

# CITROËN C3 2002

«The technical information contained in this document is intended for the exclusive use of the trained personnel of the motor vehicle repair trade. In some instances, this information could concern the security and safety of the vehicle. The information is to be used by the professional vehicle repairers for whom it is intended and they alone would assume full responsibility to the exclusion of that of the manufacturer».

«The technical information appearing in this brochure is subject to updating as the characteristics of each model in the range evolve. Motor vehicle repairers are invited to contact the CITROËN network periodically for further information and to obtain any possible updates».

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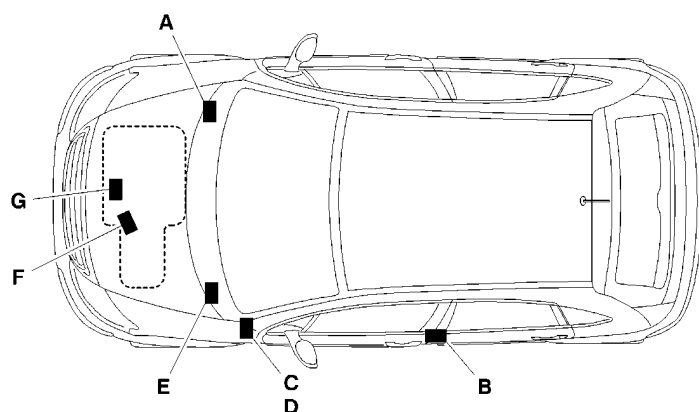
## PRESENTATION

**THIS HANDBOOK** summarises the specifications, adjustments, checks and special features of the **CITROEN C3**.

The handbook is divided into the following sections representing the main functions :

GENERAL - ENGINE - INJECTION - IGNITION - CLUTCH - GEARBOX - DRIVESHAFTS - AXLES - SUSPENSION - STEERING - BRAKES -  
HYDRAULICS - ELECTRICAL - AIR CONDITIONING.

## IDENTIFICATION OF VEHICLES



**A** : Chassis stamp  
(cold stamp on bodywork).

**B** : Manufacturer's data plate.  
(on the LH centre pillar)

**C** : A-S / RP No. and RP paint code  
(label on front pillar close to driver's door).

**D** : Inflation pressures and tyre references.  
(label on front pillar close to driver's door)

**E** : Serial no. on bodywork.

**F** : Gearbox reference – Factory serial no.

**G** : Engine legislation type – Factory serial no.

E1AP09HD

IDENTIFICATION OF VEHICLES								
	PETROL							
	TU							
	1							
	JP							
	1.1i							
	X-SX							X
Emission standard	L4				IFL5		L4/INF	K'
Type code	FC HFXB/T	FR HFXB	FN HFXB	FC HFXB	FN HFXC /IF	FC HFXC /IF	FC HFXB /D	FC HFX5
Engine type	HFX							
Cubic capacity (cc)	1124							
Fiscal rating (hp)	4							
Gearbox type	MA/5N							
Gearbox ident. plate	20 CF 14							

IDENTIFICATION OF VEHICLES						
	PETROL					
	TU					
	3					
	JP					
	1.4i					
	Auto.		Auto.		Auto.	
	SX – Exclusive					
Emission standard	L4			IFL5		
Type code	FC KFVE	FN KFVB	FN KFVE	FC KFVC/IF	FC KFVF/IF	FN KFVC/IF
Engine type	KFV					
Cubic capacity (cc)	1360					
Fiscal rating (hp)	5					
Gearbox type	AL4	MA/5N	AL4	MA/5N	AL4	MA/5N
Gearbox ident. plate	20 TP 75	20 CF 15 20 CF 16 (*)	20 TP 75	20 CF 15 20 CF 16 (*)	20 TP 75	20 CF 15 20 CF 16 (*)
(*) = Export.						

GENERAL

IDENTIFICATION OF VEHICLES						
	PETROL					
	TU					
	3				5	
	JP				JP4	
	1.4i				1.6i 16V	
	Auto.					
	SX – Exclusive					
Emission standard	IFL5	L4	L4/INF		L4	
Type code	FN KFVF/IF	FC KFVB	FC KFVB/D	FC KFVE/D	FN NFUB	FC NFUB
Engine type	KFV				NFU	
Cubic capacity (cc)	1360				1587	
Fiscal rating (hp)	5				6	
Gearbox type	AL4	MA/5N			MA/5S	
Gearbox ident. plate	20 TP 75	20 CF 15	20 CF 16 (*)		20 CN 40	
(*) = Export.						

IDENTIFICATION OF VEHICLES						
	DIESEL					
	DV					
	4					
	TD					
	1.4 HDi					
	X - SX					
Emission standard	L4					
Type code	FC 8HBXB/T	FN 8HXB	FC 8HXB	FC 8HXB/MOD	FC 8H XK	FR 8HXB
Engine type	8HX					
Cubic capacity (cc)	1398					
Fiscal rating (hp)	4					
Gearbox type	MA/5O					
Gearbox ident. plate	20 CN 33		20 CN 36 (*)			
(*) = Export.						

GENERAL

IDENTIFICATION OF VEHICLES				
	DIESEL			
	DV			
	4			
	TD		TED4	
	1.4 HDi		1.4 HDi 16V	
	S - SX		SX - Exclusive	
Emission standard	L4			
Type code	FN 8HWK	FC 8HWB	FN 8HVB	FC 8HVB
Engine type	8HW		8HV	
Cubic capacity (cc)	1398			
Fiscal rating (hp)	4		5	
Gearbox type	MA/50		BE4/5	
Gearbox ident. plate	20 CN 33	20 CN 36 (*)	20 DM 25	20 DM 26
(*) = Export.				

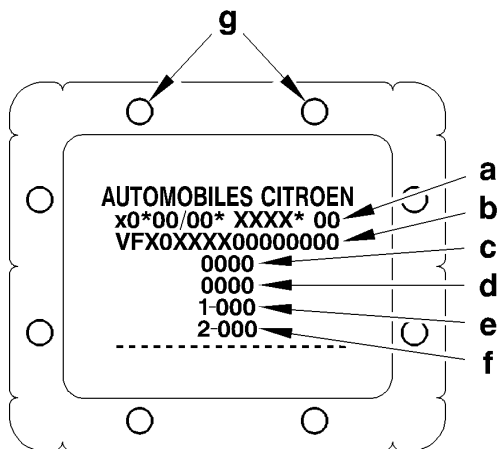


IDENTIFICATION OF VEHICLES						
	DIESEL					
	DV					
	4					
	TED4					
	1.4 HDi 16V					
	SX - Exclusive			SX	SX - Exclusive	
Emission standard	L4					
Type code	FN 8HYB	FC 8HYC	FC 8HYB/MOD	FC 8HYB/T	FC 8HYK	FR 8HYB
Engine type	8HY					
Cubic capacity (cc)	1398					
Fiscal rating (hp)	5					
Gearbox type	BE4/5					
Gearbox ident. plate	20 DM 25			20 DM 26		

GENERAL

## IDENTIFICATION OF VEHICLES

## Manufacturer's plate.



The manufacturer's plate carries the following information :

- (a) Type approval number (\*).
- (b) Type serial number.
- (c) Gross vehicle weight (\*).
- (d) Gross vehicle weight (\*).
- (e) Maximum weight on front axle (\*).
- (f) Maximum weight on rear axle (\*).
- (g) Manufacturer identification.

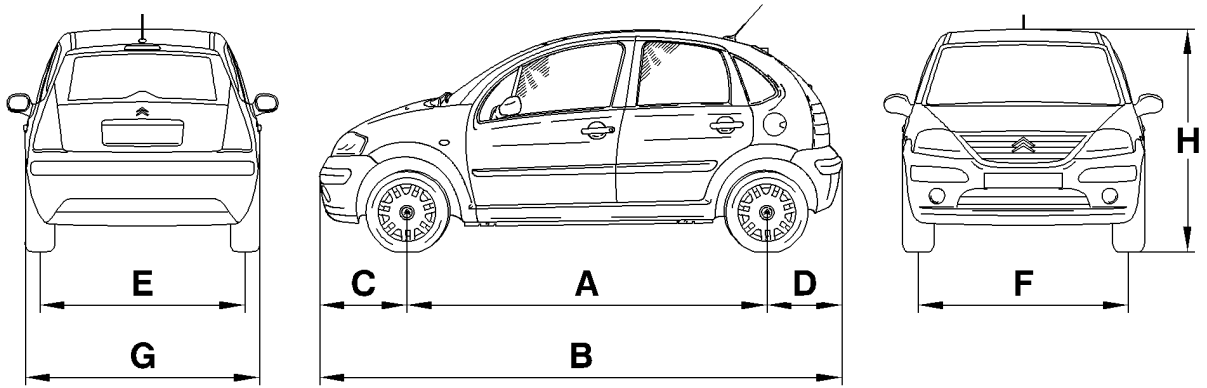
(\*) = According to marketing country.

E1AP09JC

IDENTIFICATION OF VEHICLES									
Factory code.									
Structure									
Example : <b>F.C.8.H.Y.B</b> :			The factory code is composed of <b>6 figures</b> or letters. <b>F</b> = Vehicle family. <b>C</b> = Body shape. <b>8.H.Y</b> = Engine. <b>B</b> = Version.						
Family			Body shape						
Ref.		Family	Ref.		Body shape				
F		CITROËN C3	C		5 door saloon				
Engine			N		5 door saloon (4 seats)				
Ref.	Capacity	Engine type	R		5 door saloon (Van not suitable for conversion)				
HFX	1124	TU1JP/L4/IFL5/L4 INF/K'	Version (Gearbox and emission standard)						
KFV	1360	TU3JP/L4/IFL5/L4 INF	Ref.	Gearbox		Emissions			
NFU	1587	TU5JP4/L4	B	Manual 5 gears		L4			
8HX-8HW	1398	DV4TD/L4	C			IFi5			
8HY-8HV		DV4TED4/L4	5			K'			
			E	Automatic 4 gears		L4			
			F			IFL4			
						K	Gear ratios and/or gearbox different from base version.		L4

GENERAL

GENERAL SPECIFICATION : DIMENSIONS



E1AP09KD

## GENERAL SPECIFICATION : DIMENSIONS

## Exterior dimensions (mm)

Vehicles		All types
Wheelbase	A	2460
Length overall	B	3850
Front overhang	C	750
Rear overhang	D	640
Rear track on the ground	E	1435
Front track on the ground	F	1438
Width overall	G	1667
Height overall (*)	H	1521

ODM = Vehicle in running order (vehicle empty, levels topped up).

## Interior dimensions and volumes (mm)

Elbow width, front	1406
Elbow width, rear	1402
Height of boot below parcel shelf	585
Minimum floor width	1040
Length of bootspace at floor level	660
Volume of boot below parcel shelf (dm <sup>3</sup> )	305
Volume in dm <sup>3</sup> of boot below Moduboard (*)	282

(\*) = Boot floor with adjustable configuration.

## GENERAL SPECIFICATION : WEIGHTS

GENERAL

GENERAL SPECIFICATION : WEIGHTS								
		Petrol				Diesel		
		Manual			Auto.	Manual		
Versions		1.1i	1 4i	1.6i	1.4i	1.4 HDi		1.4 HDi 16V
Engine type		HFX	KFV	NFU	KFV	8HX	8HW	8HY 8HV
Gearbox type		MA/5N			AL4	MA/50		BE4/5
Payload		485	465	467	468	479		467
Weight empty in	Without options	1053	1080	1133	1114	1097		1147
running order	With all options	1138	1147	1200	1182	1177		1214
Gross vehicle weight		1463	1470	1525	1507	1501		1539
Gross train weight		2113	2370	2425	2407	2401		2439
Maximum trailer weight without brakes		526	540	566	557	548		573
Maximum trailer weight with brakes								
Incline 12%		926	1174	1176		1175		1176
Maximum nose weight		38	47	48		47		48
Maximum roof rack load		60 kg						

## OPERATIONS TO BE CARRIED OUT AFTER A REPAIR

**IMPERATIVE :** All these operations are to be performed following a reconnection of the battery.

**Antiscanning function.**

It is necessary to wait 1 minute after the battery has been disconnected in order to be able to start the vehicle.

**Tailgate.**

The opening of the tailgate is deactivated on reconnection of the battery.  
Perform locking/unlocking to activate the opening of the tailgate.

**Overspeed check.**

The vehicle's overspeed values have to be re-initialised.

The button on the wiper stalk operates the following functions:

- Activation of the vehicle's overspeed function.
- Programming of the overspeed alert.

**Electric windows**

It is necessary to re-initialise the sequential and anti-pinch function

**NOTE :** If the window is open at the time the battery is reconnected, action the window switch several times to close it, then re-initialise.

Open the window fully.

Action and release the window switch until the window is completely closed.

This operation has to be carried out on each electric window.

## OPERATIONS TO BE CARRIED OUT AFTER A REPAIR

### **Sun roof.**

The anti-pinch function has to be re-initialised.

Place the sun roof switch in the maximum tilt position.

Keep the sun roof switch pressed until the sun roof ceases its movement.

Release the sun roof switch within **5 seconds**.

Keep the sun roof switch pressed until the end of the sun roof opening sequence.

### **Multifunction screen.**

It is necessary to adjust the date, time and outside temperature.

Adjust the display language of the multifunction screen if necessary.

**NOTE :** The default display language of the multifunction screen is French.

### **Navigation.**

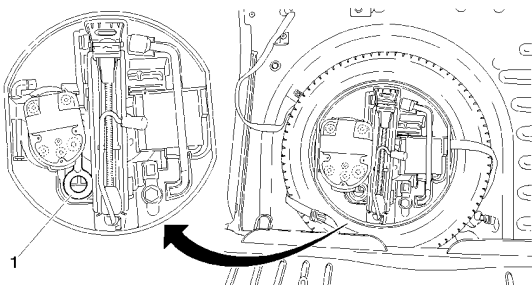
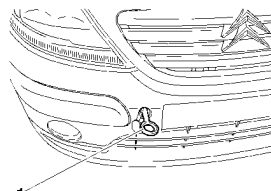
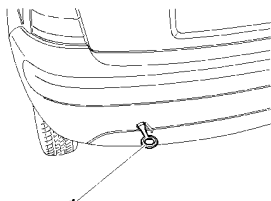
Vehicle location is only effective after some ten minutes.

Reprogramme the customer parameters.

### **Radio.**

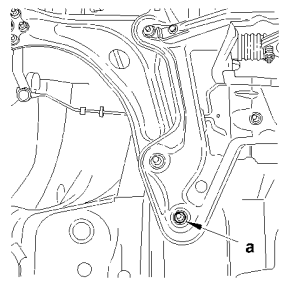
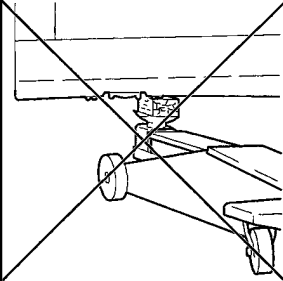
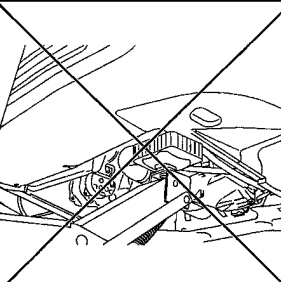
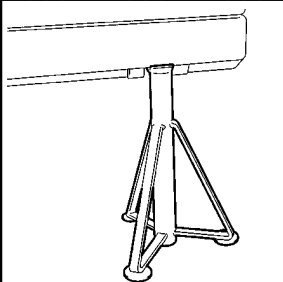
Reprogramme the radio stations.



GENERAL SPECIFICATION : TOWING THE VEHICLE			
 E2AP01KD	<p><b>WARNING :</b> When the engine is not running, steering and braking are no longer power-assisted.</p> <p><b>Towing eye</b></p> <p>(1) Towing eye</p> <p>The towing eye is stowed in the jack protection box inside the spare wheel.</p> E2AP01LC E2AP01MC		<b>Front towing</b>
			
			<b>Rear towing</b>
			

GENERAL

GENERAL SPECIFICATION : TOWING THE VEHICLE	
Vehicle towing : Precautions to be taken	
Manual gearbox	AL4 automatic gearbox
<p><b>ESSENTIAL : Never tow the vehicles with wheels hanging</b> (towing by the wheels).</p>	<p><b>ESSENTIAL : Never tow the vehicles with wheels hanging</b> (towing by the wheels).</p> <p><b>AL4 autoactive gearbox.</b></p> <p><b>Towing.</b> In the event of impossibility to raise the front of the vehicle :  - It is <b>ESSENTIAL</b> to place the selection lever in position «<b>N</b>».  - Do not add oil.  - Do not exceed a speed of <b>30 mph</b> over a distance of <b>30 miles</b>.</p> <p><b>Moving the vehicle.</b>  - Never be towed with the ignition switched off.  - Never attempt to push-start the vehicle.</p> <p><b>NOTE :</b> The automatic gearbox is only lubricated when the engine is running.</p>

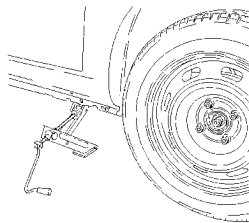
GENERAL SPECIFICATION: LIFTING AND SUPPORTING THE VEHICLE					
Front lifting	Lifting and supporting the vehicle				Side lifting
	<p><b>Front of the vehicle.</b></p> <p>The authorised lifting points at the front of the vehicle are on the rear fixing bolts of the subframe at «a».</p> <p>For front lifting, take weight at the two lifting points at «a», using a crossbeam equipped with blocks.</p> <p>For front lifting from the side, take weight at the lifting point at «a».</p> <p><b>ESSENTIAL :</b></p> <ul style="list-style-type: none"><li>- Never attempt to lift by the front panel mounting.</li></ul>				
	<p><b>Side lifting</b></p> <p><b>ESSENTIAL :</b></p> <ul style="list-style-type: none"><li>- Always ensure the jack is correctly positioned at the lifting points.</li><li>- Do not place the axle stands under the jack contact lugs.</li></ul> <p>Position of the axle stand.</p>				
B3CP07KC	E2AP016C	E2AP017C	E2AP018C	E2AP00GC	

GENERAL

# GENERAL SPECIFICATION: LIFTING AND SUPPORTING THE VEHICLE

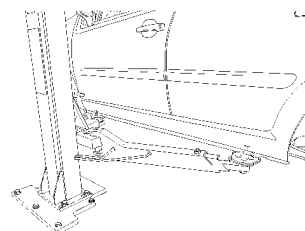
## Lifting and supporting the vehicle (continued)

### Lifting with the handle jack at the front



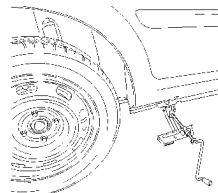
E2AP01NC

### Lifting on a two-column lift using the jack supports



E2AP01QD

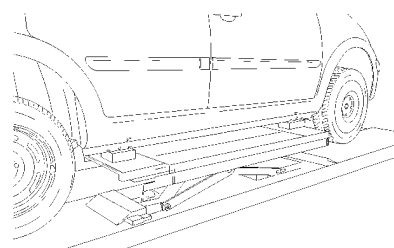
### Lifting with the handle jack at the rear



**NOTE :** The handle jack is specific to the vehicle, do not use it for any other purposes.

E2AP01PC

### Lift accessory with blocks on the jack supports



E2AP01RD

### CAPACITIES (in litres)

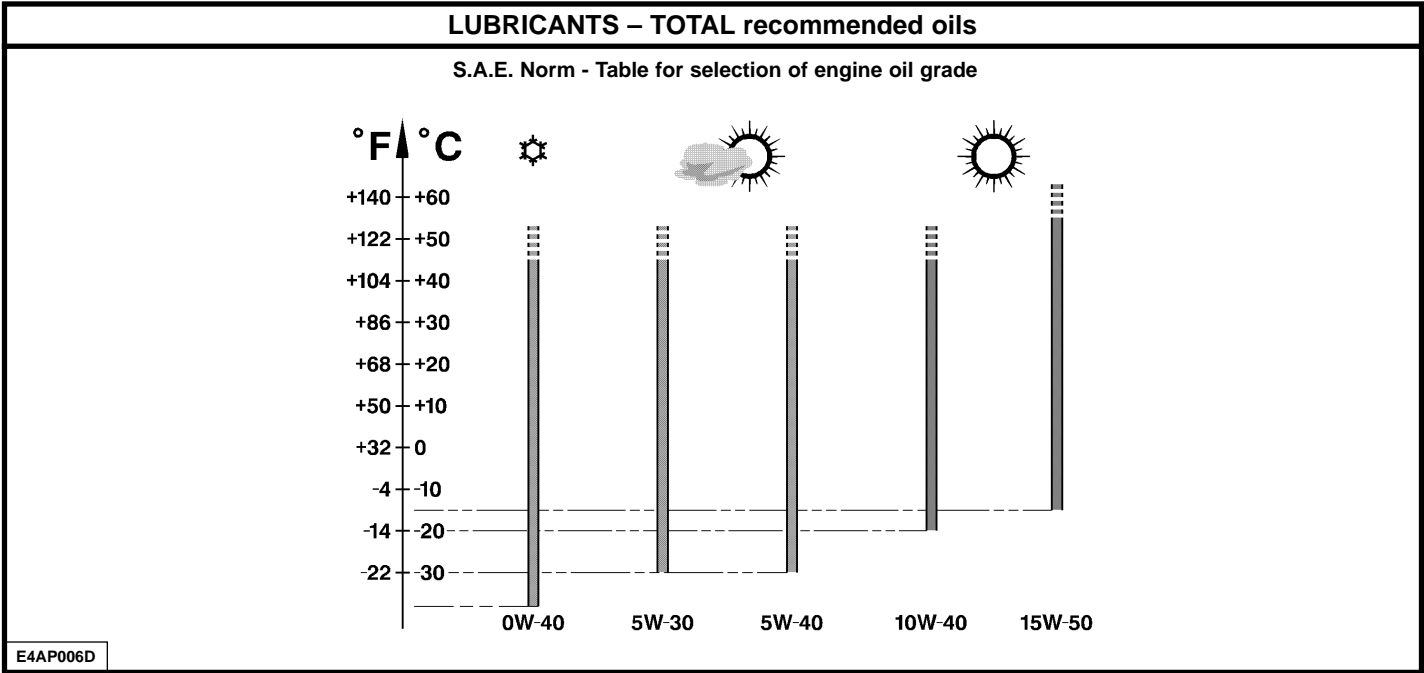
#### Draining method.

Oil capacities are defined as below.

- 1/ Vehicle on horizontal ground (*in the high position, if hydropneumatic suspension*).
- 2/ Engine warm (*oil temperature 80°C*).
- 3/ Drain oil sump + remove filter cartridge (*time for draining to last drops = 15 minutes*).
- 4/ Refit drain plug + filter cartridge.
- 5/ Refill the engine.
- 6/ Start the engine (*to allow the cartridge to fill*).
- 7/ Stop the engine (*to allow oil to stabilise for 5 minutes*).

**ESSENTIAL : Systematically check the oil level using the oil dipstick.**

CAPACITIES (in litres)								
	C3							
	Petrol				Diesel			
	1.1i	1.4i	1.6i 16V	1.4 HDi		1.4 HDi 16V		
		Auto.						
Engine type	HFX	KFV	NFU	8HX	8HW	8HV	8HY	
Drain by <u>gravity</u> : engine with filter change	2.9			3.8				
Between Min. and Max.	1.5		1	2				
Drain by <u>suction</u> : engine with filter change	3.1							
Between Min. and Max.	1.5		1					
5-speed gearbox	2			2		1.9		
Automatic gearbox			(1)					
After oil change								
Braking circuit	0.7 Litre version with front calipers Ø 48 / rear drums 0.8 Litre version with front calipers Ø 54 / rear discs							
Cooling system	7			5.7		5.6		
Fuel tank capacity	45							
ESSENTIAL : <u>Systematically check the oil level using the oil dipstick.</u>								
(1) = The gearbox is <u>lubricated for life</u> . (For your information, the TOTAL capacity is <b>5.85 litres</b> , after draining: <b>3 litres</b> )								



GENERAL

## LUBRICANTS – TOTAL recommended oils

### Factory evolutions in 2001 model year

**CITROËN** engines are lubricated at the factory with **TOTAL** oil of grade **S.A.E.5W-30**.

**TOTAL** oil of grade **S.A.E.5W-30** allows improved fuel economies (approx 2.5%).

### Features of CITROËN C5 :

**2.0** and **2.2 HDi** engines have a particle filter.  
The maintenance interval for normal operation is **30.000 km (20.000 miles)** for petrol engines.

**WARNING : HDi engines are high technology engines which imperatively require use of quality SYNTHETIC OILS : TOTAL ACTIVA or TOTAL QUARTZ 5W40.**

To maintain engine performances, all countries in Europe should observe this requirement.

**NOTE :** Only **PORTUGAL** and **GREECE** may use **10W40** semi-synthetic oil.

**ESSENTIAL :** For all vehicles with a 30.000 km (20.000 miles) maintenance interval, use exclusively **TOTAL ACTIVA/QUARTZ 7000 or 9000** or any other oils offering identical specifications to these.

These oils offer specifications that are superior to those defined by norms **ACEA A3/98** or **API SJ**.

Failing this, it is essential to adhere to the maintenance programmes covering severe operating conditions.

**5W30** cannot be used in the following engines:  
XU10J4RS : XSARA VTS 2.0i 16V (3 doors).  
SOFIM : RELAY 2.8 D and 2.8 TD.  
1580 SPI : DISPATCH 1.6i.  
2.0 and 2.2 HDi engines equipped with particle filter.

**WARNING :** **CITROËN** engines prior to model year 2000 do not have to be lubricated with oils adhering to the norms **ACEA A1-98/B1-98** and **API SJ/CF EC**.



## LUBRICANTS – TOTAL recommended oils

### Selection of engine oil grades recommended for climatic conditions in countries of distribution

#### ACEA Norms

The first letter corresponds to the type of engine concerned :

**A** : petrol and dual fuel petrol / LPG engines.

**B** : diesel engines.

The figure following the first letter corresponds to the type of oil.

**1** : highly fluid oils, for reducing friction and lowering fuel consumption.

**3** : high performance oils.

The number after that (**96** or **98**) corresponds to the year of creation of the norm.

**NOTE** : From **01/03/2000**, all engine oils must comply with **ACEA-98 norms**.

**Example** :

**ACEA A1-98 / B1-98** : Blended oils for all engines, permitting fuel economy (*complying with ACEA 98 norms*).

#### API Norms

The first letter corresponds to the type of fuel used by the engine :

**S** : petrol and dual fuel petrol / LPG engines.

**C** : diesel engines.

The second letter corresponds to the degree of evolution, in ascending order.

**Example** : The norm **SJ** is more severe than the norm **SH** and corresponds to a higher level of performance.

The adding of the letters **EC** indicates that the engine oil concerned is an oil which permits fuel economy.

**EC** : **Energy Conserving**, reduction in fuel consumption.

**Examples** :

**API SJ / CF** : Blended oils for all engines.

engines **API CF / EC**: Oils specifically for **diesel** engines, permitting fuel economy.

**API SJ / CF / EC** : Blended oils for all engines, permitting fuel economy.

## LUBRICANTS – TOTAL recommended oils

### Engine oil norms.

#### Norms in force.

These engine oils have been classified by the following recognised organisations:

**S.A.E. : Society of Automotive Engineers.**

**API : American Petroleum Institute.**

**ACEA : Association des Constructeurs Européens d'Automobiles.**

#### Recommendations.

Denominations of TOTAL oils, according to country of marketing:

**TOTAL ACTIVA** (France only).

**TOTAL QUARTZ** (Outside France).

**ESSENTIAL : To preserve engine performances, all engines fitted in CITROEN vehicles must be lubricated with high quality oils (synthetic or semi-synthetic)**

### Summary

Engine oil norms to be respected in **2001 model year**

Model year	Types of engine	ACEA norms	API norms
AM 2001	Petrol and dual fuel petrol / LPG engines	A3-98 or A1-98 (*)	SJ or SJ / EC (*)
	Diesel engines	B3-98 or B1-98 (*)	CF or CF / EC (*)

(\*) = It is essential not to use engine oils respecting these norms for the following engine-types .

**XU10J4RS, 1580 SPI, SOFIM 2.8 D and SOFIM 2.8 TD.**

LUBRICANTS – TOTAL RECOMMENDED OILS			
	S.A.E. grades	SPI norms	ACEA norms
Blended oils for all engines (petrol, dual-fuel petrol / LPG and diesel)			
TOTAL ACTIVA 9000 TOTAL QUARTZ 9000	5W-40	SJ / CF	A3-98 / B3-98
TOTAL ACTIVA 9000. (*) TOTAL QUARTZ 9000. (*)	5W-30	SJ / CF EC	A1-98 / B1-98
TOTAL ACTIVRAC	10W-40	SJ / CF	A3-98 / B3-98
(*) = Blended oils for all engines, permitting fuel economy.			
Oils specifically for petrol and dual-fuel petrol / LPG engines			
TOTAL ACTIVA 7000 TOTAL QUARTZ 7000	10W-40	SJ	A3-98
TOTAL QUARTZ 9000	0W-40		
TOTAL ACTIVA 7000 TOTAL QUARTZ 7000	15W-50		
Oils specifically for diesel engines			
TOTAL ACTIVA DIESEL 7000 TOTAL QUARTZ DIESEL 7000	10W-40	CF	B3-98
TOTAL ACTIVA DIESEL 7000	15W-50		
TOTAL ACTIVA DIESEL 9000	5W-40		

GENERAL

LUBRICANTS – TOTAL RECOMMENDED OILS			
FRANCE			
Blended oils for all engines, supplied in bulk			
Metropolitan FRANCE	TOTAL ACTIVRAC	S.A.E : 10W-40 Norms	
	TOTAL ACTIVA		TOTAL ACTIVA DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Metropolitan FRANCE	9000 5W-40 9000 5W-30 (*)	7000 10 W-40	7000 10W-40 9000 5W-40
New Caledonia Guadeloupe Saint-Martin La Réunion Martinique Guyana Tahiti Mauritius Mayotte	9000 5W-40	7000 15W-50	7000 15W-50
(*) = Blended oils for all engines, permitting fuel economy.			

LUBRICANTS – TOTAL RECOMMENDED OILS			
(*) = Blended oils for all engines, permitting fuel economy	EUROPE		
	TOTAL QUARTZ		TOTAL QUARTZ DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Germany	9000 5W-40 9000 5W-30 (*)	7000 10W-40 9000 0W-40	7000 10W-40
Austria		7000 10W-40	
Belgium		7000 10W-40 9000 0W-40	
Bulgaria		7000 10W-40	
Cyprus		7000 15W50	
Croatia		7000 10W-40	
Denmark		7000 10W-40 9000 0W-40	
Spain		7000 10W-40 7000 15W-50	
Estonia		7000.10W-40	
Finland		7000 10W-40 9000 0W-40	
Great Britain		7000 10W-40	

GENERAL

LUBRICANTS – TOTAL RECOMMENDED OILS			
(*) = Blended oils for all engines, permitting fuel economy	EUROPE (continued)		
	TOTAL QUARTZ		TOTAL QUARTZ DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Greece	9000 5W-40 9000 5W-30 (*)	7000 10W-40 7000 15W-50	7000 10W-40
Holland		7000 10W-40 9000 0W-40	
Hungary			
Italy			
Ireland		7000 10W-40	
Iceland			
Latvia		7000 10W-40 9000 0W-40	
Lithuania		7000 10W-40	
Macedonia		7000 10W-40 7000 15W-50	
Malta		7000 10W-40	
Moldova		7000 10W-40 9000 0W-40	
Norway			
Poland		7000 10W-40	
Portugal			
Slovak Republic			

LUBRICANTS – TOTAL RECOMMENDED OILS			
(*) = Blended oils for all engines, permitting fuel economy	EUROPE (continued)		
	TOTAL QUARTZ		TOTAL QUARTZ DIESEL
	Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
Czech Republic	9000 5W-40 9000 5W-30 (*)	7000 10W-40 9000 0W-40	7000 10W-40
Romania		7000 10W-40 7000 15W-50	
Russia		7000 10W-40 9000 0W-40	
Slovenia		7000 10W-40	
Sweden		7000 10W-40 9000 0W-40	
Switzerland		7000 10W-40	
Turkey		7000 10W-40 7000 15W-50 9000 0W-40	
Ukraine		7000 10W-40 9000 0W-40	
Yugoslavia		7000.10W-40	

GENERAL

LUBRICANTS – TOTAL RECOMMENDED OILS				
		TOTAL QUARTZ		TOTAL QUARTZ DIESEL
		Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
	Australia New-Zealand	9000 5W-40	7000 10W-40	7000 10W-40
	OCEANIA			
	Ivory Coast Egypt Gabon Madagascar Morocco Senegal Tunisia		7000 15W-50	
	AFRICA			
	Argentina Brazil, Chile Cuba Mexico Paraguay Uruguay			
	CENTRAL AND SOUTH AMERICA			



LUBRICANTS – TOTAL RECOMMENDED OILS				
(*) = Blended oils for all engines, permitting fuel economy		TOTAL QUARTZ		TOTAL QUARTZ DIESEL
		Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
China	SOUTH EAST ASIA	9000 5W-40	7000 10W-40 7000 15W-50	7000 10W-40
South Korea			7000 10W-40	
Hong-Kong India Indonesia			7000 15W-50	
Japan		9000 5W-40 9000 5W-30	7000 10W-40 7000 15W-50	
Malaysia Pakistan Philippines Singapore		9000 5W-40	7000 15W-50	
Taiwan			7000 10W-40 7000 15W-50	
Thailand			7000 15W-50	
Vietnam				

GENERAL

LUBRICANTS – TOTAL RECOMMENDED OILS				
		TOTAL QUARTZ		TOTAL QUARTZ DIESEL
		Blended oils for all engines	Oils specifically for petrol and dual-fuel petrol / LPG engines	Oils specifically for diesel engines
GENERAL	Saudi Arabia	MIDDLE EAST	9000 5W-40	7000 15W-50
	Bahrain			
	Dubai			
	United Arab Emirates			
	Iran			
	Israel			
	Jordan			
	Kuwait			
	Lebanon			
	Oman			
	Qatar			
	Yemen			

LUBRICANTS – TOTAL RECOMMENDED OILS		
Gearbox oils		
Manual gearbox	All countries	TOTAL TRANSMISSION BV Norms S.A.E 75W-80 Special oil distributed by CITROËN (Part No. 9730 A2)
MB3 automatic gearbox		TOTAL FLUIDE ATX or TOTAL FLUIDE AT 42. Special oils distributed by CITROËN (Part No. 9730 A3).
4 HP 20 and AL4 automatic gearboxes		Special oil distributed by CITROËN (Part No. 9736 22).
Transfer box and rear axle		TOTAL TRANSMISSION X 4
Power steering oils		
Power- assisted steering	All countries	TOTAL FLUIDE ATX
	Very cold countries	TOTAL FLUIDE DA Special oil distributed by CITROËN (Part No. 9730 A1)

GENERAL

## LUBRICANTS – TOTAL RECOMMENDED OILS

### Synthetic brake fluid

All countries	CITROEN Fluid Protection : - 35°C	Packs	CITROEN reference	
			GLYSANTIN G 33	REVCOGEL 2000
		2 litres	9979 70	9979 72
		5 litres	9979 71	9979 73
		20 litres	9979 76	9979 74
		210 litres	9979 77	9979 75

### Synthetic brake fluid

All countries	CITROEN Fluid	Packs	CITROEN reference	
		0.5 litre	9979 05	
		1 litre	9979 06	
		5 litres	9979 07	

### CITROEN hydraulic circuit fluid

All countries		Norm	Pack	CITROEN reference
	TOTAL LHM PLUS	ISO 7308-7309 Green in colour	1 litre	ZCP 830 095 9979.20 (Scandinavia)
	TOTAL FLUIDE LDS	Orange in colour		9979.69
	WARNING: TOTAL LDS fluid cannot be blended with TOTAL LHM PLUS			
	WARNING: CITROËN C5 : Use only TOTAL FLUIDE LDS suspension fluid.			

### Hydraulic circuit rinsing fluid- green in colour

All countries	TOTAL HYDRAURINCAGE
---------------	---------------------

LUBRICANTS – TOTAL RECOMMENDED OILS				
Wash/wipe fluid				
All countries	Packs	CITROEN reference		
	Concentrated : 250 ml	9980 33	ZC 9875 953 U	9980 56
	Liquid ready to use: 1 litre	9980 06	ZC 9875 784 U	
	Liquid ready to use: 5 litres	9980 05	ZC 9885 077 U	ZC 9875 279 U
Grease				
All countries			Norms NLGI (1)	
	TOTAL MULTIS EP2		2	
	TOTAL MULTIS COMPLEX EP2		2	
	TOTAL MULTIS N4128		1	
TOTAL SMALL MECHANISMS				

(1) NLGI = National Lubricating Grease Institute.

GENERAL

**ENGINE OIL CONSUMPTION**

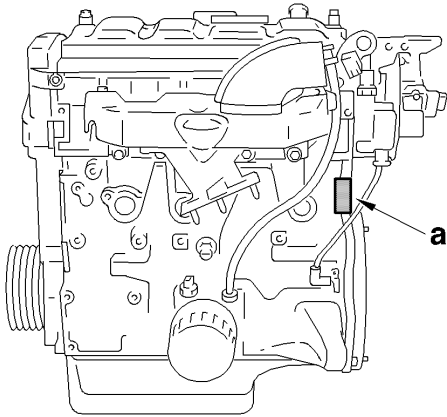
- I - Oil consumption depends on :
  - the engine type.
  - how run-in or worn it is.
  - the type of oil used.
  - the driving conditions.
- II - An engine can be considered **RUN-IN** after:
  - **3.000 miles** (5.000 km) for a **PETROL** engine.
  - **6.000 miles** (10.000 km) for a **DIESEL** engine.
- III - **MAXIMUM PERMISSIBLE** oil consumption for a **RUN-IN** engine.
  - **0.5 litres per 600 miles** (1.000 km) for a **PETROL** engine.
  - **1 litre per 600 miles** (1.000 km) for a **DIESEL** engine.**DO NOT WORK BELOW THESE VALUES.**
- IV - **OIL LEVEL** : The level should **NEVER** be above the **MAX.** mark on the dipstick after changing or topping up the oil.
  - This excess oil will be used up rapidly.
  - It will reduce the engine output and adversely affect the operation of the air circuits and gas recycling.

ENGINE SPECIFICATIONS							
	Petrol			Diesel			
	1.1i	1.4i	1.6i 16V	1.4 HDi		1.4 HDi 16V	
Engine type	HFX	KFV	NFU	8HX	8HW	8HY	8HV
Cubic capacity (cc)	1124	1360	1587	1398			
Bore / Stroke	72/69	75/77	78/82	73/82			
Compression ratio	10.5/1		11/1	17.9/1		18.25/1	
Power ISO or EEC KW - rpm)	44-5500	54-5400	80-5800	50-4000		66-4000	
Power DIN (HP - rpm)	61-5500	75-5400	110-5800	70-4000		92-4000	
Torque ISO or EEC (m.daN - rpm)	9.4-3400	12-3400	14.7-4000	15-2000		20-2000	
Torque DIN (mkg-rpm)	9.8-3400	12.5-3400	15.3-4000	15.6-2000		20.8-2000	
Max. speed (rpm)							

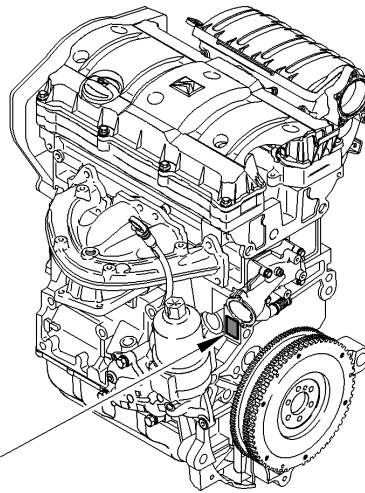
## ENGINE SPECIFICATIONS

Engines : HFX - KFV - NFU

## Engine identification



B1BP10JC



B1BP2GKC

A = Engines: HFX - KFV

B = Engine: NFU.

Compulsory engine identification in zone «a» :

- Component reference.
- Engine legislation type.
- Factory serial no.



SPECIAL FEATURES : TIGHTENING TORQUES (m.daN)			
	Crankshaft		
Engine types	HFX	KFV	NFU
Accessories drive pulley	0.8 ± 0.2		
Pinion fixing on crankshaft	10 ± 1		2.5 ± 0.2
	Cylinder block		
Sump	0.8 ± 0.2		
Timing belt tensioner roller	2 ± 0.2		2.2 ± 0.2
Accessories belt tensioner roller	2 ± 0.2		2.5 ± 0.2
Alternator support fixing	1.7 ± 0.3		
Alternator fixing on support	3.7 ± 0.3		
	Cylinder head		
Coolant outlet housing	0.8 ± 0.2		
Camshaft bearing cap			
Tightening	2 ± 0.2		2 ± 0.2
Angular tightening	44° ± 4°		50° ± 5°
Inlet manifold	0.8 ± 0.2		
Exhaust manifold	1.7 ± 0.3		2 ± 0.2
Valve rockers adjusting screw	1.75 ± 0.25		
Sparking plugs	2.75 ± 0.25		
Camshaft pulley screw	8 ± 0.8		

**SPECIAL FEATURES : TIGHTENING TORQUES (m.daN)**

	Flywheel - Clutch		
Engines	HFX	KFV	NFU
Flywheel	6.7 ± 0.6 + LOCTITE FRENETANCH		
Clutch mechanism	2 ± 0.2		
	Lubrication circuit		
Oil pressure switch	2 ± 0.2		
Oil pump	0.9 ± 0.1		
	Cooling circuit		
Coolant pump	1.4 ± 0.1		
Coolant outlet housing	0.8 ± 0.1		

## CYLINDER HEAD

Engines : HFX - KFU - NFU

## Identification of cylinder head gasket

Engine types	Thicknesses (Standard)	Thicknesses (repair)	Thickness references
HFX	$1.2 \pm 0.1$	$1.4 \pm 0.1$	2
KFU			1
NFU	$0.66 \pm 0.04$		4

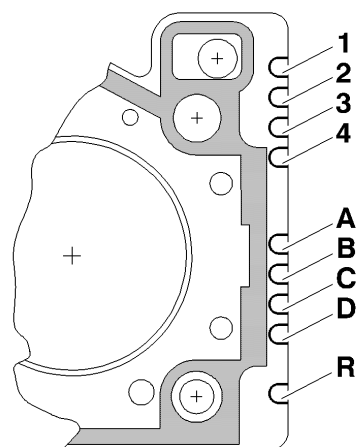
## References

1,2,3,4 = Type of engine.

A,B,D = Suppliers.

C = Gasket material.

R = Repair.



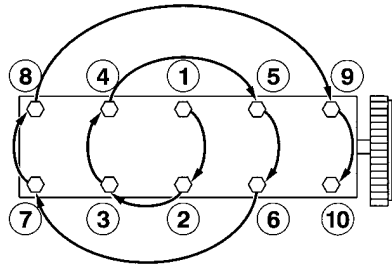
B1BP10KC

## CYLINDER HEAD

Engines : HFX - KFV - NFU

## Cylinder head tightening (m.daN)

## Cylinder head bolts



**NOTE :** Retightening of the cylinder head after a completed repair is prohibited.

## HFX - KFV

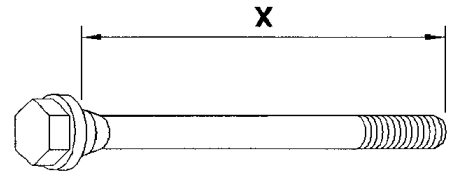
Tightening  $2 \pm 0.2$   
 Angular tightening  $240^\circ \pm 5^\circ$   
*(In the order 1 to 10)*

## NFU

Tightening  $2 \pm 0.2$   
 Angular tightening  $260^\circ \pm 5^\circ$   
*(In the order 1 to 10)*

**NOTE :** Oil the threads and under the heads of the bolts. (Use engine oil or Molykote G Rapid Plus).

B1DP05BC



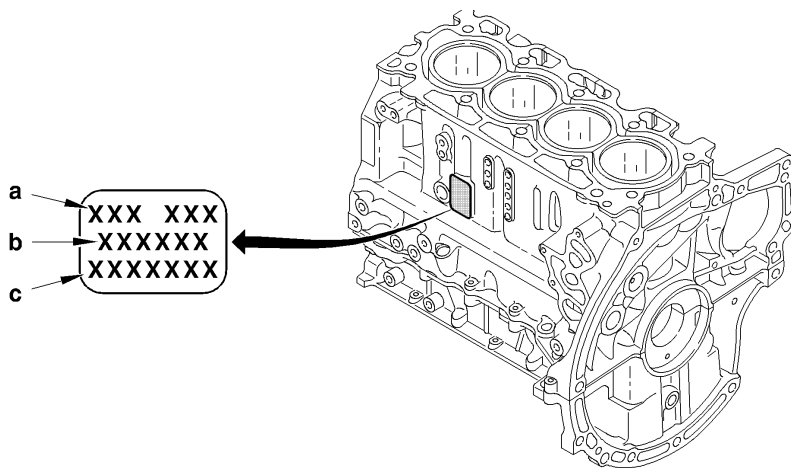
B1BP1DVC

**X = MAXIMUM reusable length**

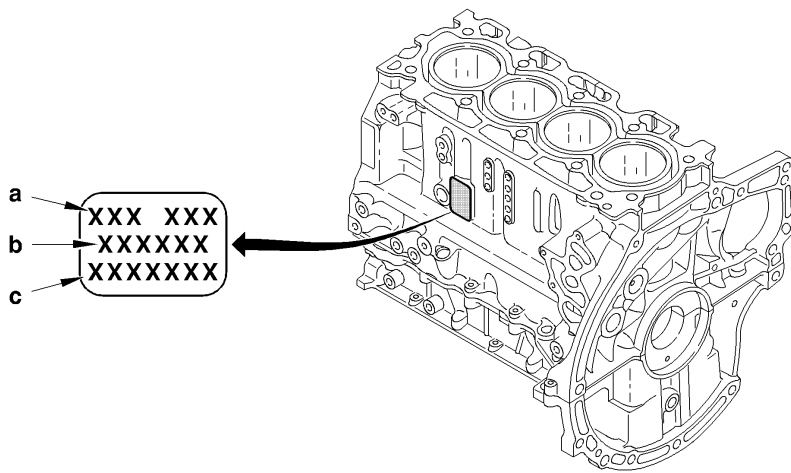
HFX - KFV

NFU

 $175.5 \pm 0.5$  $122 \pm 0.3$

**ENGINE SPECIFICATIONS****Engines : 8HX - 8HW****Engine identification****B1CP0BKD****"a"** Engine legislation type.**"b"** Component reference.**"c"** Factory serial no.

CYLINDER HEAD			
Engines : 8HX - 8HW			
Cylinder head tightening (m.daN)		Cylinder head bolts	
	<b>8HX - 8HW</b>	<div>B1DP1DBC</div>	
	Pre-tightening <b>2 ± 0.2 m.daN</b>		<b>X = MAXIMUM reusable length</b>
	Tightening <b>4 ± 0.4 m.daN</b>		
	Angular tightening <b>230° ± 5°</b>		
	<i>(In the order 1 to 10)</i>		
<b>NOTE :</b>			
- The bolts should have been thoroughly cleaned and dried with a dry metal brush.			
- Oil the threads and under the heads of the bolts. (Use engine oil or Molykote G Rapid Plus).			
- Pass a tap into the holes in the cylinder block.			
	<b>B1DP1CLC</b>	<b>8HX - 8HW</b>	
		<b>X = 149 mm</b>	

**ENGINE SPECIFICATIONS****Engines : 8HY - 8HV****Engine identification****B1CP0BKD**

"a" Engine legislation type.

"b" Component reference.

"c" Factory serial no.

SPECIAL FEATURES : TIGHTENING TORQUES (m.daN)	
	<b>Crankshaft</b>
Engines	<b>8HY-8HV</b>
Bearing cap fixing screw Tightening Angular tightening	<b>3 ± 0.3 140° ± 1°.4'</b>
Crankshaft pullet hub Tightening Angular tightening	<b>3 ± 0.3 180° ± 5°</b>
	<b>Cylinder block</b>
Oil sump	<b>1 ± 0.1</b>
Timing belt tensioner roller	<b>4 ± 0.4</b>
Timing belt guide roller	<b>2.5 ± 0.2</b>
Timing belt guide roller support	
	<b>Cylinder head</b>
Camshaft bearing cap cover	<b>1 ± 0.1</b>
Inlet manifold	
Exhaust manifold	<b>2.5 ± 0.2</b>
Cylinder head cover	<b>Bolts (M6) to 1 ± 0.2</b>
Camshaft pinion	<b>4.3 ± 0.4</b>
Fuel high pressure pump pinion	<b>5 ± 0.5</b>



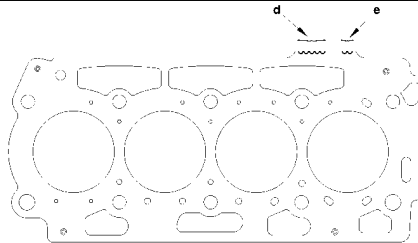
SPECIAL FEATURES : TIGHTENING TORQUES (m.daN)	
	<b>Flywheel - Clutch</b>
Engines	<b>8HY-8HV</b>
Flywheel	<b>1.7 ± 0.2</b>
Clutch mechanism	<b>2 ± 0.2</b>
	<b>Lubrication circuit</b>
Oil pump assembly	<b>0.9 ± 0.1</b>
Oil/coolant heat exchanger	<b>1 ± 0.1</b>
Turbocharger lubrication pipe	<b>2.2 ± 0.2</b>
	<b>Injection circuit</b>
Injector fixing flange nut Tightening Angular tightening	<b>0.4 ± 0.1</b> <b>65° ± 5°</b>
Unions on fuel high pressure common injection rail	<b>2.3 ± 0.2</b>
Fuel high pressure pump	
Union on diesel injector	
Fuel high pressure pump pinion	<b>5 ± 0.5</b>
Union on fuel high pressure pump	<b>2.3 ± 0.2</b>
	<b>Cooling circuit</b>
Coolant pump	<b>1 ± 0.2±</b>

## CYLINDER HEAD

Engines : 8HY - 8HV

## Identification of cylinder head gasket

Engine types	Supplier	Piston standproud (mm)	Thicknesses (mm)	No. of notches at d	No. of notches at e	Type of gasket : Metallic multilayer  "d" Thickness reference.  "e" Engine reference
8HY-8HV	ELRING	0.675 to 0.725	1.25	1	2	
		0.726 to 0.775	1.30	2		
		0.776 to 0.825	1.35	3		
		0.826 to 0.875	1.40	4		
		0.876 to 0.983	1.45	5		



B1DP1CKD

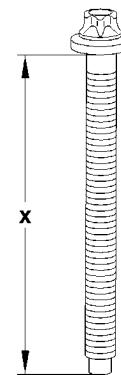
**CYLINDER HEAD****Engines : 8HY - 8HV****Cylinder head tightening (m.daN)****Cylinder head bolts****8HY - 8HV**

Pre-tightening :  $2 \pm 0.2$   
 Tightening :  $4 \pm 0.5$   
 Angular tightening :  $230^\circ \pm 5^\circ$   
*(In the order 1 to 10)*

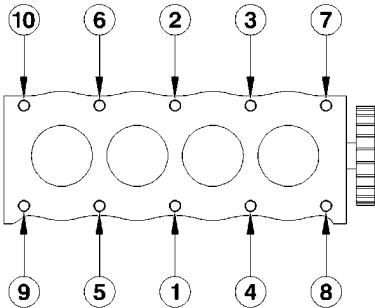
**NOTE :**

- The bolts should have been thoroughly cleaned and dried with a dry metal brush.
- Oil the threads and under the heads of the bolts. (Use engine oil or Molykote G Rapid Plus).
- Pass a tap into the holes in the cylinder block.

B1DP1CLC



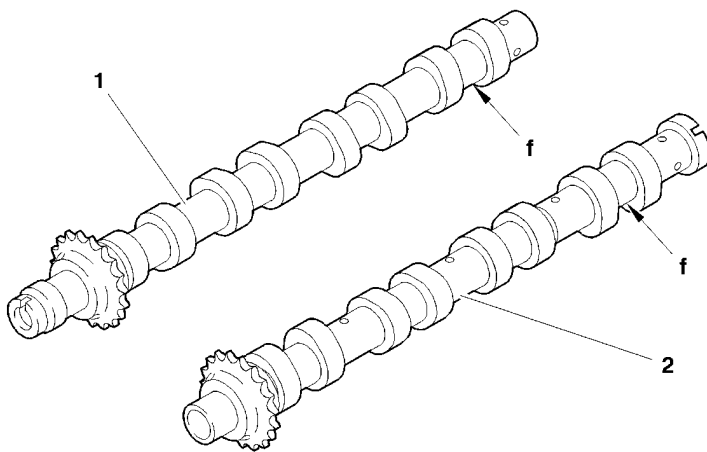
B1DP1DBC

**X = MAXIMUM reusable length****8HY - 8HV****X = 149 mm****The cylinder head gasket is dry-fitted.****NOTE :** Retightening of the cylinder head after a completed repair is prohibited.

## CAMSHAFT

Engines : 8HY - 8HV

Camshaft identification



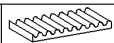
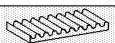


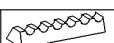

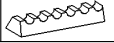

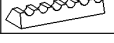

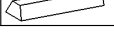

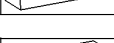

(1) - Inlet camshaft.

(2) - Exhaust camshaft.

"f" : Marking zone.

B1EP18AD

## BELT TENSION/SEEM UNITS CORRESPONDENCE TABLE

↓ 4099-T (C.TRONIC.105)		← Tools →		4122-T (C.TRONIC.105.5) ↓																										
1 daN = 1 Kg TYPE DE COURROIES		daN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	daN	1 daN = 1 Kg TYPE DE COURROIES						
<b>S</b> 			18	28	36	44	51	58	64	70	76	82	88	94	100	106	112													
			18	28	36	44	51	58	64	70	76	82	88	94	100	106	112													
<b>P</b> 		E5 E6	18	23	27	31	34	37	40	43	46	49	52	54	56	58	60	62	64	66	68									
			25	32	39	45	50	54	58	62	66	70	74	78	81	84	86	88	89	90	91									
<b>P</b> 		E6	32	41	48	55	62	69	76	83	90	96	102	108	114	120	126	132	138	144	150									
			27	36	43	49	55	61	66	71	76	80	84																	
<b>P</b> 		E6	32	41	49	57	63	69	75	81	87	93	99																	
			26	35	42	48	53	58	63	68	73	78	82																	
<b>P</b> 		E7	30	40	47	54	61	68	75	81	87	93	99																	
			45	55	65	74	83	89	95	101	107	113	119																	
<b>T</b> 		E7	36	49	52	64	73	80	86	92	98	104	110																	
			28	34	39	44	48	52	56	60	64	68	71																	
<b>T</b> 		E8	34	41	48	55	62	69	76	83	89	96	102																	
			32	39	45	51	56	61	66	71	76	79	81																	
<b>T</b>		E9	37	43	51	59	66	73	80	86	92	98	104																	
			52	60	67	74	81	88	94	100	106	110	114																	
B1EP135D			49	57	63	69	75	81	87	93	99	105	111																	

## AUXILIARY EQUIPMENT DRIVE BELT

	Petrol			Diesel			
	TU			DV			
	1	3	5	4			
	JP		JP4	TD		TED4	
Engine type	HFX	KFV	NFU	8HX	8HW	8HV	8HYX
C3	X	X	X	X	X	X	X
See pages :	53 to 54			55 to 56		57	

## AUXILIARY EQUIPMENT DRIVE BELT

Engines : HFX - KFY - NFU

### Tools.

- [1] Pliers for removing plastic pegs  
[2] Belt tension measuring instrument

: 7504-T.  
: 4122-T.

### Vehicle without air conditioning.

#### Remove.

Slacken:

- Screw (2).
- Screw (3).
- Tensioning screw (1).

Push the alternator back towards the engine.  
Remove the belt.

#### Refit.

Refit the belt.

Respect the following sequence:

- Crankshaft pinion.
- Alternator pulley.

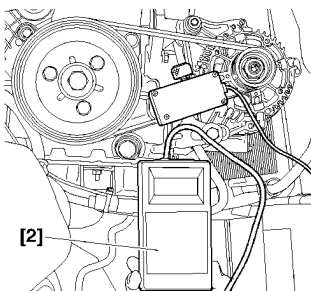
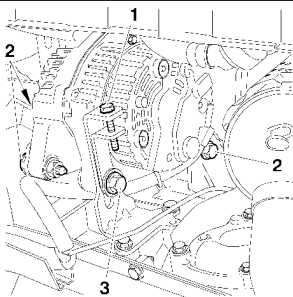
Place tool [2] on the belt.

Tighten screw (1) to achieve a tension of:  
**55 ± 3 unités SEEM.**

Tighten:

- Screw (3).
- Screw (2).

Remove tool [2] and complete the refitting.

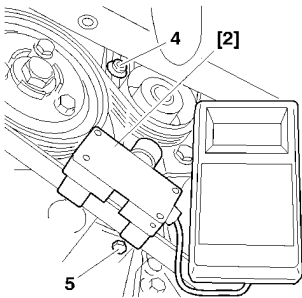
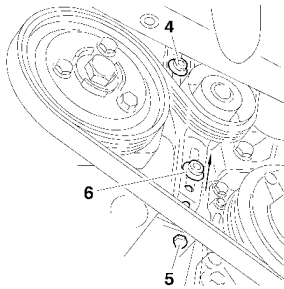


B1BP2LSC

B1BP2LTC

## AUXILIARY EQUIPMENT DRIVE BELT

Engines : HFX - KfV - NFU



### Vehicle with air conditioning.

#### **Remove**

#### **Slacken:**

- Screws (6), (4) and (5).
- Fully detension the belt by acting on the tensioner roller.
- Remove the accessories drive belt.

#### **Refit.**

Respect the following sequence:

- Crankshaft pinion.
- Aircon compressor pulley.
- Guide roller.
- Alternator pulley.
- Tensioner roller.

Place tool [2] on the belt.

- Tighten screw (5) to achieve a belt tension of:

**$120 \pm 3$  SEEM units.**

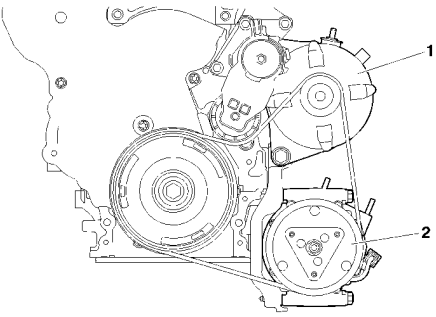
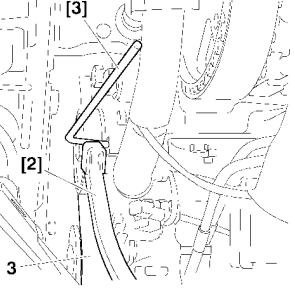
- Tighten screws (4) and (6).
- Remove tool [2].
- Complete the refitting.

B1BP10VC

B1BP10XC

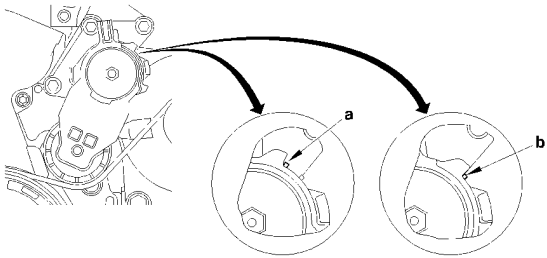


## AUXILIARY EQUIPMENT DRIVE BELT

With compressor and alternator	Engines : 8HX - 8HW	
 <p>B1BP2MJD</p>	<p><b>Tools</b></p> <p>[1] Pliers for removing plastic pegs : 7504-T.          [2] Tensioner roller compression lever : (-).0194.E.          [3] Tensioner roller setting peg Ø4 mm : (-).0194.F.</p> <p><b>Removing.</b>          Disconnect the battery negative cable.          Raise and support the vehicle, wheels hanging.          Remove the front RH wheel.          Move aside the splash-shield, using tool [1].</p> <p><b>IMPERATIVE : In the case of belt re-use, mark the direction of rotation of the belt. If the index on the tensioner roller is outside the marks, change the auxiliary equipment drive belt.</b></p> <p>Remove :          The alternator (1).          The aircon compressor (2).          Detension the auxiliary belt tensioner roller, using tool [2].          Position the peg [3]. Remove the auxiliary drive belt.</p>	 <p>B1BP2MKC</p>

## AUXILIARY EQUIPMENT DRIVE BELT

Engines : 8HX - 8HW

**Markings on the dynamic tensioner roller.**

- "a" Position of «maximum wear» of the auxiliary drive belt.  
"b" Normal position.

**Refitting**

**NOTE :** Check that the tensioner roller moves freely (no tight spot). If this is not the case, replace the tensioner roller.

Respect the direction of fitting of the drive belt.

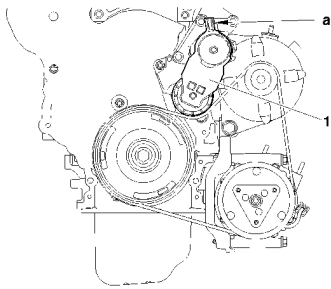
Complete the setting of the belt, of both sides, by means of the tensioner roller. Make sure that the drive belt is correctly positioned in the «V» grooves of the various pulleys.

Move the tool [2] on the tensioner roller to remove the peg [3].

B1EP18UD

**AUXILIARY EQUIPMENT DRIVE BELT**

Engines : 8HY - 8HV

**Tools.**

- [1a] Dynamic tensioner roller lever : (-).0194-E1.  
[1b] Lever extension : (-).0194-E2.  
[2] Accessories belt roller locking peg Ø 4 mm : (-).0194-F

**Removing**

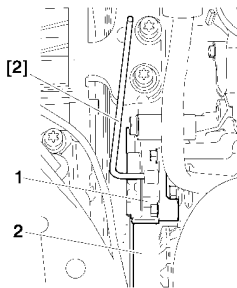
Pivot the tensioner roller support (1) (clockwise), using tools [1a] and [1b] at «a».  
Remove the belt.  
Immobilise the support (1) of the tensioner roller, using tool [2].  
Remove the auxiliary drive belt (2).

**IMPERATIVE : Ensure that the tensioner rollers turn freely (no play, no tight spot).**

**Refitting**

Reposer la courroie.  
Move the tool [1] on the tensioner roller to remove the peg [2].

**ESSENTIAL: Make sure that the belt is correctly positioned in the various pulley grooves.**



B1BP2MYD B1BP2MZC

## CHECKING AND SETTING THE VALVE TIMING

	Petrol			Diesel			
	TU			DV			
	1	3	5	4			
	JP		JP4	TD		TED4	
Engine type	HFX	KFV	NFU	8HX	8HW	8HV	8HY
C3	X	X	X	X	X	X	X
See pages :	59 to 68			69 to76		77 to 85	

## CHECKING AND SETTING THE VALVE TIMING

Engines : HFX - KfV - NFU

### Tools.

[1] Engine flywheel peg	: 4507-T.A
[2] Camshaft pulley peg	: 4507-T.B
[3a] Camshaft peg	: 4533-TA.C1
[3b] Camshaft peg	: 4533-TA.C2
[4] Dynamic tensioner roller pin	: 4200-T.H
[5] Belt retaining pin	: 4533-T.AD
[6] Pliers for removing plastic pins	: 7504-T.

### Checking the valve timing.

#### Engines HFX - KfV - NFU

Raise and support the front RH side of the vehicle.

Disconnect the battery positive terminal.

Engage 5th gear.

Remove the oil filter (1).

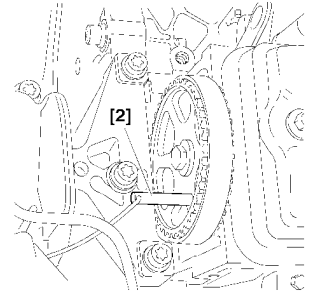
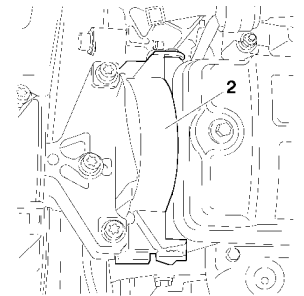
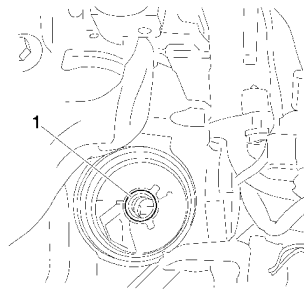
#### HFX – KfV engine

Remove :

The timing top casing (2).

Turn the wheel to rotate the engine (normal direction of rotation).

Peg the camshaft pulley, using tool [2].



B1BP2M7C

B1BP2M8C

B1BP2M9C

CHECKING AND SETTING THE VALVE TIMING

Engine : NFU

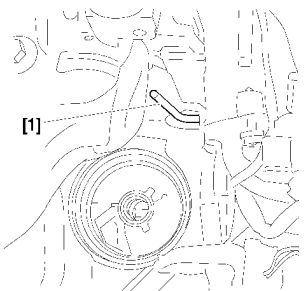
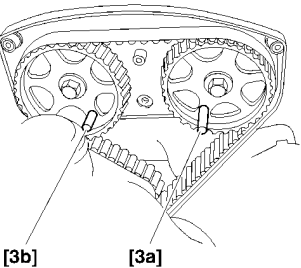
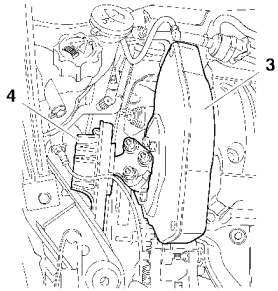
Checking the timing (continued)

Engine: NFU

Place a jack under the engine, peg the engine.  
Remove:

- The engine support (4) complete.
- The timing casing (3).
- The sparking plugs (eases engine rotation).

Turn the wheel to rotate the engine (normal direction of rotation).  
Position the pegs [3a] and [3b].  
Peg the flywheel, using tool [1].  
If the setting is not correct, recommence the operation.  
Remove the tools [1], [2], [3a] and [3b].  
Complete the refitting.



B1BP2MAC

B1EP18MC

B1BP2MBC

## CHECKING AND SETTING THE VALVE TIMING

Engines : HFX - KFV

**Setting the timing****Preliminary operation.**

Lift and support the vehicle, wheels hanging.

Disconnect the battery.

Remove:

- The front RH wheel.
- The splash-shield, using tool [6]
- The accessories belt (See corresponding operation).
- The crankshaft pulley.
- The oil filter.

Place a jack under the engine, peg the engine.

**Removing.****HFX – KFV engine**

Turn the engine by means of screw (1). (normal direction of rotation).

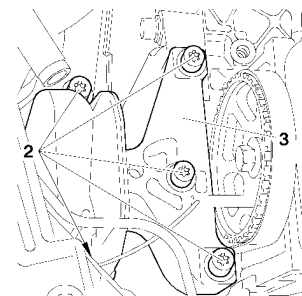
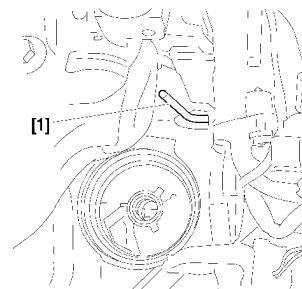
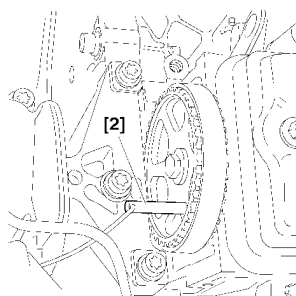
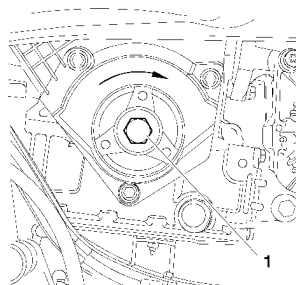
Remove the timing casings.

Peg the camshaft pinion, using tool [2].

Peg the flywheel, using tool [1].

Remove:

- The fixing screws (2).
- The upper engine support (3).



B1BP2MCC B1BP2M9C

B1BP2MBC B1BP2MDC

## CHECKING AND SETTING THE VALVE TIMING

Engines : HFX - KFV

### Setting the timing (continued)

#### HFX – KFV engines

Slacken the screws (4) without removing them.

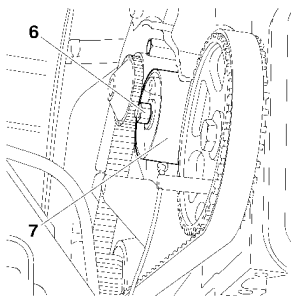
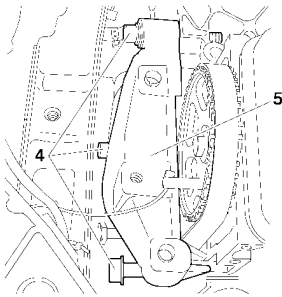
Remove the bottom engine support assembly (5), and the fixing screws (4).

Slacken the nut (6).

Completely detension the belt by acting on the tensioner roller (7).

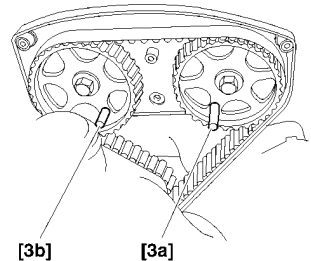
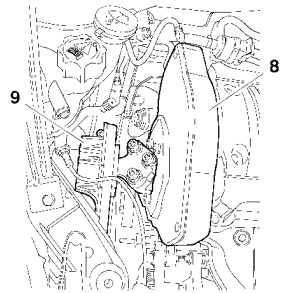
Remove the timing belt.

**IMPERATIVE : Check that the tensioner roller turns freely (no tight spot).**



B1BP2MEC B1EP18NC



**CHECKING AND SETTING THE VALVE TIMING****Engine : NFU****NFU engine.****Setting the timing (continued)**

Remove:

The bottom plastic casing.

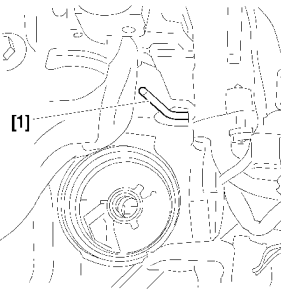
The engine support (9).

The middle support.

The timing cover (8).

Peg the flywheel, using tool [1].

Position the tools [3a] and [3b].

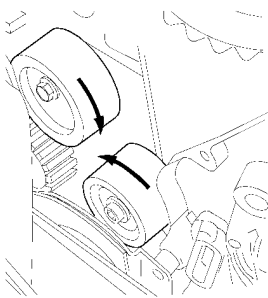
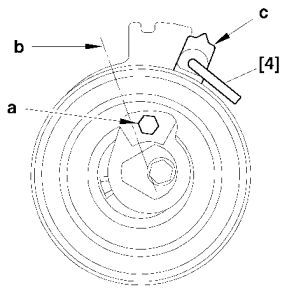


B1BP2MFC B1BP2MBC

B1EP18MC

## CHECKING AND SETTING THE VALVE TIMING

Engine : NFU

**Setting the timing (continued)****NFU Engine**

Slacken the tensioner roller.

Turn the tensioner roller so as to be able to position the tool [4], with the aid of an Allen key placed at «a».

Turn the tensioner roller towards the right to bring it to the index «c» in position «b».

Peg the tensioner roller in this position in order to slacken the timing belt to the maximum.

**IMPERATIVE : Never make the dynamic tensioner roller turn by a complete rotation.**

Remove the timing belt (8).

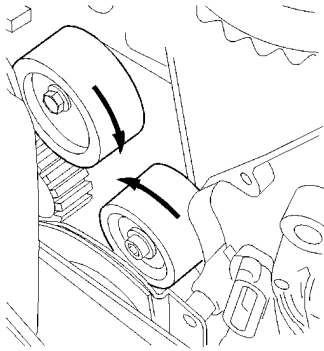
Check that the rollers (9) and (10) turn freely (no tight spot).

B1EP18PC

B1EP18QC

**CHECKING AND SETTING THE VALVE TIMING**

Engines : HFX - KfV



B1EP18QC

**Setting the timing (continued)****HFX-KfV Engines****Refit.**

**WARNING:** Respect the direction of fitting of the belt: (the arrows «d» indicate the direction of rotation of the crankshaft).

Refit the timing belt.

Position the timing belt, belt «e» well tensioned, in the following order:

Crankshaft pinion, hold the belt using tool [5].

Camshaft pulley.

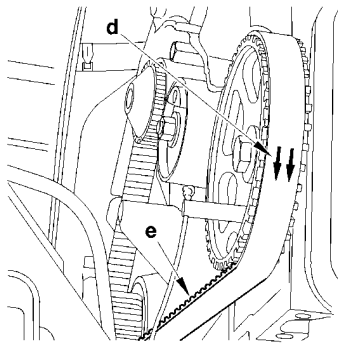
Coolant pump pulley.

Tensioner roller.

Remove the pegs [1] and [2].

## CHECKING AND SETTING THE VALVE TIMING

Engines : KFX - KfV - NFU



B1EP18RC

**Setting the timing (continued)****HFX-KFV engines****Refitting.****NOTE :** Check that the pegs [1] and [2] are in place.**WARNING:** Respect the direction of fitting of the timing belt, the arrows «d» indicate the direction of rotation of the crankshaft.

Refit the timing belt.

Position the timing belt, belt «e» well tensioned, in the following order:

Crankshaft pinion, hold the belt using tool [5].

- Camshaft pulley.
- Coolant pump pulley.
- Tensioner roller.

Remove the tools [1], [2].

**NFU engine.**

Fit the timing belt in position in the following order:

- Inlet camshaft pulley.
- Exhaust camshaft pulley.
- Guide roller.
- Crankshaft pulley.

Position tool [5].

- Coolant pump pulley.
- Dynamic tensioner roller.

Remove the tools [1], [3] and [5].

## CHECKING AND SETTING THE VALVE TIMING

Engine : NFU

Timing belt overtensioned:**A** : Engines HFX – KFV.**B** : Engine NFU

Turn the tensioner roller (7) with the aid of a hexagonal spanner at «a».

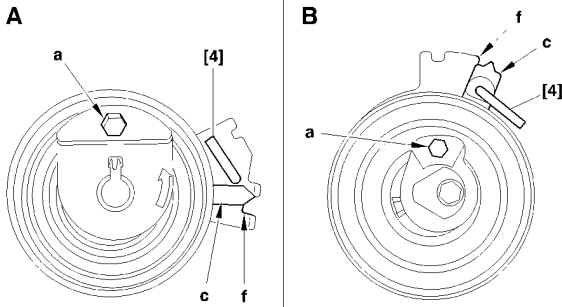
Bring the index «c» to position «f», to tension the belt to the maximum of the interval indicated.

Hold the tensioner roller (7), using tool [4].

Tighten the fixing nut of the tensioner roller, tightening to  $1 \pm 0,1$  m.daN.Turn the crankshaft by **4 rotations** (normal direction of rotation).**IMPERATIVE : Never make the crankshaft rotate backwards.**

Make sure that the timing is correctly set by refitting the tools [1], [2] and [3].

Remove the tools [1], [2] and [3].



B1EP18SD

## CHECKING AND SETTING THE VALVE TIMING

Engines : HFX - KfV - NFU

Adjusting the fitting tension of the timing belt**A** : Engines HFX – KfV.**B** : Engine NFU.

Slacken the nut while maintaining the position of the tensioner roller, with the aid of a hexagonal spanner at «a».

Next bring the index «c» to its adjusting position «a».

The index «c» should not go beyond the notch «g».

**WARNING:** The index «c» must not go beyond the notch «g». If it should do this, restart the timing belt tensioning operation.

Hold the tensioner roller (7) in this position, with the aid of a hexagonal spanner.

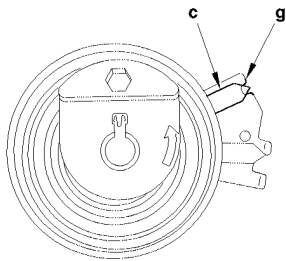
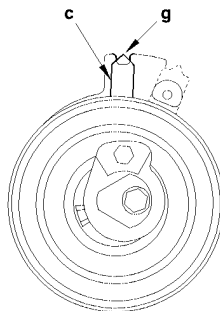
Tighten the tensioner roller fixing nut to :

**$2 \pm 0.2$  m.daN.** (HFX - KfV engines)

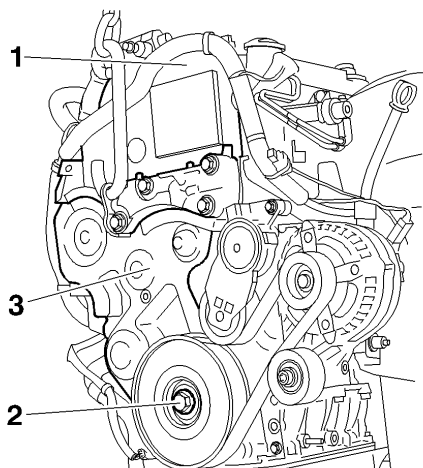
**$2.2 \pm 0.2$  m.daN.** (NFU engines)

**IMPERATIVE :** The tensioner roller must not rotate during the tightening of its fixing. If it does, restart the timing belt tensioning operation.

Complete the refitting.

**A****B**

B1EP18TD

**CHECKING AND SETTING THE VALVE TIMING****Engines : 8HX - 8HW****Tools.**

- |   |               |
|---|---------------|
| [1] Pliers for removing plastic pegs                    | : 7504-T.     |
| [2] Lever for detensioning the dynamic tensioner roller | : (-).0194.E  |
| [3] Engine flywheel setting peg                         | :(-).0194.C   |
| [4] Camshaft setting peg                                | : (-).0194.B. |
| [5] Crankshaft and high pressure pump setting peg       | : (-).0194.A. |

**Preliminary operations.**

Remove:

- The front RH wheel.
- The front RH splash-shield, using tool [1].
- The clips of the electrical harness on the upper timing cover.
- The accessories belt, using tool [2] (see corresponding operation).

**Check ing the setting.**

Disconnect the battery negative cable.

Remove the upper timing cover (1).

Rotate the engine using the screw (2) of the crankshaft pulley.

**NOTE :** The locking hole is located under the crankshaft bearing cap cover.

Undo the screw (2).

Detension the auxiliary drive belt dynamic tensioner roller, using tool [2].

B1BP2LXC

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW

**Check ing the setting (continued)**

Remove:

- the accessories drive belt.
- the accessories drive pulley.
- the lower timing cover (3).

**IMPERATIVE : The magnetic track should show no signs of damage and should not be approached by any other source of magnetism.**

Reposition the screw (2).

Remove tool [3].

Rotate the engine by means of the crankshaft pinion screw (2) (clockwise), to bring it to the pegging position.

Position the tool [4].

Peg the crankshaft pinion (1), using tool [5].

Peg the high pressure pump pinion, using tool [5].

**NOTE :** Index «a» of the roller tensioner must be centred within the area «b».

Check the correct positioning of index «a».

Remove tools [4] and [5].

Rotate the engine ten times.

Fit the tools [4] and [5].

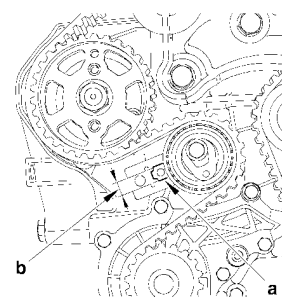
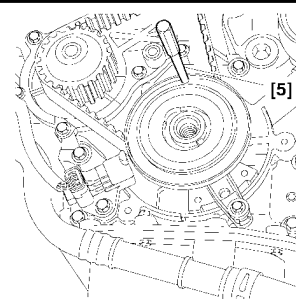
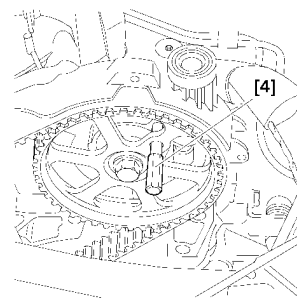
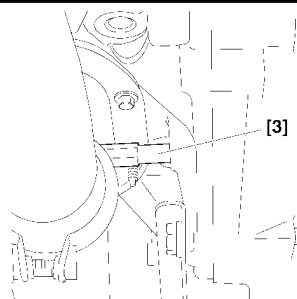
If pegging is not possible, carry out the operation to remove/refit the timing belt. (See corresponding operation).

B1JP03SC

B1EP18DC

B1EP18EC

B1EP18FC





## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW

### Setting the timing.

Remove the upper timing cover (1).  
Rotate the engine by means of the crankshaft screw (2).

**NOTE :** The pegging hole is located under the crankshaft bearing cap cover.  
Peg the engine flywheel, using tool [3].  
Remove the lower timing cover (3).  
Uncouple the exhaust line from the manifold.

**IMPERATIVE :** Uncouple the exhaust line in order to avoid damaging the front flexible pipe. Twisting, pulling and bending the front flexible pipe reduces its life.

Remove:

- The engine speed sensor (6).
- The belt retaining stop (5).
- The screw (2).
- The crankshaft pinion (4) (with its magnetic track «a»).

**IMPERATIVE :** The magnetic track should show no signs of damage and should not be approached by any other source of magnetism. Should this not be adhered to, it is essential to replace the crankshaft pinion.

Refit the screw (2).

B1BP2LXC B1EP18GC

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW

**Setting the timing (continued).**

Remove the tool [3].

Rotate the engine by means of the crankshaft pinion screw (2) (clockwise), to bring it to the pegging position.

Peg the camshaft pulley, using tool [4].

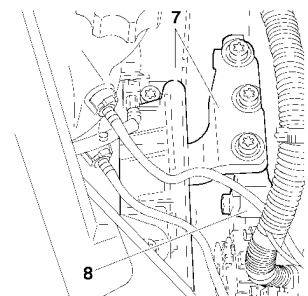
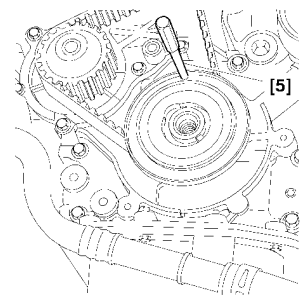
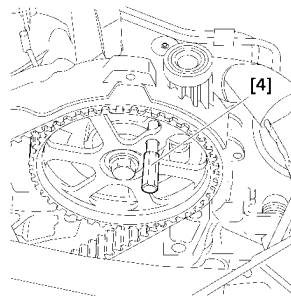
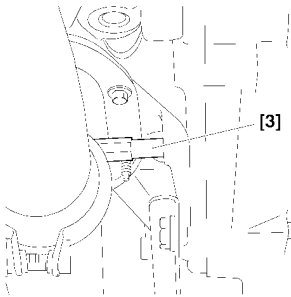
Peg :

- The crankshaft pinion (6), using tool [5].
- The high pressure pump pinion, using tool [5].

Support the engine with the aid of a roller jack equipped with a chock.

Remove:

- The RH engine support (7).
- The intermediate engine support (right hand side) (8).



B1JP03SC

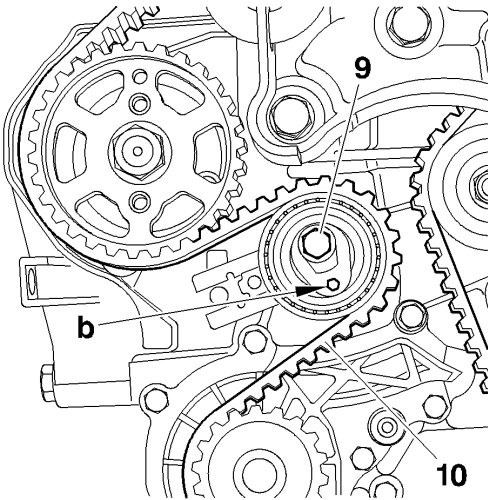
B1EP18DC

B1EP195C

B1BP2LYC

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW



B1EP18HC

**Setting the timing (continued).**

Hold the tensioner roller, using a hexagonal spanner at «b».

Slacken the screw (9).

Remove the timing belt (10).

**Refitting.**

**IMPERATIVE :** Check that both the tensioner roller and the fixed roller turn freely (no tight spots). If this is not the case, replace the rollers.

**Fitting of the pulleys.**

- Camshaft pulley

**Tighten to  $4.3 \pm 0.4$  m.daN.**

- Fuel high pressure pump pulley

**Tighten to  $5 \pm 0.5$  m.daN.**

The crankshaft pinion is located without a screw at the end of the crankshaft.

**Fitting of the rollers.**

**IMPERATIVE :** Check that the tensioner roller turns freely (no tight spot). Otherwise, replace the rollers.

- Guide roller

**Tighten to  $4.5 \pm 0.4$  m.daN**

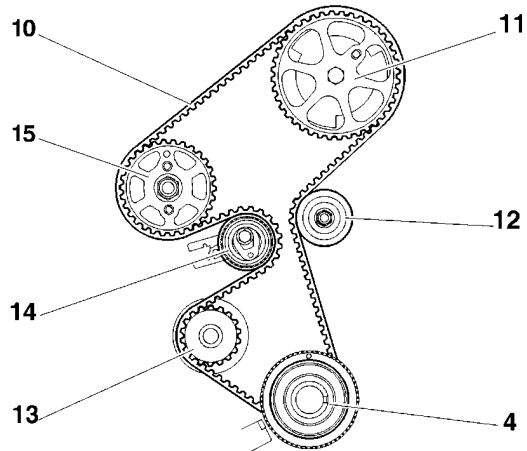
- Tensioner roller

**Pre-tighten to 0.1 m.daN**

Check the condition of the seals at the camshaft and at the crankshaft pinion..

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW

**Setting the timing (continued).****NOTE :** Screw (9) slackened.

Position the timing belt (10) observing the following sequence:

Crankshaft pinion (4).

Guide roller (12).

Camshaft pulley (11), (check that the belt is held correctly against the roller).

Coolant pump pinion (13).

Fuel high pressure pump pulley (15).

Tensioner roller (14).

B1EP18JD

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW

### Setting the timing (continued).

Turn the tensioner roller to the right to bring the index «**c**» to position «**d**», using a hexagonal spanner.

Tighten the screw **(9)** of the tensioner roller, tighten to **3 ± 0.3 m.daN**.

Remove the tools **[4]** and **[5]**.

Rotate the engine **ten times** (check that the timing pinion is correctly up against the crankshaft)..

Check:

The pegging of the camshaft.

The crankshaft pinion.

The fuel high pressure pump pinion **(15)**.

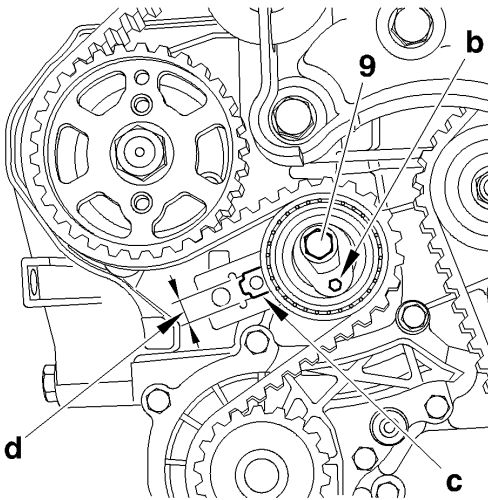
The correct positioning of the index of the dynamic tensioner.

If these are not correct, repeat the operation to position the timing belt.

Refit:

The engine speed sensor **(6)**.

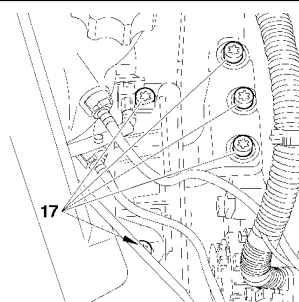
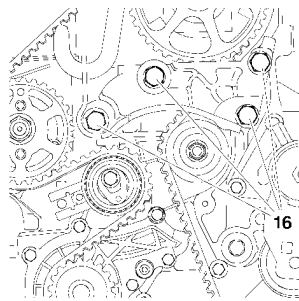
The belt retaining stop **(5)**, tighten to **0,7 m.daN**.



B1EP18KC

CHECKING AND SETTING THE VALVE TIMING

Engines : 8HX - 8HW



Setting the timing (continued).

Refit:

The intermediate RH engine support, tighten the screws (16) to  $5,5 \pm 0,5$  m.daN.

The RH engine support, tighten the screws (17) to  $4,5 \pm 0,4$  m.daN.

The bottom timing cover (3).

Immobilise the engine flywheel, using tool [3].

Remove the screw (2).

Refit the accessories drive pulley and tighten to:

Pre-tighten to :  $3 \pm 0,3$  m.daN.

Angular tighten to :  $180^\circ \pm 1^\circ,8'$

Remove tool [3].

Refit:

The top cover (1).

The accessories belt (see corresponding operation).

The exhaust line (see corresponding operation).

The front RH splash-shield.

The front RH wheel.

B1EP18LC

B1BP2LZC

**CHECKING AND SETTING THE VALVE TIMING**

Engines : 8HY - 8HV

**Tools.**

- |                                  |               |
|----------------------------------|---------------|
| [1] Engine flywheel peg Ø 12 mm  | : (-).0194-C. |
| [2] Camshaft pulley peg Ø 8 mm   | : (-).0194-B. |
| [3] Crankshaft pulley peg Ø 5 mm | : (-).0194-A. |

**Preliminary operations.****Remove:**

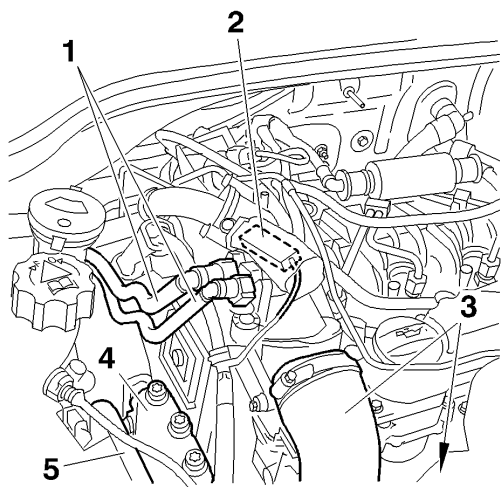
- The front RH wheel.
- The front RH splash-shield.
- The accessories belt (see corresponding operation).

**Uncouple:**

- The supply unions (1).
- The air/air heat exchanger inlet/outlet pipes (3).
- The exhaust line (at the flexible pipe).

**Disconnect the connector (2).**

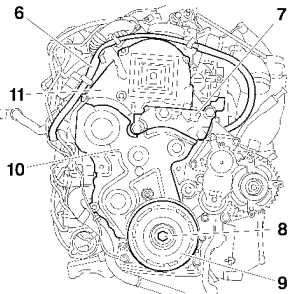
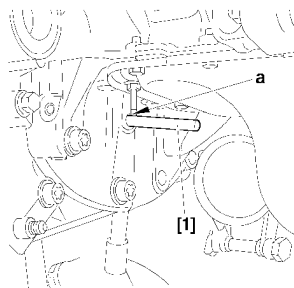
Support the engine by means of a roller jack equipped with a chock.  
Remove the engine supports (4) and (5).



B1BP2N0C

CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV



Checks.

Rotate the engine to engage it (normal direction of rotation).  
Immobilise the engine flywheel at «a», using tool [1].  
Move aside the harness (6).

Remove:

- The engine support (7).
- The screw (8).
- The pulley (9).
- The lower timing cover (10).
- The upper timing cover (11).
- The tool [1].

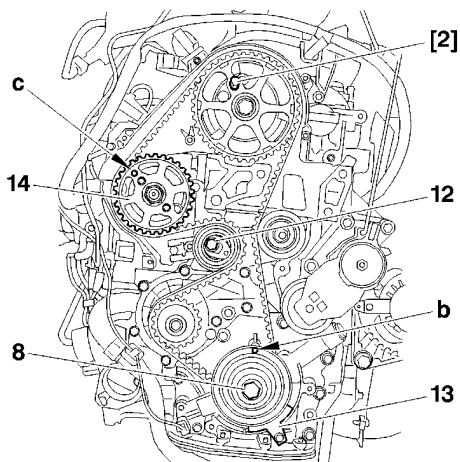
B1BP2N1C

B1BP2N2C



## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV

**Checks (continued).**

Refit the screw (8).  
Rotate the crankshaft six times (clockwise).

**IMPERATIVE : Never rotate the engine backwards.**

Peg :

- The camshaft, using tool [2]. (Oil the pegs.)
- The fuel high pressure pump pulley (14), using tool [3] at «c».

**WARNING:** The magnetic track should show no signs of damage and should not be approached by any source of magnetism.

Peg the crankshaft at «b», using tool [3].

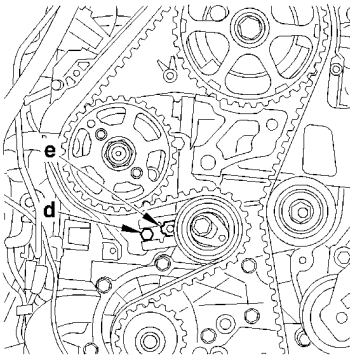
**IMPERATIVE:** Should it be impossible to peg the camshaft, check that the offset between the hole in the camshaft pinion and the pegging hole is not greater than 1 mm.

Otherwise repeat the operation to position the timing belt. (See corresponding operation).

B1EP18YD

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV

**Checks (continued).**

**NOTE :** The index «e» of the dynamic tensioner roller should be centred within the area «d».  
Check the correct positioning of the index «e».

If it is not correct, repeat the operation to tension the timing belt (see corresponding operation).

**Refitting.**

Refit the tool [1] at «a».

Remove the screw (8).

Refit:

- The upper timing cover (11).
- The lower timing cover (10).
- The accessories drive pulley (9).
- The screw (8).

**Tightening torque:**

- Screw (8) :

Pre-tighten to :  $3 \pm 0,3 \text{ m.daN.}$

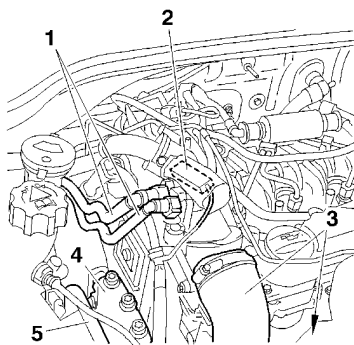
Angular tightening :  $180^\circ \pm 5^\circ.$

Remove the tool [1].

B1EP18ZC

**CHECKING AND SETTING THE VALVE TIMING**

Engines : 8HY - 8HV

**Checks (continued).****Refit :**

- The engine support (7), tighten to  $1,5 \pm 0.4$  m.daN.
- The engine support (4), tighten to  $6,1 \pm 0,.$  m.daN.
- The engine support (5), tighten to  $6 \pm 0.6$  m.daN.
- The electrical harness (6).

**Couple:**

- The exhaust line, tighten the collar to :  $2.5 \pm 0.3$  m daN
- The fuel supply unions (1).
- The air/air heat exchanger inlet/outlet pipes (3).

Connect the connector (2).

**Refit :**

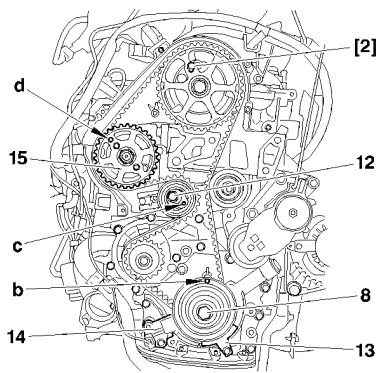
- The accessories belt (see corresponding operation).
- The front RH splash-shield (see corresponding operation).
- The front RH road wheel, tighten to  $9 \pm 1$  m.daN.

Reconnect the battery.

B1BP2N0C

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV



B1EP18VD

**Setting the timing.**

Perform the preliminary operations for checking the timing up to removing tool [1] at «a» for immobilizing the engine flywheel.

Refit screw (8).

Rotate the crankshaft to bring the camshaft towards its pegging point.

Peg the camshaft, using tool [2]. (Oil the pegs).

**WARNING: Do not press or damage the track which is the target for the engine speed sensor (14).**

Peg the crankshaft at «b», using tool [3].

Remove:

- The timing protector (13).
- The engine speed sensor (14).

Slacken the screw (12) of the tensioner roller, keeping it slack with the aid of a hexagonal spanner at «c».

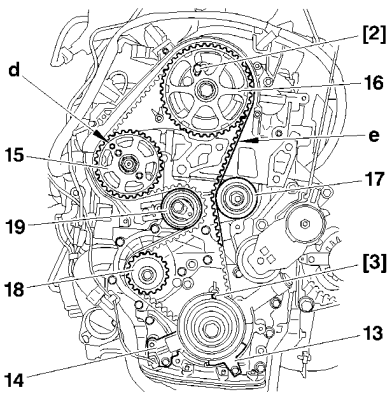
Detension the belt by pivoting the tensioner roller (clockwise).

Remove the timing belt, commencing with the coolant pump pinion.

Peg the pulley (15), using a 5 mm diameter peg at «d».

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV



B1EP18WD

### Setting the timing (continued).

#### Checking the setting.

**IMPERATIVE : Just prior to refitting, carry out the following tests:**

Check that:

- the rollers and the coolant pump operate freely (no play and no tight spot).
  - there are no traces of oil (from the crankshaft and camshaft sealing rings).
  - there is no leak of coolant fluid (from the coolant pump).
  - the target track of the engine speed sensor (**14**) is not damaged or scratched.
- (If necessary replace the defective components).

#### Refitting

Fit the timing belt on the crankshaft pinion.

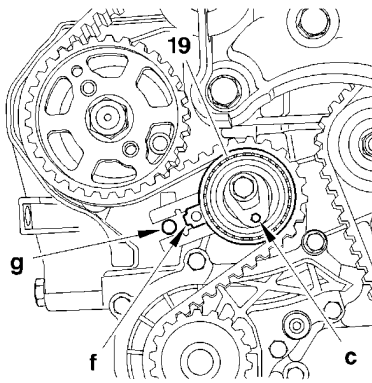
Position the belt on the guide roller, with the belt well tensioned.

Refit:

- The timing protector (**13**).
- The sensor (**14**).

## CHECKING AND SETTING THE VALVE TIMING

Engines : 8HY - 8HV



B1EP18XC

Setting the timing (continued).**Checks (continued).**

Reposition the timing belt, belt at «e» well tensioned, in the following order:

- Guide roller (17).
- Camshaft pulley (16).
- Fuel high pressure pump pulley (15).
- Coolant pump pinion (18).
- Tensioner roller (19).

Remove the 5 mm diameter peg at «d».

Adjusting the fitting tension of the belt.

Action the tensioner roller (19) to align the marks «f» and «g», avoiding detensioning the timing belt, with the aid of a male hexagonal spanner, at «c».

If this is not successful, repeat the operation to tension the belt.

Hold the tensioner roller in position (19).

Tighten the tensioner roller, tightening to  $3,7 \pm 0,3 \text{ m.daN}$ .

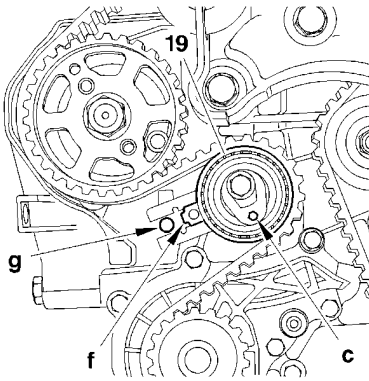
Check the position of the tensioner roller (the alignment of the marks «f» and «g» should be correct).

Remove tools [2] and [3].

Turn the crankshaft **six rotations** (clockwise).

**CHECKING AND SETTING THE VALVE TIMING**

Engines : 8HY - 8HV



B1EP18XC

**Adjusting the timing belt tension (continued).****IMPERATIVE :** Never rotate the engine backwards.**WARNING :** Do not touch or damage the track of the target of the engine speed sensor (14).

Peg the crankshaft, using tool [3].

Check the position of the tensioner roller (the alignment of the marks «f» and «g» should be correct).

If this is not the case, repeat the operation to tension the belt.

Peg the camshaft pulley, using tool [2].

**IMPERATIVE :** Should it be impossible to peg the camshaft, check that the offset between the camshaft hole and the pegging hole is not more than 1 mm. If the offset is too great, repeat the operation.

Remove the pegs [2] and [3].

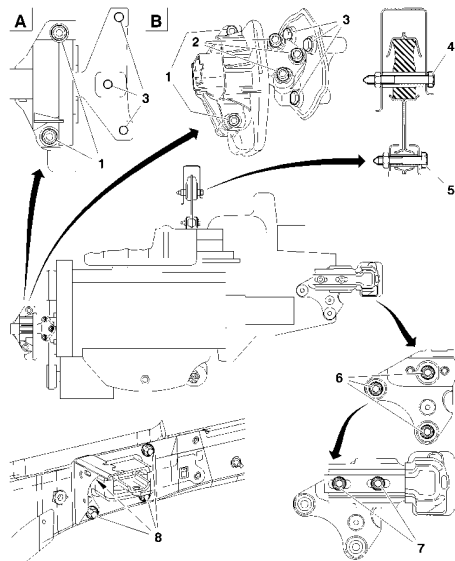
Refit tool [1] at «a».

Remove the screw (8).

Complete the refitting.

# SPECIAL FEATURES : POWER UNIT SUSPENSION

Engines : HFX - KFV - NFU



## Tightening torques (m.daN)

### RH engine support.

- (1) :  $4.5 \pm 0.4$
- (2) :  $6.1 \pm 0.6$
- (3) :  $4.5 \pm 0.4$

### Torque reaction rod.

- (4) :  $6 \pm 0.6$
- (5) :  $6 \pm 0.6$

### LH engine support.

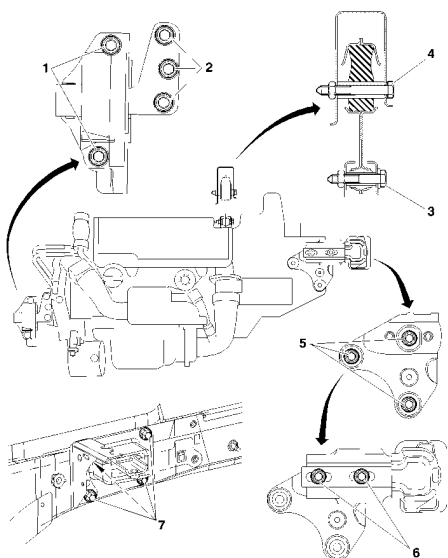
- (6) :  $3 \pm 0.3$
- (7) :  $6 \pm 0.6$
- (8) :  $5.5 \pm 0.5$

B1BP2NEP



**SPECIAL FEATURES : POWER UNIT SUSPENSION**

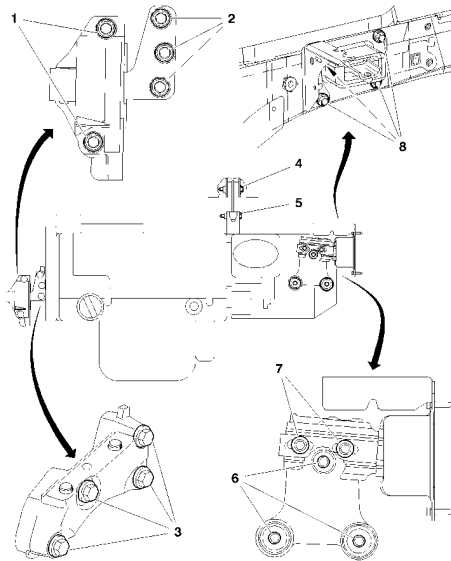
Engines : 8HX - 8HW

**Tightening torques (m.daN)****RH engine support.****(1) :  $4,5 \pm 0,4$** **(2) :  $3 \pm 0,3$** **Torque reaction rod.****(3) :  $6 \pm 0.6$** **(4) :  $6 \pm 0.6$** **LH engine support.****(5) :  $5.4 \pm 0.5$** **(6) :  $6 \pm 0.6$** **(7) :  $5.5 \pm 0.5$** 

B1BP2LJP

**SPECIAL FEATURES : POWER UNIT SUSPENSION**

Engines : 8HY - 8HV



B1BP2MNP

**Tightening torques m.daN.****Upper RH engine support.**

- (1) Screws :  $6 \pm 0.6$   
 (2) Screws :  $6 \pm 0.6$

**Lower RH engine support.**

- (3) Screws :  $5.7 \pm 0.9$

**Torque reaction rod.**

- (4) Screws :  $6 \pm 0.6$   
 (5) Screws :  $6 \pm 0.6$

**Lower LH engine support.**

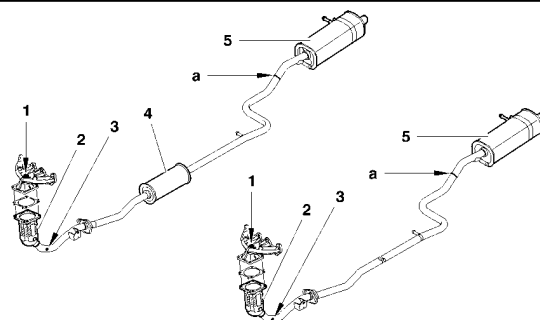
- (6) Screws :  $5.4 \pm 0.5$

**Upper LH engine support.**

- (7) Screws :  $6 \pm 0.6$   
 (8) Screws :  $5.5 \pm 0.5$

## EXHAUST SPECIFICATIONS

Engines : HFX - KFV - NFU

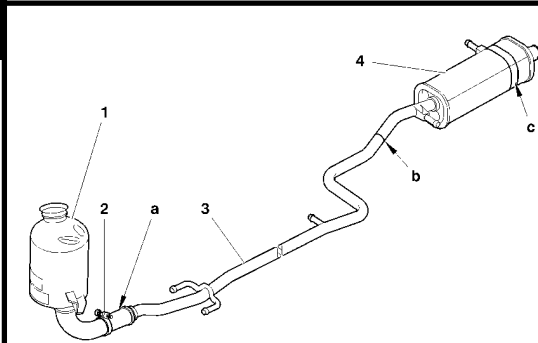


B1JP03TD

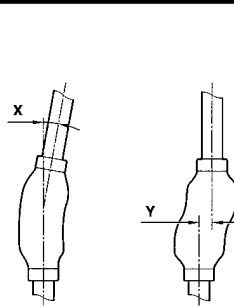
Engine types	(1) Upstream oxygen sensor	(2) Catalytic converter	(3) Downstream oxygen sensor	(4) Front silencer	(5) Rear silencer
	Tighten to (m.daN)		Tighten to (m.daN)		
HFX	4,7 ± 0.5	TR PSA K179	4.7 ± 0.5	PSA 4175	PSA 4173
KFV		TR PSA K208			PSA 4174
NFU		TR PSA K181			PSA 4176

## EXHAUST SPECIFICATIONS

Engines : 8HX - 8HW



B1JP03PD



B1JP02JC

**Repair**

Respect the precautions to be taken when operating on a vehicle.

The flexible pipe must not come into contact with corrosive products.

Do not distort the flexible pipe by more than **20°** angular (**X**), **20 mm** axial, **25 mm** shear (**Y**) (flexible pipe not fitted).

Do not distort the flexible pipe by more than **3°** angular (**X**), **0 mm** axial, **3 mm** shear (**Y**) (flexible pipe in place).

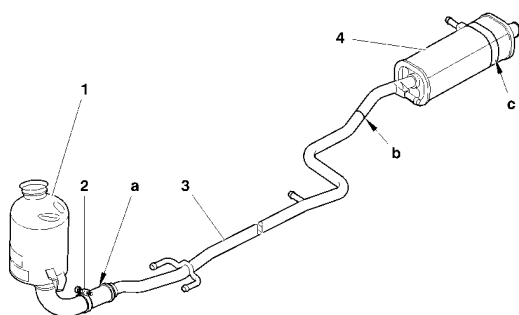
**WARNING** : Non-respect for these precautions will result in a reduction in the lifetime of the flexible pipe. It is thus essential to disconnect or remove the exhaust line in any operation necessitating the lifting of the power unit.

Engine types	(1) Catalytic converter	(2) Clip	(3) Intermediate pipe	(4) Rear silencer
	Tighten to $2,5 \pm 0,3$			Tighten to $1,5 \pm 0,1$
8HX - 8HW	TR PSA K213			PSA 4177

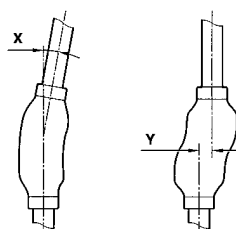
## EXHAUST SPECIFICATIONS

Engines : 8HY – 8HV

«a» : Cutting zone (Marked by burrs).



B1JP03ND



B1JP02JC

**Flexible pipe**

Respect the precautions to be taken when operating on a vehicle.

The flexible pipe must not come into contact with corrosive products.

Do not distort the flexible pipe by more than **20°** angular (**X**), **20 mm** axial, **25 mm** shear (**Y**) (flexible pipe not fitted).

Do not distort the flexible pipe by more than **3°** angular (**X**), **0 mm** axial, **3 mm** shear (**Y**) (flexible pipe in place).

**WARNING** : Non-respect for these precautions will result in a reduction in the lifetime of the flexible pipe. It is thus essential to disconnect or remove the exhaust line in any operation necessitating the lifting of the power unit.

Engine types	(1) Catalytic converter	(2) Intermediate pipe	(3) Rear silencer	(4) Clip
	Tighten to $2,5 \pm 0,3$			Tighten to $2,5 \pm 0,3$
8HY-8HV	TR PSA K213		PSA 4177-PSA 4179	

### COOLING SYSTEM SPECIFICATIONS

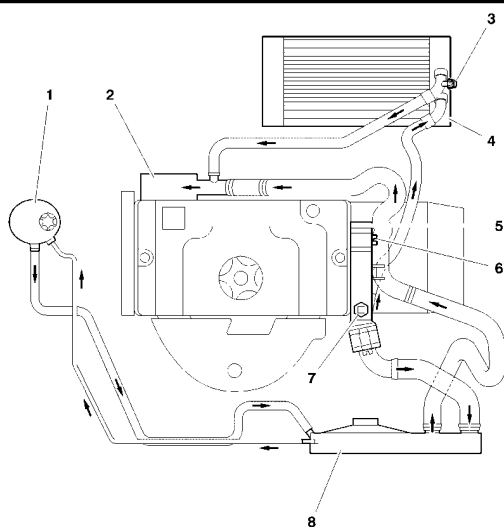
Engines : HFX - KFV - NFU

	1.1i	1.4i	1.6i 16V
Engine type	HFX	KFV	NFU
Capacity	7		
Radiator surface	12 and 16 dm³		
Pressurisation	1,4 bars		
Opening of thermostatic regulator	89°C/101°C		
Cooling fan	100W (without aircon)		300W (with aircon)
1st speed			
2nd speed			
Warning	118°C		
Post-cooling	Managed by the ECU		

## COOLING SYSTEM SPECIFICATIONS

Engines : HFX - KFV - NFU

Manual gearbox.



- (1) Venting chamber.
- (2) Water pump.
- (3) Heater matrix.
- (4) Bleed screw, heater matrix
- (5) Coolant outlet housing
- (6) Bleed screw, coolant outlet housing.
- (7) Calorstat.
- (8) Cooling radiator.

### Thermostat.

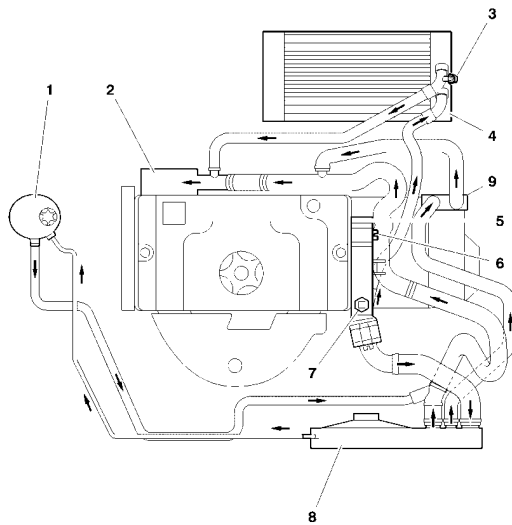
Colour of connector : **Blue.**  
 Colour of seal : **Yellow.**  
 Tightening torque : **1.7 ± 0.2 m.daN.**

B1GP09HP

## COOLING SYSTEM SPECIFICATIONS

Engines : HFX – KFV – NFU

Automatic gearbox



- (1) Venting chamber.
- (2) Water pump.
- (3) Heater matrix.
- (4) Bleed screw, heater matrix
- (5) Coolant outlet housing
- (6) Bleed screw, coolant outlet housing.
- (7) Calorstat.
- (8) Cooling radiator.
- (9) Heat exchanger (for automatic gearbox).

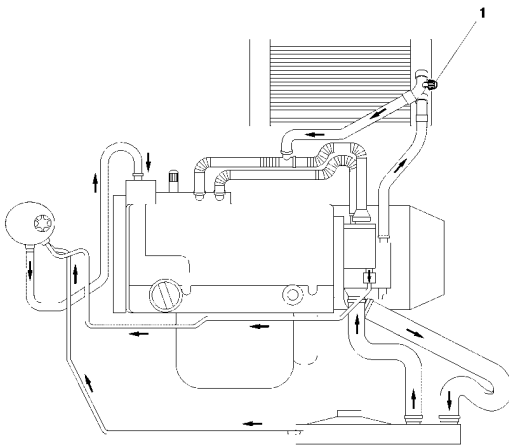
### Thermostat.

Colour of connector : **Blue.**  
 Colour of seal : **Yellow.**  
 Tightening torque : **1.7 ± 0.2 m.daN.**

B1GP09JP



COOLING SYSTEM SPECIFICATIONS				
Engines : 8HX - 8HW - 8HY - 8HV				
	1.4 HDi		1.4 HDi 16V	
Engine type	8HX	8HW	8HY	8HV
Capacity	5.7 Litres		5.6 Litres	
Radiator surface	16 dm³			
Pressurisation	1.4 bar			
Opening of thermostatic regulator	83°C			
Cooling fan	1x300W			
1st speed	97°C			
2nd speed				
Air conditioning cut-off	115°C			
Warning	118°C			
Post-cooling	105°C    6 minutes			
Thermostat : Tightening torque <b>1.7 ± 0.4 m.daN.</b>				

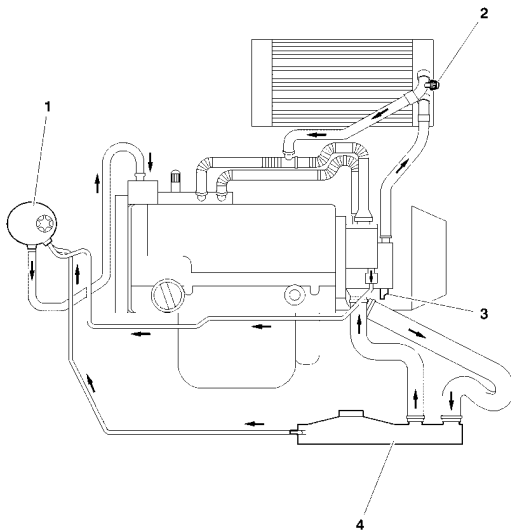
**COOLING SYSTEM SPECIFICATIONS****Engines : 8HX - 8HW**

(1) Bleed screw (with or without aircon)

**B1GP09MP**

**COOLING SYSTEM SPECIFICATIONS**

Engines : 8HY - 8HV

**(1)** Venting chamber.**(2)** Bleed screw.**(3)** Thermostat.

B1GP09QP

## OIL FILTERS

OIL FILTERS				
	Petrol			
	TU			
	1	3	5	
	JP		JP4	
	1.1i	1.4i	1.6i 16V	
	HFX	KFV	NFU	
	FILTRAUTO	X	X	X
	Diesel			
	DV			
	4			
	TD		TED4	
	1.4 HDi		1.4 HDi 16V	
	8HX	8HW	8HV	8HY
	MALHEX	X	X	X

CHECKING THE OIL PRESSURE			
	Petrol engines		
	1.1i	1.4i	1.6i 16V
Engine type	HFX	KFV	NFU
Temperature (°C)	90°C		
Pressure (Bars)	3		
Rpm	2000		
	Diesel engine		
	1.4 HDi	1.4 HDi 16V	
Engine type	8HX - 8HW	8HV - 8HY	
Temperature (°C)	90°C		
Pressure (Bars)	> 1.3		
Rpm	1000		
<b>Tools :</b>			
Pressure gauge	: 2279-T.Bis	Toolkit 4103-T.	
Flexible pipe			
Engine oil pressure take-off union ( <b>TU</b> engine)	: 7001-T	Toolkit 4103-T.	
Oil pressure take-off union ( <b>DV</b> engine)	: 9780-80-T		
<b>NOTE : Tightening</b> of the oil pressure switch <b>2 ± 0,2</b> . (New seal).			
<b>IMPERATIVE : Respect the safety and cleanliness requirements.</b>			

## VALVE CLEARANCES

The valve clearances should be checked with the engine cold.

	● Inlet	⊗ Exhaust
<b>HFX - KfV</b>	0.20 mm ± 0.05	0.40 mm ± 0.05
<b>NFU</b>	1 mm ± 0.05	1 mm ± 0.05
<b>8HX - 8HW - 8HY - 8HV</b>	Hydraulic adjustment	

## POSSIBLE METHODS

On engines: 4 cylinders in line (1-3-4-2 )

## Rocking

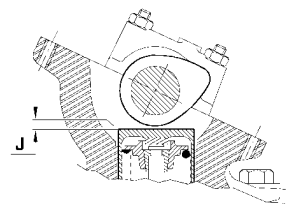
Rocking	Adjust
1 ● ⊗ 1	4 ● ⊗ 4
3 ● ⊗ 3	2 ● ⊗ 2
4 ● ⊗ 4	1 ● ⊗ 1
2 ● ⊗ 2	3 ● ⊗ 3

## Fully open (Exhaust)

Valves fully open	Adjust
⊗ 1	3 ● ⊗ 4
⊗ 3	4 ● ⊗ 2
⊗ 4	2 ● ⊗ 1
⊗ 2	1 ● ⊗ 3

⊗ Inlet  
● Exhaust

Engines without hydraulic adjustment : the clearance (**J**) should be checked opposite the cam.



B1DP13QC

## FILLING AND BLEEDING THE COOLING CIRCUIT

Engines : 8HX - 8HW

### Tools

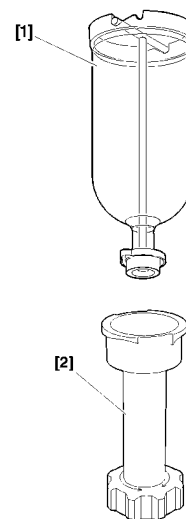
- [1] Filling cylinder : 4520-T  
 [2] Adaptor for filling cylinder : 4222-T.

**ESSENTIAL : Respect the safety and cleanliness recommendations.**

- The draining and refilling operations can be carried out by means of a WINN'S coolant replacement apparatus or similar; **it is essential to follow the instructions when using this apparatus.**

### Filling and bleeding

- Fit the cylinder adaptor [2] 4222-T and the filling cylinder [1] 4520 -T.
  - Use the coolant to ensure protection between - 15°C and - 37°C.
  - Slowly fill the system.
- NOTE :** Keep the cylinder filled up (visible level).
- Close each bleed screw as soon as the coolant flows without air bubbles.
  - Start the engine : Engine speed **1500 rpm**.
  - Maintain this speed until the third cooling cycle (cooling fans have cut in and cut out).
  - Stop the engine and allow it to cool down.
  - Remove the filling cylinder [1] 4520 – T and the adaptor [2] 4222-T.
  - Top up the system to the **maximum** mark, with the engine cold.
  - Refit the cap.



B1GP00AC

E5AP1GNC

IDLING - ANTI-POLLUTION								
Vehicles		Engine type	Emission standard	Make - Injection type	Idling speed (± 50 rpm)		% Content	
					Manual gearbox	Auto. gearbox: N gear engaged	CO	CO2
C3	1.1 i	HFX	L4	MAGNETTI MARELLI 48P	850		< 0.5	> 9
			IF/L5					
	1.4 i	KFW	L4	SAGEM S2000				
			IF/L5					
	1.6 i 16V	NFU	L4	BOSCH M 7.4.4.				



PETROL INJECTION			
	C3		
	1.1i	1.4i	1.6i 16 V
Engine type	HFX	KFW	NFU
Emission standard	L4 / IFL5	L4	L4
Make Injection type	M. MARELLI 48P2	SAGEM S2000	BOSCH M.7.4.4.
Fuel pressure (bars)	3.5	3.5	3.5
Overspeed cut-off (rpm)			
Injection cut-in during deceleration (rpm)	5500	5500	5500
Injector resistive value (ohms)	14.5	14.5	14.5
Engine coolant temperature sensor resistive value (ohms)	3 800 at 10°C	2500 at 20° C	800 at 50°C
Idling actuator or stepper motor resistive value (ohms)	Stepper motor : 53		
Air temperature sensor resistive value (ohms)	3 800 at 10°C	2500 at 20° C	800 at 50°C

EMISSION STANDARDS							
STANDARD				APPLICATION		NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
ECE R 15.04	K K'	15.04 15.04	Petrol Diesel	Private vehicles : > 2 litres • new cyl. < 2 litres • existing cyl. < 2 litres	→06/89 →06/92 →12/92	Brussels directive 83/351 → except special derogations for certain private vehicles cyl. > 2 litres	With oxygen sensor, without catalytic converter
				Utility vehicles : All Types	→10/89 imminent	→ Utility vehicle limits = private vehicle limits increased by 25 % → For private vehicles and utility vehicles in major export	
ECE R 15.05	W vp	15.05	Petrol	Private vehicles : > 2 litres • new models • existing models	01/10/88 → 01/10/89 →	Brussels directive 88/76 « Luxembourg Accords » → Replaced by 89/458 + 91/441	

EMISSION STANDARDS							
STANDARD			APPLICATION		NOTES	CHARACTERISTICS	
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
<b>ECE R 15.05</b>	W vu	15.05	Petrol Diesel	Utility vehicles : All Types • new models • existing models	01/10/88 → 01/10/89 → → 10/94	Brussels directives 88/76 and 88/436 → Utility vehicle limits = private vehicle limits of Brussels directive 88/436 7 classes of limits by vehicle weight	
<b>US 83</b>	Z	US 83	Petrol Diesel	Private vehicles : • certain non-EEC European countries • certain Export countries	Current	→ Adoption of U.S. standard	With oxygen sensor and catalytic converter for petrol vehicles

INJECTION

EMISSION STANDARDS							
STANDARD				APPLICATION		NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
US 87	Y	US 87	Diesel	Private vehicles : • certain non-EEC European countries • certain Export countries	Current	→ Adoption of the U.S. standard	With catalytic converter and EGR
US 93	Y2	US 93	Petrol Diesel	Private vehicles : • certain Export countries	Current	→ Adoption of the U.S. standard	
US 84 LDT	X1	US 84	Petrol Diesel	Private vehicles : • certain non-EEC European countries • certain Export countries	Current	→ Adoption of the U.S. standard for light utility vehicles	
US 87 LDT	X2	US 87	Petrol Diesel	Private vehicles : • certain non-EEC European countries • certain Export countries	Current	→ Adoption of the U.S. standard for light utility vehicles	

EMISSION STANDARDS							
STANDARD			APPLICATION		NOTES	CHARACTERISTICS	
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
<b>US 90 LDT</b>	X3	US 90	Petrol Diesel	Private vehicles : • certain non-EEC European countries • certain Export countries	Current	→ Adoption of the U.S. standard for light utility vehicles	
<b>EURO 1 (EURO 93)</b>	L1	CEE 19.5	Petrol Diesel	Private vehicles : < 1.4 litres • new models • existing models	07/92 → → 01/07/93 → 31/12/94	Brussels directive 89/458  → Possible alternative to emission standard L from 1992 to 1994	
<b>EURO 1 (EURO 93)</b>	L	CEE 19.5	Petrol Diesel	Private vehicles : All Types • new models • existing models • new models • existing models	07/92 → 01/93 → → 01/96 → 01/97	EU Brussels Directive 93/59 (91/441)	With oxygen sensor and catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles.

INJECTION

EMISSION STANDARDS							
STANDARD			APPLICATION		NOTES	CHARACTERISTICS	
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
EURO 1 (EURO 93)	W2	CEE W2	Petrol Diesel	Utility vehicles : < 3.5 tonnes • new models • existing models Class 1 : • new models • existing models Class 2/3 : • new models • existing models	01/10/93 → 01/10/94 → → 01/97 → 10/97 → 01/98 → 10/98	Brussels Directive 93/59  → 3 classes depending on vehicle weight : Class 1 < 1250 kg Class 2 : 1250/1700 kg Class 3 > 1700 kg	With oxygen sensor and catalytic converter for petrol vehicles
EURO 2 (EURO 96)	L3	CEE 95	Petrol Diesel	Private vehicles : < 6 seats and < 2.5 tonnes • new models • existing models	01/96 → 01/97 →	Brussels Directive 94/12  → EURO 93 standard made stricter	With oxygen sensor and reinforced catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles.

EMISSION STANDARDS							
STANDARD			APPLICATION		NOTES	CHARACTERISTICS	
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
EURO 2 (EURO 96)	W3	CEE 95	Petrol Diesel Gas	Utility vehicles : < 3.5 tonnes Class 1 : • new models • existing models Class 2/3 : • new models • existing models	01/97 → 10/97 → 01/98 → 10/98 →	Brussels Directive 96/69 → 3 classes depending on vehicle weight : Class 1 < 1250 kg Class 2 : 1250/1700 kg Class 3 : 1700 kg	With oxygen sensor and reinforced catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles.
EURO 3 (EURO 2000)	L4	CEE 2000	Petrol Diesel Gas	Private vehicles : All Types • new models • existing models	01/2000 → 01/2001 →	Brussels Directive 98/69 → EURO 2 standard (L3) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles. With EOBD on-board diagnosis.

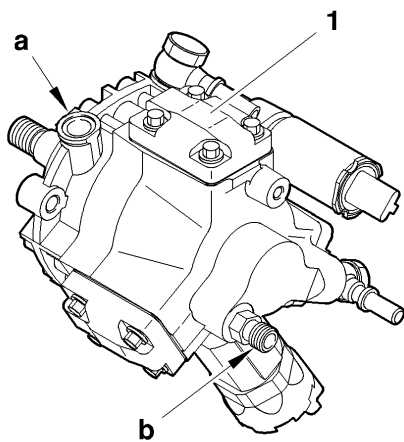
EMISSION STANDARDS							
STANDARD			APPLICATION		NOTES	CHARACTERISTICS	
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
EURO 3  (EURO 2000)	W3		Petrol Diesel Gas	Utility vehicles :  < 3.5 tonnes Class 1 : <ul style="list-style-type: none"><li>• new models</li><li>• existing models</li></ul> Class 2/3 : <ul style="list-style-type: none"><li>• new models</li><li>• existing models</li></ul>	→ 01/2000 → 01/2001  → 01/2001 → 01/2002	Brussels Directive 98/69  → EURO 2 standard (L3) made stricter → Fiscal incentives → 3 classes depending on vehicle weight : Class 1 < 1305 kg Class 2 : 1305/1760 kg Class 3 : 1760 kg	With 2 oxygen sensors and catalytic converter for petrol vehicles. With catalytic converter and EGR for diesel vehicles.  With EOBD on-board diagnosis.
EURO 4	IF / L5		Petrol	Private vehicles : All Types <ul style="list-style-type: none"><li>• new models</li><li>• existing models</li></ul>	01/96 → 01/97 →	Brussels Directive 98/69  → EURO 3 standard (L4) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.



EMISSION STANDARDS							
STANDARD				APPLICATION		NOTES	CHARACTERISTICS
E.E.C.	PSA		Engines	Vehicles	Applicable		
	A-S	RP					
EURO 4	IF/ L5		Petrol Diesel Gas	Private vehicles : All Types • new models • existing models	→ 01/2005 → 01/2006	Brussels Directive: 2001/1 → EURO 3 standard (L4) made stricter → Fiscal incentives	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.
EURO 4	IF/ L5		Petrol Gas	Utility vehicles : < 3.5 tonnes Class 1 : • new models • existing models Class 2/3 : • new models • existing models	→ 01/2005 → 01/2006 → 01/2006 → 01/2007	Brussels Directives: 99/102 et 2001/1 (Gas) → EURO 3 standard (L4) made stricter → Fiscal incentives → 3 classes depending on vehicle weight : Class 1 < 1305 kg Class 2 : 1305/1760 kg Class 3 : 1760 kg	With 2 oxygen sensors and catalytic converter for petrol vehicles.  With EOBD on-board diagnosis.

# PROHIBITED OPERATIONS: SIEMENS HDI DIRECT INJECTION SYSTEM

Engines : 8HX - 8HW



B1HP1K9C

## Cleaning.

- The use of high pressure cleaners is prohibited.
- Do not use compressed air.

## Fuel supply circuit.

- Required fuel : diesel.

## Electric circuit.

- Swapping injection ECUs between two vehicles will render it impossible to start either vehicle.
- It is forbidden to supply a diesel injector with **12 volts**.

## High pressure fuel pump.

Do not separate the following components from the high pressure fuel pump **(5)** :

- Sealing ring **(a)** (no replacement parts).
- High pressure outlet connector **(b)** (will cause a malfunction).

**PS : HDi = High pressure Diesel injection**

# PROHIBITED OPERATIONS: SIEMENS HDI DIRECT INJECTION SYSTEM

Engines : 8HX - 8HW

## Diesel injectors.

### WARNING: Diesel and ultrasonic cleaners are prohibited.

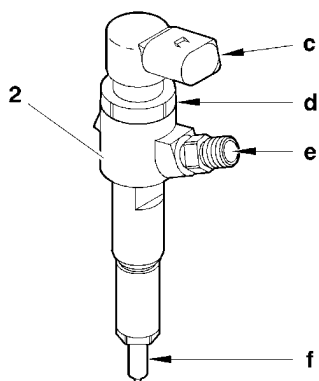
Do not separate the following components from the diesel injector carrier **(2)** :

- Diesel injector **(f)** (no replacement parts).
- Electromagnetic element **(c)** (no replacement parts).

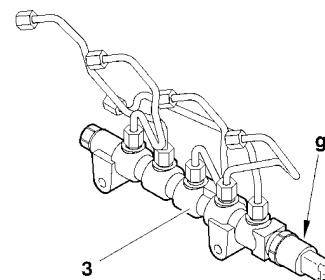
Do not alter the position of the nut **(d)** (malfunction).

Do not separate the connector **(e)** from a diesel injector.

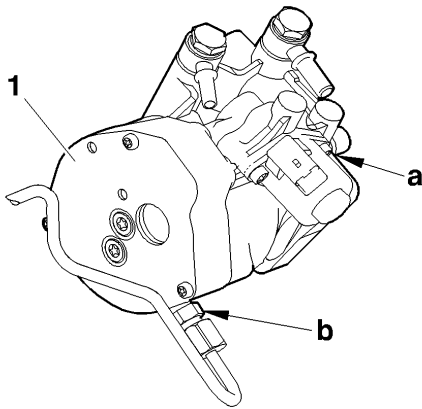
It is forbidden to clean the carbon deposits from the diesel injector nozzle.



B1HP1KAC



B1HP1KBC

**PROHIBITED OPERATIONS: DELPHI HDI DIRECT INJECTION SYSTEM****Engines : 8HY - 8HV****B1HP1J6C****Cleaning.**

- The use of high pressure cleaners is prohibited.
- Do not use compressed air

**Fuel supply circuit.**

- Required fuel : diesel.

**Electric circuit.**

- Swapping injection ECUs between two vehicles will render it impossible to start either vehicle.
- It is forbidden to supply a diesel injector with **12 volts**.

**High pressure fuel pump.**

Do not separate the following components from the high pressure fuel pump **(5)** :

- Sealing ring **(a)** (no replacement parts).
- High pressure outlet connector **(b)** (will cause a malfunction).

**PS : HDi = High pressure Diesel injection**

# **PROHIBITED OPERATIONS: DELPHI HDI DIRECT INJECTION SYSTEM**

**Engines : 8HY - 8HV**

## **Fuel high pressure injection common rail.**

Do not separate the pressure regulator «**c**» from the injection common rail (**2**) (Risk of malfunction).

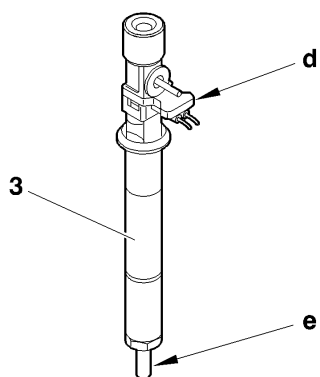
Diesel injectors.

## **WARNING: Diesel and ultrasonic cleaners are prohibited.**

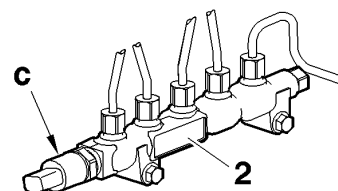
Do not separate the following components from the diesel injector carrier (**3**) :

- Diesel injector (**e**) (no replacement parts).
- Electromagnetic component «**d**». (no replacement parts).

It is forbidden to clean the carbon deposits from the diesel injector nozzle..



B1HP1J8C



B1HP1J7C

## SAFETY REQUIREMENTS : HDi DIRECT INJECTION SYSTEM

Engines : 8HX - 8HW - 8HY - 8HV

### SAFETY REQUIREMENTS

#### Preamble.

All interventions on the injection system must be carried out to conform with the following requirements and regulations :

- Competent health authorities.
- Accident prevention.
- Environmental protection.

**WARNING** : Repairs must be carried out by specialised personnel informed of the safety requirements and of the precautions to be taken.

#### Safety requirements.

**IMPERATIVE** : Take into account the very high pressures in the high pressure fuel circuit (1350 bars), and respect the requirements below :

- No smoking in proximity to the high pressure circuit when work is being carried out.
- Avoid working close to flame or sparks.

#### Engine running :

- Do not work on the high pressure fuel circuit.
- Always stay clear of the trajectory of any possible jet of fuel, which could cause serious injuries.
- Do not place your hand close to any leak in the high pressure fuel circuit.

After the engine has stopped, wait **30 seconds** before any intervention.

**NOTE** : This waiting time is necessary in order to allow the high pressure fuel circuit to return to atmospheric pressure.

## SAFETY REQUIREMENTS : HDi DIRECT INJECTION SYSTEM

Engines : 8HX - 8HW - 8HY - 8HV

### CLEANLINESS REQUIREMENTS.

#### Preliminary operations

**IMPERATIVE : The technician should wear clean overalls.**

Before working on the injection system, it may be necessary to clean the apertures of the following sensitive components :  
(refer to corresponding procedures).

- Fuel filter.
- High pressure fuel pump.
- Third piston deactivator.
- High pressure regulator.
- High pressure sensor.
- High pressure fuel injection common rail.
- High pressure fuel pipes

**IMPERATIVE : After dismantling, immediately block the apertures of the sensitive components with plugs, to avoid the entry of impurities.**

#### Work area.

- The work area must be clean and free of clutter.
- Components being worked on must be protected from dust contamination.

**CHECKS : LOW PRESSURE FUEL SUPPLY CIRCUIT****Engines : 8HX-8HW****TOOLS**

- [1] Ø 10 mm low pressure connector : 4215-T.  
 [2] Pressure gauge for testing boost pressure : 4073-T.A Toolkit 4073-T

**IMPERATIVE : Respect the safety and cleanliness specific to high pressure diesel injection engines.**

Link tools [1] and [2] in series between the fuel high pressure pump and the fuel filter.

**ESSENTIAL : Check that the tool [2] is clean.**

Check the negative pressure according to the table below:

Vacuum	Observations
± cmhg	Engine driven by the starter motor
± cmhg	Engine running under full load
± cmhg	Supply circuit obstructed (full tank strainer, piping, fuel filter).

B1BP2NWC



## CHECKS : LOW PRESSURE FUEL SUPPLY CIRCUIT

Engines : 8HV-8HY

## TOOLS

- [1] Ø 10 mm low pressure connector : 4215-T.  
 [2] Pressure gauge for testing boost pressure : 4073-T.A Toolkit 4073-T

**IMPERATIVE : Respect the safety and cleanliness specific to high pressure diesel injection engines.**

Remove the air filter duct.

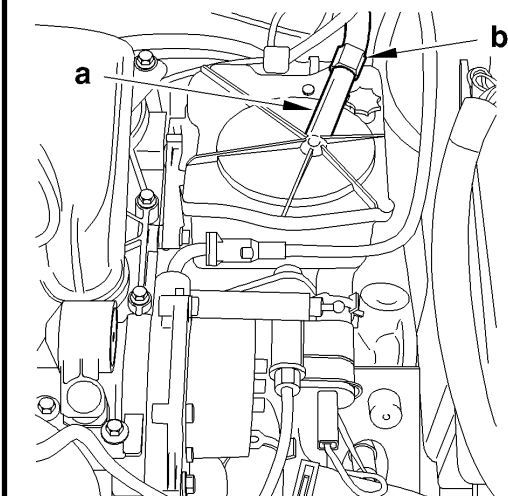
Link tool [1] in series, downstream of the injectors, between the fuel high pressure pump and the fuel filter at «a» and «b».

**WARNING: Any checking of pressure downstream of the fuel filter is prohibited.**  
 Switch on the ignition.

**ESSENTIAL : Check that the tool [2] is clean.**

Check the negative pressure according to the table below:

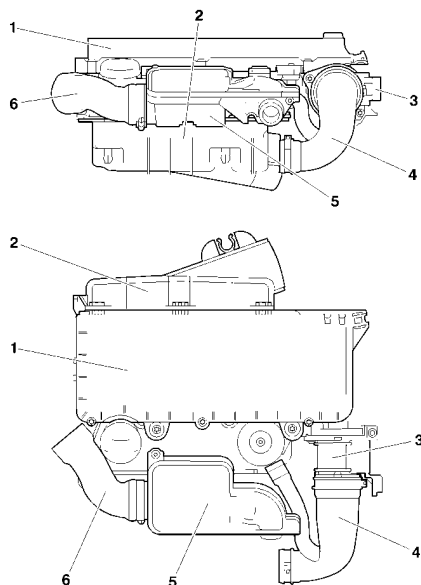
Vacuum	Observations
10 ± 05 cmhg	Engine driven by the starter motor
20 ± 20 cmhg	Engine running under full load
60 ± 05 cmhg	Supply circuit obstructed (full tank strainer, piping, fuel filter).



B1BP2PHC

## AIR SUPPLY CIRCUIT SPECIFICATION

Engines : 8HX - 8HW



B1HP1JMP

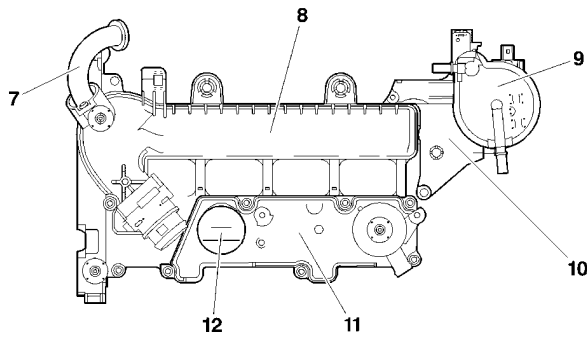
### Upper integrated air inlet distributor.

The upper integrated air inlet system is composed of the following elements:

- (1) Air filter cover.
- (2) Air filter chamber.
- (3) Flowmeter
- (4) Turbocharger inlet.
- (5) Resonator.
- (6) Turbocharger outlet.

## AIR SUPPLY CIRCUIT SPECIFICATION

Engines : 8HX - 8HW



### Lower integrated air inlet distributor.

The lower integrated air inlet system is composed of the following elements:

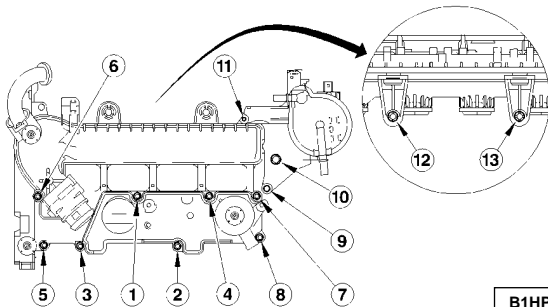
- (7) Top **EGR** pipe.
- (8) Inlet manifold.
- (9) Diesel fuel filter with reheater and water detector (according to country).
- (10) Diesel fuel filter support.
- (11) Oil trap.
- (12) Oil filler cap.

B1HP1JND

# AIR SUPPLY CIRCUIT SPECIFICATION

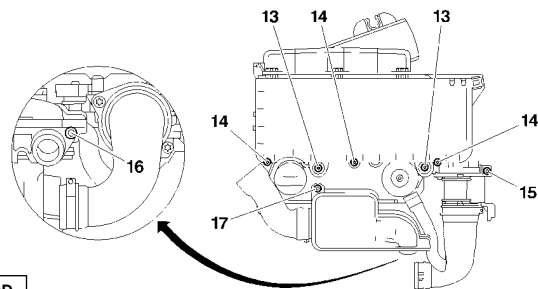
Engines : 8HX - 8HW

## Lower integrated air inlet distributor.



B1HP1JPD

## Upper integrated air inlet distributor.



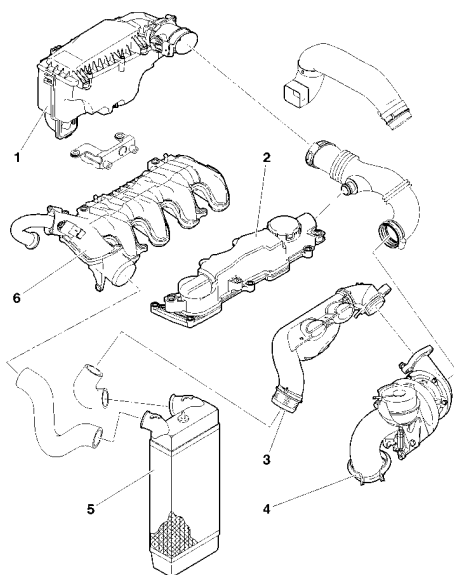
B1HP1JQD

**WARNING:** After each removal, replace the seals of components that have been removed, lubricating the new seals when refitting.

Description	Tighten in sequence	m.daN.	Description	Tighten in sequence	m.daN.
Oil trap fixing screw.	1 à 8	1 ± 0.1	Air filter housing fixing screw.	13	0.5
Diesel fuel filter support fixing screw.	9 à 10	1 ± 0.1	Air filter cover fixing screw.	14	
Diesel fuel filter support fixing screw.	11	0.5	Air inlet duct fixing screw.	15	
Integrated air distributor fixing screw.	12 à 13	1 ± 0.1	Resonator on turbocharger fixing screw.	16	0.75
			Resonator on oil trap fixing screw.	17	

# AIR SUPPLY CIRCUIT SPECIFICATION

Engines : 8HY - 8HV

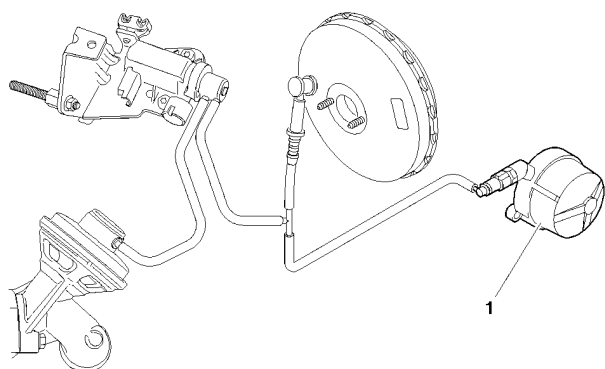


- (1) Air filter assembly.
- (2) Oil trap.
- (3) Turbocharger resonance attenuator.
- (4) Turbocharger.
- (5) Air/air exchanger.
- (6) Air distributor.

Air filter  
Turbocharger  
(Supplier: «IHI»)

Ref : MARK 4.  
Ref : RHF 3V.

B1HP1JGP

**CHECKS : AIR SUPPLY CIRCUIT****Engines : 8HX - 8HW - 8HY - 8HV****Tools.****[1] Manual pressure-vacuum pump    FACOM DA 16.****Vacuum pump :**Connect the tool **[1]** onto the vacuum pump **(1)**.

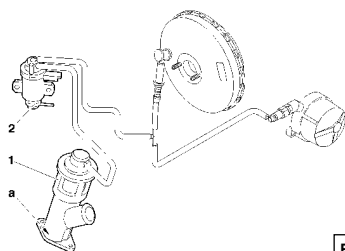
Start the engine.

Wait 30 seconds.

The vacuum value should be **0.9 ± 0.1** bar at idle.**B1HP1K8D**

## CHECKS : EXHAUST GASES RECYCLING CIRCUIT

## Engines : 8HX-8HW



## Tools

[1] Manual pressure-vacuum pump : FACOM DA 16.

**IMPERATIVE** : Respect the safety and cleanliness specific to high pressure diesel injection (HDi) engines.

EGR valve

Connect tool [1] on the capsule take-off (2).

Apply a vacuum of approx. **0,6 bar** several times to activate the rod «a».

In abruptly suppressing the vacuum, the valve should click and lock itself back on its seating.

Regulation electrovalve (EGR). (Engine 8HX-8HW).

Check to be performed between the electrovalve (1) and the EGR valve (2).

Link the tool [1] in series, between the electrovalve (1) and the capsule (2).

Compare the values noted with those in the table below.

Regulation electrovalve (EGR). (Engine 8HV-8HY).

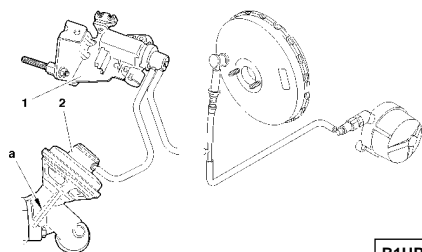
Check to be performed between the electrovalve (2) and the EGR valve (1).

Link the tool [1] in series, between the electrovalve (2) and the capsule (1).

Compare the values noted with those in the table below.

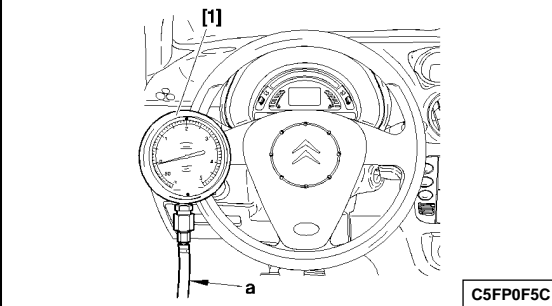
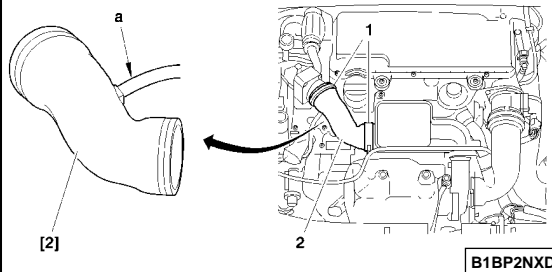
Engine speed (rpm)	Vacuum value
780	0.5
2500	0

## Engines : 8HV-8HY



## CHECKS : TURBO PRESSURE

Engines : 8HX - 8HW

**Tools.**

1] Pressure gauge for checking boost pressure

: 4073-T.A

[2] Sleeve for checking boost pressure

: (-).0171.F

**Checks****IMPERATIVE : Respect the following test conditions:**

- Engine at operating temperature.
- Vehicle in running order.
- Engine under full load.

**Preparation.**

Remove the clips (1).

Fit the tool [2] in the place of the duct (2).

Couple the sleeve [2] on the pressure gauge [1] using the tube «a».

**Mode of operation.**

Position tool [1] in the vehicle.

Start the engine.

Engage first gear, start the vehicle.

Engage the gears up to third gear.

Decelerate to an engine speed of **1000 rpm**.Check the pressure : **0,6 ± 0,05 bar (1500 rpm)**.

Accelerate freely (change from fourth gear to third gear)

Check the pressure: **0,9 ± 0,05 bar** (between 2500 and 3500 rpm).

Remove tools [1], [2] at «a».

Reposition the tube (2) and tighten the clip (1).



## CHECKS : TURBO PRESSURE

Engines : 8HV - 8HY

**Tools.**

**1]** Pressure gauge for checking boost pressure : **4073-T.A**  
**[2]** Sleeve for checking boost pressure :

**Checks**

Respect the following test conditions:

- Engine at operating temperature.
- Vehicle in running order.
- Engine under full load.

**Preparation.**Remove the clips **(1)**.Fit the tool **[2]** in the place of the duct **(2)**.Couple the sleeve **[2]** on the pressure gauge **[1]** using the tube «a».**Mode of operation.**Position tool **[1]** in the vehicle.

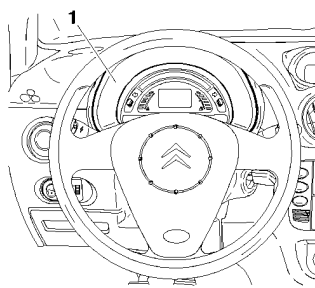
Start the engine.

Engage first gear, start the vehicle.

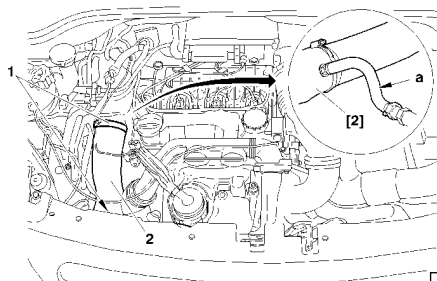
Engage the gears up to third gear.

Decelerate to an engine speed of **1000 rpm**.Check the pressure : **0,6 ± 0,05 bar (1500 rpm)**.

Accelerate freely (change from fourth gear to third gear)

Check the pressure: **0,9 ± 0,05 bar** (between 2500 and 3500 rpm).Remove tools **[1]**, **[2]** at «a».Reposition the tube **(2)** and tighten the clip **(1)**.

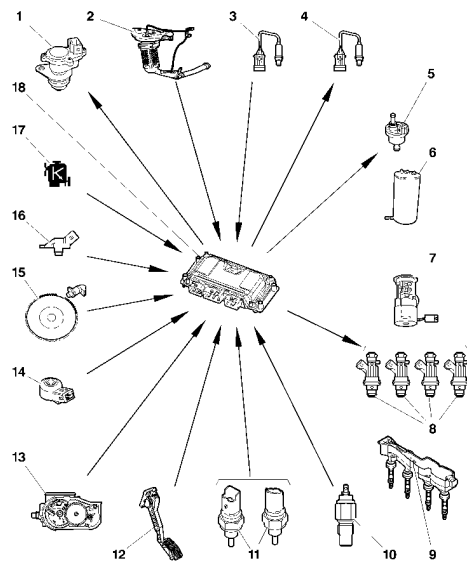
C5FP0EJC



B1BP2NBD

## FEATURES OF MULTIPOINT INJECTION SYSTEM

### Summary



- (1) Vehicle speed sensor.
- (2) Catalytic converter.
- (3) Downstream oxygen sensor.
- (4) Upstream oxygen sensor.
- (5) Canister purge electrovalve.
- (6) Canister reservoir.
- (7) Fuel pump, fuel filter, gauge, pressure regulator.
- (8) Injectors.
- (9) Ignition coil.
- (10) Thermoswitch – engine coolant thermostat.
- (11) Engine coolant temperature sensor.
- (12) Accelerator pedal pressure sensor.
- (13) Butterfly housing.
- (14) Knock sensor.
- (15) Engine speed sensor.
- (16) Inlet air pressure sensor.
- (17) Diagnostic warning lamp, engine ECU.
- (18) Ignition injection ECU.

B1HP1K5P

FEATURES OF MULTIPOINT INJECTION SYSTEM				
Fuel system				
(diagr.)	Component	Supplier	Reference	Observations
	Approved fuel			Unleaded 95 RON or 98 RON.
(7)	Pressure regulator	BOSCH		Pressure: <b>3,5 Bars</b> . Fixing : Integrated in the fuel pump and gauge assembly.
		MAGNETTI MARELLI		
(8)	Petrol injector	SAGEM	KFV (1.4i)	2-way black connector. Resistance : <b>14,5 Ohms</b> .
		MAGNETTI MARELLI	HFX (1.1i)	
		BOSCH	NFU (1.6i 16V)	
(5)	Canister purge electrovalve	EATON		2-way brown connector. Located to the right of the injection rail.
		SAGEM		
	Fuel tank	PLASTIC OMNIUM		Capacity : <b>45 Litres</b> .
(6)	Canister reservoir	COUTIER		Located beside the fuel tank.
(7)	Pump, gauge and petrol filter assembly	BOSCH		Voltage: <b>12V</b> . - Pressure: <b>3,5 Bars</b> . Electric pump submerged in the tank.

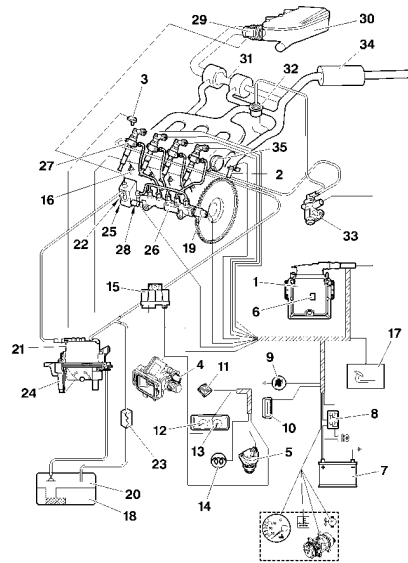
FEATURES OF MULTIPOINT INJECTION SYSTEM				
Air inlet system				
(diagr.)	Component	Supplier	Reference	Observations
(16)	Air inlet pressure sensor	BOSCH	1.1i-1.4i 96.393.814.80	4 way black connector, fixed on the air inlet manifold.
			1.6i 16V 0261 230 043	
(13)	Idle regulation stepper motor	MAGNETTI MARELLI	1.1i	4 way black connector, fixed on the butterfly housing.
	Butterfly housing	SOLEX		The butterfly housing comprises : Butterfly potentiometer. Idle regulation stepper motor.
	Potentiometer			3 way black connector, fixed on the butterfly housing.
	Motorised butterfly housing assembly	SIEMENS VDO EGAST02	1.4i 96 407 962 80	6 way black connector, fixed on the butterfly housing.
	Butterfly housing	BOSCH	1.6i 16V 0 289 000 259	6 way connector, fixed on the inlet manifold.
(12)	Accelerator pedal with integral sensor		96 458 515 80	2 way connector.

FEATURES OF MULTIPOINT INJECTION SYSTEM				
Electrical system				
(diagr.)	Component	Supplier	Reference	Observations
(18)	Ignition injection ECU	MAGNETTI MARELLI	1.1i MM 48.P2	"Flash" type Eprom (reprogrammable Eprom).
		SAGEM	1.4i S2000 PM.1	
		BOSCH	1.6i 16V M7.4.4 261 204 707	
(10)	Engine coolant thermoswitch			On the cylinder head, closing temperature <b>118°C</b>
(14)	Knock sensor	SIEMENS		2 way black connector, fixed on the rear part of the engine block. <b>IMPERATIVE : Tighten to <math>2 \pm 0,5</math> m.daN</b>
		BOSCH		
(11)	Engine coolant temperature sensor	DAV	96 368 027	3 way blue connector, fixed on the coolant outlet housing, tighten to <b><math>1,7 \pm 0,1</math> m.daN.</b>
(15)	Engine speed sensor	ELECTRIFIL	96 399 998	2 way black connector, fixed on the clutch casing. <b>IMPERATIVE : Tighten to <math>0,8 \pm 0,25</math> m.daN.</b>
(1)	Vehicle speed sensor	EATON	PA66-GF 30	3 way white connector, fixed on the gearbox differential housing.

FEATURES OF MULTIPOINT INJECTION SYSTEM				
Ignition system				
(diagr.)	Component	Supplier	Reference	Observations
	Sparkign plugs	SAGEM	RFN 58 LZ	Electrode gap : 0.9 mm. Tighten to 3 m.daN
		BOSCH	FR 7 DE	
		CHAMPION	RC 8 YCL	
(9)	Ignition coil	SAGEM	BBC 2.2 NDT 2 526 208	4 way grey connector.
		ELECTRIFIL	BBC 2.2 NDT C15 43 02	
(4)	Upstream oxygen sensor	BOSCH		4 way green connector, on the exhaust manifold. Tighten to 4,7 ± 0,7 m.daN
(3)	Downstream oxygen sensor			4 way blue connector, on the exhaust pipe. Tighten to 4,7 ± 0,7 m.daN

## FEATURES OF SIEMENS HDI DIRECT INJECTION SYSTEM

### Summary



B1HP1JFP

FEATURES OF SIEMENS HDI DIRECT INJECTION SYSTEM				
Electrical system				
(diagr.)	Component	Supplier	Reference	Observations
1	Diesel injection ECU	SIEMENS	F217718001	
2	Engine speed sensor	ELECTRIFIL		Tightening torque between 5 min. and 10 max. m.daN – 3 way black
3	Camshaft position sensor			Airgap adjustment 1.2 mm – 3 way grey.
4	Engine coolant temperature sensor	ELTH		On coolant outlet housing.
5	Vehicle speed sensor			
6	Atmospheric pressure sensor	SIEMENS		Incorporated in the engine ECU.
7	Battery			12 volts.
8	Injection double relay	SIEMENS		Incorporated in the BSM.
9	Diagnostic warning lamp			Incorporated in the instrument panel.
10	Central diagnostic socket			In the passenger compartment.
11	Electronic immobiliser			Incorporated in the BSI transponder, and engine ECU.
12	Consumption information			Incorporated in the instrument panel.
13	Rev counter			
14	Preheating warning lamp			
15	Pre-postheating unit	NAGARES CARTIER		
16	Preheater plugs	NGK		
17	Accelerator pedal sensor			

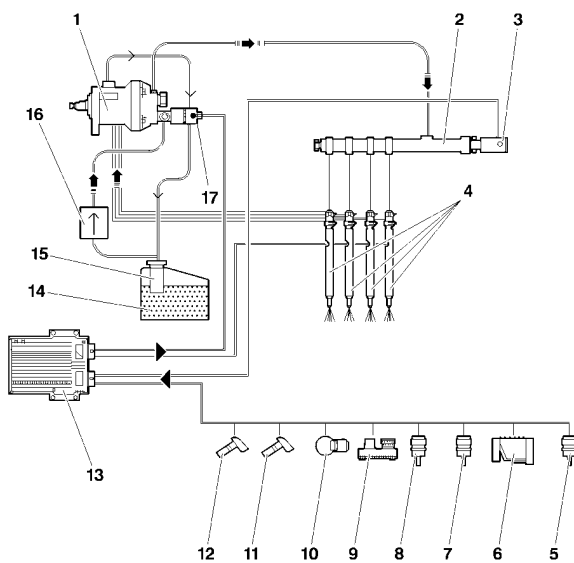


FEATURES OF SIEMENS HDI DIRECT INJECTION SYSTEM				
Fuel system				
(diagr.)	Component	Supplier	Reference	Observations
18	Fuel			Diesel fuel
19	Fuel high pressure sensor			On fuel filter
20	Fuel tank			Capacity 45 Litres - Composition = polyethylene
21	Fuel filter			
22	Low pressure regulator			
23	Fuel cooler			
24	Fuel heater			Incorporated in the diesel fuel filter
25	Fuel high pressure pump	SIEMENS		The fuel high pressure pump is driven by the timing belt
26	Fuel high pressure common injection rail			
27	Diesel injector			Diesel injectors with Piezo-electric control
28	Fuel high pressure regulator			Fixed on the fuel high pressure pump

FEATURES OF SIEMENS HDI DIRECT INJECTION SYSTEM				
Air inlet system				
(diagr.)	Component	Supplier	Reference	Observations
29	Air flowmeter	MECAPLAST	3907 LS.F	In the Integrated Exhaust System
30	Air filter		50557 LP.A	In the Integrated Inlet System
31	Turbocharger	KKK	TYPE KP35	
32	Exhaust gas recycling (EGR) valve	SAGEM	25801 32-A	
33	EGR recycling regulation electrovalve			
34	Exhaust line			
35	Vacuum pump			

## FEATURES OF DELPHI C6 HDI DIRECT INJECTION SYSTEM

### Summary



FEATURES OF DELPHI C6 HDI DIRECT INJECTION SYSTEM				
(diagr.)	Component	Supplier	Reference	Observations
1	Fuel high pressure pump.			
2	Fuel pressure sensor.			
3	Fuel high pressure supply common rail.			
4	Diesel injectors.			
5	Vehicle speed sensor.			
6	Air flowmeter.	PIERBURG	238 342	
7	Engine coolant temperature sensor.			
8	Air temperature sensor.			
9	Inlet air pressure sensor.	DENSO		
10	Accelerator pedal potentiometer.			
11	Camshaft phase sensor.			
12	Engine speed sensor.			
13	Engine injection ECU.			
14	Tank.			
15	Fuel filter.			
16	Fuel pump assembly.			
17	Fuel pressure regulator			

### FEATURES OF DELPHI C6 HDI DIRECT INJECTION SYSTEM

#### Electrical system

(diagr.)	Component	Supplier	Reference	Observations
13	Engine injection ECU	DELPHI	C6	112 way connector. Sequential injection.
11	Camshaft phase sensor	ELECTRICFIL	14.43.22	3 way white connector, on the valve cover.
12	Engine speed sensor		14.43.34	3 way black connector.
5	Vehicle speed sensor	BITRON		2 way grey connector, on the gearbox
	Engine coolant temperature sensor	ELTH	269.414	2 way green connector, on the coolant inlet housing.
	Knock sensor	SIEMENS	219.237	2 way grey connector, on the cylinder block.
	Diagnostic socket			
	Preheater indicator			
	Diagnostic warning lamp			
11	Accelerator pedal potentiometer	BOSCH		
	Aircon compressor			
	Rev counter			
	Cooling fan unit			
	Battery			

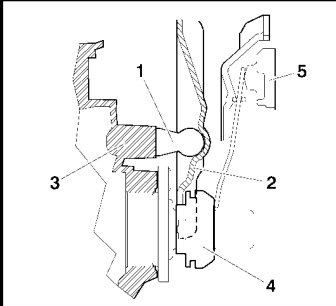
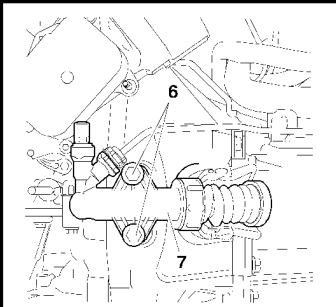
FEATURES OF DELPHI C6 HDI DIRECT INJECTION SYSTEM				
Air system				
(diagr.)	Component	Supplier	Reference	Observations
6	Air flowmeter	PIERBURG	238 342	5 way black connector. On the air filter inlet duct.
9	Inlet air pressure sensor	DENSO		3 way grey connector. On the inlet manifold.
Fuel system				
2	Fuel high pressure supply common rail	LAJOUS	RRT 2051	Volume : 14 cc.                      Pressure : 1350 bars
3	Fuel pressure sensor	LUCAS	9307Z502A	3 way black connector, on the fuel high pressure rail.
15	Fuel filter	DELPHI	R6356010	
	Fuel heater	ELTH	2690362	2 way black connector, on the fuel filter.
4	Diesel injectors	DELPHI	783DCC20	2 way grey connector
1	High pressure pump	DELPHI		2 way brown connector
16	Fuel pump assembly	BOSCH		6 way orange connector, located under the floor. Pressure : 3,5 bars.
	Fuel pressure regulator			
Ignition system				
	Electronic control unit Pre-postheating	CARTIER		5 way connector
		NAGARES		
	Sparkign plugs	NGK	YE04	Electrode gap : 1 mm. Tighten to : 1 ± 0,1 m.daN.

## SPARKING PLUGS

Vehicles – Models		Engine type	BOSCH	CHAMPION	SAGEM	Electrode gap	Tightening torque
C3	1.1i	HFX	FR7DE	RC8YCL	RFN58LZ	0.9 mm	2.5 mda.N
	1.4i	KFV					
	1.6i 16v	NFU	FR7ME				

CLUTCH SPECIFICATION					
	Petrol			Diesel	
	1.1i	1.4i	1.6i 16V	1.4 HDi	1.4 HDi 16V
Engine type	HFX	KFV	NFU	8HX - 8HW	8HV - 8HY
Gearbox type	MA/5N		MA/5S	MA/50	BE4/5
Supplier	VALEO		LUK		
Mechanism / type	180 CP0 3400		200 P 3900		230 P 4700
Clutch disc	11 R 10X				
Identification of springs	4		4		4 outer 4 inner
No. of splines					
Ø of lining. Ext/Int	180/127		200/134		228/155
Quality of lining	408				

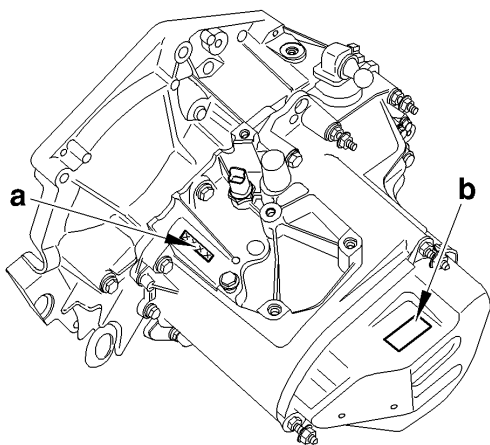


CLUTCH SPECIFICATION								
Engines : HFX – KfV – NFU - 8HX – 8HW – 8HV – 8HY								
	<p><b>NOTE :</b> All the clutches are «push» type with hydraulic control.</p> <p><b>Description.</b>  The declutch control has a declutch fork mounted on a ball-joint.  <b>(1)</b> The ball-joint is screwed into the clutch casing  <b>(2)</b> Declutch fork.  <b>(3)</b> Clutch casing.  <b>(4)</b> Bearing.  <b>(5)</b> Clutch plate.</p>							
	<p>The clutch control slave cylinder <b>(7)</b> is fixed by two screws <b>(6)</b> onto the exterior of the clutch casing.</p> <p><b><u>Tightening torques (m.daN).</u></b></p> <table> <tr> <td>- Fixing of clutch plate/engine flywheel</td><td>: <b>2 ± 0.2</b></td></tr> <tr> <td>- Fixing of engine flywheel/crankshaft</td><td></td></tr> <tr> <td>    Pre-tightening</td><td>: <b>1.7 ± 0.1</b></td></tr> <tr> <td>    Angular tightening</td><td>: <b>70° ± 5°</b></td></tr> </table>	- Fixing of clutch plate/engine flywheel	: <b>2 ± 0.2</b>	- Fixing of engine flywheel/crankshaft		Pre-tightening	: <b>1.7 ± 0.1</b>	Angular tightening
- Fixing of clutch plate/engine flywheel	: <b>2 ± 0.2</b>							
- Fixing of engine flywheel/crankshaft								
Pre-tightening	: <b>1.7 ± 0.1</b>							
Angular tightening	: <b>70° ± 5°</b>							
								
<div>B2BP047C</div> <div>B2BP04QC</div>								

GEARBOX AND TYRE SPECIFICATIONS						
		Petrol				
		1.1i	1.4i			1.6i 16V
			Auto.			
Trim level	X - SX Exclusive	X - SX	Exclusive	X - SX	Exclusive	X - SX Exclusive
Engine type	HFX	KFV				NFU
Tyres-Rolling circumference	165/70 R14 1.804 m		185/60 R15 1.828 m	165/70 R14 1.804 m	185/60 R15 1.828 m	
Gearbox type	MA/5N			AL4		MA/5S
Gearbox ident. plate	20 CN 14	20 CF 15 ou 20 CF 16 (*)		20 TP 75		20 CN 40
Differential ratio	14x60	16x63 ou 14x60 (*)		21x73		17x64
Speedo drive ratio	21x18					
Kick-down ratio	Auto.				52/67	
(*) = Export						

GEARBOX AND TYRE SPECIFICATIONS				
	Diesel			
	1.4 HDi		1.4 HDi 16V	
Trim level	X – SX - Exclusive			
Engine type	8HX	8HW	8HV	8HY
Tyres-Rolling circumference	165/70 R14    1.804 m		185/60 R15    1.828 m	
Gearbox type	MA/50		BE4/5	
Gearbox ident. plate	20 CN 33	20 CN 36 (*)	20 DM 25	20 DM 26
Differential ratio	17x61	16x65 (*)	19x72	19x77
Speedo drive ratio	21x18		22x19	
(*) = Export				

CLUTCH  
GEARBOX  
DRIVESHAFTS

**MA/5 GEARBOX****Engines : HFX - KFV - NFU - 8HX - 8HW**

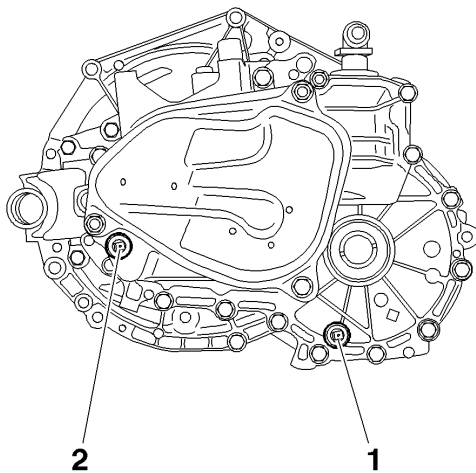
B2CP3HTC

"a" Identification label.

"b" Location of engraving of serial and gearbox nos.

## MA/5 GEARBOX

Engines : HFX - KVV - NFU - 8HX - 8HW



### Draining – filling – level

(1) Gearbox drain plug.

(2) Filling and level cap.

#### **Oil quality.**

Refer to the manufacturer's instructions.

#### **Oil quantity.**

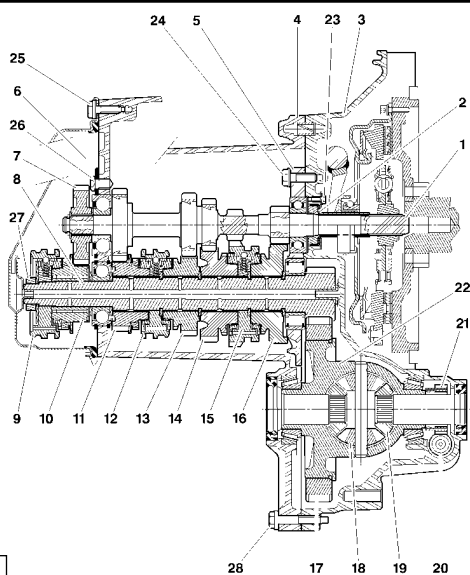
After draining : **2 Litres.**

#### **Draining intervals.**

«Lubricated for life »

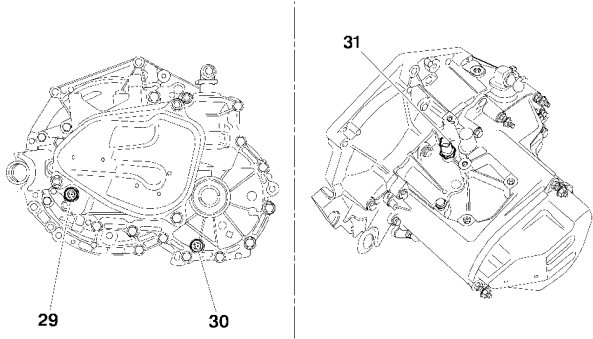
Check the oil level: Every **37 500/40 000 miles.**

B2CP3HWC

**MA/5 GEARBOX****Engines : HFX - KFV - NFU - 8HX - 8HW**

B2CP167P

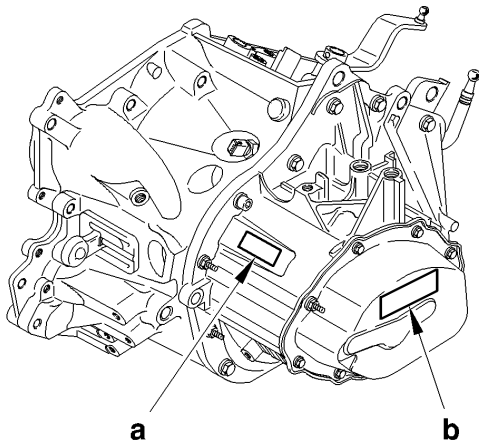
- (1) Primary shaft.
- (2) Clutch bearing guide.
- (3) Clutch housing.
- (4) Gearbox casing.
- (5) Intermediate plate.
- (6) Bearing retaining clip.
- (7) Drive pinion (5th gear).
- (8) Secondary shaft.
- (9) 5th gear synchroniser.
- (10) Driven pinion (5th gear).
- (11) Driven pinion (4th gear).
- (12) 3rd / 4th gear synchroniser.
- (13) Driven pinion (3rd gear).
- (14) Driven pinion (2nd gear).
- (15) 1st / 2nd gear synchroniser and reverse gear driven pinion.
- (16) Driven pinions (1st gear).
- (17) Differential gearwheel.
- (18) Satellite pinions.
- (19) Planet pinions.
- (20) Counter drive.
- (21) Speedometer screw.
- (22) Differential housing.

MA/5 GEARBOX																		
Engines : HFX - KFV - NFU - 8HX - 8HW																		
	<p><b><u>Tightening torques: m.daN.</u></b></p>																	
	<table> <tr> <td>(23) Clutch bearing guide (3 fixing screws)</td><td>: 0.6 ± 0.15.</td></tr> <tr> <td>(24) Intermediate plate (11 fixing screws)</td><td>: 5 ± 0.5.</td></tr> <tr> <td>(25) Rear cover (3 fixing screws)</td><td>: 2.2 ± 0.2.</td></tr> <tr> <td>(26) Bearing retaining clip (4 fixing screws)</td><td>: 1.8 ± 0.2.</td></tr> <tr> <td>(27) Secondary shaft nut (1 nut)</td><td>: 14 ± 1.</td></tr> <tr> <td>(28) Gearbox casing (15 fixing screws)</td><td>: 1.8 ± 0.2.</td></tr> <tr> <td>(29) Top-up plug (1)</td><td>: 2.5 ± 0.5.</td></tr> <tr> <td>(30) Drain plug (1)</td><td>: 2.5 ± 0.5.</td></tr> <tr> <td>(31) Reverse gear switch (1)</td><td>: 2.5 ± 0.5.</td></tr> </table>	(23) Clutch bearing guide (3 fixing screws)	: 0.6 ± 0.15.	(24) Intermediate plate (11 fixing screws)	: 5 ± 0.5.	(25) Rear cover (3 fixing screws)	: 2.2 ± 0.2.	(26) Bearing retaining clip (4 fixing screws)	: 1.8 ± 0.2.	(27) Secondary shaft nut (1 nut)	: 14 ± 1.	(28) Gearbox casing (15 fixing screws)	: 1.8 ± 0.2.	(29) Top-up plug (1)	: 2.5 ± 0.5.	(30) Drain plug (1)	: 2.5 ± 0.5.	(31) Reverse gear switch (1)
(23) Clutch bearing guide (3 fixing screws)	: 0.6 ± 0.15.																	
(24) Intermediate plate (11 fixing screws)	: 5 ± 0.5.																	
(25) Rear cover (3 fixing screws)	: 2.2 ± 0.2.																	
(26) Bearing retaining clip (4 fixing screws)	: 1.8 ± 0.2.																	
(27) Secondary shaft nut (1 nut)	: 14 ± 1.																	
(28) Gearbox casing (15 fixing screws)	: 1.8 ± 0.2.																	
(29) Top-up plug (1)	: 2.5 ± 0.5.																	
(30) Drain plug (1)	: 2.5 ± 0.5.																	
(31) Reverse gear switch (1)	: 2.5 ± 0.5.																	

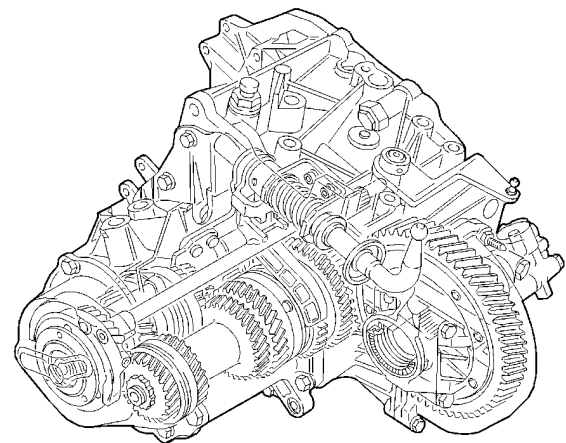
B2CP3HUD

**BE4/5 GEARBOX**

Engines : 8HV - 8HY



B2CP3BNC



B2CP3BPD

- (a) Engraving zone (sequence and serial no.)  
(b) Location of identification label.



## BE4/5 GEARBOX

Engines : 8HV - 8HY

### Draining – filling – levelu

- (1) Drain plug.
- (2) Filling and top-up plug.
- (3) Air vent.

**NOTE :** The air vent aperture can be used for filling.

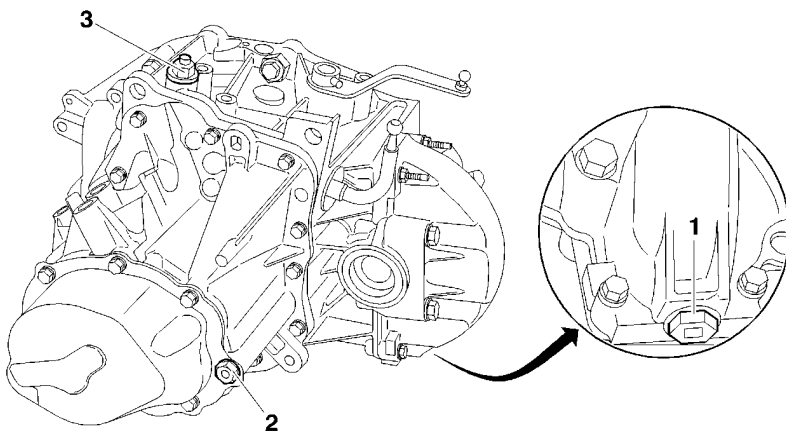
#### **Quality of oil**

Refer to the manufacturer's instructions.

#### **Quantity of oil**

Gearbox empty : **1,9 Litres.**

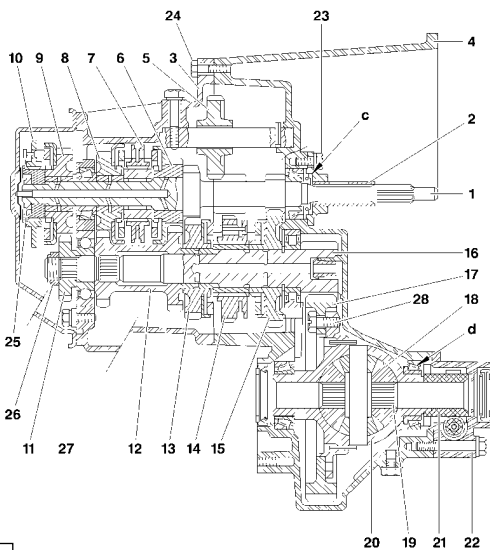
After draining : **2 Litres.**



B2CP3BLD

**BE4/5 GEARBOX**

Engines : 8HV - 8HY



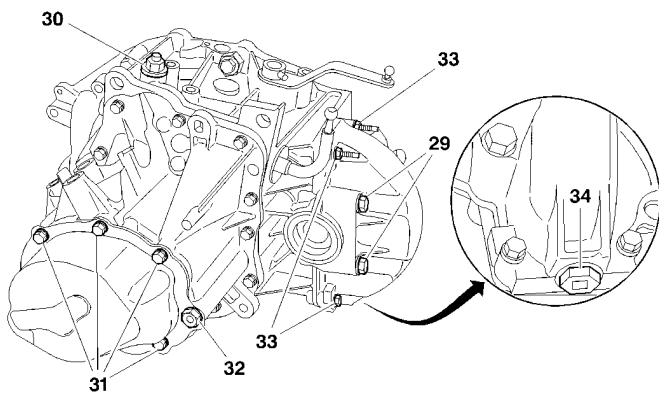
B2CP3BQP

**Description.**

- (1) Primary shaft.
- (2) Clutch bearing guide.
- (3) Gearbox casing.
- (4) Clutch housing.
- (5) Reverse idle.
- (6) Drive gear (3rd gear).
- (7) 3rd /4th gear synchroniser
- (8) Drive gear (4th gear).
- (9) Drive gear (5th gear).
- (10) 5th gear synchroniser.
- (11) Driven gear (5th gear).
- (12) Driven gear (3rd / 4th gear )
- (13) Driven gear (2nd gear).
- (14) 1st / 2nd gear synchroniser.
- (15) Driven gear (1st gear).
- (16) Secondary shaft.
- (17) Differential gear.
- (18) Satellite gears.
- (19) Planet gears.
- (20) Differential housing.
- (21) Speedometer drive.
- (22) Extension.
- «c» Adjusting shims : **0,7 to 2,4 mm** (From 0,10 to 0,10 mm)
- «d» Adjusting shims:**1,4 to 1,6 mm** (From 0,10 to 0,10 mm)

## BE4/5 GEARBOX

Engines : 8HV - 8HY



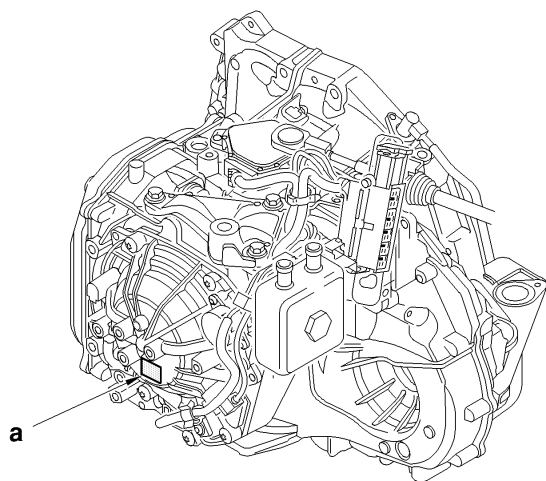
### Tightening torques (m.daN).

(23) Clutch bearing guide (3 screws)	: 1.25 ± 0.2
(24) Clutch housing (13 screws)	: 1.3 ± 0.2
(25) Primary shaft nut (1 screw)	: 7.25 ± 0.5
(26) Secondary shaft nut (1 screw)	: 6.5 ± 0.5
(27) Yoke retaining screw (2 screws)	: 1.5 ± 0.2
(28) Differential gearwheel screw (2 screws)	: 6.5 ± 0.5
Reverse gear switch (1 screw)	: 2.5 ± 0.3
(29) Differential housing (4 screws)	: 5 ± 0.5
(30) Breather pipe	: 1.7 ± 0.2
(31) Rear housing cover screws (7 screws)	: 1.25 ± 0.2
(32) Top-up plug (1 screw)	: 2.2 ± 0.2
(33) Differential housing screws (4 screws)	: 1.25 ± 0.2
(34) Drain plug (1 screw)	: 3.5 ± 0.3

B2CP3BRD

## AL 4 AUTOMATIC GEARBOX

Engine : KfV

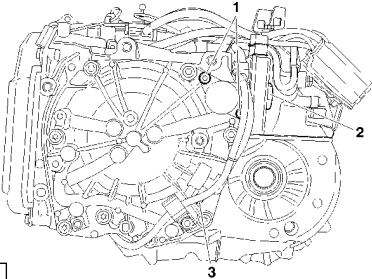
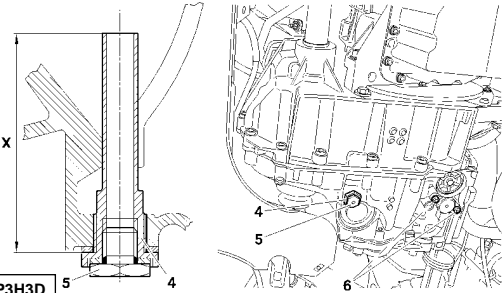


B2CP3H1D

**WARNING** : This gearbox benefits from a special **CITROEN** semi-synthetic oil which cannot be mixed with any other oil.

The gearbox is lubricated for life.

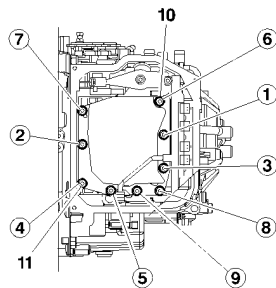
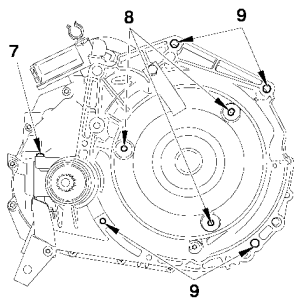
**(a)** Part reference.

AL 4 AUTOMATIC GEARBOX	
Engine : KFV	
 B2CP3H2D	<p><b><u>Tightening torques: (m.daN).</u></b></p> <p>(1) Fixing of electrovalve for modulation of flow of oil into the exchange (EPDE) : <math>1 \pm 0.2</math></p> <p>(2) Fixing of oil heat exchanger : <math>5 \pm 1</math></p> <p>(3) Fixing of gearbox input speed sensor : <math>1 \pm 0.2</math></p> <p>(4) Fixing of oil overflow and drainage (<math>X = 81</math> mm). : <math>4 \pm 0.2</math></p> <p>(5) Oil top-up plug : <math>2.4 \pm 0.4</math></p> <p>(6) Fixing of oil pressure sensor : <math>0.8 \pm 0.1</math></p>
	 B2CP3H3D

CLUTCH  
GEARBOX  
DRIVESHAFTS

## AL 4 AUTOMATIC GEARBOX

Engine : KFV

Tightening torques: (m.daN).

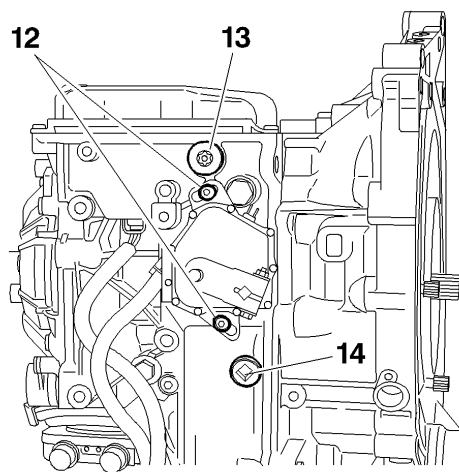
- |  |                 |
|--|-----------------|
| (7) Fixing of plug                                 | : $0.8 \pm 0.2$ |
| (8) Fixing of converter on the engine diaphragm :  |                 |
| Pre-tightening                                     | : $1 \pm 0.1$   |
| Tightening   | : $3 \pm 0.3$   |
| (9) Fixing of gearbox on the engine                | : $5.2 \pm 1$   |
| (12) Fixing of the selection lever position switch | : $1.5 \pm 0.2$ |
| (13) Oil filler cap                                | : $2.4 \pm 0.4$ |

B2CP3H4C

B2CP3H5C

## AL 4 AUTOMATIC GEARBOX

Engine : KfV



B2CP3H6C

### Hydraulic valve block fixing.

Centre the hydraulic valve block by means of screws (10) and (11).

Pre-tightening : 0.9

Slacken : the screws (9).

Tightening : 0,75 (respect the order indicated)

**NOTE :** The screw (11) est collared.

**WARNING:** Do not slacken the TORX screw (14), risk of dropping the selection control inside the gearbox.

**RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)**

Engine : KfV

**PRECAUTIONS TO BE TAKEN****Towing**

The front of the vehicle must be raised in order to be towed.  
If the front of the vehicle cannot be raised

**IMPERATIVE : - Put gear lever in position «N»..**

**- Do not add any oil.**

**- Do not exceed 50 kph over a distance of 50 km.**

**Driving.**

Never drive with the ignition switched off.  
Never push the vehicle to try to start it;  
(impossible with an automatic gearbox).

**Lubrication**

The automatic gearbox is only lubricated when the engine is running.

**REMOVING - REFITTING (Automatic gearbox).**

**WARNING :** Never place the gearbox on its lower casing  
(risk of deforming the tray and damaging the hydraulic valve block).  
Never use the connections as handles for raising, turning, holding or  
pushing the gearbox.

**ESSENTIAL :**

**- Fit the converter retaining peg while the gearbox is removed.**

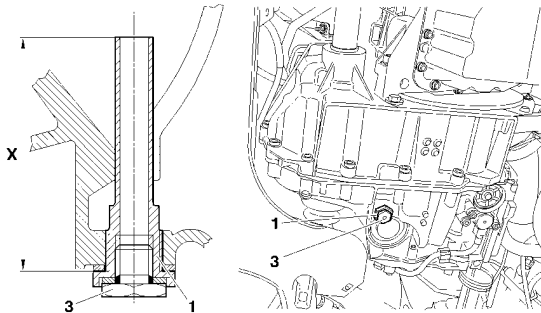
**- Fit the centring peg to locate the gearbox on the engine:  
(remove the converter retaining peg just before locating)**

**WARNING :** With the safety programme selected, a snatching can be  
felt when changing from "P" → "R" or "N" → "R".



## RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)

### Gearbox only



B2CP31FD

### Engine : KFV

#### PROCEDURE BEFORE REPAIRS

##### Oil level **AL 4** (prior conditions).

- Vehicle in horizontal position.
- Check gearbox is not in back-up mode.
- Remove the oil filler plug **(3)**.
- Add **0.5 litres** extra oil into the gearbox.
- Foot on the brake, change through all the gears.
- Selection lever in position "**P**".
- Engine running, at idle.
- Oil temperature : **60°C** (+8°C; -2°C), measured with the aid of a diagnostic tool.
- Remove the oil level plug **(3)**.
- Thread of oil then "drip-drip": refit plug **(3)**. Tighten **2.4 m.daN**.
- "Drip-drip" or nothing : refit the plug **(3)**.
- Stop the engine.
- Add **0.5 litres** extra oil into the gearbox.
- Repeat the oil level procedure.

**NOTE** : The level is correct at the moment the thread of oil becomes drip-drip.

- Refit the oil filler plug **(3)**. Tighten to **2.4 m.daN**.

Initialise the oil usage counter (open the diagnostic tool procedure).

**NOTE** : The dimension **X** : **TU engines = 81 mm**

**RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)**

Engine : KfV

**PROCEDURE BEFORE REPAIRS (continued)****When the ECU detects an erroneous or absent value on input or output :**

- It writes the fault in memory.
- For each associated context, it writes the context of the oldest fault in memory.
- It initiates a back-up mode strategy

**There are two types of back-up modes :**

- The ECU makes replacement values available (relating to comfort, gear selection quality, loss of functions).
- Access to emergency programme (only 3rd gear and reverse are available)

**Reading the fault codes.**

Read the fault codes.

**Absence of fault codes:**

Carry out a measure of parameters.

**Presence of anomalies:**

- **YES** : Carry out the necessary repairs.
- **NO** : Read the fault codes – engine ECU

- Carry out a road test.

Following an initialisation of the ECU, for a certain period of time there may be an inconsistent gear selection quality (while ECU parameters are adapting to the gearbox).

To achieve a consistent standard, it will be necessary to carry out a road test taking in frequent gear changes (auto-adaptive laws)

## RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)

Engine : KfV

ECU : Downloading

### Updating the gearbox ECU by downloading :

- Follow the procedure using the diagnostic tool.

The downloading operation enables the automatic gearbox to be updated, or adapted to an evolution of the engine ECU.

Before commencing the downloading, take the value of the oil usage counter present in the automatic gearbox ECU.

### After the downloading operation, carry out the following:

A clearing of faults.

A pedal initialisation.

An initialisation of the auto-adaptives.

A recording of the value of the oil usage counter previously read.

A road test.

**ESSENTIAL :** Every update of the automatic gearbox ECU should be accompanied by an update of the engine ECU.

Updating the value of the oil usage counter.

### Using PROXIA

Access to reading and recording of the oil counter is via the menu :

«**Configuration (integrated circuit button) / Oil counter** ».

Adjustment of the oil counter value is done in incremental steps of  
**2750 units.**

### Using LEXIA or ELIT.

Access to reading and recording of the oil counter is via the menu :

«**Oil counter** ».

Adjustment of the oil counter value is done by entering directly the  
**5 figures** of the oil counter.

**RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)**

Engine : KfV

**ECU : Downloading, Configuration, Initialisation (pedal) (continued)****Downloading.**

ECU downloading procedure :

- Follow the diagnostic tooling procedure.

A new ECU or downloaded update is always configured with the following options :

- SHIFT LOCK gear selection lever position.
- OBD outlet (emission standard L4).

If the ECU is to be fitted to a vehicle without one or both of these options:

- Carry out a configuration which inhibits the diagnosis of the option(s) concerned.

**Pedal initialisation.**

A pedal initialisation must be carried out in the following cases :

- Replacement of the automatic gearbox ECU.
- Replacement of the automatic gearbox.
- Downloading of the ECU configuration.
- Adjustment or replacement of the accelerator cable.
- Replacement of the throttle potentiometer.

**IMPERATIVE :** For a certain period of time, while the ECU parameters are adapted to the gearbox, there may be an inconsistent gear selection quality. To achieve a consistent standard, it will be necessary to carry out a road test taking in frequent gear changes (auto-adaptive laws).

## RECOMMENDATIONS - PRECAUTIONS (AL 4 AUTOMATIC GEARBOX)

Engine : KfV

### SHIFT LOCK

The **shift lock** is a system which locks the gear selection lever in the park position «P».

#### Unlocking the «shift lock» (normal operation).

Switch on the ignition.

Apply the brake pedal and keep it pressed.

Using the selection lever, disengage from position «P».

#### Unlocking the «shift lock» (with a fault).

**NOTE** : It is impossible to unlock the «shift lock» with the « normal operation » method.

The causes of the fault may arise from the following components :

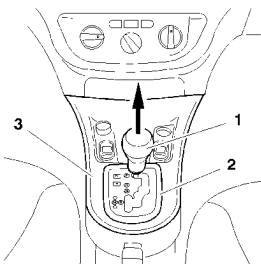
- «Shift lock».
- Gear lever position switch.
- Automatic gearbox ECU.
- Electrical harnesses.
- Battery voltage.

Remove :

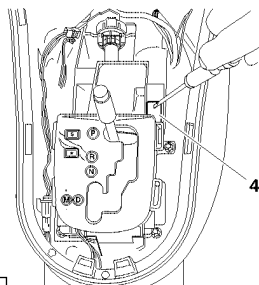
- The gear lever knob (1) by pulling upwards.
- The cover (2) (unclip).
- The top of the central console (3).

Unlock the «shift lock» (4) with aid of a screwdriver.

Using the selection lever, disengage from position «P».

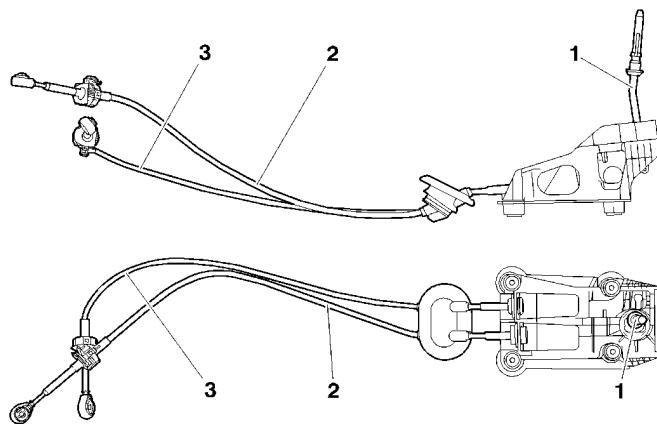


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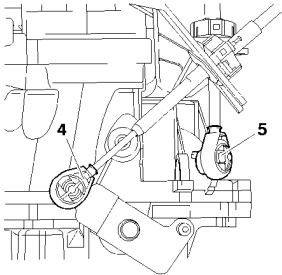
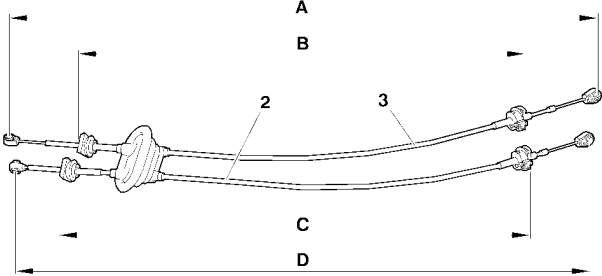


B2CP3GZC

CLUTCH  
GEARBOX  
DRIVESHAFTS

**MA/5 GEARBOX CONTROLS****Engines : HFX - KFV - NFU - 8HX - 8HW****(1)** Gear control lever.**(2)** Gear engagement control cable (\*)**(3)** Gear selection control cable (\*)**(\*)** The two cables cannot be separated.

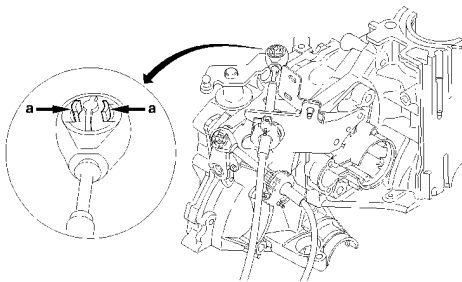
B2CP3HxD

MA/5 GEARBOX CONTROLS			
Engines : HFX - KFV - NFU - 8HX - 8HW			
	<p>(4) Gear engagement ball-joint Ø 10 mm.</p> <p>(5) Gear selection ball-joint Ø 10 mm.</p>		
		Length D	Length C
	Gear engagement control cable (2)	1015 mm	790 mm
		Length A	Length B
	Gear selection control cable (3)	1093 mm	775 mm

CLUTCH  
GEARBOX  
DRIVESHAFTS

## MA/5 GEARBOX CONTROLS

Engines : HFX - KFV - NFU - 8HX - 8HW



B2CP3J0D

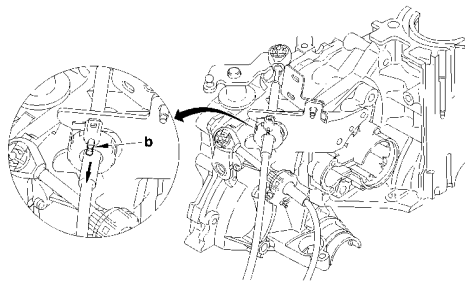
### Adjustment.

**WARNING: Do not use any tool to detach the ball-joints.**

The gear selection control and gear engagement control cables cannot be adjusted.

To unlock the ball-joint, press at «a» then pull the ball-joint upwards.

To release the sleeve stops, pull the needles «b», in the direction of the arrow, then disengage the sleeve stops from their supports.

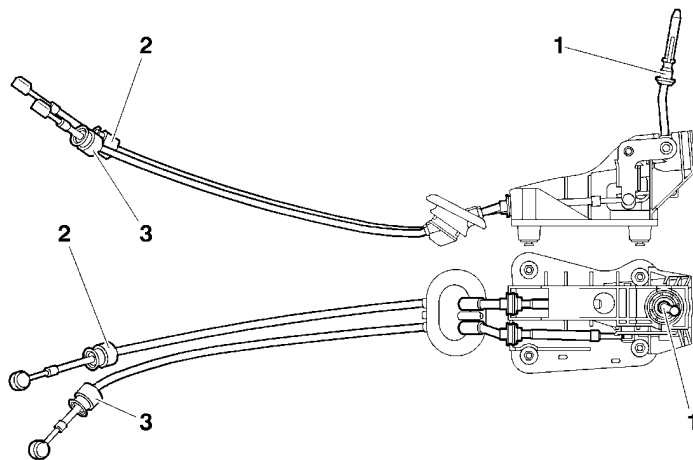


B2CP3J1D



## BE4/5 GEARBOX CONTROLS

Engines : 8HV - 8HY



(1) Gear control lever

(2) Gear engagement control cable (\*).

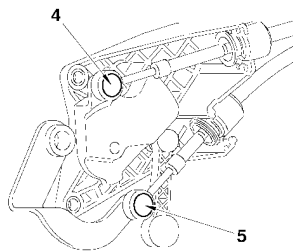
(3) Gear selection control cable (\*).

(\*) These two cables cannot be separated.

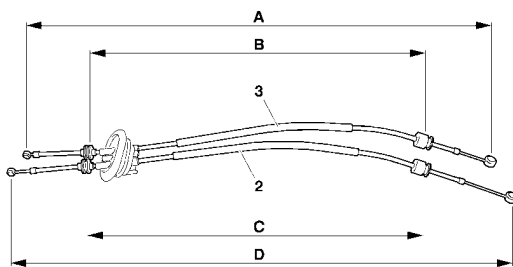
B2CP3J3D

**BE4/5 GEARBOX CONTROLS**

Engines : 8HV - 8HY



B2CP3J4C

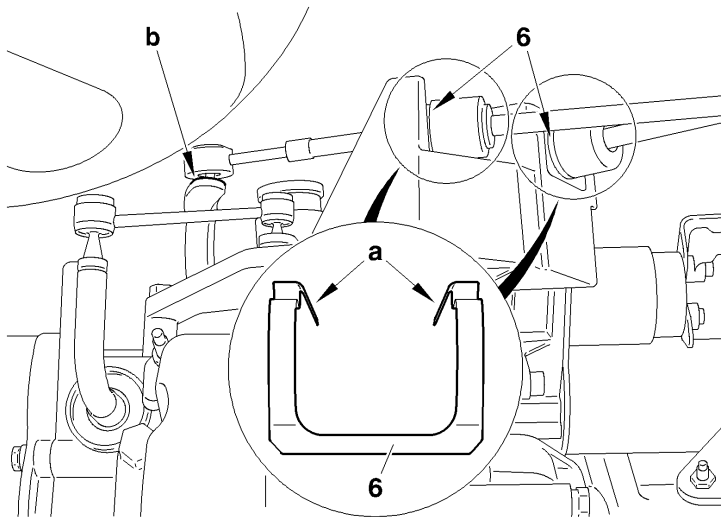
**(4)** Gear engagement ball-joint Ø 10 mm.**(5)** Gear selection ball-joint Ø 10 mm.

B2CP3J5D

	Length A	Length B
Gear selection cable <b>(5)</b>	907 mm	645 mm
	Length D	Length C
Gear selection cable <b>(4)</b>	965 mm	610 mm

## BE4/5 GEARBOX CONTROLS

Engines : 8HV - 8HY



B2CP3J6D

### Adjustment.

**The gear selection control and gear engagement control cables cannot be adjusted.**

To release the ball-joint, press at «d» then pull the ball-joint upwards.

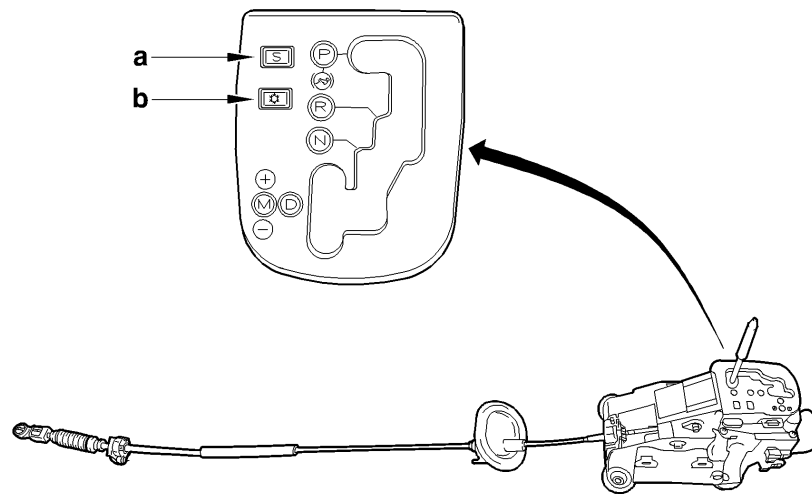
To release sleeve stops:

- Press on the tabs of the clip (6) at «a».
- Disengage the sleeve stops from their supports.

CLUTCH  
GEARBOX  
DRIVESHAFTS

## AL4 GEARBOX CONTROLS

Engine : KfV



B2CP3H7D

## AL4 GEARBOX CONTROLS

The gear selection lever is guided by the shape of the stepped grille and by a return spring which holds it to the left.

The gear control has **5 positions**:

- "**P**" Park (locks and immobilises the vehicle).
- "**R**" Reverse gear.
- "**N**" Neutral.
- "**D**" Drive (use of all four gears in automatic and autoactive mode).
- "**M**" Manual (This position permits the driver to choose his own gears in one-touch mode, by pulling «**M**» or pushing «**M+**» on the gear selection lever).

**NOTE** : Only positions «**P**» or «**N**» authorise the engine to be started.

In position «**M**», selection is made by an electronic sensor located close to the gear lever.

The degree of movement required to actuate the sensor cells is achieved by a magnet located on the lever opposite the cells, this causing the change of status.

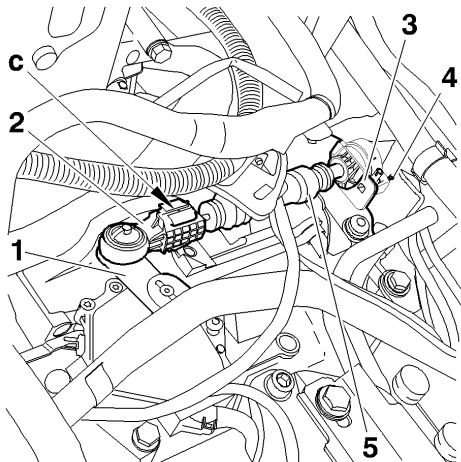
The information is transmitted to the gearbox ECU.

**NOTE** : On a vehicle equipped with the «**shift lock**», it is necessary to switch on the ignition and apply the brake pedal in order to release the selection lever from position «**P**».

The two switches on the gear control grille permit the driver to choose one of the following three driving programmes:

- «**Normal**» programme: this applies in the absence of any other selection. (autoactive mode; eco law).
- «**a**» «**Sport**» programme: for a more dynamic driving style, favouring performance and overtaking etc.
- «**b**» «**Snow**» programme: for easier starting and traction on slippery surfaces.

To return to the «Normal» programme you have only to press a second time on the «**sport**» or «**snow**» switch.

**AL4 GEARBOX CONTROLS****Engine : KfV**

B2CP3H8C

**Close to the gearbox.**

Control of the automatic gearbox is by a cable.

«c» Push button.

**(1)** Control lever with ball-joint.

**(2)** Automatic adjustment.

Pull out the button to permit adjustment of the control.

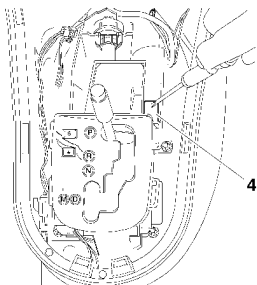
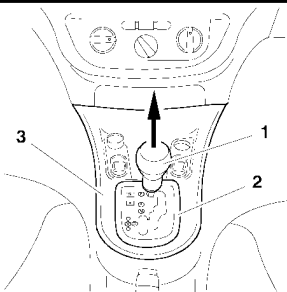
Press in the button to lock the adjustment of the control.

**(3)** Sleeve stop.

**(4)** Selection control locking clip **(5)**, on the sleeve stop **(3)**.

## AL4 GEARBOX CONTROLS

Engine : KfV



### Unlocking: «Shift lock» function.

**NOTE :** The «shift lock» is a system that locks the gear selection lever in position «P».

#### Unlocking the «shift lock». (Normal operation).

Switch on the ignition.

Press the brake pedal and keep it pressed.

Move the gear selection lever out of position «P».

#### Unlocking the «shift lock». (With an operating fault).

**NOTE :** It is impossible to unlock the «shift lock» with the «Normal operation» method.

The fault may originate from one of the following components:

- «Shift lock».

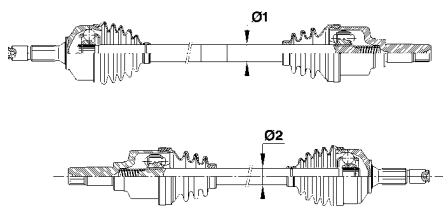
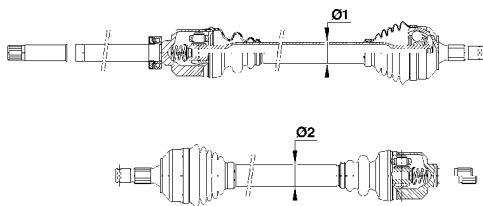
- Gear lever position switch.
- Automatic gearbox ECU.
- Electrical harness.
- Battery voltage.

Remove:

- The gear lever knob (1) (Pull upwards).
- The cover (2) (Unclip).
- The top of the central console (3).
- Unlock the «shift lock» (4) with the aid of a screwdriver.
- Move the gear selection lever out of position «P».

C5FP0ETC

B2CP3GZC

**SPECIFICATION OF DRIVESHAFTS****Engines : HFX - KVV - NFU - 8HX - 8HW - 8HV - 8HY****A****B****B2FP05CP**

**NOTE :** The wheel hubs have bearings with integral magnetic wheels designed for the **ABS** system.

**Features.**

The driveshafts no longer have gearwheels for the **ABS** system.

This function is performed by the wheel bearings.

The driveshaft gaiters are secured by rings.

Should the driveshafts need repairs, the rings are replaced by clips.

**Tightening torques: m.daN.**

Driveshaft nuts : **24.5 ± 0.5.**

Driveshaft bearings : **2 ± 0.2.**



SPECIFICATION OF DRIVESHAFTS							
Vehicles	Engine types	Gearbox		References			
		Type	Differential diameter	Wheel end	Gearbox end		
1.1i	HFX	MA/5N	68	AC/1700i	Gi 1700i		
1.4i	KFV	MA/5N - MA/5L					
		AL4					
1.6i 16V	NFU	MA/5S	77	AC 2000i	Gi 2000i		
1.4 HDi	8HX-8HW	MA/50		AC 1700i			
1.4 HDi 16V	8HV-8HY	BE4/5L		AC 2000i			
		Housing diameter (mm)		Shaft diameter (mm)		Driveshaft gaiters	
		Wheel end	Gearbox end	Diameter LH side	Diameter RH side	Wheel end	Gearbox end
1.1i	HFX	75	72	22.8	31	TP (1)	C/C (2)
1.4i	KFV						
1.6i 16V	NFU	79	75	26.7			
1.4 HDi	8HX-8HW	75	72	22.8			
1.4 HDi 16V	8HV-8HY	79	75	26.7	36		
(1) = Thermoplastic. - (2) = Rubber.							

DRIVESHAFTS - GEARBOX							
			Tightening torques (m.daN)		Gearbox oil seal mandrels		
Vehicles	Gearbox	Engines	Driveshaft bearing	Driveshaft nut	RH side	LH side	Tool kit
C3	MA/5	HFX - KfV 8HX - 8HW	None	24.5 ± 0.5	7114-T.W	7114-T.X	7116-T
		NFU	2 ± 0.2				
	AL4	KfV	1 ± 0.1	32.5 ± 1.5	(-) 0338 J1 + (-)0338 J3	(-) 0338 H1 (-) 0338 H2	(-) 0338
	BE4/5	8HV - 8HY	2 ± 0.2		7114-T.W	7114-T.X	7116-T

Tightening torques for wheel bolts (m.daN)		
CITROËN C3	Steel	9 ± 0.5
	Aluminium	

WHEELS AND TYRES					
		Petrol			
		1.1i  X – SX - Exclusive		1.4i	
				Manual and automatic gearboxes X - SX   Exclusive	
Engine type		HFX		KFV	
Tyre circumference	S	165/70 R14 81T XT1 – 1.804 m		165/70 R14 81T XT1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
	O	165/70 R14 81T XT1 – 1.804 m		165/70 R14 81T XT1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
Wheel	T	5.5J 14 H2.4.24 Milan trims		5.5J 14 H2.4.24 Milan trims	6J 15 H2.4.27 Eagle trims
	A	5.5 J14 CH.4.24-Tiger		5.5 J14 CH.4.24-Tiger	6J 15 CH.4.27-Lynx
Pressure	Front/Rear	(1)	2.1 / 2.1		
Spare wheel	Tyre circumference	S	165/70 R14 81T XT1 – 1.804 m	165/70 R14 81T XT1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
		O	165/70 R14 81T XT1 – 1.804 m	165/70 R14 81T XT1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
	Wheel	T	5.5J 14 H2.4.24	5.5J 14 H2.4.24	6J 15 H2.4.27
		T	5.5 J14 CH.4.24	5.5 J14 CH.4.24	6J 15 H2.4.27
Pressure (Bars)		2.3			
Symbols and abbreviations used :      S = Standard fit              T = Steel wheel.              O = Option fit              A = Alloy wheel (1) = Normal operating pressure              (Max. 4 persons and 40 kg in the boot).					

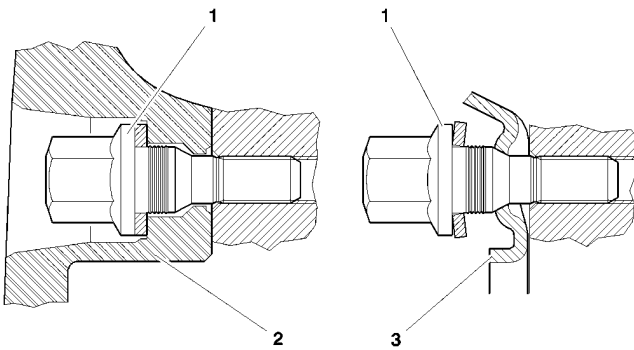
WHEELS AND TYRES				
		Petrol		
		1.6i 16V X-SX-Exclusive		
Engine type		NFU		
Tyre circumference		S	185/60 R15 84H XH1 – 1.828 m	
		O		185/60 R15 84H XH1 – 1.828 m 185/60 R15 84H XH1 – 1.828 m
Wheel		T	6J 15 H2.4.27 - Eagle trims	
		A		6J 15 CH.4.27-Lynx 5.5J 14 CH 4.24 Tiger
Pressure	Front/Rear	(1)	2.1 / 2.1	
Spare wheel	Tyre circumference	S	185/60 R15 84H XH1 – 1.828 m	
		O		185/60 R15 84H XH1 – 1.828 m 185/60 R15 84H XH1 – 1.828 m
	Wheel	T	6J 15 H2.4.27	
		T		6J 15 CH.4.27-Lynx 5.5J 14 CH 4.24 Tiger
	Pressure (Bars)		2.3	
Symbols and abbreviations used :    S = Standard fit    T = Steel wheel.    O = Option fit    A = Alloy wheel (1) = Normal operating pressure    (Max. 4 persons and 40 kg in the boot).				

WHEELS AND TYRES				
		Diesel		
		1.4 HDi X – SX - Exclusive	1.4 HDi 16V X – SX - Exclusive	
Engine type		8HX - 8HW	8HV - 8HY	
Tyre circumference	S	165/70 R14 84H XH1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m	
	O	165/70 R14 84H XH1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m	
		185/60 R15 84H XH1 – 1.828 m		
Wheel	T	5.5 J14 H2.4.24 - Milan trims	6J 15 H2.4.27 - Eagle trims	
	A	5.5 J14 H2.4.24-Tiger	6J 15 H2.4.27-Lynx	
		6J 15 H2.4.27-Coyote		
Pressure	Front/Rear	(1)	2.1 / 2.1	
Spare wheel	Tyre circumference	S	165/70 R14 84H XH1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
		O	165/70 R14 84H XH1 – 1.804 m	185/60 R15 84H XH1 – 1.828 m
			185/60 R15 84H XH1 – 1.828 m	
	Wheel	T	5.5 J14 H2.4.24	6J 15 H2.4.27
		T	5.5 J14 H2.4.24	6J 15 H2.4.27
			6J 15 H2.4.27	
	Pressure (Bars)		2.3	
Symbols and abbreviations used :      S = Standard fit      T = Steel wheel.      O = Option fit      A = Alloy wheel (1) = Normal operating pressure      (Max. 4 persons and 40 kg in the boot).				

WHEELS AND TYRES	
Identification of inflation pressures	
<p>PRESSIONS CONTRÔLÉES PNEUS FROIDS</p> <p><b>a</b></p> <p><b>b</b></p> <p><b>c</b></p>	<p>The label indicating recommended tyre pressures is affixed to the inner panel of one of the front doors.</p> <p>«<b>a</b>»: Recommended tyre inflation pressures. (vehicle empty and vehicle under load).</p> <p>«<b>b</b>»: Type of tyre.</p> <p>«<b>c</b>»: Recommended inflation pressure for the spare tyre.</p>

## WHEELS AND TYRES

### Identification of wheel bolts



- (1) : Wheel bolt.
- (2) : Light alloy wheel.
- (3) : Spare wheel.

#### Steel wheel.

Bolt for wheel with conical contact surface.

#### Light alloy wheel.

Mixed fixing wheel bolts, permitting the securing of the following wheel types:

Light alloy wheel (fixing with flat contact surface).

Steel spare wheel (fixing with conical contact surface).

#### Tightening torque:

$9 \pm 1$  m.daN.

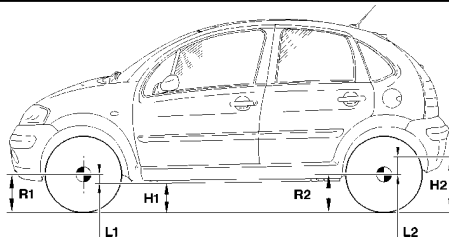
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## AXLE GEOMETRY

### Conditions for checking and adjusting

Tyres inflated to correct pressures.  
Vehicle at reference height.  
Steering rack locked at mid point (See corresponding operation).

### Vehicle heights at reference height



E1AP09MD

#### Front height

L1

$$H1 = R1 - L1$$

**H1** = Measurement between the measuring zone underneath the front subframe and the ground.  
**R1** = Front wheel radius under load.  
**L1** = Distance between the wheel axis and the measuring zone underneath the front subframe.

#### Rear height

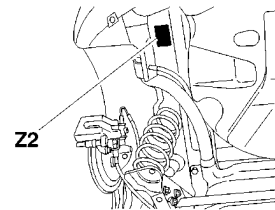
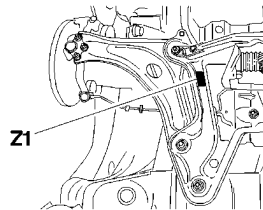
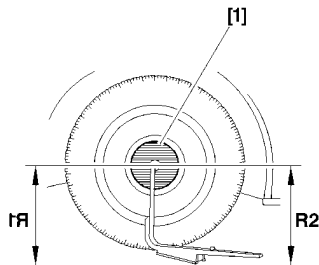
L2

$$H2 = R2 + L2$$

**H2** = Measurement between the measuring zone underneath the rear sill and the ground.  
**R2** = Rear wheel radius under load.  
**L2** = Distance between the wheel axis and the measuring zone underneath the rear sill.



## AXLE GEOMETRY



B3CP07SD

### Measuring front height

### Measuring rear height

[1] Gauge for measuring the wheel radius, 4 bolts, tool 8006-T

Z1 = Measuring zone underneath the front subframe.

Z2 = Measuring zone underneath the rear sill.

Measure the radius of the front wheel R1 - Calculate dimension H1 = R1 - L1

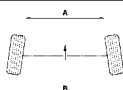
Measure the radius of the rear wheel R2 - Calculate dimension H2 = R2 + L2

Value at reference height (+ 6 - 8 mm)	All types (except CRD) (*)	CRD vehicles (*)	Value at reference height (+ 10 - 6 mm)	All types (except CRD) (*)	CRD vehicles (*)
	L1 = 142.5 mm	L1 = 132.5 mm		L2= 52 mm	L2= 62 mm

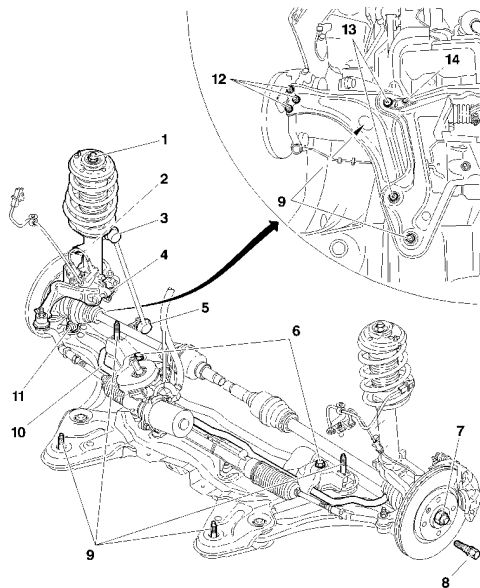
(\*) = CRD : Difficult road conditions.

Definition for a type of vehicle whose axles and suspensions are adapted for driving on rough roads.

Compress the suspension to obtain the calculated values. The height difference between the two axle dimensions should be less than 10 mm.

AXLE GEOMETRY							
Front axle					Rear axle		
Dissymmetry of lower castor at 0° 30'.					Dissymmetry of lower camber at 0° 18.		
Dissymmetry of lower camber at 0° 18'.							
Distribute symmetrically, LH / RH wheel, the total tracking value.							
All types (except CRD)							
Vehicle		Tracking	Castor	Camber	King pin inclination	Tracking	Camber
		Adjustable	Non adjustable			Non adjustable	
All Types	mm	- 2 ± 1				- 5.5 ± 1	
	0°	0° 19'±0°10'	3°57'	- 0°28'	11°24'	- 0°50' ± 0°10'	- 1°30'
CRD vehicle							
Vehicle		Tracking	Castor	Camber	King pin inclination	Tracking	Camber
		Adjustable	Non adjustable			Non adjustable	
All Types	mm	- 2 ± 1				- 5.2 ± 1	
	0°	0° 19'±0°10'	3°53'	- 0°26'	11°14'	- 0°47' ± 0°10'	- 1°30'
<div></div>							
B3CP02UC					A < B = Positive figure :		+ = TOE-IN
					A > B = Negative figure :		- = TOE-OUT

## FRONT AXLE



B3CP07HP

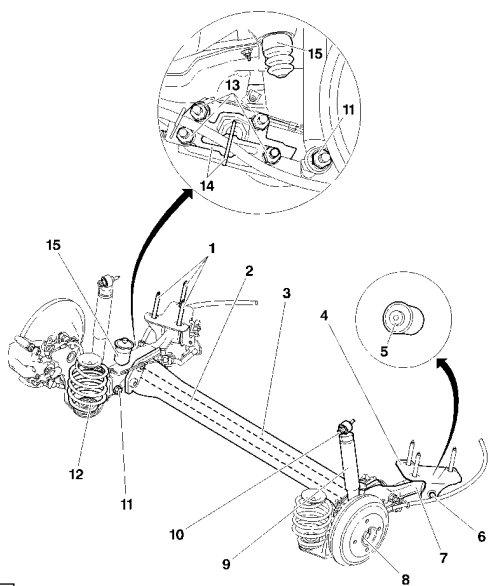
### Tightening torques (m.daN)

(1) Damper nut	: 6.5 ± 0.6
(2) Suspension leg	:
(3) Anti-roll bar link rod upper ball-joint	: 4.5 ± 0.5
(4) Suspension leg pivot	: 5.4 ± 0.5
(5) Anti-roll bar link rod lower ball-joint	: 4.5 ± 0.5
(6) Anti-roll bar bearing fixing	: 8 ± 0.8
(7) Hub nut	: 24.5 ± 0.5
(8) Wheel bolt	: 9 ± 1
(9) Subframe to bodysell fixing screw	: 9.2 ± 0.9
(10) Anti-roll bar	:
(11) Pivot lower ball-joint fixing	: 14 ± 1.4
(12) Ball-joint fixing on lower arm	: 4 ± 0.4
(13) Lower arm front and rear mounting fixing	: 14 ± 0.4
(14) Stabiliser bar screw	: 6.6 ± 0.7

### Anti-roll bar

	Diameter (mm)	Colour
HFX - KFV - NFU 8HX - 8HW 8HV - 8HY	19	Blue

## REAR AXLE



### Tightening torques (m.daN)

(1) Rear fixing screw	: 10 ± 1
(2) Anti-roll bar	:
(3) Rear axle crossmember	:
(4) Rear suspension arm mounting yoke	:
(5) Rear suspension arm mounting	: 7.6 ± 0.5
(6) Yoke suspension arm fixing screw	:
(7) Rear suspension arm	:
(8) Stub axle bearing nut	: 20 ± 2
(9) Damper	:
(10) Damper upper fixing	: 4.2 ± 0.4
(11) Damper lower fixing	: 10.6 ± 1
(12) Suspension spring	:
(13) Suspension arm fixing on rear axle crossmember	: 13 ± 1.3
(14) Secondary brake cable guide and support assembly	:

### Anti-roll bar

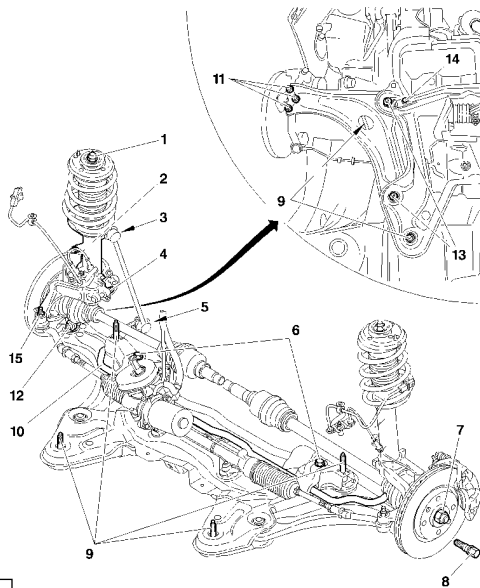
### Diameter (mm)

HFX - KFU - NFU  
8HX - 8HW  
8HV - 8HY

25.5 (tubular)

B3DP09GP

## SUSPENSION



Front axle		
(1) Suspension leg on bodyshell fixing nut	:	6.5 ± 0.6
(2) Damper	:	
(3) Anti-roll bar link rod upper ball-joint	:	4.5 ± 0.5
(4) Suspension leg pivot	:	5.4 ± 0.5
(5) Anti-roll bar link rod lower ball-joint	:	4.5 ± 0.5
(6) Anti-roll bar bearing fixings on bodyshell	:	8 ± 0.8
(7) Hub nut	:	24.5 ± 0.5
(8) Wheel bolt	:	9 ± 1
(9) Subframe on bodyshell fixing screw	:	9.2 ± 0.9
(10) Anti-roll bar	:	
(11) Pivot lower ball-joint fixing on lower arm	:	4 ± 0.4
(12) Pivot lower ball-joint fixing	:	6.6 ± 0.7
(13) Lower arm front and rear mounting fixing	:	14 ± 1.4
(14) Stabiliser bar screw	:	6.6 ± 0.7
(15) Steering ball-joint fixing	:	8 ± 0.8

### Anti-roll bars

Engines	Diameter (mm)	Colour
All Types	19	Blue

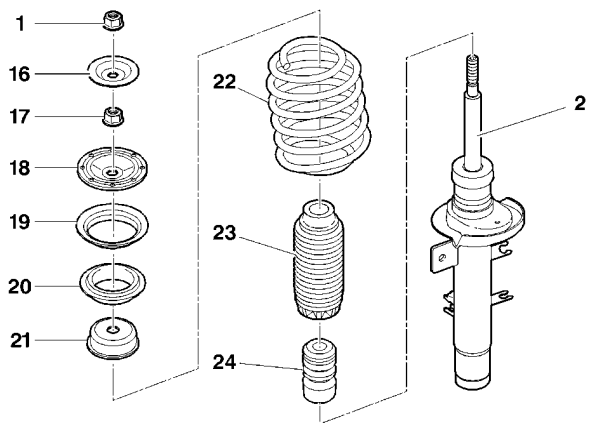
### Pivot

Engines	Diameter of bearing	Type
All Types	72	In U (Cast-iron)

### Damper

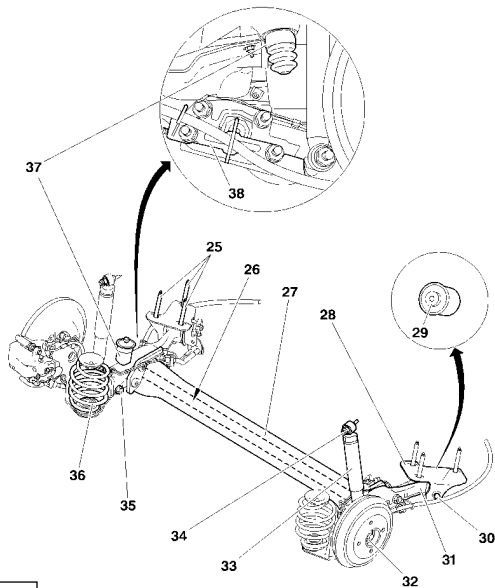
Engines	Damping law
All Types	R 59 M

B3CP07RP

SUSPENSION		
		Front axle
	(1) Nut fixing suspension leg on body	: 6.5 ± 0.6
	(2) Damper. (16) Cup. (17) Damper nut. (18) Damper cup. (19) Ball bearing (20) Spring thrust cup. (21) Travel stop cup. (22) Suspension spring. (23) Damper rod protector. (24) Travel stop.	: 6.5 ± 0.6

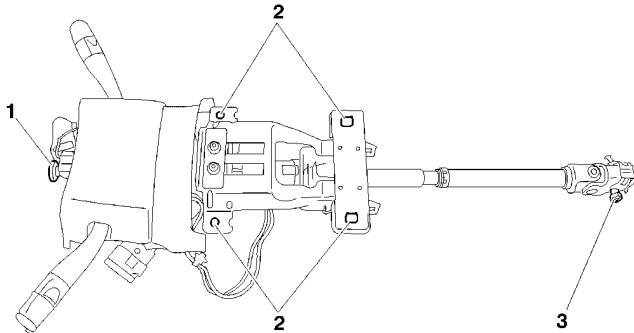
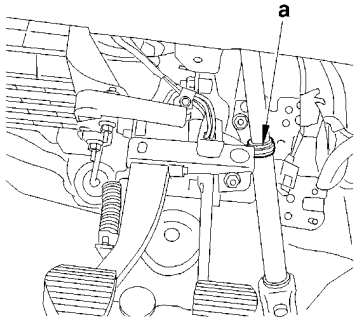
B3BP180D

## SUSPENSION



Rear axle	
(25) Rear axle fixing screw	: 10 ± 1
(26) Anti-roll bar	:
(27) Rear axle crossmember	:
(28) Rear suspension arm flexible mounting yoke	:
(29) Rear suspension arm flexible mounting	:
(30) Suspension arm fixing screw on yoke	: 7.6 ± 0.5
(31) Rear suspension arm	:
(32) Stub axle bearing nut	: 20±2 (greased)
(33) Damper	:
(34) Damper upper fixing screw	: 4.2 ± 0.4
(35) Damper lower fixing screw	: 10.6 ± 1
(36) Suspension spring	:
(37) Travel stop	:
(38) Secondary brake cable guide support	:
Anti-roll bar	
Engines	Diameter (mm)
All Types	25,5 (Tubular)
Damper	
Engines	
1.4i (Auto.)-1.6i 16V 1.4 HDi 16V	F168K
1.1i-1.4i (Man.)-1.4 HDi	F77D
	F77B (*)
(*) = For CRD vehicle	

B3DP09UP

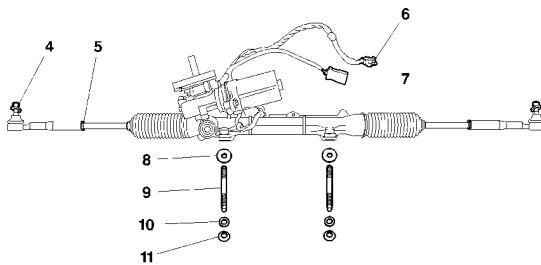
FEATURES OF ELECTRIC POWER STEERING			
Engines : HFX - KFV - NFU - 8HX - 8HW - 8HY			
Steering column			
			
B3EP13GD		B3EP13HC	
<p><b>Tightening torques m.daN.</b></p> <p>(1) Steering wheel fixing : <b>2 ± 0.3</b></p> <p>(2) Steering column fixing on support : <b>2.2 ± 0.5</b></p> <p>(3) Steering cardan fixing : <b>2.2 ± 0.2</b></p>		<p><b>Identification</b></p> <p>Identified by the colour of the ring at "a".</p> <p>Left hand drive : <b>BLUE ring.</b></p> <p>Right hand drive : <b>WHITE ring.</b></p>	



## FEATURES OF ELECTRIC POWER STEERING

Engines : HFX – KFV – NFU – 8HX – 8HW – 8HY

### Steering mechanism



B3EP13JD

### Tightening torques m.daN

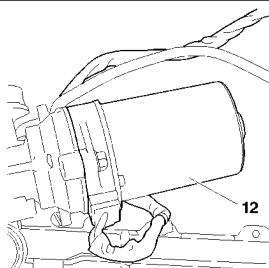
- |                                      |                 |
|--------------------------------------|-----------------|
| (4) Ball-joint fixing on pivot       | : $3.5 \pm 0.3$ |
| (5) Steering rod lock-nut            | : $5 \pm 0.5$   |
| (8) Threaded washer                  |                 |
| (9) Stud                             | : $0.8 \pm 0.1$ |
| (10) Flat washers                    |                 |
| (11) Fixing of mechanism on subframe | : $8 \pm 0.8$   |

	HFX - KFV - 8HX - 8HW	KFV (Auto.) NFU - 8HY - 8HV	Connectors.  (6) Supply of electric assistance motor.  (7) Torque sensor signals.
Electric motor	60 A	65 A	
Steering rack travel	2x72	2x64	
Steering ratio	45.6/1		
Number of rotations of steering wheel	3.2	2.8	
Inner angle of lock	38°	32°30'	
Outer angle of lock	32°24'	28°42'	

## FEATURES OF ELECTRIC POWER STEERING

Engines : HFX - KFV - NFU - 8HX - 8HW - 8HY

### Steering assistance



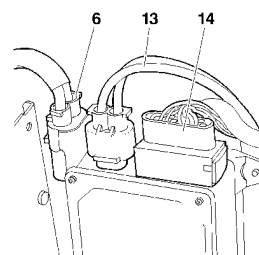
B3EP13KC

Supplier: **KOYO**.

The steering assistance is provided by the assistance motor **(12)**, controlled by the ECU.

Power delivered to the assistance motor **(12)** depends on:

- Speed of the vehicle.
- Torque applied on the steering wheel.



B3EP13LC

#### Electric power-assisted steering ECU.

Only one ECU version, whatever the engine-type.

The electric power steering ECU is linked to the following connectors:

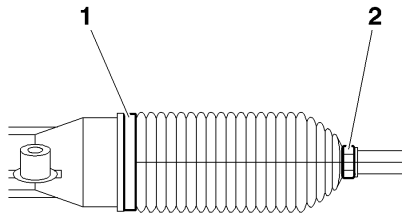
- **(6)** Assistance motor supply.
- **(13)** Electric power steering ECU supply.
- **(14)** Control signals.

After changing the electric power steering ECU, it is necessary to perform a configuration. (See corresponding operation).

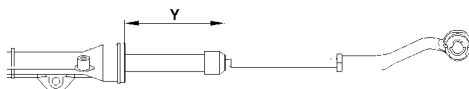
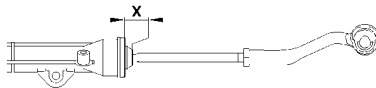
## SPECIAL FEATURES : STEERING

Engines : HFX - KfV - NFU - 8HX - 8HW - 8HY

### Centring the steering rack



B3EP13UC



B3EP13VD

#### Preliminary operation.

Raise and support the vehicle on a two-column lift.  
Remove, on the RH side of the steering rack:

- Clip (1).
- Clip (2).

Release the steering rack protection gaiter.

#### Setting

Move the steering to full left hand lock.

Measure the dimension X.

Move the steering to full right hand lock.

Measure the dimension Y.

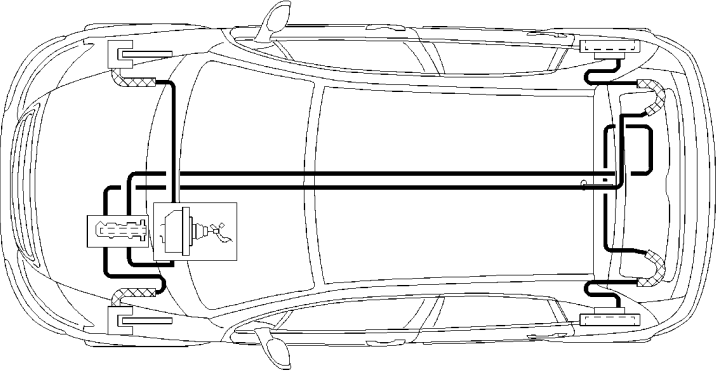
Calculate the dimension:  $L = (Y - X) : 2$ .

Refit:

- The steering rack protection gaiter
- New clips (1) and (2).

BRAKE SPECIFICATIONS (WITHOUT ABS)						
			1.1i	1.4i	1.4 HDi	
Engine type			HFX	KFV	8HX	8HW
FR	Ø mm	Master cylinder		20.6		
		Master vac		203.2		
		Caliper/piston makes		LUCAS/TRW C48/13 48		
		Disc	Plain	266		
	Ventilated					
	Disc thickness/min. thickness		13/11			
	Brake pad grade		TEXTAR T 4144			
RR	Ø mm	Drum		203		
		Max. thickness		205		
	Make		DON			
	Brake lining grade		8259			

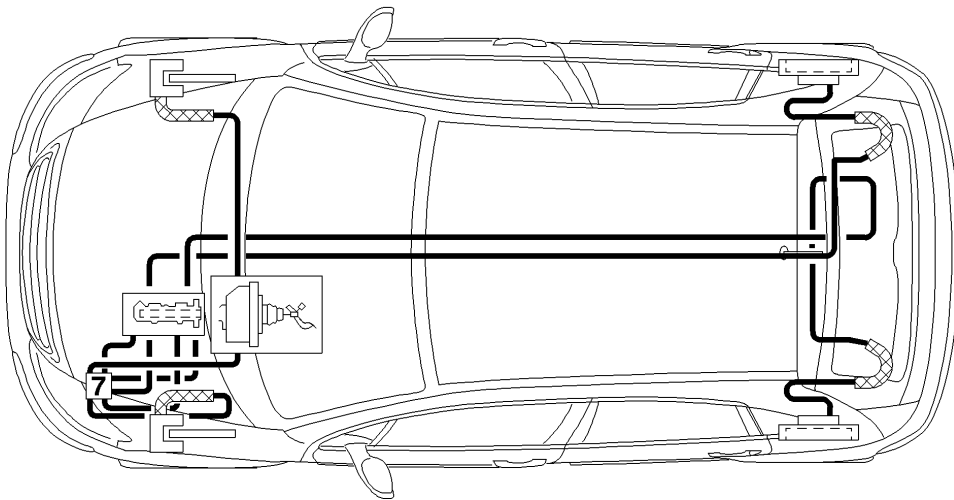
BRAKE SPECIFICATIONS (WITH ABS)						
			1.6i 16V		1.4 HDi 16V	
Engine type			NFU		8HV	8HY
FR	Ø mm	Master cylinder		22.2		
		Master vac		228.6		
		Caliper/piston makes		LUCAS/TRW C54/22 54		
		Disc	Plain			
	Ventilated		266			
	Disc thickness/min. thickness		22/20			
	Brake pad grade		TEXTAR T 4144			
RR	Ø mm	Cylinder or caliper		LUCAS C38 HR 9/13		
		Disc	Ventilated	247		
	Disc thickness/min. thickness		9/7			
	Make		GALFER			
	Brake lining grade		G 4554			

BRAKE SPECIFICATIONS	
Braking circuit without ABS - REF (drum brakes at the rear)	Braking system specifications
	<ul style="list-style-type: none"><li>- Braking circuit at «X».</li><li>- Front brakes with ventilated discs (*).</li><li>- Rear brakes with either drums or discs (*).</li><li>- Handbrake lever controlling cables acting on the rear wheels.</li></ul> <p>The compensator and main brake limiter functions are assured by the <b>ABS EBD</b> system.</p> <p><b>NOTE : REF</b> = Electronic Brakeforce Distribution</p> <p>(*) = according to version</p>

B3FP161D

## BRAKE SPECIFICATIONS

Braking circuit with ABS - REF (drum brakes at the rear)

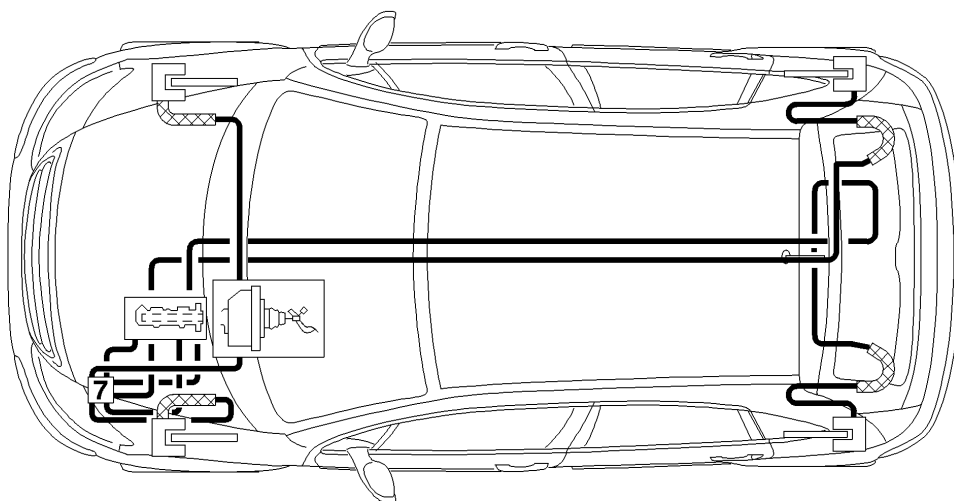


B3FP162D

BRAKE

**BRAKE SPECIFICATIONS**

Braking circuit with ABS - REF (disc brakes at the rear)

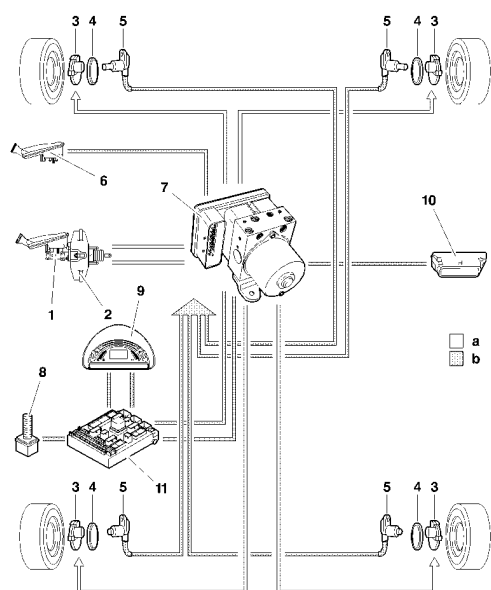


B3FP163D



## BRAKE SPECIFICATIONS

### Braking circuit with ABS - REF



(a) Hydraulic circuit.

(b) Electrical circuit.

(1) Master cylinder in tandem.

(2) Braking servo.

(3) Brake caliper (or drum at the rear).

(4) Hub equipped with a bearing with an integral magnetic wheel (48 pairs of poles).

(5) Wheel sensor.

(6) Brake fluid level sensor.

(7) Hydraulic block plus ECU.

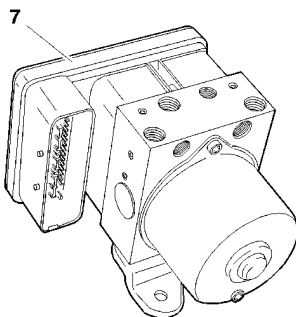
(8) Stoplamp switch.

(9) Instrument panel.

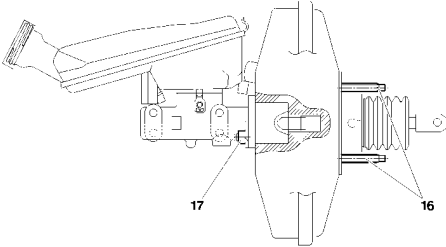
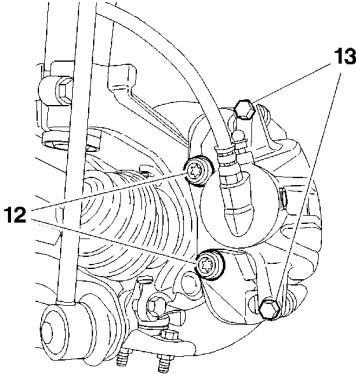
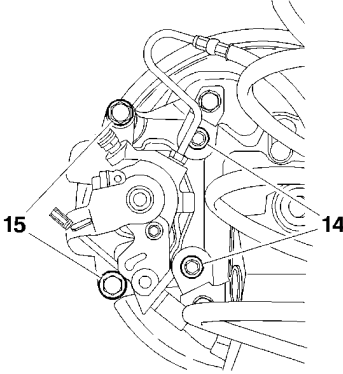
(10) Diagnostic socket.

(11) Built-in systems interface (BSI).

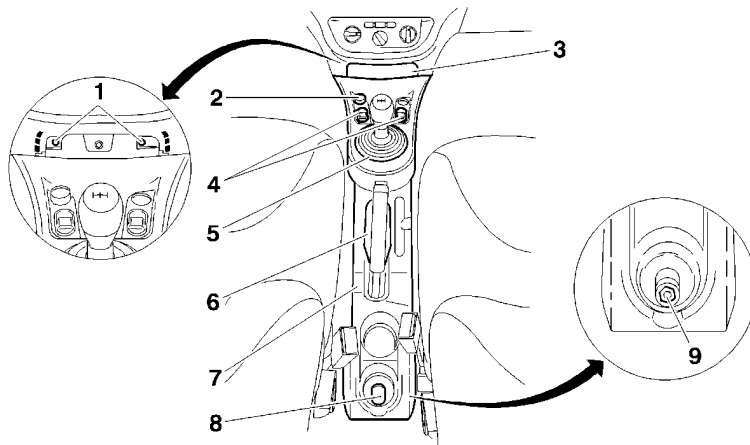
B3GP02RP

BRAKE SPECIFICATIONS						
(7) Hydraulic block						
	Elements	Ref.	Supplier	Part No.	Observations	
	Electronic ECU	7	TEVES	ABS MK 60	47 way connector.	
				ESP ABS MK 60	Alone on the hydraulic block.. Changing only the ECU is prohibited.	
	Front wheel sensor.	5		96 387 201 80	2 way blue connector. The sensors are inductive-type. Mounted on the pivot. Non-adjustable airgap: <b>0,16 to 1,6 mm.</b> Tightening torque: <b>0,8 ± 0,2 m.daN</b>	
	Rear wheel sensor.			96 385 307 80	2 way blue connector. The sensors are inductive-type. Mounted on the suspension arm. Non-adjustable airgap: <b>0,35 to 1,6 mm.</b> Tightening torque: <b>0,8 ± 0,2 m.daN</b>	
	Hub bearing.	4		SNR		Hub equipped with a bearing with an integral magnetic wheel ( <b>48</b> pairs of poles).
	Hydraulic block.	7		TEVES	ABS MK.60 96 394 937 80	Installed on the front LH chassis member 4 adjustment channels
ESP ABS MK 60 96 418 772 80						
B3FP12XC						

## BRAKE SPECIFICATIONS

Brake pedal gear	Front brake	Rear brake
		
B3FP166D	B3FP164C	B3FP165C
Tightening torques (m.daN).		
<b>(16)</b> Servo fixing $2.2 \pm 0.3$ <b>(17)</b> Fixing on master cylinder $2 \pm 0.5$	<b>(12)</b> Yoke fixing on caliper $10.5 \pm 1$ <b>(13)</b> Yoke fixing on caliper $3 \pm 0.3$	<b>(14)</b> Rear caliper fixing on arm $5.3 \pm 0.5$ <b>(15)</b> Yoke fixing on caliper $3.8 \pm 0.3$

## HANDBRAKE (Adjustment)



### Adjustment

Lift and chock the vehicle.

Remove:

- The rear cover (8).
- The nut (9).
- The handbrake trim (6).
- The gear lever gaiter (5).
- The front cover (3).
- The screws (1).

Disconnect the connectors of the following components:

- The cigar lighter (2).
  - The electric window buttons (4).
- Remove the central console (7).

**WARNING:** Check that the brake cables are correctly routed under the vehicle.

Slacken the handbrake lever.

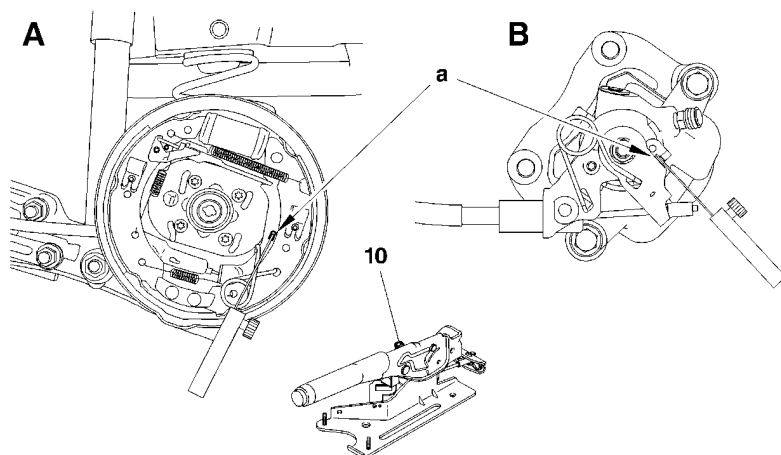
Press gently on the brake pedal (Then repeat the operation **3 times**).

Pull vigorously on the handbrake lever **4 or 5 times**.

C5FP0ELD

## HANDBRAKE (Adjustment)

### Adjustment (continued)



**A** : Drum brakes

**B** : Disc brakes

**(10)** Nut for adjusting cable tensions.

Remove:

- The rear wheels.
- The drums (according to version).

Release the handbrake.

Use a gauge set to measure at «a» the travel of the lever from its stop.

Adjust the nut **(10)** to obtain a travel of less than or equal to **1 mm** at «a».

Refit the brake drums without tightening them (according to version).

Action the handbrake lever **8 times** with an effort of **40 m.daN**.

With the handbrake released, check the travel of the lever at «a», using a gauge set.

**NOTE** : The travel should be less than **1 mm** and more than **0,05 mm**.

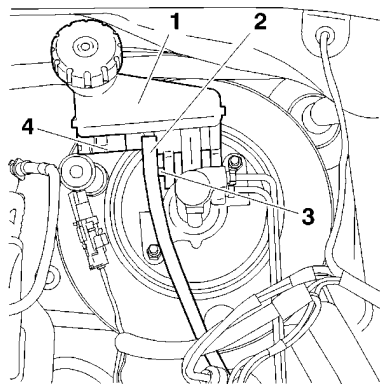
Refit:

- The brake drums.
- The wheels.
- The central console.

Check the operation of the handbrake.

B3FP16ED

## BLEEDING AND FILLING THE BRAKING SYSTEM



B3FP15XC

### Tools.

[1] Generic bleeding apparatus

: «LURO» or similar.

### Bleeding, refilling.

#### Draining.

Drain the brake fluid reservoir (1) to the maximum (if necessary, use a clean syringe).

Disconnect the connector (4).

Uncouple the pipe (2).

Unscrew the shaft (3).

Remove the reservoir (1).

- Empty the brake fluid reservoir (1).

- Clean the brake fluid reservoir (1).

Refit:

The brake fluid reservoir (1).

The shaft (3).

Couple the pipe (2).

Reconnect the connector (4).

#### Filling the braking system.

**WARNING :** Use only those hydraulic fluids that are approved and recommended.

- Fill the brake fluid reservoir (1).

#### Bleeding the braking system.

**WARNING:** During the bleeding operation, take care to maintain the level of brake fluid in the reservoir and to top it up, using only brake fluid that is clean and clear.

## BLEEDING AND FILLING THE BRAKING SYSTEM

### Bleeding, filling (continued).

#### Bleeding the primary braking circuit.

**WARNING:** The **ABS** should not be active during the bleeding operation.

- Front brake caliper: Bleed screw **(5)**.

A : Rear brake caliper

B : Rear brake drum

Bleed screw **(6)**.

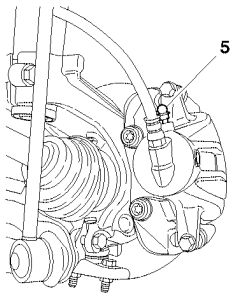
Bleed each wheel cylinder, proceeding in the following order :

Front LH wheel.

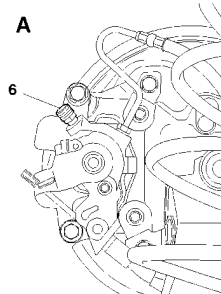
Front RH wheel..

Rear LH wheel..

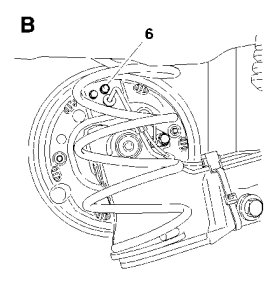
Rear RH wheel



B3FP15YC

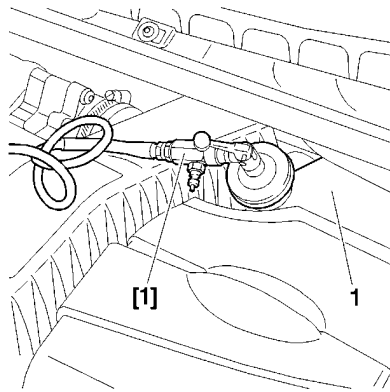


B3FP15ZD



BRAKE

## BLEEDING AND FILLING THE BRAKING SYSTEM



B3FP160C

### Purge. remplissage (Suite).

#### With the bleeding apparatus

- Raccorder l'appareil à purger [1] sur le réservoir de liquide de frein (1).
- Régler la pression de l'appareil à 2 Bars.

#### For each circuit :

- Connect a transparent tube onto the bleed screw, submerge the other end of the tube in a clean container.
- Open the bleed screw, wait until the fluid is flowing out without air bubbles.
- Close the bleed screw.
- Remove the bleeding apparatus [1].
- Check the brake fluid level (Should be between «**MINI**» level and «**MAXI**» level).
- Fill if necessary with the approved and recommended synthetic brake fluid.

Without the bleeding apparatus.

#### Without the bleeding apparatus.

**NOTE :** Two operators are necessary.

#### For each circuit :

- Apply the brake pedal to place the circuit under pressure.
- Connect a transparent tube onto the bleed screw, submerge the other end of the tube in a clean container.
- Open the bleed screw, wait until the fluid is flowing out without air bubbles.
- Close the bleed screw.
- Remove the tool [1].

**NOTE :** Recommence the process a second time if that is necessary.

- Check the brake fluid level, (Should be between «**MINI**» level and «**MAXI**» level).
- Fill if necessary with the approved and recommended synthetic brake fluid.



STARTER MOTORS				
Vehicles / models		Types of starter motor	Class	Climate
C3	1.1i	VALEO D7E16	1	H,T,C
		BOSCH A001 183 027F		
		MELCO M002T 13081		
		VALEO D6RA572	3	VC
	1.1 i Aircon 1.4 i Aircon 1.6i 16v Aircon	VALEO D7E16	1	H, T
		BOSCH A001 183 027F		
		MELCO M002T 13081		
		VALEO D6RA572	3	C, VC
	1.4 i 1.6 i 16v	VALEO D7E16	1	H, T
		BOSCH A001 183 027F		
		MELCO M002T 13081		
		VALEO D7E23	2	C
		BOSCH E OAL 101 390		
		VALEO D6RA572	3	VC
	1.4I Auto.	VALEO D6RA572	3	H, T, C, VC
	1.4 HDi 1.4 HDi 16v	VALEO D6RA110	4	H, T
		VALEO D7GP09	5	C, VC

ELECTRICAL  
SYSTEM

ALTERNATORS								
Engine	G'box	Classes and types						
		Without aircon		Climate	With aircon		Climate	
1.1i	M	7	VALEO A11 VI 109	H,T,C,VC	7	VALEO A11 VI 109	C, VC	
			VALEO SG7 S016			VALEO SG7 S016		
					8	VALEO A13 VI 282	H, T	
						VALEO SG8 B022		
1.4i		7	VALEO A11 VI 109	H,T,C,VC	7	VALEO A11 VI 109	C, VC	
			VALEO SG7 S016			VALEO SG7 S016		
					8	VALEO A13 VI 282	H, T	
						VALEO SG8 B022		
1.4i	A	7	VALEO A11 VI 109	H		VALEO A13 VI 282		
			VALEO SG7 S016			VALEO SG8 B022		
		8	VALEO A13 VI 282	T, C, VC	9	VALEO A13 VI 283+	C, VC	
			VALEO SG8 B022			VALEO SG 10 B023		
CLIMATE : H (Hot), T (Temperate), C (Cold), VC (Very cold)								

## ALTERNATORS

Engine	G'box	Classes and types						
		Without aircon		Climate	With aircon		Climate	
1.6i 16 v	M	7	VALEO A11 VI 109	H, T	8	VALEO A13 VI 282	C, VC	
			VALEO SG7 S016			VALEO SG8 B022		
		8	VALEO A13 VI 282	C, VC	9	VALEOA13 VI 282+	H, T	
			VALEO SG8 B022			VALEO SG8 B022		
1.4 HDi			VALEO A13 VI 282	H, T		DENSO SC2	C	
			VALEO SG8 B022					
15		DENSO SC2	C, VC					
1.4 HDi 16v		8	VALEO A13 VI 282	H		DENSO SC2	H, T, C, VC	
			VALEO SG8 B022					
			15	DENSO SC2		T, C, VC		
CLIMATE : H (Hot), T (Temperate), C (Cold), VC (Very cold)								

PRE-HEATING AND STARTING CIRCUITS				
Vehicles / models		Pre-heater plugs	Pre-heater control unit	Pre-post-heating (Pre-heating time at 20°C)
C3	1.4 HDI	NGK YE04	NAGARES 960411-P	Controlled by the diesel injection ECU
			CARTIER 735068	
	1.4 HDI	NGK YE04	NAGARES 960411-P	
			CARTIER 735068	
	1.4 HDI 16v	NGK YE04	NAGARES 960411-P	
			NAGARES 960411-P	
			NAGARES 960411-P	

The diagram illustrates a power supply system for a model locomotive. It features a battery pack on the left, connected to a switch at the top. A rheostat (R) is connected in series with the switch, and an ammeter (A) is connected in parallel with the rheostat. A voltmeter (V) is connected in parallel with the battery pack. The circuit then splits into two parallel branches. The first branch contains a motor and a capacitor. The second branch contains a motor and a regulator (Reg.). The entire system is connected to a common ground at the bottom.

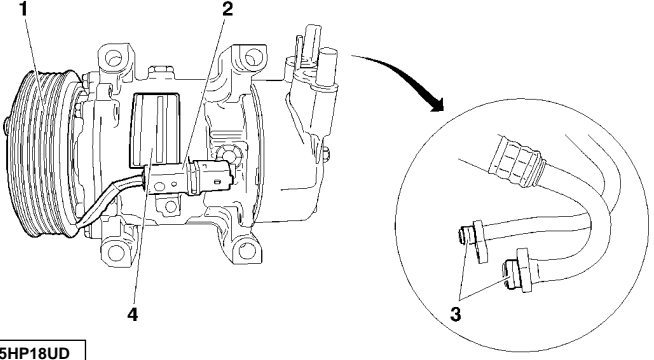
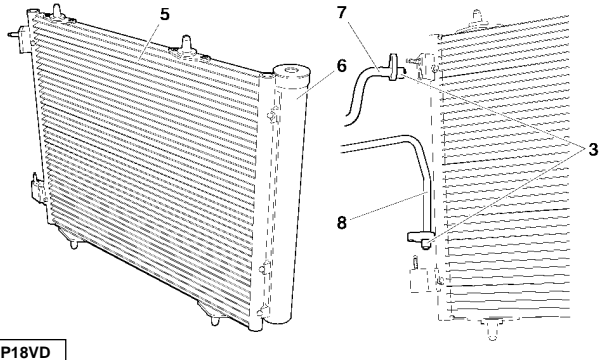
Connect as shown in the diagram opposite, using an ammeter (**A**), a voltmeter (**V**), and a rheostat (**R**) or a Volt/Ammeter/Rheostat combination. Referring to the vehicle's equipment specification (see table opposite), adjust the engine speed and rheostat charge to obtain **U=13.5V**.

### Checking the voltage regulator

**Note :** These tests should be performed with the engine hot and the battery fully charged.

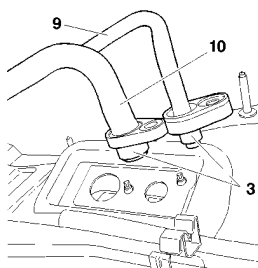
Speed Class	2000 rpm	3000 rpm	4000 rpm
5	29 A	39 A	43 A
7	42 A	54 A	59 A
8	49 A	62 A	68 A
9	62 A	76 A	83 A
12	72 A	90 A	100 A
15	99 A	128 A	140 A

AIR CONDITIONING R 134 a (HFC)						
Vehicle	Engine	Date	Refrigerant refill	Compressor		
				Variable Capacity	Oil quantity cc	Oil reference
C3	All Types	11/2001 →	625 + 0 - 50 gr	SD 6 V 12	135	SP 10
<p>Cooling fan FAURE ECIA (250 Watts)</p>						

SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)	
Compressor	Condenser
	
<b>C5HP18UD</b>	<b>C5HP18VD</b>
<p>The drive plate (1) is held on the aircon compressor shaft by ribs. New wiring (2). New seals (3) (MANULLI). Identification label (4) for aircon compressor.</p>	<p>The condenser (5) has a cylinder (6) incorporating the function of aircon fluid reservoir and with integral filtering cartridge. The inlet (7) and the outlet (8) of the condenser (5) are equipped with new seals (3) (MANULLI). Condenser : <b>MODINE 16 dm³</b></p>

## SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)

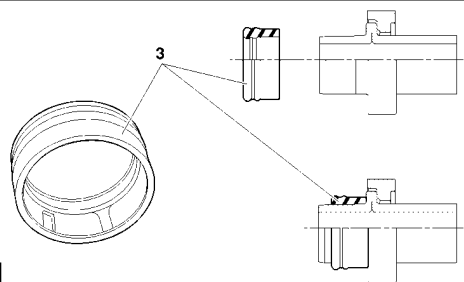
### Pressure reducer



C5HP18WC

The inlet (10) and the outlet (9) are equipped with new seals (3) (MANULLI).  
 Pressure reducer: **TGK 2,02/2,7/2 Tons**  
 Evaporator : **VALEO 60 mm.**

### Seals



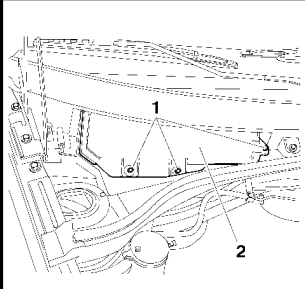
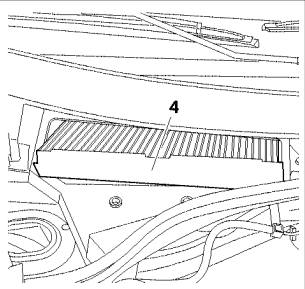
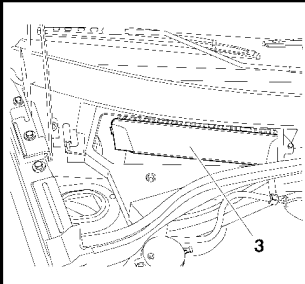
C5HP18XD

**MANULLI** calibrated seal (3)  
 Direction of fitting of the seal (3).  
 Before fitting the seal, amply lubricate the seal with air conditioning compressor oil (**SP10**).

### Special feature: Blower

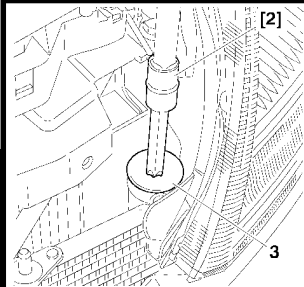
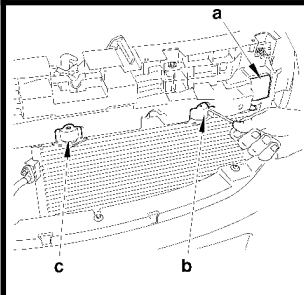
**C3** vehicles are equipped with an **additional protection fuse for the blower**, located on the bulkhead inside the vehicle, next to the heater matrix pipes up to approx. **04/2002**.  
 As a consequence, if a customer reports his blower not working, you should inspect not only the fuse in the engine fusebox, but also the fuse referred to above.  
 After **04/2002**, the fuse should be incorporated in the blower itself.



SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)		
Pollen filter		
	<p><b>Note :</b> The pollen filter is located in the engine compartment on the RH side.</p> <p><b>Removing</b></p> <p>Remove:</p> <ul style="list-style-type: none"><li>- The three screws <b>(1)</b>.</li><li>- The plastic cover <b>(2)</b>.</li></ul> <p>Tilt the flap <b>(3)</b>.</p> <p>Remove the pollen filter <b>(4)</b>.</p> <p><b>Refitting</b></p> <p>Proceed in reverse order.</p>	
	<div>C4AP169C</div> <div>C4AP16AC</div>	<div>C4AP16BC</div>

**SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)**

**Changing the filtering/drying cartridge**

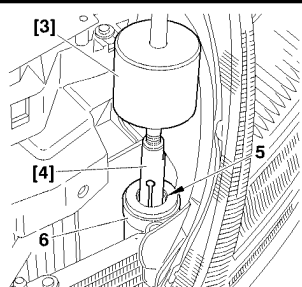
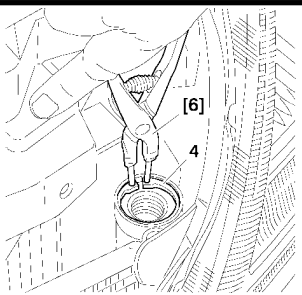


- Tools.**
- [1] Charge station
  - [2] TORX adaptor
  - [3] Inertia extractor
  - [4] Endpiece Ø 20
  - [5] Set of plugs
  - [6] Circlip pliers

- : (according to workshop equipment)
- : **TORX 70 FACOM.**
- : **1671-T.**      **Toolkit 4114-T**
- : **1671-T.D20.**
- : **(-).0188.T.**
- : **FACOM.**

**Removing**

Depressurise the aircon circuit, using tool [1].  
Remove the grille.  
At «a», remove the pin and the plastic cover.  
Unclip the condenser at «b» and «c», using a screwdriver.  
Tilt the condenser towards the front.  
Lift and release the condenser.  
Clean the area around the cap (3).  
Remove the plastic cap (3), using tool [2].  
Remove the safety circlip (4), using tool [6].  
Position the tool [3] and [4] in the aperture of the cartridge (5).  
Extract the cartridge from the reservoir (6), using tool [3] and [4].  
Block the reservoir (6), using tool [5].



C4AP163C

C4AP164C

C4AP165C

C4AP166C

SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)			
Changing the filtering/drying cartridge			
	<p><b>Refitting</b></p> <p>Remove the new cartridge from its packaging. Do not expose the cartridge, the filter and seals to pollutants. Lightly oil the seals (compressor oil). Remove tool [5] from the reservoir (6). Insert the new cartridge (5) into the reservoir (6). Refit the safety circlip (4), using tool [6]. Make sure that the circlip (4) is correctly positioned in its location.</p> <p><b>WARNING : Not more than 5 minutes should elapse between the removal of the cartridge (6) from its packaging and its being fitted.</b></p> <p>Refit:</p> <ul style="list-style-type: none"><li>- The plastic cap (3), using tool [5]</li><li>- Tighten to <math>1,2 \pm 0,1</math> m.daN.</li><li>- The condenser (reclip, pushing at «b» and «c»).</li><li>- The plastic cover and the pins at «a».</li><li>- The grille (2).</li><li>- The screws (1).</li></ul> <p>Proceed to:</p> <ul style="list-style-type: none"><li>- Recharge the circuit (see corresponding operation).</li><li>- Check the operation of the air conditioning (see corresponding operation).</li></ul>		
C4AP167C	C4AP165C	C4AP163C	C4AP164C

### SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)

#### Compressor lubricant.

**ESSENTIAL:** The compressor lubricant is extremely hygroscopic; always use FRESH oil.

#### Checking the compressor oil level.

There are three specific cases :

- 1) Repairs to a system without leaks.
- 2) Slow leak.
- 3) Fast leak.

#### 1) Repairing a system without leaks.

##### a) Using draining/recovery equipment not fitted with an oil decanter.

- Drain the system as slowly as possible via the **LOW PRESSURE** valve, so as not to lose any oil.
- No more oil should be added when filling the system with **R 134.a** fluid.

##### b) Using draining/filling equipment fitted with an oil decanter.

- Drain the **R 134.a** fluid from the system in accordance with the instructions in the equipment handbook.
- Measure the amount of oil recovered.
- Add the same amount of **NEW** oil when filling the system with **R 134.a** fluid.

##### c) Replacing a compressor.

- Remove the old compressor, drain it and measure the oil quantity.
- Drain the new compressor (supplied full), so that the same amount of **NEW** oil is left in the compressor as was in the old compressor.
- No more oil should be added when filling the system with **R 134.a** fluid.

## SPECIAL FEATURES : AIR CONDITIONING SYSTEM (R 134.a)

### Checking the compressor oil level (continued)

#### 2) Slow leak.

- Slow leaks do not lead to oil loss, therefore the same procedure should be followed as if there was no leak at all.

#### 3) Fast leak.

This type of leak causes both oil loss as well as allowing air to enter the system.

It is therefore necessary to :

- Replace the dryer.
- Drain as much oil as possible (when replacing the faulty component).

Either before or during filling of the system with **R 134.a** fluid, introduce **80 cc** of **NEW** oil into the system.

CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM	
CHECKING TEMPERATURES	
<p style="text-align: center;"><b>TOOLS</b></p> <p>Two thermometers</p> <p><b>Preliminary conditions.</b></p> <p>Position of the air conditioning controls :</p> <ul style="list-style-type: none"> <li>- Maximum cold air.</li> <li>- Air blower in maximum position.</li> <li>- Air distributor in "<b>ventilation</b>" position, with the dashboard vents open.</li> <li>- Air intake flap in "exterior air" position.</li> </ul> <p><b>Conditions and vehicle equipment.</b></p> <ul style="list-style-type: none"> <li>- Boot closed.</li> <li>- Doors and windows shut.</li> <li>- Ensure the vehicle is in a sheltered area (away from wind, sun, etc.).</li> </ul>	<p><b>Checks.</b></p> <p>If all these conditions are met, take the following action :</p> <ul style="list-style-type: none"> <li>- Start the engine, with the air conditioning off, and wait for the cooling fan first speed to cut in.</li> <li>- Operate the air conditioning and set the engine speed to <b>2500 rpm</b>.</li> </ul> <p><b>NOTE</b> : If the ambient temperature reaches <b>40°C</b>, the engine speed will return to <b>2000 rpm</b> in order to prevent the compressor from being cut off by the High Pressure safety device (Pressostat).</p> <p>After the air conditioning has been on for three minutes, measure :</p> <ul style="list-style-type: none"> <li>- the ambient temperature in the workshop,</li> <li>- the temperature of the air coming from the central vents.</li> </ul> <p>Compare the two values using the table on the following page.</p>

CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM								
CHECKING TEMPERATURES (continued)								
			Vehicle using R134.a fluid (Compressor with variable capacity)					
Ambient temperature in °C			40	35	30	25	20	15
Air temperature from the central vents in °C	Vehicle	Engine types						
	C3	All types	18.5 ± 2	15 ± 2	12.5 ± 2	10 ± 2	8.5 ± 2	6.5 ± 2

## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### CHECKING PRESSURES

**TOOLS** - 1 Charging station.  
- 2 Thermometers.

Once the preliminary conditions, vehicle equipment and checks have been fulfilled (see table) : After the air conditioning has been on for three minutes, record the following parameters :

#### **CHECK**

- The temperature of the air coming from the central vents (see table).
- The High Pressure.
- The Low Pressure.

Compare the values recorded with the table below, or the graphs.

			Vehicle using R134.a fluid (Compressor with variable capacity)					
Ambient temperature in °C			40	35	30	25	20	15
	Vehicle	Engine types						
High pressure (Bars)	C3	All types	14.5 ± 2	17.6 ± 2	20 ± 2	21.4 ± 2	23.6 ± 2	25.2 ± 2
Low pressure (Bars)			2.4 ± 0.2		2.5 ± 0.2	2.8 ± 0.2	3 ± .02	3.5 ± .02

**Note :** For vehicles with **RFTA (1)**, disconnect the connector of the air inlet motor, ensuring that it is in the outside air position.

Reminder: The above results are expressed in absolute bars. If using equipment for measuring relative pressure (e.g. manifold), the value can be increased in order to bring it up to absolute bars.

(1) RFTA = Fully automatic air conditioning.



## CHECKING THE EFFICIENCY OF THE AIR CONDITIONING SYSTEM

### CHECKING PRESSURES (continued)

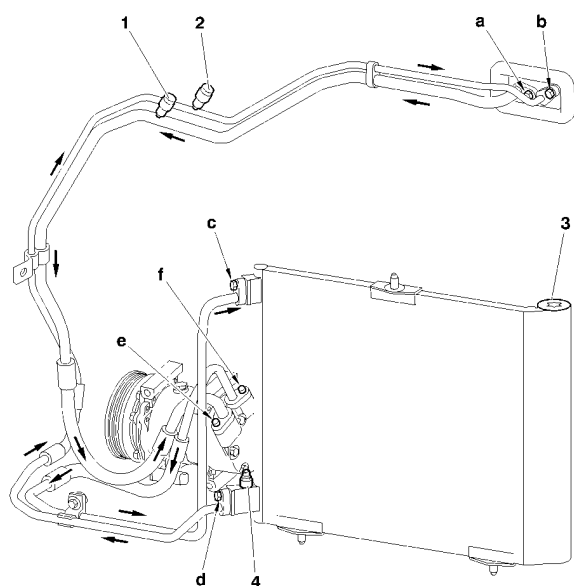
	Low pressure too low	Low pressure normal	Low pressure too high
<b>High pressure too low</b>	<ul style="list-style-type: none"> <li>- Insufficient fluid charge.</li> <li>- Constriction of the HP system.</li> <li>- Dirty pressure control valve.</li> </ul>	<ul style="list-style-type: none"> <li>- Cooling fan speed unsuitable.</li> <li>- Faulty compressor.</li> </ul>	<ul style="list-style-type: none"> <li>- Faulty pressure control valve.</li> <li>- Faulty compressor.</li> </ul>
<b>High pressure normal</b>	<ul style="list-style-type: none"> <li>- Faulty compressor.</li> <li>- Dirty evaporator.</li> </ul>	<ul style="list-style-type: none"> <li>- Circuit normal.</li> </ul>	<ul style="list-style-type: none"> <li>- Cooling fan speed unsuitable.</li> </ul>
<b>High pressure too high</b>	<ul style="list-style-type: none"> <li>- Faulty pressure control valve.</li> <li>- System blocked.</li> <li>- Water in the system.</li> </ul>	<ul style="list-style-type: none"> <li>- Presence of solid matter in the system.</li> <li>- Dirty condenser.</li> </ul>	<ul style="list-style-type: none"> <li>- Excessive fluid charge.</li> <li>- Dirty condenser.</li> <li>- Faulty pressure control valve.</li> <li>- Cooling fan speed unsuitable.</li> </ul>

**Checking the pressure at temperatures between 15°C and 35°C for information only.**

In general, the pressure should be approximately:

- For **R134.a** fluid, less than **2 Bars** (Low pressure), and between **13 and 24 Bars** (High pressure).

## AIR CONDITIONING SYSTEM R 134.a



(1) Low pressure valve.

(2) High pressure valve.

(3) Filter.

(4) Pressostat

### Tightening torque m.daN

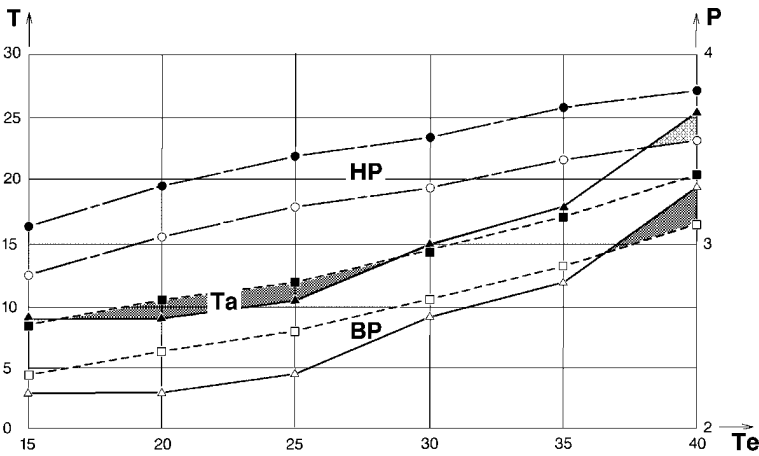
(a)	: 0.6.
(b)	: 0.6.
(c)	: 0.6.
(d)	: 0.6.
(e)	: 0.6.
(f)	: 0.6.

C5HP17SP

AIR CONDITIONING SYSTEM R 134.a	
Testing procedure	
<p><b>Conditions inside the vehicle</b></p> <p>Positions of the air conditioning controls :</p> <ul style="list-style-type: none"> <li>Maximum cold.</li> <li>Maximum blower power.</li> <li>Air distribution on «ventilation» with the air vents open.</li> <li>Position the air inlet flap to outside air.</li> </ul> <p><b>WARNING:</b> For <b>RFTA (1)</b>, disconnect the air inlet motor connector, first ensuring that it is in the outside air position.</p> <p><b>(1) RFTA</b> = Fully automatic air conditioning.</p> <p><b>Test procedure.</b></p> <p>When all these conditions are met, proceed in the following order:</p> <p>Measure the temperature in the workshop approx. one metre in front of the vehicle's air inlet grille.</p> <p>Start the engine (without the air conditioning, or the blower, operating) and wait for the cooling fan slow speed to trigger (should the engine temperature not rise sufficiently, it is permissible to increase the engine speed to <b>2000 rpm</b>).</p> <p>Once it is sufficiently hot in the engine compartment, return the engine to idle and commence the test.</p>	<p>Switch on the air conditioning and adjust the engine speed to <b>2500 rpm</b>. In an ambient temperature of <b>40°C</b>, the engine speed will be brought down to <b>2000 rpm</b>, in order for the pressure safety threshold to cut off the compressor.</p> <p>For further temperatures/pressures: see Tables on pages <b>224</b> and <b>225</b>, and Graph on page <b>229</b>.</p> <p>After <b>3 minutes</b> of operation, note down the following 3 parameters:</p> <ul style="list-style-type: none"> <li>- The temperature of the blown air coming out of the 2 central air vents (take the average).</li> <li>- The high pressure, via the intermediary of the clickfit union (at the pressure reducer inlet).</li> <li>- The low pressure, via the intermediary of the clickfit union (at the pressure reducer outlet).</li> </ul> <p><b>NOTE:</b> The low and high pressures are absolute pressures.</p> <p>When measuring the blown air temperatures, avoid any contact between the thermocouple and the air vents.</p> <p>At the conclusion of the test involving vehicles with «<b>RFTA</b>», do not forget to reconnect the air inlet motor connector.</p>

# AIR CONDITIONING SYSTEM R 134.a

## Checking the air conditioning system



### Key.

- T/P = Average temperature (°C) at the air vents / high pressure (Bars).
- P = Low pressure (Bars).
- Te = Exterior temperature (C°).
- HP = Pressure at compressor outlet (Bars).
- BP = Pressure at compressor inlet (Bars).
- TA = Average temperature (°C) of air blown from the central vents.

C5HP18GD