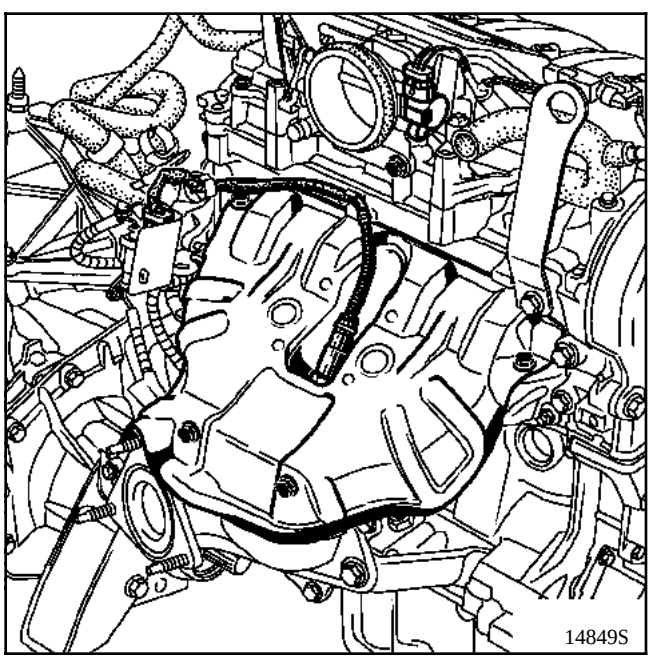
TIGHTENING TORQUE (in daN.m)	
Oxygen sensors	**4.5**

IMPORTANT: the two oxygen sensors are different and are therefore not interchangeable.

REMOVING THE UPSTREAM OXYGEN SENSOR

Disconnect the battery.

Remove the air filter unit (see section **12** Fuel mixture "**Air filter unit**").

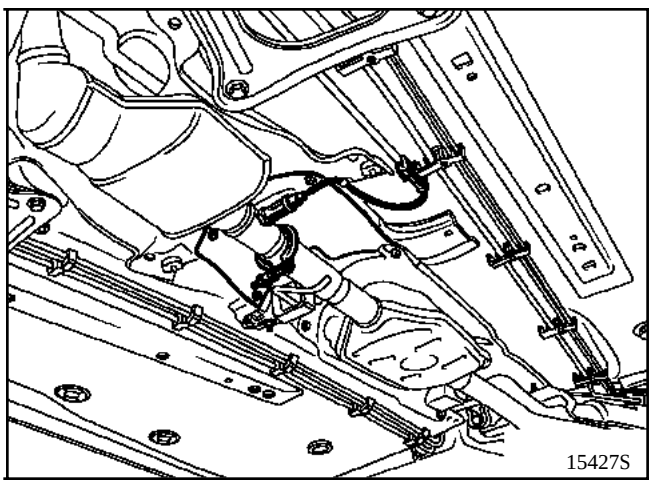


Disconnect and remove the oxygen sensor using **Mot. 1495**.

REMOVING THE DOWNSTREAM SENSOR

Place the vehicle on a two post lift.

Remove the connector cover.



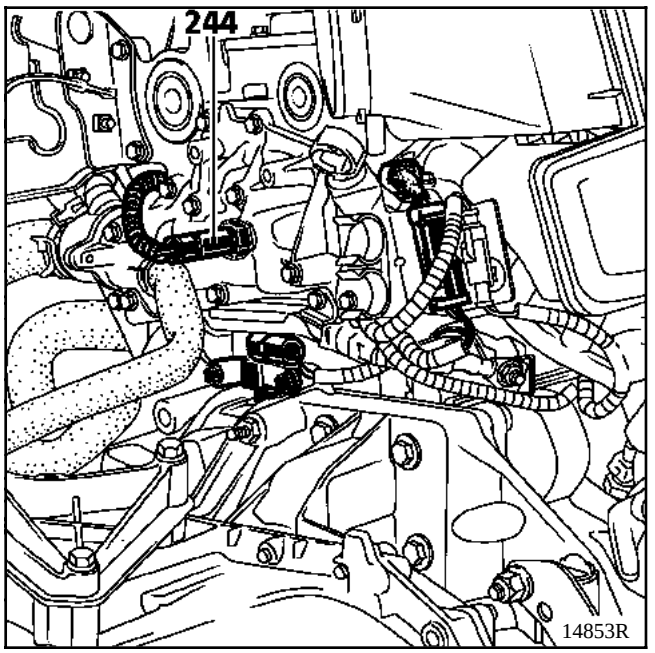
Disconnect and remove the oxygen sensor using an open wrench.

REFITTING

Refitting is the reverse of removal.

NOTE : check that the heat shield is correctly positioned between the oxygen sensor and the manifold (to prevent a chimney effect which would destroy the oxygen sensor connector).

Centralised coolant temperature management



244 Coolant temperature sensor (injection and coolant temperature indication on the instrument panel).
3 track sensor, two for coolant temperature information and one for information to the instrument panel.

This system is equipped with a single coolant temperature sensor for the injection, the fan and the temperature warning light on the instrument panel.

Operation

Sensor **244** allows:
- indication of the coolant temperature on the instrument panel,
- the injection computer to be informed of the engine coolant temperature.

Depending on engine coolant temperature, the injection computer manages:
- the injection system,
- the fan relays,
  - the **engine cooling fan** is controlled at slow speed if coolant temperature exceeds **99 °C** and stops when the temperature becomes less than **96 °C**,
  - the **engine cooling fan** is controlled at fast speed if coolant temperature exceeds **102 °C** and stops when the temperature becomes less than **98 °C**,
  - the **engine cooling fan** may be controlled at slow speed for the anti-percolation device and at fast speed for the AC.
- the temperature warning light.

COOLANT TEMPERATURE WARNING LIGHT

The warning light is controlled by the injection computer if the coolant temperature exceeds **118 °C**.

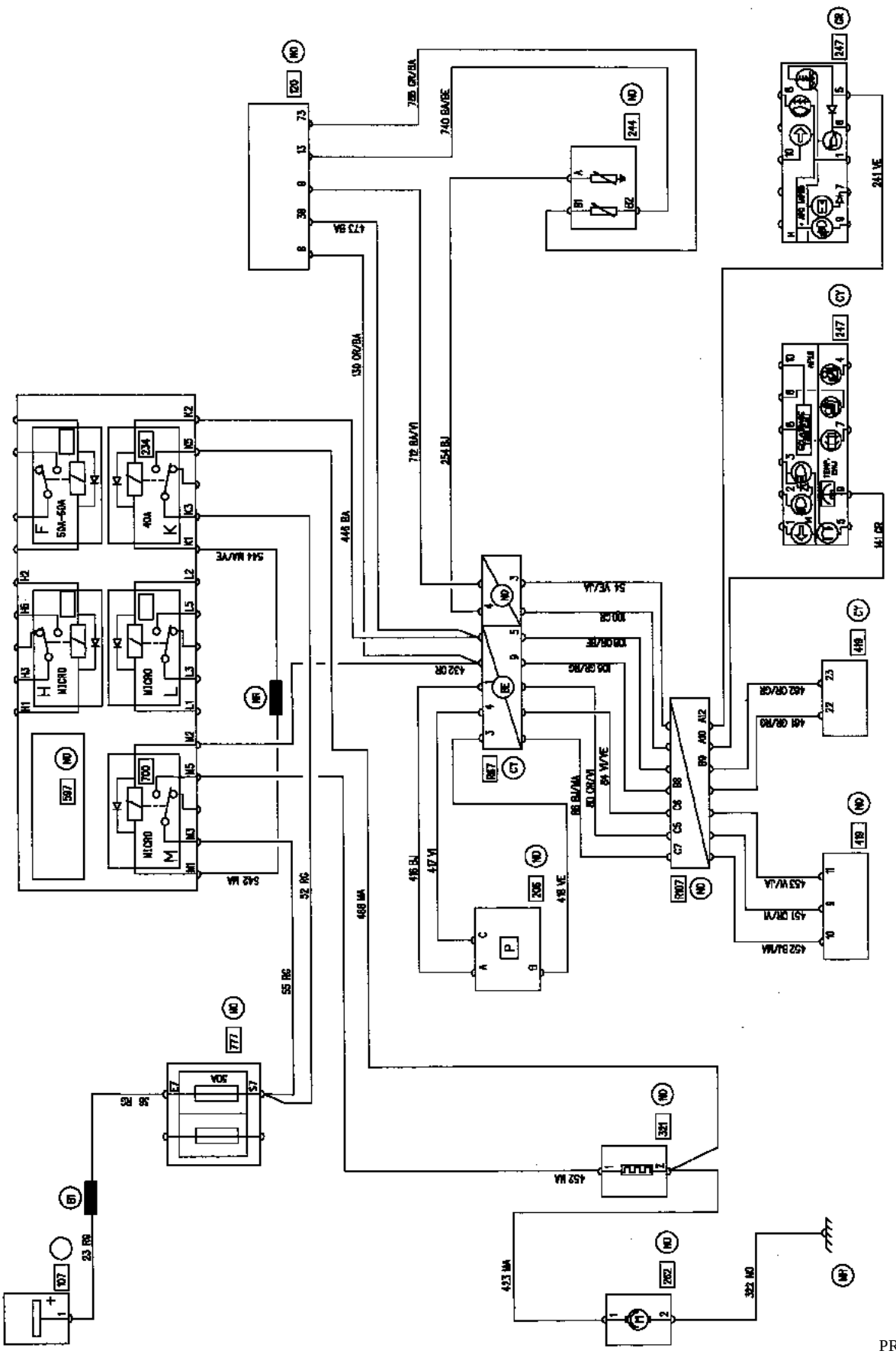
KEY TO COMPONENTS

120 injection computer
206 AC pressostat
234 Fast speed fan assembly relay
244 Coolant temperature sensor
247 Instrument panel warning light
262 Engine cooling fan assembly (GMV)
321 Fan assembly resistance
419 AC control unit
700 Slow speed fan assembly relay

Specifications of the coolant temperature sensor

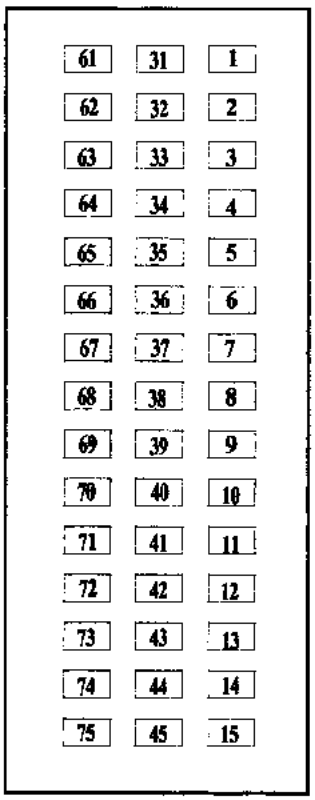
Temperature in °C (± 1°)	**20**	**40**	**80**	**90**
Coolant temperature sensor CTN type Resistance in Ohms	3 060 to 4 045	1 315 to 1 600	270 to 300	210 to 270

Operating wiring diagram

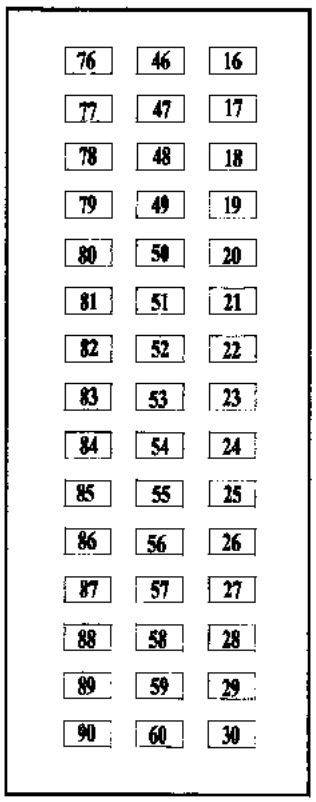


PRO15242

ALLOCATION OF INPUTS AND OUTPUTS FOR THE INJECTION COMPUTER



1	- - > - -	COIL CONTROL
3	- - - - -	EARTH
4	- - > - -	CANISTER SOLENOID VALVE CONTROL
8	- - > - -	FAN ASSEMBLY RELAY CONTROL (SLOW SPEED)
9	- - > - -	COOLANT TEMPERATURE WARNING LIGHT
10	- - > - -	AC COMPRESSOR CONTROL
11	- - > - -	ADAC OUTPUT
12	- - > - -	IDLE SPEED REGULATOR CONTROL
13	- - < - -	COOLANT TEMPERATURE INPUT
15	- - - - -	PRESSURE SENSOR EARTH
32	- - > - -	COIL CONTROL
33	- - - - -	EARTH
38	- - > - -	FAN ASSEMBLY RELAY CONTROL (FAST SPEED)
39	- - > - -	ACTUATOR RELAY CONTROL
41	- - > - -	IDLE SPEED REGULATOR CONTROL
42	- - > - -	IDLE SPEED REGULATOR CONTROL
43	- - < - -	THROTTLE POTENTIOMETER SIGNAL
44	- - < - -	DOWNSTREAM OXYGEN SENSOR SIGNAL
45	- - < - -	UPSTREAM OXYGEN SENSOR SIGNAL
63	- - > - -	UPSTREAM OXYGEN SENSOR HEATING CONTROL
65	- - > - -	DOWNSTREAM OXYGEN SENSOR HEATING CONTROL
66	- - - - -	POSITIVE AFTER RELAY FEED
68	- - > - -	FUEL PUMP RELAY CONTROL
70	- - > - -	ENGINE SPEED INFORMATION
72	- - > - -	IDLE SPEED REGULATOR CONTROL
73	- - - - -	COOLANT TEMPERATURE SENSOR EARTH
74	- - - - -	THROTTLE POTENTIOMETER SUPPLY
75	- - - - -	THROTTLE POTENTIOMETER EARTH

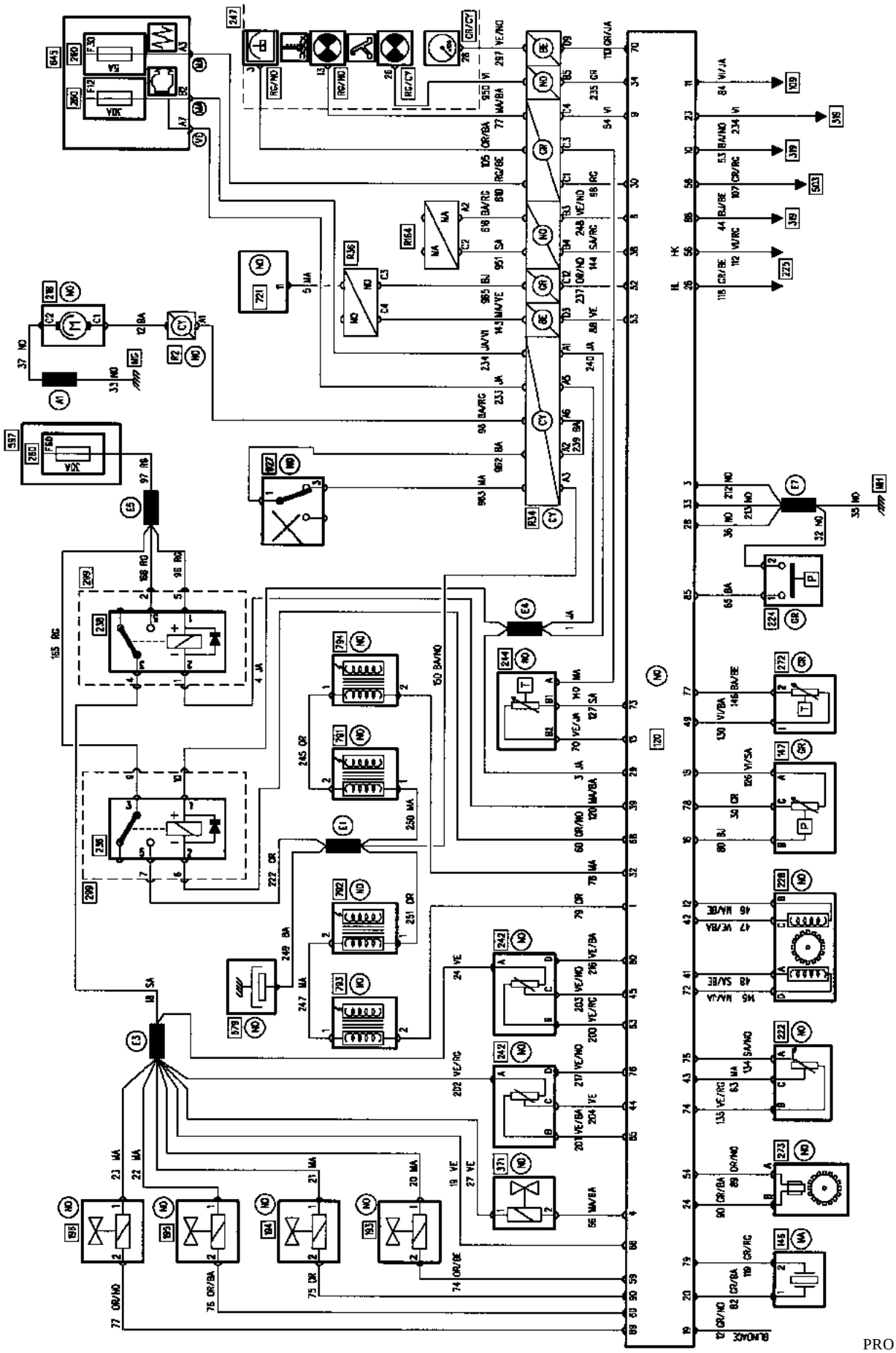


16	- - < - -	PRESSURE SENSOR SIGNAL
19	- - - - -	PINKING SENSOR SCREENING
20	- - < - -	PINKING SENSOR SIGNAL
23	- - < - -	CONSUMED POWER INFORMATION (AC COMPRESSOR)
24	- - < - -	ENGINE SPEED SENSOR SIGNAL
26	- <> -	FAULT FINDING
28	- - - - -	EARTH
29	- - - - -	POSITIVE AFTER IGNITION FEED
30	- - - - -	POSITIVE BEFORE IGNITION FEED
49	- - < - -	AIR TEMPERATURE SENSOR INPUT
52	- - - - -	NOT USED
53	- - < - -	VEHICLE SPEED
54	- - < - -	ENGINE SPEED SENSOR SIGNAL
56	- <> -	FAULT FINDING
58	- - < - -	ENGINE IMMOBILISER INPUT
59	- - > - -	INJECTOR CONTROL 1
60	- - > - -	INJECTOR CONTROL 3
76	- - - - -	DOWNSTREAM OXYGEN SENSOR EARTH
77	- - - - -	AIR TEMPERATURE SENSOR EARTH
78	- - - - -	PRESSURE SENSOR SUPPLY
79	- - - - -	PINKING SENSOR EARTH
80	- - - - -	UPSTREAM OXYGEN SENSOR EARTH
85	- - < - -	PAS PRESSOSTAT
89	- - > - -	INJECTOR CONTROL 4
90	- - > - -	INJECTOR CONTROL 2

PRO15097 - - < - - **INPUT**
- - > - - **OUTPUT**

KEY TO COMPONENTS

109	Computer
120	Injection computer
146	Pinking sensor
147	Temperature sensor
193, 194	
195, 196	Injectors
218	Fuel pump
222	Throttle potentiometer
224	Power assisted steering pressostat
225	Diagnostic socket
228	Idle speed regulator
236, 238	Control relay
242	Oxygen sensor
244	Coolant temperature sensor
272	Air temperature sensor
273	Speed threshold sensor
319	AC control panel
371	Canister solenoid valve
503	Electronic decoder unit
679	Anti-interference condenser
791, 792	
793, 794	Ignition coils
721	ABS computer assembly
927	Impact sensor



PRO14816

SETTING UP DIALOGUE BETWEEN THE FAULT FINDING TOOL AND THE COMPUTER

- connect the fault finding tool to the diagnostic socket.
- Select the vehicle.
- Select INJECTION.

COMPUTER IDENTIFICATION

The computer is identified by (parameter window):

COMPUTER PART NUMBER	**77 00 XX XX XX**
VDIAG NUMBER	**04**

ERASING THE MEMORY (ignition on)

Following an operation on the injection system, the computer memory can be erased.

There are three types of erasure (command window then erasure):

- ERASURE OF MEMORISED FAULTS
- ERASURE OF O.B.D FAULTS
- ERASURE OF PROGRAMMING

DESCRIPTION OF FAULT FINDING PHASES

FAULT CHECKING

This stage is the essential starting point before carrying out any operation on the vehicle.

1 - Order of priority

Electrical faults must be dealt with first, then the O.B.D. electrical faults then continue fault finding for O.B.D. operating faults (Oxygen sensor operating fault, Catalytic converter operating fault, Polluting misfiring, Destructive misfiring, Fuel circuit operating fault).
It should be noted that there must be no electrical fault present or memorised before dealing with O.B.D. operating faults.
Other priorities are dealt with in the "NOTES" section of the fault finding for the fault concerned.

2 - Fault

a) Non O.B.D. fault present :

Deal with the fault in accordance with the steps indicated in the "INTERPRETATION OF FAULTS" section.

b) O.B.D. fault present :

Follow the instructions in the "NOTES" section for the fault concerned.

If the fault is confirmed by the "NOTES" section:

The fault is present again. In this case, deal with the fault.

If the fault is not confirmed by the "NOTES" section:

Carry out the basic checks. To do this, check:
- the electrical lines corresponding to the fault,
- the connectors for these lines (rust, bent pins, ...),
- the resistance of the component which has been detected as being faulty,
- the cleanliness of the wires (insulation melted or cut, friction, ...).

c) O.B.D. or non O.B.D. memorised fault :

Note the faults displayed.
Follow the instructions in the "NOTES" section for the fault concerned.

If the fault is confirmed by the "NOTES" section:

The fault is present again. In this case, deal with the fault.

If the fault is not confirmed by the "NOTES" section:

Carry out the basic checks. To do this, check:
- the electrical lines corresponding to the fault,
- the connectors for these lines (rust, bent pins, ...),
- the resistance of the component which has been detected as being faulty,
- the cleanliness of the wires (insulation melted or cut, friction, ...).

3 - No faults:

If no faults are indicated by the fault finding tool, carry out a conformity check. This may help to locate a fault.

CHECKING CONFORMITY

The aim of the conformity check is to check the status and parameters which display no fault on the fault finding tool when they are outside the tolerance limits. As a result this phase allows :

- Faults to be diagnosed without a fault display, which may correspond to a customer complaint**.**

- To check that the injection is operating correctly and to ensure that there is no risk of a fault reappearing shortly after repair.

Therefore, there is status and parameter fault finding in this section, in their test conditions.

If a status does not function normally or a parameter is outside the tolerance range, you must consult the corresponding fault finding page.

CORRECT CHECKING USING THE FAULT FINDING TOOL

If the check using the fault finding tool is correct, but the customer complaint is still present, the problem must be dealt with through the customer complaint.

Dealing with the customer complaint

This section uses fault charts which give a series of possible causes for a fault.

These lines of enquiry are only to be used in the following circumstances:
- No fault appears on the fault finding tool.
- No anomaly is detected during the conformity check.
- The vehicle is not operating correctly.

NO COMMUNICATION	NO COMMUNICATION WITH THE COMPUTER

NOTES	None

Try the fault finding tool on another vehicle.

Check:
- the connection between the fault finding tool and the diagnostic socket (cable in good condition),
- the injection, engine and passenger compartment fuses.

Repair if necessary.

Check for the presence of **+ 12 V** on **track 16** and **earth** on **track 5** of the diagnostic socket.

Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, the continuity and that there is no interference resistance on line**:

Computer 28 → Earth
Computer 33 → Earth
Computer 3 → Earth
Computer 56 → 7 Diagnostic socket
Computer 26 → 15 Diagnostic socket
Computer 29 → Fuse
Computer 30 → Fuse

Repair.

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT	COMPUTER 1.dEF = Computer fault 2.dEF = Saved memory zone fault 3.dEF = Engine immobiliser memory zone fault
NOTES	None.
1.dEF	Computer incorrect or faulty. Change the computer.
2.dEF **3.dEF**	**Do not change the computer immediately.** Carry out the following procedure: - Switch the ignition on and enter into dialogue with the computer. - Erase the computer memory. - Switch off the ignition and wait for the loss of dialogue with the computer. - Switch the ignition on, enter into dialogue with the computer. If the computer fault is still present, carry out this procedure again. If the computer fault is still present after the fifth attempt to erase it, change the injection computer.
AFTER REPAIR	Erase the memorised faults.

JSI051.0

FAULT PRESENT or MEMORISED	FEED 1.dEF = +12V after actuator relay feed fault 2.dEF = +12V after ignition feed fault

NOTES	**Conditions for fault detection by the computer:** Switch off the ignition and wait for the loss of dialogue. Switch the ignition on, enter into dialogue. **Condition for carrying out fault finding:** The fault is present.

1.dEF	Check **the condition of the battery and vehicle earths**. Repair if necessary.
	Check **the connection and condition of the actuator relay connector.** Change the connector if necessary.
	With the ignition switched on, check for **12 V on track 3 of the actuator relay.** Repair the line up to the fuse.
	Disconnect the clip on track 5 of the relay carrier. With the ignition switched on, check for **12 V on track 5 of the actuator relay.** Change the relay if this is not the case.
	Check **the insulation and continuity of the line:** **Computer 66 → 5 Actuator relay** Repair if necessary.
	Disconnect each of the components in turn (injector, canister bleed solenoid valve, ...) using these 12 Volts to determine which of these is faulty. Change the faulty component.
2.dEF	This fault is not active as it creates a loss of dialogue.

AFTER REPAIR	Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	ACTUATOR RELAY CONTROL CIRCUIT CC0 = Open circuit or short circuit to earth of computer line 39 (control) CC1 = Short circuit to 12 V of computer line 39 (control)

NOTES	**Conditions for fault detection by the computer:** Switch the ignition on and wait for the loss of dialogue. Switch the ignition on, enter into dialogue. **Condition for carrying out fault finding:** The fault is present. **NOTE:** This fault takes priority. It must be dealt with before those which follow.

Check **the condition of the battery and vehicle earths.**
Repair if necessary.

Check **the connection and condition of the actuator relay connector.**
Change the connector if necessary.

Check for **12 V on track 1 of the actuator relay.**
Repair the line up to the fuse.

Check the coil of the actuator relay.
Change the actuator relay if necessary.

Check **the insulation and continuity of the line:**

Computer 39 ⟶ 2 Actuator relay

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	FUEL PUMP RELAY CONTROL CIRCUIT CO0 = Open circuit or short circuit to earth of computer line 68 CC1 = Short circuit to 12 V of computer line 68 O.B.D. = O.B.D. fault : Fuel pump relay
NOTES	**Conditions for fault detection by the computer:** 1/ Switch off the ignition and wait for the loss of dialogue. Switch the ignition on, enter into dialogue. 2/ If O.B.D. fault, run the engine. **Condition for carrying out fault finding:** The fault is present. **NOTE**: This fault takes priority. It must be dealt with before those which follow.

CO0 **CC1**	Check **the connection and condition of the fuel pump relay connector.** Change the connector if necessary.
	With the ignition switched on, check for **+12 V on track 1 of the fuel pump relay.** Repair if necessary.
	Check **the insulation and continuity of the line:** **Computer 68 ⟶ 2 Fuel pump relay** Repair if necessary.
	Check the fuel pump relay coil. Change the fuel pump relay if necessary.
	The fault is still not resolved! The injection computer must be changed. **IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.**

O.B.D.	The fault is not actually present (otherwise there would be CO0 or CC1) but it has been detected several times. The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer). For this check, you must refer to the method for "CO0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	CYLINDER 1 INJECTOR CIRCUIT CC1 = Short circuit to 12 V of computer line 59 (injector control) CC0 = Short circuit to earth of computer line 59 (injector control) CO = Open circuit of computer line 59 (injector control) O.B.D. = O.B.D. fault : Cylinder 1 injector
NOTES	**Conditions for fault detection by the computer:** Run the engine. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO or CC0 or CC1. 3/ The fault is memorised but became present with CO or CC0 or CC1.

CC1
CC0
CO

NOTES	If the fault is memorised but became present with CO or CC0 or CC1 then deal with this fault finding.

Check the **resistance of injector 1.**
Change the injector if necessary.

When the ignition is switched on, check for **12 V** on track **1 of injector 1.**
If necessary, repair the **line up to the actuator relay**.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

Computer 59 → 2 Injector 1

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with CO or CC0 or CC1, then consult "CO, CC0, CC1"

The fault is not actually present (otherwise there would be CO or CC0 or CC1) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CO and CC0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	CYLINDER 2 INJECTOR CIRCUIT CC1 = Short circuit to 12 V of computer line 90 (injector control) CC0 = Short circuit to earth of computer line 90 (injector control) CO = Open circuit of computer line 90 (injector control) O.B.D. = O.B.D. fault : Cylinder 2 injector
NOTES	**Conditions for fault detection by the computer:** Run the engine. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO or CC0 or CC1. 3/ The fault is memorised but became present with CO or CC0 or CC1.

CC1
CC0
CO

NOTES	If the fault is memorised but became present with CO or CC0 or CC1 then deal with this fault finding.

Check the **resistance of injector 2.**
Change the injector if necessary.

When the ignition is switched on, check for **12 V** on track **1 of injector 2.**
If necessary, repair the **line up to the actuator relay**.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

Computer 90 ⟶ 2 Injector 2

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with CO or CC0 or CC1, then consult "CO, CC0, CC1"

The fault is not actually present (otherwise there would be CO or CC0 or CC1) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CO and CC0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	CYLINDER 3 INJECTOR CIRCUIT CC1 = Short circuit to 12 V of computer line 60 (injector control) CC0 = Short circuit to earth of computer line 60 (injector control) CO = Open circuit of computer line 60 (injector control) O.B.D. = O.B.D. fault : Cylinder 3 injector
NOTES	**Conditions for fault detection by the computer:** Run the engine. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO or CC0 or CC1. 3/ The fault is memorised but became present with CO or CC0 or CC1.

CC1
CC0
CO

NOTES	If the fault is memorised but became present with CO or CC0 or CC1 then deal with this fault finding.

Check the **resistance of injector 3.**
Change the injector if necessary.

When the ignition is switched on, check for **12 V** on track **1 of injector 3.**
If necessary, repair the **line up to the actuator relay**.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

Computer 60 ⟶ 2 Injector 3

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with CO or CC0 or CC1, then consult "CO, CC0, CC1"

The fault is not actually present (otherwise there would be CO or CC0 or CC1) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CO and CC0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	CYLINDER 4 INJECTOR CIRCUIT CC1 = Short circuit to 12 V of computer line 89 (injector control) CC0 = Short circuit to earth of computer line 89 (injector control) CO = Open circuit of computer line 89 (injector control) O.B.D. = O.B.D. fault : Cylinder 4 injector

NOTES	**Conditions for fault detection by the computer:** Run the engine. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO or CC0 or CC1. 3/ The fault is memorised but became present with CO or CC0 or CC1.

CC1
CC0
CO

NOTES	If the fault is memorised but became present with CO or CC0 or CC1 then deal with this fault finding.

Check the **resistance of injector 4.**
Change the injector if necessary.

When the ignition is switched on, check for **12 V** on track **1 of injector 4.**
If necessary, repair the **line up to the actuator relay**.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

Computer 89 ⟶ 2 Injector 4

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with CO or CC0 or CC1, then consult "CO, CC0, CC1"

The fault is not actually present (otherwise there would be CO or CC0 or CC1) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CO and CC0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	IGNITION COIL 1-4 CIRCUIT CC1 = Short circuit to 12 V of computer line 1 CO0 = Open circuit or short circuit to earth of computer line 1 O.B.D. = O.B.D. fault : Ignition coil 1-4

NOTES	**Conditions for fault detection by the computer:** Run the engine or set to starter speed for 10 seconds. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO0 or CC1. 3/ The fault is memorised but became present with CO0 or CC1.

CC1
CO0

NOTES	If the fault is memorised but became present with CO0 or CC1 then deal with this fault finding.

Check the **cleanliness of the anti-interference condenser.**

Check the **resistance of the coil** for cylinder 1 then 4. Change the coil if necessary.

Check the **connection between coil 1 on track 2 and coil 4 on track 1.**
Repair if necessary.

Check for **+ after fuel pump relay feed** on track 1 of coil 1.
Repair if necessary.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

32 of the computer ⟶ **Track 2 of the coil for cylinder 4**

Repair if necessary.

Check:
- The connection and condition of the fuel pump relay connector.
- With the ignition switched on, for +12 V on track 1 of the fuel pump relay.
- The line on track 68 from the computer to line 2 of the fuel pump relay.
- The fuel pump relay coil.

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with CO0 or CC1, then consult "CO0, CC1"
		The fault is not actually present (otherwise there would be CO0 or CC1) but it has been detected several times. The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer). For this check, you must refer to the method for "CO0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	IGNITION COIL 2-3 CIRCUIT CC1 = Short circuit to 12 V of computer line 32 CO0 = Open circuit or short circuit to earth of computer line 32 O.B.D. = O.B.D. fault : Ignition coil 2-3

NOTES	**Conditions for fault detection by the computer:** Run the engine or set to starter speed for 10 seconds. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with CO0 or CC1. 3/ The fault is memorised but became present with CO0 or CC1.

CC1
CO0

NOTES	If the fault is memorised but became present with CO0 or CC1 then deal with this fault finding.

Check the **cleanliness of the anti-interference condenser.**

Check the **resistance of the coil** for cylinder 2 then 3. Change the coil if necessary.

Check the connection between coil **2 on track 2 and coil 3 on track 1**.
Repair if necessary.

Check for **+ after fuel pump relay feed** on track 1 for coil 2.
Repair if necessary.

Connect the bornier in place of the computer and check **the insulation and continuity of the line:**

1 of the computer ⟶ **Track 2 of the coil for cylinder 3**

Repair if necessary.

Check:
- The connection and condition of the fuel pump relay connector.
- With the ignition switched on, check for +12 V on track 1 of the fuel pump relay.
- The line on track 68 from the computer to line 2 on the fuel pump relay.
- The fuel pump relay coil.

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with CO0 or CC1, then consult "CO0, CC1"
		The fault is not actually present (otherwise there would be CO0 or CC1) but it has been detected several times. The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer). For this check, you must refer to the method for "CO0 and CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	FLYWHEEL SIGNAL INFORMATION 1 dEF = Engine flywheel target fault 2 dEF = No flywheel signal 1 O.B.D. = O.B.D. fault : Engine flywheel target 2 O.B.D. = O.B.D. fault : No flywheel signal

NOTES	The pressure sensor must not be faulty when this fault finding is carried out. **Conditions for fault detection by the computer:** 1/ Switch off the ignition and wait for the loss of dialogue with the computer. Enter into dialogue with the computer and erase the memorised faults. 2/ Activate the starter motor for 10 seconds or run the engine at idle speed. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with 1 dEF or 2 dEF. 3/ The fault is memorised but became present with 1 dEF or 2 dEF.

1 dEF
2 dEF

NOTES	If the fault is memorised but became present with 1 dEF or 2 dEF then deal with this fault finding.

Check the **connection and condition of the target sensor connector**.
Change the connector if necessary.

Check the resistance of the target sensor.
Change the sensor if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 54 → Target sensor
Computer 24 → Target sensor

Repair if necessary.

If 1 dEF, then check the condition of the engine flywheel.

If the fault persists, change the sensor.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

1 O.B.D. **2 O.B.D.**	***NOTES***	If the fault is present with 1 O.B.D. or 2 O.B.D. but became present with 1 dEF or 2 dEF, then consult "1 dEF, 2 dEF"

The fault is not actually present (otherwise there would be 1 dEF or 2 dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "1 dEF, 2 dEF".

AFTER REPAIR	After repair, the fault may become 1 O.B.D. or 2 O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	ENGINE IMMOBILISER Electrical fault on the coded line.

NOTES	None

Check the **connection and condition of the coded line connectors** on track 58 of the injection computer. Change the faulty connector if necessary.
Connect the bornier in place of the computer and check **the insulation and the continuity of the coded line** on track 58 of the injection computer. Repair if necessary.
If the fault persists, consult the engine immobiliser fault finding.

AFTER REPAIR	Erase the memorised faults. Deal with any other faults.

JSI051.0

FAULT PRESENT	ENGINE IMMOBILISER CODE NOT PROGRAMMED

NOTES	None

This fault indicates that the computer has not been programmed with the code or that the code has been deliberately erased from the injection computer.

If necessary, refer to the engine immobiliser method.

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT or MEMORISED	PRESSURE SENSOR CIRCUIT dEF = Manifold pressure fault O.B.D. = O.B.D. fault : Manifold pressure

NOES	**Conditions for fault detection by the computer:** 1/ Switch off the ignition and wait for the loss of dialogue with the computer. Enter into dialogue with the computer. 2/ Increase the engine speed to more than 608 rpm for a minimum of 10 seconds. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF	***NOTES***	If the fault is memorised but became present with dEF then deal with this fault finding.

If the fault is only present when the engine is running, check the coherence of the throttle position parameter in the no load and full load positions.
Press the accelerator pedal gently (from no load to full load) and check that the throttle position increases regularly.
If this is not the case, the information is not correct. Deal with the fault finding for this parameter.

Check **the condition of the pressure sensor connector**.
Change the connector if necessary.

Check that the pressure sensor is **pneumatically connected.**

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 16 → Pressure sensor
Computer 15 → Pressure sensor
Computer 78 → Pressure sensor

Repair if necessary.

If the fault persists, change the sensor.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF".

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	IDLE SPEED REGULATION CIRCUIT dEF = Idle speed regulation fault O.B.D. = O.B.D. fault : Idle speed regulation fault

NOTES	**Conditions for fault detection by the computer:** Switch on the ignition. **Condition for carrying out fault finding:** The fault is present.

dEF

Check the **connection and condition** of the idle speed regulation stepping motor connector.
Change the connector if necessary.

Check **the resistance of the idle speed regulation stepping motor.**
Change the valve if necessary.

Check **the insulation, continuity and that there is no interference resistance on line:**

Computer 12 → Idle speed regulation stepping motor
Computer 41 → Idle speed regulation stepping motor
Computer 42 → Idle speed regulation stepping motor
Computer 72 → Idle speed regulation stepping motor

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	THROTTLE POTENTIOMETER CIRCUIT dEF = Throttle position fault O.B.D. = O.B.D. fault : Throttle position

NOTES	**Conditions for fault detection by the computer:** 1/ Leave the vehicle with the ignition switched on for 10 seconds in the no load position. 2/ Gently vary the throttle potentiometer from no load to full load. 3/ Remain at full load for 10 seconds. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the throttle potentiometer connector.
Change the connector if necessary.

Check the **resistance of the throttle potentiometer** (the resistance is **zero or equal to infinity** in the event of a clear fault).
Check that the resistance of the potentiometer is correctly following its curve, by moving the throttle from no load to full load.
Check that the throttle moves the potentiometer.
Repair or change the throttle potentiometer if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 75 → Throttle potentiometer
Computer 74 → Throttle potentiometer
Computer 43 → Throttle potentiometer

Repair if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF"

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	COOLANT TEMPERATURE SENSOR CIRCUIT dEF = Coolant temperature fault O.B.D. = O.B.D. fault : Coolant temperature

NOTES	**Conditions for fault detection by the computer:** 1/ Switch on the ignition. 2/ If the fault is only memorised, run the engine (1 operation of the engine cooling fan assembly). **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the coolant temperature sensor connector.
Change the connector if necessary.

Check that the **resistance of the coolant temperature sensor** is **not zero or equal to infinity** (sensor fault).
Change the coolant temperature sensor if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 73 ⟶ Coolant temperature sensor
Computer 13 ⟶ Coolant temperature sensor

Repair if necessary.

Check the **resistance of the sensor at different temperatures.**
Change the sensor if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF".

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	AIR TEMPERATURE SENSOR CIRCUIT dEF = Air temperature fault O.B.D. = O.B.D. fault : Air temperature

NOTES	**Conditions for fault detection by the computer:** 1/ Switch on the ignition. 2/ If the fault is only memorised, run the engine (1 operation of the engine cooling fan assembly). **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF	***NOTES***	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the air temperature sensor connector.
Change the connector if necessary.

Check that the resistance of the air temperature sensor is **not zero or equal to infinity** (sensor fault).
Change the air temperature sensor if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 77 ⟶ Air temperature sensor
Computer 49 ⟶ Air temperature sensor

Repair if necessary.

Check the **resistance of the sensor at different temperatures.**
Change the sensor if necessary.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF"

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	CANISTER BLEED SOLENOID VALVE CIRCUIT CC1 = Short circuit to 12 V of computer line 4 CC0 = Short circuit to earth of computer line 4 CO = Open circuit of computer line 4 O.B.D. = O.B.D. fault : Canister bleed

NOTES	**Conditions for fault detection by the computer:** Switch on the ignition. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF.

CO
CC0
CC1

NOTES	None

Check the **connection and condition** of the canister bleed connector**.** Change the connector if necessary.
Check the **resistance of the canister bleed valve.** Change the valve if necessary.
With the ignition switched on, check for **12 V on the canister bleed valve.** Repair if necessary.
Connect the bornier in place of the computer and check **the insulation and continuity of the line:** **Computer 4 ⟶ Canister bleed valve** Repair if necessary.
Change the canister bleed valve.
The fault is still not resolved! The injection computer must be changed. **IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.**

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with CO or CC0 or CC1, then consult "CO, CC0, CC1"

The fault is not actually present (otherwise there would be CO, CC0, CC1) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CO, CC0, CC1".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	UPSTREAM OXYGEN SENSOR CIRCUIT dEF = Oxygen sensor signal fault O.B.D. = O.B.D. fault : Oxygen sensor fault

NOTES	**Conditions for fault detection by the computer:** 1/ Switch on the ignition. 2/ Run the engine, wait until richness regulation is active and wait 5 minutes. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the oxygen sensor connector.
Change the connector if necessary.

Check that there is **no air leak.**

If the vehicle is frequently driven in urban areas, **decontaminate the oxygen sensor.**

With the ignition switched on, check for **+12 V (after actuator relay feed) on track A of the oxygen sensor.**
Repair if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 45 → Oxygen sensor
Computer 80 → Oxygen sensor

Repair if necessary.

If the fault persists, change the oxygen sensor.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF"

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	UPSTREAM OXYGEN SENSOR HEATING CIRCUIT CC1 = Short circuit to 12 V of computer line 63 (sensor heating control) CC0 = Short circuit to earth of computer line 63 (sensor heating control) CO = Open circuit of computer line 63 (sensor heating control) dEF = Heating power fault 1 O.B.D. = O.B.D. fault : Oxygen sensor heating 2 O.B.D. = O.B.D. fault : Heating power

NOTES	**Conditions for fault detection by the computer:** Run the engine. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with 1 O.B.D. or 2 O.B.D. but became present with CO or CC0 or CC1 or dEF. 3/ The fault is memorised but it became present with CO or CC0 or CC1 or dEF.

CC1 CC0 CO dEF	***NOTES***	If the fault is memorised but became present with CC1, CC0, CO or dEF then deal with this fault finding.

Check the **connection and condition** of the oxygen sensor connector. Change the connector if necessary.
Check the oxygen sensor **heating resistance**. Change the oxygen sensor if necessary.
Check for **12 Volts on track A of the oxygen sensor.** Repair the electrical line up to the actuator relay.
Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line**: **Computer 63 ⟶ Oxygen sensor** Repair if necessary.
The fault is still not resolved! The injection computer must be changed. **IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.**

AFTER REPAIR	After repair, the fault may become 1 O.B.D. or 2 O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

1 O.B.D. **2 O.B.D.**	***NOTES***	If the fault is present with 1 O.B.D. or 2 O.B.D. but became present with CC1, CC0, CO or dEF, then consult "CC1, CC0, CO, dEF"

The fault is not actually present (otherwise there would be CC1, CC0, CO or dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CC1, CC0, CO, dEF".

AFTER REPAIR	After repair, the fault may become 1 O.B.D. or 2 O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	DOWNSTREAM OXYGEN SENSOR CIRCUIT dEF = Oxygen sensor signal fault O.B.D. = O.B.D. fault : Oxygen sensor signal

NOTES	**Conditions for fault detection by the computer:** 1/ Switch on the ignition. 2/ Carry out a road test after the engine cooling fan has operated for at least 2 minutes. You must not be in no load position during the test. 3/ Continue the road test on a slope under no load conditions (deceleration phase). **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the oxygen sensor connector.
Change the connector if necessary.

Check that there is **not an air leak.**

If the vehicle is frequently driven in urban areas, **decontaminate the oxygen sensor.**

With the ignition switched on, check for **+12 V (after actuator relay feed) on track A of the oxygen sensor.**
Repair if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 44 → Oxygen sensor
Computer 76 → Oxygen sensor

Repair if necessary.

If the fault persists, change the oxygen sensor.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

O.B.D.	***NOTES***	If the fault is present with O.B.D. but became present with dEF, then consult "dEF"

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	DOWNSTREAM OXYGEN SENSOR HEATING CIRCUIT CC1 = Short circuit to 12 V of computer line 65 (sensor heating control) CC0 = Short circuit to earth of computer line 65 (sensor heating control) CO = Open circuit of computer line 65 (sensor heating control) dEF = Heating power fault 1 O.B.D. = O.B.D. fault : Oxygen sensor heating 2 O.B.D. = O.B.D. fault : Heating power

NOTES	**Conditions for fault detection by the computer:** Switch on the ignition, run the engine and wait for the engine cooling fan assembly to operate then accelerate gently for one minute. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with 1 O.B.D. or 2 O.B.D. but became present with CO or CC0 or CC1 or dEF. 3/ The fault is memorised but it became present with CO or CC0 or CC1 or dEF.

CC1 CC0 CO dEF	***NOTES***	If the fault is memorised but became present with CC1, CC0, CO or dEF then deal with this fault finding.

Check the **connection and condition** of the oxygen sensor connector. Change the connector if necessary.
Check the oxygen sensor **heating resistance**. Change the oxygen sensor if necessary.
Check for **12 Volts on track A of the oxygen sensor.** Repair the electrical line up to the actuator relay.
Connect the bornier in place of the computer and check **the insulation and continuity of the line**: **Computer 65 ⟶ Oxygen sensor** Repair if necessary.
The fault is still not resolved! The injection computer must be changed. **IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.**

AFTER REPAIR	After repair, the fault may become 1 O.B.D. or 2 O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

CONT	

1 O.B.D. **2 O.B.D.**	***NOTES***	If the fault is present with 1 O.B.D. or 2 O.B.D. but became present with CC1, CC0, CO or dEF, then consult "CC1, CC0, CO, dEF"

The fault is not actually present (otherwise there would be CC1, CC0, CO or dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "CC1, CC0, CO, dEF".

AFTER REPAIR	After repair, the fault may become 1 O.B.D. or 2 O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	PINKING SENSOR CIRCUIT dEF = Pinking signal fault O.B.D. = O.B.D. fault : Pinking signal

NOTES	**Conditions for fault detection by the computer:** Carry out a road test with warm engine and high engine speed. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the pinking sensor connector.
Change the connector if necessary.

Check the **tightness of the pinking sensor** on the engine block.
Repair if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:**

Computer 20 → Pinking sensor
Computer 79 → Pinking sensor
Computer 19 → Pinking sensor screening

Repair if necessary.

The fault persists! Change the pinking sensor.

The fault is still not resolved! The injection computer must be changed.

IMPORTANT: The damage to the computer is probably due to an electrical shock. The cause of the damage must be found before a new computer is fitted.

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with dEF, then consult "dEF"

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	VEHICLE SPEED INFORMATION dEF = Vehicle speed fault O.B.D. = O.B.D. fault : Vehicle speed

NOTES	The ABS MUST NOT BE faulty when this fault finding is carried out. **Conditions for fault detection by the computer:** 1/ Carry out a test whilst monitoring vehicle speed. 2/ Continue the road test on a hill at constant speed. 3/ Continue the road test, driving on a slope, in the no load position. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is present with O.B.D. but became present with dEF. 3/ The fault is memorised but it became present with dEF.

dEF

NOTES	If the fault is memorised but became present with dEF then deal with this fault finding.

Check the **connection and condition** of the vehicle speed line connector.
Change the connector if necessary.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line 53 of the computer.**
Repair if necessary.

If the fault persists, consult the **ABS fault finding.**

O.B.D.

NOTES	If the fault is present with O.B.D. but became present with dEF, then consult "dEF".

The fault is not actually present (otherwise there would be dEF) but it has been detected several times.
The circuit must therefore be checked without changing the components which are not clearly identified as being faulty (there is therefore no need to change the computer).
For this check, you must refer to the method for "dEF".

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the memorised faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	INJECTION ----> AC CONNECTION Absence or incoherence of power consumed information, computer line 23

NOTES	**Conditions for fault detection by the computer:** 1/ Run the engine and turn on the air conditioning. 2/ Check the battery voltage as it should be greater than 11 V. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is memorised but it became present during the test.

Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line 23 of the computer.**
Repair if necessary.

If the fault persists, consult the air conditioning fault finding.

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	AIR CONDITIONING CC1 = Short circuit to 12 V CC0 = Short circuit to earth CO = Open circuit
NOTES	None

Ignore this fault as it is not active on this vehicle

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	CAMSHAFT OFFSET DEVICE CC1 = Short circuit to 12 V CC0 = Short circuit to earth CO = Open circuit
NOTES	None

Ignore this fault as it is not active on this vehicle

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	COOLANT TEMPERATURE OVERHEATING WARNING LIGHT CIRCUIT CC0 = Open circuit or short circuit to earth, computer line 9 CC1 = Short circuit to 12 V, computer line 9

NOTES	**Conditions for fault detection by the computer:** Run the engine at a speed greater than 1500 rpm for 10 seconds. **Condition for carrying out fault finding:** 1/ The fault is present. 2/ The fault is memorised but it became present during the test.

Check the **connection and condition of the overheating warning light line connector.** Change the connector if necessary.
Check **the condition of the warning light** (if it does not illuminate). Replace it if necessary.
Check that **12 V is reaching the warning light.** Repair the line up to the fuse.
Connect the bornier and **check the insulation and continuity** of the line for computer track 9. Repair.

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	MIL WARNING LIGHT CIRCUIT (O.B.D.) CC0 = Open circuit or short circuit to earth CC1 = Short circuit to 12 V O.B.D. = O.B.D. fault : MIL warning light (O.B.D.) (only with a memorised fault)
NOTES	None.

Ignore this fault as it is not active on this vehicle.

AFTER REPAIR	After repair, the fault may become O.B.D., in which case, ignore it. It must be erased before the conformity check is carried out. Erase the MEMORISED faults.Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	SLOW SPEED FAN ASSEMBLY CIRCUIT CC1 = Short circuit to 12 V CC0 = Short circuit to earth CO = Open circuit
NOTES	None

Ignore this fault as it is not active on this vehicle

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	FAST SPEED FAN ASSEMBLY CIRCUIT CC1 = Short circuit to 12 V CC0 = Short circuit to earth CO = Open circuit
NOTES	None

Ignore this fault as it is not active on this vehicle

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	WHEEL SPEED SENSOR CIRCUIT DEF = Wheel speed sensor fault O.B.D. = O.B.D. fault : Wheel speed sensor
NOTES	None

Ignore this fault as there are no wheel speed sensors on this vehicle.

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	INJECTION ----> AT CONNECTION None
NOTES	None

Ignore this fault as this vehicle does not have AT.

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT or MEMORISED	MIL (O.B.D.) ----> TCM CONNECTION None
NOTES	None

Ignore this fault as this vehicle does not have AT.

AFTER REPAIR	Erase the MEMORISED faults. Give the order to confirm the repair. Deal with any other faults.

JSI051.0

FAULT PRESENT	O.B.D. OXYGEN SENSOR FAULT FINDING : IN PROGRESS Indicates that this fault finding is being carried out.

NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT	O.B.D. OXYGEN SENSOR FAULT FINDING : CARRIED OUT Indicates that this fault finding has just finished.

NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT or MEMORISED	OXYGEN SENSOR OPERATING FAULT Indicates incoherence of the information received by the upstream oxygen sensor.

NOTES	None

Check that the **exhaust pipe does not have an air leak.**
If the vehicle is frequently driven in urban areas, **decontaminate the oxygen sensor.**
Check the connection and condition **of the oxygen sensor connector**. Change the connector if necessary.
Check the **oxygen sensor heating resistance**. Change the oxygen sensor if necessary.
With the ignition switched on, check for **+12 V (after actuator relay feed) on track A of the oxygen sensor.** Repair if necessary.
Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on line:** **Computer 45 ⟶ Oxygen sensor** **Computer 80 ⟶ Oxygen sensor** Repair if necessary.
Connect the bornier in place of the computer and check **the insulation, continuity and that there is no interference resistance on the line:** **Computer 63 ⟶ Oxygen sensor** Repair if necessary.
The fault persists! Change the oxygen sensor.

AFTER REPAIR	Note the other operating faults. Erase the O.B.D. faults. Deal with any other faults.

JSI051.0

PRESENT or MEMORISED	OXYGEN SENSOR REPAIR VALIDATION BON = Repair validated 1 dEF = Road test condition not observed 2 dEF = Fault present detected
NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

PRESENT	O.B.D. CATALYTIC CONVERTER FAULT FINDING : IN PROGRESS Indicates that this fault finding is being carried out

NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

PRESENT	O.B.D. CATALYTIC CONVERTER FAULT FINDING: CARRIED OUT Indicates that this fault finding has just finished

NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT or MEMORISED	CATALYTIC CONVERTER OPERATING FAULT Indicates incoherence of the information received by the upstream oxygen sensor

NOTES	None

Check that the **exhaust pipe does not have an air leak.**
Repair if necessary.

Visually check the condition of the catalytic converter. Deformation may explain why it is malfunctioning.

Visually check that there has not been a thermal shock. Cold water hitting a hot catalytic converter may damage it.

Check that the oil and coolant consumption is not excessive. Ask the customer if he has used an additive or other product of this type. This type of product can pollute the catalytic converter and in the long or short term, render it ineffective.

Check whether there has been misfiring. This can damage the catalytic converter.

If the cause of the damage has been found, you can change the catalytic converter. If you change the catalytic converter without finding the cause, there is a risk that the new catalytic converter will be damaged very quickly.

AFTER REPAIR	Note the other operating faults. Erase the O.B.D. faults. Deal with any other faults.

JSI051.0

PRESENT or MEMORISED	CATALYTIC CONVERTER REPAIR VALIDATION BON = Repair validated 1 dEF = Road test condition not observed 2 dEF = Fault present detected
NOTES	This information can only be used during a specific road test which cannot be carried out in after sales.

Ignore this information.

AFTER REPAIR	None.

JSI051.0

PRESENT	O.B.D. MISFIRING FAULT FINDING : IN PROGRESS Indicates that this fault finding is being carried out

NOTES	There should be no present or memorised electrical fault. Carry out engine target programming (see section 17 "Conditions for fault finding")

Erase the memorised faults and the O.B.D. fault.
The following conditions must be met to activate this fault finding and check that the system has been repaired correctly:
- There must be no more electrical faults on the vehicle.
- Engine target programming must have been carried out.
- The engine must be warm (75 °C).
- The vehicle must be running at idle speed with all consumers operating for 11 minutes.

If no "misfiring" fault becomes present, the repair is correct.

If a "misfiring" fault is present, deal with the fault.

AFTER REPAIR	None.

JSI051.0

FAULT **PRESENT**	POLLUTING MISFIRING DESTRUCTIVE MISFIRING 1 dEF = Misfiring during last driving period 2 dEF = Misfiring confirmed

NOTES	Misfiring on cylinder 1 Misfiring on cylinder 2 Misfiring on cylinder 3 Misfiring on cylinder 4 Gives information on the nature and location of the fault

Connect the OPTIMA 5800 station and start the ignition test.
Follow the instructions and change the necessary components.

Connect the OPTIMA 5800 station and start the compression test.
Follow the instructions and change the necessary components.

Connect the OPTIMA 5800 station and check the engine target.
Repair if necessary.

If nothing faulty has been found, there must be a fault on the fuel circuit.
The following must therefore be checked:
- The fuel filter.
- The fuel flow and pressure.
- The condition of the fuel pump.
- The cleanliness of the fuel tank.
- The condition of the injectors.

Repair the fuel circuit.

AFTER REPAIR	Note the other operating faults. Erase the O.B.D. faults. Deal with any other faults.

JSI051.0

PRESENT	MISFIRING ON CYLINDER 1 MISFIRING ON CYLINDER 2 MISFIRING ON CYLINDER 3 MISFIRING ON CYLINDER 4
NOTES	It should be noted that in rare cases, the information from the faulty cylinder is not exact. Because of this, the computer may declare cylinder 1 faulty even though this cylinder is not the cause. This cylinder must be checked first but if everything is correct, the other cylinders must be checked. This information should only be used if polluting or destructive misfiring occurs.
One cylinder is declared faulty	The fault is probably due to a component which can only act on one cylinder: - Fault on an injector. - Fault with a plug. - Fault on the high tension cable ...
Cylinders 1 and 4 or Cylinders 2 and 3 are declared faulty	The fault is probably due to a component which can only act on these pairs of cylinders: - Fault on the coil, high tension side. - Fault on the coil, control side ...
Four cylinders are declared faulty	The fault is probably due to a component which can only act on all cylinders: - Fuel filter fault. - Fuel pump fault. - Fuel type fault ...
AFTER REPAIR	None

JSI051.0

FAULT PRESENT	O.B.D. FUEL CIRCUIT FAULT FINDING : IN PROGRESS

NOTES	None

Ignore this information, as this function is not active

AFTER REPAIR	None.

JSI051.0

FAULT PRESENT	FUEL CIRCUIT OPERATING FAULT

NOTES	None

Ignore this information, as this function is not active

AFTER REPAIR	None.

JSI051.0

NOTES	Engine stopped, ignition on.

Order	Function	Descriptions	Display and notes	Fault finding
		Status window		
1	Battery voltage	**Status**: + After ignition computer feed **Parameter:** Computer feed voltage	**ACTIVE** 11.8 < X < 13.2 V	**If there is a fault, consult the fault finding for this parameter**
2	Computer configuration	**Status**: Air conditioning connection **Status**: Computer configured with AT **Status**: PAS pressostat connection **Status**: Heated windscreen connection **Status**: Computer configured without wheel speed sensor **Status**: Wheel speed sensor from the ABS **Status**: Reluctance type wheel speed sensor **Status**: Magneto resistive type wheel speed sensor **Status**: Configured with engine immobiliser	**ACTIVE** **(if it is an option)** **INACTIVE** **ACTIVE** **(if it is an option)** **ACTIVE** **(if it is an option)** **ACTIVE** **INACTIVE** **INACTIVE** **INACTIVE** **ACTIVE**	**None**
		Status: Speed sensor connection	**ACTIVE**	**If there is a fault, consult the fault finding for this status**
3	Engine immobiliser	**Status**: Engine immobiliser	**INACTIVE**	**If there is a fault, consult the fault finding for this status**

JSI051.0

NOTES	Engine stopped, ignition on.

Order	Function	Descriptions	Display and notes	Fault finding
4	Throttle position potentiometer	**Status**: Throttle position: no load	**ACTIVE**	
		Parameter: Throttle position	0 < X < 47	
		Parameter: No load position programming value	0 < X < 47	
		Accelerator pedal lightly pressed down		
		Status: Throttle position: no load	**INACTIVE**	**If there is a fault, consult the fault finding for these parameters**
		Status: Throttle position: full load	**INACTIVE**	
		Status: Throttle position: full load	**ACTIVE**	
		Parameter: Throttle position	170 < X < 255	
Parameter window				
5	Coolant temperature sensor	**Parameter:** Coolant temperature	X = Engine temperature ± 5 °C	**If there is a fault, consult the fault finding for this parameter**
6	Air temperature sensor	**Parameter:** Air temperature	X = Temperature under the bonnet ± 5 °C	**If there is a fault, consult the fault finding for this parameter**
7	Pressure sensor	**Parameter:** Manifold pressure	X = Atmospheric pressure	**If there is a fault, consult the fault finding for these parameters**
		Parameter: Atmospheric pressure	X = Atmospheric pressure	

NOTES	Engine stopped, ignition on.

Order	Function	Descriptions	Display and notes	Fault finding
		Command window		
8	Fuel pump	**Command:** Fuel pump	The fuel pump should be heard to operate	**If there is a fault, consult the fault finding for this command**
9	Engine cooling fan assembly	**Command:** Engine cooling fan assembly, slow speed **Command**: engine cooling fan assembly, fast speed (only if AC)	The engine cooling fan should be heard to operate at slow speed The engine cooling fan should be heard to operate at fast speed	**If there is a fault, consult the fault finding for this command** **If there is a fault, consult the fault finding for this command**
10	Idle speed regulation valve	**Command:** Idle speed regulation valve	Place you hand on top to feel whether it is operating	**If there is a fault, consult the fault finding for the idle speed regulation warning light circuit fault : DEF**
11	Canister bleed solenoid valve	**Command:** Canister bleed	The canister bleed solenoid valve should operate	**If there is a fault, consult the fault finding for the canister bleed solenoid valve circuit fault : CO**
12	Air conditioning	AC selected on the instrument panel. **Command:** AC compressor	The compressor should engage	**If there is a fault, consult the fault finding for air conditioning statuses**

NOTES	Carry out the actions below with the engine warm, at idle speed, no consumers

Order	Function	Descriptions	Display and notes	Fault finding
Status window				
1	Battery voltage	**Status**: + After ignition computer feed **Parameter:** Computer feed voltage If **parameter:** Computer feed voltage Then **parameter:** Engine speed	**ACTIVE** 13 < X < 14.5 V X < 12.8 V 750 < X < 900 rpm	**If there is a fault, consult the fault finding for this parameter**
2	Fuel pump control	**Status**: Fuel pump relay control	**ACTIVE**	**None**
3	Actuator control	**Status**: Actuator relay control	**ACTIVE**	**None**
4	Flywheel signal	**Status**: Flywheel signal	**ACTIVE**	**If there is a fault, consult the fault finding for the flywheel signal information fault : 2 DEF**
5	Cylinder n° 1 recognition	**Status**: Cylinder 1 recognition	**ACTIVE**	**If there is a fault, consult section 17 "Conditions for fault finding"**

NOTES	Carry out the actions below with the engine warm, at idle speed, no consumers

Order	Function	Descriptions	Display and notes	Fault finding
6	Oxygen sensor heating	**Status**: Upstream oxygen sensor heating **Status**: Downstream oxygen sensor heating	**ACTIVE** **ACTIVE**	(see operating conditions)
7	Throttle potentiometer	**Status**: Throttle position: no load	**ACTIVE**	**If there is a fault, consult the fault finding for the parameter**
8	Idle speed regulation	**Status**: Idle speed regulation **Parameter:** Engine speed **Parameter:** Idle speed difference **Parameter:** RCO idle **Parameter:** Adaptive RCO idle	**ACTIVE** 725 < X < 775 rpm - 25< X <+25 rpm 6 % < X < 22 % - 4 % < X < 4 %	**If there is a fault, consult the fault finding for this status**
Parameter window				
9	Pressure circuit	**Parameter:** Manifold pressure **Parameter:** Atmospheric pressure	320 < X < 380 mb X = Atmospheric pressure	**If there is a fault, consult the fault finding for these parameters**

NOTES	Carry out the actions below with the engine warm, at idle speed, no consumers

Order	Function	Descriptions	Display and notes	Fault finding
10	Pinking circuit	**Parameter:** Pinking signal	30 < X < 70	**If there is a fault, consult the fault finding for this parameter**
		Status window		
11	Richness regulation	**Status**: Richness regulation **Parameter:** Upstream oxygen sensor voltage **Parameter:** Richness correction	**ACTIVE** 20 < X < 840 mV 0 < X < 255 Average value 128	**If there is a fault, consult the fault finding for this status**

NOTES	Carry out the actions below with the engine warm, at idle speed, no consumers

Order	Function	Descriptions	Display and notes	Fault finding
12	Air conditioning (if it is an option) (AC selected)	**Status**: Air conditioning requested **Status**: Fast idle **Status**: Air conditioning compressor **Parameter:** Engine speed **Parameter:** Power consumed by the AC compressor	**ACTIVE** Illuminated if AC requests compressor operation **ACTIVE** Illuminated if fast idle is active **ACTIVE** Illuminated if the injection authorises compressor operation 850 < X < 900 rpm 250 < X < 5000 W	**If there is a fault, consult the fault finding for these statuses**
		Status: Air conditioning requested **Status**: Fast idle **Status**: Air conditioning compressor **Parameter:** Engine speed **Parameter:** Power absorbed by AC compressor	**INACTIVE** **ACTIVE** **INACTIVE** if the injection does not authorise compressor operation 850 < X < 900 rpm X ≤ 250 W	**None**
		Status: Engine cooling fan assembly, slow speed	The engine cooling fan should operate at slow speed	**None**

NOTES	Carry out the actions below with the engine warm, at idle speed, no consumers

Order	Function	Descriptions	Display and notes	Fault finding
13	Power assisted steering pressostat	Turn the wheels to full lock **Status**: Power assisted steering pressostat	**ACTIVE**	**If there is a fault, consult the fault finding for this status**
14	Canister bleed	**Status**: Canister bleed **Parameter:** RCO canister bleed	**INACTIVE** X < 1.5 % Canister bleed is forbidden. The solenoid valve remains closed.	**None**
15	Engine cooling fan	**Status**: Engine cooling fan assembly, slow speed **Parameter:** Coolant temperature **Status**: Engine cooling fan, fast speed (only if equipped with AC) **Parameter:** Coolant temperature	**INACTIVE** The engine cooling fan should operate when the engine coolant temperature exceeds 99 °C **ACTIVE** The engine cooling fan should operate when the engine coolant temperature exceeds 102 °C	**None**
16	EGR	**Parameter:** Order to open the EGR valve	**0** **Vehicle not equipped with the EGR device**	**None**

NOTES	Carry out the actions below during a road test.

Order	Function	Descriptions	Display and notes	Fault finding
Status window				
1	Canister bleed	**Status**: Canister bleed **Parameter:** RCO canister bleed	**ACTIVE** Canister bleed is authorised X > 1.5 % and variable	**None**
Parameter window				
2	Vehicle speed	**Parameter:** vehicle speed	X = speed read on speedometer in km / h	**If there is a fault, consult the fault finding for this parameter**
3	Pinking sensor	Vehicle under full load **Parameter:** Pinking sensor **Parameter:** Pinking correction	X is variable and not zero 0 < X < 7° Crankshaft	**If there is a fault, consult the fault finding for this parameter**
4	Downstream oxygen sensor	**Parameter:** Downstream oxygen sensor voltage operating under full load decelerating after full load **Parameter:** Downstream sensor activity	Ignore the voltage at idle speed. Consult the section concerned. The sensor indicates rich X increases after a short response time The sensor indicates lean. X falls after a short response time	**None**

NOTES	Carry out the actions below during a road test.

Order	Function	Descriptions	Display and notes	Fault finding
5	Adaptive richness	After programming **Parameter:** Adaptive richness operation **Parameter:** Adaptive idle richness	 64 < X < 160 64 < X < 160	**If there is a fault, consult the fault finding for these parameters**
6	Pollutant emission	2500 rpm after driving At idle speed, wait for stabilisation	CO < 0.3 % CO2 > 13.5 % O2 < 0.8 % HC < 100 ppm 0.97 < 1 < 1.03 CO < 0.5 % HC < 100 ppm 0.97 < 1 < 1.03	**If there is a fault, consult the Anti-pollution Technical Note**

STATUS	SPEED SENSOR CONNECTION

NOTES	No fault should be present or memorised

The injection computer must have just been changed or the vehicle has never been driven at a speed greater than 25 mph (40 km / h).
This bargraph MUST be illuminated before the vehicle is returned to the customer.
To illuminate the bargraph, carry out a road test (you must drive at a speed greater than 25 mph (40 km / h)).
If the bargraph does not illuminate, consult the fault finding for the vehicle speed parameter.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

STATUS	ENGINE IMMOBILISER

NOTES	No fault should be present or memorised

Check whether the engine immobiliser is faulty. If the engine immobiliser is faulty, repair the fault before carrying out this fault finding.
Check **the insulation and continuity** of the wiring for **track 58** of the injection computer.
If the fault is not resolved, consult the engine immobiliser fault finding.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

Status	IDLE SPEED REGULATION

NOTES	No fault should be present or memorised

Check the **resistance of the idle speed regulation stepping motor.**
Change the idle speed regulation valve if necessary.

Check **the insulation and continuity** of line:

Computer 12 → Idle speed regulation motor
Computer 41 → Idle speed regulation motor
Computer 42 → Idle speed regulation motor
Computer 72 → Idle speed regulation motor

Repair if necessary and continuer le fault finding in accordance with the idle speed difference.

Idle speed difference < minimum threshold

NOTES	The speed is too low

- Check the operation of richness regulation.
- Clean the air supply circuit (throttle body, idle speed regulation motor) as it is probably contaminated.
- Check the engine oil level (too high => splashing).
- Check and ensure that the fuel pressure is correct (fuel pressure too low).
- Using the OPTIMA 5800 station, check the engine compressions.
- Check the valve clearances and the setting of the timing.
- Check the ignition.
- Check the injectors.

If all these points are correct, change the idle speed regulation motor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

CONT	

Idle speed difference > minimum threshold	***NOTES***	The speed is too high

- Check the engine oil level.
- Check that the pressure sensor is operating correctly.
- Check the cleanliness of the pipes connected to the manifold.
- Check the pneumatically controlled solenoid valves .
- Check the manifold gaskets.
- Check the throttle body seals.
- Check the sealing of the brake servo.
- Check for the restrictions in the oil vapour rebreathing circuit.
- Check the fuel pressure.
- Check the valve clearances and the setting of the timing.

If all these points are correct, change the idle speed regulation motor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

STATUS	RICHNESS REGULATION

NOTES	No fault should be present or memorised

Check the **connection and condition of the upstream oxygen sensor connector**.
Repair if necessary.

Check for **12 V** at the upstream oxygen sensor.
Check **the insulation and continuity** of line:

Computer 45 ⟶ Oxygen sensor
Computer 80 ⟶ Oxygen sensor

Repair if necessary.

Check the ignition.
Check the sealing of the canister bleed (a leak is considerably disrupting the richness).
Check the sealing of the exhaust pipe.
Check the sealing of the inlet manifold.
If the vehicle is only driven in urban areas, the sensor may be contaminated (try to drive under full load conditions).
Check the fuel pressure.
If idle speed is unstable, check the valve clearances and the timing.
Check the injectors (flow and shape of jet).
If necessary, change the oxygen sensor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

STATUS	AIR CONDITIONING REQUEST AIR CONDITIONING COMPRESSOR

NOTES	No fault should be present or memorised

The computer does not register the request for air conditioning	Check **the insulation and continuity of the line on track 23** of the injection computer. Repair if necessary.
	If the fault persists, check the air conditioning fault finding.

The compressor clutch does not operate	Check **the insulation and continuity of the line on track 10** of the injection computer. Repair if necessary.
	If the fault persists, check the air conditioning fault finding.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

STATUS	POWER ASSISTED STEERING PRESSOSTAT

NOTES	No fault should be present or memorised

Check that the **power assisted steering is operating correctly** (oil level, ...).
Check that the **PAS pressostat is correctly connected**.
Check **the insulation and continuity** of line:

Injection computer **85** ⟶ **PAS pressostat**
PAS pressostat ⟶ **Earth**

Repair if necessary.

If all these points are correct, change the PAS pressostat.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	COMPUTER SUPPLY VOLTAGE

NOTES	No fault should be present or memorised No consumers

Ignition on	**If voltage < Minimum, the battery is flat**: Check the charging circuit to find the origin of this fault.
	If voltage >Maximum, the battery may have excess charge: Check that the charging voltage is correct with and without consumers.

At idle speed	**If voltage < Minimum, the battery voltage is too low**: Check the charging circuit to find the origin of this fault.
	If voltage >Maximum, the battery voltage is too high: The alternator regulator is faulty. Solve this fault and check the electrolyte level in the battery.

NOTE:
The check of the battery and the charging circuit can be carried out using the OPTIMA 5800 station (the battery does not need to be disconnected for this, which allows the computer memories to be retained).

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	THROTTLE POSITION VALUE OF NO LOAD POSITION PROGRAMMING

NOTES	No fault should be present or memorised Ignition on or engine running

Programming at threshold or non-detection of no load or non-detection of full load	Check that the **mechanical stop for the potentiometer has not been modified.** Check the accelerator control (rubbing against an obstacle ...).
	Check the **throttle potentiometer resistance.** Change the throttle potentiometer if necessary.
	Check **the insulation, continuity and that there is no interference resistance on line**: **Computer 43 → Throttle potentiometer** **Computer 74 → Throttle potentiometer** **Computer 75 → Throttle potentiometer** Repair if necessary.

The throttle position is fixed	Check the **resistance of the throttle potentiometer** by moving the throttle.
	If the resistance varies, check the **electrical lines for the sensor.**
	If the resistance does not vary, check that the sensor is mechanically connected to the throttle. If necessary, change the sensor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	COOLANT TEMPERATURE

NOTES	No fault should be present or memorised

If the value read is inconsistent, check that the sensor is correctly following the calibration curve "resistance depending on temperature".
Change the sensor if it drifts (**NOTE**: a drifting sensor is often the result of an electrical impact).

Check **the insulation, continuity and that there is no interference resistance on electrical line**:

Computer 13 ⟶ Coolant temperature sensor
Computer 73 ⟶ Coolant temperature sensor

Repair.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	AIR TEMPERATURE

NOTES	No fault should be present or memorised

If the value read is inconsistent, check that the sensor is correctly following the calibration curve "resistance depending on temperature".
Change the sensor if it drifts (**NOTE**: a drifting sensor is often the result of an electrical shock).

Check **the insulation, continuity and that there is no interference resistance on electrical line**:

Computer 49 ⟶ Air temperature sensor
Computer 77 ⟶ Air temperature sensor

Repair.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	MANIFOLD PRESSURE ATMOSPHERIC PRESSURE

NOTES	No fault should be present or memorised

Manifold pressure not consistent, ignition on **Manifold pressure < Minimum at idle speed** **Atmospheric pressure not consistent**	Check **the insulation, continuity and that there is no interference resistance on line**: **Computer 15 → Pressure sensor** **Computer 16 → Pressure sensor** **Computer 78 → Pressure sensor** Repair if necessary. If all these points are correct, change the sensor.

Manifold pressure > Maximum at idle speed	Check: - Sealing of the pipe between the manifold and the sensor. - Valve clearance. - The canister bleed which should be closed at idle speed. - The compression of the cylinders using the OPTIMA 5800 station. If all these points are correct, change the sensor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	PINKING SIGNAL

NOTES	No fault should be present or memorised

The pinking sensor should send a signal which is not zero, to prove that it registers the mechanical vibrations of the engine.
If the signal is zero:
- Check that the **sensor is correctly screwed in**.
- Check **the insulation and continuity of the wiring**:

Computer 20 → Pinking sensor
Computer 79 → Pinking sensor
Computer 19 → Pinking sensor screening

If necessary, change the sensor.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	VEHICLE SPEED

NOTES	No fault should be present or memorised Check using a road test

Check **the insulation, continuity and that there is no interference resistance on line** of line:

Computer 53 ⟶ ABS

NOTE: Check the various functions which use this information.

Repair.

The fault persists! Consult the ABS fault finding.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

PARAMETER	ADAPTIVE RICHNESS OPERATING ADAPTIVE IDLE RICHNESS

NOTES	No fault should be present or memorised Carry out programming

Ensure **the sealing of the canister bleed.**

Erase the computer memory.
Warm, in idle regulation, observe these parameters.
- **If one of these parameters goes to the MAXIMUM threshold, there is not enough fuel.**
- **If one of these parameters goes to the MINIMUM threshold, there is too much fuel.**

Ensure the hygiene, cleanliness and correct operation of the:
- Filter.
- Fuel pump.
- Fuel circuit.
- Fuel tank.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

COMMAND	FUEL PUMP

NOTES	No fault should be present or memorised

Check that the **impact sensor is correctly engaged.** Engage the impact sensor if necessary.
While the **computer is controlling the fuel pump**, check for **12 V on track 1 of the impact sensor connector.** If there is not 12 V, repair the line from track 1 of the impact sensor to track 5 of the fuel pump relay.
Check the **continuity between tracks 1 and 3 of the impact sensor.** If there is not continuity, change the impact sensor.
Check the cleanliness and the presence of **earth on track C2 of the fuel pump.**
Check **the insulation and continuity** of the wiring: **Impact sensor 3 ⟶ C1 Fuel pump** Repair if necessary.
The fault persists! Change the fuel pump.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

COMMAND	SLOW SPEED ENGINE COOLING FAN ASSEMBLY FAST SPEED ENGINE COOLING FAN ASSEMBLY

NOTES	No fault should be present or memorised

The engine cooling fan does not operate at slow speed	Check **the insulation and continuity of line 8.** Repair if necessary.
	The fault persists. Use the wiring diagram to check: - The fan relay and fan feed. - The cleanliness of the fan assembly earth. - The condition of the fan assembly relay. - The condition of the fan assembly resistance. - The condition of the fan assembly. Repair if necessary.

The engine cooling fan does not operate at fast speed	Check **the insulation and continuity of line 38.** Repair if necessary.
	The fault persists. Use the wiring diagram to check: - The fan relay and fan feed. - The cleanliness of the fan assembly earth. - The condition of the fan assembly relay. - The condition of the fan assembly. Repair if necessary.

AFTER REPAIR	Repeat the conformity check from the beginning.

JSI051.0

NOTES	Only consult this customer complaint after a complete check using the fault finding tool.

STARTING PROBLEMS	Chart 1
IDLE PROBLEMS	Chart 2
PROBLEMS WHEN DRIVING	Chart 3

Chart 1	STARTING PROBLEMS

NOTES	Only consult this customer complaint after a complete check using the fault finding tool.

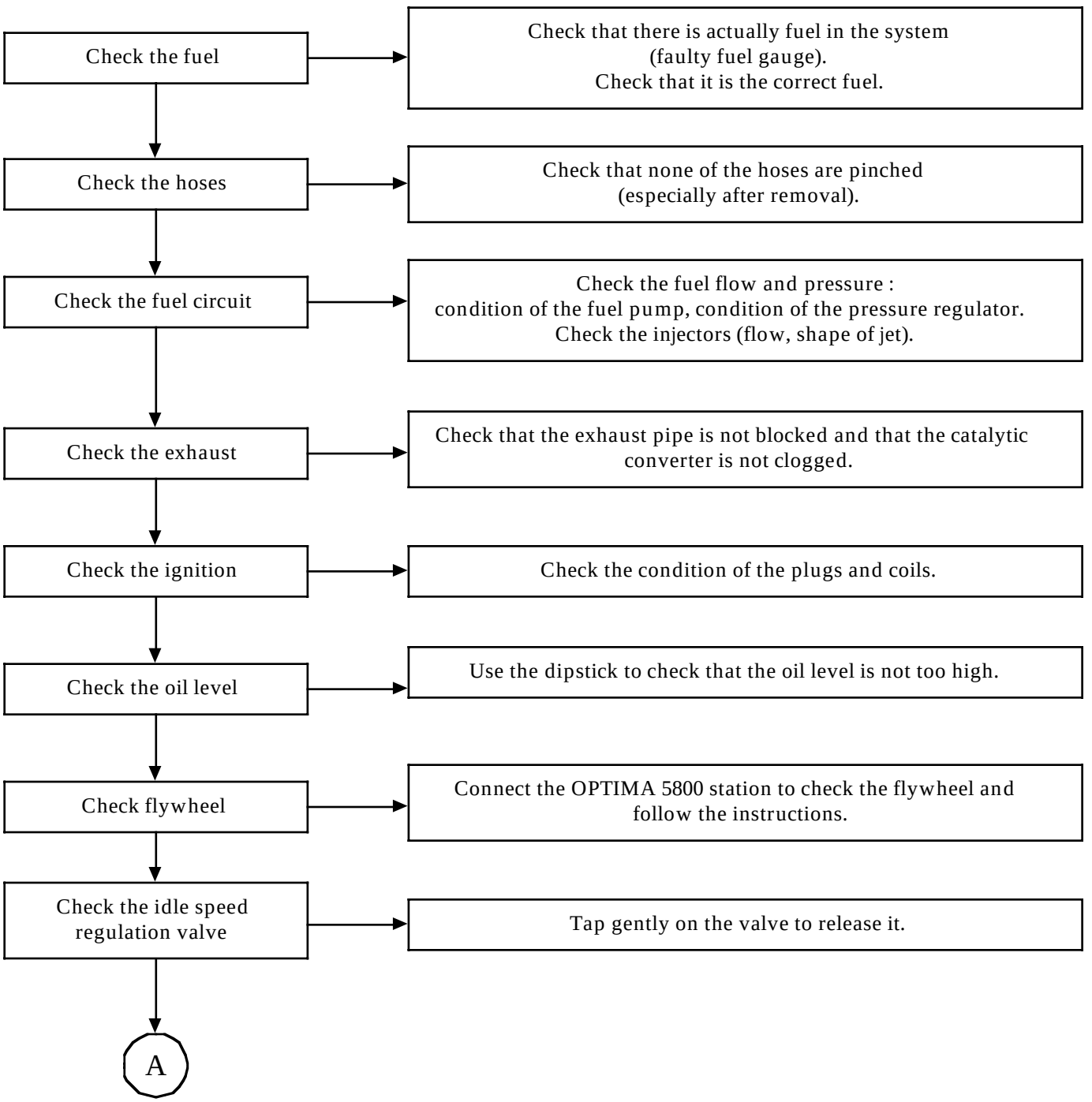
Check the fuel	Check that there is actually fuel in the system (faulty fuel gauge). Check that it is the correct fuel.
Check the hoses	Check that none of the hoses are pinched (especially after removal).
Check the fuel circuit	Check the fuel flow and pressure: condition of the fuel pump, condition of the pressure regulator. Check the injectors (flow, shape of jet).
Check the exhaust	Check that the exhaust pipe is not blocked and that the catalytic converter is not clogged.
Check the ignition	Check the condition of the plugs and coils.
Check the canister bleed	Disconnect the pipe which connects the canister bleed solenoid valve to the inlet manifold. Block the pipe so there is no air leak. If there is no more disruption, the canister bleed is the cause.
Check engine compressions	Connect the OPTIMA 5800 station to test compressions and follow the instructions.
Check flywheel	Connect the OPTIMA 5800 station to check the flywheel and follow the instructions.
Check the idle speed regulation valve	Tap gently on the valve to release it.

AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Chart 2	IDLE PROBLEMS

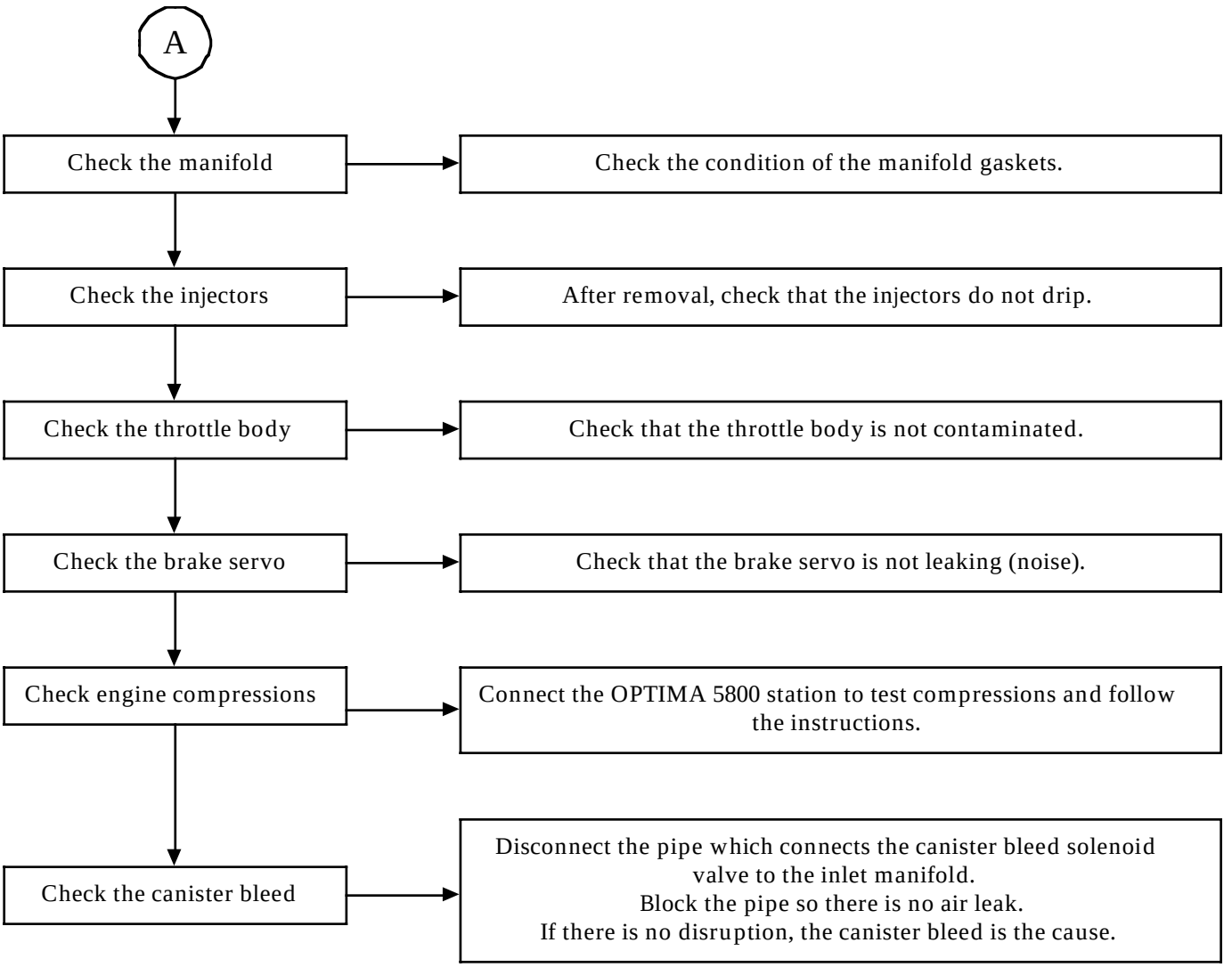
NOTES	Only consult this customer complaint after a complete check using the fault finding tool.



AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Chart 2 CONT	
NOTES	Only consult this customer complaint after a complete check using the fault finding tool.



AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Chart 3	PROBLEMS WHEN DRIVING

NOTES	Only consult this customer complaint after a complete check using the fault finding tool.

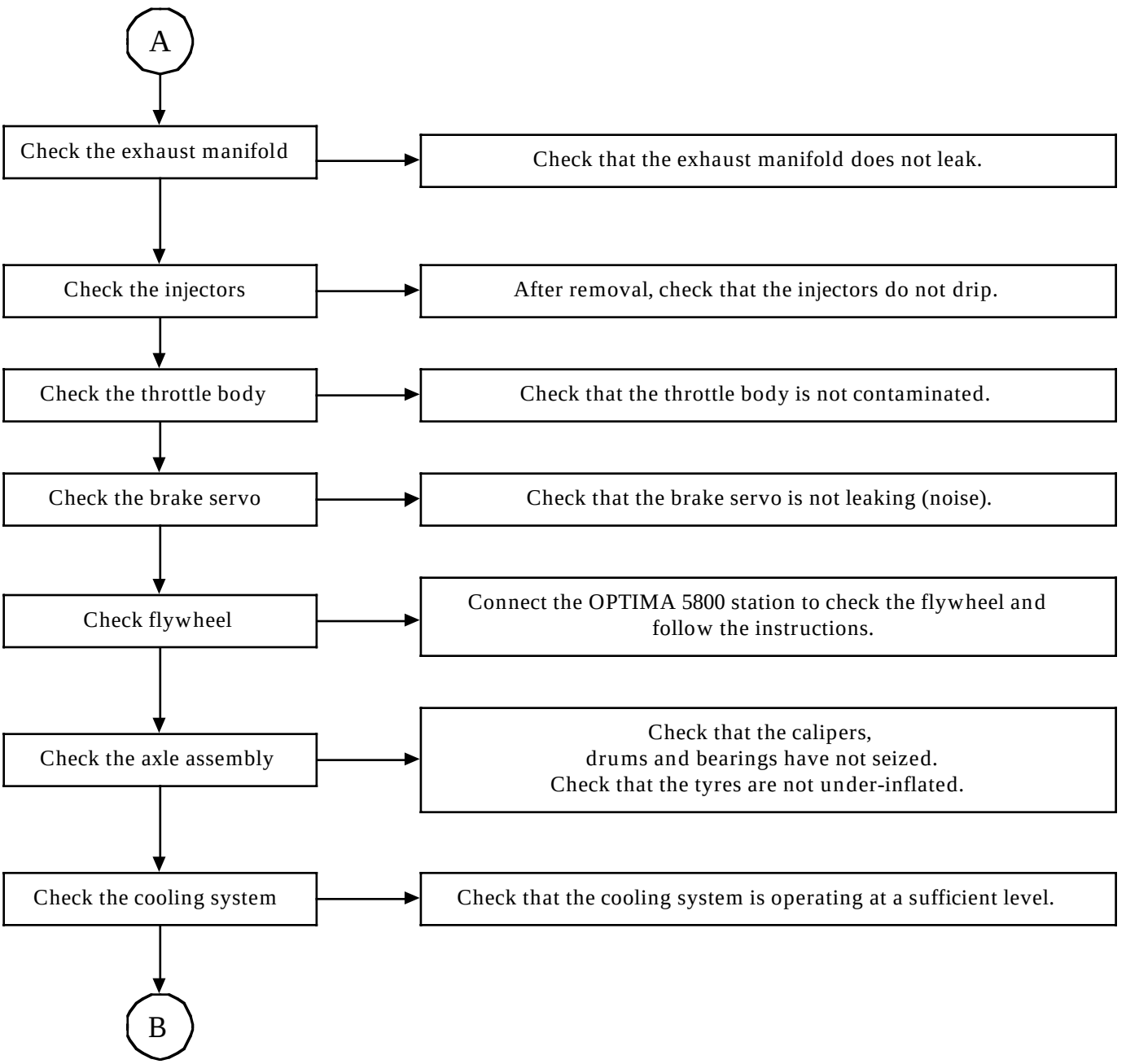
Check the air filter	Check that the air filter is not damaged.
Check the fuel	Check that there is actually fuel in the system (faulty fuel gauge). Check that it is the correct fuel.
Check the hoses	Check that none of the hoses are pinched (especially after removal).
Check the fuel circuit	Check the fuel flow and pressure : condition of the fuel pump, condition of the pressure regulator. Check the injectors (flow, shape of jet).
Check the exhaust	Check that the exhaust pipe is not blocked and that the catalytic converter is not clogged.
Check the ignition	Check the condition of the plugs and coils.
Check the oil level	Use the dipstick to check that the oil level is not too high.
Check the inlet manifold	Check the condition of the manifold gaskets.

A

AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Chart 3 CONT	
NOTES	Only consult this customer complaint after a complete check using the fault finding tool.

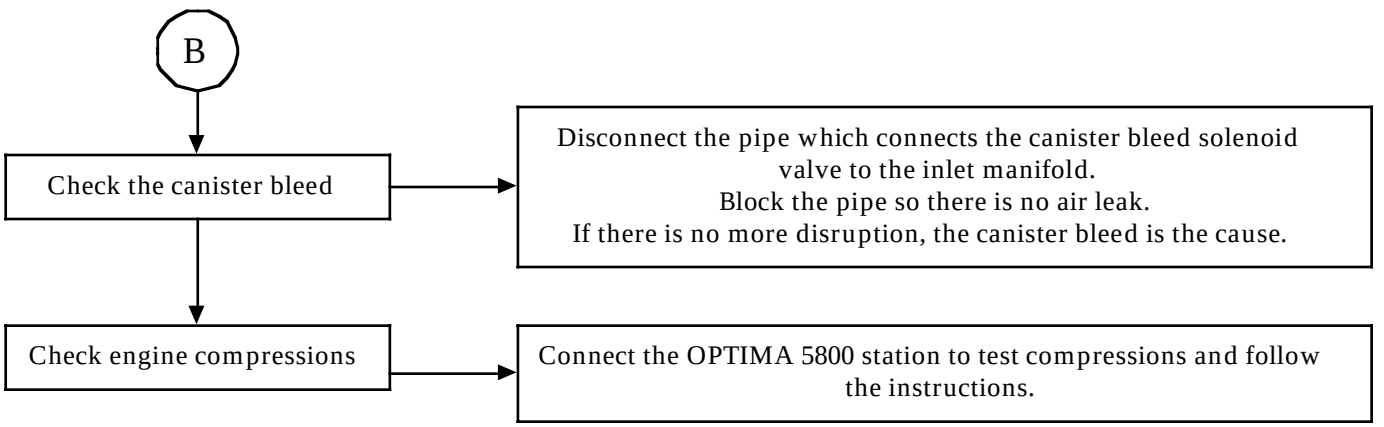


AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Chart 3 CONT	

NOTES	Only consult this customer complaint after a complete check using the fault finding tool.



AFTER REPAIR	Erase the memorised and O.B.D. faults. If there are no longer any faults on the vehicle, erase programming.

JSI051.0

Coolant circulates continuously in the heater matrix, assisting with engine cooling.

FILLING

The bleed screws on the cylinder head coolant outlet unit MUST be opened.

Fill the circuit through the expansion bottle opening.

Close the bleed screws as soon as the coolant comes out in a continuous jet.

Start the engine (**2 500 rpm**).

Adjust the level by overflow for approximately **4 minutes**.

Close the reservoir.

BLEEDING

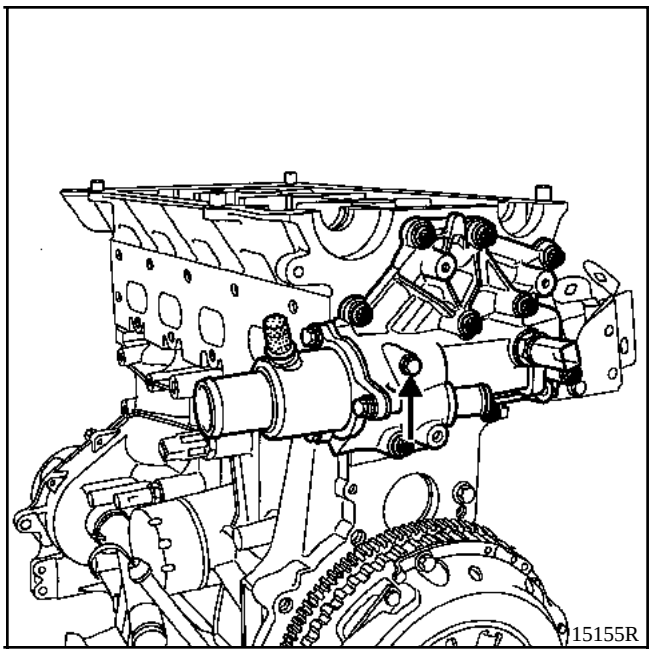
Let the engine run for **20 minutes** at **2 500 rpm**, until the engine cooling fan(s) operate(s) (time required for automatic degassing).

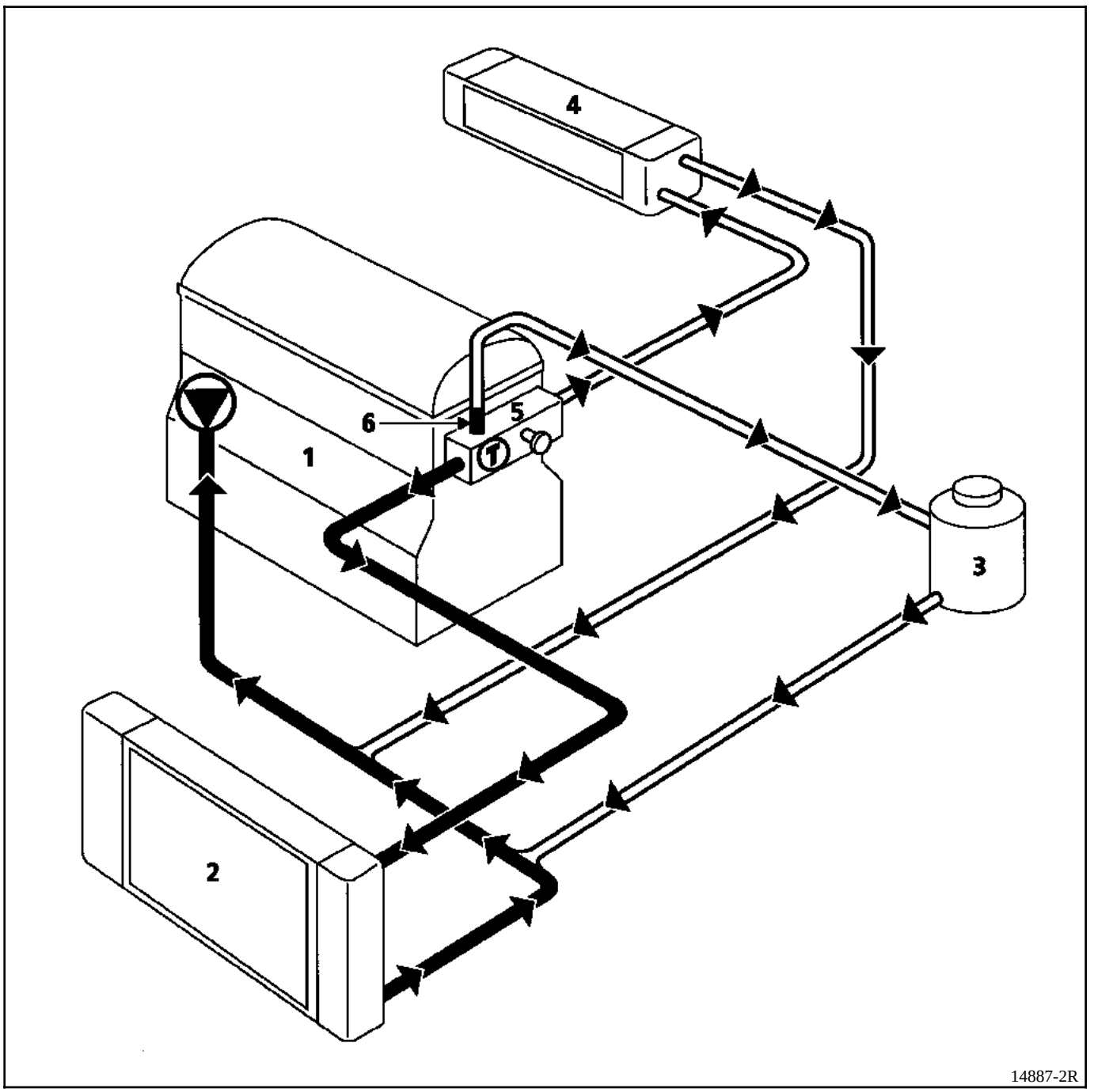
Check whether the fluid level is close to the "**Maximum**" mark.

DO NOT OPEN THE BLEED SCREW OR SCREWS WHEN THE ENGINE IS RUNNING

RETIGHTEN THE EXPANSION BOTTLE PLUG WHEN THE ENGINE IS WARM

Location of the bleed screw on the coolant unit





1 Engine
2 Radiator
3 "Hot" bottle with degassing after thermostat
4 Heater matrix
5 Thermostat mounting
6 3 mm diameter restriction

Water pump

Thermostat

Bleed valves

The rating value for the expansion bottle valve is **1.2 bar** (brown).

SPECIAL TOOLING REQUIRED	
Mot. 1202	**Hose clip pliers**

TIGHTENING TORQUES (in daN.m)		
Water pump bolt	**M6**	**1**
	M8	**2.2**
Tension wheel nut		**2.7**

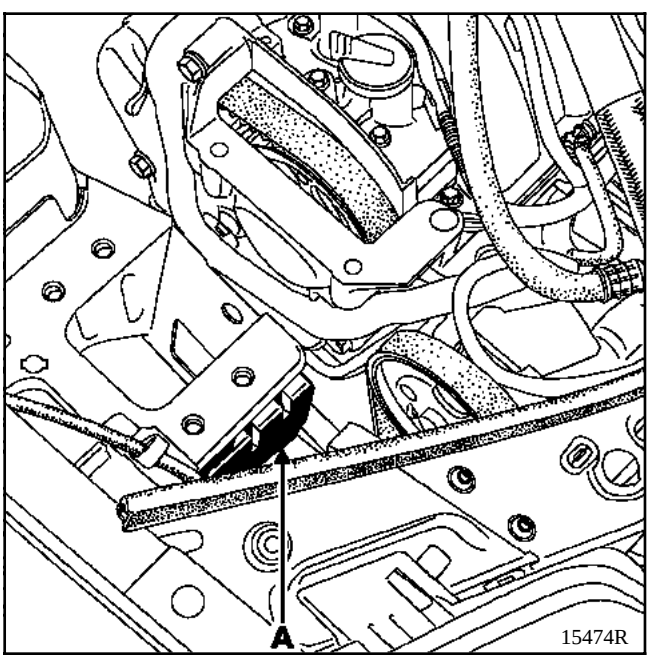
REMOVAL

Place the vehicle on a two post lift.

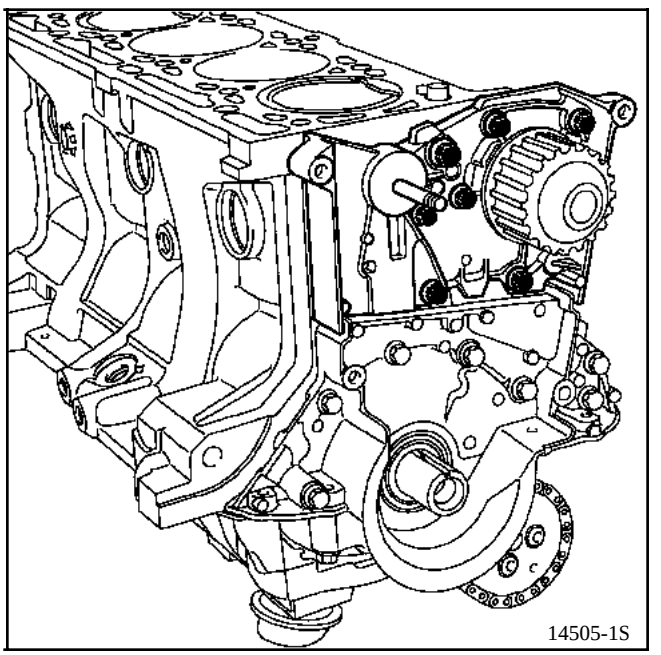
Disconnect the battery.

Drain the cooling circuit via the lower radiator hose.

Remove:
- the timing belt (see section **11** "**Timing belt**"),
- the tension wheel for the timing,
- the acoustic weight (A),



- the water pump.



Cleaning

It is very important not to scratch the sealing surfaces.

Use **Décapjoint** to dissolve any part of the seal which remains adhered.

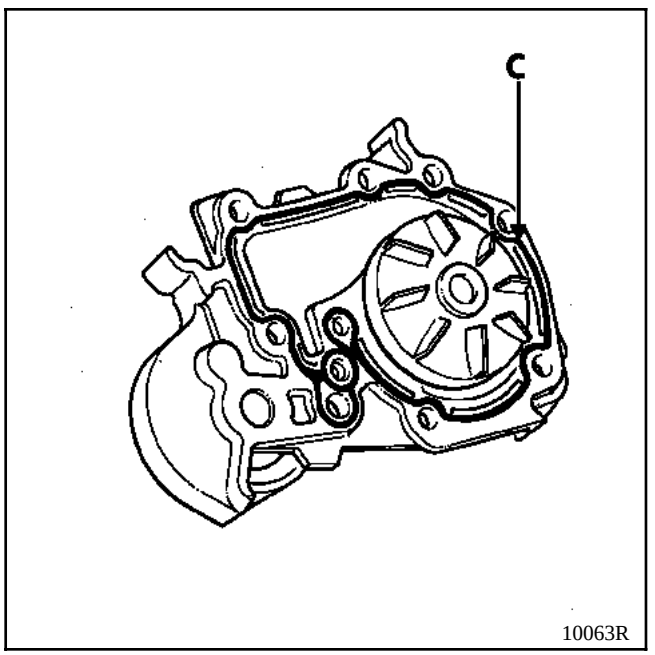
Apply the product to the section to be cleaned ; wait for approximately ten minutes, then remove using a wooden spatula.

Gloves should be worn during the operation.

Do not drop any of the product onto the paintwork.

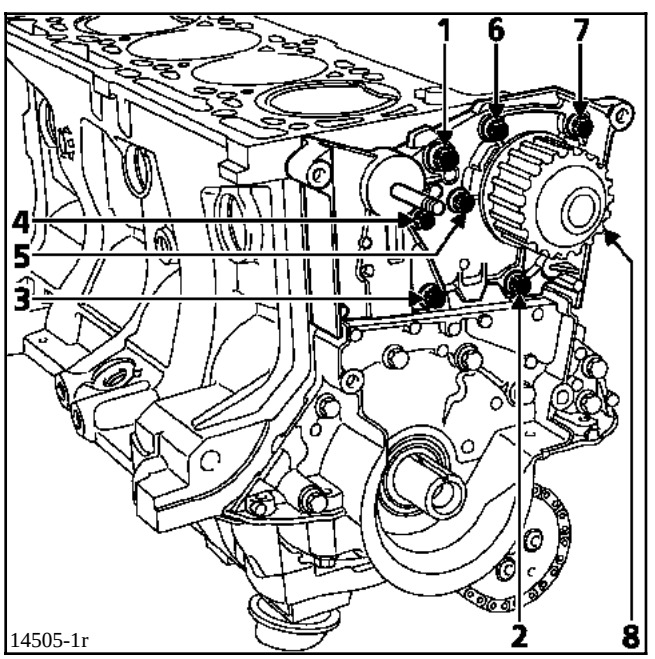
REFITTING

Refit the water pump, sealing it with **Loctite 518**, the bead (C) should be **0.6** to **1 mm** wide and should be applied according to the diagram below.

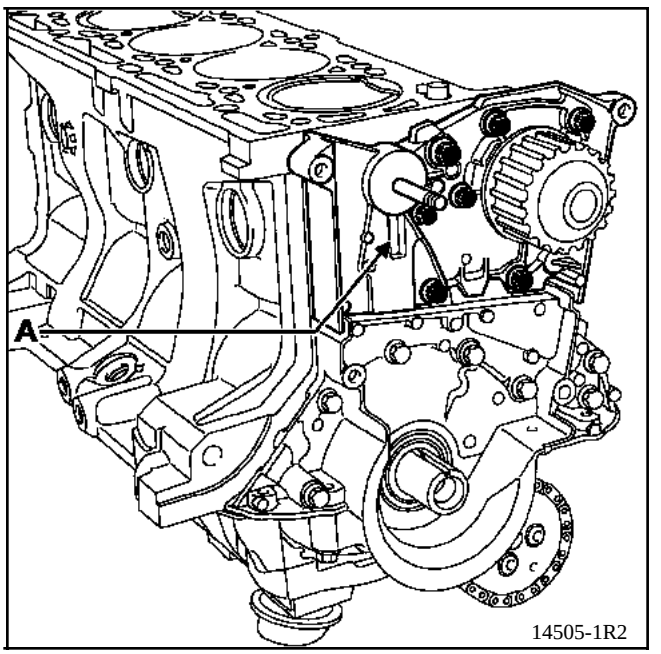


Pretighten bolts **M6 and M8** to **0.8 daN.m** then tighten **M6 bolts** to **1.1 daN.m** and **M8 bolts** to **2.2 daN.m** in the recommended order.

NOTE: put 1 to 2 drops of **Loctite FRENETANCH** on bolts **1 and 4** of the water pump.



Refit:
- the timing belt tension wheel, by correctly positioning the wheel lug in the groove (A),



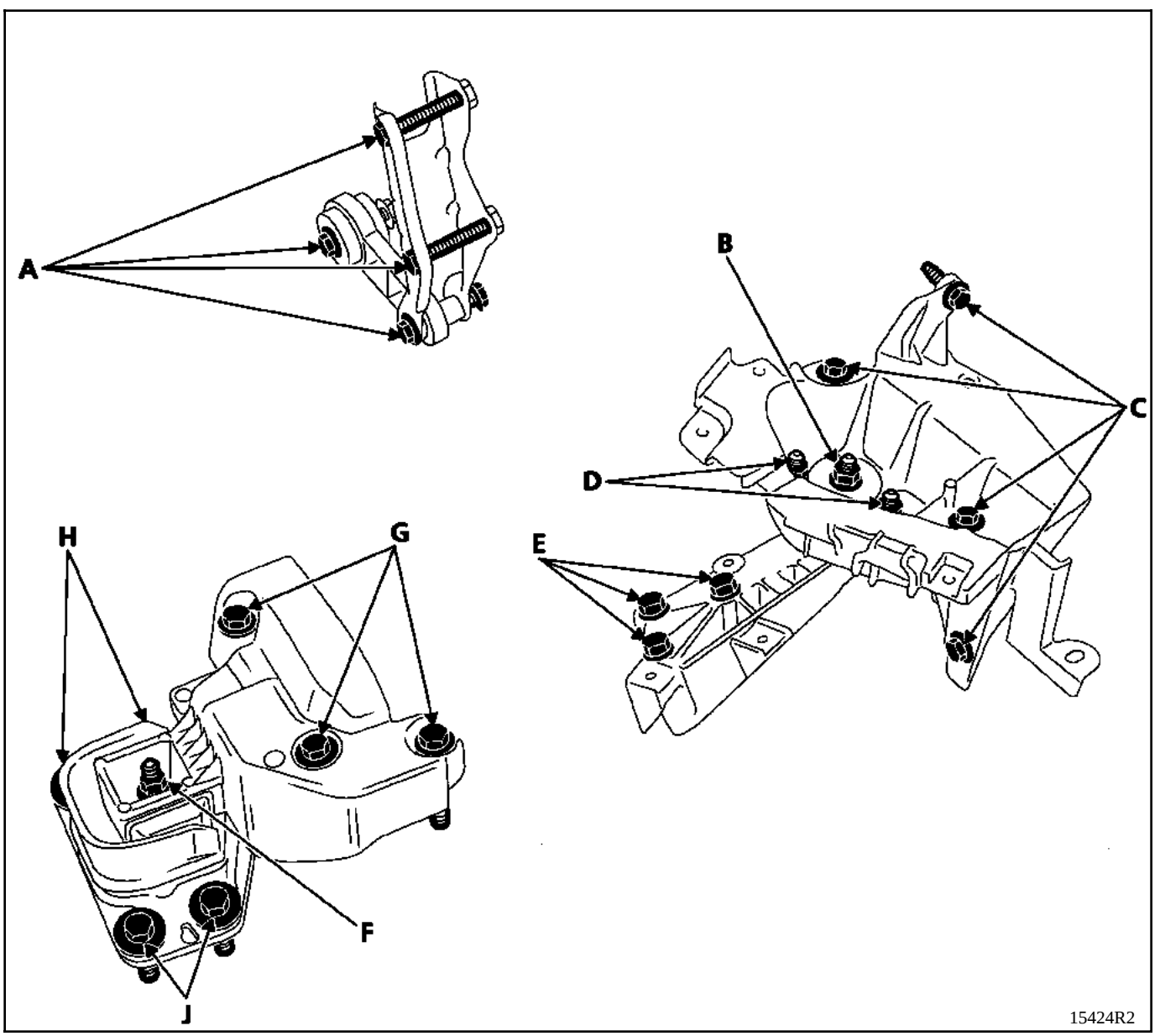
- the timing belt (the method described in **section 11** "**Timing belt**" must be observed).

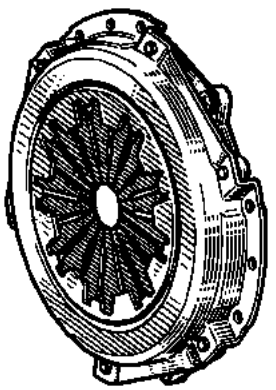
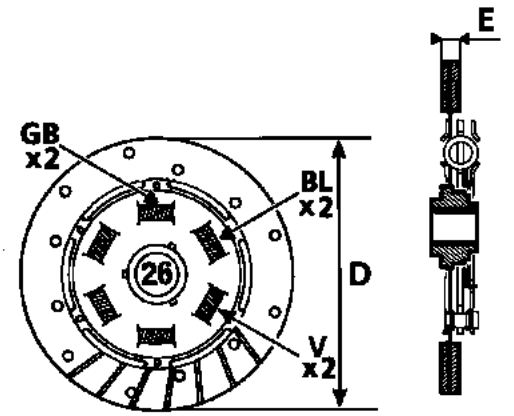
Fill and bleed the cooling circuit (see section **19** "**Filling - Bleeding**").

TIGHTENING TORQUE (daN.m)

A	6.2
B	6.2
C	2.1
D	2.1
E	6.2

F	4.4
G	6.2
H	6.2
J	6.2



VEHICLE TYPE	ENGINE TYPE	MECHANISM	DISC
CB0H CB0T	K4M	 85873S **200 CPO 4000**	**26 splines** D = 200 mm E = 6.8 mm GB : Blue-grey BL : Lilac-blue V : Green  90693R13 76906R

Single disc clutch operating dry with cable control.

Clutch thrust bearing under constant pressure.

REPLACEMENT (after removal of the gearbox)

SPECIAL TOOLING REQUIRED	
Mot. 582	
or	**Locking sector**
Mot. 582-01	

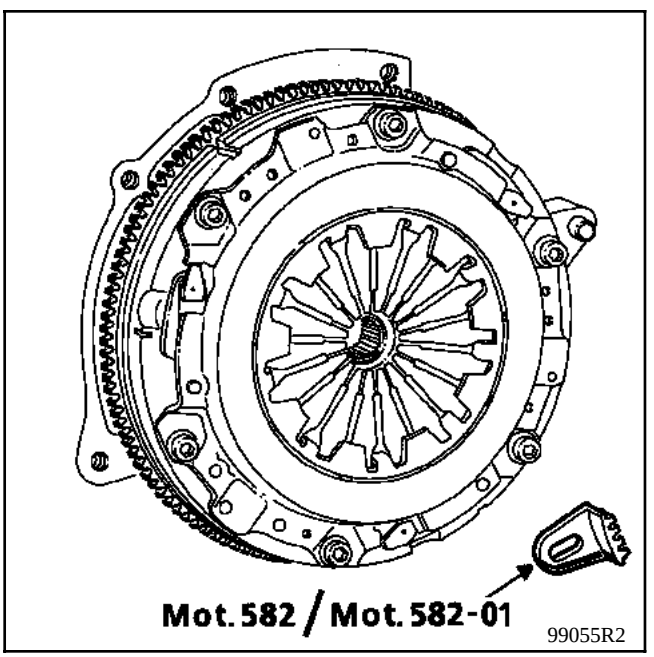
TIGHTENING TORQUE (in daN.m)	
Mechanism mounting bolt	**2**

REMOVAL

Fit the locking sector **Mot. 582** or **Mot. 582-01**.

Remove the mechanism mounting bolt and remove the friction disc.

Check and change the faulty components.

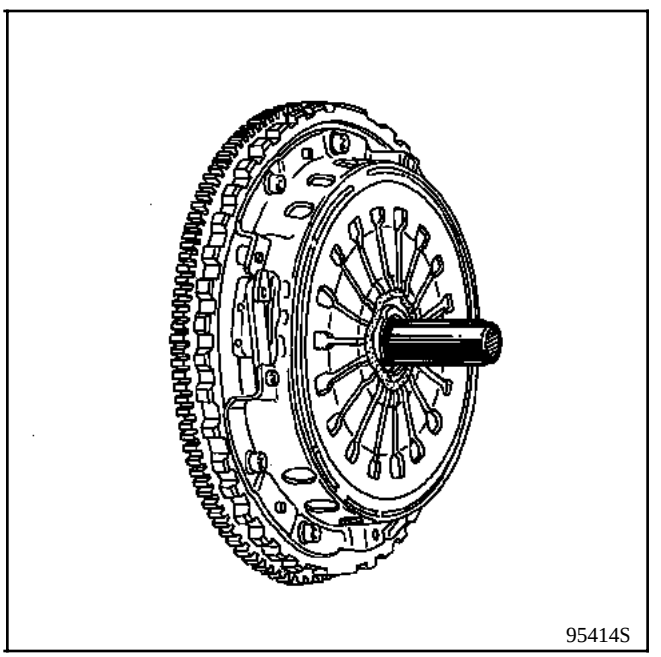


REFITTING

Clean the clutch shaft splines and refit the assembly **without lubricant**.

Fit the disc (hub offset on gearbox side).

Centre it using the tool supplied with the spare part.



Gradually tighten in a star pattern then torque tighten the mechanism mounting bolts.

Remove the locking sector **Mot. 582** or **Mot. 582-01**.

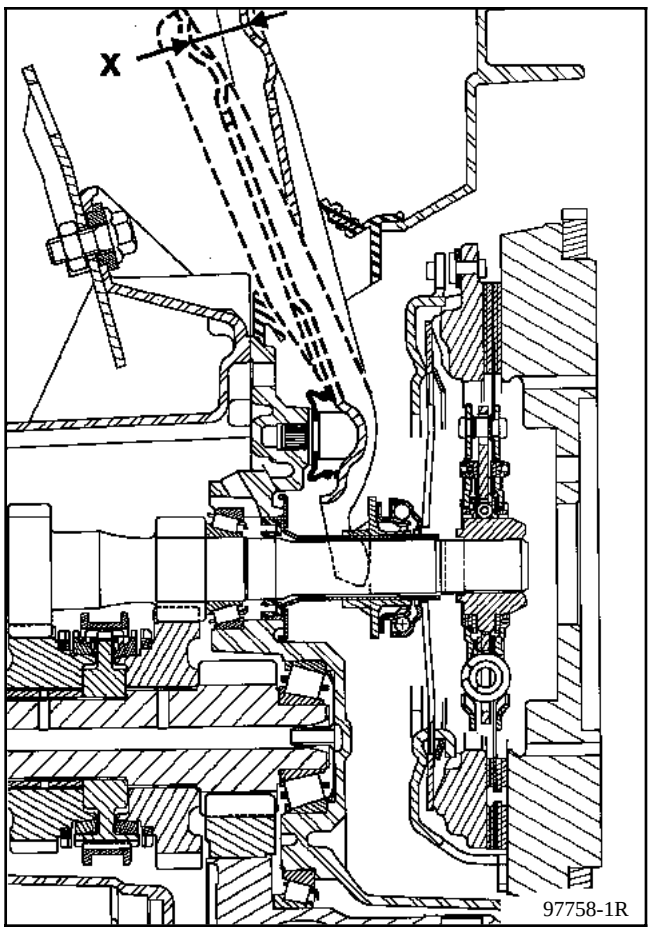
Coat the following with **MOLYKOTE BR2**:
- the guide tube,
- the fork pads.

After refitting the gearbox, place the cable on the clutch fork, reset the notched sector and check the operation of the wear compensation.

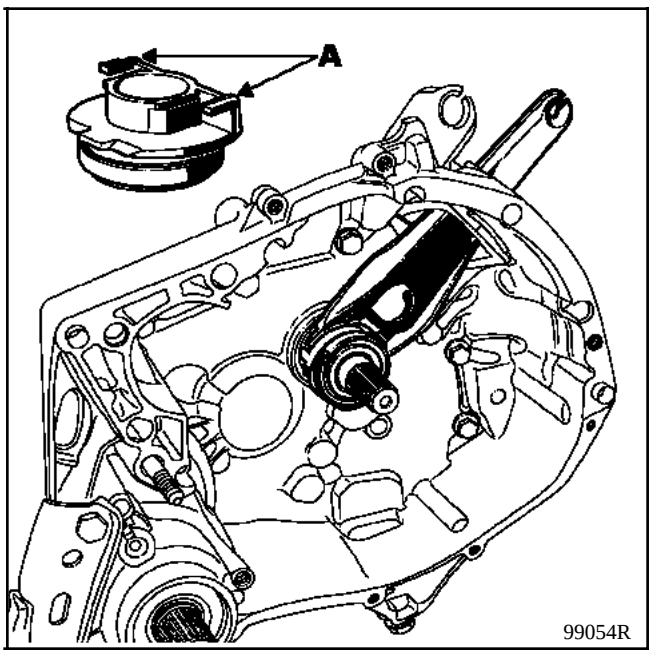
Check clutch travel.

Fork travel should be:

X = 27 to **31.6 mm**



NOTE: when an operation does not require removal of the gearbox or after it is fitted, **DO NOT LIFT** as it may become detached from the notch (A) of the thrust bearing.



REPLACING THE FLYWHEEL

SPECIAL TOOLING REQUIRED		
Mot.	**582 -01**	**Locking sector**

TIGHTENING TORQUE (in daN.m)	
Flywheel bolt	**5.5**

REMOVAL

After removing the friction disc, remove the engine flywheel mounting bolts (bolts can not be reused).

The friction face can not be reground.

REFITTING

On the crankshaft, clean the flywheel mounting bolt threads.

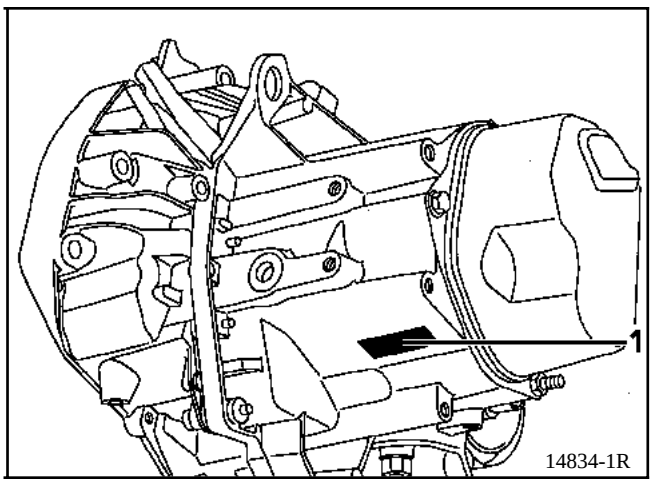
Remove the grease from the flywheel bearing face on the crankshaft.

Refit the flywheel, immobilising it using tool **Mot. 582-01**.

NOTE: the flywheel mounting bolts should be systematically changed.

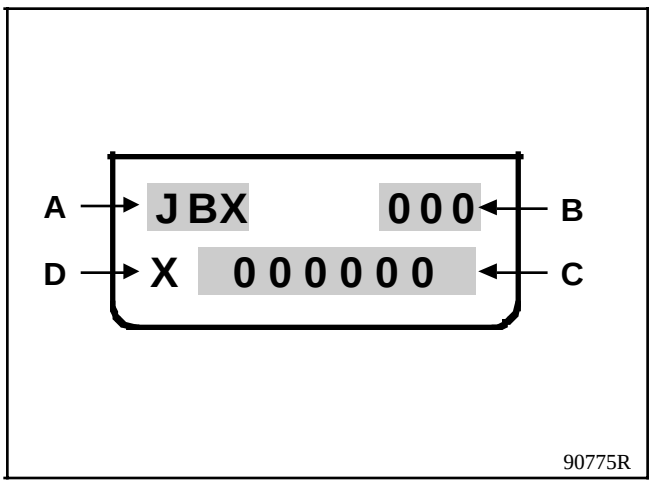
"**CLIO**" vehicles with **K4M** engines are equipped with **JB3** type manual gearboxes.

Workshop Repair Manual "**B.V. JB**" deals with the complete repair of this component.



A mark (1), located on the gearbox housing indicates:

A Type of gearbox
B Gearbox suffix
C Fabrication number
D Factory of manufacture



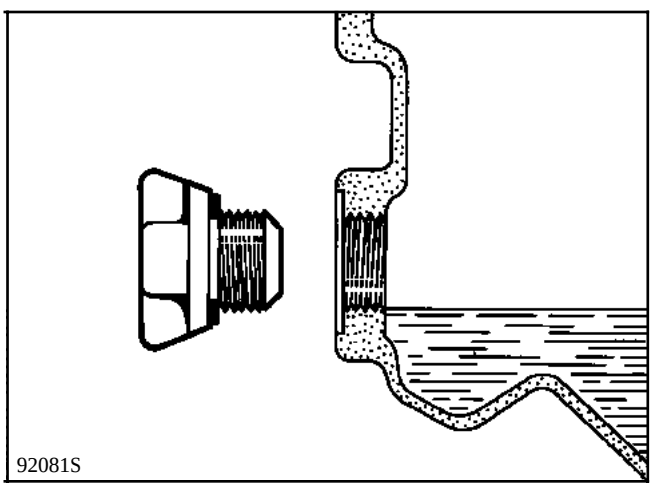
JB3									
Suffix	**Vehicle**	**Differential ratio**	**Speedo drive gear**	**1st**	**2nd**	**3rd**	**4th**	**5th**	**Reverse**
167	CB0H CB0T	15 -- 61	21 -- 19	11 -- 37	22 -- 41	28 -- 37	34 -- 35	39 -- 32	11 -- 26 39

CAPACITY (in litres)

5 speed gearbox	
JB3	3.4

Viscosity grade
TRX 75W 80W

CHECKING THE LEVEL



Fill to the level of the opening.

TYPE	PACKAGING	PART NUMBER	COMPONENT
MOLYKOTE BR2	1 kg tin	77 01 421 145	Right hand sunwheel splines Fork pivot Thrust guide Fork pads } Clutch
LOCTITE 518	24 ml syringe	77 01 421 162	Housing assembly face
RHODORSEAL 5661 **eg : CAF 4/60 THIXO**	100 g tube	77 01 404 452	Threaded plugs and switches Bearing plugs Ends of the roll pins on the driveshafts
LOCTITE FRENBLOC (locking and sealing resin)	24 cc bottle	77 01 394 071	Primary and secondary shaft nuts Fixed gear and hub for 5th Differential lock drive stud

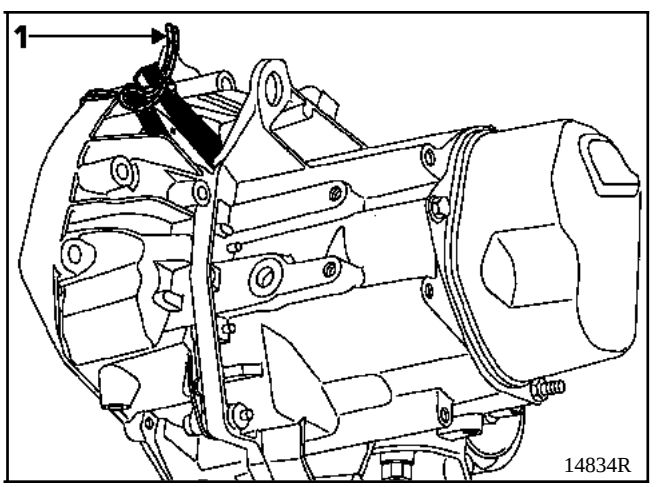
Components to be systematically changed

Once they have been removed :
- lip seals,
- O ring seals,
- clutch thrust bearing guide tubes,
- secondary and differential shaft nuts,
- the speedo gear and its shaft,
- the speedo crown gear,
- the roll pins,
- the rings under the gears.

TIGHTENING TORQUES (in daN.m)	
Drain plug	**2.2**
Brake caliper bolts	**4**
Driveshaft gaiter bolts	**2.5**
Lower ball joint nut	**6.5**
Shock absorber base bolt	**18**
Bolts at edge of gearbox and starter motor	**3**
Suspended engine mounting bolts on gearbox	**6.2**
Wheel bolts	**9**
Steering shaft yoke mounting bolt	**3**
Sub-frame rear mounting bolt	**10.5**
Sub-frame front mounting bolt	**6.2**
Lower ball joint nut	**5.5**
Track rod end nut	**4**
Engine tie bar bolt	**6.5**

The removal and refitting operations for the gearbox are identical and present no particular difficulty with relation to **CLIO** vehicles equipped with the "**JB**" gearbox.

NOTE: when refitting the gearbox, it is best to hold the clutch control fork using a piece of string (1), so that it doesn't come off its ball joint (located on the clutch bell housing).



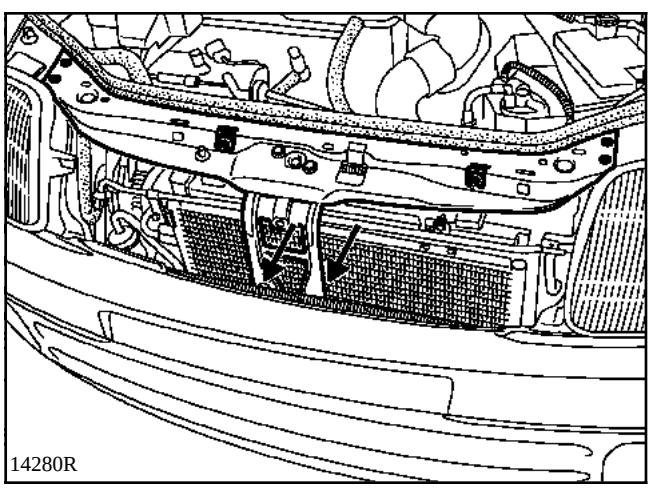
SPECIAL TOOLING REQUIRED		
Mot.	**453 -01**	**Hose clamp pliers**

Place the vehicle on a two post lift.

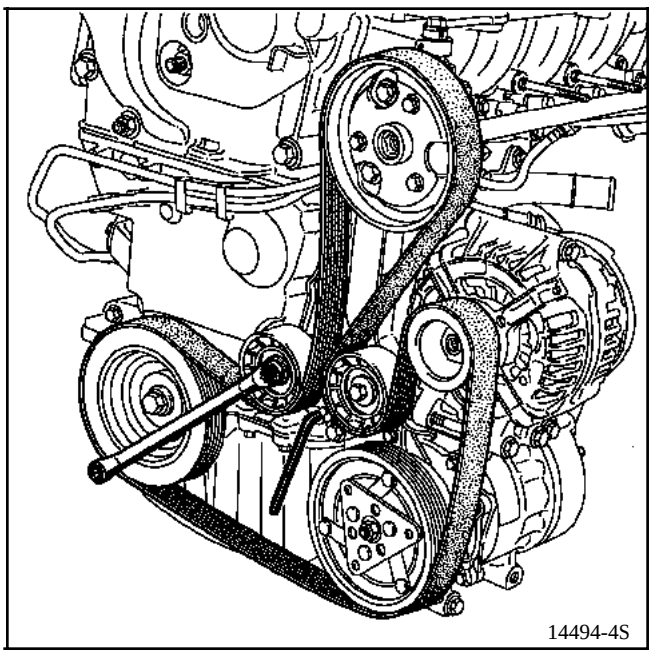
REMOVAL

Disconnect the battery.

Remove:
- the engine undertray and the right hand mud guard,
- the right hand headlight unit,
- the radiator grille,
- the upper cross member (by slackening the lower mountings).


14280R

Remove the accessories belt using an allen key to immobilise the tension wheel after tilting it.

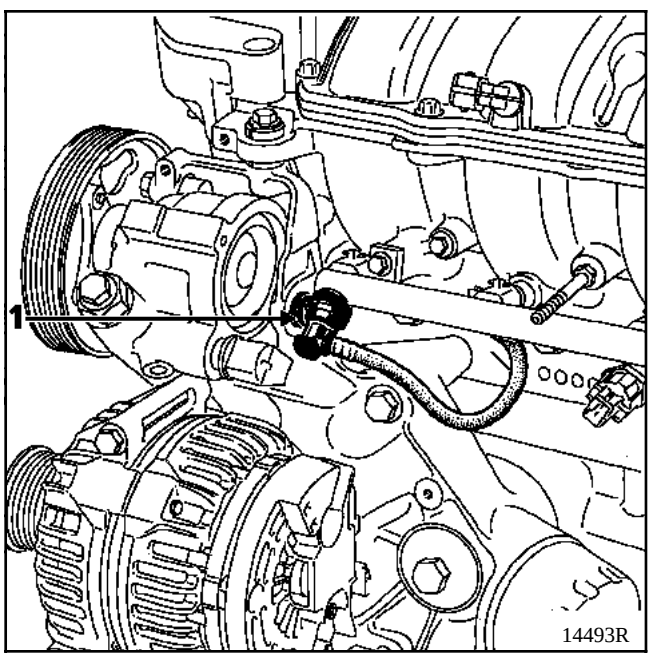

14494-4S

Place the hose clamp pliers **Mot. 453-01** on the supply line.

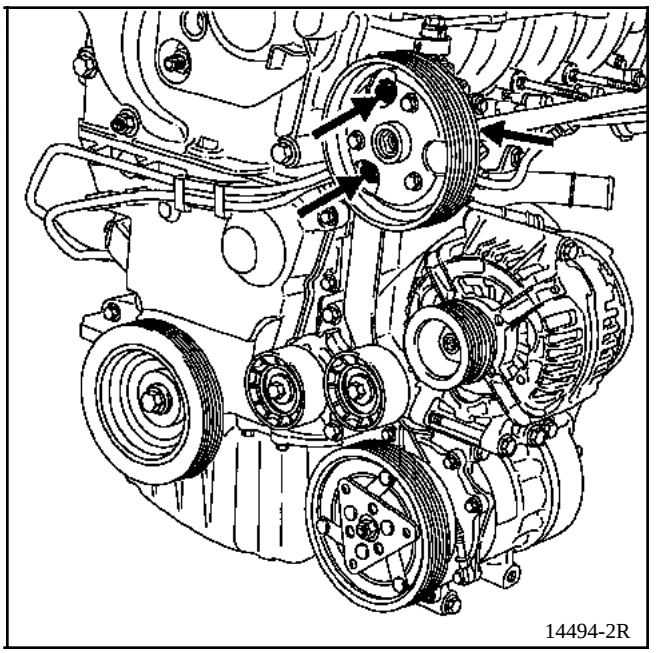
Disconnect the supply and high pressure pipes and be prepared for the **PAS** fluid which will flow out.

IMPORTANT: as the alternator is located below the pump, it will have to be protected from the **PAS** fluid which will flow out.

Disconnect the fuel supply pipe from the injector gallery which will allow you to remove the torx bolt (1) (**T40**) for securing the pump.



Completely remove the pump (three bolts).



REFITTING

Refitting is the reverse of removal.

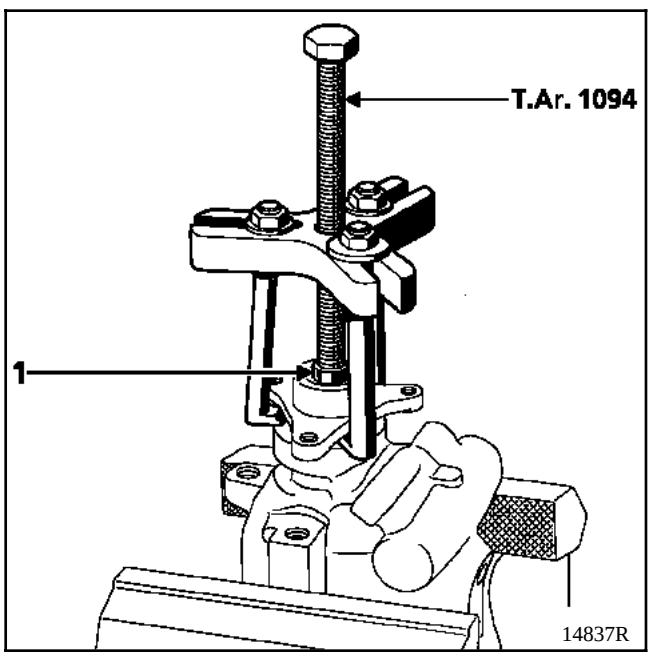
Fill and bleed the circuit by moving the wheels from lock to lock with the engine running.

SPECIAL TOOLING REQUIRED		
T.Ar.	1094	Differential bearing extractor
Dir.	1083 -01	Tool for refitting the pulley

REPLACING THE HUB

Place the pump on a work bench, in a vice.

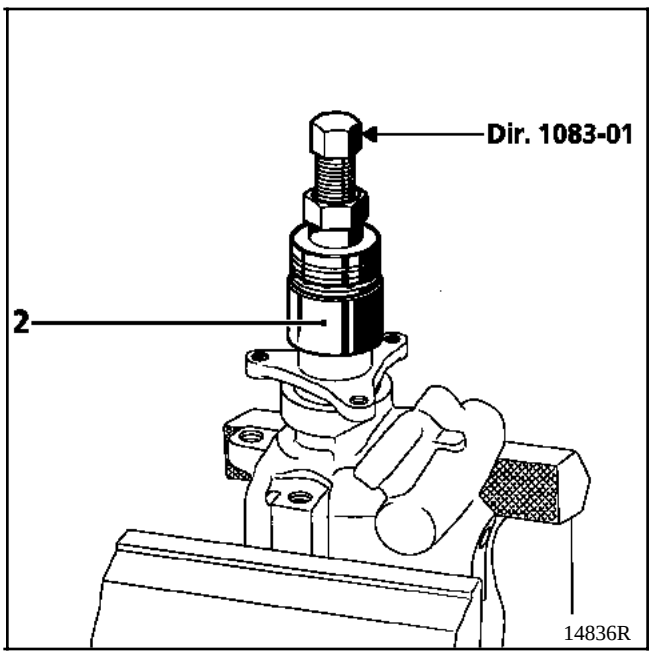
Fit tool **T.Ar. 1094** and extract the hub.



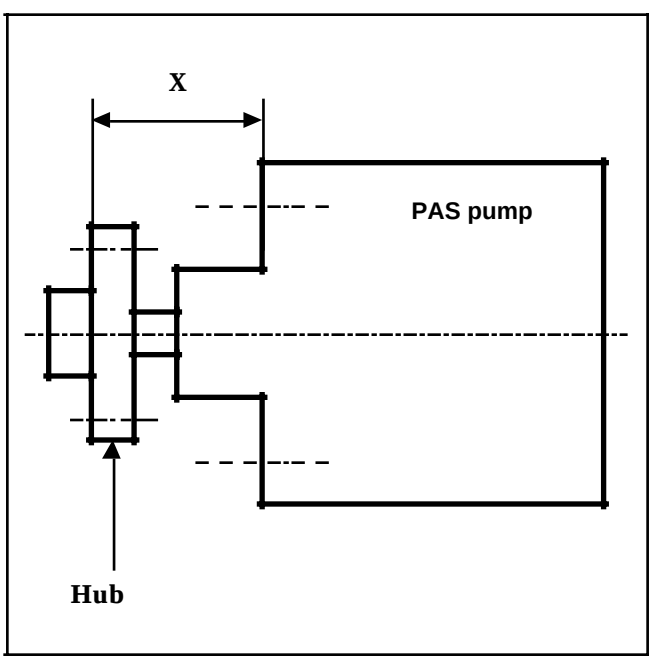
NOTE: insert a bolt (1) between the pump shaft and the pushrod of tool **T.Ar. 1094**.

Fit the hub (new) and press it into place using tool **Dir. 1083-01**. First coat it with multipurpose lubricant to make refitting easier.

NOTE: between tool **Dir. 1083-01** and the hub, insert a shim (2) which is approximately **25 mm**.



Observe the fitting dimension:
X = 34.3 mm.



CONSUMABLES

- Oil for the compressor:
  SANDEN SP 10 : 135 cm^3

- Refrigerant fluid:
  R134a : 650 ± 35 g

- Compressor:
  SANDEN SD 7V

TIGHTENING TORQUES (in daN.m)	
Expansion valve bolt on evaporator	**0.6**
Connecting pipe mounting nut on expansion valve	**0.8**
Expansion valve connecting pipe mounting nut on dehydration canister	**0.8**
Condenser connecting pipe mounting bolt on dehydration canister	**1.2**
Compressor connecting pipe mounting bolt on condenser	**0.8**
Connecting pipe mounting bolt on compressor	**2.1**
Compressor mounting bolt	**2.1**
Circuit pressure sensor	**0.8**

REMOVAL

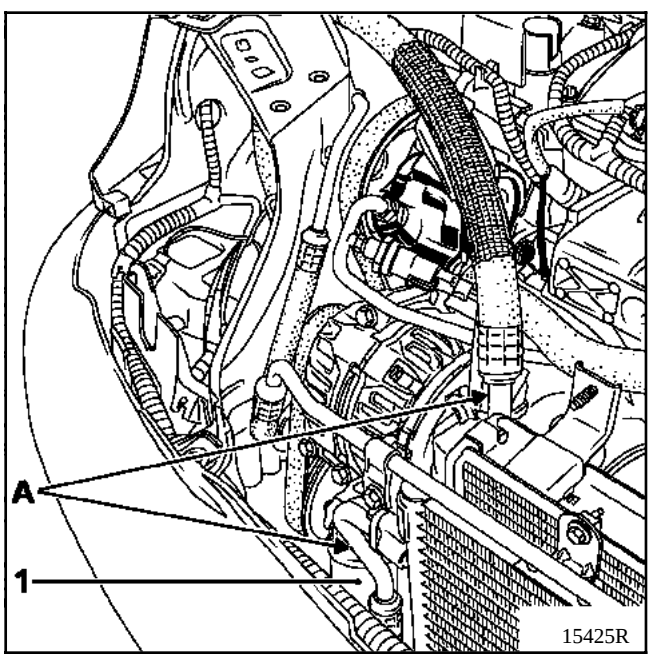
Place the vehicle on a lift.

Drain the circuit of **R134a** refrigerant.

Disconnect the battery.

Remove:
- the radiator grille,
- the front protective covers in the wheel arches,
- the front bumper,
- the accessories drive belt,
- the two R134a connecting pipes (A),
- the mounting bolts from the compressor and take it out from below the vehicle.

NOTE: the pipes and the compressor MUST be plugged to prevent humidity entering the circuit.



REFITTING

Refitting is the reverse of removal.

If the compressor is changed, it is supplied full of oil.

Place the compressor in the correct direction (filling plug to the top).

Tighten the mounting bolts (tightening torque: **2.1 daN.m**).

Refit the two R134a refrigerant pipes (A) (tightening torques: **2.1 daN.m**) onto the compressor.

Pump out, then fill the circuit with **R134a** using the filling station.

NOTE: when refitting the connecting pipes on the compressor, it is essential to fit all the bolts, then hand tighten them before tightening them to the correct torque. The aim is to ensure that the pipe is correctly positioned so that it is not damaged at the "damper" (1).

Check the condition of the seals and lubricate them with **SANDEN SP 10**.

IMPORTANT

When changing the compressor, it is essential to ensure that it has the correct oil level.

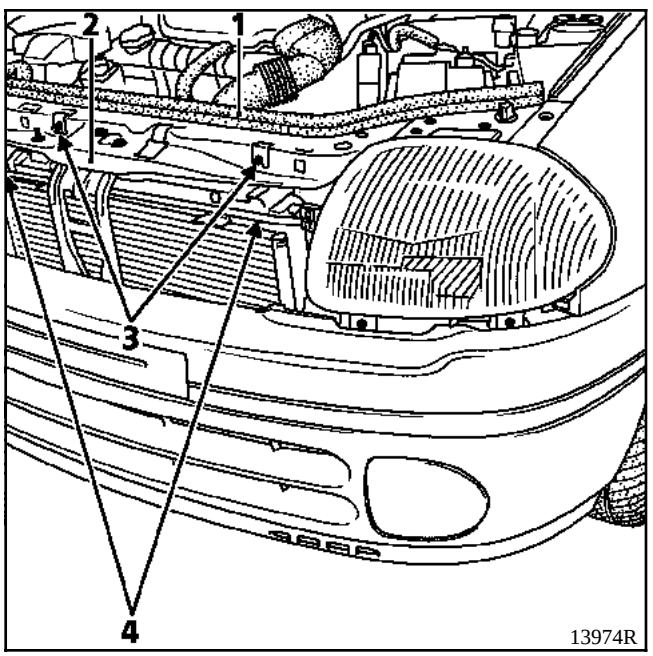
REMOVAL

It is not necessary to use a lift.

Drain the circuit of R134a refrigerant.

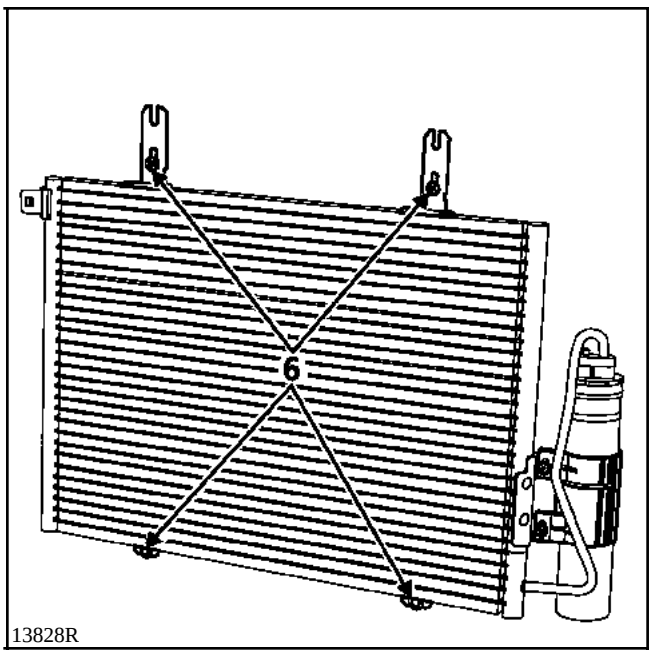
Disconnect the battery.

Remove:
- the radiator grille,
- the seal (1),
- the upper cross member (2),
- the two R134a refrigerant pipes (4) (fit plugs to prevent the entry of humidity),
- the two upper radiator mounting bolts (3).



Remove the four condenser mounting bolts (6) on the radiator.

Carefully remove the condenser.



REFITTING

Refitting is the reverse of removal.

Check the condition of the seals.

Pump out, then fill the circuit with R134a using the filling station.

IMPORTANT

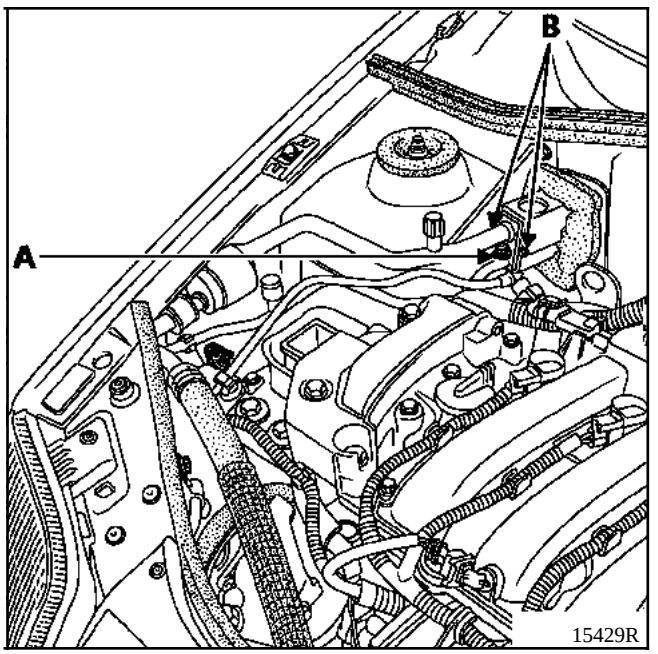
When changing the condenser, add **30 ml** of **SP 10** oil into the circuit.

NOTE: bolt tightening torque (6) : **0.8 daN.m**.

REPLACEMENT

Drain the circuit of R134a refrigerant using the filling station.

Remove:
- the connecting pipework mounting nut (A),
- the two expansion valve mounting bolts (B) on the evaporator.



When refitting, ensure that the pipe seals are in good condition.

Bolt tightening torques:
- bolt (A) : **0.8 daN.m,**
- bolt (B) : **0.6 daN.m**.

Pump out, then fill the circuit with R134a refrigerant using the filling station.

REMOVAL

Place the vehicle on a lift.

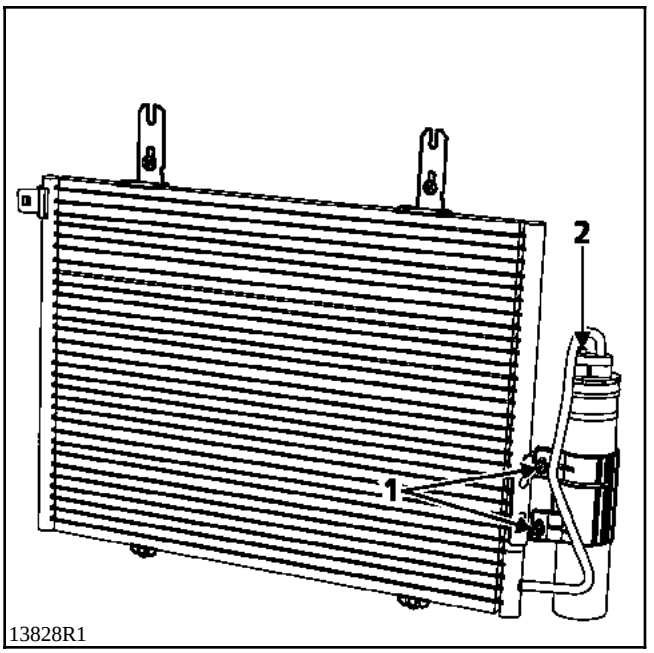
Drain the circuit of R134a refrigerant using the filling station.

Remove:
- the radiator grille,
- the two upper radiator mounting bolts,
- the R134a union (2),
- the two pipe mounting bolts on the dehydration canister.

Slightly push back the radiator-condenser assembly.

From below the vehicle

Remove the two dehydration canister mounting bolts (1) on the condenser.



13828R1

Remove the dehydration canister.

Plug each opening to prevent humidity entering the components.

REFITTING

Refitting is the reverse of removal.

Check that the seals are in good condition and lubricate them with **SP 10** oil.

Pump out, then fill the circuit with R134a refrigerant using the filling station.

When changing the dehydration canister, add **15 ml** of **SP 10** oil to the circuit.

NOTE: bolt tightening torque (2) : **1.2 daN.m**

Disconnect the battery.

Drain the circuit of R134a refrigerant using the filling station.

LOW PRESSURE COMPRESSOR - EXPANSION VALVE PIPE

REMOVAL

Remove the pipe mounting nut on the expansion valve.

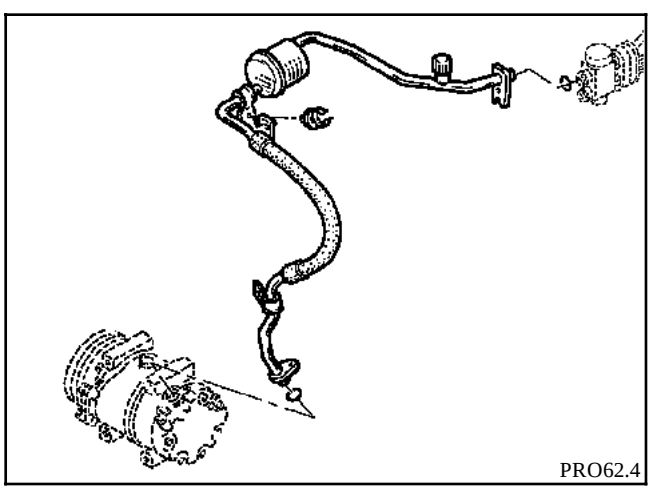
Plug the expansion valve and the pipe.

Remove:
- the radiator grille,
- the pipe mounting bolt on the compressor.

Plug the compressor and the pipe.

Slacken the pipe mounting bracket.

Take out the low pressure pipe.


PRO62.4

REFITTING

Refitting is the reverse of removal.

Check the condition of the seals and lubricate them with **SP 10** oil.

When changing a pipe, add **10 ml** of **SP 10** oil or if a pipe bursts (rapid leak), add **100 ml**.

NOTE:
- Pipe mounting bolt on compressor: **2.1 daN.m**
- Pipe mounting nut on expansion valve: **0.8 daN.m**
- Pipe mounting bolt on condenser: **0.8 daN.m**

Disconnect the battery.

Drain the circuit of R134a refrigerant using the filling station.

HIGH PRESSURE COMPRESSOR-CONDENSER PIPE

REMOVAL

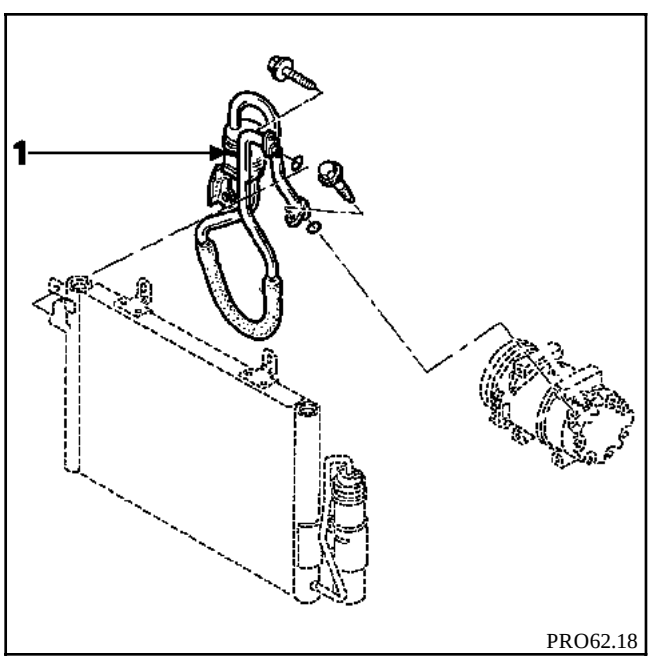
Remove:
- the radiator grille,
- the union mounting bolt on the compressor,
- the pipe mounting bolt on the compressor at the damper (1).

Plug the compressor and the pipe.

Remove the mounting bolt on the condenser.

Take out the pipe.

Plug the condenser and the pipe.



REFITTING

Refitting is the reverse of removal.

NOTE: when refitting this connecting pipe on the compressor; it is essential to fit all the bolts, then hand tighten them before tightening them to the correct torque. The aim is to ensure that the pipe is correctly positioned so that it is not damaged at the "damper" (1).

Check the condition of the seals and lubricate them with **SP 10** oil.

When changing a pipe, add **10 ml** of **SP 10** oil or if a pipe bursts (rapid leak), add **100 ml**.

Disconnect the battery.

Drain the circuit of R134a refrigerant using the filling station.

HIGH PRESSURE DEHYDRATION CANISTER - EXPANSION VALVE PIPE

REMOVAL

Remove:
- the radiator grille,
- the upper cross member.

Detach the pipe from its mountings.

Disconnect the pressure sensor connector.

Remove the mounting nut on the expansion valve.

Plug the expansion valve and the pipe.

Remove the mounting bolt on the dehydration canister.

Plug the dehydration canister and the pipe.

Take out the pipe.

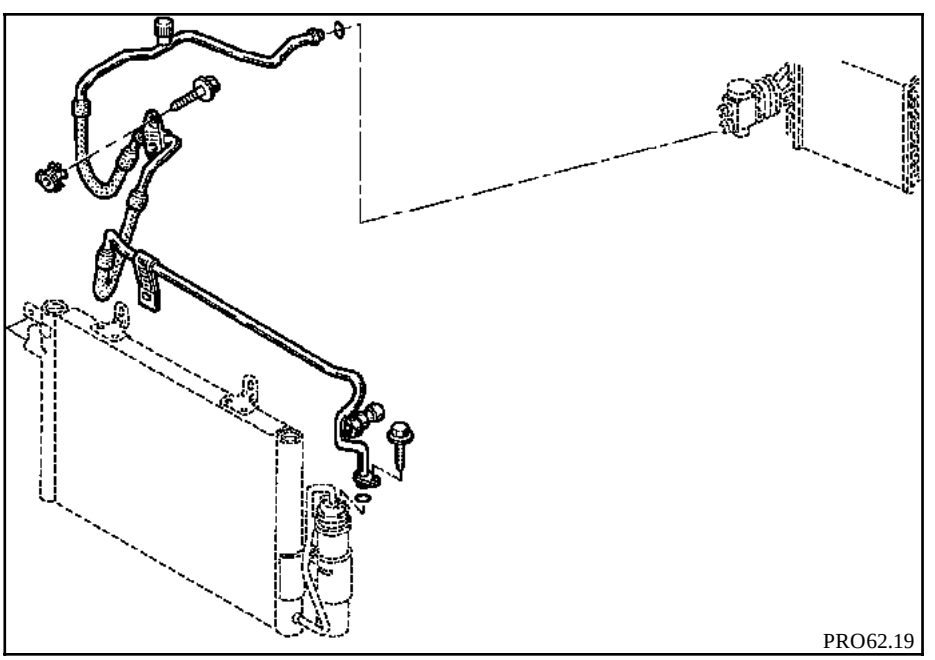
REFITTING

Refitting is the reverse of removal.

Check the condition of the seals and lubricate them with **SP 10** oil.

When changing a pipe, add **10 ml** of **SP 10** oil or if a pipe bursts (rapid leak), add **100 ml**.

NOTE:
- Pipe mounting bolt on the dehydration canister: **0.8 daN.m**
- Pipe mounting nut on the expansion valve: **0.8 daN.m**


PRO62.19