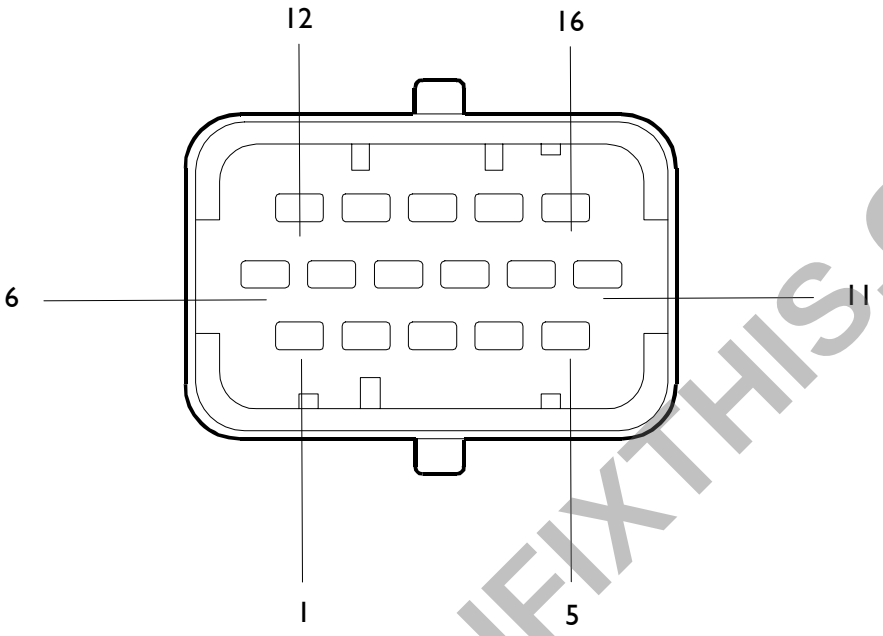
EDC control unit PIN-OUT

Electric injector connector "A"

Figure 5



Colour legend

B	black
R	red
U	blue
W	white
P	purple
G	green
N	brown
Y	yellow
O	orange
E	grey
K	pink

ECU Pin	Colour legend	Function
1	-	Free
2	-	Free
3	B	Solenoid valve for electronic cylinder (4-5-6) injection
4	-	Free
5	-	Free
6	W	Solenoid valve for electronic cylinder 2 injection
7	O	-
8	N	-
9	-	Free
10	-	Free
11	R	Solenoid valve for electronic cylinder (1-2-3) injection
12	G	Solenoid valve for electronic cylinder 3 injection
13	W	Solenoid valve for electronic cylinder 1 injection
14	U	Solenoid valve for electronic cylinder 4 injection
15	E	Solenoid valve for electronic cylinder 6 injection
16	P	Solenoid valve for electronic cylinder 5 injection

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TIGHTENING TORQUE

PART		TORQUE Nm	TORQUE kgm
Capscrews, undercrankcase to crankcase ♦			
M12x1.75 outer screws	Stage 1: pretightening	30	(3)
M 17x2 inner screws	Stage 2: pretightening	120	(12)
Inner screws	Stage 3: angle	60°	
Inner screws	Stage 4: angle	55°	
Outer screws	Stage 5: angle	60°	
Piston cooling nozzle union ♦		35 ± 2	(3.5 ± 0.2)
Capscrews, heat exchanger to crankcase ♦			
pretightening		11.5 ± 3.5	(1.15 ± 0.35)
tightening		19 ± ≤	(1.9 ± 0.3)
Piston cooling nozzle union ♦		24,5 ± 2,5	(2.4 ± 0.25)
Spacer and oil sump capscrews ♦			
pretightening		38	(3.8)
tightening		45	(4.5)
M 12x1.75 screws, gear case to crankcase ♦		63 ± 7	(6.3 ± 0.7)
M 12x1.75 screws, gear case to crankcase ♦		24 ± 2,5	(2.4 ± 0.25)
Cylinder head capscrews ♦			
Stage 1:	pretightening	60	(6)
Stage 2	pretightening	120	(12)
Stage 3:	angle	90°	
Stage 4:	angle	65°	
Rocker shaft capscrew ♦			
Stage 1:	pretightening	100	(10)
Stage 2:	angle	60°	
Locknut, rocker adjusting screw ♦		39 ± 5	(3.9 ± 0.5)
Capscrews, injector securing brackets ♦		26	(2.6)
Capscrews, injector securing brackets ♦		8,5 ± 1,5	(0.8 ± 0.15)
Capscrews, thrust plates to head ♦		19 ± 3	(1.9 ± 0.3)
Screw fastening the engine supporting bracket to the cylinder head			
Stage 1:	pretightening	120	(12)
Stage 2:	angle	45°	

♦ Before assembly, lubricate with UTDM oil
• Before assembly, lubricate with graphitized oil

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EDC 7 UC31 control unit Blink Table

Failure code	Failure description	Warning lamp	Used only in SW
	Vehicle 1 (Sensors/Plausibility checks)		
10011	Fault path 1 for vehicle Speed sensing		
20011	Fault path 2 for vehicle Speed sensing(CAN)		
30011	Fault path 3 for veh. Speed (max.pulse width)		
10012	Accelerator Pedal 1		
20012	Accelerator Pedal 2		
10013	Accelerator Pedal and brake not plausible		
10014	Multiple State Switch		
10015	Cruise control actuating device evaluation error		
10016	Main clutch signal		
10017	Brake signal		
10018	Engine brake preselection switch status		
10019	No terminal 15 signals detected		
1001A	Terminal 50 always pressed		
1001B	High resolution wheel speed CAN message		
2001B	Vehicle dynamics control unit CAN message		
1001C	Water in fuel		
1001D	Loss of efficiency in SCR catalyst		
1001E	NH3 Slip		
1001F	Plausibility check of catalyst system		
	Vehicle 2 (Lamps/relays/actuators)		
10021	Adjustable speed limit lamp		
10022	Power stage fault status for MIL		
10023	Power stage for system lamp		
10024	Cold start lamp		
10025	Main relay defect (for High press pump P340/for engine brake decompr.valve P342)		
20025	Interrupted afterrun		
10026	Battery voltage fault		
10027	Eng.brake decompr.valve		
10028	Main relay SCBatt (Lambda H./Grid H./Batt.switch)		
20028	Main relay SCGND (Lambda H./Grid H./Batt.switch)		
10029	Main relay 3 (A/C compr./fuel filter heater)		
1002A	Main relay 4 (Exhaust valve eng.brake flap)		
1002B	Power stage air heater 1 actuator		
1002C	Power stage air heater 2 actuator		
1002D	Air heater test switch on (voltage<low thresh.)		
2002D	Air heater test switch off (voltage>high thresh.)		
3002B	Error path for the glow control relay actuator		P315
3002C	Error path for the glow display lamp		P315
3002D	Errors of Glow control unit		P315
2002E	Error path of power stage pre-supply pump		P315
1002E	Grid heater always switched on		
1002F	Air condition power stage CAN message		
	Engine 1 (Temperature and Pressure Sensors)		
10031	Coolant temperature sensor		
10032	Coolant temperature sensor dynamic test		
10033	Boost Temp. Signal	SysLamp ON	
10034	Boost pressure sensor	SysLamp ON	

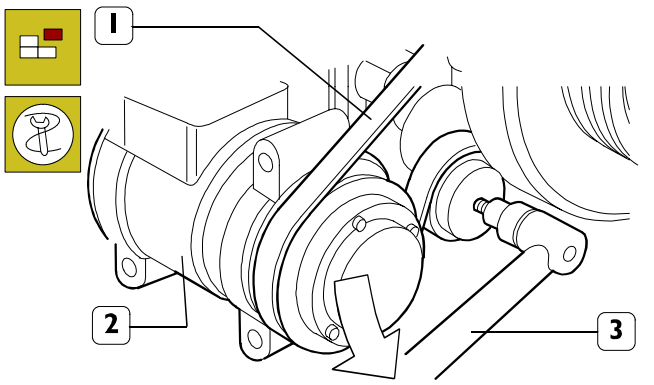
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ENGINE DISASSEMBLY ASSEMBLY

Handle all parts extremely carefully. Never get your hands or fingers between pieces.
Wear the required safety clothing such as goggles, gloves and safety shoes.

Figure 1



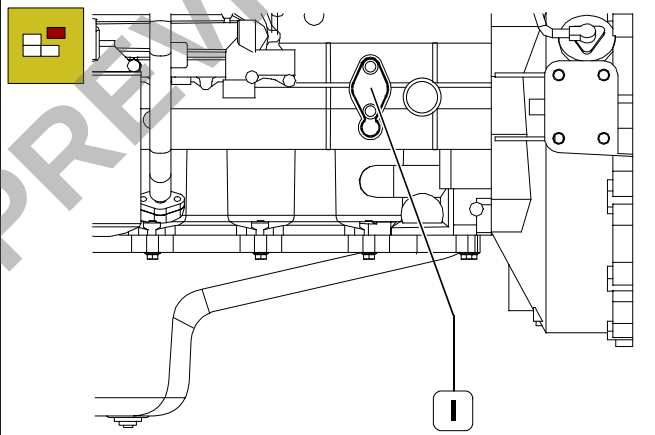
99357

Protect the electric parts before doing any washing with high-pressure jets.

Before securing the engine on the rotary stand, remove:

- the engine electric cable, disconnecting it from the control unit and from all the sensors/transmitters connected to it;
- using a suitable tool (3), work in the direction of the arrow on the tightener and remove the compressor drive belt (1);
- remove the compressor (2) together with the engine support.

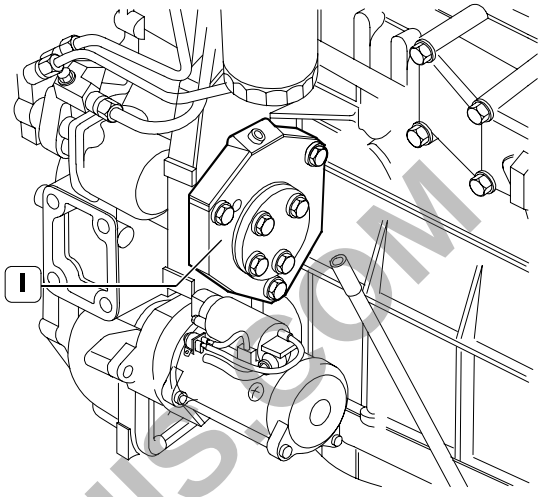
Figure 2



104246/A

- Remove the oil pressure adjuster valve (1).

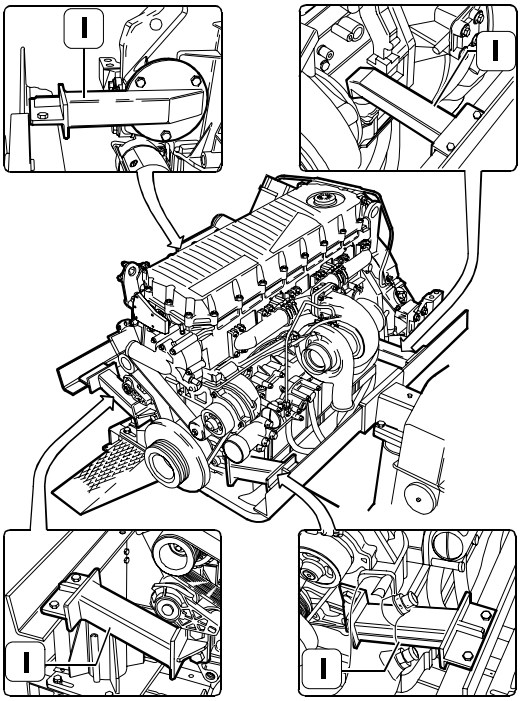
Figure 3



104247

- Remove the engine supports;
- remove the drive (1).

Figure 4



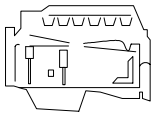
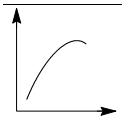
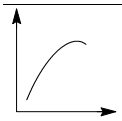
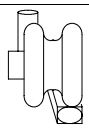
104248

- Secure the engine to the rotary stand with the brackets 380000155 (1).
- Drain the lubricating oil from the sump.

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CLEARANCE DATA

	Type	**F3BE0684H*E901**	**F3BE0684G*E901**
ϱ	Compression ratio	16.5 ± 0.8	
 	Max. output kW (HP) rpm	324 (441) 2000	286 (389) 2000
 	Max. torque Nm (kgm) rpm	2164 (216) 1400	1914 (191) 1400
	Loadless engine idling rpm	875	875
	Loadless engine peak rpm	2350	2350
	Bore x stroke mm Displacement cm^3	135 x 150 12880	
	**SUPERCHARGING** Turbocharger type	Intercooler Direct injection HOLSET HX55	
	**LUBRICATION** Oil pressure (warm engine) - idling bar - peak rpm bar	Forced by gear pump, relief valve single action oil filter 4 5	
	COOLING Water pump control **Thermostat** - start of opening °C	Liquid Through belt 81	



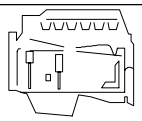
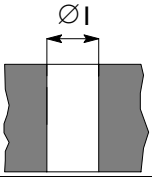
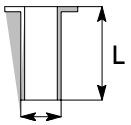
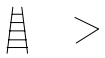
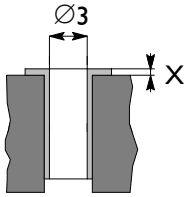
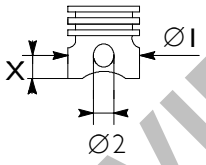
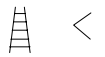
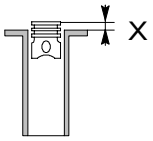
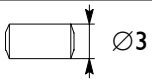
Data, features and performances are valid only if the setter fully complies with all the installation prescriptions provided by Iveco Motors.

Furthermore, the users assembled by the setter shall always be in conformance to couple, power and number of turns based on which the engine has been designed.

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ASSEMBLY CLEARANCE DATA

	Type		**F3B**
CYLINDER BLOCK AND CRANKMECHANISM COMPONENTS			mm
	Bores for cylinder liners: Ø1	upper	153.500 to 153.525
		lower	152.000 to 152.025
	Cylinder liners: external diameter: Ø2	upper	153.461 to 153.486
		lower	151.890 to 151.915
	length	L	-
	Cylinder liners - crankcase bores	upper	0.014 to 0.039
		lower	0.085 to 0.135
	External diameter	Ø2	-
	Cylinder sleeve inside diameter	Ø3A*	135.000 to 135.012
	inside diameter	Ø3B*	135.011 to 135.023
	Protrusion	X	0.045 to 0.075
* Selection class			
* Under a load of 800 N			
	Pistons: measuring dimension	X	18
	external diameter	Ø1A●	134.861 to 134.873
	external diameter	Ø1B●●	134.872 to 134.884
	pin bore	Ø2	54.010 to 54.018
	Piston - cylinder sleeve	A*	0.127 to 0.151
		B*	0.127 to 0.151
* Selection class			
	Piston diameter	Ø1	-
	Pistons protrusion	X	0.12 to 0.42
	Gudgeon pin	Ø3	53.994 to 54.000
	Gudgeon pin - pin housing		0.010 to 0.024

● Class A pistons supplied as spares.
●● Class B pistons are fitted in production only and are not supplied as spares.

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MAINTENANCE

Maintenance services chart

The covered distances indicated in this schedule are typical of engines used in vehicles.

The kilometre frequency for engine lubrication is in relation to a percentage of sulphur in diesel of under 0.5%.
NOTE: If using diesel with a percentage of sulphur above 0.5%, the oil-change frequency has to be halved.

Use engine oil: **ACEA E3 - 96**

- In the case of very low annual mileage of less than 500 h/year, the engine oil and filters must be changed every 12 months.
- Premature clogging of the air cleaner is generally due to the operating conditions. The filter should therefore be renewed whenever clogging is signalled by the sensor regardless of the prescribed time interval, which should in any case be respected in the absence of any specific indications.

The covered distances specified in this schedule are provided purely as indications, owing to their being typical of average use of vehicle engines related to their displacement.

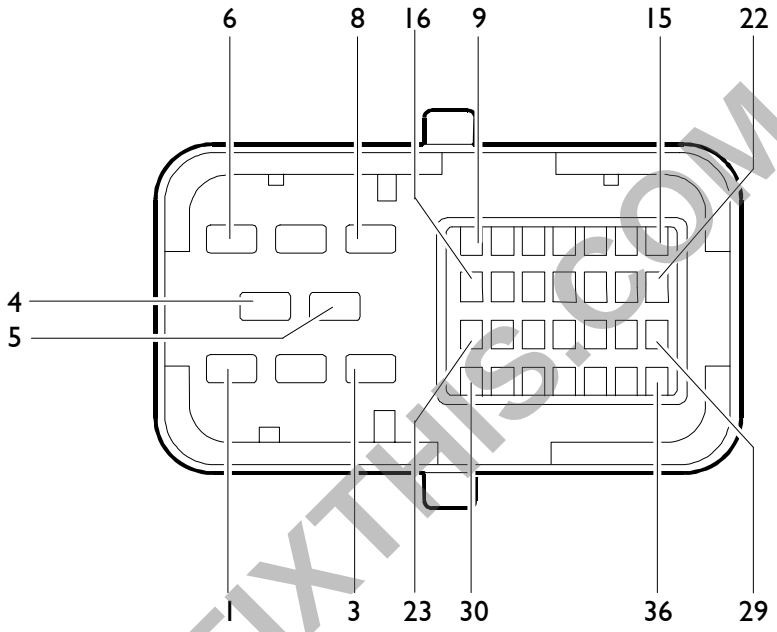
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EDC control unit PIN-OUT

Sensor connector "C"

Figure 6



Colour legend

B	black
R	red
U	blue
W	white
P	purple
G	green
N	brown
Y	yellow
O	orange e
E	grey
K	pink

ECU Pin	Cable colour	Function
1	N	-
2	-	Free
3	B	-
4÷8	-	Free
9	W	Valve gear flywheel sensor
10	R	Valve gear flywheel sensor
11÷14	-	-
15	K	Coolant temperature sensor
16 ÷17	-	Free
18	O/B	Fuel temperature sensor
19	B	Flywheel sensor
20	N	-
21÷22	-	Free
23	W	Flywheel sensor
24	N	Pressure sensor mass / Engine oil temperature
25	W	Air temperature/pressure sensor power supply
26	Y	Coolant temperature sensor
27	O/B	Oil temperature signal from the engine oil temperature/pressure sensor
28	U	Oil pressure signal from the engine oil temperature/pressure sensor
29	-	Free
30	W	-
31	-	Free
32	O	Engine oil temperature/pressure sensor power supply
33	R	Air temperature/pressure sensor power supply
34	G	Air pressure signal from the air temperature/ pressure sensor
35	W/R	Fuel temperature sensor
36	O	Air temperature signal from the air temperature / pressure sensor

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PART		TORQUE Nm	TORQUE kgm
Screw fastening the engine supporting bracket to the flywheel case			
Stage 1:	pretightening	100	(10)
Stage 2:	angle	60°	
Camshaft gear capscrews ♦			
Stage 1:	pretightening	60	(6)
Stage 2:	angle	60°	
Screw fixing phonic wheel to timing system gear ♦		8.5 ± 1.5	(0.85 ± 0.15)
Exhaust manifold capscrews •			
pretightening		40 ± 5	(4 ± 0.5)
tightening		70 ± 5	(7 ± 0.5)
Capscrews, connecting rod caps ♦			
Stage 1:	pretightening	60	(6)
Stage 2:	angle	60°	
Engine flywheel capscrews ♦			
Stage 1:	pretightening	120	(12)
Stage 2:	angle	90°	
Screws fixing damper flywheel: ♦			
First phase	pre-tightening	70	(7)
Second phase	closing to angle	50°	
Screws fixing intermediate gear pins: ♦			
First phase	pre-tightening	30	(3)
Second phase	closing to angle	90°	
Screw fixing connecting rod for idle gear		24.5 ± 2.5	(2.45 ± 0.25)
Screws fixing oil pump		24.5 ± 2.5	(2.45 ± 0.25)
Screws fixing crankshaft gasket cover		24.5 ± 2.5	(2.45 ± 0.25)
Screws fixing fuel pump/filter		19	(1.9)
Screw fixing control unit mount to crankcase		19 ± 3	(1.9 ± 0.3)
Screws and nuts fixing turbocharger •			
pre-tightening		35	(3.5
tightening		46	(4.6)
Screws fixing water pump to crankcase		22 ± 2	(2.2 ± 0.2)
Screws fixing water pump to crankcase		25	(2.5)
Screw fixing automatic tensioner to crankcase		26 ± 3	(2.6 ± 0.3)
Screw fixing fixed tensioner to crankcase		50 ± 5	(5 ± 0.5)
Screws fixing fan mount to crankcase		105 ± 5	(10.5 ± 0.5)
Screws fixing starter motor		74 ± 4	(7.4 ± 0.4)
Screws fixing air heater to cylinder head		30 ± 3	(3 ± 0.3)

♦ Before assembly, lubricate with UTDM oil
• Before assembly, lubricate with graphitized oil

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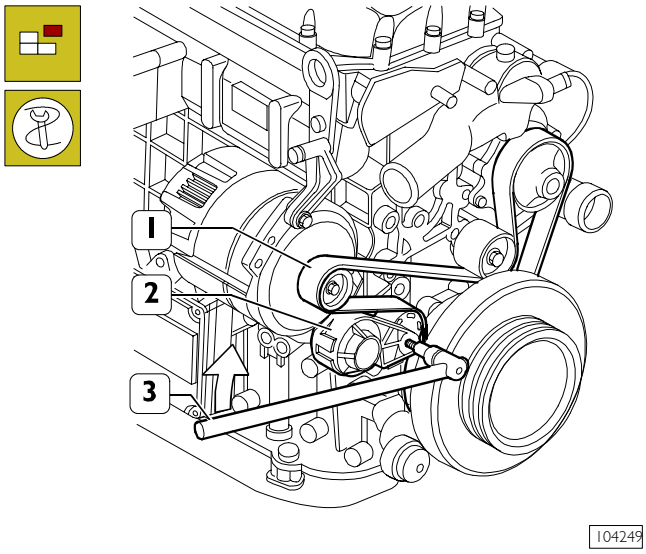
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Failure code	Failure description	Warning lamp	Used only in SW
10035	Fuel Temp. Signal		
10036	Rail pressure sensor CP3		P315/340
20036	Rail pressure sensor offset monitoring		P315/340
10037	Rail pressure relief valve		P315/340
10038	Oil Pressure Sensor		
20038	Oil Pressure too low		
30038	Oil level sensor		P315
10039	Error path for signal range check of duty cycle of air temparature signal		P315
20039	Error path for signal range check of air temparature; do not enter into fault code memory, always use fault class 0		P315
1003A	Oil Temp. Sensor		
2003A	Oil Temperature above normal		
2003B	Missing pressure in coolant circuit		P315
1003C	Atmospheric Temperature Sensor (Humidity)		
2003C	BET temperature sensor		P315
3003C	ClgZn temperature sensor		P315
4003C	Inside air temperature sensor		P315
1003D	Fuel pressure sensor		
2003D	Fuel pressure sensor dynamic plausibility test		P315
1003E	Coolant temperature sensor absolute test		
1003F	Coolant pressure sensor not plausbile		P315
	Engine 2 (Speed sensing/actuators)		
10041	Crankshaft sensor failure	SysLamp ON	
10042	Running with camshaft sensor only		
10043	Camshaft sensor failure	SysLamp ON	
10044	Offset between camshaft and cranksh		
10045	Power stage Fan actuator		
10046	Power stage Fan 2 actuator		
10047	Fan speed sensor signal		
10048	Air condition power stage		
10049	Fuel filter heating output		
1004A	Engine Compartment Start Button is stuck		
1004B	Blowby recircul. Control relay actuator		P342
1004C	Blowby engine overspeed detection		P342
1004D	Engine overspeed protection		
1004E	TurboCompound monitoring		
1004F	Torque reduction due to NOx OBD threshold		
	Fuel metering CR Systems		
	Fuel metering Unit Injector Systems		
10051	Rail pressure max.positive deviation exceeded	SysLamp ON	P315/340
20051	Rail pressure positive deviation 2nd part		P315/340
10051	Cyl.1 specific errors	SysLamp ON	P342
10052	Rail pr.max.pos.deviation exceeded conc.set flow of fuel	SysLamp ON	P315/340
10052	Cyl.2 specific errors	SysLamp ON	P342

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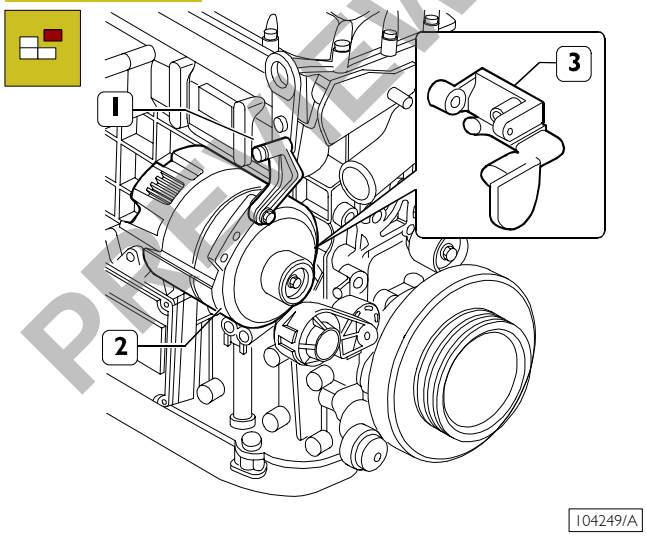
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Figure 5



- Using a suitable tool (3), work in the direction of the arrow on the tightener (2) and remove the belt (1).

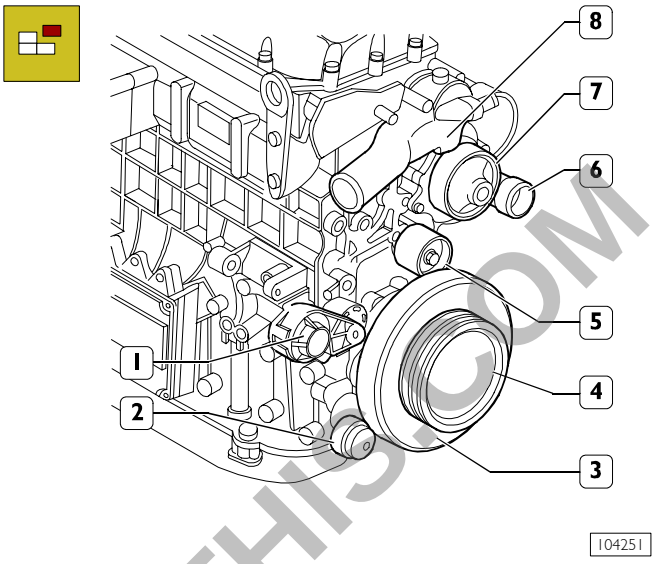
Figure 6



Remove:

- alternator (2).
- supports (1 and 3).

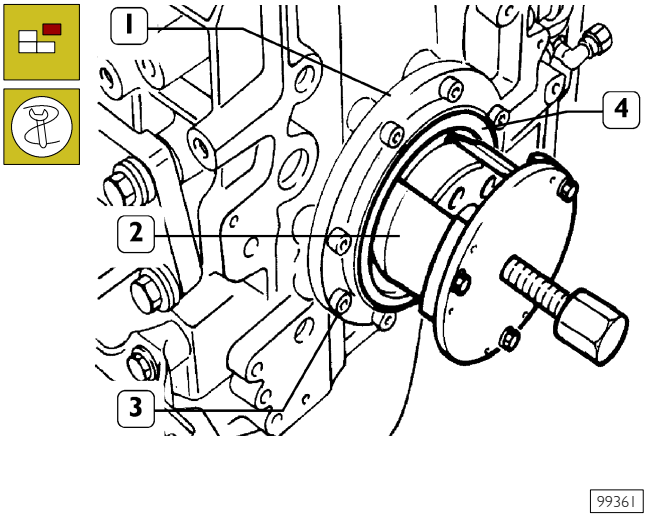
Figure 7



Remove:

- thermostat assembly (8);
- pipes complete with coolant (6);
- pulley (4);
- water pump (7);
- automatic tightener support (1);
- fixed tightener (5);
- damper flywheel (3) and pulley beneath;
- automatic tightener (2);

Figure 8

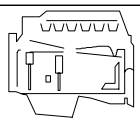
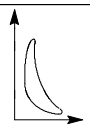
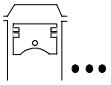
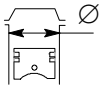
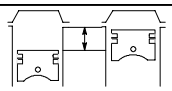
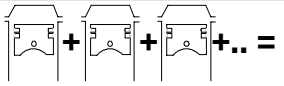


With the extractor 380000120 (2) applied as shown in the figure, extract the seal (4). Undo the screws (3) and take off the cover (1). Disconnect all the electrical connections and sensors.

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GENERAL CHARACTERISTICS

	Type		**F3B**
	Cycle		4-stroke Diesel engine
	Fuel feed		Turbocharged
	Injection		Direct
	No. of cylinders		6 in line
	Bore	mm	135
	Stroke	mm	150
	Total displacement	cm^3	12880

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