

TIGHTENING TORQUES : EP ENGINE (DIRECT INJECTION)

1. Engine top

1.1. Cylinder head

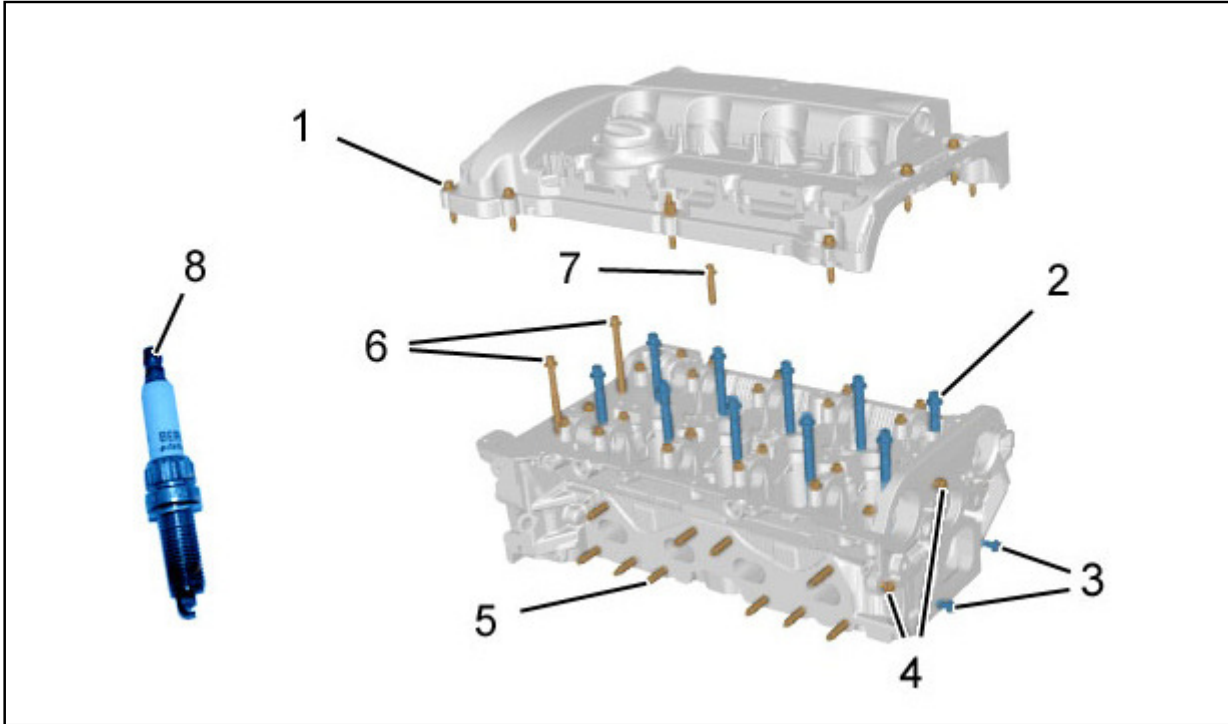


Figure : B1BB0SFD

Reference	Designation	Tightening torque
(1)	Cylinder head cover fixing bolts	0,9 daNm
(2)	Cylinder head bolts (*)	Pre-tighten to 3 daNm
		Angular pre-tightening to 90°
		Angular tightening to 90°
(3)	fixing screws (Coolant outlet housing)	1 daNm
(4)	fixing screws (vacuum pump)	0,9 daNm
(5)	Exhaust manifold fixing studs	1,5 daNm
(6)	Peripheral bolt for cylinder head / Cylinder block (*)	Pre-tighten to 1,5 daNm
		Angular pre-tightening to 90°
		Angular tightening to 90°
(7)	Peripheral bolt for cylinder head / Cylinder block (*)	Pre-tighten to 2,5 daNm
		Angular tightening to 30°
(8)	Spark plug	2,3 daNm
(*) Follow the tightening sequence		

1.2. Order of tightening : Cylinder head



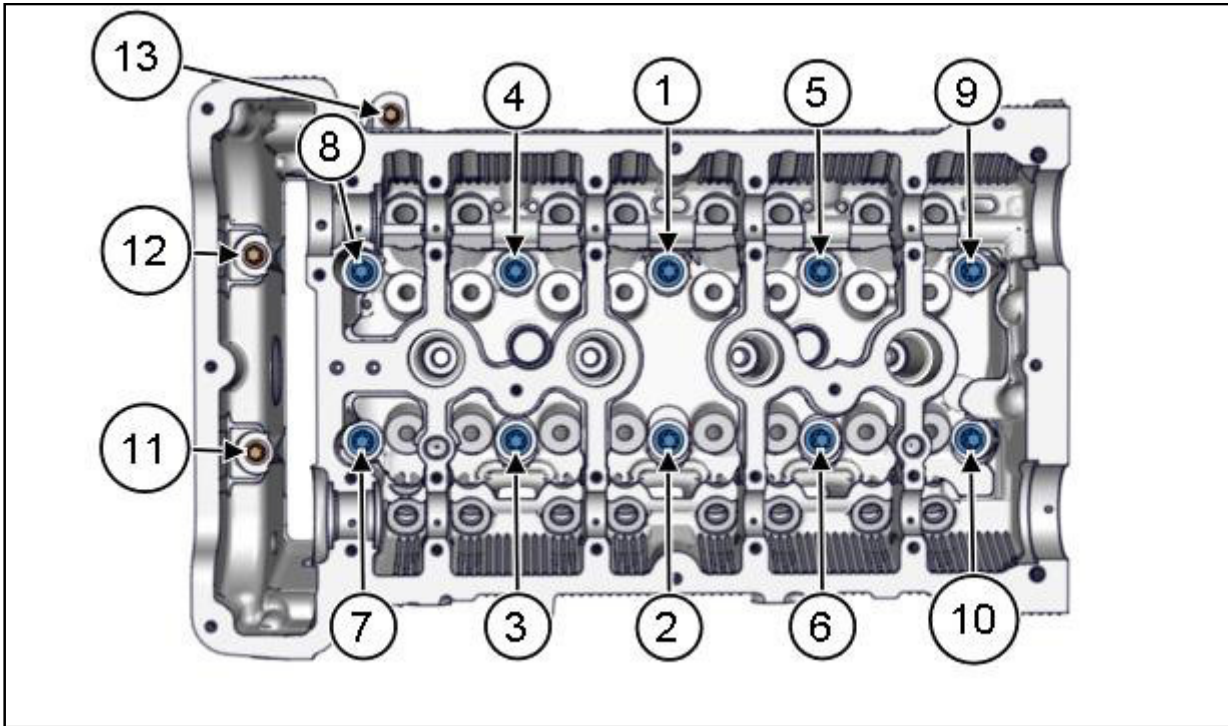


Figure : B1DM03QD

1.3. inlet manifold

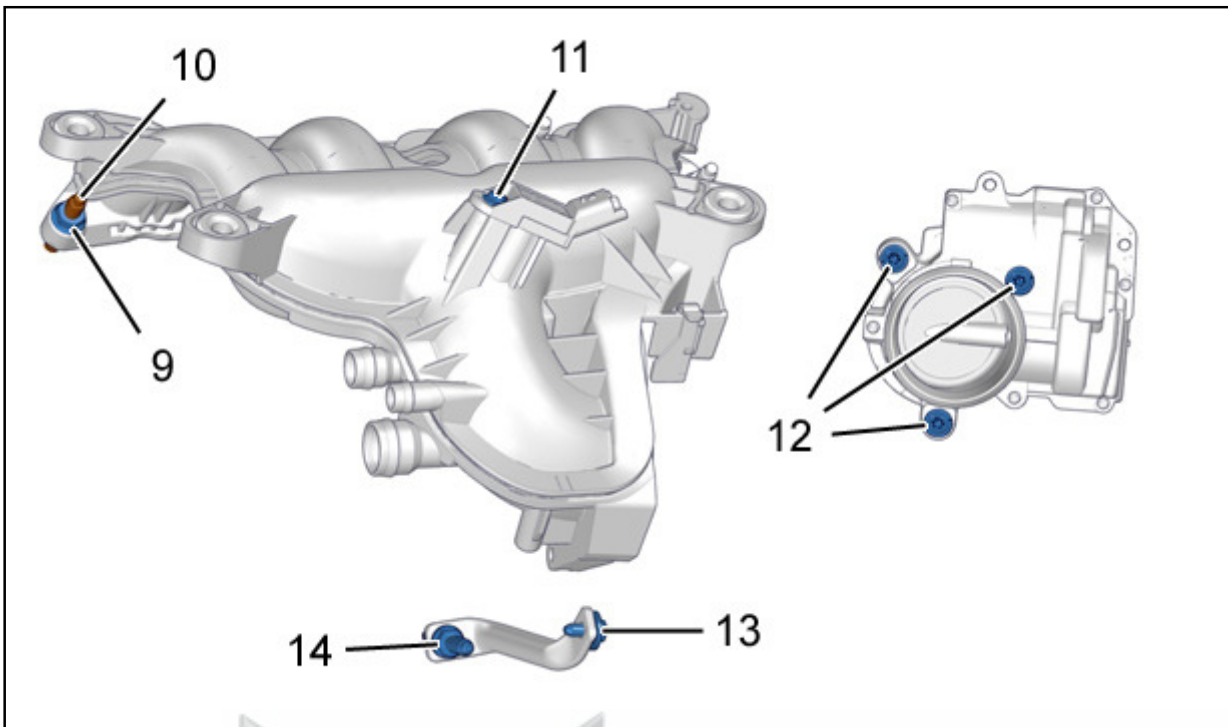


Figure : B1BB0SBD

Reference	Designation	Tightening torque
(9)	Air inlet manifold fixing nuts (*)	2 daNm
(10)	Air inlet manifold fixing studs	1,5 daNm
(11)	fixing screws : Air pressure sensor	0,5 daNm
(12)	Throttle housing fixing bolts / Air inlet manifold (New)	1 daNm
	Throttle housing fixing bolts / Air inlet manifold (Re-used)	0,8 daNm
(13)	Support fixing screws / inlet manifold	0,8 daNm

(14)	Support fixing screws / Cylinder block	2 daNm
(*) Follow the tightening sequence		

1.4. Order of tightening : Air inlet manifold

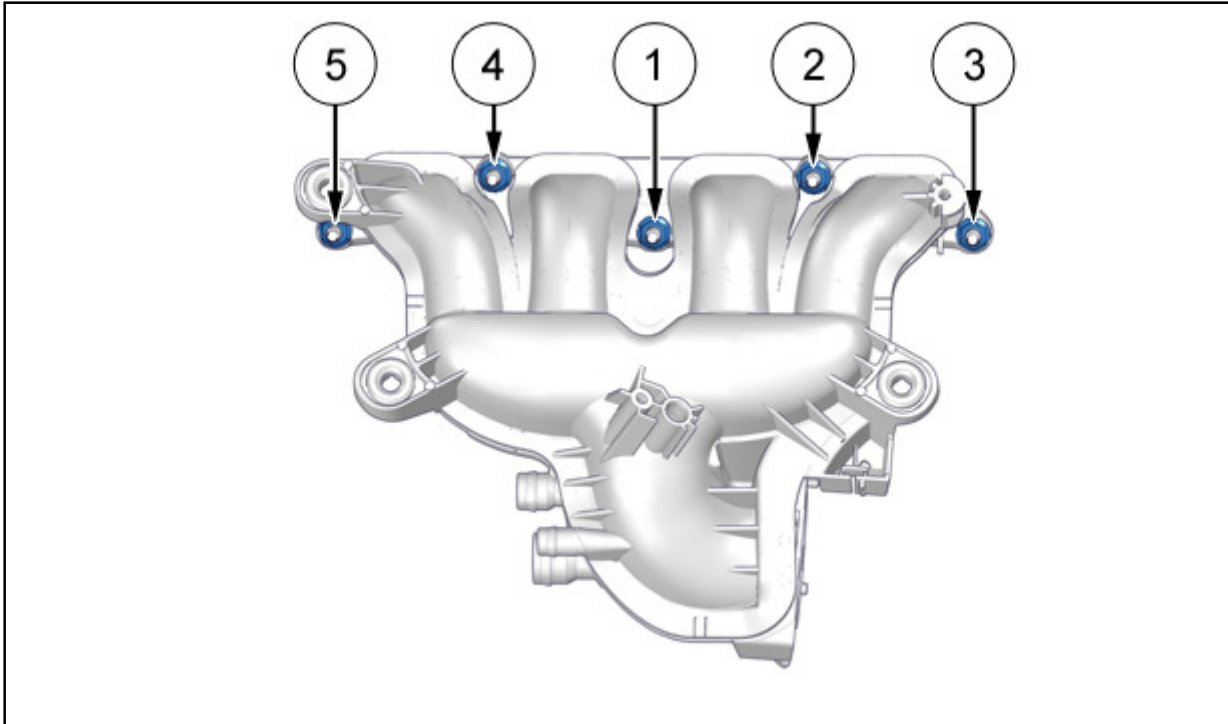


Figure : B1BB0SCD

(9) Mounting nut : inlet manifold.

1.5. Exhaust manifold / turbocharger

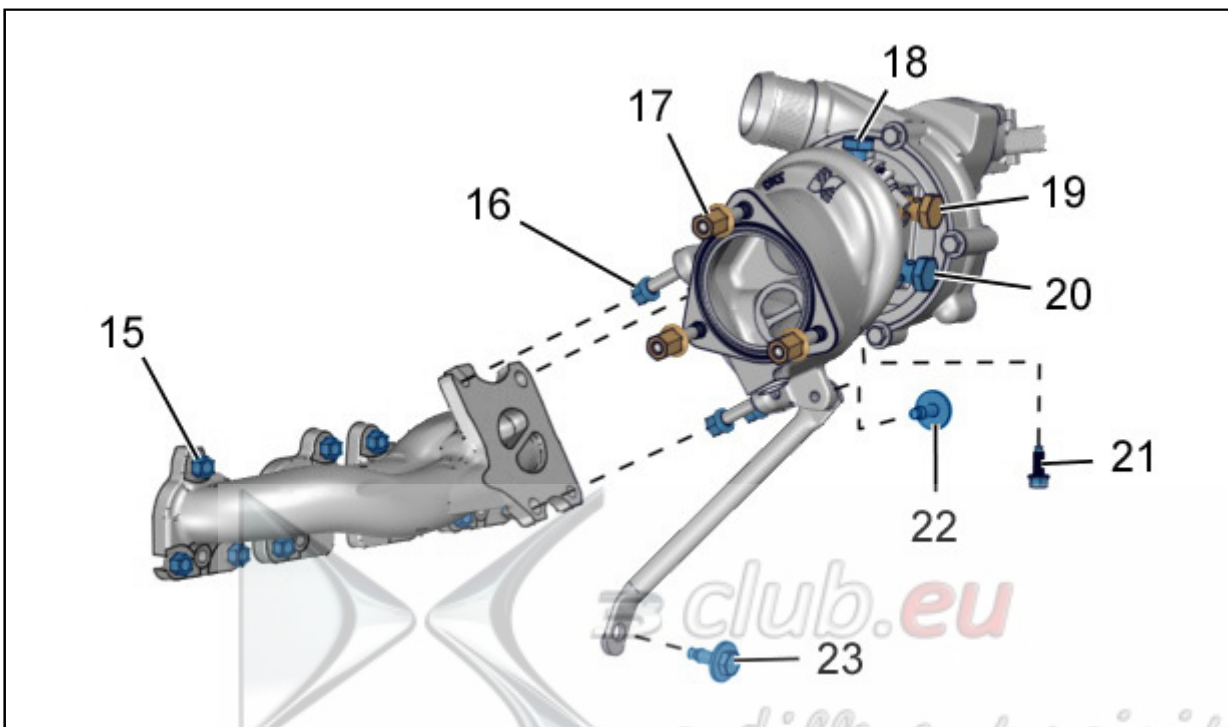


Figure : B1BB0RXD

Reference	Designation	Tightening torque

(15)	Exhaust manifold fixing nuts / Cylinder head	2 daNm
(16)	Turbocharger fixing nuts / Manifold	2,5 daNm
(17)	Catalytic converter mounting nuts / turbocharger	2 daNm
(18)	Lubrication union banjo bolt	3 daNm
(19)	Cooling return banjo bolt	3,5 daNm
(20)	Cooling input hollow bolt	3,5 daNm
(21)	Lubrication pipe fixing bolt	0,8 daNm
(22)	Support fixing screws / turbocharger	2,4 daNm
(23)	Support fixing screws / Cylinder block	1,9 daNm

2. Under engine

2.1. Cylinder block

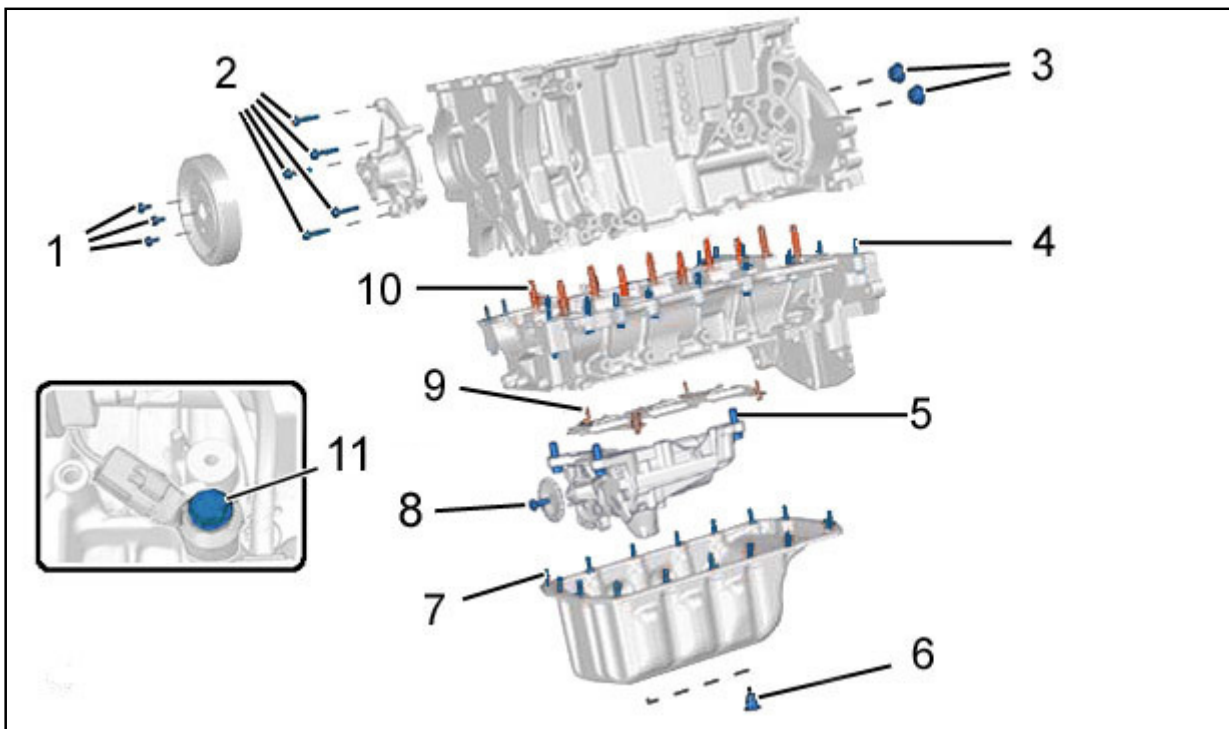


Figure : B1BB0SHD

Reference	Designation	Tightening torque
(1)	fixing screws (Water pump pulley)	0,8 daNm
(2)	Coolant pump fixing bolts / Cylinder block	0,9 daNm
(3)	Cylinder block oil channel caps	3,5 daNm
(4)	Crankshaft main bearing cap casting peripheral bolt (*)	0,9 daNm
(5)	fixing screws : oil pump (*)	Pre-tighten to 1 daNm Tightening torque to 2,5 da.Nm
(6)	drain plug	3 daNm
(7)	fixing screws (Lower oil sump)	1,2 daNm
(8)	fixing screws : Pinion of the oil pump	0,5 daNm Angular tightening to 90°
(9)	Anti-surge plate fixing bolt	1 daNm
(10)	Crankshaft bearing cap bolts (*)	Pre-tighten to 3 daNm Angular tighten to 150 ± 5 °
(11)	Knock sensor	2 daNm

(*) Follow the tightening sequence

2.2. Order of tightening : oil pump

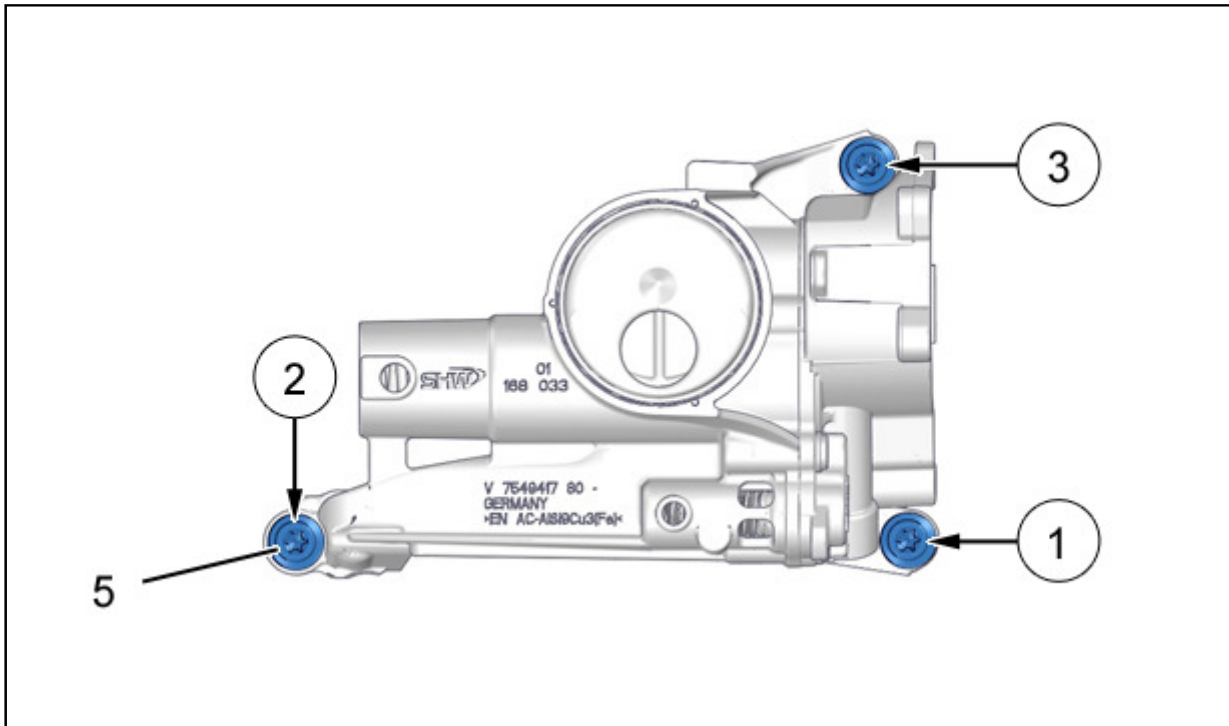


Figure : B1BB0SID

(5) fixing screws : oil pump.

2.3. Order of tightening : Crankshaft main bearing cap casting

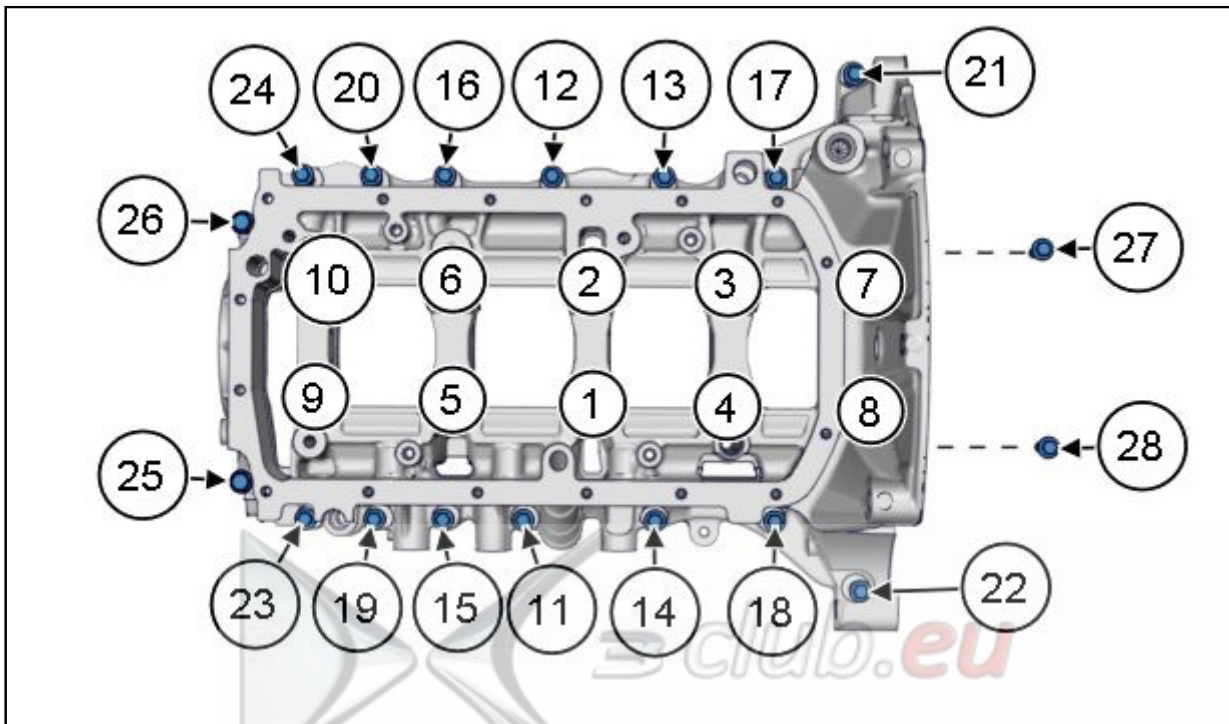


Figure : B1BM0ABD

2.4. Reciprocating gear

a different spirit

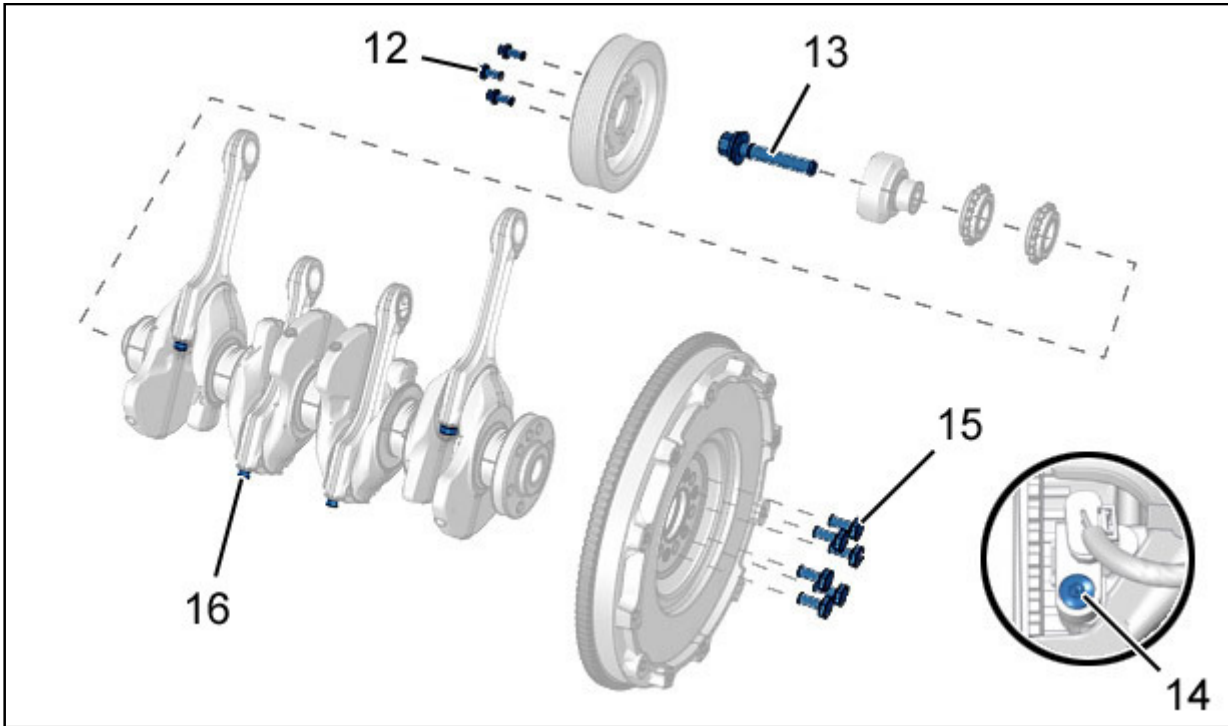


Figure : B1BB0SKD

Reference	Designation	Tightening torque
(12)	Ancillary drive pulley fixing bolt	Tightening torque to 2,8 da.Nm
(13)	fixing screws (Crankshaft gear)	Pre-tighten to 5 daNm
		Angular tighten to $180 \pm 10^\circ$
(14)	Engine speed sensor	0,5 daNm
(15)	Flywheel bolts (*)	Pre-tighten to 0,8 daNm
		Pre-tighten to 3 daNm
		Angular tighten to $90 \pm 5^\circ$
	Metal screw (Automatic gearbox) (*)	Pre-tighten to 0,8 daNm
		Pre-tighten to 3 daNm
		Angular tighten to $90 \pm 5^\circ$
(16)	bolts (Big end caps)	Pre-tighten to 0,5 daNm
		Pre-tighten to 1,5 daNm
		Angular tighten to $130 \pm 5^\circ$
(*) Follow the tightening sequence		

2.5. Order of tightening : Engine flywheel



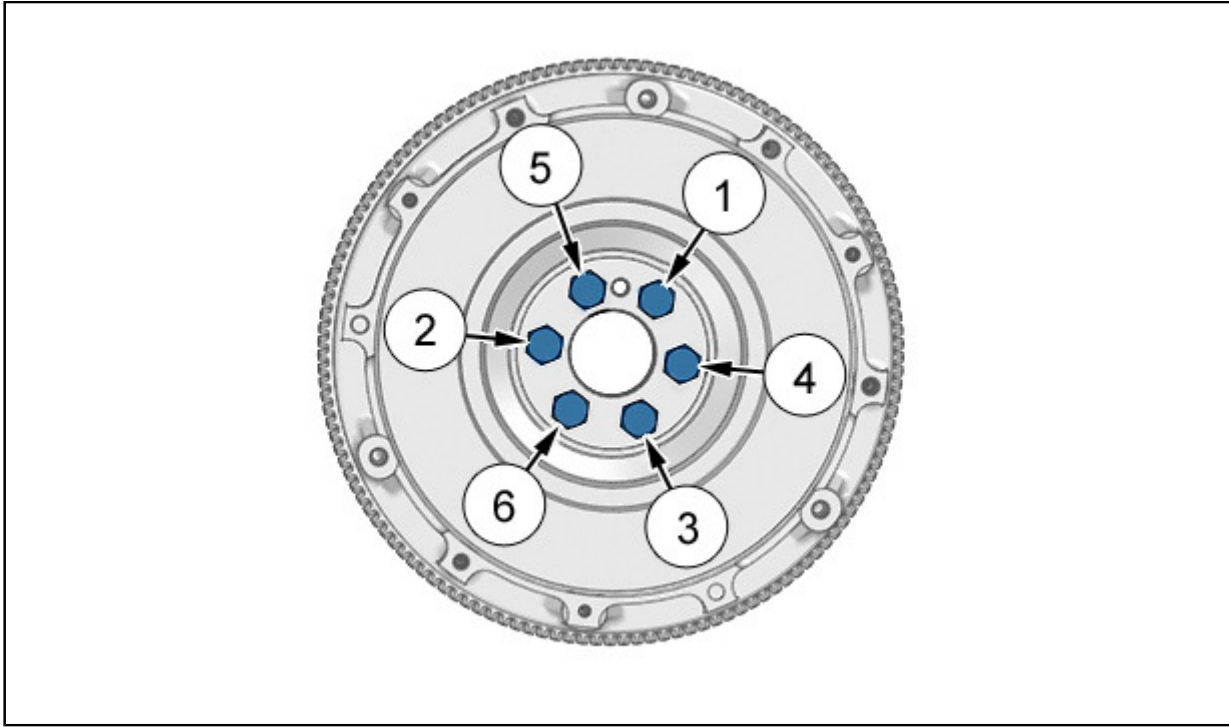


Figure : B1BM0ADD

(15) fixing screws : Engine flywheel.

3. Lubrication

3.1. 1st assembly

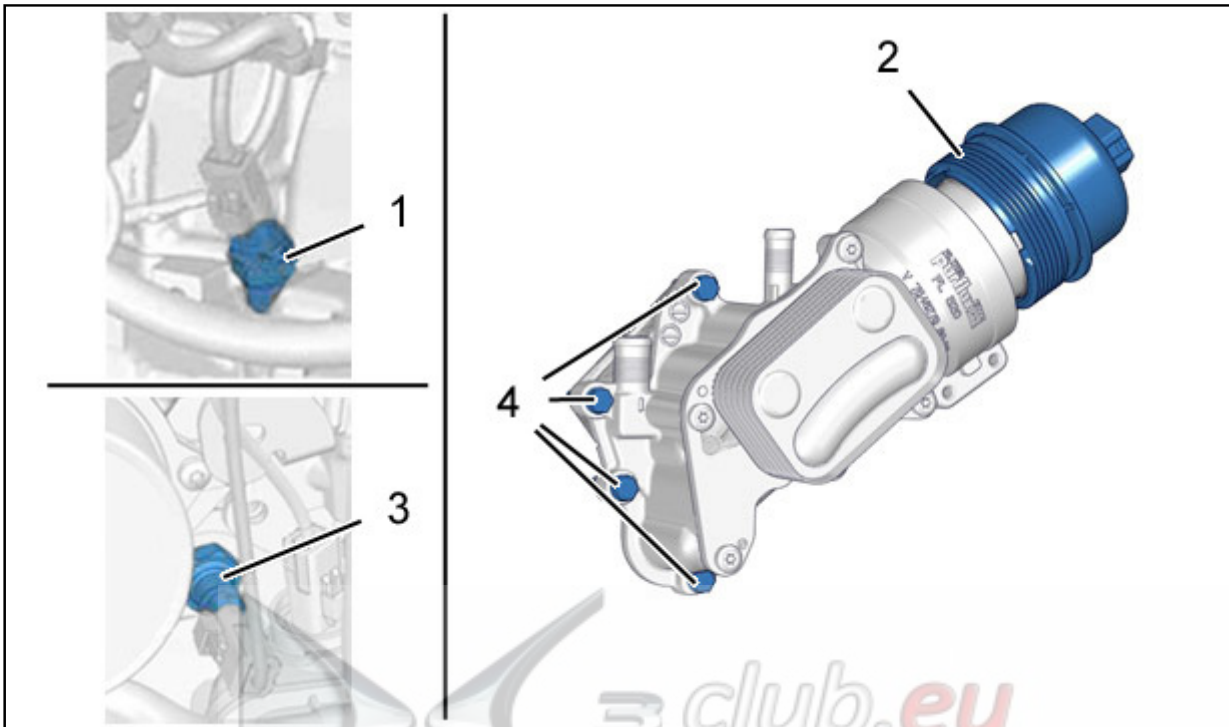


Figure : B1BB0SMD

Reference	Designation	Tightening torque
(1)	Engine oil temperature and level sensor	2,7 daNm
(2)	Oil filter cover	2,5 daNm
(3)	Oil pressure sensor	2 daNm

(4)	Oil filter support fixing bolt / Cylinder block	1 daNm
-----	---	--------

3.2. 2nd assembly

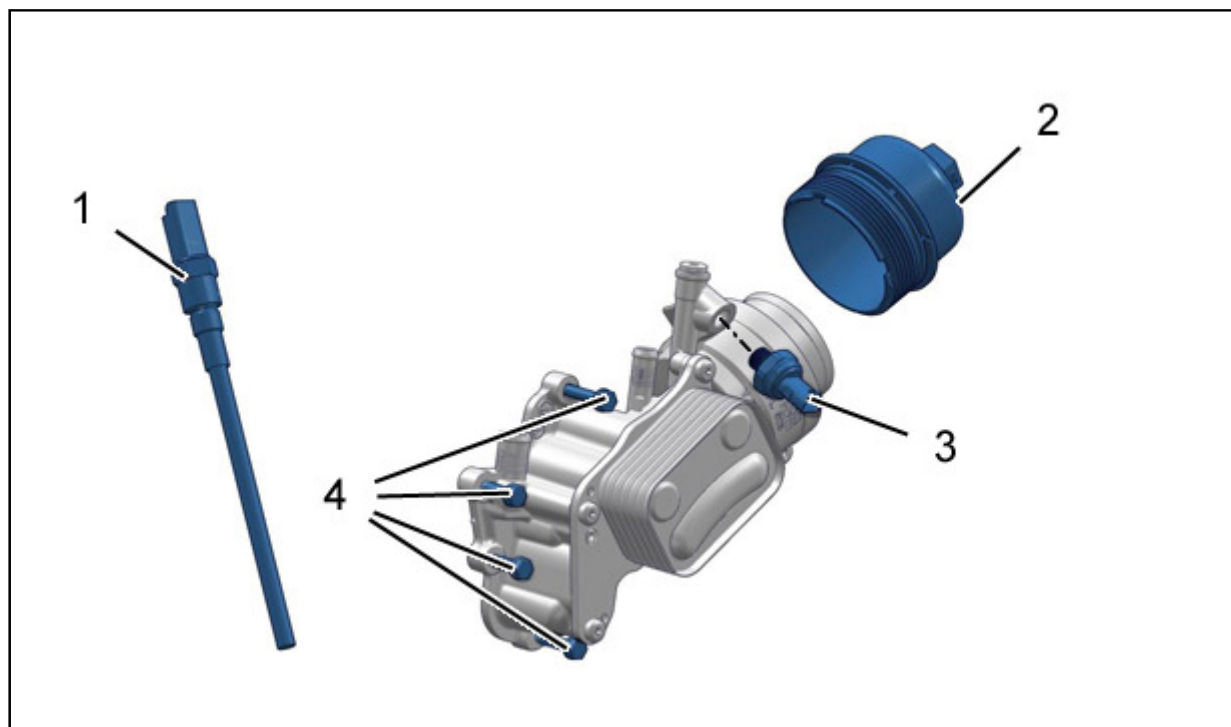


Figure : B1FB017D

Reference	Designation	Tightening torque
(1)	Engine oil temperature and level sensor	2,7 daNm
(2)	Oil filter cover	2,5 daNm
(3)	Oil pressure sensor	2 daNm
(4)	Oil filter support fixing bolt / Cylinder block	1 daNm

4. Timing gear

4.1. Camshafts



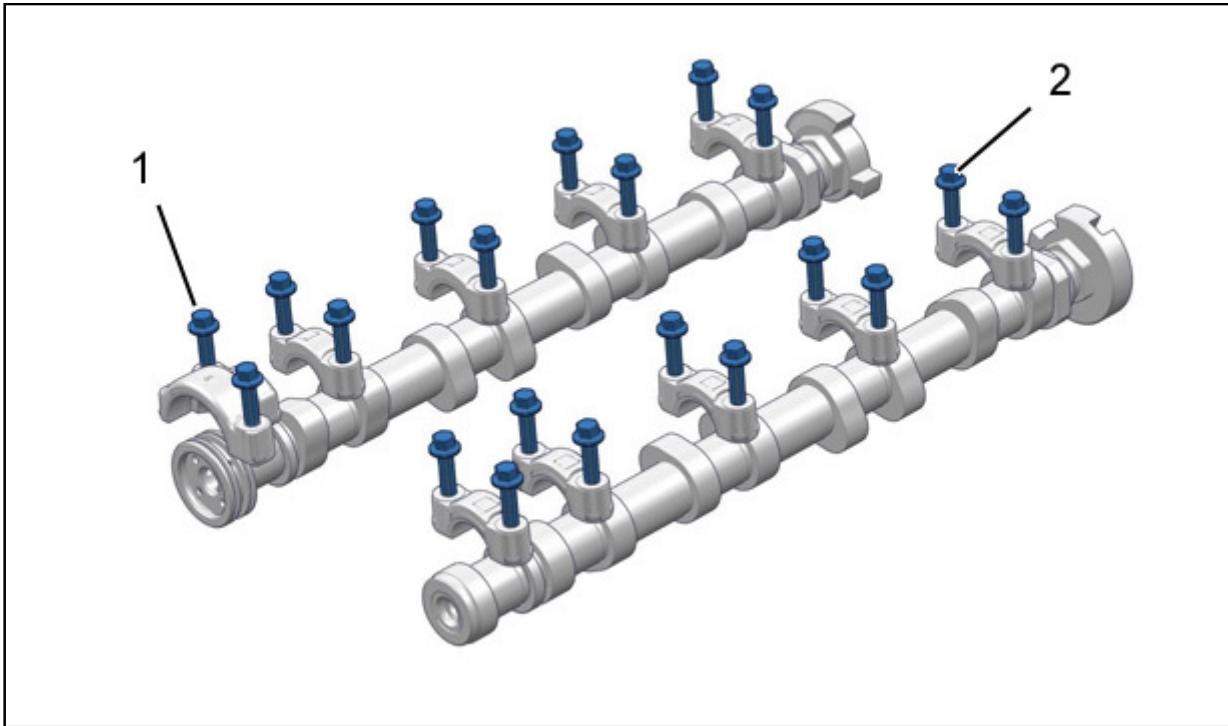


Figure : B1EB00SD

Reference	Designation	Tightening torque
(1)	fixing screws : Inlet camshaft main bearing caps (*)	1 daNm
(2)	fixing screws : Exhaust camshaft main bearing caps (*)	1 daNm
(*) Follow the tightening sequence		

4.2. Order of tightening : Inlet camshaft main bearing caps

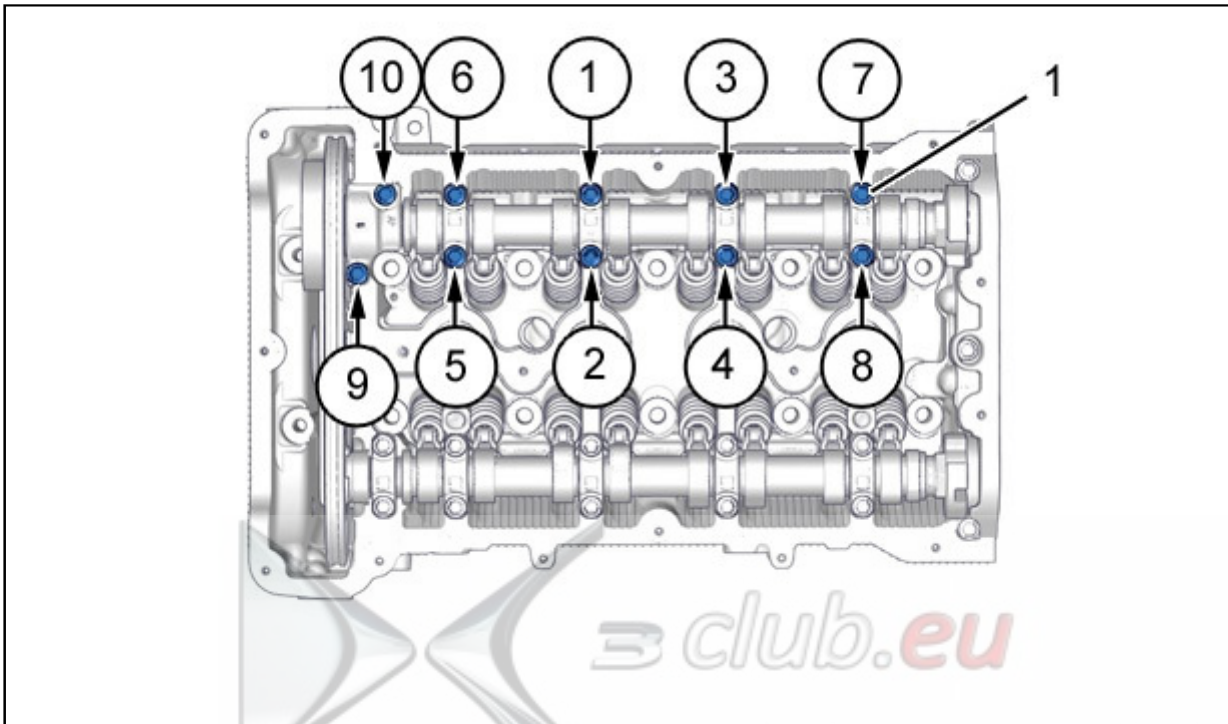


Figure : B1EB00TD

(1) Inlet camshaft main bearing cap bolts.

4.3. Order of tightening : Exhaust camshaft main bearing caps

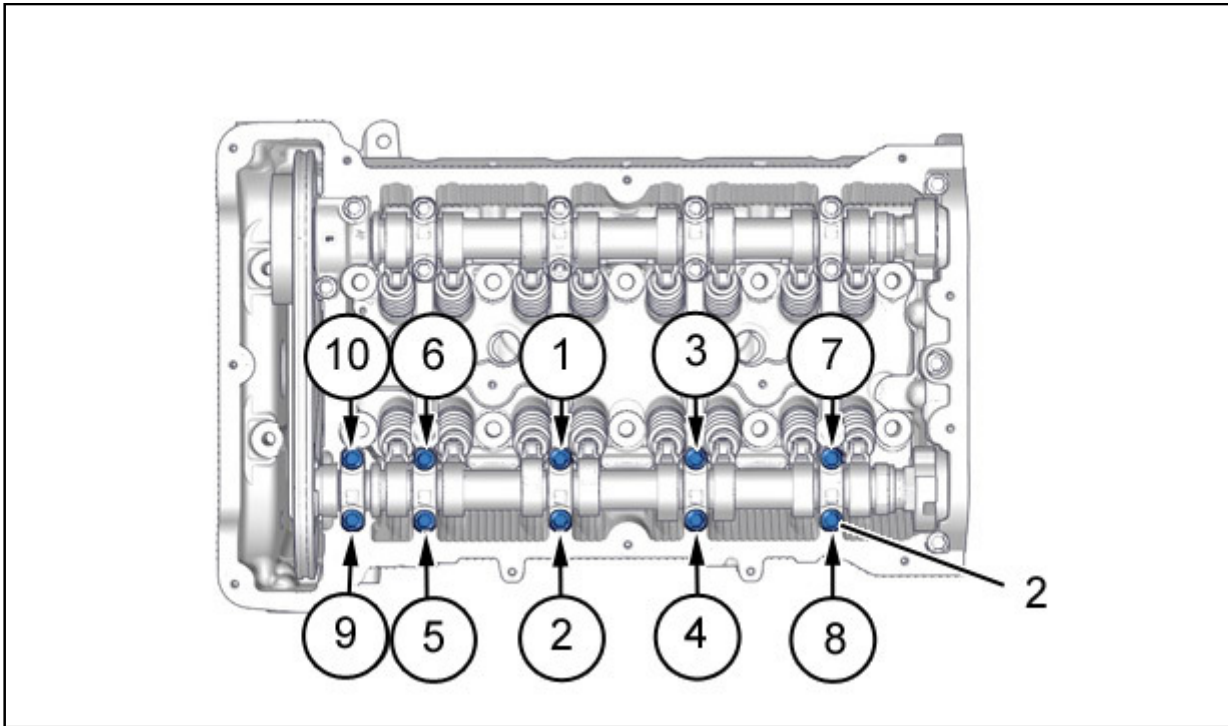


Figure : B1EB00UD

(2) Exhaust camshaft main bearing cap bolts.

4.4. Timing controls

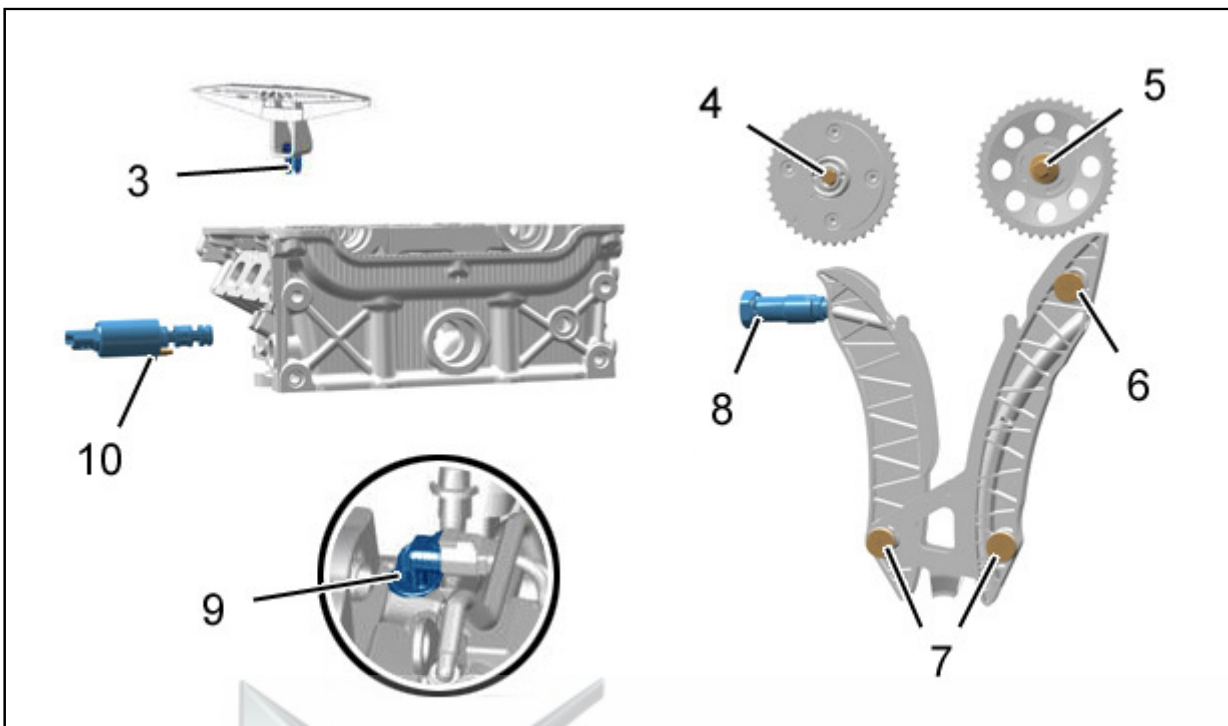


Figure : B1EB00VD

Reference	Designation	Tightening torque
(3)	fixing screws (Timing chain anti-knock pad)	0,9 daNm
(4)	fixing screws (Inlet gear)	Pre-tighten to 2 daNm
		Angular tighten to $180 \pm 5^\circ$
(5)	fixing screws (Toothed exhaust rotor)	Pre-tighten to 2 daNm
		Angular tighten to $90 \pm 5^\circ$

(6)	Fixed guide upper fixing bolt	2,5 daNm
(7)	Lower fixing bolts of the timing chain guides	2,4 daNm
(8)	Timing chain tensioner	7,5 daNm
(9)	Cylinder reference sensor (Induction camshaft)	0,8 daNm
(10)	fixing screws : Timing control electrovalve	0,9 daNm

5. Fuel supply

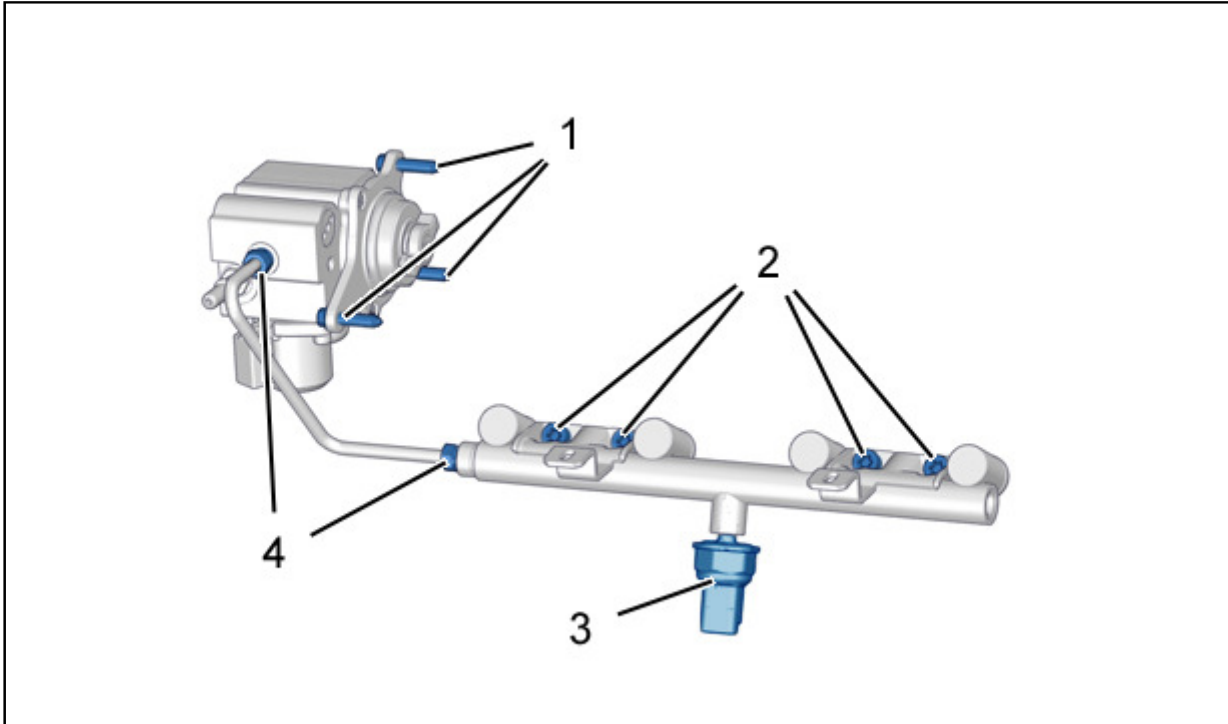


Figure : B1HB0FVD

Reference	Designation	Tightening torque
(1)	fixing screws : high pressure pump(*)	1,1 daNm
(2)	fixing screws : Injectors rail (*)	2 daNm
(3)	Fuel pressure sensor	3,2 daNm
(4)	High pressure fuel pipe unions (*)	3 daNm
(*) Follow the tightening sequence		

5.1. Order of tightening : high pressure fuel pump



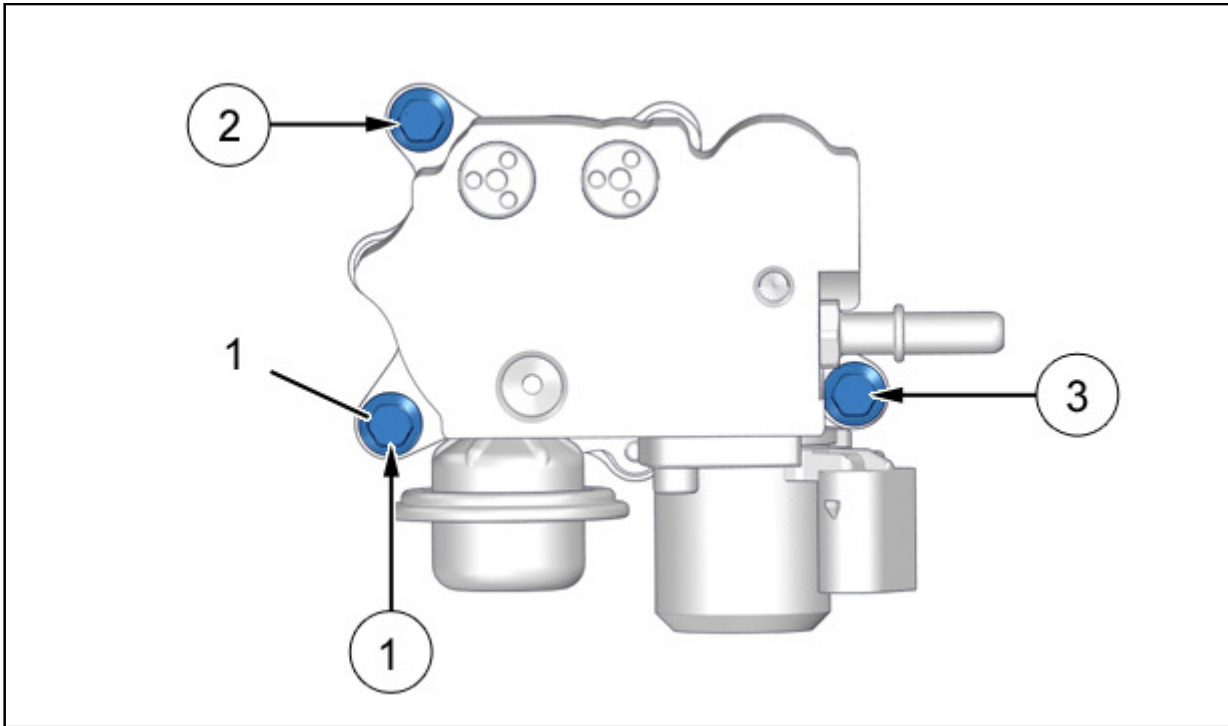


Figure : B1BB0SPD

(1) fixing screws : high pressure pump.

5.2. Order of tightening : Supply circuit

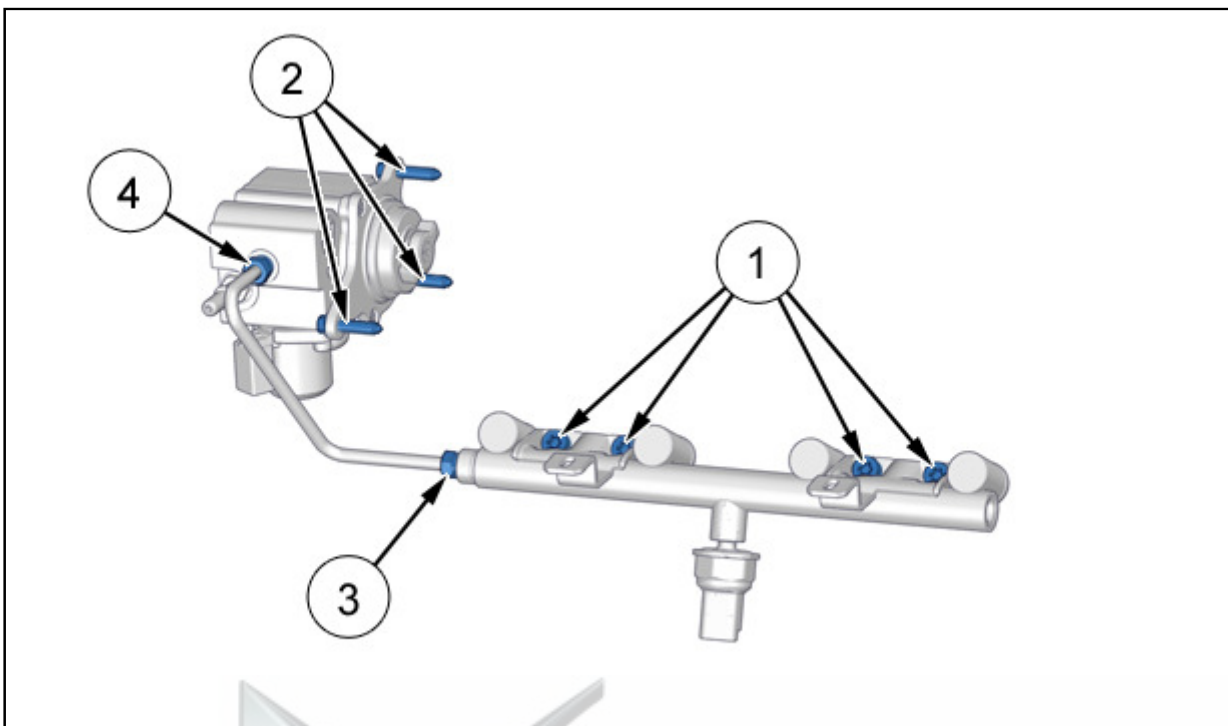


Figure : B1BB0SSD

6. Accessories

6.1. Alternator



3 club.eu

a different spirit

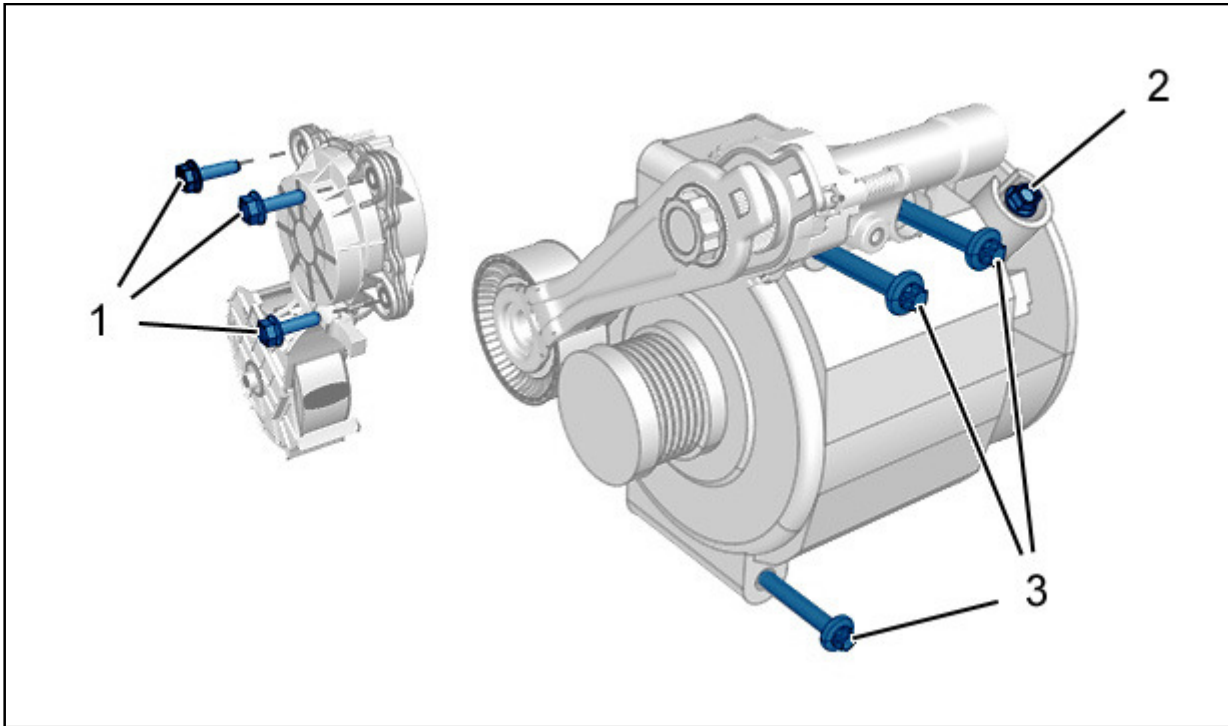


Figure : D1AB005D

Reference	Designation	Tightening torque
(1)	fixing screws (Coolant pump friction wheel)	0,8 daNm
(2)	nut(Alternator supply harness)	1,6 daNm
(3)	fixing screws (Alternator) / Roller tensioner	2 daNm

6.2. Starter

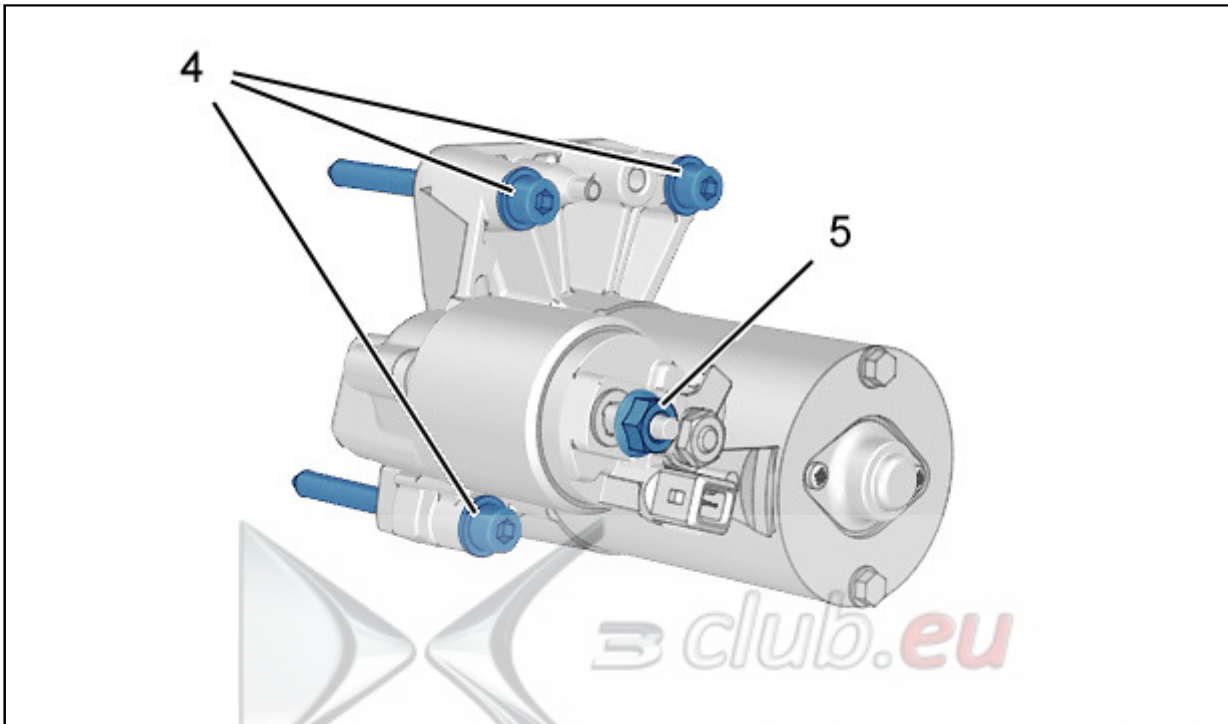


Figure : D1BB00CD

Reference	Designation	Tightening torque
(4)	fixing screws (Starter)	2 daNm

3 club.eu

a different spirit

(5) Starter supply harness nut | 1,6 daNm

6.3. Air conditioning compressor

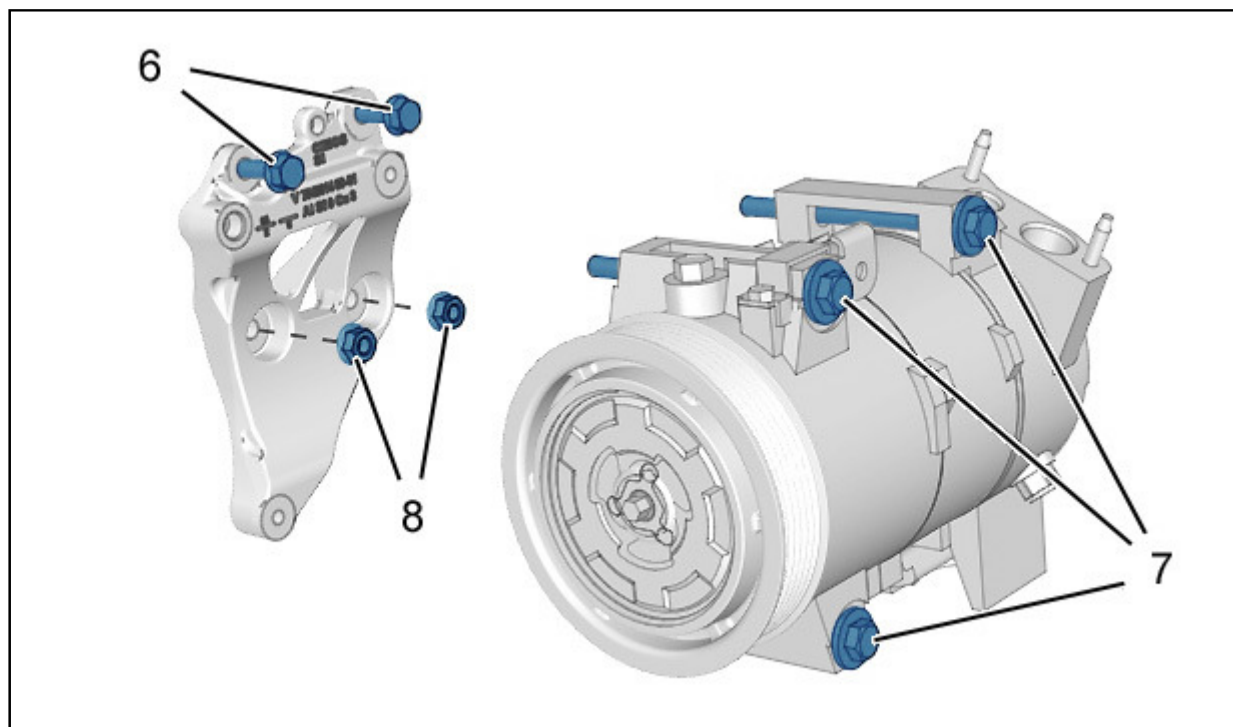


Figure : C5HB00QD

Reference	Designation	Tightening torque
(6)	Support fixing screws / Cylinder block	2 daNm
(7)	fixing screws (compressor) / Cylinder block	2,4 daNm
(8)	Support fixing nuts / Cylinder block	2 daNm

