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SUBSCRIPTION

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PETROL ENGINE

ES9J4 (2946 cm³. V6)

- COOLING

MAN 108931

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COOLING

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DATA : COOLING SYSTEM

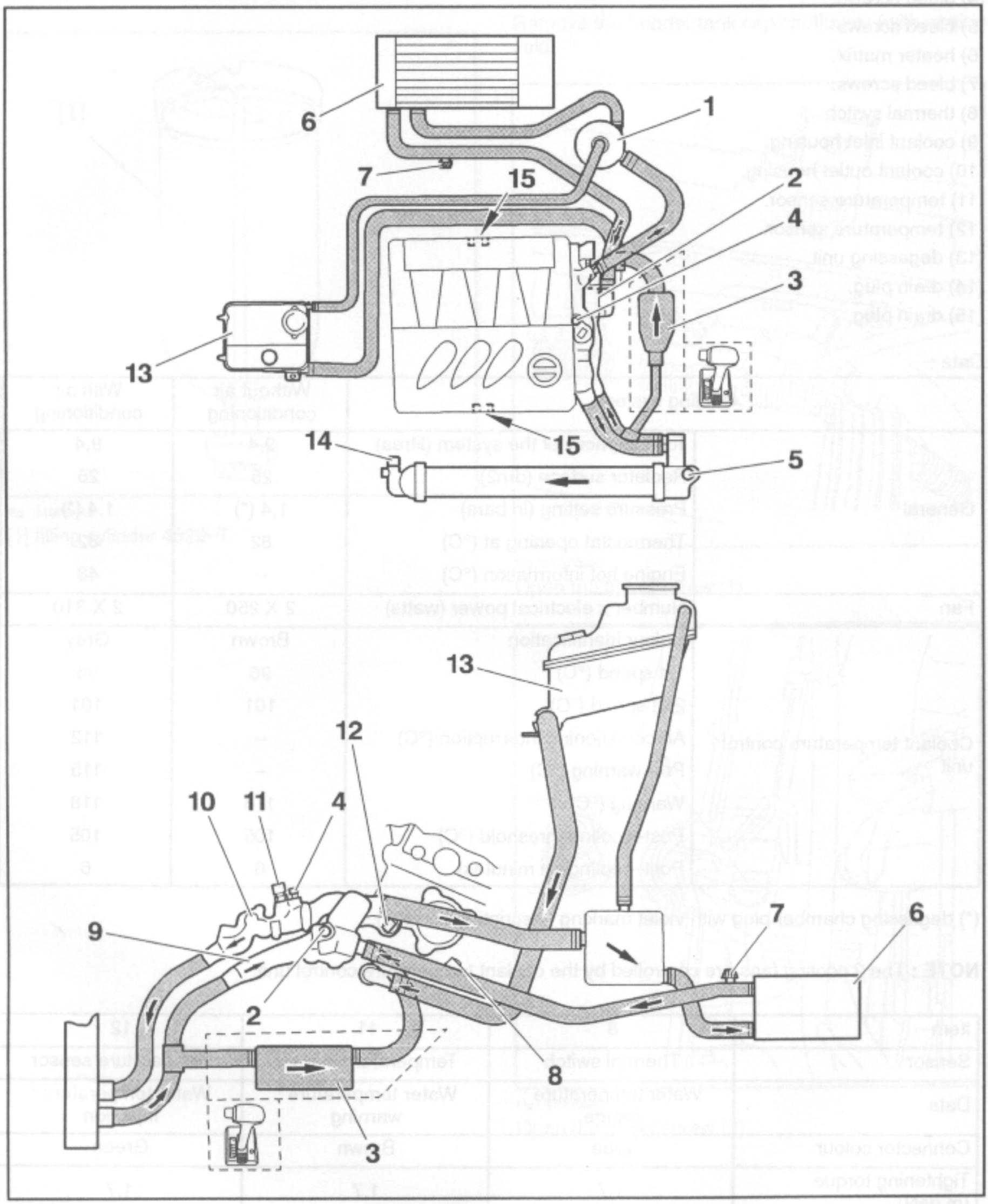


Fig : B1GP061P

(1) degasser.
(2) bleed screws.
(3) oil / water heat exchanger.
(4) bleed screws.
(5) bleed screws.
(6) heater matrix.
(7) bleed screws.
(8) thermal switch.
(9) coolant inlet housing.
(10) coolant outlet housing.
(11) temperature sensor.
(12) temperature sensor.
(13) degassing unit.
(14) drain plug.
(15) drain plug.

Data :

Cooling system		Without air conditioning	With air conditioning
General	Total capacity of the system (litres)	9,4	9,4
	Radiator surface (dm2)	25	25
	Pressure setting (in bars)	1,4 (*)	1,4 (*)
	Thermostat opening at (°C)	82	82
	Engine hot information (°C)	–	48
Fan	Number x electrical power (watts)	2 X 250	2 X 310
Coolant temperature control unit	Colour identification	Brown	Grey
	1st speed (°C)	96	96
	2nd speed (°C)	101	101
	Air conditioning interruption (°C)	–	112
	Pre–warning (°C)	–	115
	Warning (°C)	118	118
	Post–cooling threshold (°C)	105	105
	Post–cooling (in minutes)	6	6

(*) degassing chamber plug with violet marking (inscriptions on top).

NOTE : The 2 cooling fans are controlled by the coolant temperature control unit.

Item	8	11	12
Sensor	Thermal switch	Temperature sensor	Temperature sensor
Data	Water temperature : gauge	Water temperature : warning	Water temperature : injection
Connector colour	Blue	Brown	Green
Tightening torque (m.daN)	1,7	1,7	1,7

DRAINING – FILLING – BLEEDING : COOLING SYSTEM

1 – RECOMMENDED TOOLS

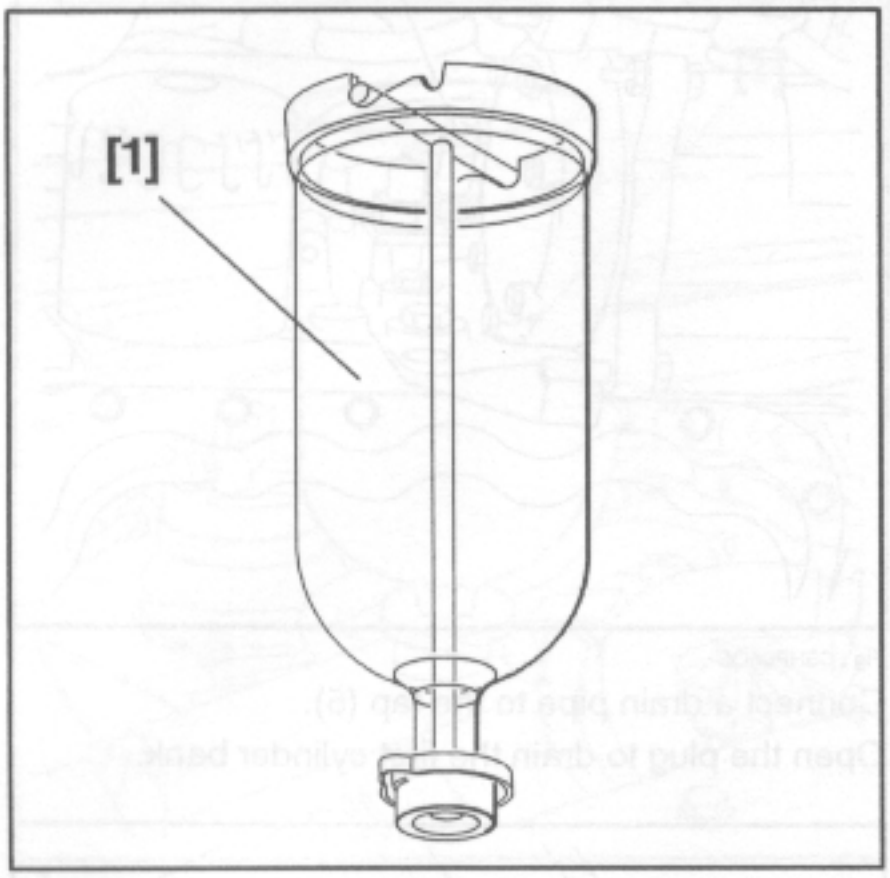


Fig : B1GP00AC

[1] filling cylinder 4520–T.

2 – DRAINING

Remove the header tank cap cautiously (with engine cold).

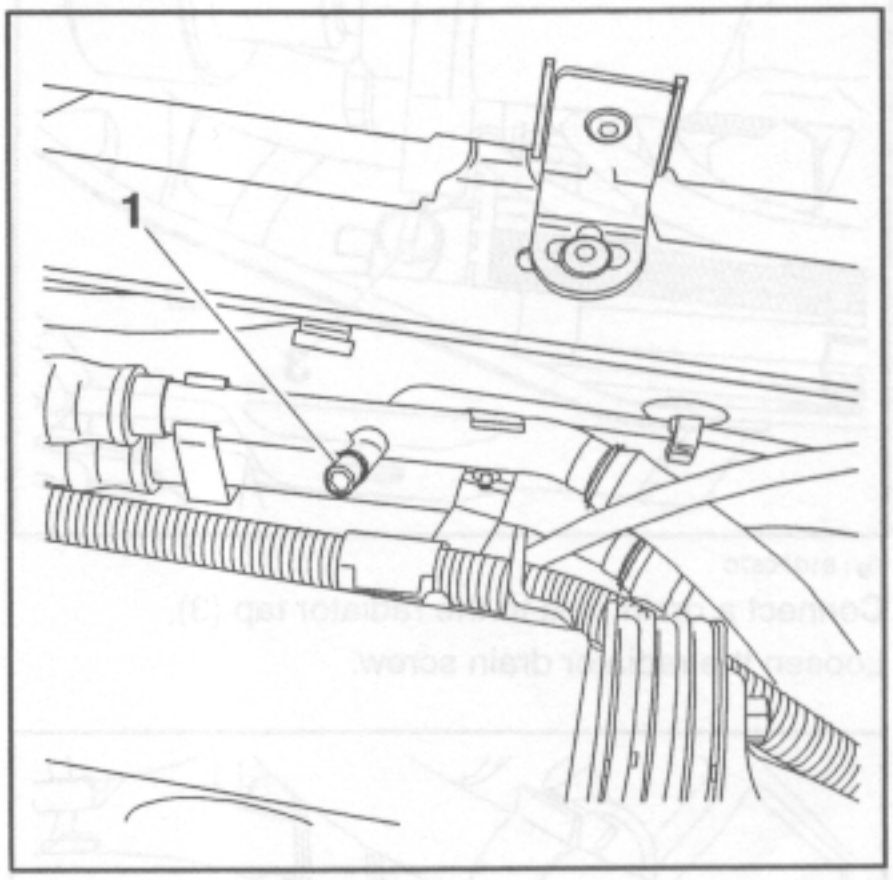


Fig : B1GP065C

Open the bleed screw (1).

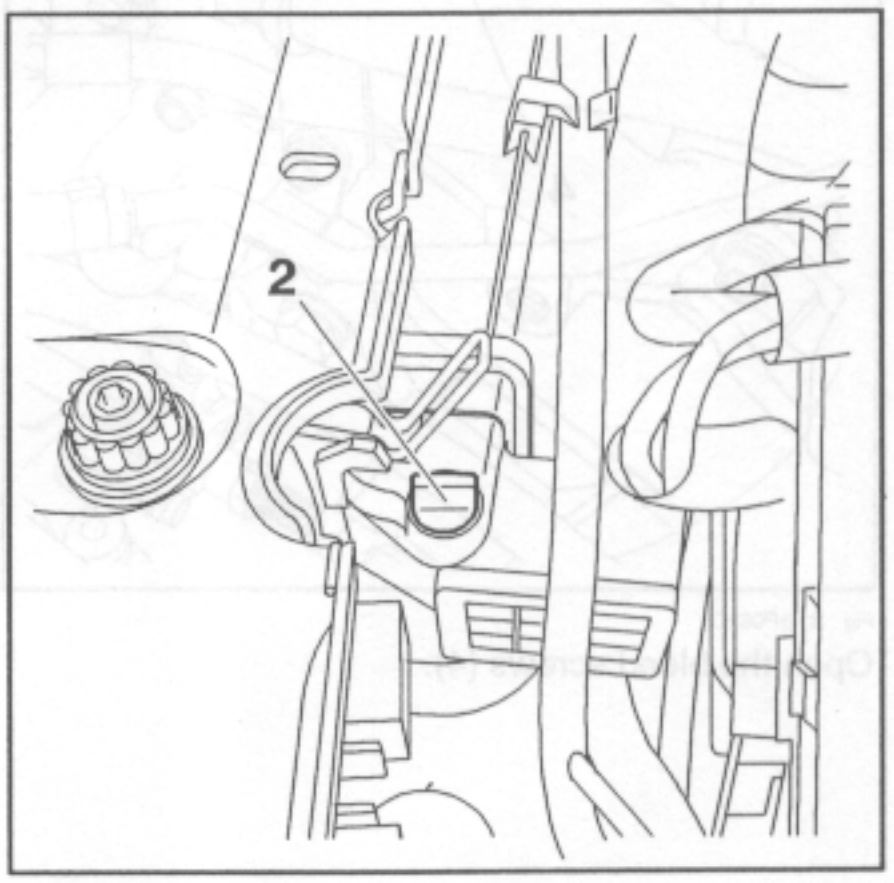


Fig : B1GP066C

Open the bleed screw (2).

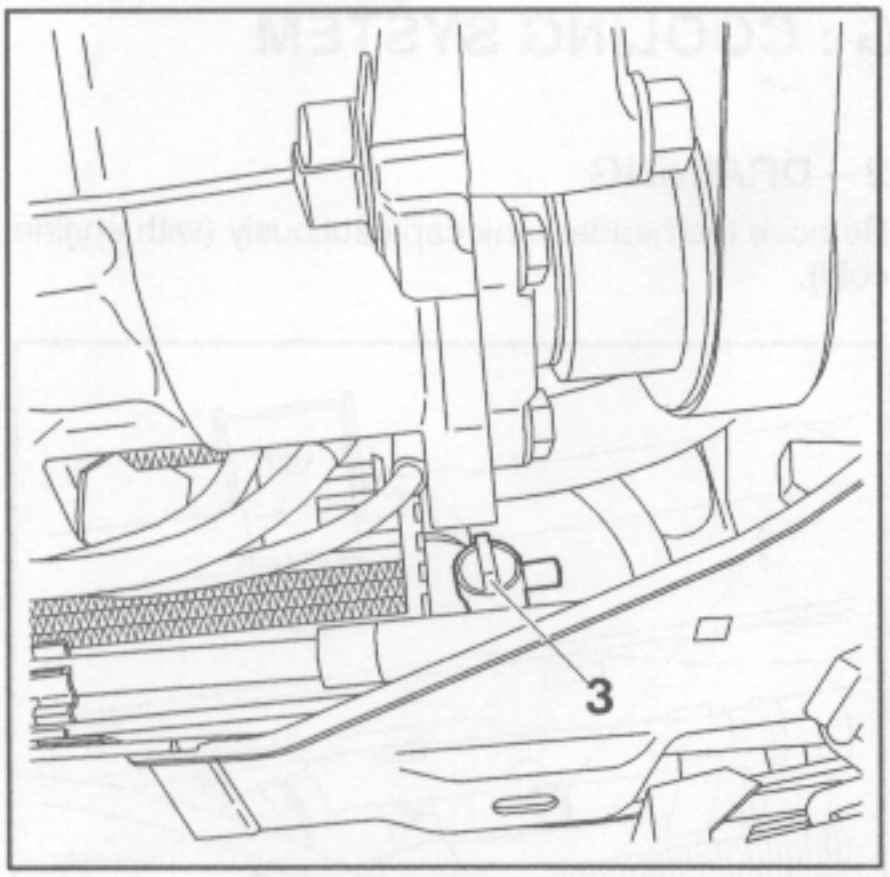


Fig : B1GP067C

Connect a drain pipe to the radiator tap (3).
Loosen the radiator drain screw.

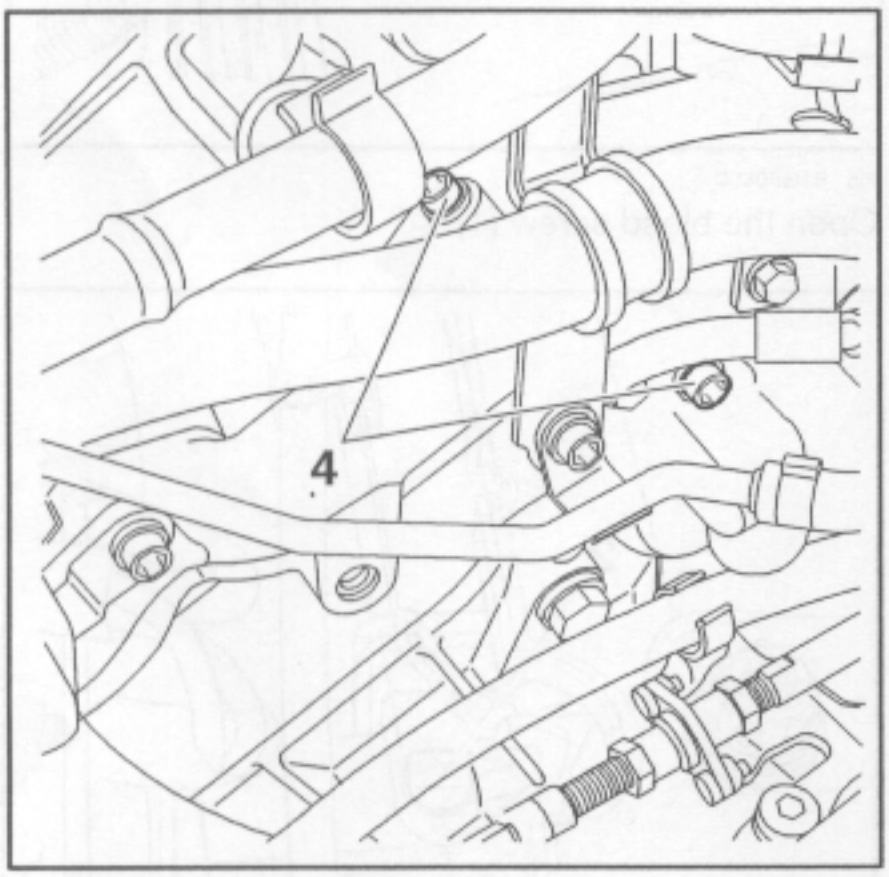


Fig : B1GP068C

Open the bleed screws (4).

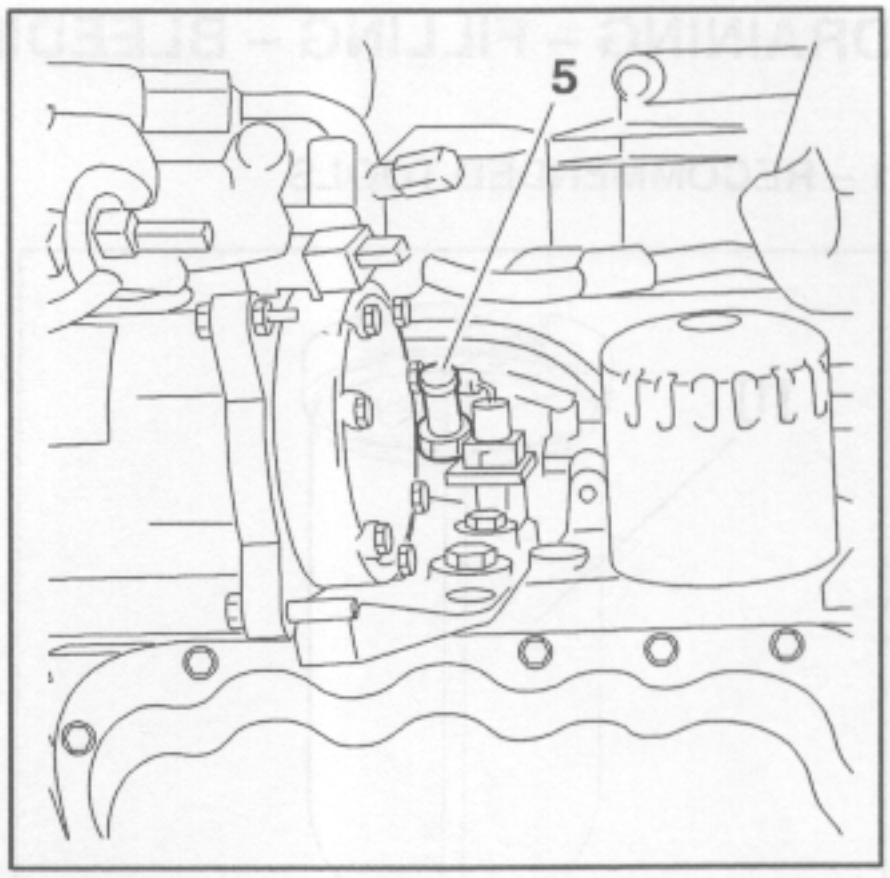


Fig : C5HP08QC

Connect a drain pipe to the tap (5).
Open the plug to drain the first cylinder bank.

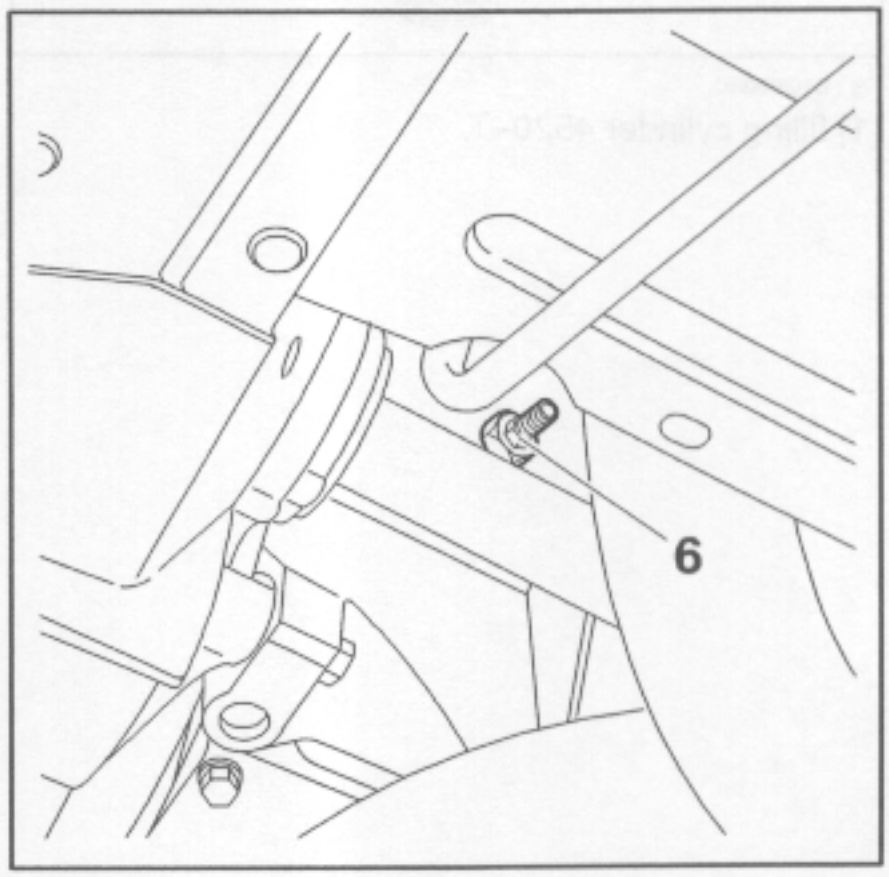


Fig : B2FP035C

Connect a drain pipe to the tap (6).
Open the plug to drain the second cylinder bank.
Disconnect the drain pipes from the taps (5) and (6).
Tighten the taps (5) and (6) ; to 3 m.daN.

3 – FILLING AND BLEEDING THE SYSTEM

NOTE : Before any filling operation, rinse the cooling system with clear water.

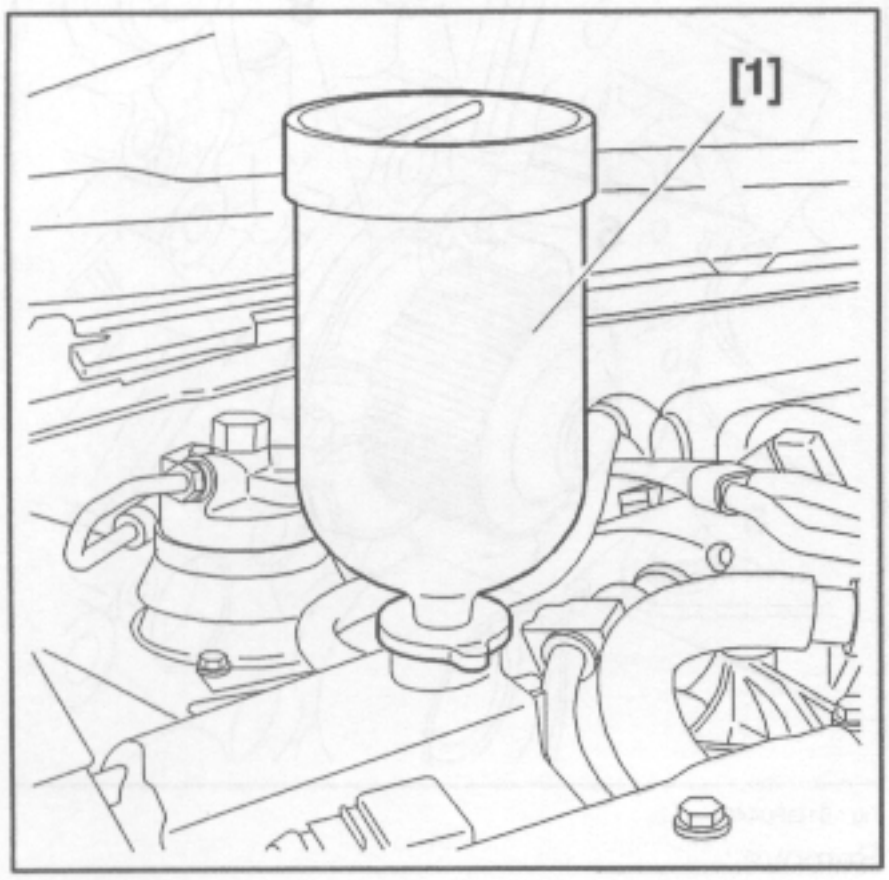


Fig : B1GP069C

Fit the filling cylinder [1] to the filler orifice.

Slowly fill the filling cylinder [1] with coolant, up to the "1 litre" mark, in order to pressurise the system.

Shut the bleed screws when the fluid flows cleanly and without any air bubbles.

Run the engine at a speed of 1500/2500 rpm.

Maintain this speed for three cooling cycles (fans starting and stopping).

NOTE : To bleed the heater matrix correctly, the filler cylinder should be filled up to the "1 litre" mark.

Switch off the engine and wait for it to cool down.

Remove the filling cylinder [1].

Refit the header tank cap.

REMOVING – REFITTING : COOLANT PUMP

1 – REMOVING

Drain the cooling system (see the relevant operation).

Remove the timing gear drive belt (see the relevant operation).



Fig : B1GP043C

Remove :

- screw (1)
- the guide roller
- screws (2)
- the engine mounting bracket (3)
- screws (4)
- the dynamic tensioner (5)

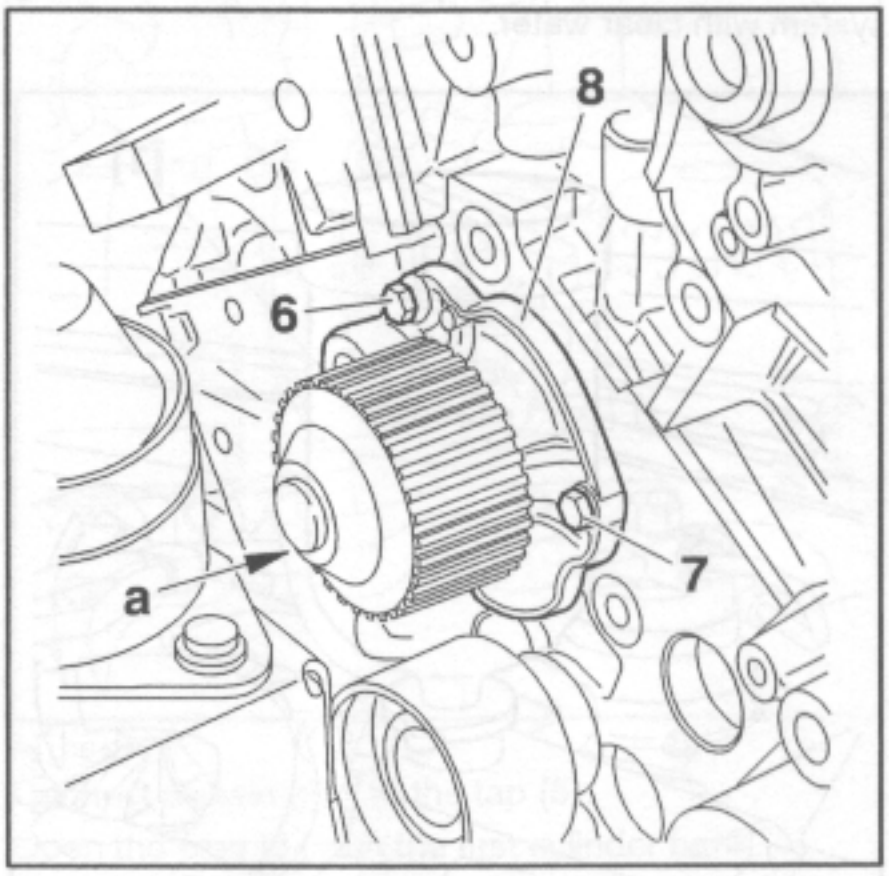


Fig : B1GP044C

Remove :

- the screws (6) and (7)
- the bolt at "a"
- the water pump (8)
- the water pump seal

2 – REFITTING

IMPERATIVE : Replace systematically the water pump seal.

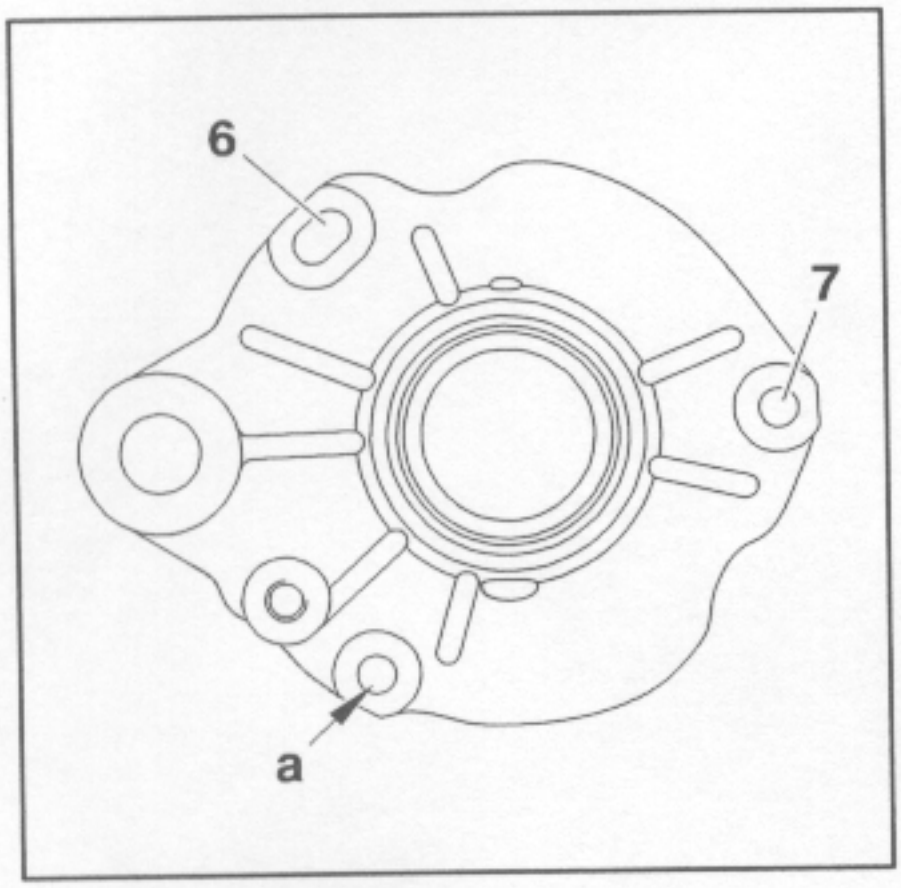


Fig : B1GP045C

Refit the water pump (8) together with a new seal.

WARNING : Respect the tightening order : 7, 6, a.

Tightening method :
- pre–tighten to 0,5 m.daN
- tightening torque = 0,8 m.daN

Fit :
- the dynamic tensioner (5)
- screws (4)
- the engine mounting bracket (3)
- screws (2) ; tighten to 6 m.daN
- the guide roller
- screw (1) ; tighten to 8 m.daN

Fit the timing belt (see the relevant operation).

Fill and bleed the cooling system (see the relevant operation).

REMOVING – REFITTING : THERMOSTAT

1 – RECOMMENDED TOOLS

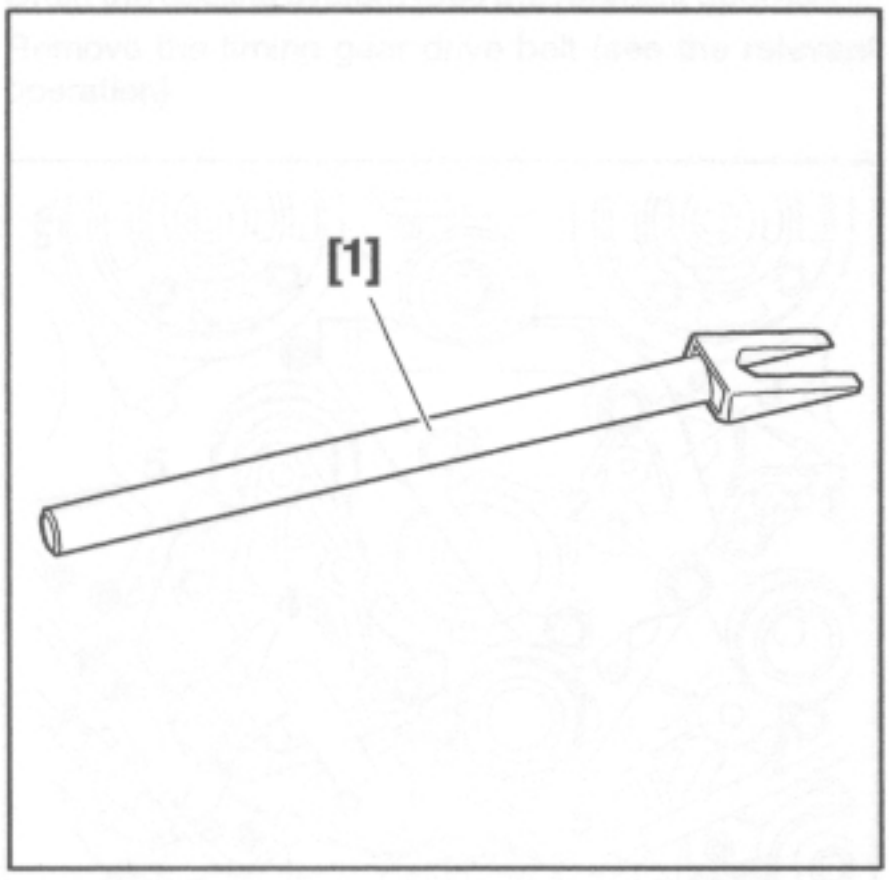


Fig : E5AP05JC

[1] fork 8010–TG.

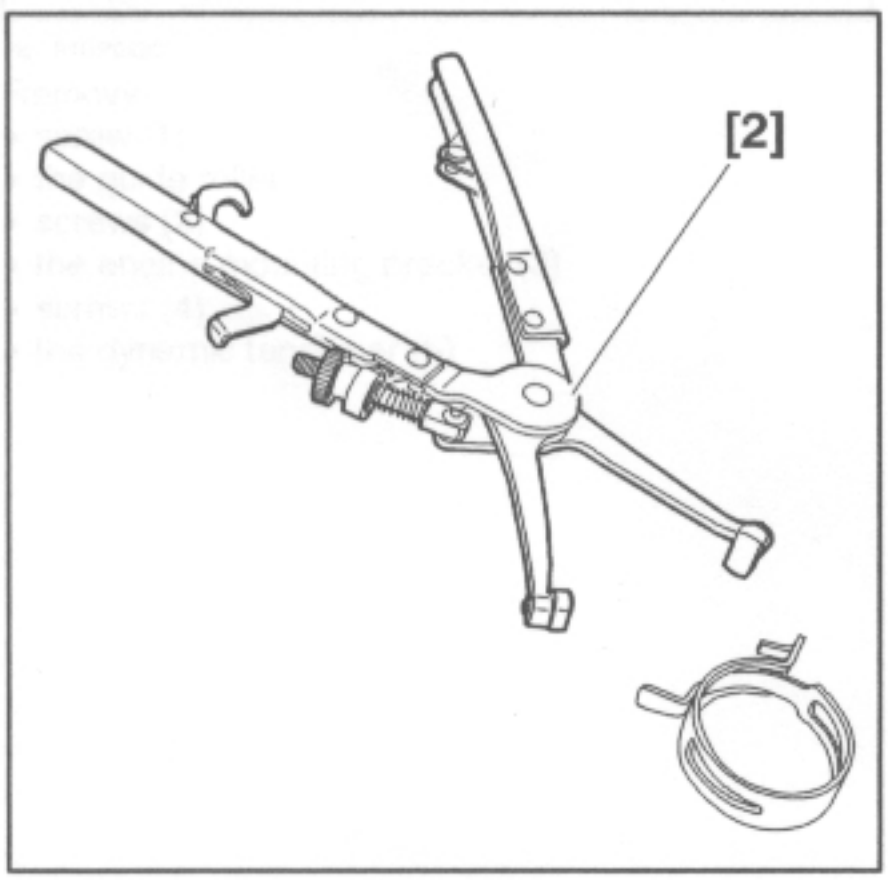


Fig : E5AP02WC

[2] pliers for removing and refitting hose clips 9029–T.

2 – REMOVING

Disconnect the battery negative terminal.

Drain the cooling system (see the relevant operation).

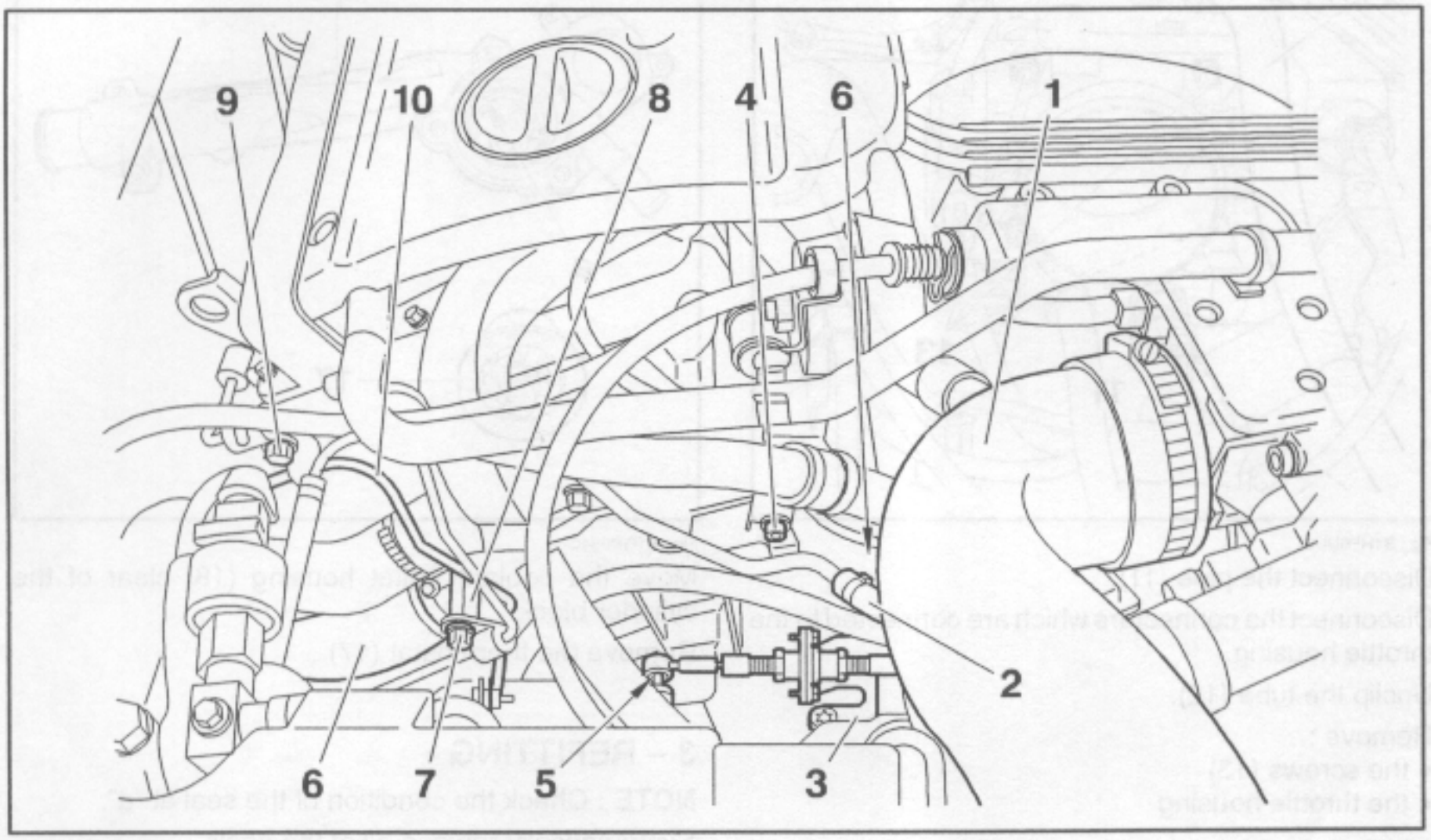


Fig : B1GP062D

Remove the air inlet duct (1).

Disconnect the pipe (2).

Disengage the ball–joint (5) ; by means of tool [1].

Remove :

- the gear control bracket (3)
- the screw (4)
- the screw (7)
- the stud (8)
- the screw (9)

Loosen the pipe (10) clamps.

Uncouple the 2 hoses (6) from the coolant outlet housing ; by means of tool [2].

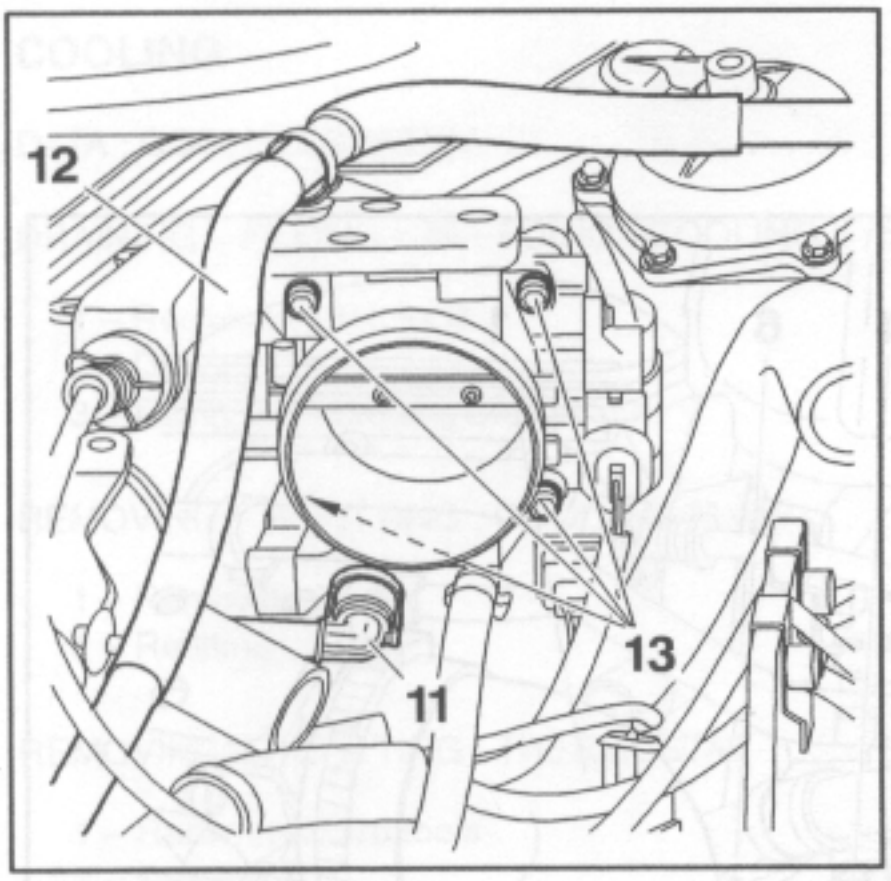


Fig : B1HP0UUC

Disconnect the pipe (11).

Disconnect the connectors which are connected to the throttle housing.

Unclip the tube (12).

Remove :
- the screws (13)
- the throttle housing

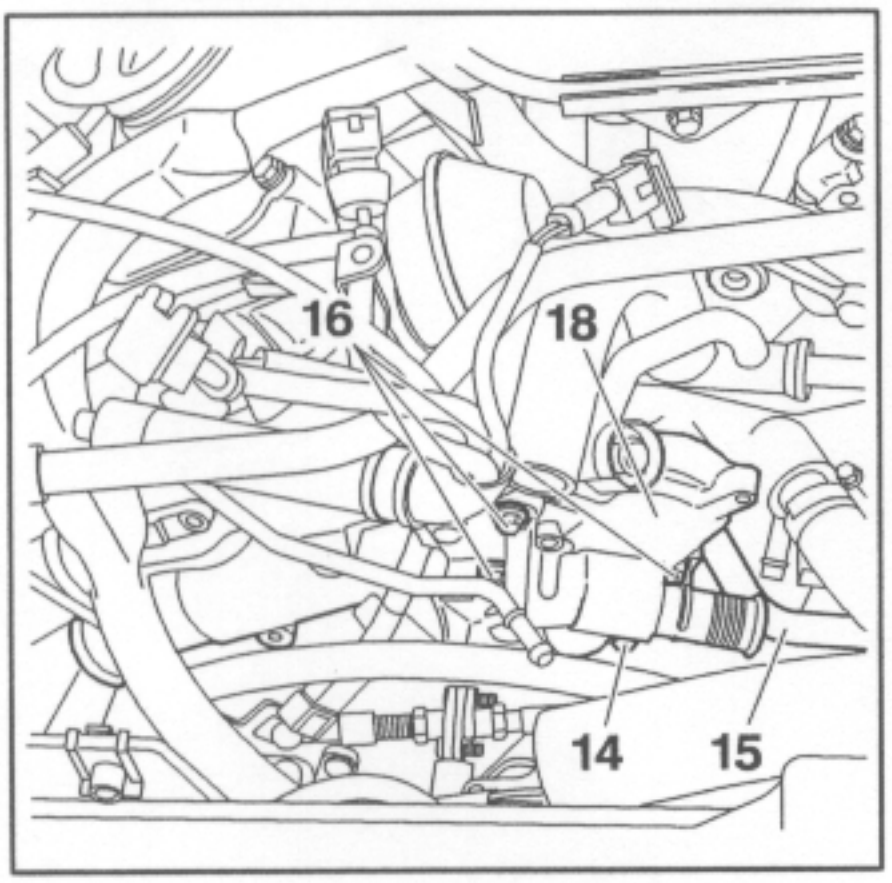


Fig : B1GP063C

Remove :
- the screw (14)
- the 2 screws fixing the pipe (15) to the rear cylinders bank (from underneath the vehicle)

Disconnect the pipe (15).

Remove the screws (16).

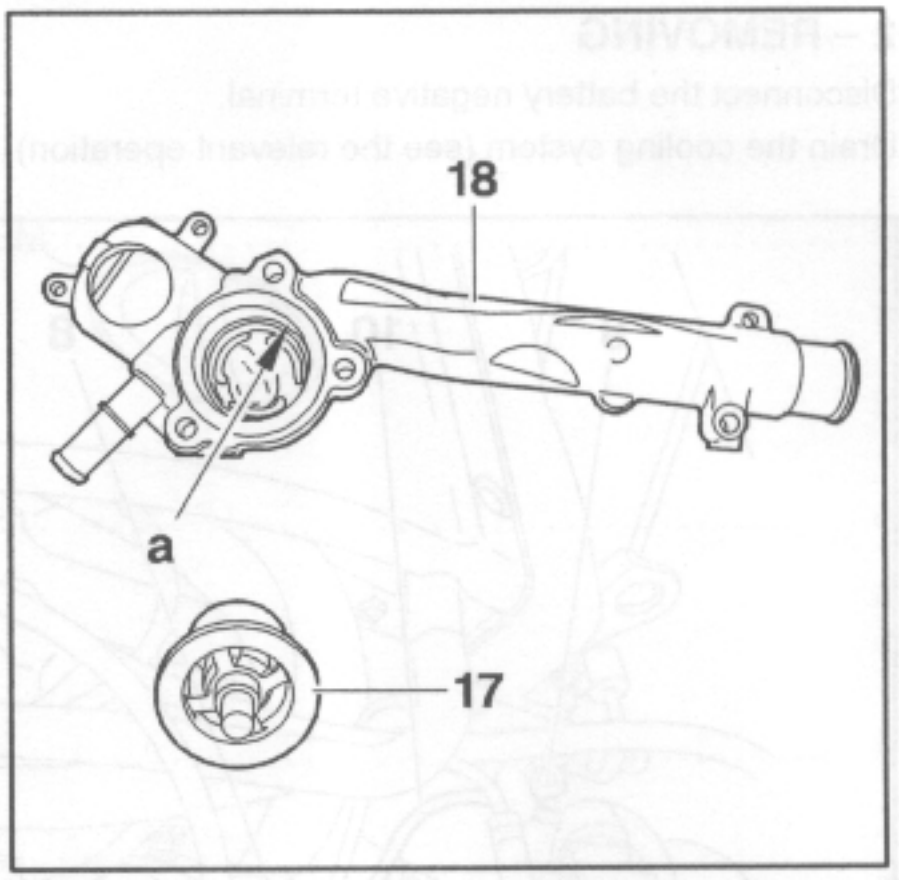


Fig : B1GP064C

Move the coolant outlet housing (18) clear of the cylinder block.

Remove the thermostat (17).

3 – REFITTING

NOTE : Check the condition of the seal at "a".

Systematically replace all of the seals.

Fit :
- the thermostat (17) (new)
- the coolant outlet housing (18)
- the screws (16) ; tighten to 2,5 m.daN

Couple :
- the pipe (15) (O ring seal)
- the hoses (6) ; by means of tool [2]

Fit :
- the screw (14)
- the 2 screws fixing the pipe (15) to the rear cylinders bank
- the throttle housing
- the screws (13) ; tighten to 0,8 m.daN

Connect the connectors which are connected to the throttle housing.

Couple up pipe (11).

Tighten the pipe (10) clamps.

Fit :
- the stud (8)
- screw (7)
- screw (9)
- screw (4)
- the gear control bracket (3)

Locate the ball–joint (5).

Couple up pipe (2).

Refit the air inlet duct (1).

Reconnect the battery negative terminal.

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