TECHNICAL NOTE : ENGINE OIL CAPACITIES

CAUTION : Always check the oil level using the dipstick.

Oil change interval : Refer to the maintenance schedule.

N.B. : Values given as an indication.

1. Petrol engines

1.1. Engines types EW

Engine type	EW7A - EW10A	EW7J4 - EW10J4 - EW10D - EW12J4 - EW12A	EW10J4
Oil capacity without replacement of the filter cartridge	4,75 litres	4 litres	5 litres
Oil capacity with replacement of the filter cartridge	5 litres	4,25 litres	5,25 litres
Capacity between minimum and maximum on the oil gauge	1,7 litre	1,7 litre	1,5 litre

1.2. Engines types EP

Engine type	EP3 - EP3C - EP6 - EP6C - EP6CB - EP6CM - EP6DT - EP6DTS - EP6CDT - EP6CDTM - EP6CDTMD - EP6CDTX
Oil capacity without replacement of the filter cartridge	4 litres
Oil capacity with replacement of the filter cartridge	4,25 litres
Capacity between minimum and maximum on the oil gauge	1,2 litre

1.3. 4A92 - 4B11 - 4B12 engines

	4A92	4B11	4B12
Oil capacity without replacement of the filter cartridge	4 litres		4,25 litres
Oil capacity with replacement of the filter cartridge	4,2 litres	4,3 litres	4,5 litres
Capacity between minimum and maximum on the oil gauge	-		

1.4. Engines types EB

Engine type	EB0 - EB2 - EB2M
Oil capacity without replacement of the filter cartridge	3 litres
Oil capacity with replacement of the filter cartridge	3,5 litres
Capacity between minimum and maximum on the oil gauge	1 litre

1.5. Engines types EC5

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Engine type	EC 5M FF	EC 5M
Oil capacity without replacement of the filter cartridge	3 litres	
Oil capacity with replacement of the filter cartridge	3,25 litres	
Capacity between minimum and maximum on the oil gauge	1,5 litre	

1.6. 384F engine

Engine type	384F
Oil capacity without replacement of the filter cartridge	2,75 litres
Oil capacity with replacement of the filter cartridge	3 litres
Capacity between minimum and maximum on the oil gauge	1 litre

1.7. Engines types ES9

Engine type	ES9J4S	ES9A - ES9J4	ES9A
Engine legislative type	XFX	XFV - XFU - XFW	XFX
Oil capacity without replacement of the filter cartridge	5 litres	4,5 litres	4,25 litres
Oil capacity with replacement of the filter cartridge	5,25 litres	4,75 litres	4,5 litres
Capacity between minimum and maximum on the oil gauge	2 litres		

1.8. ET3J4 engine

Engine type	ET3J4
Oil capacity without replacement of the filter cartridge	2,75 litres
Oil capacity with replacement of the filter cartridge	3 litres
Capacity between minimum and maximum on the oil gauge	1,5 litre

1.9. Engines types TU

Engine type	TU1 - TU3	TU5 - TU9M
Oil capacity without replacement of the filter cartridge	2,75 litres	3 litres
Oil capacity with replacement of the filter cartridge	3 litres	3,25 litres
Capacity between minimum and maximum on the oil gauge	1,5 litre	1,5 litre

2. Diesel engines

2.1. Engines types DV

Engine type	DV4TD - DV4TED	DV4C - DV6A - DV6AU - DV6B - DV6BU - DV6TED4 - DV6C - DV6CM - DV6DTED - DV6DBM - DV6ETED - DV6ETEDM	DV6UTED
Oil capacity without replacement of the filter cartridge	3,25 litres	3,25 litres	4,75 litres
Oil capacity with replacement of the filter cartridge	3,75 litres	3,75 litres	5 litres
Capacity between minimum and maximum on the oil gauge	1,8 litre	1,5 litre	1,5 litre

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2.2. Engines types DW10

Engine type	DW10TD - DW10ATED4	DW10BTED4 - DW10UTED4
Oil capacity without replacement of the filter cartridge	4,5 litres	5 litres
Oil capacity with replacement of the filter cartridge	4,75 litres	5, 25 litres
Capacity between minimum and maximum on the oil gauge	1,4 litre	2 litres

Engine type	DW10CTED4	DW10CTED4
RPO number	To 11918	From 11919
Colour : dipstick	Handle : Yellow	Handle : Orange
Engine type	DW10CTED4	
Engine legislative type	RHD-RHE-RHH	
Oil capacity without replacement of the filter cartridge	5,25 litres	4,75 litres
Oil capacity with replacement of the filter cartridge	5,5 litres	5 litres
Capacity between minimum and maximum on the oil gauge	1,7 litre	1 litre

Engine type	DW10CD - DW10CE	DW10DTED4
Engine legislative type	AHZ - AHY	RHB
Oil capacity without replacement of the filter cartridge	4,75 litres	
Oil capacity with replacement of the filter cartridge	5 litres	
Capacity between minimum and maximum on the oil gauge	1 litre	

2.3. Engines types DW12

Engine type	DW12C - DW12BTED4 - DW12UTED - DW12MTED4	DW12TED
Oil capacity without replacement of the filter cartridge	5 litres	4,5 litres
Oil capacity with replacement of the filter cartridge	5,25 litres	4,75 litres
Capacity between minimum and maximum on the oil gauge	1,7 litre	

2.4. F30DTE engine

Engine type F30DTE		
	EURO 4	EURO 5
Oil capacity without replacement of the filter cartridge	7,6 litres	8 litres
Oil capacity with replacement of the filter cartridge	8,6 litres	9 litres
Capacity between minimum and maximum on the oil gauge	1 litre	1 litre

2.5. DT17ted4 engine

Engine type DT17TED4		
Designation	By gravity	By suction
Oil capacity without replacement of the filter cartridge	5,25 litres	5,5 litres
Oil capacity with replacement of the filter cartridge	5,5 litres	5,75 litres
Capacity between minimum and maximum on the oil gauge	1,75 litre	1,75 litre

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2.6. Engines types F28

Engine type F28D - F28DT - F28DTCR - F28DTSE		
Designation	8140.63 - 8140.43-	8140.23 - 8140.43 S
Oil capacity without replacement of the filter cartridge	6 litres	7 litres
Oil capacity with replacement of the filter cartridge	4,7 litres	5,7 litres
Capacity between minimum and maximum on the oil gauge	-	-

2.7. 4N13 engine

Engine type	4N13
Oil capacity without replacement of the filter cartridge	5 litres
Oil capacity with replacement of the filter cartridge	5,3 litres

2.8. DW8 engine

Engine type DW8		
Designation	Without air conditioning	With air conditioning
Oil capacity without replacement of the filter cartridge	4,5 litres	4,25 litres
Oil capacity with replacement of the filter cartridge	4,75 litres	4,5 litres
Capacity between minimum and maximum on the oil gauge	1,5 litre	

2.9. DT20C engine

Engine type DT20C		
Designation	By gravity	By suction
Oil capacity without replacement of the filter cartridge	6,1 litres	6,35 litres
Oil capacity with replacement of the filter cartridge	6,25 litres	6,5 litres
Capacity between minimum and maximum on the oil gauge	1,75 litre	

2.10. 2,3 SOFIM engine

Engine type	2,3 SOFIM
Oil capacity without replacement of the filter cartridge	5,9 litres
Oil capacity with replacement of the filter cartridge	6,5 litres
Capacity between minimum and maximum on the oil gauge	-

2.11. PUMA 2.2 DTE engine

Engine type PUMA 2.2 DTE						
	EURO 4			EURO 5		
Engine legislative type	4HV	4HU	4HM	4HG	4HH	4HJ
Oil capacity without replacement of the filter cartridge	5,75 litres			5,9 litres		
Oil capacity with replacement of the filter cartridge	6 litres			6,2 litres		
Capacity between minimum and maximum on the oil gauge	1,5 litre			1,5 litre		

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2.12. F13DTE engine

Engine type	F13DTE
Oil capacity without replacement of the filter cartridge	3 litres
Oil capacity with replacement of the filter cartridge	3,2 litres
Capacity between minimum and maximum on the oil gauge	-

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TECHNICAL NOTE : GENERAL ENGINE INFORMATION

1. Engine code



Figure : E1AB07LD

(1) : First 2 characters of the engine code.

First 2 characters	engine	Commercial designation
CF-	384F	1,0 l 12V
ZM-	EB0	1.0 i VTI
HF-	TU1	1,1 l
HM-	EB2	1.2 i 16v VTI
KF- K6-	TU3	1,4 l
KF-	ET3	1.4 16V
NF- N6-	TU5	1.6 16V
NF-	EC5	1.6 l 16V
NK-	4A92	1,6 l 16V
AF-	4B11	2,0 l 16V
SF-	4B12	2,4 l 16V
8F-	EP3	1.4 VTi 16V
5F-	EP6	1.6 VTi 16V
		1.6 THP 16V

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6F-	EW7	1,8 l 16V
RF-	EW10	2,0 l 16V
3F-	EW12	2,2 l 16V
XF-	ES9	V6 3,0 l 24V
8H-	DV4	1,4 l HDi
9H-	DV6	1,6 l HDi
6H-	4N13	1,8 l HDI
RH-	DW10	2.0 HDi 16v
4H-	DW12	2.2 HDi 16v
	P22DTE	2.2 HDI (Puma) engine type
F1-	F30DT	3.0 HDi (Sofim engine type)
UH-	DT17	2.7 HDi 24v
X8-	DT20	3.0 HDi 24v

2. petrol engines

	384F	EB0	TU1	TU3						
Engine legislative type	CFA	ZMZ	HFX/ HFV	KFX	KFV	K6D/ K6F	K6E	KFT	KFW	KFS
Capacity (cc)	998	999	1124	1360						
Bore (mm)	71	71	72	75						
Travel (mm)	84	84	69	77						
Maximum power : (KW EEC)	50	50	44	55	54	53		54	55	
Engine speed at max. power (r.p.m.)	6000	6000	5500		5400	5300	5400	5200	5500	
Maximum torque : (daNm EEC)	9,3	9,5	9,4	11,1	11,8				12	
Engine speed at max. torque (r.p.m.)	3600	3000	3300	3400	3300	3400	3300		3400	2800

	ET3	EB2	EB2 m	TU5						
Engine legislative type	KFU	HMZ	HMY	NFR	NFZ	N6A	NFV	NFV	NFU	NFS
Cubic capacity (cc)	1360	1199		1587						
Bore (mm)	75	75		78						
Travel (mm)	77	90,5		77						
Maximum power : (KW EEC)	65	60	52	66	65	78		70	80	90
Engine speed at max. power (r.p.m.)	5250	5750	5500	5800	5600			5700	5800	6500
Maximum torque : (daNm EEC)	13,3	11,8	11	13,2	13,5		14,2	13,5	14,7	14,3
Engine speed at max. torque (r.p.m.)	3250	2750	3000	2500	3000		4000	3000	4000	3750

	4A92	4B11		4B12	EP3/ EP3C	
Engine legislative type	NKZ	AFZ	AFY	SFZ/ SFY	8FS/ 8FP	8FR
Cubic capacity (cc)	1590	1998		2359	1397	
Bore (mm)	75	86		88	77	
Travel (mm)	90	86		97	75	
Maximum power : (KW EEC)	86	108	113	125	70	72
Engine speed at max. power (r.p.m.)	6000					
Maximum torque : (daNm EEC)	15,4	19,9	19,8	23,2	13,6	
Engine speed at max. torque (r.p.m.)	4000	4200	4250	4100	4000	

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	EP6/ EP6C			EP6DT/ EP6CDT				EP6DTS		
Engine legislative type	5FK	5FP/ 5FJ	5FW/ 5FS/ 5FL	5FT	5FX/ 5FN/ 5F4/ 5FE	5FV/ 5FR	5FM	5FY	5FF	5FI
Capacity (cc)	1598									
Bore (mm)	77									
Travel (mm)	85									
Maximum power : (KW EEC)	72	84	88	103	110	115	120	128	149	152
Engine speed at max. power (r.p.m.)	6000	5200	6000	5800	6000					
Maximum torque : (daNm EEC)	15,2	16		24					27,5	
Engine speed at max. torque (r.p.m.)	3500	4250		1400				1600	2000	

	EP6CDTS	EP6CDTX	EW7A		EW10A		
Engine legislative type	5FU	5FU	6FZ	6FY	RFN	RFH	RFJ
Capacity (cc)	1598		1749	1749	1997		
Bore (mm)	77		82,7	82,7	85		
Travel (mm)	85		81,4	81,4	88		
Maximum power : (KW EEC)	135	147	85	92	100	103	
Engine speed at max. power (r.p.m.)	6000	5800	5500	6000			
Maximum torque : (daNm EEC)	25,5	27,5	16	17	19	18	20
Engine speed at max. torque (r.p.m.)	1600	1700	4000	3750	4100	4000	

	EW12J4	ES9		EC5
Engine legislative type	3FZ	XFW	XFV	NFP
Capacity (cc)	2230	2946		1587
Bore (mm)	86	87		78,5
Travel (mm)	96	82,6		82
Maximum power : (KW EEC)	116	150	155	85
Engine speed at max. power (r.p.m.)	5650	6000		6000
Maximum torque : (daNm EEC)	21,7	28,5	29	15
Engine speed at max. torque (r.p.m.)	3900	3750		4000

3. diesel engines

	DV4					DV6					
Engine legislative type	8HT	8HX	8HS/ 8HP/ 8HR	8HZ	8HY	9HW	9HN/ 9HK	9HT	BHZ	BHY	
Capacity (cc)	1398					1560					
Bore (mm)	73					75					
Travel (mm)	82					88,3					
Maximum power : (KW EEC)	40	50			66	55			84	73	
Engine speed at max. power (r.p.m.)	4000					4000			3750		
Maximum torque : (daNm EEC)	13	15	16	16	20	17,5	18,5		30	25,4	
Engine speed at max. torque (r.p.m.)	1750			2000	1750	1750	1500	1750			

	DV6	DW8

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Engine legislative type	9HH/ 9HM	9HF/ 9HE	9HU	9HX/ 9HV	9HP/ 9HJ	9HY/ 9HZ	9HL	9HR	9HG	WJZ/ WJY
Capacity (cc)	1560									1868
Bore (mm)	75									82,2
Travel (mm)	88,3									88
Maximum power : (KW EEC)	66				68	80	82		84	51
Engine speed at max. power (r.p.m.)	4000									4600
Maximum torque : (daNm EEC)	18	21,5	18	21,5	23	24		27	25,4	12,5
Engine speed at max. torque (r.p.m.)	1500		1750				1500	1750		2500

	DW10									
Engine legislative type	RHV	RHY	AHY	RHS/ RHM	RHT	RHG/ RHK	RHL	AHZ	RHJ	RHR/ RHD
Capacity (cc)	1997									
Bore (mm)	85									
Travel (mm)	88									
Maximum power : (KW EEC)	62	66	72	79	80	88	93	94	100	100
Engine speed at max. power (r.p.m.)	4000									
Maximum torque : (daNm EEC)	19,2	20,5	26	25	27	30	32	32	27	32
Engine speed at max. torque (r.p.m.)	1900		1500	1750		2000				

	DW10				DW12				
Engine legislative type	RHF	RHE	RHH	RHC	4HW	4HN/ 4HK	4HP	4HR	4HT
Capacity (cc)	1997				2179				
Bore (mm)	85				85				
Travel (mm)	88				96				
Maximum power : (KW EEC)	103	110	120		94	115	120	120	125
Engine speed at max. power (r.p.m.)	4000	3750	3850	3750	4000				
Maximum torque : (daNm EEC)	32	34		30	31,4	38	37	40	37
Engine speed at max. torque (r.p.m.)	2000			1750	2000		1500	1750	1500

	DW12		DT17	DT20		P22DTE		
Engine legislative type	4HS	4HL	UHZ	X8Y	X8Z	4HV/ A	4HU/ B	4HM
Capacity (cc)	2179		2720	2993	2993	2198		
Bore (mm)	85		81	84		86		
Travel (mm)	96		88	90		94,6		
Maximum power : (KW EEC)	125	150		177	175	74	88	95
Engine speed at max. power (r.p.m.)	4000	3500	4000	3800		2900	3500	
Maximum torque : (daNm EEC)	40	45	44	50	45	25	32	
Engine speed at max. torque (r.p.m.)	1750	2000	1900		1600	1500	2000	

	F30DT	4N13
Engine legislative type	F1CE0481D	6HZ
Capacity (cc)	2998	1798
Bore (mm)	88	83
Travel (mm)	94	83,1

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Maximum power : (KW EEC)	115	110
Engine speed at max. power (r.p.m.)	3500	4000
Maximum torque : (daNm EEC)	40	30
Engine speed at max. torque (r.p.m.)	1700	2000

4. Electric motors

	ION/C-Zero	Partner/Berlingo Venturi
Engine legislative type	ZKZ	-
Engine type	Triple-phase synchro motor	
Maximum power : (KW EEC)	49	42
Continuous power	35	-
Engine speed at max. power (r.p.m.)	2500 to 8000 rpm	-
Maximum torque : (daNm EEC)	18	
Engine speed at max. torque (r.p.m.)	0 to 2000 rpm	-

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TECHNICAL NOTE : ANCILLARY DRIVE BELT

1. Flexible ancillary drive belt

ESSENTIAL : Before removal and for any future reuse of the removed belt, the engine must be at ambient temperature (below 30°C) ; In all other cases : Replace the flexible ancillary drive belt .

CAUTION : Mark the direction of rotation of the ancillary drive belt before removing it.

CAUTION : If re-using the existing accessories drive belt, refit it in the correct fitting direction.

CAUTION : Check that the rollers turn freely (no play and no tightness).

2. Visual check

Check that the timing belt is free of cracks and traces of oil.
Check the absence of oil leaks (crankshaft and camshaft sealing rings).
Check the absence of coolant fluid leaks (Coolant pump).
Check that the track of the engine speed sensor target is not distorted or scratched.

N.B. : Replace any defective parts.

3. Petrol engines

3.1. 384F engine

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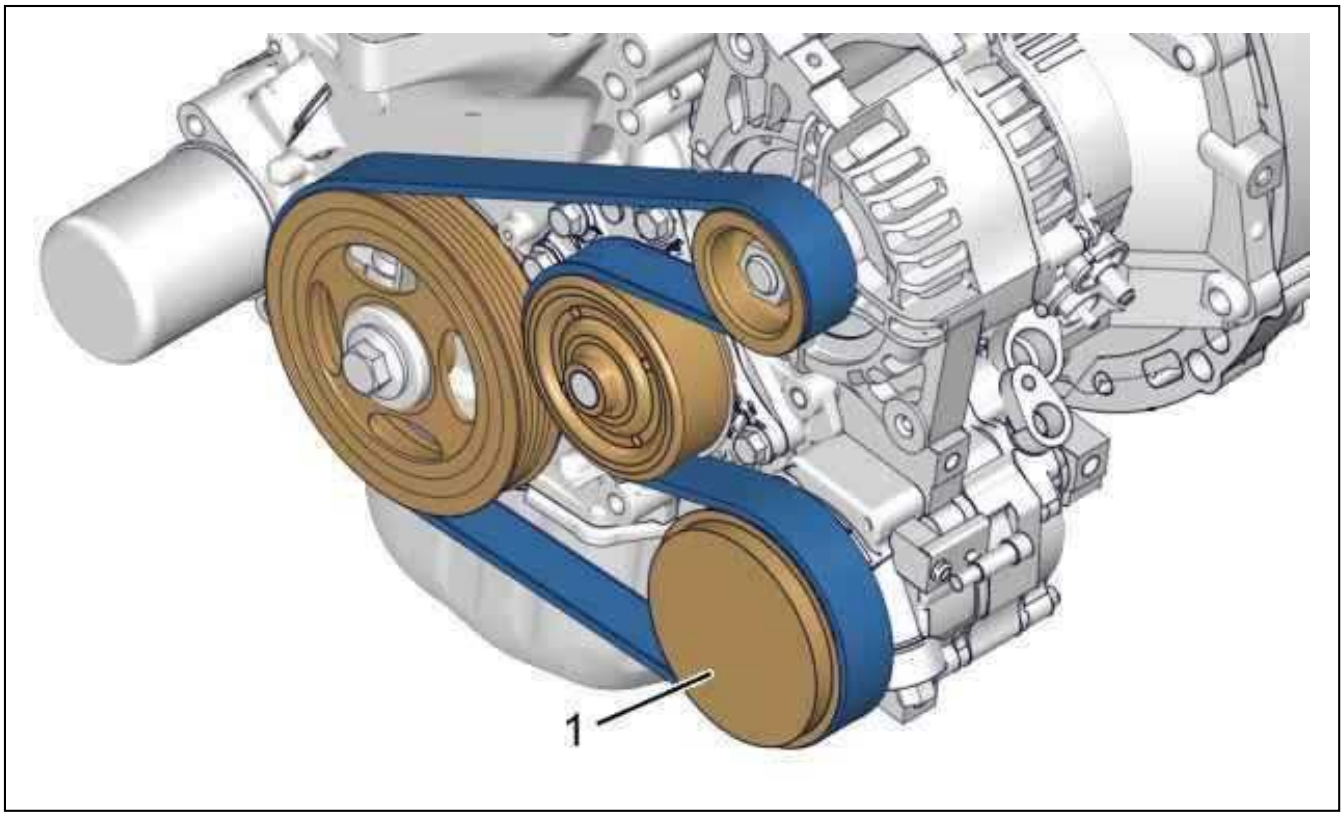


Figure : B1BB1E8D

all models.
(1) Air conditioning compressor (according to equipment).

3.2. TU1/TU3/TU5/ET3 engines

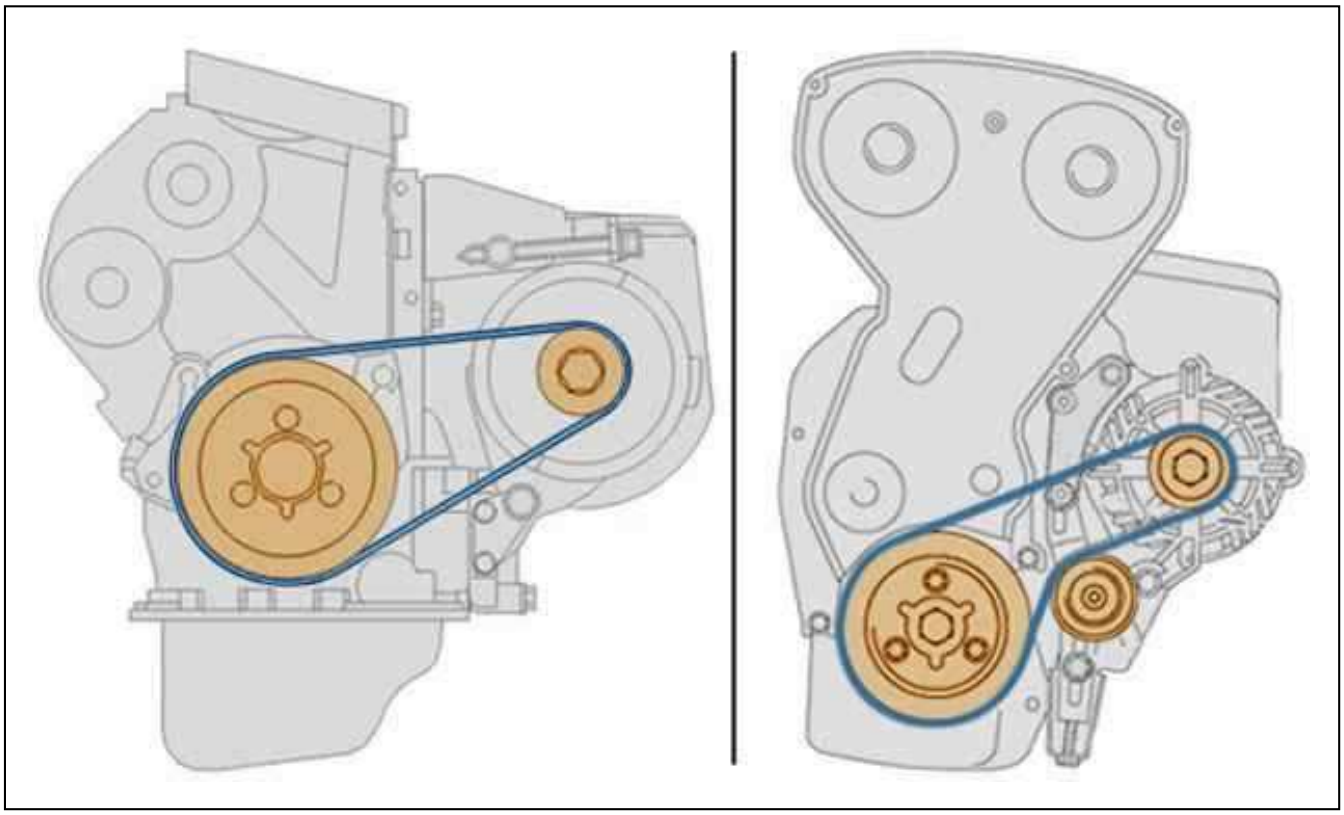


Figure : B1BB1E9D

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Without power steering and without air conditioning.

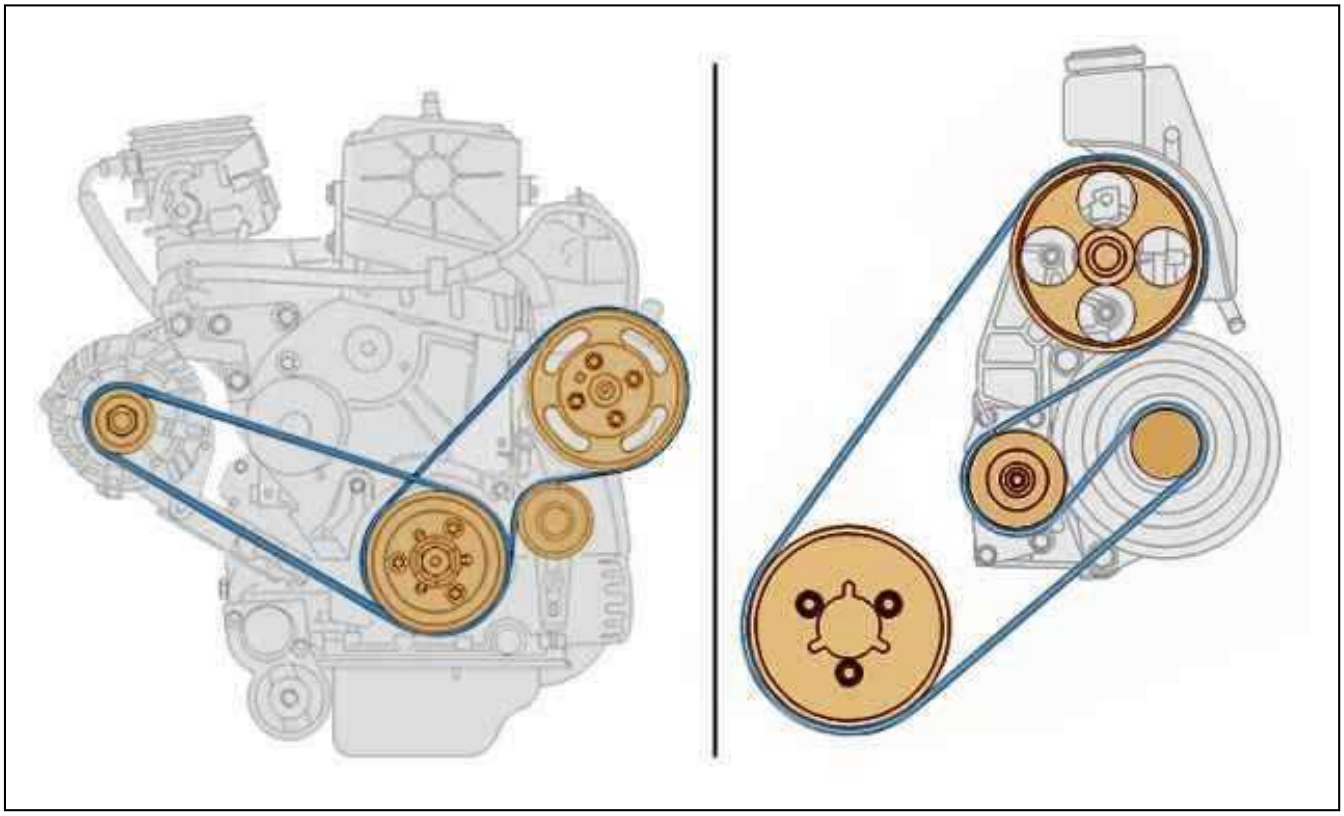


Figure : B1BB1EAD

Without air conditioning / With driven power steering pump.

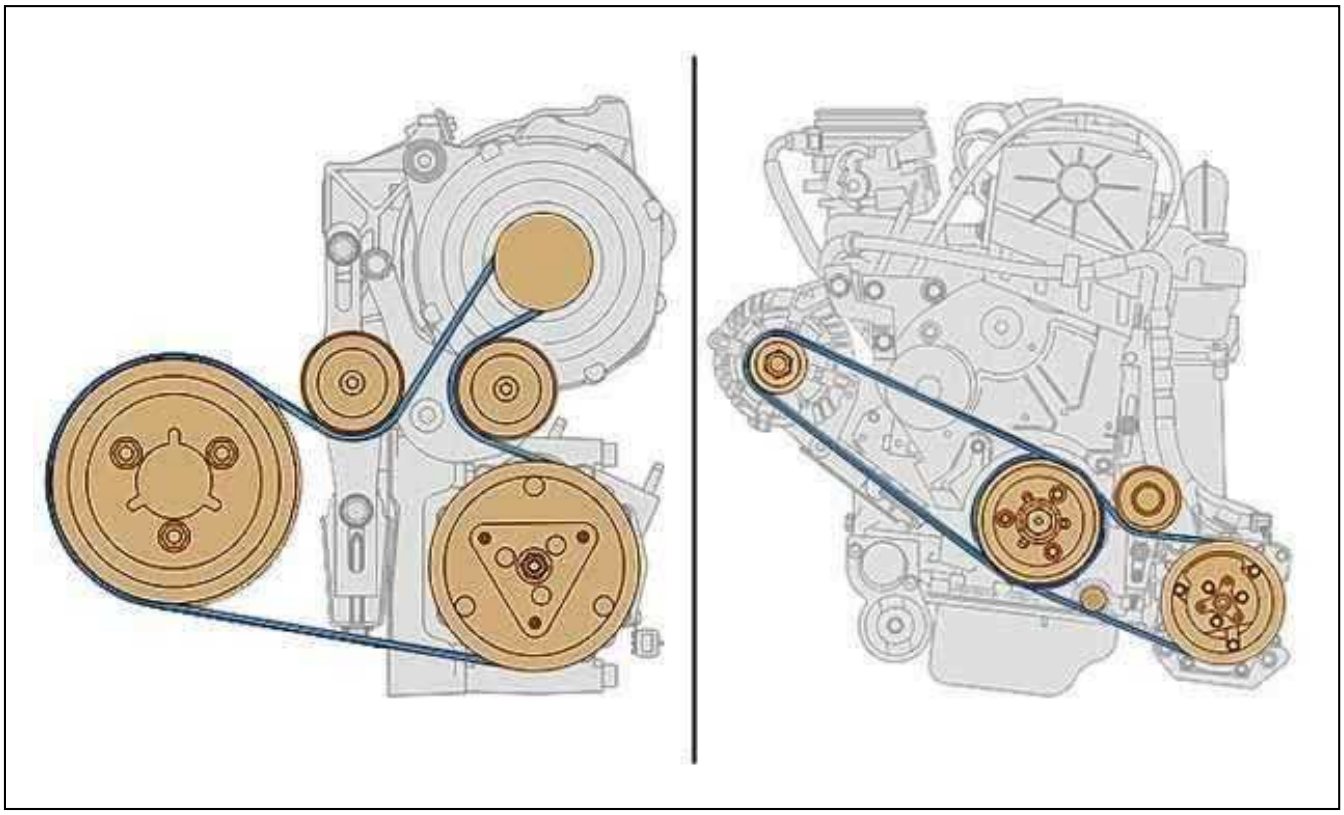


Figure : B1BB1EBD

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With air conditioning and without power steering.

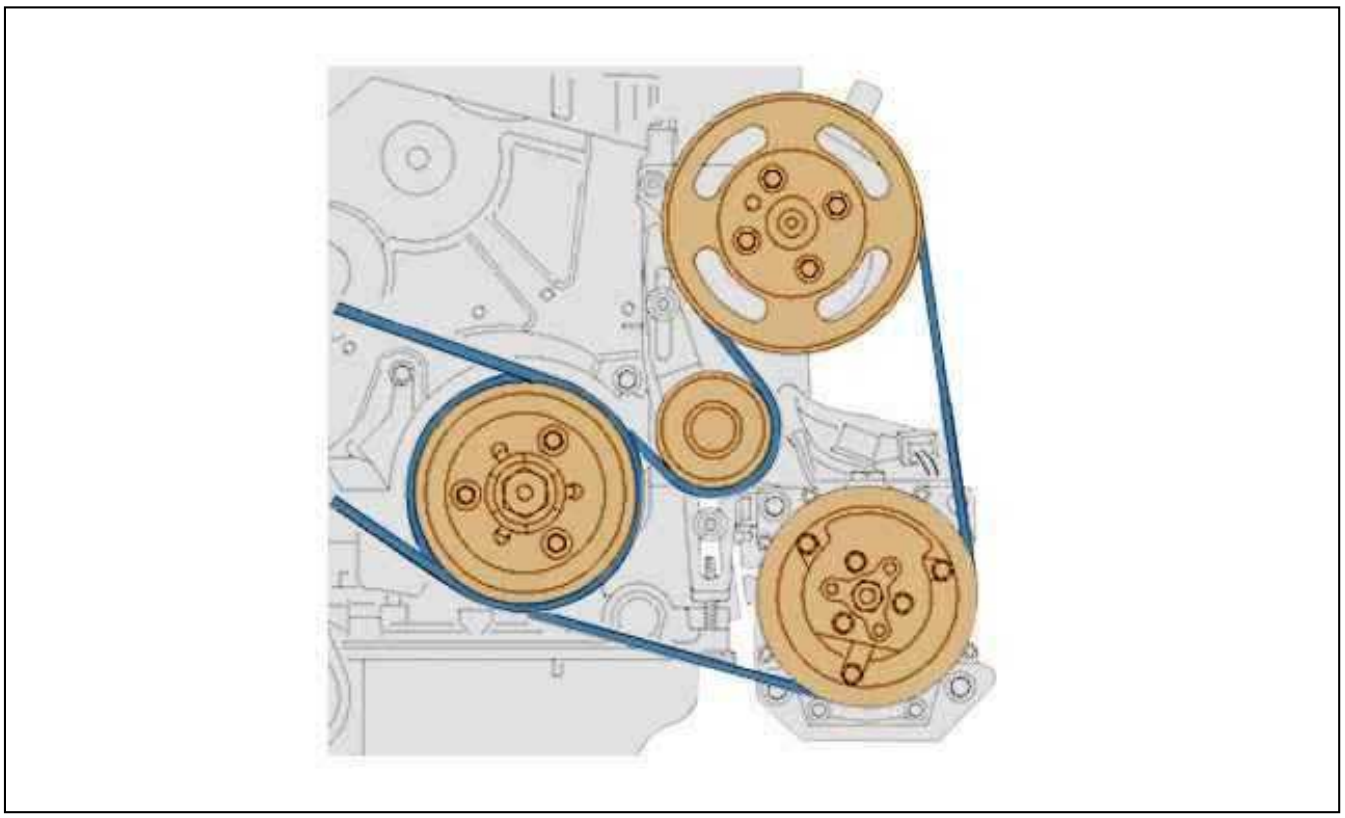


Figure : B1BB1ECD

With air conditioning / With driven power steering pump (Manual tension roller).

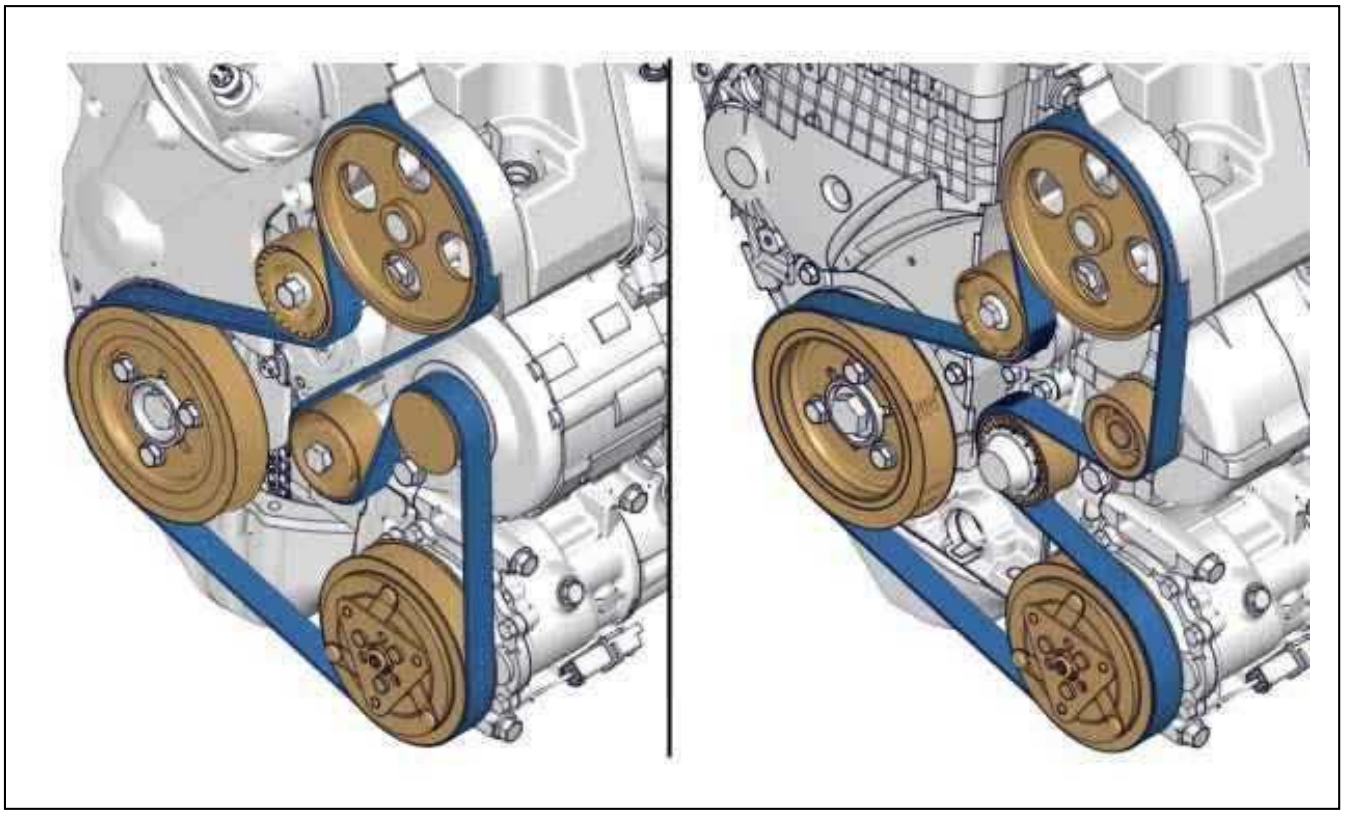


Figure : B1BB1EDD

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With air conditioning / With driven power steering pump (Dynamic roller tensioner).

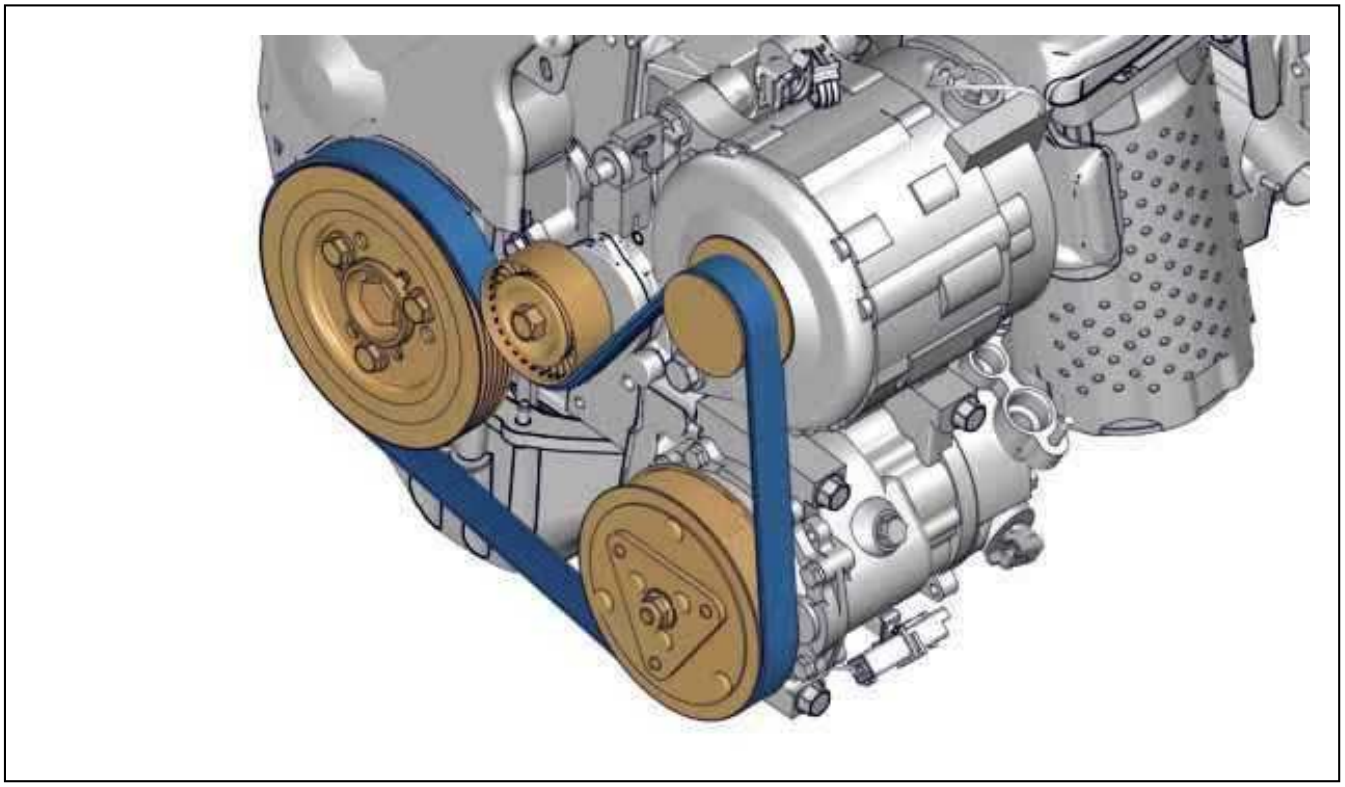
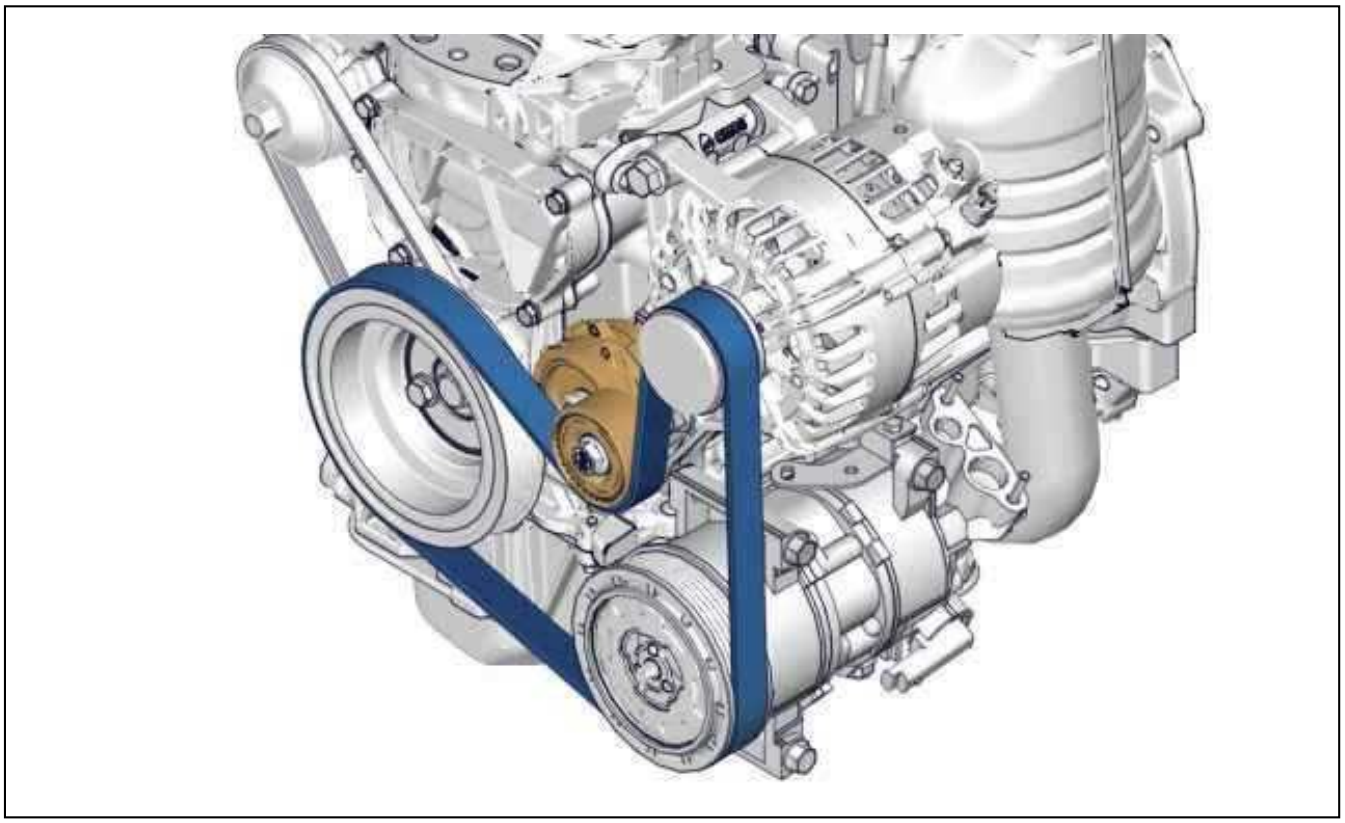


Figure : B1BB1EED

With air conditioning / Power steering electric pump assembly (Dynamic roller tensioner).

3.3. EB0/EB2 engines



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Figure : B1BB1LTD

With air conditioning.

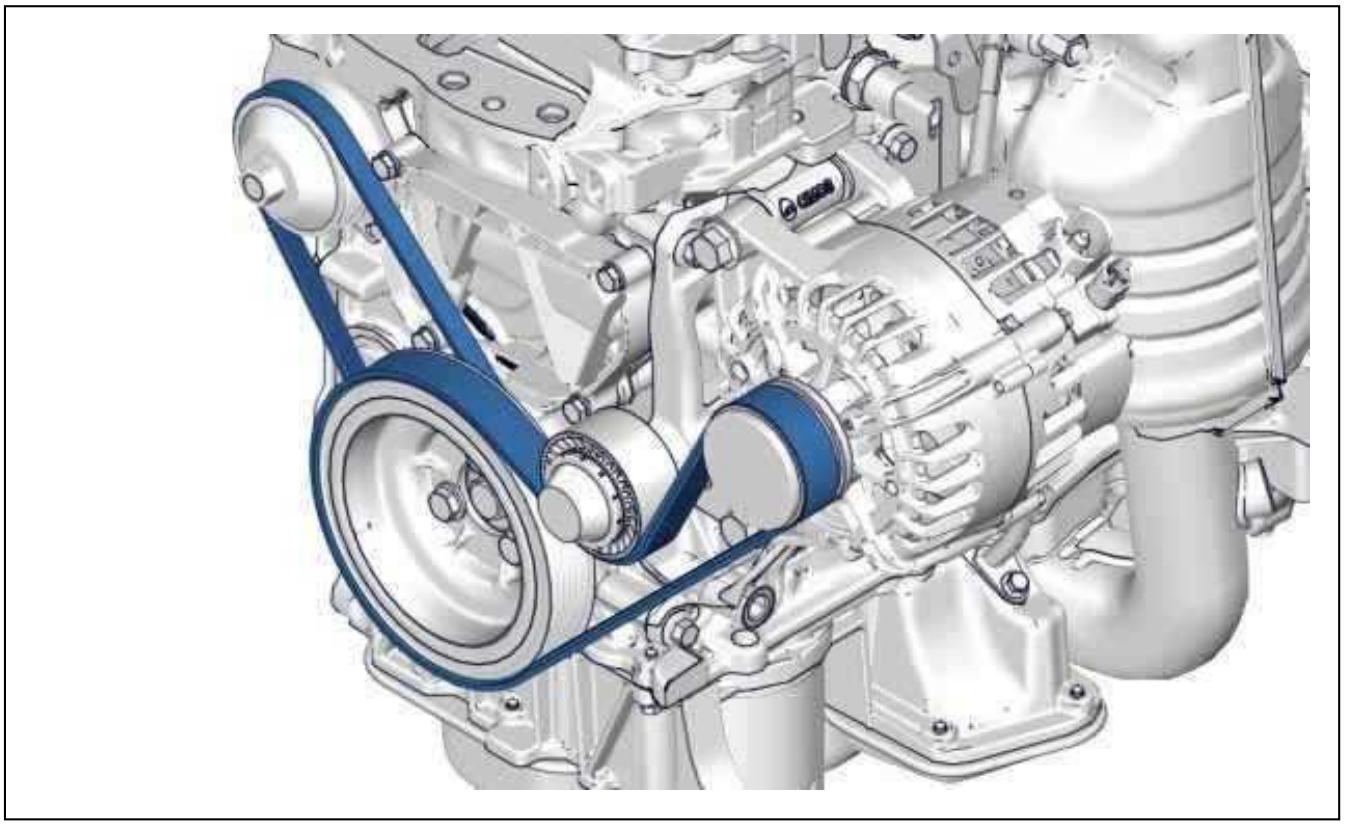


Figure : B1BB1LUD

Without air conditioning.

3.4. EP3/EP6 engines

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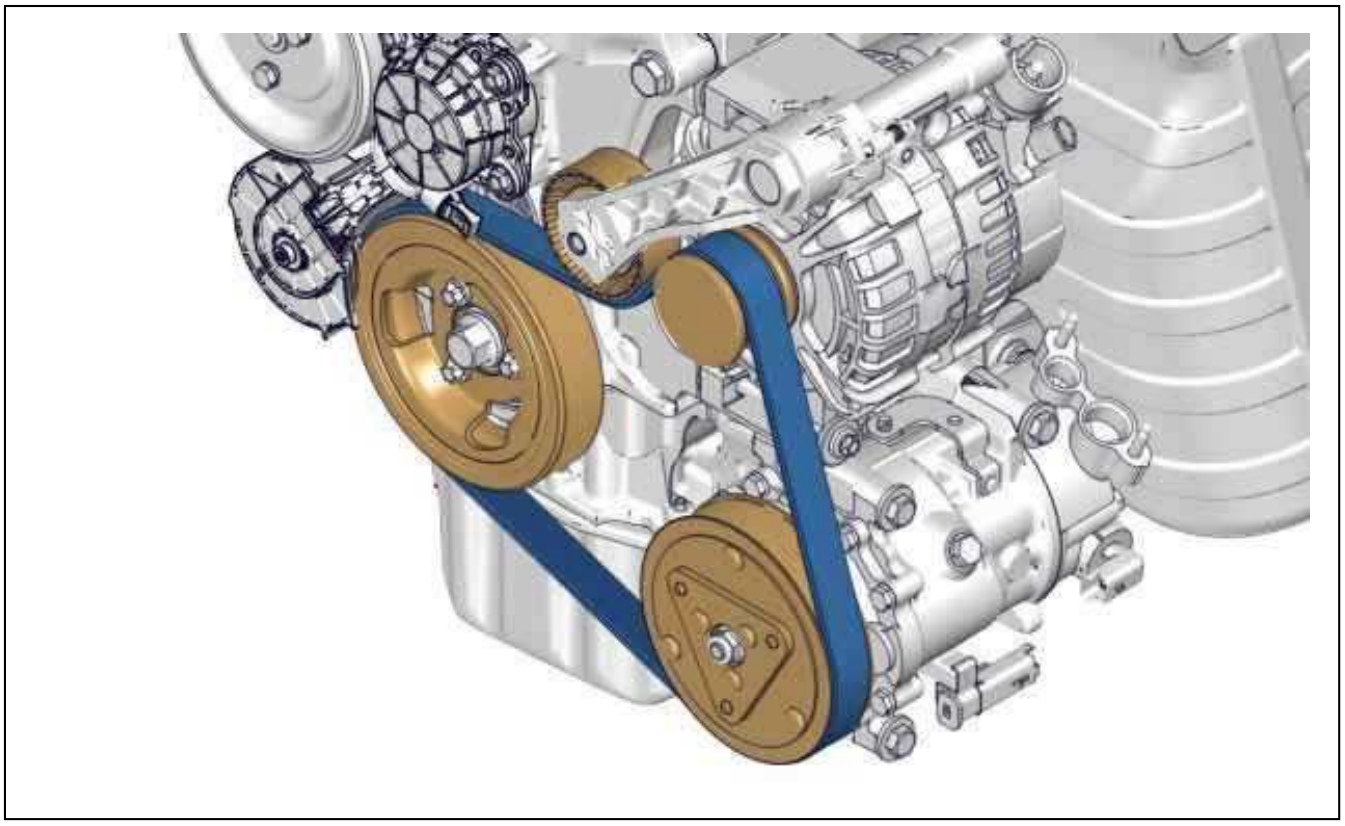
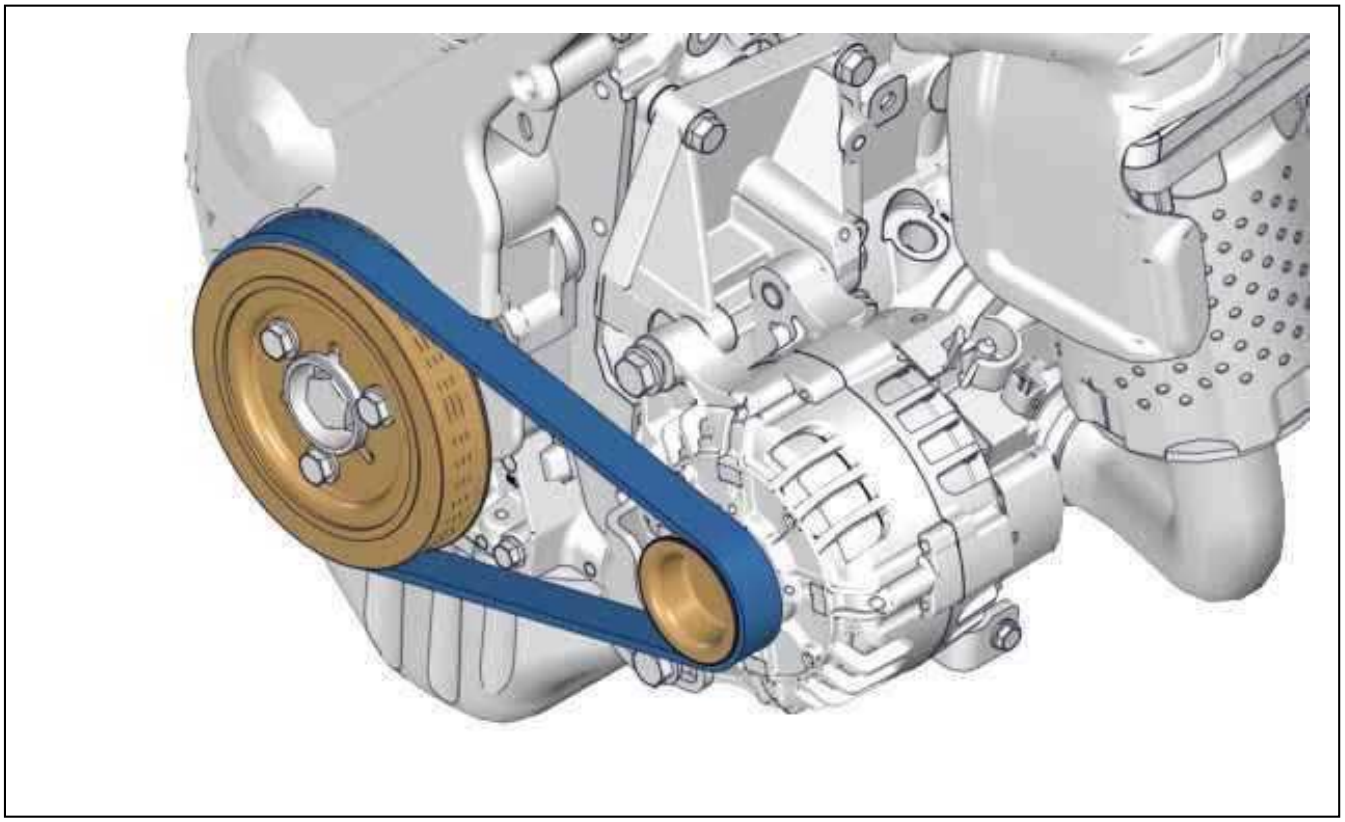


Figure : B1BB1EFD

all models.
(1) Air conditioning compressor (according to equipment).

3.5. EC5 engine



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Figure : B1BB1LVD

Without air conditioning.

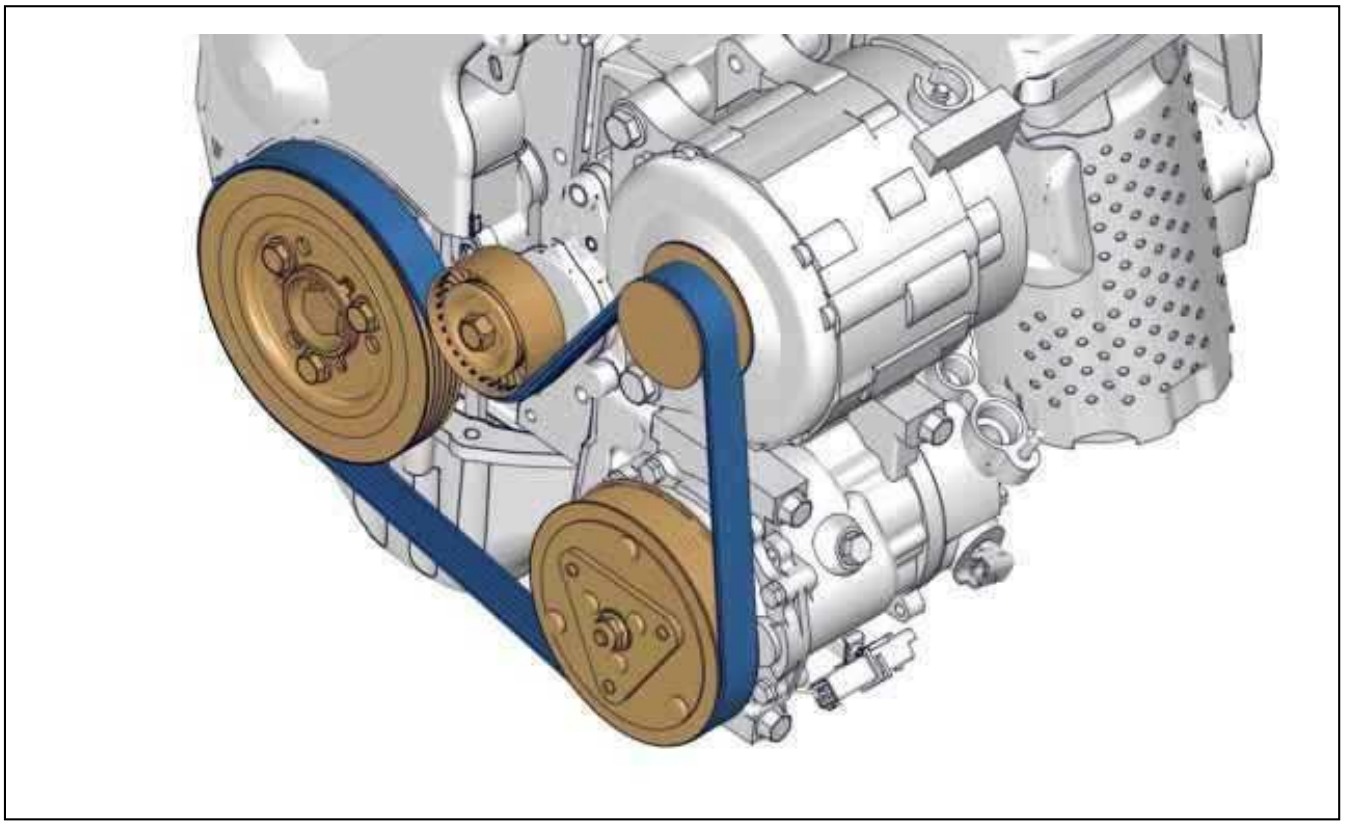


Figure : B1BB1LWD

With air conditioning.

3.6. EW7/EW10/EW12 engines

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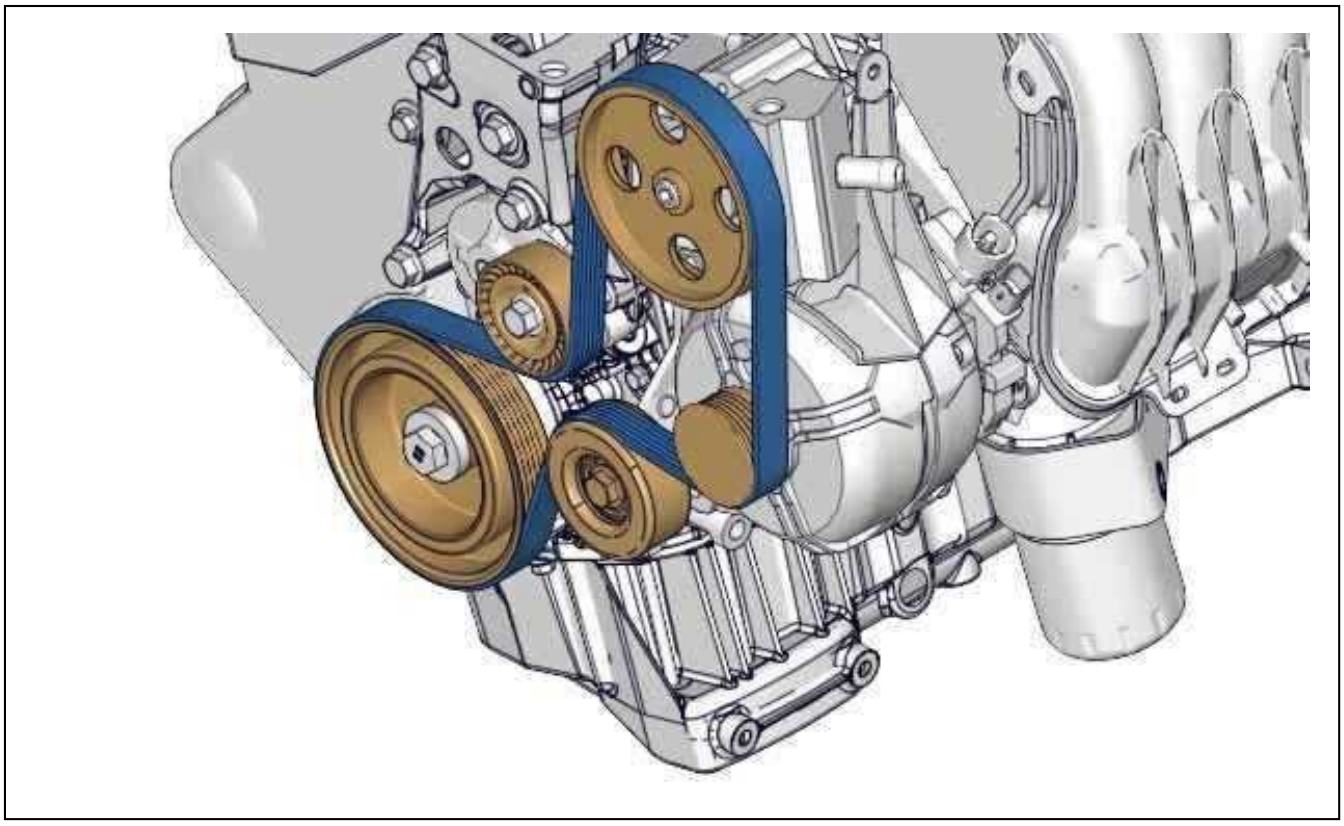


Figure : B1BB1EGD

Without air conditioning / With driven power steering pump.

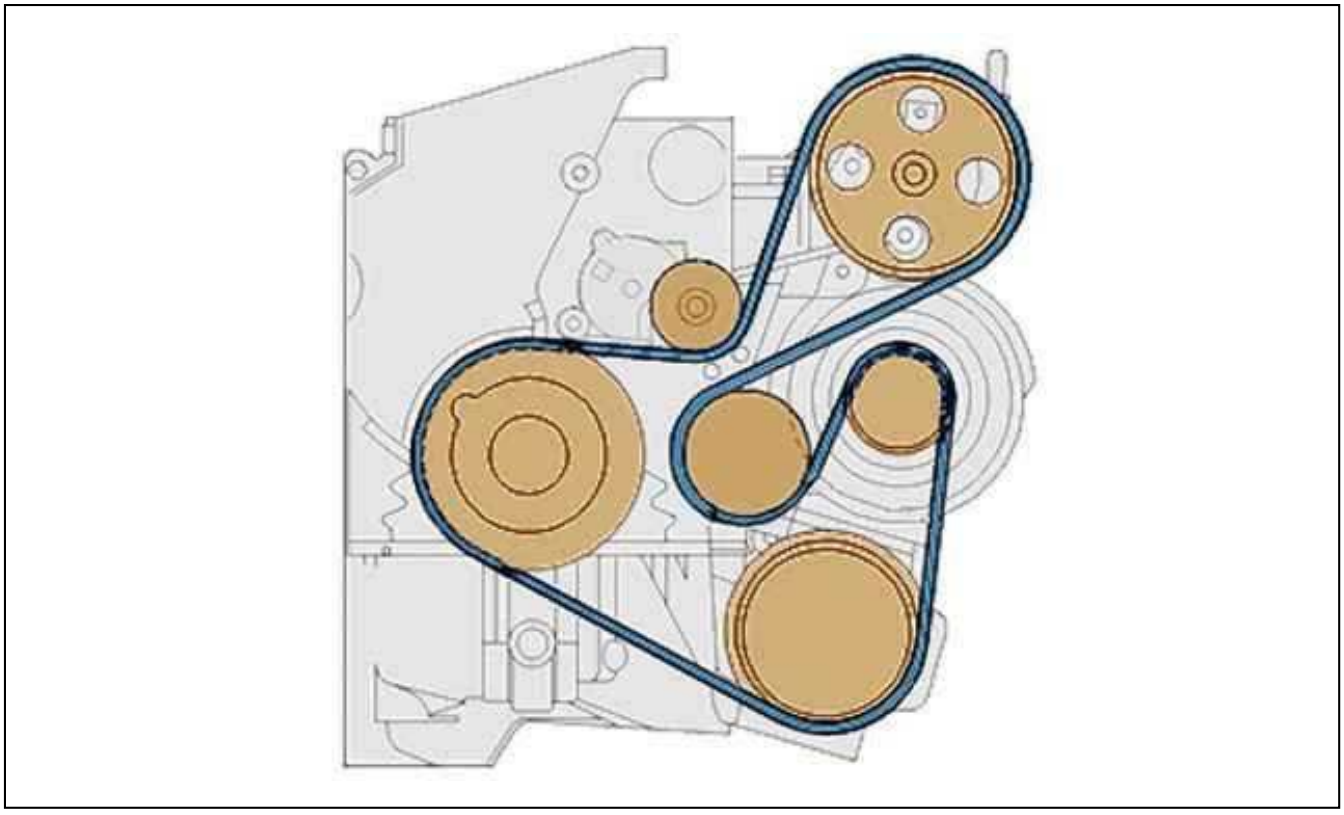


Figure : B1BB1EHD

With air conditioning / With driven power steering pump.

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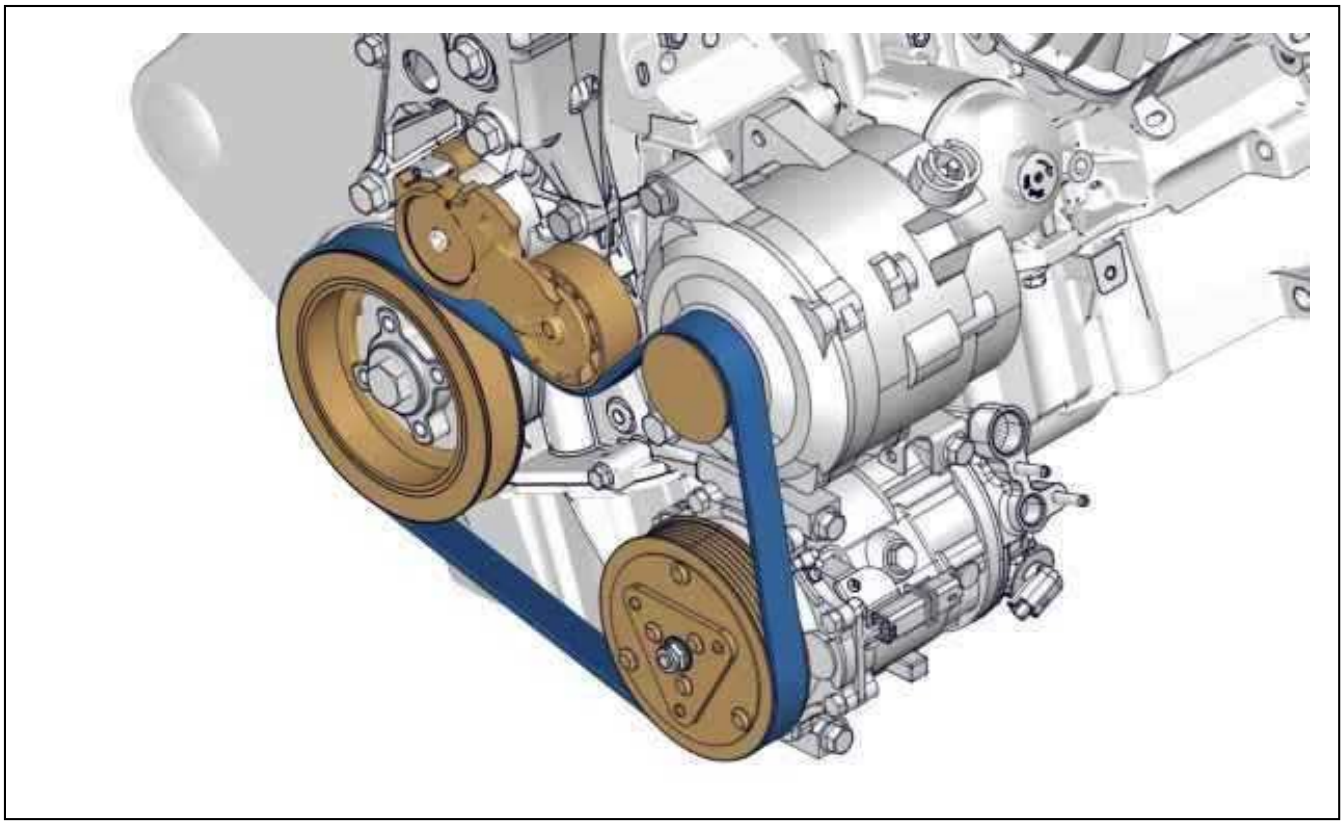
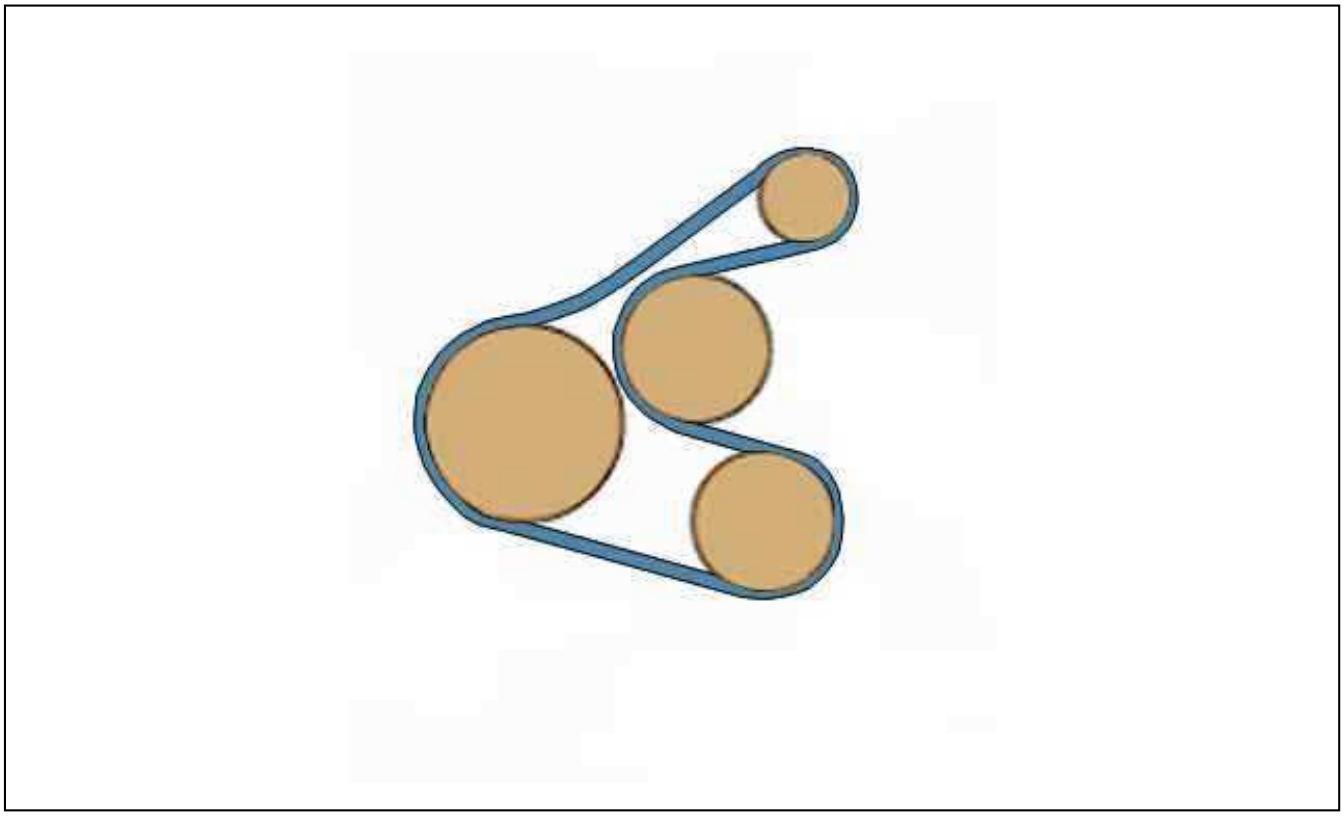


Figure : B1BB1EID

With air conditioning / Power steering electric pump assembly .
(1) : Air conditioning compressor (according to equipment).

3.7. 4A92 engine



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Figure : B1BB1IZD

all models.

3.8. 4B11 / 4B12 engines

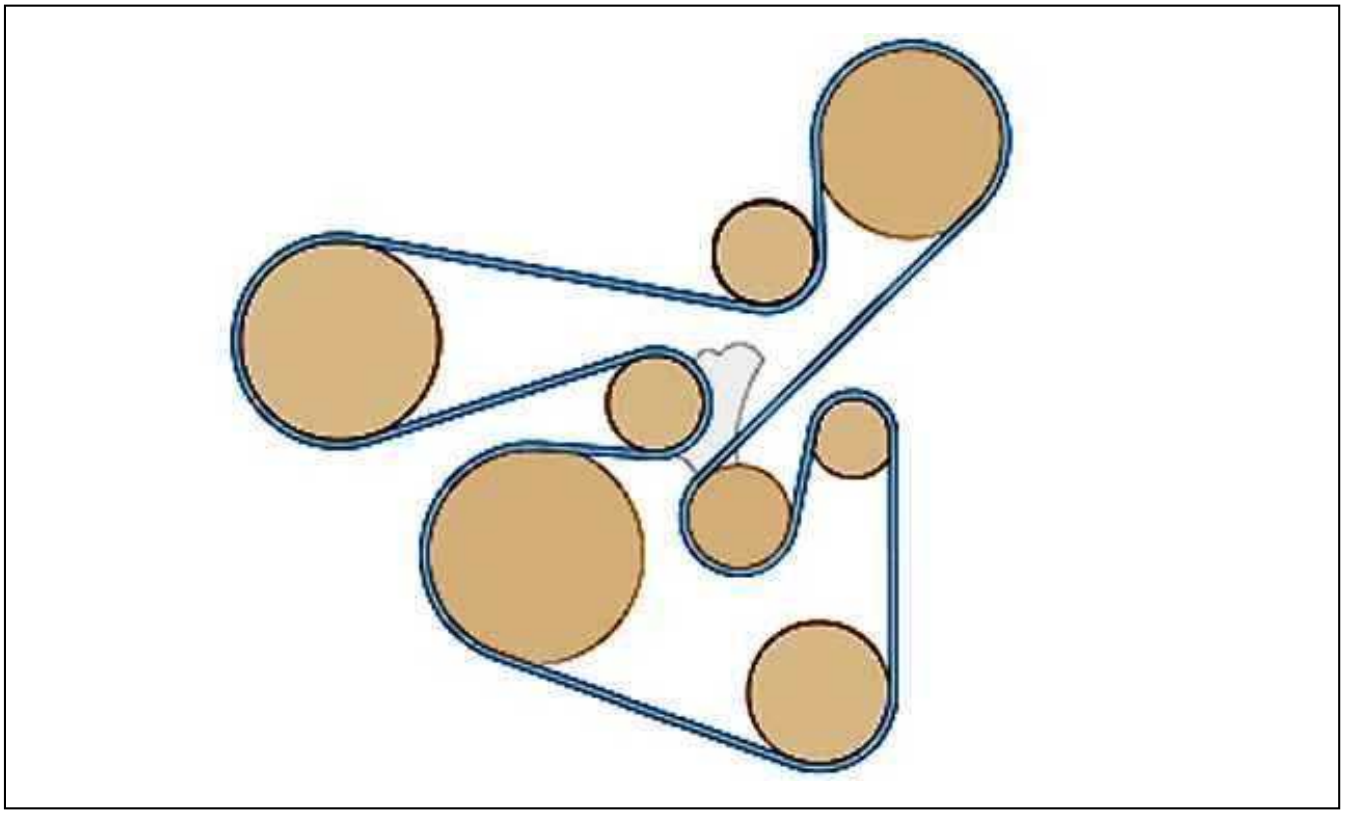


Figure : B1BB1EJD

all models.

3.9. ES9 engine

cardiagn.com

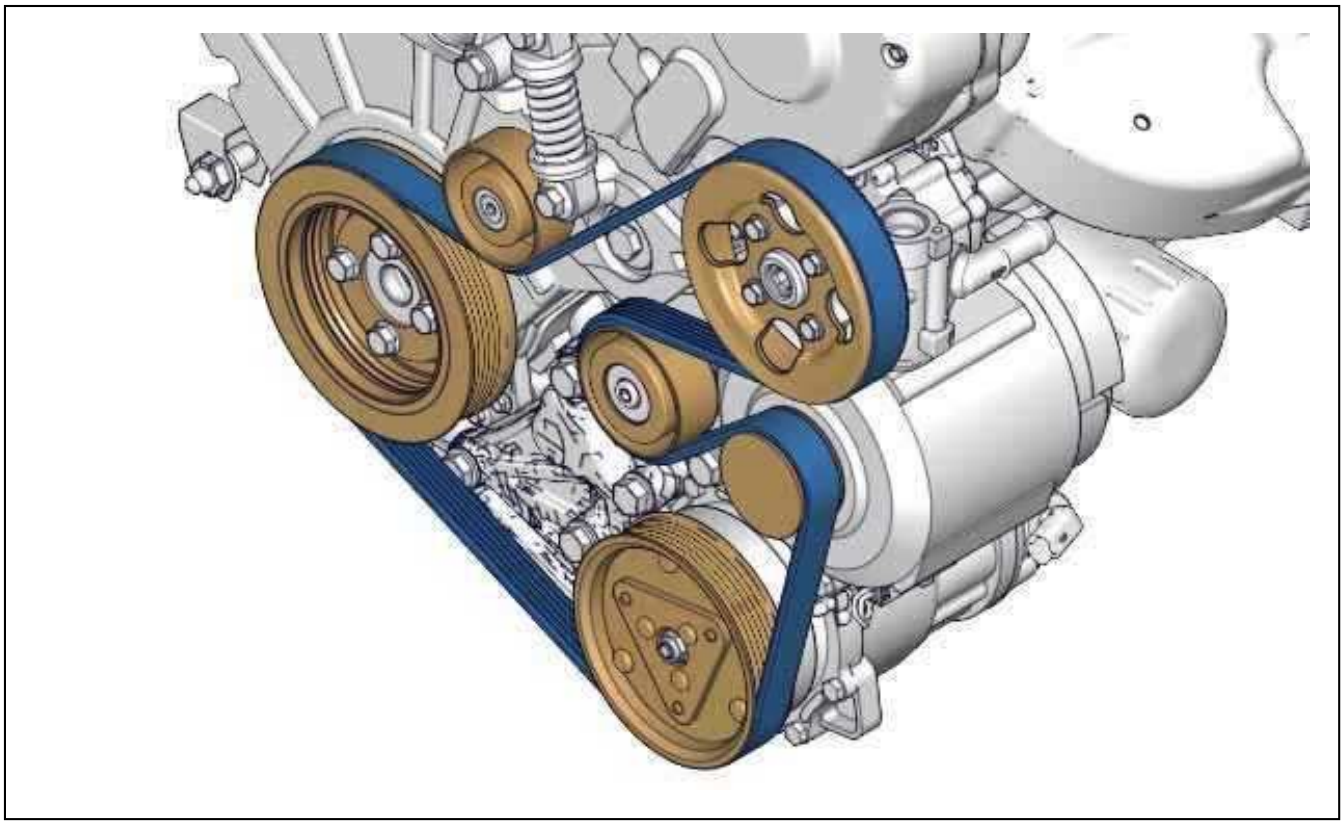


Figure : B1BB1EKD

all models.

4. diesel engines

4.1. DV4/DV6 engine

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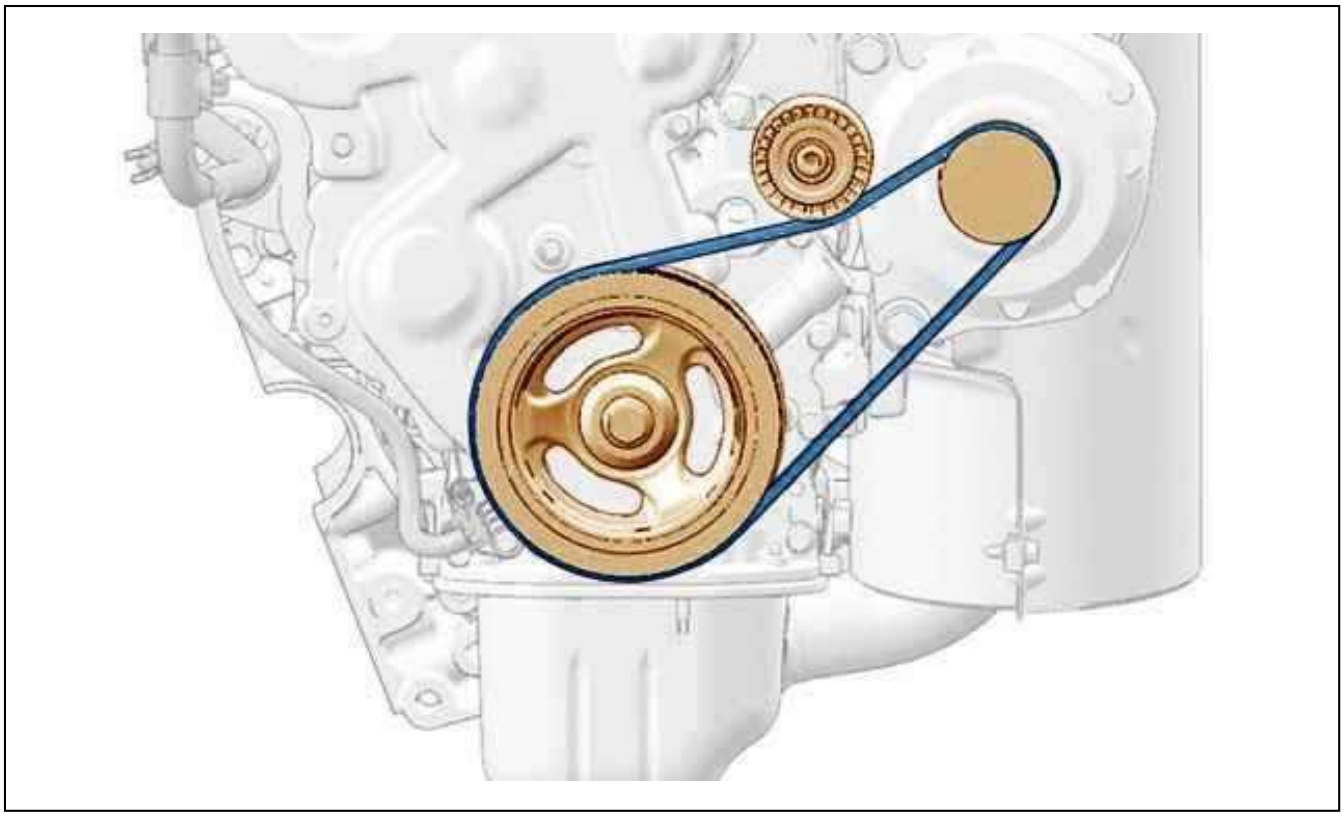


Figure : B1BB1ELD

Without air conditioning.

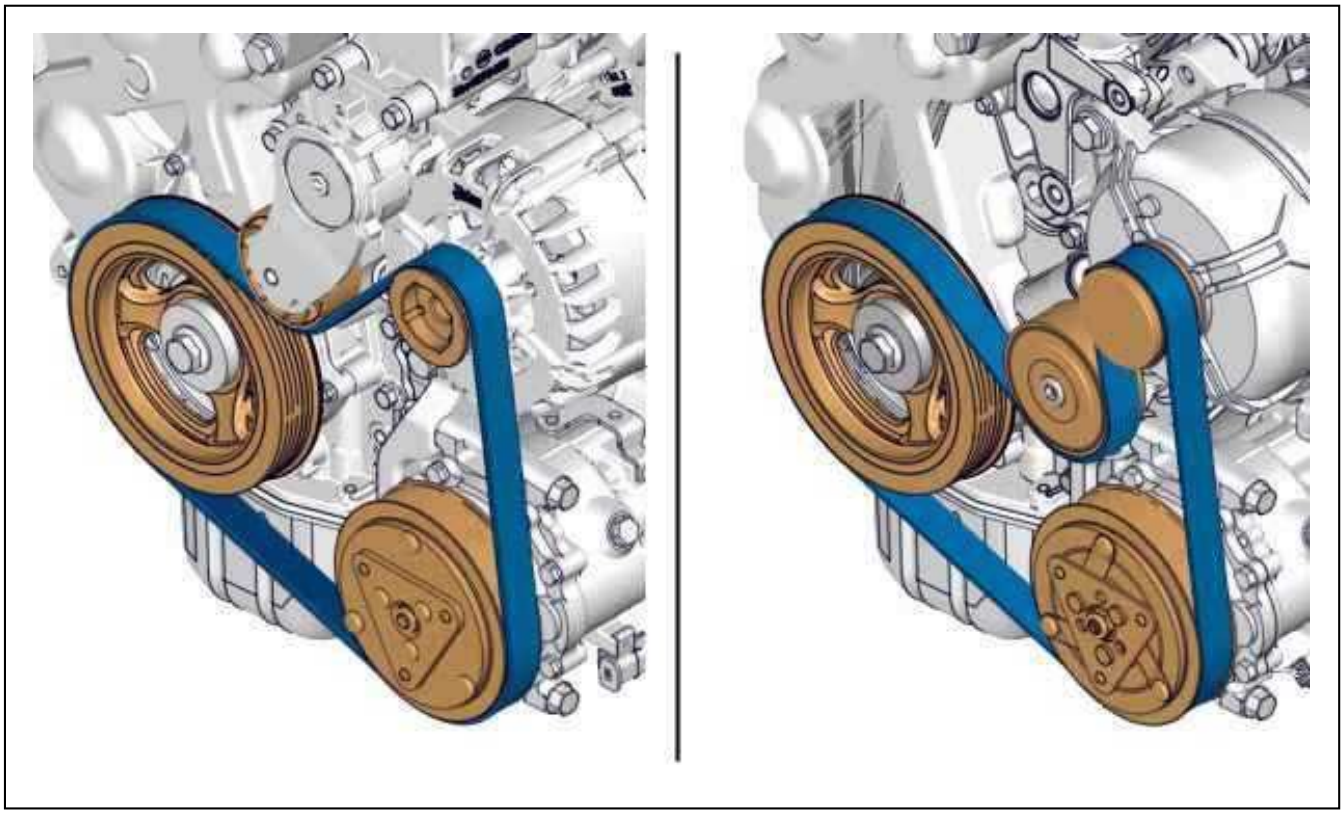


Figure : B1BB1EMD

With air conditioning.

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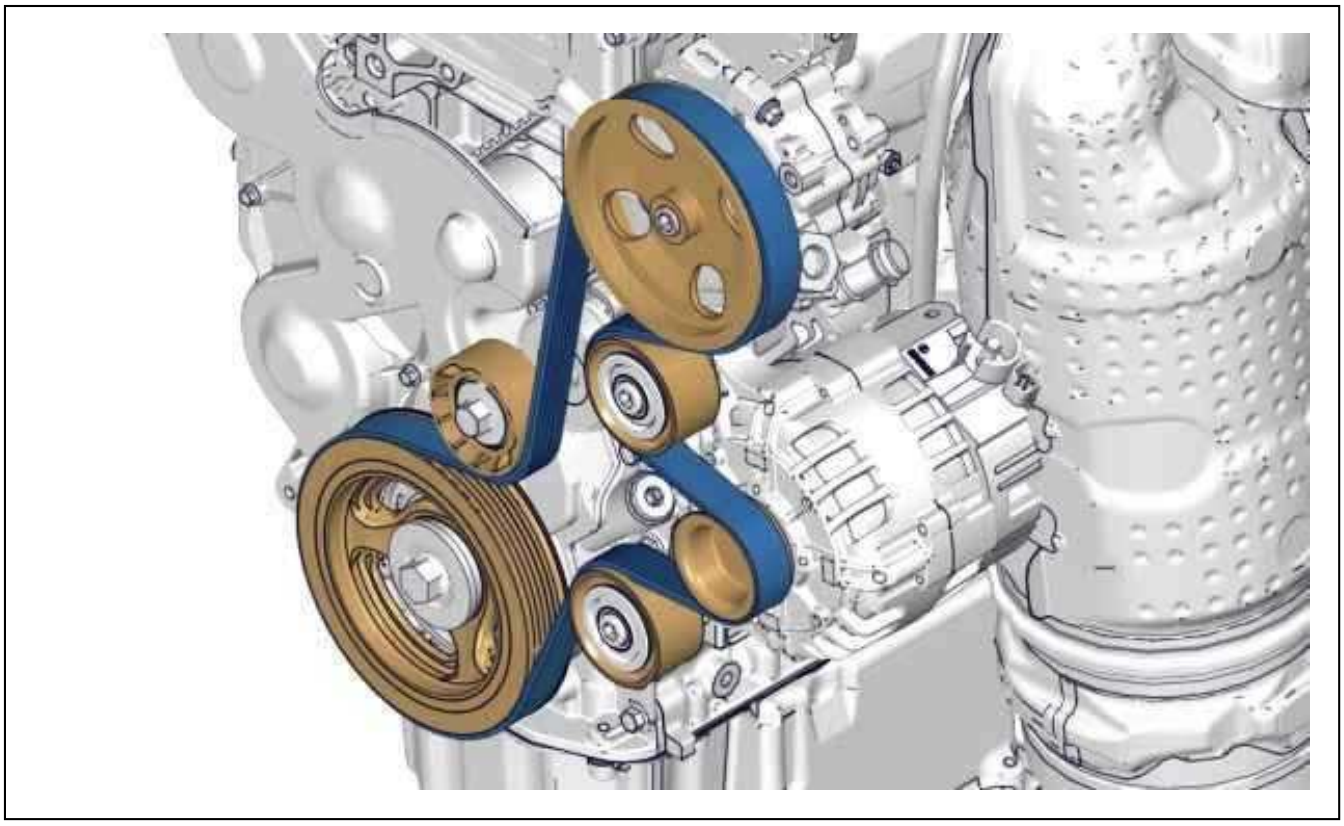


Figure : B1BB1END

Without air conditioning / With driven power steering pump.

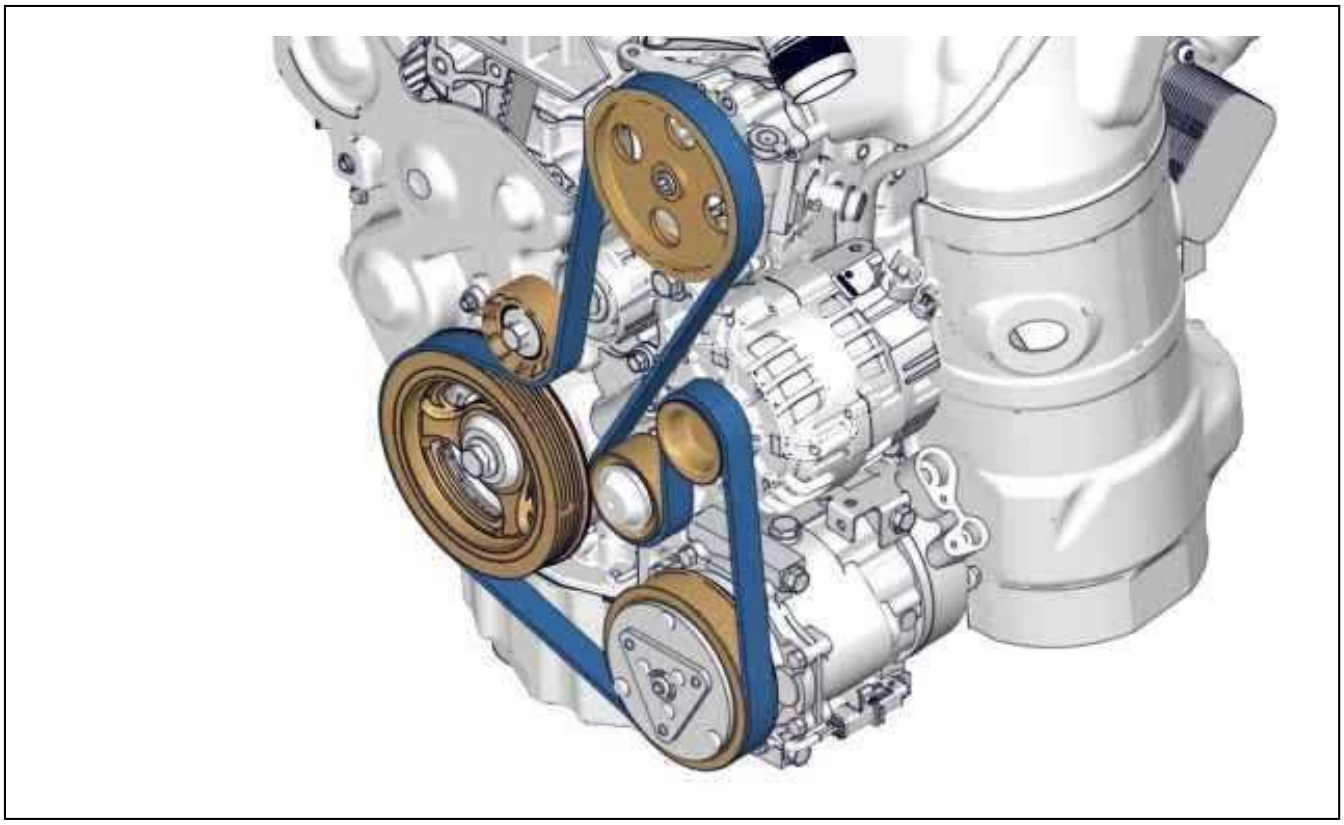


Figure : B1BB1EOD

With air conditioning / With driven power steering pump.

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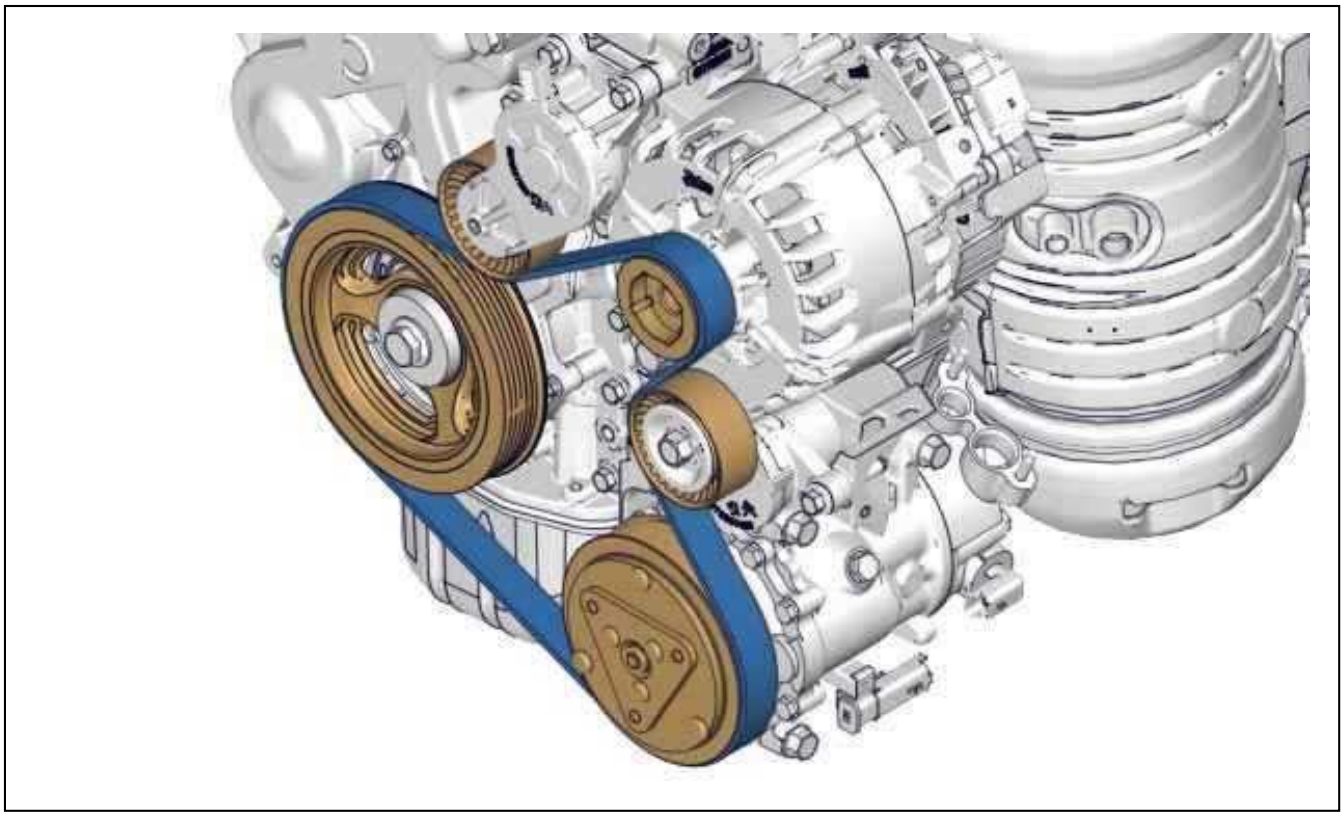


Figure : B1BB1EPD

With air conditioning/Power steering electric pump assembly / Stop and start.

4.2. DW8/DW10/DW12 engines

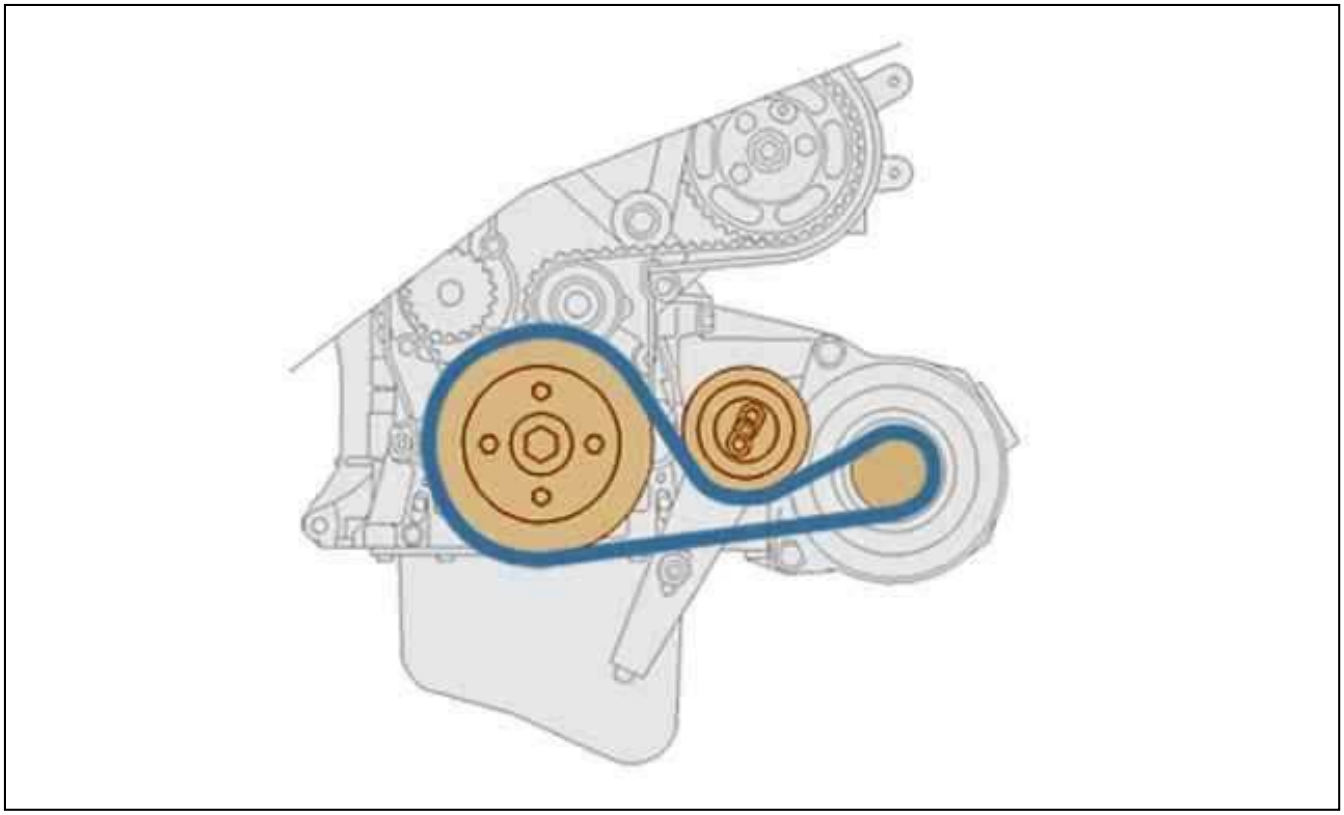


Figure : B1BB1EQD

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Without power steering and without air conditioning.

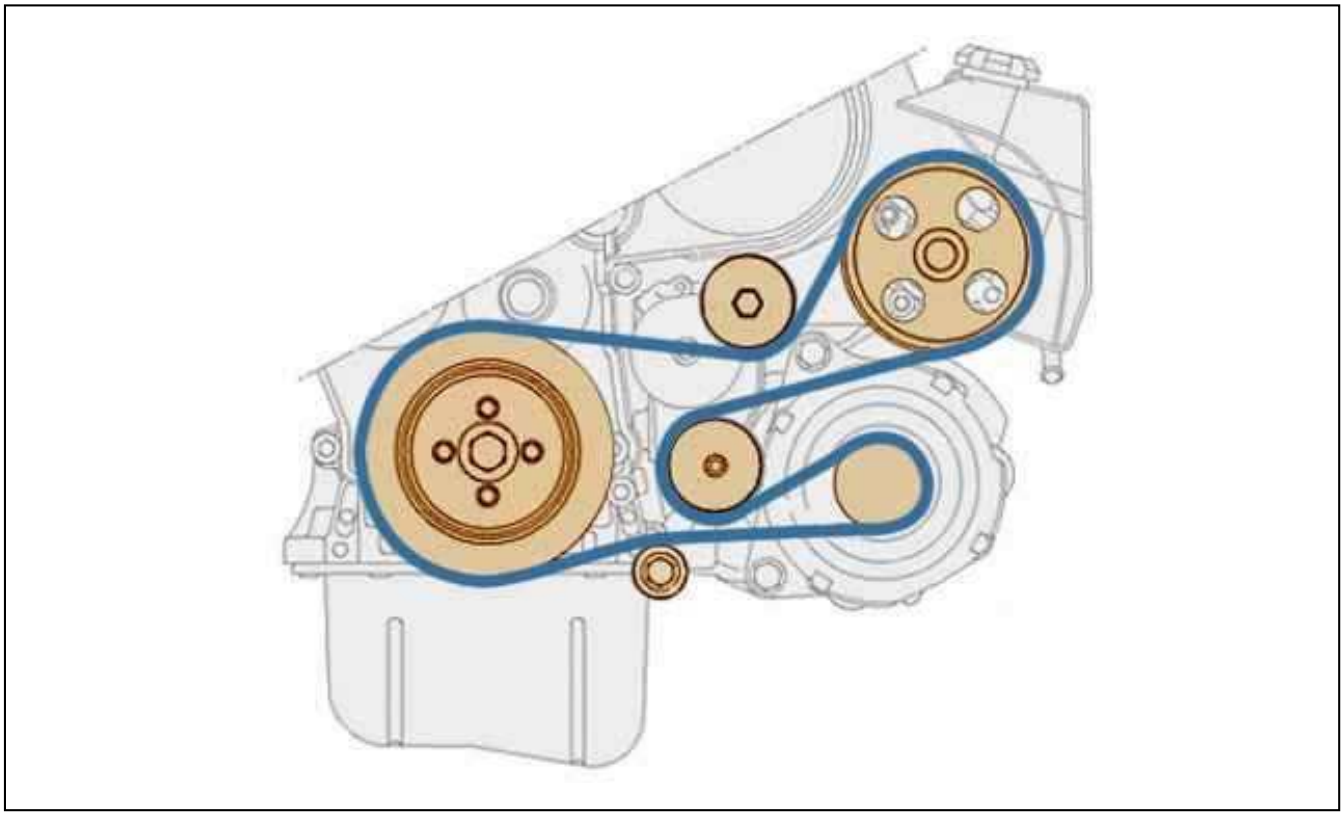


Figure : B1BB1ESD

Without air conditioning / With driven power steering pump.

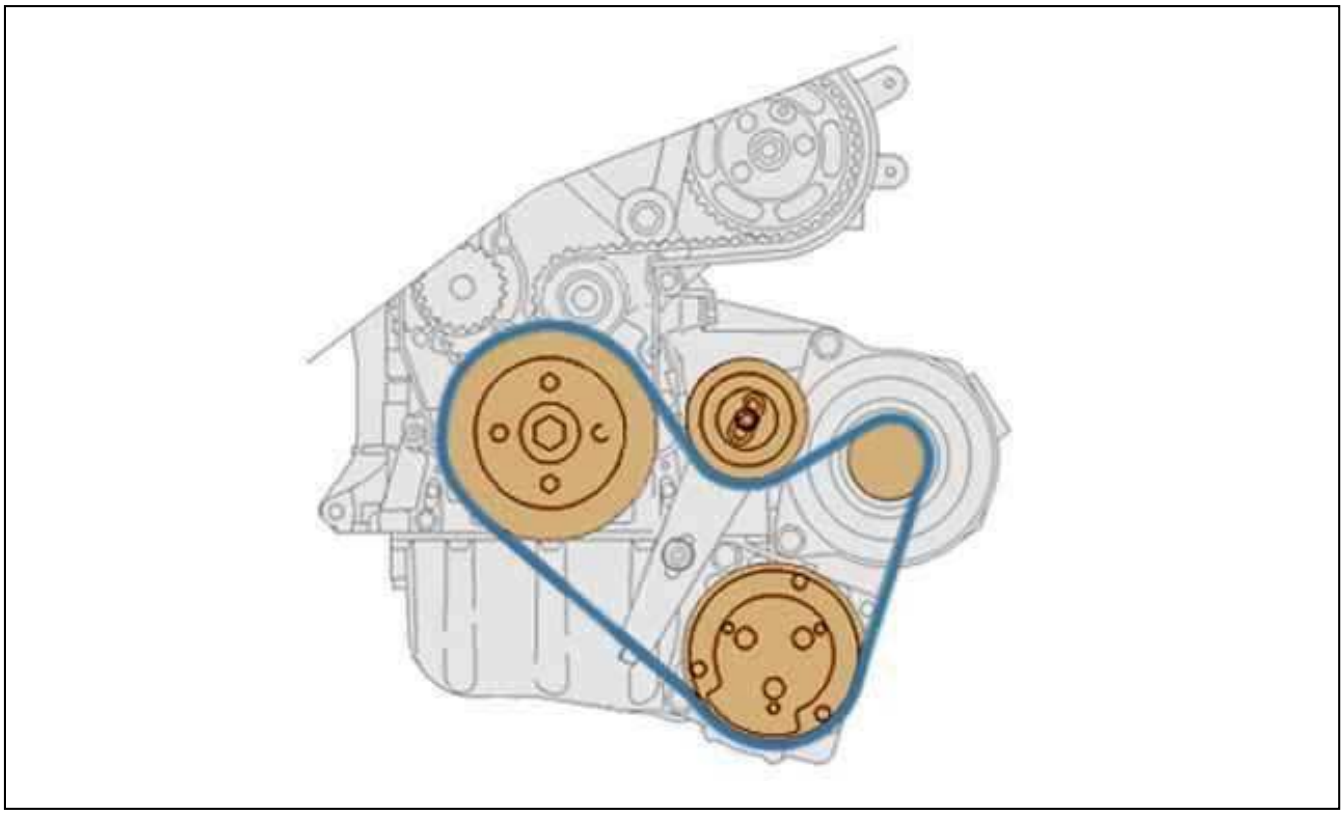


Figure : B1BB1ETD

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With air conditioning and without power steering.

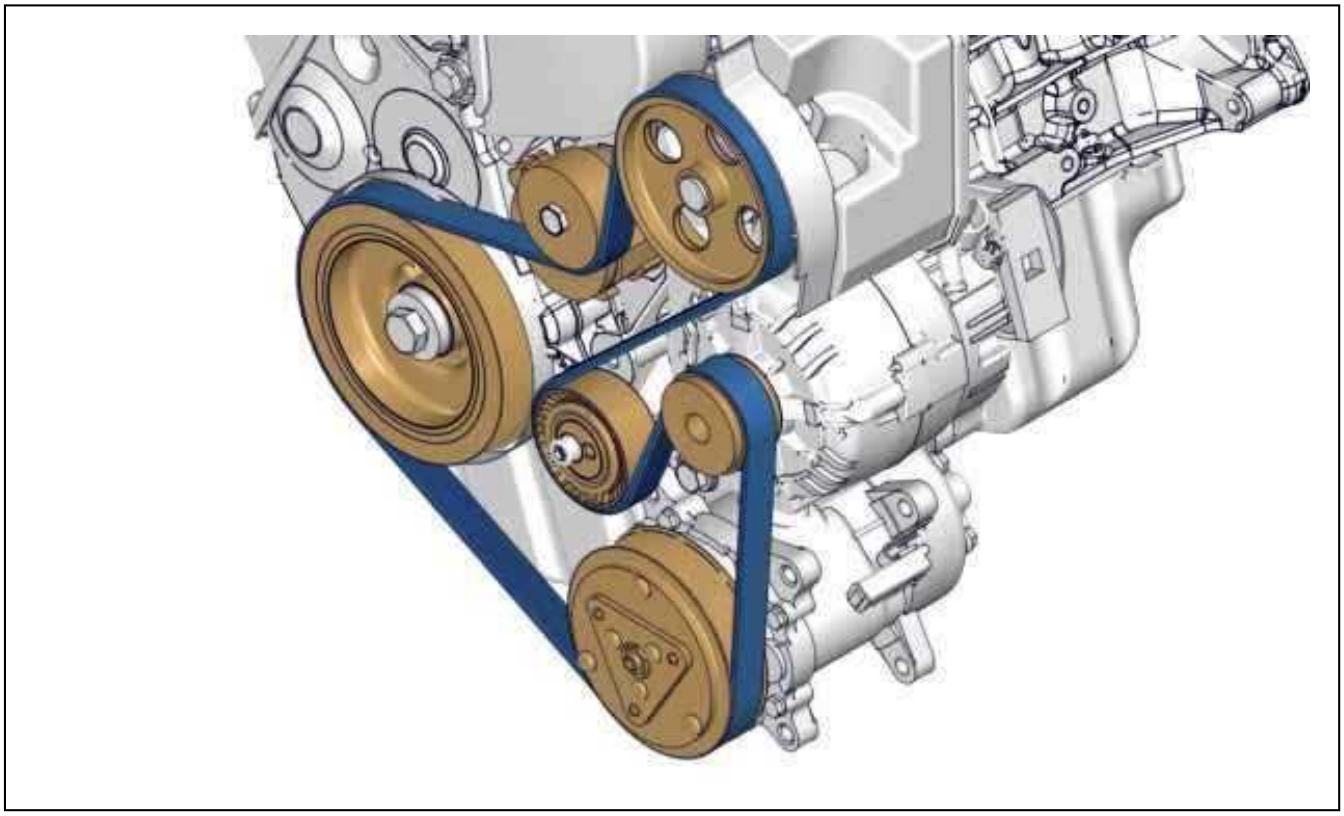


Figure : B1BB1EUD

With air conditioning / With driven power steering pump.

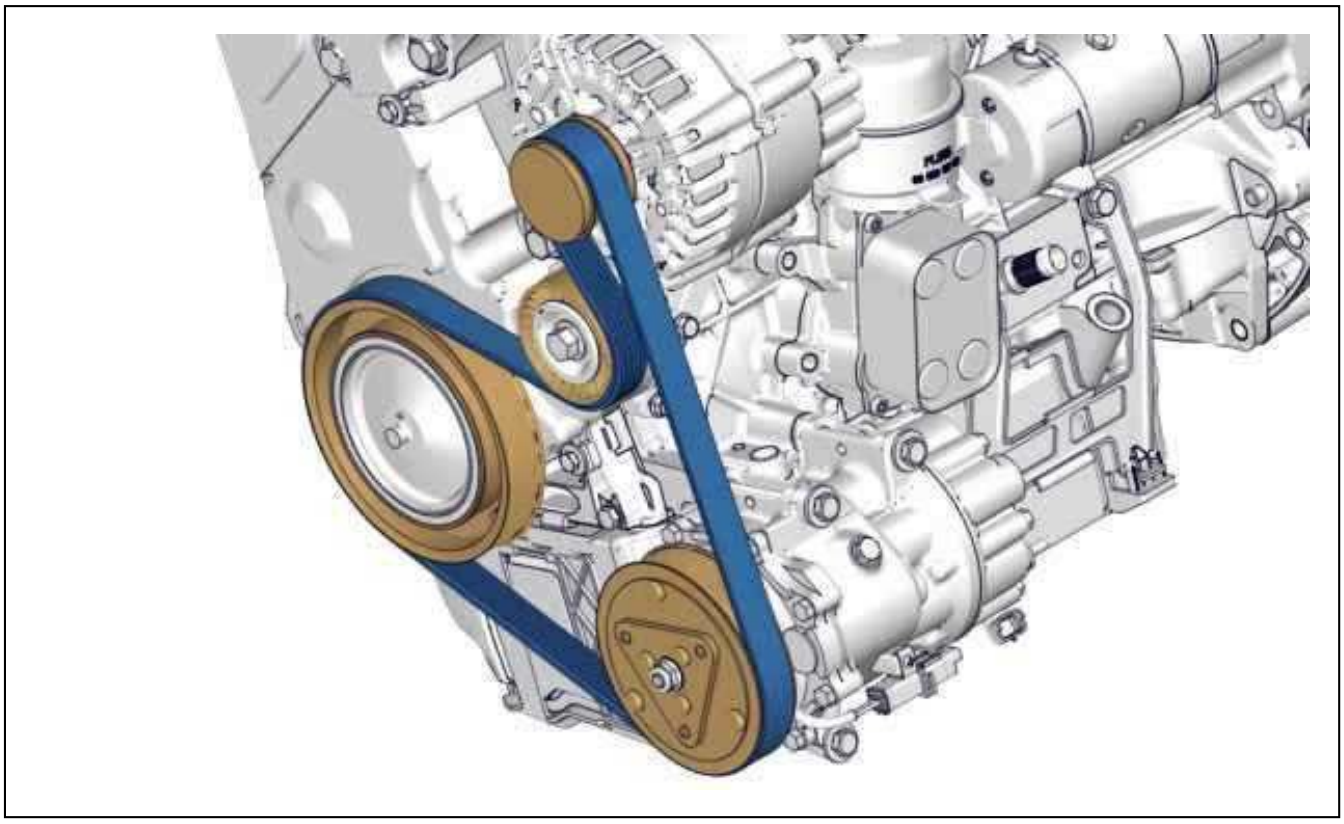


Figure : B1BB1EVD

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With air conditioning / Power steering electric pump assembly .

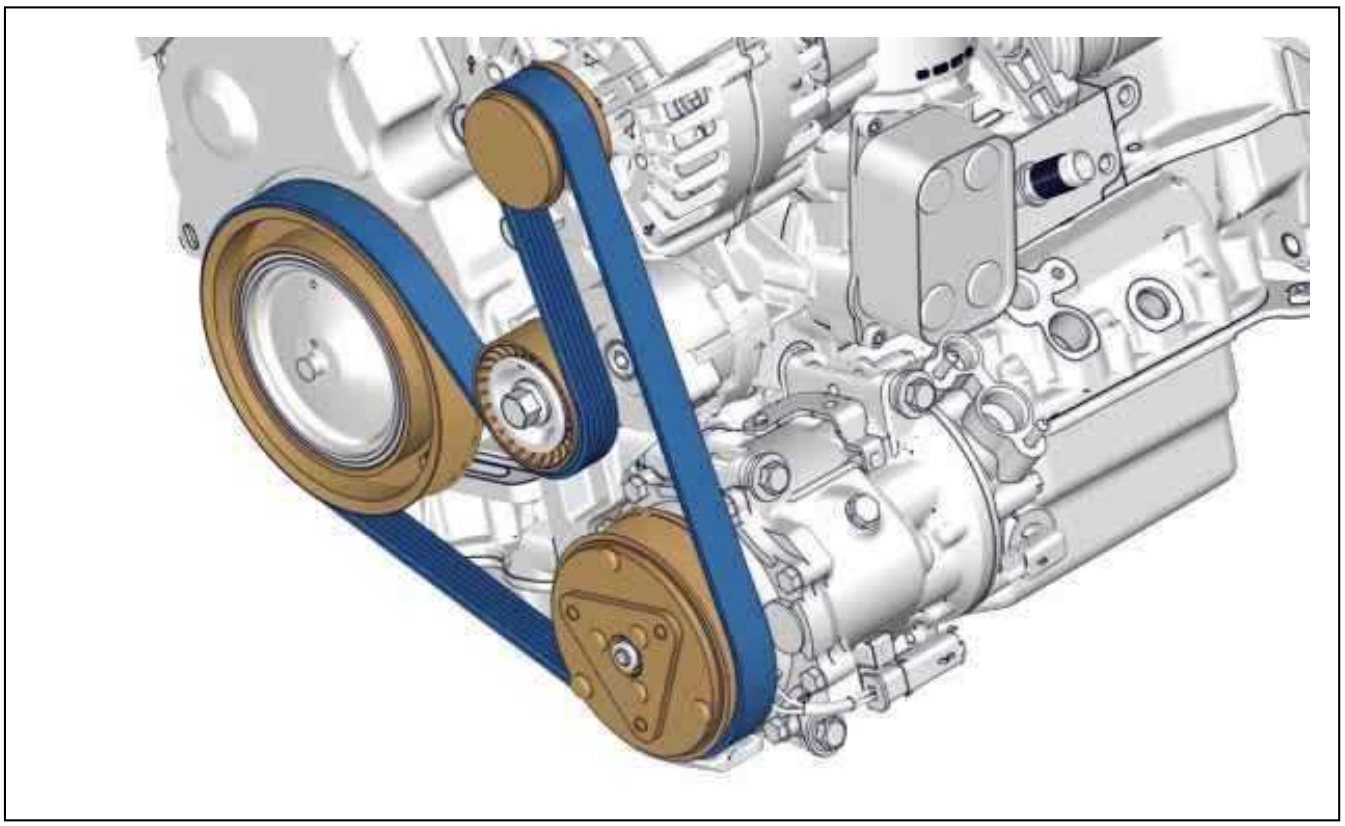


Figure : B1BB1EWD

With air conditioning / Power steering electric pump assembly .

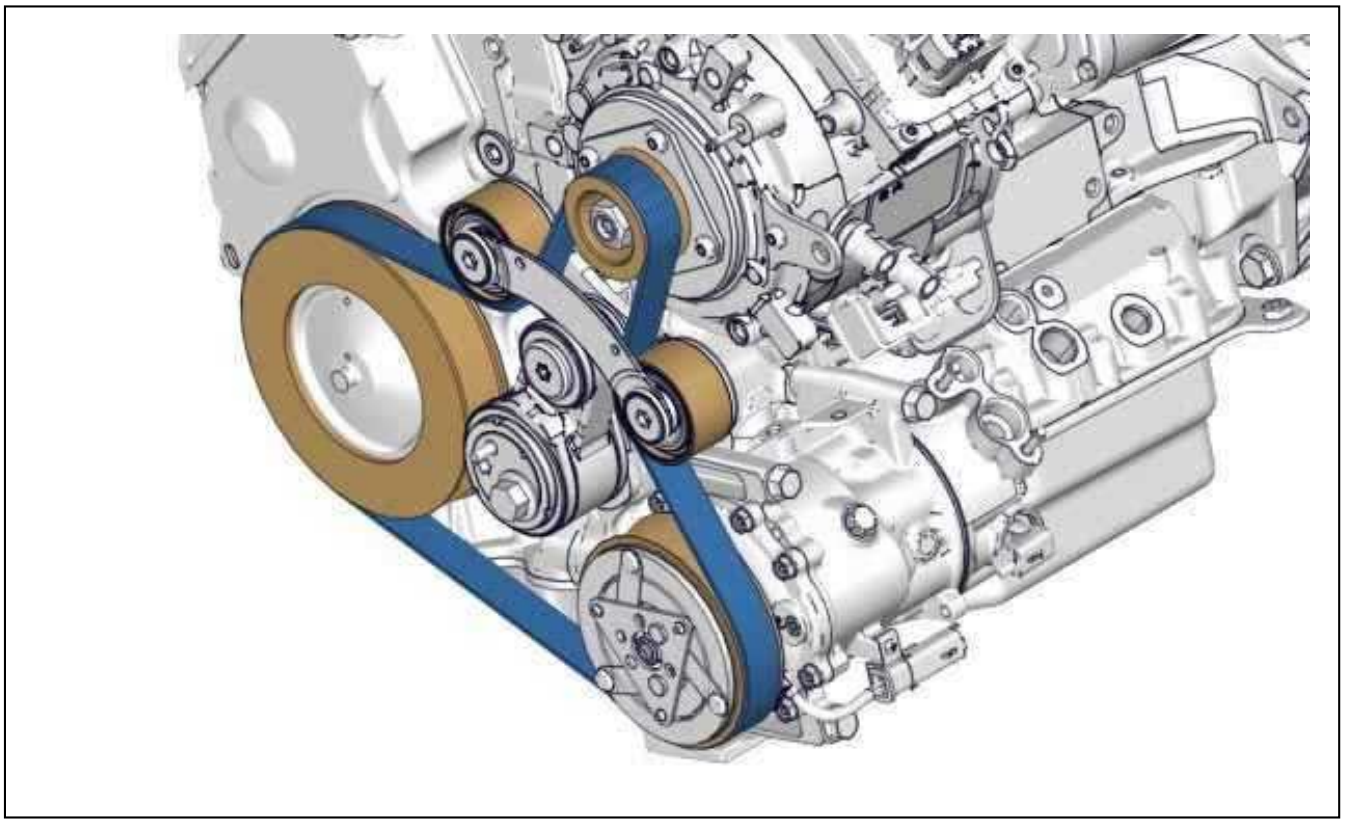


Figure : B1BB1EXD

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With air conditioning / Power steering electric pump assembly / Hybrid.

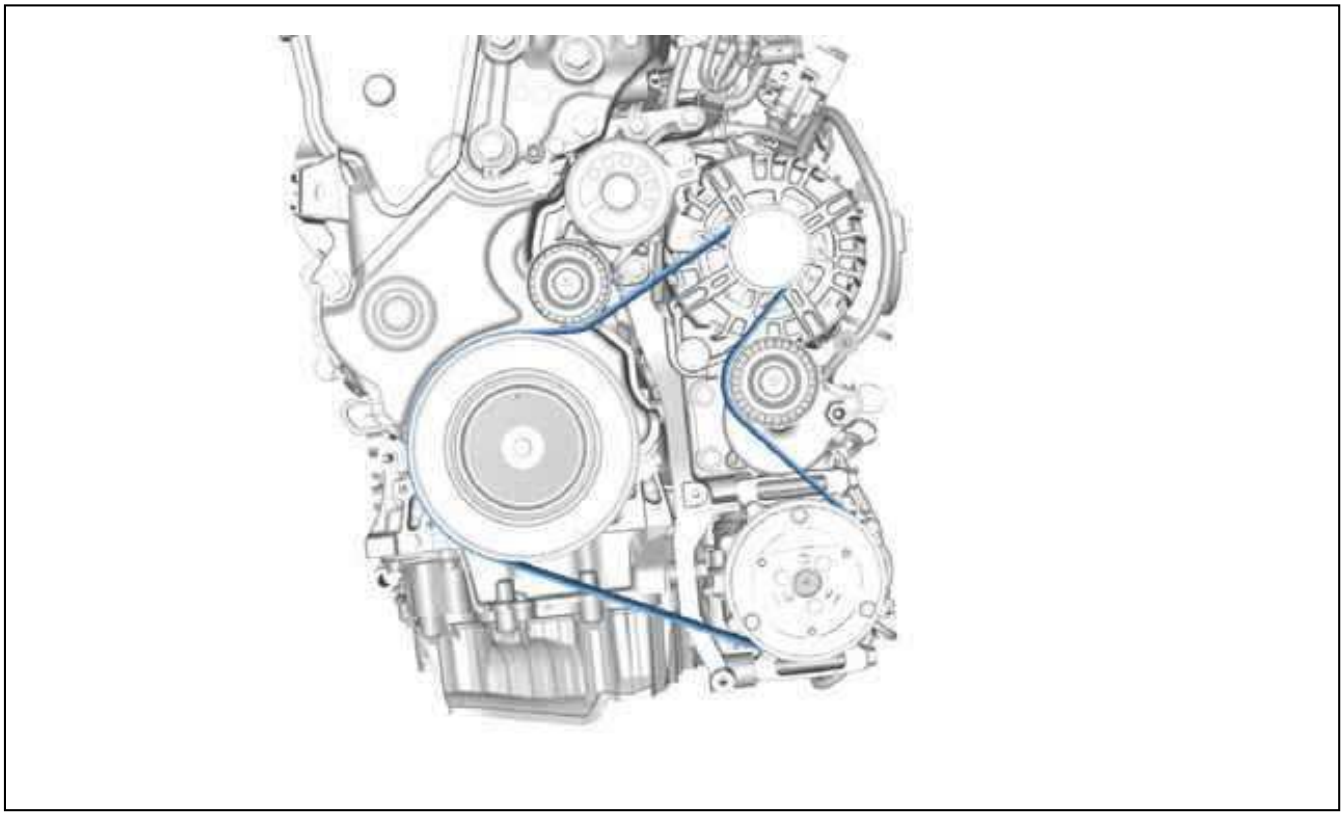
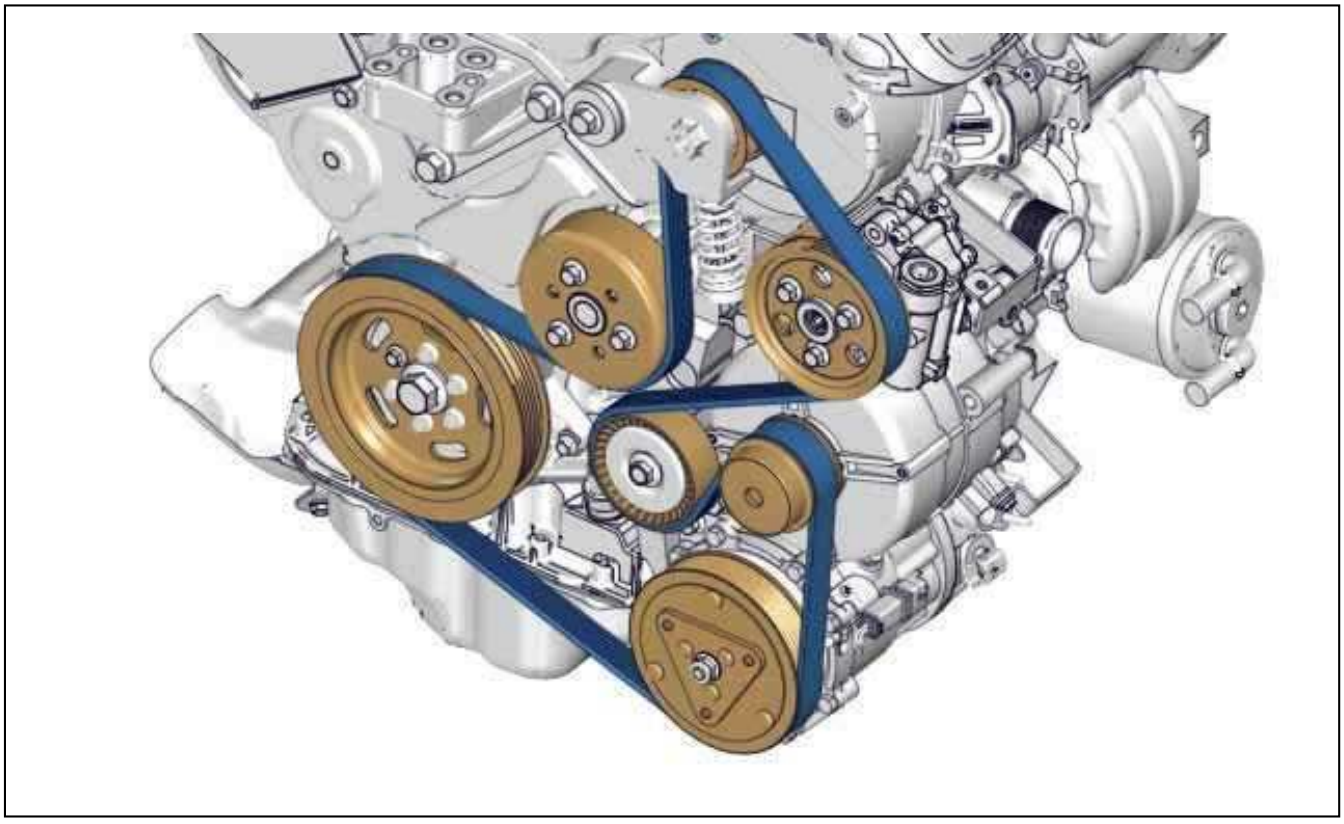


Figure : B1BB1T6D

With air conditioning / Power steering electric pump assembly .

4.3. DT17/DT20 engines



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Figure : B1BB1EYD

all models.

4.4. 4N13 engine

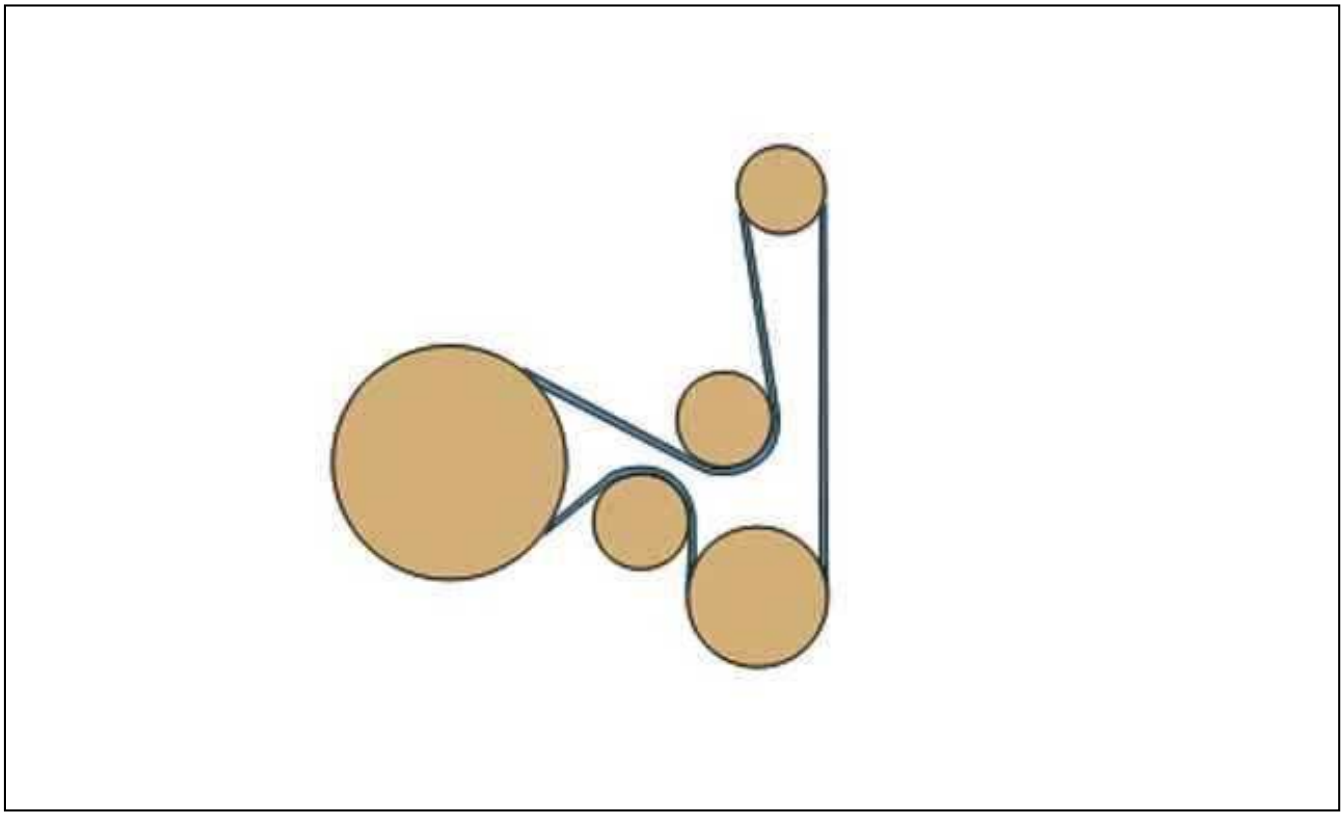


Figure : B1BB1J0D

all models.

4.5. P22DTE engine

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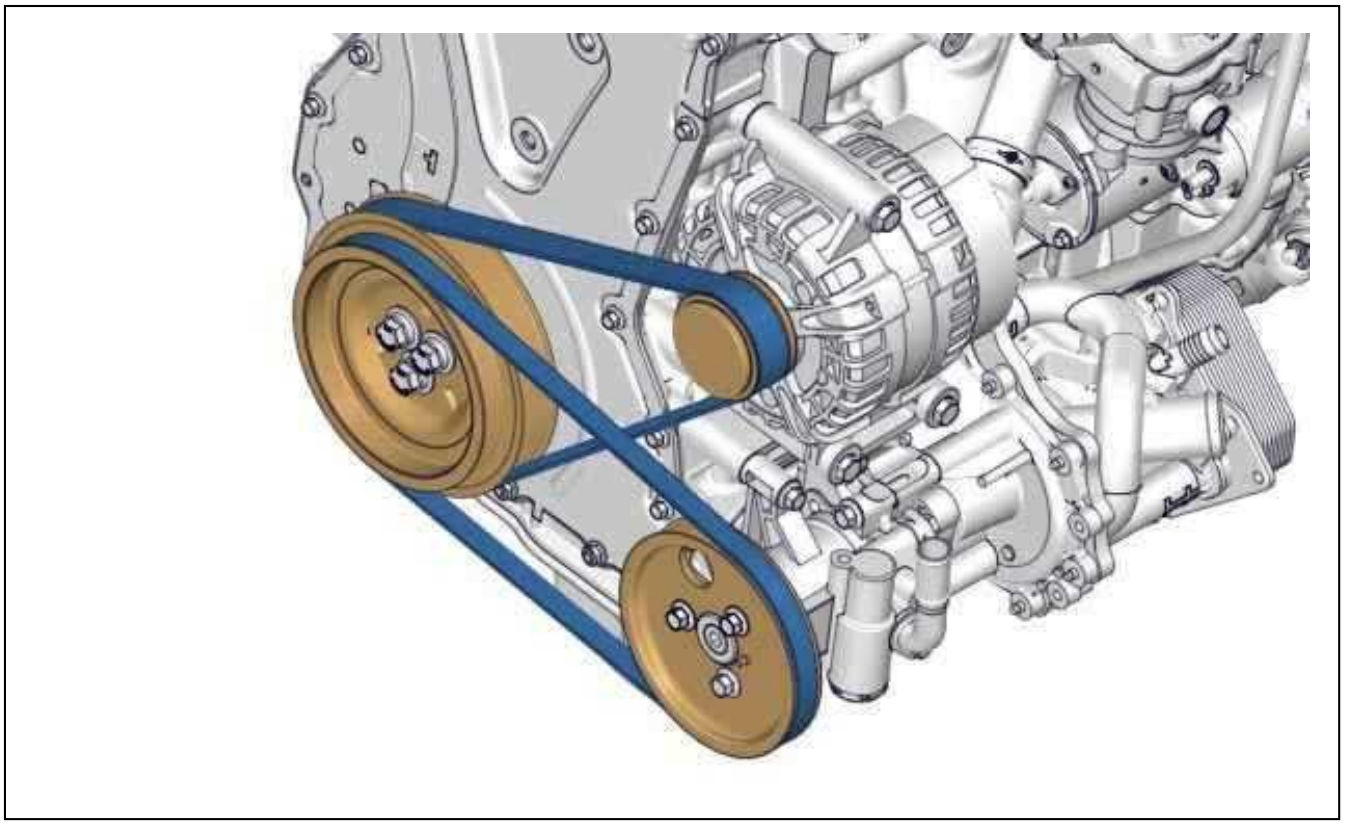


Figure : B1BB1EZD

Without air conditioning.

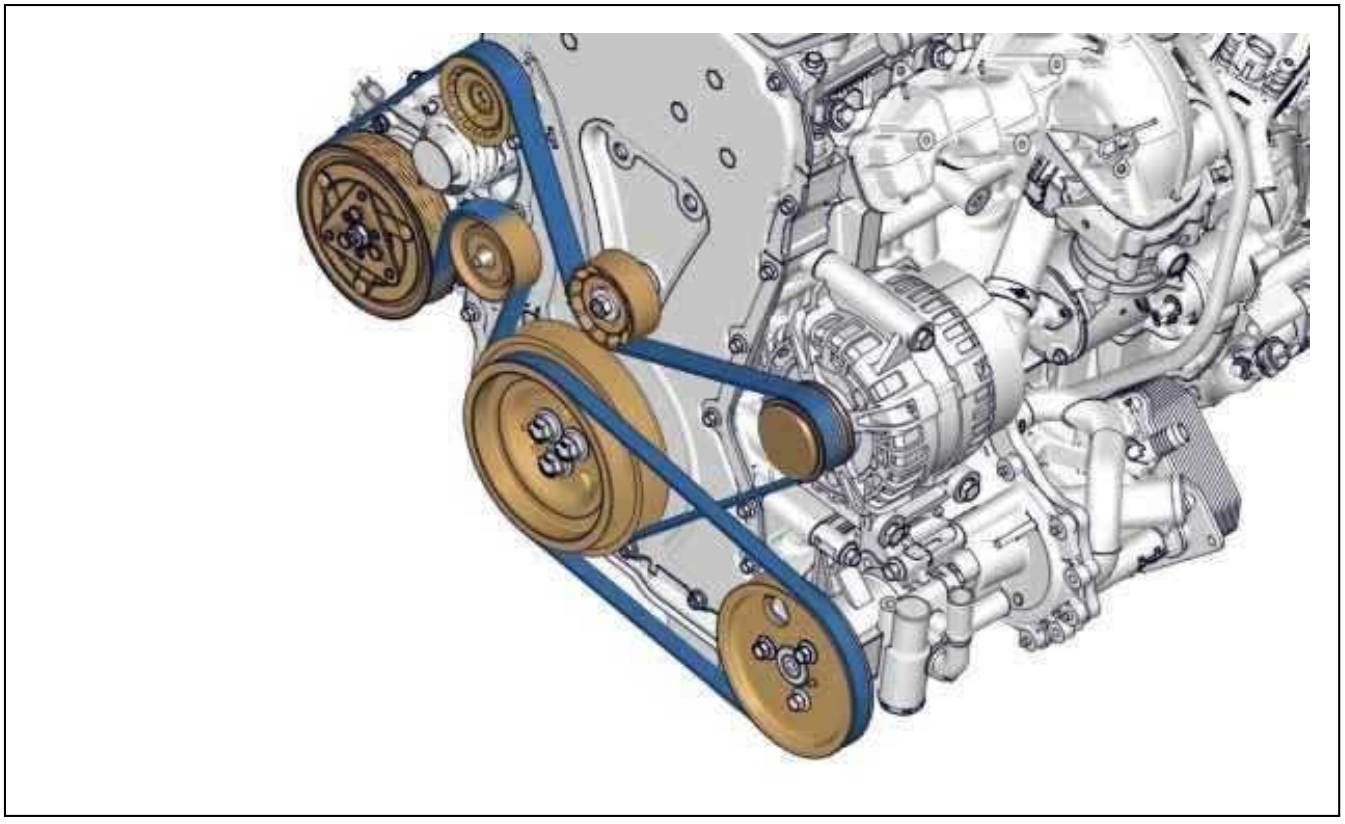


Figure : B1BB1F0D

With air conditioning.

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4.6. F30DT engine

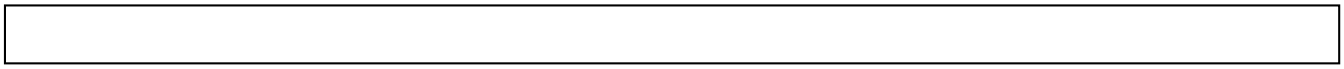


Figure : B1BB1F1D

all models.

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TIGHTENING TORQUES : DW10C ENGINE TYPE

CAUTION : Follow the tightening sequence.

CAUTION : Follow the tightening procedure.

1. Reciprocating gear

1.1. Tightening torques

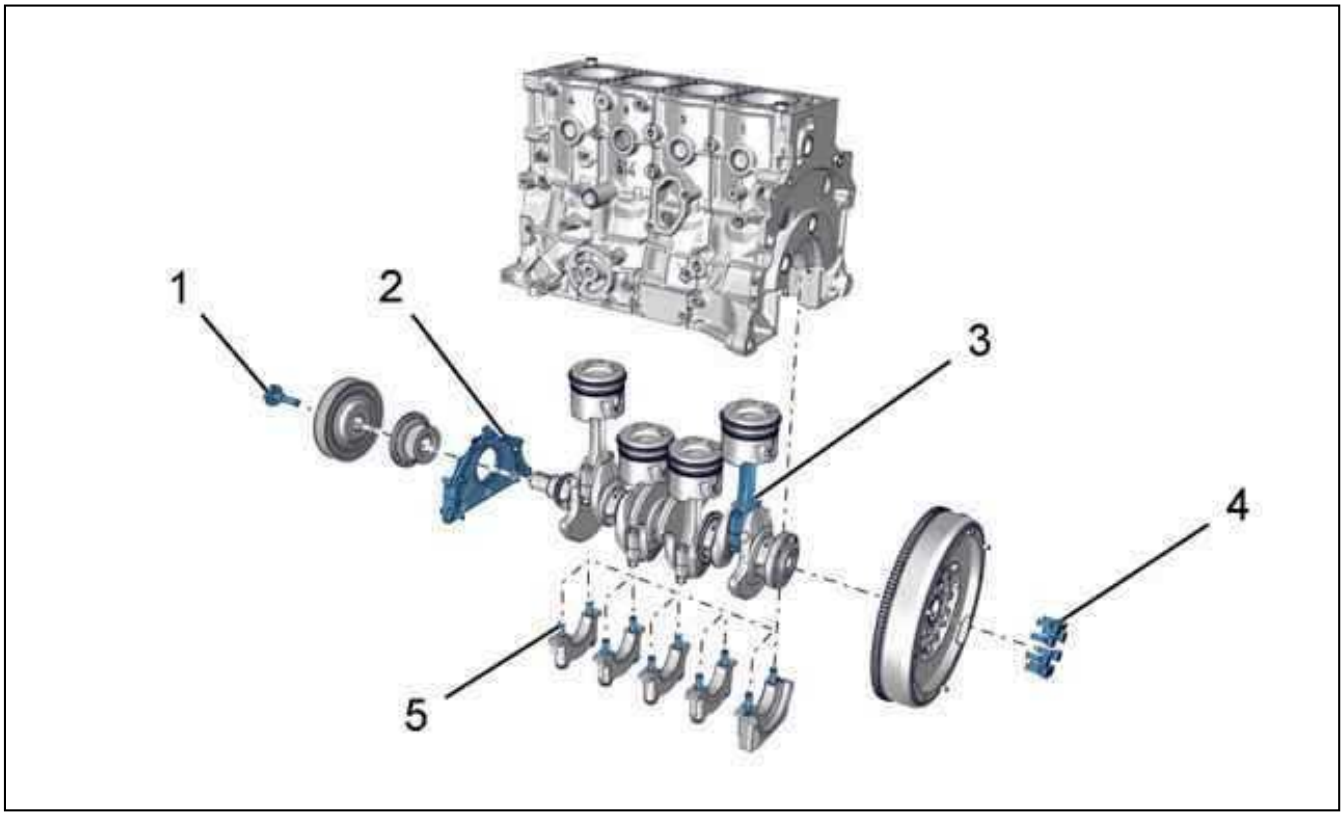


Figure : B1CB006D

Reference	Designation	Tightening torque
(1)	bolts (Accessories drive pulley)	Pre-tighten to 7 daNm
		Angular tightening to 62°
(2)	Crankshaft sealing flange	Pre-tighten to 0,7 daNm
		Tightening to 1,4 m.daN
(3)	nuts (Big end caps)	Pre-tighten to 2 daNm
		Angular tightening to 70°
(4)	bolts (Engine flywheel) (Manual gearbox) (*)	Pre-tighten to 2 daNm
		Tightening to 4,8 m.daN
	bolts (Drive plate) (Automatic gearbox) (*)	Pre-tighten to 2 daNm
		Tightening to 6,6 m.daN
(5)	bolts (Crankshaft main bearing caps) (*) (**)	Pre-tighten to 1 daNm

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		Tightening to 3 m.daN
		Angular tightening to 82°
(*) Follow the tightening sequence (**) Follow the tightening procedure		

1.2. Procedure - Order of tightening : Crankshaft bearing cap bolts

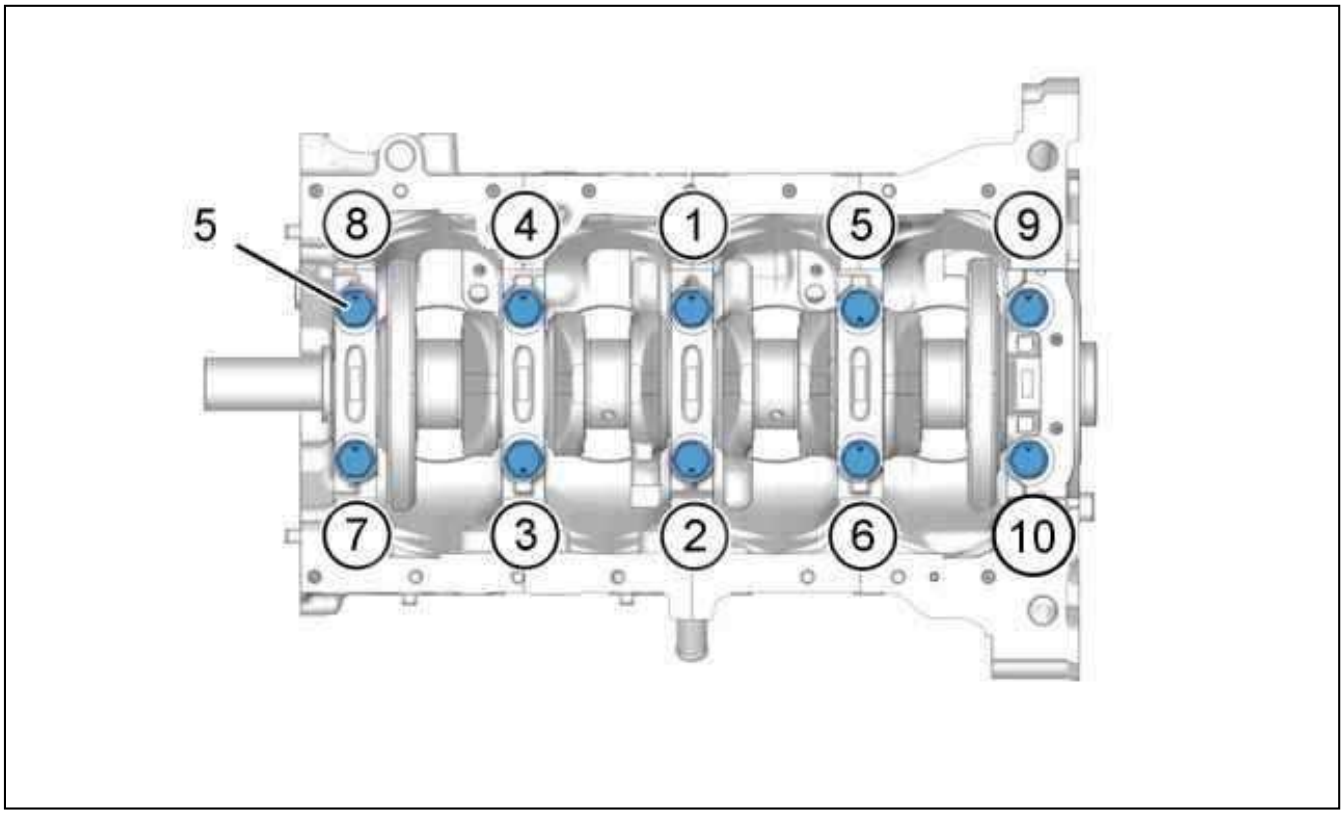


Figure : B1CB007D

(5) : Crankshaft bearing cap bolts.
Tightening procedure :

- Draw up the bolts
- Pre-tighten to the correct torque (In ascending order of bolts)
- Tighten to the correct torque (In ascending order of bolts)
- Angular tightening (In ascending order of bolts)

1.3. Order of tightening : bolts Engine flywheel / Drive plate

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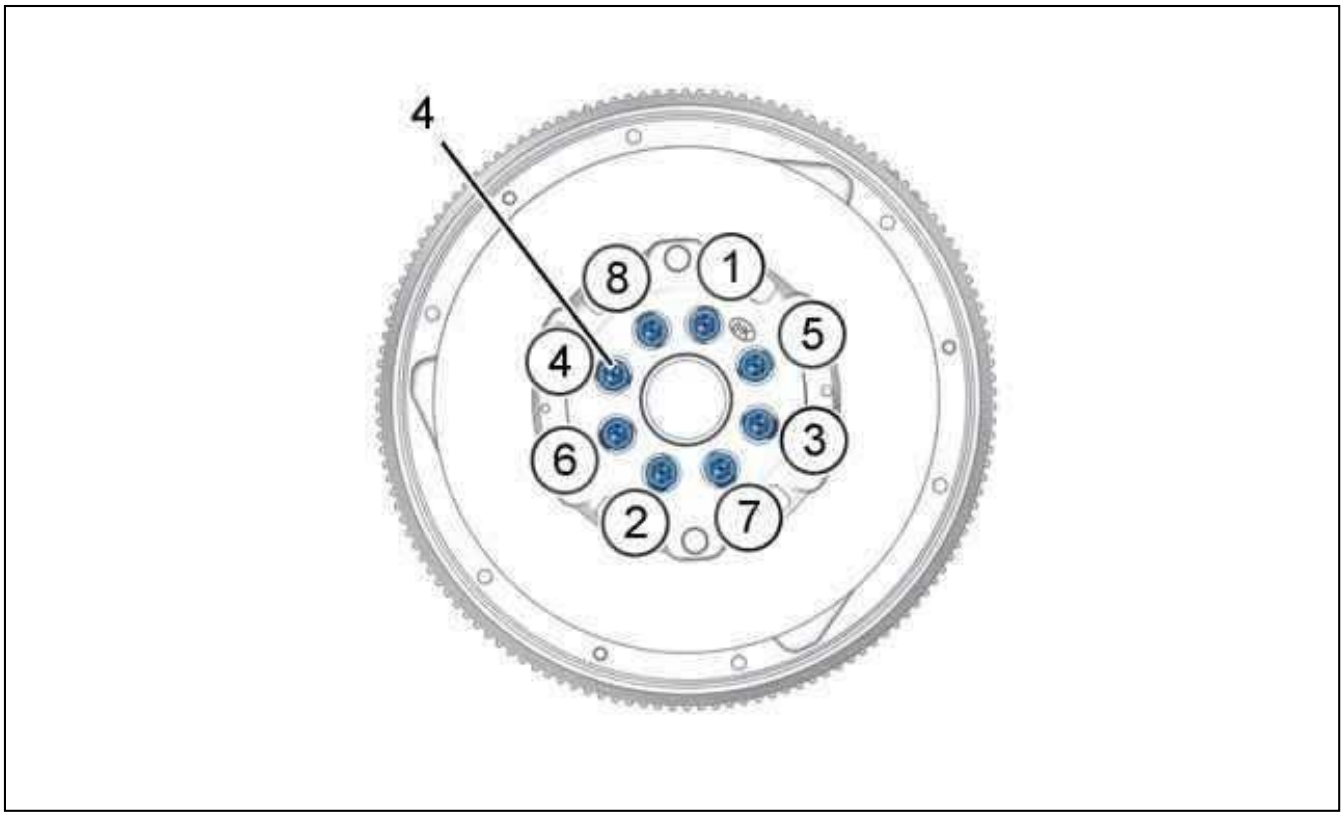


Figure : B1CB008D

(4) bolts (Engine flywheel / Drive plate).

2. Lubrication system (Internal)

2.1. Tightening torques

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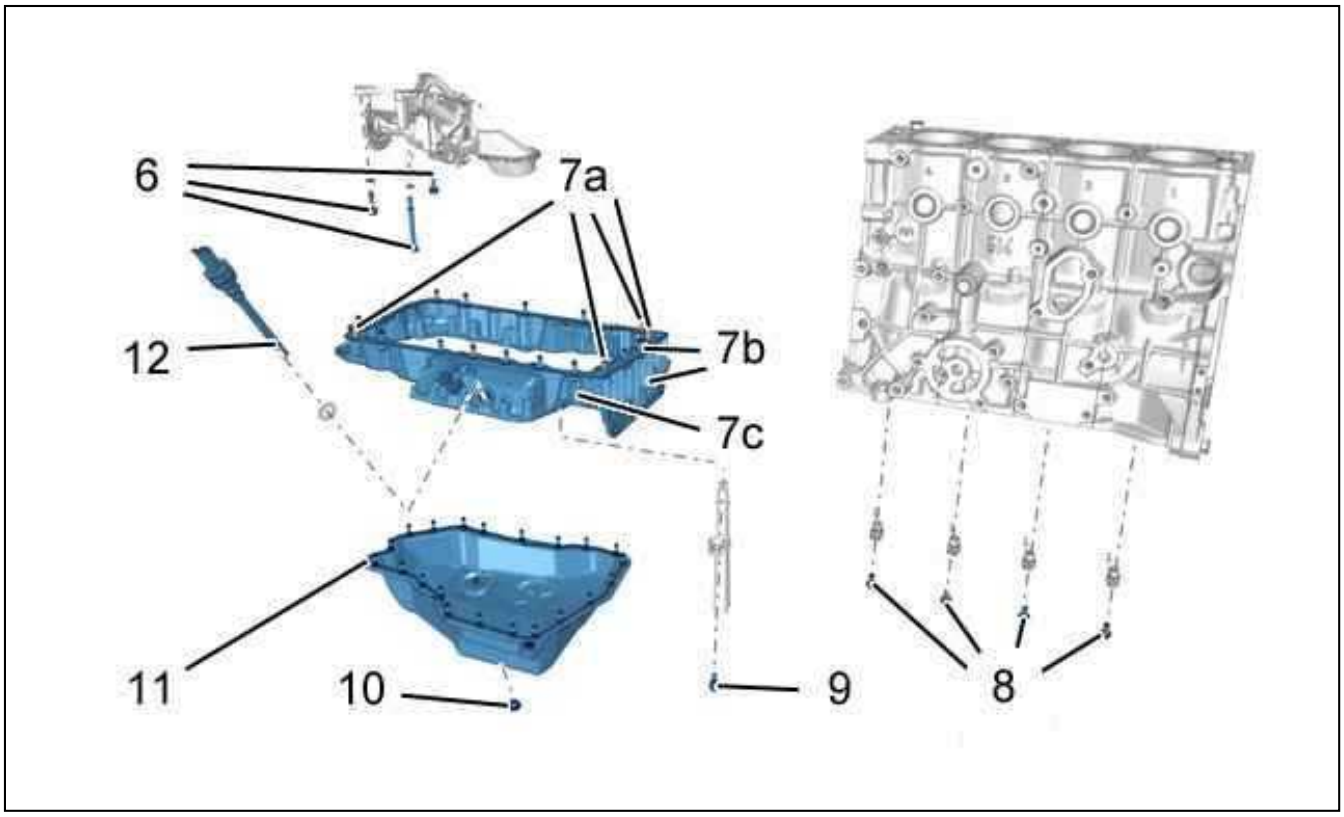


Figure : B1BB1QVD

Reference	Designation	Tightening torque
(6)	bolts (oil pump)	1,6 daNm
(7a)	bolts 40 mm - 45 mm (Upper oil sump) (*)	Pre-tighten to 1 daNm
		Tightening to 1,6 m.daN
(7b)	bolts 21 mm (Upper oil sump) (*)	Pre-tighten to 1 daNm
		Tightening to 1,6 m.daN
(7c)	bolts 21 mm - 25 mm (Upper oil sump) (*)	Pre-tighten to 1 daNm
		Tightening to 1,6 m.daN
(8)	bolts (underside of piston jet)	1 daNm
(9)	bolts (Oil filler return pipe)	0,8 daNm
(10)	Engine oil drain plug	3,4 daNm
(11)	bolts (Lower oil sump) (*)	Pre-tighten to 0,5 daNm
		Tightening to 0,9 m.daN
(12)	Oil temperature and level sensor	2,7 daNm
(*) Follow the tightening sequence		

2.2. Order of tightening : Upper oil sump

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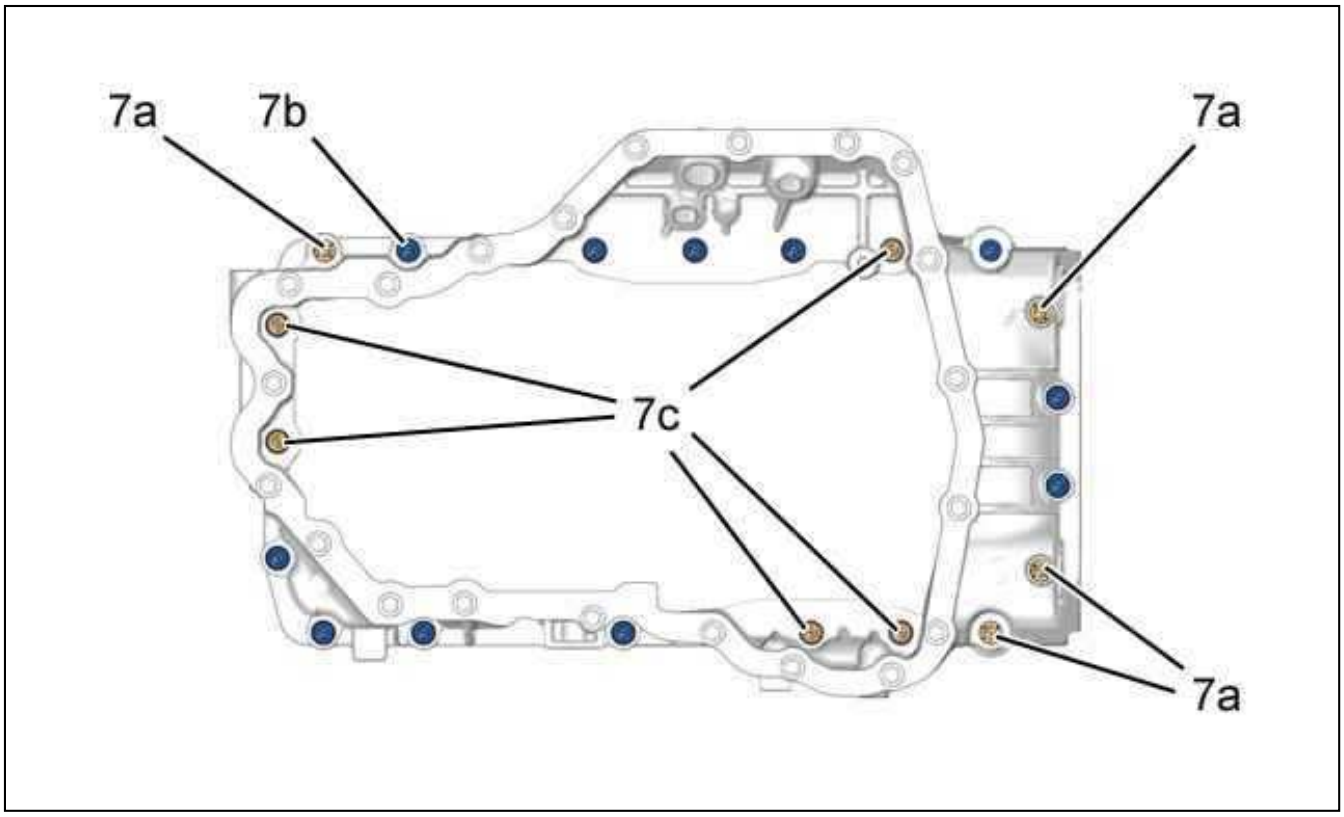


Figure : B1BB1QWD

CAUTION : 2 possible assemblies of bolts (7). It is essential to keep the positions of the bolts correct ; Risk of damage to the cylinder block (Crankshaft bearing cap incompatible with the bolts 25 mm in length).

CAUTION : Whichever assembly it is, the 5 bolts (7c) have to be coated with sealing product (Index E4) ; Risk o leaks.

First assembly		
Reference	Number of bolts	Nominal length of bolts (mm)
(7a)	4	40 mm
(7b)	11	21 mm
(7c)	5	21 mm

Second assembly		
Reference	Number of bolts	Nominal length of bolts (mm)
(7a)	4	45 mm
(7b)	11	21 mm
(7c)	5	25 mm

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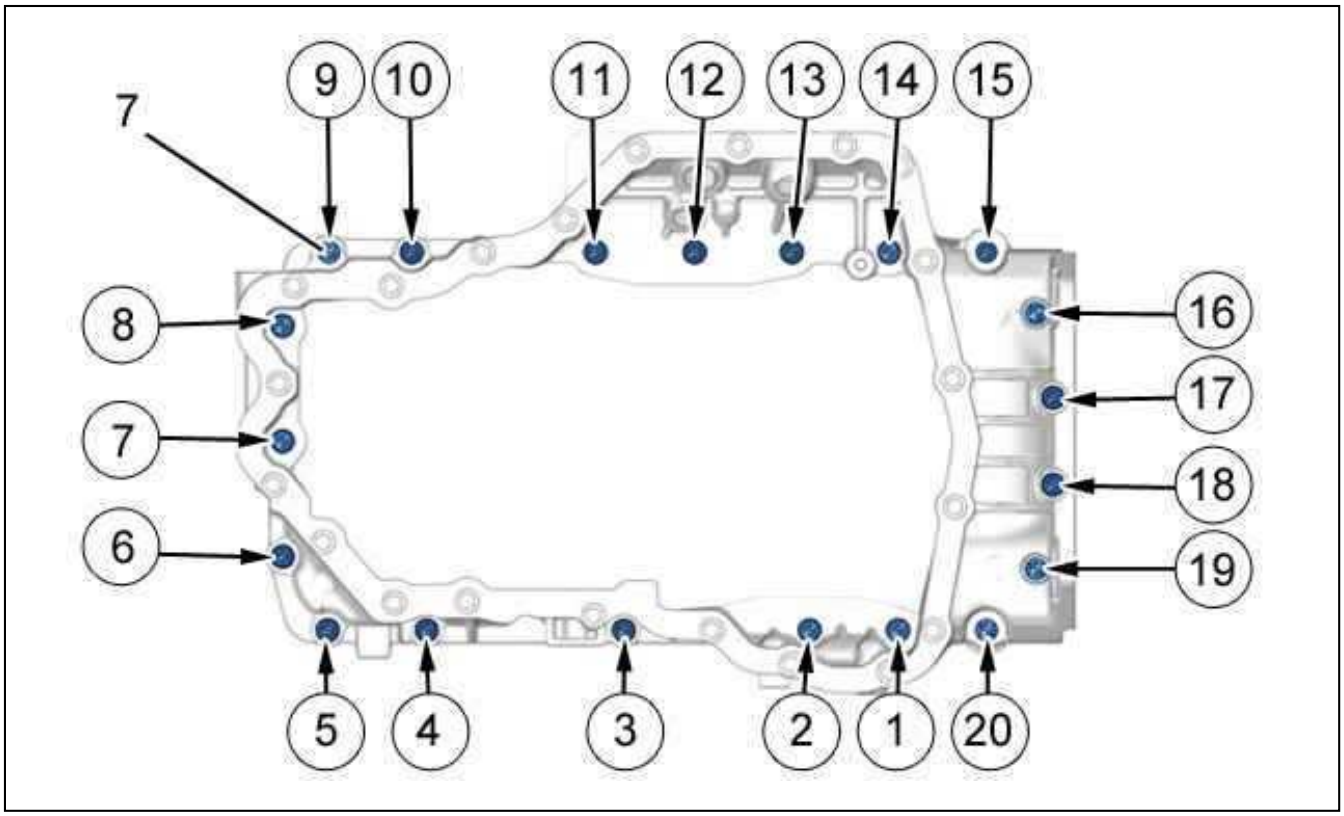


Figure : B1BB1QXD

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Draw up the bolts (7)
- Do up the bolts (7)
- Tighten the bolts (7) to torque

2.3. Order of tightening : Lower oil sump

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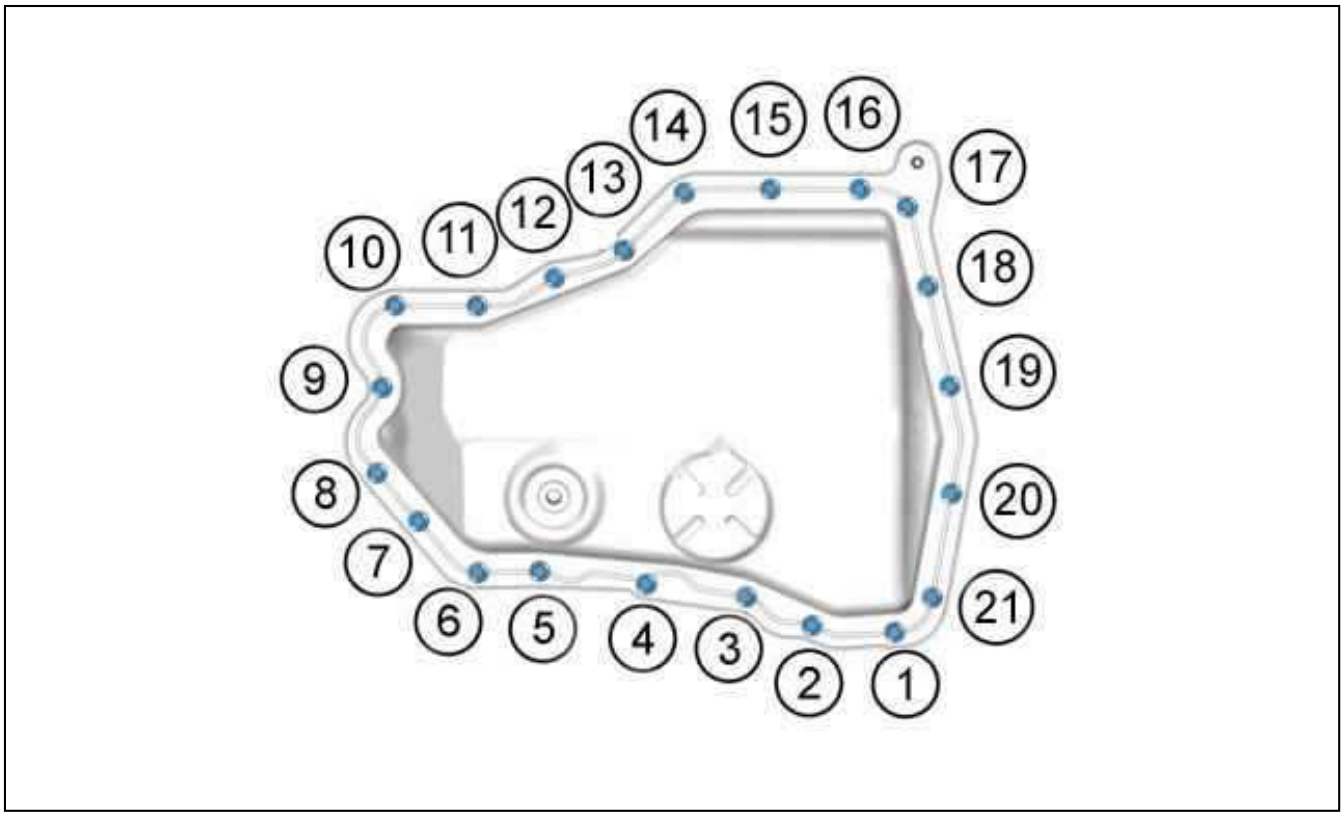


Figure : B1FB00LD

(11) bolts (Lower oil sump).

3. Lubrication system (External)

3.1. Tightening torques

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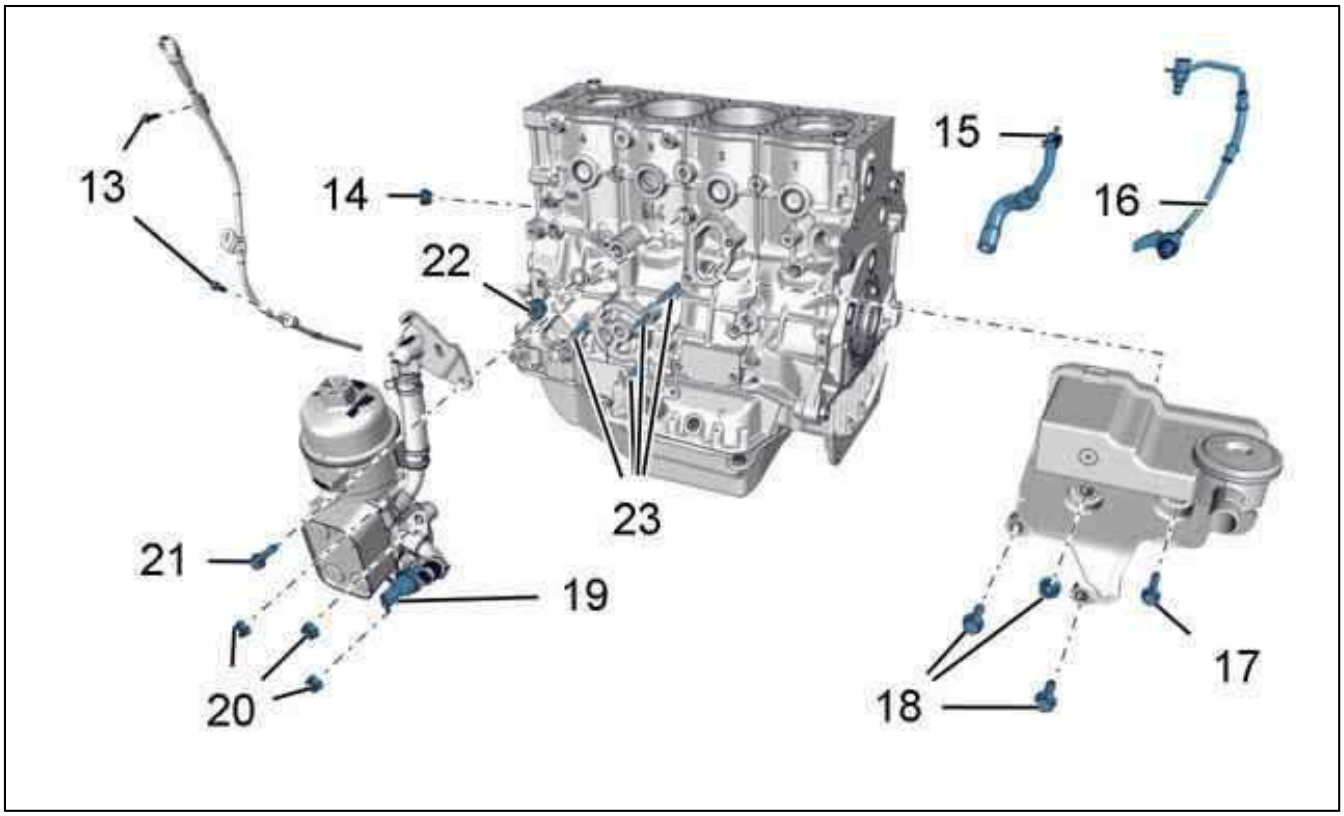


Figure : B1CB00AD

Reference	Designation	Tightening torque
(13)	bolts (Dipstick guide)	0,8 daNm
(14)	Plug (Cylinder block)	3,7 daNm
(15)	bolts (Turbocharger lubricating pipe)	1 daNm
(16)	banjo bolts (Turbocharger lubricating pipe)	Cylinder block side : 4 daNm
		Turbocharger side : 2,8 daNm
(17)	bolts (Oil separator (M6)) (*)	0,8 daNm
(18)	Fasteners (Oil separator (M8)) (*)	2 daNm
(19)	Oil pressure switch	3,2 daNm
(20)	nuts (Oil filter support) (*)	Pre-tighten to 1 daNm
		Tightening to 2 m.daN
(21)	bolts (Oil union fork) (*)	Pre-tighten to 1 daNm
		Tightening to 2 m.daN
(22)	Plug (Cylinder block)	5,5 daNm
(23)	studs (Oil filter support)	0,65 daNm
(*) Follow the tightening sequence		

3.2. Order of tightening : Oil separator

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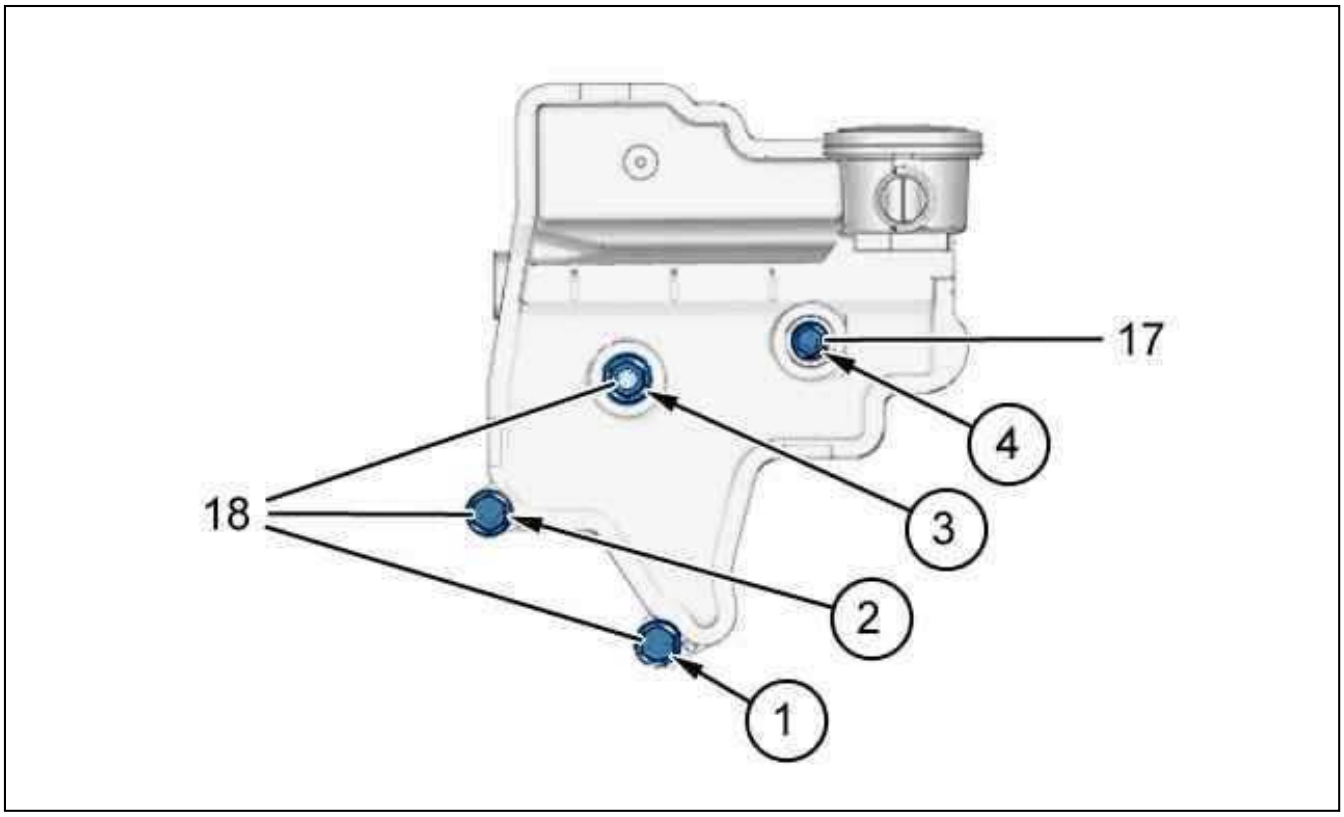


Figure : B1FB01CD

(17) bolts (M6) .
(18) Fasteners (M8).

3.3. Order of tightening : Oil filter support

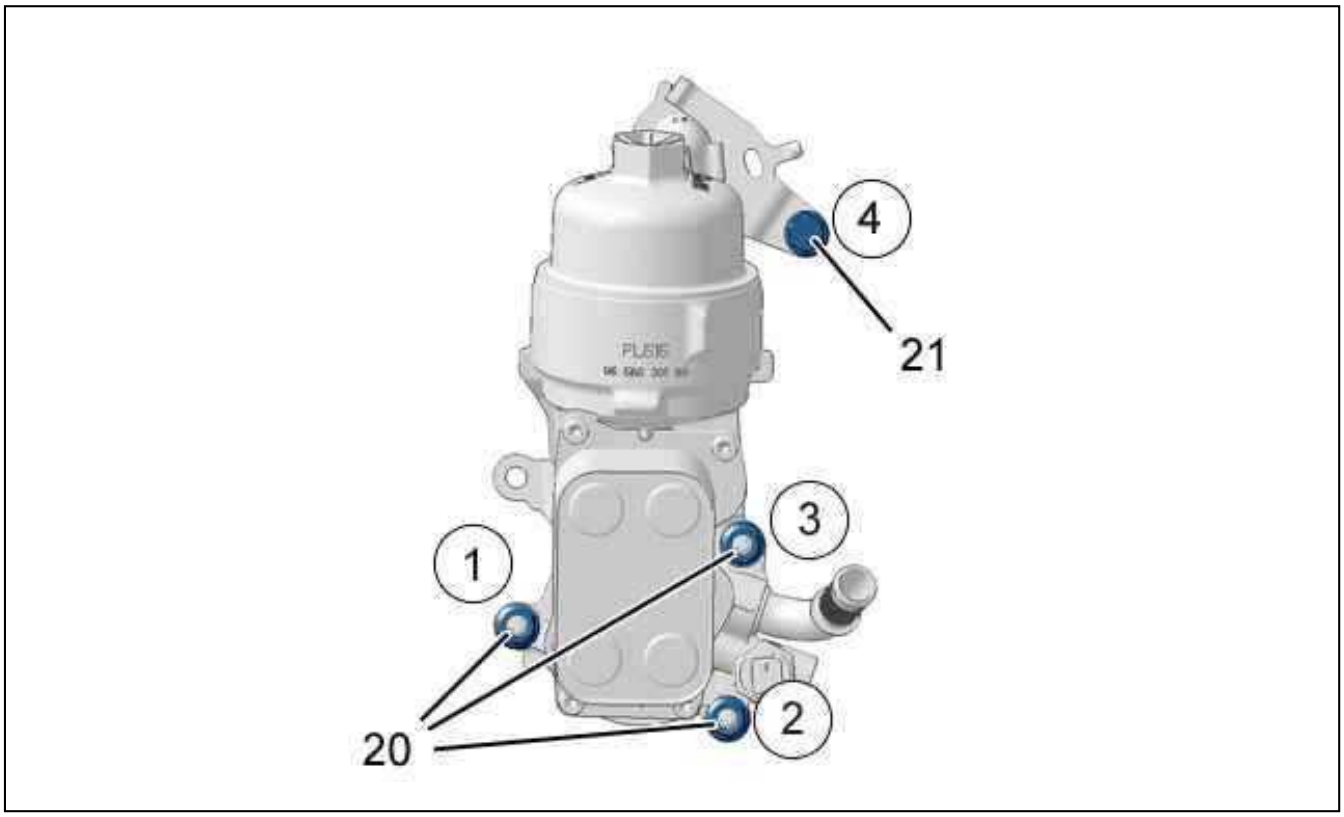


Figure : B1FB00MD

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(20) nuts (Oil filter support).
(21) bolts (Oil union fork).

4. Cylinder head

4.1. Tightening torques

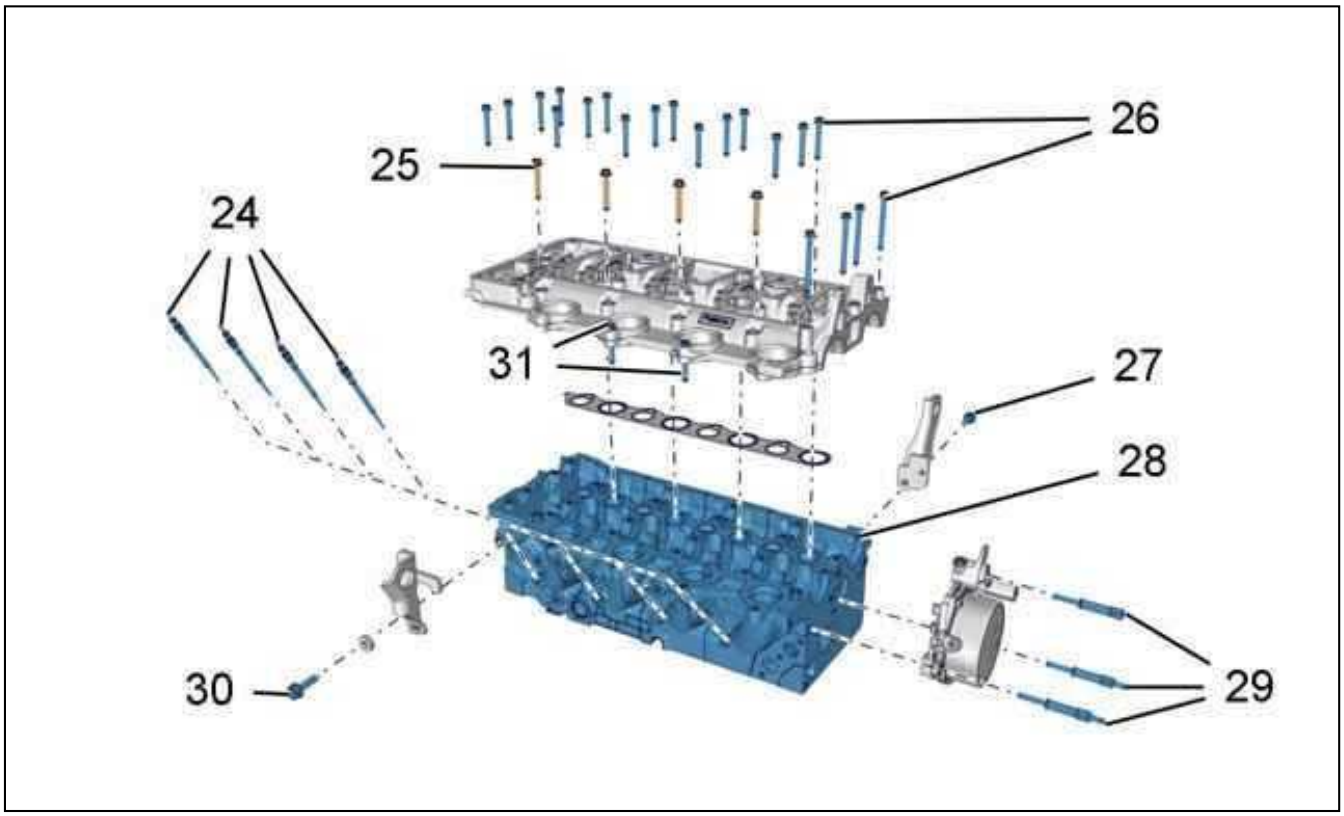


Figure : B1DB00PD

Reference	Designation	Tightening torque
(24)	Pre-heater plugs	0,6 daNm
(25)	Pre-coated bolts (Camshaft bearing cap casing) (*)	Pre-tighten to 0,5 daNm
		Tightening to 1 m.daN
(26)	bolts (Camshaft bearing cap casing) (*)	Pre-tighten to 0,5 daNm
		Tightening to 1 m.daN
(27)	bolts (Rear lifting bracket)	3 daNm
(28)	bolts (Cylinder head) (*)	Pre-tighten to 2 daNm
		Tightening to 6 m.daN
		Angular tightening to 220°
(29)	bolts (Vacuum pump)	0,9 daNm
(30)	bolts (Front lifting bracket)	3 daNm
(31)	bolts (Camshaft bearing cap casing) (*)	Pre-tighten to 0,5 daNm
		Tightening to 1 m.daN
(*) Follow the tightening sequence		

4.2. Cylinder head tightening sequence

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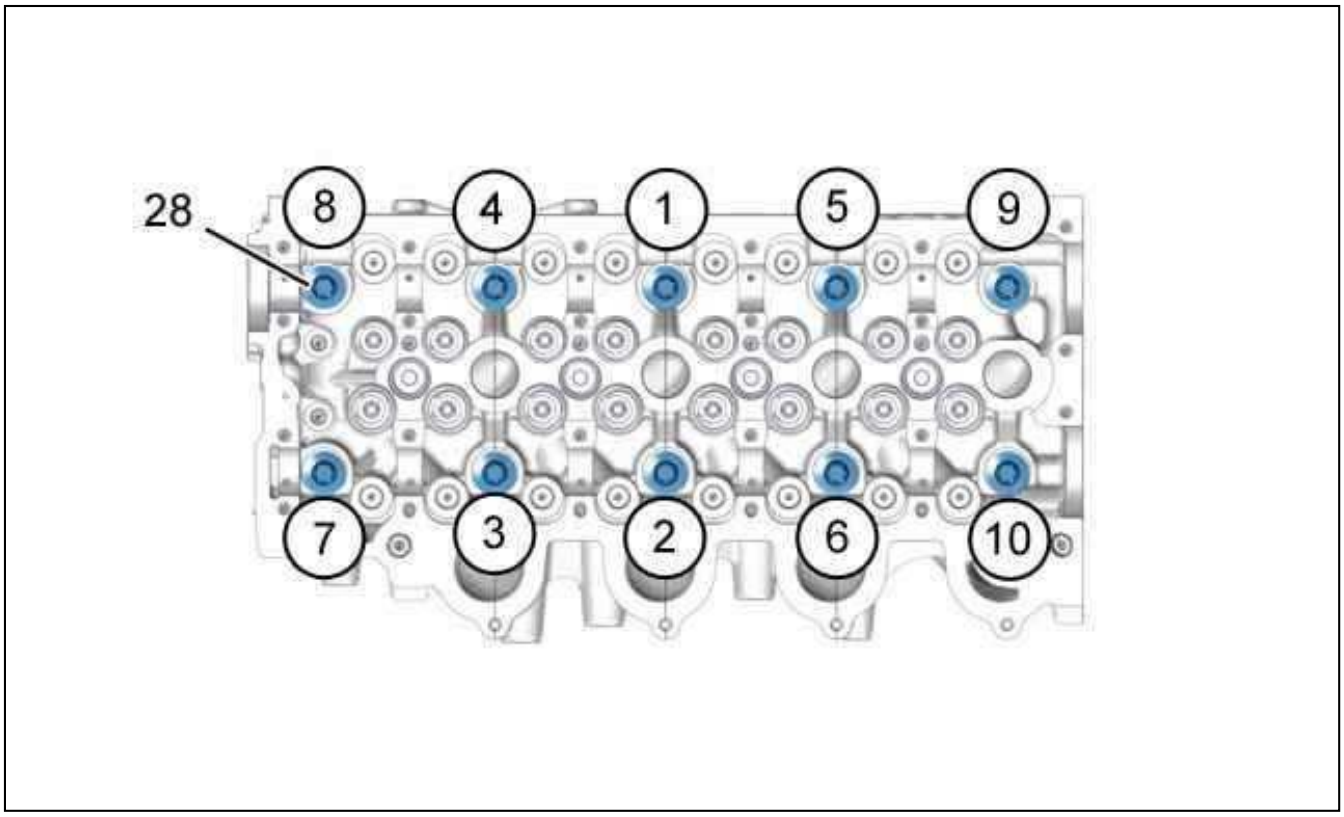


Figure : B1DB00QD

(28) Cylinder head bolts.

4.3. Order of tightening : Camshaft bearing cap casing

CAUTION : Presence of 4 pre-coated bolts.

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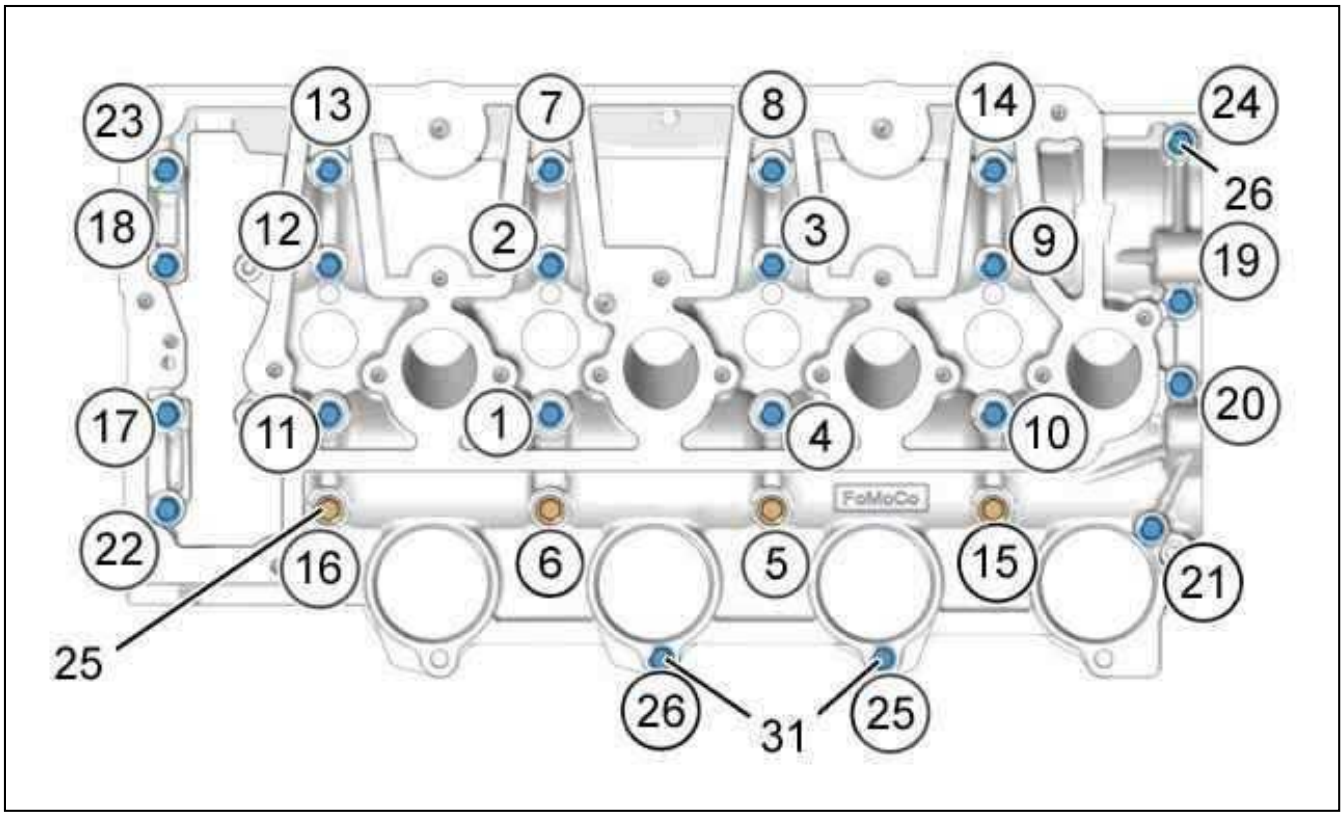


Figure : B1DB00RD

(25) Pre-coated bolts (Camshaft bearing cap casing).
(26) bolts (Camshaft bearing cap casing).
(31) bolts (Camshaft bearing cap casing).

5. Induction circuit / Exhaust gas recycling

5.1. Tightening torques

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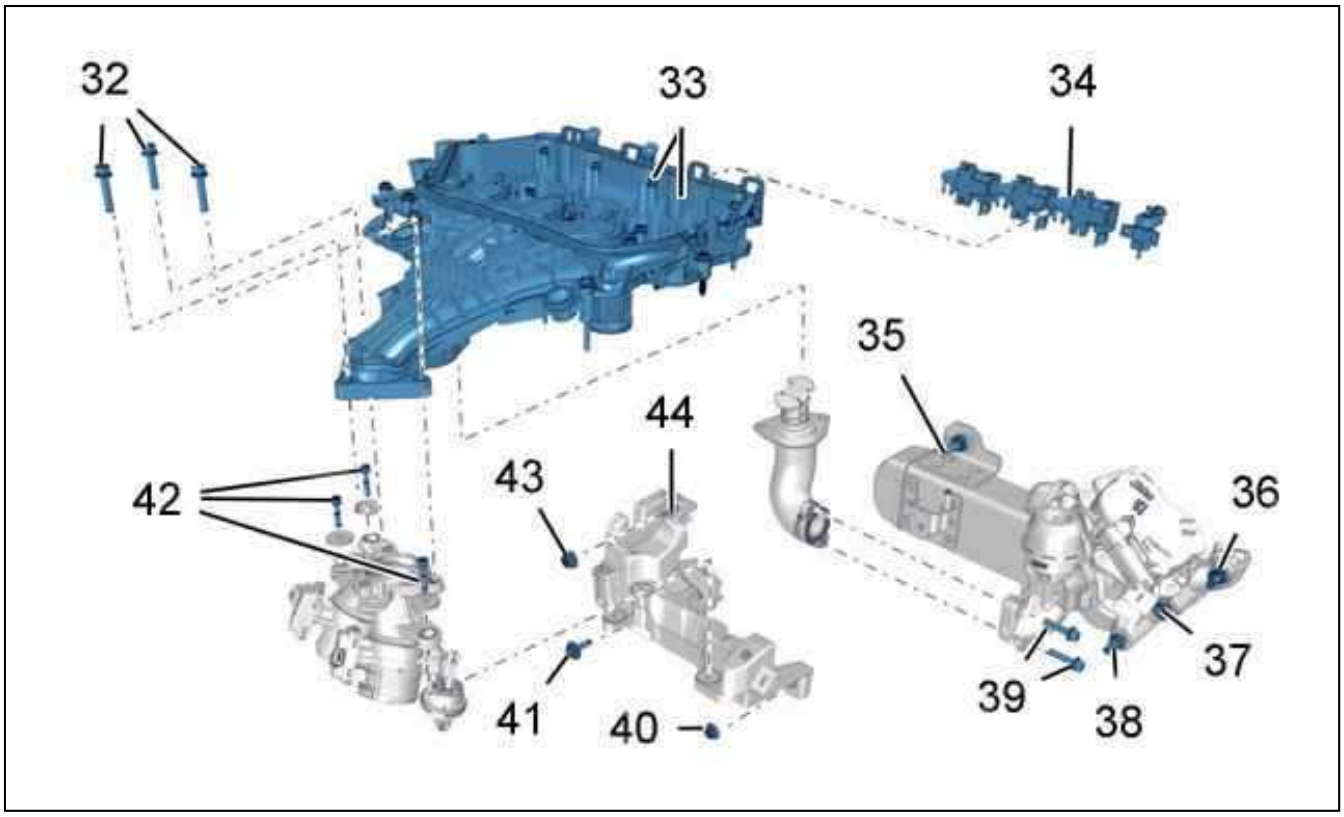


Figure : B1BB1J6D

Reference	Designation	Tightening torque
(32)	bolts (Inlet air metering unit)	0,8 daNm
(33)	bolts (Air inlet manifold) (*) (**)	1 daNm
(34)	Fasteners (Piloting electrovalves)	0,65 daNm
(35)	nut (Exhaust gas recirculation heat exchanger)	2 daNm
-	Stud (Exhaust gas recirculation heat exchanger)	0,6 daNm
(36)	nut (Exhaust gas recycling valve)	0,8 daNm
-	Stud (Exhaust gas recycling valve)	0,4 daNm
(37)	bolts (Exhaust gas recycling valve)	0,8 daNm
(38)	Stud (Exhaust gas recycling valve)	1 daNm
(39)	bolts (Exhaust gas recycling duct)	0,8 daNm
(40)	nut (Inlet air metering unit support)	0,8 daNm
(41)	bolts (Inlet air metering unit support)	2 daNm
(42)	bolts (Inlet air metering unit)	0,8 daNm
(43)	nut (Inlet air metering unit support)	2 daNm
(44)	Stud (Inlet air metering unit support)	0,6 daNm
(*) Follow the tightening sequence (**) Follow the tightening procedure		

5.2. Procedure - Order of tightening : Air inlet manifold

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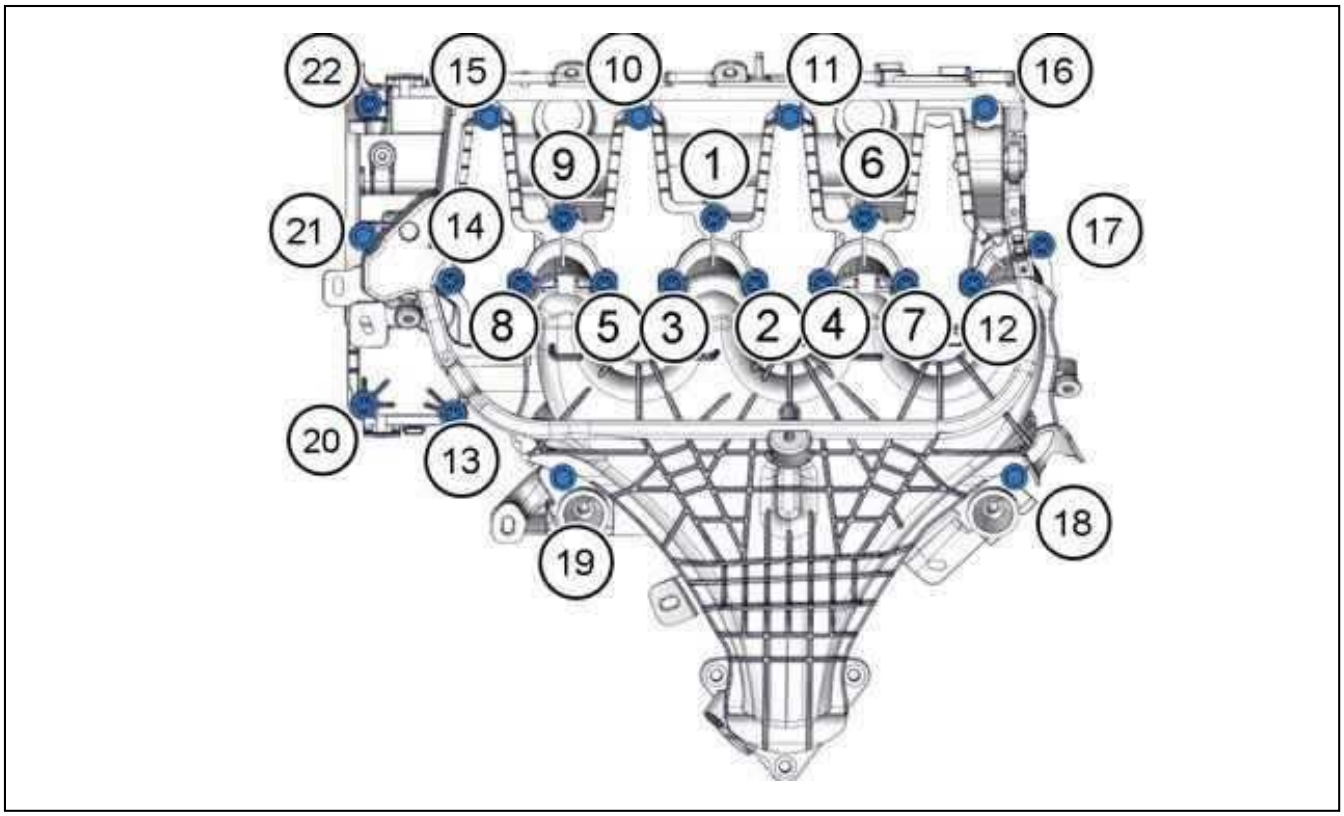


Figure : B1HB070D

(33) bolts (Air inlet manifold).

Tightening procedure :

- Do up the bolts (33)
- Loosen the bolts (33)
- Retighten the bolts (33) to the correct torque

6. Timing gear

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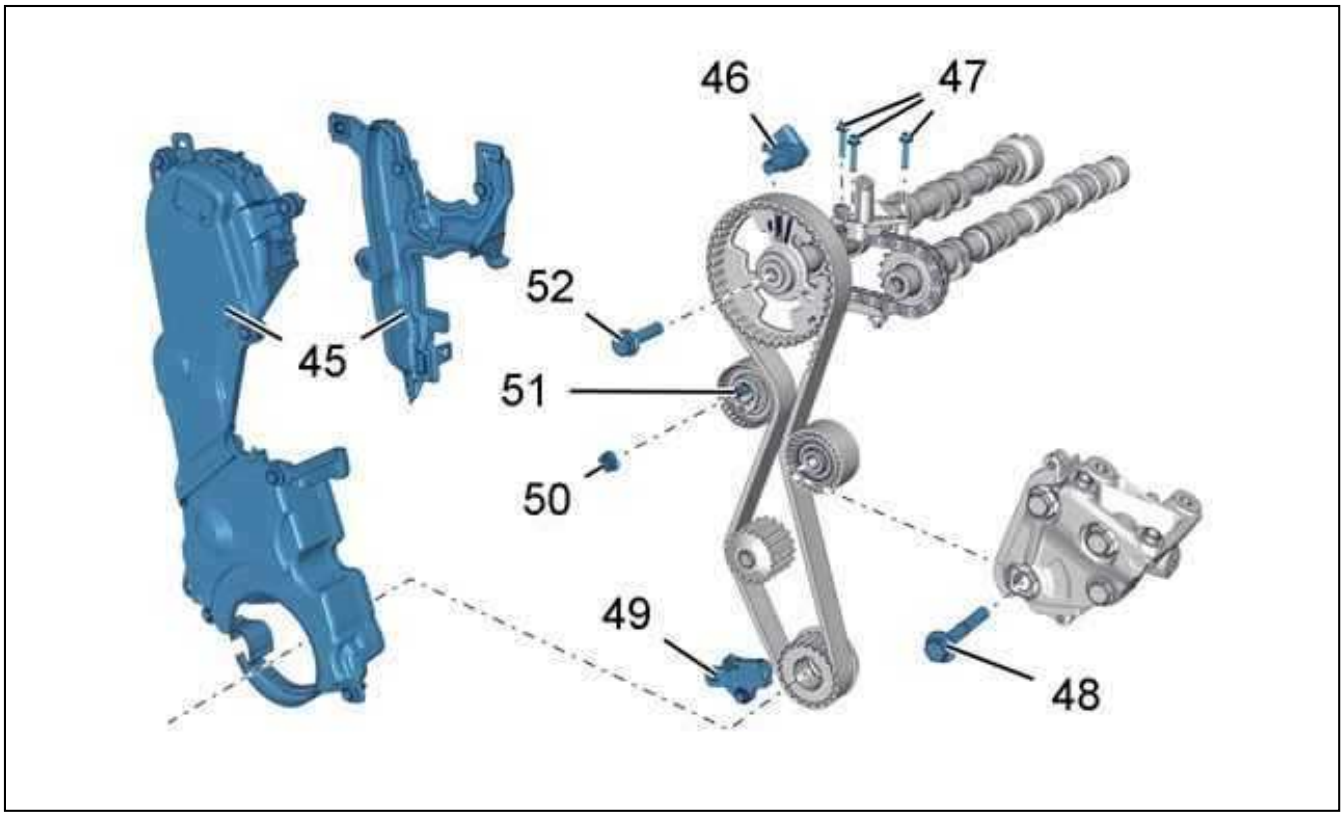


Figure : B1EB004D

Reference	Designation	Tightening torque
(45)	bolts (Timing cover)	0,5 daNm
(46)	bolts (Cylinder reference sensor)	0,6 daNm
(47)	bolts (Timing chain tensioner)	0,6 daNm
(48)	bolts (Roller tensioner)	5,7 daNm
(49)	bolts (Engine speed sensor)	0,7 daNm
(50)	nut (Roller tensioner) (Timing gear)	2,1 daNm
(51)	Stud (Roller tensioner) (Timing gear)	1 daNm
(52)	bolts (Camshaft pulley)	Pre-tighten to 2 daNm
		Angular tightening to 60°

7. injection

7.1. Tightening torques

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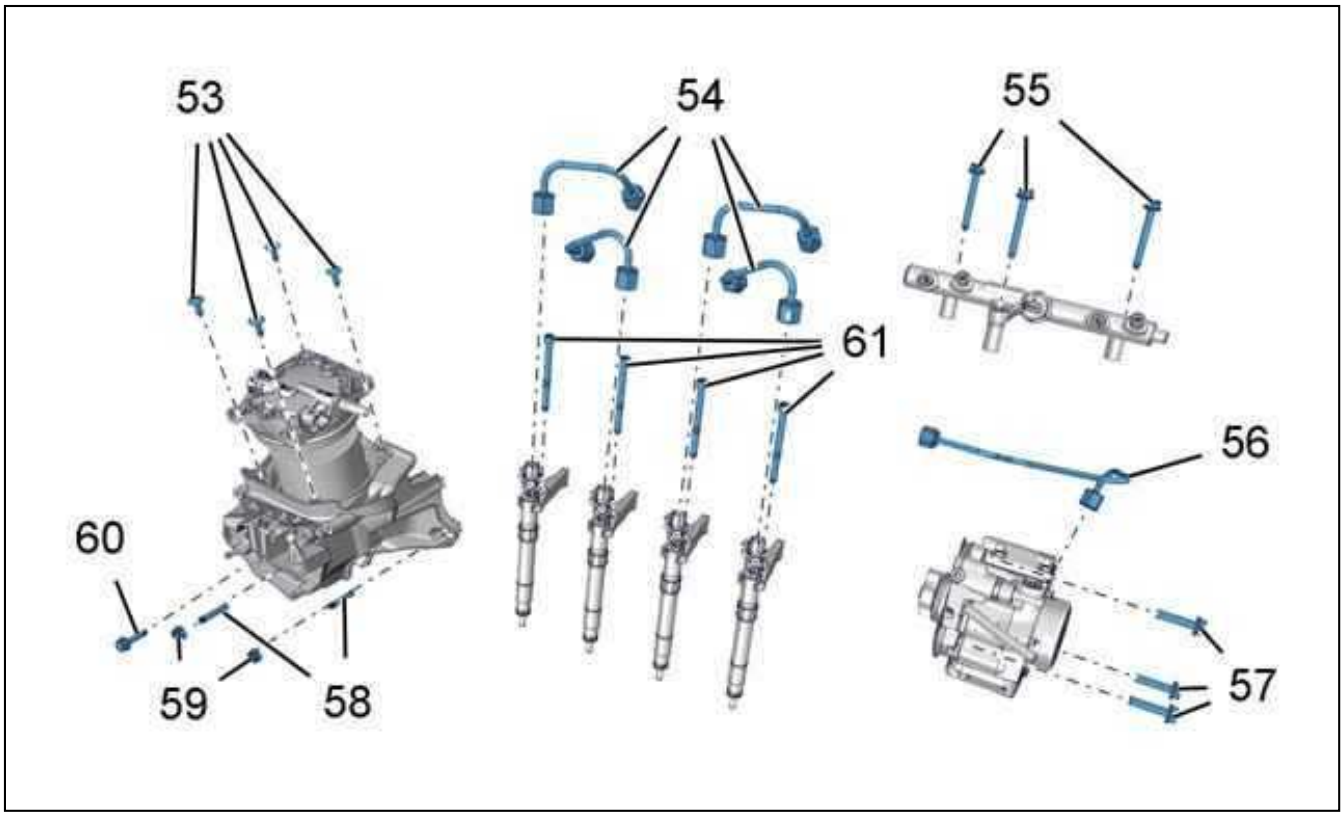


Figure : B1HB071D

Reference	Designation	Tightening torque
(53)	bolts (Fuel filter)	1,1 daNm
(54)	Union (High-pressure fuel pipe / Injectors) (*) (**)	Pre-tighten to 1,8 daNm
		Tightening to 2,7 m.daN
(55)	bolts (Fuel high pressure rail)	2,2 daNm
(56)	Union (High-pressure fuel pipe / Fuel high pressure common injection rail)	Pre-tighten to 1,8 daNm
		Tightening to 2,7 m.daN
(57)	bolts (high pressure fuel pump)	2 daNm
(58)	studs (Fuel filter support)	0,4 daNm
(59)	nuts (Fuel filter support)	0,8 daNm
(60)	bolts (Fuel filter support)	0,8 daNm
(61)	bolts (Injector holder clips)	Pre-tighten to 0,7 daNm
		Angular tightening to 55°
(*) Follow the tightening sequence (**) Follow the tightening procedure		

7.2. Procedure - Order of tightening

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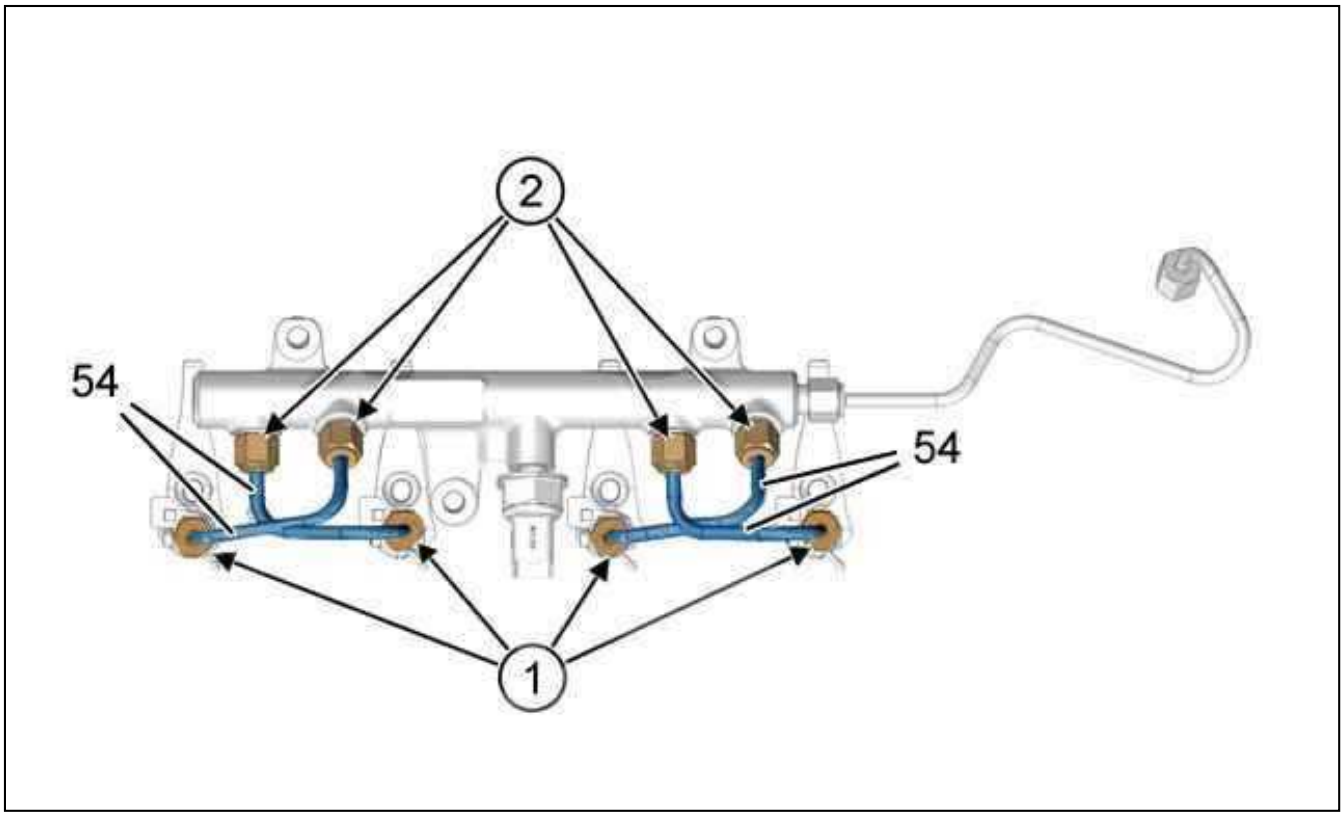


Figure : B1HB072D

(54) : High-pressure fuel pipe .
Tightening procedure :

- Pre-tighten to the specified torque : The unions (Injector side)
- Pre-tighten to the specified torque : The unions (High pressure rail side)
- Tighten to the specified torque : The unions (Injector side)
- Tighten to the specified torque : The unions (High pressure rail side)

8. Sensor connection / Injection actuator

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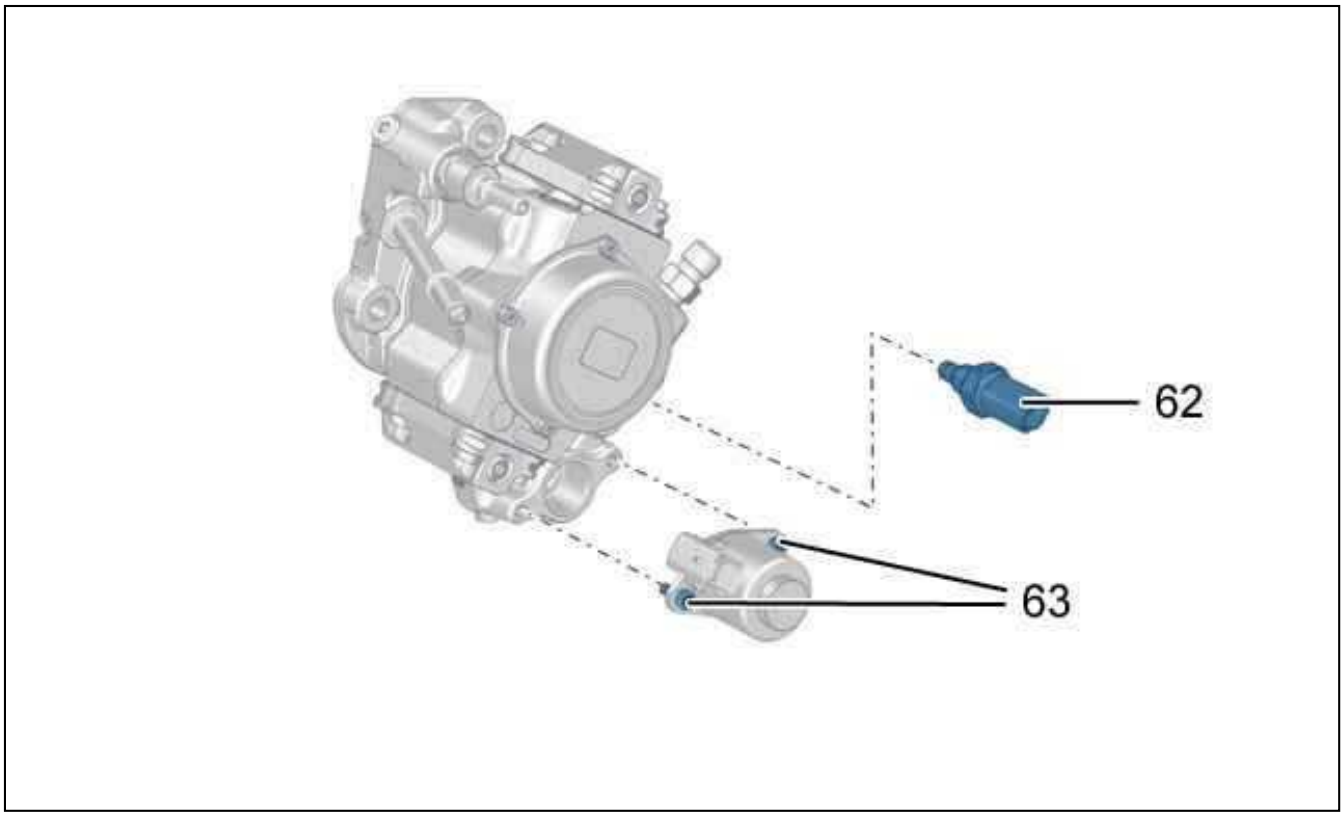


Figure : B1BB1J7D

Reference	Designation	Tightening torque
(62)	Fuel temperature sensor	1,5 daNm
(63)	bolts (Fuel low pressure actuator)	Pre-tighten to 0,3 daNm
		Loosen by 1/2 turn(s)
		Pre-tighten to 0,15 daNm
		Pre-tightening to 0,3 daNm
		Tightening to 0,55 m.daN

9. Turbocharging circuit

9.1. Tightening torques

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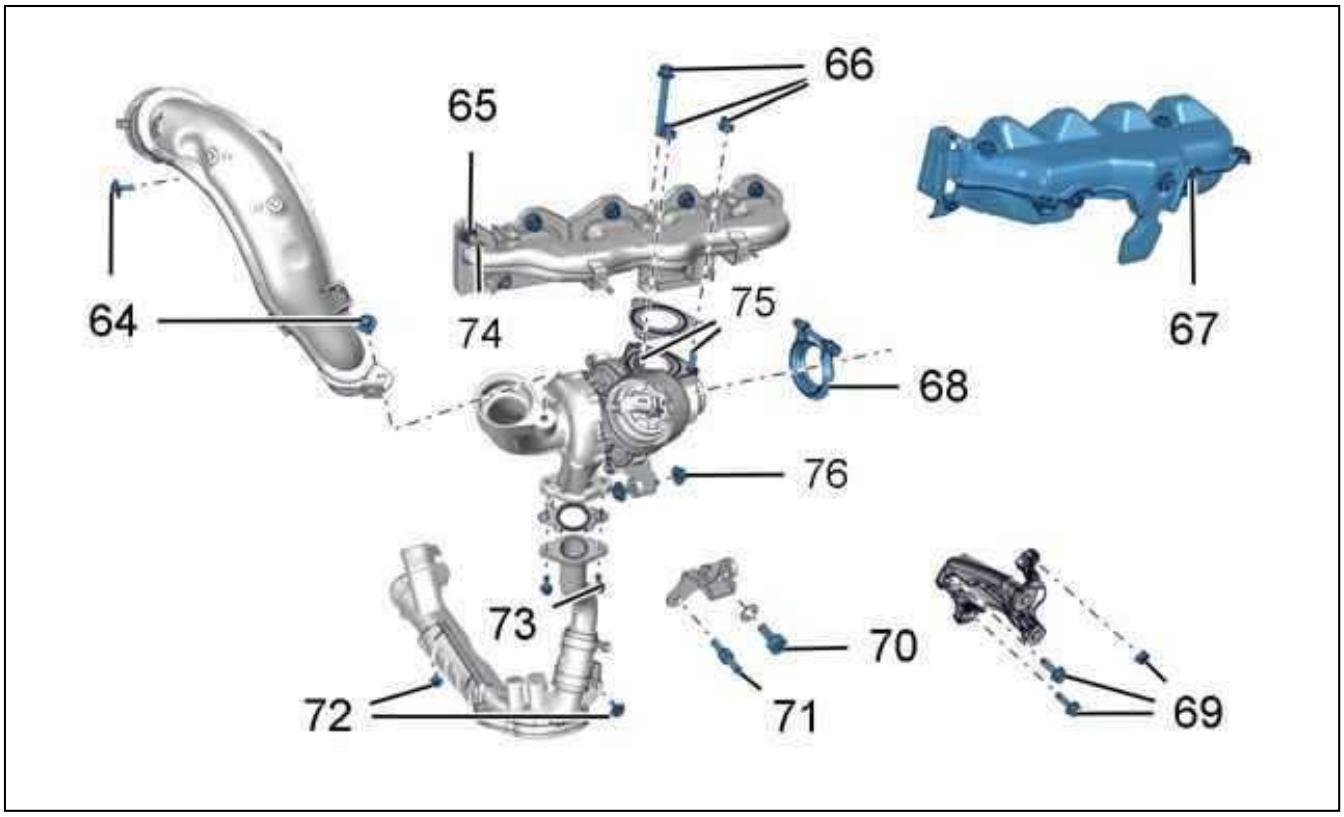


Figure : B1BB0K9D

Reference	Designation	Tightening torque
(64)	bolts (Air inlet union)	0,8 daNm
(65)	nut (Exhaust manifold) (*)	Pre-tighten to 1 daNm
		Tightening to 2 m.daN
(66)	Fixing (turbocharger)	2,5 daNm
(67)	bolts (Exhaust manifold heat shield)	0,8 daNm
(68)	Clip (turbocharger)	2,2 daNm
(69)	Fixing (Pre-catalyser support)	2 daNm
(70)	bolts (Turbocharger support)	3,7 daNm
(71)	Stud (Turbocharger support)	1,5 daNm
(72)	bolts (Expansion chamber)	0,7 daNm
(73)	bolts (The turbocharger air outlet connector)	1 daNm
(74)	Stud (Exhaust manifold)	0,6 daNm
(75)	Stud (turbocharger)	1 daNm
(76)	nut (Turbocharger support)	2,5 daNm
(*) Follow the tightening sequence		

9.2. Order of tightening : Exhaust manifold fixing nuts

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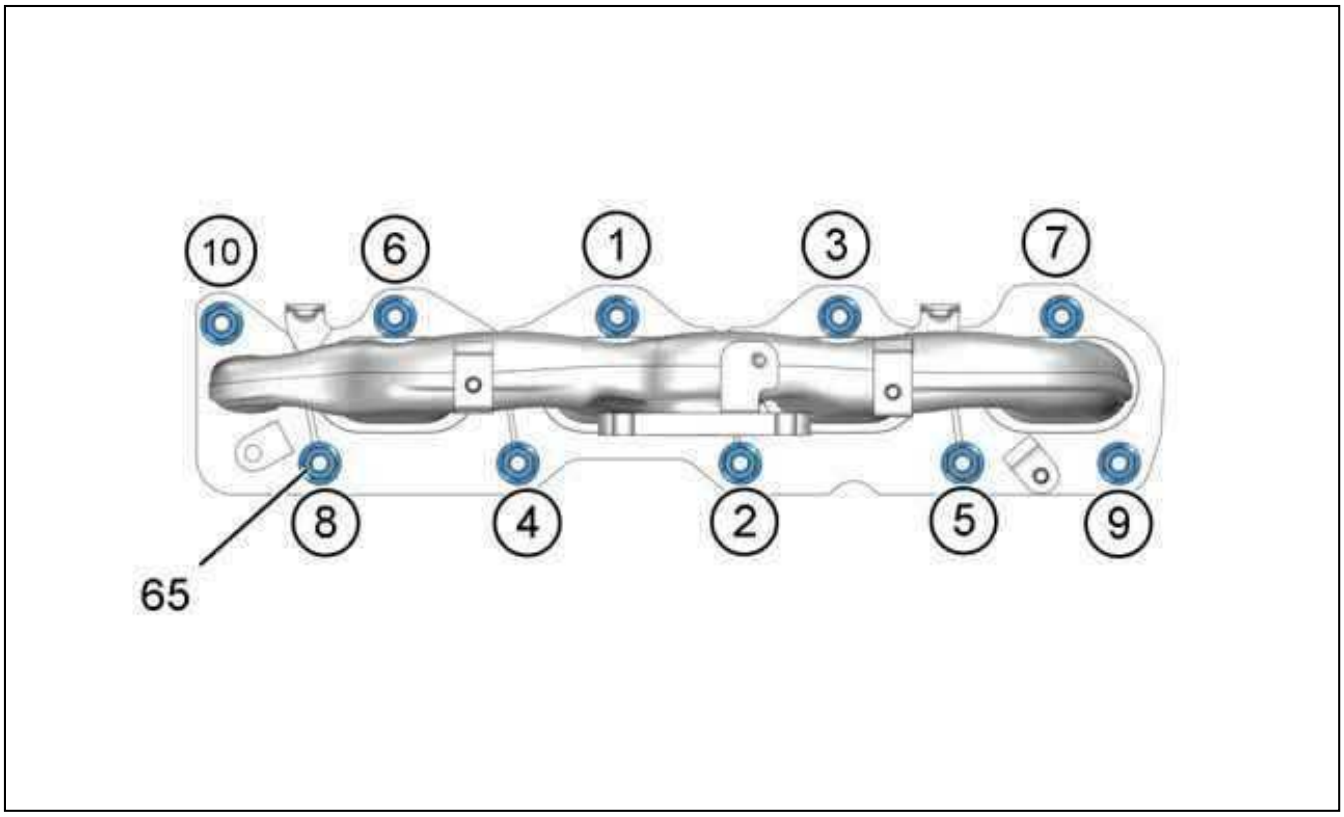


Figure : B1JB08AD

(65) Exhaust manifold fixing nuts.

10. Coolant outlet housing

10.1. Tightening torques

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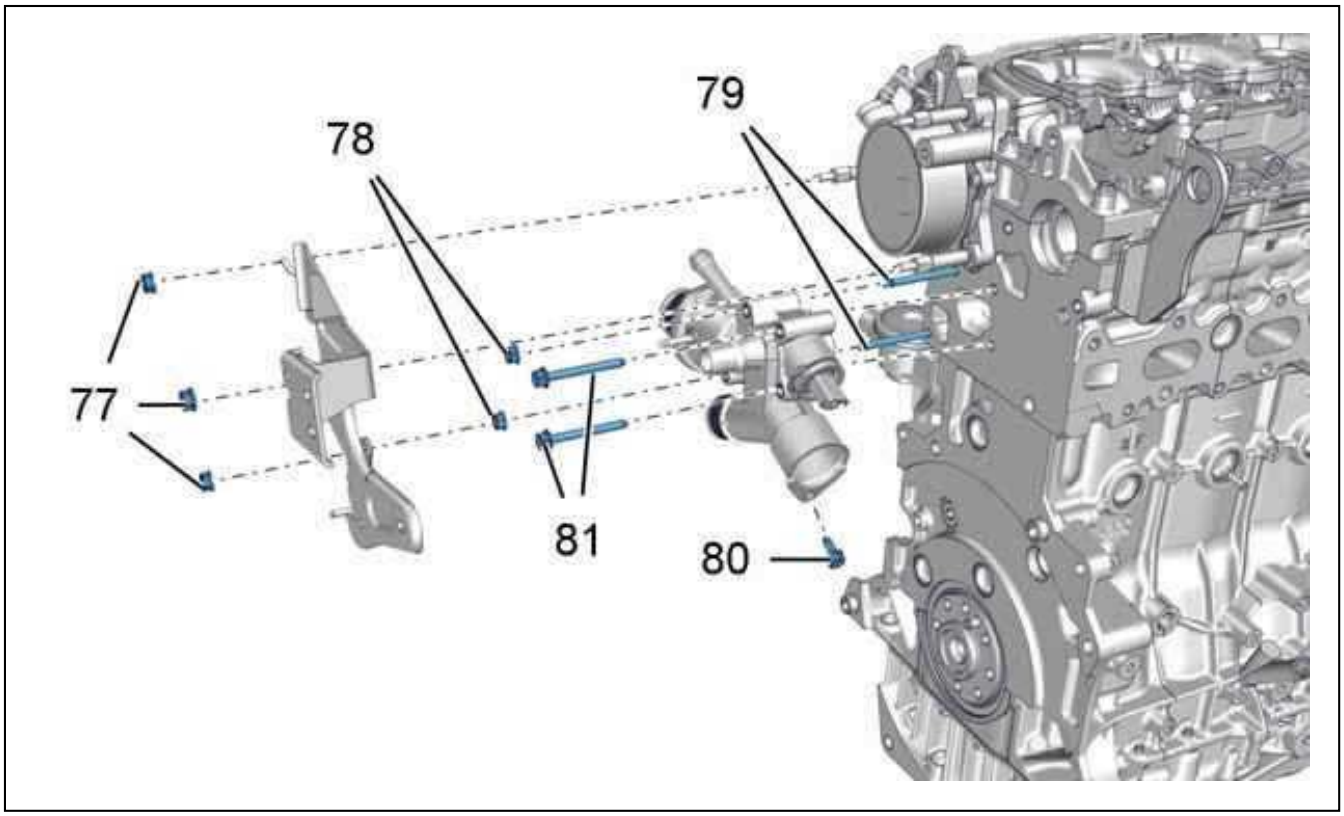


Figure : B1CB00BD

Reference	Designation	Tightening torque
(77)	nuts (Electrical harness mounting)	0,8 daNm
(78)	nuts (Coolant outlet housing) (*)	0,8 daNm
(79)	studs (Coolant outlet housing)	0,4 daNm
(80)	bolts (fork)	0,8 daNm
(81)	bolts (Coolant outlet housing) (*)	0,8 daNm
(*) Follow the tightening sequence		

10.2. Order of tightening : Coolant outlet housing

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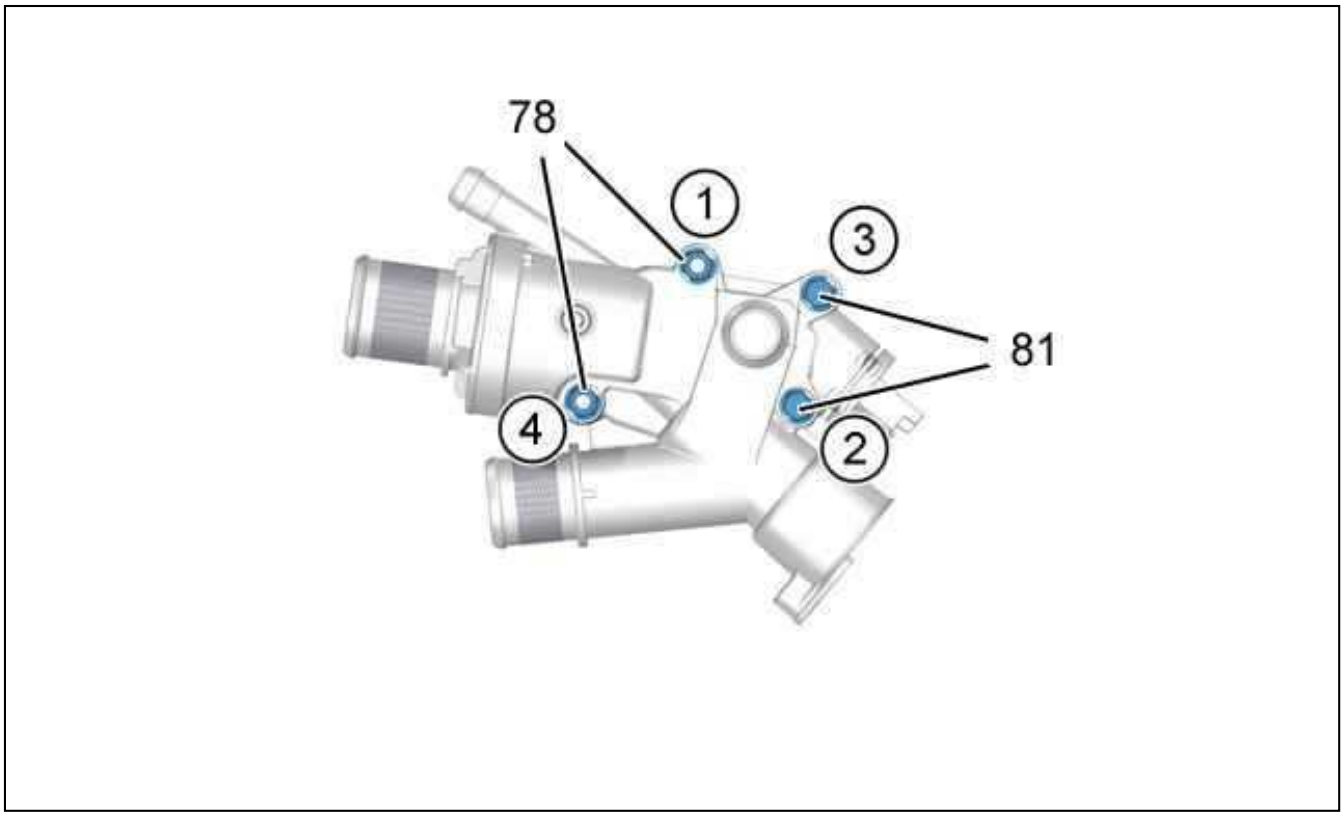


Figure : B1GB002D

(78), (81) : Coolant outlet housing fixings.

11. Coolant pump / Coolant inlet manifold

11.1. Tightening torques

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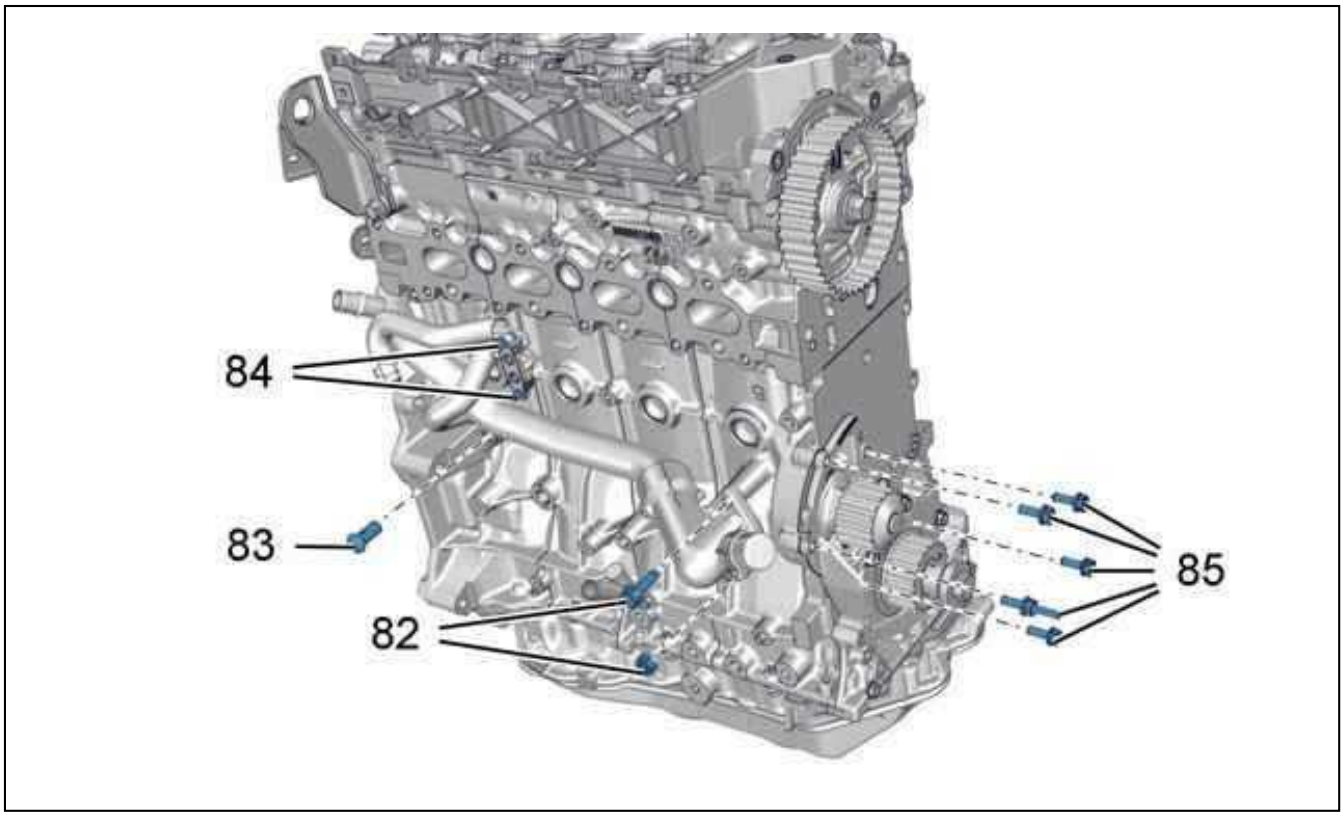


Figure : B1CB00CD

Reference	Designation	Tightening torque
(82)	Fasteners (Coolant inlet manifold)	1,75 daNm
(83)	Banjo bolt (Turbocharger cooling pipe)	3,5 daNm
(84)	bolts (Turbocharger cooling interface harness)	0,9 daNm
(85)	bolts (Coolant pump) (*)	1,6 daNm
(*) Follow the tightening sequence		

11.2. Order of tightening : Coolant pump

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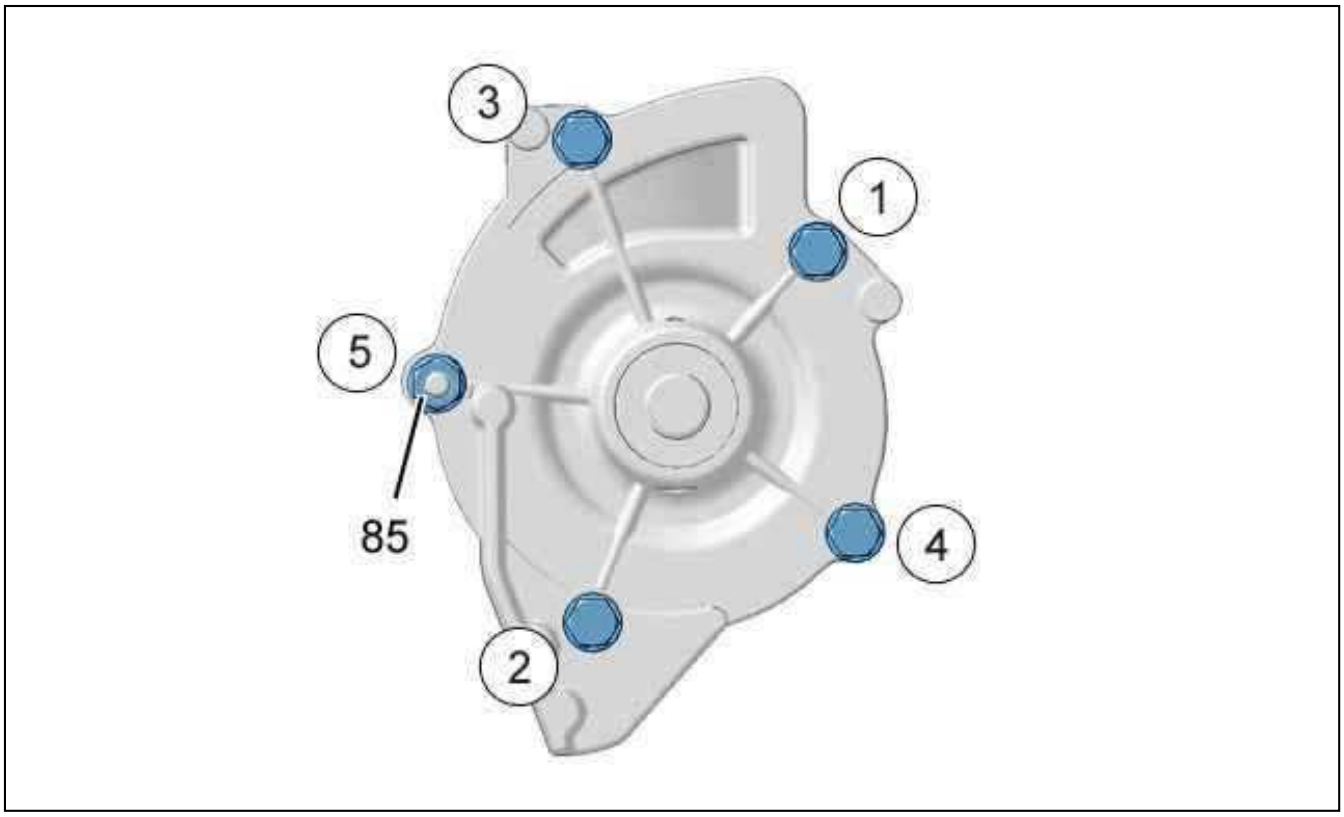


Figure : B1GB003D

(85) Coolant pump fixing bolts .

12. Driving the ancillaries

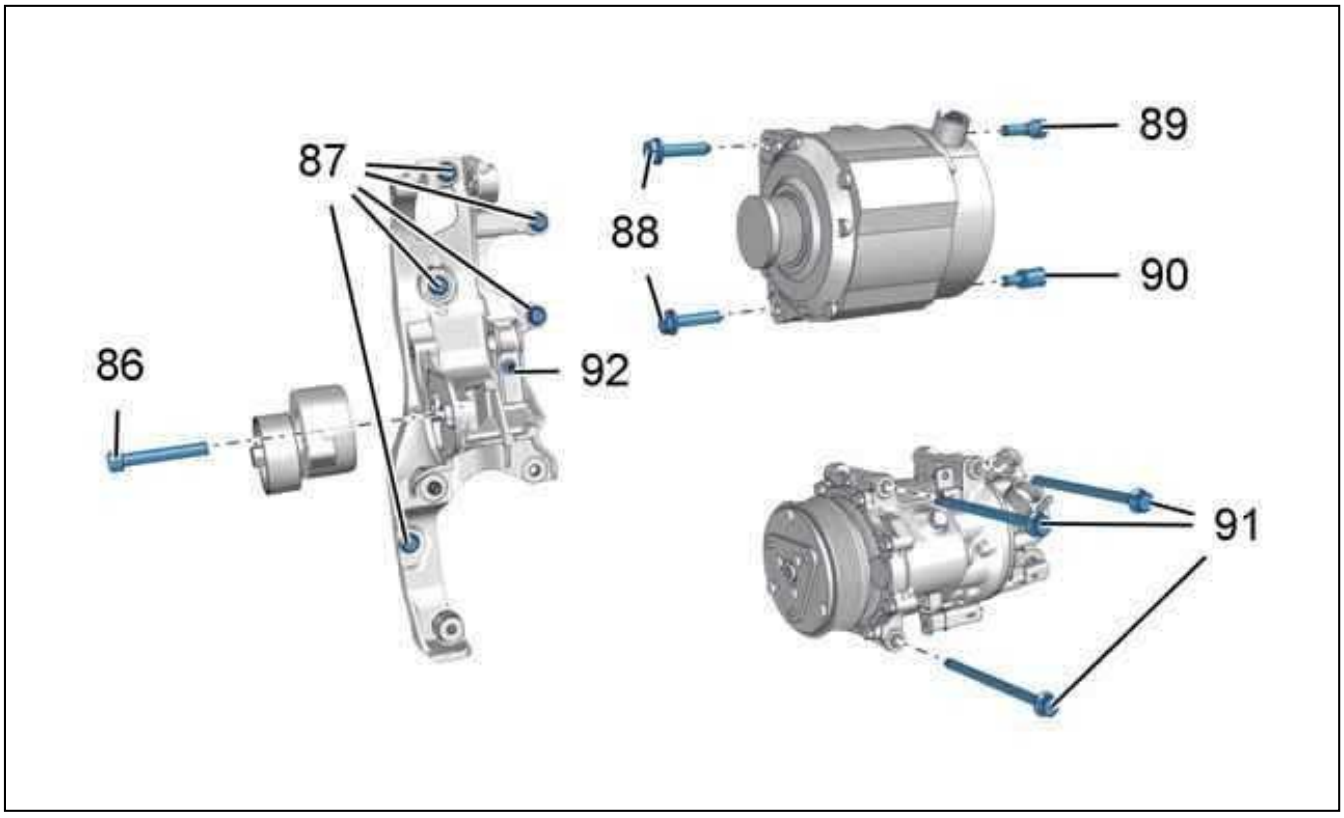


Figure : B1BB0I8D

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Reference	Designation	Tightening torque
(86)	bolts (Roller tensioner)	4,3 daNm
(87)	bolts (Alternator mounting)	2 daNm
(88)	bolts (Front of the alternator)	4,1 daNm
(89)	bolts (Top rear of the alternator)	4,9 daNm
(90)	bolts (Bottom rear of the alternator)	4,1 daNm
(91)	bolts (air conditioning compressor)	2,4 daNm
(92)	bolts (Alternator bracket)	0,9 daNm

13. Starter

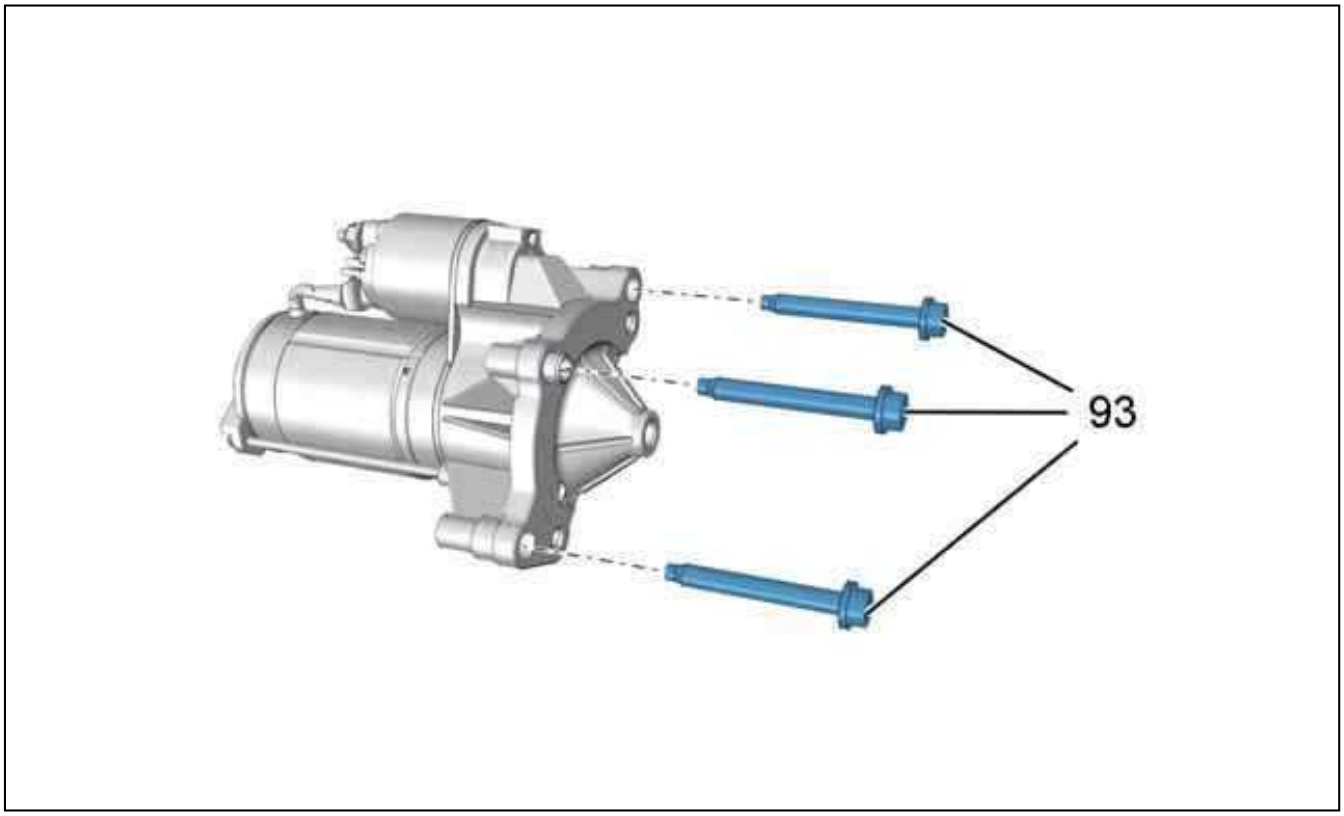


Figure : D1BB004D

Reference	Designation	Tightening torque
(93)	bolts (Starter)	3,5 daNm

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TIGHTENING TORQUES : ENGINE ASSEMBLY MOUNTINGS - GEARBOX

1. Right side upper engine mounting

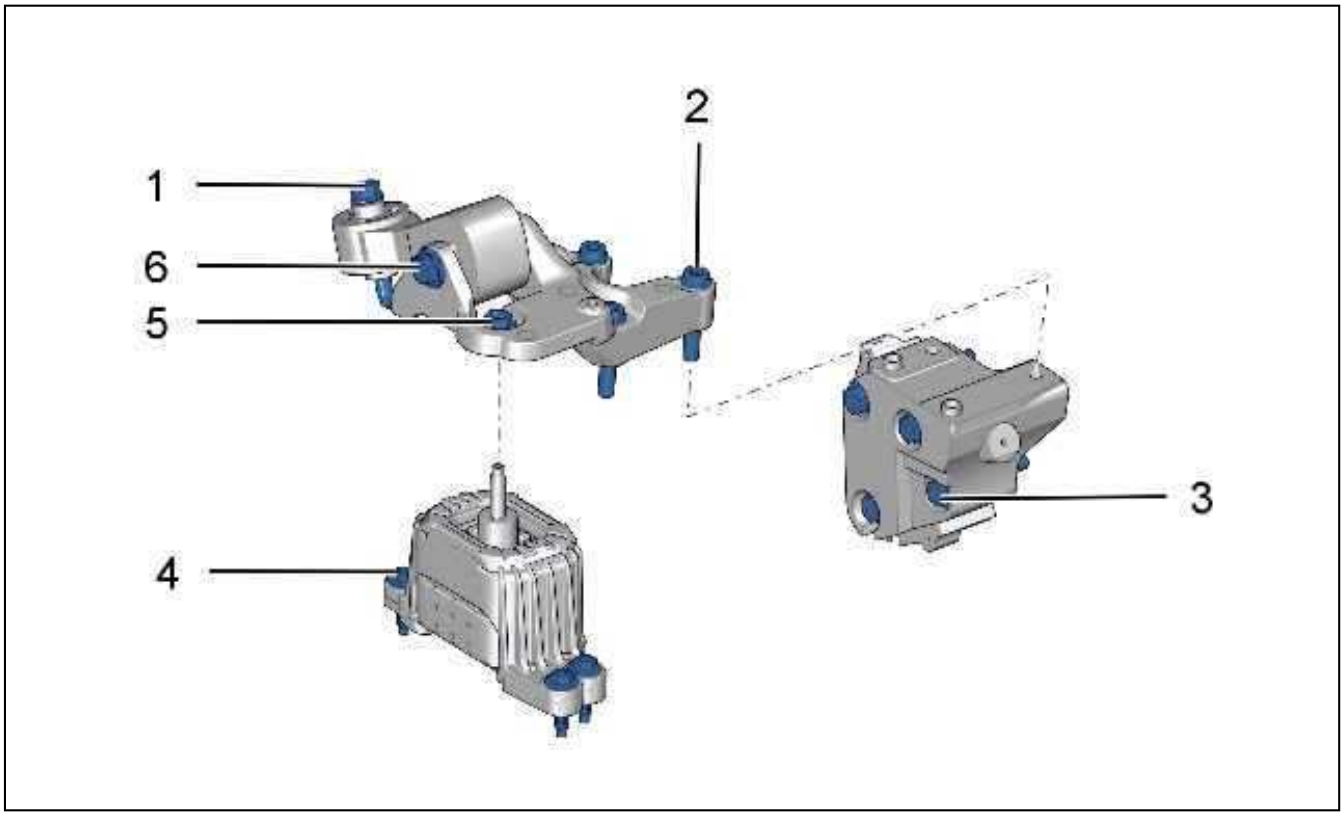


Figure : B2CG15YD

Reference	Designation	Tightening torque
(1)	bolts : Reaction rod/Body	4,75 daNm
(2)	bolts : engine support /Intermediate mounting	6 daNm
(3)	bolts : Intermediate mounting /Cylinder block	5,6 daNm
(4)	bolts : engine flexible mounting/Body	2,8 daNm
(5)	nut : engine support / engine flexible mounting	4,5 daNm
(6)	bolts : engine support /Reaction rod	4,75 daNm

2. LH engine support

2.1. manual gearbox

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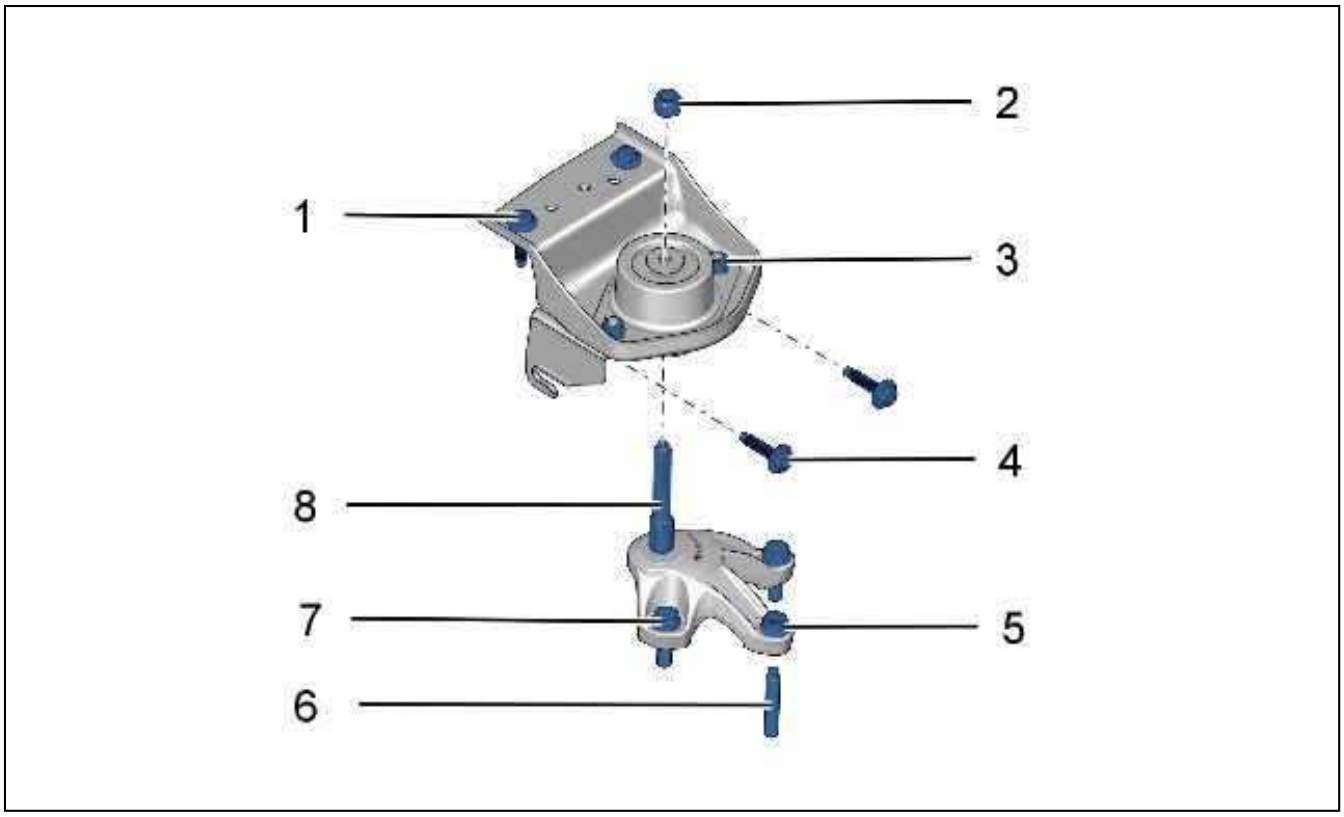


Figure : B2CG15ZD

Reference	Designation	Tightening torque
(1)	bolts : Left support plate bed/Body	2,8 daNm
(2)	nut : Flexible bush/ gearbox mounting	6,5 daNm
(3)	nut : Flexible bush/Left support plate bed	3 daNm
(4)	bolts : Left support plate bed/Body	2,8 daNm
(5)	nut : gearbox mounting/ gearbox	6 daNm
(6)	Stud : gearbox mounting/ gearbox	3 daNm
(7)	bolts : gearbox mounting/ gearbox	6 daNm
(8)	Gearbox flexible support shaft	6 daNm

2.2. automatic gearbox

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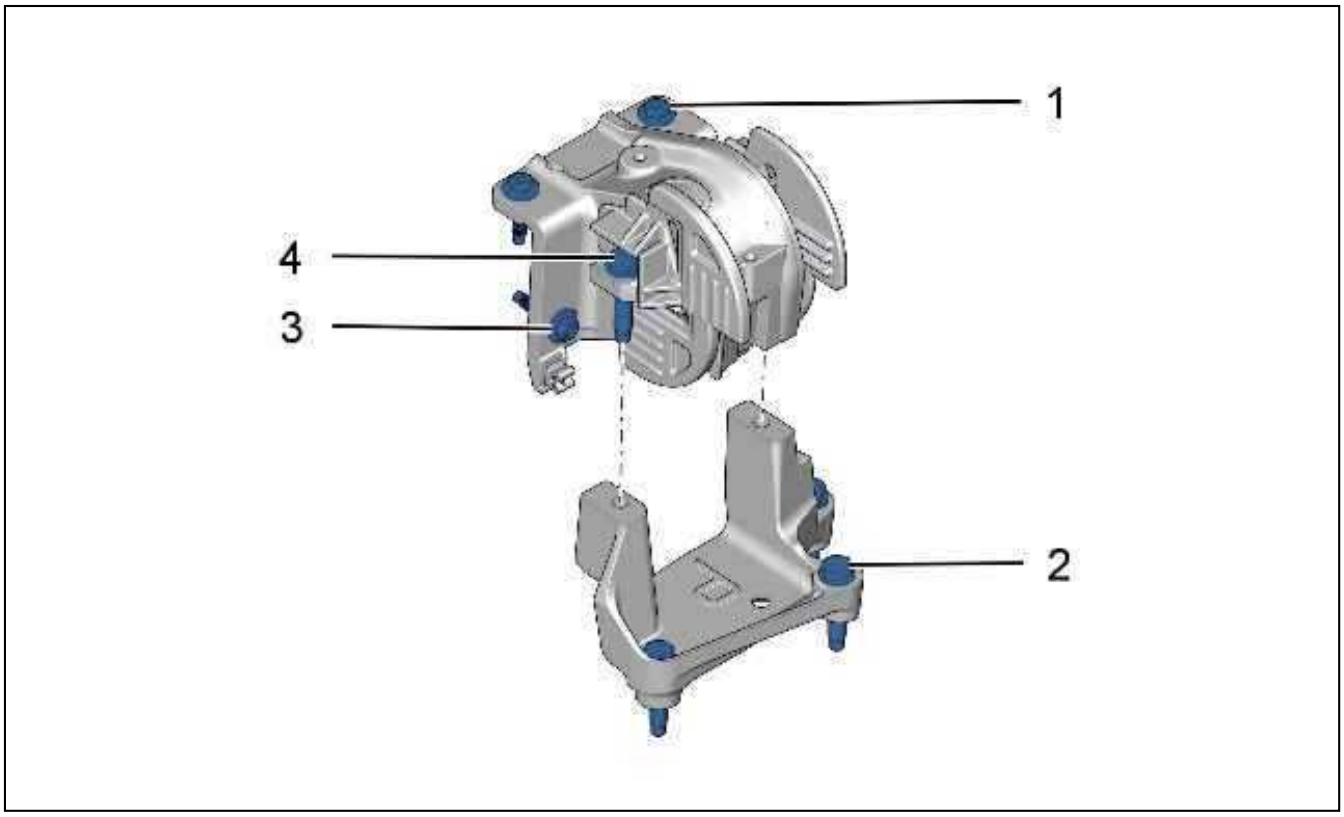


Figure : B2CG160D

Reference	Designation	Tightening torque
(1)	bolts : Left support plate bed/Body	2,8 daNm
(2)	bolts : gearbox mounting/ gearbox	6 daNm
(3)	bolts : Left support plate bed/Body	2,8 daNm
(4)	bolts : Flexible bush/ gearbox mounting	6 daNm

3. Right side lower engine mounting

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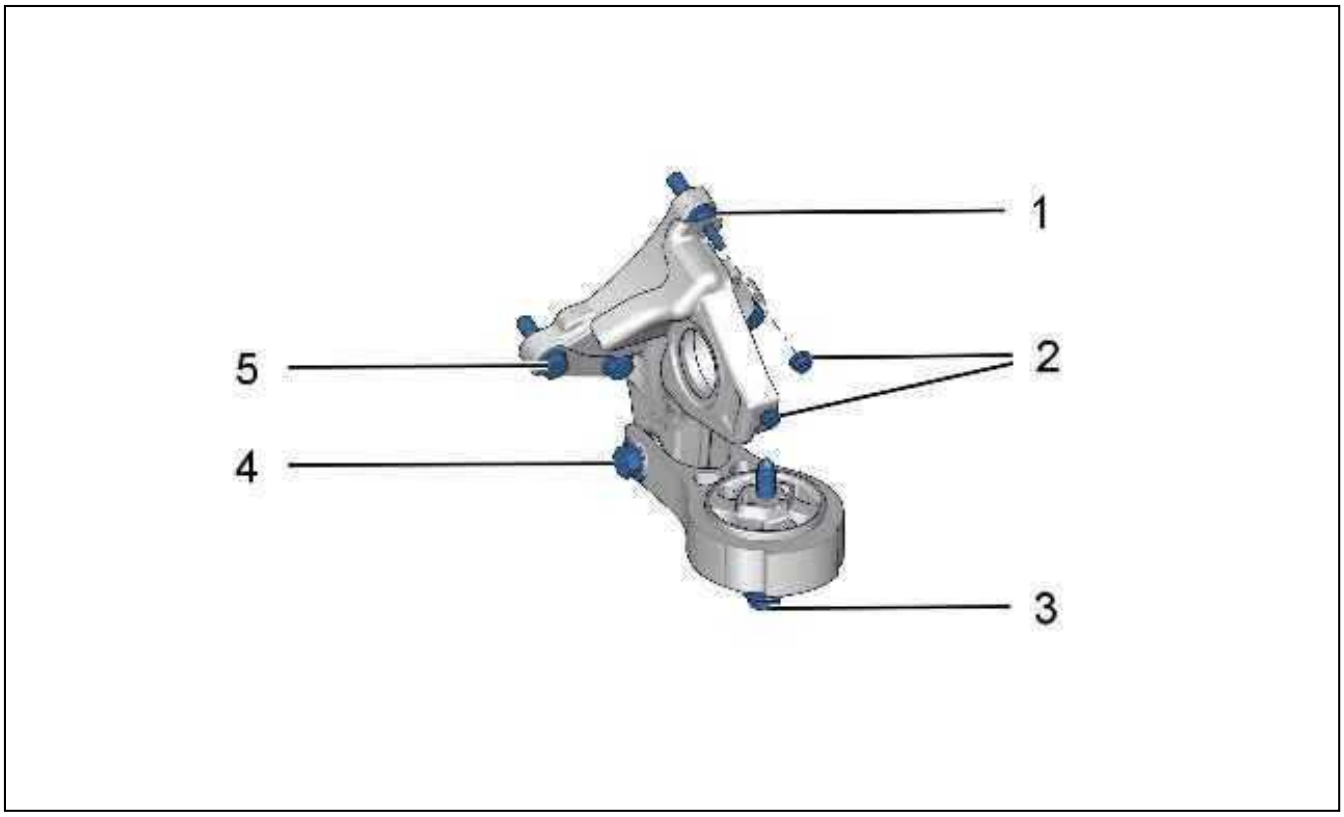


Figure : B2CG161D

Reference	Designation	Tightening torque
(1)	Fixing : Right side lower engine mounting/Cylinder block	6 daNm
(2)	Heat shield fixing /Lower engine mounting	0,8 daNm
(3)	Torque reaction rod fastener/Subframe	6,5 daNm
(4)	Torque reaction rod fastener/Lower engine mounting	6,5 daNm
(5)	Fixing : Lower engine mounting/Cylinder block	6 daNm

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IDENTIFICATION - DATA : UNDER ENGINE

1. Cylinder block

1.1. Identification

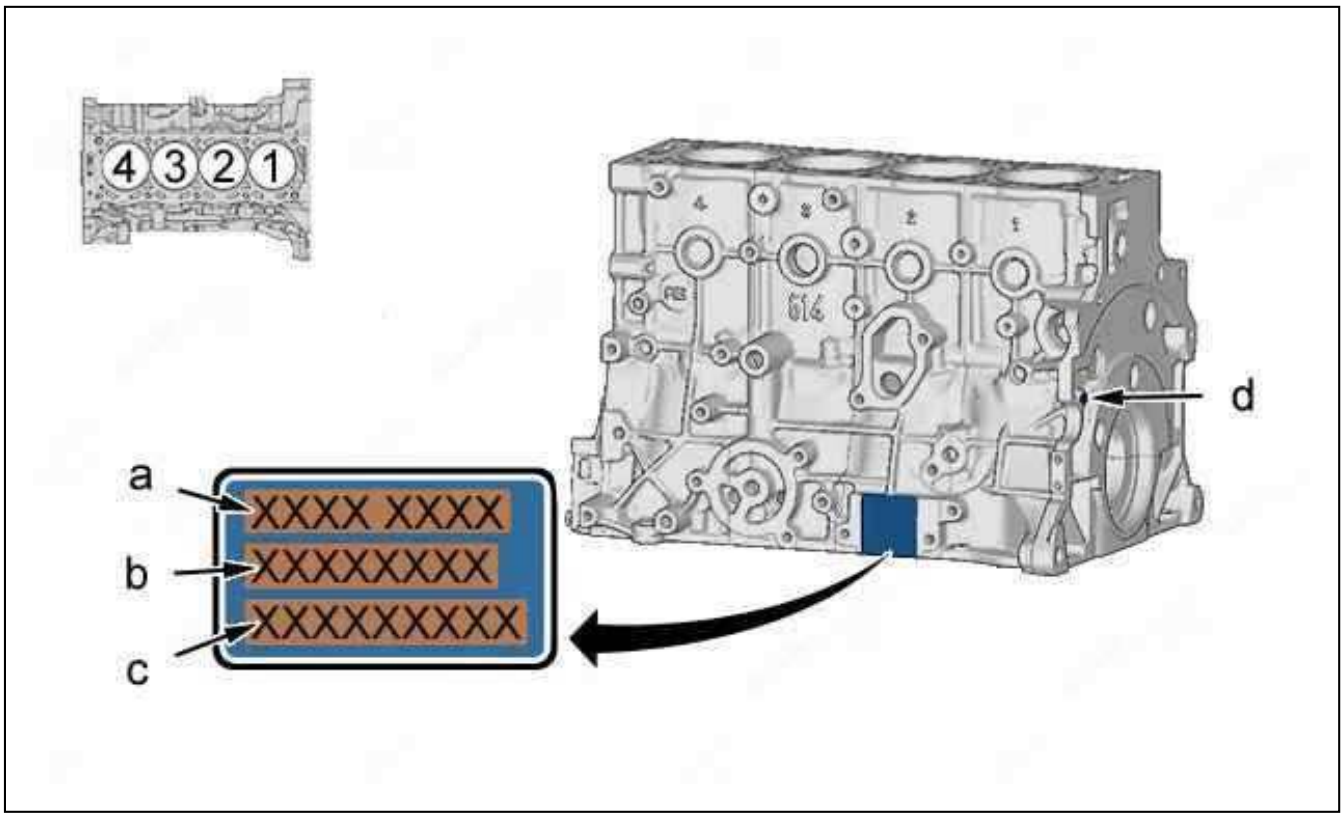


Figure : B1BB15WD

Identification of the cylinder block :

- "a" approved prescribed type
- "b" engine reference mark
- "c" production serial number

Cast cylinder block (block without liner) :

- The hole for setting the crankshaft is located at "d" (flywheel side)
- The cylinder block has removable piston head spray jets
- The cylinder block has 5 bearings
- The cylinder block is non-repairable
- The cylinders are marked from 1 to 4 (bearing N°1, flywheel side)

1.2. Cylinder block height and flatness

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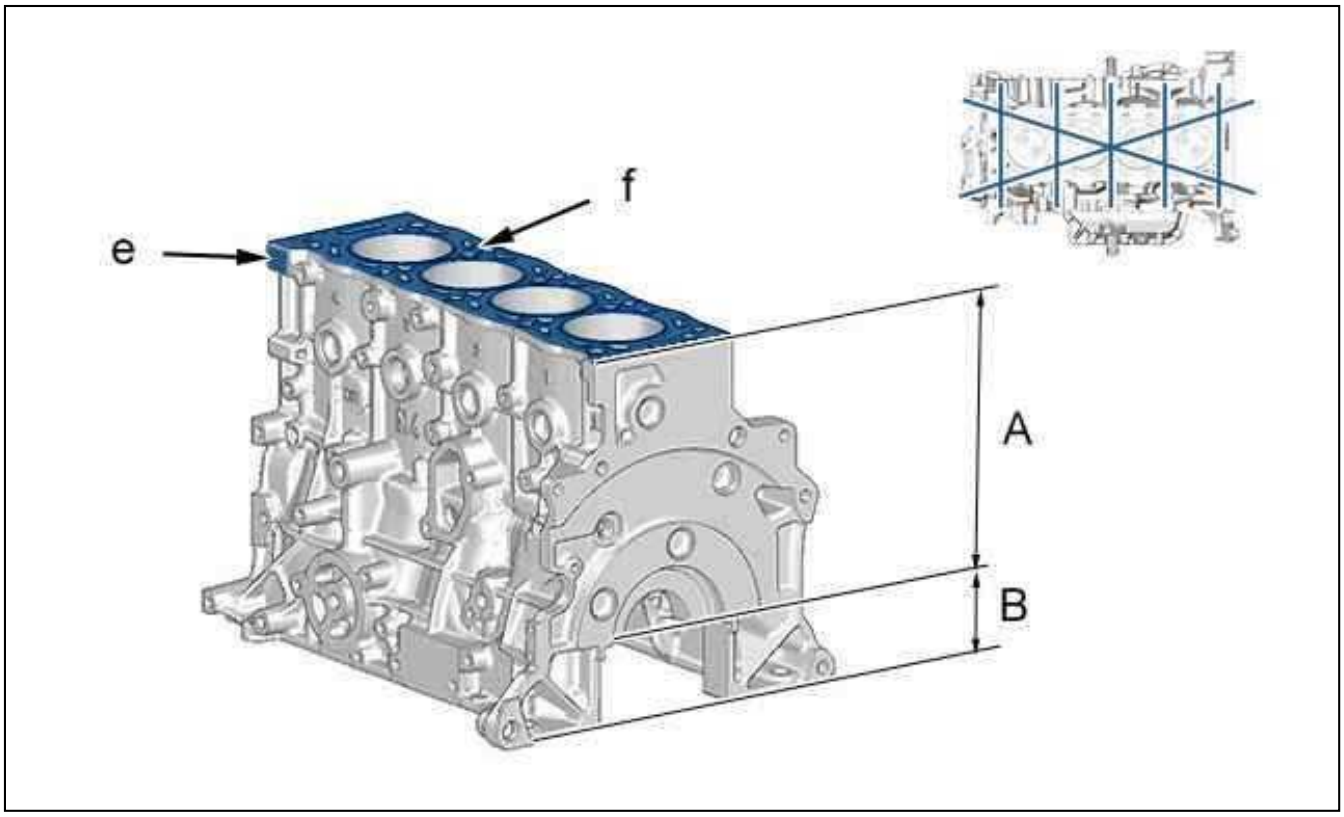


Figure : B1BB15ZD

"e" "reconditioning" marking zone.
"f" Cylinder block flatness checking zone (Cylinder head sealing face).

Values for checking the cylinder block height	
Description	Values
Height "A"	235 ± 0,05 mm
Overall height "A + B"	303 ± 0,15 mm
Overall flatness (at "f")	0,042 mm
Machining permitted	Without

N.B. : Checking the flatness is done with the aid of a checking ruler and a set of shims (see figure below).

1.3. Bore of the cylinders

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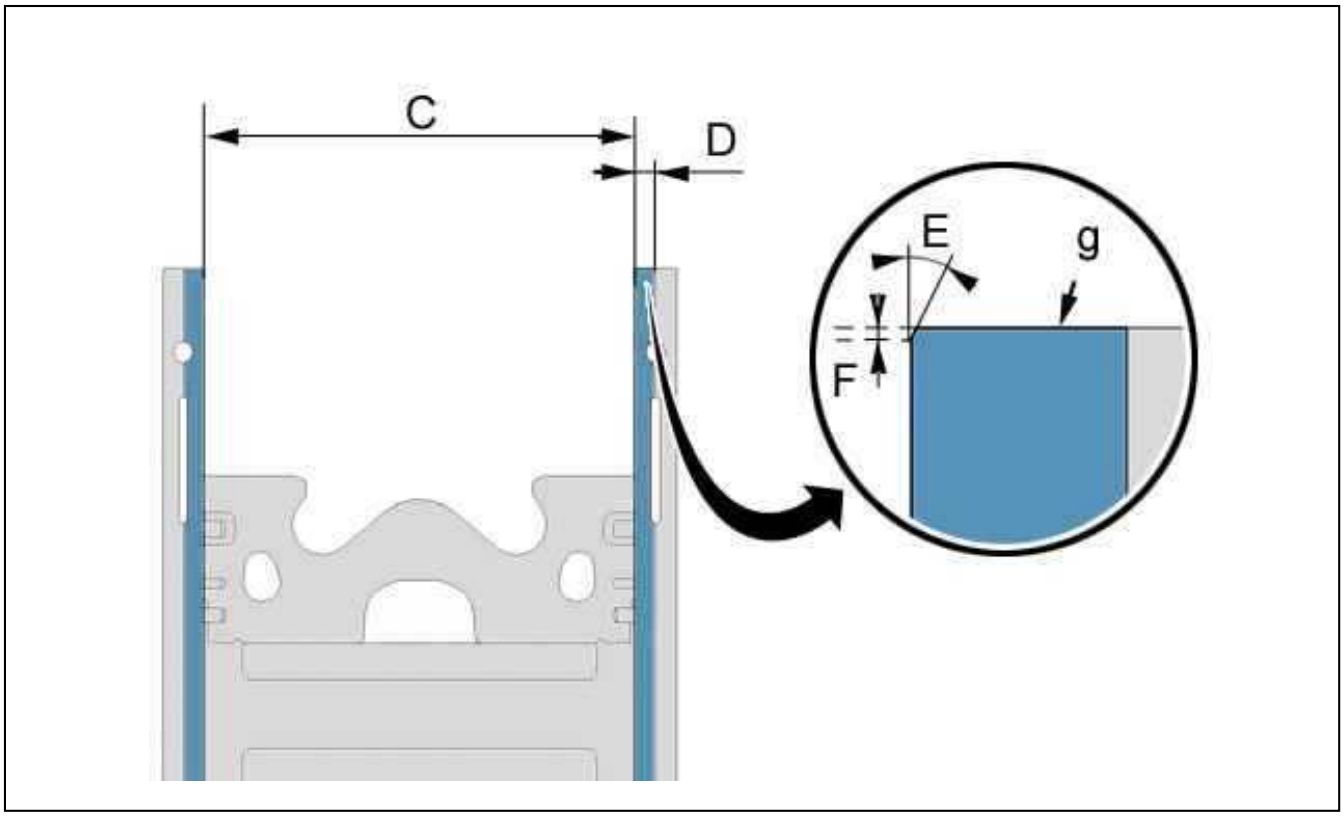


Figure : B1BB160D

Bore "C" of the cylinders (Identical on each cylinder)	
Description	Values
Nominal dimension	85 (+ 0,02 ; -0) mm

Cylinder inlet chamfers (Identical on each cylinder)	
Description	Values
Cylinder chamfer angle "E"	25° +/- 5°
Cylinder chamfer thickness "F"	0,4 ± 0,2 mm

Flatness of the sealing face (Around each cylinder)	
Description	Values
Max. surface variation (at "g")	0,03 mm
Minimum surface "D"	5,5 mm

N.B. : The flatness is defined on the surface "g" of each cylinder.

1.4. Checking the diameters of the cylinders

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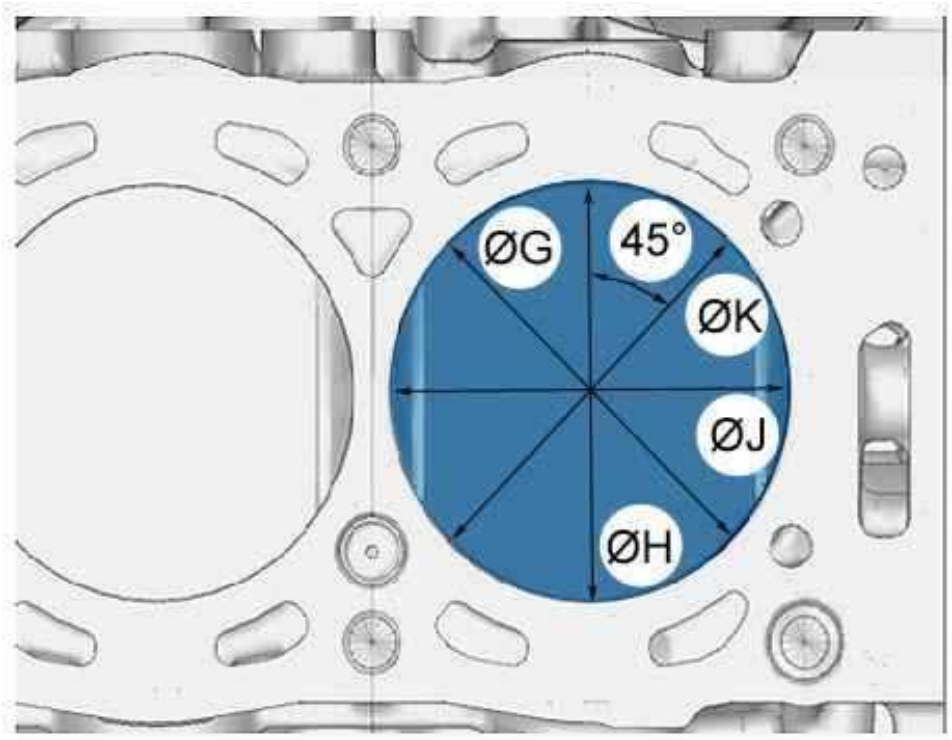


Figure : B1BB163D

Values for checking diameters of cylinders	
Description	Values
Diameter "G", "H", "J", "K"	85 (+ 0,02 ; 0) mm
Maximum difference between 2 diameters ; At 15 mm from the end of the cylinder	0,007 mm
Maximum difference between 2 diameters ; Over a range from 40 mm to mid-height of the cylinder	0,018 mm

1.5. Drilled plugs (Cooling of the cylinders)

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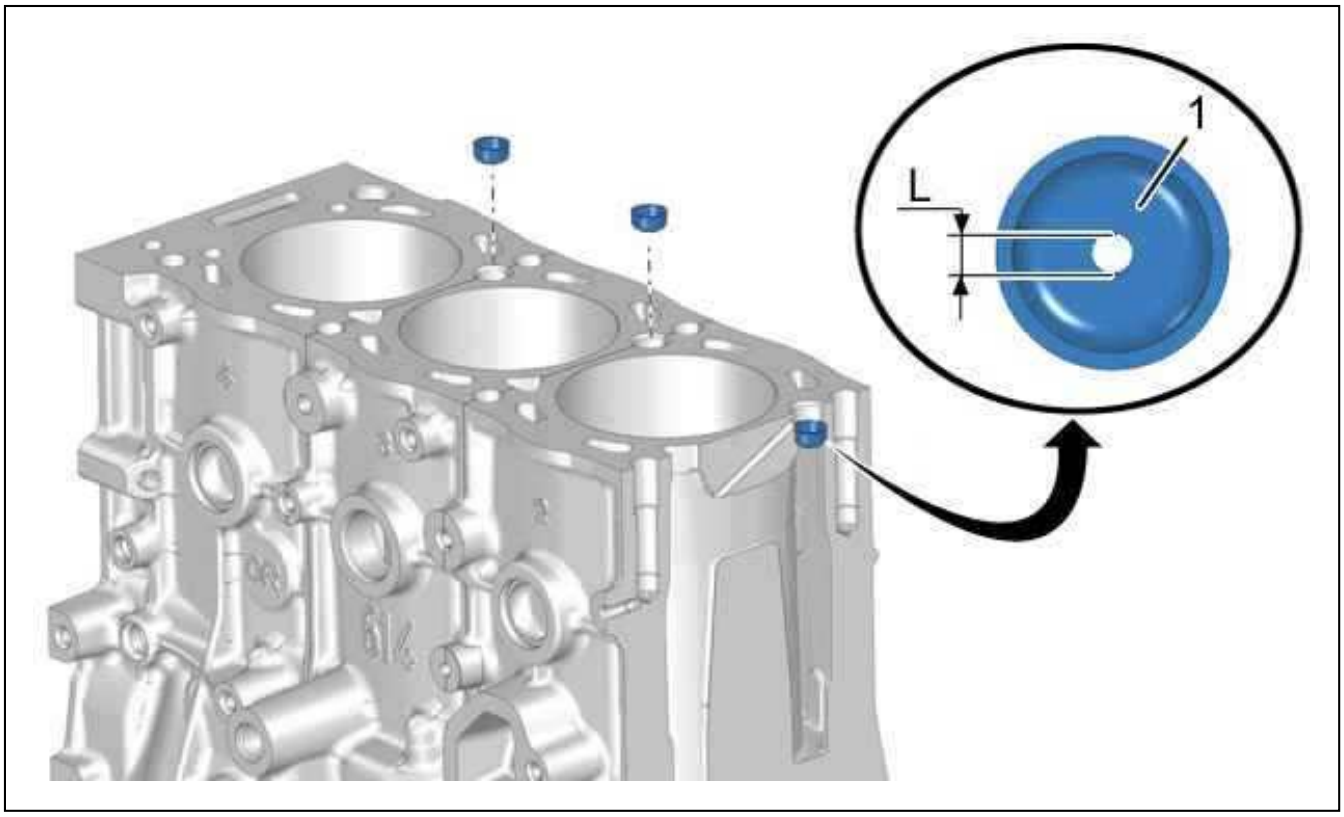


Figure : B1BB166D

Drilled plug checking values (1)	
Description	Values
Diameter "L"	2,5 (+ 0,25 ; 0) mm
Plug fitting values	7,65 (+ 0,5 ; 0) mm

N.B. : The drilled plugs (1) are force-fitted.

CAUTION : Check that there are no foreign bodies in the cylinder block cooling channels.

1.6. Crankshaft main bearing caps

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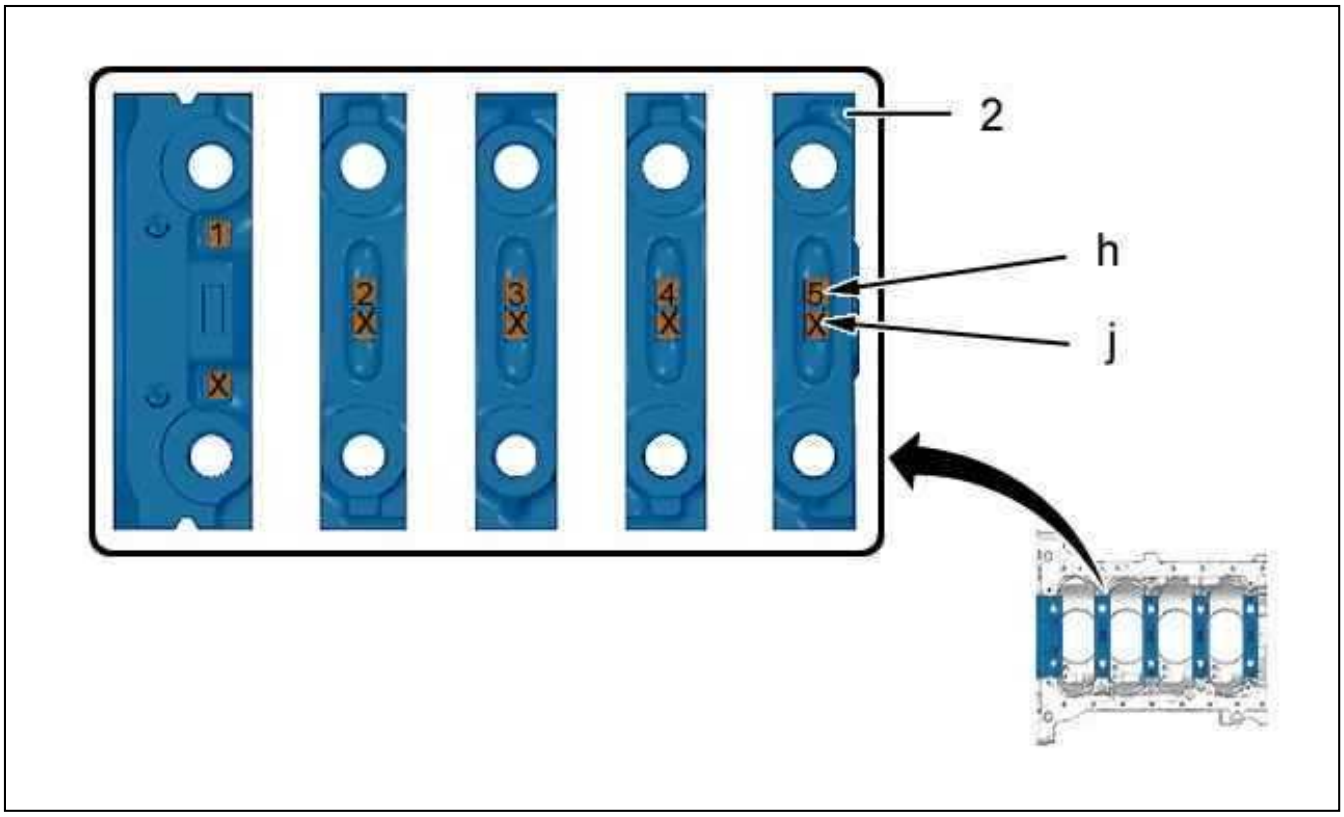


Figure : B1BB169D

Identification of the crankshaft main bearing caps (2) :

- "h" Number of the bearing cap (bearing N°1, flywheel side)
- "j" Socket reference of the bearing cap

CAUTION : Respect the location of each bearing cap, do not fit a bearing cap from another engine or marked with a different socket reference "j".

1.7. Diameters of the crankshaft main bearings

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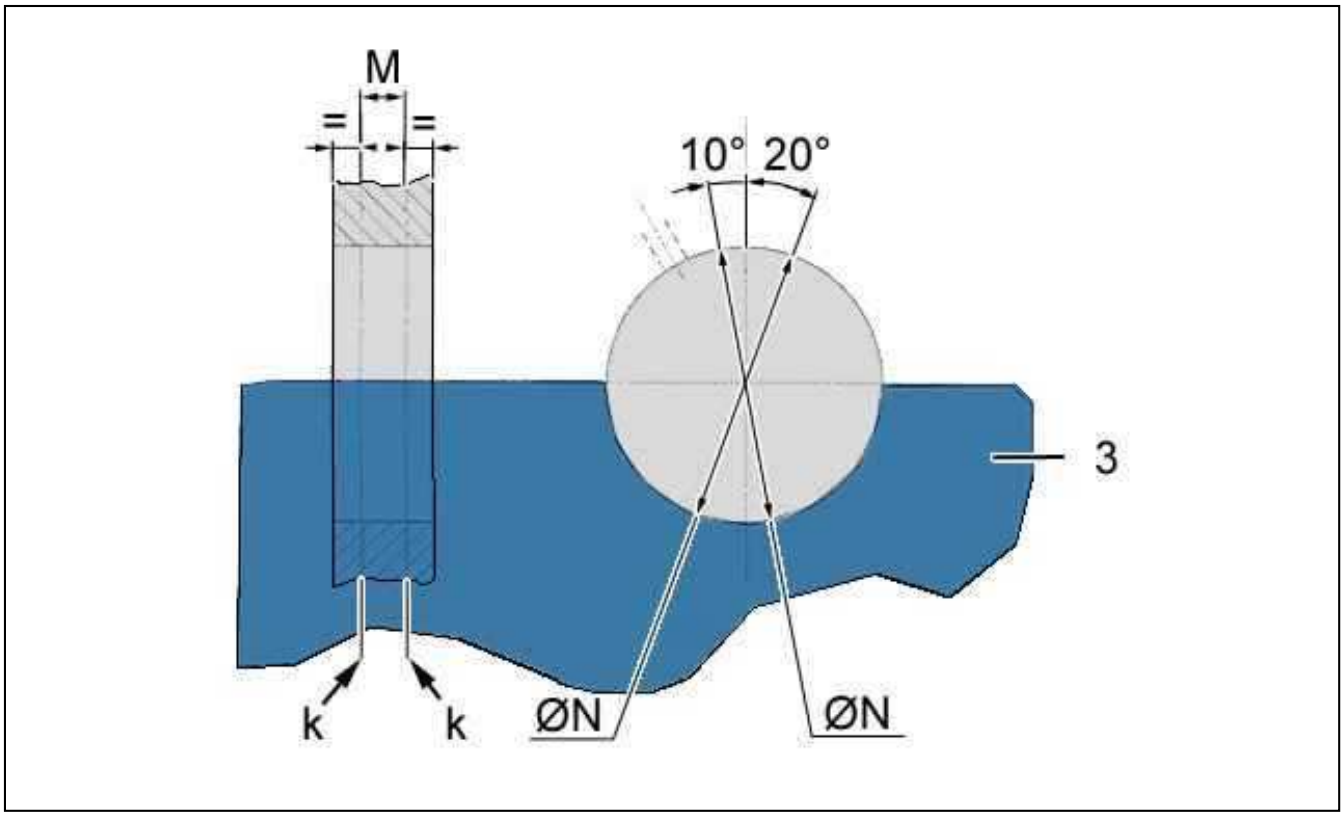


Figure : B1BB16CD

(3) Bearing cap (On the right-hand side = Exhaust side).

Values for checking diameters of bearing caps	
Description	Values
Interval "M" between the measuring planes "k"	10 mm
Nominal diameter of the bearing "N"	63,731 mm

N.B. : Measurements are taken in 2 planes : Measuring in each plane 2 diameters as indicated above, that is 4 diameters in total.

2. Crankshaft

2.1. Identification

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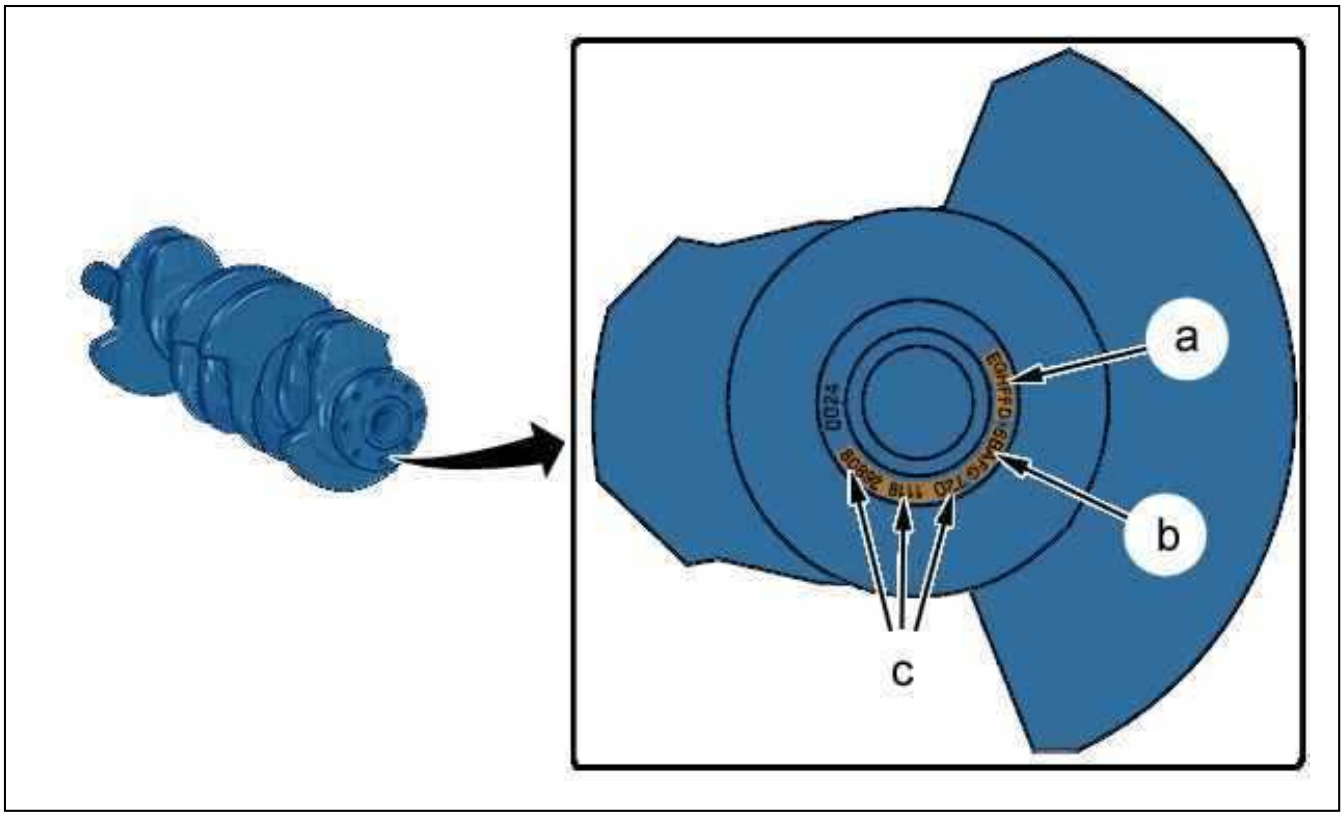


Figure : B1BB16FD

Identification of the crankshaft :

- "a" Classes of crankshaft main bearing journals (Main bearing half shells) : 5 characters + 1 checking character
- "b" Classes of crankshaft crank pins (Connecting rod half shells) : 4 characters + 1 checking character
- "c" Serial number

2.2. Data

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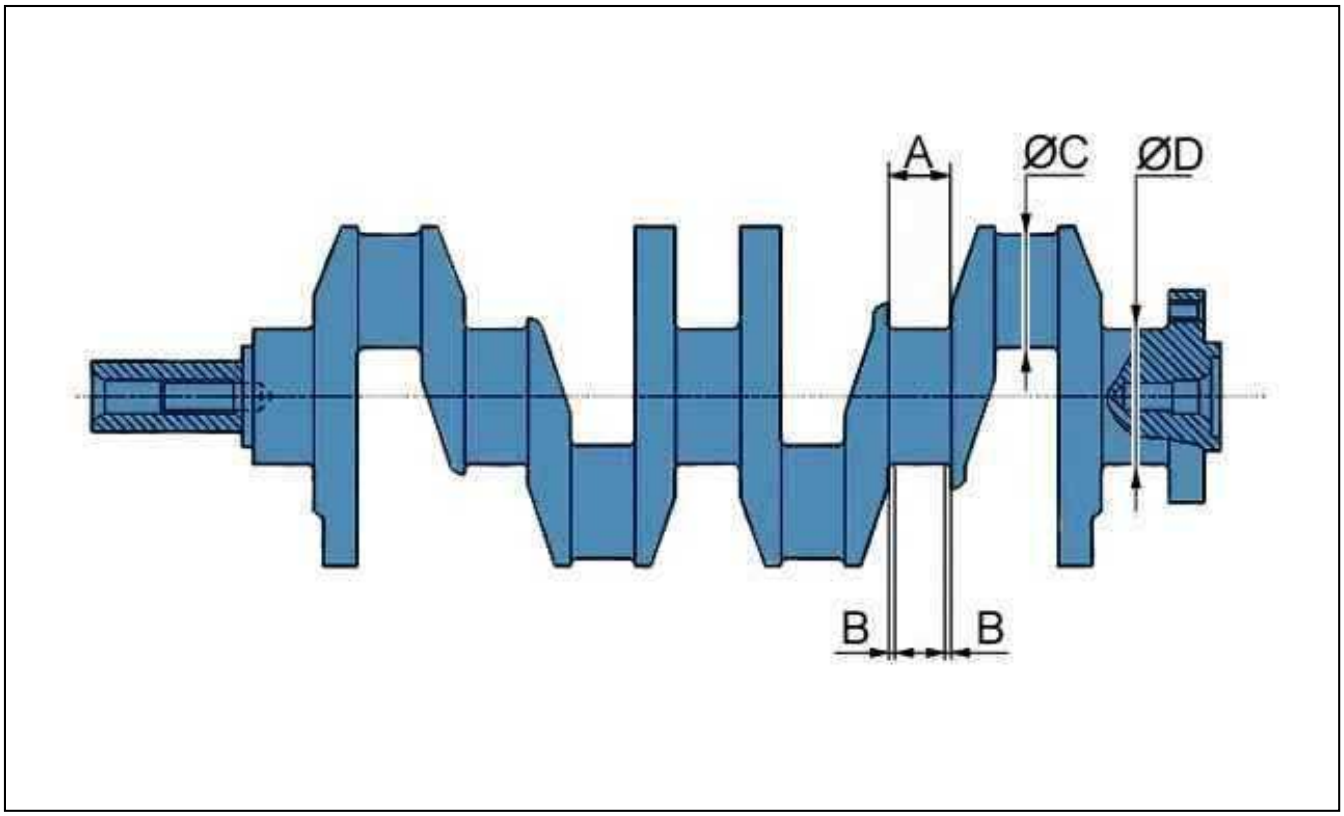


Figure : B1CP0NPD

"A" : Crankshaft bearing width.
"B" : Thickness of the thrust bearings.
"C" : Diameter of the crank pins .
"D" : Diameter of the crankshaft main bearing journals .

2.3. Crankshaft bearings

Designation	Nominal dimension
Crankshaft bearing width "A"	26,625 ± 0,025 mm

N.B. : No straightening permitted.

2.4. Thrust washers

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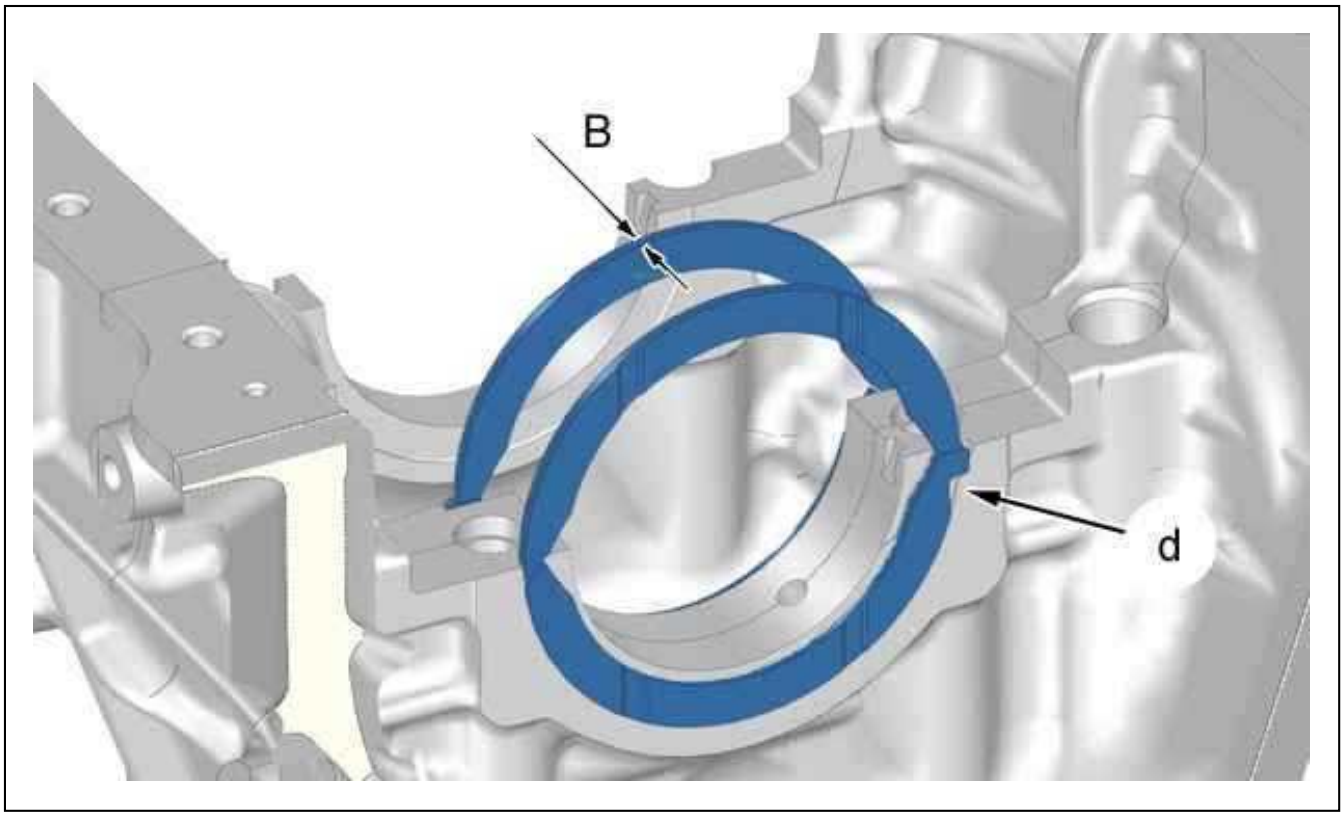


Figure : B1BB16HD

"d" Positioning lug .

Designation	Nominal dimension
Thickness of the thrust bearings "B"	2,30 mm (+0,03 ; -0,02)

The grooves are oriented towards the crankshaft.
The crankshaft lateral clearance is adjusted by means of thrust washers on bearing No. 2.
There should be a 0,07 to 0,32 mm endfloat.

N.B. : The crankshaft main bearings are marked from 1 to 5 (bearing N°1, flywheel side).

2.5. Crankshaft big end journals

Designation	Nominal dimension
Diameter of the crank pins "C"	50 mm (+0 ; -0,02)

N.B. : White paint spot on the bearing.

2.6. Main bearing journals

Designation	Nominal dimension
Diameter of the crankshaft main bearing journals "D"	60 mm (+0 ; -0,025)

N.B. : Repair-specific crankshaft bearing shells are not available in replacement parts.

3. Crankshaft half bearing shells

The operating clearances of the crankshaft bearings are obtained from the creation of 5 classes of smooth lower bearin

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shell (Crankshaft bearing caps side).

CAUTION : The crankshaft half bearing shells of engines on vehicles with a hybrid drive train are specific..

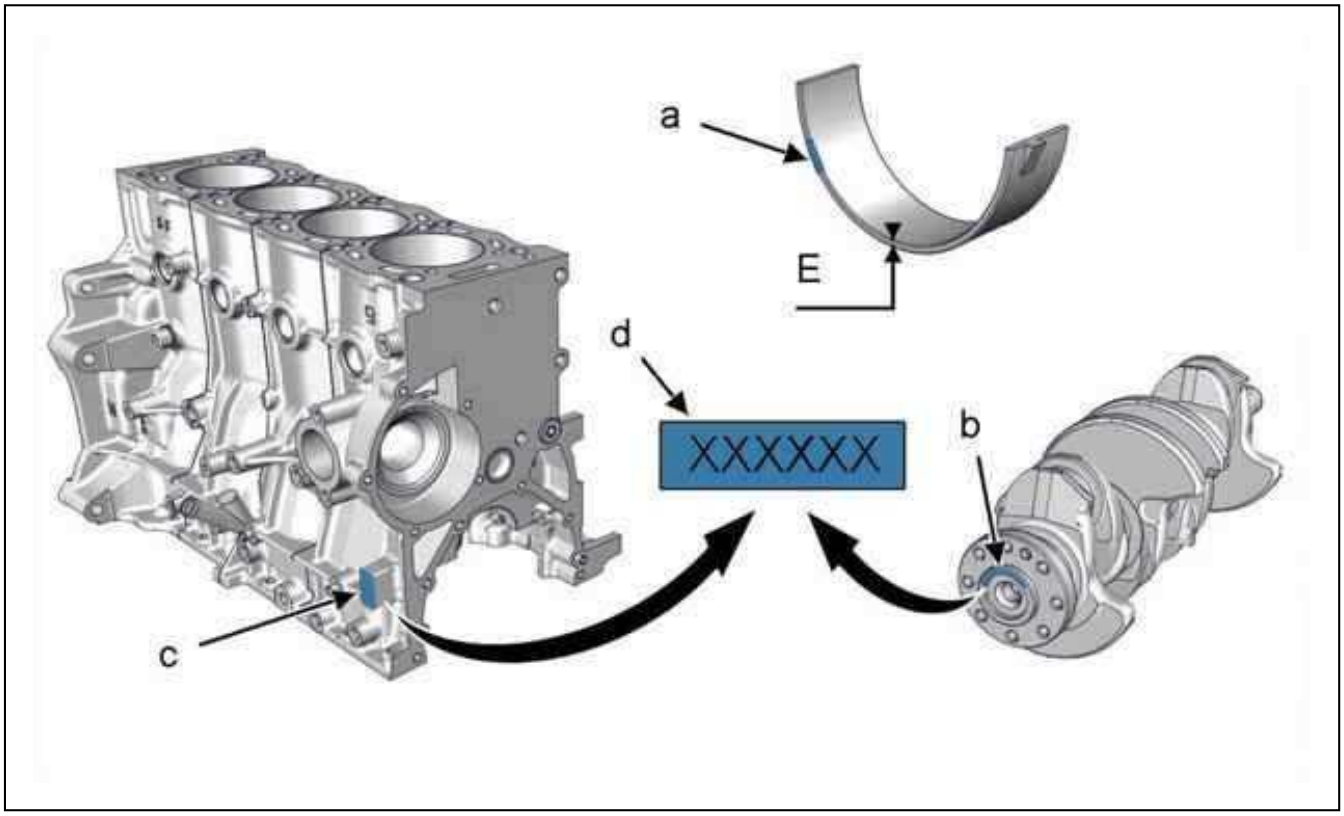


Figure : B1CM035D

3.1. Upper bearing shells (grooved)

There is only one class of grooved upper crankshaft bearing shell (cylinder block side).

Thickness of the upper bearing shells "T"	
Distance "E"	1,853 ± 0,003 mm
Colour identification marking at "a"	Black

3.2. Lower bearing shells (smooth)

The classes of main bearing shells are marked on the engine block at "c" and on the crankshaft (flywheel side) at "b".
"d" Alphanumeric characters : For "After Sales" use.
The first character corresponds to bearing N°1, the second to bearing N°2, and so on.

N.B. : The crankshaft main bearings are marked from 1 to 5 (bearing N°1, flywheel side).

CAUTION : There is a sixth character used for monitoring in the factory. Do not use this sixth character of a matching the lower bearing shells.

3.3. Matching the lower bearing shells

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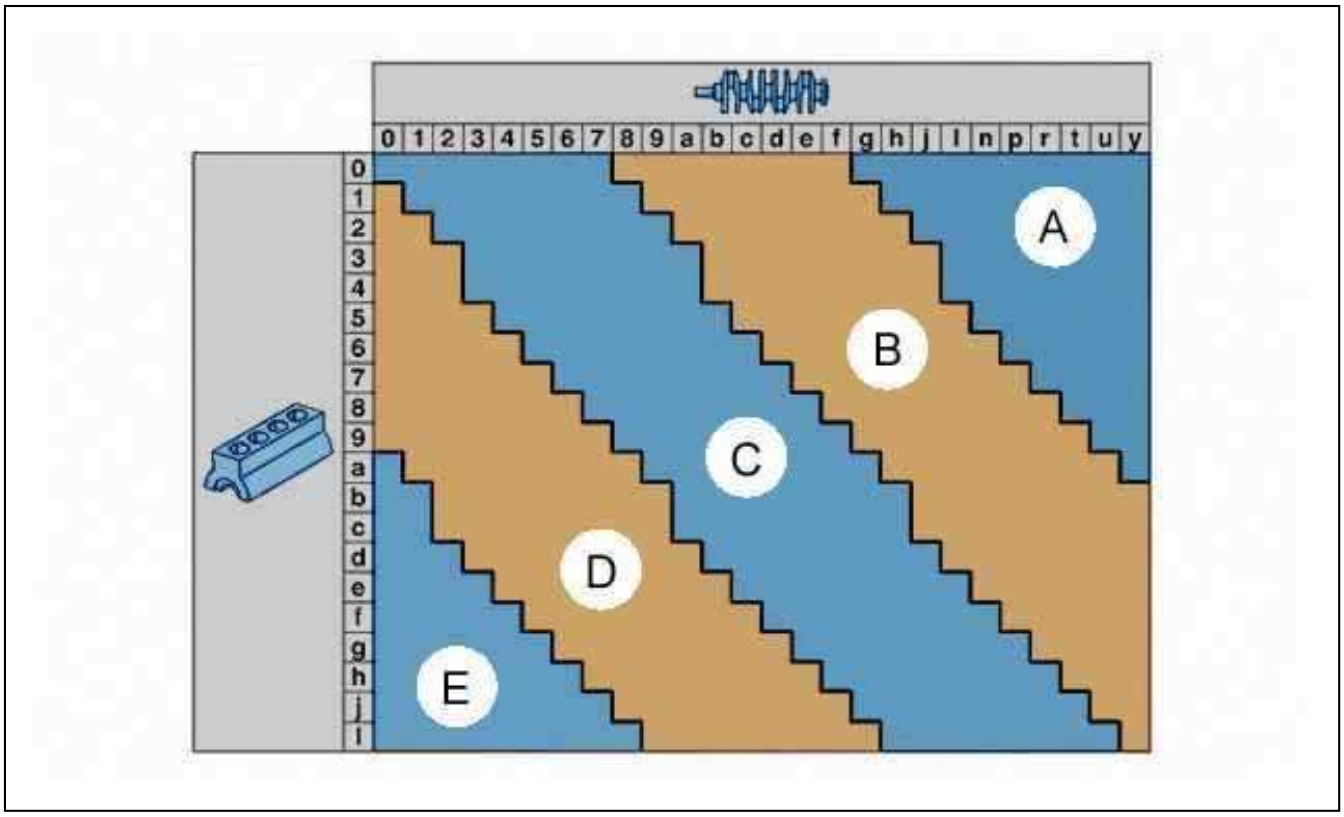


Figure : B1BPSK5D

Zone "A"	
Distance "E"	1,837 ± 0,003 mm
Colour identification marking at "a"	Blue

Zone "B"	
Distance "E"	1,845 ± 0,003 mm
Colour identification marking at "a"	Black

Zone "C"	
Distance "E"	1,853 ± 0,003 mm
Colour identification marking at "a"	Green

Zone "D"	
Distance "E"	1,861 ± 0,003 mm
Colour identification marking at "a"	Red

Zone "E"	
Distance "E"	1,869 ± 0,003 mm
Colour identification marking at "a"	Yellow

E.g. :

- Characters read on the crankshaft : A7H6D
- Characters on the cylinder block : EJDG6
- For bearing No. 1 (AE), the lower half-bearing shell to be fitted is class D
- For bearing No. 2 (7J), the lower half-bearing shell to be fitted is class E

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- Proceed in the same way for the 3 other assemblies

4. Conrods

4.1. Identification

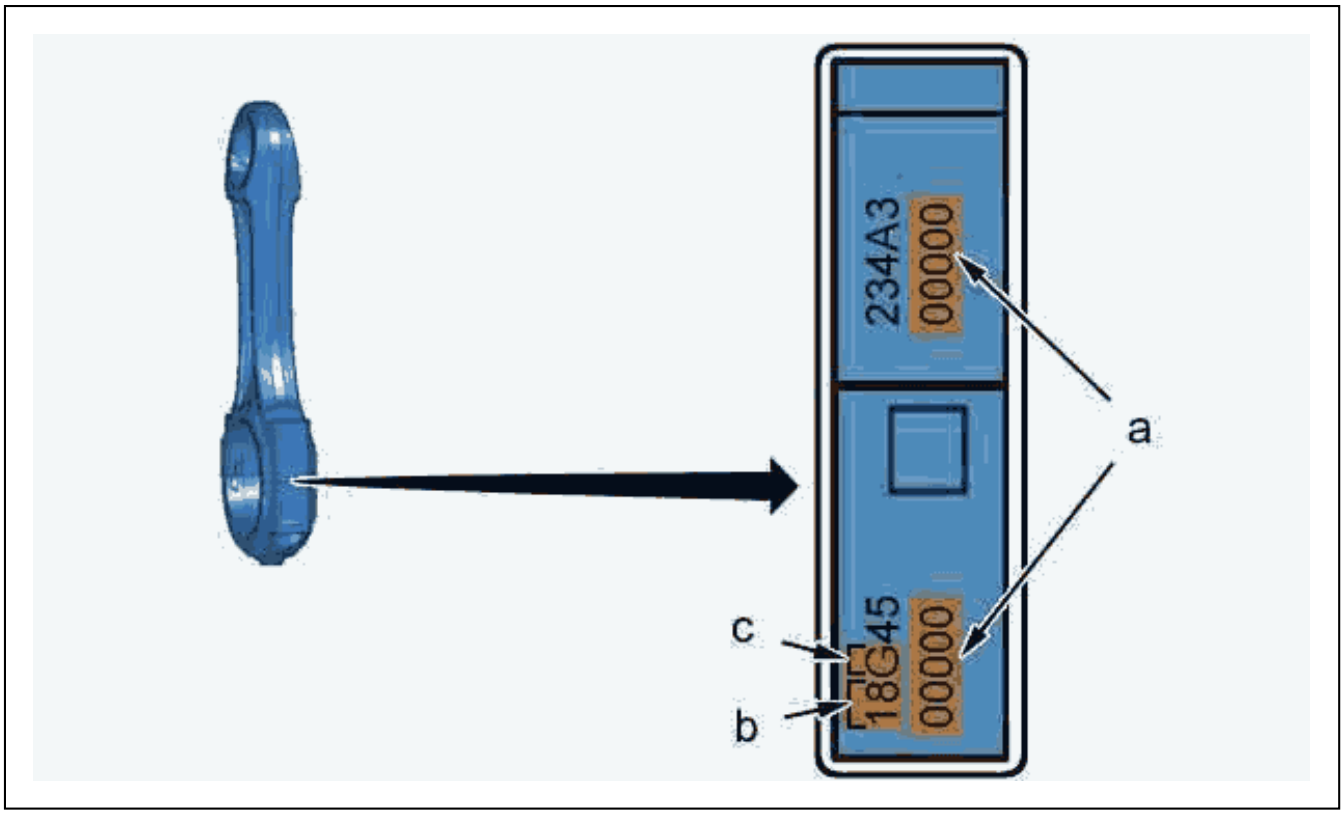


Figure : B1BB16JD

Identification of the conrods :

- "a" Identification no. of the body and of the big end
- "b" Weight class (Do not use)
- "c" Class of conrod (Connecting rod bearing shells)

N.B. : The identification nos. should be the same for each conrod.

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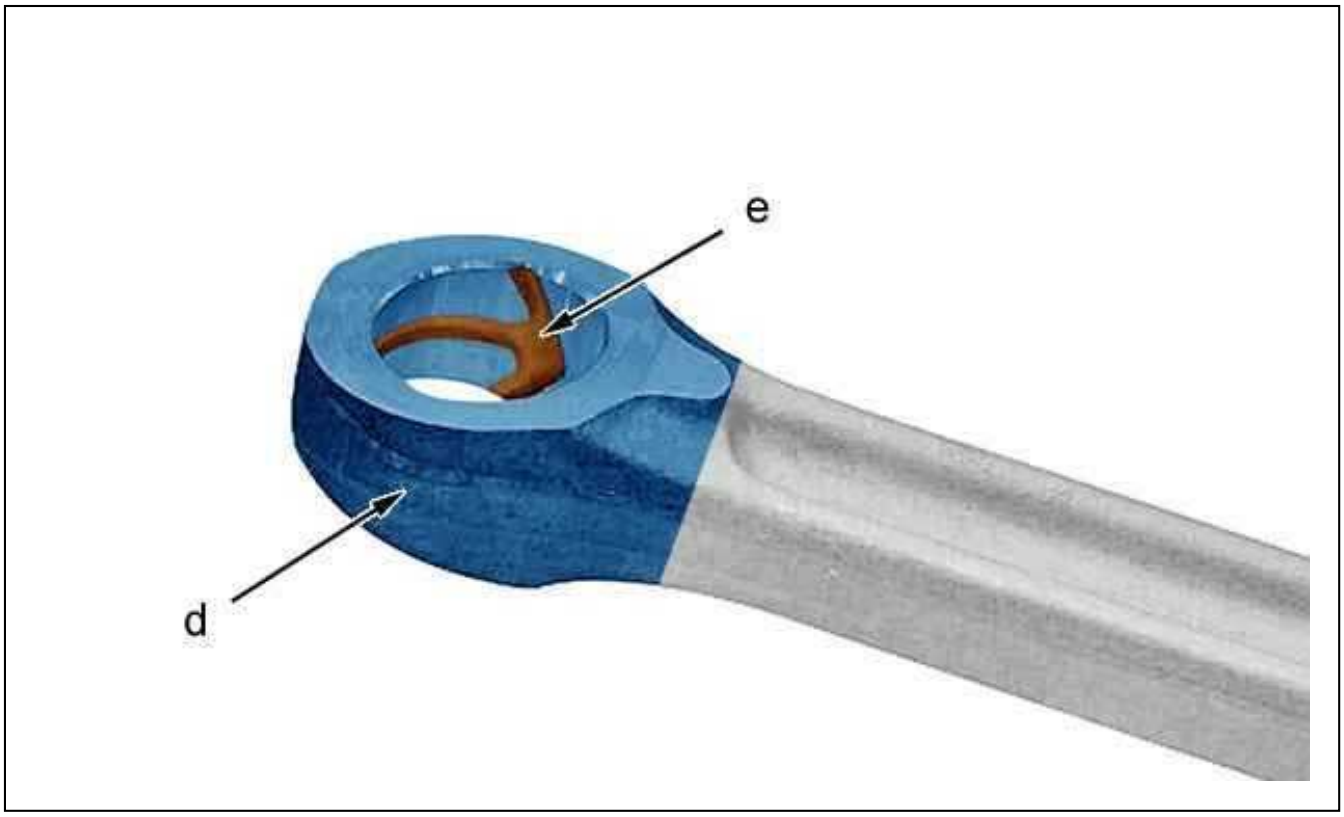
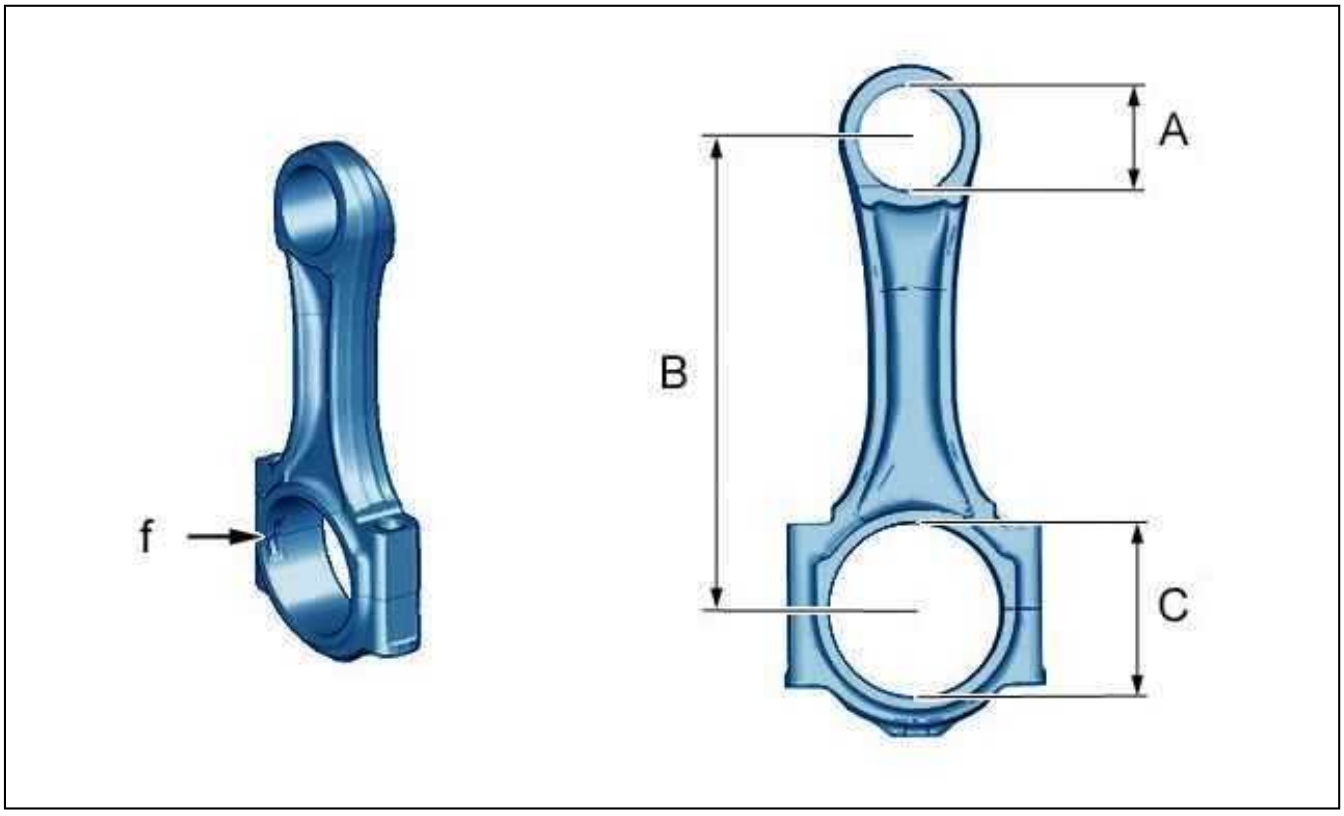


Figure : B1BB16MD

The conrod little end has a bronze ring that is non-repairable.
The whole is machined to the shape of a viper’s head ("d") (After assembly).
The bronze ring is grooved (at "e").

4.2. Data



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Figure : B1BB16PD

"f" Conrod lugs oriented towards the front of the engine (Oil filter side).

Checking values	
Description	Values
Diameter "A"	30,006 (+0,020 ; +0,007) mm
"B" length	145 ± 0,025 mm
Diameter "C"	53,695 (+0,013 ; 0) mm

5. Connecting rod half shells

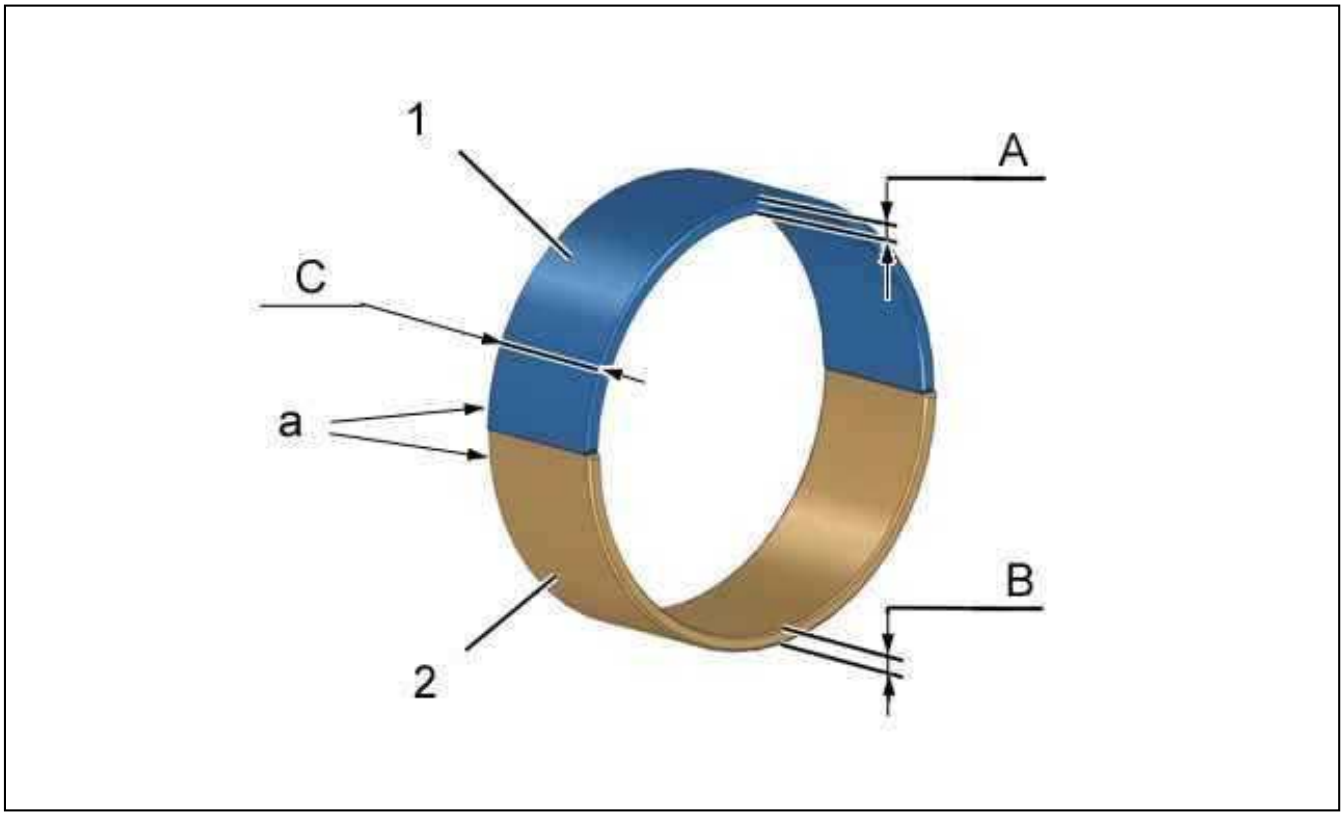


Figure : B1BB16SD

The operating clearance of the conrods is obtained by the creation of 3 classes of upper bearing shells (1) (conrod body side).
There is only one class of conrod bearing shells (2) (Lower) (big end).
There are 2 types of conrod half shell :

- Half shells with a positioning lug
- Upper and lower conrod half shells without lug (Centering is by a special tool)

5.1. Top half shells

Reference "a"	Thickness "A"	Width "C"	Class
Green	1,822 mm to 1,832 mm	20 + 0 / -0,25 mm	C1
Yellow	1,832 mm to 1,842 mm	20 + 0 / -0,25 mm	C2
Blue	1,842 mm to 1,852 mm	20 + 0 / - 0,25 mm	C3

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5.2. Bottom half shells

Reference "a"	Thickness "B"	Width "C"	Class
Black	1,834 mm to 1,840 mm	20 + 0 / - 0,25 mm	C4

5.3. Pairing the upper bearing shells

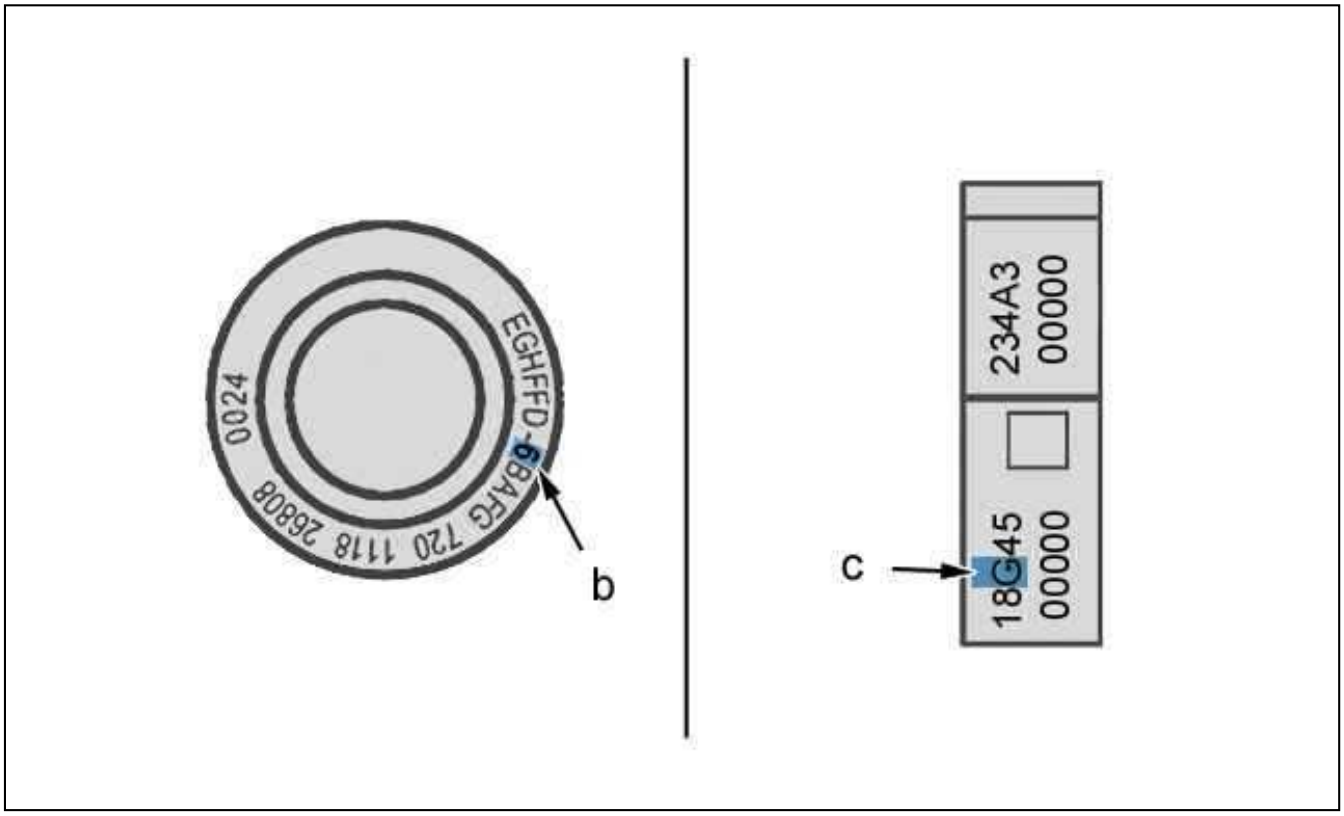


Figure : B1BB16VD

Example of marking of the classes :

- "b" Class of the crank pin for cylinder n°1
- "c" Class of conrod

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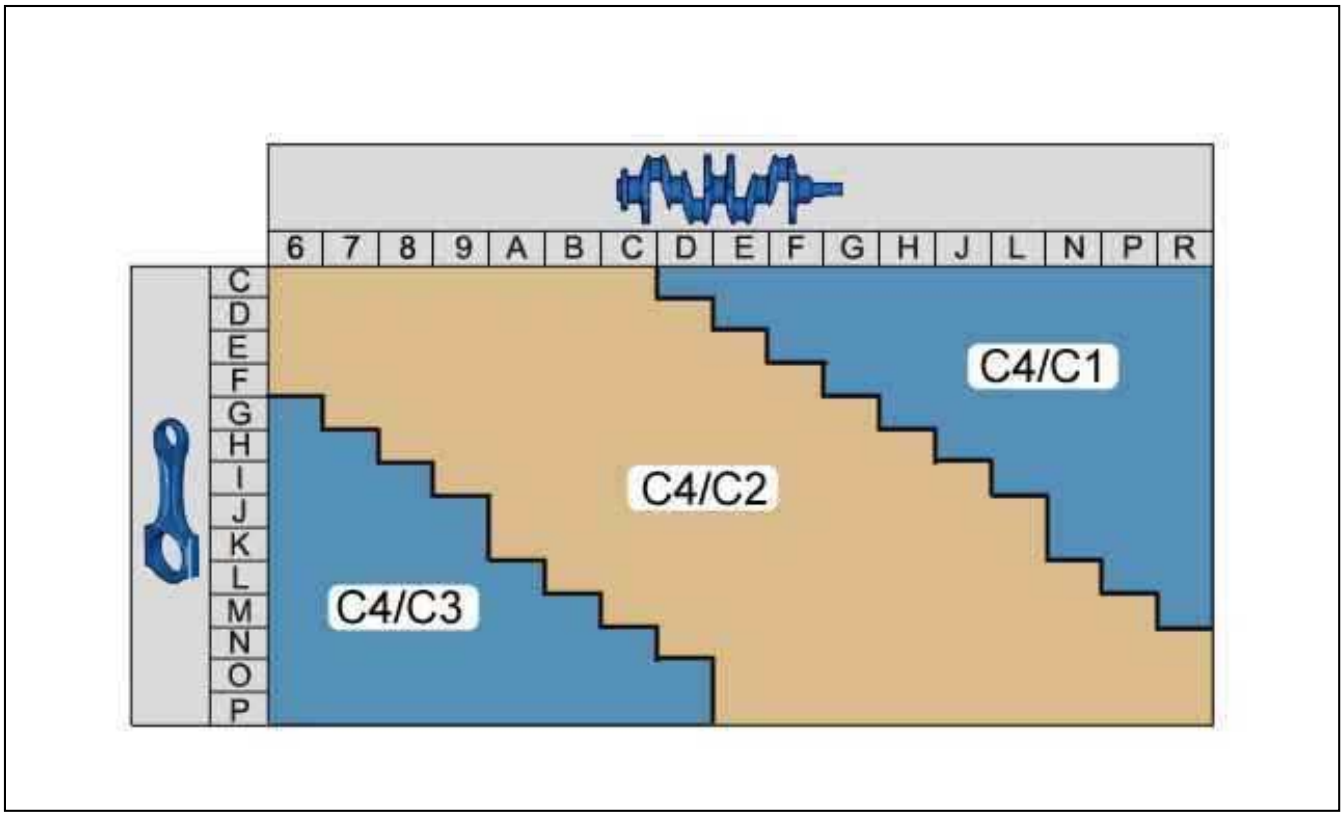


Figure : B1BB1F7D

E.g.: For the conrod of cylinder number 1 :

- Characters read on the crankshaft (6)
- Characters read on the conrod (G)
- 6G : The upper bearing shell to be fitted is class C3
- Carry out the same procedure for the other three cylinders using the corresponding conrods

6. Pistons

6.1. Identification

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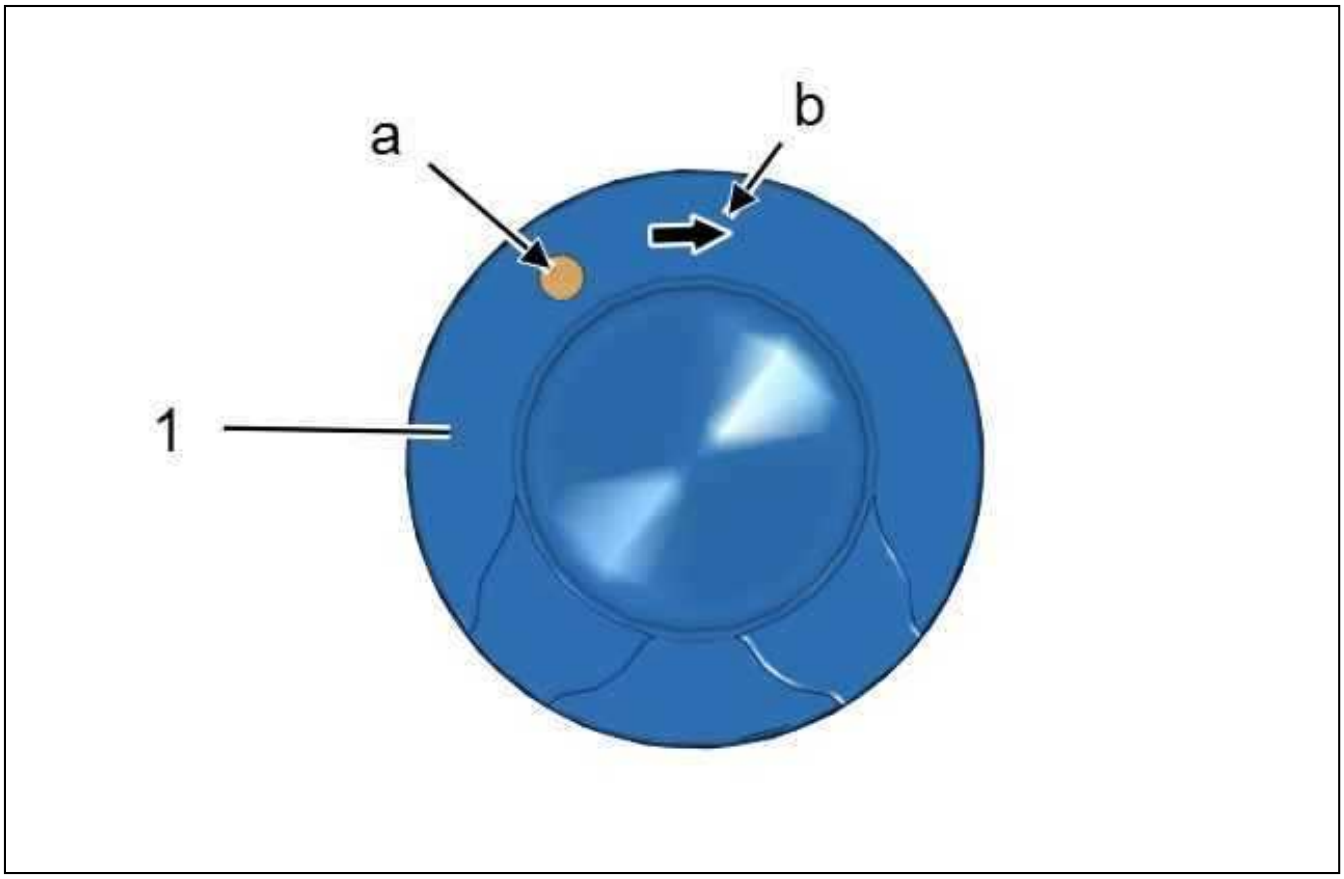


Figure : B1BB171D

(1) Piston.
"a" Marking of the class of weight.
The orientation is indicated by the arrow "b", timing end.

6.2. Piston weight category

P1	595 - 600 grammes
P2	601 - 605 grammes
P3	606 - 610 grammes
P4	611 - 615 grammes

CAUTION : Fit 4 pistons of the same weight category.

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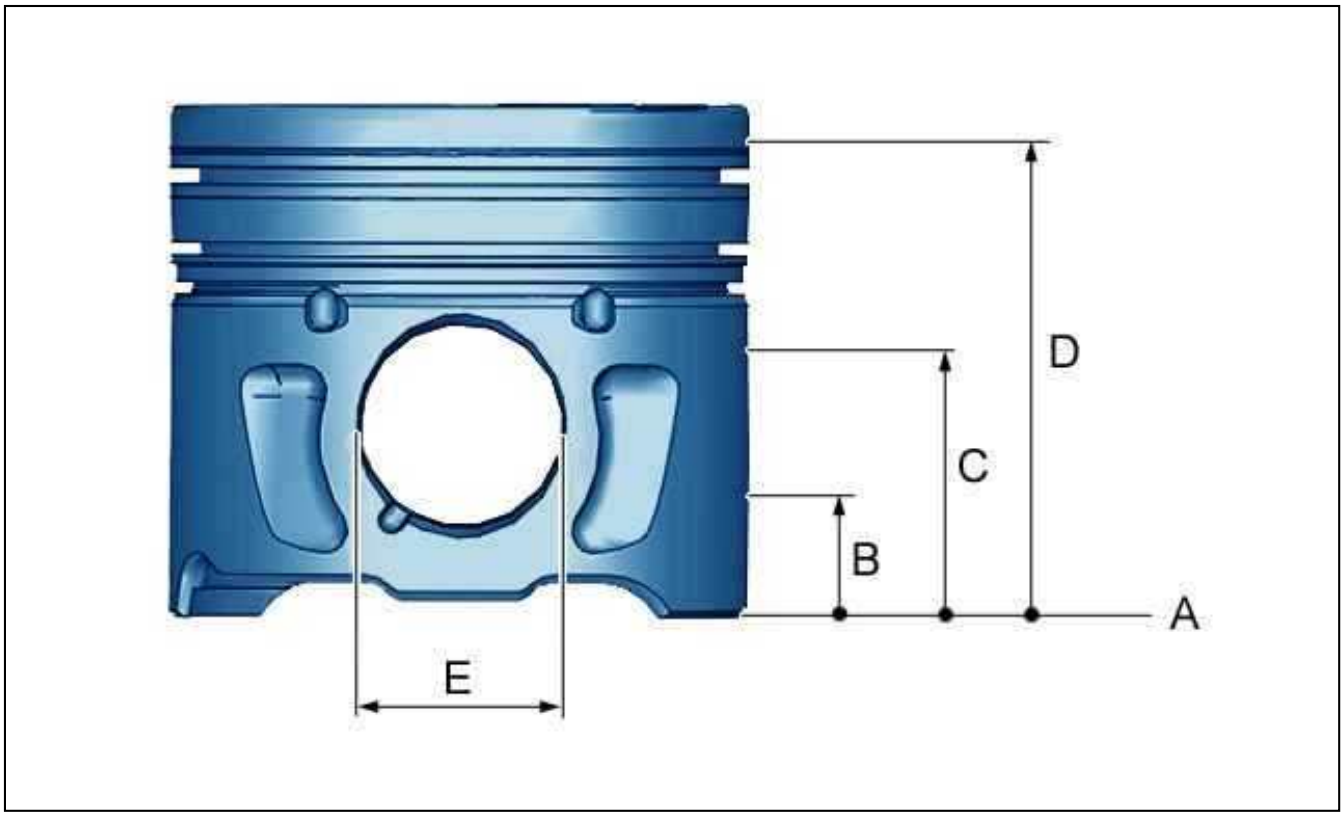


Figure : B1BB174D

6.3. Data

Piston diameter		
Description	Measurement height	Diameter
"A"	0 mm	-
"B"	17 mm	84,944 ± 0,009 mm
"C"	38 mm	84,774 ± 0,007 mm
"D"	68,7 mm	83,944 ± 0,012 mm
"E"	-	30 (+0,01 ; -0,005) mm

7. Little ends

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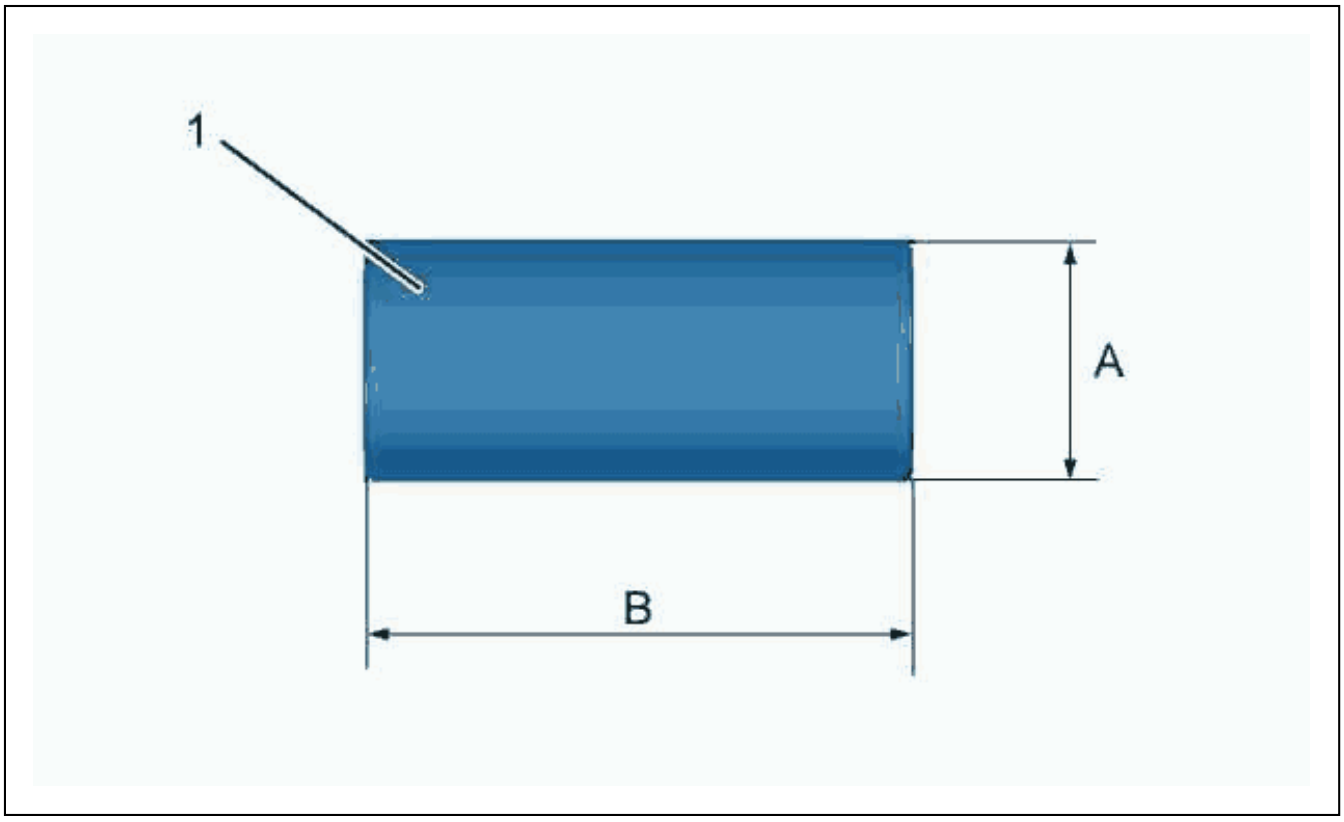


Figure : B1BB177D

(1) The piston shaft .
Diameter "A" : 30 (-0,01 ; -0,005) mm .
"B" length : 68 (+0 ; -0,3) mm .

N.B. : The gudgeons pins are fitted free in the little ends and in the pistons ; The gudgeon pins are immobilised in translatory motion by two stop rings.

8. Piston rings

8.1. Identification

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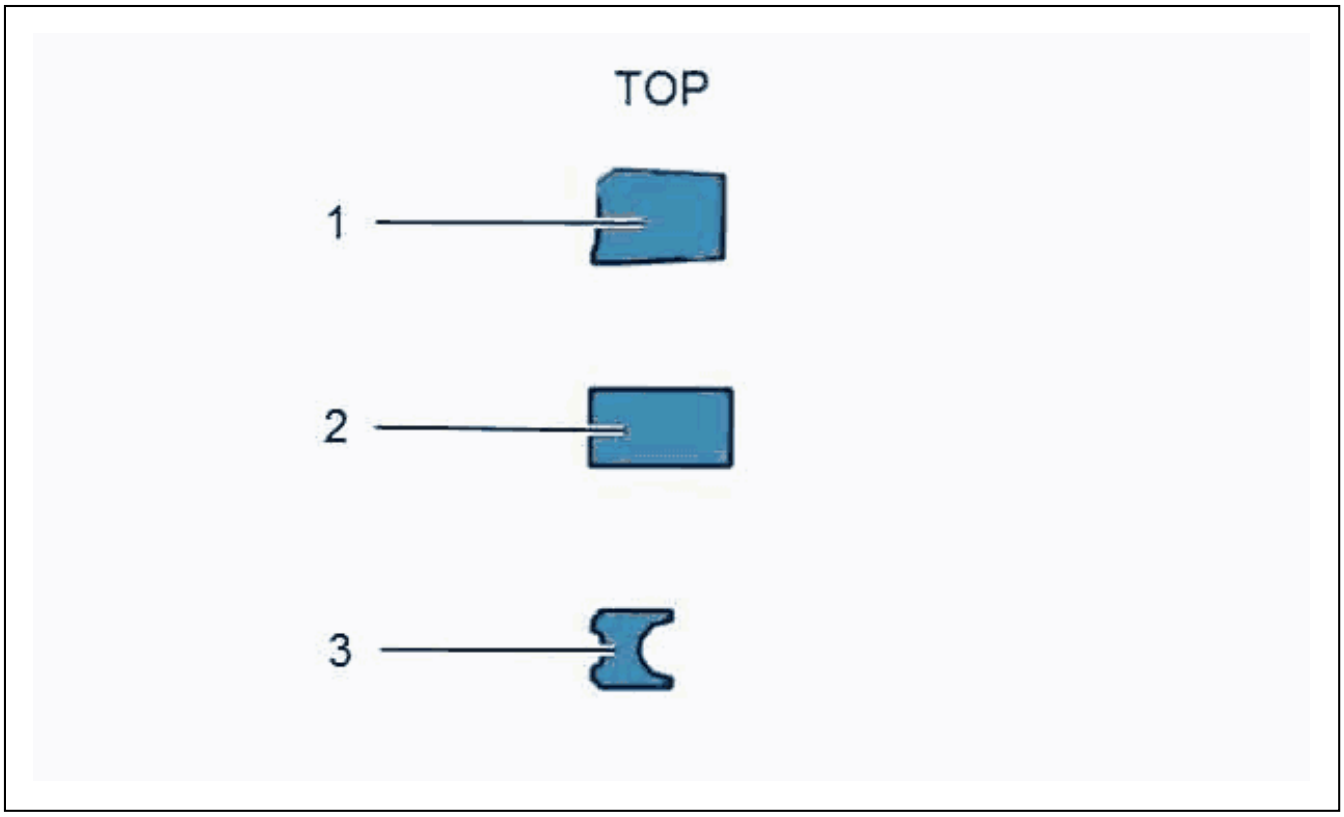


Figure : B1BB17AD

(1) Compression ring.
(2) Sealing ring .
(3) Scraper ring .

8.2. Data

DW10C engine			
Piston rings	Compression ring	Sealing ring	Scraper ring
Colour identification : Nominal dimension	Yellow	Light blue	Green
Clearance at the gap	0,25 - 0,35 mm	0,8 - 1 mm	0,25 - 0,50 mm
Thickness	2,5 mm	2 (-0,01 ; -0,03) mm	2 (-0,01 ; -0,03) mm

9. Piston head spray jets

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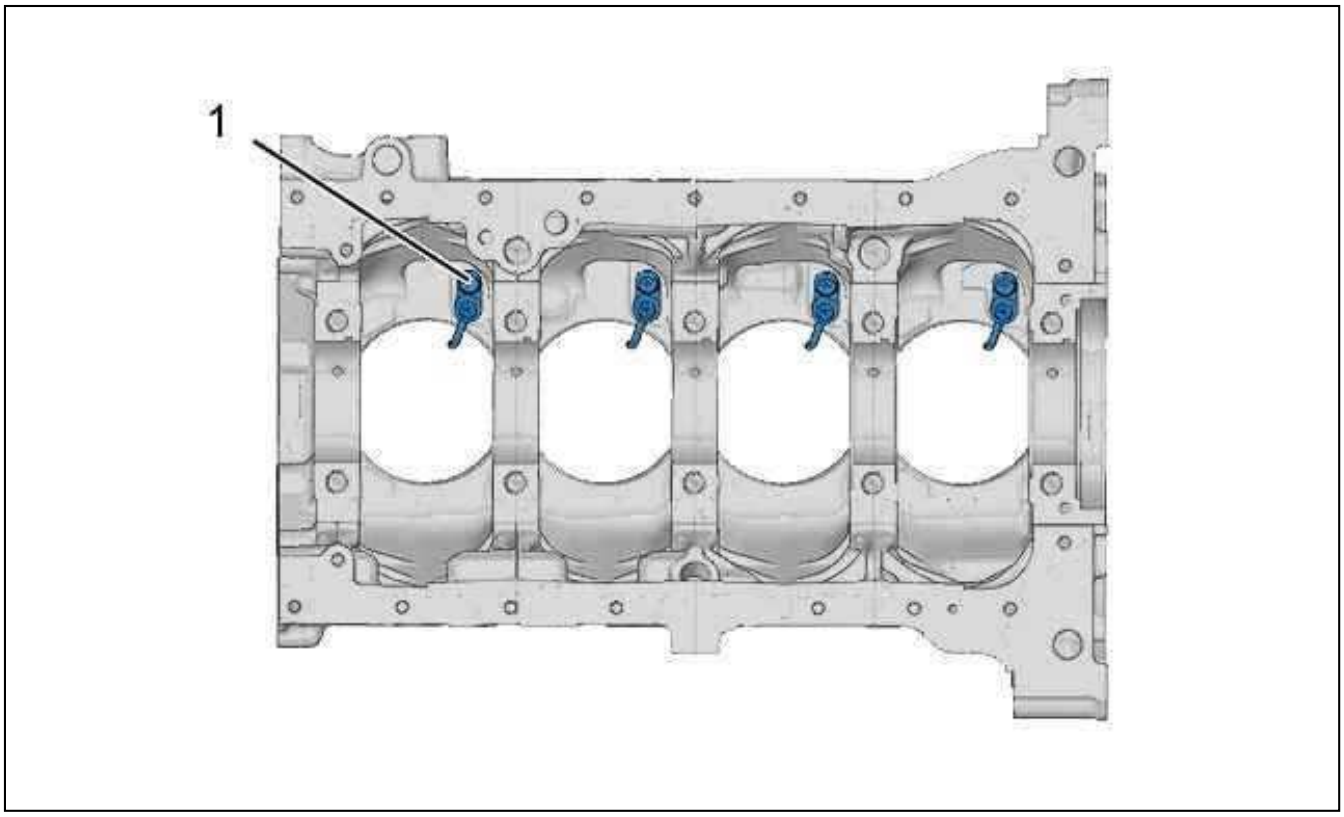


Figure : B1BB17DD

The piston head spray jets (1) are removable and replaceable.

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IDENTIFICATION - DATA : ENGINE TOP

1. Cylinder head

1.1. Identification

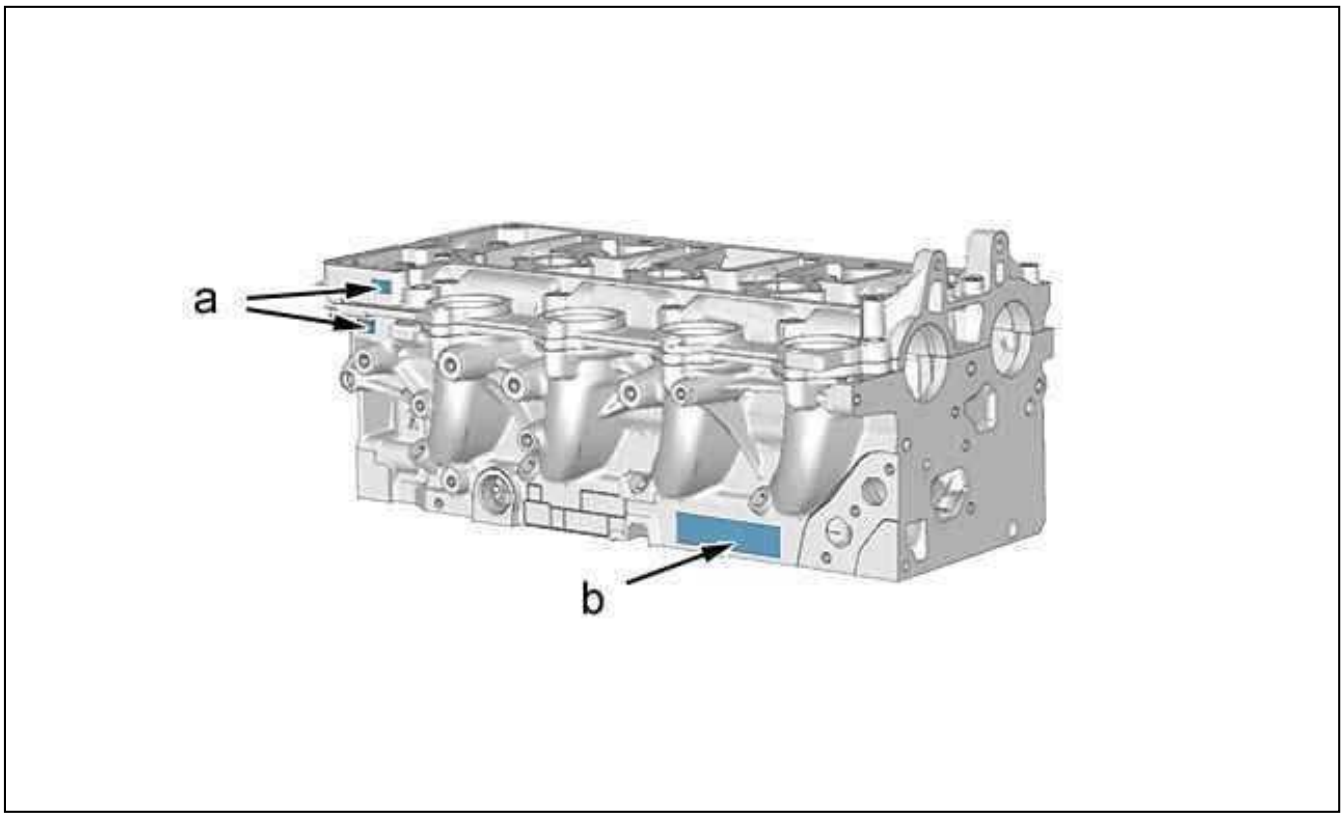


Figure : B1BB18HD

Identification of the cylinder head :

- "a" Production number
- "b" Identification no.

N.B. : Do not assemble parts with different "a" marks.

1.2. Data

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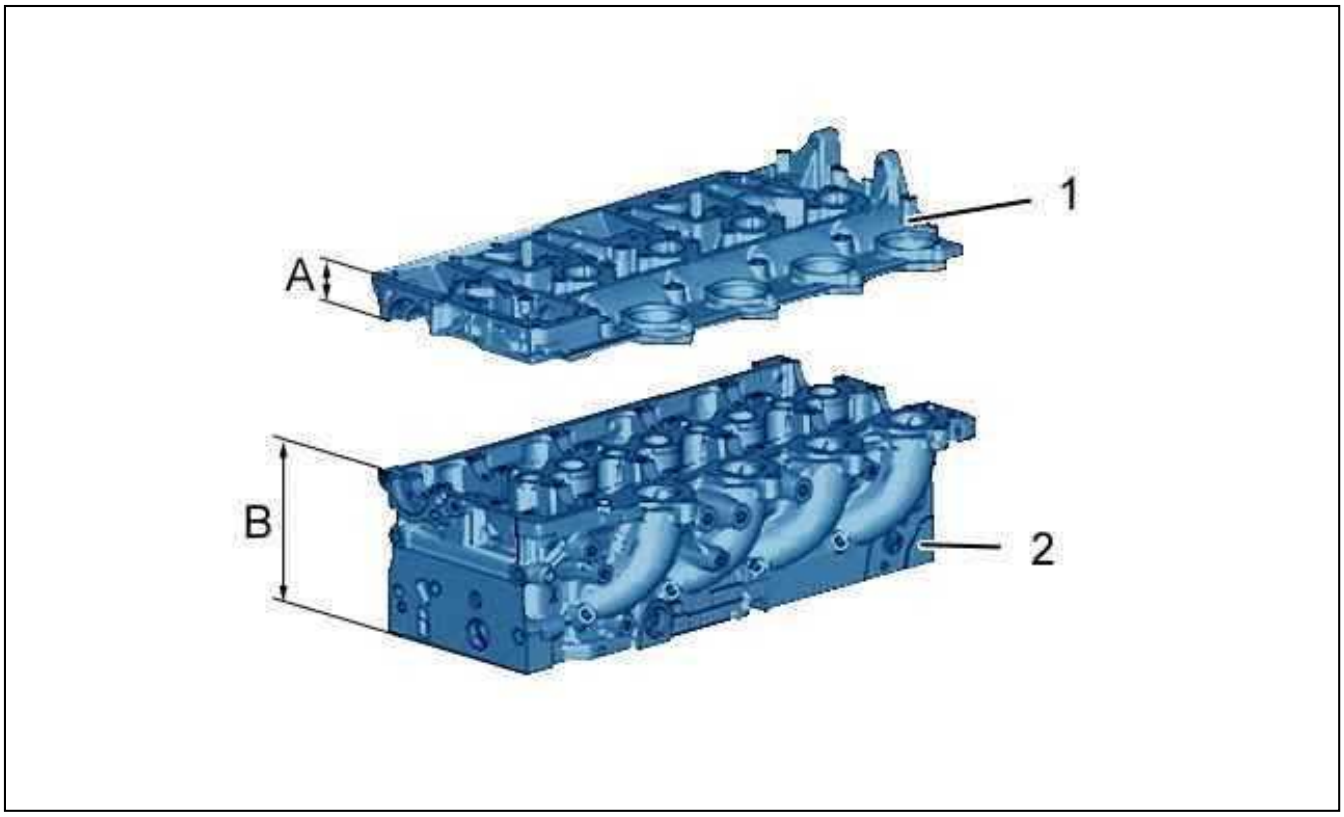


Figure : B1BB18KD

(1) Camshaft bearing cap housings.
(2) Cylinder head.

Height of the cylinder head and of the camshaft bearing caps	
Designation	Value
Nominal height "A"	31 mm
Nominal height "B"	133 mm
Max. out-of-true	0,03 mm
Machining permitted	No straightening permitted

Data :

- The cylinder head (2) is of light alloy
- 4 valves per cylinder (2 inlet, 2 exhaust) with clearance adjustment by hydraulic tappets
- The camshaft bearing cap cover (1) is in light alloy
- The sealing between the camshaft bearing caps (1) and the cylinder head (2) is with an anaerobic type sealing paste
- The camshaft bearing cap casing (1) is matched to the cylinder head (2). Substitution is not possible
- No grinding is permitted on the joint planes of the cylinder head

1.3. Camshaft bearings

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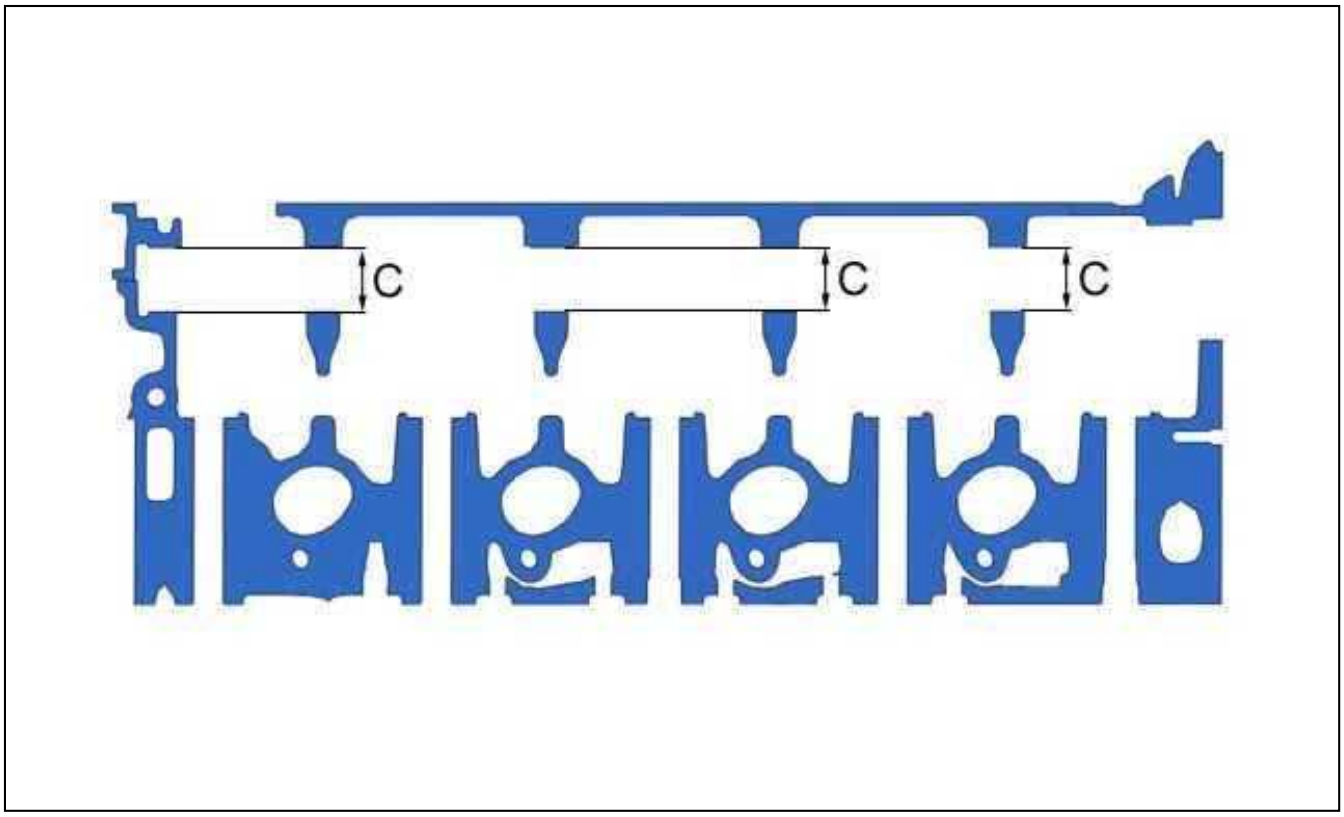


Figure : B1BB18ND

Diameters of camshaft bearings	
Designation	Value
Diameters of the bearings "C"	26 ± 0,015 mm

1.4. Flatness of the cylinder head

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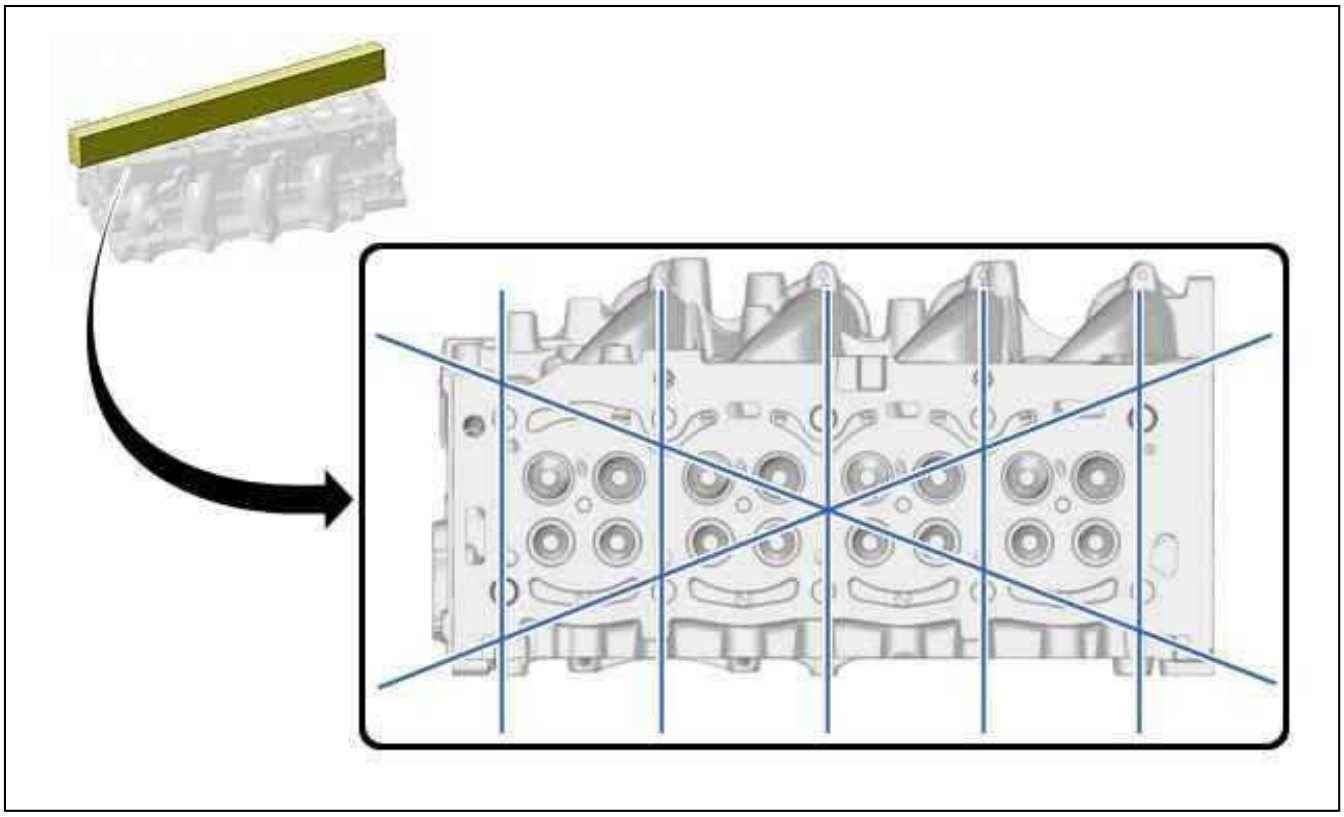


Figure : B1DG02WD

The flatness of the cylinder head is checked with a ruler (as shown on the illustration).
Maximum permissible bow = 0,03 mm.

CAUTION : If there is distortion greater than the permitted value, check the valve pocketing then remove the valves i they stand proud of the cylinder seal face.

1.5. Anti-return valve

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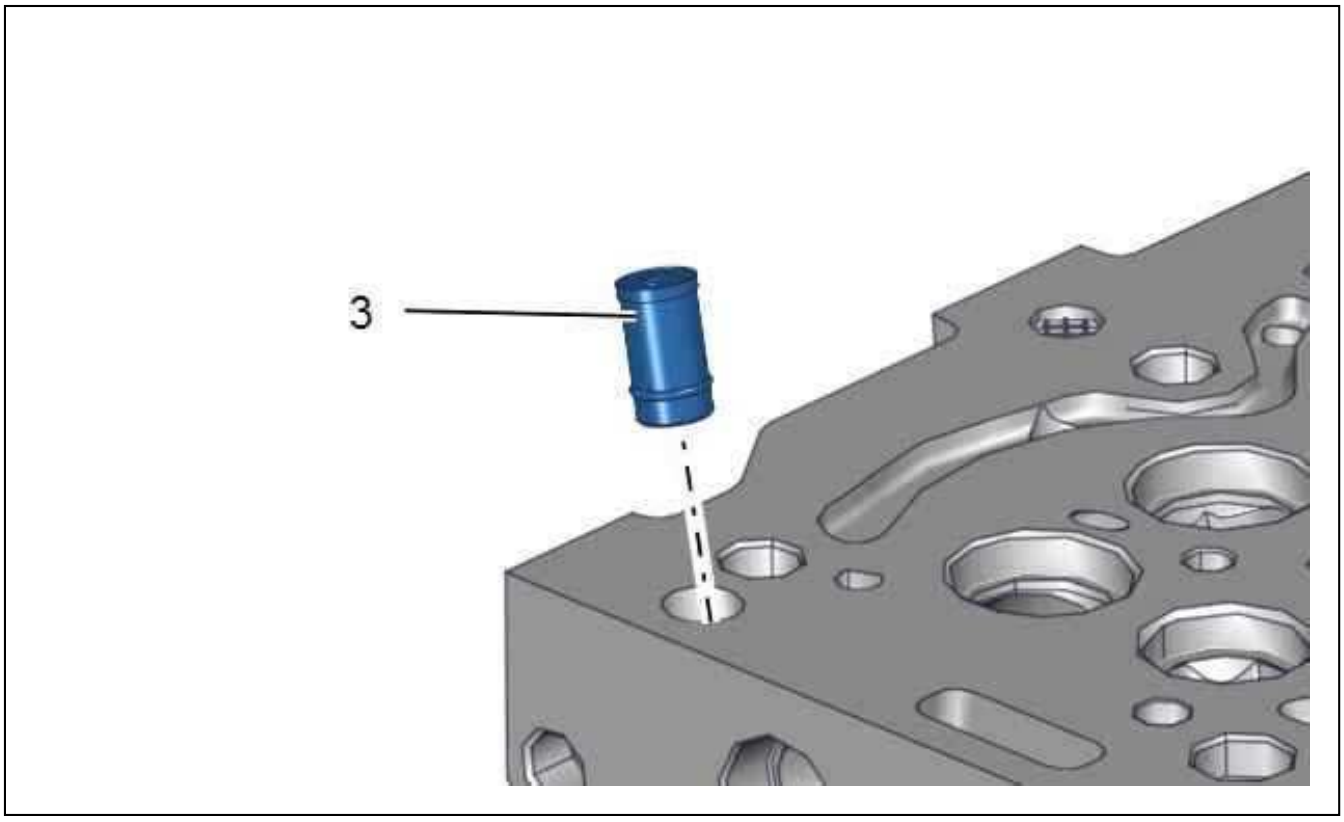


Figure : B1BB18PD

The non-return valve (3) is force-fitted into the cylinder head.

2. Cylinder head gasket

The choice of the class of cylinder head gasket takes account of how far the pistons protrude beyond the seal face of th cylinder block.

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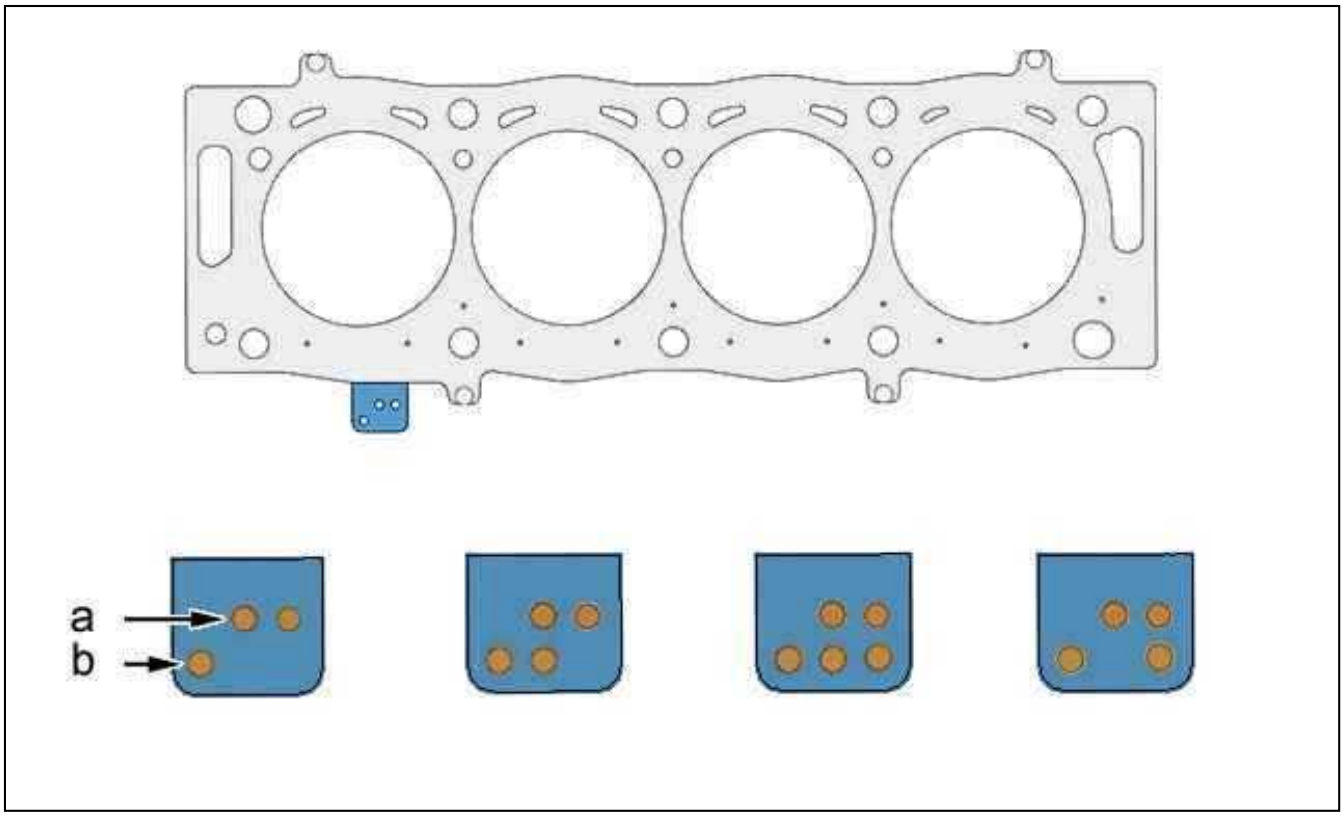


Figure : B1BB18SD

"a" : Engine identification marking.
"b" : Thickness identification .

Classes of multi-layer metallic cylinder head gaskets / Piston protrusion measurements				
	Thickness	Hole (at "b")		
From 0,550 mm inclusive to 0,600 mm inclusive	1,25 ± 0,05	X		
From 0,601 mm exclusive to 0,650 mm inclusive	1,30 ± 0,05	X	X	
From 0,651 mm exclusive to 0,700 mm inclusive	1,35 ± 0,05	X	X	X
From 0,701 mm exclusive to 0,750 mm inclusive	1,40 ± 0,05	X		X

3. Cylinder head bolts

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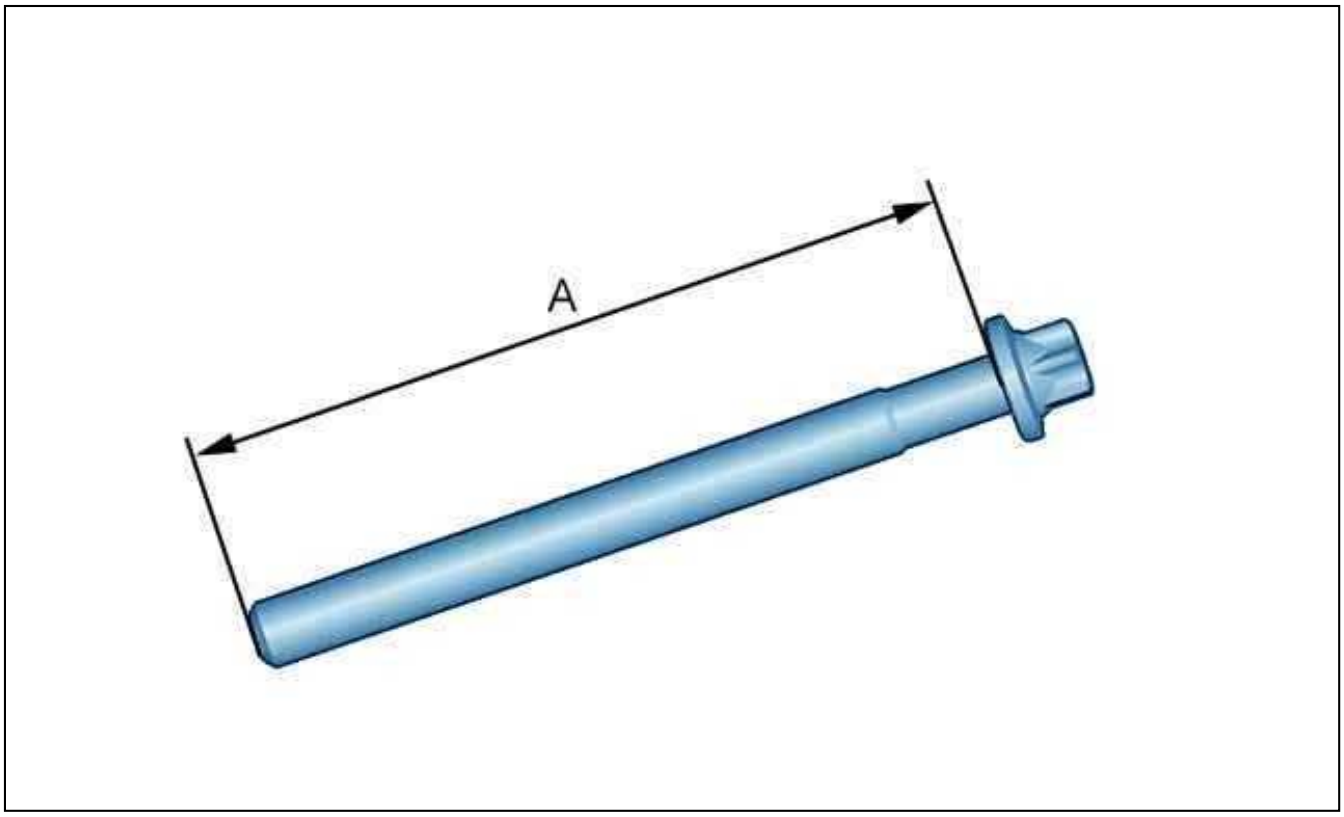


Figure : B1DP22AD

CAUTION : The cylinder head bolts can only be re-used once maximum.

The length of bolts under heads "A" must be less than or equal to 128 mm.

4. Camshaft bearing cap casing fixing bolt

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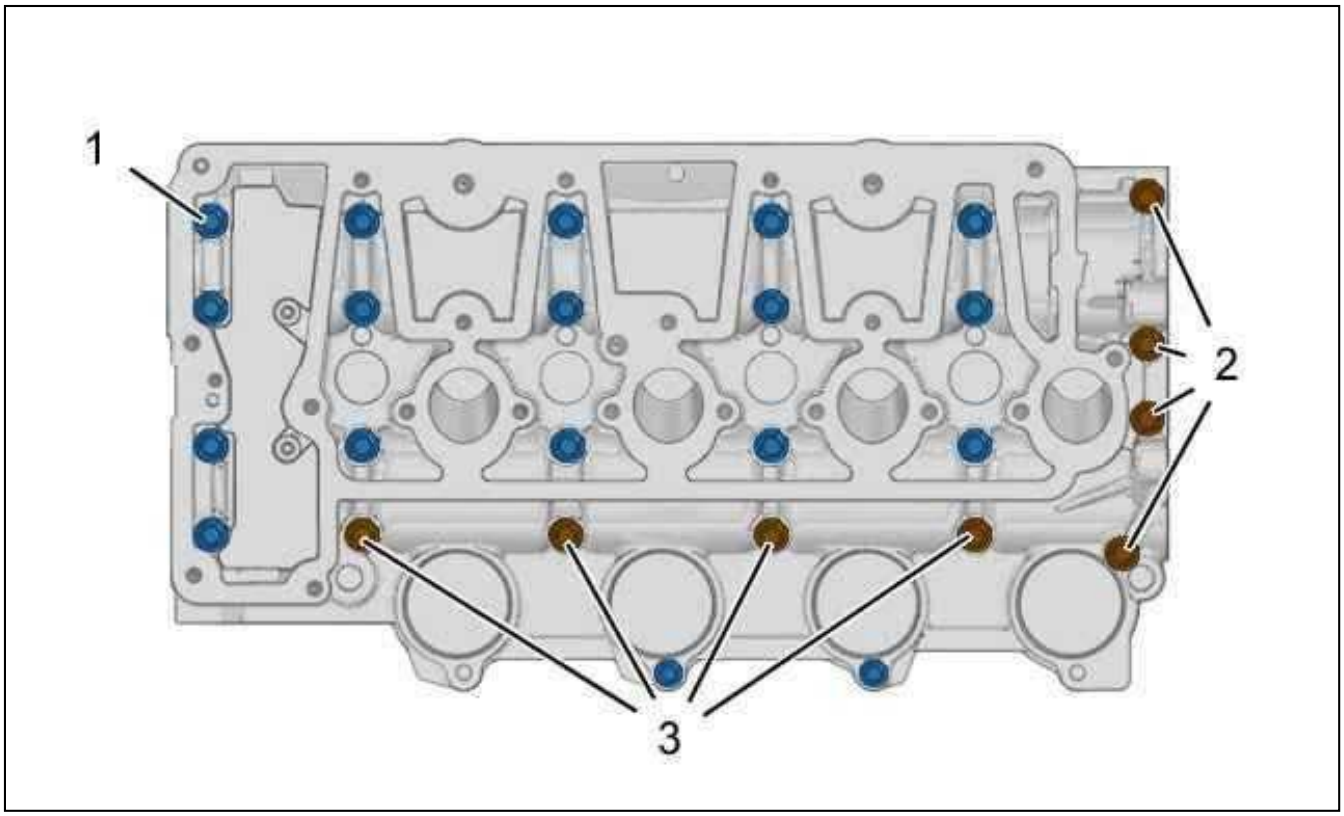


Figure : B1BB18UD

CAUTION : Observe the position of the camshaft bearing cap bolts.

(1) 40 mm long M6 x 100 bolt.
(2) 60 mm long M6 x 100 bolt.
(3) Precoated bolts M 6 x 100 length 40 mm.

N.B. : Instead of replacing the bolts (3), it is possible to place some sealing and locking product on the threads afte cleaning.

5. Camshafts

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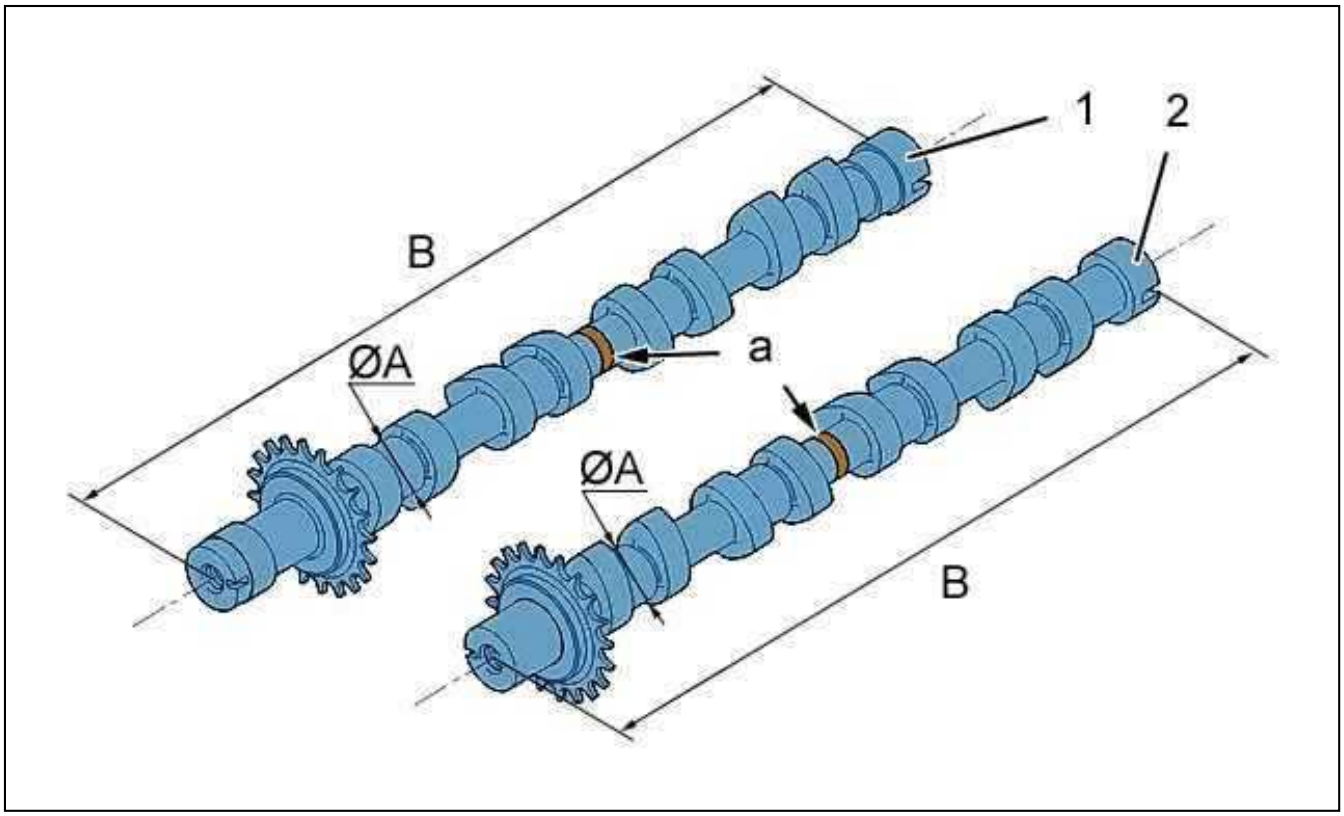


Figure : B1EP1CWD

(1) Exhaust camshaft.
(2) Induction camshaft.
"a" Manufacturing marks.

Characteristics of the camshafts		
Description	Induction camshaft	Exhaust camshaft
Diameter A	26 (-0,02 ; -0,041) mm	26 (-0,02 ; -0,041) mm
B length	428,62 ± 0,35 mm	449,9 ± 0,35 mm

N.B. : No repair dimension.

6. Cam lift

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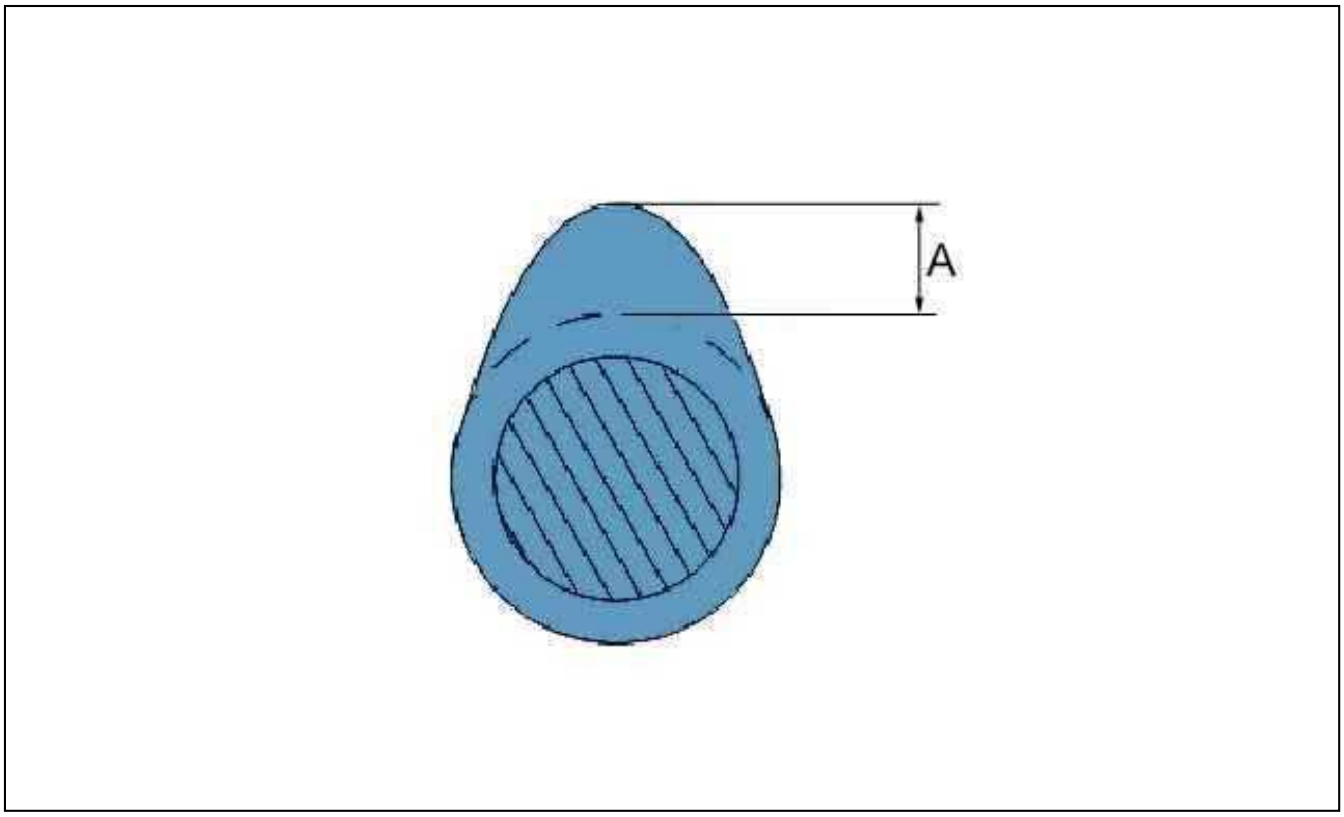


Figure : B1BB18WD

Height "A" = Cam lift.

Cam lift - Cam openings	
Description	Cam lift "A"
Inlet cams	3,753 mm
Exhaust cams	3,981 mm

7. Timing

7.1. Drive chain for camshafts

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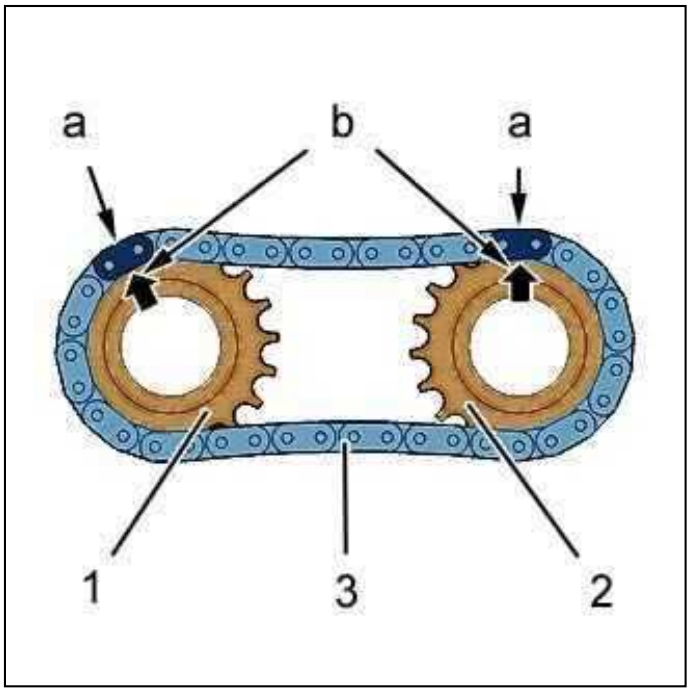


Figure : B1EP166C

(1) Exhaust camshaft.
(2) Induction camshaft.
(3) Drive chain.
The exhaust camshaftdrives the inlet camshaft via the drive chain.
The camshaft drive chain is marked by 2 black links at "a".

CAUTION : When fitting match up the marks "a" on the drive chain with the marks "b" on the camshaft.

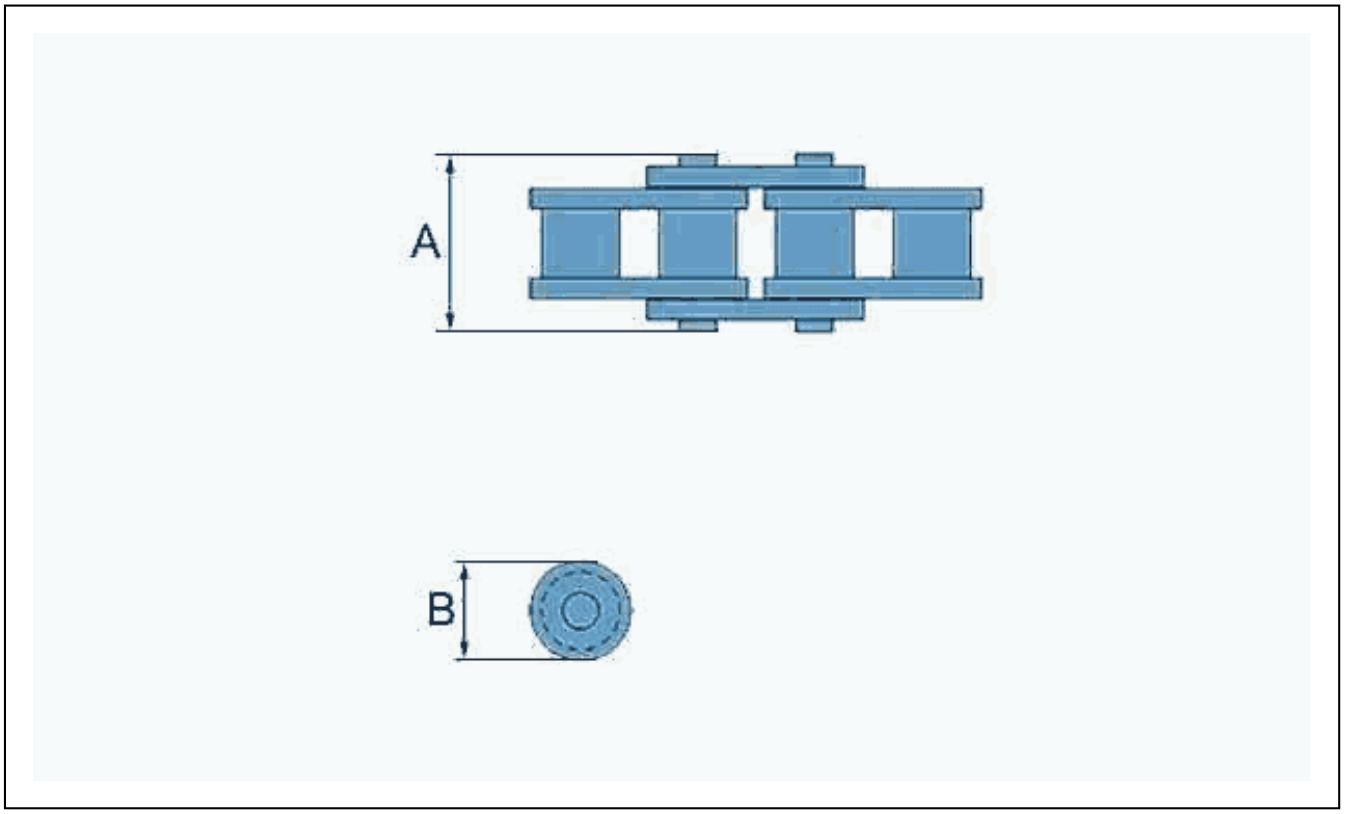


Figure : B1BB18YD

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Characteristics of the camshaft drive chain	
make	DAYCO
Number of links	20
Chain width: A	12,9 mm
Roller thickness: B	6,35 mm

7.2. timing belt

Timing belt data	
make	DAYCO
Number of teeth	116
Width	25,4 ± 0,8 mm

8. Valve seats and guides

8.1. Location of the valve guides

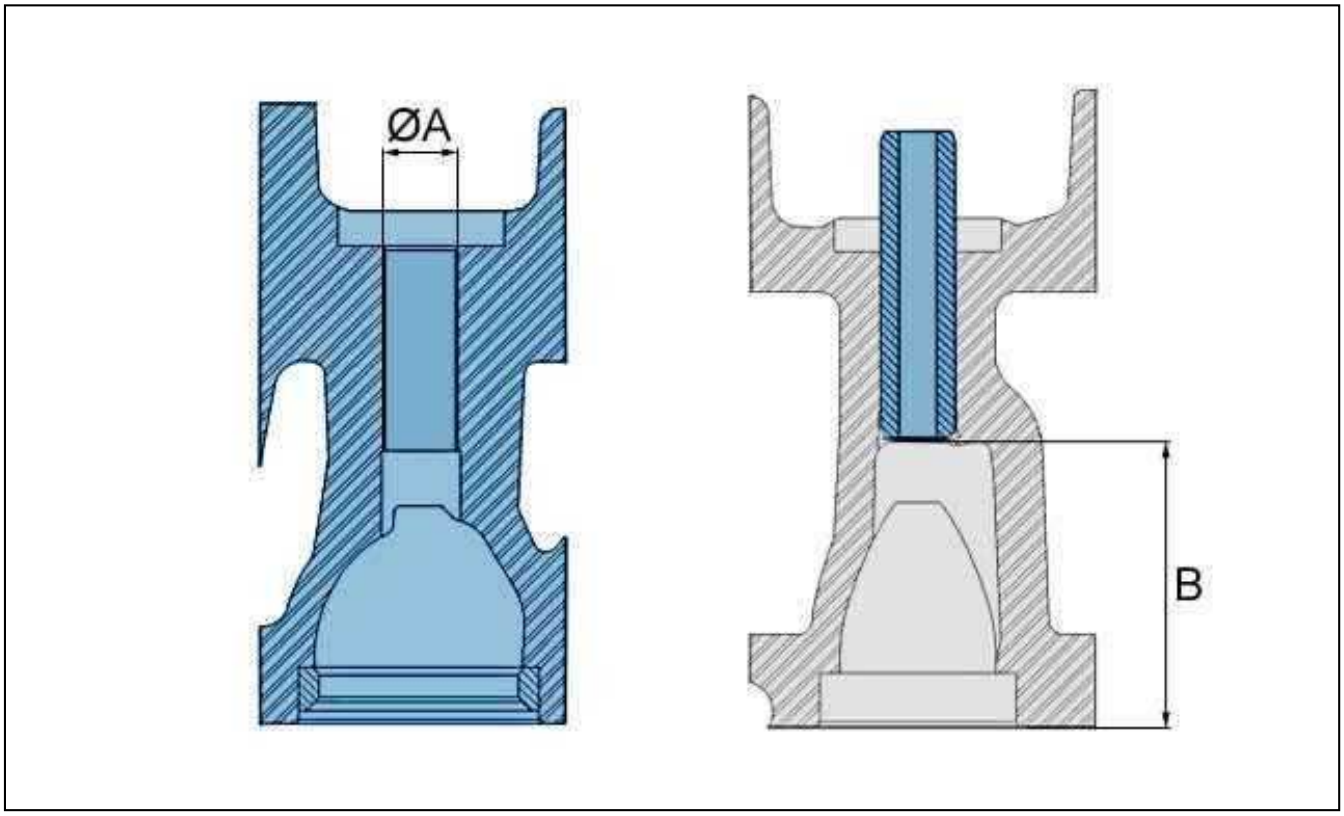


Figure : B1DP1AHD

Location of the valve guides		
Description	Inlet valve	Exhaust valve
Diameter A	9,974 (+ 0,022 ; 0) mm	9,974 (+ 0,022 ; 0) mm
Height B	36,1 ± 0,6 mm	36,1 ± 0,6 mm

8.2. Valve guides and seats

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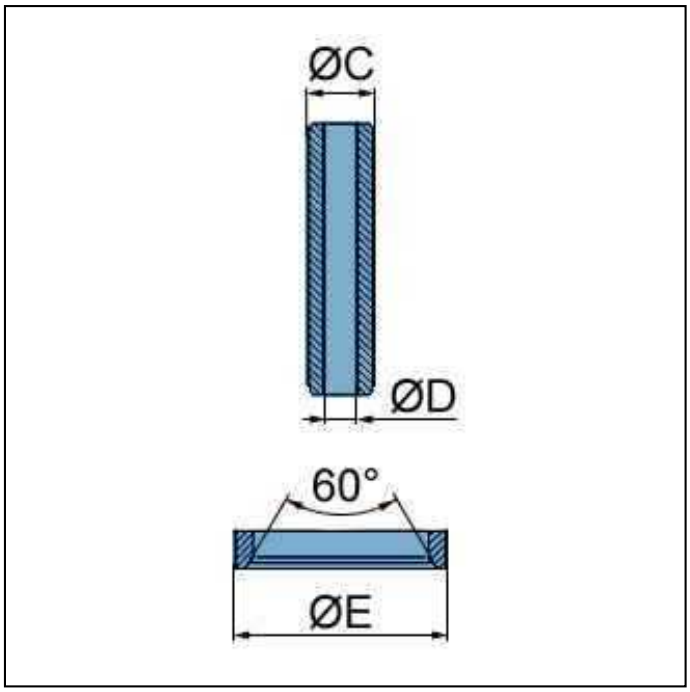


Figure : B1DP1AJC

Characteristics of the valve guides		
Description	Inlet valve	Exhaust valve
Diameter "C"	10 (+ 0,032 ; 0) mm	10 (+ 0,032 ; 0) mm
Diameter "D"	6 (+ 0,018 ; 0) mm	6 (+ 0,018 ; 0) mm

Characteristics of the valve seats		
Description	Inlet valve	Exhaust valve
Diameter "E"	28,75 (+ 0,025 ; 0) mm	26,4 (+ 0,025 ; 0) mm

9. Valves and valve springs

9.1. valves

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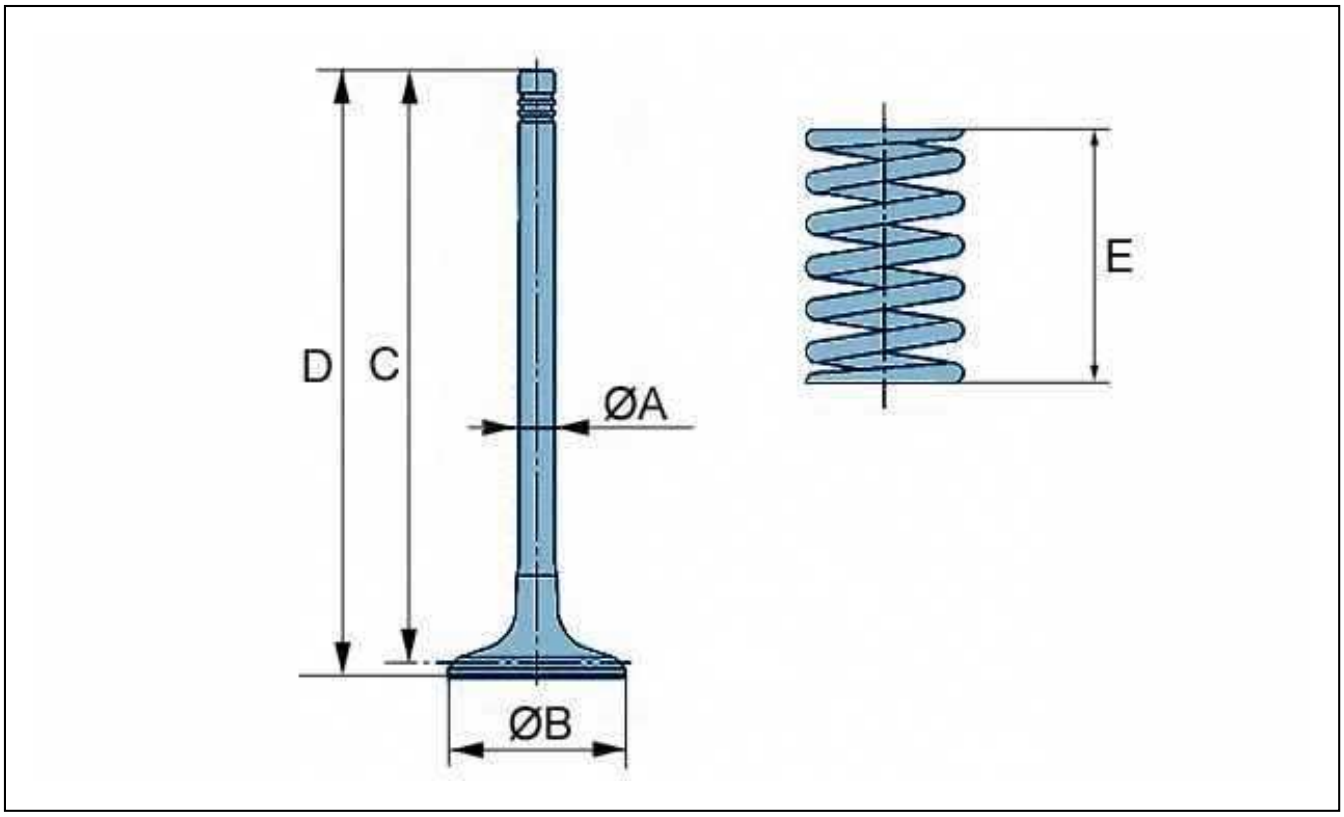


Figure : B1BB190D

Characteristics of the valves		
Description	Inlet valve	Exhaust valve
Diameter "A"	5,92 ± 0,02 mm	5,92 ± 0,02 mm
Diameter "B"	27,25 ± 0,1 mm	25 ± 0,1 mm
"C" length	101,96 ± 0,1 mm	102,48 ± 0,1 mm
"D" length	104,46 ± 0,2 mm	105 ± 0,8 mm

N.B. : There are no specific repair valves available in Replacement Parts.

9.2. Valve springs

Free height : "E" = 42,3 mm.

N.B. : The inlet and exhaust valve springs are identical.

10. Valve rockers

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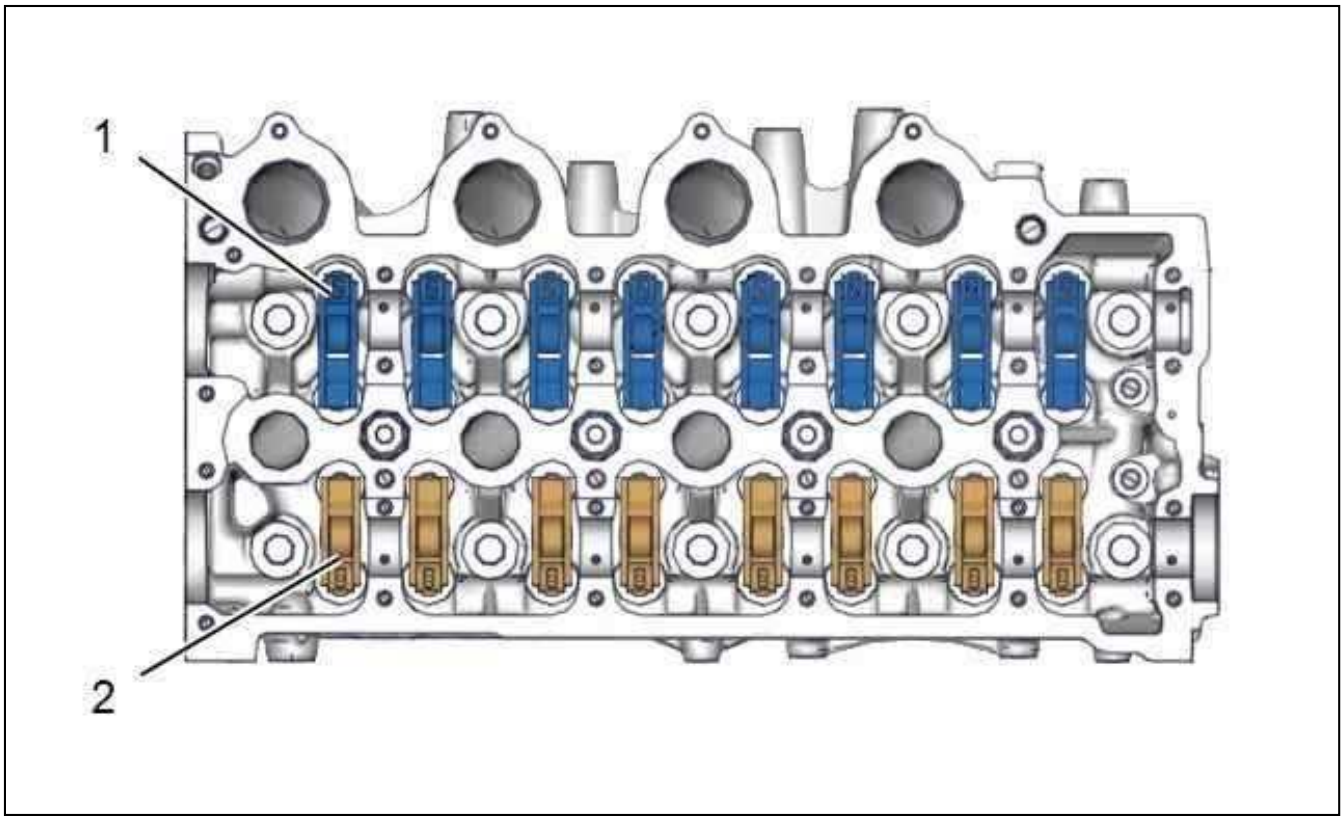


Figure : B1BB193D

(1) The exhaust valve rockers.
(2) Inlet valve rockers.
The exhaust valve rockers (1) longer than the inlet valve rockers (2).

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CHECKING AND ADJUSTING VALUES : DW10 ENGINE TYPE

1. Foreword

1.1. Units of pressure

1/ Units of pressure in bars.

N.B. : One bar has the advantage of being close to the average atmospheric pressure at sea level.

2/ Unit of pressure in millimetres of mercury (symbol: mmHg) or Torr (symbol: Torr).
This unit of measurement of pressure was origially defined as the pressure exerted at 0°C by a 1 millimetre column of mercury, later indexed to the atmospheric pressure.
The pressure values given in the tables below are values read on a pressure gauge (relative pressure).

N.B. : Relative pressure is equal to absolute pressure minus atmospheric pressure.

1.2. Units of tension

The SEEM unit measures by deflection of the static tension of the belt, by deforming a portion of its length.

2. General engine information

2.1. DW10CTED4 engine

Engine type	DW10CTED4	DW10CTED4	DW10CTED4	DW10CTED4
Engine legislation type	RHD	RHE	RHH	RHC
Cubic capacity	1997 cc			
Fuel	Diesel			
Maximum power	100 kW	110 kW	120 kW	120 kW
Engine speed at maximum power	4000 rpm	3750 rpm	3750 rpm	3850 rpm
Maximum torque	32 daNm	34 daNm	34 daNm	30 daNm
Engine speed at maximum torque	2000 rpm	2000 rpm	2000 rpm	1750 rpm

2.2. DW10CD engine

Engine type	DW10CD	DW10CE
Engine legislation type	AHZ	AHY
Cubic capacity	1997 cc	
Fuel	Diesel	
Maximum power	94 kW	72 kW
Engine speed at maximum power	4000 rpm	4000 rpm
Maximum torque	32 daNm	26 daNm
Engine speed at maximum torque	2000 rpm	1500 rpm

2.3. DW10DTED4 engine

Engine type	DW10DTED4

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Engine legislation type	RHB
Cubic capacity	1997 cc
Fuel	Diesel
Maximum power	110 kW
Engine speed at maximum power	3750 rpm
Maximum torque	30 daNm
Engine speed at maximum torque	1750 rpm

3. Oil capacity

3.1. DW10CTED4 engine

RPO number	To 11918	Since 11919
colour : dipstick	handle : Yellow	handle : Orange
Engine type	DW10CTED4	
Engine legislation type	RHD-RHE-RHH	
Oil capacity without replacement of the filter cartridge	5,25 litres	4,75 litres
Oil capacity with replacement of the oil filter	5,5 litres	5 litres
Capacity between minimum and maximum on the oil gauge	1,7 litre	1 litre

3.2. DW10CD/CE - DW10DTED4 engines

Engine type	DW10CD DW10CE	DW10DTED4
Engine legislation type	AHZ - AHY	RHB
Oil capacity without replacement of the filter cartridge	4,75 litres	
Oil capacity with replacement of the oil filter	5 litres	
Capacity between minimum and maximum on the oil gauge	1 litre	

Oil change interval : Refer to the maintenance schedule.

CAUTION : Check the oil level systematically using the manual oil dipstick.

4. Oil pressure

N.B. : Check the oil level with the engine cold.

CAUTION : Oil pressure is checked with the engine hot after checking the oil level (110 °C).

Designation	Minimum oil pressure
Idling	2 ± 0,2 bar
From 2500 to 4000 rpm	4,8 ± 0,2 bar

CAUTION : Carry out work on the engine if the oil pressure values are below those in the table.

5. Ancillary drive belt

	With and without air conditioning

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Belt tension	By dynamic roller tensioner

6. timing belt

Belt tension	By dynamic roller tensioner

7. Cylinder head bolts

CAUTION : After a removal, systematically replace the cylinder head bolts .

8. Pressure, engine end of compression

Measure the pressure at the end of compression, in order, on cylinders 1, 2, 3 and 4.

N.B. : The difference in pressure between 2 cylinders must not exceed 5 bars.

CAUTION : Always search for the origins of fault(s), where the values measured are found to be significantly out.

9. Turbocharge pressure

Designation	Turbo pressure with vehicle stationary	Turbo pressure with vehicle being road tested
Idling	0 bar	-
2500 rpm	0,2 ± 0,05 bar	-
Full load	1,1 ± 0,05 bar	1,4 ± 0,05 bar

10. Low pressure fuel supply circuit

Reference values Engine idling or under starter motor for less than 15 seconds (If the engine does not start)	Vacuum measured by the pressure gauge [4073-T.A] (cmHg)	Vacuum measured by the pressure gauge [1604-A] (mbar)
Vacuum values to identify an air leak on the low-pressure circuit	D < 7,5 cmHg	D < 100 Mbar
Normal vacuum values	7,5 cmHg < D < 22,5 cmHg	100 Mbar < D < 300 Mbar
Vacuum values to identify a block on the low-pressure circuit (Clogged fuel filter,….)	D > 22,5 cmHg	D > 300 Mbar

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IDENTIFICATION - DATA : PISTONS - THE PISTON SHAFT - PISTON RINGS

1. Piston

1.1. Identification

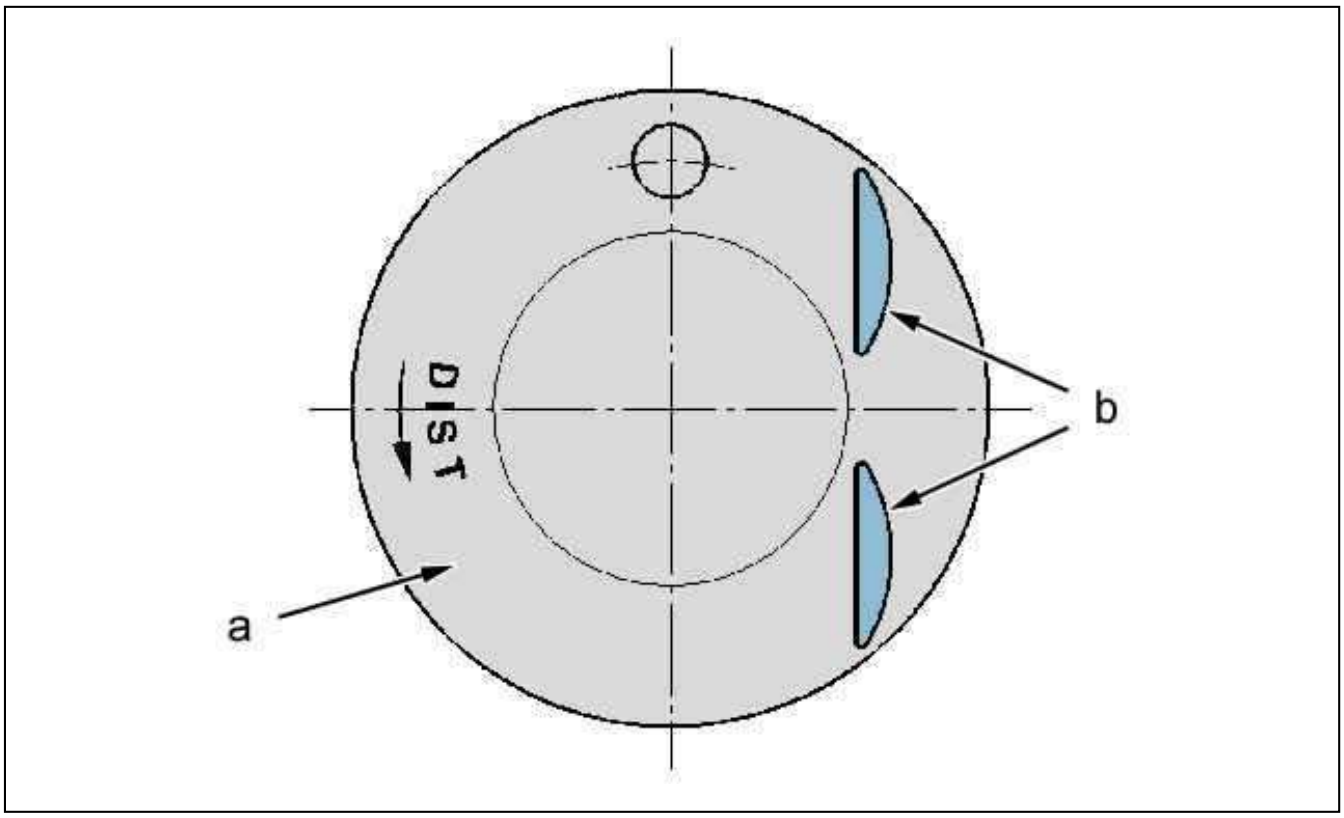


Figure : B1CP0N7D

engine	Cold stamp marking (as "a")	Valve clearance (as "b")
EW10A	Letter L	Yes
EW10J4	Letter E	No OK
EW10J4S	-	Yes

1.2. Data

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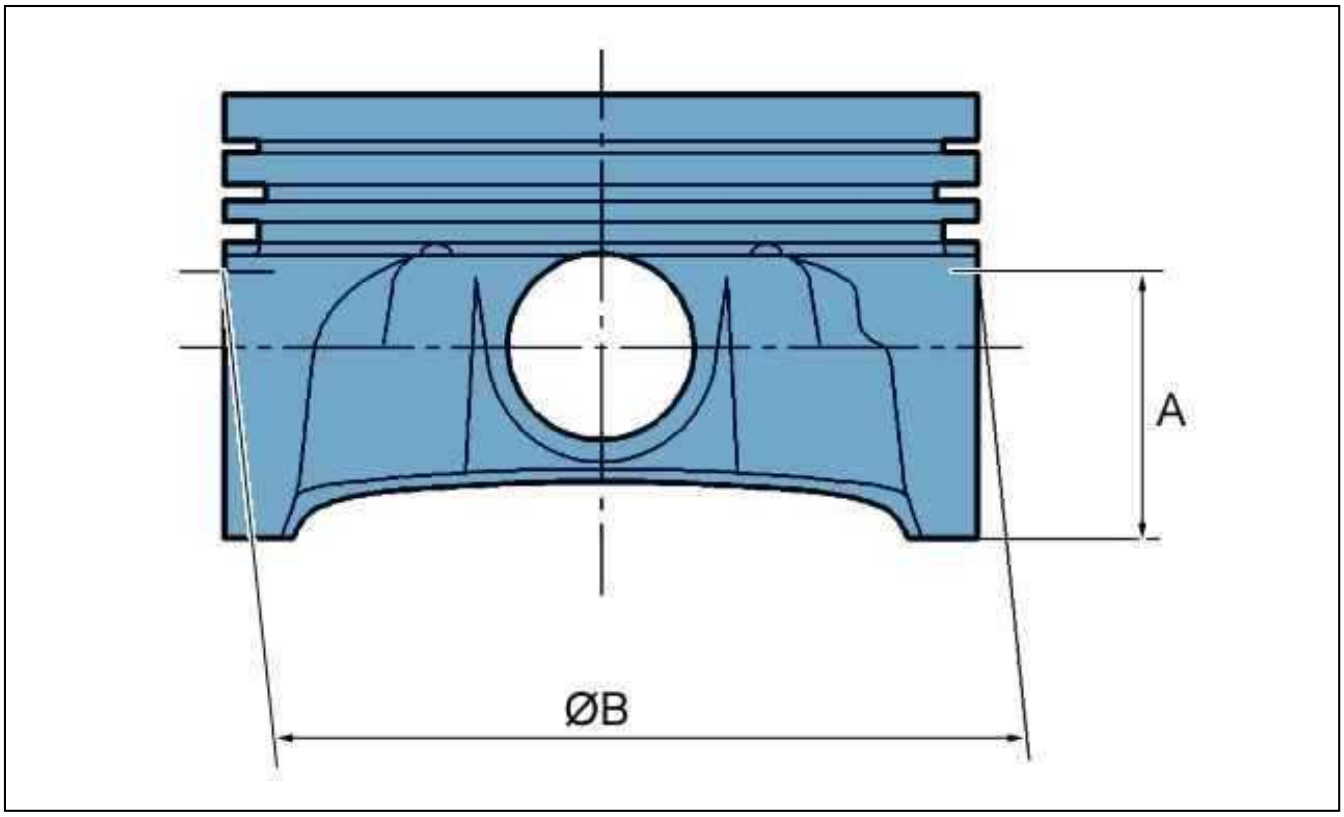


Figure : B1CP0N8D

Piston diameter (mm)			
engine	Distance	Nominal dimension	Repair size
EW10A	A	30,6 mm	
	Ø B	84,975 mm	85,575 mm
EW10J4	A	30,6 mm	
	Ø B	84,948 mm	85,548 mm
EW10J4S	A	29,5 mm	
	Ø B	84,88 mm	85,48 mm

1.3. Piston misalignment

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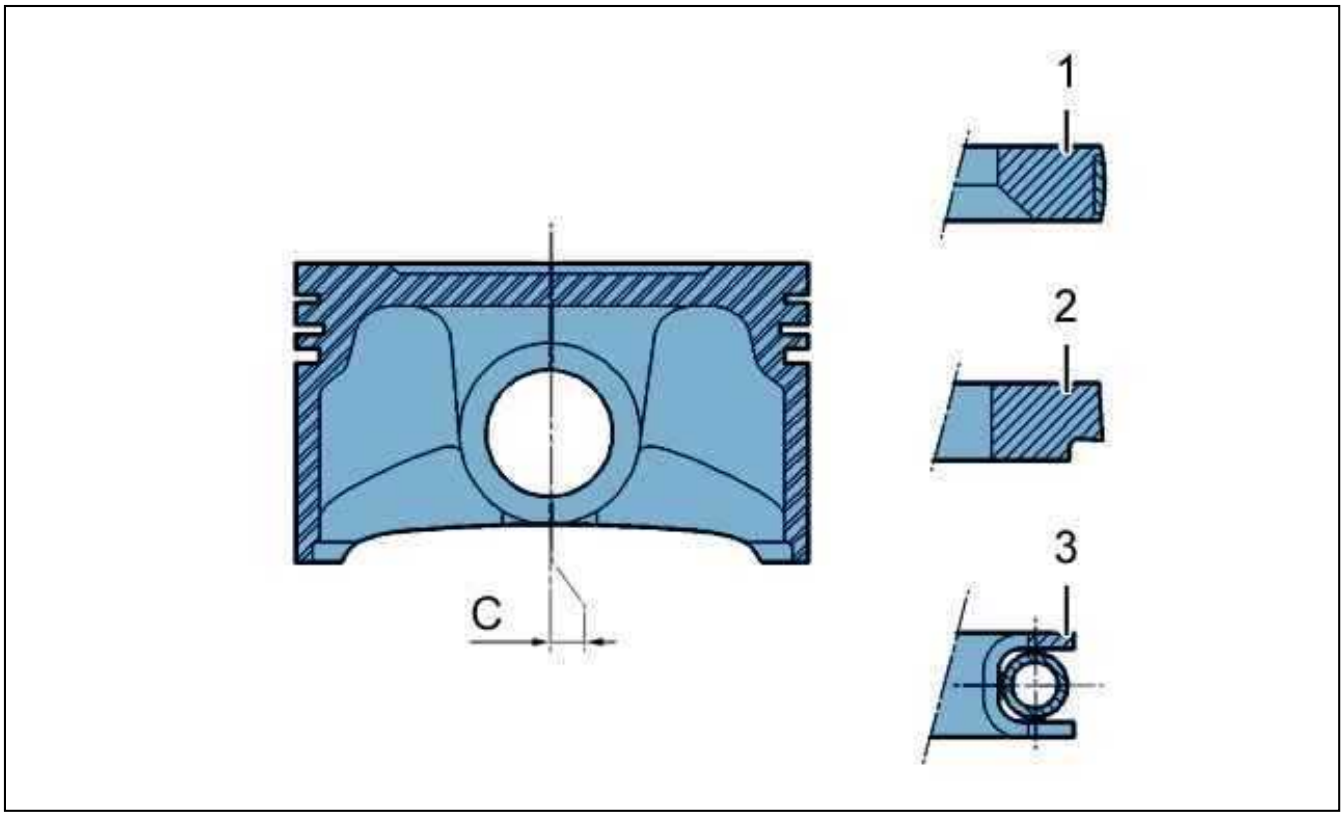


Figure : B1CP0N9D

(1) Compression ring.
(2) Sealing ring .
(3) Scraper ring .

"C" Piston misalignment	
engine	Distance "C"
EW10A	0,8 ± 0,1 mm
EW10J4	0,8 ± 0,1 mm
EW10J4S	0,8 ± 0,1 mm

1.4. Height

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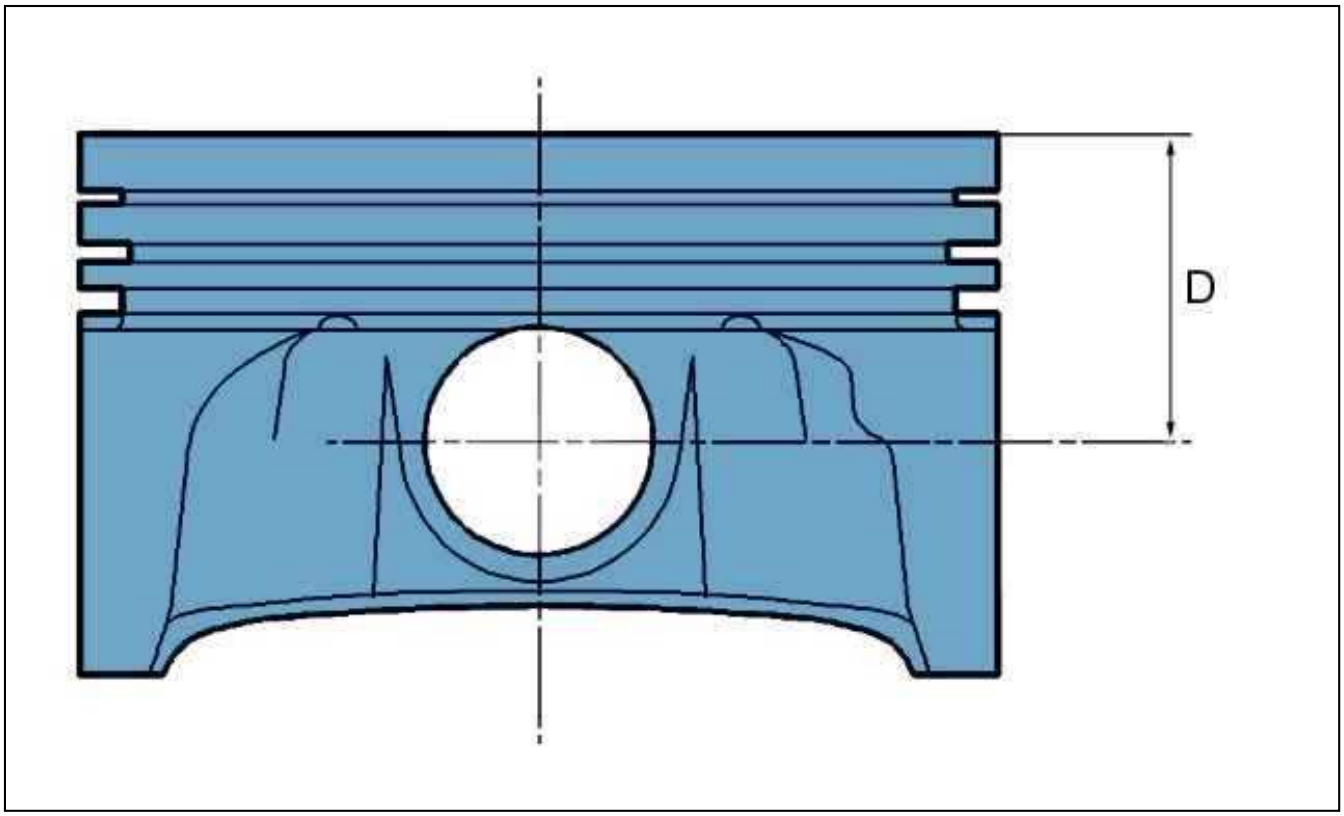


Figure : B1CP0NAD

Height "D"	
engine	Distance "D"
EW10A	29 ± 0,025 mm
EW10J4	29 ± 0,025 mm
EW10J4S	29,55 ± 0,025 mm

2. Piston rings

EW10A - EW10J4 engine			
Piston rings	(1) Compression ring	(2) Sealing ring	(3) Scraper ring
Thickness	1,2 (-0,005 ; -0,03) mm	1,5 (-0,005 ; -0,03) mm	2 (-0,01 ; -0,05) mm
Ring gap	0,2 (+0,25 ; 0) mm	0,2 (+0,20 ; 0) mm	-
Colour identification	Pink	dark brown	violet

EW10J4S engines			
Piston rings	(1) Compression ring	(2) Sealing ring	(3) Scraper ring
Thickness	1,2 (-0,005 ; -0,03) mm	1,5 (-0,005 ; -0,03) mm	2,5 (-0,01 ; -0,05) mm
Ring gap	0,2 (+0,15 ; 0) mm	0,2 (+0,20 ; 0) mm	-
Colour identification	White	dark brown	yellow

3. The piston shaft

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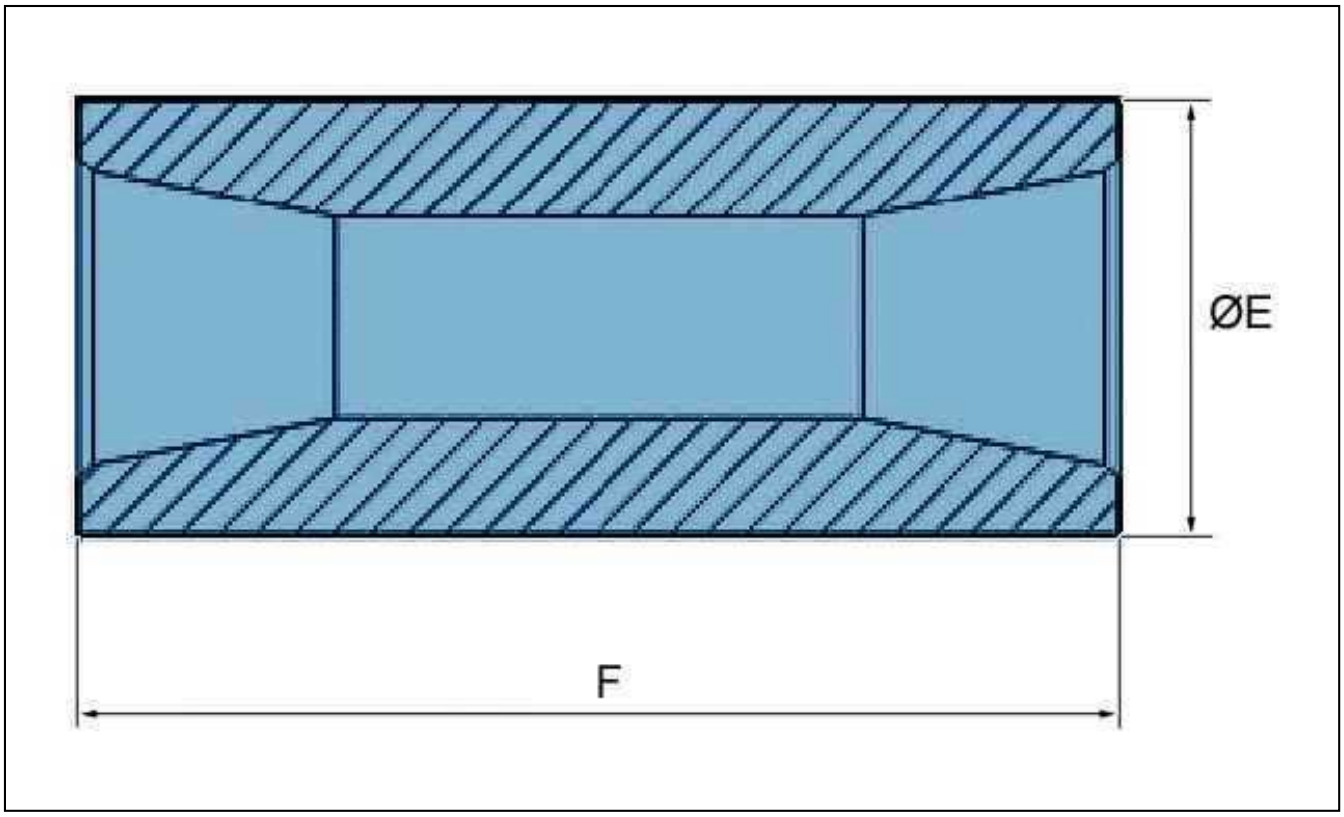


Figure : B1CP0NBD

The piston shaft		
engine	"F" length	Diameter "E"
EW10A	56 (+0 ; -0,3) mm	21 (+0 ; -0,005) mm
EW10J4	58 (+0 ; -0,3) mm	21 (+0 ; -0,005) mm
EW10J4S	55 (+0 ; -0,2) mm	21 (+0 ; -0,005) mm

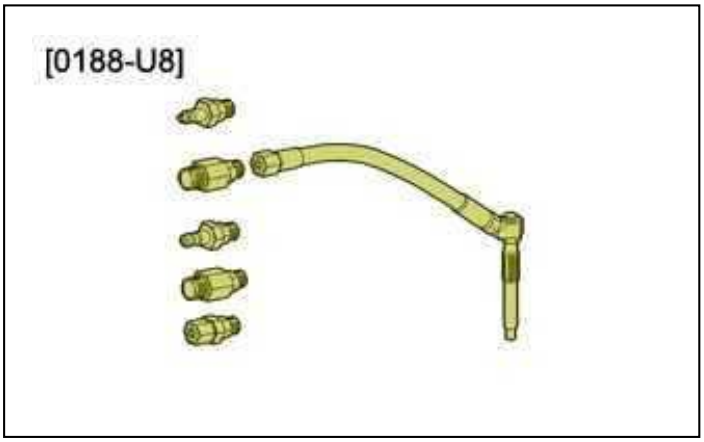
The engine EW10J4S has circlips on the piston rods.

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CHECK : PRESSURE, ENGINE END OF COMPRESSION

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB0IXT	-	Compression tester MULLER 203 102-100
 Figure : E5AB0IYT	[0188-U8]	Dummy plug

2. Preliminary operations

Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The cooling fan control relay unit
- The fuel filter
- The exhaust gas recycling module

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- The pre-heater plugs

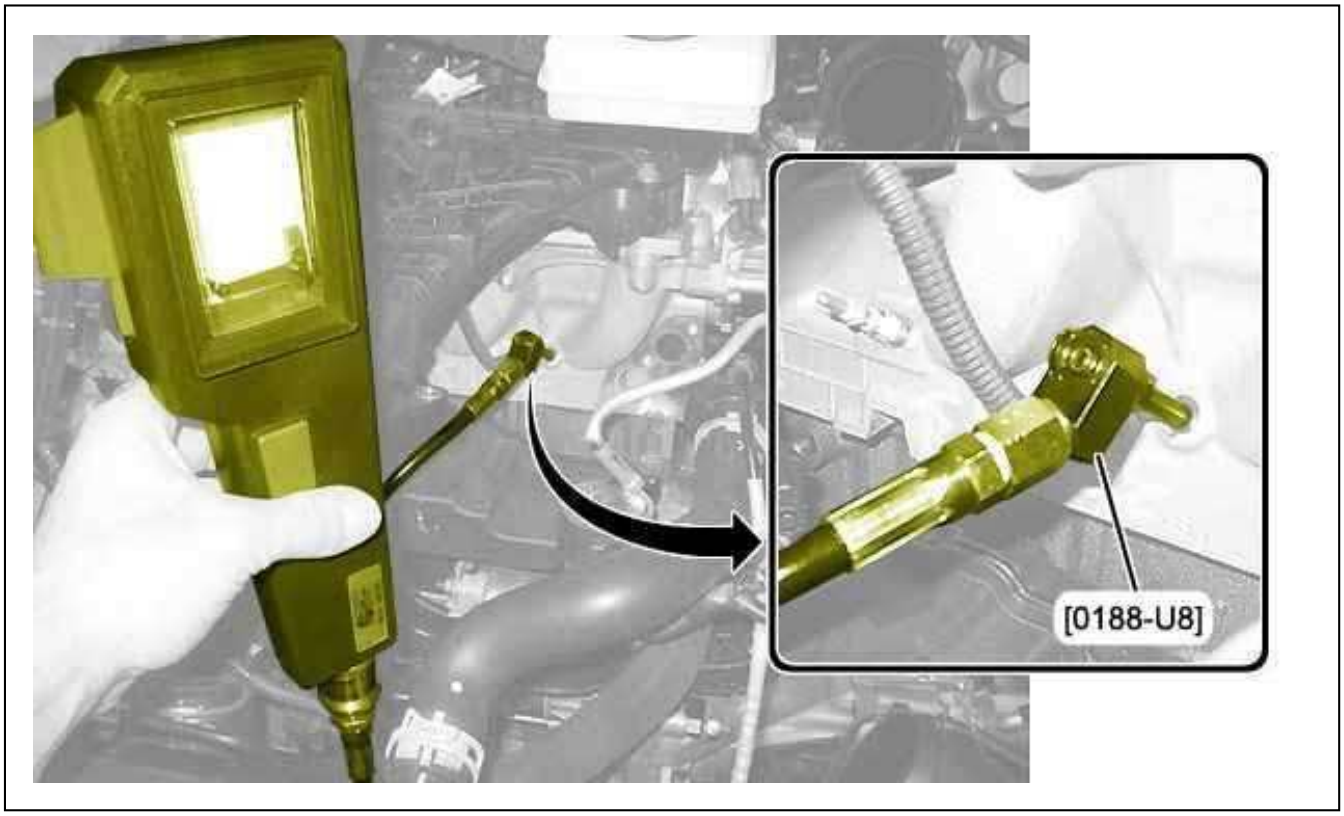


Figure : B1BD03FD

Position the tool [0188-U8] on cylinder no. 1 (Flywheel side).
Connect the compressiometer to the tool [0188-U8].

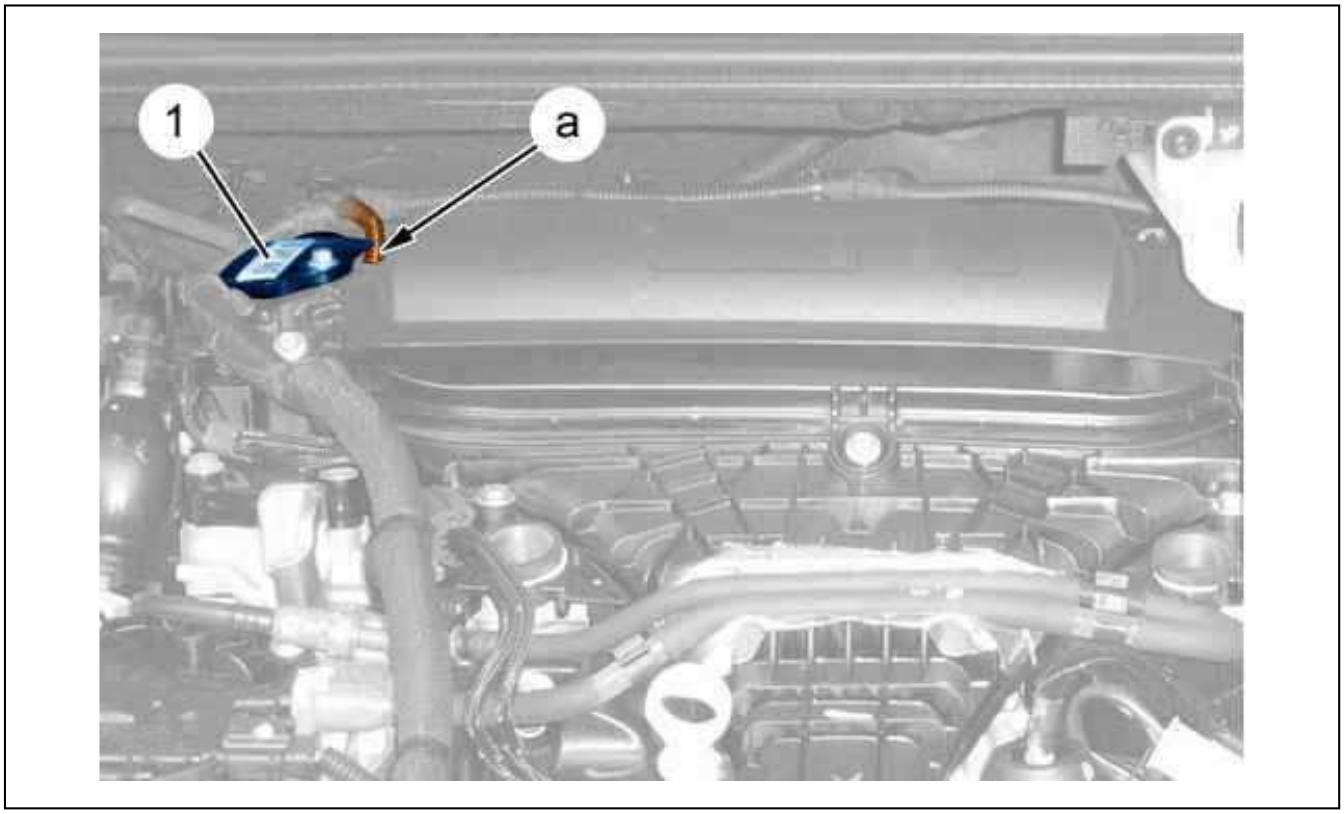


Figure : B1BD01VD

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Remove : The control solenoid valves breather cover (1).
Unplug : The cylinder reference sensor (at "a").

N.B. : Disconnection of the cylinder reference sensor prohibits the engine from being started.

3. Check

Reconnect the battery.
Operate the starter motor for 10 seconds.
Note down the value of the pressure in cylinder N° 1.
Apply the same procedure for cylinders 2, 3 and 4 ; Using tool [0188-U8] and the compression tester.
Checking and adjusting values : DW10C engine type .

N.B. : The difference in pressure between two cylinders should not be more than 5 bars.

4. Refitting

CAUTION : Ensure that the glow plugs are in good condition ; Replace any defective parts.

Disconnect the battery.
Remove the compression tester and the tool [0188-U8].
Connect : The cylinder reference sensor (at "a").
Refit : The control solenoid valves breather cover (1).
Refit :

- The pre-heater plugs
- The exhaust gas recycling module
- The fuel filter
- The cooling fan control relay unit
- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

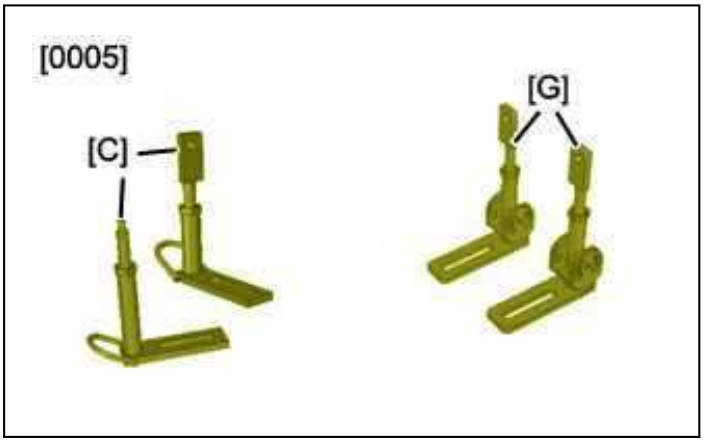
CAUTION : Clear the memory of faults (Using the diagnostic equipment).

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REMOVING - REFITTING : ENGINE - GEARBOX

ESSENTIAL : Ensure that the precautions relating to safety and cleanliness are adhered to .

1. Tooling

Tool	Reference	Description
 Figure : E5AB05KT	[0004]	Lifting table
 Figure : E5AB0EJT	[0005-C]	set of retaining supports (Right hand)
	[0005-G]	set of retaining supports (Adjustable supports)
	[0165-2]	Cable pliers for flexible clips

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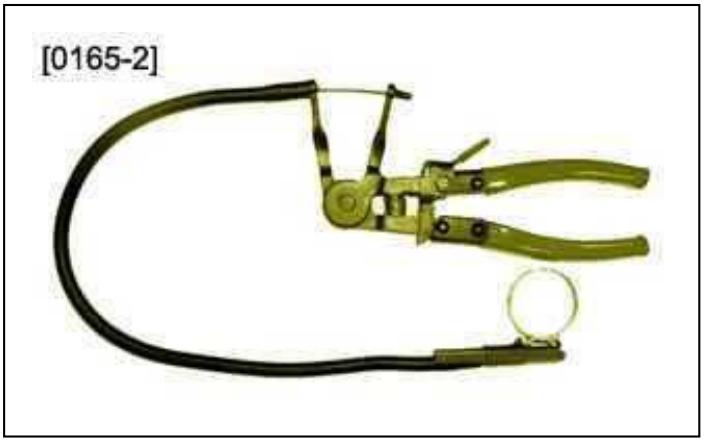


Figure : E5AI007T

[0188-AQ]	Lifting ring



Figure : E5AG083T

[1617-J]	Sealing plugs HDI

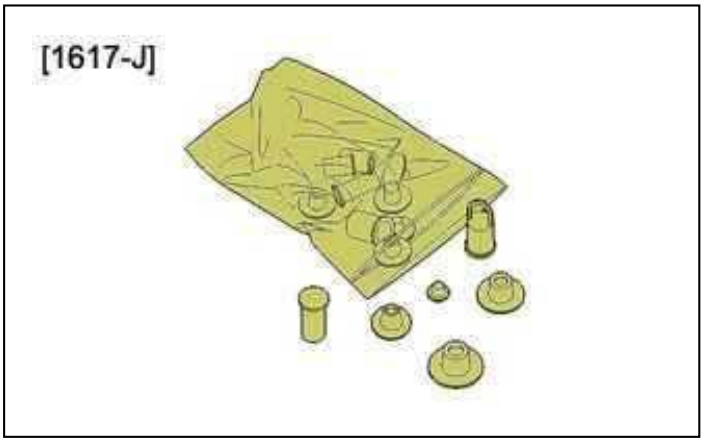


Figure : E5AB0FMT

[9029-T]	pliers for cooling hose clips

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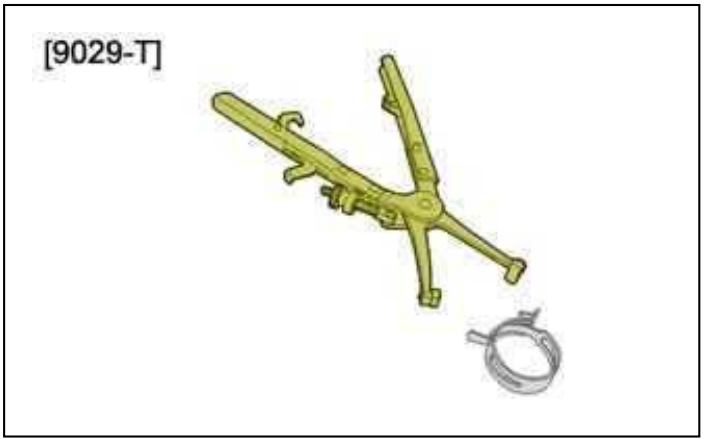


Figure : E5AI00AT

2. Preamble

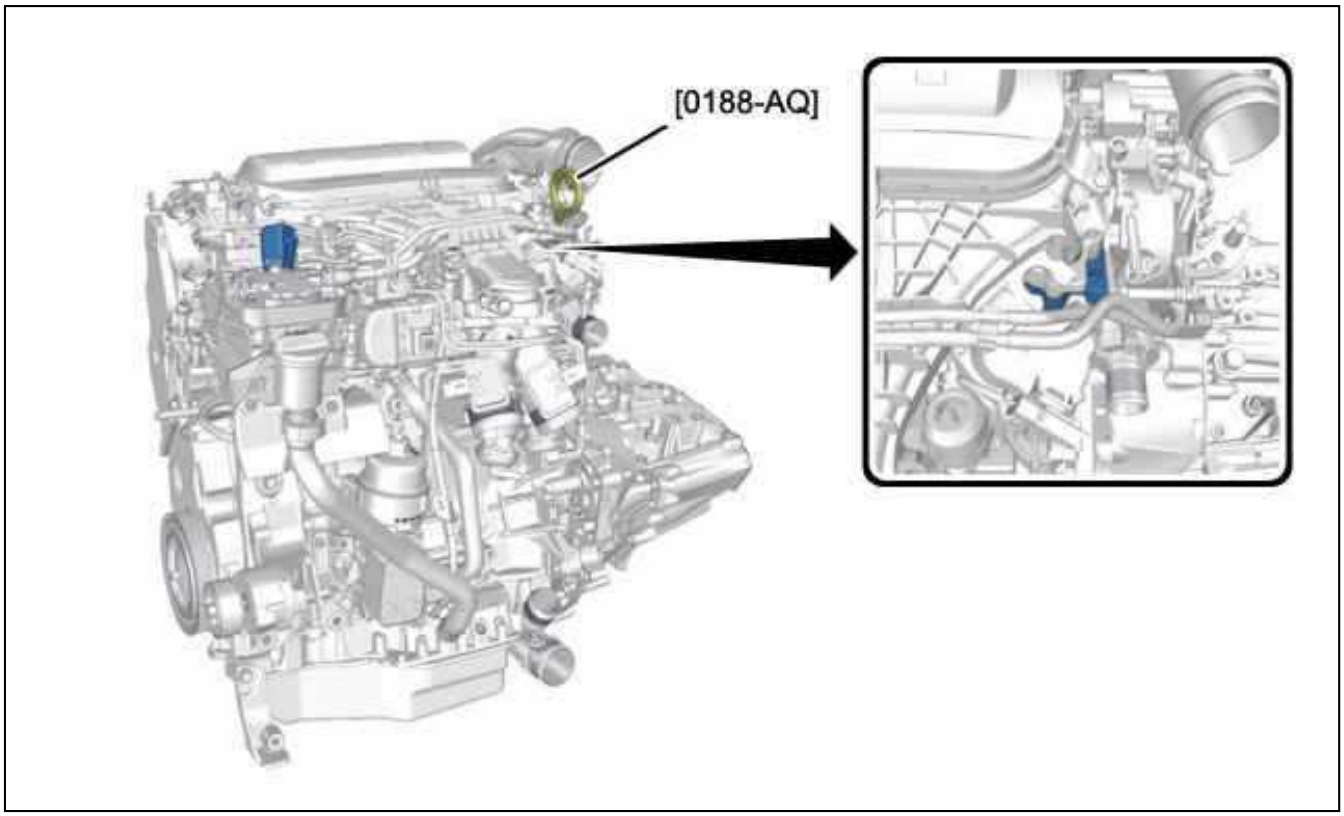


Figure : B1BG17GD

CAUTION : The engine-gearbox assembly is removed from underneath using the lifting bench [0004] and its set o supports [0005]. However, it is possible to proceed using a workshop crane by screwing the lifting ring [0188-AQ] inte the cylinder head (Vacuum pump side).

3. Removing

3.1. Common operations

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Raise the vehicle, wheels hanging.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The protector under the engine
- The front wheels
- Front splash shields

Drain :

- The cooling system
- The manual gearbox

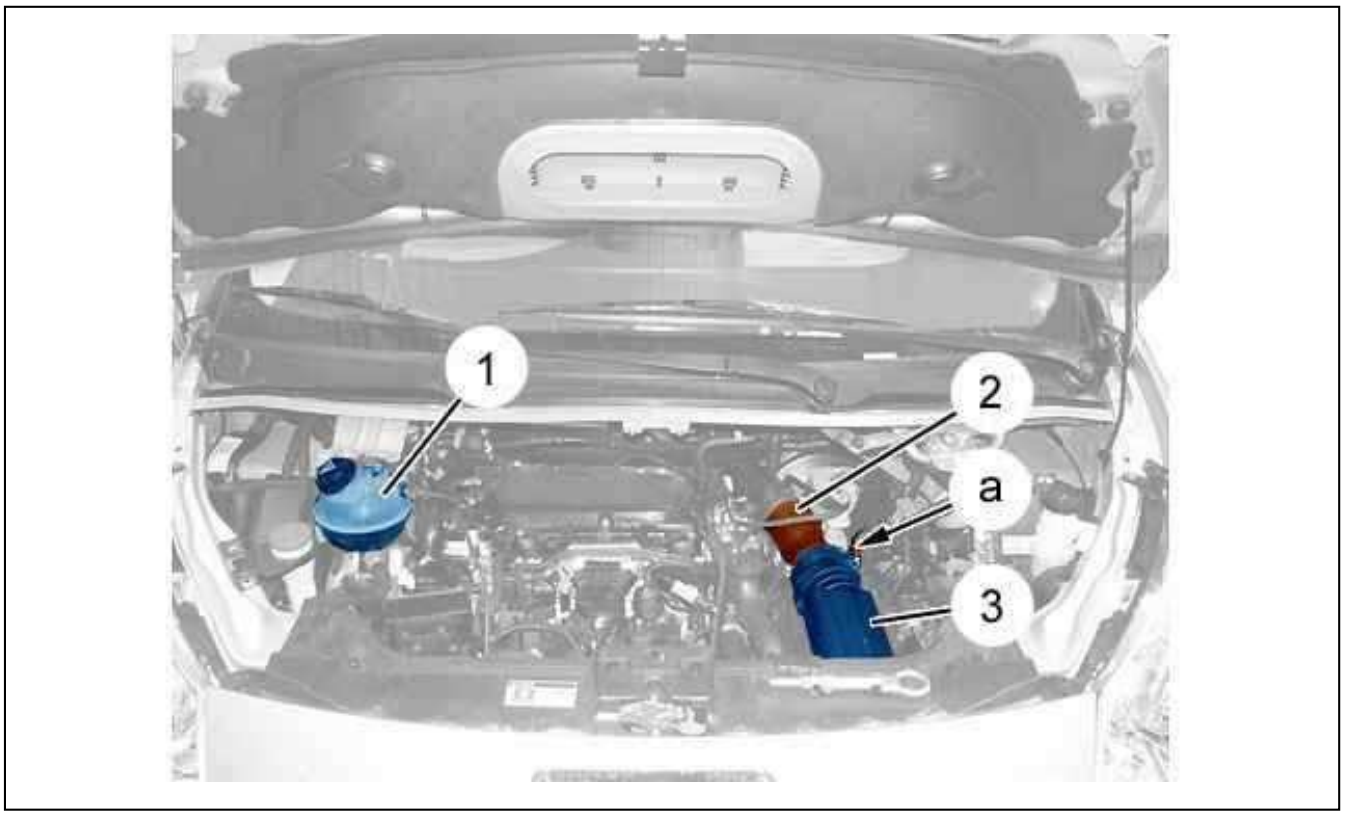


Figure : B1BG1KND

Disconnect the connector (at "a").
Remove :

- The air filter (3) with the flow meter
- The air duct (2)
- The venting unit (1)

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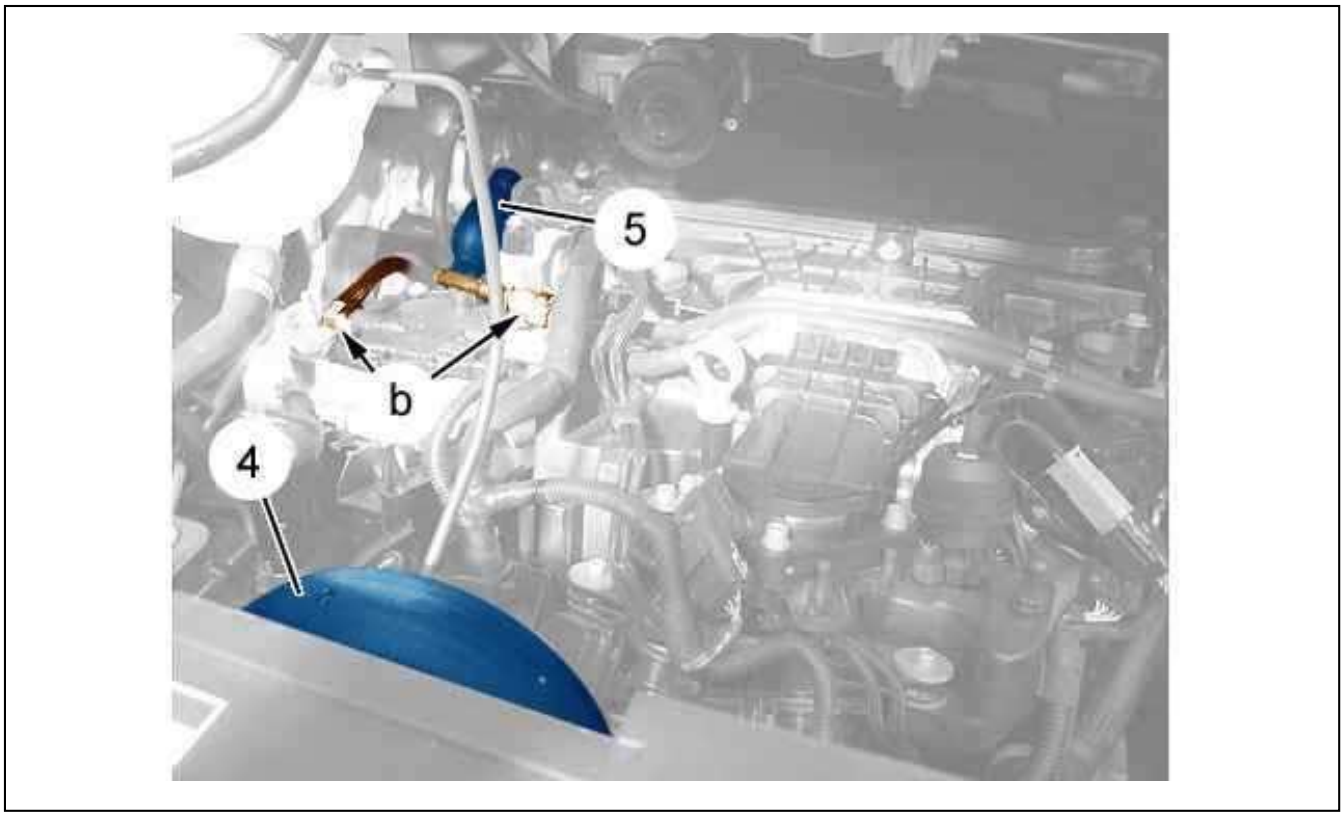


Figure : B1BG1KOD

CAUTION : During removal : Plug the fuel pipes ; Using the plugs [1617-J].

Uncouple and move aside :

- The inlet air union (4)
- The fuel supply pipes (At " b ")
- The priming pump (5)

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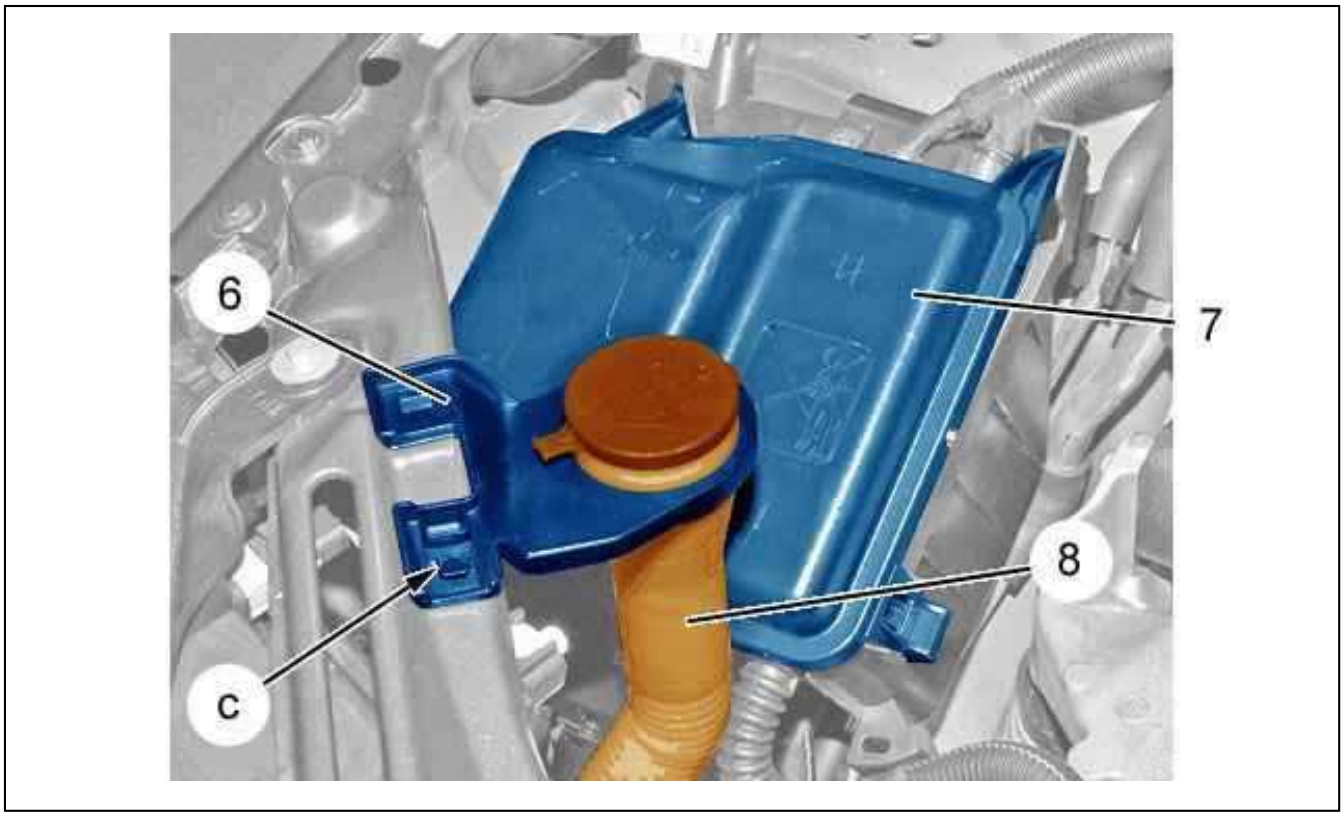
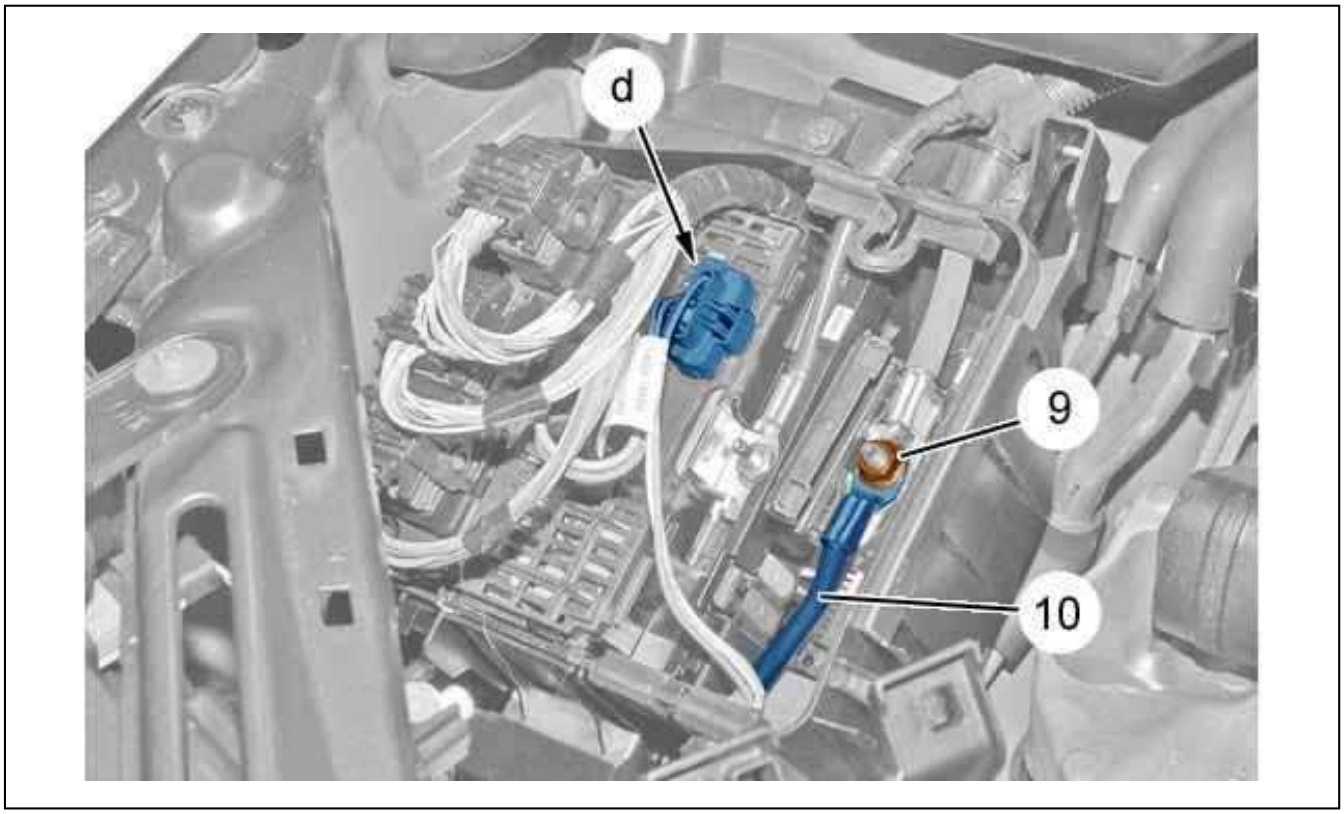


Figure : B1BG1KPD

Raise the lug (At " c ").
Slide the mounting bracket (6) towards the engine cooling radiator.
Move aside bracket (6) and screen wash fluid reservoir filler tube (8).
Remove : The engine fusebox cover (7).



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Figure : B1BG1KQD

Remove nut (9).
Uncouple : The positive cable (10).
Disconnect the connector (At " d ").
Move aside and clamp : The electrical harness (On the engine).

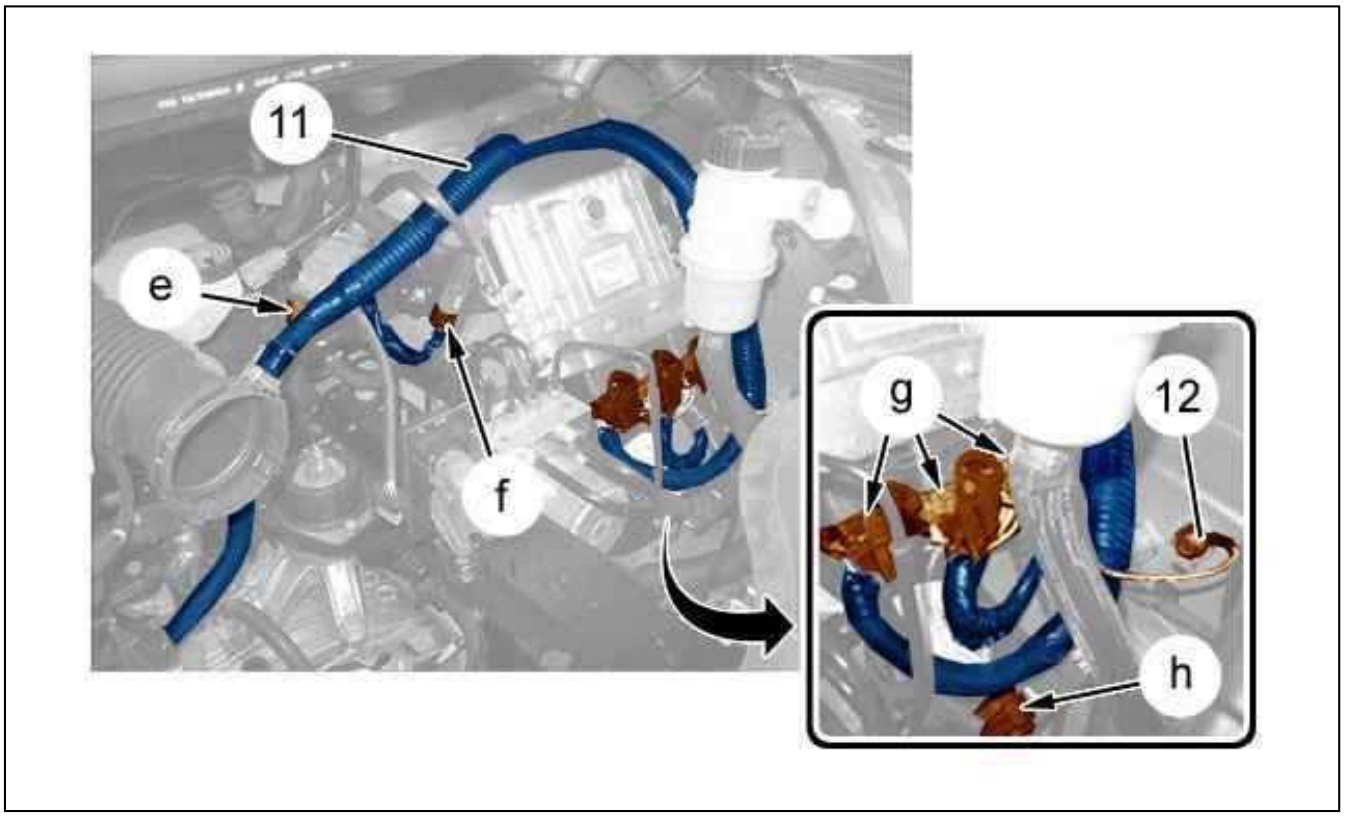


Figure : B1BG1KRD

Remove : The pneumatic suspension ECU with its support .
Disconnect - Release the connectors (At " e", "f", "g", "h ").
Remove : The earth lead (12).
Unclip and move aside : The engine electrical harness (11).
Clamp : The engine electrical harness (11) (on the engine).

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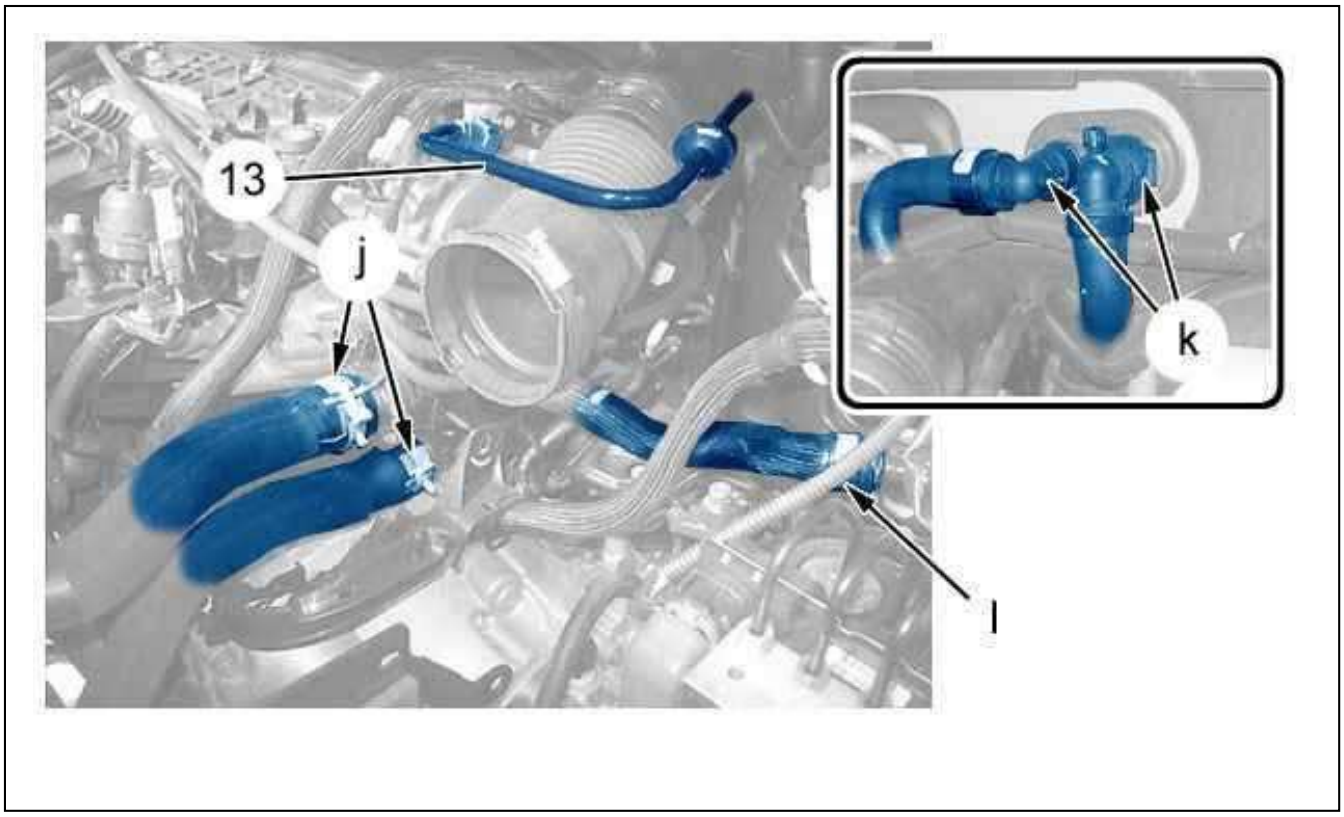


Figure : B1BG1KSD

Remove : The vacuum pipe (13).
Uncouple : The coolant hoses (at "j", "k", "l") ; Using tool [0165-2].

3.2. Manual gearbox

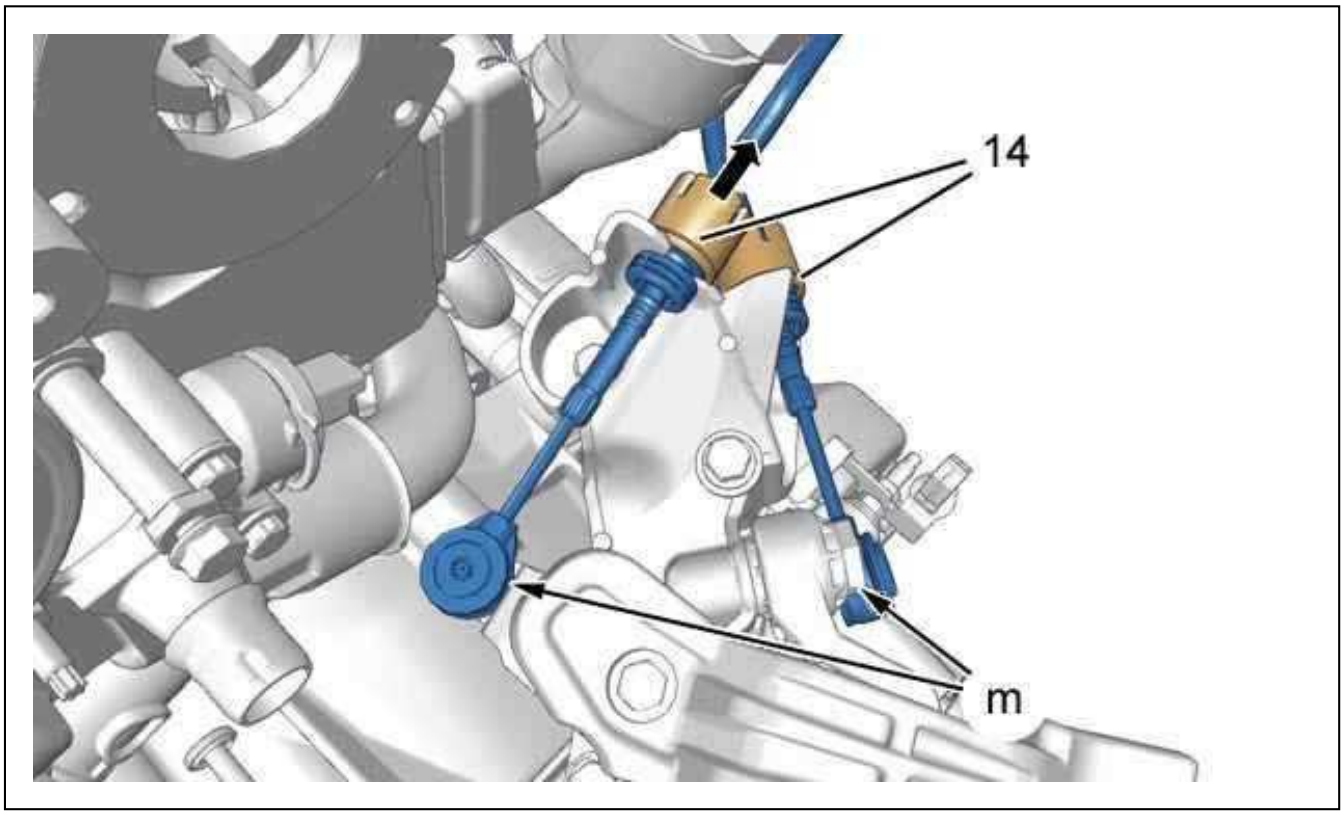


Figure : B1BG1KTD

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Uncouple the gearbox controls (14) (at "m").

N.B. : Unlock then move aside the gear selection controls from the gearbox (where illustrated).

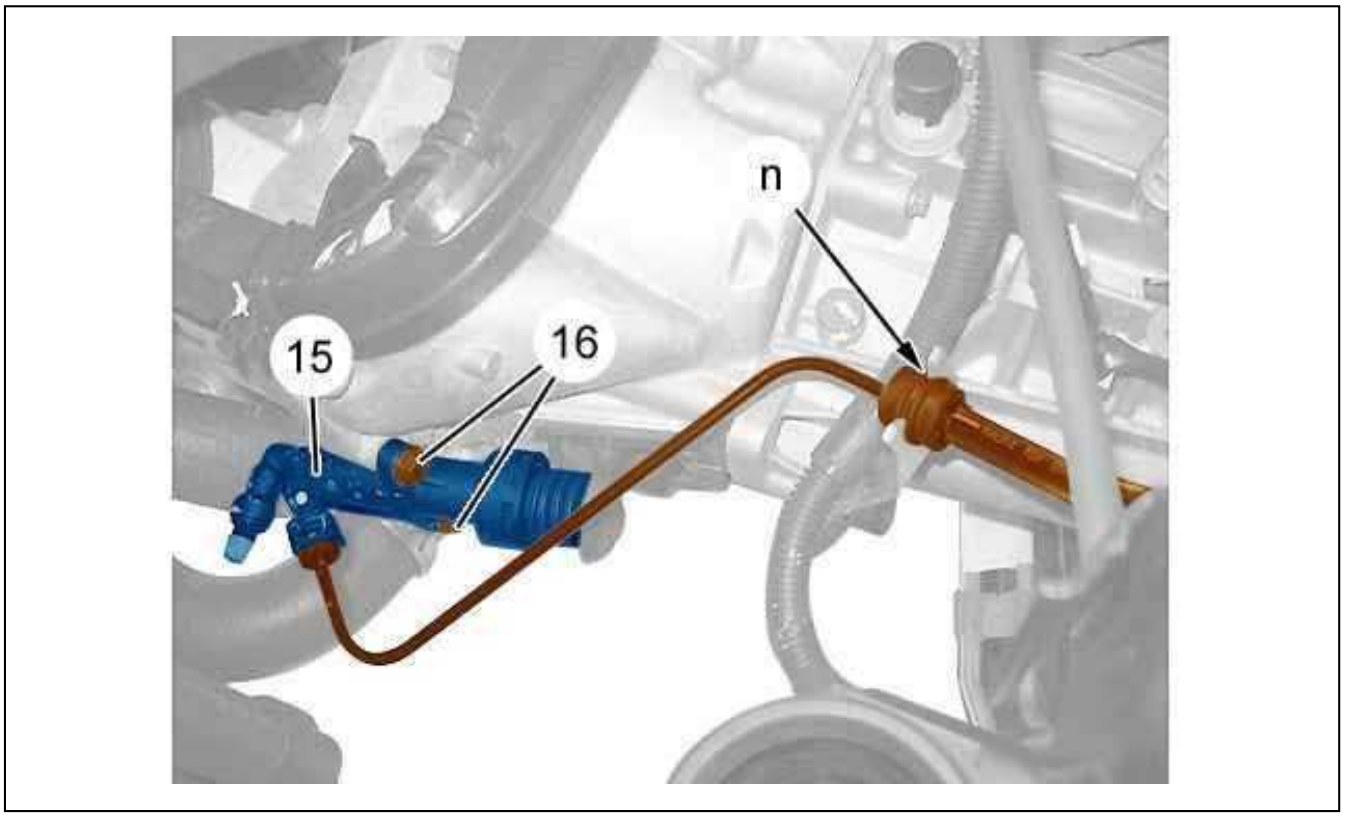


Figure : B1BG1KUD

CAUTION : Do not action the clutch pedal when the clutch slave cylinder has been removed.

Unclip : The clutch hydraulic pipe (At " n ").
Remove bolts (16).
Remove ; Move aside and clamp : The hydraulic clutch slave cylinder (15) ; Without opening the circuit.

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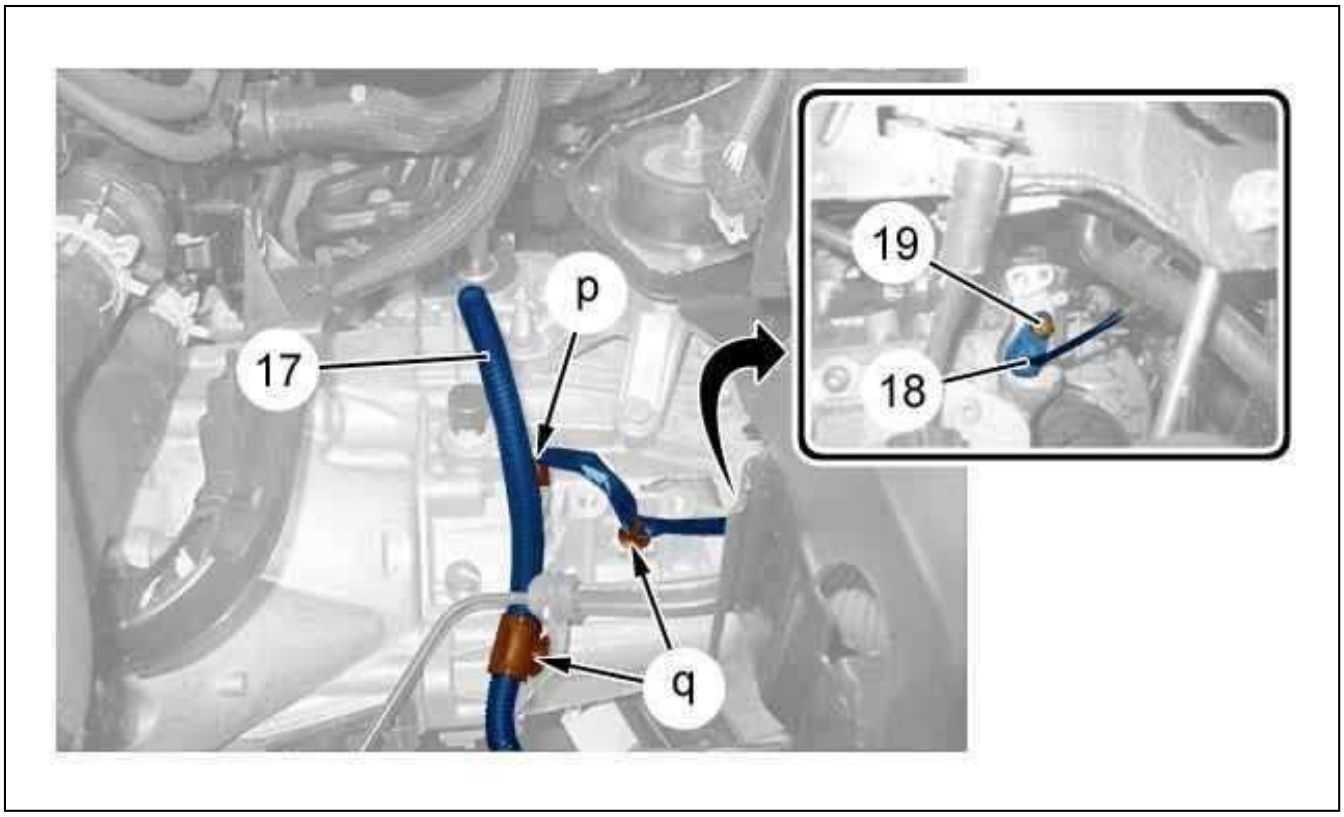


Figure : B1BG1KVD

Release the electric harnesses (at "q").
Disconnect the connector (At " p ").
Remove the earth wire (17).
Remove :

- The bolt (19)
- The reverse gear actuator (18) ; Secure the assembly to the bodywork

N.B. : Unclip the electrical harness attached to the gearbox .

3.3. Automatic gearbox

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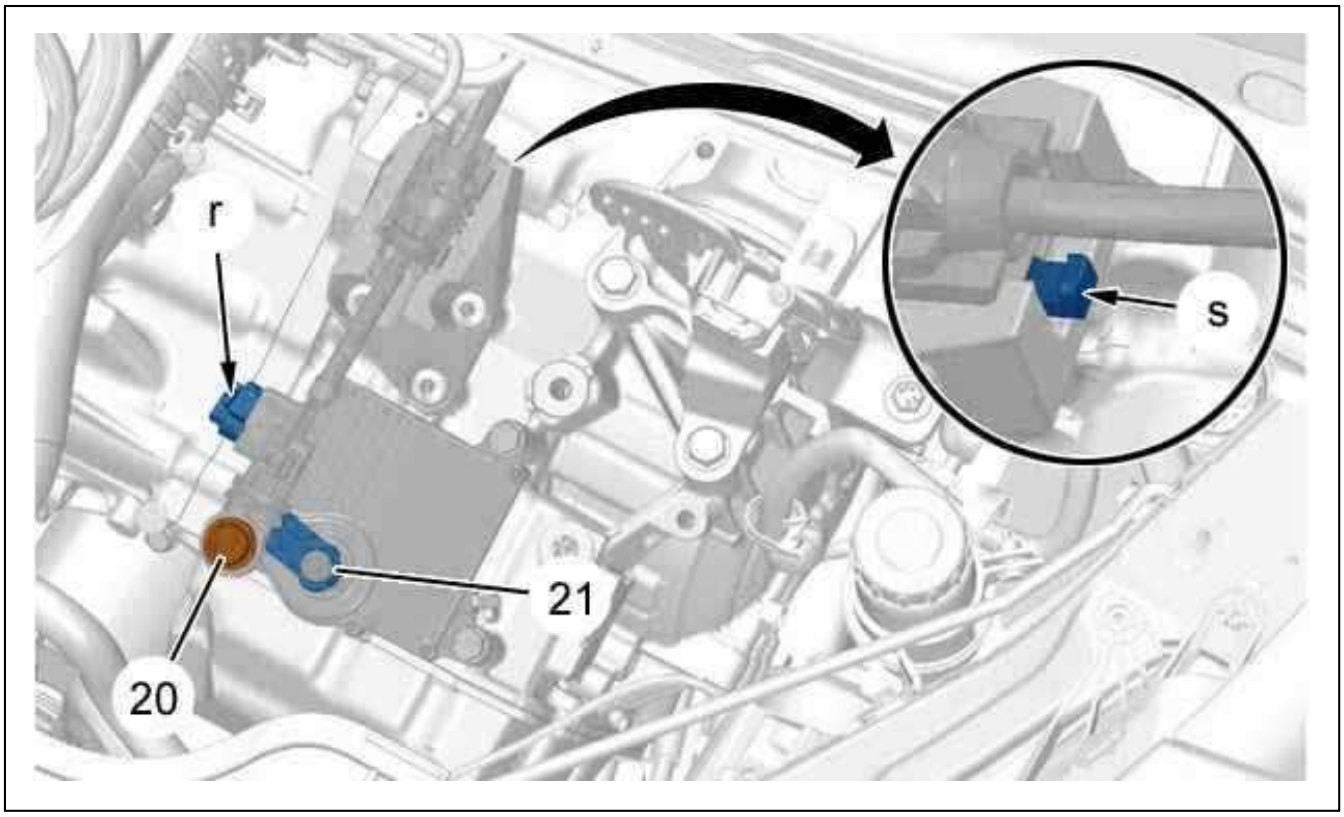


Figure : B1BG2W1D

Place the selector lever (21) in position N.
Disconnect the gear selector ball-joint (20).
Disconnect the gear selection control (20) (at "s").
Disconnect the connector (At " r ").
Disconnect : The electrical harness adjoining the automatic gearbox.
Remove the earth wire .

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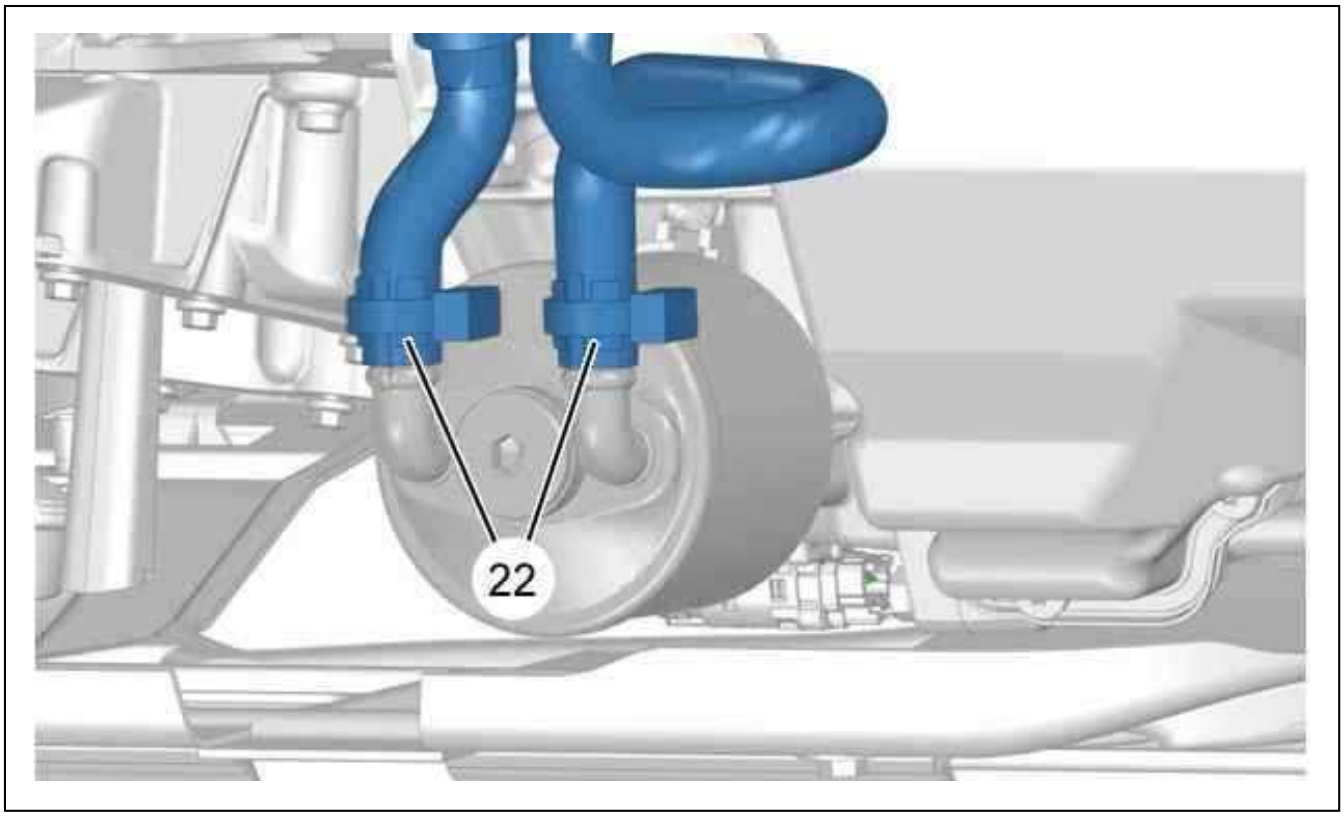


Figure : B1BG2W2D

Disconnect the pipes (22) ; Using tool [9029-T].

3.4. Common operations

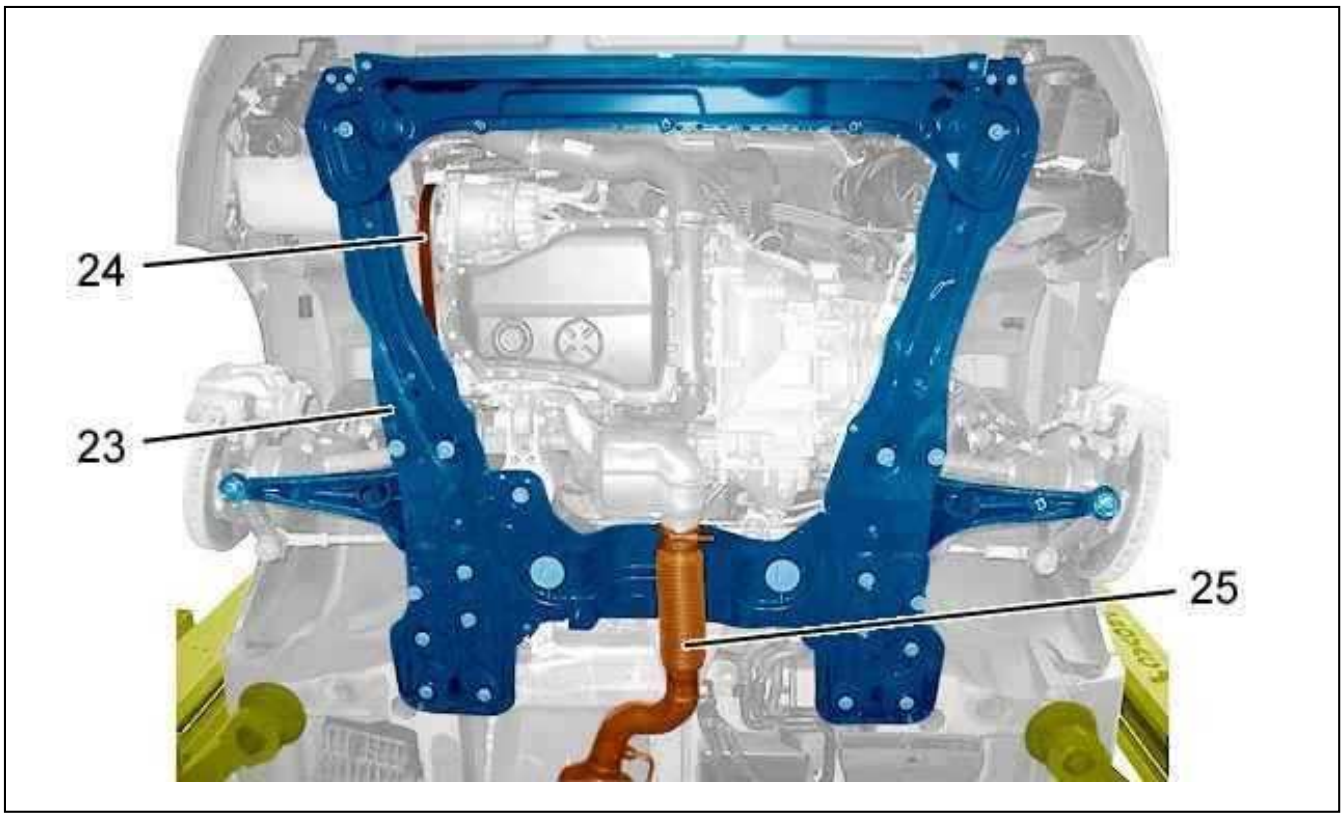


Figure : B1BG2W3D

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Remove :

- The accessories drive belt (24)
- The particle emission filter (25)
- The sub-frame (23)

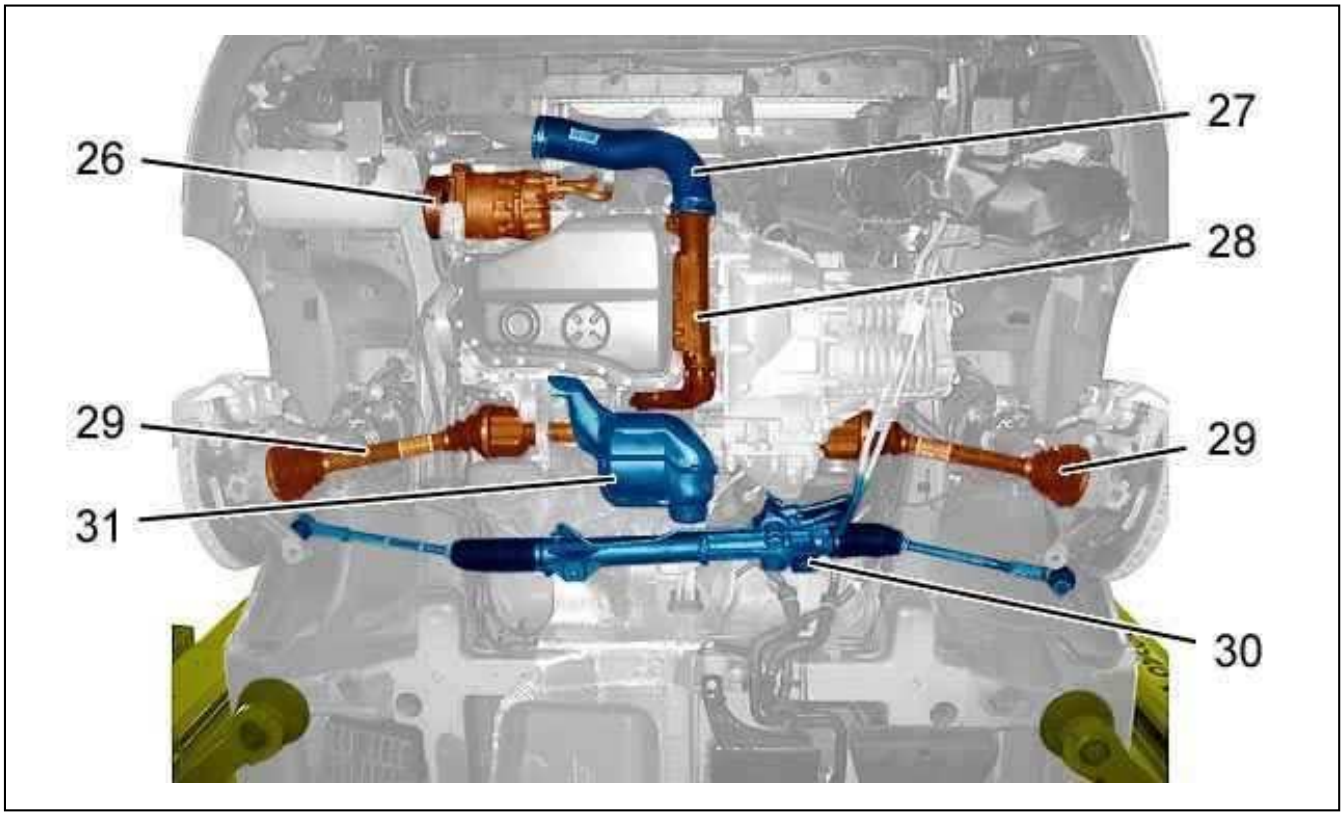


Figure : B1BG2W4D

Remove ; Move aside and clamp : The air-conditioning compressor (26) ; Without opening the refrigerant circuit.
Remove :

- The pre-catalytic converter (31)
- The air union (27)
- The resonator (28)
- The driveshafts (29)

CAUTION : Mark the position of the steering before uncoupling the mechanism (30).

Uncouple the steering column from the steering mechanism (30).
Move aside the steering mechanism (30) and secure it to the bodywork ; Without opening the circuit.

N.B. : The steering mechanism has to be secured in order to allow the engine assembly to be removed - Gearbox.

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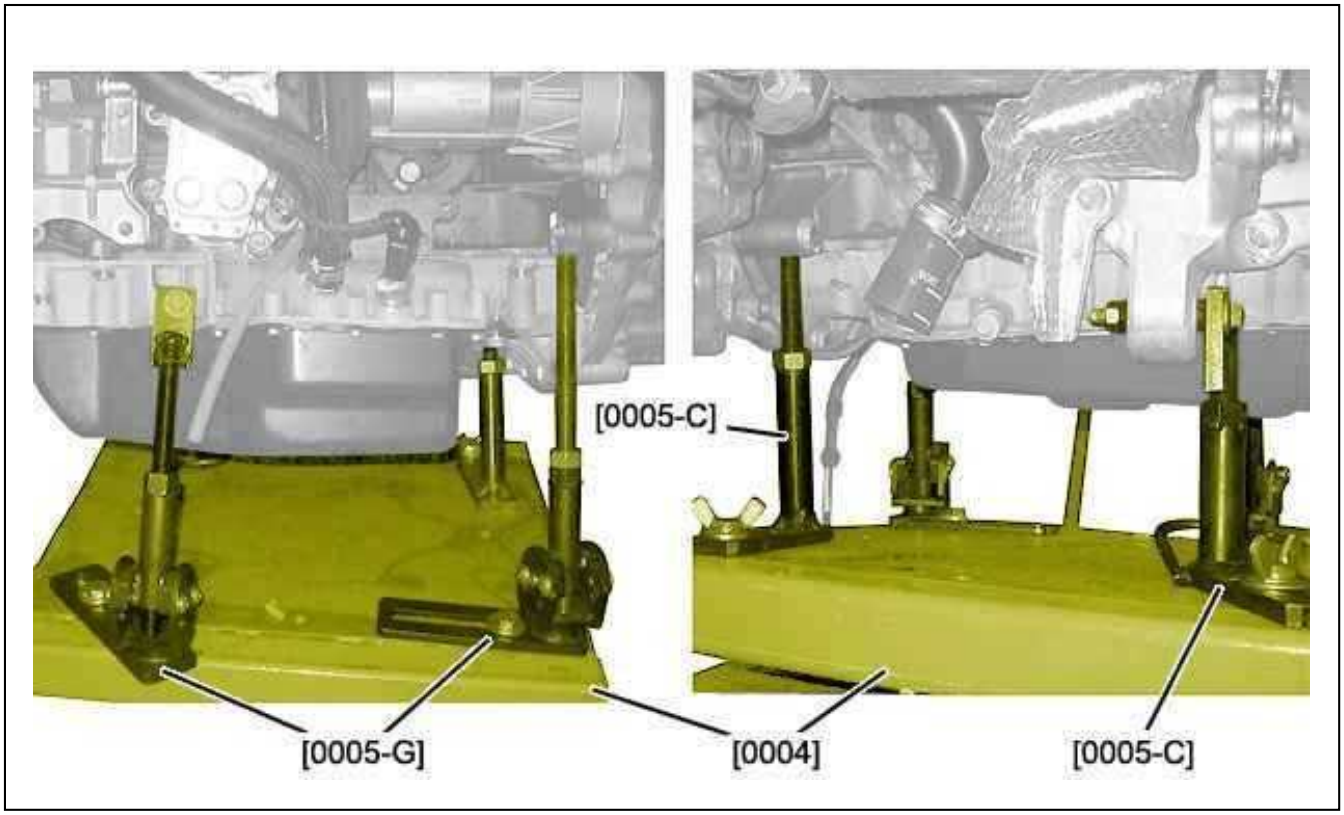
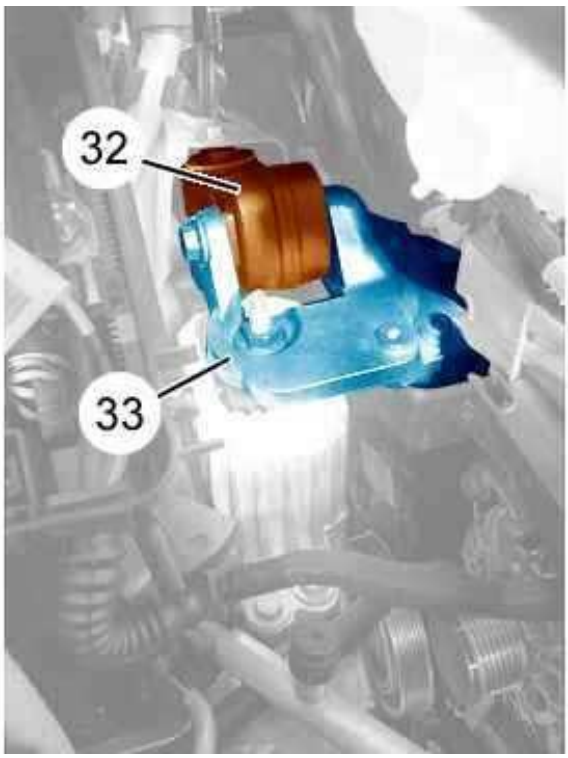


Figure : B1BG17RD

Position the vehicle at a height of 50 cm (approximately).
Centre the lifting bench [0004] under the engine-gearbox assembly.
Support the engine-gearbox assembly using the tools [0005-C], [0005-G].
Gently raise the lifting bench [0004] so it takes the weight of the engine-gearbox assembly.



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Figure : B1BG2W5D

Remove :

- The torque reaction rod (32)
- The intermediate engine mounting (33)

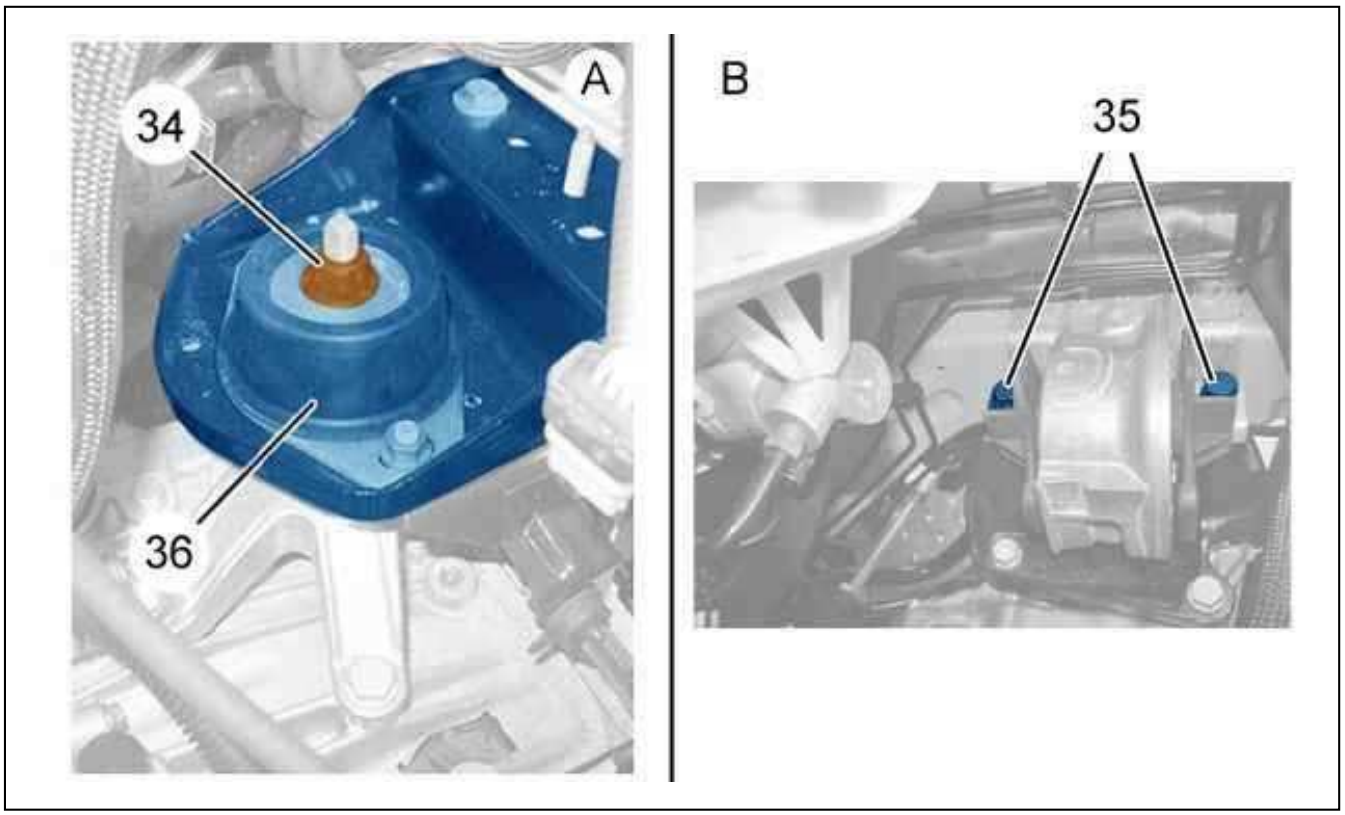


Figure : B1BG2W6D

A assembly ; Manual gearbox.
Remove :

- The nut (34)
- The flexible mounting (36)

B assembly ; Automatic gearbox.
Remove the 2 bolts (35).

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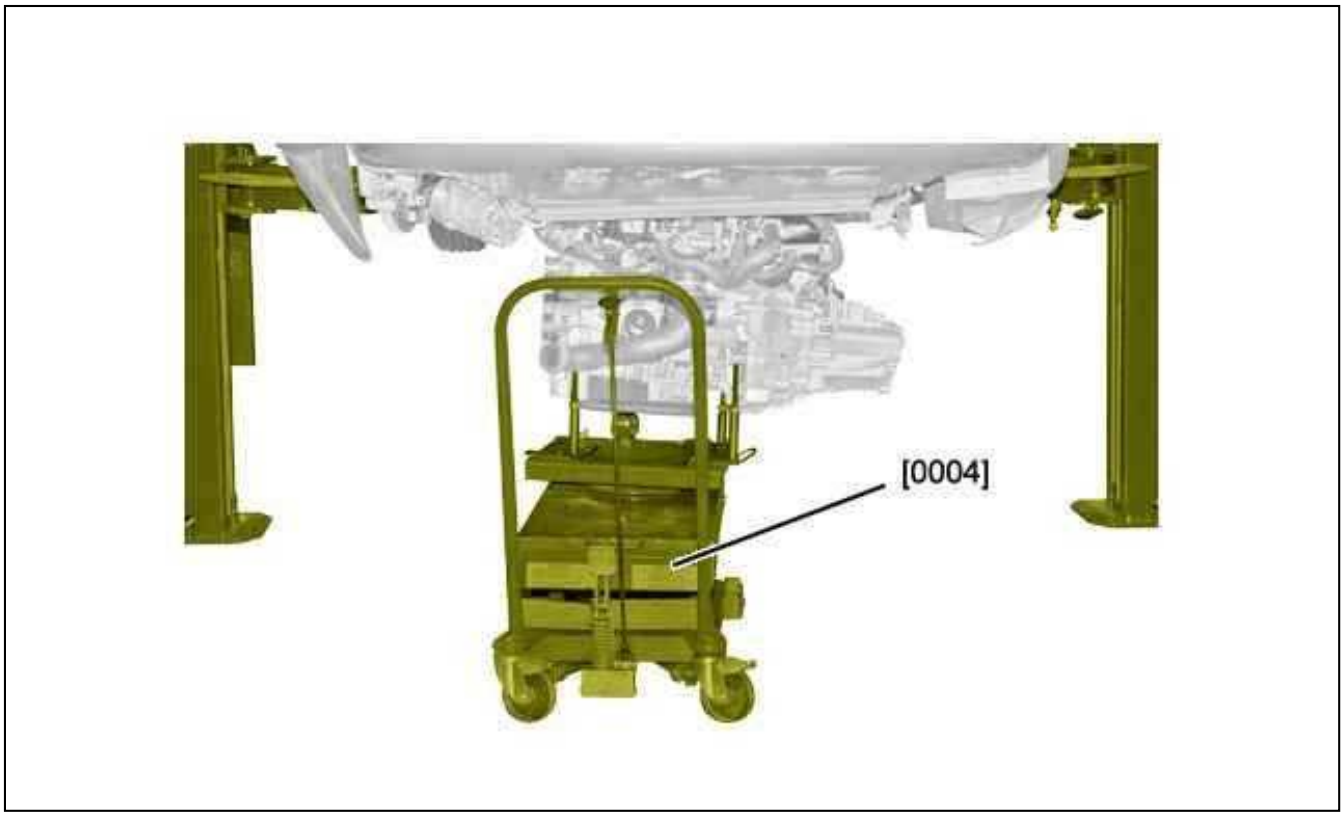


Figure : B1BG1L0D

CAUTION : When removing the engine-gearbox assembly : Ensure that there is no interference between the engine-gearbox assembly and the body.

Removal method :

- The fan unit [0004]
- Make sure there is no fouling with the air conditioning compressor (26)
- Raise the lift
- Remove the power unit assembly

Mark on the ground the positioning of the lifting table.
Move the engine-gearbox assembly away from under the vehicle.

4. Refitting

CAUTION : Observe the tightening torque values.

Tightening torques :

- Engine
- Engine-gearbox assembly mountings
- Exhaust

CAUTION : Always fit new locknuts.

Position :

- The lifting bench [0004] under the vehicle (to the marks made during removal)
- The vehicle has a height of 50 cm

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CAUTION : Align the engine-gearbox assembly before tightening the upper suspension bolts.

B assembly ; Automatic gearbox.
Refit the 2 bolts (35).
A assembly ; Manual gearbox.
Refit :

- The flexible mounting (36)
- The nut (34)
- The intermediate engine mounting (33)
- The torque reaction rod (32)

Withdraw the lifting bench [0004] from under the vehicle.
Couple up : The steering mechanism (30) ; Keep to the position marked at removal.
Refit :

- The driveshafts (29)
- The resonator (28)
- The air union (27)
- The pre-catalytic converter (31)
- The air-conditioning compressor (26)
- The sub-frame (23)
- The particle emission filter (25)
- The accessories drive belt (24)

4.1. Automatic gearbox

Join the hoses (22) ; Using tool [9029-T].
Refit : The earth cable .
Reconnect : The electrical harness adjoining the automatic gearbox.
Reconnect the connector (At " r ").
Connect the gear selector ball-joint (20).

4.2. Manual gearbox

Reconnect : The electrical harness adjoining the automatic gearbox.
Refit :

- The reverse gear actuator (18)
- The bolt (19)
- The earth cable (17)

Connect the connector (at "p").
Clip the electric harnesses (At " q ").
Refit :

- The hydraulic clutch slave cylinder (15)
- The screws (16)
- The clutch hydraulic pipe (at "n")
- The gearbox controls (14) (at "m")
- The vacuum pipe (13)

Couple up the cooling hoses (At " j", "k", "l ").
Clip : The engine electrical harness (11).
Refit : The earth lead (12).
Connect the connectors (at "h", "g", "f", "e", "d").
Couple the positive cable (10).
Refit : The pneumatic suspension ECU with its support .

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Refit nut (9).
Refit :

- The engine fusebox cover (7)
- The bracket (6)
- The screen wash reservoir filler pipe (8)

Couple up :

- The priming pump (5)
- The fuel supply pipes (At " b ")
- The inlet air union (4)

Refit :

- The venting unit (1)
- The air duct (2)
- The air filter (3) with the flow meter

Connect the connector (at "a").
Refit :

- Front splash shields
- The front wheels

CAUTION : Perform the operations that are necessary after a battery reconnection.

Reconnect the battery.
Fill with oil and top up :

- Gearbox
- Cooling system.

Refit the protective panel under the engine.

5. Checks

Start the engine.
Check the absence of leaks or abnormal noise.
Check the operation of the air conditioning.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

Carry out :

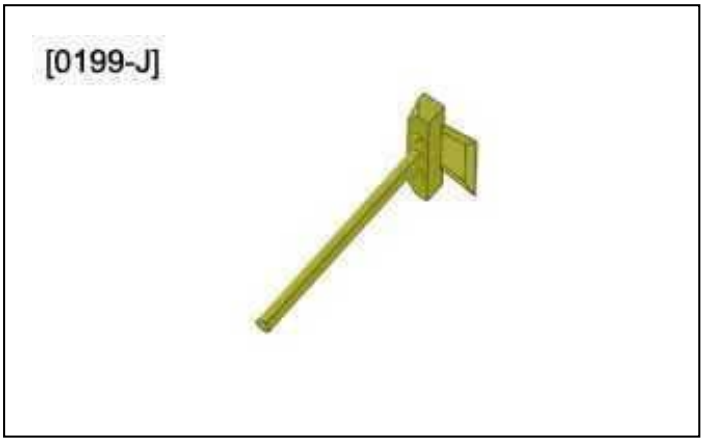
- A road test
- A reading of the diagnostic memories

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DISMANTLING : UNDER ENGINE

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB0QZT	[0199-J]	Oil sump seal cutting chisel

2. Removing

2.1. Engine stripping

CAUTION : The engine must be drained of all its oil before any work is carried out.

CAUTION : As the flywheel cannot be extracted once the engine is in place on its stand, it is essential to lock the timing, remove the crankshaft pulley bolt and then remove the flywheel before any work.

Place the engine on a stand .
Remove the cylinder head .

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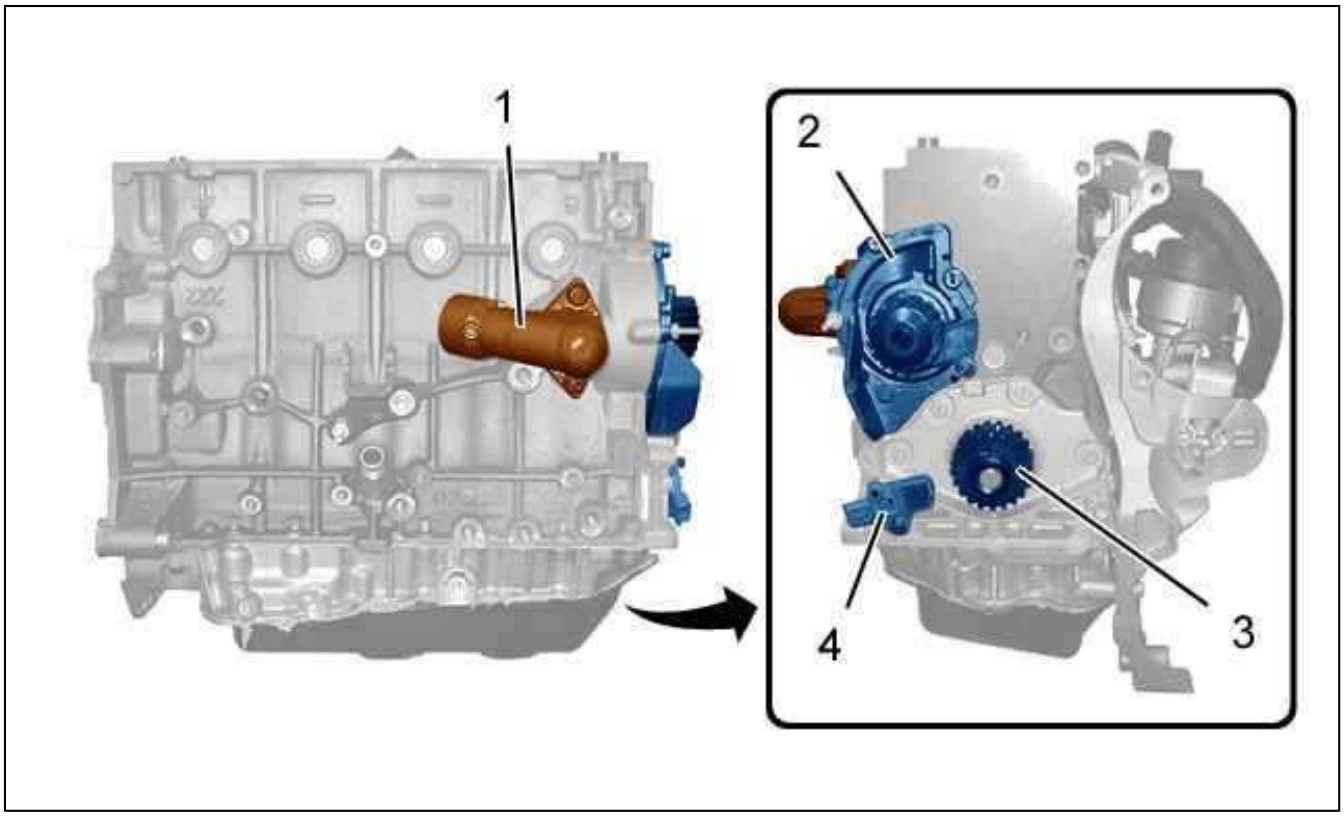


Figure : B1BG2EKD

Remove :

- The coolant manifold (1)
- The water pump (2) and its gasket
- Crankshaft pulley (3) and its key
- The engine speed sensor (4)

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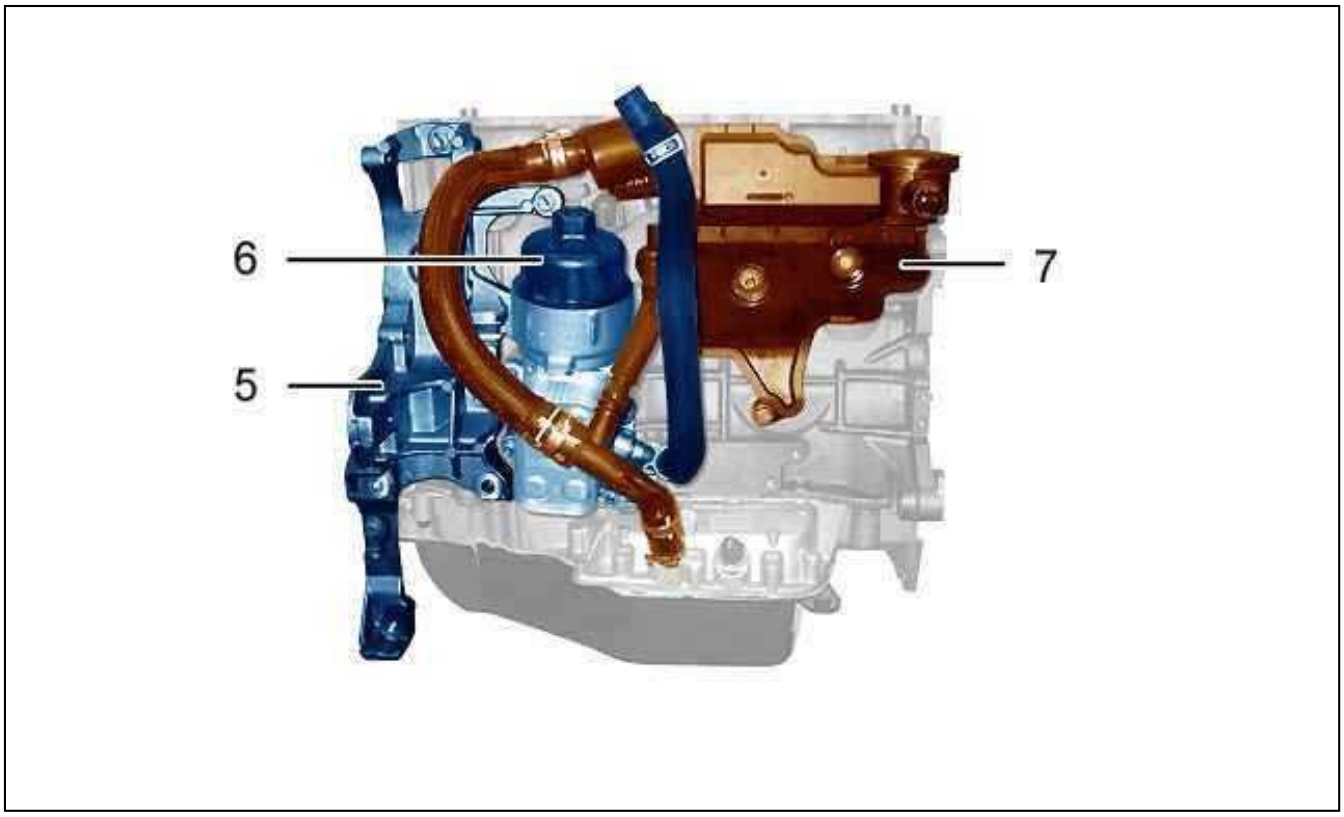


Figure : B1BG2END

Remove :

- The multifunction support (5)
- The oil filter bracket (6)
- The oil sediment unit (7)

2.2. Removing : sump

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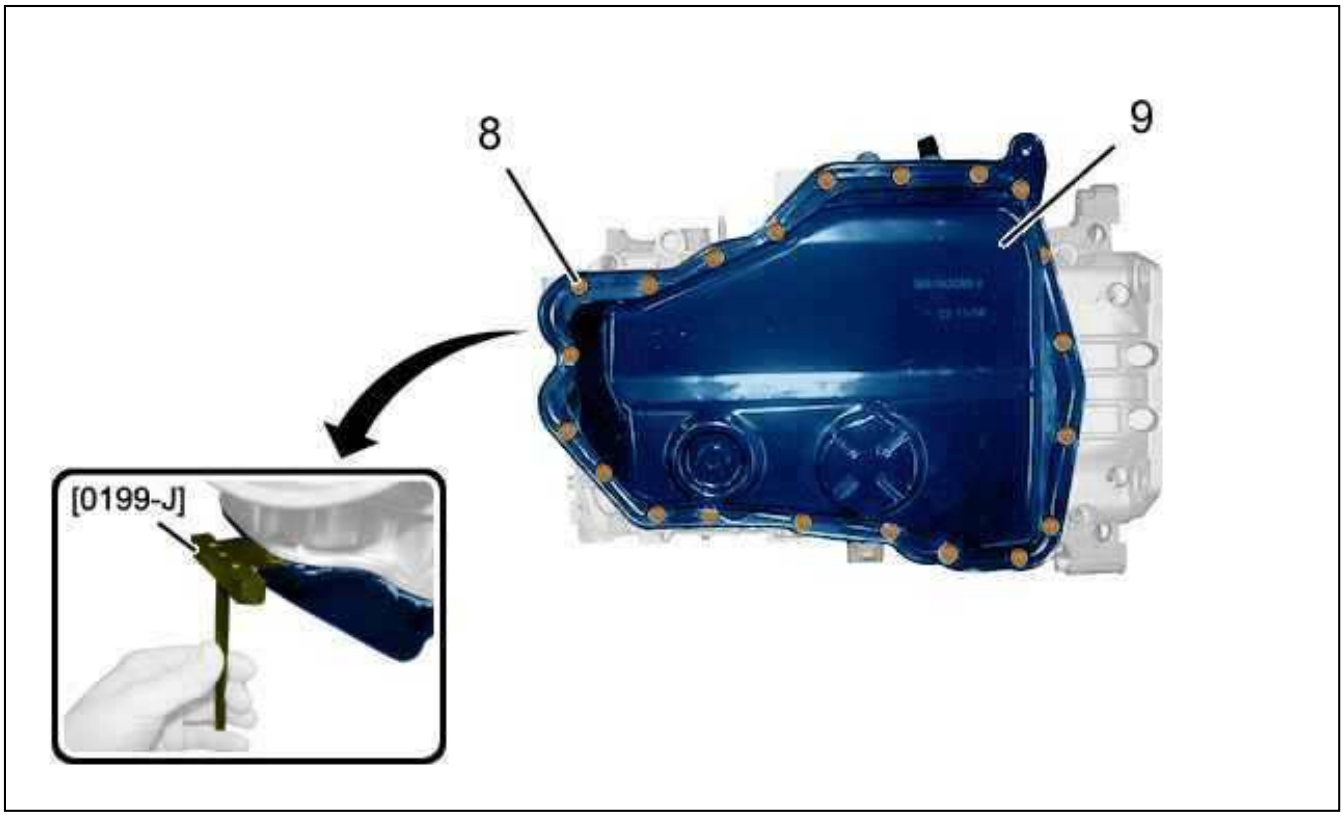


Figure : B1BG2EUD

Turn the cylinder block over.
Remove : The bolts (8).

CAUTION : Do not use a lever to detach the oil sump : Risk of distortion of the oil sump.

Remove the oil sump (9) ; Using tool [0199-J] and a mallett.

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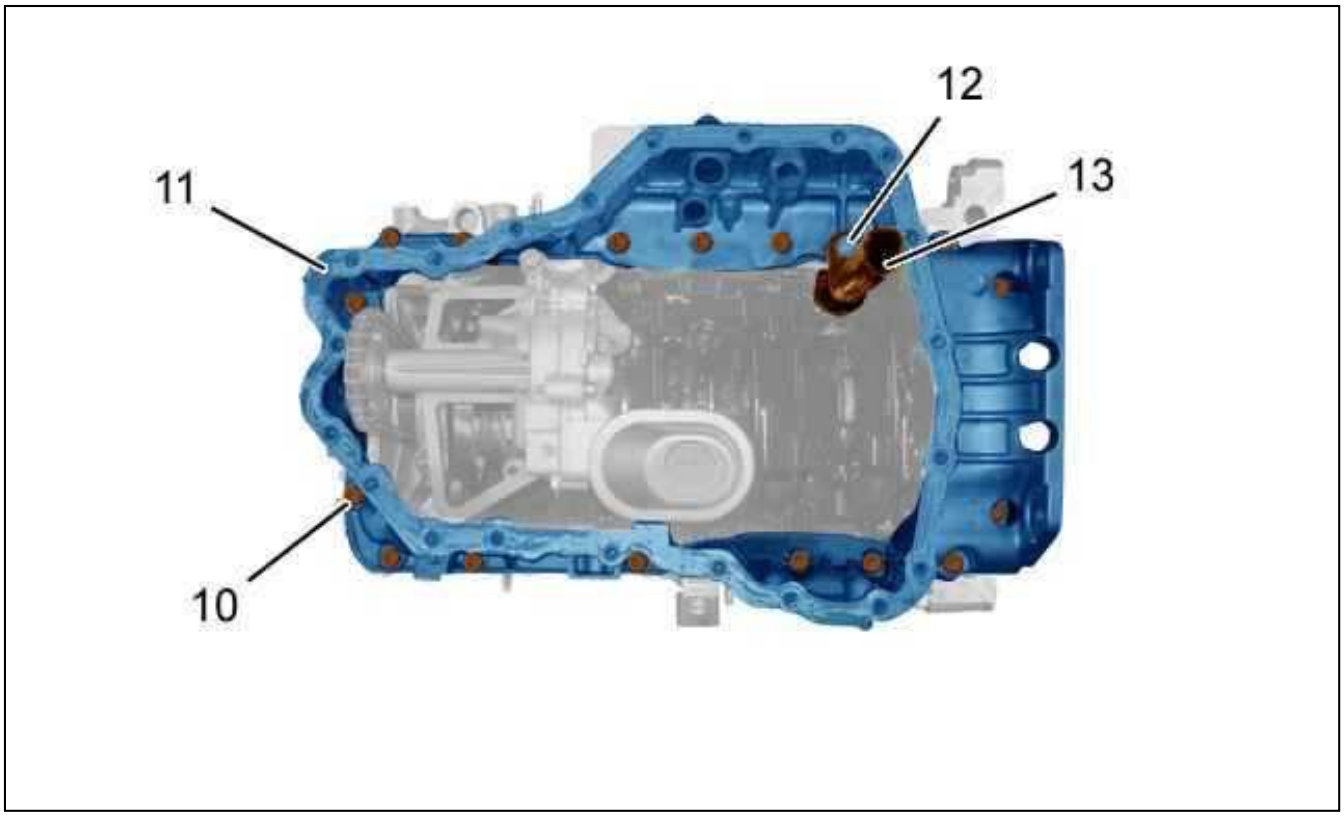


Figure : B1BG2EVD

Remove :

- The (12) bolt
- The discharge pipe (13)
- The bolts (10)
- The upper oil sump (11)

2.3. Removing : Front sealing panel

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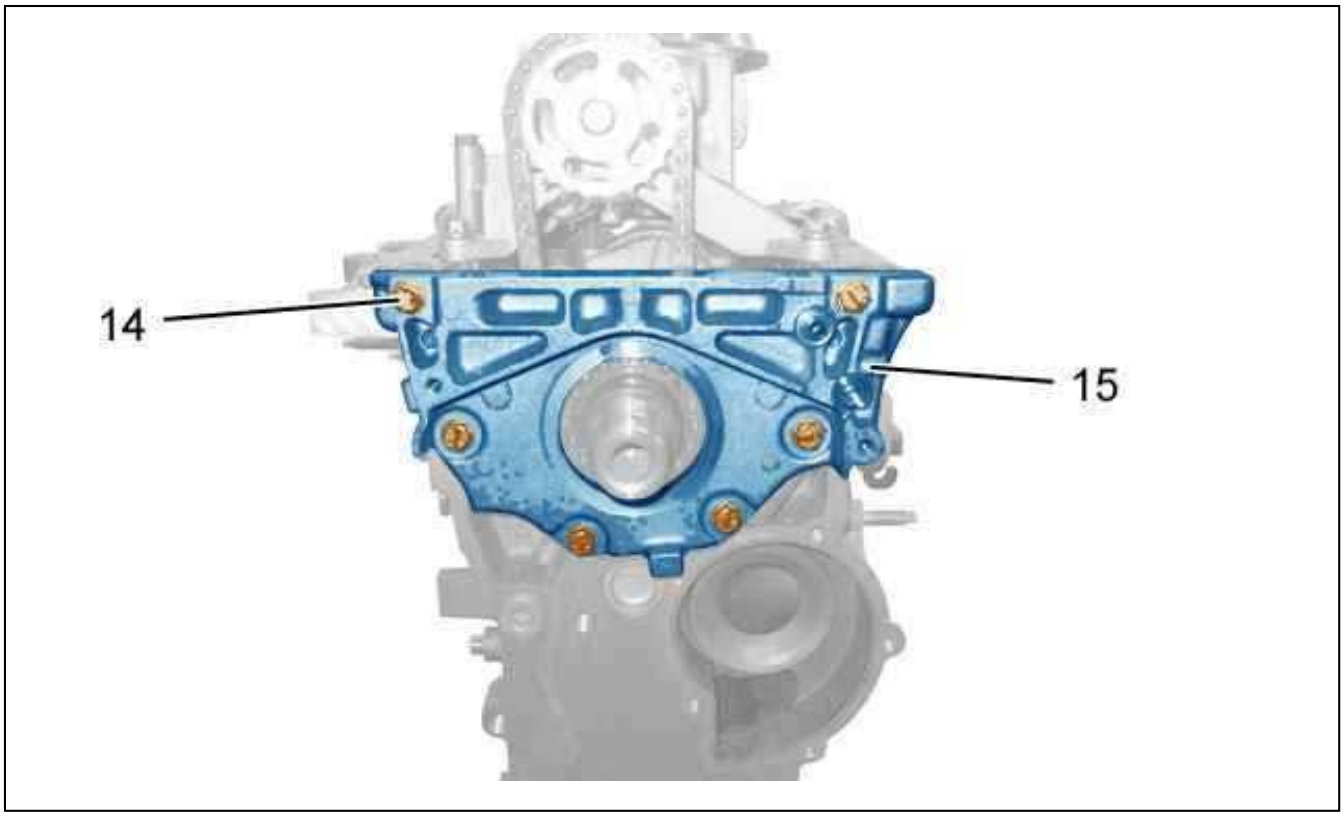


Figure : B1BG2F2D

Remove :

- The bolts (14)
- Sealing plate (15) with the sealing ring

2.4. Removing : Oil pump

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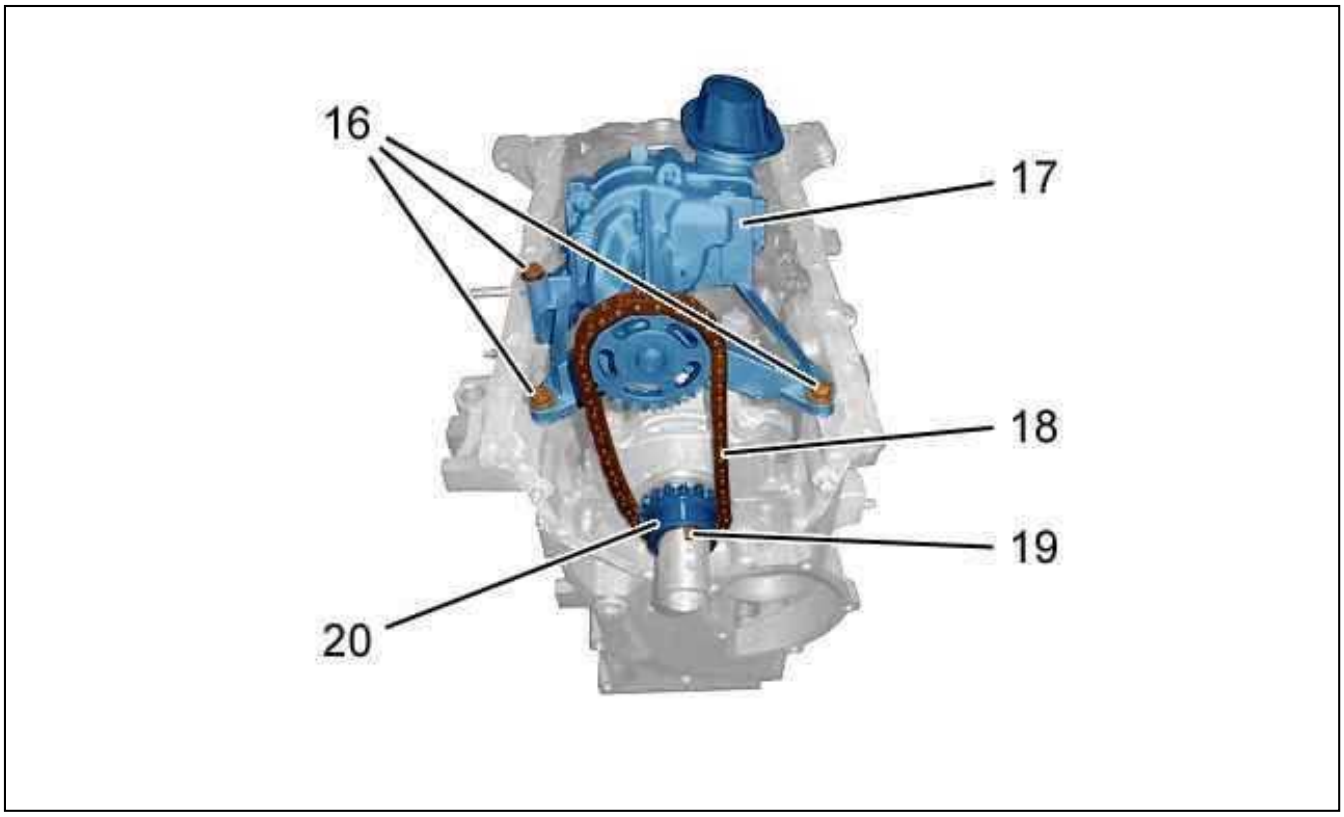


Figure : B1BG2F7D

Remove : The bolts (16) (mark their location).
Push the pinion (20) back towards the cylinder block.
The chain (19).
Remove together :

- The oil pump (17)
- The pinion (20)
- The chain (18)
- The O-ring

2.5. Removing : Reciprocating gear

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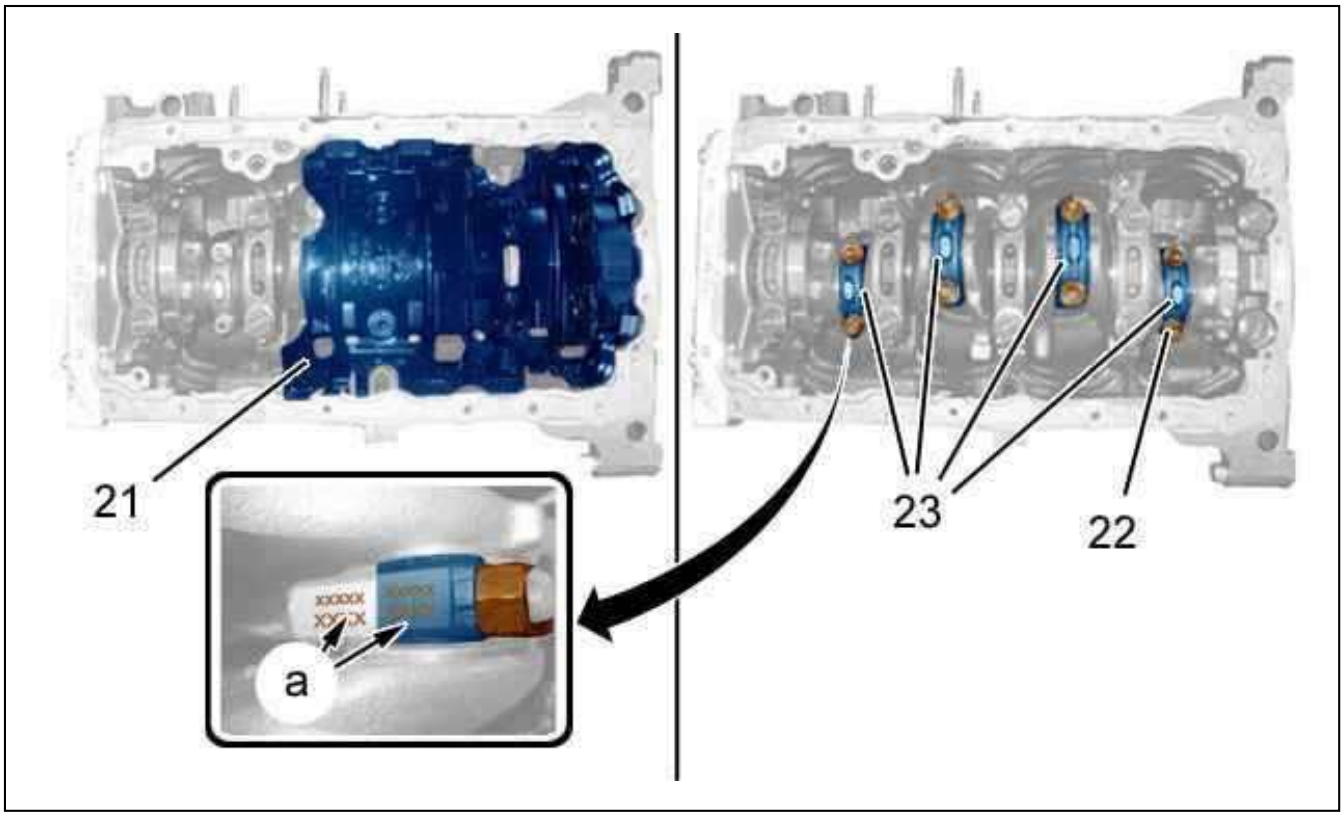


Figure : B1BG2FCD

CAUTION : Mark the connecting rod caps in relation to the connecting rods (Components "a").

Remove :

- The emulsion prevention plate (21)
- The 8 nuts (22)
- The big end caps (23)

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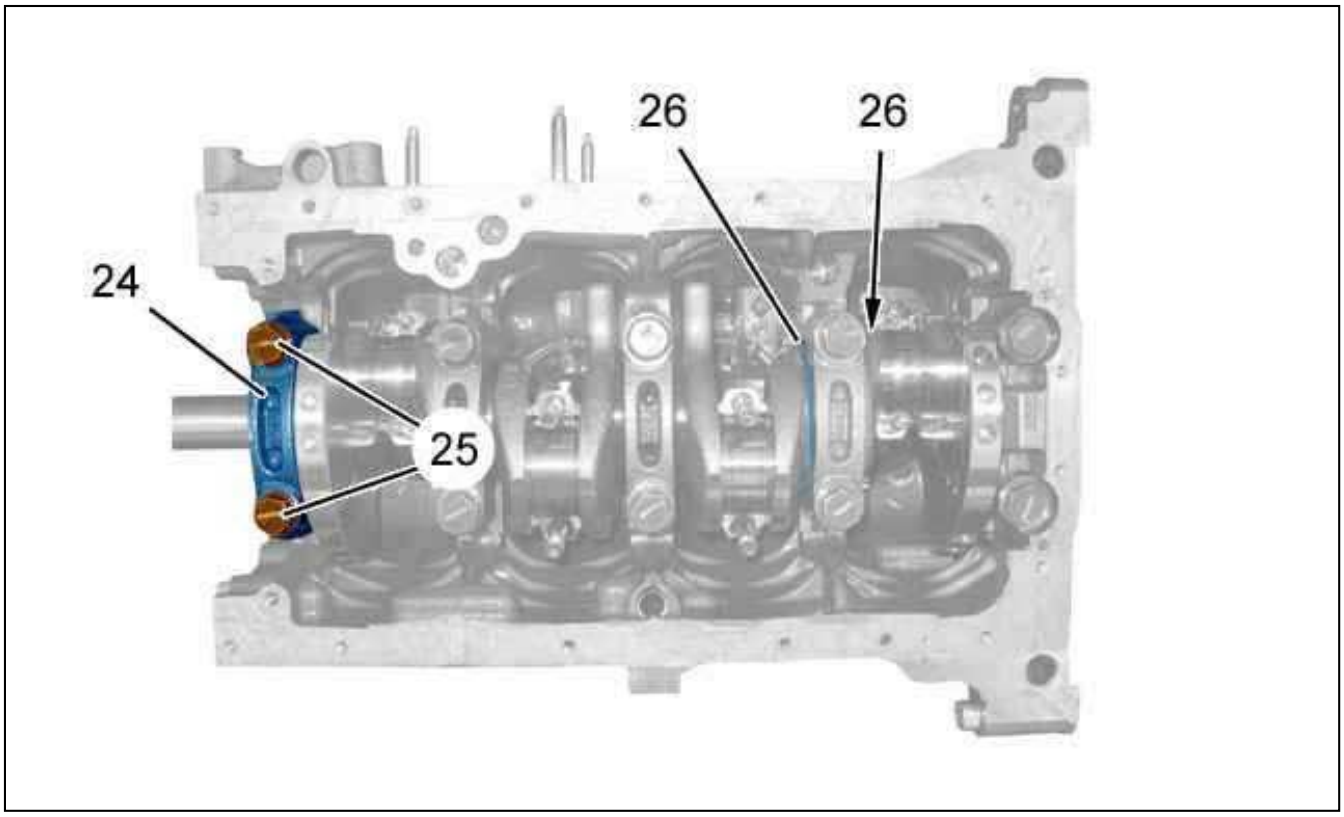


Figure : B1BG2FJD

CAUTION : Mark both the order and direction of fitting of the bearing caps (Number 1 : Flywheel side).

Remove :

- The bolts (25)
- The main bearing caps (24)
- The crankshaft lateral play thrust washers (26) (Bearing n°2

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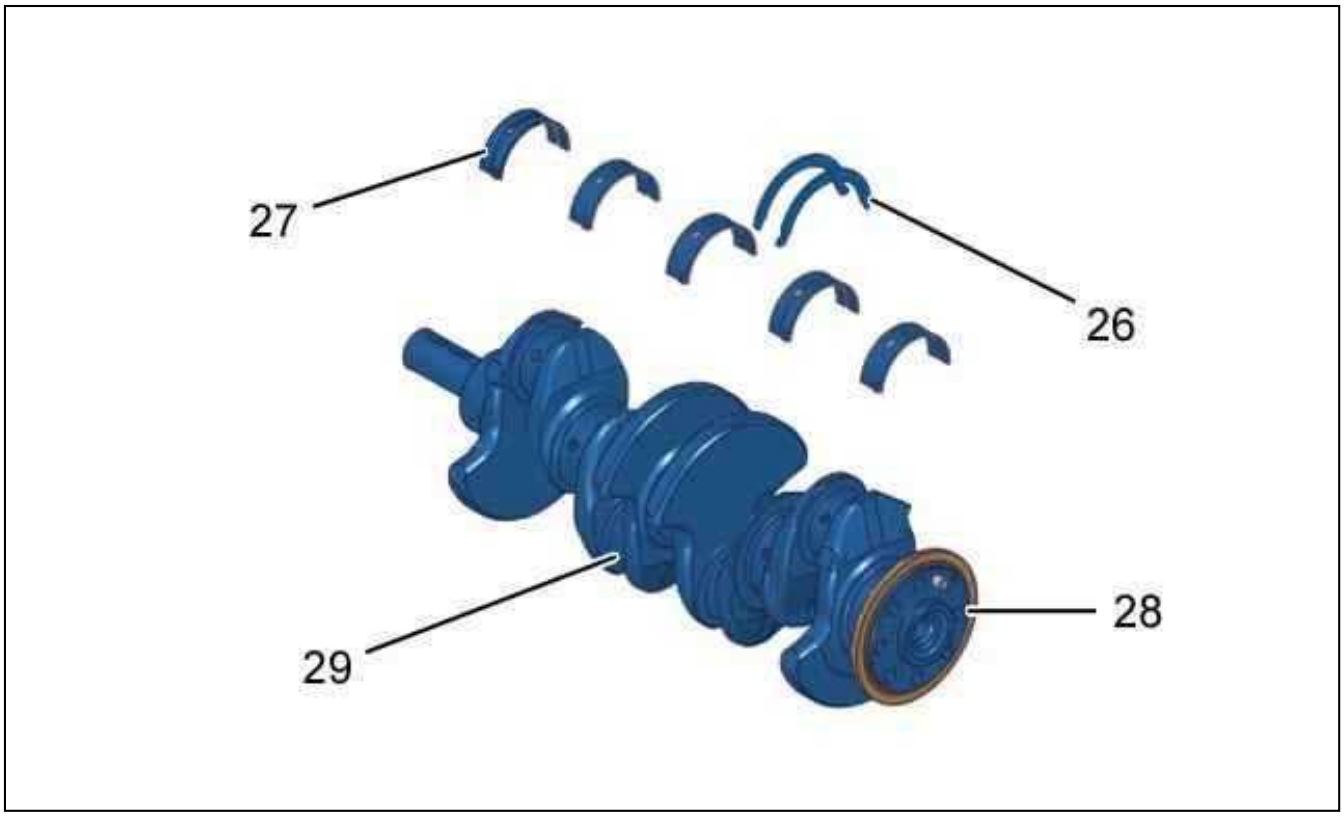


Figure : B1BG2G4D

CAUTION : Note the direction of fitting of the bearing shells and the lateral play washers.

Remove :

- The crankshaft (29)
- The crankshaft seal (28)
- The crankshaft lateral play thrust washers (26)(Bearing n°2
- The half bearing shells (27) (Cylinder block)

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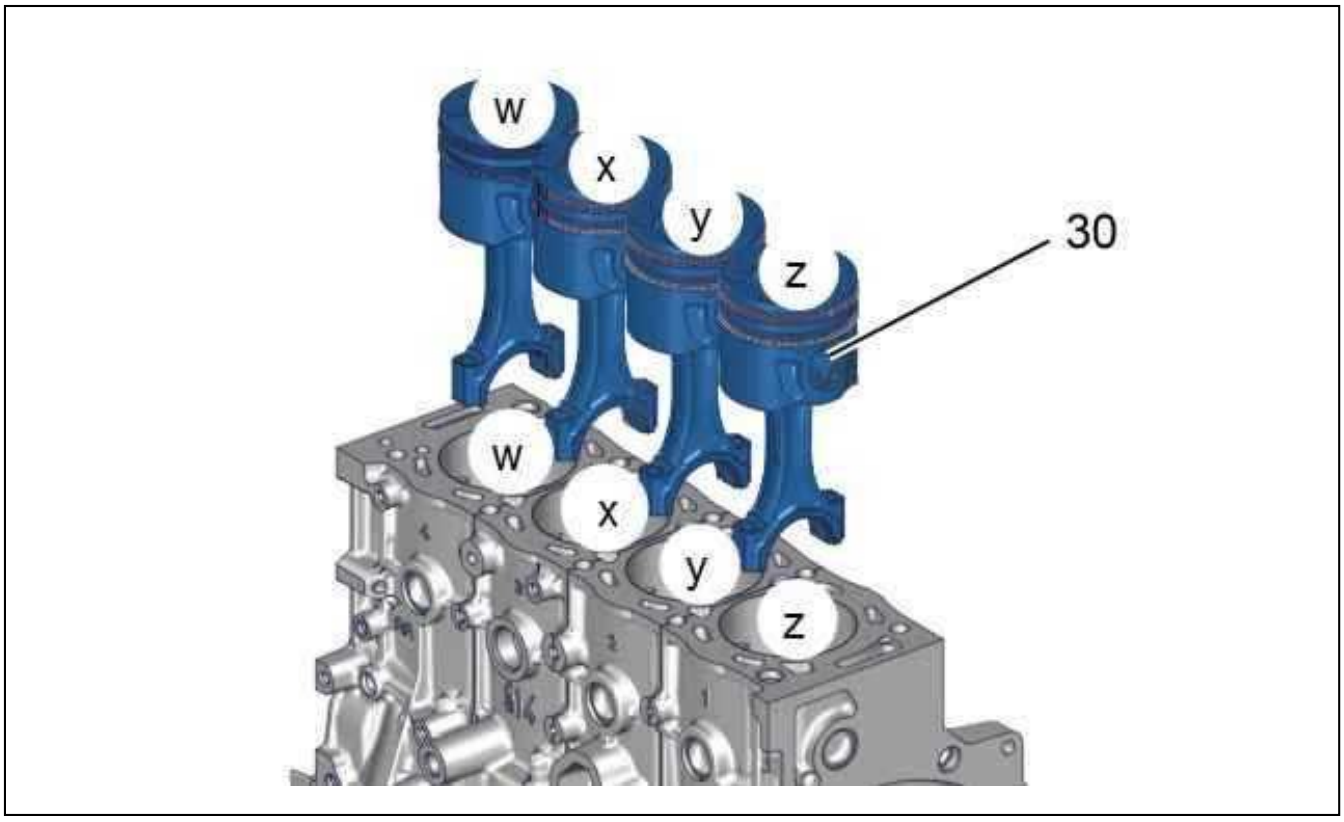


Figure : B1BG2FND

CAUTION : Mark the conrod/piston assemblies in relation to the cylinder block (E.g. : ww/xx/yy/zz) ; From the markings "a".

Remove the piston/conrod assemblies (30) from above.

2.6. Disassembling the connecting rod/piston assemblies

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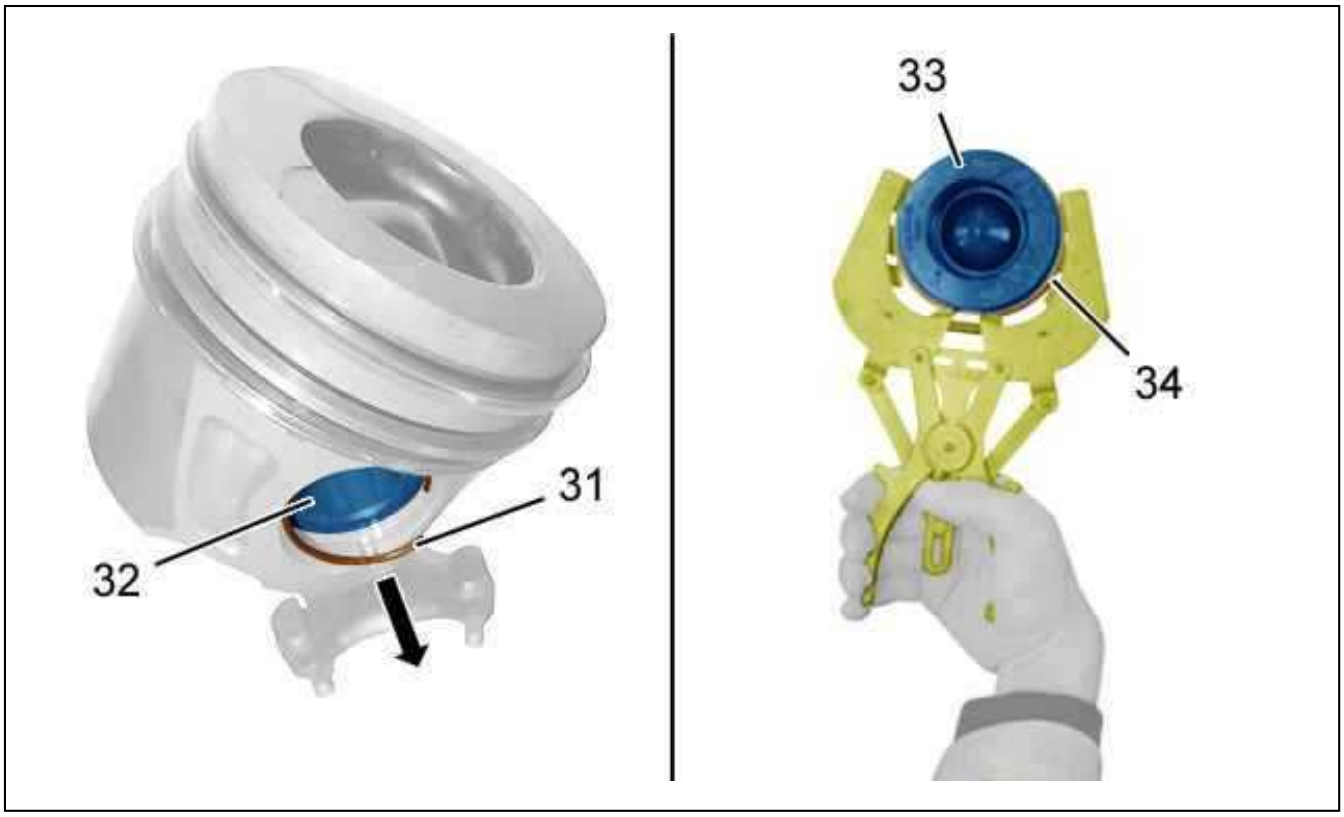


Figure : B1BG2FQD

Remove :

- The circlip (31)
- The shaft (32)
- The piston (33)
- The shoes (34)

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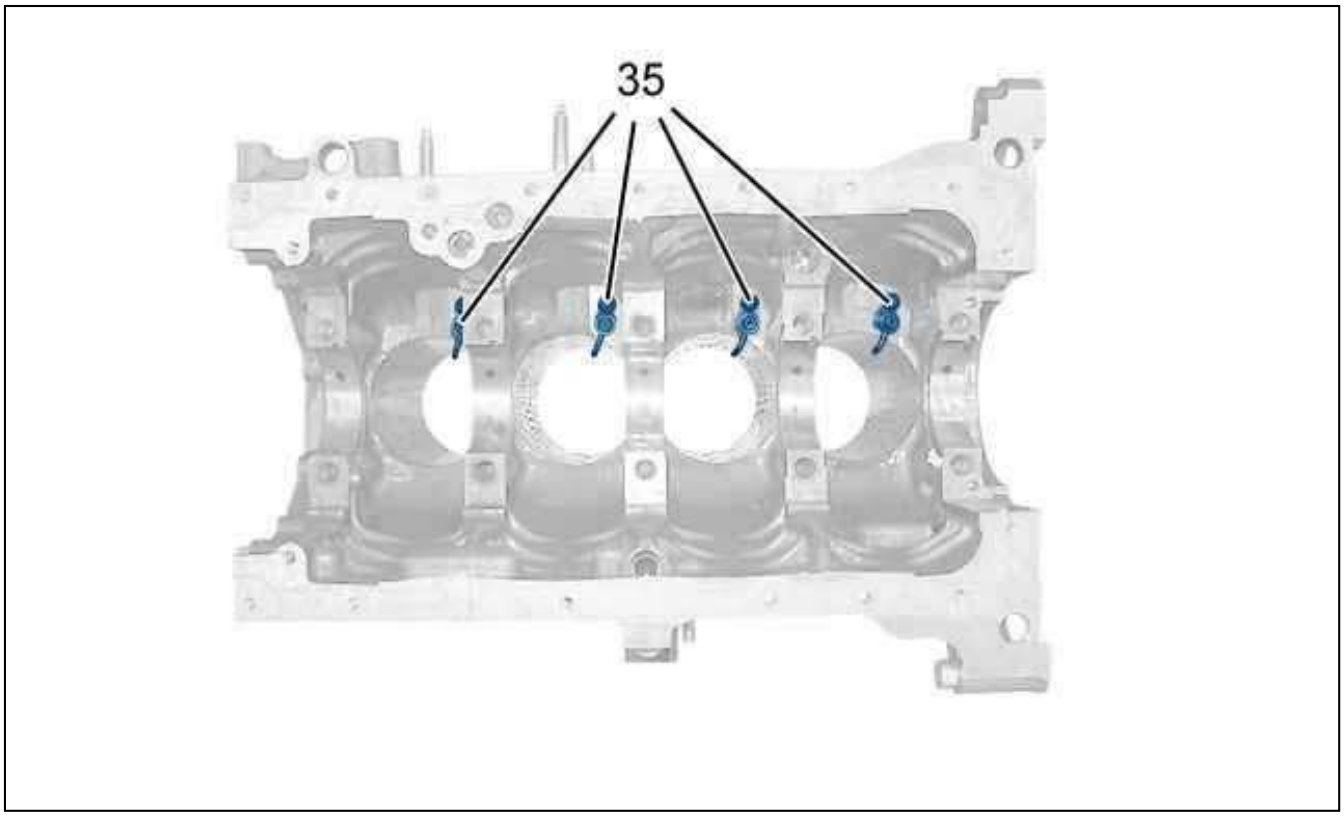


Figure : B1BG2FZD

Take out the piston skirt spray jets (35).

3. Checks

CAUTION : Thoroughly clean each component, using the specially approved products.

3.1. Cylinder block

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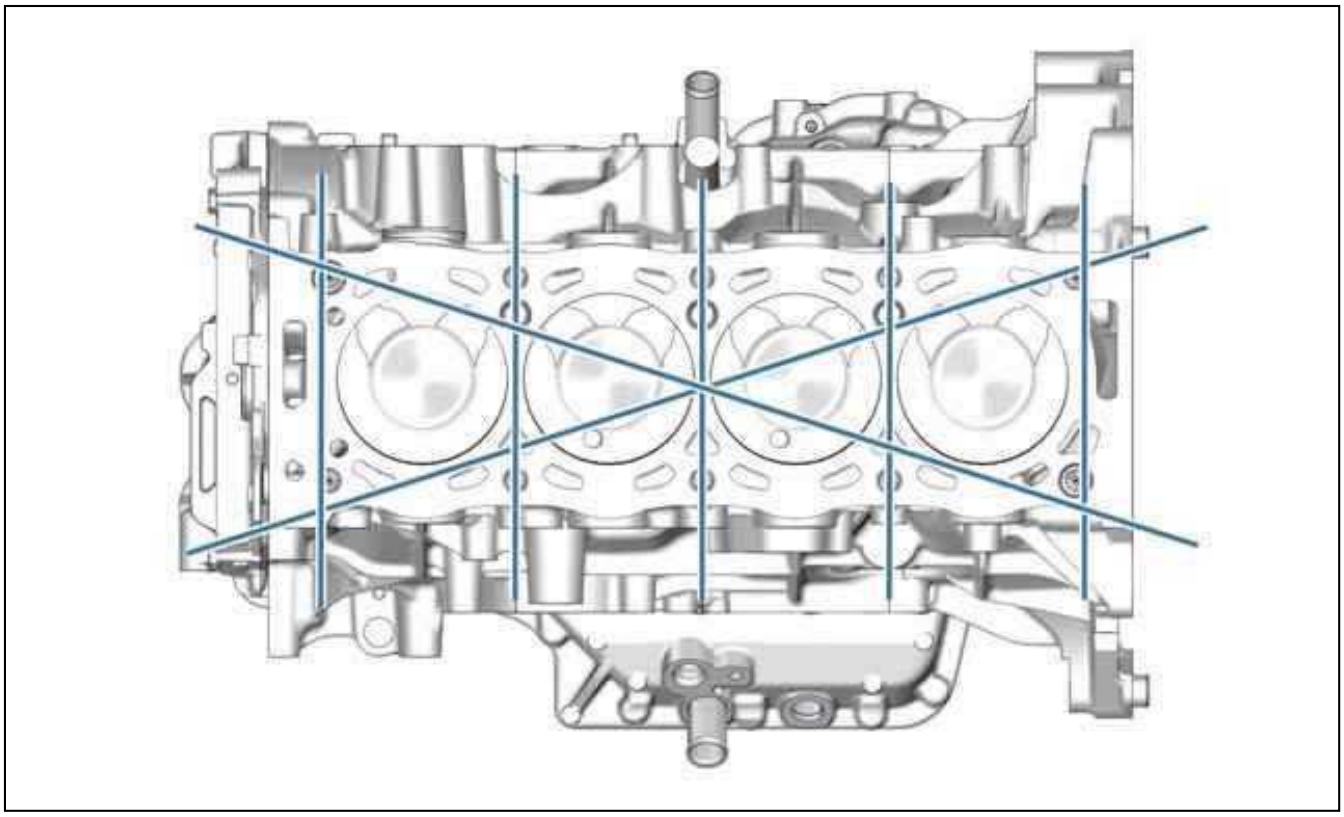


Figure : B1BG2G2D

Checking the flatness is done with the aid of a checking ruler and a set of shims (see figure below).
Maximum permissible bow = 0.042 mm.
Check the following points :

- Check that there is no stripping of the metal (Cylinders - Main bearings)
- Measure the wear on the different components (Cylinders - Main bearings)
- Check the various lubrication channels
- Check the sealing of the cylinder block (Sealing test using pressurisation)
- Check there are no leaks from the balls - Blanks
- Check there are no leaks from the well caps

Replace any defective parts.

3.2. Reciprocating gear

Check the following points :

- Check that there is no stripping of the metal (Barrels ; Pistons ; Little ends ; Piston rings ; Conrods ; Half shells ; Thrust washers ; Crankshaft)
- Measure the wear on the different components (Barrels ; Pistons ; Little ends ; Piston rings ; Conrods ; Half shells ; Thrust washers ; Crankshaft)

Replace any defective parts.

3.3. Oil pump

Check the following points :

- Check there are no particles in the oil pump strainer
- Check there are no tight spots on the oil pump
- Check the condition of the teeth on the oil pump pinions
- Check the condition of the oil pump chain

Replace any defective parts.

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3.4. Piston skirt spray jets

Check there are no plugs in the piston skirt spray jets.

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DISMANTLING : ENGINE TOP

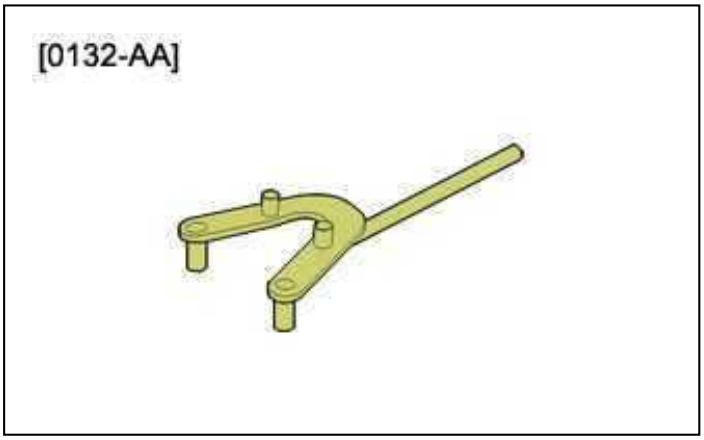
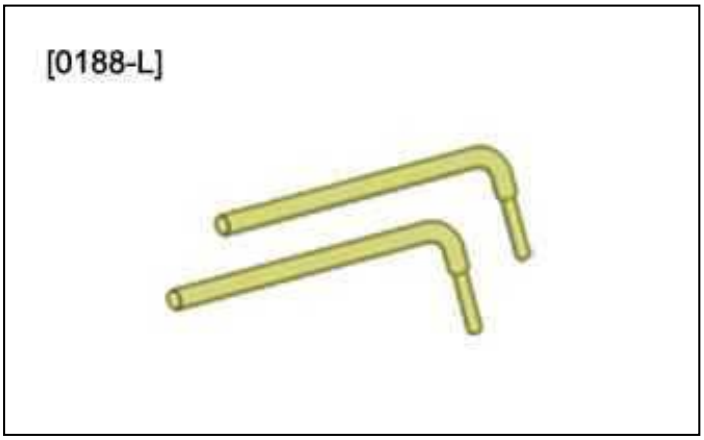
ESSENTIAL : Follow the safety instructions .

CAUTION : This procedure is intended for the replacement of faulty internal components of the cylinder head. If the cylinder head is damaged, replace it with a new cylinder head assembly.

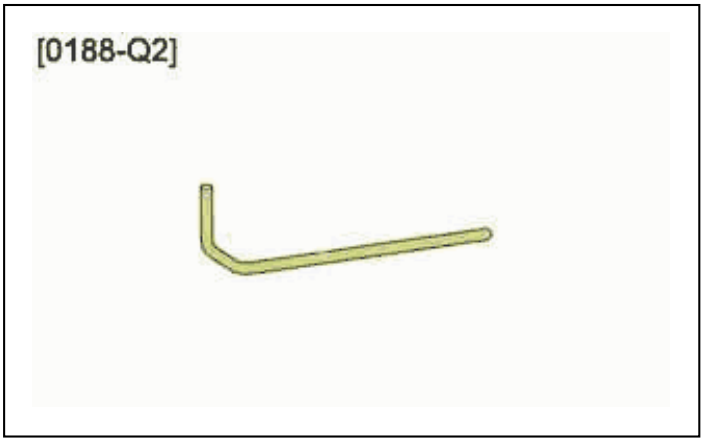
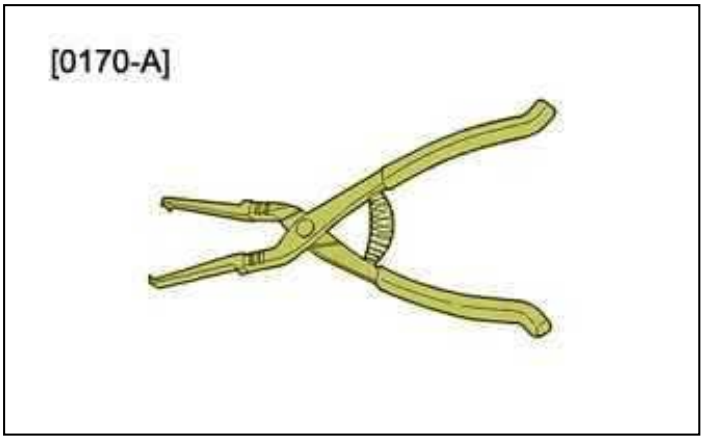
1. Tooling

Equipment :

- Valve spring compressor (Type FACOM U.43 LA)
- Cup thrust pad (Type FACOM SP 18380)
- dial gauge
- dial gauge support

tool	Reference	Designation
 Figure : E5AB0DDT	[0132-AA]	Tool for immobilisation of the notched belt sprocke
 Figure : E5AB0AUT	[0188-L]	Set of levers to detach the cylinder head cover
	[0188-Q2]	setting rod for dynamic roller

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 Figure : E5AG05MT		
 Figure : E5AB0SAT	[0170-A]	pliers for removing the valve stem seals

1.1. Stripping the cylinder head

CAUTION : The engine must be drained of all its oil before any work is carried out.

CAUTION : As the flywheel cannot be extracted once the engine is in place on its stand, it is essential to lock the timing, remove the crankshaft pulley bolt and then remove the flywheel before any work.

Fitting the engine to the stand .

The following components have to be priorly removed :

- The engine electric harness
- The complete fuel filter with its mounting
- The inlet air mixer unit and its support
- The vacuum pump
- The injection system
- The turbocharger

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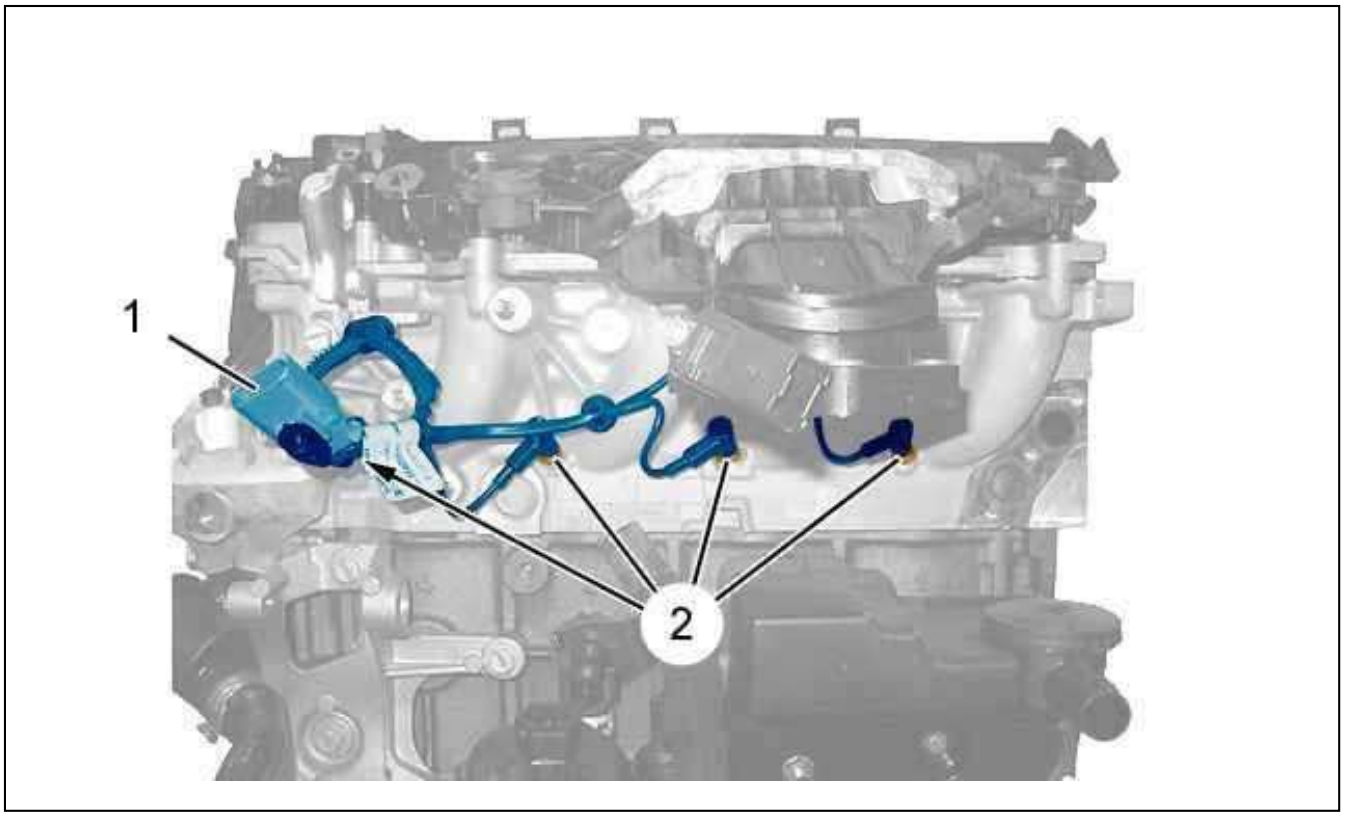


Figure : B1BG2BOD

Remove :

- The glow plugs supply harness (1)
- The pre-heater plugs (2)

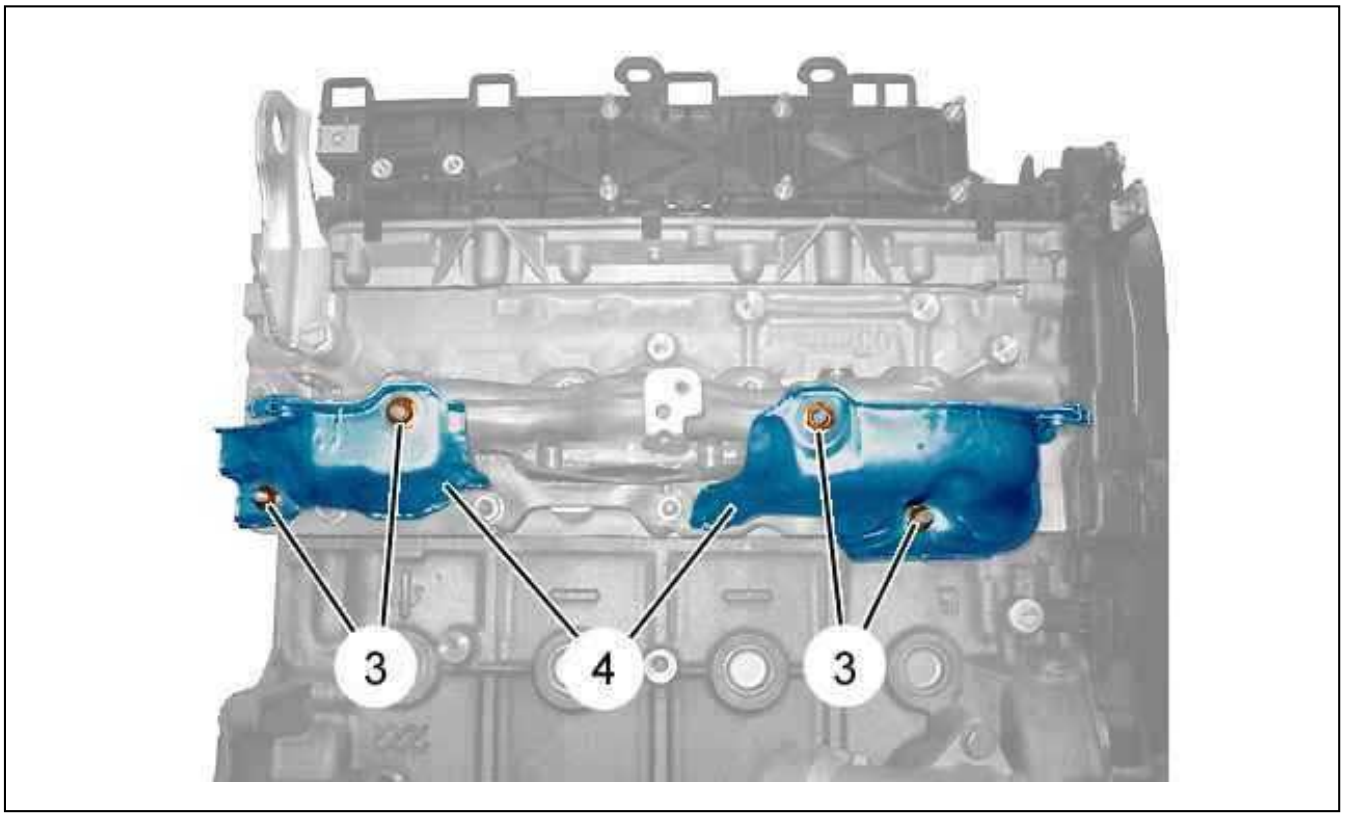


Figure : B1BG2BPD

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Remove :

- The nuts (3)
- The heat shields (4)

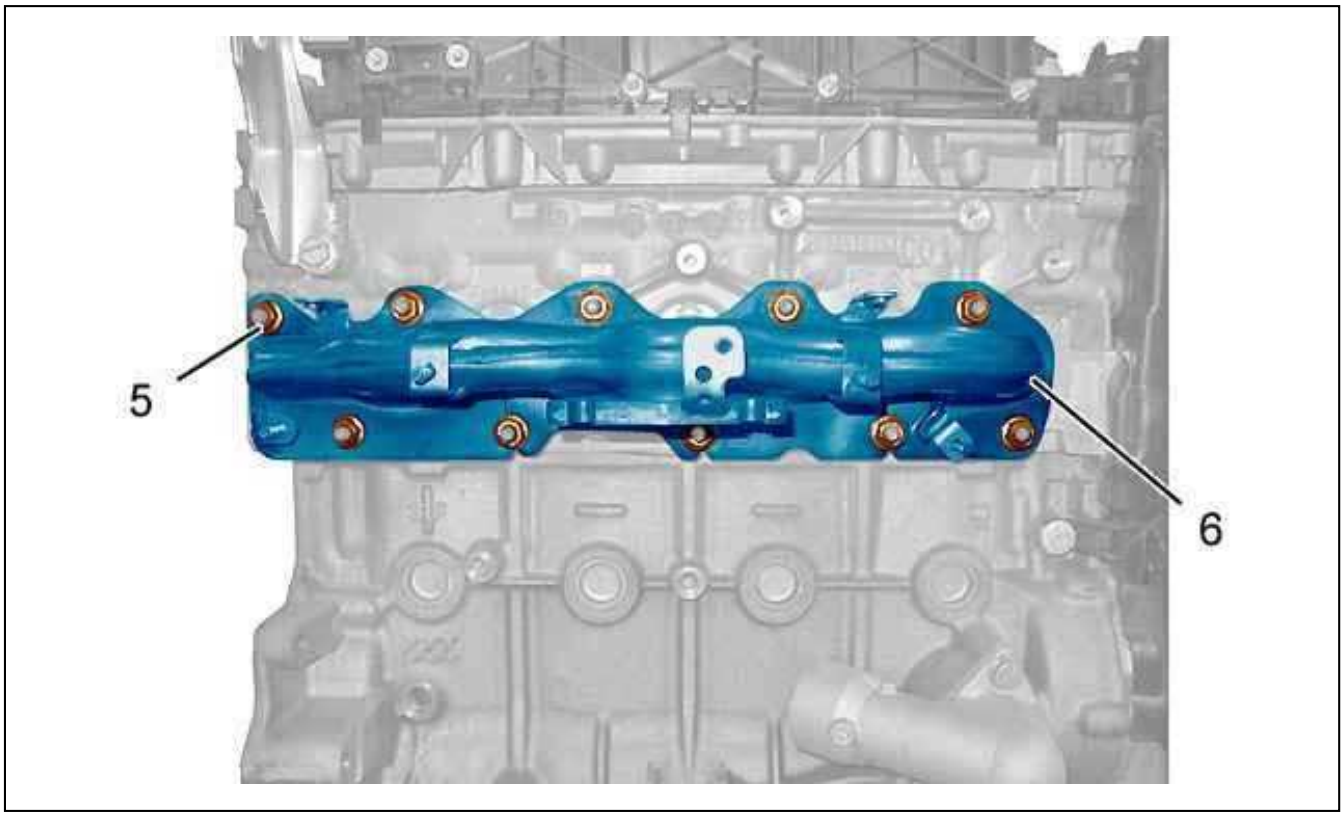


Figure : B1BG2BQD

Remove :

- The nuts (5)
- The exhaust manifold (6)
- Seal

1.2. Removing the timing

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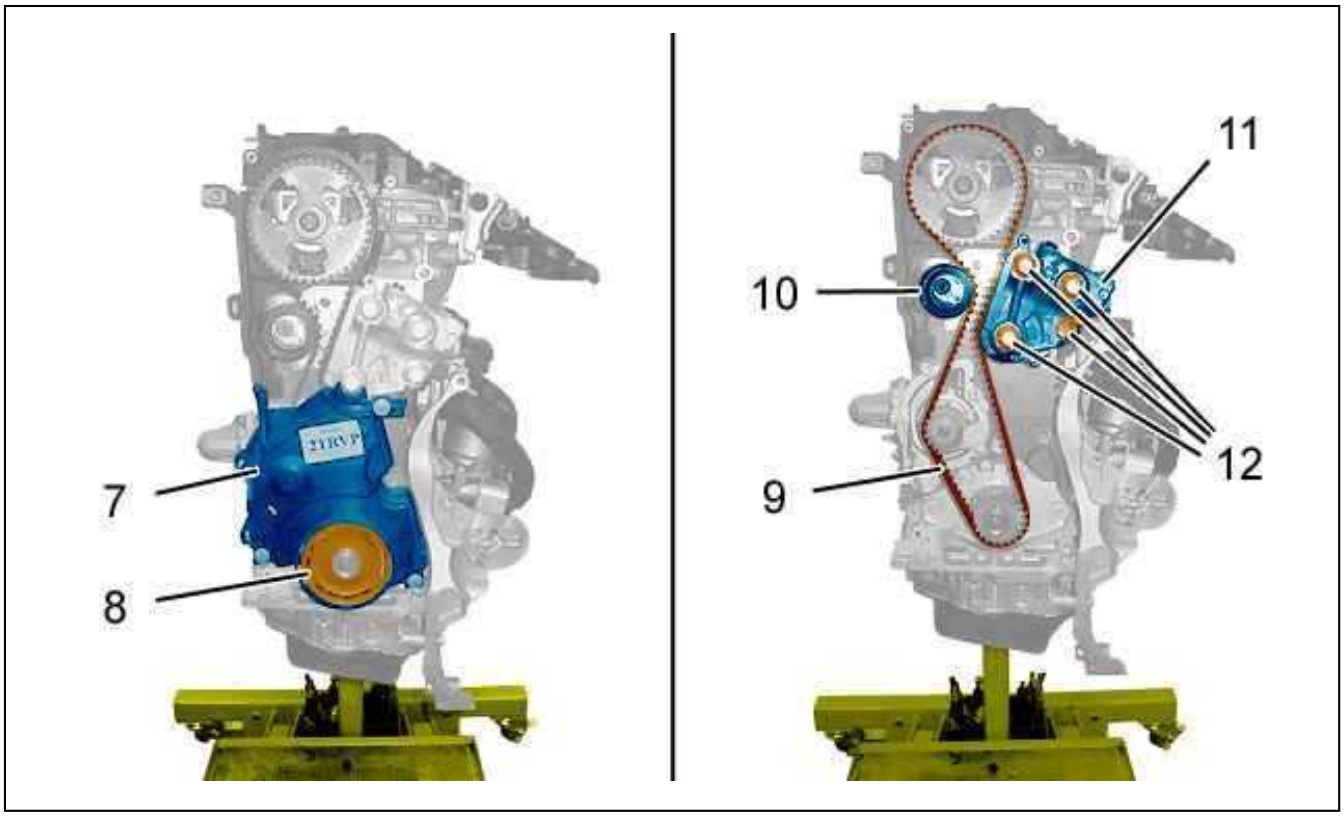


Figure : B1BG2BRD

CAUTION : The timing must priorly be set and the crankshaft pulley bolt removed.

Remove :

- The lower timing cover (7)
- The target (8)
- The dynamic roller tensioner (10)
- The timing belt (9)
- The bolts (12)
- The engine support (11) complete with the guide roller

1.3. Removing : Air inlet manifold

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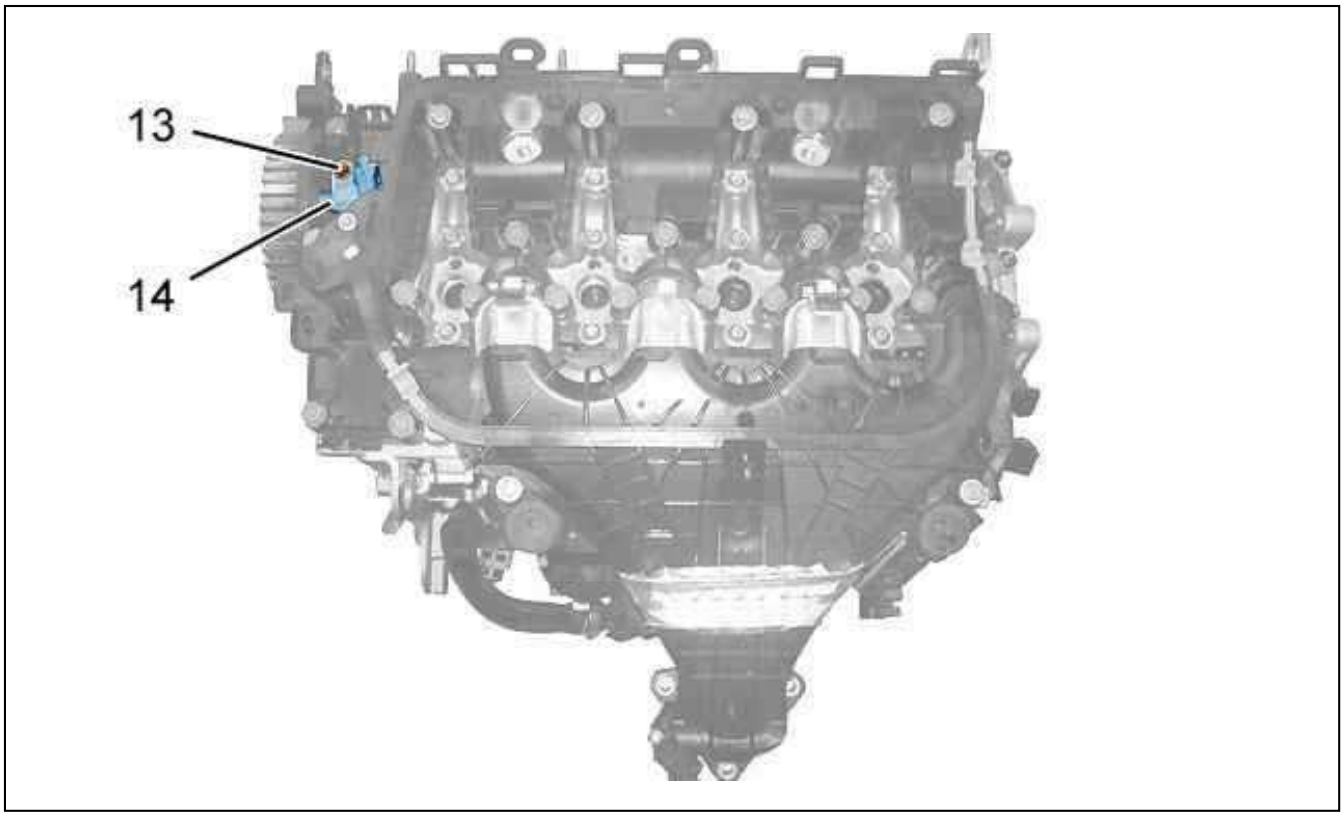


Figure : B1BG2BSD

Remove :

- The (13) bolt
- The cylinder reference sensor (14)

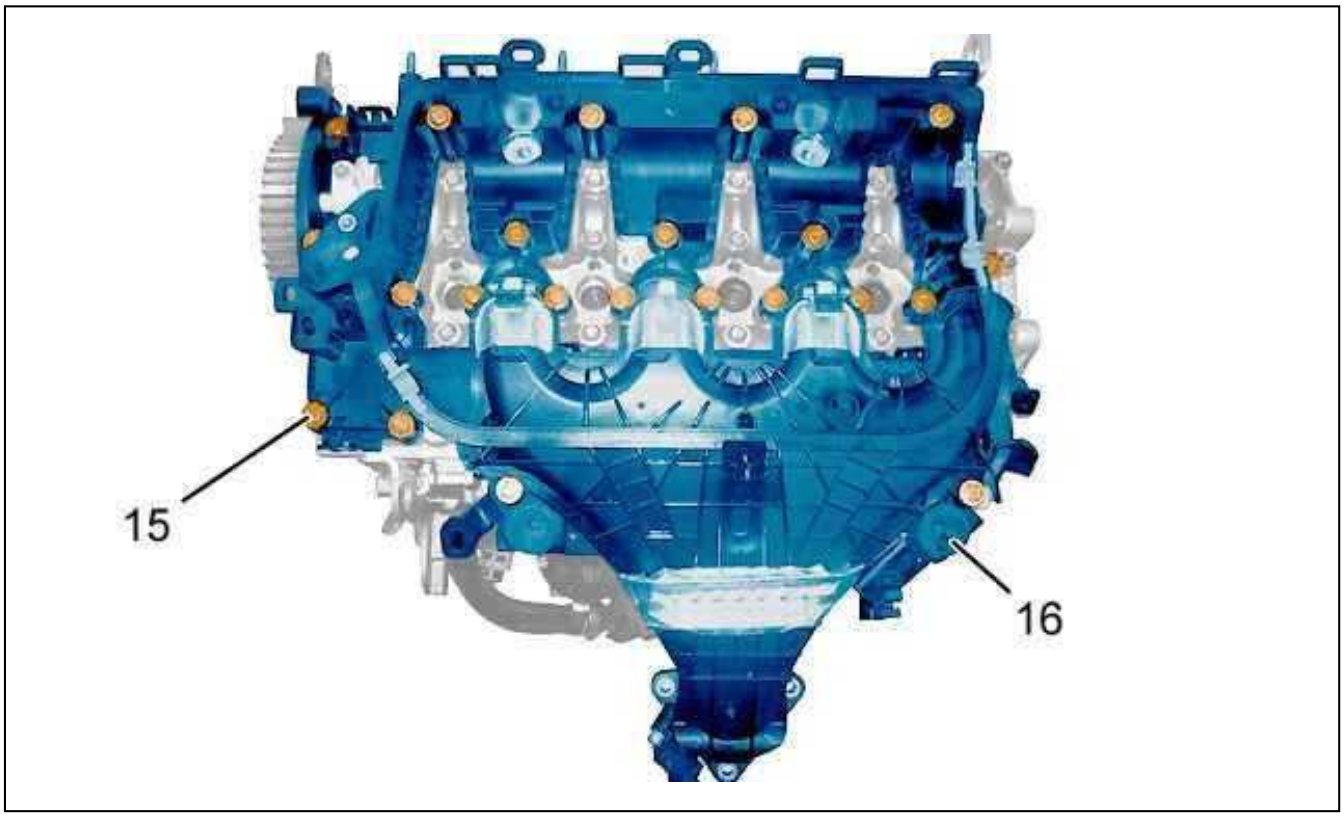


Figure : B1BG2BTD

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Remove :

- The bolts (15)
- The inlet manifold (16)

1.4. Removing the camshafts

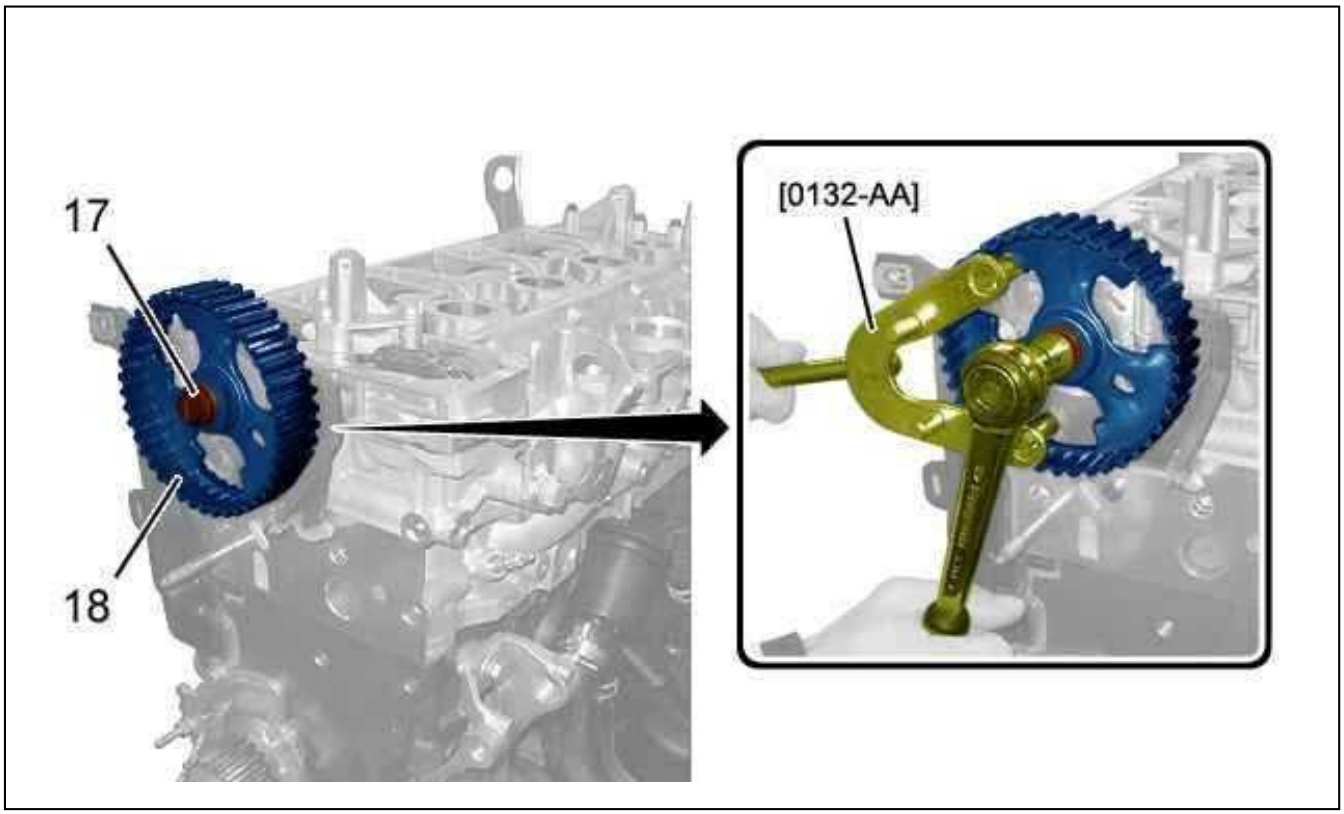


Figure : B1BG2BUD

Remove ; Using tool [0132-AA] :

- The screw (17) and its washer
- The pulley (18)

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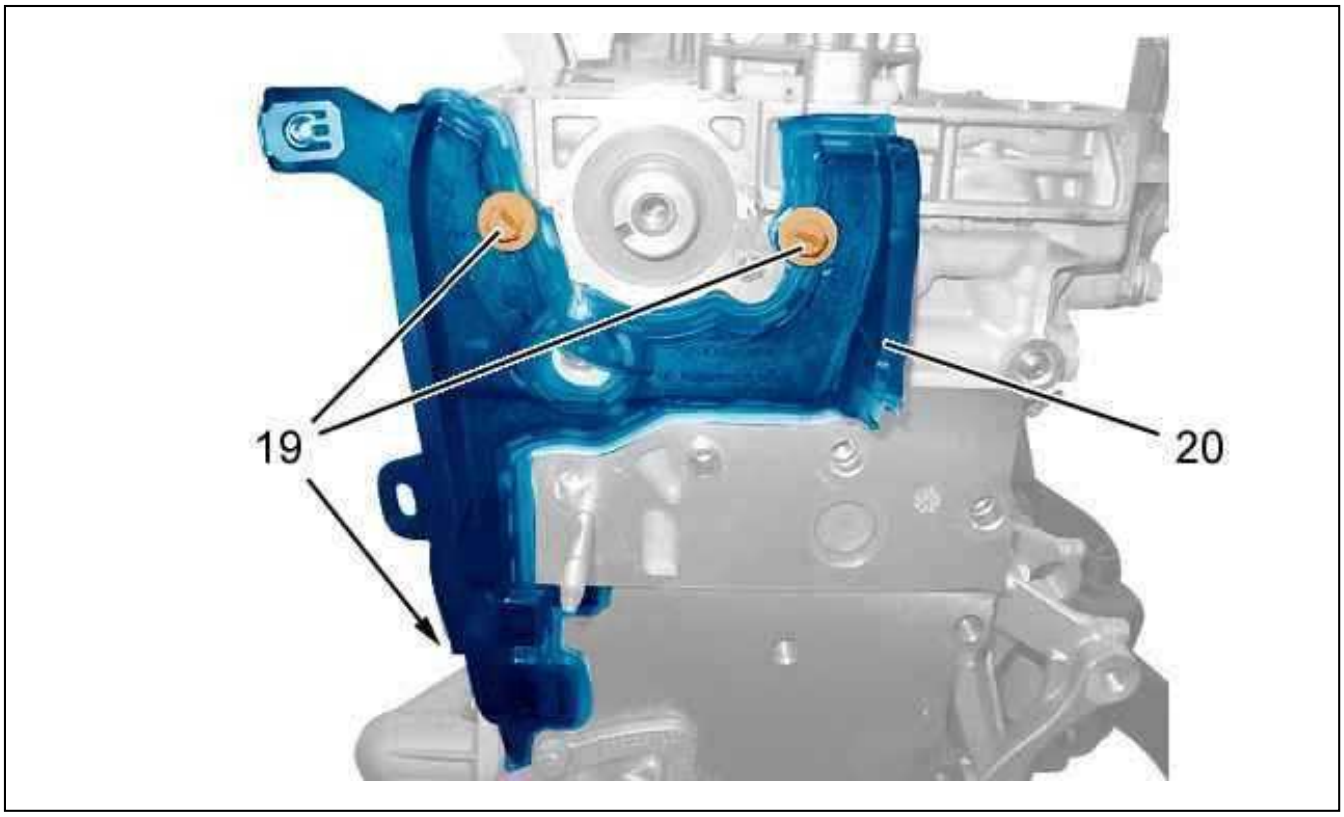


Figure : B1BG2BVD

Remove :

- The bolts (19)
- The rear timing cover (20)

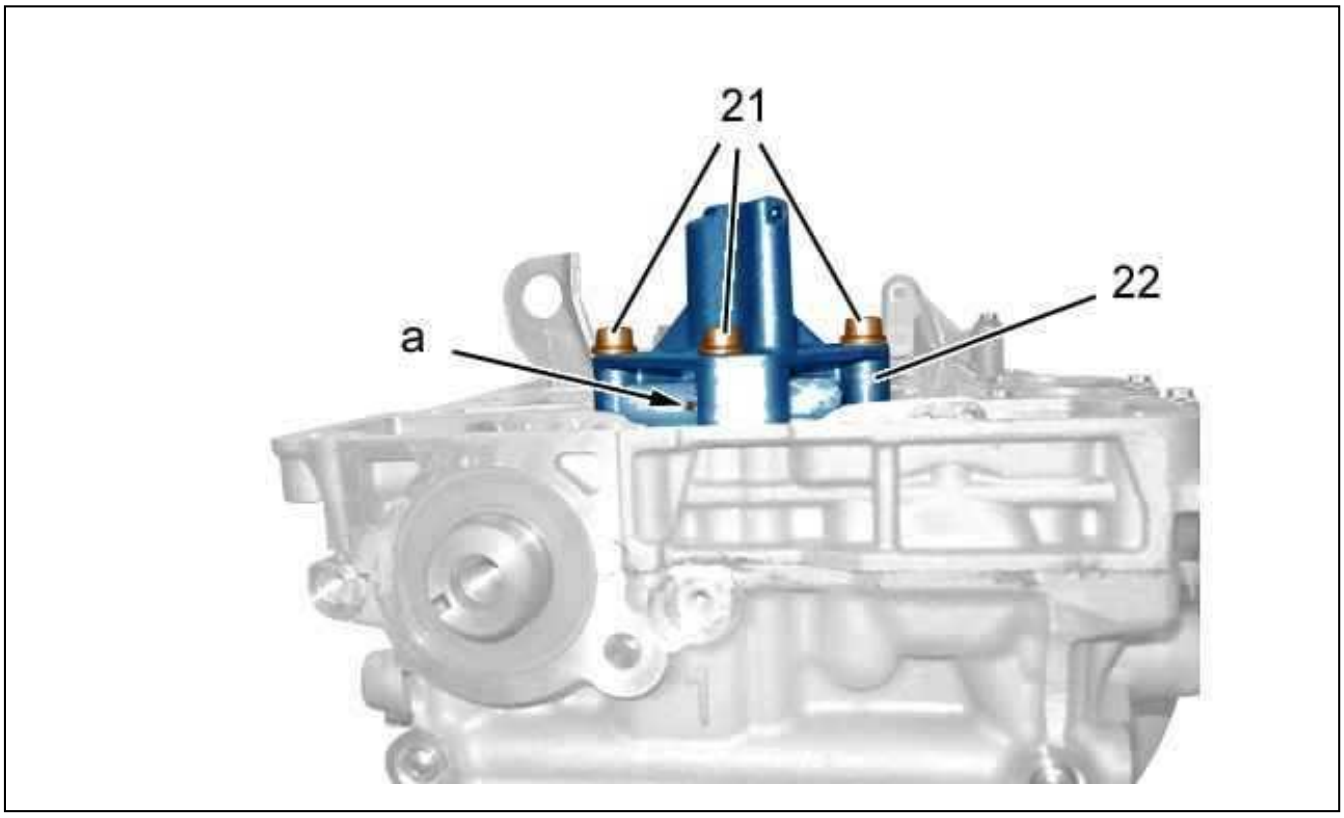


Figure : B1BG2BWD

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Pin the timing chain (22) tensioner (at "a") ; Using the pin [0188-Q2].
Remove :

- The bolts (21)
- The timing chain (22) tensioner

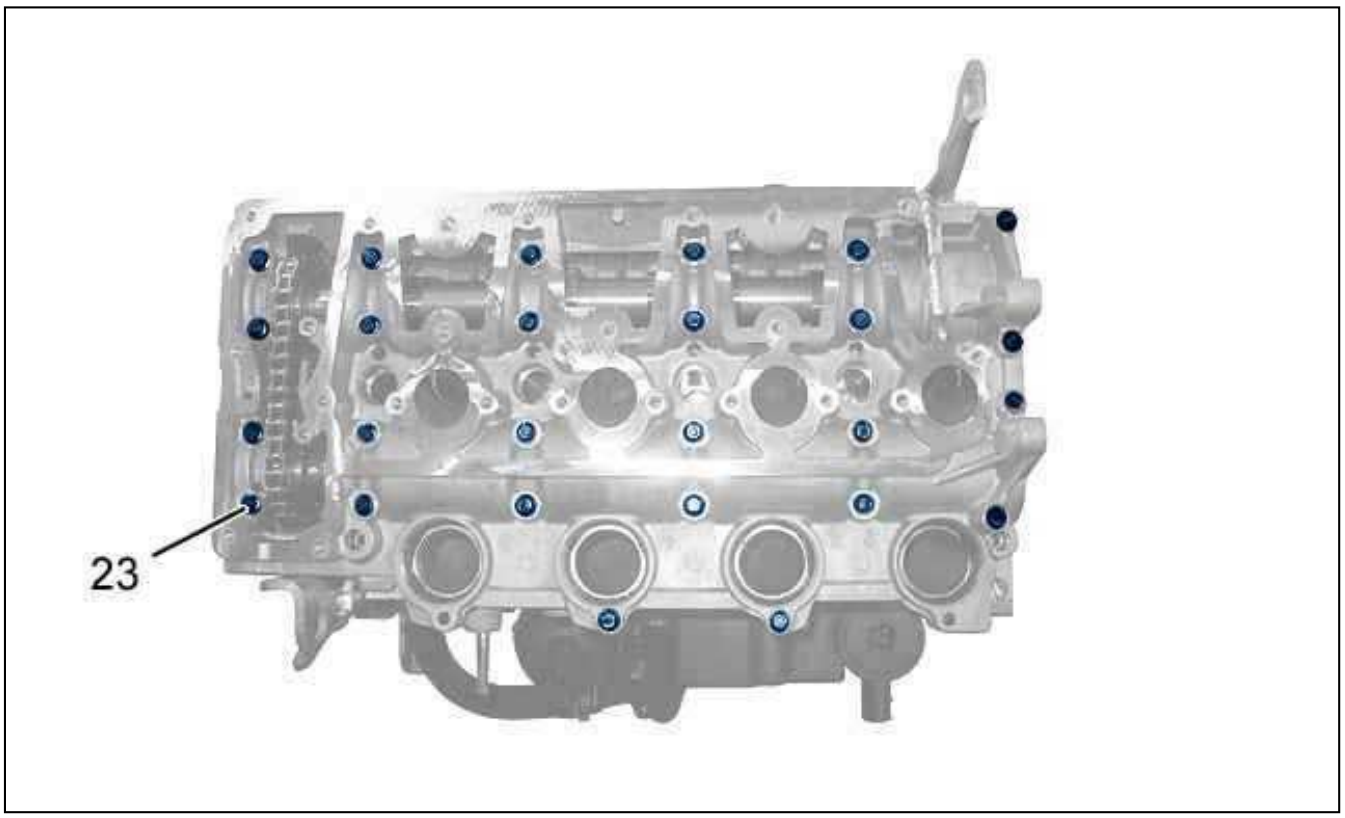


Figure : B1BG2BXD

Remove the bolts (23).

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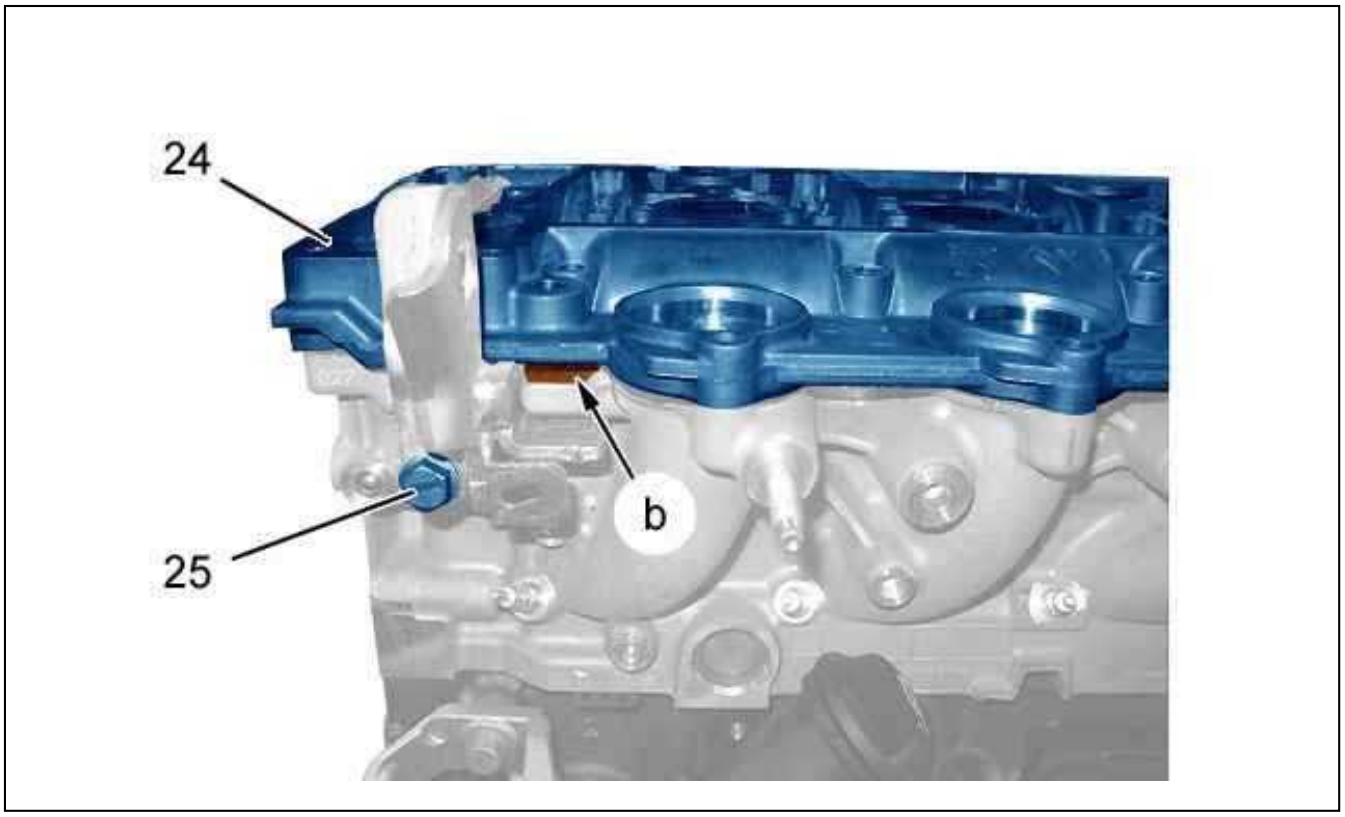


Figure : B1BG2BYD

Unscrew the screw (25) several turns.
Detach the camshaft bearing cap housing (24) (at "b").
Remove the camshaft bearing cap housing (24).

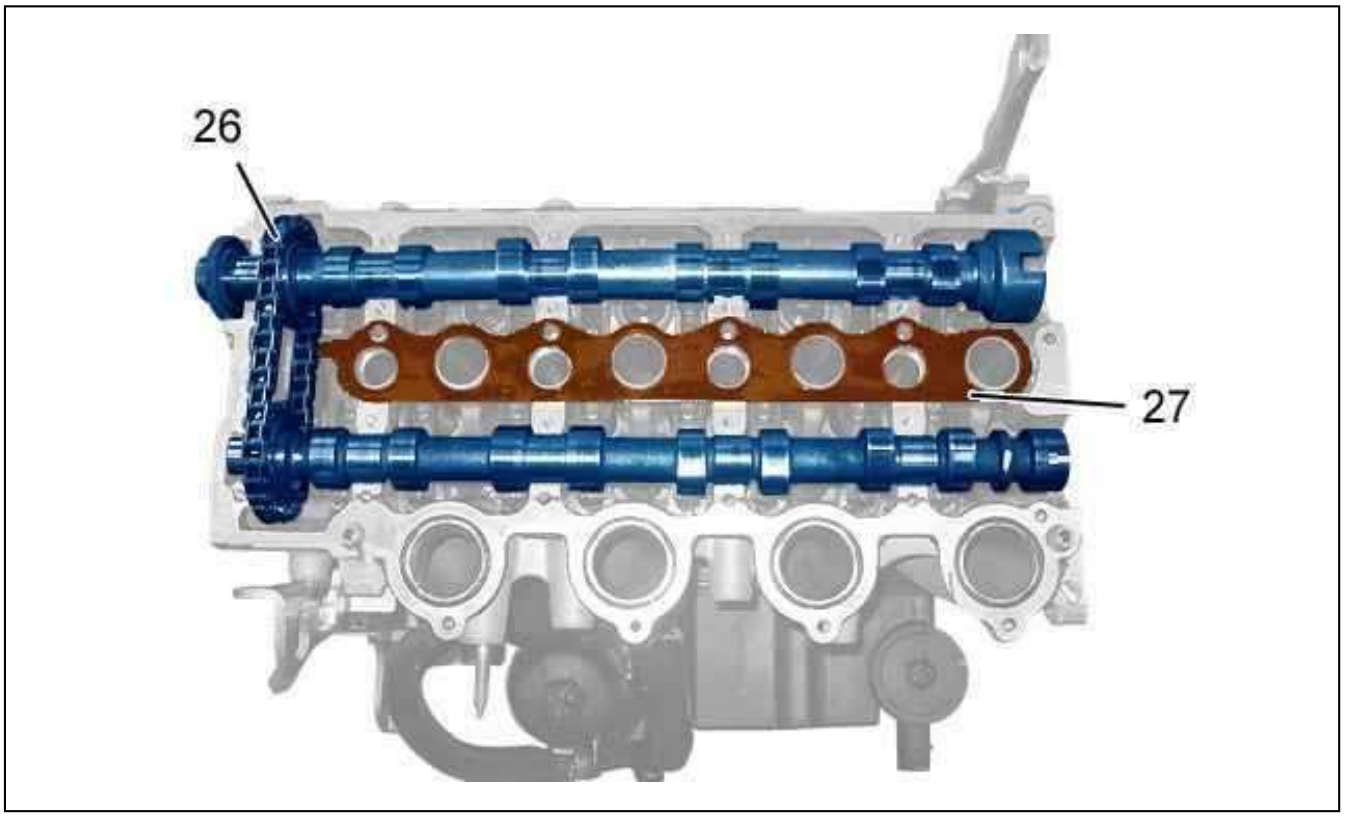


Figure : B1BG2BZD

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Remove :

- The camshaft and timing chain assembly (26)
- The sealing ring on the camshaft
- Seal (27)

1.5. Removing : Valve rockers

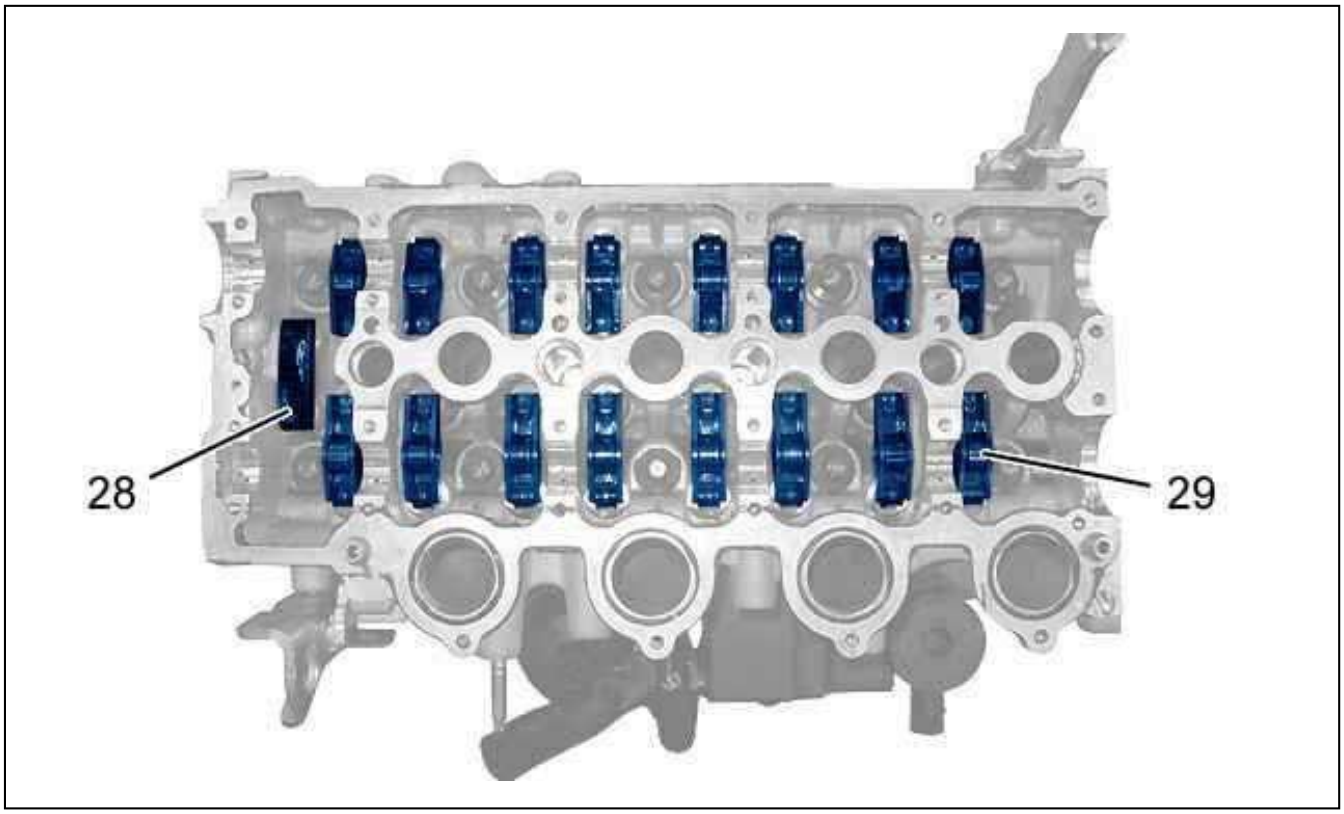


Figure : B1BG2C0D

CAUTION : Before removal, mark the position of each valve rocker (29).

Remove :

- The slide pad (28)
- The valve rockers (29) complete with their tappets

1.6. Removing the cylinder head

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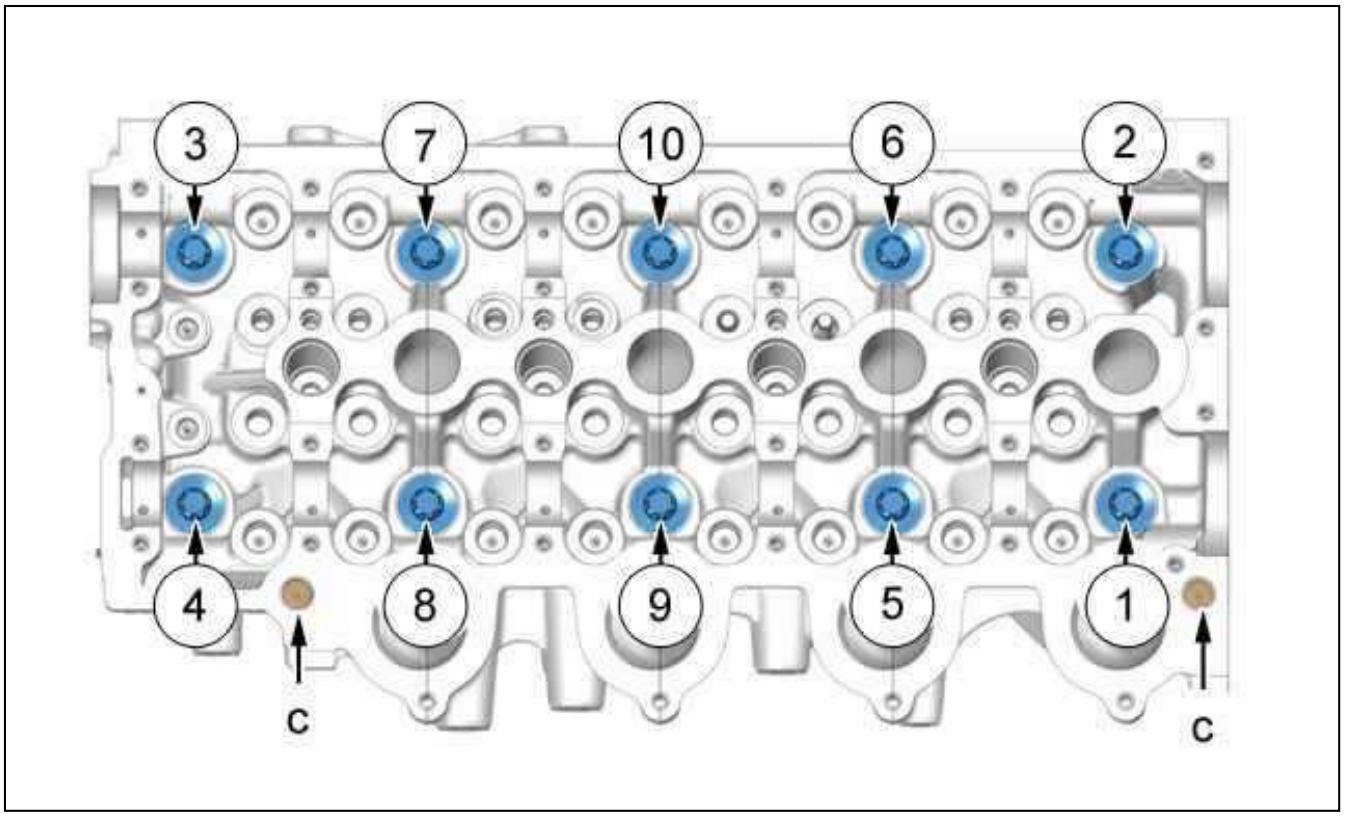


Figure : B1BG2C1D

CAUTION : Observe the order of slackening indicated.

Remove the cylinder head bolts (in the order indicated).
Detach the cylinder head ; Using the levers [0188-L] (at "c").
Remove :

- The cylinder head
- The cylinder head gasket

1.7. Removing the valves

CAUTION : Before removal, inspect the recession - protusion of the valves (See chapter "Checking").

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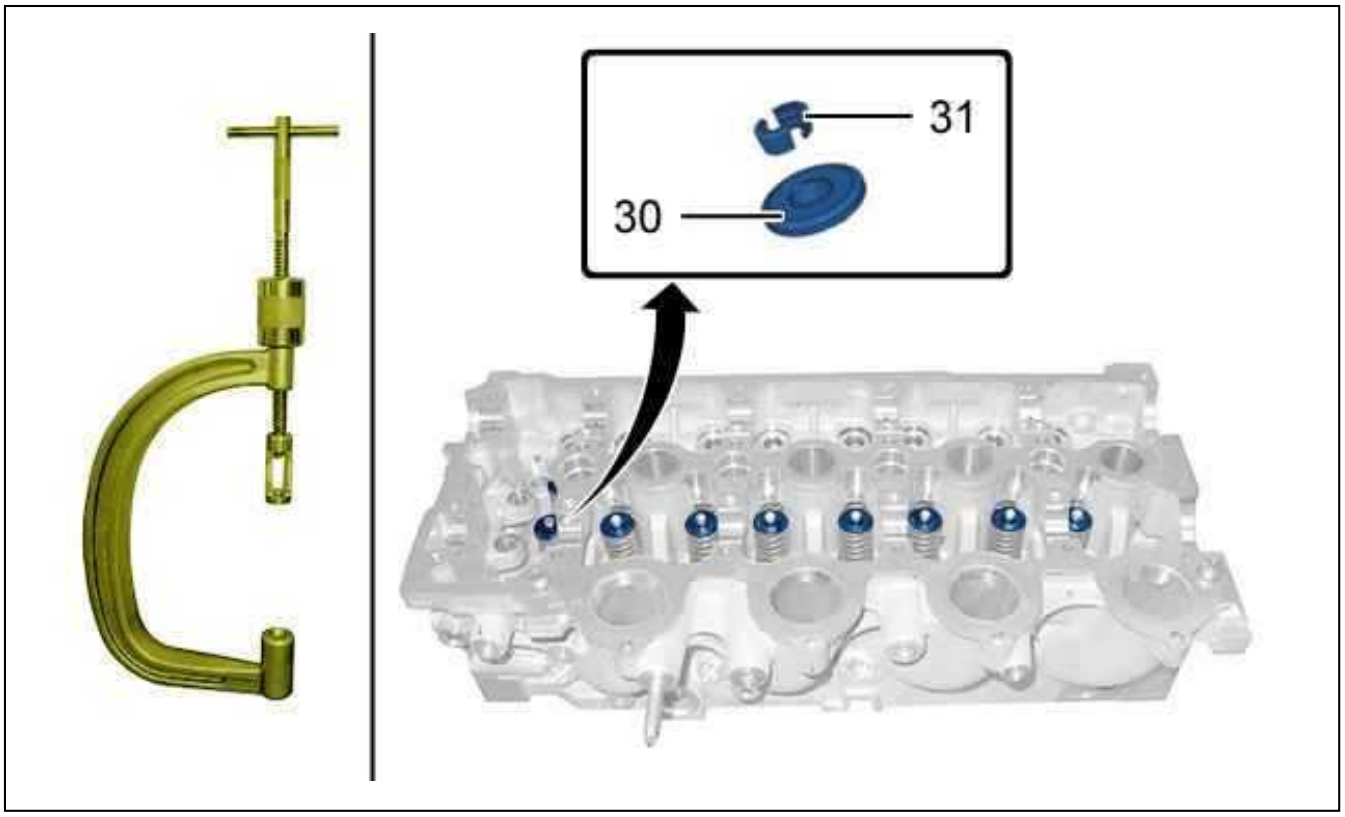


Figure : B1BG2C2D

CAUTION : Before removal, mark the position of each valve.

Fit the valve spring compressor tool on the cup (30).
Compress the valve springs.
Detach the half-cones (31) ; Using the slide hammer.

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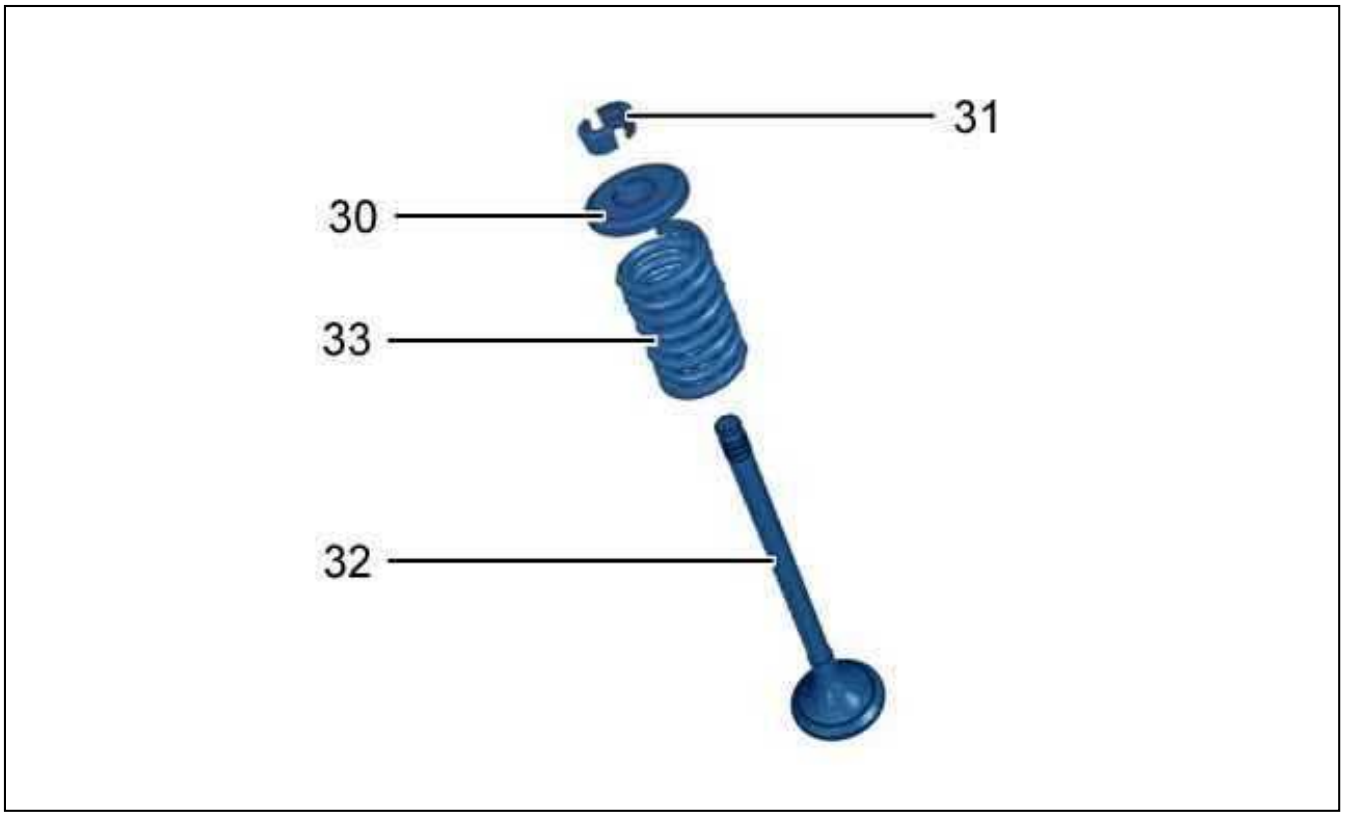


Figure : B1BG2C3D

Remove :

- Collets (31) ; Using a magnetised screwdriver
- The cup (30)
- The spring (33)
- The valve (32)

Repeat the operation for each valve.

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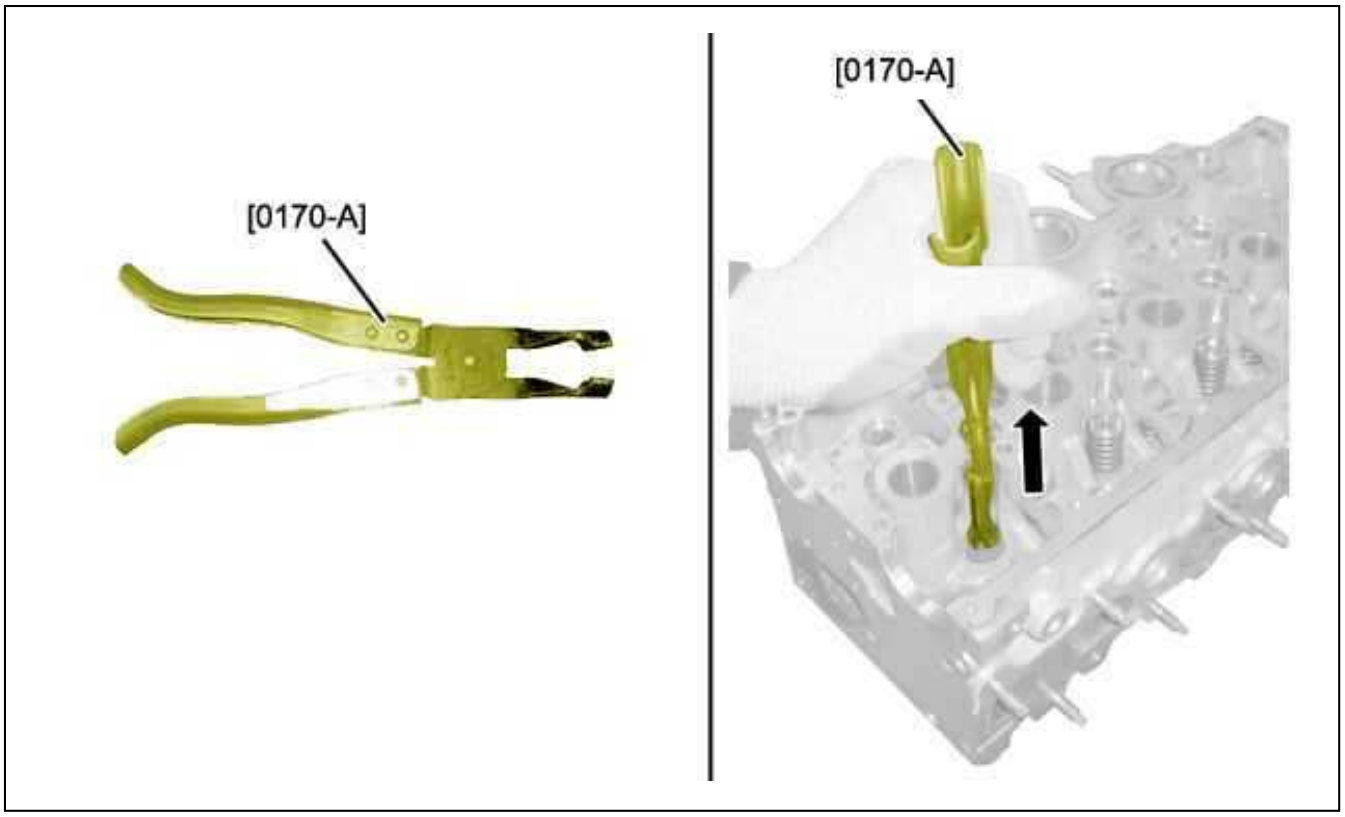


Figure : B1BG2C4D

Remove valve stem seals ; Using tool [0170-A].

2. Checking

CAUTION : Thoroughly clean each component, using the specially approved products.

2.1. Camshafts - Chain - Main bearings - Valve rockers

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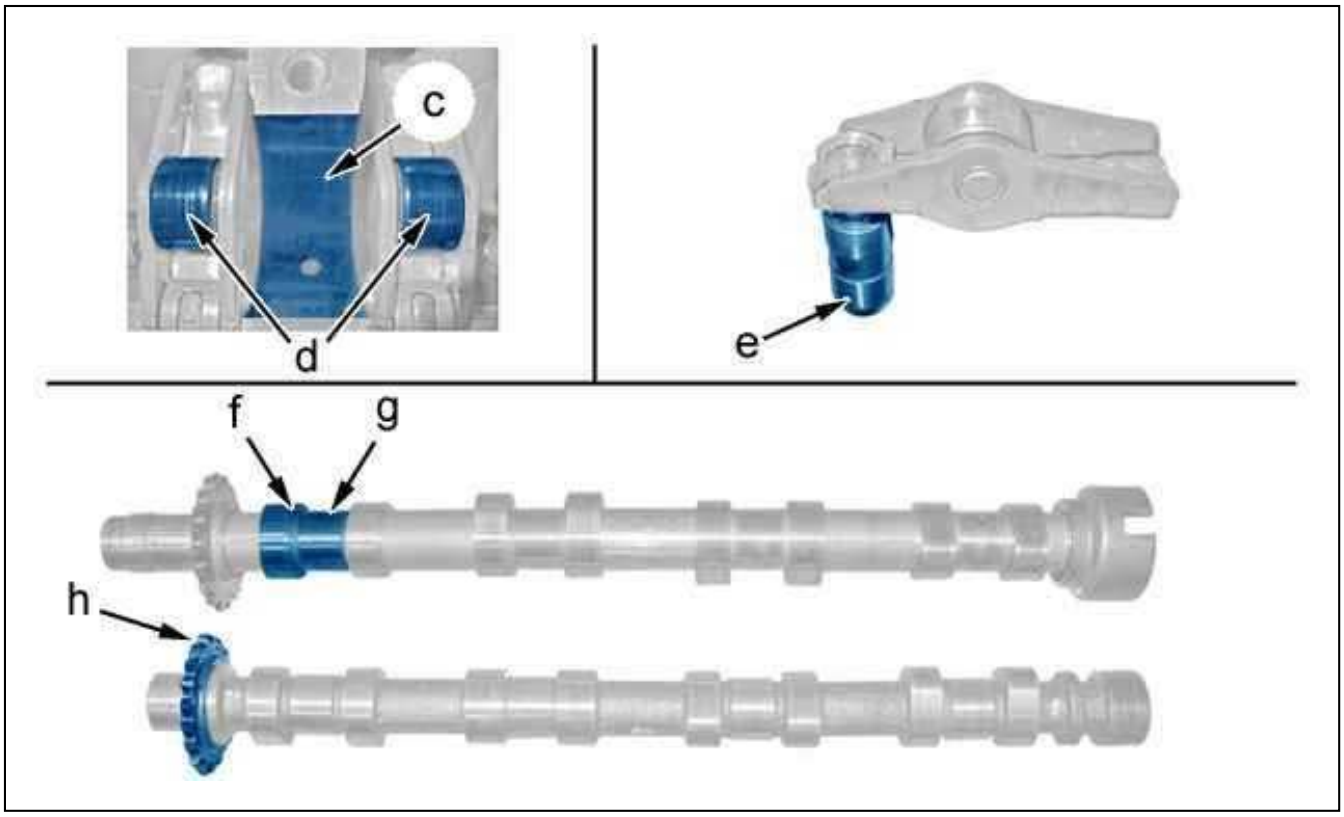


Figure : B1BG3XED

Check the following points :

- Check that there is no stripping of metal at the camshaft bearings (at "c")
- Check that there is no stripping of bearing metal at the valve rockers (at "d")
- Check that the bearings rotate freely on the valve rockers
- Check that the tappets "e" move freely in their barrels
- Check that there is no stripping of metal on the camshaft bearings (at "g")
- Check that there is no stripping of metal at the camshaft bearings (Cams) (at "f")
- Check the condition of the teeth on the timing pinions (at "h")
- Check the condition of the timing chain
- Check the condition of the slide pads on the timing chain tensioning system

Replace any defective parts.

2.2. valves - Valve seats - Valve guides

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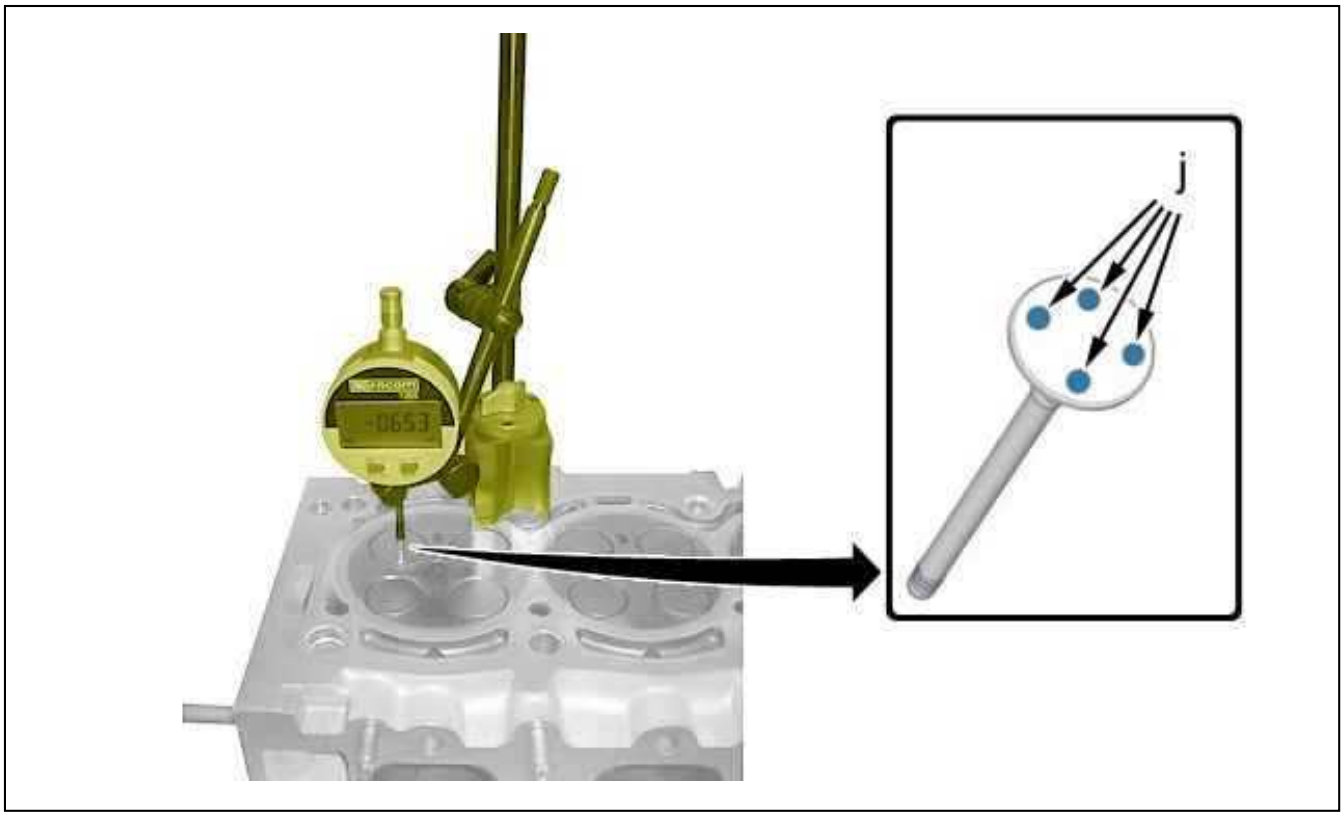


Figure : B1BG3XFD

CAUTION : The sealing surfaces must be perfectly clean : No signs of impact, no traces of scaling permitted.

Check the pocketing of the valves in relation to the cylinder head face (Valve by valve) :

- Assemble the dial gauge on its support
- Place the dial gauge in a stable position on the cylinder head gasket face ; Set the dial gauge to zero
- Move the dial gauge over the 4 checking points "j" (Valve) ; Read the values
- Calculate the average of the 4 values measured

Valve pocketing values	
Inlet valves	0,4 to 0,7 mm
Exhaust valves	-0,07 to 0,17 mm

If there is excessive stand-proud or recession, check the condition of the valves and valve seats, replace then bed them in if necessary.

2.3. Cylinder head

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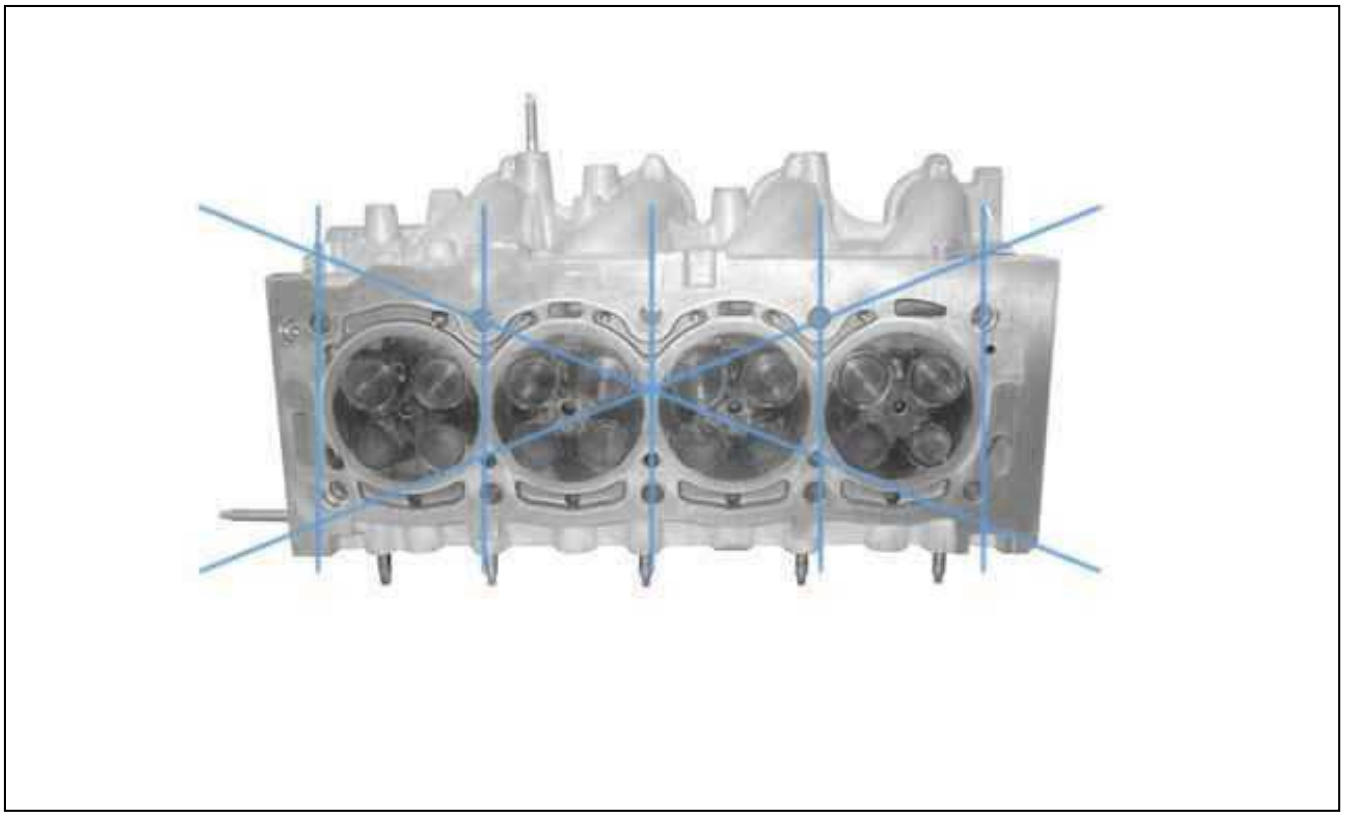


Figure : B1BG2C7D

Check the flatness of the cylinder head ; Using a rule (as shown on the illustration).
Maximum permissible bow = 0.03 mm.
Check the following points :

- Check the sealing of the cylinder head (Sealing test using pressurisation)
- Check there are no leaks from the balls - Blanks
- Check there are no leaks from the well caps

2.4. Oil non-return valve

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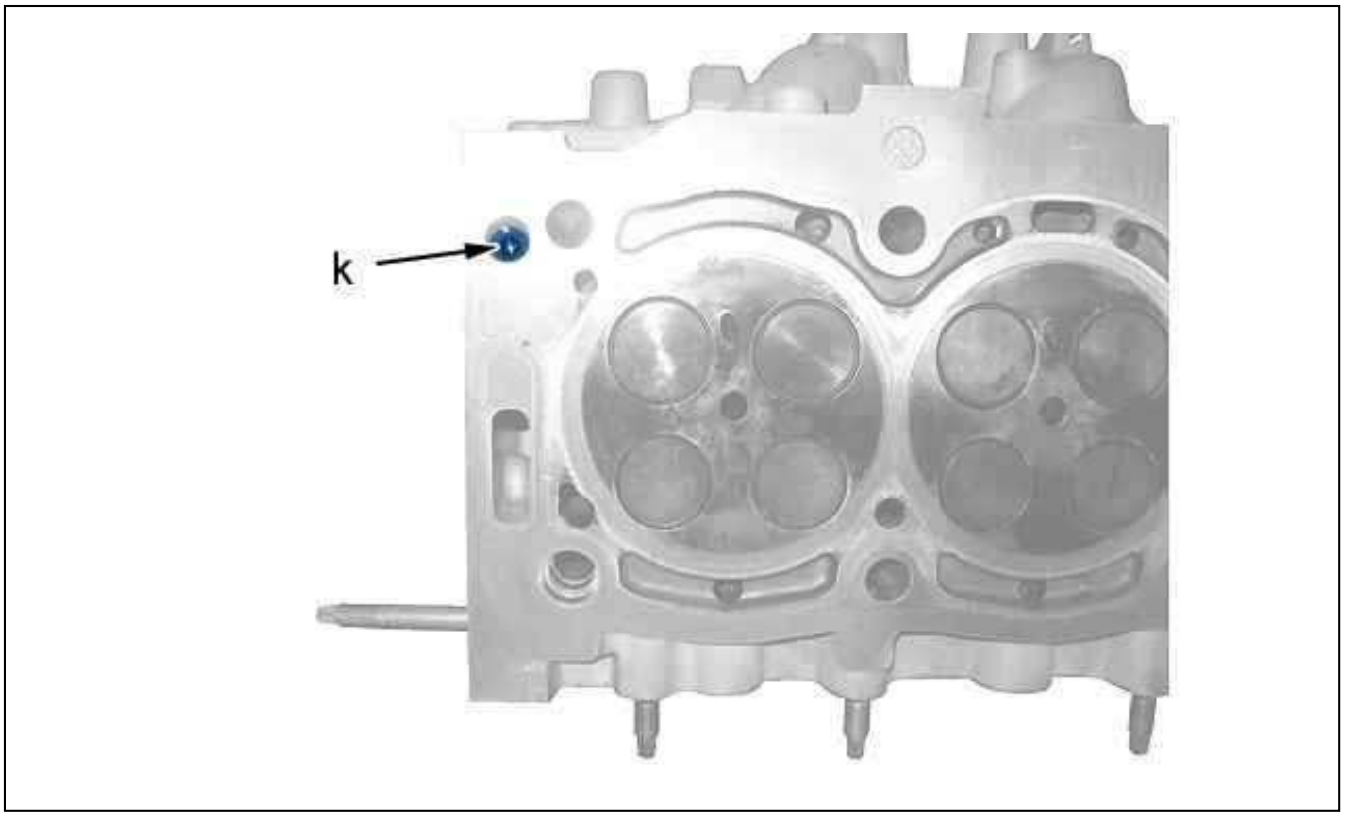


Figure : B1BG3XGD

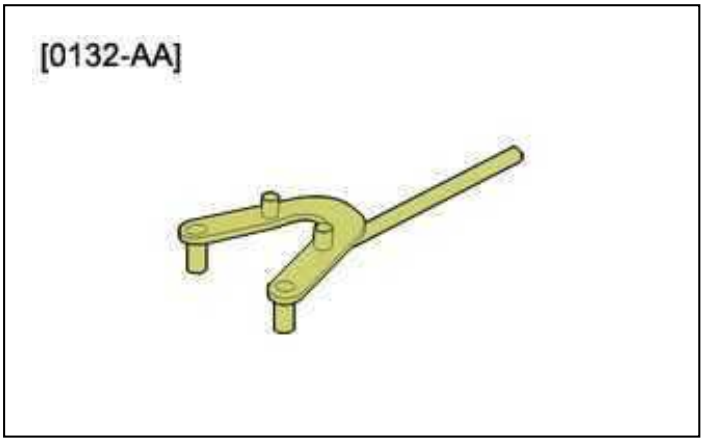
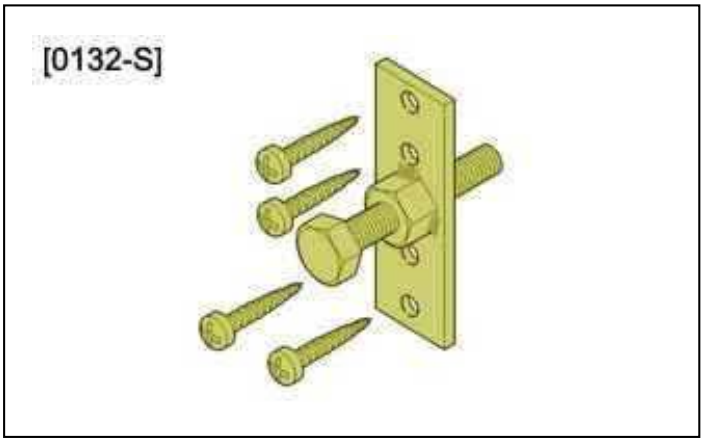
Check that the oil non-return valve is operating (at "k") : No foreign bodies, ball not stuck.

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REMOVING - REFITTING : ENGINE RING SEALS

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB08VT	[0132-AA]	Tool for immobilisation of the camshaft pulley
 Figure : E5AB0DBT	[0132-S]	Ring seals extraction plate
	[0188-AJ]	Crankshaft ring seal fitting drift (Timing gear side)

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Figure : E5AB0D9T

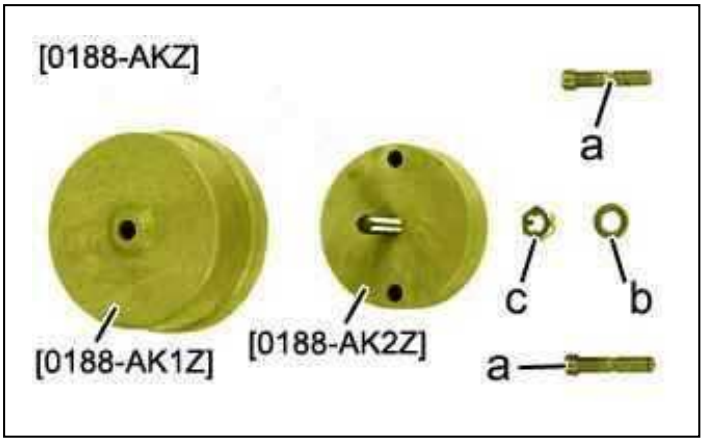


Figure : E5AB0Z5T

[0188-AK1Z]	Crankshaft seal fitting bell (Flywheel side)
[0188-AK2Z]	Crankshaft seal fitting guide (Flywheel side)
-	"a" bolts
-	"b" Washer
-	"c" Nut

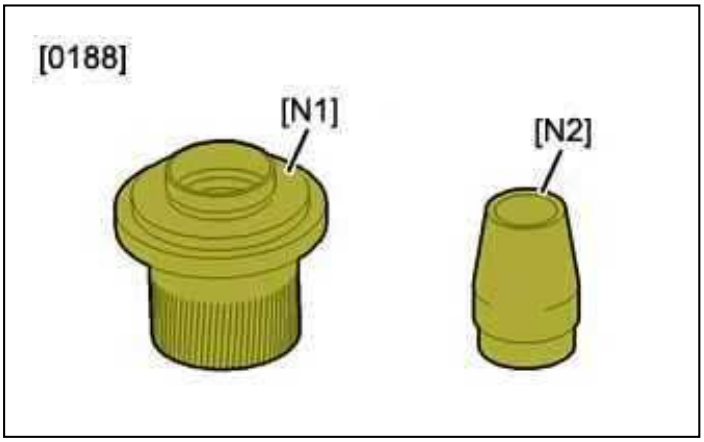


Figure : E5AB0DCT

[0188-N1]	Seal fitting mandrel
[0188-N2]	

2. Removing

2.1. Crankshaft ring seal(Timing gear side)

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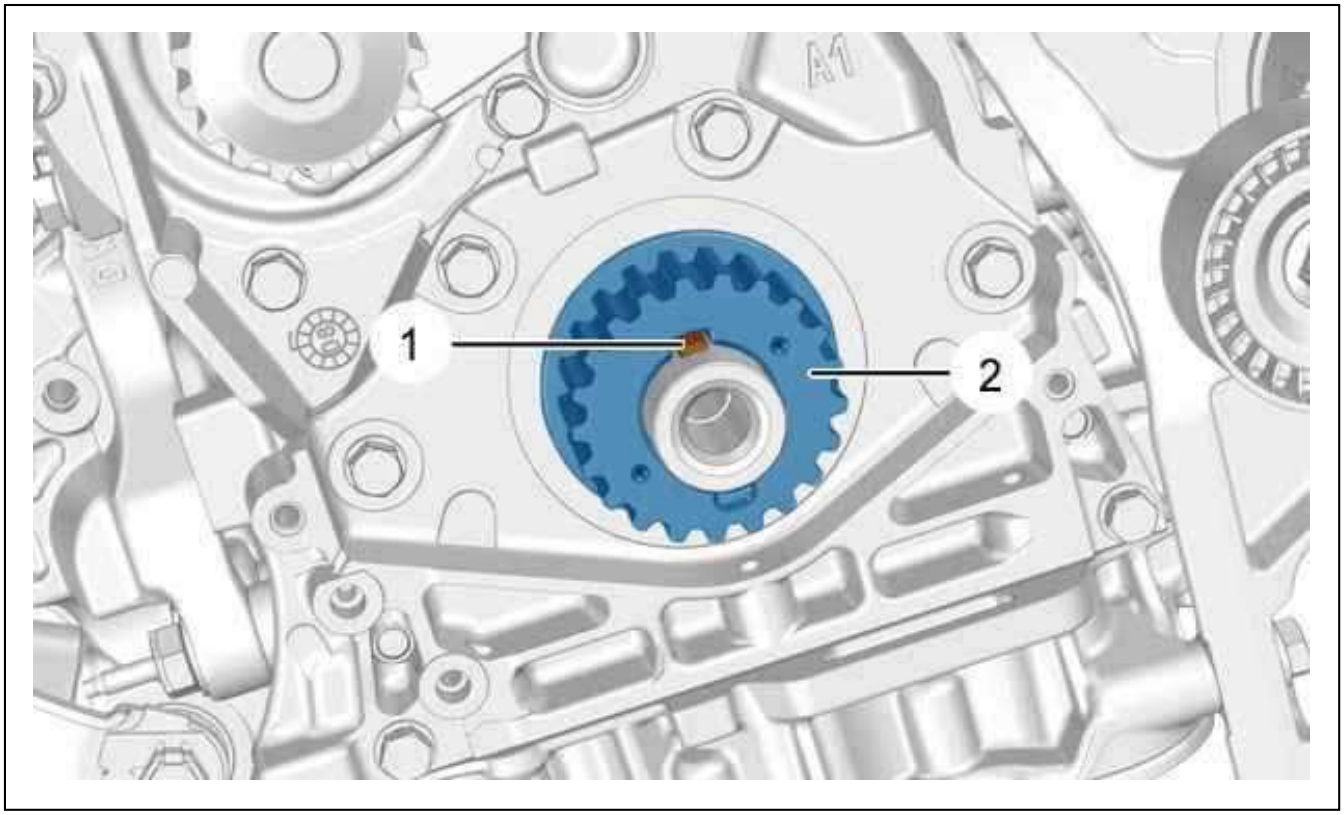
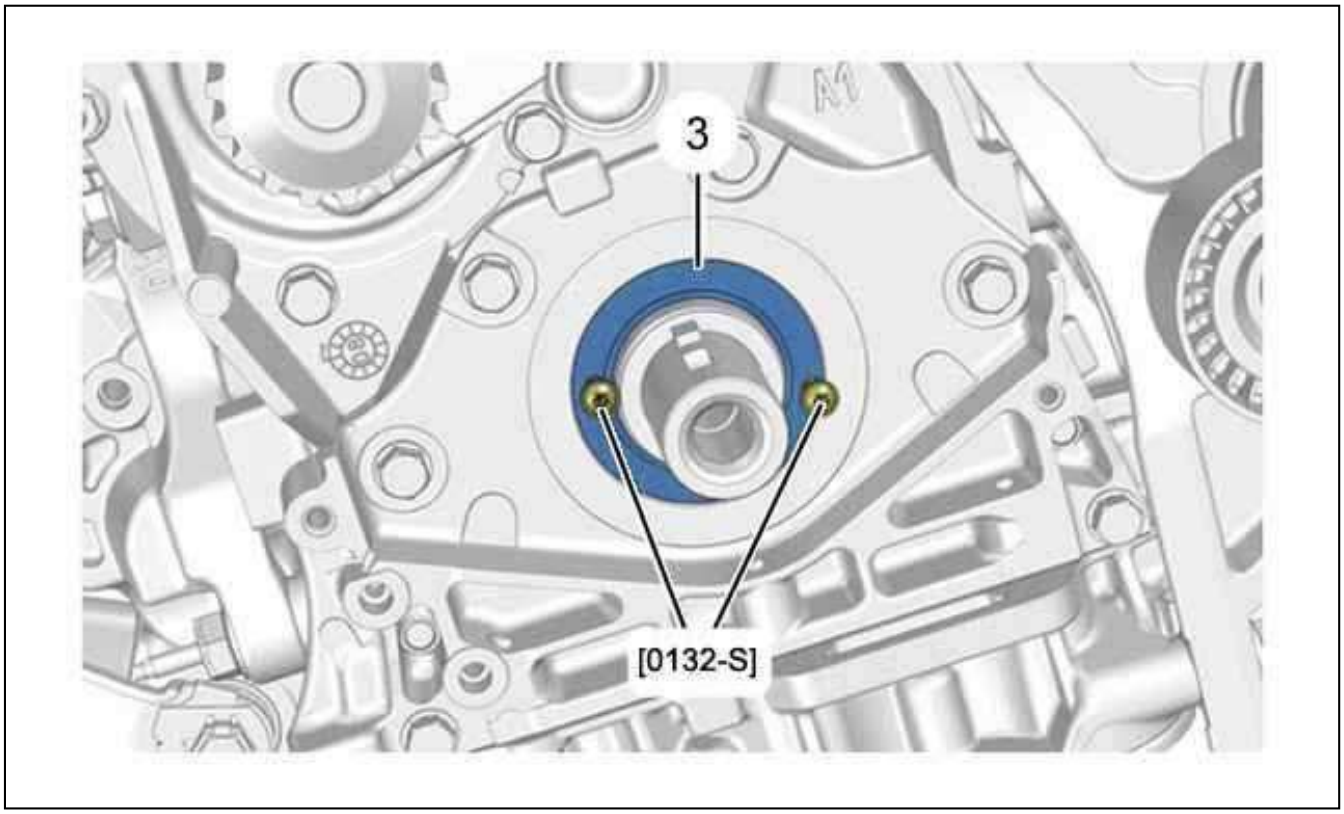


Figure : B1BG08QD

Remove :

- The timing belt
- The crankshaft gear (2)
- The cotter (1)



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Figure : B1BG0XFD

Drill 2 holes, diameter 3,5 mm, in the ring seal (3).
Screw 2 bolts of the tool [0132-S] in the holes.
Extract the seal ; Using pliers.

2.2. Crankshaft ring seal(Flywheel side)

Remove :

- The gearbox
- The clutch mechanism (According to gearbox)
- The flywheel or drive plate (According to gearbox)

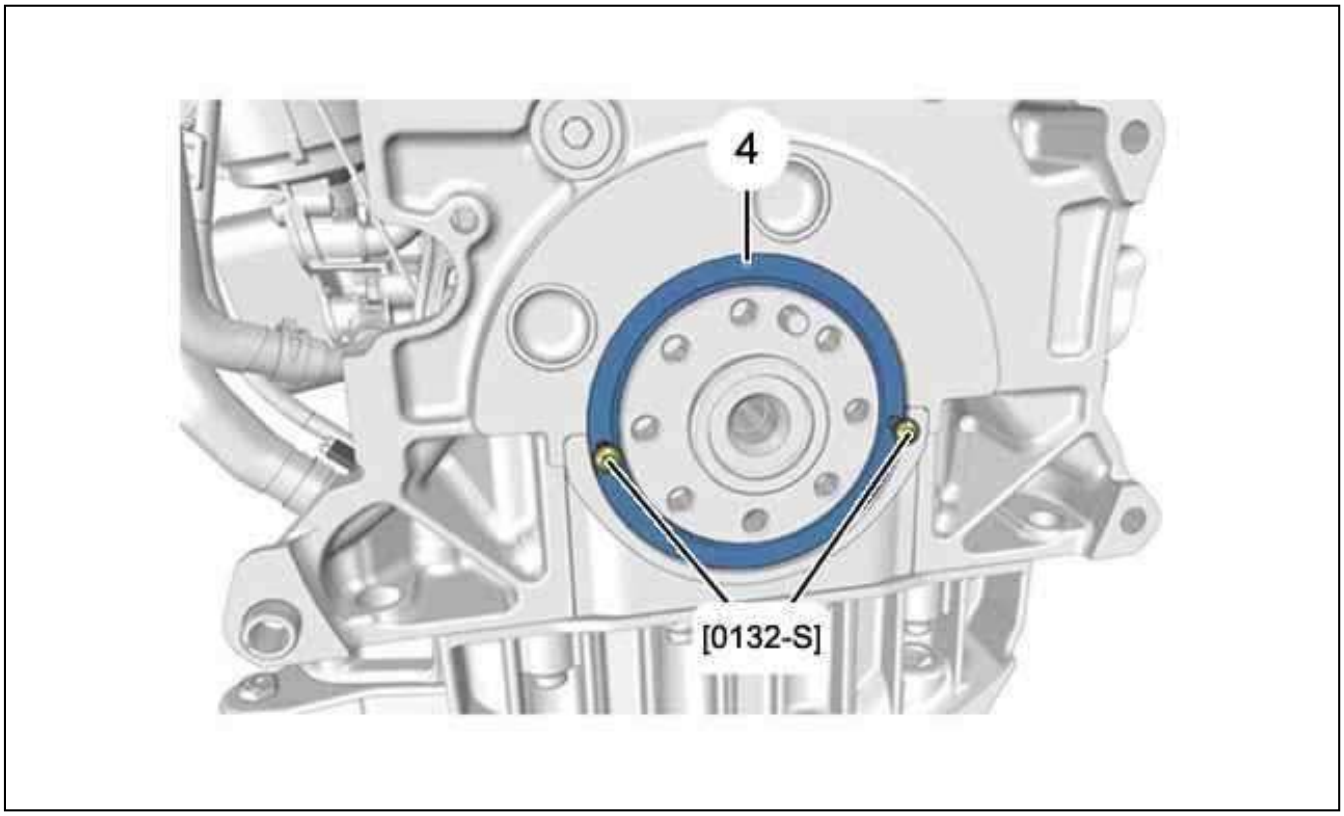


Figure : B1BG0XID

Drill 2 holes, diameter 3,5 mm, in the ring seal (4).
Screw 2 bolts of the tool [0132-S] in the holes.
Extract the seal ; Using pliers.

2.3. Camshaft oil seal

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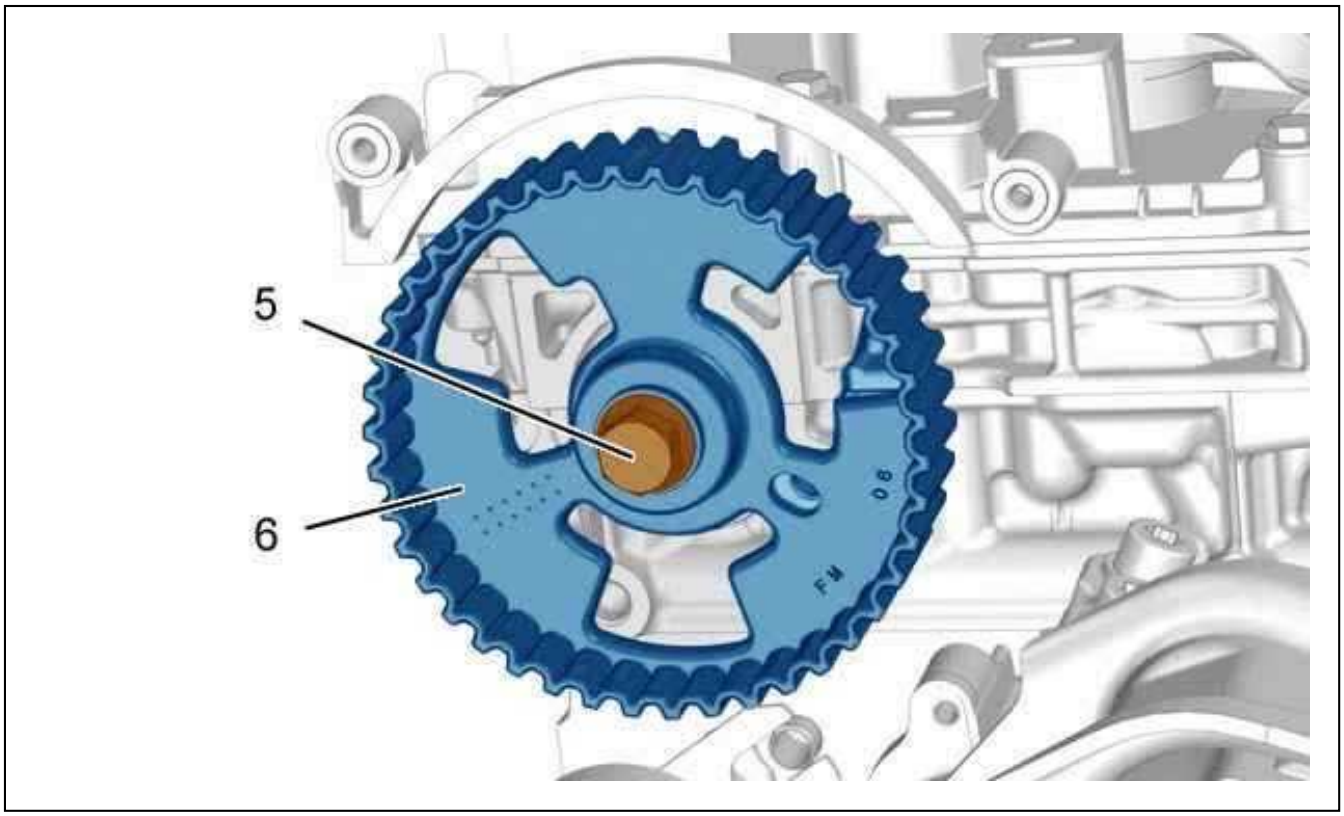


Figure : B1BG0W2D

CAUTION : Do not rest on the target of the camshaft position sensor with the tool [0132-AA].

Slacken the bolt (5).
Immobilise the camshaft pulley (6) ; Using tool [0132-AA].
Remove :

- The (5) bolt
- The camshaft pulley (6)

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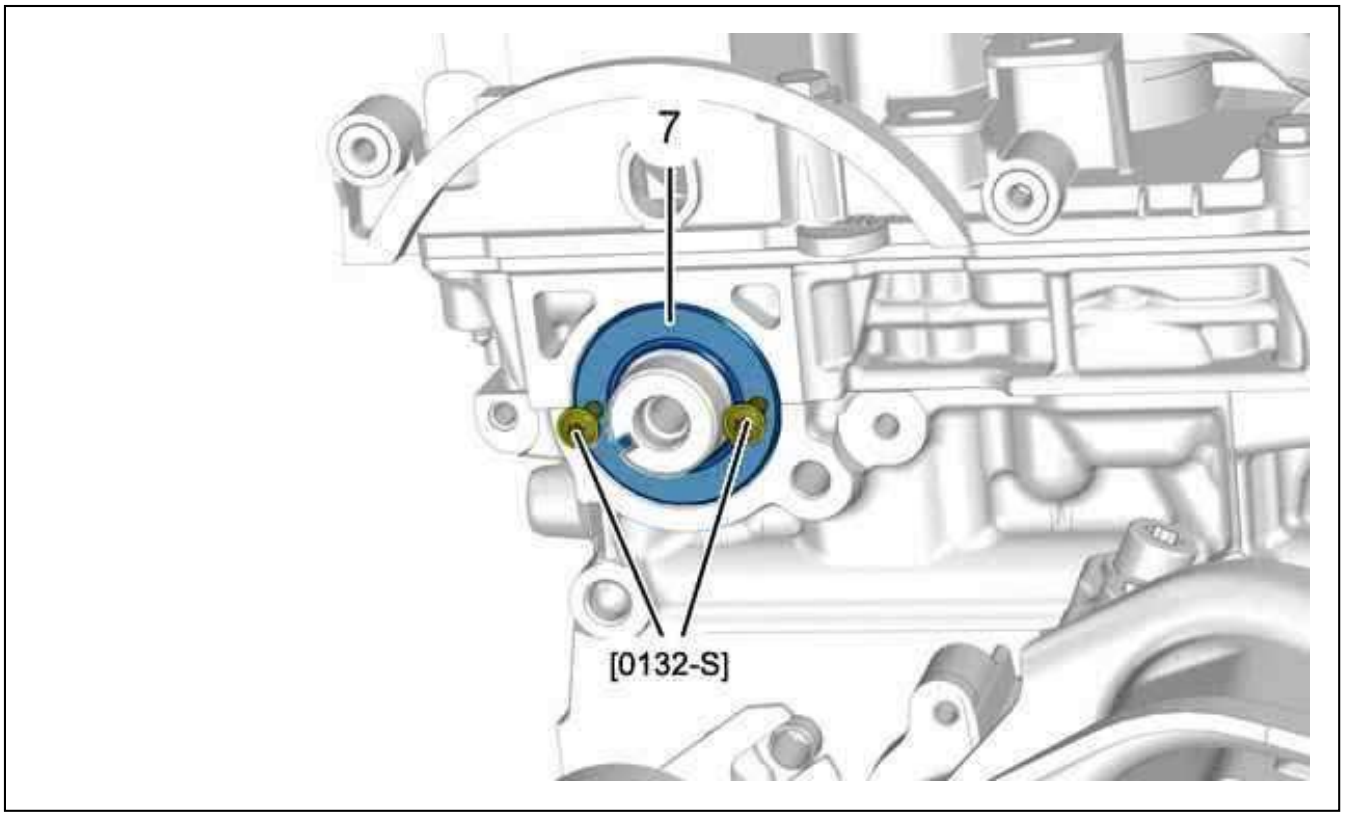


Figure : B1BG0W3D

Drill 2 holes, diameter 3,5 mm, in the ring seal (7).
Screw 2 bolts of the tool [0132-S] in the holes.
Extract the seal ; Using pliers.

3. Refitting

CAUTION : Check the absence of any mark on the bearings of the sealing ring.

CAUTION : Adhere to the tightening torques.

3.1. Camshaft oil seal

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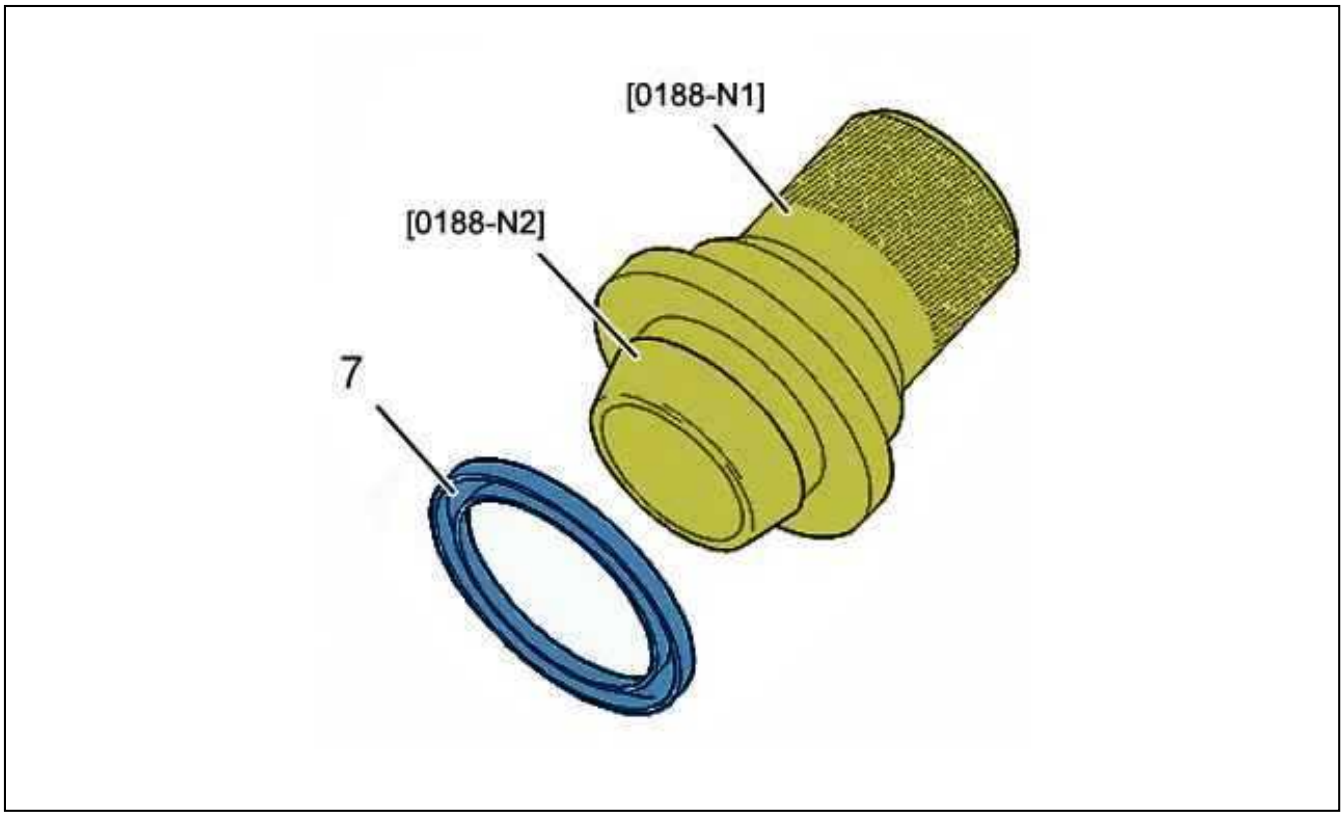


Figure : B1BG0XOD

Use the cone [0188-N2] to fit the sealing ring on the tool [0188-N1].

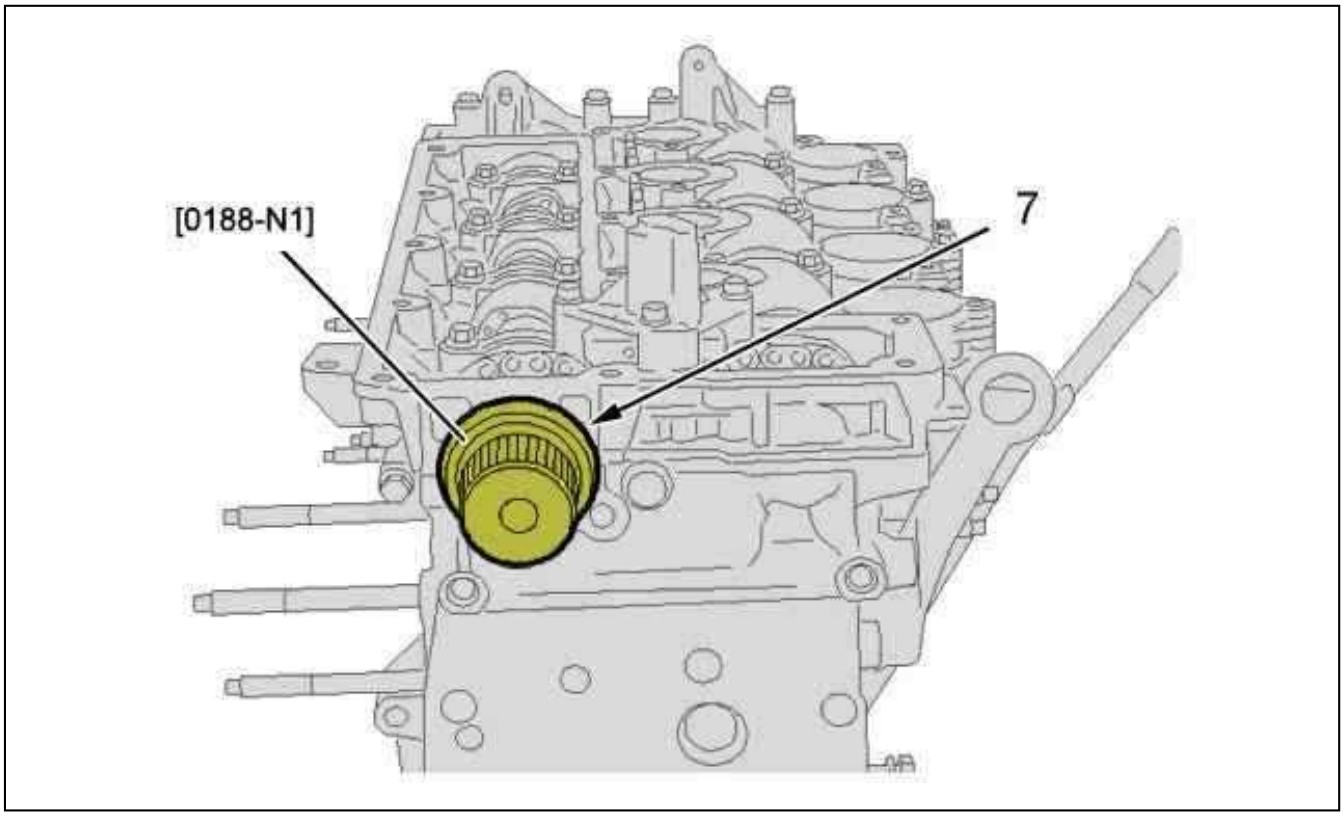


Figure : B1BG0XRD

Fit the new oil seal (7) ; Using the tool [0188-N1] and the bolt (5).

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CAUTION : Do not rest on the target of the camshaft position sensor with the tool [0132-AA].

Refit :

- The camshaft pulley (6)
- The (5) bolt ; Tighten to the specified torque

3.2. Crankshaft ring seal(Timing gear side)

CAUTION : The new seal has its own fitting cone. Do not separate this assembly before positioning the seal.

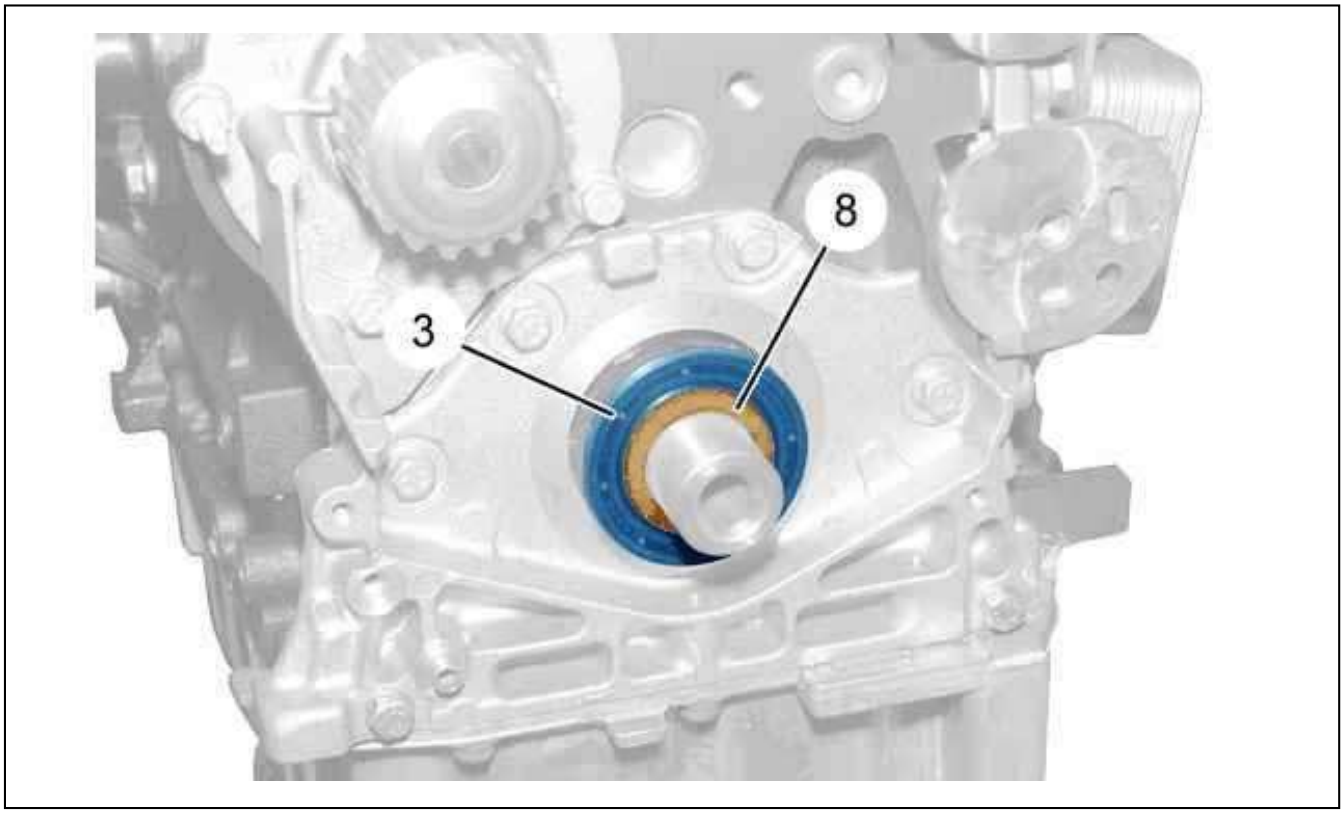


Figure : B1BG0W9D

CAUTION : Dry fitting ; Do not lubricate the exterior of the sealing ring.

Position the seal (3) complete with its fitting cone (8).

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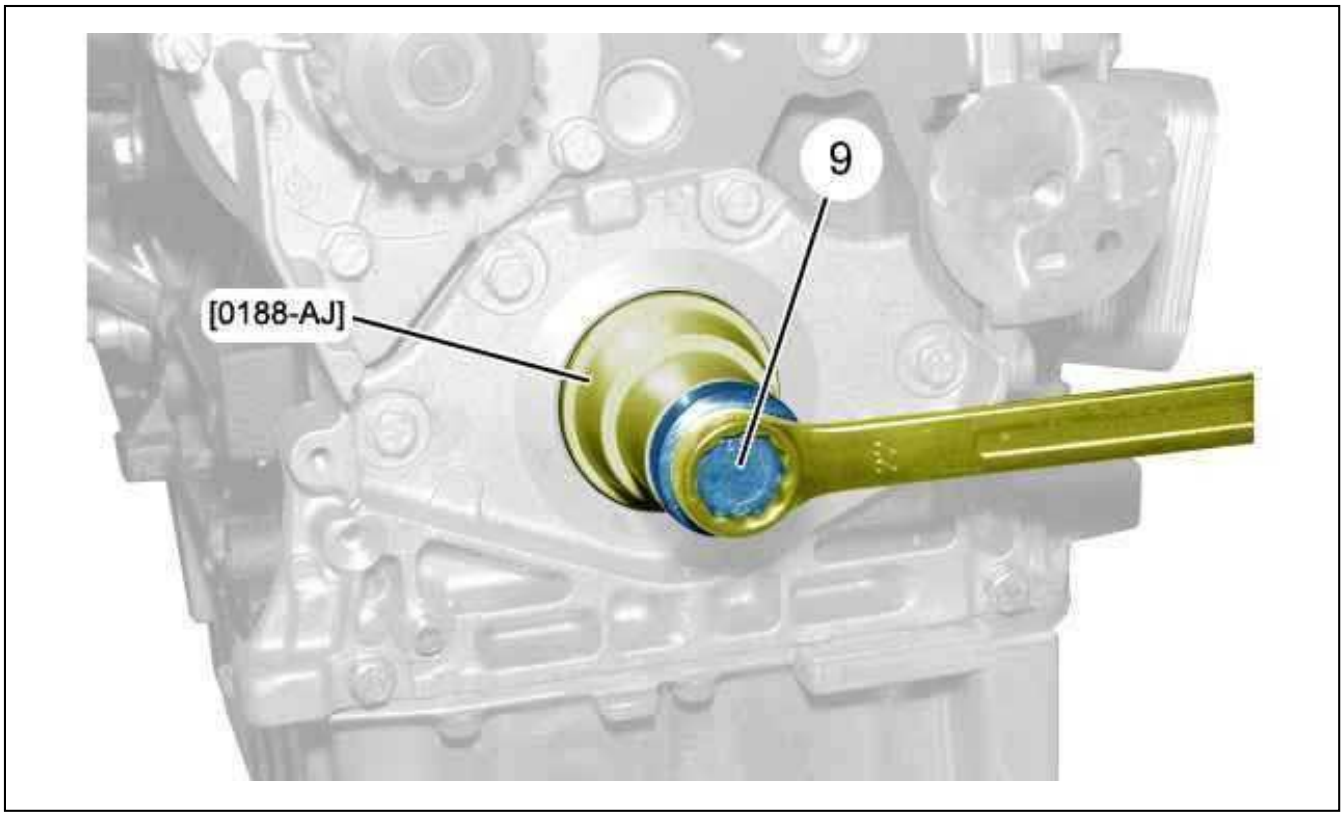


Figure : B1BG2OLD

Fit the tool [0188-AJ].
Tighten the ancillary drive pulley fixing bolt (9).
Remove :

- The bolt (9)
- The tool [0188-AJ]
- The fitting cone (8)

Refit :

- The cotter (1)
- The crankshaft gear (2)
- The timing belt

3.3. Crankshaft ring seal(Flywheel side)

CAUTION : The new seal has its own fitting cone. Do not separate this assembly before positioning the seal.

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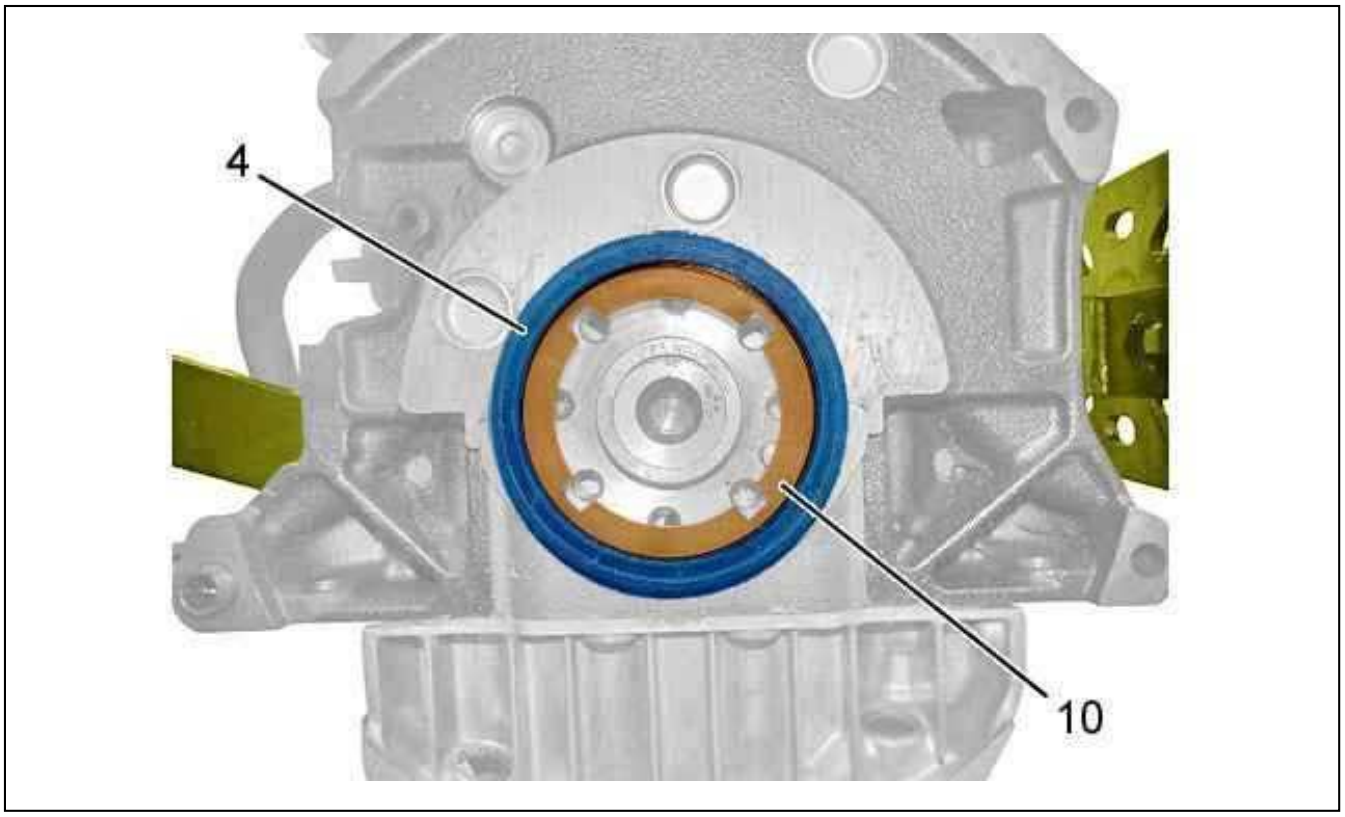


Figure : B1BG2GGD

CAUTION : Dry fitting ; Do not lubricate the exterior of the sealing ring.

Position the seal (4) complete with its fitting cone (10).

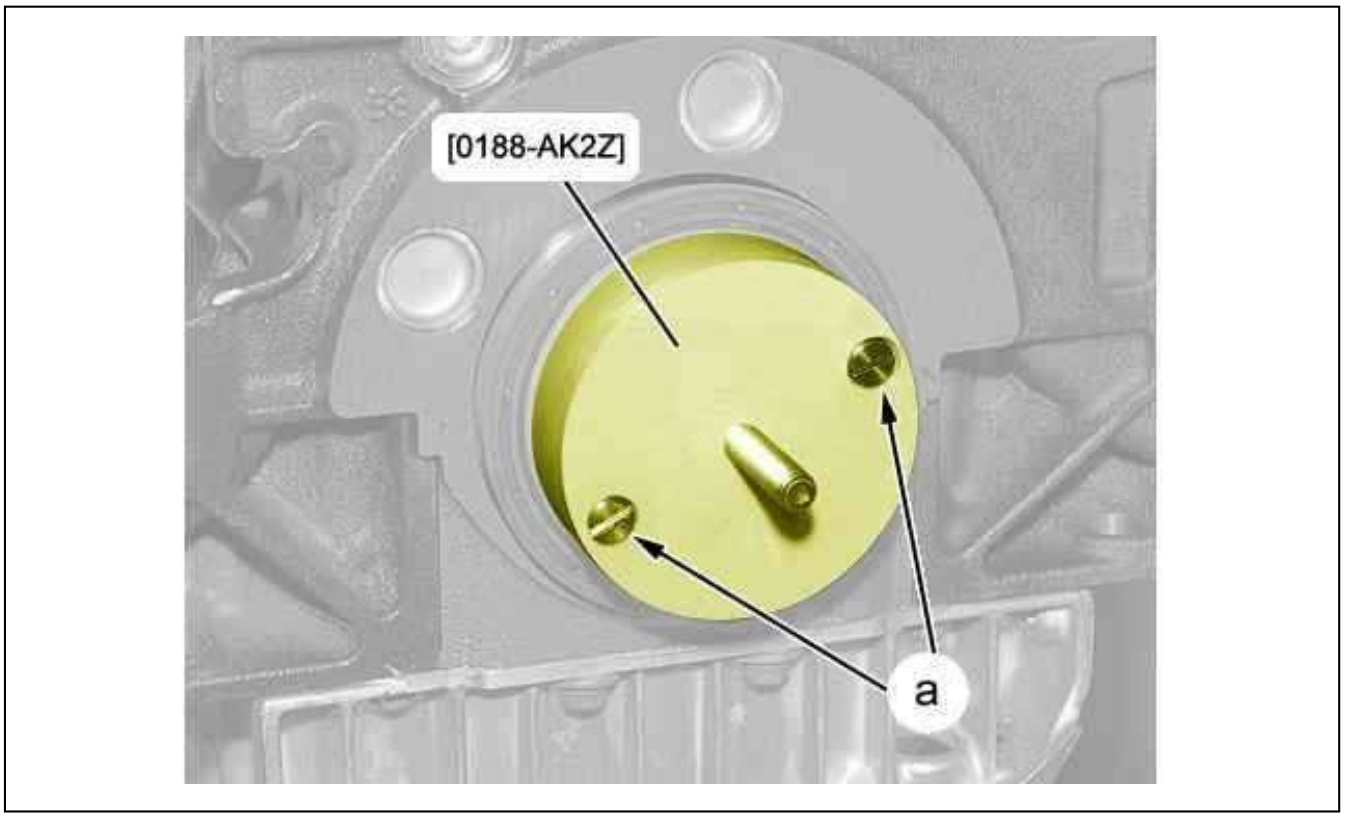


Figure : B1BG2GHD

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Fit :

- The tool [0188-AK2]
- The bolts "a"

Fix the tool [0188-AK2Z] on the crankshaft (The new bolts tightened to "a" dan.m (pre-coated with thread lock)).

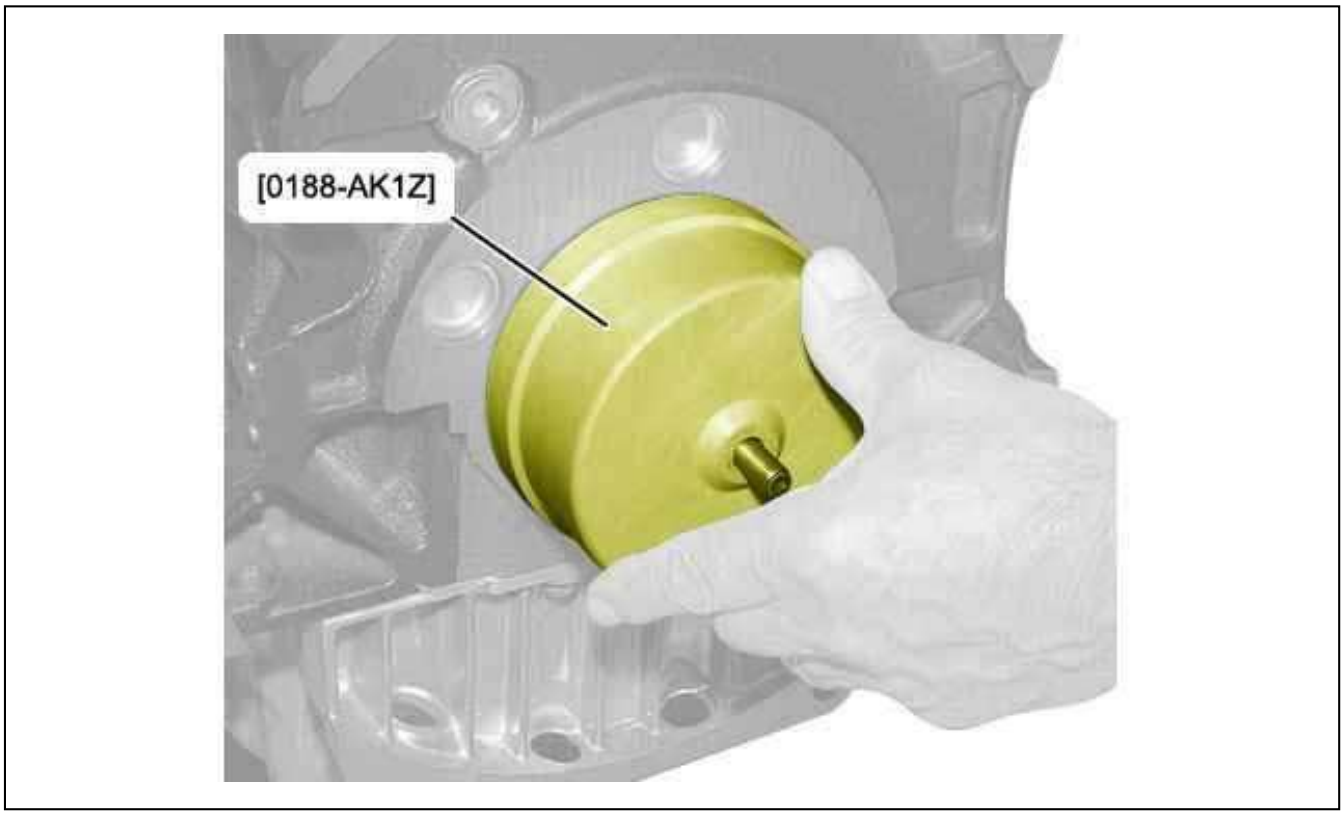


Figure : B1BG2GID

Fit the tool [0188-AK1Z].

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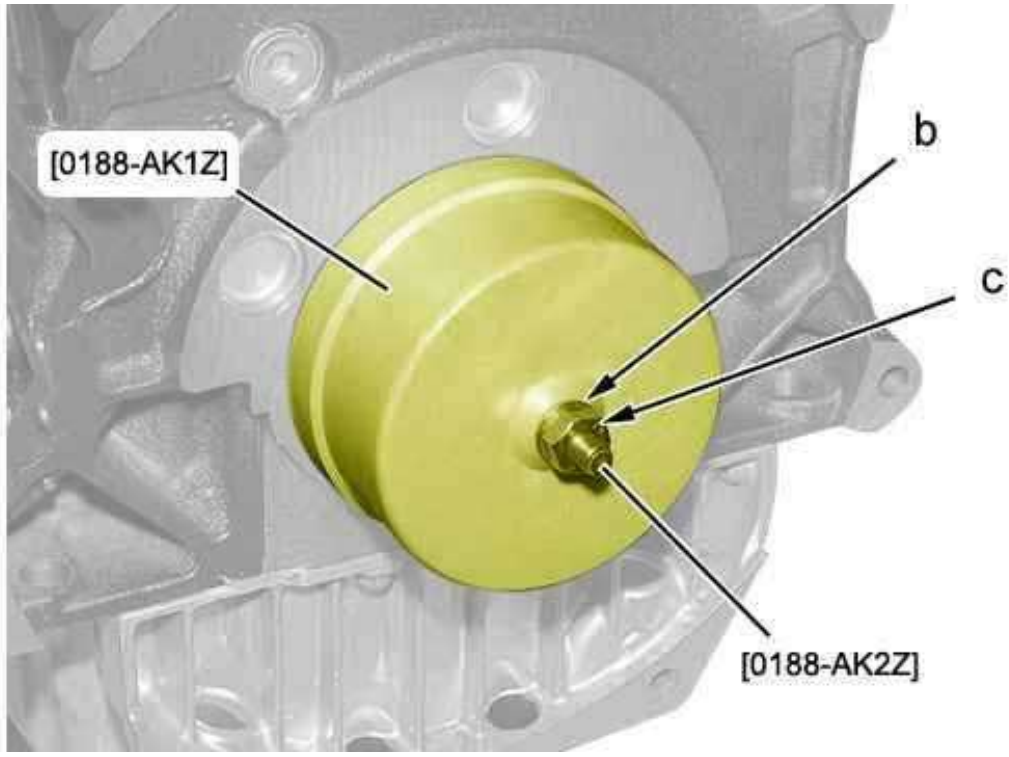


Figure : B1BG2GJD

Position :

- The washer "b"
- The nut "c"

Tighten the nut "c".

Remove :

- The nut "c"
- The washer "b"
- The tool [0188-AK1Z]
- The bolts "a"
- The tool [0188-AK2Z]
- The fitting cone (10)

Refit :

- The flywheel or drive plate (According to gearbox)
- The clutch mechanism (According to gearbox)
- The gearbox

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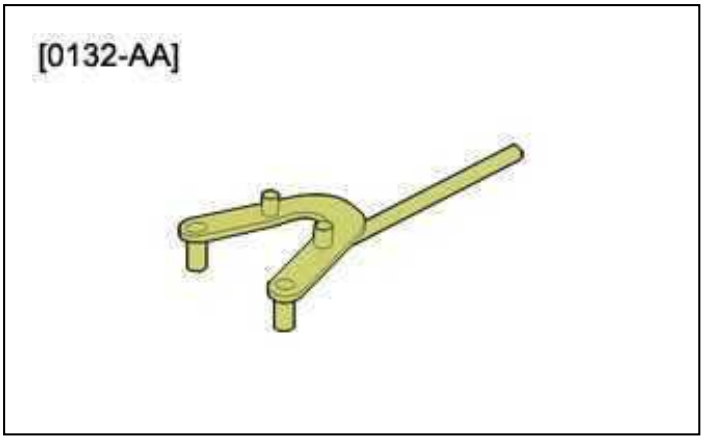
REFITTING : ENGINE TOP

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment :

- Valve spring compressor (Type FACOM U.43 LA)
- Cup thrust pad (Type FACOM SP 18380)
- dial gauge
- dial gauge support

tool	Reference	Designation
 Figure : E5AB0DDT	[0132-AA]	Tool for immobilisation of the notched belt sprocke
 Figure : E5AMXYMT	[0132-W]	Tool for fitting valve stem seals
	[0188-AD]	belt clamp

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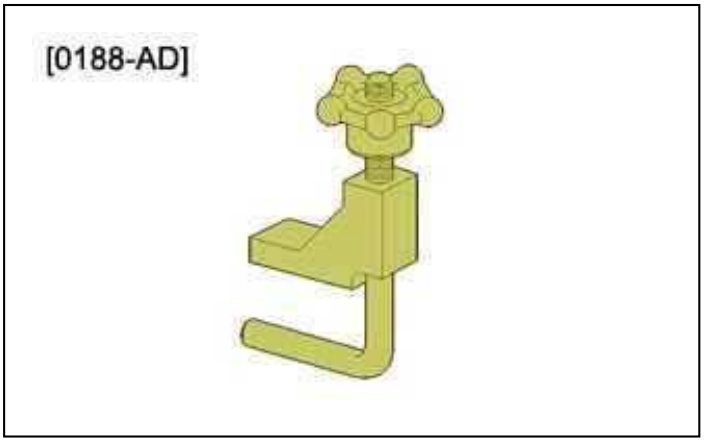


Figure : E5AB0FQT

[0188-AH]	Pulley centring tool

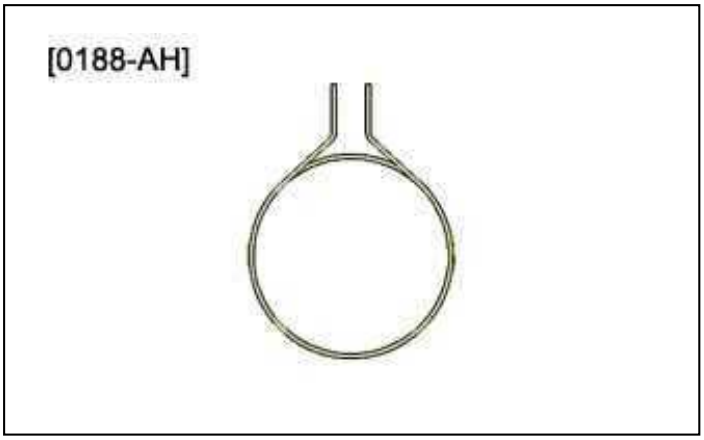


Figure : E5AB0FRT

[0188-F]	flywheel stop

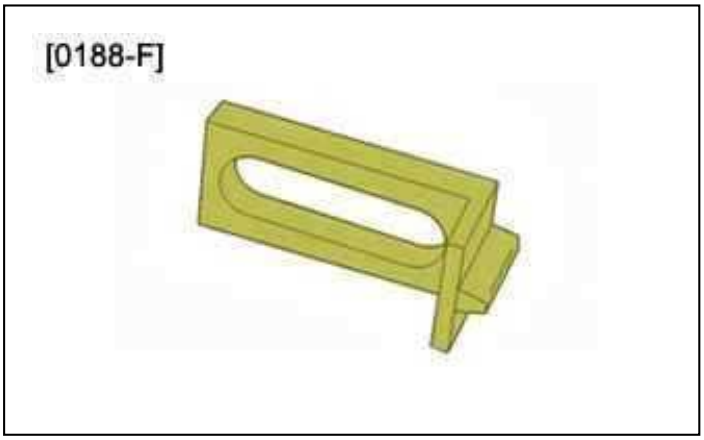


Figure : E5AB0DRT

[0188-M]	Peg for setting camshaft pulley

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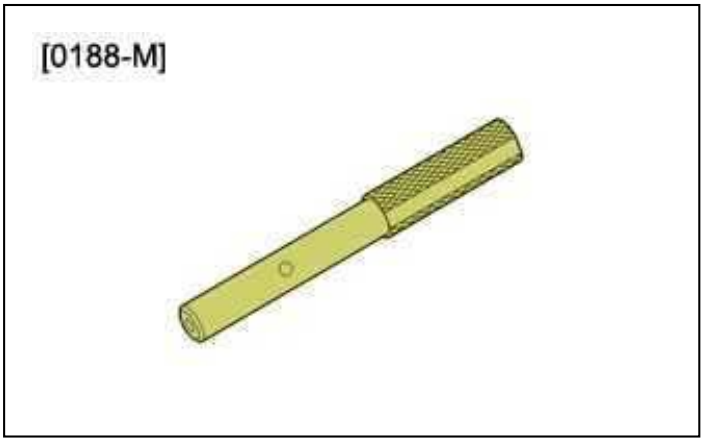


Figure : E5AB0FOT

[0188-Q2]	setting rod for dynamic roller

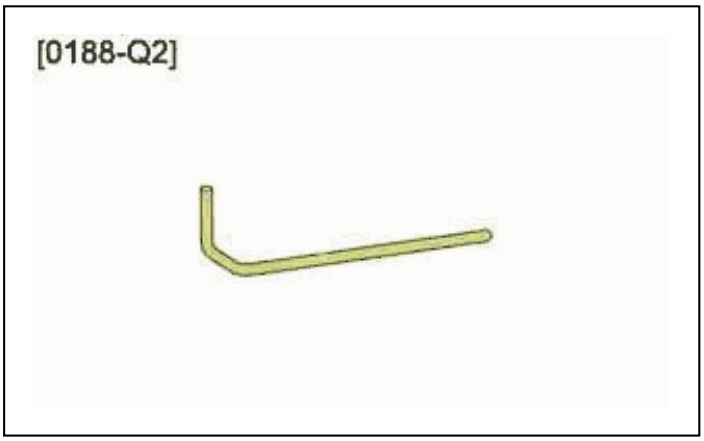


Figure : E5AG05MT

[0188-Y]	flywheel locking tool

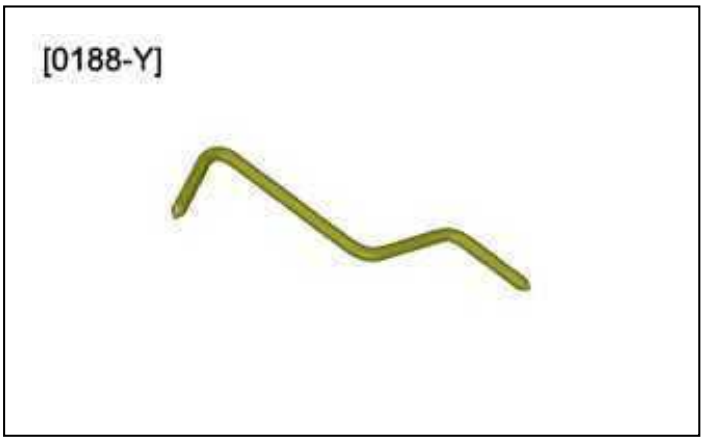


Figure : E5AB0D0T

[0004]	lifting bench

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Figure : E5AB05KT

	[0005-C]	set of retaining supports (RH)
	[0005-G]	set of retaining supports (Adjustable supports)

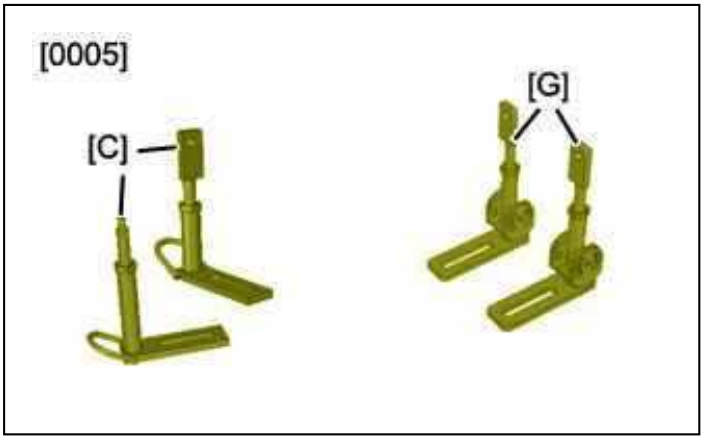


Figure : E5AB0EJT

2. Precautions to be taken before re-assembly

CAUTION : Take note of the points listed below.

Before refitting :

- Each component must be checked and then cleaned before being refitted
- Clean the gasket faces with an approved descaling product ; Do not use abrasives or sharp tools on the joint faces ; The gasket faces must not have any traces of knocks or scores
- Clean the bolt threads and taps before refitting
- Always replace all the seals

3. Refitting

CAUTION : Adhere to the tightening torques .

3.1. Refitting : valves

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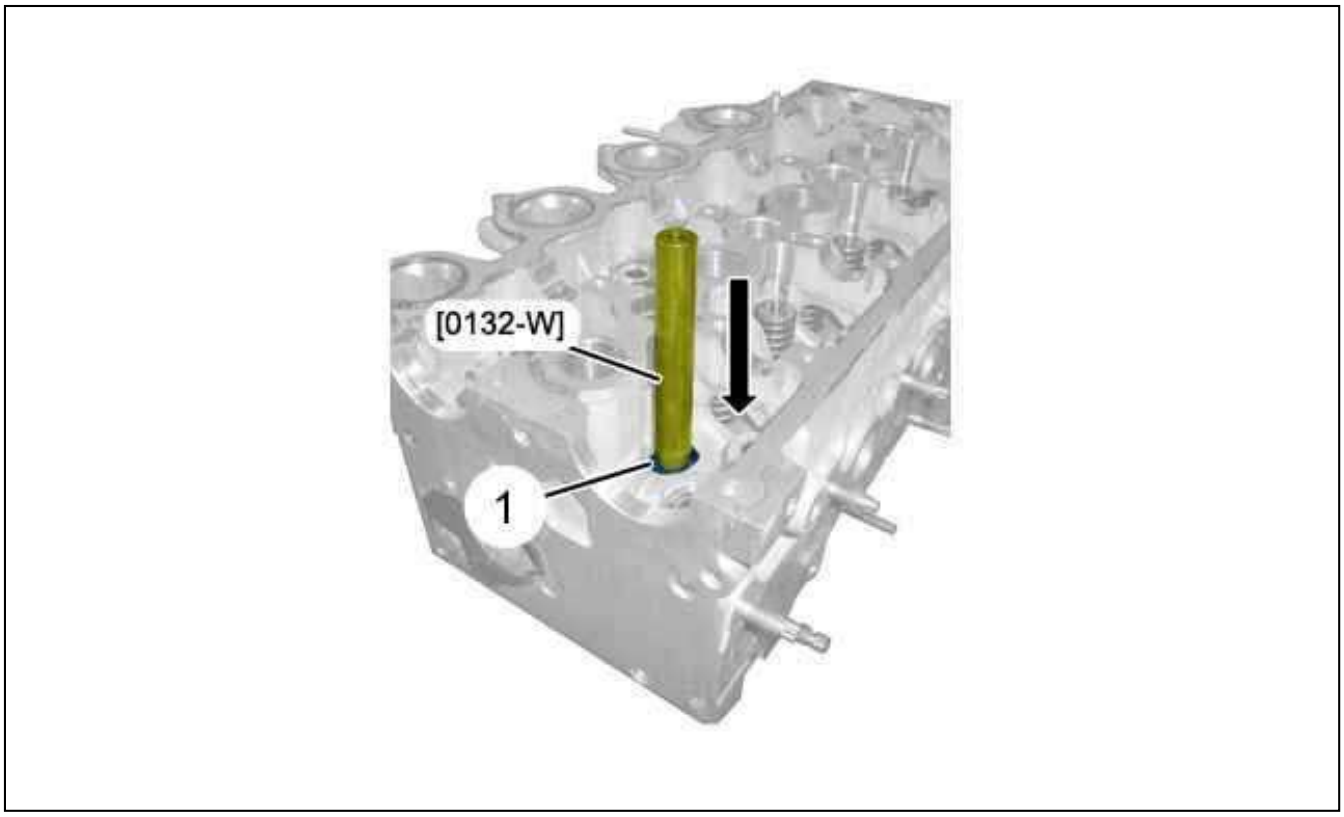


Figure : B1BG2ORD

Refit : The valve stem seals (1) ; Using tool [0132-W].

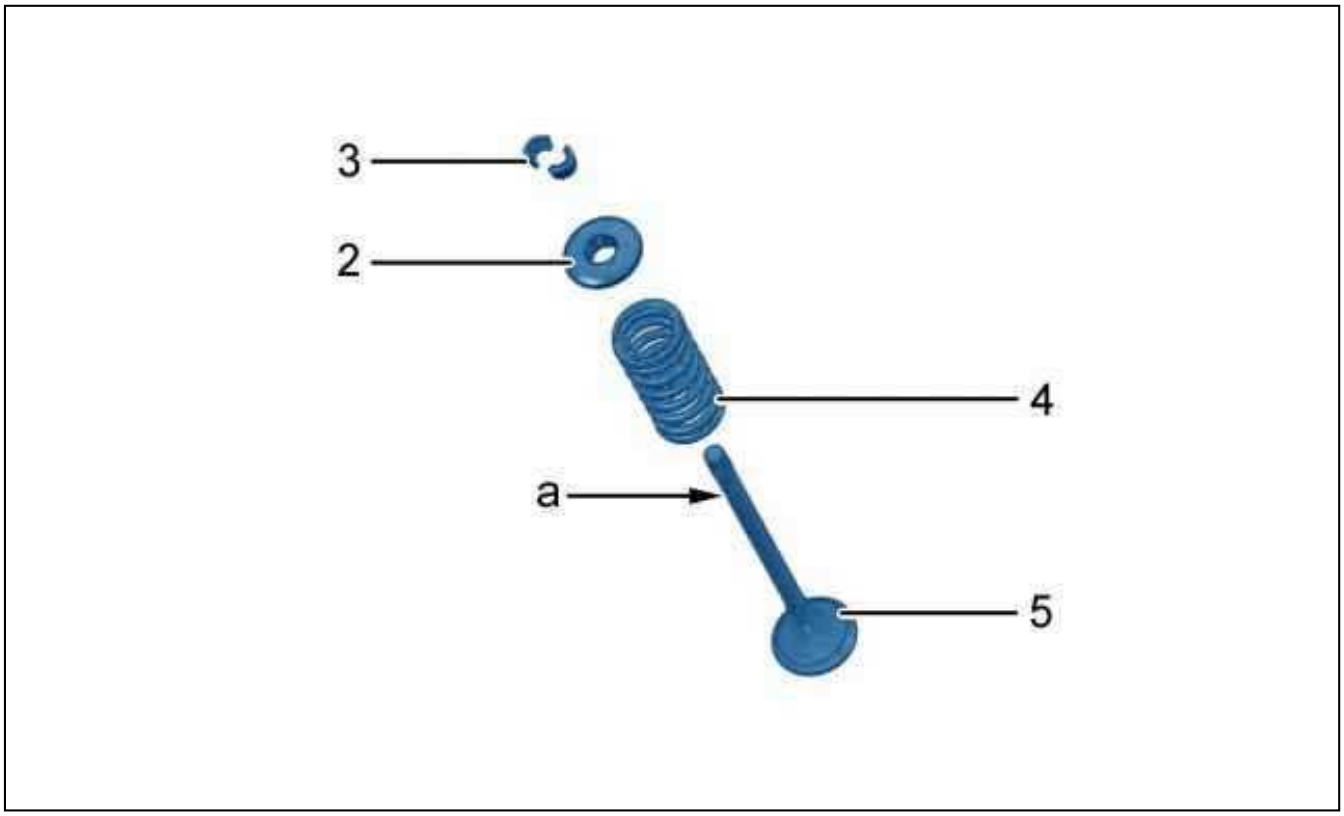


Figure : B1BG2OSD

(3) collets.

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CAUTION : If a valve is replaced, it requires bedding in.

Apply oil evenly on the valve stems (at "a").

CAUTION : If they are being re-used, keep to the positions of the valves as marked on removal.

Refit ; Valve by valve :

- The valve (5)
- The spring (4)
- The cup (2)

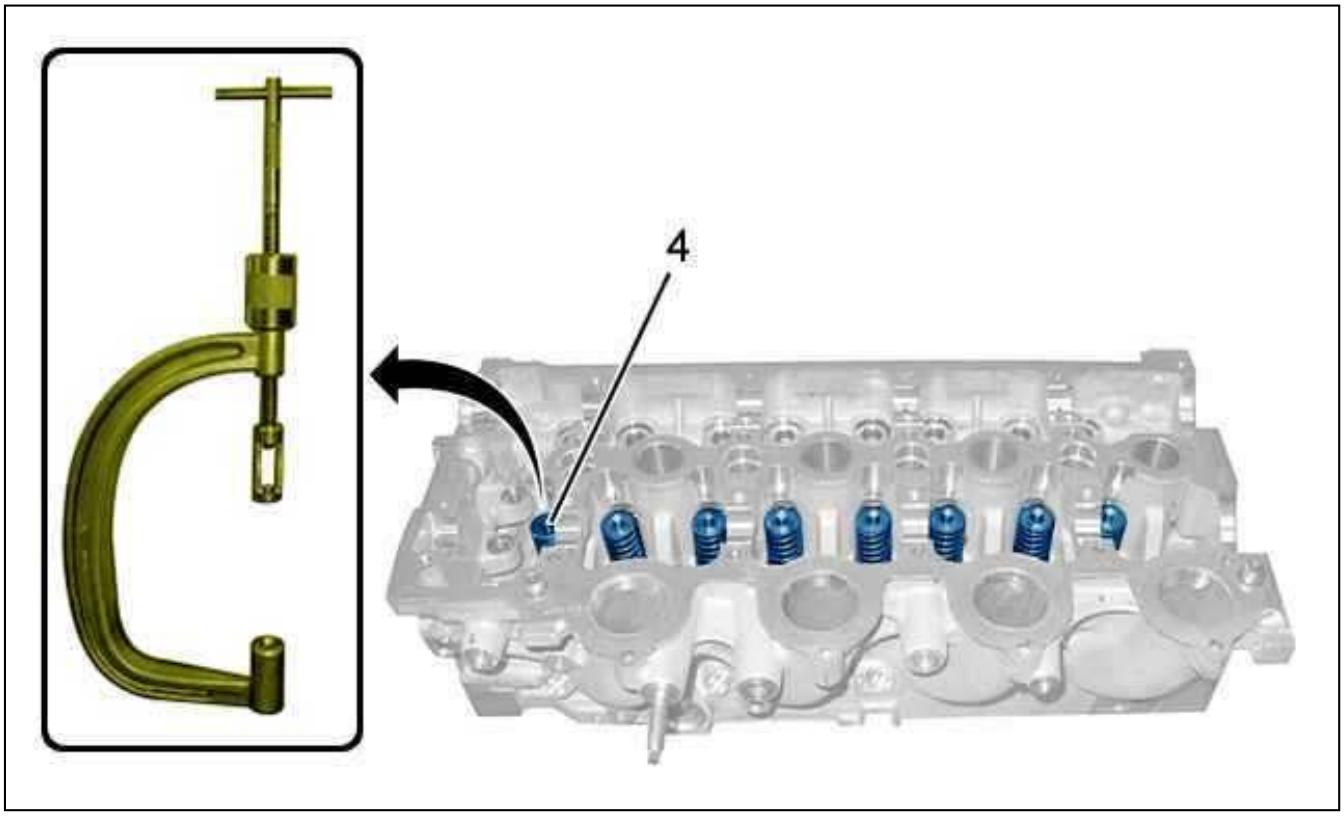


Figure : B1BG2OYD

Compress the valve springs (4) ; Using the valve spring compressor.
Refit the half cones (3).
Repeat the operation for each valve.

3.2. Piston protrusion

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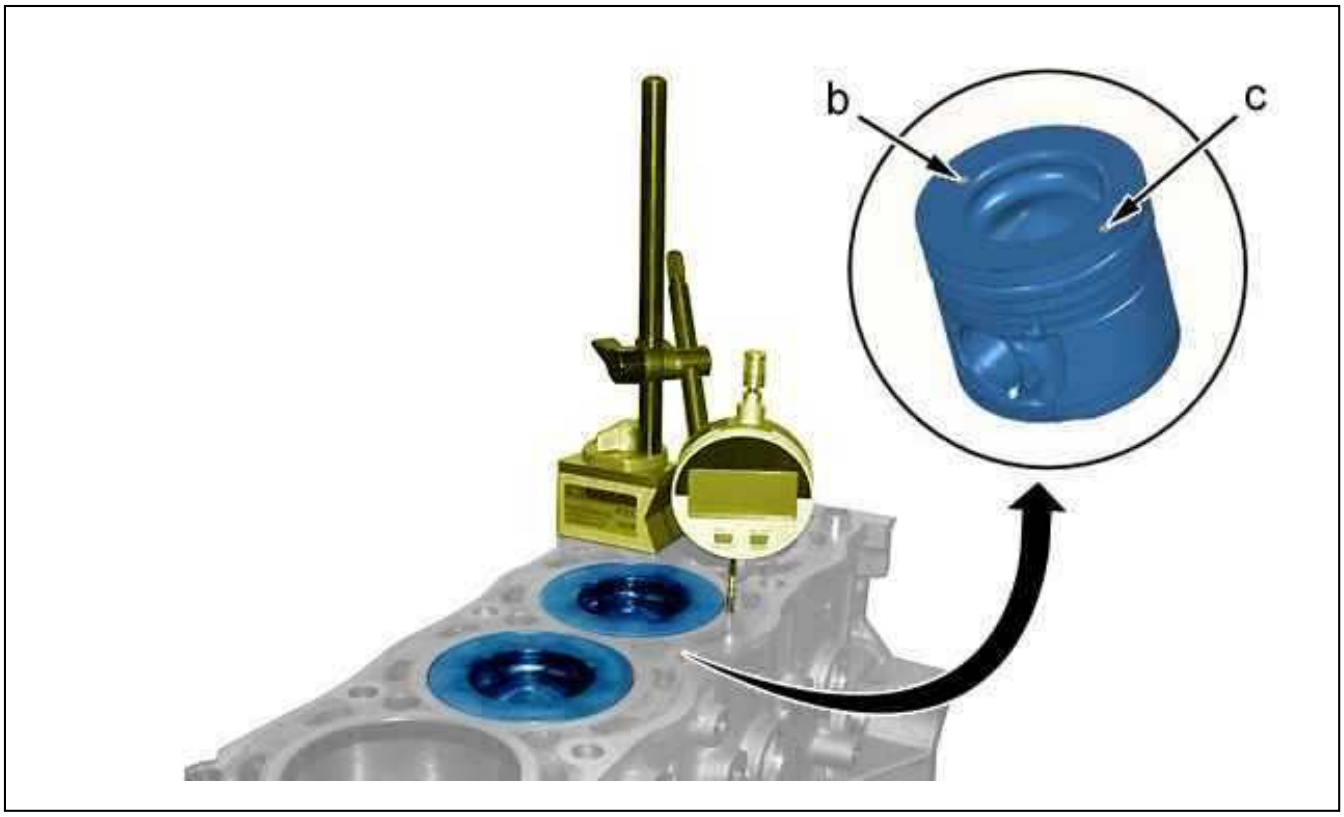


Figure : B1DG0OLD

CAUTION : The sealing surfaces must be perfectly clean : No signs of impact, no traces of scaling permitted.

Place the pistons of cylinders 1 and 4 at top dead centre ; Using the dial gauge.
Note down the stand-proud of the pistons in relation to the cylinder block seal face.
Pistons 1 - 4 :

- Place the dial gauge in a stable position on the cylinder block gasket face
- Set the dial gauge to zero
- Move the dial gauge over the 2 control points "b", "c" (Piston) (10 mm from the edge) ; Read the values
- Calculate the average of the 2 values measured

Pistons 2 - 3 : Repeat the operation.

CAUTION : Use the highest piston as a reference : Minimum variation between two consecutive cylinders = 0,07 mm.

3.3. Choice of cylinder head gasket

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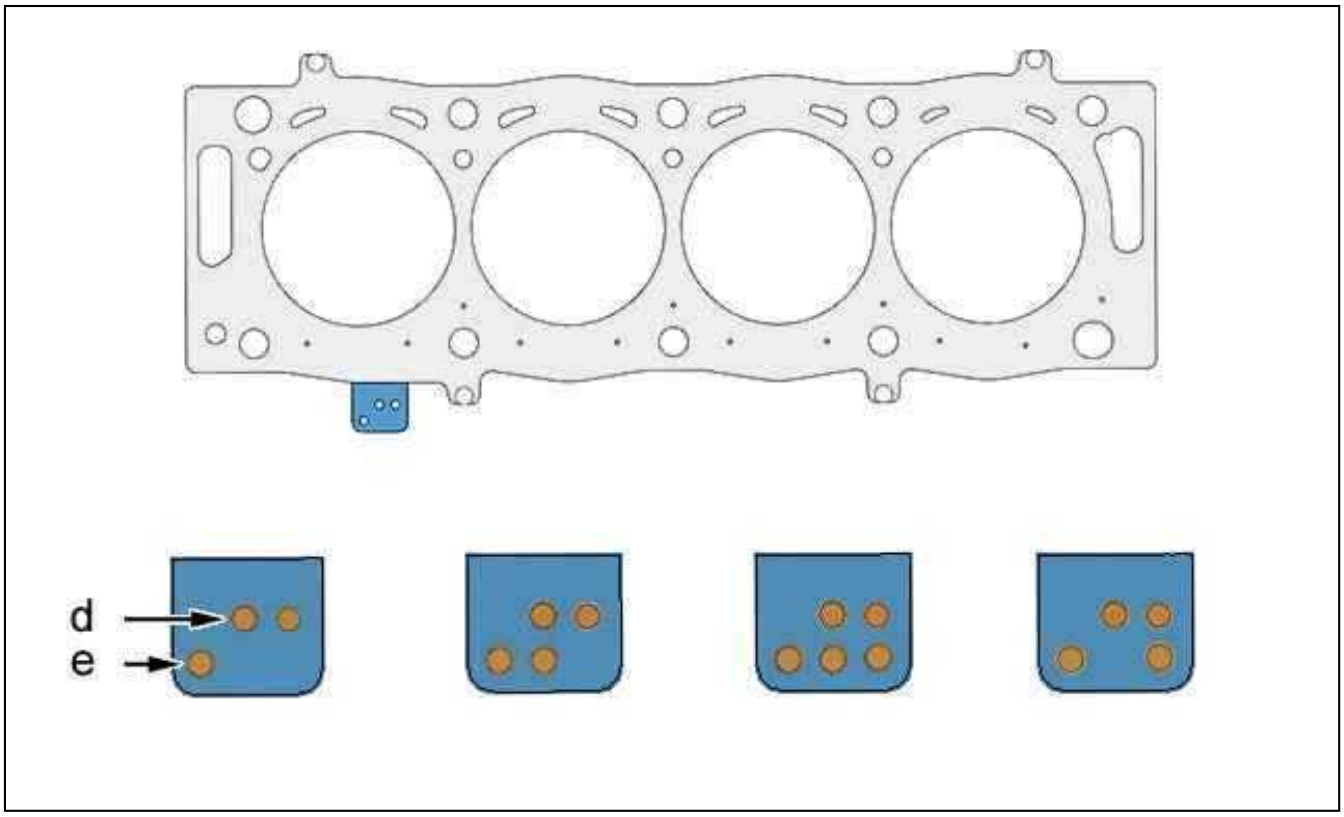


Figure : B1DG030D

"d" : Engine identification marking.
"e" : Gasket thickness identification.

N.B. : There are 4 classes of laminated metal cylinder head gaskets.

If the value read does not correspond to the values specified, look for the source of the fault (Reading or handling error)

Classes of multi-layer metallic cylinder head gasketsPiston protrusion measurements				
	Gasket thickness	Number of holes at "e"		
From 0,550 mm inclusive to 0,600 mm inclusive	1,25 ± 0,05 mm	X		
From 0,601 mm inclusive to 0,650 mm inclusive	1,30 ± 0,05 mm	X	X	
From 0,651 mm inclusive to 0,700 mm inclusive	1,35 ± 0,05 mm	X	X	X
From 0,701 mm inclusive to 0,750 mm inclusive	1,40 ± 0,05 mm	X		X

3.4. Refitting : Cylinder head

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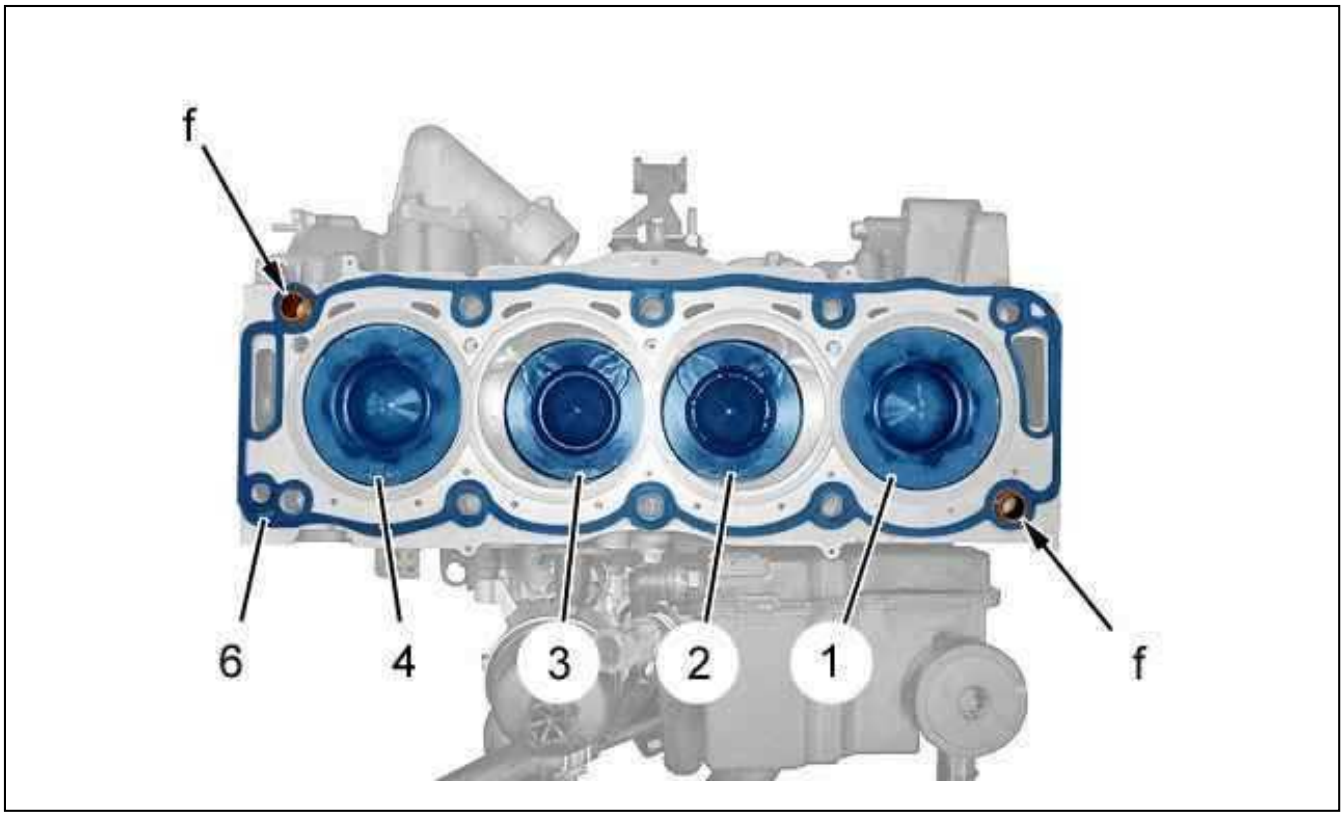


Figure : B1BG2P0D

CAUTION : Check that the centring pins are present (as "f").

Position :

- The cylinder head gasket chosen (6) ; As in the figure
- The pistons no. 1 and no. 4 at top dead centre

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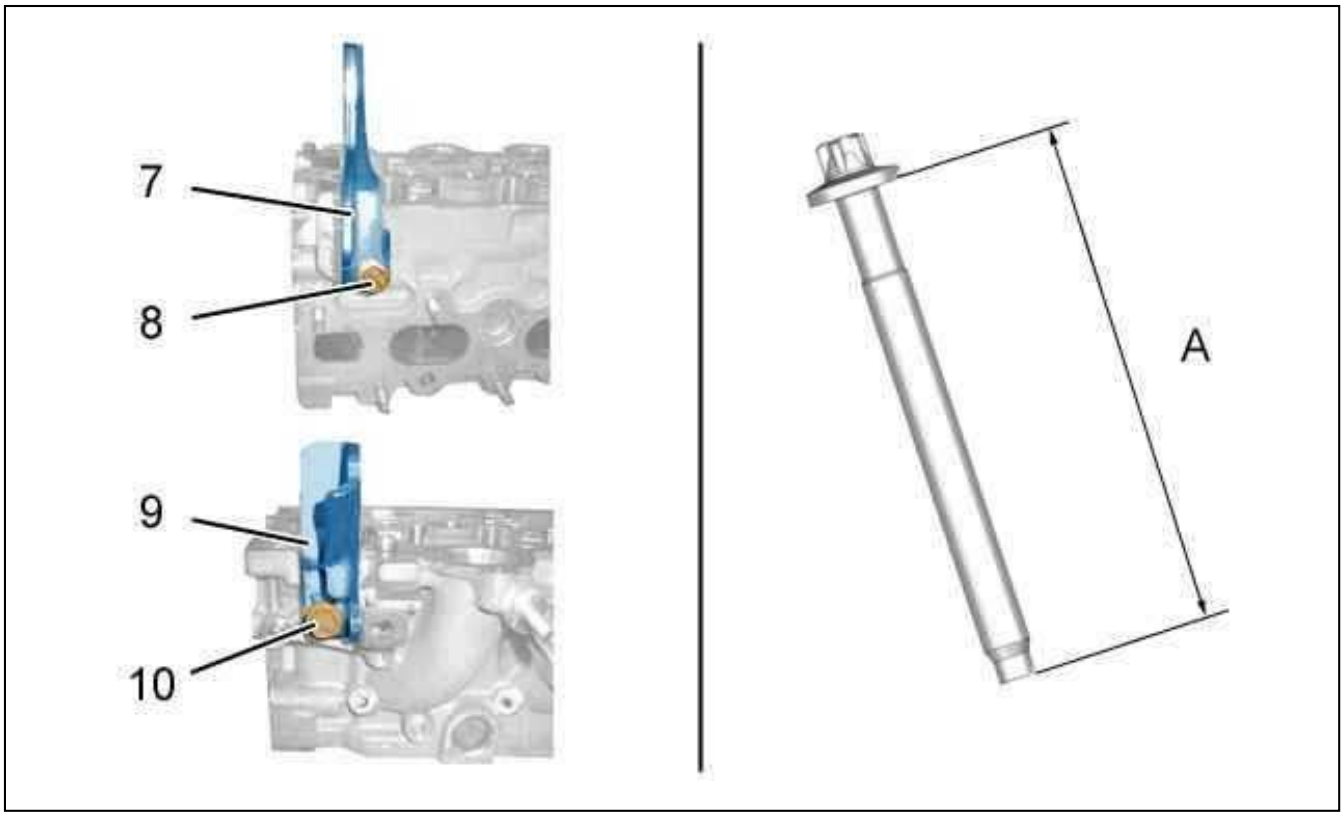


Figure : B1BG2P1D

CAUTION : The cylinder head bolts can only be re-used once maximum.

Check the length of the cylinder head bolts.
The length of bolts under heads "A" must be less than or equal to 128 mm.
Refit :

- The lifting ring (7) on the rear face of the cylinder head
- The bolt (8) ; Tighten to the specified torque
- The lifting ring (9) on the front face of the cylinder head
- The bolt (10) ; Hand-tighten a few turns

3.5. Cylinder head tightening

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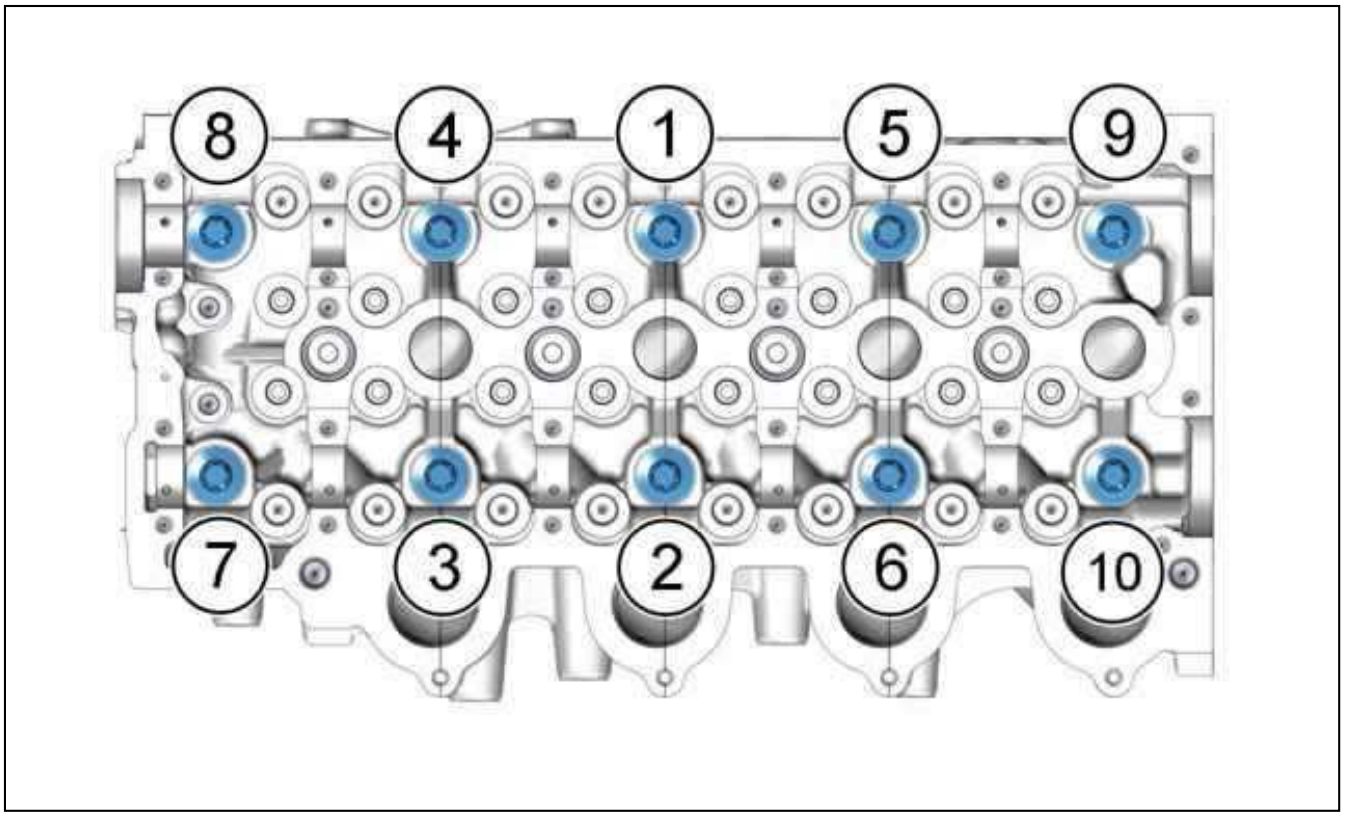


Figure : B1DG032D

Refit :

- The cylinder head
- The cylinder head bolts

CAUTION : Follow the tightening sequence.

Tightening procedure :

- Pre-tighten the cylinder head bolts
- Tighten the cylinder head bolts to the correct torque
- Angular-tighten the cylinder head bolts

CAUTION : Check that the tightening torque for the cylinder head bolts is greater than 10 m.daN.

3.6. Refitting : Valve rockers

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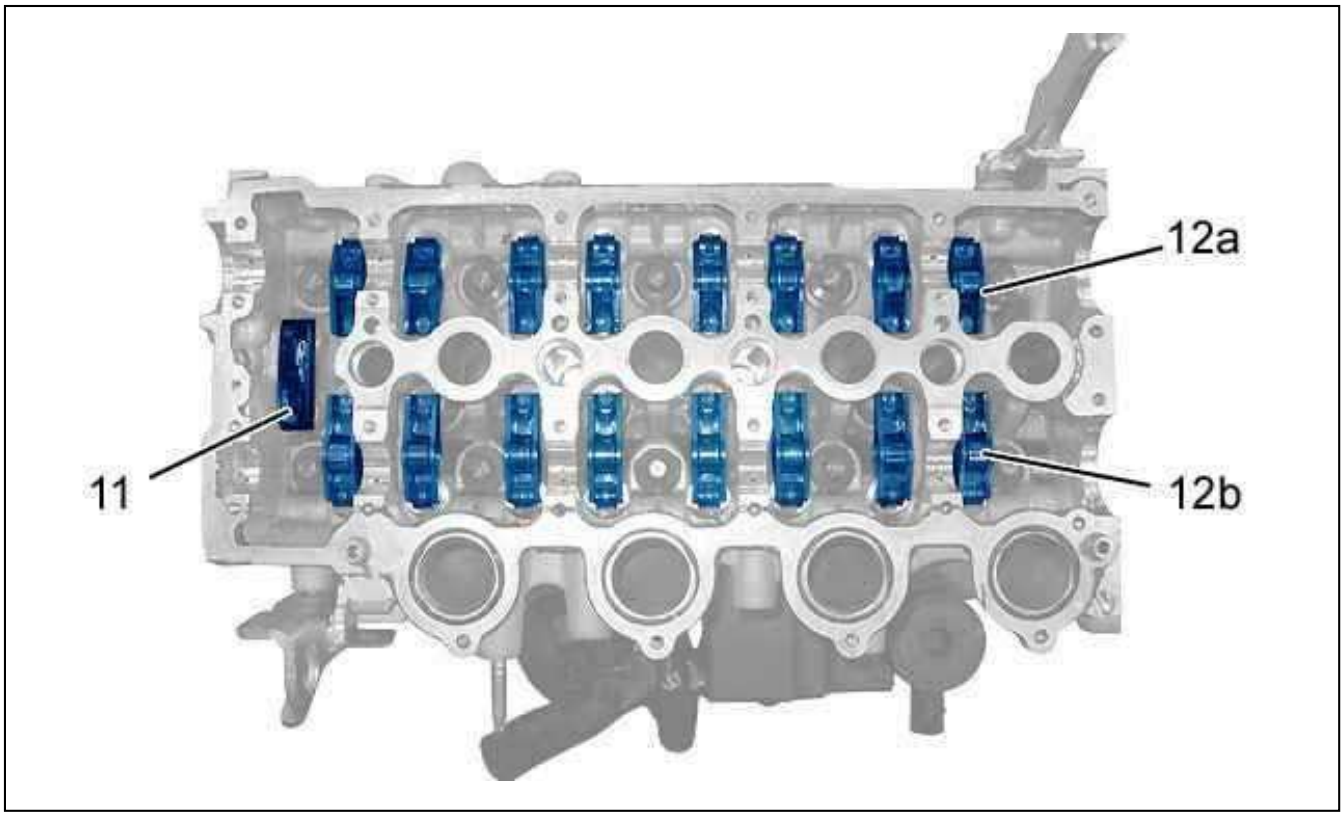


Figure : B1BG2P3D

CAUTION : If they are being re-used, keep to the positions of the valve rockers as marked on removal.

Refit :

- The short valve rockers (12a) (exhaust side) ; With the tappets
- The long valve rockers (12b) (inlet side) ; With the tappets
- The slide pad (11)

3.7. Refitting : Camshafts

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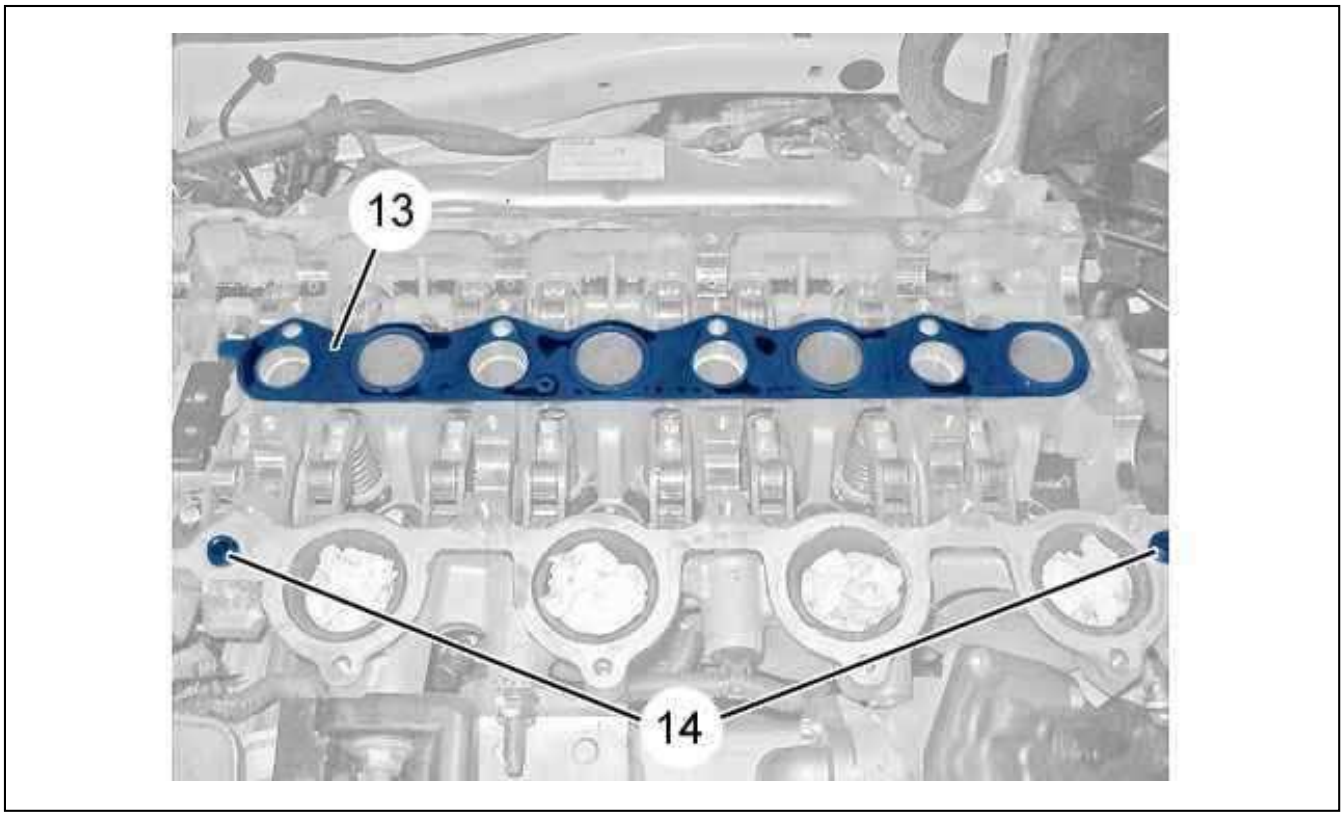


Figure : B1BG2P6D

CAUTION : Take care to fit the gasket (13) the correct way round (See figure(s)).

Refit the seal (13).

N.B. : Fit the injector centring rings to centre the seal (13).

Check the presence of the centring pins (14).

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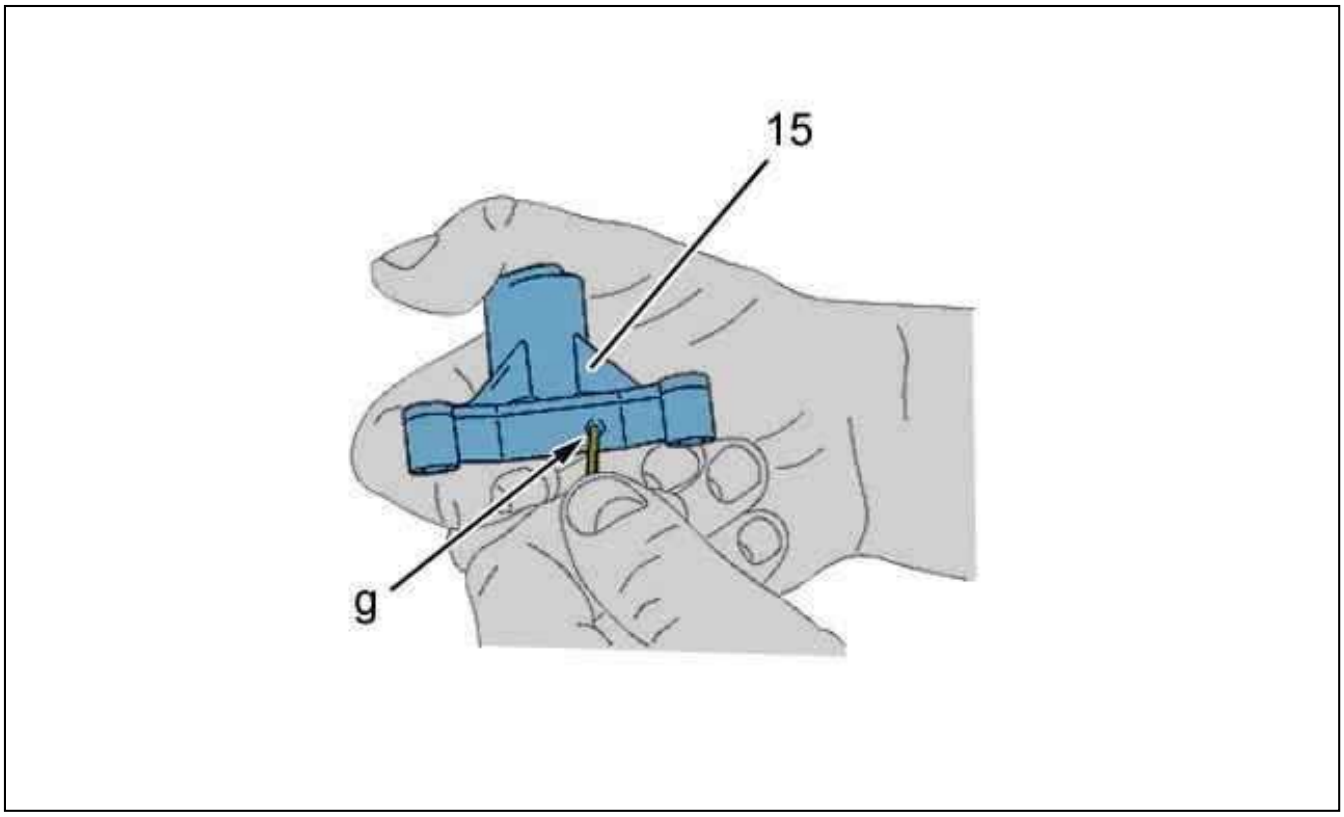


Figure : B1BG2P7D

CAUTION : If it is a new chain tensioner (15), do not pull out the pin that is present (at "g").

If re-used : Set the chain tensioner (15) ; Using tool [0188-Q2] (at "g").

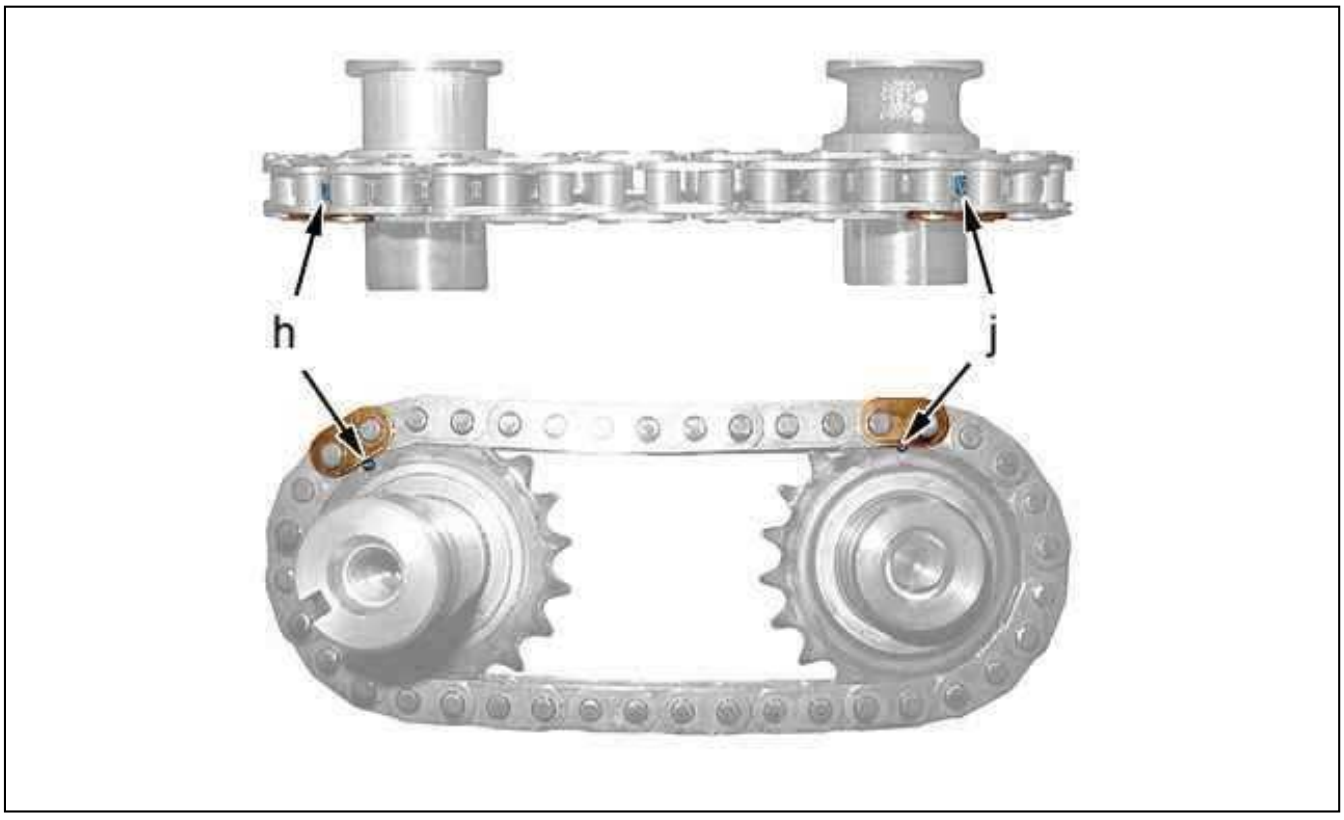


Figure : B1DG0GXD

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CAUTION : The browned links must always be turned to the timing side.

Pre-fit the camshafts :

- Line up the brown link of the chain with the paint mark and with the point of the exhaust camshaft (at "h")
- Line up the brown link of the chain with the paint mark and with the engraved mark on the exhaust camshaft (at "j")

CAUTION : Lubricate the roller cam followers , The bearing caps , Bearings , The cams : With engine oil .

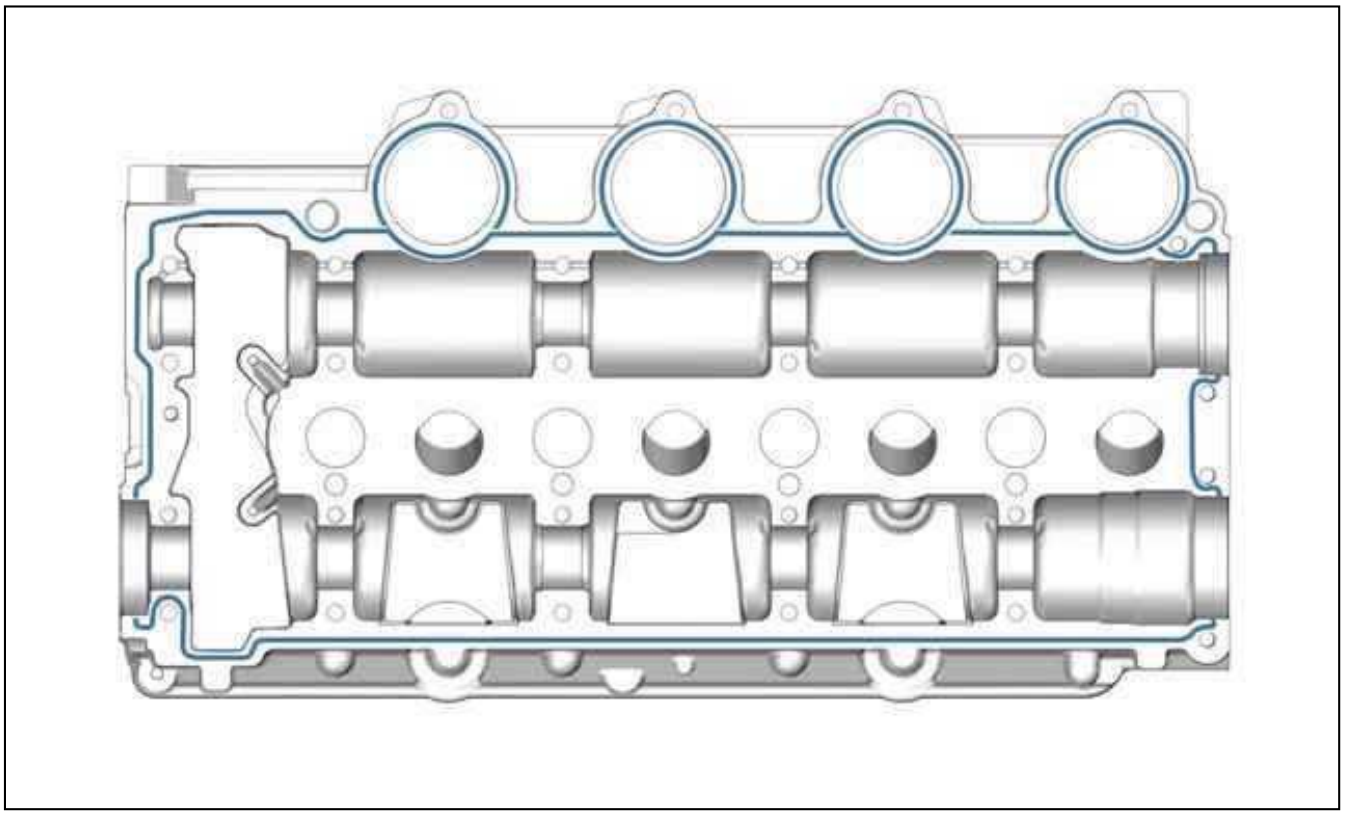


Figure : B1DG02GD

CAUTION : Do not exceed 5 minutes for positioning the camshaft main bearing cap casting in order to ensure satisfactory sealing before polymerisation.

Apply a strip of special seal paste (anaerobic type) on the camshaft bearing cap casing (Refer to the products catalogue).

N.B. : Strip 1,2 mm wide.

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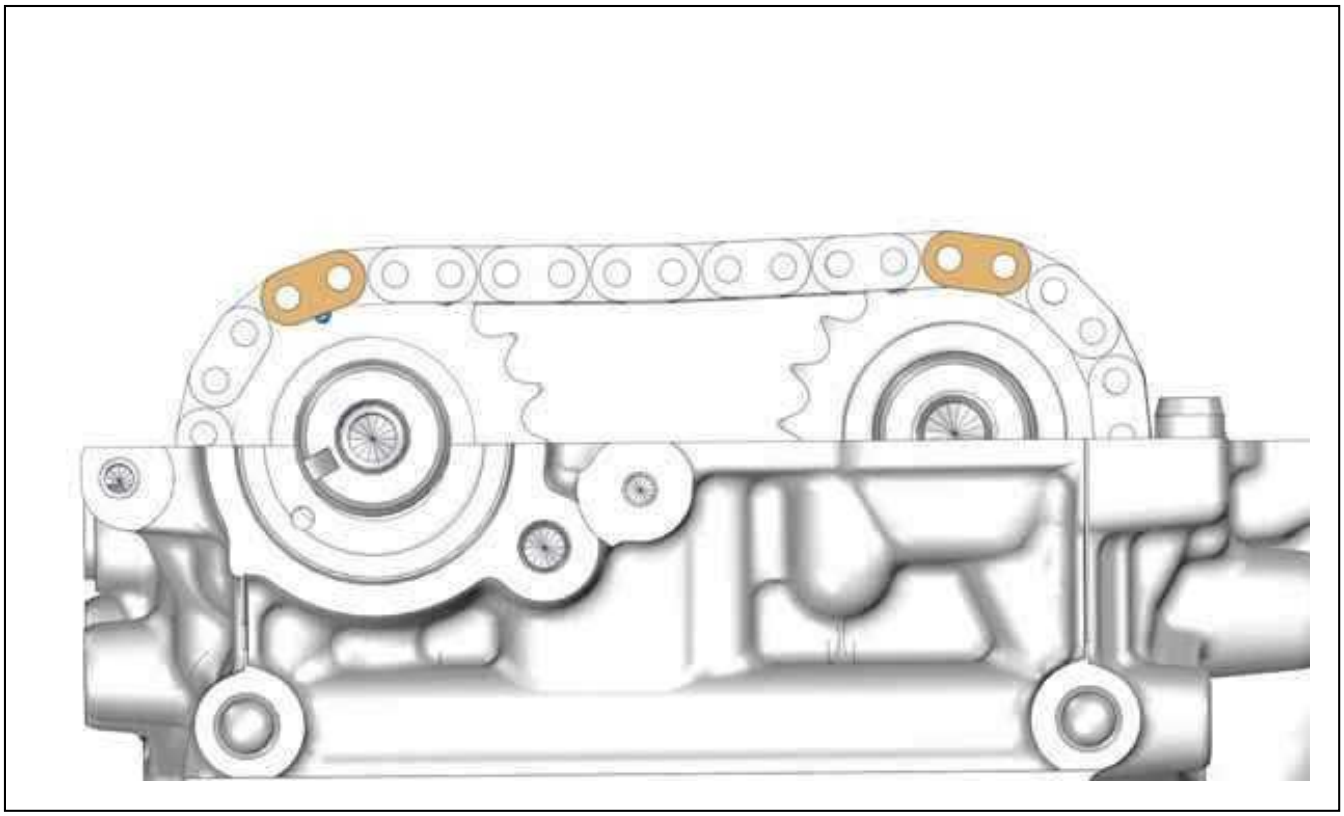


Figure : B1EG06XD

CAUTION : The brown links must be positioned as shown above.

CAUTION : Check that the timing chain is set correctly on the camshafts.

Remove the plugs from the air inlet ducts and diesel injector wells.
Refit :

- The camshaft and timing chain assembly
- The camshaft bearing cap cover

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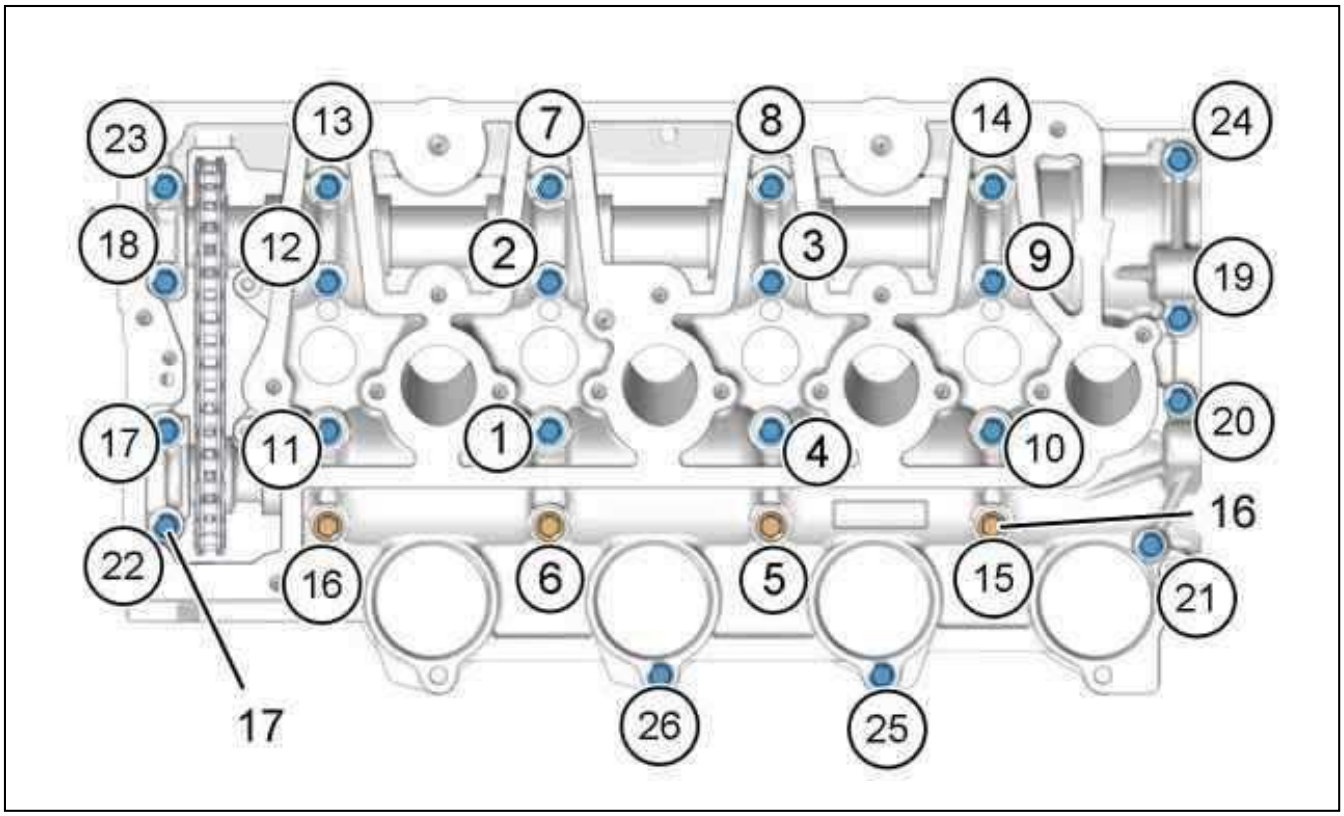


Figure : B1BG2P9D

N.B. : In the tightening sequence, the bolts in positions (19), (20), (21), (24) are longer.

CAUTION : Always replace the bolts (16) (Presence of sealing product on the bolt contact surfaces).

Refit the bolts (16), (17) ; Follow the tightening sequence :

- Do up the bolts (16), (17)
- Pre-tighten the bolts (16), (17)
- Tighten the bolts (16), (17) to torque

Tighten the bolt (10) to torque (Lifting ring).

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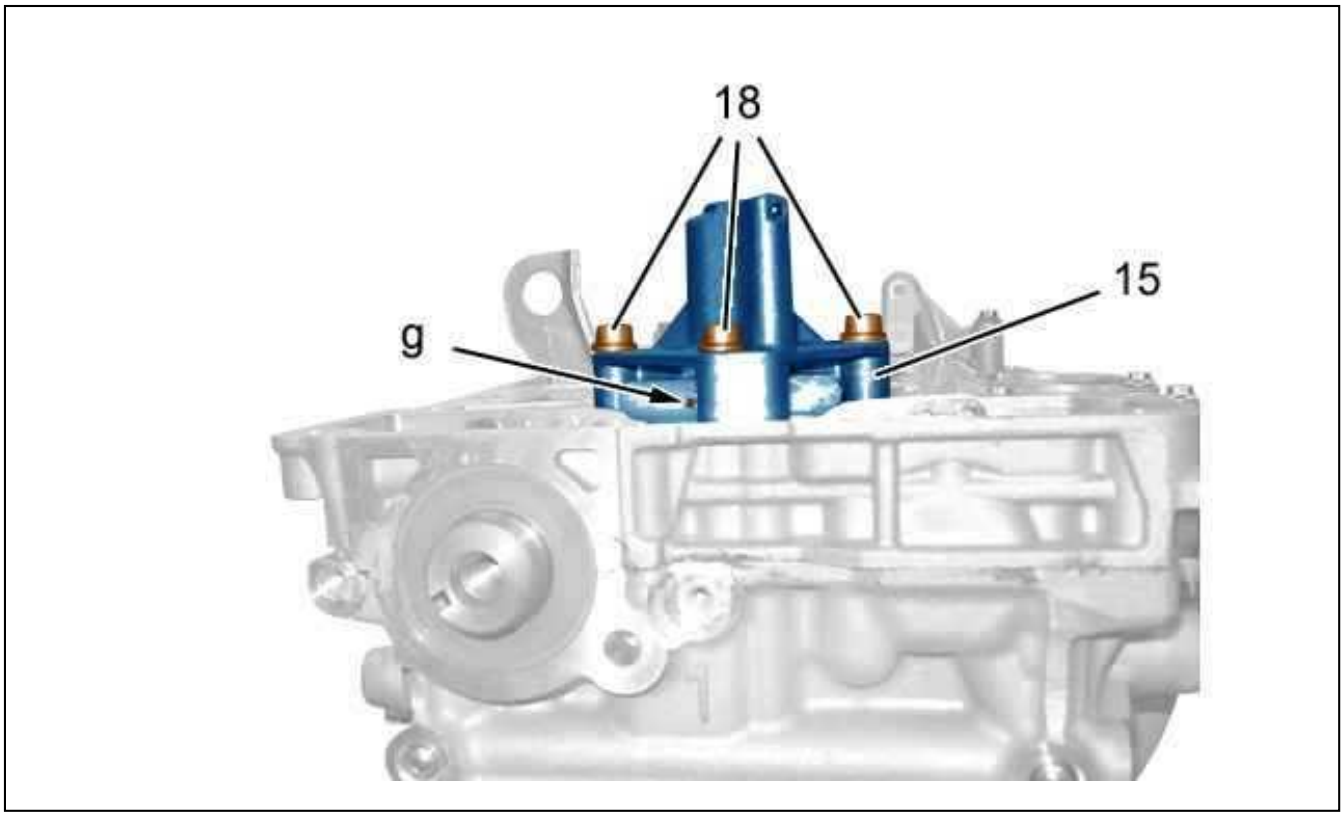


Figure : B1BG2PAD

Oil the timing chain slide pad.
Refit :

- The timing chain (15) tensioner
- The bolts (18)

Remove the peg [0188-Q2] (at "g").

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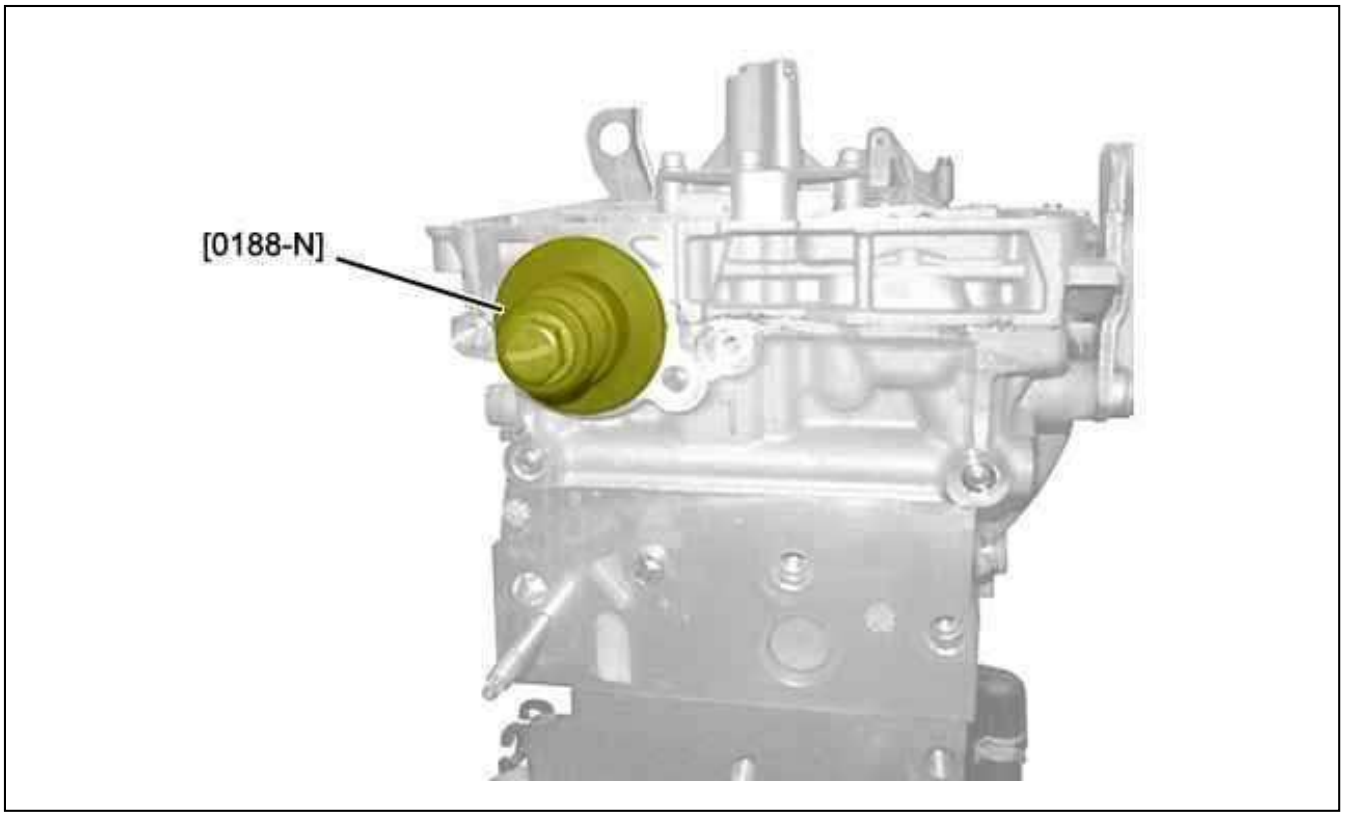


Figure : B1BG2PDD

Fit a new camshaft sealing ring ⓘ ; Using tool [0188-N].

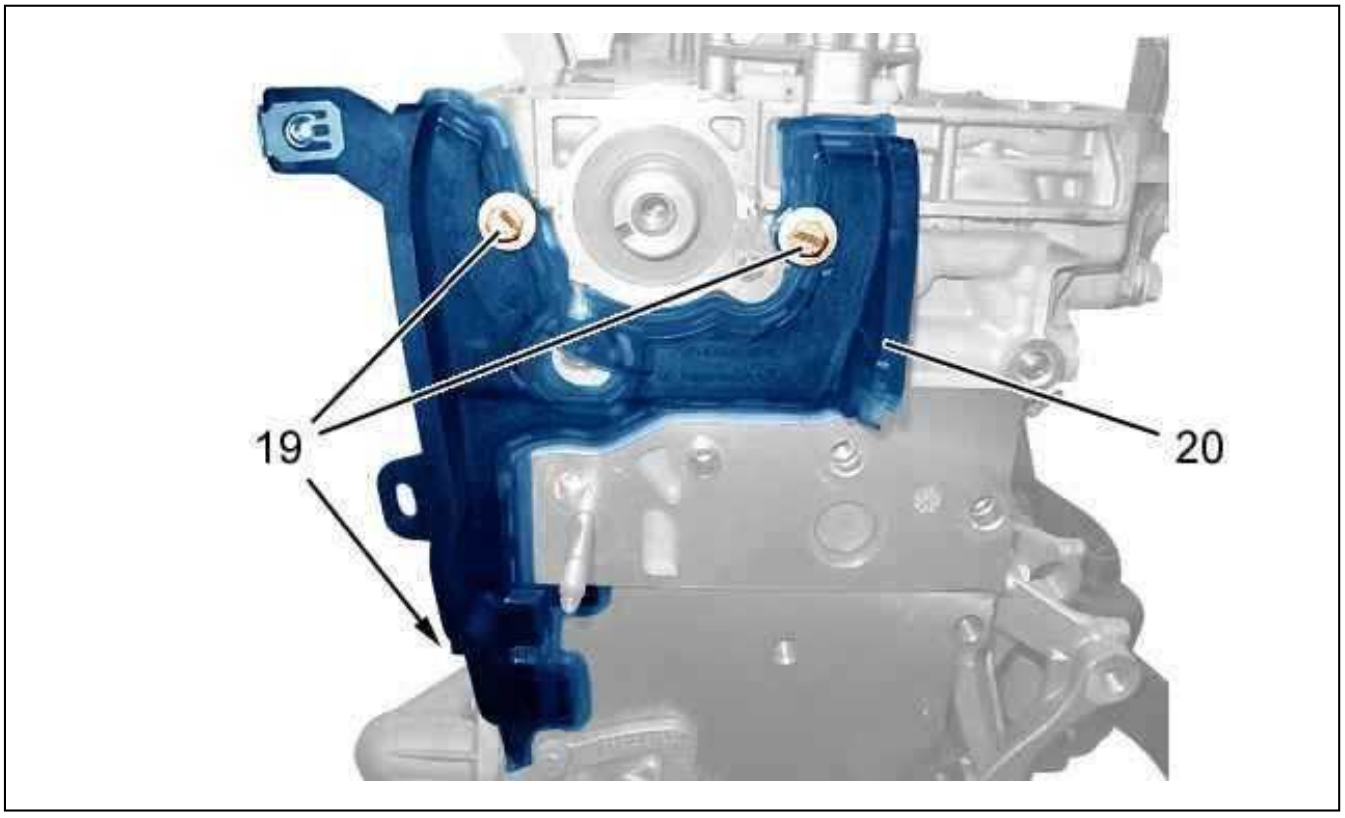


Figure : B1BG2PHD

Refit :

- The rear timing cover (20)

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- The bolts (19)

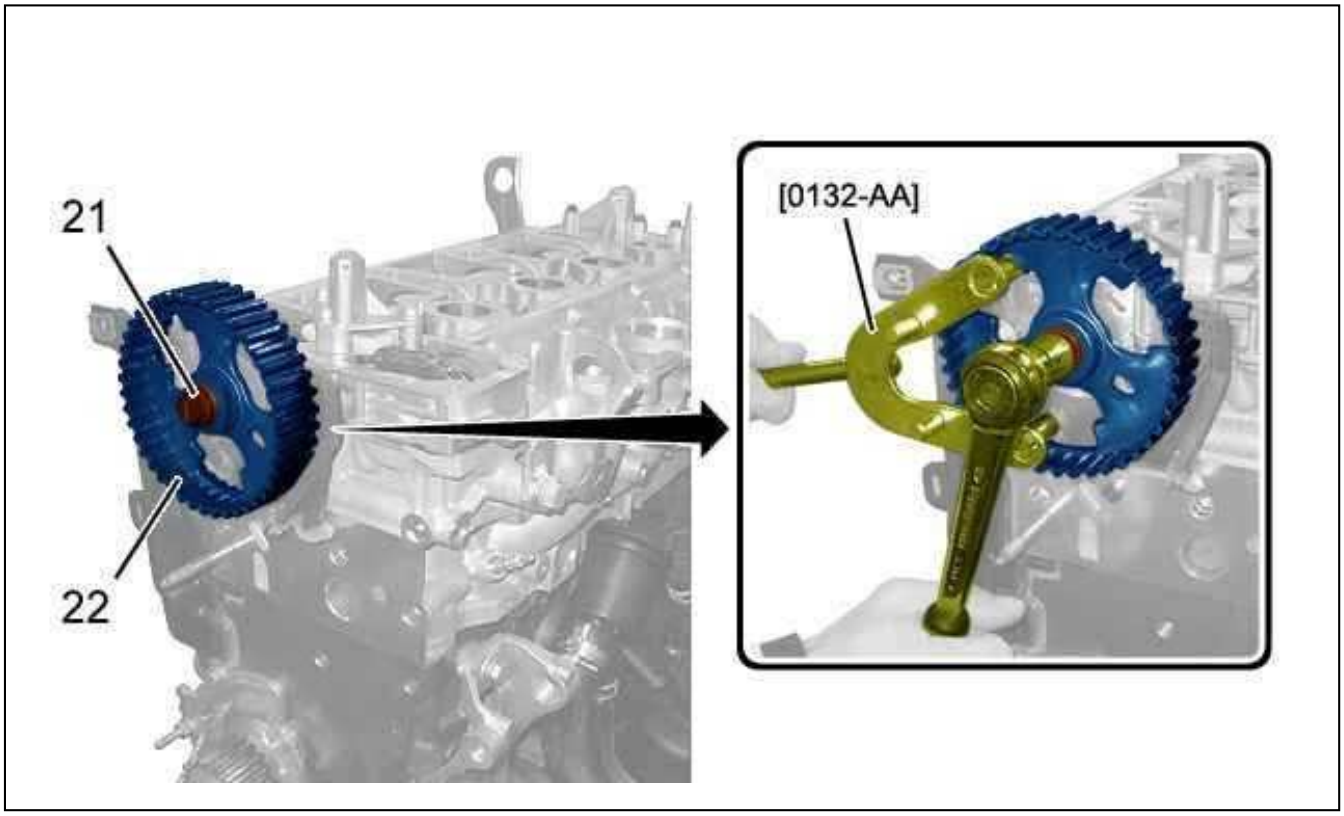


Figure : B1BG2PID

Refit ; Using tool [0132-AA] :

- The pulley (22)
- The screw (21) and its washer

Pin the camshaft pulley ; Using tool [0188-M].

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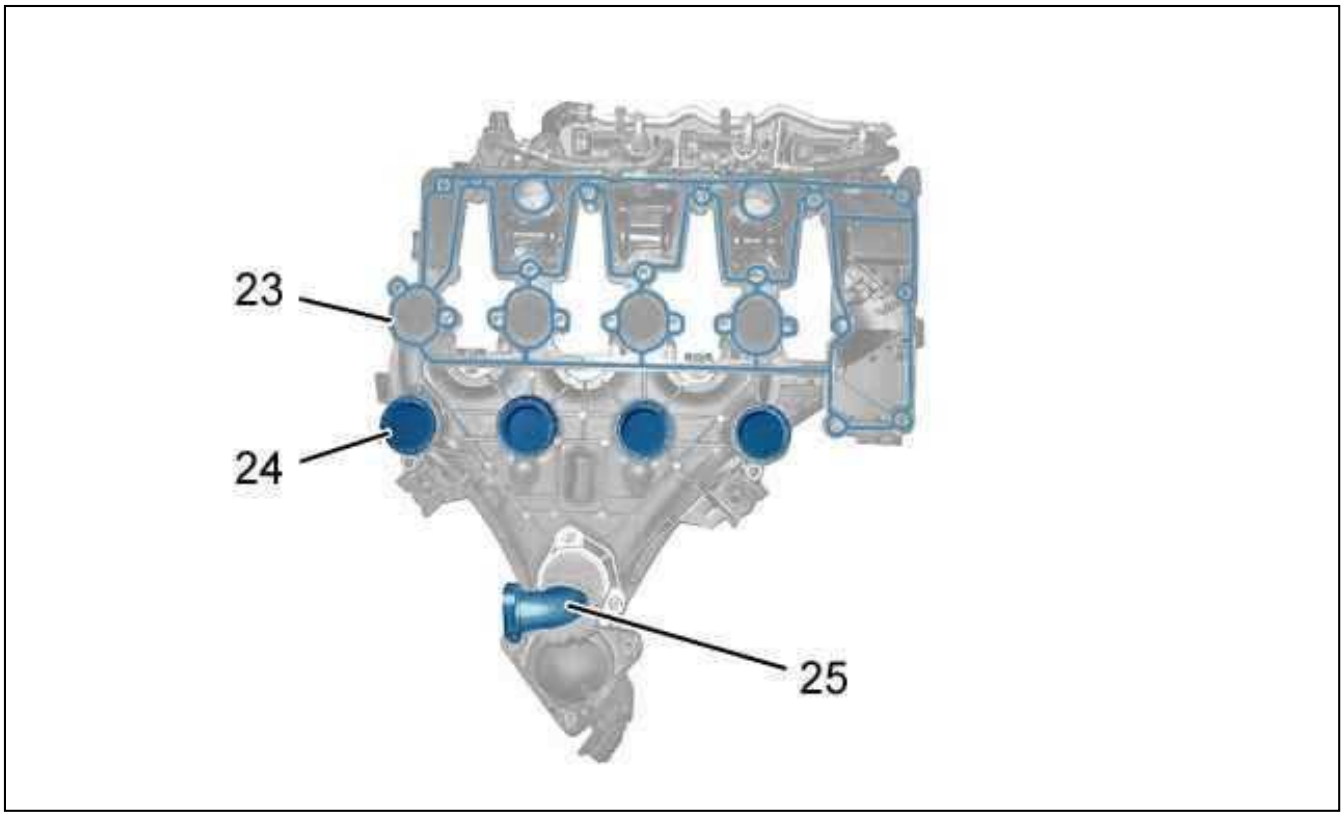


Figure : B1BG2PJD

CAUTION : Replace the seals (23), (24) with new seals.

Check the sealing of the EGR tube (25) ; Replace the seals (if necessary).
Oil the O-rings (24) before refitting.
Refit the air inlet manifold .

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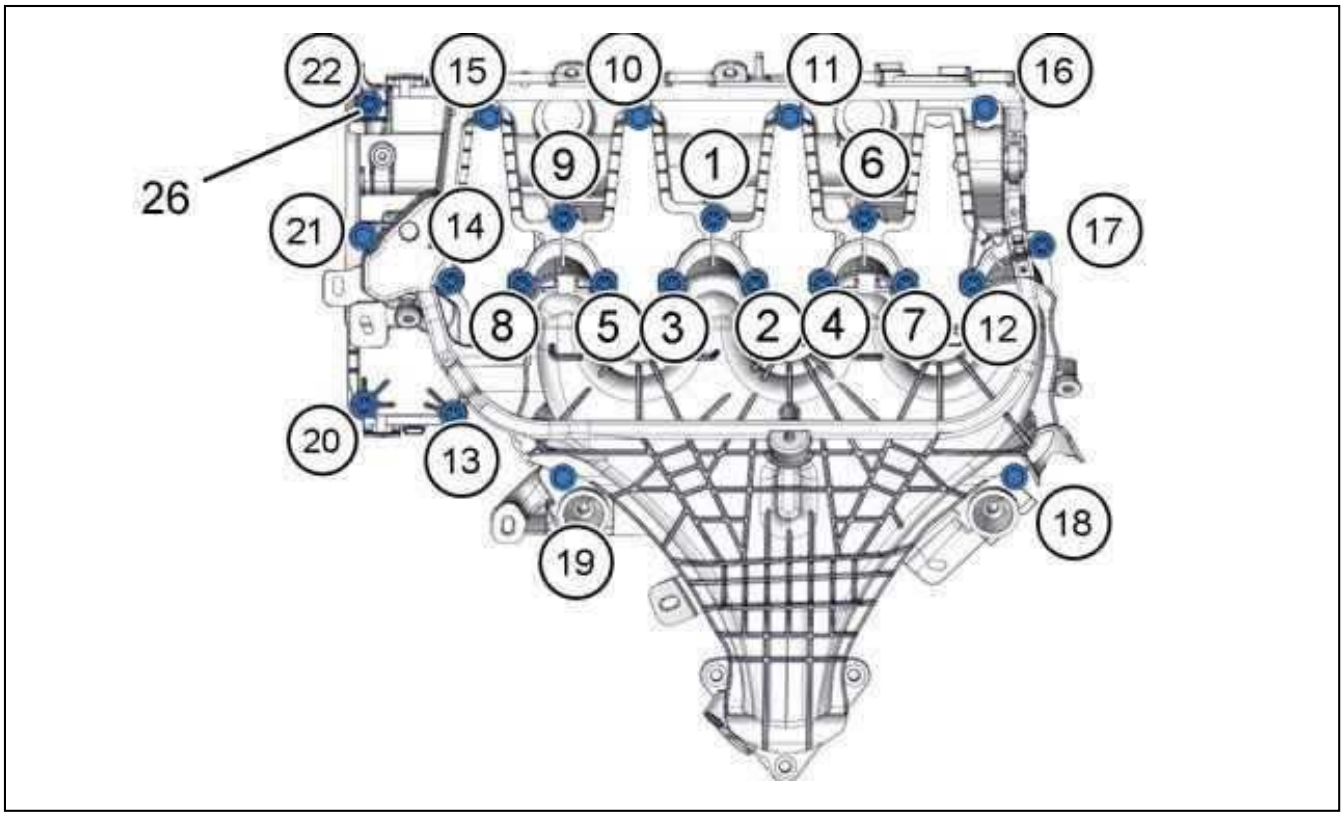


Figure : B1BG2PQD

Position : bolts	length
(4), (5), (13), (14), (17), (22)	70 mm
(20)	55 mm
OTHERS	40 mm

CAUTION : Respect the tightening sequence indicated.

Refit the bolts (26) :

- Do up the bolts
- Slacken the bolts
- Retighten the bolts to the correct torque

3.8. Cylinder reference sensor

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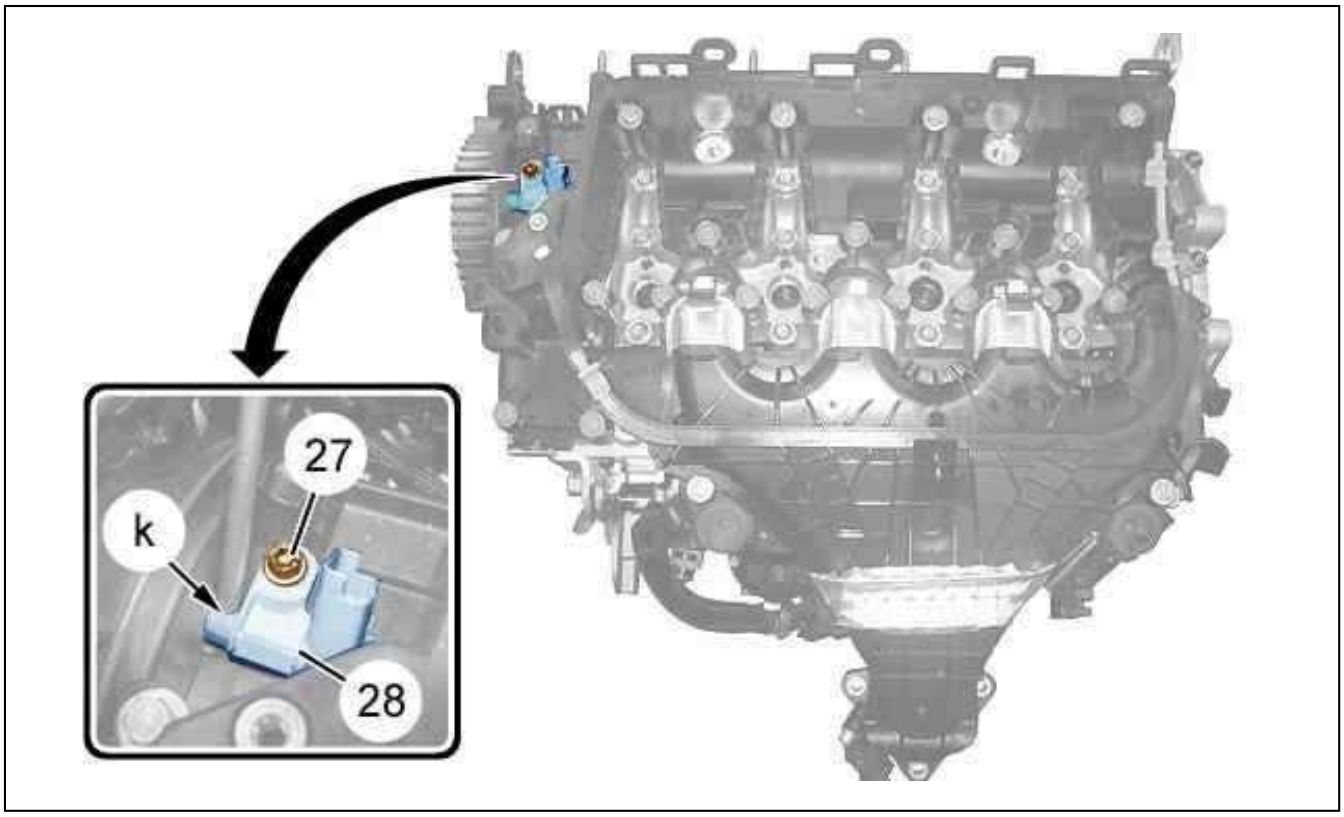


Figure : B1BG2PTD

Refit :

- The cylinder reference sensor (28)
- The (27) bolt ; Finger tighten

If re-used :

- Position a 7,5 mm diameter pin (at "k") (E.g. : Drill bit)
- Put the cylinder reference sensor (28) to its stop on the 7,5 mm diameter shaft
- Tighten the bolt (27) to torque

New sensor :

- Put the cylinder reference sensor (28) in contact with the target (Camshaft pulley)
- Tighten the bolt (27) to torque

3.9. Assembling the cylinder head

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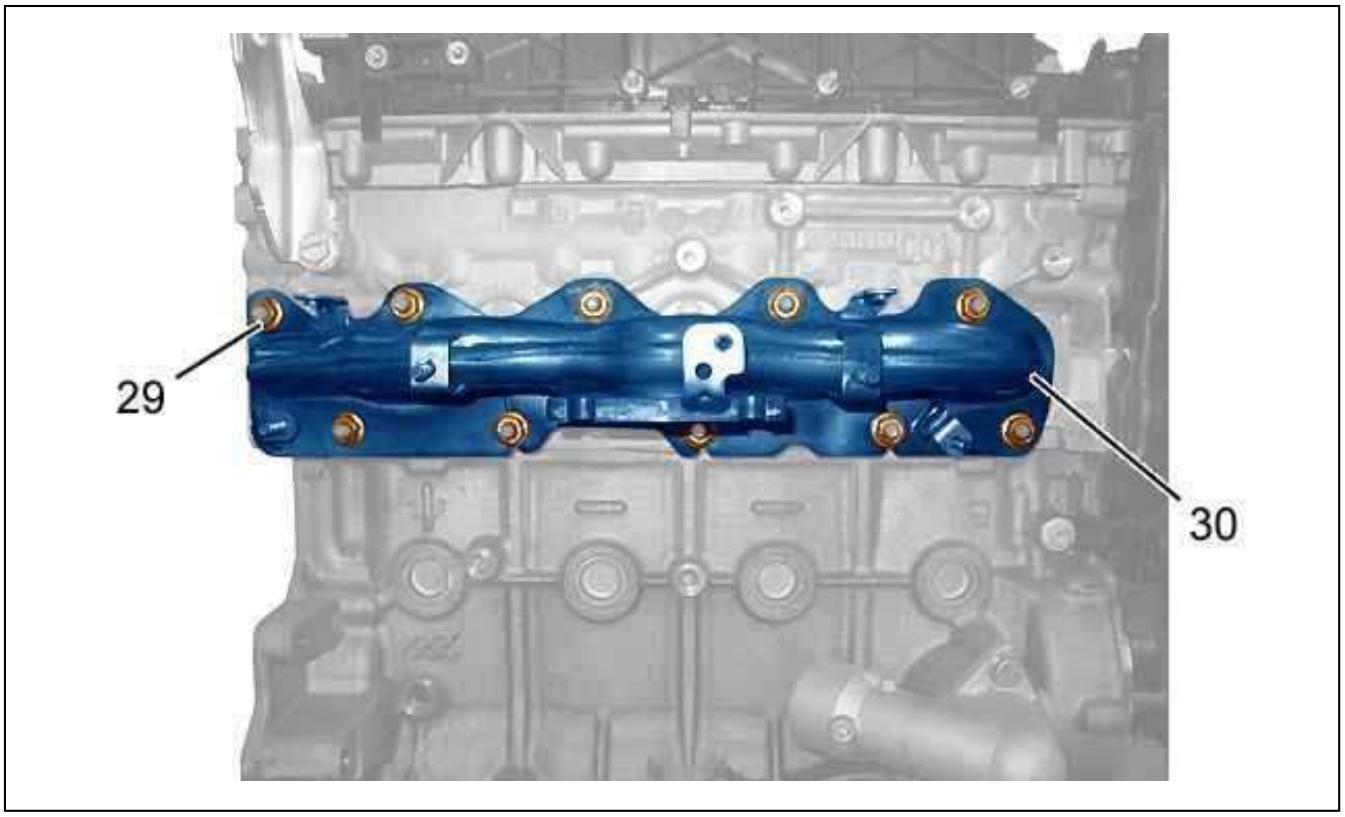
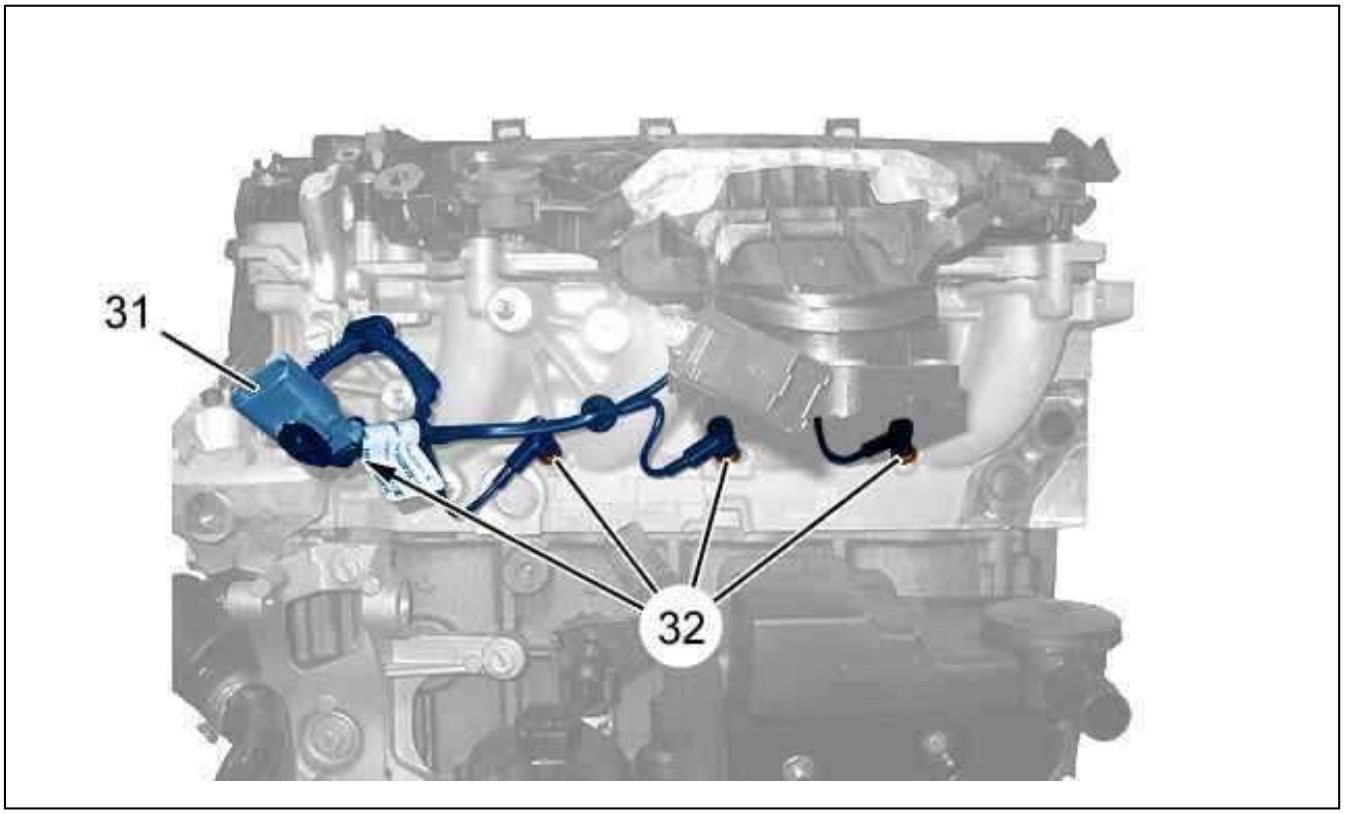


Figure : B1BG2PUD

Refit :

- Seal
- The exhaust manifold (30)
- The nuts (29)



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Figure : B1BG2PXD

Refit :

- The pre-heater plugs (32)
- The glow plugs supply harness (31)

3.10. Refitting : Engine flywheel (Manual gearbox / Automatic)

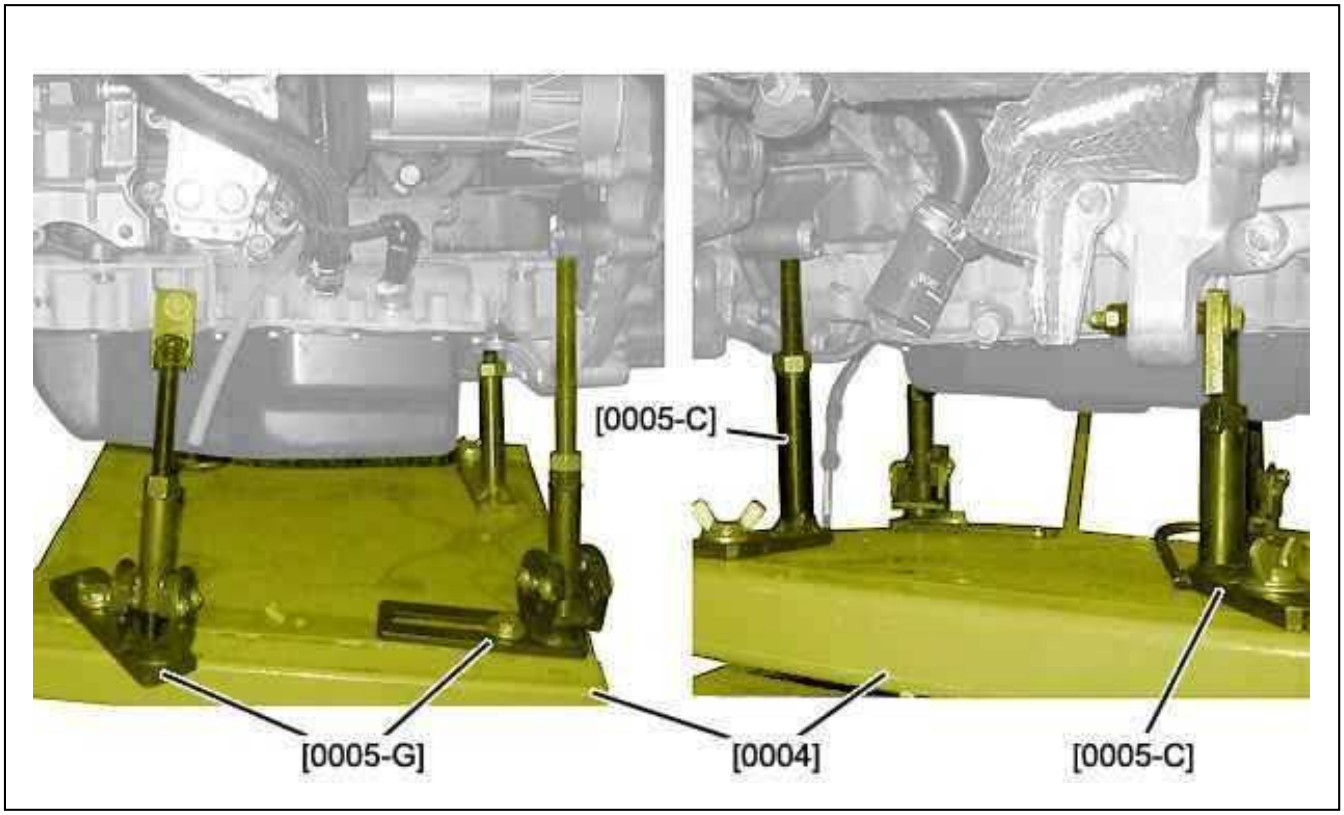


Figure : B1BG17RD

CAUTION : It is necessary to remove the engine from its stand in order to install the flywheel.

Remove the engine from its stand and then fit and secure the assembly ; Using the tools [0005-C], [0005-G].

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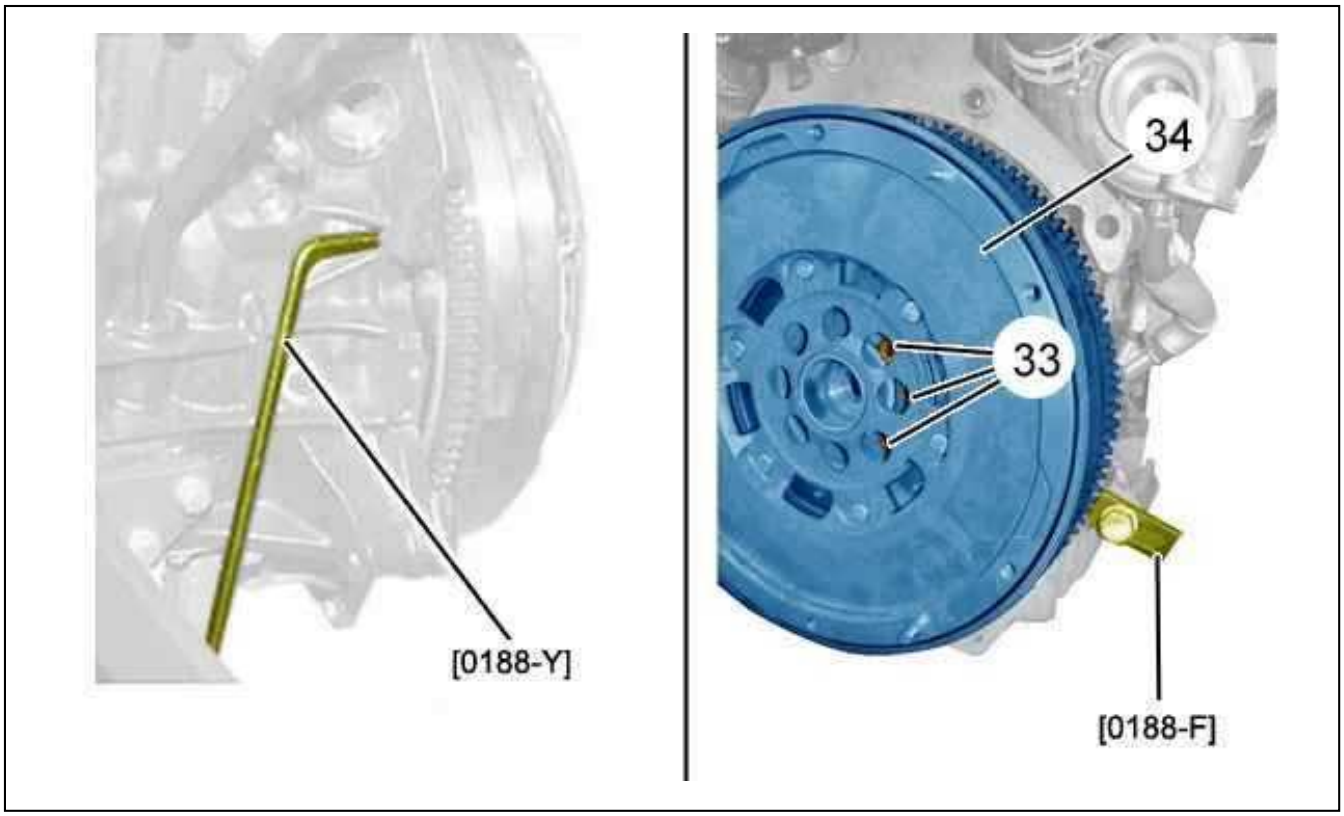


Figure : B1BG2PZD

CAUTION : Always replace : The engine flywheel fixing bolts.

Check that the centring pin is present.
Refit :

- The flywheel (34)
- The bolts (33) (without tightening)

Lock the crankshaft ; Using the pin [0188-Y].
Immobilise crankshaft ; Using tool [0188-F].

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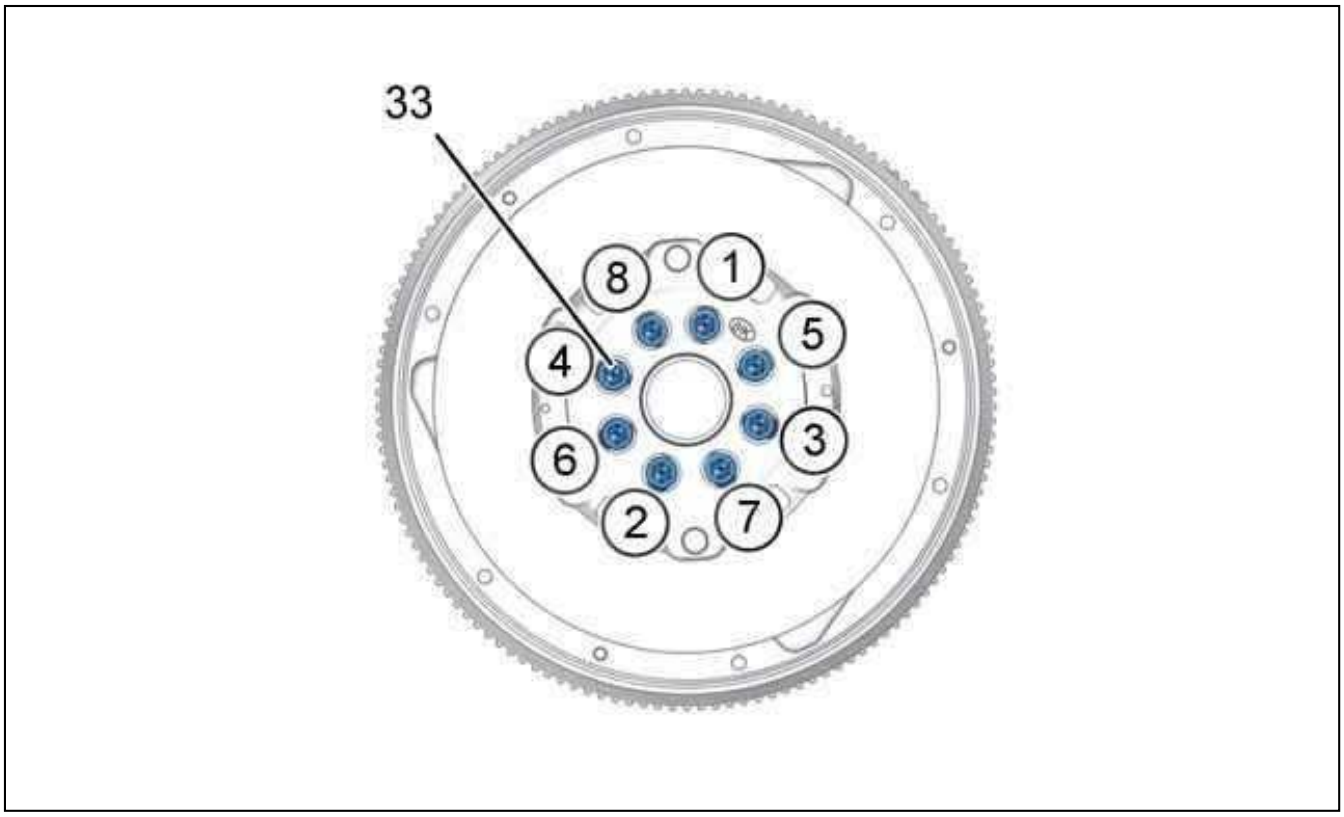


Figure : B1BG2Q0D

Tightening of screws (33) ; In the order shown :

- Pre-tighten the bolts to the specified torque
- Tighten the bolts to the specified torque

3.11. Refitting : Timing gear

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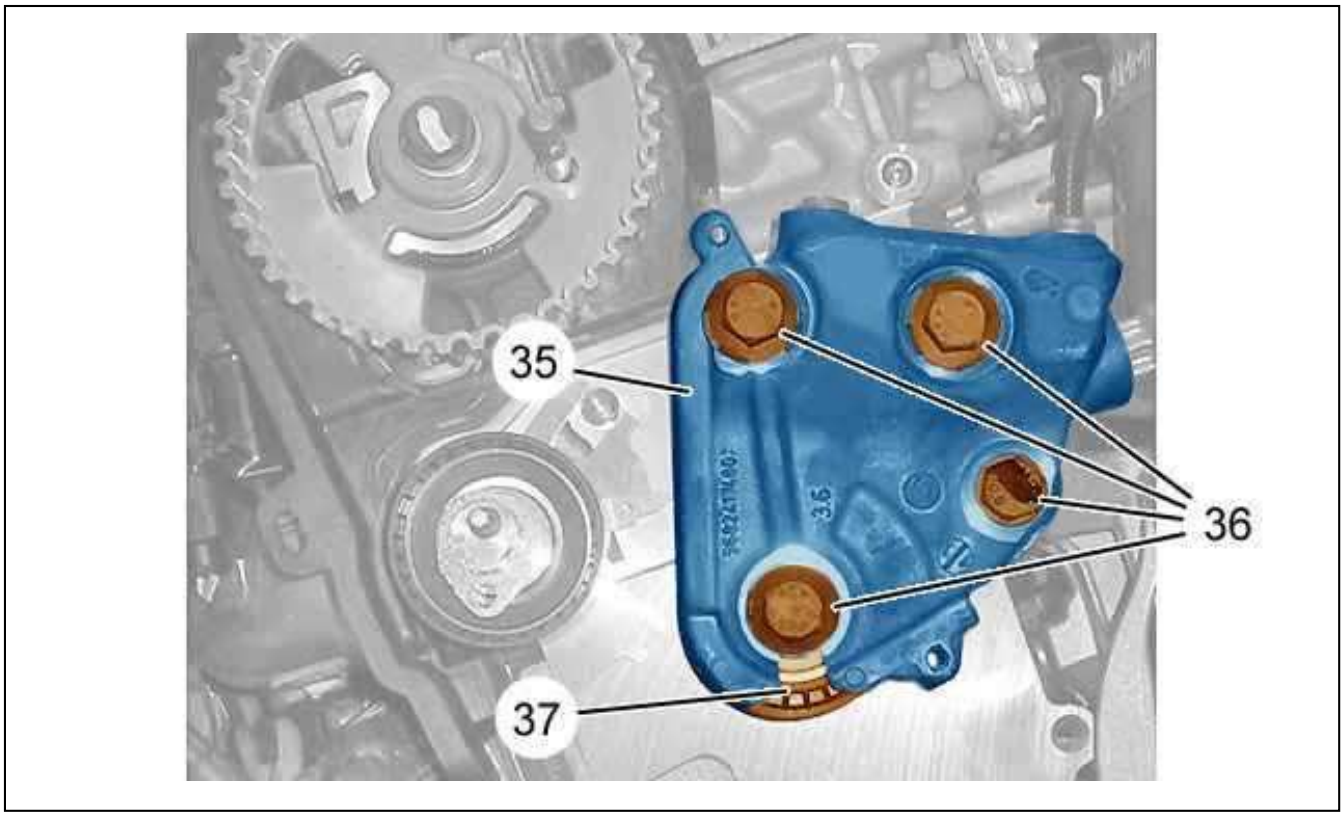


Figure : B1BG2Q1D

CAUTION : If re-using the rollers, check the absence of play and tight spots.

Refit :

- The tensioning roller (37)
- The engine mounting (35)
- The bolts (36)

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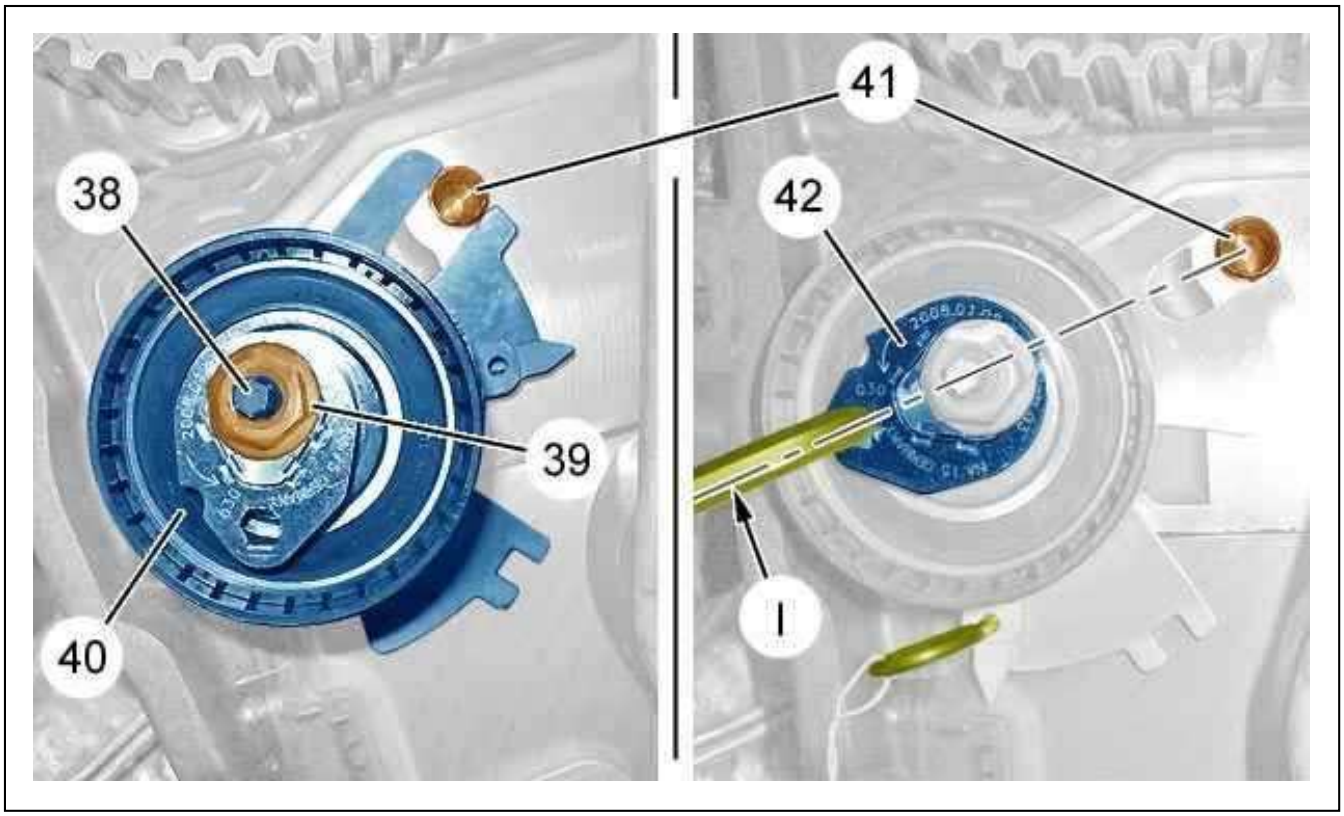


Figure : B1BG2Q2D

CAUTION : Do not unlock the new dynamic tensioner roller without having refitted the timing belt.

Check the tightening of the stud (38).

CAUTION : The dynamic tensioner roller must be secured on the cylindrical pin (41).

Refit :

- The dynamic roller tensioner (40)
- The nut (39) ; Finger tighten
- Align the eccentric (42) on the axis "I" ; Using a hexagonal spanner

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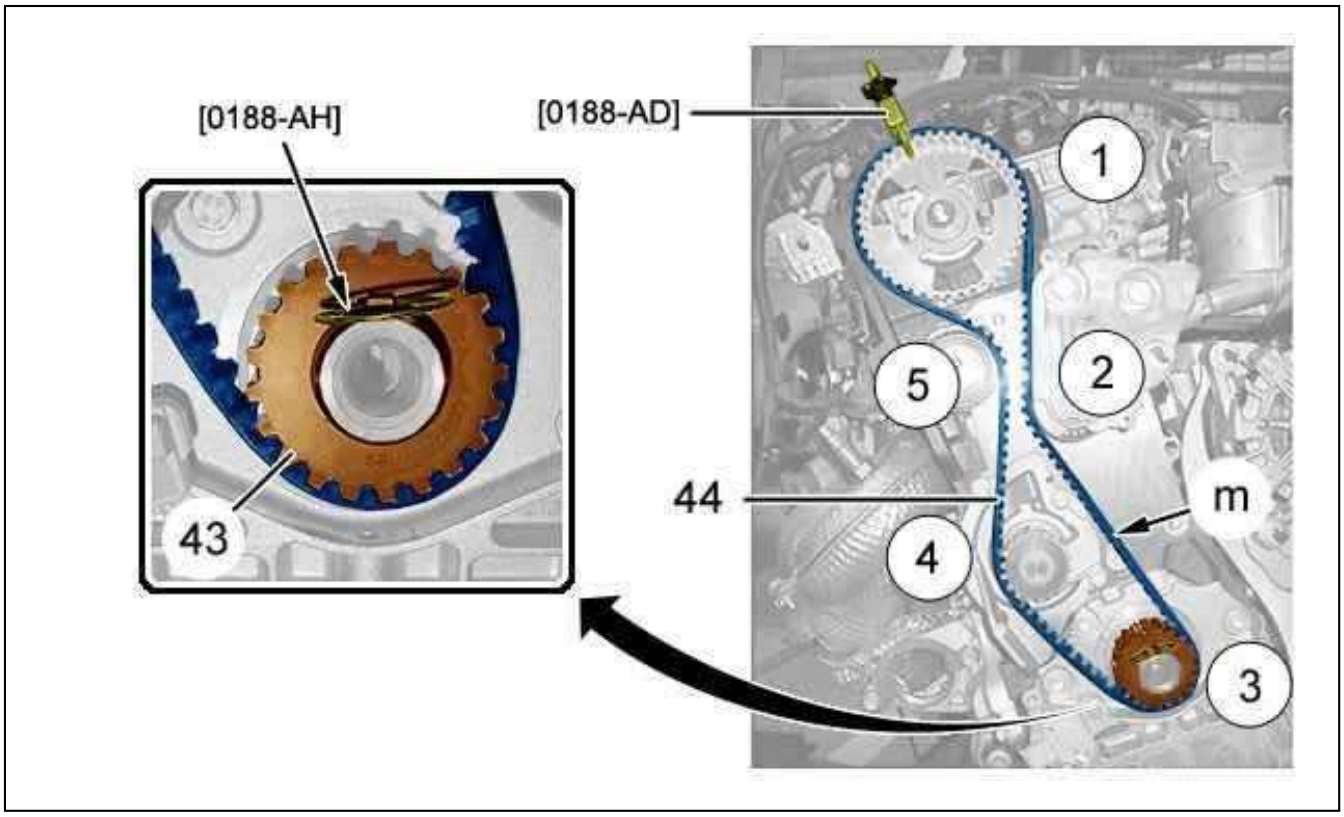


Figure : B1BG2Q3D

CAUTION : Always replace the timing belt .

Rotate the crankshaft pulley (43) on its cotter pin ; Centre using the tool [0188-AH].
Fit the timing belt (44) on the camshaft pinion ; Immobilise the pinion using tool [0188-AD].
Fit the belt, the right way round, with run ("m") taut, in the following order : 1, 2, 3, 4, 5.

CAUTION : New dynamic tensioner roller : Take away the locking pin.

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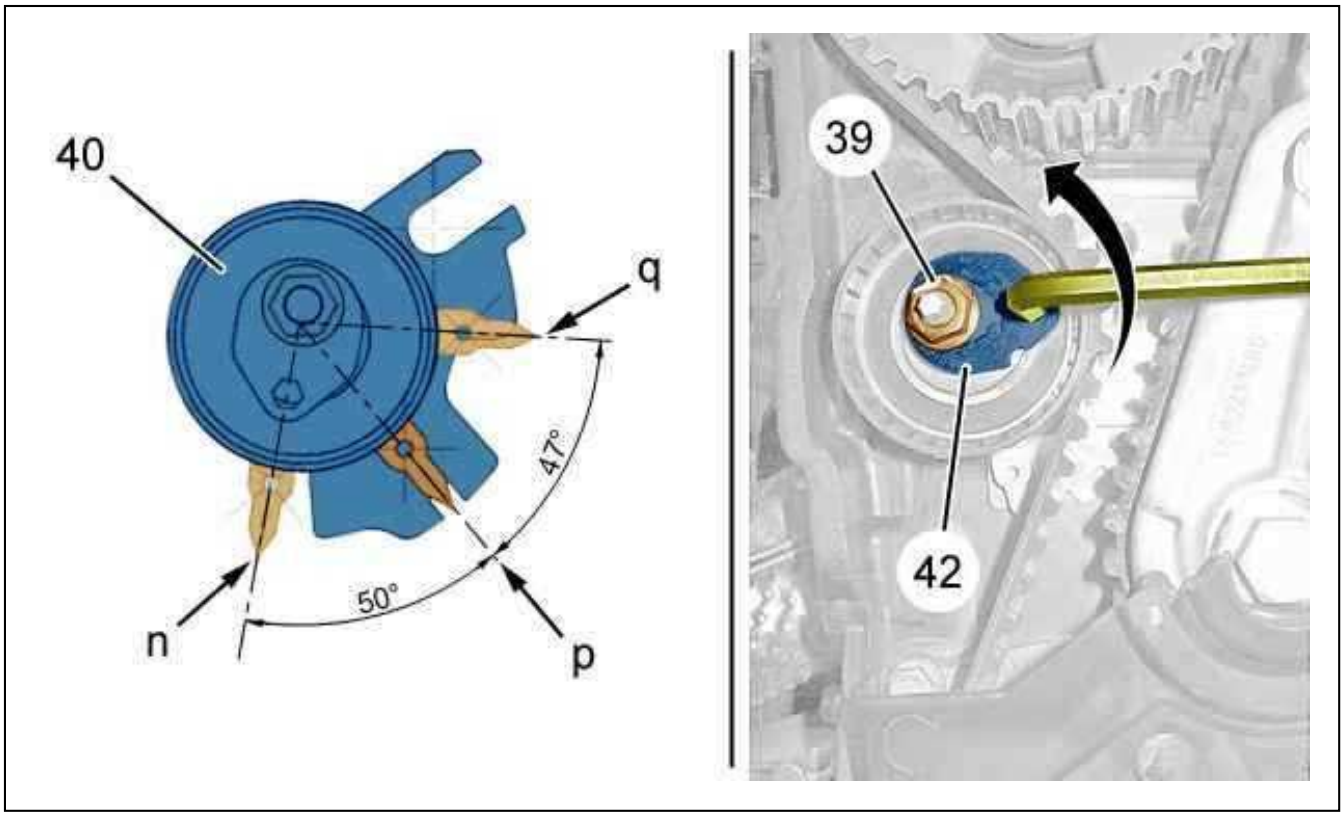


Figure : B1BG2Q4D

Position of the index	State of tension of the timing belt
"n"	Dynamic roller tensioner (40) at maximum timing belt tension
"p"	Dynamic roller tensioner (40) at nominal timing belt tension
"q"	Dynamic roller tensioner (40) at minimum timing belt tension

Apply a maximum tension to the timing belt (Pre-tightening the belt) :

- Do up the nut (39) by hand
- Rotate the eccentric (42) anti-clockwise (Using a hexagonal spanner)
- Bring the index to position "n"
- Tighten the nut (39)

N.B. : The eccentric (42) is close to the horizontal.

Remove the tools [0188-AD], [0188-AH].

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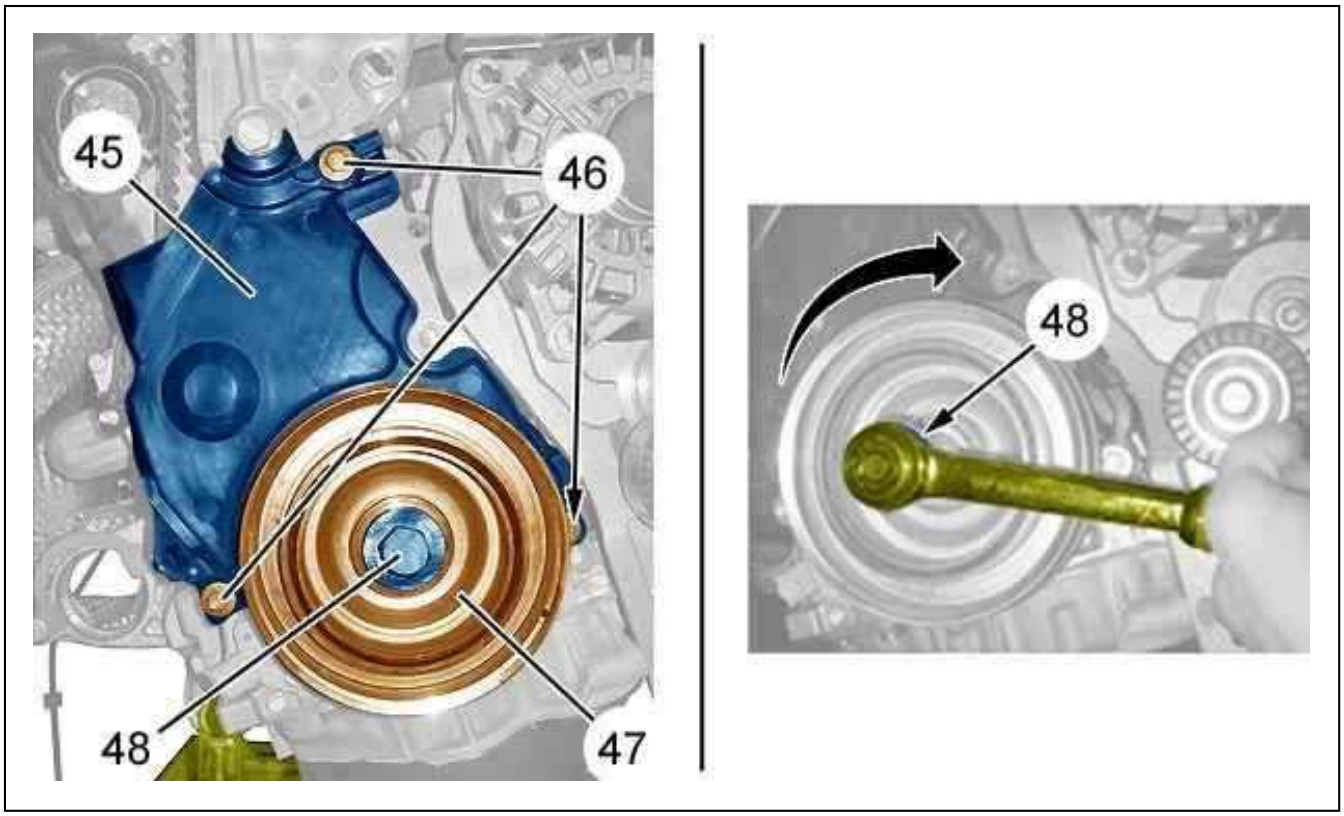


Figure : B1BG2Q5D

CAUTION : Place loctite on the bolt (48) ; Do not go beyond 5 minutes between pre-tightening and final tightening o the bolt (48).

Refit :

- The timing cover (45)
- The bolts (46)
- The engine speed sensor target
- The crankshaft pulley (47)
- The bolt (48) and its spacer ; Pre-tightening to 5 daNm

Remove the tools [0188-F], [0188-M], [0188-Y].
Turn the engine 6 rotations in the clockwise direction.
Check the position of the timing belt (44).
Peg the assembly with tools [0188-F], [0188-M], [0188-Y].
Slacken the bolt (48) in order to permit the crankshaft pulley to rotate on its keyways.

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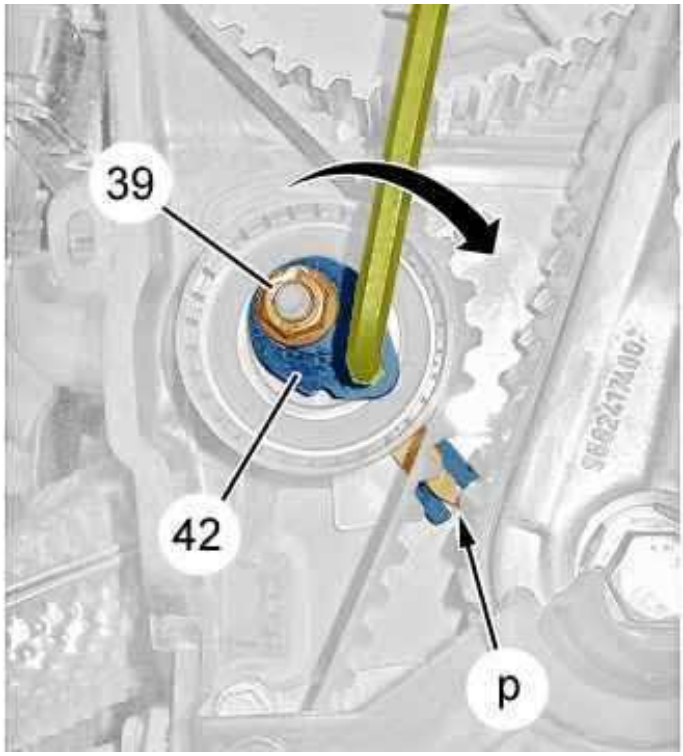


Figure : B1BG2Q6D

CAUTION : When detensioning the dynamic tensioner roller, do not go past the index "p". Otherwise, you must restar the pretensioning operation.

Apply a nominal tension to the timing belt :

- Slacken the nut (39) while maintaining the eccentric (42) in position
- Slowly rotate the eccentric (42) in the clockwise direction
- Bring the index to position "p"
- Tighten to the specified torque : The nut (39)

Retighten the bolt (48) to the correct torque.
Remove the tools [0188-F], [0188-M], [0188-Y].

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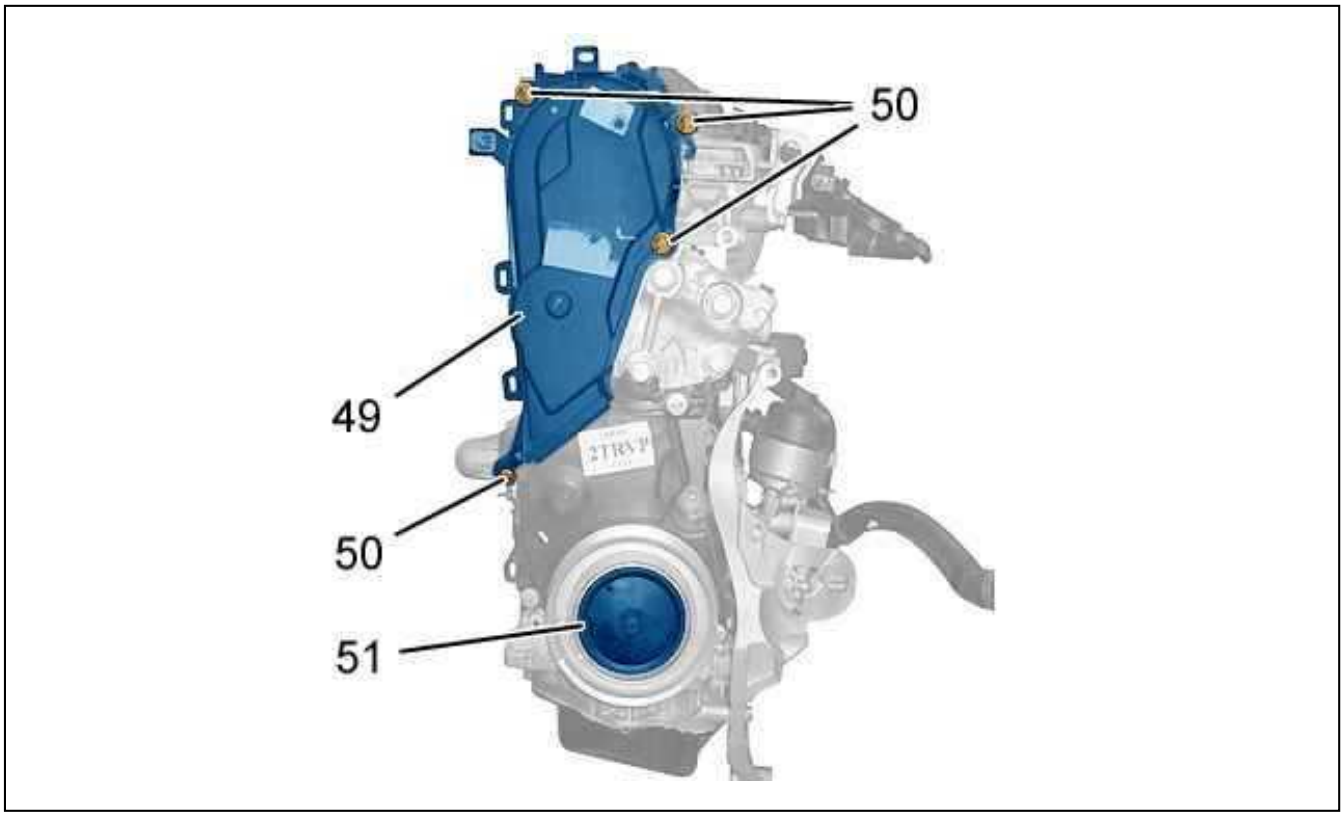


Figure : B1BG2Q7D

Refit the pulley cover (51) ; Using rubber lubricant (Refer to the products catalogue).

CAUTION : Check the positioning of the pulley cover (51) by pulling gently on the nipple.

Refit :

- The top timing cover (49)
- The mountings (50)

4. Assembling the engine

Continue the re-assembly by fitting the engine with the following components :

- The turbocharger
- The injection system
- The vacuum pump
- The inlet air mixer unit and its support
- The complete fuel filter with its mounting
- The engine electric harness

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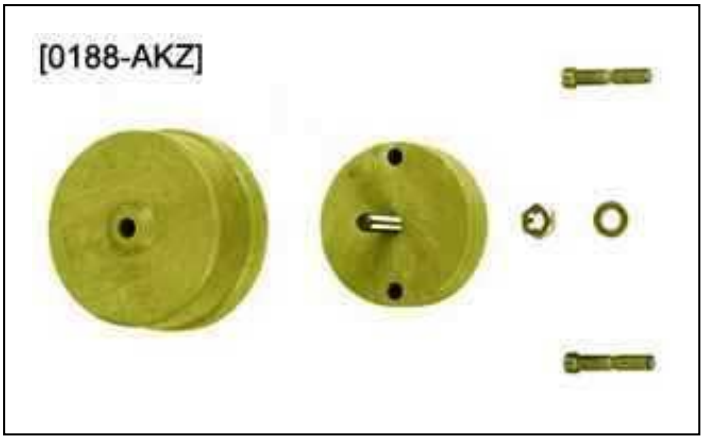
REFITTING : UNDER ENGINE

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment :

- Dial gauge
- Dial gauge magnetic support
- Piston ring pliers
- Engine piston rings fitting collar

Tool	Reference	Designation
 Figure : E5AB0ZJT	[0188-AKZ]	Crankshaft seal fitting bell (Flywheel side)
 Figure : E5AB0D9T	[0188-J]	Crankshaft ring seal fitting drift (Timing gear side)
	[0188-AS]	Conrod half shell centring tool

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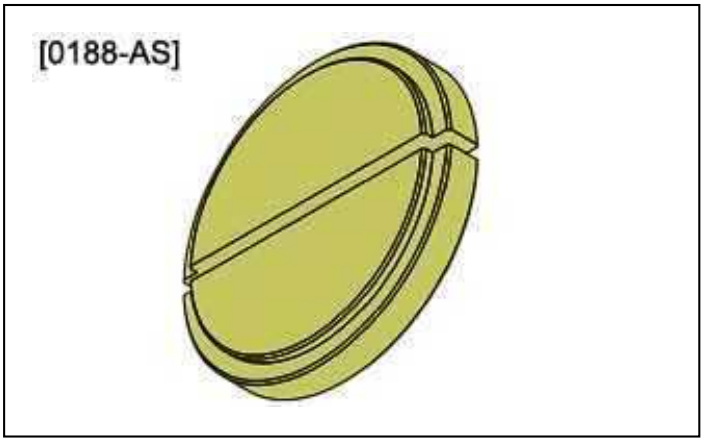


Figure : E5AB1JUT

2. Precautions to be taken before re-assembly

CAUTION : Respect the following requirements.

Before refitting :

- Check and then clean each component prior to refitting
- Clean the gasket faces with an approved descaling product ; Do not use abrasives or sharp tools on the joint faces ; The gasket faces must not have any traces of knocks or scores
- Clean the bolt threads and taps before refitting
- Always replace all the seals

3. Refitting

CAUTION : Adhere to the tightening torques .

3.1. Refitting : Reciprocating gear

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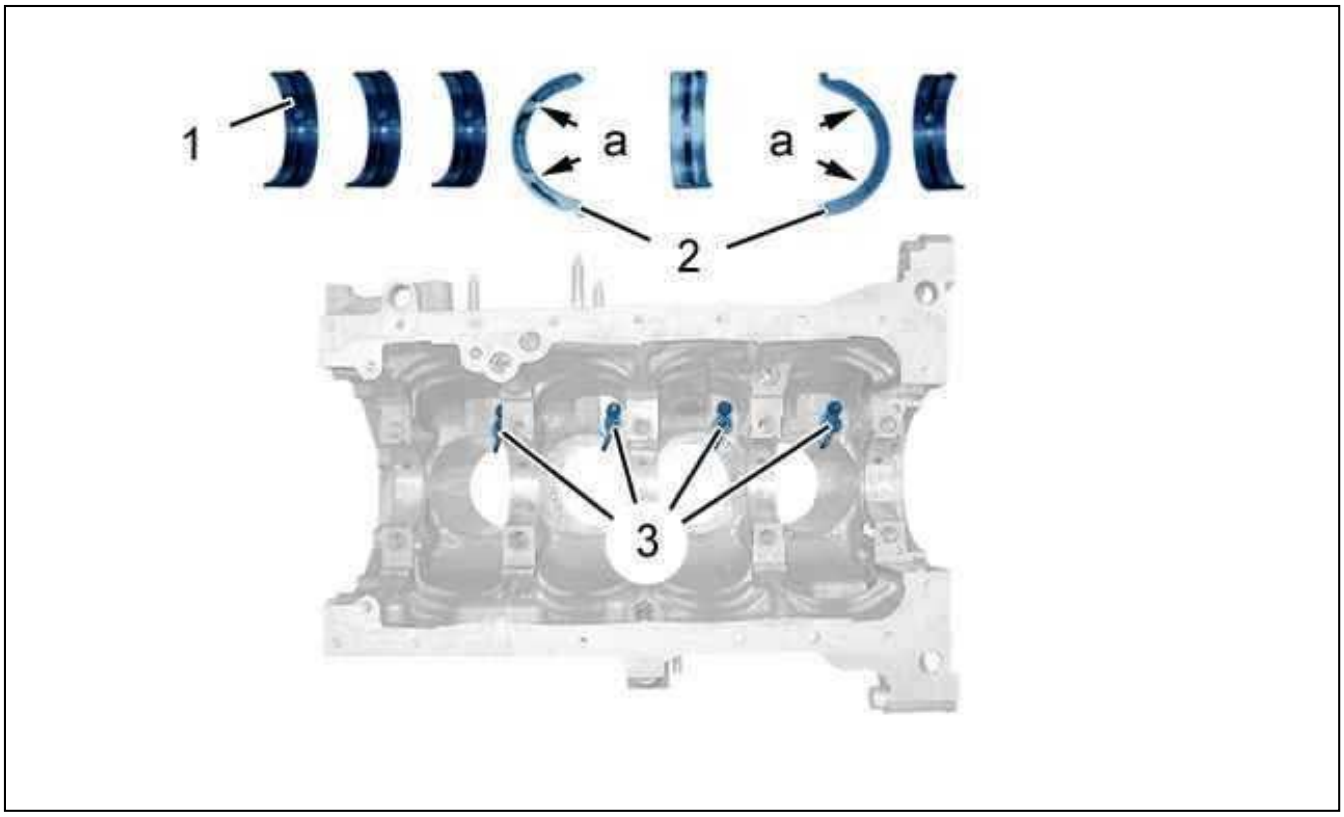


Figure : B1BG2ILD

CAUTION : If re-used : Ensure that the half bearing shells are positioned correctly.

Refit :

- The piston base jets (3)
- The grooved upper bearing shells (1) (Lugs in the housings)
- The upper thrust bearings (2) (lubricating grooves "a" on the crankshaft side) ; Lugs in the housings)

Oil the upper half shells evenly (One drop of oil).

3.2. Adjusting the crankshaft endfloat

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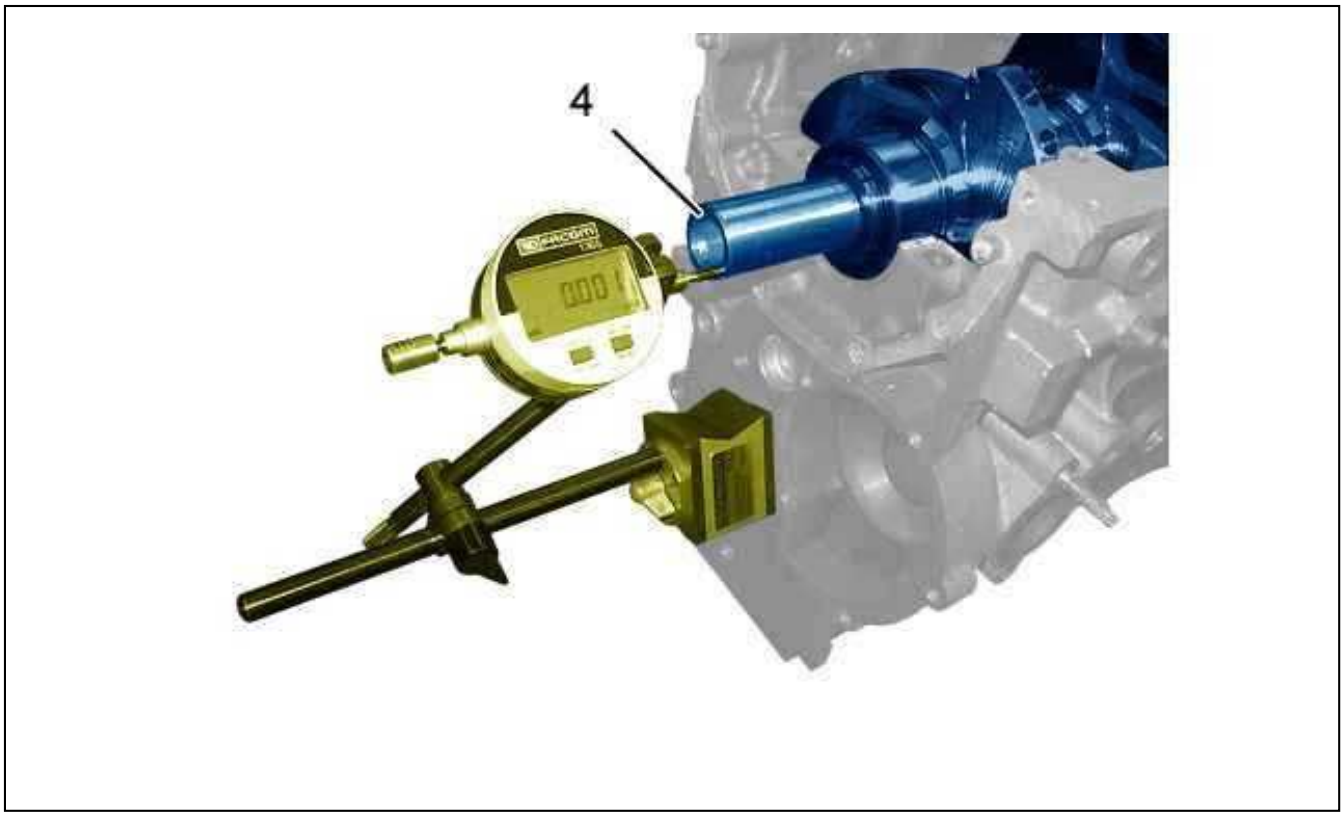


Figure : B1BG2IMD

Uniformly lubricate the crankshaft bearings (One drop of oil).
Refit the crankshaft (4).
Position :

- The dial gauge magnetic support
- The dial gauge

Push the crankshaft back and forth in the cylinder block.
Set the dial gauge to zero.
Push the crankshaft back and forth, on the opposite side, in the cylinder block.
There should be a 0,07 to 0,32 mm endfloat.

CAUTION : Select upper and lower thrust bearings of the same thickness for the same face of the crankshaft.

3.3. Refitting : Crankshaft main bearing caps

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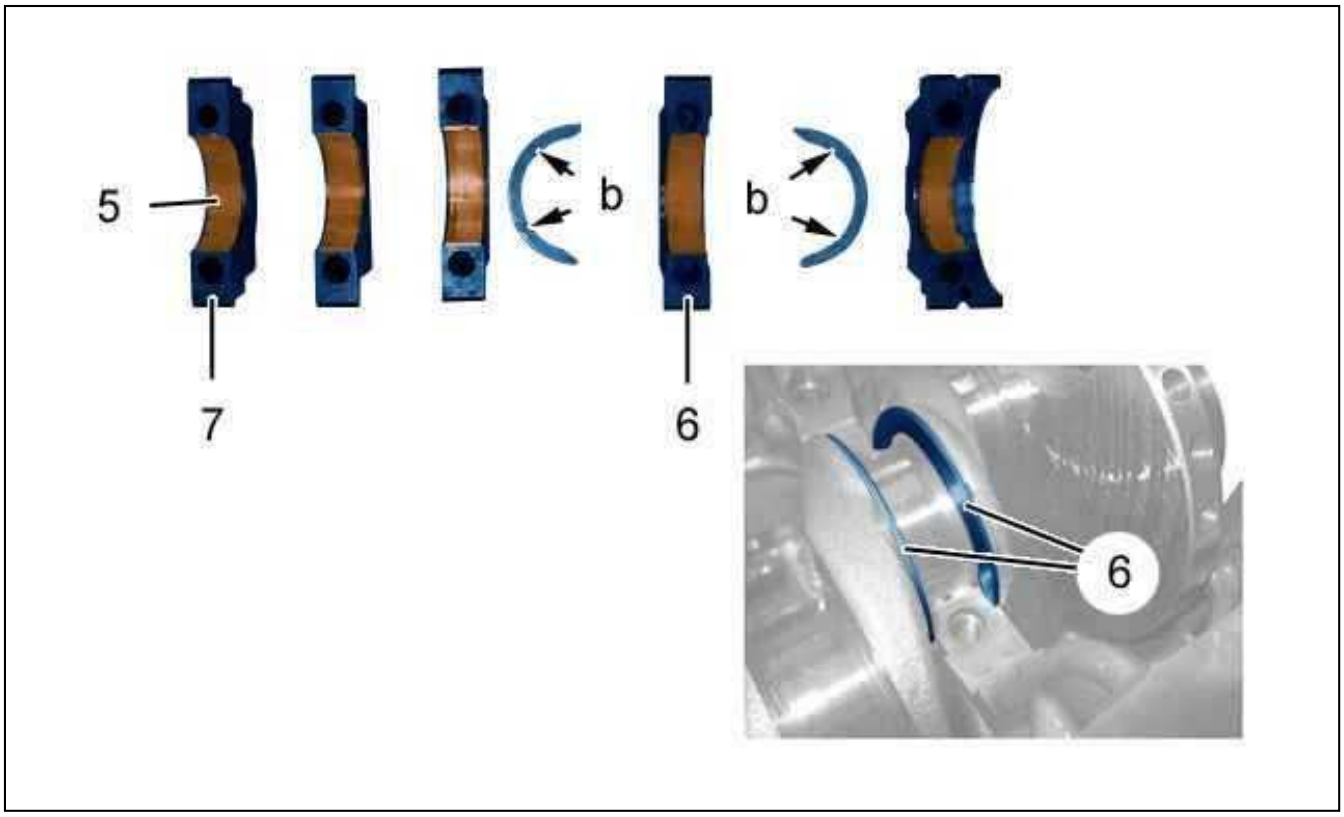


Figure : B1BG2IND

CAUTION : The smooth lower bearing shells (5) have 5 thickness classes.

Determine the thickness of the smooth lower bearing shells for each crankshaft bearing cap .

CAUTION : If re-used : Ensure that the half bearing shells are positioned correctly.

Refit :

- Depending on the thickness class chosen, the smooth lower bearing shells (5) on the crankshaft bearing caps (7) (Lugs in the housings)
- The upper thrust bearings (6) (Lubrication grooves "b" on the crankshaft side)

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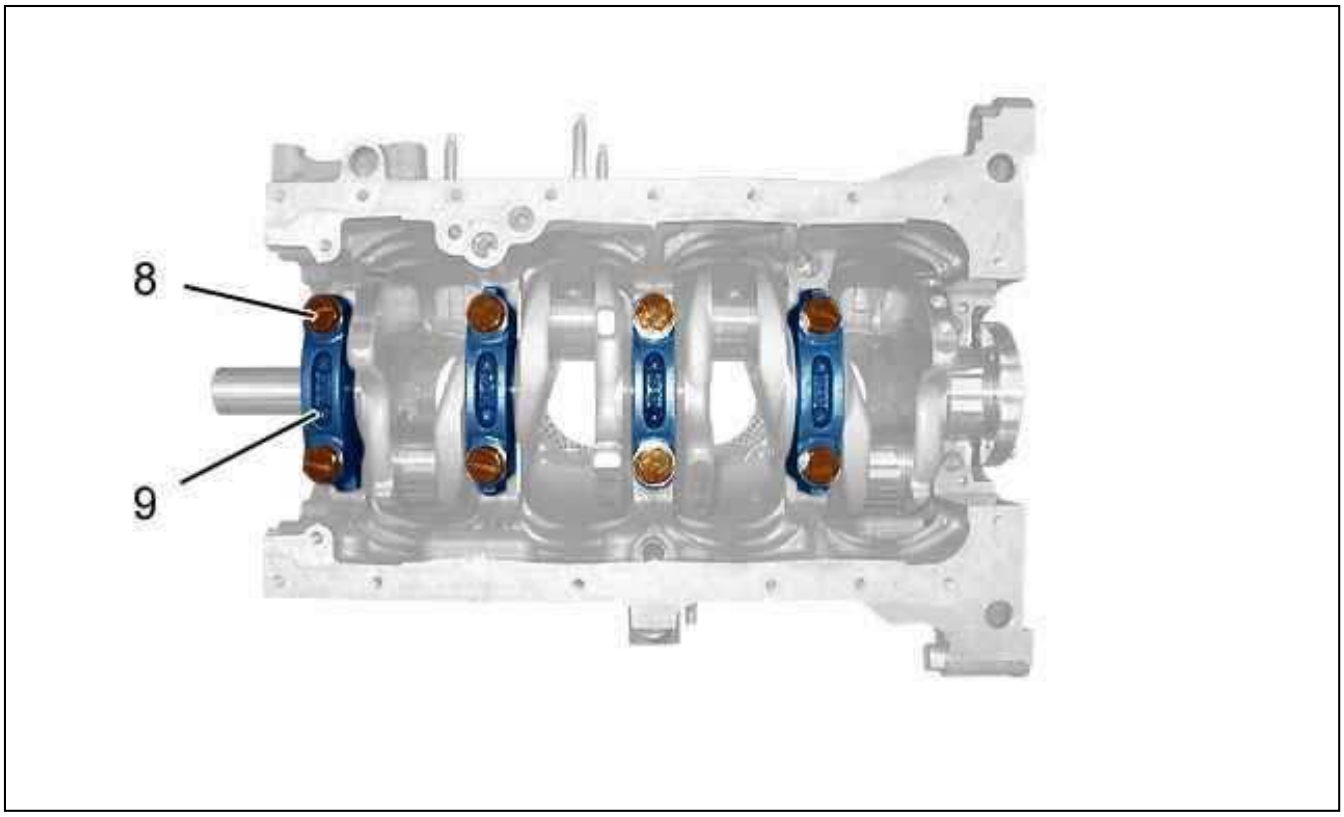


Figure : B1BG2IOD

CAUTION : Do not lubricate the cylinder block/crankshaft bearing caps contact faces.

Uniformly lubricate each half bearing shell (One drop of oil).

CAUTION : Observe the position and direction of the main bearing caps (Bearing n°1 flywheel end).

Refit the crankshaft bearing caps (9) (N°2, 3, 4, 5).
Method for refitting the bolts (8) (New) (Proceed bearing by bearing) :

- Refit the bolts (8)
- Do up the bolts (8)
- Slacken the bolts (8) by 2 turns

Check that the crankshaft rotates freely.

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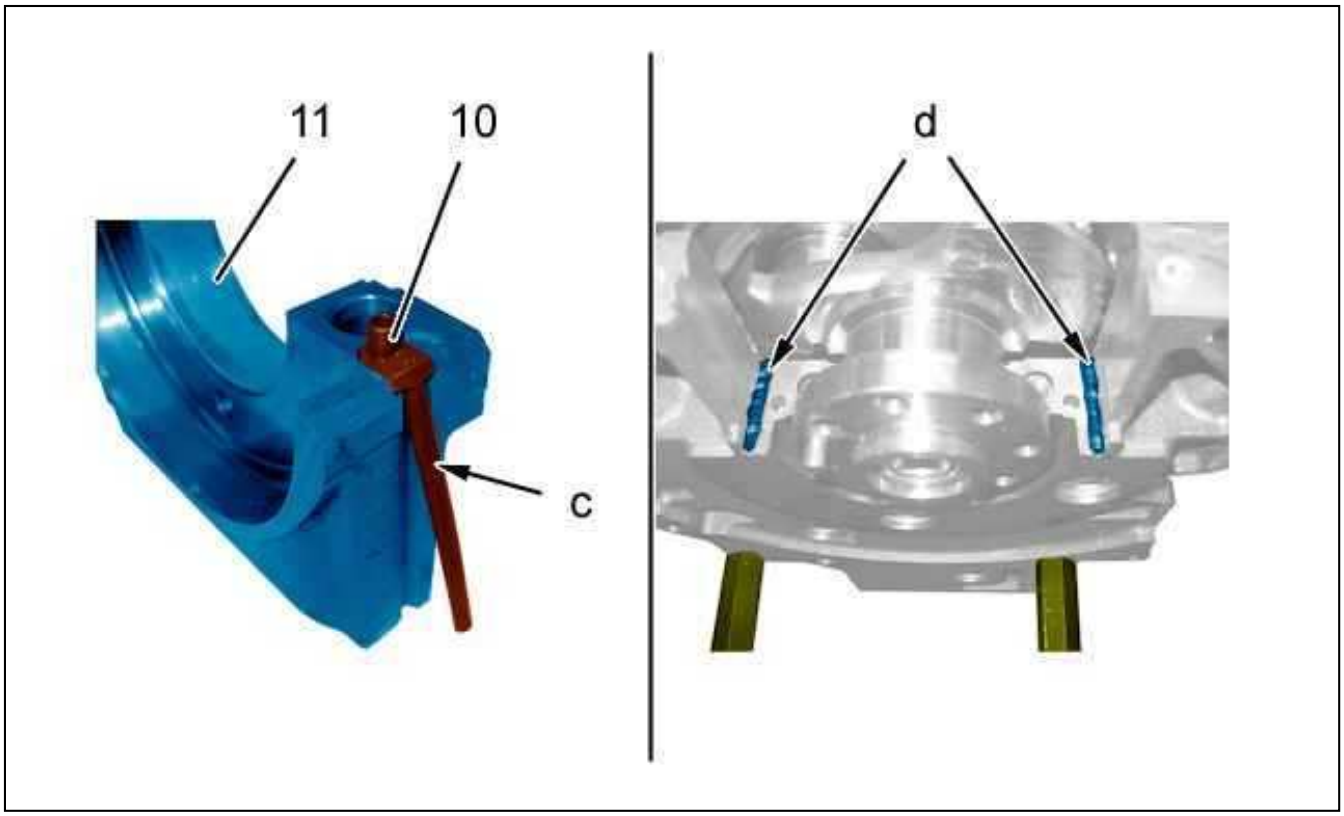


Figure : B1BG2IPD

CAUTION : Do not lubricate the cylinder block/crankshaft bearing caps contact faces.

Refit the lateral seals (10) in the grooves of the bearing cap (11) (N°1).
Apply a seal index "E10" in the corners of the bearing cap (11) (N°1) (at "d").
Apply a little oil in the contact areas of the lateral seals (10) (at "c").
Refit the crankshaft bearing cap (11) :

- Engage the crankshaft bearing cap (11) in the cylinder block
- Slide the crankshaft bearing cap (11) fully into the cylinder block

CAUTION : Always replace the bolts (8).

Method for refitting the bolts (8) (new) :

- Refit the bolts (8)
- Do up the bolts (8)
- Slacken the bolts (8) by 2 turns

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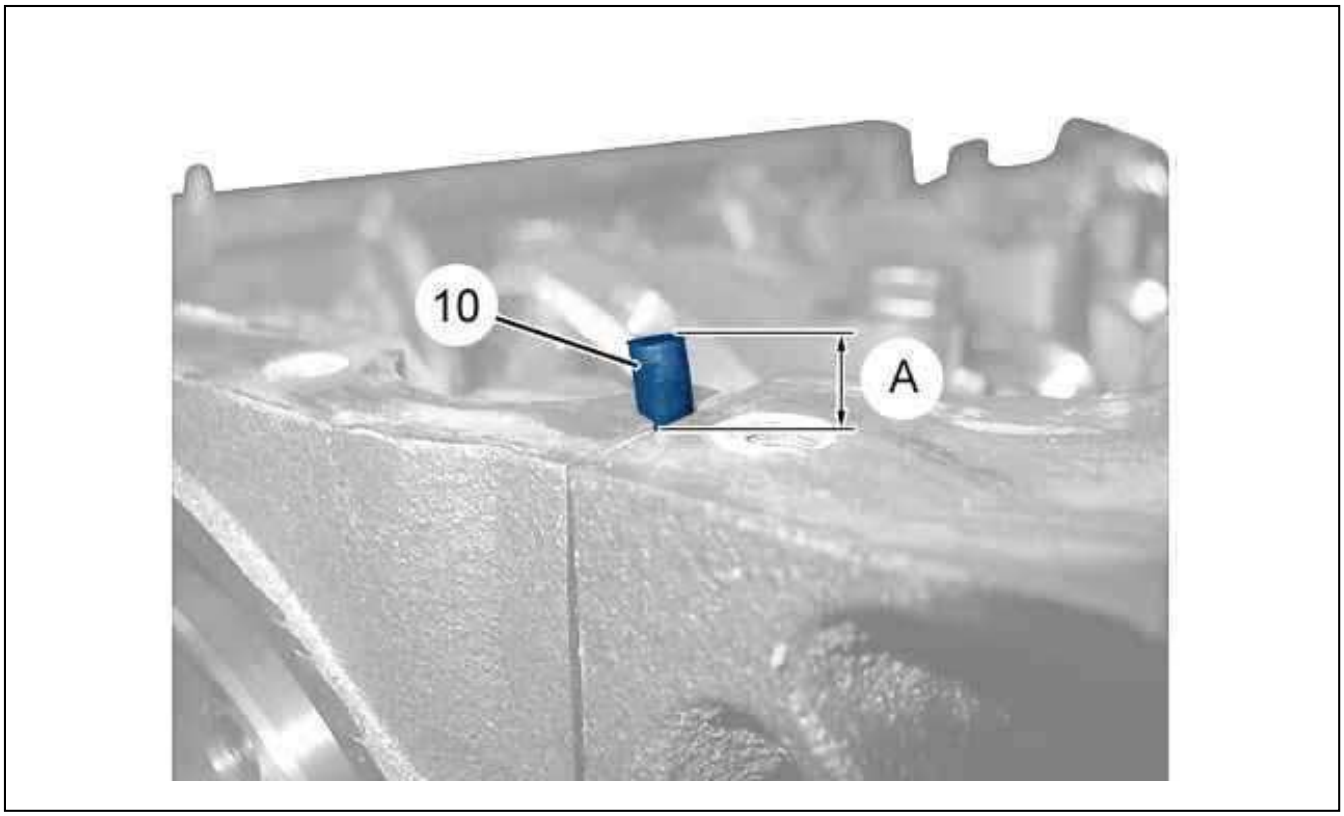


Figure : B1BG2ISD

CAUTION : The standproud "A" of the lateral seals (10) should be between 1 and 3 mm.

Check the standproud of the lateral seals (10).

N.B. : If in excess, cut the seal strip.

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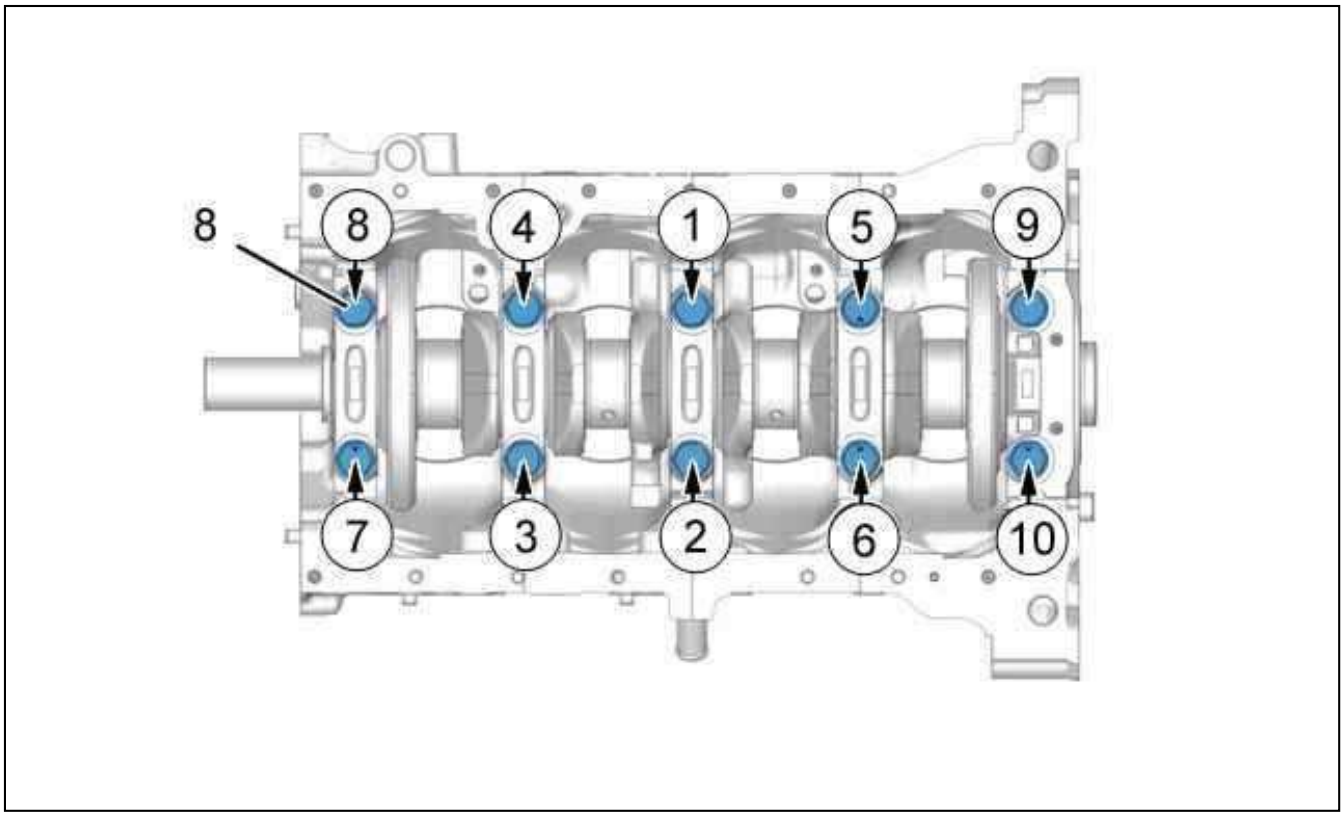


Figure : B1CB03ND

Tighten the bolts (8) to the specified torque (In ascending order of bolts) :

- Do up the bolts
- Pre-tighten to the correct torque
- Tighten to the correct torque
- Angular tightening

3.4. Assembling the conrod/piston/piston ring assemblies

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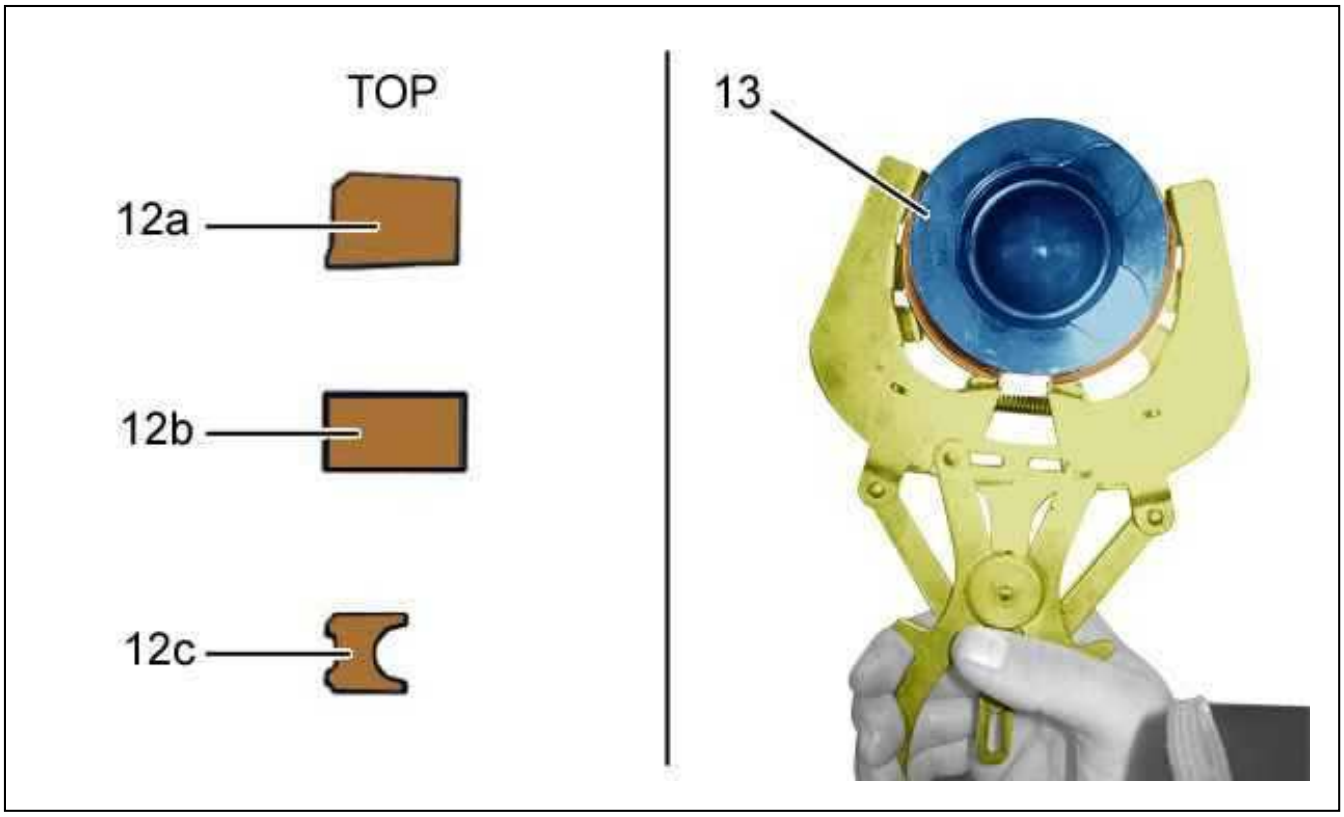


Figure : B1BG2IUD

CAUTION : Take care with the location of each piston ring (12). The piston ring surfaces marked "TOP" must face upwards.

Refit the rings on the piston (13) ; Using piston ring pliers .
Observe the following order of fitting :

- Scraper ring (12c) (At the bottom)
- Sealing ring (12b) (Half way)
- Top compression ring (12a) (At the top)

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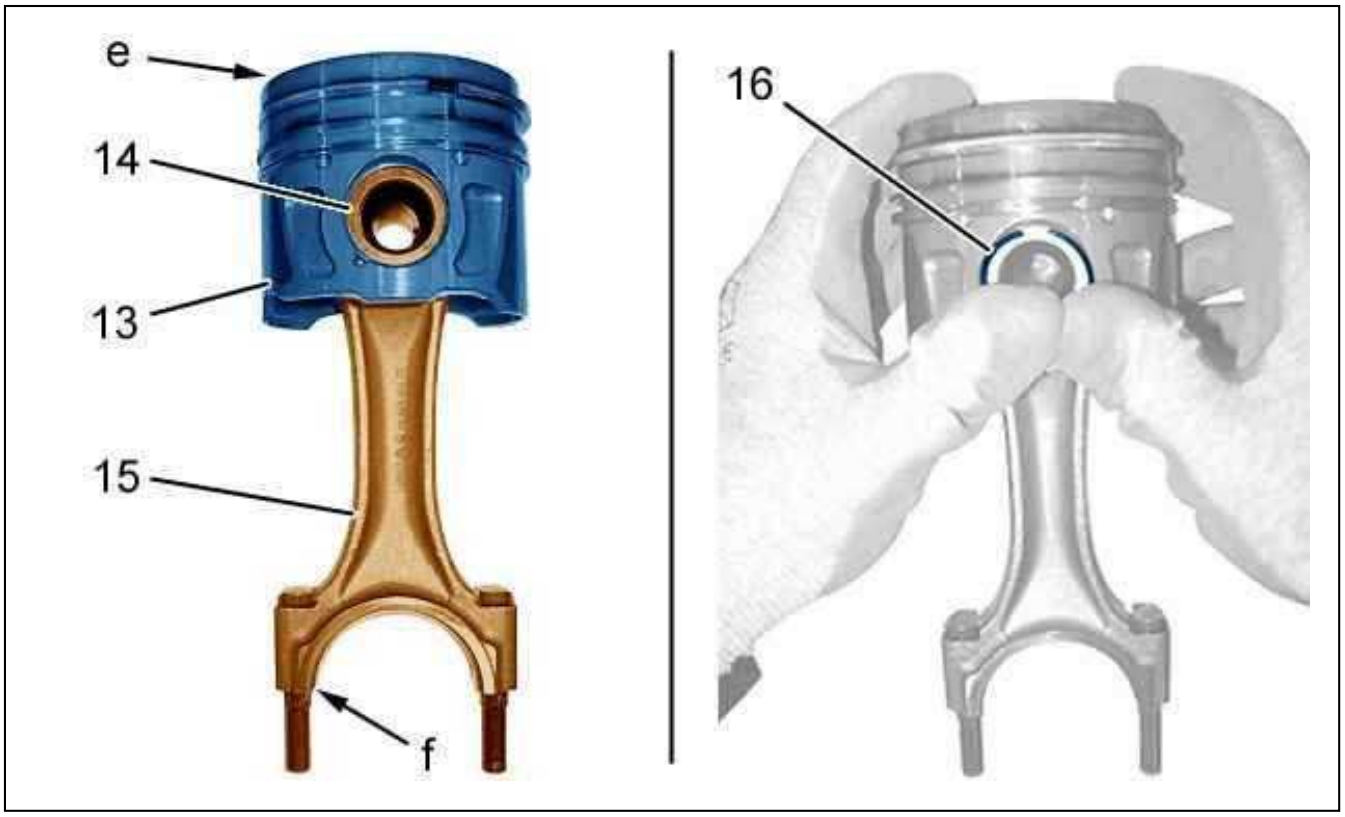


Figure : B1BG2IVD

CAUTION : Observe the direction of the conrod in relation to the piston ; The arrow "e" engraved on the piston should be towards the timing end ; Orient the lugs on the bearing shells "f" on the conrod towards the front face of the engine (Oil filter side).

Refit on the piston (13) :

- The connecting rod (15) ; Respect the orientation indicated
- The gudgeon pin (14)
- The circlips (16)

CAUTION : If re-using the connecting rods : Always replace the connecting rod bolts/nuts assembly with new parts.

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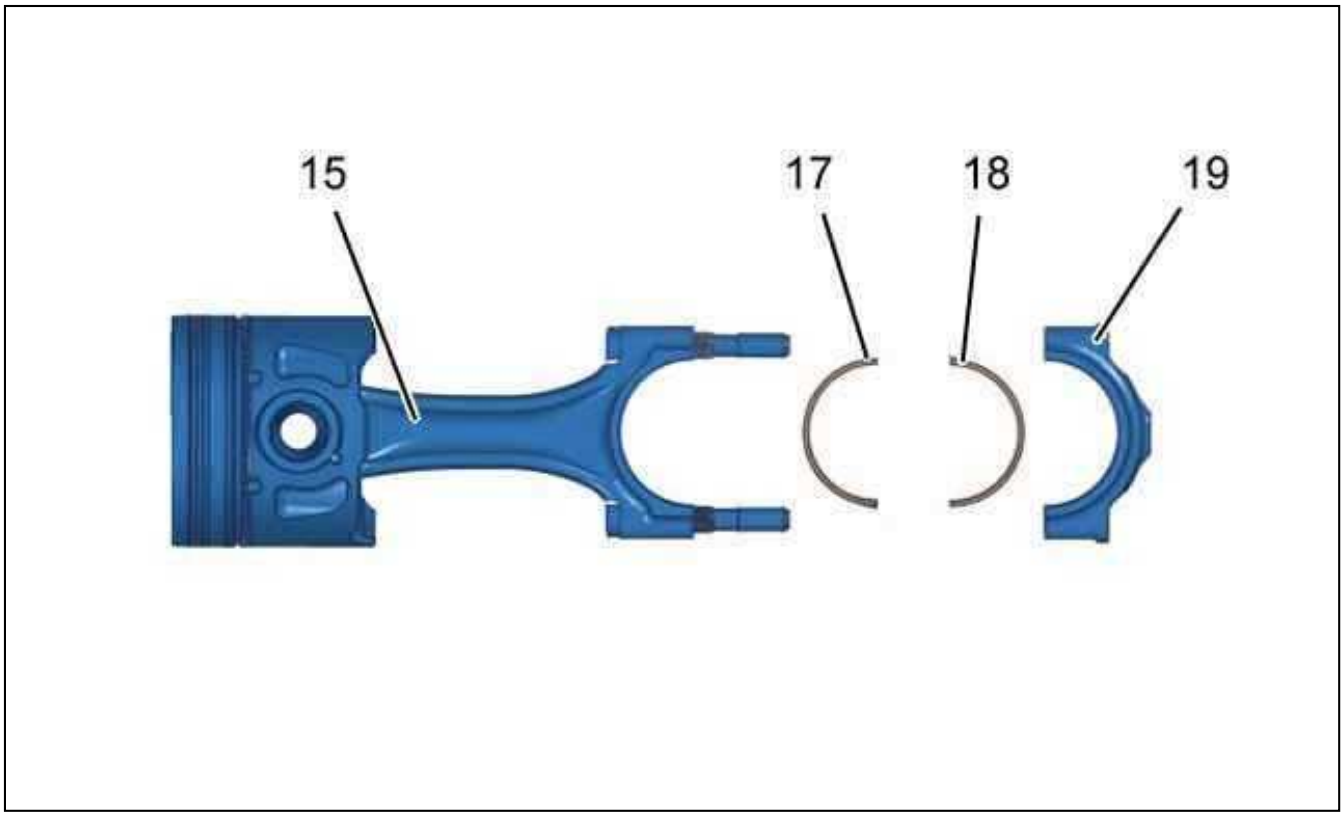


Figure : B1BG2IWD

CAUTION : The difference between each conrod/piston assembly must not exceed 10 grammes.

Weigh the four conrod/piston assemblies : Check the differences between each element.

CAUTION : The smooth upper bearing shells (17) have 3 thickness classes.

Determine the thickness of the smooth upper bearing shells (17) for each conrod .

CAUTION : If re-used, Ensure that the half bearing shells are positioned correctly.

CAUTION : In the case of half bearing shells without lugs, use the centring tool [0188-AS].

Depending on the thickness class chosen, refit on each conrod (15) the corresponding smooth upper bearing shells (17 (Lugs in the housings).
Refit (18) the smooth lower bearing shells on the conrod caps (19) (Lugs in the housings).

N.B. : The smooth lower bearing shells (18) have no thickness classes.

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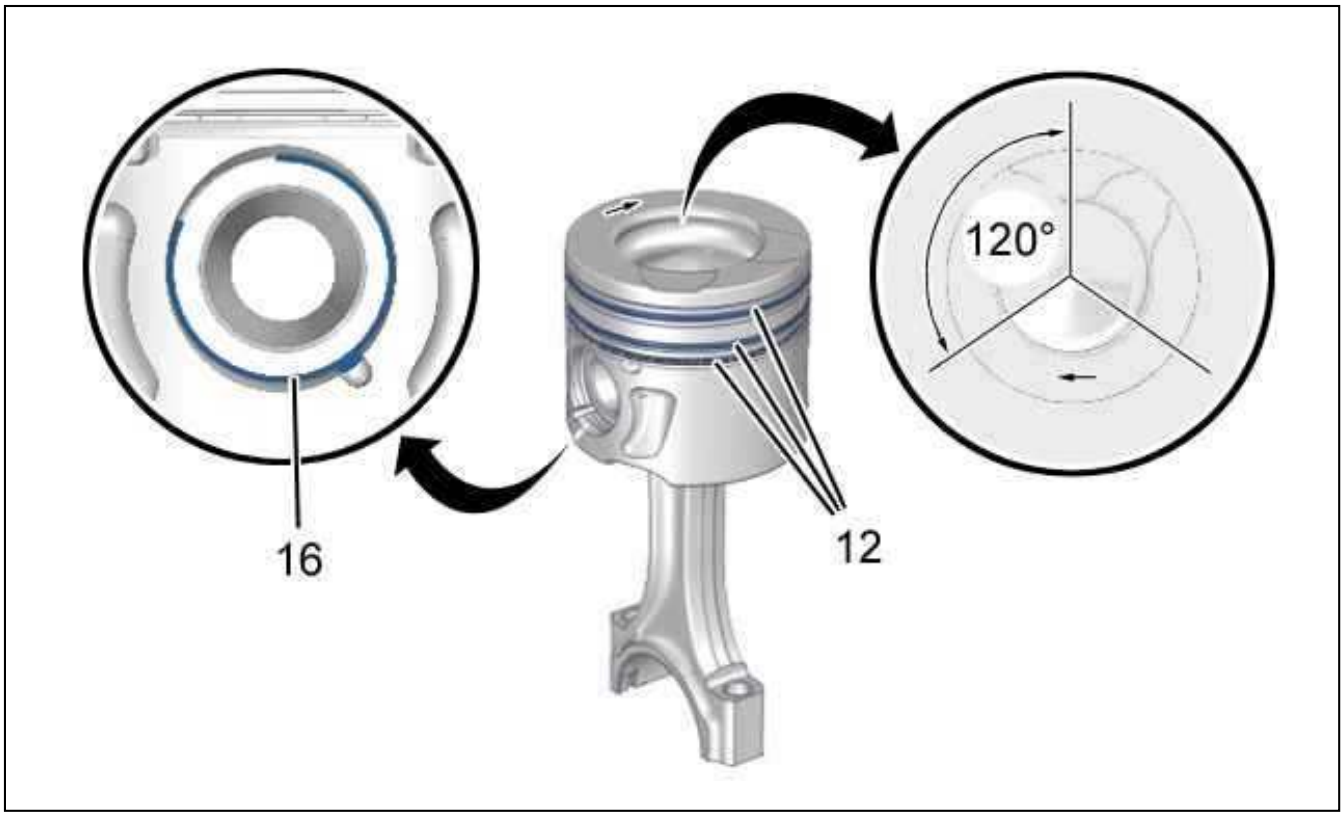


Figure : B1BG2IZD

Positioning the piston rings and circlips :

- Orient the cut in each circlip (16) on the opposite side to the dimple
- Check the orientation of the piston ring gaps (12) (Interval : 120°)

3.5. Refitting : Conrod/piston/piston ring assemblies

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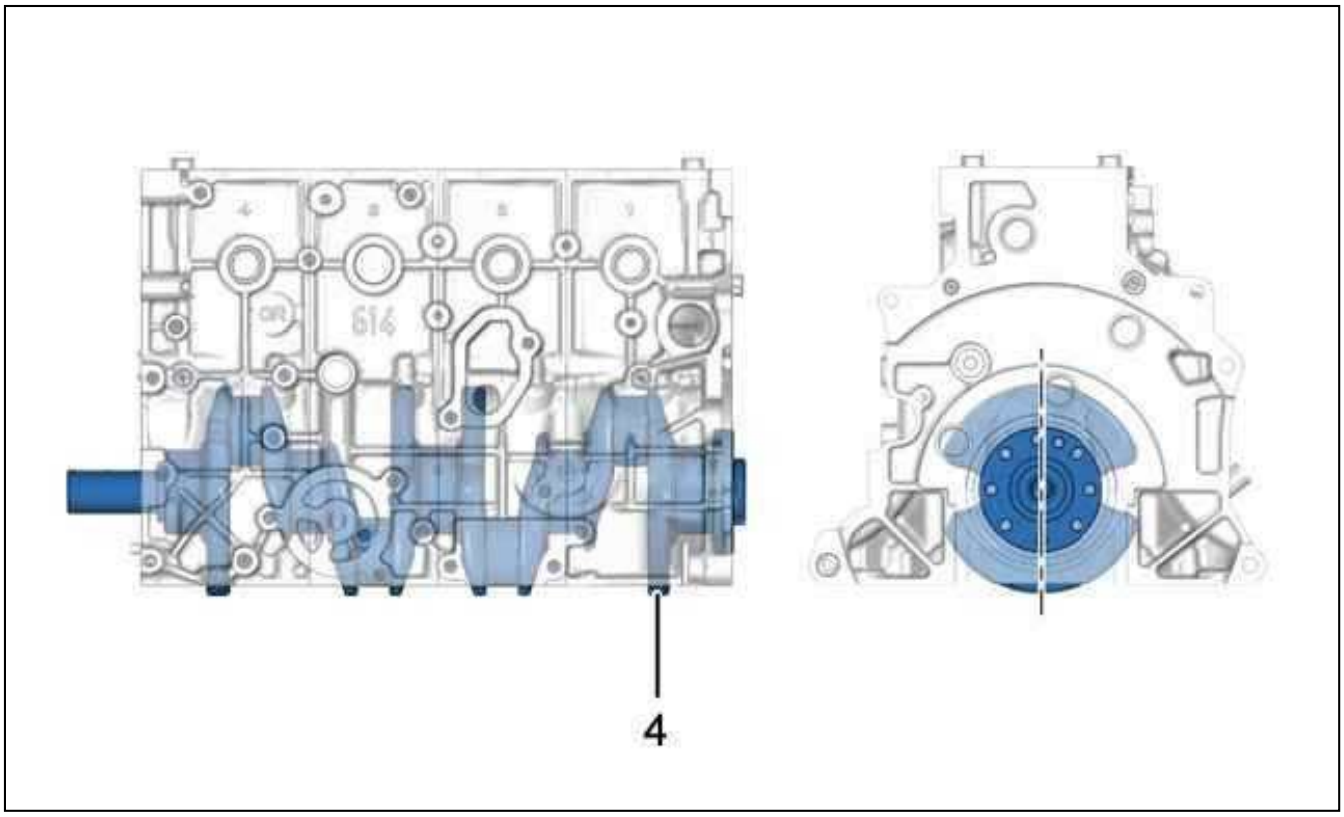


Figure : B1BG2J2D

Orient the crankshaft (4) to position the crank pins corresponding to the cylinders n°1 and n°4 at top dead centre.

N.B. : This ensures that the conrod/piston assemblies are correctly mounted on the crankshaft.

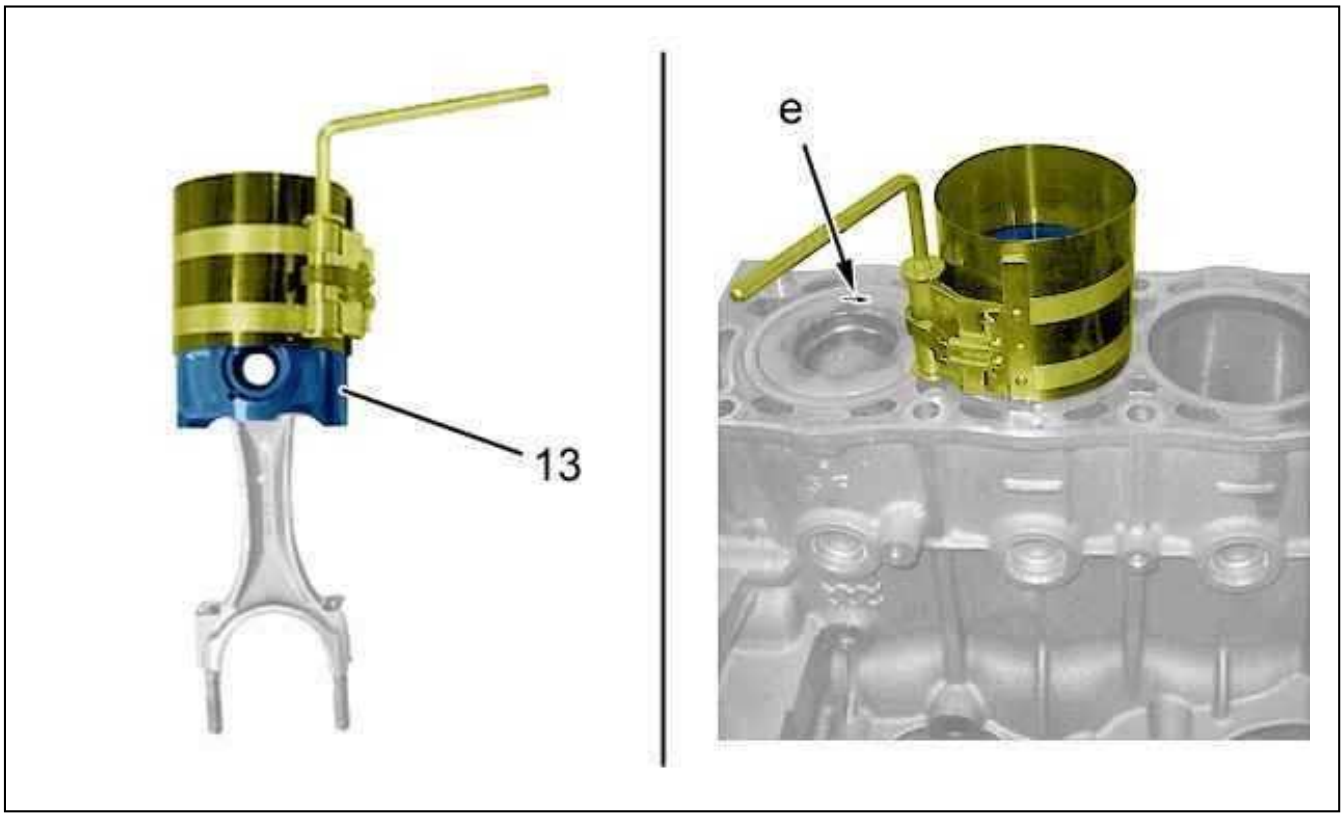


Figure : B1BG2J3D

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CAUTION : Use a piston mounting clip that is clean.

Uniformly lubricate :

- The mounting clip
- The conrod bearing shells
- The bores (Cylinder block)

Place the mounting clip on the piston (13) ; Leave sufficient piston skirt to be able to engage the assembly in the cylinders.
Compress the piston rings while tightening the mounting clip.

CAUTION : The arrow "e" engraved on the piston should be towards the timing end ; Keep to the conrod/cylinde matchings noted at removal.

Position each piston in its cylinder.

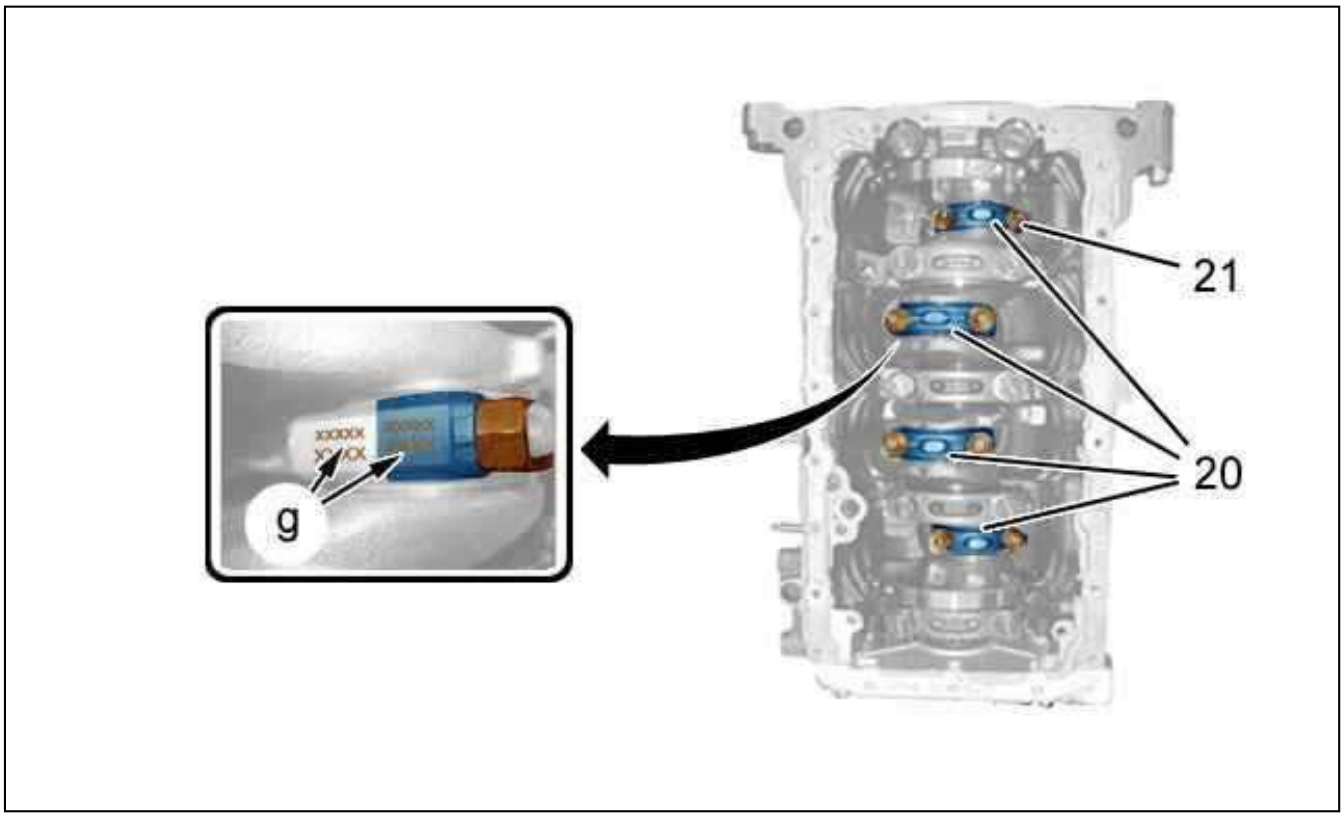


Figure : B1BG2J6D

CAUTION : Observe pairing of the conrods/big end caps (Components "g").

Refit :

- The big end caps (20)
- The 8 nuts (21) ; Hand-tighten

Tightening of the nuts to the correct torque :

- Pre-tighten the nuts (21) (Conrod by conrod)
- Carry out an angular tightening of the nuts (21) (Conrod by conrod)

Check that the crankshaft rotates freely, then return it to the top dead centre position.

3.6. Refit the oil pump

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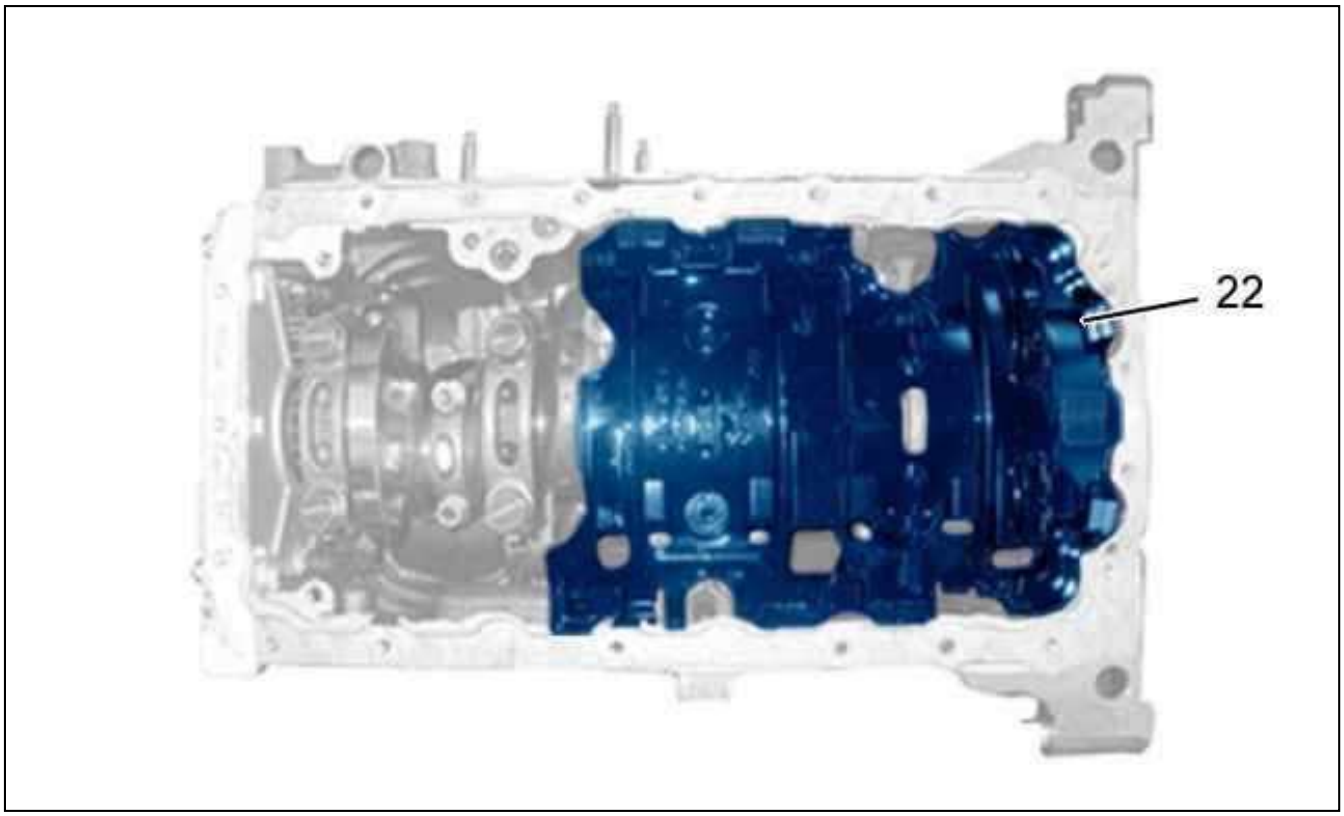


Figure : B1BG2J7D

Refit the anti-foaming plate (22).

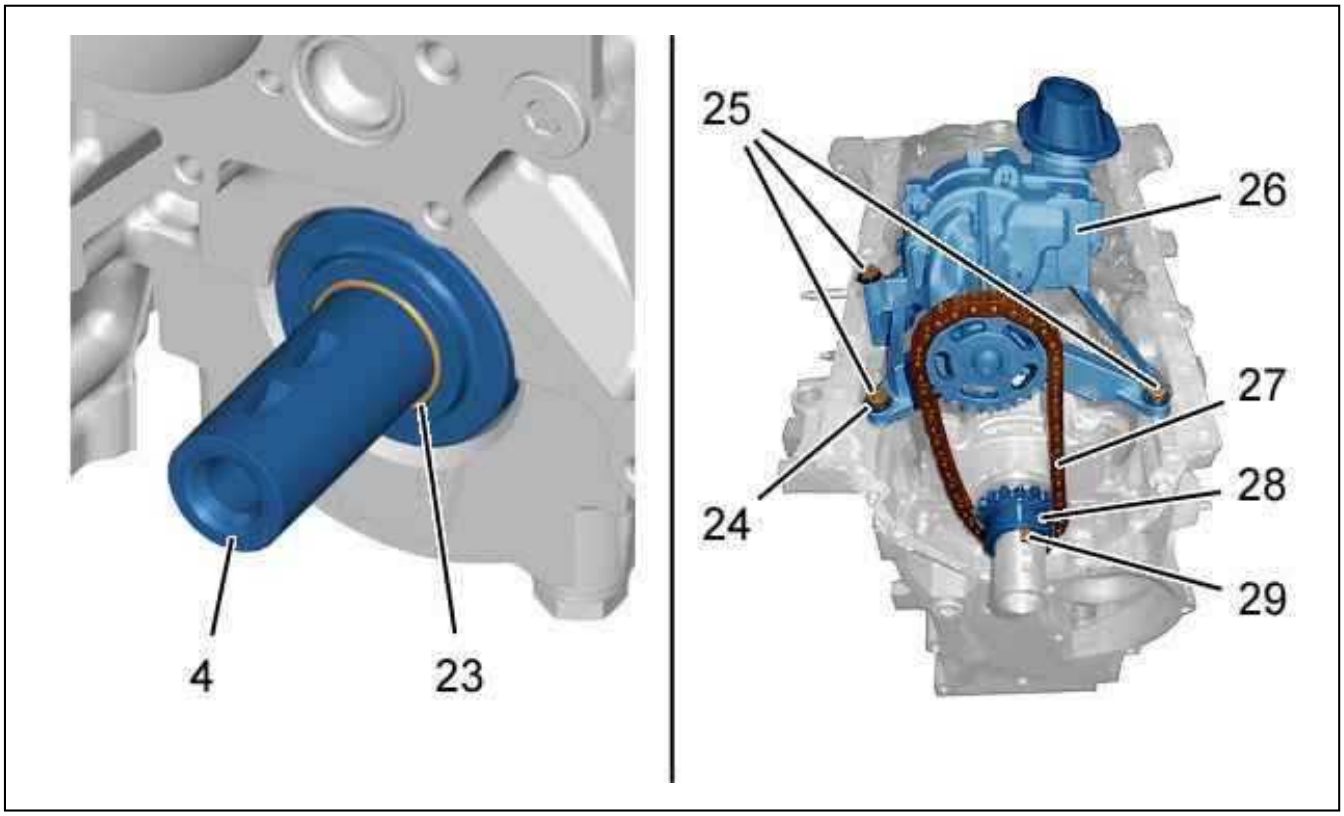


Figure : B1BG2J8D

Uniformly lubricate the end of the crankshaft (4).
Fit the O-ring seal (23) fully onto the crankshaft.

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Refit the cotter pin (29) on the second groove of the crankshaft (4).
Assemble the following components :

- Engine oil pump (26)
- Drive chain (27)
- Keyed drive pinion (28)

CAUTION : The long bolt (25) is fitted on with a washer (24).

Refit :

- The assembly of components (26), (27), (28)
- The washer (24)
- The bolts (25) ; Finger tighten

CAUTION : Check that the drive pinion (28) is captured by the keyway (29).

Tighten the bolts (25) to torque.

3.7. Refitting : Ring seals

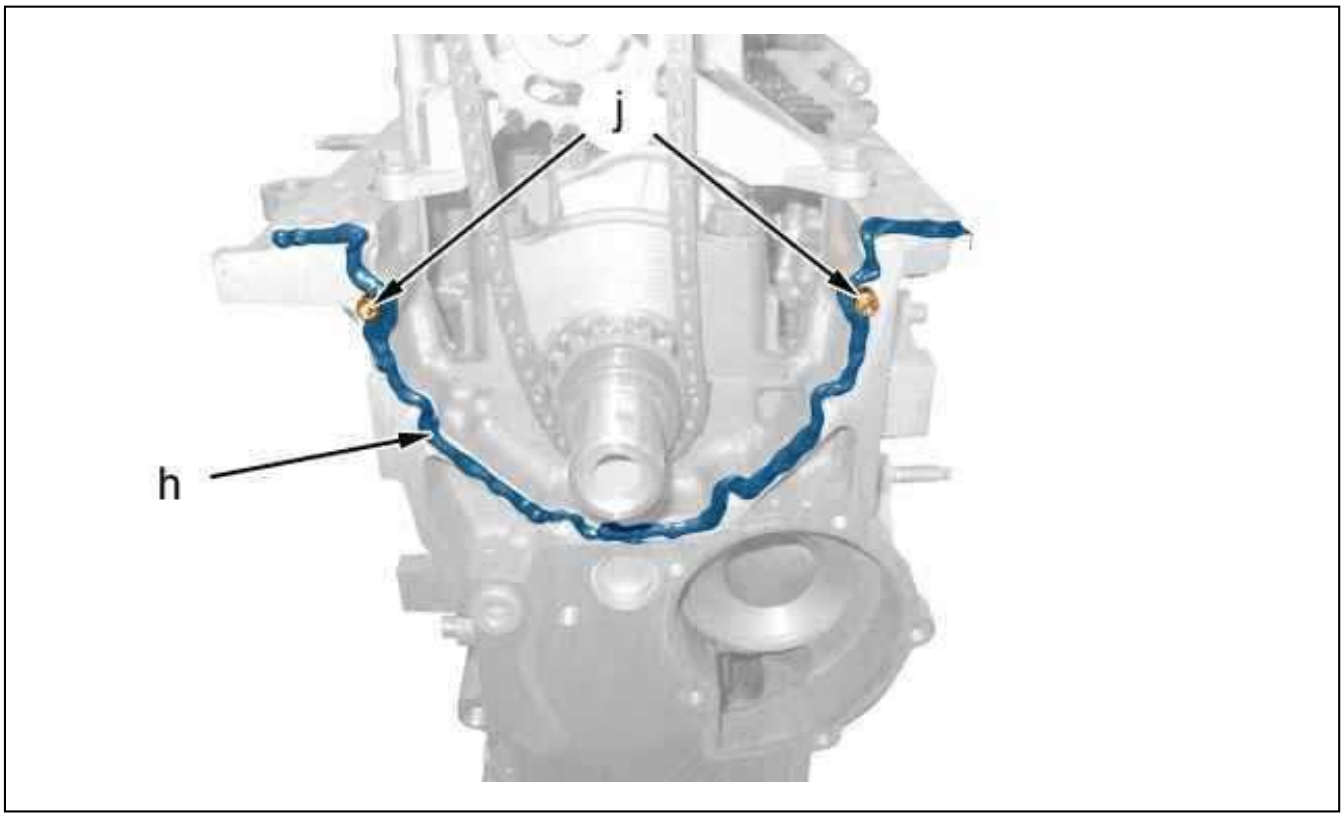


Figure : B1BG2J9D

CAUTION : The positioning operation must not take longer than 5 minutes.

Check that the centring pins are present (at "j").
Apply a seal (index "E10") (at "h").

N.B. : Thickness of the sealing bead 4 mm.

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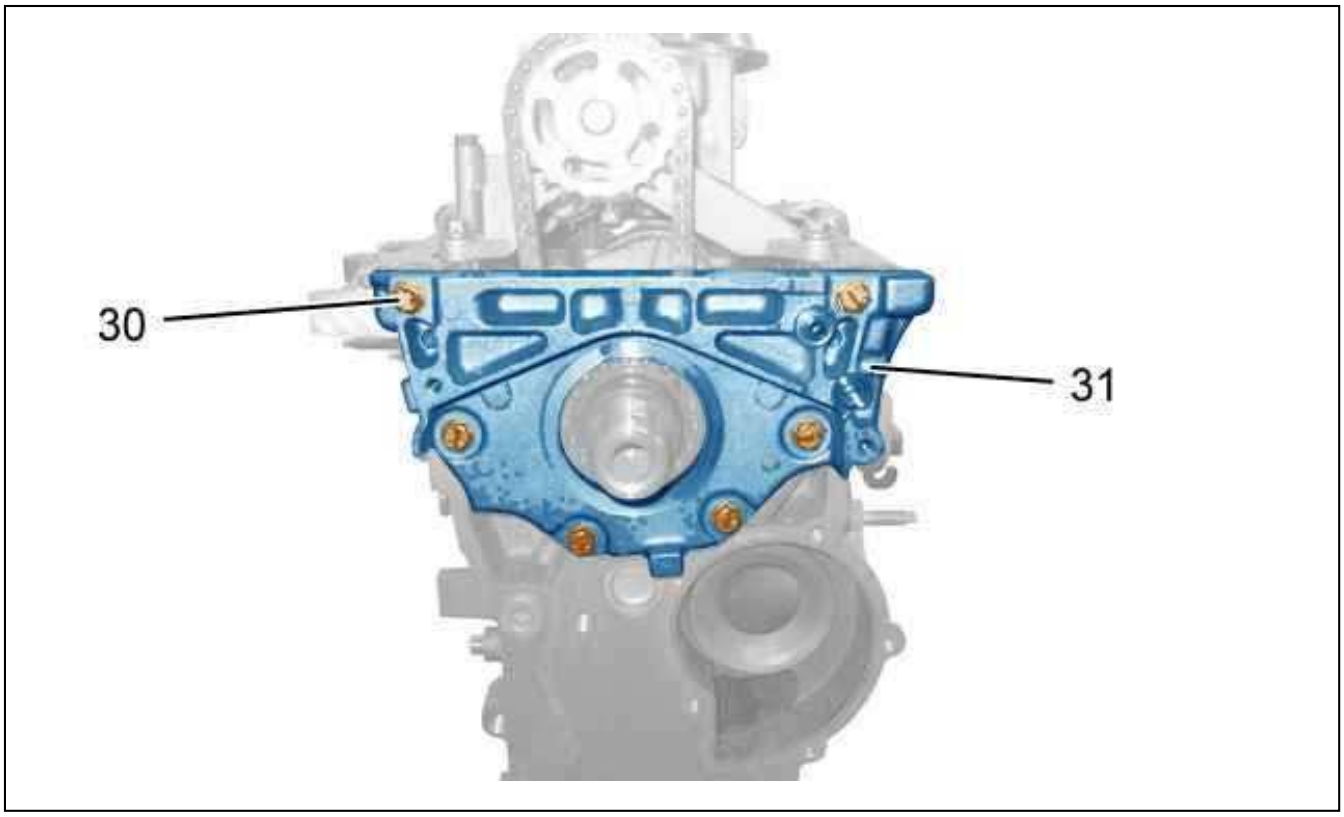


Figure : B1BG2JCD

Refit :

- Diesel injector extractor (31)
- The bolts (30) ; Hand-tighten

Tightening of screws (30) :

- Pre-tightening to torque of the bolts (30)
- Tighten the bolts (30) to torque

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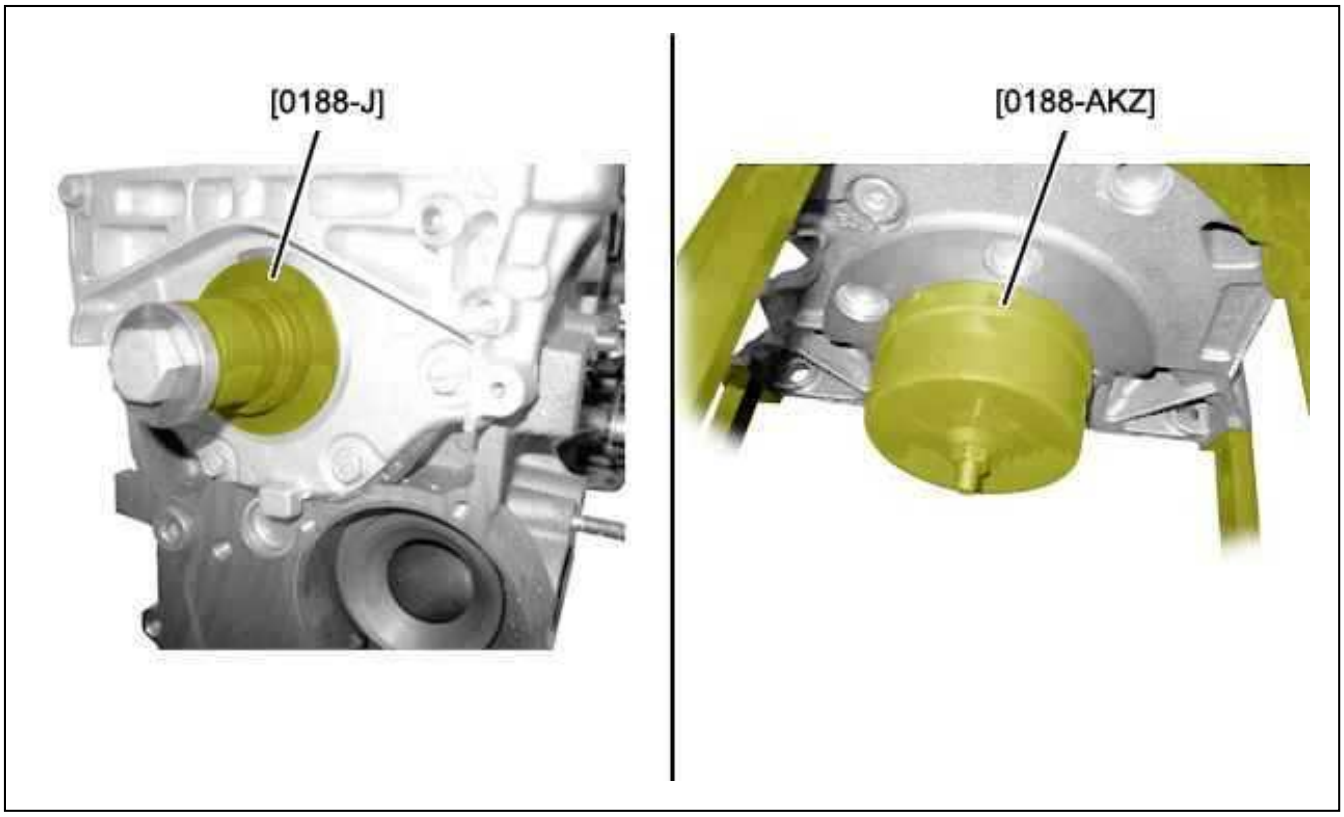


Figure : B1BG2JDD

Refit the crankshaft ring seals ⓘ ; Using the tools [0188-J], [0188-AKZ].

3.8. Lower cover

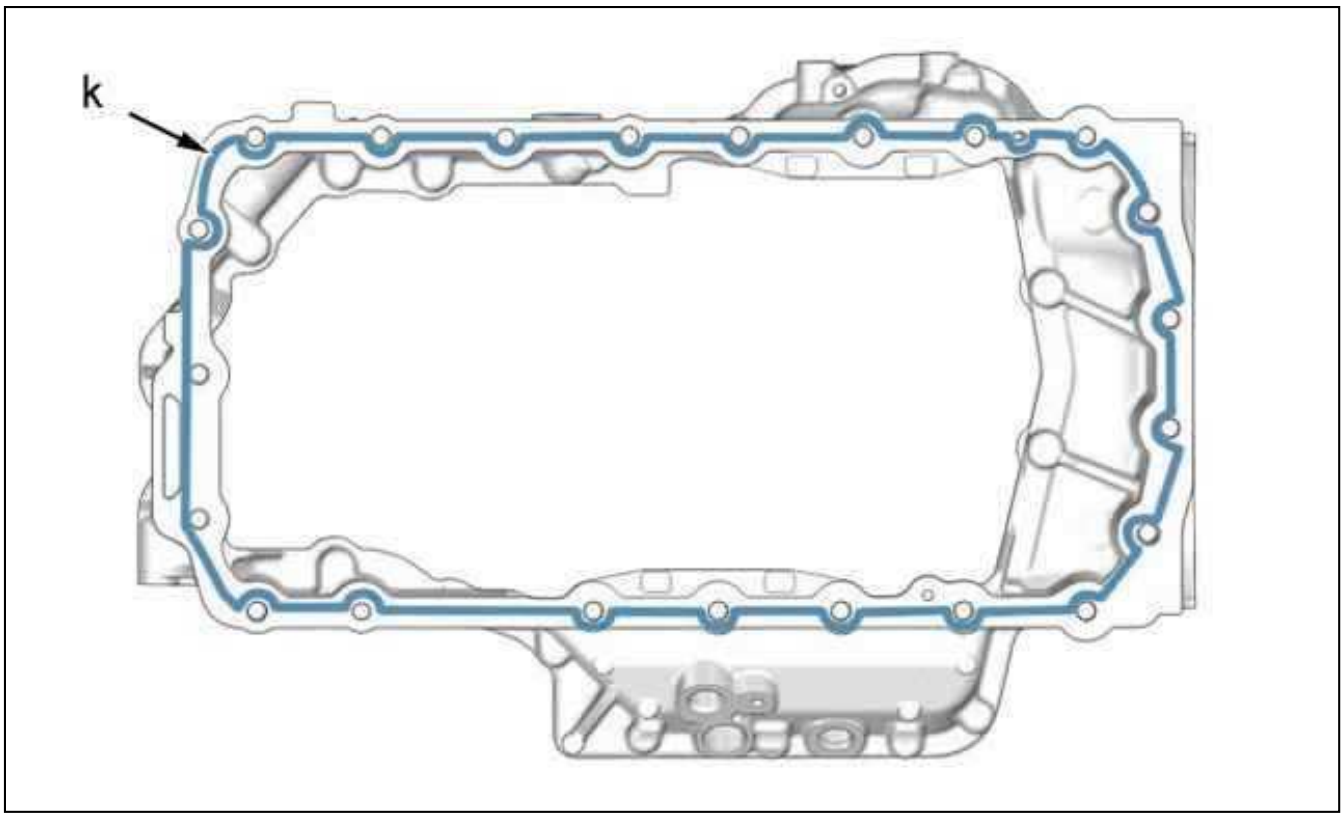


Figure : B1FG066D

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CAUTION : The positioning operation must not take longer than 5 minutes.

Apply a strip of sealing product on the sealing face of the oil sump (index "E10") (at "k").

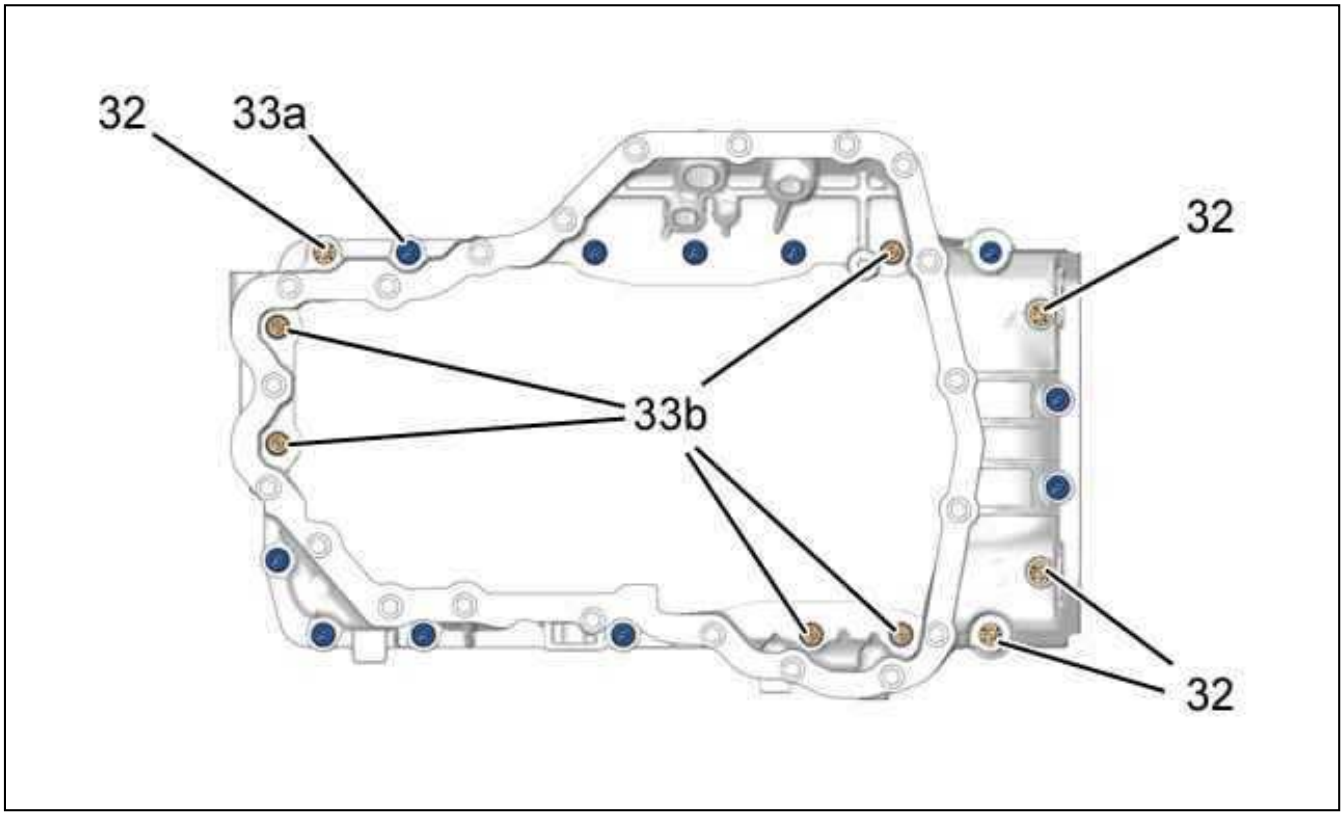


Figure : B1FG0CMD

CAUTION : 2 possible assemblies of bolts (32), (33a), (33b); It is essential to keep the positions of the bolts correct Risk of damage to the cylinder block (Crankshaft bearing cap incompatible with the bolts 25 mm in length).

CAUTION : Whichever assembly it is, the 5 bolts (33b) have to be coated with sealing product (index "E4"); Risk o leaks.

First assembly :

- 4 bolts (32) 40 mm long
- 16 bolts (33a) and (33b) 21 mm long

Second assembly :

- 4 bolts (32) 45 mm long
- 11 bolts (33a) 21 mm long
- 5 bolts (33b) 25 mm long

Refit :

- The sump
- The bolts (32), (33) (respecting their original positions)

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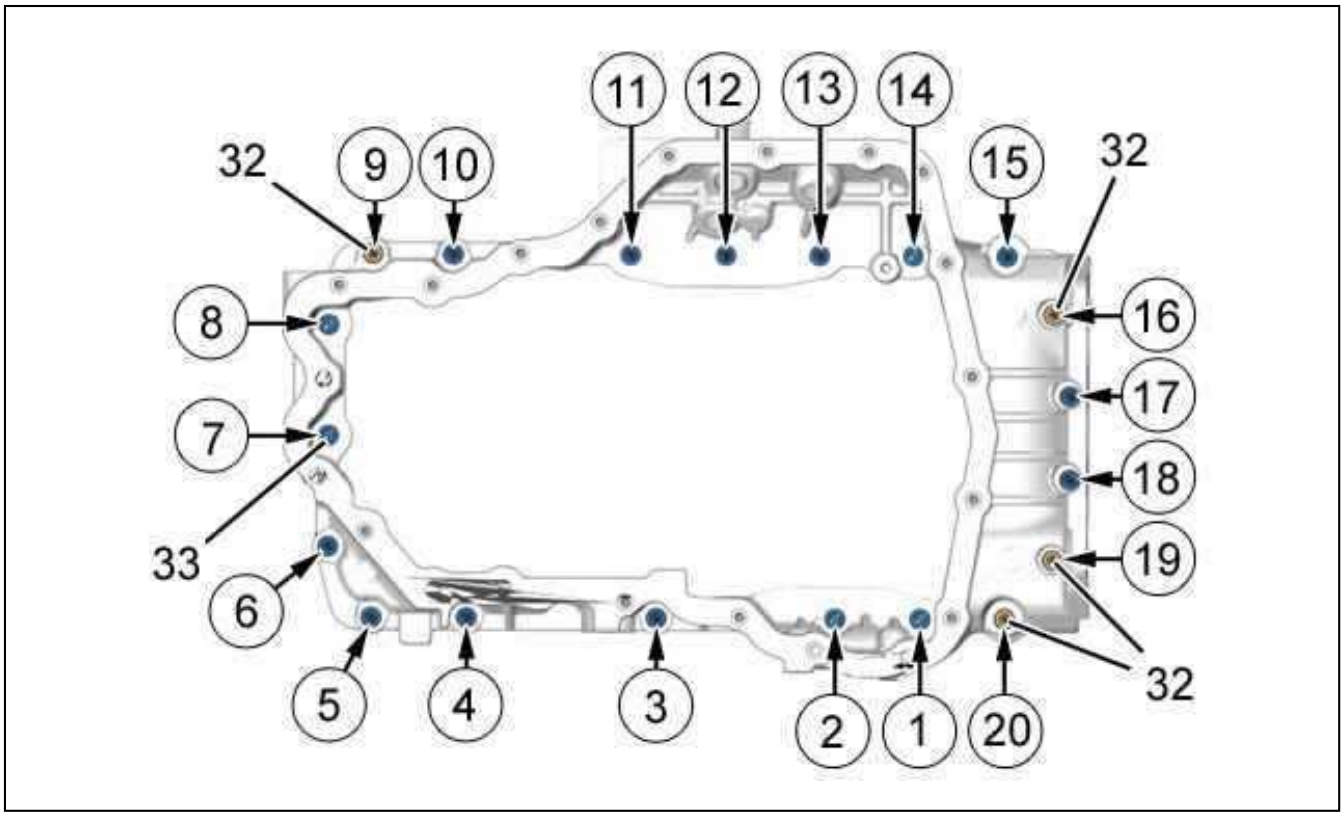


Figure : B1FG0CND

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Draw up the bolts (32), (33)
- Do up the bolts (32), (33)
- Tighten the bolts (32), (33) to torque

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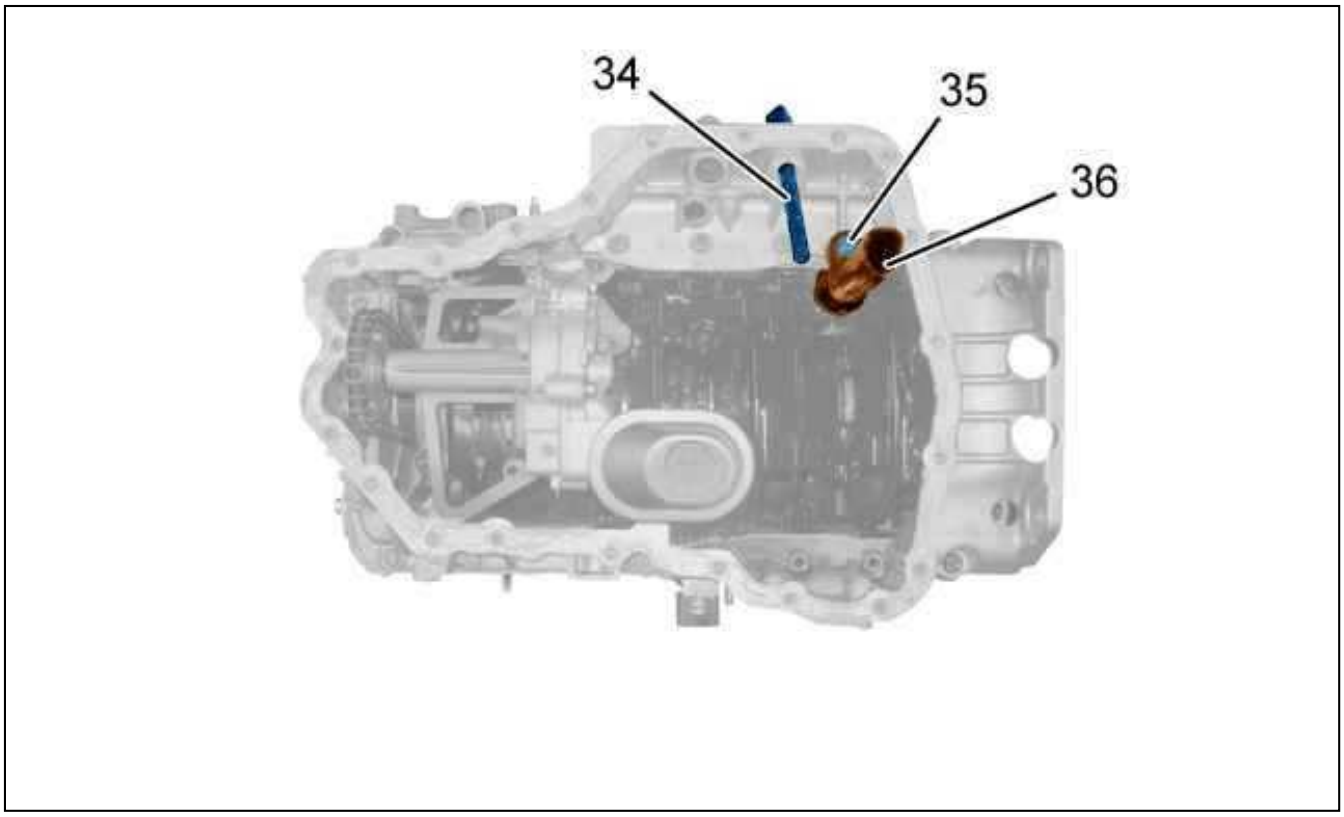


Figure : B1BG2JJD

Refit :

- The discharge pipe (36)
- The (35) bolt
- The engine oil level and temperature sensor (34)

3.9. Oil sump

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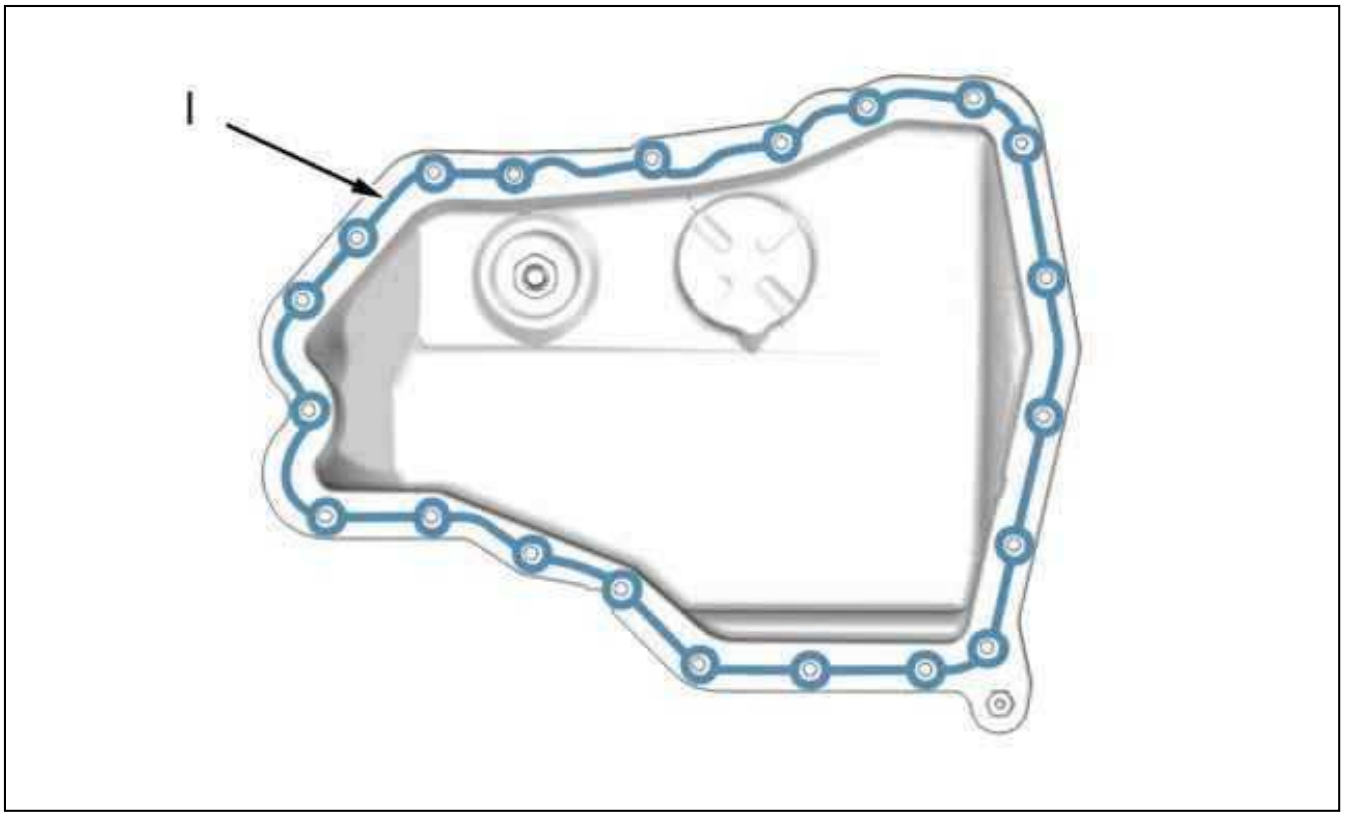


Figure : B1FG067D

CAUTION : The positioning operation must not take longer than 5 minutes.

Apply a strip of sealing product on the sealing face of the oil sump (index "E10") (at "I").

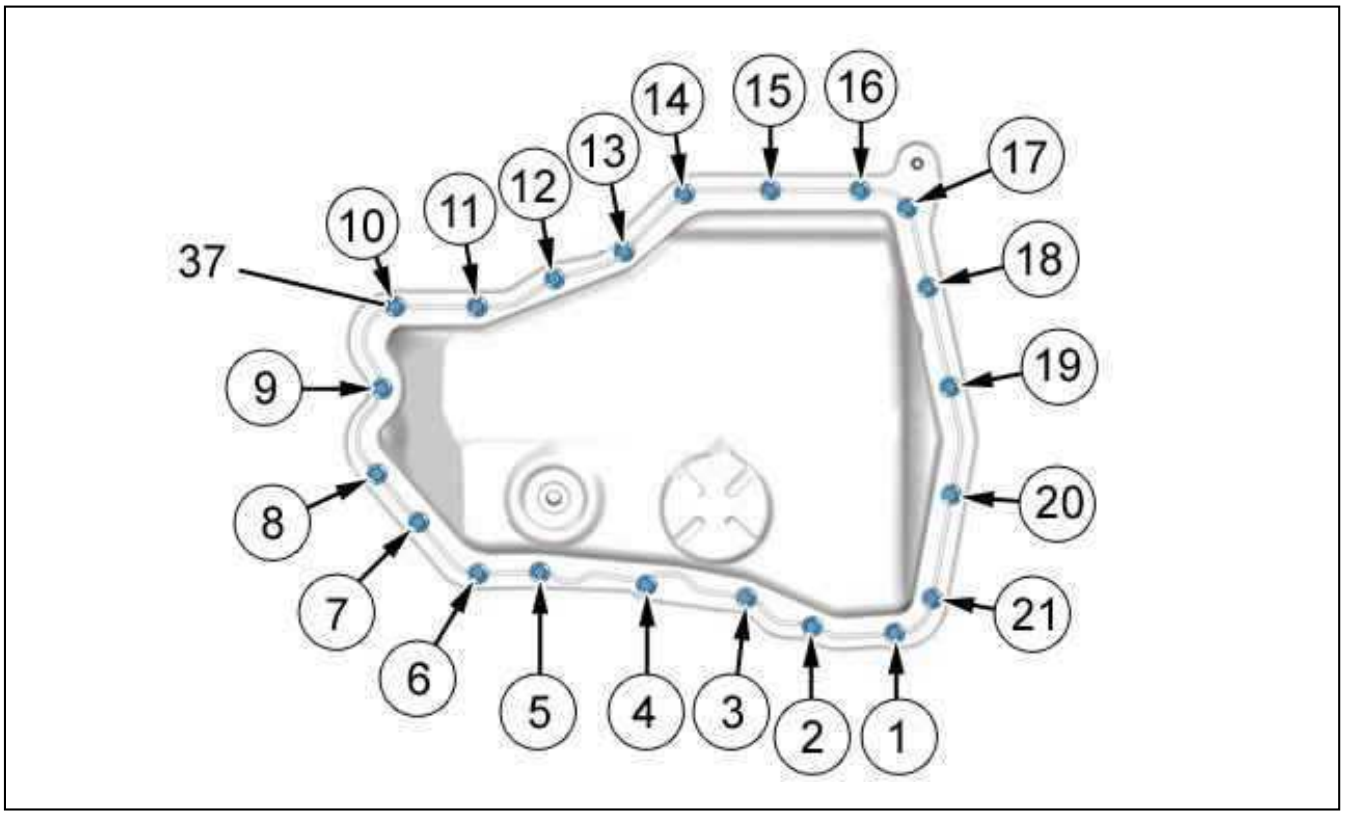


Figure : B1FB01UD

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Refit the oil sump.

CAUTION : Respect the tightening sequence indicated.

Tightening of screws (37) :

- Do up the screws by hand
- Do up the bolts (37)
- Tighten the bolts (37) to torque

4. Re-assembling : Under engine (front surface)

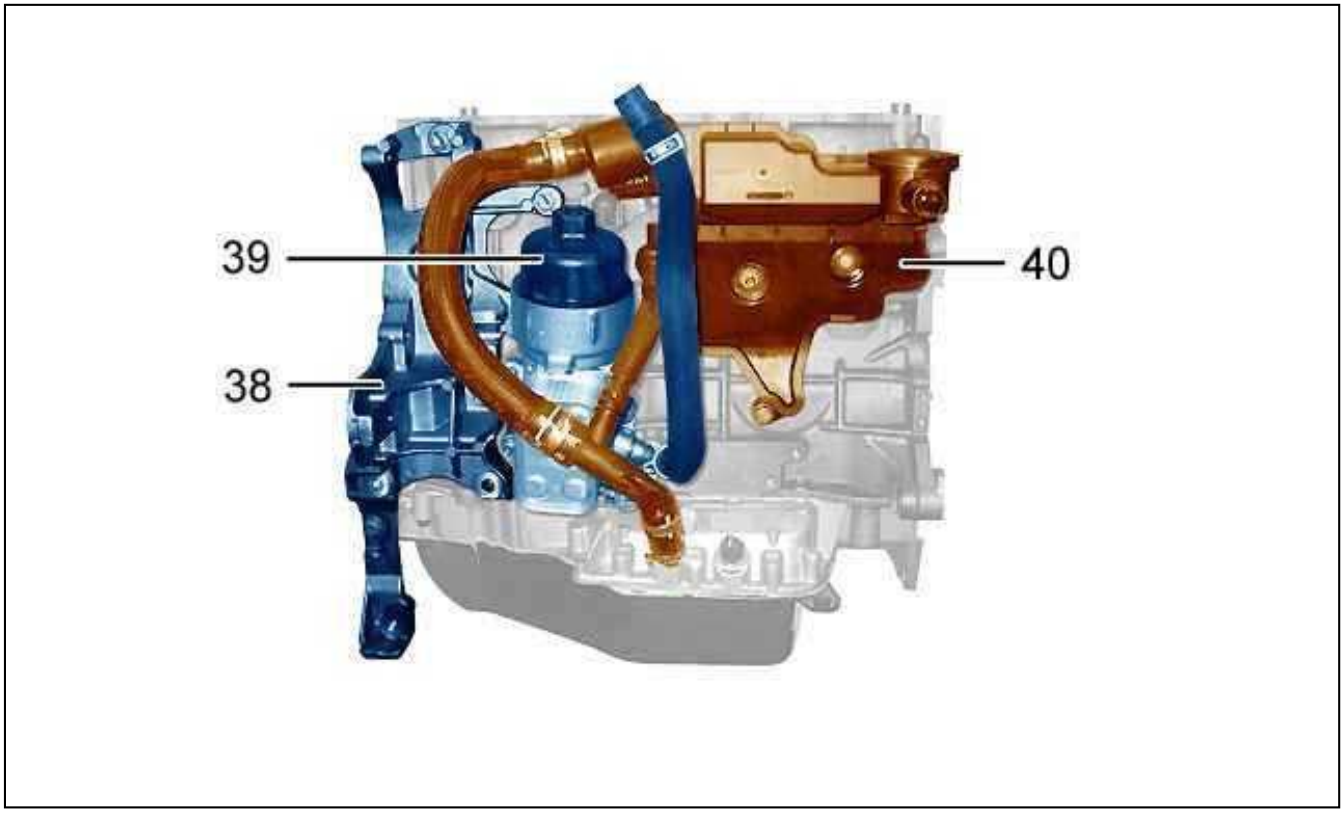


Figure : B1FG068D

Assembly of the components located on the front face of the engine :

- Engine oil separator (40)
- Engine oil filter support (39)
- Multifunction support (38)

4.1. Engine oil separator

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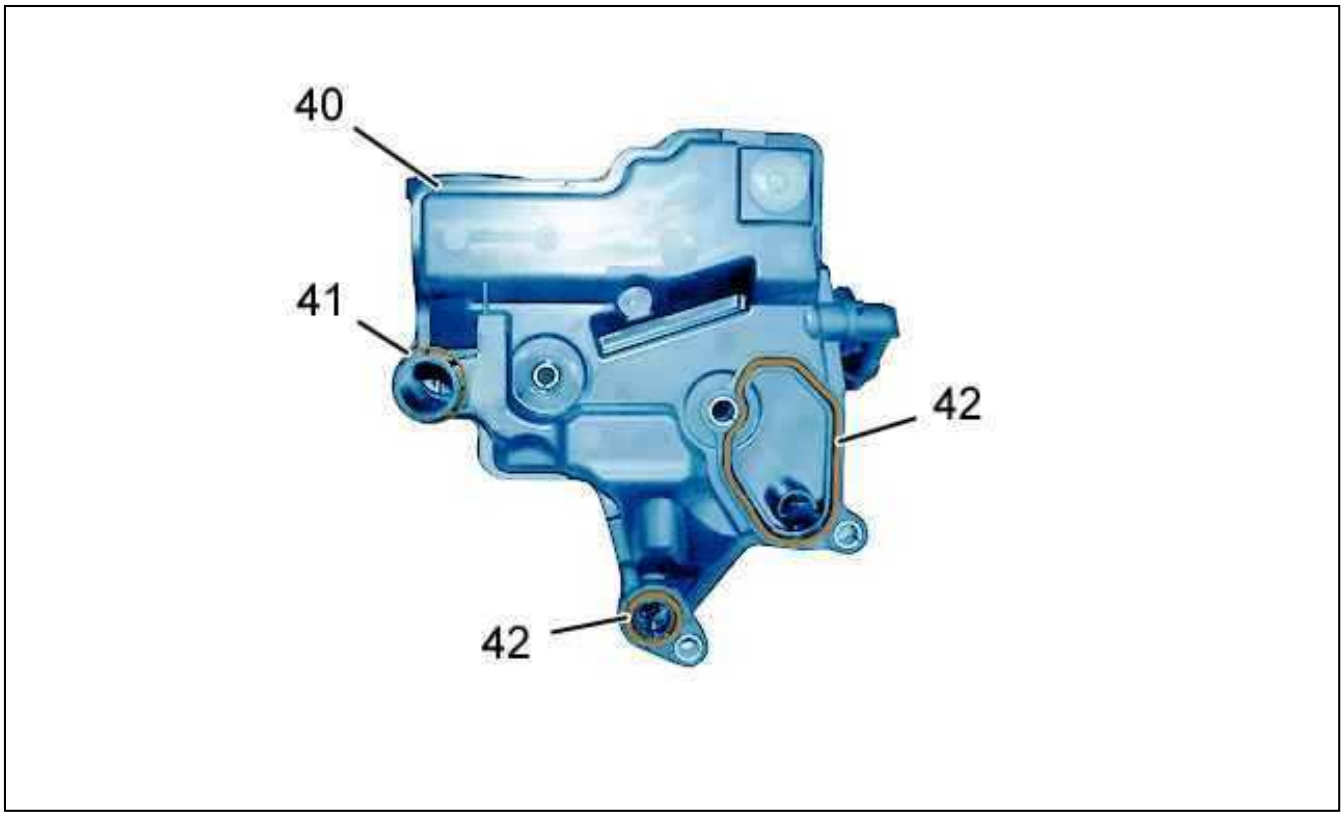


Figure : B1FG069D

Before refitting :

- Check there are no leaks on the part
- Check the appearance of the sealing surfaces (No cuts, scrapes, scratches)
- Check the internal cleanness of the part, that there are no foreign bodies, the interfaces of the manifold (Cylinder head - Cylinder head cover, …)
- Replace the seals (41), (42) with new seals

N.B. : Do nothing to the components of the part.

Lubricate the seal (41) ; Use clean engine oil.

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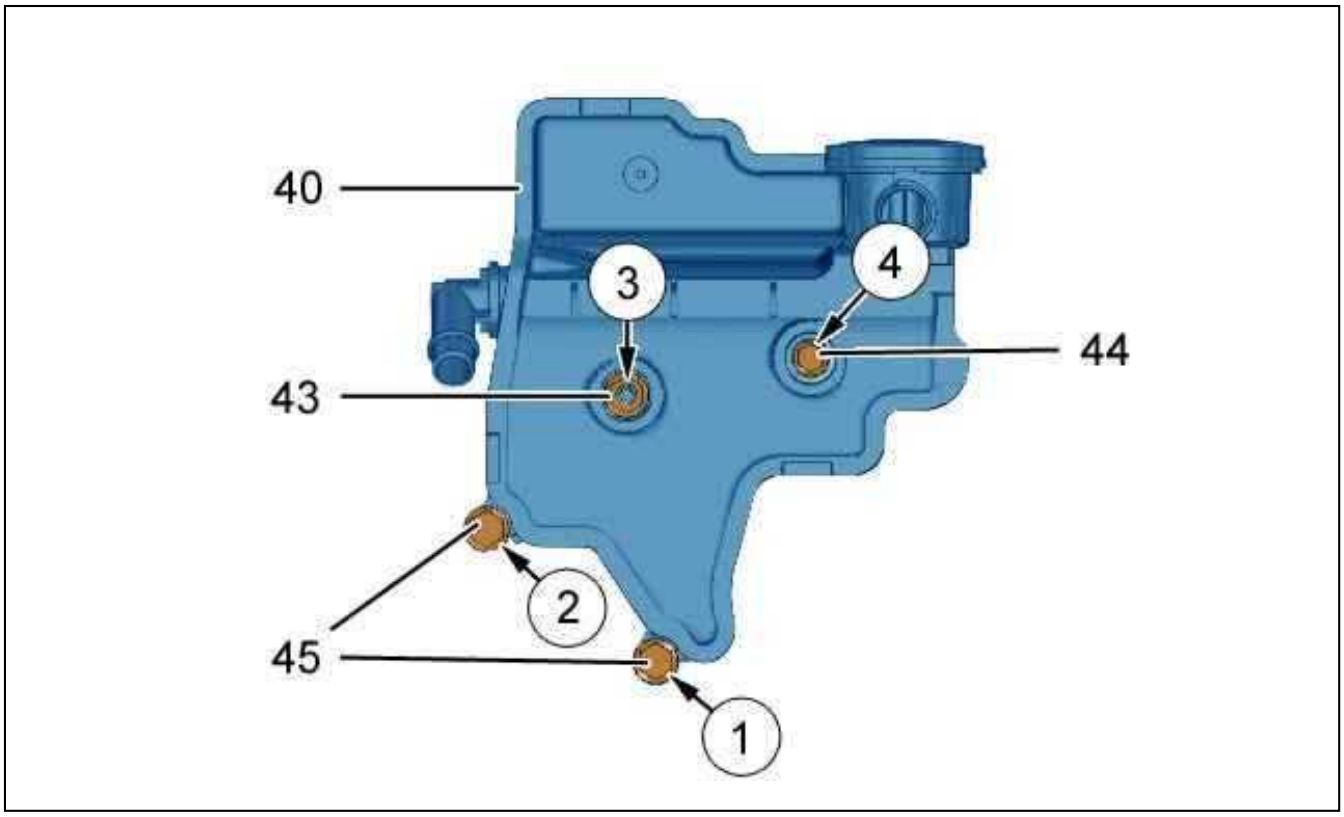


Figure : B1FG06AD

Refit :

- The engine oil separator (40)
- The bolts (45), (44)
- The nut (43)

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Pre-tighten the bolts (45), (43), (44) (Hand-tighten)
- Tighten the bolts (45), (43), (44) to the specified torque

4.2. Engine oil filter support

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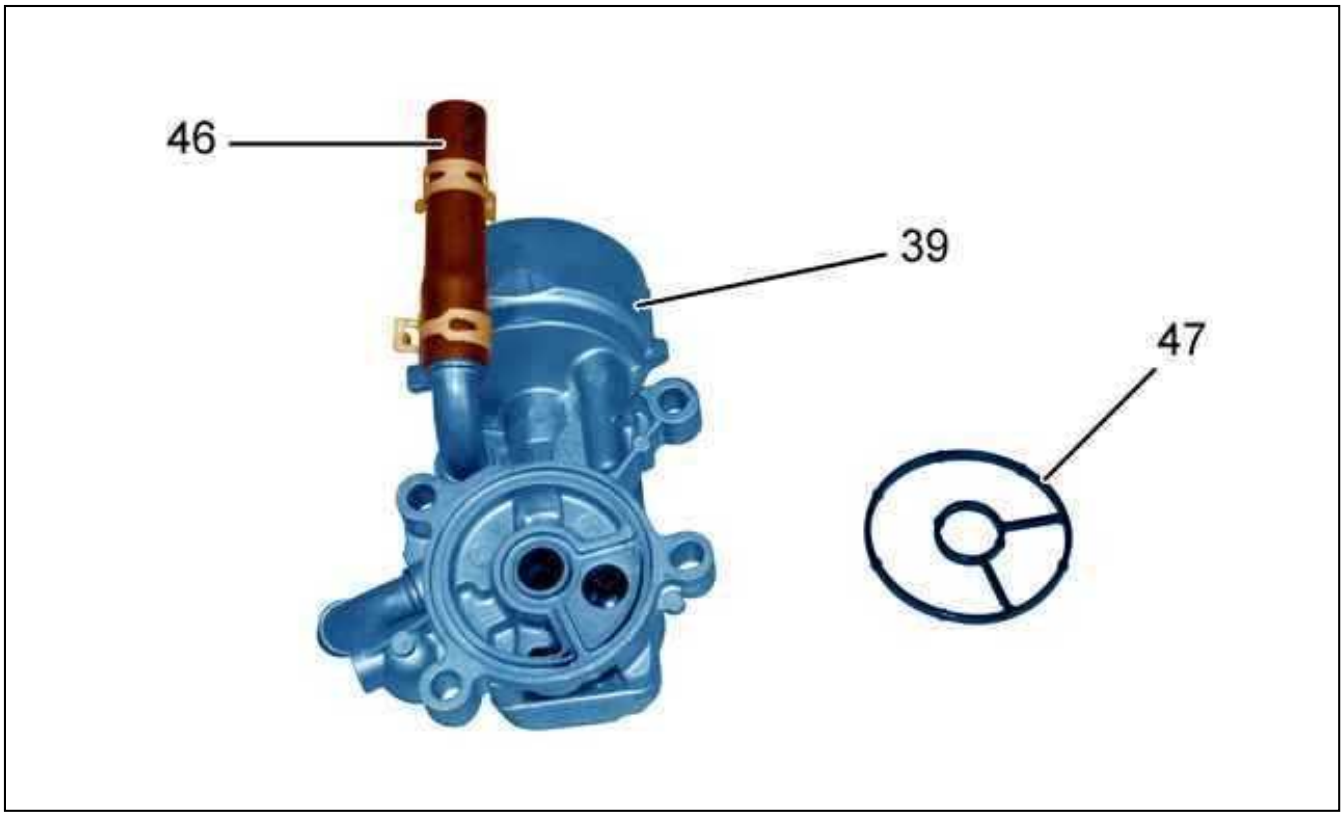
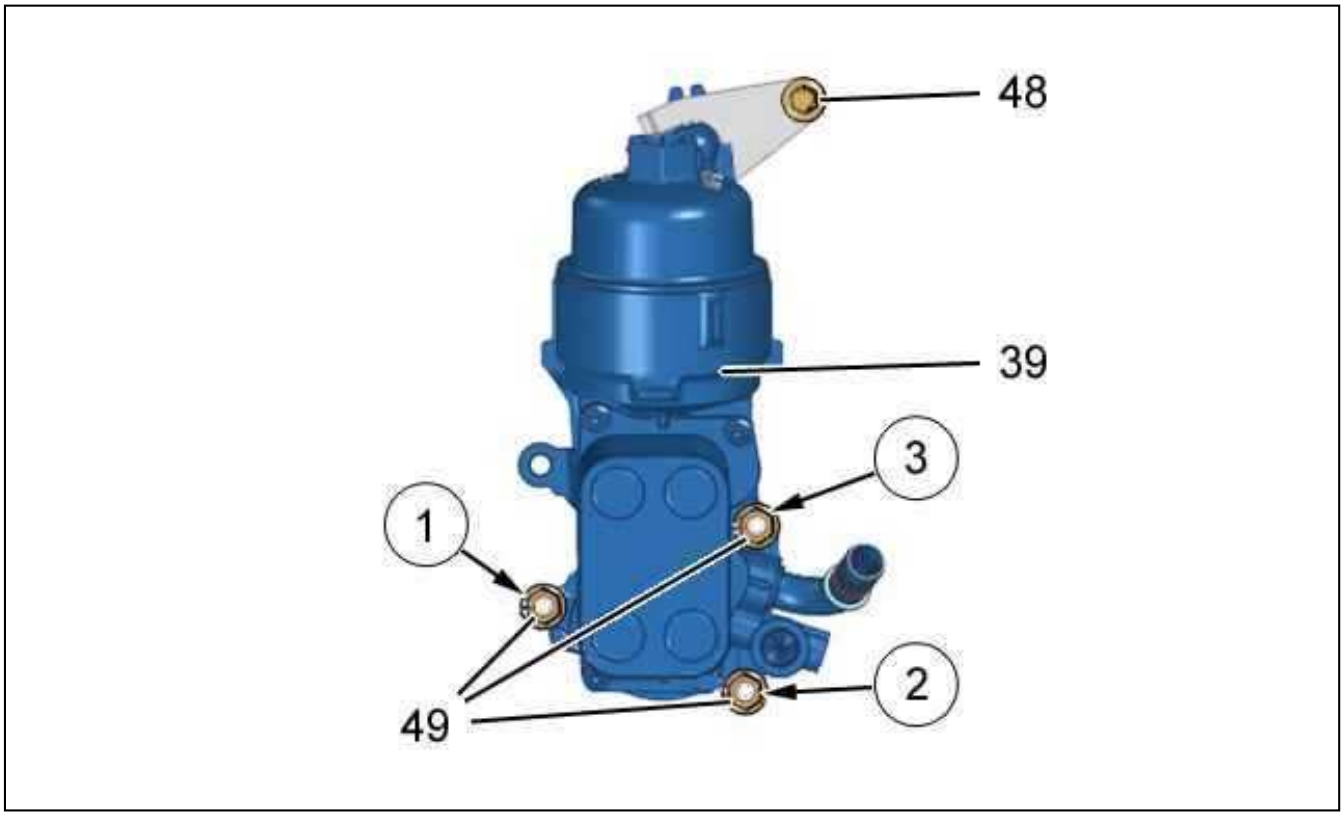


Figure : B1FG06BD

Replace :

- The engine oil filter support (39) seal (47)
- The coolant pipe (46)
- The O-ring seal on the endpiece of the coolant pipe (46)



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Figure : B1FG06CD

Refit the engine oil filter support (39).
Couple up the coolant hose (46).

CAUTION : Follow the tightening sequence.

Refit :

- The nuts (49)
- The (48) bolt
- The engine oil pressure switch complete with a new seal

CAUTION : Change the filter cartridge.

4.3. Multifunction support

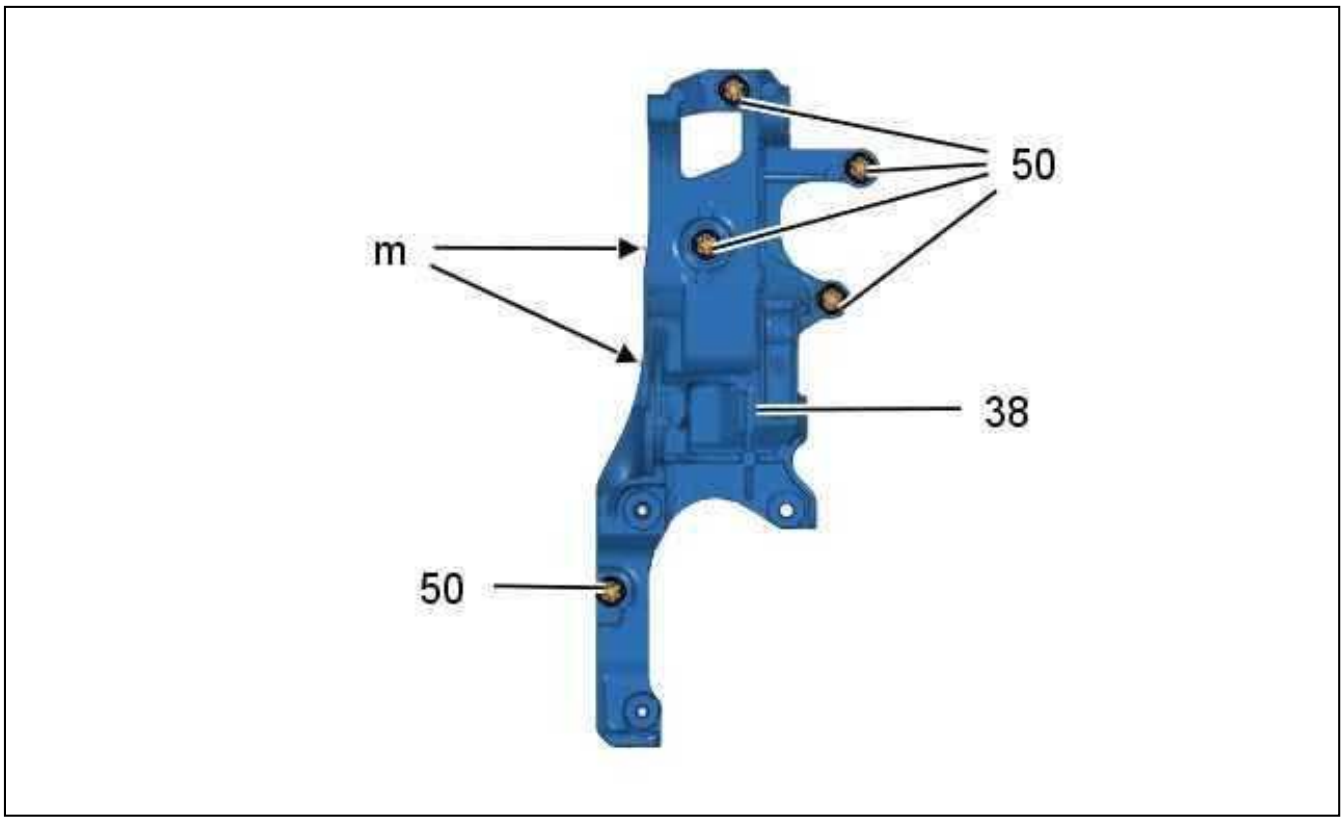


Figure : B1BG2K2D

CAUTION : Check for the presence of the centring pins at "m".

Refit :

- The multifunction support (38)
- The bolts (50)

5. Re-assembling : Under engine (Timing end and rear face)

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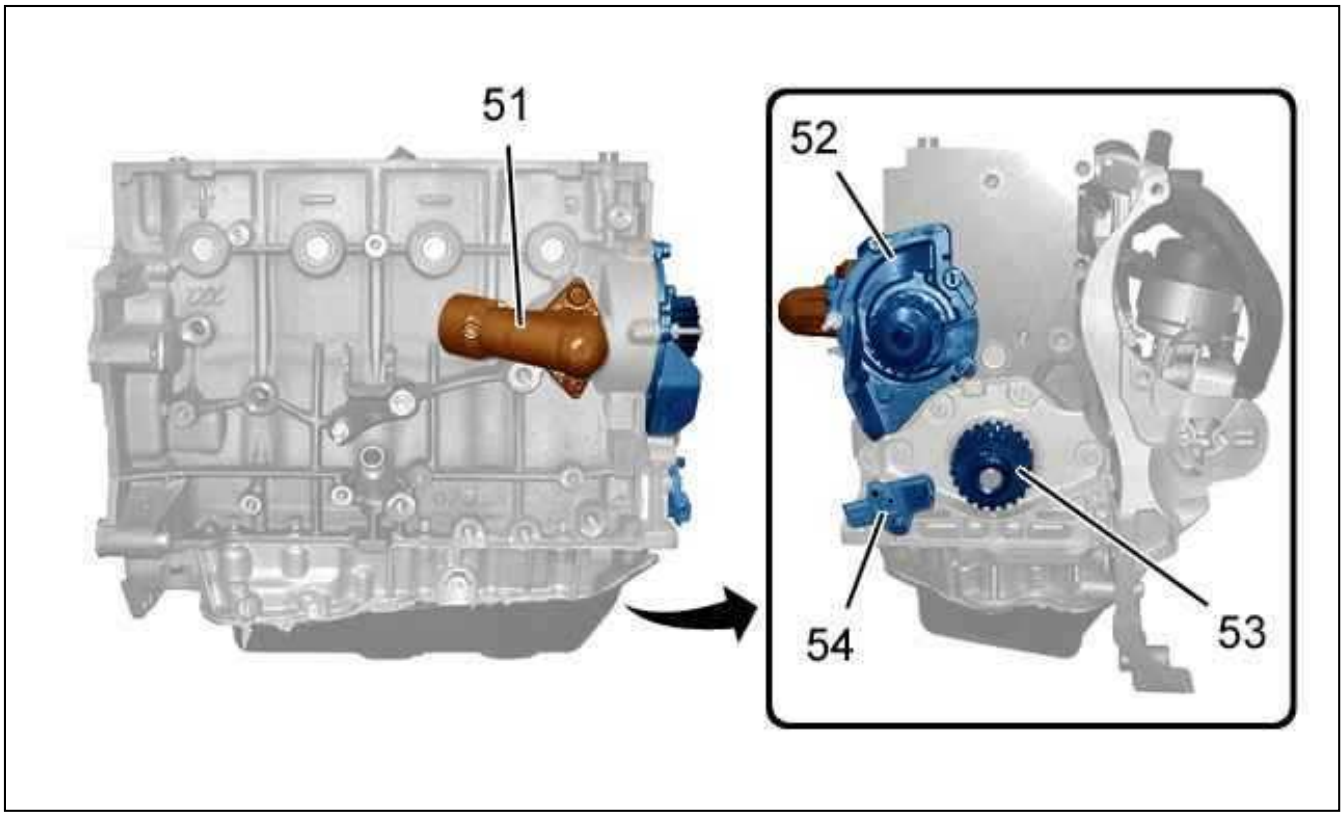


Figure : B1BG2K3D

Assembly of the components located at the timing end and on the rear face of the engine :

- Coolant inlet manifold (51)
- Coolant pump (52)
- Crankshaft pulley (53)
- Engine speed sensor (54)

5.1. Coolant inlet manifold

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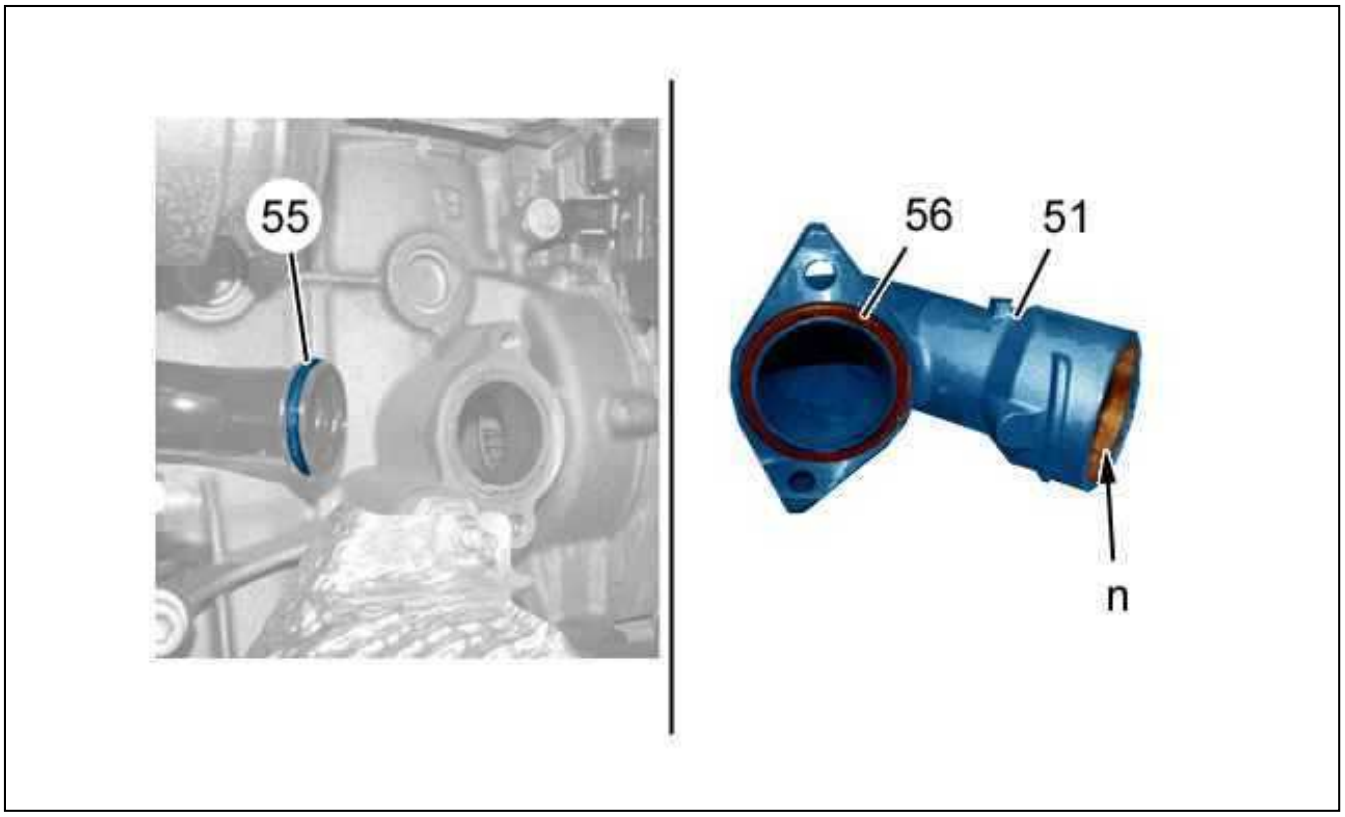


Figure : B1GG0WXD

CAUTION : Check the cleanness to guarantee the sealing in the joint face area (at "n") ; Clean and vacuum i necessary.

Refit the seals (55), (56) (new).
Lubricate the seals (55), (56).

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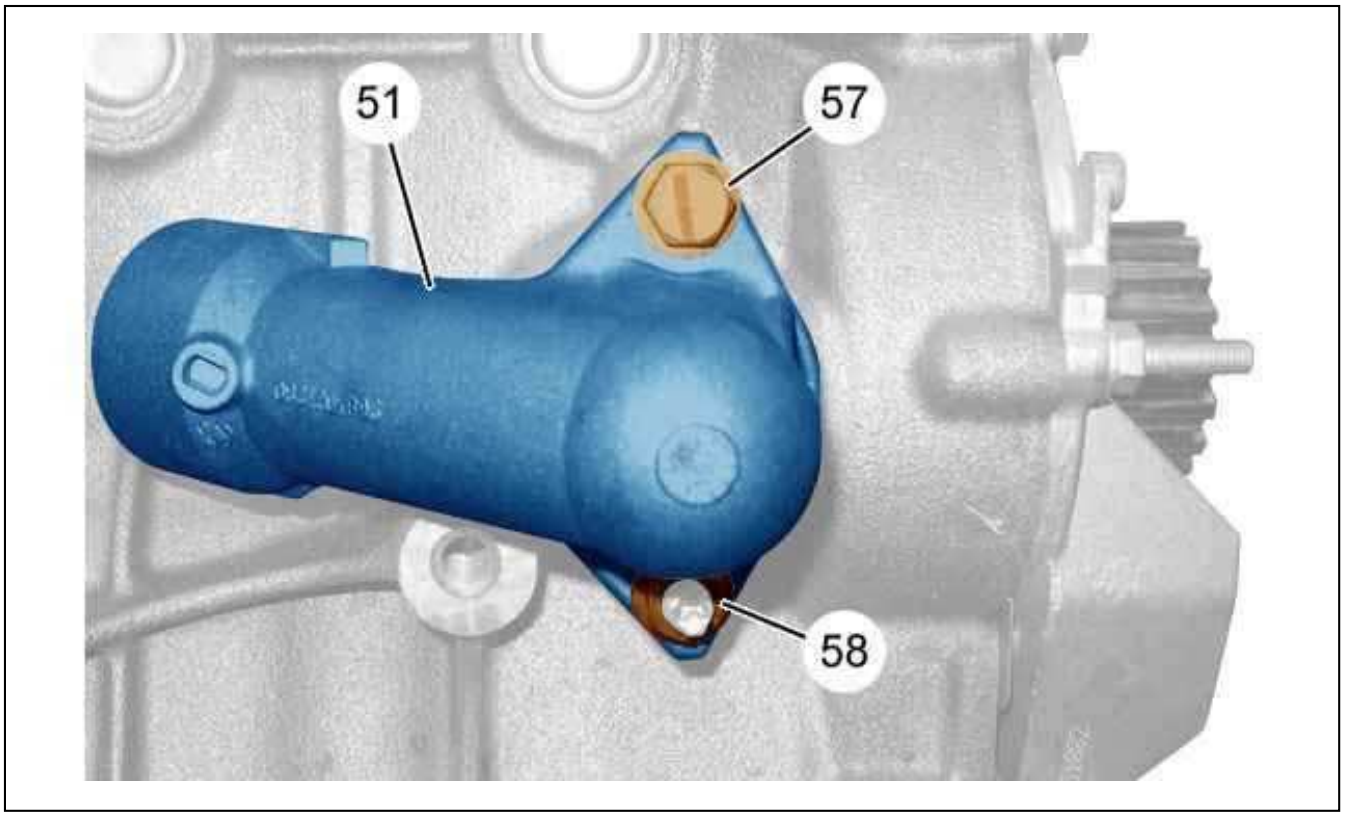


Figure : B1GG0WYD

Refit :

- The coolant manifold (51)
- The (57) bolt
- The nut (58)

5.2. Coolant pump

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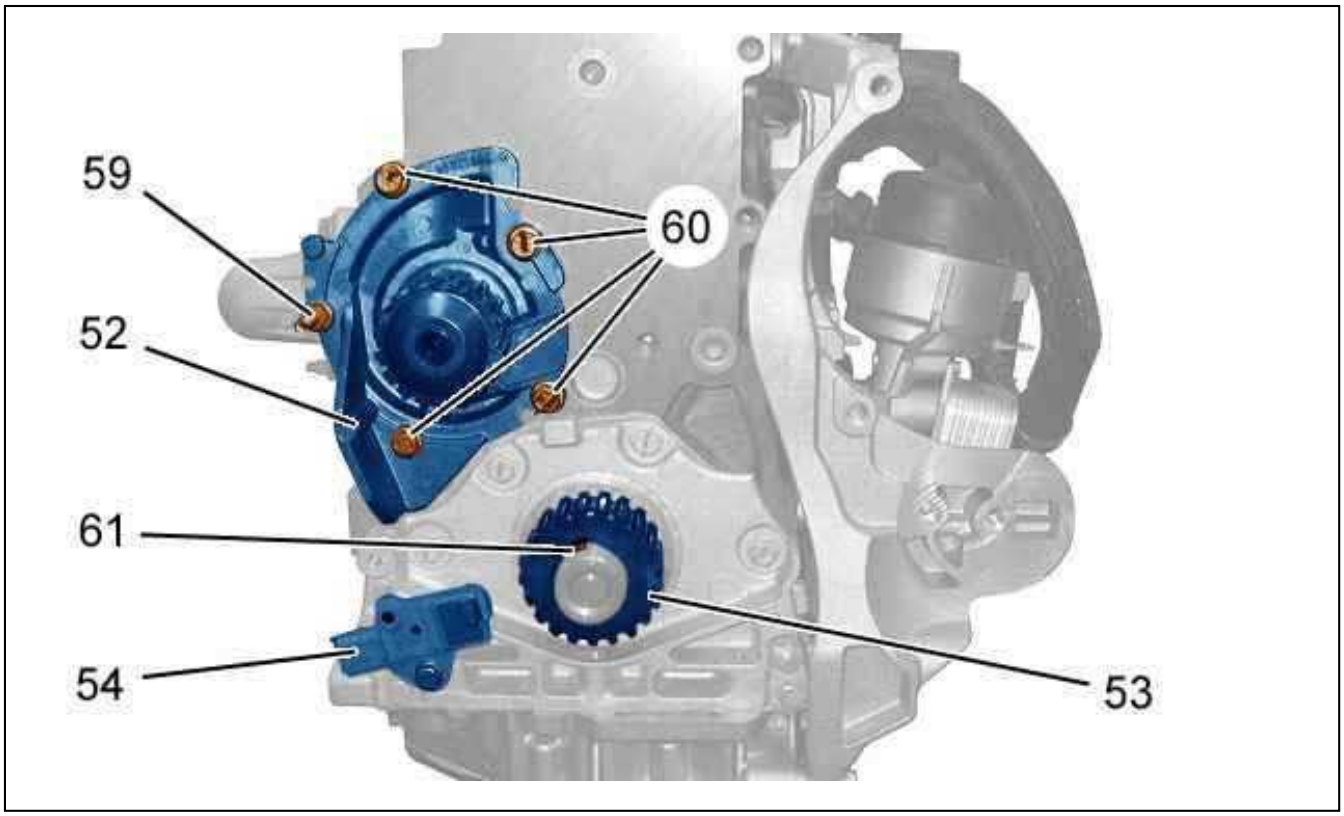


Figure : B1BG2K8D

Refit :

- The cotter (61)
- The crankshaft pulley (53)
- The engine speed sensor (54)
- The (new) seal for the coolant pump
- The coolant pump (52)
- The bolts (60) ; Finger tighten
- The pillar screw (59) ; Finger tighten

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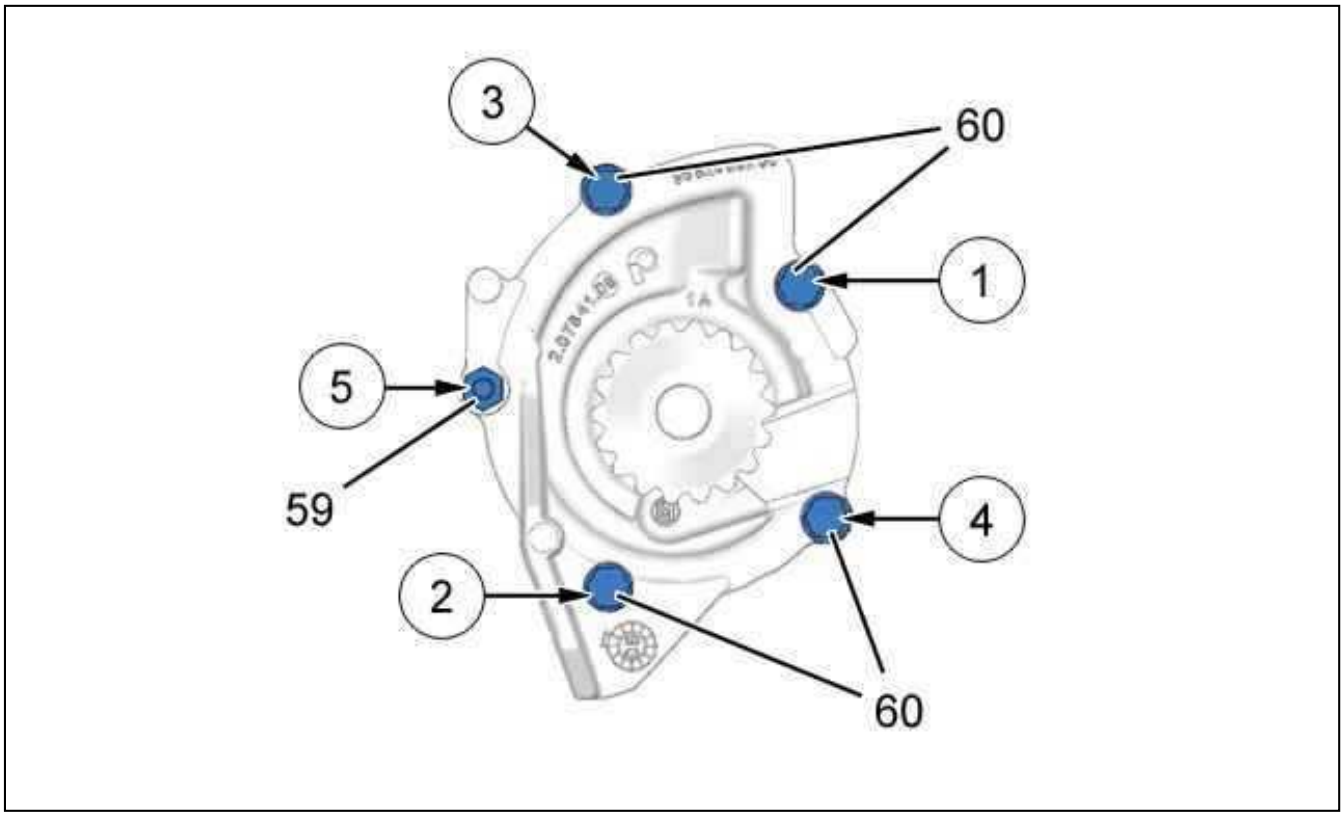


Figure : B1GG0X0D

CAUTION : Observe the order of tightening of the bolts .

Tighten the bolts (59), (60) to torque.

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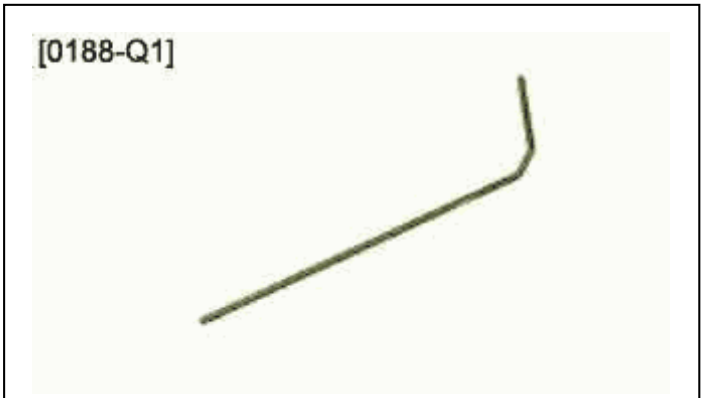
REMOVING - REFITTING : ANCILLARY DRIVE BELT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment :

- 15 mm 6-sided socket
- Extension 1/2
- 1/2 sliding handle

tool	Reference	Designation
 Figure : E5AB05JT	[0188-Q1]	4 mm dia. peg

2. Removing

Raise the vehicle, wheels hanging.
Turn the steering to right-hand full lock.
Remove the right-hand front mudguard.

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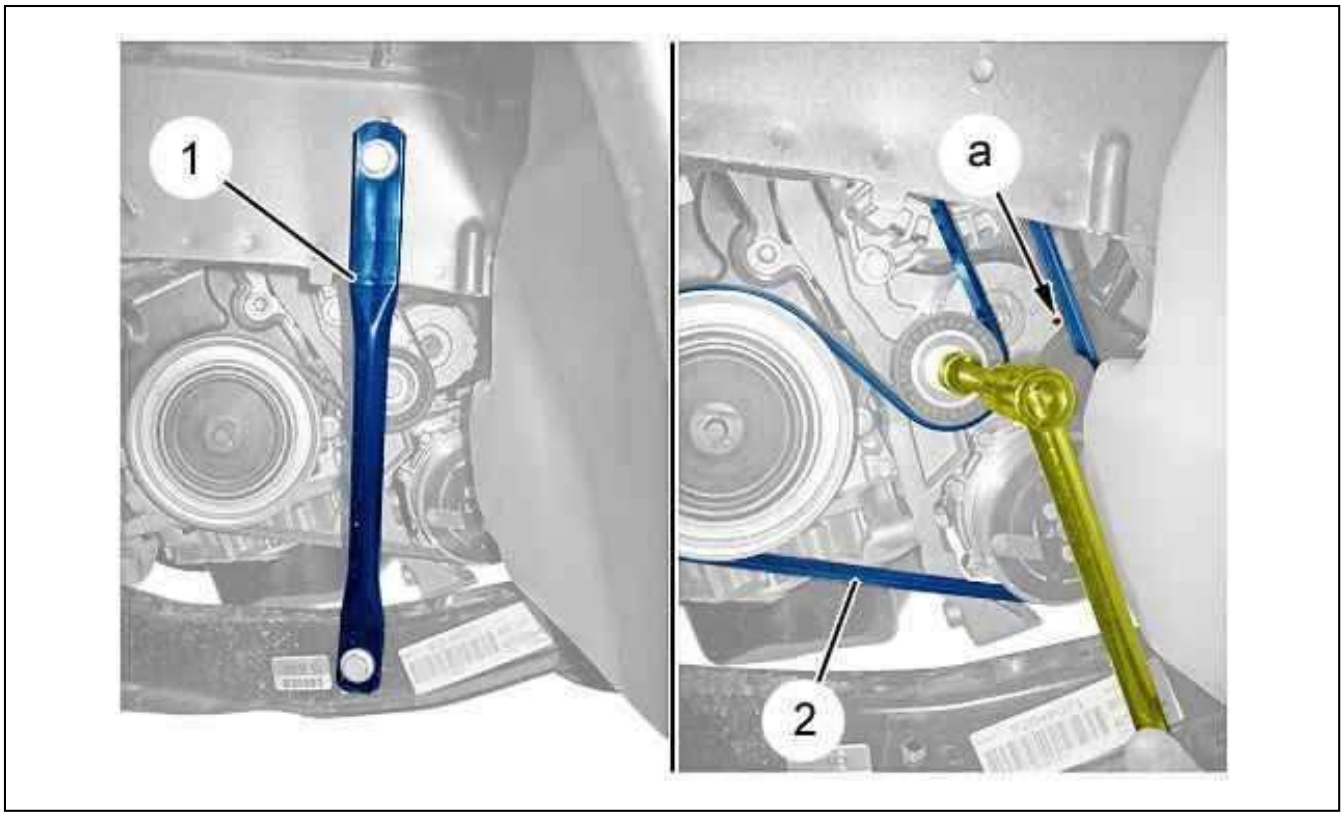


Figure : B1BG1EBD

CAUTION : Mark the direction of fitting of the ancillary drive belt if it is to be reused.

Remove the stiffener (1).
Keep the dynamic tensioner tensioned.
Peg (as "a") ; Using tool [0188-Q1].
Remove the accessories drive belt (2).

3. Checks

Make the following checks :

- Confirm the absence of points of resistance, noise and traces of grease on the dynamic tensioner and accessory pulleys
- Check there is no oil on the accessory drive belt
- Visually inspect the belt, flexing it slightly to check that it has no splits or cracks on the back or in the grooves

Replace any defective parts.

4. Refitting

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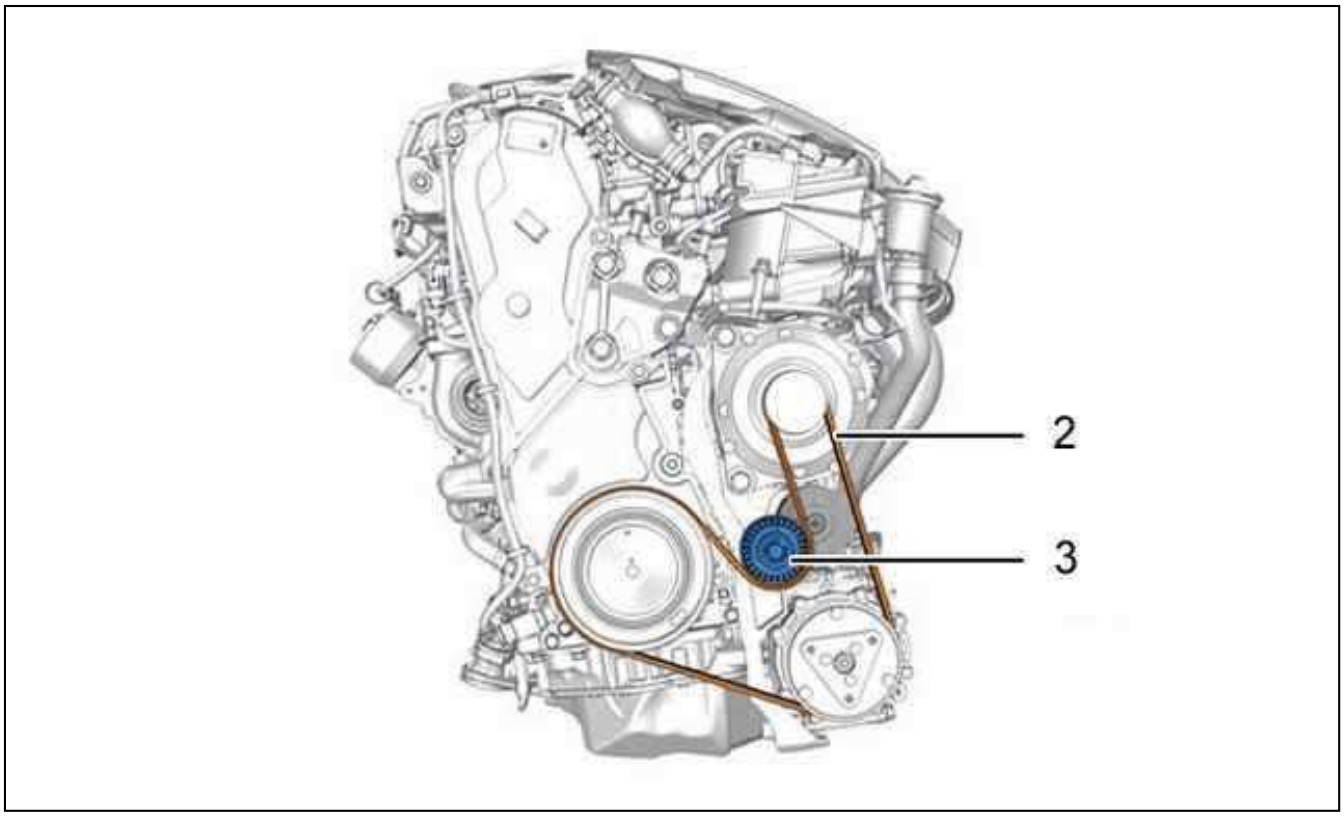


Figure : B1BG1ECD

CAUTION : If re-using the existing accessories drive belt, refit it in the correct fitting direction.

Refit the ancillary belt (2).

CAUTION : Check that the belt is correctly fitted in the grooves of the different pulleys.

Remove the peg [0188-Q1] while compressing the dynamic tensioner (3).
Refit :

- The stiffener (1)
- The front right mud guard

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OVERHAUL : DW10CTED4 ENGINE TYPE

1. Identification - Data

1.1. Engine top

Identification - Data : Cylinder head .
Identification - Data : Cylinder head gasket .
Identification - Data : Cylinder head bolts .
Identification - Data : Camshaft bearing cap casing fixing bolt .
Identification - Data : Camshafts .
Identification - Data : Cam lift .
Identification - Data : Timing gear .
Identification - Data : Valve seats and guides .
Identification - Data : Valves and valve springs .
Identification - Data : Valve rockers .

1.2. Under engine

Identification - Data : Cylinder block .
Identification - Data : Crankshaft .
Identification - Data : Crankshaft half bearing shells .
Identification - Data : Conrods .
Identification - Data : Connecting rod bearing shells .
Identification - Data : Pistons .
Identification - Data : Little ends .
Identification - Data : Piston rings .
Identification - Data : Piston head spray jets .

2. Fitting the engine to the stand

Fitting : Engine on stand .

3. Dismantling

Dismantling : Under engine .
Dismantling : Engine top .

4. Refitting

Refitting : Under engine .
Refitting : Engine top .

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PROHIBITED OPERATIONS : HDI DIRECT INJECTION SYSTEM

1. Protection

CAUTION : Always plug the apertures straightaway after opening up the fuel circuit ; Using the specific plugs kit.

2. Cleaning

CAUTION : Using a "high pressure" cleaner is prohibited, do not use compressed air.

3. Fuel supply system

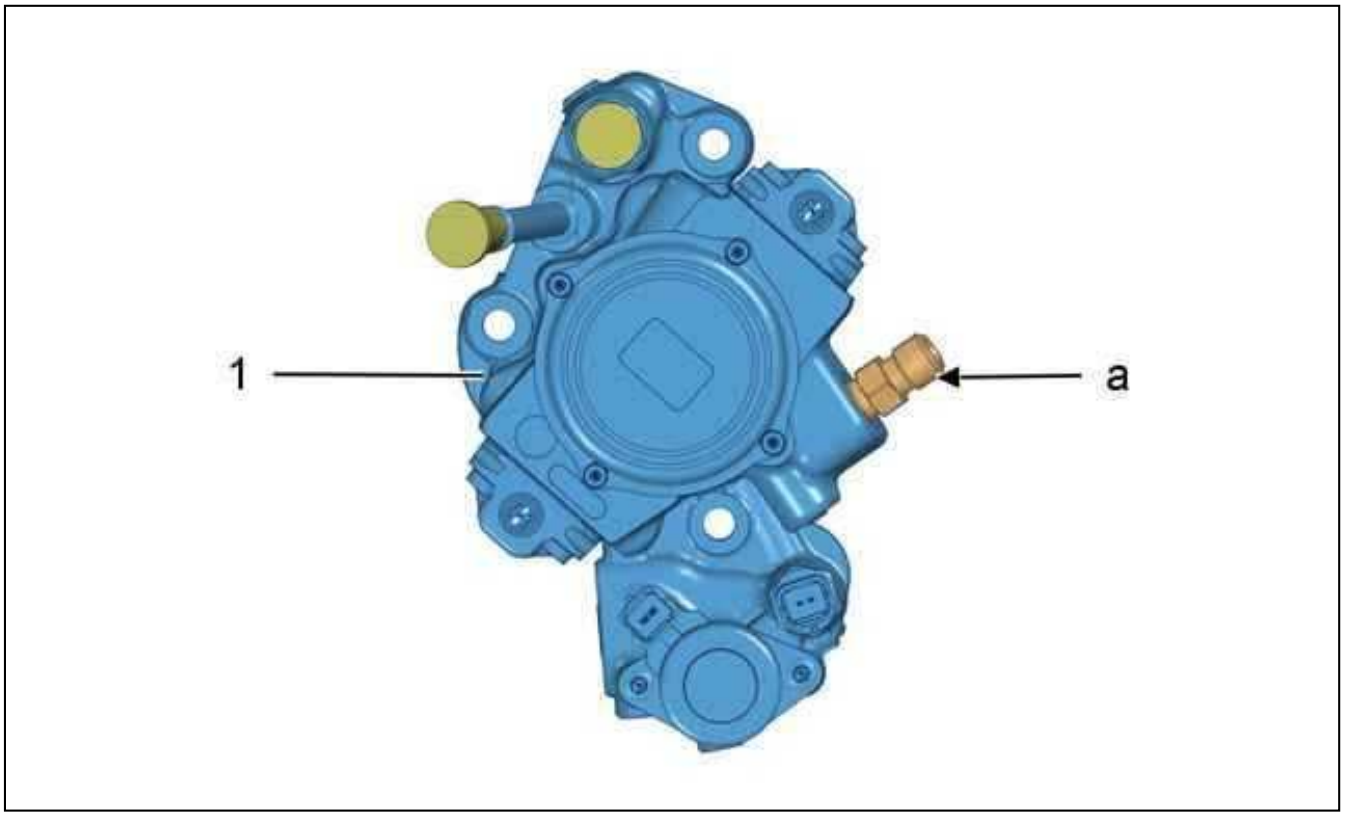
CAUTION : Do not use fuel other than diesel.

4. Electrical circuit

Switching an injection ECU from one vehicle to another will make it impossible to start either vehicle.

CAUTION : It is forbidden to supply either one or all of the injectors with 12 volts.

5. high pressure fuel pump



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Figure : B1BK3XFD

Do not separate from the high pressure fuel pump (1) the high pressure output union (a) (malfunction).

6. Diesel injector "/"

CAUTION : Cleaning operations using diesel and ultrasound are prohibited.

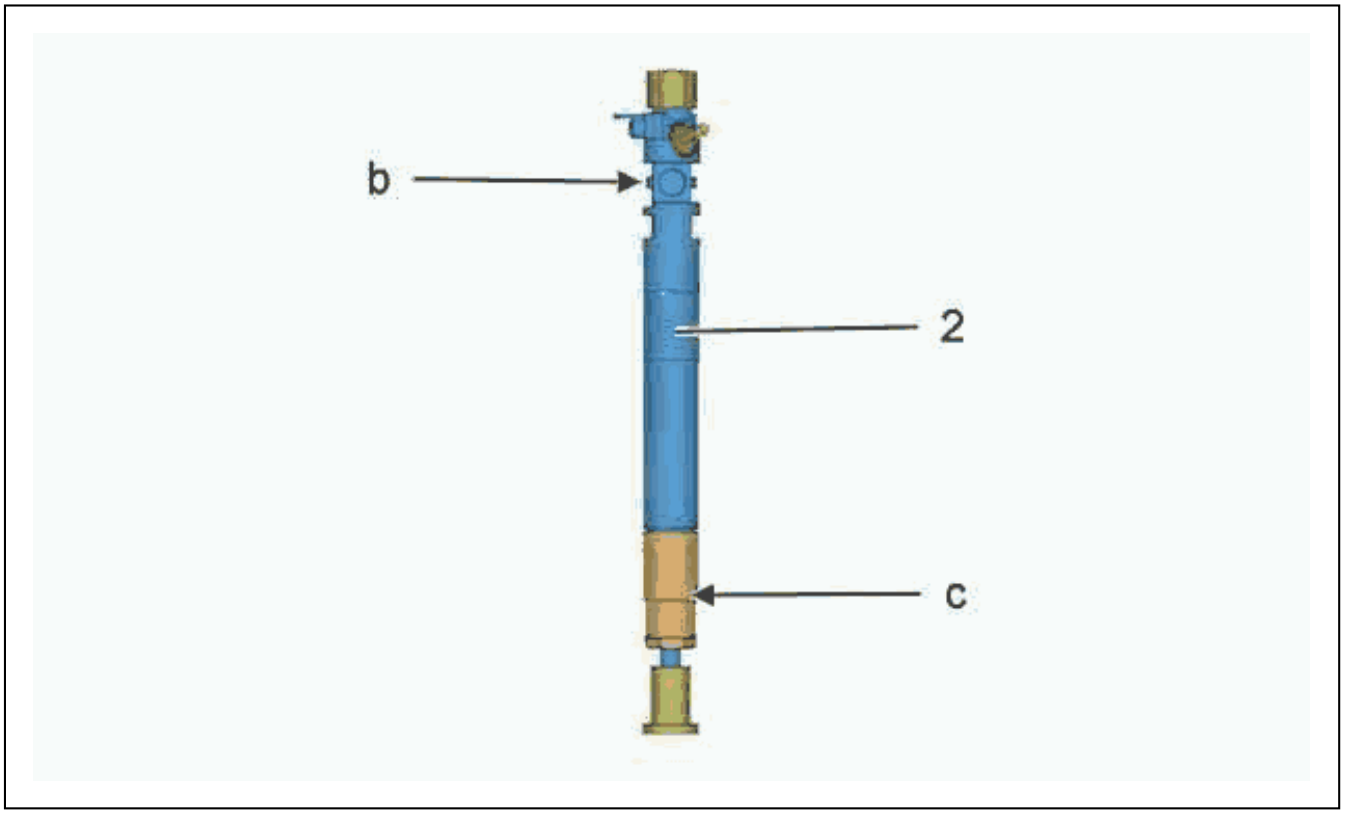


Figure : B1BK3XGD

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

- Diesel injector "c" (replacement parts not available)
- Electromagnetic element "b" (replacement parts not available)

Calamine cleaning on the injector nose is prohibited.

7. Fuel high pressure common injection rail

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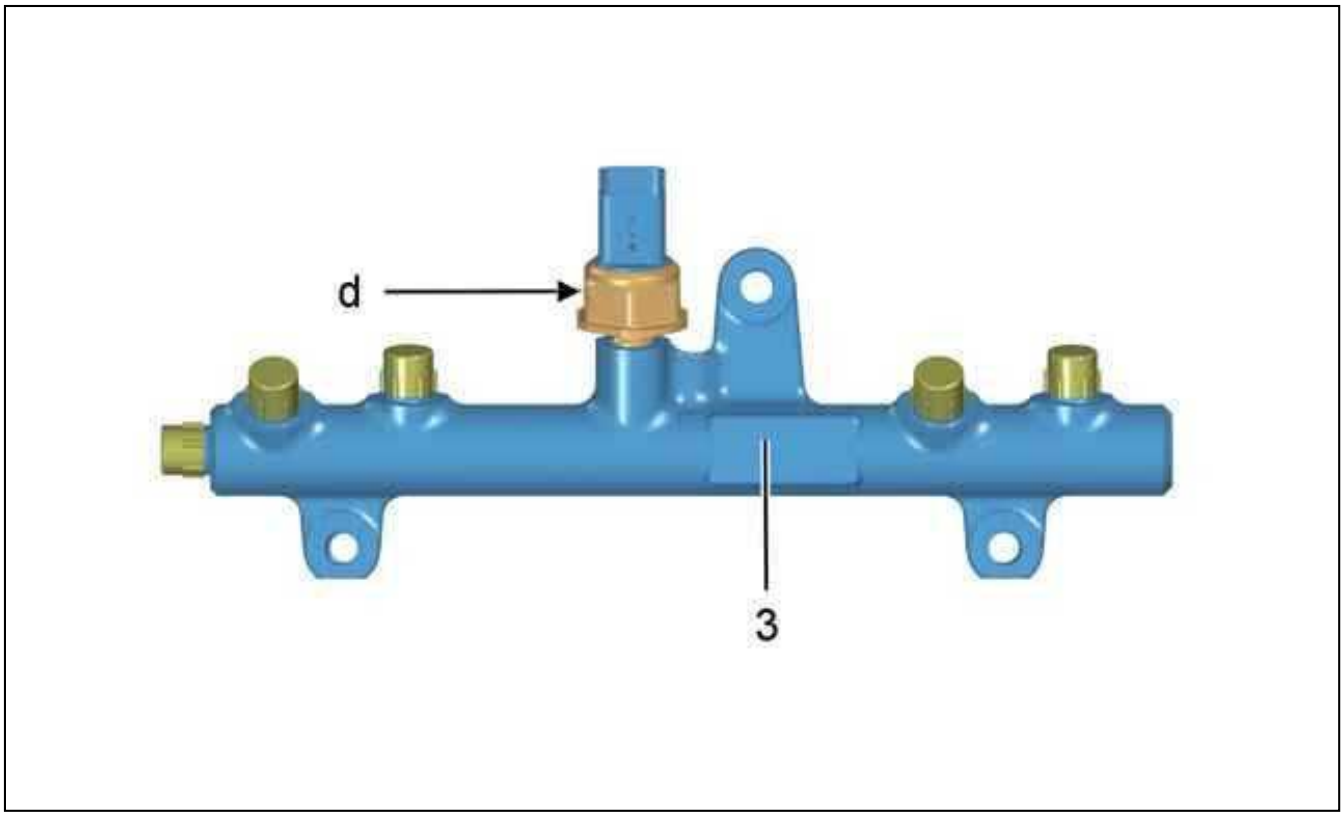


Figure : B1BK3XHD

Do not separate the fuel high pressure common injection rail (3) from the fuel high pressure sensor "d".

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PROHIBITED OPERATIONS : HDI DIRECT INJECTION SYSTEM BOSCH

1. Protection

CAUTION : Always plug the apertures straightaway after opening up the fuel circuit ; Using the specific plugs kit.

2. Cleaning

CAUTION : The use of a "high pressure" cleaner is prohibited.

CAUTION : Do not use compressed air.

3. Fuel supply system

Recommended fuel : Diesel.

CAUTION : Do not use fuel other than diesel (Risk of destruction of the injection system and of the engine).

CAUTION : The addition of additives such as fuel circuit cleaner/remetalliser, is prohibited.

4. Electrical circuit

Exchanging an engine management ECU between two vehicles makes it impossible to start the vehicles.

CAUTION : Do not supply a diesel injector with 12 volts.

5. high pressure fuel pump

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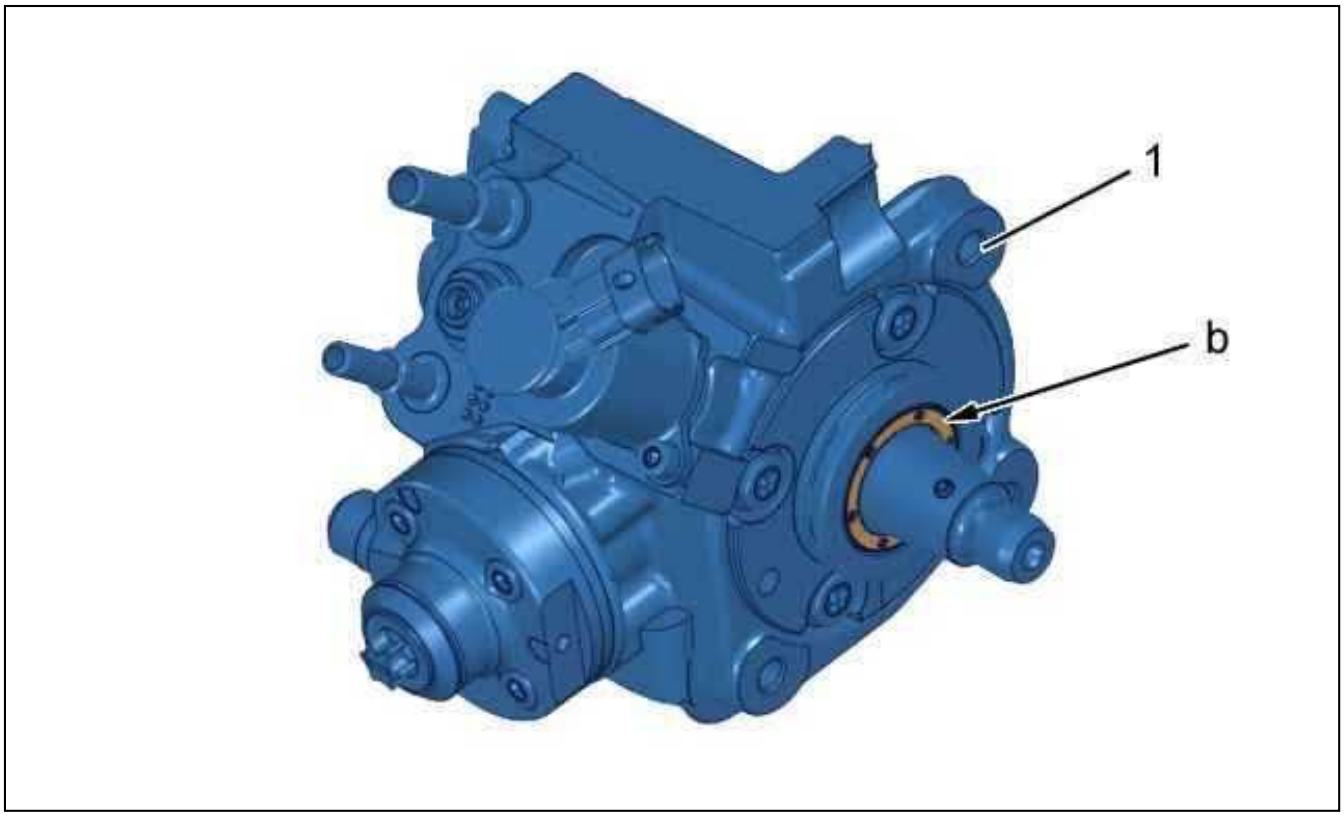


Figure : B1BK3YND

Do not separate the ring seal from the high pressure fuel pump (1) (at "b") (No replacement parts).

6. Diesel injector

CAUTION : Cleaning operations using diesel and ultrasound are prohibited.

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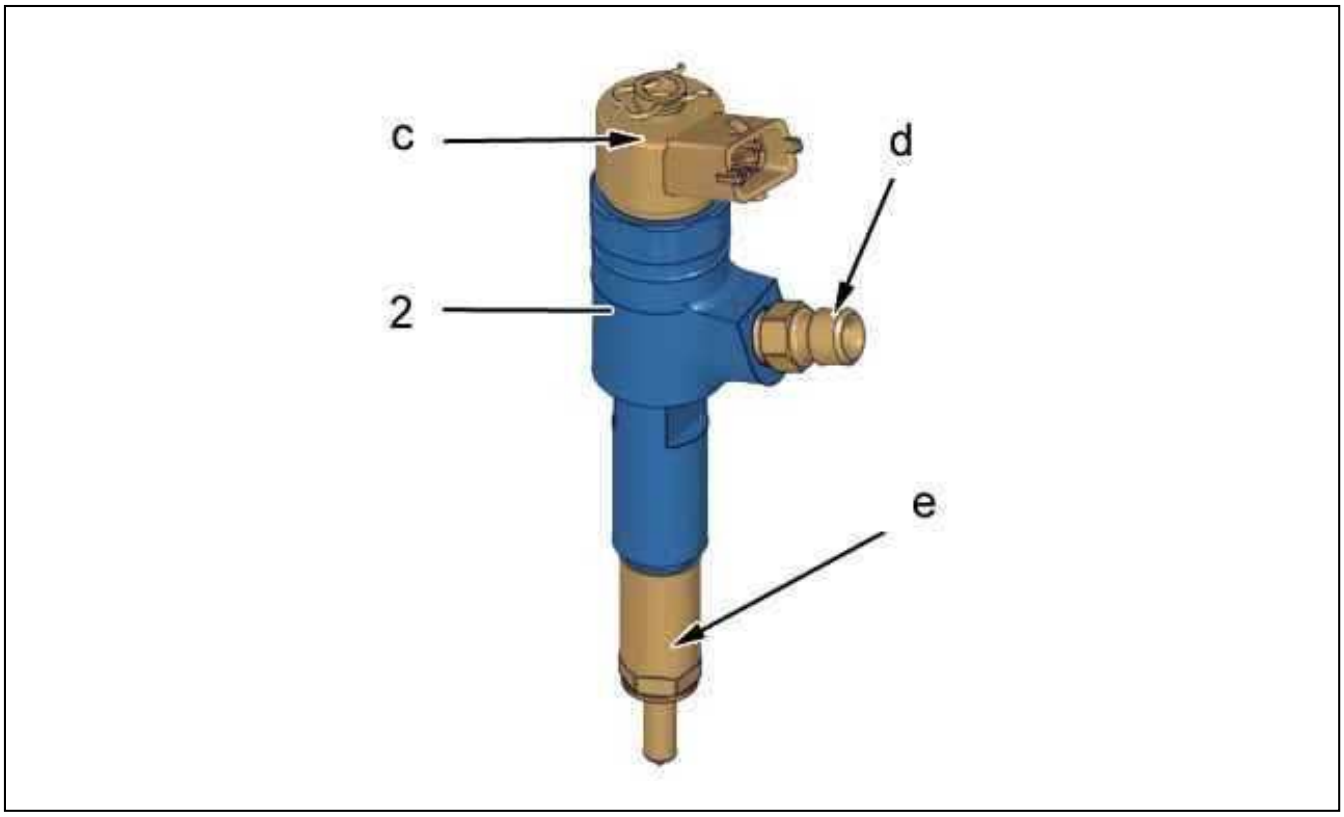


Figure : B1BK3YQD

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

- High pressure union (at "d") (malfunction)
- Diesel injector (at "e") (replacement parts not available)
- Electromagnetic element (at "c") (replacement parts not available)

Calamine cleaning on the injector nose is prohibited.

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PROHIBITED OPERATIONS : HDI DIRECT INJECTION SYSTEM DENSO

1. Protection

CAUTION : Always plug the apertures straightaway after opening up the fuel circuit ; Using the specific plugs kit.

2. Cleaning

CAUTION : The use of a "high pressure" cleaner is prohibited.

CAUTION : Do not use compressed air.

3. Fuel supply system

Recommended fuel : Diesel.

CAUTION : Do not use fuel other than diesel (Risk of destruction of the injection system and of the engine.

CAUTION : The addition of additives, such as fuel circuit cleaners/remetallisers, is forbidden.

4. Electrical circuit

Switching an injection ECU from one vehicle to another will make it impossible to start either vehicle.

CAUTION : Do not supply a diesel injector with 12 volts.

5. Fuel high pressure pump

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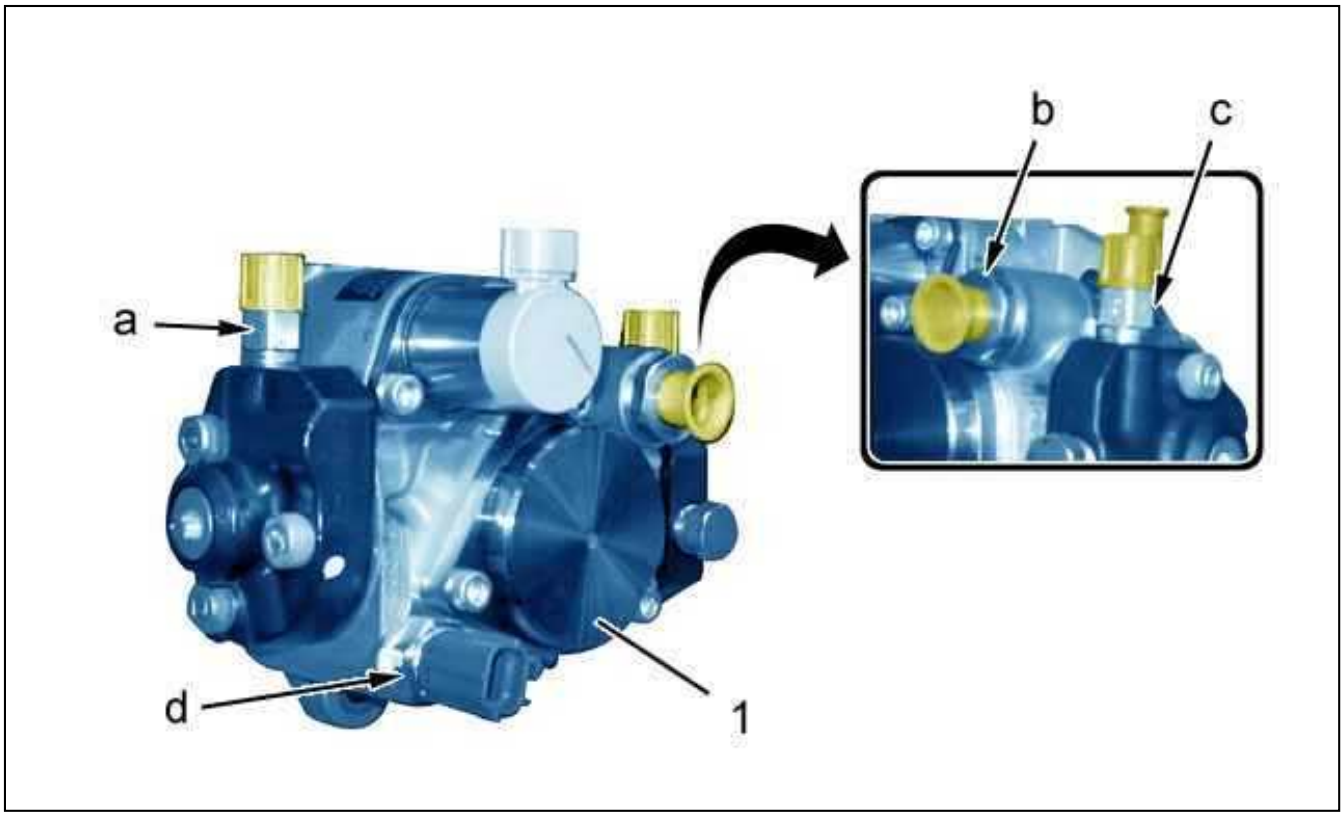


Figure : B1BK3YJD

Do not separate the following components from the high pressure fuel pump (1) :

- The high pressure outlet unions "a" and "c" (malfunction)
- The fuel supply union "b" (Malfunction)
- The fuel temperature sensor "d" (replacement parts not available)

6. Fuel high pressure common injection rail

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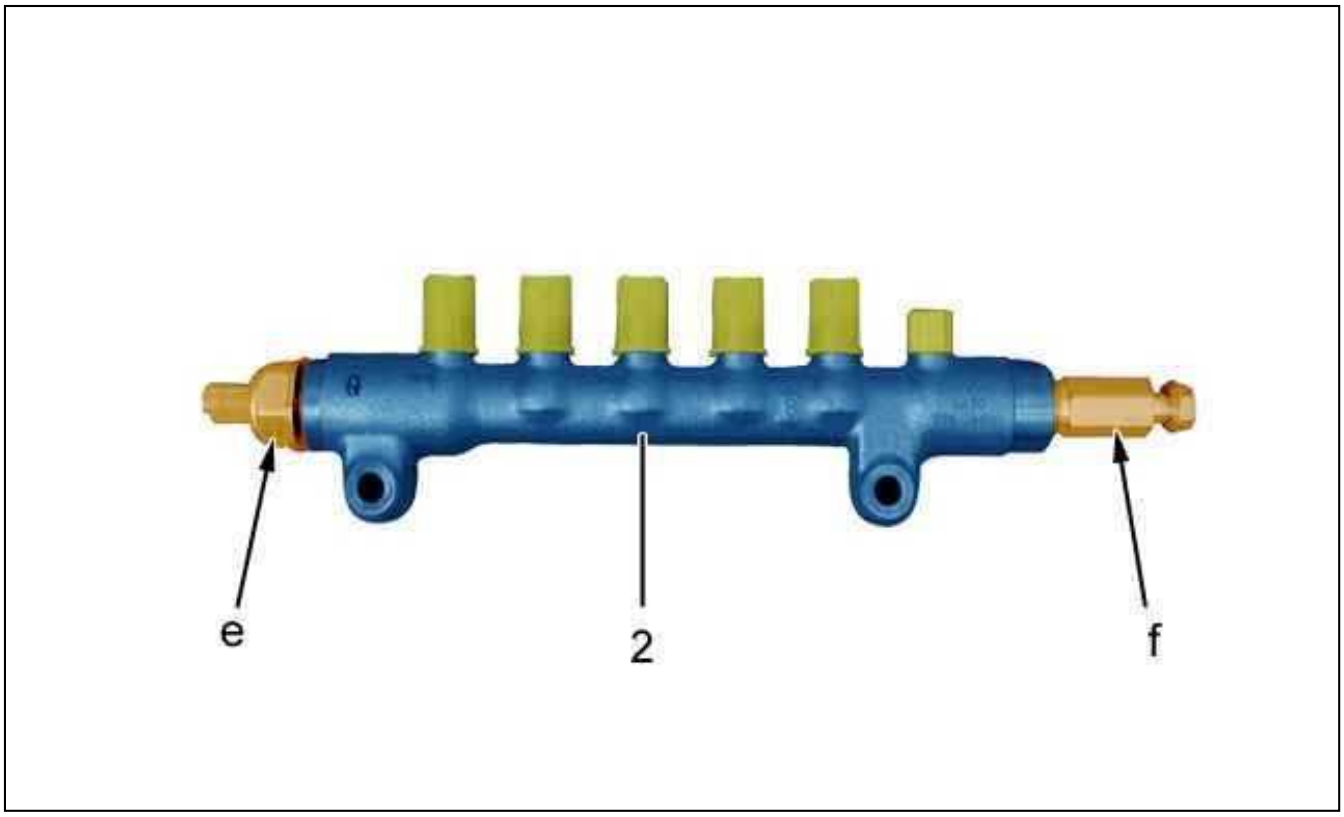


Figure : B1BK3YKD

Do not separate the following components from the fuel high pressure common injection rail (2) :

- The pressure sensor "e" (replacement parts not available)
- The pressure regulator "f" (replacement parts not available)

7. Diesel injector

CAUTION : Cleaning operations using diesel and ultrasound are prohibited.

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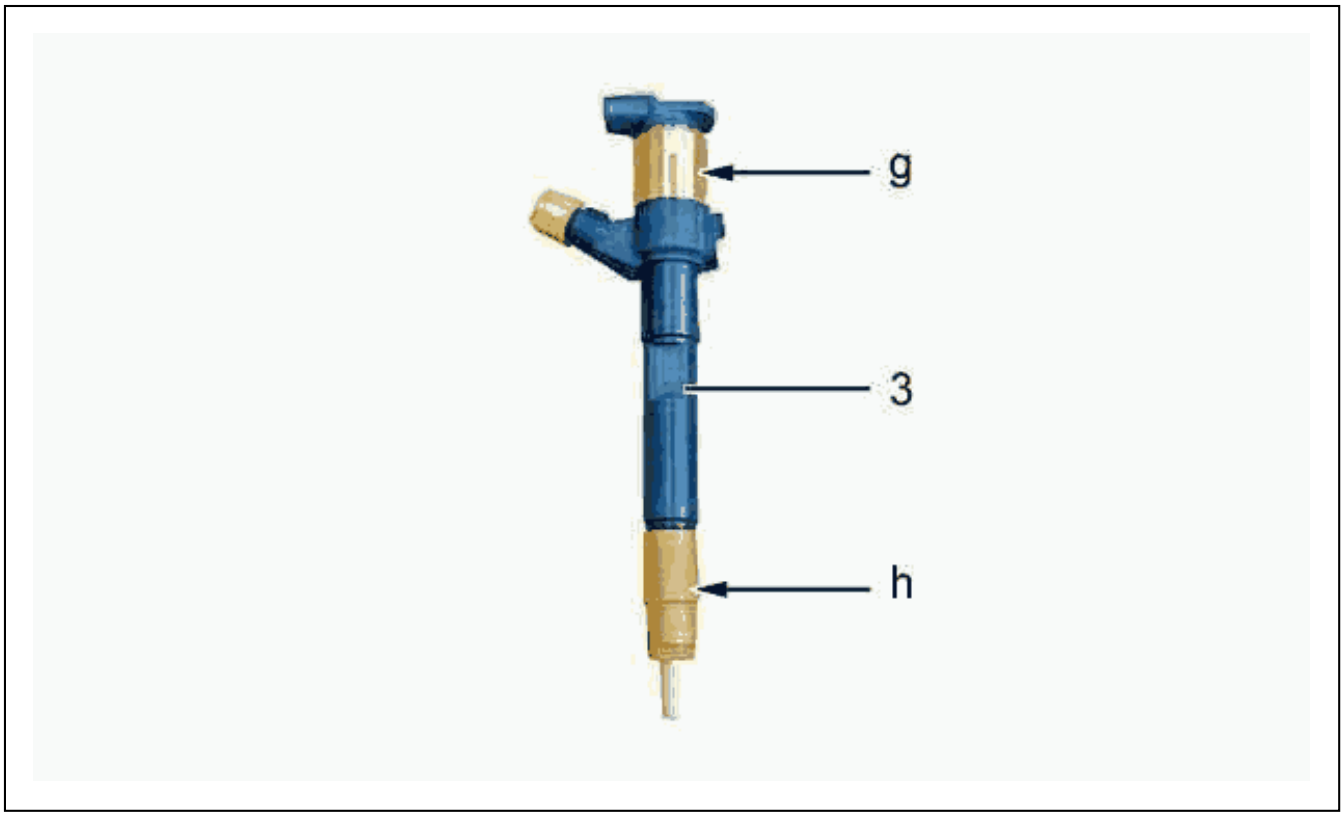


Figure : B1BK3YLD

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

- Electromagnetic element "g" (replacement parts not available)
- Diesel injector "h" (replacement parts not available)

CAUTION : Calamine cleaning on the injector nose is prohibited.

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PROHIBITED OPERATIONS : PETROL DIRECT INJECTION SYSTEM THP

1. Cleaning

The use of a "high pressure" cleaner is prohibited.
Do not use compressed air.

2. Fuel supply system

Recommended fuel : Unleaded petrol.

3. Electrical circuit

Swapping of engine ECUs between two vehicles makes it impossible to start either vehicle.
It is forbidden to supply either one or all of the injectors with 12 volts.

4. high pressure fuel pump

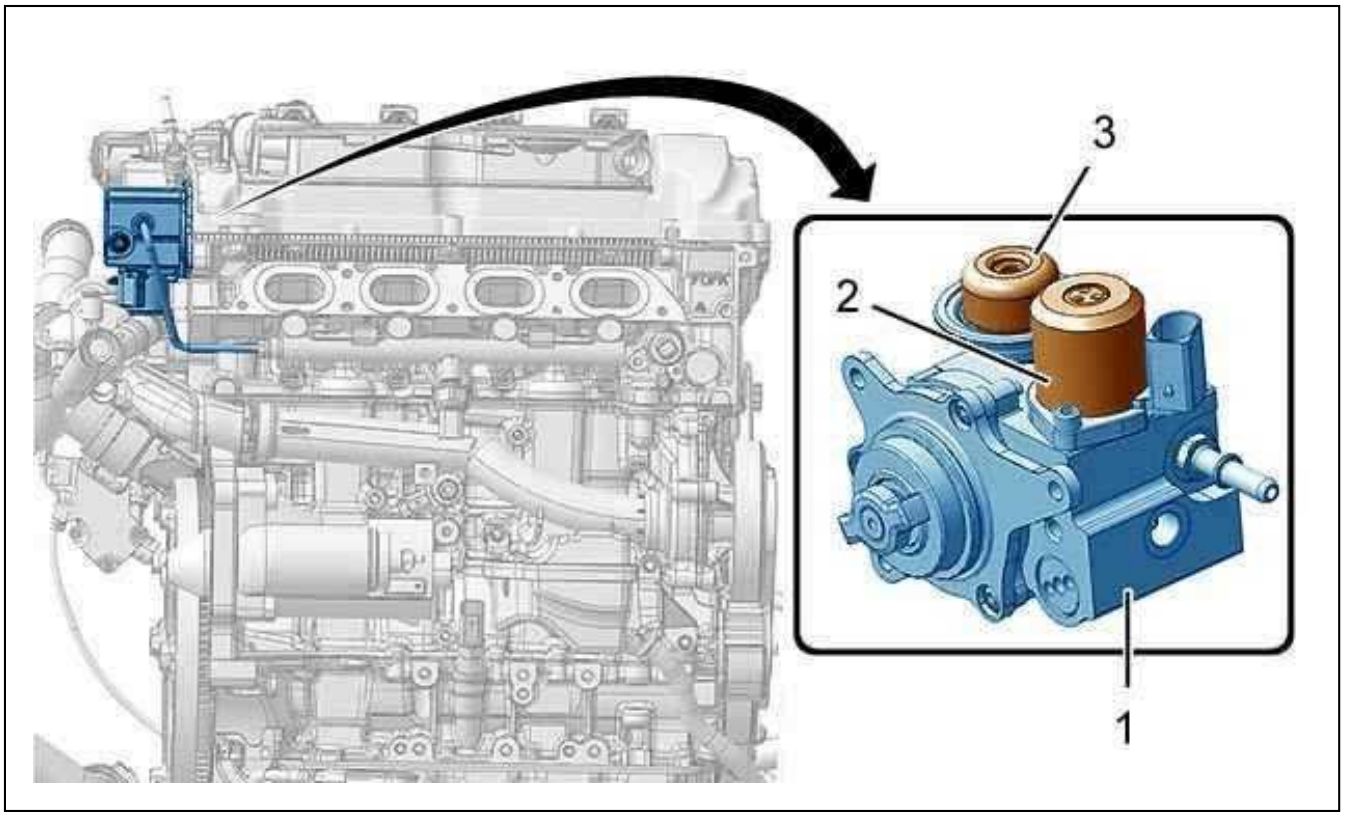


Figure : B1BK3XBD

Heating unit (1) :

- Fuel high pressure regulation electrovalve (2) ; (No replacement parts)
- Oil excess pressure valve (3) ; (No replacement parts)

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PROHIBITED OPERATIONS : HDI DIRECT INJECTION SYSTEM CONTINENTAL-SIEMENS

1. Protection

CAUTION : Always plug the apertures straightaway after opening up the fuel circuit ; Using the specific plugs kit.

2. Cleaning

CAUTION : The use of a "high pressure" cleaner is prohibited.

CAUTION : Do not use compressed air.

3. Fuel supply system

Recommended fuel : Diesel.

CAUTION : Do not use fuel other than diesel (Risk of destruction of the injection system and of the engine.

CAUTION : The addition of additives, such as fuel circuit cleaners/remetallisers, is forbidden.

4. Electrical circuit

Switching an injection ECU from one vehicle to another will make it impossible to start either vehicle.

CAUTION : Do not supply a diesel injector with 12 volts.

5. high pressure fuel pump

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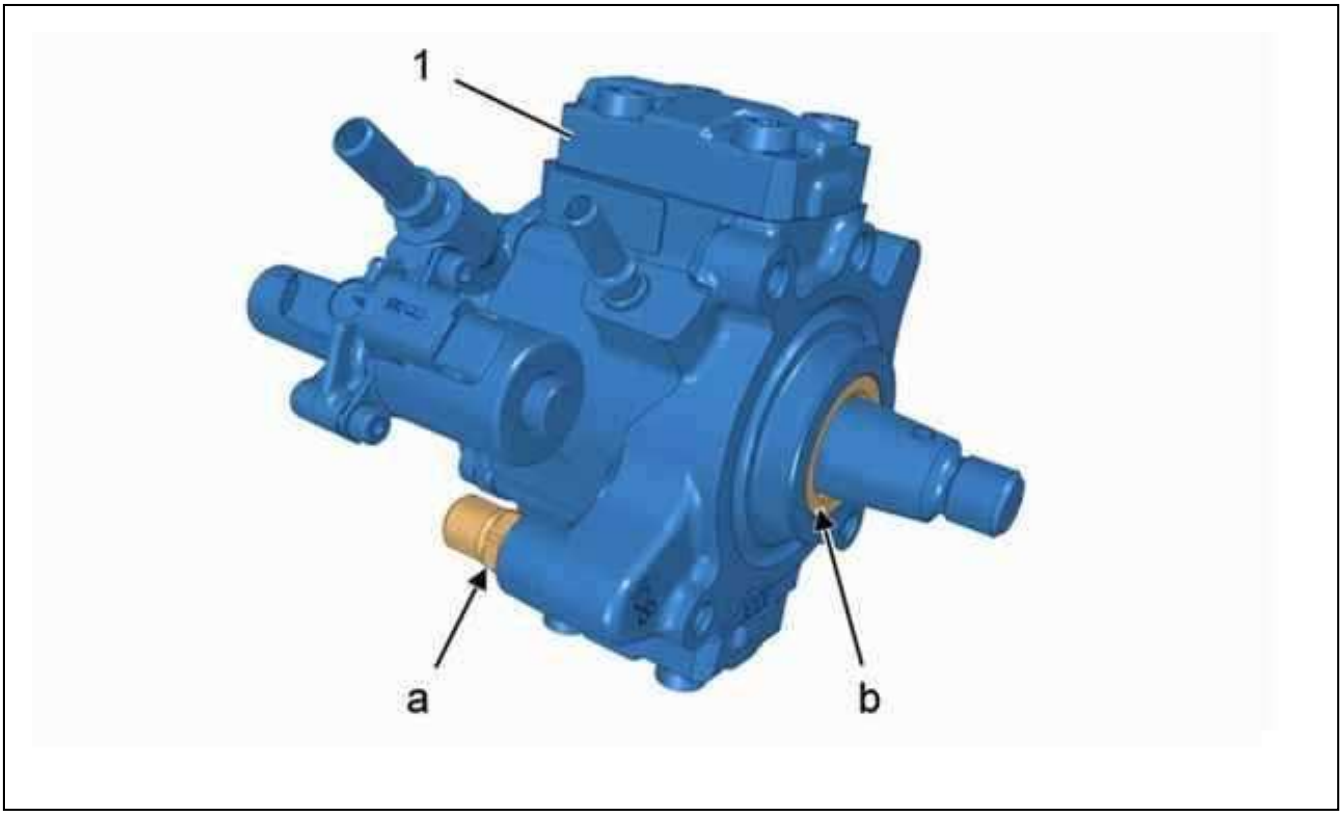


Figure : B1BK3XMD

Do not separate the following components from the fuel high pressure pump (1) :

- High pressure outlet union "a" (malfunction)
- Sealing ring "b" (replacement parts not available)

6. Diesel injector

CAUTION : Cleaning operations using diesel and ultrasound are prohibited.

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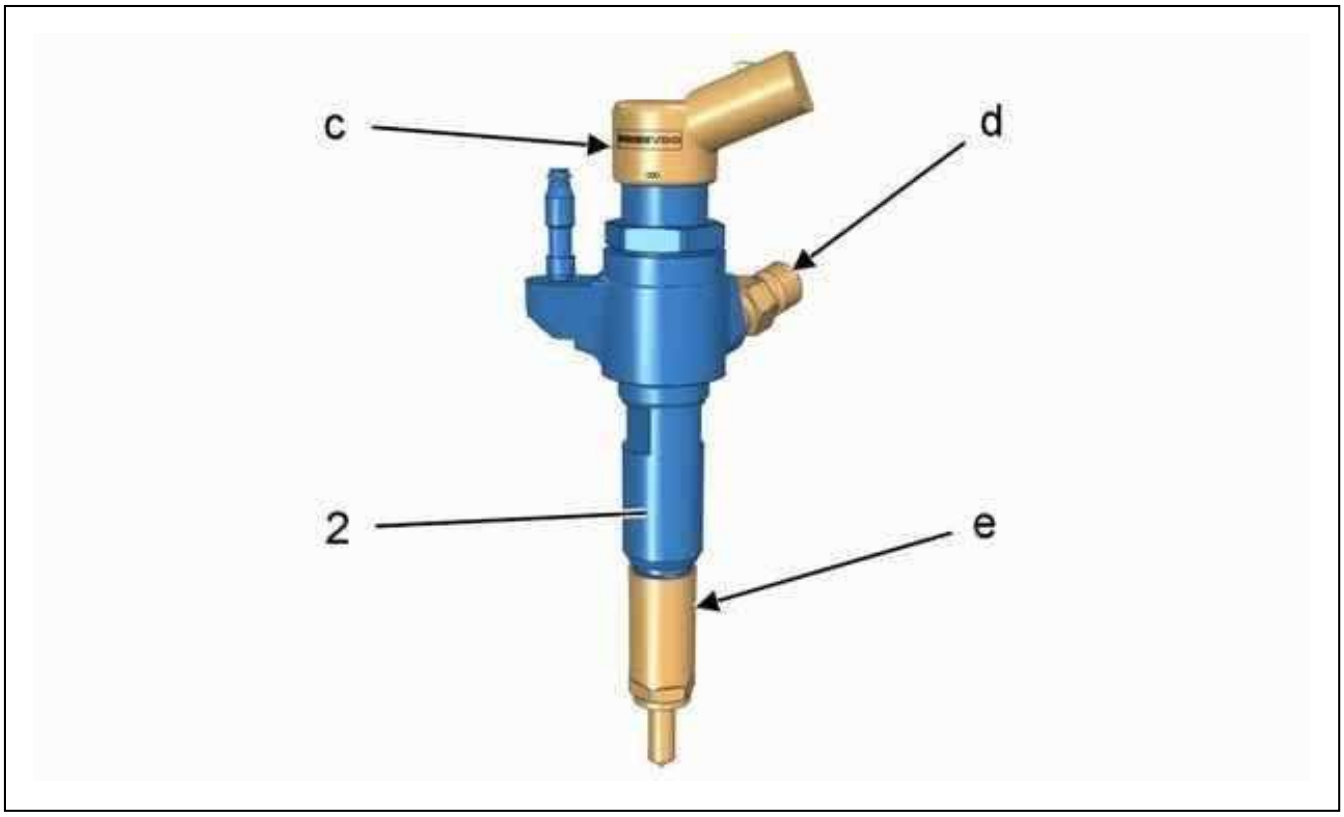


Figure : B1BK3XND

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

- Electromagnetic element "c" (replacement parts not available)
- High pressure union "d" (malfunction)
- Diesel injector "e" (replacement parts not available)

Calamine cleaning on the injector nose is prohibited.

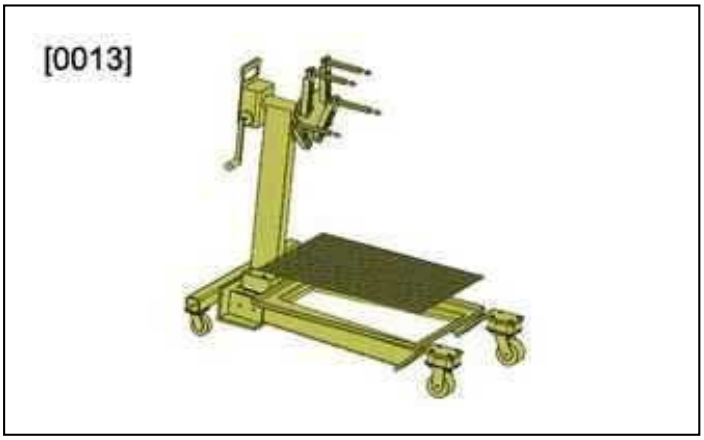
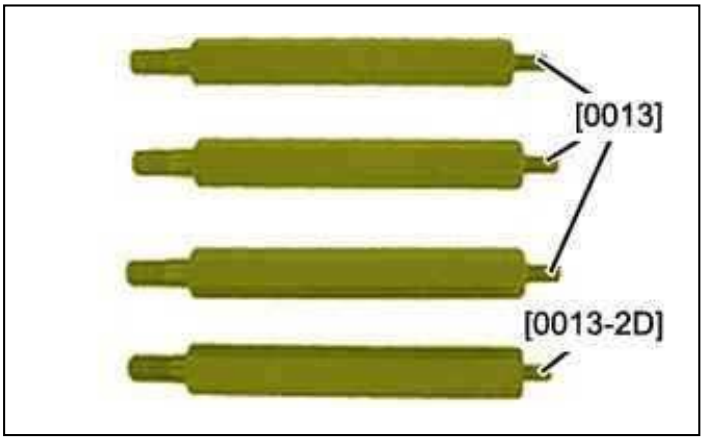
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FITTING : ENGINE ON STAND

1. Tooling

Equipment :

- workshop hoist
- Lifting chain

tool	Reference	Designation
 Figure : E5AB0QVT	[0013]	engine or gearbox mounting bracket stand
 Figure : E5AB0W3T	[0013]	Column bolt (M10) 18 length
	[0013-2D]	Column bolt with removable pin M10

2. Fitting the engine to the stand

CAUTION : As the flywheel cannot be extracted once the engine is in place on its stand, it is essential to lock the timing, remove the crankshaft pulley bolt and then remove the flywheel before any work.

Lift the engine ; Using a workshop crane.

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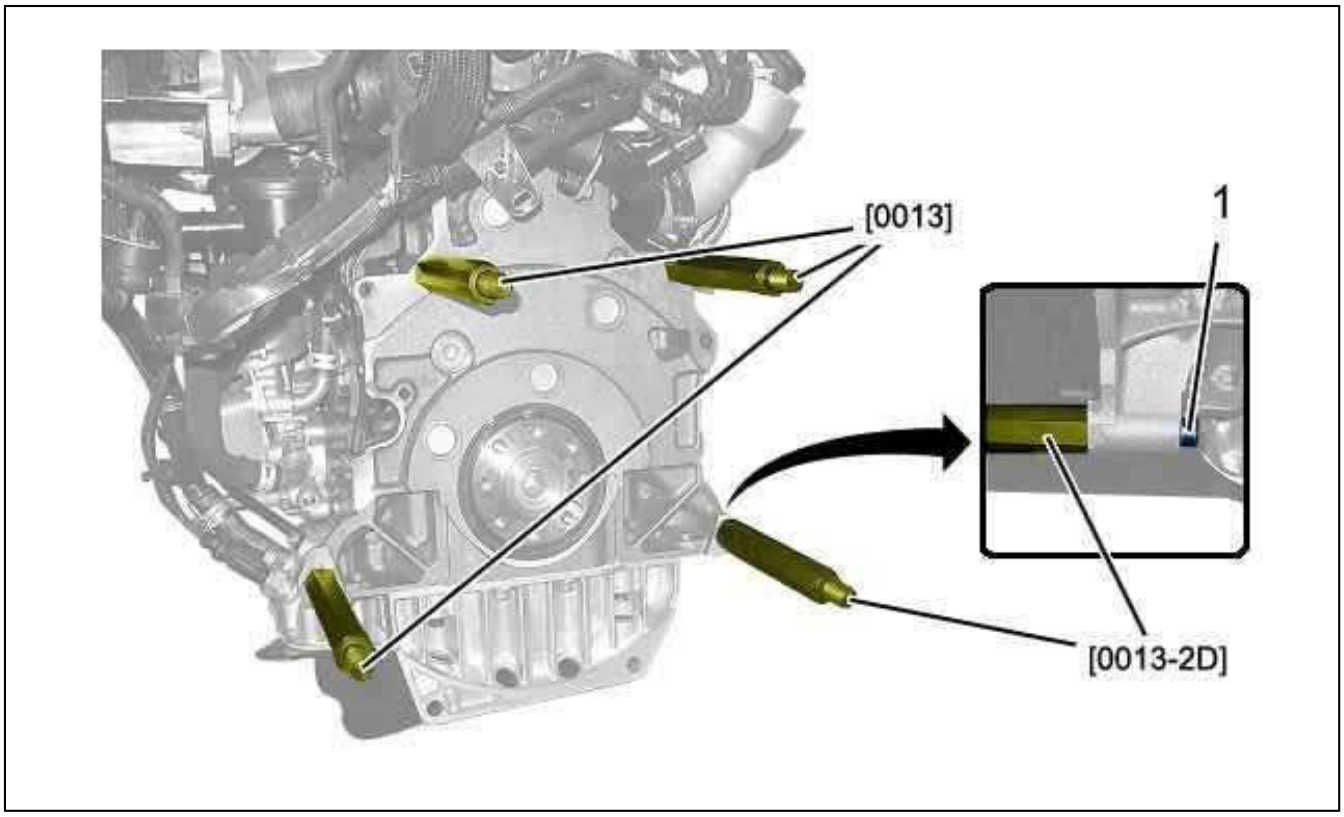


Figure : B1BPST6D

Fit : The pillar screws [0013] ; On engine(As indicated above).
Remove the removable pin from the column bolt [0013-2D].
Fix the column bolt [0013-2D] ; Using a bolt (1).

N.B. : Bolt (1) type M10 of length 80 mm.

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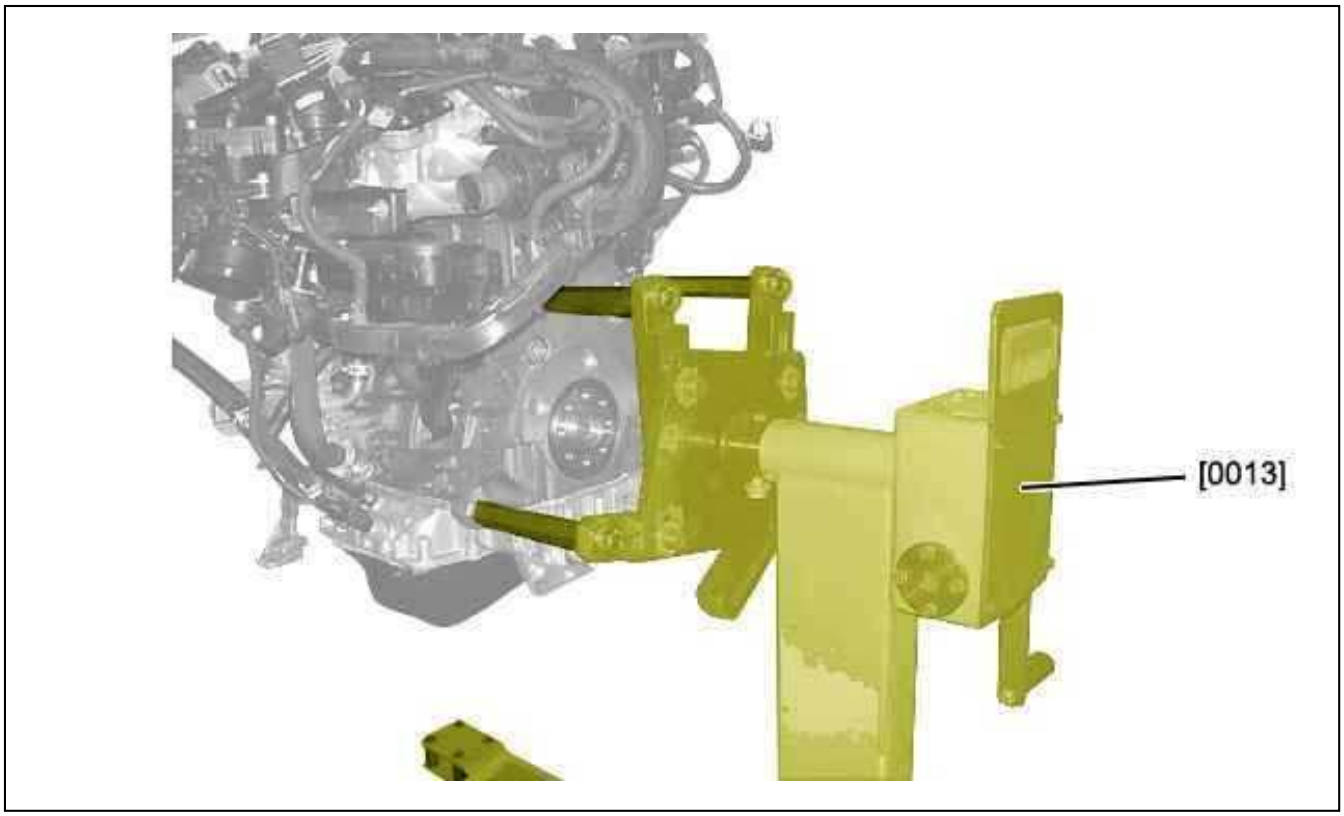


Figure : B1BPSTAD

Position the arm of the stand [0013], as shown.
Fix the engine to the stand ; Using nuts.

CAUTION : Check that all the fixings are correctly tightened before detaching the crane.

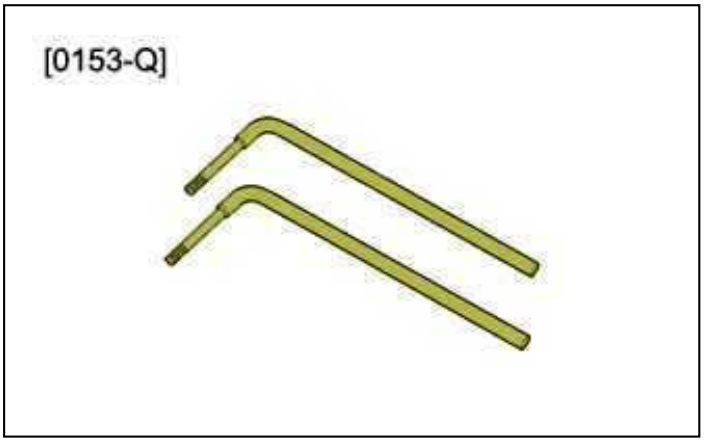
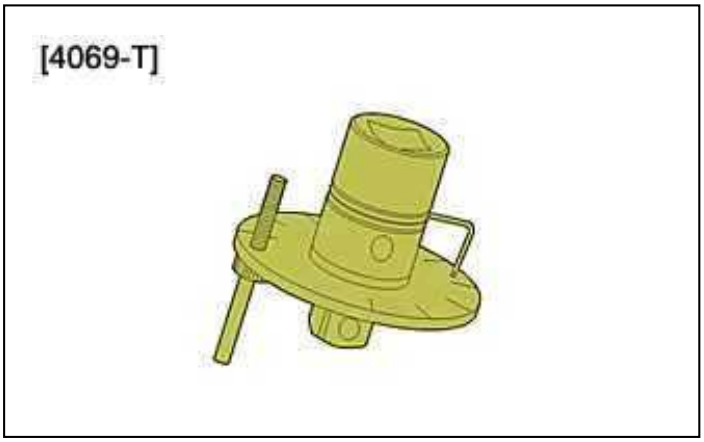
Detach the workshop crane from the engine.

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REMOVING - REFITTING : CYLINDER HEAD (ON VEHICLE)

ESSENTIAL : Observe the safety and cleanliness instructions .

1. Tooling

Tool	Reference	Description
 Figure : E5AB0UPT	[0153-Q]	Set of levers to free cylinder head
 Figure : E5AB0B1T	[4069-T]	Adaptor for angular tightening

2. Removing

Place the vehicle on a lift.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

Disconnect the battery.

CAUTION : Check the condition of the hoses : Cooling (Distortion, cracking) ; Replace any defective parts.

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Drain the engine cooling circuit .

Remove :

- The complete fuel filter with its mounting
- Exhaust gas recycling module
- The glow plugs
- The timing belt
- The coolant outlet elbow
- The vacuum pump
- The fuel high pressure pump
- The fuel high pressure injection common rail
- The diesel injectors
- The air inlet manifold
- The camshafts

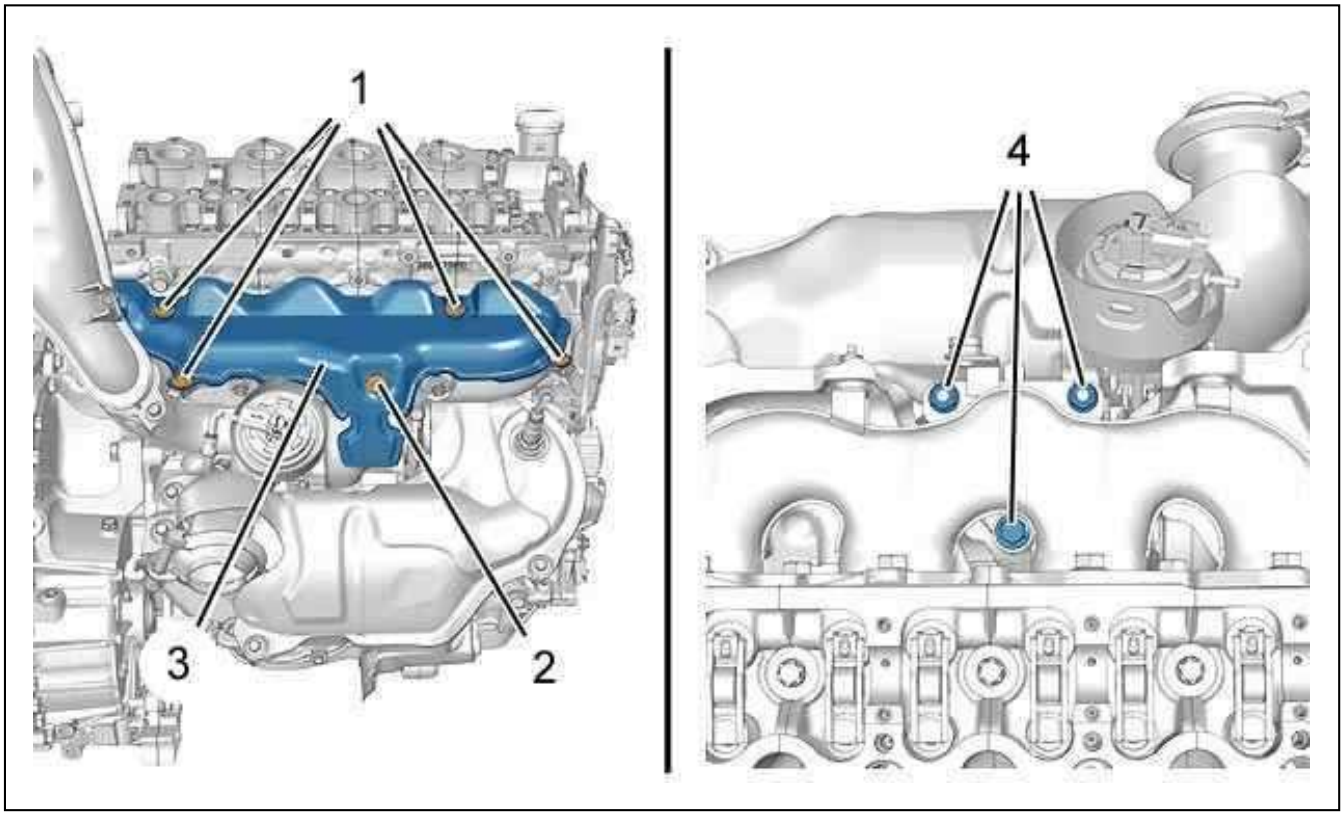


Figure : B1BG0ARD

Remove :

- The bolts (1)
- The bolt (2)
- The exhaust manifold thermal protector (3)
- The turbocharger mounting nuts (4)

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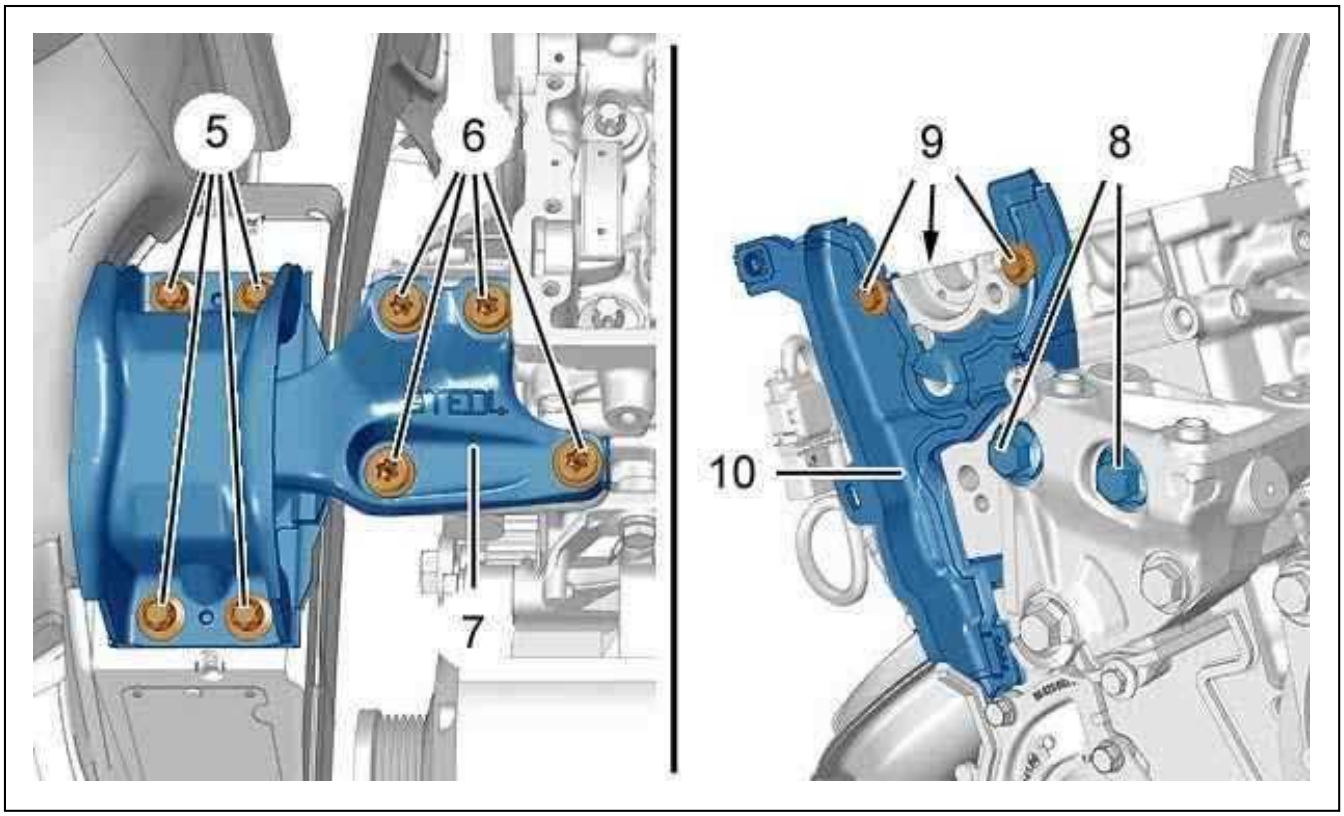


Figure : B1BG0ASD

CAUTION : Use a rubber pad to prevent damage to the oil sump : Risk of obstruction of the oil pump suction strainer.

Immobilise the engine (Timing side) ; Using a jack and a flexible shim .
Remove :

- The bolts (5), (6)
- The engine mounting 7
- The bolts (8)
- The bolts (9)
- The rear timing cover (10)

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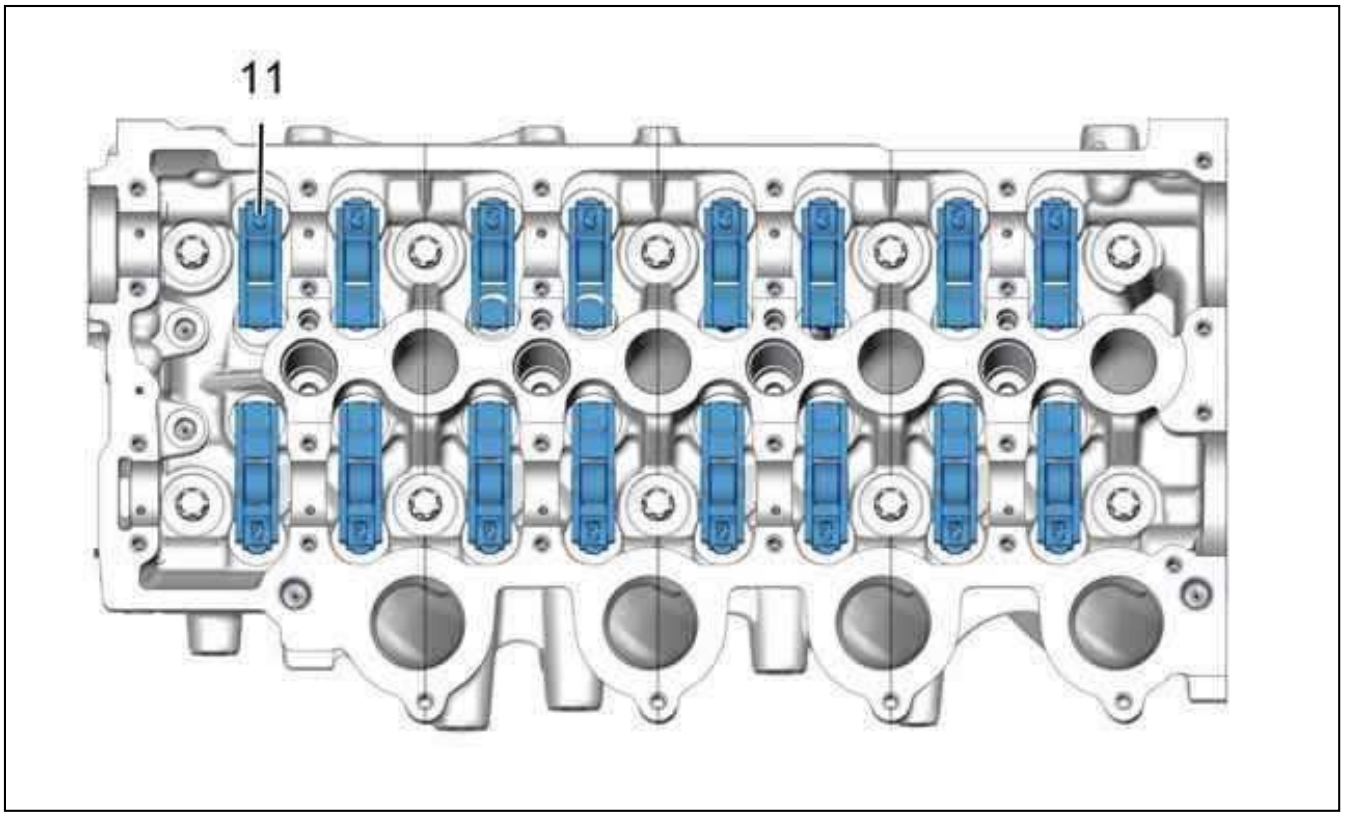


Figure : B1DG02QD

CAUTION : Mark the location of the valve control rockers and their hydraulic followers (11).

Remove the valve control rockers with their hydraulic followers (11).

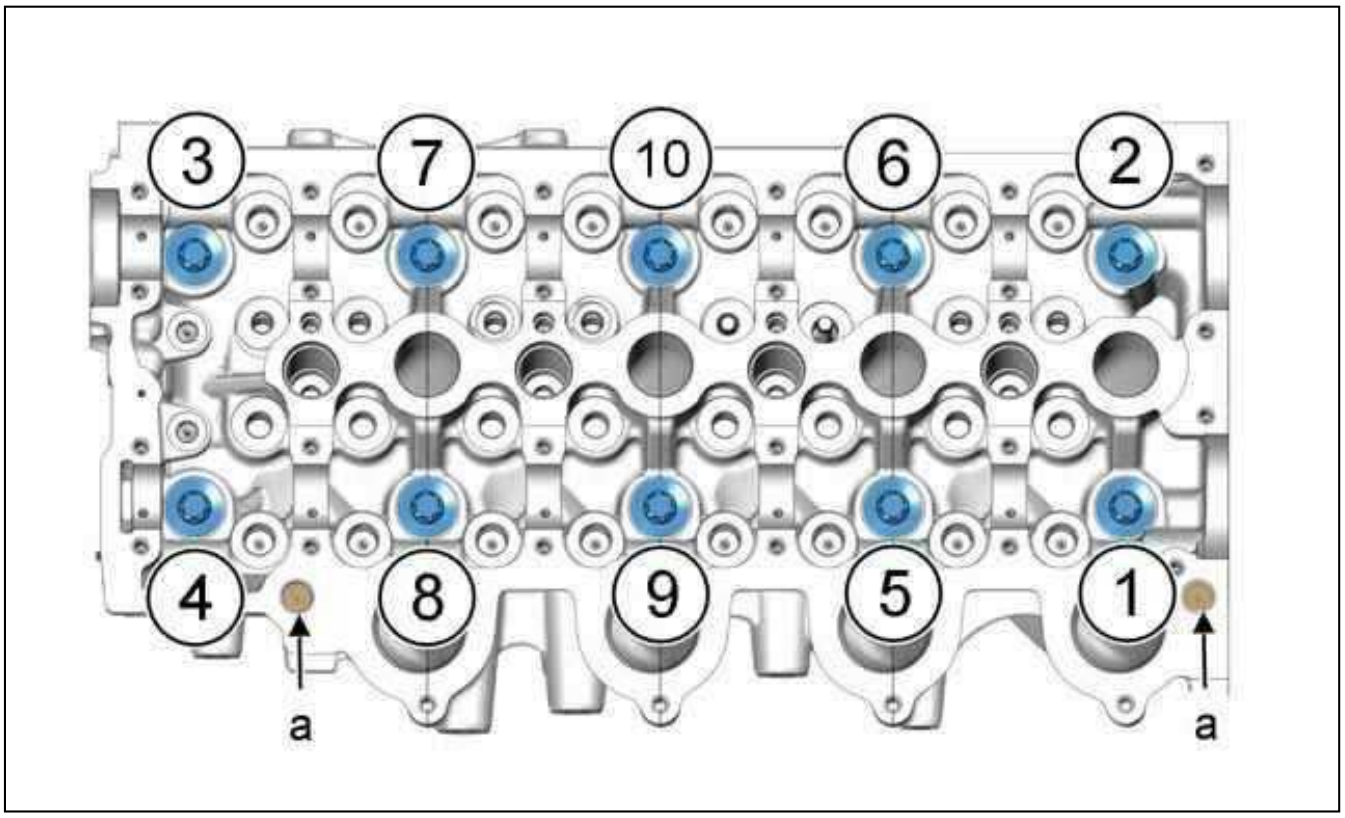


Figure : B1DG02RD

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CAUTION : Observe the order of slackening indicated.

Remove the cylinder head bolts (In the order shown).
Detach the cylinder head (In "a") ; Using the levers [0149-T].
Remove :

- The cylinder head
- The cylinder head gasket

3. Verification / Preparation

3.1. Cleaning

CAUTION : There must be no traces of impacts or scratches on the joint face. Do not use sharp or abrasive tools.

Clean the joint faces using the approved stripping product (Refer to the products catalogue).

3.2. Re-using the cylinder head screws

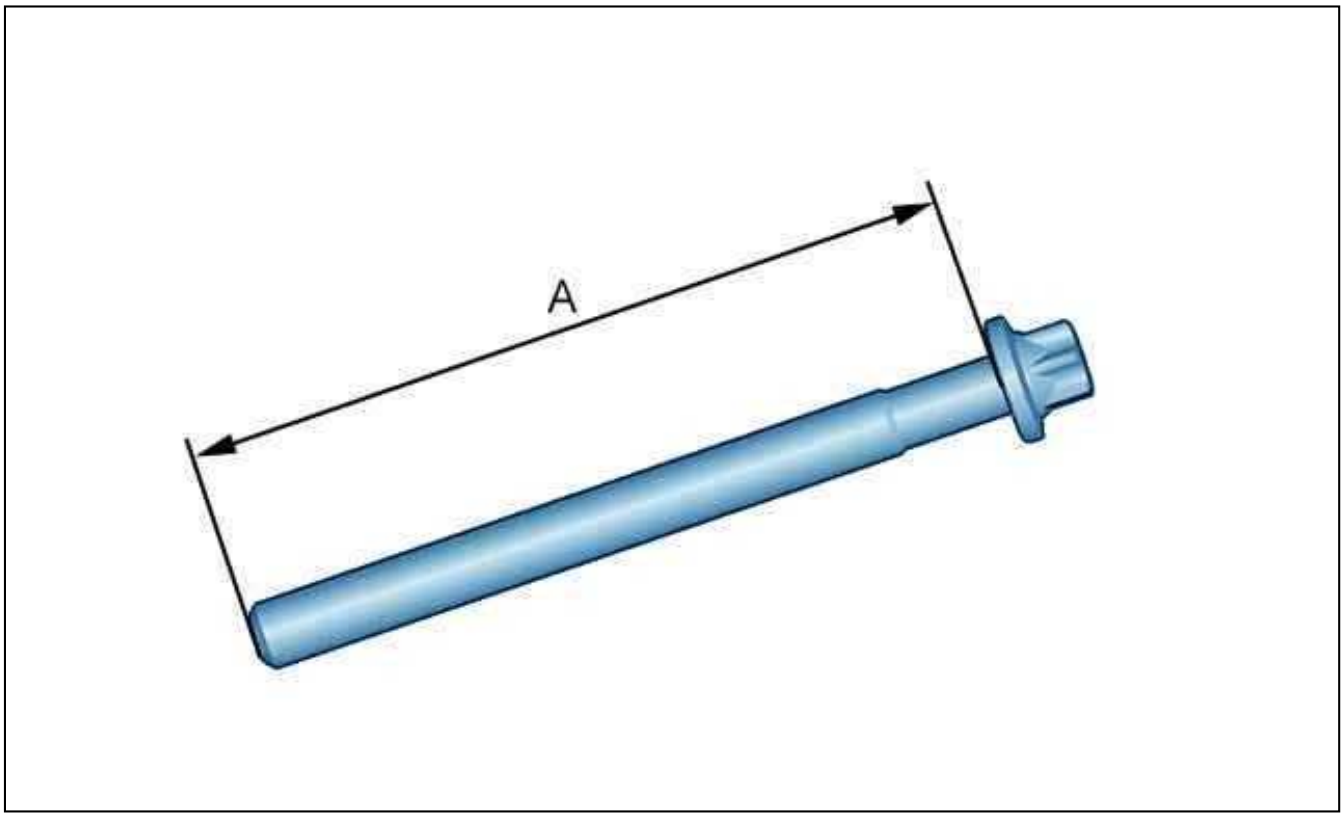


Figure : B1DP22AD

CAUTION : The cylinder head bolts can only be re-used once maximum.

Check the length of the cylinder head screws.

N.B. : The length of bolts under heads "A" must be less than or equal to 128 mm.

3.3. Check of the flatness of the cylinder head

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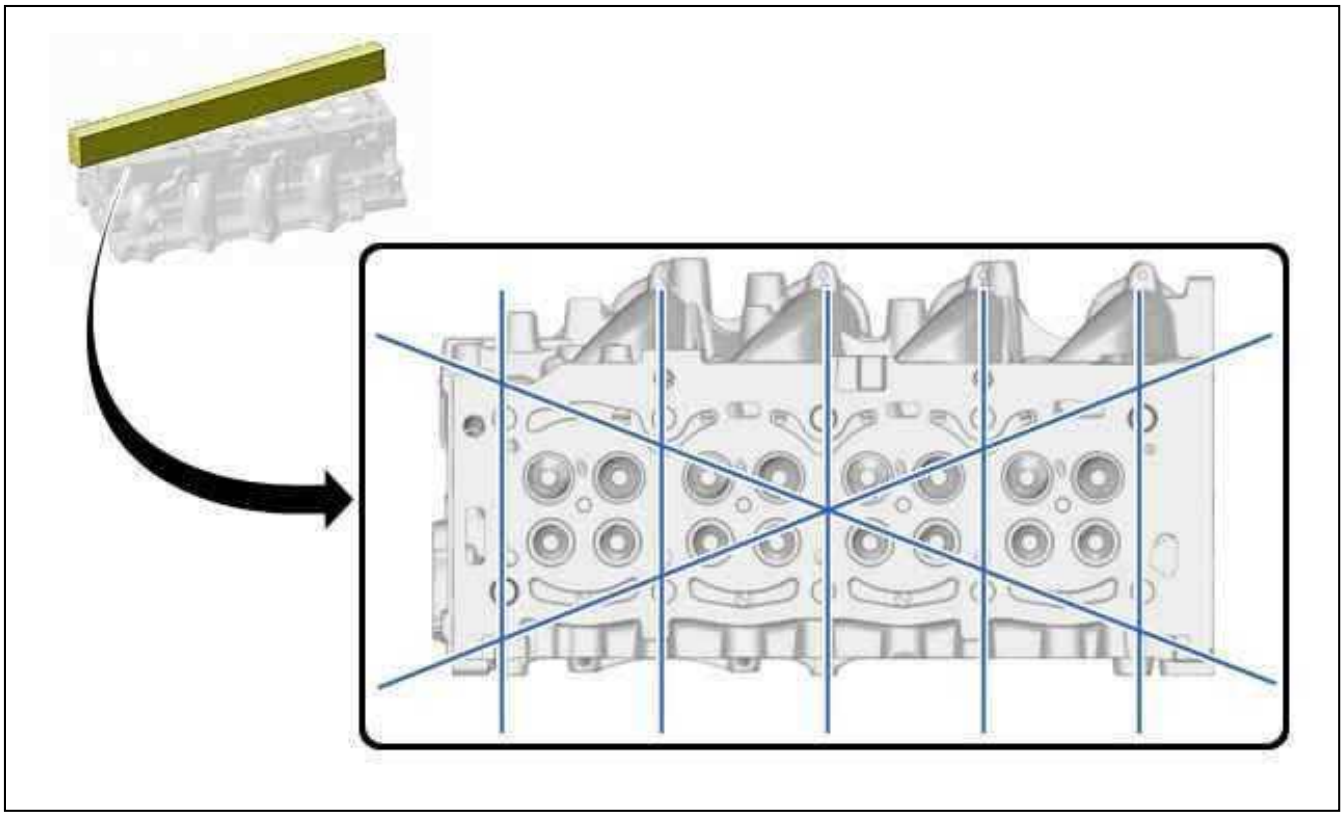


Figure : B1DG02WD

Check the flatness of the cylinder head ; Using a rule (as shown on the illustration).

N.B. : Maximum permissible bow = 0,03 mm.

CAUTION : If there is distortion greater than the permitted value, check the valve pocketing then remove the valves i they stand proud of the cylinder seal face.

3.4. Max. surface variation : Cylinder block

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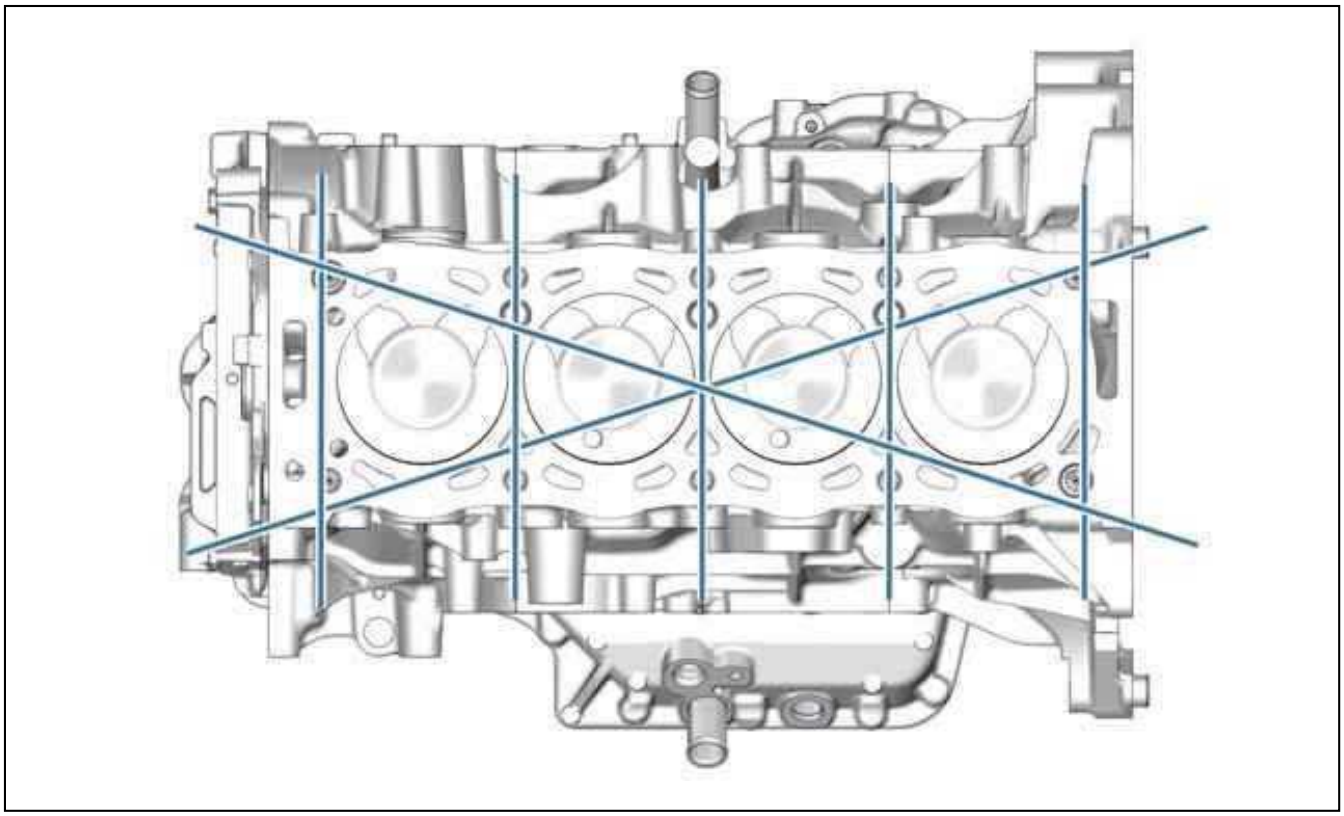


Figure : B1DG02XD

CAUTION : Position the pistons at mid-stroke.

Remove the centring pins on the cylinder block.
Check the flatness of the cylinder block ; Using a rule (as shown on the illustration).
Maximum distortion permitted over the surface :

- Overall : 0,042 mm
- Around the openings : 0,03 mm

3.5. Checking valve pocketing

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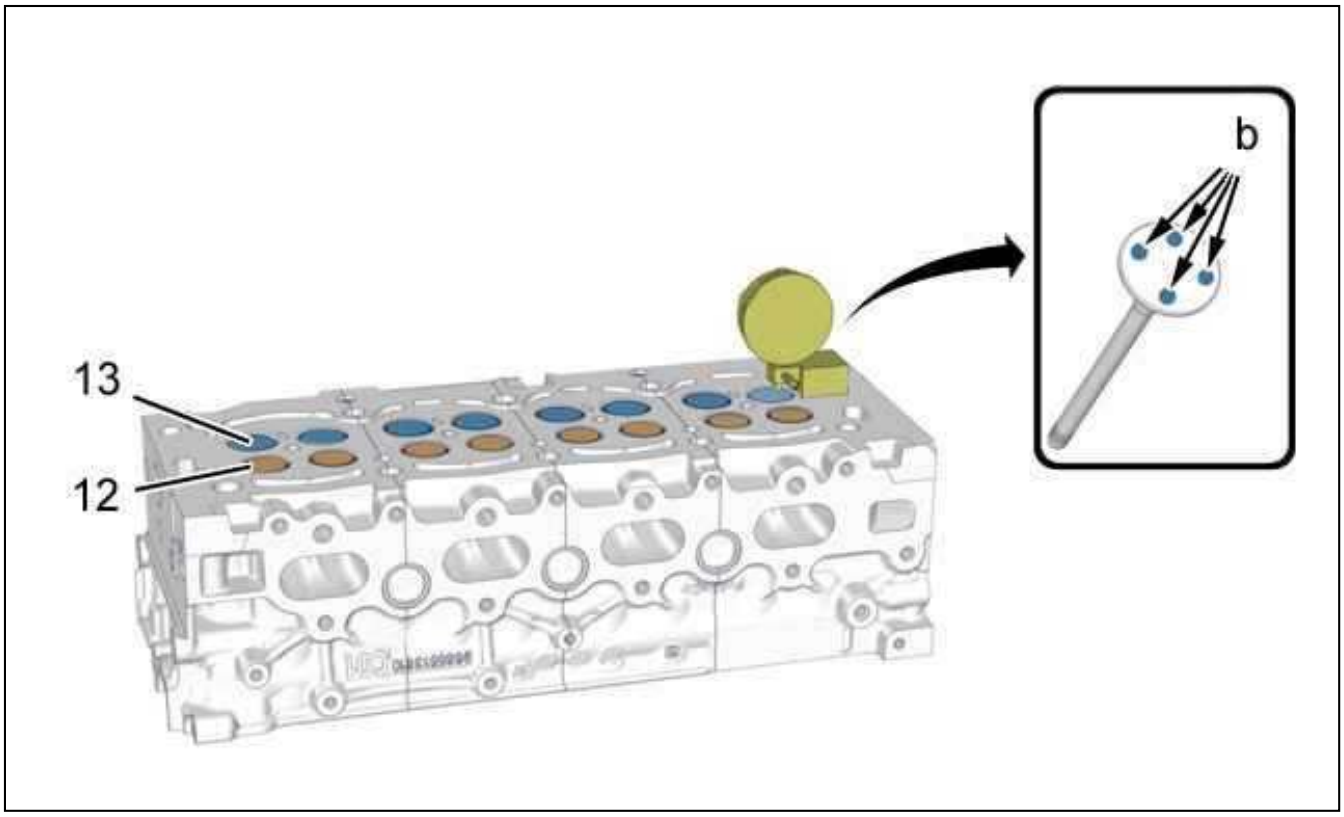


Figure : B1DG0OND

CAUTION : The sealing surfaces must be perfectly clean : No signs of impact, no traces of scaling permitted.

Check the pocketing of the valves in relation to the cylinder head face (Valve by valve) :

- Assemble the dial gauge on its support
- Place the dial gauge in a stable position on the cylinder head gasket face ; The dial gauge to zero
- Move the dial gauge over the 4 checking points "b" (Valve) ; Read off the values
- Take the average of the 4 values measured

Valve pocketing values	
Inlet valves 12	0,4 to 0,7 mm
Exhaust valves 13	-0,07 to 0,17 mm

N.B. : If there is excessive stand-proud or recession, check the condition of the valves and valve seats, replace ther bed them in if necessary.

4. Choice of cylinder head gasket

4.1. Noted : Piston stand-proud values

Fit :

- The auxiliary equipment drive pulley
- The screws of the accessories drive pulley ; Tighten to 5 daN.m

Turn the crankshaft clockwise using the pulley bolt .

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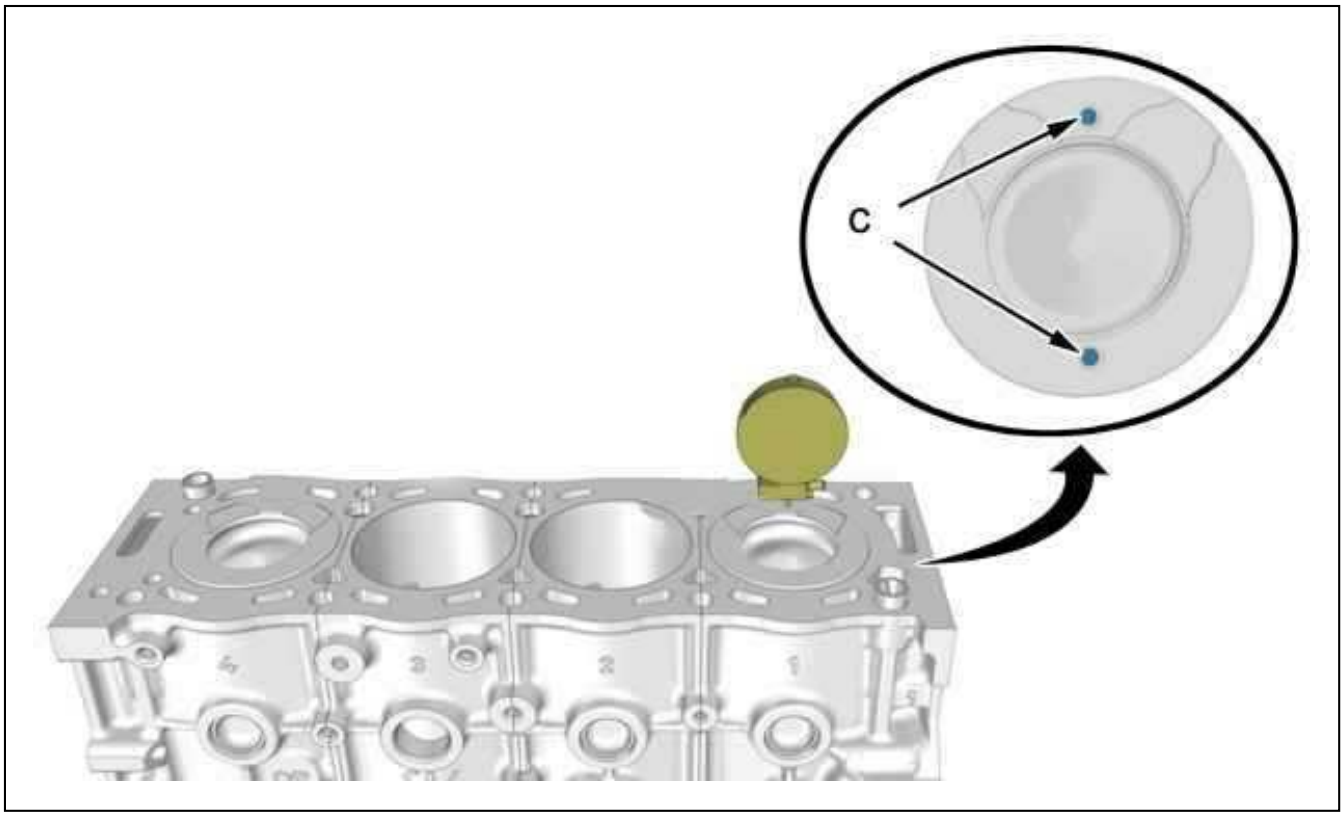


Figure : B1DG0OOD

CAUTION : The sealing surfaces must be perfectly clean : No signs of impact, no traces of scaling permitted.

Position 1 and 4 pistons at TDC ; Using the dial gauge.
Note down the stand-proud of the pistons in relation to the cylinder block seal face.

CAUTION : Take the highest piston as a reference : Maximum gap between two consecutive cylinders = 0,07 mm.

Pistons 1 - 4 :

- Place the dial gauge in a stable position on the cylinder block gasket face ; The dial gauge to zero
- Move the dial gauge over the 2 checking points "c" (Piston) (10 mm from the edge) ; Read off the values
- Take the average of the 2 values measured

Pistons 2 - 3 : Repeat the operation.

4.2. Choice of cylinder head gasket

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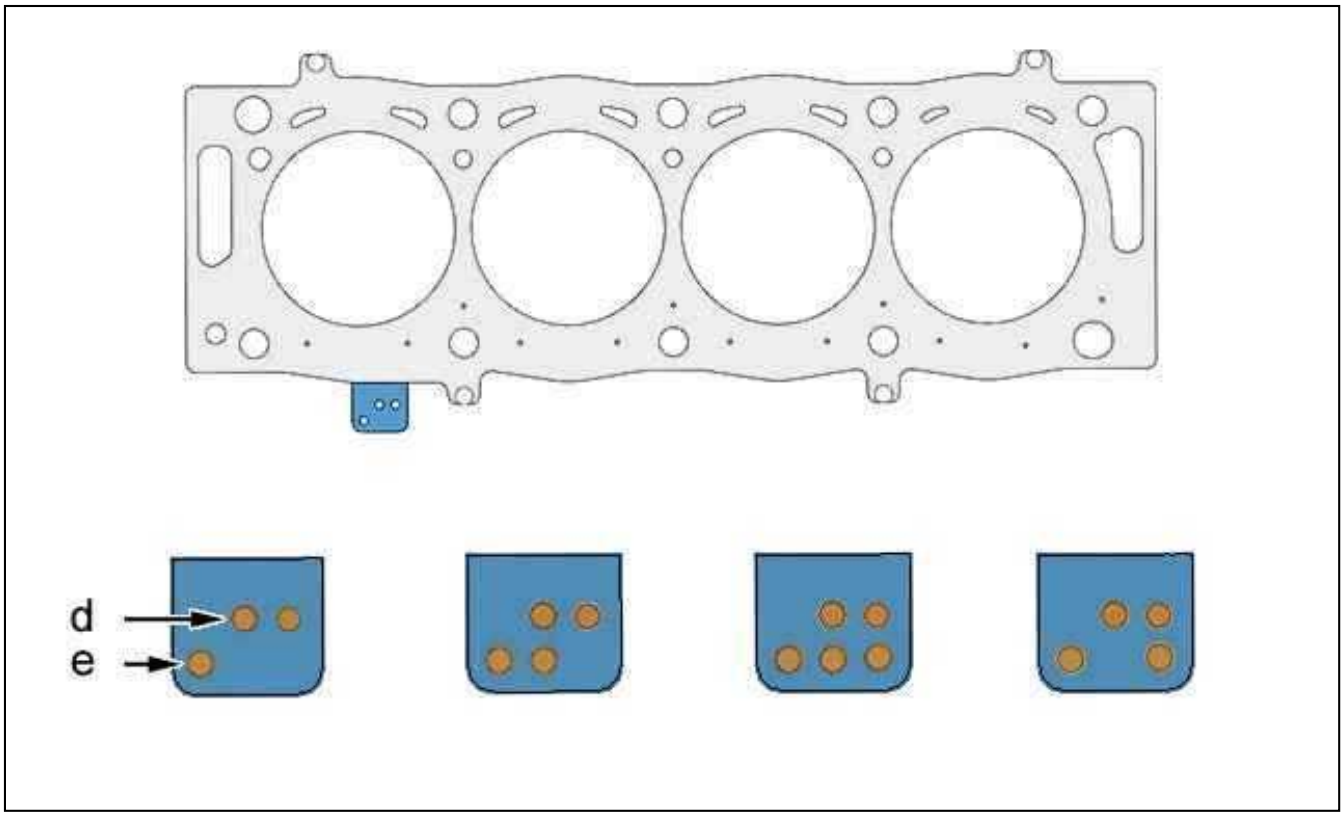


Figure : B1DG030D

"d" : Engine identification marking.
"e" : Thickness identification.

Classes of multi-layer metallic cylinder head gaskets / Piston protrusion measurements				
	Thickness	Hole (at "e")		
From 0,550 mm inclusive to 0,600 mm inclusive	1,25 ± 0,05	X		
From 0,601 mm exclusive to 0,650 mm inclusive	1,30 ± 0,05	X	X	
From 0,651 mm exclusive to 0,700 mm inclusive	1,35 ± 0,05	X	X	X
From 0,701 mm exclusive to 0,750 mm inclusive	1,40 ± 0,05	X		X

CAUTION : If the value read does not correspond to the values specified, look for the source of the fault (Reading o handling error).

5. Refitting

CAUTION : Observe the tightening torque values .

CAUTION : Clean out with a tap the threads in the crankcase which accommodate the cylinder head screws ;With a tap M12x150.

Brush the threads of the cylinder head bolts.

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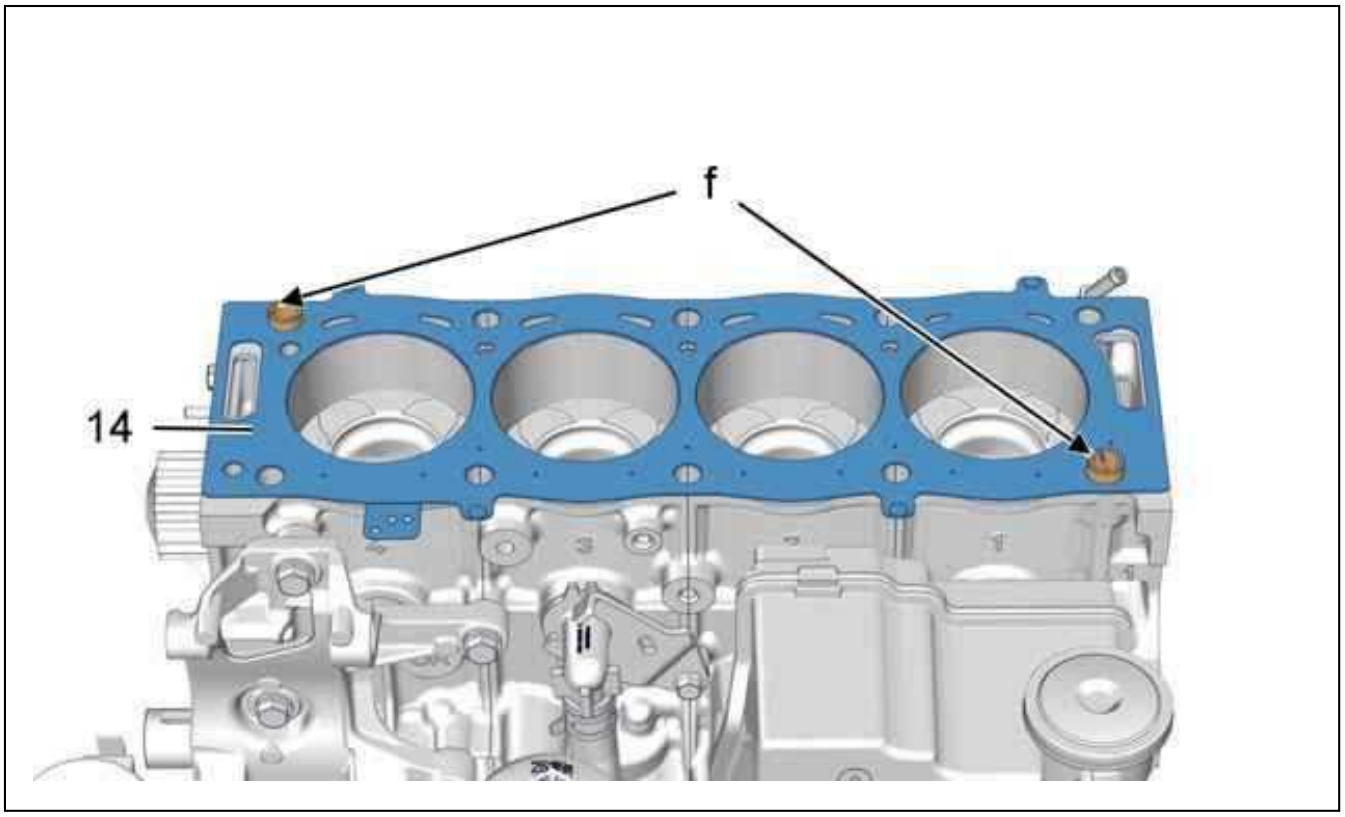


Figure : B1DG031D

CAUTION : Check the presence of the centring pins (In "f").

Position the cylinder head gasket chosen (As illustrated).
Position the pistons at mid-stroke.
Fit :

- The cylinder head
- The cylinder head bolts

5.1. Cylinder head tightening

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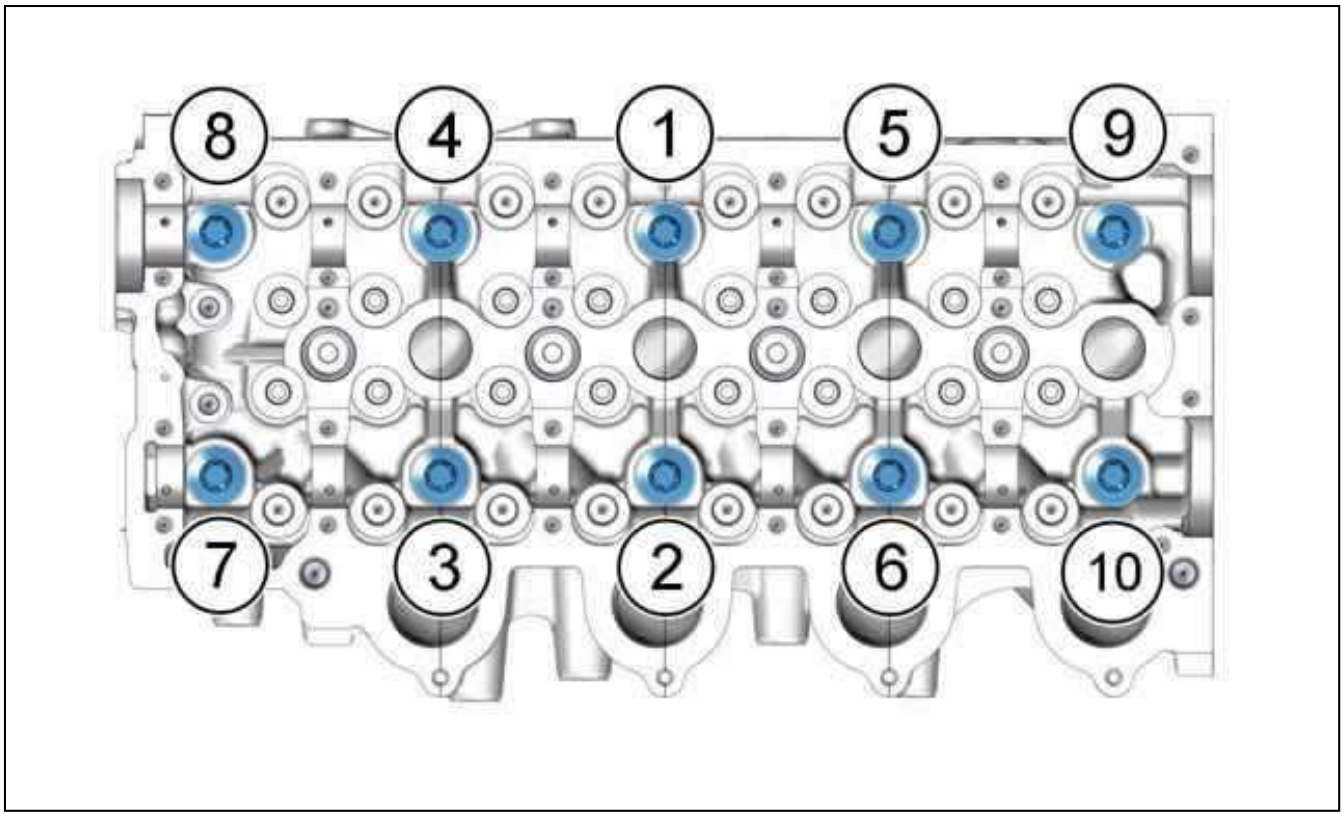


Figure : B1DG032D

CAUTION : Respect the tightening order.

CAUTION : Check that the tightening torque for the cylinder head bolts is greater than 10 m.daN.

Tightening method ; Using the tool [4069-T] :

- Pre-tighten the cylinder head bolts
- Tighten : The cylinder head bolts
- Angular tightening : Cylinder head bolts

5.2. Subsequent operations

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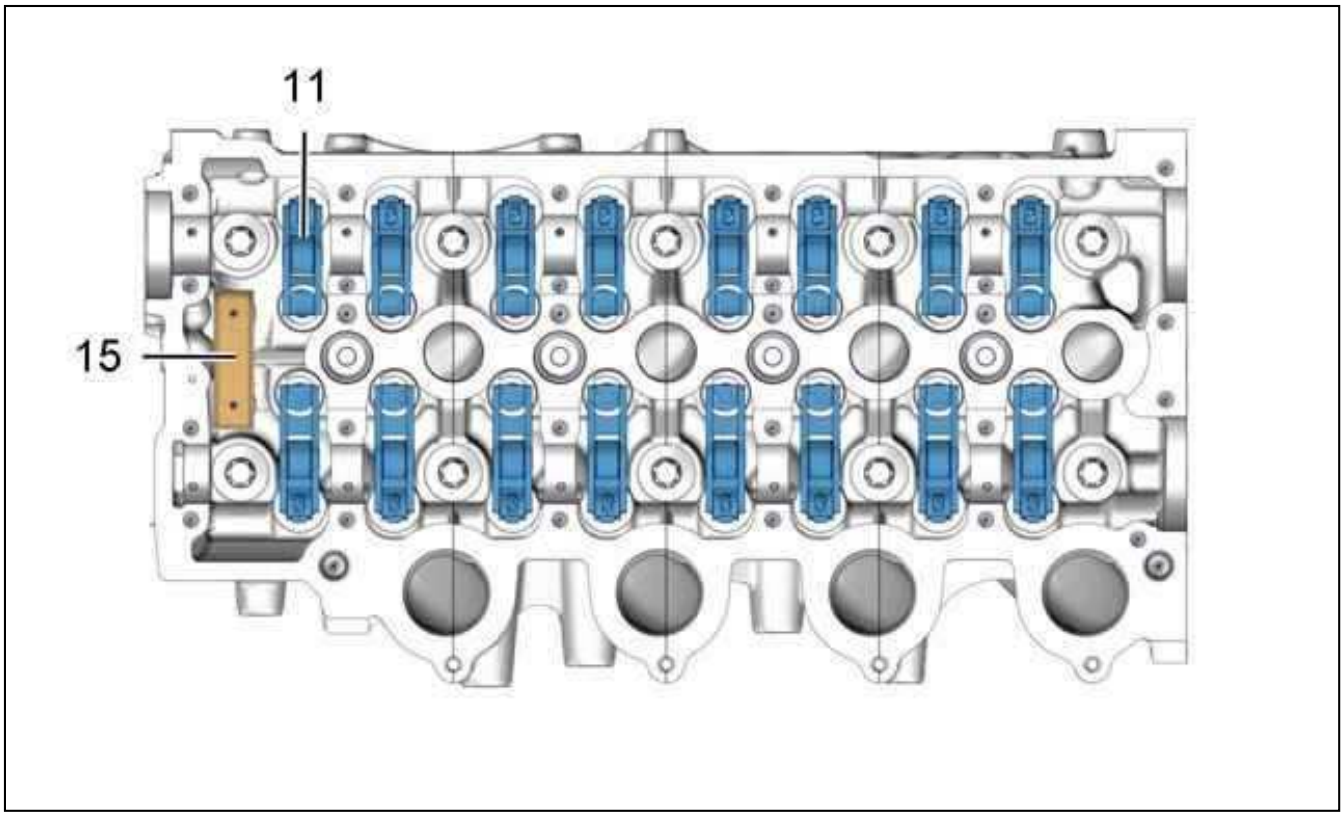


Figure : B1DG033D

CAUTION : Check that the bottom guide (15) is correctly positioned.

CAUTION : Lubricate : The valve control rockers - The hydraulic tappets (11) ; With engine oil .

Fit :

- The valve control rockers with their hydraulic followers (11) (According to the location marked on removal)
- The rear timing cover (10)
- The bolts (9)
- The bolts (8)
- The engine mounting 7
- The bolts (5), (6)

Remove the jack from under the engine.

CAUTION : Always renew : The turbocharger mounting nuts (4) ; Seals.

Fit :

- The turbocharger mounting nuts (4) (new nuts)
- The exhaust manifold thermal protector (3)
- The bolt (2)
- The bolts (1)

Fit :

- The camshafts
- The air inlet manifold
- The diesel injectors
- The fuel high pressure injection common rail
- The fuel high pressure pump

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- The vacuum pump
- The coolant outlet elbow
- The timing belt
- The glow plugs
- Exhaust gas recycling module
- The complete fuel filter with its mounting

CAUTION : Operations to be carried out following reconnection of the battery.

Reconnect the battery.
Fill and bleed the engine cooling circuit.

6. Checks

Clear the memory of faults.
Start the engine.
Carry out a road test.
Check :

- Coolant temperature (Instrument panel)
- Check the absence of leaks or abnormal noise
- Check that there are no bulges in the cooling pipes

Read the fault codes in memory.
Switch off the engine.
Fit :

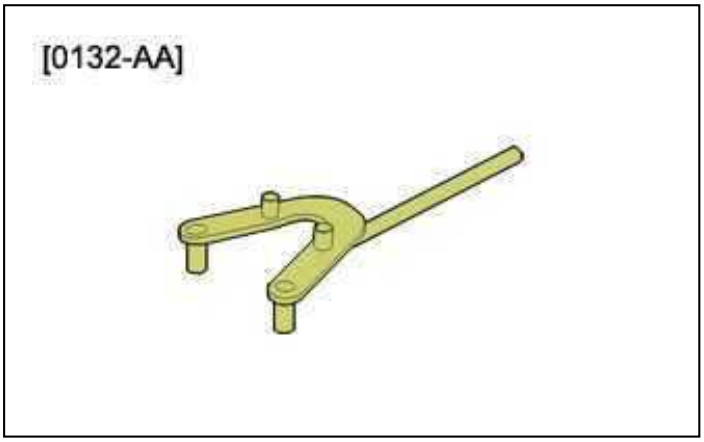
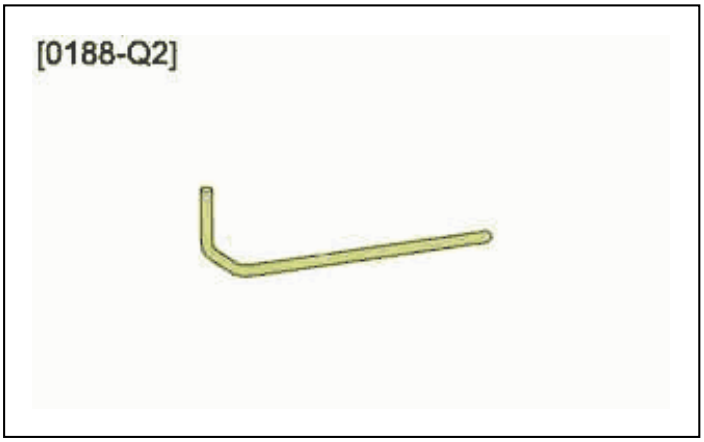
- The engine cover
- The passenger compartment air inlet manifold

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REMOVAL - REFITTING : CAMSHAFT

ESSENTIAL : Observe the safety and cleanliness instructions .

1. Tooling

Tool	Part number	Description
 Figure : E5AB0DKT	[0132-AA]	Camshaft locking tool
 Figure : E5AG05MT	[0188-Q2]	Dynamic roller setting rod

2. Removal

Place the vehicle on a lift.
Take down :

- The passenger compartment air inlet manifold
- The engine cover

Disconnect the battery.
Take down :

- The timing belt

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- The fuel high pressure pump
- The fuel high pressure injection common rail
- The diesel injectors
- The air inlet manifold
- The vacuum pump

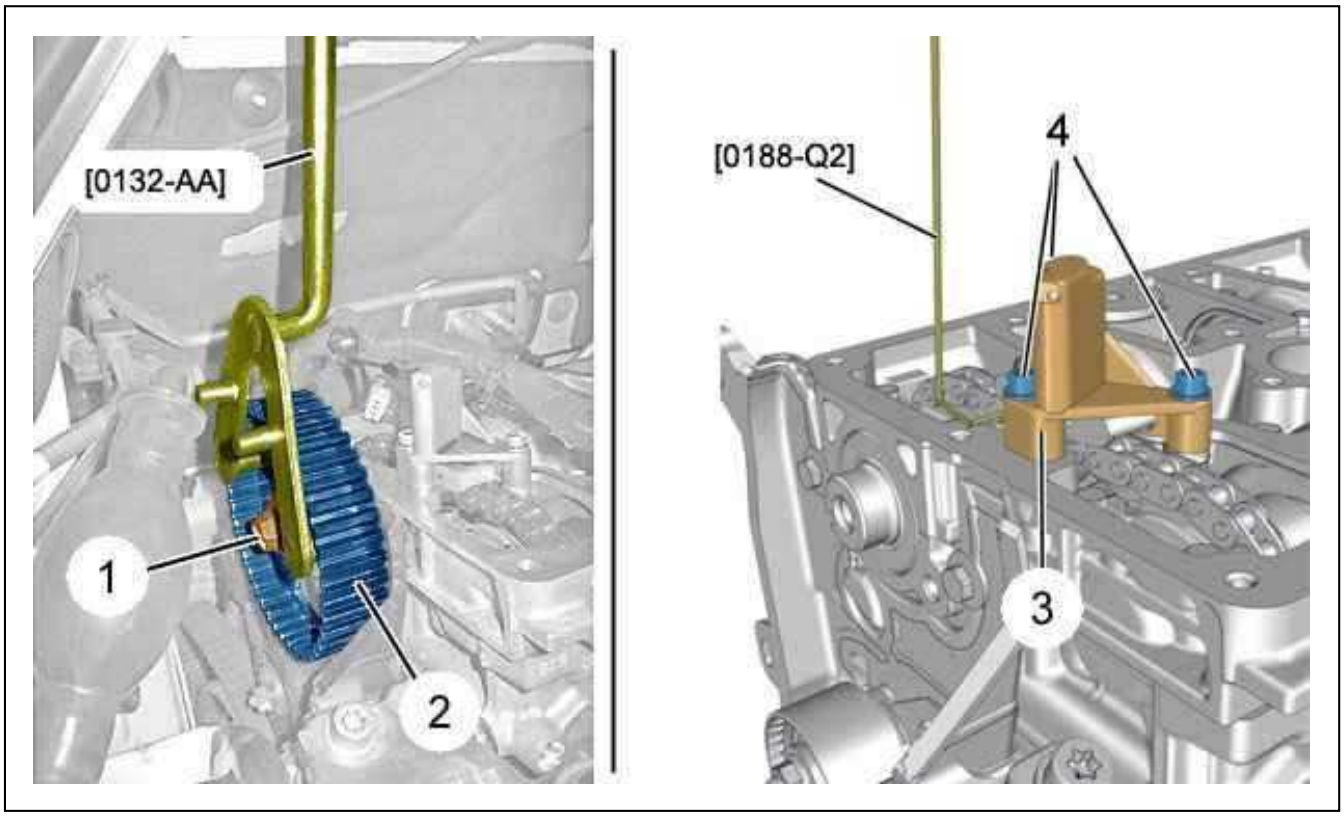


Figure : B1EG0FKD

Immobilise the camshaft pulley (2) ; Using tool [0132-AA].
Take down :

- The screw (1) and its washer
- The camshaft pulley (2)

Pin the timing chain (3) tensioner ; Using the dynamic roller setting rod [0188-Q2].
Take down :

- The bolts (4)
- The timing chain (3) tensioner

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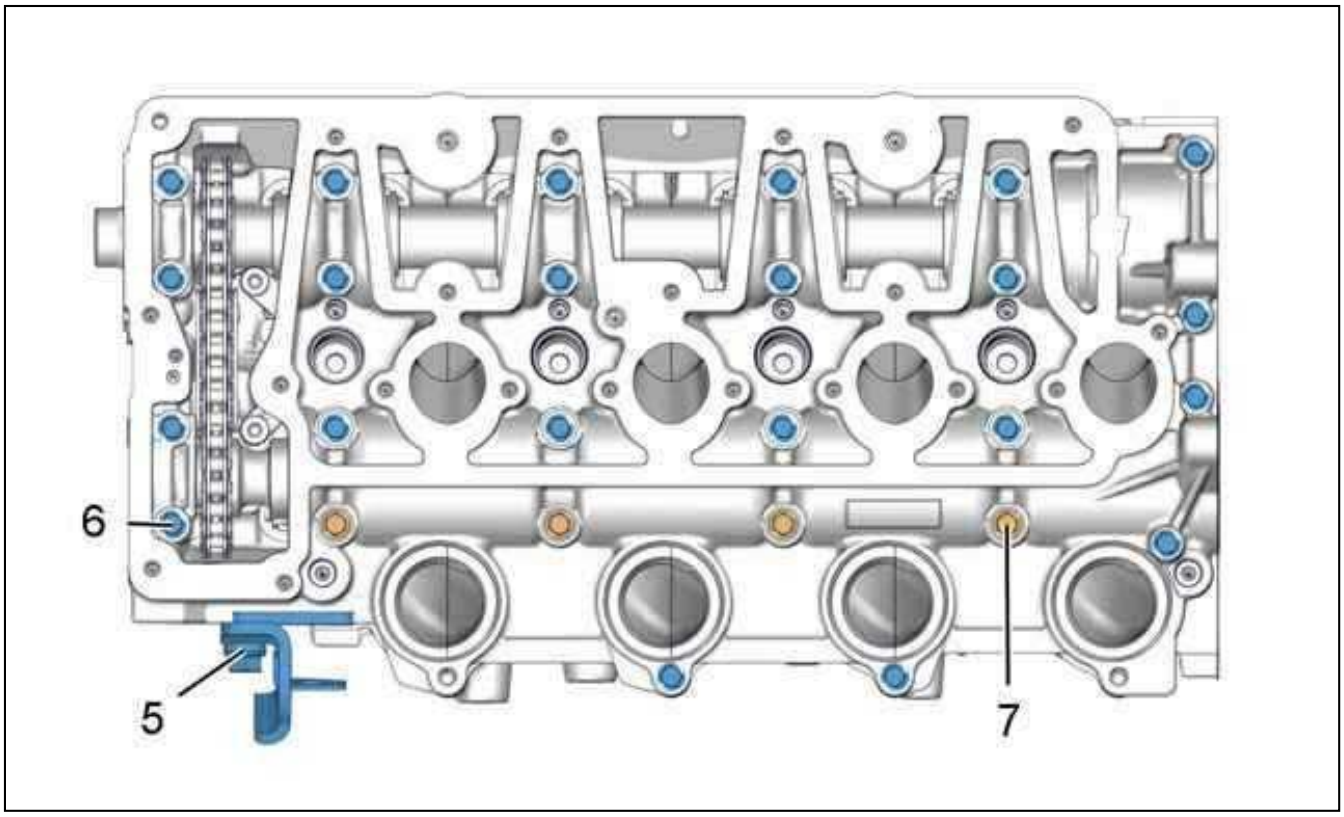


Figure : B1DG029D

Take down :

- The lifting plate (5)
- The 22 bolts (6)
- The 4 bolts (7)



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Figure : B1DG0JOD

Detach the camshaft bearing cap housing (8) (At " a ").

CAUTION : Plug the air inlet ducts ; Side member stiffener .

Take down :

- The camshaft bearing cap housing (8) and the seal
- The camshaft and timing chain assembly
- The sealing ring on the camshaft

3. Verification / Preparation

3.1. Verification

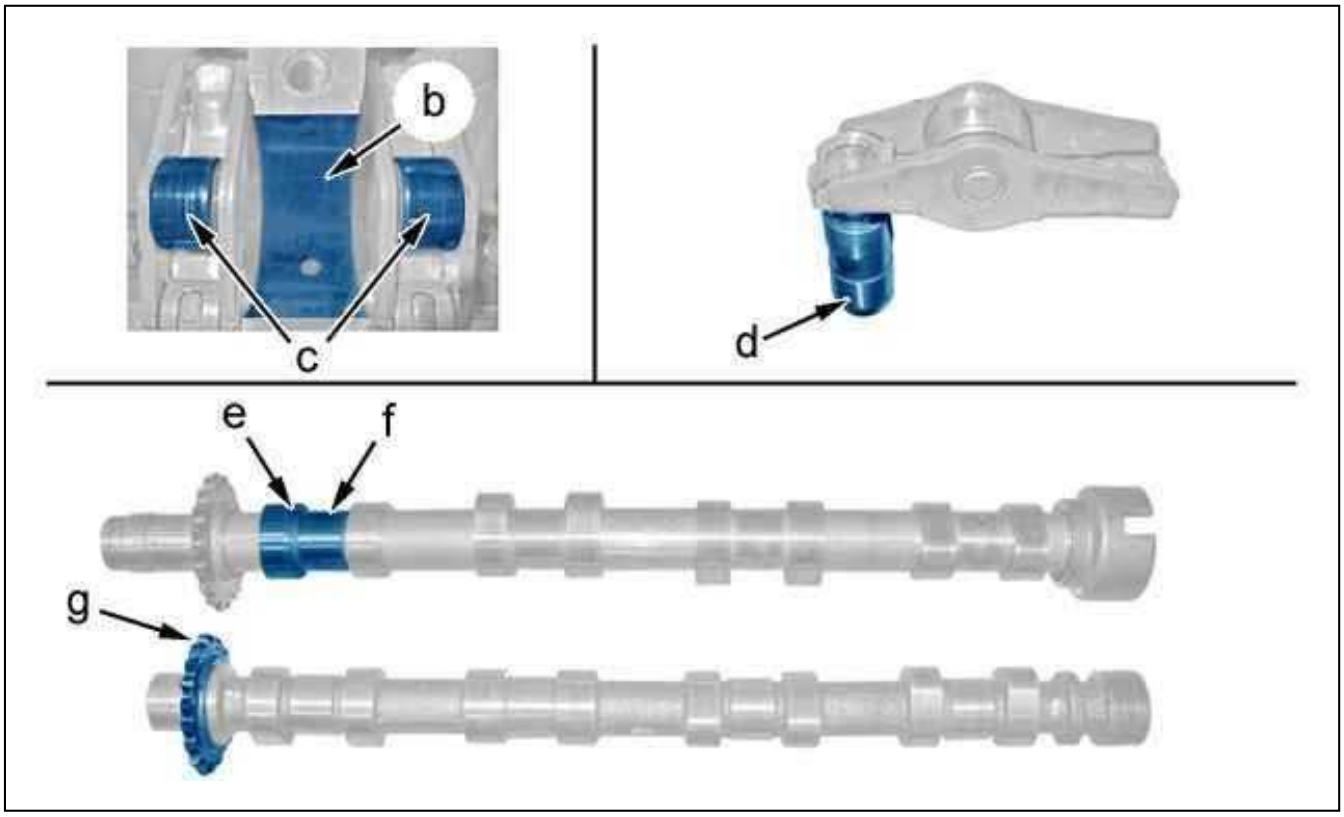


Figure : B1EG06WD

Check the following points :

- Check that there is no stripping of the metal (Camshaft bearing caps) (At " b ")
- Check that there is no stripping of the metal (Cam follower rollers) (At " c ")
- Check that the rollers rotate freely on the cam followers
- Check that the cam followers "d" move freely in their shafts
- Check that there is no stripping of the metal (Camshaft bearings) (At " f ")
- Check that there is no stripping of the metal (Cams) (At " e ")
- Check the condition of the teeth on the timing pinions (At " g ")
- Check the condition of the timing chain
- Check the condition of the guides on the timing chain tensioning system

Replace any defective parts.

3.2. Preparation

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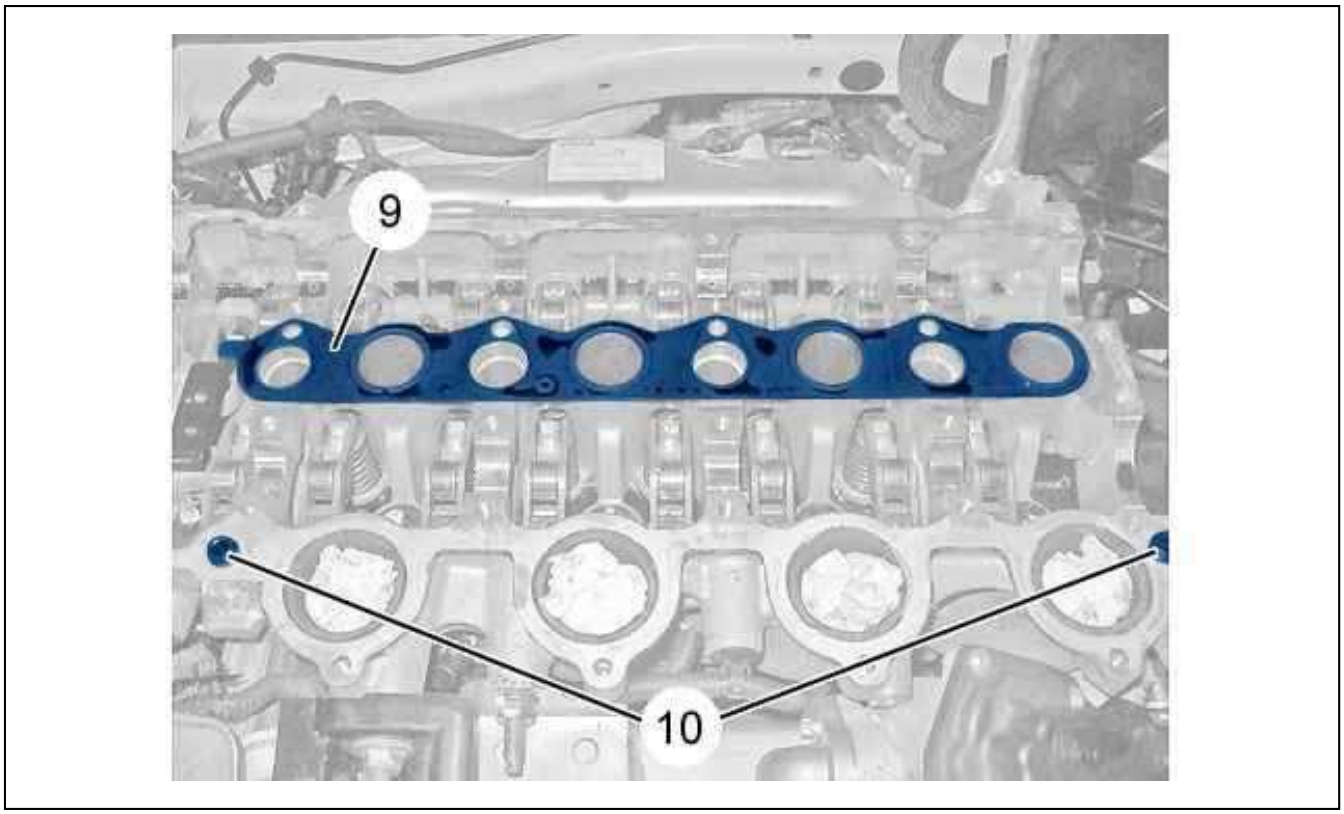


Figure : B1DG02FD

CAUTION : The seal faces should not show any traces of impacts or scratches. Do not use sharp or abrasive tools.

Clean the joint faces using the approved stripping product .

CAUTION : Take care to fit the gasket (9) the correct way round (see figure).

Fit a new seal (9).

N.B. : Fit the injector centring rings to centre the seal (9).

Check the presence of the centring pins (10).

4. Refitting

CAUTION : Observe the tightening torque values .

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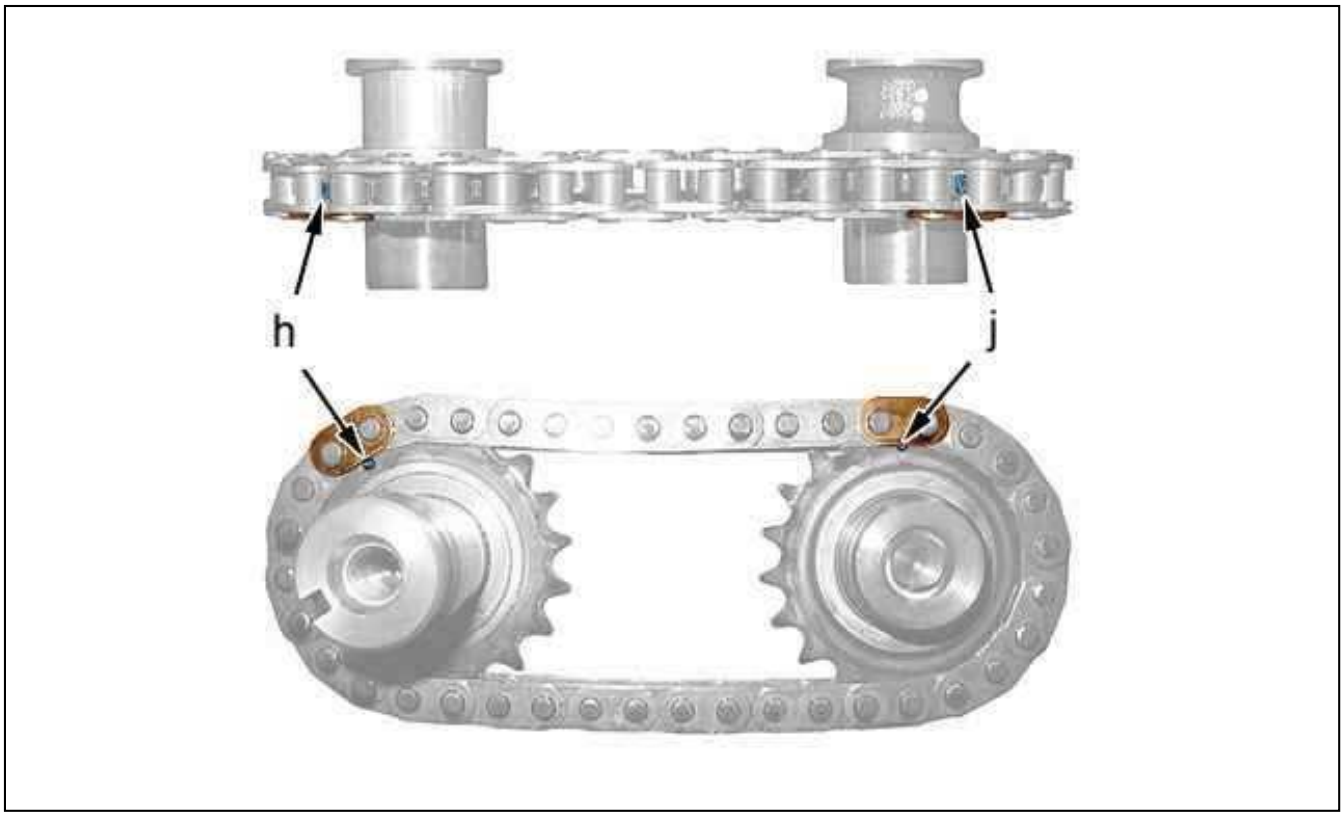


Figure : B1DG0J7D

CAUTION : The browned links must always be turned to the timing side.

Pre-fit the camshafts :

- Line up the brown link of the chain with the paint mark and with the point of the exhaust camshaft (At " h ")
- Line up the brown link of the chain with the paint mark and with the engraved mark on the exhaust camshaft (At " ")

CAUTION : Lubricate the cam follower rollers (At " c ") - The camshaft bearing caps (At " b ") - The camshaft bearings (At " f ") - The cams(At " e ") ; With engine oil .

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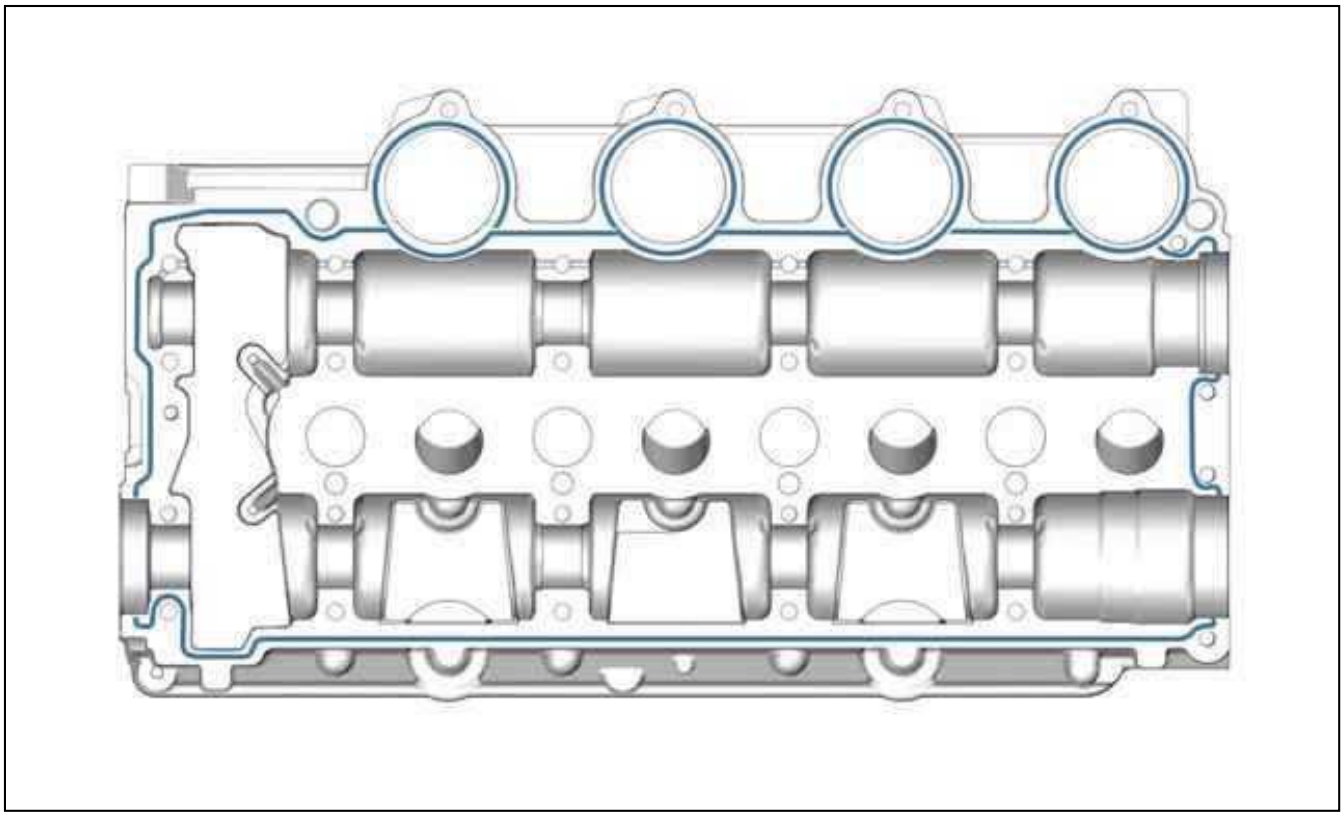


Figure : B1DG02GD

CAUTION : Do not exceed 5 minutes for positioning the camshaft main bearing cap casting in order to ensure satisfactory sealing before polymerisation.

Apply a strip of special sealing paste (catalogue produced) on the camshaft main bearing cap casing.

N.B. : Strip 1,2 mm wide.

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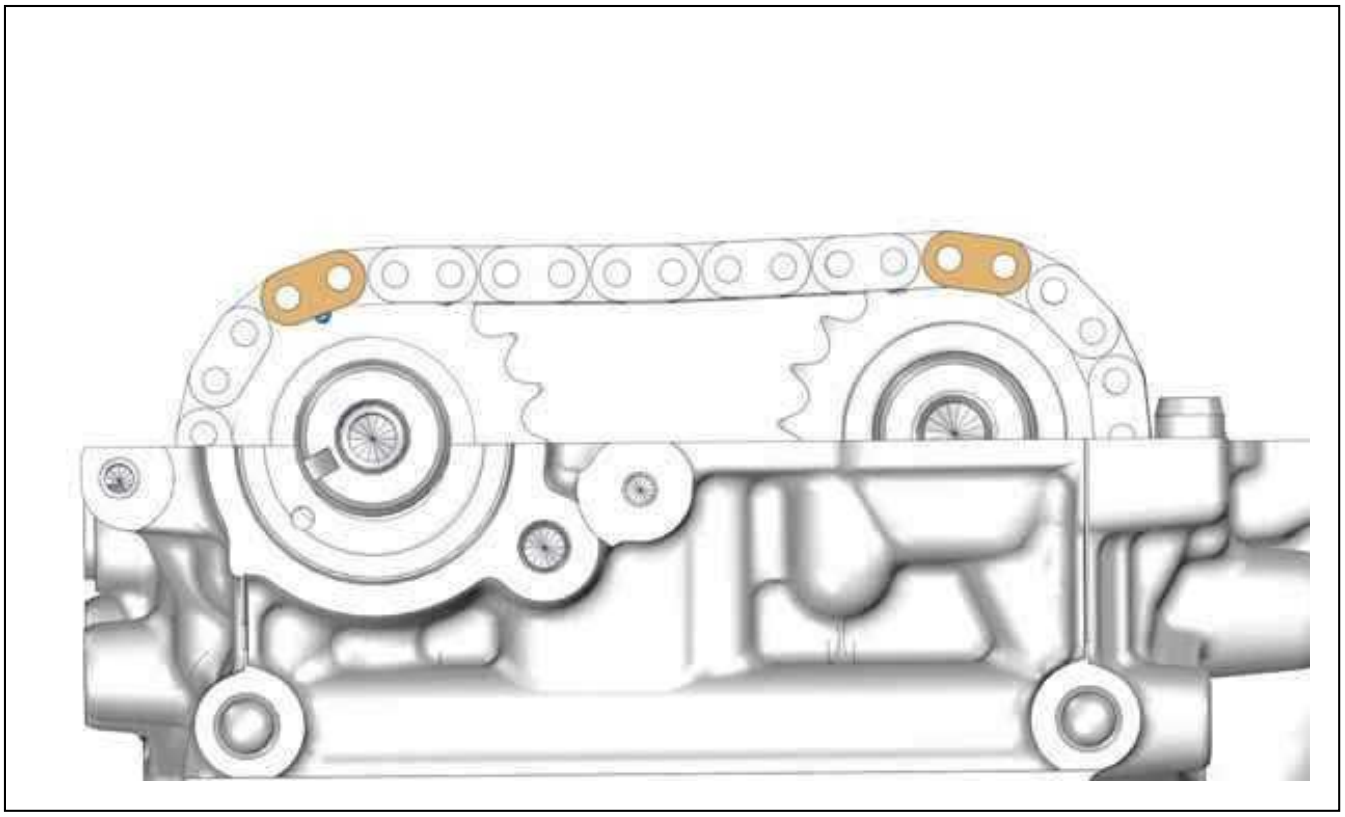


Figure : B1EG06XD

CAUTION : The brown links must be positioned as shown above.

CAUTION : Check that the timing chain is set correctly on the camshafts.

Fit :

- The camshaft and timing chain assembly
- The camshaft bearing cap cover (8)

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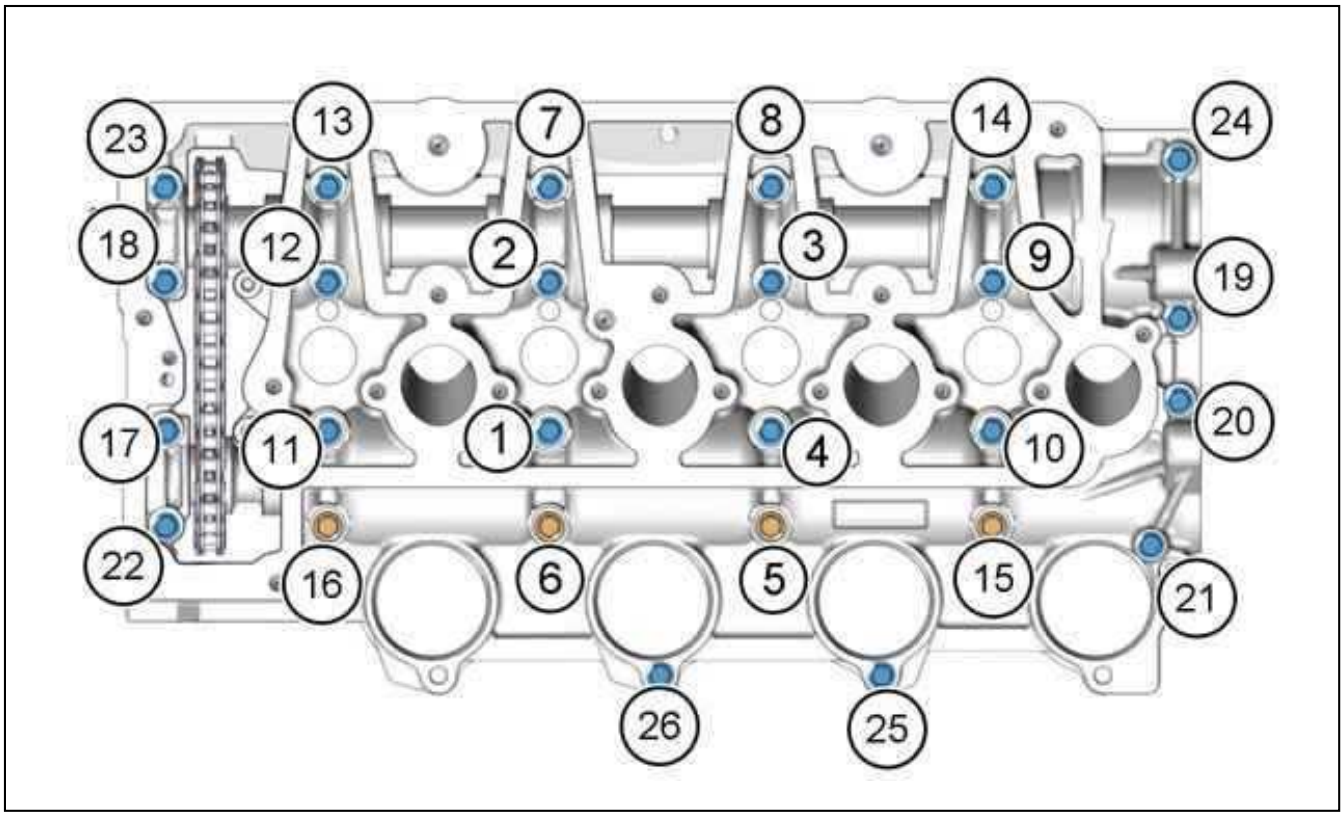


Figure : B1DG02LD

N.B. : The bolts for which the tightening sequence is (19), (20), (21), (24) are longer.

CAUTION : Pre-coat the bolts (7) with normal thread locking compound.

Refit the bolts (6), (7) - Follow the tightening sequence :

- Do up the bolts (In the order shown)
- Pre-tighten in the order indicated
- Tighten in the order indicated

Fit :

- The lifting plate (5)
- The timing chain (3) tensioner
- The bolts (4)

Remove the dynamic roller setting rod [0188-Q2].

Fit a new camshaft sealing ring .

Immobilise the camshaft pulley (2).

Fit :

- The camshaft pulley (2)
- The screw (1) and its washer ; Using tool [0132-AA]

Fit :

- The vacuum pump
- The air inlet manifold
- The diesel injectors
- The fuel high pressure injection common rail
- The fuel high pressure pump
- The timing belt

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CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Fit :

- The engine cover
- The passenger compartment air inlet manifold

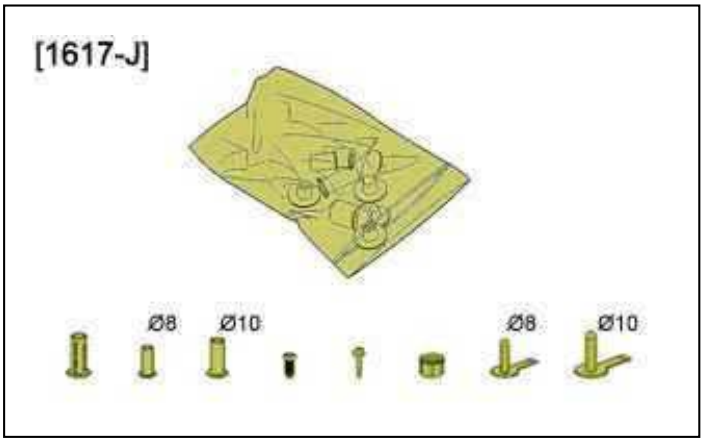
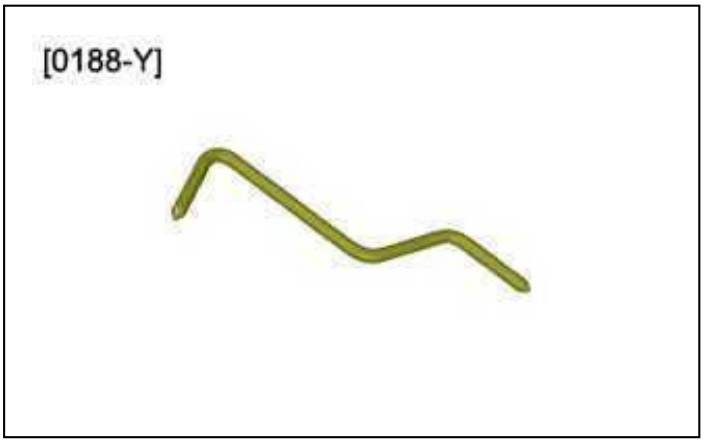
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CHECK : SETTING THE VALVE TIMING

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tools

Equipment : pipe spanner 13 mm.

tool	Reference	Designation
 Figure : E5AG03LT	[1617-J]	Set of plugs HDI
 Figure : E5AB0D0T	[0188-Y]	flywheel locking tool
	[0188-M]	Setting pin for camshaft pulley

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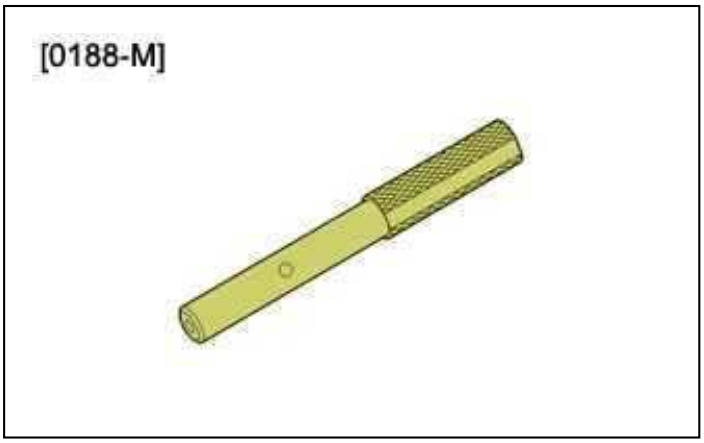


Figure : E5AB0D1T

2. Precautions to be taken

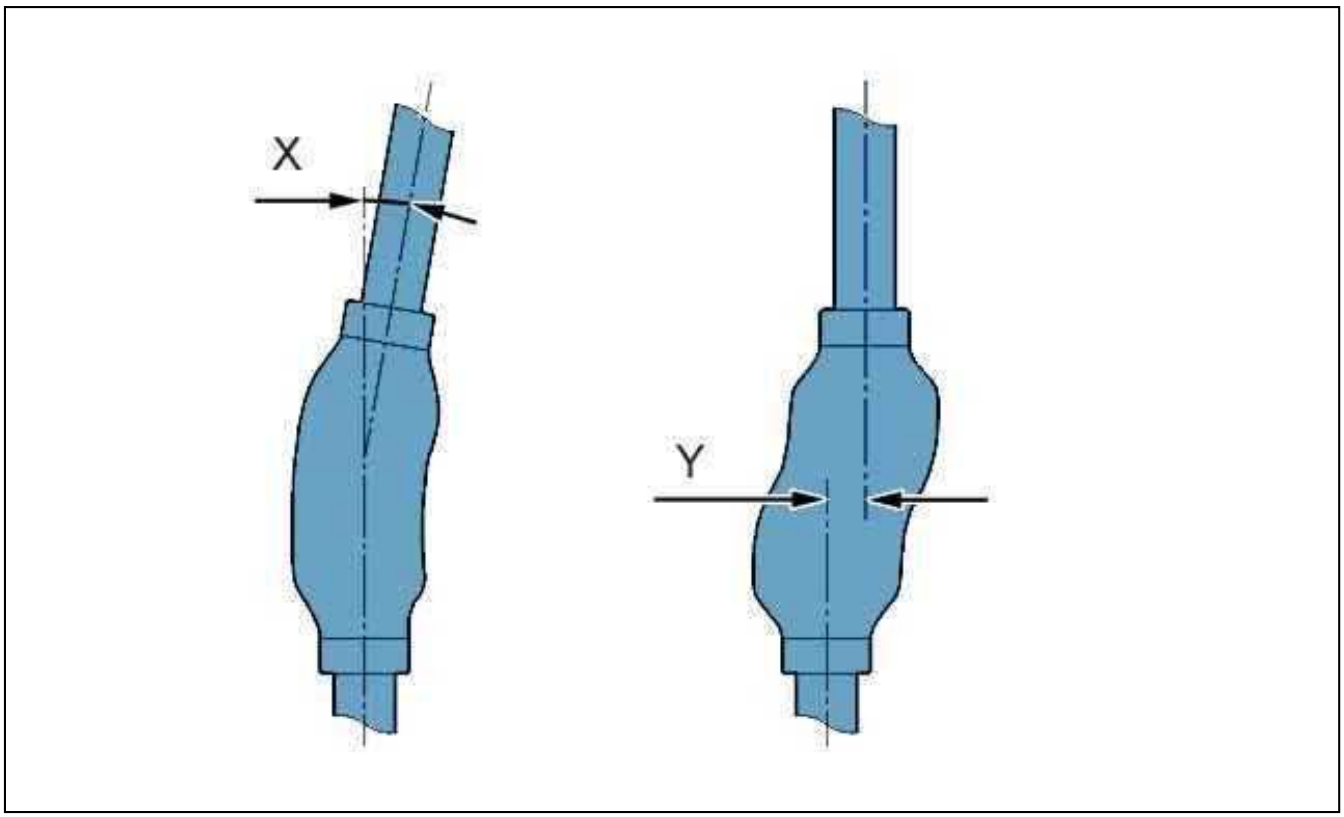


Figure : B1JP0FLD

Respect the precautions to be taken before repair :

- The front flexible pipe should be protected against any external mechanical interference
- The front flexible pipe should not come into contact with any corrosive products

CAUTION : Front flexible pipe removed : Do not deform the front flexible hose by more than 20° angular (X), 20 mm axial and 25 mm in shear (Y) ; Front flexible pipe in place : Do not deform the front flexible hose by more than 3° angular (X) , 0 mm axial and 3 mm in shear (Y).

CAUTION : Failure to observe these precautions results in a reduction of the service life of the front hose ; The

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uncoupling or removal of the exhaust line is essential for operations requiring lifting of the power train.

3. Preliminary operations

Put the vehicle on a hoist.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The protective panel under the engine
- The front right wheel
- The front right mud guard
- The accessories drive belt

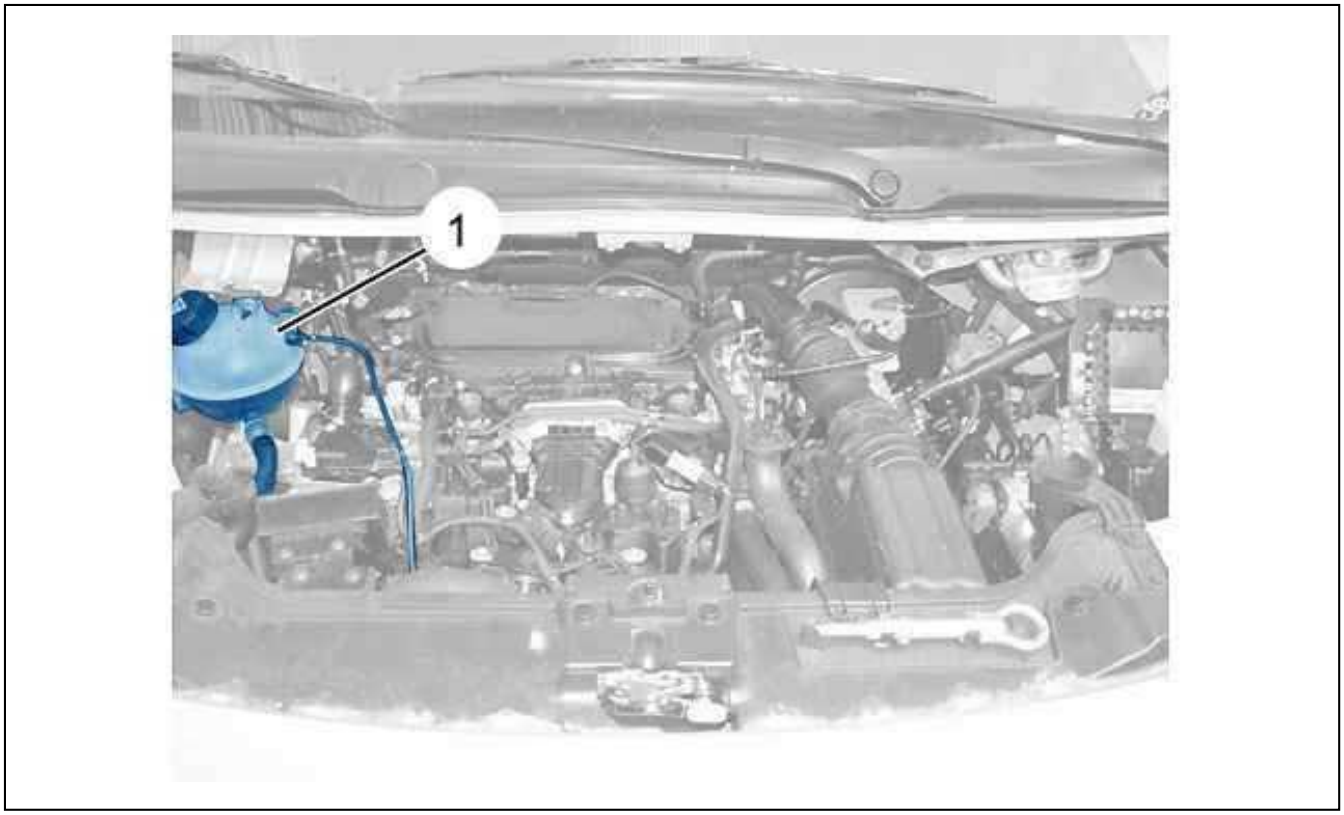


Figure : B1BG1KHD

Move aside and secure the expansion bottle (1) ; Without opening the cooling system.

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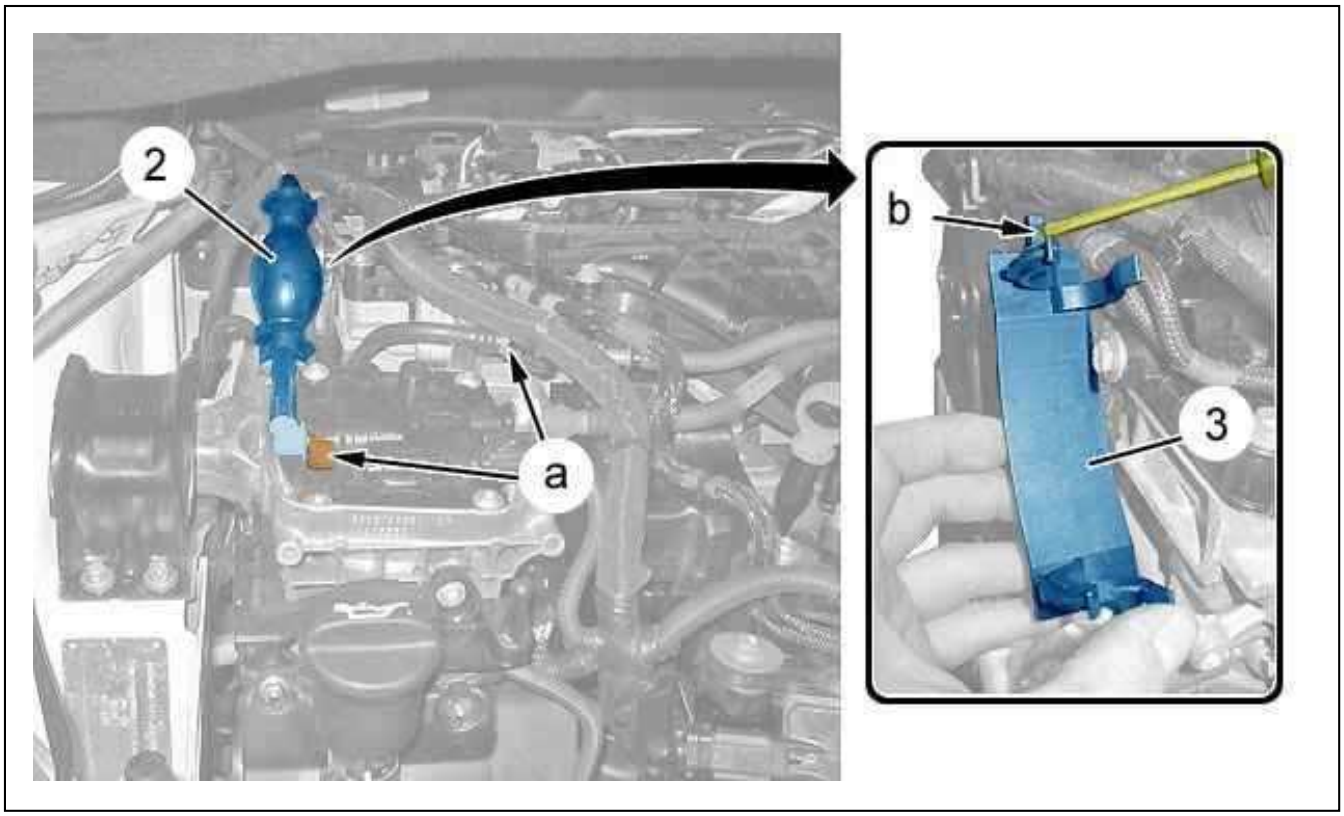


Figure : B1ED08UD

CAUTION : During removal : Plug the fuel low pressure supply pipes ; Using the plugs [1617-J].

Uncouple : The low pressure fuel unions (as "a").
Release : The manual diesel priming pump (2).
Remove : The bracket (3) for the diesel fuel manual priming pump (2) ; By means of a screwdriver (as "b").

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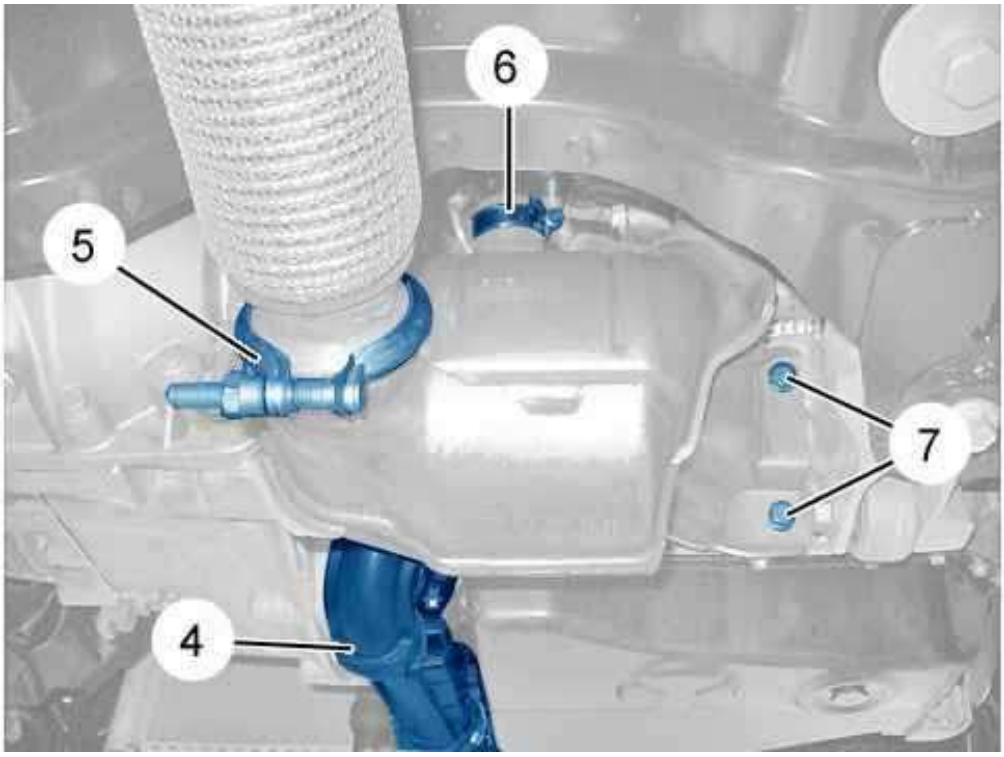


Figure : B1ED08VD

Remove :

- The clip (6) on the resonator (4)
- The fixings on the resonator (4)
- The exhaust clip (5)
- The bolts (7)

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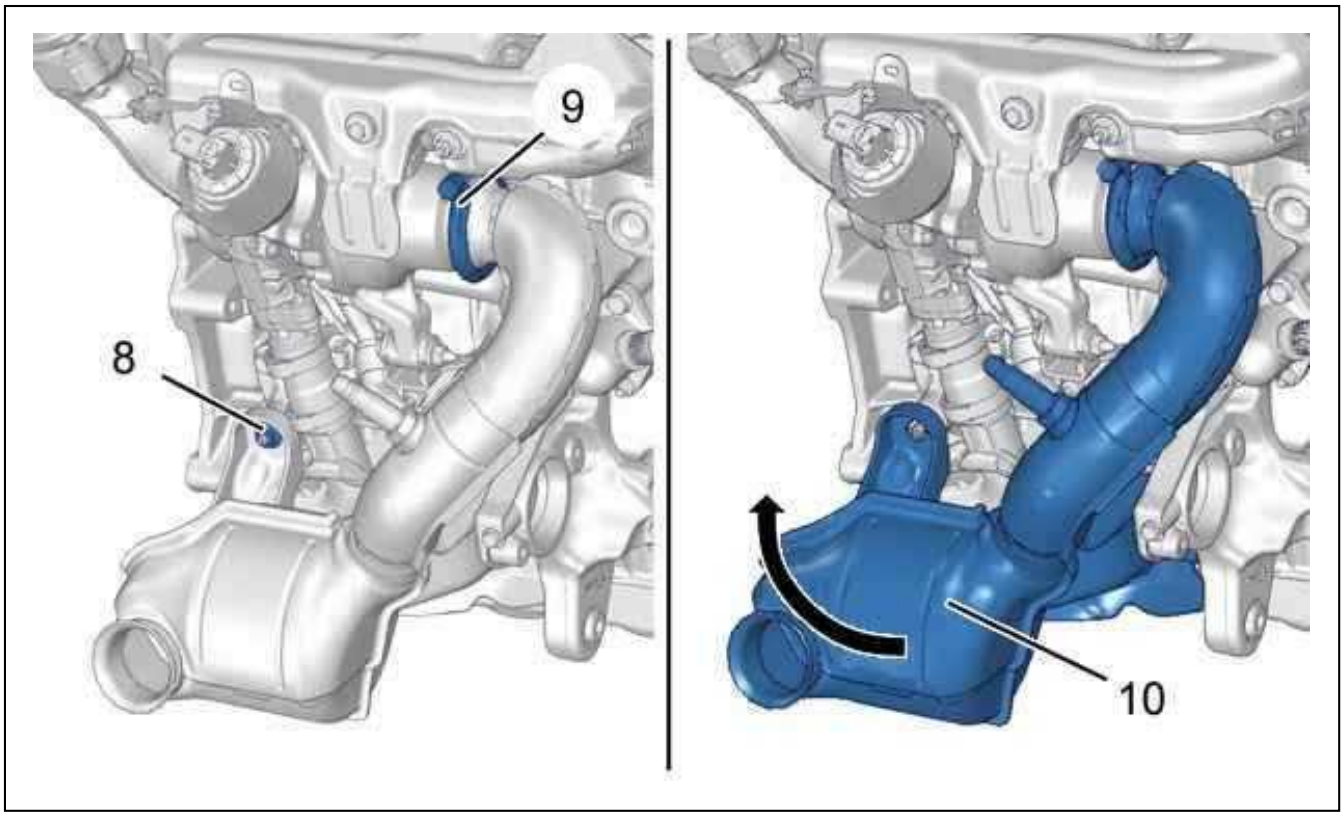


Figure : B1ED08WD

Remove the nut (8) ; Using a pipe spanner.
Slacken the self-slackening clip (9) by a few turns.
Pivot the precatalyst (10) (following the arrow).

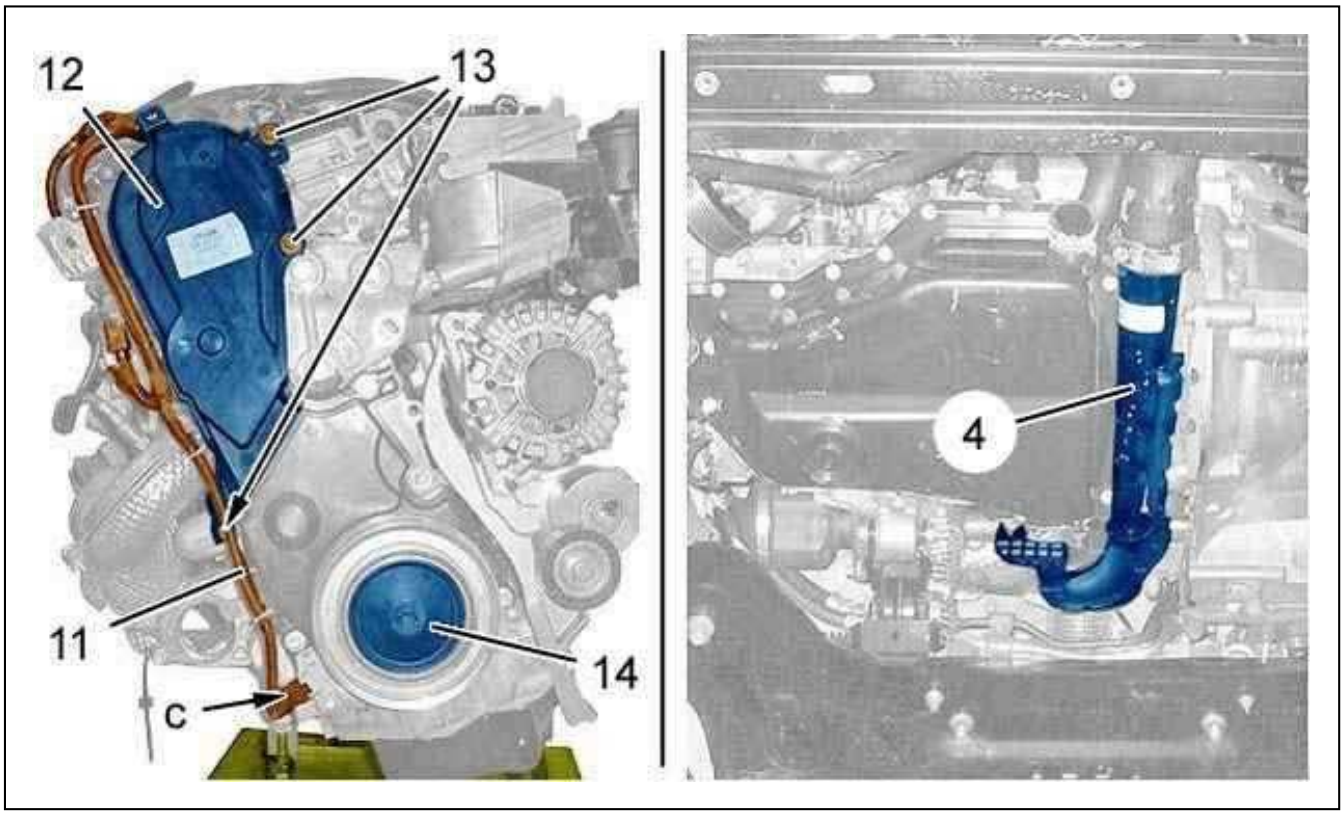


Figure : B1EG0LPD

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Remove the resonator (4).
Disconnect the engine speed sensor(as "c").
Release and move aside the electrical harness (11).
Remove :

- The pulley cover (14)
- The bolts (13)
- The top timing cover (12)

4. Check

4.1. timing belt

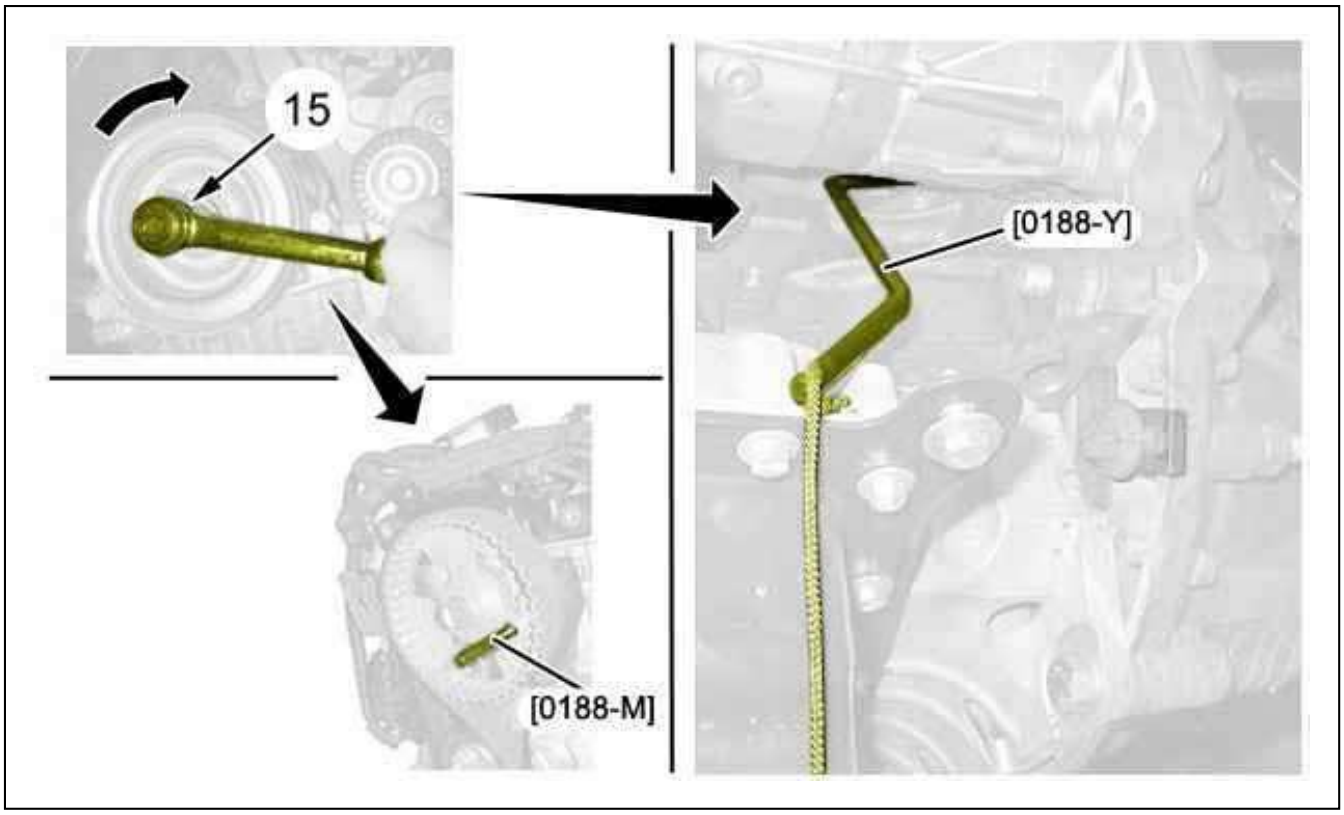


Figure : B1ED08XD

CAUTION : It is essential to rotate the engine by means of the bolt (15) and in the clockwise direction only.

Peg :

- The camshaft pulley ; Using tool [0188-M]
- The flywheel ; Using tool [0188-Y]

CAUTION : If it is impossible to peg the camshaft, check that the offset between the camshaft pulley hole and the pegging hole is not greater than 1 mm. When the offset is more than 1 mm, reset the timing.

Remove the tools [0188-Y], [0188-M].

4.2. Drive chain for camshafts

Remove the air inlet manifold .

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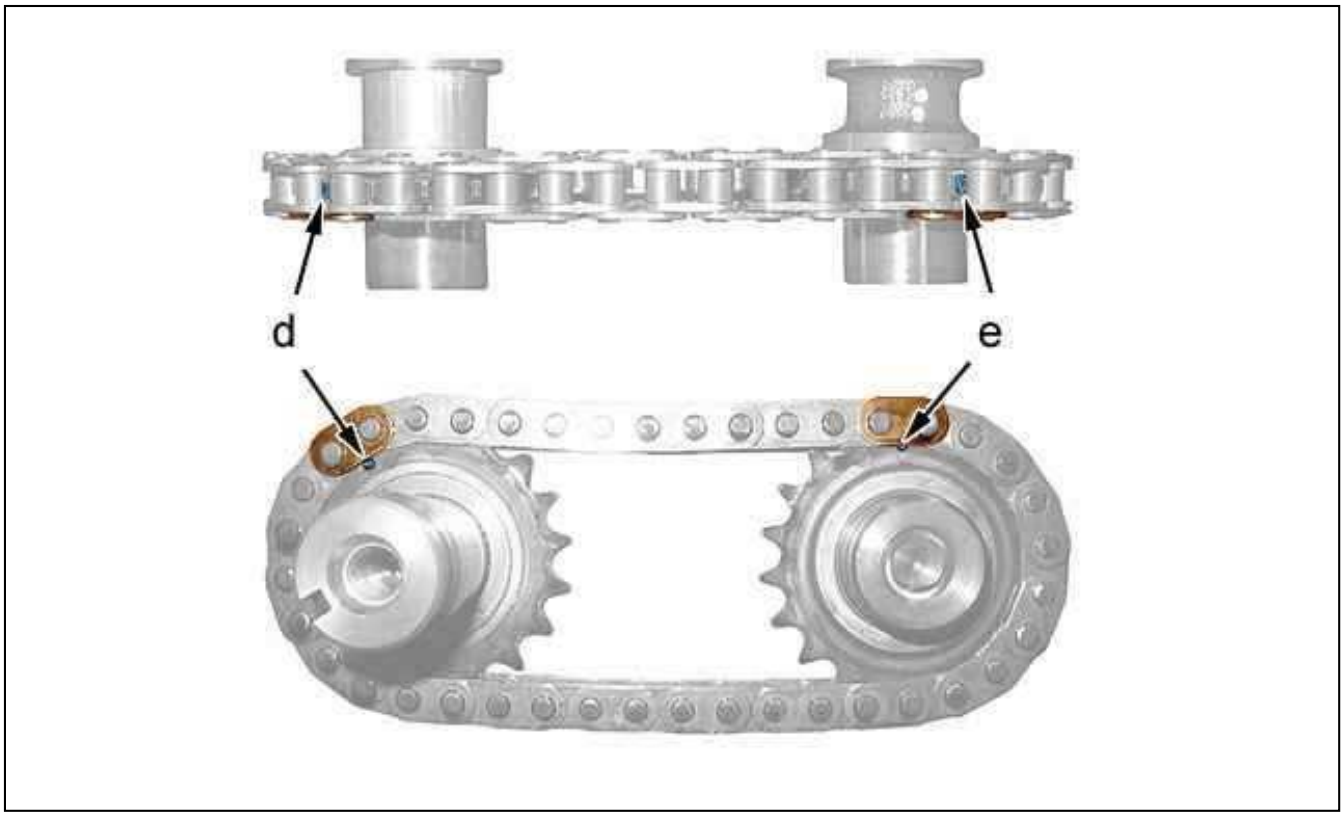


Figure : B1ED01ND

Turn the crankshaft in the normal direction of rotation (40 turns maximum) :

- Bring the brown link of the camshaft drive chain to the paint spot and to the paint mark on the exhaust camshaft (as "d")
- Bring the brown link of the camshaft drive chain to the paint spot and marking on the inlet camshaft (as "e")

CAUTION : If it is not possible to align the marks on the chain and the camshaft drive pinions, reset the camshaf timing.

The air inlet manifold .

5. Refitting

Refit the pulley cover (14) ; Using rubber lubricant (Refer to the products catalogue).

CAUTION : Check that the pulley cover (14) is correctly positioned by pulling moderately on the nipple.

Refit :

- The top timing cover (12)
- The bolts (13)

Clip the electrical harness (11).
Connect the engine speed sensor (as "c").
Refit :

- The resonator (4)
- The pre-catalytic converter (10)
- The nut (8) ; Without tightening it
- The bolts (7) ; Without tightening it

Tighten in the sequence :

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- The self-slackening clip (9)
- The nut (8) ; Using a pipe spanner (13 mm)
- The bolts (7)

Refit :

- The exhaust clip (5)
- The fixings on the resonator (4)
- The clip (6) on the resonator (4)
- The bracket (3) for the diesel fuel manual priming pump (2) ; By means of a screwdriver (as "b")
- The manual diesel priming pump (2)

Remove the plugs [1617-J].
Connect up all the low pressure fuel supply unions(as "a").
Refit :

- The expansion chamber (1) ; Without opening the cooling system
- The accessories drive belt
- The front right mud guard
- The front right wheel
- The protective panel under the engine

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

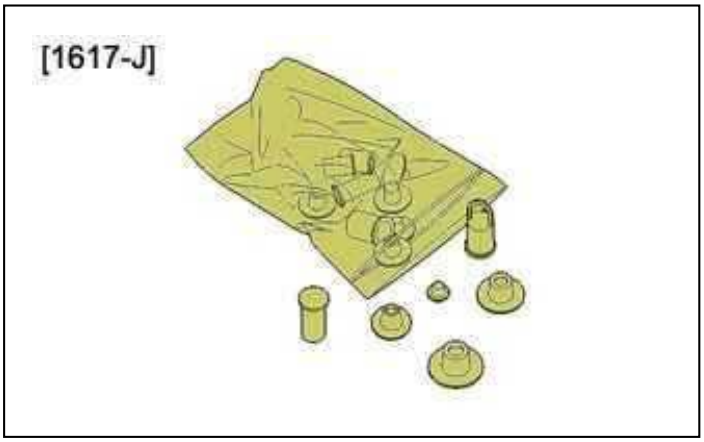
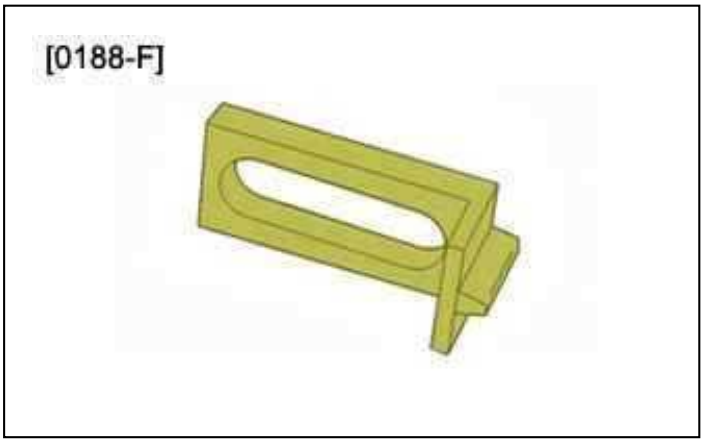
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REMOVING - REFITTING : TIMING BELT

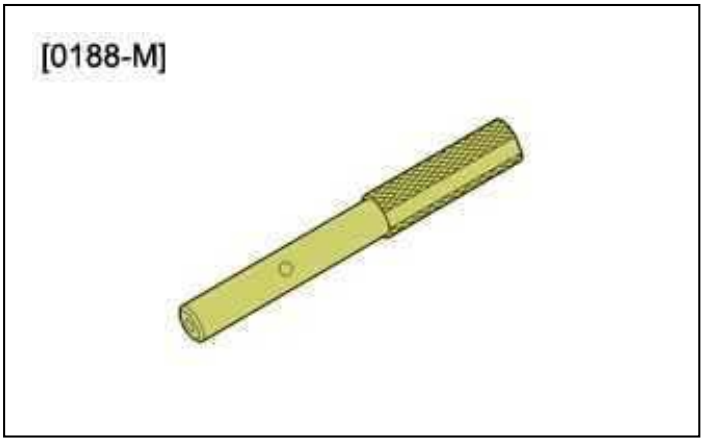
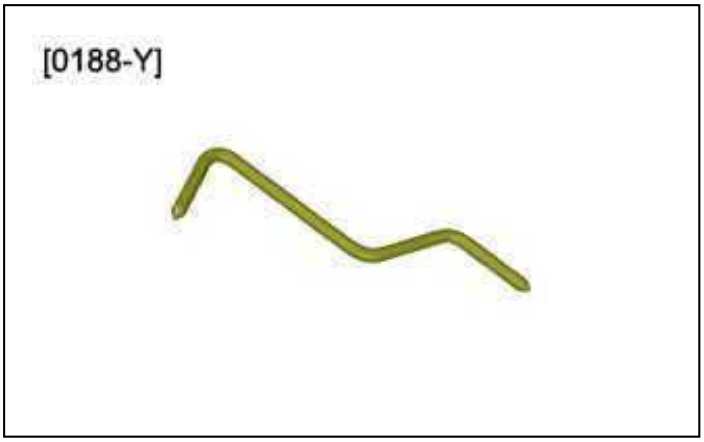
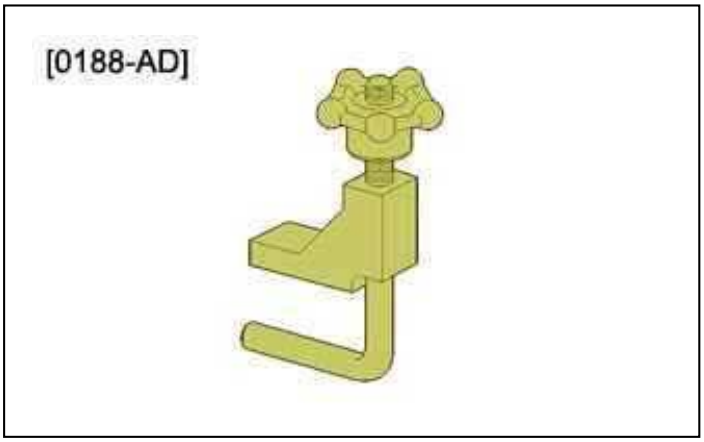
ESSENTIAL : Observe the safety and cleanliness instructions .

1. Tooling

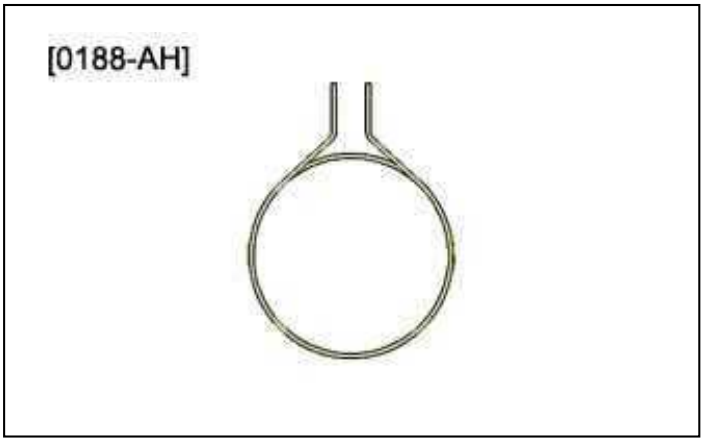
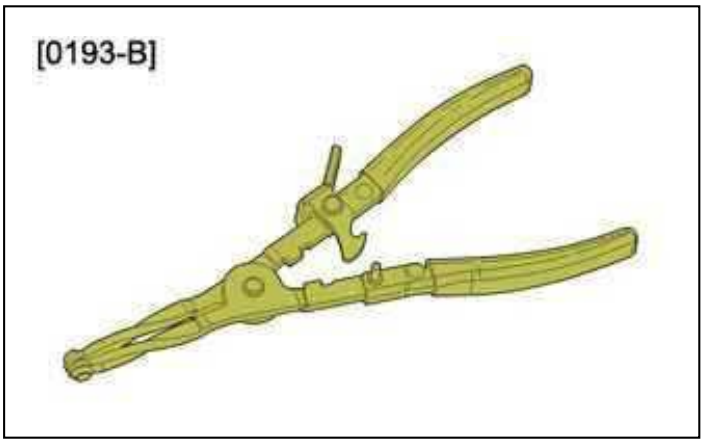
Equipment : 13 mm pipe spanner .

Tool	Reference	Description
 Figure : E5AB0FMT	[1617-J]	Set of plugs HDI
 Figure : E5AB0DRT	[0188-F]	Flywheel stop
	[0188-M]	Peg for setting camshaft pulley

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 Figure : E5AB0FOT		
 Figure : E5AB0D0T	[0188-Y]	Flywheel setting peg
 Figure : E5AB0FQT	[0188-AD]	Belt clamp
	[0188-AH]	Pulley centring device

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 Figure : E5AB0FRT		
 Figure : E5AG06ZT	[0193-B]	Pliers for removing exhaust clips

2. Precautions to be taken

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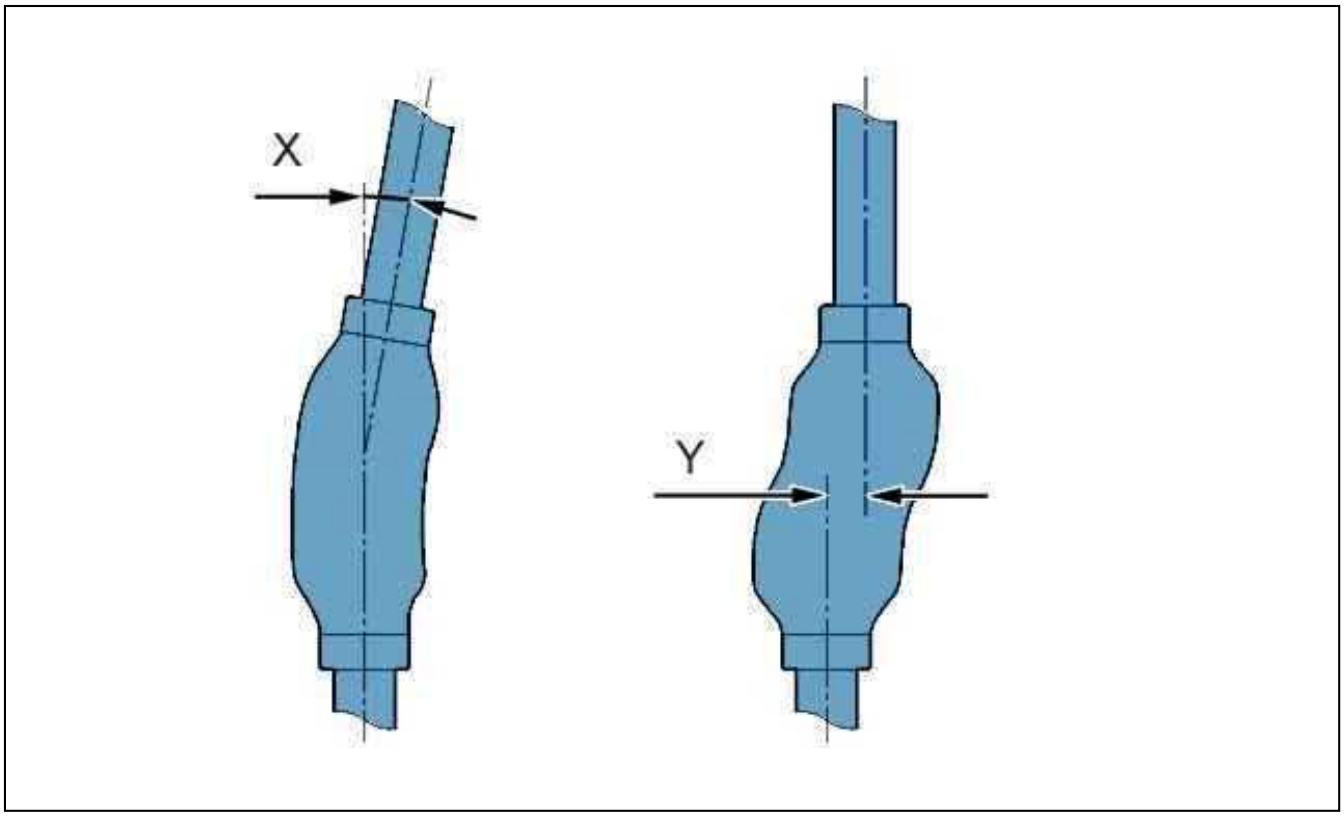


Figure : B1JP0FLD

Respect the precautions to be taken before repair :

- The front flexible pipe should be protected against any external mechanical interference
- The front flexible pipe should not come into contact with any corrosive products

CAUTION : Front flexible pipe removed : Do not deform the front flexible hose by more than 20° angular (X), 20 mm axial and 25 mm in shear (Y) ; Front hose in place : Do not deform the front flexible hose by more than 3° angular (X) 0 mm axial and 3 mm in shear (Y).

CAUTION : Non-respect of these precautions will reduce the life of the front flexible pipe ; It is essential either to disconnect or to remove the exhaust line in any operations that require the power unit to be lifted.

3. Removing

Place the vehicle on a lift.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The protective plate under the engine
- The RH front road wheel
- The RH front splash shield
- The ancillary drive belt

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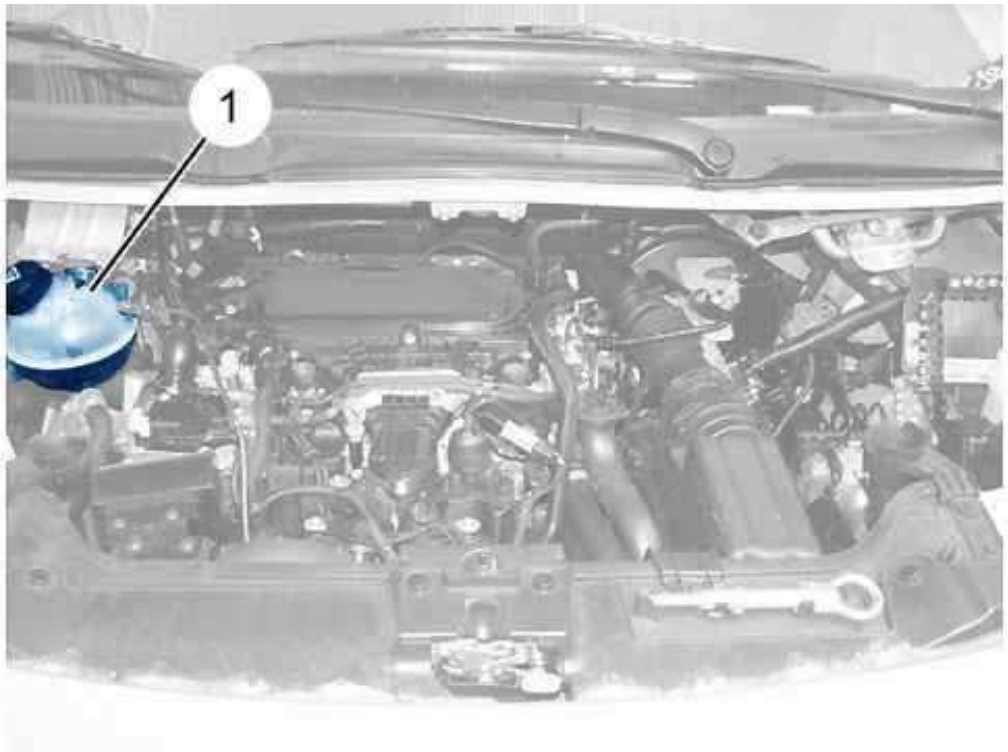


Figure : B1BG1LZD

Move aside and clamp : The expansion bottle (1) ; Without opening the cooling system.

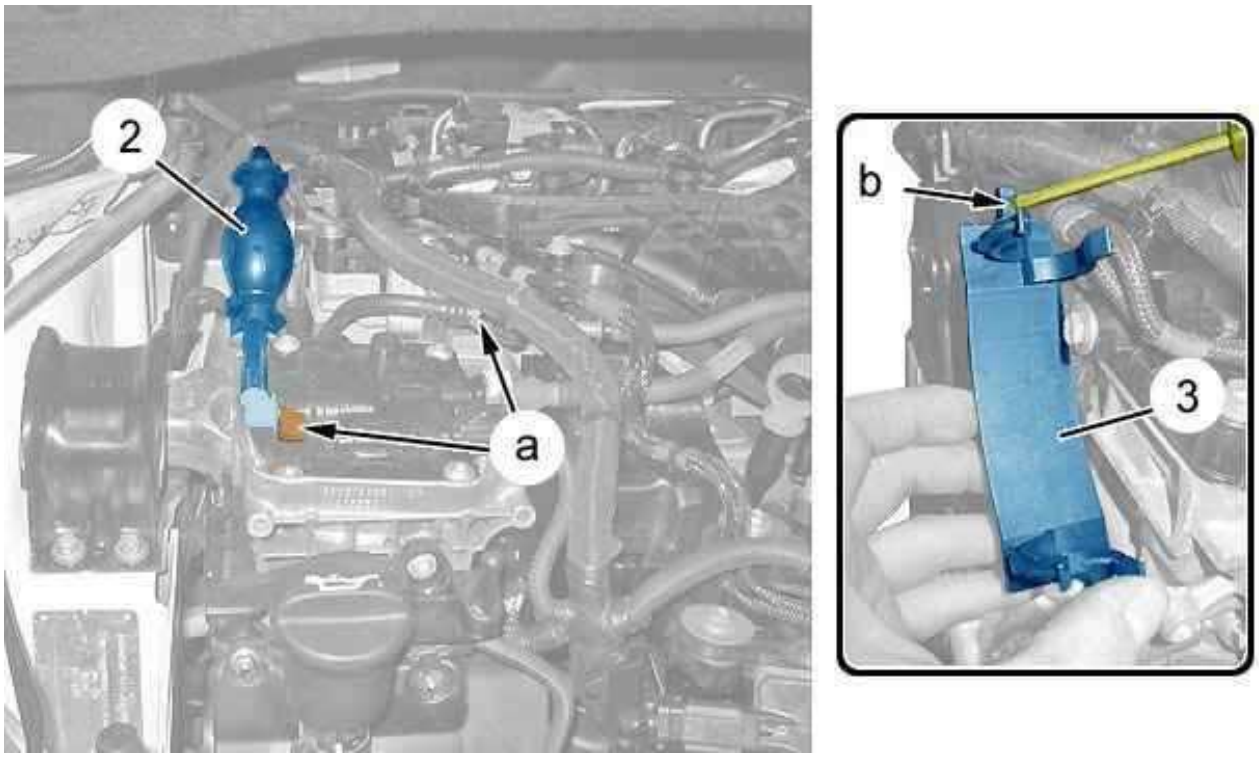


Figure : B1EG0LXD

CAUTION : During removal : Plug the fuel low pressure supply pipes ; Using the plugs [1617-J].

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Uncouple : The low pressure fuel unions (at "a").
Unclip and move aside the manual priming pump (2).
Remove : The bracket (3) for the diesel fuel manual priming pump (2) ; By means of a screwdriver (at "b").

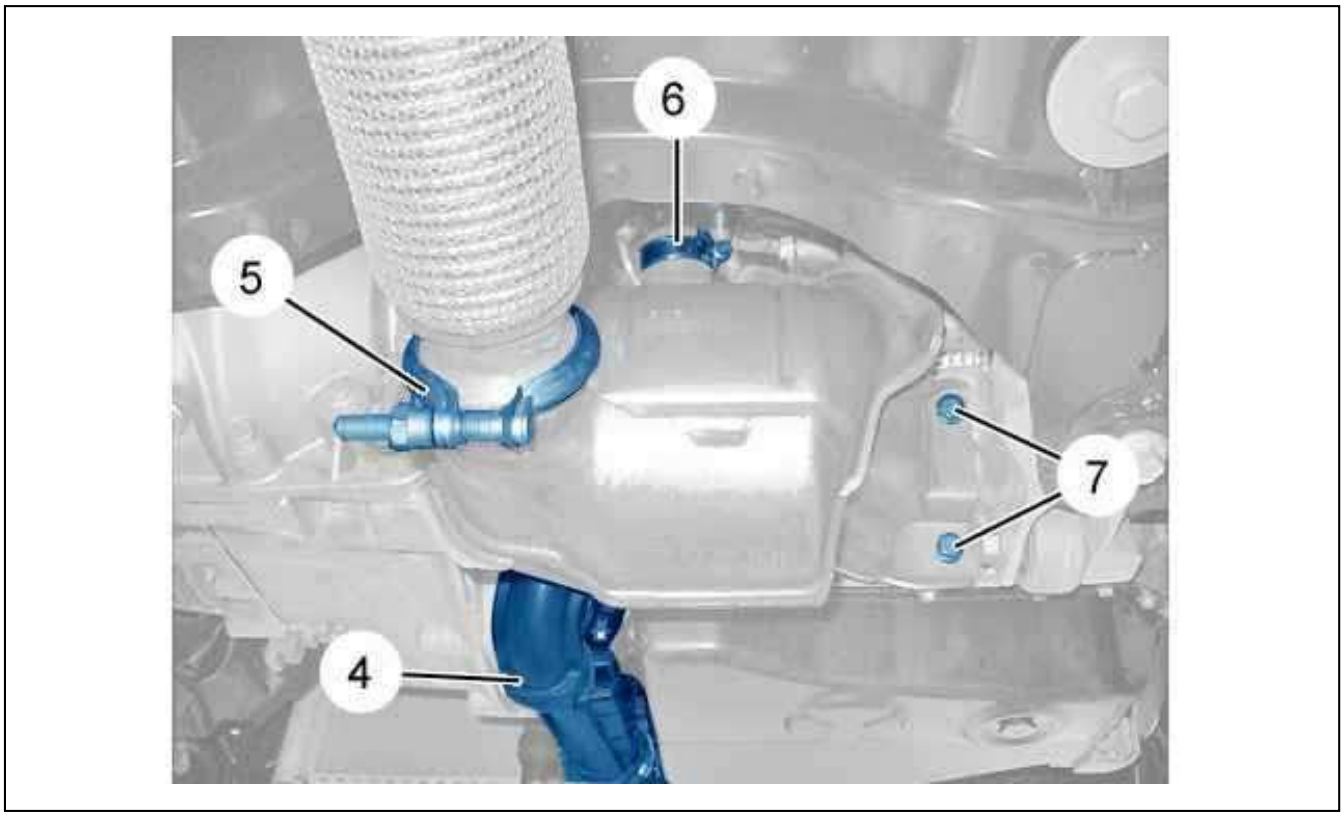


Figure : B1EG0LYD

Remove :

- The clip (6) on the resonator (4)
- The fixings on the resonator (4)
- The exhaust clip (5) ; Using tool [0193-B]
- The bolts (7)

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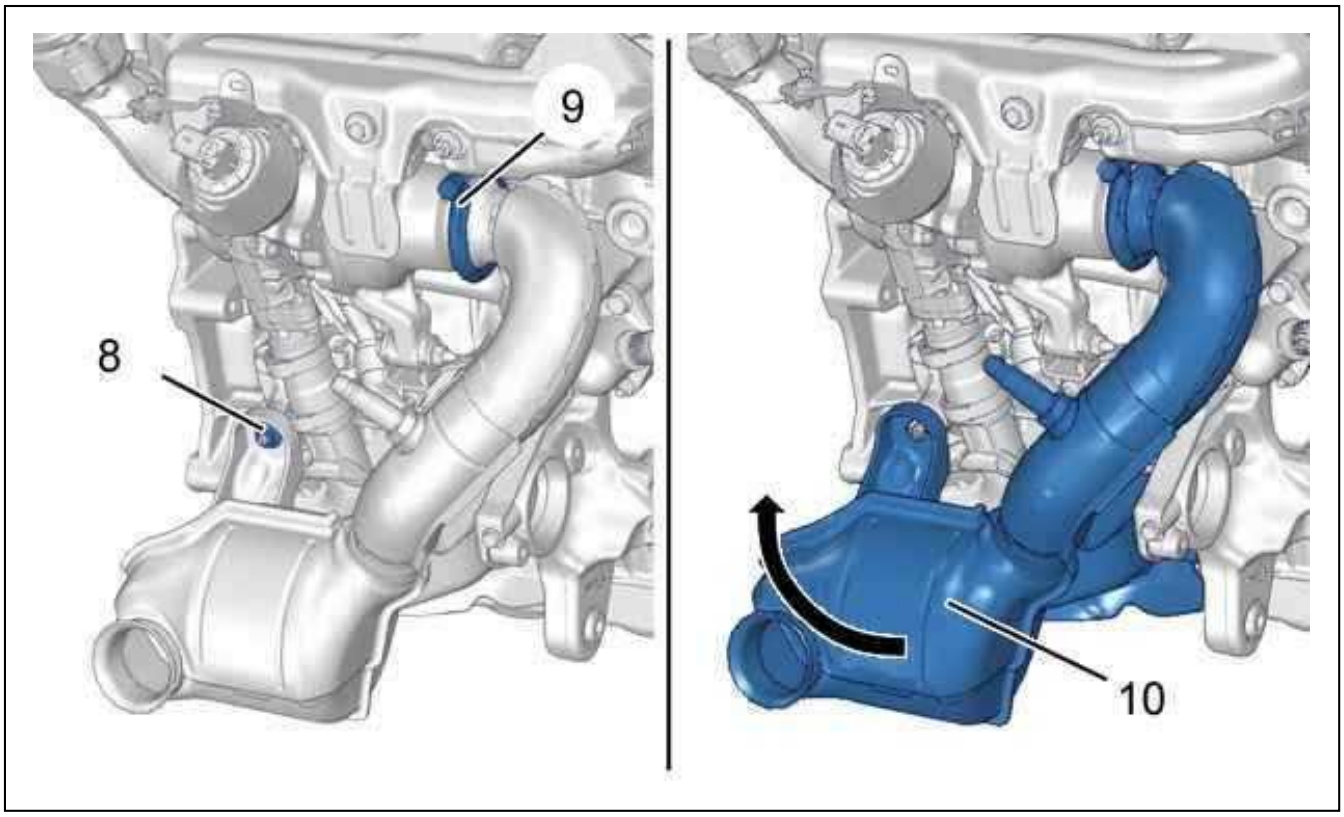


Figure : B1EG0LZD

Remove the nut (8) ; Using a pipe wrench 13 mm.
Slacken the self-slackening clip (9) by a few turns.
Pivot the pre-catalyser (10) (Following the arrow).

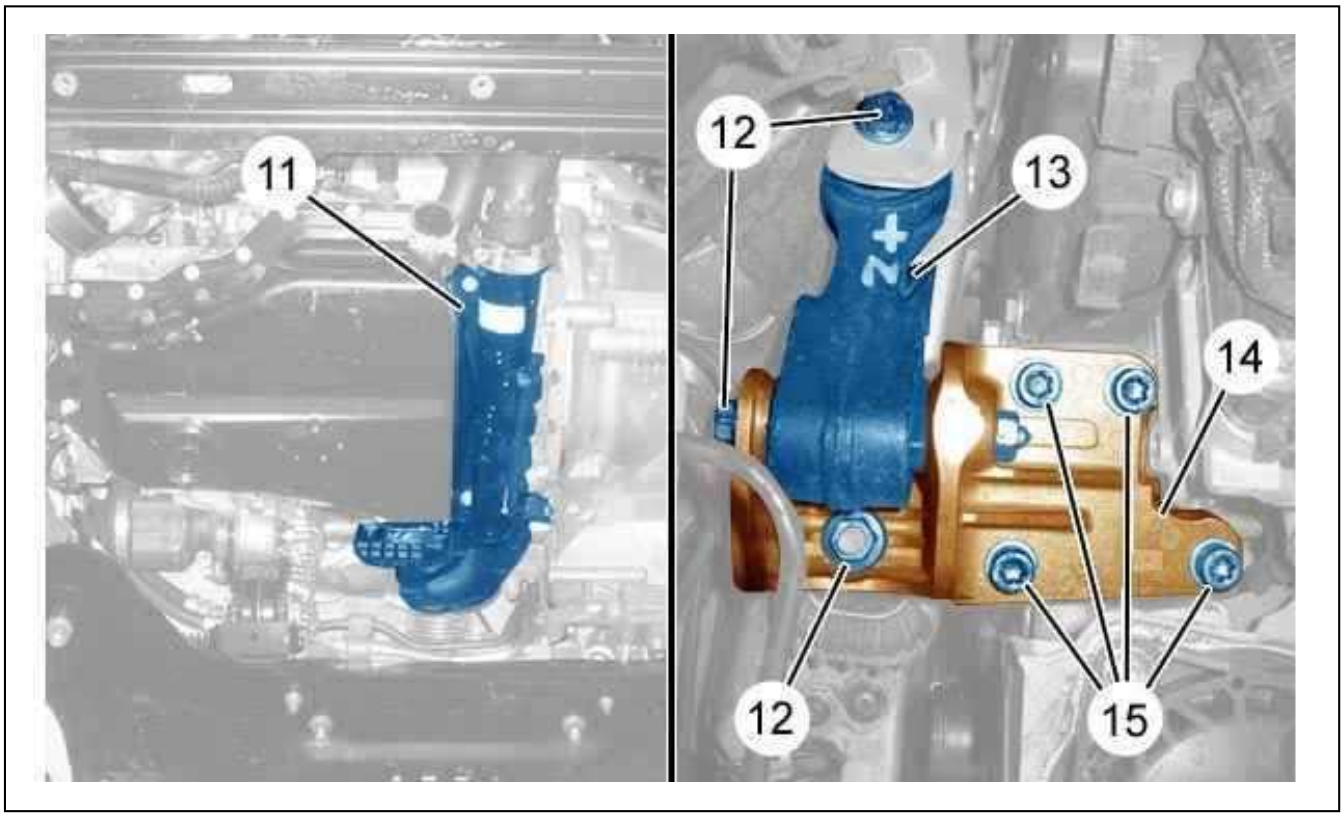


Figure : B1EG0M0D

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Remove the resonator (11).

CAUTION : Use a rubber shim of sufficient surface area to avoid distorting the engine oil sump : Risk of obstruction o the oil pump suction strainer.

Immobilise the engine (timing side) ; Using a jack and a flexible shim .
Remove :

- Fixings (12)
- The bolts (15)
- The engine brackets (13), (14)

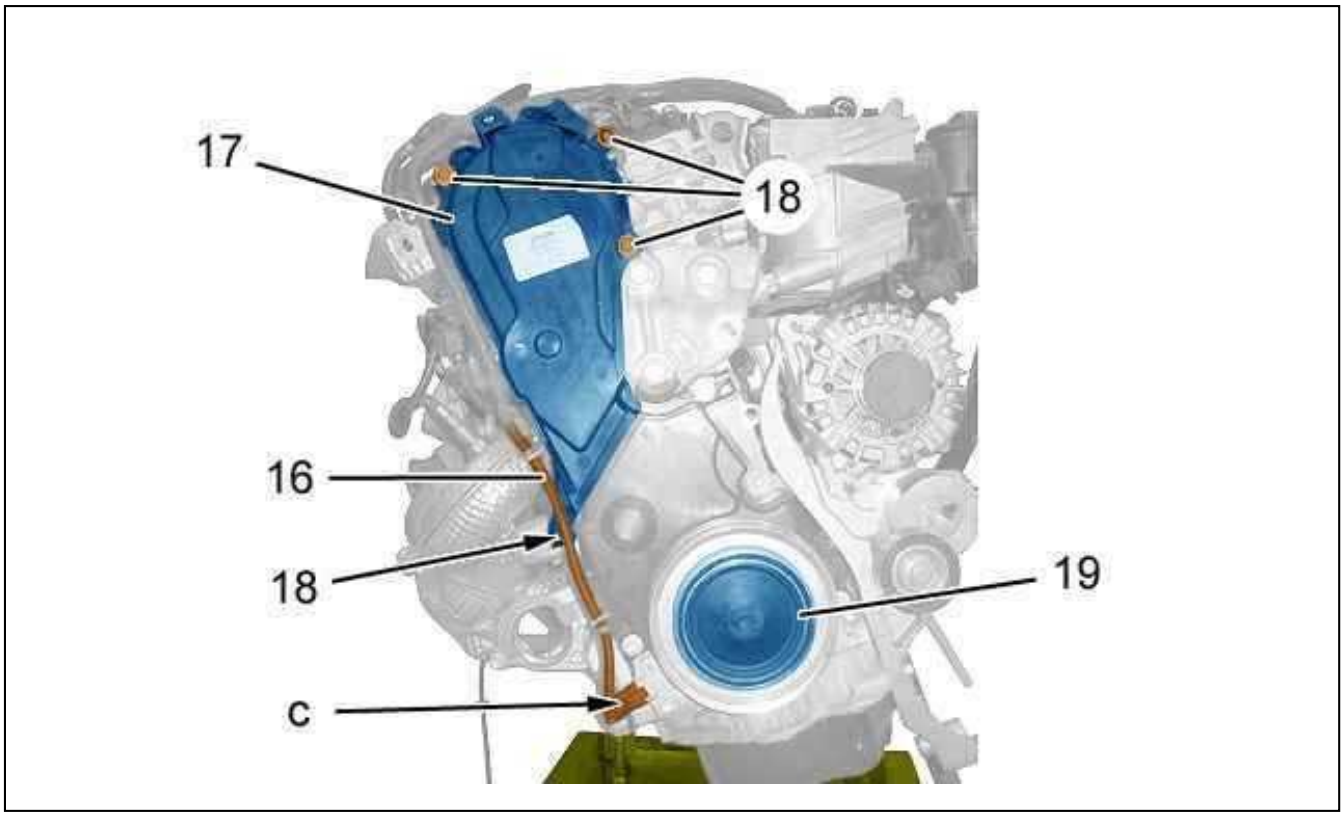


Figure : B1BG1M0D

Disconnect the connector of the engine speed sensor (at "c").
Release and move aside the electrical harness (16).
Remove :

- The pulley cover (19)
- The bolts (18)
- Upper timing cover (17)

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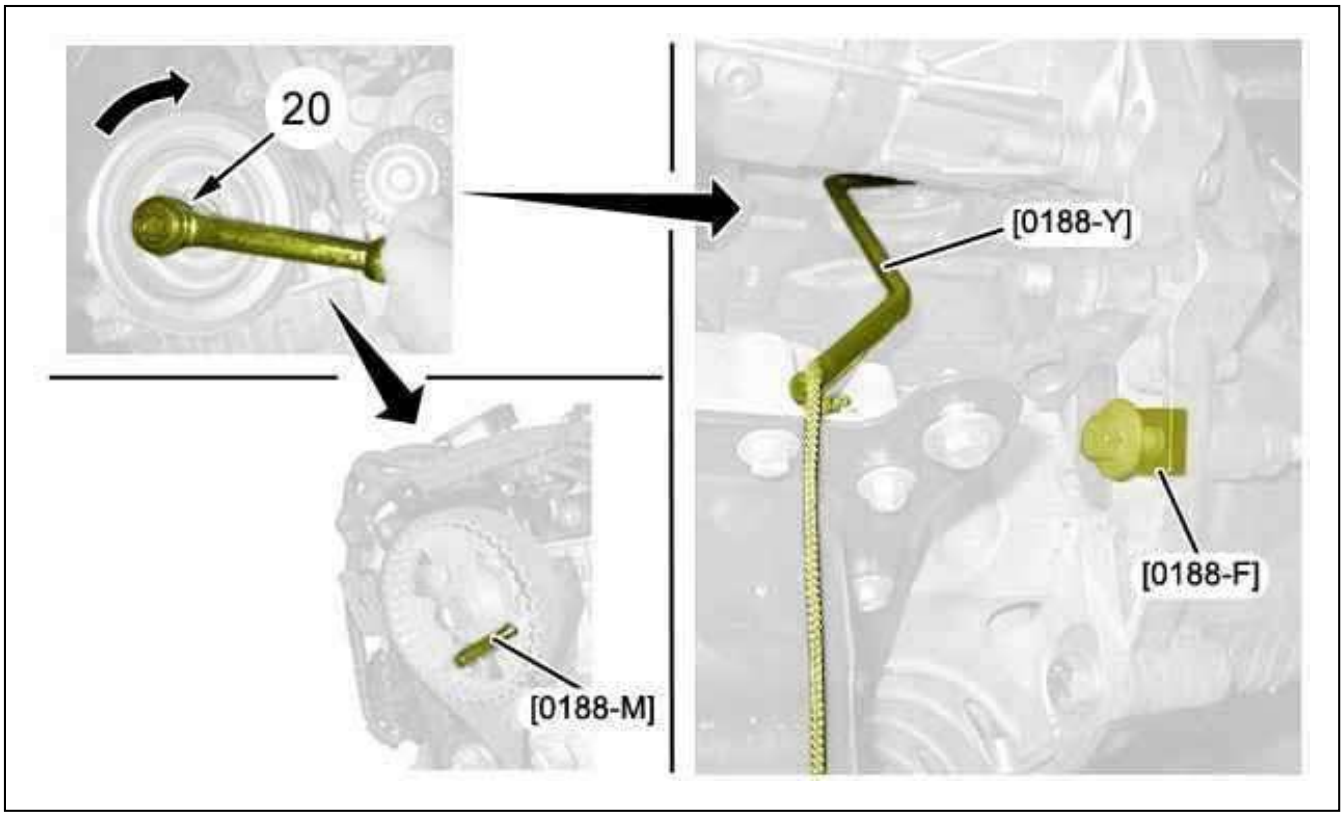


Figure : B1EG0M1D

CAUTION : It is essential to rotate the engine by means of the bolt (20) and in the clockwise direction only.

Peg :

- The camshaft pulley ; Using tool [0188-M]
- The flywheel ; Using tool [0188-Y]

Lock the flywheel using the retainer [0188-F].

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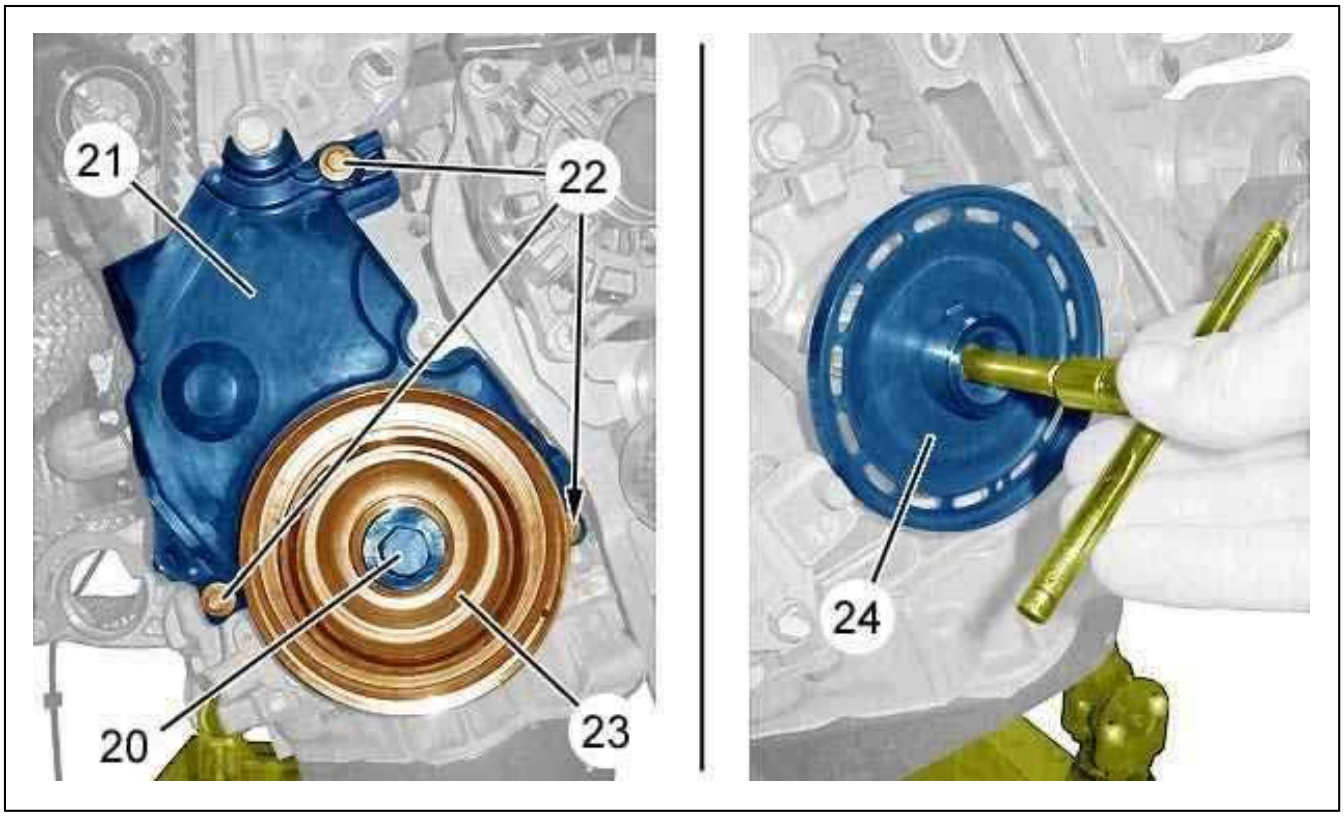


Figure : B1EG0M2D

CAUTION : The engine speed sensor target (24) must not show any sign of damage and must not be approached by any source of magnetism.

CAUTION : Use of an impact wrench is prohibited : Risk of the bolt (20) breaking in the crankshaft (Consult the evolution bulletin for removing the bolt).

Remove :

- The bolt (20) and its spacer
- Crankshaft pulley (23)
- The engine speed sensor target (24)
- The 3 bolts (22)
- The timing cover (21)

Clean the crankshaft thread with a M14x150 thread cutter.

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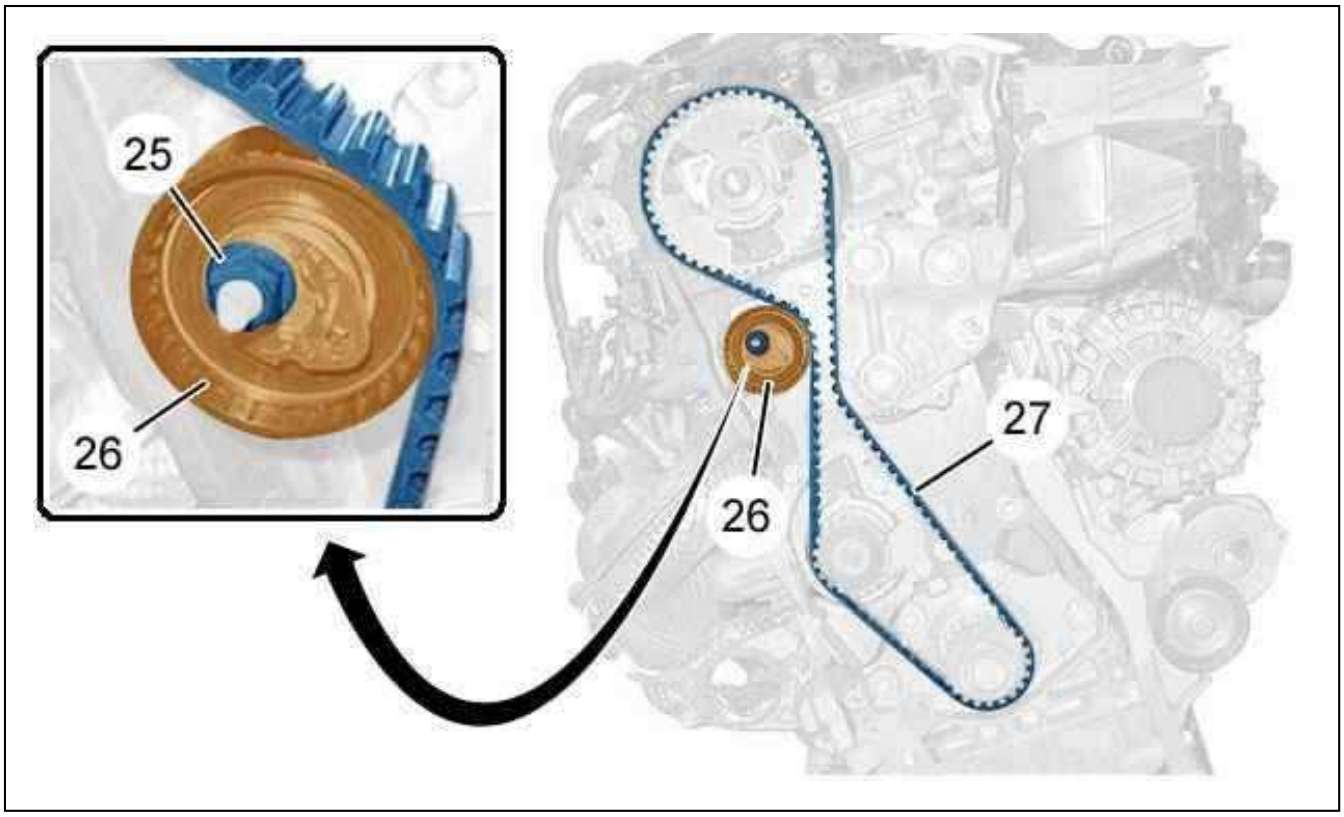


Figure : B1EG0M3D

Unscrew nut (25).
Slacken the tensioning roller (26).
Remove the timing belt (27).

4. Verification

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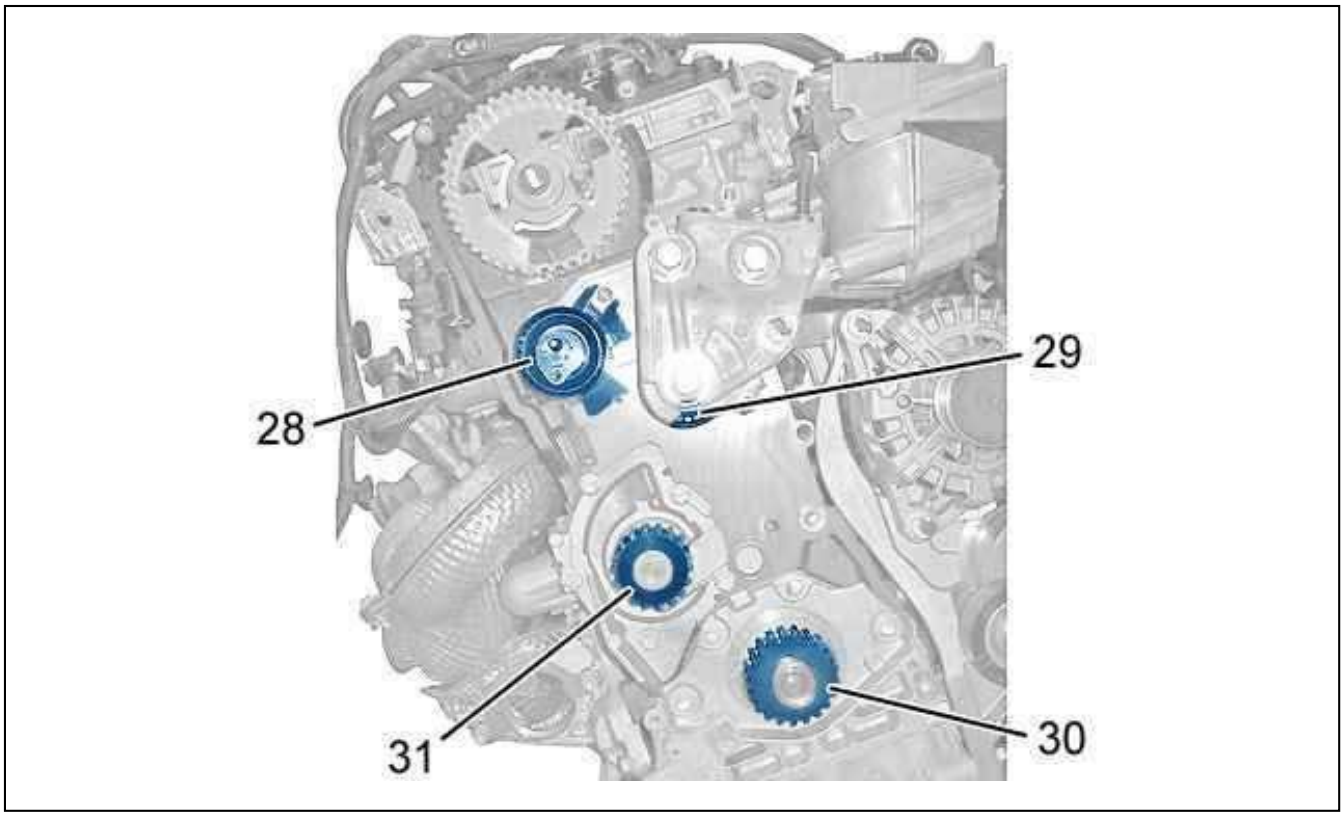


Figure : B1EG0M4D

Check that the following components rotate freely (Absence of play and points of resistance) :

- Dynamic roller tensioner (28)
- The guide roller (29)
- Crankshaft pulley (30) on keyways
- Water pump pulley (31)

Visually check :

- That there is no trace of an oil leak
- That there are no coolant leaks
- That there is no rubbing on the timing covers

CAUTION : Replace any defective parts.

5. Dynamic roller tensioner

CAUTION : The operations for replacing and adjusting the tension of the dynamic tensioner roller (28) are performed with the aid of a mirror.

5.1. Replacement

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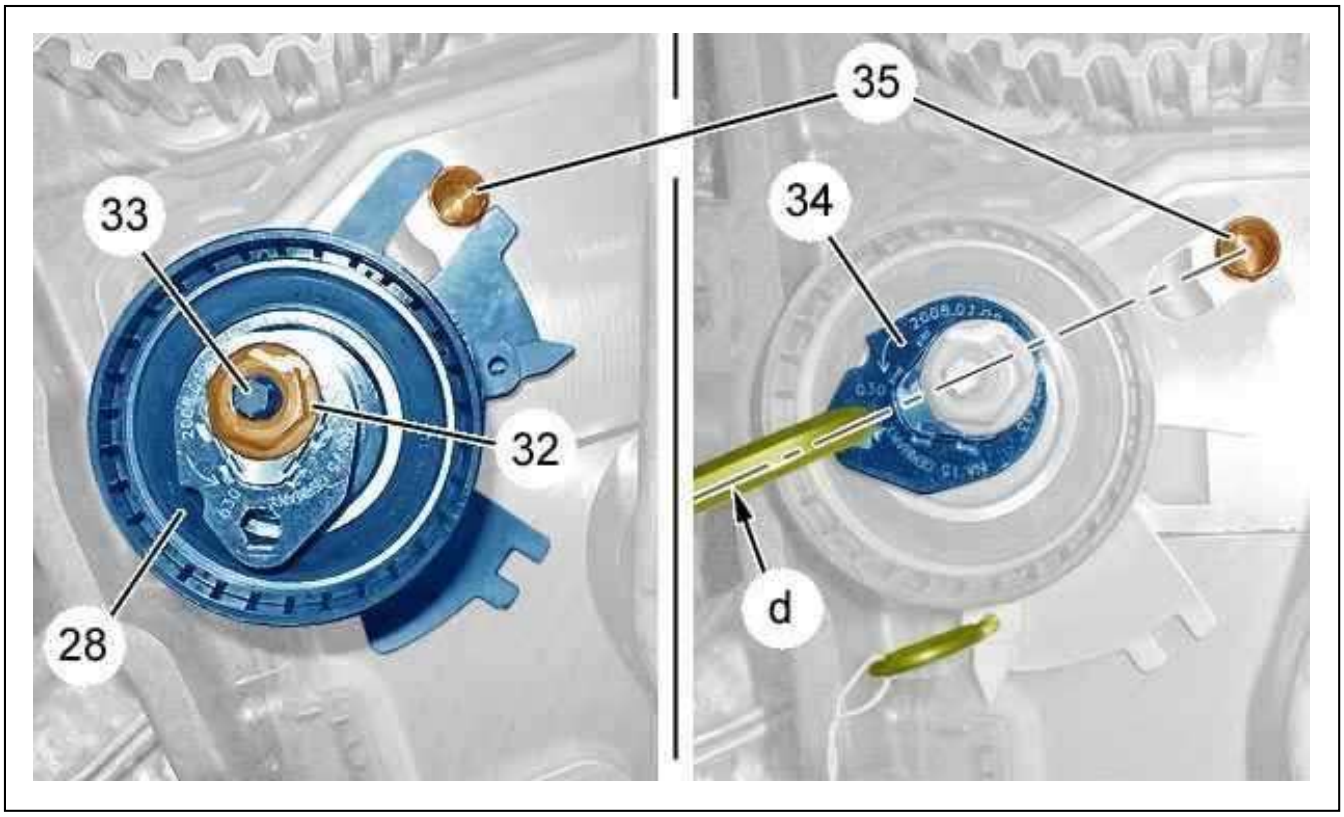


Figure : B1EG0M5D

CAUTION : Do not release the new dynamic tensioner roller (28) without having refitted the timing belt (27).

Remove :

- The nut (32)
- The stud (33)
- The dynamic roller tensioner (28)

CAUTION : The dynamic tensioner roller (28) should be secured in the cylindrical pin (35).

Fit :

- The dynamic roller tensioner (28) (new) (Locked)
- The stud (33)
- The nut (32) ; Hand-tighten
- Align the eccentric (34) on the axis "d" ; Using a hexagonal spanner

5.2. If re-used

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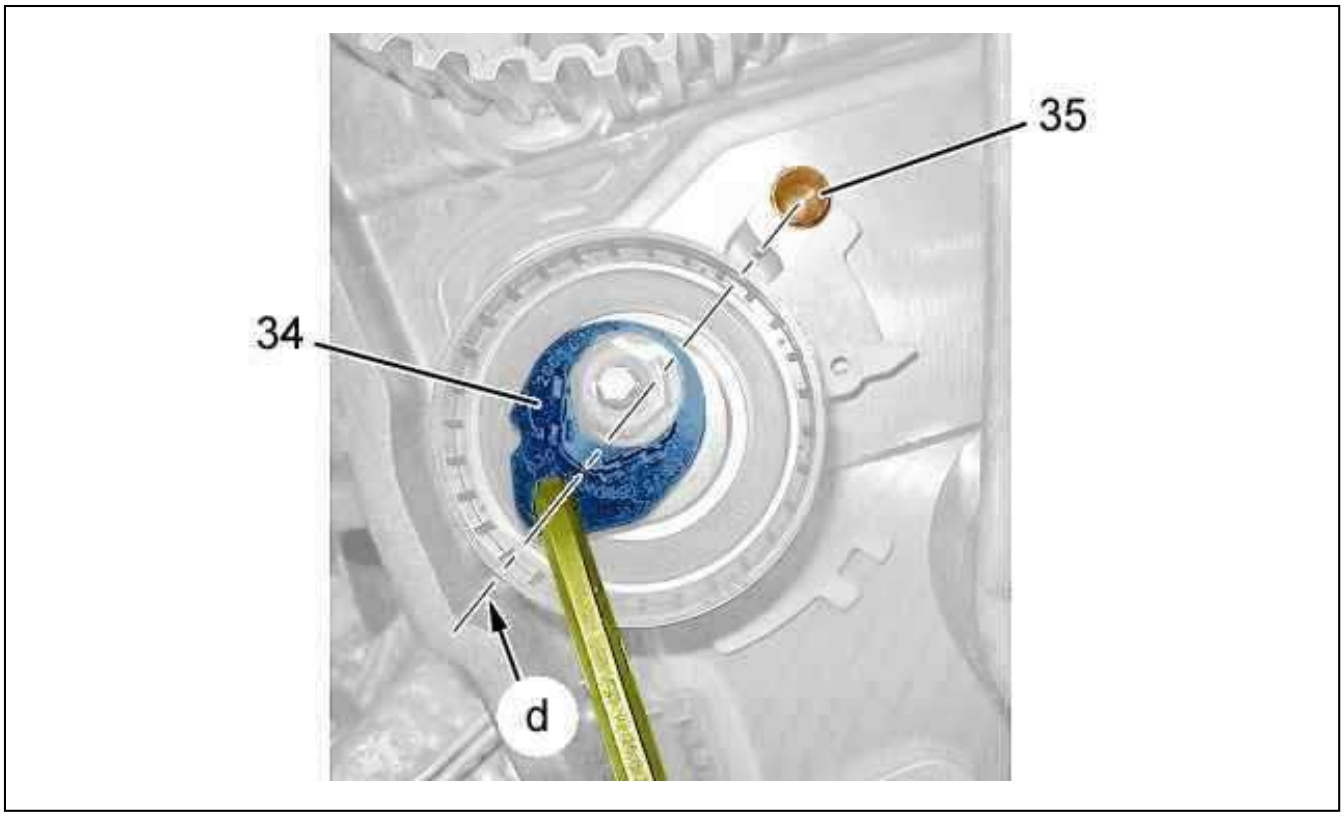


Figure : B1EG0M6D

CAUTION : The dynamic tensioner roller (28) should be secured in the cylindrical pin (35).

Align the eccentric (34) on the axis (at "d") ; Using a hexagonal spanner.

6. Refitting

CAUTION : Observe the tightening torque values.

Tightening torques :

- Engine
- Exhaust

6.1. Pre-tightening the belt

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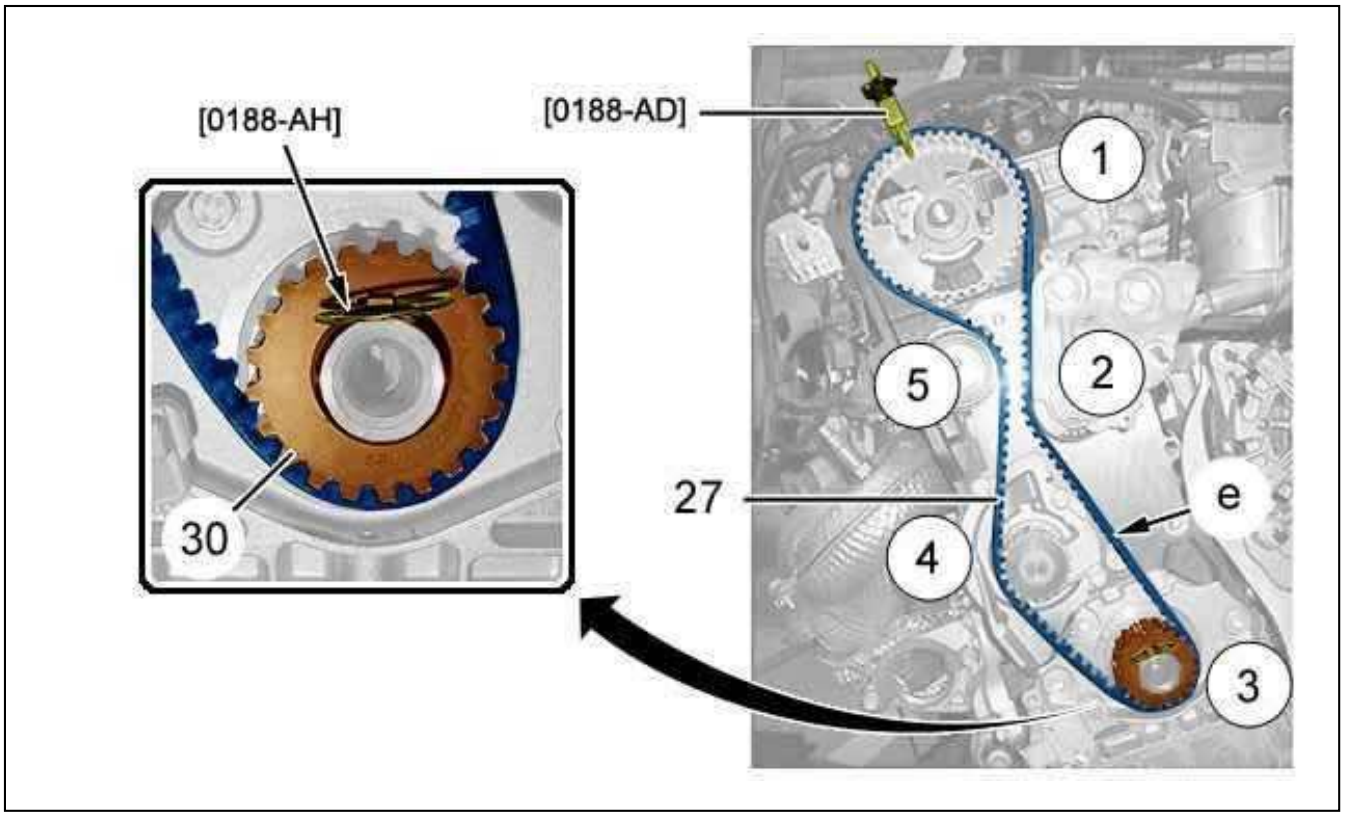


Figure : B1EG0M7D

CAUTION : Always replace the timing belt (27).

Rotate the crankshaft pulley (30) on its cotter pin ; Centre ; Using tool [0188-AH].
Fit the timing belt (27) on the camshaft pinion .
Hold the cam pinion with locking tool [0188-AD].
Position the timing belt (27) on the pulleys in the order indicated ; Span of the belt correctly tensioned (at "e").

CAUTION : Dynamic roller tensioner (28) (new) : Take away the locking pin.

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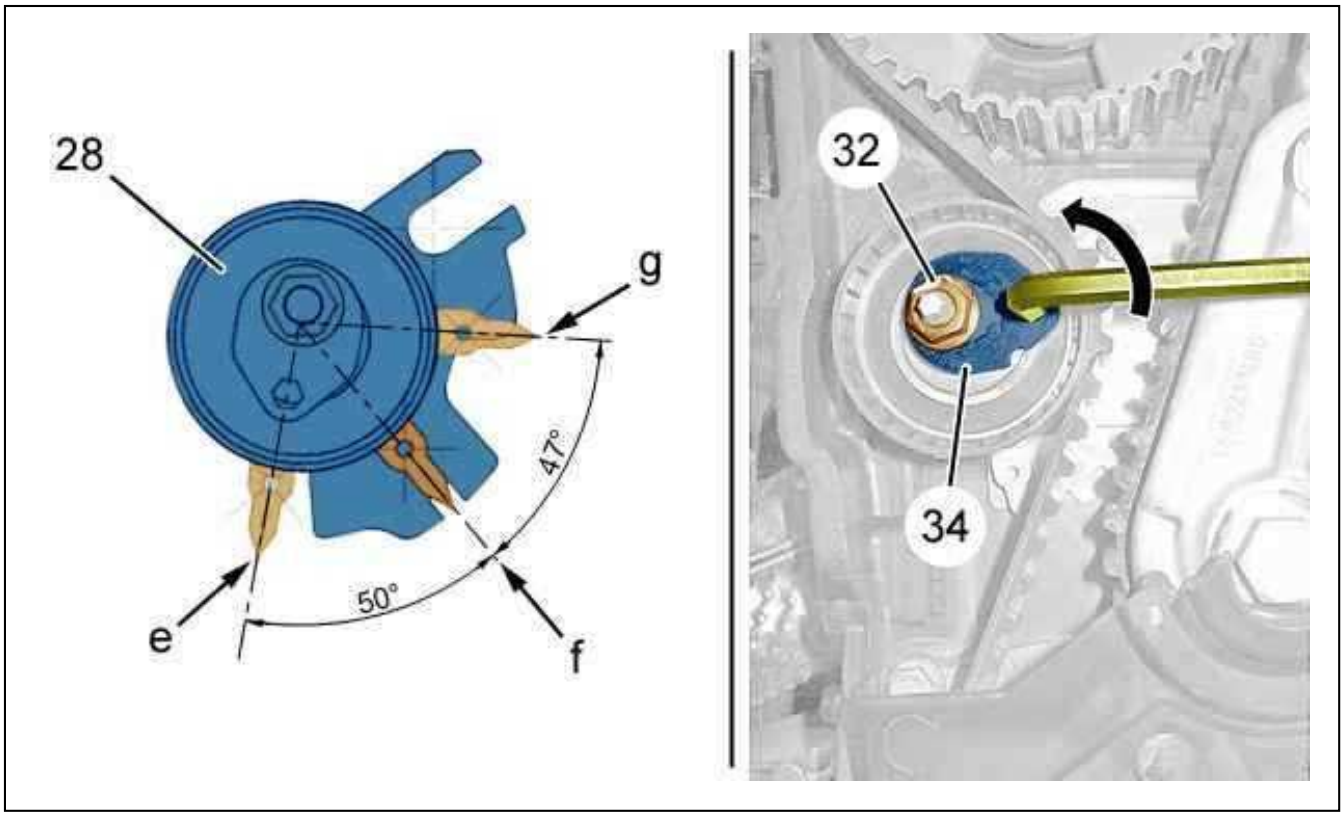


Figure : B1EG0M8D

Position of the index	State of tension of the timing belt
"e"	Dynamic roller tensioner (28) at maximum timing belt (27) tension
"f"	Dynamic roller tensioner (28) at nominal timing belt (27) tension
"g"	Dynamic roller tensioner (28) at minimum timing belt (27) tension

Apply a maximum tension to the timing belt (27) :

- Do up the nut (32) by hand
- Rotate the eccentric (34) anti-clockwise
- Bring the index to position "e"
- Tighten nut (32)

N.B. : The eccentric (34) is close to the horizontal.

Remove the tools[0188-AD], [0188-AH].

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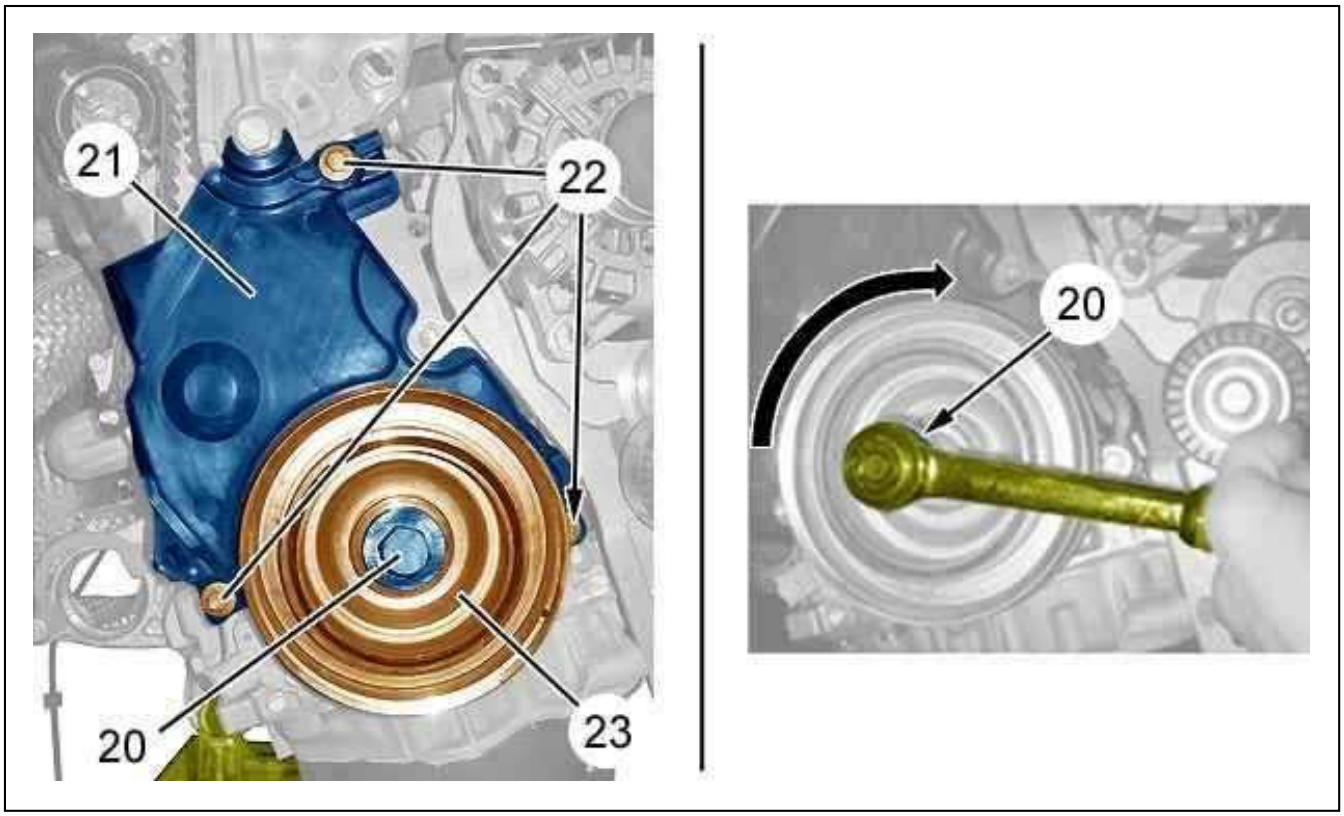


Figure : B1EG0Z5D

CAUTION : Systematically replace the screw (20) ; Do not go beyond 5 minutes between pre-tightening and fina tightening of the bolt .

Fit :

- The timing cover (21)
- The 3 bolts (22)
- The engine speed sensor target (24)
- Crankshaft pulley (23)
- The bolt (20) and its spacer ; Pre-tightening to 5 daNm

Remove the tools[0188-F], [0188-M], [0188-Y].
Turn the engine 6 rotations in the clockwise direction.
Check the position of the timing belt (27).
Peg the assembly with tools [0188-F], [0188-M], [0188-Y].
Slacken the bolt (20) in order to permit the crankshaft pulley to rotate on its keyways.

6.2. Final tension

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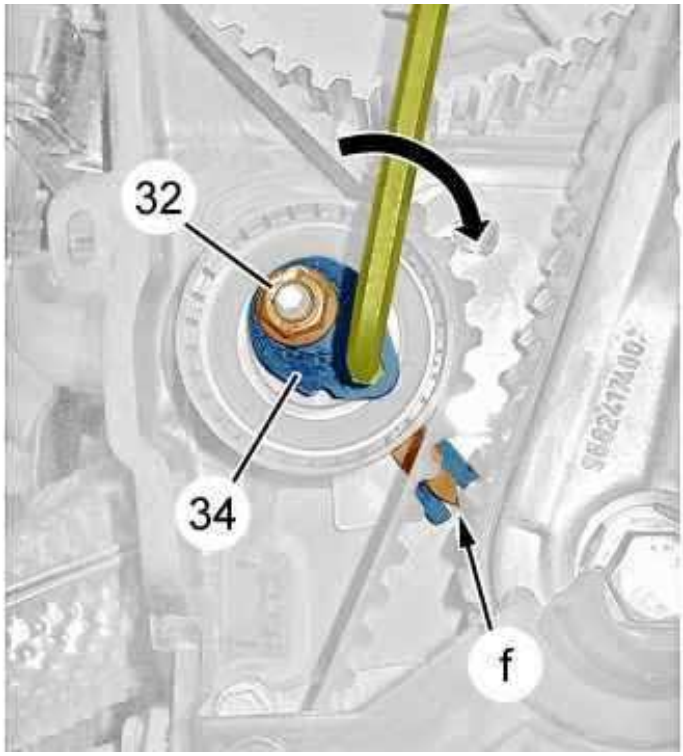


Figure : B1EG0MAD

CAUTION : When detensioning the dynamic tensioner roller, do not go past the index "f". Otherwise, you must restar the pretensioning operation.

Apply a nominal tension on the timing belt (27) :

- Slacken the nut (32) while maintaining the eccentric (34) in position
- Slowly rotate the eccentric (34) in the clockwise direction
- Bring the index to position "f"
- Tighten : The nut (32)

Retighten the bolt (20) to the correct torque.
Remove the tools[0188-F], [0188-M], [0188-Y].

6.3. Refitting (Continued)

Refit the pulley cover (19) ; Using rubber lubricant (Refer to the products catalogue).

CAUTION : Check that the pulley cover (19) is correctly positioned by pulling moderately on the nipple.

Fit :

- Upper timing cover (17)
- The bolts (18)

Clip the electrical harness (16).
Connect the connector of the engine speed sensor (at "c").
Fit :

- The engine brackets (13), (14)
- Fixings (12)
- The bolts (15)
- The resonator (11)
- The pre-catalytic converter (10)

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- The nut (8) ; Without tightening
- The bolts (7) ; Without tightening

Tighten in the order :

- The self-slackening clip (9)
- The nut (8) ; Using a pipe wrench 13 mm
- The bolts (7)

Fit :

- The exhaust clip (5)
- The fixings on the resonator (4)
- The clip (6) on the resonator (4)
- The bracket (3) for the diesel fuel manual priming pump (2) ; By means of a screwdriver (at "b")
- The diesel fuel manual priming pump (2)

Connect up all the low pressure fuel supply unions (at "a").
Fit :

- The expansion chamber (1) ; Without opening the cooling system
- The ancillary drive belt
- The RH front splash shield
- The RH front road wheel
- The protective plate under the engine
- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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MODIFICATION : REMOVAL OF THE CRANKSHAFT PULLEY BOLT

This bulletin describes the procedure that is additional to the methods for removing-refitting the timing belts on DW engines.

1. Tooling

Equipment :

- Reversible torque spanner
- Hot air gun with adaptors

2. Presentation : The crankshaft pulley fixing bolt

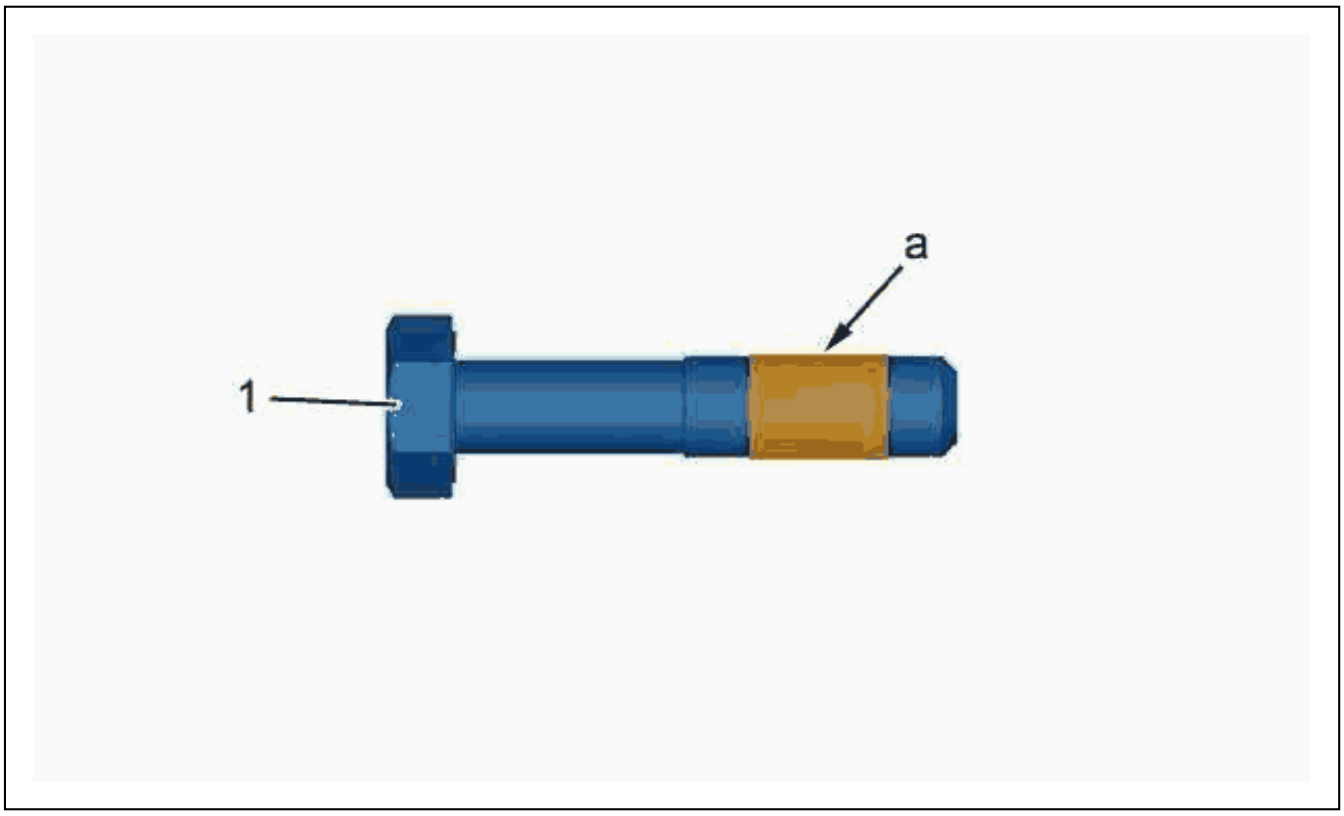


Figure : B1ET001D

"a" : Zone pre-coated with "thread-lock" type adhesive.
The crankshaft pulley bolt (1) has on its thread an adhesive "a" which activates on tightening. This adhesive makes the assembly of the crankshaft belt drive pulleys safe.
On slackening, particles of adhesive could possibly accumulate in significant quantities in the threads, thus rendering th operation particularly difficult and also possibly leading to the bolt breaking inside the crankshaft.
It is important to keep to the slackening procedure so that the operation will succeed.

3. Slackening procedure

CAUTION : Use of an impact wrench is prohibited : Risk of the bolt breaking inside the crankshaft.

CAUTION : Keep to the method "Removing - refitting : Associated timing belt".

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3.1. Slackening at the correct torque

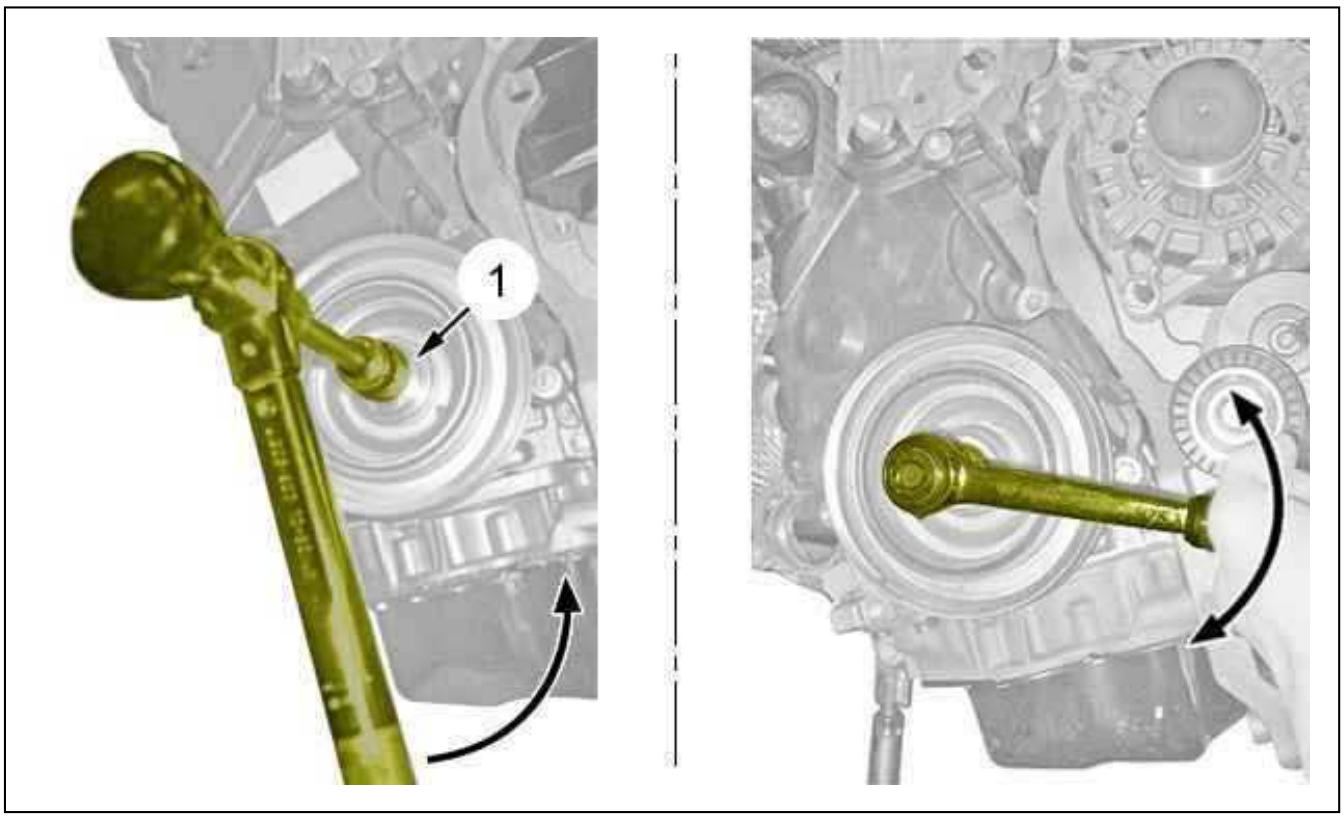


Figure : B1ET004D

CAUTION : The flywheel immobilisation tool must be in place.

Slacken the bolt (1) ; Using a wrench (Do not exceed 1 turn).

CAUTION : During the slackening, make sure that the resisting torque does not exceed 20 m.daN ; By using a reversible torque spanner.

Slackening the bolt (1) :

- Unscrew the bolt (1) ; Monitor the resisting torque
- If the effort increases, redo up and then renew the slackening (More than once if necessary)
- Alternately repeat the above operations until the bolt is completely slackened

N.B. : As the slackening effort increases, it is important to retighten fully so as to spread the adhesive which has accumulated in the threads.

CAUTION : Stop the operation if the slackening effort is too great ((greater than 20 m.daN). Go to the next section.

3.2. Slackening with heating of the bolt

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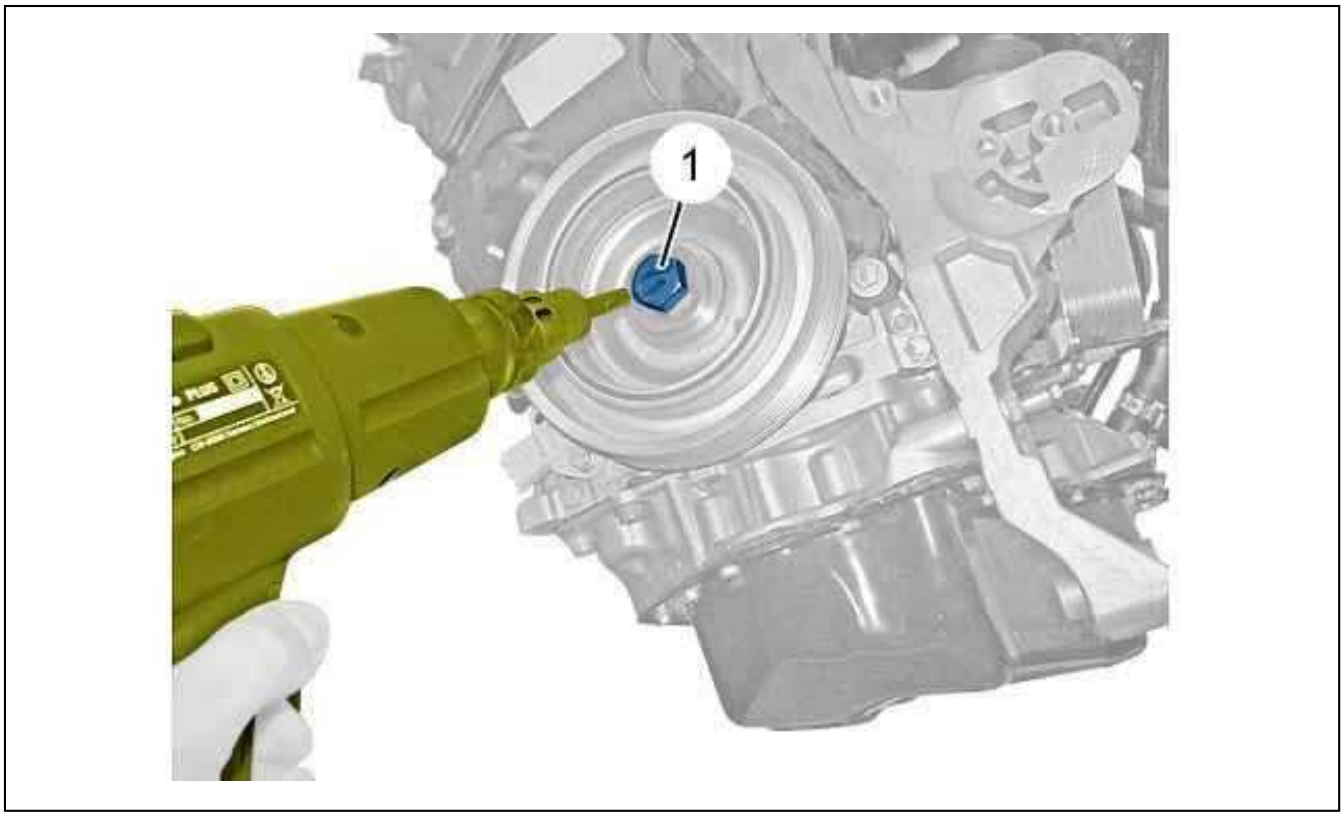


Figure : B1ET007D

CAUTION : The heat of the gun can damage the rubber sealing on the ancillary drive pulley. Do not exceed 4 minutes of heating.

Heat the head of the bolt (1) for 4 minutes ; Using a hot air gun fitted with a small calibre adaptor.

CAUTION : Monitor the slackening torque, using the torque spanner, do not exceed 20 m.daN.

Undo the bolt (1) immediately.
Repeat the operation for 1 minute if the slackening effort still remains too great.

4. Checking - Cleaning

CAUTION : Check the state of the rubber sealing on the ancillary drive pulley. Check the state of the target of the engine speed sensor. Replace parts that are damaged.

Always replace the bolt (1) if the slackening torque reached 20 m.daN.
Clean (M14 x 150 tap) :

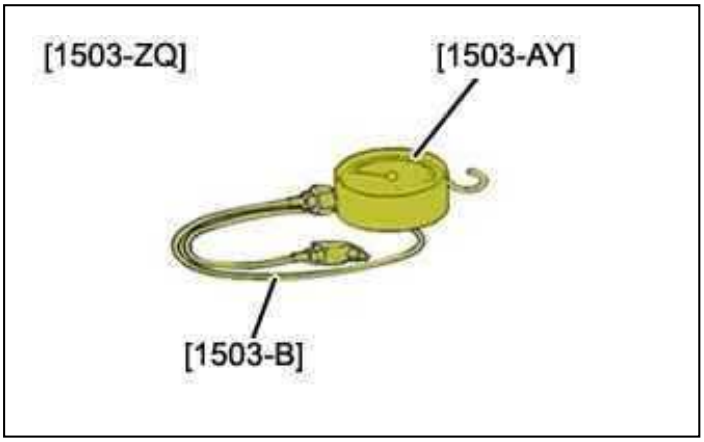
- The thread
- The tap

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CHECK : OIL PRESSURE

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AD01MT	[1503-ZQ]	The upper dipstick guide
	[1503-B]	flexible hose
	[1503-AY]	pressure gauge for checking the oil pressure
 Figure : E5AB0A8T	[1503-M]	Engine oil pressure take-off union

2. Preliminary checks

Make the following checks :

- The oil level
- Oil quality (Viscosity, absence of other fluids)
- Absence of foreign particles in the oil

3. Removing

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CAUTION : Oil pressure is checked with the engine hot after checking the oil level.

Put the vehicle on a hoist.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The cooling fan control relay unit
- The protective panel under the engine

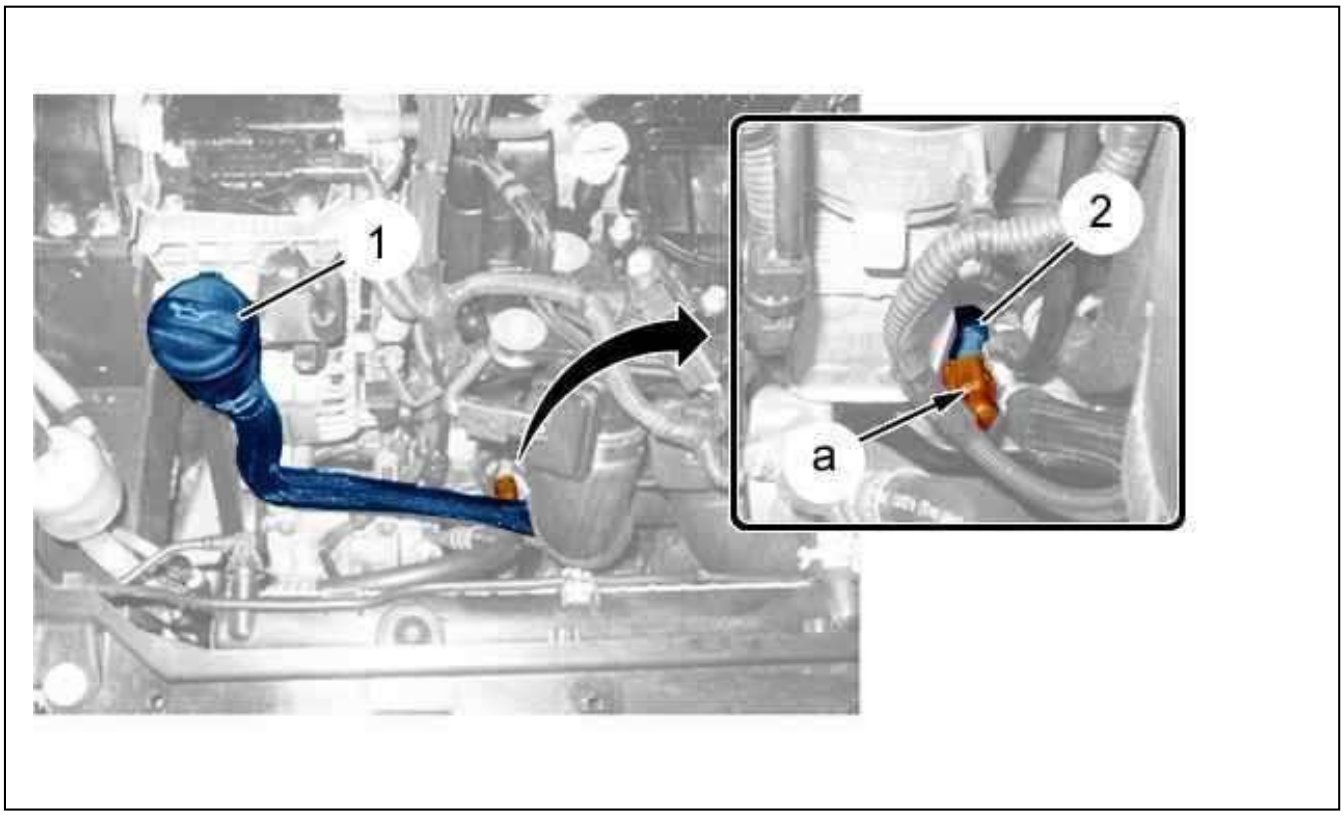


Figure : B1FD005D

Remove and move aside the engine oil filler neck (1).

N.B. : The filler pipe prevents access to the oil pressure switch (2).

Disconnect the connector (as "a").

CAUTION : Expect oil to drain out.

Remove :

- The oil pressure switch (2)
- Seal

4. Check

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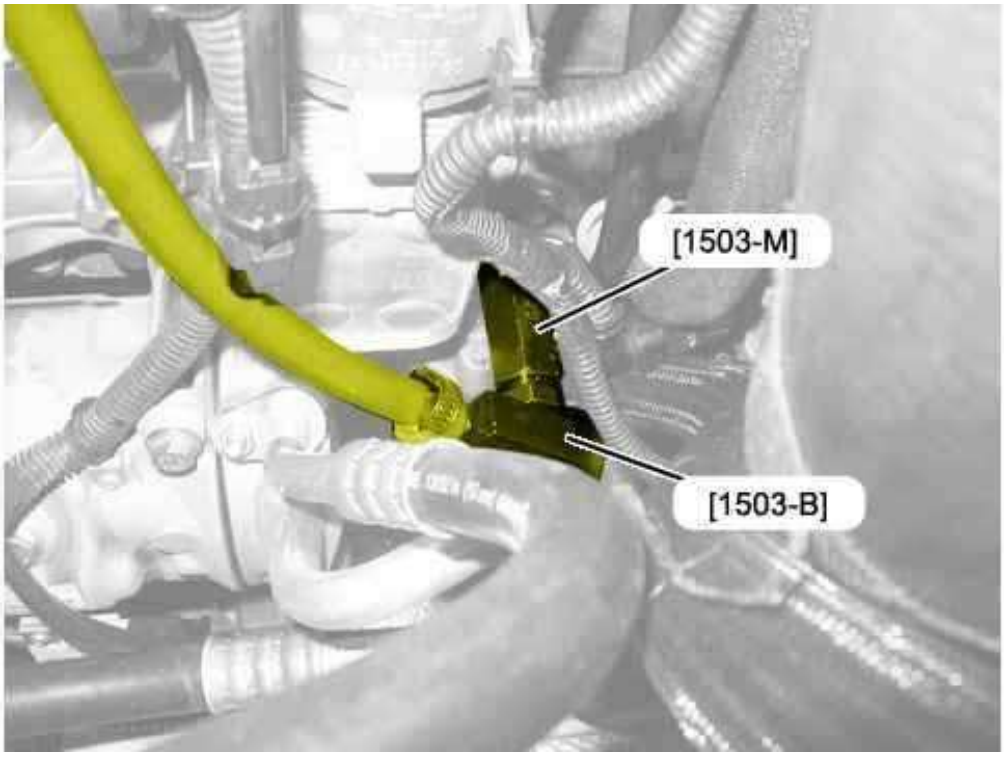


Figure : B1FD029D

Do a trial fitting of the tools [1503-AY], [1503-B], [1503-M].
Fit all the tools in the place of the oil pressure switch (2) with the seal.
Tighten the tool [1503-M].
Clip : The engine oil filler neck (1).

4.1. Check

Method of checking :

- Start the engine
- Check that there are no leaks
- Take the pressure
- Accelerate the engine to 2500 r.p.m
- Take the pressure
- Accelerate the engine to 4000 r.p.m
- Take the pressure

Compare the readings on the oil pressure gauge with those in the table .

4.2. Verification : Lubrication system

N.B. : If there is a big difference between the pressures taken on the pressure gauge and the reference values, inspec the points below and then replace the part(s) that are faulty.

Oil pressure	Possible causes
Oil pressure below the reference values	Oil sump deformed oil pump (Drive, strainer) Oil filter clogged Oil passage obstructed
Oil pressure above the reference values	Oil viscosity too great

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	oil pump Oil passage obstructed

5. Refitting

CAUTION : Adhere to the tightening torques .

Unclip and move aside : The engine oil filler neck (1).
Remove the tools [1503-AY], [1503-B], [1503-M].
Refit :

- A new seal : Oil pressure switch (2)
- The oil pressure switch (2)

Connect the connector (as "a").
Clip : The engine oil filler neck (1).
Check the oil level ; Top up if necessary.
Start the engine.
Check that there are no leaks.
Stop the engine.
Refit :

- The protective panel under the engine
- The cooling fan control relay unit
- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Clear the memory of faults ; Using the diagnostic equipment.

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REMOVING - REFITTING : ENGINE OIL TEMPERATURE AND LEVEL SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Location

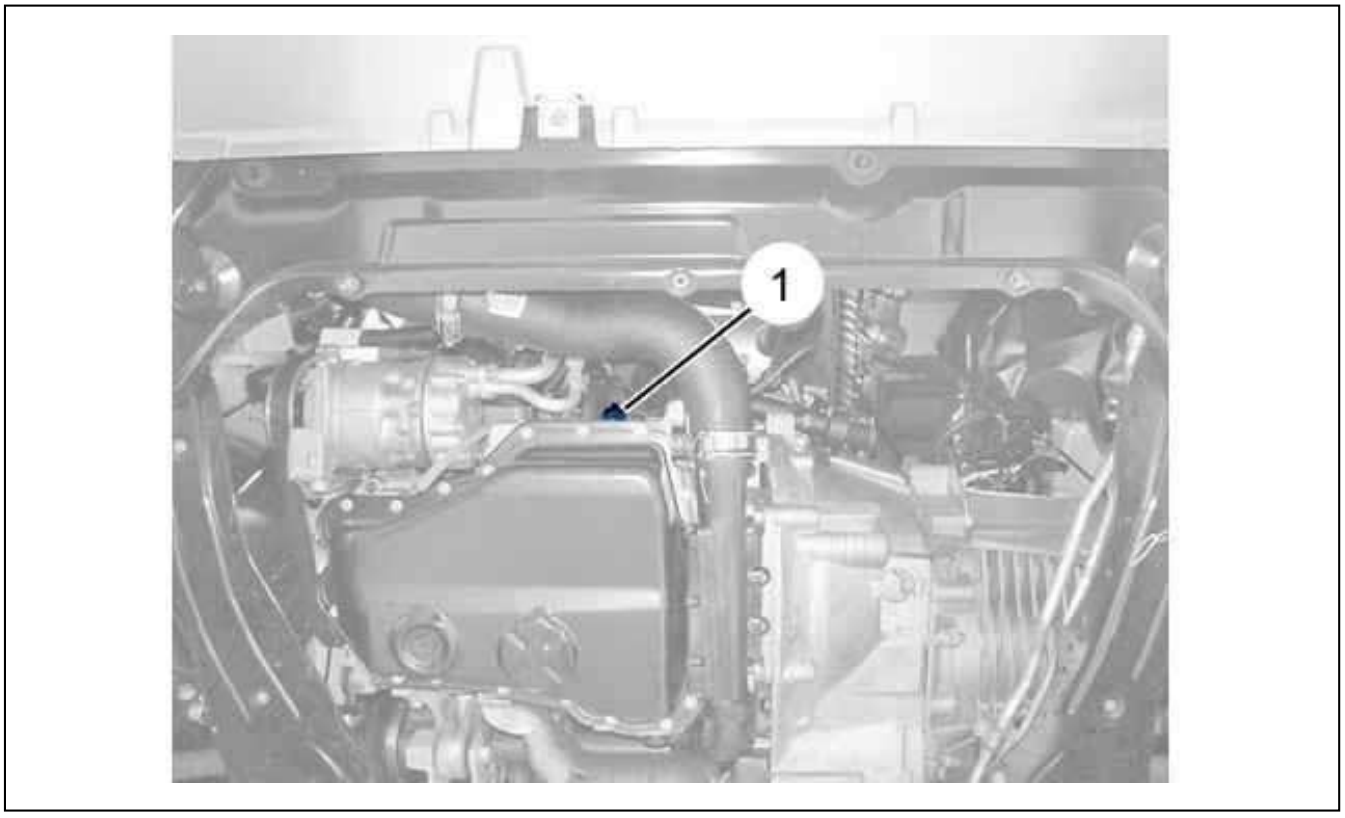


Figure : B1FG033D

(1) Engine oil temperature and level sensor.

2. Removing

Disconnect the battery.
Remove the under engine protection .

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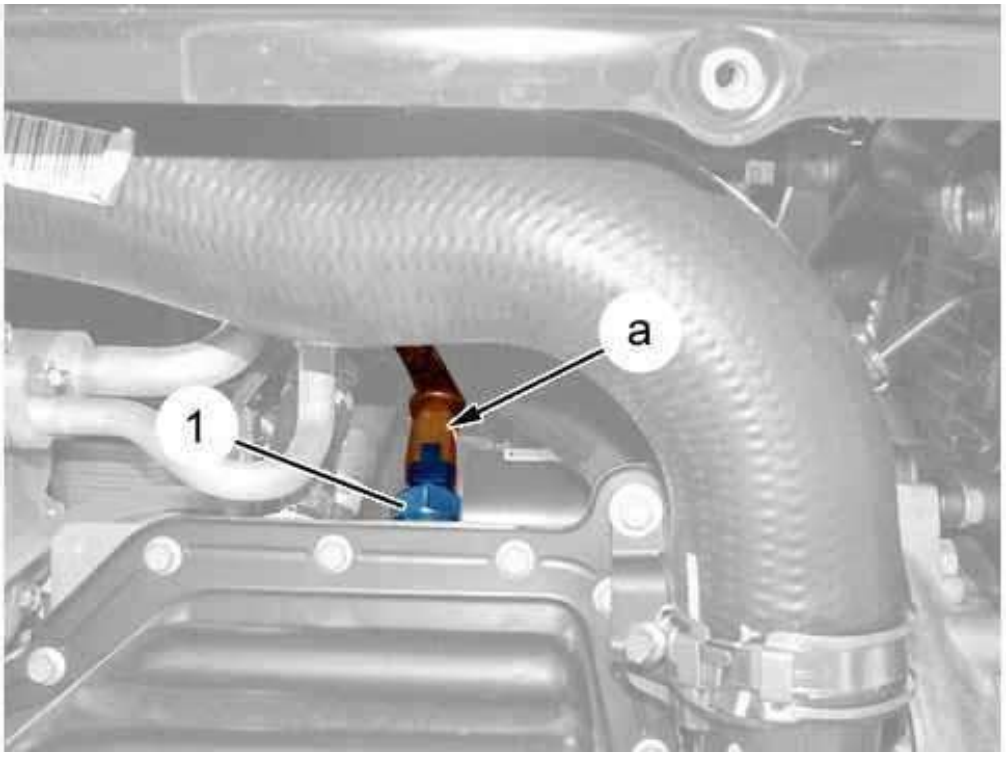


Figure : B1FG036D

Disconnect the connector (at "a").
Remove : The engine oil level and temperature sensor (1).

3. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Always replace the oil temperature level sensor seal.

Refit : The engine oil level and temperature sensor (1).
Connect the connector (at "a").
Refit the under-engine protection .

CAUTION : Perform the operations to be carried out following reconnection of the battery.

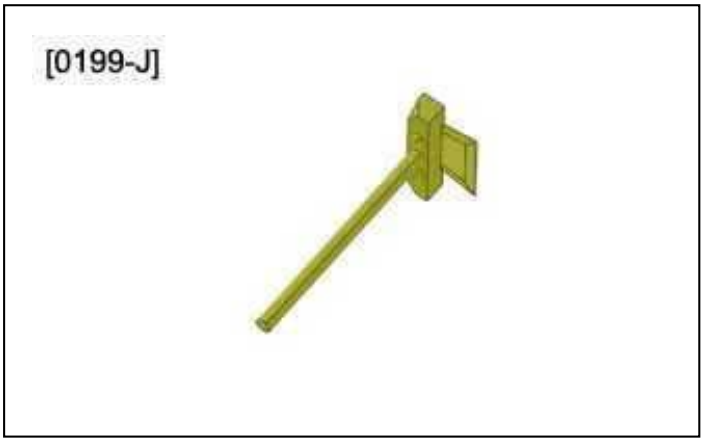
Reconnect the battery.

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REMOVING - REFITTING : OIL PUMP

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Tool	Reference	Designation
 Figure : E5AB0QZT	[0199-J]	Oil sump seal cutting chisel

2. Removing

Put the vehicle on a hoist.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

Disconnect the ancillaries battery .

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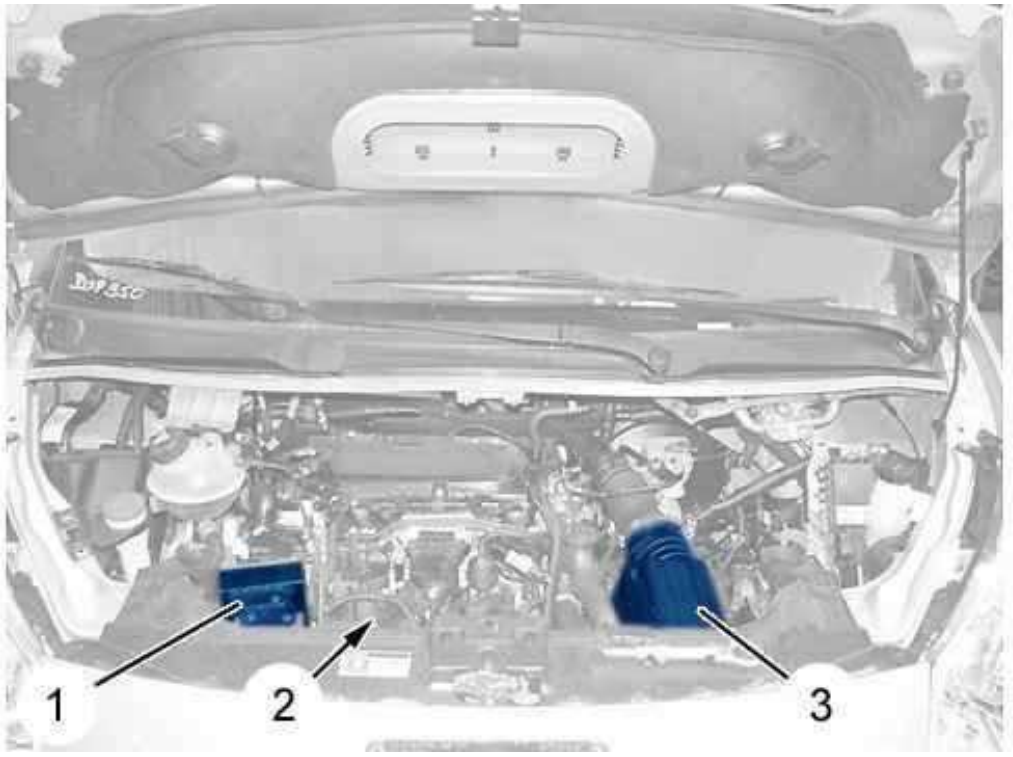


Figure : B1BG1KAD

CAUTION : Protect the engine cooling radiator to prevent damage to the fins.

Remove :

- The fan control relay unit (1)
- The air filter casing (3)
- The air mixer unit (2)

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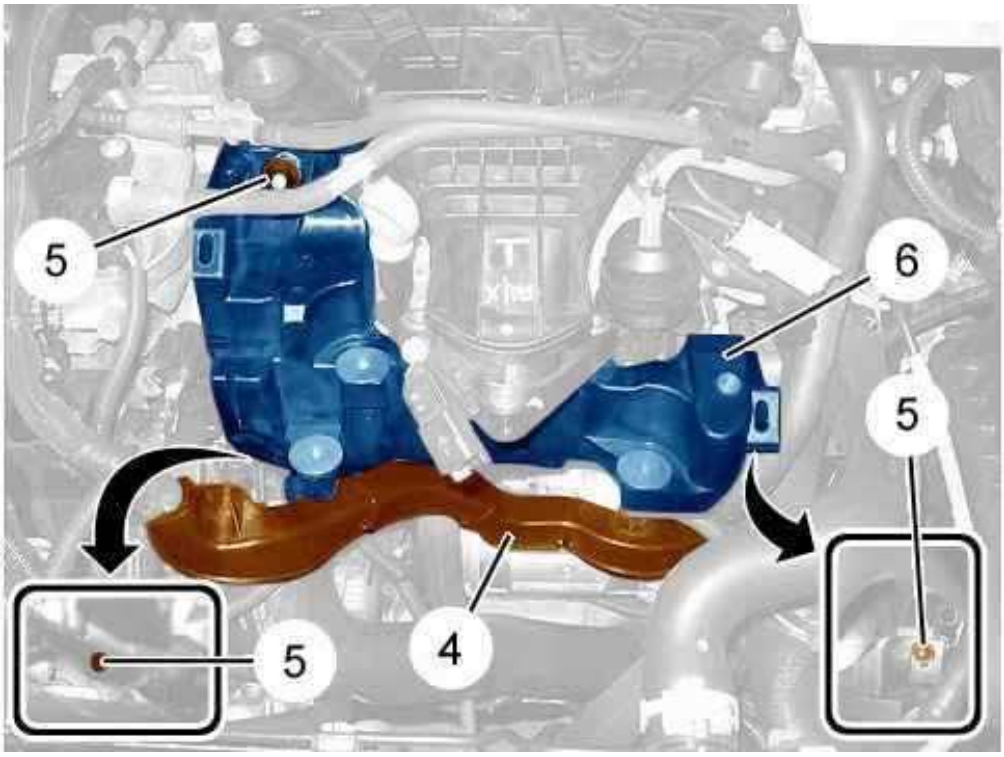
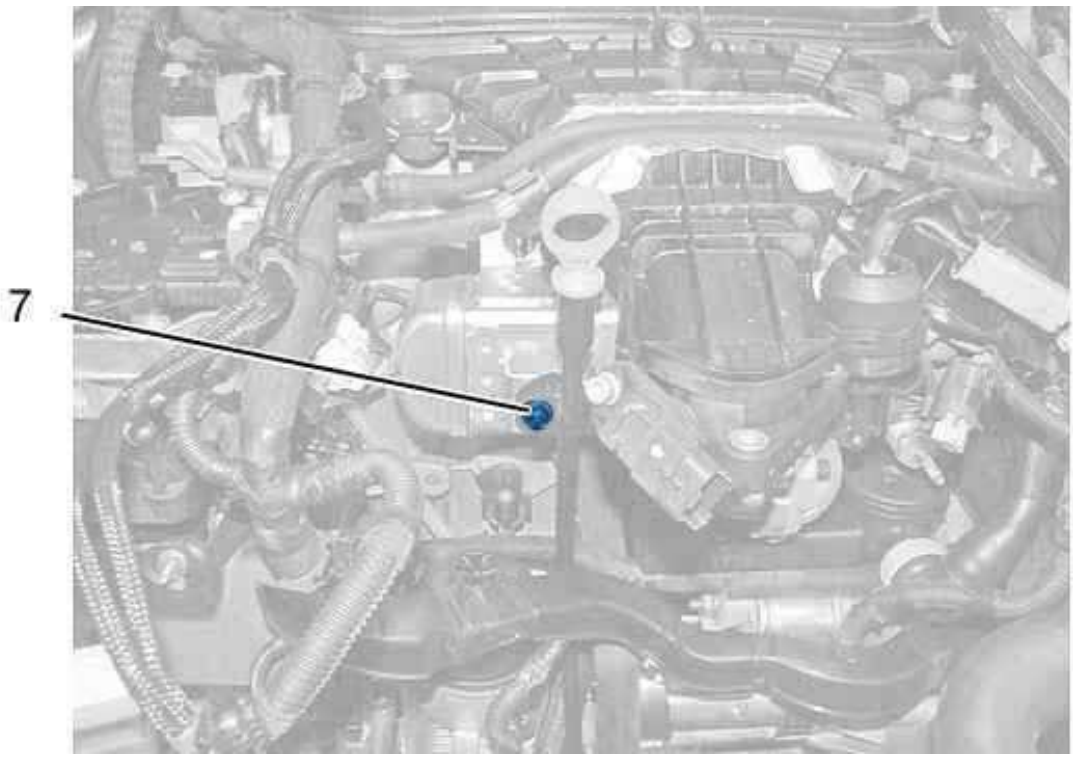


Figure : B1FG037D

Unclip the electrical harness sheath (4) and move it aside.
Remove :

- The mountings (5)
- The inlet air mixer unit support (6)



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Figure : B1FG038D

Remove :

- The dipstick
- The (7) bolt

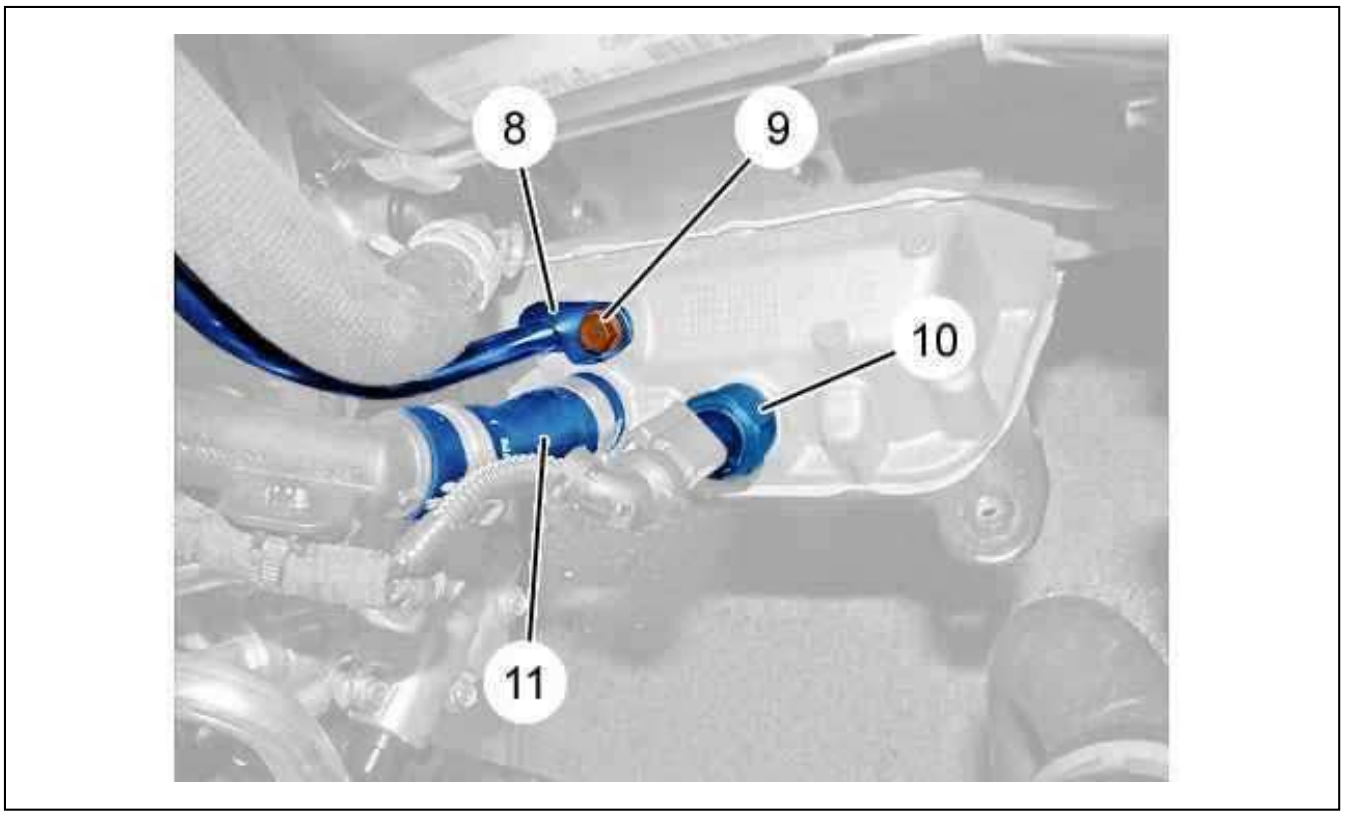


Figure : B1FG039D

Remove :

- The (9) bolt
- The dipstick guide (8)
- The engine oil level and temperature sensor (10)

Uncouple the engine oil filler pipe (11).

Remove :

- The protective panel under the engine
- The front wheel
- The front splash shield

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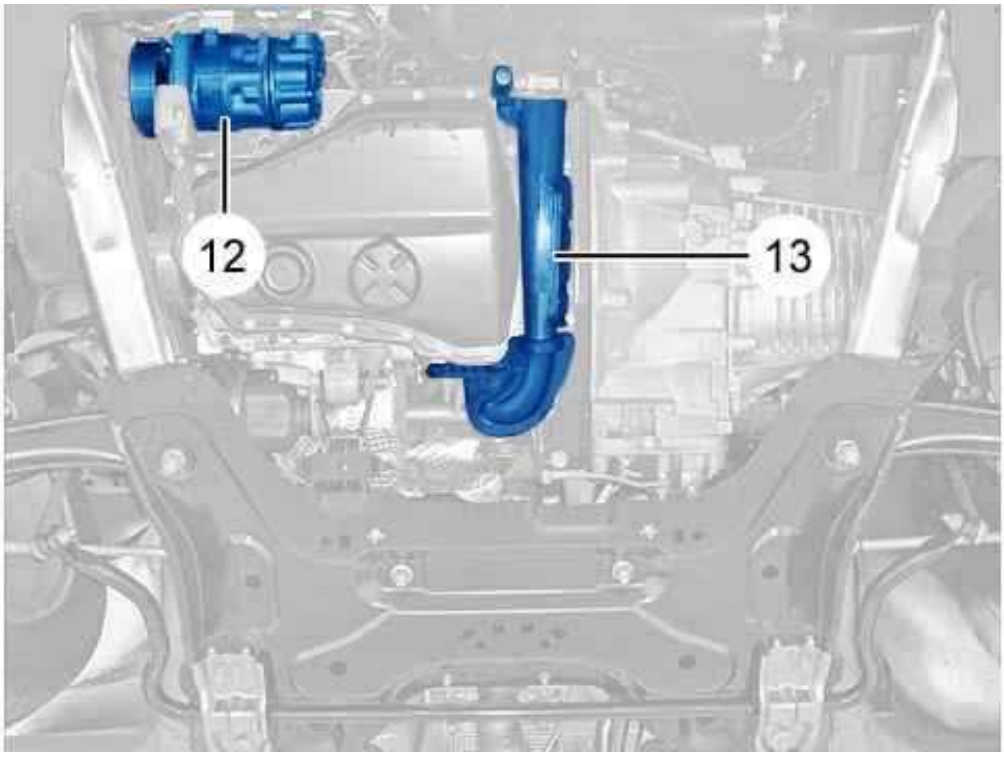
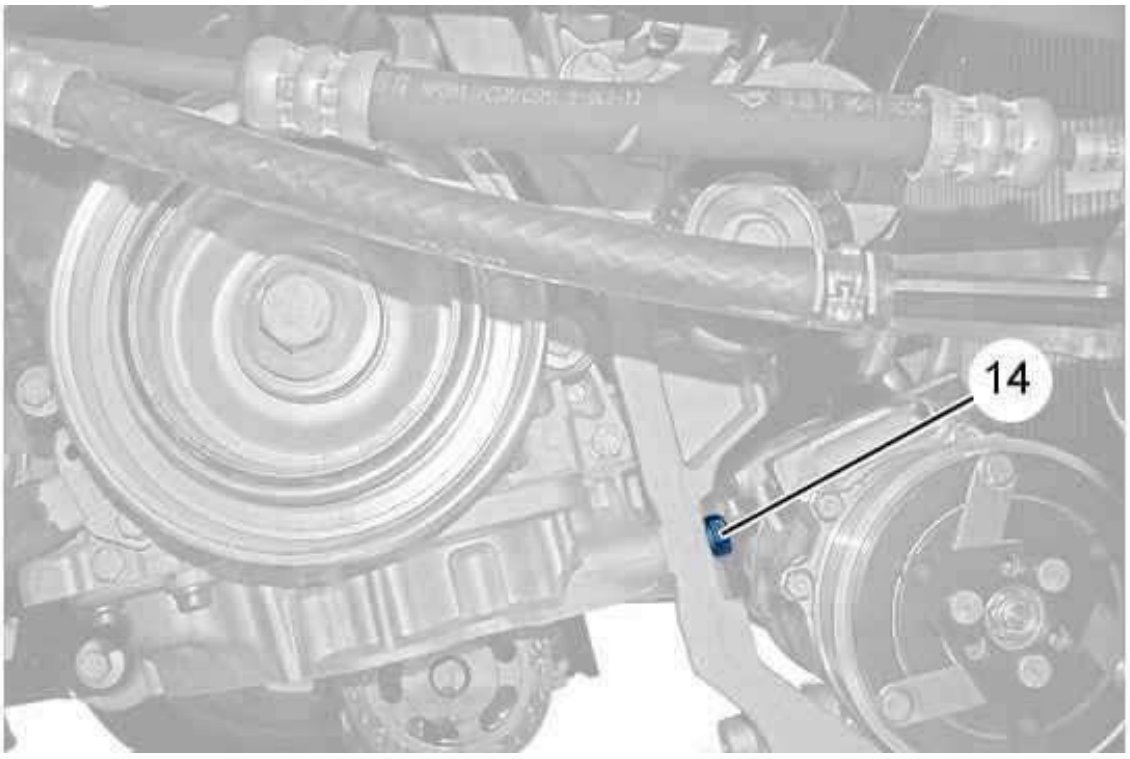


Figure : B1FG03AD

Remove :

- The air union (13)
- The accessories drive belt

Move aside the air conditioning compressor (12) without opening the air conditioning circuit.



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Figure : B1FG03BD

Remove the bolt (14).

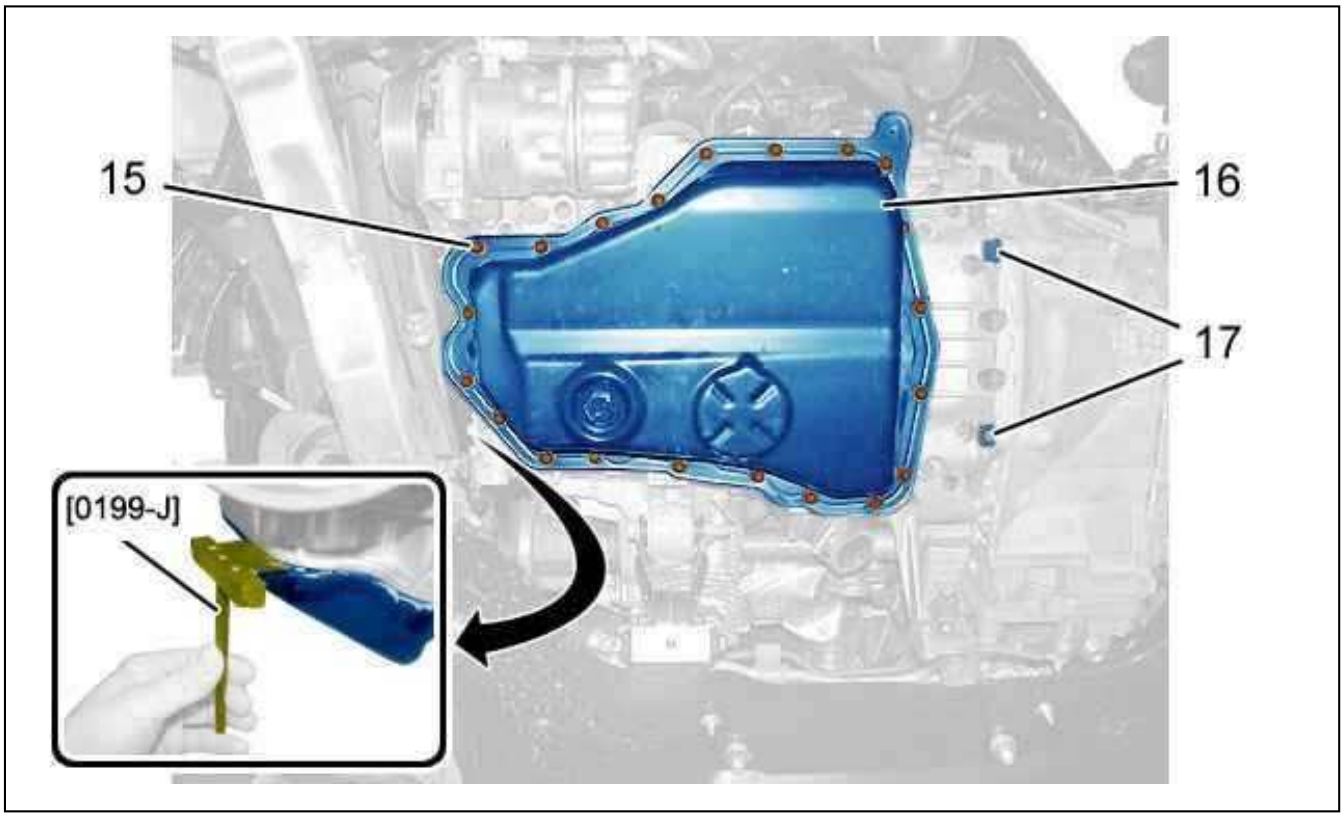


Figure : B1FG0CWD

Drain the engine oil.
Remove :

- The 21 bolts (15)
- The oil sump (16) ; Using tool [0199-J]
- The bolts (17)

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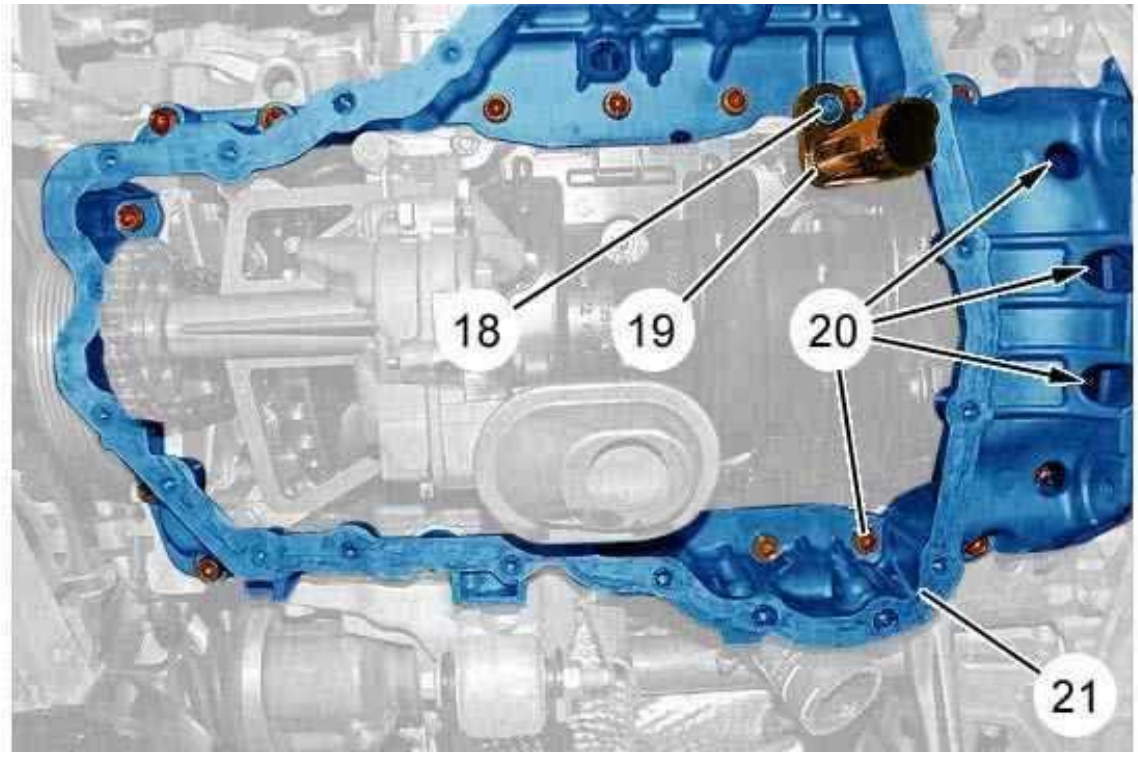


Figure : B1FG03DD

Remove :

- The (18) bolt
- The discharge pipe (19)
- The 20 bolts (20)
- The upper oil sump (21)

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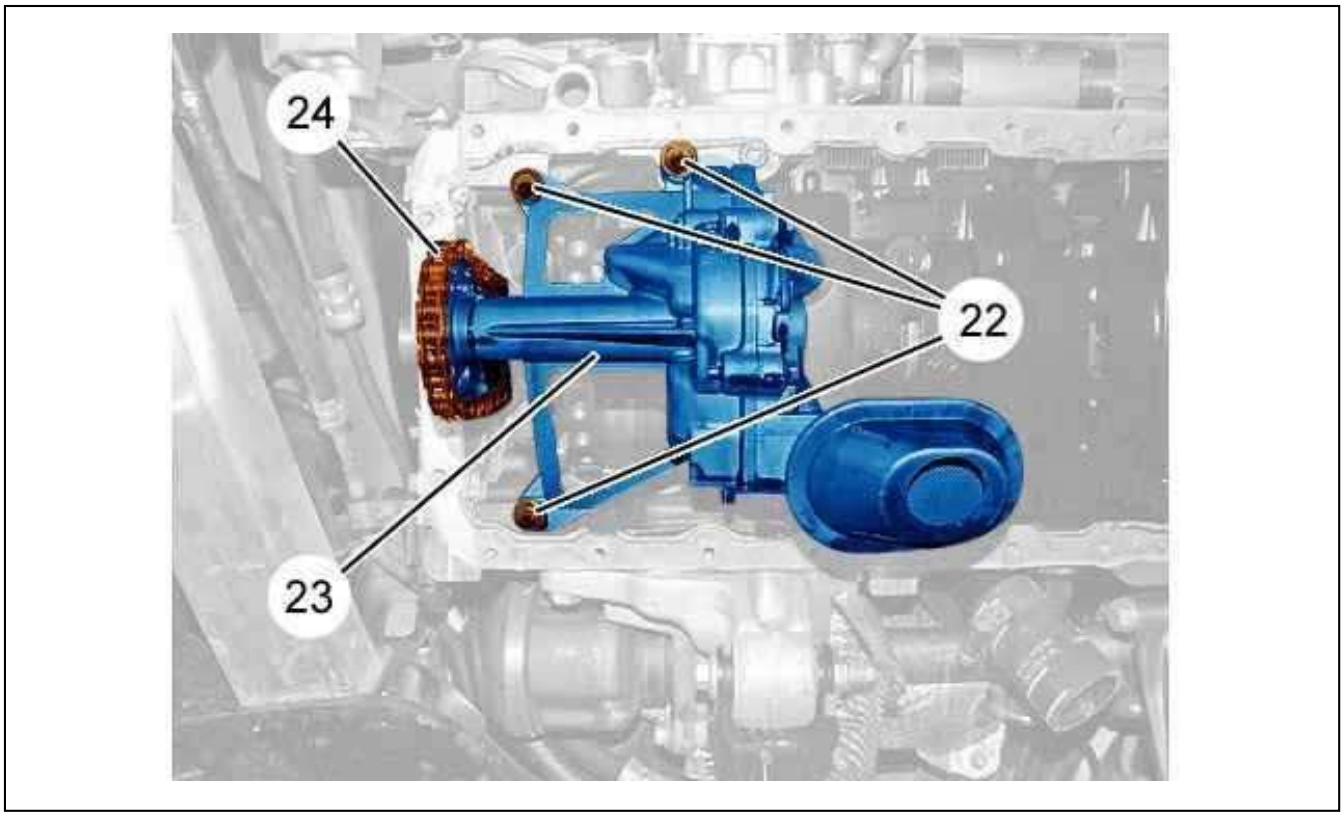


Figure : B1FG03ED

Remove the bolts (22).
Released the oil pump (23) from its fixings and from the drive chain (24).
Remove the oil pump (23).

3. Preparation

CAUTION : Clean the gasket faces with an approved descaling product. Do not use a cutting or abrasive tool. The gasket faces must not have any traces of knocks or scores.

CAUTION : Clean the threads of the bolts (15), (20).

Check the following elements :

- The suction strainer (no swarf, impurities, tears)
- The pinion and drive chain assembly (24) of the oil pump (23)
- That there are no foreign bodies in the oil pump (23)

4. Refitting

CAUTION : Adhere to the tightening torques .

Refit the oil pump (23), engaging the pinion in the drive chain (24).
Refit the bolts (22).

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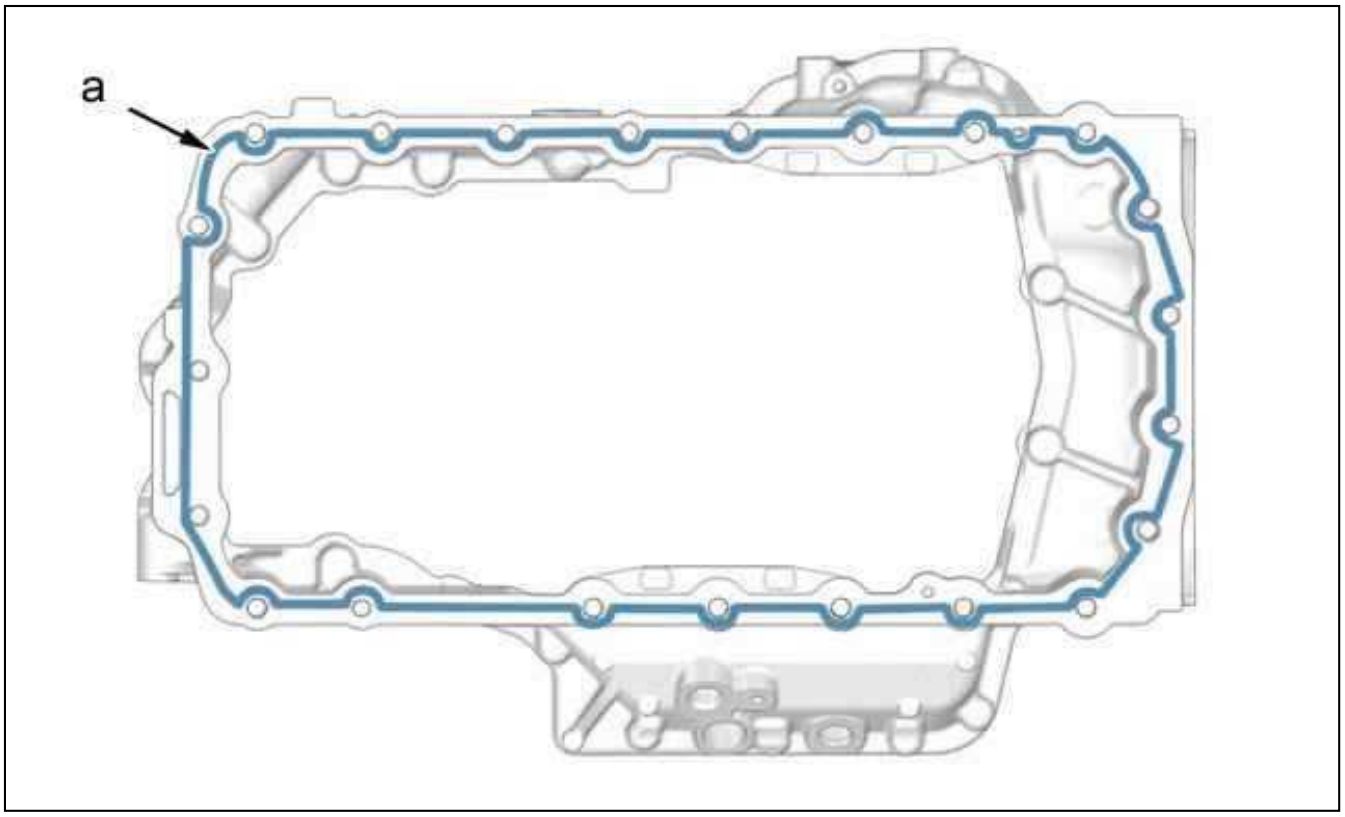


Figure : B1FG03FD

CAUTION : The positioning operation must not take longer than 5 minutes.

Apply a strip of sealing product on the sealing face of the oil sump (Index E10) (at "a").

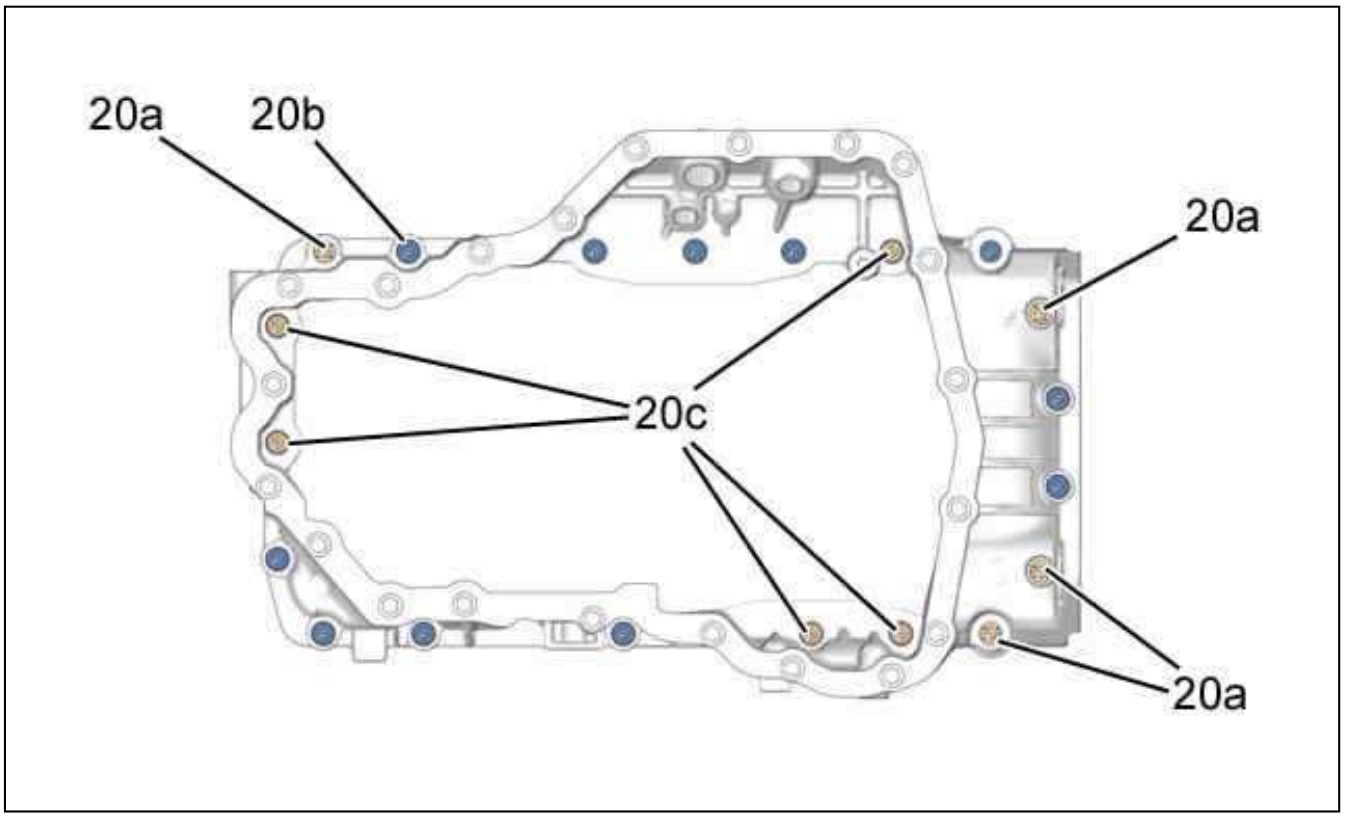


Figure : B1FG0CJD

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CAUTION : 2 possible assemblies of bolts (20). It is essential to keep the positions of the bolts correct ; Risk o damage to the cylinder block (Crankshaft bearing cap incompatible with the bolts 25 mm in length).

CAUTION : Whichever assembly it is, the 5 bolts (20c) have to be coated with sealing product (Index E4); Risk o leaks.

First assembly :

- 4 bolts (20a) 40 mm long
- 16 bolts (20b) and (20c) 21 mm long

Second assembly :

- 4 bolts (20a) 45 mm long
- 11 bolts (20b) 21 mm long
- 5 bolts (20c) 25 mm long

Refit :

- The upper oil sump (21)
- The bolts (20) (respecting their original positions)

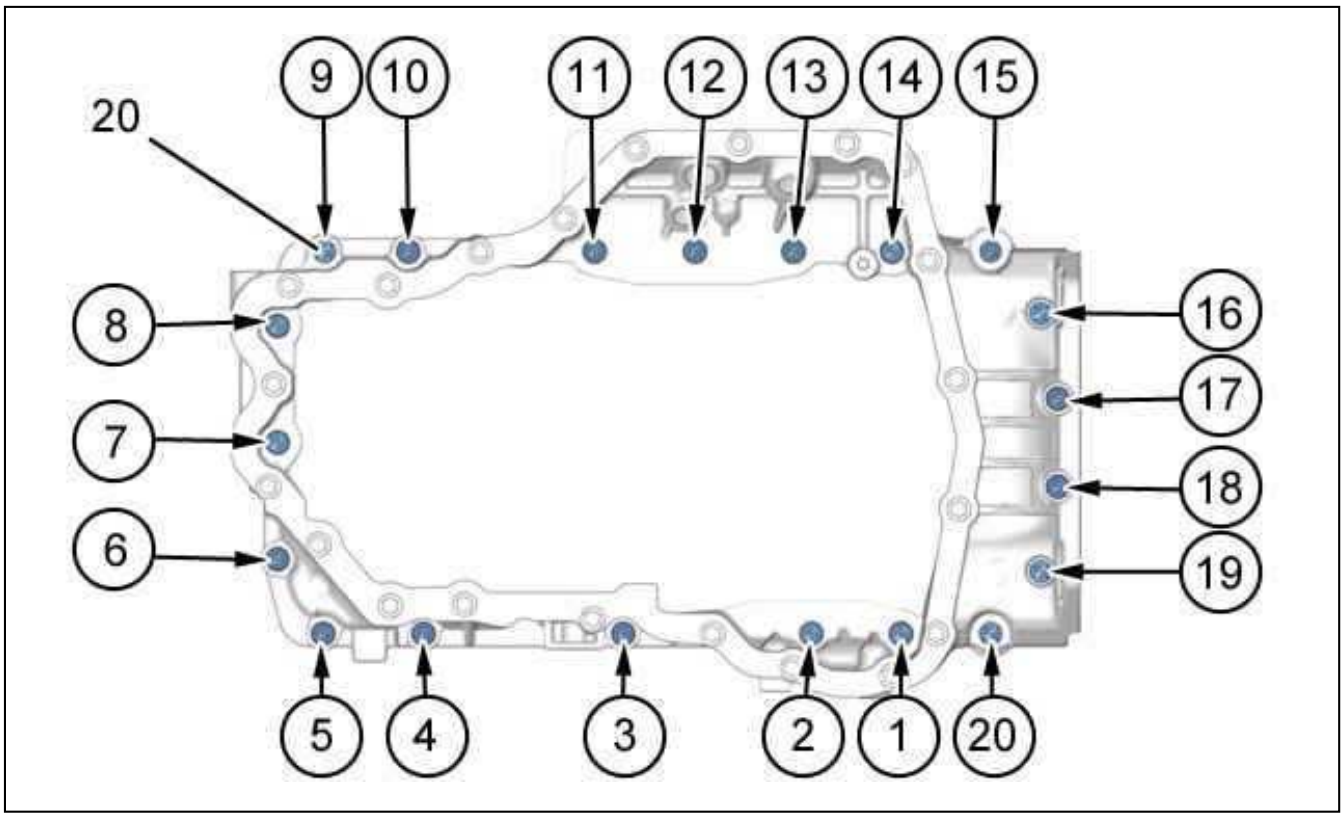


Figure : B1FG0CKD

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Draw up the bolts (20)
- Do up the bolts (20)
- Tighten the bolts (20) to torque

Refit :

- The discharge pipe (19)

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- The (18) bolt
- The bolts (17)

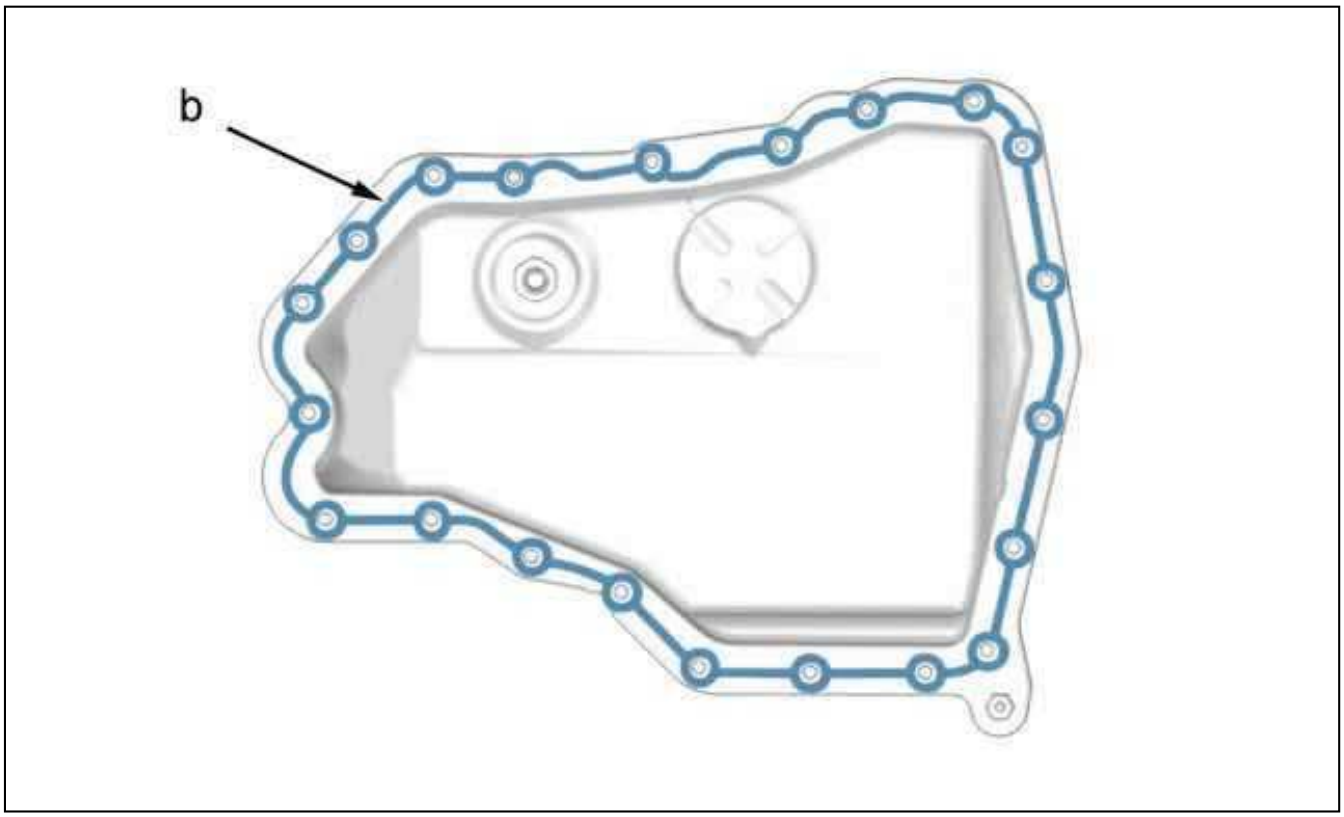


Figure : B1FG03HD

CAUTION : The positioning operation must not take longer than 5 minutes.

Apply a strip of sealing product on the sealing face of the oil sump (Index E10) (at "b").

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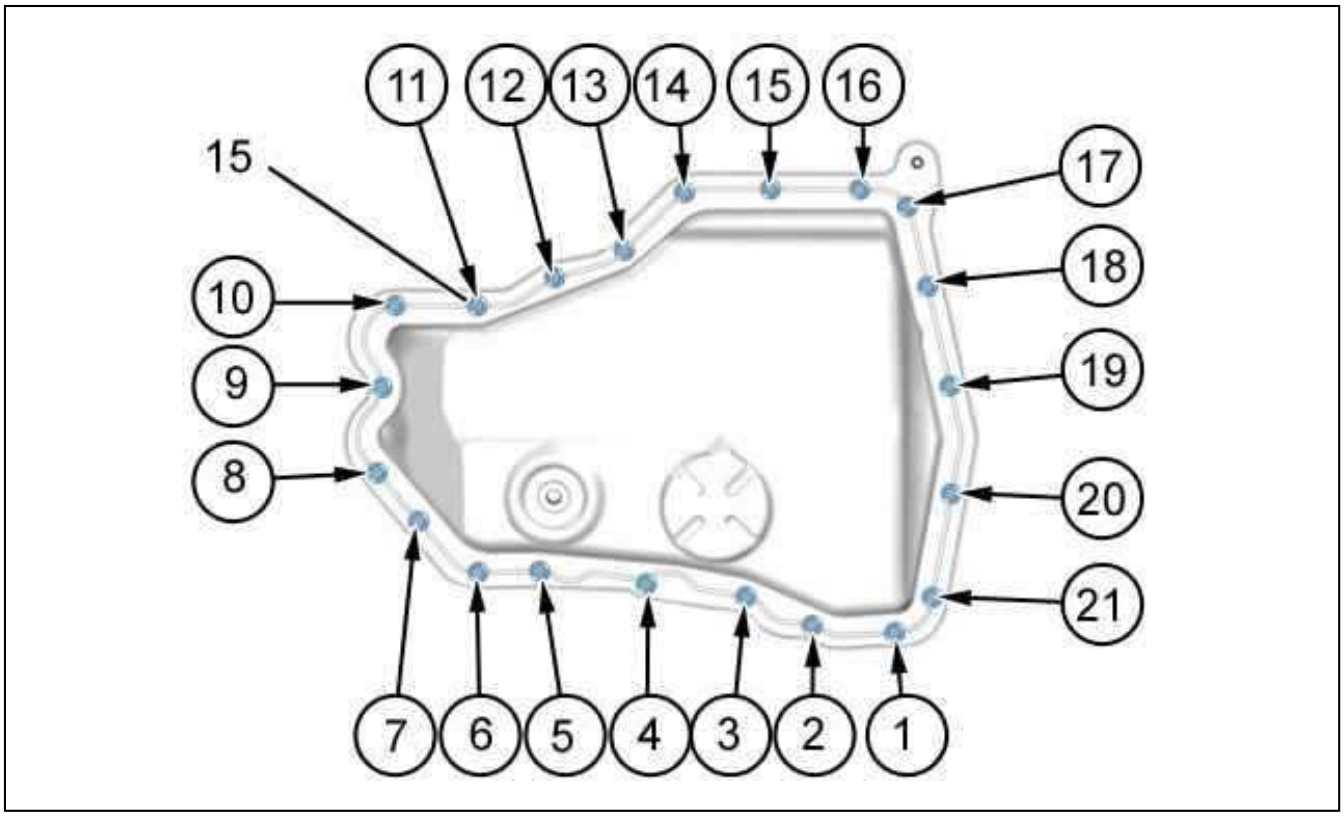


Figure : B1FG0CLD

Refit the sump (16).

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Draw up the bolts (15)
- Do up the bolts (15)
- Tighten the bolts (15) to torque

Refit :

- The (14) bolt
- The air-conditioning compressor (12)
- The accessories drive belt
- The air union (13)
- The front splash shield
- The front wheel
- The protective panel under the engine

Couple the engine oil filler pipe (11).
Refit :

- The engine oil level and temperature sensor (10)
- The dipstick guide (8)
- The (9) bolt
- The (7) bolt
- The dipstick (/)
- The inlet air mixer unit support (6)
- The mountings (5)

Clip the electrical harness sheath (4).

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Refit :

- The air mixer unit (2)
- The air filter housing (3)
- The fan control relay unit (1)

Replace the oil filter.
Fill the engine with the correct quantity of oil for the engine concerned.

CAUTION : Perform the operations that are required following a reconnection of the ancillaries battery.

Reconnect the ancillaries battery .

5. Precautions to be taken before starting the vehicle

CAUTION : Do not start the vehicle without having carried out the following operations.

Disconnect the camshaft position sensor connector.
Turn the engine over with the starter motor for 15 seconds.
Connect the camshaft position sensor connector.
Let the engine run at idle for 30 seconds before increasing the load.
After the engine has been run, check the sealing of the components that were removed. .
Clear the faults in the memory ; Using a diagnostic tool.

6. Check

Top up the engine oil level (If necessary).
Start the engine.
Check there are no oil leaks.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

Stop the engine.

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REMOVING - REFITTING : OIL FILTER SUPPORT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Preliminary operations

Place the vehicle on a 2-post lift.
Disconnect the battery.
Remove :

- The engine cover
- The protective panel under the engine

Drain the cooling system.

2. Removing

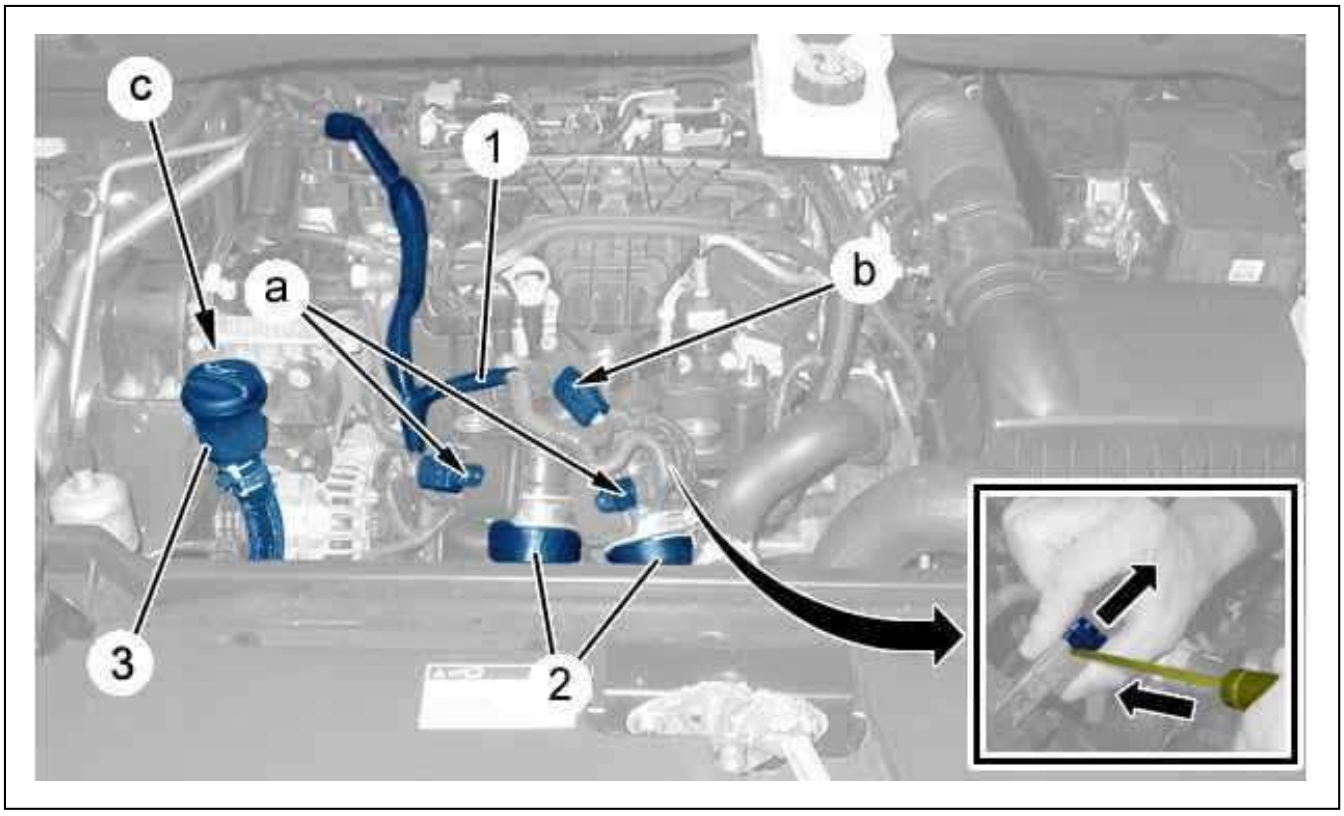


Figure : A1BM073D

CAUTION : Protect the cooling radiator to avoid damaging the fins.

Unclip and disconnect ; Using a thin screwdriver :

- The inlet air mixer sensor(s) (at "a")
- The inlet air pressure/temperature sensor (at "b")

Release and move aside the electrical harness (1).
Uncouple and remove : The inlet air union(s) (2).

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Unfasten and move aside the engine oil filler neck (3) (at "c").

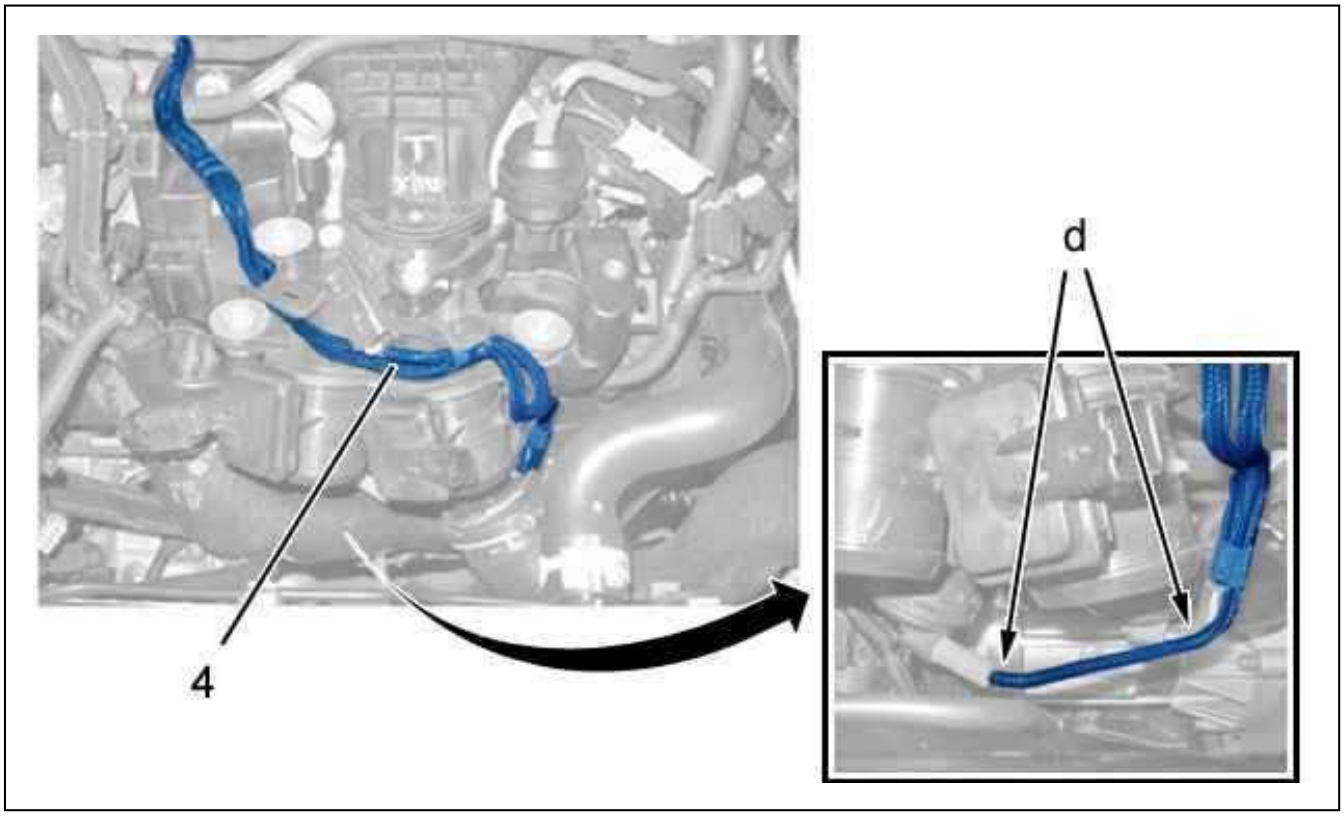


Figure : A1BM074D

Uncouple : The vacuum pipes (at "d").
Unfasten and move aside : The vacuum pipes (4).

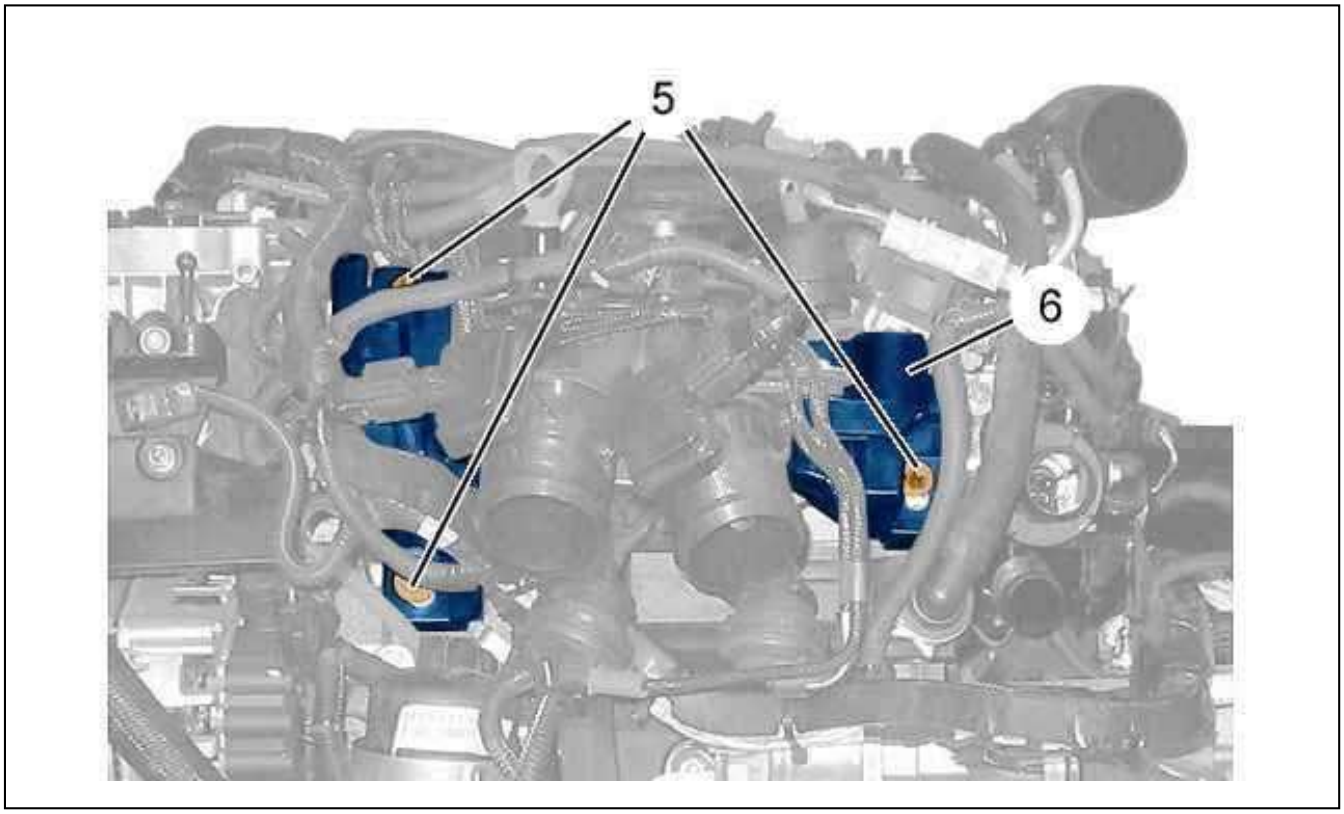


Figure : A1BM077D

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Slacken the mountings (5) sufficiently to allow lateral movement of the support (6).

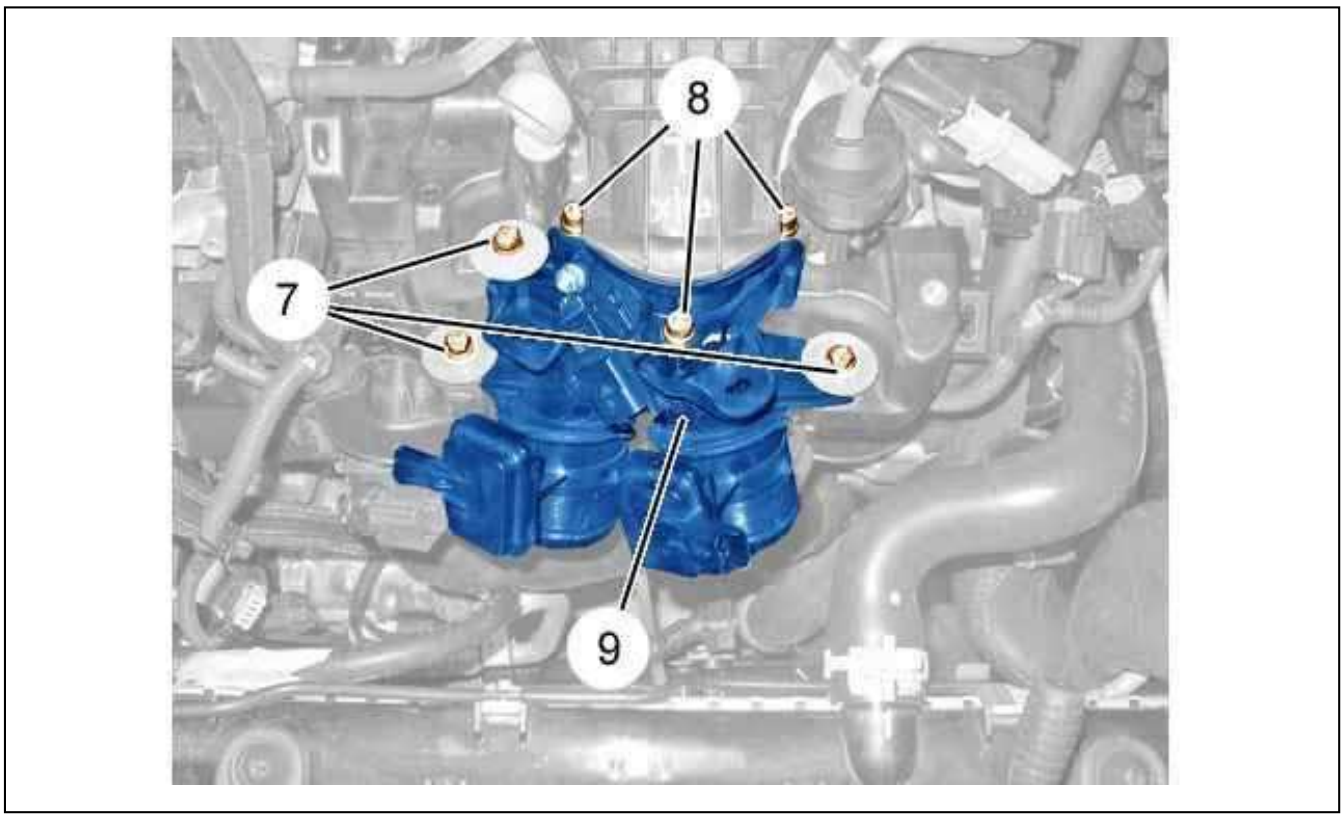
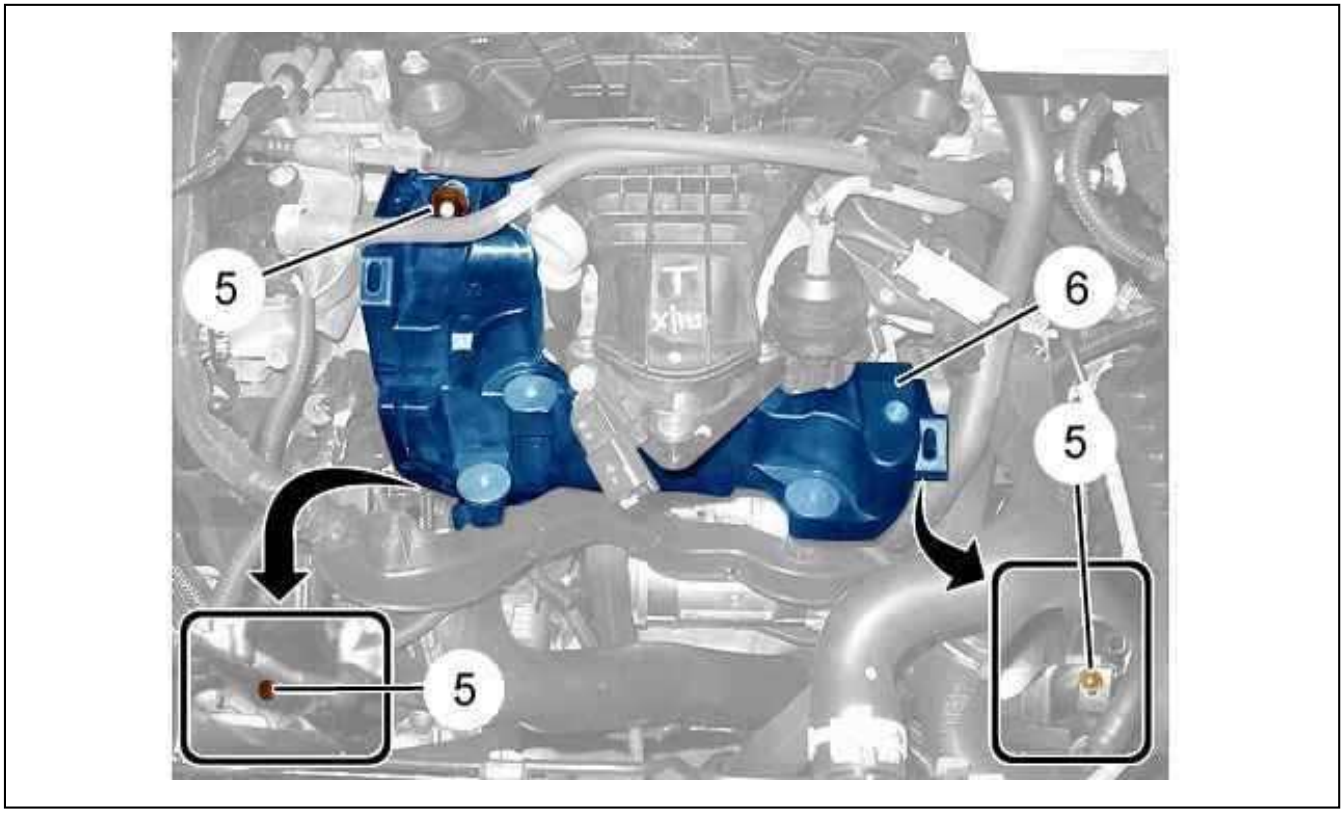


Figure : A1BM07AD

Remove :

- The screws (7) and (8)
- The inlet air metering unit (9)



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Figure : A1BM07JD

Unfasten and move aside : The electric harness transition duct .
Remove :

- The mountings (5)
- The support (6) for the inlet air metering unit

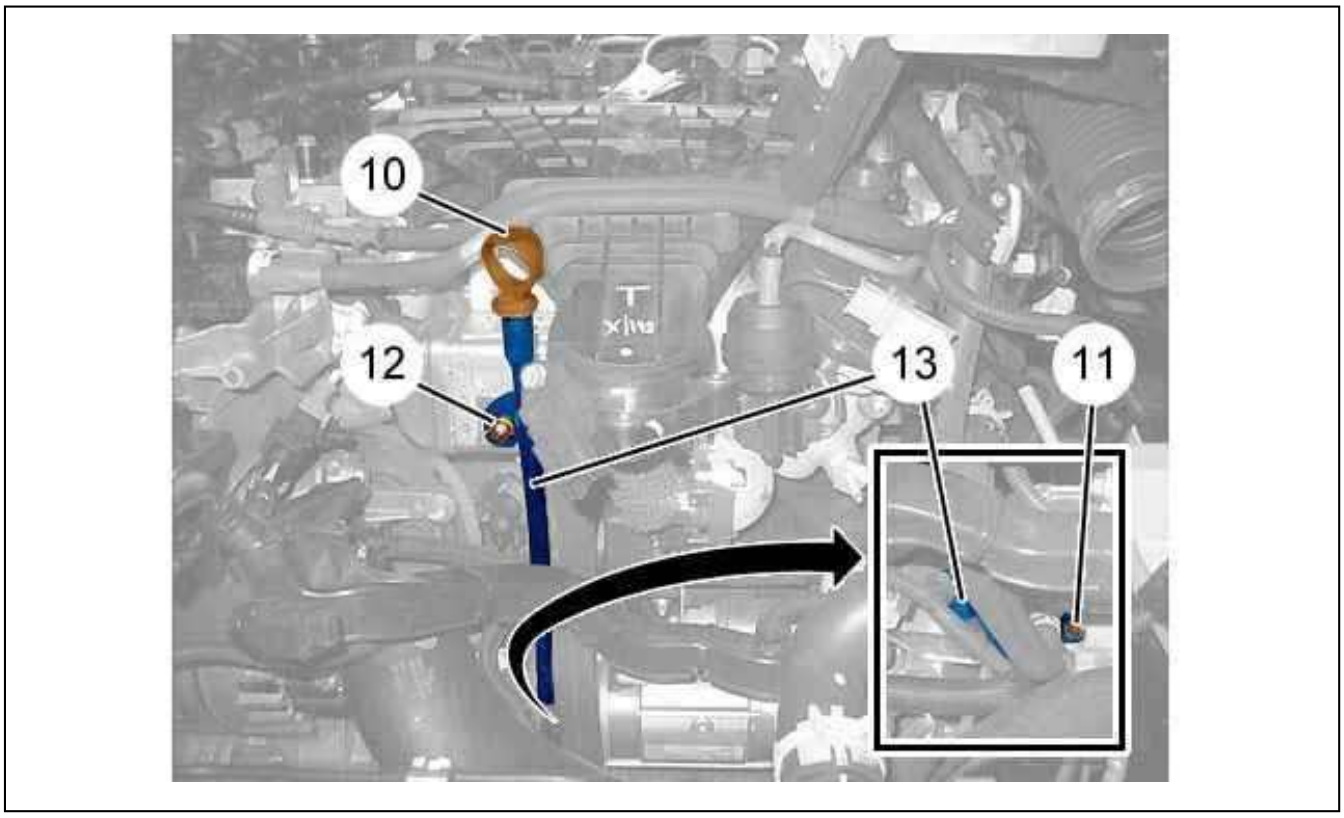


Figure : A1BM07KD

Remove :

- The engine oil dipstick (10)
- The dipstick tube mounting bolt (11)
- The nut (12)
- The engine oil dipstick guide tube (13)

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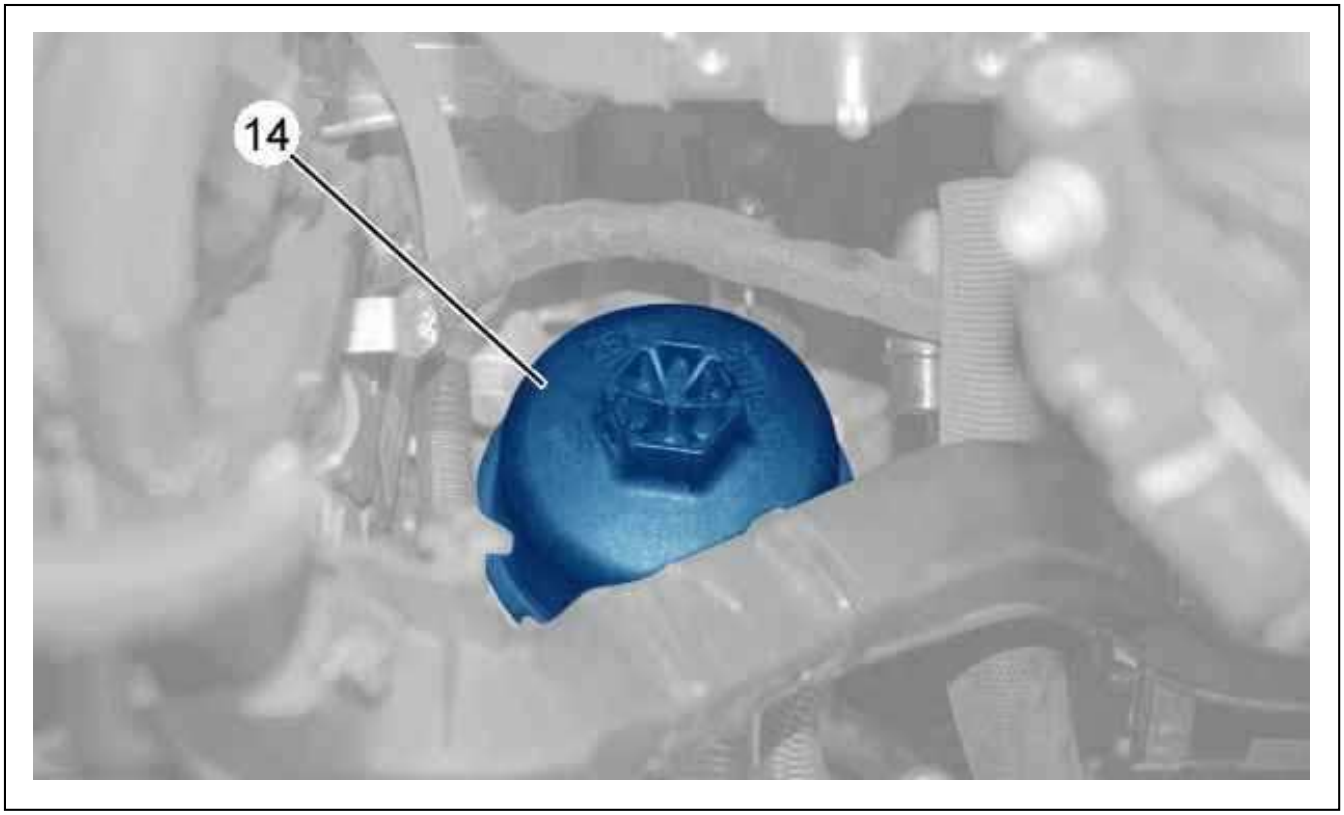


Figure : A1BM07LD

Remove : The engine oil filter cover (14).

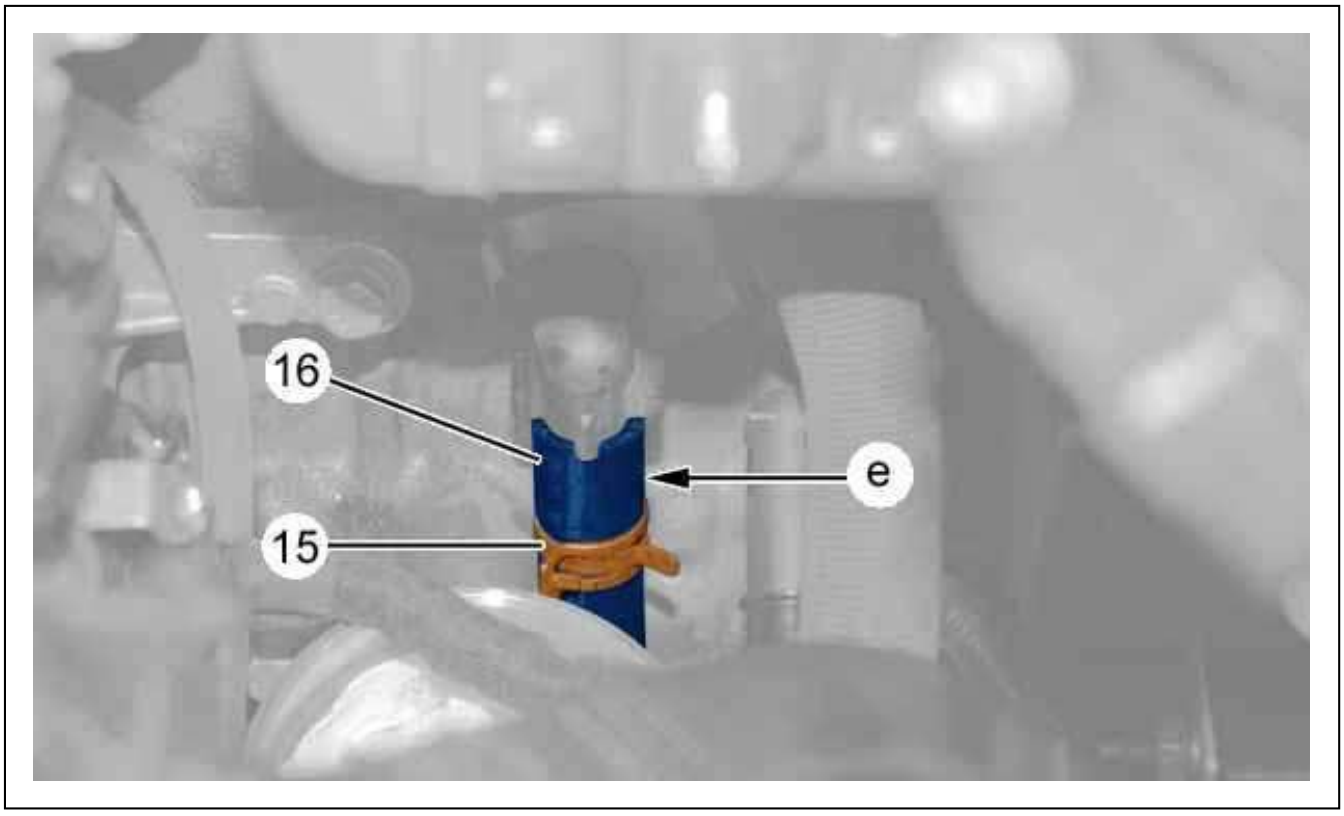


Figure : A1BM07MD

Release : The clip (15) securing the coolant pipe (16) (at "e").

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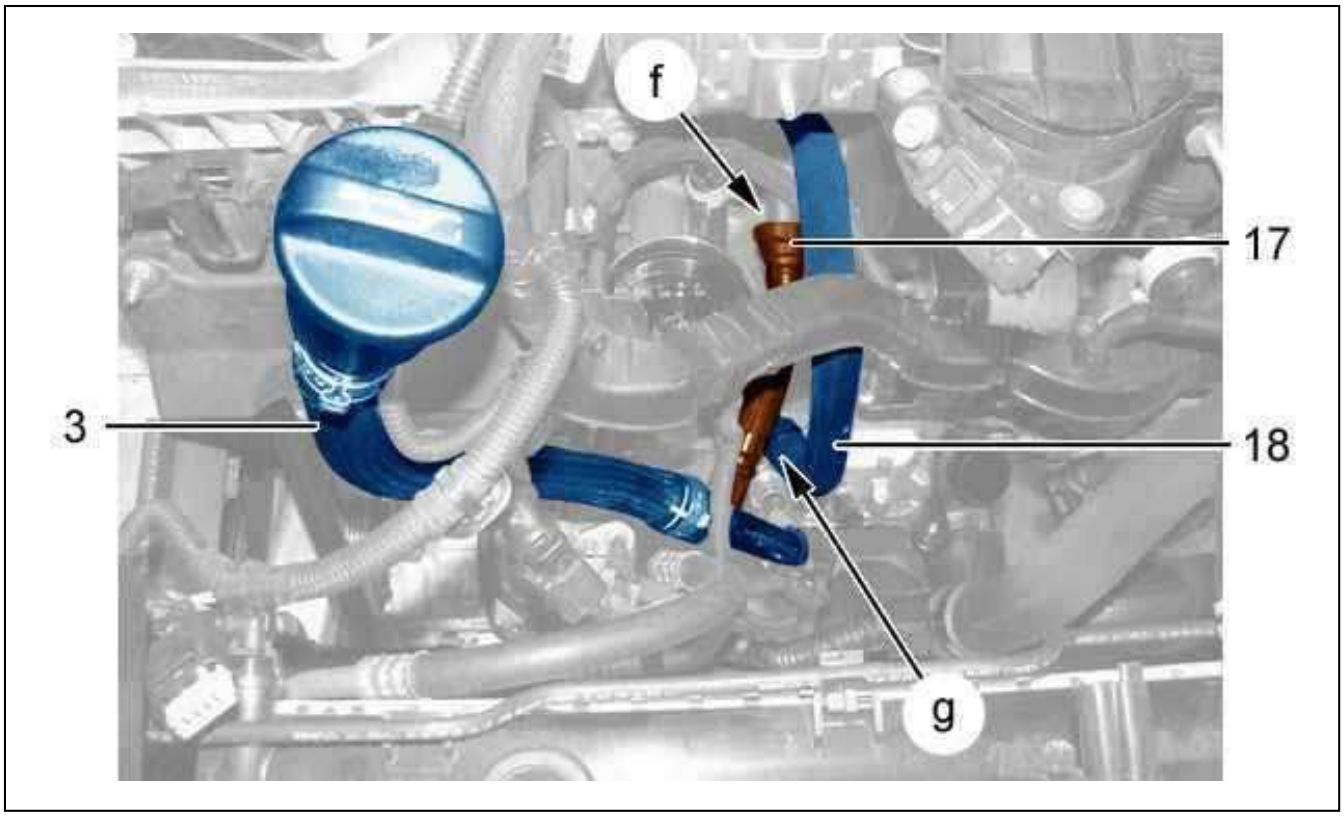


Figure : B1FG057D

Uncouple :

- The hose (17) on the engine oil filler neck (3) (at "f")
- The coolant pipe (18) (at "g")

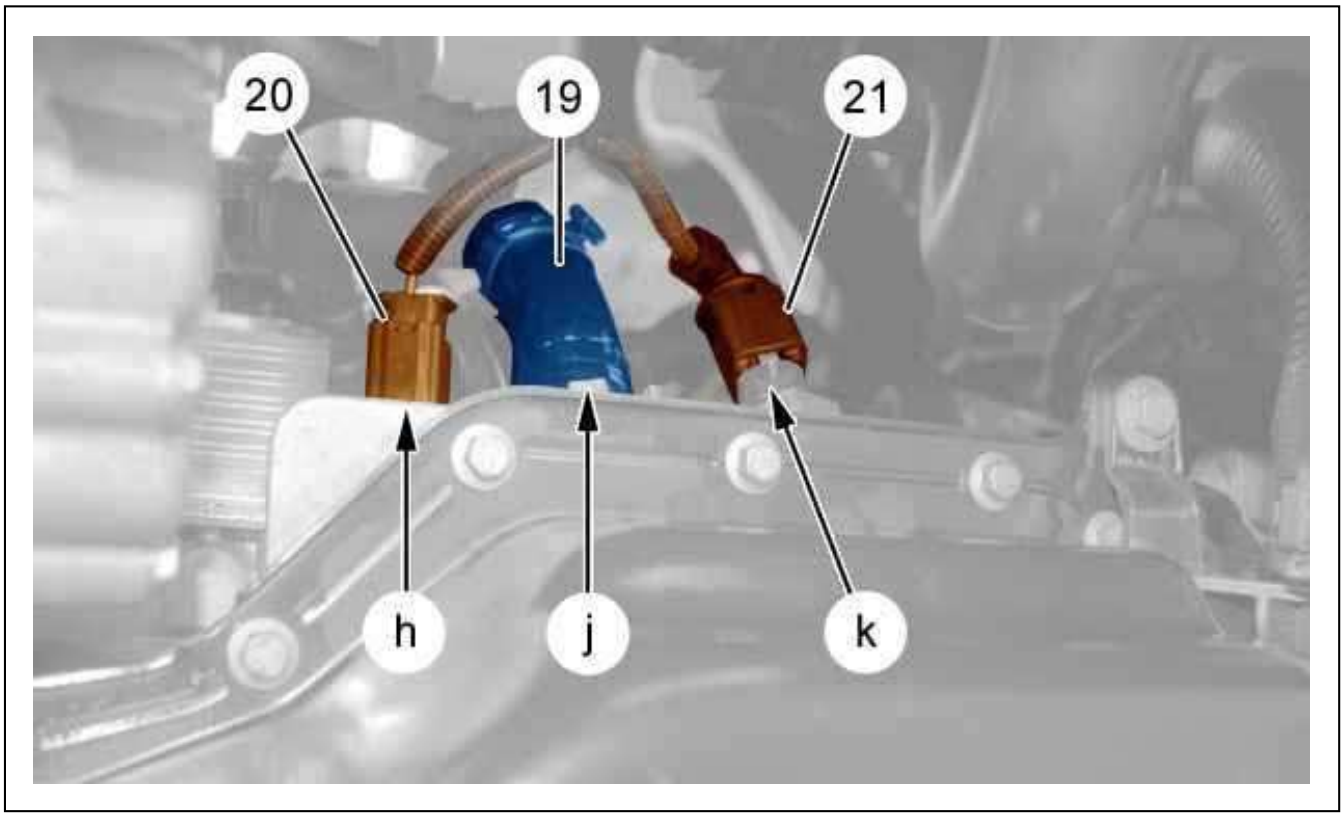


Figure : B1FG058D

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Disconnect and move aside ; Using a thin screwdriver :

- The connector (20) (at "h")
- The connector (21) (at "k")

Uncouple the hose (19) from the engine oil filler neck (3) (at "j").

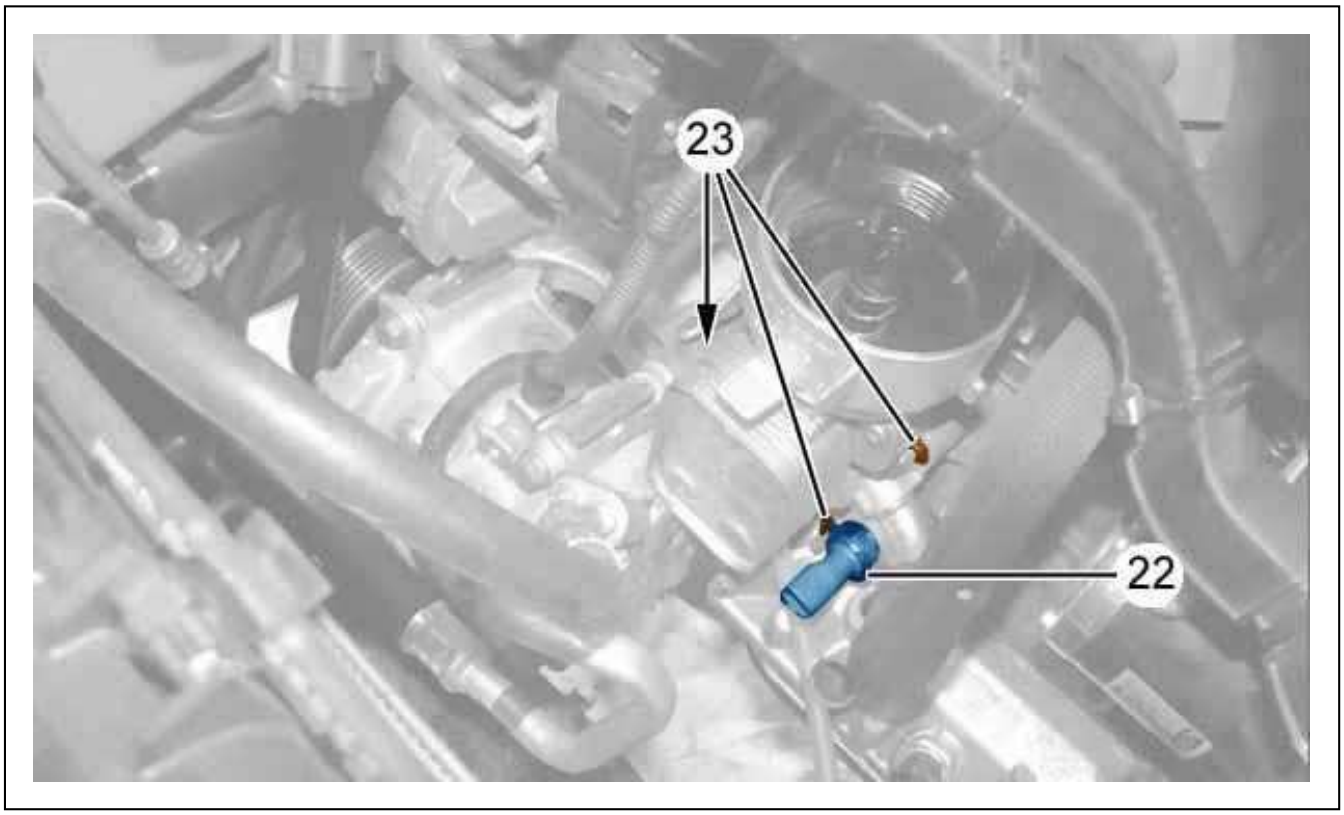


Figure : A1BM07PD

Remove :

- The oil pressure switch (22)
- The nuts (23)

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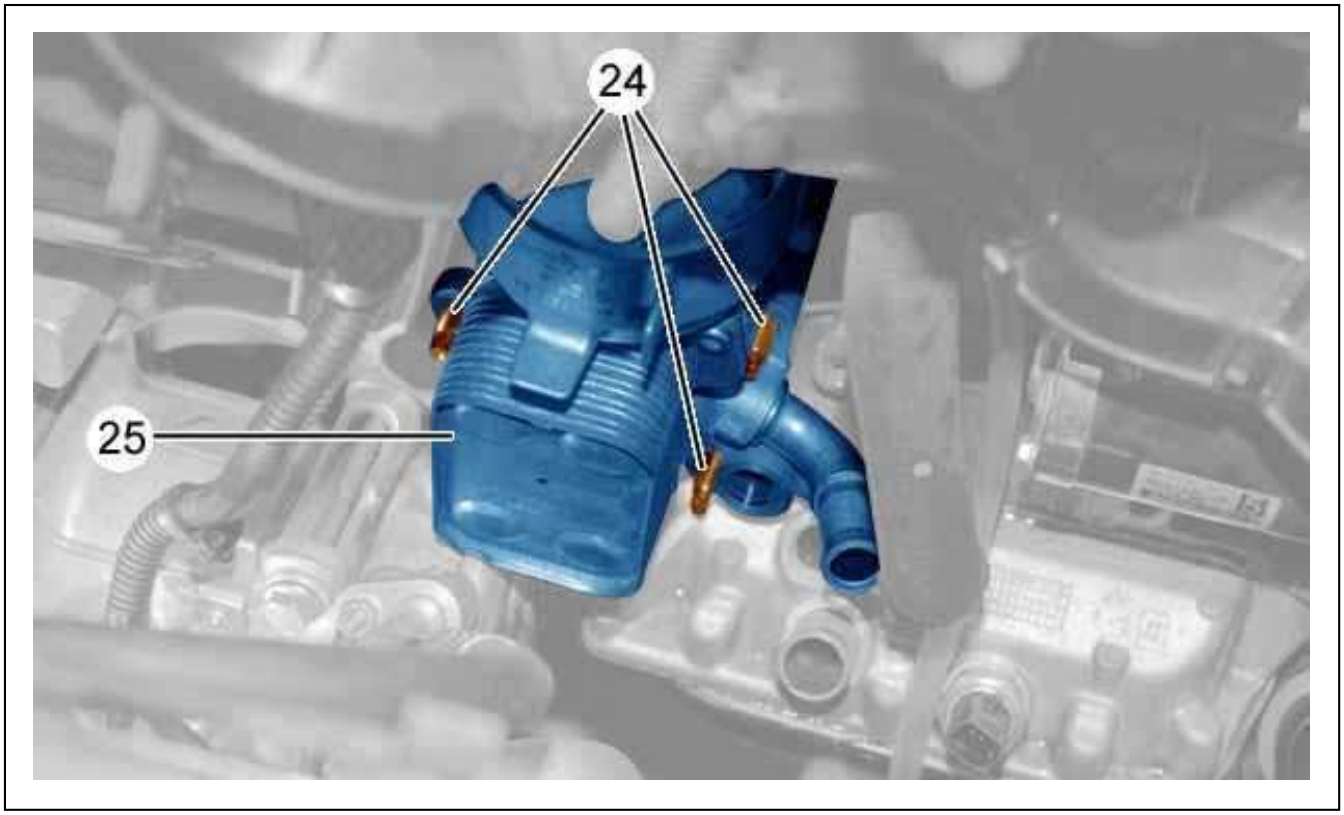


Figure : A1BM07QD

Remove :

- The studs (24)
- The oil filter support (25)

3. Refitting

CAUTION : Adhere to the tightening torques .

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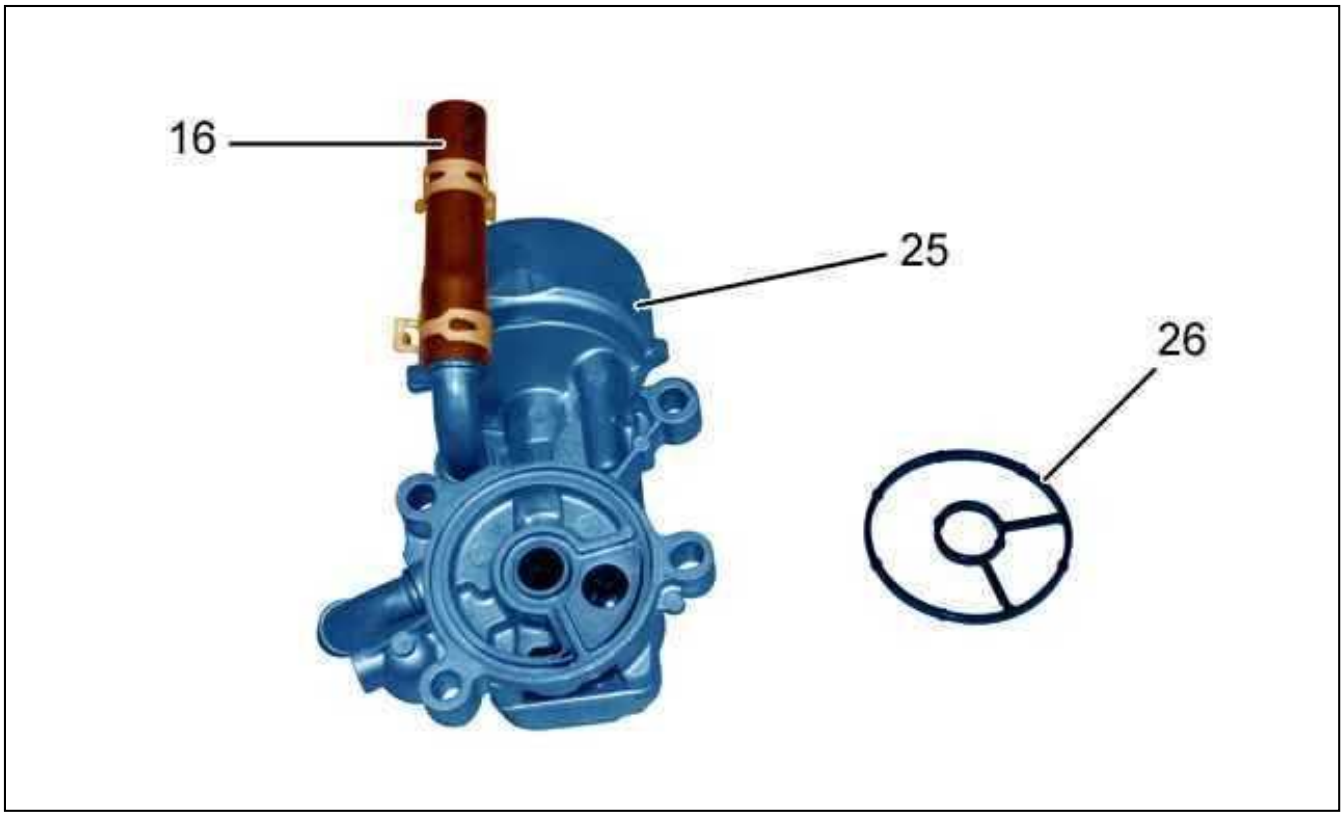


Figure : A1BM07RD

Replace :

- The seal (26) of the oil filter support (25)
- The coolant pipe (16)

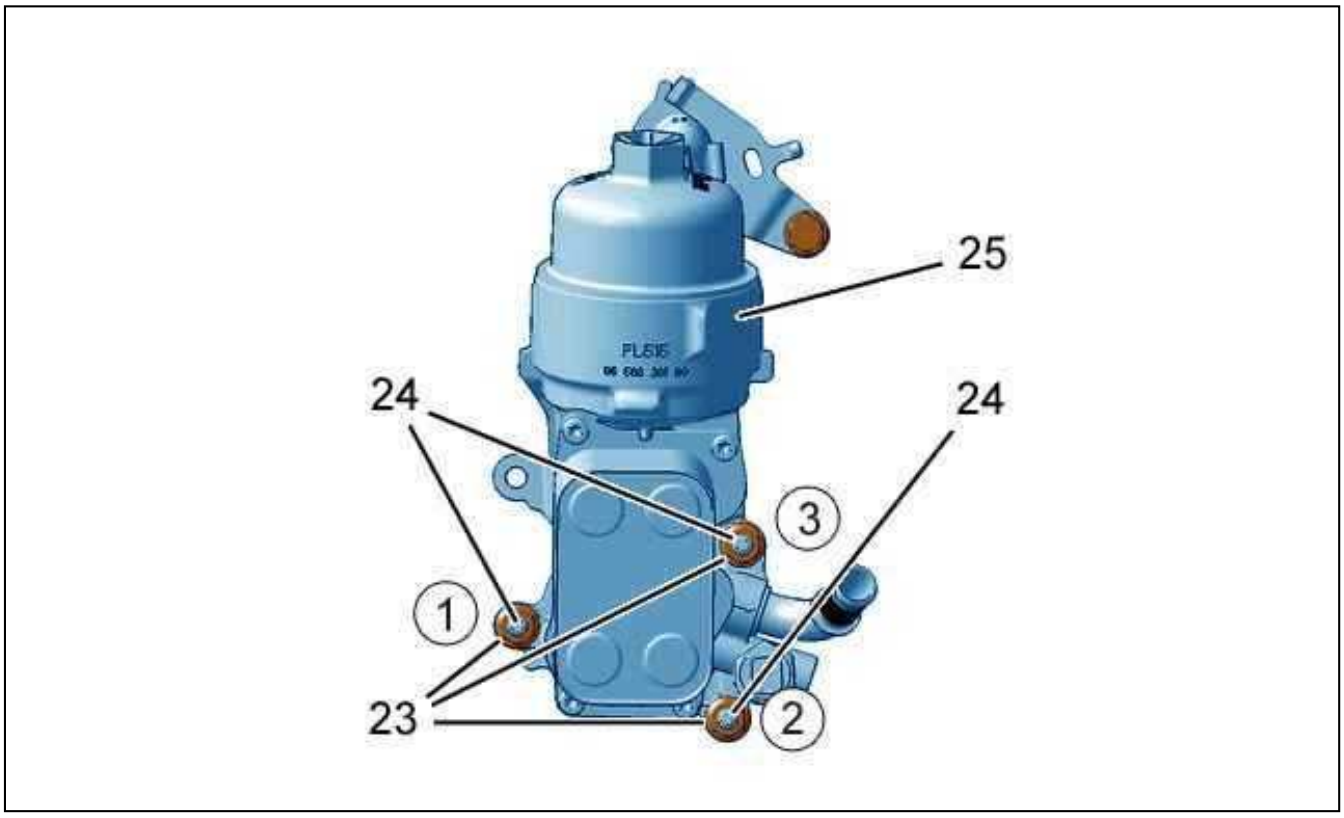


Figure : A1BM07VD

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CAUTION : Keep to the sequence of tightening as well as the tightening torques.

Refit : The oil filter bracket (25).
Couple up the coolant hose (16) (at "e").
Reposition the clip (15) on the coolant hose (16).
Refit :

- The studs (24)
- The nuts (23)
- The engine oil pressure switch (22) complete with a new seal

Reconnect :

- The connector (20) (at "h")
- The connector (21) (at "k")

Couple up :

- The hose (19) on the engine oil filler neck (3) (at "j")
- The coolant pipe (18) (at "g")
- The hose (17) on the engine oil filler neck (3) (at "f")

Replace the engine oil filter.

CAUTION : Lubricate the O-ring seals of the engine oil dipstick guide tube (13) and of the engine oil filter cover (14) with engine oil.

Refit :

- The engine oil filter cover (14) (equipped with a new seal)
- The engine oil dipstick guide tube (13)
- The nut (12)
- The dipstick tube mounting bolt (11)
- The engine oil dipstick (10)
- The support for the inlet air metering unit (6)
- The mountings (5) (without tightening)

Clip the electrical harness sheath .

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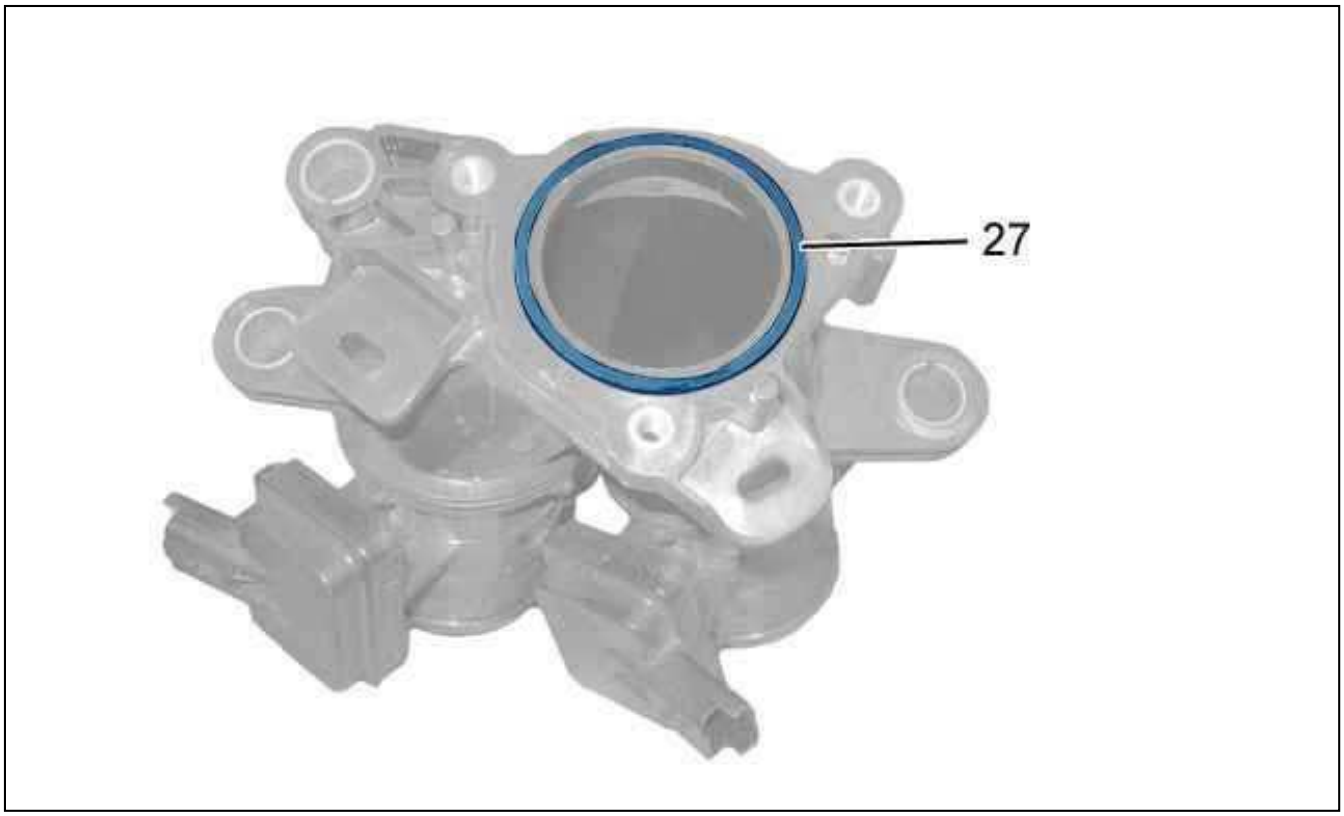


Figure : A1BM07WD

CAUTION : Check the condition of the seal (27) on the inlet air mixer unit (9); Exchange it if necessary.

Position :

- The seal (27) on the inlet air mixer unit (9)
- The inlet air metering unit (9)

Tightening procedure : The inlet air mixer unit and its support :

- Tighten the mountings (5) by hand ; The support (6) must be properly seated, allowing lateral movement
- Tighten the bolts (8) to torque
- Tighten the bolts (7) to torque
- Tighten the mountings (5) to the specified torque

Couple up :

- The vacuum pipes (at "d")
- The inlet air union (2)

Clip in place :

- The vacuum pipes (4)
- The electrical harness (1)
- The engine oil filler spout (3) (at "c")

Reconnect :

- The inlet air mixer sensor (at "a")
- The inlet air pressure/temperature sensor (at "b")

CAUTION : Remove the protection on the cooling radiator.

Check the engine oil level ; Top up the engine oil (if necessary).

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4. Additional operations

Fill and bleed the cooling system.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Start the engine.
Verify :

- The sealing of the engine cooling system
- The operation of the cooling fan

Refit :

- The protective panel under the engine
- The engine cover

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REMOVING - REFITTING : OIL FILTER

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : The oil filter must be replaced after the engine has been drained.

1. Recommended tools

Oil filter spanner (type Facom U46CL).

2. Removing

Drain the engine oil circuit.

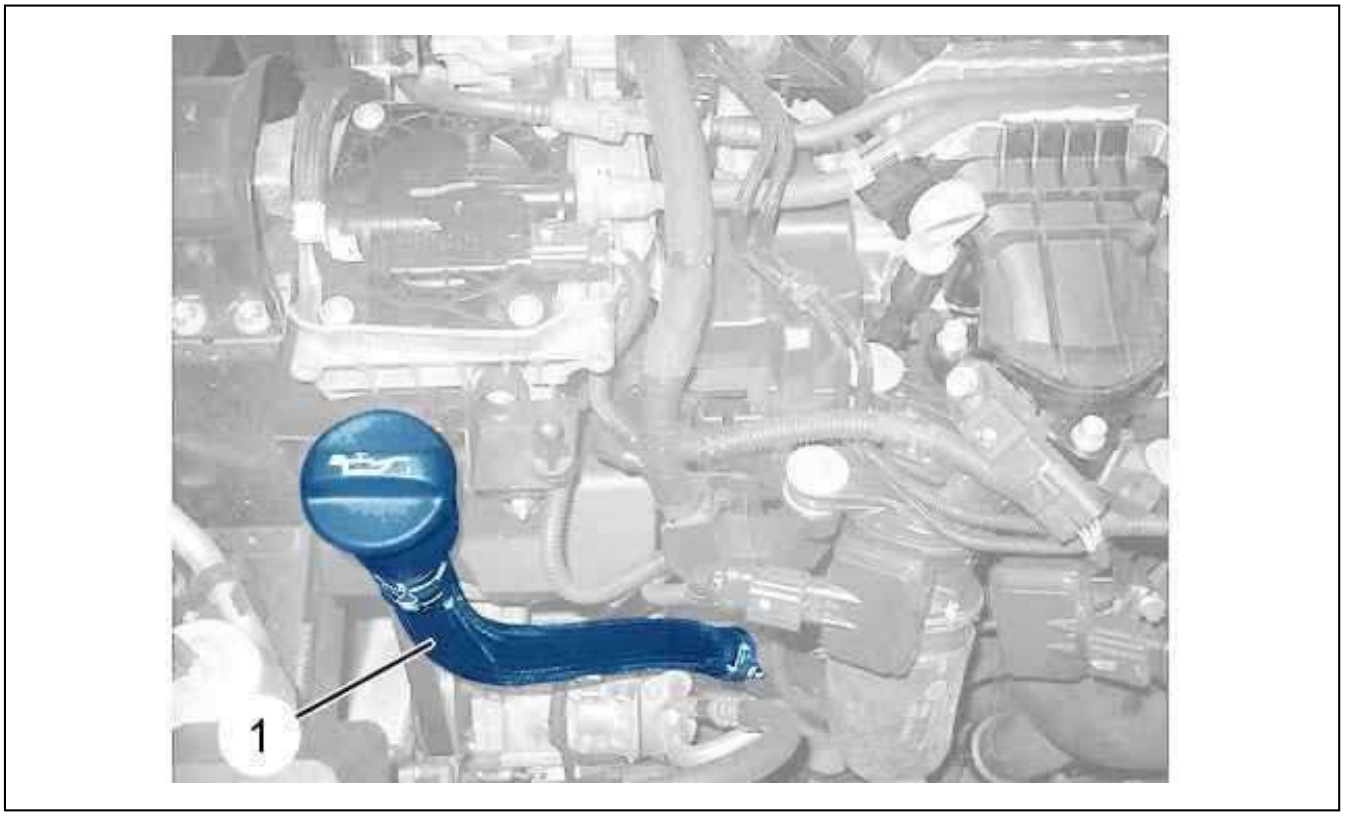


Figure : B1FG05OD

Remove the engine style cover .
Unfasten and move aside the engine oil filler neck (1).

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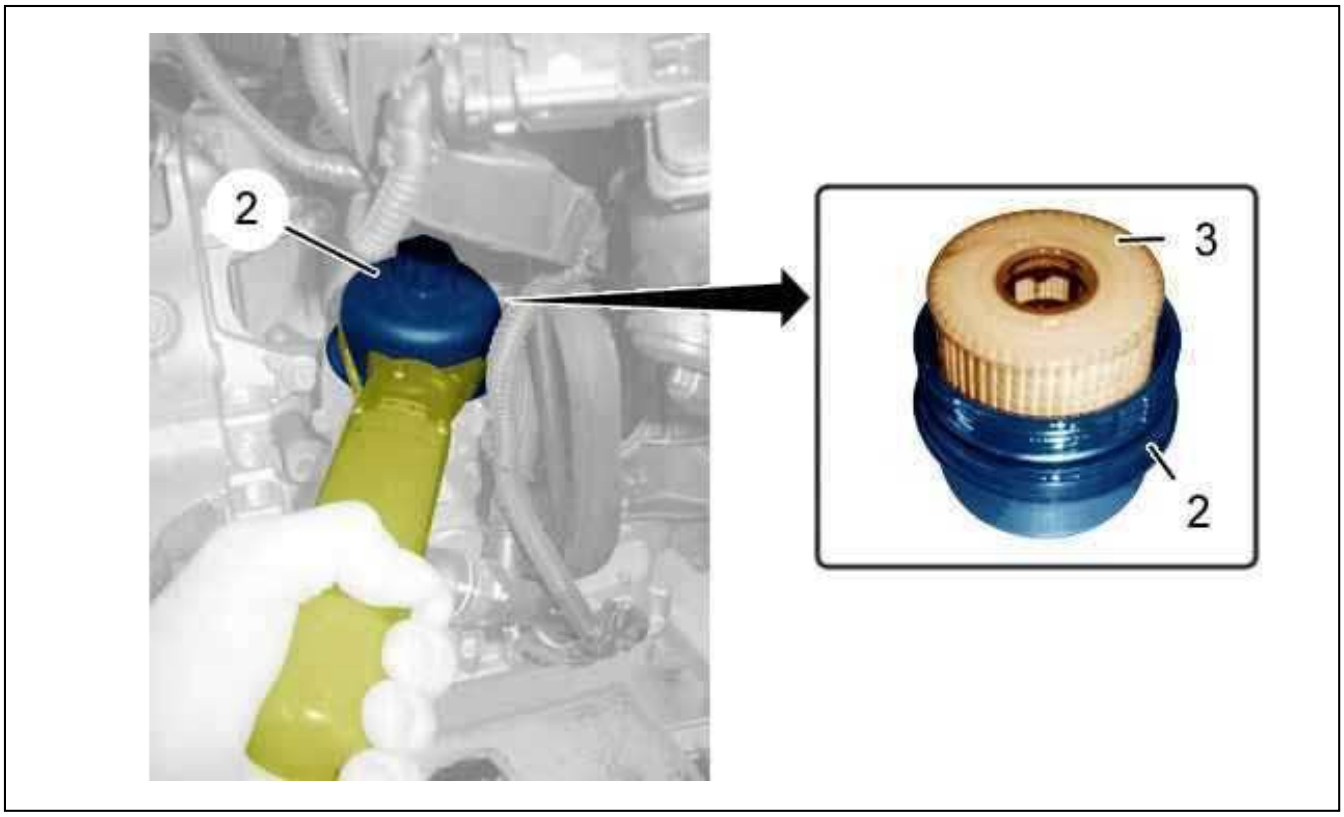


Figure : B1FG05RD

Remove : The oil filter cover (2) ; Using the oil filter wrench (type Facom U46CL).
Separate the filter element (3) from the cover (2).

3. Refitting

CAUTION : Always replace the filter element and its seal.

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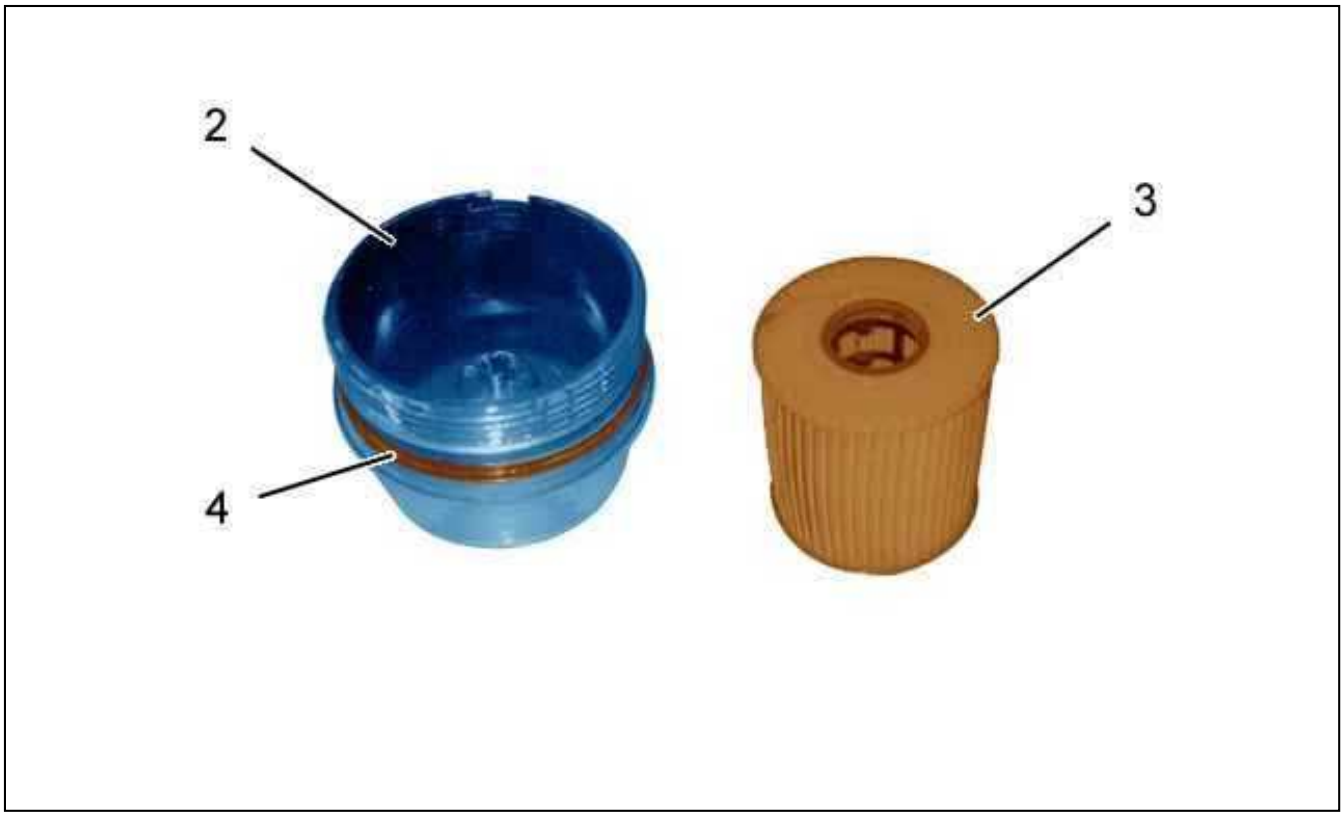


Figure : B1FG05UD

Replace the seal (4) on the cover (2).
Lubricate the seal (4) ; With engine oil .
Refit the new filter element (3) on the cover (2).
Refit the cover (2) ; Using the oil filter wrench (type Facom U46CL).

CAUTION : Clean any drips of oil.

Clip in place : The engine oil filler spout (1).
Fill the engine oil and check the level.
Refit the engine style cover .

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REMOVING - REFITTING : OIL PRESSURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Disconnect the battery.
Lift and support the vehicle.
Remove the under engine protection .

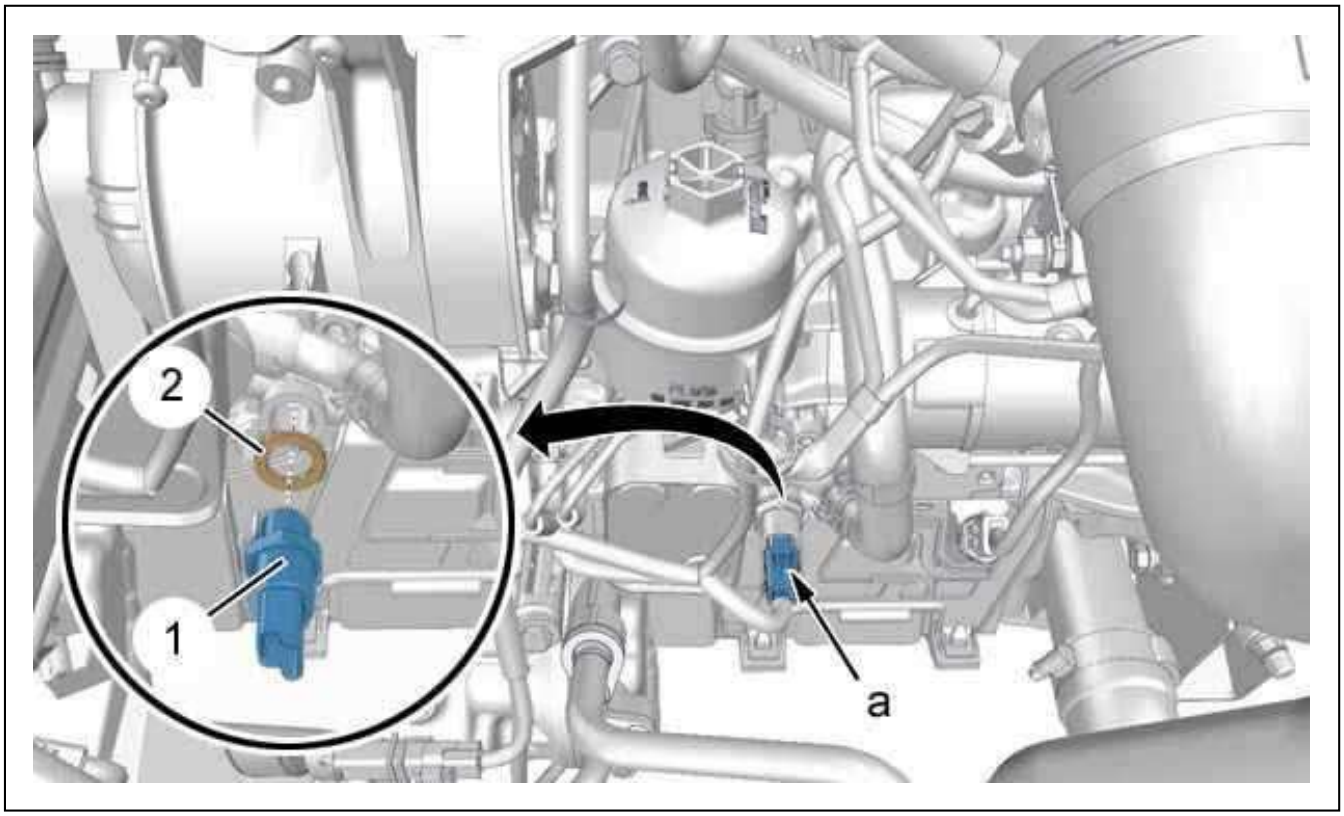


Figure : B1FG00JD

Disconnect the connector (at "a").

CAUTION : Recover the excess oil using a tray.

Remove :

- The oil pressure sensor (1)
- The seal (2)

2. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Always replace the seal (2).

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Refit :

- The seal (2) (new)
- The oil pressure sensor (1) ; Tighten to the specified torque

Connect the connector (at "a").
Refit the under-engine protection .
Top up the engine oil (If necessary).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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REMOVING - REFITTING : OIL SEPARATOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Put the vehicle on a hoist.
Remove the engine style cover .
Disconnect the battery.

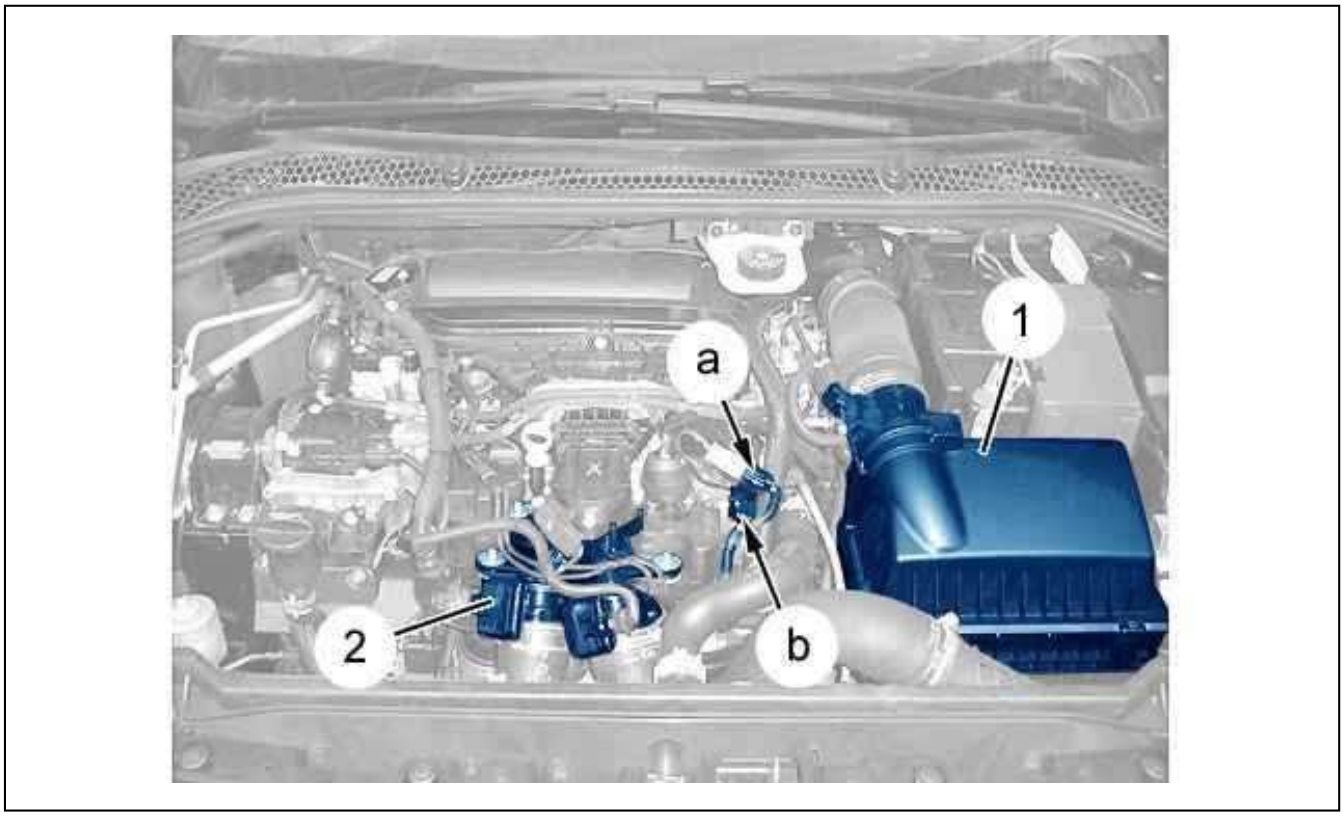


Figure : B1BG169D

CAUTION : Protect the engine cooling radiator to prevent damage to the fins.

Disconnect the connectors (at "a", "b").
Remove :

- The air filter housing (1) with the air flow sensor
- The inlet air metering unit (2)

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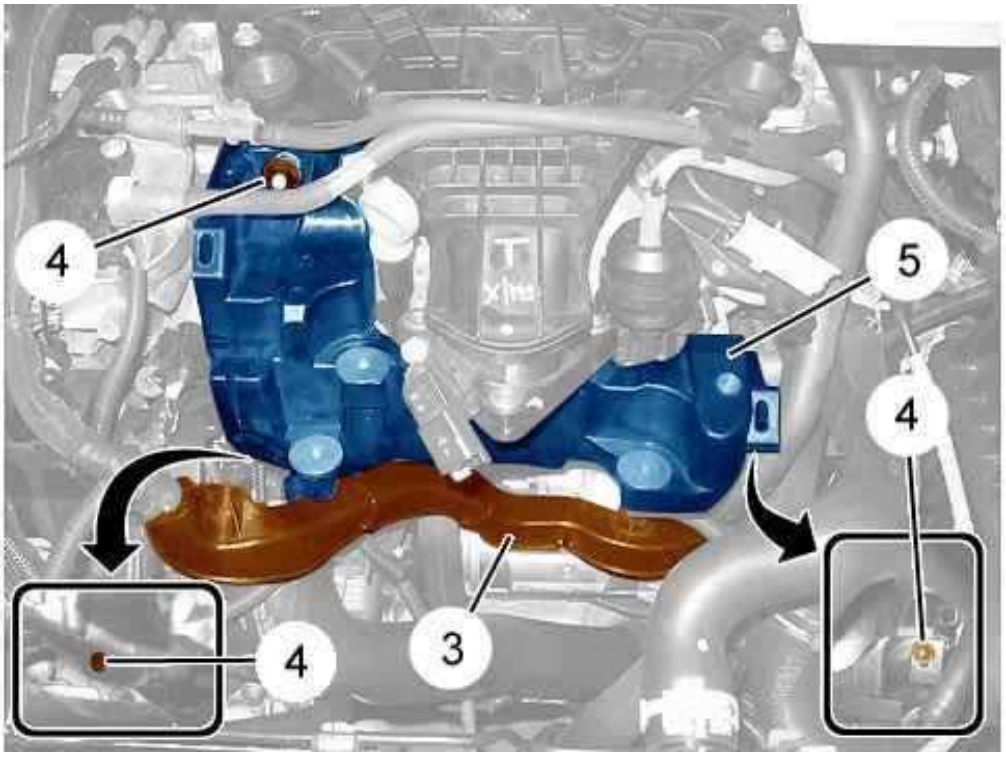
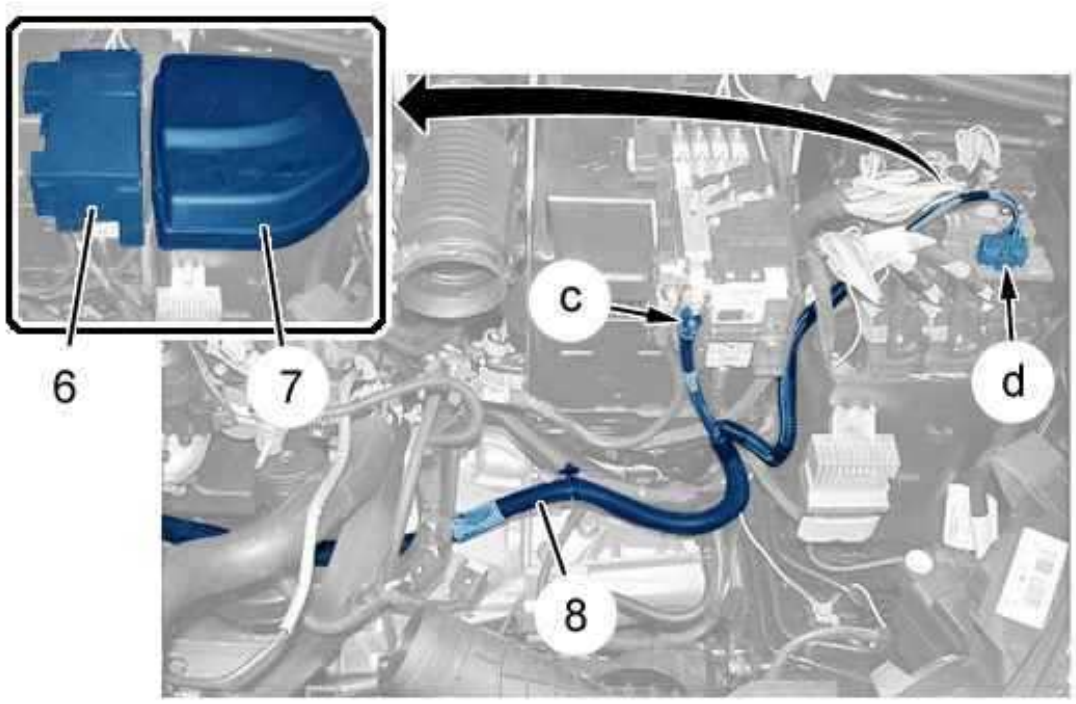


Figure : B1BG16AD

Unclip the electrical harness sheath (3) and move it aside.
Remove :

- The mountings (4)
- The inlet air mixer unit support (5)



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Figure : B1BG16BD

Remove the covers (6), (7).
Unplug :

- The positive supply (at "c")
- The connector (at "d")

N.B. : Release the electrical harness (8) in order to make it easier to remove the starter and oil filler orifice.

CAUTION : Refit the covers (6), (7) ; Risk of short circuit.

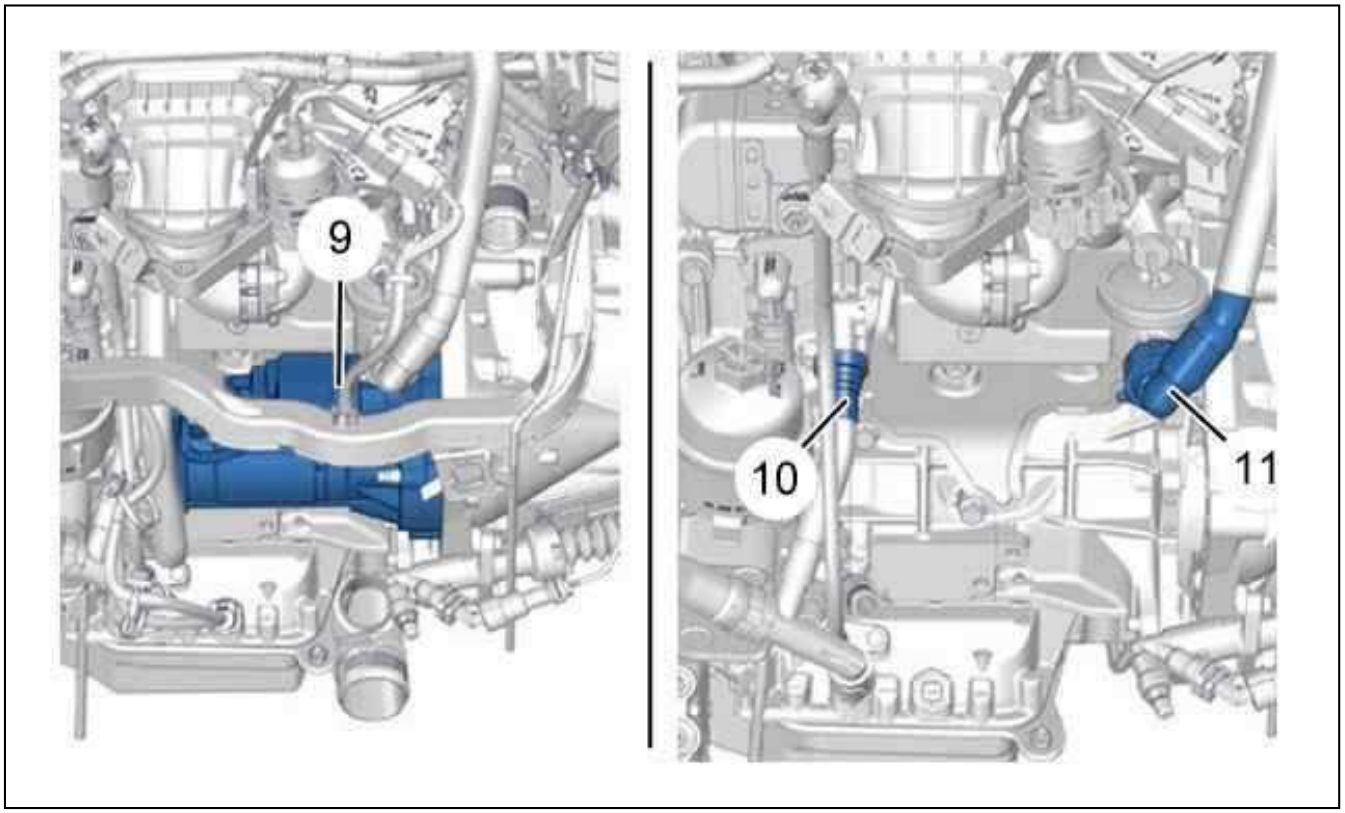


Figure : B1BG16CD

Remove the starter motor (9) .
Uncouple the connectors (10), (11).

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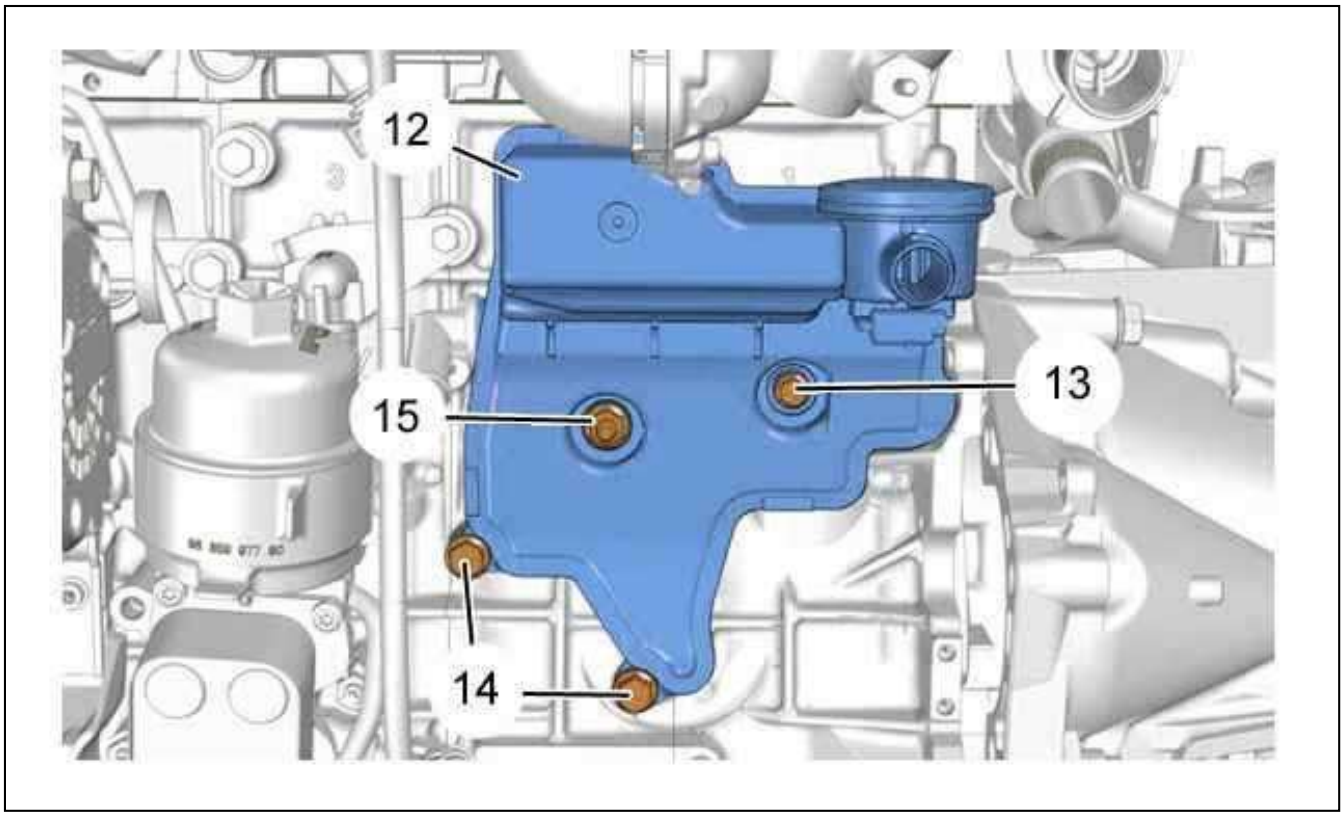


Figure : B1FG02GD

Remove :

- The stud and nut assembly (15)
- The bolts (14)
- The (13) bolt

Disconnect the oil filler orifice (12), then remove it carefully from above.

2. Preparation

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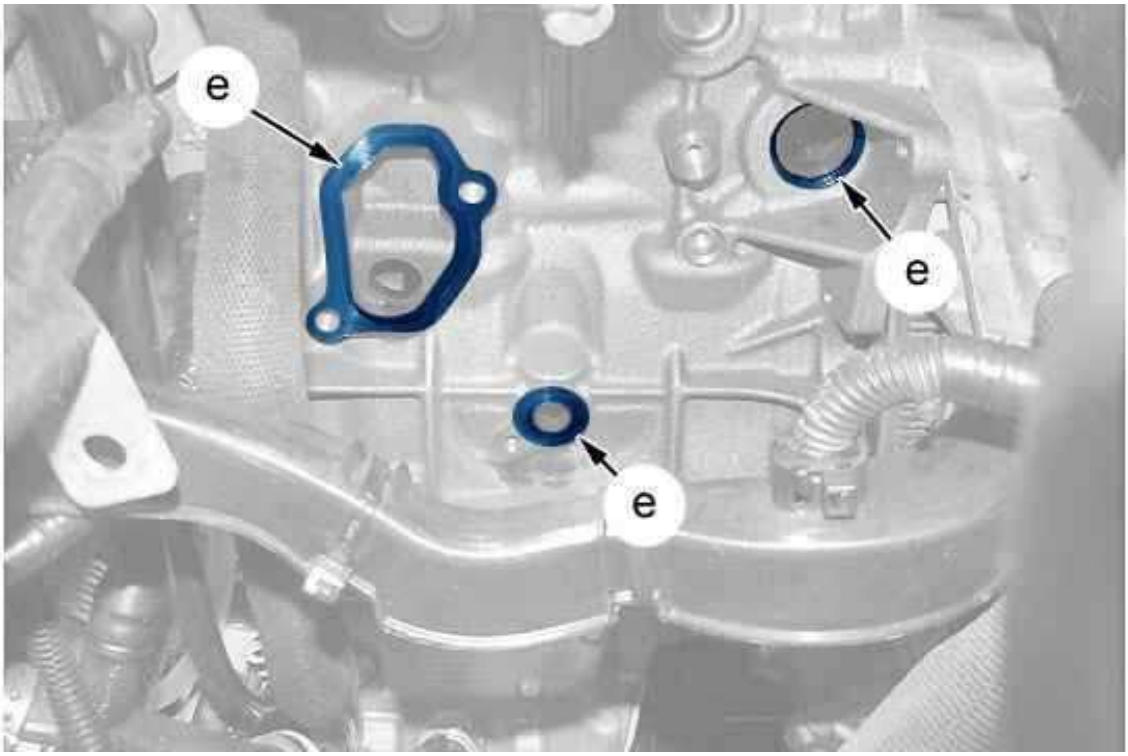


Figure : B1FG02HD

Before refitting :

- Check the appearance of the sealing surfaces (No cuts, scrapes, scratches)
- Clean the joint faces (at "e") ; With a suitable special product (Refer to the products catalogue)

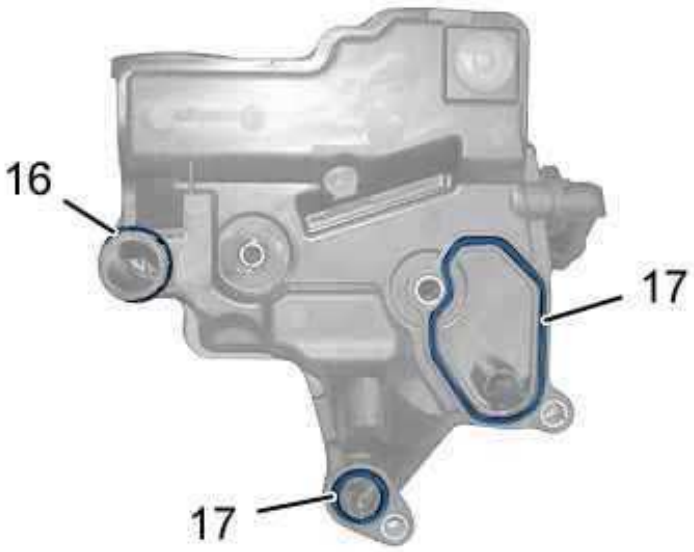


Figure : B1FG02ID

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Before refitting :

- Check there are no leaks on the part
- Check the appearance of the sealing surfaces (No cuts, scrapes, scratches)
- Check the internal cleanness of the part, that there are no foreign bodies, the interfaces of the manifold (Cylinder head - Cylinder head cover, …)
- Replace the seals (16), (17) with new seals

Do nothing to the components of the part.

3. Refitting

CAUTION : Adhere to the tightening torques .

Lubricate the seal (16) ; Use clean engine oil.
Refit :

- The oil sediment unit (12) (Carefully)
- The stud and nut assembly (15)
- The bolts (14)
- The (13) bolt

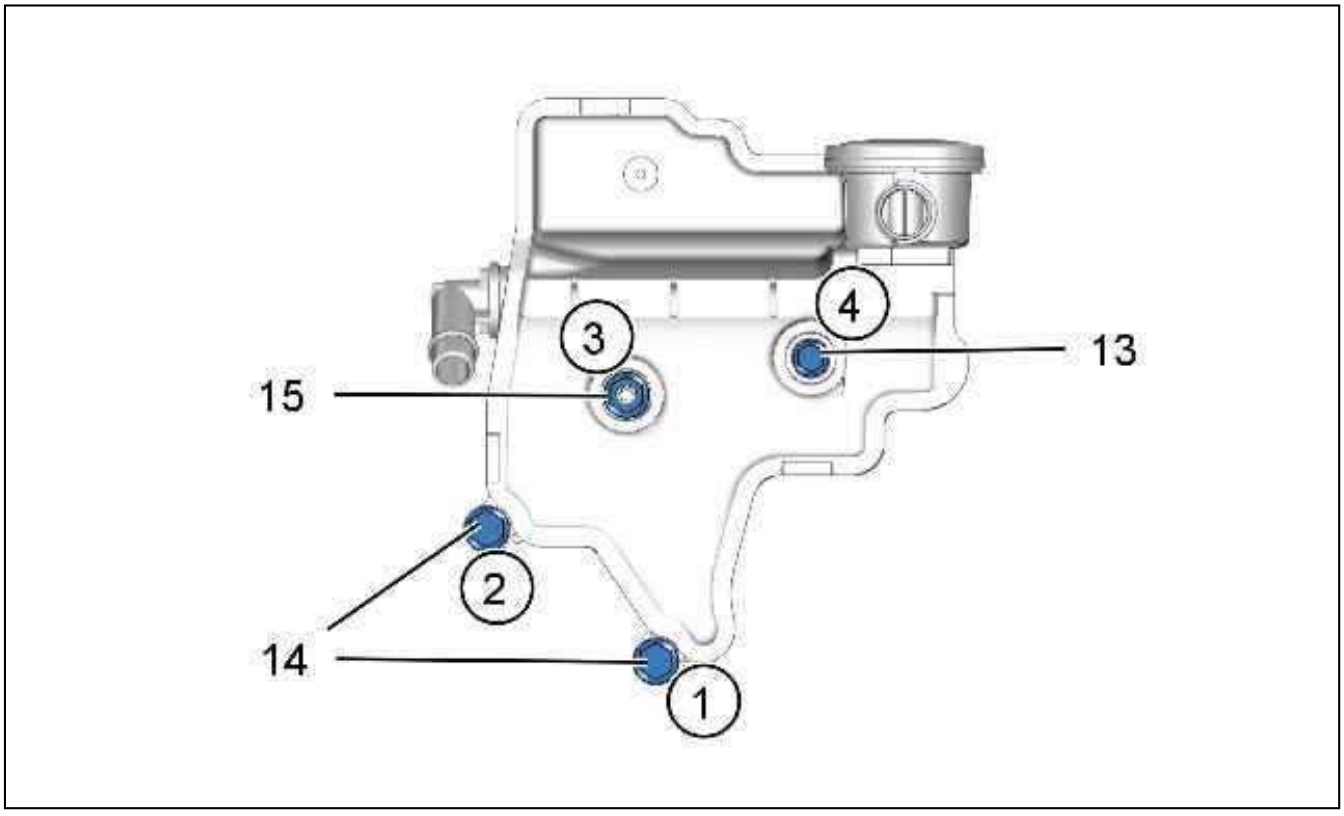


Figure : B1FG02JD

CAUTION : Respect the tightening sequence indicated.

Tightening procedure :

- Pre-tighten the fasteners (14), (15), (13) (by hand)
- Tighten the mountings (14), (15), (13) to the specified torque

Recouple the unions (10), (11).
Refit the starter (9) .

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Put the electrical harness in place (8).
Connect :

- The positive supply (at "c")
- The connector (at "d")

Refit :

- The covers (6), (7)
- The inlet air mixer unit support (5)
- The mountings (4) (without tightening)

Clip the electrical harness sheath (3).
Refit the intake air mixer unit (2) .
Refit the air filter housing (1) with the air flow sensor.
Connect the connectors (at "a", "b").

CAUTION : Remove the protection from the cooling radiator .

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Check

Check and top up the engine oil level (if necessary).
Start the engine.
Check there are no oil leaks.
Refit the engine style cover .

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REMOVING - REFITTING : COOLANT TEMPERATURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Remove the engine style cover .
Disconnect the battery.
Drain the engine cooling circuit .
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The air filter casing

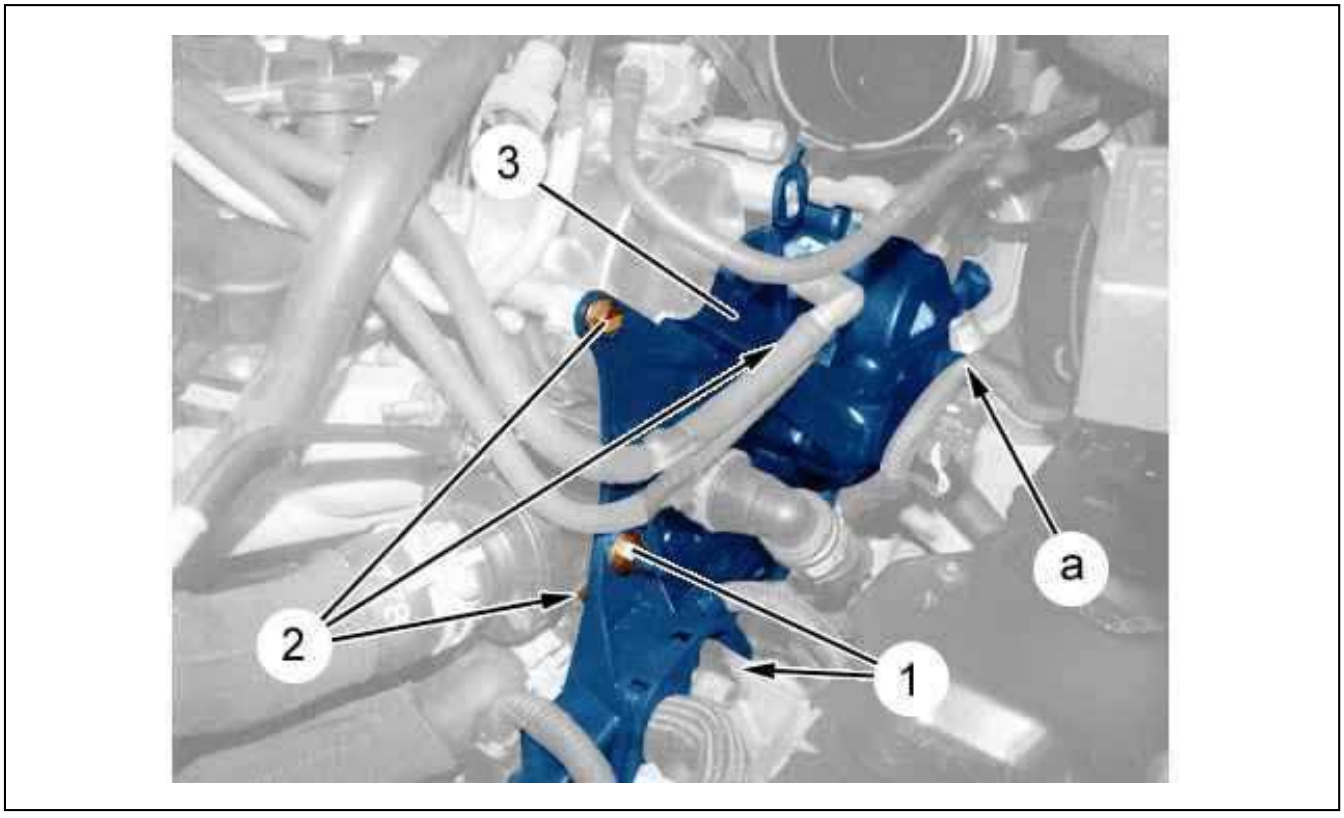


Figure : B1GG0JKD

Release and move aside the electrical harness (as "a").
Remove the nuts (1).
Move aside the electrical harness sheathing .
Remove :

- The fixing bolts (2) from the support (3)
- The bracket (3)

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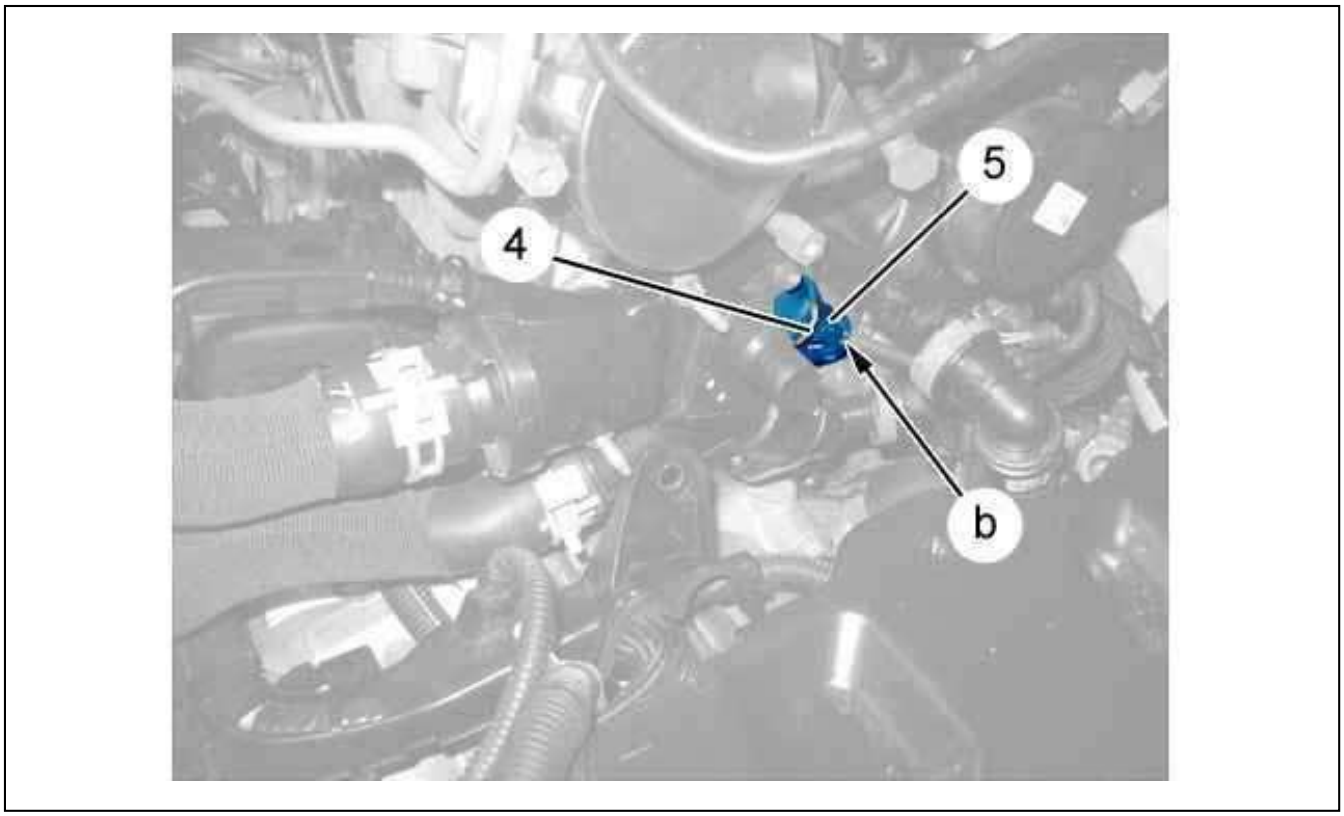


Figure : B1GG03JD

Disconnect the connector (as "b").
Remove :

- The clip (4)
- The coolant temperature sensor (5)

2. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : At refitting, all the removed seals must be replaced with new seals.

Refit :

- The coolant temperature sensor (5)
- The clip (4)

Connect the connector (as "b").
Refit :

- The bracket (3)
- The securing bolts (2)

Reposition the electrical harness sheathing.
Fit the nuts (1).
Clip the electrical harness (/)(as "a").
Refit :

- The air filter box
- The engine cover

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CAUTION : Perform the operations to be carried out following reconnection of the battery.

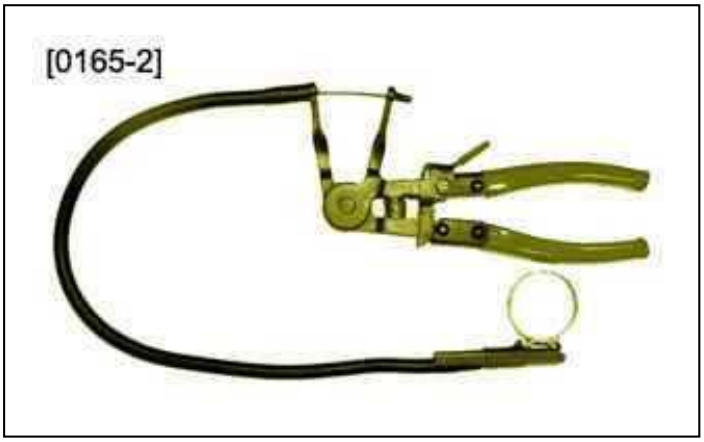
Reconnect the battery.
Carry out filling and bleeding of the coolant circuit and top up the level.
Refit the cabin air inlet manifold .

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REMOVING - REFITTING : COOLANT OUTLET HOUSING

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB0GVT	[0165-2]	Pliers for removing elastic clips

2. Removing

Put the vehicle on a hoist.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

Drain the cooling system.

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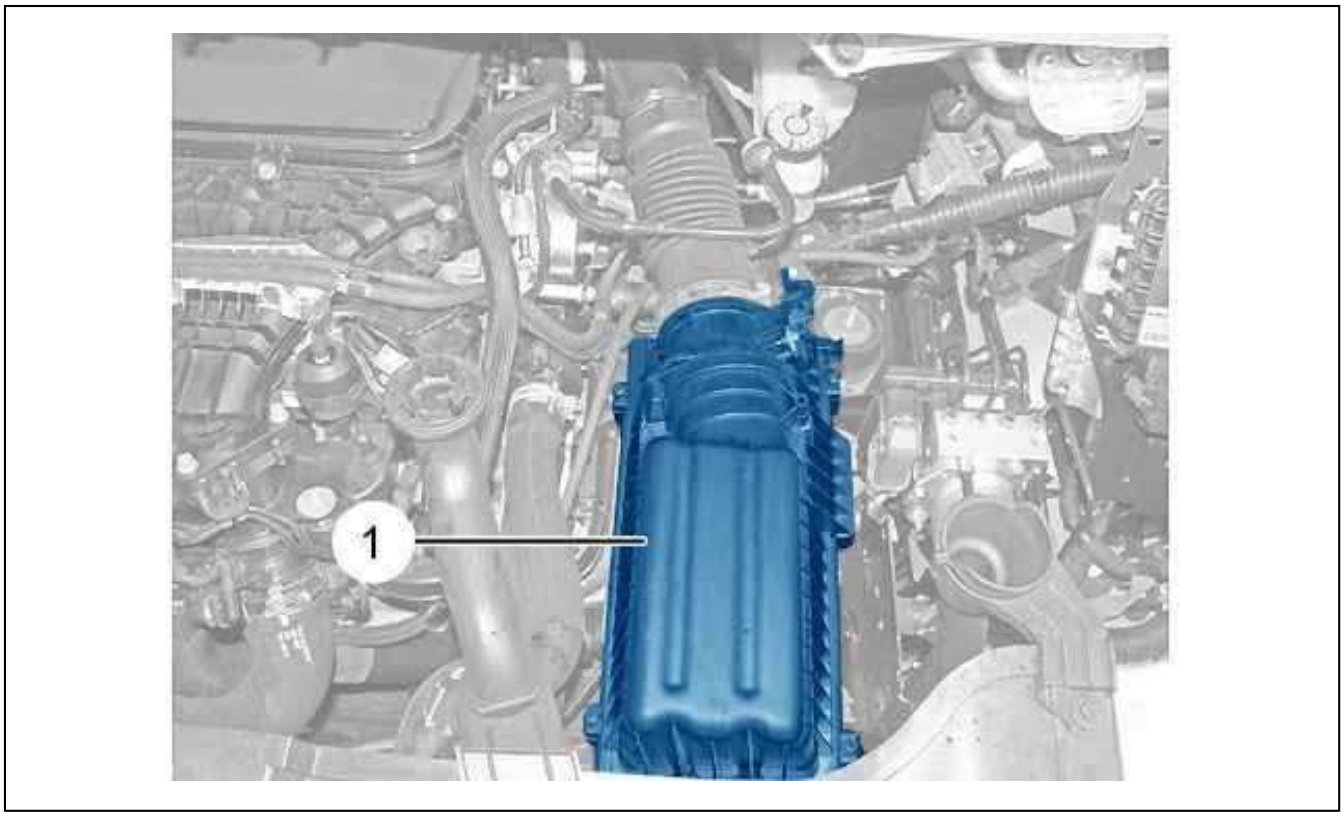


Figure : B1GG0LGD

Remove : The air filter housing (1) with the air flow sensor.

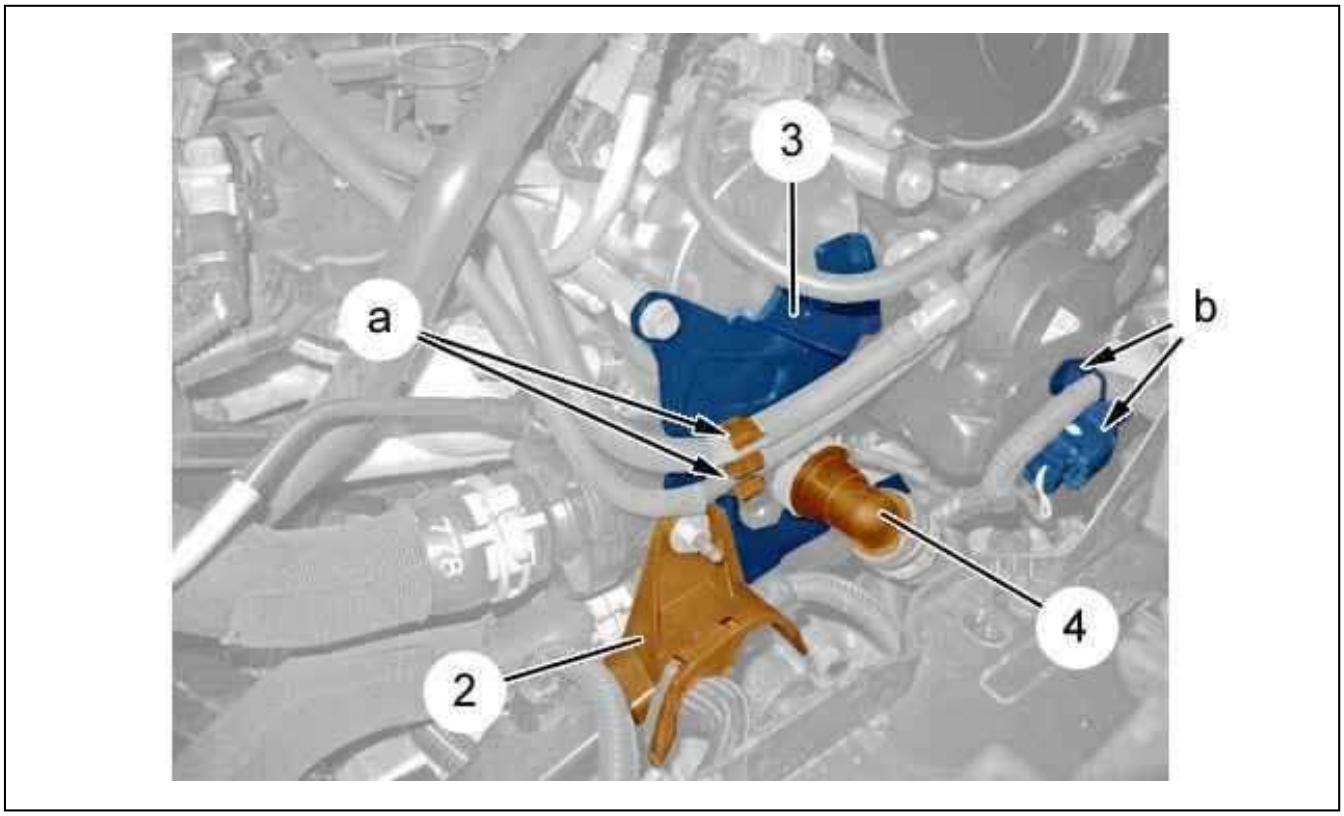


Figure : B1GG06FD

Unfasten and move aside :

- The low pressure fuel supply pipes (as "a")

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- The electrical harnesses (as "b")

Remove :

- The electric harness transition duct (2)
- The support plate (3)

Uncouple the coolant pipe (4).

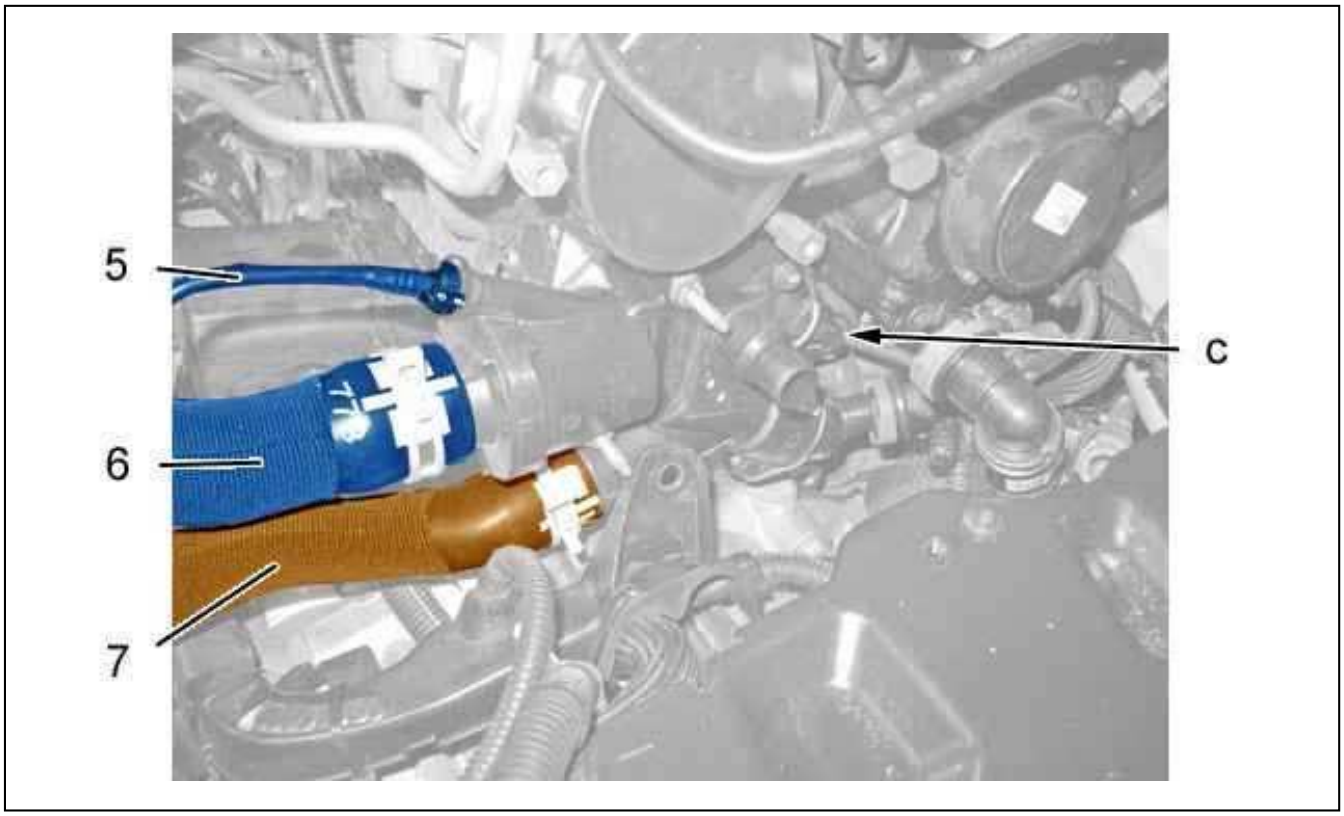


Figure : B1GG06GD

Uncouple :

- The venting tube (5) (According to version)
- The coolant hose (6) ; Using tool [0165-2]
- The coolant hose (7) ; Using tool [0165-2]

Disconnect the coolant temperature sensor (as "c").

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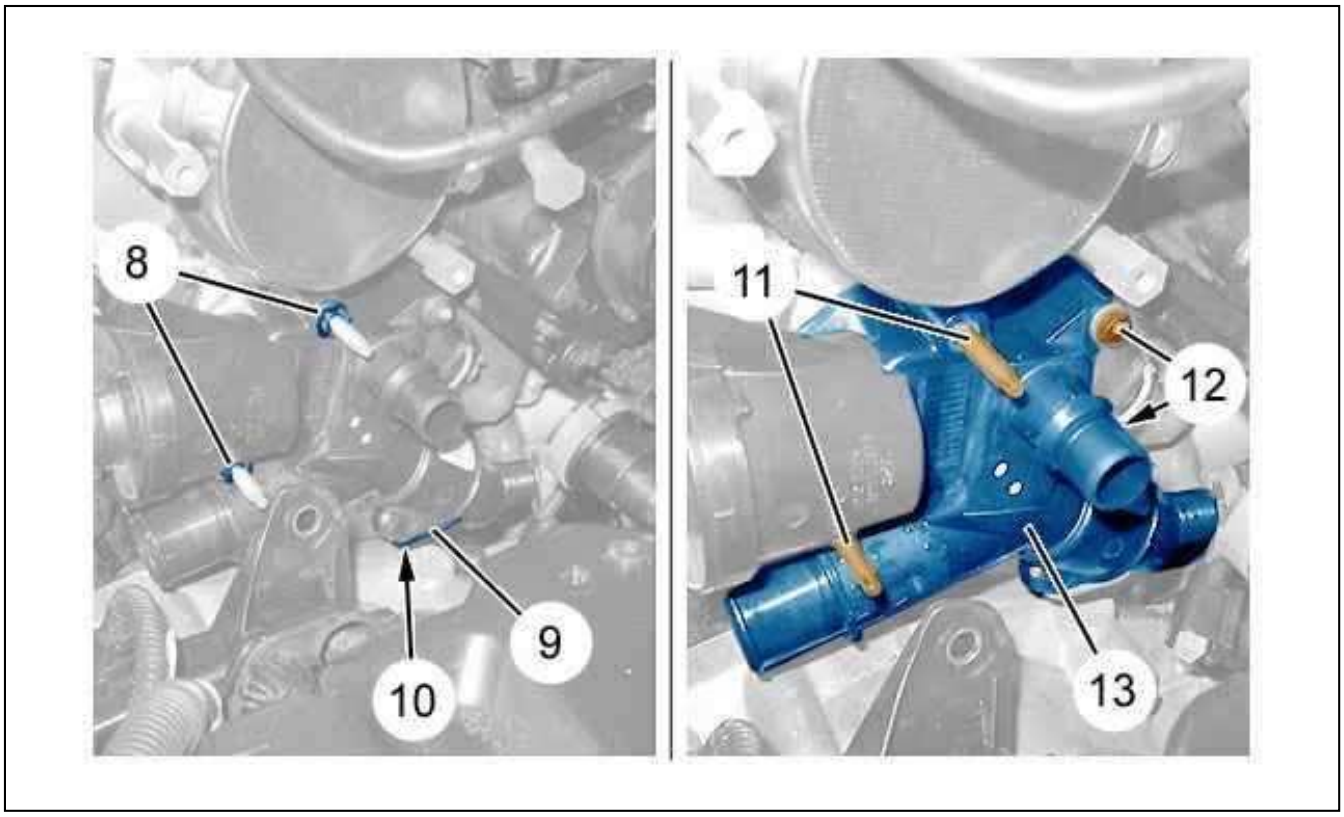


Figure : B1GG06HD

Remove :

- The nuts (8)
- The (10) bolt
- The mounting bracket (9)
- The bolts (12)
- The studs (11)
- The thermostat (13)

3. Refitting

3.1. Preparation

Clean the joint faces of the coolant outlet housing using a special degreaser(Refer to the products catalogue).

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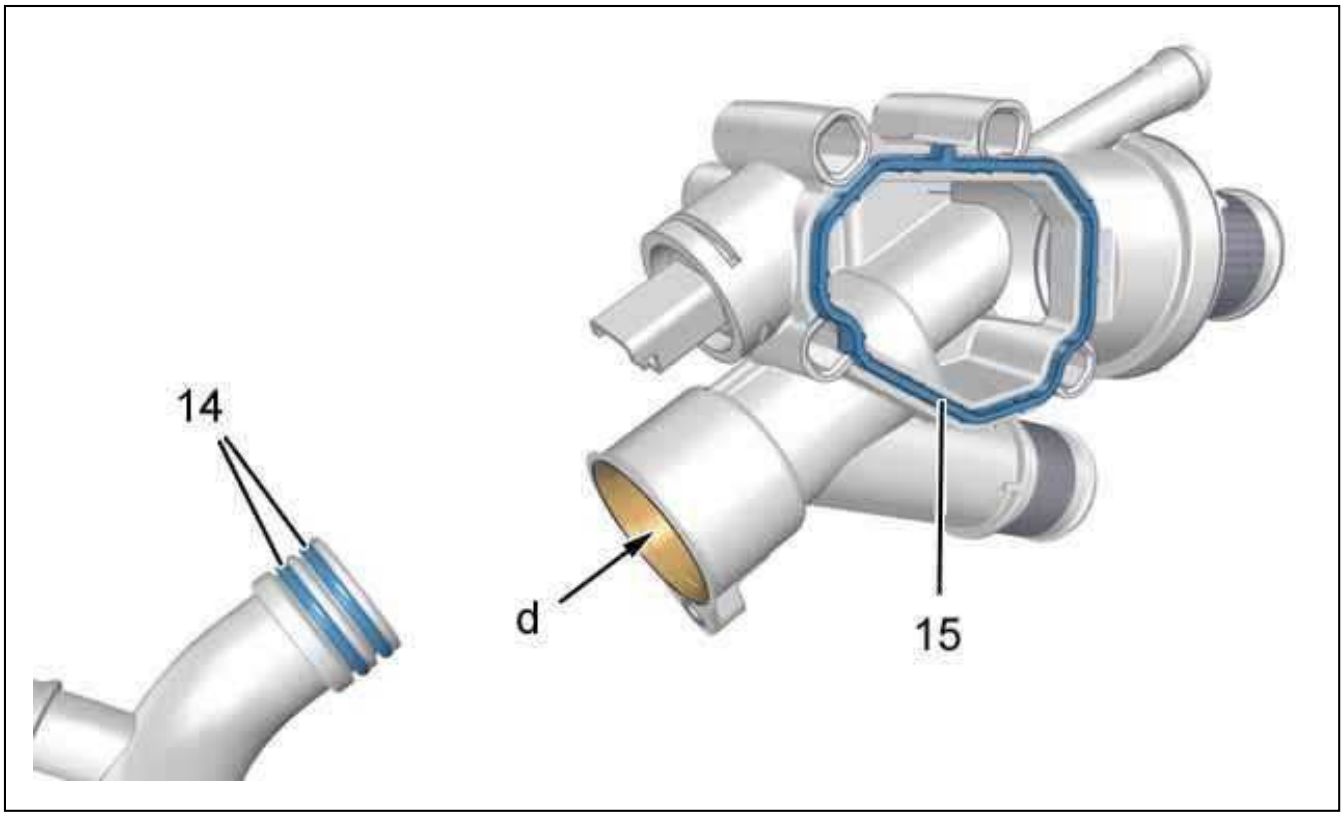


Figure : B1GG06ID

Check the cleanness to guarantee the sealing in the joint face area (as "d") (if necessary).
Fit new seals (14), (15).
Lubricate the seals (14).

3.2. Refitting (Continued)

CAUTION : Adhere to the tightening torques .

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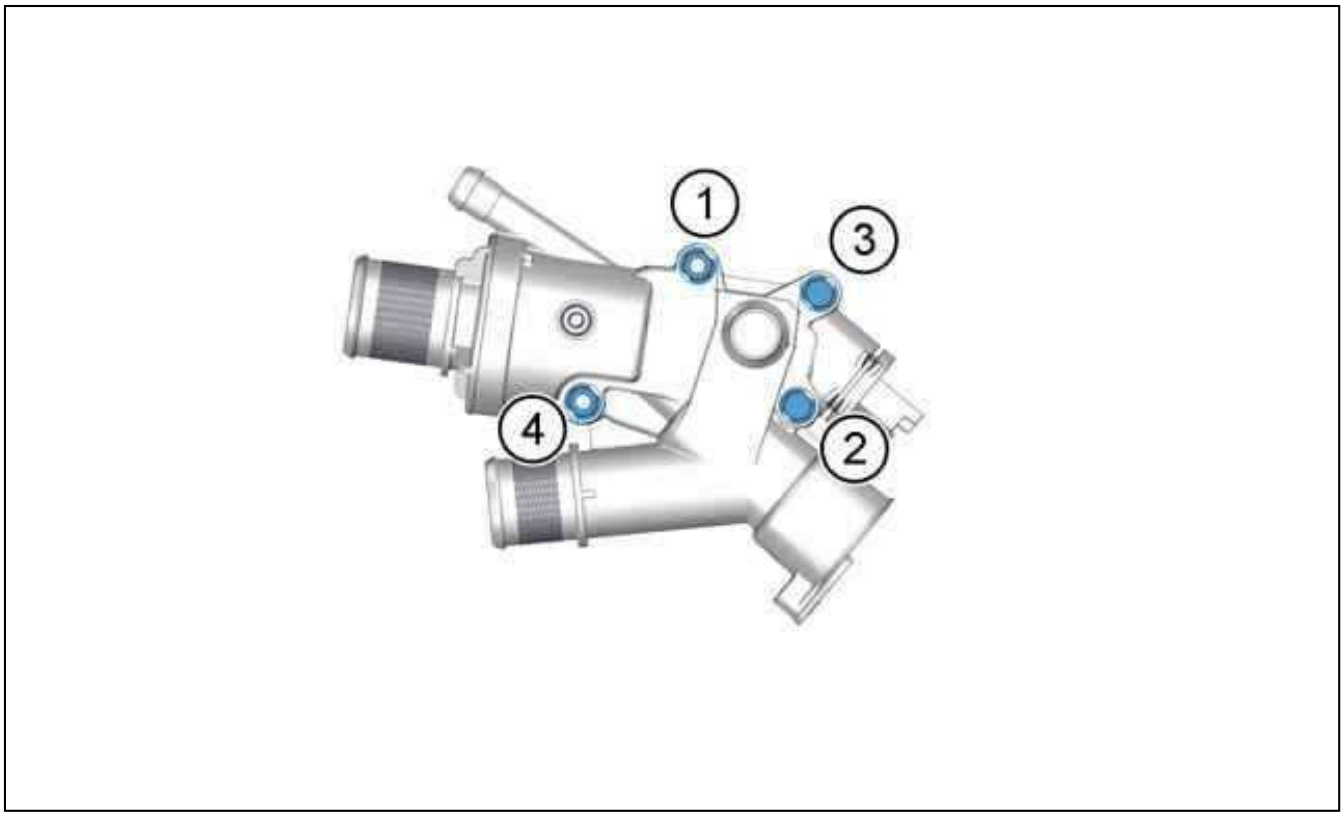


Figure : B1GG03WD

Refit :

- The thermostat (13)
- The studs (11)

Tighten : According to tightening sequence :

- The bolts (12)
- The nuts (8)
- The mounting bracket (9)
- The (10) bolt

Connect : The coolant temperature sensor (as "c").
Couple up :

- The coolant hose (7)
- The coolant hose (6)
- The venting tube (5) (According to version)
- The coolant hose (4)

Refit :

- The support plate (3)
- The electric harness transition duct (2)

Clip in place :

- The electrical harnesses (as "b")
- The low pressure fuel supply pipes (as "a")

Refit : The air filter housing (1) with the flow meter .

CAUTION : Perform the operations to be carried out following reconnection of the battery.

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Reconnect the battery.
Fill, bleed and top up the level of the cooling circuit.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

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REMOVAL - REFITTING : COOLANT PUMP

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removal

Put the vehicle on a hoist.
Disconnect the battery.
Drain the engine cooling circuit .
Remove the timing belt .

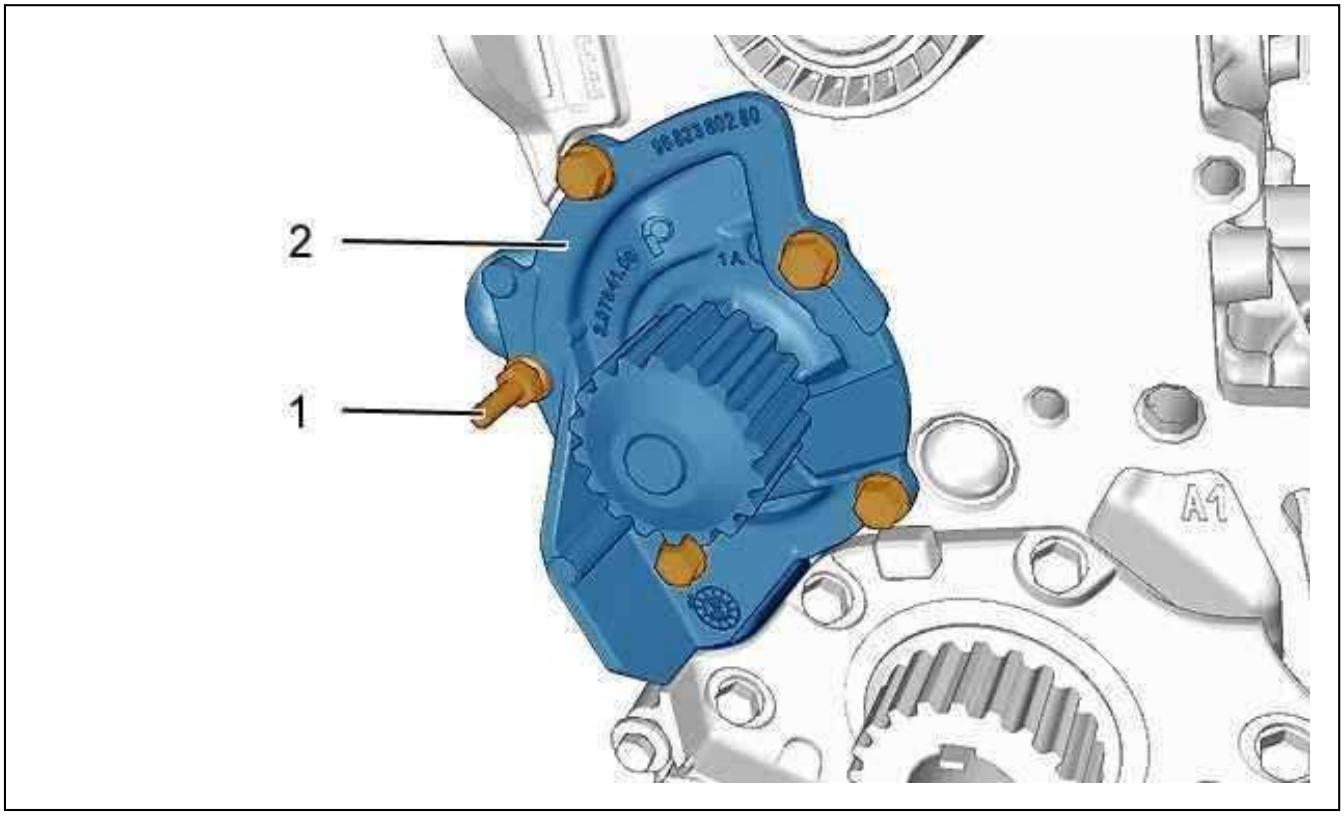


Figure : B1GG0LHD

Remove :

- The bolts (1)
- Coolant pump (2)

2. Preparation

CAUTION : The gasket faces must not have any traces of knocks or scores.

Clean the gasket faces with an approved descaling product ; Do not use sharp or abrasive tools.

3. Refitting

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CAUTION : Adhere to the tightening torques .

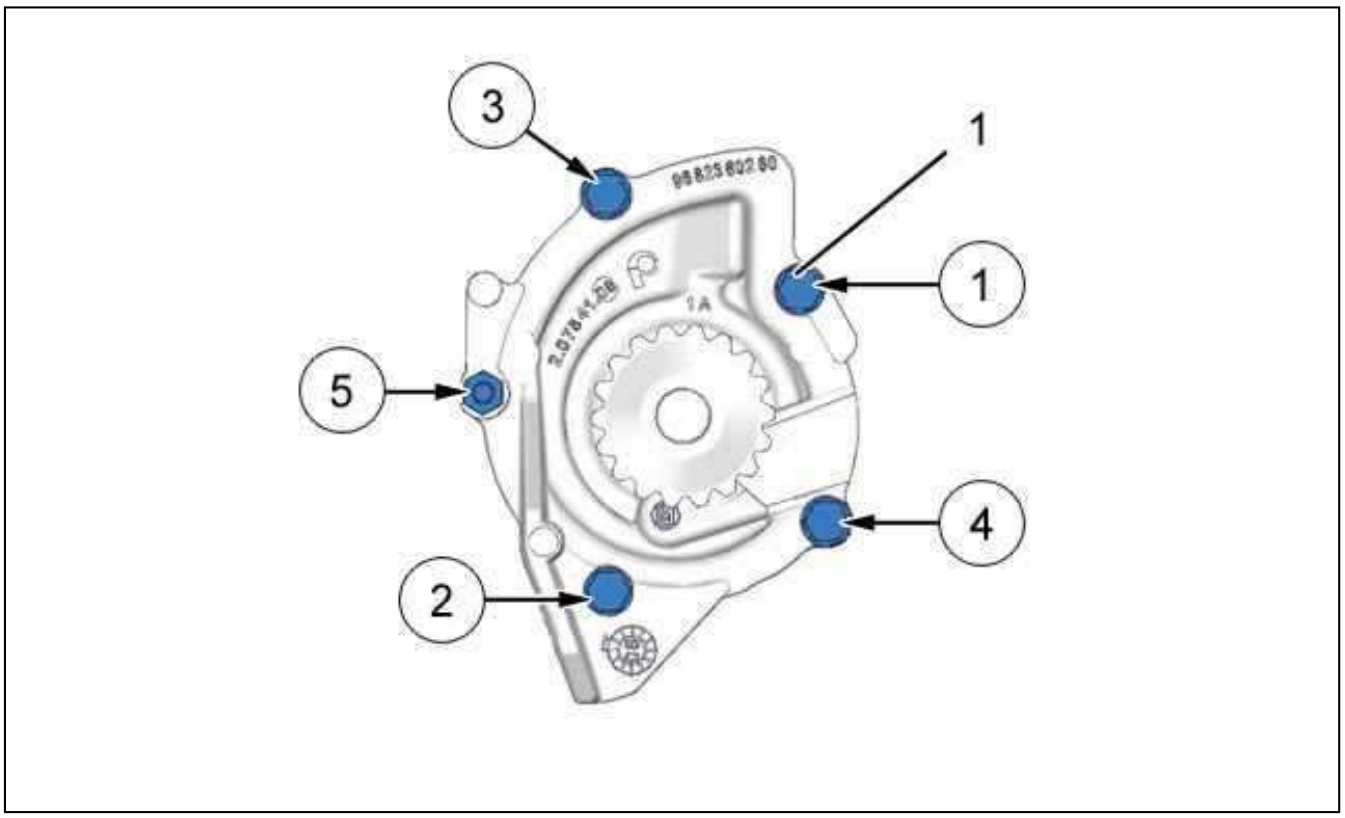


Figure : B1GG0LKD

CAUTION : Observe the order of tightening of the bolts (1).

Fit :

- The coolant pump (2) complete with a new seal
- The bolts (1) (in the order indicated)
- The timing belt

Fill and bleed the engine cooling circuit.

CAUTION : Perform the operations that are necessary after a battery reconnection.

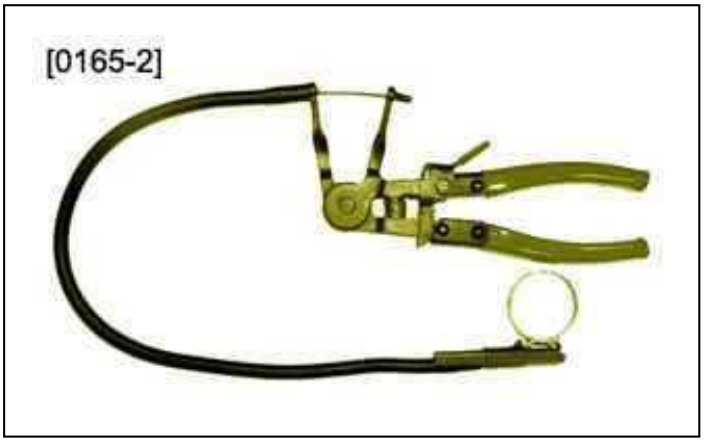
Connect the battery.

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REMOVING - REFITTING : ENGINE COOLING RADIATOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Tool	Reference	Description
 Figure : E5AB0GVT	[0165-2]	Cable pliers for flexible clips

2. Removing

Place the vehicle on a lift.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

Drain the engine cooling circuit .

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Figure : B1BG1KID

Remove : The fan control relay unit (1).

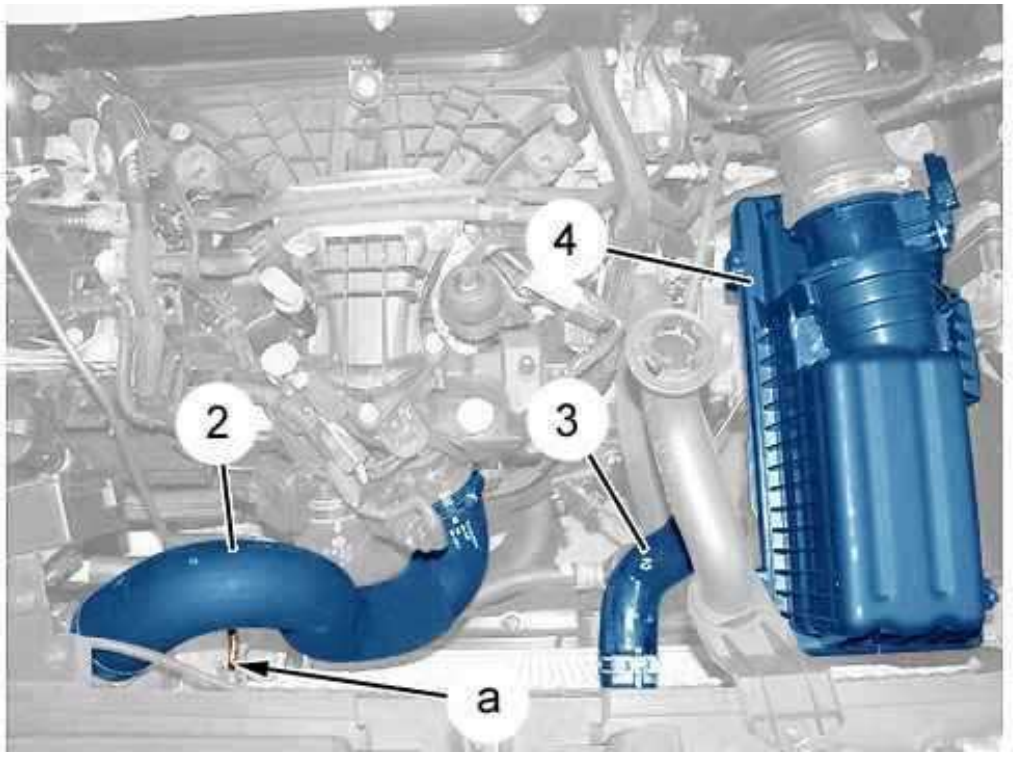


Figure : B1GG0M3D

Remove the air filter housing (4).
Uncouple :

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- The air duct (2)
- The engine cooling circuit hose (3) ; Using the tool [0165-2]
- The degassing hose (In "a")

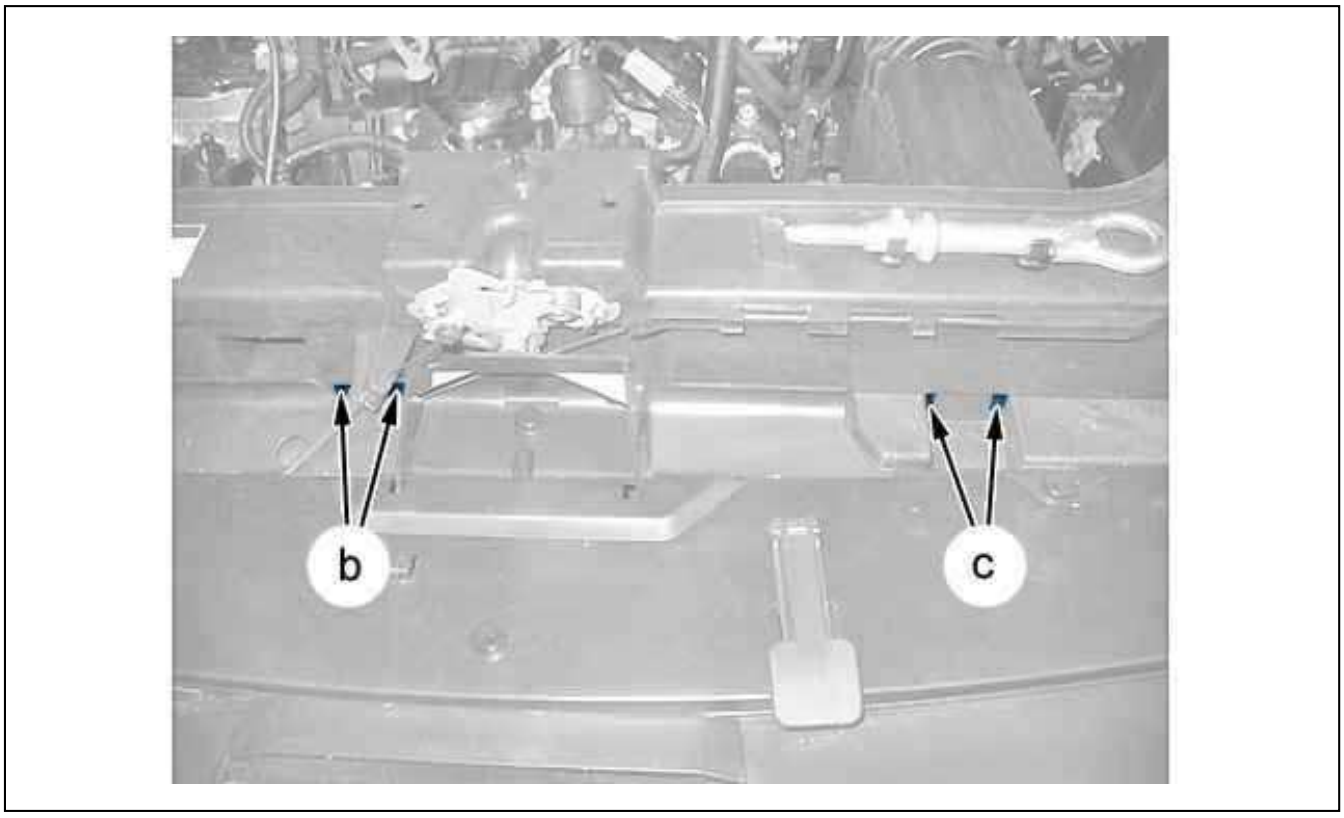


Figure : B1GG0JPD

Remove the front bumper.

CAUTION : Protect the engine cooling radiator to prevent damage to the fins.

Unclip the 2 engine cooling radiator upper fixing rings from the front panel (At "b" and "c") ; Using a flat screwdriver.
Tilt the engine cooling radiator towards the rear and remove it upwards (Carefully).

3. Refitting

CAUTION : Check the presence of the lower and upper fixings of the engine cooling radiator .

Reposition : The engine cooling radiator.
Clip the 2 engine cooling radiator upper fixing rings on the front panel (At "b") and (In "c").
Refit the front bumper.
Couple up :

- The engine cooling circuit hose (3)
- The degassing hose (In "a")
- The air duct (2)

Refit :

- The air filter housing (4)
- The fan control relay unit (1)

Fill and bleed the engine cooling circuit.
Refit :

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- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Perform the operations that are necessary after a battery reconnection.

Reconnect the battery.

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REMOVING - REFITTING : COOLING FAN

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Disconnect the battery.

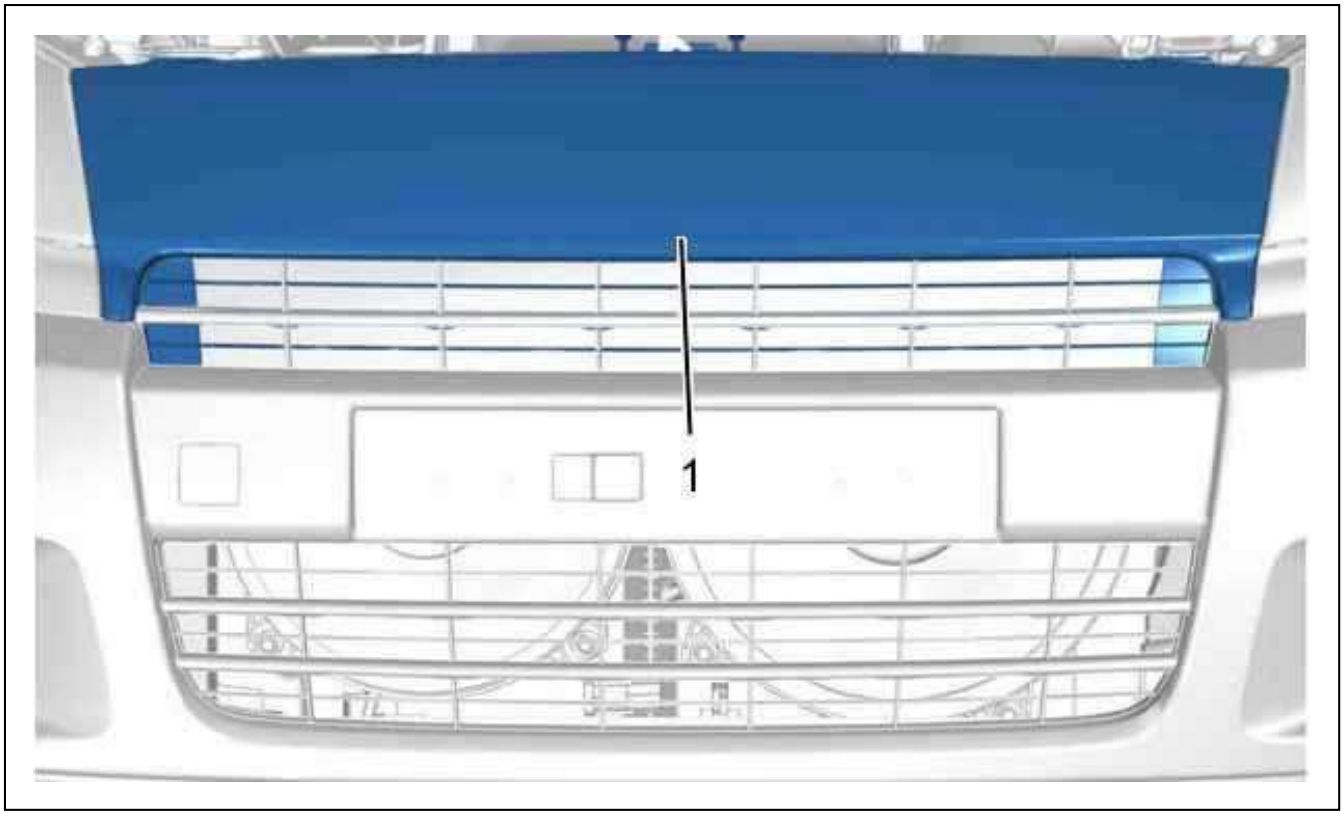


Figure : B1GG0ZRD

Remove : The upper grille (1).
Unplug - Release : The connectors (Fans).

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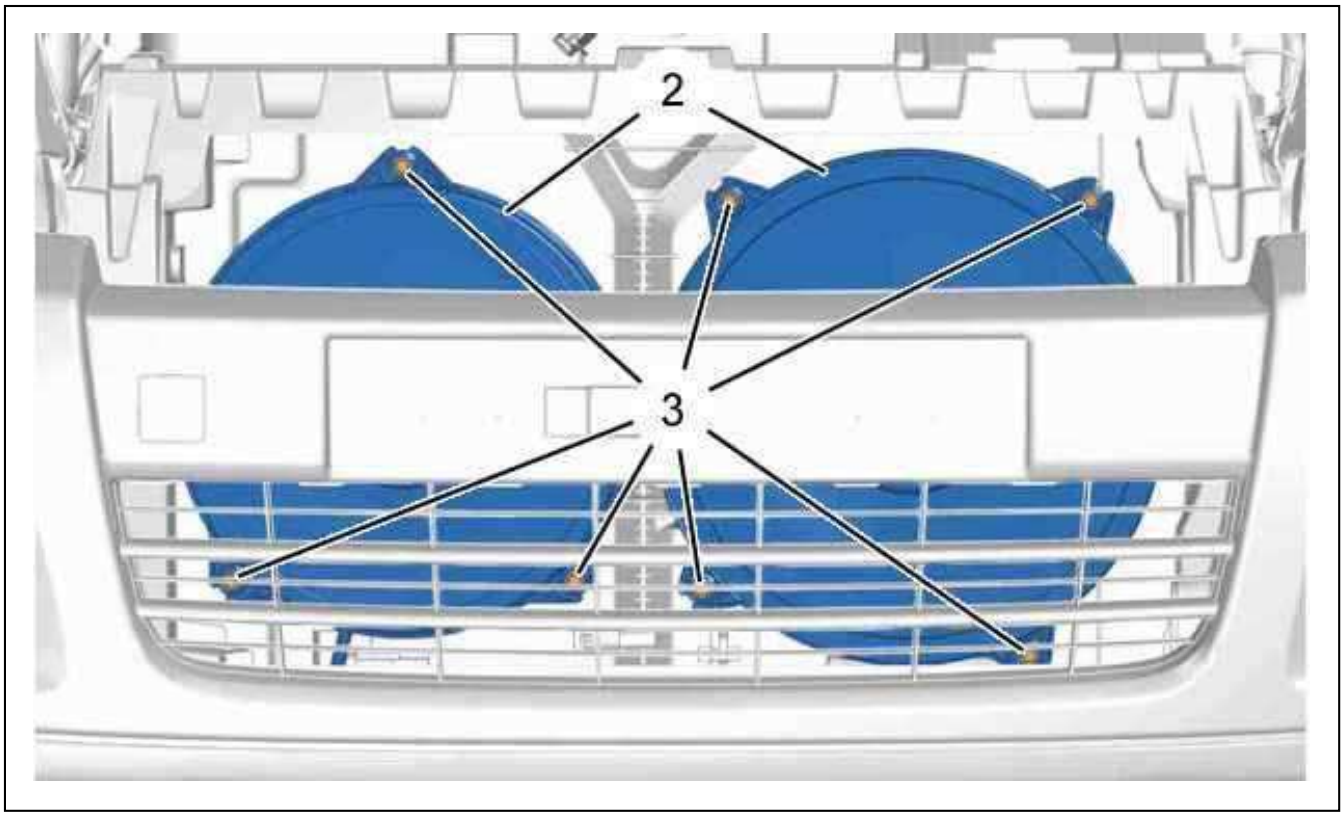


Figure : B1GG0ZSD

Remove :

- The bolts (3)
- The cooling fans (2)

2. Refitting

Refit :

- The cooling fans (2)
- The bolts (3)

Connect the connectors (Fans).
Refit : The upper grille (1).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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DRAINING - FILLING - BLEEDING : COOLING SYSTEM (VERSION WITH ADDITIONAL HEATING)

ESSENTIAL : Observe the safety and cleanliness recommendations.

N.B. : Draining and filling operations can be carried out using a coolant fluid replacement cylinder WYNN'S (or similar
It is essential to follow the prescribed method of using the cylinder.

1. Recommended tools

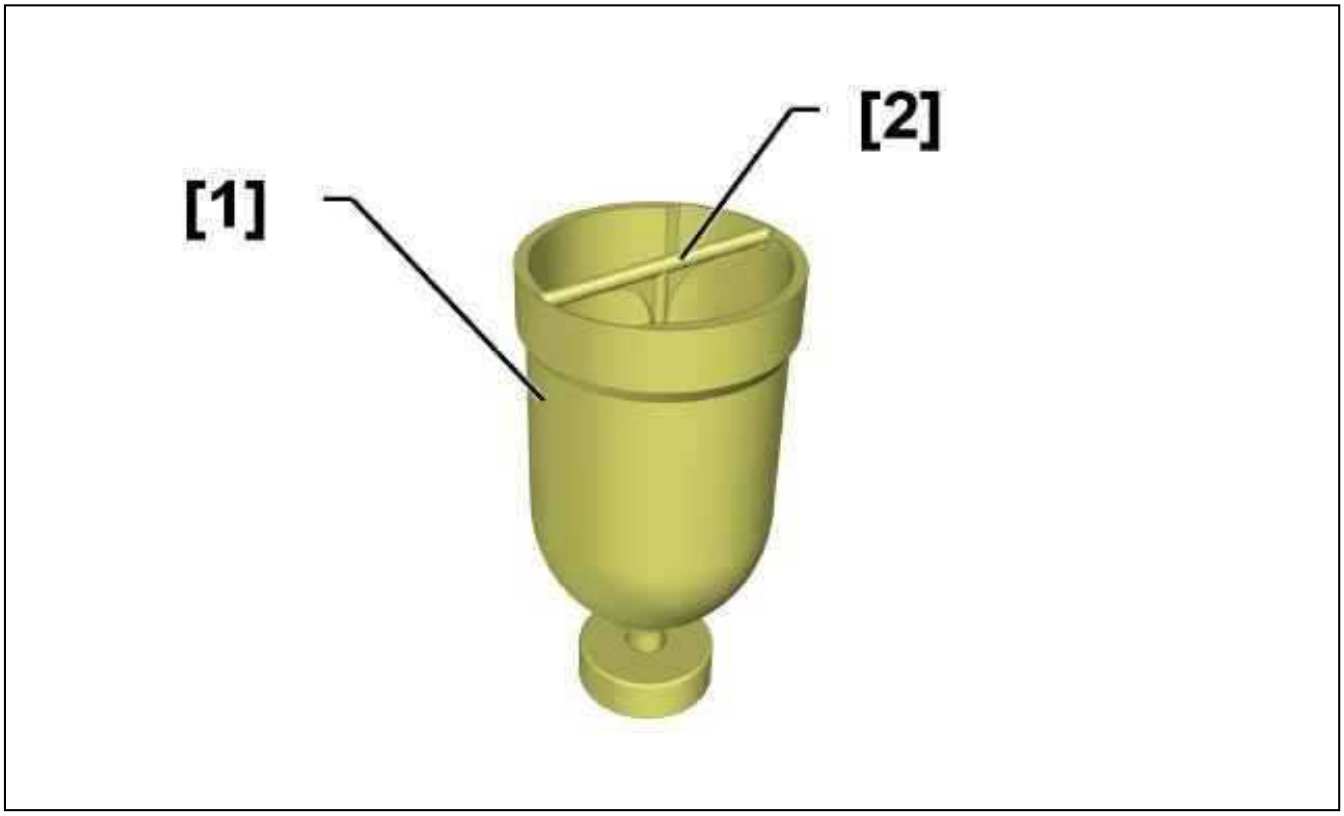


Figure : E5AP3PBD

Reference	Designation	Reference	Reference
[1]	filling cylinder	4520-T	(-).0173/2
[2]	blocking rod for filling cylinder	4370-T	-

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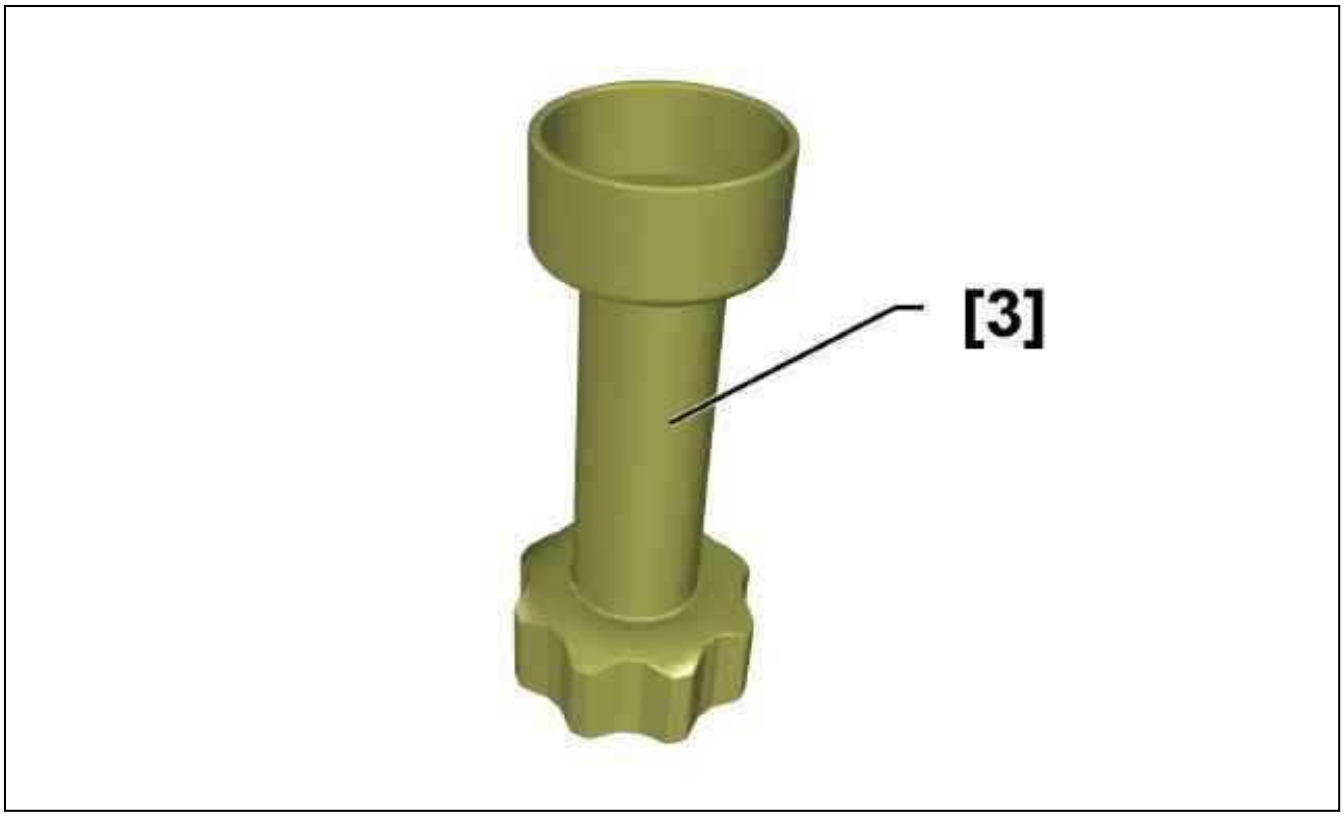


Figure : E5AP3PCD

Reference	Designation	Reference
[3]	Filling cylinder adaptor	4222-T

2. Drain and refill

ESSENTIAL : Vehicle with pneumatic suspension : Deactivate the pneumatic suspension before lifting the vehicle (2 or 4 post lift, workshop jack or vehicle jack).

2.1. Draining the main cooling circuit

Place the vehicle on a 2-post lift.
Disconnect the battery.

CAUTION : Remove the venting chamber plug, taking the required precautions.

Remove the protectors under the engine.
Place a draining tray under the engine.
Open the bleed screw on the heater matrix hose.
Drain the radiator by uncoupling the bottom hose.

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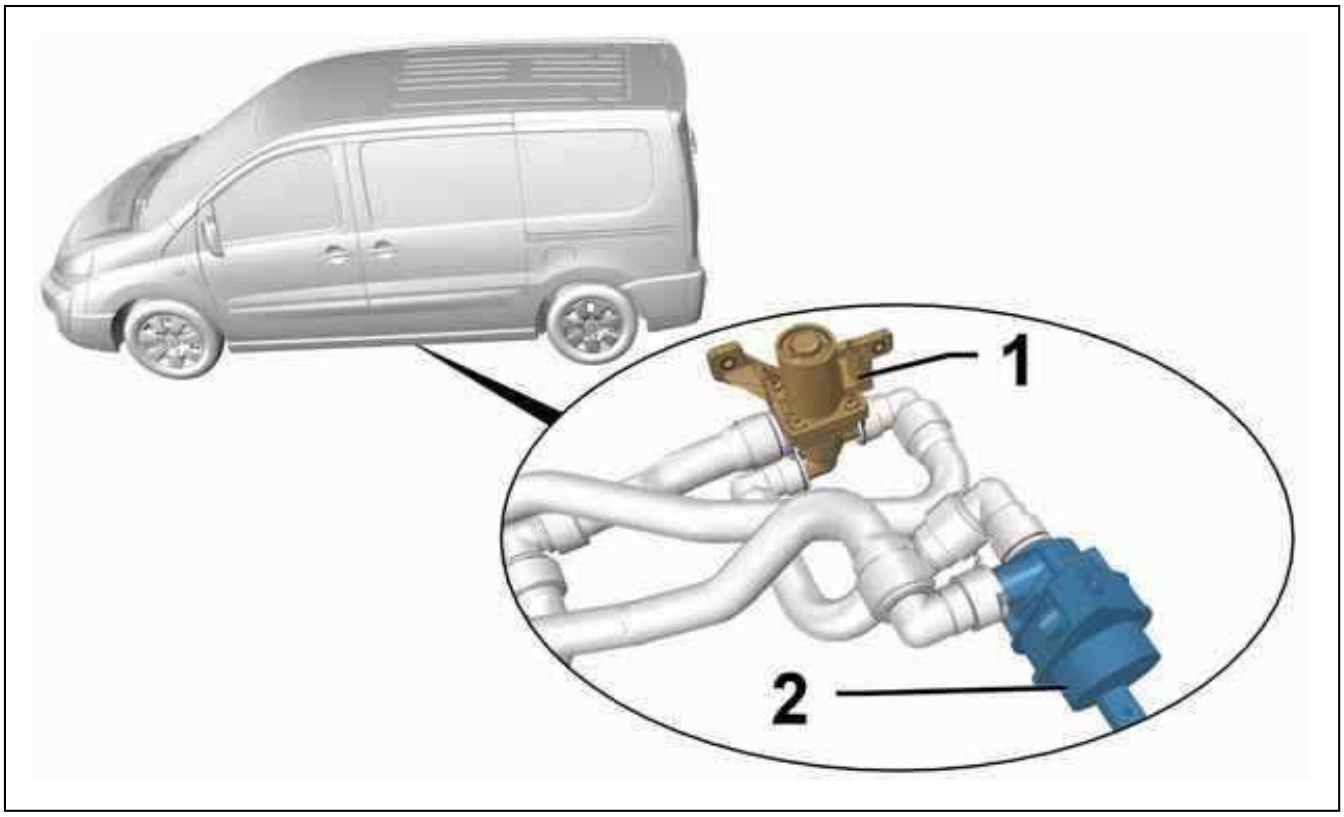


Figure : B1GP0LLD

2.2. Draining the secondary cooling circuit

Raise the vehicle.
Position a receptacle to recover the coolant.
Uncouple :

- The hoses from the solenoid valve (1)
- The hoses from the pump (2)

3. Filling and bleeding the system

ESSENTIAL : Observe the instructions for closing the cooling circuit.

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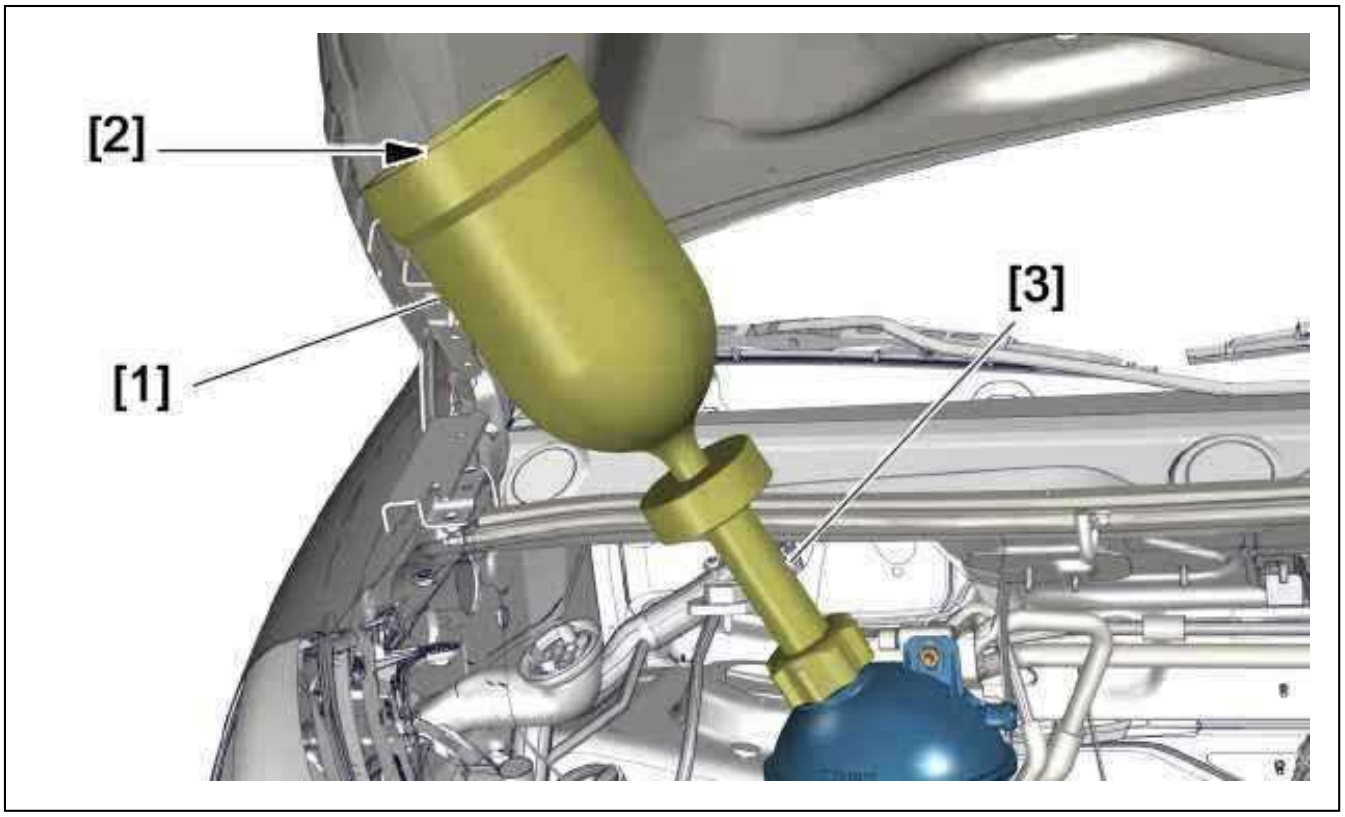


Figure : B1GP0K7D

Couple up :

- The hoses from the solenoid valve (1)
- The hoses from the pump (2)
- The lower radiator hose

Close the bleed screw on the heater matrix hose .
Fit the filling cylinder [1], plug [2], and adaptor [3] assembly on the filler aperture.
Slowly fill the filling cylinder [1] with coolant, up to the "1 litre" mark, in order to pressurise the system.

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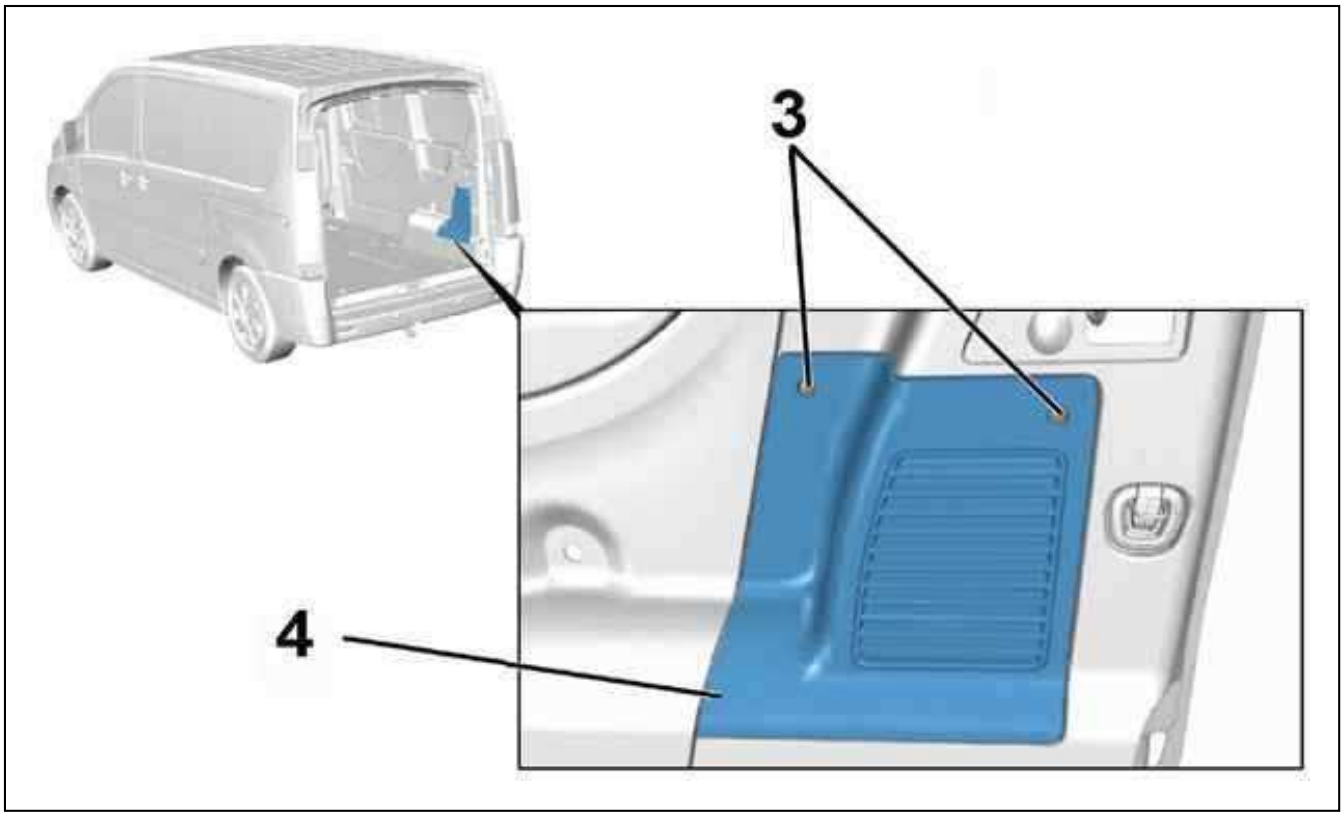


Figure : C5GP13AD

Turn the screws a quarter of a turn (3).
Remove the trim (4).

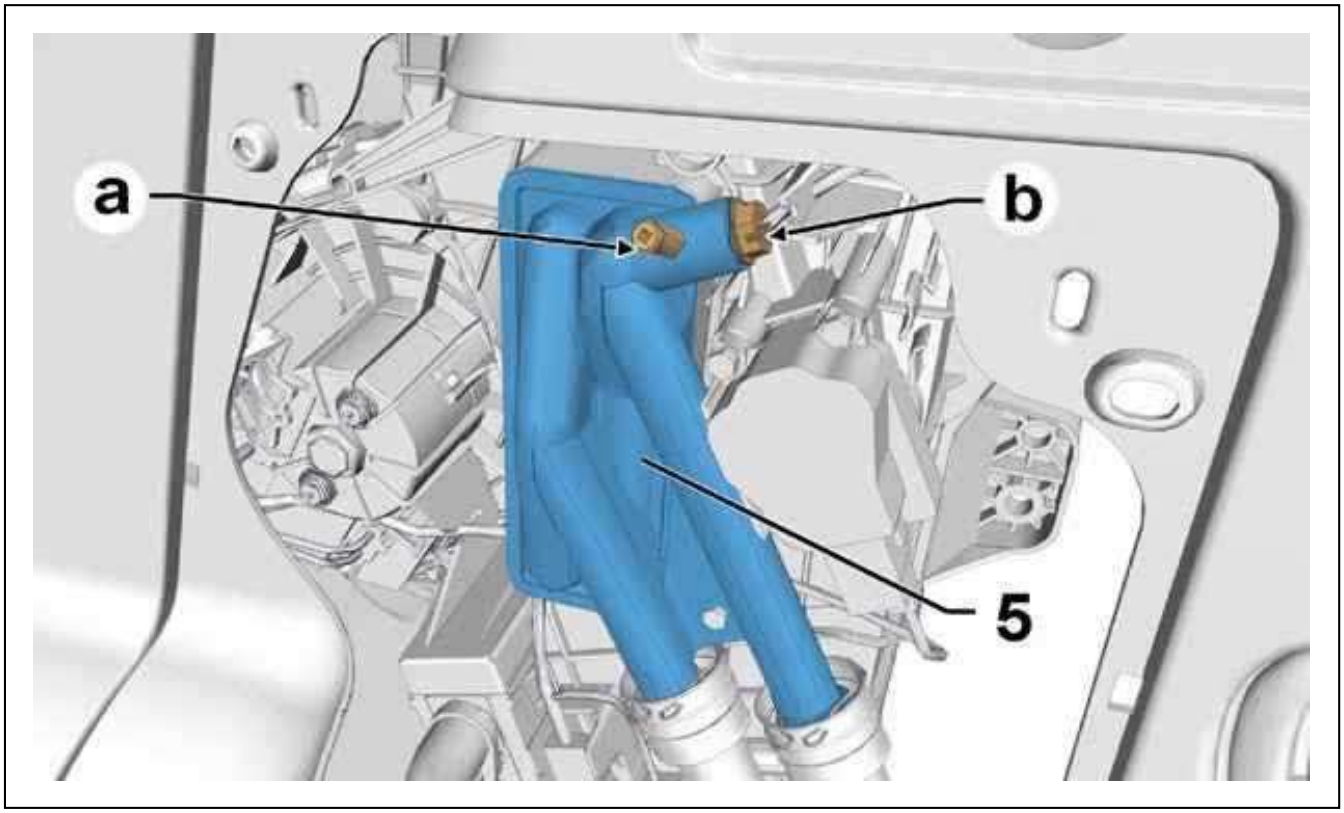


Figure : B1GP0LMD

Fit a transparent pipe to the secondary heater matrix (5)(at " a").

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Position a receptacle to recover the coolant.
Loosen the bleed screw (at " b").
Close the bleed screw when the fluid flows out cleanly without air bubbles.

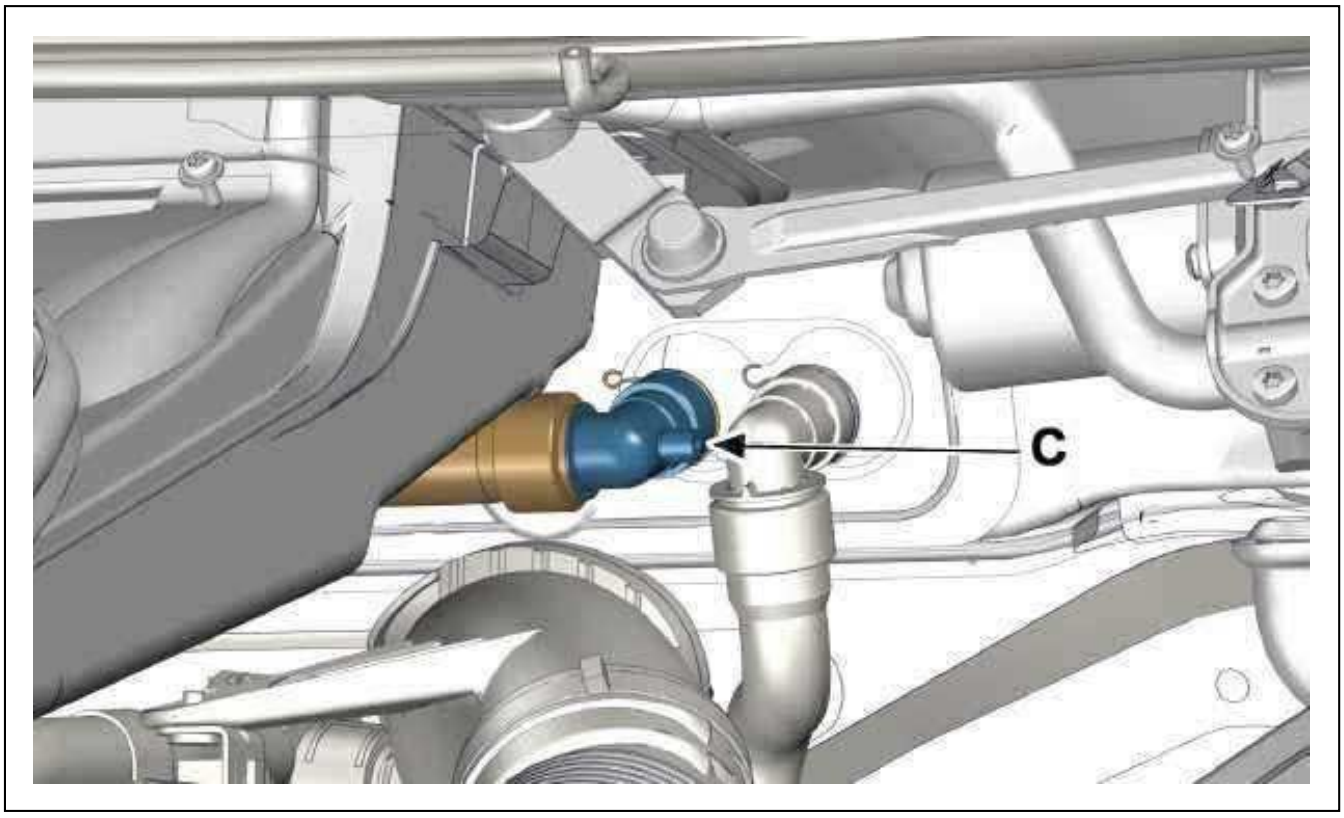


Figure : B1GP0K8D

Plug the filling cylinder ; Using tool [2].
Remove the bleed valve plug (Under bonnet).
Couple a transparent pipe onto the bleed valve (at " c").
Position a receptacle to recover the coolant.
If necessary top up the filling cylinder to the maximum level(if necessary).
Open the filling cylinder ; Using tool [2].
Plug the filling cylinder ; Using tool [2] When the liquid flows out clean and with no air bubbles.
Remove the transparent pipe from the bleed valve (at " c").
Refit the bleed valve plug .
Reconnect the battery.

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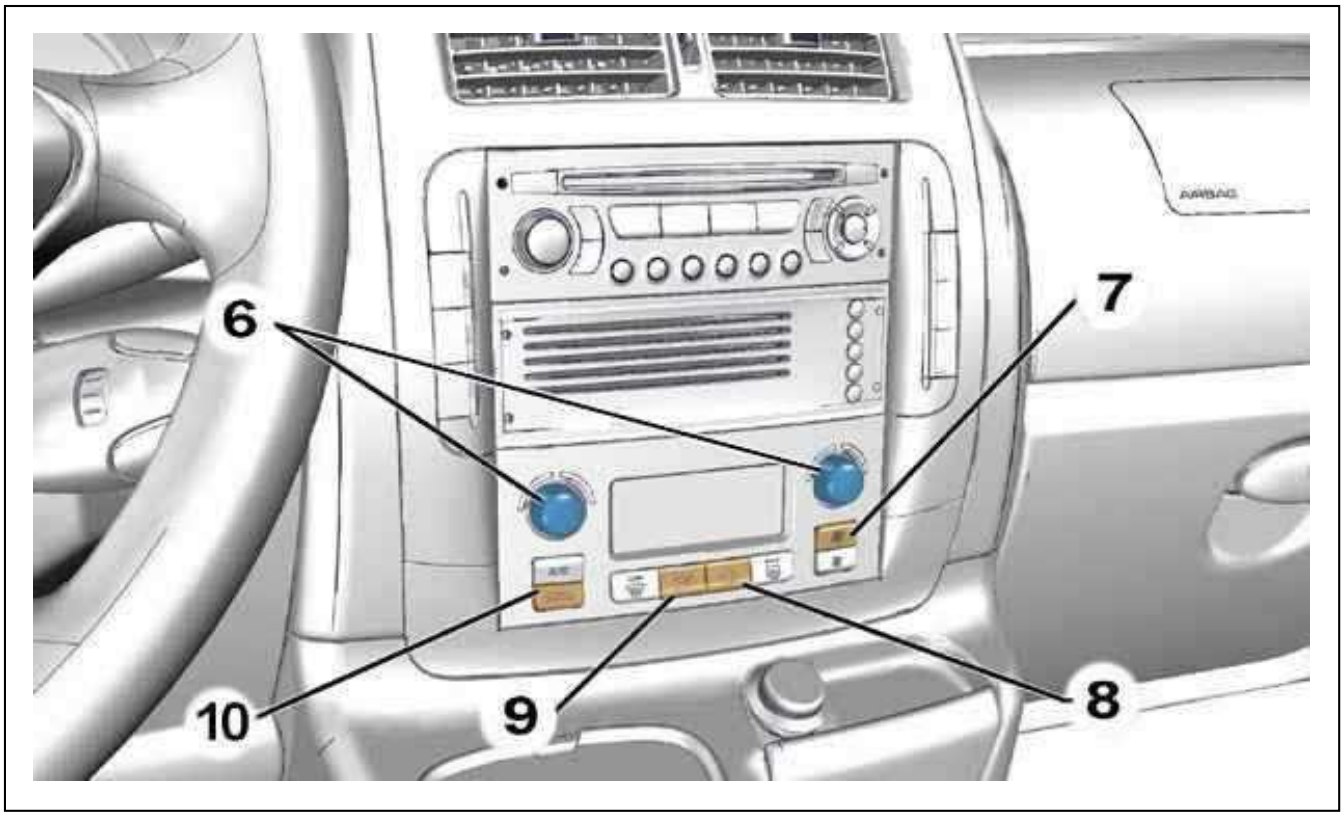


Figure : C5FP1FDD

CAUTION : The complete bleeding of the cooling circuit with additional heating is done after the additional heating controls have been operated (Motor running).

Switch on the ignition.
Place the heating controls (6), (7), (8), (9), (10) to maximum (Dashboard).

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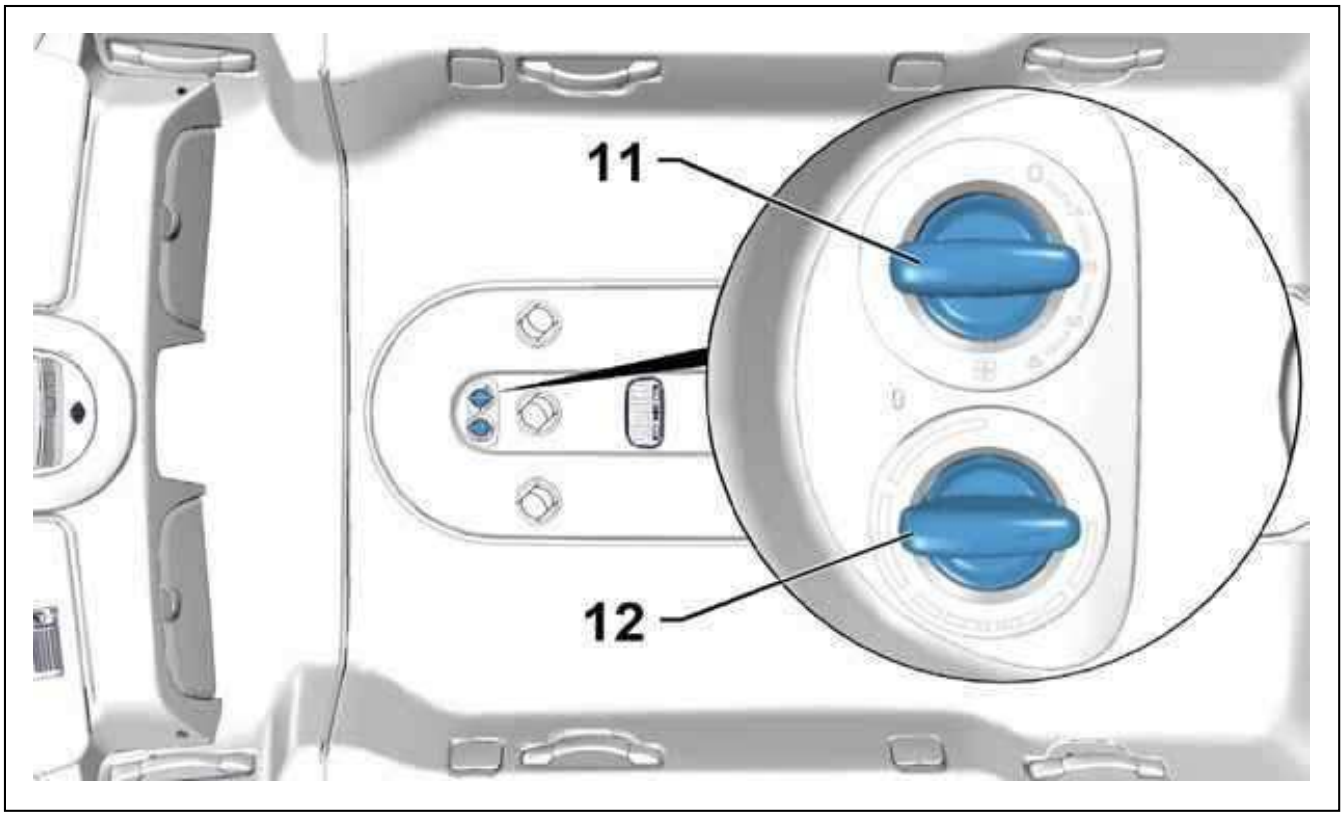
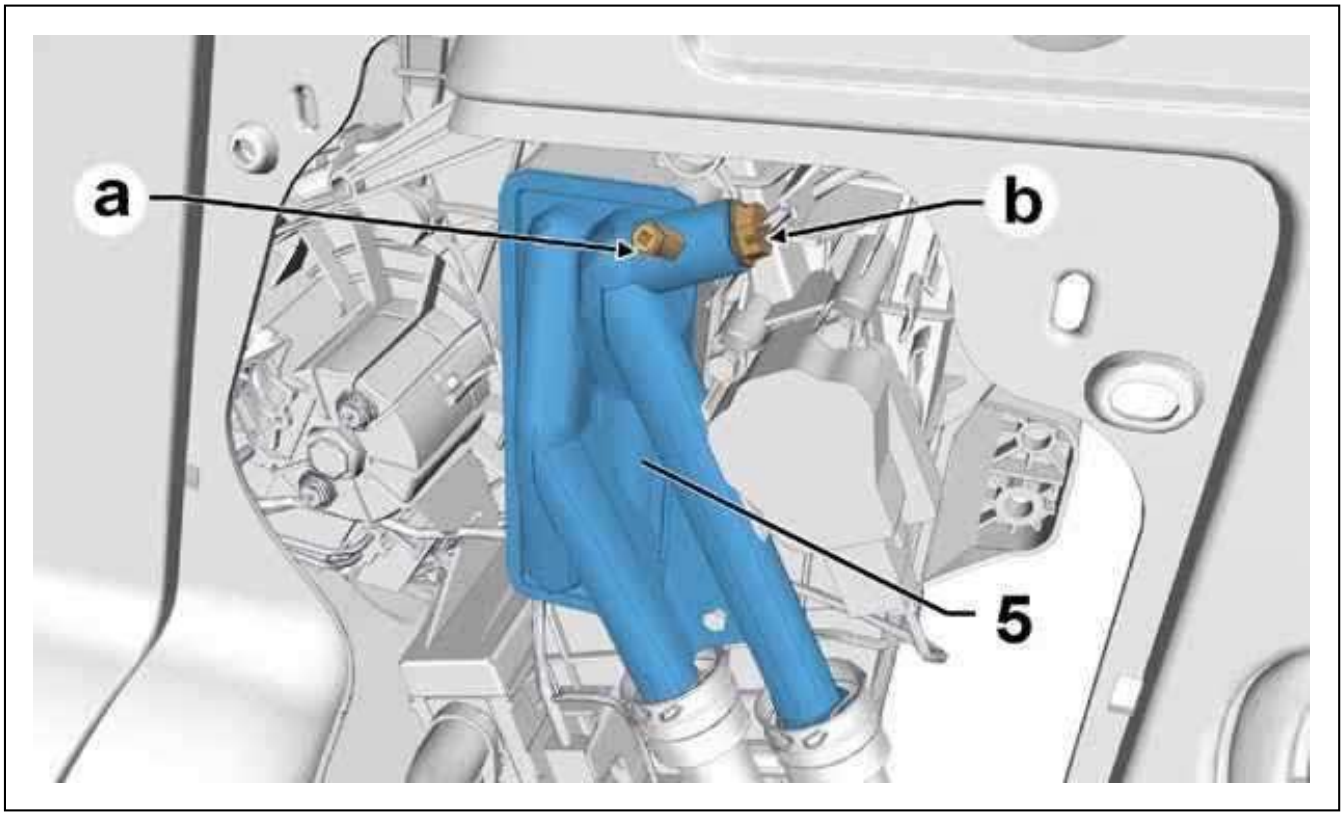


Figure : C5GP13BD

Place the heating controls (11), (12) to maximum.

N.B. : The heating controls are fitted in the roof trim .

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



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Figure : B1GP0LMD

Fit a transparent pipe to the secondary heater matrix (5)(at " a").
Position a receptacle to recover the coolant.
Loosen the bleed screw (at " b").
Start the engine.
Close the bleed screw when the fluid flows out cleanly without air bubbles.
Check the removal of the air bubbles and the fluid level in the expansion bottle .
Keep the filler cylinder filled up to the "1 litre" marking.
Top up to the maxi. level (if necessary).
Keep the engine speed at 1500 rpm, up to the second cooling cycle (cooling fan(s) cutting in and out).
Stop the engine.
Refit the trim (4).
Remove the filling cylinder [1], plug [2], and adaptor [3] assembly.
Top up to the maxi. level (engine cold).
Fit the degassing tank cap .

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DRAIN AND REFILL - REFILLING - BLEEDING : COOLING SYSTEM

ESSENTIAL : Observe the safety and cleanliness recommendations .

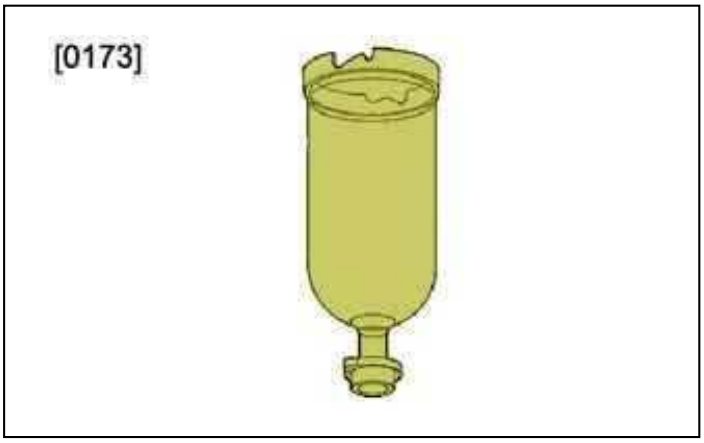
CAUTION : Refer to the vehicle's servicing schedule for the coolant checking interval.

Check the pH of the coolant ; Using reactive strips.

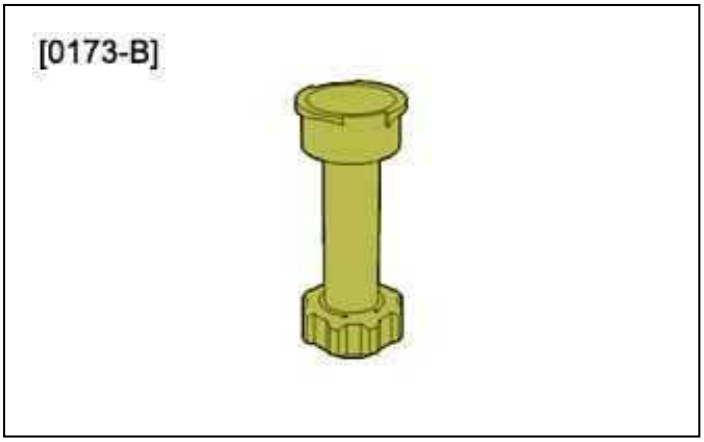
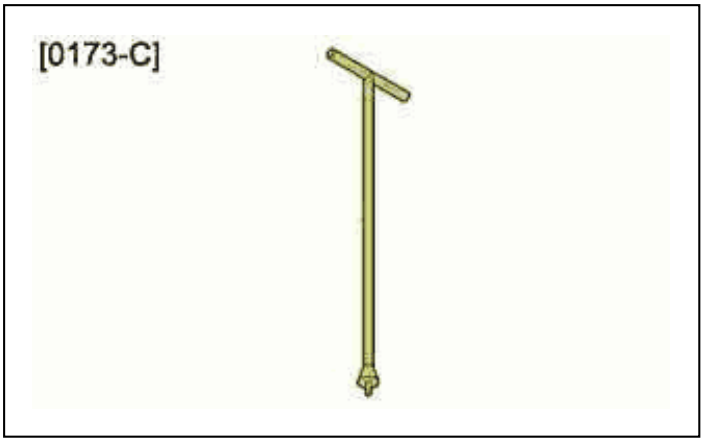
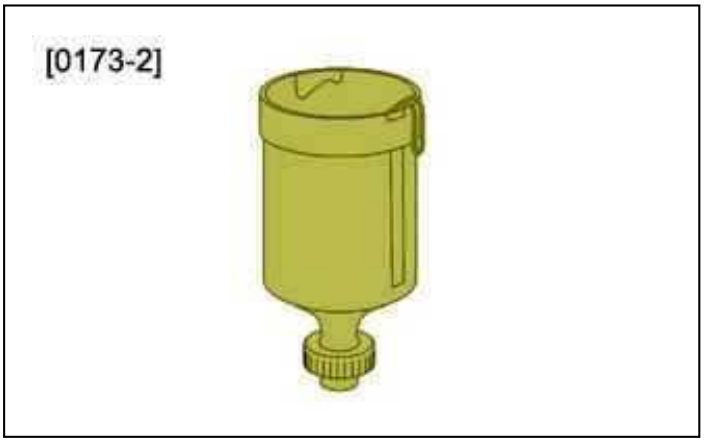
N.B. : The pH value of the coolant should be between 7 and 8.

Replace the coolant if the pH value is out of tolerance.

1. Tooling

Tool	Reference	Designation
 Figure : E5AB1CNT	[01102]	Tool for filling the cooling system by vacuum
 Figure : E5AB1JNT	[0173]	Bayonet filling cylinder
	[0173-B]	Adaptor / extension for bayonet filling cylinder [0173]

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 Figure : E5AI009T		
 Figure : E5AI006T	[0173-C]	blocking rod for filling cylinder
 Figure : E5AB1JOT	[0173-2]	Screw-fit filling cylinder (without extension)
	[0165-2]	Cable pliers for flexible clips

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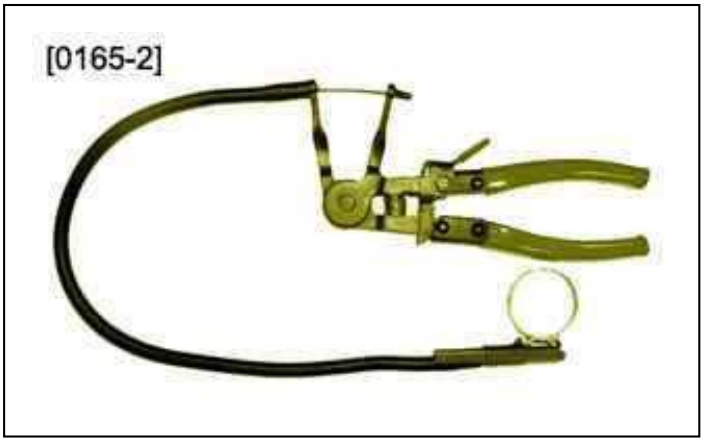


Figure : E5AB0GVT

2. Draining the cooling system

CAUTION : The draining operation is carried out with the engine cold.

Put the vehicle on a hoist.
Remove :

- The protective panel under the engine (according to equipment)
- The de-aeration chamber plug (Carefully)

N.B. : Place a clean tray underneath the engine to recover the coolant.

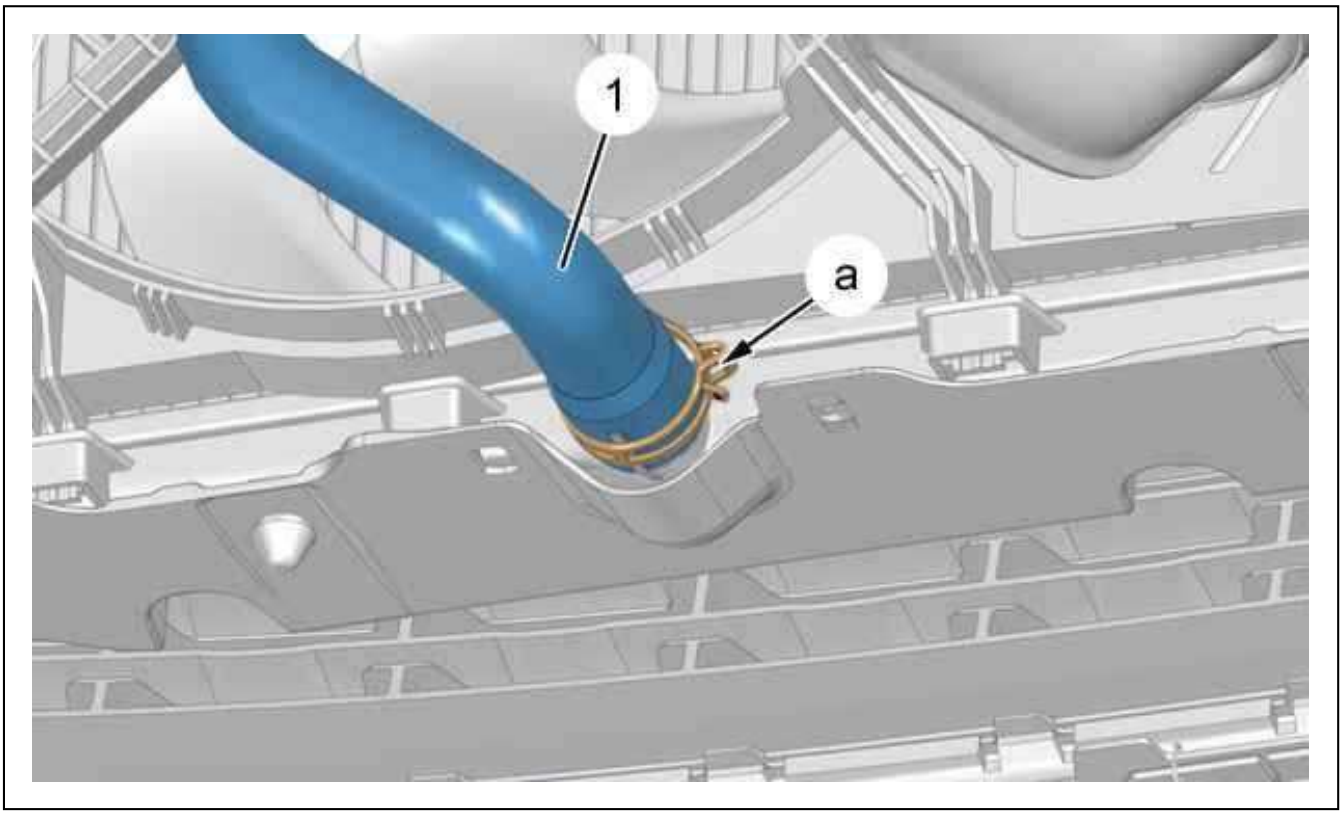


Figure : B1GI00MD

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Uncouple the pipe (1) (at "a") ; Using tool [0165-2].
Open the bleed screws located on the coolant outlet housing and the heater pipe.
Allow the coolant to run out.
Drain the cylinder block (if necessary).

CAUTION : If the tool for filling the cooling system by vacuum [01102] is used, measure the quantity of coolan drained.

3. Filling the cooling system

CAUTION : If the cooling system is contaminated, rinse with clean water.

CAUTION : Always use new coolant.

CAUTION : Each filling operation must always be followed by a cooling system degas operation.

3.1. Filling the cooling system by gravity

Connect the hose (1) (at "a") ; Using tool [0165-2].

N.B. : Refit new clips .

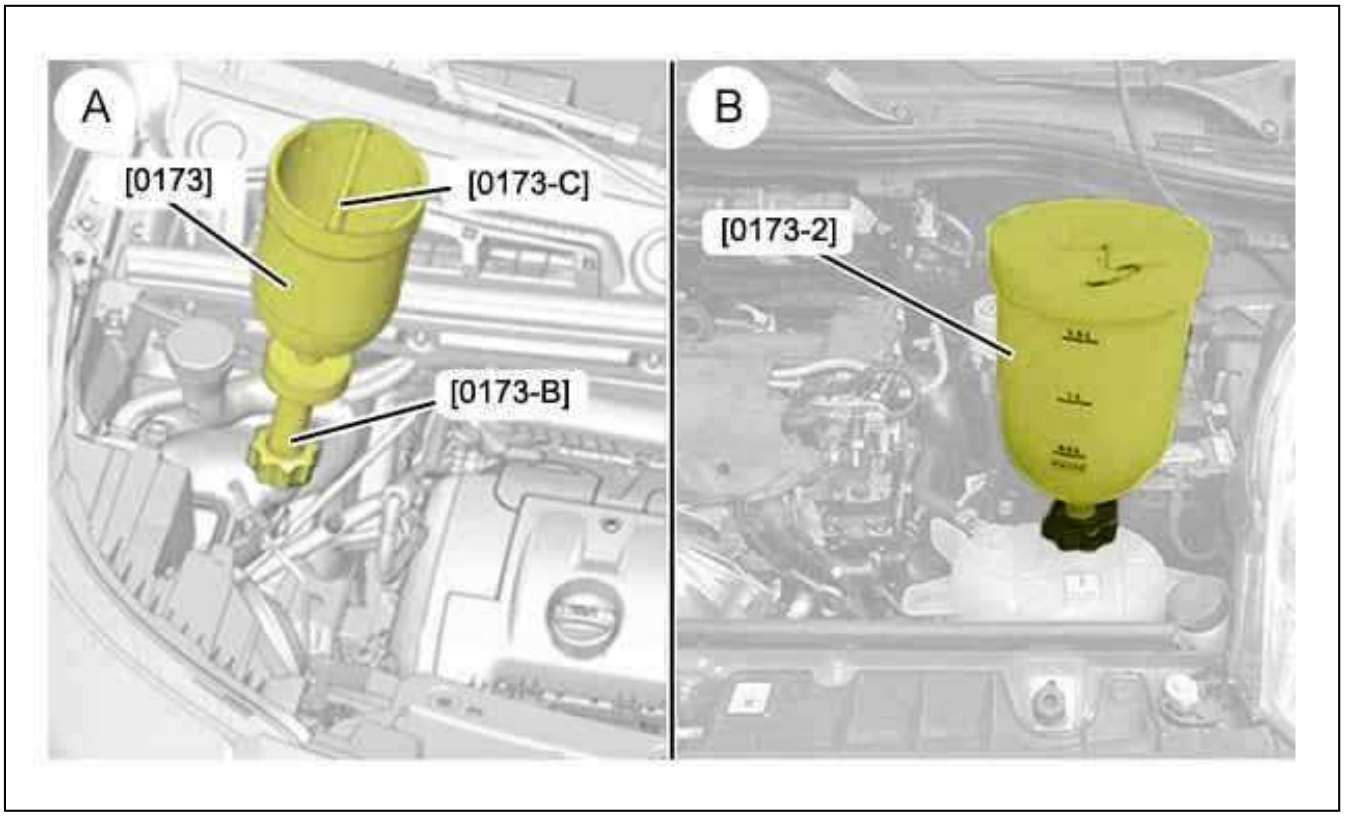


Figure : B1GI09DD

"A" : Fitting with filling cylinder offset ; Using the tools [0173], [0173-B], [0173-C].
"B" : Fitting with filling cylinder direct ; Using tool [0173-2].
Fit the filling cylinder , blank and adaptor assembly on the expansion chamber (according to assembly).
Open the rod on the filling cylinder .
Slowly fill the cooling system with clean coolant.

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Close the bleed screw when the fluid is flowing freely without any air bubbles.

N.B. : The filling cylinder should be filled to the 1 litre mark for correct bleeding of the heater matrix.

3.2. Filling using the tool for filling the cooling system by vacuum

CAUTION : Always use new coolant.

Connect the hose (1) (at "a") ; Using tool [0165-2].

N.B. : Refit new clips .

Close the bleed screw .
Put the equipment for filling by vacuum [01102] in place on the expansion bottle .

CAUTION : To avoid entry of air into the circuit, provide for 20 % additional coolant.

Prepare a receptacle of coolant containing the quantity of fluid drained + 20 %.

N.B. : The receptacle must be positioned slightly lower than the equipment for filling by vacuum.

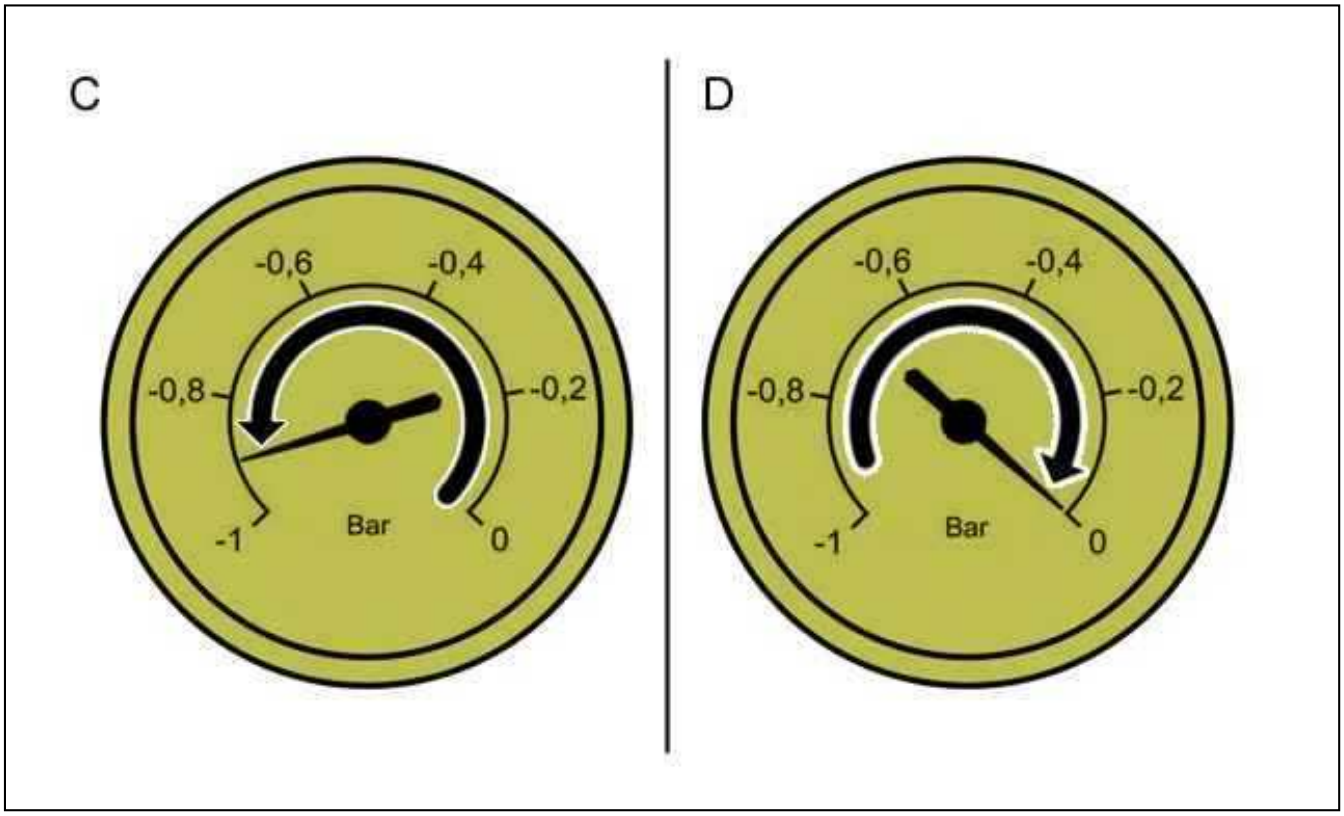


Figure : B1GI09CD

Place the cooling circuit under a vacuum to reach -0,9 bar (diagram "C") :

- Wait 10 seconds and check that the value obtained does not drop
- Fill the cooling circuit completely and wait for the return to 0 bar (diagram "D")

N.B. : The quantity of coolant filled should correspond to the quantity of fluid drained.

Repeat the operation until the cooling system is full (if necessary).

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CAUTION : Remove the equipment for filling by vacuum [01102] and rinse the assembly with clean water.

4. Degassing and checking the cooling system

Fit the charging cylinder , closer and adaptor assembly on the expansion bottle, in the case of draining using the tool for filling by vacuum [01102].
Open the rod on the filling cylinder .
Start the engine.

N.B. : The air conditioning control should not operate during this phase.

4.1. Toutes motorisations sauf norme de dépollution EURO 6

Keep the engine speed at 1500 - 2000 rpm, up to the second cooling cycle (cooling fan(s) cutting in and out).

CAUTION : Check that there are no coolant leaks.

4.2. Diesel engine Euro 6

The cutting in of the fan assembly for 10 seconds indicates the switch to after sales degas mode.
Accelerate to an engine speed above 2300 rpm for more than 10 seconds to switch to degas mode.
Maintain the engine speed at 2500 rpm until the fan assembly cuts in again.

4.3. Degassing and checking the cooling system (continued)

CAUTION : Check that the level of coolant in the filling cylinder is sufficient.

Stop the engine.

ESSENTIAL : Do not remove the filling cylinder while the engine is hot.

Leave the engine to cool.
Blank the filling cylinder using the blocking rod .
Remove the filling cylinder , plug and adapter assembly.
Check the coolant level when cold.
Top up the coolant to the "max" level (Cold).

CAUTION : Do not fill the system past the max mark.

Refit and tighten the cap on the header tank .

CAUTION : Check that the cooling system filler cap is locked (For bayonet cap).

Refit :

- The protective panel under the engine (according to equipment)
- The vehicle to its wheels

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TIGHTENING TORQUES : COMPONENTS OF THE FUEL CIRCUIT

1. Fuel main tank

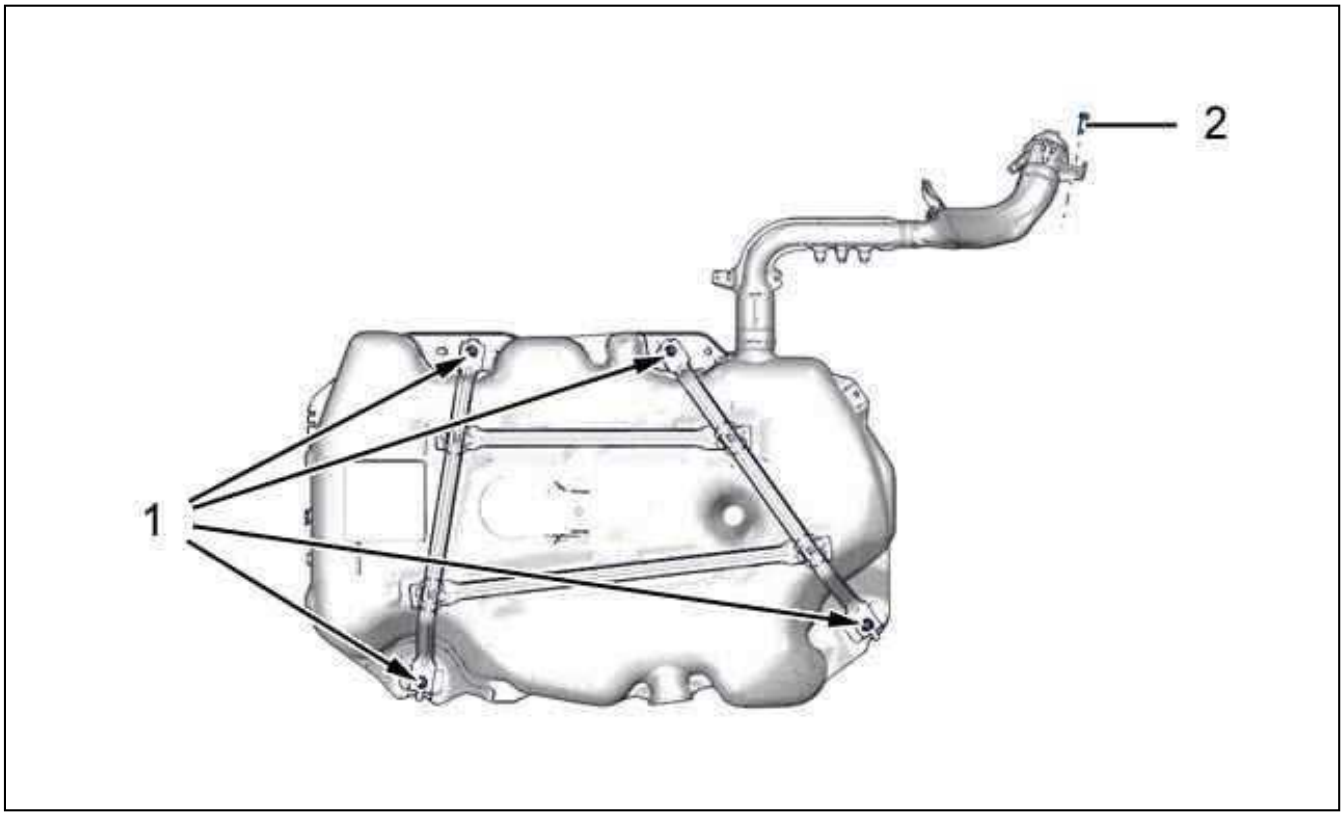


Figure : B1HB0EWD

Reference	Designation	Tightening torque
(1)	bolts - reservoir	3,5 daNm
(2)	bolts - Fuel filler neck	2,5 daNm

2. Fuel additive tank

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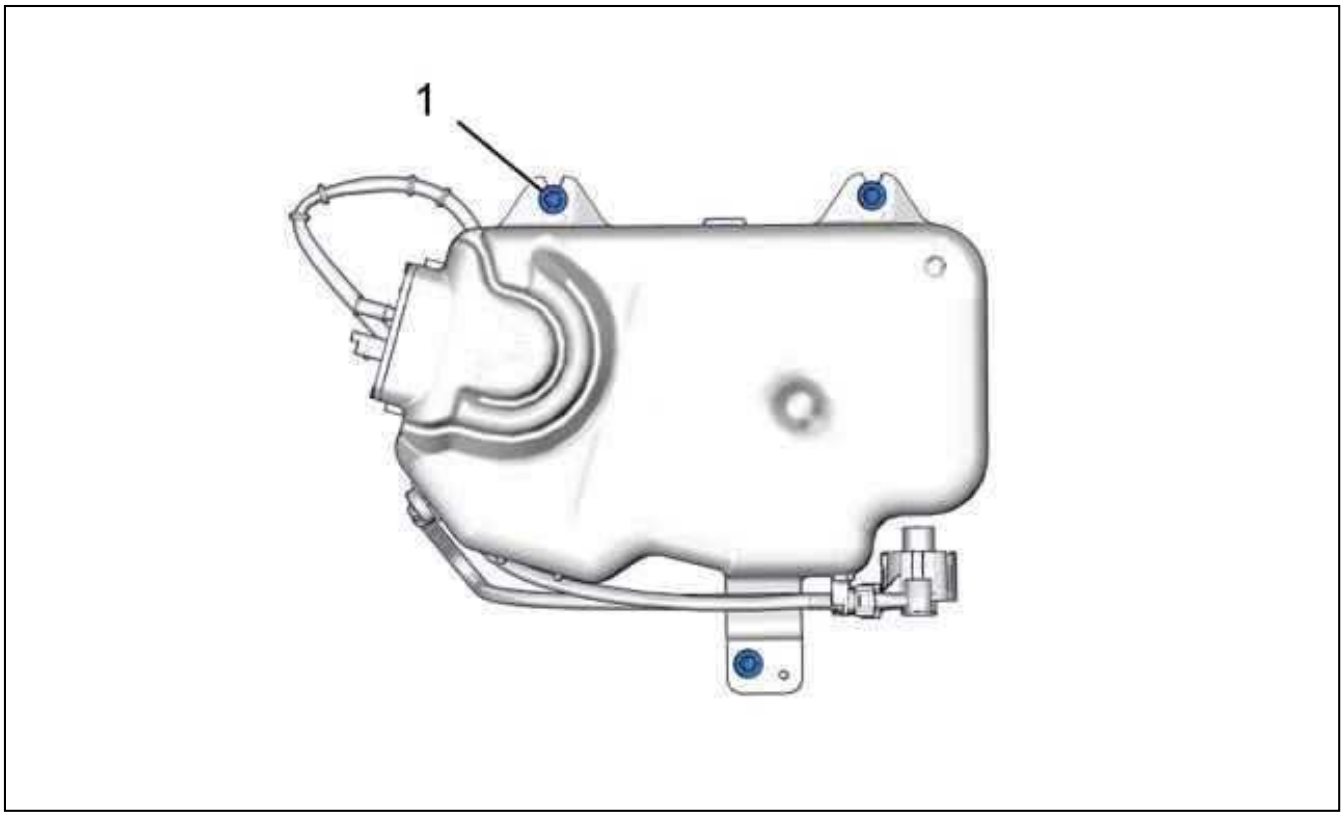


Figure : B1HB0EZD

Reference	Designation	Tightening torque
(1)	bolts - Fuel additive tank	0,6 daNm

3. Fuel cooler

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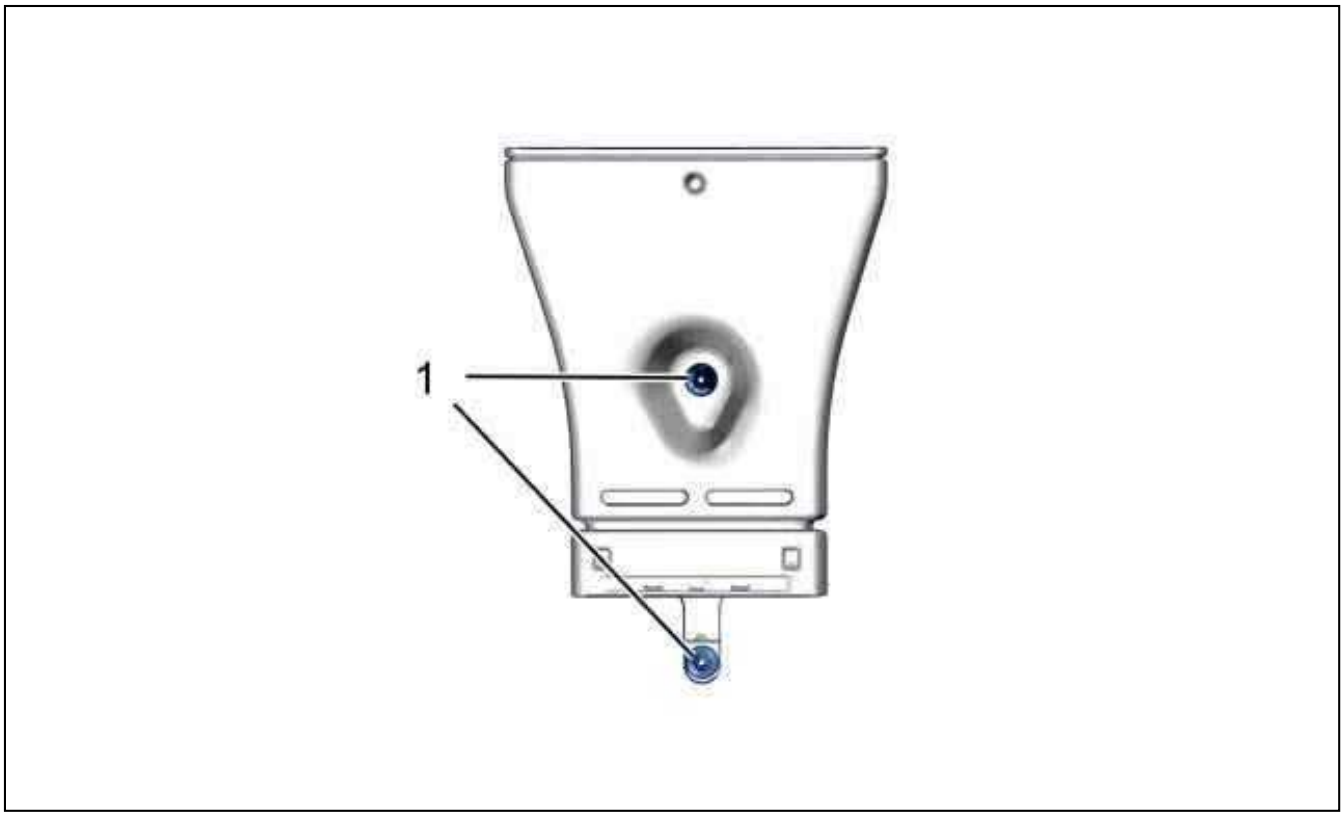


Figure : B1HB0F2D

Reference	Designation	Tightening torque
(1)	nut - Fuel cooler	0,8 daNm

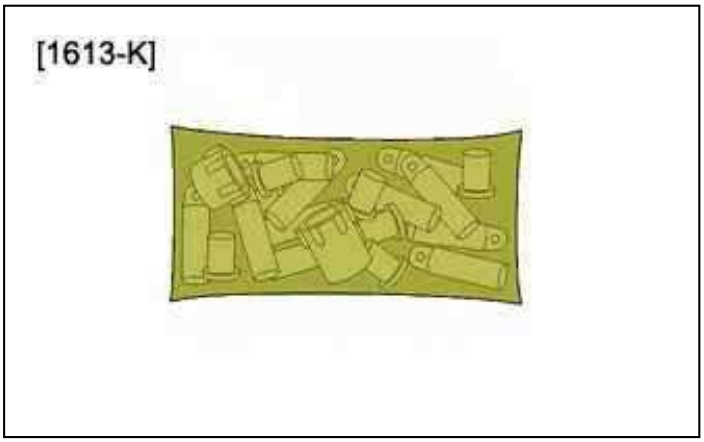
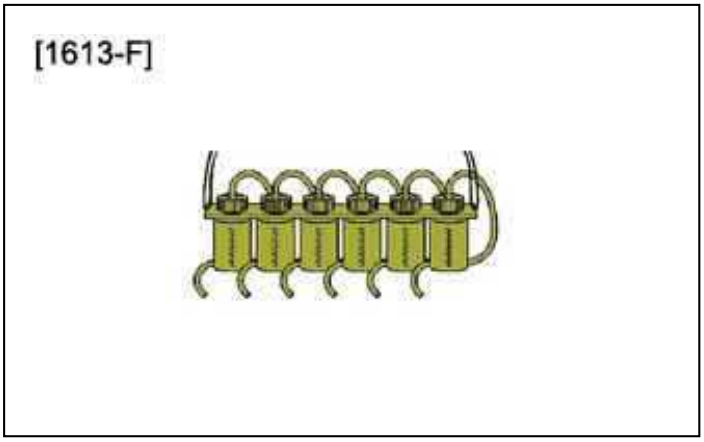
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CHECK : FUEL HIGH PRESSURE SUPPLY CIRCUIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Before carrying out any work on the high pressure fuel supply circuit, read the faults memory and carry out the actuator tests available in the diagnostic tool .

1. Tooling

tool	Reference	Designation
 Figure : E5AD011T	[1613-K]	[/] plugs kit
 Figure : E5AD012T	[1613-F]	containers for return of diesel injector leaks
	[1613-P]	union for return of leaks on DELPHI diesel injector

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[1613-P]



Figure : E5AD013T

2. Preliminary checks

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

2.1. Low pressure fuel circuit

Check the following components :

- The quantity of fuel in the tank : 15 litres minimum
- Fuel quality (if in doubt over the fuel quality, use an auxiliary tank with a filter, filled with fuel which you know where it came from)
- That there are no leaks on the high pressure fuel circuit
- The low pressure fuel supply circuit (filter clogged, condition of the pipes, no air bubbles) : Refer to the low pressure fuel circuit checking method

2.2. Electrical circuit

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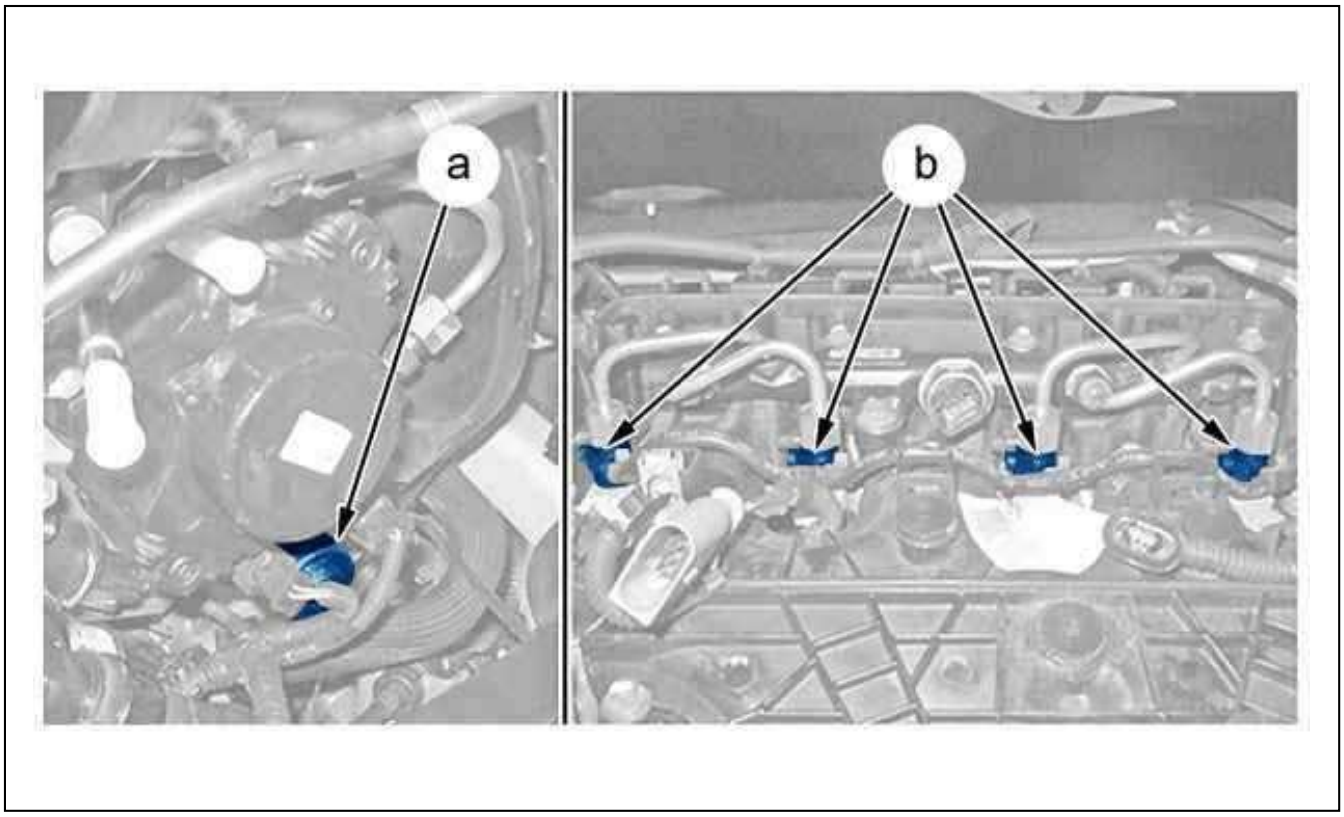


Figure : B1HDZ94D

Remove :

- The passenger compartment air inlet manifold
- The engine cover

Check the elements which could cause system malfunctions :

- The battery charge
- The fault codes using the diagnostic tool
- The fuel flow solenoid valve using the actuator test available in the diagnostic tool (Touch the solenoid valve at "a" to feel it vibrate)
- The electrical actuator of each injector using the actuator test available in the diagnostic tool (Audible test of the injectors at "b", proceed by comparison)

3. Check : Fuel pressure regulation

Follow the procedure below :

- The engine will not start : Check the fuel pressure regulation
- The engine starts : Check the injectors

3.1. Check : Fuel pressure regulation

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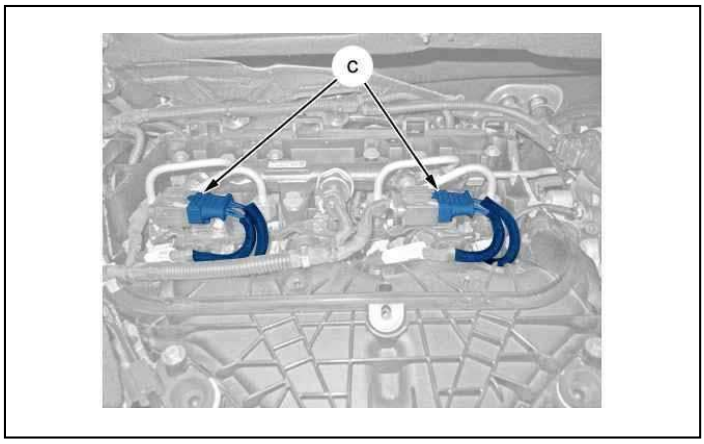


Figure : B1HDZ96T

Disconnect the injectors (at "c").
Connect the diagnostic tool to the vehicle's diagnostic socket ; Select in succession the following menus :

- Parameter Measurements menu
- Fuel circuit information
- Fuel pressure ordered - Measured fuel pressure

Operate the starter for 5 seconds ; Read the maximum values of the ordered and measured pressures on the diagnostic tool simultaneously.

CAUTION : The ordered and measured pressures must be identical (± 50 bar).

N.B. : If the pressures read are identical, the system is providing sufficient pressure to start and operate normally Confirm the preliminary checks, otherwise contact the technical assistance platform.

N.B. : If the pressures read are different, the system does not have the pressure required : Check the leaks return from the injectors .

3.2. Injector check

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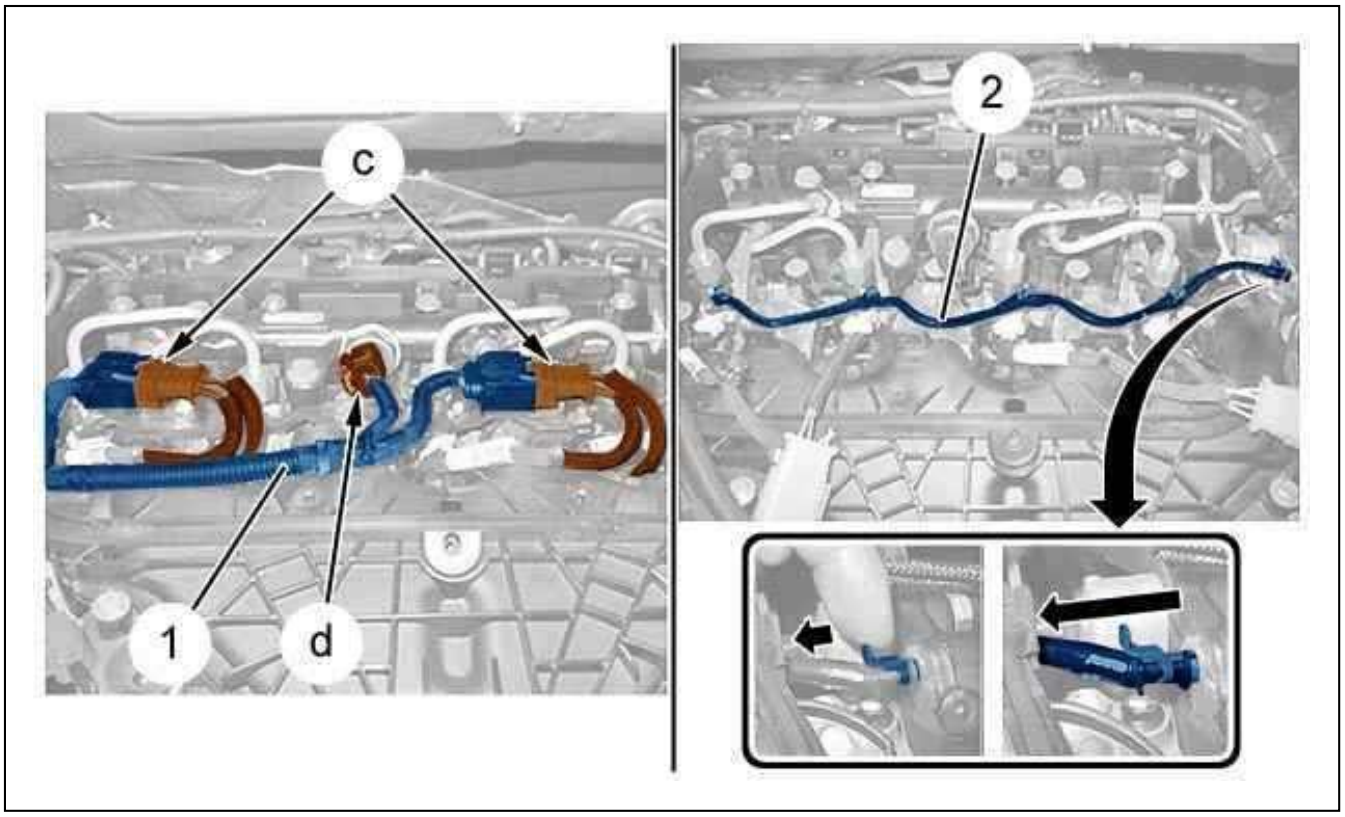


Figure : B1HDZ9AD

Unplug :

- The injectors (at "c")
- The high pressure fuel sensor (at "d")

Release and move aside the electrical harness (1).
Uncouple the clickfit unions going from the injector at the timing end towards the high pressure pump :

- Pull the locking tab rearwards
- Extract the fuel return click-fit union

CAUTION : Immediately plug the fuel unions using plugs [1613-K].

Remove : The fuel return pipe (2).

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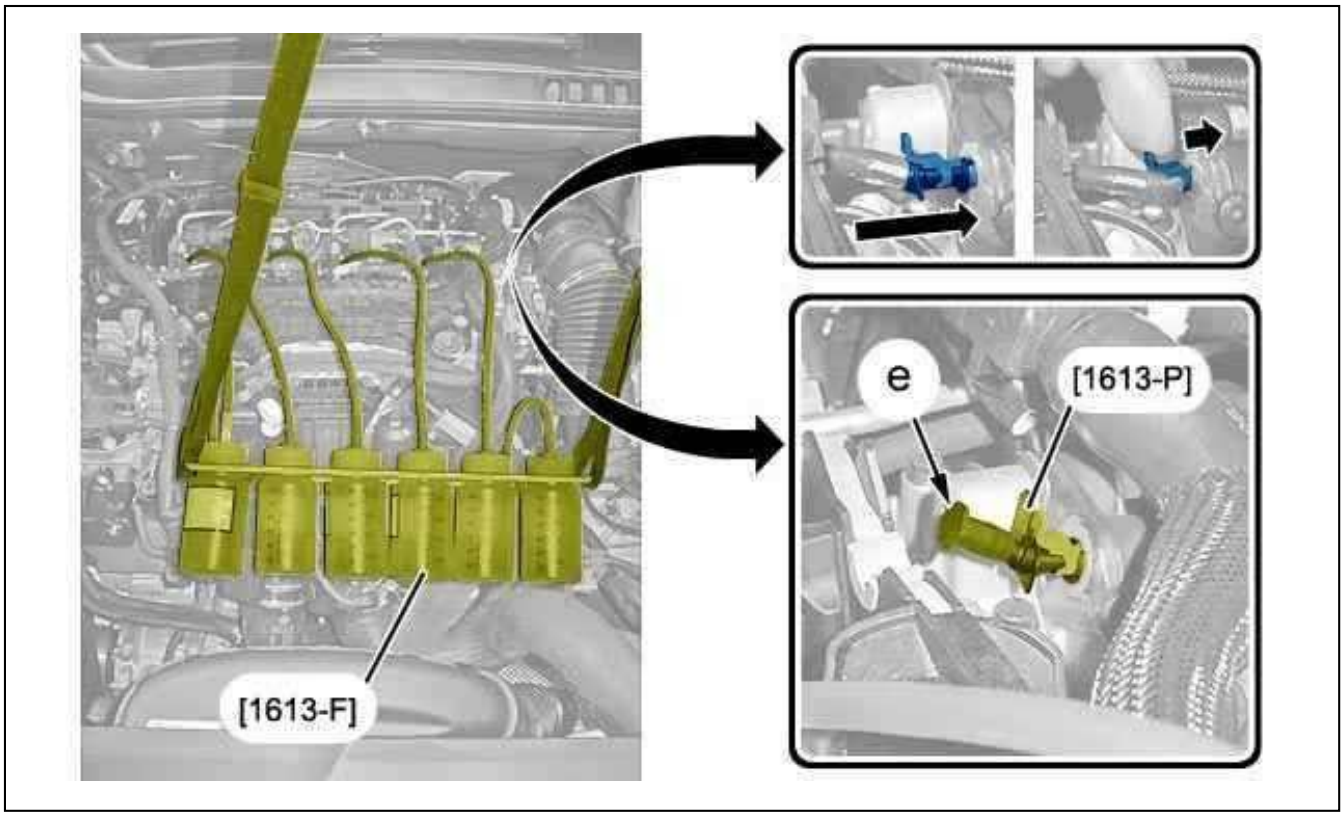


Figure : B1HDZ9BD

CAUTION : Check the condition of the O-rings on the unions [1613-P] (replace if necessary).

Couple the 4 unions [1613-P] on the injectors :

- Check that the tab is open (Pull rearwards)
- Insert the union fully home
- Push the locking tab
- Pull gently on the union to check that it is in place

Couple up :

- A 5th union [1613-P] previously plugged on the high pressure pump (at "e")
- The tool containers [1613-F] on the diesel injector unions [1613-P]

Hook the container holder bar [1613-F] on the bonnet.
Connect :

- The injectors (at "c")
- The high pressure fuel sensor (at "d")

CAUTION : The engine coolant temperature must be higher than 60°C for the "engine running" check. Do not press the pedals once the test has started.

Method of operation :

- The engine starts : Using the diagnostic tool, start the leak detection test (1 single cycle)
- The engine will not start : Operate the starter motor for 5 seconds

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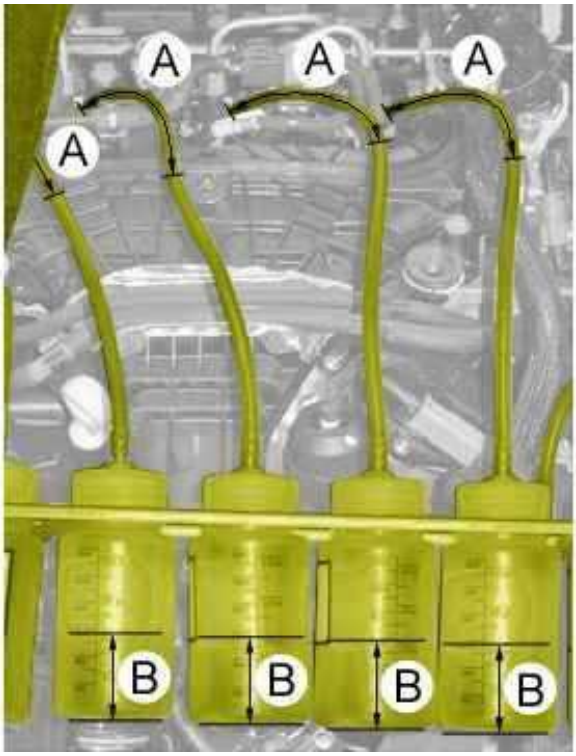


Figure : B1HDZ9CD

"A" : Volume collected (Engine not running).
"B" : Volume collected (engine running).

CAUTION : The maximum volume collected must not exceed 36 ml per container (engine running) or 16 cm length in each pipe of inside diameter 4 mm (engine not running).

N.B. : If one or more injectors exceed this value, replace them then repeat the check.

N.B. : If the volume collected is correct, the high pressure pump is not providing the pressure required. Replace the high pressure pump.

CAUTION : Clean, cap and carefully store the tools used.

Remove the tools [1613-F], [1613-P].

CAUTION : Always replace the O-ring seals on the clickfit unions (2) ; Risk of leaks.

Pre-position the fuel return pipe (2) on the pump and the injectors starting with the pump.
Couple up : The fuel return pipe (2) :

- Check that the tabs are open (Pull rearwards)
- Fully insert the unions, commencing with the pump, then the injectors 1, 2, 3, 4
- Push the locking tabs
- Pull carefully on the unions to check they are in place

N.B. : Injector N° 4 (timing side).

Connect :

- The injectors (at "a")

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- The high pressure fuel sensor (at "b")

Clip in place - Move aside the electrical harness (1).
Refit :

- The high pressure fuel system protector
- The engine cover
- The passenger compartment air inlet manifold

4. Final check

Carry out :

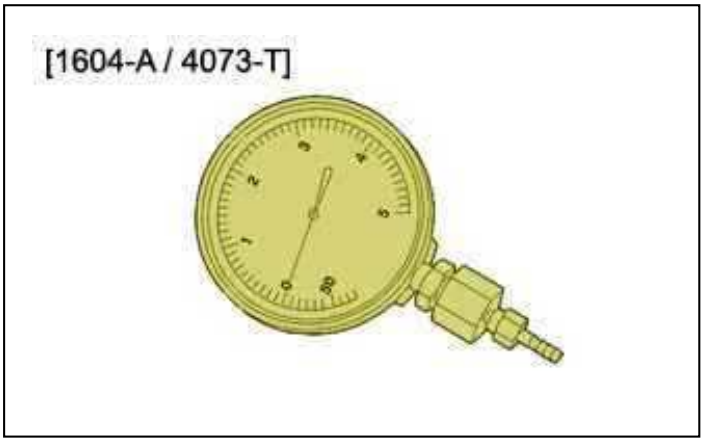
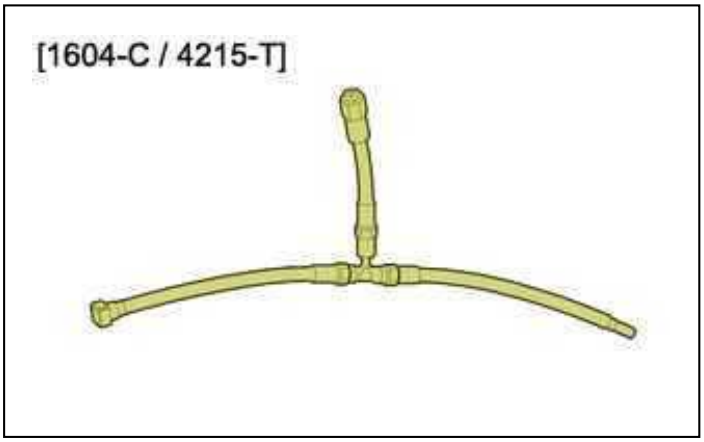
- Clearing of the faults memory ; Using the diagnostic equipment
- A road test
- Reading of the faults memory ; Using the diagnostic equipment

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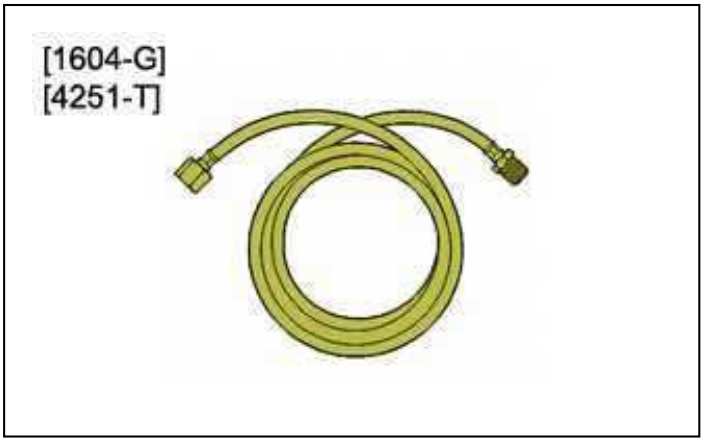
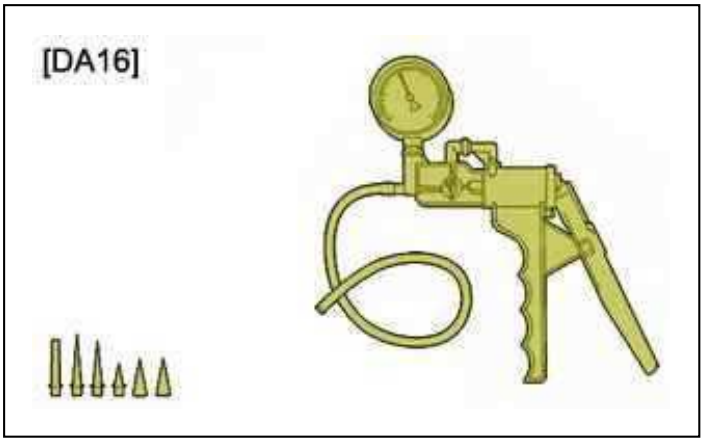
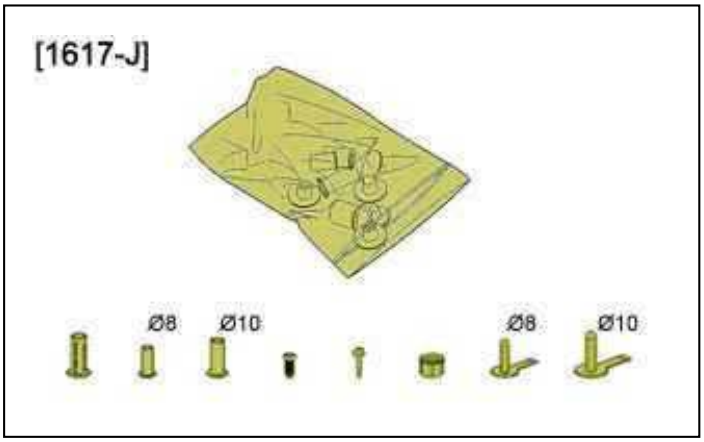
CHECK : LOW PRESSURE FUEL SUPPLY CIRCUIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB0HMT	[1604-A] [4073-T]	[/]pressure gauge for checking the turbocharging pressure
 Figure : E5AB0MDT	[1604-C] [4215-T]	10 mm dia. union for taking low pressure
	[1604-G] [4251-T]	Extension

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 Figure : E5AB0MFT		
 Figure : E5AB0JWT	[DA16]	vacuum-pressure manual pump DA16 + adaptor
 Figure : E5AG03LT	[1617-J]	Sealing plugs HDI

2. Preliminary checks

CAUTION : Prior to any operation on the low pressure fuel supply circuit, read the memory of faults and perform the tests as required by the diagnostic tool.

Before starting the procedure for testing the low pressure fuel supply circuit, you are strongly advised to carry out the

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following checks :

- Check the fuel tank breather (audible vacuum noise when you open the cap)
- Visually check the condition of the fuel circuit pipes (low pressure and high pressure)
- Make sure there is a sufficient quantity of fuel in the tank (15 litres minimum)
- Ensure yourself of the quality of the fuel contained in the tank

3. Checking the vacuum of the low pressure fuel supply circuit

3.1. Application

Remove :

- The passenger compartment air inlet manifold
- The engine cover

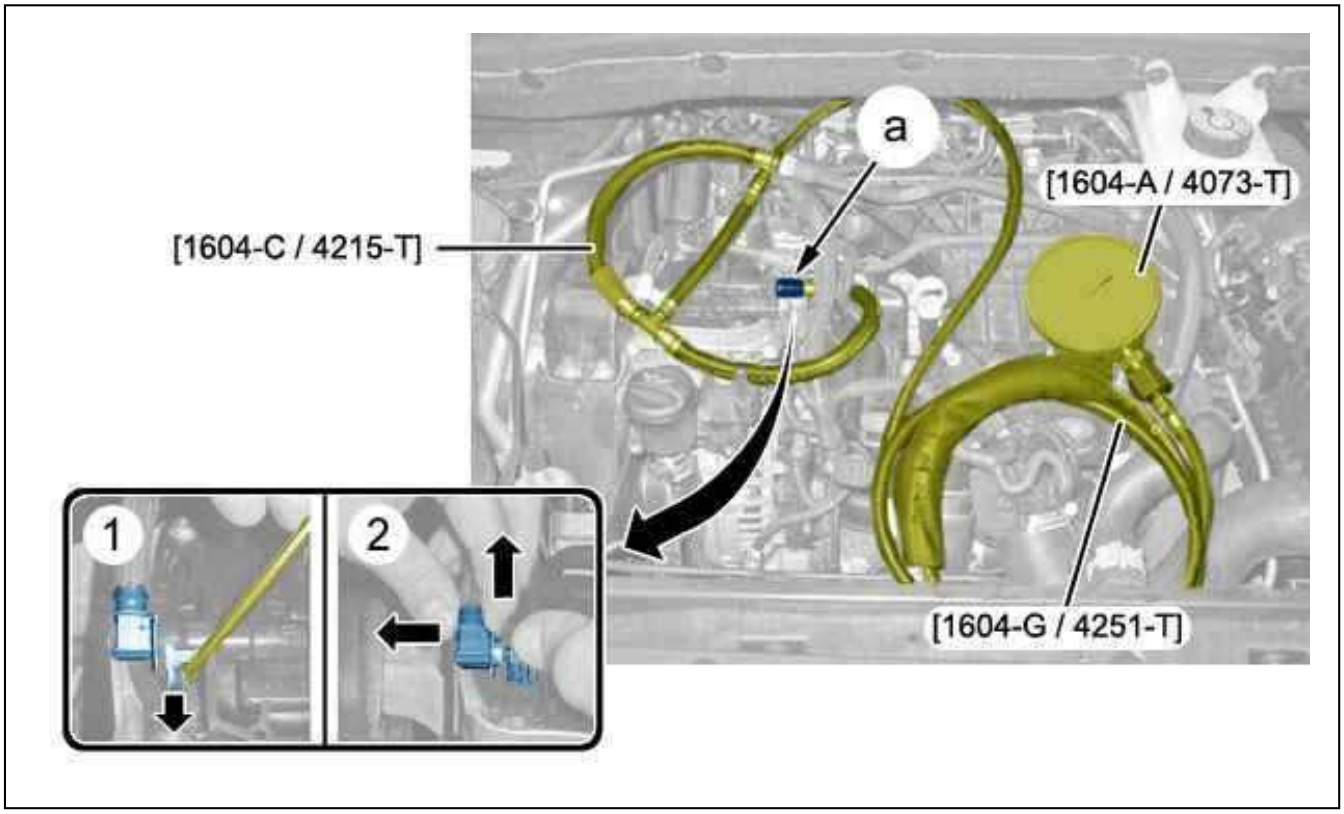


Figure : B1HDZCLD

Uncouple the union of the fuel low pressure pipe (as "a") ; Using a flat screwdriver.

CAUTION : Check the cleanliness of the tools [1604-A / 4073-T] , [1604-C / 4215-T] , [1604-G / 4251-T].

Connect with a by-pass circuit tools 1604-A / 4073-T and 1604-C / 4215-T between the fuel high pressure pump and the fuel filter (at the fuel filter outlet).
Secure the tool [1604-A / 4073-T] so that it is immobilised during taking of measurements.

N.B. : An extension [1604-G / 4251-T] may be used in order to obtain a reading from the passenger compartment.

3.2. Check

CAUTION : This test is carried out with the vehicle stationary.

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Method of checking (Engine not running) :

- Operate the starter motor for 10 seconds
- Note the vacuum on the tool [1604-A / 4073-T]

Compare the vacuum value read.

Method of checking (engine running) :

- Start the engine
- Note the vacuum on the tool [1604-A / 4073-T]

Compare the vacuum value read.

3.3. Low pressure fuel supply system check

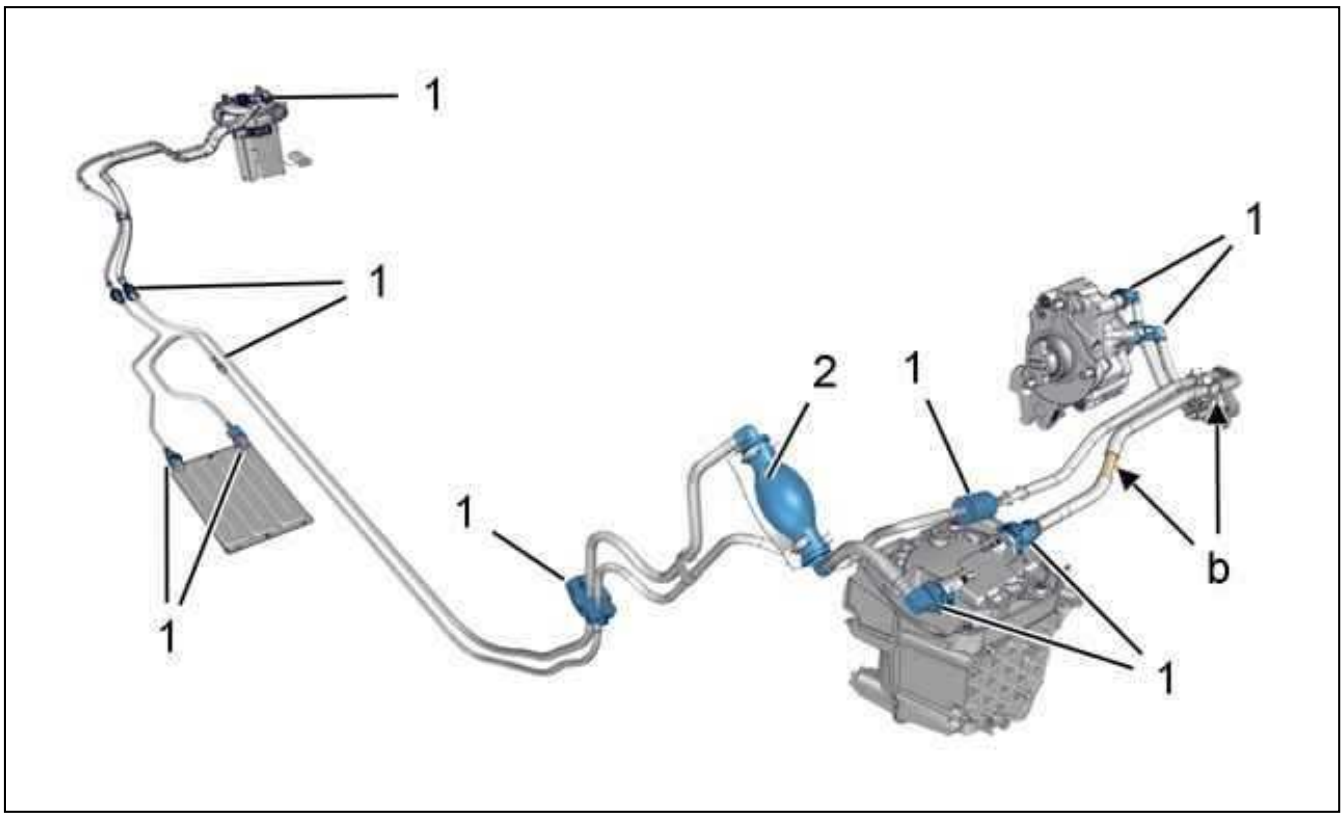


Figure : B1HDZ68D

(1) Low pressure union.
(2) Manual priming pump.
(b) Transparent zones.

If the vacuum is too large, check the following points :

- That the pipes are not kinked or compressed (by the lifting jack under the body, or incorrect routing)
- The condition of the fuel filter (Clogging)
- The condition of the fuel pre-filter in the fuel suction/gauge module assembly (Clogging)

Check the sealing of the fuel circuit (See next chapter).

N.B. : In the event of the vacuum being zero, check the condition of the low pressure supply pipe (en "b"), the fuel lov pressure return circuit and the fuel high pressure pump ; Replace any defective parts.

If the vacuum is correct, check the following points :

- That there is not a large amount of air bubbles in the circuit ; Using the transparent zones (en "b")
- That there are no leaks on the low pressure unions (1) or on the manual priming pump (2)

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3.4. Refitting

CAUTION : Plug the tools [1604-A / 4073-T], [1604-C / 4215-T], [1604-G / 4251-T] immediately after removal.

Remove the tools [1604-A / 4073-T], [1604-C / 4215-T], [1604-G / 4251-T].
Couple up : The low-pressure fuel supply union .
Prime the fuel circuit ; Using the manual priming pump (2).
Refit the engine style cover .

4. Checking the sealing of the low pressure fuel supply circuit (large amount of air bubbles)

4.1. Application

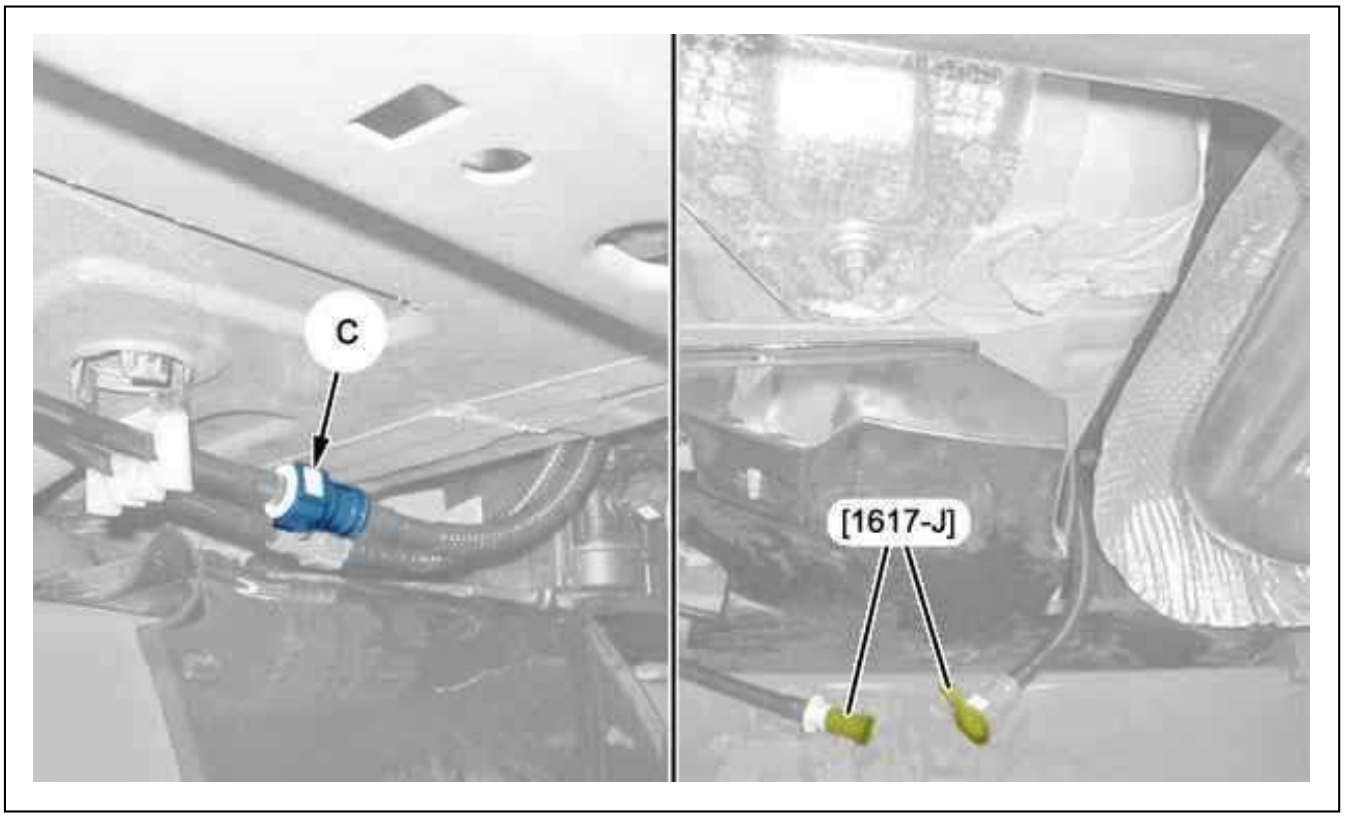


Figure : B1HDZABD

Raise the vehicle, wheels hanging.
Remove the engine style cover .
Drain the low pressure fuel supply circuit .

CAUTION : Plug the union (at "c") immediately after removal ; Using the plugs [1617-J] (Ø 10 mm).

Uncouple : The fuel low pressure supply pipe exiting the tank (as "c").

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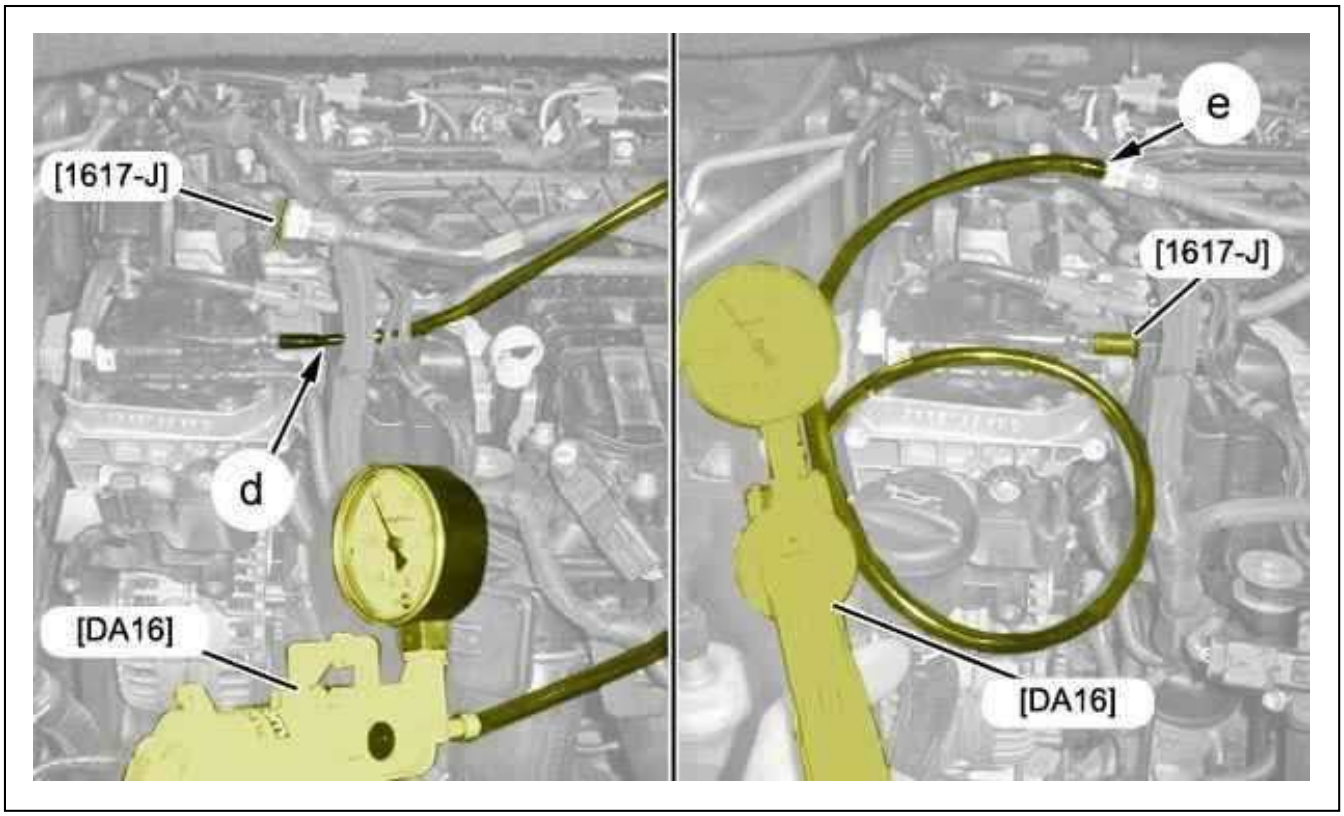


Figure : B1HDZCND

CAUTION : Prior to any operation, the supply circuit must be emptied of its fuel.

Uncouple the low pressure union at the fuel filter outlet.

CAUTION : The vacuum pump connectors [1617-J] have to be clean.

Close the union ; Using one of the plugs [1617-J] (Ø 10 mm).

4.2. Checking the sealing upstream of the fuel filter

Connect the vacuum pump [DA16] and its adaptor (as "d").
Apply a vacuum of 0,4 bar :

- The vacuum is reached and does not drop : The circuit is sealed, pass to the next check
- The vacuum is reached with difficulty, and drops : Recommence the operation upstream of the fuel filter and so o until you identify the leak, then replace the component that is faulty

4.3. Checking the sealing downstream of the fuel filter

Connect the vacuum pump [DA16] and its adaptor (as "e").
Apply a vacuum of 0,4 bar :

- The vacuum is reached and does not drop : The circuit is sealed, pass to the next check
- The vacuum is reached with difficulty, and drops : Disconnect the fuel low pressure supply union from the high pressure pump, then block it with the plug [1617-J]
- Repeat the operation ; Replace the component that is faulty

4.4. Checking the sealing of the fuel gauge well

Remove the fuel sender and pump unit .
Check the sealing of the fuel gauge and pump assembly, replace any faulty component.

4.5. Refitting

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Refit the fuel gauge and pump assembly .
Remove the tools [DA16], [1617-J].
Connect up all the low pressure fuel supply unions.
Fill and bleed : The fuel filter .
Prime the fuel circuit ; Using the manual priming pump (2).
Start the engine.
Verify :

- Check there are no air bubbles in the low-pressure fuel circuit
- That there are no leaks of fuel

Refit :

- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Clear the memory of faults ; Using the diagnostic equipment.

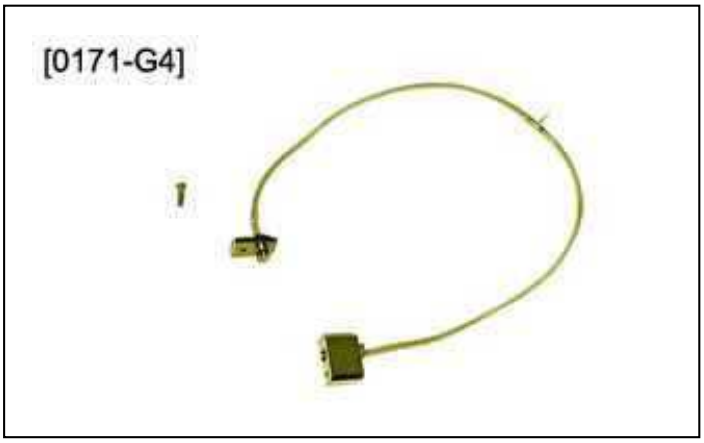
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CHECK : TURBOCHARGE PRESSURE

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment : Diagnostic station.

tool	Reference	Designation
 Figure : E5AB0M1T	[0171-A] [4073-T]	pressure gauge for checking the turbocharging pressure
 Figure : E5AB0G4T	[0171-G4]	inlet air pressure/vacuum checking tools

2. Removing

CAUTION : Prior to any operation on a sensor or an actuator, read the memory of faults and do the necessary tests with the aid of the diagnostic tool.

Remove :

- The passenger compartment air inlet manifold
- The engine cover

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Figure : B1BD03RD

Remove the turbocharging pressure sensor (1).

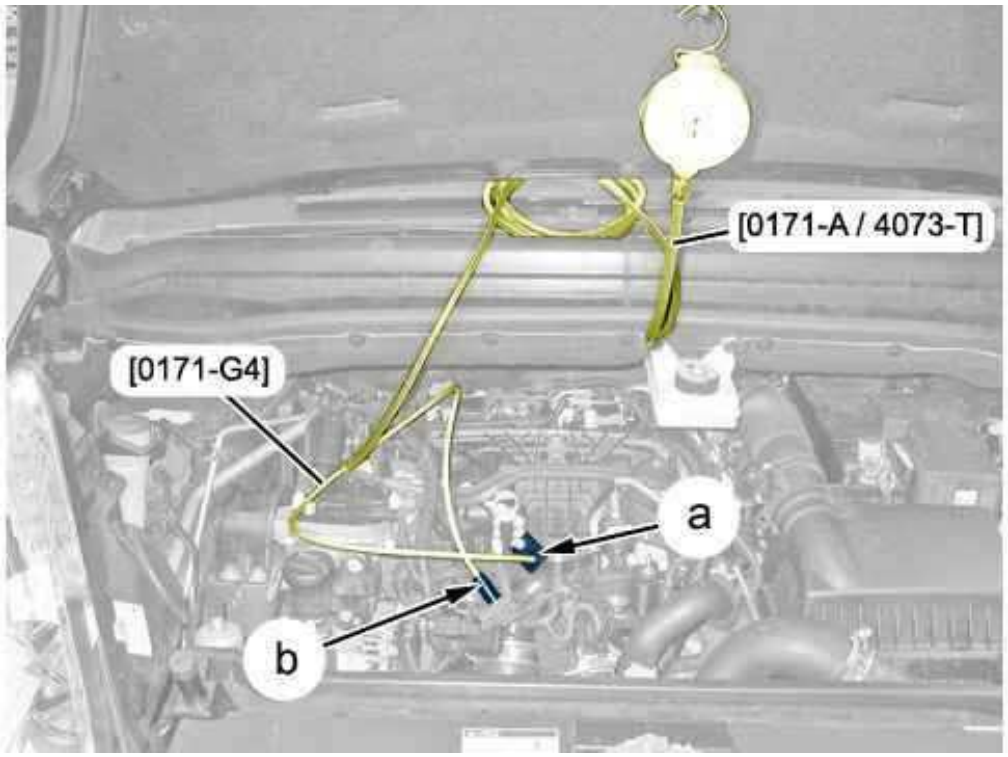


Figure : B1HDZCJD

Connect :

- The tool [0171-G4] in place of the turbocharging pressure sensor (1) (as "a")

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- The turbocharging pressure sensor (1) on the tool [0171-G4] (as "b")
- The tool [0171-A / 4073-T] on the tool [0171-G4]

Connect the diagnostic equipment to the vehicle's diagnostic socket.
Place the diagnostic tool in parameter measures.

3. Check

3.1. Check (Vehicle stopped)

CAUTION : Observe the following checking conditions : Engine at operating temperature ; Vehicle stopped.

Method of checking : Vehicle stopped :

- Start the engine
- Note down the pressures on the tool [0171-A / 4073-T] and on the diagnostic station
- Accelerate the engine to 2500 r.p.m
- Note down the pressures on the tool [0171-A / 4073-T] and on the diagnostic station
- Accelerate fully
- Note down the pressures on the tool [0171-A / 4073-T] and on the diagnostic station

Compare the values of the pressures read .

3.2. Check (Road test)

CAUTION : Observe the following checking conditions : Engine at operating temperature ; Vehicle being driven ; Two operators are necessary.

Method of checking : On road test :

- Position the tool [0171-A / 4073-T] and the diagnostic station inside the vehicle
- Start the engine
- Select 2nd gear
- Accelerate fully
- Note down the pressures on the tool [0171-A / 4073-T] and on the diagnostic station

Compare the values of the pressures read .

3.3. Verification of the coherence of the signal

N.B. : If there is a big difference between the pressures taken by the diagnostic tool and on the pressure gauge, do the tests on the turbo pressure sensor and its supply circuit.

N.B. : If the pressures taken are identical between the diagnostic tool and the pressure gauge, but different from the reference values ; Perform the tests as required by the diagnostic tool.

Table summarising the possible causes of a turbo pressure fault.

Faults : Turbocharger pressure				
	Lack of pressure	Measured pressure too high	Pressure fluctuations (Hesitation while driving)	Turbo whistles
Possible causes	Break in the turbo circuit (collars - Air ducts - Exchanger)	Variable geometry control fault (Vacuum circuit - Actuator …)	Turbocharger variable geometry actuator fault (Hard spot)	Break in the turbo circuit (collars - Air ducts - Exchanger)
	Variable geometry control	Information from the	Transient circuit breaks in the	Increase in the

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	fault (Vacuum circuit - Actuator …)	turbocharger position copy sensor incorrect	variable geometry control (Vacuum pipes - Actuator …)	imbalance on the turbocharger shaft
	Clogging : Turbocharging circuit (Air cleaner / catalytic converter)	Movements of the flaps in the air loop (Metering unit - Recycling valve)	Information from the turbocharger position copy sensor (Transient circuit breaks)	
	Movements of the flaps in the air loop (Metering unit - Recycling valve)	Defective intake air temperature signal (Air flow meter)	Signal fault : (Transient circuit breaks) : Air temperature - Air flow meter - Atmospheric pressure	
	Information from the turbocharger position copy sensor incorrect	Atmospheric pressure signal fault	Signal fault : (Transient circuit breaks) : Turbocharging pressure sensor	
	Signal fault : Turbocharging pressure sensor	Signal fault : Turbocharging pressure sensor		
	Lack of fuel flow (Low pressure - High pressure)			
	Turbocharger fault (Significant play - Fins damaged)			
	Engine temperature : Too high			

N.B. : This table gives the possible causes of problems with the turbo system as a guide, but it is not exhaustive.

4. Refitting

CAUTION : Adhere to the tightening torques .

Remove :

- Tools [0171-A / 4073-T] and [0171-G4]
- The diagnostic station

Refit :

- The turbocharging pressure sensor (1)
- The engine cover
- The passenger compartment air inlet manifold

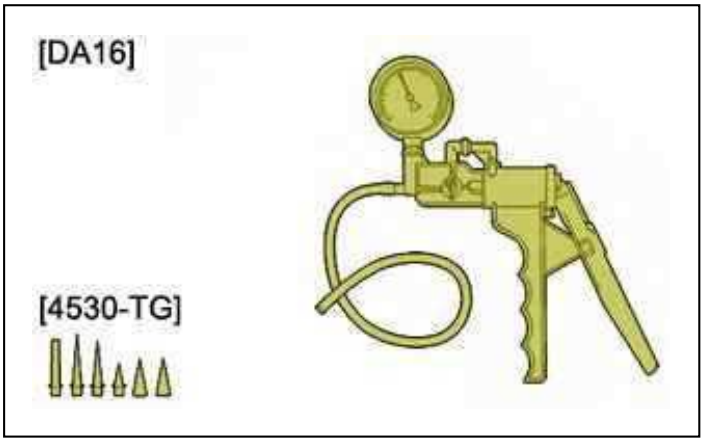
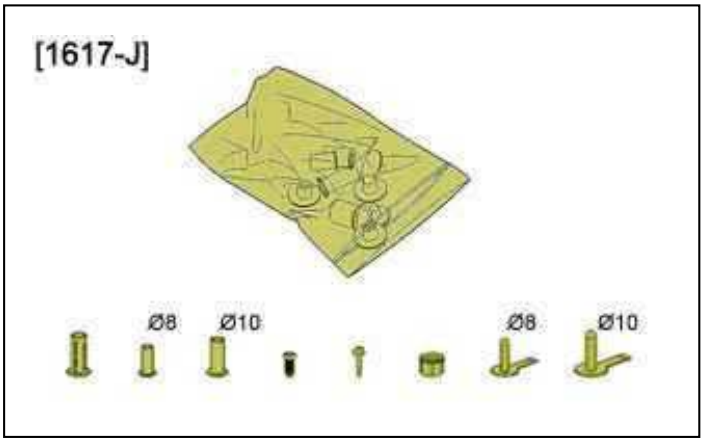
CAUTION : Clear the memory of faults ; Using the diagnostic equipment.

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CHECKING : AIR SUPPLY CIRCUIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Tools	Reference	Description
 Figure : E5AD01GT	[DA 16]	Manual vacuum pump with adaptors [4530-T.G]
 Figure : E5AG03LT	[1617-J]	Sealing plugs HDI
	-	Diagnostic station

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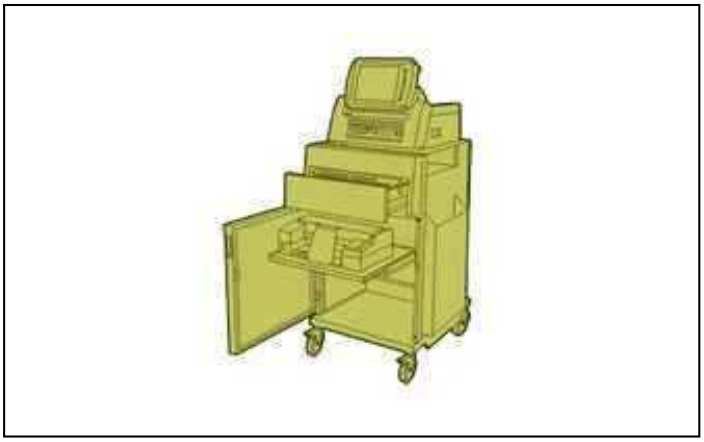


Figure : E5AD01HT

2. Flow chart : Vacuum circuit

2.1. Components

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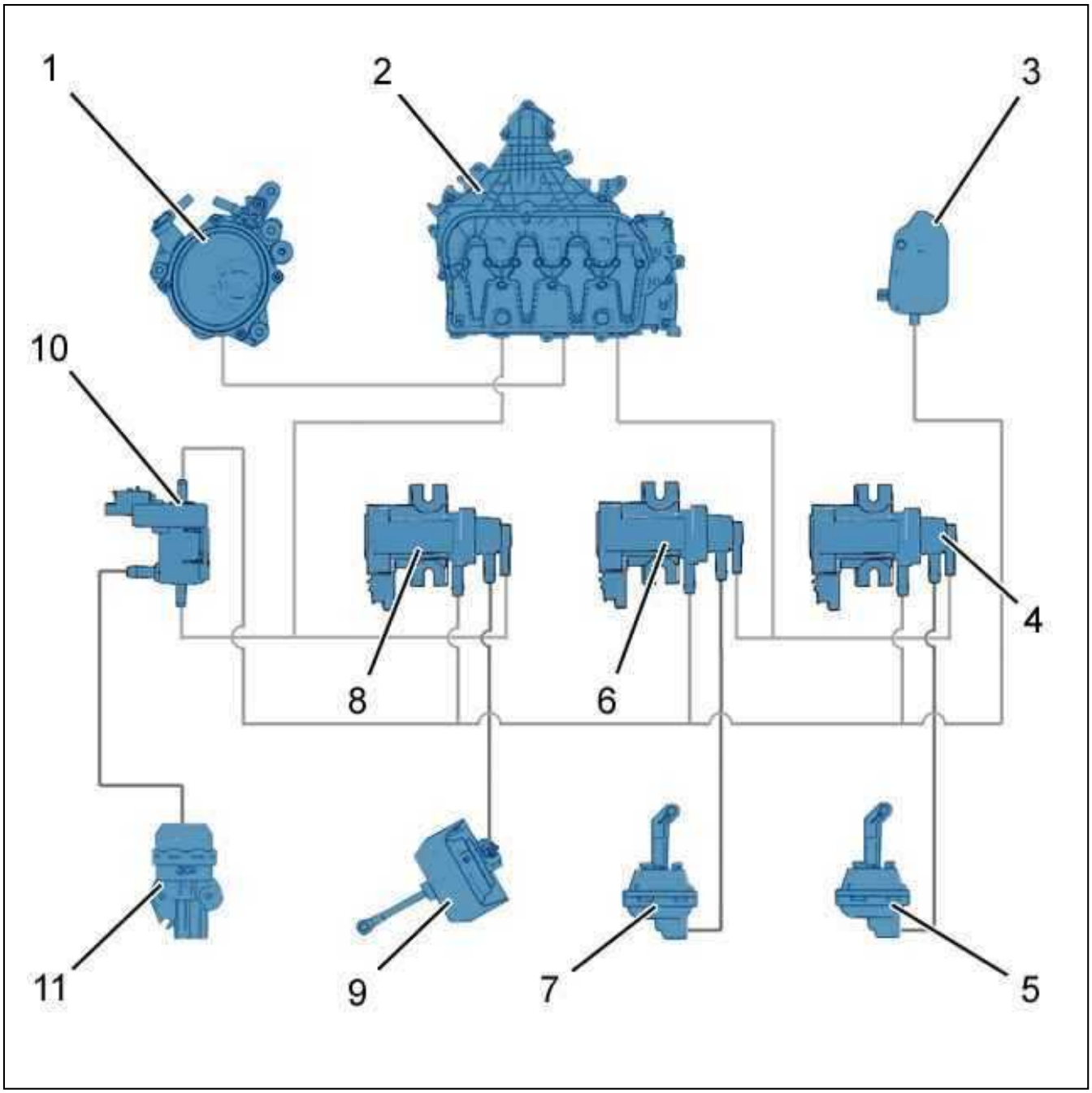


Figure : B1HDZ6NP

(1) vacuum pump.
(2) Air inlet manifold with integral vacuum reserve.
(3) Remote breather.
(4) Proportional control electrovalve .
(5) Control capsule for the inlet air mixer.
(6) Proportional control electrovalve .
(7) Control capsule for the inlet air cooler by-pass mixer.
(8) Proportional control electrovalve .
(9) Variable geometry control capsule (turbocharger).
(10) Solenoid valve "ON/OFF".
(11) Control capsule for the exhaust gas cooler by-pass flap.

2.2. Link : tyre

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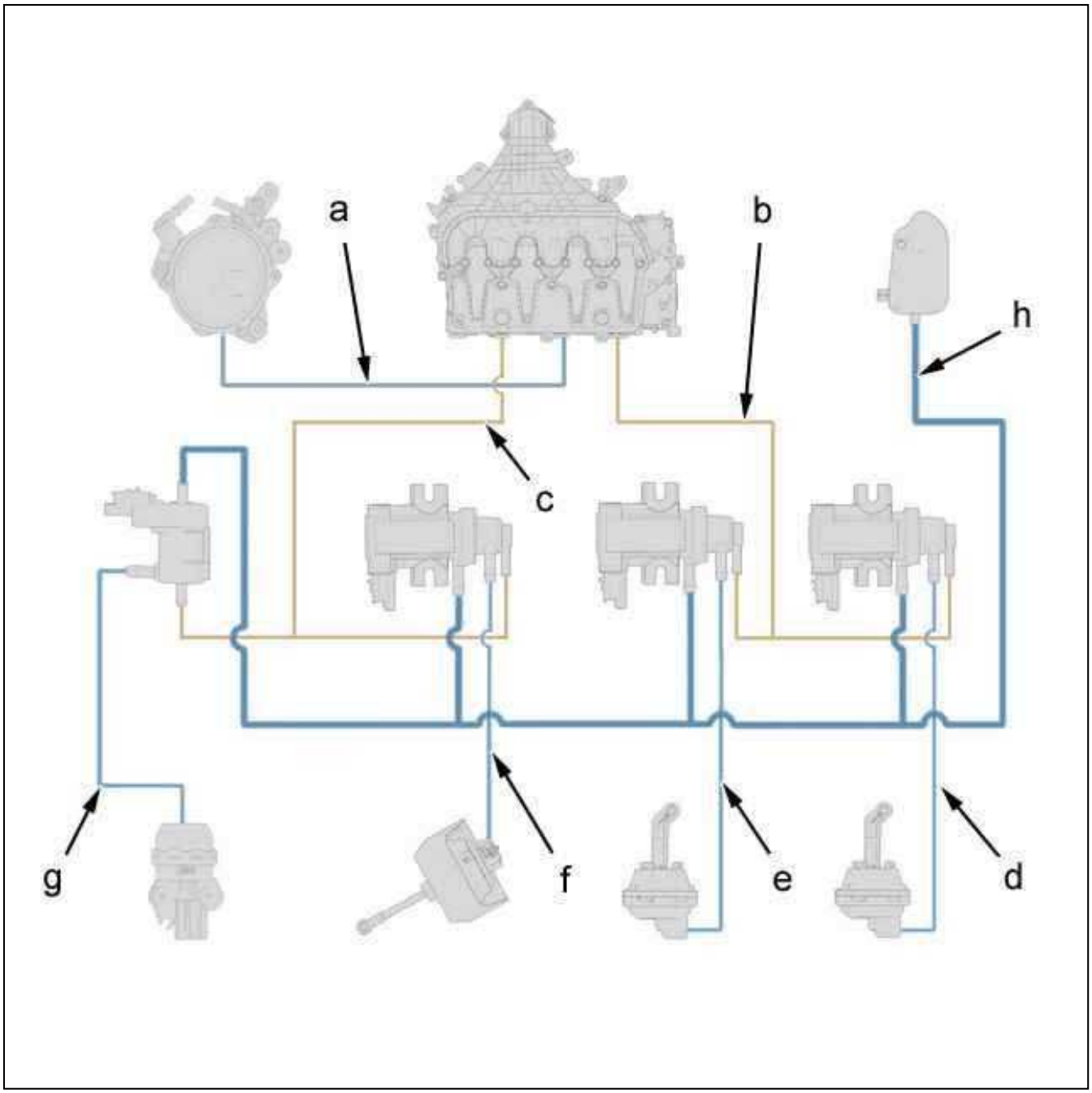


Figure : B1HDZ6QP

"a" Vacuum generation circuit with take-off for the exhaust gas recovery control circuit.
Circuit upstream of the electrovalves :

- "b" Vacuum coupling circuit on the proportional control electrovalves (4) and (6)
- "c" Vacuum coupling circuit on the proportional control electrovalves (8) and "ON/OFF" (10)

Circuit downstream of the electrovalves :

- "d" Control circuit for the inlet air cooler by-pass mixer
- "e" Control circuit for the inlet air mixer
- "f" Control circuit for the variable geometry turbo
- "g" Control circuit for the exhaust gas cooler by-pass flap
- "h" Breather circuit

3. Preliminary operations

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CAUTION : Prior to any operation on the vacuum circuit, read the memory of faults and perform the tests as required by the diagnostic tool.

Remove :

- The passenger compartment air inlet manifold
- The engine cover

Check the efficiency of the vacuum pump .

N.B. : If the values are not correct : Replace the component that is faulty.

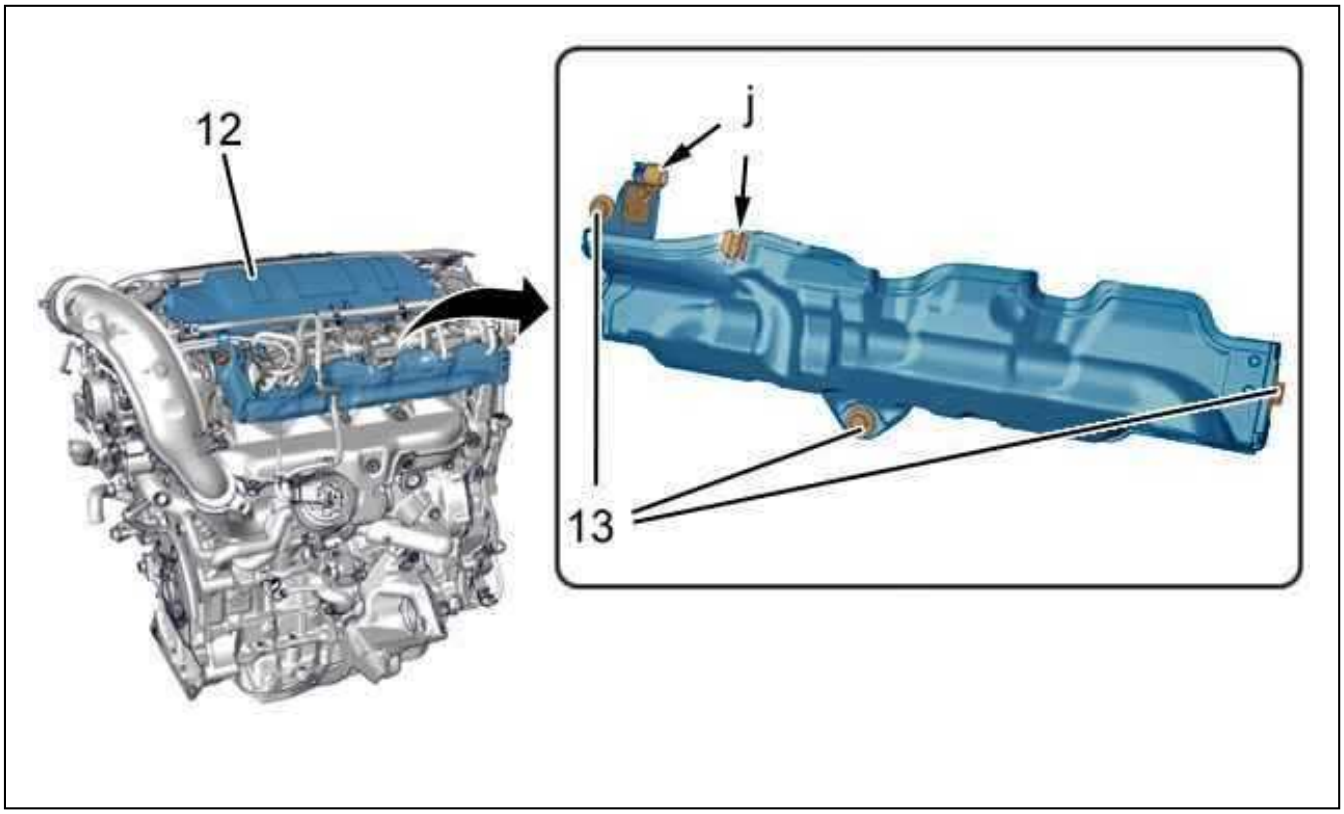


Figure : B1HDZ7GD

Remove the protector (12) from the injection system.
Unclip the pipes (as "j").
Remove the bolts (13).

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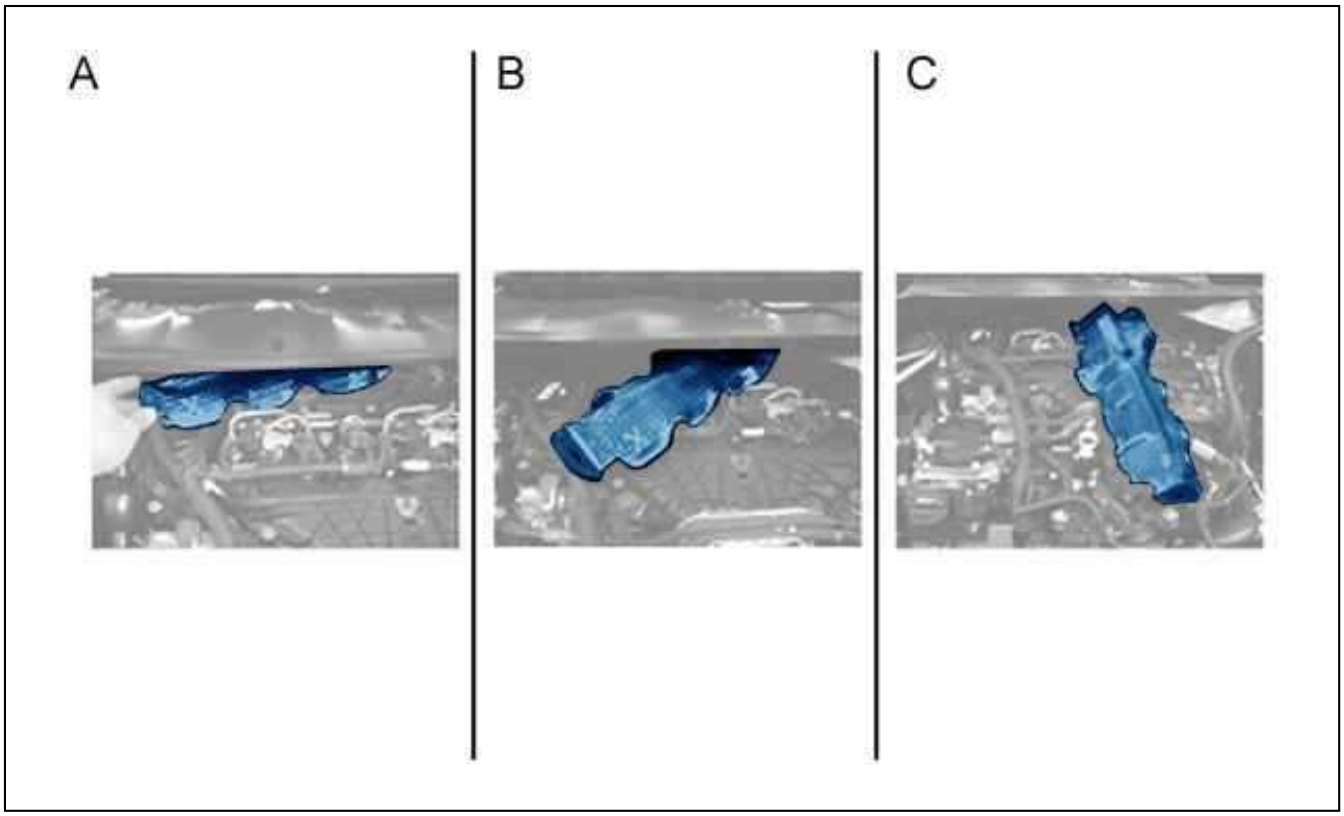


Figure : B1BD03ED

Take out the heat shield (In accordance with the illustration above).

4. Checking for leaks

CAUTION : The operation on the electrovalves is done with the help of a mirror.

Checks to be performed depending on the types of problems :

- If there is a general failure of the vacuum circuit ("d" + "e" + "f" + "g"), refer to the method for checking the sealing of the vacuum reserve (See below)
- If there is a failure relating to the vacuum circuit controls ("d" + "e" or "f" + "g"), refer to the methods for checking the sealing of the circuit upstream of the electrovalves (See below)
- If it is a localised problem in the vacuum circuit ("d", "e", "f" or "g"), refer to the methods for checking the sealing of the circuit downstream of the electrovalves (See below)

4.1. Vacuum reservoir

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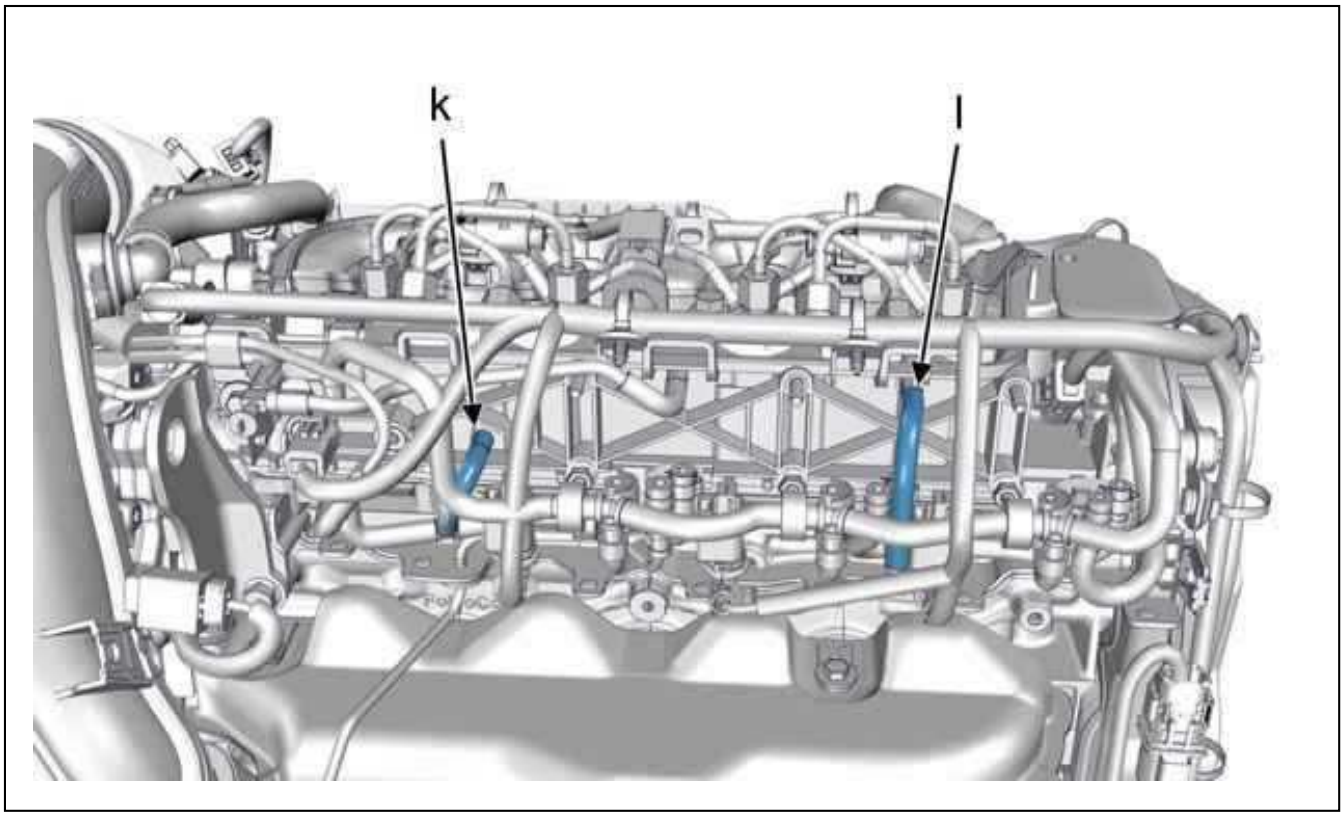


Figure : B1HDZ6YD

Uncouple the vacuum pipes (At "k" and "l").

N.B. : Without removing the electrovalves.

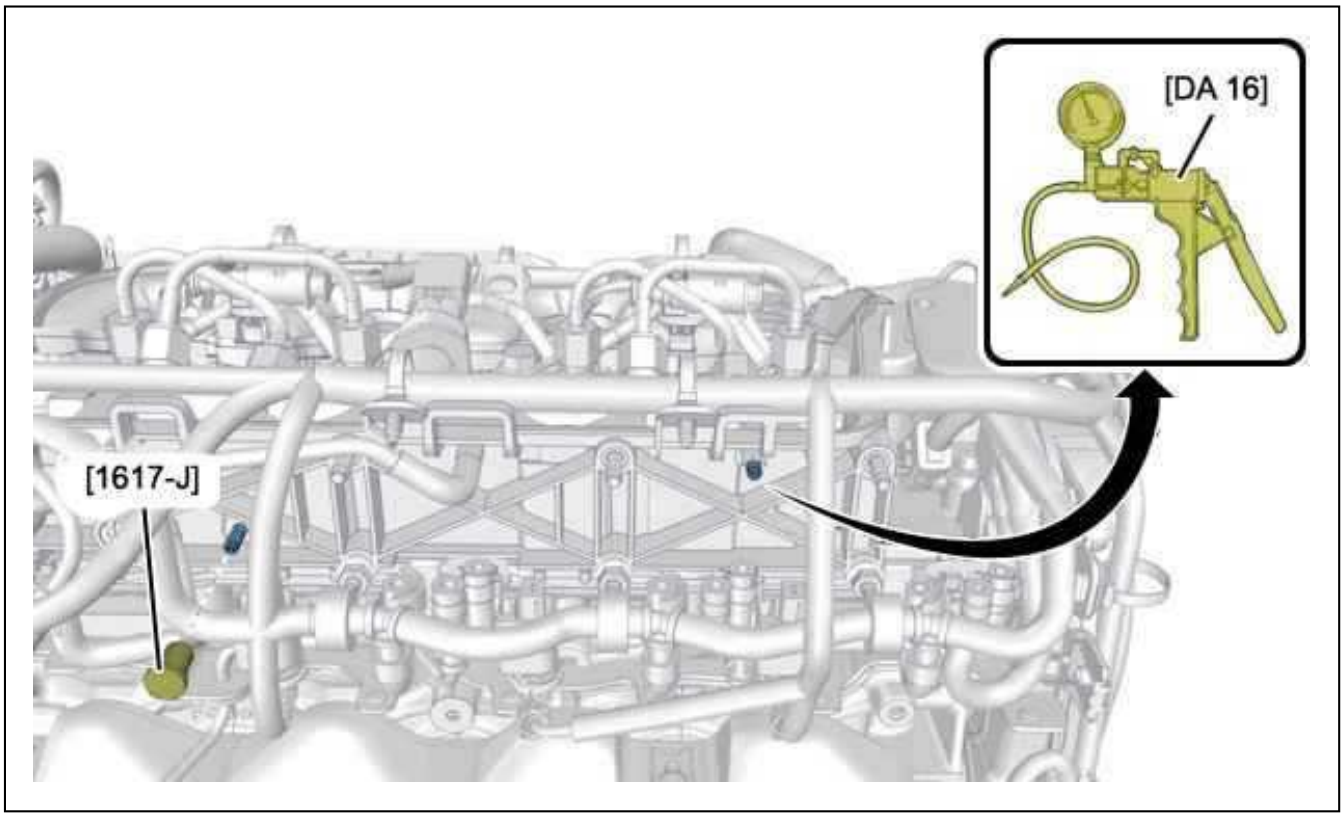


Figure : B1HDZ9YD

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Fit a plug [1617-J] in place of the pipe (at "k").
Connect the manual vacuum pump [DA 16] in place of the pipe (at "l").
Apply a vacuum of 0,7 bar :

- The vacuum is reached and does not drop : The circuit is sealed, pass to the next check
- The vacuum is reached with difficulty, and drops : Recommence the operation upstream of the vacuum reserve until the leak has been identified ; Replace the component that is faulty

Couple the vacuum circuit pipes(At "k" and "l").

4.2. Control circuit for the inlet air mixers (Upstream of the electrovalve)

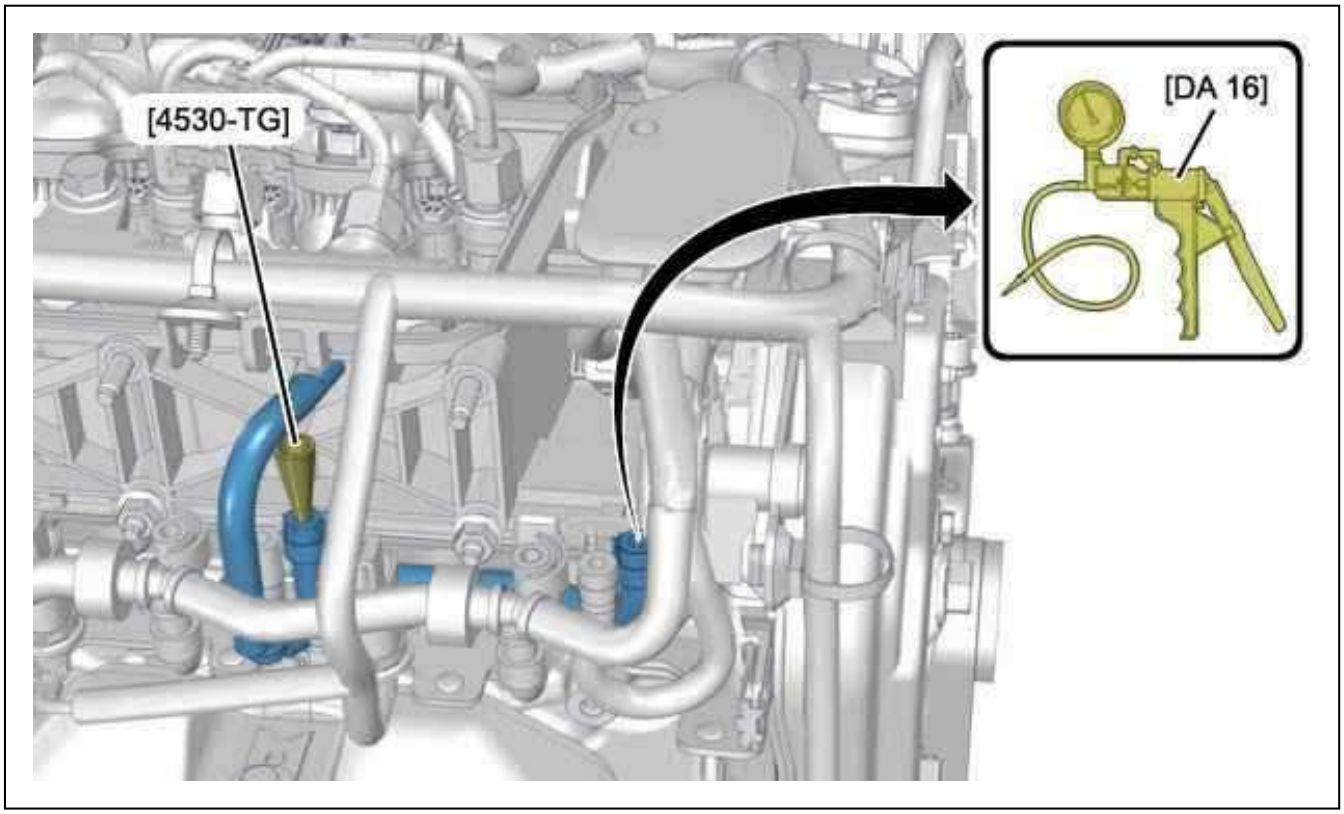


Figure : B1HDZ9WD

CAUTION : The plug [1617-J] must be in place.

Remove :

- Regulated solenoid control valve (4)
- Regulated solenoid control valve (6)

Fit a tapered plug [4530-TG] on the pipe exiting the vacuum reserve.
Connect the manual vacuum pump [DA 16] on the second pipe exiting the vacuum reserve.
Apply a vacuum of 0,7 bar :

- The vacuum is reached and does not drop : The circuit is sealed, pass to the next check
- The vacuum is reached with difficulty, and drops : Inspect the condition of the pipes exiting the vacuum reserve ; Replace the component that is faulty

Remove :

- The plugs [4530-TG], [1617-J]
- The manual pressure vacuum pump [DA 16]

Refit :

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- Regulated solenoid control valve (6)
- Regulated solenoid control valve (4)

4.3. Control circuit for the inlet air mixing (Downstream of the electrovalve)

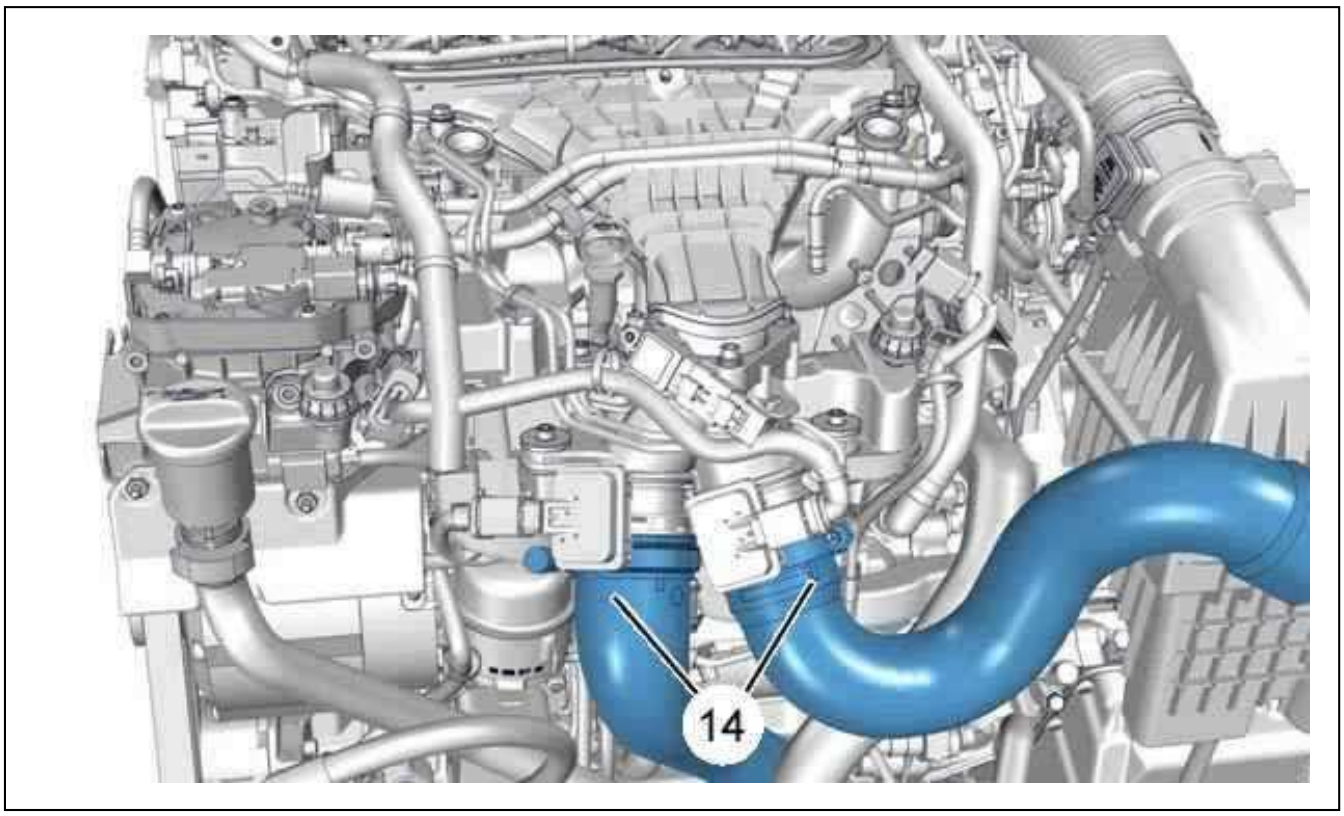


Figure : B1HDZ7HD

Uncouple : The turbo air inlet unions (14).

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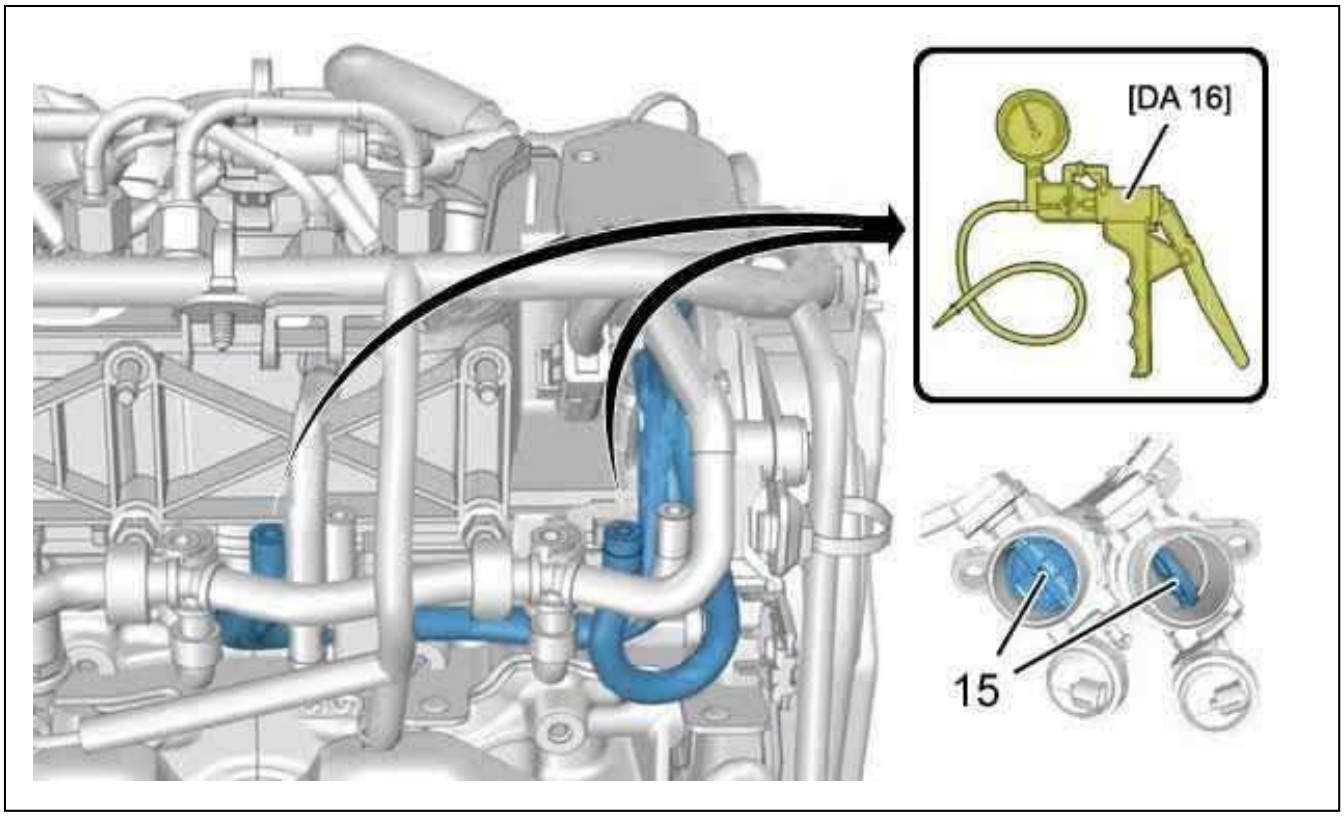


Figure : B1HDZA3D

Remove :

- Regulated solenoid control valve (4)
- Regulated solenoid control valve (6)

CAUTION : Check one inlet air mixer control circuit at a time.

Connect the manual vacuum pump [DA 16] on the pipe exiting the electrovalve.

CAUTION : Check the movement of the flaps (15), with the aid of a mirror and using the diagnostic tool .

Apply a vacuum of 0,5 bar :

- The vacuum is achieved, the flap (15) moves freely : The circuit is sealed, check the electrical components of the system
- The vacuum is reached with difficulty, the flap (15) moves scarcely or not at all ; Replace any defective parts

Remove : The manual pressure vacuum pump [DA 16].
Refit :

- The turbo air inlet unions (14)
- Regulated solenoid control valve (6)
- Regulated solenoid control valve (4)

4.4. Control circuit for the turbocharger and the exhaust gas cooler by-pass (Upstream of the electrovalve)

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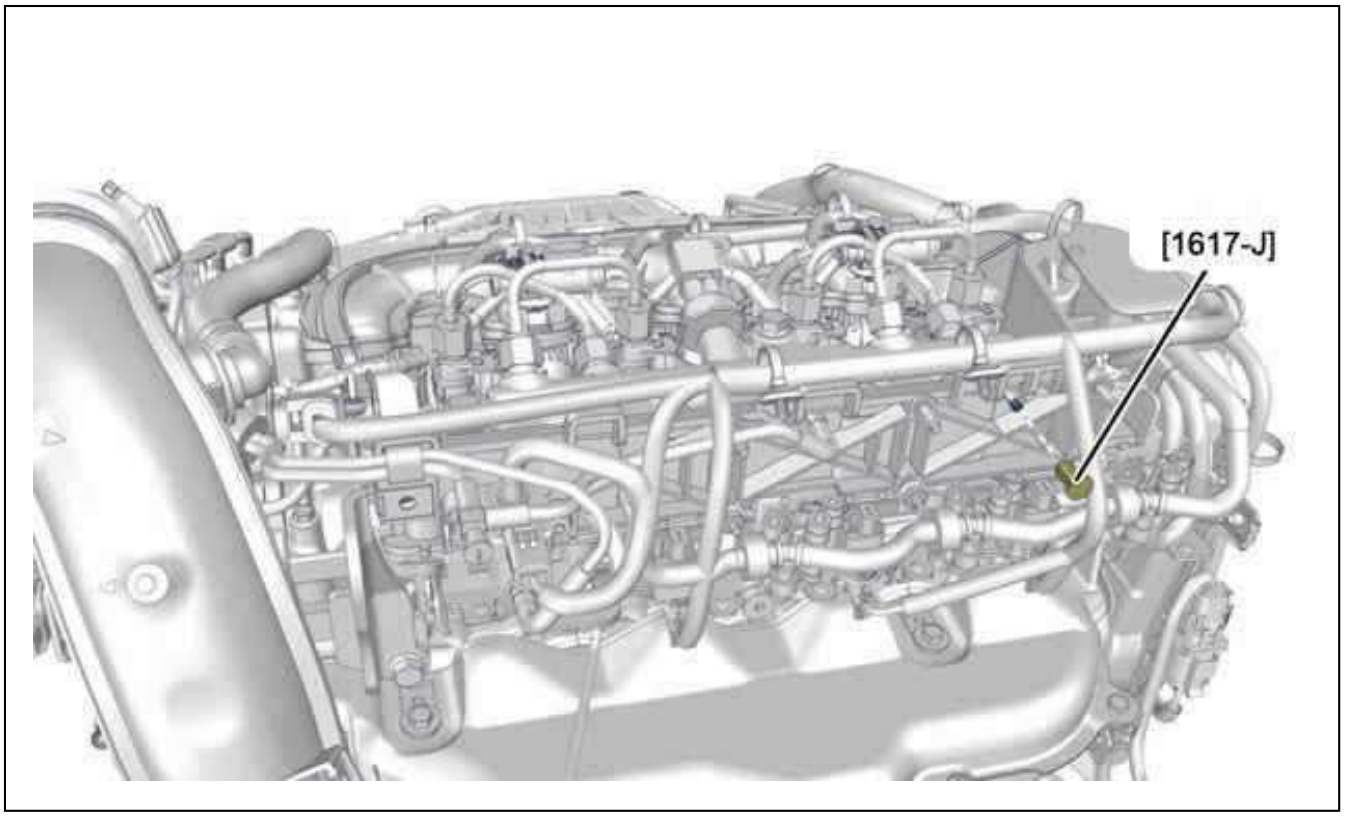


Figure : B1HDZA4D

Remove :

- Regulated solenoid control valve (8)
- Regulated solenoid control valve (10)

Uncouple the vacuum pipe (as "I").
Fit a plug [1617-J] in place of the pipe (as "I").

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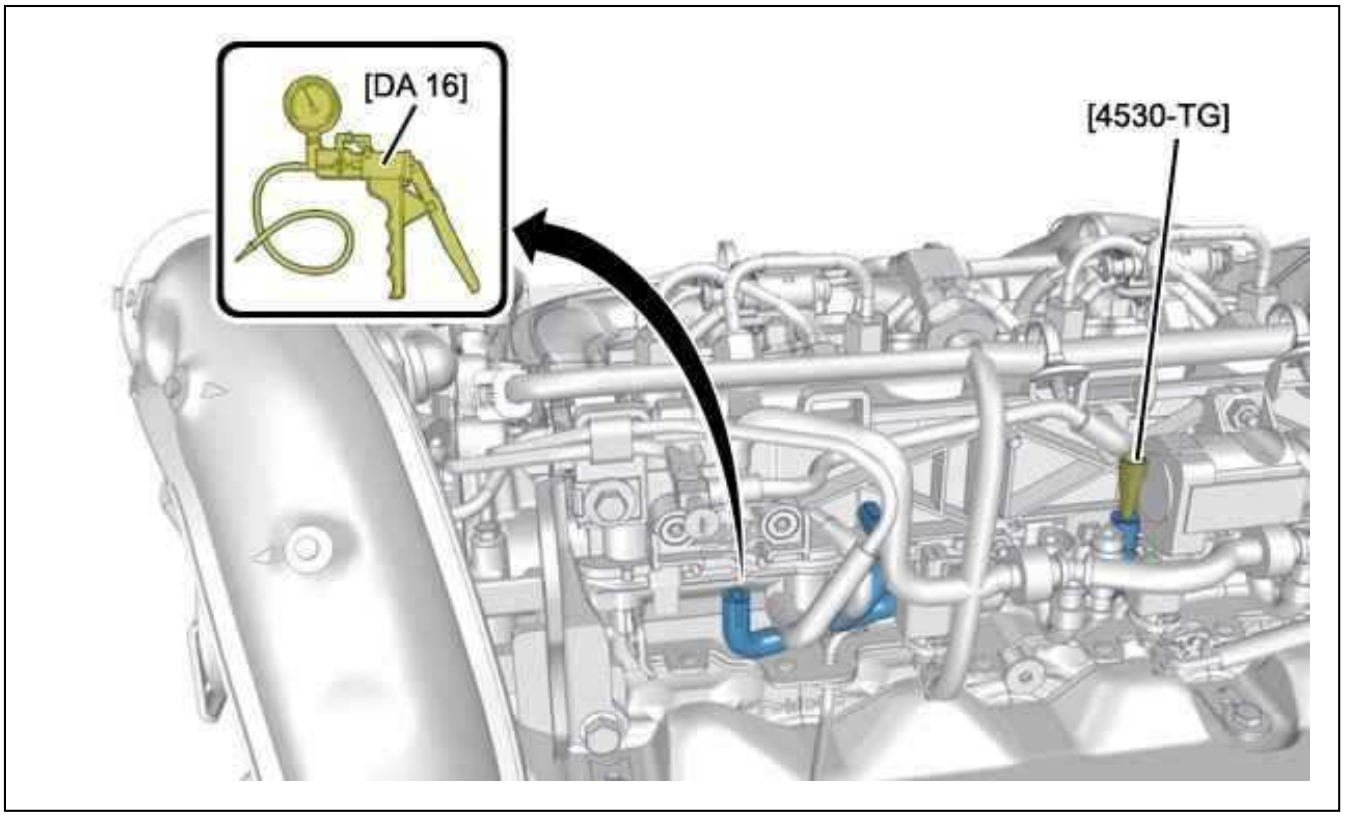


Figure : B1HDZA5D

Fit a tapered plug [4530-TG] on the pipe exiting the vacuum reserve.
Connect the manual vacuum pump [DA 16] on the second pipe exiting the vacuum reserve.
Apply a vacuum of 0,7 bar :

- The vacuum is reached and does not drop : The circuit is sealed, pass to the next check
- The vacuum is reached with difficulty, and drops : Inspect the condition of the pipes exiting the vacuum reserve ; Replace the component that is faulty

Remove :

- The plugs [4530-TG]
- The manual pressure vacuum pump [DA 16]

Refit :

- Regulated solenoid control valve (10)
- Regulated solenoid control valve (8)

4.5. Control circuit for the variable geometry turbo (Downstream of the electrovalve)

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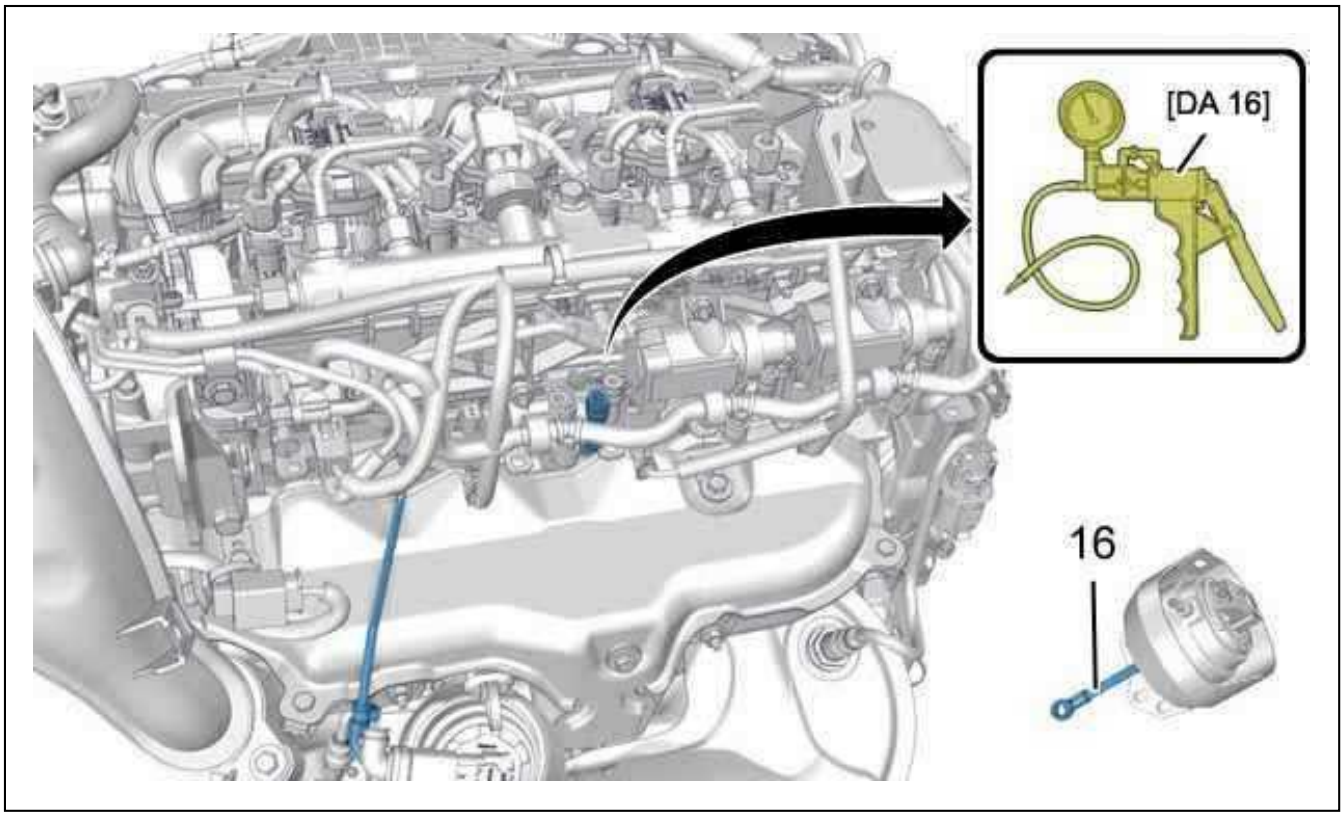


Figure : B1HDZA6D

Remove : Regulated solenoid control valve (8) .
Connect the manual vacuum pump [DA 16] on the pipe exiting the electrovalve.

CAUTION : Check that the control rod (16) on the turbocharger moves, with the aid of a mirror and using the diagnostic tool .

Apply a vacuum of 0,7 bar :

- The vacuum is achieved, the control rod (16) moves freely : The circuit is sealed, check the electrical component of the system
- The vacuum is reached with difficulty, the control rod (16) moves scarcely or not at all : Inspect the condition of the pipe at the electrovalve outlet as well as the variable geometry (turbocharger) control diaphragm (9) ; Replace any defective parts

Remove : The manual pressure vacuum pump [DA 16].
Refit : Regulated solenoid control valve (8) .

4.6. Control circuit for the exhaust gas cooler by-pass flap (Downstream of the electrovalve)

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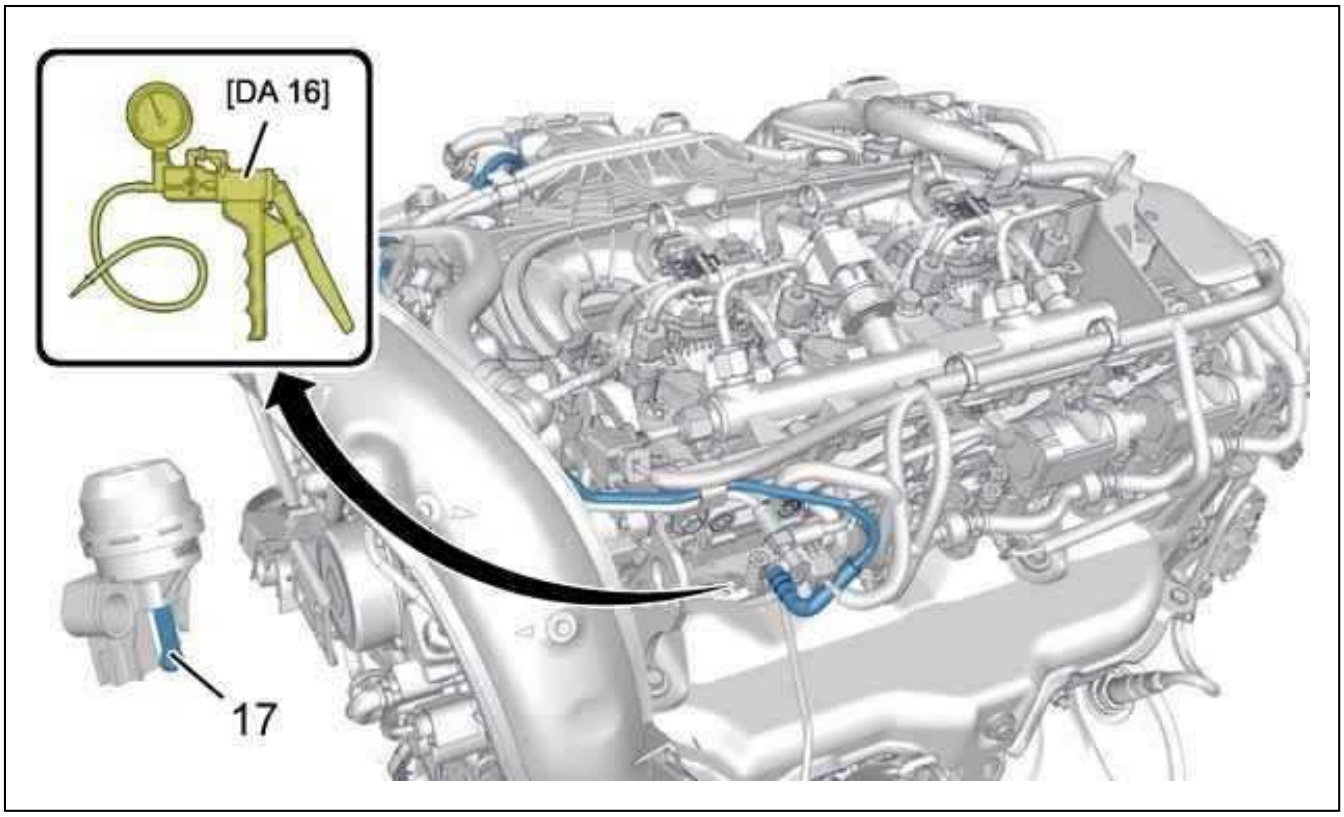


Figure : B1HDZA7D

Remove : Regulated solenoid control valve (10) .
Connect the manual vacuum pump [DA 16] on the pipe exiting the electrovalve.

CAUTION : Check the movement of the control rod (17) on the EGR valve.

Apply a vacuum of 0,5 bar :

- The vacuum is achieved, the control rod (17) moves freely : The circuit is sealed, check the electrical component of the system
- The vacuum is reached with difficulty, the control rod (17) moves scarcely or not at all : Inspect the condition of the pipe at the electrovalve outlet as well as the control diaphragm of the exhaust gas cooling by-pass flap (11) ; Replace any defective parts

Remove : The manual pressure vacuum pump [DA 16].
Refit : Regulated solenoid control valve (10) .

4.7. Refitting

Refit :

- The heat shield
- The bolts (13)

Clip the pipes (as "j").
Refit the protector (12) on the injection system.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

CAUTION : Clear the memory of faults ; Using the diagnostic equipment.

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Refit :

- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : ENGINE SPEED SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Disconnect the battery.
Lift and support the vehicle with the wheels free.
Remove the right-hand front mudguard.

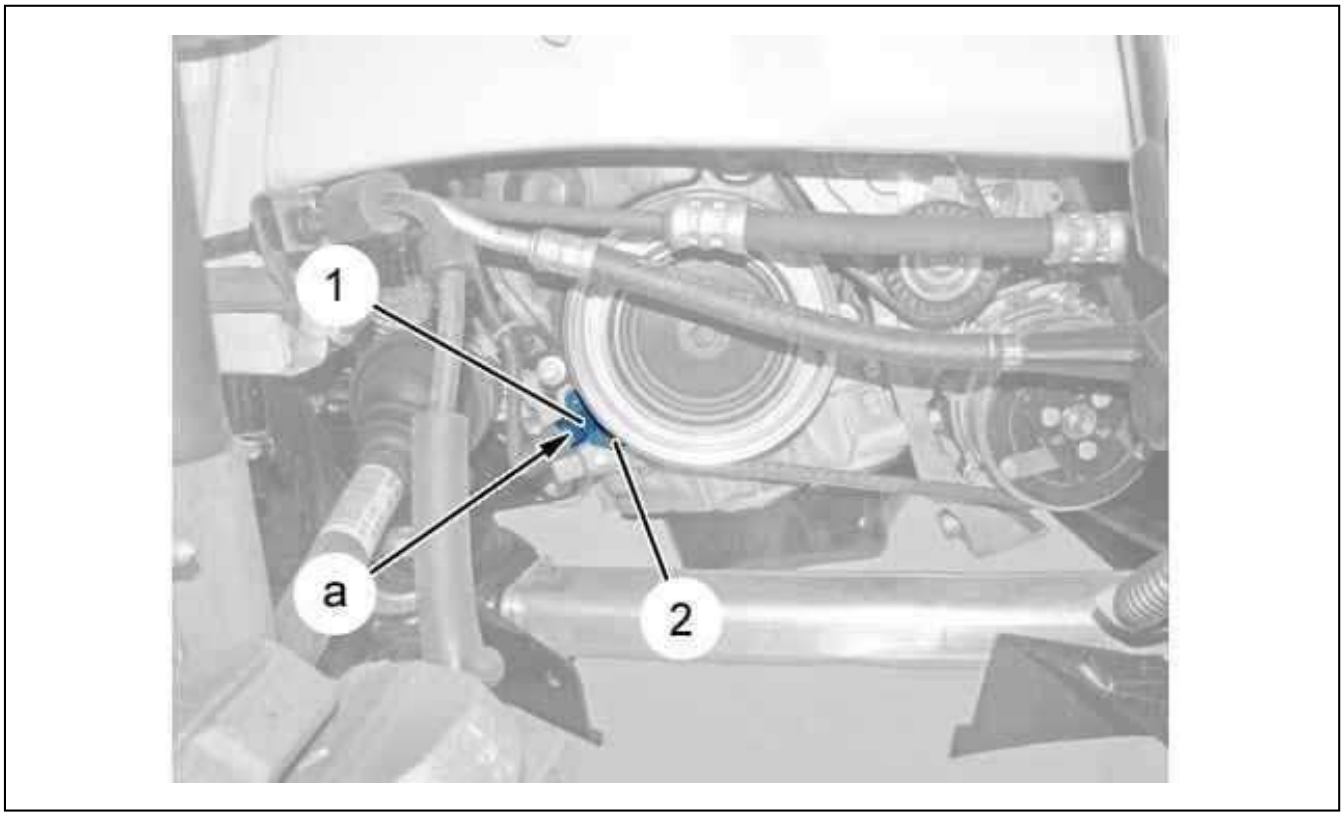


Figure : B1HG085D

Disconnect the connector (as "a").
Remove :

- The (2) bolt
- The engine speed sensor (1)

2. Refitting

CAUTION : Adhere to the tightening torques .

Refit :

- The engine speed sensor (1)
- The (2) bolt ; Tighten to the specified torque

Connect the connector (as "a").

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Refit the front RH splash-shield.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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REMOVING - REFITTING : CYLINDER REFERENCE SENSORS

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Location

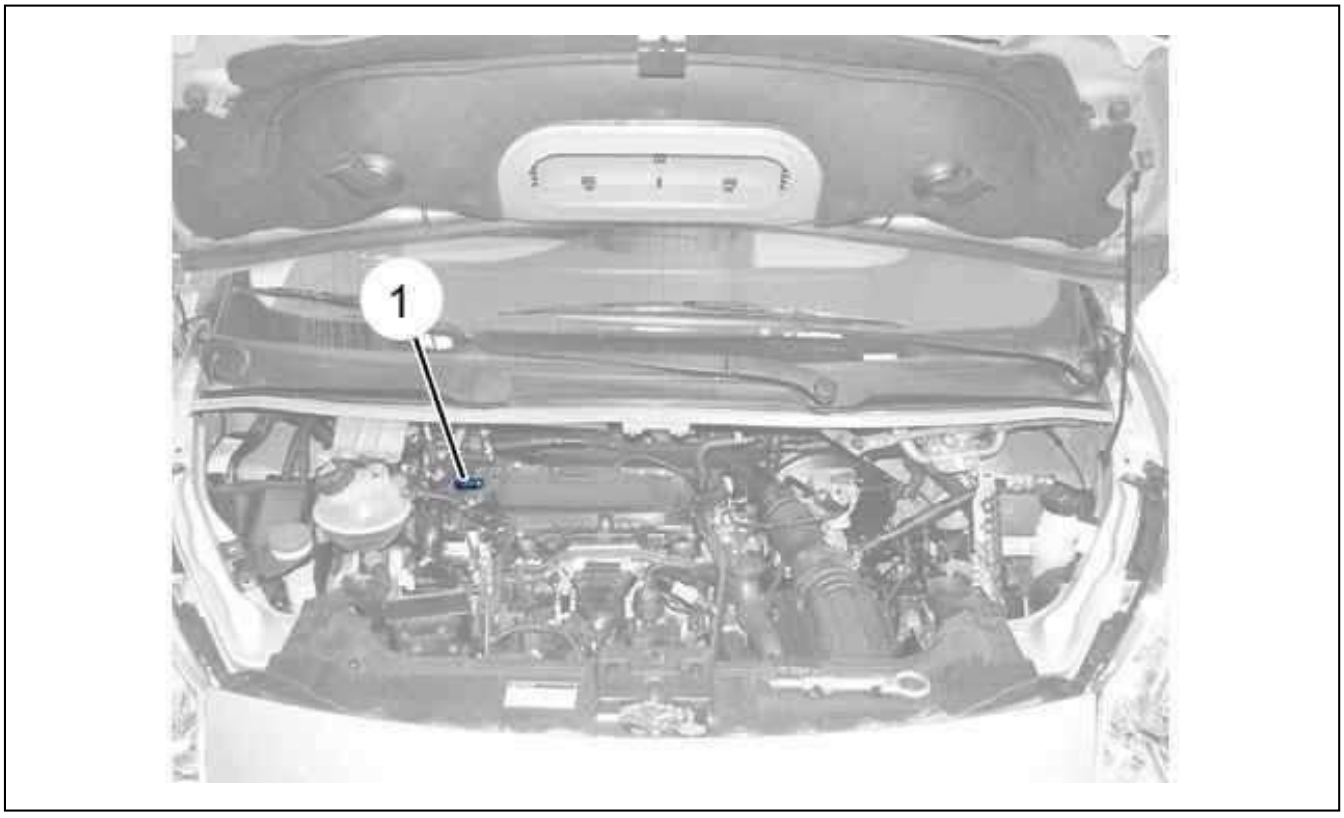


Figure : B1BG1I4D

(1) Cylinder reference sensor .

2. Removing

Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

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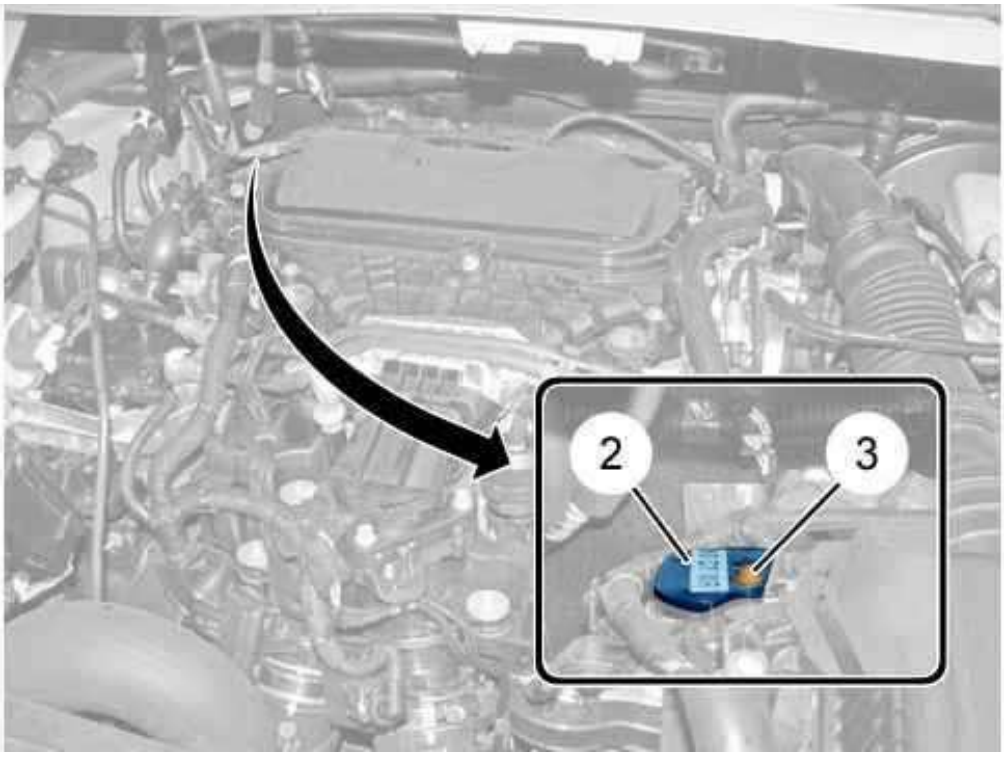


Figure : B1HG1YGD

Remove :

- The (3) bolt
- The electrovalve breather (2)

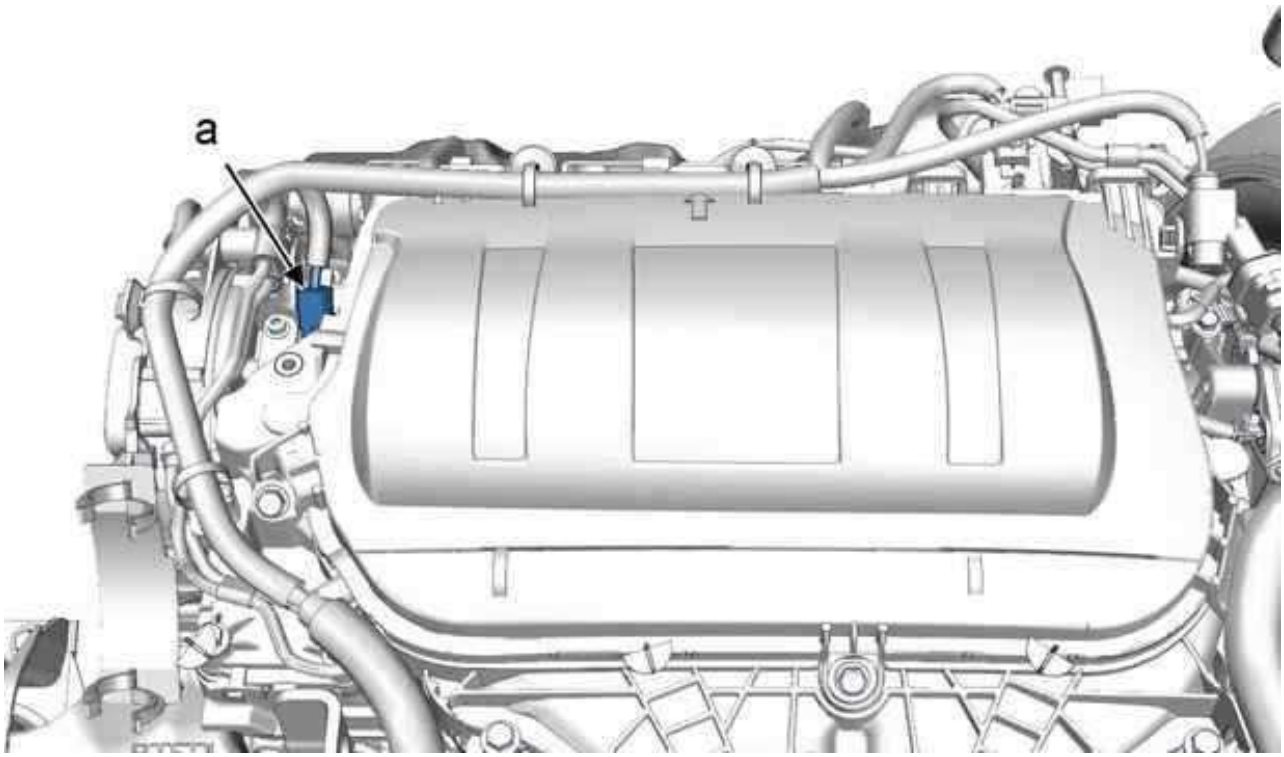


Figure : B1HG0Z8D

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Disconnect the connector (as "a").

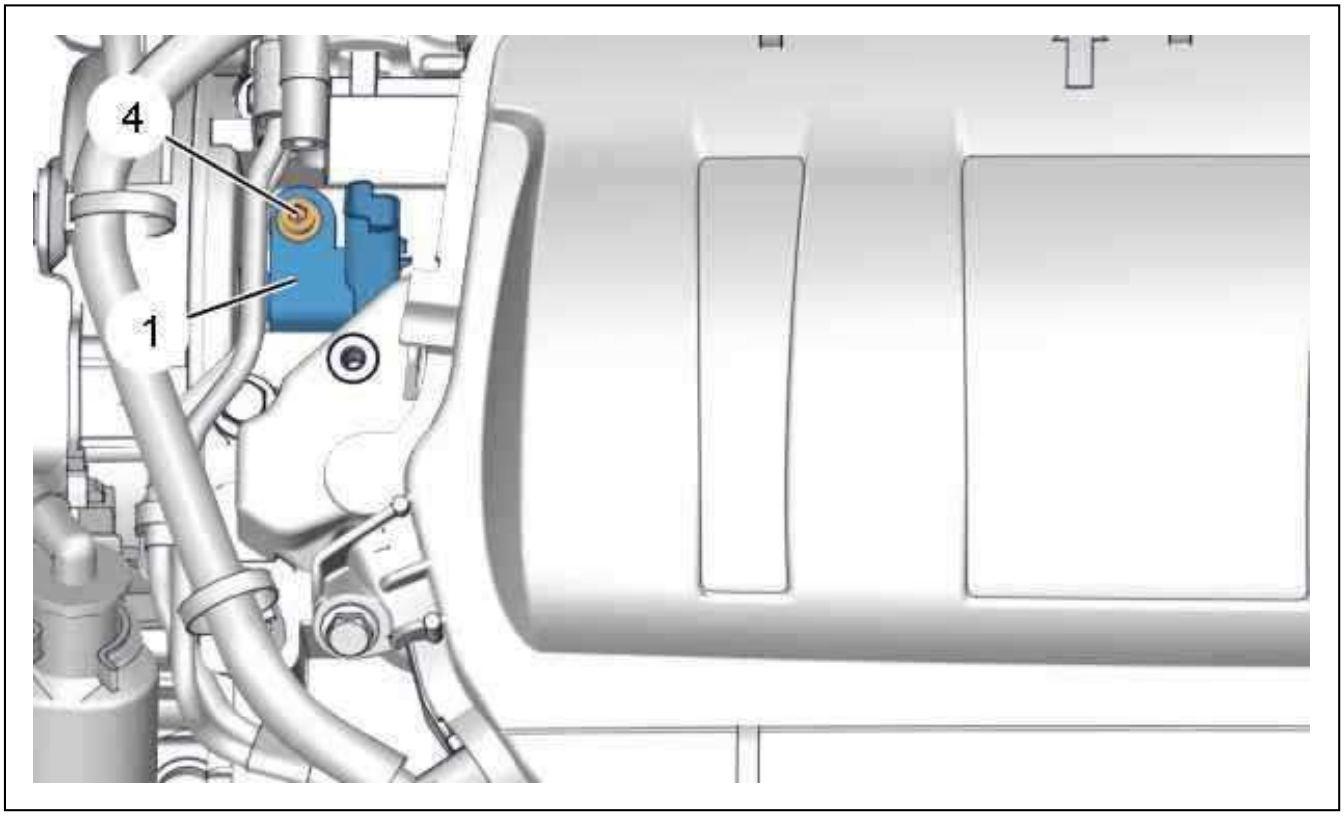


Figure : B1HG08ND

Remove :

- The (4) bolt
- The cylinder reference sensor (1)

3. Refitting

CAUTION : Adhere to the tightening torques .

Refit :

- The cylinder reference sensor (1)
- The (4) bolt ; Without tightening it

3.1. Reused sensor

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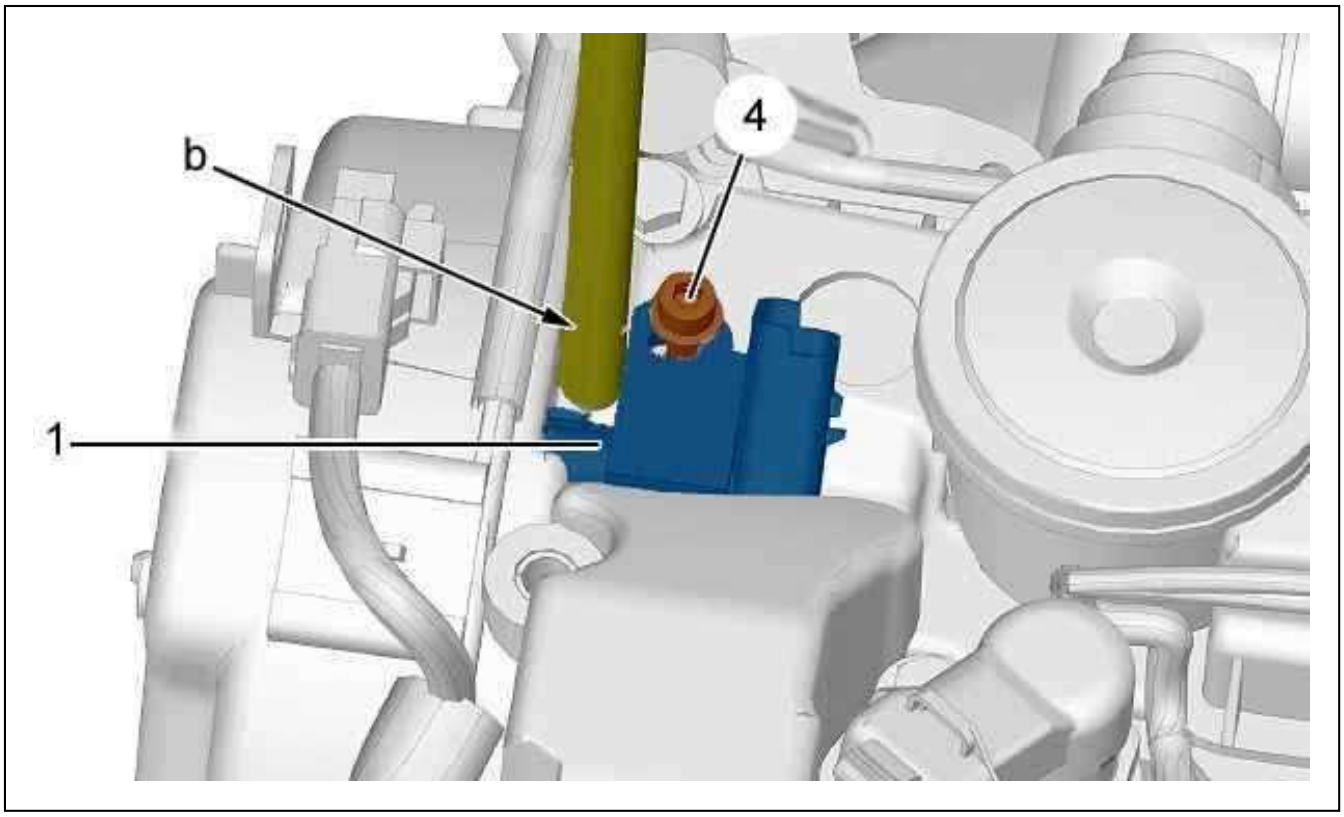


Figure : B1HG08OD

Position a 7,5 mm diameter pin (at "b") (Example : Drill bit).
Put the cylinder reference sensor (1) to its stop on the 7,5 mm diameter shaft.
Tighten to the specified torque : The (4) bolt .
Connect the connector (at "a").

3.2. New sensor

Put the cylinder reference sensor (1) in contact with the target (Camshaft pulley).
Tighten to the specified torque : The (4) bolt .
Connect the connector (at "a").

3.3. Common operations

Refit :

- The electrovalve breather (2)
- The (3) bolt
- The engine cover
- The passenger compartment air inlet manifold

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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REMOVING - REFITTING : INLET AIR PRESSURE AND TEMPERATURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

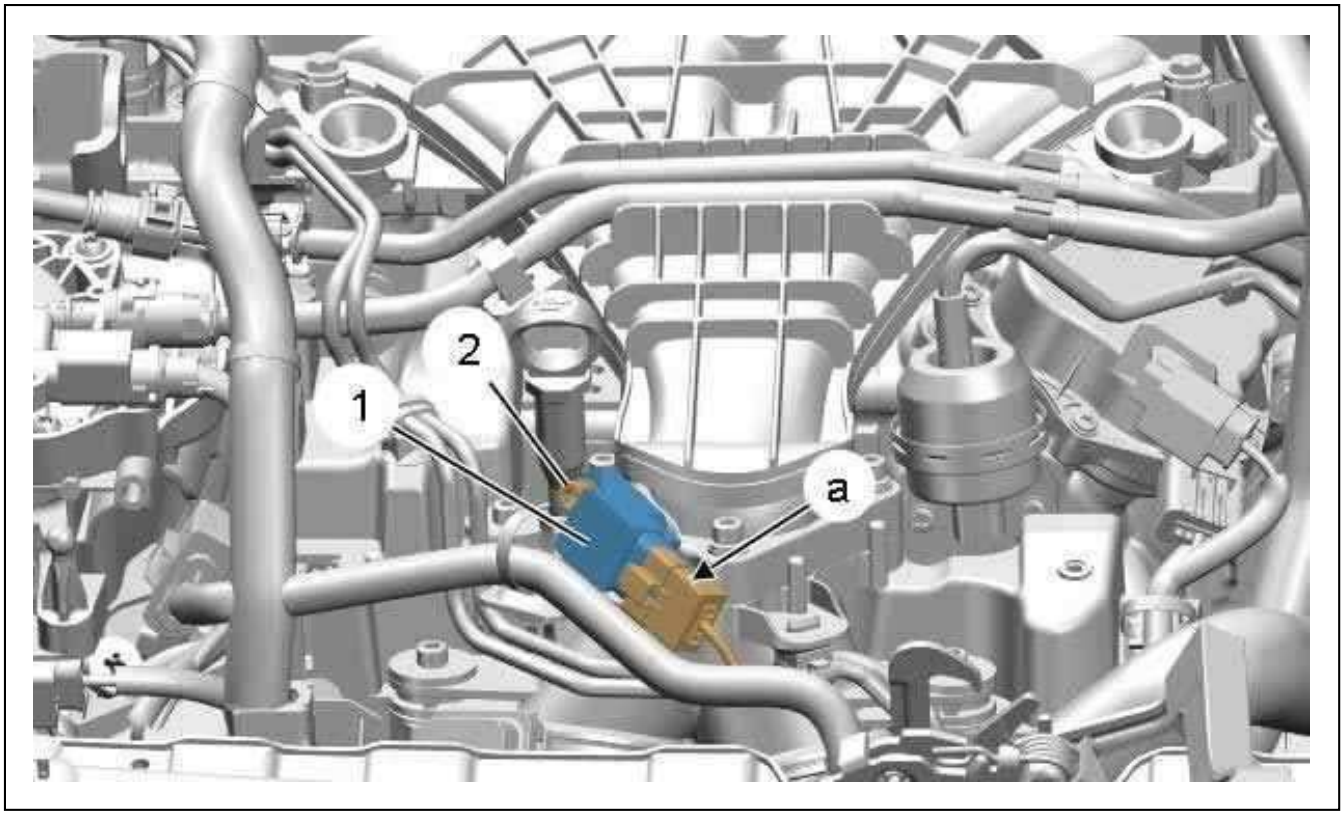


Figure : B1HG0L0D

Disconnect the connector (at "a").
Remove :

- The (2) bolt
- The inlet air pressure and temperature sensor (1)

2. Refitting

Refit :

- The inlet air pressure and temperature sensor (1)
- The (2) bolt

Connect the connector (at "a").
Refit :

- The engine cover

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- The passenger compartment air inlet manifold

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

CAUTION : Check the memory of faults ; Using the diagnostic equipment. Clear the faults in the memory (I necessary).

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REMOVING - REFITTING : HIGH PRESSURE FUEL SENSOR

1. Location

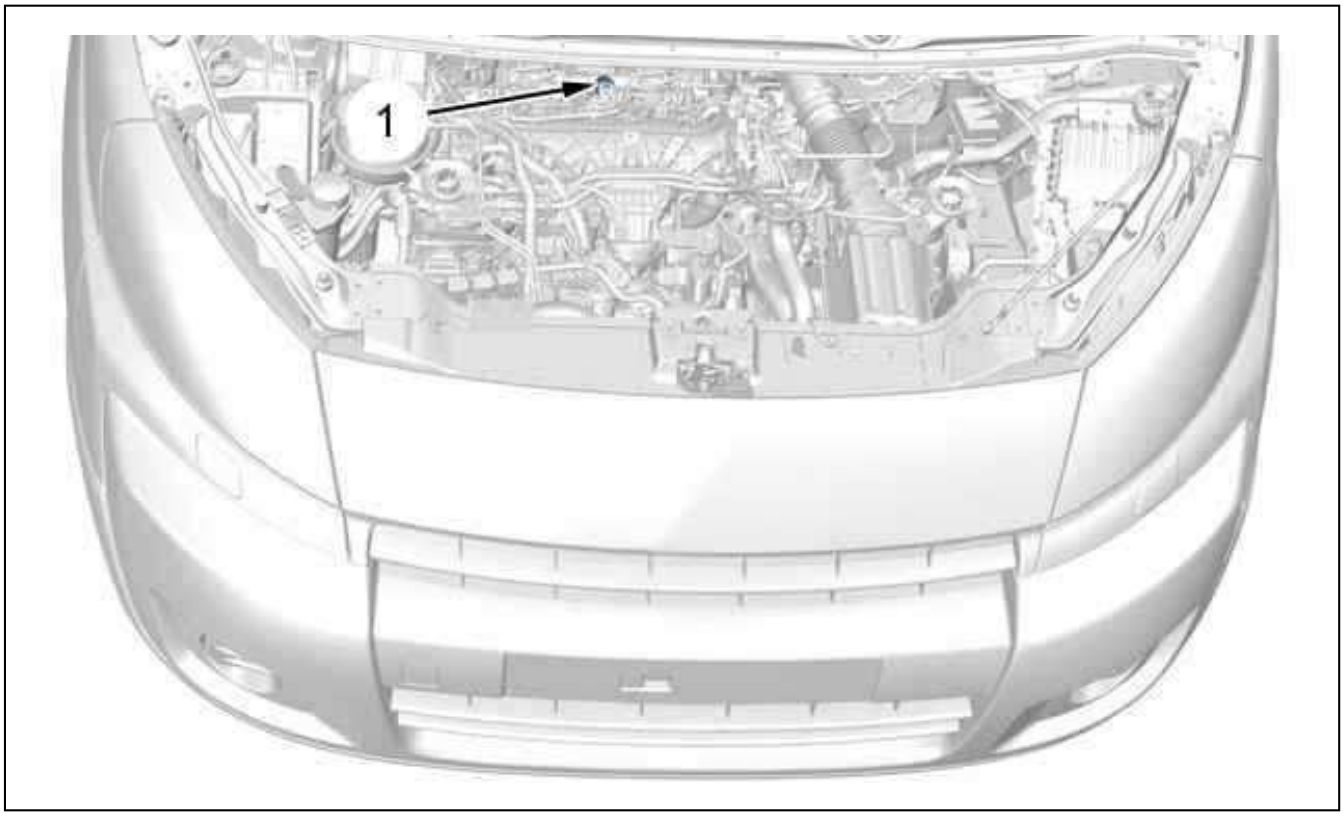


Figure : B1BG1IKD

(1) High pressure fuel sensor .

2. Removing

N.B. : Replacing the high-pressure sensor requires the replacement of the injection manifold as these 2 components cannot be separated.

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REMOVING - REFITTING : CONTROL ELECTROVALVES (TURBOCHARGER - INLET AIR MIXER - INLET AIR COOLER - EGR)

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Location

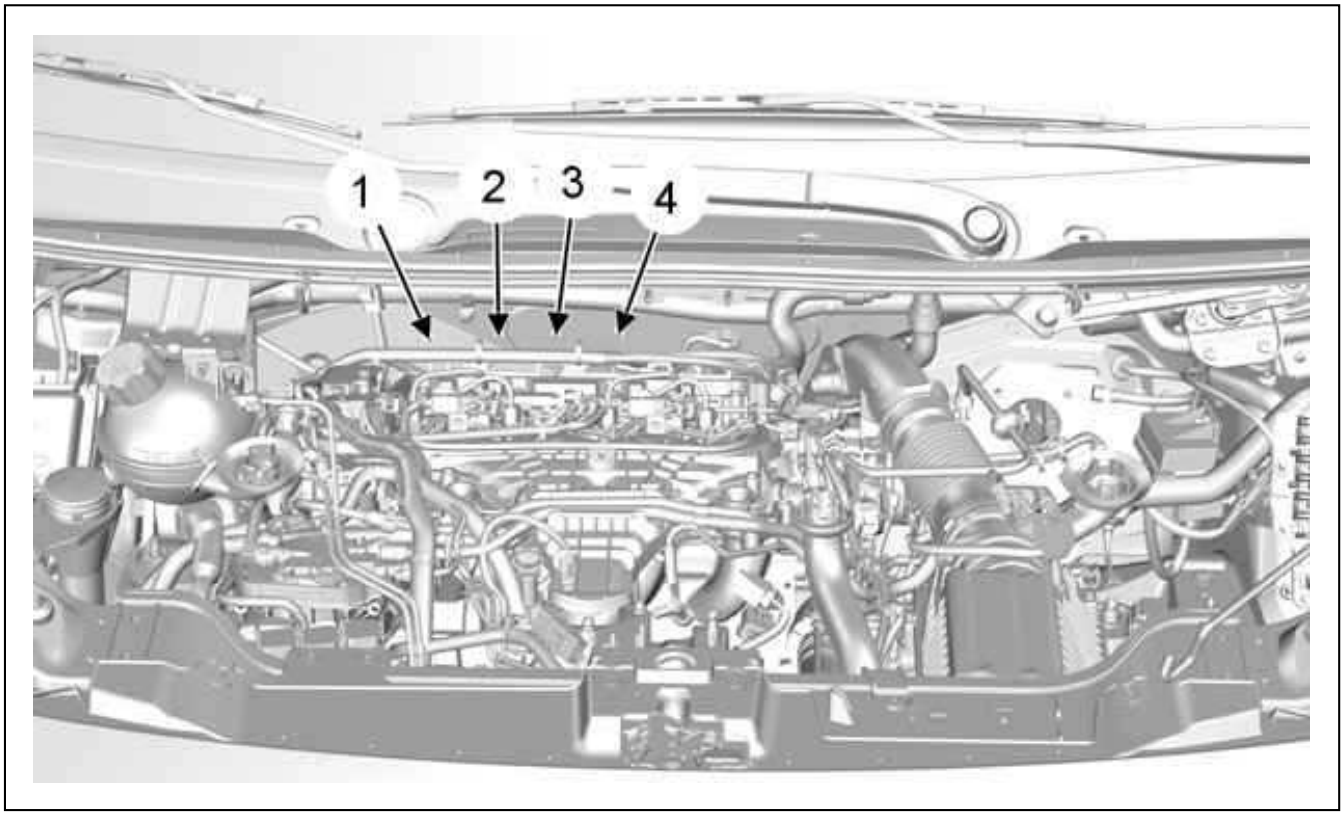


Figure : B1BG1J8D

(1) Air metering device control solenoid valve (Inlet) .
(2) Inlet air cooling solenoid valve.
(3) Turbocharger pressure regulation solenoid valve.
(4) EGR cooling solenoid valve.

2. Common operations

Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The windscreen surround
- The screen wiper mechanism

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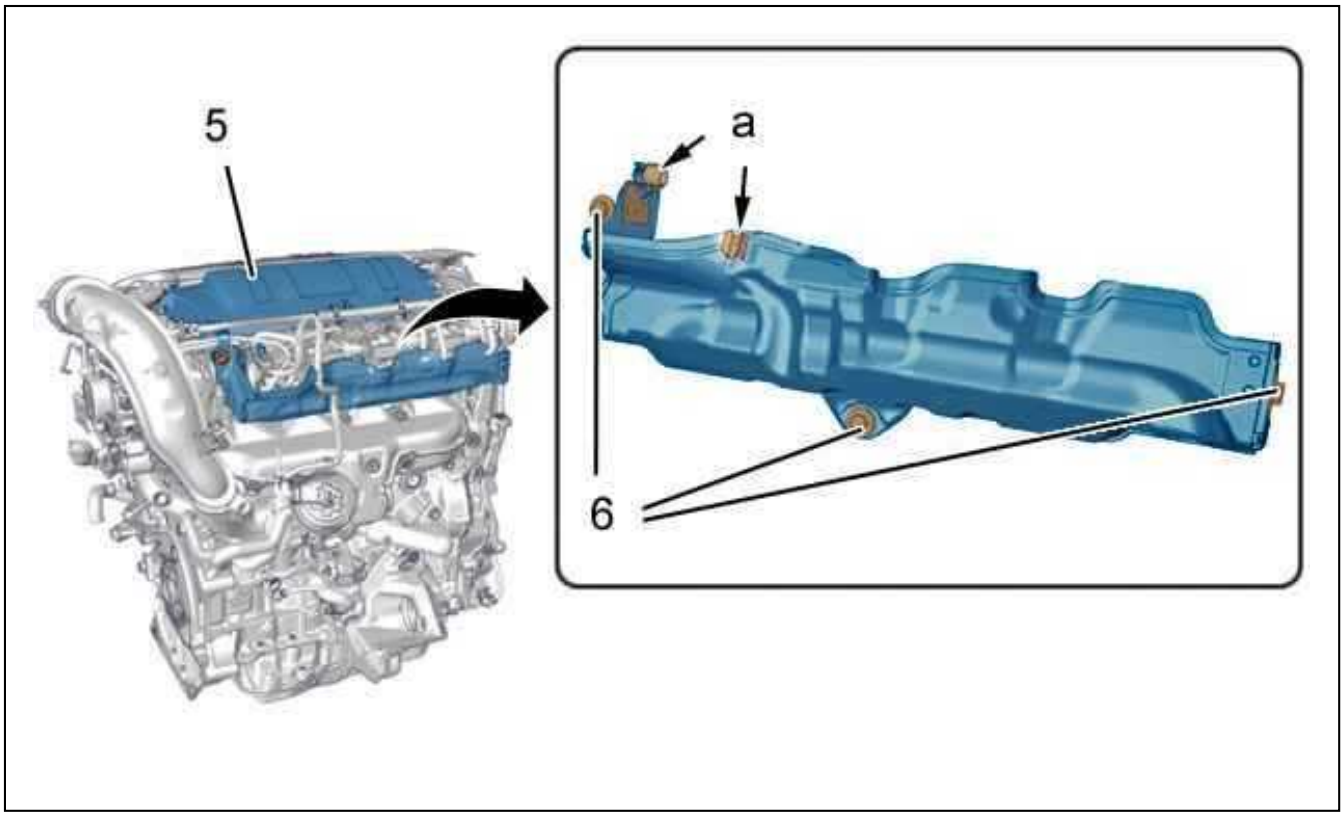


Figure : B1HG1GVD

Remove :

- The protector (5)
- The bolts (6)

CAUTION : The bottom screw (6) has a separate recess.

Unclip the pipes (at "a").

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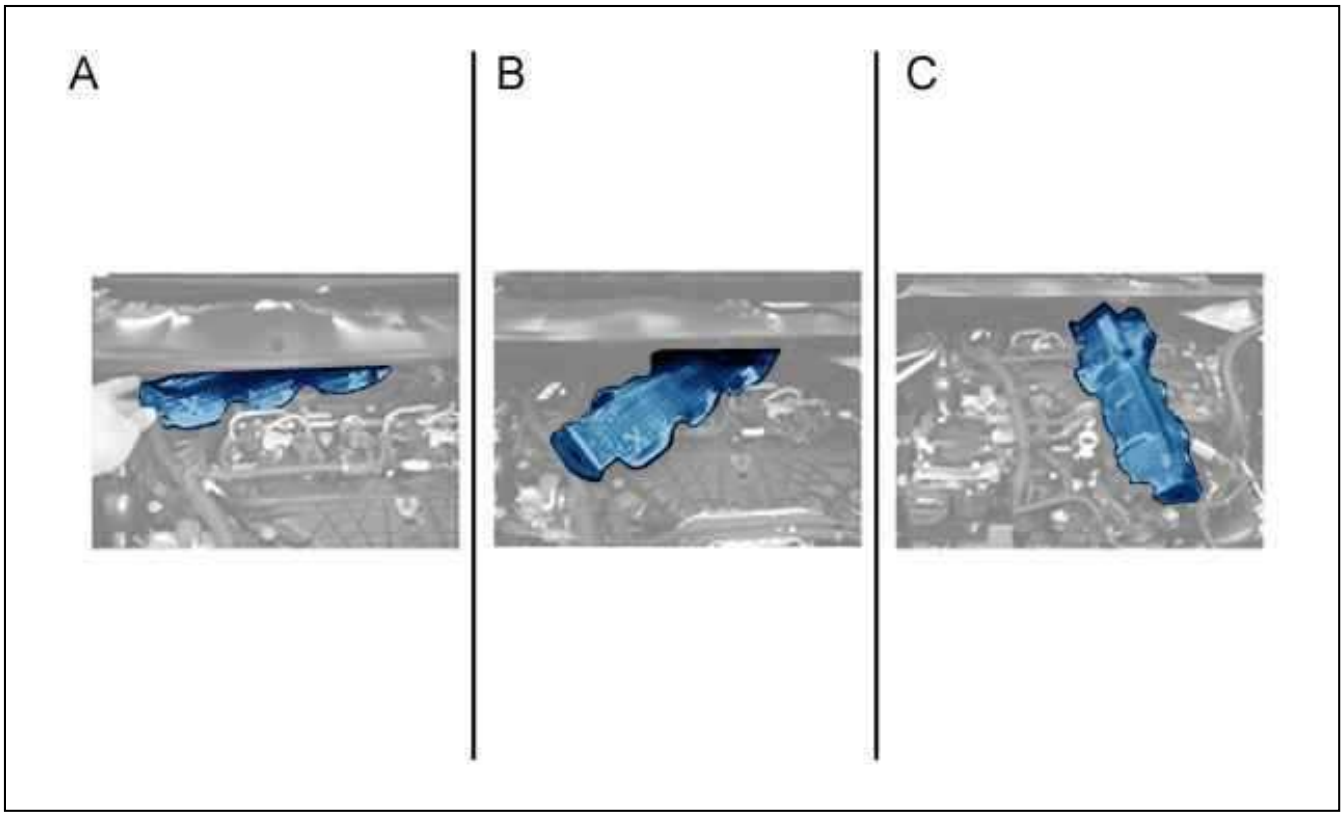


Figure : B1HG1GYD

Take out the heat shield(In accordance with the illustration above).

3. Turbocharger pressure regulation solenoid valve

3.1. Removing

Disconnect the battery.

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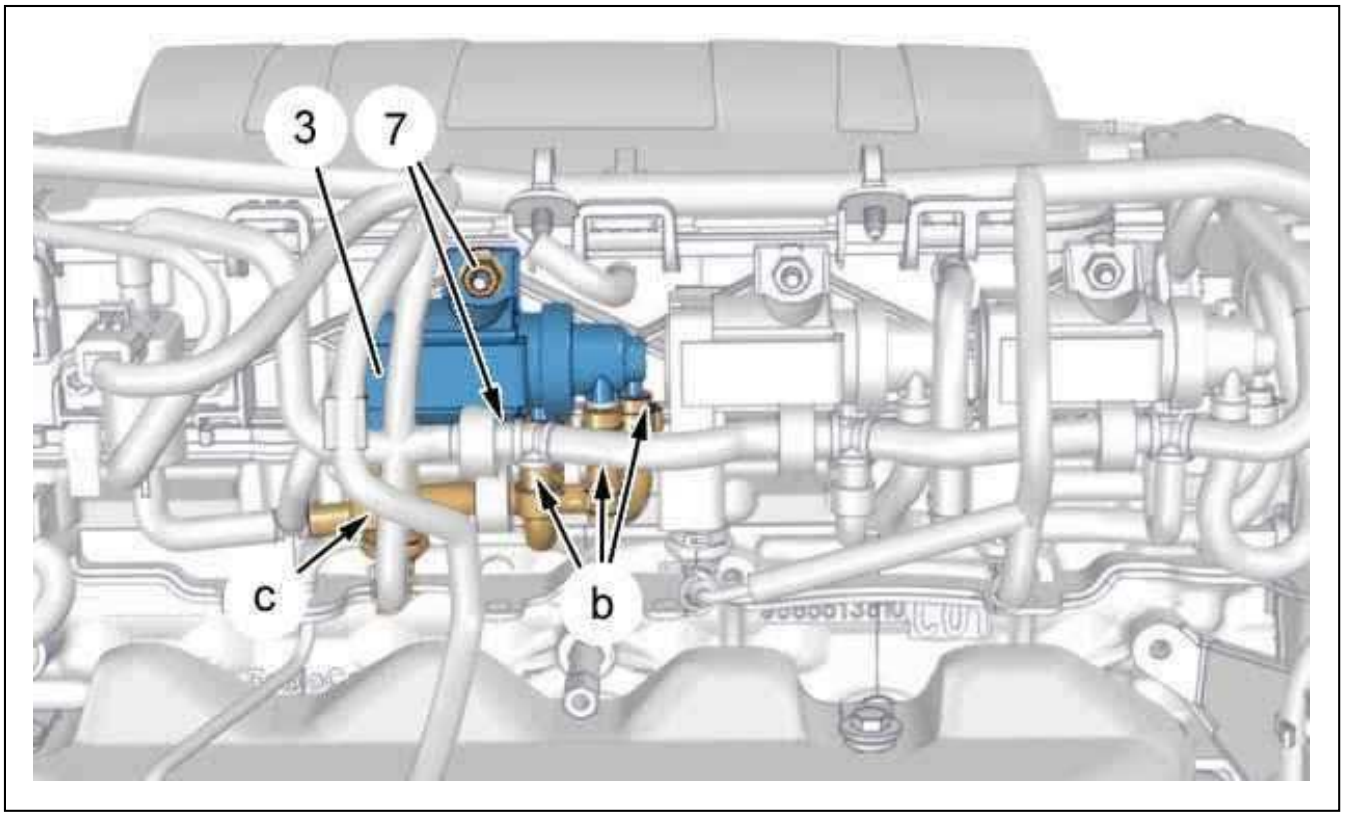


Figure : B1HG1ZAD

Remove the bolts (7).

CAUTION : Mark the position of each vacuum circuit pipe.

Uncouple and move aside the vacuum circuit pipes (at "b").
Disconnect the connector (at "c").
Remove : The turbocharger pressure regulation electrovalve (3).

3.2. Refitting

Refit : The turbocharger pressure regulation electrovalve (3).

CAUTION : When refitting : Do not invert the vacuum circuit pipes.

Couple the vacuum circuit pipes (at "b").
Connect the connector (at "c").
Refit the bolts (7).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. EGR cooling solenoid valve

4.1. Removing

Disconnect the battery.

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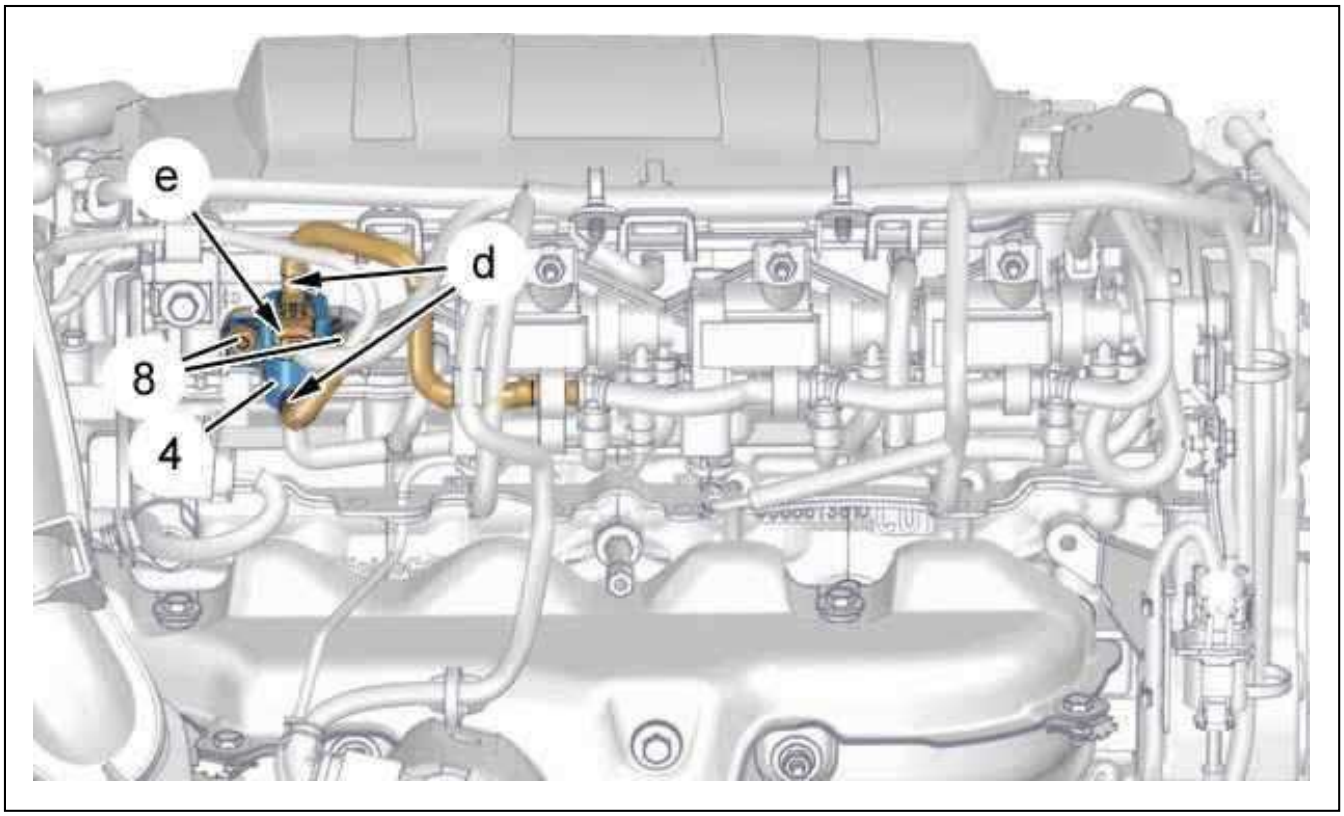


Figure : B1HG1ZBD

Remove the bolts (8).

CAUTION : Mark the position of each vacuum circuit pipe.

Uncouple and move aside the vacuum circuit pipes (at "d").
Disconnect the connector (at "e").
Remove the EGR cooling solenoid valve (4).

4.2. Refitting

Refit the EGR cooling solenoid valve (4).

CAUTION : When refitting : Do not invert the vacuum circuit pipes.

Couple the vacuum circuit pipes (at "d").
Connect the connector (at "e").
Refit the bolts (8).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

5. Inlet air cooling solenoid valve

5.1. Removing

Disconnect the battery.

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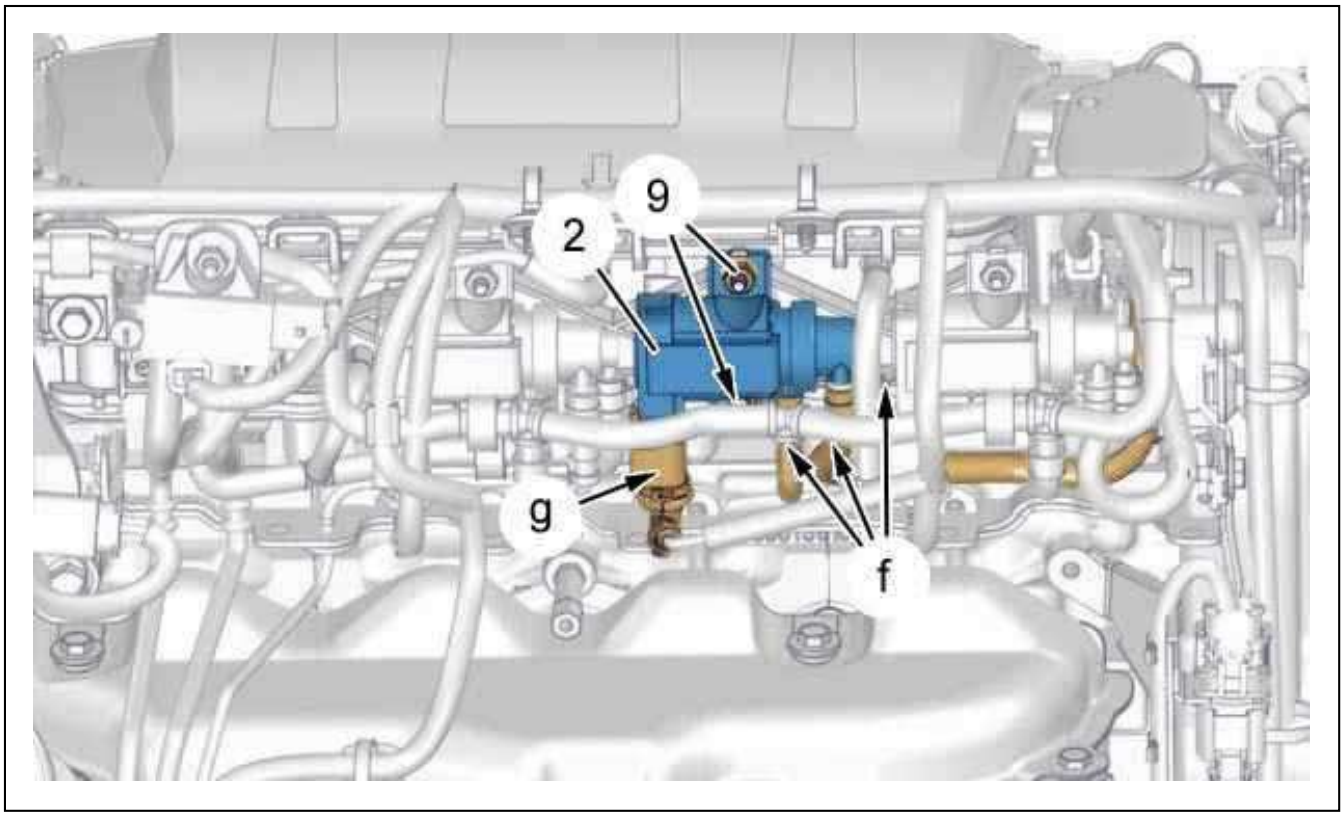


Figure : B1HG1ZCD

Remove the bolts (9).

CAUTION : Mark the position of each vacuum circuit pipe.

Uncouple and move aside the vacuum circuit pipes (at "f").
Disconnect the connector (at "g").
Remove the inlet air cooling solenoid valve (2).

5.2. Refitting

Refit the inlet air cooling solenoid valve (2).
Couple the vacuum circuit pipes (at "f").

CAUTION : When refitting : Do not invert the vacuum circuit pipes.

Connect the connector (at "g").
Refit the bolts (9).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

6. Air metering device control solenoid valve (Inlet)

6.1. Removing

Disconnect the battery.

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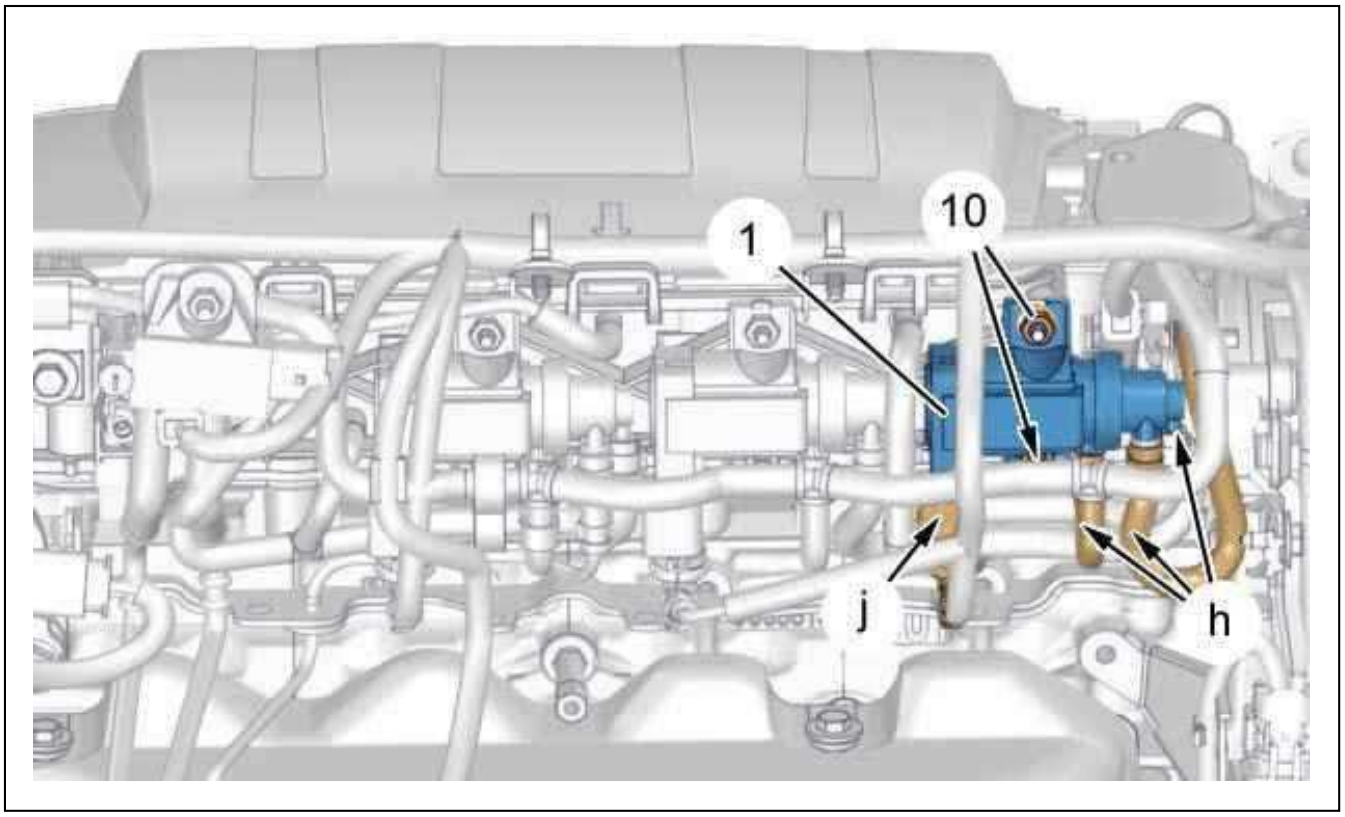


Figure : B1HG1ZDD

Remove the bolts (10).

CAUTION : Mark the position of each vacuum circuit pipe.

Uncouple and move aside the vacuum circuit pipes (at "h").
Disconnect the connector (at "j").
Remove : The inlet air mixer control electrovalve (1).

6.2. Refitting

Refit : The inlet air mixer control electrovalve (1).

CAUTION : When refitting : Do not invert the vacuum circuit pipes.

Couple the vacuum circuit pipes (at "h").
Connect the connector (at "j").
Refit the bolts (10).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

7. Common operations

Refit the heat shield .
Clip the pipes (at "a").
Refit :

- The bolts (6)
- The protector (5)
- The screen wiper mechanism

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- The windscreen surround
- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : HIGH PRESSURE FUEL REGULATOR (HIGH PRESSURE PUMP)

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Before removing any high pressure fuel sensor or actuator, carry out the diagnostics using the specific tools.

1. Tooling

Equipment :

- Degreasing product (Type SODIMAC)
- Cleaning tray
- Brush
- Vacuum extractor
- Round end-piece

2. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Disconnect the battery.

Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The air filter casing

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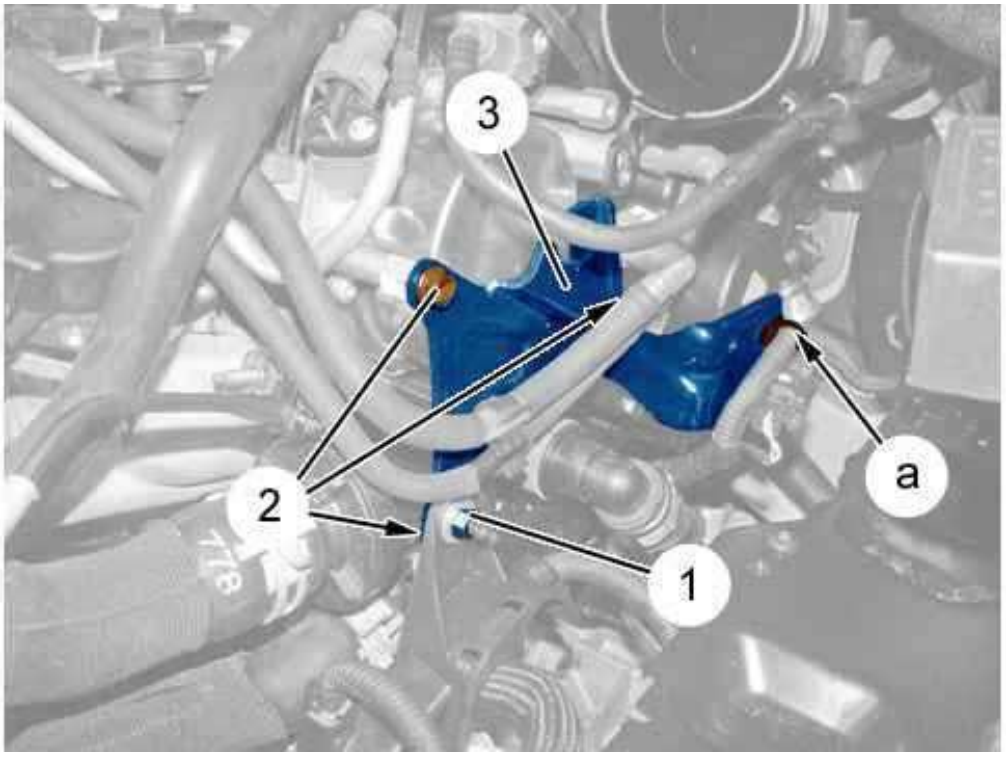


Figure : B1HG089D

Unclip - Release : The electrical harness (as "a").
Remove the nut (1).
Release : The electric harness transition duct .
Remove :

- The fixing bolts (2) from the support (3)
- The bracket (3)

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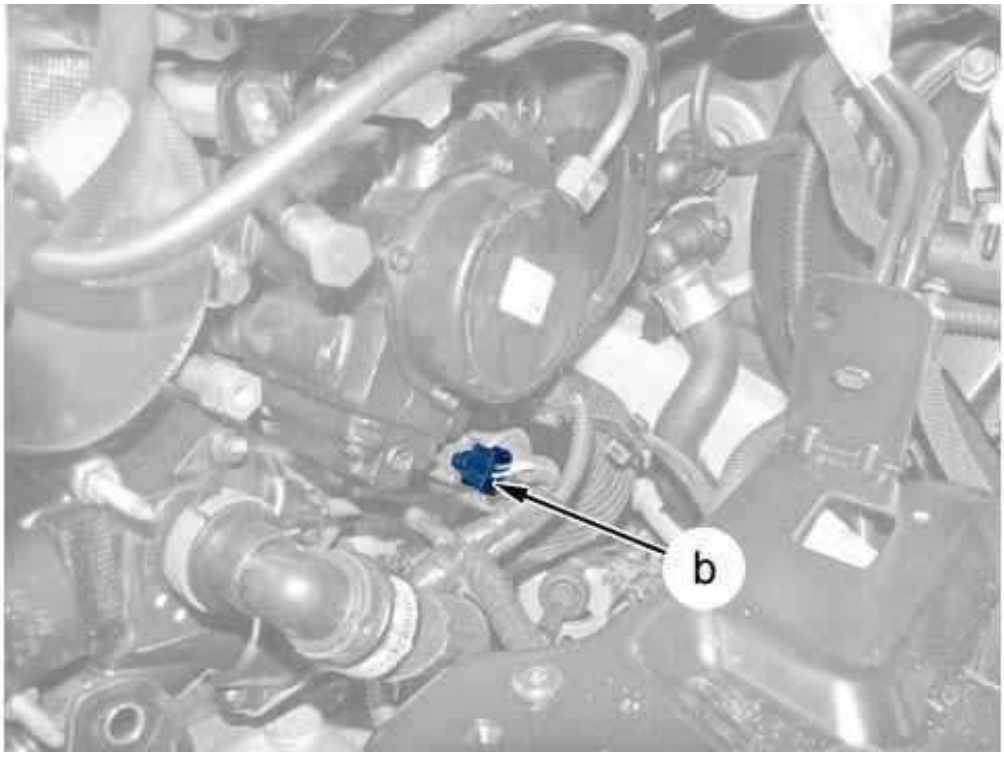


Figure : B1HG08VD

Disconnect the connector (as "b").

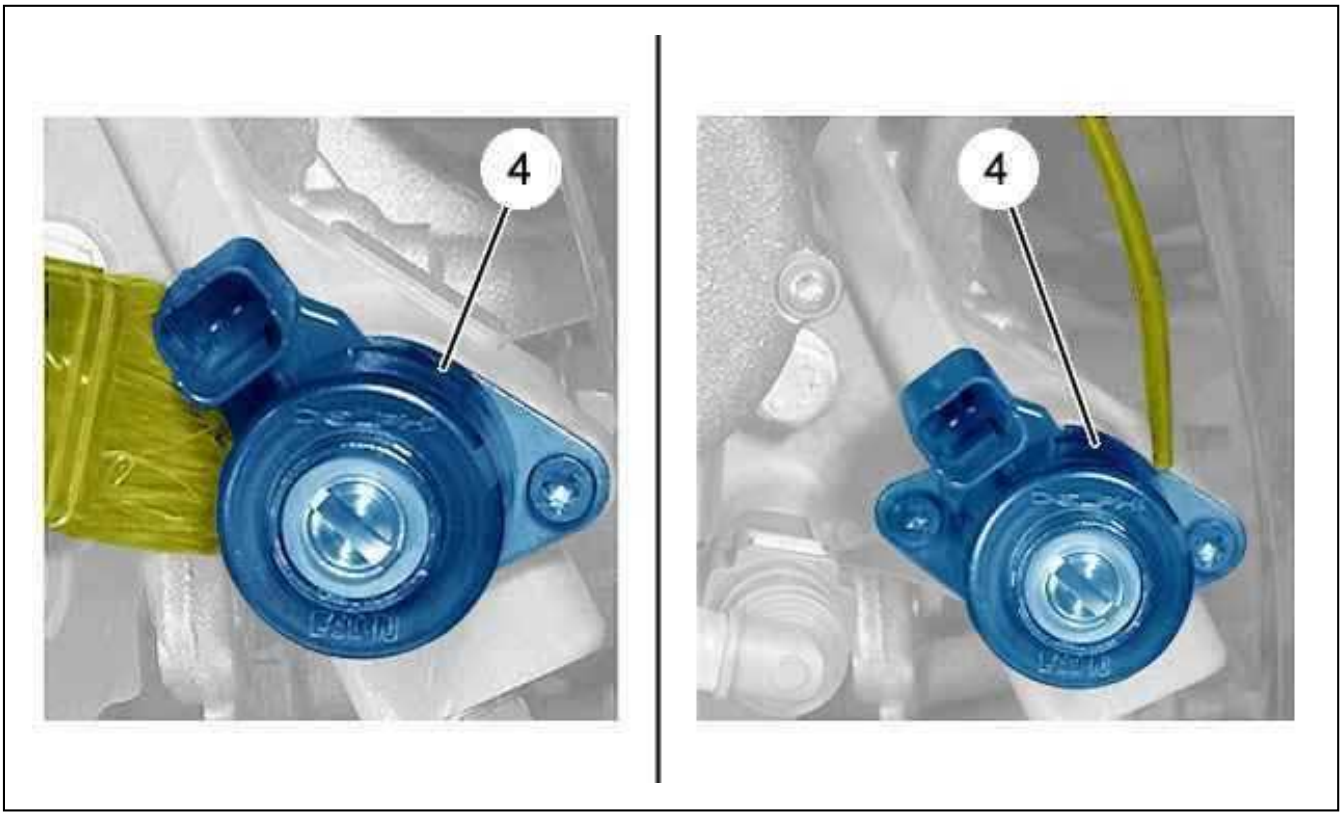


Figure : B1HG0OKD

CAUTION : Protect the surrounding area from any spray of fuel.

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Fit the closer (4).

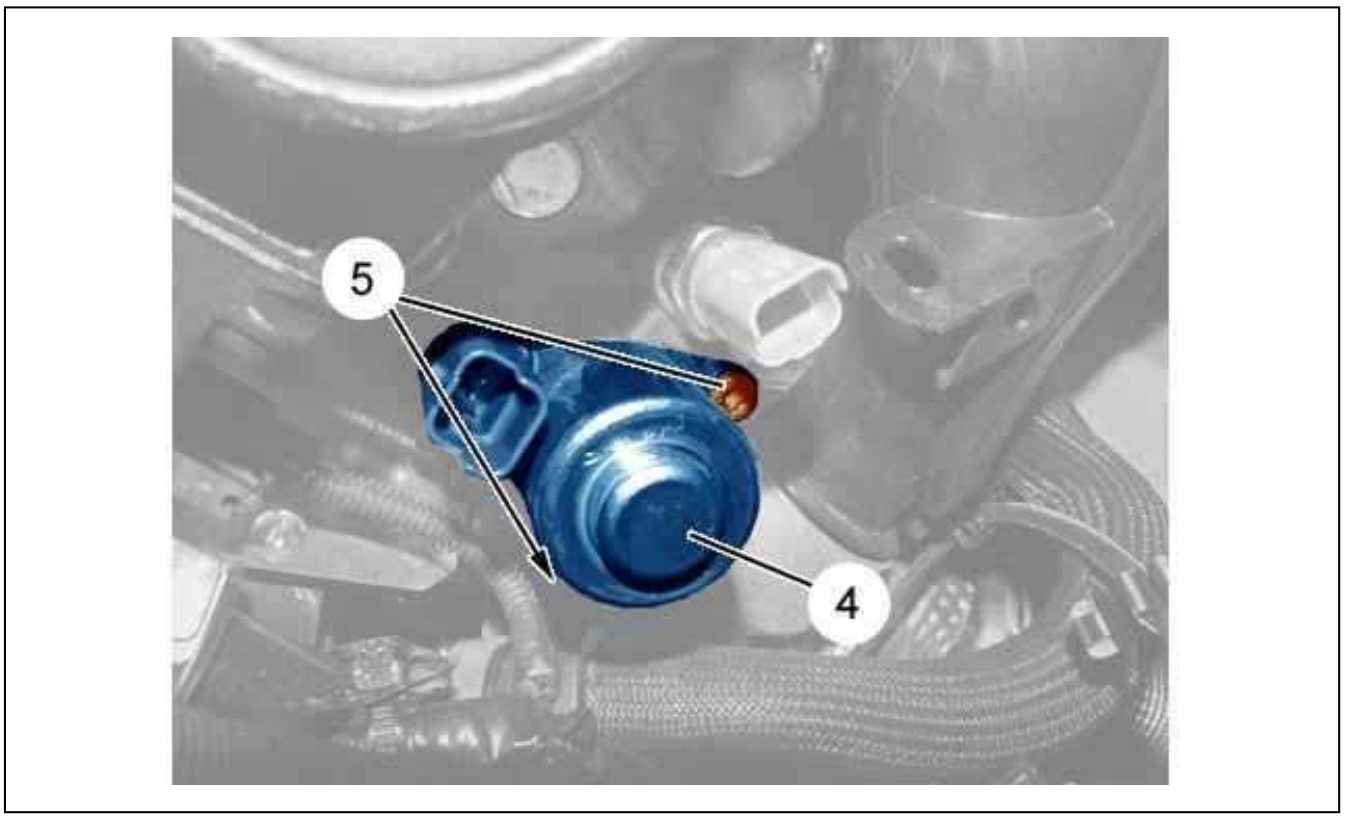


Figure : B1HG0OLD

Remove the bolts (5).
Rotate the fuel high pressure regulator (4) several times to break the paint.

CAUTION : Clean and vacuum up the impurities and particles of paint.

CAUTION : Do not use the connector for leverage.

CAUTION : To avoid any risk of contamination of the fuel circuit, only remove the fuel high pressure regulator (4) wher the new part is available.

Remove : The fuel high pressure regulator (4).

3. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Fit the new fuel high pressure regulator (4) immediately, so as to avoid any risk of contamination of the fuel circuit.

Lubricate the O-ring seals of the fuel high pressure regulator (4) from the sachet provided in the kit.

CAUTION : Check that there are no particles of paint on the mating surface of the high pressure fuel pump.

Insert the fuel high pressure regulator (4), rotating it carefully.

CAUTION : Do not apply pressure to the connector.

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Refit the bolts (5).
Connect : The fuel high pressure regulator (4) (as "b").
Refit :

- The bracket (3)
- The securing bolts (2)

Relocate : The electric harness transition duct .
Refit the nut (1).
Clip in place : The electrical harness (as "a").
Refit the air filter housing.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Learning

CAUTION : Following replacement of the fuel high pressure regulator (4), perform its initialisation using the diagnostic tool.

Use the diagnostic tool.

N.B. : From the "spare parts" menu select the "high pressure fuel pump change" function and follow the programming procedure.

5. Check

Start the engine, at the same time operating the fuel circuit priming pump.

N.B. : Operation requiring two people.

Check that there are no fuel leaks.
Stop the engine.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : FUEL TEMPERATURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Before removing any high pressure fuel sensor or actuator, carry out the diagnostics using the specific tools.

1. Tooling

Equipment :

- Degreasing product (Type SODIMAC)
- Cleaning tray
- Brush
- Vacuum extractor
- Round end-piece

2. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Disconnect the battery.

Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The air filter box

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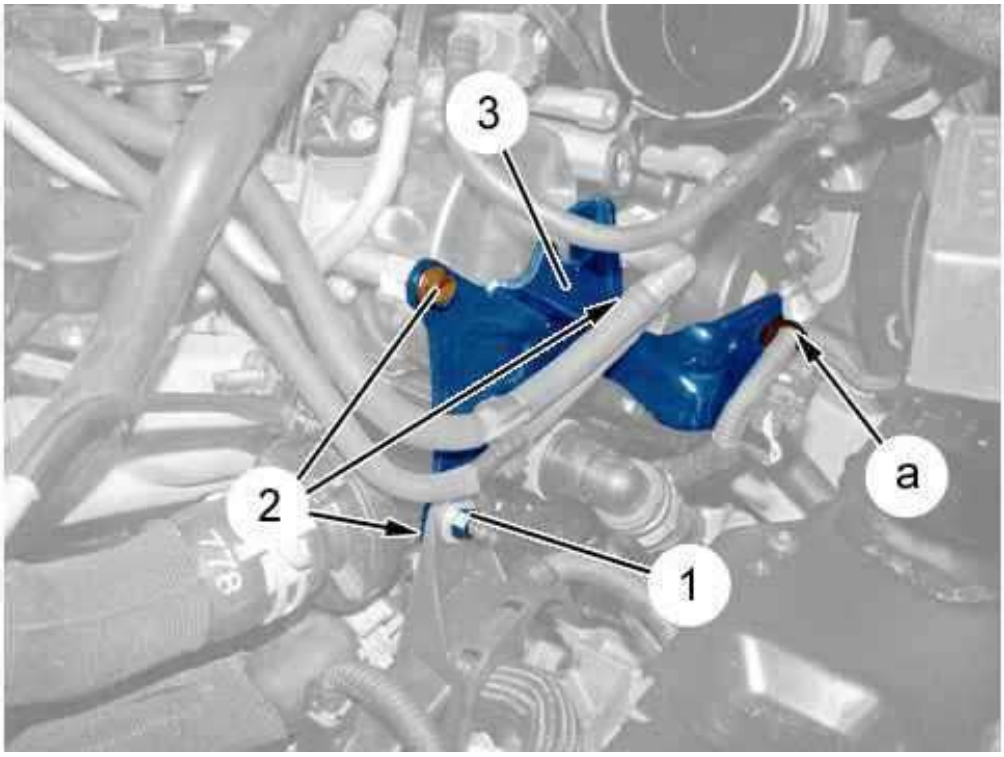


Figure : B1HG089D

Release and move aside the electrical harness (as "a").
Remove the nut (1).
Move aside the electrical harness sheathing .
Remove :

- The fixing bolts (2) from the support (3)
- The bracket (3)

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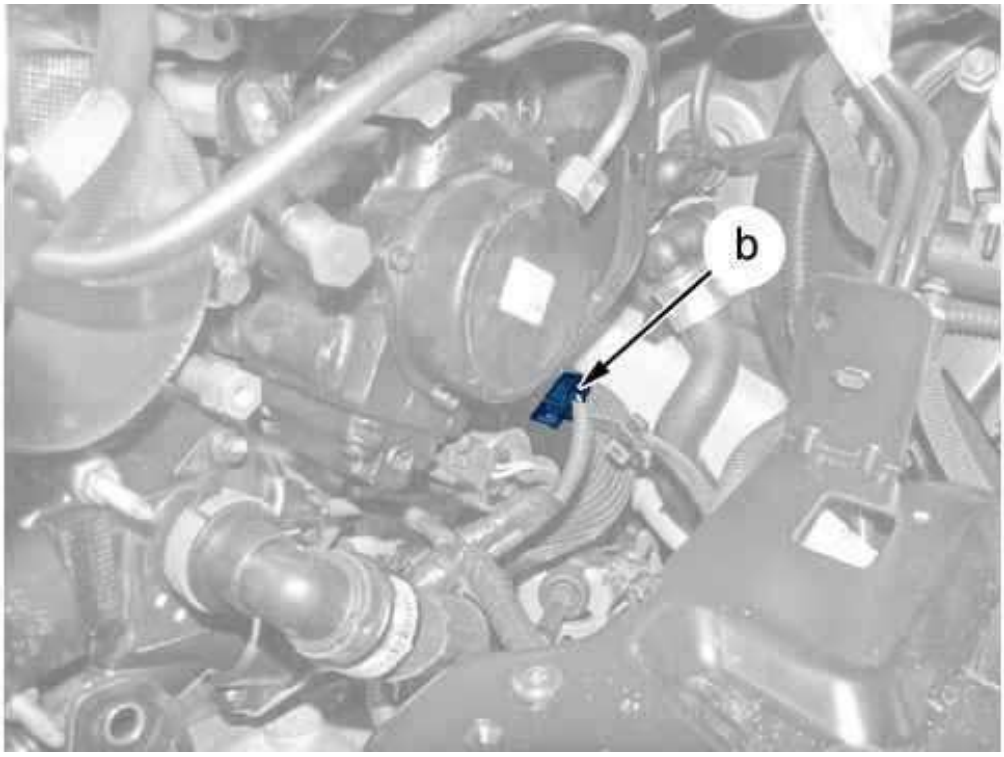


Figure : B1HG08AD

Disconnect the connector (as "b").

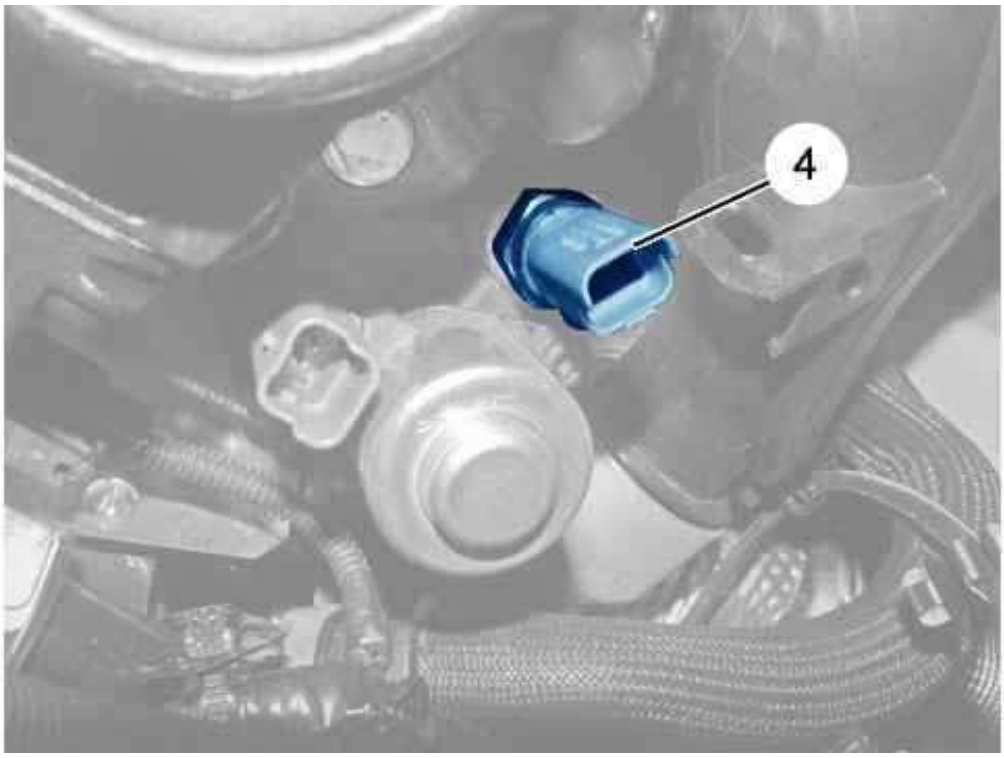


Figure : B1HG08HD

CAUTION : Protect the surrounding area from any spray of fuel.

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Remove : The fuel temperature sensor (4).

N.B. : When loosening, rotate it several times to break the paint.

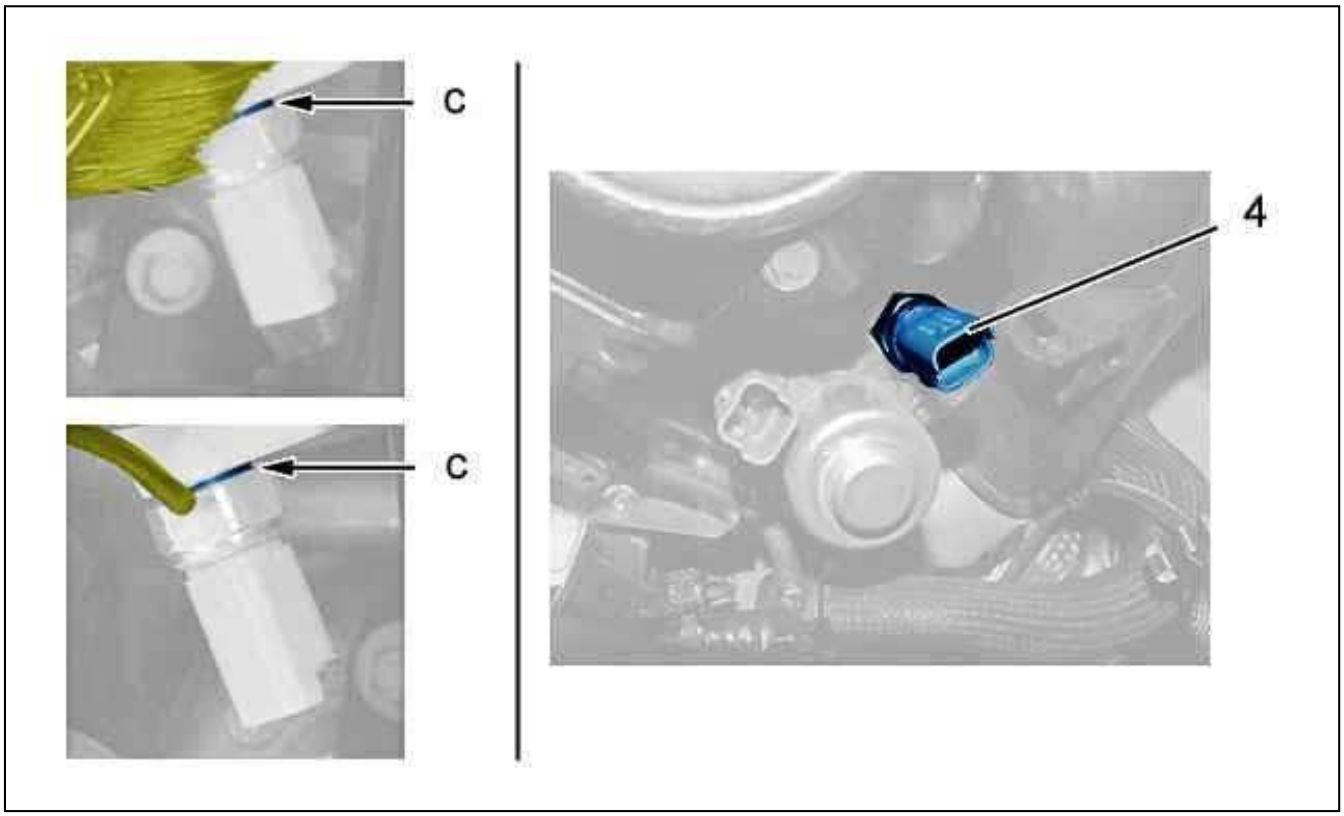


Figure : B1HG1S6D

CAUTION : Clean and vacuum up the impurities and particles of paint (as "c").

CAUTION : To prevent any risk of contaminating the fuel circuit, only remove the fuel temperature sensor when the new component is available.

3. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Fit the new fuel temperature sensor immediately, in order to prevent any risk of contaminating the fuel circuit.

Lubricate the O-ring of the fuel temperature sensor with the dispenser supplied in the kit.

CAUTION : Checked the presence and condition of the copper seal on the fuel temperature sensor.

Refit : The fuel temperature sensor (4).
Connect the connector (as "b").
Refit :

- The bracket (3)
- The bolts (2)
- The nut (1)

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Position the electrical harness (as "a").
Refit the air filter housing.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Check

Start the engine, at the same time operating the fuel circuit priming pump.

N.B. : Two operators are necessary.

Check that there are no fuel leaks.
Stop the engine.
Refit :

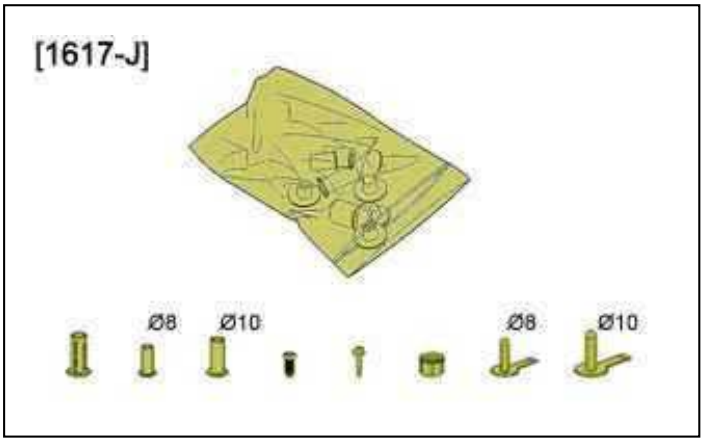
- The passenger compartment air inlet manifold
- The engine cover

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REMOVING - REFITTING : FUEL FILTER

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AG03LT	[1617-J]	Sealing plugs HDI

2. Removing

Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The cooling fan control relay unit

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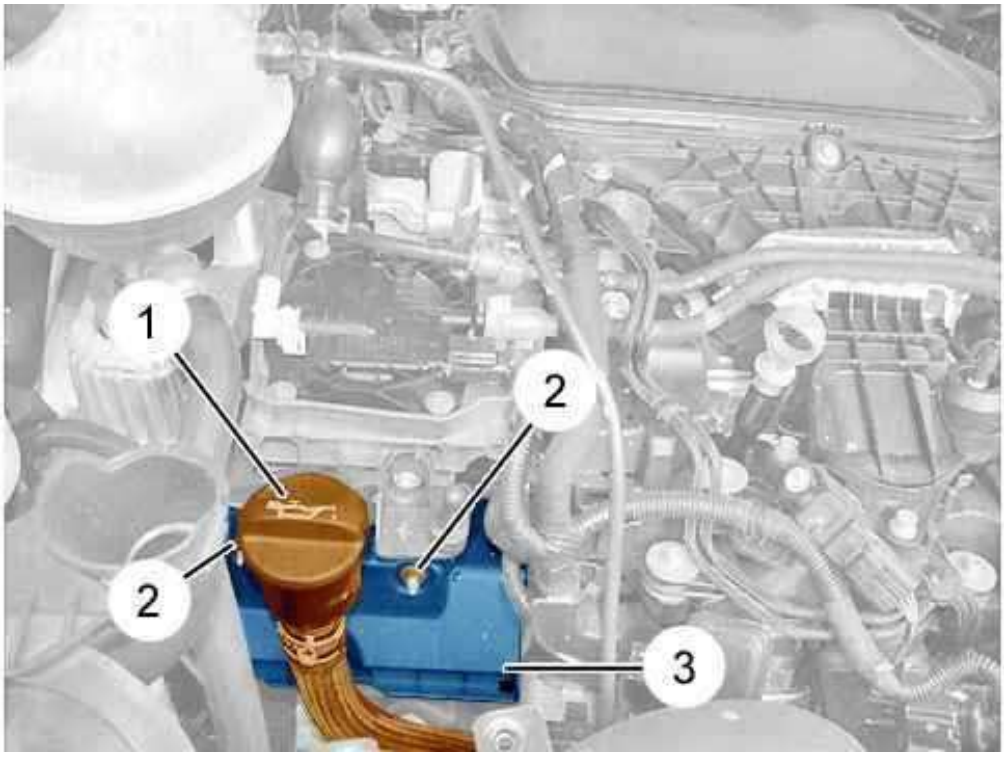
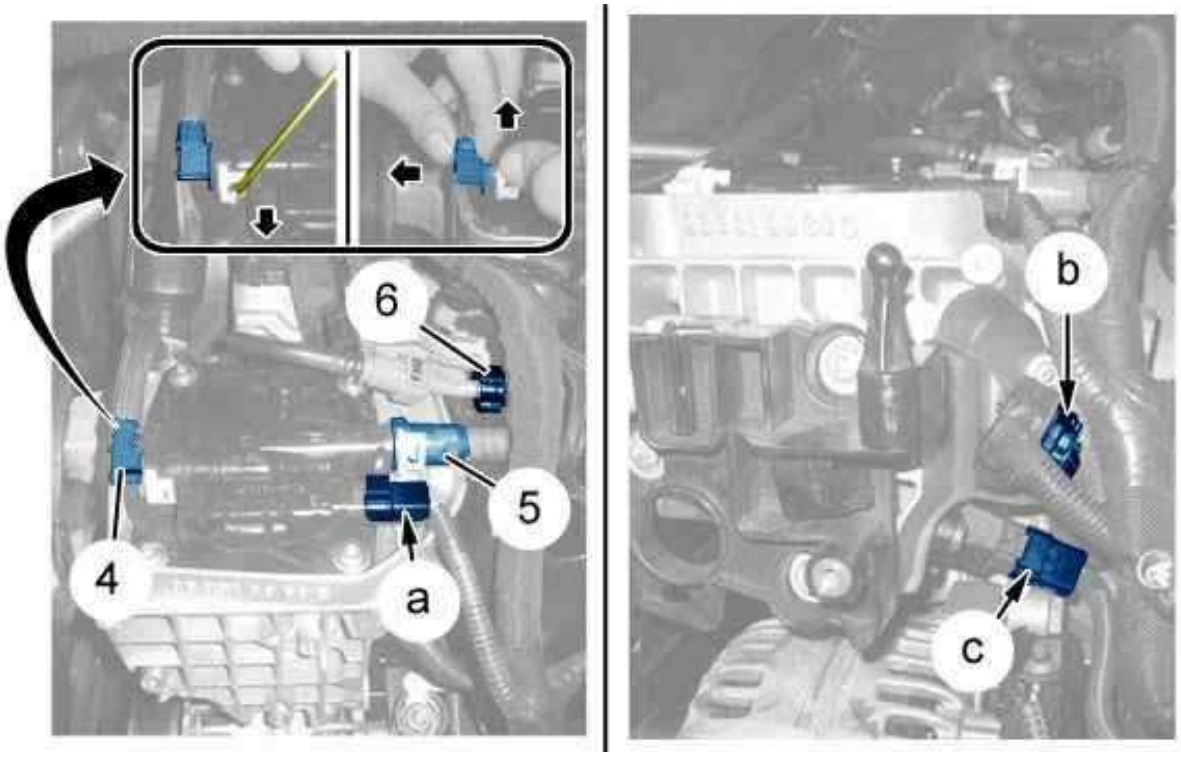


Figure : B1HG22AD

Unclip and move aside : The engine oil filler neck (1).
Remove :

- The nuts (2)
- The protector (3)



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Figure : B1HG07SD

CAUTION : After dismantling, immediately plug the unions, to avoid entry of foreign bodies (diameter 10 mm).

Uncouple : The fuel low pressure supply unions (4), (5) ; Using a flat screwdriver.
Unclip :

- The connector (as "b")
- The bracket (6)

Unplug :

- The diesel heater (as "a")
- The water detection sensor (as "c") (according to model)

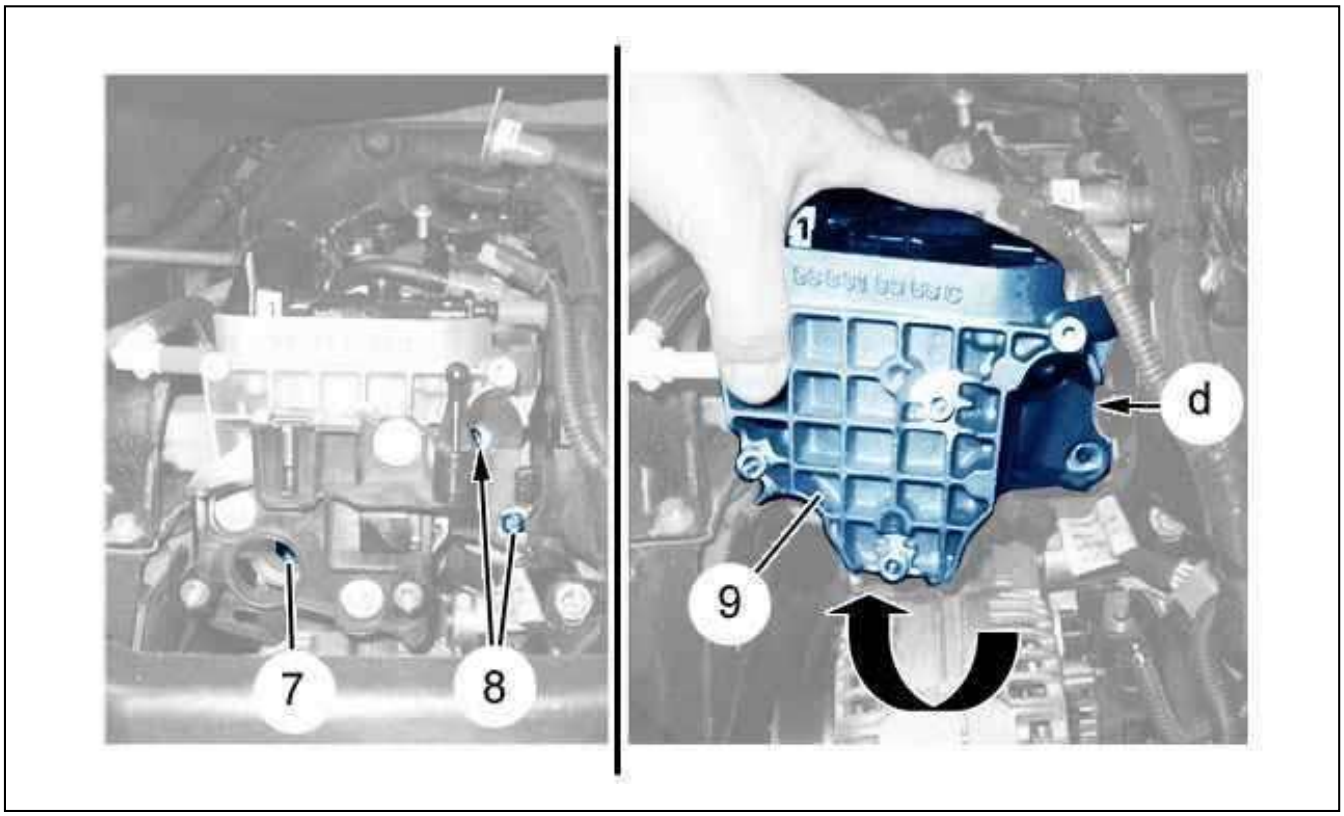


Figure : B1HG0Z4D

Remove :

- The (7) bolt
- The nuts (8) and their studs

Pivot the fuel filter (9) to extract it from the zone (as "d").
Remove the fuel filter (9).

3. Refitting

CAUTION : Adhere to the tightening torques .

Refit the fuel filter (9).
Refit :

- The (7) bolt
- The nuts (8) and their studs

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Clip in place :

- The bracket (6)
- The connector (as "b")

Connect the connectors (as "a", "c").
Remove the plugs .
Couple up : The fuel low pressure supply unions (4), (5).
Refit :

- The protector (3)
- The nuts (2)

Clip : The engine oil filler neck (1).
Prime the fuel circuit ; Using the manual priming pump .
Refit : The cooling fan control relay unit .

4. Check : Sealing of the fuel circuit

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Start the engine.
Check the absence of leaks.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

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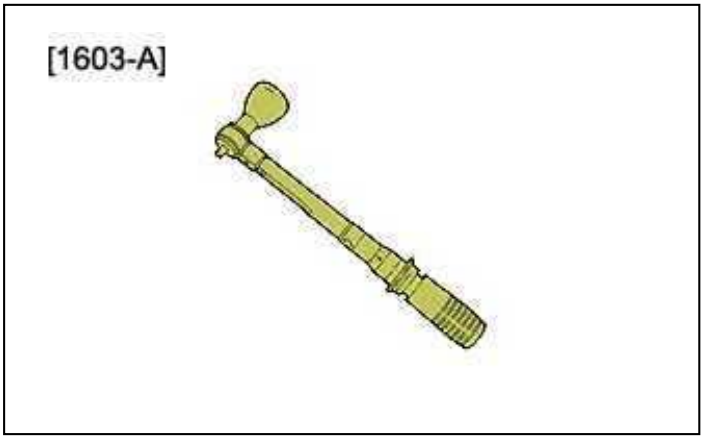
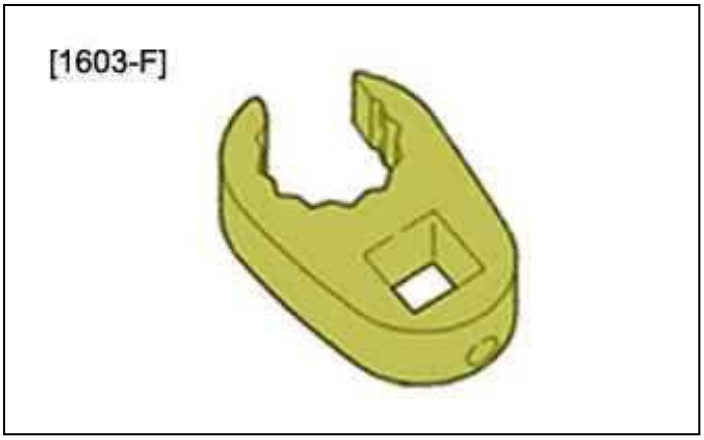
REMOVING - REFITTING : DIESEL INJECTOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

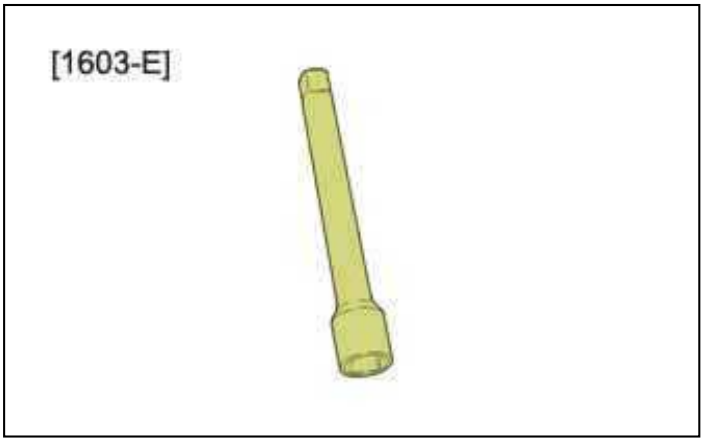
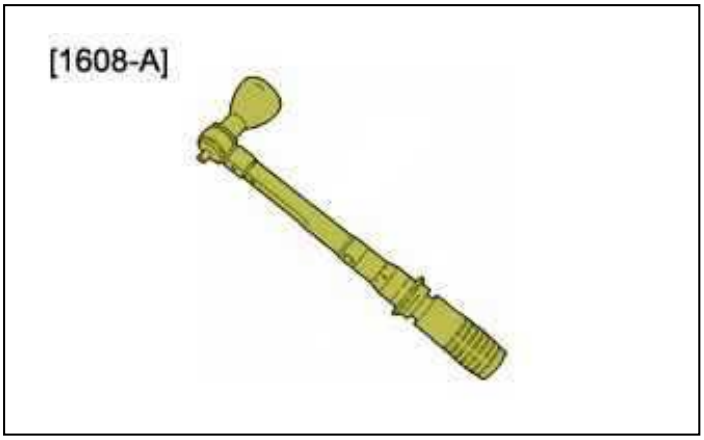
1. Tooling

Equipment :

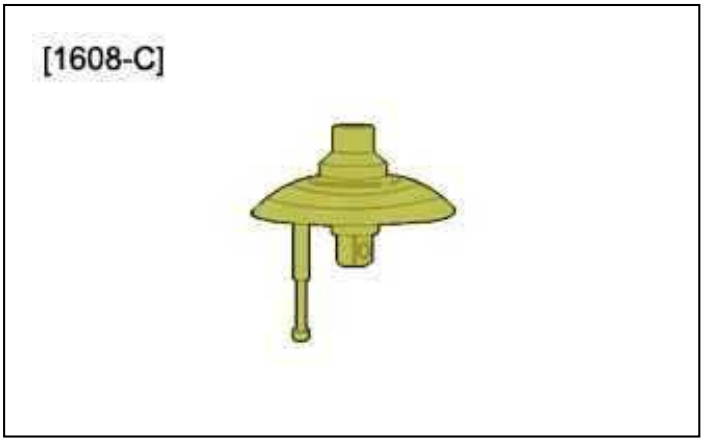
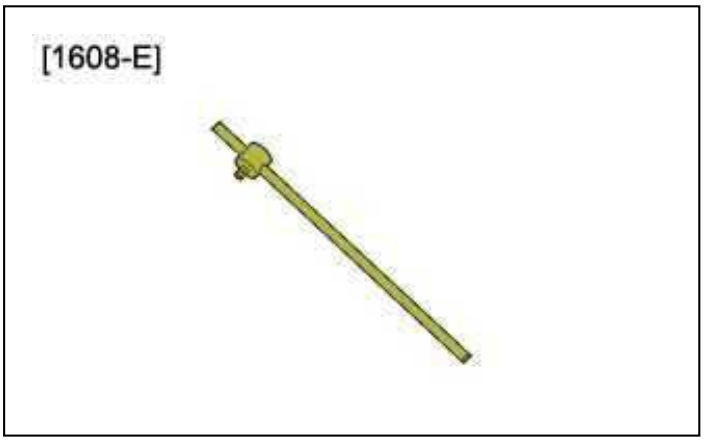
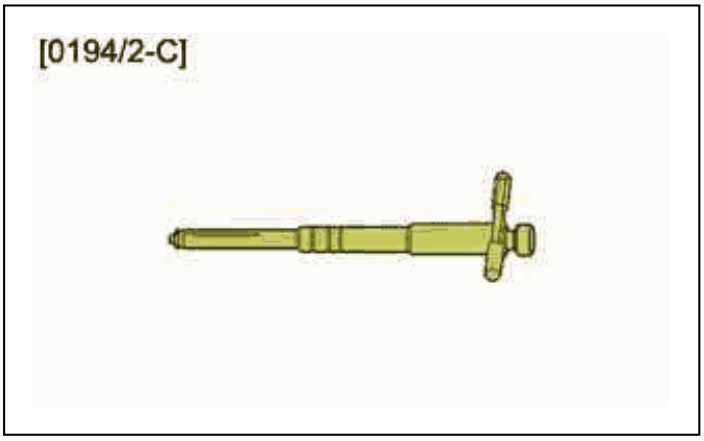
- Leak detector
- Vacuum extractor
- Vacuum adaptor

tool	Reference	Designation
 Figure : E5AG07KT	[1603-A]	Torque wrench
 Figure : E5AG07LT	[1603-F]	pipe spanner
	[1603-E]	Extension

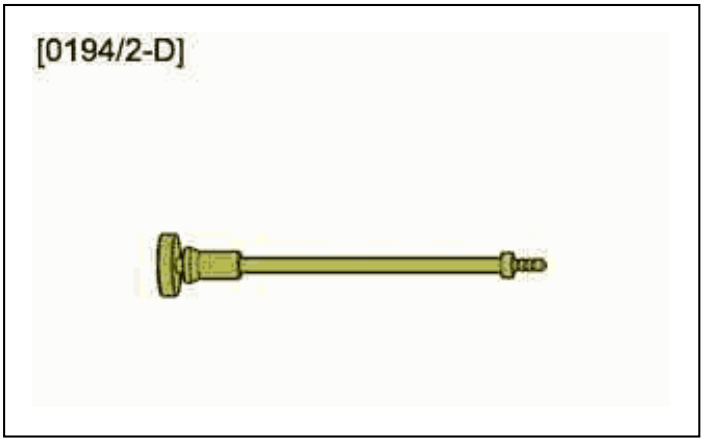
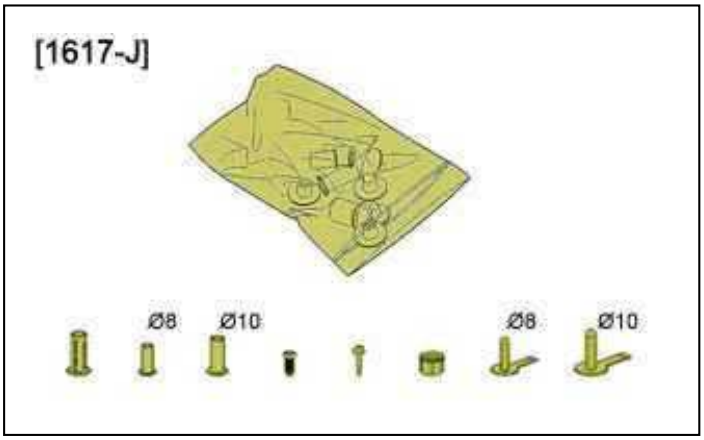
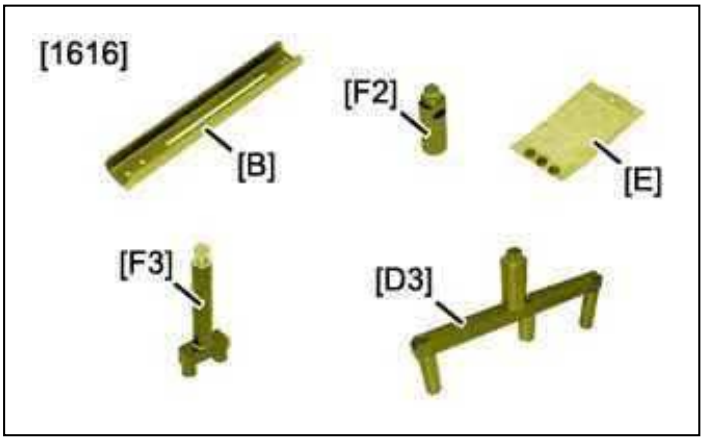
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 Figure : E5AG07XT		
 Figure : E5AB0CAT	[1608-A]	Torque wrench
 Figure : E5AB0O8T	-	6-sided 6mm screwdriver socket (Type FACOM JT-6)
	[1608-C]	Angular locking cotter

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 Figure : E5AB0CBT		
 Figure : E5AB0C9T	[1608-E]	T piece extension
 Figure : E5AG06JT	[0194/2-C]	Sealing washer extractor kit
	[0194/2-D]	Diesel injector well cleaning tool

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 Figure : E5AG06KT		
 Figure : E5AG03LT	[1617-J]	Set of plugs HDI
 Figure : E5AB0IZT	[1616-B]	Diesel injector extractor rail
	[1616-F2]	Diesel injector extractor end-piece
	[1616-E]	Blanks
	[1616-F3]	Diesel injector extractor support
	[1616-D3]	Diesel injector extractor support

2. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

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Remove :

- The passenger compartment air inlet manifold
- The engine cover

Disconnect the battery.
Remove the air filter housing .

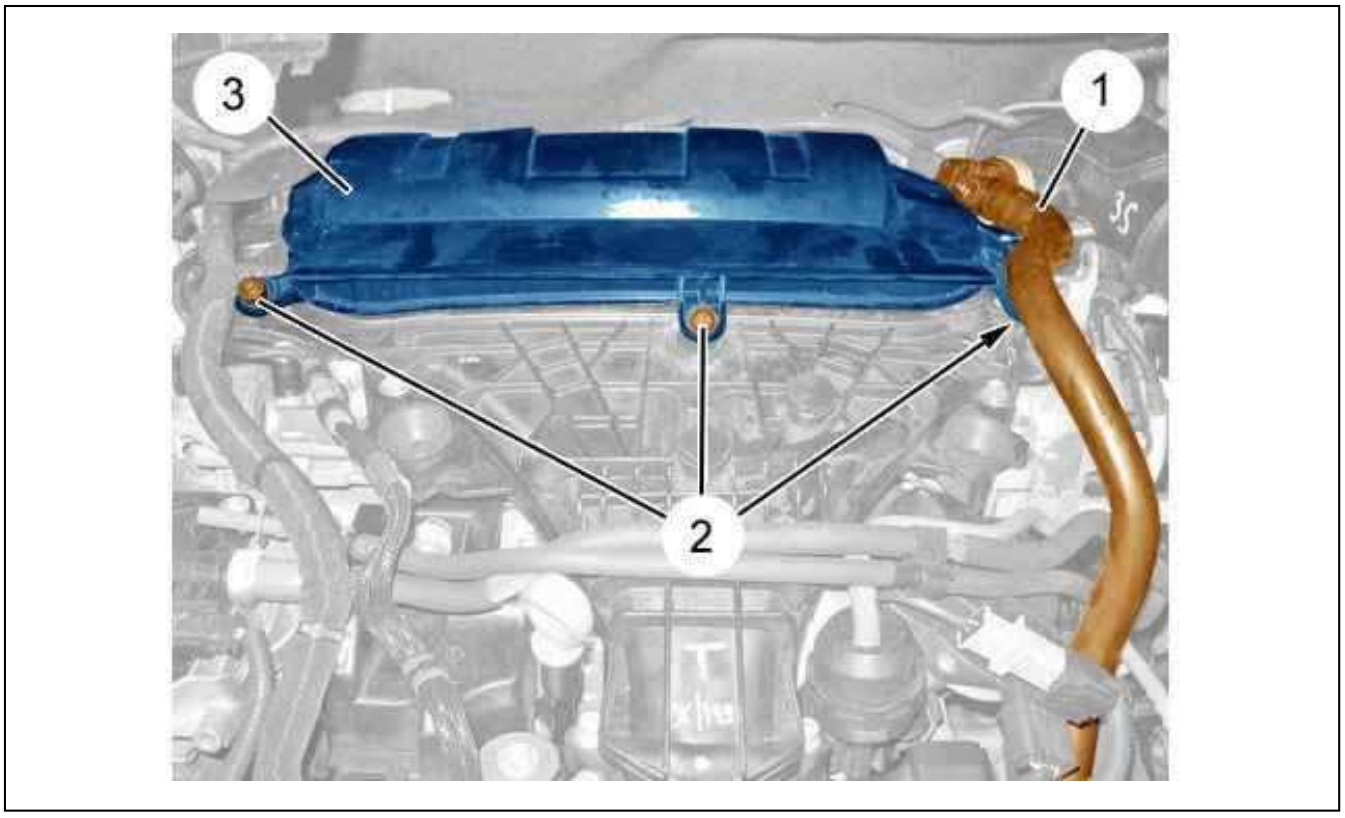


Figure : B1HG21OD

Uncouple the pipe (1).
Remove :

- The 3 bolts (2)
- The protector (3)

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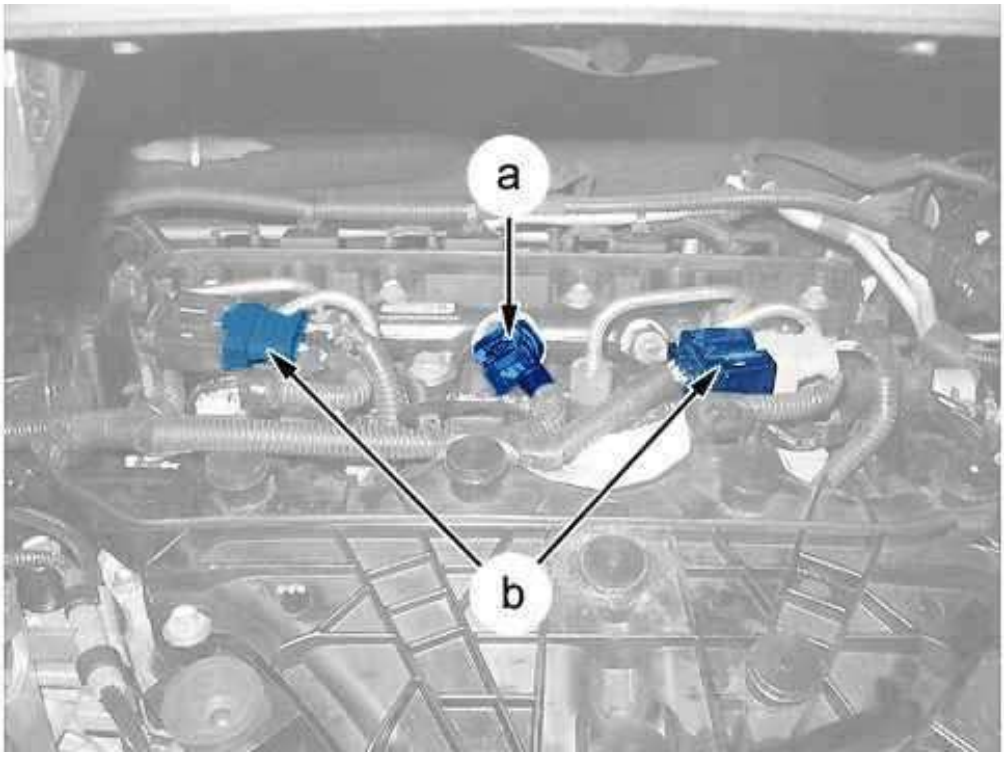


Figure : B1HG1HDD

Unplug :

- The high pressure fuel sensor (as "a")
- The injection pipe assembly (as "b")

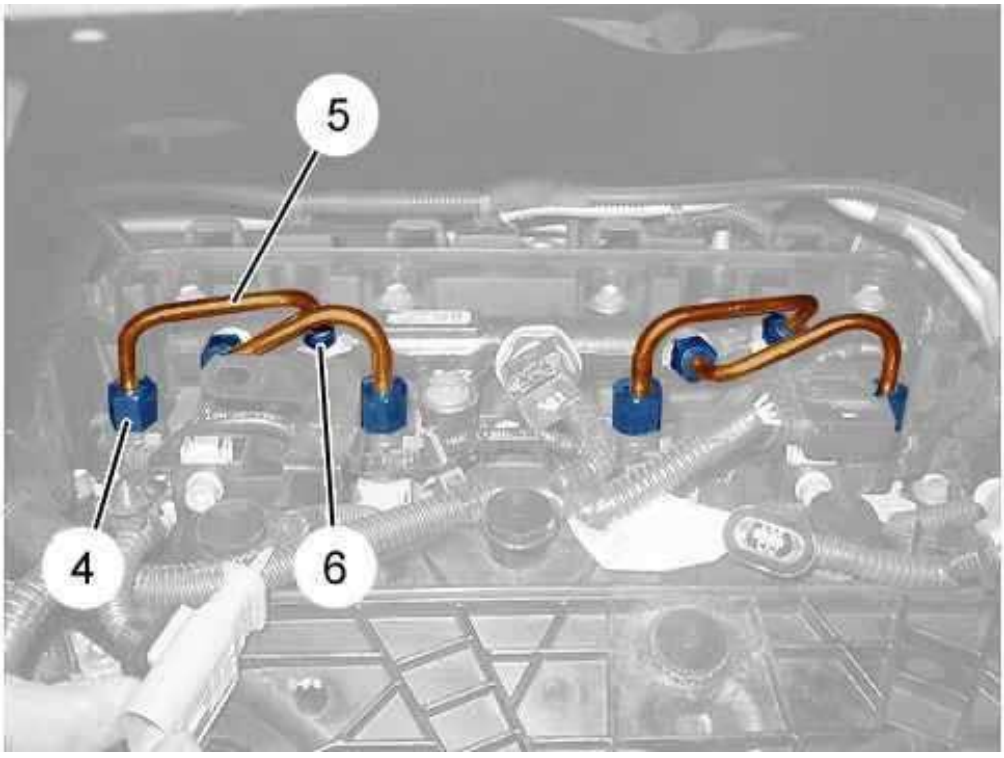


Figure : B1HG1HED

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CAUTION : Clean the fuel high pressure unions before untightening .

Unscrew :

- The unions of the high pressure fuel pipes (4)
- The unions of the high pressure fuel pipes (6)

CAUTION : Close : The high pressure fuel pipe unions (4), (6); Using the plugs [1617-J].

Remove the high pressure fuel pipes (5).

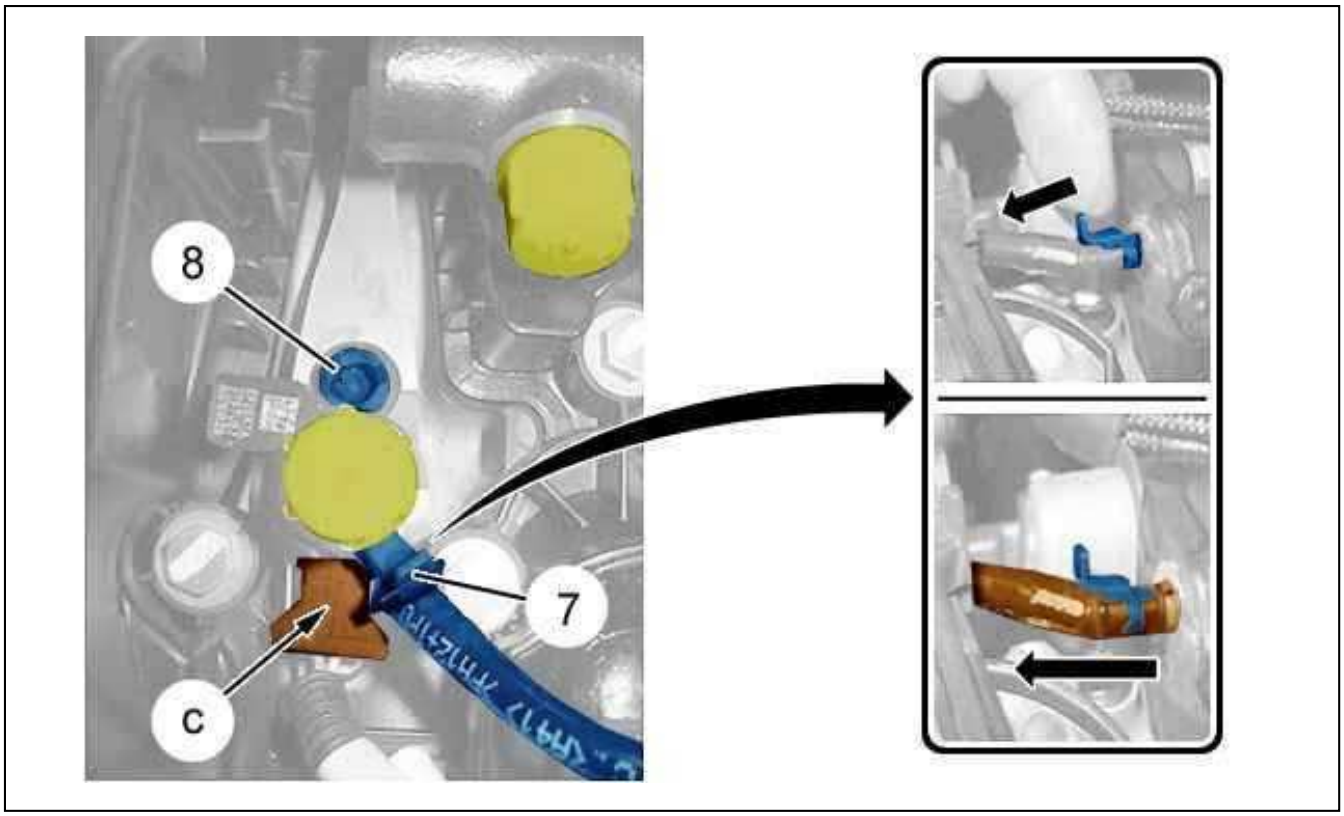


Figure : B1HG1HFD

Disconnect injectors (as "c").
Remove : The electrical harnesses.

CAUTION : Immediately plug the fuel unions using plugs [1617-J].

Uncouple the fuel injector return pipes (7) from the timing side towards the high pressure pump :

- Pull the locking tab (Towards the rear)
- Extract the fuel injector return pipes (7)

Remove :

- The fuel injector return pipes (7)
- The bolts (8) ; Using the 6-sided 6 mm screwdriver socket (type FACOM JT-6)

2.1. Extraction of injectors

CAUTION : If injectors are seized, it is necessary to use the extraction tool [1616].

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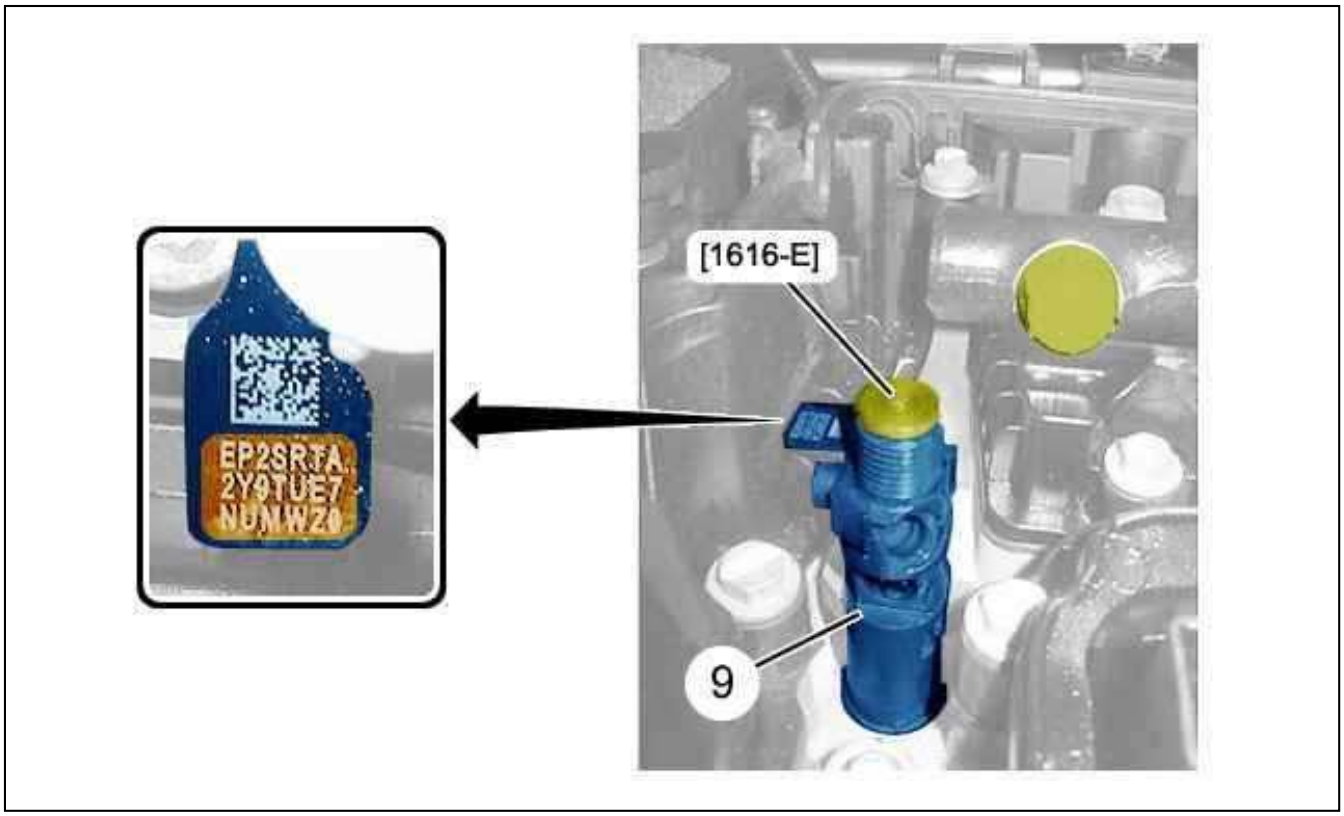


Figure : B1HG1HGD

CAUTION : Note down the classification number of the diesel injectors (9) (20 characters) ; Mark the location of each diesel injector (9) in relation to the cylinder (If re-used).

Fits the blanking piece [1616-E] onto the diesel injector (9).
Screw the endpiece [1616-F2] on the diesel injector (9).

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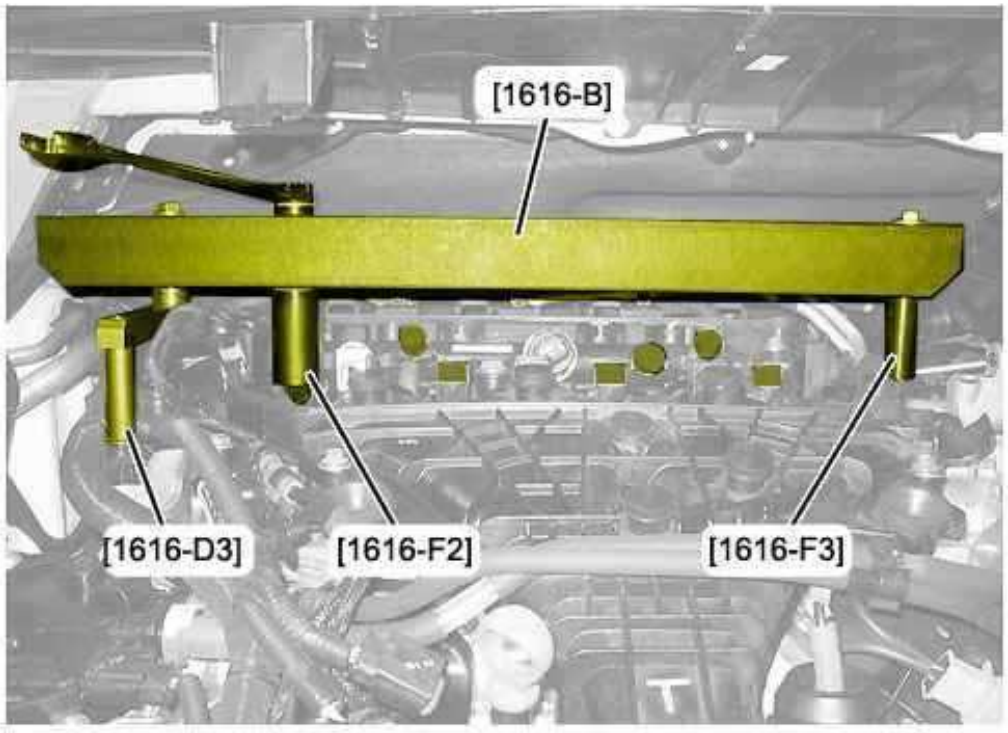


Figure : B1HG1HHD

Positioning the extraction tool :

- Prefit the extraction tool with [1616-B], [1616-F3], [1616-D3]
- Fit the extraction tool on the engine
- Do up the screw on the endpiece [1616-F2]
- Use a flat spanner to tighten the screw, ready for the extraction

CAUTION : Plug the injector wells as well as the diesel injectors ; Using the plugs [1617-J].

Remove : The injectors with the clips .

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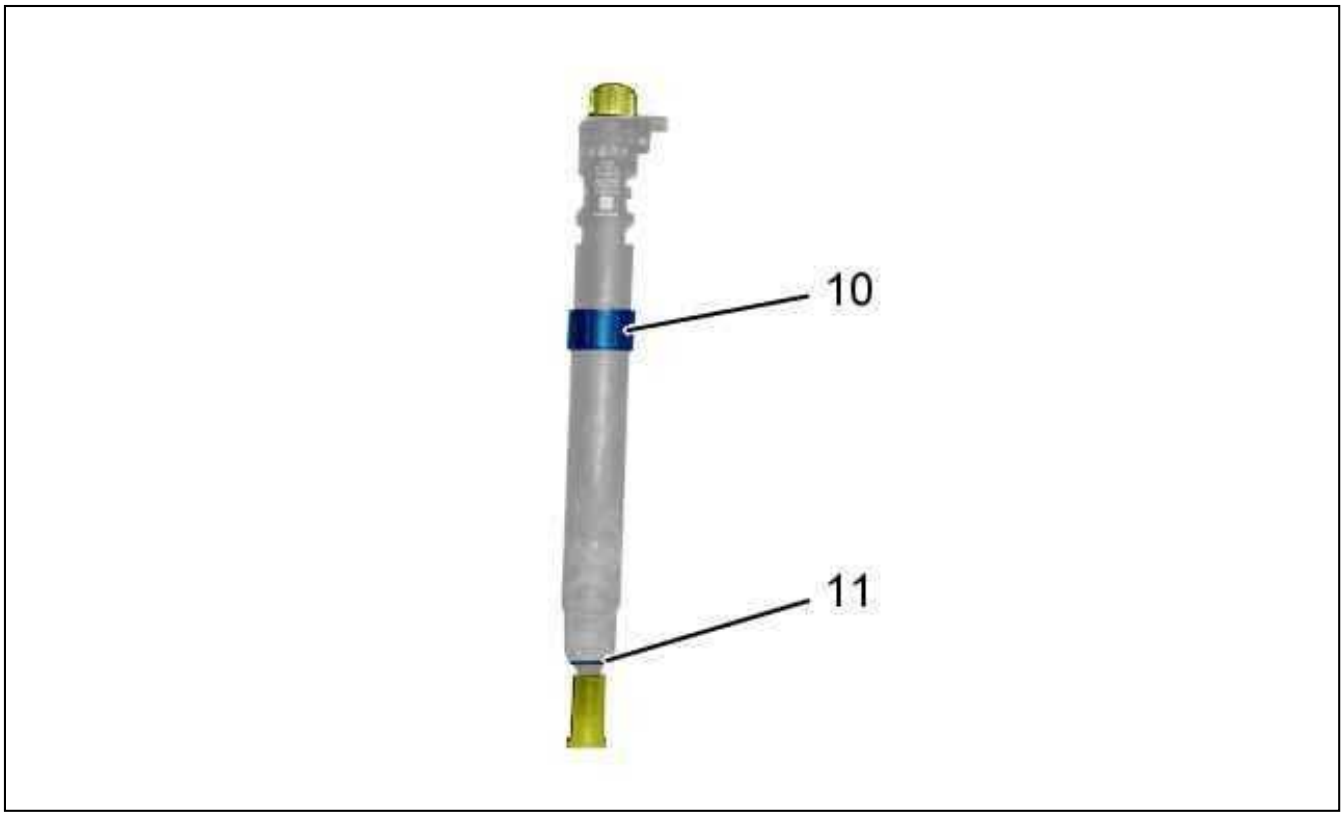


Figure : B1HG1HID

Remove :

- The centring rings (10)
- The seals (11)

2.2. Extracting the copper seals (If necessary)

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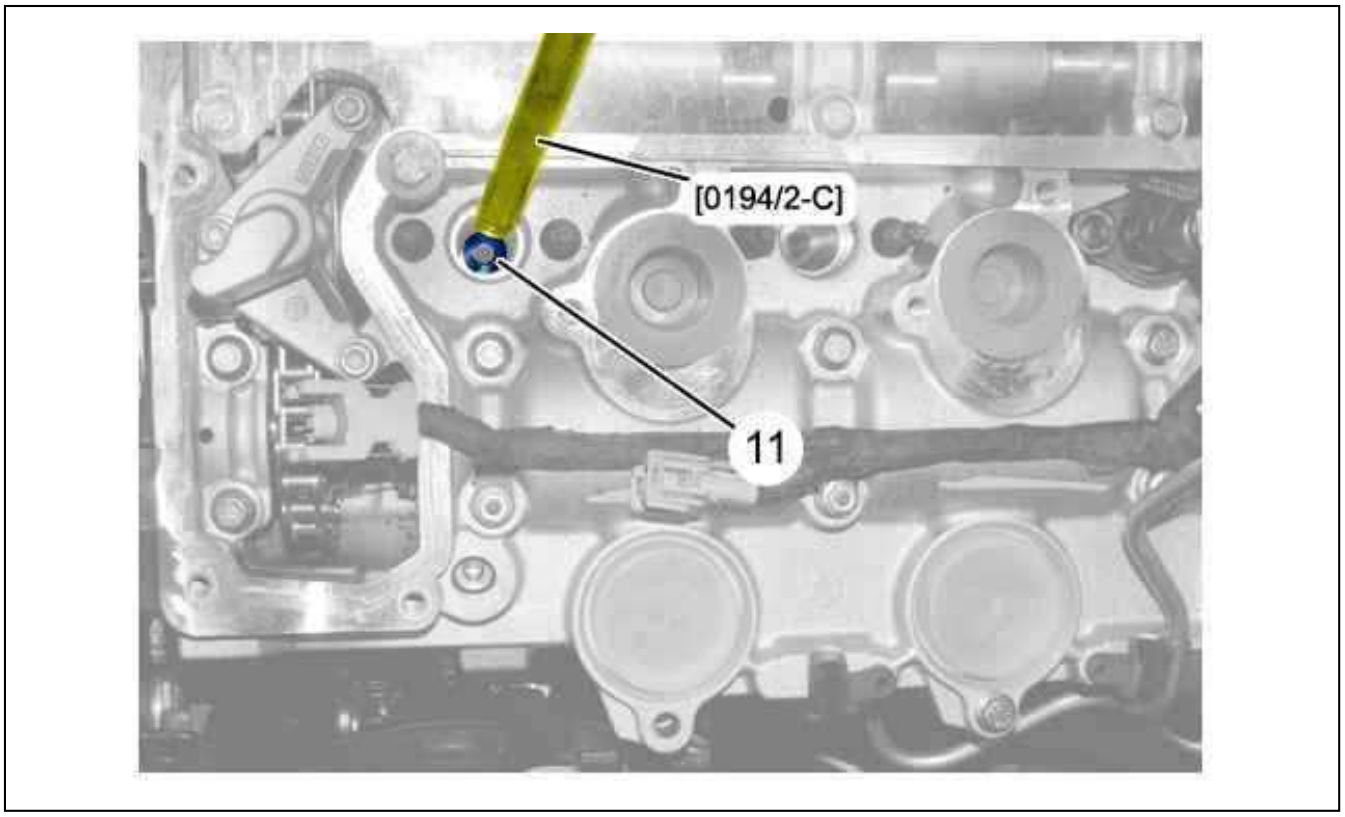


Figure : B1HG1HJD

Slacken the tool [0194/2-C] by a few turns.
Fit the tool [0194/2-C] on the copper seal (11) in the diesel injector well .
Tighten the bolt of the tool [0194/2-C] fully to immobilise the copper seal (11).
Remove the copper seal (11).

2.3. Cleaning the injector wells

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Figure : B1HG17ID

Fit the tool [0194/2-D] in the diesel injector well .

CAUTION : Do not force when manoeuvring the tool [0194/2-D] : Risk of damage to the diesel injector well .

Clean the diesel injector hole by turning the tool [0194/2-D] clockwise.
Vacuum the inside of the injector well.

CAUTION : After cleaning, plug the diesel injector wells.

3. Refitting

CAUTION : Adhere to the tightening torques .

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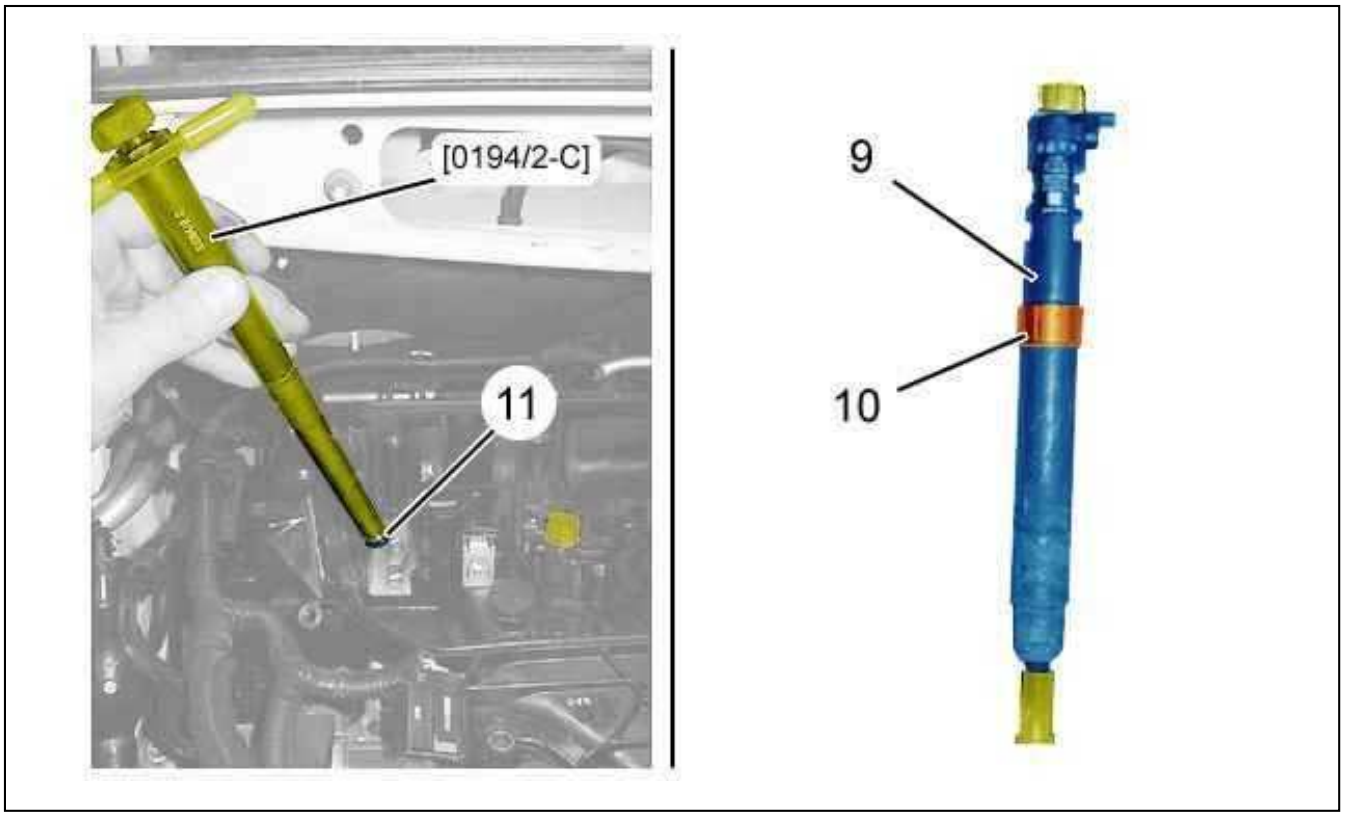
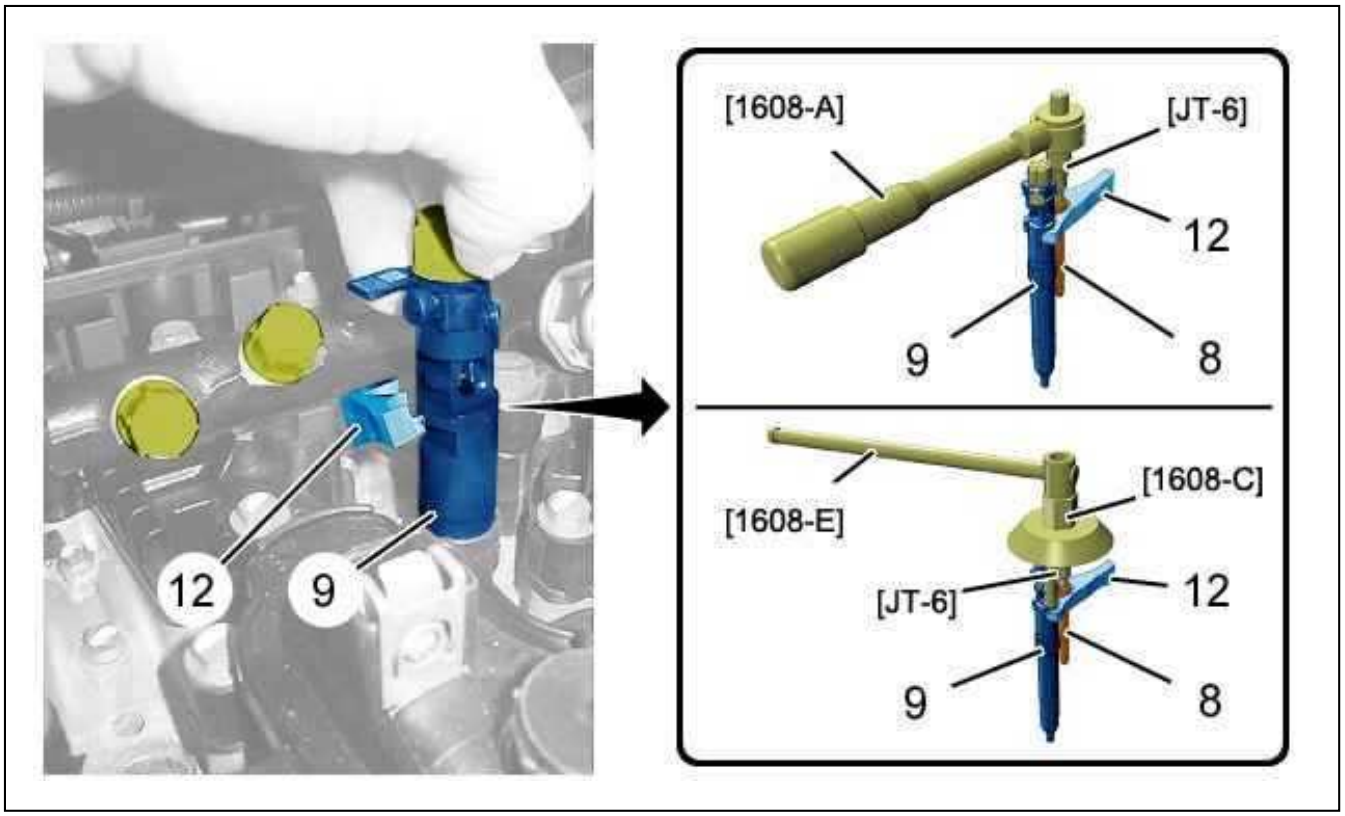


Figure : B1HG1HLD

CAUTION : Use new seals (11) and new centring rings (10).

Fit the seals (11) into the injector wells ; Using tool [0194/2-C].
Fit the centring rings (10) on the diesel injectors (9).



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Figure : B1HG1HMD

CAUTION : Refit the diesel injectors (9) in the cylinders as priorly noted (Diesel injectors re-used).

CAUTION : Keep rigorously to the procedure for tightening the diesel injectors (9) ; Risk of breaking the screws (8).

Refitting - Tightening : Injectors (Proceed injector by injector) :

- Fit the retaining clamp (12)
- Engage the diesel injector (9) in the flange
- Refit bolt (8)
- Pre-tighten to the specified torque : The (8) bolt ; Using the tools [1608-A] - 6-sided 6mm screwdriver socket (type FACOM JT-6)
- Angular tighten : The (8) bolt ; Using the tools [1608-C], [1608-E] - 6-sided 6mm screwdriver socket (type FACOM JT-6)

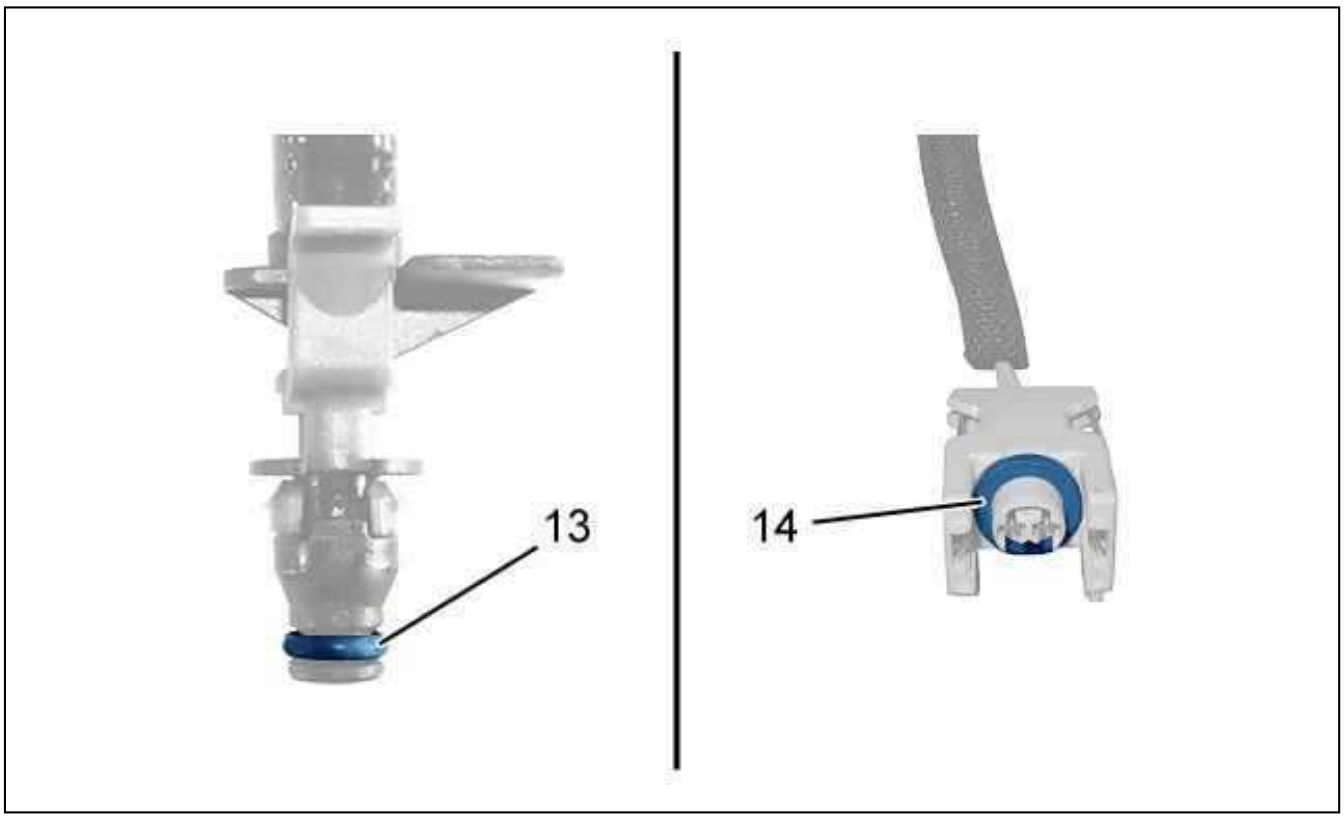


Figure : B1HG1HND

CAUTION : Always replace the O-ring seals (13) on the clickfit unions ; Risk of leaks.

CAUTION : Always replace the seals (14) on the injector connectors ; Risk of electrics being cut off.

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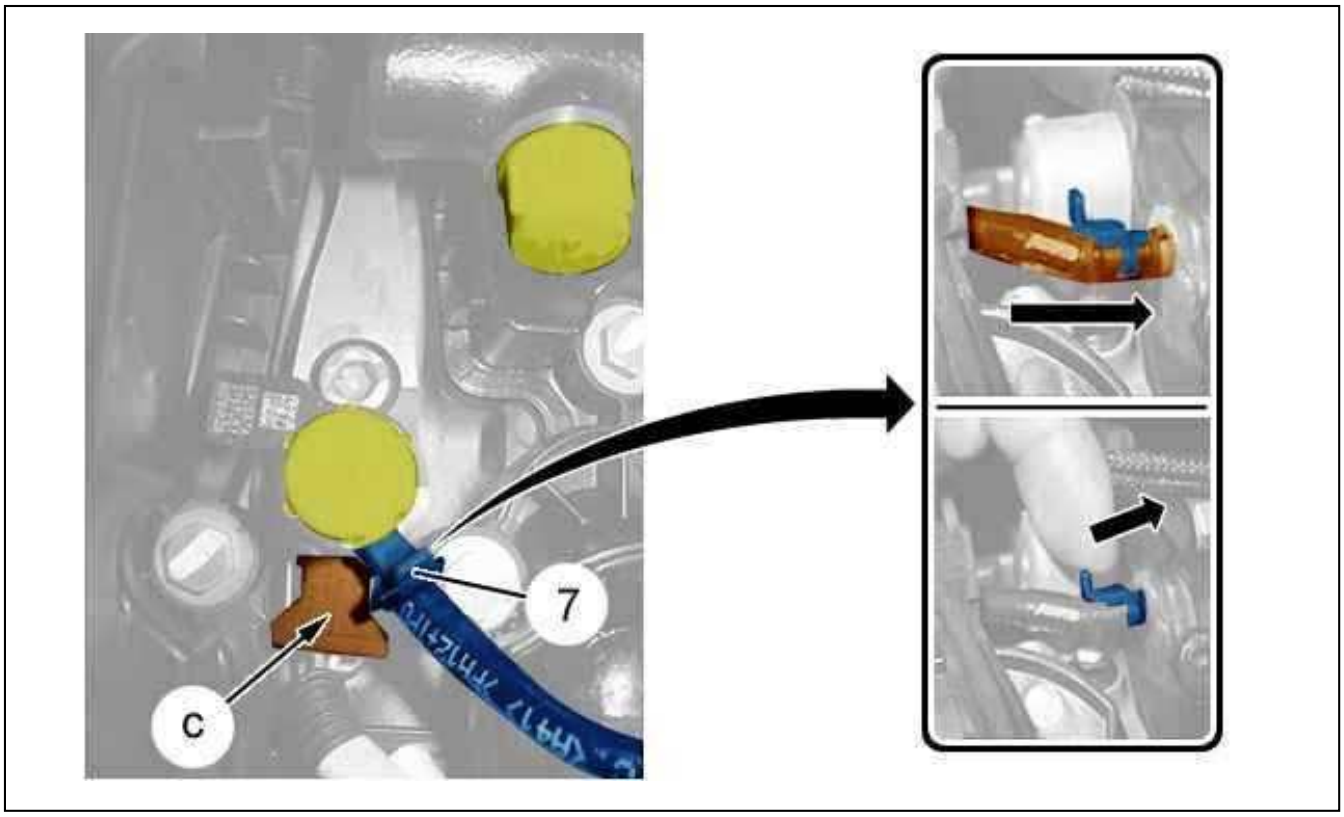


Figure : B1HG1HOD

Connect the injectors (as "c").
Pre-position the fuel injector return pipes (7) on the pump and on the injectors, on the pump first.
Couple up : The fuel injector return pipes (7) :

- Check that the tabs are open (Pull rearwards)
- Fully insert the unions, commencing with the pump, then the injectors 1, 2, 3, 4
- Push the locking tabs
- Pull carefully on the unions to check they are in place

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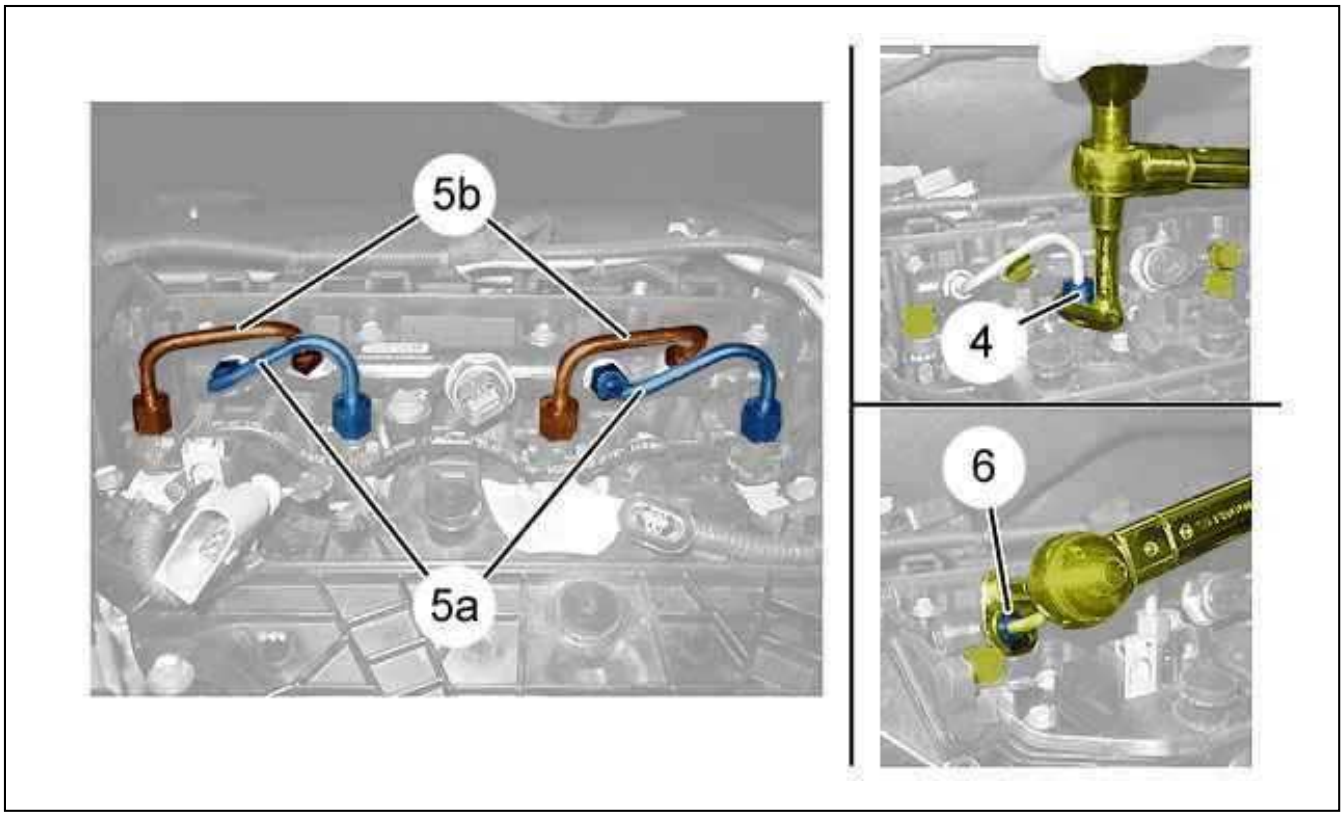


Figure : B1HG1HPD

CAUTION : Always fit new high pressure fuel pipes ; Risk of fuel leak (2000 bars).

Position : The 2 high pressure fuel pipes (5a).
Tightening the high-pressure fuel pipes (5a) ; Using the tools [1603-A] , [1603-F] , [1603-E] :

- Tighten : The fuel high pressure unions (by hand)
- Pre-tighten : The unions (4) on the diesel injectors
- Pre-tighten : The unions (6) on the fuel high pressure common rail
- Tighten : The unions (4) on the diesel injectors
- Tighten : The unions (6) on the fuel high pressure common rail

Follow the same procedure for the high-pressure fuel pipes (5b).
Connect :

- The injection pipe assembly (as "b")
- The high pressure fuel sensor (as "a")

Connect the pipe (1).
Prime the fuel circuit, using the manual priming pump (for one minute).
Refit the air filter unit.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Programming the new injectors

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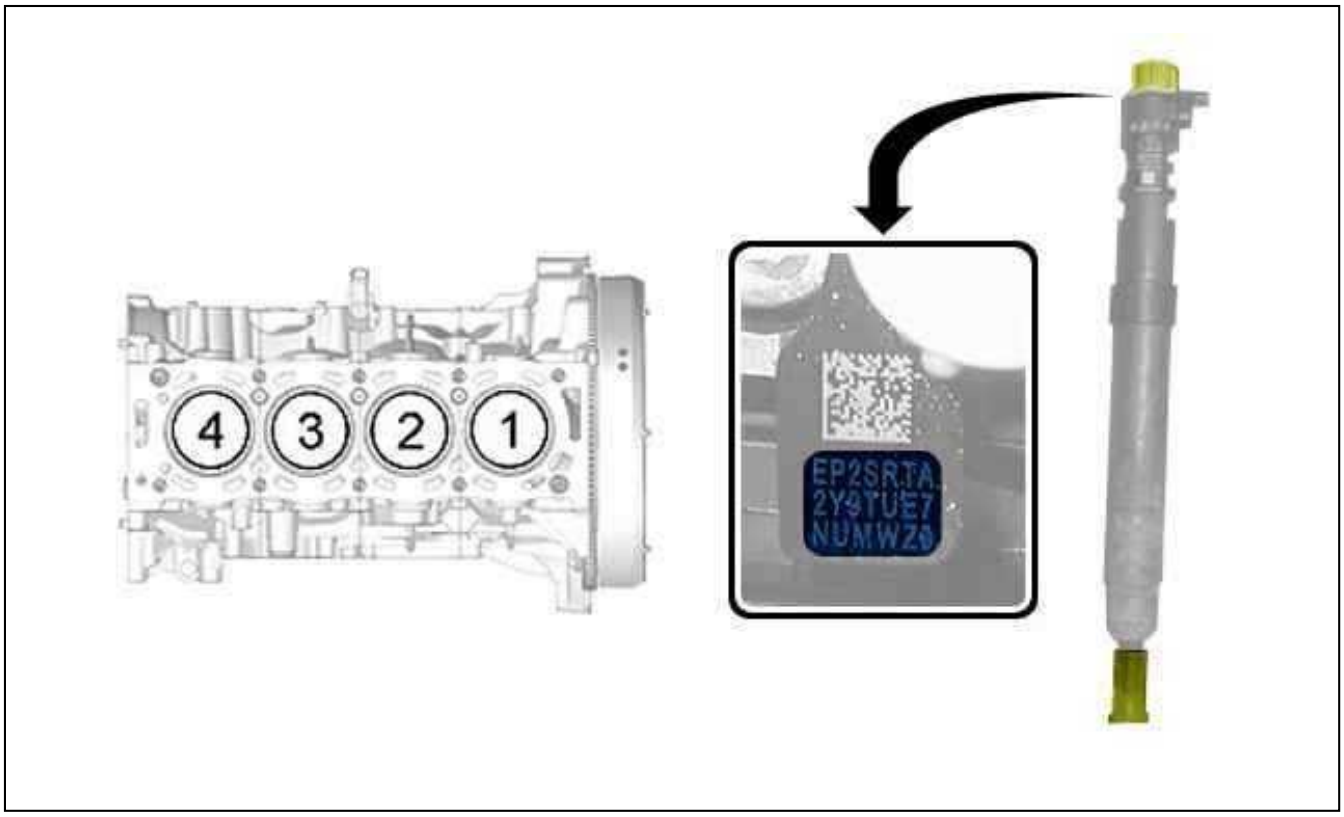


Figure : B1HG0JQD

Note down the 20 identification characters on each injector.
Match the injectors to the cylinders ; Using the diagnostic equipment.

5. Check

Checking for leaks :

- Spray the leak detector product on the high pressure fuel unions
- Allow the product to dry
- Start the engine
- Check there are no leaks
- Carry out a road test
- Stop the engine
- Check there are no leaks
- Replace any defective parts

CAUTION : Check the memory of faults ; Using the diagnostic equipment.

Refit :

- The protector (3)
- The 3 bolts (2)
- The engine cover
- The passenger compartment air inlet manifold

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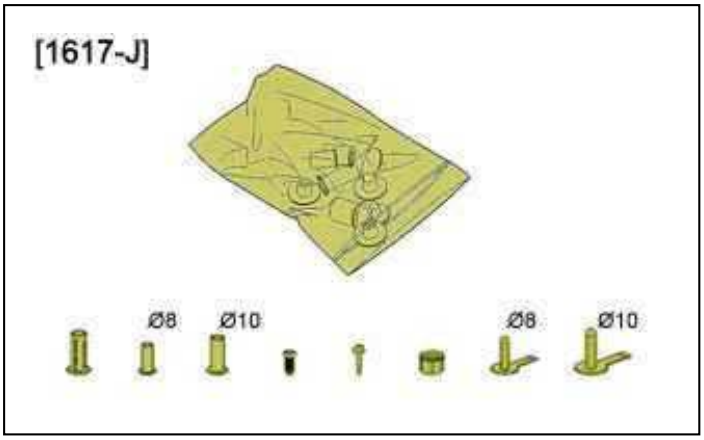
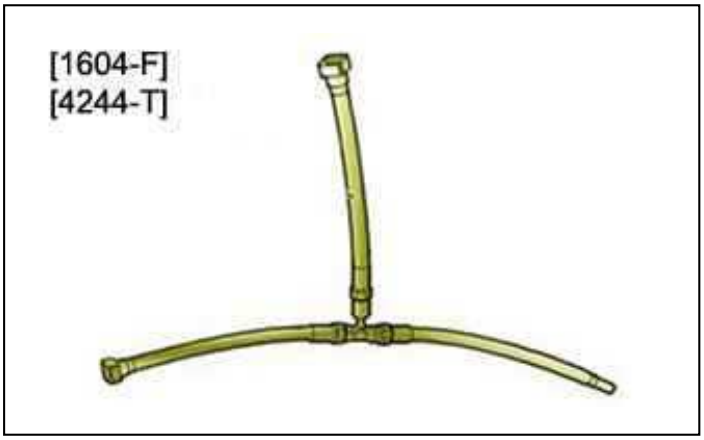
REMOVING - REFITTING : ENTIRE FUEL FILTER WITH ITS SUPPORT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment :

- Degreasing product (Type SODIMAC)
- Cleaning tray
- Brush
- Diesel substitute (kerdane-dilutine or paraffin)

tool	Reference	Designation
 Figure : E5AG03LT	[1617-J]	Sealing plugs HDI
 Figure : E5AB0M5T	[1604-F] [4244-T]	Connector for diesel filter draining

2. Replacement of the fuel filter element

2.1. Removing

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ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Put the vehicle on a hoist.
Disconnect the battery.
Remove :

- The protective panel under the engine
- The passenger compartment air inlet manifold
- The engine cover

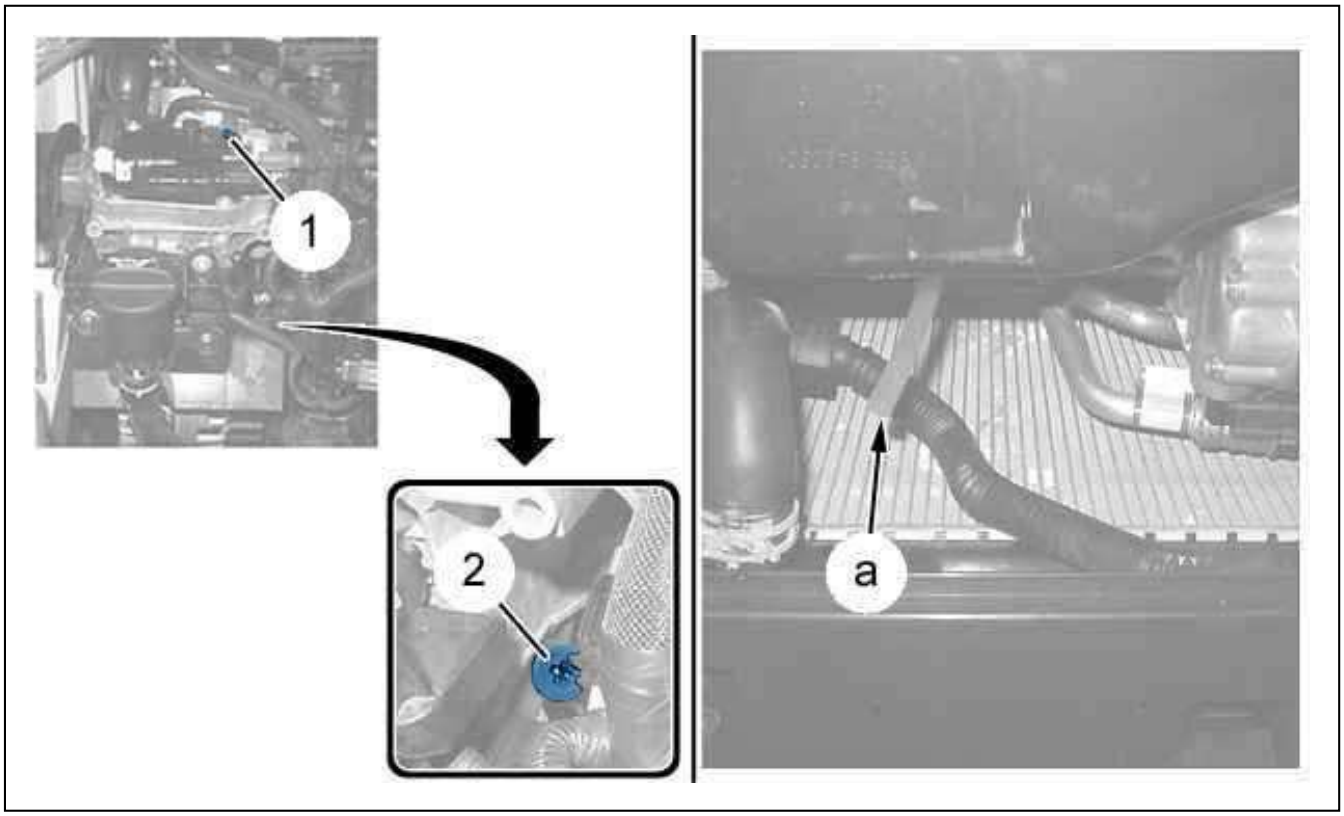


Figure : B1HG07FD

CAUTION : Protect the alternator.

Place the tray underneath the fuel bleed pipe outlet (as "a").
Open :

- The air bleed screw (1)
- The water bleed screw (2)

Allow the liquid to flow out.
Reclose :

- The air bleed screw (1)
- The water bleed screw (2)

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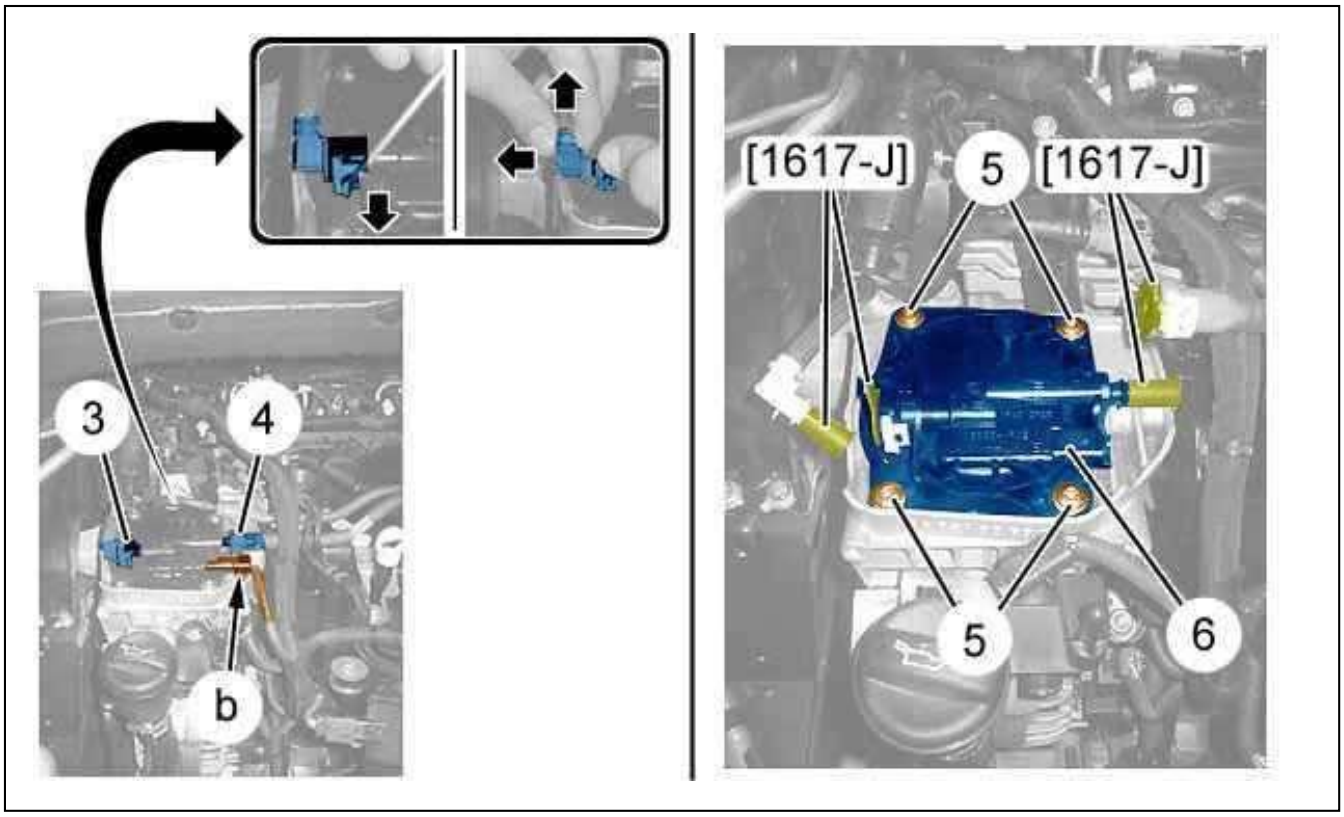


Figure : B1HG1EWD

CAUTION : Immediately blank the connectors by means of plugs [1617-J], to prevent the entry of impurities (Ø 10 mm).

Uncouple : The fuel low pressure supply unions (3), (4) ; Using a flat screwdriver.
Disconnect the connector (as "b").
Remove :

- The bolts (5)
- The cover (6)
- The filter element (/)

CAUTION : Open the sachet containing the new filter element just before refitting.

2.2. Cleaning the filtering compartment

CAUTION : Do not clean the fuel filter with a cloth. Do not use compressed air.

Pour the degreasing product into the cleaning tray.
Clean the fuel filter ; Using the degreasing product, the brush and the cleaning tray.
Dry and wipe the fuel filter.
Dry and wipe the fuel filter using a high-precision wiper (available from Replacement Parts).

2.3. Refitting

CAUTION : Adhere to the tightening torques .

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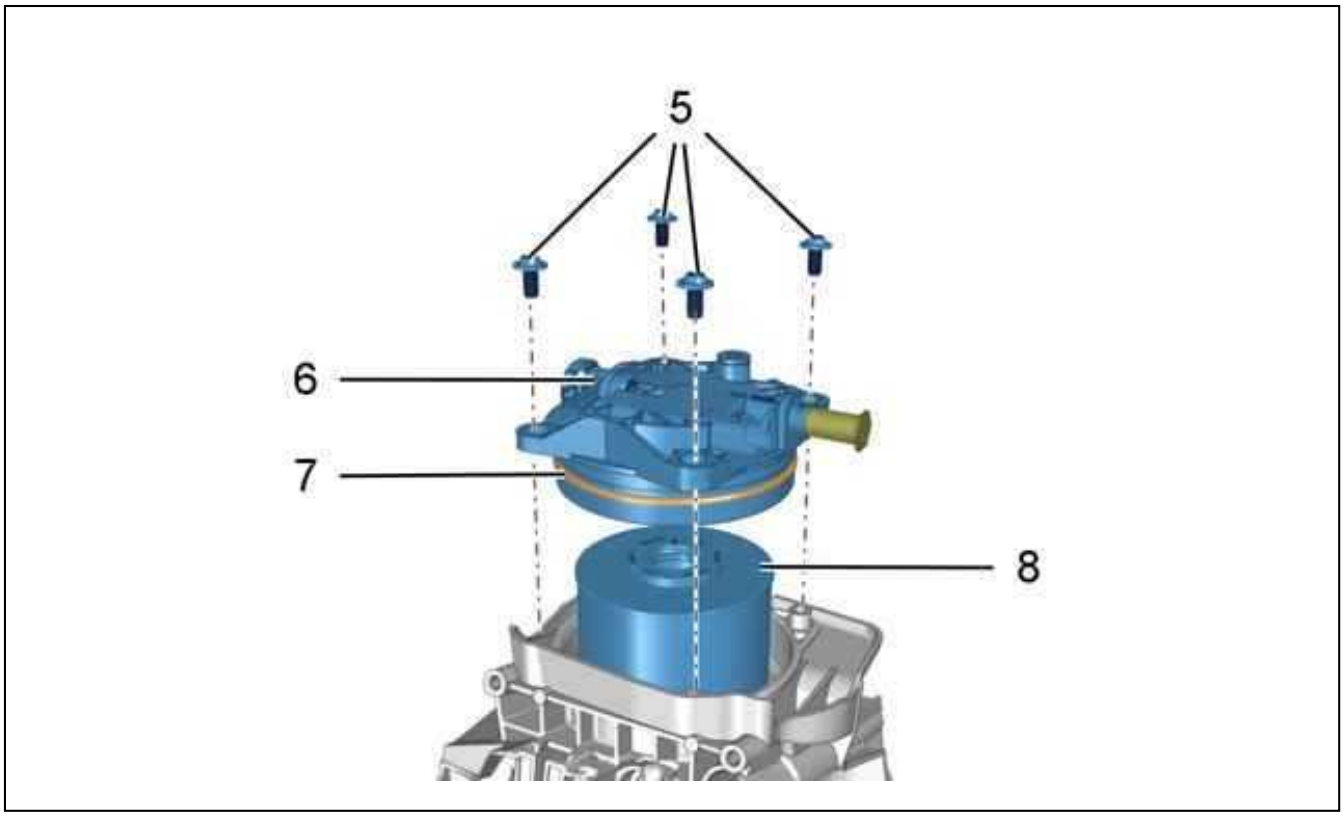


Figure : B1HG07HD

CAUTION : Systematically replace the seal (7).

Refit :

- The new seal (7) lubricated with the diesel substitute
- The (new) filter element (8) on the cover (6)
- The cover (6) fitted with its filter element
- The bolts (5)

Couple up : The low-pressure fuel supply union (3).
Connect the connector (as "b").

3. Priming and bleeding the fuel circuit

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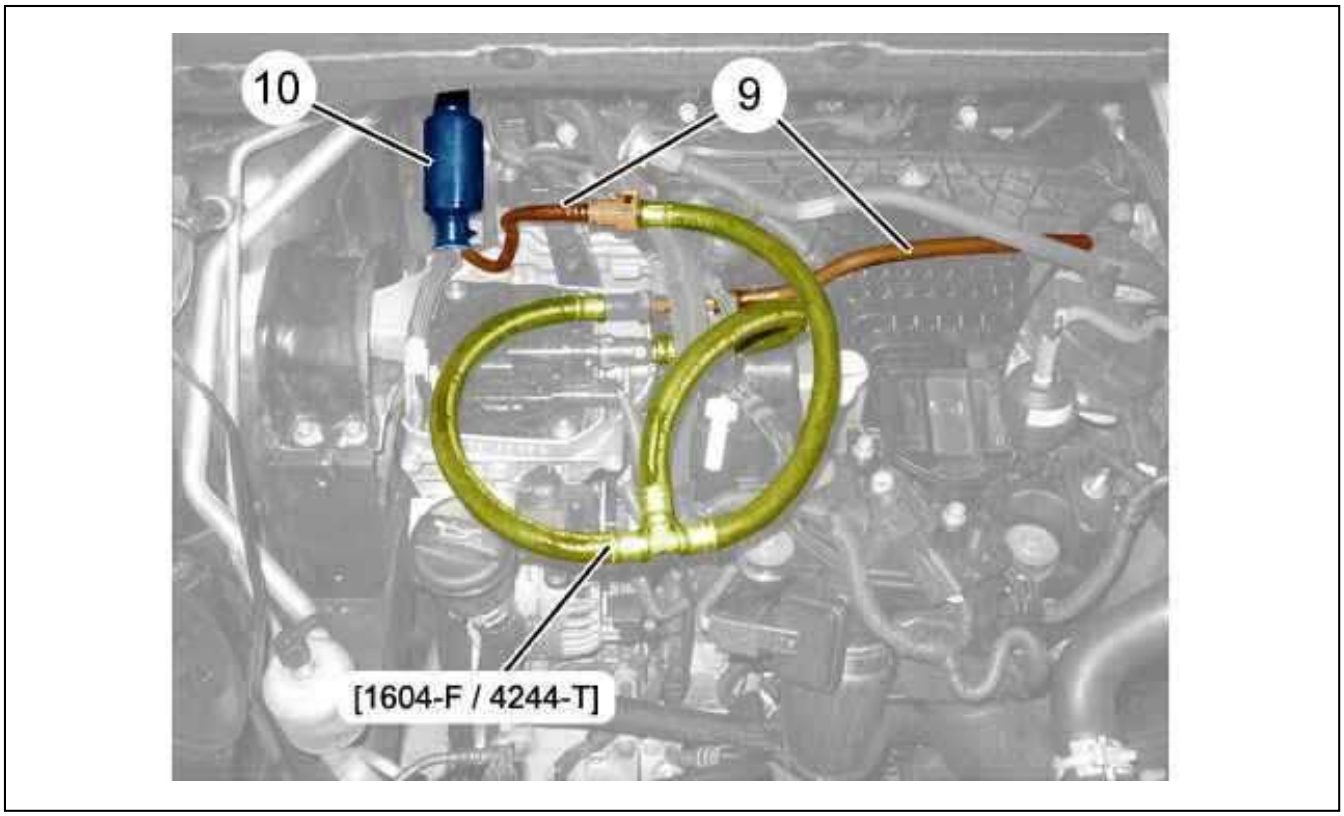


Figure : B1HG1QXD

Connect the female unions (Ø 10 mm) of the tool [1604-F / 4244-T] in place of the union .
Insert the unions (diameter 8 mm) of the tool [1604-F / 4244-T] in the fuel return circuit (9).
Operate the priming pump (10) for 1 minute.
Remove the tool [1604-F / 4244-T].
Couple up :

- The low-pressure fuel supply union (4)
- The fuel return circuit (9)

4. Checking the seal

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Start the engine.
Check the absence of leaks.
Stop the engine.
Refit :

- The engine cover
- The passenger compartment air inlet manifold
- The protective panel under the engine

5. Bleed during service (presence of water)

Place a draining tray under the engine.
Open the bleed screw (2).
Operate the priming pump (10) several times.
Close the bleed screw (2).

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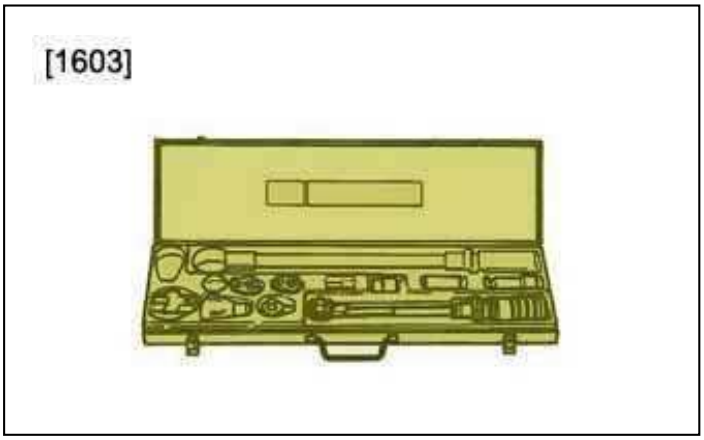
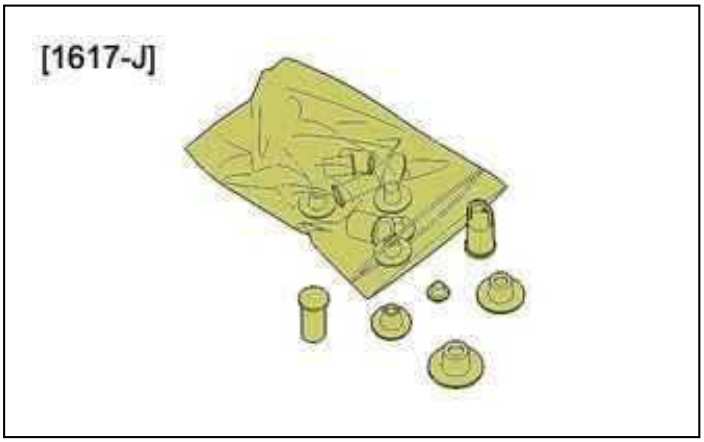
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REMOVING - REFITTING : FUEL HIGH PRESSURE COMMON INJECTION RAIL

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment : Leak detector.

tool	Reference	Designation
 Figure : E5AB0A3T	[1603]	Tightening kit HDI
	[1603-A]	Torque wrench
	[1603-F]	[/] pipe spanner
	[1603-E]	Extension
 Figure : E5AB0FMT	[1617-J]	Set of plugs HDI

2. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Remove :

- The passenger compartment air inlet manifold

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- The engine cover

Disconnect the battery.

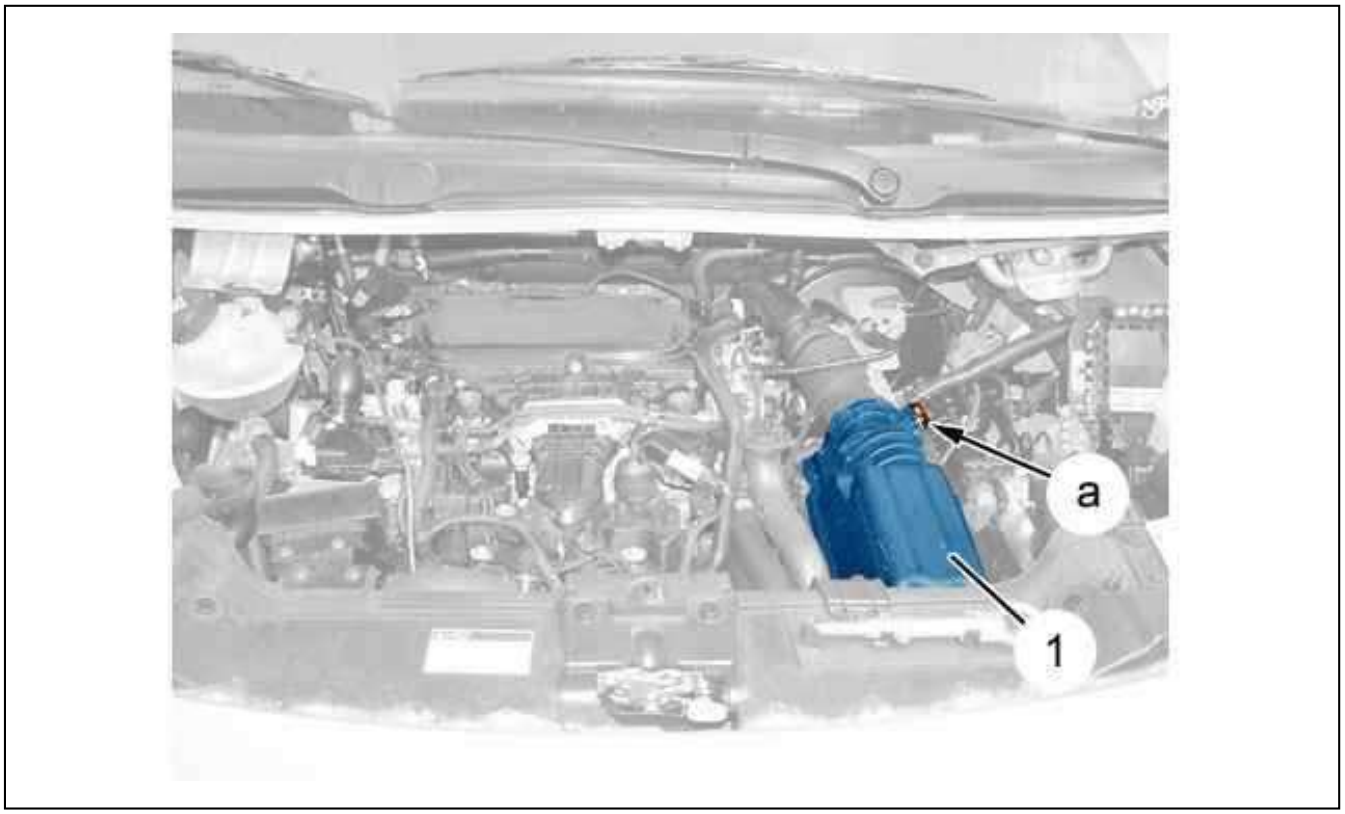


Figure : B1BG1KCD

Disconnect the connector (as "a").
Remove the air filter housing (1).

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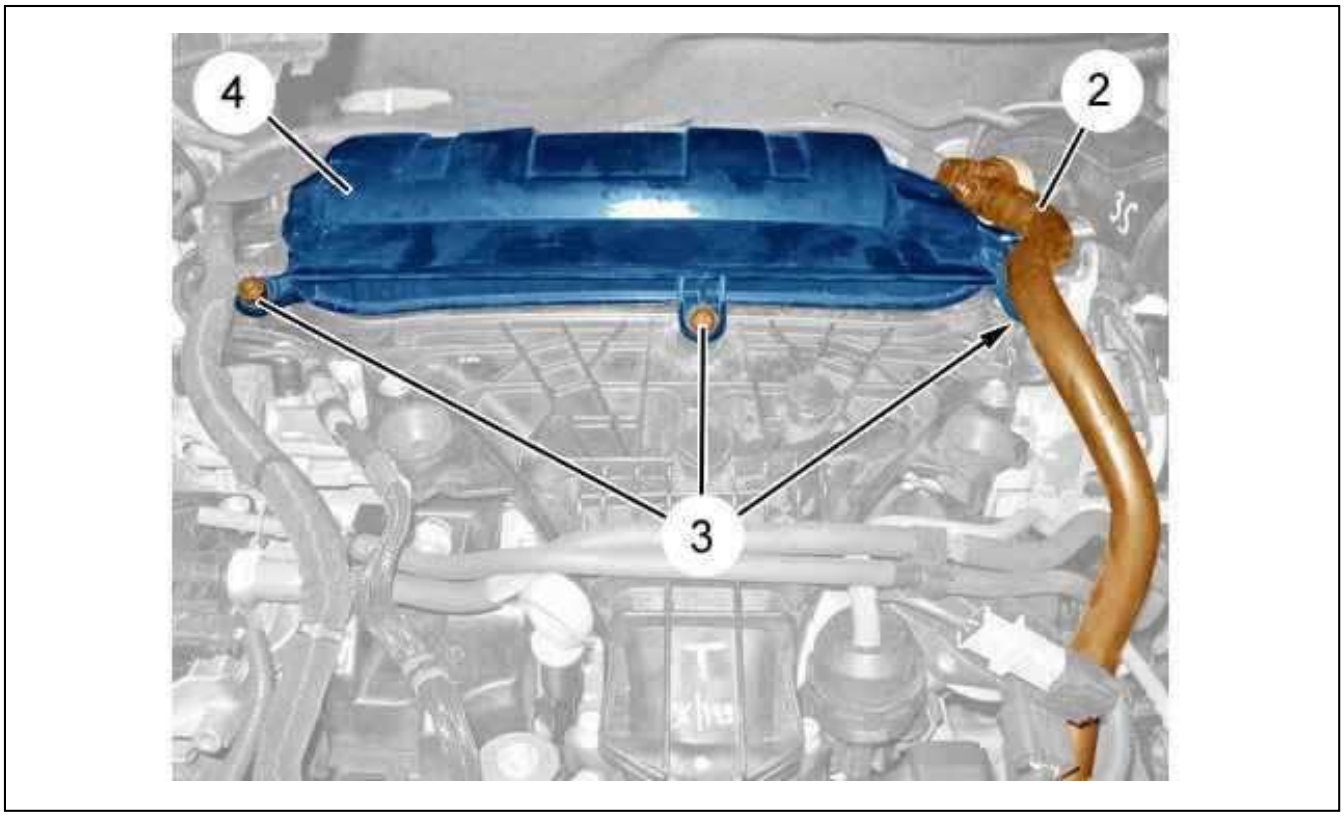
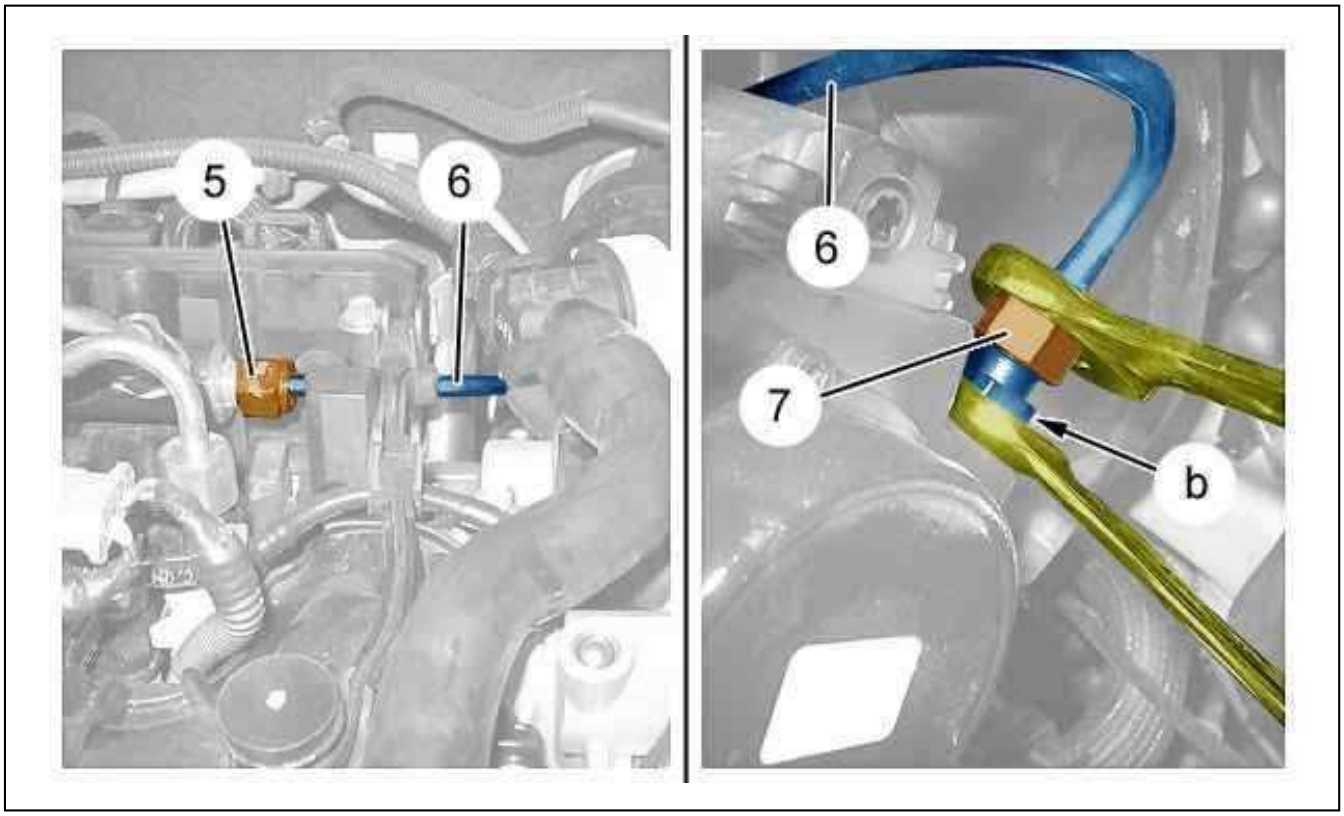


Figure : B1HG21RD

Uncouple the pipe (2).
Remove :

- The 3 bolts (3)
- The protector (4)



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Figure : B1HG21TD

CAUTION : When tightening the unions of the fuel high pressure pipes , apply a counter-torque (as "b").

Unscrew :

- The fuel low pressure union (5)
- The high pressure fuel pipe (7) union on the high pressure fuel pump ; Apply a counter-torque (as "b")

CAUTION : Immediately plug the fuel unions using plugs [1617-J].

Remove the fuel high pressure pipe (6).

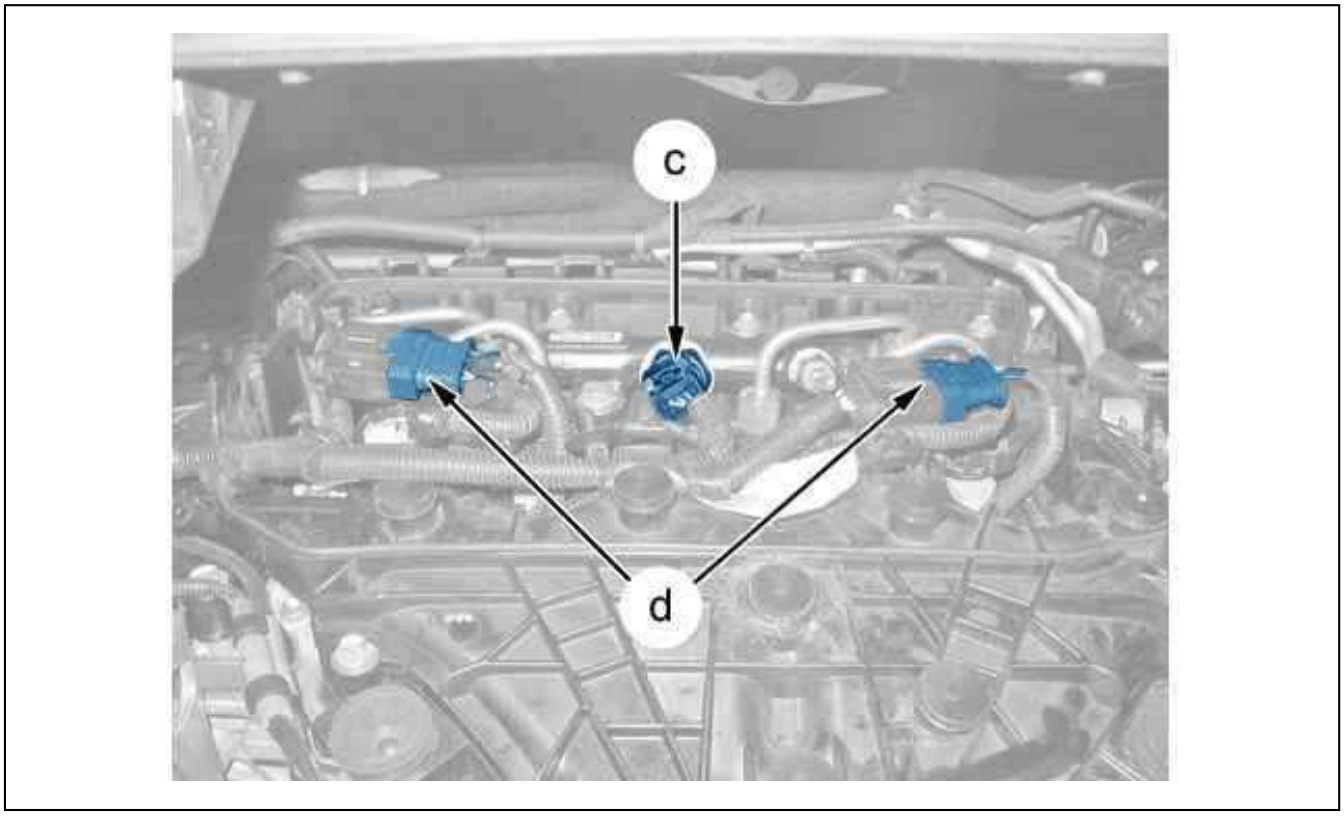


Figure : B1HG0FPD

Unplug :

- The high pressure fuel sensor (as "c")
- The injection pipe assembly (as "d")

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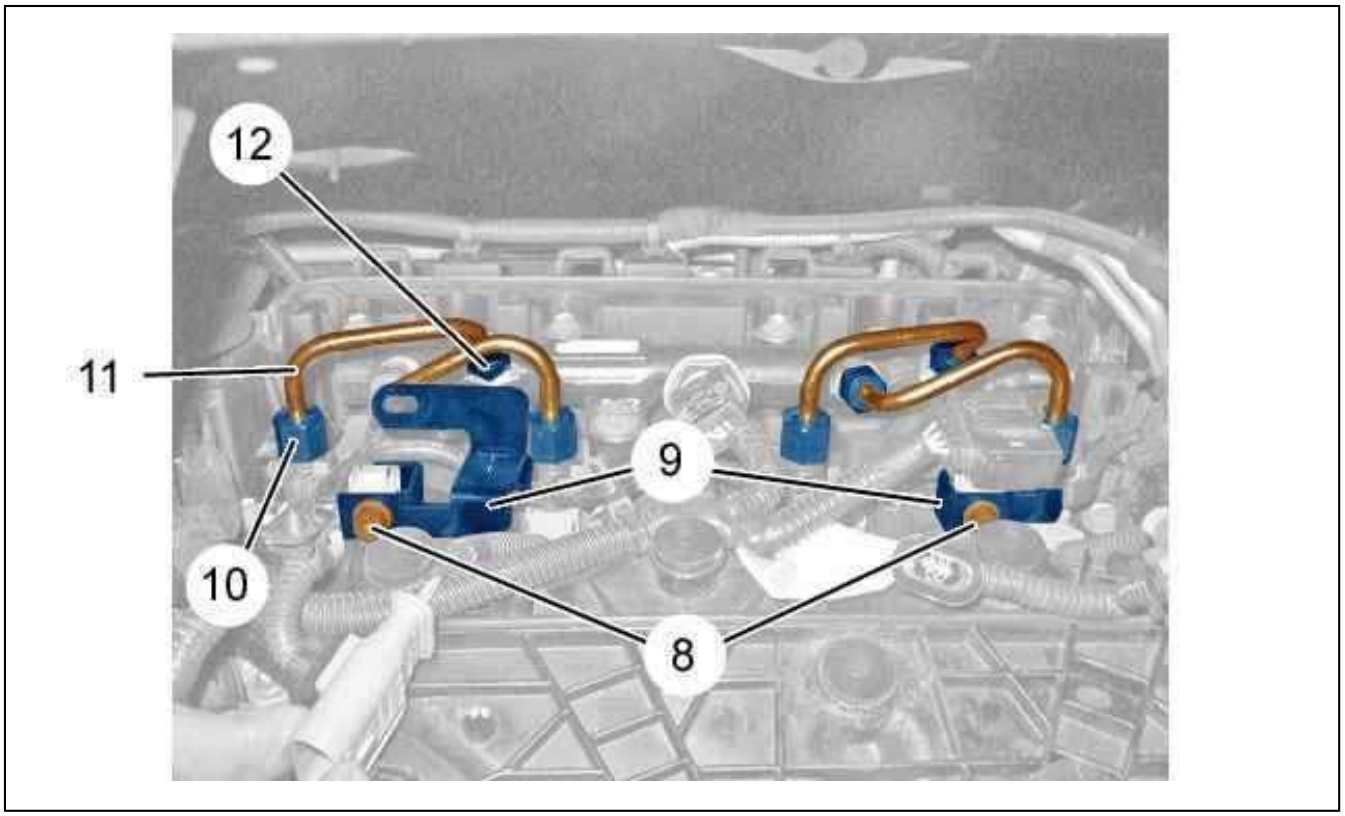


Figure : B1HG21VD

Remove :

- The bolts (8)
- The electrical harness supports (9)

CAUTION : Clean the fuel high pressure unions before untightening .

Unscrew : The unions of the high pressure fuel pipes (10), (12).

CAUTION : Immediately plug the fuel unions using plugs [1617-J].

Remove the high pressure fuel pipes (11).

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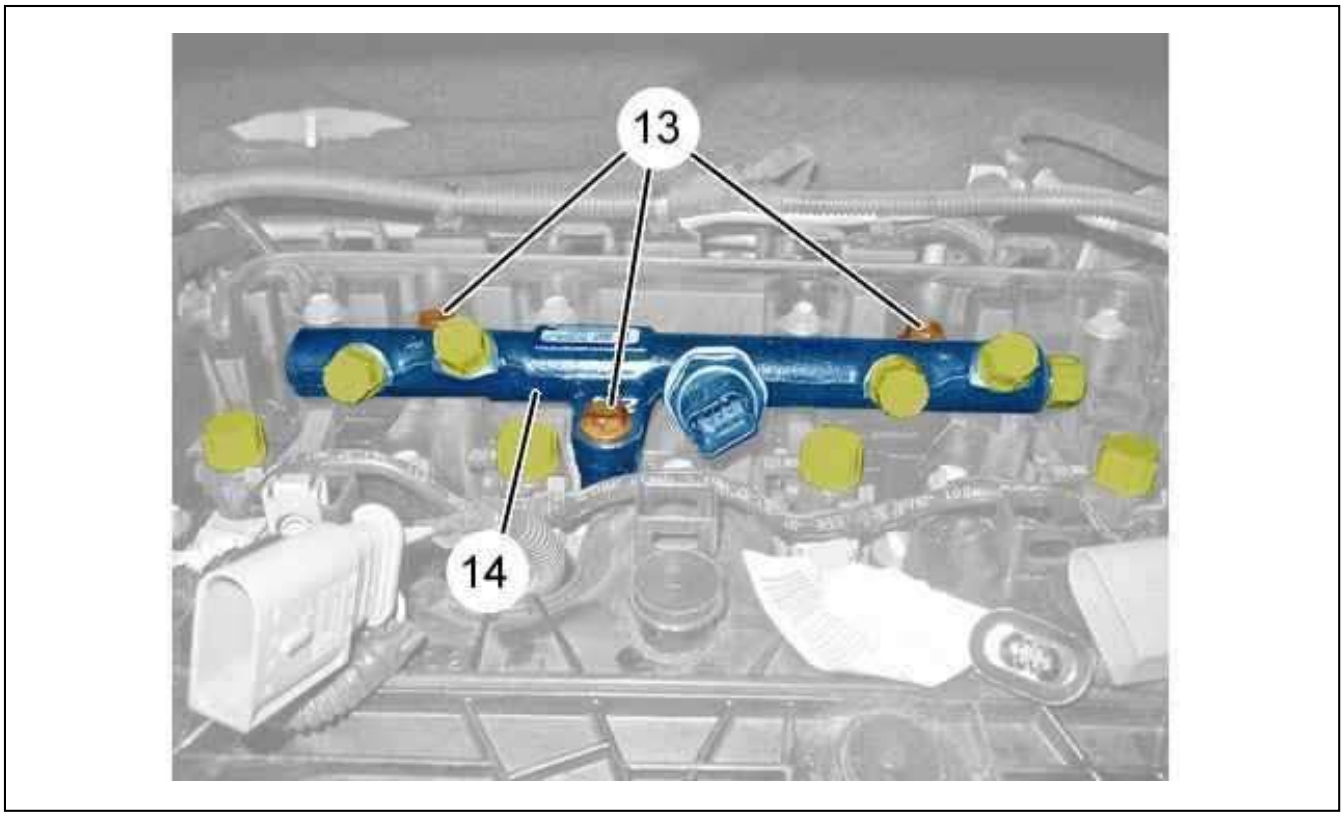


Figure : B1HG21WD

Remove :

- The bolts (13)
- The fuel high pressure common injection rail (14)

3. Refitting

CAUTION : Adhere to the tightening torques .

Refit :

- The fuel high pressure common injection rail (14)
- The bolts (13)

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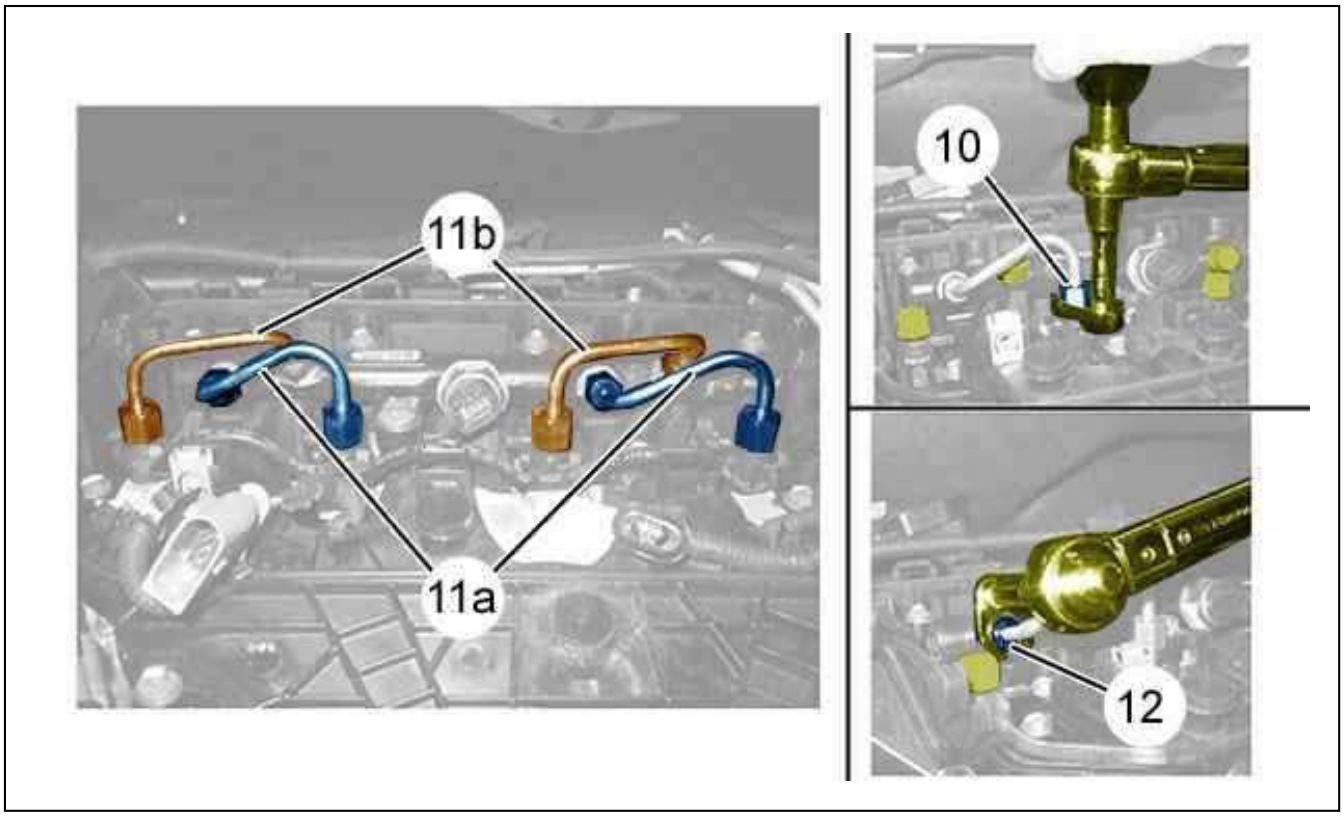


Figure : B1HG21XD

CAUTION : Always fit new high pressure fuel pipes ; Risk of fuel leak (2000 bar).

Position : The 2 high pressure fuel pipes (11a).
Tightening the high-pressure fuel pipes (11a) ; Using the tools [1603-A], [1603-F], [1603-E] :

- Hand-tighten the unions of the fuel high pressure tubes
- Pre-tighten : The unions (10) on the diesel injectors
- Pre-tighten : The connectors (12) on the fuel high pressure injection common rail
- Tighten : The unions (10) on the diesel injectors
- Tighten : The connectors (12) on the fuel high pressure injection common rail

Follow the same procedure for the high-pressure fuel pipes (11b).
Refit :

- The electrical harness supports (9)
- The bolts (8)

Connect :

- The injection pipe assembly (as "d")
- The high pressure fuel sensor (as "c")

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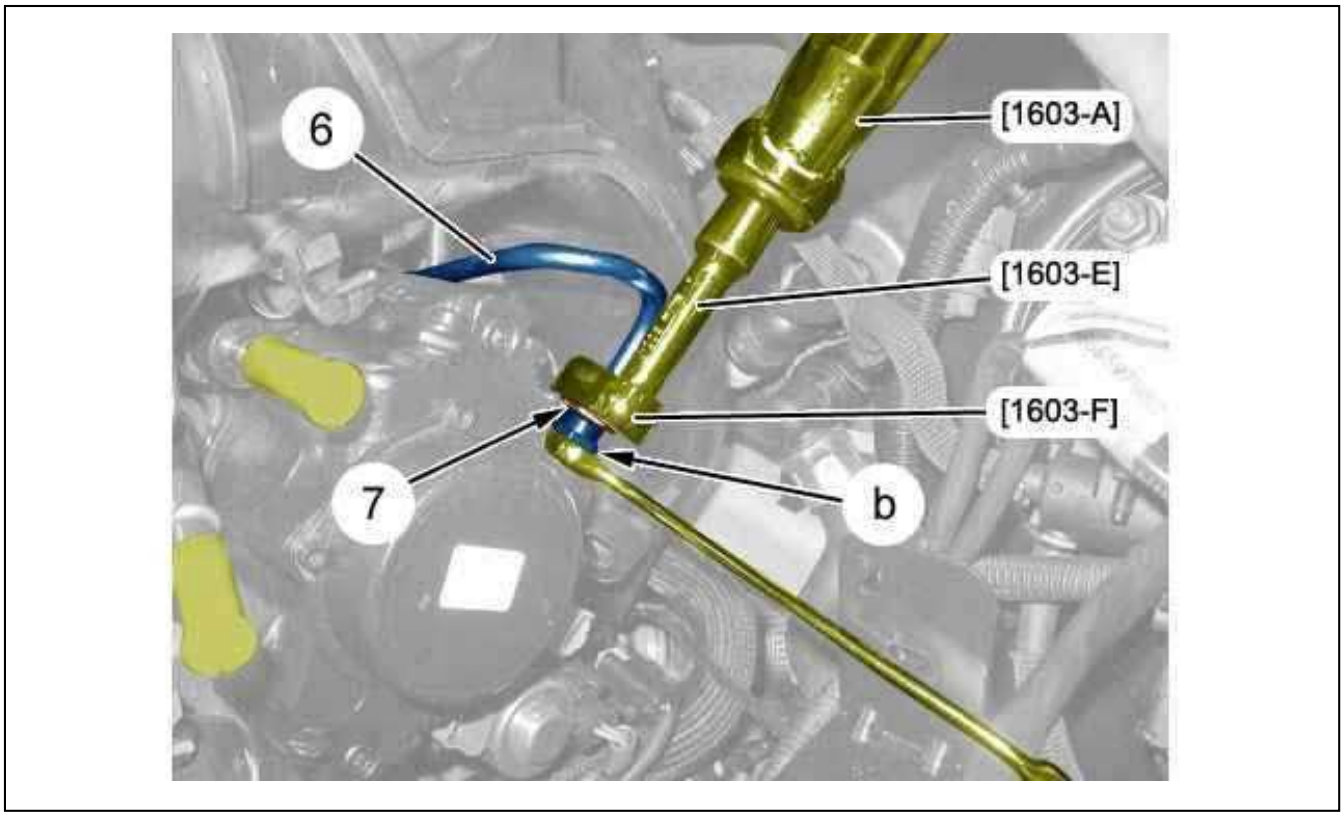


Figure : B1HG21YD

CAUTION : Always fit a new high-pressure fuel pipe ; Risk of fuel leak (2000 bar).

Position : The high pressure fuel pipe (6).
Tightening the high-pressure fuel pipe (6) ; Using the tools [1603-A], [1603-F], [1603-E] :

- Hand-tighten the unions of the fuel high pressure tubes
- Pre-tighten : The high pressure fuel pipe (7) union on the high pressure fuel pump ; Apply a counter-torque (as "b")
- Pre-tighten : The high pressure fuel pipe (5) union on the fuel high pressure common injection rail
- Tighten : The high pressure fuel pipe (7) union on the high pressure fuel pump ; Apply a counter-torque (as "b")
- Tighten : The high pressure fuel pipe (5) union on the fuel high pressure common injection rail

Connect the pipe (2).
Prime the fuel circuit, using the manual priming pump (for one minute).
Refit the air filter housing (1).
Connect the connector (as "a").

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Check

Checking for leaks :

- Spray the leak detector product on the high pressure fuel unions
- Allow the product to dry
- Start the engine
- Check there are no leaks
- Carry out a road test
- Stop the engine

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- Check there are no leaks
- Replace any defective parts

Refit :

- The protector (4)
- The 3 bolts (3)
- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : HIGH PRESSURE FUEL PUMP

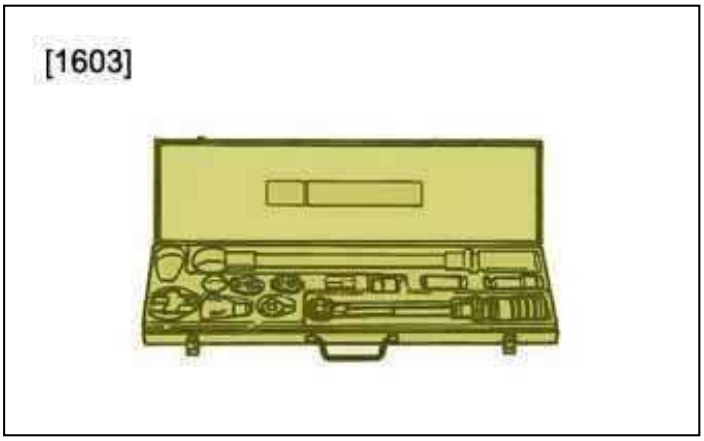
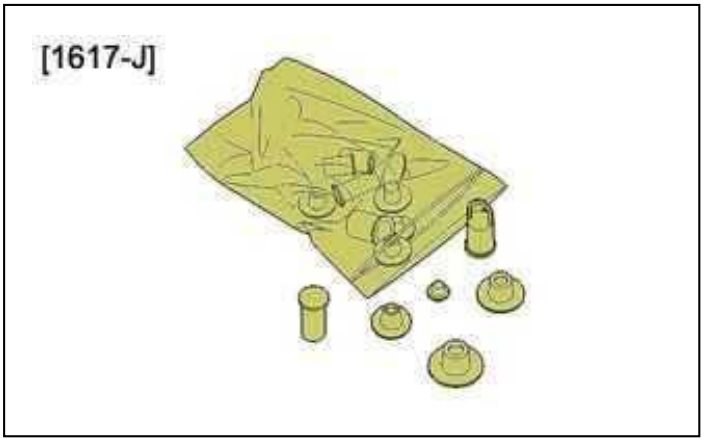
ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Precaution

CAUTION : Risk of confusing the connector of the coolant temperature sensor with the fuel temperature connector; i is essential to mark them before removing them (Spot of paint - Felt...).

2. Tooling

Equipment : Leak detector.

tool	Reference	Designation
 Figure : E5AB0A3T	[1603-A]	Torque wrench
	[1603-F]	[/] pipe spanner
	[1603-E]	Extension
 Figure : E5AB0FMT	[1617-J]	Set of plugs HDI

3. Removing

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ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Remove :

- The passenger compartment air inlet manifold
- The engine cover

Disconnect the battery.

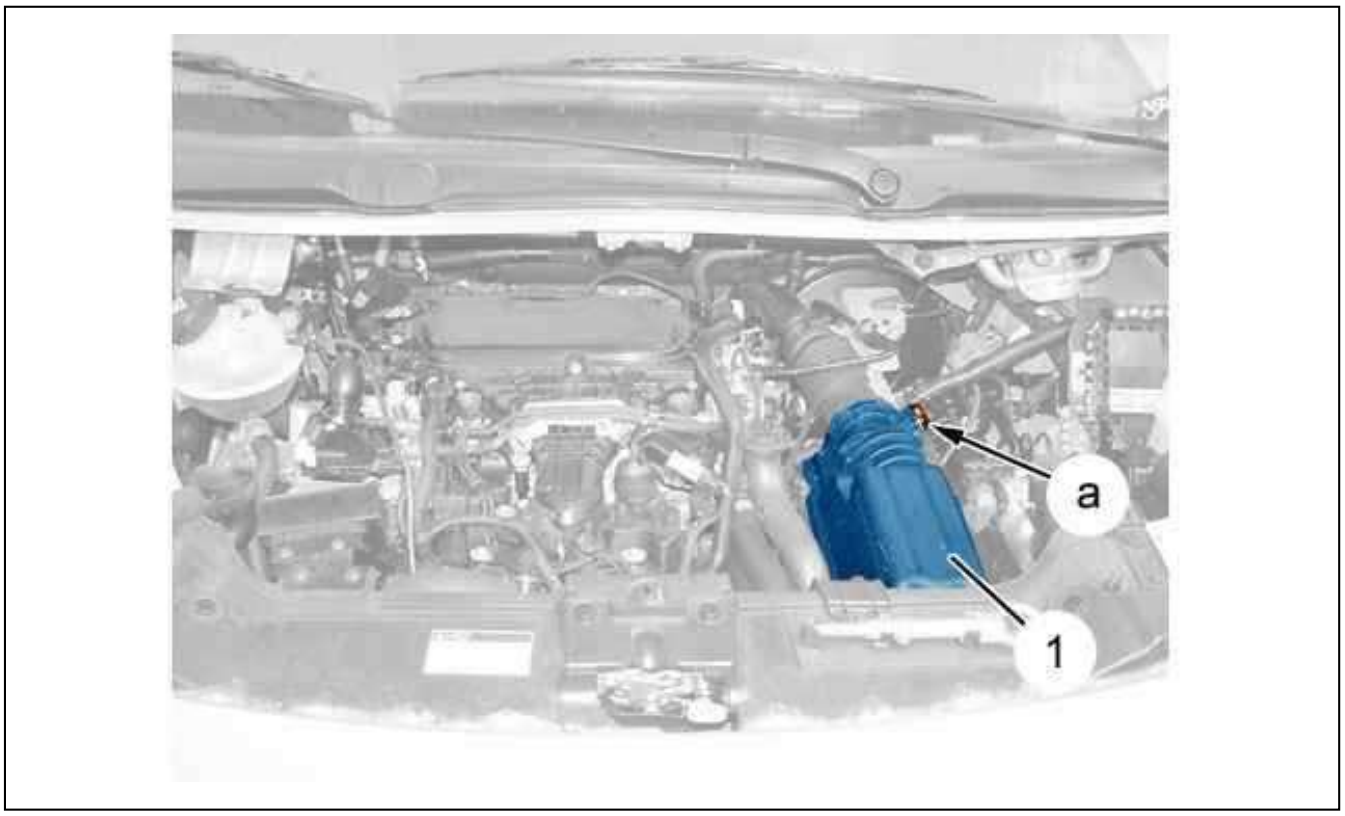


Figure : B1BG1KCD

Disconnect the connector (at "a").
Remove the air filter housing (1).

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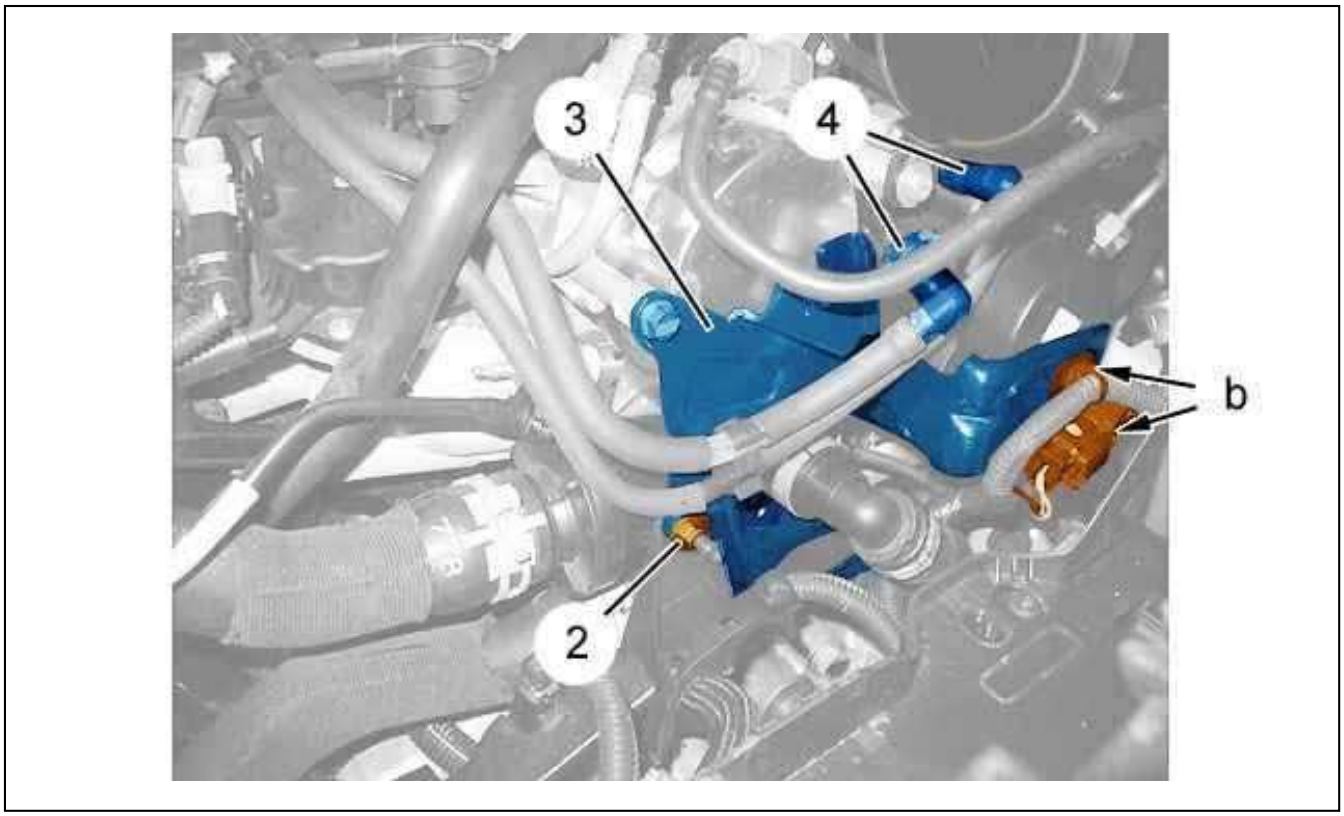


Figure : B1HG220D

CAUTION : Plug the unions immediately after removal ; Using the plugs [1617-J].

Uncouple : The fuel low pressure supply unions (4).
Unfasten and move aside : The electrical harnesses (as "b").
Remove the nut (2).
Move aside the electrical harness sheathing .
Remove the support plate (3).

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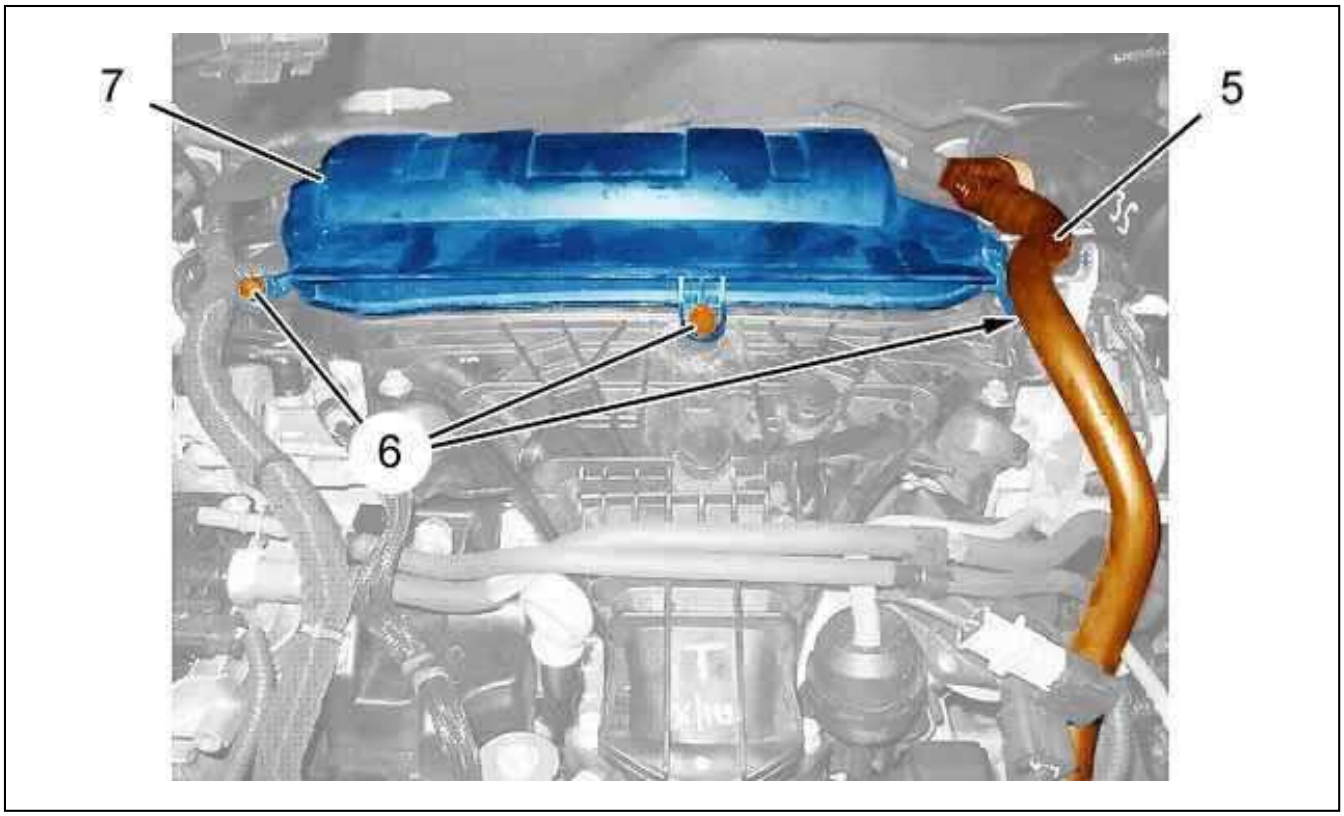
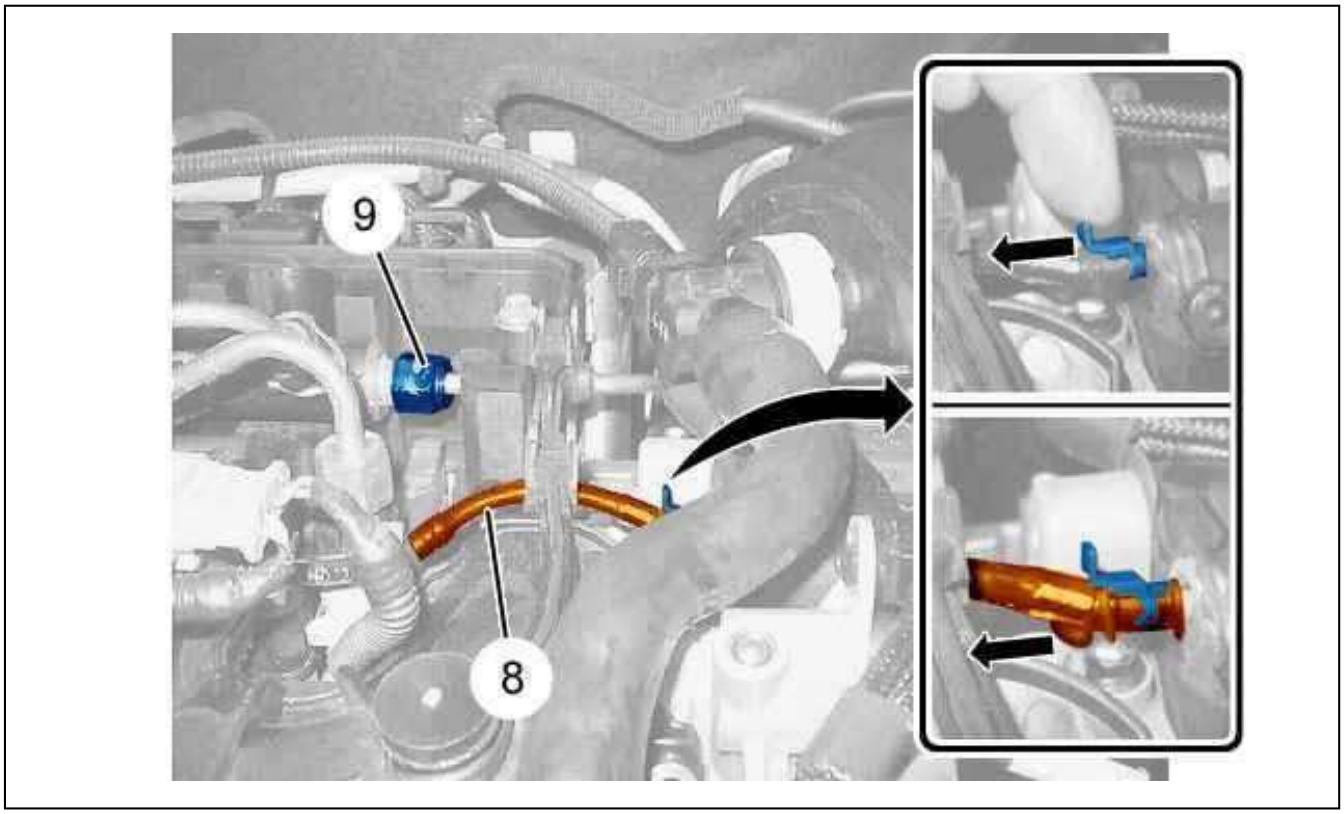


Figure : B1HG221D

Uncouple the pipe (5).
Remove :

- The 3 bolts (6)
- The protector (7)



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Figure : B1HG222D

CAUTION : Clean the fuel high pressure unions before untightening .

Slacken the union (9) of the high pressure fuel pipe on the common injection rail.

CAUTION : Blank the fuel unions to ensure they are sealed; Using the plugs [1617-J].

Uncouple : The fuel return clickfit union (8) :

- Pull the locking tab (Towards the rear)
- Extract : The fuel return clickfit union (8)

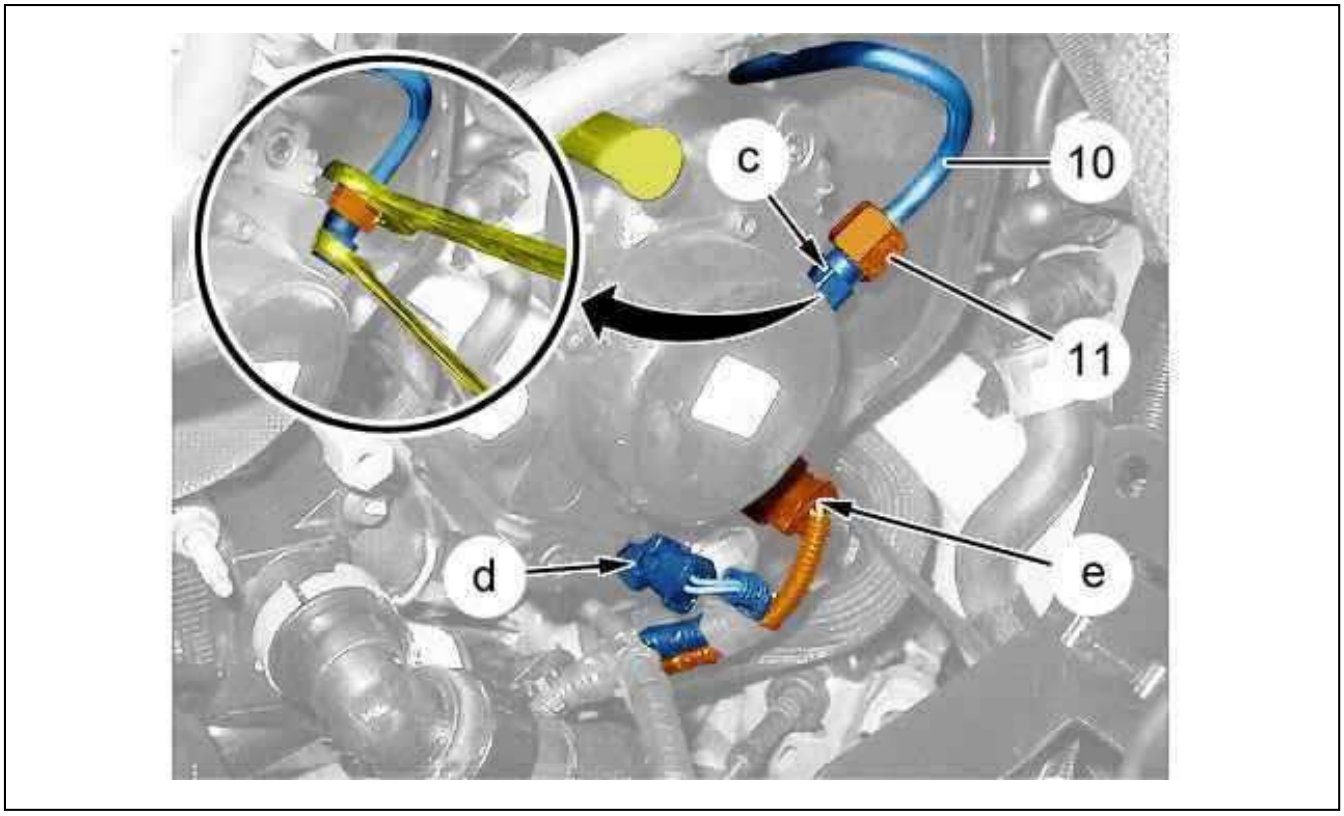


Figure : B1HG223D

Disconnect the connectors (at "d", "e").

CAUTION : When slackening the unions of the fuel high pressure pipes , apply a counter-torque (as "c") Retightening the high-pressure fuel pipe.

Unscrew : The union (11) on the high pressure fuel pump.

CAUTION : Immediately plug the fuel unions using plugs ; Using the plugs [1617-J].

Remove the fuel high pressure pipe (10).

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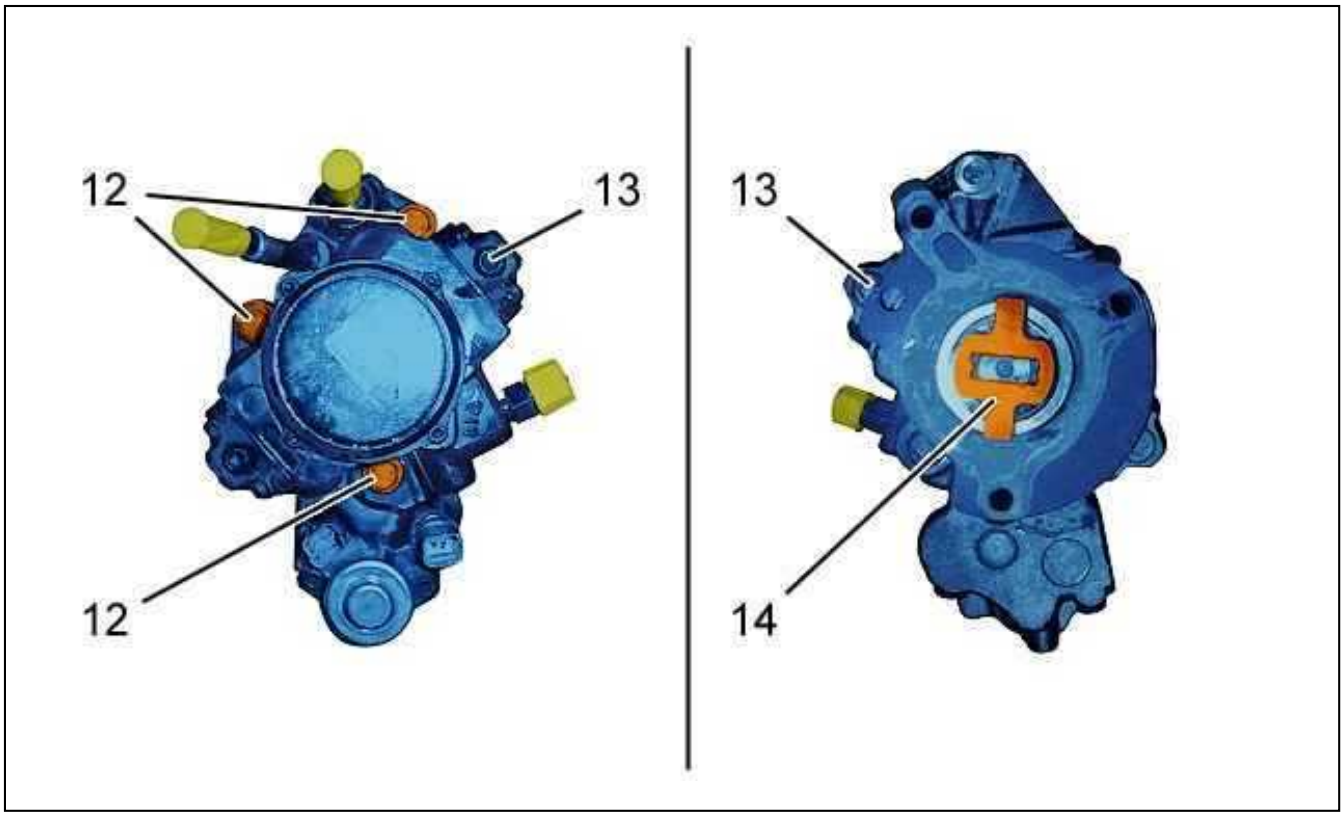


Figure : B1HG224D

Remove :

- The bolts (12)
- The fuel high pressure pump (13)
- The elastic coupling (14)

4. Refitting

4.1. Preparation

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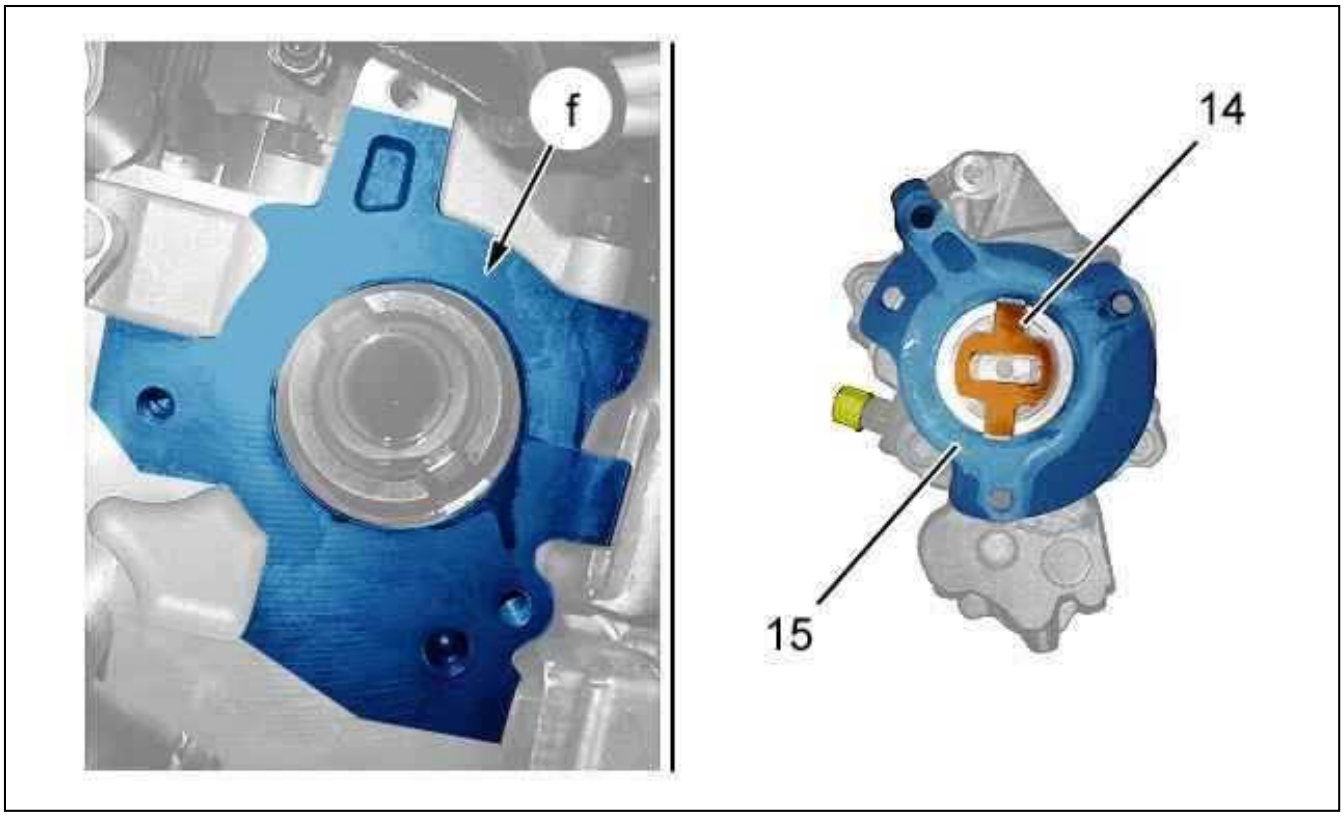


Figure : B1HG225D

CAUTION : Clean the joint contact face (as "f") ; Using degreaser index 24 (Refer to the products catalogue).

Replace the seal (15).
Refit : The elastic coupling (14).

4.2. Refitting (Continued)

CAUTION : Adhere to the tightening torques .

Refit :

- The fuel high pressure pump (13)
- The bolts (12)

Connect the connectors (at "d", "e")).

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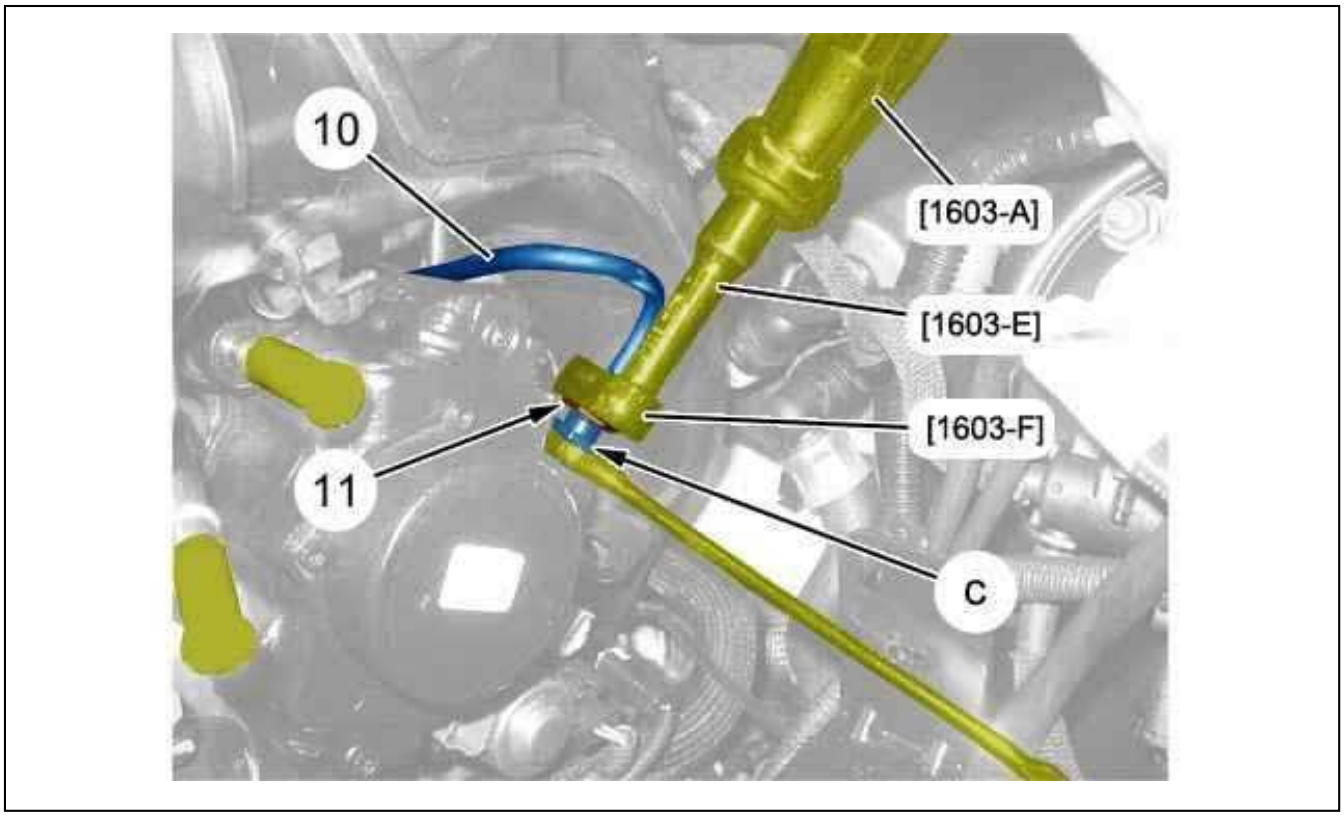


Figure : B1HG226D

CAUTION : Always fit a new high-pressure fuel pipe ; Risk of fuel leak (2000 bars).

Position : The high pressure fuel pipe (10).
Tightening the high-pressure fuel pipe (10) ; Using the tools [1603-A] , [1603-E] , [1603-F] :

- Tighten : The fuel high pressure unions (by hand)
- Pre-tighten : The union (11) on the high pressure fuel pump ; Apply a counter-torque (as "c")
- Pre-tighten : The union (9) on the fuel high pressure common injection rail
- Tighten : The union (11) on the high pressure fuel pump ; Apply a counter-torque (as "c")
- Tighten : The union (9) on the fuel high pressure common injection rail

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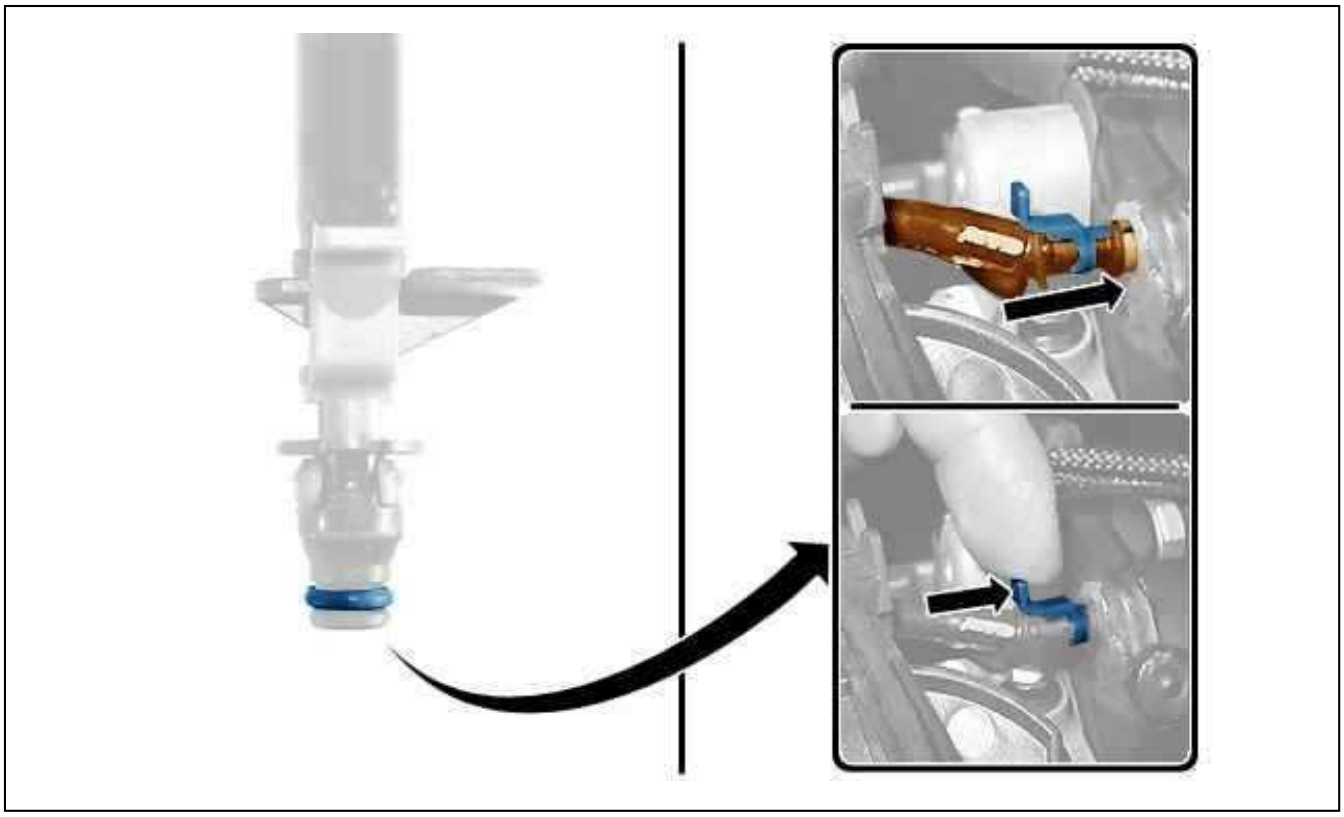


Figure : B1HG0LGD

CAUTION : Always replace the O-ring seals on the fuel low pressure return unions.

Couple up : The fuel return clickfit union (8) :

- Check that the tab is open (Pull rearwards)
- Fit home the fuel return clickfit union (8)
- Push the locking tab
- Pull gently on the fuel return clickfit union (8) to check that it is properly fitted

Refit :

- The support plate (3)
- The electrical harnesses (as "b")
- The electric harness transition duct
- The nut (2)

Couple up :

- The tube (5)
- The fuel low pressure supply unions (4)

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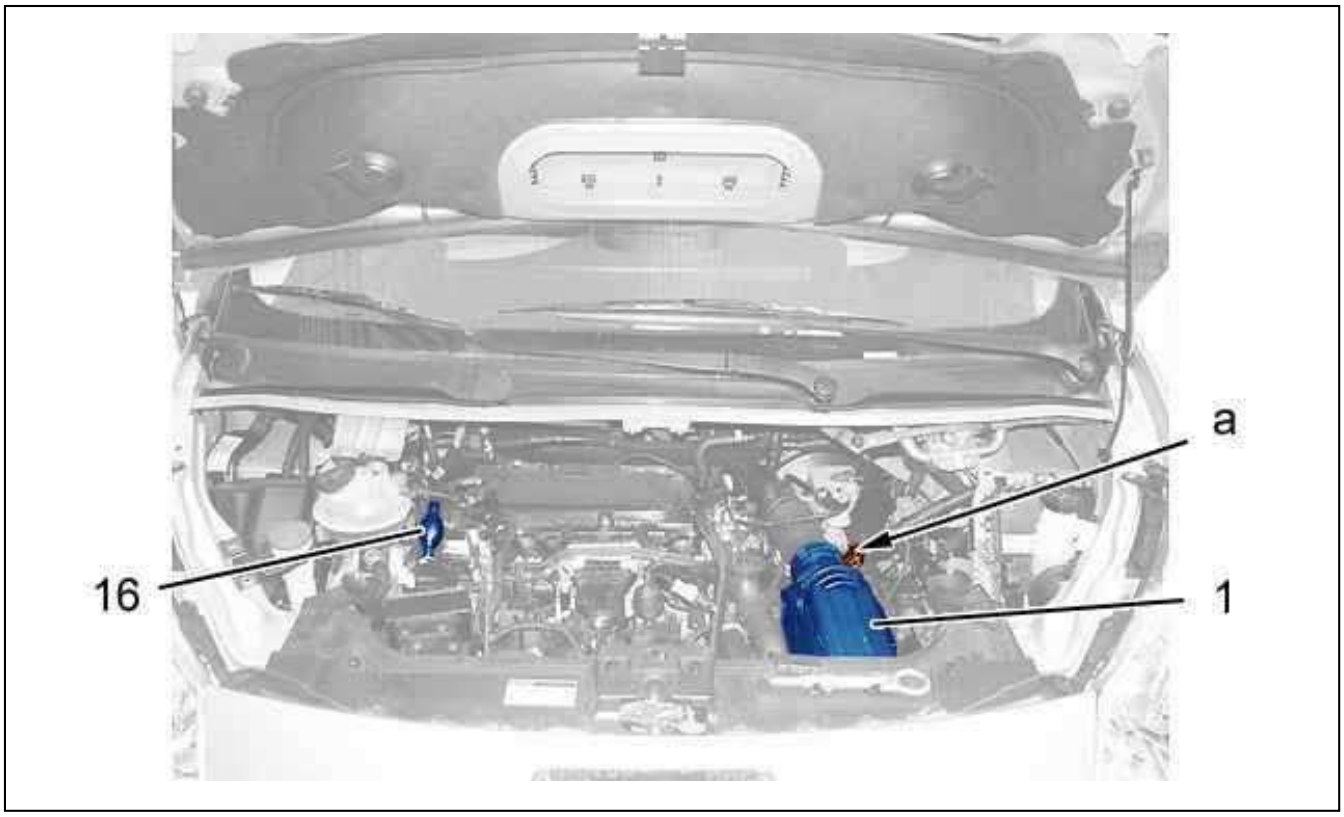


Figure : B1BG1KDD

Connect the connector (at "a").
Refit the air filter housing (1).
Prime the fuel circuit ; Using the manual priming pump (16) (For at least one minute).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

5. Check

Checking for leaks :

- Spray the leak detector product on the high pressure fuel unions
- Allow the product to dry
- Start the engine
- Check there are no leaks
- Carry out a road test
- Stop the engine
- Check there are no leaks
- Replace any defective parts

Refit :

- The protector (7)
- The 3 bolts (6)
- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : AIR INLET MANIFOLD

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

Remove :

- The fuel high pressure common injection rail
- The air mixer unit and its support

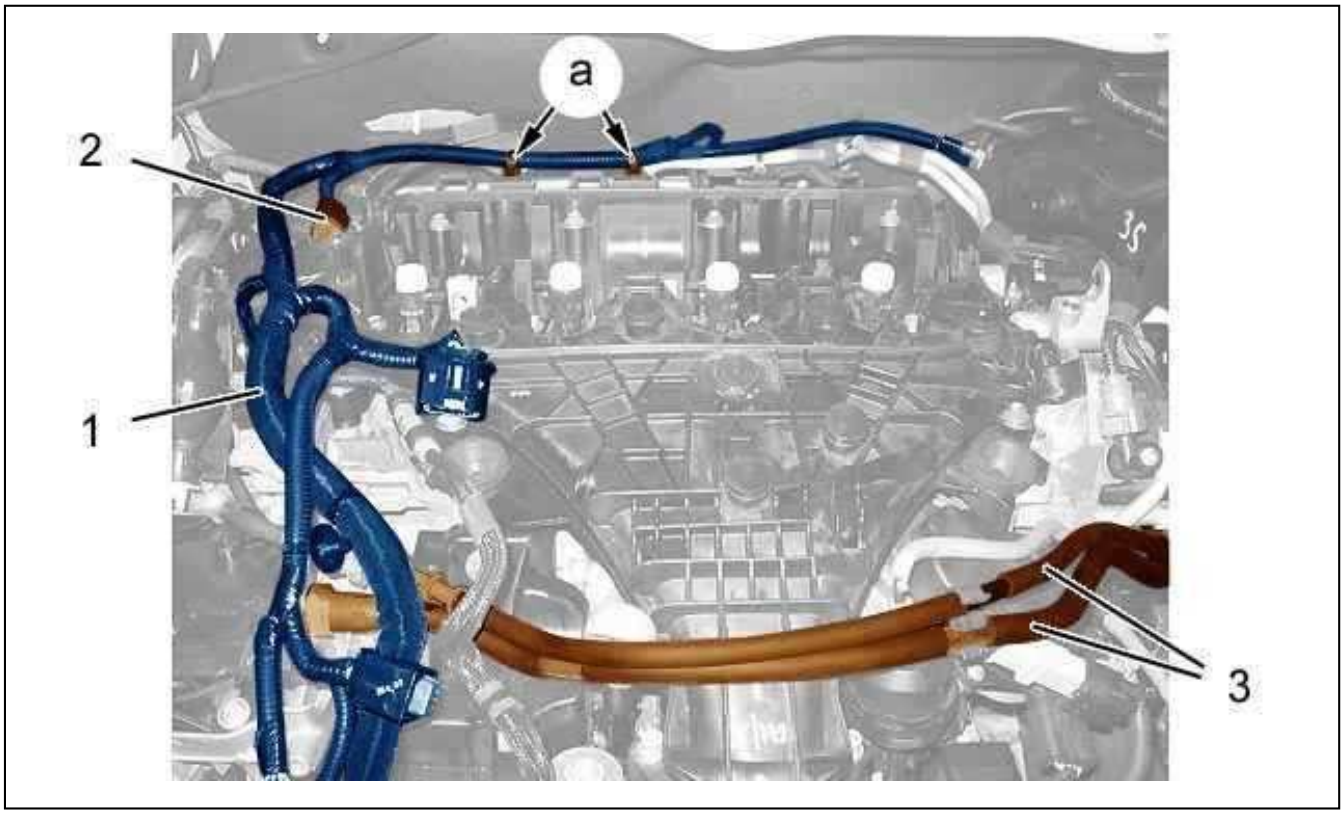


Figure : B1HG0F1D

Unfasten and move aside :

- The electrical harness (as "a")
- The main engine harness (1)

Remove :

- Cylinder reference sensor (2)

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- The fuel low pressure supply pipes (3)

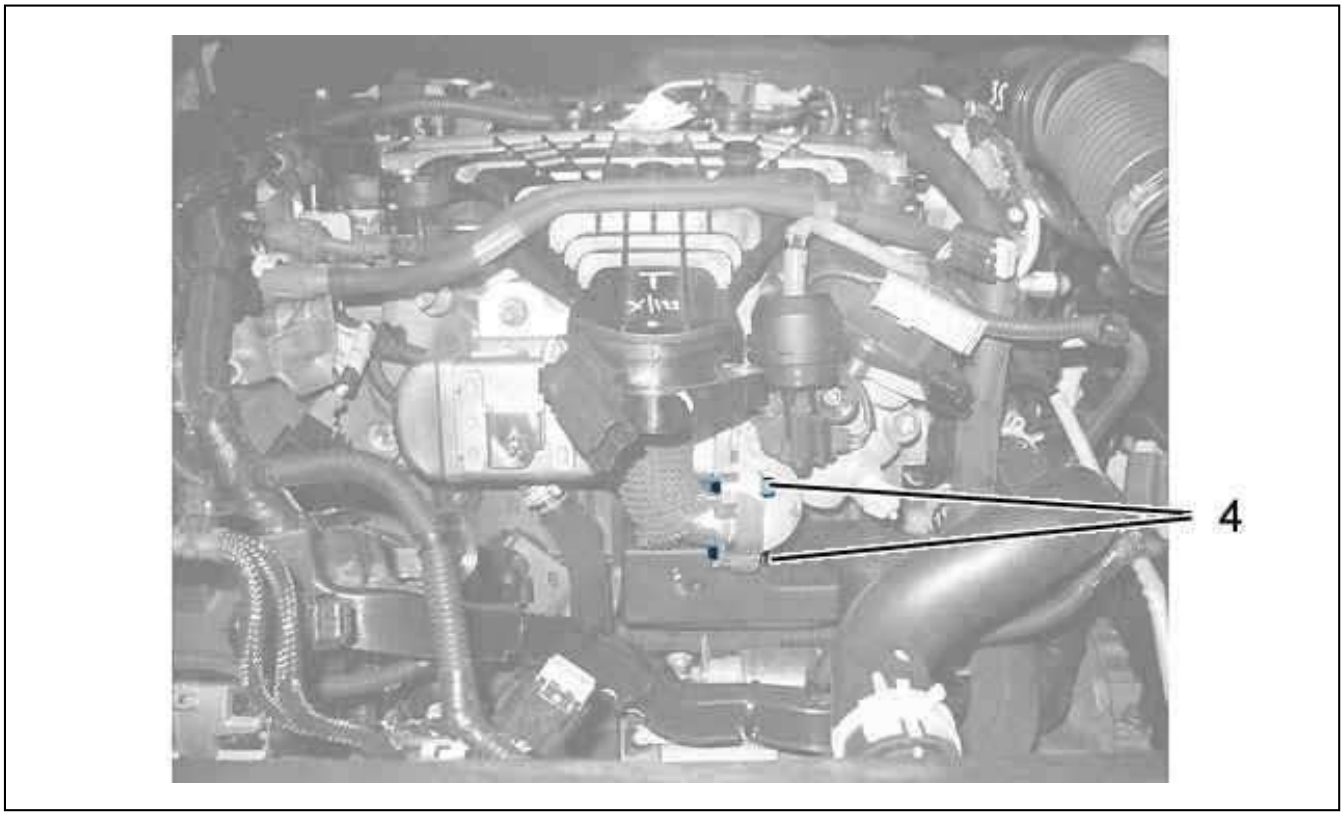


Figure : B1HG0F3D

Remove the bolts (4).

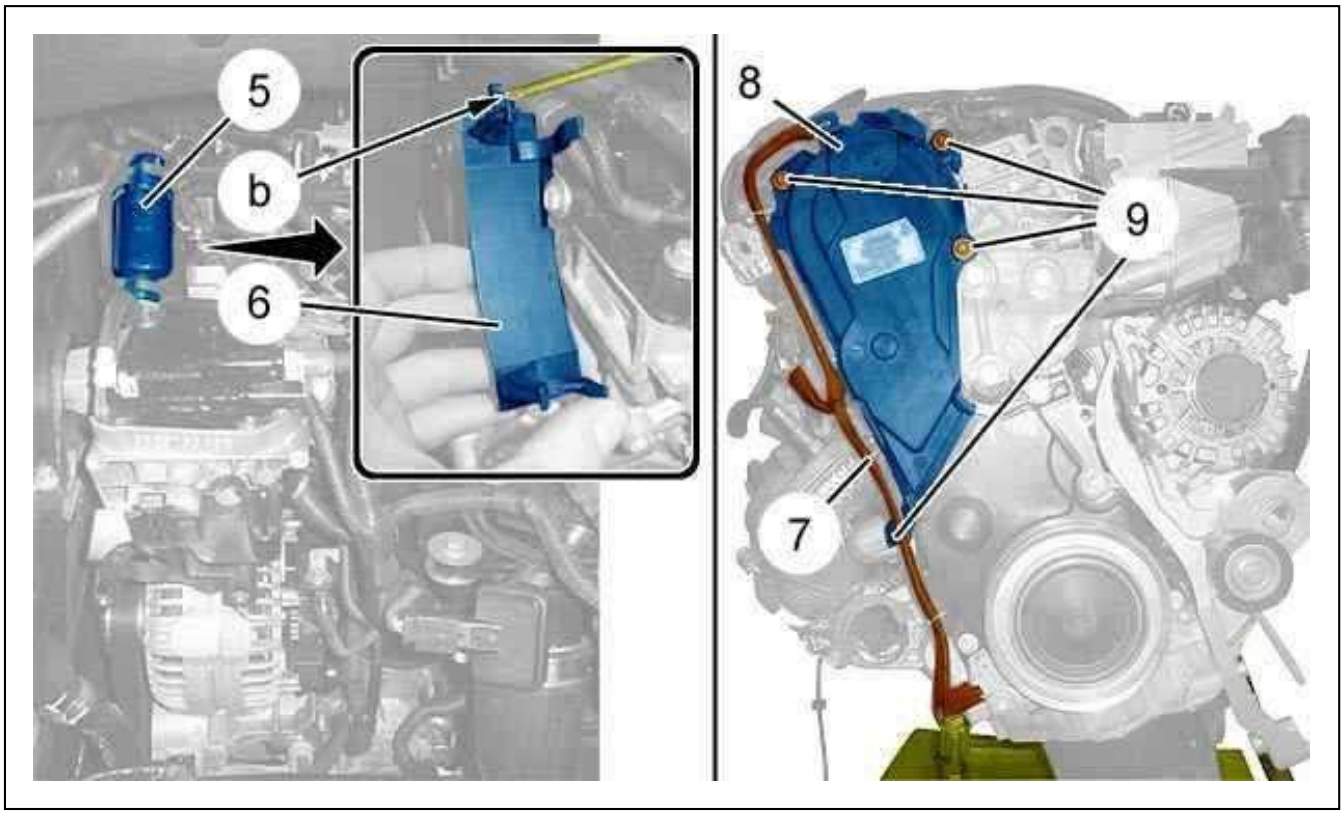


Figure : B1HG0F4D

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Release : The manual diesel priming pump (5).
Remove : The bracket (6) for the diesel fuel manual priming pump (5) ; By means of a screwdriver (as "b").
Release and move aside the electrical harness (7).
Remove :

- The bolts (9)
- The top timing cover (8)

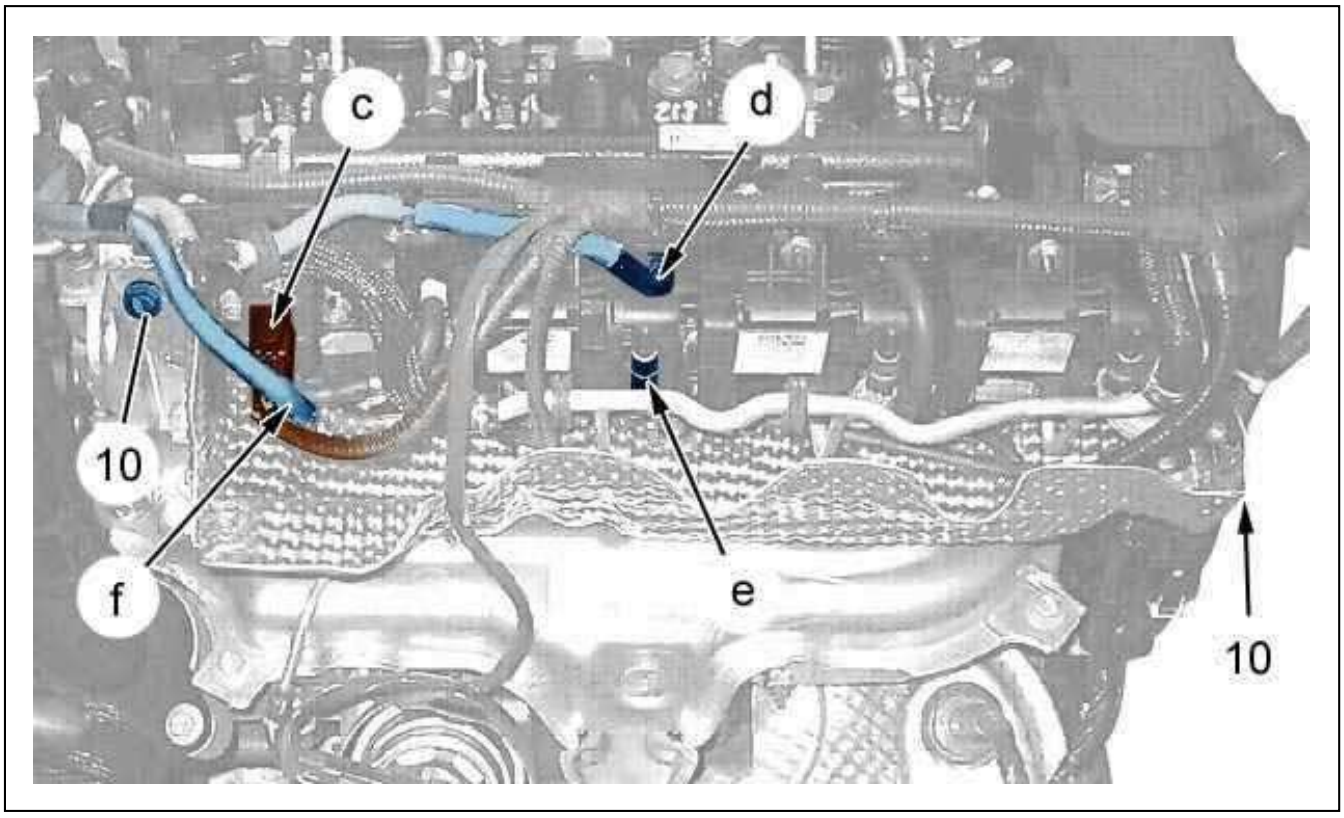


Figure : B1HG0F7D

Remove the bolts (10).
Tilt the electrovalve heat shield slightly rearwards.

CAUTION : The operation on the electrovalves is done with the help of a mirror.

Disconnect the solenoid valve "ON/OFF" (as "c").
Uncouple :

- The vacuum pipe (as "d")
- The vacuum pipe (as "e")
- The vacuum pipe (as "f")

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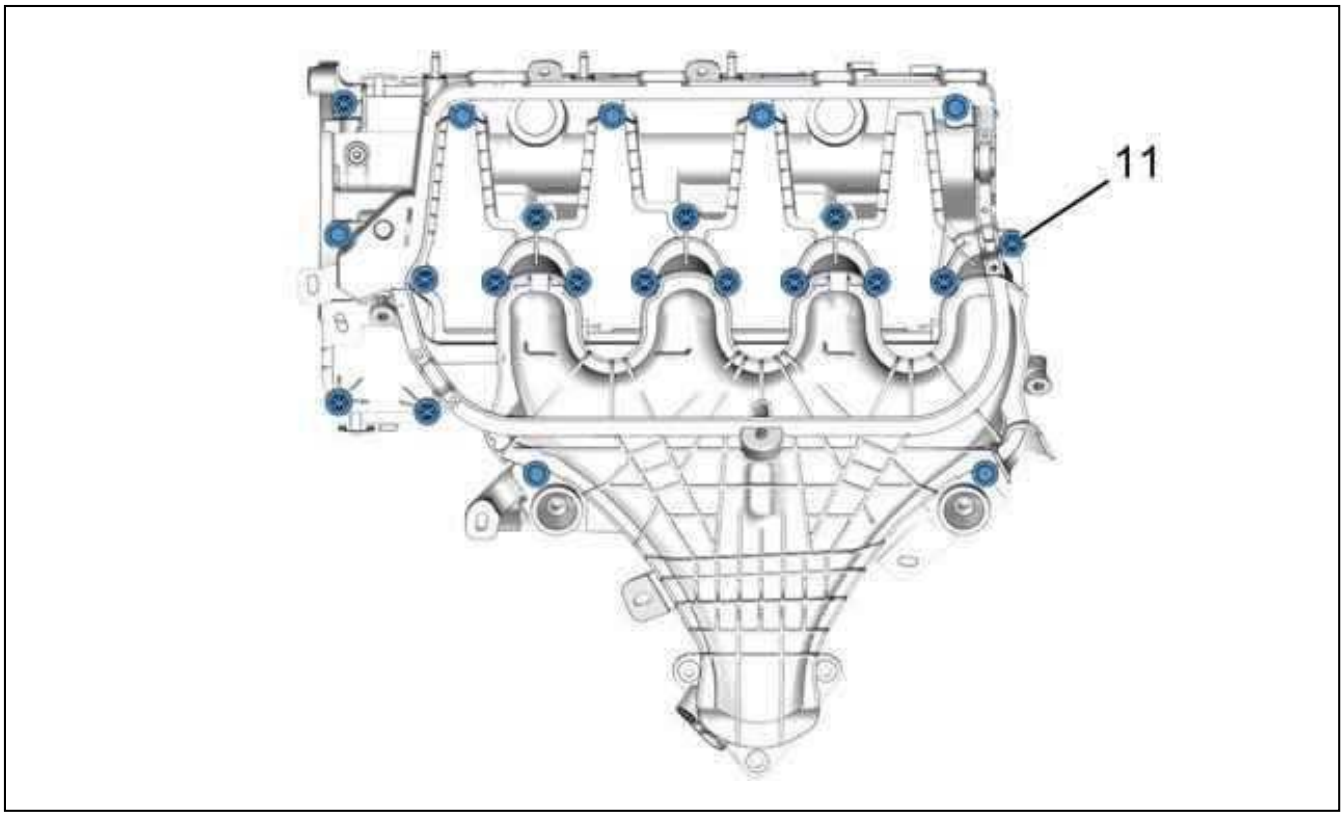


Figure : B1HG0FHD

Remove the bolts (11).

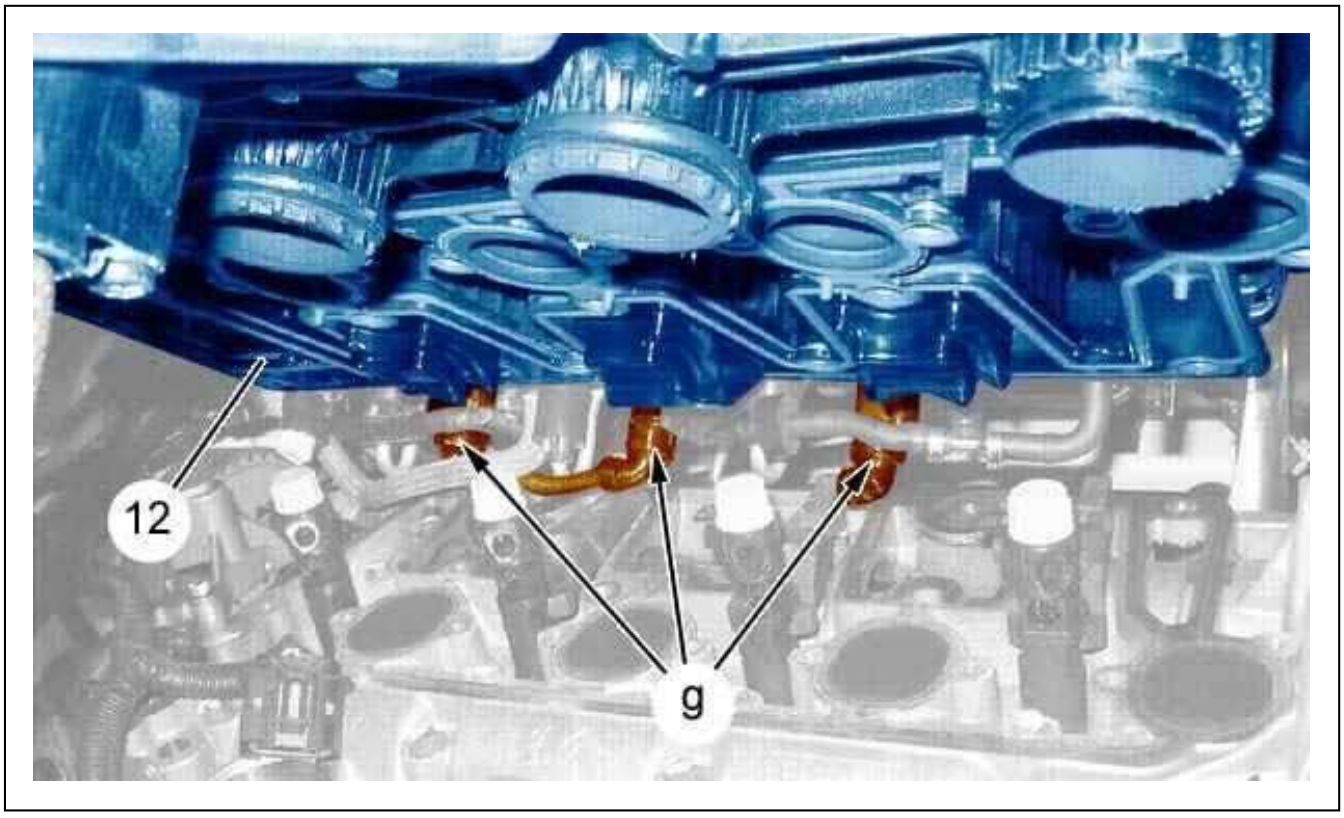


Figure : B1HG0FID

Remove and tilt : The air intake manifold (12).
Disconnect the electrovalves (as "g").

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CAUTION : Cover the openings of the air inlet circuit .

Remove the air inlet manifold (12).

2. Preparation

CAUTION : Clean the sealing face on the valve cover ; Using a special degreaser (Refer to the products catalogue).

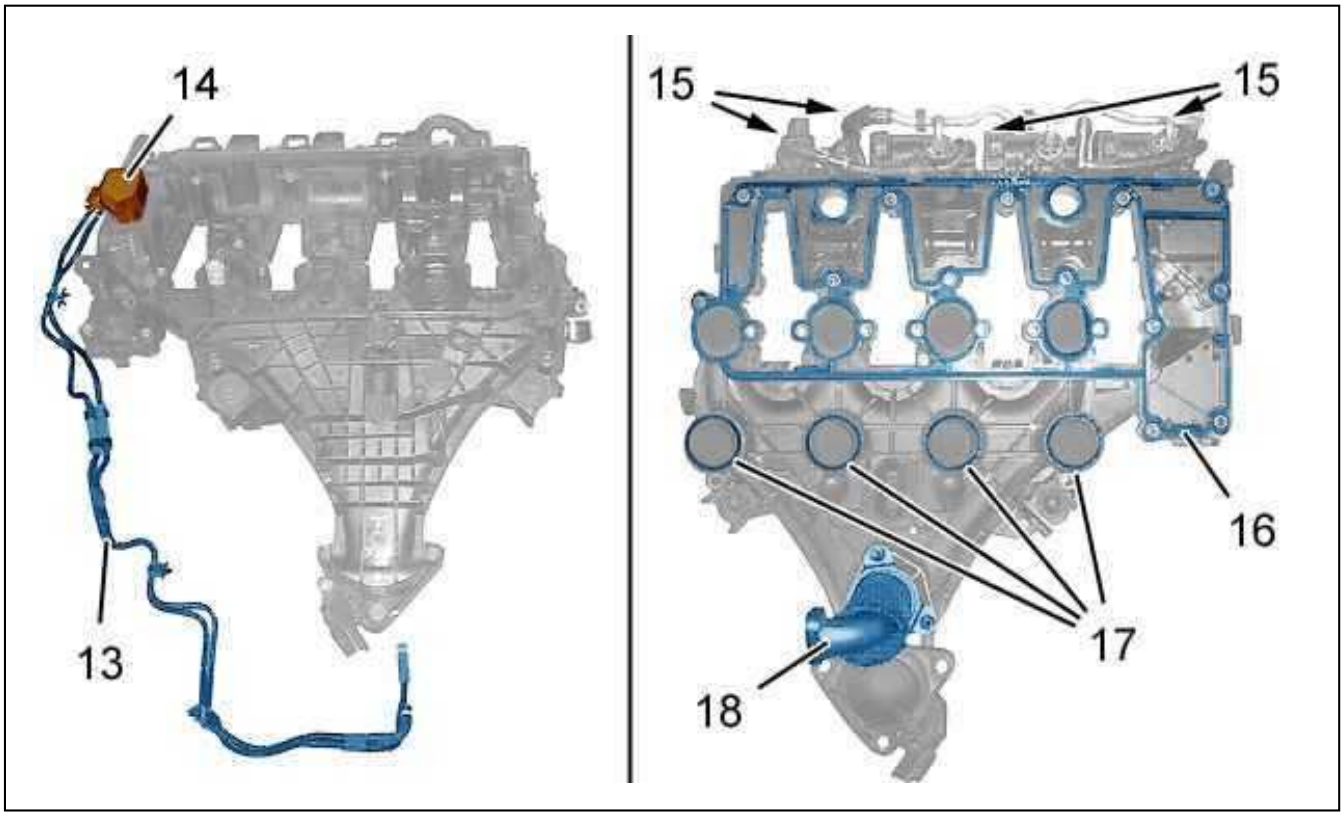


Figure : B1HG0FJD

CAUTION : Replace the seals (16) et (17) with new seals.

In the case of a replacement, save and refit on the new component :

- The vacuum pipes (13)
- The electrovalve breather (14)
- The control electrovalves (15)
- The EGR pipe (18) ; With new seals

Oil the O-rings (17) before refitting ; With engine oil .

3. Refitting

CAUTION : Adhere to the tightening torques .

Offer up : The inlet manifold (12).
Connect the electrovalves (as "g").
Refit the air inlet manifold (12).

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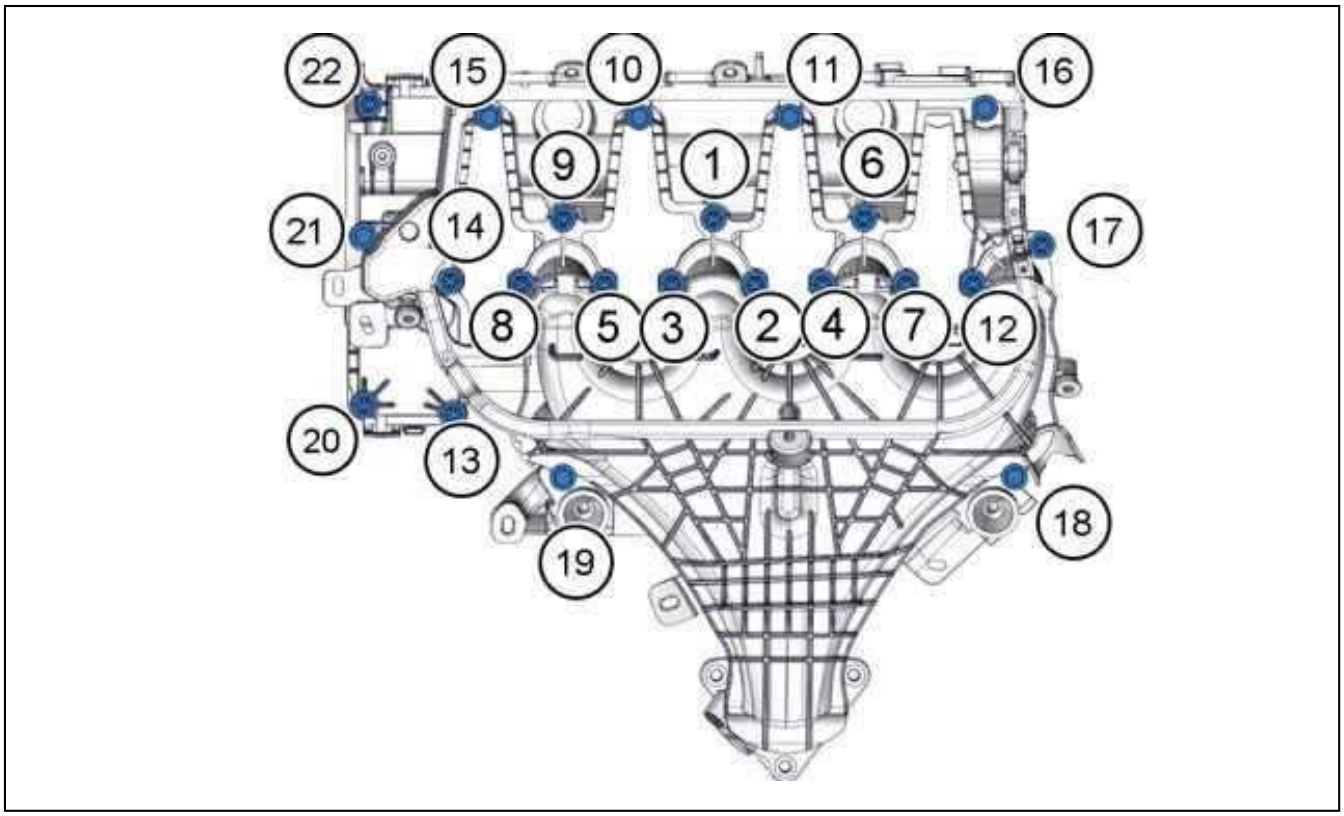


Figure : B1HB070D

bolts	length
(4), (5), (13), (14), (17), (22)	70 mm
(20)	55 mm
OTHERS	40 mm

CAUTION : Respect the tightening sequence indicated.

Refit the bolts (11) :

- Do up the bolts (11)
- Slacken the bolts (11)
- Retighten the bolts (11) to the correct torque

Couple up :

- The vacuum pipe (as "f")
- The vacuum pipe (as "e")
- The vacuum pipe (as "d")

Connect : The solenoid valve ("ON/OFF") (as "c").
Reposition the heat protection for the electrovalves.
Refit :

- The bolts (10)
- The top timing cover (8)
- The bolts (9)

Clip the electrical harness (7).
Refit :

- The bracket (6) for the diesel fuel manual priming pump (5)
- The manual diesel priming pump (5)

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- The bolts (4)
- The electrical harness (as "a")
- The main engine harness (1)

Refit :

- The fuel low pressure supply pipes (3)
- The air mixer unit and its support
- The fuel high pressure common injection rail
- Cylinder reference sensor (2)

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Refit :

- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : INLET AIR METERING UNIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

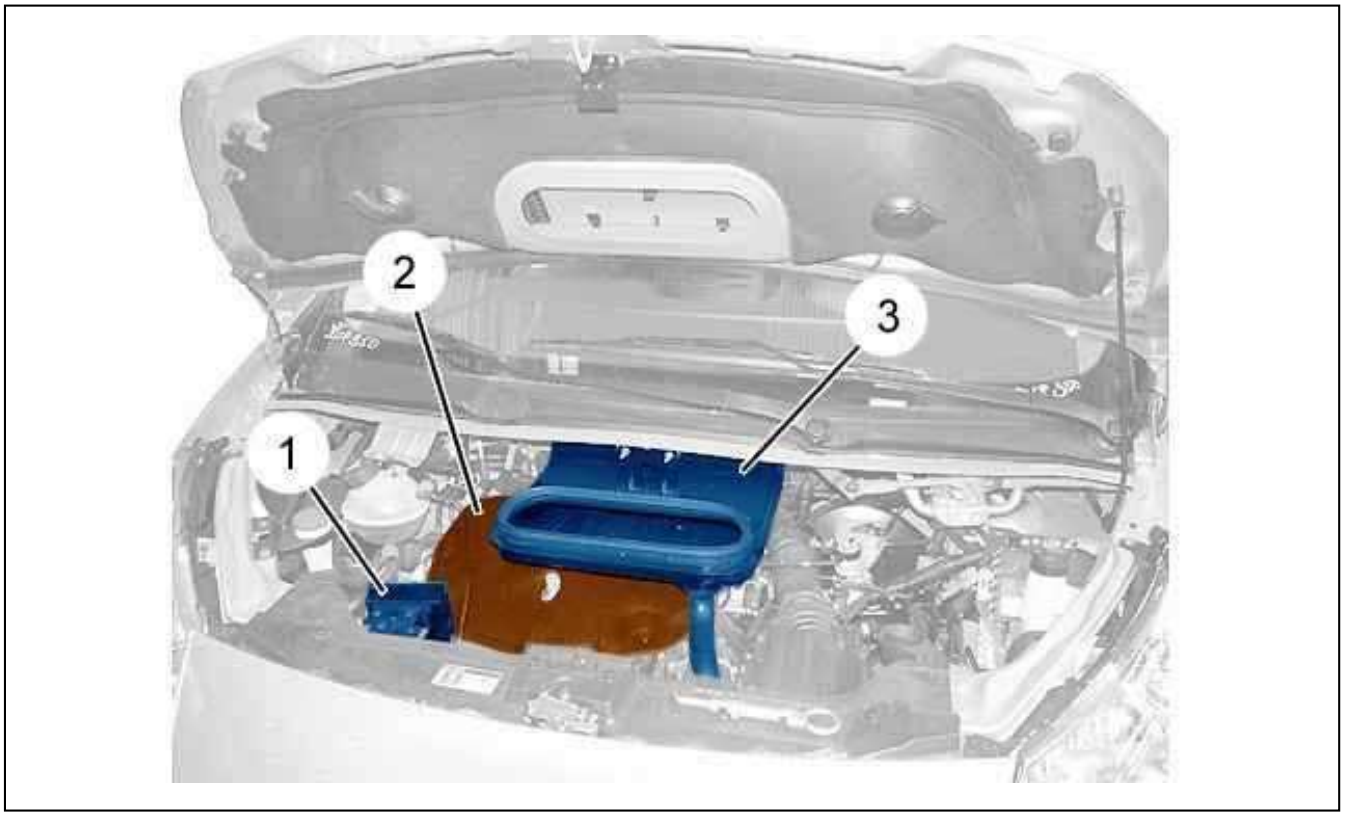


Figure : B1BG1KBD

Remove :

- The cooling fans control relay unit (1)
- The passenger compartment air inlet manifold (3)
- The engine cover (2)

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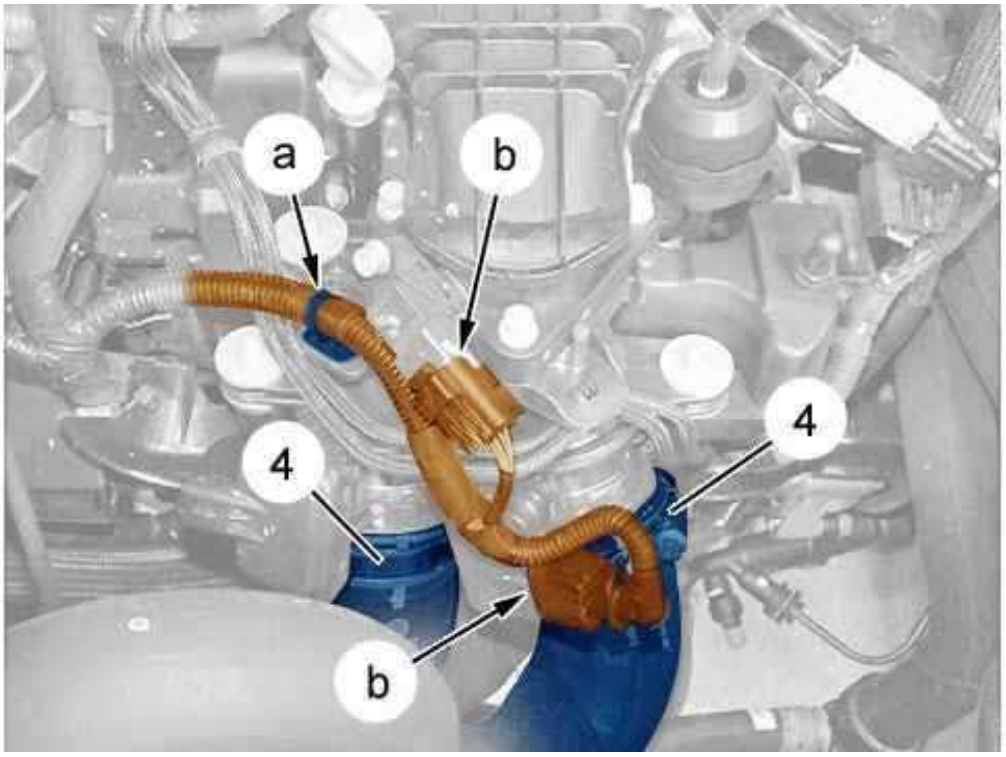


Figure : B1HG20XD

CAUTION : Protect the engine cooling radiator to prevent damage to the fins.

Disconnect the sensors (as "b") ; Using a thin screwdriver.
Release and move aside the electrical harness (as "a").
Uncouple : The air inlet unions (4).

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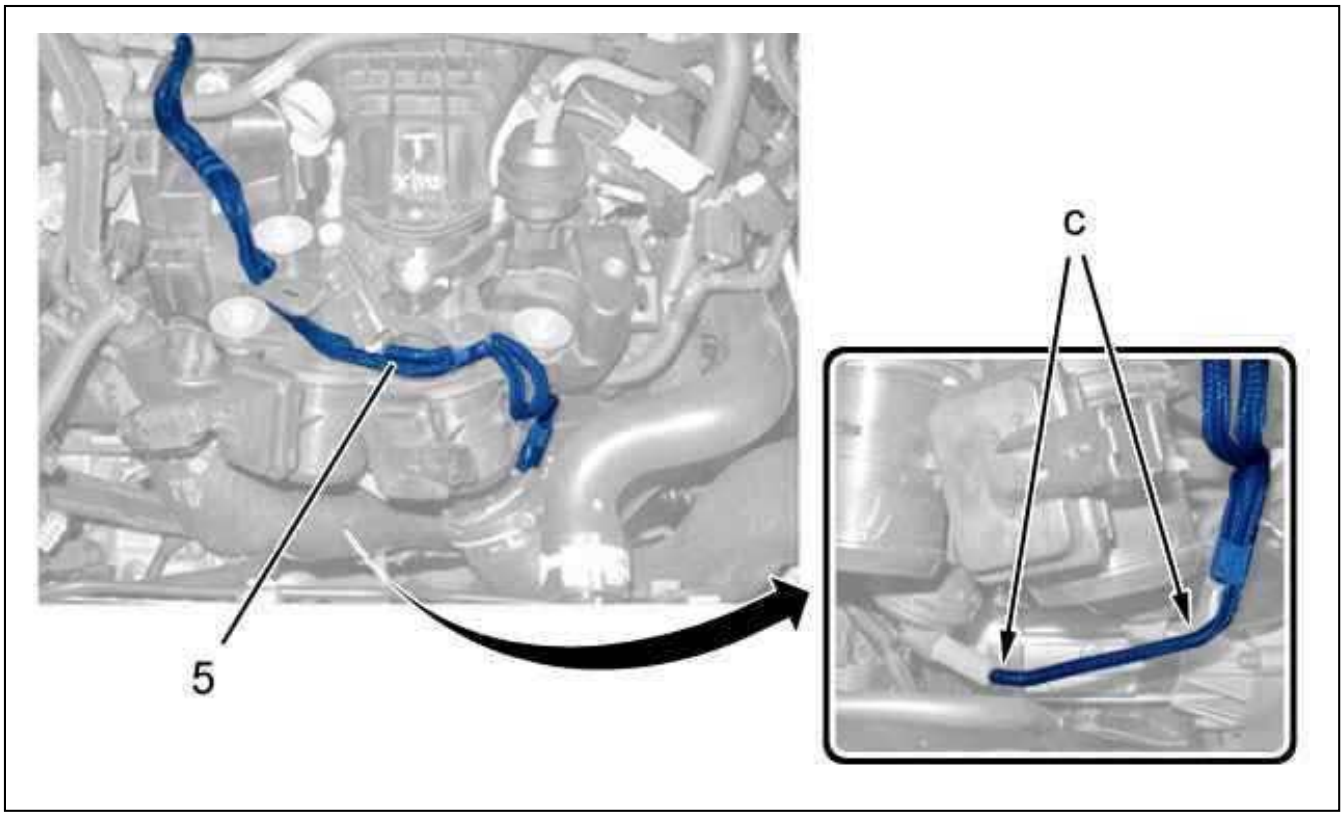


Figure : B1HG210D

Uncouple : The vacuum pipes (5) (as "c").
Unfasten and move aside : The vacuum pipes (5).

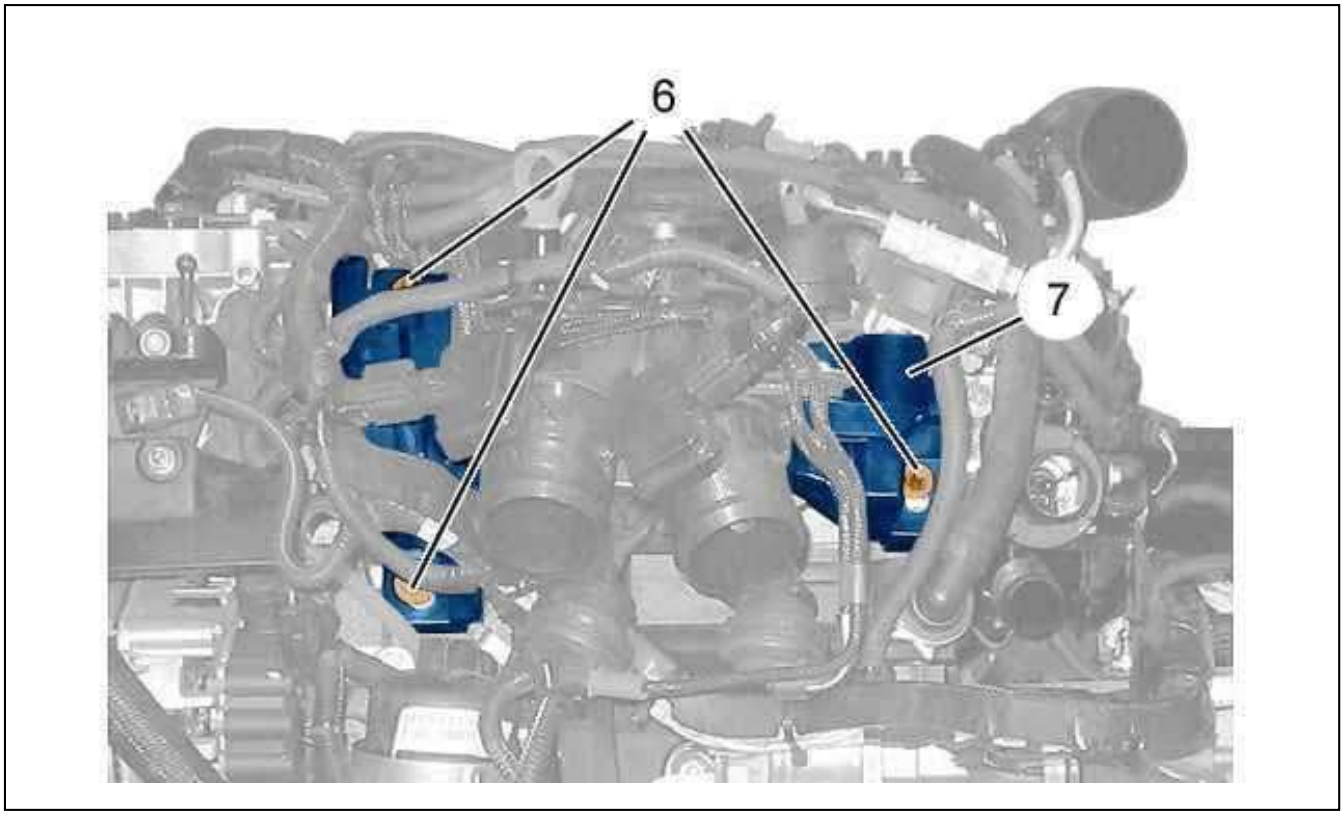


Figure : B1HG213D

Slacken the mountings (6) sufficiently to allow lateral movement of the support (7).

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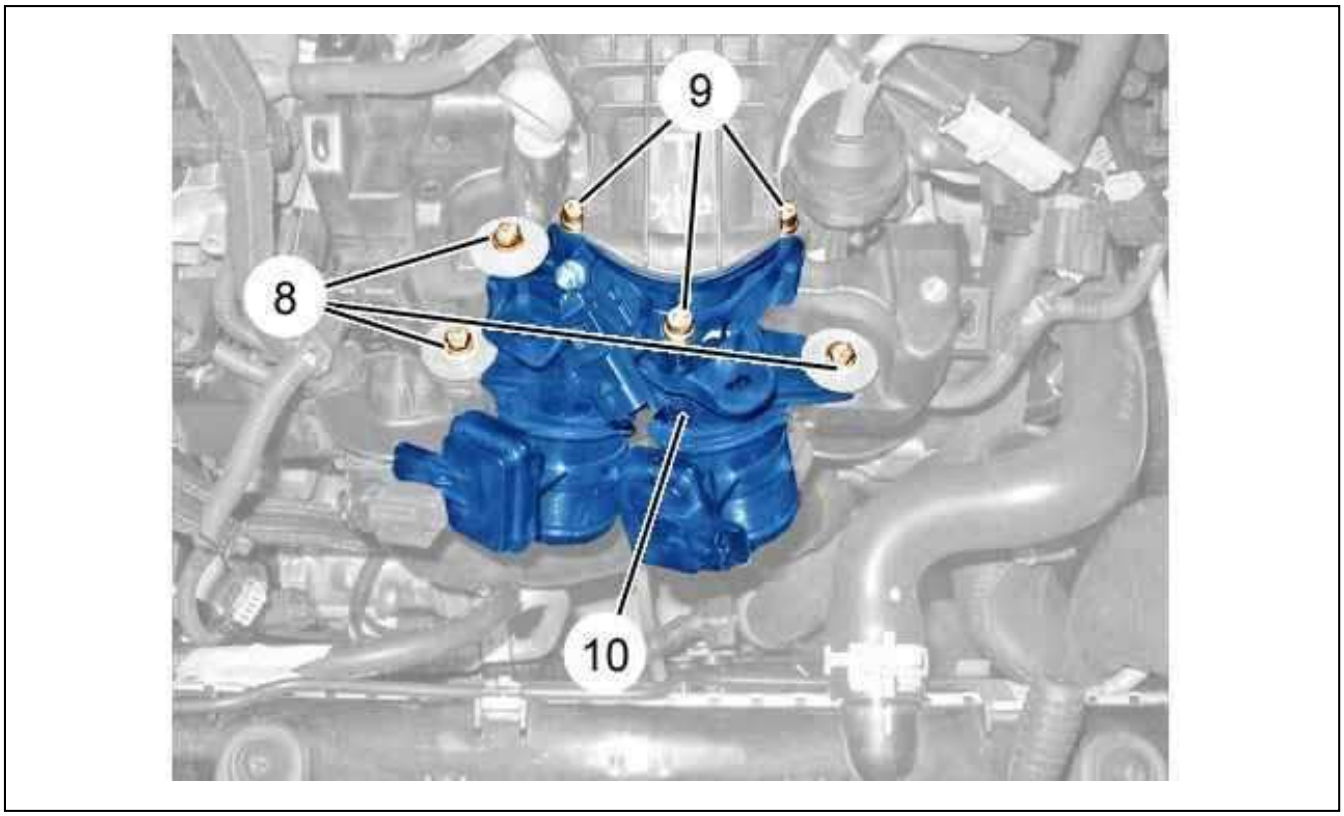


Figure : B1HG214D

Remove :

- The bolts (8)
- The bolts (9)
- The inlet air metering unit (10)

2. Refitting

CAUTION : Adhere to the tightening torques .

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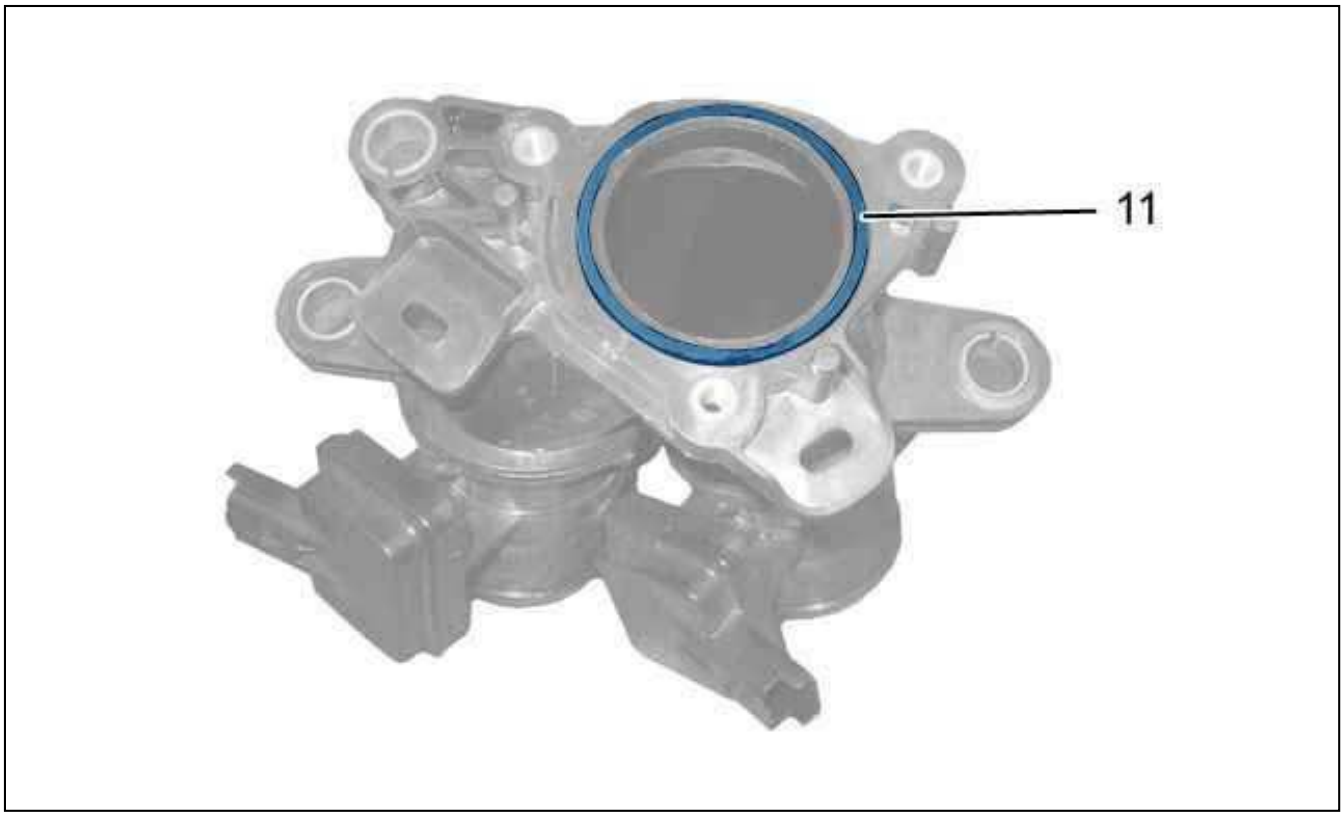


Figure : B1HG215D

CAUTION : Check the condition of the seal (11) ; Exchange it if necessary.

Position :

- The seal (11) on the inlet air mixer unit (10)
- The inlet air metering unit (10)

Tightening procedure : Inlet air mixer unit assembly (10) / support (7) :

- Tighten the mountings (6) by hand ; The support (7) must be properly seated, allowing lateral movement
- Tighten the bolts (9) to torque
- Tighten the bolts (8) to torque
- Tighten the mountings (6) to the specified torque

Couple up :

- The vacuum pipes (5) (as "c")
- The air inlet unions (4)

Clip in place :

- The vacuum pipes (5)
- The electrical harness (as "a")

Connect the sensors (as "b").

CAUTION : Remove the protection on the cooling radiator.

Refit :

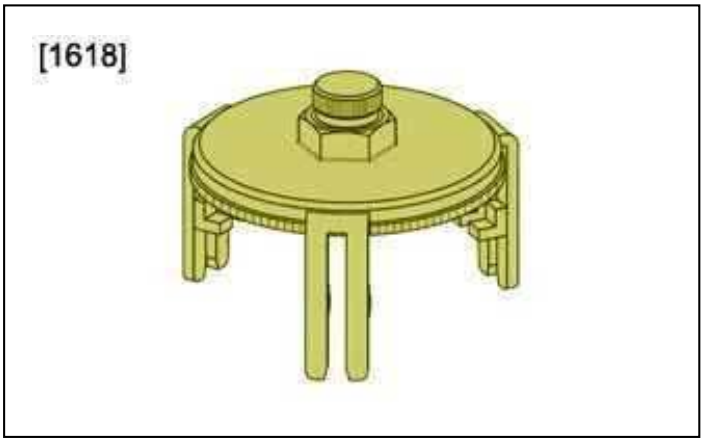
- The engine cover (2)
- The passenger compartment air inlet manifold (3)
- The cooling fan control relay unit (1)

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REMOVING - REFITTING : FUEL PUMP-GAUGE ASSEMBLY

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB05LT	[0194-T]	Set of plugs
 Figure : E5AB09PT	[1618]	Tool for removing/fitting the fuel gauge fixing ring
	[1618]	Tool for removing/fitting the fuel gauge fixing ring

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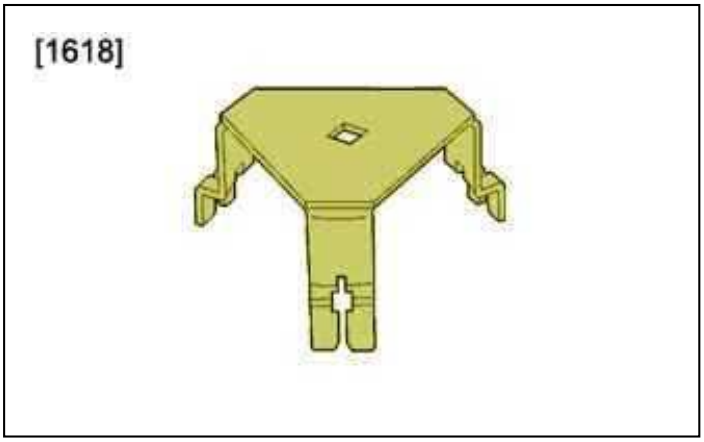


Figure : E5AG03FT

2. Removing

Disconnect the battery.
Drain the fuel tank (If necessary).
Remove the fuel tank .

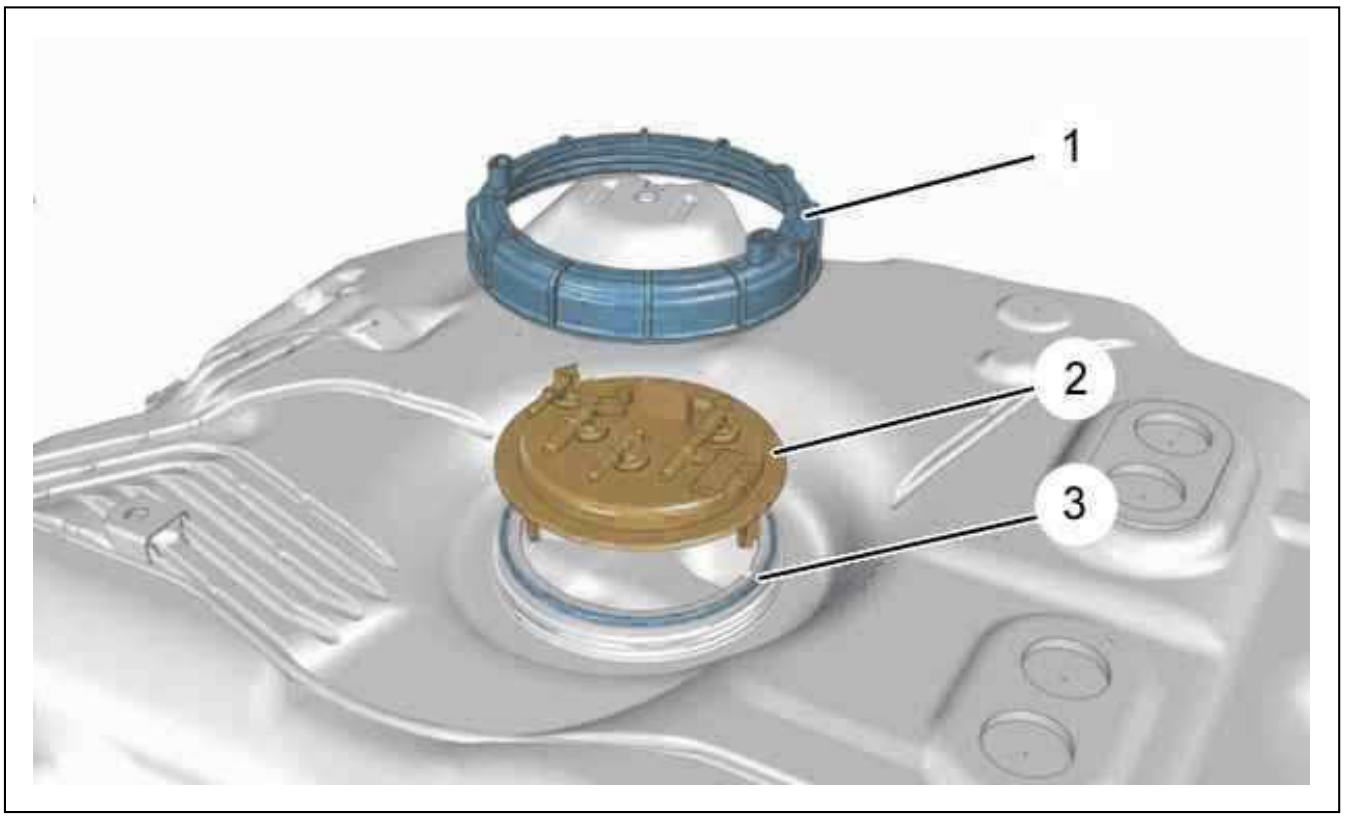


Figure : B1HM0BHD

Disconnect the fuel pipes linking to the fuel pump and gauge assembly (2).
Close the openings using the plugs kit [0194-T].
Remove the bush/nut (1) ; Using tool [1618].

CAUTION : Protect the fuel gauge well periphery and fuel pump with absorbent paper.

Remove :

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- The tank unit and fuel pump assembly (2)
- Seal (3)

CAUTION : Immediately place a tray under the fuel pump and gauge assembly .

CAUTION : Following removal of the fuel pump and gauge assembly : Immediately do up the ring nut on the tank sc as to prevent any deformation of the pick-up unit (Risk of fuel leak).

3. Refitting

CAUTION : Systematically replace the seal (3).

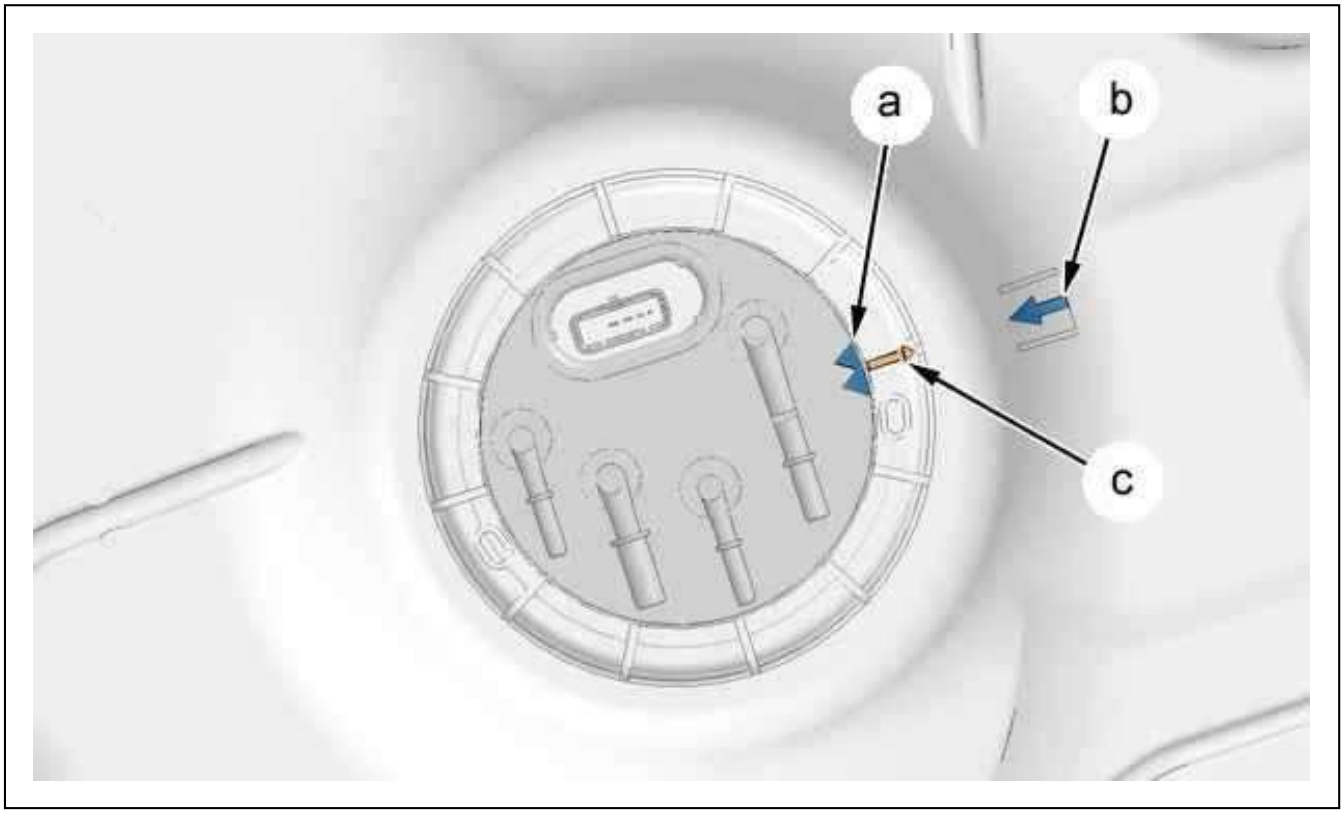


Figure : B1HP2VQD

Refit the new seal (3).
Refit the fuel gauge and pump assembly (2).

CAUTION : Refit the ring (1) and tighten using the tool [1618] until the mark "a" is aligned with the arrow "c" and the mark "b".

Tighten the ring-nut (1) until the arrows "c", "b" are aligned ; Using tool [1618].
Reconnect the fuel pipes linking to the fuel pump and gauge assembly (2).
Clean up any splashes of fuel.
Refit the fuel tank .
Fill the fuel tank .

CAUTION : Perform the operations to be carried out following reconnection of the battery.

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Reconnect the battery.

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REMOVING - REFITTING : TURBOCHARGER AIR COOLER

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Removing

Put the vehicle on a hoist.
Remove :

- The passenger compartment air inlet manifold
- The engine cover

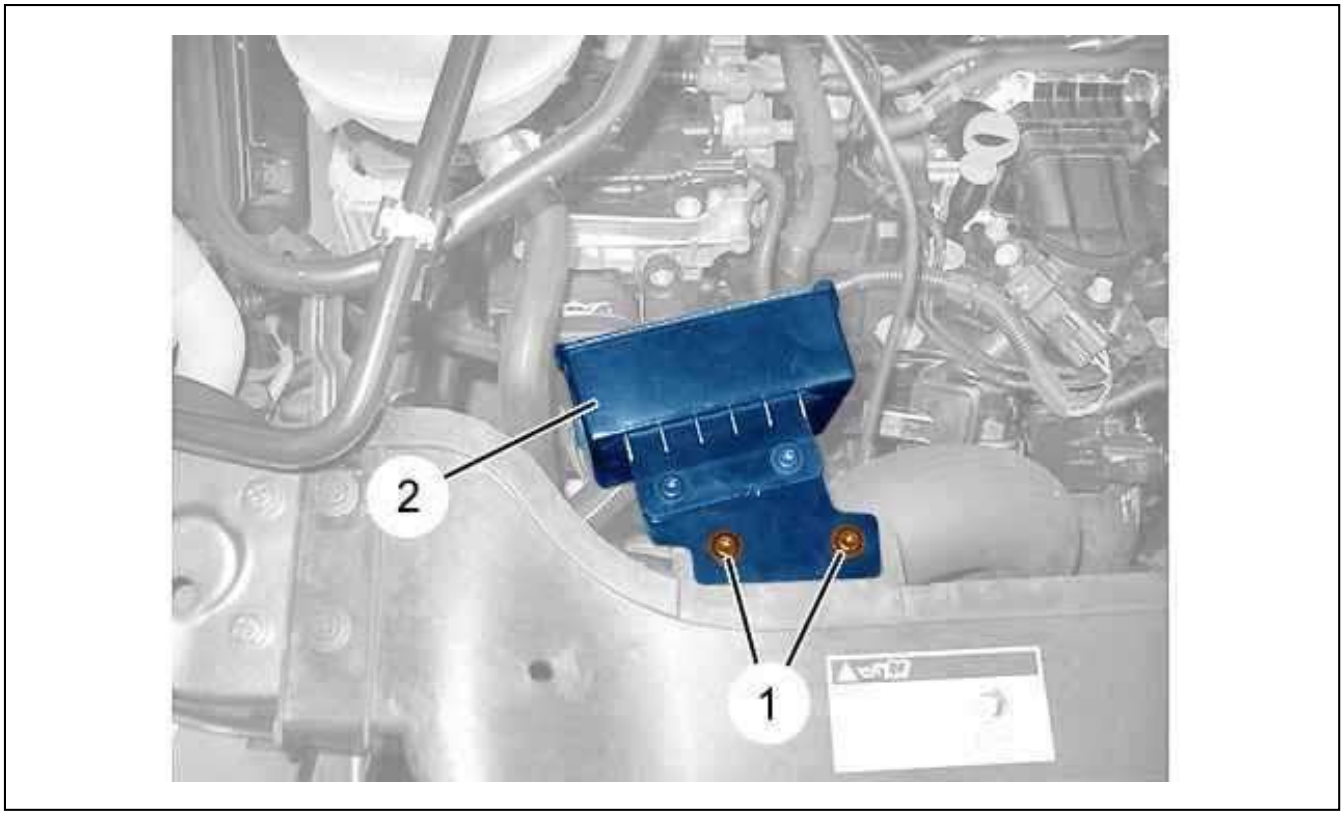


Figure : B1HG1RXD

Remove :

- The bolts (1)
- The cooling fan control relay unit (2)

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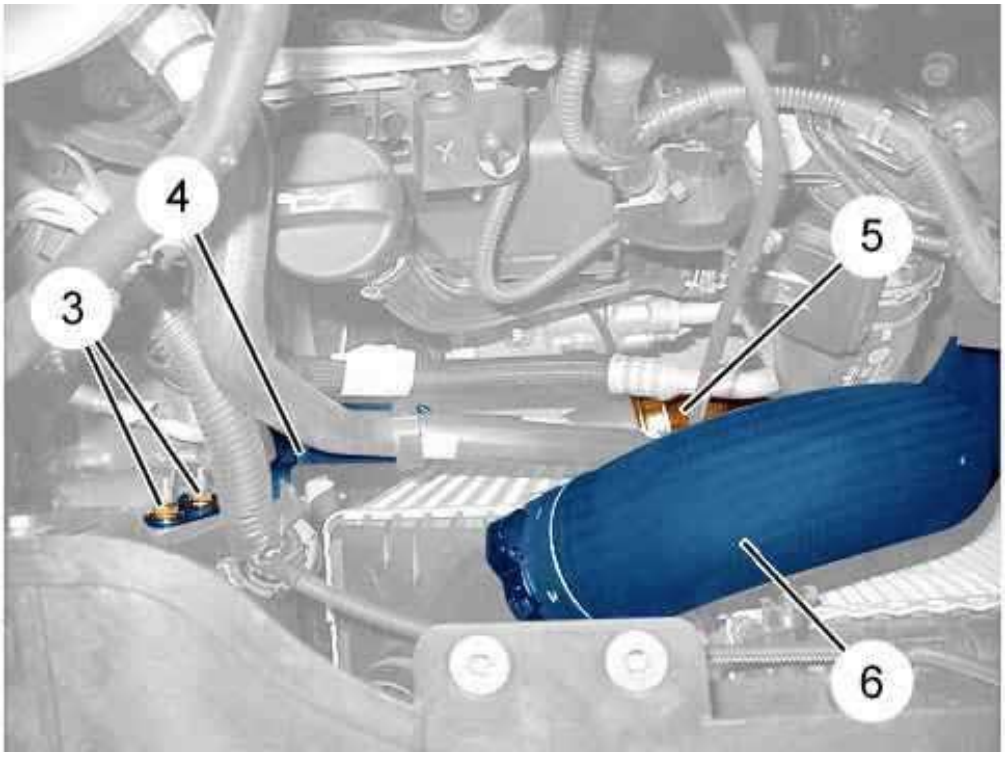


Figure : B1HG1S0D

Remove :

- The upper air duct (6)
- Refit the lower air duct (5)
- The nuts (3)

Move aside and secure the metal bracket (4).

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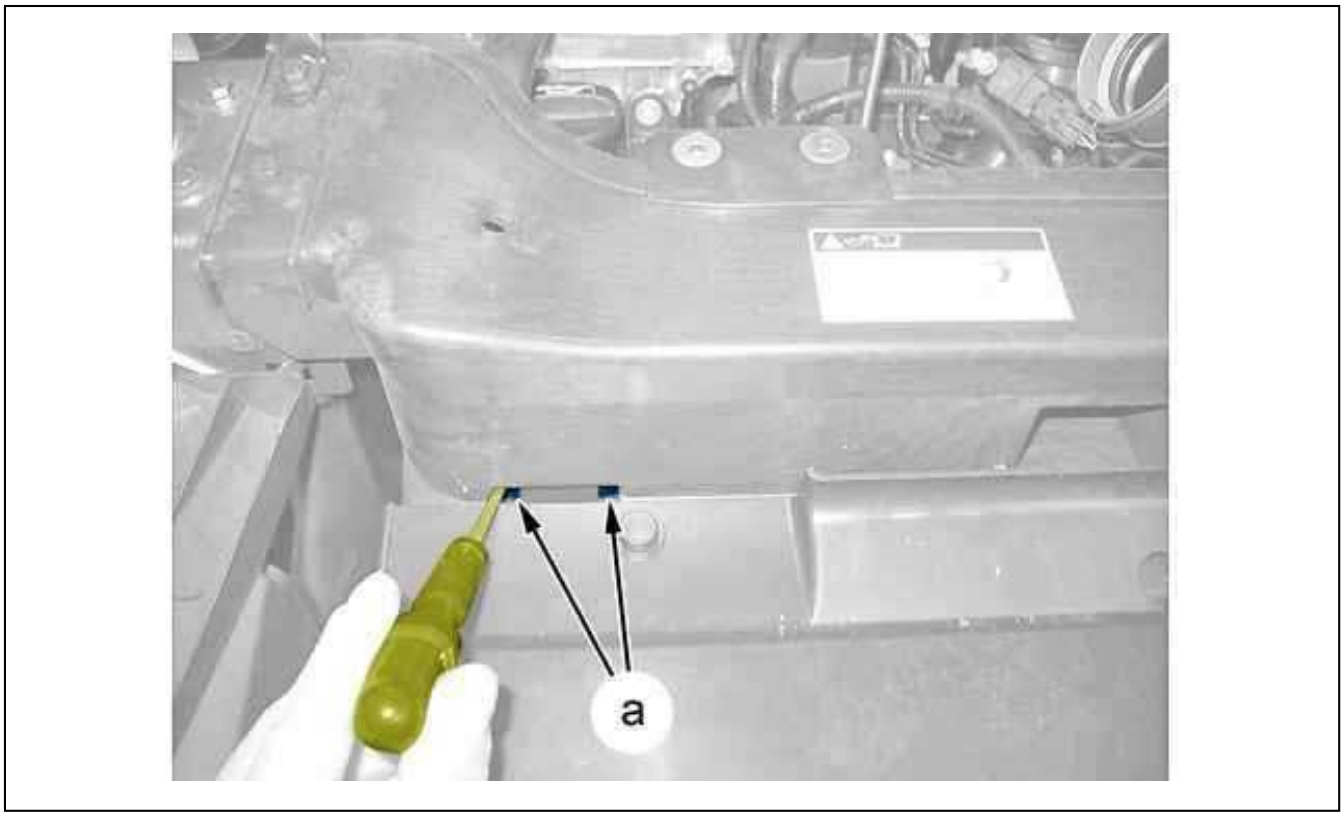


Figure : B1HG1S3D

CAUTION : Protect the radiator so as not to damage the fins.

Unclip the fixings (as "a") ; Using a flat screwdriver.
Tilt the turbo air cooler of engine .
Remove the turbocharger air cooler ; From above the vehicle (Carefully).

2. Refitting

CAUTION : Check the presence of the top and bottom fixings of the turbocharger air cooler .

Reposition the turbocharger air cooler .
Attach the fixing (as "a").
Refit :

- The metal bracket (4)
- The nuts (3)
- Refit the lower air duct (5)
- The upper air duct (6)
- The cooling fan control relay unit (2)
- The bolts (1)
- The engine cover
- The passenger compartment air inlet manifold

3. Check

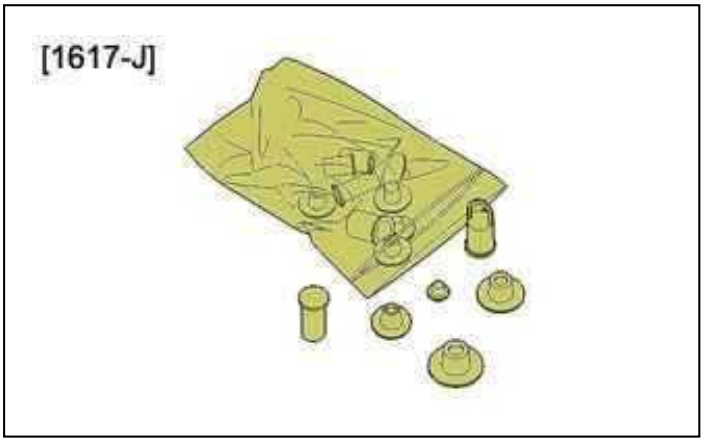
Start the engine.
Check the absence of leaks.

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REMOVING - REFITTING : FUEL TANK

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB0FMT	[1617-J]	The plugs kit HDI

2. Removing

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

Raise the vehicle, wheels hanging.
Disconnect the battery.
Drain the fuel tank (if necessary).

CAUTION : Wait 30 seconds after switching off the engine before uncoupling the fuel pipes.

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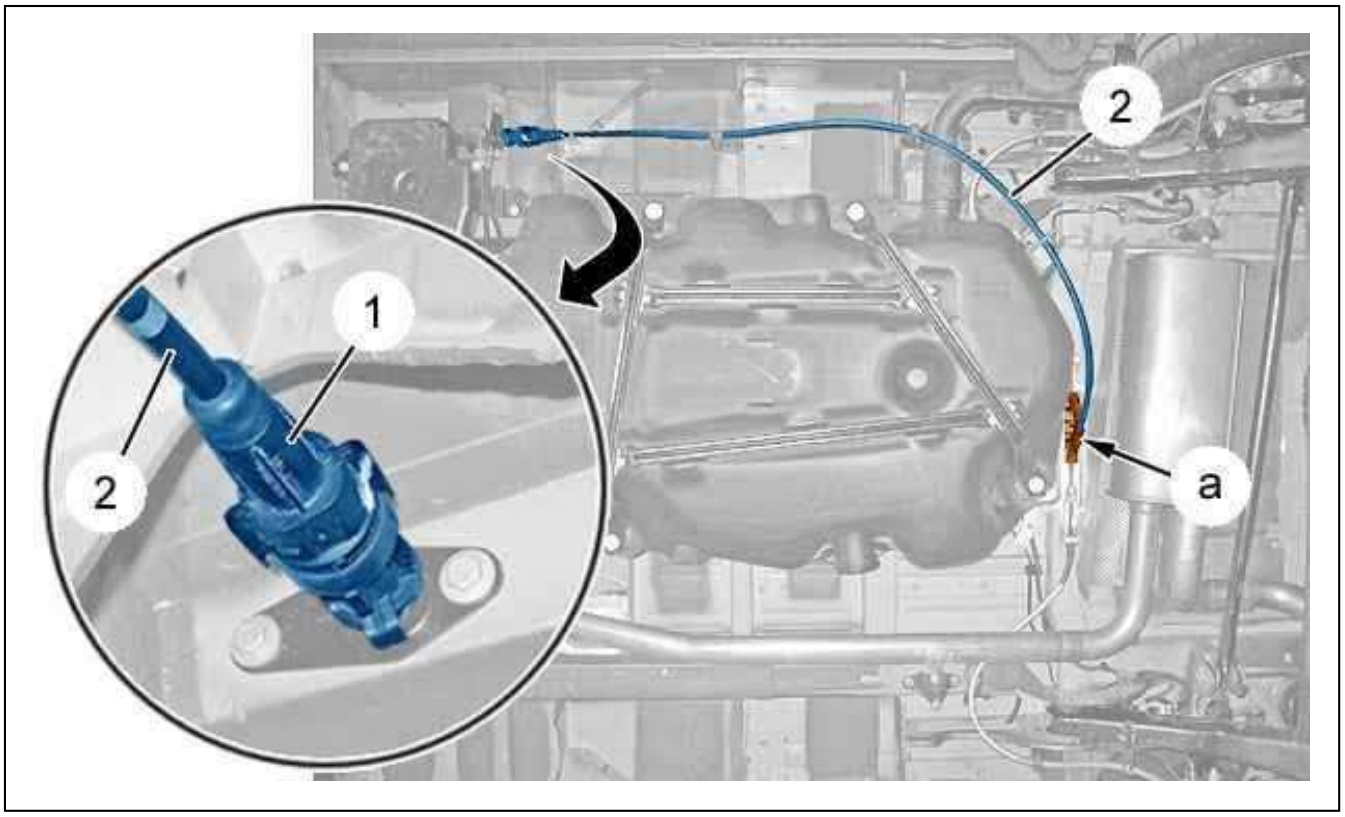
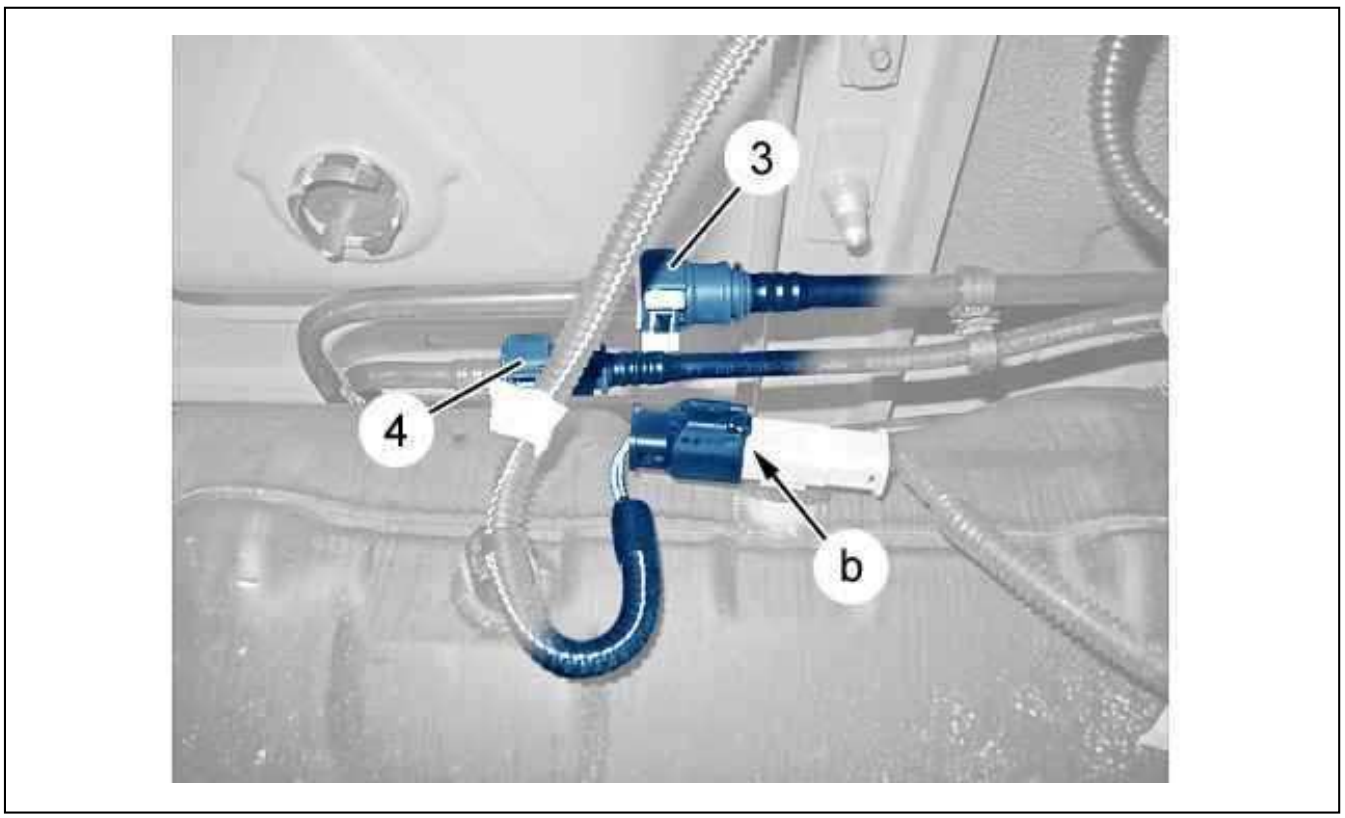


Figure : B1HG1QND

Partially remove : The handbrake control cable (2) :

- Unlock the control system (1)
- Disconnect the control cable (at "a")

Unfasten and move aside the control cable (2) and secure it to the body.



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Figure : B1HG1QQD

Uncouple the fuel pipes (3) et (4).
Disconnect the connector (at "b").

CAUTION : Plug the fuel supply and return pipes ; Using tool [1617-J].

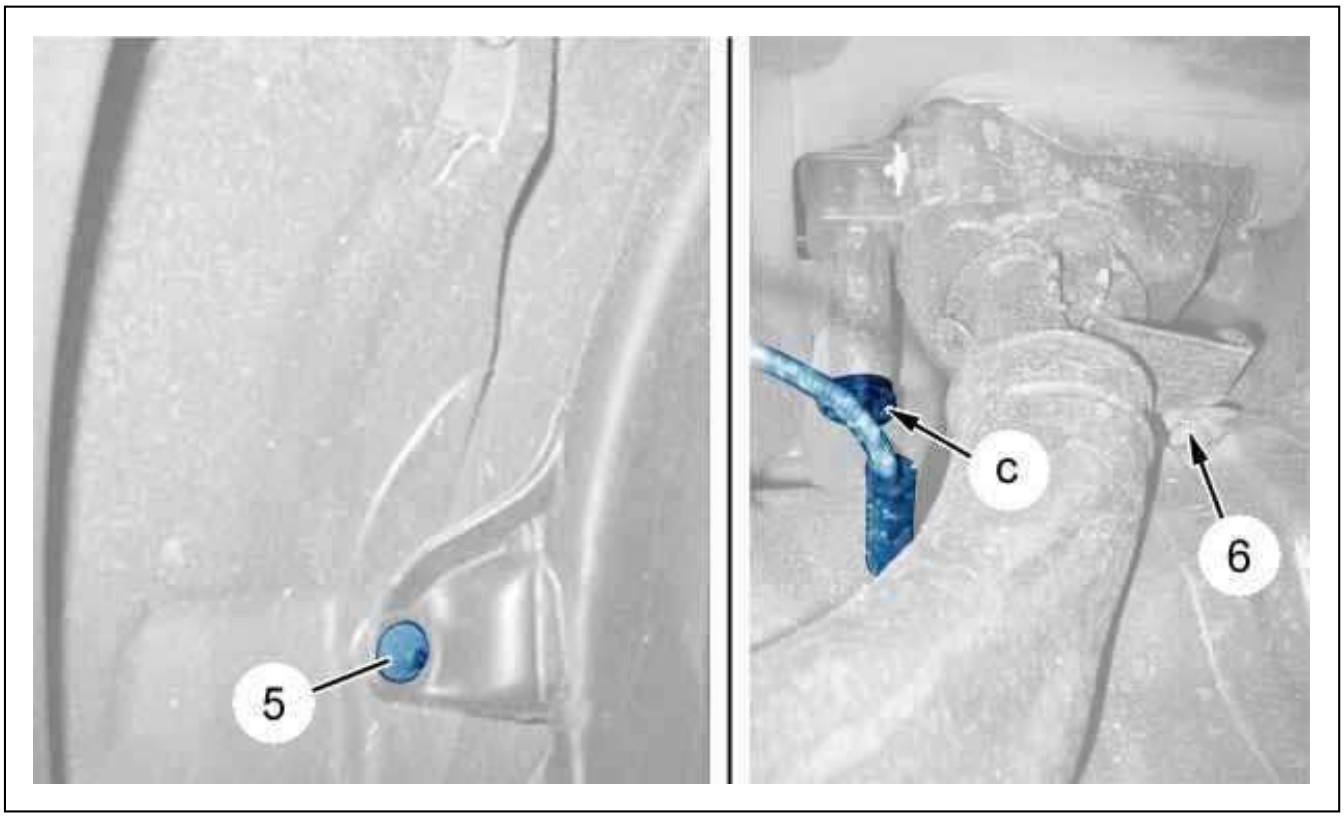


Figure : B1HG1QRD

Remove :

- The fuel tank cap
- The left hand rear wheel

Remove :

- The (5) bolt
- The (6) bolt

Disconnect the connector (at "c").

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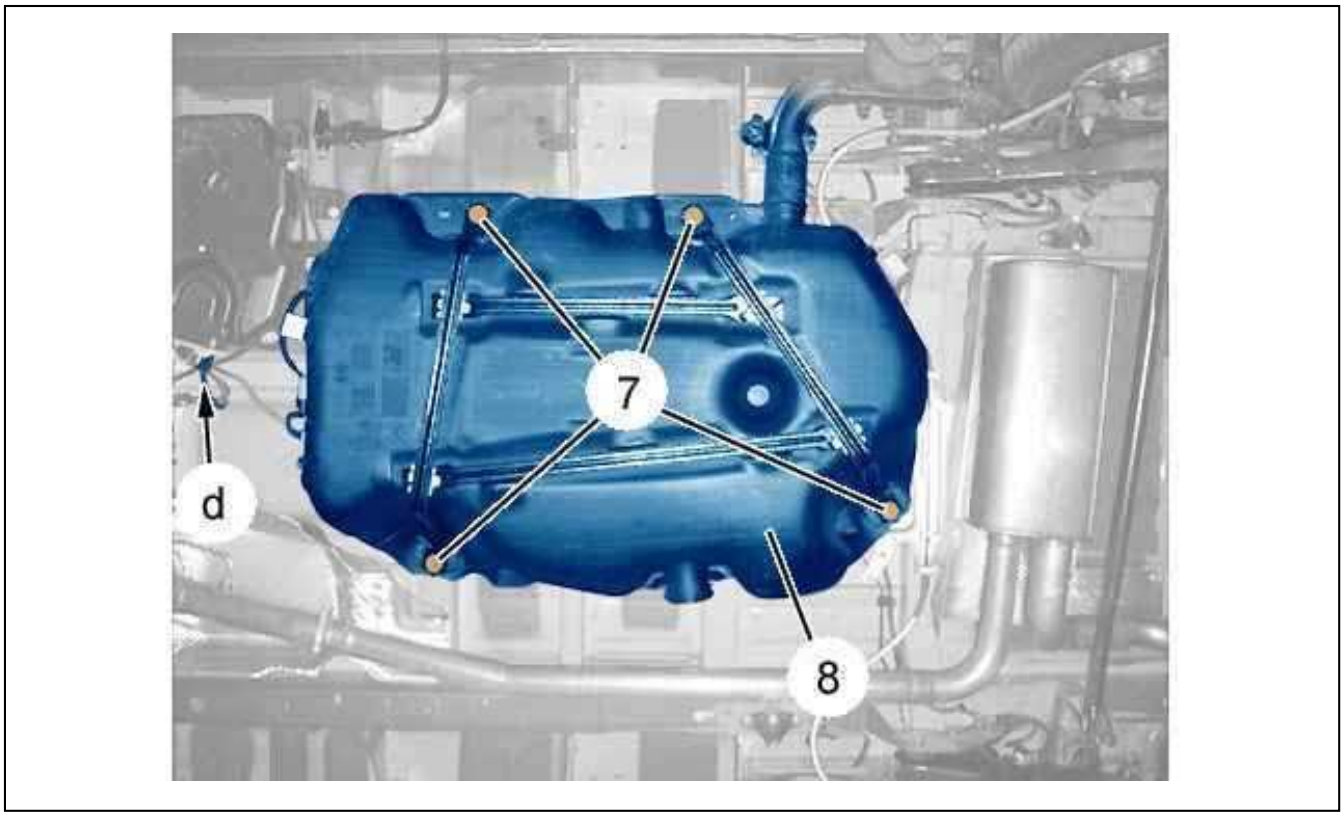


Figure : B1HG1QUD

Uncouple : The additive filler tube (at "d").

CAUTION : Block the additive supply tube ; Using tool [1617-J].

Position a supporting tool under the fuel tank (8).
Remove the bolts (7).

CAUTION : Secure the fuel tank (8) ; By means of the supporting tool.

Remove the fuel tank (8).

3. Refitting

CAUTION : Adhere to the tightening torques .

Position and support the fuel tank (8).
Refit :

- The fuel tank (8)
- The bolts (7), (6), (5)

Couple up :

- The additive filler tube (at "d")
- The fuel pipes (3), (4)

Connect the connector (at "b", "c").
Couple up : The control cable (at "a").
Lock the control system (1).
Refit : The handbrake control cable (2).

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Refit the rear LH wheel.
Fill the fuel tank .
Refit : The fuel tank cap .

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Prime the fuel circuit, using the manual priming pump.

4. Check

Start the engine.
Check the absence of leaks.
Check that the fuel gauge works.
Stop the engine.

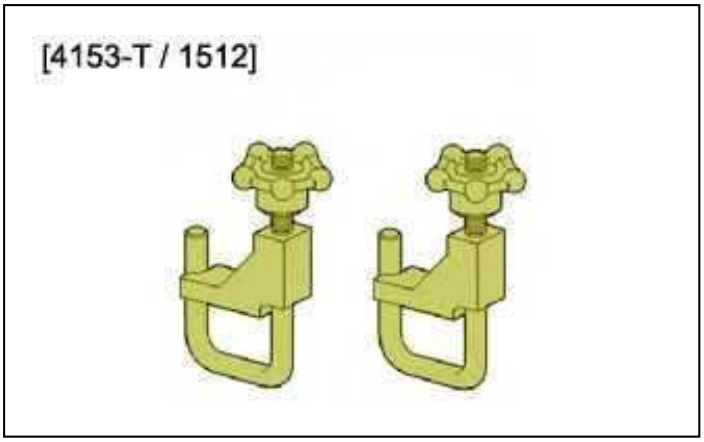
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REMOVING - REFITTING : TURBOCHARGER

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Do not separate the pressure regulation valve from the turbocharger or slacken its fixings.

1. Tooling

tool	Reference	Designation
 Figure : E5AB0NWT	[4153-T] [1512]	Set of hose clamps 0 to 26 mm dia.

2. Removing

Raise the vehicle, wheels hanging.
Disconnect the battery.

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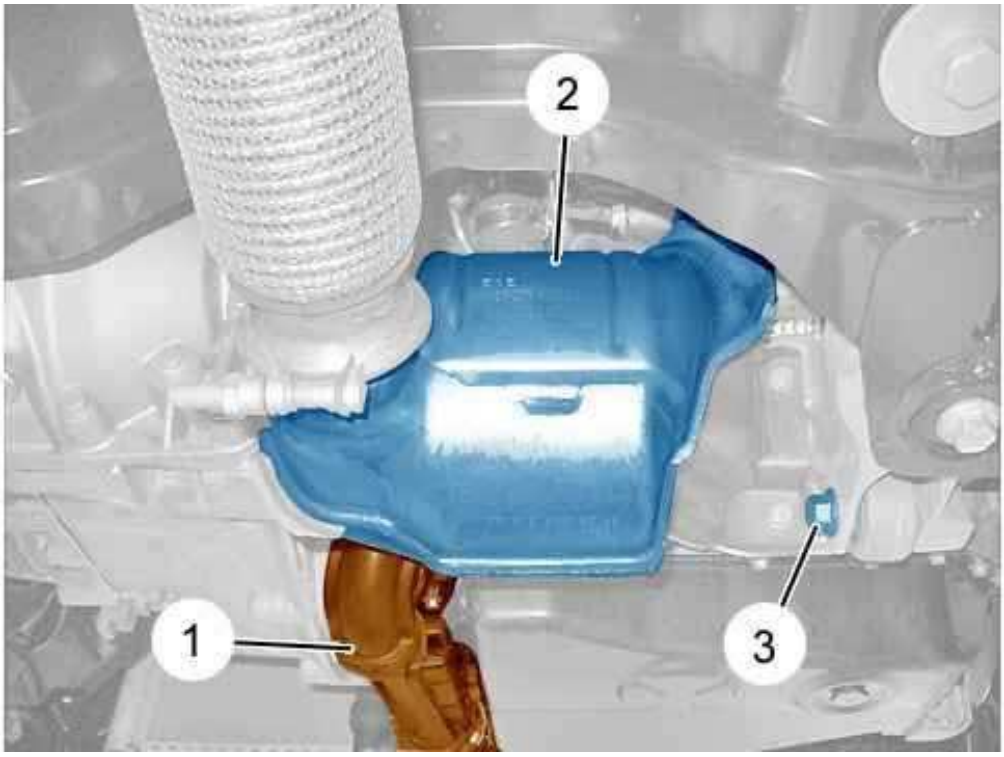


Figure : B1HG1W3D

Remove :

- The protective panel under the engine
- The (3) bolt
- The resonator (1)
- The pre-catalytic converter (2)

N.B. : Tilt the engine forward.

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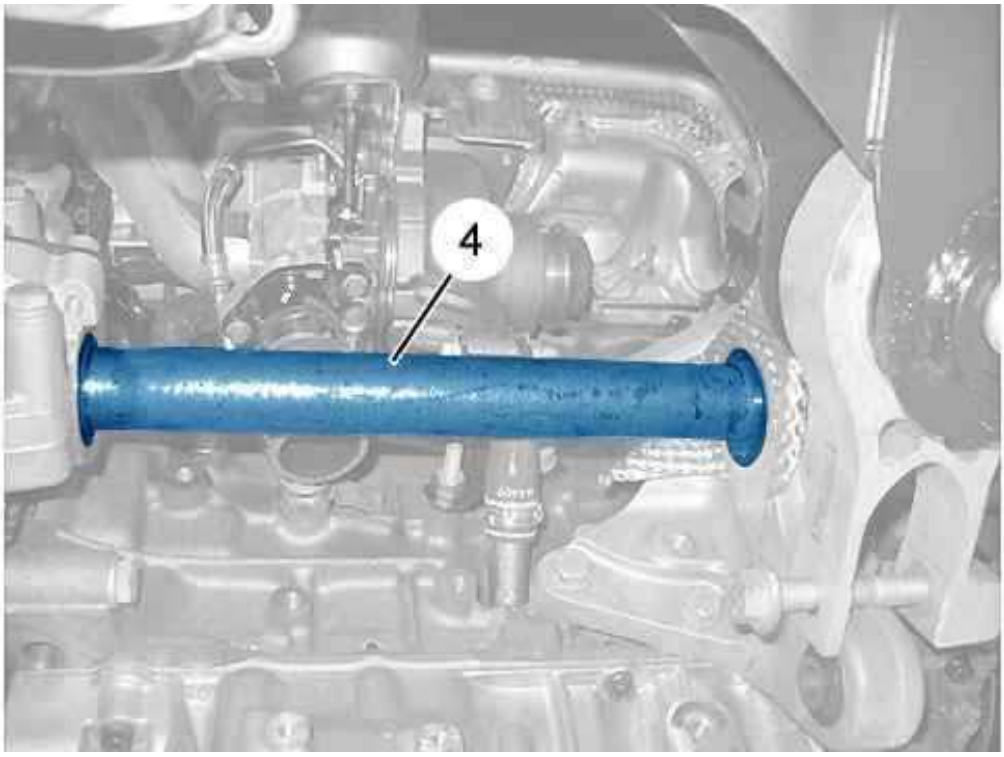


Figure : B1HG1W4D

Remove : The front right transmission (4).

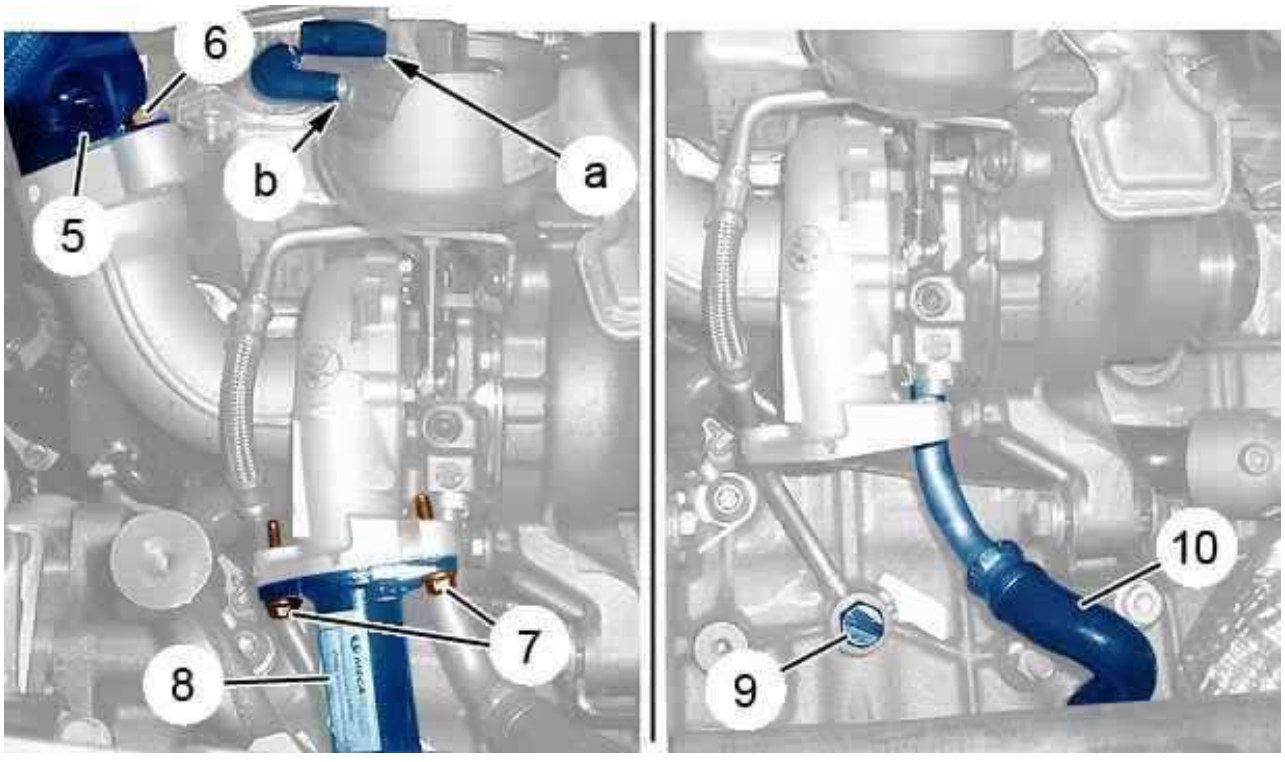


Figure : B1HG0GJD

Disconnect the turbocharger position repeat sensor(as "a").
Uncouple the vacuum pipe (as "b").

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CAUTION : Plug the turbocharger ducts immediately the air unions are removed.

Remove :

- The bolts (7)
- The air outlet pipe (8) of the turbocharger
- The (6) bolt

Uncouple : The air entry union (5).

CAUTION : Plug the lubrication ducts immediately the oil unions are removed.

Remove :

- The banjo bolt (9)
- The seals

Uncouple : The lubrication tube (10).

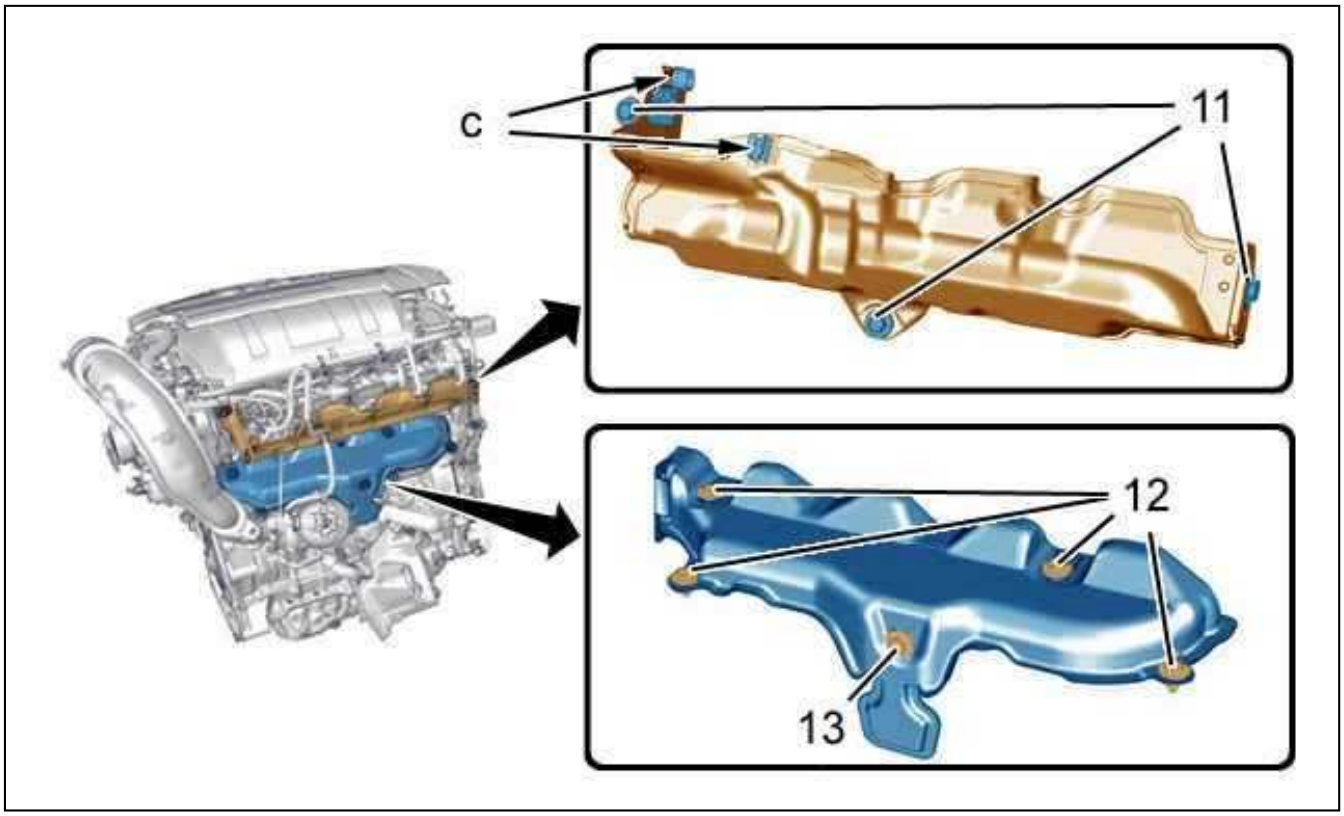


Figure : B1HG0LHD

ESSENTIAL : Use protective gloves for removing heat shields.

Remove :

- The long screw (13)
- The short screws (12)
- The exhaust manifold heat shield

CAUTION : The heat shield for the control electrovalves is removed from underneath the vehicle; do not deform i during removal.

Unclip : The electrical harnesses (as "c").

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Remove :

- The bolts (11)
- The heat shield for the control electrovalves (Carefully)

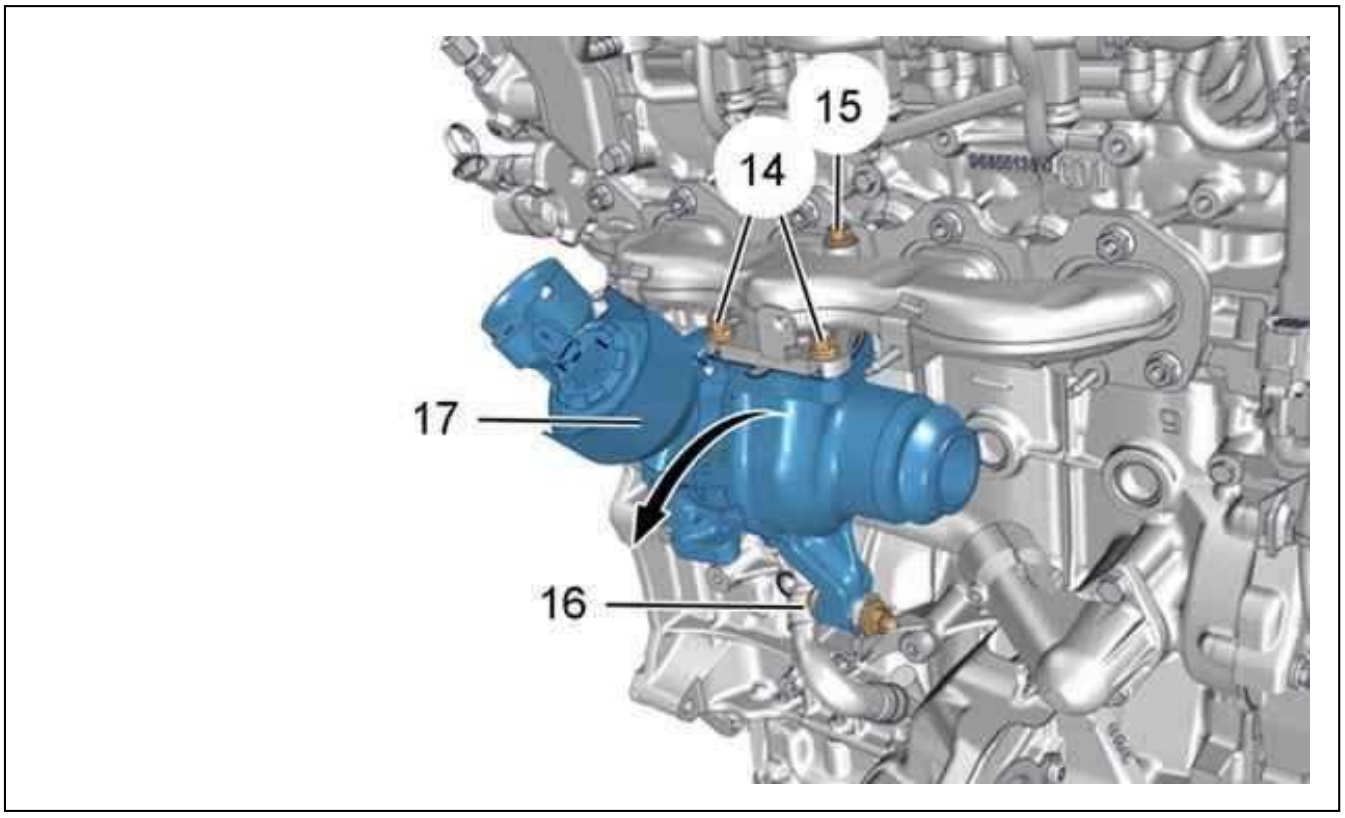


Figure : B1HG0GLD

Remove the screw (15).
Unscrew :

- The nuts (14)
- The (16) bolt

Tip the turbocharger rearwards (following the arrow).
Tighten the bolt (16) .

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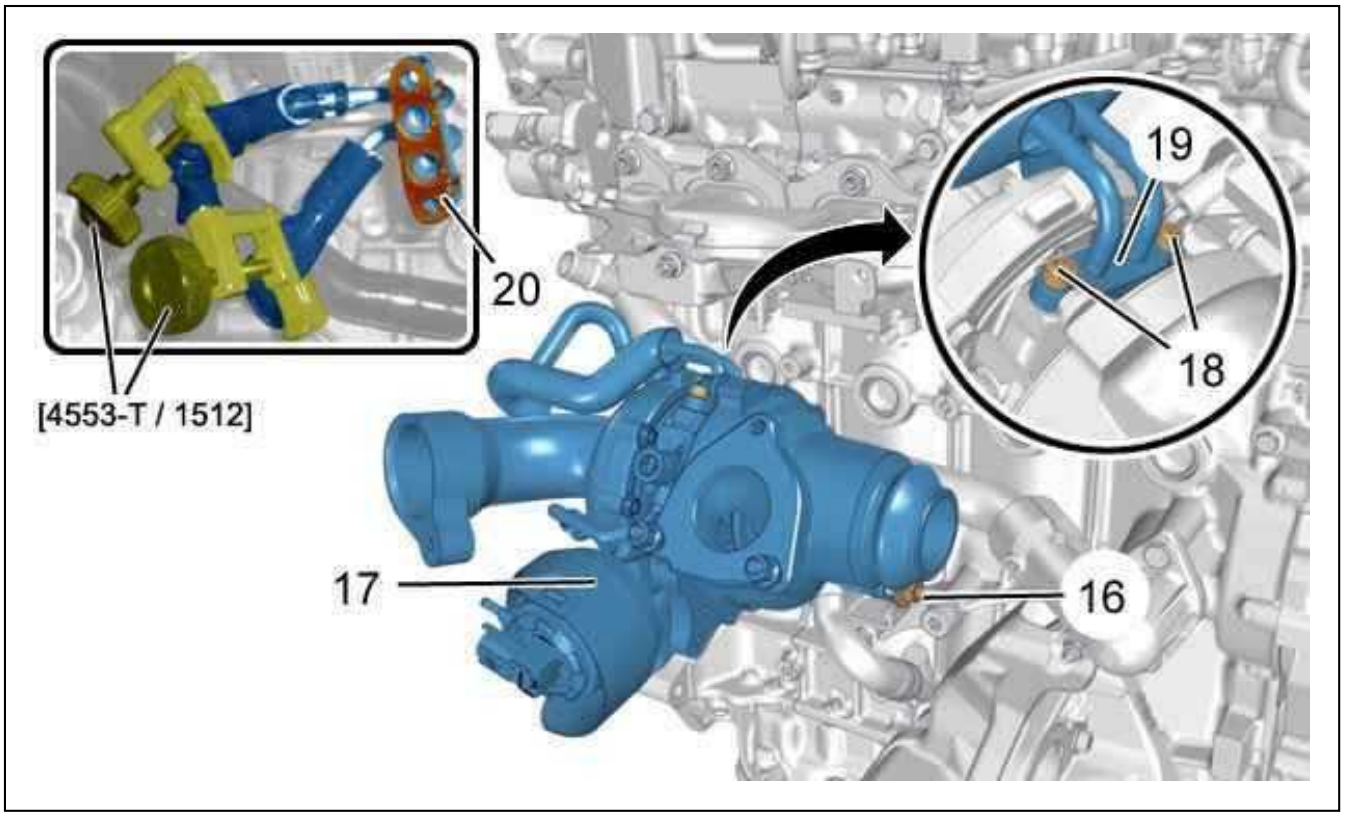


Figure : B1HG1W6D

Fit the tools [4153-T / 1512] on the turbocharger cooling hoses (17) (as shown on the illustration).
Remove the bolts (18).
Release : The coolant fluid duct (19).
Slacken the bolt (16).
Remove the turbocharger (17).

CAUTION : Make sure that no coolant fluid flows out.

Retrieve : Seal (20).

3. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Check the surface condition of the exhaust manifold and of the turbocharger (17) ; Clean and vacuum i necessary.

3.1. Case of replacement of the turbocharger

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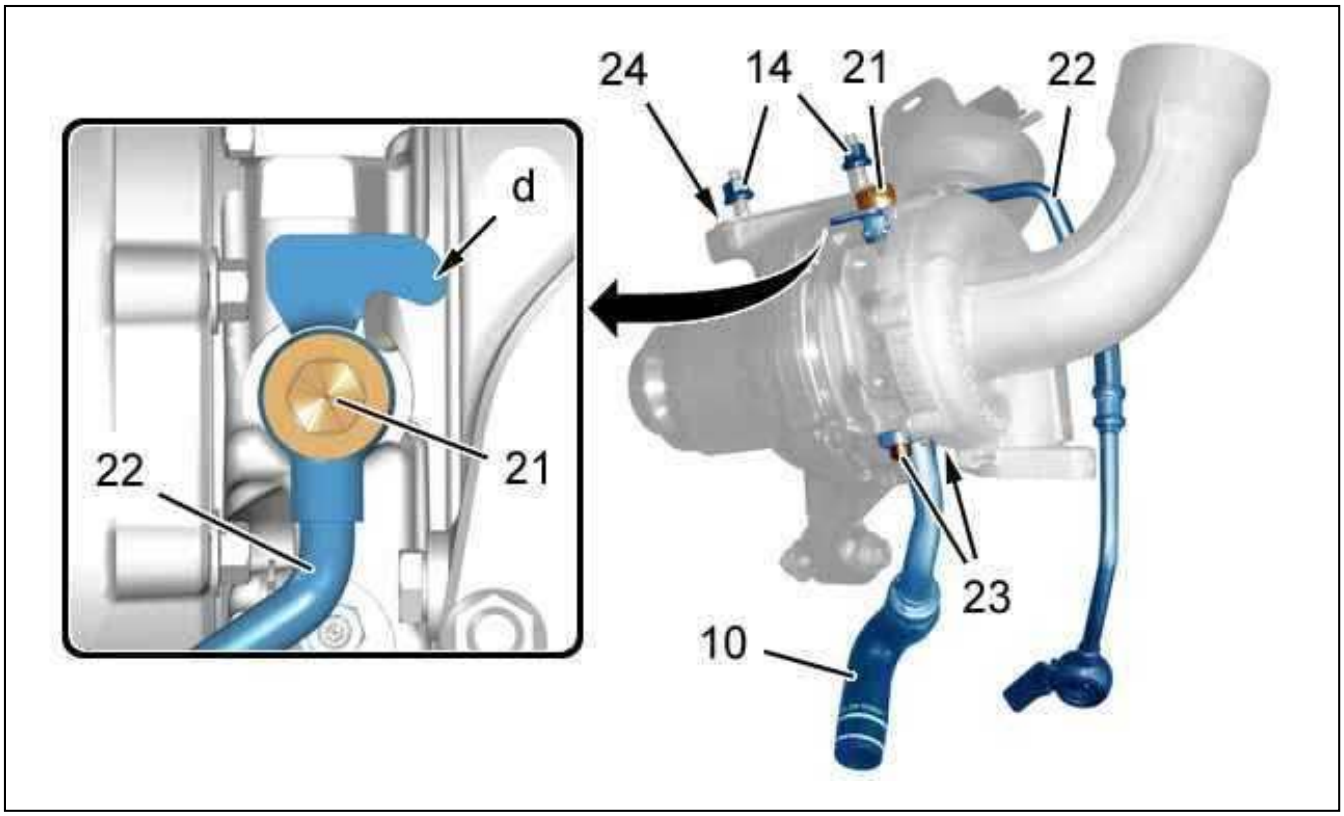


Figure : B1HG0GRD

CAUTION : Refit the new seal (20).

Place the turbocharger (17) on a stable work surface.

CAUTION : The lubrication tube (22) has to be tightened on the impeller body (as "d").

Refit :

- The lubrication tube assembly (22) - Banjo bolt (21) (With new seals) - Lubrication pipe (10) (equipped with a nev seal)
- The bolts (23)
- The (new) seal (24) on the turbocharger (17)
- Fit the new nuts (14)

3.2. Subsequent operations

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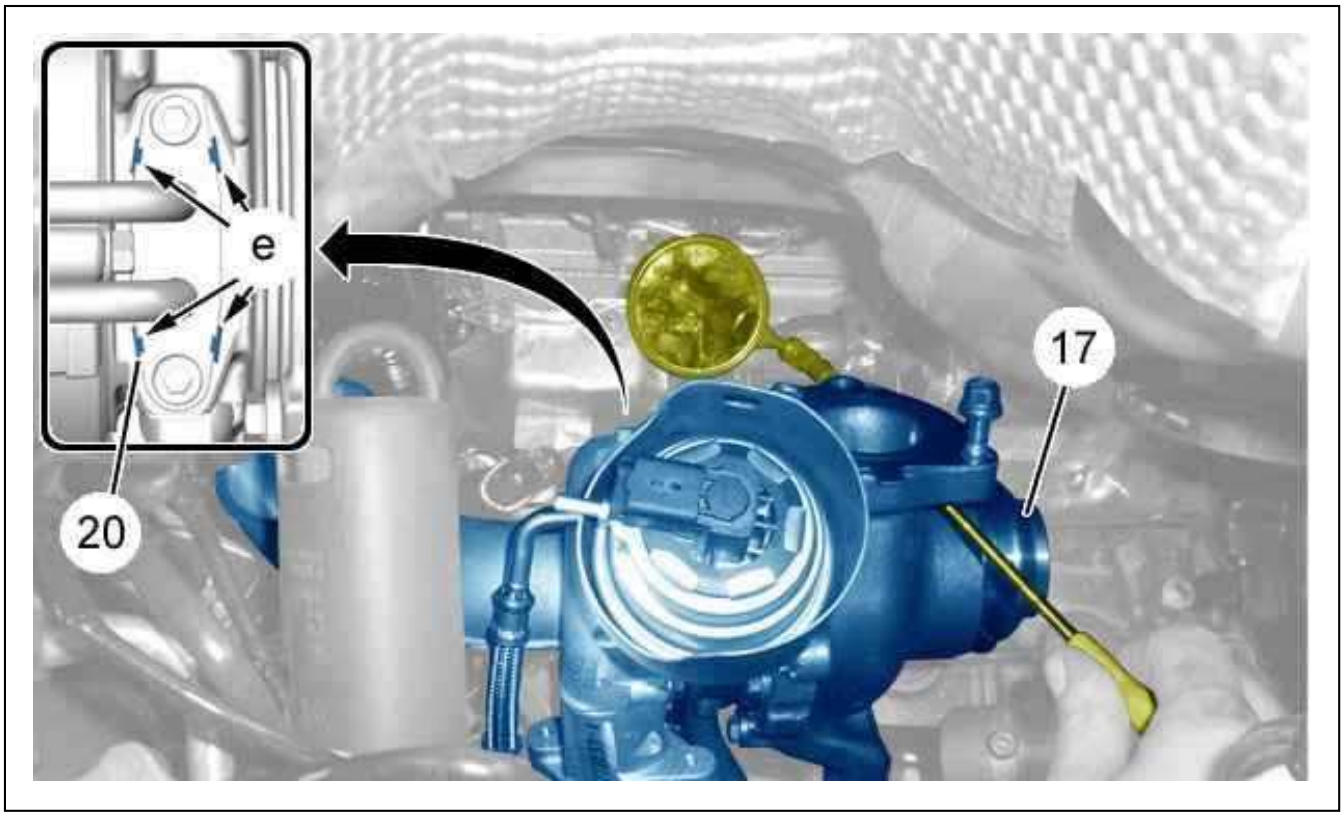


Figure : B1HG0H6D

CAUTION : Fit new seals .

Refit the seal (20) (New).
Put the turbocharger (17) in place in an inclined position.
Tighten the bolt (16) .
Refit :

- The coolant fluid duct (19)
- The bolts (18)

CAUTION : With the aid of a mirror, check the presence of the four lugs on the seal (20) of the coolant fluid duct (19) (as "e").

Remove the hose clamps [4153-T / 1512].

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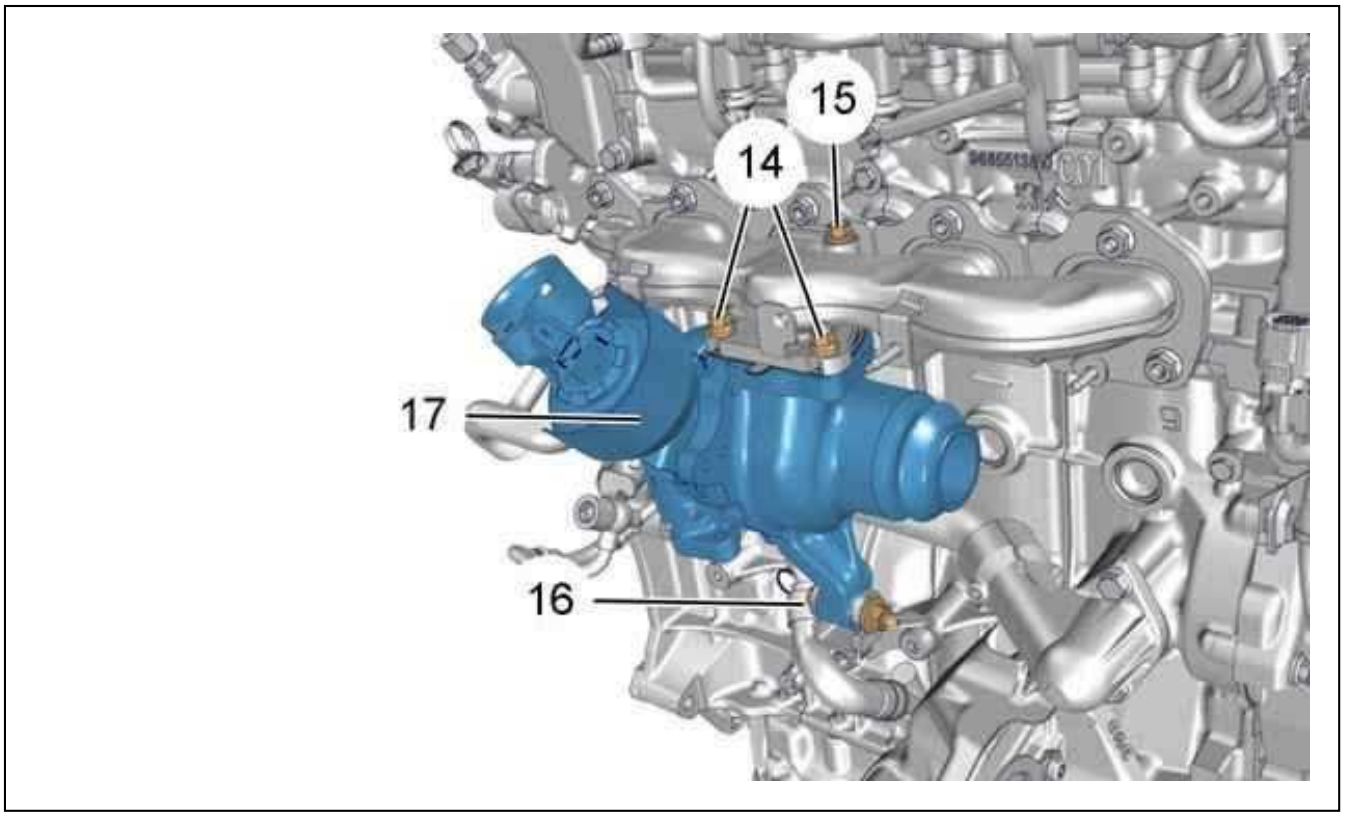


Figure : B1HG0H7D

Slacken the bolt (16).
Tilt the turbocharger (17).
Refit bolt (15).
Tighten :

- The nuts (14)
- The (16) bolt

CAUTION : When refitting the exhaust manifold heat shield, do not mix up the long screw (13) and the short screws (12).

Refit :

- The heat shield for the control electrovalves (Carefully)
- The bolts (11)
- The exhaust manifold heat shield
- The short screws (12)
- The long screw (13)

Clip in place : The electrical harnesses (as "c").

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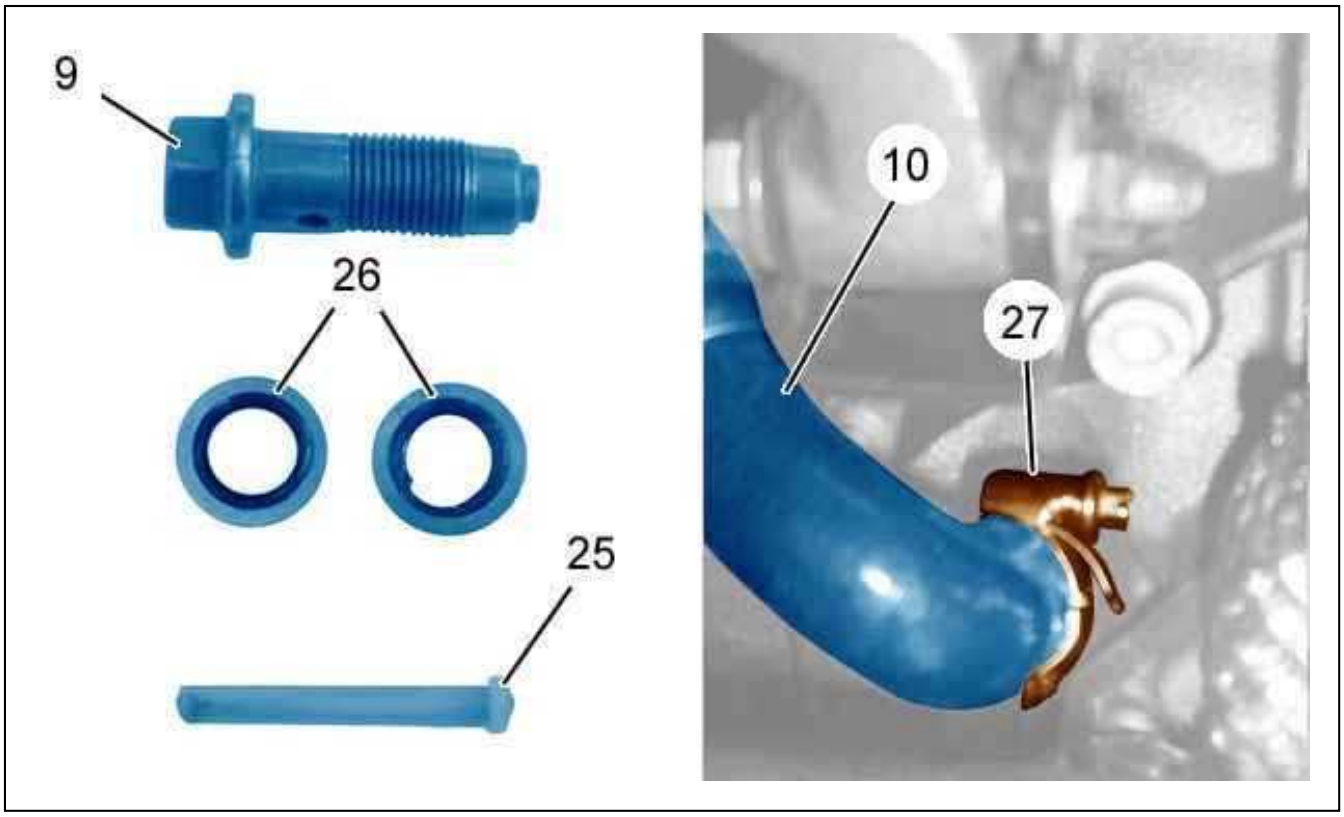


Figure : B1HG0HCD

CAUTION : Before refitting the banjo bolt (9), check the condition of the filter bolt (25) (Exchange it if necessary).

Refit :

- The banjo bolt (9)
- The new seals (26)

Couple up : The lubrication tube (10) ; Point the clip (27) in the anti-clockwise direction (as shown on the illustration).

CAUTION : Check that there are no foreign bodies in the air ducts.

Couple up : The air entry union (5).
Refit :

- The (6) bolt
- The air outlet pipe (8) of the turbocharger (17) (With a new seal)
- The bolts (7)

Connect the negative pressure pipe (as "b").
Reconnect the turbocharger position repeat sensor(as "a").
Refit :

- The front right transmission (4)
- The pre-catalytic converter (2)
- The resonator (1)
- The (3) bolt
- The protective panel under the engine

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

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4. Precautions to be taken before starting the vehicle

CAUTION : Do not start the vehicle without having carried out the following operations.

Disconnect the camshaft position sensor connector.
Turn the engine over with the starter motor for 15 seconds.
Connect the camshaft position sensor connector.
Let the engine run at idle for 30 seconds before increasing the load.

N.B. : After switching on, check the sealing of the various unions.

Clear the faults in the memory ; Using a diagnostic tool.

5. Checking the levels

Check and top up the coolant fluid level if necessary. Bleed if necessary.
Check the engine oil level ; Top up if necessary.

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REMOVING - REFITTING : ENGINE ECU

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Before adding or replacing any parts, ensure that the customer has not lost their confidential card.

1. Removing

Disconnect the battery.

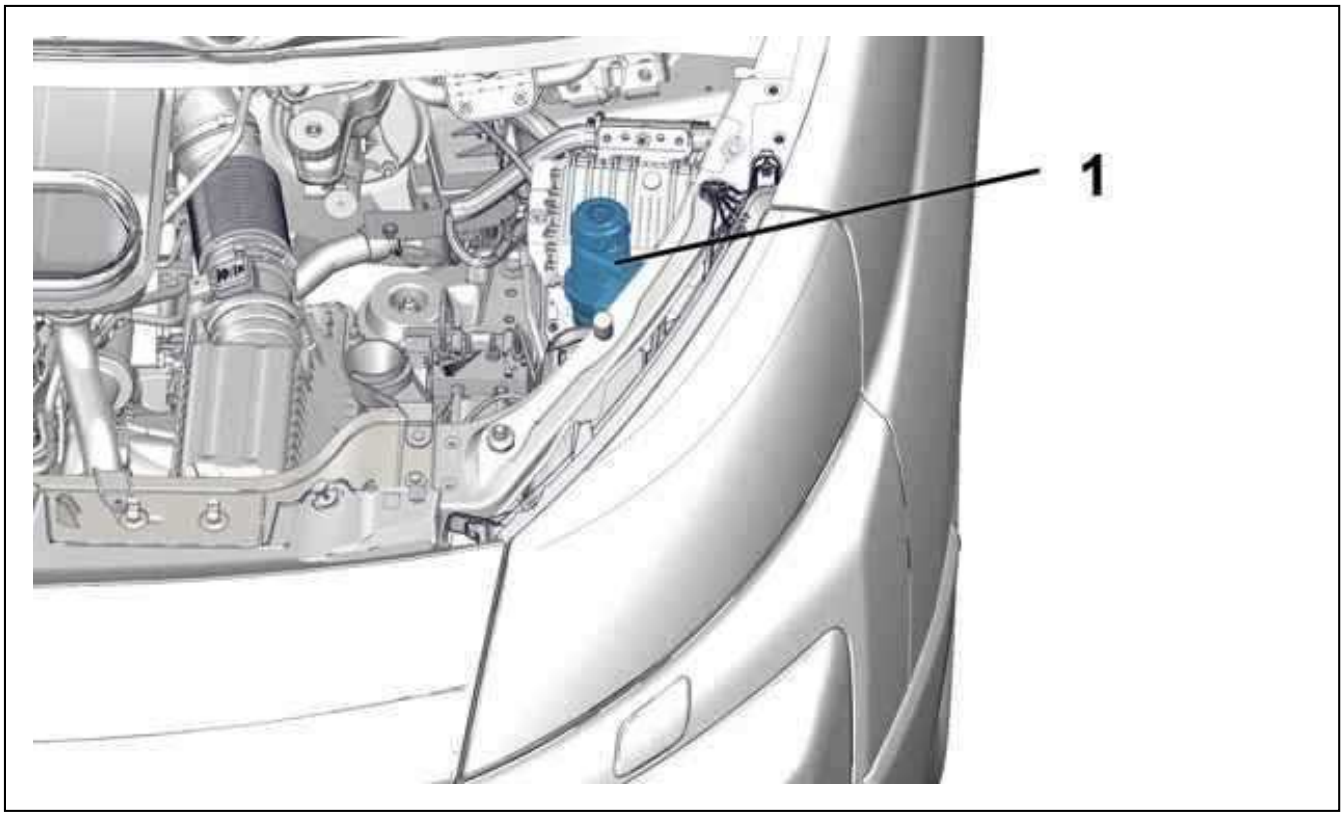


Figure : C4AM03PD

Remove and move aside the power steering fluid reservoir (1).

N.B. : The reservoir must be secured vertically.

1.1. Vehicle with pneumatic suspension

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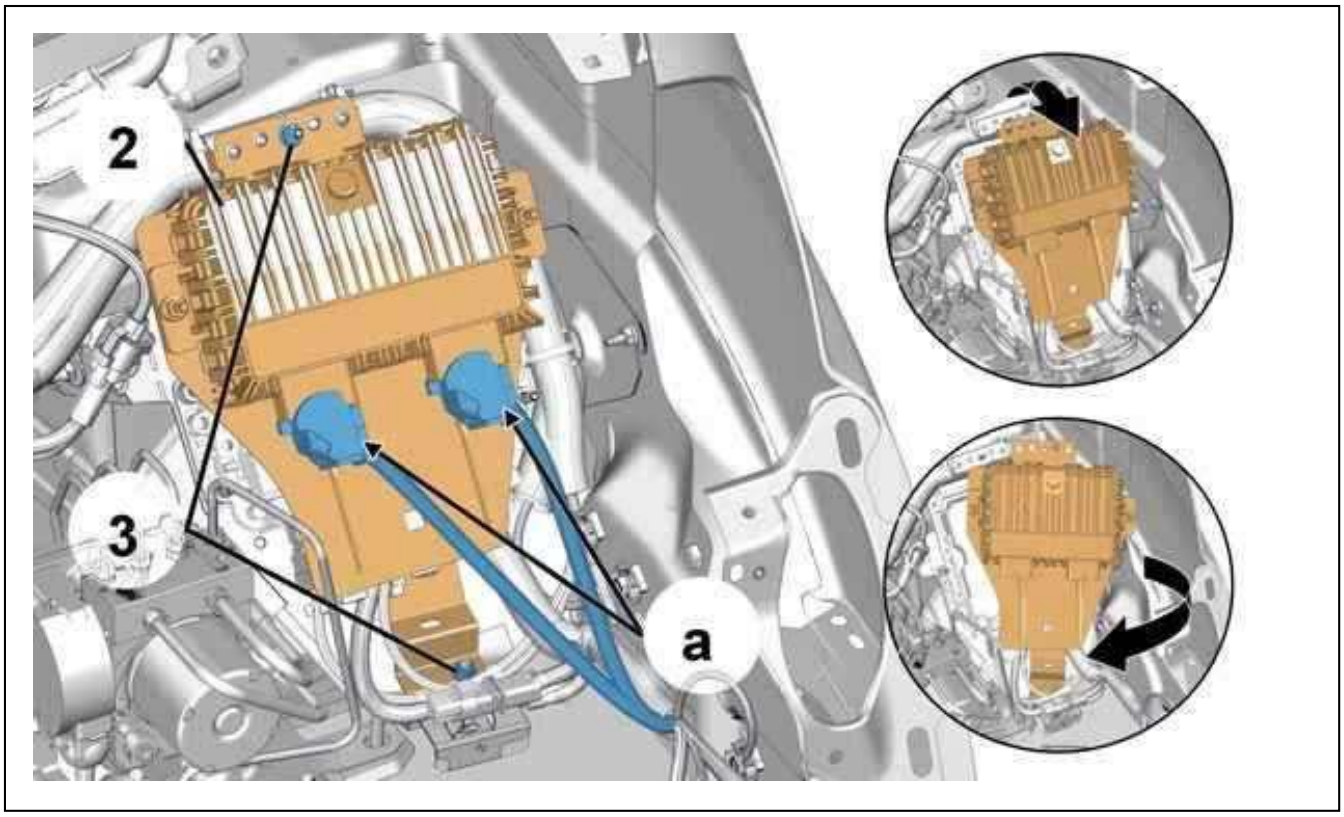


Figure : B1BM048D

Remove the nuts (3).
Disconnect the connectors (at "a").
Swing the pneumatic suspension ECU (2) forwards and then rotate it.
Remove the pneumatic suspension ECU (2).

1.2. Removing (continued)

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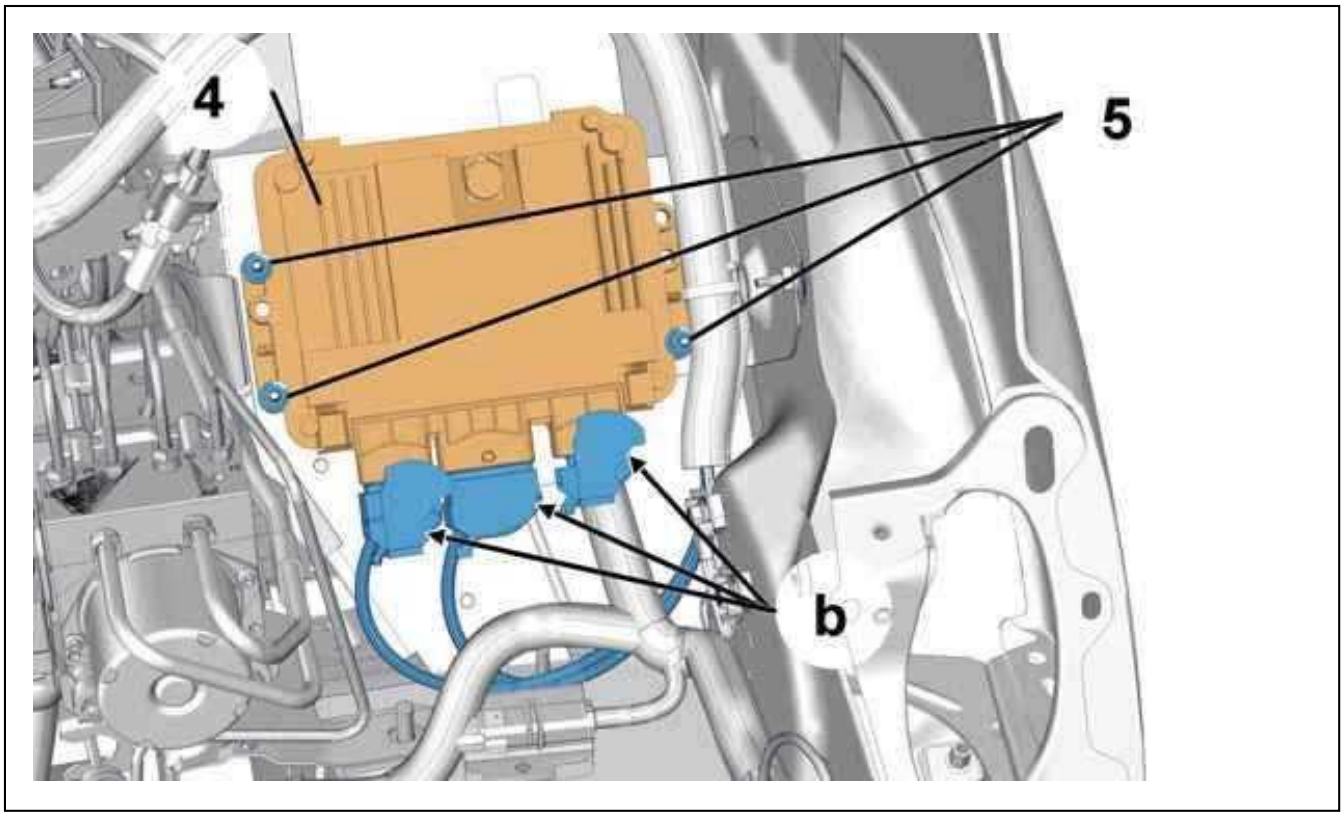


Figure : B1BM049D

Remove the nuts (5).
Disconnect the connectors (at "b").
Remove the engine management ECU (4).

2. Refitting

Connect the connectors (at "b").
Refit :

- The engine management ECU (4)
- The nuts (5) ; Tighten to 0,77 ± 0,11 daN.m

2.1. Vehicle with pneumatic suspension

Connect the connectors (at "a").
Refit :

- The pneumatic suspension ECU (2)
- The nuts (3) ; Tighten to 0,8 ± 0,2 daN.m

2.2. Refitting (continued)

Refit : The power-assisted steering fluid reservoir (1).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

3. Operations to be performed : After a replacing of the engine management ECU

CAUTION : Always carry out the operations below following the replacement of an engine management ECU.

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CAUTION : Swapping an engine management ECU between two vehicles means that it will be impossible to start the vehicles.

N.B. : When changing an engine management ECU, it is necessary to carry out using the diagnostic tool the procedure for the replacement of an engine management ECU from the "replacement parts" menu.

Conditions to be met to carry out the procedure :

- The vehicle access code, recorded on the customer's confidential card, must be available
- Be in possession of a new engine management ECU
- Use the diagnostic tool

4. Engine management ECU downloading

N.B. : The engine management ECU software is updated by downloading (This ecu is fitted with a flash eprom memory) This operation is performed using diagnostic equipment.

Download the engine management ECU (if necessary).

5. Procedures for returning under warranty

N.B. : Disconnecting the engine management ECU results in it being locked automatically.

CAUTION : If a part is returned under warranty, return the engine management ECU with the access code.

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REMOVING - REFITTING : TURBOCHARGER SOLENOID VALVE

ESSENTIAL : Observe the safety and cleanliness recommendations.

1. Removing

CAUTION : After switching off the ignition: wait 15 minutes before disconnecting the battery, to ensure that the initialisations of the various ECUs are memorised.

Disconnect the battery.
Unclip and move aside : The engine cover (towards the front).

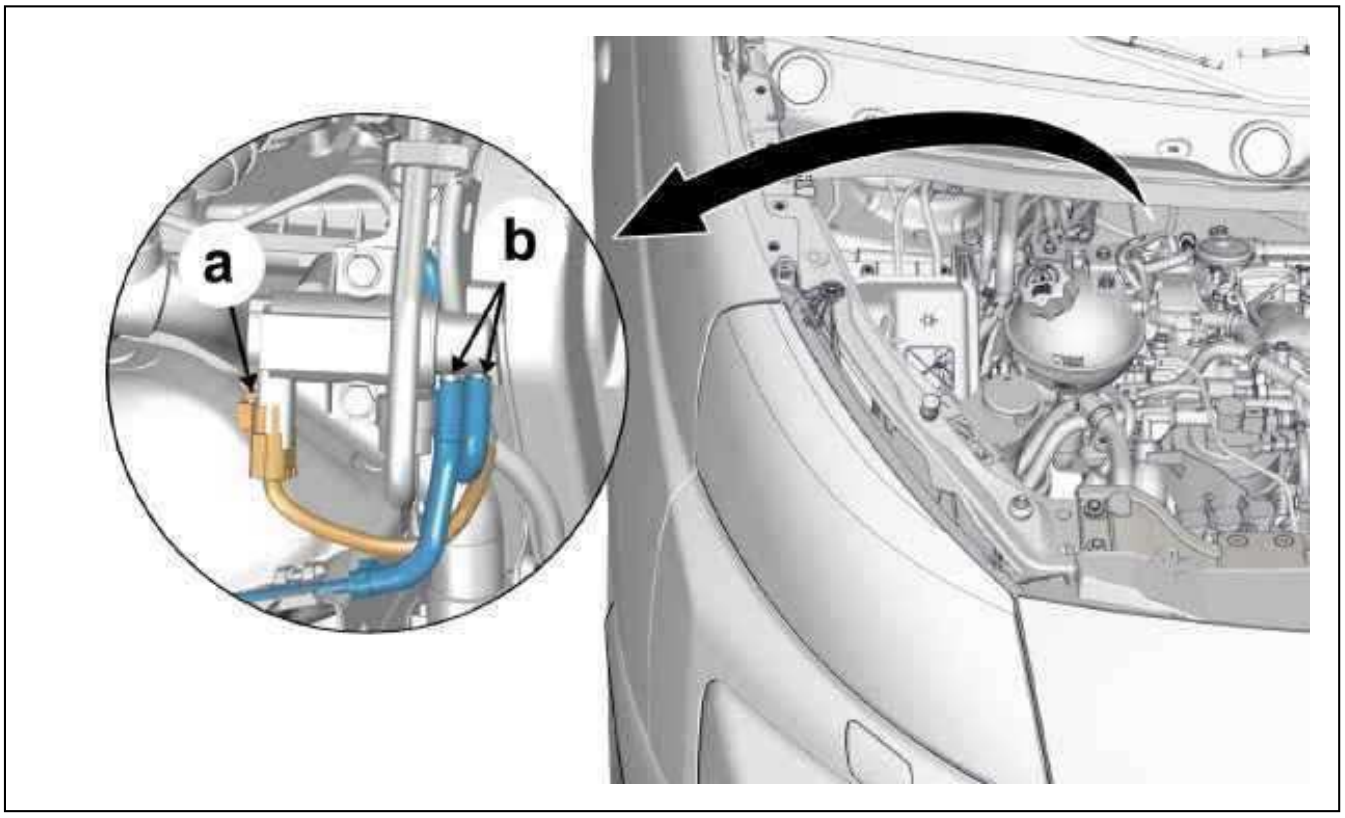


Figure : B1BM047D

Disconnect the connector (at "a").

CAUTION : On each removal :Mark the direction of the vacuum pipes .

Uncouple : The vacuum pipes (at "b").

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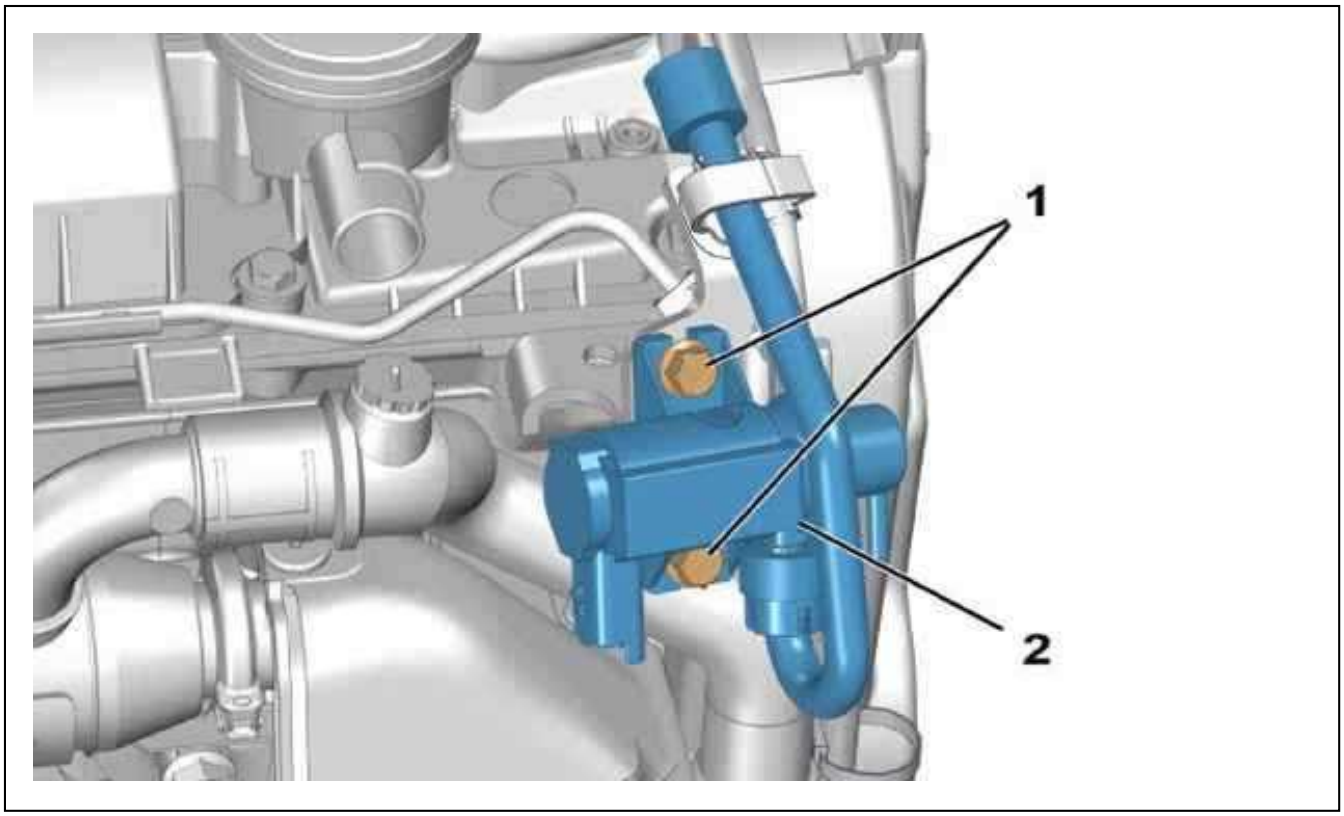


Figure : B1HM01BD

Remove :

- The bolts (1)
- The turbocharger solenoid valve (2)

2. Refitting

Refit :

- The turbocharger solenoid valve (2)
- The bolts (1) ; Tighten to 0,7 ± 0,1 daN.m

CAUTION : When refitting : Do not reverse the vacuum pipes .

Couple up : The vacuum pipes (at "b").
Connect the connector (at "a").
Refit the engine style cover .
Reconnect the battery.

CAUTION : Perform the operations to be carried out following reconnection of the battery .

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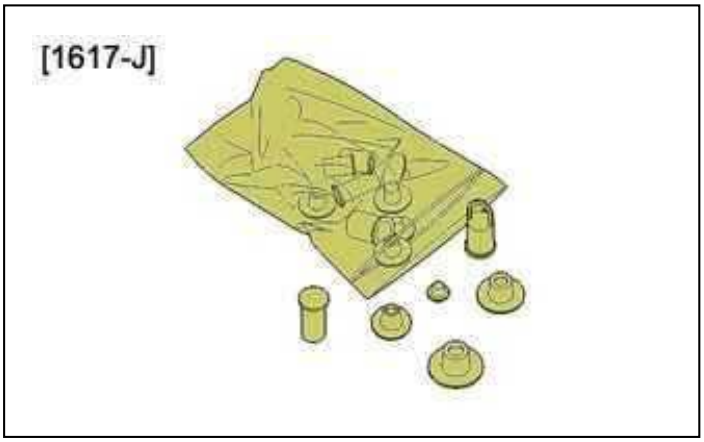
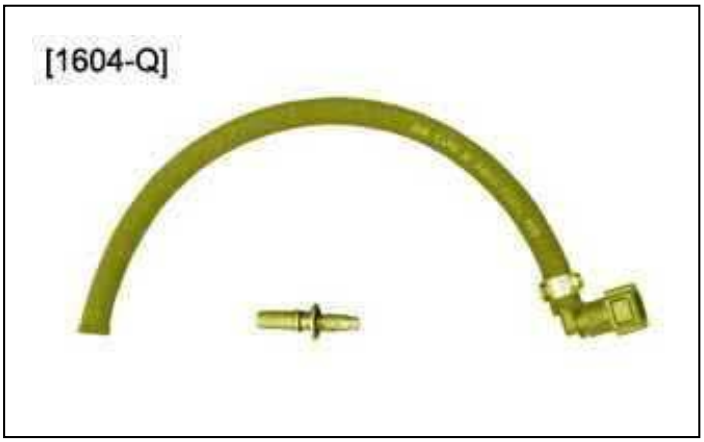
DRAIN - REFILL : FUEL TANK

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : Depending on the vehicle, use the method that is most appropriate.

1. Tooling

Equipment : station for draining and filling fuel tanks (see garage equipement catalogue).

tool	Reference	Designation
 Figure : E5AB0FMT	[1617-J]	Set of plugs HDI
 Figure : E5AB15YT	[1604-Q]	8 mm diameter union for low pressure take-off

2. Draining the fuel tank via the filler neck

CAUTION : Make sure you will observe the operating instructions of the drain unit.

CAUTION : Use a clean receptacle to collect the fuel.

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2.1. Draining the fuel tank

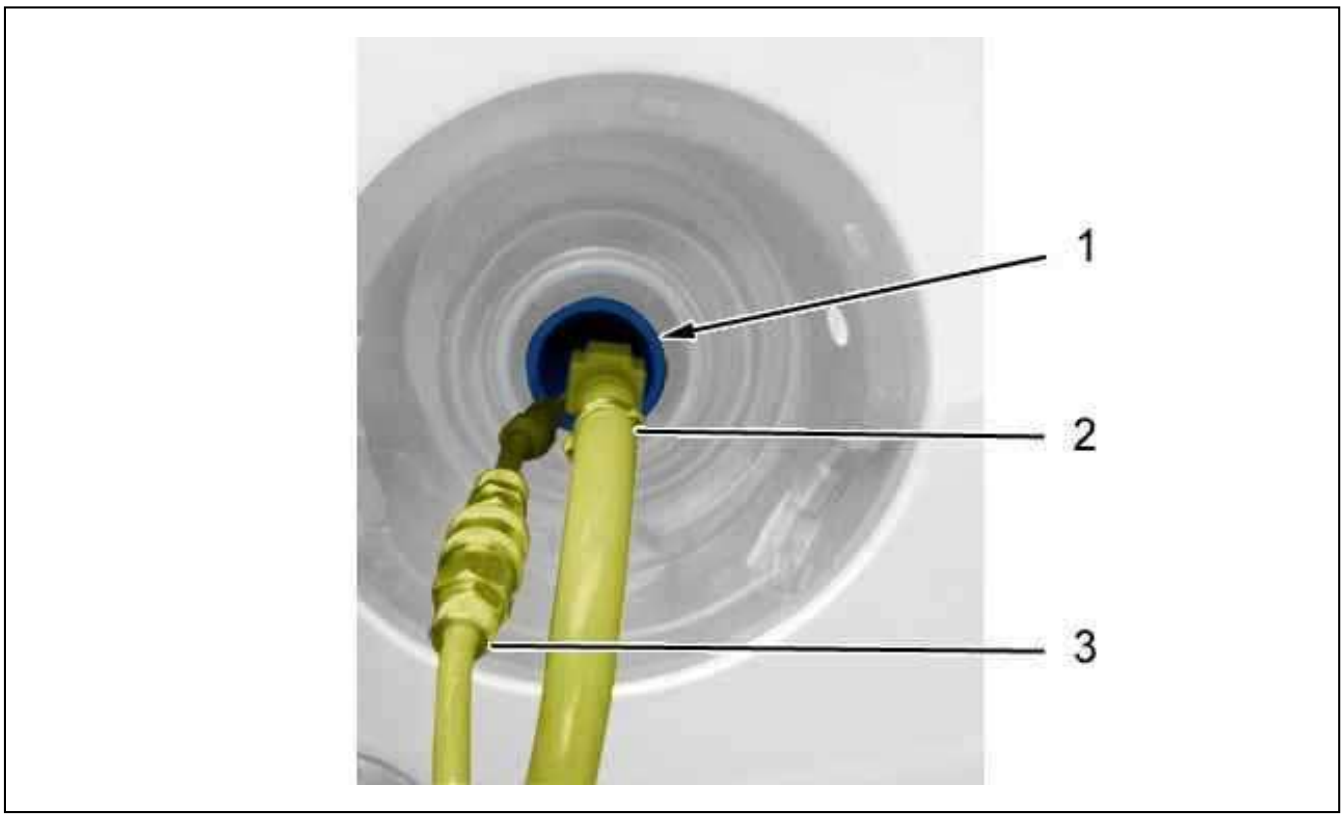


Figure : B1HI00KD

CAUTION : This operation should be carried out with the ignition switched off in order not to interfere with the functioning of the fuel gauge.

Connect plunger pipe (1) to suction pipe (2).
Position suction pipe (2) in fuel tank filler neck .
Couple up The fuel vapour re-induction pipe (3).
Suction the fuel ; Using the equipment .
Uncouple The fuel vapour re-induction pipe (3).
Remove the suction pipe (2) from the fuel tank filler neck (1).
Disconnect plunger pipe (1) from suction pipe (2).

2.2. Fuel filling

CAUTION : If the fuel recovered is polluted, use the strainer when filling.

Fill the tank ; Using the equipment .

3. Draining the fuel tank through the opening of the fuel pump and gauge assembly

3.1. Draining the fuel tank

CAUTION : Protect the vehicle’s carpets and seats.

ESSENTIAL : Open the vehicle’s windows and doors while draining the fuel tank.

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Remove the fuel pump gauge module .

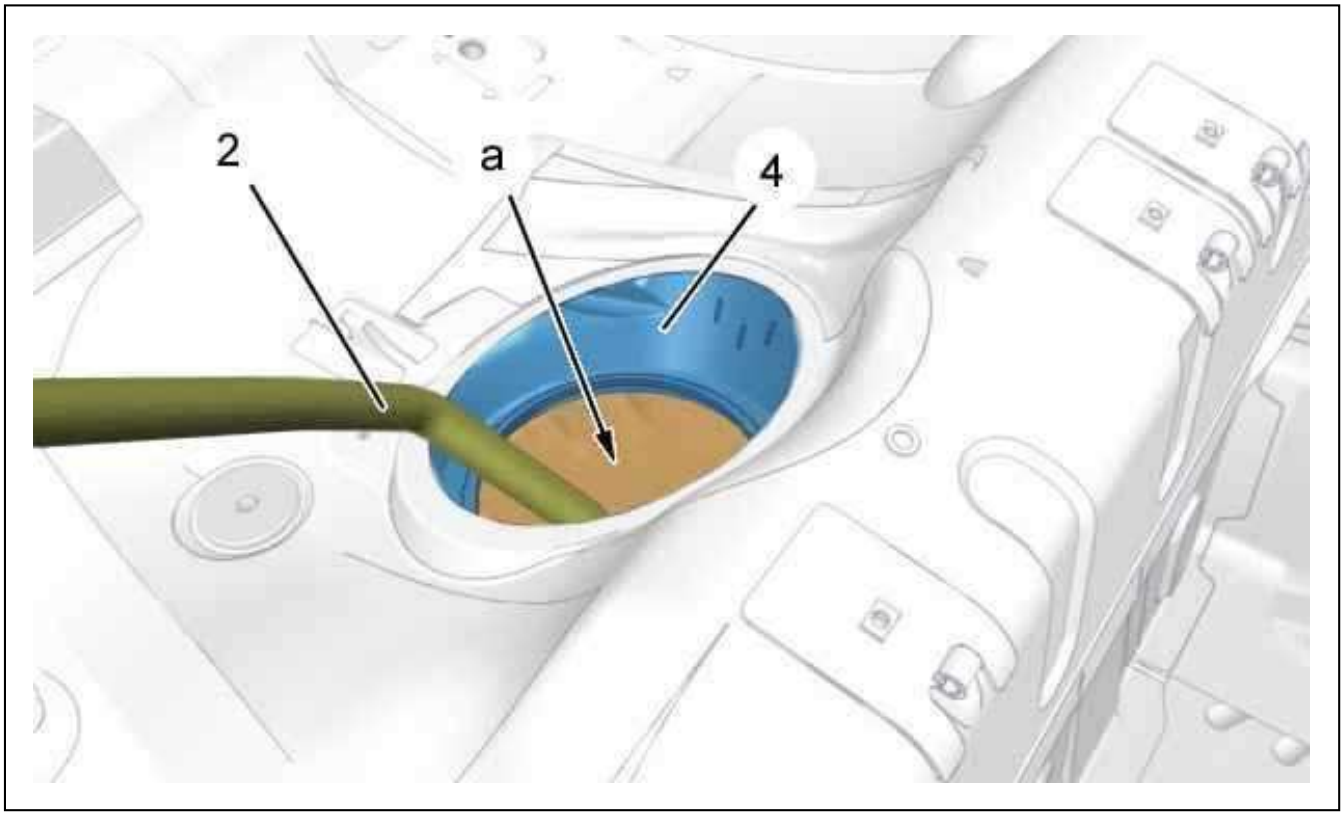


Figure : B1HI00ID

ESSENTIAL : Suction the fuel vapours from the pipe (3) ; Connect the vehicle to an approved gas extractor for this type of operation.

Position the suction pipe (2) via the opening of the fuel pump gauge module (at "a").
Drain the fuel tank (4) ; Using the equipment .

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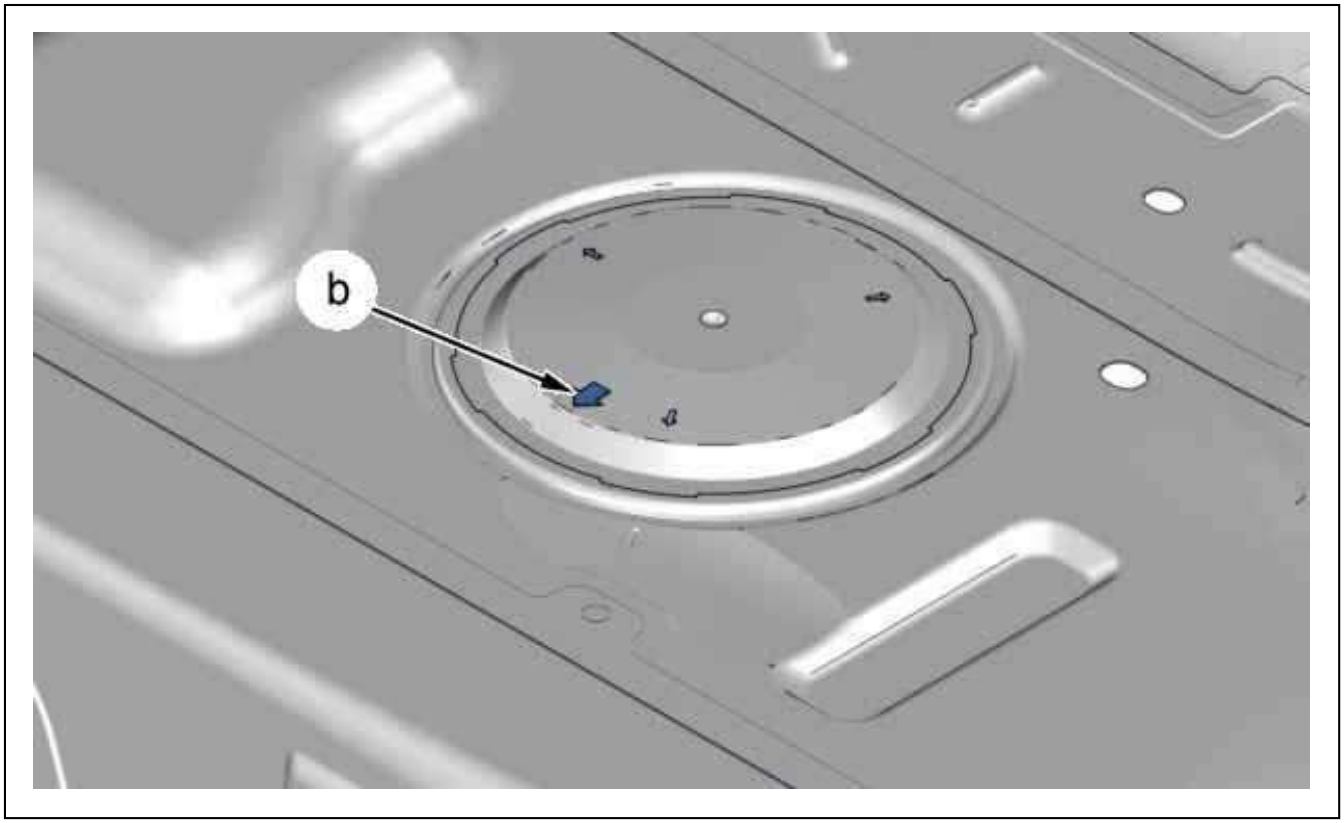


Figure : B1HI00UD

CAUTION : Repositioning of the access cap to the fuel pump-gauge assembly Towards the front of the vehicle (following the arrow) (at "b").

Refit the fuel gauge and pump assembly.

3.2. Special features of vehicles fitted with a two-compartment fuel tank

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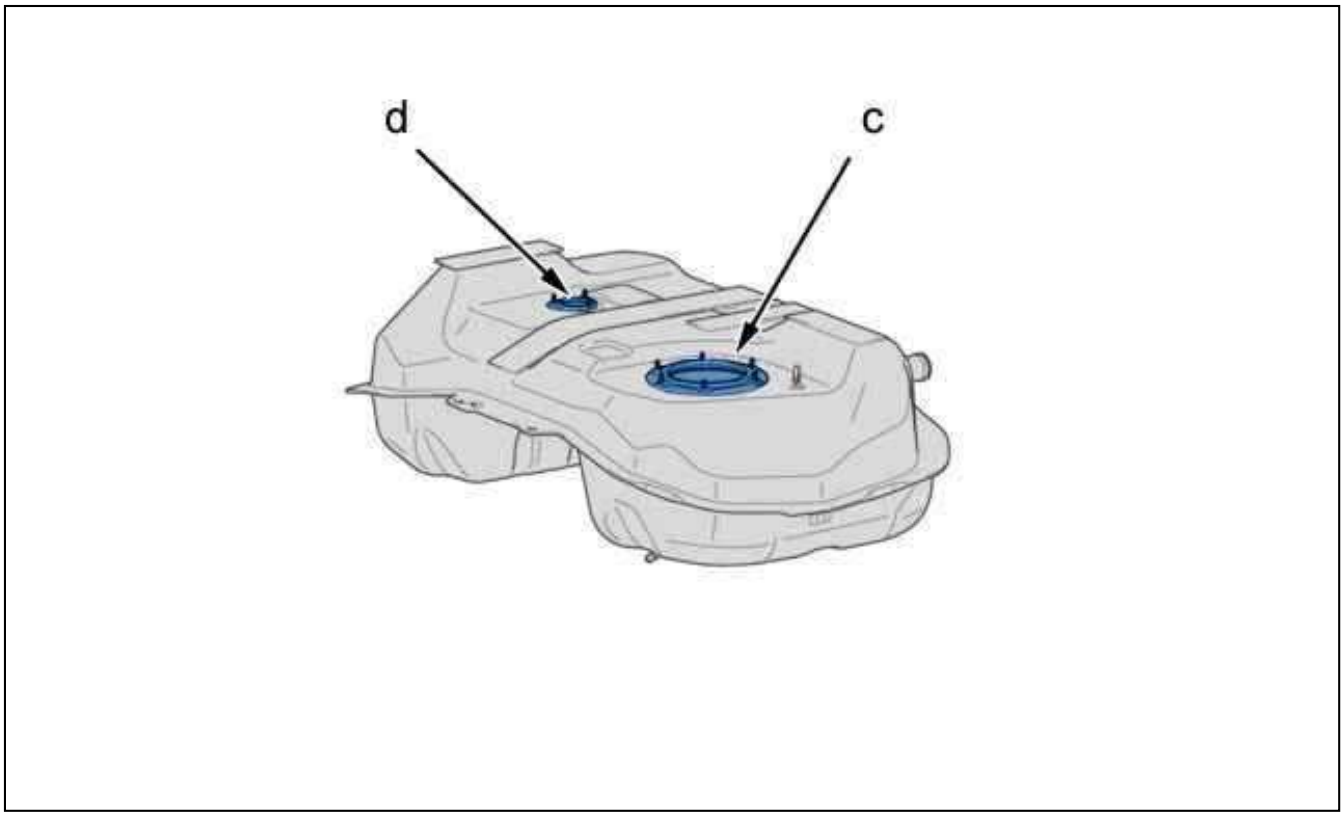


Figure : B1HI00VD

For certain vehicles, the 2 compartments of the fuel tank must be drained.
Remove the fuel pump gauge module .
Drain the reservoir (at "c", "d") ; Using the equipment .
Refit the 2 fuel pump/gauge module assemblies.

3.3. Fuel filling

CAUTION : If the fuel recovered is polluted, use the strainer when filling.

Fill the tank ; Using the equipment .

4. Draining the fuel tank via the injection rail supply (petrol)

4.1. Draining the fuel tank

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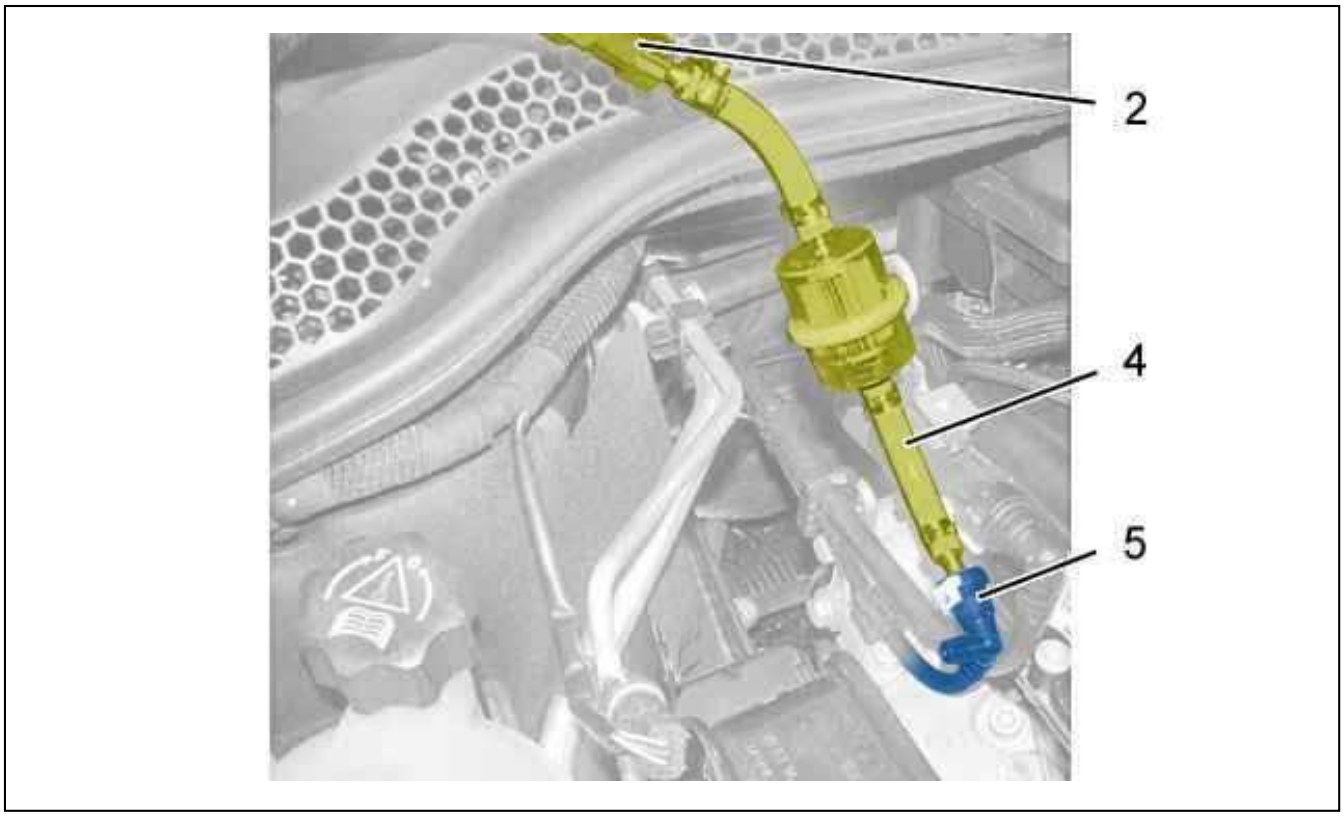


Figure : B1HI00LD

CAUTION : Drop the pressure in the fuel supply circuit.

Disconnect fuel injection rail supply hose (5) from the fuel injection rail.
Connect suction pipe (2) to union (4).
Connect union (4) to fuel injection rail supply hose (5).
Suction the fuel ; Using the equipment .
Disconnect union (4) from fuel injection rail supply hose (5).
Disconnect suction pipe (2) from union (4).
Connect fuel injection rail supply hose (5) to the fuel injection rail.

4.2. Fuel filling

CAUTION : If the fuel recovered is polluted, use the strainer when filling.

Fill the tank ; Using the equipment .

5. Draining the fuel tank by supplying the fuel high-pressure pump (engine 4N13)

5.1. Draining the fuel tank

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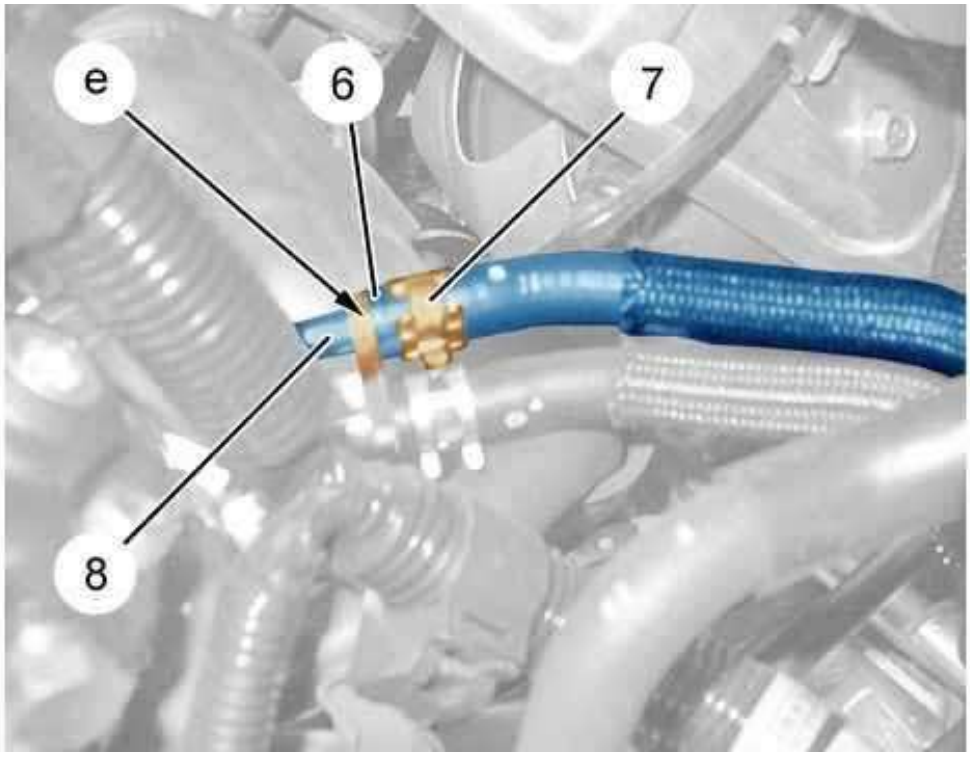


Figure : B1HI00WD

Remove the air filter housing .
Protect the surrounding area from any spray of fuel.
Push back the collar (7).
Uncouple the fuel supply pipe (6) (at "e").
Connect hose (6) to the end of the tool [1604-Q].
Put the clip (7) in place.
Block the pipe (8) ; Using tool [1617-J].

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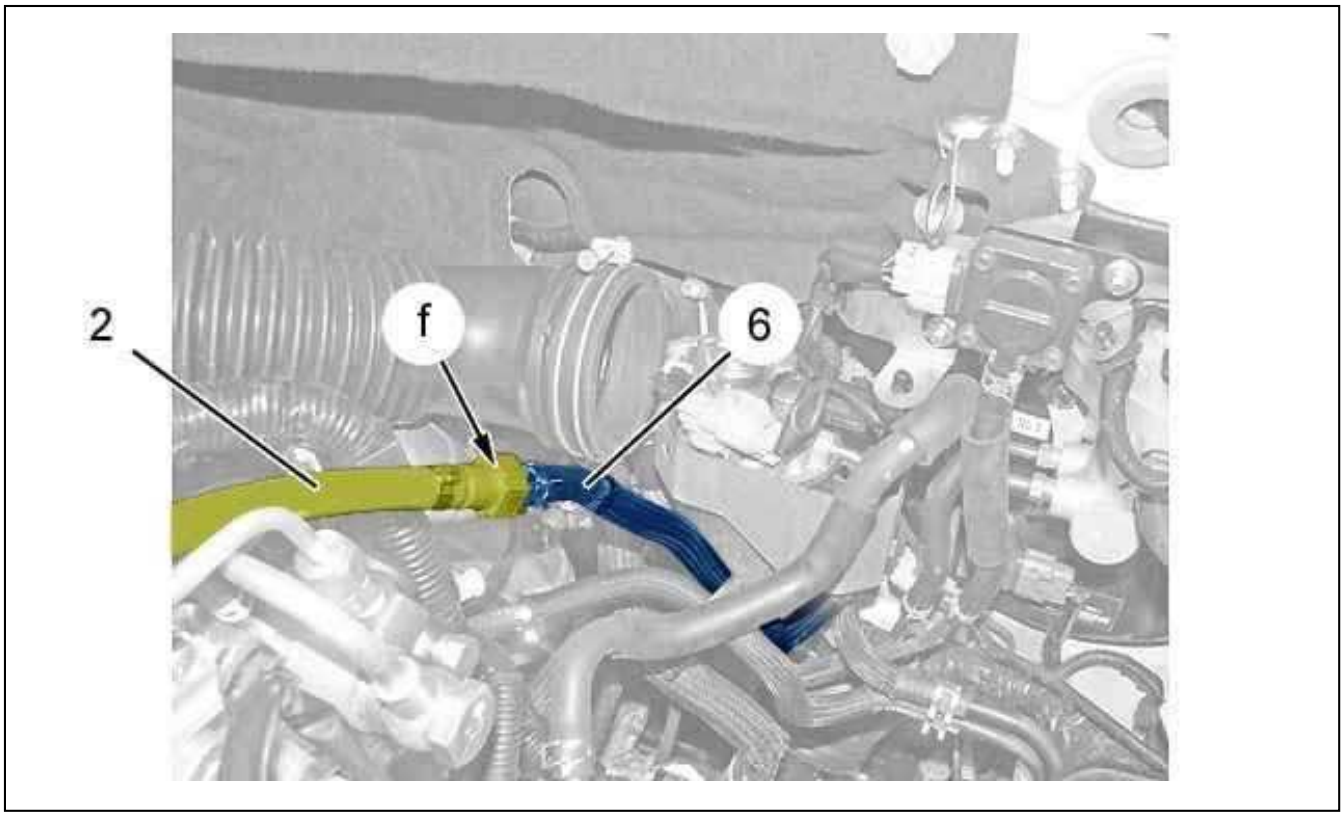


Figure : B1HI00XD

Connect suction pipe (2) to fuel supply hose (6) (at "f").
Suction the fuel ; Using the equipment .
Disconnect suction pipe (2) from fuel supply hose (6) (at "f").
Remove the tool [1617-J] from the pipe (8).
Push back the collar (7).
Disconnect hose (6) from the end of the tool [1604-Q].
Connect the fuel supply pipe (6) (at "f").
Put the clip (7) in place.
Refit the air filter housing .

5.2. Fuel filling

CAUTION : If the fuel recovered is polluted, use the strainer when filling.

Fill the tank ; Using the equipment .

6. Draining the fuel tank (DV6C, DV6D, DV6E, DV6UC, DV6CM, DV6DM, DV6DUM et DV6EM et DV4C version)

6.1. Draining the fuel tank

Protect the surrounding area from any spray of fuel.
Uncouple the fuel supply pipe (Fuel filter outlet).

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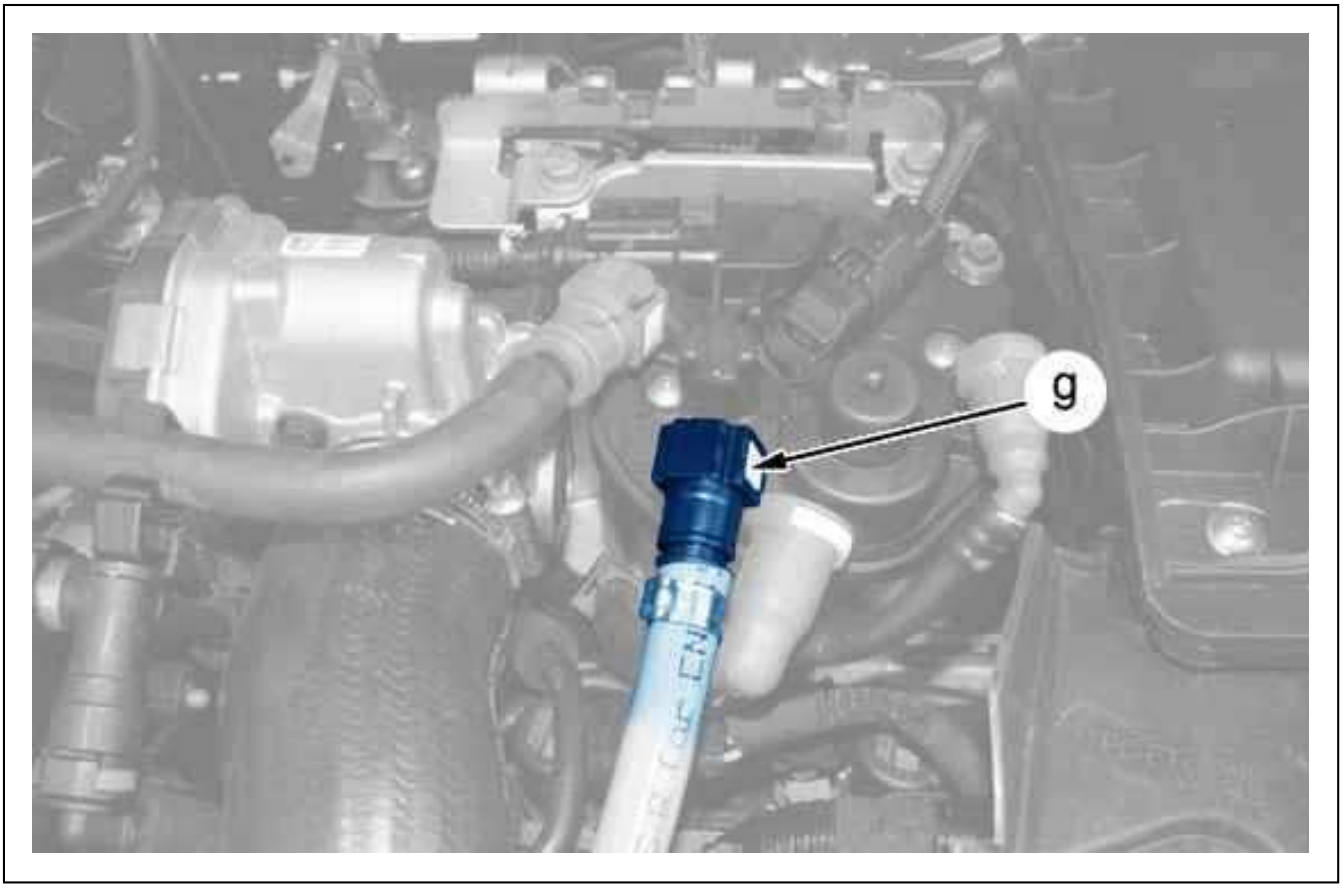


Figure : B1HI00YD

Couple up the filling station click-fit union (at "g").
Suction the fuel ; Using the equipment .
Uncouple the filling station click-fit union (at "g").
Connect the fuel supply pipe .

6.2. Fuel filling

CAUTION : If the fuel recovered is polluted, use the strainer when filling.

Fill the tank ; Using the equipment .

7. Special features of vehicles fitted with a particle filter

CAUTION : The fuel recovered is not compatible with engine versions that do not have particle filters.

The fuel which is retrieved contains an additive for particulate emission filter requirements.
The quantity of additive injected into the fuel tank corresponds to the quantity of fuel and is defined by the fuel additive adding ECU.
Put back all of the fuel recovered.
If the fuel taken during the draining operation is not re-usable (water or impurities present), proceed as follows :

- Place the cap on the fuel tank
- Switch on the ignition for 5 seconds (minimum)
- Switch off the ignition
- Remove the plug
- Refill the tank

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N.B. : This operation enables the fuel additive adding ECU to inject the quantity of additive corresponding to the quantity of diesel added.

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CLEANING : UNIONS ON THE FUEL HIGH PRESSURE COMMON INJECTION RAIL (HDI)

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment :

- Degreasing product (Type SODIMAC N°35)
- Brush
- Cleaning tray
- Vacuum extractor
- Round end-piece

2. Method of operation

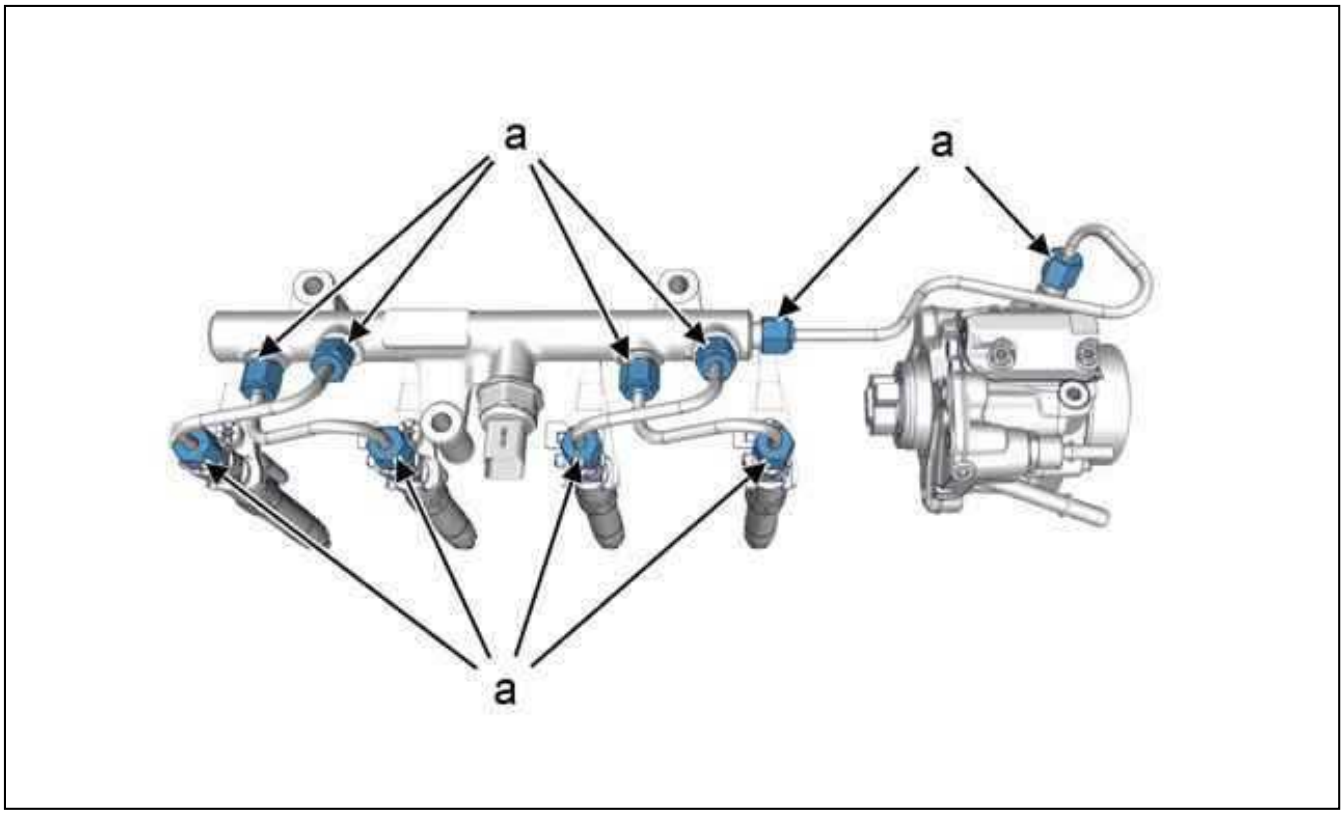


Figure : B1HJ001D

Clean the repair areas (at "a") :

- Pour the degreasing product into the cleaning tray
- Dip the brush in the degreasing product
- Clean the points "a" using the product and draw up simultaneously using suction equipment

Clean the vacuum cleaner and the round adaptor after use.

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TIGHTENING TORQUES : EXHAUST SYSTEM

CAUTION : (*) Follow the tightening procedure.

1. pre-catalyst

1.1. Tightening torques

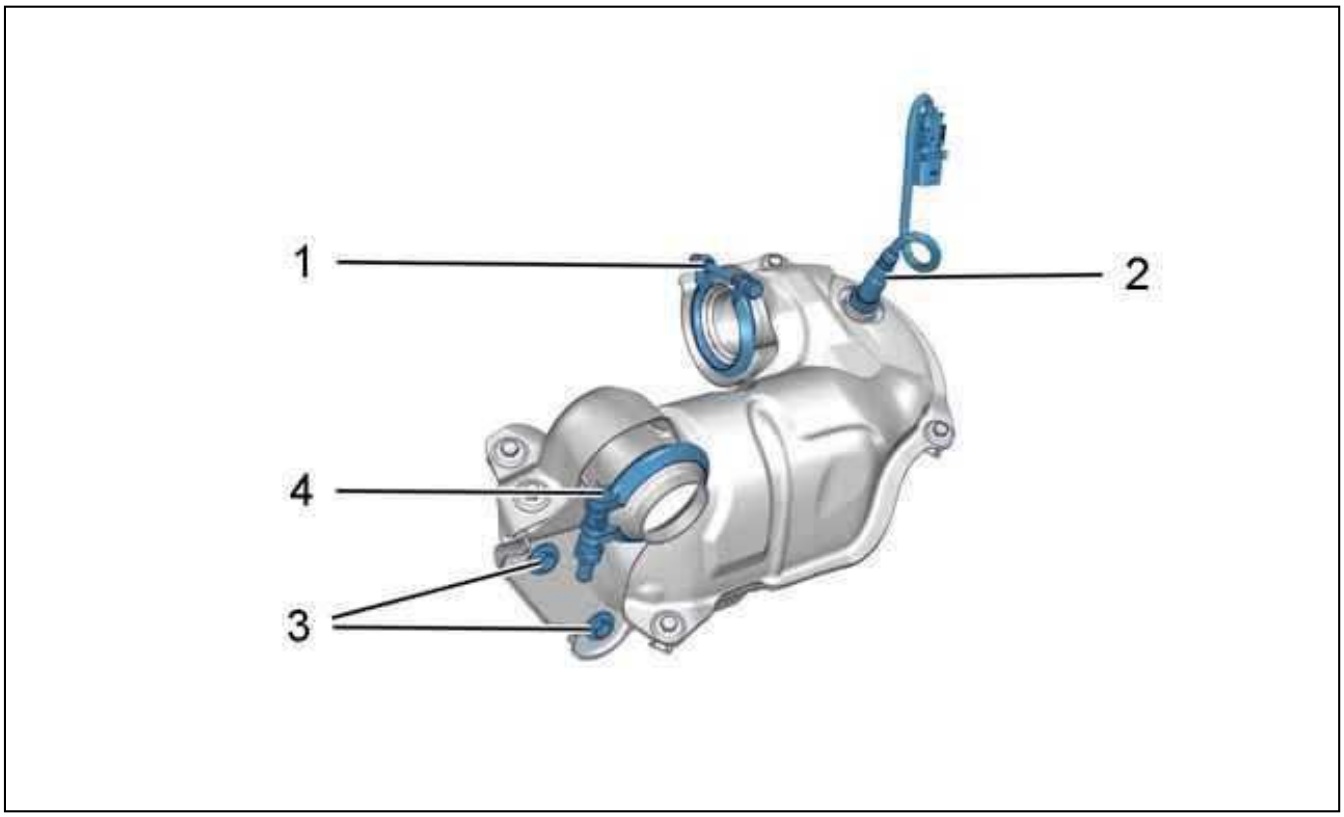


Figure : B1JB098D

Reference	Designation	Tightening torque
(1)	Clip / Turbocharger outlet (*)	2,2 daNm
(2)	Oxygen sensor	5 daNm
(3)	bolts / Pre-catalyser support (*)	2 daNm
(4)	Clip / Front pipe	2,5 daNm

1.2. (*) Tightening procedure : pre-catalyst

Tightening procedure :

- Put the pre-catalyser in place
- Do up the bolts (3)
- Tighten the clip (1) to the specified torque
- Tighten the bolts (3) to the specified torque

2. Exhaust system

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2.1. Tightening torques : Assembly without exhaust heat recovery

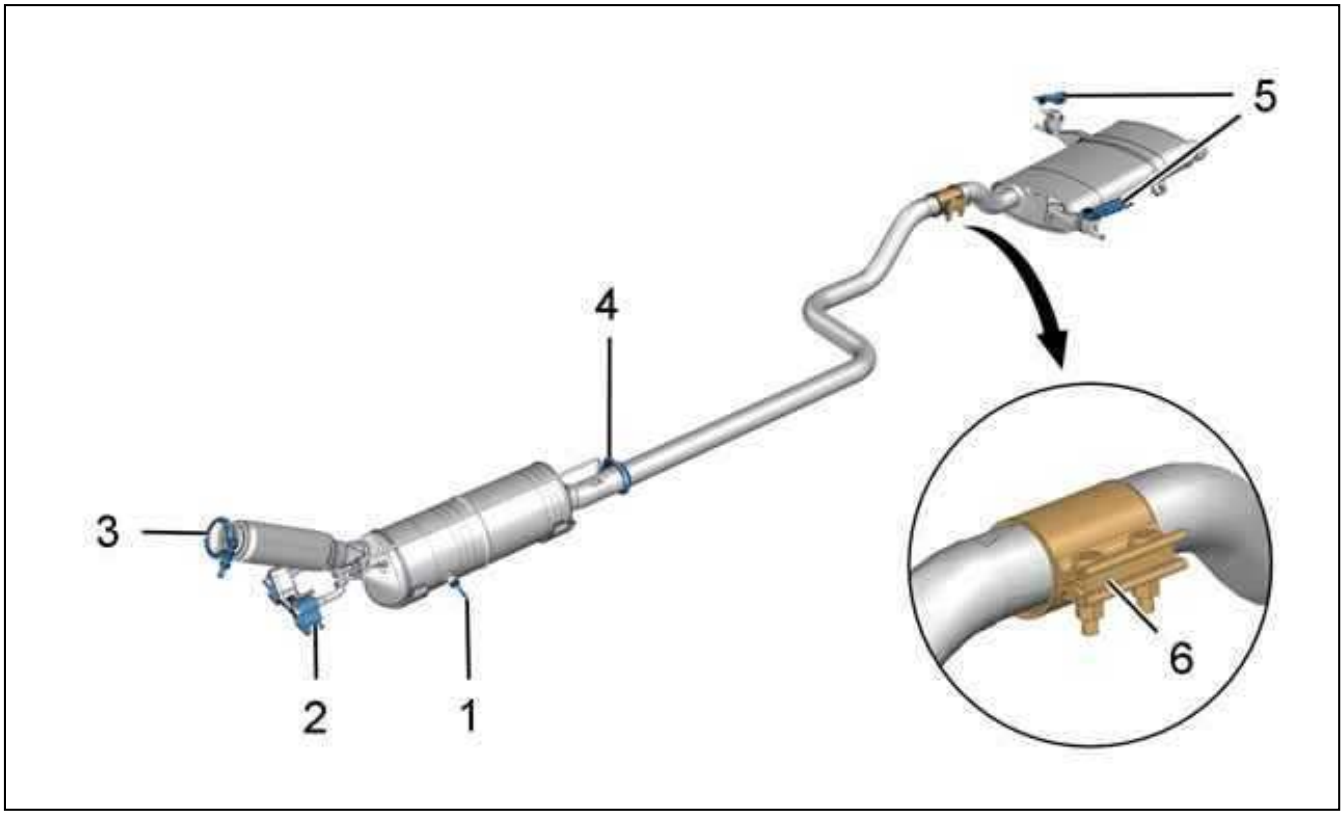


Figure : B1JB099D

Reference	Designation	Tightening torques
(1)	Exhaust gas temperature sensor	1 daNm
(2)	nuts / Exhaust front hangers	1 daNm
(3)	Clip /Turbocharger outlet	2,5 daNm
(4)	Clip / Front pipe	2,5 daNm
(5)	nuts / Exhaust rear hangers	1 daNm
(6)	Connecting sleeve TORCA	5,2 daNm
	Connecting sleeve CAILLAU	2,1 daNm

2.2. Tightening torques : Assembly with exhaust heat recovery

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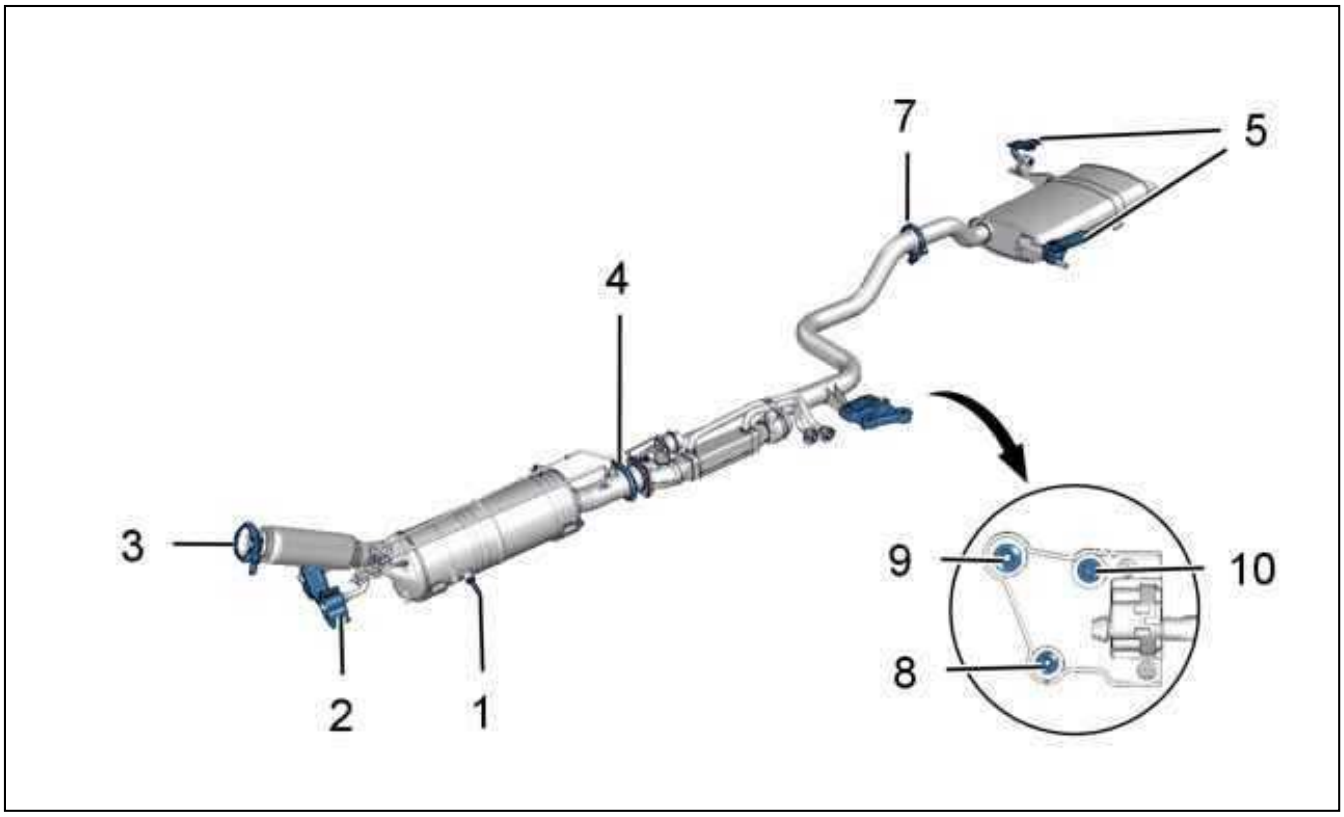


Figure : B1JB09AD

Reference	Designation	Tightening torques
(1)	Exhaust gas temperature sensor	1 daNm
(2)	nuts / Exhaust front hangers	1 daNm
(3)	Clip / Turbocharger outlet	2,5 daNm
(4)	Clip / Front pipe	2,5 daNm
(5)	nuts / Exhaust rear hangers	1 daNm
(7)	Clip / exhaust silencer	2,5 daNm
(8)	M6 nut / Intermediate exhaust line hanger	1 daNm
(9)	M8 nut / Intermediate exhaust line hanger	1,4 daNm
(10)	bolts / Intermediate exhaust line hanger	1 daNm

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TIGHTENING TORQUES : EXHAUST SYSTEM

1. pre-catalyst

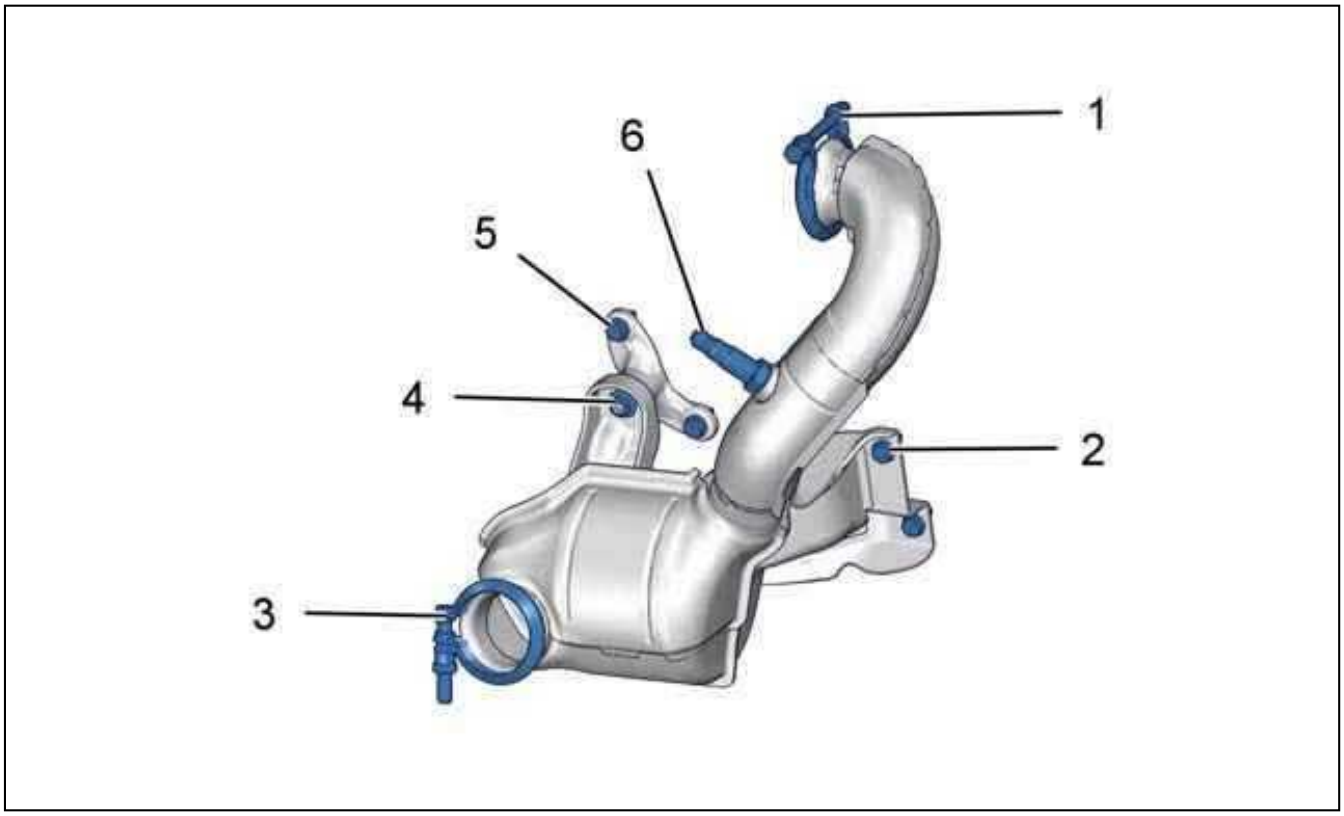


Figure : B1JB0AUD

Reference	Designation	Tightening torque
(1)	Self-slackening clip	2,5 daNm
(2)	bolts : pre-catalyst / Cylinder block	2 daNm
(3)	Exhaust clip	2,5 daNm
(4)	nut : pre-catalyst / support	2 daNm
(5)	bolts : support / Cylinder block	2 daNm
(6)	Oxygen sensor	3 daNm

2. Exhaust system

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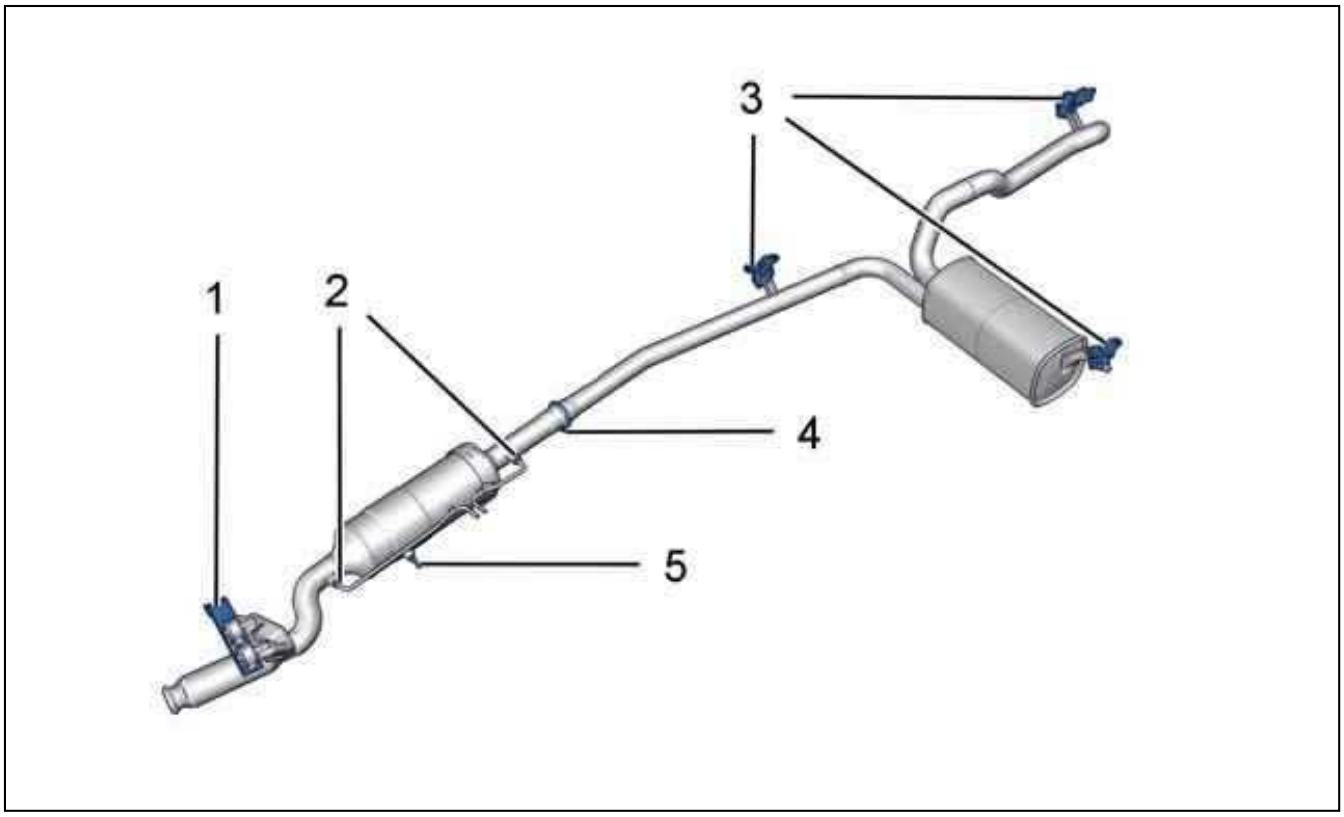


Figure : B1JB0AVD

Reference	Designation	Tightening torque
(1)	Exhaust front hangers	0,8 daNm
(2)	Exhaust gas pressure take-off pipes	3 daNm
(3)	Exhaust rear hangers	1 daNm
(4)	(/) clips	2,5 daNm
(5)	Exhaust gas temperature sensor	3 daNm

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TECHNICAL NOTE : ADDITIVES FOR PARTICLE FILTER

This document describes the after-sales maintenance operations that follow from the changes in the particle filter additives.

CAUTION : This document concerns filling of the rigid reservoir only. The additive must be used only on the vehicles that have a particle filter.

1. The new 3rd generation particle filter additives

Suppliers and brands :

- RHODIA : EOLYS POWERFLEX
- INFINEUM : F7995

2. Previous type of additive

Additive DPX 42 is still available and must be used for all servicing on vehicles that have DPX 42.
The EOLYS 176 additive is replaced by the INFINEUM F7995 additive. When current stocks are exhausted, only the new product will be supplied.

3. Compatibility between additives

Additive DPX42 cannot be mixed with any other additive.
Additives EOLYS POWERFLEX and INFINEUM F7995 cannot be mixed with each other.

N.B. : The different generations of additive do not affect the calibrations of the engine management ECU.

CAUTION : It is not permissible to mix additives INFINEUM F7995 and Rhodia EOLYS POWERFLEX with each other

4. Filling or topping up with additive

Conversion chart for filling or topping-up operations		
Additive present in the vehicle	Colour of clickfit on filler interface	Additive to be used in all operations
DPX 42	Click-fit neither blue nor green	DPX 42
EOLYS 176	Green clickfit	EOLYS 176 - INFINEUM F7995
INFINEUM F7995	Green clickfit	INFINEUM F7995
EOLYS POWERFLEX	Blue clickfit	EOLYS POWERFLEX

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REMOVING - REFITTING : OXYGEN SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

CAUTION : For any operation on an oxygen sensor : The oxygen sensor connector must be cleaned dry. It is strictly prohibited to use solvents or contact greases for cleaning the connectors of the upstream and downstream oxygen sensors.

1. Location

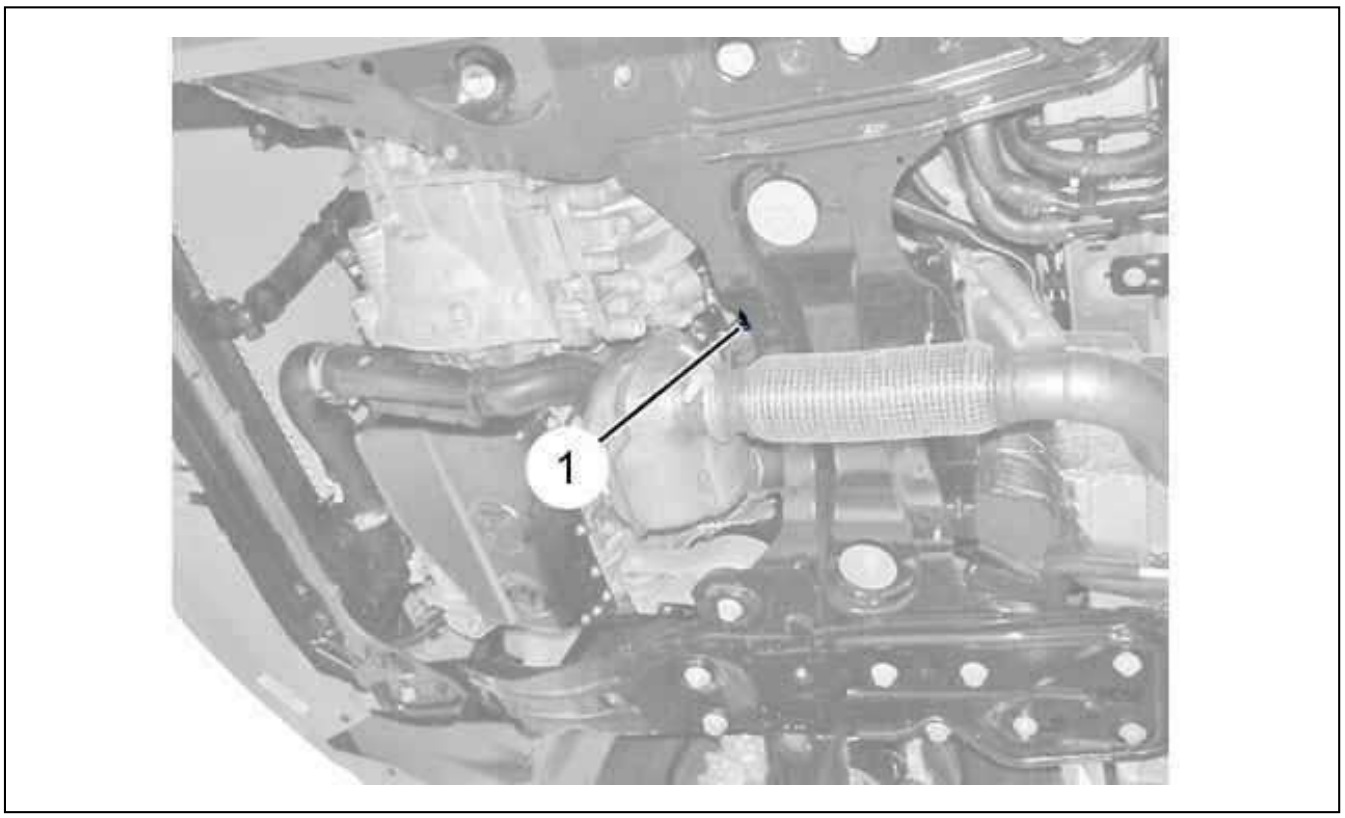


Figure : B1JG0C3D

(1) Oxygen sensor.

2. Removing

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line.

Raise the vehicle, wheels hanging.
Remove the under engine protection .

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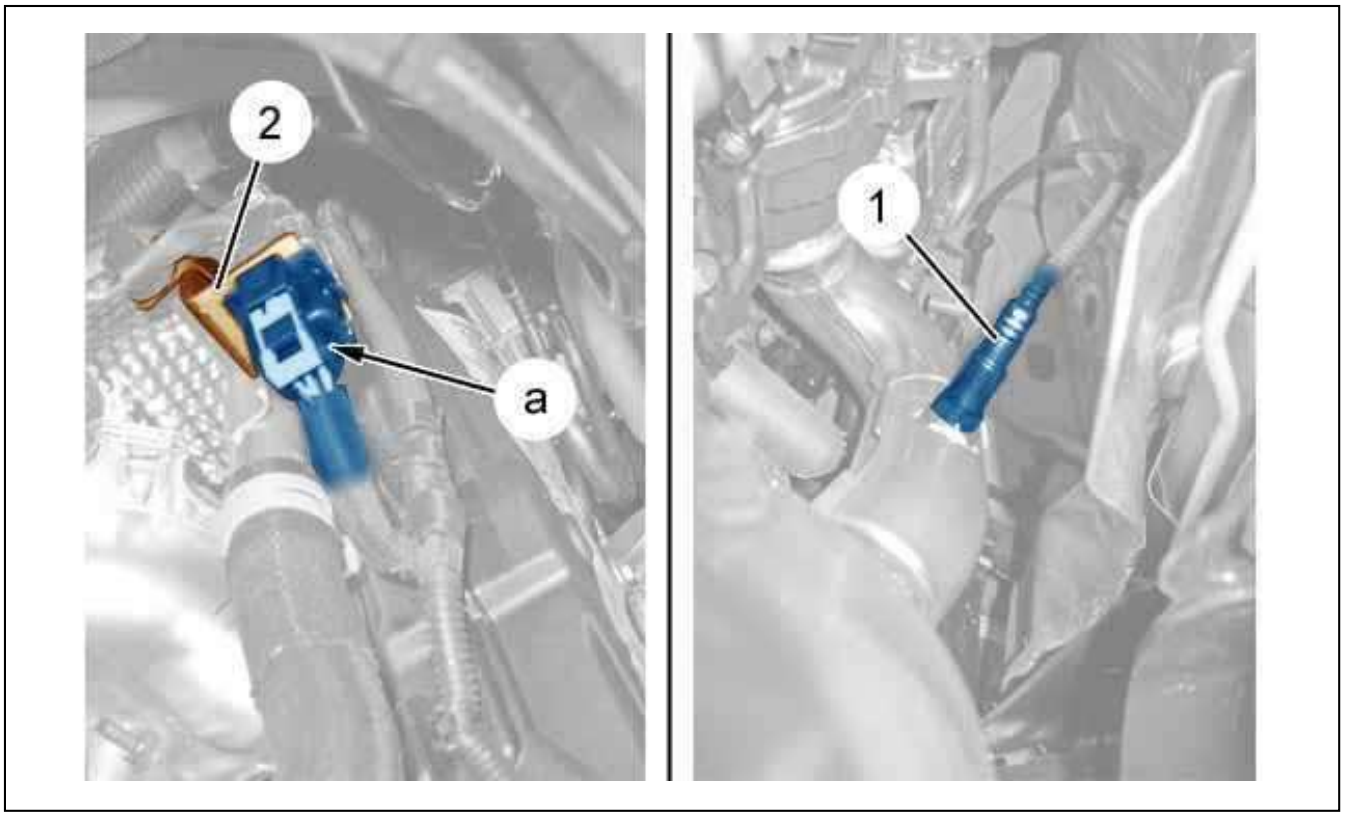


Figure : B1KG07MD

Disconnect the connector (as "a").
Slide the connector from the support (2).
Remove the oxygen sensor (1) ; Using a flat spanner.

3. Refitting

CAUTION : Adhere to the tightening torques .

Refit : The oxygen sensor (1).
Clip the connector on its support (2).
Connect the connector (as "a").
Refit the under-engine protection .

CAUTION : Erase the fault codes from the ECU memory ; Using the diagnostic equipment (If necessary).

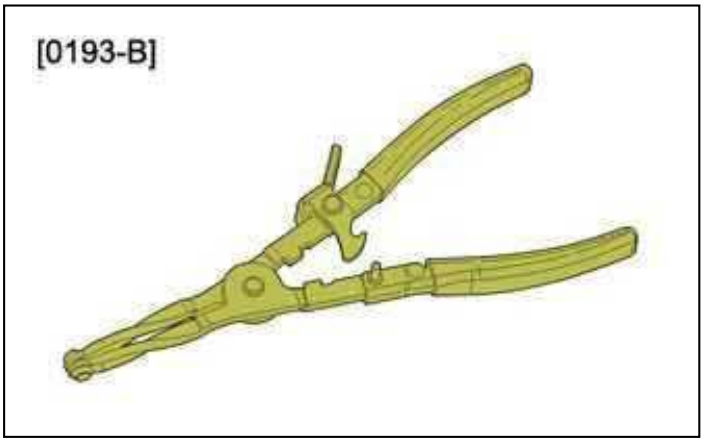
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REMOVING - REFITTING : EXHAUST SYSTEM

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment : Component lift.

tool	Reference	Designation
 Figure : E5AG06ZT	[0193-B]	Pliers for removing exhaust clips

2. Precautions to be taken

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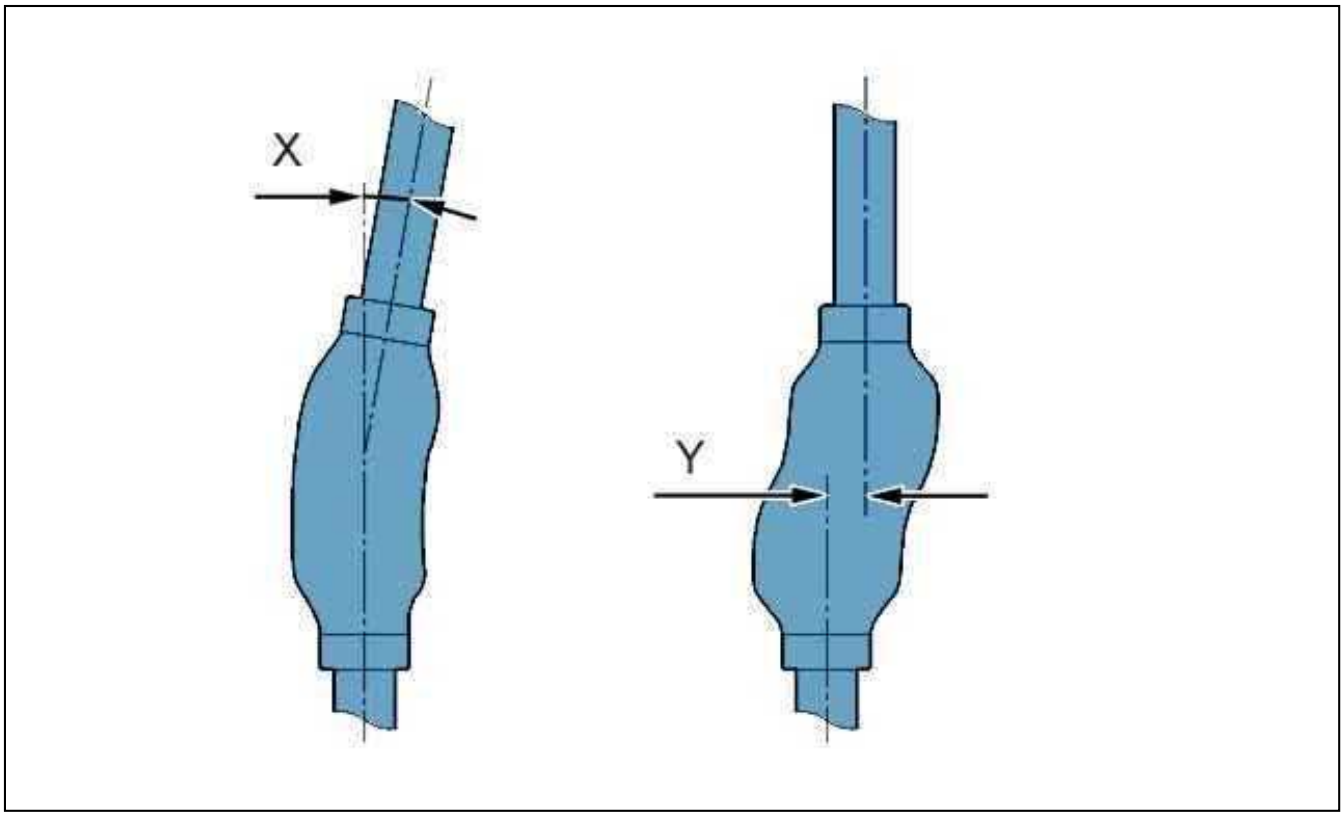


Figure : B1JP0FLD

Respect the precautions to be taken before repair :

- The front flexible pipe should be protected against any external mechanical interference
- The front flexible pipe should not come into contact with any corrosive products

CAUTION : Front flexible pipe removed : Do not deform the front flexible pipe by more than 20° angular (X), 20 mm axial and 25 mm shear (Y) ; Front flexible pipe in place : Do not deform the front flexible pipe by more than 3° angula (X), 0 mm axial and 3 mm shear (Y).

CAUTION : Failure to observe these precautions results in a reduction of the service life of the front hose ; The uncoupling or removal of the exhaust line is essential for operations requiring lifting of the power train.

3. Verification

CAUTION : Before carrying out any work on the exhaust system, wait for it to cool down.

Inspect the state of the rubbers and straps on the exhaust hangers, be ready with replacement parts.

4. Removing

Place the vehicle on a 2-post lift.

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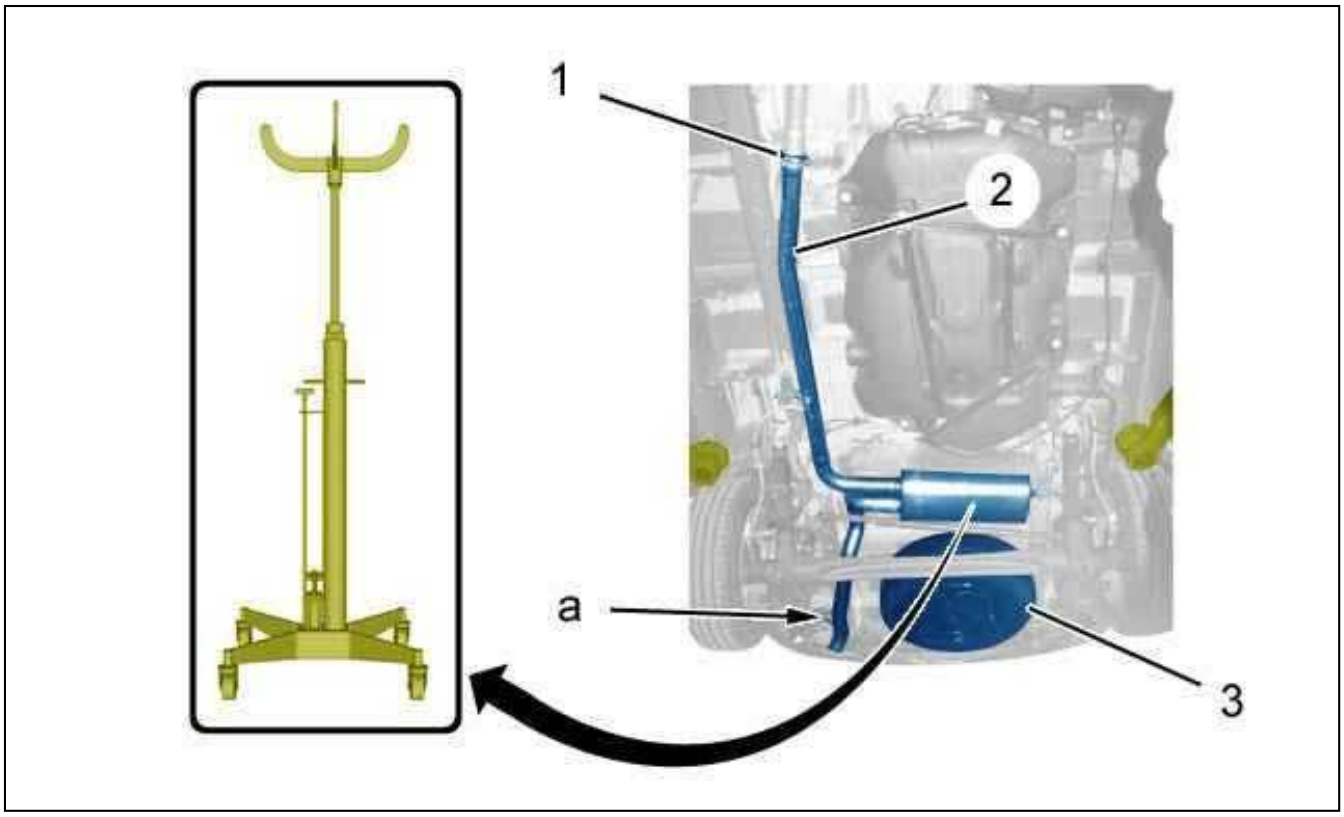


Figure : B1JG0B0D

Remove the spare wheel (3).
Place a component lift under the exhaust silencer.
Remove :

- The exhaust clip (1) ; Using tool [0193-B]
- The exhaust hangers (as "a")
- The rear silencer (2)

5. Preparation

CAUTION : Do not fit exhaust mountings that are defective.

Arrange then install the exhaust mountings on the replacement section of the exhaust line.

6. Refitting

CAUTION : Adhere to the tightening torques .

Refit :

- The rear silencer (2)
- The exhaust hangers (as "a")
- The exhaust clip (1) ; Using tool [0193-B]

Refit the spare wheel (3).

7. Check

Start the engine.

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Check that there are no exhaust gas leaks.
Stop the engine.

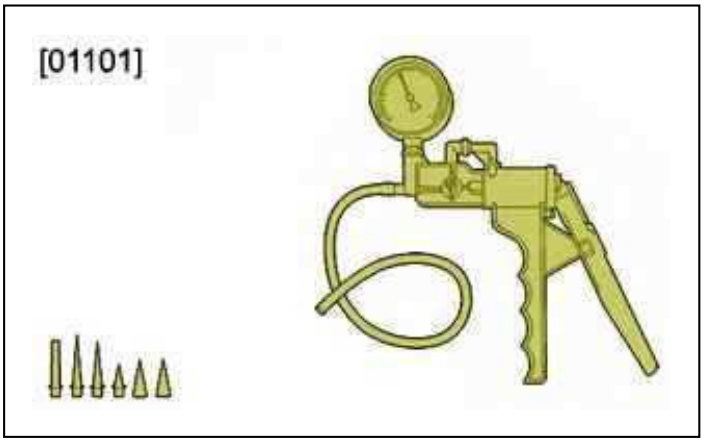
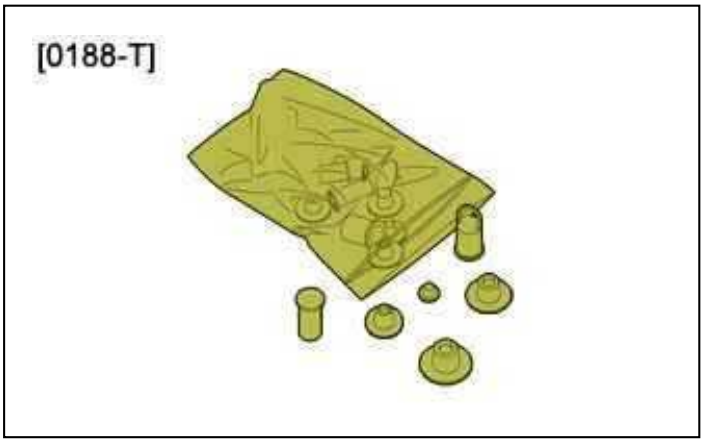
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CHECK : FUEL ADDITIVE CIRCUIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment : Diagnostic station.

tool	Reference	Designation
 Figure : E5AB16GT	[01101]	Manual vacuum pump DA16 with adaptors
 Figure : E5AB06IT	[0188-T]	plugs kit

2. Schematic diagram : Fuel additive circuit

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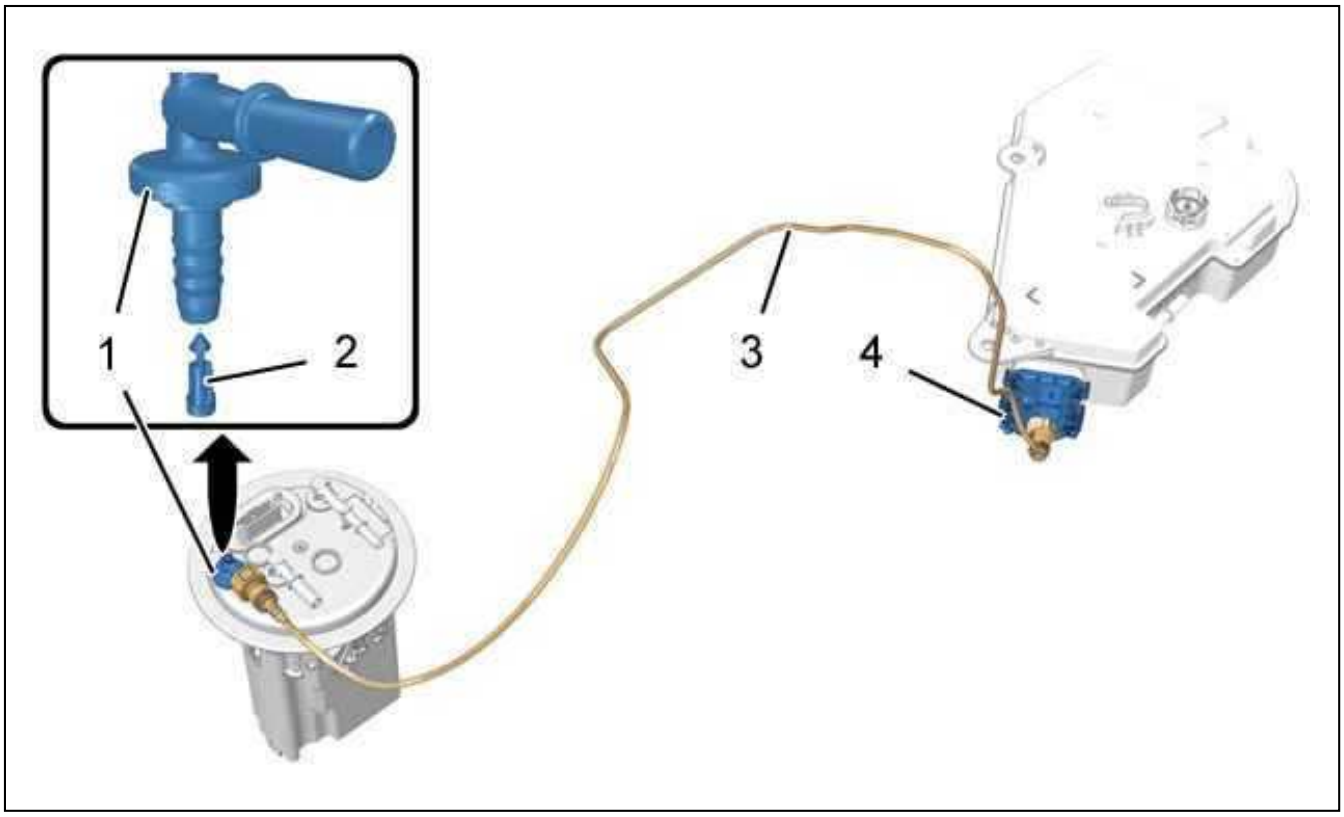


Figure : B1KD00SD

(1) Additive injector (Fuel pump gauge module).
(2) Anti-return valve (According to equipment).
(3) Additive supply pipe.
(4) Additive pump (Additive tank).

CAUTION : Some vehicles are not fitted with a non-return valve from the additive injector.

N.B. : The additive injector fitted with a non-return valve should open at a pressure lower than 400 mbars (According to equipment).

3. Check

ESSENTIAL : Respect the safety and cleanliness requirements relating to the particle filter .

3.1. ADDITIVE PUMP AUDIBLE TEST

Carry out the "actuating the additive pump" actuator test (According to specification) ; Using a diagnostic tool.

N.B. : This is an audible test to ensure that the additive pump is controlled.

Check	Noise and sensation of vibration when the additive pump is operating	No noise or sensation of vibration when the additive pump is operating
Finding	The additive pump is controlled	The additive pump is faulty or the power supply is cut
Action	Continue the checking	Repair the additive pump or restore the power supply Continue the checking

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3.2. Checking the additive circuit, the additive supply pipe and the additive injector

ESSENTIAL : For all work on the additive circuit, wear safety goggles and hydrocarbon resistant gloves.



Figure : B1KD01ID

CAUTION : Visually check the condition of the additive supply pipe (3), looking for traces of additive leaks. Replace the additive supply pipe (3) (if necessary).

Plug the additive pump ; Using tool [0188-T].
Connect the tool [01101] to the additive supply pipe (3) (Additive tank end) ; Using a click-on pipe that guarantees the assembly is leak free.
Activate, using pressure, the manual pump [01101].

Check	Pressure lower than or equal to 400 mbars	Pressure higher than 400 mbars
Observation	The additive injector and the additive supply pipe are not blocked	The additive injector is jammed or The additive supply tube is blocked
Action	Condition correct End of check	Condition not correct Continue the checking

4. Repriming the additive supply tube

CAUTION : In all cases, Always fill the additive supplied pipe (3).

Remove tools [01101] and [0188-T].
Couple the additive supply tube (3) to the fuel pump gauge module (5) and to the additive pump (4).
Carry out the actuator test "filling of the pipe: additive pump - additive injector" (According to specification) ; Using a

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diagnostic tool.

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CHECK : EXHAUST GAS RECIRCULATION CIRCUIT

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Preliminary operations

CAUTION : Prior to any operation on the EGR system, read the faults memory and perform the required tests with the aid of the diagnostic tool.

2. Check : Electric EGR valve

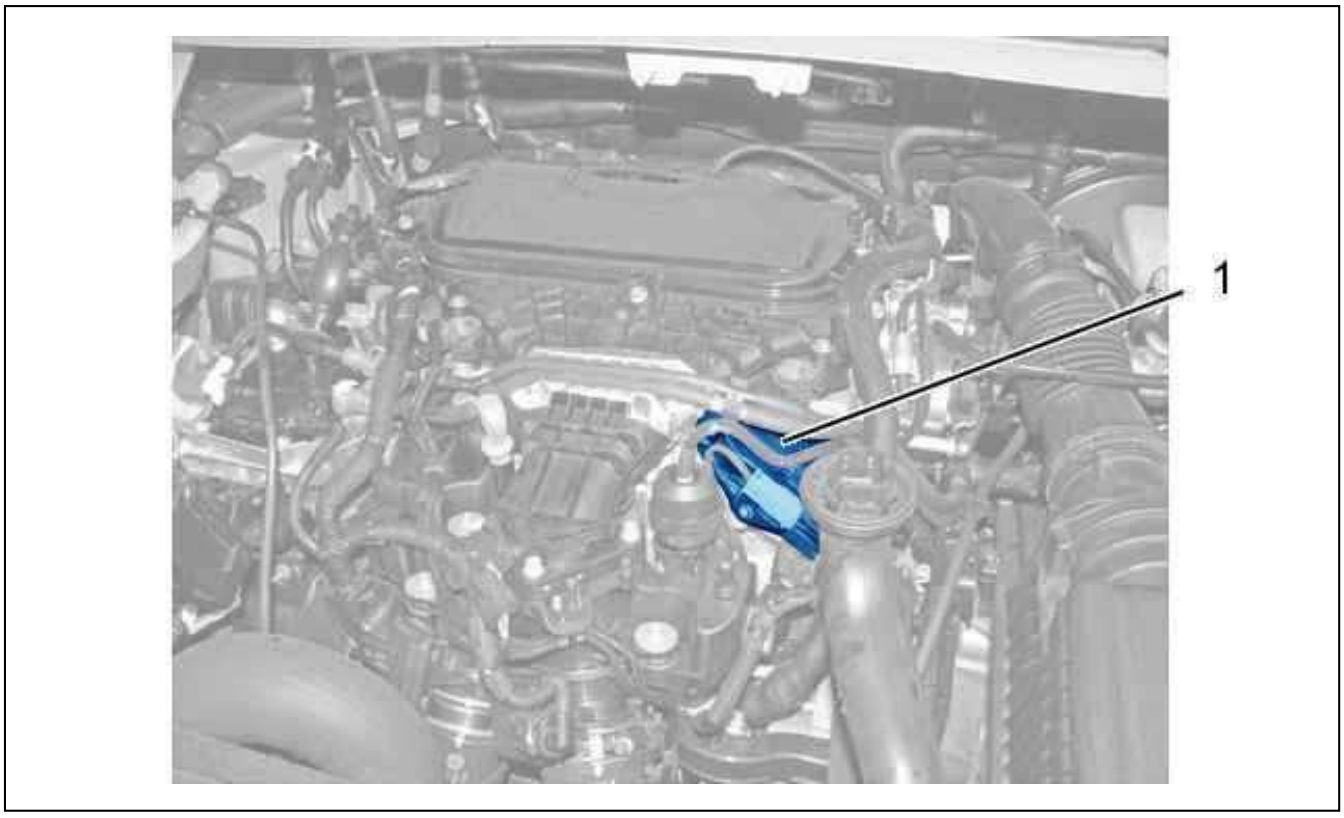


Figure : B1BB0VQD

(1) Electric EGR valve .

N.B. : Diagnosis of the electric EGR valve is only possible with the aid of the diagnostic tool.

Perform the checking of the electric EGR valve from the following selections :

- Menu : Engine ECU / injection
- Actuator tests
- Miscellaneous tests
- Electric EGR valve
- Movement of the EGR gas cooling circuit by-pass

Pursue the operations offered in the diagnostic tool ; Replace the component that is faulty.

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N.B. : The electric EGR valve and the exchanger cannot be separated ; the recycling valve and its seating canno tolerate being cleaned.

CAUTION : Clear the memory of faults ; Using the diagnostic equipment.

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REMOVING - REFITTING : EXHAUST GAS DIFFERENTIAL PRESSURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB05LT	[0194-T]	The plugs kit

2. Removing

Put the vehicle on a hoist.
Disconnect the battery.
Lift and support the vehicle.

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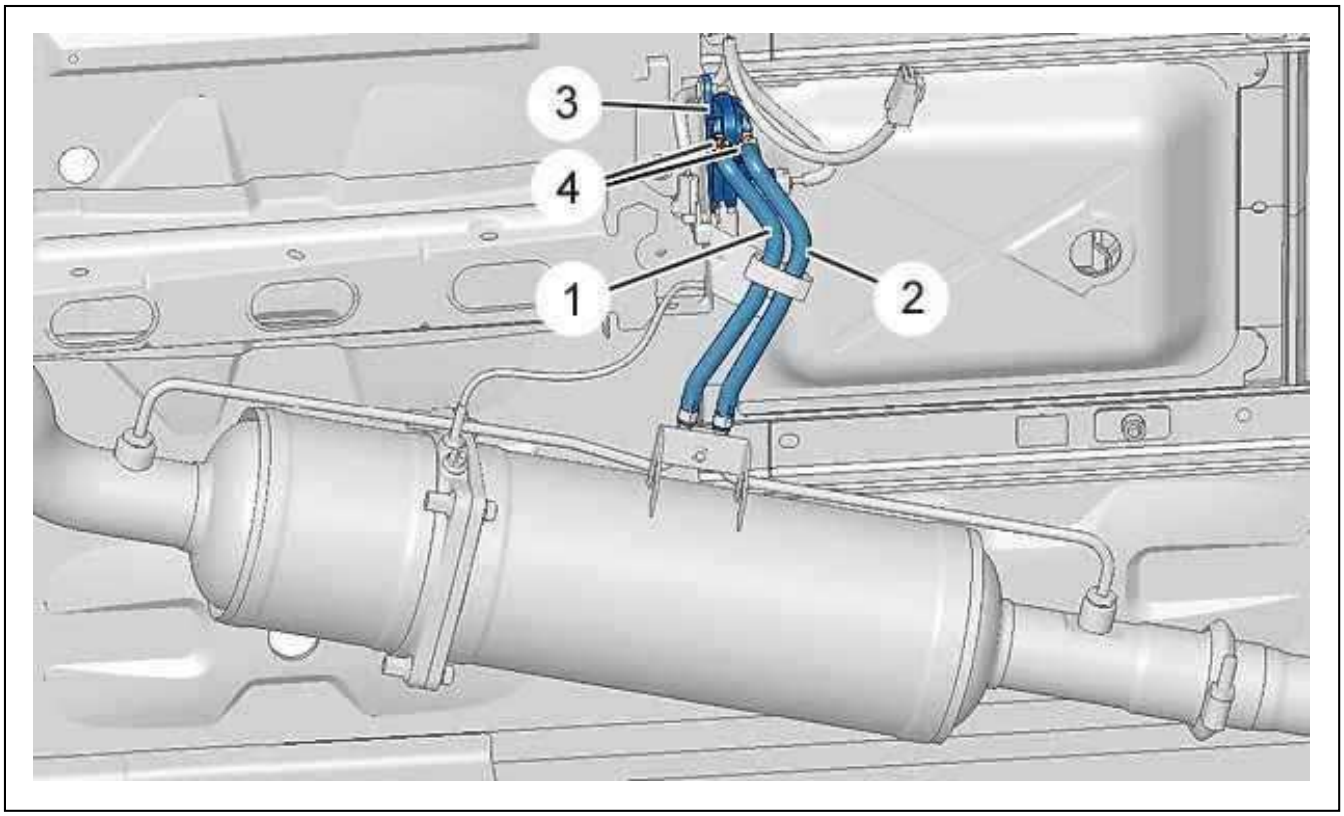


Figure : B1KG0EFD

Loosen the clips (4).
Uncouple and close : The exhaust gas differential pressure sensor (3) pipes (1), (2) ; Using the tools [0194-T].
Remove the clips (4).
Disconnect the connector (Exhaust gas differential pressure sensor (3)).
Remove : The exhaust gas differential pressure sensor (3).

3. Refitting

ESSENTIAL : Replace the tightening clips (Always).

Refit : The exhaust gas differential pressure sensor (3).
Reconnect the connector (Exhaust gas differential pressure sensor (3)).
Remove the tools [0194-T].
Fit : The clips (4) on the pipes (1), (2) (new clips).
Couple up : The pipes (1), (2) on the exhaust gas differential pressure sensor (3).
Tighten the clips (4).

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.

4. Check

Start the engine.
Check that there are no exhaust gas leaks.
Check the operation : Exhaust gas differential pressure sensor .

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REMOVING - REFITTING : EXHAUST GAS TEMPERATURE SENSOR

ESSENTIAL : Observe the safety and cleanliness recommendations .

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line.

1. Removing

Put the vehicle on a hoist.
Raise the vehicle.

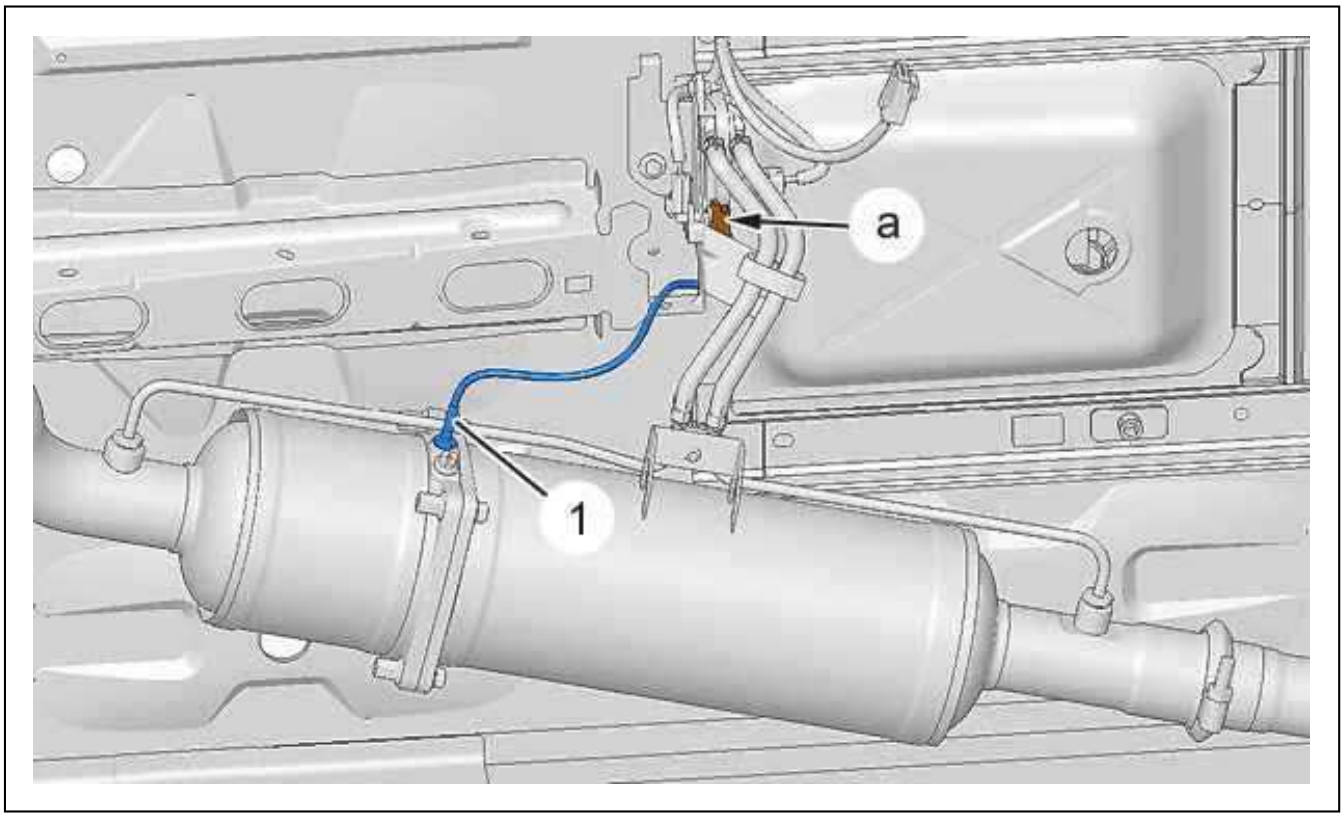


Figure : B1JP0FHD

Disconnect the connector (Exhaust gas temperature sensor (1)) (as "a").
Remove the exhaust gas temperature sensor (1).

2. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Check the condition of the thread of the exhaust gas temperature sensor (1).

CAUTION : Check the condition of the internal thread of the exhaust gas temperature sensor (1) on the particle filter.

Refit the exhaust gas temperature sensor (1).

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Connect the connector (as "a").

3. Check

Start the engine.
Check :

- The absence of exhaust gas leaks
- The operation of the exhaust gas temperature sensor (1) ; Using the diagnostic equipment

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REMOVING - REFITTING : EXHAUST GAS RECYCLING ELECTROVALVE OR EXCHANGER

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Precaution

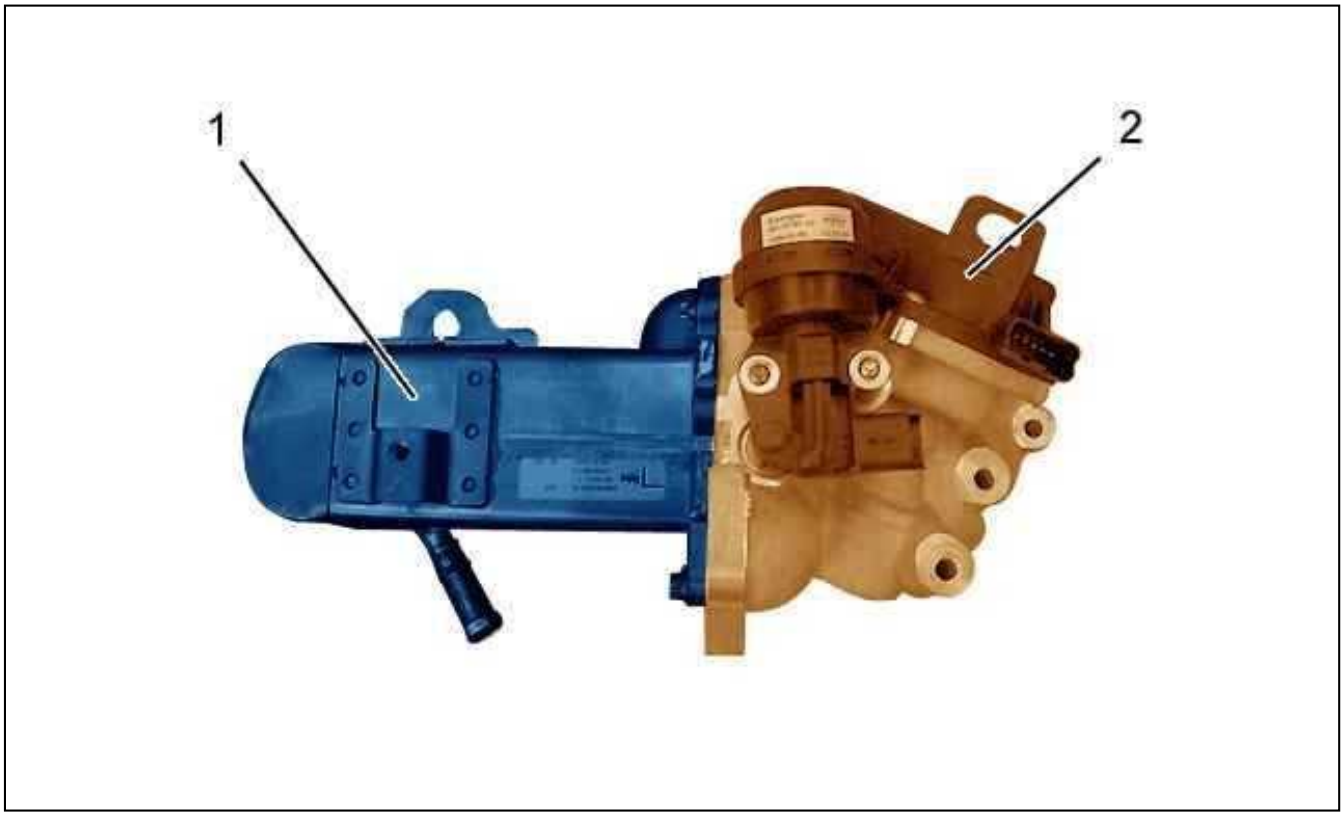


Figure : B1KG017D

CAUTION : Do not separate the exchanger (1) from the valve (2).

N.B. : The exhaust gas recycling module is assembled at the factory with the aid of a template. Assembling it withou using a template would create positioning tensions on the cylinder head, adversely affecting the fixings and the sealings of the module.

2. Tooling

tool	Reference	Designation
	[0165-2]	Pliers for removing elastic clips

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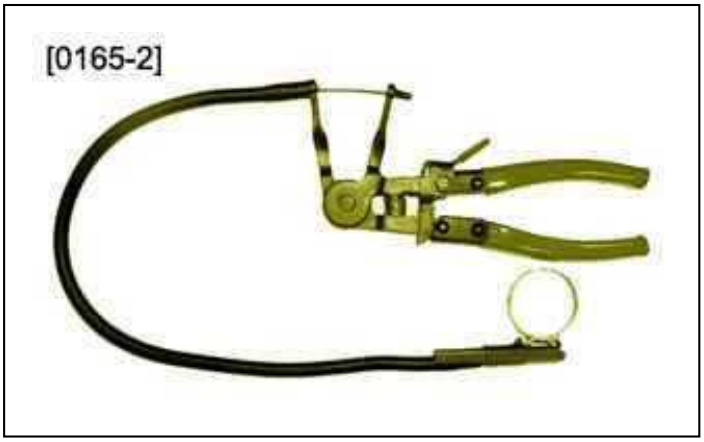


Figure : E5AB0GVT

3. Removing

Put the vehicle on a hoist.
Disconnect the battery.
Remove :

- The passenger compartment air inlet manifold
- The engine cover
- The cooling fan control relay unit

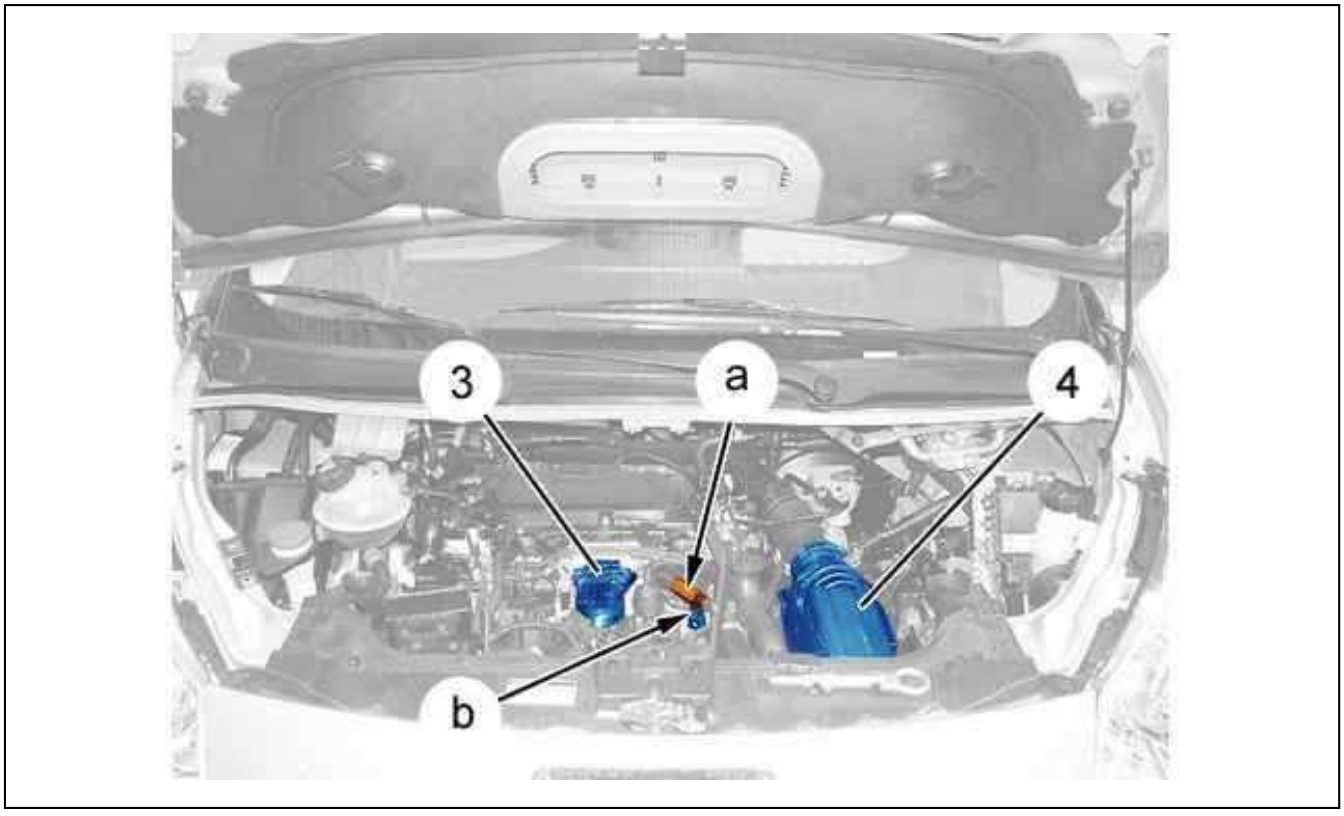


Figure : B1BG1KFD

CAUTION : Protect the engine cooling radiator to prevent damage to the fins.

Disconnect the connectors (at "a", "b").
Remove :

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- The air filter housing (4) with the air flow sensor
- The air mixer unit (3)

Drain the cooling system.

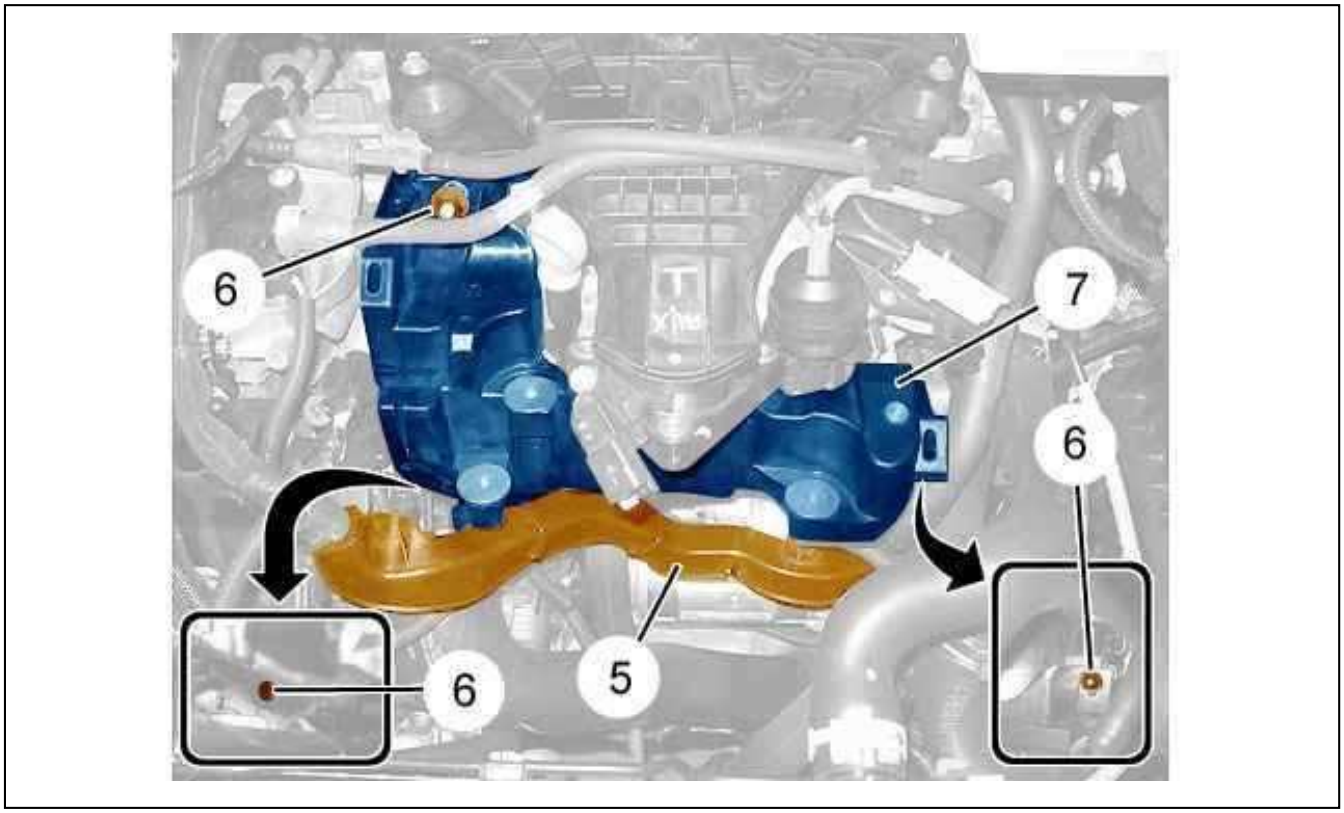


Figure : B1KG018D

Unclip the electrical harness sheath (5) and move it aside.
Remove :

- The mountings (6)
- The inlet air mixer unit support (7)

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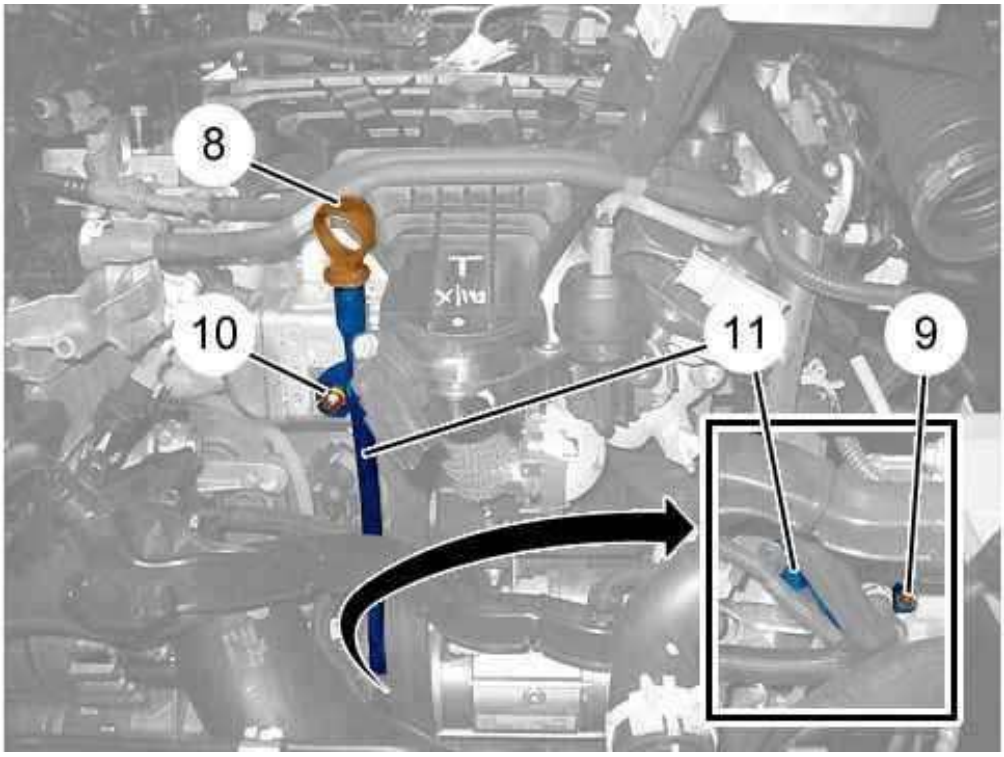


Figure : B1KG01DD

Remove :

- The dipstick (8)
- The (9) bolt
- The nut (10)
- The guide tube (11) for the oil dipstick (8)

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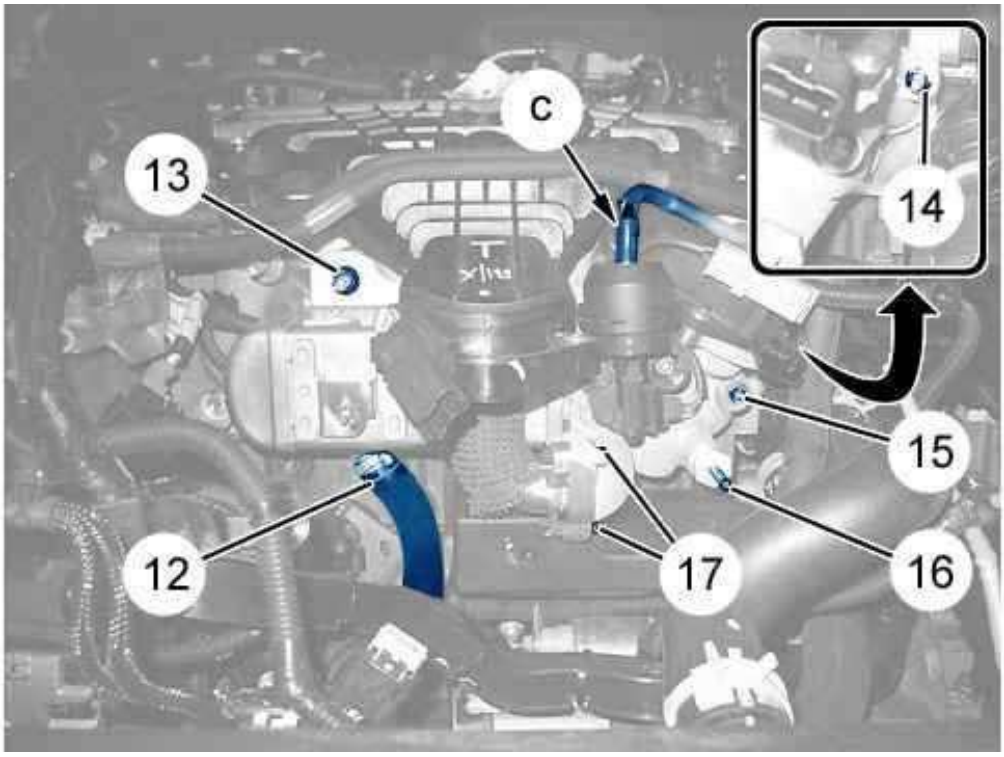


Figure : B1KG02AD

Uncouple :

- The vacuum pipe (as "c")
- The pipe (12) ; Using tool [0165-2]

Remove :

- The bolts (17)
- The nut (13)
- The nut (14)
- The (15) bolt
- The pillar screw (16)

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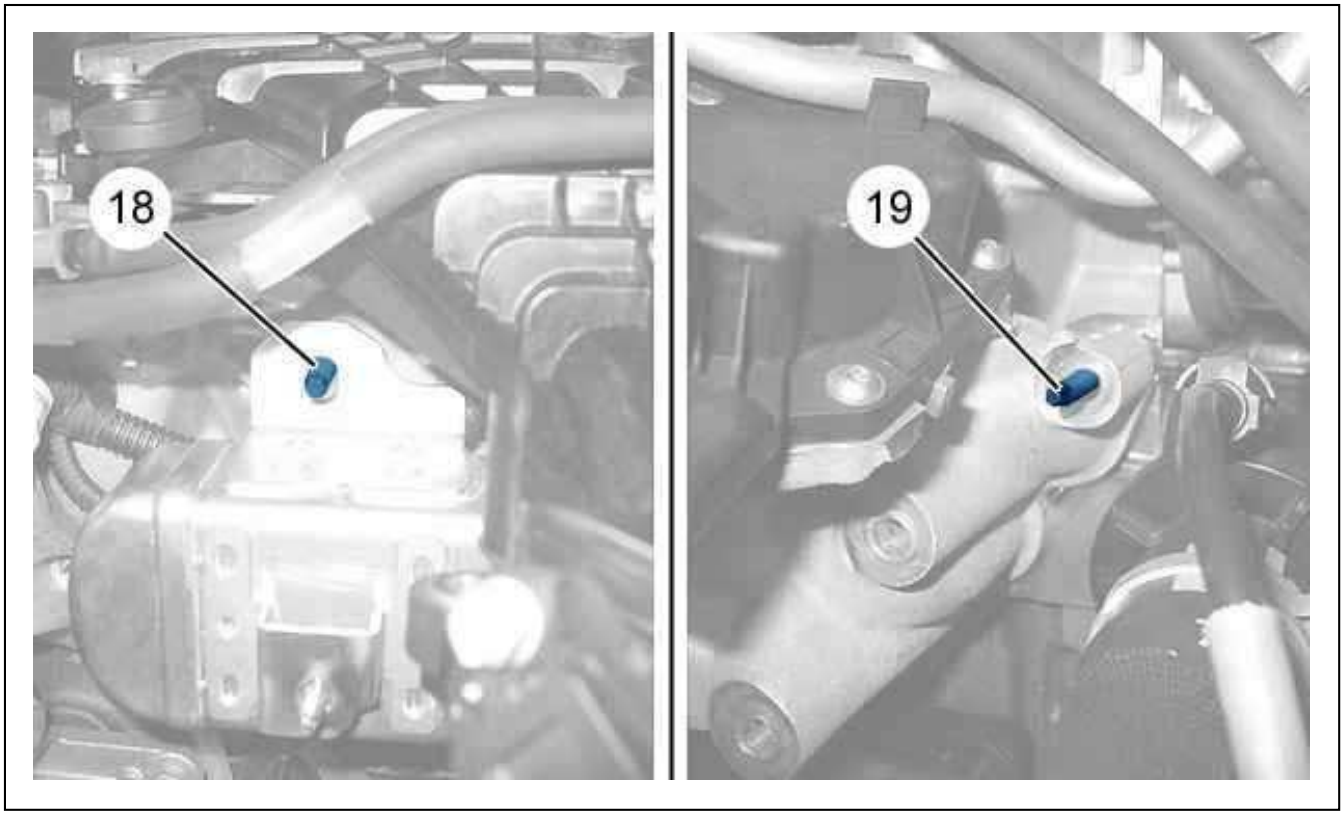


Figure : B1KG01FD

Remove :

- The stud (18)
- The stud (19)

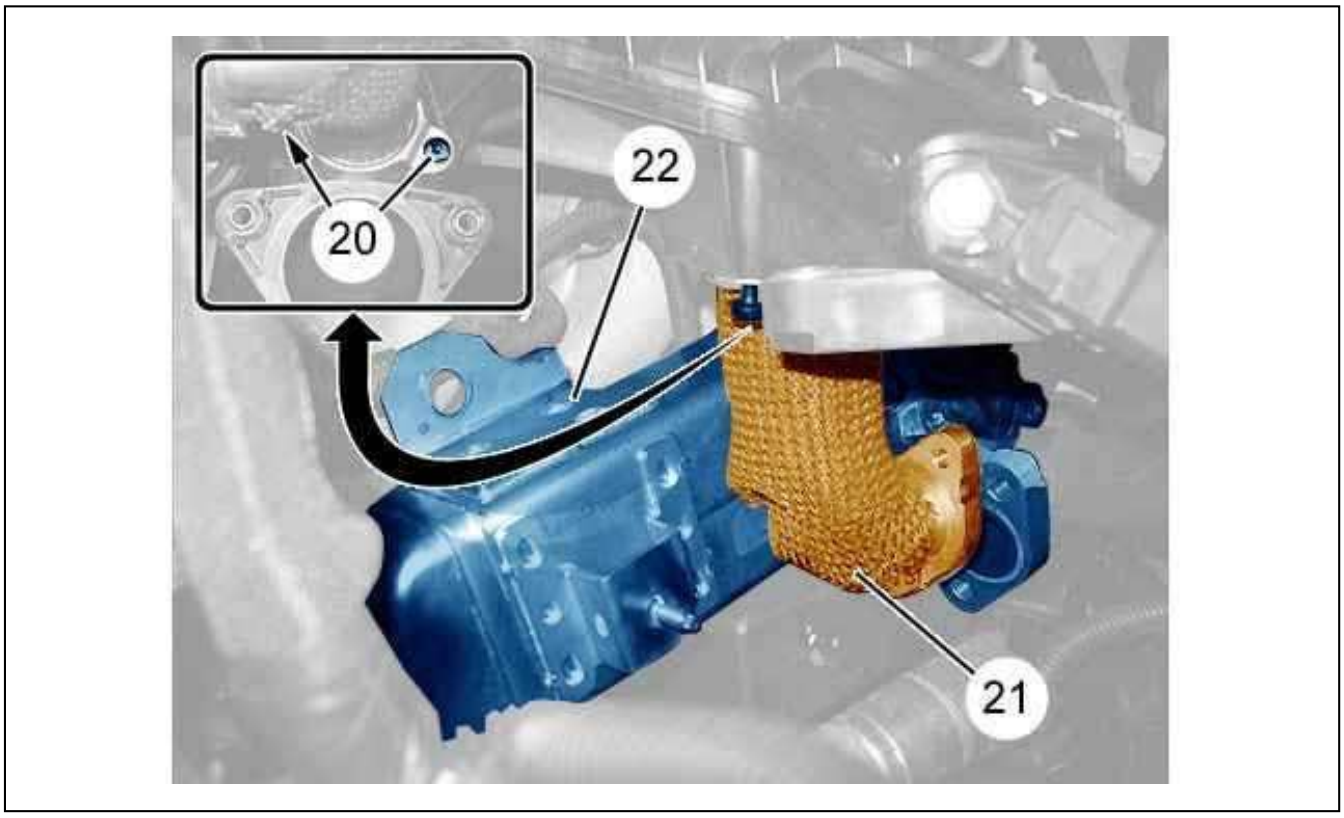


Figure : B1KG01GD

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Tilt the EGR module (22) downwards.
Remove :

- The bolts (20) ; Using a Torx spanner with extension
- The tube (21)
- The exhaust gas recycling module (22) (Carefully)

4. Refitting

4.1. Preparation

Clean the seal faces of the EGR module, using a special degreaser index "24".

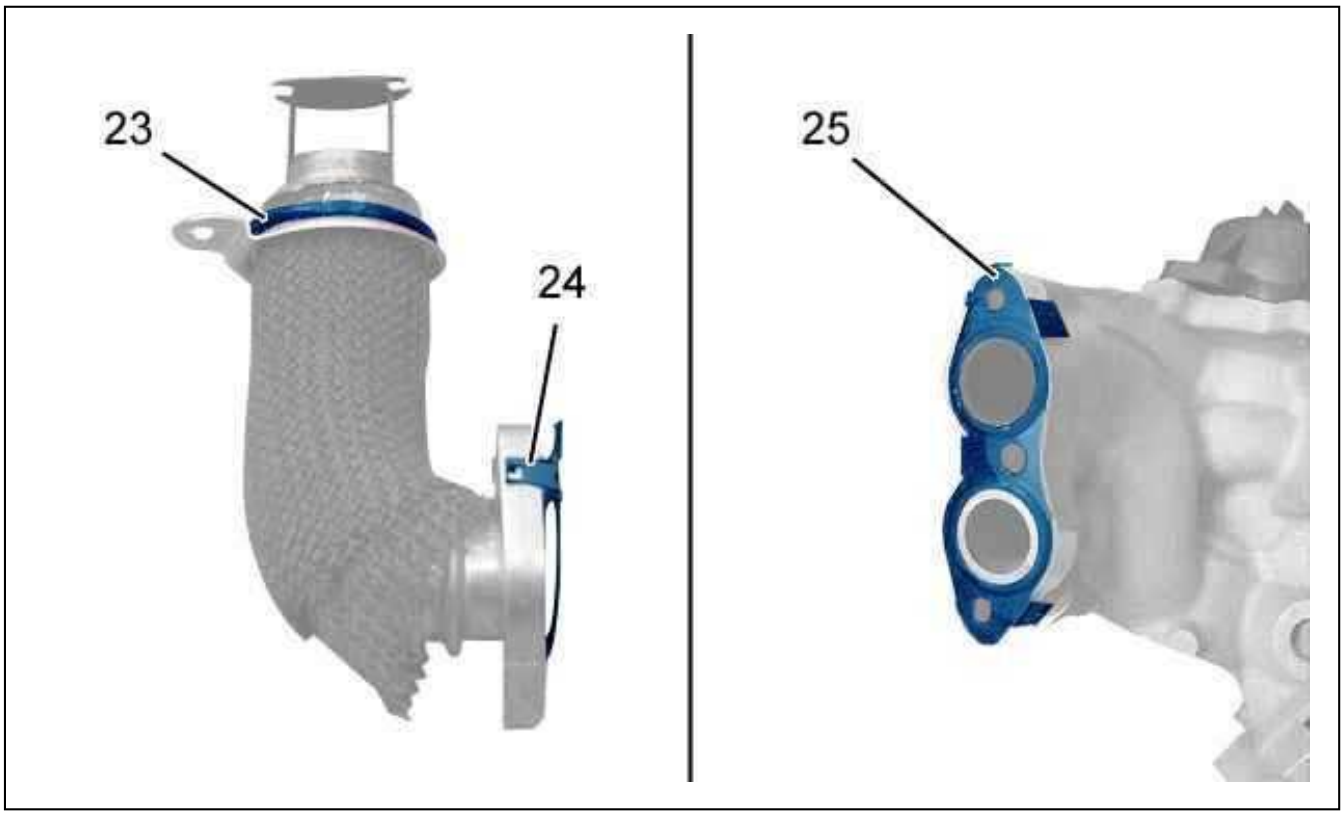


Figure : B1KG01HD

CAUTION : When positioning the seal faces (24), (25), pay particular attention to the retaining studs (risk of leaks).

Fit new seals (23), (24), (25).
Lubricate the seal (23) ; With engine oil .

4.2. Subsequent operations

CAUTION : Adhere to the tightening torques .

Refit :

- The exhaust gas recycling module (22)
- The tube (21)
- The bolts (20)
- The stud (19)
- The stud (18)

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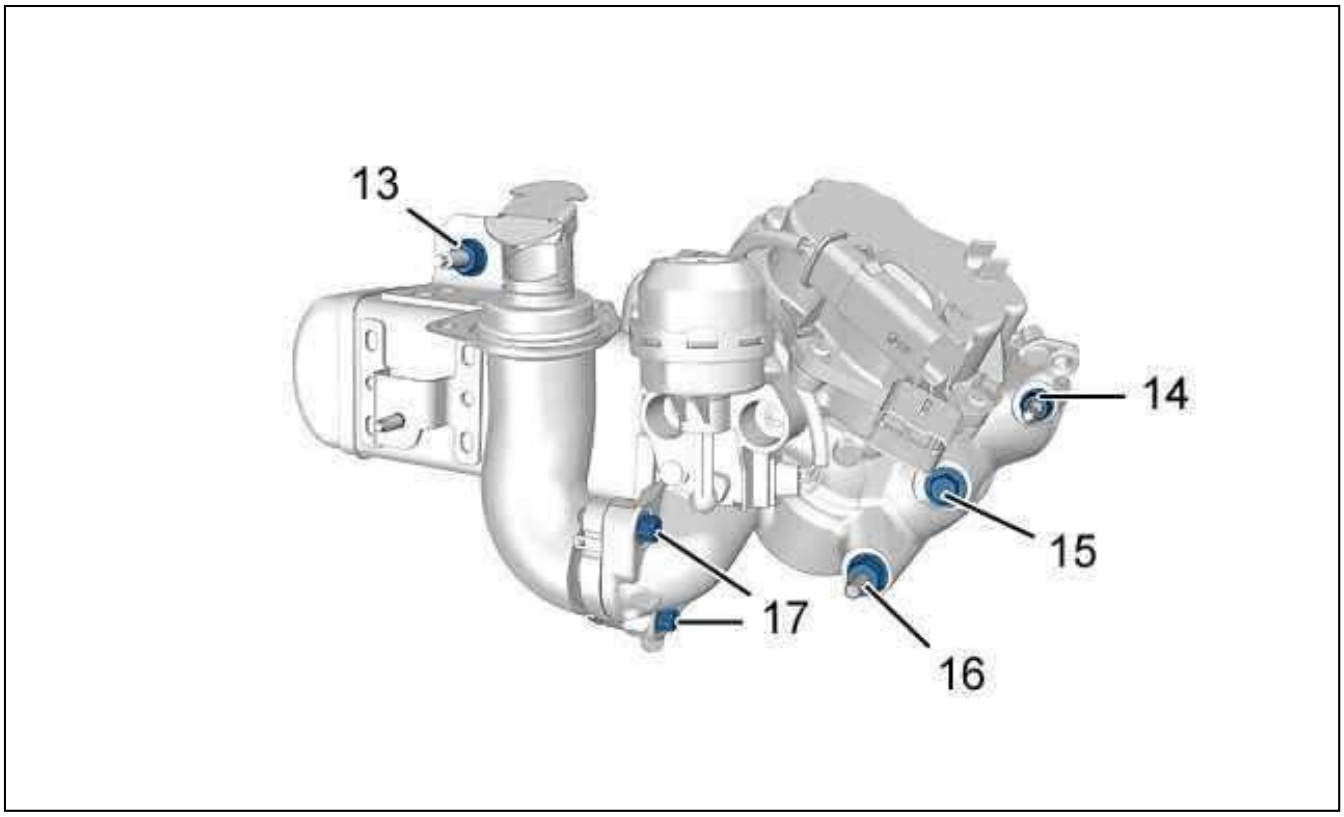


Figure : B1KG01ID

Tightening procedure : EGR module (22).
Finger tighten : The mountings (13), (14), (15), (16), (17).
Tighten to the specified torque :

- The pillar screw (16)
- The (15) bolt
- The nut (14)
- The nut (13)
- The bolts (17)

Couple up :

- The pipe (12); Using tool [0165-2]
- The vacuum pipe (as "c")

CAUTION : Lubricate the O-ring seals of the guide tube (11) for the oil dipstick (8) ; With engine oil .

Refit :

- The guide tube (11) for the oil dipstick (8)
- The (9) bolt
- The nut (10)
- The dipstick (8)
- The inlet air mixer unit support (7)
- The mountings (6)

Clip the electrical harness sheath (5).
Refit :

- The air mixer unit (3)
- The air filter housing (4) with the air flow sensor

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CAUTION : Remove the protection from the cooling radiator .

Connect the connectors (at "a", "b").
Fill and bleed the cooling system.

CAUTION : Perform the operations to be carried out following reconnection of the battery.

Reconnect the battery.
Refit :

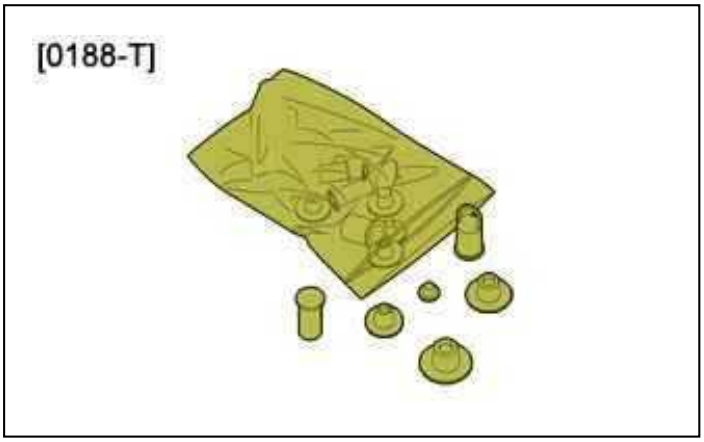
- The cooling fan control relay unit
- The engine cover
- The passenger compartment air inlet manifold

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REMOVING - REFITTING : ADDITIVE TANK

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Description
 Figure : E5AB06IT	[0188-T]	Set of plugs

2. Removing

ESSENTIAL : For all work on the additive circuit, wear safety goggles and hydrocarbon resistant gloves.

Raise the vehicle, wheels hanging.

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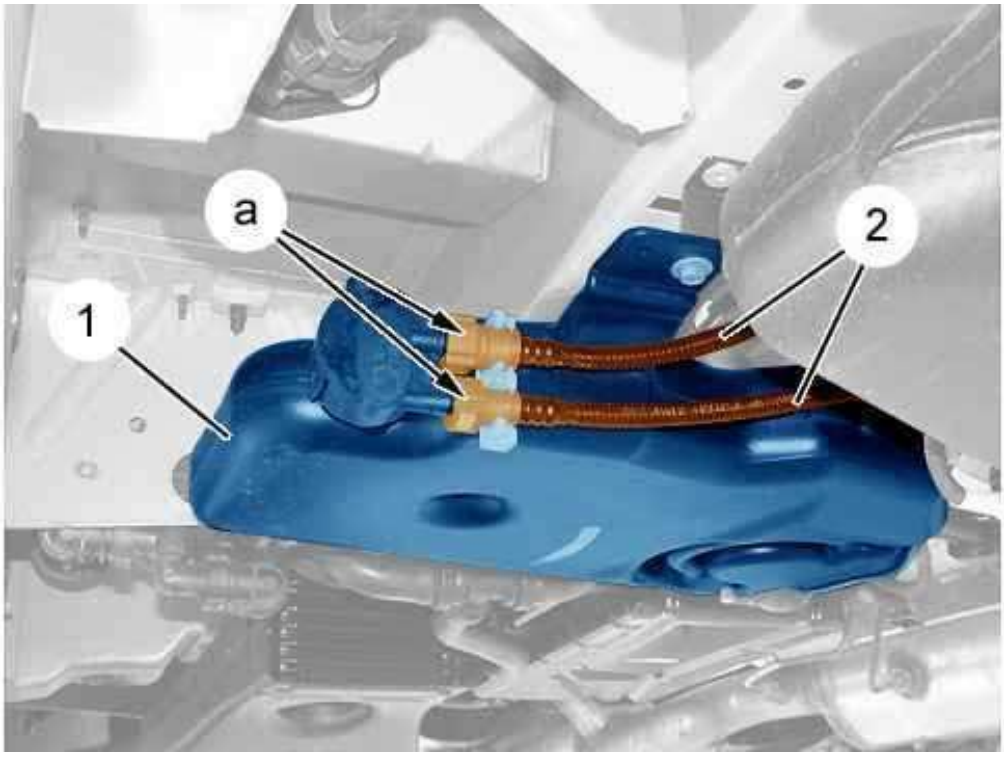


Figure : B1KG095D

Disconnect the pipes (2).
Plug the tubes (2) as well as the opening of the additive tank (1) ; Using tool [0188-T] (as "a").

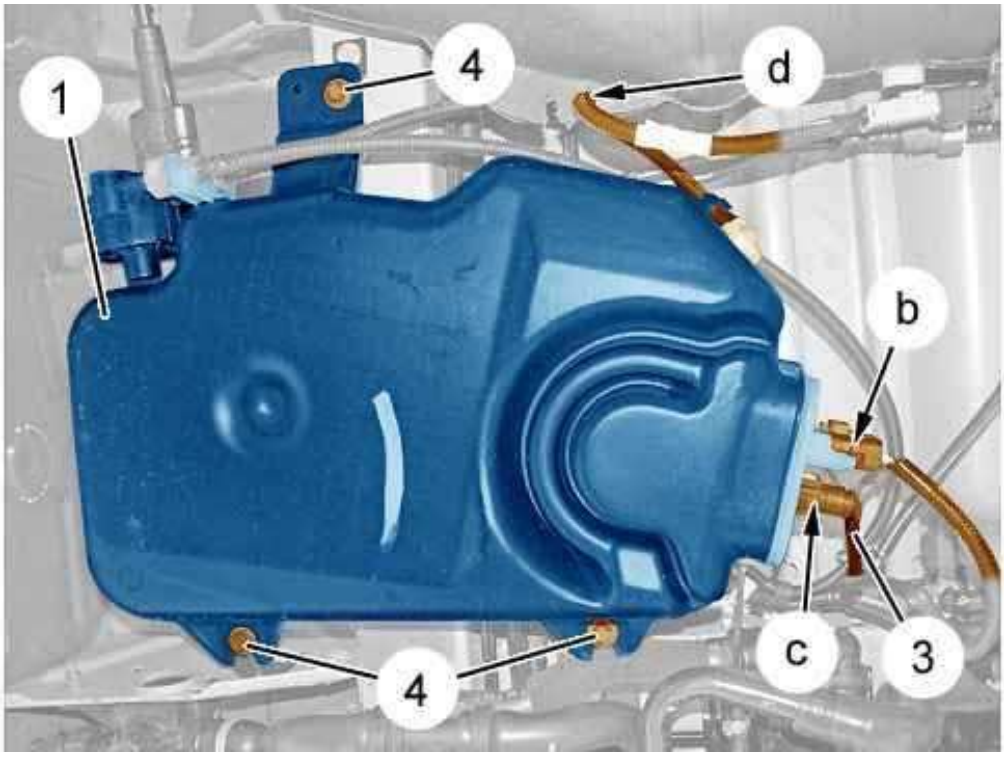


Figure : B1KG096D

Disconnect the connector (as "b").

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Uncouple the pipe (3).
Plug the pipe (3) and the opening of the fuel additive reservoir (1) ; Using tool [0188-T] (as "c").
Remove the bolts (4).
Release the air vent tube (as "d").
Remove the additive reservoir (1).

3. Refitting

Refit the additive tank (1).
Reposition the air vent tube (at "d").
Refit the bolts (4).
Remove the tool [0188-T].
Connect the pipe (3).
Connect the connector (as "b").
Couple up the pipes (2).
Top up the level of the additive reservoir (if necessary).
Connect the diagnostic equipment .
Action the additive pump ; Using a diagnostic tool.

N.B. : The "replacement parts" procedure primes the circuit.

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MODIFICATIONS : CONNECTING SLEEVE / INTERMEDIATE EXHAUST LINE

1. Application

Vehicle application :

- CITROEN C2
- CITROEN C3
- CITROEN C3 PLURIEL
- CITROEN C3 2
- CITROEN C3 Picasso
- CITROEN C4 Picasso
- CITROEN DISPATCH 3
- Peugeot 1007
- Peugeot 207
- Peugeot Expert 3
- Peugeot 308

N.B. : The factory fit rear exhaust line is monoblock.

2. Description

2.1. Previous assembly

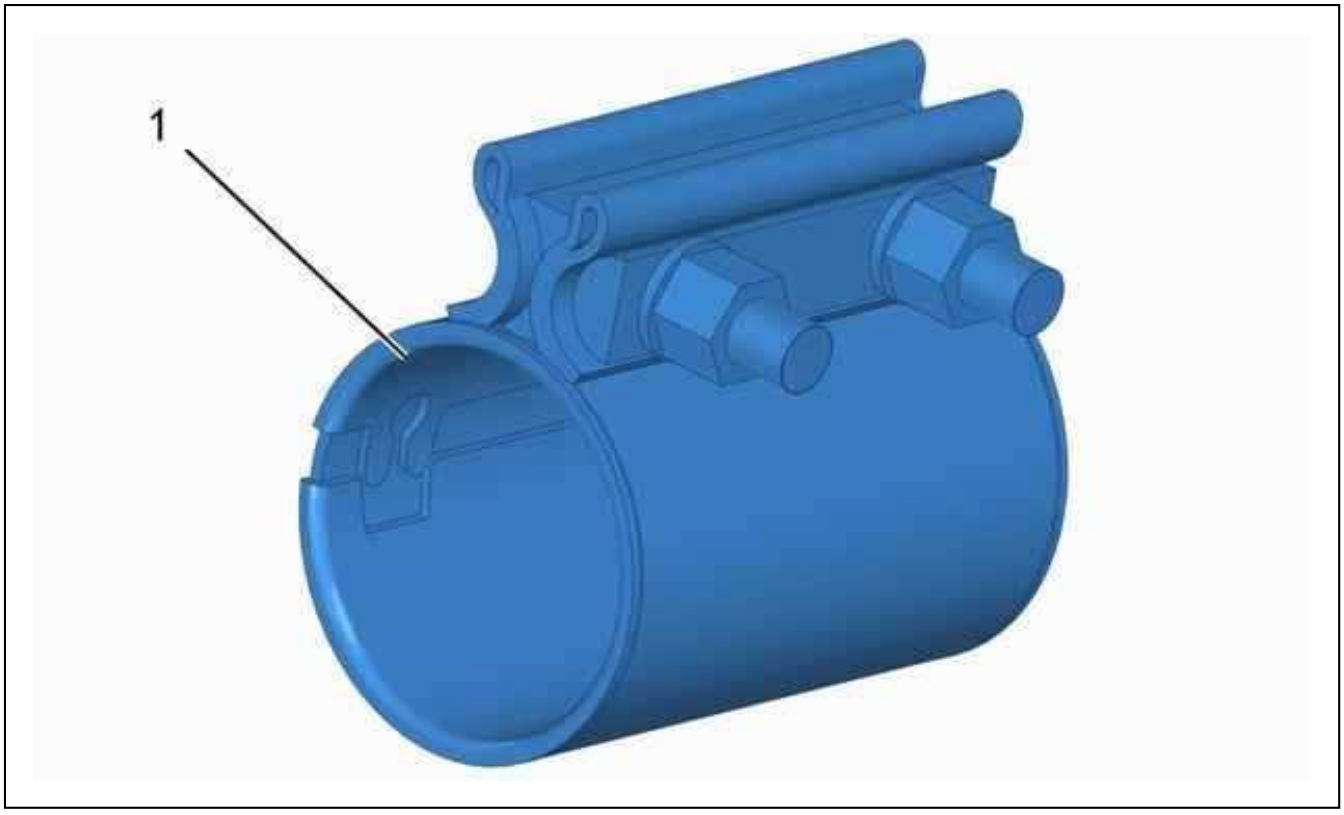


Figure : B1JT001D

(1) Linking sleeve TORCA for intermediate line.

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2.2. New assembly

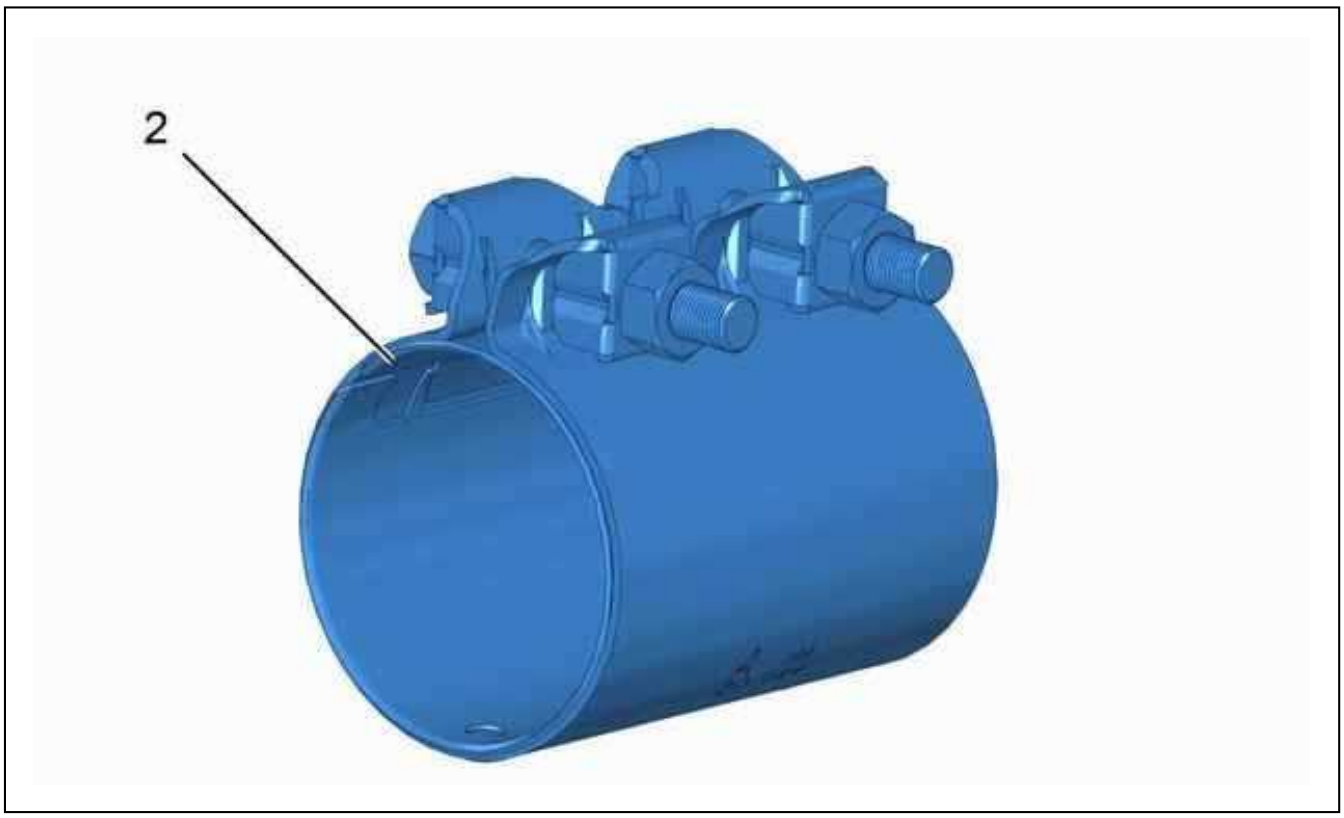


Figure : B1JT002D

(2) Linking sleeve CAILLAU for intermediate line.

3. Replacement Parts

Once the stocks are exhausted, only the new parts will be available.

4. Repair

CAUTION : Adhere to the tightening torques.

N.B. : Select a connecting sleeve suited to the diameter of the intermediate exhaust pipe .

55 mm diameter.

Reference	Description	Tightening torque
(1)	Connecting sleeve TORCA	5,2 daNm
(2)	Connecting sleeve CAILLAU	2,1 daNm

45 mm diameter.

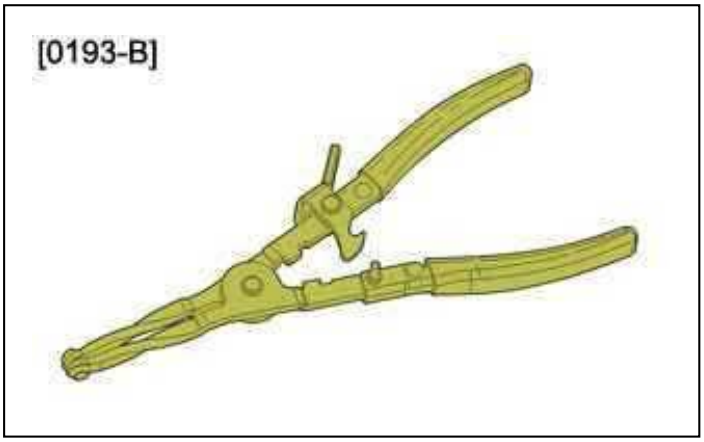
Reference	Description	Tightening torque
(1)	Connecting sleeve TORCA	3,5 daNm
(2)	Connecting sleeve CAILLAU	2,1 daNm

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REMOVING - REFITTING : PARTICLE FILTER

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

tool	Reference	Designation
 Figure : E5AB041T	[0193-B]	Exhaust clamp fitting and removal pliers

2. Precautions to be taken before carrying out any work

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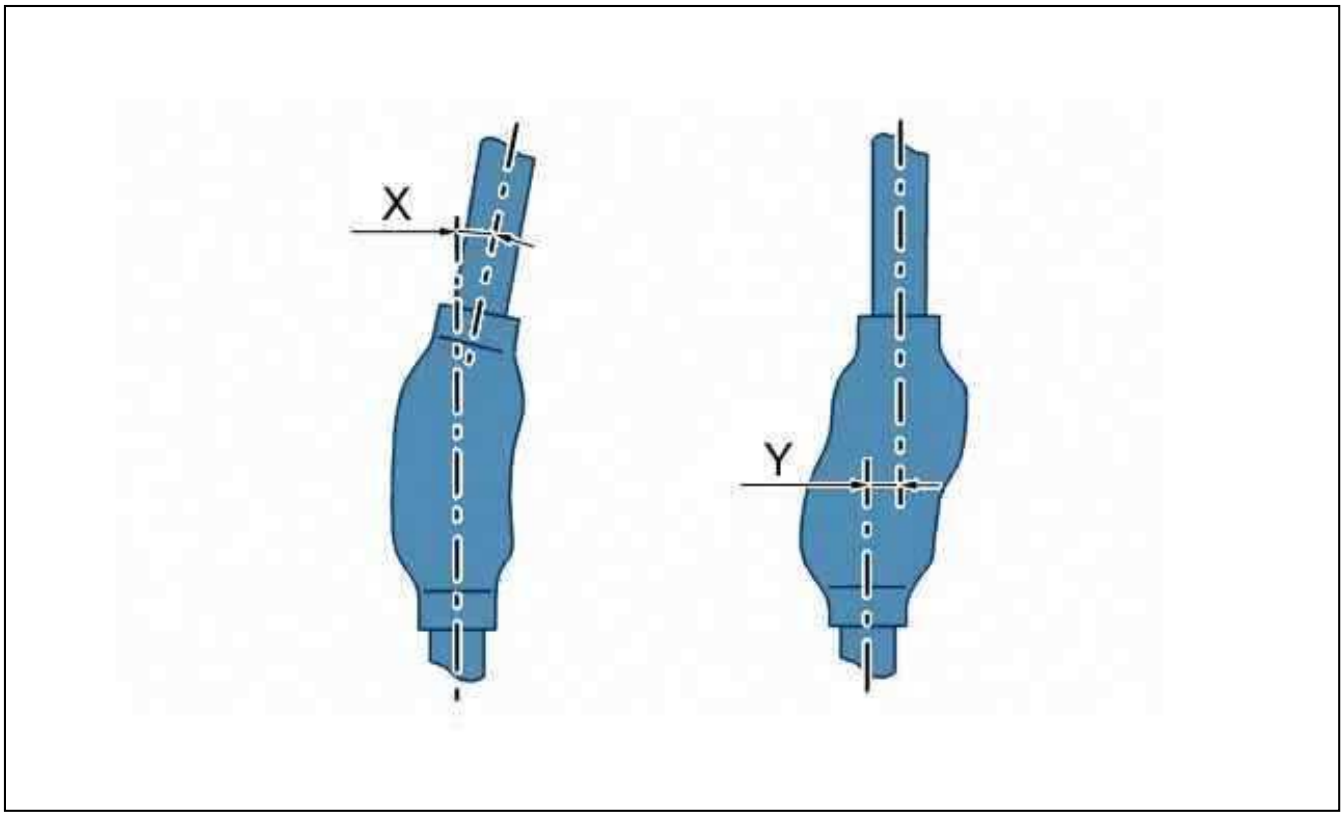


Figure : B1JM00ED

Respect the precautions to be taken before repair :

- The front flexible pipe should be protected against any external mechanical interference
- The front flexible pipe should not come into contact with any corrosive products
- Do not deform the front flexible hose by more than 20° angular "X", 20 mm axial and 25 mm in shear "Y" (Front flexible pipe removed)
- Do not deform the front flexible hose by more than 3° angular "X", 3 mm axial and 3 mm in shear "Y" (Front flexible pipe in place)

CAUTION : Non-compliance with these precautions will reduce the working life of the front flexible hose or its performance, thus annulling the warranty.

3. Verification

CAUTION : Before starting any operation close to the exhaust line, wait the latter to cool down.

Inspect the state of the rubbers and straps on the exhaust hangers, be ready with replacement parts.

4. Removing

ESSENTIAL : Before carrying out any work on the exhaust system, wait for it to cool down.

Put the vehicle on a hoist.
Remove the under engine protection .

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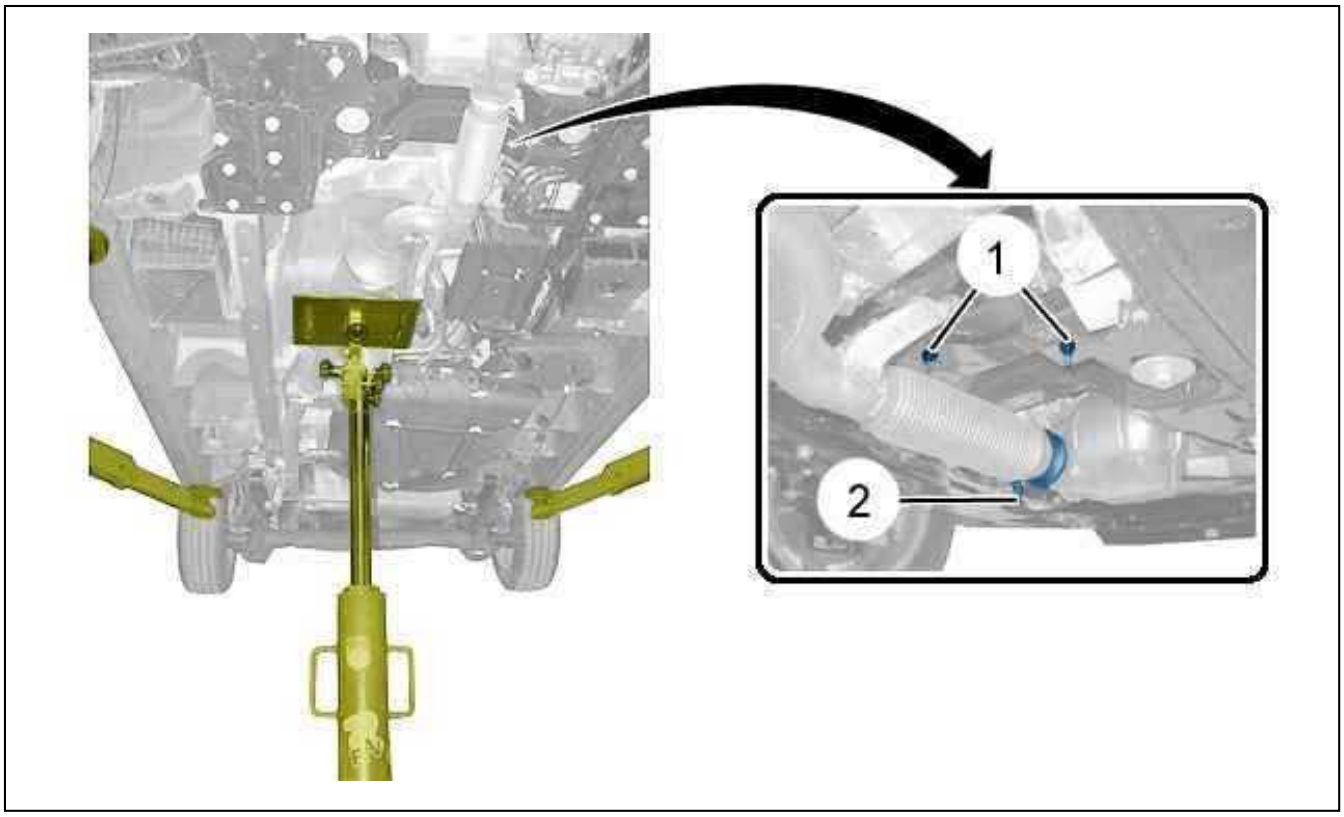
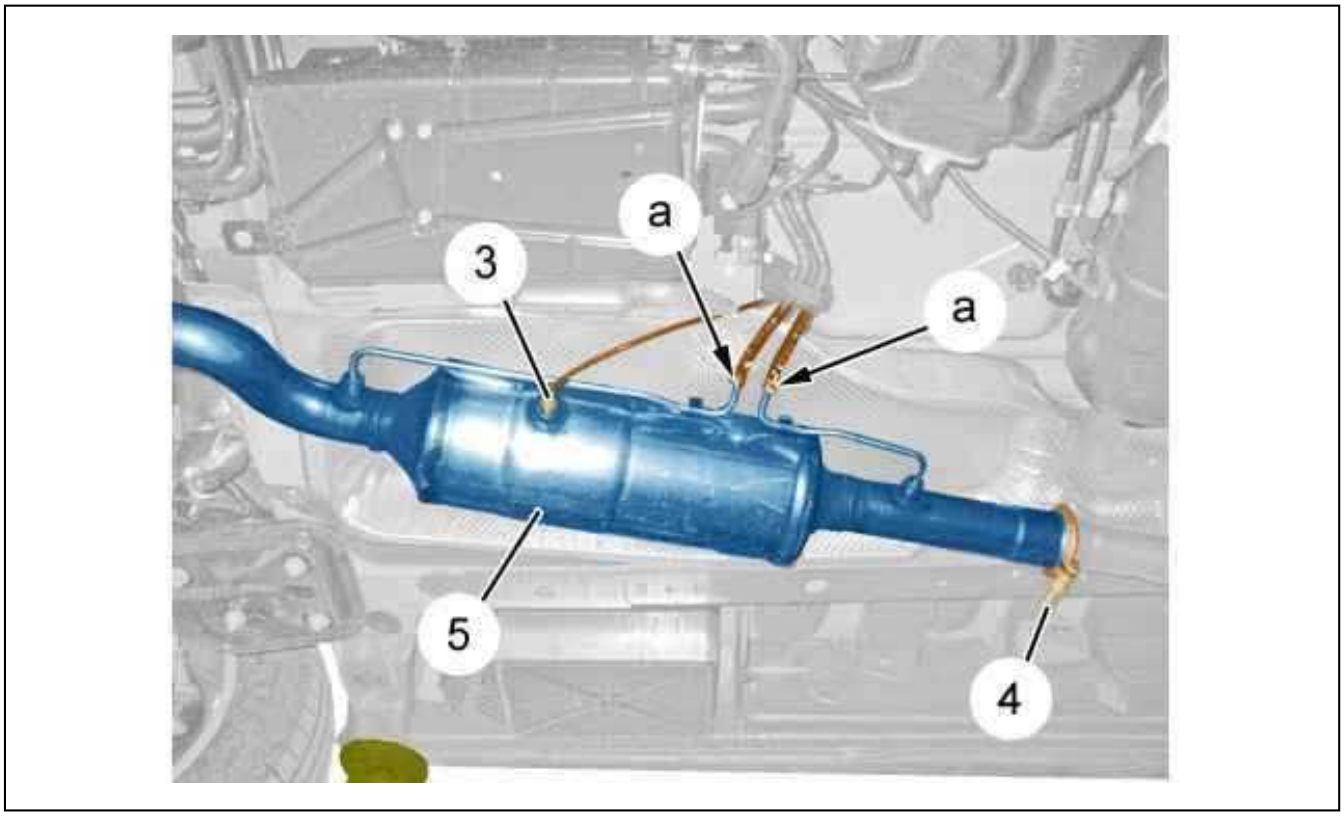


Figure : B1KG07JD

Support : The catalytic converter /particle emission filter assembly ; By means of a lifting tool.
Remove :

- The bolts (1)
- The clip (2) ; Using tool [0193-B]



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Figure : B1KG07KD

Remove :

- The exhaust gas temperature sensor (3)
- The pressure take-off pipes (as "a")
- The exhaust clip (4) ; Using tool [0193-B]

Remove the particulate emission filter (5).

5. Refitting

CAUTION : Adhere to the tightening torques .

CAUTION : Check the condition of the clips .

Refit :

- The particle emission filter (5) ; Using the component lift
- The clips (2), (4) ; Using tool [0193-B]
- The bolts (1)
- The temperature sensor (3)

Couple up : The pressure take-off pipes (as "a").

6. Check

Start the engine.
Verify :

- Note down or print out the parameters so that you can re-write them in the new ECU
- Fault codes missing ; Using the diagnostic equipment

Stop the engine.
Refit the under-engine protection .

7. Instructions for returning the particle filter (used)

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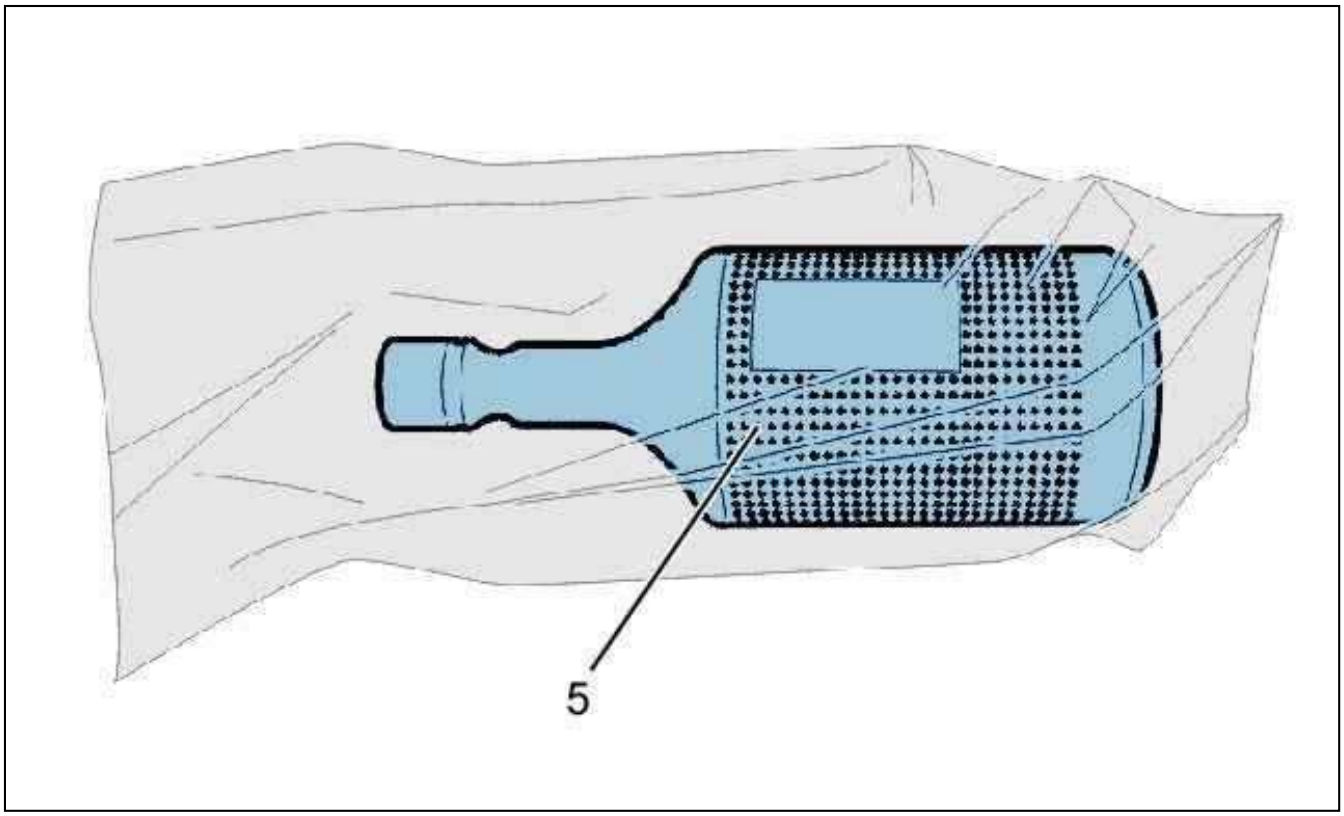


Figure : B1JP0B6D

Blank the particle filter orifices with the plugs and cover retrieved from the new particle filter.
Put the used particle filter (5) in the bag of the new particle filter.
Place this in the original packaging.

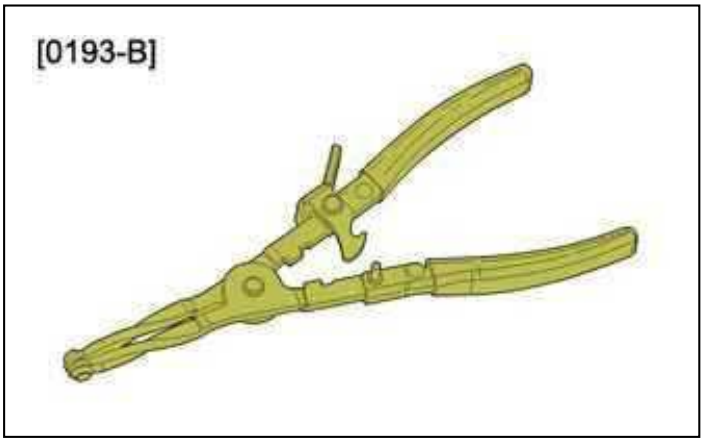
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REMOVING - REFITTING : EXHAUST MANIFOLD AND/OR PRE-CATALYTIC CONVERTER

ESSENTIAL : Observe the safety and cleanliness recommendations .

1. Tooling

Equipment : 13 mm pipe spanner .

tool	Reference	Designation
 Figure : E5AG06ZT	[0193-B]	Pliers for removing exhaust clips

2. Precautions to be taken

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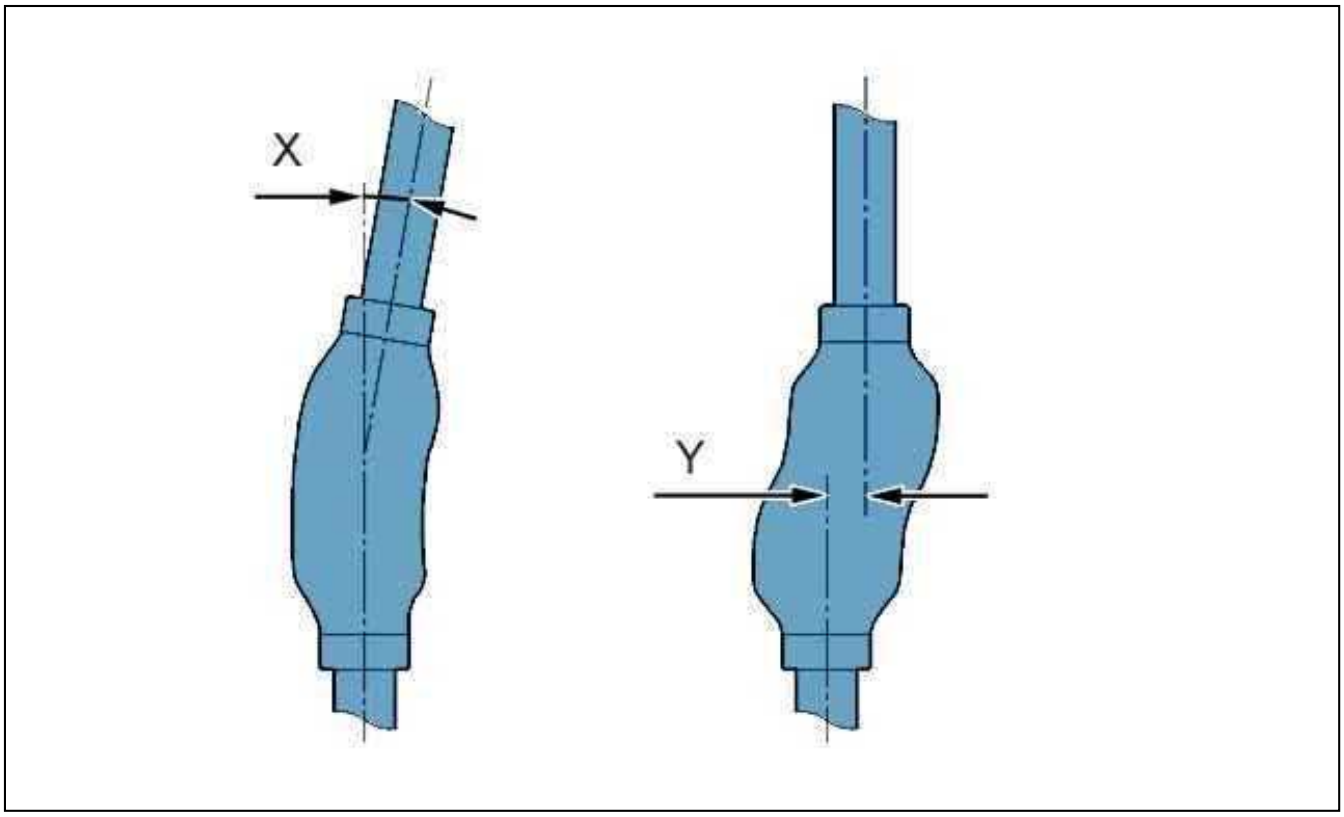


Figure : B1JP0FLD

Respect the precautions to be taken before repair :

- The front flexible pipe should be protected against any external mechanical interference
- The front flexible pipe should not come into contact with any corrosive products

CAUTION : Front flexible pipe removed : Do not deform the front flexible hose by more than 20° angular (X), 20 mm axial and 25 mm in shear (Y) ; Front flexible pipe in place : Do not deform the front flexible hose by more than 3° angular (X), 0 mm axial and 3 mm in shear (Y).

CAUTION : Failure to observe these precautions results in a reduction of the service life of the front hose ; The uncoupling or removal of the exhaust line is essential for operations requiring lifting of the power train.

3. Removing

CAUTION : Before starting any operation close to the exhaust line, wait the latter to cool down.

Lift and support the vehicle.
Remove the under engine protection .

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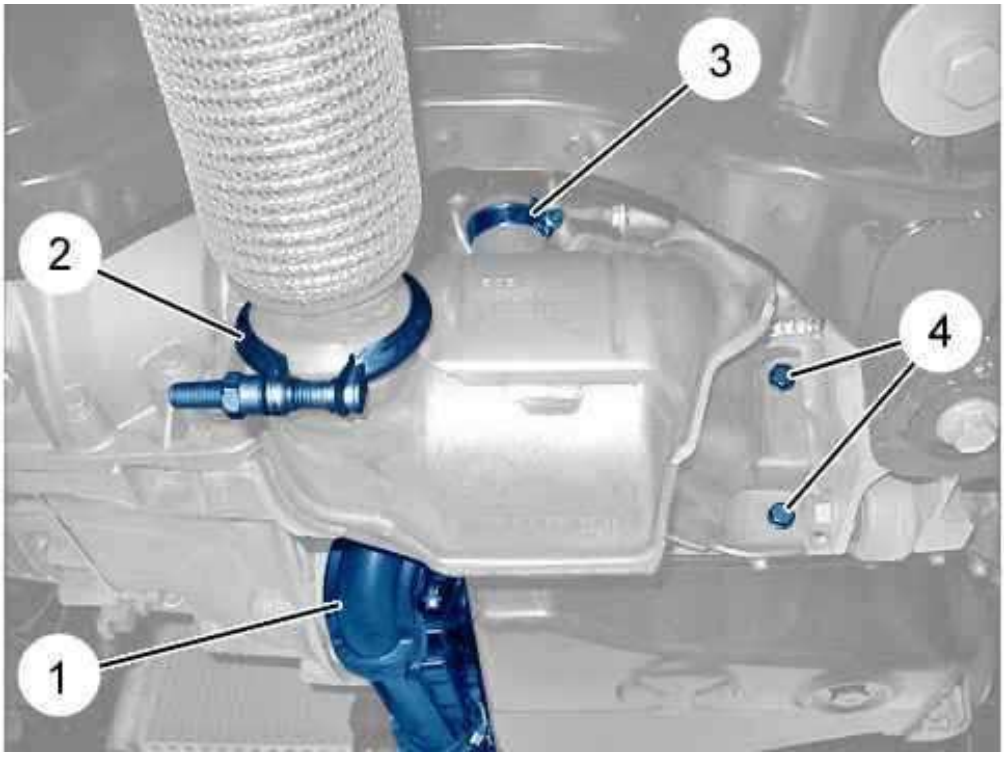


Figure : B1JG0BCD

Remove :

- The clip (3)
- The fixings on the resonator (1)
- The exhaust clip (2) ; Using tool [0193-B]
- The bolts (4)

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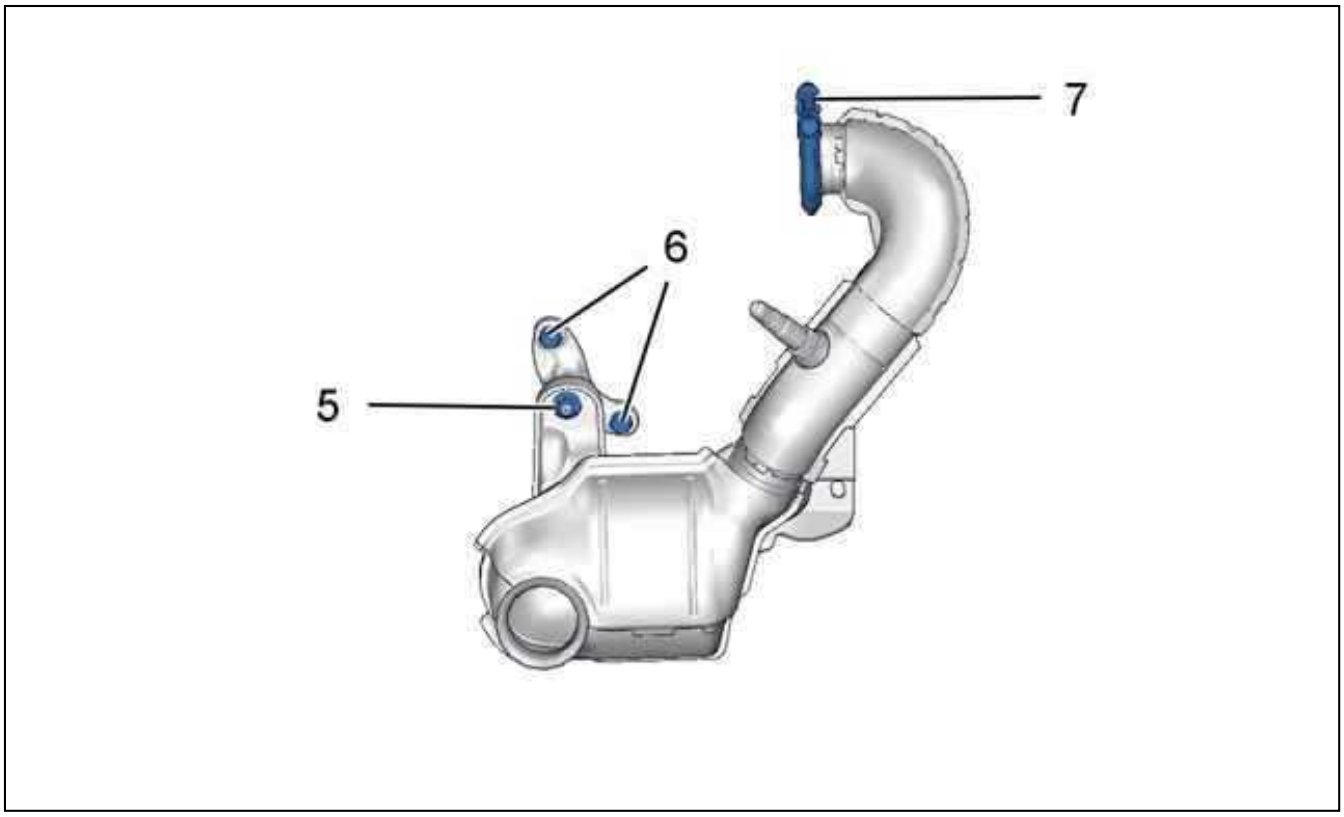


Figure : B1JG0BDD

Disconnect the oxygen sensor.
Slacken the self-slackening clip (7) sufficiently.
Remove :

- The nut (5) ; Using a pipe spanner
- The bolts (6)
- The resonator (1)

Remove the pre-catalyst (from underneath the vehicle).

4. Refitting

CAUTION : Adhere to the tightening torques.

Tightening torques :

- engine
- Exhaust

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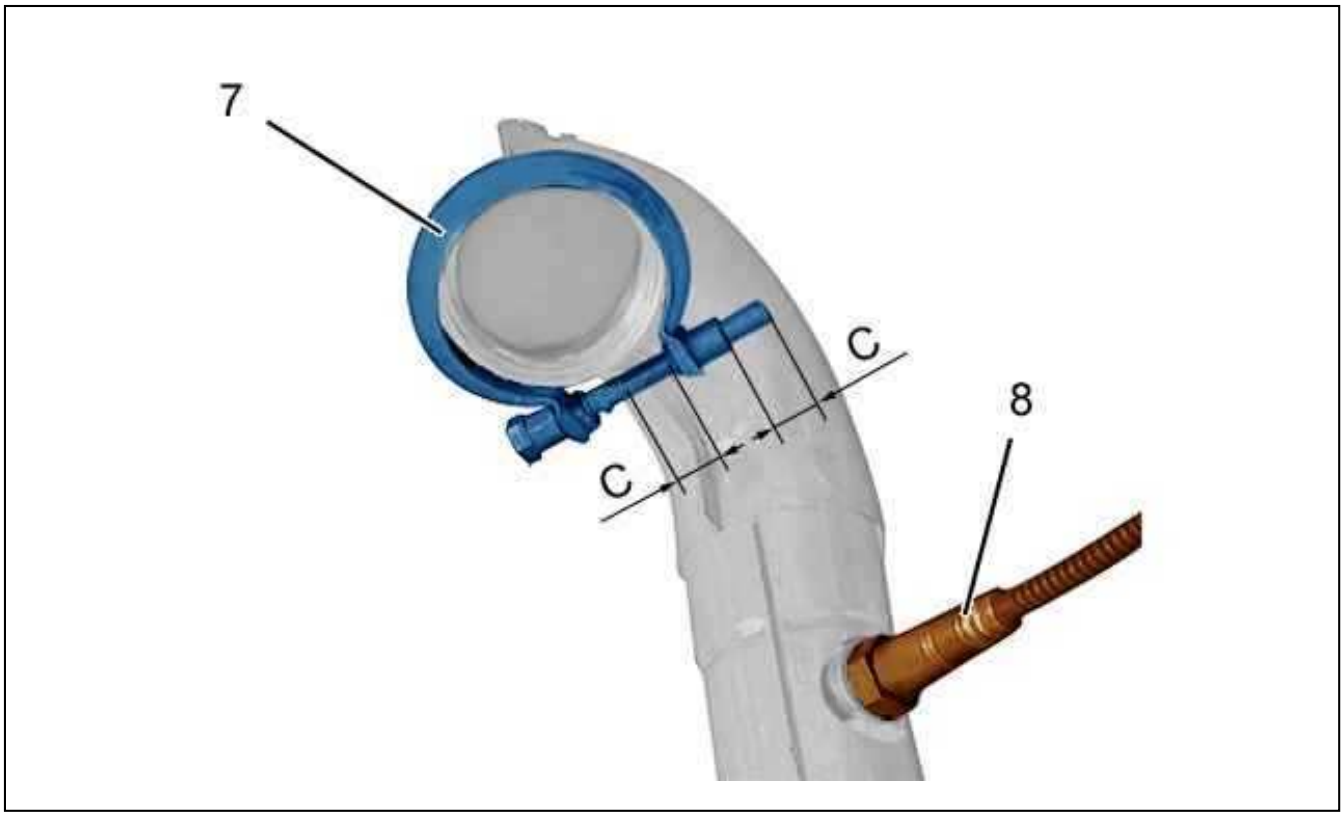


Figure : B1JG0BED

CAUTION : Check the condition of the surface of the splayed part and of the dual cone of the pre-catalyst.

Refit : The oxygen sensor (8) (If replacing the precatalyser).

CAUTION : Fit a new self-slackening clip (7) on the pre-catalyst.

Position : The self-slackening clip (7) (On the pre-catalyst).

N.B. : The visible parts of the thread should be of identical lengths "c".

CAUTION : The pre-catalyst is subject to large variations in temperature. Respect the order of refitting in order to avoid any interference.

Refit :

- The pre-catalytic converter (From below the vehicle)
- The resonator (1)

Screw in without tightening :

- The bolts (6)
- The nut (5)
- The bolts (4)

Tighten :

- The self-slackening clip (7)
- The bolts (6)
- The nut (5) ; Using a pipe spanner
- The bolts (4)

Connect : The oxygen sensor (/).

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Refit :

- The exhaust clip (2)
- The fixings on the resonator (1)
- The clip (3)
- The protective panel under the engine

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REFILLING : ADDITIVE TANK

ESSENTIAL : Observe the safety and cleanliness recommendations .

ESSENTIAL : For all work on the additive circuit, wear safety goggles and hydrocarbon resistant gloves.

1. Disposal - Recycling

The empty packaging and the kit pipes (which are specific industrial waste) will be stored in the soiled packaging container.
The drums which have been opened (these drums should never be re-used) as well as the overfill drums must be carefully closed and stored in a special container to await removal by a contractor for elimination/recycling.
The refilling kit, containers that have been opened and empty containers must in no circumstances be reused.
All opened receptacles as well as the unions used for the filling operation must be recycled.

2. Description of the filling kit

1 product drum(Containing either 1 or 3 litres).
1 Filler pipe with click-on connector (With stop valve for the 3 litre packaging).
1 Retaining net for the product container (Packaging for 1 litre(s)).
1 adaptor (8/10 mm diameter).
1 Empty drum for overfill.
1 Overflow pipe.
1 Retaining net for the overflow container.

3. Check(s) to be carried out before-hand

CAUTION : Should there be a breakdown in the system, verify the quantity of additive remaining as estimated by the ECU by checking the level using a measuring receptacle.

Checking the level : Using the diagnostic tool :

- Connect the diagnostic equipment
- Note down the quantity of additive remaining in the additive reservoir as given by the additive ECU

Checking the level ; Using a measuring receptacle :

- Remove the additive reservoir
- Inside the tank : Check the level of additive

Select the packaging appropriate for the quantity of additive to be added :

- 3 litres = Servicing of the filter or replacement of the reservoir
- 1 litre = Partial additive top-up only

4. Quantity of additive

The quantity of additive put in at the factory is 3,4 litres.

5. Refilling

Put the vehicle on a hoist.

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Disconnect the ancillaries battery.

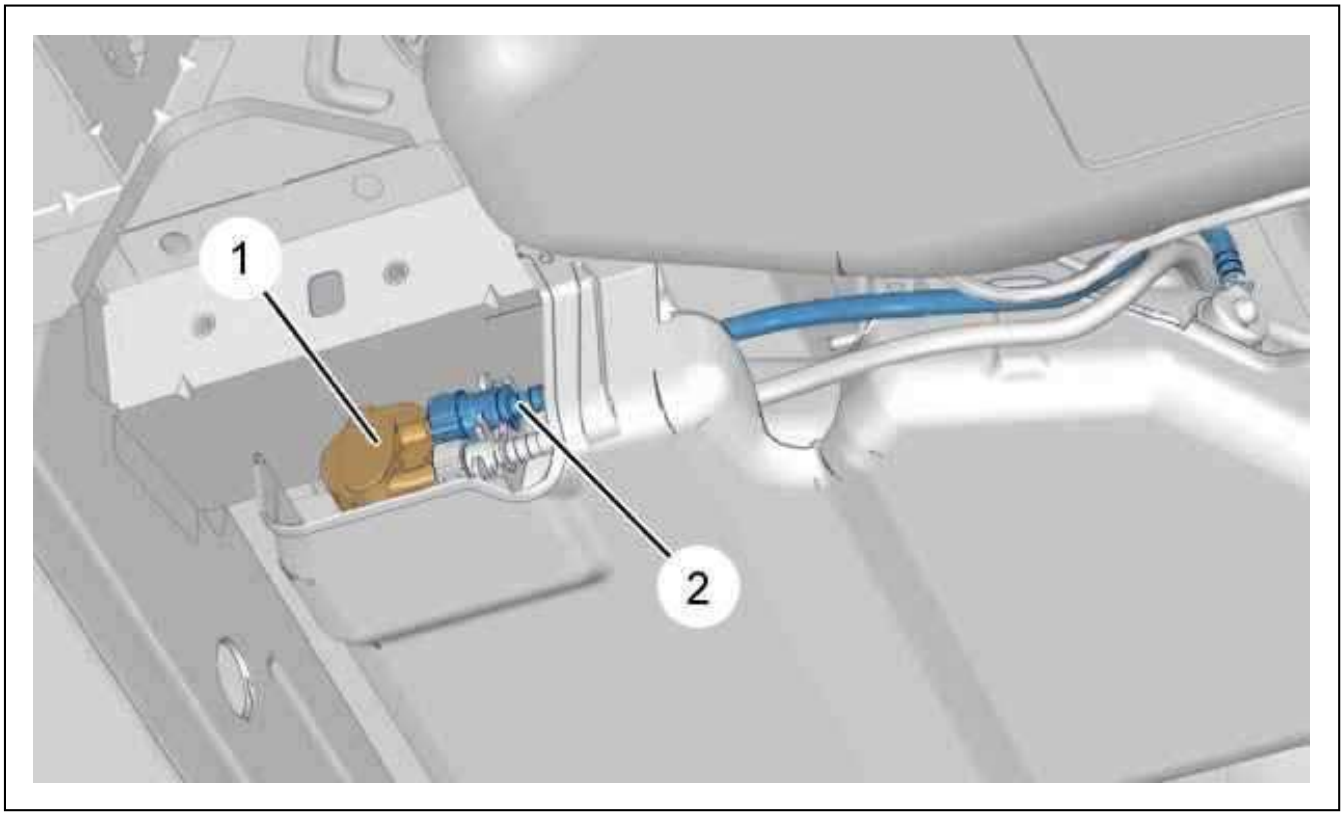


Figure : B1KP03CD

Unclip the factory-fitted filler union (1).
Uncouple the pipe (2).
Couple the additive container to the tube (2) using the adaptor and pipe (with tap) from the filling kit.
Couple the empty container, suspended in the retaining net, to the breather of the filling system.

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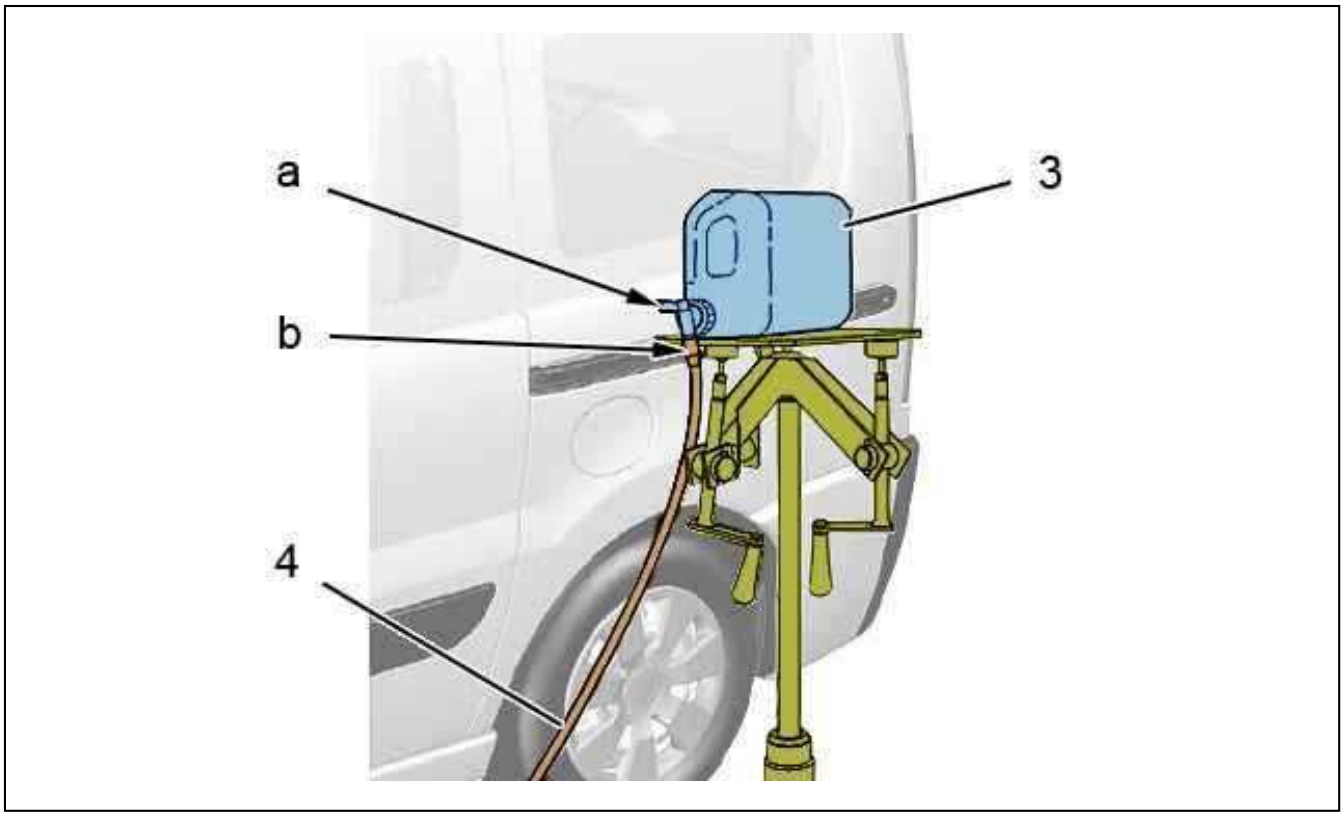


Figure : C4CP2G0D

Place the additive drum at a higher level than the additive reservoir.
1 litre can of product :

- Use the retaining net provided in the kit
- Pierce the additive container (indicated by a triangle on the container)

3 litre can of product :

- Screw the filler pipe onto the additive container (3) (at "b")
- Place the additive container on a component lift (3)
- Open the valve located on the click-fit filler pipe (at "a")
- Add the quantity desired, depending on the value (quantity of additive consumed) read via the diagnostic tool.

N.B. : When all of the fluid has flowed out, release the click-fit filler pipe .

Couple the tube (2) to the factory-fitted filler union (1).
Reclip the factory-fitted filler union (1).

CAUTION : Perform the operations that are required following a reconnection of the ancillaries battery.

Reconnect the ancillaries battery.

CAUTION : Prime the fuel additive circuit ; Using the diagnostic tool.

6. Reinitialisation : Additive ECU

CAUTION : Reset the counter of the additive ECU to zero. ; Using the diagnostic equipment.

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7. Recommendations for cleanliness

ESSENTIAL : The filling kit should be recycled after the repair. Any container of additive once opened must not be kept.

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FORCED REGENERATION : PARTICLE FILTER

ESSENTIAL : Observe the safety and cleanliness recommendations .

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line.

1. Tooling

Diagnostic tool.

2. Forced regeneration of the particle emission filter

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines .

ESSENTIAL : Where the recommended installation is not available, carry out the forced regeneration of the particle filter outside the workshop, on an area of hard standing and remote from any inflammable materials. Make the work area secure. Ensure that no one passes or stands behind the vehicle during the forced regeneration. Put the vehicle in the "high" position (vehicle with hydraulic suspension). Check that there are no aerosols or inflammable products inside the boot. Wear heat-resistant gloves. Connect the vehicle to an approved gas extractor for this type of operation.

CAUTION : Check that the level of fuel in the tank is sufficient (minimum 20 litres).

CAUTION : Check the following levels : Engine oil ; Coolant.

CAUTION : Check : The tightness of the turbocharging hoses (Risk of uncoupling).

ESSENTIAL : Remove the under-engine protection.

Start the engine and allow it to warm up (65°C minimum).
Connect the diagnostic tool on the vehicle’s central socket.
Carry out :

- Fault reading (Engine ECU)
- Fault clearing

Trigger the particle emission filter forced regeneration cycle ; Using the diagnostic equipment.
After the regeneration cycle : Allow the engine to run at idle, with the bonnet open, to help the cooling.
Stop the engine.

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line. Wear heat-resistant gloves.

Refit the under-engine protection .

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FORCED REGENERATION : PARTICLE FILTER (TECHNICAL NOTE)

ESSENTIAL : Observe the safety and cleanliness recommendations.

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line.

1. Tooling

Diagnostic tool.

2. Forced regeneration of the particle emission filter

ESSENTIAL : Respect the safety and cleanliness recommendations that are specific to high pressure diesel injection (HDi) engines.

ESSENTIAL : Where the recommended installation is not available, carry out the forced regeneration of the particle filter outside the workshop, on an area of hard standing and remote from any inflammable materials. Make the work area secure. Ensure that no one passes or stands behind the vehicle during the forced regeneration. Put the vehicle in the "high" position (vehicle with hydraulic suspension). Check that there are no aerosols or inflammable products inside the boot. Wear heat-resistant gloves. Connect the vehicle to an approved gas extractor for this type of operation.

CAUTION : Check that the level of fuel in the tank is sufficient (minimum 20 litres).

CAUTION : Check the following fluid levels : Engine oil ; Coolant.

CAUTION : Check : The tightness of the turbocharging hoses (Risk of uncoupling).

ESSENTIAL : Remove the under-engine protection.

Start the engine and allow it to warm up (65°C minimum).
Connect the diagnostic tool on the vehicle’s central socket.
Carry out :

- Fault reading (Engine ECU)
- Fault clearing

Trigger the particle emission filter forced regeneration cycle ; Using the diagnostic equipment.
After the regeneration cycle : Allow the engine to run at idle, with the bonnet open, to help the cooling.
Stop the engine.

ESSENTIAL : Wait at least one hour before carrying out any work on the exhaust line. Wear heat-resistant gloves.

Refit the under-engine protection .

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MODIFICATION : OXYGEN SENSOR

1. Application

Vehicles all types : Petrol injection engines.

2. Description

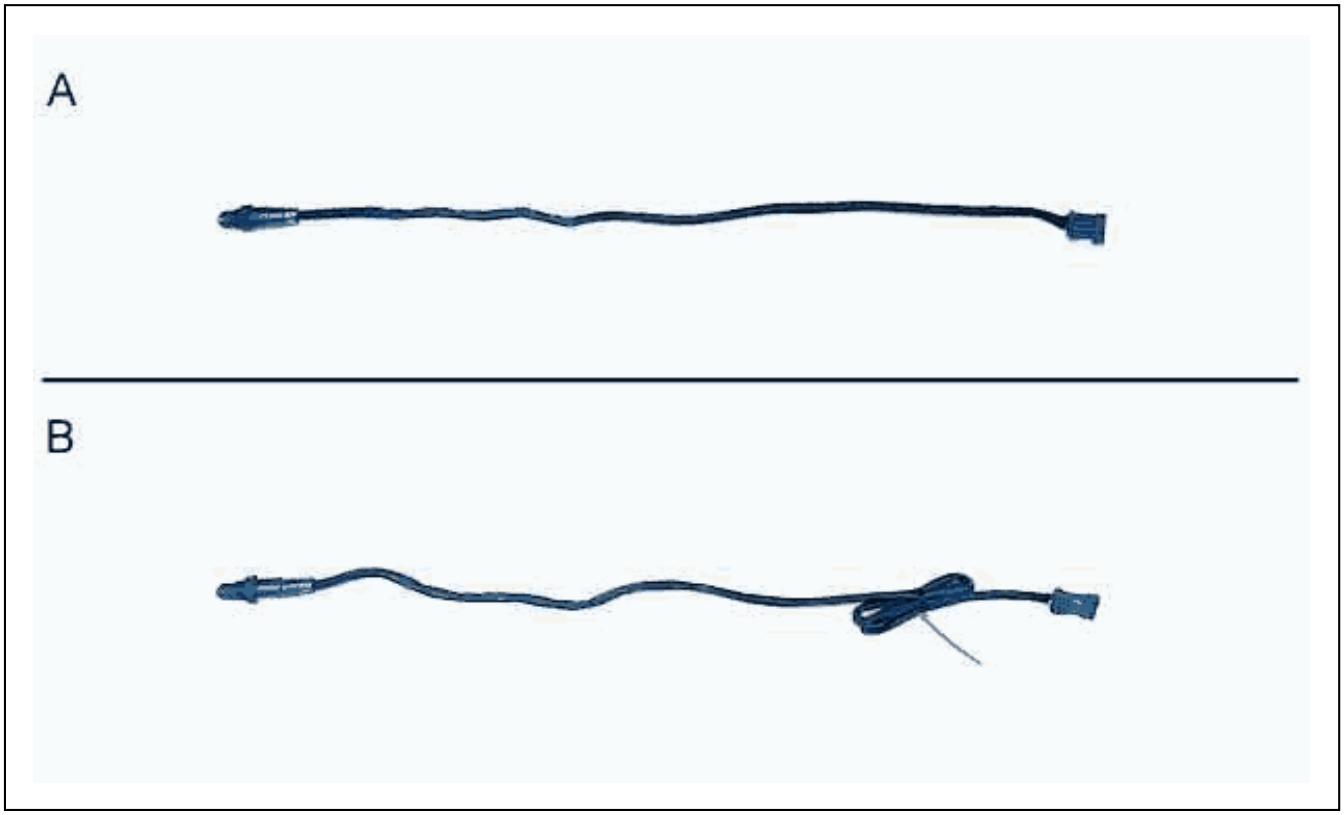


Figure : B1KT001D

Modification of the length of the oxygen sensor electrical harness.
"A" Old oxygen sensor.
"B" New oxygen sensor (Lengthened electrical harness).

3. Replacement Parts

Only the new parts will be available from the Replacement Parts Division once stocks have been exhausted.

4. Repair

The method for replacing the oxygen sensor is unchanged.

CAUTION : The electrical harness must always stay well out of range of the exhaust line . Secure the excess length o electrical harness with a zip strap.

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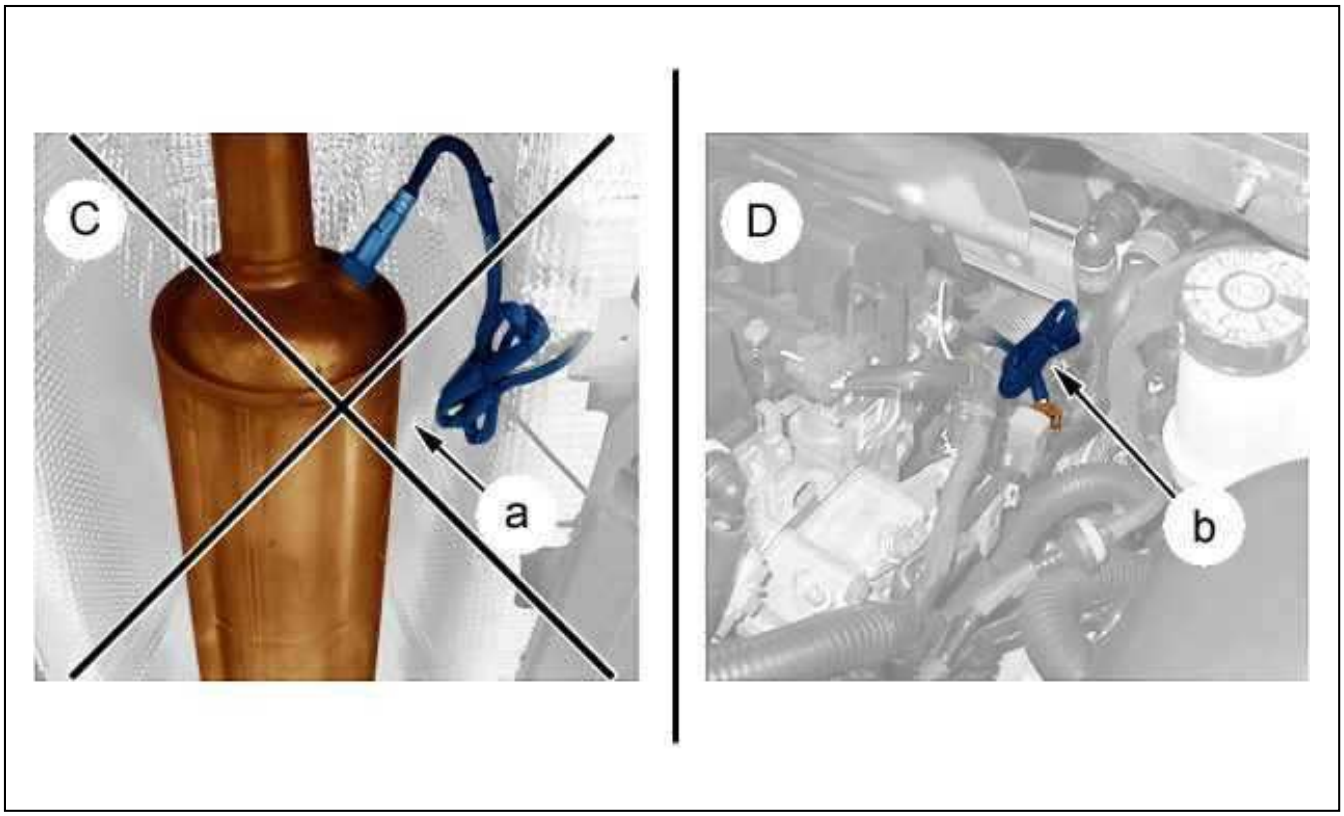


Figure : B1KT002D

"C" Assembly not correct : The excess electrical harness is secured close to the exhaust line (at " a").
"D" Assembly correct : Secure the excess electrical harness close to the connector (at " b").

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MODIFICATION : PARTICLE FILTER ADDITIVE

CAUTION : This bulletin concerns only the filling of the rigid reservoir. This bulletin does not concern the replacemen of soft pouches.

This development bulletin describes the changes to the factory-fitted particle filter additives and their impact on after-sales maintenance operations.

1. The new 3rd generation particle filter additives

Suppliers and brands :

- RHODIA : EOLYS POWERFLEX
- INFINEUM : F7995

2. Previous type of additive

Additive DPX 42 is still available and must be used for all servicing on vehicles that have DPX 42.
The EOLYS 176 additive is replaced by the INFINEUM F7995 additive When current stocks are exhausted, only the nev product will be supplied.

3. Compatibility between additives

Additive DPX42 cannot be mixed with any other additive.
Additives EOLYS POWERFLEX and INFINEUM F7995 cannot be mixed with each other.

N.B. : The different generations of additive do not affect the calibrations of the engine management ECU.

CAUTION : It is not permissible to mix additives INFINEUM F7995 and Rhodia EOLYS POWERFLEX with each other

4. Filling or topping up with additive

4.1. Identifying the type of additive present in the vehicle

CAUTION : Prior to any operation on the additive reservoir, it is necessary to identify the type of additive present in the vehicle Identification by the colour of the click-on union on the filler interface.

Identification by the colour of the click-on union on the filler interface	
Colour of the clickfit	Type of additive
Click-fit neither blue nor green	EOLYS DPX42
	Blue clickfit : EOLYS POWERFLEX

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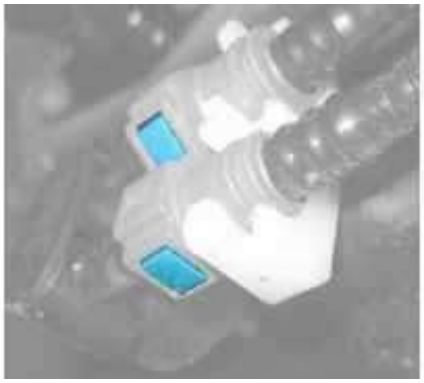


Figure : B1KT004T

Green clickfit : EOLYS 176 or INFINEUM F7995



Figure : B1KT008T

4.2. Rules for choice of additive for after-sales operations

N.B. : These rules only concern the filling of rigid reservoirs with particle filter additive.

Conversion chart for filling or topping-up operations		
Additive present in the vehicle	Colour of clickfit on filler interface	Additive to be used in all operations
DPX 42	Click-fit neither blue nor green	DPX 42
EOLYS 176	Green clickfit	INFINEUM F7995
INFINEUM F7995	Green clickfit	INFINEUM F7995
EOLYS POWERFLEX	Blue clickfit	EOLYS POWERFLEX

5. Recommendations/precautions

CAUTION : If the additives should be reversed, the filter becomes clogged with particles.

Use these products exclusively ; any other product causes a mmalfunction of the filtration system.
Use clean additive only as any particles risk causing the additive injector to seize.

N.B. : The soft additive pouches have a Part No. and must be replaced with respect to that Part No..

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