

Consumables

Type	Quantity	Units concerned
Molykote BR2	Coating	- Drive shaft splines at gearbox end - Clutch shaft splines
CAF 4/60 THIXO	Coating	Drive shaft pin holes
Loctite FRENBLOC (Locking and sealing resin)	Coating	Brake caliper securing bolts
Loctite FRENETANCH (Locking and sealing resin)	Coating	Crankshaft pulley securing bolts
ELF. Multi	Coating	Wheel bolts
Molykote CU. 7439	Coating	Wheel locating shoulders only

COMPLETE ENGINE AND LOWER ENGINE UNITS Identification

Vehicle type	Engine	Index no.	Capacity (cm ²)	Bore (mm)	Stroke (mm)	Comp.
B.C.S.400	CIC	A.700	956	65	72	9,7
F400	CIC	B.706	956	65	72	8,6
B.C.F.S.401	C1E	G.750	1108	70	72	9,5
B.C.F.401	C1E	752 *	1108	70	72	9,5
B.F.401	CIE	754	1108	70	72	8.3
B.C.F.402	C1J	A.768 ***	1397	76	77	9.2
B.F.402	C1J	780	1397	75	77	9.2
B.C.403	C2 1	M780 Q781 788 * 798	1397	76	77	9,2
B.C.F.S.404	F8M	D720 730	1596	78	83,5	22,5
C.405	C1J	782 G788	1397	76	77	7.9
C.405	C1J	784 *	1397	76	77	8.0
B.C.F.407	C3J **	700 702	1397	76	77	9.0
		760	1390	75,8	77	9.0
B.C.408	F3N **	H717 G716	1721	81	83,5	9.5
C.409	F3N **	702	1721	81	83.5	9,5
B.C.S.40F	CIG	702 720	1237	71.5	77	9,2
B.C.40G	F2N	H740	1721	81	83.5	10
B.C.F.40H	C1E **	B756	1108	70	72	8.8
B.C.40j	CŽJ	G782 ** V789	1397	76	77	9 9,2
B.C.40K	F2N **	G742	1721	81	83,5	9,5
8.C.F.40M	C2J **	T784	1397	76	77	9

Switzerland - Germany

^{**} Unleaded fuel

^{***} Non-premium fuel

ESSENTIAL SPECIAL TOOLS

Mot. 1014

Pressure gauge

CONSUMABLES

Gas leak detector :

1000 bulles (L'AIR LIQUIDE)

MOUSS MM2 (Huiles LUBRO) or an equivalent.

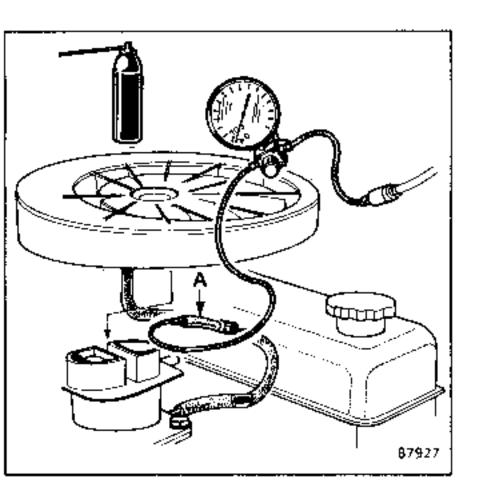
(These products are sold in aerosol cans of approximately 400 ml).

The detection of external oil leakage is facilitated by pressurising the inside of the engine and spraying a "gas leak detector" over roughly the area on the engine from which the leakage is coming.

CONNECTIONS :

Connect into the oil vapour re-intake system : (This permits one to check all that part of the engine which is not subject to oil pressure).

Example of connection :



 Pressure gauge Mot.1014 with end fitting (A) that can be connected into the oil vapour re-intake system.

METHOD :

NEVER EXCEED A PRESSURE OF 80 MILLIBARS.

Above this pressure, the lips on the seals fold back.

- Fully unscrew the screw on pressure gauge Mot.1014 before connecting it to the reintake system.
- Very gradually raise the pressure to 80 millibars and check :
 - that the filler cap and the dipstick are air tight,
 - for any air leakage on the air intake system (if the re-intake system is not blocked).
- Spray a considerable quantity of the leak detection product over the suspect area and check for the formation of soapy bubbles.

NOTE :

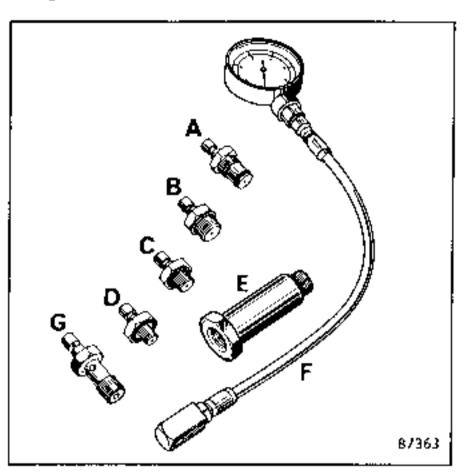
- In certain cases the removal of adjacent parts will be necessary, for example : the flywheel cover plate.
- This operation can also be undertaken after an engine has been repaired but it will cause jointing compounds to harden and is only to be carried out for a short period to avoid the compounds being blown out.

ESSENTIAL SPECIAL TOOLS

Mot.836-05 Oil pressure gauge kit.

Mot.836-06 Complete set of unions.

Composition of kit Mot.836-05.



Test method :

Engines : C1C-C1E-C1G-C1J-C2J and C3J :

E + C + F

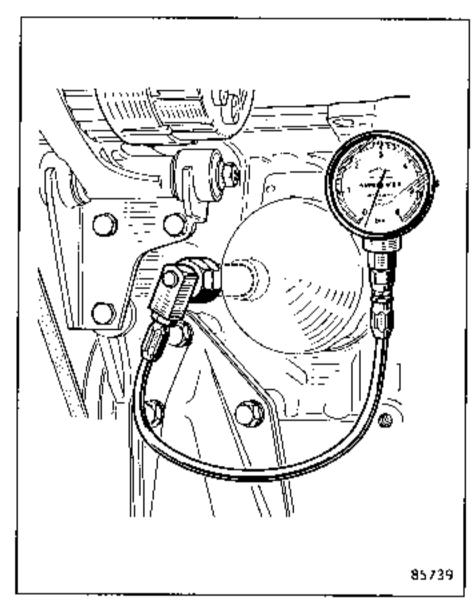
Engines ClJ Turbo : G + F

Engines: F2N-F3N and F8N:B+F

The test is to be carried out at the normal engine operating temperature (of approximately 80°C).

Connect the pressure gauge to the switch tapping.

ENGINES :: C1C-C1E-C1G-C1J-C2J and C3J



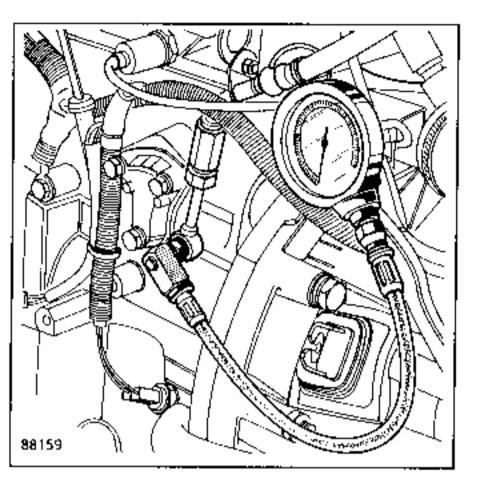
Testing :

Min. pressure in bars

- at idling ..0,7

- at 4000 rpm ...3,5.

ENGINES CIJ Turbo



Testing :

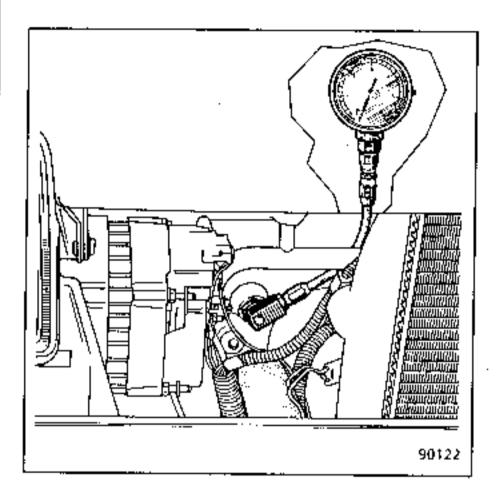
Min. pressure (bars)

- at 750 rpm, 1	_ :	3
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- at 4000 rpm 3.2

ENGINES: P2N-F3N and F8M

This operation is made easier by removing the radiator grille and air baffle (on certain versions)



Testing : .

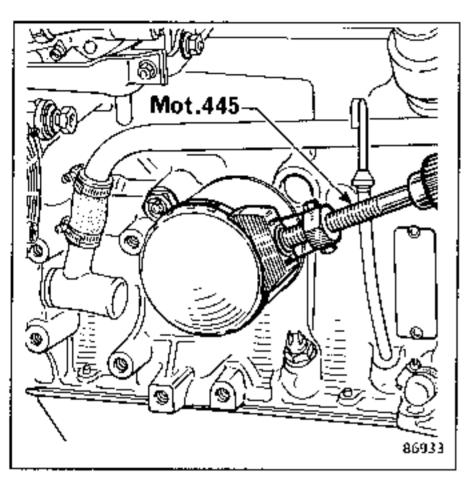
Min. pressure in bars

- at 1000 rpm 2

- at 3000 rpm 3.5

ESSENTIAL SPECIAL TOOLS

Mot. 445 Oil filter spanner



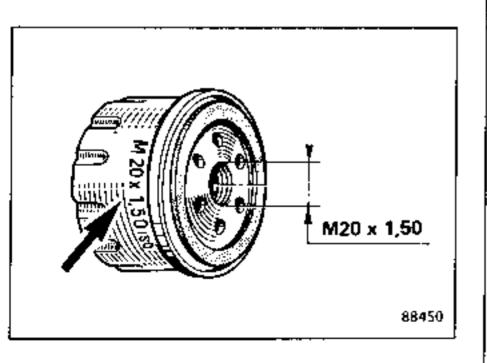
Check that the nipple is fully screwed in and that the old seal is not still in place on the cylinder block.

Oil the seal on the new filter with engine oil.

Fit the filter.

Fill the engine with oil or top-up the oil level.

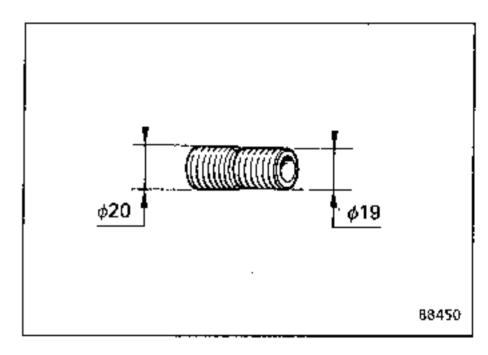
THESE VEHICLES ARE FITTED WITH FILTERS WITH AN ISO THREAD (M20 \times 1.50).



OIL FILTER NIPPLE

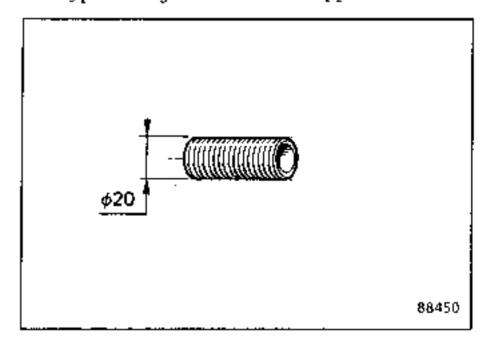
There are 2 types of oil filter nipple.

1st type : 2 diameter nipple



Ø19 mm pitch 1.587 (cylinder block side)
Ø20 mm pitch 1.50 (oil filter side)

2nd type :Single diameter nipple



Ø 20 mm p#tch 1.50

NOTE :

NEVER FIT A 2 DIAMETER NIPPLE TO A CYLINDER BLOCK WITH A 20 MM x 1.50 PITCH THREAD - IT MAY COME LOOSE.

ONLY THE TYPE "C" ENGINE CAN BE REMOVED WITHOUT THE GEARBOX, EXCEPT ON THE TURBO MODELS.

ESSENTIAL SPECIAL TOOLS		
Elé.	346 - 04	Tool for checking the belt tension.
Mot.	878	Tool for lifting the engine with a chain.

TIGHTENING TORQUES (in dan.m)

Crankshaft pulley securing bolts 11
Engine mounting securing nuts 4

CONSUMABLES

Loctite FRENETANCH : crankshaft pulley securing bolts.

Molykote BR2 : clutch shaft splines.

REMOVING ALL TYPE "C" ENGINES

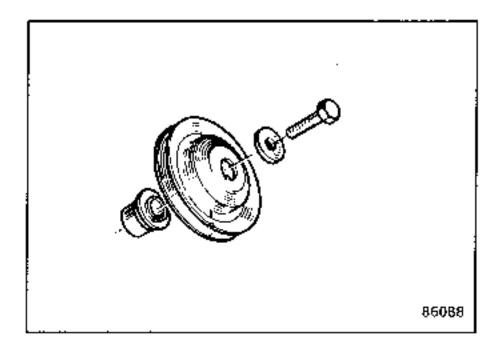
Except on the Turbo models and vehicles with power steering or air conditioning.

REMOVING :

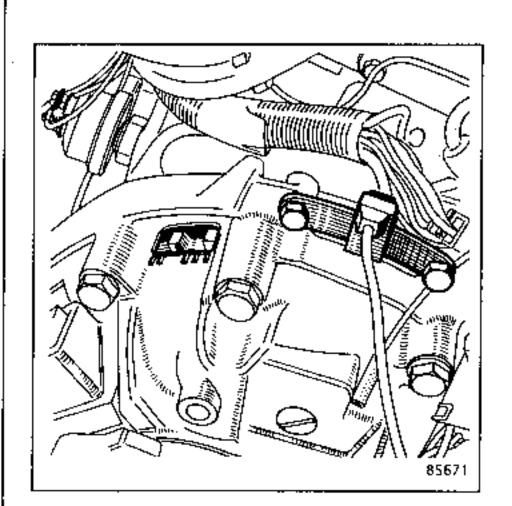
Disconnect the battery.

Remove :

- the bonnet,
- the air filter,
- the radiator, after draining the cooling system,
- the coolant pump alternator belt,
- the tie rod between engine and gearbox,
- the flywheel protection plate,
- the crankshaft pulley. Place the crankshaft key at the top and remove the pulley hub,



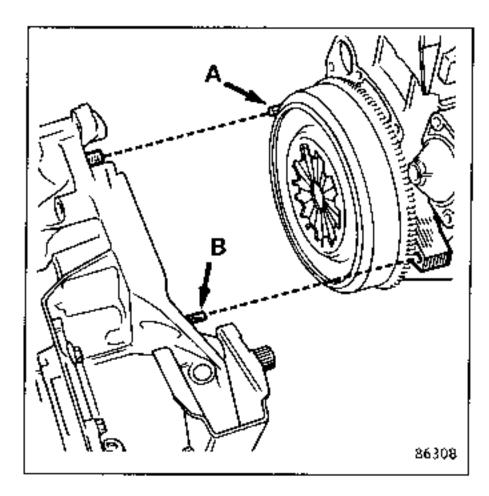
- remove the rear fastenings from the starter and take it out,
- the accelerator and choke cables,
- the electrical junction blocks,
- the heater hoses,
- the electronic ignition sensor on vehicles equipped with this system,



COMPLETE ENGINE AND LOWER ENGINE UNITS Engine

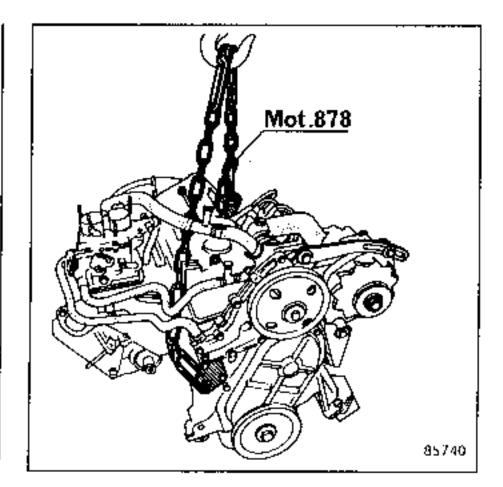
REMOVING (continued)

- the engine to gearbox securing bolts,
- the two studs A and B,



- the lower securing nut from the RH engine mounting pad,
- the exhaust pipe flange,
- Using a lifting hook and the chain from tool Mot.878, gradually lift the engine, whilst checking the position of the right hand drive shaft, as it rises, to ensure it does not come out of place.

Place a jack under the gearbox to hold it in position.



Take out the engine.

VEHICLES WITH AIR CONDITIONING

Follow the previous section, paying attention to the following points.

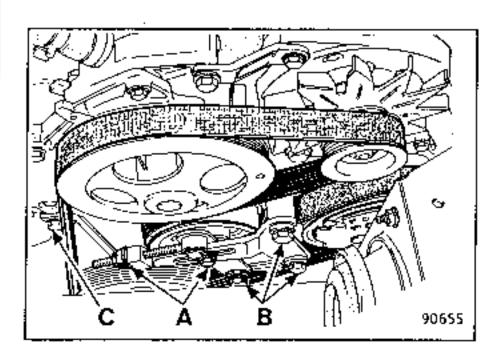
REMOVING

It is essential, before carrying out the operations described above, to drain the freen system.

Loosen bolts (A) and remove bolts (B) and (C) from the belt tensioner.

Remove :

- the belt,
- the alternator.



REMOVING (continued)

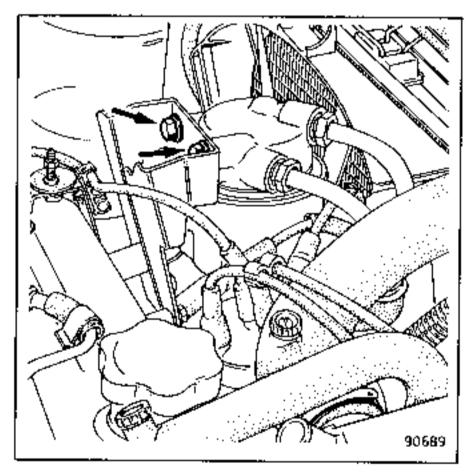
After the belt tensioner assembly has been removed, refit bolt (C) which also secures the engine lifting hook.

Remove :

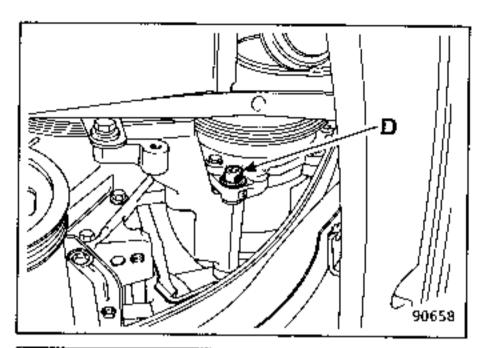
- the right hand side protector,
- the radiator grille,
- the crankshaft pulley.

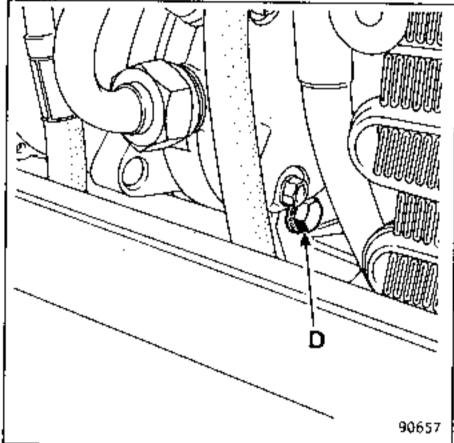
Unscrew the freen pipes from the compressor.

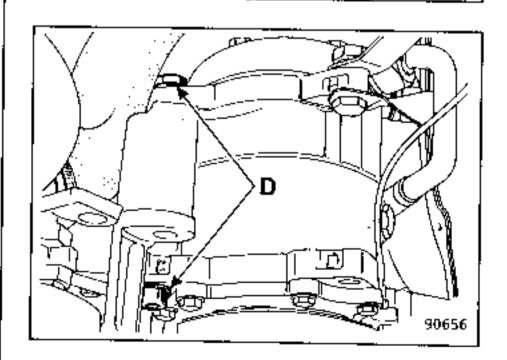
Remove the two bolts that secure the oil filter support.



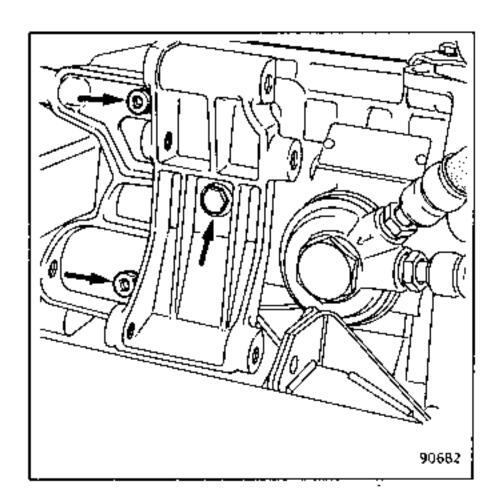
With the assembly in this position, remove the radiator, condenser, dryer bottle assembly. Remove the compressor at points D.







Remove the securing bolts from the compressor support.



REMOVING (continued) REFITTING

From this point onwards, the operations of removing and refitting the engine or the gearbox become the same as those on vehicles without air conditioning.

VEHICLES WITH POWER STEERING

See the section entitled removing all type "C" Engines and add the following special features.

REMOVING

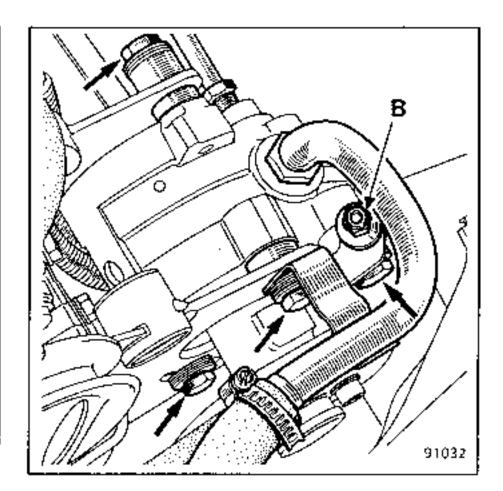
Remove the alternator.

Place a clamp Mot.453-01 on the input pipe.

Loosen the 4 pump and tensioner securing points.

Completely slacken off the belt at (B).

Disconnect the pressure switch from its connector.

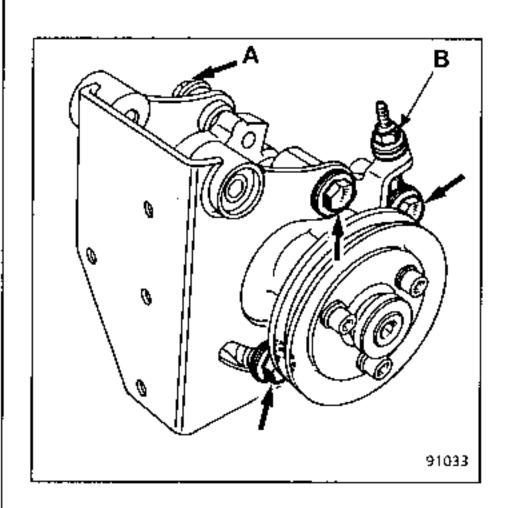


Disconnect and remove the following pipes:

- the input pipe,
- the high pressure pipe by removing bolt
 (A) (take care not to lose the spacer).

Remove :

 the 3 other securing bolts from the pump and the tensioner taking care not to lose the spacers.



COMPLETE ENGINE AND LOWER ENGINE UNITS Engine

- the pump after first removing the belt.

VEHICLES FITTED WITH TURBO ENGINES.

The engine cannot be removed alone. The complete engine-gearbox assembly must be removed.

REFITTING ALL TYPE "C" ENGINES.

Except for turbo vehicles and vehicles with power steering or air conditioning.

CHECKING :

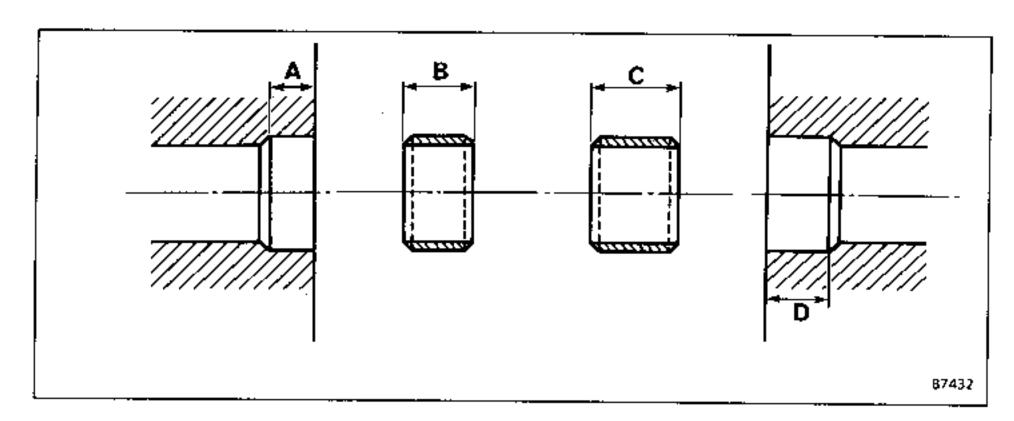
When replacing an engine or a gearbox, one must check the length of the locating dowel bushes and their locations.

Depending on the type of engine to gearbox securing system, one of 2 types of dowel bush is fitted:

- 1 medium length bush (dimension B)
- 2 long bush (dimension C)

From now on, to facilitate connecting the gearbox to the engine (types C and F), the dowel bushes have been lengthened.

The fitting of these new dowel bushes has been accompanied by a modification of their locations in the cylinder blocks of types C and F engines.



Location in cylinder block of type C or F engine		Dowel bush	Location in clutch housing	
First	A = 3,5 ± 0,25 mm	B = 9.5 mm	D = 6,75 7,5 mm	
type	A = 3,3 ± 0,23 mm	C = 23,45 mm	D = 20,5 mm	
Second	A = 6 + 0.25 mm	B = 12 mm	D = 6,75 7,5 mm	
t ype	A = 6 ± 0,25 mm	C = 25 _e 9 mm	D = 20,5 mm	

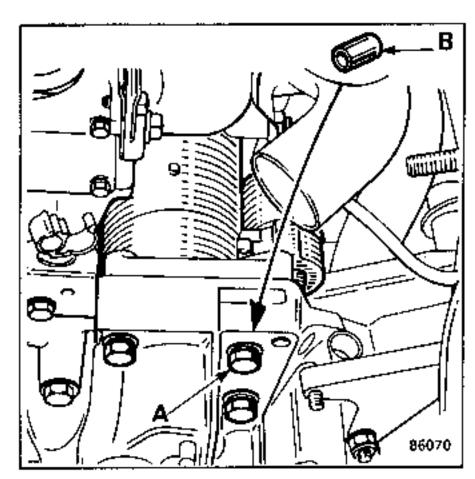
Consequently, it is essential to fit a dowel bush of the correct length for the locations in the cylinder block and in the clutch housing.

REFITTING (Special features)

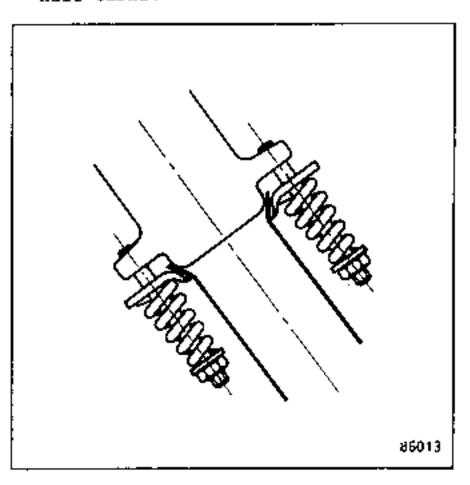
Grease the splines on the clutch shaft.

Ensure :

 that the starter is in the correct position,

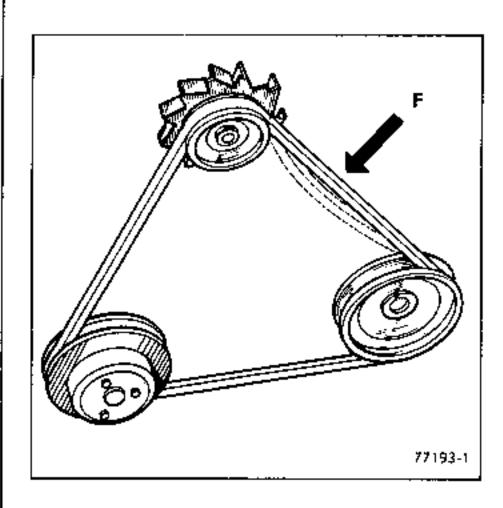


 the exhaust flange is correctly tightened: tighten until the springs are coil bound then loosen by one and a half turns.



- fill the engine with oil,
- fill and bleed the cooling system,
- correctly tension the belt using tool Ele.346-04 (Deflection F = 4 mm).

Adjust the choke cable travel.

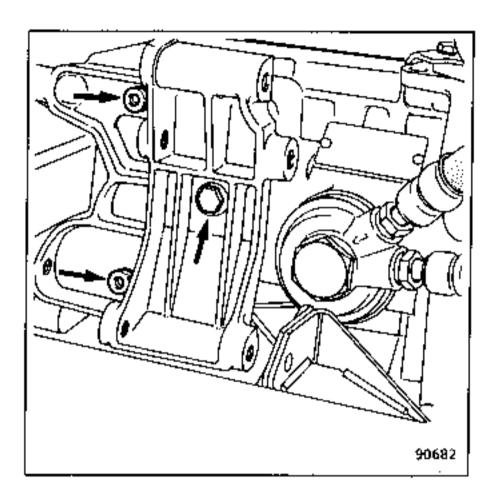


VEHICLES WITH AIR CONDITIONING.

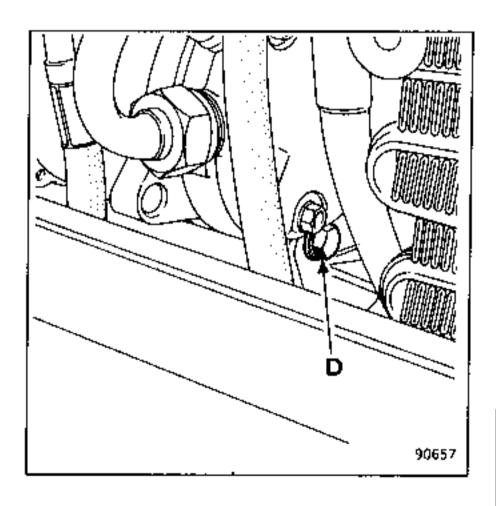
As described in the preceeding section except for the following special points.

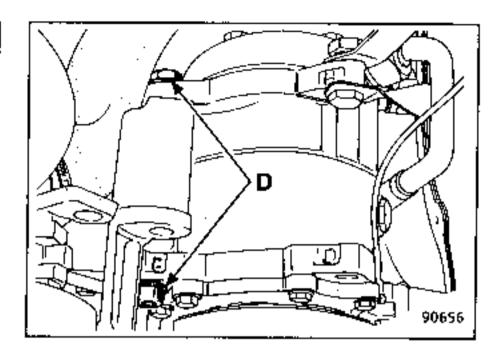
REFITTING (continued)

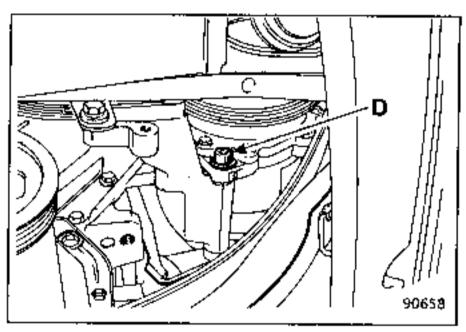
Refit the compressor support securing bolts.



Refit the compressor at points D.

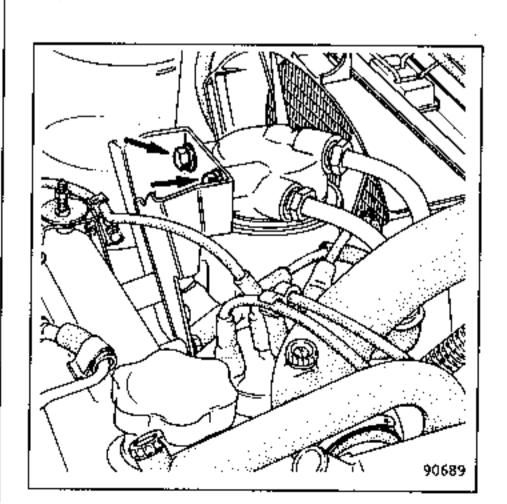






Refit the radiator, condenser, dryer bottle assembly.

Refit the two oil filter support securing bolts.



COMPLETE ENGINE AND LOWER ENGINE UNITS Engine

REFITTING (continued)

Screw the freon pipe unions into the compressor.

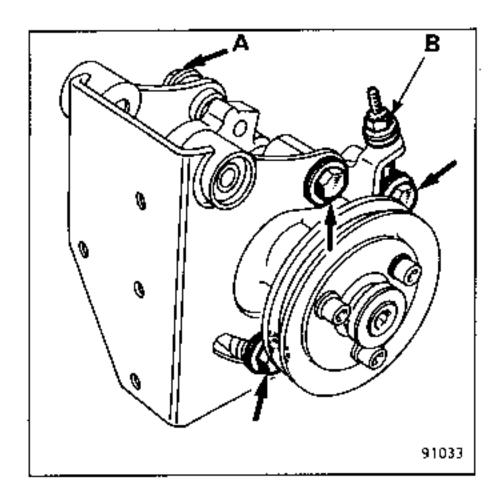
Refit :

- the crankshaft pulley,
- the radiator grille,
- the right hand side protector,
- the belt,
- fill and bleed the freon system.

VEHICLES WITH POWER STEERING.

See the section on refitting all type "C" engines plus the following special points.

Refit the pump, the tensioner and the 3 other tensioner securing bolts.



Refit the piping.

Reconnect the pressure switch.

Refit the alternator.

Refit the belt.

ESSENTIAL SPECIAL TOOLS 8. Vi. 31-01 Punches for spring pins. Mot. 878 Lifting chain and rings. T. Av. 476 Ball joint extractor.

TIGHTENING TORQUES (in dan.m)	\bigcirc
Brake caliper securing bolts	10
Shock absorber securing bolts	8
Steering ball joints	4
Wheel bolts	8
Drive shaft bellows	
securing screw	2,5

CONSUMABLES

Loctite FRENBLOC : brake caliper securing bolts.

CAF 4/60 THIXO : drive shaft pins.

Molikote BR2 : drive shaft splines.

Loctite FRENETANCH : crankshaft pulley securing bolts.

Removing - Refitting the engine - gearbox assembly, all type "C" engines.

REMOVING

Disconnect the battery.

Drain :

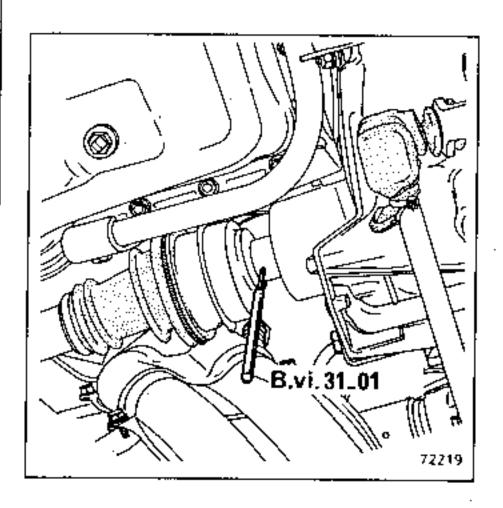
- the cooling system (at the lower radiator hose),
- the gearbox oil,
- the engine oil, if necessary,...
- the freon system for vehicles with air conditioning,
- the power steering system for vehicles with power steering.

Remove :

- the bonnet.
- the radiator,
- the wheels.

On the right hand side of the vehicle :

 the drive shaft pin using punches B.Vi. 31-01.

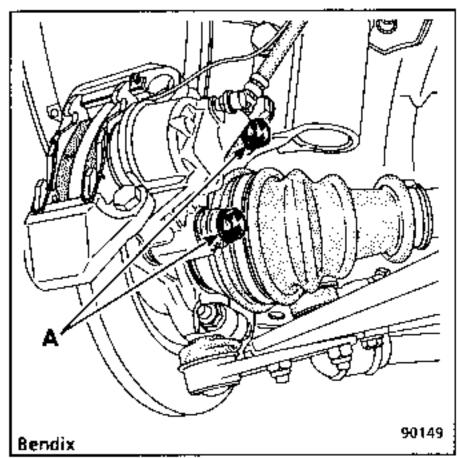


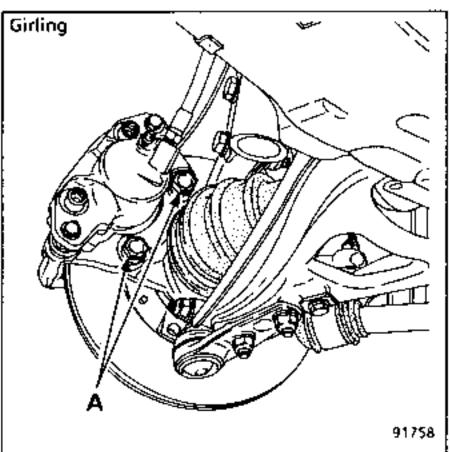
REMOVING (continued)

- the two bolts that secure the lower end of the shock absorber and free the drive shaft taking care not to catch the bellows. Secure the stub axle carrier to avoid tension being applied to the brake hose.

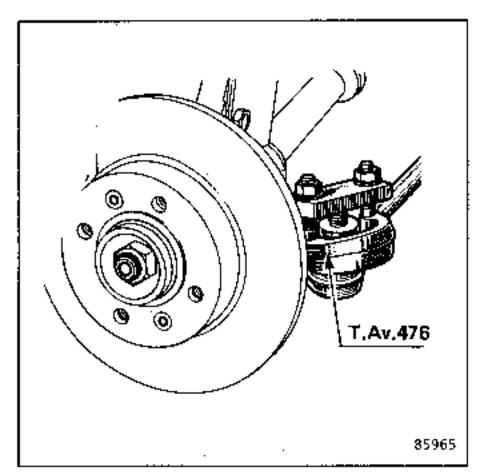
On the left hand side of the vehicle :

 the two caliper securing bolts : secure the caliper to the suspension spring to avoid applying tension to the hose,

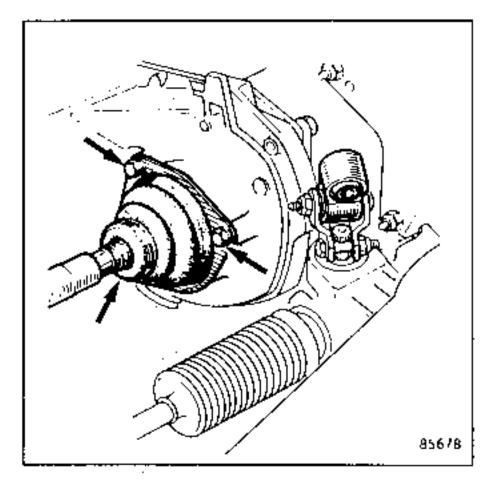




 the steering link ball joint using tool T.Av. 476,



 the three screws that secure the drive shaft bellows,



 the two bolts that secure the lower end of the shock absorber and free the drive shaft.

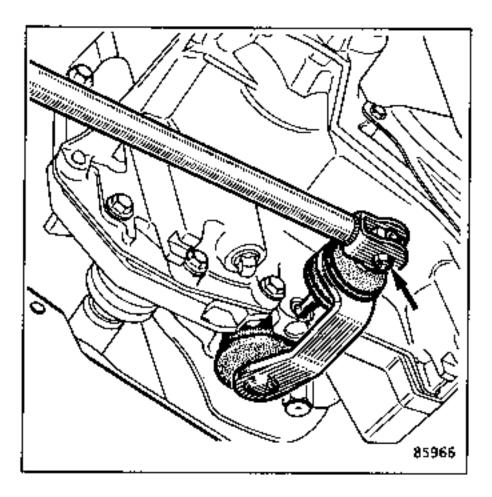
REMOVING (continued)

Disconnect :

- the heater hoses at the coolant pump,
 the fuel system hoses and the vacuum
 hose from the brake servo,
- the positive cable between the starter and the battery, freeing it from the heater partition,
- the electrical junction blocks,
- the electronic ignition unit,
- the accelerator, choke and speedometer cables,
- the engine and gearbox earthing braids,
 if the vehicle has any.

Remove :

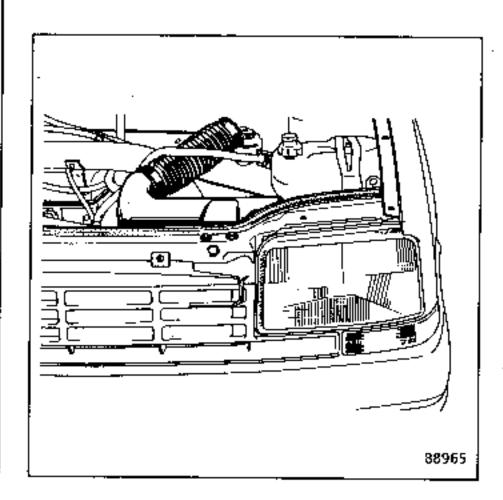
- the gear shift control,



- the exhaust pipe flange,
- the nuts and bolts that secure the engine flexible mountings,
- the engine-gearbox assembly using the chain from tool Mot.878.

Special features of Turbo vehicles
Remove :

- the air intake duct from the air filter,

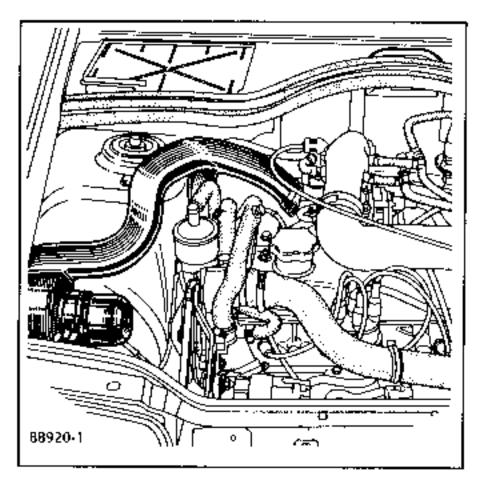


- the intercooler and its support,
- Drain the cooling system by disconnecting the lower hose from the expansion bottle and moving it downwards.
- Disconnect the engine oil input pipes from the radiator.

Remove :

- the radiator,
- the anti-percolation system (the fuel input pipe passes through the cooling duct).

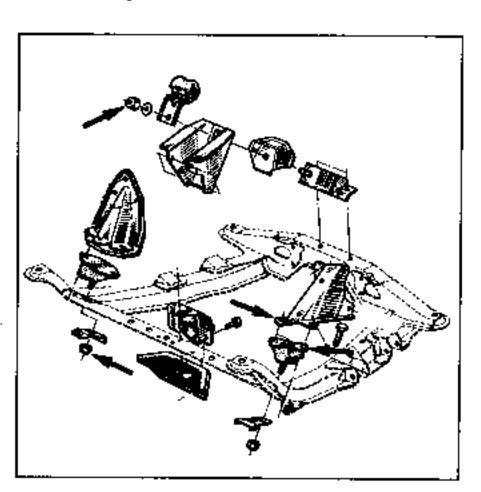
REMOVING (continued) REFITTING



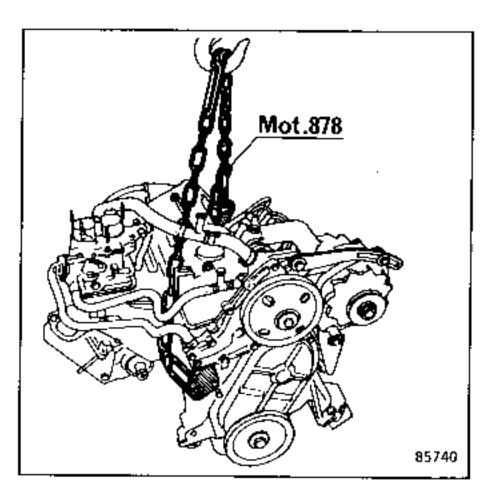
- the securing bolts from the engine movement limiter, leaving the limiter in position.
- Release the tension in the alternator belt.

Remove :

 the fastenings from the engine mountings (it is not necessary to remove the bumper shield).



Using a lifting hook and tool Mot.878, lift the engine-gearbox assembly out of the engine compartment.



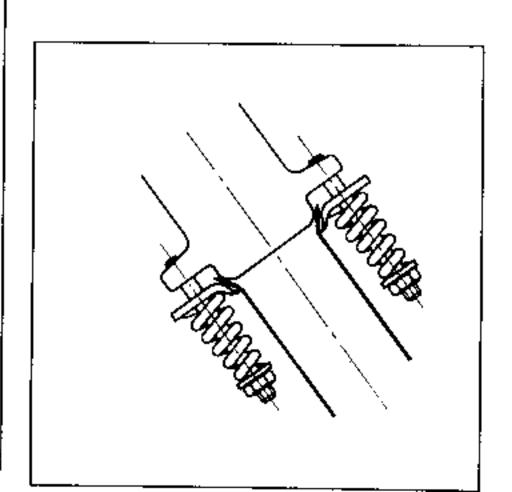
REFITTING, ALL TYPES

Fit the caliper securing bolts after first coating them with Loctite FRENBLOC and tighten them to torque.

Press the brake pedal a number of times to bring the pistons into contact with the brake pads.

Retighten :

- the exhaust pipe flange.



REFITTING (continued)

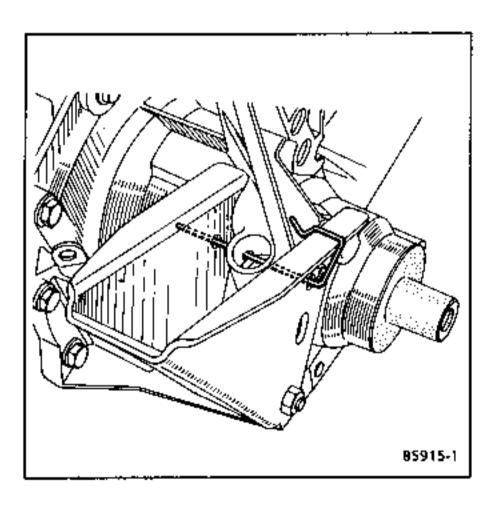
Tighten the springs until they are coil bound and loosen them by 1 and a half turns, never leave the springs coil bound.

- fill the engine and gearbox with oil,
- fill and bleed the cooling system,
- fill and bleed the freon system (when applicable),
- fill the power steering system (when applicable.

Adjust the accelerator and choke cable travels.

Apply CAF 4/60 THIXO to the drive shaft pin holes.

Fit the speedometer drive cable securing clip.



Special features on Turbo vehicles

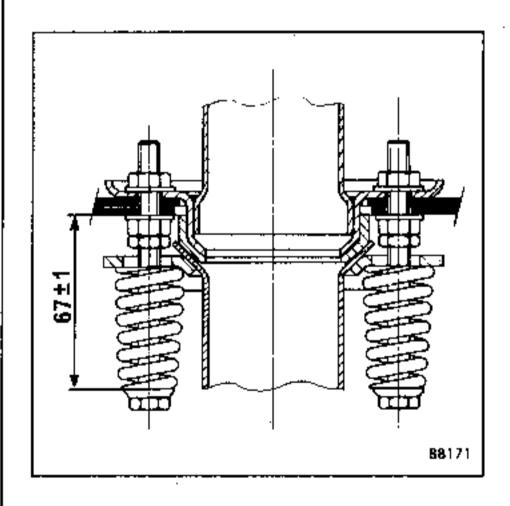
REFITTING

Fit the engine movement limiting stop and place the engine-gearbox assembly in the engine compartment.

Position the assembly carefully to avoid damaging the non-return valve tube, the various pipes, the electrical cables.

When fitting the electronic ignition unit, do not forget the earthing braid and the condenser wire on the lower securing point.

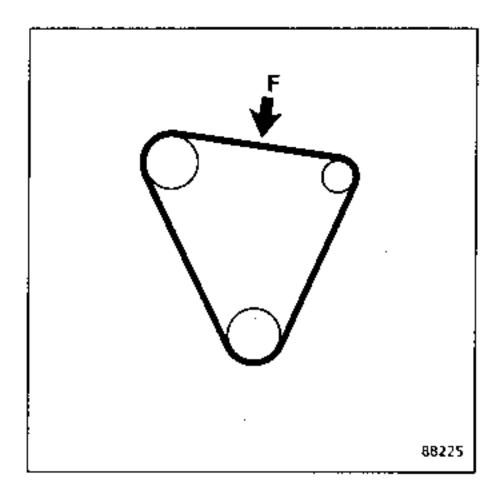
Refit, correctly, the exhaust pipe flange.



- fill the engine and gearbox with oil,
- fill and bleed the cooling system.

REFITTING (continued)

Check the belt tension.



Deflection F : 2.5 to 3, when the belt is cold.

	ESSENTIAL SPECIAL TOOLS
B. Vi. 31-01	Punches for spring pins.
Mot . 878	Lifting chain and rings.
T. Av. 476	Ball joint extractor.

TIGHTENING TORQUES (in dan.m	·) 🕥
Caliper securing bolts	10
Shock absorber securing bolts	В
Steering ball joints	6
Support securing bolts,	4 - 5
Wheel bolts	8
Drive shaft bellows securing	
screws	2,5

To remove Engine types F2N-F3N-F8M

THE ENTIRE ENGINE-GEARBOX ASSEMBLY MUST
BE REMOVED

Removing the complete unit presents no particular difficulty, however attention should be paid to the following points :

REMOVING

Disconnect the battery.

Drain :

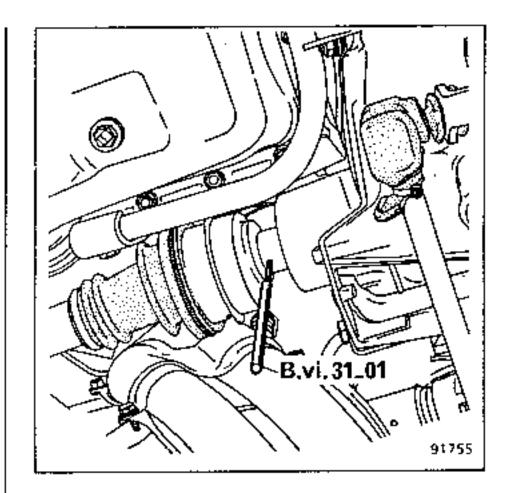
- the gearbox,
- the engine if necessary,
- the cooling system.

Disconnect :

- the accelerator cable,
- the clutch cable,
- the electrical connectors,
- the gear shift control.

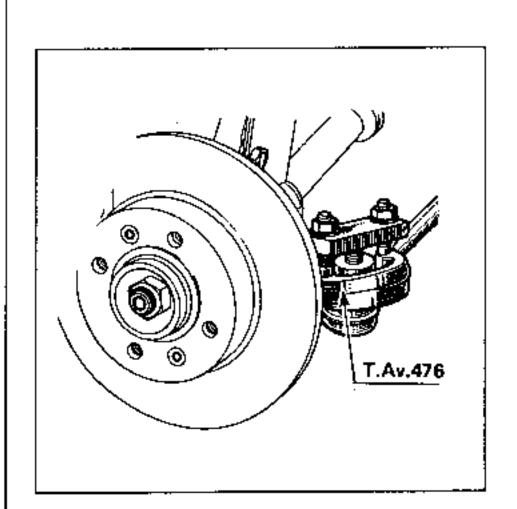
Remove :

- the bumper shield,
- the bonnet,
- the resonator on those vehicles equipped
 ed with one,
- the radiator,
- the drive shaft pin, using punches B.Vi.31-01.



Free the drive shaft, protecting the bellows at the wheel end so that it is not damaged.

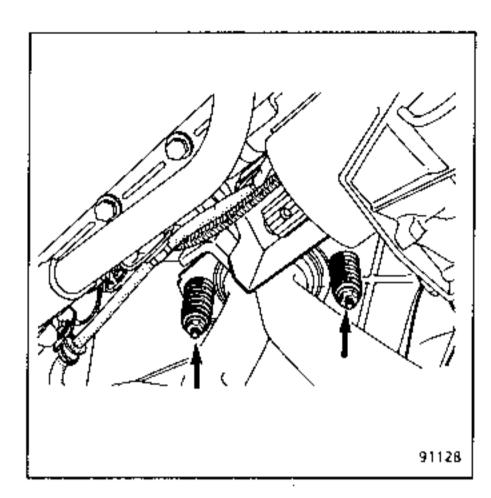
the steering ball joints using extractor
 T.Av. 476.



COMPLETE ENGINE AND LOWER ENGINE UNITS Engine - gearbox

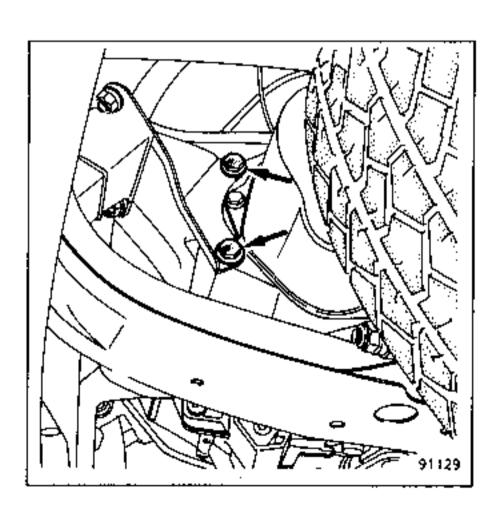
REMOVING (continued)

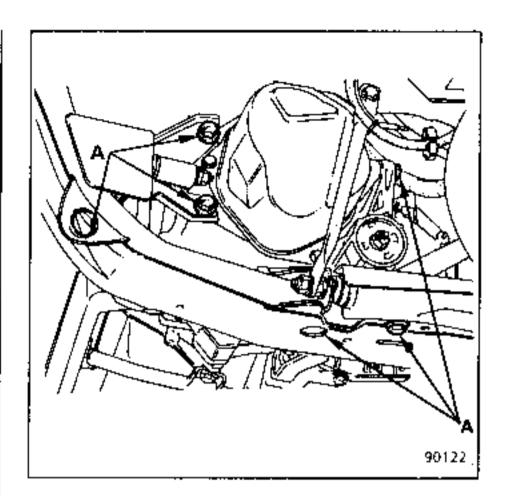
- the exhaust pipe flange.

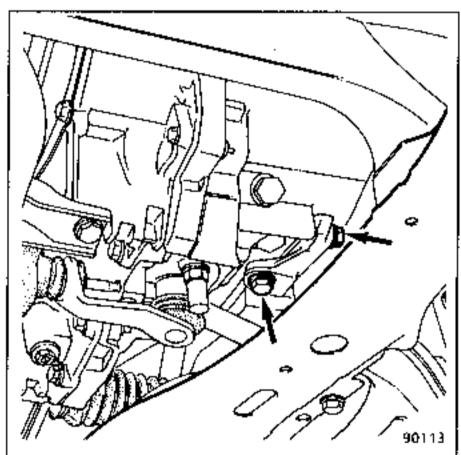


Remove :

- the gearbox front mounting pad.

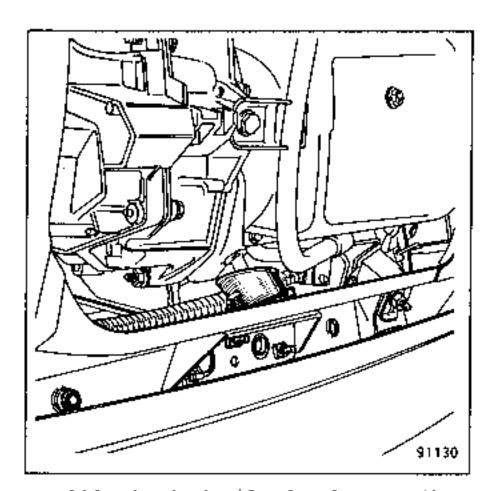




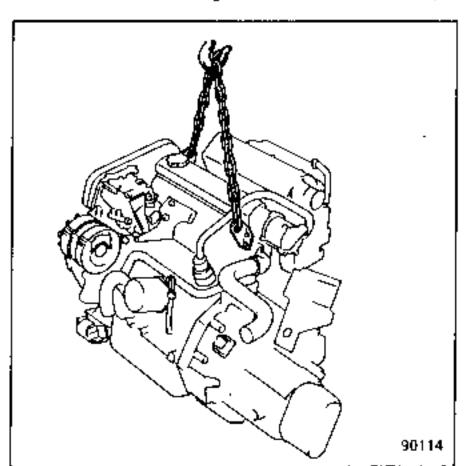


REMOVING (continued) REFITTING

 the front anti-movement support for those vehicles equipped with them.



- slide the Engine-Gearbox between the side member and the sub-frame to be able to lift the front of the engine by its maximum extent,
- take out the Engine-Gearbox assembly.

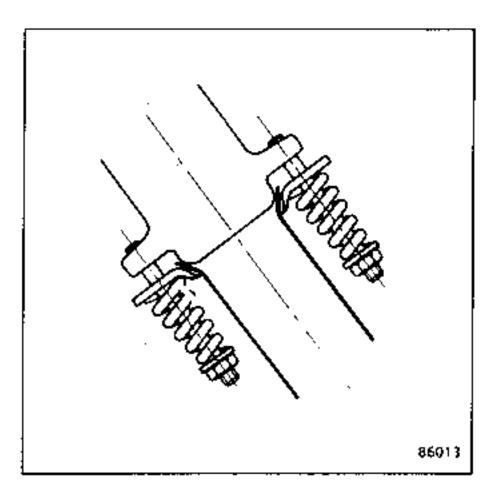


The assembly is lifted out using lifting chain and rings Mot.878.

REFITTING



- tighten the nuts and bolts to the W specified torques.
- fit the caliper securing bolts and tighten them to torque.
- Press the brake pedal a number of times to bring the pistons into contact with the brake pedals.
- fill the engine and, if necessary, the gearbox with oil,
- fill and bleed the cooling system,
- tighten the exhaust pipe flange by tightening the springs until they are coil bound and then loosening them by 1 and a half turns.



Adjust the gear shift control (see "GEAR-BOX" section).

Apply CAF4/60 THIXO to the pin holes.

Adjust :

- the accelerator cable.

ESSENTIAL SPECIAL TOOLS

Mot. 1040 - 01

Dummy sub-frame for removing and refitting the power unit assembly.

	TIGHTENING TORQUES (in dan.m)	\bigcirc
-	Sub-frame securing bolts :	
l	10 mm Ø	4,5
l	12 mm Ø	10
-	Shock absorber upper cup	
	securing bolts	2,5
-	Brake caliper securing bolts	10
-	Steering column universal joint	
	securing holt	3
-	Wheel bolts	8

Removing all type "C" engined power unit assemblies

REMOVING

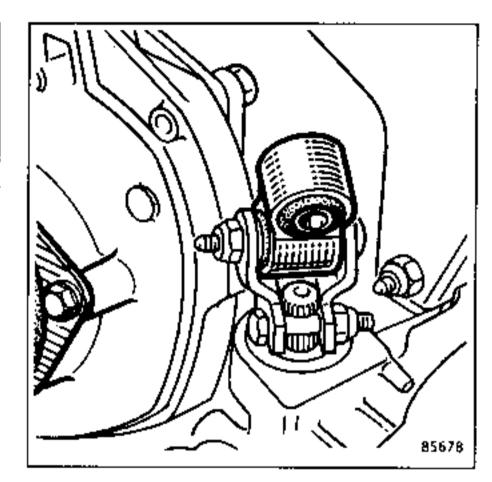
Disconnect the battery.

Remove :

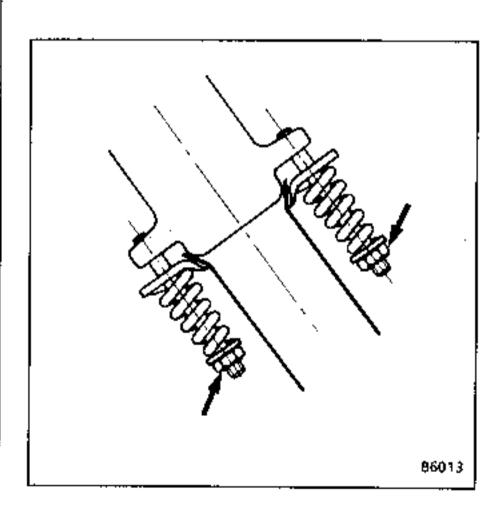
- the bumper shield,
- the radiator grille,
- the radiator air baffle.

Disconnect :

- the speedometer drive cable. It is retained by a clip,
- the steering column universal joint.



 the pipe flange from the manifold and remove the down pipe.



REMOVING (continued)

Remove :

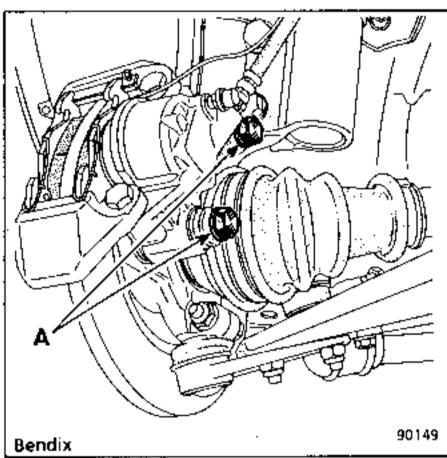
- the air filter,
- the engine accessories :

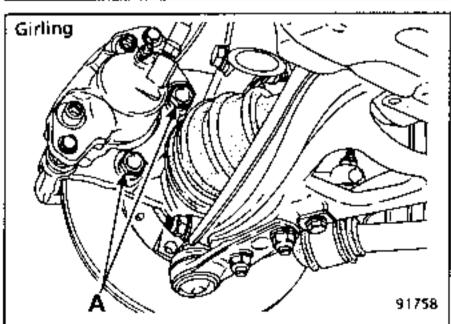
The cables, hoses, electrical connections, gear shift control and earthing braids.

Fit clamps Mot.453-01 to the heater hoses then disconnect the hoses at the scuttle.

Remove :

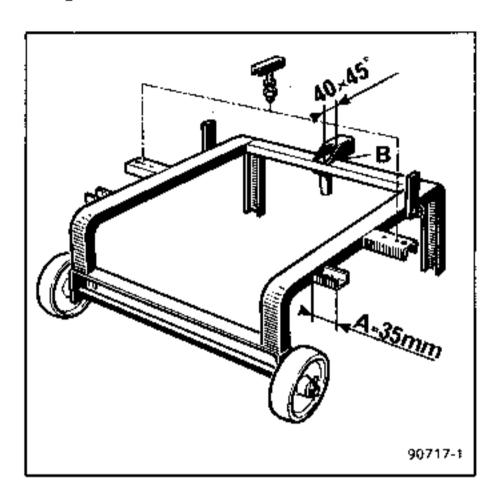
 the brake calipers and attach them to the body shell,



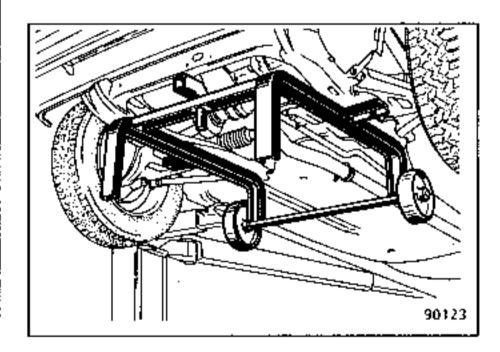


 the tie rods connecting the sub-frame to the body. This operation involves modifying tool Mot.1040-01 as follows:

Cut the 2 rear fastenings on the tool, at A, at a length of 35 mm and the front fastening B at 40 mm and 45°.



- position tool Mot.1040-01.

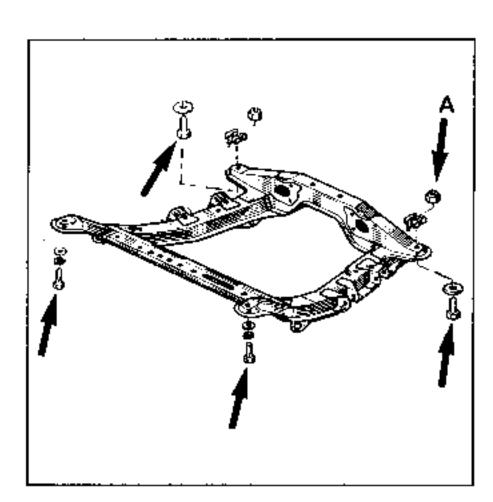


Lower the vehicle to the floor.

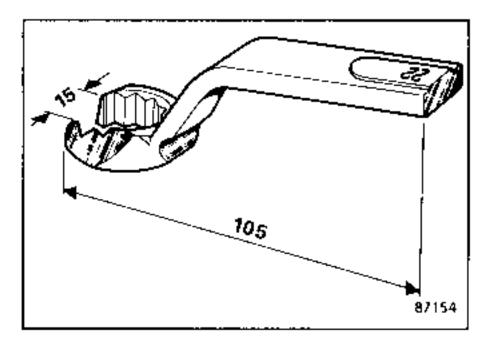
REMOVING (continued) REFITTING

Remove :

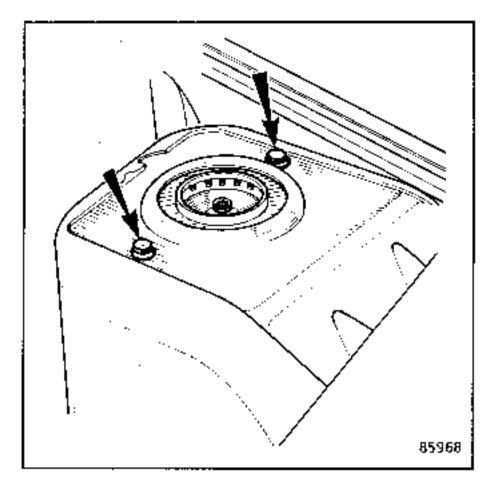
- the four bolts that secure the sub-frame.



If there are no sheet steel locking washers on nuts A, lock the sub-frame nuts A using a ring spanner ground open and shortened as shown below.



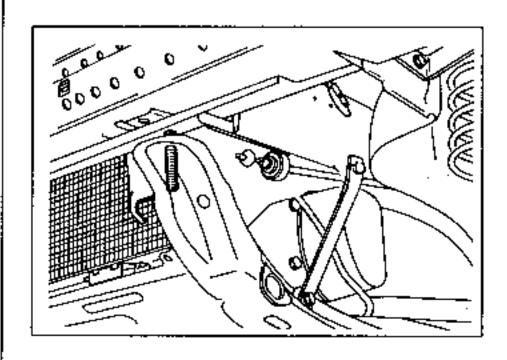
 the bolts on the shock absorber upper cup,



 lift the body shell and remove the power unit assembly.

REFITTING (Special points)

Aligning the body shell with the engine sub-frame will be made easier by fitting the acrewed rods approximately 100 mm long.



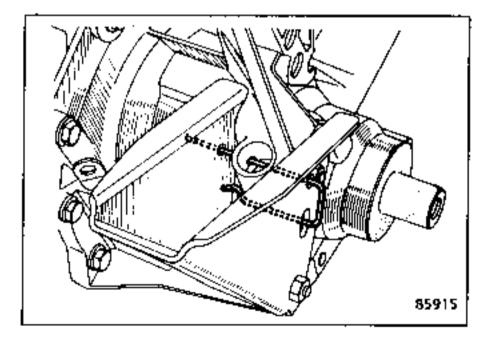
REFITTING (continued)

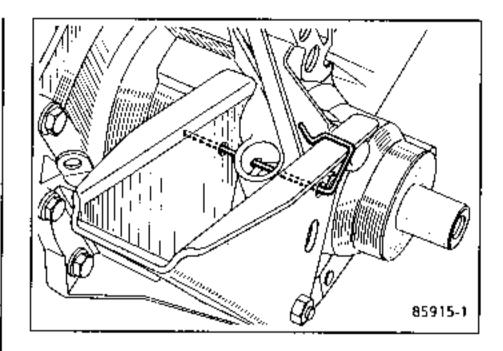
To obtain the correct clutch clearance, see the "CLUTCH" section of M.R.257.

 Tighten the brake caliper securing bolts to a torque of 10 daN.m.

Press the brake pedal a number of times to bring the caliper pistons into contact with the brake pads.

- fill the engine and gearbox with oil (when applicable),
- fill and bleed the cooling system,
- fill and bleed the freon system (when applicable),
- fill the power steering system (when applicable),
- adjust the gear shift control,
- reconnect the speedometer drive cable ensuring that the clip is in the correct position.





 tighten the steering column universal joint in the correct position (see the "Front Axle" section).



ESSENTIAL SPECIAL TOOLS

Mot.1040-01 Dummy sub-frame for removing and refitting the power unit assembly.

· -	
TIGHTENING TORQUES (in dan.m)	\bigcirc
- Sub-frame securing bolts :	
10 mm Ø	4,5
12 mm Ø	10
- Shock absorber upper cup	
securing bolts	2,5
- Brake caliper securing bolts	10
- Steering column universal joint	
securing bolts	3
- Wheel bolts	8
l	

Removing the power unit assembly, all type "f" engines

REMOVING

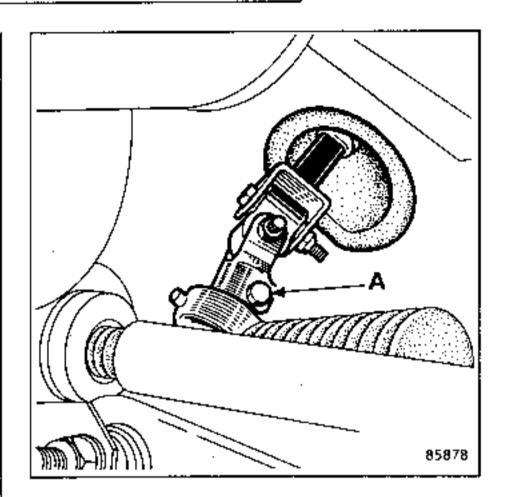
Disconnect the battery.

Remove :

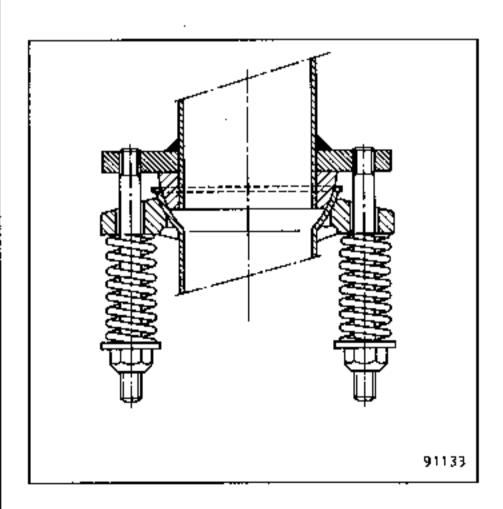
- the bumper shield,
- the two steering protection plastic half shells.

Disconnect :

- the speedometer drive cable which is retained by a clip,
- the steering column universal joint at (A),
- the earthing braid,
- the accelerator cable,
- the clutch cable,
- the electrical connectors.



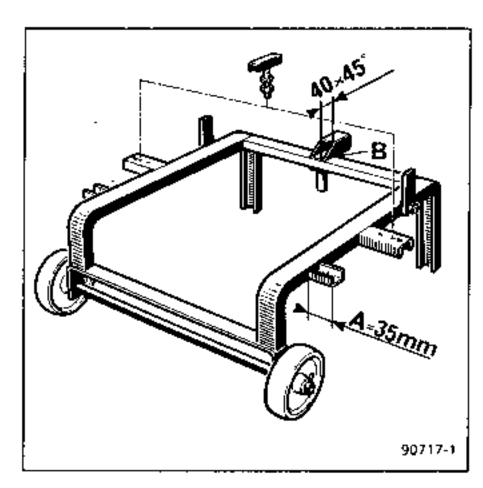
The exhaust pipe flange and remove the down pipe.



REMOVING (continued)

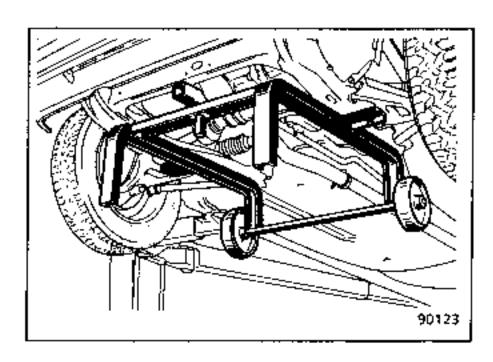
This operation involves modifying tool Mot.1040-01 as follows:

Cut the 2 rear fastenings on the tool A at 35 mm and the front fastening, B at 40 mm and 45° .



Remove :

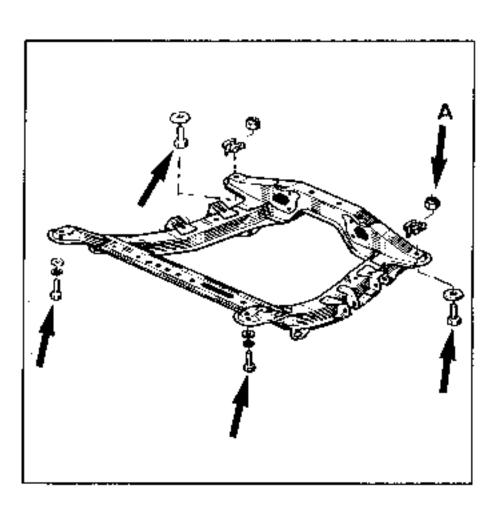
- the brake calipers and secure them to the body,
- the tie rods that connect the subframe to the body shell,
- place tool Mot.1040-01 in position.



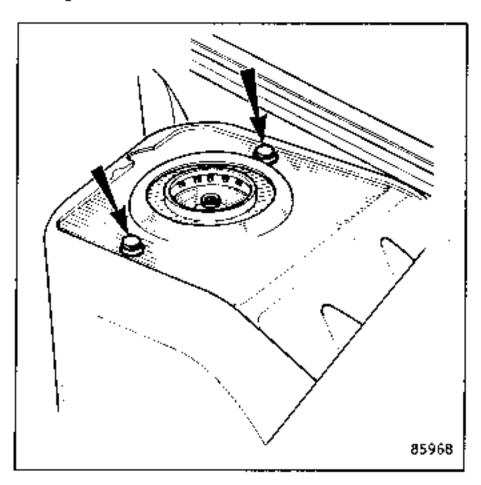
Lower the vehicle to the ground.

Remove :

- the four sub-frame securing bolts.



 the bolts on the shock absorber upper cup.

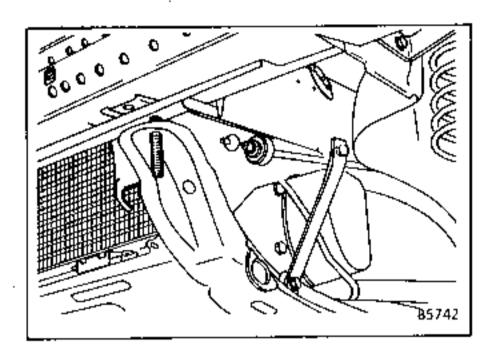


 lift the body shell and remove the power unit assembly.

COMPLETE ENGINE AND LOWER ENGINE UNITS Power unit assembly

REFITTING (Special points)

Aligning the body shell with the engine sub-frame can be made easier by using screwed rods approximately 100 mm long.



To obtain the correct clutch clearance, see the "CLUTCH" section of M.R. 257.

- tighten the brake caliper securing bolts to a torque of 10 dan.m.

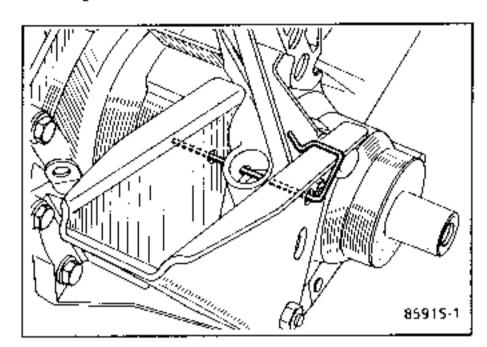


Press the brake pedal a number of times to bring the caliper pistons into contact with the brake pads.

- fill the engine and gearbox with oil (when applicable),
- fill and bleed the cooling system.

Adjust the gear shift control (see the "GEARBOX" section of M.R.257).

- reconnect the speedometer drive cable ensuring that the clip is in the correct position.



Adjust :

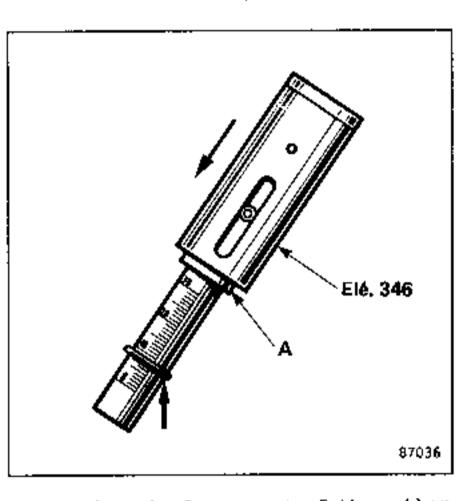
- the accelerator cable.

CHECKING THE TENSION

	ESSENTIAL SPECIAL TOOLS		
Elé.	346	Belt tension tester	
Elé.	346 - 04	Kit consisting of	
		Elé 346 + Elé 346-01 + Elé 346-03	

A belt msut always be fitted with the tensioner in the released position so as not to apply force to the pulleys and the belt.

CHECKING METHOD



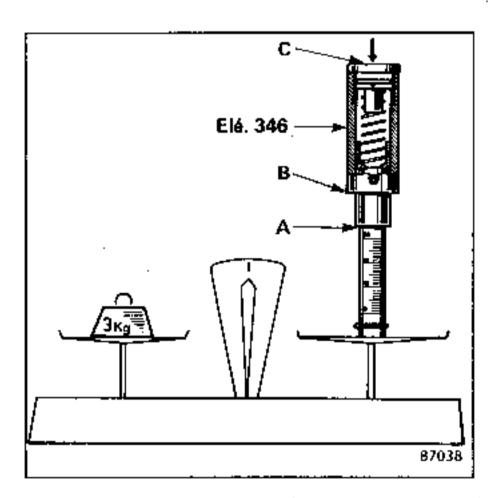
Check that the lower part of the rubber ring is in line with the zero on the plunger scale.

Place the bar against the belt with the plunger halfway between the centres of the two pulleys.

Press the sliding part of the plunger until the shoulder (A) is flush with the plunger body.

Remove the tool and read the deflection from the bottom edge of the rubber ring. ZEROING TOOL Ele.346

From time to time the accuracy of tool Ele.346 must be checked.



Apply a force of 3 daN (a weight of 3 kg) to the tool. Shoulder (A) should be flush with the body of plunger (B). If it is not, turn screw (C) to increase or reduce the spring pressure.

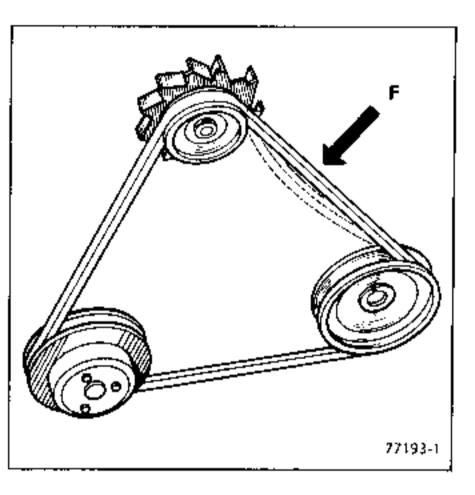
CHECKING THE TENSION

ARRANGEMENT ON TYPE "C" ENGINES

CHECKING

The deflection (F) :

A new belt or one that has run for 10 minutes.



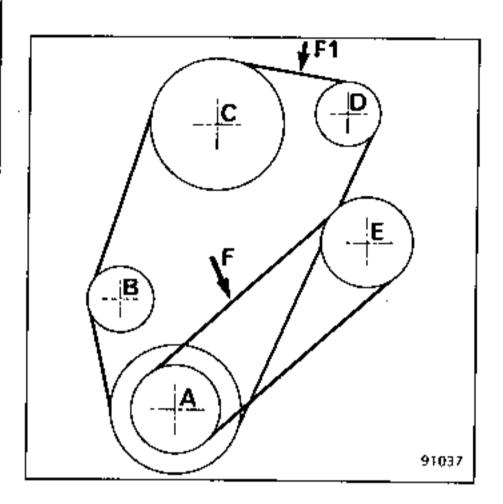
Alternator drive belt : F = 4 mm.

- A. Crankshaft pulley
- Tensioner roller
- C. Coolant pump pulley
- D. Alternator pulley
- Power steering pump pulley
- G. Compressor pulley

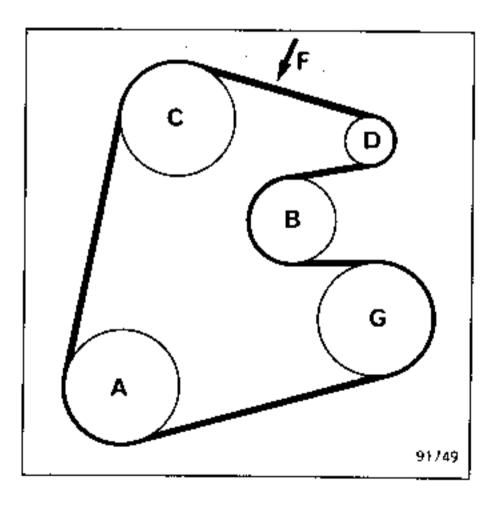
Checking :

F = 3.5 to 4.5 mm when cold

F1 = 4 mm when cold



Vehicle with power steering



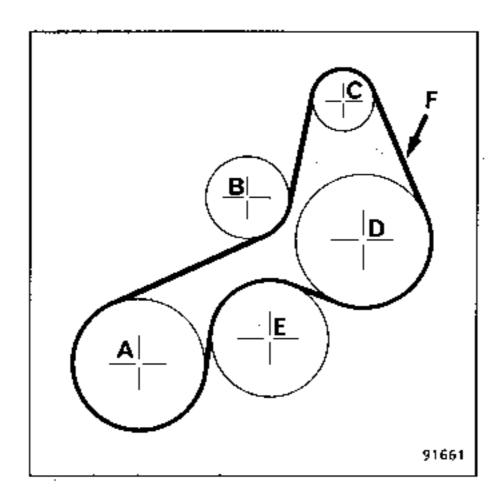
Checking :

vehicle with air conditioning

F = 3 to 4 mm (when cold)

CHECKING THE TENSION

TYPE F .. (e) ENGINES



- A. Crankshaft pulley
- B. Tensioner roller
- C. Alternator pulley
- D. Power steering pump pulley
- E. Coolant pump pulley

Checking :

F = 3.5 to 4.5 mm when cold

		Market	:					Euro	p e		
Wahi ala			Er	ngine							
Vehicle	Туре	Suffix	Bore (mm)	Strok (mm)	- 1		Comp.	Gearbox	Carbu	rettor	Ref.
B 400 · C 400 S 400	C1C	A 700	65	72	95	6	9,7	Manual		IITH IF2	V10508
		I	dling sp	peed				Tamperpr cap	_		st ing
Speed	Speed (rpm) Mixture (CO) Cond						:	Part	no.	Speed	(rpm)
700 ±	25		1 ± 0,5		After E		has	77 01 200 835			
							Gr	ade	Octane rating		ting
	Fuel:							per		1.0.98	ļ
	Emission control system :							· 			
	EXHAUST						Conventional				

		Market	:					Euroj	рe		
Vehicle		_	En	gine							
veniuic	Туре	Suffix	Bore (mm)	Stro (mm		apacity (cm³)	Comp.	Gearbox	Carbu	rettor	Ref.
В 400 С 400	C1C	E 700	65	72		956	9,2	Manual		1 32 IF2 32 BIS	V10508 885
· · · · ·		Id	ling spe	eeđ				Tamperpro cap	ofing		ist .ing
Speed	(rpm)	Mix	ture (C	ტ)	Con	ditions	:	Part :	no.	Speed	(rpm)
700 :	± 50		1,5 ± 0,5	3		r E.F. h ut in	as	ZENITH 77 01 200 5QLEX 77 01 200	835		
		Engl.					Gra	de	Oc.	tane ra	iting
	Fuel :							er		1.0.98	
	Emission control system :										
	EXHAUST						Conventional				

		Marke	t :				Europe			
Vehicle			1	Engine						
·ciicie	Туре	Suffix	Bore (mm)	Stroke (mm)	Capacit	Comp. Gear		Carbu	rettor	Ref.
F 400	C1C	8 706	65	72	956	8_6	Manual		IITH BIF	V0508
		I	dling sp	peed	_		Tamperpro cap	-		ist ing
Speed	(rpm)	Mi	xture (20)	Condition	ıs :	Part	no.	o. Speed (rpm	
700	± 50		1,5 ± 0,5	·			77 01 200	834		
		Puol :		•		Gra	đe	Oct	ane rat	ing
	Fuel :						emium		I.O.92	
	Emi:	ssion co	ntrol sy	stem :						
		EXHA	UST				Conve	entiona	1	

		Market	:					. Europ	e		,
Vehicle	L		Eng	ine							
840 1	Туре	Suffix	Bore (mm)	Strok (mm)		pacity (cm³)	Comp.	Gearbox	Carbu	rettor	Ref.
C401 F401 S401	C1E	G 750	70	72		1 108	9,5	Manual .	SOLEX 32 BIS		
			Idling s	peed			•	Tamperpro cap	ofing	Fa idl	
Speed	Speed (rpm) Mixture (CO) Cond							Part n	ю.	Speed	(rpm)
	50 (1) 50 (2)		1 ± 0,5 (1 1,5 ± 0,5 (2			r E.F. i	has	ZENITH: 77 01 200 835 SOLEX: 77 01 200 831			
		Fue l	;	•			Gr	ade	Oc.	tane ra	ting
	ruei ;							per	r 1.O.98		
	Emission control system :										
	EXHAUST							Conventional			

		Marke	:t :				Sw	COLD Ci eden, Nor		nland	
Vehicle			Engine	•							
	Type	Suffix	Bore (mm)	Stro) (mm	Cap	acity :m³)	Comp.	Gearbox	Carbu	rettor	Ref.
B401 C401 S401	C401 C1E 757 70 72 1							Manual	ZENIT	1 32 IF2	V10513
·· ·		Id	lling spe	ed				Tamperpro cap	oofing	_	ast lling
Speed (rpm) Mixture (CO) Cond							s :	Part (10.	Speed	(rpm)
	650 ± 25 (1) 1 ± 0,5 (1) After 700 ± 50 (2) 1,5 ± 0,5 (2) cut						has	77 01 200	835		
		Fuel :					Gr	ade	00	tane ra	ting
	Fuel:							pe <i>r</i>		1.0.98	l
	Emission control system :										
	EXHAUST						Conventional				

^{(1) -} Phase I up to during 1987 model year

^{(2) -} Phase II from during 1987 model year

		Market	:				Isra	el .			
Vehicle			E	ngine							
venicie	Туре	Suffix	Bore (mm)	Stroke (mm)	Capacity (cm3)	Comp.	Gearbox	Carbu	rettor	Ref.	
B401 F401	CIE	754	70	72	1 108	8_3	Manual .	ZEN 32	ITH IF2	V10524	
		I	dling sp	peed			Tamperpro cap	ofing		ist .ing	
Speed	(rpm)	Mi	xture (20)	Conditions	3 :	Part no	o.	Speed	l (rpm)	
650	± 50		1,5 ± 0,5		After E.F.	has	77 01 200 835				
		۴uel				Gr	ade	00	tane ra	iting	
	Fuel:						remium		1.0.85		
	Emission control system :										
	FXHAUST						Conventional				

		Market	:					Swede	n		
Vehicle			En	gine							
	Type	Suffix	Bore (mm)	Stroke (mm)	Capac (cm	ity 3)	Comp. ratio	Gearbox	Carbu	rettor	Ref.
8401 C401 S401	C401 C1E 752 70 72 S401						9,5	Manual		ZENITH 32 IF2	
			Idling s	peed		•		Tamperpro- cap	ofing		ast L in g
Speed	Speed (rpm) Mixture (CO) C						:	Part n	٥.	Speed	(rpm)
	650 ± 25 (1) 1 ± 0,5 (1) 700 ± 50 (2) 1,5 ± 0,5 (2)					After E.F. has			835	1 700 ± 100	
		_		_			Gr	ade:	Oc	tane ra	ating
	Fuel :							Super 1.0.98			!
	Emission control system :										
	EXHAUST							Conventional			

		Market	:					SWITZE	RLAND		
		•	E	ngine					·		
Vehicle	Type	Suffix	Bore (mm)	Stroke (mm)		pacity cm³)	Comp.		Carbu	rettor	Ref.
B401 C401	C401							Manua1	ZEN 32	ITH IF2	V10514
		1	[dling s	peed			Tamperpro cap	ofing		ast ling	
Speed	Speed (rpm) Mixture (CO) Cond							Part n	.0.	Spee	d (rpm)
650	650 ± 25 1 ± 0,5 After						has	77 01 200	1 700) ± 100
							Gı	rade	Octane rating		ating
	Fue 1 :							ıper	<u> </u>	1.0.98	3
	Emission control system										
	EXHAUST						Conventional				

^{(1) -} Phase I up to during 1987 model year (2) - Phase II from during 1987 model year

		Market	:					Germany	- Holla	and	
Vehicle			F	Engine							
*61,2626	туре	Suffix	Bore (mm)	Strok (mm)		ity)	Comp. ratio	Gearbox	Carbu:	rettor	Ref.
840H C40H F40H	C1E	B 756	70	72	110	8	8.8			(ITH V105)	
			Idling s	peed				Tamperpro cap	oofing	Fast idling	
Speed	Speed (rpm) Mixture (CO) Con							Part no.		Spee	d (rpm)
700	± 50		1,5 ± 0,5	,	After :		has	77 01 200 835		1 700 ± 100	
		Fuel	;				Gr	ade	Oc.	tane ra	ting
	raer ,							Ordinary unleaded 1.0.91			
	Emission control system :										
	EXHAUST							Cor	nventio	nal	

		Market	1					Spai	in		,
Vehicle				Engine			I				
	Type	Suffix	Bore (mm)	Strok (mm)		city 3)	Comp.		Carbu	Carburettor	
B40F C40F	C40F							Menual		32 BIS 1 32 IF2	869 V10513
		:	I dli ng s	peed				Tamperpro cap	ofing	I	ast ling
Speed	Speed (rpm) Mixture (CO) Con						ខេ	Part :	10.	Spee	đ (rpm)
650							has	SOLEX: 77 01 200 831 ZENITH: 77 01 200 835			
							Gre	ade	. 00	ctane r	ating
	Fuel:							per		1.0.98	
	Emission control system :										
	EXHAUST						Conventional				

		Marke	t:					Eur	cope		
Vehicle			Er	ngine	•	•		••			
	Туре	Suffix	Bore (mm)	Strok (mm)	ce Car	macity	ty Comp. Gearbox		Carbu	Carburettor	
840F C40F	CIG	E 720	71,5	77	1	237	9,2	Manual		LEX BIS	907
	Idling speed							Tamperpro cap	ofing	_	ast ling
Speed	Speed (rpm) Mixture (CO) Con						÷	Part no	٠,	Spee	d (rpm)
700	700 ± 50 1.5 ± 0.5 Afte						has	77 01 200 831			
		Fuel	t				G	rade	Oc	tane ra	ting
								Super 1.O.98			
Emission control system :											
	EXHAUST						Conventional				

		Market	:					Euro	pe			
			En	gine								
Vehicle	Туре	Suffix	Bore (mm)	Strok (mm)		pacity cm³}	Comp.		Carbu	rettor	Ref.	
B402 C402 F402	C1J	A 768	76	77	1	397	9,2	Manual		ZENITH 32 IF2 SOLEX 32 BIS		
			Idling s	peed				Tamperpro cap	ofing		ast l in q	
Speed	Speed (rpm) Mixture (CO) Con							Part n	10.	Spee	d (rpm)	
62 5	625 ± 25						has	ZENJTH 77 01 200 SOLEX 77 01 200	831			
		70a v					G:	rade	Octane rating		ting	
	fuel :							Super 1.0.98(1)			t)	
	Emiss	ion con	trol sys	tem :	1515 11 11							
	EXHAUST							Conventional				

		Market	:					Germa	ny	Germany				
Vehicle			Er	ngine						-				
venicie	Type	Suffix	Bore (mm)	Strok (mm)		acity m³)	Comp,	Cearbox	Carbu	ırettor	Ref.			
B402 C402 F402	C1J	E 768	76	77	1	397	9,2	Manual		1 32 IF2 32 BIS	V10511 849			
		I	dling sp	peed				Tamperpro cap	ofing		st ing			
Spee	Speed (rpm) Mixture (CO) C					itions	:	Part n	o .	Speed	d (rpm)			
625	± 25		1 ± 0,5			E.F.	has	ZENITH 77 01 200 SOLEX 77 01 200	835 831					
							G	Grade	00	tane ra	ting			
		Fuel	•				Non-	premium		1.0.92 (2)			
	Emissi	on cont	rol syst	em :										
		EXHAUS	T					Con	ventior	nal				

⁽¹⁾⁻ Including regulation RE 204(2)- Including regulation Re 211

· ~~~		Market	;				Norwa	COLD CI ay, Sweden		and	
				Engin	ıe		i				_
Vehicle	Туре	Suffix	Bore (mm)	Stroke (mm)	Capac (cm		Comp. ratio	Gearbox	Carbu	rettor	Ref.
B402 C402	CIJ	A 768	76	77	1 39	7	9,2	Manual	ZEN 32	IITH IF2	V10512
		I	đling sp	eed				Tamperpro cap	ofing		ast ling
Speed	Speed (rpm) Mixture (CO)					tions	3	Part n	10+	Spee	d (rpm)
625	± 25		1 ± 0,5		After D		has	77 01 200	835		
		Fuel	:	•			G	rađe	· 0c	tane ra	ting
							Šī	aper		1.0.98	
Emission control system :											
		EXHAUS'	T					Con	nventional		

		Market	. 1					Isra	iel		
]	Engine				,		_	••
Vehicle	Type	Suffix	Bore (mm)	Strok (mm)	e Capac (cm	ity 3)	Comp.	Gearbox	Carbu	rettor	Ref.
B402 F402	C11	M 780	76	77	1 39	7	9,2	Manual		LEX BIS	849.c
		I	dling s	peed			•	Tamperpro cap	ofing		ast l in g
Speed	(rpm)	Mi	xture ((20)	Condit	ions	:	Part n	art no. Speed		
700	± 25	5 1 ± 0.5 After E.F. has cut in		77 01 200 831		1 050	± 50 (1)				
		Fue l	÷			No	n-Pred	n. Grade	00	tane ra	ting
								(2)		I.Q.89	<u> </u>
	Emis	sion con	trol sys	stem :							
		EXHAUS	T					Con	vention	na1	

- (1) With air conditioning (2) Including regulation RE 211

		• -				Europe	: un	to during	198 7 7	model v	ear
		arket :				_	_	y from 88		_	Y
Vehicle		,.	Eng	inc							
	туре	Suffix	Bore (mm)	Strok (mm		pacity (cm³)	Comp.	1 1	carbu	rettor	Ref.
C405	C1.J	782	76	77		1 397	7,9	Manual	SOI 32	.EX BIS	854
			Idling s	peed				Tamperpro cap	ofing		ast ling
Speed	(rpm)	М	ixture (co)	Сот	ditions	3	Part n	o.	Spee	d (rpm)
650	± 50		1.5 ± 0	.5		r E.F.	has	77 01 200	831		
•		Fuel					Gr	ade	Oct	tane ra	ting
		ruei	-				Su	per		1.0.98	
	Emiss	ion con	trol ays	tem :							
	:	EXHAUST						Conve	ntional	1	
Electric (against	_	-	mber)				tput (60 1/hr at	a pres	ssure of	£ 2.5
Speedomet	er rel	ay				; on	acces	ssories pla	ațe		
Fuel filt	er						per ty	ype : to bo	e repla	aced eve	ery
Air filte	r with	paper	cartridg	e		: To	be re	eplaced ev	ery 20	000 km	
Fue l pre s	ssure r	egulato	r			Fu	el pre	at idling : essure = To pressure a	urbocha	rge.pr	
Antiperco - Fan tem - Relay - Fan						;Ski	. 89℃ rted t e : A.E.				
	rbocharger, ter cooled during 86 model year						g valv ening	type T2 w ve pressure ! lift of 0	590 to	650 mba	ers at
Turbochar	rbocharging pressure at a speed of							in paral: n:680 ± 30 m n:700 ± 30 m	ıbar	h Elec.	ign.
Engine sa	fety p	cessure	switch			: Cut-out pressure : 1 100 ± 50 mbar					bar
Intercool	gine safety pressure switch						: Air-air type Thermostatic flap 43°-47°				

	M	arket :						Europe			
**-1-2-27-			En	gine							
Vehicle	Type	Suffix	Bore (mm)	Stroke (mm)	e Capa (c	icity m³)	Comp. ratio	ı .	Carbu	rettor	Ref.
C405	CIJ	G 788	76	77	1	397	7,9	Manual	SOI 32	EX BIS	931
		I	dling sp	eed				Tamperprod cap	ofing	Fa idl	st ing
Speed	(rpm)	Mi	xture (O	10)	Cond	litions	3	Part no		Speed	(rpm)
650	± 50		1,5 ± 0,5			E.F.	has	77 01 200	831		
-		Fuel	:	<u>, </u>			Gr	ade	Ос	tane ra	ting
							Su	per		1.0.98	. <u>– – – </u>
	Emiss	ion con	trol sys	tem :							
	•	EXHAUST	1					Conve	ntiona	1	
Electric against :	_	_	er)				itput ars	60 1/hr at	a pre	ssure o	f 2.5
Speedome	ter rel	ау				: 01	n acce	ssory plat	:e		
Fuel fil	ter				- <u>-</u> .		aper t	ype : to h	e repl	aced ev	ery
Air filt	er with	paper	cartrido	je		; To	o be r	eplaced ev	ery 20	000 km	ı
Fuel pre	ssure r	egulato	er			F	uel pr	at idling essure = 7 pressure a	Turboch	arge pr	
Antiperc - Fan te - Relay - Fan		_	1:			: Sk	-84°C irted be:A.E				
- Static	urbocharger, water cooled Static opening pressure Test at travel of 0.38						g valv 0±30 π	mbars for a at a t rav e	a lift	of 4 <u>+</u> 0.	02 mm
Turboch@	urbocharging pressure at a speed of						00 rps	f in parali n :680 ± 30 n :700 ± 30	mbar	th Elec	ign.
Engine s	gine safety pressure switch						t-out	pressure	: 1 ′	100 ± 50 r	nbar
Interco	oler						r-air ermosi	type tatic flap	43° -	47°C	·

					1						
		Market	: :		:			Switzer	land		
			Enç	jine		• •					
Vehicle	Туре	Suffix	Bore (mm)	Strok (mm)	• -	acity cm³)	Comp.	1 1	Carbu	rettor	Ref.
C405	C1J	784	76	77	1	3 97	8	Manual	\$01 32	LEX BIS	860
•			ldling sp	peed				Tamperpro cap	ofing	· .	ist Ling
Spee	d (rpm)) M:	xture (0	20)	Con	dition	s :	Part no	٠.	i	l (rpm)
650	± 50		1.5 ± 0	,5		r E.F.	has	77 01 200	831	1 800) ± 100
		Fuel.	:	1.			Gr	ađe	Oct	ane rat	ing
							Su	ıper	1	I.O.98	
	Emis	ssion co	ntrol sy	rstem :			7	Air drawn	into ex	haust	
		EXHAUST						Conve	entiona	11	
	lectric fuel pump against rear cross member)							0 1/hr at	a pres	ssure of	2.5
Speedome	ter rel	lay				:on	acces	ssory plate	:- <u>-</u>		
Fuel fil	ter						per ty 000 k	ope : to be	repla	iced eve	ry
Air filt	er with	ı paper	cartridg	le		:To be replaced every 20 000 km					
Fuel pre	ssure 1	regulato	r			Fu	el pre	it idling s ssure - Tu pressure at	irbocha	ırge.pre	
Antiperco - Fan ter - Relay - Pan			ι ;			:Sk	-89°C irted pe : A			- -	
	Purbocharger, water cooled during 86 model year						g valv ening	type T2 wi e pressure 9 lift of 0.	390 to	650 mba	ırs at
Turbocha	Turbocharging pressure at a speed of						:Take-off in parallel with Elec. ign 3 500 rpm : 680 + 30 mbars				ign.
Engine e	afety r)TAKANTA	switch			5 500 rpm : 700 + 30 mbars :Cut-out pressure : 1 100 + 50 mbars					ibara
	ngine safety pressure switch							type			

NOTE: Without system for drawing air into the exhaust.

		Market	:								
11-1-1 - 7 - 7		-	Er	ngine	•				••		
Vehicle	Type	Suffix	Bore (mm)	Strok (mm)	1 -		Comp.	1 1	Carbu	rettor	Ref.
B403 C403	C2J	F 700	76	77	1 39	97	9.2	Manual		BER DRT	21 Ind 100
	1		dling sp	peed				Tamperprod cap	ofing	· Fa	st ing
						litio	ns :	Part no	٠.	Speed	(rpm)
700	3004F0 15405					E.F it in	E.F. has 77 01 200 833				
							Gr	ade	00	tane ra	ting
		Fuel	:				Su	iper		I.O.98	
	Emis	sion cor	ntrol sys	stem							
		EXHAUS	ST					Con	vention	ıa 1	
		Market	:					Euro	pe		

		Market						Euro	pe		
Vehicle				Engine	ı			i i			
venicle	Туре	Suffix	Bore (mm)	Štro (mm			Comp. ratio	Gearbox	Carbu	rettor	Ref.
B403 C403	C2J	M 780	76	77		1 397	9,2	Manual		Spee	7
		Id	lling sp	eed				Tamperproofing cap		1	ast ling
Speed	(rpm)	Mix	ture (C	0)	Co	ndition	ıs :	Part n	10.	BER DRT Faid: Speed	d (rpm)
700	± 25		1,5 ± 0,5	i		er E.F. cut in	has	77 01 200	0 833		
		fuel					G	rađe	001	tane ra	ting
		ruei					Sı	uper		1.0.98	1
	Emiss	ion cont	rol sys	tem							
•	7.	EXHAUS	ST					Conv	entiona	1	

		Marke	t :									
Vahiala			E	Ingine								
Vehicle	Туре	Suffix	Bore (mm)	Stro (mm		Capaci (cm		Comp. ra ti o	Gearbox	Carbi	urettor	Ref.
8403 C403	C2J	Q 781	76	77		1 397	,	9,2	Automatic			8
			Idling s	peed					Tamperproo cap	fing		ast ling
Speed	(rpm)	М	ixture (co)	C	Conditi	ions	; ;	Part no		Speed	đ (rpm)
600	± 25		1 ± 0,5		Af	fter E.	E.F. has in 77 01 200 833					
Fuel:								Gra	ade	0c1	tane rat	ting
								 Տա յ	per	WESE 32 DR fing 333	1.0.98	
	Emissi	on cont	rol syst	em								
		ЕХНАЦ;	ST						Conven	tiona!	L	

•			*								
		Marke	t :					COLD C			
			F	ngine						<u> </u>	
Vehicle	Type	Suffix	Bore (mm)	Strok (mm)	r -	acity cm³)	Comp. ratio	5	Carbur	ettor	Ref.
B403 C403	C2J	M 780	76	77	13	97	9,2	Manual	,	BER DRT	13
			Idling s	peed				Tamperpr cap	_	I	ist Ling
Speed	Speed (rpm) Mixture (CO)				Cond	itions	s :	Part	no.	Speed	i (rpm)
700	± 25		1,5 ± 0,5	,		E.F. t in	has	77 01 20	0 833		
		Fuel					Gr	ade	Oç.	tane ra	ting
		1 401	•				Su	per		1.0.98	3
	Emissi	on cont	rol syst	em :							<u> </u>
	•	EXHAUS'	T					Con	vention	al	

		Marke	t :					Spain	ì		
Vehicle				Engine	•						
venicie	Type	Suffix	Bore (mm)	Stro			Comp.		Carbu	rettor	Ref.
B403 C403	C2J	798	76	77	1.3	97	9,2	Manual	WEI 32 (BER DRT	12
		· ;	Idling s	peed				Tamperpro cap	ofing		ast Ling
Speed	(rpm)	M	ixture (co)	Condi	Ltions	: :	Part r	no.	Speed	i (rpm)
700	± 25		1,5 ± 0,5		After cut	E.F. in	has	77 01 200	0 833		
		Fuel	:		· · · · · ·		G:	rade	00	ctane ra	ating
										1,0,98	
	Emissi	on cont	rol syst	em :							
		EXHAUS'	T				•••	Cor	ventio	nal	

		Marke	t:		ļ			Switze:	rland		
**.1.*.7.		•		Engine							
Vehicle	Туре	Suffix	Bore (mm)	Stroke (mm)	e Capac (cm		Comp.	Gearbox	Carbu	rettor	Ref.
C403	C21	788	76	77	1 39	17	9,25	Manual		OTTUG	
	,	I	dling sp	peed	•			Tamperprocap			st ing
Speed	eed (rpm) Mixture (CO) Conditions: Part no. After E.F. has					no.	Speed (rpm				
700	± 25		1 ± 0,5*		After E		has	77 01 200	833	1 800	± 100
		En .	_				Gr	ade	Oc	tane ra	ting
		Fuel					Su	per	1	1.0.98	
	Emiss	ion cont	rol ayst	tem :		E		ir drawn gas reci			.R.)
		EXHAUS	T					Co:	nventio	nal	

		Market	-				Switze	rland		
Vehicle			Eng	ine						
	Type Suffix Bore Stroke (mm) (mm)		Capacity (cm ³)	Comp. ratio	Gearbox	Carburettor		Ref.		
C403	C403 C2J 789 76 77				1 397	9,25	Automatic	ı	EBER DRT	6
		-	[dling s	peed			Tamperproo cap	fing		ist Ling
Spec	ed (rpm) M3	Lxture (CO)	Conditions	3 :	Part no	•.	Speed	nqx)
600	± 25		1 ± 0,5 *	, ,	After E.F.	has	77 01 200 8	333		
						G	rade	0c	tane rat	ing
		Fuel :	1			Sı	uper		1.0.98	
	Emiss	ion cont	rol sys	tem :	Е		Air drawn i t gas recir			;.R.)
		EXHAUST	•]		Conv	ention	nal	

Mixture adjustment without air drawn into exhaust

		,						Swede				
		Market	: : 					SWede				
***1 1 - 7 -				Engine	•							
Vehicle	Type	Suffix	Bore (mm)	Strok (mm)	ce Capac	j ^{ty}	ty Comp.	Gearbox	Carbu	rettor	Ref.	
C403	403 C2J 788 76 77						9,25	Manual ·	WE!	BER ORT	5	
	•	I	dling s	peed				Tamperpro cap		l .	ast ling	
Speed	(rpm)	Mi	xture (co)	Condit	ions	:	Part :	no.	Spee	d (rpm	
700	± 25		1,5 ± 0,5	*	After E		has	77 01 200	0 833	1 800	± 100	
							Gr	ađe	00	tane ra	ting	
		Fuel	:				Su	per		I.O.98		
	Emission control system :							ir drawn gas reci			.R.)	
	•	EXHAUS						Con	vention	ıal		

^{*} Mixture adjustment without air drawn into exhaust

											
		Marke	:t :					Germany-	folland	l	
Vehicle			. 1	Engine							
venicie	Туре	Suffix	Bore (mm)	Stro (mm		acity m³)	Comp.		Carbu	rettor	Ref.
B 40J C 40J	1 1 197 1 1 1						9	Manual		BER DRT	18
	Idling speed									1	ast ling
Speed	(rpm)	Mi	ixture (0	co)	Con	lition	ftions: Part no. S		Spee	d (rpm)	
700	± 50		1,5 ± 0,5	:		r E.F. in twi		77 01 200	833	1 700	± 100
							Gr	ade	Oc.	tane ra	ting
		Fue l	:			Or	dinary	unleaded	1	1.0.91	
	Emission control system :							rrection b	etween oil	15 and	70° ir
		EXHAUS	T					Conv	ention	al	

		Market	: :					Germany	-Hollan	ıd	
Vehicle			Eı	ngine							
	Туре	Suffix	Bore (mm)	Strok (mm)		city 3)	Comp.	1	Carbur	ettor	Ref.
B 40M C 40M F40M	C2J	T 784	76	77	1 39	97	9	Manua1	WEBER 32 DRT		20
]	dling sp	peed						ast ling	
Speed	(rpm)	Mi	xture (20)	Condi	tions: Part no. S			Speed	đ. (spm)	
700	<u>*</u> 50		1,5 ± 0,5		After 1		I	77.01 200	833	1 700	0 ± 100
	·	·					Gr	ade	Octane rating		ting
		Fuel	:			Or	dinary	unleaded		1.0.91	
	Emission control system :							orrection	betwee	n 15 ar	nd 70°
		EXHAUS	T					Conve	ntiona	1	

	Markets : Cermany, Austria, Switzerland										
Vehicle			Eng:	ine		Injection	Ignition				
	Туре	Suffix	Bore (mm)	Stroke (mm)	Capacity (cm³)	Comp. ratio	1	type	type		
B407 C407 F407	C3J	A 700	76	77	1 397	9	Manual	Single point + mixture regulation	A.I.E.		

T	Idling	speed	Fuel			
Engine	Speed (rpm)	Mixture (CO)	Grade	Octane rating		
C3JA 700	850±50 (non-adjustable)	0,5% maxi (non-adjustable)	Unleaded	1.0.92		

Fuel system type	Bendix regulated single point injection
Fuel pump : on rear cross member	Voltage: 12 volts Pressure: 3 bars Output: 130 l/h
Fuel filter : on rear cross member	To be replaced every : 20 000 km
Air filter with paper cartridge	To be replaced every : 20 000 km
Pressure regulator (integral part of throttle unit)	Pressure : 1 - 0.05 bars
Solenoid injector	Voltage : 12 volts Resistance : 1.4 Ω . Must be less than 10 Ω
Catalyser (mounted under floor)	C03 N° 89 33 001 421
Oxygen sensor	Make: Autolite no. 89 33 000 596 At 800°C: - Rich mixture: 625 to 1 100 mV - Lean mixture: 0 to 150 mV
E.G.R.	Fitted valve no. 89 33 003 208
Anti-evaporation system	
	A Similar

Computer	Computer reference	Fault finding	REMARKS
(in passenger compartment)	BENDIX : N° A.M.C : 89 33 002 473	With Multimeter	- Mixture regulation by oxygen sensor - Speed regulation by electric motor

		•	Markets	: Germa	ny, Austri	la, Sw	itzerland		
Vehicle			Eng	ine				Injection	Ignition
venicie	Туре	Suffix	Bore (mm)	Stroke (mm)	Capacity (cm ³)	Comp.]	type	type
8407 C407 F407	C31	B 702	76	77	1 397	9	Manual	Single point + mixture regulation	Ignition power module (M.P.A.)

To out on a	Idling	g speed	Fuel		
Engine	Speed (rpm)	Mixture (CO)	Grade	Octane rating	
C3JB 702	850 ± 50 (non-adjustable)	0,5% maxi (non-adjustable)	Unleaded	1.0.92	

C3JB 702	(non-adjustable	(non-ad	justable)	Unleaded	1.0.92		
Fuel system t	уре		Renix re	gulated single po	int injection		
Fuel pump : 0	n rear cross member		Voltage : 12 volts Pressure : 3 bars Output : 130 l/h				
Fuel filter :	on rear cross member		To be replaced every : 20 000 km				
Air filter wi	th paper cartridge		To be replaced every : 20 000 km				
Pressure regu (integral par	lator t of throttle unit)		Pressure1 ± 0,05 bar				
Solenoid injector				: 12 volts ce : 1.4 Ω . Must :	be less than		
Catalyser (mo	unted under floor)		V _s Co	3 89 33 001 421			
Oxygen sensor			At 800°C - Rich m	utolite no. 89 33 : ixture : 625 to 1 ixture : 0 to 150	100 mV		
E.G.R.			Fitted valve no	. 89 33 003 208			
Anti-evaporat	ion system	•					
Computer	Computer reference	Fault f	inding	REMAR	KS		
(in passenger compartment)	N° Rénix: \$1 00 813 101 Official approval no 77 00 735 140	- Using te XR25 - Cassette or follo	no. 4	 Mixture regulat sensor Speed regulation motor Transitory defe 	n by electric		

150.3

 N^{α} R.N.U.R.

77 00 731 801

- Injection warning light does

on memory

not operate

			Mar	kets : S	weden, Swi	itzerl	and		
Vehicle			. En	gine		Injection	Ignition		
AGUIÇIE	Type	Suffix	Bore (mm)	Stroke (mm)	Capacity (cm³)	Comp.		type	type
8407 C407 F407	C3J	E 760	75,8	77	1 390	9	Manual .	Single point + mixture regulation	Ignition power module (M.P.A.)

Engine	Idling	g speed	Fuel			
Engine	Speed (rpm)		Grade	Octane rating		
C3JE 760	850 ± 50 (non-adjustable)	0,5% maxi (non-adjustable)	Unleaded	I.O.92		

C3JE /6U	(non-adjustable	e) (non-ad	justable) Unleaded	1.0.92	
Fuel system t	уре		Renix r	egulated single po	int injection	
Fuel pump : o	n rear cross member		Voltage : 12 volts Pressure : 3 bars Output : 130 l/h			
Fuel filter :	on rear cross member	r	To be replaced every : 20 000 km			
Air filter wi	th paper cartridge	To be r	eplaced every : 20	000 km		
Pressure regu (integral par	lator t of throttle unit)		Pressur	e1 ± 0,05 bar		
Solenoid inje	ctor	Voltage : 12 volts Resistance : 1.4 Ω , Must be less than 10 Ω				
Catalyser (mo	unted under floor)		1 ()	03 ° 89 33 001 421	· · · · ·	
Oxygen sensor			At 800° - Rich	Autolite no. 89 33 C : mixture : 625 to 1 mixture : 0 to 150	100 mV	
E.G.R.			Fitted valve no. 89 33 003 208			
Anti-evaporat	ion system		FITTED GM cani	: To certain verși ster	ons	
Computer	Computer reference	Fault f	inding	REMARKS		
(in passenger compartment)	(in passenger compartment) N° Rénix: - Using to XR25 - Cassett or follows: 7700735140			 Mixture regulation sensor Speed regulation motor Transitory defended 	n by electric	

150.3

on memory

not operate

- Injection warning light does

 $N^{\bullet}\,R.N.U.R.$

77 00 731 801

		Marke	t:					Europ	pe		
	Engine										
Vehicle	Туре	Suffix	Bore (mm)				Comp.	I	Carbu	rettor	Ref.
B40G C40G	F2N	F2N H 81 88,5 172				721	10	Manual		LEX 4 Z10	932(1) 932D(2
		1	dling sp	peed		Tamperproofing cap			L	ast lling	
Speed	(rpm)	Má	xture (0	20)	Conc	ditions: Part no. Speed				ed)rpm	
800	± 50		1,5 ± 0,5			E.F.		77 01 200	831	1 050	± 50 (2)
							Gr	ađe	00	tane ra	ting
Fue1							Su	ıper		1.0.98	ļ.
Emission control system :											
		EXHAUS					Conventional				

		Marke	t ;					Germa	ny-Holl	L an d	
	Engine									:	
Vehicle	Туре	Suffix	Bore (mm)		Stroke Capacity Comp. (mm) (cm ³) ratio			Gearbox	Carbu	rettor	Ref.
B/C 40K	F2N	G 742	81	88,5				Manual		\$OLEX 28x34 Z10	
Idling speed							Tamperproofing cap				ist Ling
Speed	(rpm)	M	ixture (co)	Condi	tions	÷	Part n	0.	Speed	i (rpm)
850	± 50		1,25 ± 0,5	5	Without into	air exha		77 01 200	831	1	100 (3) 50 (2)
							Gra	ıde	Oct	tane rai	ing
		Fuel	:				Unlea	ided		1.0.95	
Emission control system :							drawn	into exh	aust sy	ystem by	/ blowe
. EXHAUST							alyser	CO 7 (m	ounted	under i	floor)

- (1)- Vehicle without power steering or air conditioning
- (2) Vehicle with power steering
- (3) Emission control and air conditioning

			Markets	: Germ	any, Aust	ria, Sw	ritzerland			
Vahimla			Eng	ine	••					<u> </u>
Vehicle	Туре	Suffix	Bore (mm)	Stroke (mm)	Capacit (cm3)	y Comp.		Inject, type		Ignition type
B40805 C40805	F3N	G 716	18	83,5	1 721	9,5	Manual .	Single + mixturegula	ure	M.P.A. with pinking sensor
En	1-0			Idling	sbeeq			fue.	1	
Eng.	Tite	Sı	peed (rp	m)	Mixture ((co)	Gra	ade	Octa	ne rating
750 ± 50 * 0,5% (non-adjustable) (non-adjustable)							Unle	aded		1.0.92
(*) For a	coolan	t temper	rature b	etween	80 and 10	00°C			•	
Fuel syste	em typ					Regulat	ed single	point in	nject	ion
Fuel pump	: on 1	rear cro	oss membe	er			: 12 volts e : 3 bars : 130 l/h			
Fuel filte	ėr: o	rea r (roes mei	uber		To be r	eplaced ev	/ery : 40	000	km
Air filte	r with	paper d	artridge	<u> </u>		To be r	eplaced ev	very : 20	000	km
Pressure : (integral			tle unit	<u>-</u>)		Pressur	e: 1.2 +	0.050 ba	ars	
Solenoid :	injecto	or			Ì	_	: 12 volt nce : 1.40		be :	less than
Throttle :	unit					. <u>- ×</u> Bendix N° 89 33 0	03 684			
Regulator	valve									
Catalyser	(mount	ed unde	r floor	}		♦ No)2 189 34 202 11	75	•	
Oxygen ser	nsor					At 800% - Rich (Autolite r C : mixture : mixture :	625 t o 1		mV
E.G.R.						Fitted valve no	p, 89 33 C	03 184		
Anti-evapo	ration	system)			With, de	epending o	n versio	n and	i mod. yr
Computer (in passer		Computer	r referen	ice I	ault fin	ding		RÉMAR	RKS	
compartmen	- 1 · · · 1				sensor te no. 4 - Speed regulation by elect lowing motor - Pinking sensor				electric	

:											···
	J		Markets	: Germ	any, Au	stri	a, Swi	itzerland T	, . 		
Vehicle	Туре	Suffix	Engi: Bore	ne Strok	e Capa	city	Comp.	Gearbox	Injec typ		Ignition type
<u> </u>	Туре	Sullia	(mm)	(mm)	(c	m³)	ratio				
B40801 C40801	F3N	H 717	81	83,5	33,5 1 721			Automatic	Single point + mixture regulation		M.P.A. with pinking sensor
				Idling	speed			<u>_</u> .	Fue	1	
i End	gine	s	eed (rp	n)	Mixtur	e (c	o)	Grad	.e	Octa:	ne rating
F3NF	1717	I .	700 ± 50 * -adjusta	ble) (0.5% m non-adj		ble)	Unlead	ed		1.0.92
(*) For a	coola	nt tempe	rature 1	etwee	n 80 an	1 100	o°C				·
Fuel syst	em typ	ė			•••	Re	gulat	ed single	point in	nject:	ion
Fuel pump	o: on	rear cro	ss membe	er	· ·-	Vo	ltage essur	: 12 volts e : 3 bars : 130 l/h			
Fuel filt	er : o	n rear ç	ross men	nber		To	be r	eplaced ev	ery : 40	000	km
Air filte	r with	paper c	artridge	<u> </u>	<u>-</u>	To	be r	eplaced ev	ery : 20	000	k m
Pressure (integral	_		tle unit	:)		Pr	essur 1,	e : 2 ± 0,050 har			
Solenoid	inject	or				Re		: 12 volt. nce : 1.40		be l	less than
Throttle	unit					Ber	ndix 89 33 00	03 685		_	
Regulator	valve										
Catalyser	(moun	ted unde	r floor)		-	7) co	2 89 34 202 175	5		
Oxygen se	nsor					At - R	800°C ich m	olite no 89 : lxture : 6; ixture :	25 to 1		I
E.G.R.						Fit val		. 89 33 003	3 184		
Anti-evap	poration system						h, dep	pending on	version	and	mod. yr.
Computer		Computer	referen	се	Fault f	indi	ng		REMA	RKS	
(in passe compartme	nt) N S S 7	l° Rénix : 1 00 811 20 fficial = 7 00 736 70 l° R.N.U.R. 7 00 736 7	approval		Using t XR25 Cassett or foll	e no owin	. 5	 Mixture sensor Speed remotor Pinking Transito on memor Inj. war 	egulatio sensor ory defe	n by cts n	electric ot held

			Markets	: G	erma	any, Aus	stri	ia, Sv	vitzerland			
Vehicle			_	ine						Inject		Ignition
	Туре	Suffix	Bore (mm)	Str (m	mm) (cm³			Comp.	1			type
C 409	F3N	J 702	81	83,	83,5 1 721			9,5	Manual	Multip + mixt regula	ure	M.P.A. with pinking sensor
	Idling speed					peed				Fue	1	
En	Speed (rpm) Mixture					xture	(CO))	Grad	e	Octa	ne rating
F3N	800 ± 50 * 0.5% max (non-adjustable) (non-adjustable)					-		ole)	Unlead	eđ	1.	.O.92/95
(*) For a	coolant temperature between 80 and					30 and .	100	°C				-
Fuel syst	em type						Rei	nix mı	ıltipoint :	regulate	đ inj	ection
Fuel pump	: on I	: on rear cross member					Voltage: 12 volts Pressure: 3 bars Output: 130 l/h					
Fuel filt	er : or	r : on rear cross member					To	be re	eplaced ev	ery : 40	000	km
Air filte	er with paper cartridge							placed evo	ery : 20	000	km 	
Pressure	regulat	.or					- 2		e : co vacuum cuum of 500			
Solenoid	injecto	r : com	puter co	ntro	lle¢	1		-	12 voits ; 2,5 ± 0,5Ω			
Throttle :	unit						WE	BER : d	loub. barre rep.100-N			2
Regulator	valve		=.				BOSCH : 12 volts					
Catalyser	(mount	ed unde	r floor)				C05 N° 77 00 774 984					
Oxygen se	nsor						Make: BOSCH At 800°C: - Rich mixture: 625 to 1 100 mV - Lean mixture: 0 to .150 mV					
E.G.R.												··
Anti-evap	oration system					į						
Computer	1	omputer	referen	ice	हन	ault fi	ndi	ıg		REMAR	KS	
(in passe compartme	senger				no. wing	. 5	motor - Pinking - Transit on memor	egulatio sensor ory defe ry	n by cts n	electric		

		· -							.			
			Market	: Wit	th a	nti-eva	apor	ration	system	 -		1
Vehicle	Type	Suffix	Eng: Bore (num)	ine Stro		Capac:		Comp.	1	Inject: type	ion	Ignition type
C 40 9	F3N	J 702	81		33,5 1 721		1	9,5	Manual .	Multipoint + mixture regulation		M.P.A. with pinking sensor
Idling speed										Fue	1	
Eng	Engine Speed (rpm) Mixture					ixture	(cc))	Grad	de	Octa	ne rating
F3N.	J 702	(nor	800 [†] 50 1-adjusta	- i	(no	0.5% t n-adjús			Unlead	ied	1	.0.92/95
(*) For a	For a coolant temperature between 80 and)°C				
Fuel sys	system							nix m	ultipoint	regulat	ed in	jection
Fuel pump : on rear cross member						Voltage : 12 volts Pressure : 3 bars Output : 130 /h						
Fuel filt	ter : a	n rear	cross me	mber			Тс	be r	eplaced e	very : 4	000	km
Air filt	er with	paper	cartridge	e			Tc	be r	eplaced e	very : 2	000	km
Pressure	regula	tor					_	essur At ze At va	e : ro vacuum cuum of 50	. •	_	± 0,2 bar ± 0,2 bar
Solenoid	inject	or : co	mputer c	ontro)1 1 e	d			12 volts : 2,5 ± 0,5Ω	!		
Throttle	unit						WEBER: doub. barrel@32 x 36 CFR2 103 - N° 77 00 740 554					2
Regulato:	r valve	!					BOSCH: 12 volts					
Catalyse:	r (moun	ted und	er floor	}			CO5 N° 77 00 774 984					
Oxygen s	ensor						At	800° Rich	SOSCH C : mixture : mixture :			mV mV
E.G.R.												
Anti-eva	aporation system						WI	TH GM	canister			
Computer		omputer	referen	ce	Fa	ult fi	ndir	ıg		REMARK	S	
(in passenger compartment) N° Rénix: S1 00 812 101 Official approval no 77 00 735 559 N° R.N.U.R. 77 00 740 149 Using test XR25 - Cassette or follow 211.3					no. wing	. 6	 Mixture sensor Speed remotor Pinking Transite on memos Inj. was 	egulation sensor ory defe	n by	electric ot held		

VEHICLES EQUIPPED WITH BOSCH SYSTEMS

Vehicle	Arrangement	Туре	Engine
RENAULT 5	2 3 2 3	8 - C - S 404	F8M.,720
EXTRA		F 404	F8M.,720

Description	Make and type	Special features
Injection pump	BOSCH VE 4/9 F 2400 R95	Single piston rotary pump with a mech- anical governor, automatic hydraulic
Pump timing (pump piston lift with engine at T.D.C.)	0,65 ± 0,02 mm	advance, hydraulic choke system elect- rically operated and solenoid shut-off.
Injector holders	BOSCH KCA 30 S 44	
Injectors	BOSCH DN OSD 189/	Setting 130 +8 -5
Fuel filter	PURFLUX 3	With integral priming pump. With integral priming pump and fuel heater. Note : From 1987 onwards, these vehicles are equipped with filters that are heated by the engine cooling system.
Injector pipes		Outside Ø 6 mm Inside Ø 2.5 mm Length 275 mm
Thermostat (fast idling)	CALORSTAT	Lift 7 to 8.5 mm between 30° and 67°C.
Cold starting advance circuit supply thermo- stat-switch	EATON 45°C (1) EATON 60°C (2)	Cut-in temperature : circuit closed = 50 + 3°C(1) 65 + 3°C(2) Gut-out temperature : circuit open = 40 - 3°C(1) 55 - 3°C(2)
Cold starting system	Integral with pump	Operational for 0.30 minutes at + 20°C to 2.45 minutes at -20°C
Temperature element on injection pump		Resistance = 23 ohms.

SETTINGS	TIMING CHECK (on diagnostic bay) Injection Idling Injection commences pump rpm Before T.D.C.
Idling speed 850 ± 25 rpm Fast idling 1150 ± 50 rpm Max. speed 5300 ± 100 rpm Smoke density	BOSCH VER95 850 ± 25 11,5° ± 1°
Approval figure 1,20m-1:39% Maximum legal 2m-1:55%	Reading taken with strobe light. Timing marks on flywheel/clutch housing.

For those items not dealt with in this Workshop Manual see : Workshop Manual : INJ (D), latest edition.

VEHICLES EQUIPPED WITH ROTO DIESEL SYSTEMS

Vehicle	Arrangement	Туре	Engine
RENAULT 5	2 3 A 0	B - C - S 404	F8M720
EXTRA	2 3 A 8	F 404	F8M720

Description	Make and type	Special features
Injection pump	ROTO DIESEL 2 DPC R 8443 A 370 A 2 DPC R 8443 A 371 A 2 DPC R 8443 A 372 A 3	Single head rotary pump with two pistons, centrifugal governor, hydraulic automat- ic advance, automatic fast idling system and solenoid shut-off.
Pump timing at T.D.C. Retained by rod		1,60 ± 0,02 mm 2 Dim. "x" on pump 3
Injector holders	ROTO DIESEL LCR 67320	
Injectors	ROTO DIESEL RDN OSDC 6843 C 2 3	Setting 118 + 7 bars, max. diff. 8 bars
Fuel filter	BOSCH OU A ROTO DIESEL A PURFLUX B	With integral priming pump. With integral priming pump and fuel heater. With integral priming pump and fuel heater. Note :From 1987 onwards, these vehicles are equipped with filters that are heated by the engine cooling system.
Injector pipes		Outside Ø 6 mm Inside Ø 2.5 mm Length 290 mm
Fast idling thermost- atic unit	CALORSTAT	Lift 7 to 8.5 mm between 30 and 67°C

SETTINGS	֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֓ ֓֞֞֞֞֞֓֓֞֓֞֓֓֓֞֞֞֓֓֓֓֓֓֓֓
Idling speed 850 ± 25 rpm Max. speed 5 300 ± 100 rpm Smoke density	
Approval figure 1,11m-1:36% Maximum legal 2 m-1:55%	Rea maa

	TIMING CHECK (on diagnostic bay)			
	Injection	Idling	Injection	
	pump	speed	commences	
İ		$\mathbf{r}\mathbf{p}$ m	Before T.D.C.	
	ROTO DIESEL DPC R 8443	850 ± 25	9°±1°	

Reading taken with strobe light. Timing marks on flywheel/clutch housing.

SINGLE POINT INJECTION SYSTEM COMPONENT UNITS (Bendix* and Renix*).

I - THE FUEL SYSTEM :

- The electric fuel pump.
- The fuel pressure regulator (integral with the throttle unit).
- The injector.

ii - THE INJECTION COMPUTER AND ITS PERIPH-ERALS :

- The injection and ignition computer.
- The coolant temperature or inlet manifold temperature sensor (B, C, F 407 Renix).
- The air temperature sensor.
- The flywheel and its target.
- The speed and position sensor.
- The pressure sensor.
 - The full load
- Switches
- Pedal released
- The pinking detector (B, C 408).
- The oxygen sensor.
- The exhaust gas recirculation solenoid valve (E.G.R.) and the antievaporation canister bleed (1).
- The A.E.I. (Bendix Injection) system.

- THE POWER SYSTEM :

- The ignition power module for Renix injection systems.
- The solenoid injector (that injects the fuel into the throttle unit on the input side of the throttle plate).
- * Bendix injection on the B, C 407 with type C3J A 700 engine.
- (1) Depending on the model year and the market.

INJECTION SYSTEM COMPONENT UNITS

| THE FUEL SYSTEM :

- The electric fuel pump.
- The fuel pressure regulator.
- The fuel filter.

THE INEJCTION COMPUTER AND ITS PERIPH-ERALS :

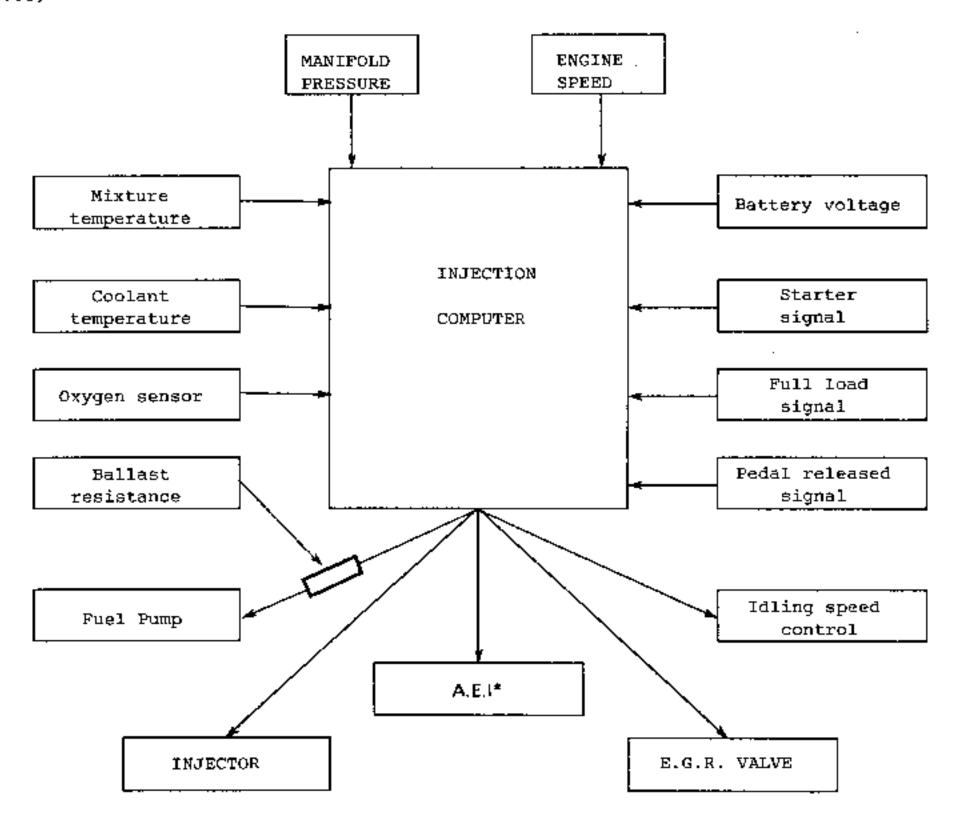
- The injection and ignition computer.
- The coolant temperature sensor.
- The air temperature sensor.
- The flywheel and its target.
- The speed and position sensor.
- The absolute pressure sensor.
- Switch : pedal released, full load.
- The pinking detector.
- The oxygen sensor.
- The idling speed regulator valve.
- The anti-evaporation system canister bleed solenoid valve (1).

IN THE POWER SYSTEM :

- The ignition power module.
- The solenoid injectors.

Depending on the model year and market.

THE PRINCIPLE OF OPERATION OF THE BENDIX SINGLE POINT INJECTION SYSTEM (Engine C3J A 700)



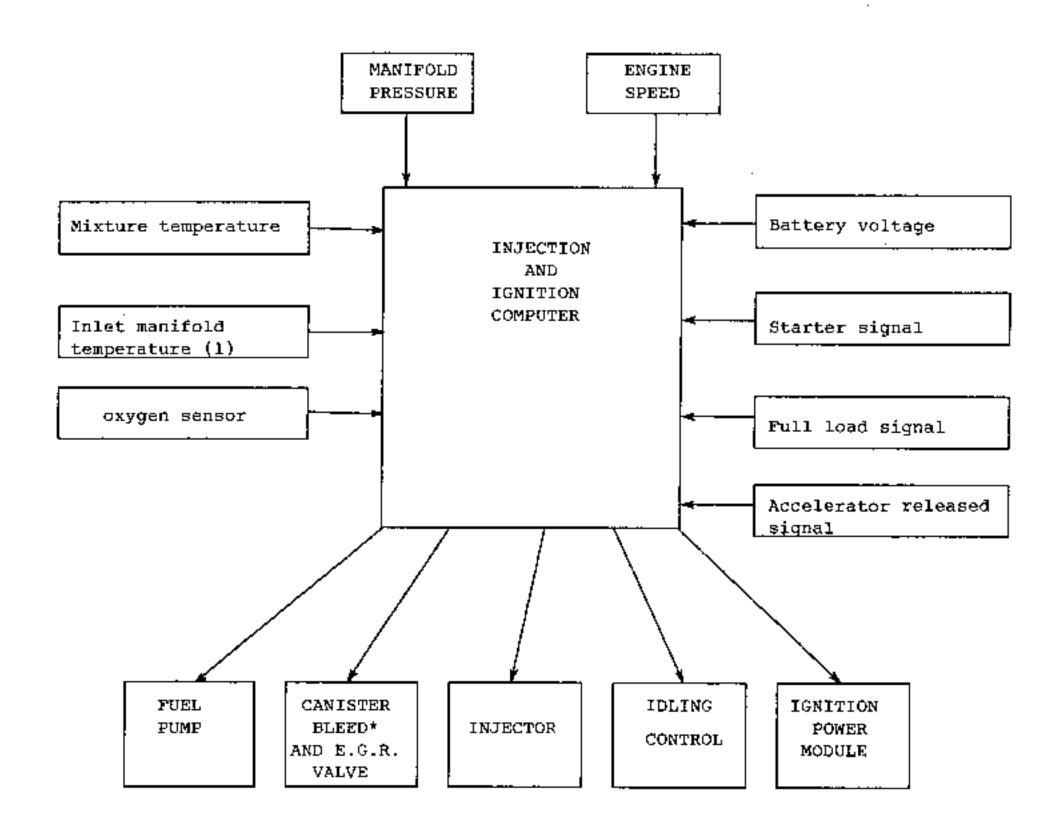
THE INJECTION COMPUTER

The computer, mounted on a printed circuit board, is a digital system the main component of which is a microprocessor.

The injection computer is mounted in the passenger compartment, under the glove box.

* The injection computer informs the A.E.I. (electronic ignition system) of certain corrections required under given engine operating conditions.

THE PRINCIPLE OF OPERATION OF THE RENIX SINGLE POINT INJECTION SYSTEM :



THE INJECTION AND IGNITION COMPUTER

The computer, mounted on a printed circuit board, is a digital system the main component of which is a microprocessor.

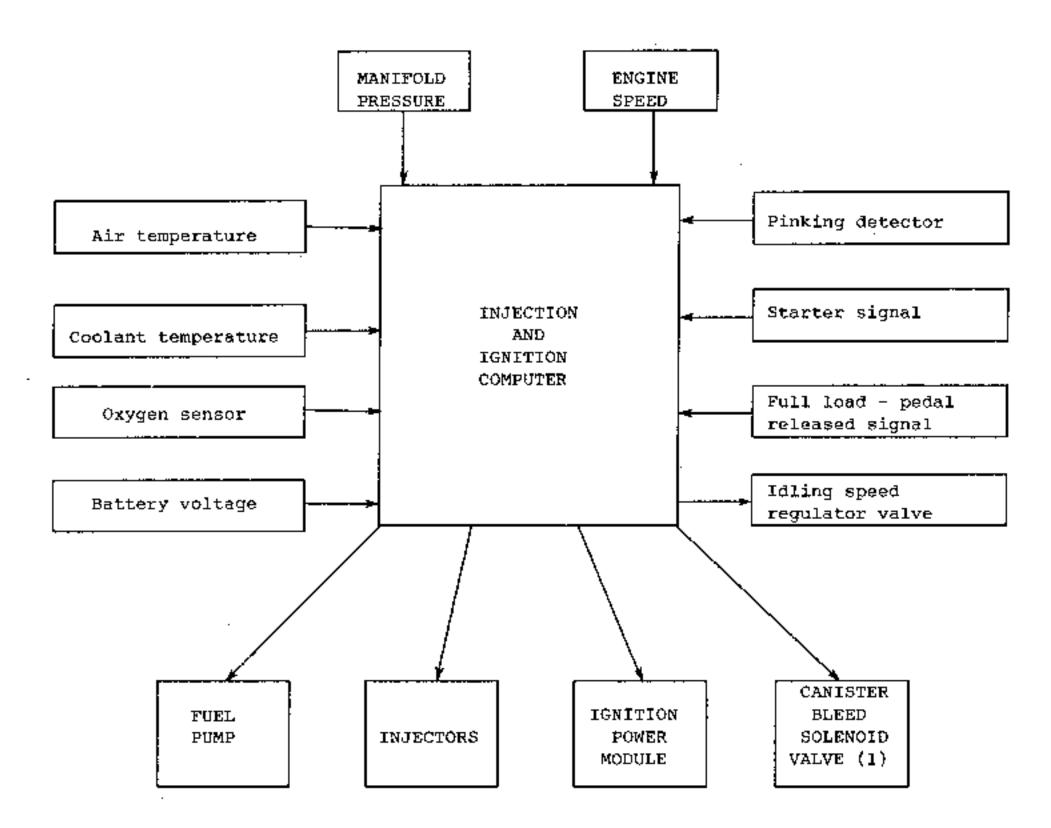
The injection computer also comprises 2 circuits that form part of the A.E.I. (electronic ignition) system which act as microprocessor peripherals.

The injection computer is mounted in the passenger compartment, under the glove box.

(1) On B/C 408 vehicles, the coolant temperature is used instead of the inlet manifold temperature.

*Depending on the market and the model year.

THE PRINCIPLE OF OPERATION OF THE MULTIPOINT INJECTION SYSTEM :



THE INJECTION AND IGNITION COMPUTER

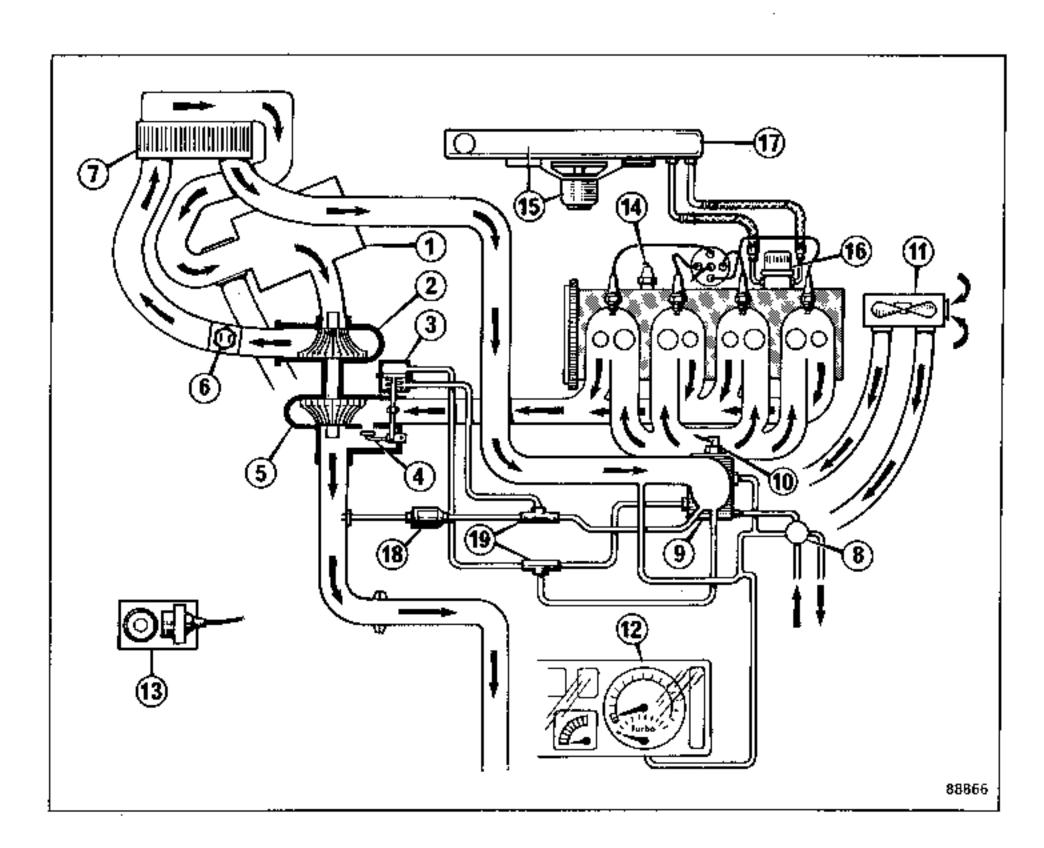
The computer, mounted on a printed circuit board, is a digital system the main component of which is a microprocessor.

The injection computer also comprises 2 circuits that form part of the A.E.I. (electronic ignition) system which act as microprocessor peripherals.

The injection computer is mounted in the passenger compartment, under the glove box.

(1)Depending on the market and the model year.

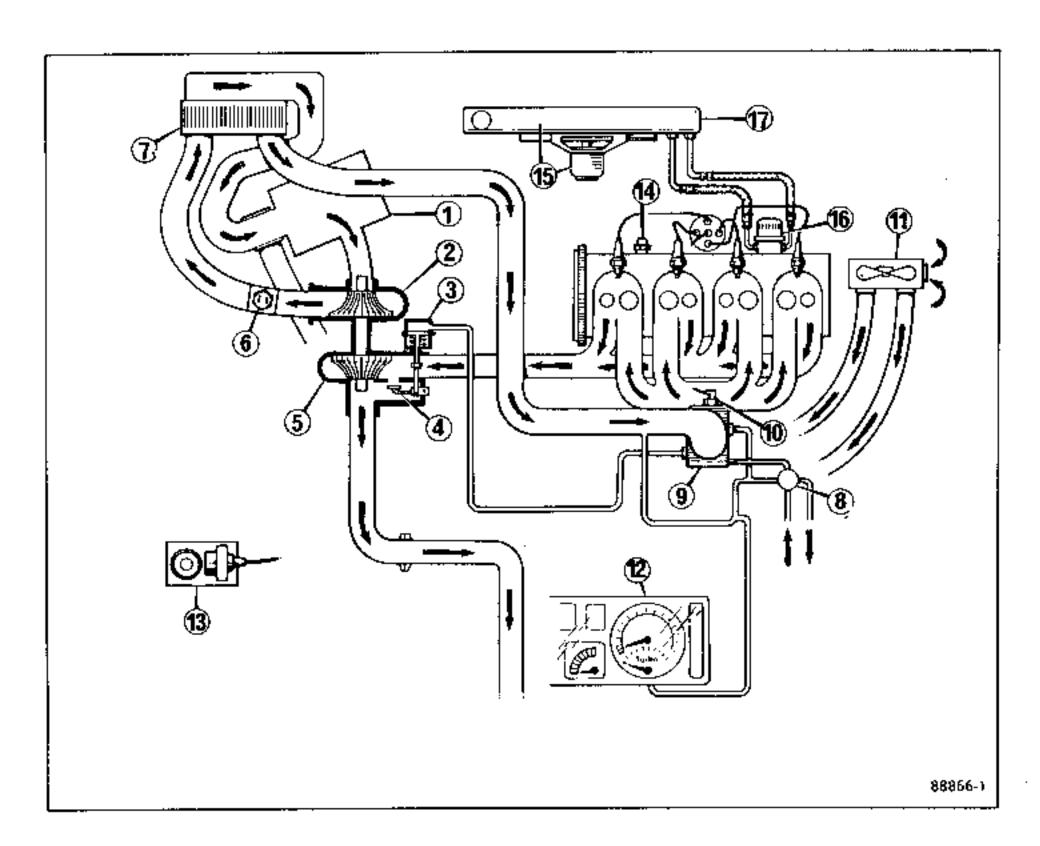
Engine circuit diagram : ENGINE ClJ-C-782



- Air filter with thermostatic flap 26°-32°C
- Compressor
- 3. Pressure regulator capsule
- Exhaust gas by-pass valve
- Turbine
- Safety pressure switch
- 7. Intercooler with thermostatic flap 43°-47°C
- Fuel pressure regulator
- 9. "Blown" carburettor

- 10 Anti-percolation system temp. switch
- 11. Anti-percolation fan unit
- 12. Pressure gauge on instrument panel
- 13 Integral electronic ignition system
- 14. Pinking detector
- 15 Radiator and fan unit
- 16. Oil filter
- 17. Oil cooler
- 18. Non-return valve
- 19. Tunion

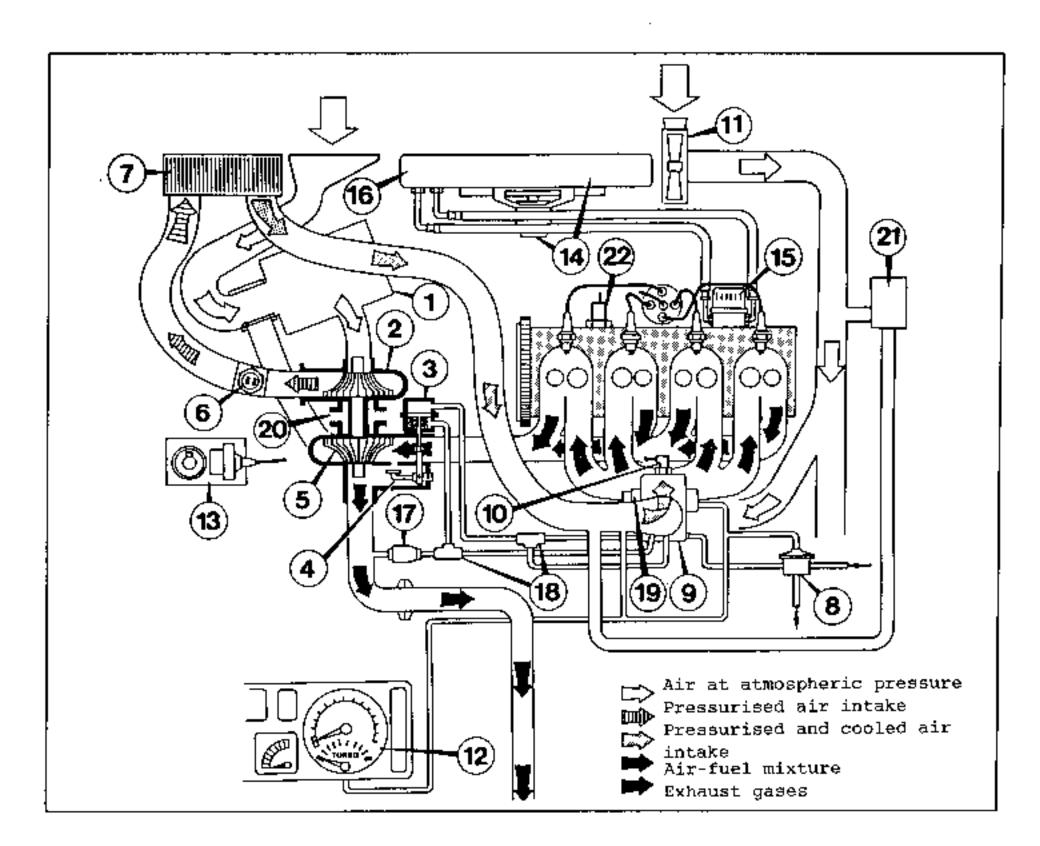
Engine circuit diagram : ENGINE ClJ 784



- 1. Air filter with thermostatic flap 26°-32°C
- Compressor
- Pressure regulator capsule
- 4. Exhaust gas by-pass valve
- 5. Turbine
- 6. Safety pressure switch
- 7. Intercooler with thermostatic flap 43°-47°C
- 8. Fuel pressure regulator
- 9, "Blown" carburettor

- 10. Anti-percolation system temp, switch
- 11. Anti-percolation fan unit
- 12. Pressure gauge on instrument panel
- 13. Integral electronic ignition system
- 14. Pinking detector
- 15. Radiator and fan unit
- 16. Oil filter
- 17, Oil cooler

Engine circuit diagram : ENGINE ClJG 788



- 1. Air filter with thermostatic flap
- Compressor
- Pressure regulator capsule
- Exhaust gas by-pass valve
- Turbine
- 6. Safety pressure switch
- 7. Intercooler with thermostatic flap
- Fuel pressure regulator
- "Blown" carburettor
- 10 Anti-percolation system temperature switch 20 Coolant flow through turbo
- 11.Anti-percolation fam unit
- 12.Pressure gauge on instrument panel

- 13 Integral electronic ignition unit including pinking control for each cylinder
- 14 Radiator and fan unit
- 15.011 filter
- 16,011 cooler
- 17 Non-return valve
- 18. T unions
- Staged enrichening units
- 21. Solenoid valve operated by the ignition switch and by temperature switch 10
- 22. Pinking detector

Adjusting the idling speed:

This adjustment is to be carried out accurately to obtain a CO percentage that is stable between overhauls. The adjustment must be carried out under the following clearly defined conditions:

- The vehicle must be run-in after a minimum of 600 miles (1000 km) (if the 'adjustment is carried out on a vehicle that has not been run-in it can change very quickly).
- The choke must not be operating (check this).
- 3) The engine must be at its normal operating temperature. To obtain this run the engine at approximately 2000 rpm until the thermostat opens. Do not leave it to warm up at idling speed because if the engine is run for a few minutes at idling, the CO percentage reading is no longer valid.
- 4) The idling speed must be that specified by the manufacturer (see chart).
- 5) The air filter must be in position and its cartridge clean.
- 6) The ignition system must be in good condition and correctly adjusted.
- 7) No additional air should be leaking into the system (vacuum pipes, emission control system etc.)
- There should be no extensive leaks on the exhaust system.
- 9) No large electrical consuming unit is to be operating (electric fan, headlights, heated rear screen etc.).

For the carburettor settings consult the charts in the following workshop manuals.

M.R. Carb \$ M.R. Carb W M.R. Carb Z

and the latest editions of their data sheets.

Adjusting using an exhaust gas analyser

In those markets where one is fitted, remove the tamperproofing cap from the mixture screw (B).

Turn screw (A) to obtain the average idling speed stated in the chart for the vehicle concerned.

Turn screw (B) to obtain the CO percentage stated on the chart.

Turn screw (A) to obtain the correct idling speed.

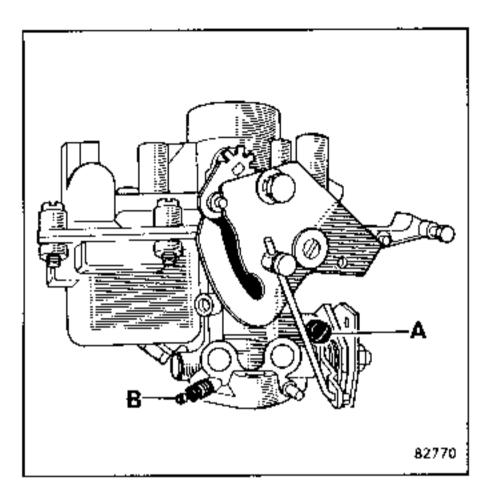
Repeat these operations until both the CO percentage and the idling speed are correct.

In those countries where the regulations require it, fit a new tamperproofing cap to screw (B) after the adjustment has been carried out.

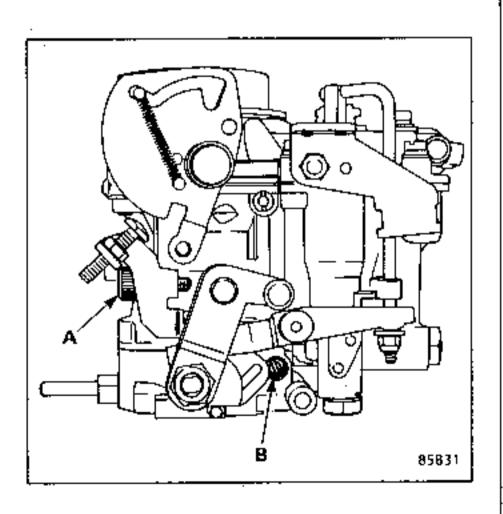
Tamperproofing cap

CARBURETTOR	Tamperproofing cap Part no.	
ZENITH 28 IF	77 01 200 834	
ZENITH 32 IF2	77 01 200 835	
SOLEX 32 BIS	77 01 200 831	
SOLEX 32 DIS	77 01 200 831	
SOLEX 28 x 34 Z 10	77 01 200 831	
WEBER 32 DRT	77 01 200 833	

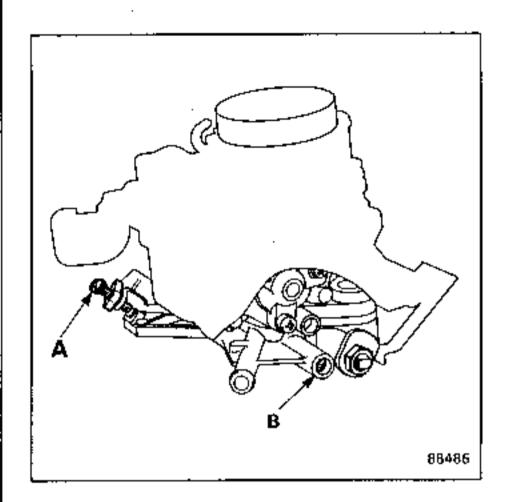
Method of adjusting the idling speed: ZENITH 28 IF



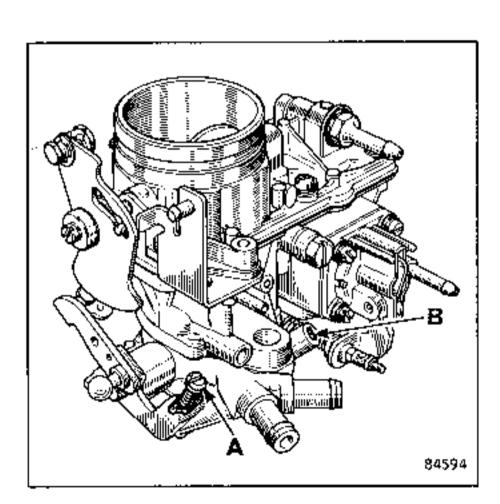
ZENITH 32 IF2



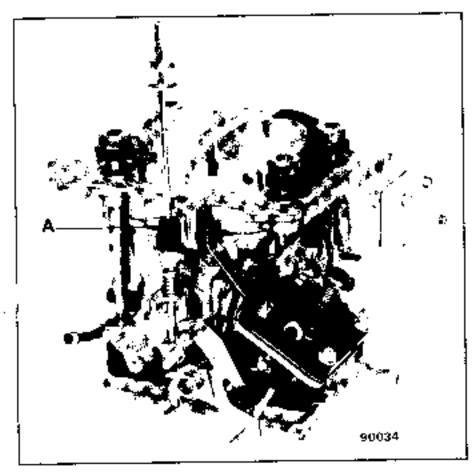
SOLEX 32 BIS

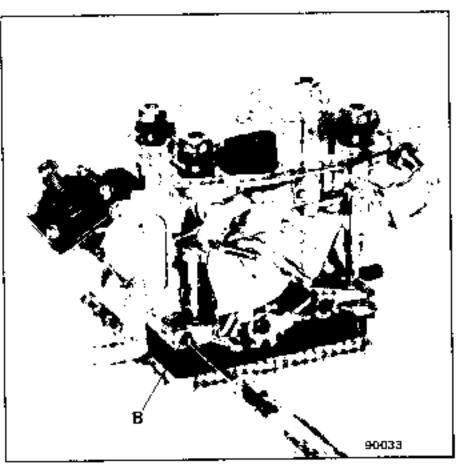


SOLEX 32 DIS

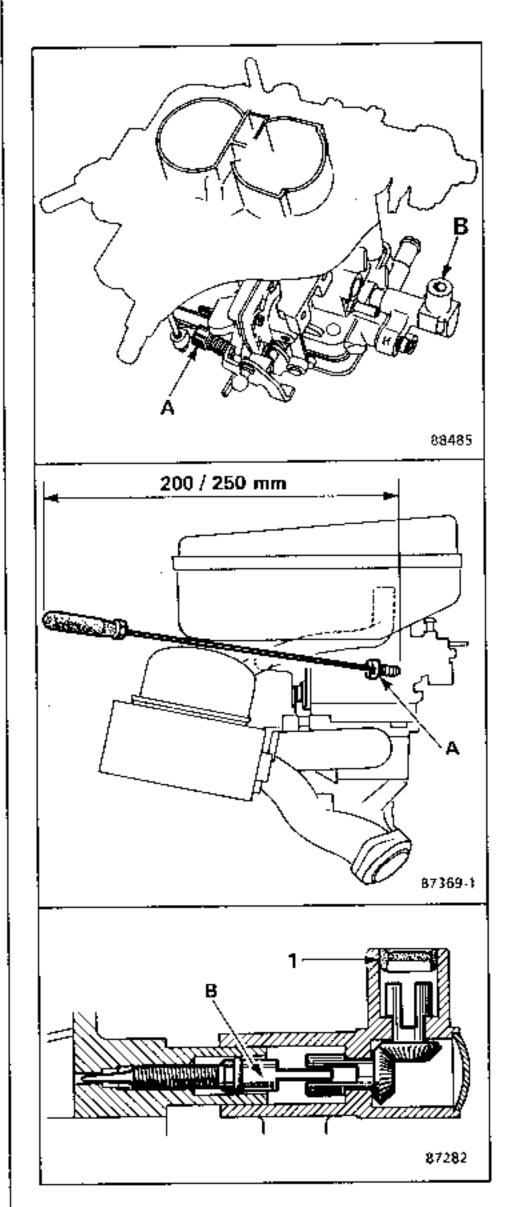


Method of adjusting the idling speed : SOLEX 28 \times 34 \times 10 $^{\circ}$



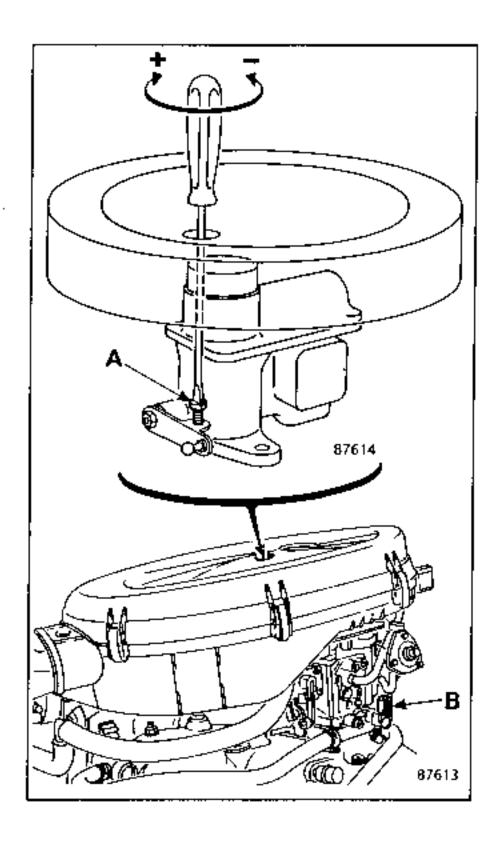


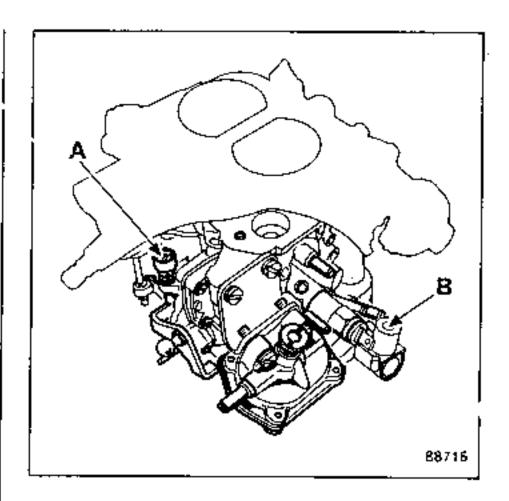
WEBER 32 DRT Screw A - 1st type



Method of adjusting the idling speed : WEBER 32 DRT

Screw A - 2nd type

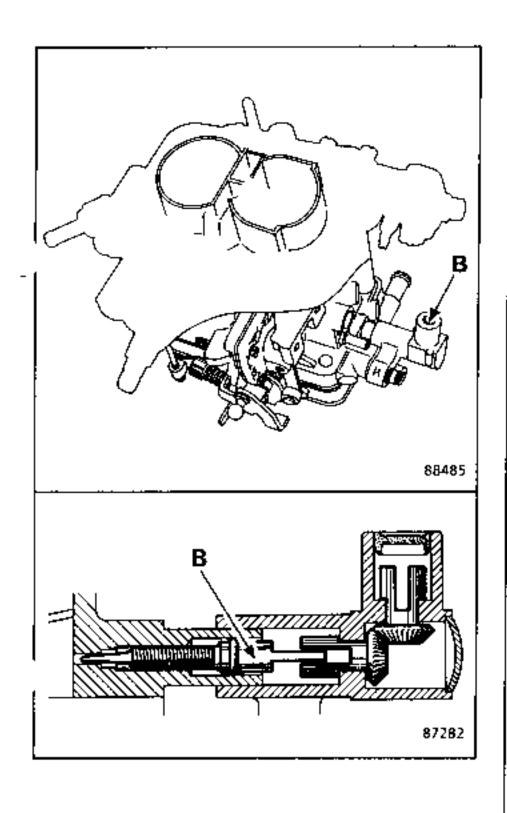


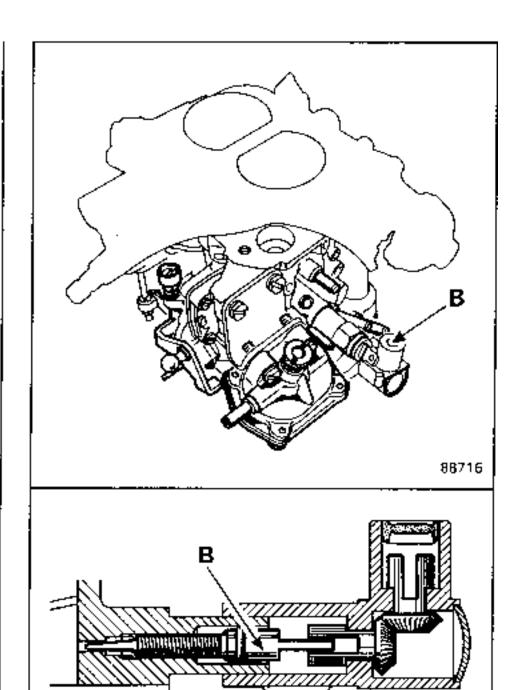


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Method of adjusting the idling speed : WEBER 32 DRT

Screw B (all types)





For the carburettor settings see the charts in the workshop manuals

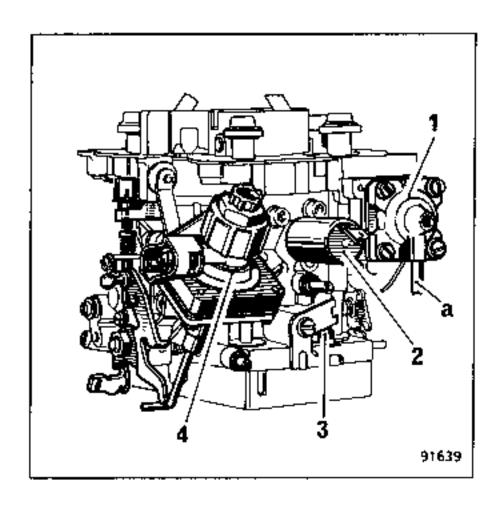
M.R. carb S M.R. carb W M.R. carb Z

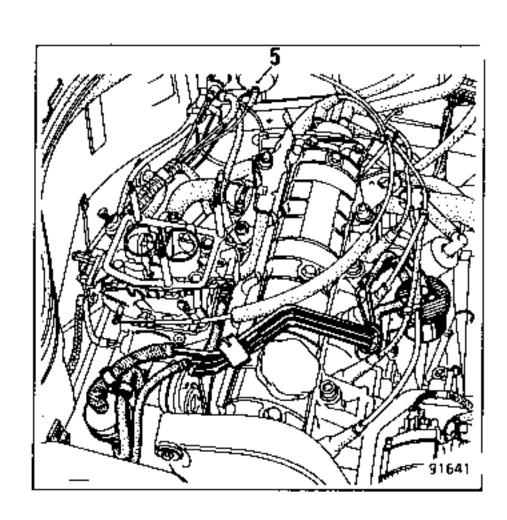
and the latest editions of their data sheets.

Special features of the SOLEX 28 x 34 Z 10 carburettor

On all versions, the SOLEX 28 x 34 Z 10 carburettor is equipped :

- with an idling speed shut-off on the first barrel idling circuit,
- with an electrical resistance on the first barrel idling circuit as a replacement for the hot water heating system,
- with an accumulator on the choke diaphragm to eliminate stalling after starting,
- a single or two stage throttle actuator depending on the version.

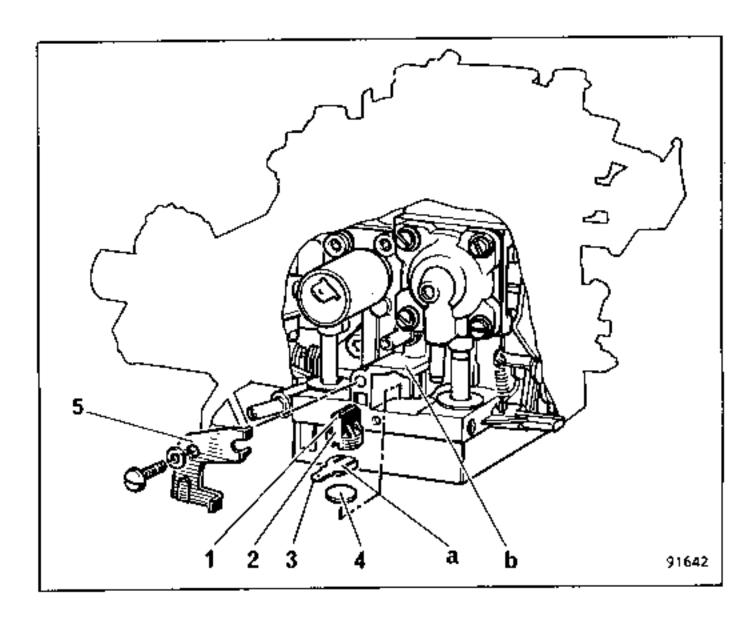




- Choke diaphragm a-Connection between diaphragm and accumulator
- 2. First barrel idling circuit shut-off
- 3. First barrel idling circuit heater resistance
- 4. Two stage throttle actuator (on certain versions)
- 5. Choke diaphragm accumulator

Special features of the SOLEX 28 x 34 Z 10 carburettor

- Removing - Refitting the electrical heating resistance :



- 1. Positioning pin
- Spacer
- 3. Connecting terminal
- 4. Resistance
- 5. Securing lug

If the resistance has been removed, pay particular attention on refitting to ensure that the component parts are fitted as shown in the drawing above and pay particular attention:

- to the fitting of the terminal (3) into the spacer (2). The tab (a) must be on the same side as the resistance (4),
- to the positioning of the pin (1) with reference to the spacer (2) and its location
 (b) on the carburettor.

WARNING : If instruction No. 1 is not obeyed, there is a risk of a short circuit.

Special features of vehicles equipped with power steering : B and C 403 :

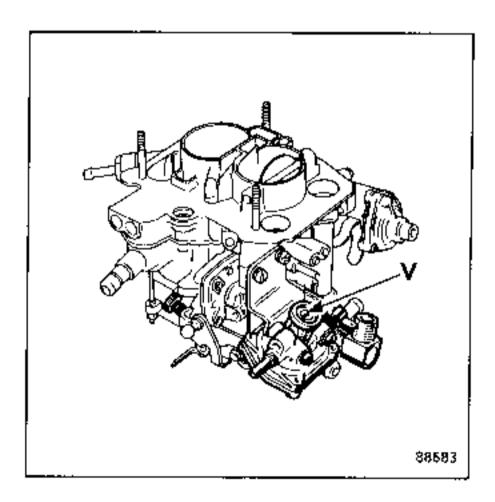
Vehicles with power steering :

On these vehicles, when the wheels are moved through full lock, a pressure switch on the power steering hydraulic circuit operates a solenoid valve to allow the manifold vacuum to reach the actuator. This adjusts the idling speed to prevent the engine stalling.

After adjusting the idling speed to the specified figure, operate the anti-stall system (without the wheels being moved through full lock) by one of the 3 methods described.

The engine speed should then be: 1050 + 50 rpm.

Adjust it if necessary by turning screw (V).



Adjusting the fast idling on vehicles fitted with power steering :

- when the engine is warm,
- after adjusting the normal idling speed.

Remove the air filter.

1st method :

Disconnect the pipe from the actuator (the connection marked in blue).

Connect a hand operated vacuum pump to the actuator.

Run the engine at idling speed.

Apply a vacuum of 600 mbars to the actuator and maintain it.

Adjust the speed by turning screw (V).

2nd method :

Disconnect the pipe from the actuator (the connection marked in blue).

Disconnect the pipe identified in red from the carburettor.

Connect a pipe between these 2 connections (the one on the actuator and the other, red connection, on the carburettor).

Pinch flat the pipe using the clamp Mot. 453-01.

Run the engine at idling speed.

Remove the clamp Mot. 453-01.

Adjust the idling speed by turning screw (V).

3rd method :

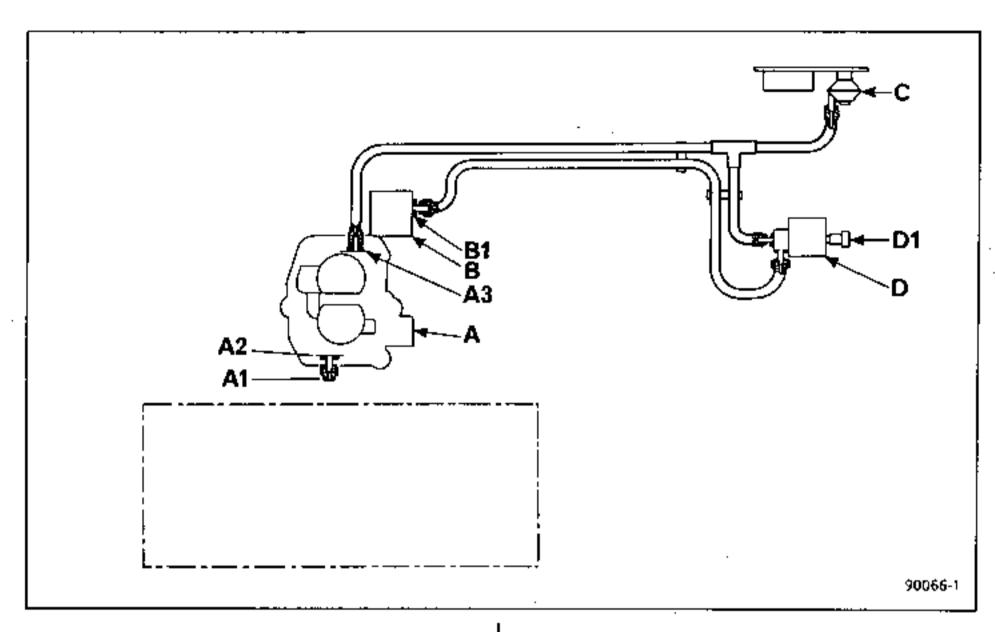
With the engine warm and running at idling speed.

Disconnect the pressure switch connector.

Interconnect the female terminals on the connector, on the wiring side. The engine speed should increase.

Adjust the speed, if necessary, by turning screw (V).

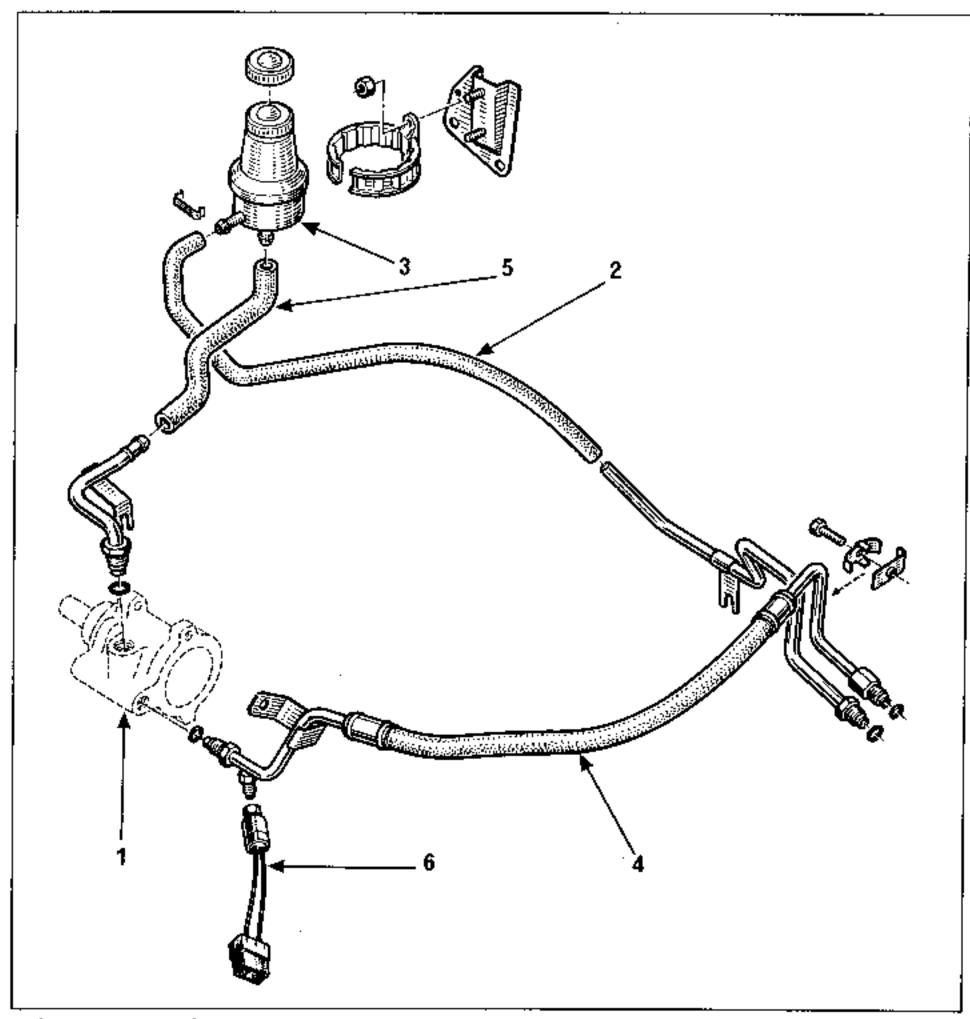
Pneumatic circuit diagrams for vehicles equipped with power steering : 8 and C 403



- A Carburettor
- Al. Plug on pipe, colour black
- A2. Locating ring on carburettor, colour red
- A3. Locating ring on carburettor, colour black
 - B. Throttle actuator
- B1. Locating ring on actuator, colour dark blue

- C. A.E.I. (Electronic Ignition Unit) On A.E.I. : no identification
- D. Solenoid valve : near A.E.I. unit
 - D1. Filter on solenoid valve

Positions of components



- Power steering pump
- Pipe from reservoir to steering box
- 3. Power steering reservoir
- 4. Pipe from power steering pump to steering box
- 5. Pipe from power steering pump to reservoir
- 6. Anti-stall system pressure switch

Solenoid valve :

The solenoid valve that controls the anti-stall system pneumatic circuit is on a bracket near the A.E.I. (Electronic ignition) unit. It is mounted on the vehicle scuttle.

Vehicles with power steering or air conditioning

Vehicles with air conditioning :

When the compressor starts, the manifold vacuum is passed to the actuator through a solenoid valve set up in the same way as on power steering versions. This compensates the idling speed to prevent the engine stalling.

Adjustment methods :

With the engine hot and the idling speed correctly adjusted.

The three first methods described for power steering versions also apply to vehicles with air conditioning. Only the speed is different.

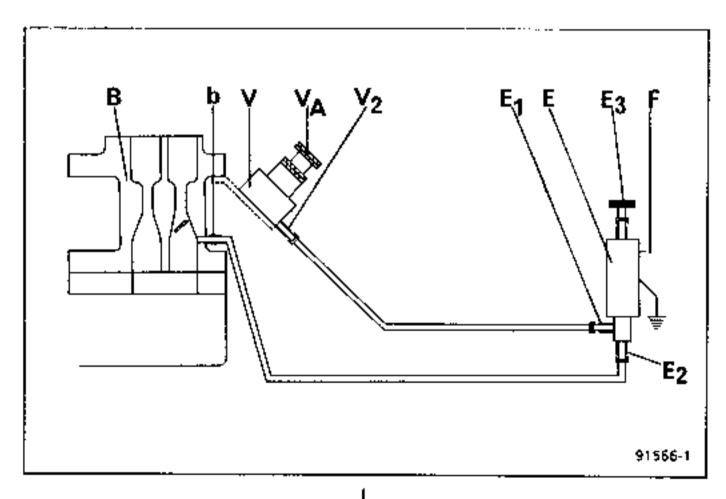
The engine speed should be : 1500 $\frac{1}{2}$ 100 rpm.

There is a fourth method which consists of carrying the battery + supply and an earth directly to the solenoid valve (it is essential to have disconnected the 2 solenoid valve terminals first).

Adjust the speed, if necessary, by turning screw $(V_{\underline{a}})$.

Vehicles with power steering or air conditioning :

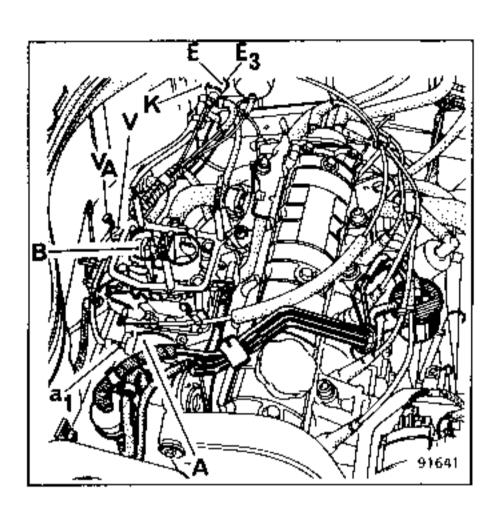
Component identification :



- V. Single stage throttle actuator
 - VA. Throttle actuator adjusting screw
 - V₂. Blue identification ring on the actuator and on the pipe
- E. Throttle actuator control solenoid valve
- F. Air conditioning or power steering signal.

- E3. Air vent filter
- E₁. Blue identification ring on the solenoid valve and on its pipe
- E₂. Red identification ring on the solenoid valve and on its pipe
- B. Carburettor SOLEX 28 x 34 Z 10
 - b. Red identification ring on the carburettor and on its pipe

These vehicles are equipped with a single stage throttle actuator.



- V. Single stage throttle actuator
 V_A. Throttle actuator adjusting screw
- E. Throttle actuator control solenoid valve
 - E₃. Solenoid valve air vent filter
- B. Carburettors SOLEX 28 x 34 Z 10
- K. Throttle actuator control valve securing plate
- A. Inlet manifold
 - a₁. A.E.I. electronic ignition manifold vacuum.

Adjusting the throttle actuator :

- Vehicles with power steering :

On these vehicles, when the wheels are moved through full lock, the pressure switch on the power steering hydraulic system passes the manifold vacuum through to the actuator via a solenoid valve. This maintains the engine speed and prevents it stalling.

After adjusting the idling speed to the specified figure, operate the anti-stall system (without moving the wheels through full lock) by one of the 4 recommended methods.

The speed should be : $1050 \stackrel{+}{-} 50$ rpm.

If necessary, adjust it by turning screw (VA).

Adjusting methods:

- The engine must be warm.
- The normal idling speed must be correctly adjusted.
- The engine must be running at idling speed.

lst method :

Disconnect the input pipe from the actuator (the blue coloured connection).

Connect a manual vacuum pump to the actuator.

Start the engine and run it at idling spee

Apply a vacuum of 600 mbars to the actuator and maintain it.

Adjust the speed by turning screw (VA).

2nd method :

Disconnect the input pipe from the actuator (the blue coloured connection).

Connect a T union between the A.E.I. electronic ignition pipe and the inlet manifold (shown as a on the drawing).

Connect the T union to the throttle actuator and adjust the speed, if necessary, by turning acrew (VA) or connect the actuator directly to the take-off point on the carburettor identified as (b) on the drawing on the following page.

3rd method :

Disconnect the filter E $_{\mbox{\scriptsize 3}}$ from the solenoid valve (E).

Connect up a manual vacuum pump and adjust the speed, if necessary, by turning screw (VA).

Reconnect the filter \mathbb{R}_3 after the adjustment.

4th method :

Disconnect the pressure switch connector.

Interconnect the female terminals on the connector, at the wiring end : the engine speed should increase.

Adjust the speed, if necessary, by turning screw (VA).

MULTIPOINT INJECTION THROTTLE UNIT

Engine F3N J 702

ADJUSTING THE AIR FLOW

Connect up tester XR25 equipped with cassette no. 5, or above (with the engine running at idling speed and the coolant temperature above 80°C).

Enter DO3 them no. 12 on the tester and note the figure shown on the central display.

Check the speed by entering no. 06: 750 to 850 rpm.

Remove the tamperproofing cap.

Find the minimum speed by unscrewing screw (B) until the idling speed starts to increase.

Then screw in the screw (B) until this figure increases from 0.2 to 0.3 ms.

Example : min. reading : 2.3 ms adjust to 2.55 ± 0.05 ms

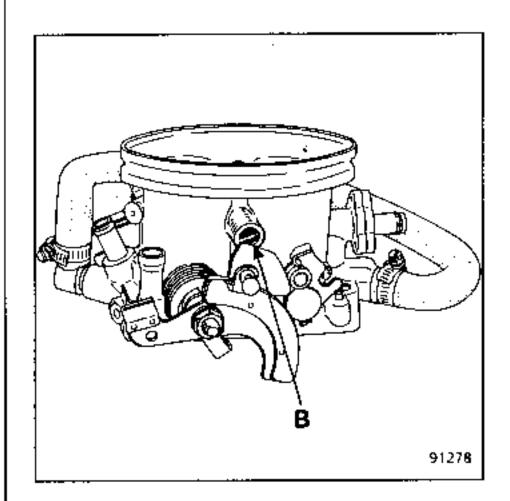
Note: on a new vehicle, screw (B) is screwed fully in.

After adjusting, plug the access to screw (B) by fitting a tamperproofing cap part no. 77 01 200 832.

CHECKING THE AIR FLOW

Pinch flat the hose that supplies the idling speed regulator valve which is connected between the filtered air duct and the throttle unit on one hand and the regulator valve on the other hand, using clamp Mot. 453-01.

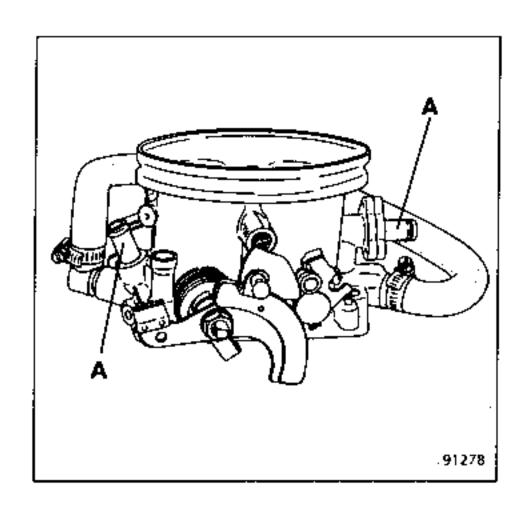
Check the speed, without the idling speed regulator operating, and adjust it by turning screw (B) until it is between 550 and 600 rpm.



REMOVING - REFITTING :

The throttle unit is heated by the engine coolant.

When removing it, do not forget to pinch flat the coolant hoses, using clamps Mot.' 453-01 to prevent any loss of the coolant that enters and leaves the throttle unit through connections A.



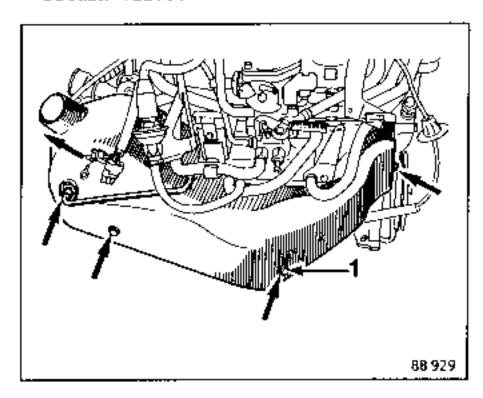
A: Coolant connections -

REMOVING - REFITTING

Raise the vehicle on a lift and disconnect the battery.

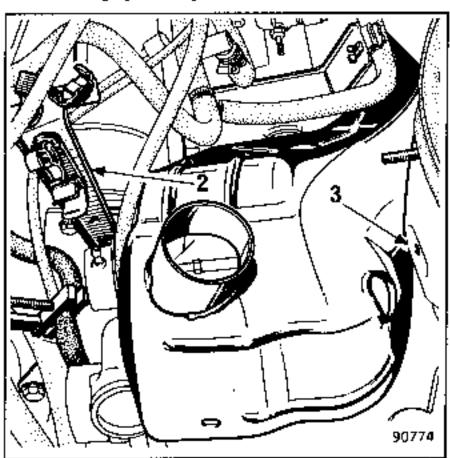
Disconnect and remove :

- the air filter,
- the intercooler and the pipes that connect it to the turbocharger,
- the A.E.I. ignition unit and the nonreturn valve.



Remove the screws that secure the heat shield in place. Screw 1 is accessible from underneath.

Tilt the pipe clip (2) forwards.



On vehicles equipped with a water cooled turbocharger :

Pinch flat the water input pipe using clamp Mot. 453.01.

Disconnect :

- The water output between the turbocharger and the hot bottle on vehicles equipped with a water cooled turbocharger.
- The turbocharger oil input.

Remove the A.E.I. ignition unit lower stud (3) and pass the securing strut for bolt (1) under the screen.

Then take out the screen from one side.

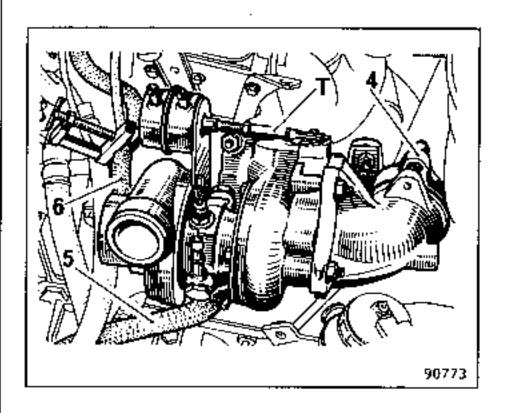
Disconnect :

- the exhaust clamp (4),
- the oil return pipe (5),
- the water input pipe (6).

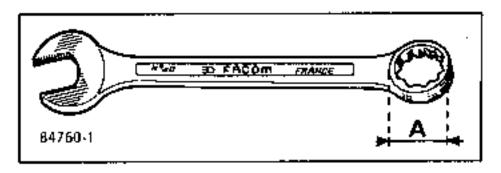
NOTE: do not unscrew the water input and return banjo unions and banjo bolts.

Remove the securing nuts and take out the turbocharger.

IMPORTANT: Never grasp the turbocharger by rod T.



NOTE: to gain access to the concealed turbocharger securing nut on the exhaust manifold, use a 13 mm combination spanner (ex: facom no. 40) or an open ended spanner (ex: facom no. 57) with area A ground off.



REFITTING (Special features)

Thoroughly clean the exhaust manifold and turbocharger joint areas.

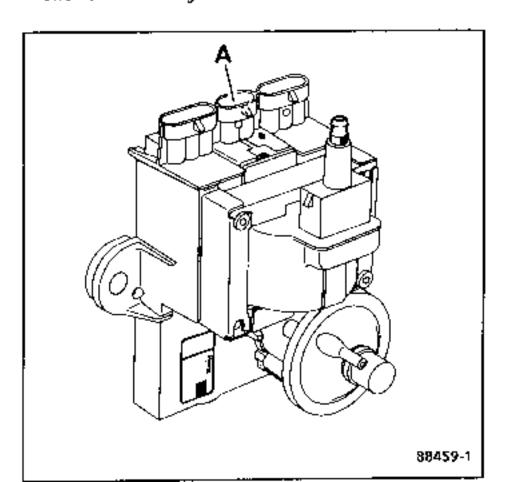
If necessary, replace the self-locking nuts that secure the turbocharger to the exhaust manifold.

Reconnect the oil input and return pipes and the air input duct.

WARNING: Never turn the engine over with the air intake ducts plugged.

Starting :

- Disconnect the central connector A from the electronic unit,
- Operate the starter to re-prime the turbocharger lubrication system until the oil pressure warning light goes out,
- Reconnect the connector (A),
- Start the engine and run it at idling speed to re-establish the oil flow through the turbocharger.



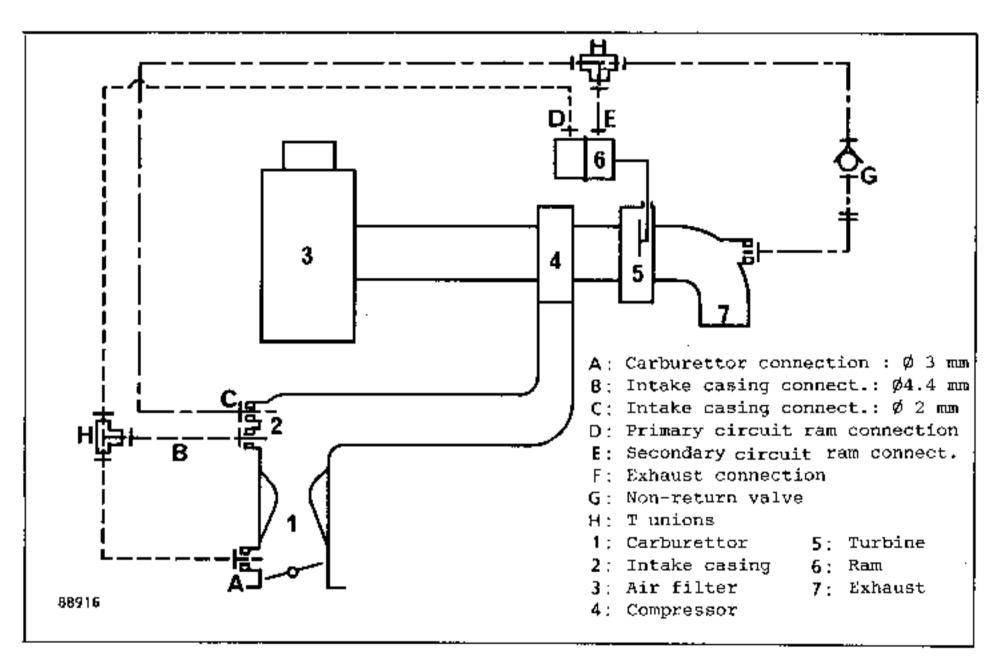
Checking, replacing and adjusting the turbocharging pressure regulator :

The performance and reliability of a turbocharged petrol engine depends directly on the correct adjustment of the turbocharging pressure regulator and it is essential that it should be adjusted to the correct figures.

Checking, adjusting or replacing the turbocharging pressure regulator can be carried out on the vehicle, with the turbocharger in position after removing the adjacent components such as the heat shield.

Before carrying out any check or removing the turbocharger, ensure that the turbochargeing pressure regulator unit control circuits are correctly connected and absolutely leakproof.

Note: it is essential to identify the pipes before disconnecting them and to ensure that the calibrated connections A, B and C, in particular, are of the correct diameter to maintain full engine performance.



PRINCIPLE OF OPERATION OF THE TURBOCHARGER REGULATOR :

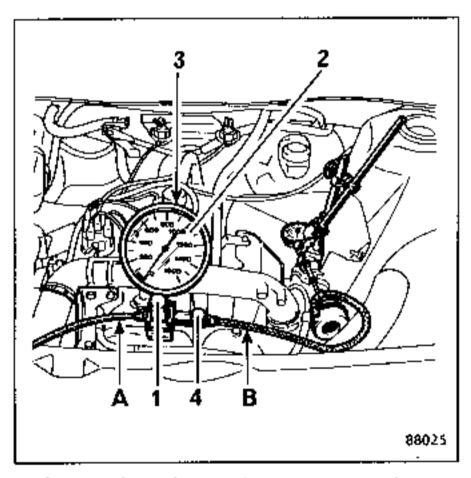
- The capsule regulation system consists of 2 circuits :
- A primary circuit between connection B on the intake casing (calibrated \emptyset 4.4 mm) and the connection A on the carburettor (calibrated \emptyset 3 mm) passing through a T union which is connected to the capsule at connection D.
- A secondary circuit between the connection C on the intake casing (calibrated Ø 2 mm) and the exhaust at connection F through a T union and a non-return valve G which are connected to the capsule at connection E.
- The capsule is regulated by means of the pressure differential between the primary circuit A, B and D and the secondary circuit E, F and C through which moves a pressure wave caused by the exhaust and regulated by the non-return valve G.

CHECKING AND ADJUSTMENT FIGURES

Vehicle	Туре	Engine	Checking figure in mbars	Adjustment figure in mbars	Movement of rod in mm
RENAULT C S GT 405 Turbo	C.1.J -C- 782 C1J - 784	590 - 650	620- 650	0,38 ± 0,02	
	405	C.1.J G 7 88	740- 800 :value B	770 - 800 value B	4 ± 0, 02 mm
			Value A	Value A	0,38 ± 0,02
			175 - 225 ; value C	175 - 200 :value C	C = B-A

METHOD USING TOOL KIT MOT. 1014

The kit consists of an adjustable pressure reducing valve (1), a pressure gauge (2) graduated from 0 to 1.6 bars with a zeroing screw (3) and a bleed screw (4).



Before using the equipment, zero the pressure gauge (screw 3), fully unscrew screw (1) on the pressure reducing valve and the bleed screw (4) and connect the inlet pipe (A) to the compressed air source.

Connect the output pipe (B) to the connection on the turbocharging pressure regulator to be tested, nearest the front, and tighten screw (4).

Then slowly screw in the screw on the pressure reducing valve (1) until the required air pressure or the regulator rod travel is obtained (slightly loosening screw (1) will stabilise the pressure).

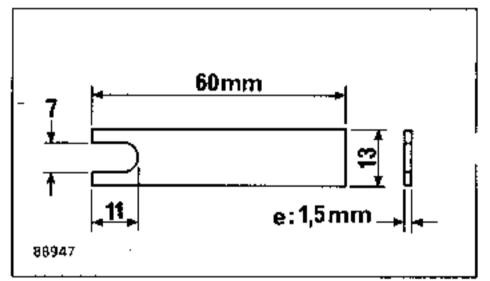
CHECKING THE CALIBRATION PRESSURE

Remove the A.E.I. electronic ignition unit after disconnecting it and the non-return valve.

Disconnect the hose from the connection on the regulator unit and connect equipment Mot.1014 to it.

Make up a spacer as shown in the drawing below and grip it, vertically, between the rod T and the nut (6).

Place a dial indicator against the spacer, mounting it on the exhaust shield by a magnetic base.



Progressively increase the pressure to obtain a movement of the adjusting rod of 0.38 - 0.02 mm and note down the pressure reading on the pressure gauge, which should be within the specified test figures.

If the calibration pressure is outside the required tolerances, replace the entire regulator unit (punched end fitting and rod) or adjust it (rod which is "locked" with a dab of shellac).

Special operations involved in checking and adjusting Clj-G-788 units :

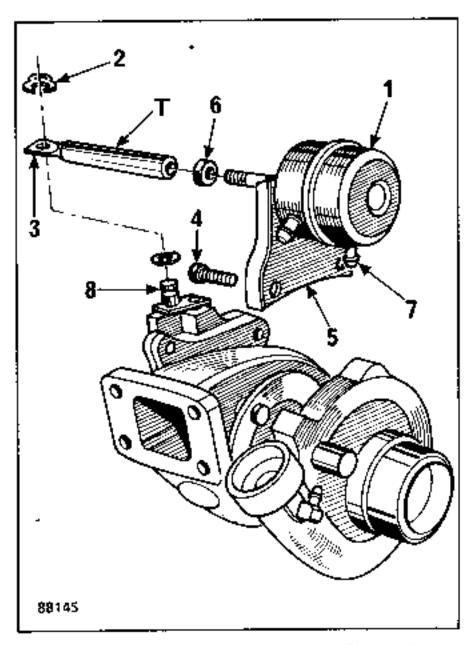
Connect up test equipment Mot.1014 as already described and set the dial indicator on zero.

- 1º Increase the pressure to obtain a movement of 0.38 0.02 mm and note the pressure A.
- 2° Increase the pressure to obtain a movement of 4 0.02 mm and note the press-B.
 - -PressureB = 770 ± 30 mbar
 - -PressureA = 580 mbar
 - -PressureC = B-A = 200 ± 25 mbar

Sample readings :

A = 580 mbar B = 775 mbar(B) 775 mbar - (A) 580 = (C) 175 mbar

REPLACING THE RECULATOR UNIT



Disconnect the hose or hoses from the regulator unit (1).

Remove the circlip (2) and take off the screwed end (3).

Remove the securing bolt (4) and take off the regulator unit.

Place the new regulator unit in position and secure it with new bolts (tightened to 1.65 to 1.85 daN.m).

Screw the lock nut (6) and the screwed end fitting (3) on to the rod.

ADJUSTING THE CALIBRATION PRESSURE

Connect equipment Mot.1014 to connection (7) and apply the adjustment air pressure stated in the chart.

WARNING: Ensure that there is no air leak between the pressure gauge and the regulator unit.

Apply force to the valve control arm (8) to keep the valve closed.

Under these conditions, adjust the position of the end fitting (3) so that the clevice hole will just fit over the control arm (8) which is still held in the valve closed position.

Drop the pressure at connection (7) to zero.

Mount a dial indicator with a magnetic base on the end of the adjusting rod and set it on zero.

Progressively increase the pressure to obtain a movement of the adjusting rod of 0.38 - 0.02 mm and note the pressure reading on the pressure gauge. It should be within the adjustment pressure limits stated on the chart.

On ClJ-G-788 engines, check figures A and B and, finally, obtain figure C from them.

If the pressure is outside tolerances, alter the position of the screwed end fitting (3) (screw it in to increase and screw it out to reduce the pressure) to obtain the specified adjustment pressure.

Bring the lock nut (6) against the screwed end fitting (3) and tighten it to between 0.6 and 0.7 daNm.

Apply a dab of paint to the lock nut and to the screwed end fitting.

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

CARBURETTOR VERSIONS (EXCEPT THE C405).

ESSENTIAL SPECIAL TOOLS

Mot. 213 -01 Pressure gauge

Mot. 453 -01 Hose clamp

METHOD OF CHECKING

Before disconnecting the pipe between the fuel pump and the carburettor, run the engine at idling speed to ensure that the carburettor float chamber is at maximum level.

Stop the engine.

Disconnect the pipe at the pump output.

Connect pressure gauge Mot.213-01 in place (provide a 6 x 8 connector and a pipe with an inside \emptyset of 8 mm).

Pinch flat the pipe returning to tank using clamp Mot.453-01.

The pipe should be :

- transparent,
- as short as possible.

Holding the pressure gauge as high as possible (with its pipe roughly vertical) start the engine and run it at idling speed.

When the fuel level in the pipe stabilises, lower the gauge until the fuel level is the same height as the pump diaphragm.

Note the static pressure reading.

Static pressure of pump with no output :

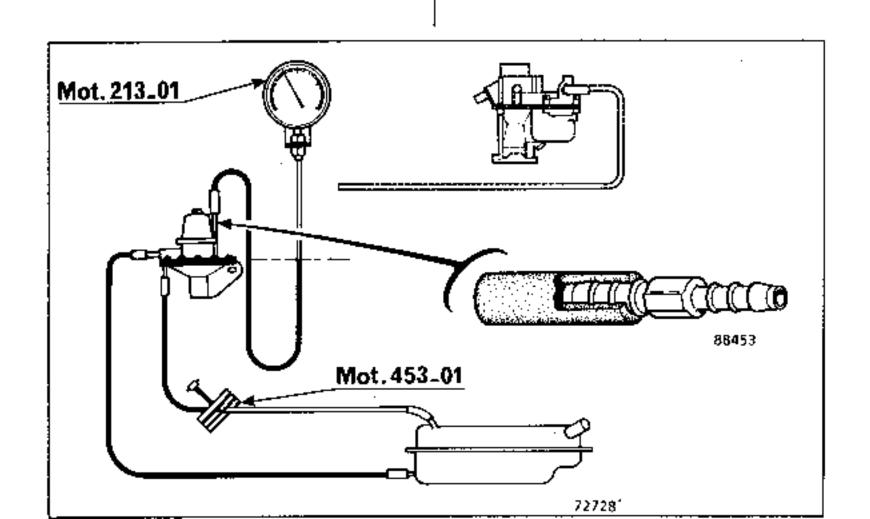
- min : 0.170 bars,
- max : 0.320 bars.

PRECAUTIONS

The pressure gauge must never be connected on a "by-pass" circuit.

Check the return to tank.

Ensure that the circuit is not blocked by unscrewing clamp Mot.453-01. The pressure should then drop by 0.01 to 0.02 bars.



C405

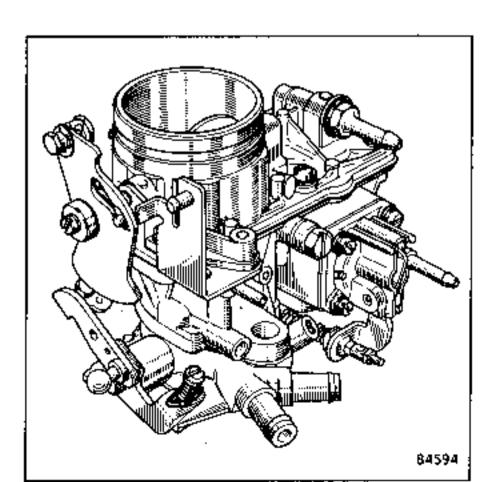
GENERAL

This single barrel carburettor is mounted on the output side of the turbocharger. All its circuits are therefore subject to turbocharging pressure.

The float chamber has no external vent. All the internal components are subject to turbocharging pressure and this means that the carburettor ment be absolutely leakproof.

More effective seals are fitted at the following points :

- the magnesium cover and float chamber,
- the reinforced rubber float chamber gasket (0.6 mm thick),
- the throttle shaft bearings which have lip seals,
- the idling jet that has an insert equipped with a seal,
- the mixture screw which is in a well (for tamperproofing purposes) and has an O ring,
- the accelerator and enrichemer pump diaphragms which are stronger,
- the gasket face between the cover and the float chamber which are stronger than those on the naturally aspirated carburettor 32 DIS.



FUEL SUPPLY

The fuel is supplied by an electric pump capable of producing 60 lit/hr at a pressure of 2.5 bars and a regulator which adjusts the pressure at the needle valve to suit the turbocharging pressure.

The regulator consists of :

A: a fuel input connection bringing pressurised fuel from the electric pump.

B: an outlet carrying fuel to the carburettor.

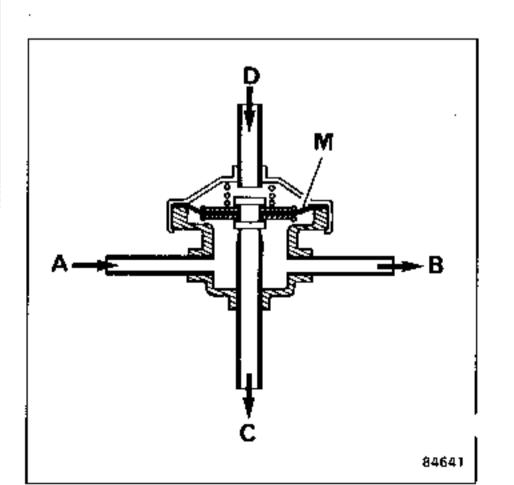
C: a return to tank connection.

D: an air intake pressure connection.

PRINCIPLE OF OPERATION

Diaphragm (M) is held down by a spring and this determines the minimum fuel pressure by blocking the return to tank. As soon as the fuel pressure rises above this figure, the diaphragm lifts and the excess fuel is returned to the tank.

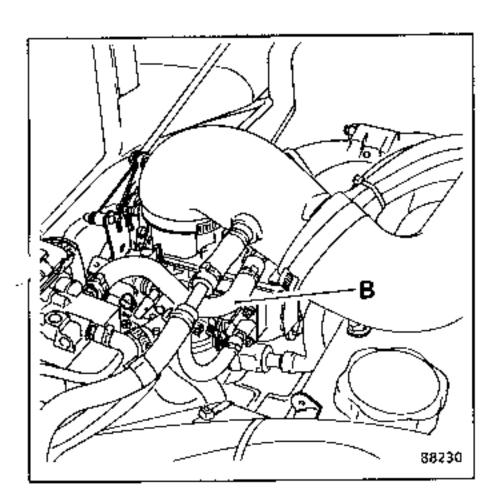
When the engine is running at full load, the turbocharging pressure acts on the diaphragm to block off the return to tank until a fresh pressure balance is established between the fuel pressure and the pressure on the diaphragm.

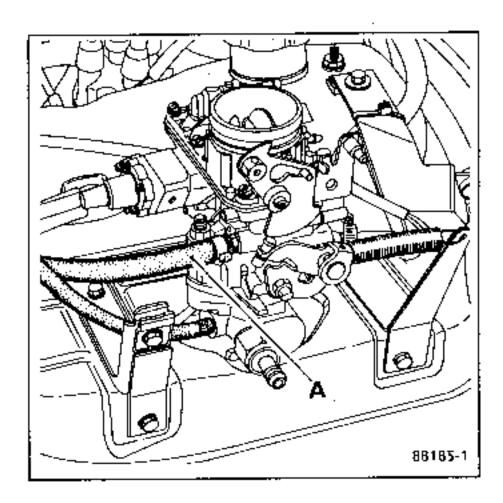


Connect pipes Mot.904 at one end to the carburettor fuel input (at B) and at the other end to the turbocharging pressure input on the carburettor (at A).

Connect the pipes of equipment Mot.904 to the pressure gauges of equipment (Mot.867 and Mot.836-05).

Bleed the air from the gauge that is to measure the fuel pressure and check that the circuit is in good condition and leakproof.





WARNING : for the fuel pressure to be correct, the pressure gauge must be roughly on the same level as the fuel pressure regulator.

Lay out the pipes so that they avoid any projections that could cut them.

- Note the fuel pressure (without any turbocharging pressure)

Run the engine at idling speed and note down the following pressures :

- . the turbocharging pressure : zero
- , the fuel pressure : 275 \pm 25 mbars
- Note down the fuel pressure and the turbocharging pressure

Turbocharging pressure with the engine at full load. On the road with the engine speed more than :

```
. 3 500 rpm 680 mbars ) Pressures measured at
```

. 5 500 rpm 700 mbars) the A.E.I. ignition unit connection

The fuel pressure = The turbocharging pressure + the fuel pressure at idling speed.

Example :

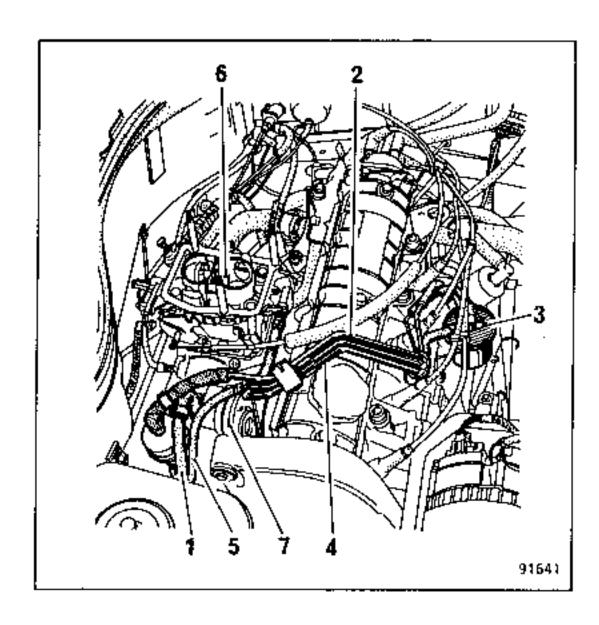
Turbocharging pressure : 650 mbars.

The fuel prossure should be between :

650 + 275 ⁺ 25 mbars

that is to say 900 to 950 mbars

To facilitate starting when the engine is hot, an accumulator is mounted between the fuel pump and the carburettor.



- 1. Input pipe chassis fuel pump
- 2. Connection pipe between fuel pump and accumulator (carries the fuel filter)
- Accumulator
- 4. Pipe connecting the accumulator (3) to the carburettor (6)
- Return pipe (to tank)
- 6. Carburettor
- 7. Fuel pump

REMOVING

B, C, F 407 - B, C 408 - C 405 - C 409

The filter is next to the fuel pump. Fit clamps Mot. 453-01 to the hoses. Loosen the fuel pipe clips and disconnect the pipes. Remove the fuel filter from its retaining clips. When refitting, ensure that the direction of the fuel flow is correct. Reconnect the hoses and refit their clips. Remove clamps Mot. 453-01. The fuel filter is to be replaced every 20 000 km (12 000 miles) or every 40 000 km (24 000 miles) in the case of the large capacity filter (this depends on the model year).

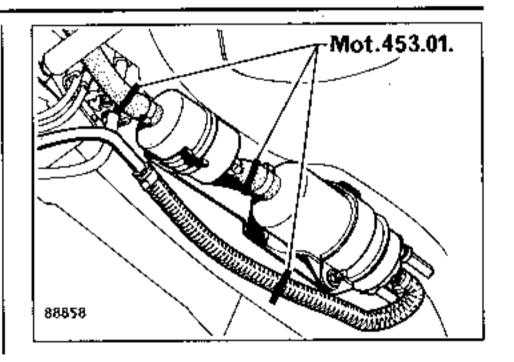
Fuel pump

REMOVING

B, C, F 407 - B, C 408 - C 405 - C 409

member, on the right hand side. Fit clamps Mot. 453-01 to the fuel input and output hoses. Disconnect the electrical wires. Unscrew the fuel pump securing clip. When refitting, ensure that the pipes and electrical cables are fitted the correct way round (the positive and negative terminal ends are of different cross sectional areas). Remove clamps Mot.453-01.

This pump is mounted on the rear cross



Pump on auxiliary tank

REMOVING

C 405 - C 409

This pump is mounted on the auxiliary tank.

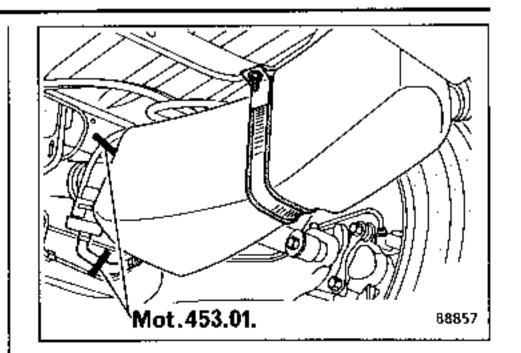
Fit clamps Mot.453-01 to the input and output pipes.

Loosen the hose clips and disconnect the hoses.

Unplug the electrical connector.

Release the pump securing clip.

On refitting, ensure that the pump is correctly fitted into its locating slot.



REMOVING

C405

The regulator is mounted on the front right hand side member.

A : fuel supply.

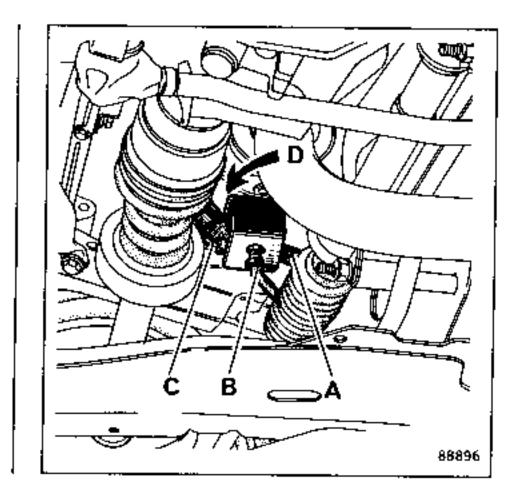
B : fuel return to tank.

C : supply to carburettor.

D : turbocharging pressure,

Remove the regulator from its support.

When refitting, replace the clips.



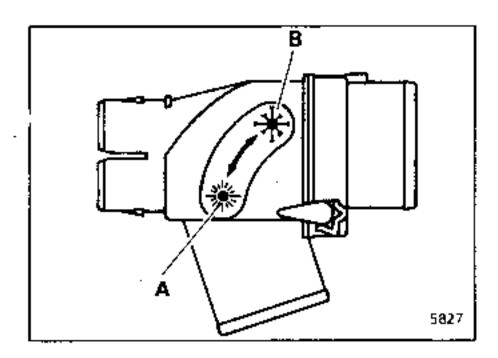
AIR INTAKE HEATING

Depending on the version, the heating system is either manual or automatic.

Manual system

This system consists of :

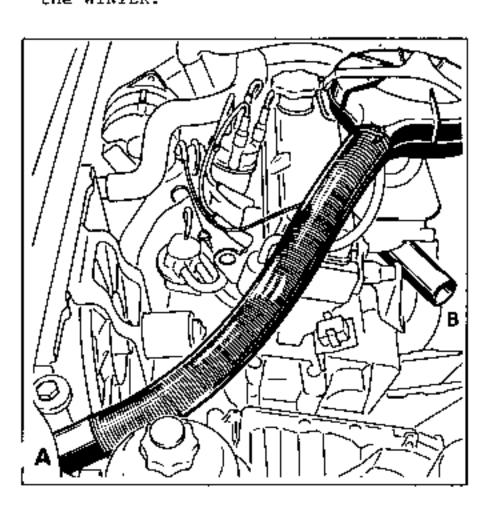
 either an air filter, with a double intake and a distribution flap for metering the amount of warm air and cold air.



A : SUMMER position (cold air).

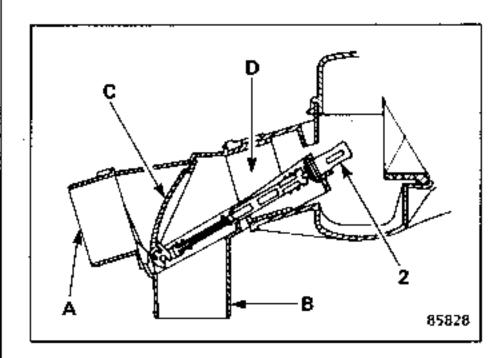
B : WINTER position (warm air).

- or a filter of the "throwaway" type comprising a pipe which is connected to point A in the SUMMER or to point B in the WINTER.



Automatic system

On this the distribution flap is controlled by a wax element (2) thermostatic system mounted on the air filter body, in the mixed air flow.



A : cold air intake.

B : warm air intake.

C: flap.

D : cold/warm air mixture to carburettor.

CHECKING

Immerse the air filter body in water up to the filter element.

After 5 minutes immersion :

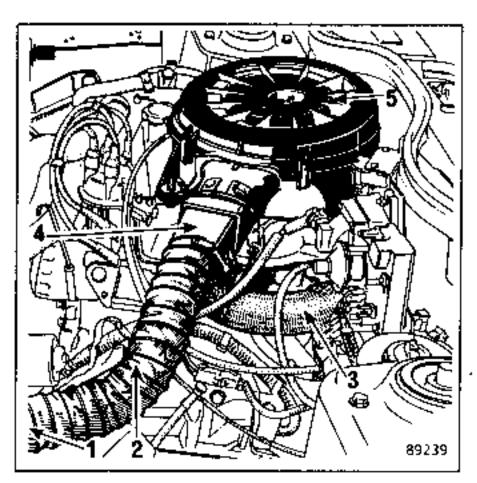
- with the water at a temperature of 26°C, the flap should close off the cold air input,
- with the water at 36°C, the flap should close off the warm air input.

ADJUSTING

The flap opening is not adjustable.

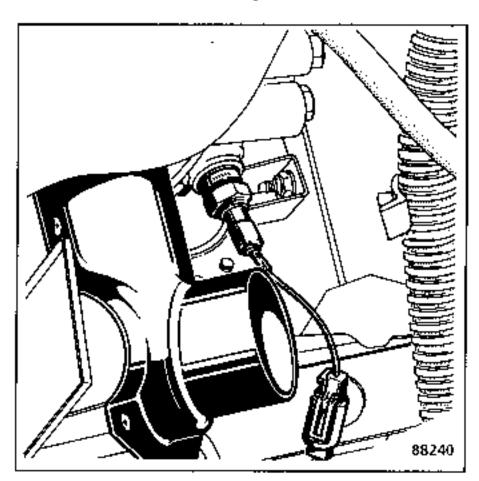
Replace the distributor flap/thermostatic element assembly in case of defect.

SPECIAL FEATURES : C3J engine.



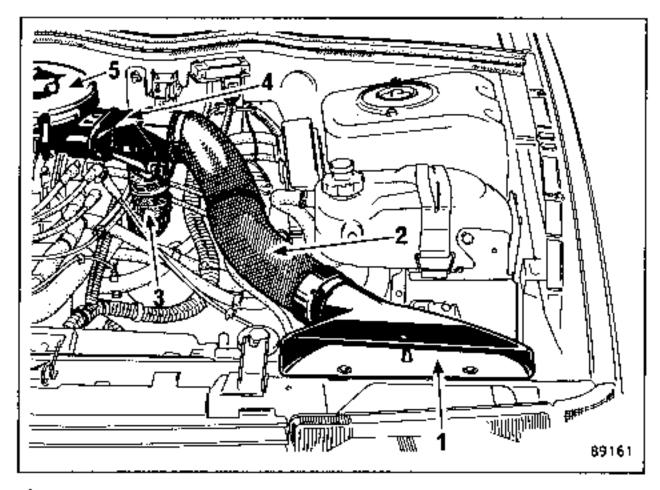
- 1. To cold air intake
- Cold air ducting
- Warm air ducting
- 4. Regulator unit
- 5. Air filter

C3J, F3N single point injection engines. Warm air intake casing.



NOTE: the warm air intake casing is crimped to the manifold.

F3N single point injection engines

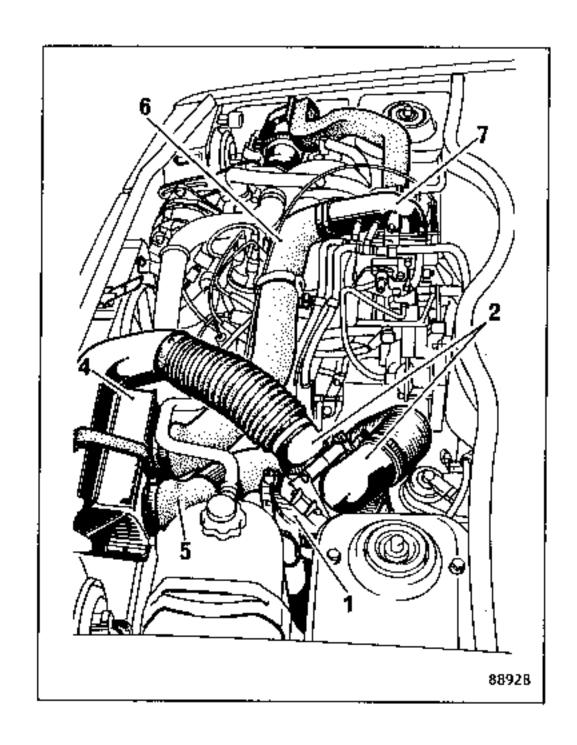


- Intake casing
- Cold air ducting
- 3. Warm air ducting
- 4. Regulator unit
- 5. Air filter

The air intake system consists of :

- a thermostatically controlled air filter (1) with a double warm air/cold air system
 (2), 26-32°C.
- a turbocharger that blows air into the intercooler (4) down ducting (5),
- an intercooler (4) with a thermostatic capsule that closes off the air flow through the intercooler when its temperature is lower than 43 ± 2°C. When the temperature of the air is above 47 ± 2°C, all the air passes through the intercooler,
- the air ducting (6) is secured to the casing (7) which is, in turn, secured to the carburettor at 3 points. The seal between the casing and the carburettor cover consists of an 0 ring.

NOTE: as the circuit between the turbocharger and the carburettor is subject to turbocharging pressure, the hose clips must be correctly tightened. After removing or replacing a pipe, ensure that it is absolutely dry before fitting.

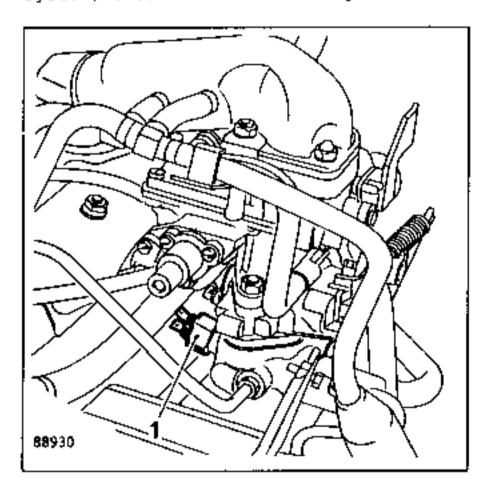


Engines C1J-C-782 and 784

The vehicle is equipped with a carburettor ventilation and pressure regulator system.

A 95/89°C temperature switch mounted on the inlet manifold, near the carburettor, controls the switching on and off of an anti-percolation fan mounted on the right hand inner wing of the vehicle and supplied with current taken before the ignition switch.

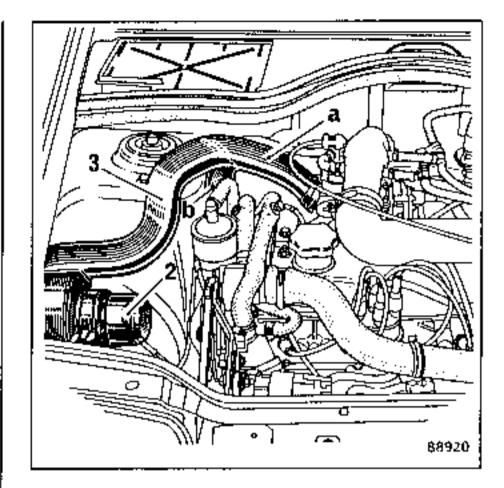
Whenever carrying out any work on the system, disconnect the battery.



Engine ClJ-G-788

The vehicle is equipped with a system for ventilating the carburettor and the air intake ducting on the input side of the carburettor.

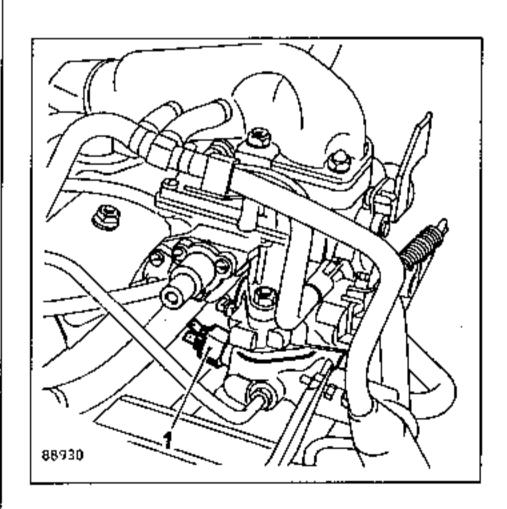
A 90/84°C temperature switch (1) mounted on the inlet manifold near the carburettor switches on and off an anti-percolation fan (2) mounted on the right hand inner wing of the vehicle and supplied from the input side of the ignition switch.



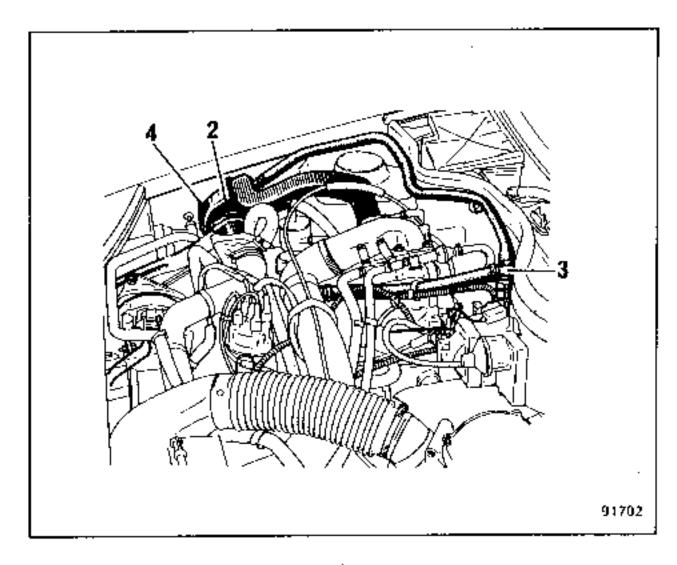
- 1. 95/89°C temperature switch
- Anti-percolation fan unit.
- Ventilation ducting

a : to carburettor

b : to fuel pressure regulator



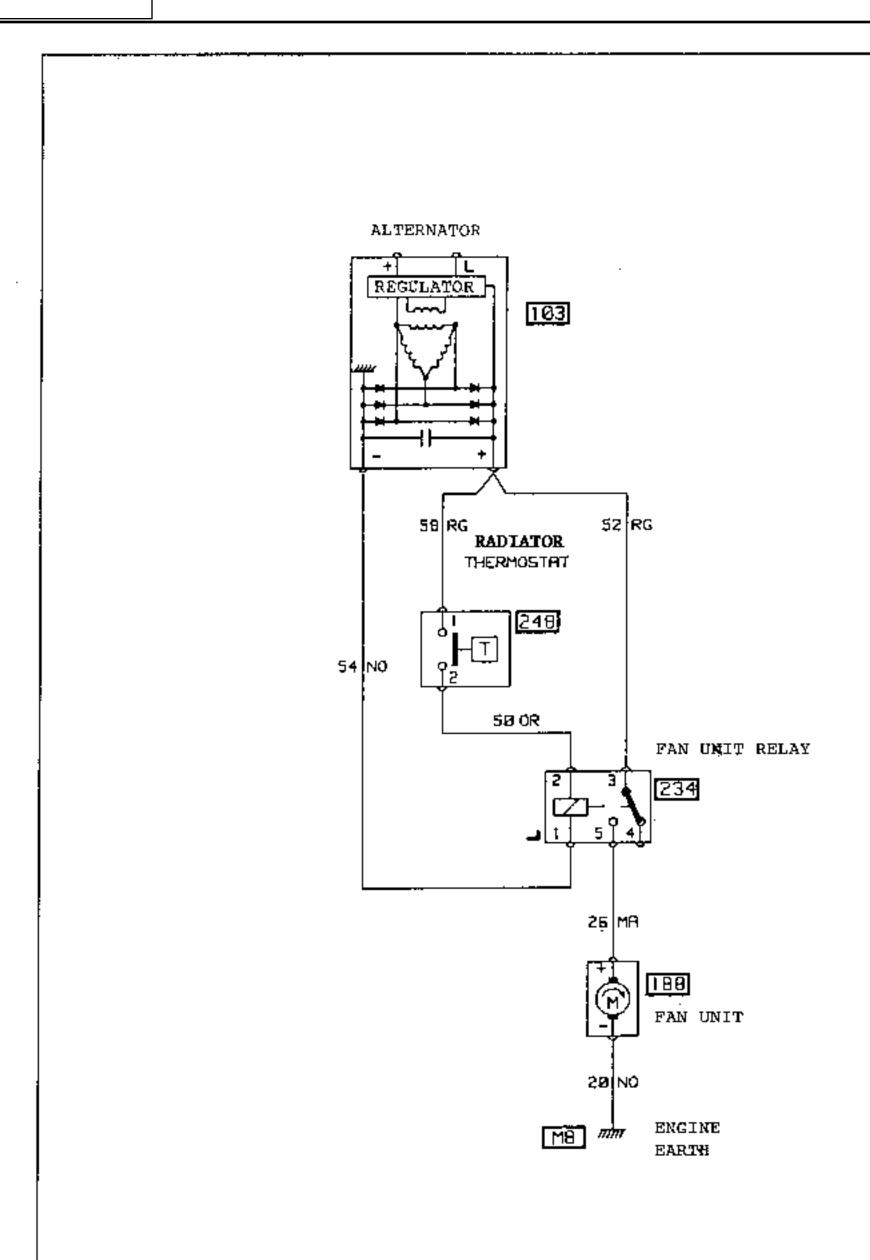
Engine ClJ-G-788 (continued)



- A When the engine is not running, the anti-percolation relay 279 supplies solenoid valve 169 with current to provide an air flow through the intake ducting.
- B When the engine is running, relay 279 cuts off the supply to the solenoid valve 169 and the air ventilation circuit is shut off.

NOTE: if the temperature in the inlet manifold is lower than 84°C, temperature switch 272 cuts off the supply to fan unit 188 and to solenoid 169 whether the engine is running or not.

- 1 Temperature switch (item 272) see preceeding page
- 2 Electric fan (item 188)
- 3 Solenoid valve (item 169)
- 4 Anti-percolation relay (item 279).



PUMP Brake servo exhauster pump

ESSENTIAL SPECIAL TOOLS

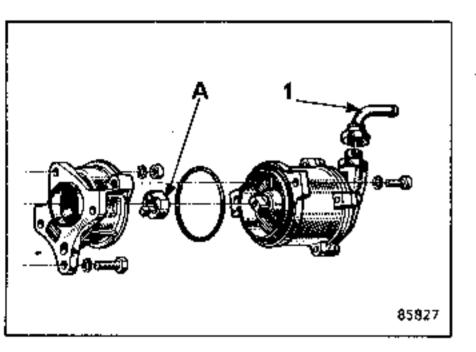
M.S. 870

Vacuum gauge

This operation is carried out on the vehicle

CHECKING

Disconnect the pipe (1) from the suction side of the pump and connect vacuum gauge M.S.870 in its place.



CHECKING

With the engine warm and running at 4 000 rpm, the minimum vacuum should be 700 mbar. (525 mmHg) after 3 seconds.

Replace the drive dog (A) whenever replacing the exhauster pump.

NOTE: the complete servo system is checked in exactly the same way as on the other vehicles in the range.

Oil grade to be used in the system :

ELF RENAULTMATIC D2

or MOBIL ATF 220

or TOTAL DEXTRON

CAPACITY : 1.1 litres

Filling the system :

Fully fill the reservoir.

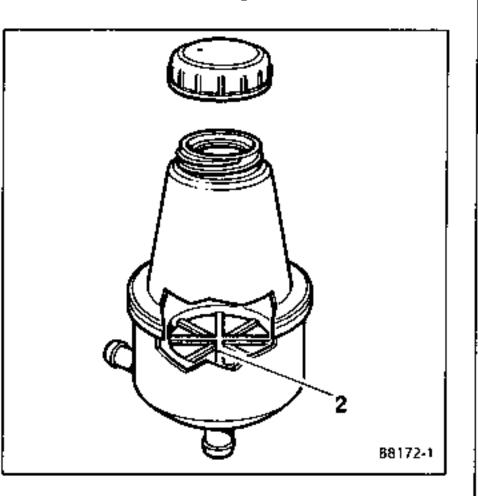
Gently turn the steering in both directions.

Top-up the level.

Start the engine and gently move the steering from one full lock stop to the other.

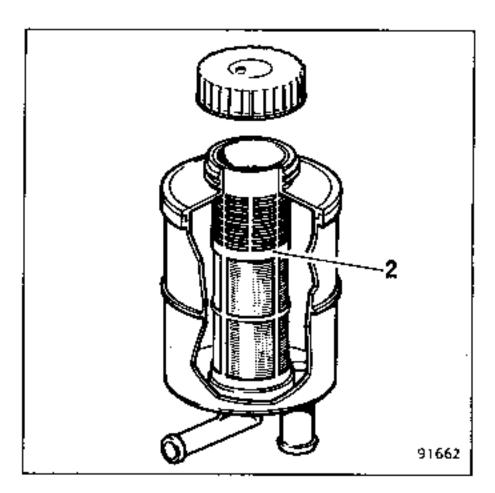
Top-up the system.

1st arrangement



The oil should come up to the grille (2).

2nd arrangement



The oil should come up to the pad (2) on the filter sleeve.

PUMP Mechanically driven power steering pump

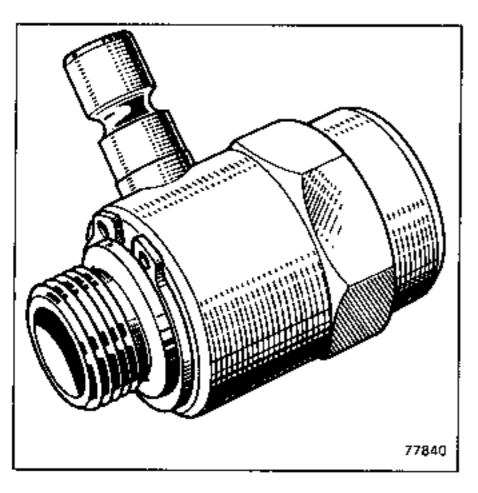
CHECKING THE OIL PRESSURE

ESSENTIAL SPECIAL TOOLS				
Mot. 453 -01	Hose clamps			
Dir. 803	Union with metric thread			
Fre. 1085	Pressure gauge			
or .	•			
Fre. 244 -04				

Place one clamp Mot.453-01 on the pump low pressure hose.

Disconnect the high pressure hose (provide a container to catch the oil).

Place union Dir.803 (with a metric thread) between the hose and the pump.



Connect in pressure gauge Fre.1085 or Fre. 244-04.

Remove clamp Mot. 453-01,

Top-up the pump oil level and run the engine to check the pressure.

The wheels must be in the straight ahead position:

Whatever the engine speed, the pressure must not exceed 5 to 7 bars.

With the wheels turned through full lock to one side :

Hold the wheels at full lock to one side. The maximum pressure should be 79 to 86 bars.

This operation is not to be prolonged as this could cause the oil to overheat.

Remove union Dir.803 and pressure gauge Fre.1085 or Fre.244-04 after cutting off the supply to the pump with clamp Mot.453-01.

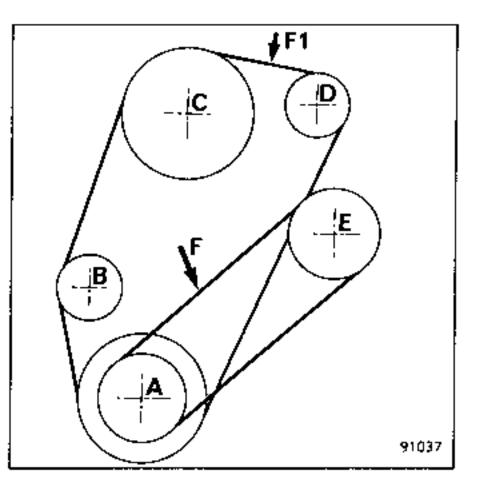
Reconnect the high pressure hose and remove clamp Mot.453-01.

Top-up the level of the oil in the reservoir.

ADJUSTING THE BELT TENSION

ESSENTIAL SPECIAL TOOLS. Elé. 346-04 Belt tension tester

ARRANGEMENT ON TYPE C ENGINES

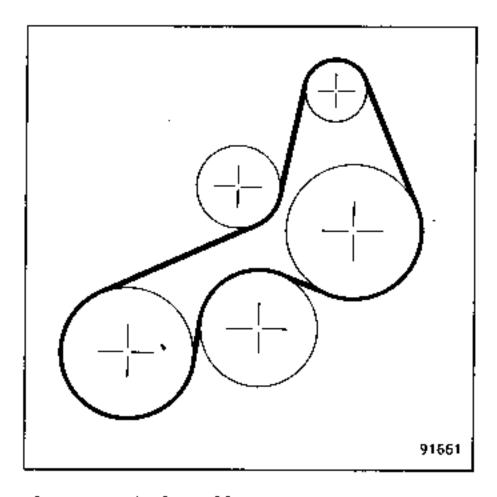


- A. Crankshaft pulley
- Tensioner roller
- C. Coolant pump pulley
- D. Alternator pulley
- E. Power steering pump pulley

Required deflection :

- cold + 3.5 to 4.5 mm
- warm → 5.5 to 6.5 mm

ARRANGEMENT ON TYPE F ENGINES (petrol)



- A. Crankshaft pulley
- B. Tensioner roller
- C. Alternator pulley
- D. Power steering pump pulley
- E. Coolant pump -pulley

Required deflection :

- cold → 3.5 to 4.5 mm

ESSENTIAL SPECIAL TOOLS

Mot. 453-01

Hose clamps

REMOVING

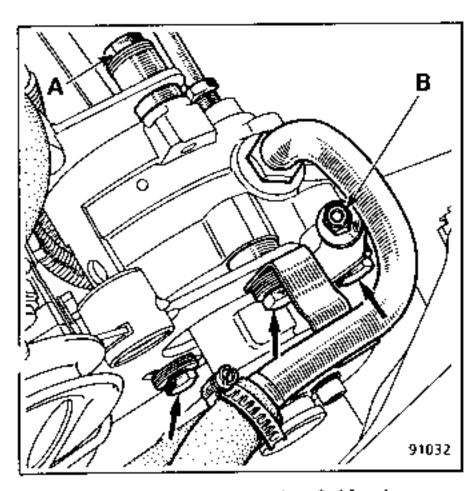
Remove the alternator (see section 16).

Place a clamp Mot.453-01 on the supply hose.

Loosen the four pump and tensioner securing points.

Fully slacken off the belt at (B).

Disconnect the pressure switch from its connector.

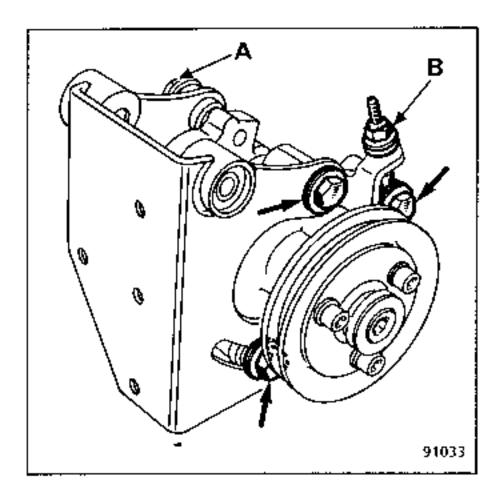


Disconnect and remove the following pipes :

- supply,
- high pressure, removing screw (A) and taking care not to lose the spacer.

Remove :

 the three other pump and tensioner securing bolts, taking care not to lose the spacers.



- the pump, after first taking off its belt.

If the pump is to be replaced, remove the pulley (see the corresponding section).

REFITTING

If the pump is being replaced, fit :

- the pulley (see the corresponding section),
- the pump and the tensioner,
- the supply and high pressure pipes (reconnect the pressure switch).

Remove the clamp Mot.453-01.

Adjust the belt tension (see the corresponding section).

Fill and bleed the system (see the corresponding section).

ESSENTIAL SPECIAL TOOLS

Mot. 453-01

Hose clamps

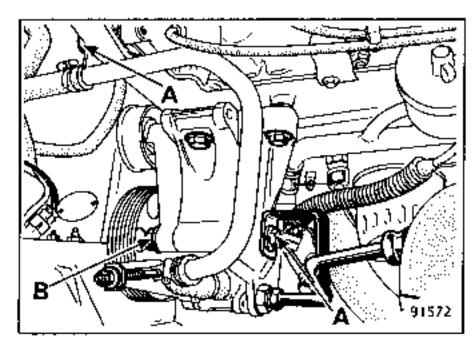
REMOVING

Remove the alternator (see section 16).

Fit a clamp Mot.453-01 to the supply hose.

Remove the two screws (A).

Disconnect the pressure switch from its connector.

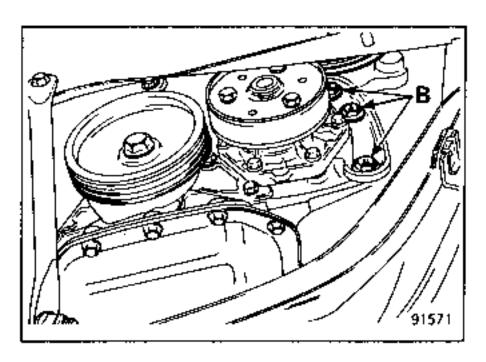


Disconnect and remove :

- the supply hose,
- the high pressure hose.

Remove :

 the four bolts (B) from the pump supports,



the power steering pump.

If the pump is to be replaced, remove the pulley (see the corresponding section).

REFITTING

If the pump is being replaced, fit :

- the pulley (see the corresponding section),
- the pump,
- the supply and high pressure hoses (reconnect the pressure switch).

Remove clamp Mot.453-01.

Refit the alternator (see section 16).

Adjust the belt tension (see the corresponding section).

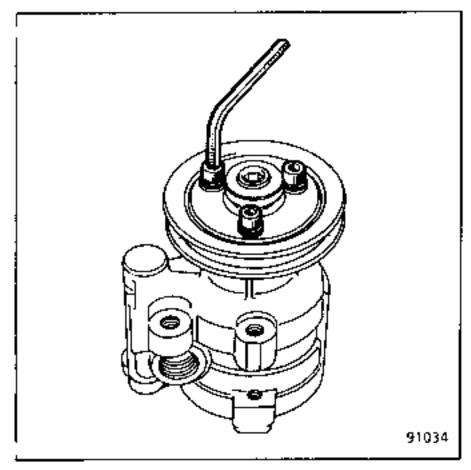
Fill and bleed the system (see the corresponding section).

REPLACING THE PULLEY

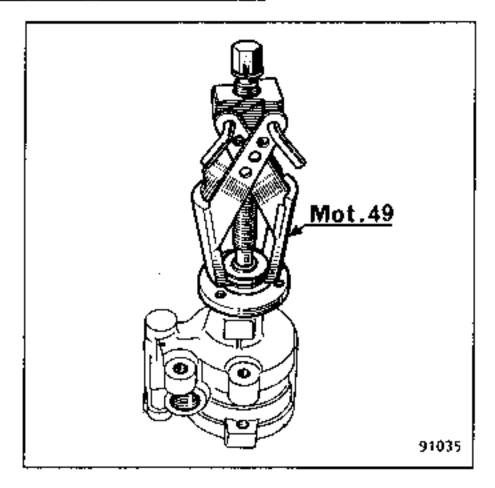
	ESSENTIAL SPECIAL TOOLS			
Mot. 49	Extractor			
Dir 1083	Tooling for refitting the			
	power steering pump pulley			

REMOVING

Remove the pulley with an allen key.

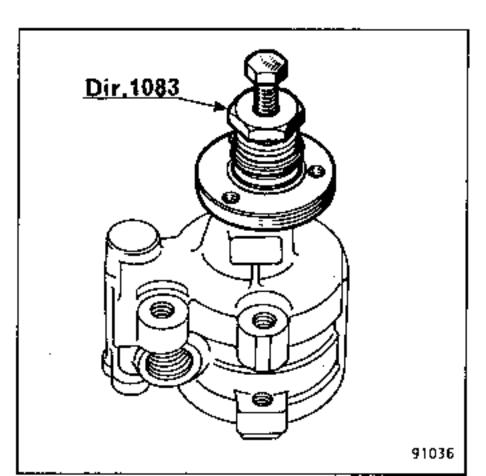


Measure the dimension between the upper edge of the hub and the end of the shaft. Extract the hub using tool Mot.49.



REFITTING

Push on the pulley using tool Dir.1083 until the dimension measured during removing is obtained.

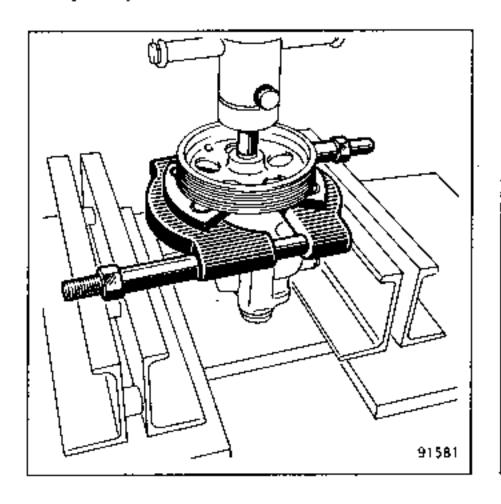


REPLACING THE PULLEY

	ESSENTIAL SPECIAL TOOLS
Dir. 1083	Tooling for refitting the
!	power steering pump pulley

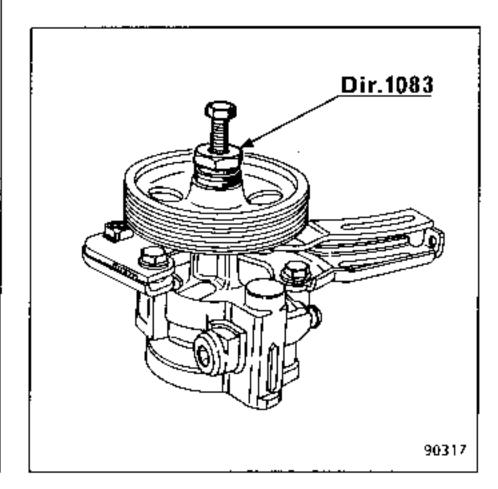
REMOVING

Extract the pulley on the press using a jaw extractor of the FACOM U53G type, after first measuring the distance between the pulley and the end of the shaft.



REFITTING

Push on the pulley using tool Dir.1083 until the dimension measured during removing is obtained.



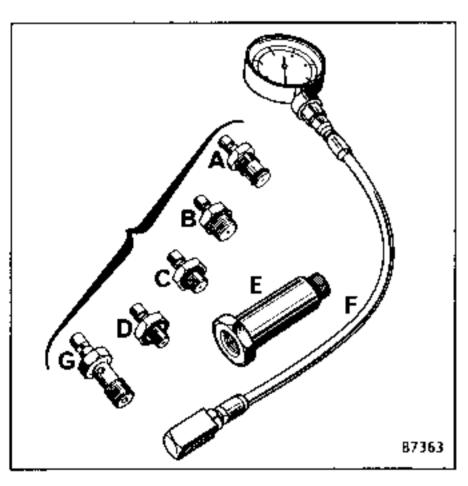
PUMP Electrically driven power steering pump

CHECKING THE OIL PRESSURE

ESSENTIAL SPECIAL TOOLS					
Mot. 836-05	Oil pressure connection kit				
Fre. 244-05					
or	Oil pressure gauge				
Fre. 1085					

Remove the plug from the pressure takeoff (using an allen key).

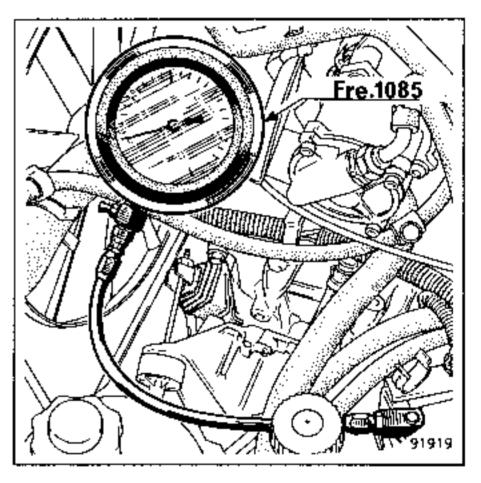
Connect union C from kit Mot.836-05 in its place.



Connect the pressure gauge Fre.1085 or Fre.244-04 to the union.

Wheels in the straight ahead position :

With the engine running at slightly above idling speed, approximately 1 500 rpm, to obtain sufficient output from the alternator, the pressure should not exceed 5 to 7 bars.



With the wheels moved through full lock to one side :

Under the same conditions, hold the wheels at full lock to one side. The maximum pressure should be 79 to 86 bars.

This operation should not be prolonged to avoid overheating the oil.

Remove the pressure gauge and the union.

Refit the plug to the take-off.

Top-up the level of the oil in the reservoir.

PUMP Electrically driven power steering pump

Grade of oil to be used in the system :

ELF RENUALTMATIC D2

or MOBIL ATF 220

or TOTAL DEXTRON

CAPACITY : 1 litre

Filling the system

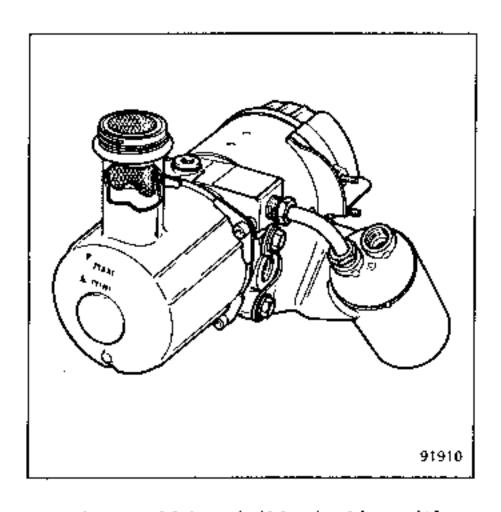
Fill the reservoir to the MAX level mark.

Slowly move the steering in both directions.

Top-up the level.

With the pump running, slowly move the steering from one lock stop to the other.

Top-up the level.



The oil should be visible in line with the MAX level mark.

ESSENTIAL	CORCIAL.	TOOLS
ROSEUTIAL.	SERVIND	TOODS

Mot. 453-01

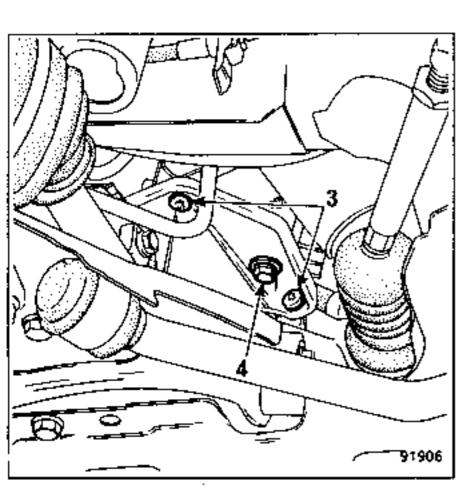
Hose clamps

REMOVING

disconnect the battery.

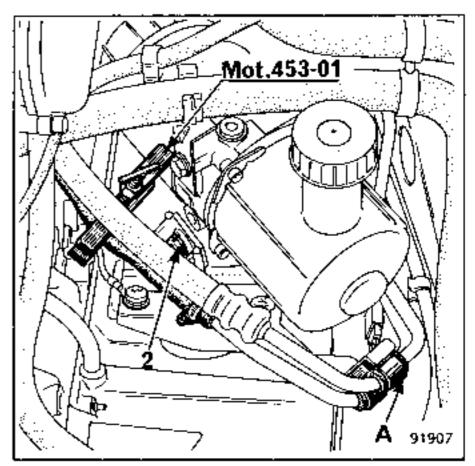
Remove :

- the front left hand wheel,
- bolts (3) and (4) that secure the lower part of the pump to its support,



- the bolt (2) that secures the upper part of the pump,
- the pipe retaining clip (A).

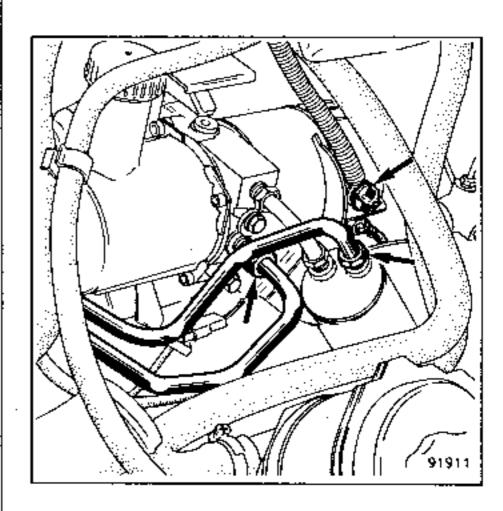
Place a clamp Mot.453-01 on the rotary valve supply hose.



Pull out the pump and lay it on one side.

Remove :

 the low pressure connection from the pump,



PUMP Electrically driven power steering pump

REMOVING (continued) REFITTING

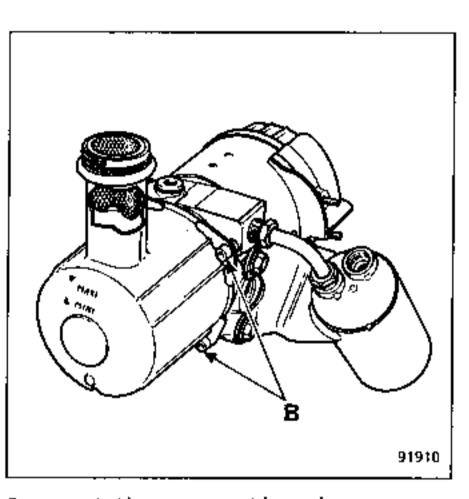
- the high pressure connection on the accumulator,
- the electric motor positive and negative terminals.

Take out the pump-reservoir unit.

NOTE: the reservoir part of this unit can be replaced.

To do this, remove :

- the four screws (B),
- the reservoir together with its 0 ring.

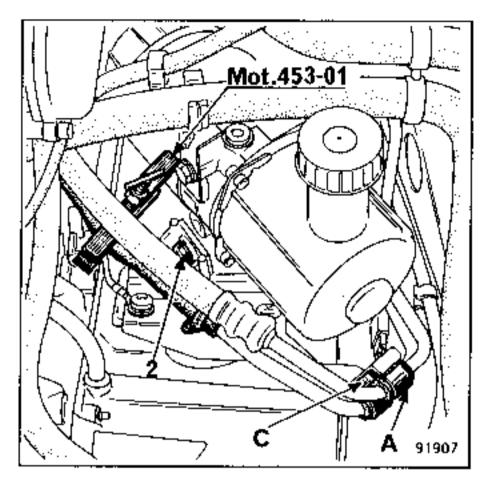


Carry out these operations in reverse to refit the reservoir, using a new 0 ring.

REFITTING

Fit :

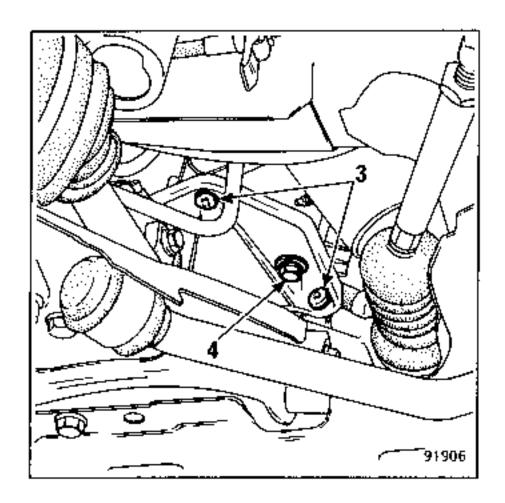
- the pump, reconnecting the electric motor terminals,
- the high and low pressure connections, without tightening them. Correctly position the pump on its support and resecure it, without tightening the fastenings,
- screw (2) and clip (A).



NOTE: ensure that the plastic pad (C) is in position.

 the pump lower securing screws (3) and (4).

NOTE: screws (30 and (4) are of different lengths. It is essential to place the short screw (4), with the socket head, in the position shown in this illustration, to avoid locking the pump motor.



Tighten the high and low pressure connectations.

Tighten the pump securing screw and clip (A).

Remove clamp Mot.453-01.

Fill and bleed the system (see the corresponding section).

EMISSION CONTROL Special features of system

METHOD OF ADJUSTING THE IDLING SPEED

This method can be used on all these vehicles unless otherwise stated :

see the special procedure for B/C 40K models.

This adjustment must be carried out accurately to obtain a CO percentage that remains stable between two adjustments and we should like to remind you that the adjustment must be carried out under the following precise conditions:

- 1) The vehicle must be fully run-in: at least 1000 km (600 miles) (any adjustment on a vehicle which is not run-in can change very quickly).
- 2) The choke must not be operating (check this).
- 3) The engine must be at its normal operating temperature. To obtain this run the engine at approximately 2000 rpm until the thermostat opens. Do not allow it to warm up at idling speed as when at engine has run for a few minutes at idling speed, the CO percentage reading is no longer valid:
- 4) The idling speed must be that specified by the manufacturer (see chart).
- 5) The air filter must be in position and have a clean cartridge.
- 6) The ignition system must be in good condition and correctly adjusted.
- 7) There must be no additional air leakage into the system (vacuum pipes, emission control system, oil vapour re-intake, anti-evaporation, exhaust gas recirculation systems etc.).
- 8) There must be no leaks on the exhaust system. It must be fully sealed.
- 9) No large electrical current consumer must be running (blower fan, headlights, heated rear screen etc.).
- 10) Check that the exhaust gas recirculation system is not operating, at idling speed.

- 11) Before adjusting the idling speed, cut out the exhaust pulsair system by pinching flat the pipe or pipes connecting the pulsair to the air filter or by blocking the pulsairs.
- 12) On vehicles equipped with a catalyser, ensure that the catalyser is not operating.

Adjusting using an exhaust gas analyser.

In those markets concerned, remove the tamperproofing cap from the mixture screw (B).

Turn screw (A) to obtain the average idling speed stated on the chart for the vehicle concerned.

Turn screw (B) to obtain the CO percentage stated on the chart.

Turn screw (A) to obtain the correct idling speed.

Repeat these two operations until both the CO percentage and the idling speed are correct.

In those countries where the regulations require it, fit a tamperproofing cap to screw (B) after the adjustment.

Tamperproofing caps

CARBURETTOR	Tamperproofing cap Part no.
ZENITH 32 IF 2	77 01 200 835
SOLEX 32 DIS	77 01 200 831
SOLEX 28 x 34 Z 10	77 01 200 831
WEBER 32 DRT	77 01 200 833

EMISSION CONTROL Special features of system

ENGINES F2N G 742

ADJUSTING THE IDLING SPEED

IMPORTANT :

It is essential when adjusting or checking the mixture at idling speed to :

- cut out the exhaust pulsair system by pinching flat the pipe connecting the air filter to the pulsair with clamp Mot.453-01,
- commence the adjustment procedure on the vehicle when the engine is cold.

Adjustment procedure :

- With the engine cold, the exhaust pulsair system cut-out and the analyser connected up.
- Start the engine on full choke, push it into 900 rpm for approximately 1 minute then fully push in the choke.
- Wait until the engine cooling fan cuts in for the first time before adjusting the idling speed.

IMPORTANT :

- It is essential to follow this adjustment procedure and, above all, not to accelerate the engine so that there is no risk of bringing the catalyser into operation.
- If, during the analysis, the CO percentage tends towards 0 and the ${
 m CO}_{_{2}}$ percentage becomes higher than 14%, the catalyser is operating :
 - . recommence the adjustment procedure when the engine is cold.

Adjustment figures :

Vehicle	Speed (rpm)	Mixture (% CO)	Conditions
B 40 K C 40 K	850 ± 50	1,25 ± 0,5	Follow the above des- cribed procedure without the exhaust pulsair system oper- ating.

Type CLE-752 engines, Switzerland-Sweden :

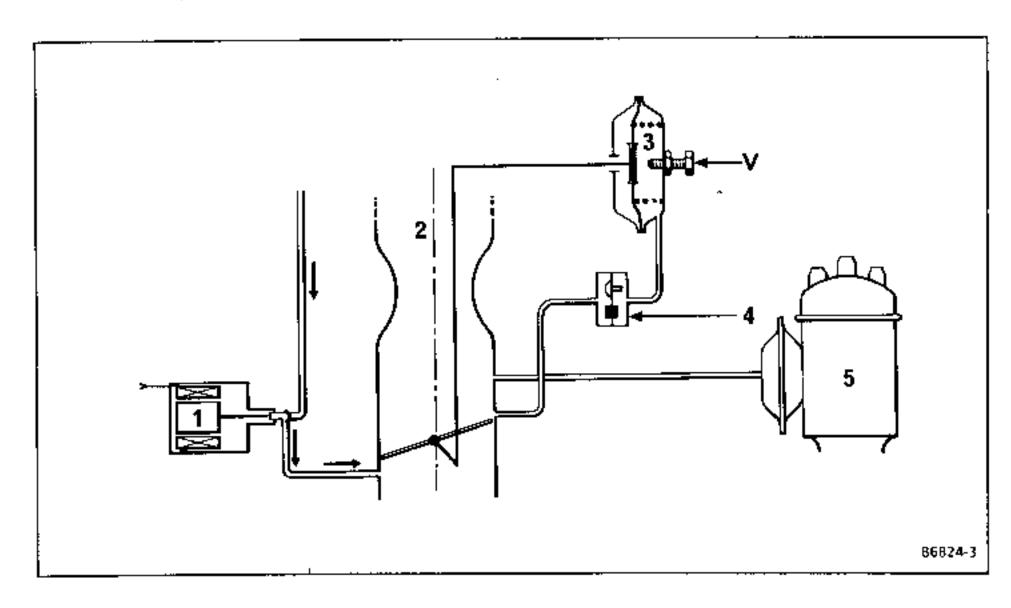
The ZENITH V 10513 carburettor is equipped :

- with an idling speed cut-out (1),
- with a throttle actuator (3) to reduce hydrocarbon emission during overrun, which is operated by a delay valve (4) the function of which is to maintain the effect of the manifold vacuum, on the throttle actuator (3) for a few seconds (ensure that the delay valve is fitted the correct way round with its white face towards the connection point on the carburettor).

ADJUSTING THE FAST IDLING

With the engine warm, after first adjusting the normal idling speed, directly connect the throttle actuator (3) to a vacuum pump and apply a vacuum of 700 mbars to it. Then adjust it by means of screw (V).

If no vacuum pump is available, directly connect the actuator to the inlet manifold, accelerate the engine and release the accelerator and adjust the fast idling speed by turning screw (V).



- Idling speed cut-out (fed from output side of ignition switch).
- 2. ZENITH 32 IF2 V 10514 carburettor
- Throttle actuator

- 4. Delay valve with its white face towards the carburettor
- 5. Distributor R 335 C 34 timing : + 6° flywheel
- V: Fast idling speed adjusting screw : 1700 + 100 rpm.

Engines ClE-B-756

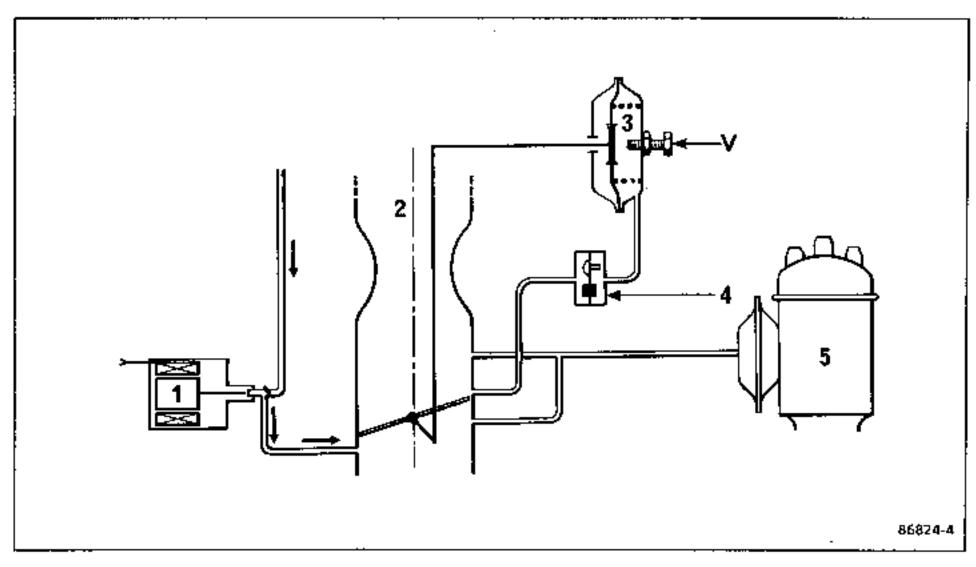
The ZENITH 321F2 V 10521 carburettor is equipped:

- with an idling speed cut-out (1),
- with a throttle actuator (3) to reduce hydrocarbon emission during overrun, which is operated by a delay valve (4) the function of which is to maintain the effect of the manifold vacuum, on the throttle actuator (3) for a few seconds (ensure that the delay valve is fitted the correct way round with its white face towards the connection point on the carburettor).

ADJUSTING THE FAST IDLING

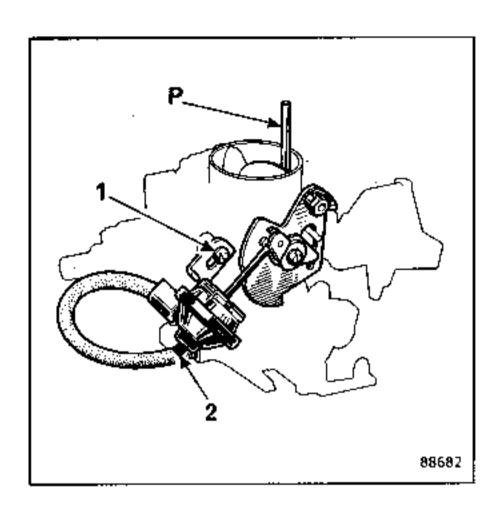
With the engine warm, after first adjusting the normal idling speed, directly connect the throttle actuator (3) to a vacuum pump and apply a vacuum of 700 mbars to it. Then adjust it by means of screw (V).

If no vacuum pump is available, directly connect the actuator to the inlet manifold, accelerate the engine and release the accelerator and adjust the fast idling speed by turning screw (V).



- Idling speed cut-out (fed from output side of ignition switch).
- 2. ZENITH 321F2 V 10521
- Throttle actuator
 - V : fast idling speed adjusting screw : 1700 + 100 rpm.
- 4. Delay valve with its white face towards the carburettor
- 5. Distributor R341C33 Timing: + 2° flywheel. Capsule C33 must be disconnected.

The SOLEX 32 DIS 860 carburettor has, in addition to the throttle actuator, pneumatic choke assistance.



Pre-adjustment :

Tighten screw (1) in its slot at the point where the choke flap just starts to lift away from its closed position.

Pneumatic initial opening.

Adjustment :

Push the rod in the direction shown by the arrow.

Turn screw (2) until rod (P) can be inserted.

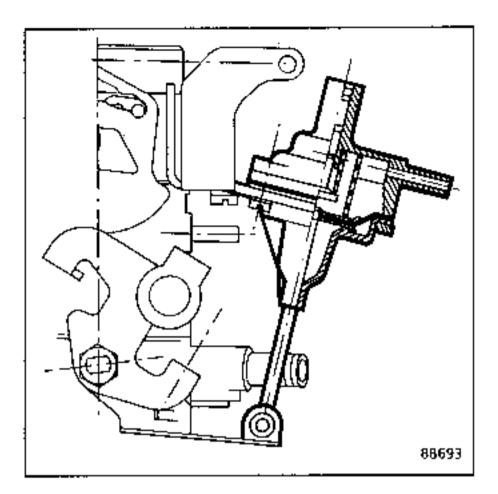
DECELERATION SYSTEM

Principle of operation :

The carburettor is equipped with a throttle actuator to reduce hydrocarbon emission duting overrun.

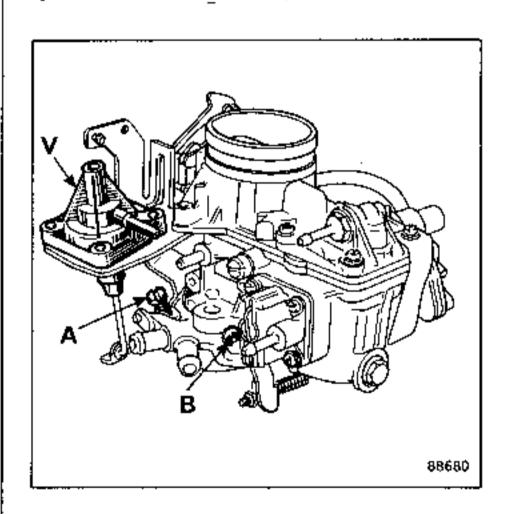
It opens in two stages.

A delay valve mounted between the carburettor and the throttle actuator maintains, for a period, the vacuum on the diaphragm, (Brown part of the valve towards carburettor connection).



ADJUSTING THE FAST IDLING

Turn screw (V), whilst applying a vacuum of 800 mbars, with a vacuum pump, to the throttle actuator to obtain a fast idling speed of: 1800 + 100 rpm.

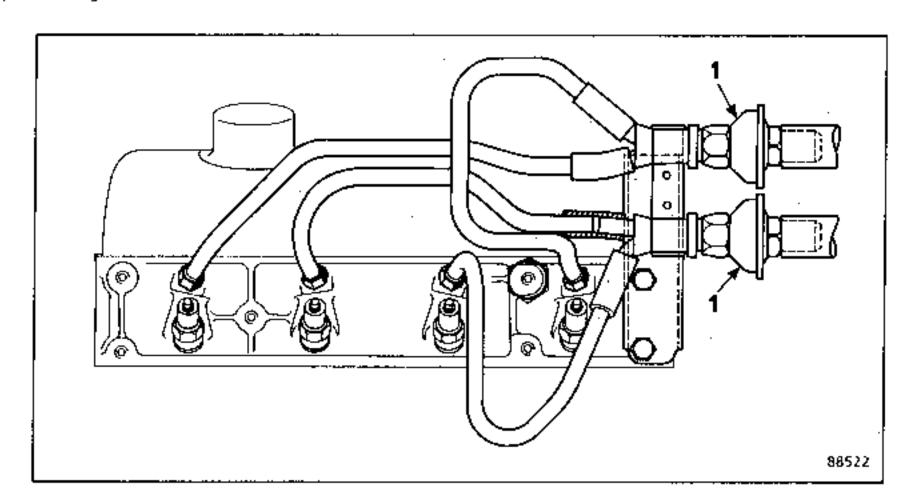


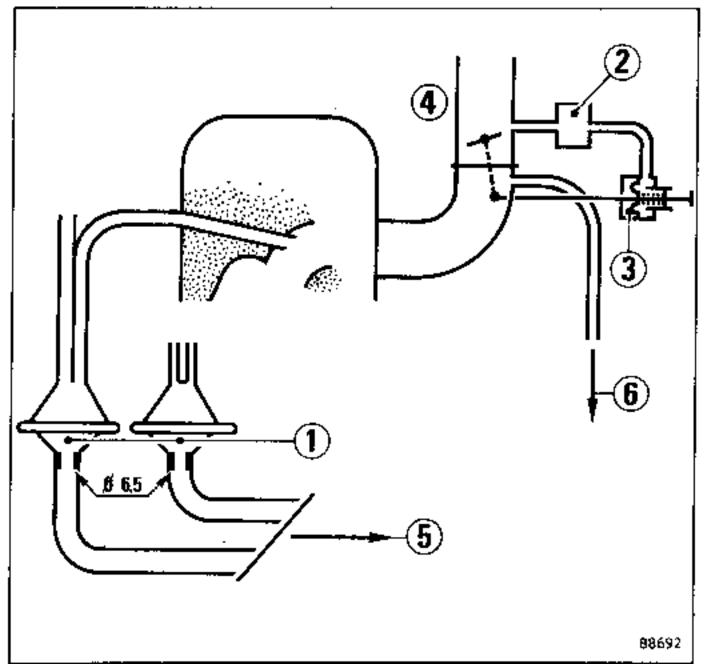
ADJUSTING THE IDLING SPEED

Do not forget to cut out the exhaust extractor system before adjusting the idling speed.

SYSTEM FOR BLOWING AIR INTO THE EXHAUST

Layout diagram



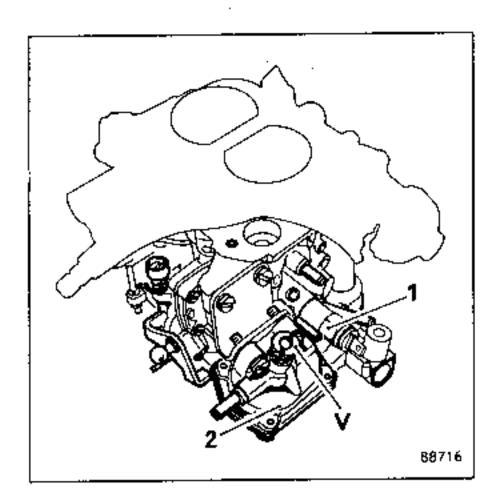


- Air inlet valves (pulsairs)
- Delay valve (brown side towards carburettor)
- 3. Throttle actuator
- 4. Carburettor
- 5. To air filter
- 6. To A.E.I. electronic ignition capsule

Special features of carburettors WEBER 32 DRT 5 and 6 :

WEBER 32 DRT 5 and 6 carburettors are equipped :

- with an idling speed cut-out (1),
- with a throttle actuator (2) only on vehicles with manual gearboxes (32 DRT 5).



Adjusting the fast idling :

After first adjusting the normal idling speed when the engine is warm, disconnect the actuator and apply a vacuum of 700 mbars, with a manual vacuum pump, to obtain an engine speed of 1800 + 100 rpm, which is adjusted by means of screw (V). A white delay valve maintains the vacuum on the throttle actuator and delays the return to normal idling speed during deceleration (for 5 to 15 seconds).

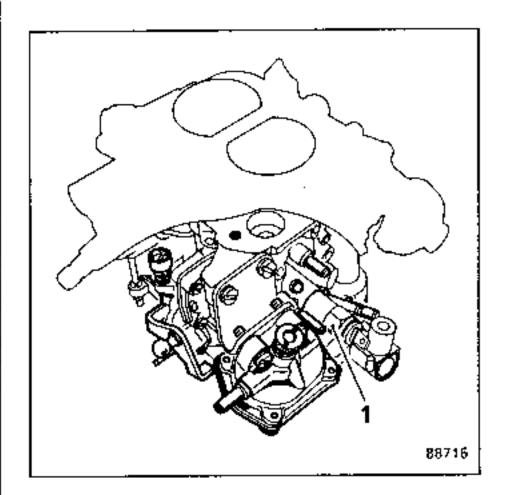
ANTI-REIGNITION SYSTEM

Idling speed cut-out (1).

This is a solenoid valve which shuts off the idling speed circuit, when its current supply is broken, that is to say when the ignition is switched off.

Testing

With the engine running at idling speed, disconnect the supply wire to the valve. The engine should stop.



Special features of WEBER 32 DRT 18 and 20 carburettors :

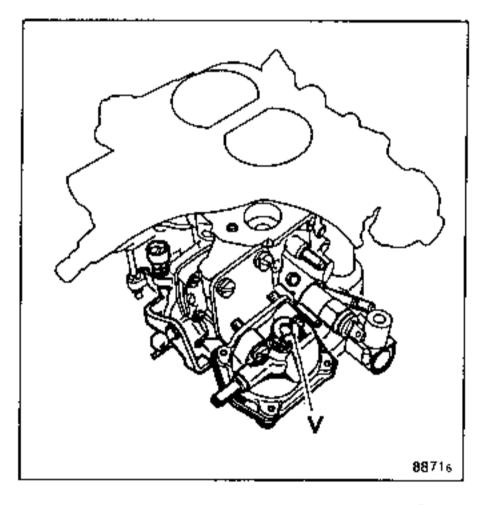
WEBER 32 DRT 18 and 20 carburettors are equipped:

- with an idling speed cut-out,
- with a throttle actuator to reduce hydro carbon emission during overrun,
- with a limited opening 2nd barrel throttle on the type 32 DRT 20.

ADJUSTING THE FAST IDLING SPEED

Conditions :

(The engine must be warm, the normal idling speed must be correctly adjusted and one of the solenoid valve terminals is to be disconnected if the oil temperature is higher than 70°C).



Disconnect the throttle actuator and apply a vacuum of 700 mbars, with a manual vacuum pump then obtain a speed of 1700 ± 100 rpm by turning screw (V). A white delay valve maintains the vacuum on the throttle actuator and slows up its normal return when the engine is decelerating (for 5 to 15 seconds).

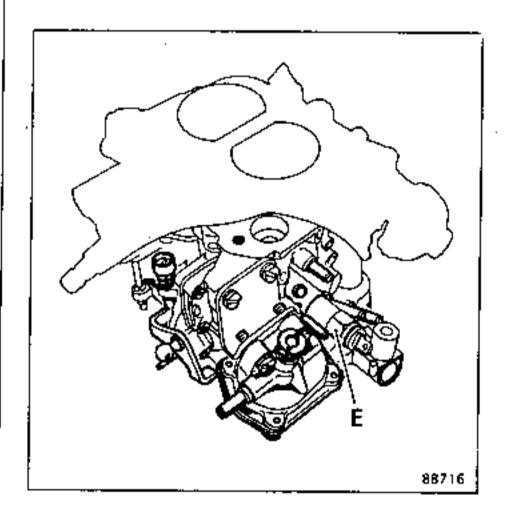
ANTI-REIGNITION SYSTEM

Idling speed cut-out (E)

This is a solenoid valve which closes off the idling circuit when no longer fed with current, that is to say when the ignition is switched off.

Checking

With the engine running at idling speed, disconnect the supply wire. The engine should stop.

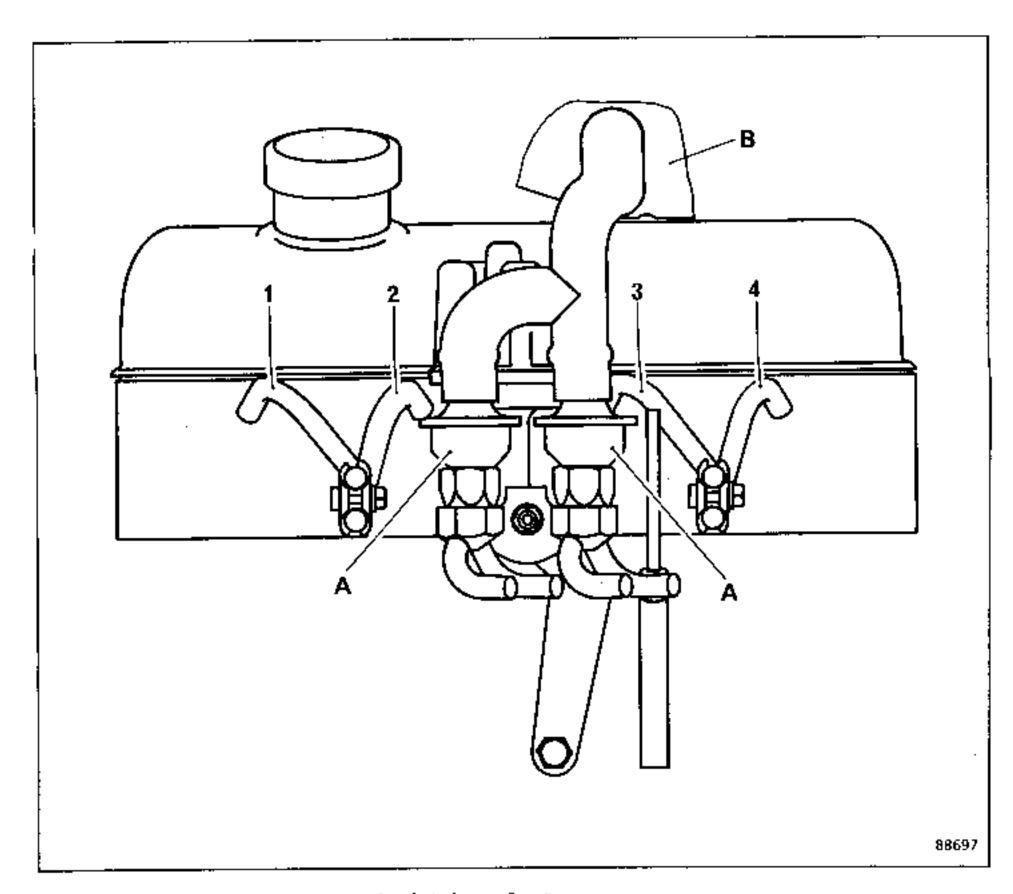


EMISSION CONTROL SYSTEM PRINCIPLE OF OPERATION :

Engines C2J-788 and 789 :

Layout of system for drawing air into the exhaust :

Item nos. 1 to 4 show the correct positions for fitting the hoses.



- A. Pulsairs, that is to say air intake valves
- B. Air filter

EMISSION CONTROLSpecial features of system

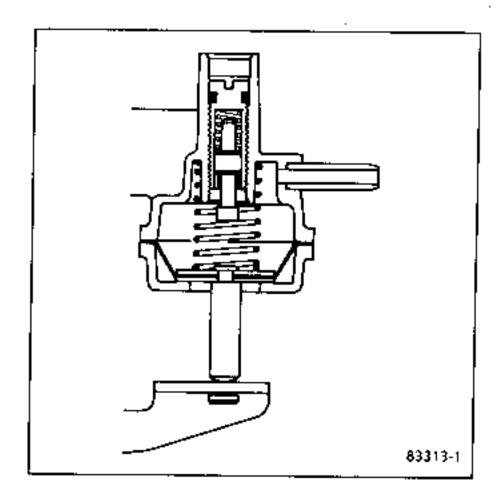
Engines C2J-788 and 789 :

OVERRUN SYSTEM

Principle of operation

On vehicles equipped with a manual gearbox the carburettor has a throttle actuator to reduce hydrocarbon emission when the engine is decelerating.

The actuator is of the single stage type.



A delay valve mounted between the carburettor and the throttle actuator maintains the vacuum on the diaphragm for a long period. EXHAUST AIR INJECTION SYSTEM

This consists of :

- 1 air filter
- 2 pulsairs or air intake valves
- pipes that carry the air to the exhaust valve.

Principle of operation

After the exhaust valve has closed, the inertia of the gases sets up a vacuum behind the valve.

The air inlet valves open to allow air to flow from the filter to the exhaust valve and thus oxydise any unburnt gases.

When there is no longer a vacuum behind the valve, that is to say the pressure rises higher than atmospheric pressure, the air intake valves close and prevent any exhaust gas reverse flow. Engines C2J-7B8 and 789

Principle of operation of the exhaust gas recirculation (E.G.R.) system :

The recirculation valve opens under the influence of the vacuum taken from the carburettor.

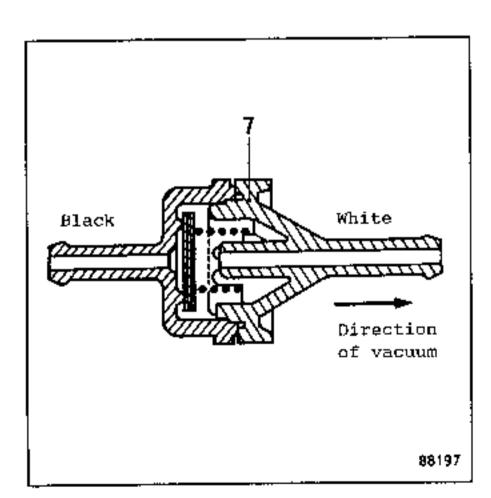
Up to a coolant temperature of 45°C, a temperature valve closes the circuit leading to the recirculation valve.

The recirculation valve is controlled by a pneumatic control unit.

The system generates a control signal that opens the recirculation valve by amplifying the differential pressure or vacuum signal from the venturi (E2) and the vacuum signal (E1) from the engine air intake by-pass circuit.

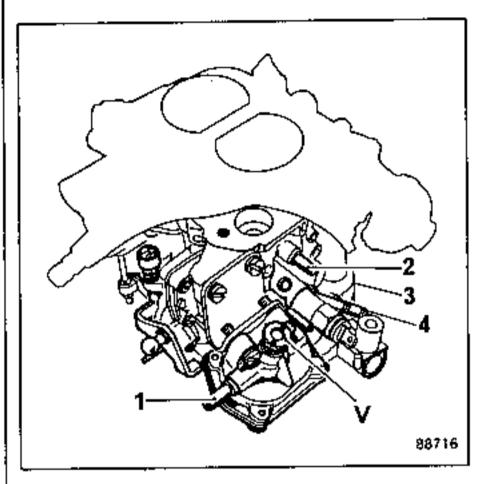
The function of the auxiliary valve (VD2) is to move the regulated point when the throughput to the engine passes a given threshold.

- Setting (VD1) = 40 mbars
- Setting (VD2) = 105 mbars
- Non-return valve : correct way of fitting



The by-pass system that includes nonreturn valve (7) causes the E.G.R. valve (8) to close more quickly during overrun. Identifying the functions of the exhaust gas recirculation system :

The exhaust gas recirculation system vacuum connections on the carburettor, are identified by rings of different colours.

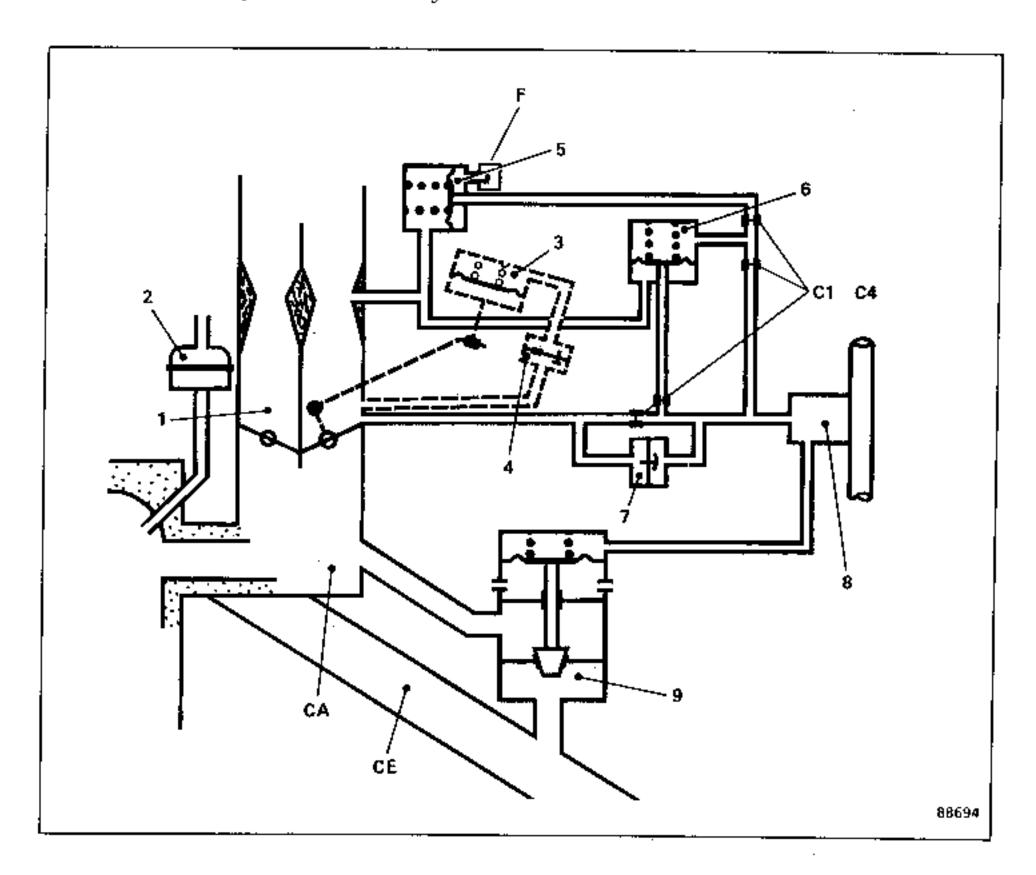


- 1 Throttle actuator (C2J-788 only, or manual gearbox). Ring colour : blue.
- 2 E.G.R. venturi vacuum connection. Ring colour : green.
- 3 E.G.R. throttle edge signal and throttle actuator reset connection (C2J-788). Ring colour: brown.
- 4 A.E.I. electronic ignition unit advance connection. Ring colour : black.

EMISSION CONTROLSpecial features of system

Engines C2J-788 and 789

Emission control system circuit diagram :



- 1. Carburettor
- 2. Pulsairs or air intake valves
- Throttle actuator*
- 4. Delay valve*
- 5. Auxiliary valve
- Regulator valve
- 7. Non-return valve
 - On engines C2J-788 only (manual gearbox).

- 8. Temperature valve
- 9. E.G.R. valve
- CA. Inlet manifold
- CE. Exhaust manifold
- F. Filter
- G. To air filter

C1

to C4: Calibrated orifices

C1: 60

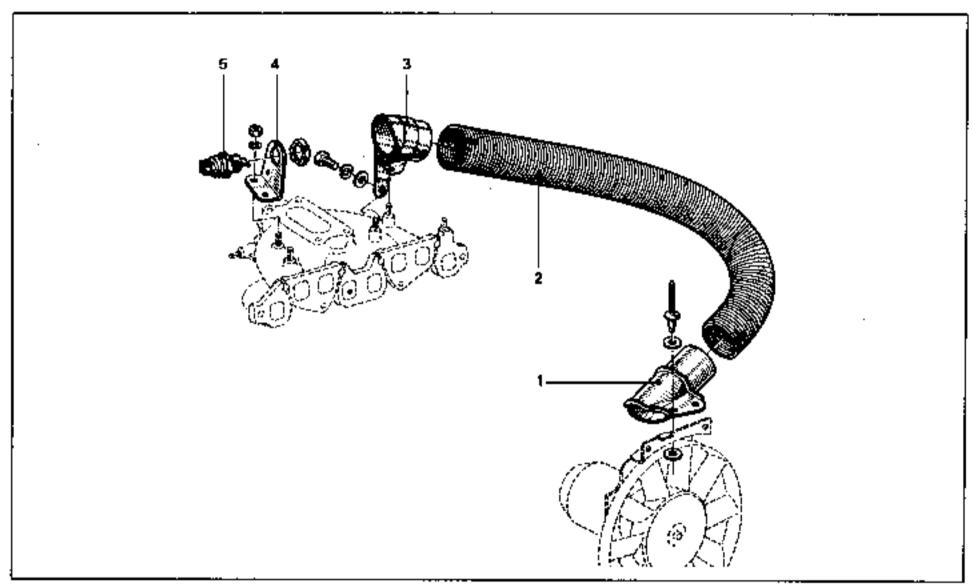
C3: 30°

C2: 80

C4: 30

Engines C2J-788 and 789

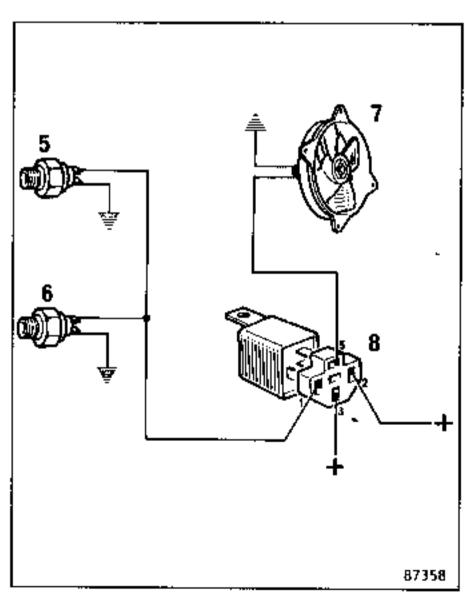
Anti-percolation system :



To improve driving comfort, air from a fan unit is blown over the carburettor.

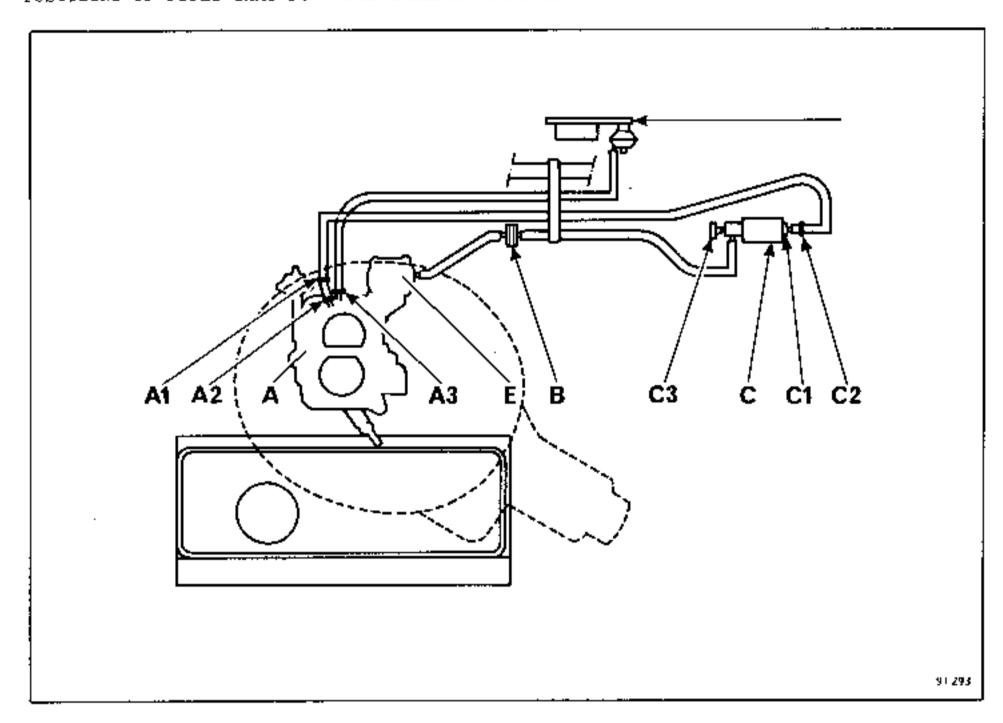
The fan switches on as soon as the ambbient temperature near the carburettor reaches 97°C. It is controlled by a 97/ 80°C temperature sensor which is secured to the inlet manifold and connected, in parallel, with the fan electrical circuit.

- 1. Intake casing
- Ducting
- 3. End fitting
- 4. Securing bracket
- 5. 97/80°C temperature sensor
- 6. Pan unit sensor
- 7. Fan unit
- 8. Relay



Engines C2J-788 and 789

POSITIONS OF PIPES THAT FORM THE EMISSION CONTROL CIRCUIT



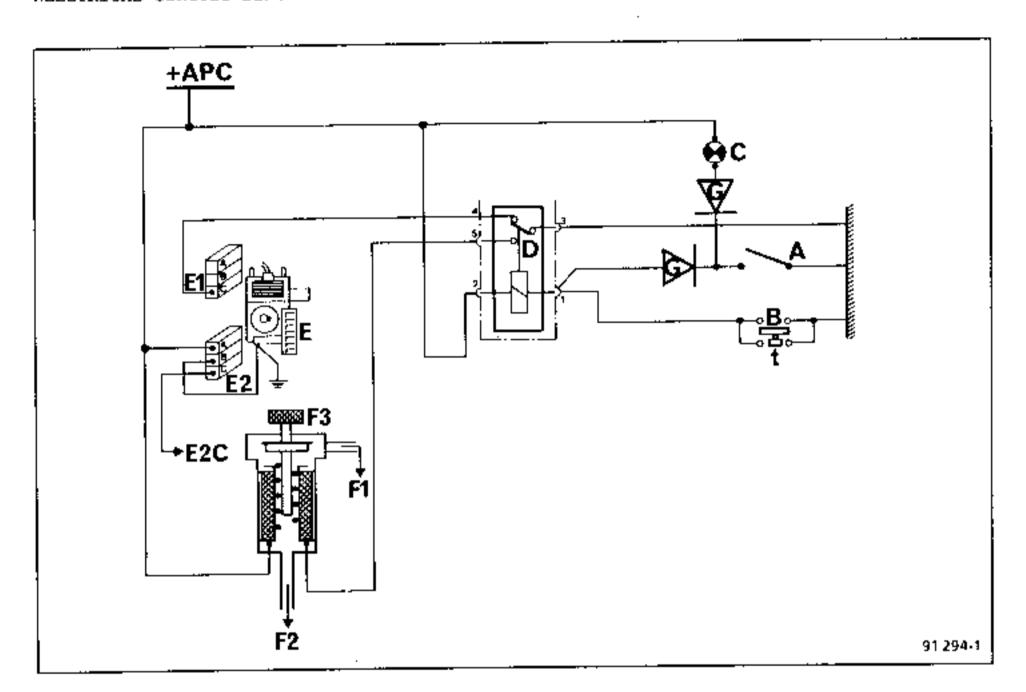
- A WEBER 32 DRT carburettor
 - Al Red ring
 - A2 Red positioning ring
 - A3 Black positioning ring
- B .Delay valve White face towards solenoid valve
- C Solenoid valve
 - Cl Red ring
 - C2 Red positioning ring
 - C3 Solenoid valve filter
- D Ignition module (capsule)
- E Throttle actuator

The throttle actuator (E) is controlled, under certain conditions, on overrun, by solenoid valve (C). These conditions are:

- when the engine oil temperature is between 15 and 70°C,
- between 15 and 70°C, the throttle actuator will not operate when the choke is pulled out.

Engines C2J G 782 and C2J T 784

ELECTRICAL CIRCUIT DIAGRAM



- A Choke control
- B 15/70°C oil temperature switch. Open at temperatures between 15 and 70°C.
- C Choke warning light
- D Relay
- E Ignition unit
 - El Black connector

Channel C : correction of advance

of - 5° at flywheel

E2 White connector

Channel A : plus after ignition

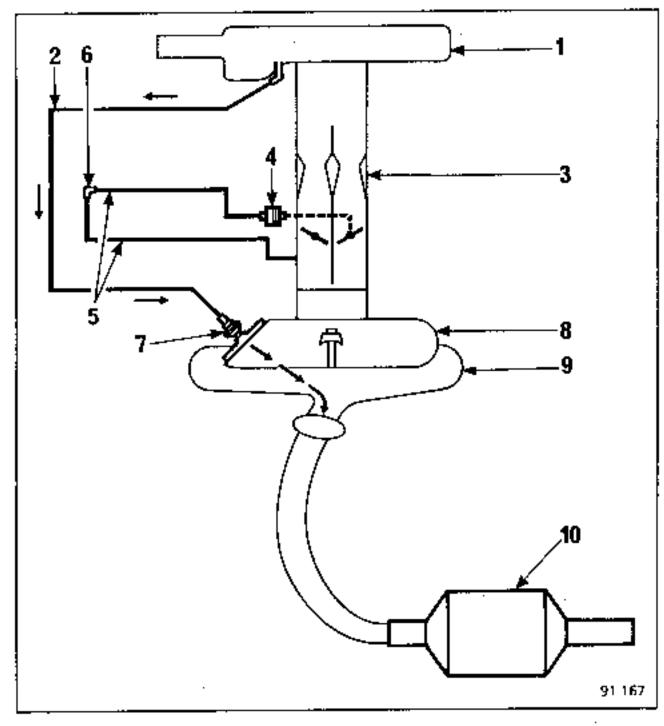
switch

Channel B : earth

Channel C : tachometer signal

- F Solemoid valve
 - Fl To throttle actuator via the white
 delay valve
 - F2 To carburettor Connection on input side of throttle
 - F3 Solenoid valve filter
- G Diodes
- + APC = + after ignition switch

Engines F2N G 742



- 1. Air filter
- Pipe conencting the air filter (1) to Pulsair air intake valve (7)
- 3. Carburettor
- 4. Delay valve
- Pipe connecting vacuum take-off point to actuator

- 6. 2 way connector
- 7. Pulsair
- 8. Inlet manifold
- 9. Exhaust manifold
- 10. Catalyser

The emission control system consists of a pulsair (7) mounted on the inlet manifold (8) and connected to the air filter (1) on one hand and to the exhaust manifold (9) on the other hand.

The pulsations in the exhaust manifold (9) set up a vacuum behind the pulsair (7) and this opens an air circuit between the air filter (1) and the exhaust (9) via the catalyser (10).

By passing fuel-free air (oxygen) into the exhaust system before the catalyser one raises the temperature of the products of combustion and permits a catalytic reaction to take place in the catalyser: this causes an oxydisation of the exhaust gases to take place to reduce the hydrocarbon (HC) and carbon monoxide (CO) content.

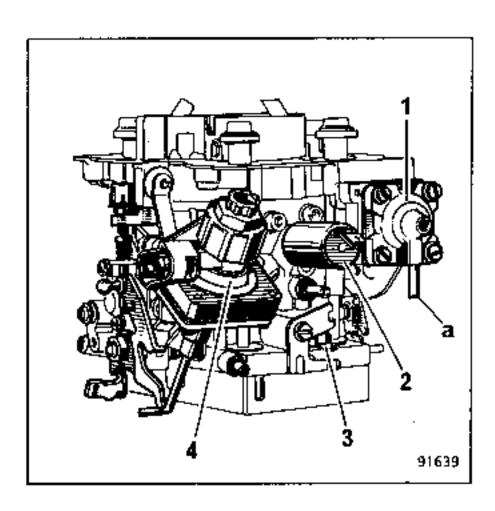
The reduction of the level of hydrocarbon emission during overrun results from the fitting of a throttle actuator and a delay valve (4) that is white or yellow in colour (the coloured side is to be towards the carburettor connection).

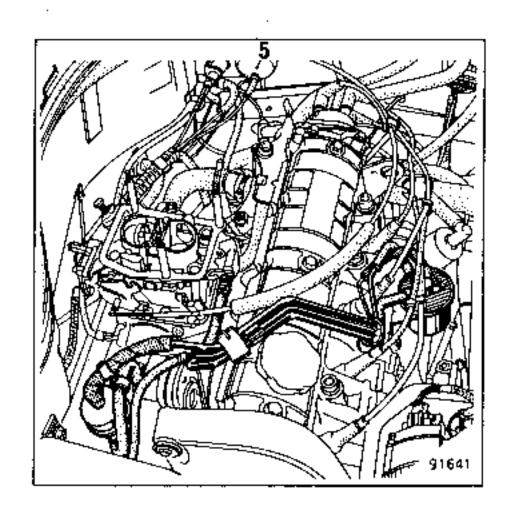
EMISSION CONTROL Special features of system

Engines F2N G 742

On all versions, the SOLEX 28 x 34 Z 10 carbruettor is equipped :

- with an idling speed cut-out on the idling speed circuit of the first barrel,
- with an electrical resistance on the idling circuit of the first barrel in place of the hot water heating system,
- with an accumulator, that is to say an additional volume on the choke servo diaphragm to eliminate stalling after starting,
- with a single or two stage throttle actuator depending on the version. The first stage is the emission control stage (to reduce hydrocarbon output during overrun) and for the air conditioning. The second stage is for the power steering system. The control systems for the different functions are therefore separate.

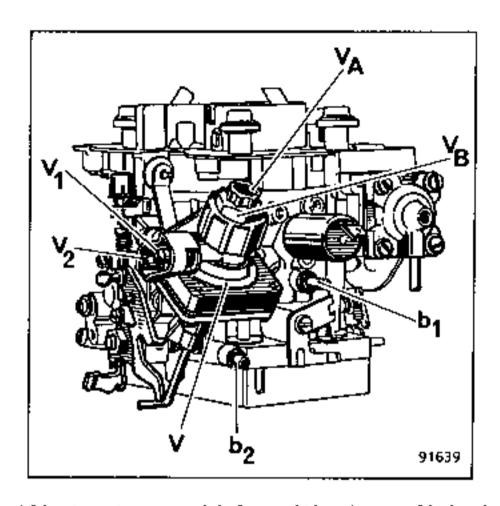




- Choke servo diaphragm
 - a Connection between servo diaphragm and accumulator
- Cut-out on first barrel idling circuit
- 3. First barrel idling circuit heating resistance
- 4. Two stage throttle actuator (on certain versions)
- Accumulator on choke servo diaphragm.

ENGINES F2N G 742 WITH POWER STEERING, AIR CONDITIONING AND EMISSION CONTROL

These vehicles are equipped with a two stage throttle actuator. Each stage is controlled separately by its own solenoid valve.



V. - Two stage throttle actuator $\mathbf{v}_{\mathbf{A}}$ -Air conditioning and emission control adjusting screw

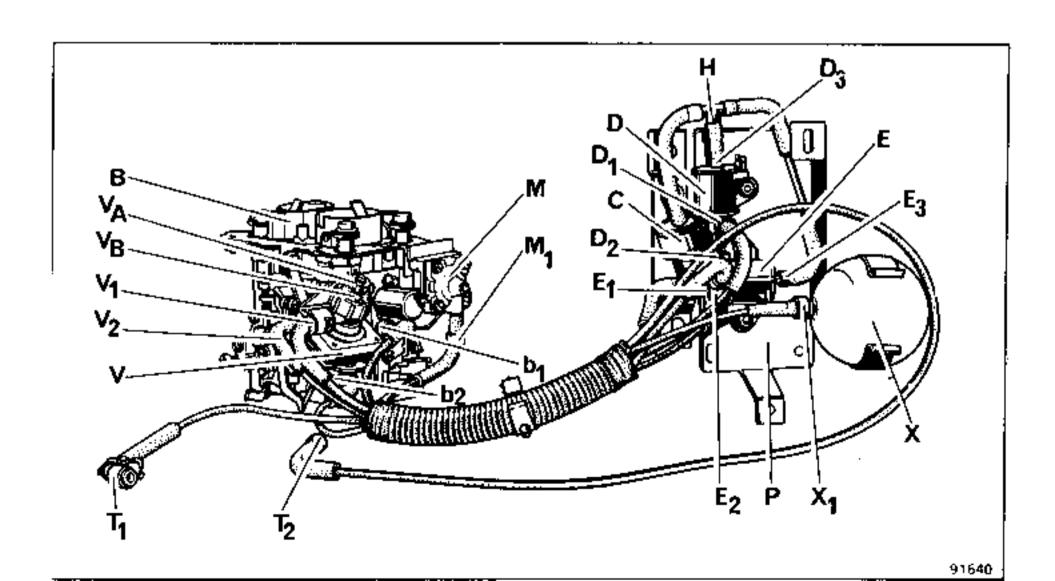
V_-Power steering adjusting screw V3-Air conditioning connector on act-

V₂-Power steering connector on actuator b_-Emission control connection

b2-Power steering and air conditioning connection

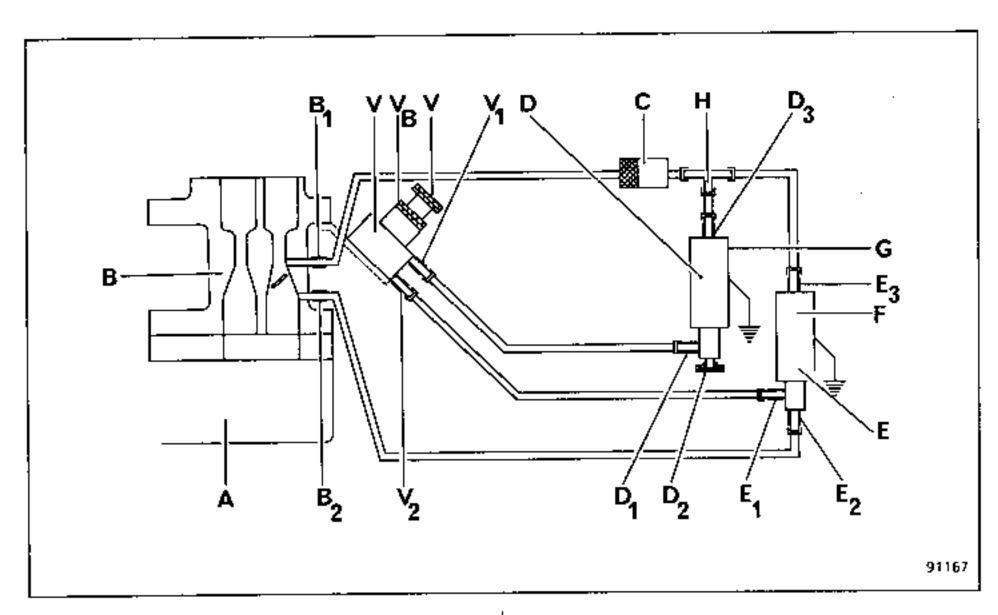
Adjustments on vehicles with air conditioning and power steering :

- Fast idling on vehicles with power steering (screw (V_B) : 1050 $\stackrel{+}{-}$ 50 rpm. - Fast idling on vehicles with air conditioning and emission control (screw (V_A) : 1500 + 100 rpm.



ENGINES F2N G 742 WITH POWER STEERING, AIR CONDITIONING AND EMISSION CONTROL

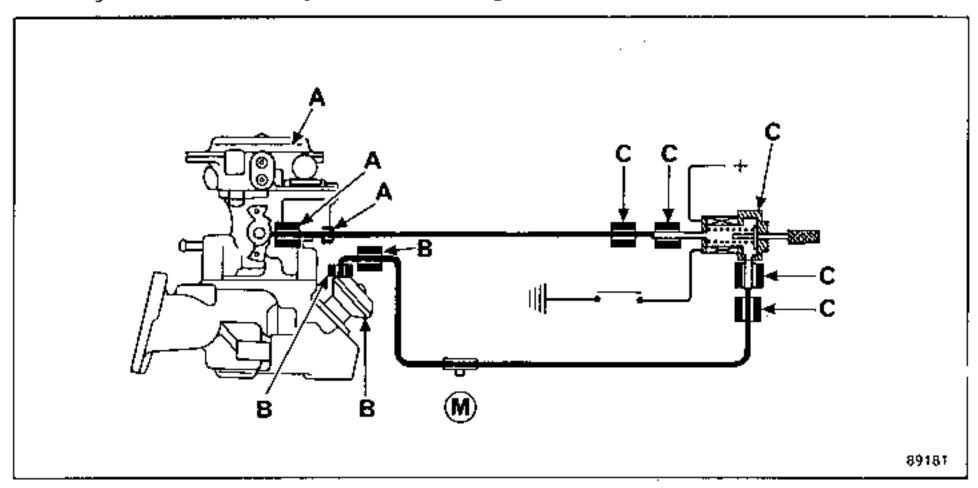
Pneumatic circuit diagram :



- A Inlet manifold
- B Carburettor Bl-White identification ring B2-Red identification ring
- C Delay valve (coloured face towards carburettor)
- O . Solenoid valve controlling stage V1 on throttle actuator V D1-Grey identification ring D2-Filter D3-White identification ring
- E Solenoid valve controlling stage V2 on throttle actuator V E1-Light blue identification ring E2-Red identification ring E3-White identification ring
- F Power steering signal
- G Air conditioning signal

- H Tunion
- V . Throttle actuator (on carburettor) V1-Grey identification ring V2-Light blue identification ring VA-Adjusting screw for air conditioning and emission control VB-Adjusting screw for power steering
- M . Choke servo diaphragm M1-Green identification ring
- X . Choke accumulator X1-Green identification ring.
- p . Support plate
- 7₁ A.E.I. connection on manifold yellow identification ring
- T₂ Connection on A.E.I., yellow identification ring

Exhaust gas recirculation system circuit diagram (E.G.R.)



A = Throttle unit

B = E.G.R. valve

C = Solenoid valve

A1 : Brown identification ring on throttle unit

A2 : Brown identification ring on pipe

B1 : Mauve identification ring on E.G.R. valve

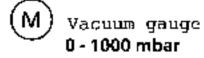
82 : Mauve identification ring on pipe

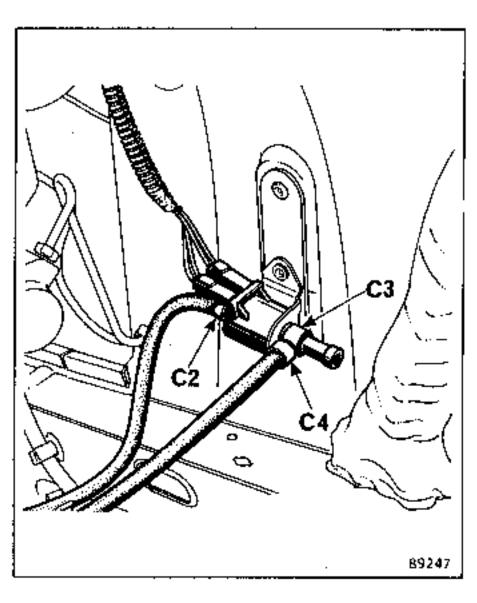
C1 : Brown identification ring on solenoid valve

C2 : Brown identification ring on pipe

C3 : Mauve identification ring on solenoid valve

C4 : Mauve identification ring on pipe





EMISSION CONTROL Fault finding

CHECKING - ADJUSTING THE SYSTEM

ENGINES CLE-752

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FUNCTION TESTED :			
TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
	i GNIT ION	ADVANCE	
Tachometer Strobe light	Warm engine (after fan has cut in twice), speed less than 800 rpm. Ad- vance capsule discon	Distributor adjust- ment R335 at + 6° flywheel <u>+</u> 2°	After adjusting advance curve R335, reconnect capsule C34: Timing should remain + 6° + 2° flywheel
	NORMAL	IDLING	
Tachometer CO tester	Warm engine (after fan has cut in twice)	Readings : - speed : 650 ± 25 rpm - mixture : 1,0 ± 0,5 % CO	Adjust if outside tolerances
		from 87 model year : - speed : 700 ± 50 rpm - mixture : 1,5 ± 0,5 % CO	
	HYDROCARBON EM	: :: : : :	
Tachometer CO tester	Warm engine (after fan has cut in twice) At normal idling speed	1. HC less than 770 ppm 2. HC more than 770 ppm	No action Check: - Spark plug gaps - Oil vapour reintake system - For air leaks
	FAST	IDLING	
Tachometer Manual vacuum pump Time change from fast idling to normal idling	After adjusting normal idling: accelerate the engine, off load, to 3000 rpm, then release the throttle control		The throttle actuator is opening correctly Check: - the direction in which the delay valve is fitted, white side towards carburettor, - the solenoid valve pneumatic connection - the electrical circ- uit.

ENCINES CIE-752 (continued)

FAST IDLING	(CONTINUED)	
	3.If the engine takes more than 20 seconds or less than 8 sec- onds to return to idling speed	Check that the follow- ing are correct: - the delay valve, - the carburettor, - the throttle control.
Warm engine : using a manual vac- uum pump, apply a vacuum of 700 mbars to the actuator	Fast idling : Speed : 1700 ± 100 rpm	Adjust if outside tolerances
TDLING SPI	ED CUT-OUT	
With the engine running at idling speed, disconnect idling speed cut-out	If the engine stalls	The system is operat- ing correctly

ENGINES CLE B 765

FUNCTION TESTED :



FUNCTION TESTED :	20000	•	
TEST EQUIPMENT	CONDITIONS	FIND IN GS	REMARKS
	IGNITION	ADVANCE	
Tachometer Storbe light	Warm engine (after fan has cut in twice), speed less than 800 rpm. Ad- vance capsule dis- connected	Distributor adjust- ment R335 at + 2° flywheel + 2°	After adjusting advance curve R341, reconnect capsule C33 : Timing should then be + 10° flywheel + 2°
	NORMAL	IDLING	
Tachometer CO tester	Warm engine (after fan has cut in twice)	Readings : - speed : - 700 ± 50 rpm - mixture : - 1,5 ± 0,5 % CO	Adjust if outside tolerances
	FAST	IDLING	
Tachometer Manual vacuum pump Time to change from fast idling to normal idling	After adjusting normal idling :	1.The engine speed	The throttle actuator is opening correctly Check: - the direction in which the delay valve is fitted, white side towards carburettor, - the solenoid valve pneumatic connection - the electrical circ- uit. Check that the follow- ing are correct: - the delay valve, - the carburettor, - the throttle control
	Warm engine : using a manual vac- uum pump, apply a vacuum of 700 mbars to the actuator	Fast idling : Speed : 1700 <u>+</u> 100 rpm.	Adjust if outside tolerances
	IDLING SPE	ED CUT-OUT	
1	Disconnect cut-out at idling.	If the engine stalls	The system is operat- ing correctly

EMISSION CONTROL Fault finding

CHECKING - ADJUSTING THE SYSTEM

ENGINES C1J TURBO

Items to be adjusted

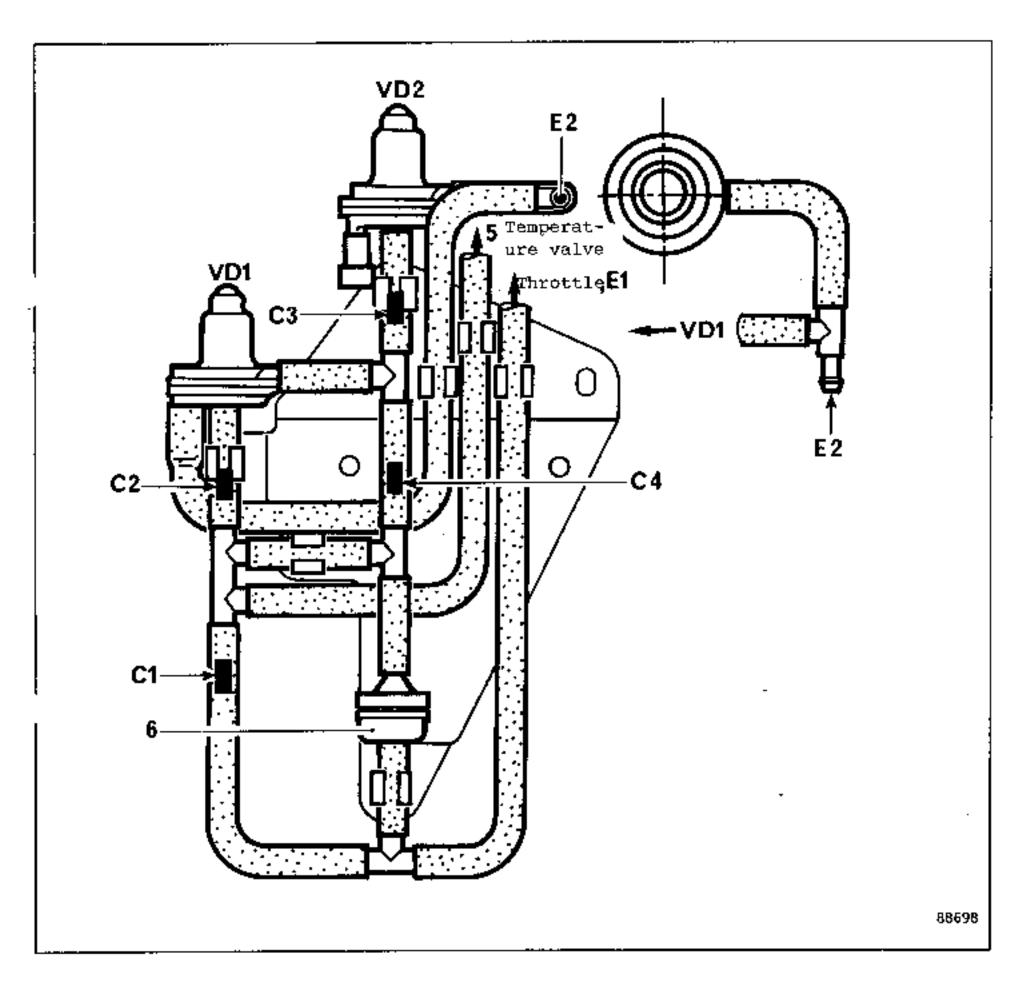
CONDITIONS	NOMINAL READING AND TOLERANCE	REMARKS
	201.000000000	
- Warm engine - Pulsair system not op- erating (air pipes pinched flat)	- Speed : 650 ± 50 rpm - mixture : 1,5 + 0,5 % CO	After adjustment, remove clamps from air pipes
 Warm engine Apply a vacuum of 800 mbars, with a vacuum pump, to the throttle actuator Accelerate the engine, off load, to 3000 rpm and allow the throttle to return normally 	- Speed : 1800 <u>+</u> 100 rpm.	After adjusting the normal idling speed

Functions tested :

CONDITIONS	FINDINGS	REMARKS		
Ove	rrun system throttle actuator - De	elay valve		
then allow the throt	The engine speed should fall, pm gradually, with a pause at 2 stlepoints: 1800 + 100 rpm and or- 1300 + 100 rpm, within a per- 10d of 3.5 to 6.5 seconds.	The throttle actuator is opening correctly		
	Defects: - Immediate return to idling	- Check the direction in which the delay valve is fitted and the strength of the throttle return system.		
	- Taking too long to return to idling	- Check that the delay valv is correct (brown in col- our) and strength of throttle return system.		

ENGINES C2J-788 and 789

Central pneumatic control unit :



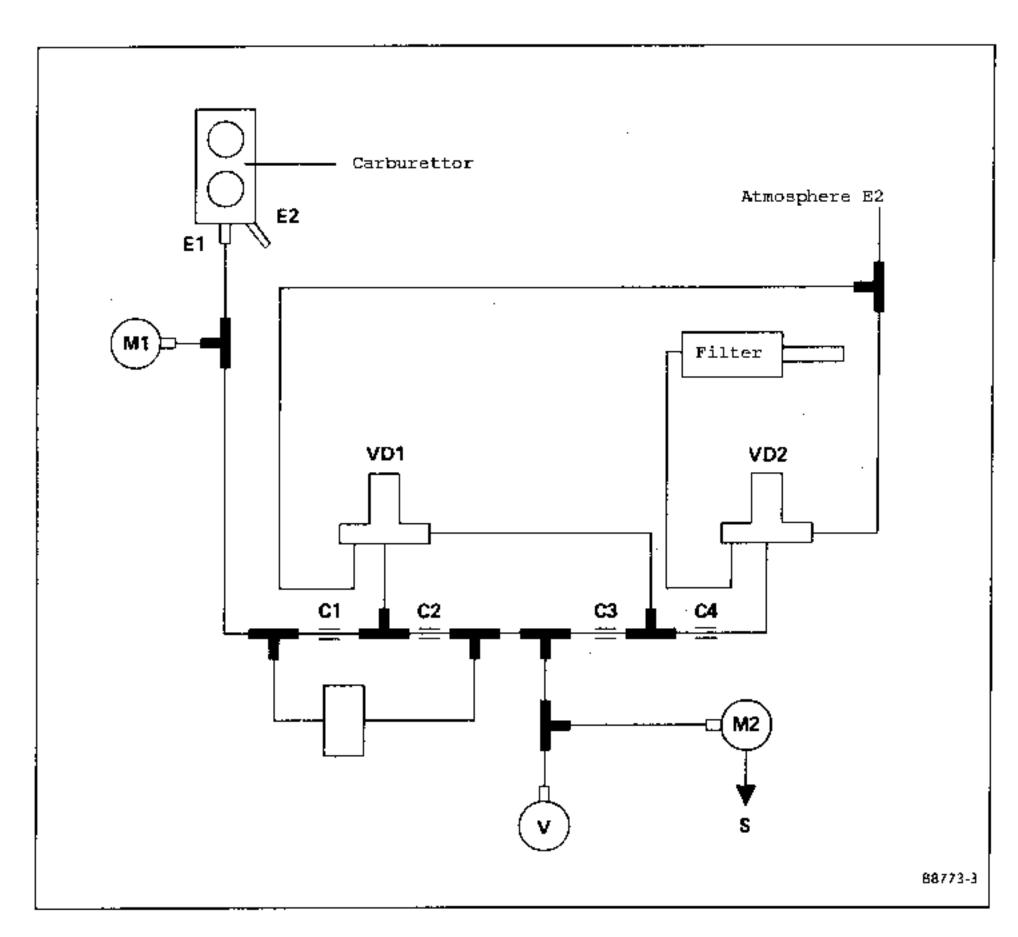
VD1. Regulator valve colour : Gold VD2. Auxiliary valve colour : Green

C1- C4 : Calibrated orifices

C1:60 C2:80 C3:30 C4:30 5. To temperature valve

6. Non-return valve

ENGINES C2J-788 and 789



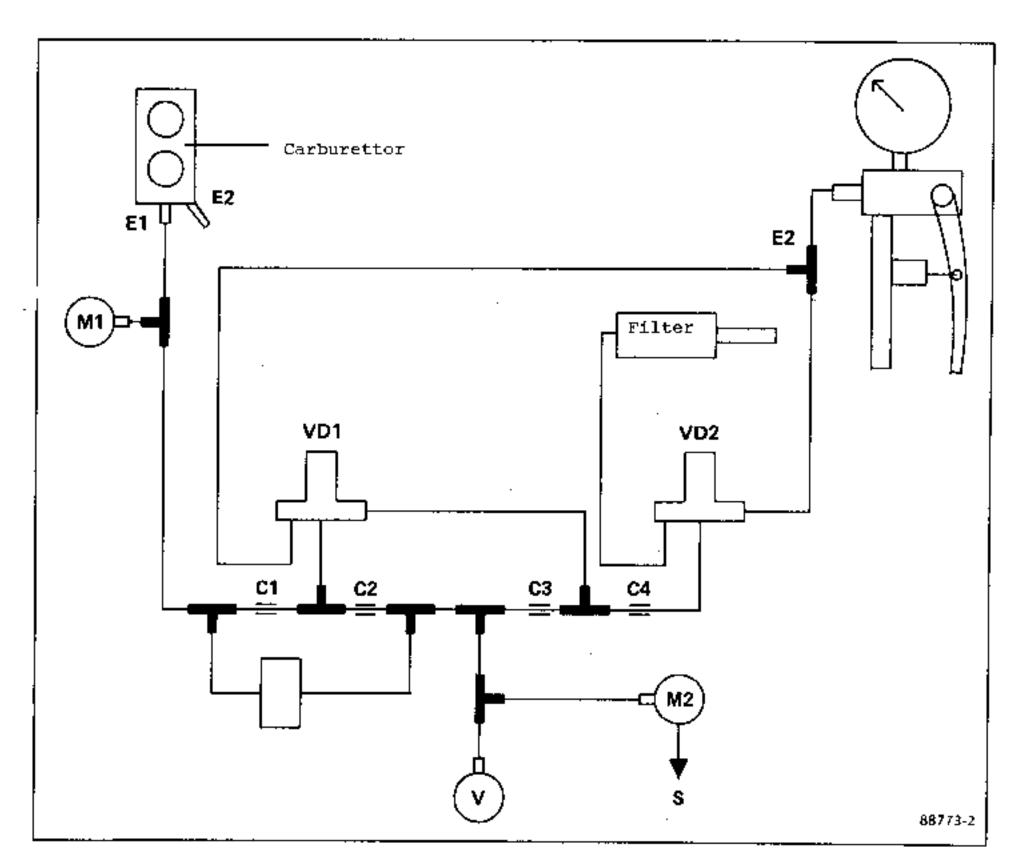
- Cl to C4 : Calibrated orifices :
- Ml) Vacuum gauges
- M2)
- V : E.G.R. valve

Adjusting VD1

Disconnect E2 and leave it vented to atmosphere.

Open the throttle to obtain a vacuum of 200 mbars at Ml. Vacuum S at M2 should then be at least 85 mbars.

ENGINES C2J-788 and 789



- CI to C4 : Calibrated orifices :
- Ml) _{Va}
- M2) Vacuum gauges
- V : E.C.R. valve

Adjusting VD2

- Disconnect E2 and leave it vented to atmosphere.
- Open the throttle to obtain a vacuum of 200 mbars at M1. The vacuum at M2 should then be between 80 mbars and 110 mbars.
- Connect a manual vacuum pump at E2 and apply a vacuum of 60 mbars.
- The vacuum 5 at M2 should then be more 150 mbars.

EMISSION CONTROL Fault finding

CHECKING - ADJUSTING THE SYSTEM

ENGINES C2J-788 and 789

FUNCTIONS TESTED

CONDITIONS	NOMINAL READINGS AND TOLERANCES	REMARKS
	Normal Idling	
- Warm engine Exhaust pulsair system not operating (air pipes pinched flat).	- Speed : Manual gearbox : 700 ± 25 rpm. Automatic transmission : 600 ± 25 rpm.* - Mixture : Manual gearbox : 1.5 ± 0.5% CO Automatic transmission : 1.0 ± 0.5% CO*	- After adjustment, remove the clamps from the air pipes *Note : with selector lever in "D"
	Fast Idling (C2J-788)	
- Warm engine Apply a vacuum of 700 mbars, with a vacuum pump, to the throttle actuator.	- Speed : 1800 ± 100 rpm	- After adjusting the norm- al idling speed
	Hydrocarbon content (C6H14)	
- Warm engine. - Exhaust pulsair system	1 - HC less than 450 PPM*	No action
not operating Engine at idling speed.	2 - HC more than 450 PPM* *(C6 H 14)	- Check the spark plug gaps the reintake system and the exhaust gas recircul- ating valve for leaks.
Operation of exhaust air intake system (Pulsair)		
- Warm engine Engine at idling speed.	<pre>1 ~ HC and CO (with exhaust pulsair system) = HC and CO (without pulsair syst- em operating). 2 ~ HC and CO (with exhaust pulsair system) less than HC and CO (without pulsair system operating).</pre>	 Pulsair system defective: Check system and its air circuits for leaks. Pulsair system operating correctly.

ENGINES C2J 782 and C2J 764

FUNCTIONS TESTED :



TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
	NORMAL	IDLING	
Tachometer CO tester	Warm engine (after fan has cut in twice). Engine oil temperat- ure higher than 70°C	1 4 F L A F W - CA	Adjust if outside tolerances
	FAST	IDLING	
Tachometer Manual vacuum pump Time to change from fast idling to norm- al idling	I	should fall grad- ually to normal idling in between 5 to 15 seconds	is opening correctly
	ure higher than 70°C Accelerate the engine, off load, to 3000 rpm, then release the throttle control		Check: - the direction in which the delay valve is fitted, white side towards solenoid valve, - the solenoid valve pneumatic connection - the electrical circuit
	Using a manual vac-	3.If the engine takes more than 15 seconds or less than 5 sec- onds to return to idling speed Fast idling:	Check that the follow- ing are correct: - the delay valve, - the carburettor, ' - the throttle control
	uum pump; apply a vacuum of 700 mbars to the actuator.	Speed : 1780 <u>+</u> 100 rpm.	Adjust if outside tolerances.

ENGINES C2J G 782 and C2J T 784

FUNCTIONS TESTED :

TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
	FAST IDLIN	G (continued)	
Tachometer Time taken to change from fast idling to normal idling	Warm engine (after fan has cut in twice) and engine oil temperature higher than 70°C.	If the engine re- turns to idling immediately (act- uator not operat- ing) after off load acceleration, If operation of actuator in quest- ion.	Operation correct Check:
			 the pneumatic and electrical circuit connections (see diagrams concerned)
			- oil temperature switch (at temperat- ures of less than 15 C or above 70°C, the switch should be earthed).
	IGNITIO	N ADVANCE	
Tachometer Ohmmeter Strobe lamp	Eliminate the ad- vance by earthing terminal C on the A.E.I.		
	Engine at idling speed: 1-Choke operating (no matter what the oil temperature and choke light on).	The input wire to the AEI unit is not earthed.	If not, check electric al connections
	2-Choke pushed in, light off, oil temperature be- tween 15 and 70°C.	The AEI unit input wire should be earthed.	<pre>If not, check : - the electrical conn- ections, - the 15/70°C oil temperature cutter</pre>
	3-Oil temperature higher than 70°C.	The AEI unit input wire should no longer be earthed.	<pre>temperature switch. If it is, check: - the electrical conn- ections, - the 15/70°C temperature switch.</pre>
	IDLING	COT-OUT	
	Disconnect cut-out at idling.	Engine stalls.	Operation correct.

ENGINES F2N G 742

Vehicles without power steering :

ITEMS TO BE ADJUSTED	CONDITIONS	READINGS	REMARKS	
Normal idling	 warm engine after warm-up procedure and fan cutting in Pipe between puls- air and air filter pinched flat. 	CO: 1,25 ± 0,5 %	Adjust after the fan has switched off. Engi: warm, running at idlinand pipe between pulsa and air filter pinched flat. The catalyser wivent itself.	
Fast idling	 engine warm (after adjusting normal idling). Apply a vacuum of 800 mbars to throttle actuator. 		After adjusting normal idling, with fan stopped.	

Vehicles with power steering :

ITEMS TO BE ADJUSTED	CONDITIONS	READINGS	REMARKS	
Normal idling	Same as vehicle with- out power steering.	See above para- graph.	Same as vehicle without power steering.	
Fast idling on power steering versions (screw VB)	 Warm engine (after adjustment of normal idling). Disconnect pipe from 2nd stage of actuator to solenoid valve D (grey ring). Disconnect pipe with light blue ring from 1st stage of throttle actuator. Apply vacuum of 800 mbars to 1st stage of actuator (V₂ on diagram). 	1050 ± 50 rpm.	 After adjustment of normal idling. Fan stopped. Wheels straight ahead. 	

ENGINES F2N G 742

FUNCTIONS TESTED :



Tachometer CO tester - Warm engine after worm-up procedure and fan cutting in Pipe between pulsair and filter pinched flat. - Past IDLING - Power Steering (FIRST STAGE) (screw marked VB on diagram) - Tachometer - Warm engine. - Warm engine after worm-up procedure and fan cutting in Pipe between pulsair and filter pinched flat. - Tachometer - Warm engine. - Warm engine. - Warm engine. - Tachometer - Warm engine. - Warm engine. - Tachometer - Warm engine. - Warm engine. - Tachometer - Check the ele connections on own valves. - Check the dire in which the dire in wh	TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
wern-up procedure and fan cutting in Pipe between pulsair and filter pinched flat. FAST IDLING - POWER STEERING (FIRST STAGE) (Screw marked VB on diagram) - Tachometer - Warm engine. - the engine should maintain it normal idling speed of 850 + 50 rpm despite turning the steering. Deptications on os valves. - Check the elections on os valves. - Tachometer - Warm engine. - Tachometer - Warm engine. - Warm engine. - Warm engine. - Time to fall from fast idling to normal idling. - Warm engine. - Time to fall from fast idling to normal idling. - Warm engine. - Stopwatch. - Accelerate engine release throttle control. - Stopwatch. - Accelerate engine speed should maintain it normal idling. - Warm engine. - The engine speed or the engine speed should maintain it normal idling. - Correct operation of 3 to 7 seconds. - DEFECTS: - Immediate return to idling: - Check the dire in which the divalve is fitte our defact throttle control. - Sluggish return - Check: - Penumatic conn on the 2 sol.		1	2.5000000000000000000000000000000000000	
- Tachometer		warm-up procedure and fan cutting in - Pipe between puls- air and filter	- speed : 850 ± 50 rpm or - mixture :	- Adjust if outside tol- erance and fan
- Tachometer - Warm engine. - the engine should maintain it normal idling speed of 850 + 50 rpm despite turning the steering. DEFECTS: Drop in speed or too high a speed. - Check the elections of pressure swit solenoid valves. - Check pneumate ections on os valves. - Tachometer - Warm engine. - Warm engine. - Warm engine. - Warm engine. - Tachometer - Warm engine. - Warm engine. - Tachometer - Warm engine. - The engine speed should gradually drop after a pause at 1500 - 100 rpm in a period of 3 to 7 seconds. - DEFECTS: - Immediate return to idling: - Check the directions on os valves. - Check the directions on os valves. - Check the directions on os valves. - Check the direction of 3 to 7 seconds. - Check the direction on on the 2 sol.		(screw marked)		E)
- Tachometer - Warm engine the engine speed should gradually drop after a pause at 1500 in the control Time to fall from fast idling to normal idling Time to fall from fast idling to normal idling Time to fall from release throttle control Timediate return to idling: - Check the direct in which the divalve is fitte oured face tow carburettor) a strength of the throttle control Sluggish return to idling speed - Correct operat throttle actual (second stage) - Correct operat throttle actual (second stage) - Check the direct in which the divalve is fitte oured face tow carburettor) a strength of the throttle control idling speed - Correct operat throttle actual (second stage)	- Tachometer		maintain it nor- mal idling speed of 850 + 50 rpm despite turning the steering. DEFECTS : Drop in speed or too high a	 Check the electrical connections on the pressure switch and solenoid valves. Check pneumatic connections on oslenoid
Stopwatch. - Accelerate engine to 3000 rpm then release throttle control. - Time to fall from fast idling to normal idling. - Time to fall from release throttle control. - Time to fall from fast idling to normal idling. - Time to fall from release throttle control. - DEFECTS: - Immediate return to idling: - Check the diretine which the divalve is fitte oured face tow carburettor) a strength of the throttle control. - Sluggish return to idling speed - Check: - Pneumatic connon the 2 sol.	FAST IDLING ON			PLUS DELAY VALVE)
DEFECTS: -Immediate return to idling: turn to idling: in which the divalve is fitte oured face town carburettor) astrength of the throttle contraction. -Sluggish return to idling speed - Check: - Check: - Check: - Check: - Pneumatic connomination on the 2 sol.	Stopwatch.Time to fall from fast idling to	- Accelerate engine to 3000 rpm then release throttle	should gradually drop after a pause at 1500 [±] 100 rpm in a period of 3 to 7	_
to idling speed - Pneumatic connon the 2 sol.			-Immediate re- turn to idling:	
correct.				Pneumatic connections on the 2 sol. valves.That delay valve is

ENGINES F2N G 742

Vehicles with power assisted steering :

ITEMS TO BE ADJUSTED	CONDITIONS	READINGS	REMARKS
Fast idling on emm- ission control vers- ions (screw V _A).	 Disconnect the pipe from the 1st stage of the actuator to solenoid valve E (light blue ring). Disconnect the pipe with the grey ring from the 2nd stage of the throttle actuator. Apply a vacuum of 800 mbars to the 2nd stage of the actuator (V on the diagram). 	1500 ± 100 rpm.	 After adjusting normal idling speed. Fan switched off. Power steering stage of actuator previously adjusted.

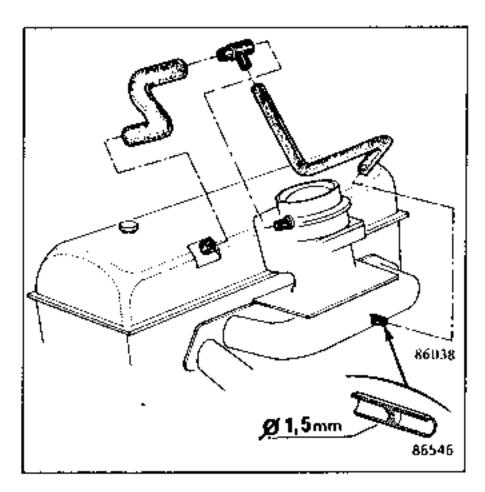
The gases from the engine crank case are recirculated. They are taken from the rocker arm cover and passed into the inlet manifold through a dual circuit (input and output) for burning in the combustion chambers.

CHECKING

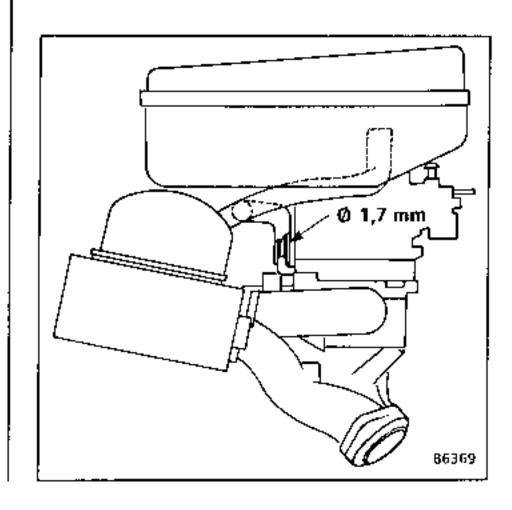
For the emission control system to operate correctly, the oil vapour reintake system must be kept clean and in good condition.

Check that the various calibrated orifices are in place and of the correct sizes.

ENGINES CIC, CLE, CLG, CLJ



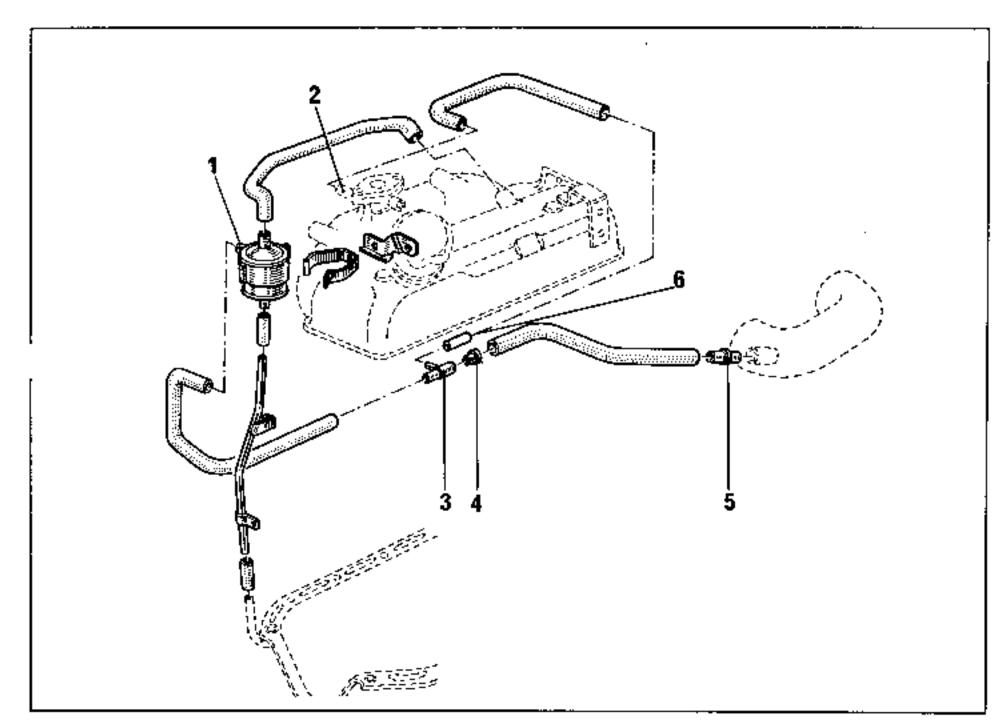
ENGINES C2J



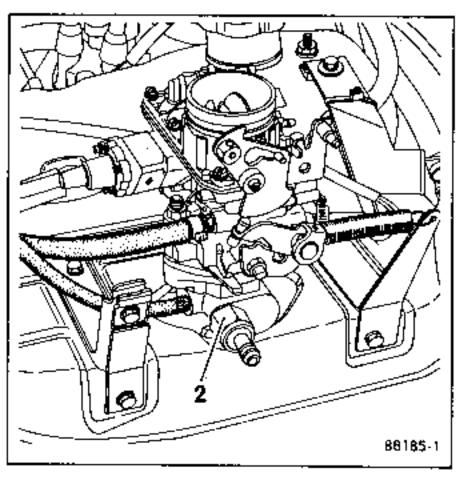
ENGINES C1C



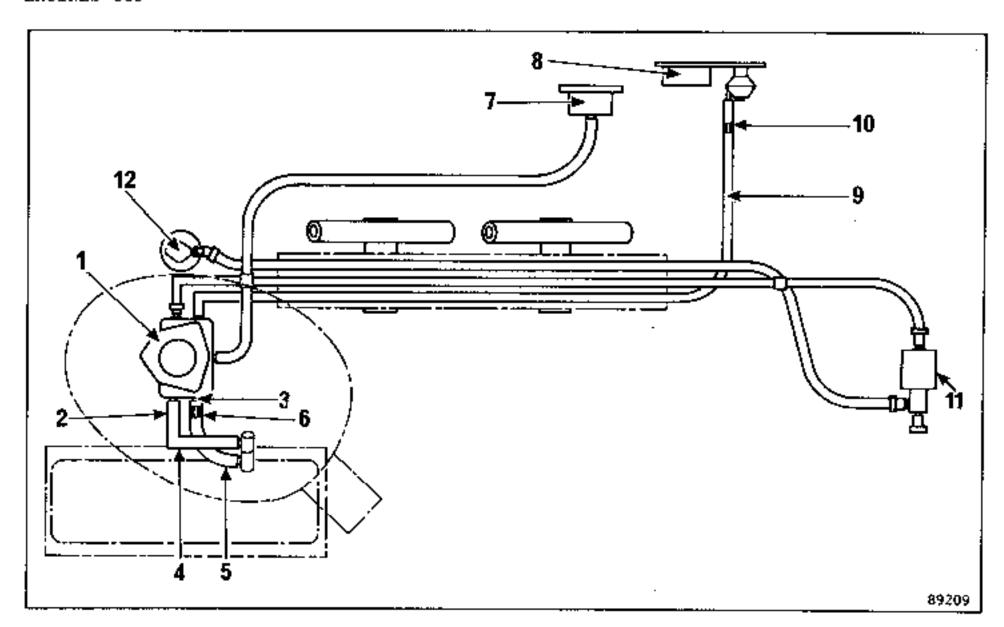
ENGINES ClJ with turbocharger



- Collector
- Valve (closed when inlet manifold under pressure)
- 3. Tunion
- 4. 7 mm \emptyset calibrated orifice
- 5. Union
- 6. 1.7 mm Ø calibrated orifice



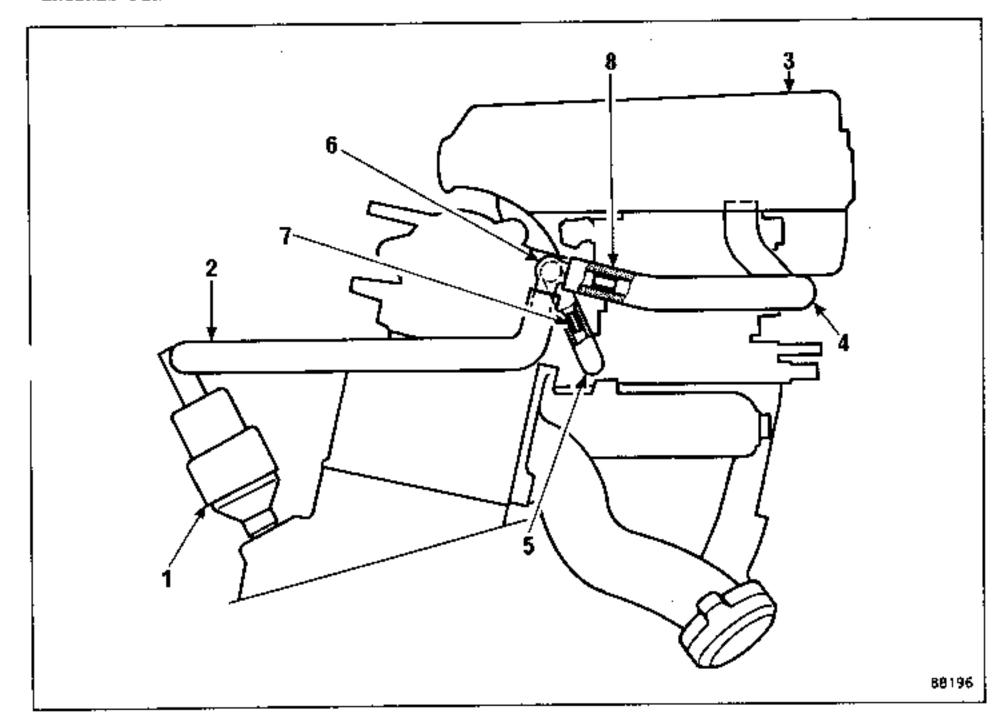
ENGINES C3J



- 1. Throttle unit
- Connector on input side of throttle unit
- Connector on output side of throttle unit
- 4. Input side pipe
- 5. Output side pipe
- 6. 1.5 mm Ø calibrated orifice
- 7. Absolute pressure sensor

- 8. A.E.I. electronic ignition unit
- Pipe connecting throttle unit to A.E.I. (only on the B,C,F 407, Bendix injection)
- 10. 1.2 mm Ø calibrated orifice (only or the B,C,F 407, Bendix injection)
- E.G.R. control solenoid valve
- 12. E.G.R. valve

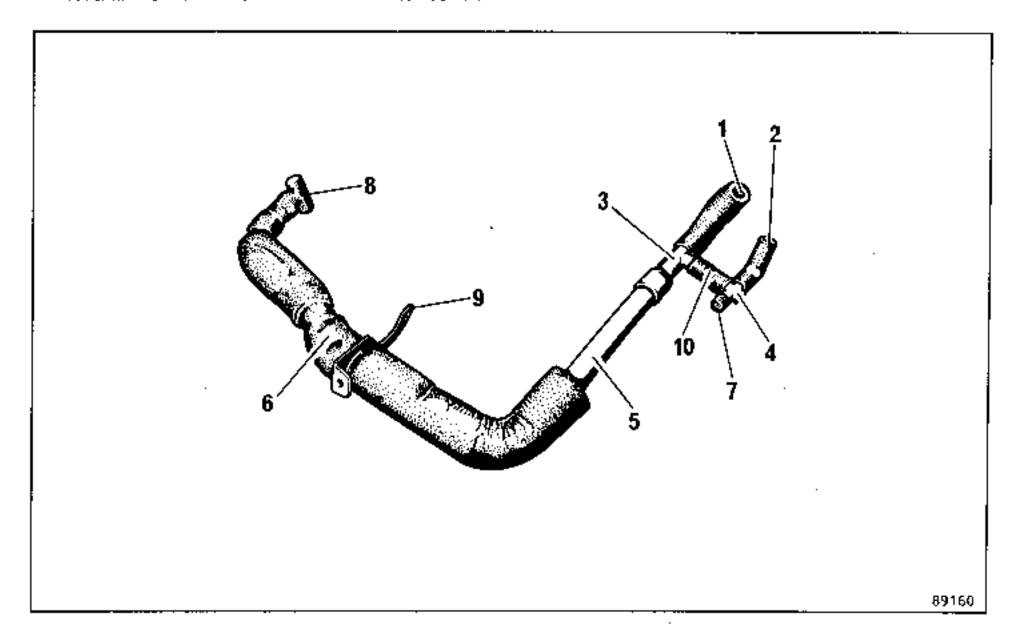
ENGINES F2N



- 1. Collector
- h Pipe (collector to 3 way union)
- 3. Air filter
- 4. Pipe (filter to 3 way union)

- 5. Pipe (3 way union to carburettor base)
- 6. 3 way union
- 7. 1.7 mm Ø calibrated orifice
- 7 mm Ø calibrated orifice

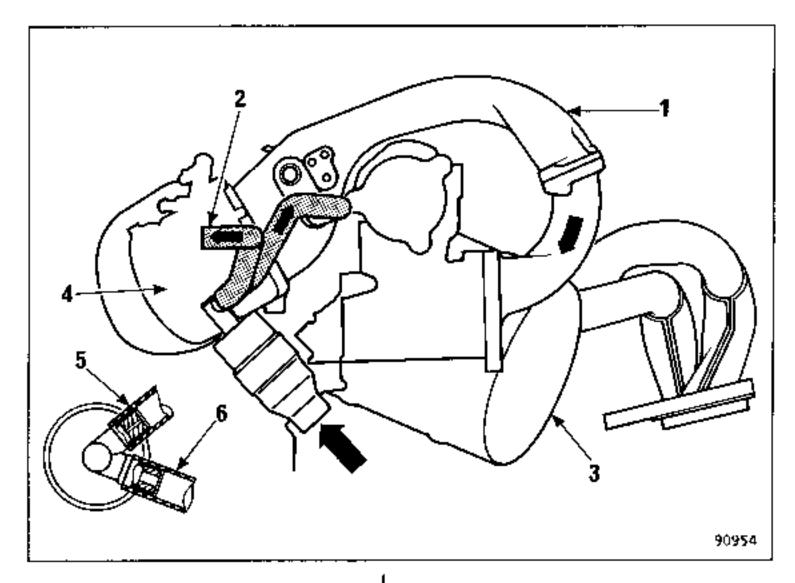
ENGINES F3N WITH SINGLE POINT INJECTION



- 1. Throttle unit upper connector (input side circuit)
- 2. Throttle unit lower connector (output side circuit)
- 3. T union
- 4. T union
- 5. Air duct
- Air duct (isolated)
- 7. Plug
- 8. Collector
- 9. Securing lug
- *10. Connecting pipe

*NOTE : on B, C 408 vehicles, 1987 model year, pipes (2) and (10), the T union (4), and plug (7) are replaced by a pre-formed elbow pipe connected to the lower connector or on the throttle unit (output side circuit).

ENGINES F3N WITH MULTIPOINT INJECTION



- 1. Distributor unit
- 2. Connecting pipe
- 3. Air filter

- 4. Throttle unit
- 5. 1.5 mm Ø calibrated orifice (to distributor unit)
- 6.6.5 mm Ø calibrated orifice (to connecting pipe)

CRANK CASE GAS/OIL VAPOUR REINTAKE SYSTEM

This system for recirculating the crank case gases is of the "closed vent" type with sircuits, one on the input side and the other on the output side of the throttle unit.

The INPUT side circuit :

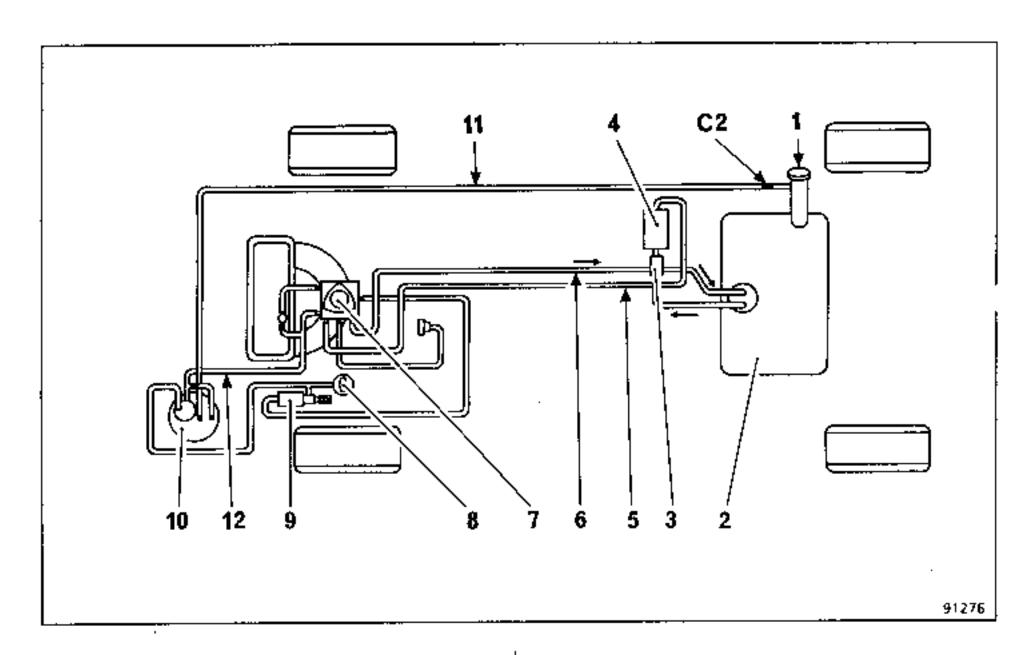
This passes from the collector, through a 6.5 mm \emptyset calibrated orifice, to the connecting pipe (between the air filter and the throttle unit).

The OUTPUT circuit :

This passes from the collector through a 1.5 mm \emptyset calibrated orifice to the inlet manifold.

CIRCUIT DIAGRAM

ENGINES C3J E 760



- 1. Sealed cap
- 2. Fuel tank
- 3. Electric fuel pump
- Fuel filter
- 5. Fuel supply line
- Fuel return line
- Throttle unit
- 8. E.G.R. valve
- Solenoid valve for controlling the E.G.R. and bleeding the canister
- Fuel vapour absorption canister
- 11. Canister connecting pipe
- Bleed pipe

Calibrated orifices :

C1 ø 0,90 mm C2 ø 1,25 mm C3 ø 1,50 mm B/C/F 407 vehicles marketed in certain countries, during certain model years, are equipped with a fuel vapour absorption sytem.

The system consists of a fuel vapour absorption canister (10) connected to the fuel tank (2) by a pipe (11).

The canister contains active carbon and has a valve (A) which is connected to the inlet manifold through a solenoid valve (9) that bleeds the canister. The solenoid valve is controlled by the computer.

ENGINES C3J £ 760

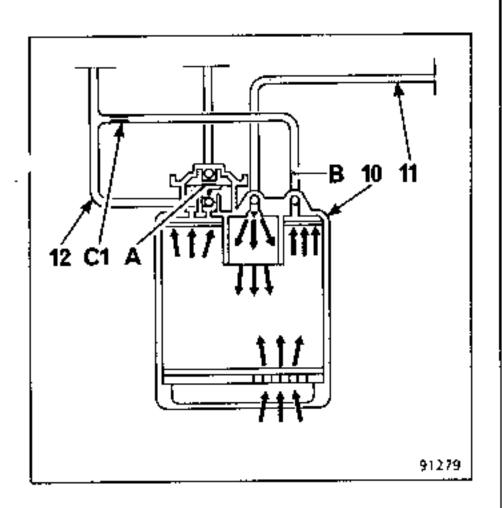
PRINCIPLE OF OPERATION

When the engine is not running : The fuel vapour is collected by the canister (10).

This vapour comes from the fuel tank (2) through a calibrated orifice (C2) \emptyset 1.25 mm.

When the engine is running at idling speed: The canister is bled through a circuit (B) in which there is a calibrated orifice (C1) 0.90 mm \emptyset .

Then the engine is running at speeds other than idling speed:
Under certain conditions, when the engine is hot, the injection computer operates the solenoid valve (9) to open the pneumatic circuit to valve (A) on the canister. The valve opens the bleed circuit between the inlet manifold and the canister along pipe (12).

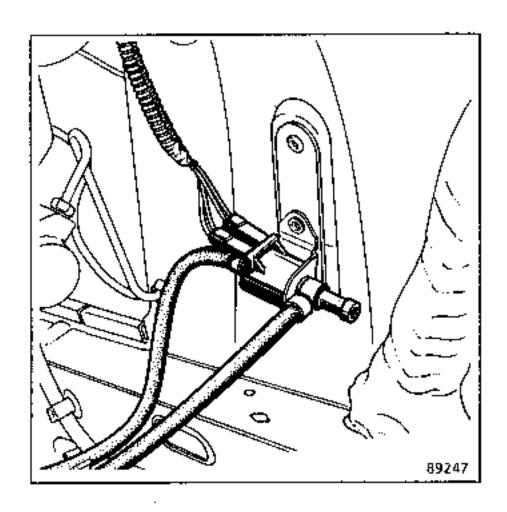


POSITIONS OF THE ANTI-EVAPORATION SYSTEM COMPONENTS

The canister :

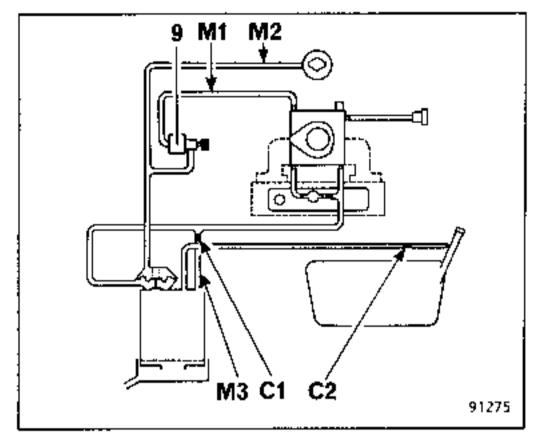
The fuel vapour absorption canister is secured, by a strap, to a support near the brake master cylinder.

The E.G.R. control and canister bleed solenoid valve is mounted on the left hand shock absorber turret near the brake master cylinder.



CHECKING THE ANTI-EVAPORATION SYSTEM

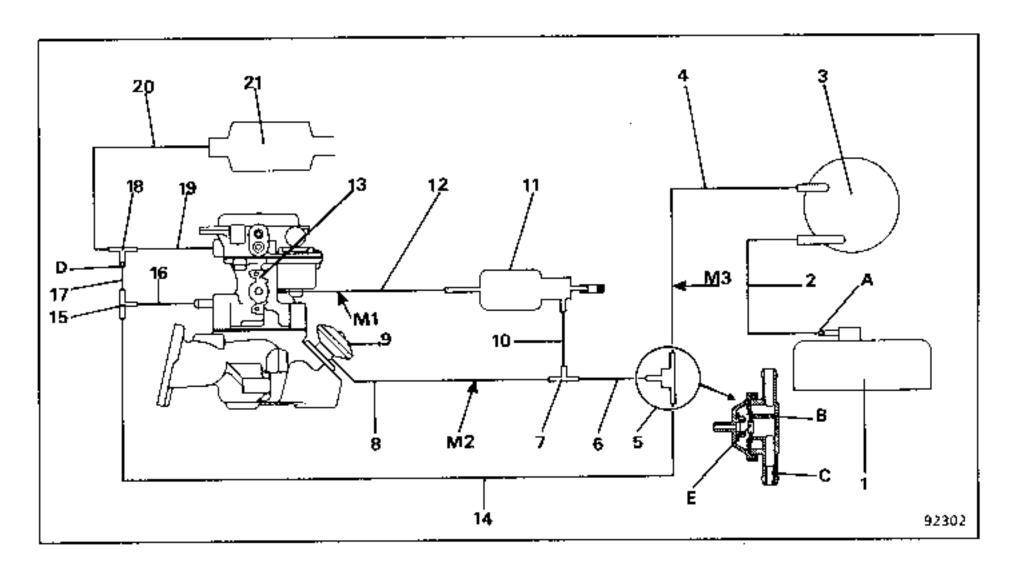
ENGINES C3J E 760



FUNCTION UNDER TEST	TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
ation circuit bleed	Vacuum gauges (0,1000 mbar) connected in parallel to : - M1 - M2 - M3 Voltmeter connected across the 2 terminals on the solenoid valve (9)	Engine warm after fan has cut in twice Running at idling speed	- No vacuum at M2 - Vacuum at M3 - Voltage = 12 volts across terminals on solenoid valve (9)	If there is a vacuum at M2, check that the solenoid valve is correctly connected and check the computer and electrical wiring. If the vacuum at M3 = the vacuum at M1, check size of calibrated orifice C1
		When acceler- ator is dep- ressed	uum at M1 - Vacuum at M3 tending	If vacuum at M2 is not the same as vacuum at M1, check the solenoid valve, that the computer is correct and that the pneumatic circuits are correct.

CIRCUIT DIAGRAM

ENGINES F3N SINGLE POINT INJECTION



- 1. Fuel tank
- Pipe between tank and canister
- 3. Fuel vapour absorption canister
- 4. Pipe between canister and bleed
- valve
- 6. Bleed valve
- 7. Pipe between bleed valve and T union
- 8. Tunion
 - Pipe between T union and recirculation valve
- Exhaust gas recirculation valve (E.G.R.)
- 10. Pipe between T union and solenoid valve
- 11. Solenoid valve controlling the exhaust gas recirculation valve and the canister bleed
- 12. Pipe between solenoid valve and throttle unit
- 13. Throttle unit
- 14. Pipe between valve and T union

- 15. T union
- 16. Pipe between T union and throttle unit
- 17. Pipe between T unions
- 18. Calibrated T union
- 19. Pipe between calibrated T union and throttle unit
- 20. Pipe between calibrated T union and collector
- 21. Collector

Calibrated orifices :

- A ø 1,4 mm
- B & 0,80 mm
- C ø 2 mm
- D ø 1,5 mm
- E diaphragm in valve (5)

ENGINES F3N SINGLE POINT INJECTION

PRINCIPLE OF OPERATION

B/C 408 vehicles marketed in certain countries and of certain model years are equipped with a system for absorbing the fuel tank vapour.

The principle of operation is identical to the system fitted to B/C and F 407s.

The bleed system is different in that the canister bleed valve is not an integral part of the canister.

PRINCIPLE OF OPERATION

When the engine is stopped:

The fuel vapour is collected in the canister (3). It comes from the fuel tank (1) through a calibrated orifice (A) 1.4 mm \emptyset .

When the engine is running at idling speed:

The canister is bled through the calibrated orifice B, 0.80 mm \emptyset and pipes (4), (14) and (16).

When the engine is running at speeds other than idling speed:

Under certain conditions, when the engine is warm, the injection computer operates the solenoid valve (11) to open the pneumatic circuit at the bleed valve (5). The diaphragm (E) on the valve is lifted to permit the canister to be fully bled through the circuit parallel with the calibrated orifice (B), as shown by the arrows, through the calibrated orifice (B) which is $2 \text{ mm } \emptyset$.

POSITIONS OF THE ANTI-EVAPORATION SYSTEM COMPONENTS

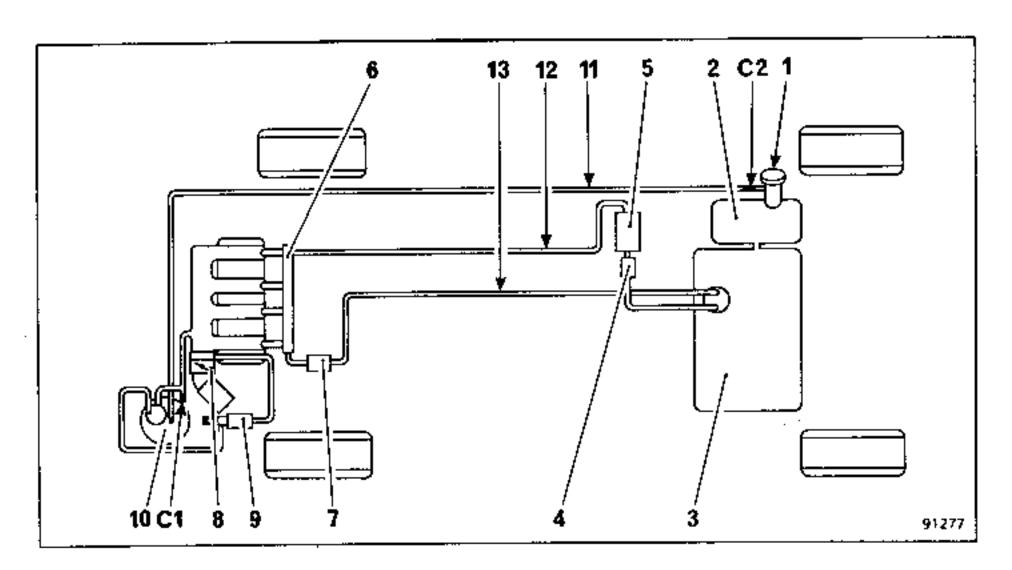
The positions of the various anti-evaporation system components are identical to those on B, C and F 407 vehicles.

Checking the anti-evaporation system :

The system is checked in exactly the same way as B,C,F 407 vehicles (see system bleeds on page 14-42).

CIRCUIT DIAGRAM

ENGINES F3N J 702



- 1. Sealed filler cap
- 2. Auxiliary tank
- Main tank
- 4. Electric fuel pump
- 5. Fuel filter
- 6. Fuel gallery
- 7. Pressure regulator
- 8. Throttle unit
- Canister bleed control solenoid valve
- Fuel vapour absorption canister
- 11. Pipe connecting filler pipe to canister
- 12. Fuel line
- 13. Return line

Calibrated orifices :

C1 Ø 0.65 mm

C2 Ø 1.25 mm

C409 vehicles marketed in certain countries (in particular SWEDEN) are equipped with a circuit to absorb vapour from the fuel tank.

The circuit consists of a fuel vapour absorption canister (10) connected to the fuel tank (2) by a pipe (11).

The canister contains active carbon. It is equipped with a valve (A) connecting it to the inlet manifold through a solenoid valve (9) which controls the canister bleed. The solenoid valve is operated by the computer.

ENGINES F/N J 702

PRINCIPLE OF OPERATION

When the engine is stopped: The fuel vapour is collected in the canister (10).

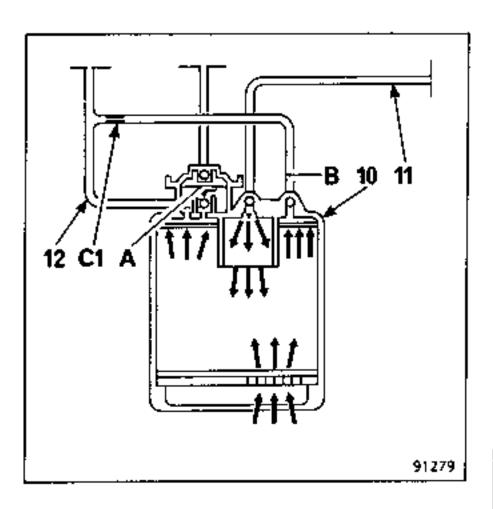
It comes from the fuel tank (2) through a calibrated orifice (C2) 1.25 mm \emptyset .

When the engine is running at idling speed:

The canister is bled through a circuit (B) with a calibrated orifice (C1) 0.65 mm ϕ in it.

When the engine is running at other than idling speed:

Under certain conditions, when the engine is warm, the injection computer operates the solenoid valve (9) to open the pneumatic circuit acting on the canister valve (A). The valve opens the bleed circuit between the inlet manifold and the canister through pipe (12).



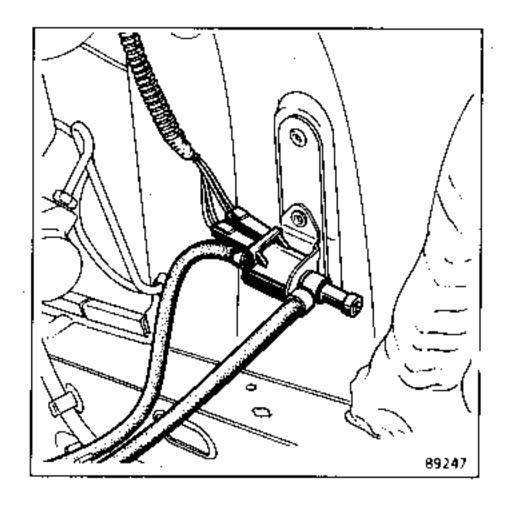
ANTI-EVAPORATION CIRCUIT COMPONENT LAYOUT

Canister :

The fuel vapour absorption canister is secured to a support by a strap, near the brake master cylinder.

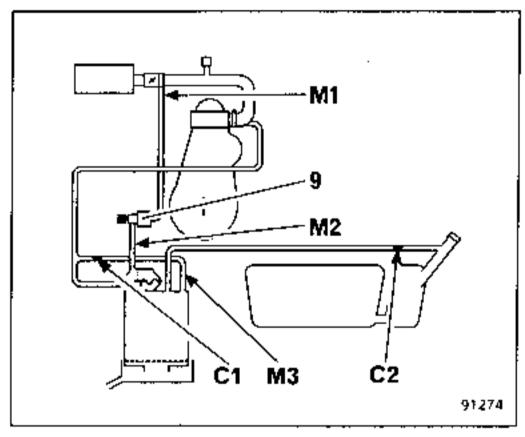
The E.G.R. and canister bleed solenoid valve :

Is mounted on the left hand shock absorber turret near the brake master cylinder.



CHECKING THE ANTI-EVAPORATION CIRCUIT

ENGINES F3N J 702



FUNCTION TESTED	TEST EQUIPMENT	CONDITIONS	FINDINGS	REMARKS
Anti-evapora- tion circuít bleed	Vacuum gauges (0.1000 mbar) connected in parallel with the circuits at : - M1 - M2 - M3 Voltmeter connected across the 2 terminals of solenoid valve (9)	Engine warm after electric fan has cut in twice Running at idling speed	 Zero vacuum at M2 Vacuum at M3 Voltage = 12 volts across the terminals of solenoid valve (9) 	If there is a vacuum at M2, check the solenoid valve connections, the computer and the electrical wiring. If the vacuum at M3 = the vacuum at M1, check that calib.
		When acceler- ator is dep- ressed	 Vacuum at M2 = vacuum at M3 Vacuum at M3 tends towards the vacuum reading at M1 (without becoming identical). Voltage drops towards 0 volts when accelerator depressed 	and check pneumatic circuits.

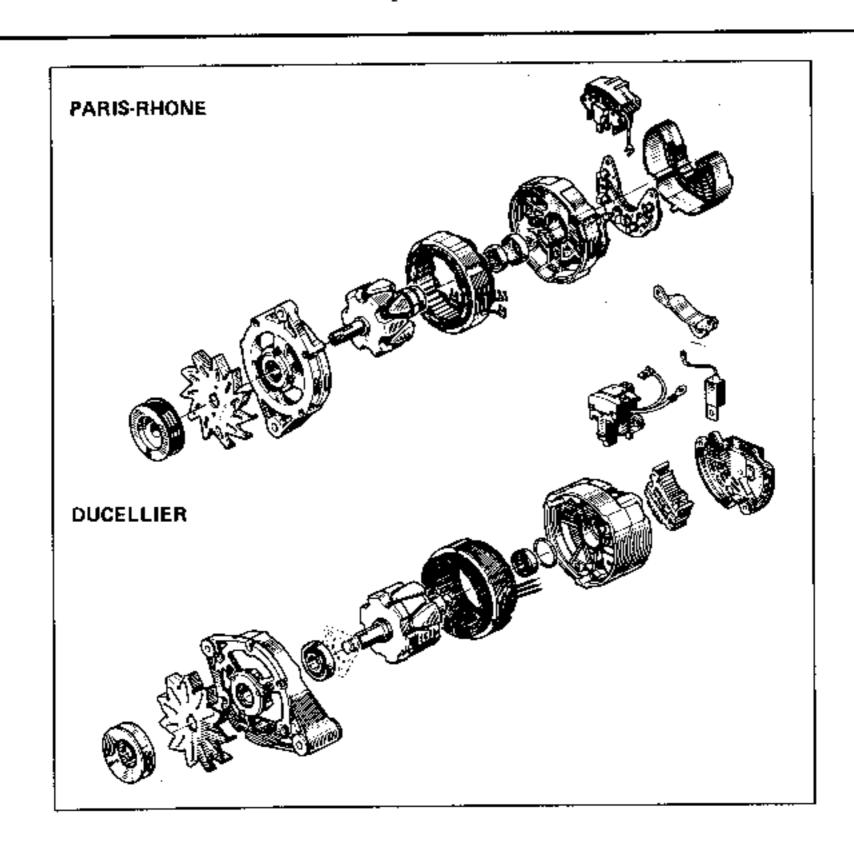
STARTING-CHARGING SYSTEMS Alternator

CHECKING :

After allowing the alternator to warm up for 15 minutes at 13.5 volts.

rpm	PARIS-RHONE A 14 N 87 75 amp	PARIS-RHONE A 13 N 104 50 amp	DUCELLIER 516 058 50 amp
1 250	12 A	10 A	10 A
3 000	61 A	43 A	43 A
6 000	70 A	48 A	48 A

Exploded view



STARTING-CHARGING SYSTEMS Alternator

OPERATION-FAULT FINDING

These vehicles are equipped with alternators that have integral voltage regulators and a warning light on the instrument panel that operates as follows:

- When the ignition is switched on, the light switches on,
- when the engine starts, the light switches off,
- if the light switches on again whilst the engine is running, there is "charging" defect.

FAULT FINDING

If the warning light does not switch on when the ignition is switched on.

Check that the regulator connector is connected.

Check whether the bulb is burnt out (to do this earth the 6.3 mm pin on the connector. The light should switch on).

If the warning light switches on whilst the engine is running:

It is an indication of a charging defect the origin of which can be:

- broken alternator drive belt. Broken charging cable,
- damage inside the alternator (rotor, stator, diodes or brushes),
- voltage regulator defect.

If the customer complains of a charging defect despite the fact that the warning light is operating correctly.

If the regulated voltage is less than 13.5 V, check the alternator. The defect may be caused by :

- a burnt out diode,
- one of the phases broken,
- carbon deposits on the slip ring tracks.

Checking the voltage

Connect a voltmeter across the battery terminals and read the battery voltage.

Start the engine and increase the speed until the voltmeter pointer stabilises at the regulated voltage.

This voltage should be between 13.5 V and 14.8 V.

Switch on as many current consuming accessories as possible. The regulated voltage should remain between 13.5 V and 14.8 V.

WARNING: It is essential to disconnect the battery and the voltage regulator before carrying out arc welding work on the vehicle.

REMOVING-REFITTING

Do not remove a drive belt by forcing it off with a screwdriver. It is made of synthetic threads and could be damaged.

Disconnect :

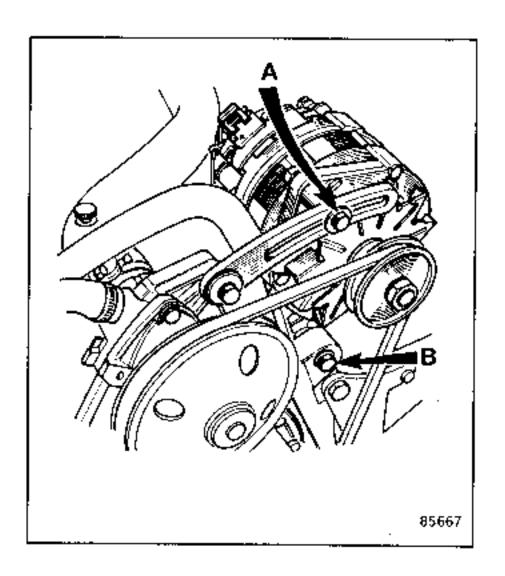
- the battery,
- the electrical wires.

Remove :

- the bolt (A) from the tensioner,
- the securing bolt (B) and take off the alternator.

Requirement after refitting

After refitting the alternator, retension the belt.



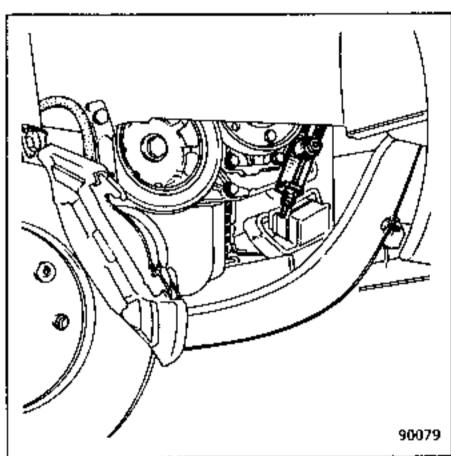
REMOVING-REFITTING

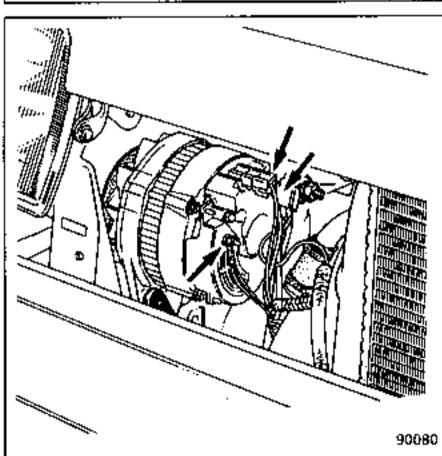
Disconnect the battery

Remove :

- The radiator grille,
- The radiator baffle on the right hand side,
- The cover from the right hand wheel arch.

Slacken the belt and remove it.



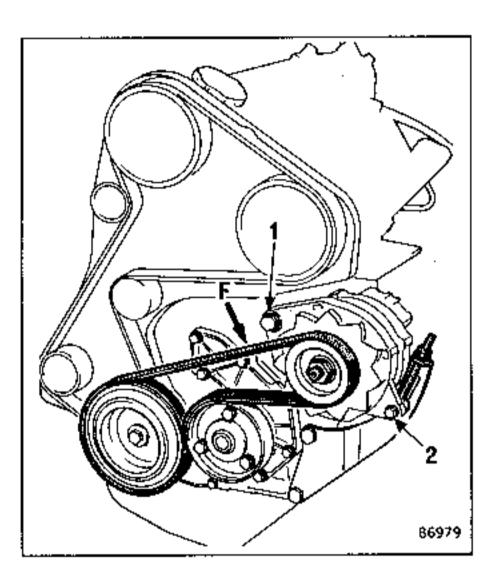


Disconnect the connectors from the alternator.

Remove alternator securing bolts (1) and (2) and take out the alternator through the radiator grille aperture.

Requirement after refitting

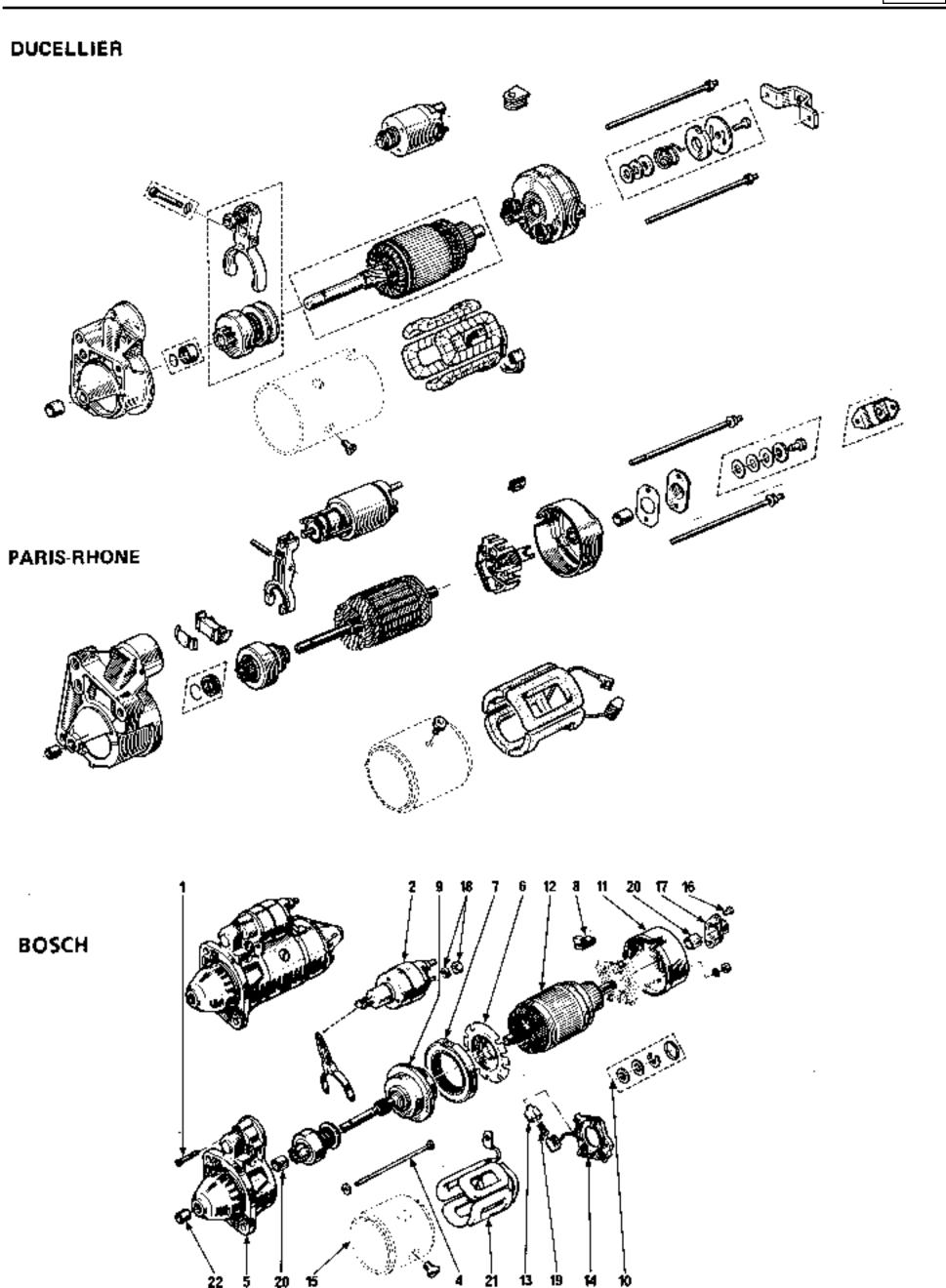
After refitting the alternator, re-tension the belt.



Using tool Ele.346-04, check the belt tension the deflection F should be 3.5 mm

CHECKING

Make	Type	Torque (locked pinion)	Current flow (locked pinion)
DUCELLIER	534 042	1 daN.m	350 A
DUCELLIER	534 043	1,1 daN.m	340 A
PARIS-RHONE	D9 E 771	0,8 daN.m	460 A
PARIS-RHONE	D9 € 76	1 , 3 daN.m	420 A
BOSCH	A001208323F	3₄4 daN.m	1 000 A



REMOVING

Disconnect the battery.

Remove the heat shield.

Disconnect the cables.

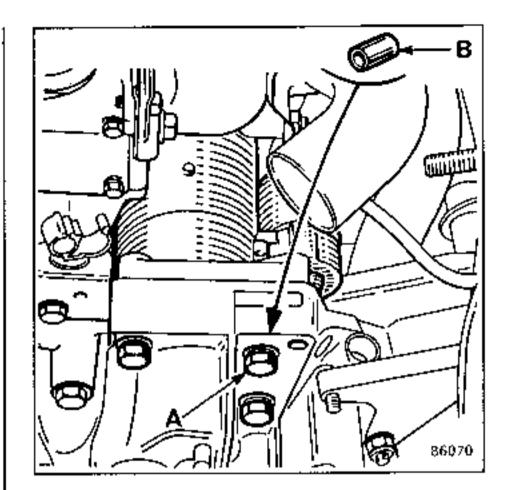
Remove :

- The rear securing lug,
- the three starter securing bolts.

SPECIAL REQURIEMENTS DURING REFITTING

Tighten the three starter securing bolts before tightening its rear fastening lug.

WARNING: Ensure that bolt (A) is in the correct position. When refitting the starter, it is ESSENTIAL to ensure that the locating dowel (B) is in the hole through which passes bolt (A).

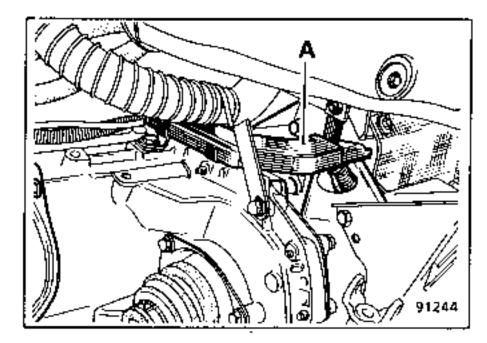


REMOVING

Disconnect the battery.

Remove :

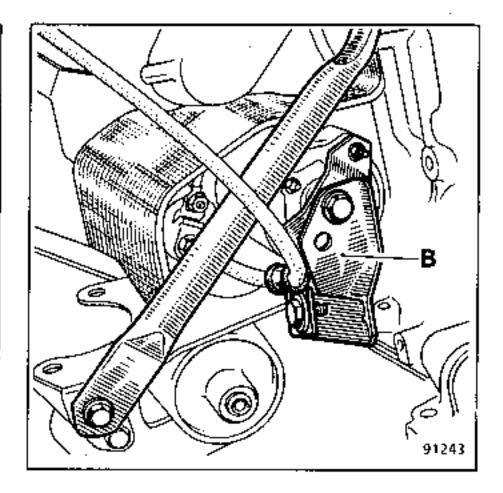
- the air ducts between the intake nozzle and the air filter,
- the air filter,
- · the turbocharger heat shield,
- the engine wiring shield (A).



- the three securing bolts from the starter,
- the starter rear support (B),
- the exhaust down pipe support bar (C).

Disconnect the wires.

Remove the starter from behind the front right hand wheel.

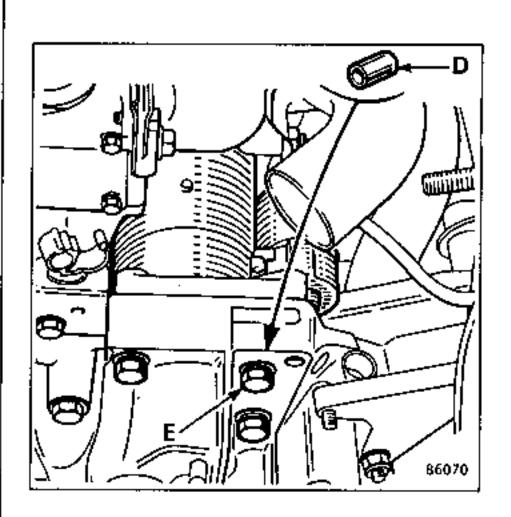


REFITTING

It is essential to ensure that the turbocharger heat shield is refitted.

Check that the locating dowel (D) is in position at point (E).

Reconnect the battery and test the starter.



REMOVING

Disconnect the battery.

Remove :

- the air ducts from the air intake nozzle and the air filter,
- the air filter,
- the heat shield,
- the three starter securing bolts,
- the starter rear support lug.

Disconnect the wires.

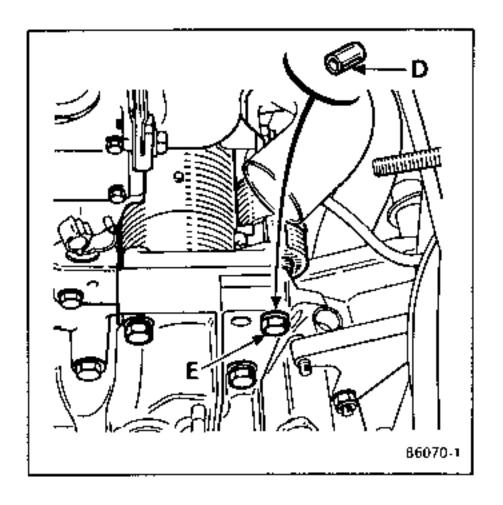
Remove the starter from behind the front right hand wheel.

REFITTING

It is essential to ensure that the heat shield is refitted.

Check that the locating dowel (D) is in position at (E).

Reconnect the battery and test the starter.



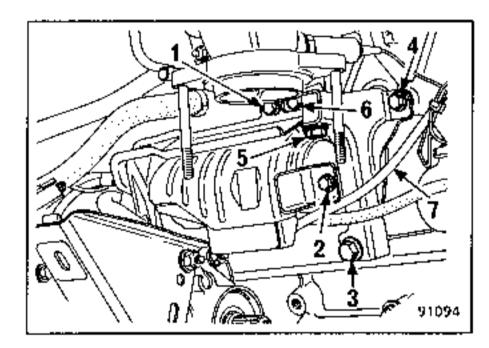
REMOVING

Disconnect the battery.

Release the air filter.

Remove :

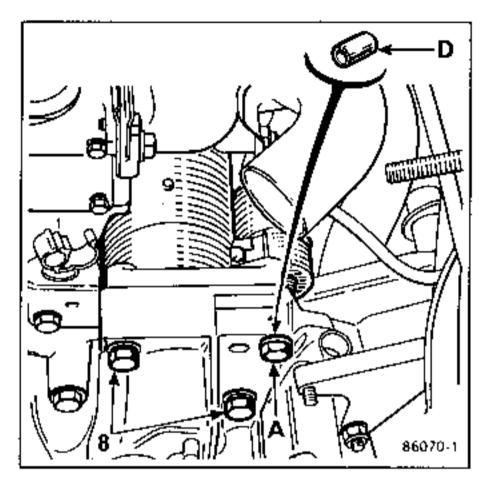
- The starter securing bolt and securing nut and remove the starter from the gearbox.
- The exhaust down pipe (between the catalyser and the exhaust manifold).
- The starter heat shield (bolts 1 and 2).



- The support lug mounting (bolts 3, 4 and 5).
- The starter rear support lug (bolts 6 and 7).
- Disconnect the starter cables and remove the starter (2 bolts on the gearbox). Take out the starter from behind the front right hand wheel.

REFITTING

Ensure that the locating dowel D is in position at A.



Refit :

- The starter (only the 2 bolts 8) and reconnect it.
- The starter rear support (Do not tighten the bolts).
- The rear support mounting and tighten all the bolts.
- The starter heat shield (1 bolt at A and bolts 1 and 1).
- The exhaust down pipe (It is essential to fit new seals).
- The air filter.
- Reconnect the battery and test the starter.

Special operations involved in removing starters with reduction gears

For the item references see page 6.

STARTER SOLENOID

Remove :

- the electrical connections (18),
- the three securing bolts (1),
- the starter solenoid (2) with its core and return spring.

FLANGE AT DRIVE END

Remove :

- the two connecting bolts (4),
- the flange (5) fitted with the drive shaft, the free wheel and the reduction gear.

WARNING: The cover plate (6) and the hollow wheel (7) may fall out.

FREE WHEEL AND PLANET TYPE REDUCING GEAR

Remove :

- the rubber seal (8),
- the cover plate (6),
- the hollow wheel (7),
- the starter pinion assembly (9) (reduction gear, free wheel and fork lever).

THE YOKE (15)

Remove :

- the two screws (16) from the cover,
- the cover (17),
- the armature shaft retaining and compensator washers (IO).
- the flange at the commutator end (11).

ARMATURE

Take out the armature (12) whilst retaining the end of the commutator with a tube of the same diameter (outside diameter 28 mm).

Eg. : A 22 mm box spanner, to prevent the brushes being ejected.

REPLACING THE BRUSHES

Unhook the brush holders (13) from the ring (14).

Extract the carbon brushes and the compression springs (19).

Do not disconnect the field windings (21) from the brush carrier ring.

Remove the worn brushes with pliers and file down the pieces of braid still remaining on the brush carrier ring.

Check the correct way round for fitting the brushes.

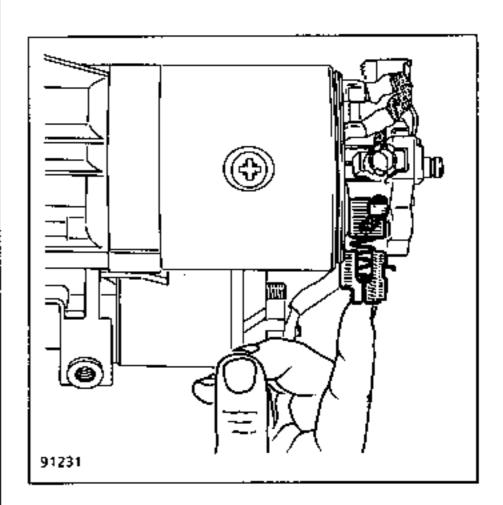
Place the new brushes on the ring and tighten the clips to the securing lugs with pliers and soft solder them in place.

REFITTING THE BRUSHES

Place the compression springs and the brushes in the brush holders.

Use the same tube as was used for removing to hook the brush holders on to the ring.

The brush holders can be replaced directly on the commutator.



REASSEMBLY

Reassemble the starter by carrying out the removing operations in reverse after first inspecting all the parts.

Each time the starter is repaired, replace the sintered metal bushes (20) in the flanges.

Check the needle race (2).

Commutator Ø: NEW 30 mm MIN 28.9 mm

Minimum length of brushes 7 mm.

Armature end float 0.05 to 0.3 mm.

CLEANING-LUBRICATION

Never use liquid cleaners. Blow out the unit with compressed air (max. pressure 4 bars).

Grease the bearing and reduction gear and oil the bearings (with silicone based oil).

SETTINGS

			Timing (degrees)	Idling	(rpm) + 25	1
Vehicle	Engine	Ignition	capsule disconnected		Dwell (%)	Cam angle (degrees)
F400	CIC	R342 - D83	+ 5 ± 1	700	63 ± 3	57 ± 3
B.C.S.400	C1C	R339 - D83	+ 10 ± 1	700	63 ± 3	57 ± 3
B.C.F.S.400	CIE	R335 - D83	+ 8 ± 1	625	63 ± 3	57 ± 3
8401 DAI	C1E 754	R341 - D80	+ 4 ± 1	625	63 ± 3	57 ± 3
F401 DAI	C1E 754	R341 - C33	+ 2 ± 1	650	63 ± 3	57 ± 3
B.C.F.401 Emiss. cont	C1E	R335 - C34	+ 6 ± 1	625	63 ± 3	57 ± 3
B.C.F.402	C1J	RE204	+ 10 ± 1	5 25		
B.C.F.402 Emiss. cont	C1J	RE211	+ 10 ± 1	700		
B.C.403	CS1	RE025	+ 8 ± 1	700		
B.C.403	C2)	RE226	+ 6 ± 1	600 EN	1 D	
B.C.403	C2J	RE254	-	· 700		
B.C.403 Spain	C2J	RE450	+ 6 ± 1	700		
B.C.403 Emiss. cont	C2J	RE217	+ 1 ± 1	700 (without puls	air)
C405	C1J	RE208/RE209	+ 8 ± 1	650		
C405 Witzerland	C1J	RE229	-	650		
B.C.S.40F	_ C1G	RE450	+ 6 ± 1	650		
B.C.40G	F2N	RE232		800		
B.C.F.40H	C1E	R341 - C33	+ 2° ± 2	700	63 ± 3	57 ± 3
B.C.40J	C2 J	RE257 BM RE026 TA	-	700 600 er	ı D	
B.C.40K	FZN	RE259		850	without puls	air)
B.C.F.40M	C2J	RE257	-	700		
B.C.F.407	C31	RE028	-	700		

BM: Manual gearbox.

TA: Automatic transmission.

DAL: Directorate of international affairs.

SPECIAL FEATURES OF ELECTRONIC UNITS

The integral electronic ignition unit (RE.257) has an additional plug that operates an advance correction system under certain conditions:

- through a dual threshold oil temperature switch : oil temperatures between 15 and 70°C.
- the advance correction is cut out if the choke is operating,
- the advance correction applies to a speed range between 1200 and 2900 rpm and at a manifold vacuum between 350 and 850 mbars. It deducts 5° of advance, as measured at the flywheel, in the zones in which it is operating.

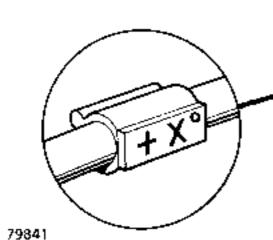
Vehicle	Engine	Advance	OIL TEMPERATURE (°C)			
	type	curve	less than 15℃	from 15 to 70°C	Above 70°C	
B40M C40M F40M	C2J T 784	RE. 257	0° flywheel	-5 ± 2° flywheel	0° flywheel	Advance correction between 1200 and 2900 rpm at vacuum
B40J C40J	C2J G 782	RE. 257	0" flywheel	-5 ± 2° flywheel	0° flywheel	of 350 to 850 mbar (no correction on choke).

NOTE: the vacuum capsule of AEI (electronic ignition unit) RE.257 is connected to the carburettor through a connection identified by a black ring.

ENGINES C1C-C1E

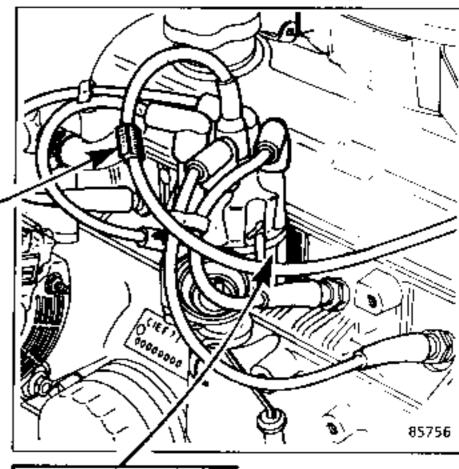
Identification of initial timing

The ignition initial timing is indicated on a clip secured to the secondary supply cable.



Identification of the centrifugal and vacuum advance curves.

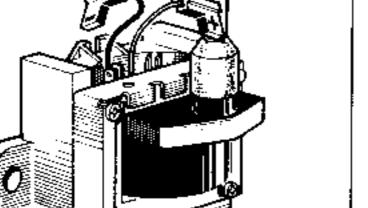
These are identified by a number engraved on the distributor body.



R 000 D 00

Unit and curve identification

UNIT TYPE D or E



84491

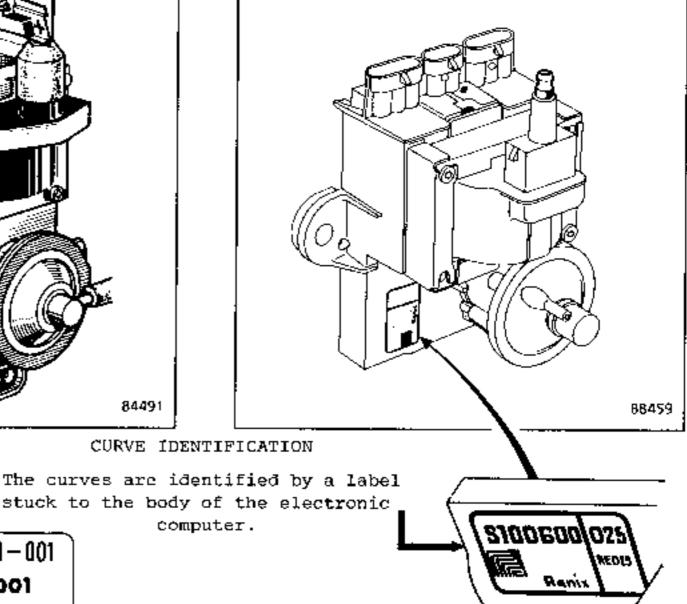
CURVE IDENTIFICATION

stuck to the body of the electronic computer.

RE 001 0109

S 100001-001

UNIT TYPE F



Example : curves RE.001

Renix

Example : curves RE.025

90686

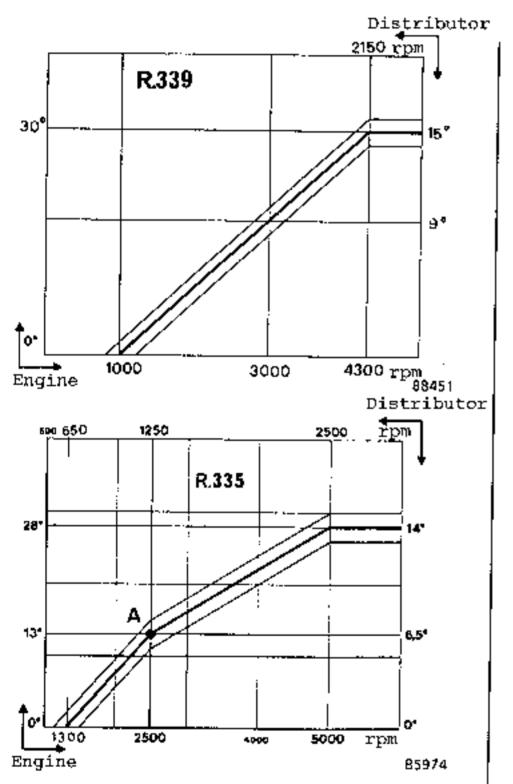
CURVE CHARACTERISTICS

Contrifugal curves

These curves are plotted in engine degrees and engine rpm (for direct readings when the engine is running) and in degrees distributor and distributor rpm (for testing the distributor on the test bench).

We should like to remind you that :

- 1 distributor rpm = two engine rpm,
- l distributor degree = two engine degrees.

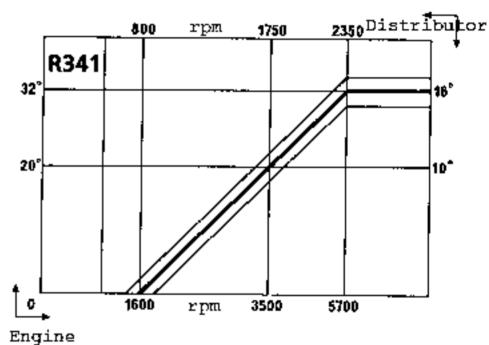


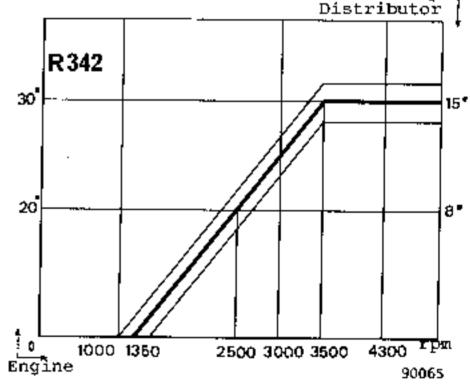
Example :

Curve R 335 and initial timing of 8°.

At point A on the curve, at a flywheel speed of 2500 rpm, read 13° plus the initial advance that is to say 13° + 8° = 21°.

On the distributor test bench read 6.5° at 1250 rpm.



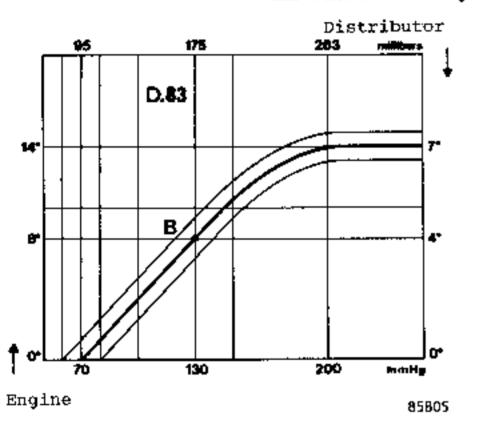


CURVE CHARACTERISTICS

Vacuum curves

These curves are plotted in millibars or millimetres of mercury and in engine degrees (for checking the timing with the engine running) and in millibars or millimetres of mercury and distributor degrees (for checking the distributor on the test bench).

We should like to remind you that one distributor degree = two engine degrees but that the vacuum reading remains the same.

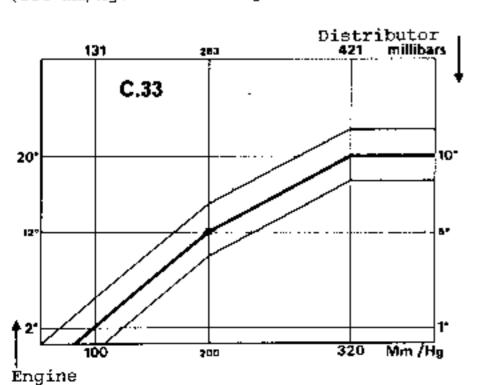


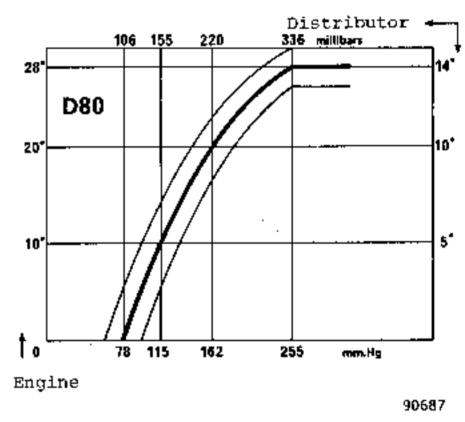
Example :

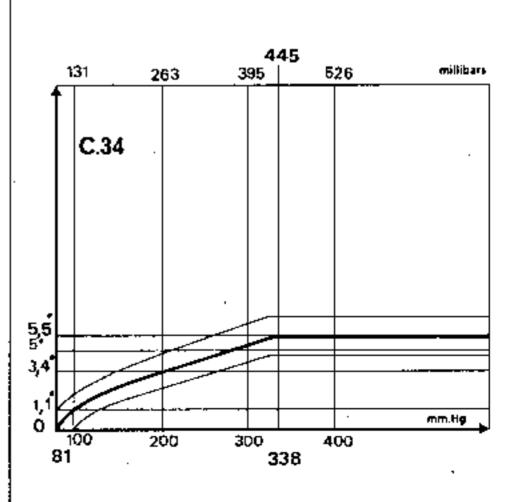
Curve D83 and initial timing of 8°.

At point B on the curve, at 175 mbar (130 mm/hg), the reading at the flywheel is 8° plus the initial timing that is to say $8^{\circ} + 8^{\circ} = 16^{\circ}$.

On the distributor test bench at 175 mbars (130 mm/hg) the reading is 4° .



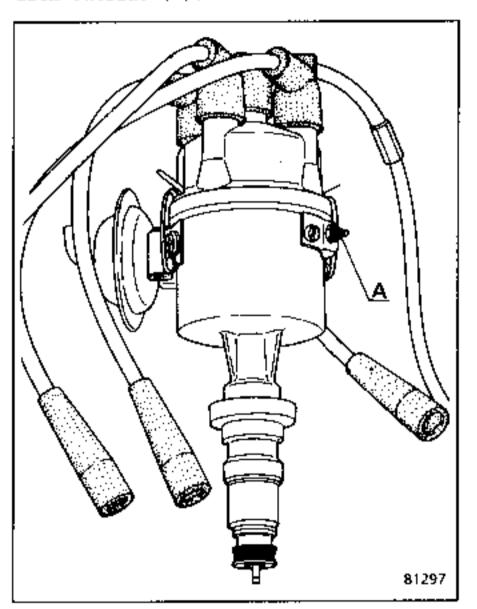




1 - SPECIFICATIONS

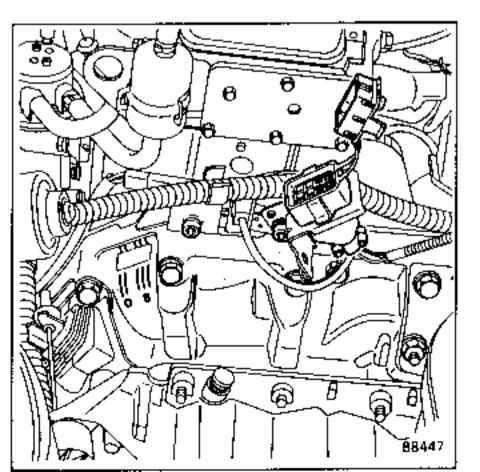
External points adjustment.

These vehicles are equipped with distributors the points of which can be adjusted from outside (A).

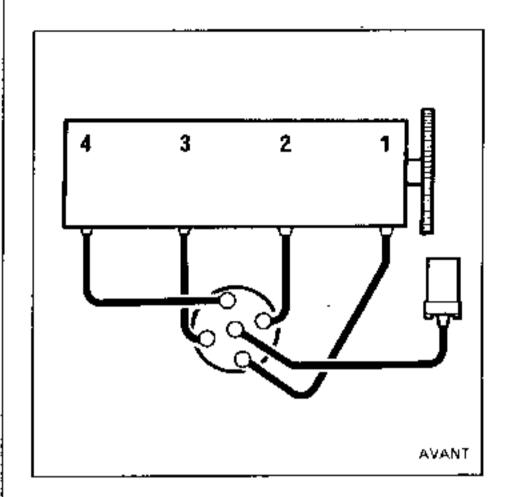


Initial timing marks.

The 0 reference is top dead centre on nos. 1 or 4 cylinders.



2 - IGNITION LEAD CONNECTION ORDER

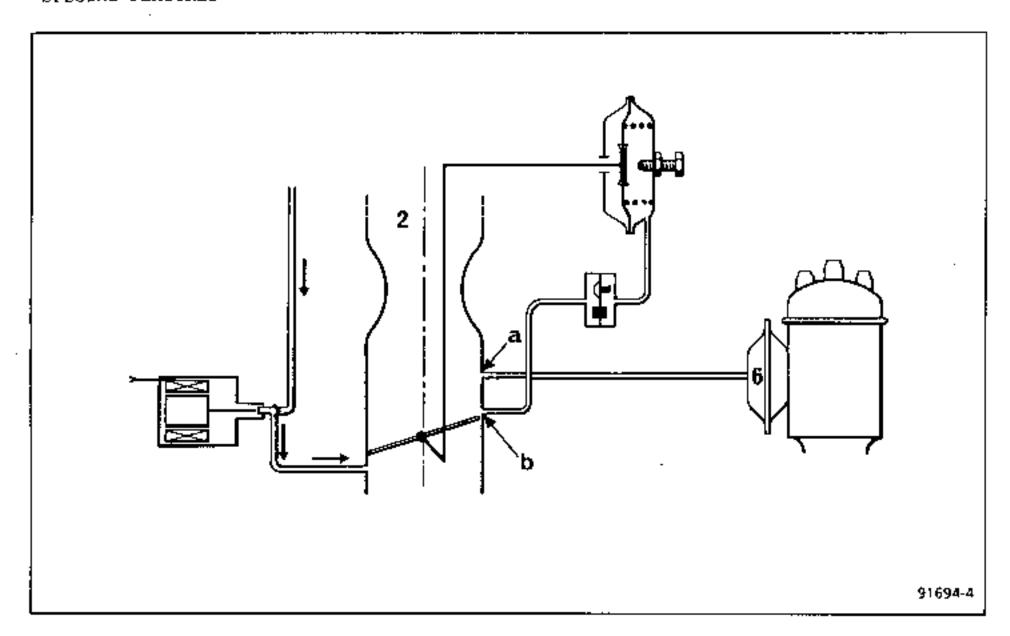


Firing order :

$$(1-3-4-2).$$

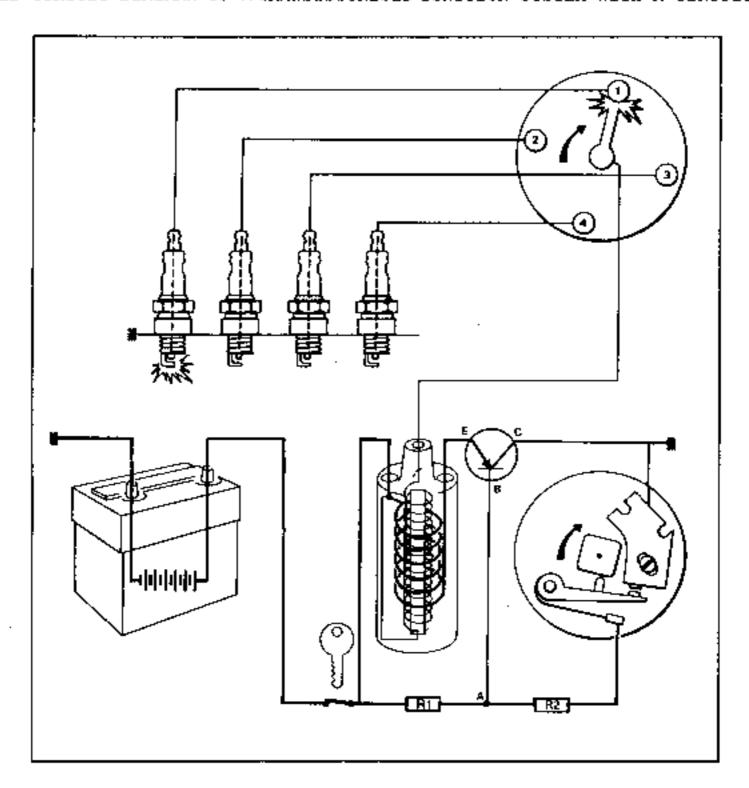
 it is essential to connect the leads as shown in the above diagram. ENGINES Cle B 756

SPECIAL FEATURES



The distributor capsule (6) C33 receives two signals one from the input side and the other from the output side of the throttle through two jets (a) and (b) which are in the carburettor throttle casing (2). It is therefore essential, when setting the distributor timing, TO DISCONNECT CAPSULE C33 (6).

SIMPLIFIED CIRCUIT DIAGRAM OF A TRANSISTORISED IGNITION SYSTEM WITH A CIRCUIT BREAKER



Principle of operation :

- When the points are open : the base (B) and the emitter (E) of the transistor are at the same potential.
- When the points are closed: the base (B) of the transistor becomes negative because the voltage has dropped at point A because of the presence of the two resistances R1 and R2: the transistor conducts current.
- As soon as the points open, the voltage rises at point A and the transistor ceases to conduct current.

The advantages of this system :

- The transistor improves the break in the primary current.
- The strength of the current passing through the points is very low and this gives them a longer operating life.

CONNECTIONS

- A : On the diagnostic bay
- 1) Connect C to the cylinder block.
- Connect (B) to the two ring terminals on the coil (if necessary disconnect the interference suppression condenser).
- Connect (A) to the diagnostic plug on the bay.

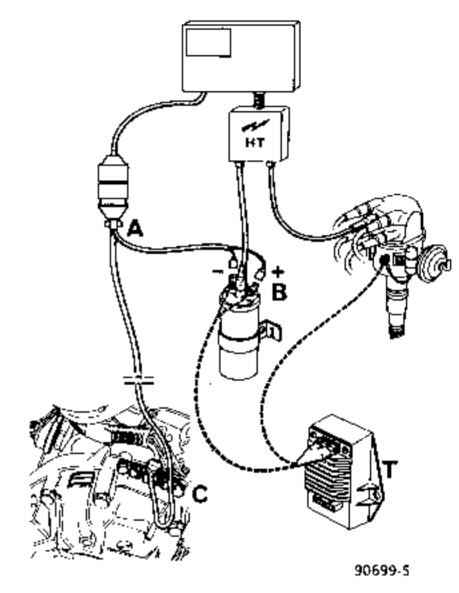
Select conventional ignition at the diagnostic bay.

IMPORTANT: the diagnostic bay engine earth is provided by sensor (C). Do not forget to secure this sensor in place.

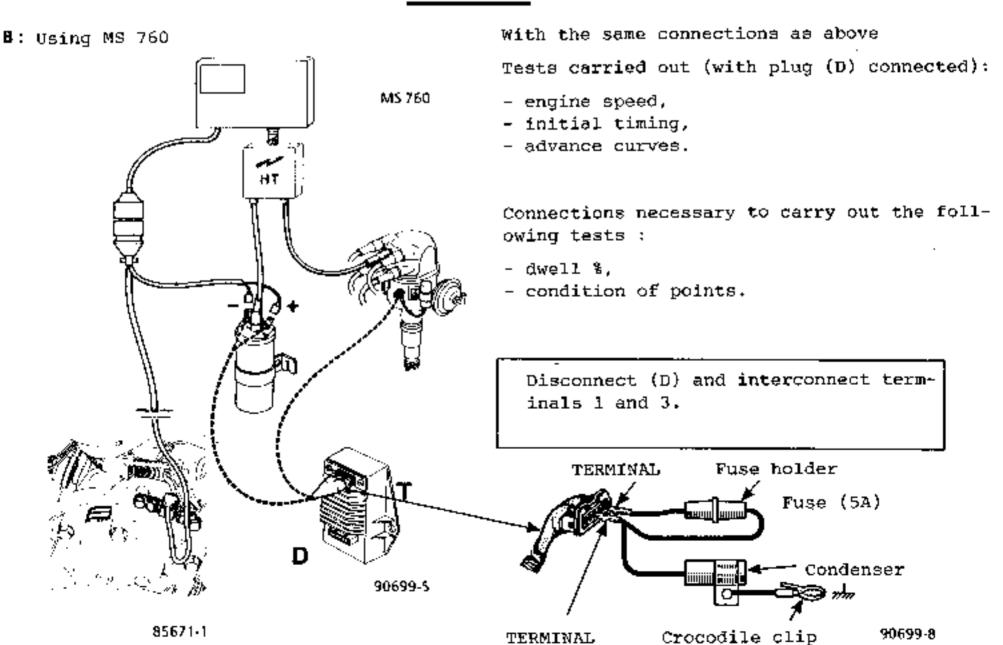
Connect :

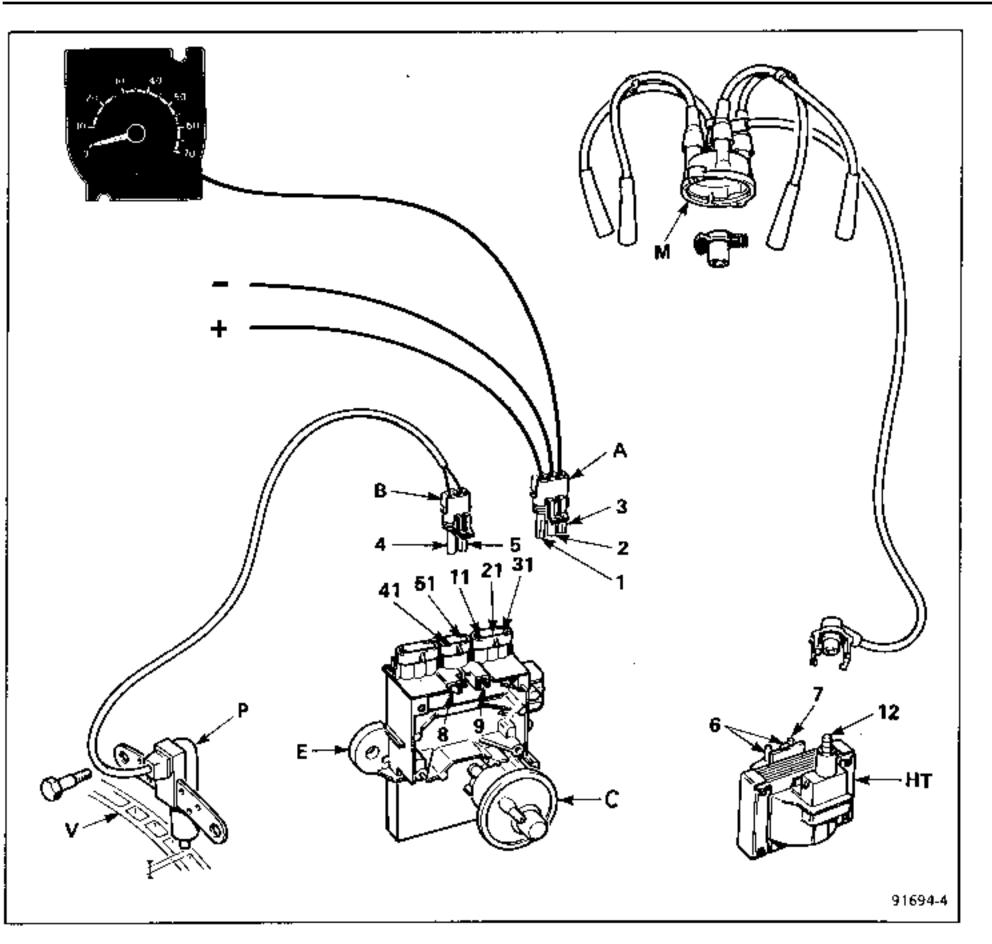
- the high tension sensor,
- the no. 1 cylinder magnetic clip,
- the connection to the + side of the battery.





85671-1 T (Transistorised module)



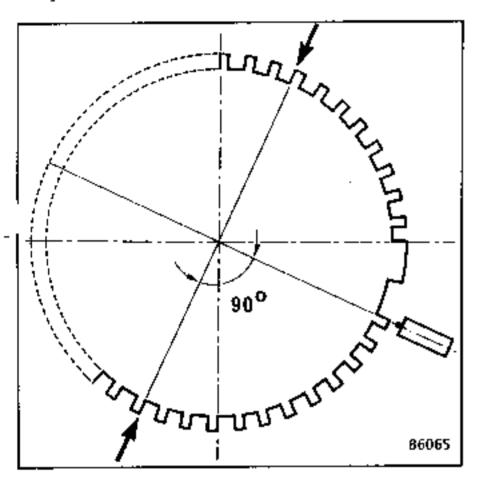


Item	Description
1.	+ supply
2.	Earth
3.	Tachometer
4.	Sensor winding
5.	Sensor winding
6 .	<pre>Coil + terminal and interference</pre>
	suppression condenser terminal
7.	Coil - terminal
8.	Coil + contact
9.	Coil - contact
11.	Module + "input"
12.	Secondary stud

Description Item 21. Module earth Tachometer "output" 31. 41. Sensor signal 51. Sensor signal Distributor cap M. HT. High tension coil Vacuum capsule €. Electronic computer module €. P. Magnetic position sensor ٧. Flywheel NOTE: terminals 8 and 11 are directly interconnected inside the unit.

1 - Flywbeel

The flywheel has 44 evenly spaced teeth of which two have been eliminated at each half turn, to create an absolute position mark at 90° before top and bottom dead centre. In reality therefore, there are only 40 teeth.



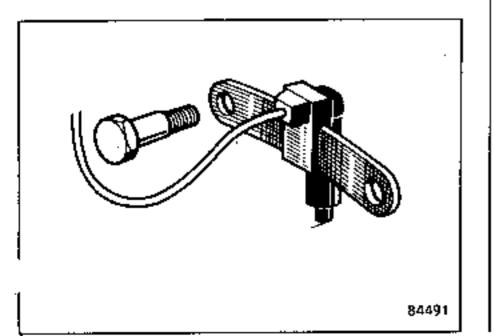
2 - Position sensor (P)

This determines :

- the position of top dead centre and bottom dead centre,
- the engine speed.

It cannot be adjusted (it is pre-adjusted on its mounting bar).

It must be secured to the clutch housing with shouldered bolts.

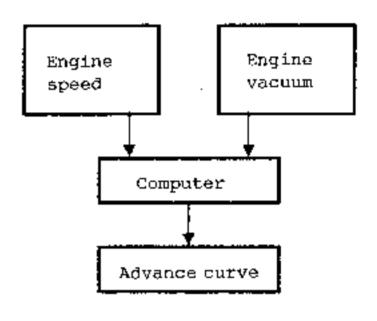


3. The vacuum sensor

The external appearance of this sensor is identical to that of the vacuum capsule of a conventional ignition system but its internal workings are different.

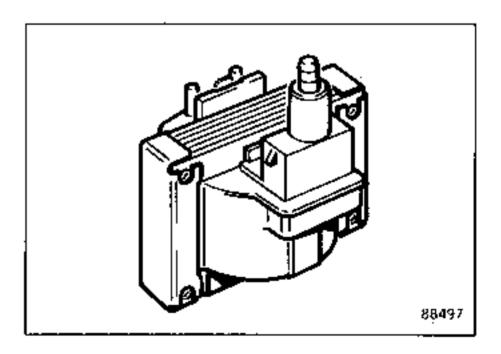
4 - The computer

This is an electronic system that determines the advance curve as a function of the engine speed and the engine vacuum.



5 . The coil

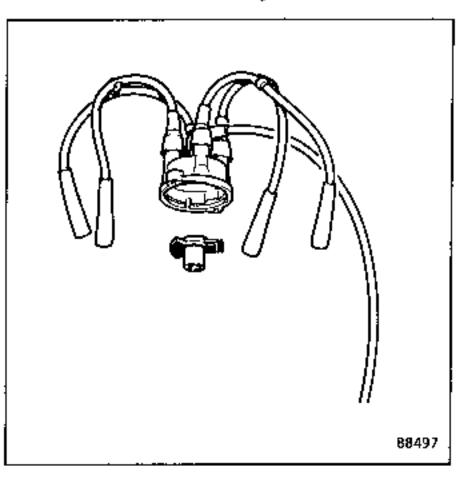
This is independent from the computer and therefore can be replaced separately.



IGNITION SYSTEM Integral electronic ignition

6 - The distributor cap

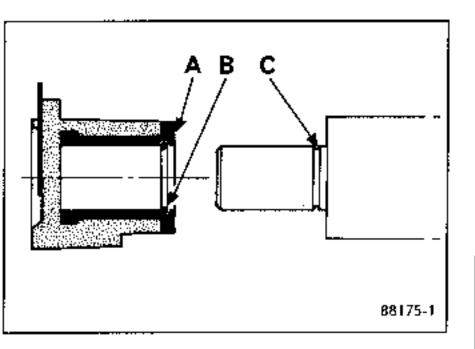
The only function of this component is to distribute the high tension current to the spark plugs in the correct firing order. It cannot be adjusted.



The rotor arm arrangement

This rotor arm has an insert (A) and a snap ring (B).

There is a groove (C) on the camshaft.



REMOVING (special operations)

Remove the disc (on certain models it has a slot on it to assist in its extraction).

If the rotor arm is difficult to remove, free it by gripping it and turning it with a pair of combination pliers, then break the plastic coating to make it possible to extract the rotor arm.

Under no circumstances should you strike the end of the camshaft.

REFITTING

WARNING: NEVER BOND A ROTOR ARM WITH THE SNAP RING B IN IT TO A CAMSHAFT WHICH COMPRISES A GROOVE C.

IGNITION SYSTEM Integral electronic ignition

CHECKING

The centrifugal and vacuum advance curves can be checked but not adjusted (the check can remove any doubt as to whether the electronic computer is operating correctly or not).

TEST EQUIPMENT

This is identical to that used on our vehicle ranges :

- voltmeter)
 ohmmeter) Of the recommended type
- test light
- strobe light
- diagnostic bay (the connections being identical to those on vehicles not equipped with a diagnostic plug and with the "electronic" key pushed in).

IMPORTANT

Precautions to be taken :

- Never strike a high tension spark on the electronic computer.
- Never earth the coil primary or secondary circuits.

IGNITION SYSTEM Integral electronic ignition

NO IGNITION

Inspect :

- the spark plugs,
- the plug leads,
- the distributor cap,
- the coil high tension lead.

Check on the condition of the pins in connectors (A) and (B) : Disconnect and reconnect the connectors several times.

Clean the terminal ends if necessary before changing any component parts.

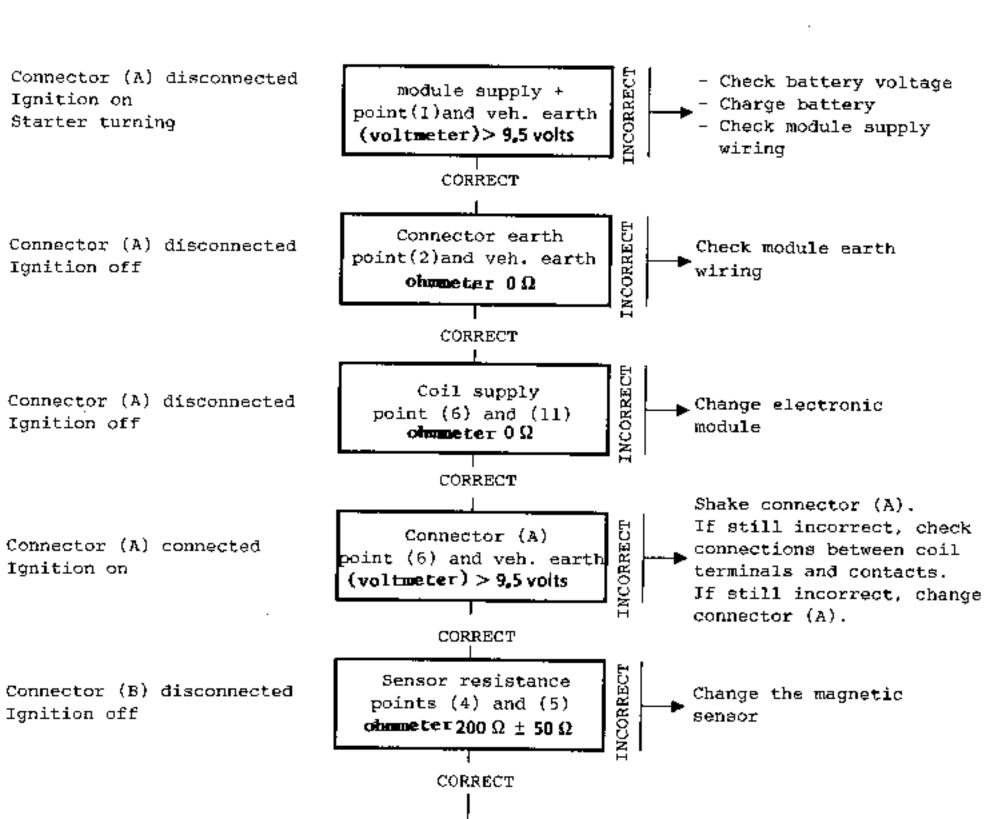
PRIOR CHECK

Check between point 6 (coil supply + at the interference suppression condenser outlet) and earth (with the ignition on) that the voltage is higher than 9.5 volts.

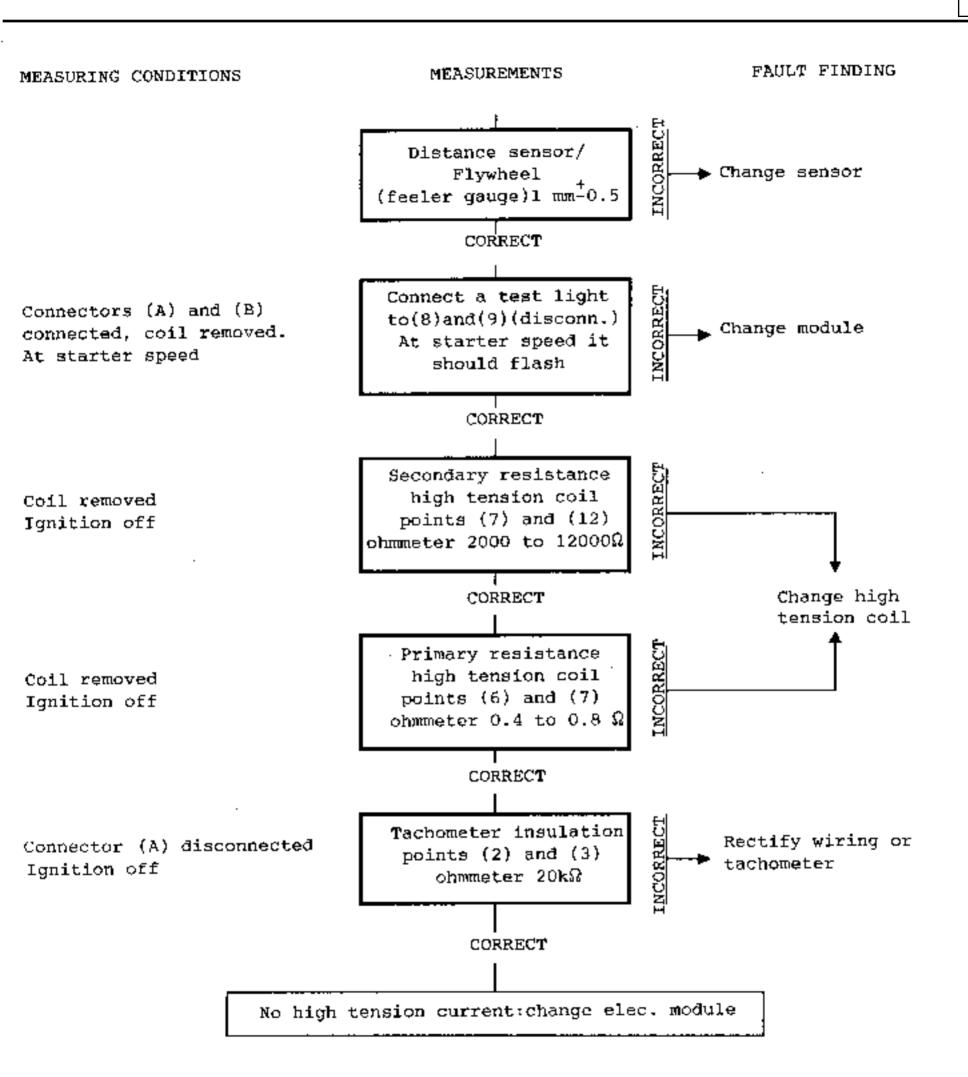
MEASURING CONDITIONS

MEASUREMENTS

FAULT FINDING



IGNITION SYSTEM Integral electronic ignition



IGNITION SYSTEM Integral electronic ignition

STARTING DIFFICULT BUT NO PROBLEMS WHEN ENGINE IS RUNNING

Inspect or check with test equipment the :

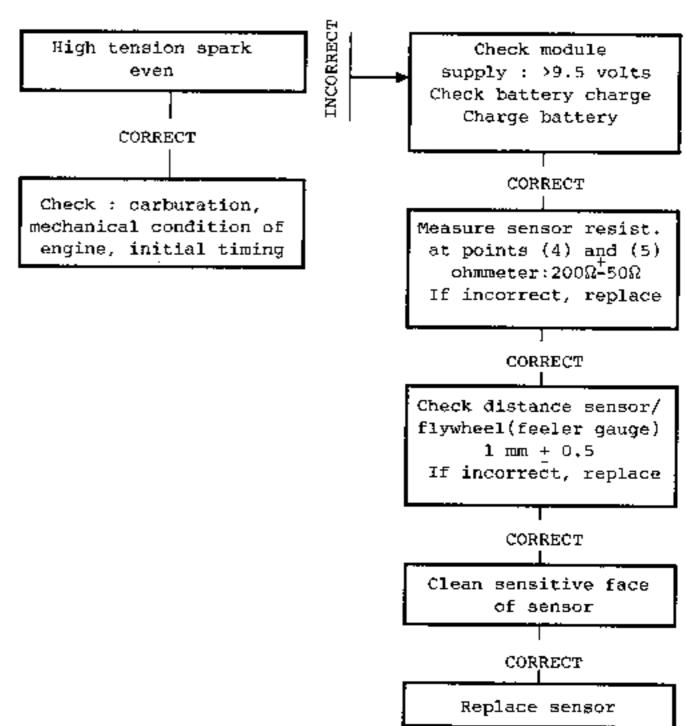
- spark plugs,
- plug leads,
- distributor cap,
- coil high tension lead.

Check the high tension at starter speed :

- disconnect the high tension lead at the distributor cap end,
- place the lead 2 cm from the cylinder block.

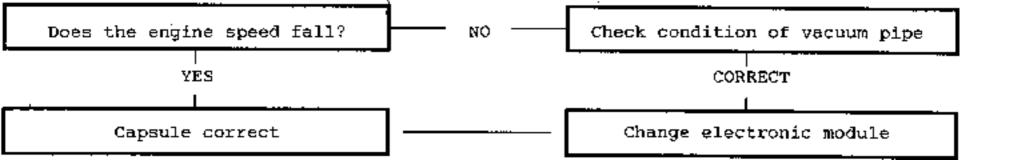
NOTE : DO NOT TOUCH THE ELECTRONIC MODULE WITH THE HIGH TENSION LEAD

Operate the starter

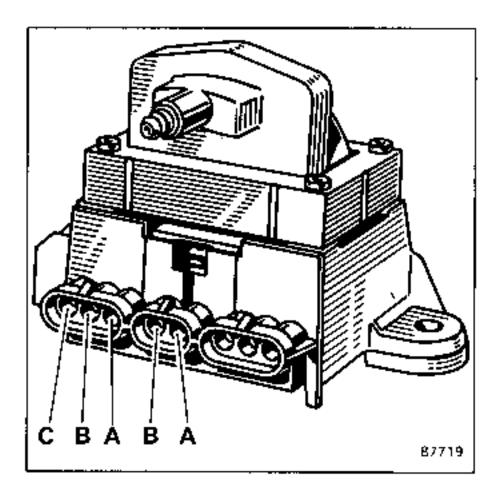


CHECK THE MECHANICAL CONDITION OF THE VACUUM CAPSULE

- stabilise engine speed at 3000 rpm.
- disconnect vacuum pipe from capsule.



The injection unit is programmed with the ignition advance curves and sends a control signal (5 volts) to the ignition power module.



3 way connector

- A Battery +
- 8 Earth
- C Tachometer

2 way connectors

- A Control earth
- B Control signal

Vehicle		Engine	AC	CHAMPION	EYQUEM	Electrode (mm)
8CSF	400	C1C	C42 CXLS	N281 YC	C52 LS	0.75 - 0.85
BCSF	401	C1E	C42 CXLS	N281 YC	C52 L\$	0,75 - 0,85
BCF	402	CIJ	-	N281 YC	C52 L5	0,75 - 0,85
ВС	403	C2J	C42 CXLS	N281 YC	C52 LS	0,75 - 0,85
C	405	CIJ		N3G	805 LP	0,6 - 0,7
BCF	407	C31	-	RN12 YC	-	0.75 - 0.85
BC	408	F3N	-	RN9 YC	-	0,75 - 0,85
C	409	F3N	C41 CXLS	N6 YC	C82 LS	0,75 - 0,85
BCS	40F	C16	C42 CXLS	N281 YC	C52 LS	0,75 - 0,85
BC	40G	F2N	C41 CXLS	N279 YC	C82 L5	0,75 - 0,85
BCF	40H	CIE	C42 CXLS	N281 YC	C52 LS	0.75 - 0.85
BCF	40M	C21	C42 CXLS	N281 YC	C52 L\$	0,75 - 0,85
BC	40)	C2J	C42 CXLS	N281 YC	C52 L5	0.75 - 0.85
BCF\$	401(S)	C1E	C42 CXLS	N281 YC	C52 L\$	0.75 ~ 0.85
BC	40K	F2N	C41 CXLS	N279 YC	C82 LS	0,75 - 0,85

⁽S) = Switzerland

PINKING DETECTOR

Principle of operation

When the computer receives a signal from the pinking detector it alters the ignition advance.

Checking

With the engine running at idling speed, connect an advance tester to the system.

Tap lightly (in a series of taps) on the cylinder head, near the sensor, with a bronze drift.

The advance reading should fall.

WARNING : Do not tap the sensor itself.

CHECKING THE SAFETY PRESSURE SWITCH ON C405 VEHICLES

Remove the component.

Connect it to tool Mot. 1014.

Connect it to an ohmmeter.

Apply a gradually increasing pressure.

P = Less than 1000 mbar

 $R = \infty$

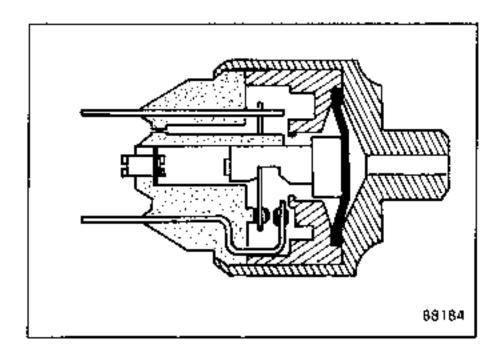
P = Greater than 1100 to 1200 mbar

 $R = 0 \Omega$

When the pressure is falling (approximate indication).

P = 900 mbar

R = ∞



The Bendix or Renix single point injection systems fitted to B,C,F 407 and B,C 408 vehicles comprise :

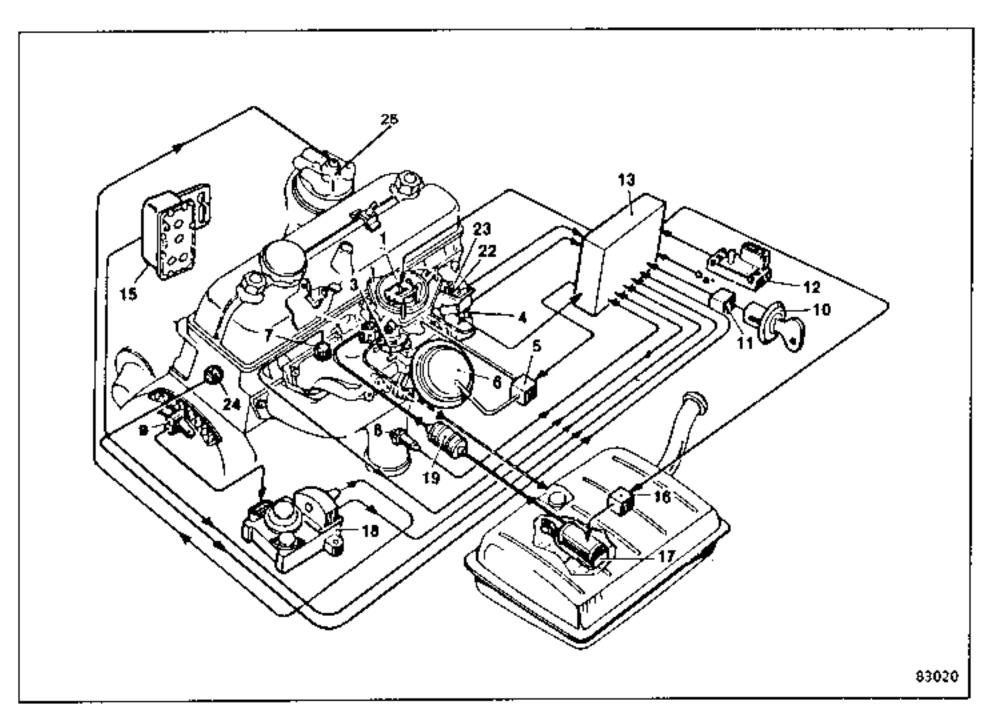
- a computer which, in the case of the Renix injection system, controls both injection and ignition. The ignition timing is regulated by a pinking detector mounted on the cylinder head between nos. 2 and 3 cylinders, on the ignition harness side. In the case of the Bendix injection system, the computer does not control the ignition and is not assisted by a pinking detector,
- the computer is in the passenger compartment under the glove box,
- the injection relays are also in the passenger compartment under the glove box alongside the accessory connection plate,
- the sensor detecting the air temperature or the mixture temperature is mounted on the inlet manifold,
- the coolant temperature sensor is mounted on the rear face of the cylinder head (Engine 3J A 700) or on the inlet manifold (Engine F3N).
- the inlet manifold temperature sensor is mounted on the outside of the inlet manifold (Engine C3J B 702),
- the absolute pressure sensor and diagnostic plug are on the scuttle (C3J B 702 and F3N),
- the diagnostic plugs (Engine C3J A 700) are under the ignition module on the scuttle,
- the idling speed is controlled by an electric motor on the throttle unit,
- the Bendix single point injection system (C3J A 700) is checked with a multimeter at plugs D1 and D2,
- the Renix injection system is checked with tester XR 25 fitted with the latest edition
 of the cassette, the fault finding signal output is constant and transitory defects
 are not placed on memory,

- the injection warning light on the instrument panel does not operate with this type of

Sensor type	Engine	Specifications o		sensors :			
Coolant temperature	C31 A	Temperature °C 0°		25°	80°	100°	
	700	Resistance $k\Omega$	31 35	9,70 10,3	1,16 1,35	0,63 0,74	
Coolant temperature		Temperature °C	4°	20°	70°	100°	
	F3N	Resistance Ω	7500	3400	450	185	
Air or	C3J	Temperature °C	4°	20°	70°	100°	
mixture temperature	F3N	Resistance Ω	7500	3400	450	185	
Inlet manifold temperature (external)	СЗЈ В	Temperature °C	4°	20°	70°	100°	
	702	Resistance Ω	7500	3400	450	185	

- the oxygen sensor is mounted on the exhaust manifold on the input side of the exhaust pipe securing flange.

Layout diagram of Bendix single point injection system components.

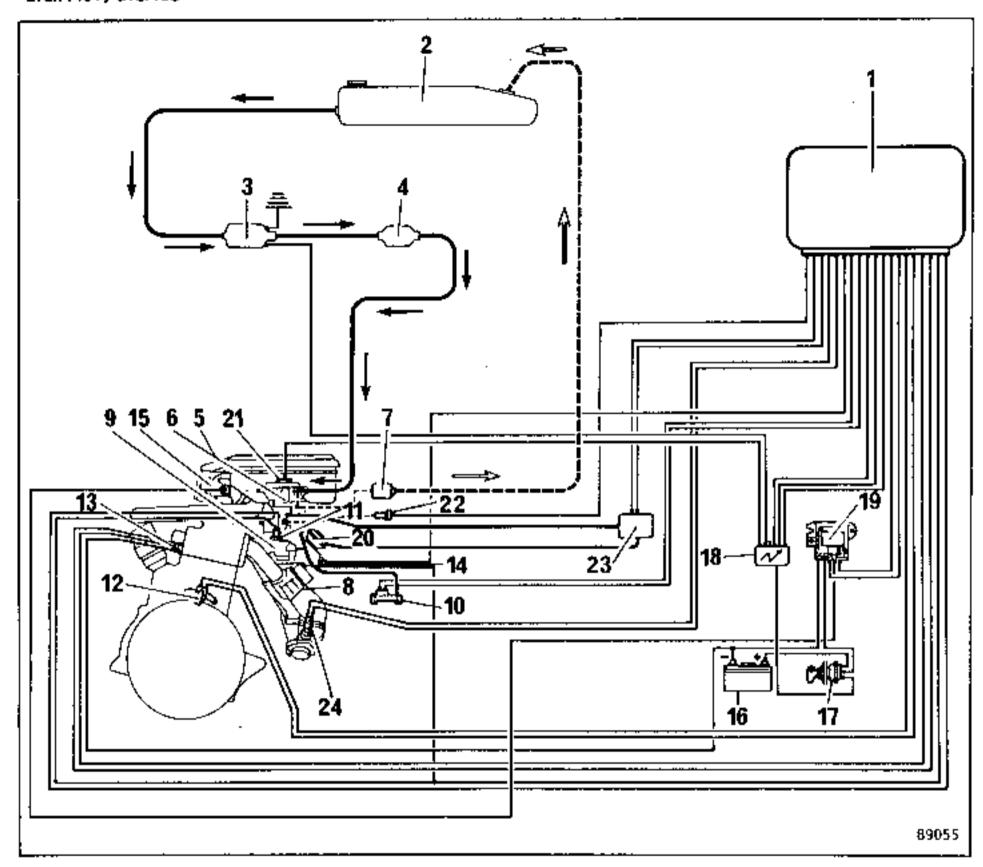


- Injector
- Pressure regulator
- Idling speed control motor
- Exhaust gas recirculation solenoid valve
- Exhaust gas recirculation valve
- 7. Sensor showing temperature of mixture in inlet manifold
- Oxygen sensor
- 9. Speed sensor
- Ignition/starting switch
- Supply relay
- Manifold absolute pressure sensor

- Electronic computer
- 15. Starter relay
- Fuel pump relay
- Fuel pump (under tank on diagram)
- 18. Electronic ignition module
- 19. Line mounted fuel filter
- 22. Throttle switch (idling)
- 23. Throttle switch (full load)
- 24. Sensor (coolant)
- 25. Distributor cap

Layout diagram of Renix single point injection system components.

B.C.F.407, B.C.408



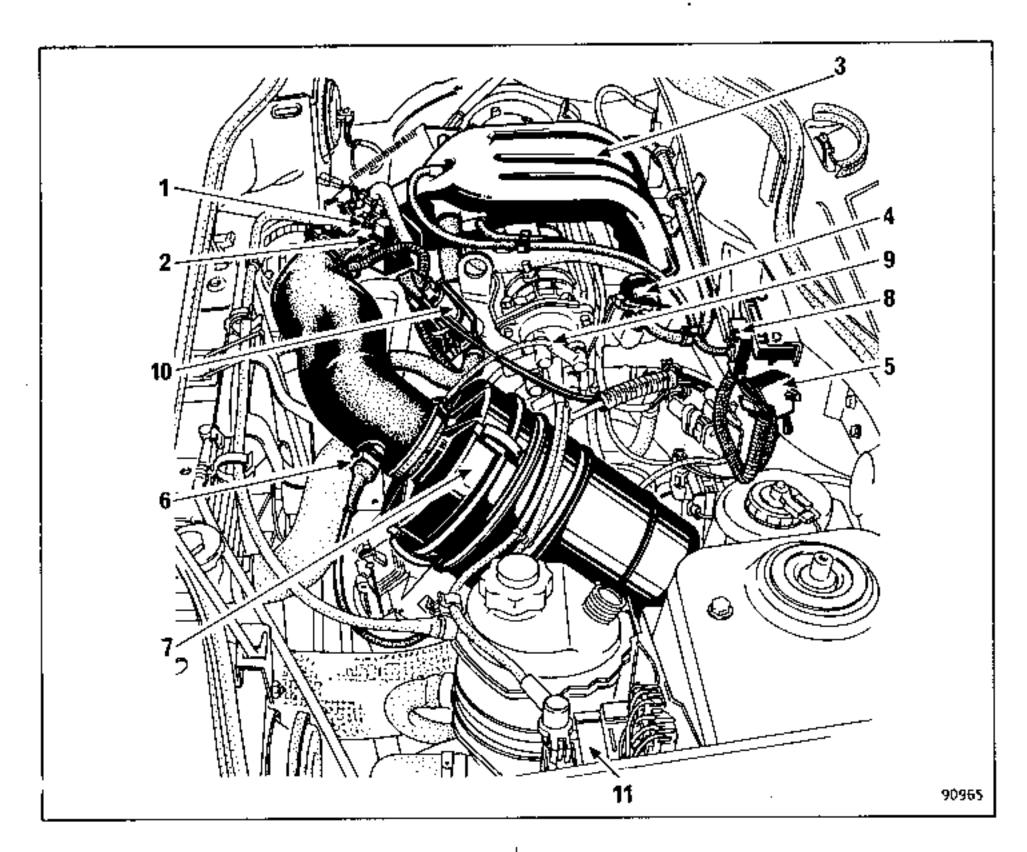
- Computer
- Fuel tank
- Electric fuel pump
- 4. Fuel filter
- 5. Air filter
- Throttle unit
- 7. Pressure regulator
- Exhaust manifold
- Inlet manifold
- 10. Absolute pressure sensor
- 11. Mixture temperature sensor
- Speed sensor
- 13. Pinking detector (B,C 408)

- 14. Coolant temperature sensor (B,C 408) or inlet manifold temperature sensor (B,C,F 407)
- 15. Distributor cap
- Battery
- 17. Ignition-starting switch
- 18. Relay unit
- Ignition power module
- 20. E.G.R. valve
- 21. Injector
- 22. Switch (Full load No load)
- 23. Exhaust gas recirculation and antievaporation system bleed control solenoid valve
- 24. Oxygen sensor

- the computer controls the injection and ignition. The ignition timing is adjusted by means of a pinking detector mounted on the cylinder head between cylinders 2 and 3, under the air distributor on the same side as the ignition harness.
- the computer itself is in the passenger compartment, under the glove box,
- the injection relays are also in the passenger compartment under the glove box alongside the accessory connection plate,
- the coolant temperature sensor is mounted on the cylinder head near the oil vapour collector and the idling speed control valve,
- the air temperature sensor is mounted on the air intake nozzle,
- the absolute pressure sensor and diagnostic plug are on the scuttle,
- the idling speed control valve is mounted on the cylinder head,
- the oxygen sensor is screwed into the exhaust manifold on the input side of the down pipe securing flange,
- the air and coolant temperature sensor specifications are identical,
- the Renix multipoint injection system is tested in exactly the same way as the Renix single point injection system. The diagnostic signal output is constant and transitory defects are not recorded on memory,
- the injection warning light on the instrument panel does not operate with this type of injection system.

Coolant temperature sensor	Temperature °C	20°	80°	90°
sensor	ResistanceΩ	283 - 297	383 - 397	403 - 417
Air temperature sensor	Temperature °C	Q° .	20℃	40°
	Resistance Ω	254 - 266	283 -297	315 - 329

ENGINES F3N 702



- 1. Throttle unit
- 2. Full load-no load switch
- 3. Inlet distributor
- 4. Fuel pressure regulator
- 5. Diagnostic plug
- 6. Air temperature sensor

- 7. Air filter
- 8. Absolute pressure sensor
- 9. Ignition distributor
- 10. Idling speed control valve
- 11. Ignition power module

Symptome

.5)	uibre	mr.si												Remarks :
,	1. Engine will not start or starts badly 2. Engine starts them stops 3. Uneven idling 4. Poor acceleration						Бa	rts	i bi	ndl5	•	For this check list to be walld, the engine must be in good condition and the electrical equipment checked and, if necessary, rectified.		
-	1	.	1							ıa a	эt	alī	speeds	
			[6 .	_[Kiq	gh 1	tae1	. 65	១០១១	ធានាភ	tio	η	
Ì	1					[7	. I:	ogie	ie]	Laci	ks	pow	er	
	1	•					ا ا	140) pe	erce None	9 M.C	398	too high at idling (>0.5%)	
		ļ						١.	10	, pe	erc Eng	ine	age too low at idling pinks	
Ì			ĺ				ļ			Į:	11.	ıα	ling speed too high	
ı		•	l				į			ŀ	Į	12	. Idling speed too low, engine stalls	
l														
-	+	 	├	\vdash	 	├	<u> </u>	+	+	+	\dashv	_	Chuse	Remedy - Check
-	<u> </u>		-	┡	_	_	ļ_	+	\bot	4.		_	l sec. timing relay defective	Check current supply.
•	<u> </u>												Electric fuel pump not running	Check fuel pressure. To current arriving at relay and fuel pump? If yes, replace fuel pump.
	┇.	•	•		<u> </u>	•		<u> </u>	\perp	_(•		Idling switch incorrantly adjusted or defective	Check switch setting or replace if defactive.
•		•	•					;		_	•		Air intake system leaking	Check inlet manifold and units bounted on it pigs all ducting for lenks.
•		•			•	•							Injector defective	Check current supply to injector by disconnecting it. The engine should stall,
•		•				•			•				Fuel pressure too low or non-existent. Mixture densor defective	Chack pressure, filter, fue! lines and pressure regulator. Chack sonsor and replace if secessary.
_	:				•								Pucl pressure too high	Fuel return like blocked or kinted. Pressure regulator defective.
•				<u></u>		_	ļ			•	•	•	Tuling spard regulator motor not operating	Chack operation of motor. If defective, replace.
•	上				_					•	•	•	Poor surrest supply to Idling speed regulacor	motor Check electrical circuit and computer. If defective or of in- correct type, replace.
_		•										•	Exhaust gas recirculating valve (E.G.R.:	Check S.G.R. Palve, solenoid velve and pneumatic circuits for leaks.
L						•						į	Defective ignition Engine temperature too sign Incorract mixture : wrong type of fuel	Chack cooling; ignition and fuel systems plus full load switch and mixture regulation.
	•	•		•									Sangor target on flywheel defective	Check that slots or apertures on flywheel are even and ourrectly spaced.

Symptoms | Remarks : For this check list to be valid, the angine must be 1. Engine will not start or starts badly in good condition and the electrical equipment 2. Engine starts them stops checked and, if necessary, rectified. 3. Uneven idling 4. Poor acceleration 5; Engine misfiring at all speeds 6. High fuel consumption Engine lacks power 8. Engine speed too high at idling (>0.5%) 9. CO percentage too low at idling 10. Engine pinks 11. Idling speed too high 12. Idling speed too low, engine stalls Cause Remedy - Check Check and replace if ancessary. Coolent or inlet temperature sensor defective full load switch Replace 17 necessary Check adjustment, replace if decessary Idling switch defective Oxygen sensor defective Replace if necessary Check fuel system Puel pressure too low Pressure sensor defective Check pipe leading to inlet manifold. Check current supply to sensor (+ 5 volta). Check resistance and gap. Speed sensor defective Ignition power module defective Check that module supply and coil resistance exe correct. mixture temperature sensor defective Check resistance. Intake Manifold temperature sensor defective Neasure resistance. Throttle not closing Free the throttle, adjust throttle linkage and adjust throttle plate. Throttle not fully opening Adjust throttle control. Poor central earth. Connector pins defective Check connections. Rectify connections. Wiring herness or connections broken Carry out complete check of system before replacing electronic Defective electronic computer. .

computer.

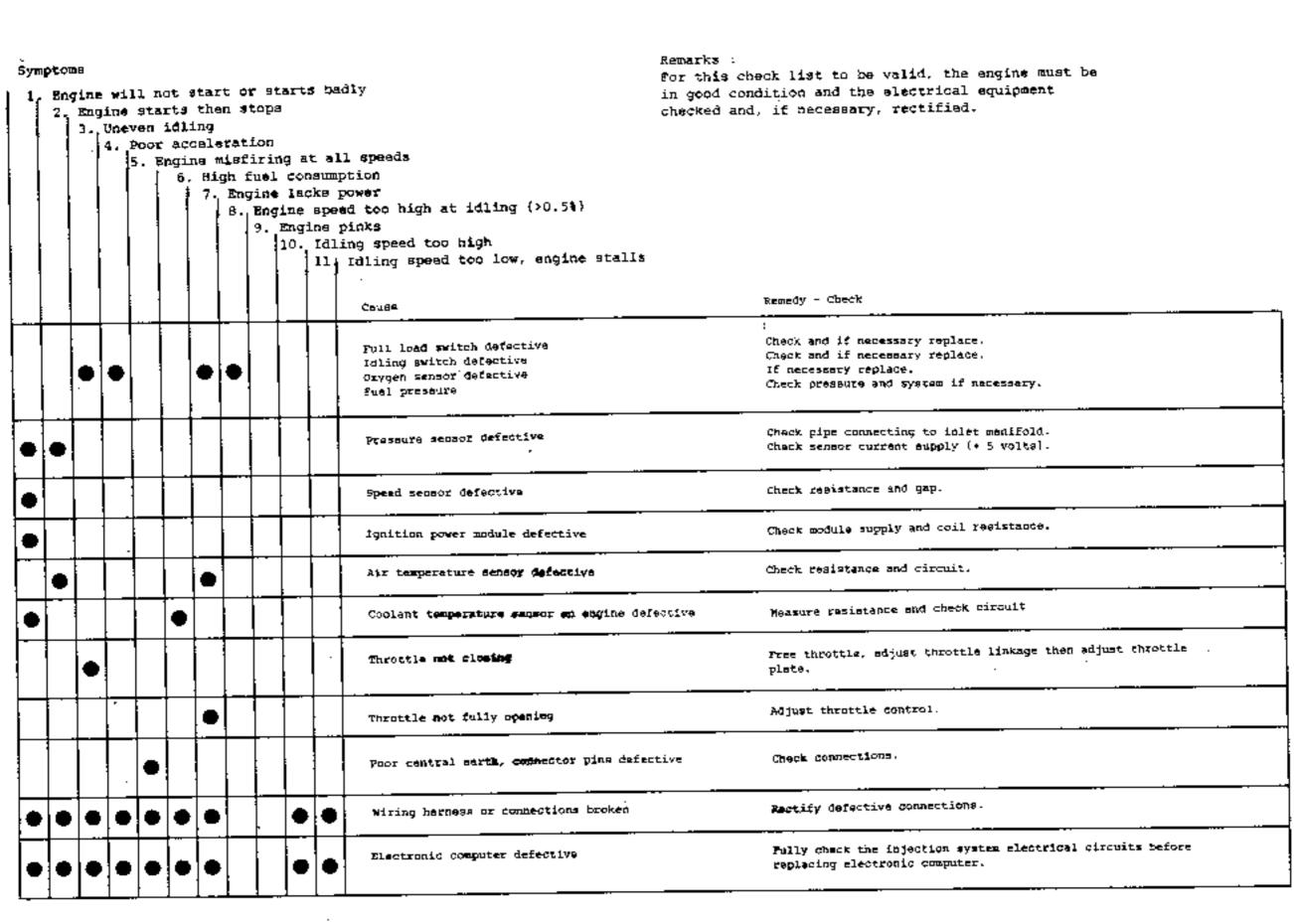
Symptoms

Romarks : 1. Engine will not start or starts badly For this check list to be valid, the engine must be 2. Engine starts then stops in good condition and the electrical equipment Uneven idling chacked and, if necessary, rectified. 4. Poor acceleration 4. 5. Engine misfiring at all speeds 5. 6. High fuel consumption 6. 7. Engine lacks power 7. 8. Engine speed too high at idling (>0.5%) a. 9. Engine pinks 10. Idling speed too high 11. Idling speed too low, engine stalls Çauce Remedy - Check 3 s. timing relay defective Check current supply. Electric fuel pump not running Check fuel pressure, Is current arriving at relay and fuel pump? If yes, replace fuel pump. idling switch incorrectly adjusted or defective Check switch setting or replace if defective. Air leaking into intake Bystem Check inlet manifold, units mounted on it and all ducting for leaks. Injectore defective Check the pulses to the injectors by trial and error, disconnecting the electrical supply (speed drops). Fuls pressure too low or non-existent Check pressure, filter, fuel lines, pressure regulator and Ашр. Air temperature sensor defective Check sensor and replace if necessary, is the pipe connecting the pressure regulator to the injet Fuel pressure too high manifold connected? Fuel return line blocked or kinked. Praymyre regulator defective. Idling speed control valve Check that valve is operating correctly. If defective, replace. Coolent temperature sensor Check sensor and replace if necessary. Taling switch defective Adjust or replace switch. Defective ignition Check cooling and fuel systems plus full load switch and mix-Engine temperature too high ture regulator. locorrect mixture : wrong type of fuel Current supply to idling regulator valve defective Check electrical circuit and computer. If defective or of incorrect type replace. hir temperature sensor defective Check sensor and replace if necessary

Check that slots or spertures on flywheel are even and corr-

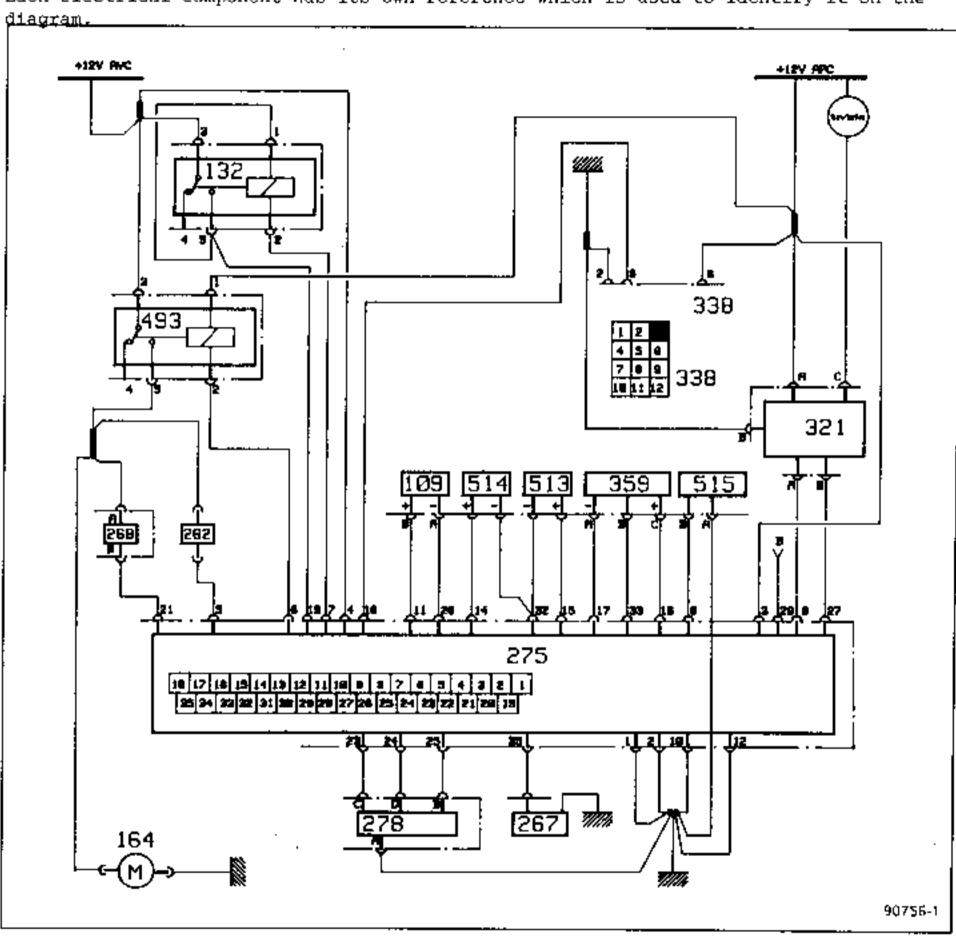
ectly spaced.

Target on flywheel defective



CIRCUIT DIAGRAM ENGINES C3J B 702

The references are the same as those on the general list of electrical components. Each electrical component has its own reference which is used to identify it on the



LIST OF ELECTRICAL COMPONENTS

- 109. Flywheel sensor
- 132. Injection relay
- 164. Fuel pump
- 267. Oxygen sensor .
- 268. Injector
- 275. Computer
- 278, Idling speed control motor
- 282. Exhaust gas recycling and canister bleed control solenoid valve
- 321. Ignition coil
- 338. Diagnostic plug

- 359 Absolute pressure sensor
- 493. Fuel pump relay
- 513. Coolant or inlet manifold temperature sensor
- 514. Air or mixture temperature sensor
- 515. Full load switch

Connectors

tr/min. - rpm

+APC. + after ignition switch

+AVC. + before ignition switch

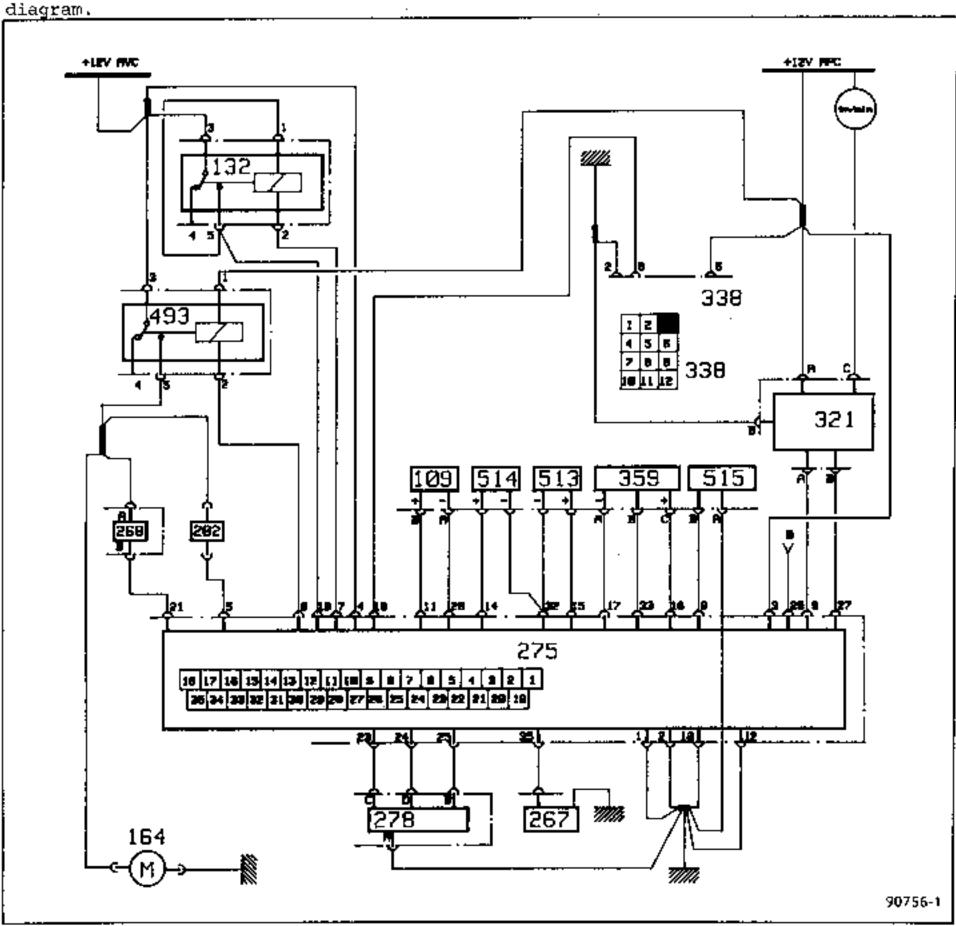
B. Starter signal

NOTA: 2 wires connected to pin No.5 on

relay 132

CIRCUIT DIAGRAM ENGINES C3J E 760

The references are the same as those on the general list of electrical components. Each electrical component has its own reference which is used to identify it on the



LIST OF ELECTRICAL COMPONENTS

- 109. Flywheel sensor
- 132. Injection relay
- 164. Fuel pump
- 267. Oxygen sensor
- 268. Injector
- 275. Computer
- 278. Idling speed control motor
- 282. Exhaust gas recycling and canister bleed control solenoid valve
- 321. Ignition coil
- 338. Diagnostic plug

- 359. Absolute pressure sensor
- 493. Fuel pump relay
- 513. Inlet manifold temperature sensor
- 514. Air or mixture temperature sensor
- 515. Full load switch Connectors

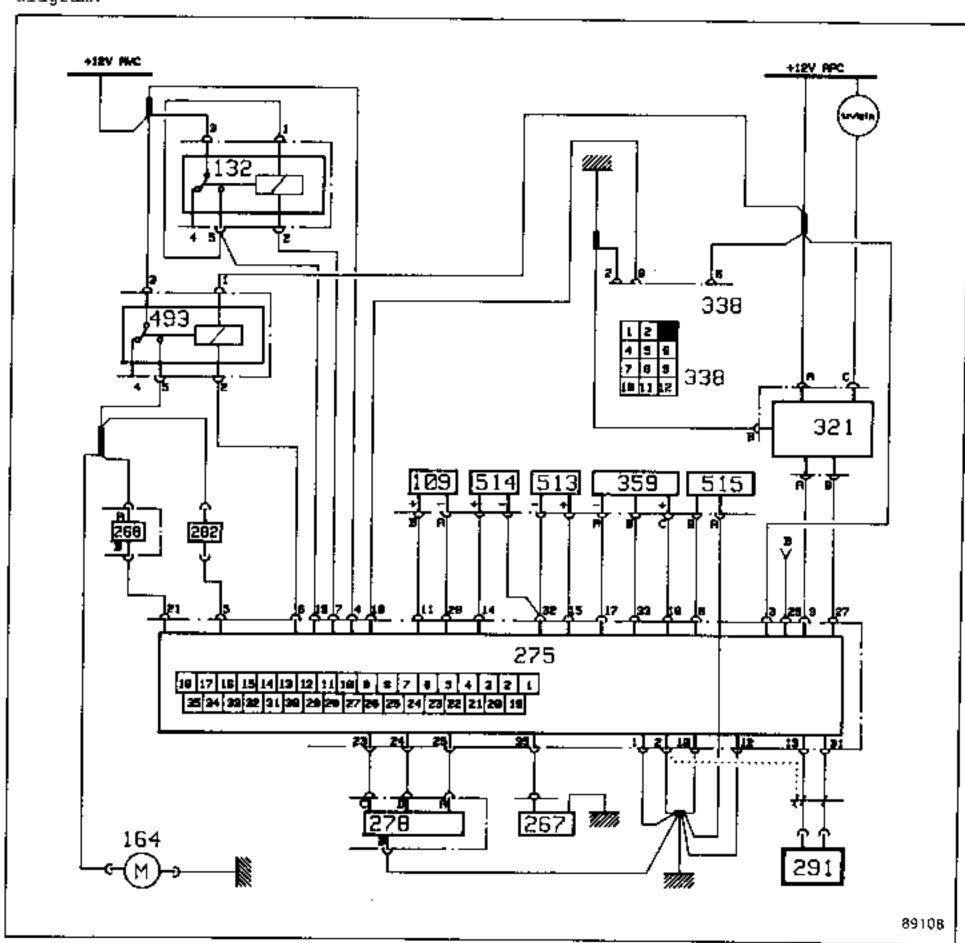
tr/min. - rpm

- + APC, + after ignition switch
- +AVC + before ignition switch
- g Starter signal
- NOTA: 2 wires connected to pin No. 5 on relay 132

CIRCUIT DIAGRAM

ENGINES F3N C 716 and F3N H 717

The references are the same as those on the general list of electrical components, Each electrical component has its own reference which is used to identify it on the diagram.

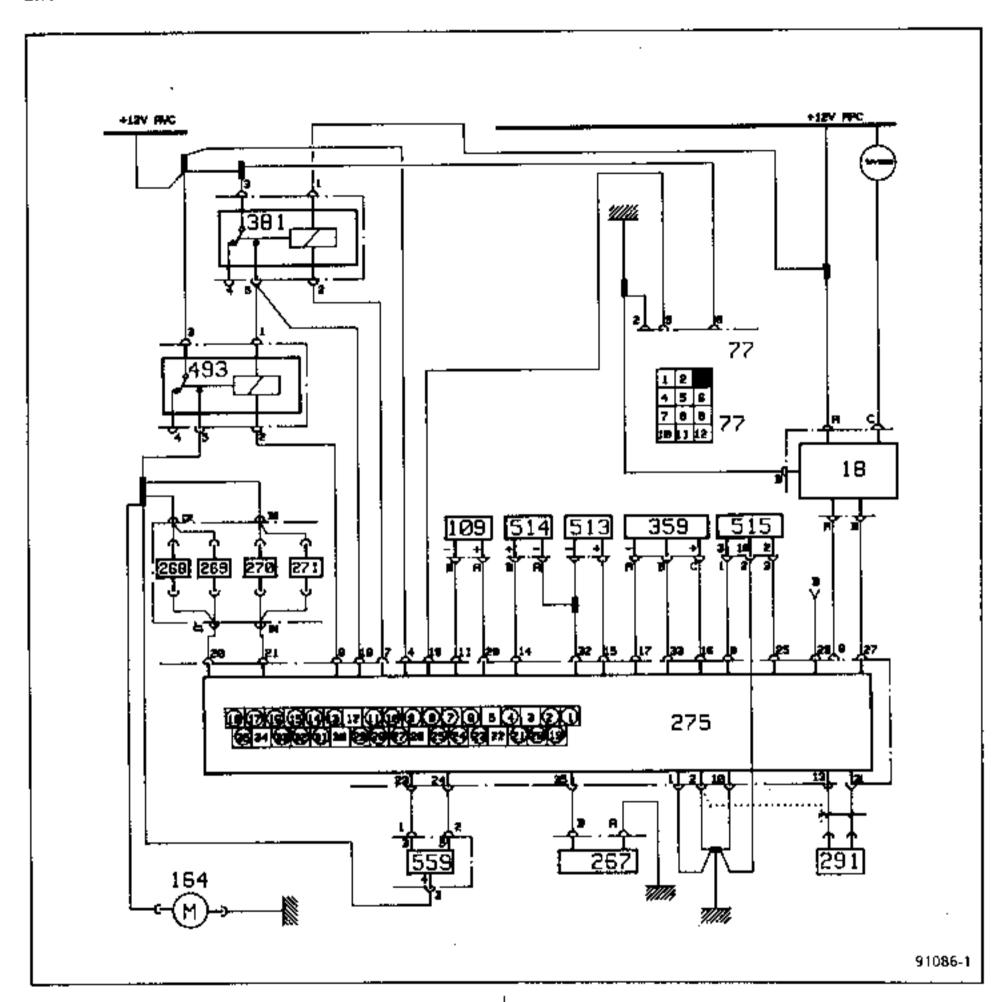


LIST OF ELECTRICAL COMPONENTS

- 109. Flywheel sensor
- 132. Injection relay
- **164**. Fuel pump
- 267. Oxygen sensor
- 268. Injector
- 275. Computer
- 278. Idling speed control motor
- 282. Exhaust gas recycling control solenoid valve
- 291. Pinking detector
- 321. Ignition coil

- 338. Diagnostic plug
- 359. Absolute pressure sensor
- **493**. Fuel pump relay
- 513. Coolant temporature sensor
- 514. Air temperature sensor
- 515. Full load switch
- tr/min. rpm
- +APC. + after ignition switch
- +AVC + before ignition switch
- B. Starter signal
- C. Neutral point switch (Engine F3N
 - н 717)

CIRCUIT DIAGRAM ENGINES F3N J 702



- 18. Ignition power module (M.P.A.)
- 77. Diagnostic socket (seen from above)
- 109.Flywheel sensor
- 164. Fuel pump (engine)
- 267. Oxygen sensor
- 268 271. Injectors
- 275. Injection and ignition computer
- **291**. Pinking sensor
- 359. Pressure sensor
- 381. Supply relay
- 493. Fuel pump relay

- 513. Coolant temperature sensor
- 514. Air temperature sensor
- 515. Full load/no load switch sensor
- **\$59**. Idling speed control valve
- ∠ Connectors
- A. Anti-evaporation canister bleed solenoid valve
- B. Starter signal
- . tr/min. rpm

NOTE: 2 wires are connected to pins No.

1 and 5 on relay 381.

SPECIAL TOOLS

A test unit has been developed for microprocessor systems. It is known as the XR 25 and connects into the diagnostic plug to permit a rapid test to determine the condition of the computer and most of its peripherals. See the latest edition of M.R.INJ. R (E) for the Renix multipoint injection system and M.R.INJ.MON for the Renix single point injection system.

Tester XR 25



PRECAUTIONS :

The computer must be disconnected before the test and no test can be carried out on the computer itself.

When carrying out electrical tests with voltmeters/ohmmeters or interconnections between electrical terminals, take care to identify, correctly, the wires as stated on the electrical wiring diagrams.

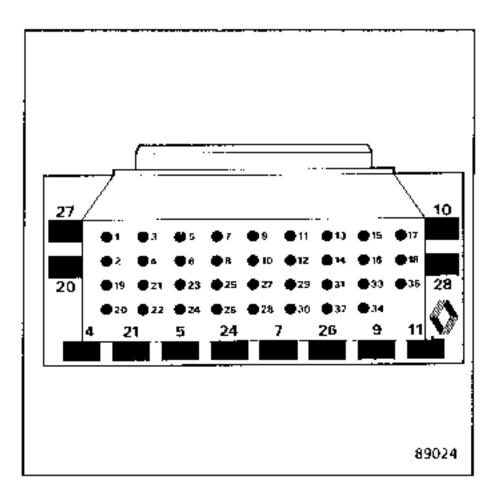
An incorrect connection could damage the injection system components.

Checking the intake system for leaks

If the idling speed is uneven (hunting) check the condition of the intake system ducts and connections.

Check, furthermore, that the throttle on load - off load switch is operating correctly as it can cause similar defects.

Junction block M.S.1048



NOTE: if the information produced by the XR 25 gives rise to a test on the electrical continuity of electrical circuits connected to the main injection system connector, plugging the connector into this junction block makes it easier to gain access to the various contacts with the tester probes.

(M.S. 1048 consists of a 35 channel block secured to a printed circuit on which there are 35 copper plated surfaces numbered 1 to 35).

INJECTION Fault finding

USING THE XR 25

If necessary consult the wiring diagram in the Workshop Manual covering the type of injection system to be tested. If one or more lines light up on the XR 25 bar graph, consult the corresponding numbers on the fault finding chart (lines 1, 7 and 8 can only light up on the right hand side of the bar graph).

Fault finding information	1	On when engine stopped : Correct. If off : check diagnostic plug wiring/computer supply/earth/defective computer.			
Air temperature sensor	4	If 4 (LH and RH) switch on : wiring or sensor short or broken circuit.			
Coolant temperature sensor	5	Test conditions: 1) engine cold: warm it up 2) engine warm: before testing switch ignition off then switch it back on again. If 5 [] [] O.K. 5 [] incorrect Check wiring/coolant temperature sensor			
		REMARK: If the engine is cold (20°) 5 may be switched on. Do not assume, from this, that the wiring or coolant temperature sensor is defective. Repeat the test at a temperature above 20°.			
Pressure sensor	7	Check : connector/wiring/pressure sensor. On central display : pressure reading = barometric reading with engine stopped (#01)			
Flywheel sensor circuit	8	If on or flashing when engine is running : check flywheel sensor/wiring/ connector			
Throttle switch (*)	10	Accelerator released : If off on the right (or on on the left),			
Oxygen sensor	13	Carry out test on warm engine. 1) If 13 is off: the engine is 3 cases possible: 2) If 13 LH is switched on: the			

If the information obtained from the XR 25 involves checking electrical continuity from the injection system main connector, plugging the connector into junction block M.S.1048 will make it easier to gain access to the various contact points, with the probes

(M.S.1048 consists of a block, with 35 channels, secured to a printed circuit, on which there are 35 copper plated surfaces numbered 1 to 35).

CHECKING THE IGNITION POWER MODULE (MPA)

This test is only to be carried out on a cold engine.

First method :

Connections :

- disconnect the 2 way connector from the power module and connect the terminal marked G, on the XR 25, to terminal B of the 2 way socket on the power module.

Check that a spark is struck between the high tension secondary lead and the cylinder block (holding the lead approximately 1 cm from the block).

- press key G on the XR 25 and on the keyboard (frequency generator), number 0.

Second method :

The test is carried out at starter speed using a kilo-voltmeter.

ASSOCIATED CHECKS

These checks are carried out if no defect is noted during tests 1 - 2 and 3 but the vehicle still suffers from operating defects.

With the Engine stopped or Engine running

DO3 # 01 Pressure in mb.

02 Coolant temperature : degrees.

03 Air temperature : degrees.

04 Battery voltage : volts.

06 Engine speed : rpm.

13 Pinking detector (except on types
C3J engines),

14 Difference between the idling speed required by the computer and the actual engine idling speed. (Single point injection only).

Examples of readings provided when the following numbers are selected :

- # 01 Ignition on, engine stopped. The pressure indication is atmospheric pressure.
- # 02 Ignition on, engine stopped or running. The temperature reading should be near that of the coolant in the radiator.
- # 03 Ignition on. The temperature reading should be that of the air entering the engine.
- # 04 Computer supply voltage.
- # 14 This reading is the difference between the idling speed required by the computer and the actual engine idling speed.

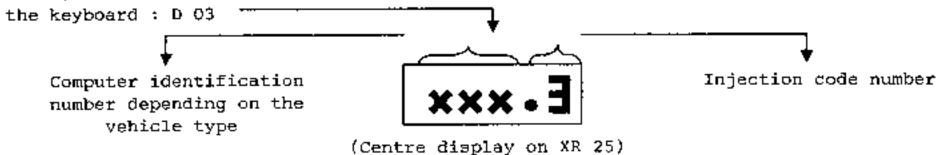
A difference of less than 100 rpm is more or less acceptable.

If the difference is greater than 100 rpm : check the setting of the motor that operates the throttle.

DISPLAYS WHEN THERE ARE NO DEFECTS

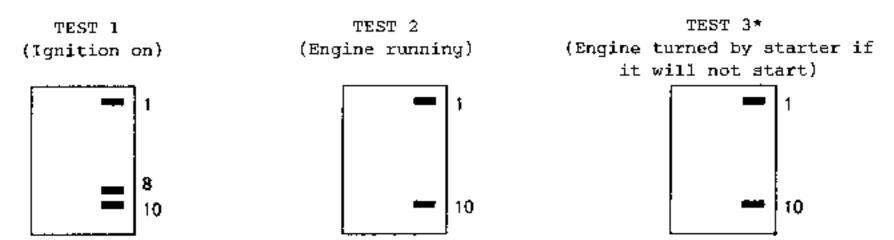
Connect tester XR 25 to the vehicle diagnostic plug and isert the latest edition of the cassette. Switch on the ignition.

Enter, on

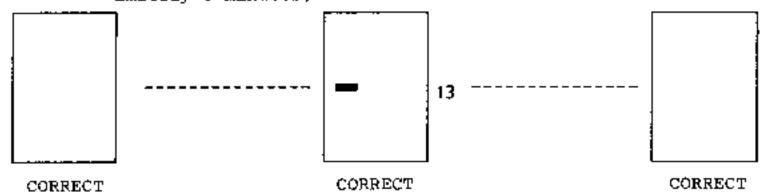


XXX : 150 B,C,F407 Renix injection (C3J B 702 and C3J E 760)

XXX : 201 B,C 408 01 (F3N H 717) **XXX** : 202 B,C 408 05 (F3N G 716)



In all 3 tests: 13 should be off when the engine is cold
(13 should switch on after the engine has been running for approximately 3 minutes)



* Ignition on 1/8/10 are switched on. Line 8 switches off when starter is operated.

Possible readings on central display



- Ignition on engine stopped.
- Ignition on, engine running (no defect). No diagnostic code displayed.



- 1) Diagnostic code not displayed, check that the computer is the correct type for the vehicle.
- 2) See the chart of non-interpreted readings in the "associated test" section.



 Check that the computer is the correct type for the vehicle. Defect can still be interpreted by the XR 25.

Special features of single point injection systems on type C3J and F3N engines :

The idling speed is controlled by a motor. The mixture is controlled by an oxygen sensor.

There is a pinking detector (engines F3N). The exhaust gas recirculation system and the anti-evaporation circuit are bled by a single solenoid valve.

The defects are not placed on memory.

If one or more lines of the bar graph on the XR 25 are switched on, consult the corresponding number on the fault finding chart.

		85.A			
٠	1 🗀	CODE PRESENT			
	2 🗀	COMPUTER FAULT]8 ₌	R SPEED START)	
	3 🗀	5 VOLT SUPPLY		TER 1	
•	4 🗔	*AIR SENSOR CIRCUIT	IGNITION VE STOPPED	STARTER S NOT S1	
•	5 🗀	COOLANT SENSOR CIRCUIT	1 ⁸ 岁.	AT ST DOES	
	6 🗔	CO POTENTIOMETER CIRCUIT	EST 1 1G (ENGINE		
•	7 🗀	PRESSURE SENSOR SIGNAL	TEST (EN	3 CHECK VEHICLE	
•	* C	FLYWHEEL SENSOR CIRCUIT	i	, " ii	
	9 📖	INJECTOR SUPPLY	1	TEST (IF	
•	10 🗔	*NL-FL SWITCHES	<u> </u>		ING
		R INJECTION CHART CODE:D 03			RUNNING
	11 🗀	FLYWHEEL SENSOR	1		CNGINE
į	12 🗀	*PINKING SENSOR			
•	13 🗔	*OXYGEN SENSOR	1		3T 2
•	14 🞞	AIR COND. SIGNAL]		TEST
		Engine stopped *** Pressure in mb. *** *** Cool. temp:degrees***	Air t Bat.v	emp:di olt:v	eg. oIts
		Engine running ros Engine speed : rpm			
	20 ====	MEMORY FUNCTION	CODE	00	

Tests carried out

PINKING SENSOR*

With the Engine at idling speed, or a higher speed, enter # 13.

Take the reading from the central display:

The reading should vary with the engine speed. If it is always less than 5, check the wiring and the pinking sensor.

Pinking sensor on the F3N engine.

TEST SEQUENCE TEST 1

Ignition on engine stopped Take readings 1 to 7 If 2 to 7 are off : no defect

TEST 2

Engine running Take readings 1 to 14

ASSOCIATED TESTS (ENGINE RUNNING)

- . Throttle switches : No load/Full load.
- . Pinking sensor.
- Daygen sensor.

THROTTLE SWITCH

- With the engine running : press the accelerator whilst watching line 10
- This can be done with engine stopped

OXYGEN SENSOR (WARM ENGINE)

Line 10 on the Lh side should not be switched on (do not carry out the test with the engine decelerating because 13 may switch off).

Possible cases :

- 13 Defect
- 13 C Engine not warm enough
- 13 Oxygen sensor. Wait for 30 seconds

NOTE : if the sensor has been disconnecte before repeating the test, switch off the

vehicle ignition.

Special features of single point injection systems on type F3N J 702 engines :

The idling is controlled by a Bosch valve. The mixture is controlled by an oxygen sensor.

There is a pinking detector.

The anti-evaporation circuit is controlled (on certain versions).

The defects are not placed on memory.

If one or more lines of the bar graph on the XR 25 are switched on, consult the corresponding number on the fault finding chart.

-			··-·		
		85.A			
•	_	CODE PRESENT		SPEED AT)	
	2 🗀	COMPUTER FAULT] 8 []	। ना	
	3 🗀	5 VOLT SUPPLY	ITION ON STOPPED)		,
•	4 🗔	*AIR SENSOR CIRCUIT	17	TAR1	
•	5 🗀	COOLANT SENSOR CIRCUIT	ST 1 IGN (ENGINE		
	6	CO POTENTIOMETER CIRCUIT	TEST (EN	3 CHECK AT	
•	7 📗	PRESSURE SENSOR SIGNAL			
•	8 🗔	FLYWHEEL SENSOR CIRCUIT		>	
	9 🚞	ANJECTOR SUPPLY	1	TEST (IF)	
•	10 🖂	*NL-FL SWITCHES			묲
		R INJECTION CHART	[Z
		CODE:0 03	ļ		ᇟ
	1	FLYWHEEL SENSOR			ENGINE RUNNING
	12 🗔	*PINKING SENSOR			
•	13 🗔	*OXYGEN SENSOR]		T 2
•	14 🗀	AIR COND. SIGNAL			TEST
		Engine stopped ***or Pressure in mb. ***or* ***or Cool. temp:degrees**or*	Air t Bat.v	emp:d olt:v	eg. oIts
		Engine running *cs Engine speed : rpm			
	20 🗔	MEMORY FUNCTION	ÇODE	00	

Tests carried out

PINKING SENSOR*

With the Engine at idling speed, or a higher speed, enter #13.

Take the reading from the central display:

The reading should vary with the engine speed. If it is always less than 5, check the wiring and the pinking sensor.

Pinking sensor on the F3N engine.

TEST SEQUENCE TEST 1

Ignition on engine stopped
Take readings 1 to 7
If 2 to 7 are off : no defect

TEST 2

Engine running Take readings 1 to 14

ASSOCIATED TESTS (ENGINE RUNNING)

- _ Throttle switches : No load/Full load.
- . Pinking sensor.
- . Oxygen sensor.

THROTTLE SWITCH

- * With the engine running : press the accelerator whilst watching line 10
- * This can be done with engine stopped

SENSOR 02 (WARM ENGINE)

Line 10 on any bar graph should not be switched on (do not carry out the test with the engine decelerating because 13 may switch off).

Possible cases :

- 13 Defect
- 13 Engine not warm enough
- Oxygen sensor. Wait for 30 seconds

NOTE: if the sensor has been disconnected before repeating the test, switch off the vehicle ignition.

DISPLAYS WHEN THERE ARE NO DEFECTS

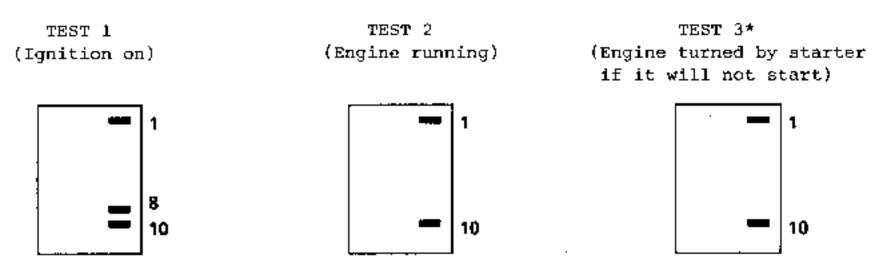
Connect tester XR 25 to the vehicle diagnostic plug and insert the latest edition of the cassette. Switch on the ignition.

Computer identification number Eg:

depending on the vehicle type
(see Manual for vehicle concerned and its technical notes)(Centre display on XR 25)

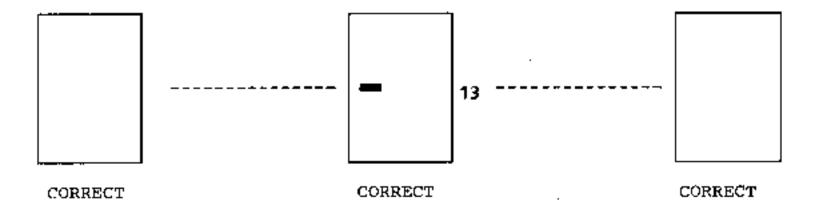
XXX :210 F3N J 702 without anti-evaporation system
XXX :211 F3N J 702 with anti-evaporation system

imately 3 minutes).



In all 3 tests: 13 should be off when the engine is cold.

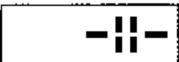
(13 should switch on after the engine has been running for approx-



Possible readings on central display



- Ignition on engine stopped.
- 2) Ignition on engine runn-(no defect). No diagnostic code displayed.



- Diagnostic code not displayed, check that the computer is the correct type for the vehicle.
- 2) See the chart of non-inter preted readings in the "associated test" section.



switched on. Line 8 switches off when the starter is oper-

1) Check that the computer is the correct type for the vehicle. Defect can still be interpreted by the XR 25.

*Ignition on 1/8/10 are

ated.

CHECKING THAT THE SYSTEM SPECIFICATIONS ARE CORRECT

ENGINES C3J B 702

Using tester XR 25 and cassette No. 4 or above

	D-3-4-1-1-00	D	1	District displant
Conditions	Selection on		Bar graph	Digital display
Conditions		-	display	Remarks
Engine stopped	D03	L1		
- 1		_		xxx3
- 1		F10	Il presence code	xxx = 150
than 80°C			L8 TDC code	125
			L10 no load	3 = injection
			switch	diagnosis
Engine stopped:				
Ignition on	i	110		
		-10		
- pedal ful.dep		L10		
Engine stopped	# 01			xxxx
Ignition on				local barometric
				pressure
Fraire rupring				- <u> </u>
_	# 02			XXX
fan has cut in				
once. If tester				
has returned				0.000 \$4.000
	# 02			80°C - 110°C
Engine cold	# 03			xxx
				Ambient tempera-
- Ignicion on				ture + 2°C
Engine stopped		L5		
Ignition on		j		
			· •	i
1				Note speed
at idling, after a few	# 06	L10		xxx
				800-900 rpm
seconds				
*If tester re-	D 03			
	Engine stopped: Engine stopped: Ignition on no load pedal slight— ly depressed pedal ful.dep Engine stopped Ignition on Engine running at idling after fan has cut in once. If tester has returned to 0 Engine cold stopped ignition on Engine stopped Ignition on Engine running at idling after fan has cut in once. If tester has returned to 0 Engine cold stopped Ignition on Engine stopped Ignition on	Engine stopped Engine stopped: Coolant temperature higher than 80°C Engine stopped: Ignition on no load pedal slight- ly depressed pedal ful.dep Engine stopped Ignition on Engine running at idling after fan has cut in once. If tester has returned to 0 #02 Engine cold stopped ignition on Engine running at idling, #06	Conditions on tester line no. Engine stopped Ignition on Coolant temperature higher than 80°C Engine stopped: Ignition on - no load - pedal slightly depressed - pedal ful.dep Engine stopped Ignition on Coolant temperature higher than 80°C Engine stopped Ignition on Coolant temperature for the stopped Ignition for the stopped Ignition for the stopped Ignition for the stopped Ignition for Ignition	Conditions on tester line no. Engine stopped Ignition on Coolant temperature higher than 80°C Engine stopped: Ignition on - no load - pedal slight-ly depressed - pedal ful.dep Engine stopped Ignition on - no load Ignition on It is incompleted Ignition It is in

ENGINES C3J B 702

Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Oxygen sensor test	Engine at idling		L13	Possible test Must be switched off on RH side	
Coolant temper- ature test if same as mixture temperature after engine started	Stop engine leave for a few seconds and re- start		L5		
E.G.R. system	Conditions	Equipm	ent	REMARK	(S
test	Engine warm, hand brake on, engage clutch in 1st and acc- elerate slightly	uum gaug ected to oid valv	e conn- solen-		vacuum ncuum equal to nnifold vacuum

The check to ensure that the system specifications are correct is carried out with tester XR 25 equipped with cassette no. 4 or above, with the corresponding magnetic card placed in front of the bar graph.

Connect the tester to the vehicle diagnostic plug with the engine switched off.

ENGINES C3J E 760

Using tester XR 25 and cassette No. 6 or above

Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Injection diag- nostic position	Engine stopped Ignition on Intake sensor temperature higher than 60°C	D03	L1 L8 L10	L1 :presence code L8 :TDC code L10:no load switch	xxxx3 xxx = 150 3 = injection diagnosis
No load/full load switch test	Engine stopped Ignition on: - no load - pedal slight- ly depressed - pedal ful.dep		L10 L10 L10		
Absolute pressure sensor test	Engine stopped Ignition on	# 01			xxxx local barometric pressure
Inlet manifold sensor test	Engine at id- ling after fan has cut in once If tester has returned to 0	# 02 D 03 # 02			××× 60°C − 110°C
Air temperature sensor test	Engine cold - stopped - ignition on	# 03			xxx Ambient temperature + 2°C
If air and inlet manifold temp- eratures are the same	Engine stopped Ignition on		L5		
Idling speed test	Engine running at idling, after a few seconds *If tester has	# 06	L10		Check speed x x x 800 - 900 tr/min.
	returned to 0	D 03 # 06			

ENGINES C3J E 760

Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Testing the oxygen sensor	Engine idling		L13	Test possible Must be switched off on the RH side	
Test on inlet manifold temp- erature sensor if it is the same as the mix- ture temperature before the eng- ine has started			1. 5		
Test on E.G.R.	Conditions	Equipm	ent	REMA)	RKS
and canister bleed systems (in certain markets)	Engine warm, hand brake app- lied, engage clutch in 1st, accelerating slightly	0-1000 mb uum gauge ected to oid valve	conn- solen-		o vacuum acuum same as anifold vacuum

The check to ensure that the system's specifications are correct is carried out with tester XR 25 equipped with cassette No. 6 or above, with the corresponding magnetic card in front of the bar graph.

Connect the tester to the vehicle diagnostic plug with the engine switched off.

ENGINES F3N G 716 and F3N H 717

Using tester XR 25 equipped with cassette No. 5 or above.

Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Injection diag- nostic position	Engine stopped Ignition on Coolant temp- erature higher than 80°C	D03	L1 L8 L10	L1 :presence code L8 :TDC code L10:no load ewitch	xxx3 F3N G 716 xxx = 202 F3N H 717 xxx = 201 3; injection diagnosis
Check on no load/ full load switch	_		L10 L10 L10		
Test on absolute pressure sensor	Engine stopped Ignition on	# 01			xxxx local barometric pressure
Coolant temper- ature sensor test	Engine running at idling after fan has cut in once. If tester has returned to				××× 80°C − 110°C
Air temperature sensor test	Engine cold - stopped, - ignition on	# 03			xxx Ambient temperature + 2°C
If air and cool- ant temperature are the same	Engine stopped Ignition on		L5		
Tdling speed test	Engine running at idling, after a few seconds *Tester has returned to 0	# 06 D03 # 06	L10		Note speed x x x F3N G 716 xxx = 700 - 800 F3N H 717 xxx = 650 - 750

ENGINES F3N G 716 and F3N H 717

					1
Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Test on pinking sensor Noise measure- ment	Engine warm and running at idling speed	· # 13	L 12		Note reading x x should be higher than 3
Test on pinking sensor Noise measure- ment	Engine warm and running off load : 3000 rpm	I .	L 12		Note the min and max readings over approx 10 seconds xx xx should be more than 10
Oxygen sensor test	Engine warm and running at idling speed		L 13	Must be switched off on RH side	Sensor primed
Test on coolant temperature if it is the same as the air temperature before the engine is started	Stop the engine for a few sec- onds and re- start		L 5		
Check on E.G.R.	Conditions	Equipm		REMAR	
system	Warm engine, hand brake app- lied, engage clutch in 1st while acceler- ating slightly	1	conn- solen-	On load — Va	vacuum cuum the same as e manifold vacuum

The check to ensure that the system specifications are correct is carried out with tester XR 25 equipped with cassette No. 5 or above, with the corresponding magnetic card place in front of the bar graph.

Connect the tester to the vehicle diagnostic plug with the engine switched off.

Using tester XR 25 and cassette No. 5 or above (F3N J 702 without anti-evaporation system).

Using XR 25 and cassette No. 6 or above (F3N J 702 with anti-evaporation system).

Function to be tested	Conditions	Selection on tester	Bar graph line no	Bar graph display	Digital display Remarks
Injection diag- nostic position	Engine stopped Ignition on	D03	L1 L8 L10	L1:presence code L8:TDC code L10:no load switch	Engine F3N J 702 without anti- evaporation sys- tem : xxx = 210 Engine F3N J 702 with anti-evap- oration system : xxx = 211 3 = injection diagnosis
Check on no load /full load switch	Engine stopped Ignition on: - no load - pedal slight- ly depressed - pedal ful.dep		L10 L10 L10		
Test on absol- ute pressure sensor	Engine stopped Ignition on	# 01			xxxx local barometric pressure
Coolant temper- ature sensor test	Engine running at idling speed after fan has cut in once. If tester has returned to 0	ĺ			x × × 80°C− 110°C
Air temperature sensor test	Engine cold - stopped - ignition on	# 03			xxx Ambient temperature - 2°C
Idling speed and idling reg- ulation test	Engine warm, running at idling. No current con- sumers operat- ing : (fan, headlights, wheels at full lock).	# 12	:		Note the speed xxx 750 to 850 rpm Note the RCO xxx 2,3-3,1

ENGINE F3N J 702 both with and without anti-evaporation system

Function to be tested	Conditions	Selection on tester	Bar graph line no.	Bar graph display	Digital display Remarks
Test on no load switch, engine running	Engine stopped: - no load - accelerator slightly dep- ressed - gently return to no load position		L10 L10 L10		
Test on pinking sensor Noise measure- ment	Engine warm running at 3000 rpm*, off load	# 13	L12		Note the min. and max readings over approx 10 seconds xxx The reading should not be 0 and should be var
Oxygen sensor test	Engine warm and running at idling speed			Must be switched off on the RH side	Sensor primed
	:		L13		

The check to ensure that the system specifications are correct is carried out with tester XR 25 equipped with cassette No. 5 or above and with the corresponding magnetic card placed in front of the bar graph.

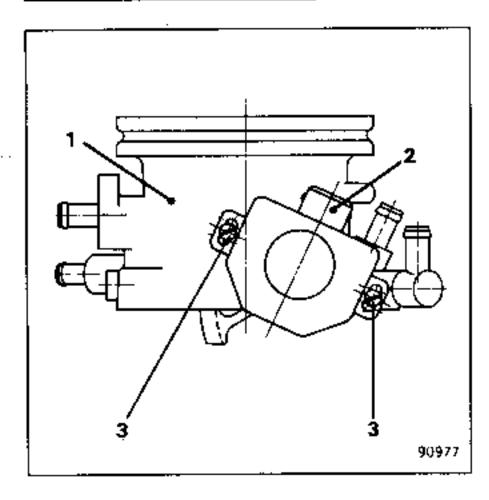
Connect the tester to the vehicle diagnostic plug with the engine switched off.

(*): it is possible for a sensor defect to be detected when the engine is accelerated, off load. Take no notice of this. CHECKING AND ADJUSTING THE NO LOAD-FULL LOAD SWITCH

Using an chmmeter and a set of feeler gauges or a throttle angle measuring tool (if the unit is removed) check that the switch is correctly positioned and operating correctly:

- A Idling: no load (throttle open by less than 1°).
- B Partial load : throttle open by more than 1° (0.25 mm feeler gauge on the throttle stop).
- C Full load (throttle open by more than 70°).

Throttle open	Resistance across terminals in ohms (Ω)				
	2 &18	18 & 3			
Α	0	Infinite			
8	Infinite	Infinite			
С	Infinite	0			



- 1. Throttle unit.
- Terminals of no load full load switch.
- 3 Adjusting screw.

ADJUSTING THE AIR FLOW

Connect tester XR 25, fitted with the latest edition of the cassette (engine at idling speed : coolant temperature higher than 80°C).

Enter DO3 then #12 on the tester and note the reading on the central display.

Check the idling speed by entering #06: 750 to 850 rpm.

Remove the tamperproofing cap.

find the minimum reading by unscrewing screw (B) until the idling speed starts to increase.

Then screw in screw (B) until this figure increases by 0.2 to 0.3 ms.

Example : minimum figure :2.3 ms, adjust to 2.55 + 0.05 ms.

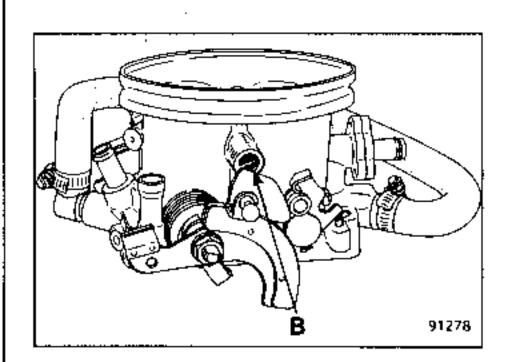
NOTE: on a new vehicle, screw (8) is screwed fully in.

After adjustment, plug the access to screw (B) by fitting a tamperproofing cap part no. 77 01 200 832.

CHECKING THE AIR FLOW

Pinch flat the air pipe that supplies the idling speed regulator valve between the filtered air ducting and the throttle unit on one hand and the regulator valve on the other hand, using tool Mot.453-01.

Check the idling speed when the regulating system is not operating and adjust it, at screw (B) so as to bring it to between 550 and 600 rpm.



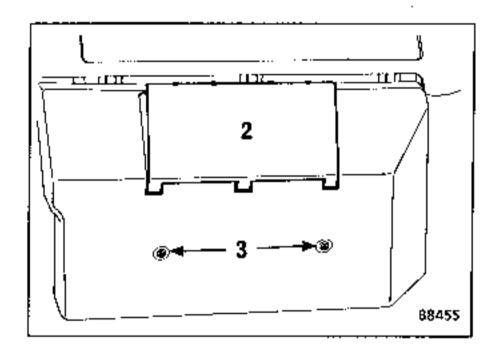
REMOVING THE COMPUTER

The computer is in the passenger compartment, on the right hand side of the vehicle, under the glove box.

Disconnect the battery.

Remove :

- the fuse box (2), (2 torx screws (3)).



Pull back the trim.

Release the strap that secures the computer and remove it from its mounting plate.

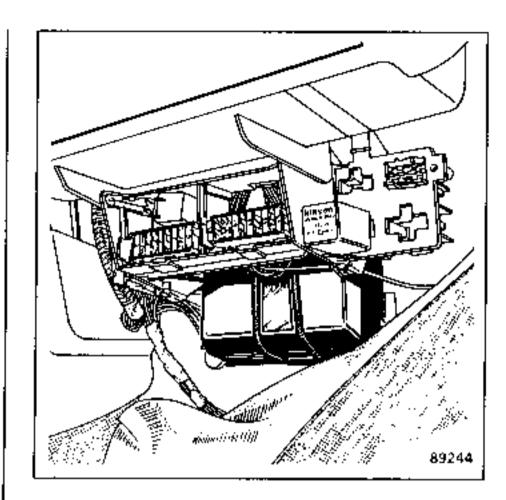
Unclip the 2 connectors that connect the computer to the vehicle wiring.

REFITTING

Carry out the removing operations in reverse.

Ensure that the computer is correctly positioned on its securing plate.

Ensure that the connection between the computer and the 2 connectors leading to the vehicle wiring is absolutely perfect.



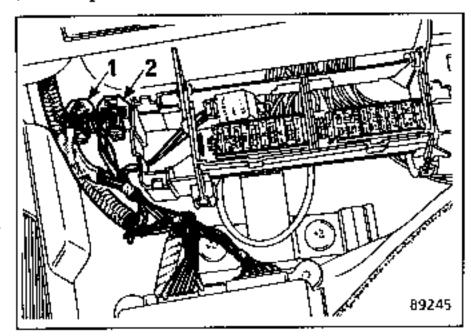
REMOVING THE RELAYS

These relays are in the passenger compartment under the glove box on the computer securing plate.

Disconnect the battery.

(See removing the computer).

Unscrew the screw that secures each relay to the plate.



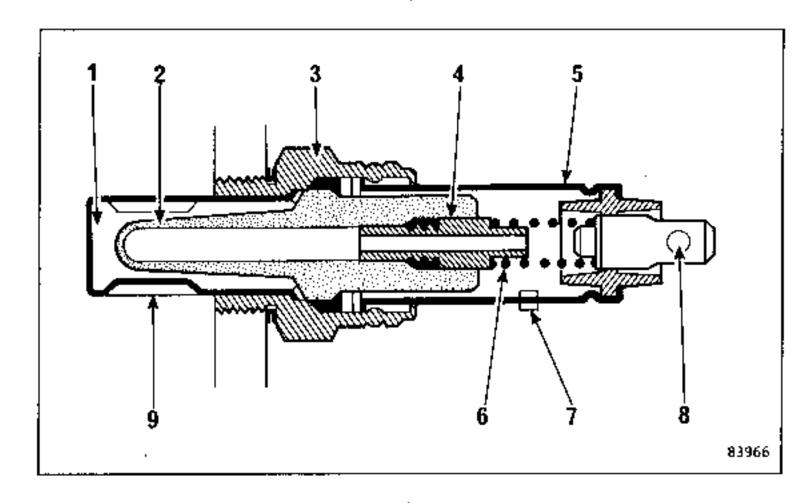
- 1. Supply or locking relay
- 2. Fuel pump relay

MIXTURE REGULATION

OXYGEN SENSOR OPERATING PRINCIPLE

The oxygen sensor determines the amount of oxygen in the exhaust gases. This reading varies according to the strength of the mixture. The sensor operates as follows. A variation in the composition of the air/fuel mixture, when compared with the stoechiometric ratio (Lambda = 1) results, automatically, in a variation of the output voltage.

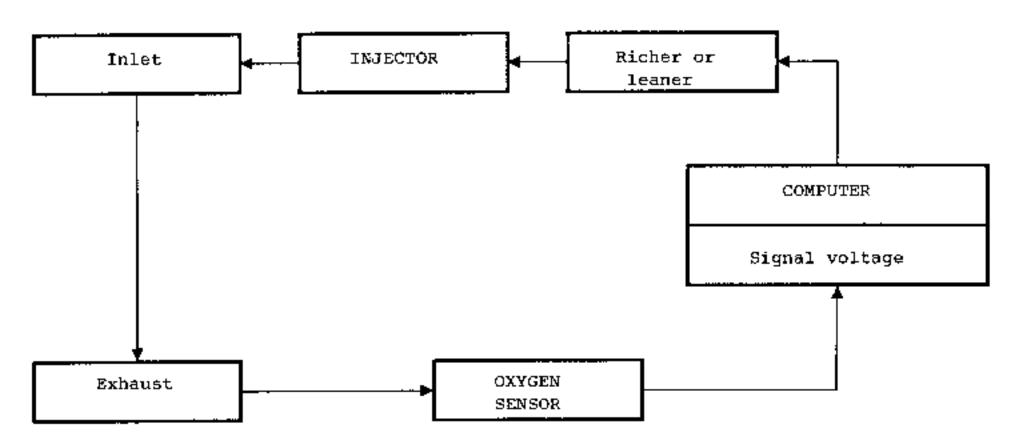
The computer corrects the air/fuel mixture to maintain its proportions as near as possible to the stoechiometric ratio (Lmbda = 1) and this permits, when used in conjunction with catalysers, a very close control to be maintained on the exhaust gas emission. The operating principle of the sensor is based on the property of the type of ceramic used to carry oxygen ions at temperatures above approximately 250°C. If the oxygen content is not the same on either side of the sensor an electrical voltage is set up across the two end surfaces because of the special properties of the material used. This voltage makes it possible to measure the oxygen content of the gases on either side of the sensor.



- Protective cover
- Ceramic sensor
- Ferrule
- Contact plug
- Protective cover

- Contact spring
- Vent orifice
- 8 Electrical connection
- q Exhaust gases

MIXTURE REGULATION

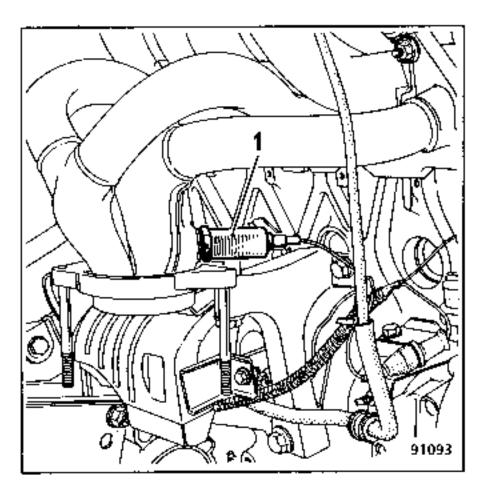


Principle of regulation by means of an oxygen sensor.

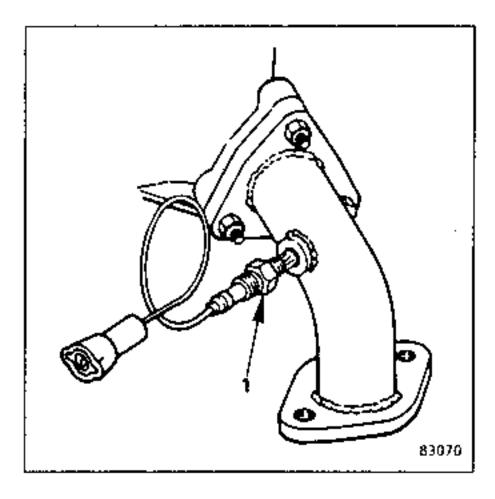
THE POSITION OF THE OXYGEN SENSOR

On the F3N engine, the oxygen sensor is mounted on the exhaust manifold on the input side of the down pipe flange.

On the C3J engine, the oxygen sensor is mounted on the exhaust pipe connector between the manifold and the down pipe.



1. Oxygen sensor



Oxygen sensor

Replacing the oxygen sensor :

REMOVING

Disconnect the electrical connector. Unscrew the oxygen sensor from the down pipe assembly.

Clean the thread in the down pipe assembly.

REFITTING

Warning :

Apply anti-seizing grease only to the thread on the sensor, not to any other of the parts.

Screw the oxygen sensor, by hand, into the down pipe assembly.

Tighten it to a torque of 2.7 to 3.4 daN.m.

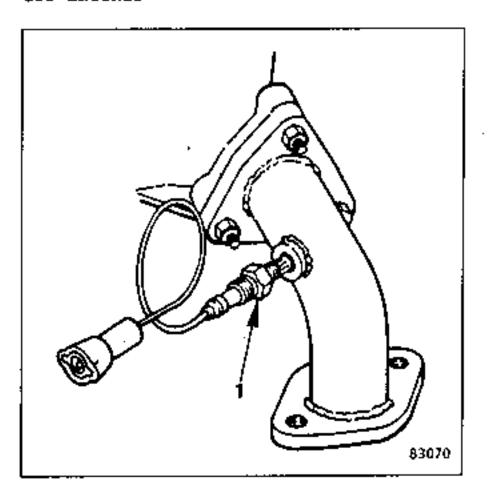
Ensure that the terminal ends of the wires are pushed fully into the connector.

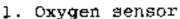
Reconnect the electrical connector.

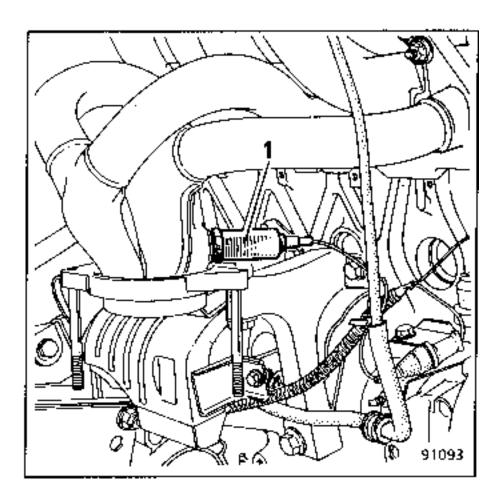
REMARK: push the rubber protector on to the sensor body only until it is 13 mm from the base.

The spiral wires on the oxygen sensor cannot be joined or soldered. If these wires are broken, the sensor must be replaced.

C3J ENGINES





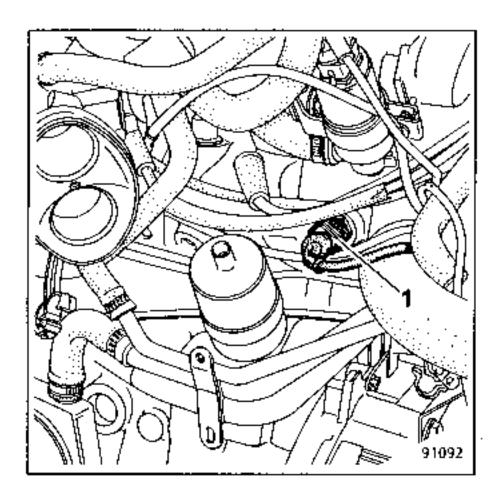


Oxygen sensor

REMOVING THE COOLANT TEMPERATURE SENSOR

Disconnect the electrical connector.

Remove the sensor, when the engine is cold, by unscrewing it and quickly plugging the hole in the cylinder head to avoid excessive coolant loss.



1. Coolant temperature sensor

There is no control valve on the heater. The coolant flow through the heater matrix is continuous and contributes to engine cooling.

DO NOT BLOCK THE PIPES

ANTI-FREEZE QUANTITIES AND GRADES

Veh i cle t yp e	Engine	Quantity in litres	Grade	Special features		
B400-C400-S400 - F400	C1C	 5,5 6,5 5,5		1		
B401-C401-S401 - F401	C1E			·		
B402-C402 - F402	C1J					
B403-C403	Ç2J					
B404-C404-S404 - F404	F8M		GLACEOL AL	Protection down to -23°C		
C405	C1J		anti-freeze	for hot, temperate and		
8407-C407 - F407	C3J		(type C)	cold climates. Protection down to -40°C		
B408-C408						for very cold climates.
C409	F3N	6,5				
B40F-C40F-\$40F	C1G					
B40G-B40K-C40G-C40K	F2N	5,5	·			
B40H-C40H - F40H	C1E					
B40M-C40M - F40M						
B40J-C40J	C2J					

It is forbidden to pour ordinary tap water into the cooling system to top up the level. Use only demineralised water.

ESSENTIAL SPECIAL TOOLS

M.S. 583 Hose clips

Refractometer

Supplier : Contact your local After-

Sales Head Office.

ANTI-FREEZE DENSITY

Place clamps M.S.583 on the radiator hoses to avoid draining the cooling system.

Remove the radiator filler cap and draw out coolant.

Measure the degree of anti-freeze protection using the refractometer.

Hot and temperate climates :

- protection -23°C (35% anti-freeze solution),
- protection -40°C (50% anti-freeze solution).

The front protection is less effective when the anti-freeze concentration exceeds 60%.

The protection figures shown in the charts are those for coolant at a temperature of 40°C when the measurements are taken.

Using the chart

On vehicles with a coolant capacity of 5.5 litres, if the protection provided is shown as -15°C:

- to take the protection down to -23°C one must take 0.7 litres of the existing solution out of the circuit and replace it by 0.7 litres of pure anti-freeze.
- to take the protection down to -40°C, one must remove 1.9 litres of the existing mixture from the system and replace it by 1.9 litres of pure anti-freeze.

PURE ANTI-FREEZE TO BE ADDED

-23°C Warm and temperate climates

Protection	
measured	System
at 40°C	capacity
(coolant	(litres)
temperat-	5.5
ure)	
-5° C	1,6
þ	
-10° ⊂ 😸	1,1
lac Jin	
-15° ⊂ 🚡 🛣	0,7
L 0	

Protecti	on
measured	System
at 40°C	capacity
(coolant	(litres)
temperat	
ure)	
-5° C	2,6
ã	5
-10°С გ	2,3
5	
-10° C है -15° C है	1,9
•	- 0
-20° C − 2	5,1년 문
+	, 49 - 10 - 10 -
-25° C ‡	្ទឹ <u>ទំ</u> 1,2
-	
-30°C 5	anti-freeze down to -40°
72	
-35° C 🗦	음독 특 0, s
=======================================	ceol
E C	o b t
Ē	15 Pr

ALUMINIUM MATRIX RADIATORS

Certain vehicles are equipped with cooling radiators that have aluminium matrixes.

1. Flushing out

Do not flush out these radiators or their cooling systems with caustic soda or any alkaline product (as this could cause corrosion of light alloy components and the risk of leakage).

2. Storage

If a radiator removed from a vehicle is to be stored for less than 48 hours no part-cular precautions need to be taken.

Above this period, however, particles of brazing flux used during the manufacture of the radiator and the dichlorate ingredients of the coolant that the radiator previously contained can, when they make contact with the air, cause oxydisation of the aluminium parts of the radiator and subsequent leakage.

If a radiator, after removal, is to be left for more than 48 hours one must :

- either FLUSH IT OUT THOROUGHLY with water, BLOW IT THROUGH with compressed air and PLUG all its apertures,
- or keep it filled with coolant, if possible.
- Anti-freeze and coolant

These aluminium radiators require an appropriate anti-freeze or coolant. AL type C coolant or GLACEOL AL type C concentrated anti-freeze, as marketed through the RENAULT network, fulfils the specification requirements laid down by our Design Office especially as regards:

- the fact that it does not attack aluminium and cast iron components,
- its alkaline content is specially designed for the special requirements of light alloy systems,
- it contains special additives that guarantee effective protection against the acidic products of combustion both in high speed Diesel and Petrol engines,
- its concentration provides both protection and efficient operation at all temperatures.

Prepared type C anti-freeze

2 litre can 7701405402,

- 10 litre can 7701405403.

215 litre drum 7701417021.

Prepared type C Export anti-freeze

- 1 litre can 7701406211.

ESSENTIAL SPECIAL TOOLS			
M.S. 554-03	Kit for testing cooling systems for leaks		
M.S. 554-01	Adaptor for M.S. 554-03		
M.S. 554-04	Adaptor for M.S. 554-03		

1) Checking the system for leaks

Replace the valve on the expansion bottle by adaptor M.S.554-01.

Connect tool M.S.554-03 to it.

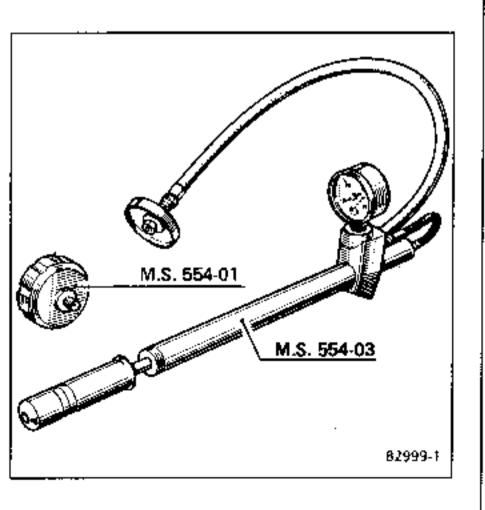
Warm up the engine then stop it.

Pump the equipment to place the system under pressure.

Stop pumping at 0.1 bars above the valve pressure setting.

The pressure should not fall. If it does, look for the leak.

Slowly unscrew the union on the tool M.S. 554-03 to release the pressure in the cooling system then remove tool M.S.554-01 and refit the expansion bottle valve, using a new seal.



2) Checking the valve pressure setting

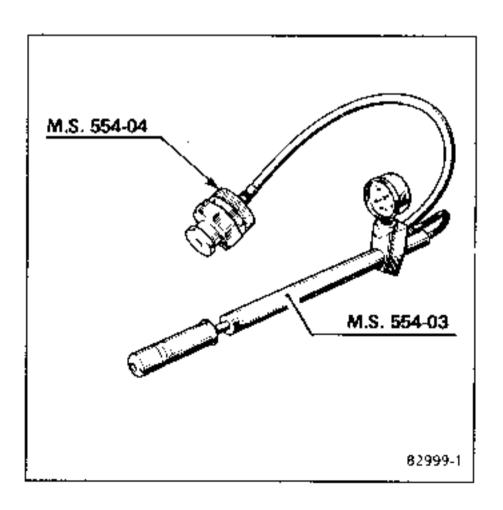
If coolant has passed through the expansion chamber valve, it must be replaced by a new one.

Fit too1 M.S.554-04 to pump M.S.554-03 and fit it to the valve to be tested.

Raise the pressure. It should stabilise at the valve pressure setting. The test tolerance is + 0.1 bar.

Valve pressure setting

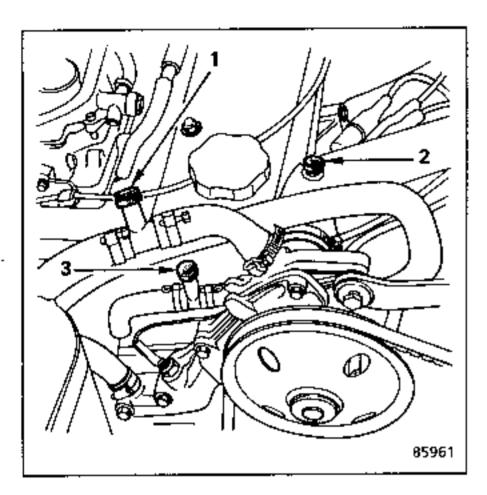
Brown plastic valve 1.2 bars.



FILLING

Check that the drain plug on the cylinder block is tight.

Open bleed screws 1 - 2 and 3.



There is no control valve on the heater. Flow through the heater matrix is continuous.

Release the expansion bottle and secure it as high up as possible on the vehicle bonnet.

Fully fill the radiator and refit its cap.

Finish filling the cooling system through the hole in the expansion bottle.

Close the bleed screws as soon as coolant runs from them.

Fill the expansion bottle to the MAX mark.

CLOSE THE EXPANSION BOTTLE.

BLEEDING ON ALL VEHICLES EXCEPT THE C 405

Run the engine at at least 1500 rpm for approximately 15 minutes.

Leave the engine to cool, completely and check and, if necessary, top up the level of the coolant in the expansion bottle to the MAX mark.

WARNING: If the system is not properly bled, hot spots may form in the cooling system.

NOTE: do not open the bleed screw or screws with the engine running.

BLEEDING THE C 405

With the engine stopped

Fill the system through the degassing bottle whilst lifting it slightly.

Screw the cooling system test pump (M.S. 554-03 + M.S.554-01) on to the bottle.

Place a clamp (Mot.453-01) on the hose at the input to the bottle.

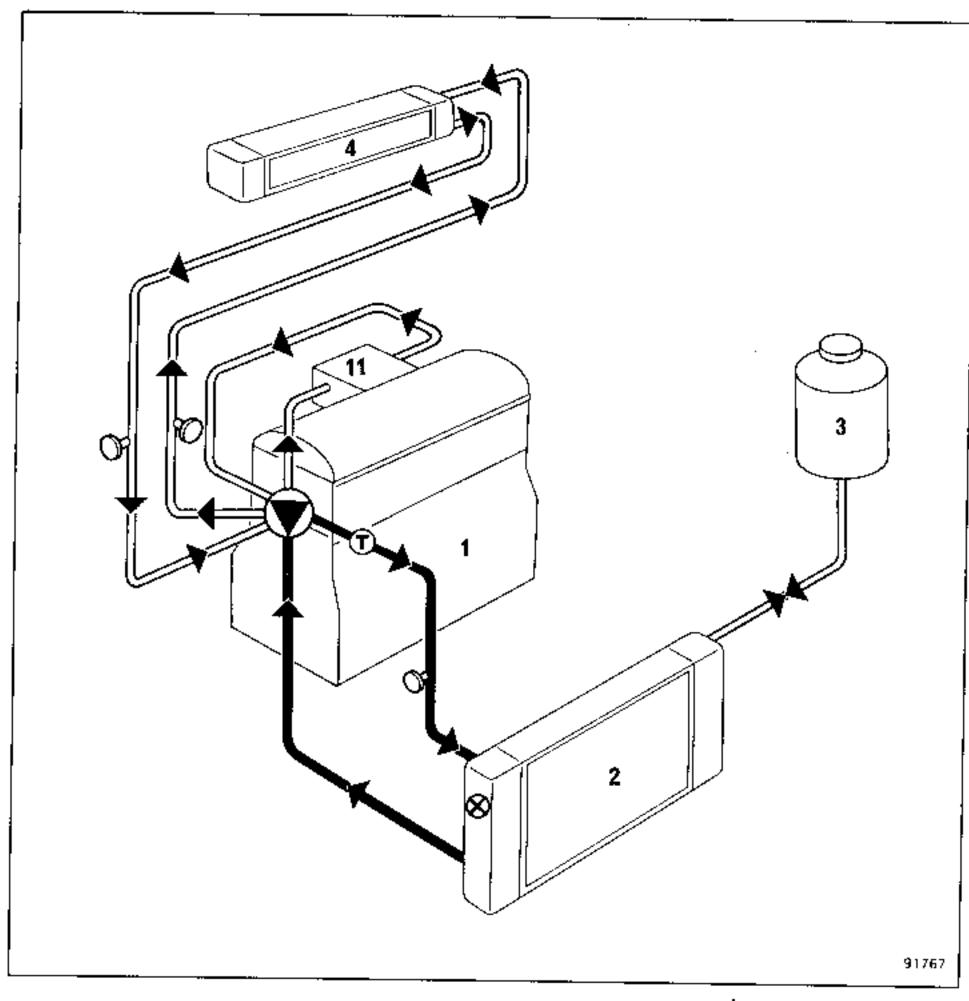
Pump the equipment to obtain a pressure of 500 gr.

Open the bleed screws and wait until the coolant flows from them in a continuous stream.

Close the bleed screws, top up the level in the bottle, remove the clamp and screw on the valve.

Start the engine and wait until the cooling fan has cut in a number of times.

ENGINES "C" - All types except C 405 vehicles



- 1. Engine
- Radiator
- 3. Cold bottle
- 4. Heater



Thermostat



Temperature switch



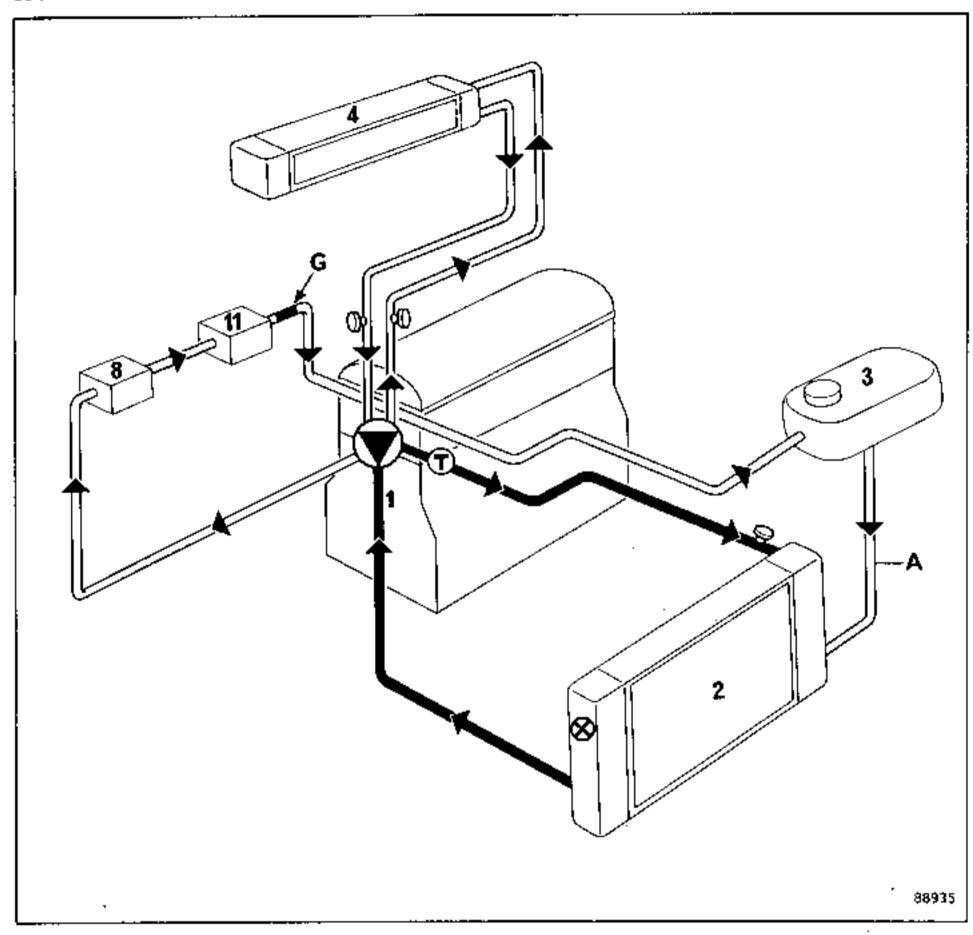
Coolant pump



Bleed screws

MODIFICATIONS TO THE COOLING SYSTEM SINCE ITS INTRODUCTION, ON THE C 405 VEHICLE

1st ARRANGEMENT



NOTE: Coolant pipe A is no longer supplied by the Parts Department and therefore when carrying out any work on a vehicle with this early type system one must fit pipe B (see 2nd arrangement) and plug the take-off point on the radiator.

- 1. Engine
- 2. Radiator
- 3. "Hot" bottle
- 4. Heater
- 8. Manifold
- Carburettor base heating
- G. 3 mm jet



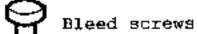
Thermostat



Temperature switch



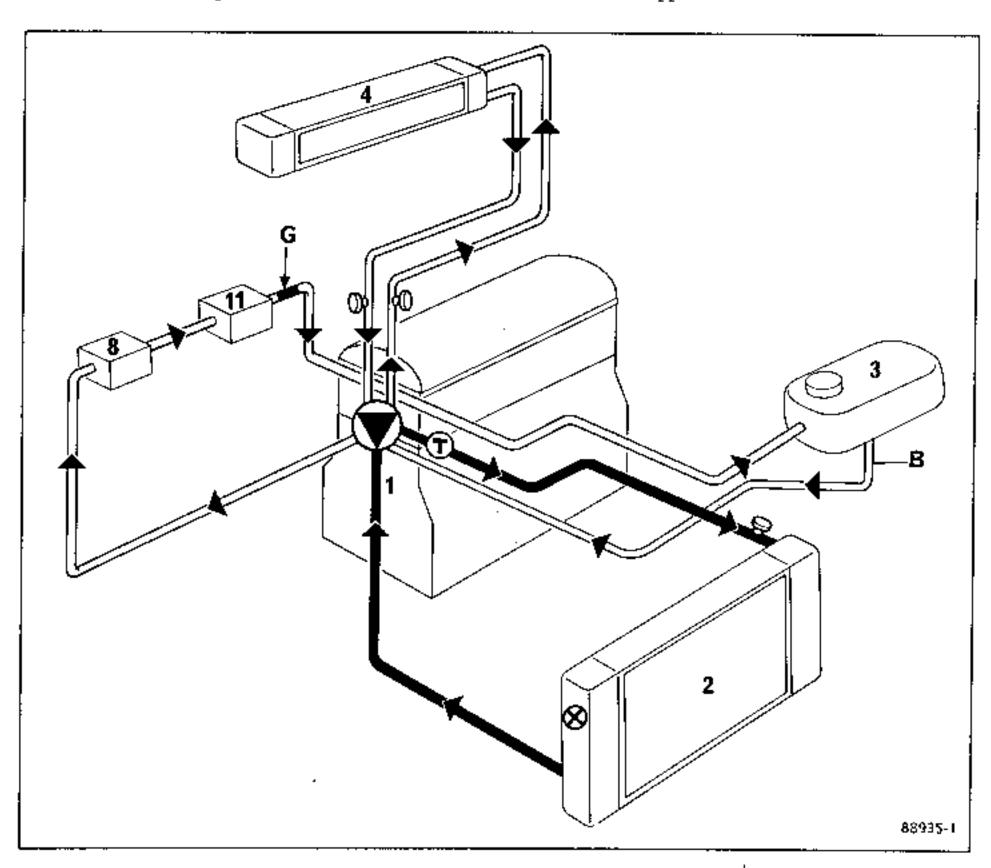
Coolant pump



The reason for introducing this second type arrangement was to improve the degassing of the radiator and the heater performance. At the same time it also contributes to reducing noise.

2nd ARRANGEMENT

From the following serial numbers : Flins : F 5666 or Dieppe : K 6559



- Engine
- 2. Radiator
- "Hot" bottle
- 4. Heater
- 8. Manifold
- Carburettor base heating
- G. 3 mm jet



Thermostat



Temperature switch



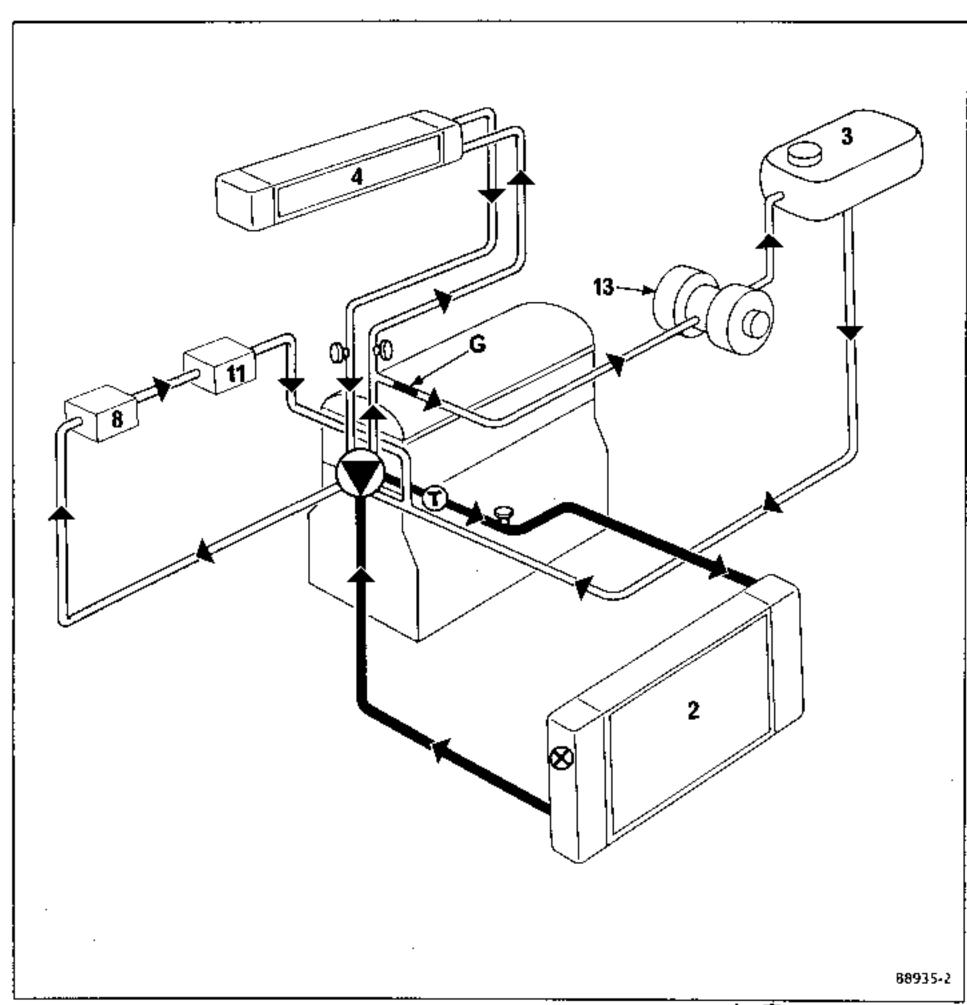
Coolant pump



Bleed screws

Water cooled turbocharger

3rd ARRANGEMENT

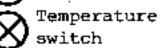


- 1. Engine
- 2. Radiator
- 3. "Hot" bottle
- 4. Heater
- 8. Manifold
- 11. Carburettor base heating
- 13. Turbocharger





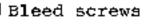
Thermostat



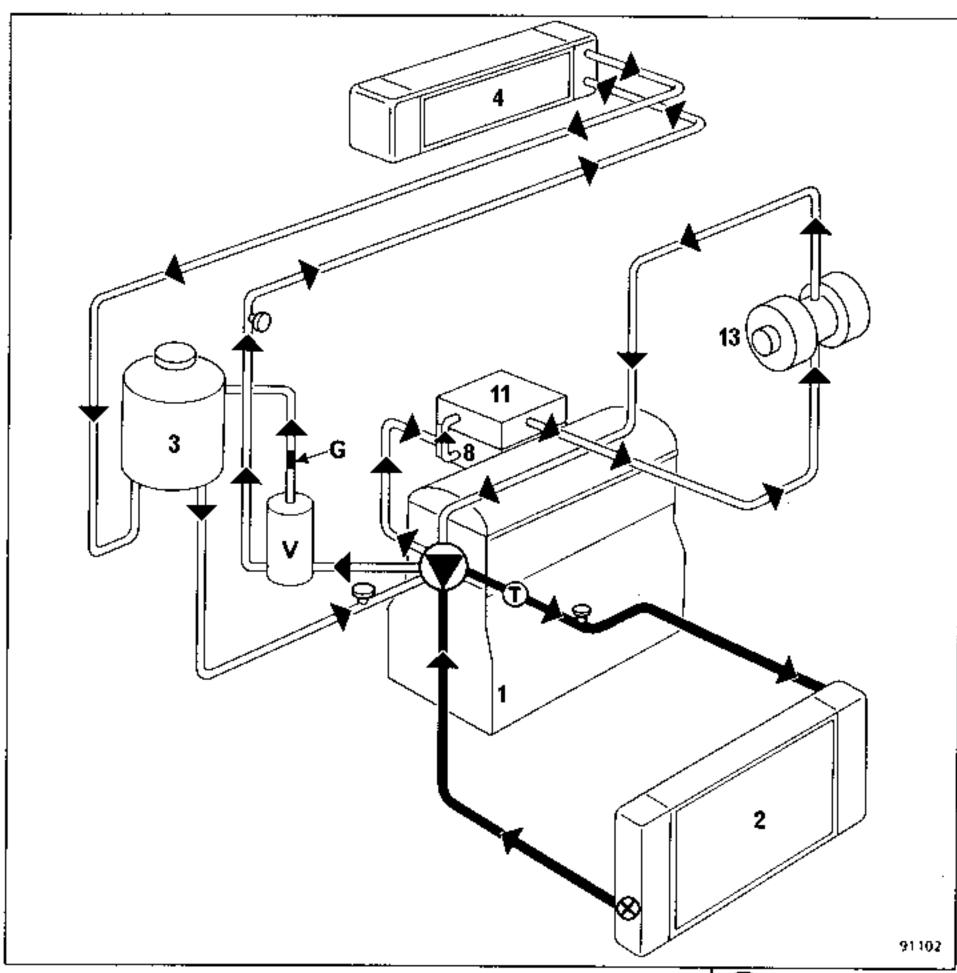


Coolant pump





4th ARRANGEMENT



- 1. Engine
- Radiator
- "Hot" bottle
- 4. Heater
- 8. Manifold
- Carburettor base heating
- 13. Turbocharger
- G. 3 mm jet



Thermostat



Bleed screws



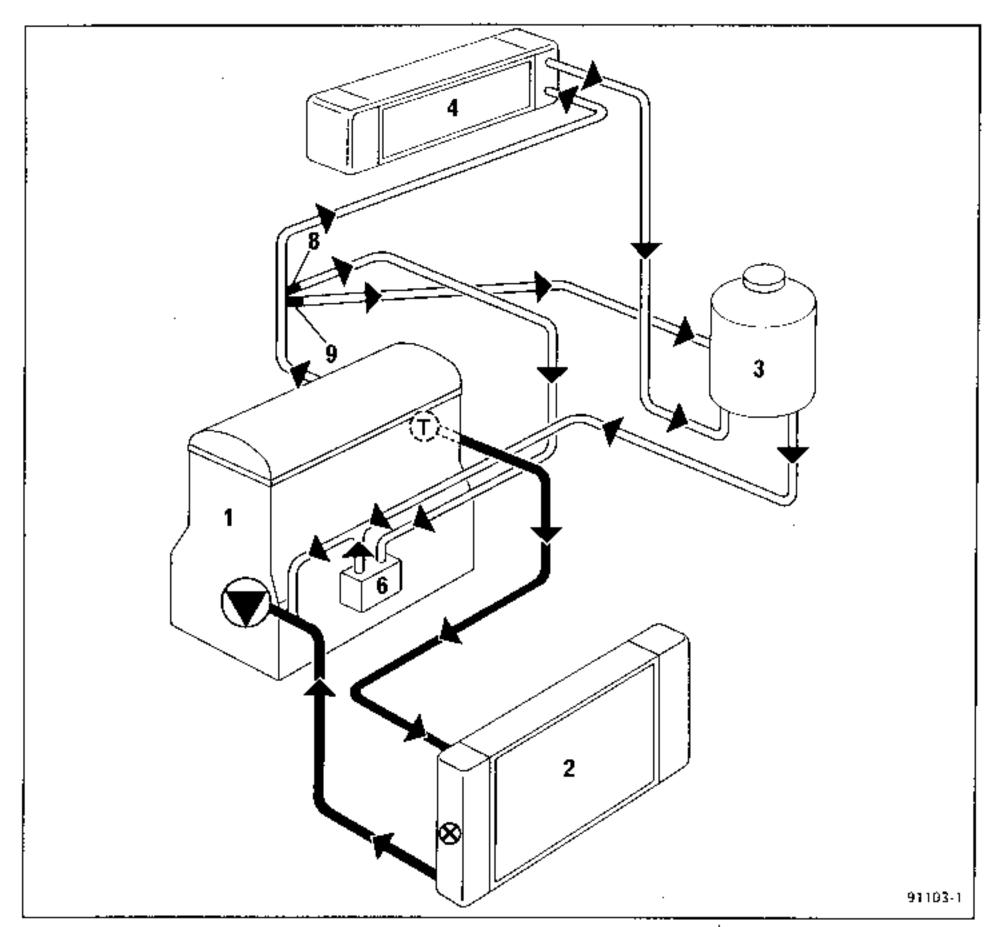
Temperature switch



Coolant pump



VORTEX unit (degassing unit)



- 1. Engine
- 2. Radiator
- "Hot" bottle
- 4. Heater
- 6. Modine unit
- 8. 8 mm jet
- 9. 3 mm jet



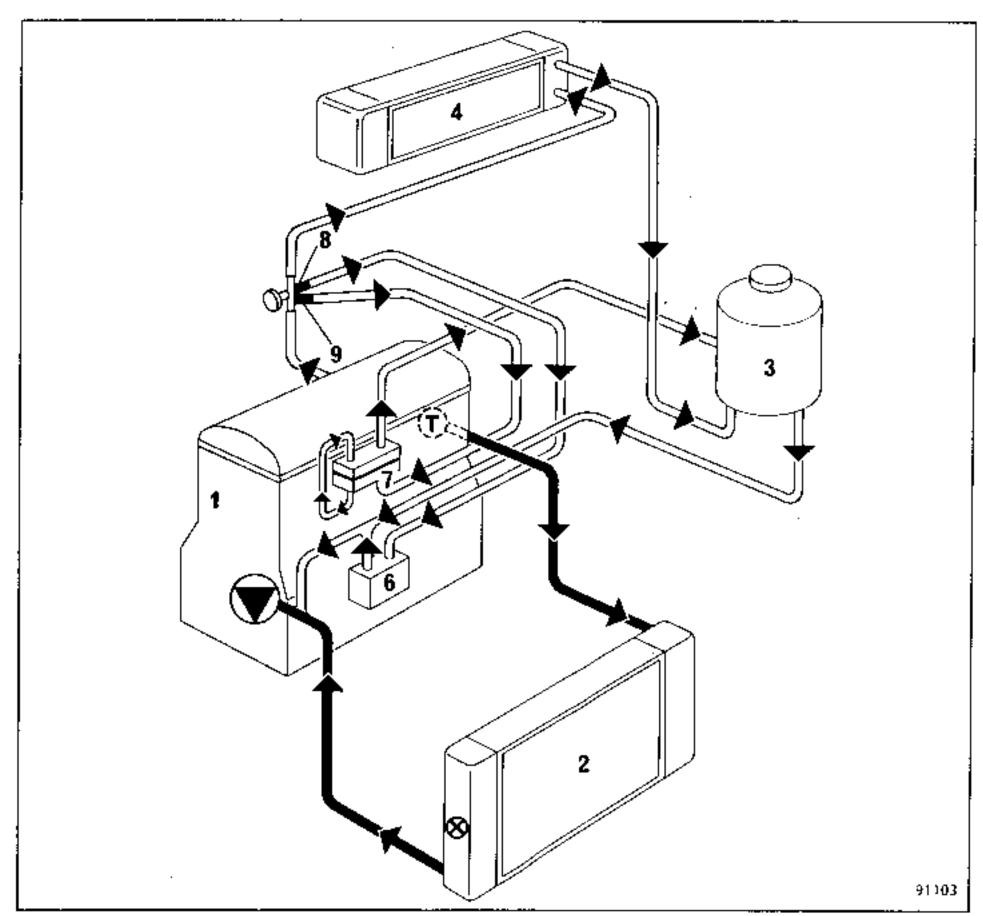
Thermostat



Temperature switch



Coolant pump



- 1. Motor
- 2. Radiator
- "Hot" bottle
- 4. Heater
- 6. Modine unit
- 7. Throttle unit
- 8. 8 mm jet
- 9. 3 mm jet



Thermostat



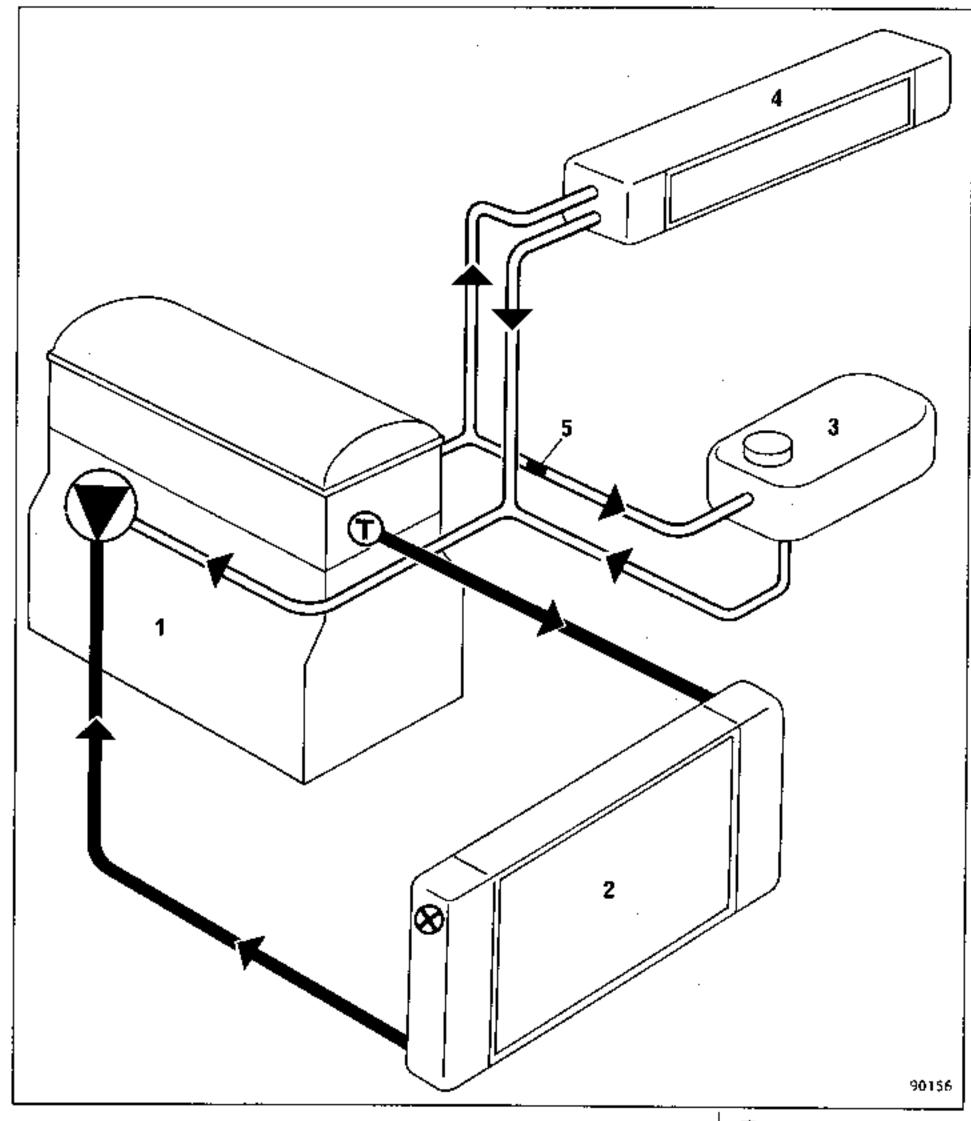
Temperature switch



Coolant pump



Bleed screw



- 1. Engine
- 2. Radiator
- 3. "Hot" bottle
- 4. Heater
- 5. 3 mm jet



Coolant pump



 ${f T}$ hermostat



Temperature switch

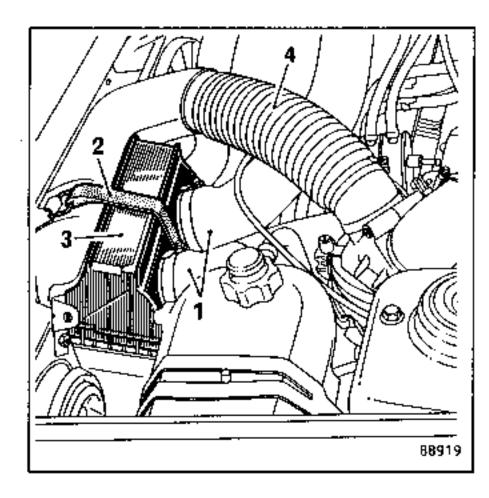
REMOVING

Disconnect the pipes from the intercooler.

Release the strap and the cold air intake and take out the intercooler by freeing it from its positioning holes.

REFITTING

Carry out the removing operations in reverse.



- Air pipes
- Strap

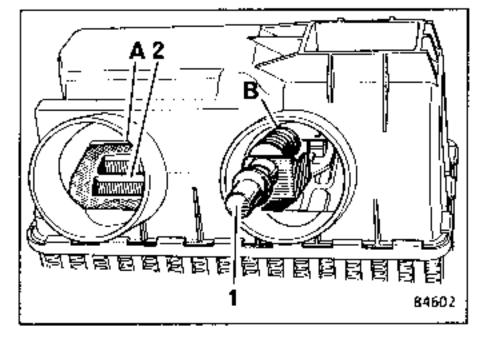
- Intercooler
- 4. Cold air intake

Checking the intercooler thermostatic capsule.

Immerse the thermostatic capsule (1) in water.

After 5 minutes immersion :

- when the water is at 43 ⁺/₋ 2°C the flap (2) should close off the flow of air to the cooler,
- with the water at 47 2°C the flap (2) should close off the direct flow between the input (A) and the output (B), all the air should flow through the intercooler.

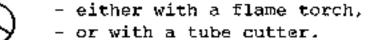


These repair methods are described by means of diagrams that show, immediately, the points at which the various operations are to be carried out.

To avoid making them too complex, symbols have been used to show details of the operation required:



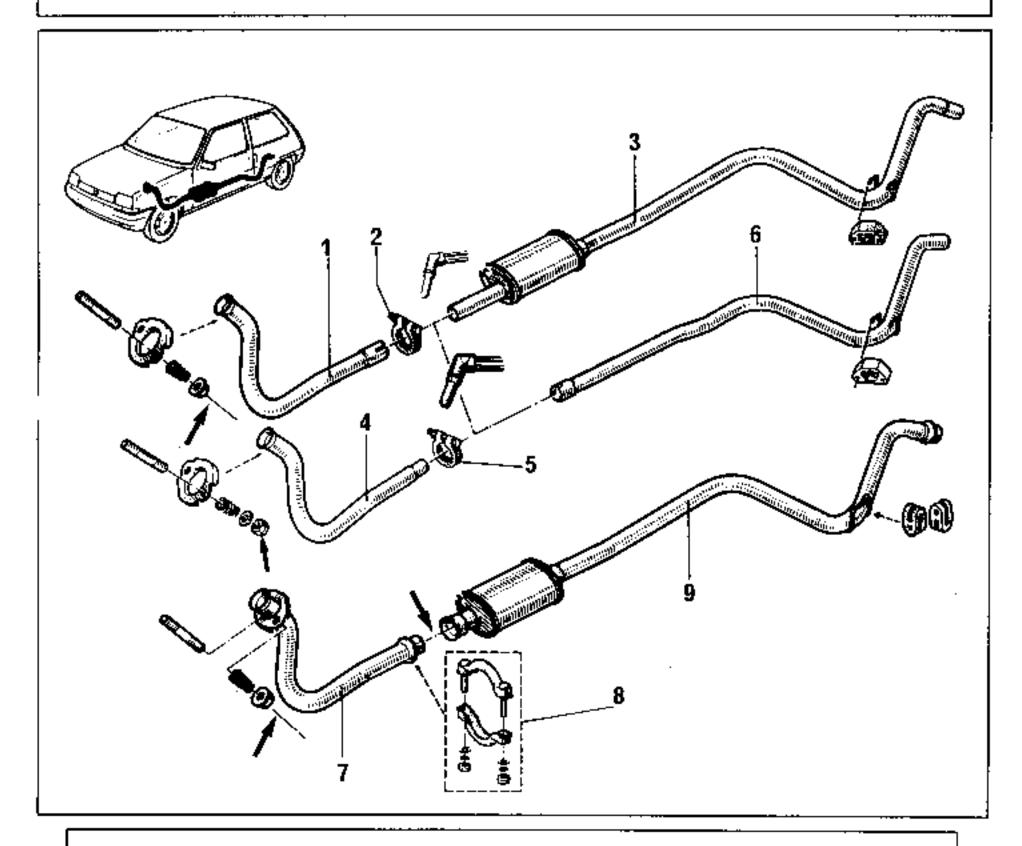
Cut :



Cut only with a flame torch :

- a clamp,

- the external tube of a sleeved section.

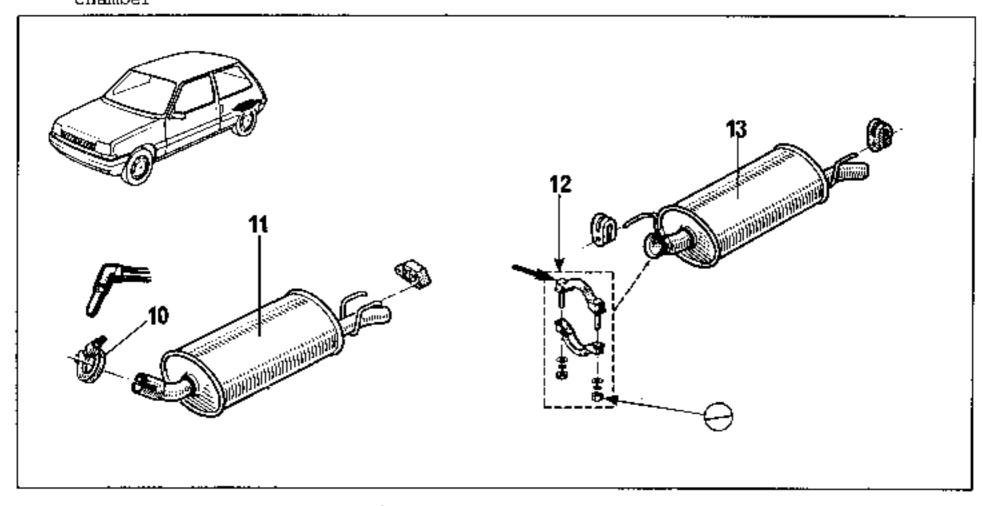


As a safety measure, keep a CO2 fire extinguisher near to the area where the work is to be carried out.

- 1. Down pipe (on all models except the C 405, 1987 model year)
- 2. Securing clamp
- 3. Intermediate pipe + expansion chamber (same note as no. 1)
- 4. Down pipe (1st arrangement except the C 405 1987 model year)
- 5. Securing clamp
- 6. Intermediate pipe (same note as no. 4)
- 7. Down pipe
- 8. Securing clamps
- Intermediate pipe + expansion, chamber

All models except the C 405,

1987 model year

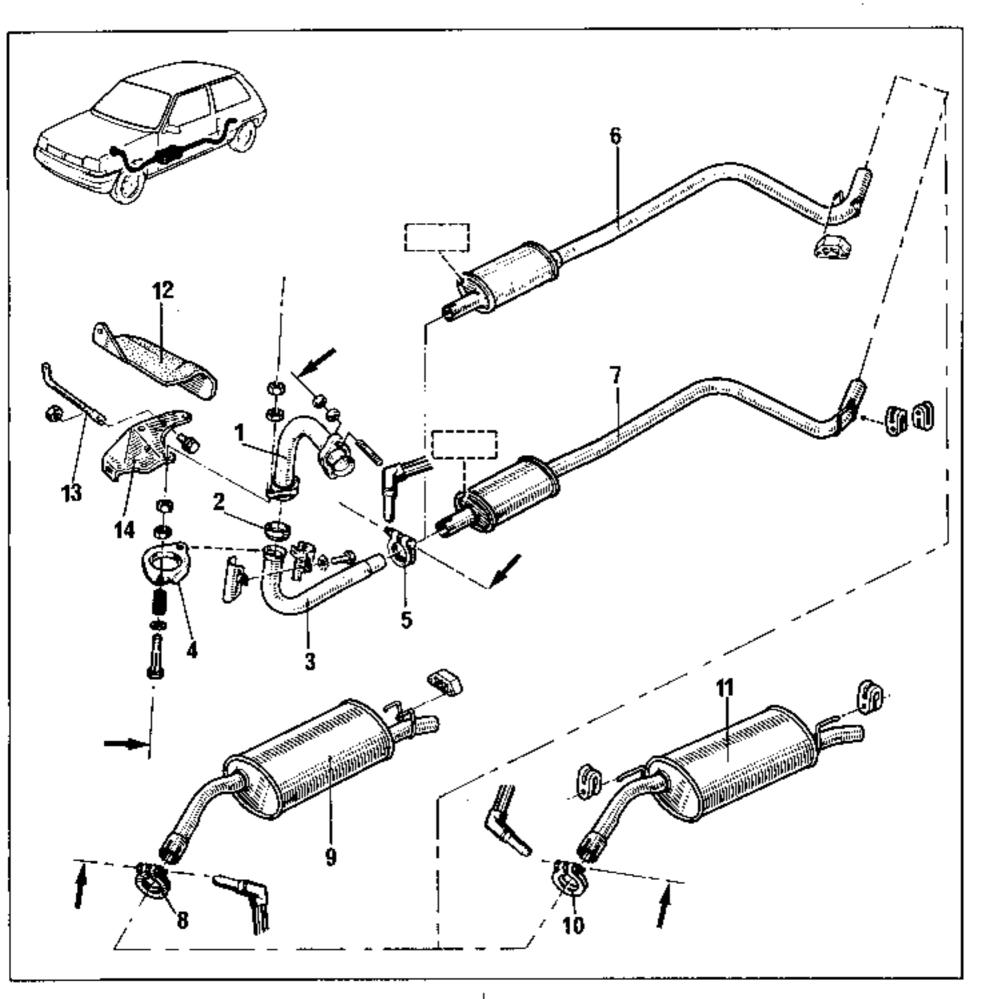


- Securing clamp
- Silencer
- Securing clamp
- Silencer

All models to 1987 model year

All models from 1987 model year

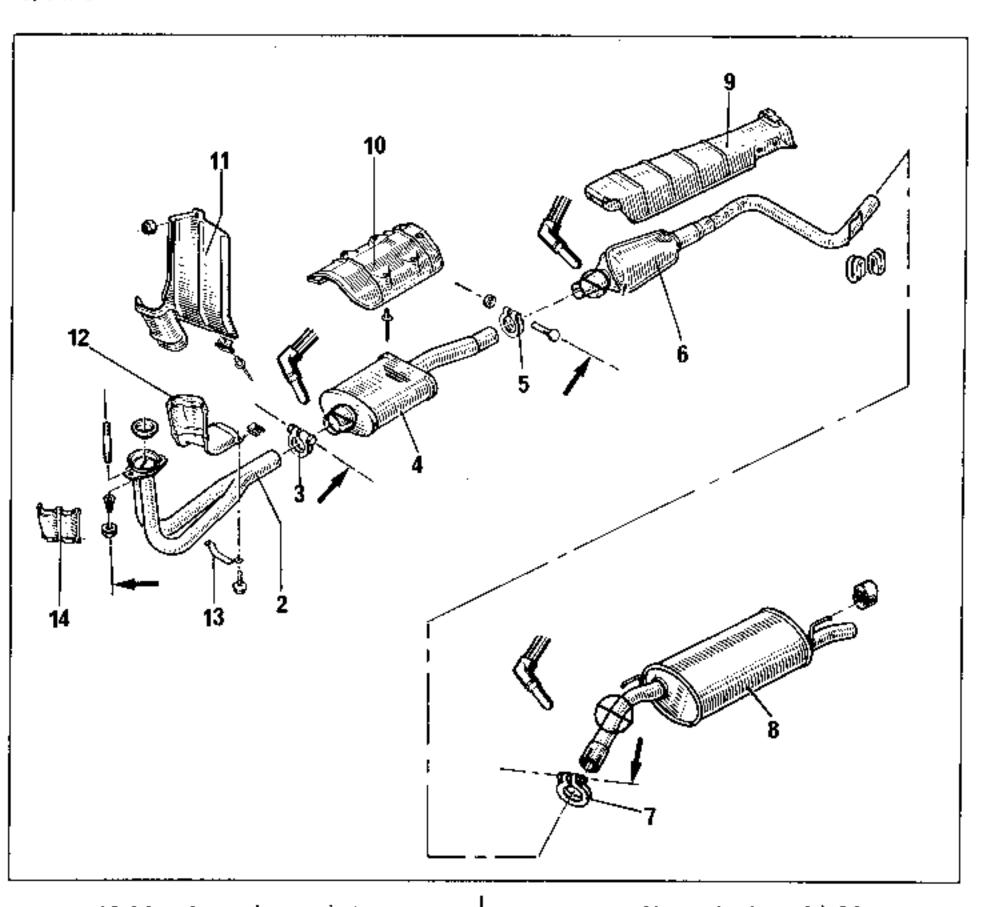
C 405



- Down pipe upper section + securing clamp
- Joint between down pipe upper and lower sections
- 3. Down pipe lower section
- 4. Down pipe securing clamp
- Securing clamp
- 6. Expansion chamber + intermediate pipe (up to 1987 model year)
- 7. Expansion chamber + intermediate pipe (from 1987 model year)

- 8. Securing clamp
- 9. Silencer (up to 1987 model year)
- Securing clamp
- 11. Silencer (from 1987 model year)
- 12. Heat shield
- 13. Strut
- 14. Spacer

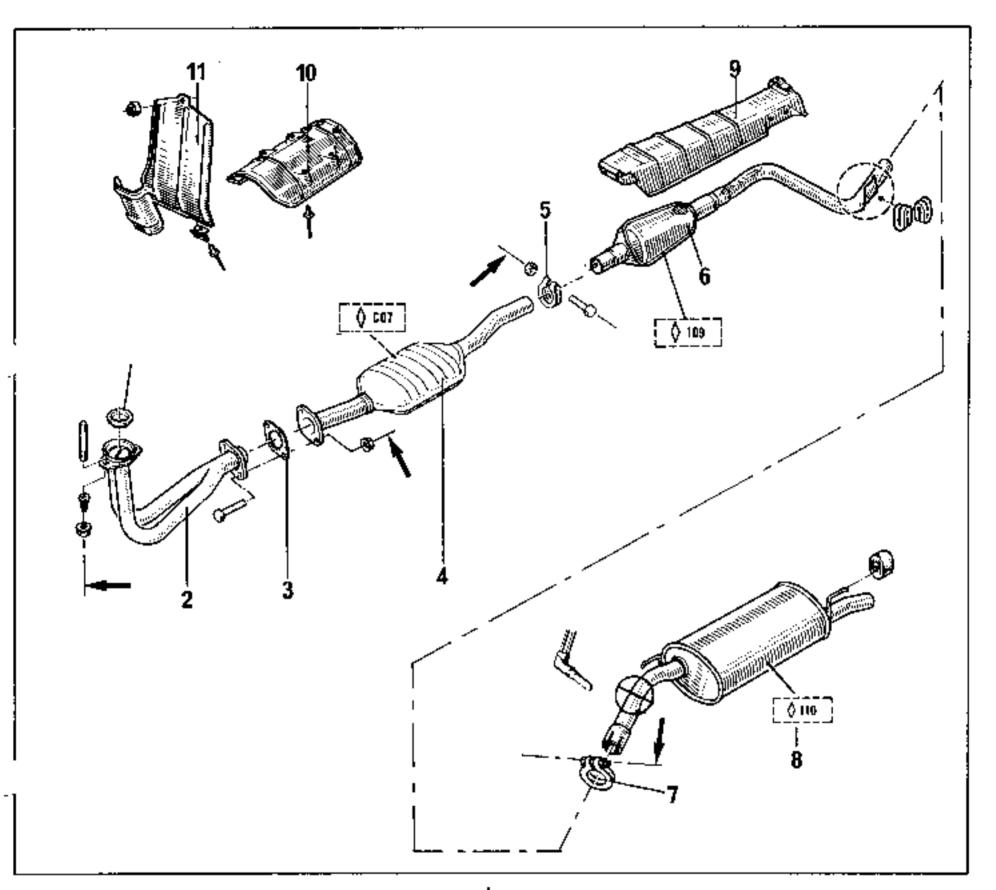
B, C 40 G



- Manifold down pipe gasket
- Down pipe
- Securing clamp
- 4. Expansion chamber
- 5. Securing clamp
- 6. Chamber + intermediate pipe
- Securing clamp
- 8. Silencer

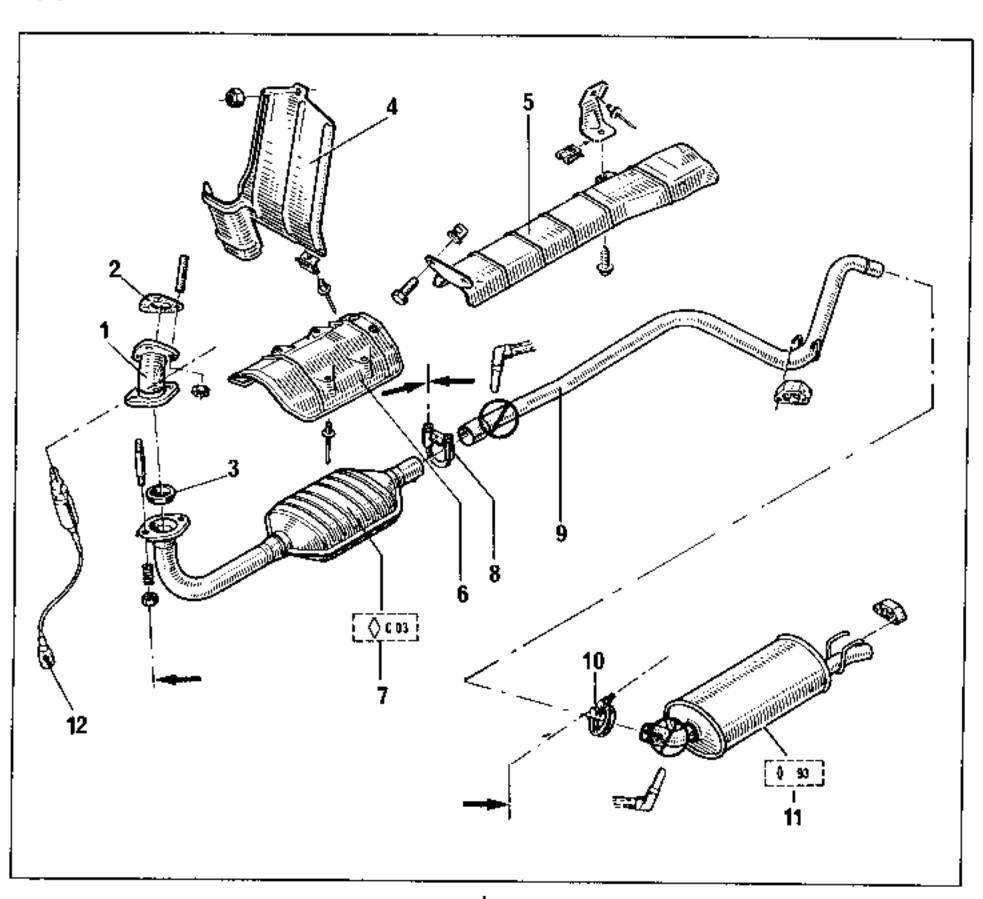
- 9. Intermediate chamber shield
- 10. Expansion chamber shield
- 11. Scuttle shield
- 12. Down pipe shield
- 13. Securing clamp
- 14. Down pipe shield

B/C 40 K



- 1. Manifold down pipe gasket
- 2. Down pipe
- 3. Down pipe catalyser seal
- 4. Catalyser or catalytic converter
- 5. Securing clamp
- 6. Expansion chamber + intermediate pipe
- 7 Securing clamp
- 8 Silencer
- Expansion chamber shield
- 10. Catalyser shield
- 11 Scuttle and down pipe shield

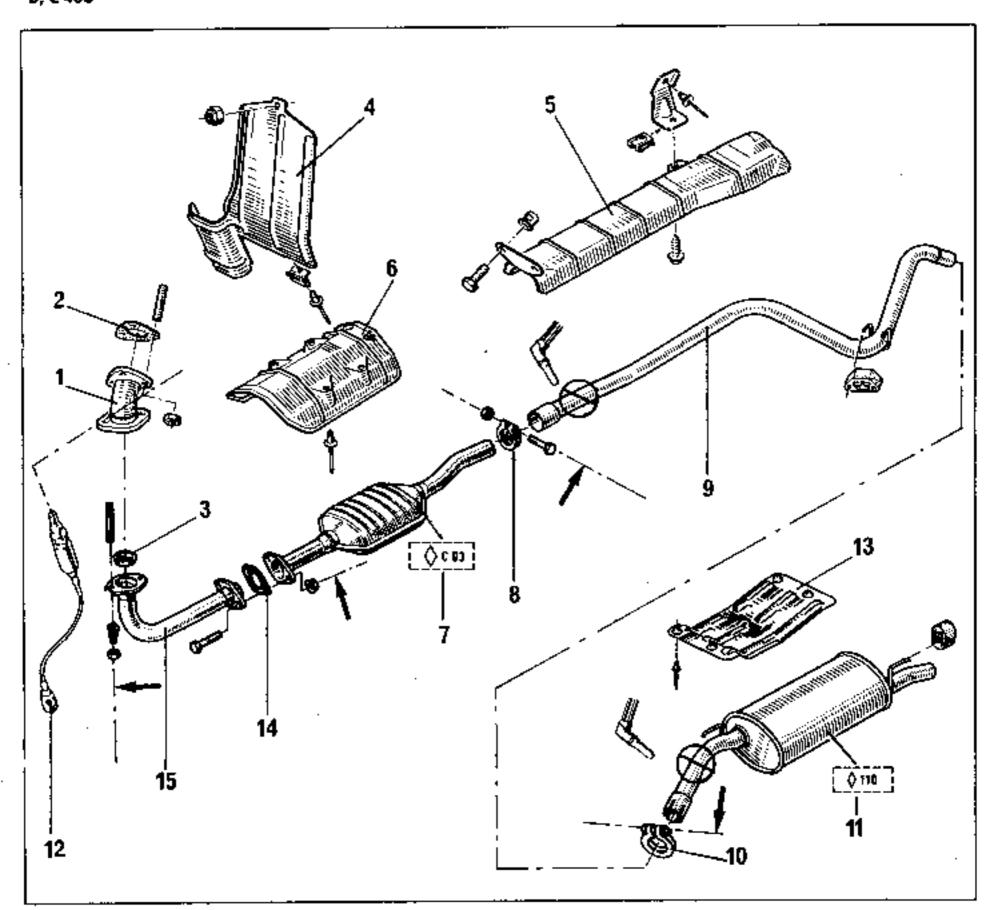
B, C, F 407:



- Connector between manifold and down pipe
- 2. Manifold connector gasket
- 3. Connector down pipe gasket
- 4. Scuttle shield
- 5. Intermediate pipe shield
- Catalyser shield

- 7. Catalyser or catalytic pot
- 8. Securing clamp
- 9. Intermediate pipe
- Securing clamp
- 11. Silencer
- 12. Oxygen sensor

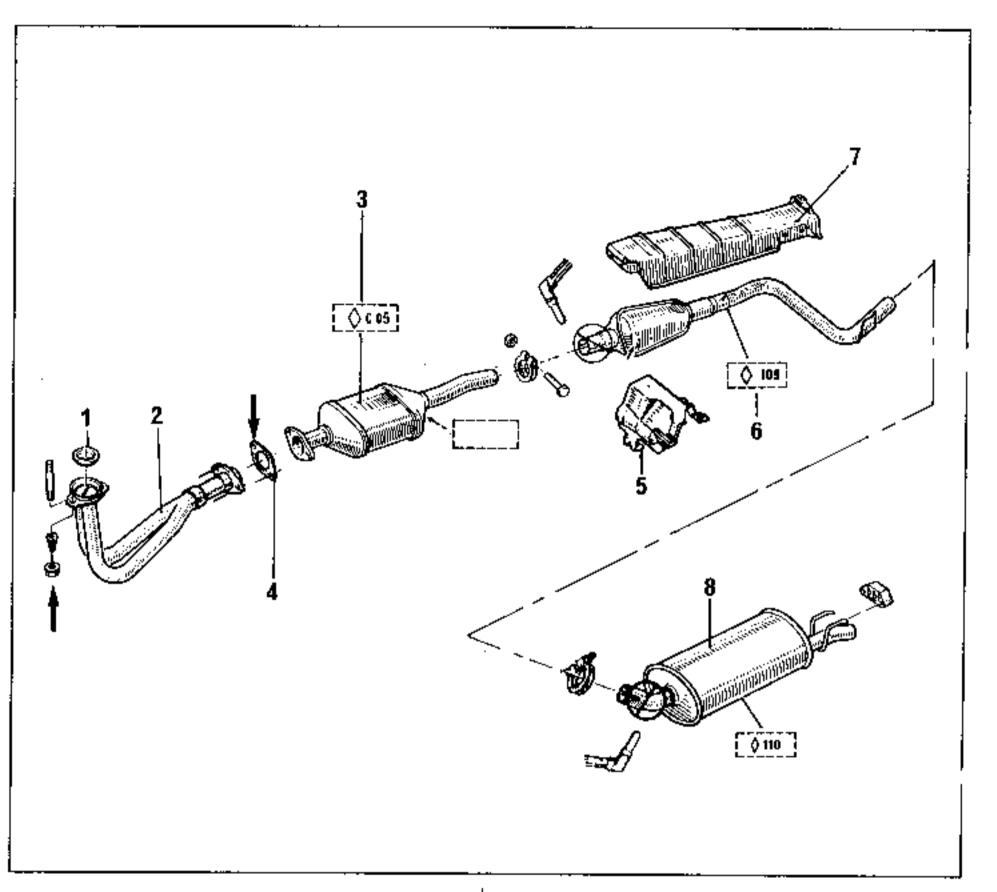
8, C, F 407 1987 model year B, C 408



- Connector between manifold and down pipe
- Manifold connector gasket
- Connector down pipe gasket
- 4. Scuttle shield
- Intermediate pipe shield
- 6. Catalyser shield
- 7. Catalyser or catalytic converter
- a. Securing clamp

- Intermediate pipe
- Securing clamp
- 11. Silencer
- 12. Oxygen sensor
- Silencer shield
- 14. Down pipe catalyser gasket
- 15. Down pipe

C 409



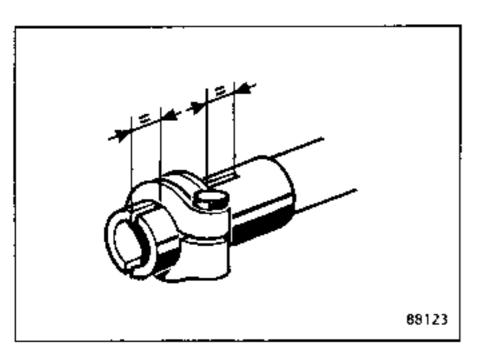
- 1. Gasket
- 2. Down pipe
- Catalyser
- Gasket

- 5. Shield
- 6. Intermediate pipe + expansion chamber
- 7. Shielđ
- 8. Silencer

EXHAUST Precautions to be taken

To align the exhaust system correctly and tighten the clamps properly :

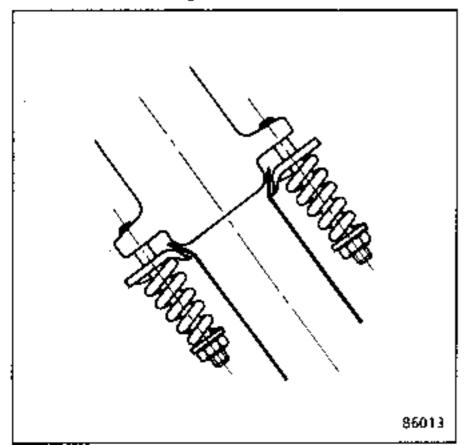
- tighten the various connections starting at the exhaust manifold and finishat the silencer,
- place the clamps so that their clamping areas pull down on to the split ends of the pipes and their gaps are between two of the slits in the pipe,



- tighten the bolts on the clamps to the specified torque: 8 mm diameter bolts: 2 daN.m, to avoid distorting the pipe and the clamp as this can cause leakage.

IMPORTANT: Any seal or gasket removed must be REPLACED by a new one.

Tightening the clamps: All models except the C405



Tighten the springs until they are coilbound, then loosen them by one and a half turns.

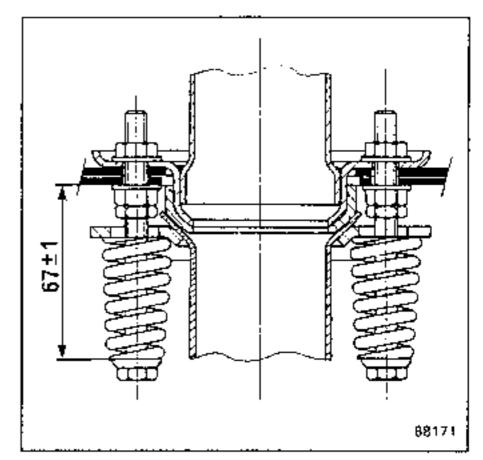
WARNING: Never leave the springs coilbound, that is to say with their coils in contact with one another.

Removing on the C 405

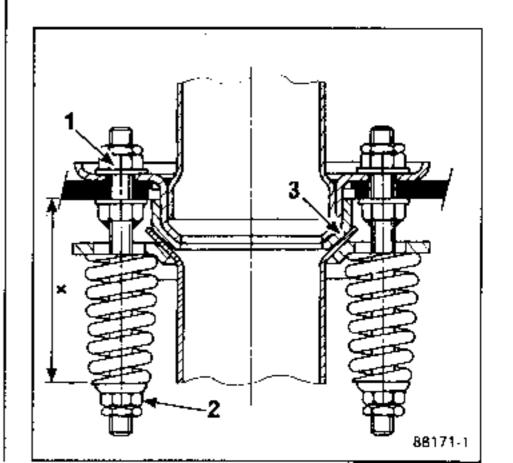
The exhaust pipe is to be disconnected at the ball joint. Hold nut 1 and loosen 2. Refitting:

Do not forget to fit the anti-grating washer 3. Pull up the springs, on the vehicle to the required pre-load. The pre-load should be $\chi = 67 \pm 1 \text{mm}$.

1st arrangement :



2nd arrangement :



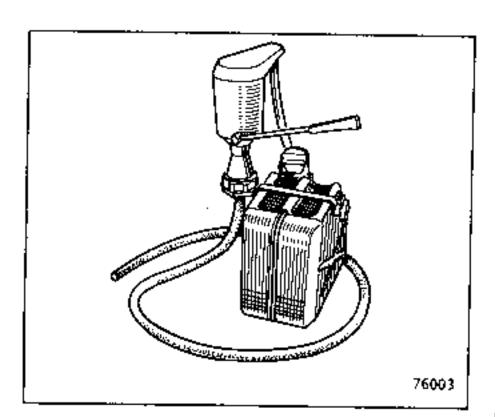
REMOVING :

Place the vehicle on a lift.

Before raising the vehicle :

- Disconnect the battery.
- Drain all the fuel from the tank using, for example, the "3000 piston pump".

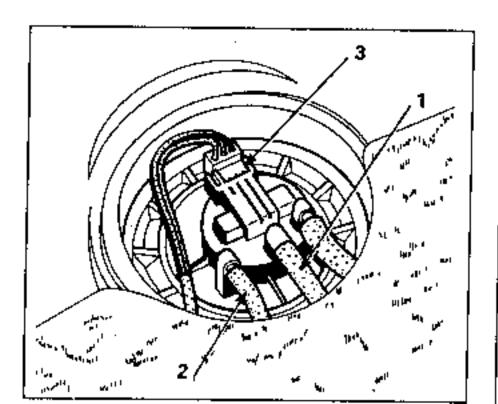
To obtain this pump, contact your local After-Sales Head Office.



Note: To fully empty the tank it may be necessary to pass the pump in through the fuel gauge tank unit aperture.

Tilt forward the rear seat, remove the cover and disconnect :

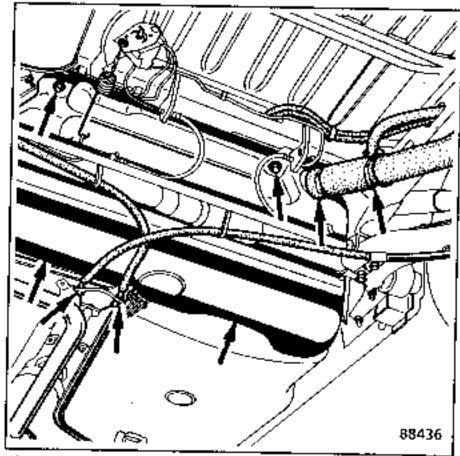
- the fuel output pipe (1),
- the fuel return pipe (2),
- the electrical connector (3).



Raise the vehicle and disconnect :

- the hand brake cables at the lever end,
- the exhaust system at the down pipe from the engine and move it as far forward as it will go on its suspension,
- the tank filler pipe and vent pipe.

Remove the 5 securing bolts and take out the tank.



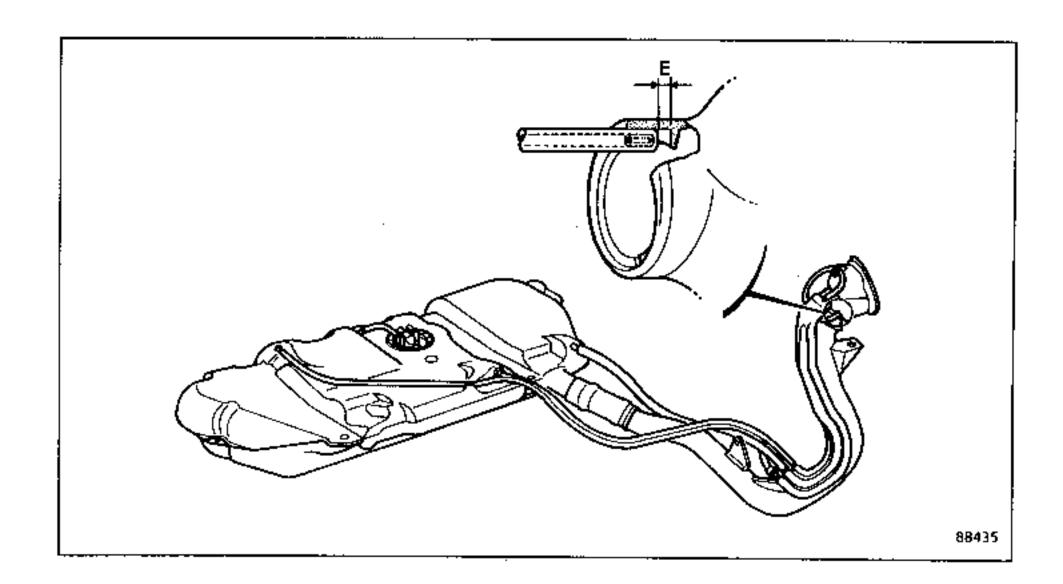
When refitting :

Ensure that the pipes are in the correct positions and correctly connected.

Resecure the filler pipe with new hose clips.

The fuel tank filler cap is of the "NON-VENTED" type. The tank is vented through pipe (5) which has a jet in it and which is located in the filler pipe funnel base.

WARNING: When pipe (5) is in place, a space (E) of approximately 5 mm must be left if the tank is to be correctly vented.

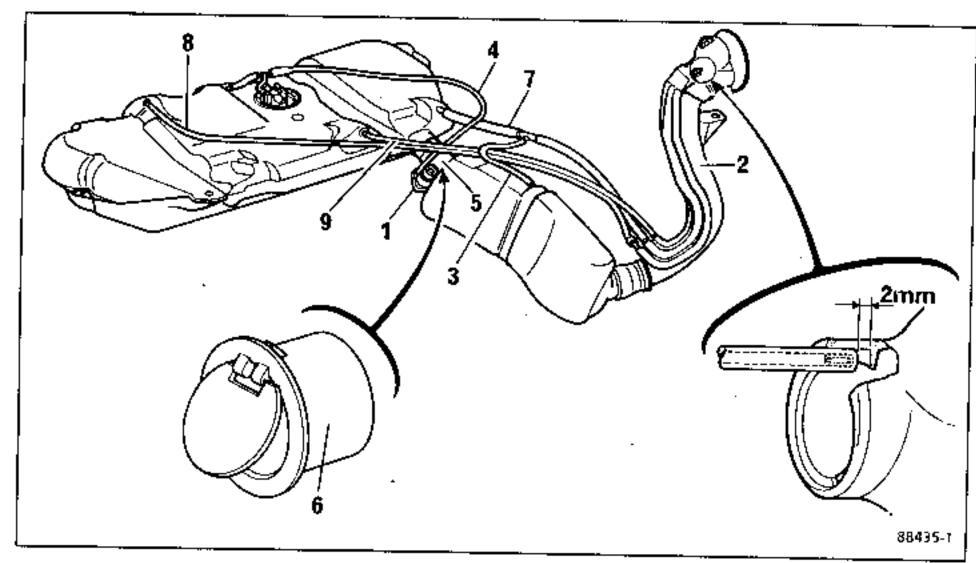


REMOVING THE MAIN TANK ONLY (special operations)

Drain the tank through the fuel gauge tank unit aperture.

Removing the main tank involves removing :

- The electric fuel pump together with its support and the fuel filter.
- Disconnecting the main fuel pipe (5).
- Disconnecting the vent pipes Nos. (7), (8) and (9) and the transfer pipe (4).



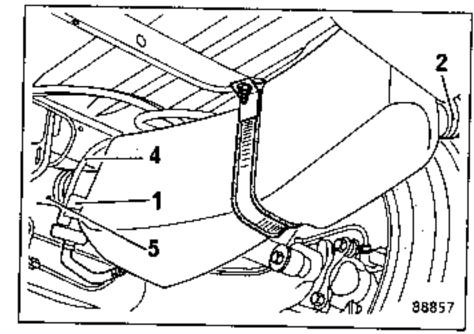
REMOVING THE AUXILIARY TANK :

Remove the spare wheel and its cradle.

Disconnect :

- The auxiliary pump connector (1)
- The filler pipe (2)
- The vent pipe (3)
- The transfer pipe to the main tank (4)
- The filler pipe (5).

On refitting, ensure that the non-return valve (6) is refitted with its slot upwards.



This vehicle is equipped with a 7 litre auxiliary tank that increases the total capacity to 50 litres.

FILLLING :

When the tanks are filled with fuel, it flows:

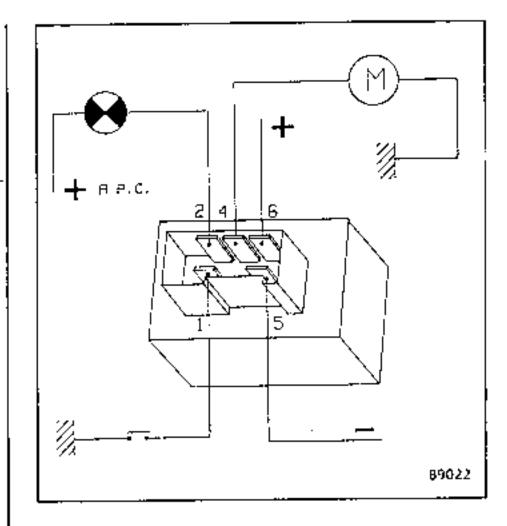
- down the filler pipe
- into the auxiliary tank
- through the connecting pipe between the 2 tanks in which there is an anti-transfer non-return valve (the function of which is to prevent fuel being transferred from the main tank to the auxiliary tank with changes in the vehicle attitude).
- and fills the main tank from which it feeds the engine.

NORMAL OPERATION :

The fuel is taken directly from the main tank by the main fuel pump.

FUEL TRANSFER FROM THE AUXILIARY TANK INTO THE MAIN TANK :

When the fuel level reaches a pre-determined threshold in the main tank, for 5 seconds, the minimum fuel level warning light on the instrument panel will switch on and the auxiliary tank pump will run for 40 seconds (to transfer fuel from the auxiliary tank into the main tank).



- 1.Fuel gauge
- 2.Minimum fuel warning light after ignition switch
- 4.M : auxiliary fuel pump
- 5.Earth
- 6.Main fuel pump signal (tachometer relay)
 - + APC : + after ignition switch.

WARNING: If the vehicle runs out of fuel or the main tank runs dry, to facilitate starting and to reduce the length of time during which the starter will be running, we recommend:

- either pouring more than 10 litres of fuel into the tank through the filler pipe (after running out of fuel),
- or pouring a few litres into the tank through the fuel gauge tank unit aperture (after draining).

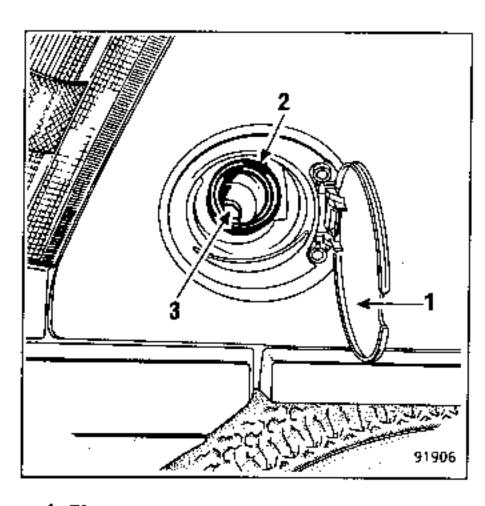
If this action is not taken, the starter will have to rotate, continuously, for more than 1 minute, to fill the systems before the engine will start.

Filling the fuel tank of vehicles adapted to run on unleaded petrol.

This type of vehicle is only to be filled with unleaded petrol and the filler pipe is therefore equipped :

- with a smaller aperture that is too small for a leaded petrol type filler nozzle.
- a valve closing off the filler pipe.

The filler pipe flap has, on its inside, a label stating, in three languages (English, French and German) that the vehicle is designed for unleaded petrol.



- 1. Flap
- 2. Filler pipe
- 3. Valve

The fuel supply system on C 405 and C 409 vehicles is identical.