



**All types**

Type

S/Section

XXX X

10

**10** SERVICE EXCHANGE ENGINE

- Engine: **J8S**
  - Gearbox: **XXX**
- Basic manual: XXX**

This Technical Note deals with:

**ASSEMBLY INSTRUCTIONS  
FOR THE J8S ENGINE  
ASSEMBLY INSTRUCTIONS**

"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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# ENGINE AND PERIPHERALS

## Service exchange engine

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### ENGINE SPECIFICATIONS

**Preparing the engine, which has reached the end of its service life, for return**

The engine must be cleaned and drained.

**The following units must be left on the returned engine or enclosed in the return packaging:**

- the oil dipstick,
- the water pump,
- the cylinder head cover,
- the heater plugs,
- the timing belt tensioner,
- the timing gear cases,
- the oil filter,
- the injection pump pulley,
- the camshaft pulley,
- the intermediate shaft pulley,
- the crankshaft timing pulley,
- the clutch and the flywheel,
- the injection pump,
- the injector pipes,
- the injectors,
- the vacuum pump.

**Do not forget to remove:**

- the coolant hoses,
- the water pump pulley,
- the oil pressure switch,
- the thermostat and its mounting.

The engine being returned should be attached to the wooden base in the same way as the service exchange engine.

Plastic plugs and covers in place.

Cardboard covering everything.

**DEDUCTIONS MAY BE MADE IN RESPECT OF ANY ENGINE WHICH DOES NOT COMPLY WITH THESE CONDITIONS.**

### ASSEMBLY INSTRUCTIONS FOR SERVICE EXCHANGE ENGINES

#### WARNING

The service exchange engine is delivered **without oil**, do not forget to fill and check the level before starting the engine.

**When fitting the service exchange engine, it is ESSENTIAL to identify the problems encountered on the faulty engine, in order to avoid any damage to the replacement engine. Please read the assembly instructions on the following pages carefully.**

#### Cleaning the engine compartment

It is preferable to clean the engine compartment after removing the engine so that the new engine can be fitted under optimum conditions and also to ensure that it will leave the customer with a good impression.

#### Radiator

The radiator should be checked carefully, firstly on the outside (honeycomb, plenum chamber), and secondly to ascertain the amount of contamination in the internal circuit, in order to ensure that it will not leak.

Depending on the condition, clean or replace the radiator.



**Risk of engine overheating, damage to the cylinder head gasket**

### Coolant hoses

Replace them, if they are porous or damaged, in order to avoid any problems with overheating or excessive coolant consumption.

The hose clips should be in good condition to ensure that they function correctly.

If not, they should be replaced.



**Risk of engine overheating, damage to the cylinder head gasket.**

### Bleeding the cooling circuit

In order to prevent the engine overheating, it is important to bleed the cooling circuit carefully following the procedures given in the **Workshop Repair Manual** for the vehicle.

### Protection

Protection down to  $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for warm, temperate and cold climates.

Protection down to  $-37^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for extremely cold climates.

**IMPORTANT:** protection decreases, if the concentration exceeds **60 %** of antifreeze.

### WARNING

#### Coolant

The coolant **MUST** be replaced. Use only the coolant recommended by the manufacturer.

#### Degassing reservoir

Check the cleanliness of the reservoir.

Replace the reservoir cap degassing valve.

Clean and replace if necessary.

#### Coolant circuit

Ensure that the cooling circuit is to specification and that the hoses are correctly routed.

### Engine cooling fan

### WARNING

When bleeding the cooling circuit, ensure that the temperature switch, the fan and the operating threshold are functioning correctly.

If necessary, replace the temperature switch.



**Risk of engine overheating, damage to the cylinder head gasket**

### Intake and exhaust manifolds.

Check the manifolds at the contact surface with the cylinder head and also that there are no cracks on the body of the manifold.

Change them, if necessary.

Clean and blow through the branches of the manifold with compressed air to remove any foreign bodies inside which could damage the new engine when it is started.



**Risk of damage to the engine if foreign matter is drawn in when the engine is started.**

The manifold gasket **MUST** be replaced.

### Oil vapour rebreathing

Check:

- the oil vapour rebreathing circuit,
- the condition of the hoses and for any porosity or cuts,
- cleanliness, amount of contamination,
- the presence, position and conformity of the calibrated restrictor,
- the conformity of the rebreathing circuit (refer to **the Workshop Repair Manual** for the engine concerned).



**Causes excessive use of oil.**

### Turbo

Clean the exhaust and turbocharger manifold gasket surfaces.

Replace the self-locking mounting nuts for the turbocharger on the exhaust manifold with new nuts.

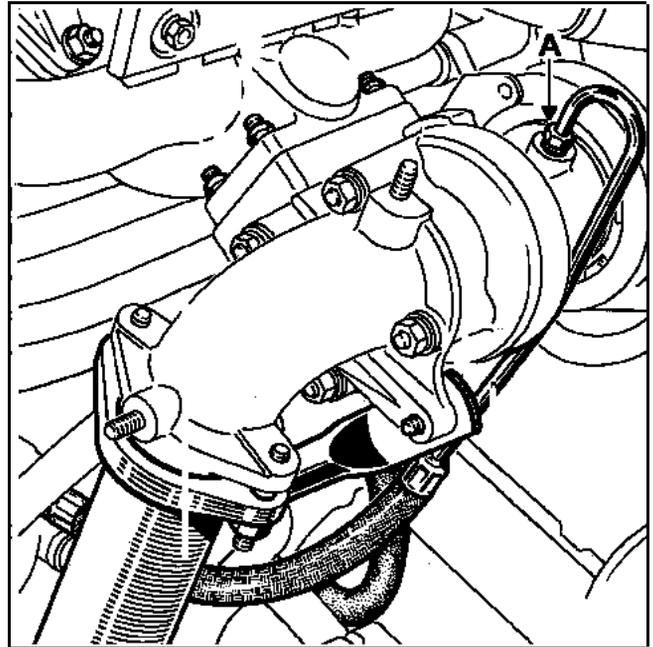


**Warning** the mounting of the turbo supply pipe on the cylinder block **MUST be** tightened to a torque of **3.5 daN.m** to avoid oil leaks.

Connect the oil return and attach it using a clamp with new screws.

Fill up the turbo engine oil using the inlet opening (A).

Tighten the oil supply connection and run the engine at idling speed so that the circulation of oil is stabilised.



### Air filter

Replace.

### Diesel filter

Replace.

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TIGHTENING TORQUES (in daN.m)	
Intake manifold	3.2 to 3.9
Exhaust manifold	3.2 to 3.9
Garrett turbo	2.6
IHI turbo	4.5
Accessories support	4

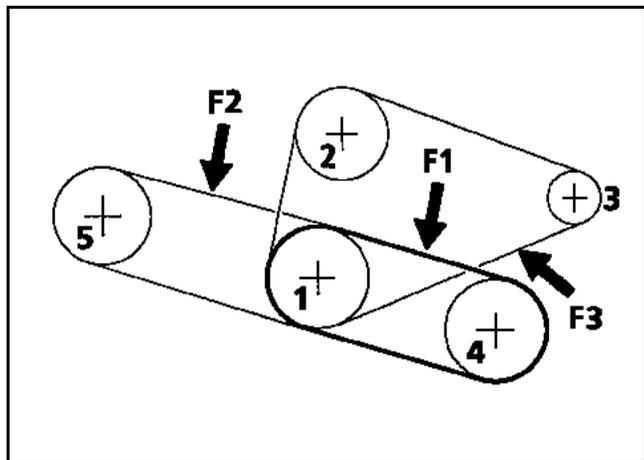
### ACCESSORIES BELT TENSION

Engine types	Belt functions	Fitting tension in SEEM units	Fitting tension in Hertz
<b>J8S</b> (all types) <b>852</b> (all types)	Alternator Water pump (trapezoid)	<b>101 ± 4</b>	*
<b>J8S</b> (all types)	Power steering (trapezoid)	<b>99 ± 4</b>	*
<b>J8S</b> / 704 - 740 742 - 784 - 786 AC/PAS	Air conditioning (four tooth groove)	<b>85 ± 5</b>	*
<b>J8S</b> / 760	Alternator (four tooth groove)	<b>98 ± 7</b>	*
<b>J8S</b> / 760 / AC	Power steering (four tooth groove)	<b>99 ± 6</b>	*
<b>J8S</b> / 760 / Electric heated windscreen	Alternator (four tooth groove)	<b>99 ± 7</b>	*
<b>J8S</b> / 760 / AC	Water pump / Air conditioning (six tooth groove)	<b>123 ± 9</b>	*

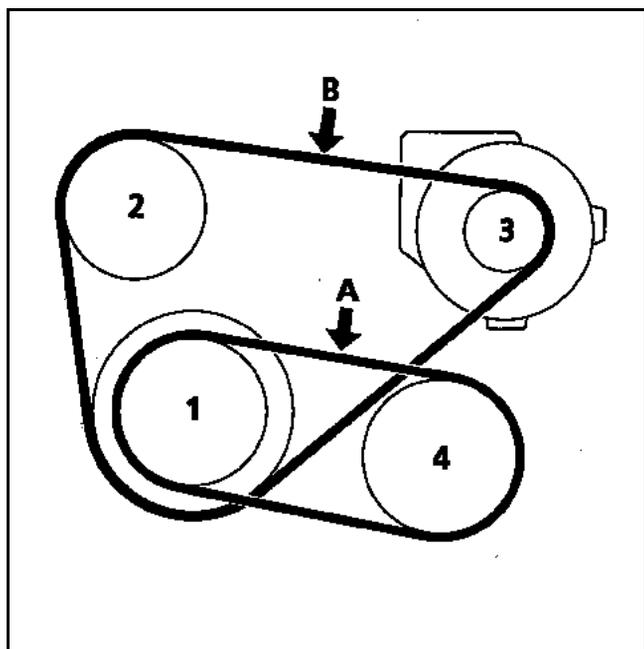
\* A Technical Note, which is being prepared, will show the tension (in Hertz) for accessories belts using **Mot. 1505**.

### J8S engine - All types except J8S 760

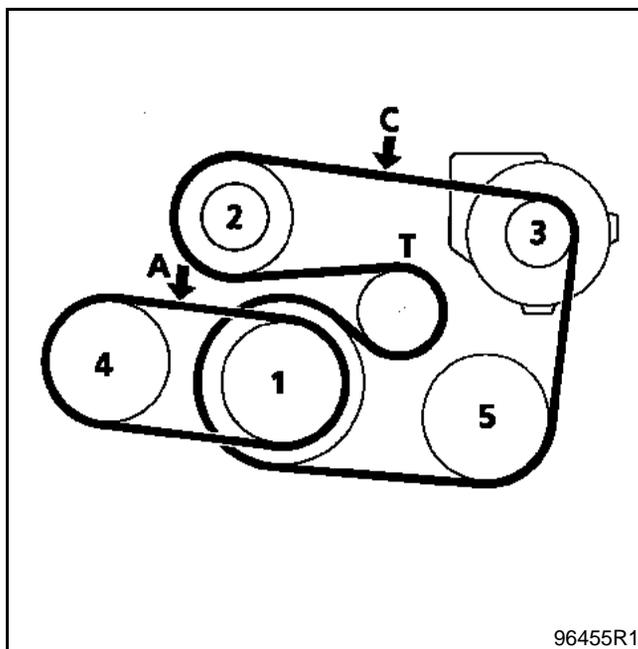
#### Alternator belt - water pump AC/PAS



### J8S 760 engine PAS



### J8S 760 engine AC/PAS



96455R1

- 1 Crankshaft
- 2 Water pump
- 3 Alternator
- 4 Power steering pump
- 5 Air conditioning compressor
- T Tensioner
- Tension checking point

The lubrication circuit diagram is shown on the next two pages to ensure that the oil pipes are connected correctly.

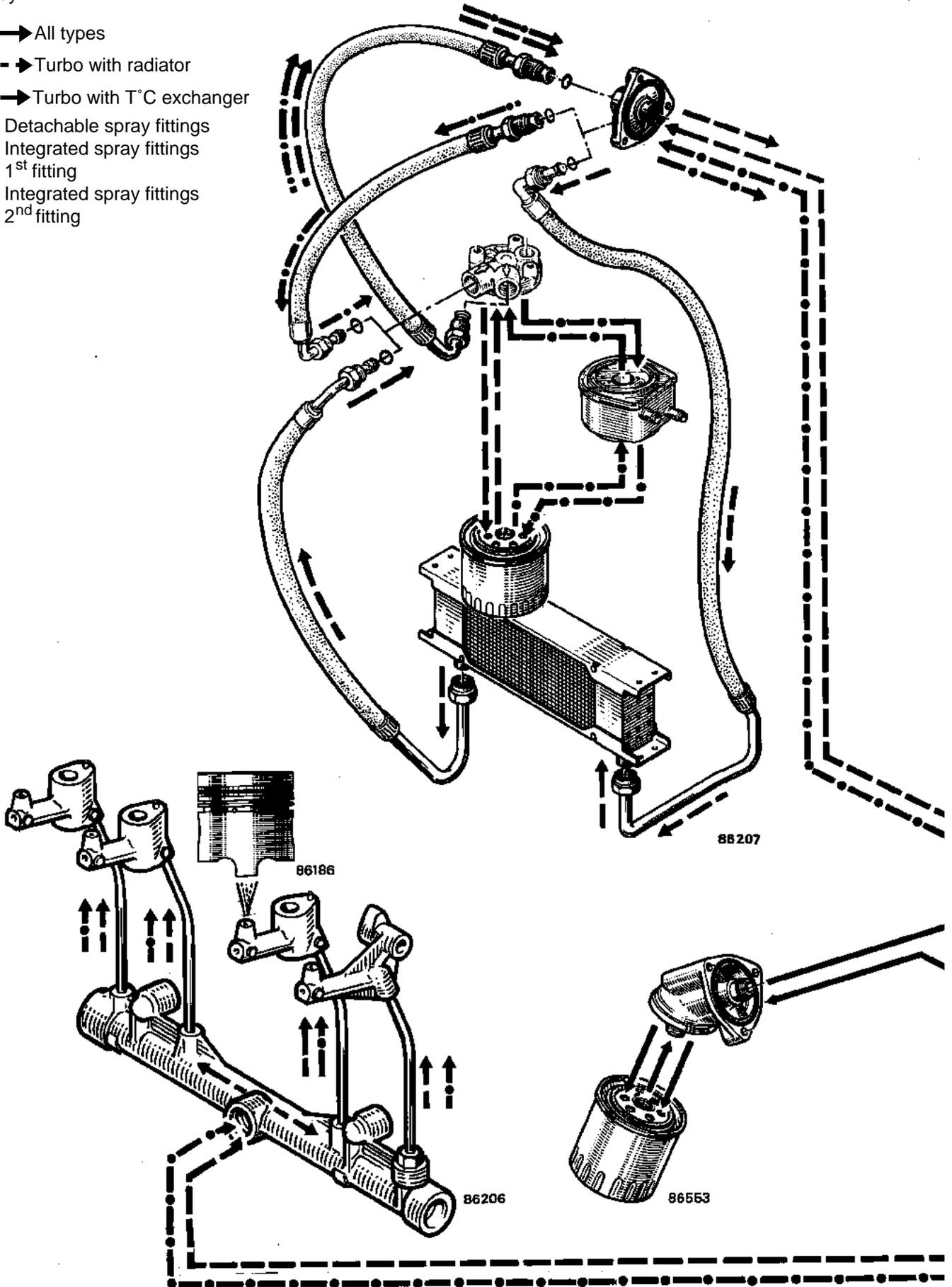
**NOTE:** it is **VITAL** to replace the oil pipe seals.

# ENGINE AND PERIPHERALS

## Service exchange engine

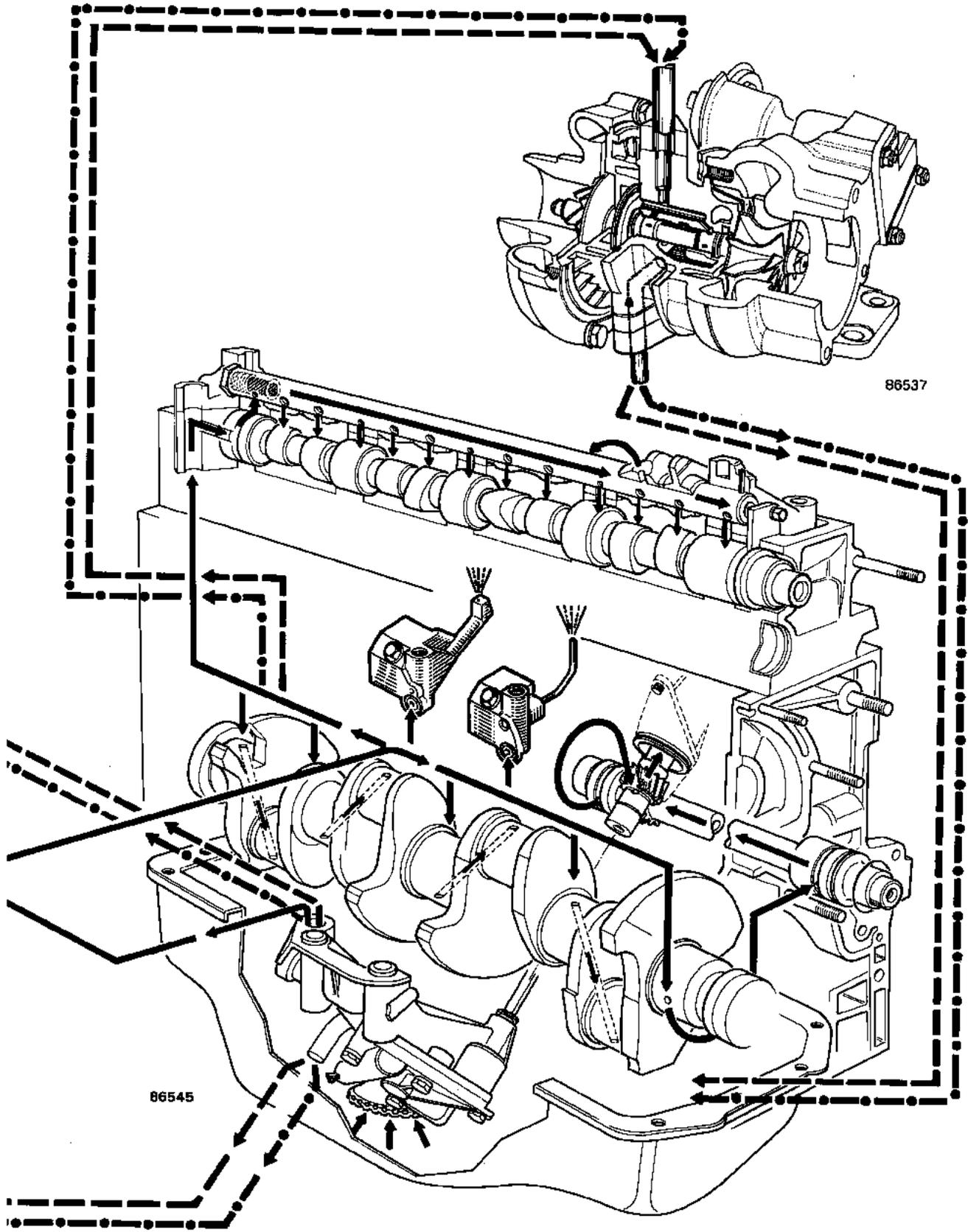
Key:

- ▶ All types
  - - ▶ Turbo with radiator
  - ▶ Turbo with T°C exchanger
- 1 Detachable spray fittings
  - 2 Integrated spray fittings 1<sup>st</sup> fitting
  - 3 Integrated spray fittings 2<sup>nd</sup> fitting

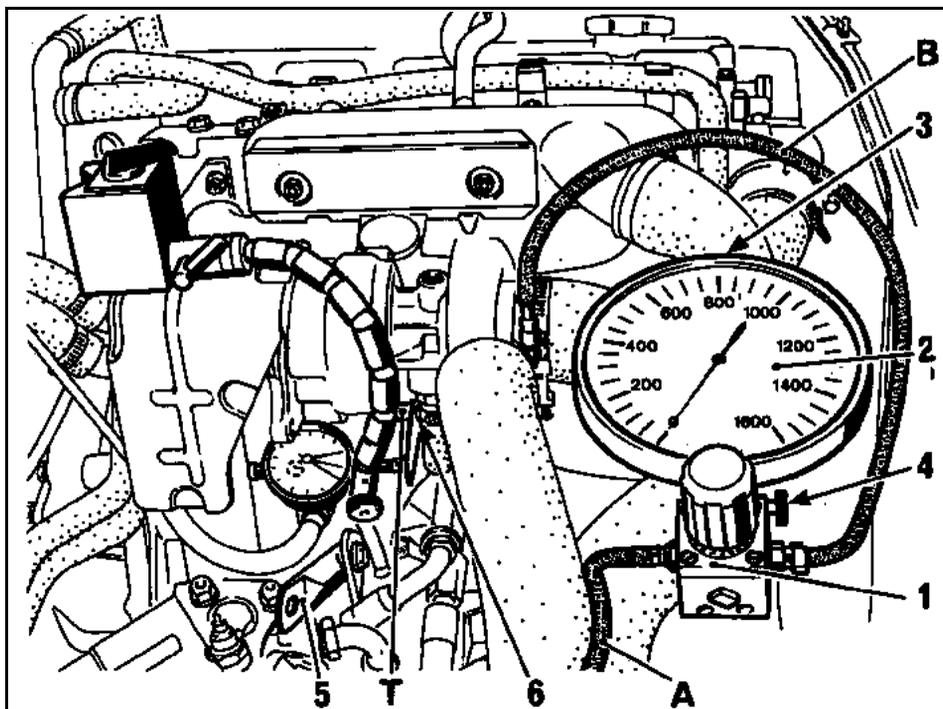


# ENGINE AND PERIPHERALS

## Service exchange engine



### CHECKING THE PRESSURE OF THE REGULATOR OPENING



#### HOW TO USE TOOL Mot. 1014

The device consists of an adjustable pressure relief valve (1), a control pressure gauge (2) with a scale from **0 to 1.6 bars** equipped with a zero adjusting screw (3) and a leakage screw (4).

Before using the equipment, set the pressure gauge to zero (screw 3), undo the pressure relief valve screw (1) as far as it will go and also the leakage screw (4) and connect the intake pipe (A) to the compressed air supply.

Connect the outlet pipe (B) to the turbocharger pressure regulator take-off to be checked and tighten the screw (4).

Then slowly unscrew the pressure relief valve screw (1) until the required pressure or the recommended regulator rod travel is achieved (slight slackening off of the screw (1) allows the pressure to be stabilised).

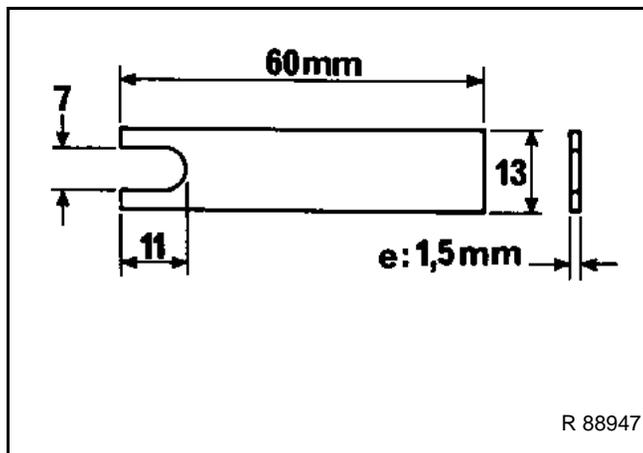
#### CHECKING CALIBRATION PRESSURE

Connect the oil inlet and the turbocharger fixing stay (5).

Disconnect the hose attached to the regulator unit take-off and connect **Mot. 1014**.

Prepare a spacer in accordance with the following diagram and tighten it between the rod (T) and the nut (6).

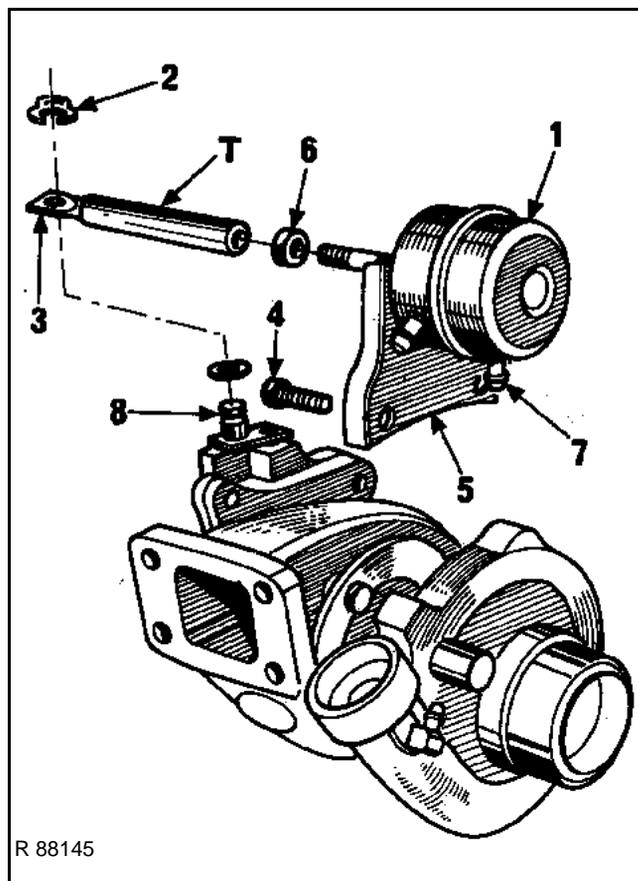
Place a gauge against the spacer, fixed by a magnetic holder on the exhaust shield.



Gradually increase the pressure until the rod movement shown in the table on the following page is achieved and record the pressure read off the pressure gauge which should correspond to the checking values indicated.

If the calibration pressure is not within tolerance, change the unit - regulator assembly (perforated end fitting and rod) or carry out adjustment ("sealed" using a dab of paint).

### REPLACING THE REGULATOR UNIT



Disconnect the hose to the regulator unit (1).

Remove the circlip (2) and detach the threaded end (3).

Remove the mounting screws (4) and take out the regulator unit.

Insert the new unit and mount it using new screws (tightening torque **1.6 to 1.8 daN.m**).

Screw the lock nut (6) and the threaded end (3) onto the rod.

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### CHECKING CALIBRATION PRESSURE

Fit tool **Mot. 1014** to the take-off (7) and apply air pressure equal to the adjustment value.

Opening pressure at full load (mbar)	Engine speed (rpm)	Static opening pressure (mbar)	Travel of the adjusting rod (mm)	Engine type	Turbo type	Vehicle type
575 to 625	2250 to 2750	820 to 880	0.36 to 0.40	J8S 786	Garrett	X487
575 to 625	2250 to 2750	760 to 800	0.36 to 0.40	J8S 714, 742, 746, 788	Garrett	X48P, X488, X48W
575 to 625	2250 to 2750	740 to 800	0.36 to 0.40	J8S 240, 708, 774	Garrett	B290, J114, J115, S115
-	-	775 ± 30	2	J8S 708	IHI	B290
725 ± 25	2200 to 4000	-	0.36 to 0.40	J8S 612	Garrett	J63E
575 to 625	2250 to 4000	825 to 925	0.36 to 0.40	J8S 610, 778	Garrett	J63D, S63D, S633
575 to 625	2250 to 2750	700 to 760	0.36 to 0.40	J8S 772, 776	Garrett	J634, J635, S635
1700 to 1750	from 2500	825 to 925	0.36 to 0.40	J8S 760	Garrett	B546
575 to 625	2250 to 2750	-	-	J8S 702, 712	Garrett	1270, 1346, 1356, 1366

### WARNING

Check that there is no leakage of air between the pressure gauge and the regulator unit.

Apply a force to the valve control arm (8) such that the valve is kept closed.

In these conditions, adjust the position of the end fitting (3) such that the clevis opening fits on the control arm (8), which is kept in the closed valve position.

Bring the pressure at the take-off back (7) to zero.

Using a magnetic holder, attach a gauge at the end of the adjustment rod and set the gauge to zero.

Gradually increase the pressure until the rod adjustment movement corresponding to the values in the table on the previous page is achieved and record the pressure read off the pressure gauge which should be within the range (adjustment pressure) shown in the table.

If the pressure is not within tolerance, modify the position of the threaded end (3) (screw in to increase and unscrew to reduce the pressure) until the adjustment pressure indicated is obtained.

Bring the lock nut (6) into contact with the threaded end (3) and lock it at **0.6 to 0.7 daN.m**.

Apply a touch of paint to the lock nut and the threaded end.

### **WARNING**

Do not apply paint to the smooth part of the regulator rod.

### **Running-in**

Up to **750 miles (1,500 km)**, do not exceed **2,500 rpm**. After this distance, your customer may drive more quickly, but only after approximately **4,000 miles (6,000 km)** will the vehicle reach its maximum potential.

During this running-in period, do not accelerate excessively when the engine is cold, do not make the engine run too quickly.