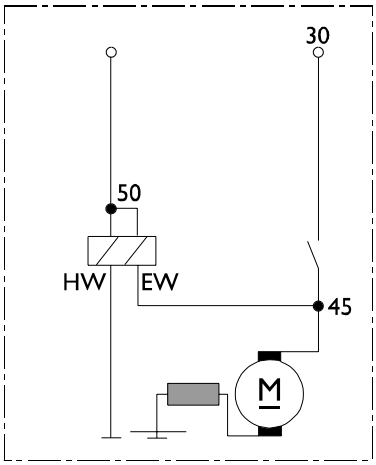
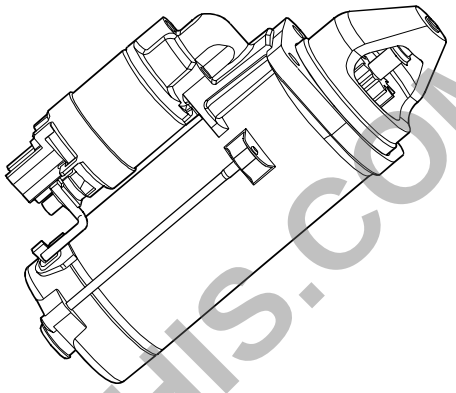
Bosch 24 V - 4 kW

6-pole type with series excitation and engagement by means of a fork controlled by an electromagnet.
Clockwise direction of rotation
Rated voltage 24 V
Power 4 kW



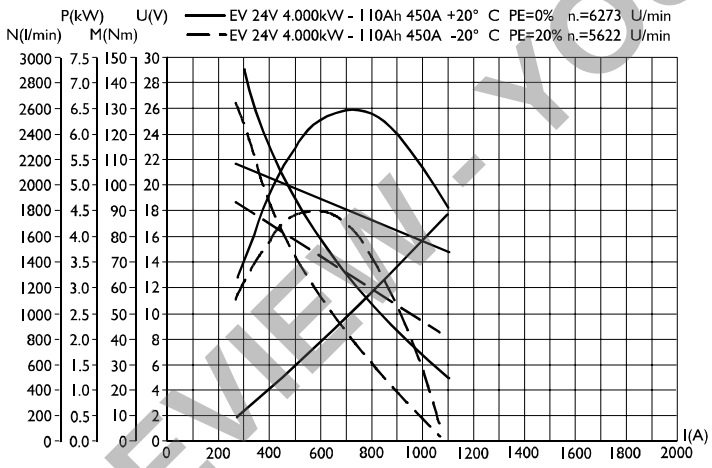
84262

WIRING DIAGRAM



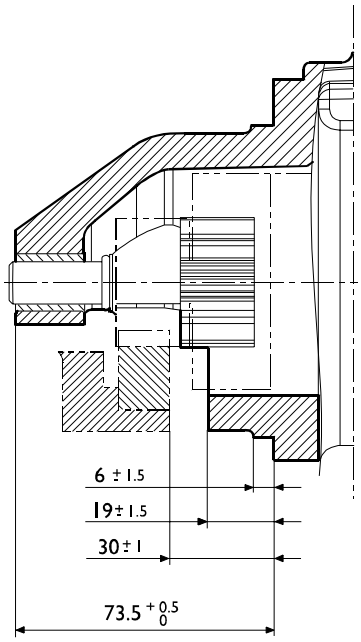
84267

3/4 VIEW



84268

CHARACTERISTIC CURVES



84269

PINION ADJUSTER

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Cylinder head

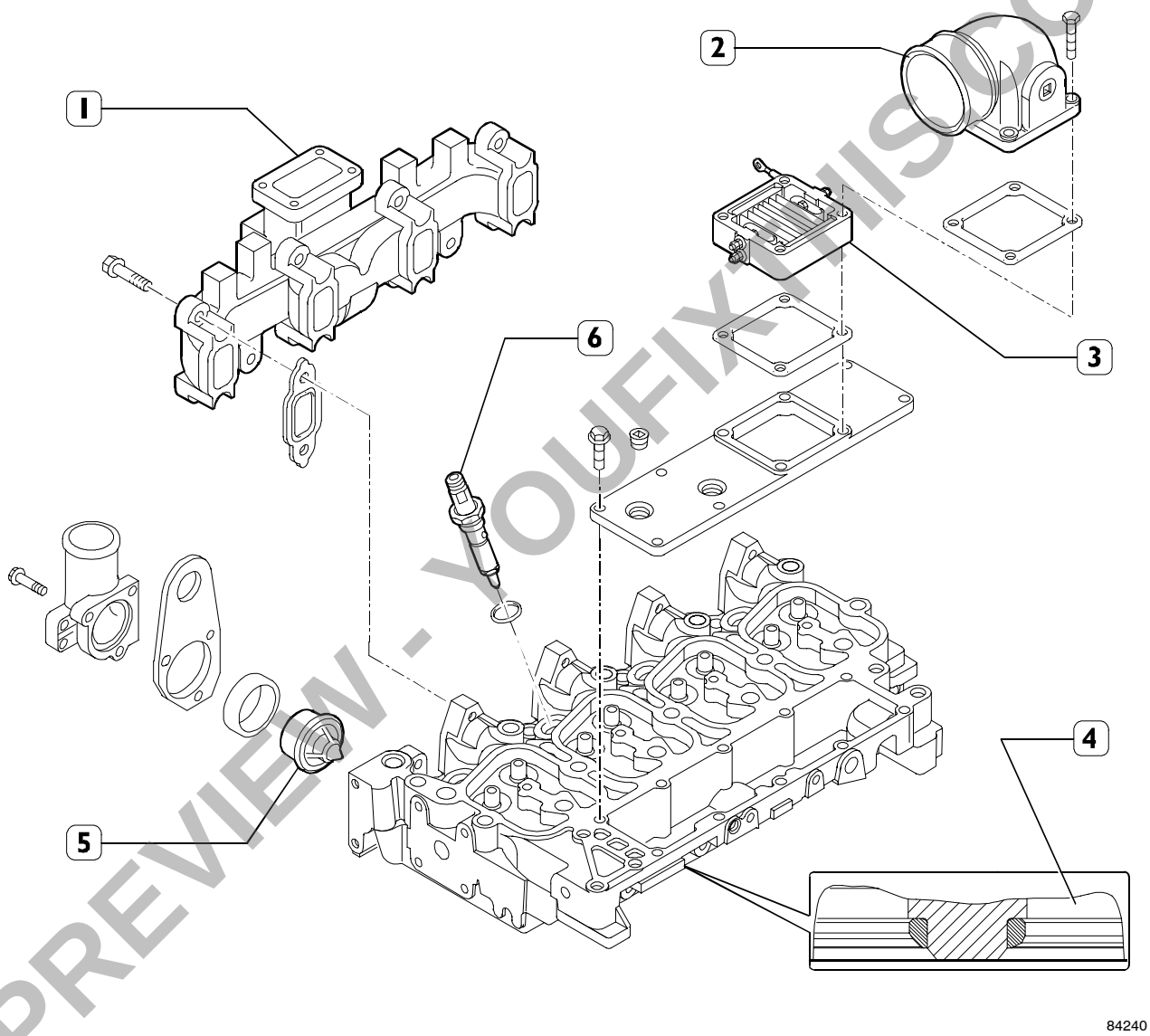
The seats of the following parts are obtained from the cast-iron cylinder head:

- ❑ inserted valve seats (4);
- ❑ injector (6);
- ❑ thermostat (5);

Moreover, the following components are inserted on the heads:

- ❑ single-block exhaust manifold (1);
- ❑ intake manifold (2) with seat for cold start air heater (3).

Figure 9



DETAIL OF CYLINDER HEAD WITH INSERTED VALVE SEATS

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TIGHTENING TORQUE

PART				TORQUE	
				Nm	(kgm)
Cylinder head fastening screw	1st phase:	screws M12x1.75x70		50 ± 5	(5 ± 0.5)
		screws M12x1.75x140		40 ± 5	(4 ± 0.5)
		screws M12x1.75x180	▲	70 ± 5	(7 ± 0.5)
	2nd phase:			90°	
	3rd phase:	(only for screws 140 and 180 mm long)		90°	
Bed cap fastening screws	1st phase			50 ± 6	(5 ± 0.6)
	2nd phase		▲	80 ± 6	(8 ± 0.6)
	3rd phase			90°	
Connecting rod cap fastening screws	1st phase			30 ± 5	(3 ± 0.5)
	2nd phase		▲	50 ± 5	(5 ± 0.5)
	3rd phase			60° ± 5°	
Engine flywheel fastening screws	pre-tighten			30 ± 5	(3 ± 0.5)
	Angle		▲	60° ± 5°	
Injector fastening				60 ± 5	(6 ± 0.5)
Fuel filter				contact + 3/4 turn	
Injection pump gear cover fastening screw				25 ± 5	(2.5 ± 0.5)
Valve gear cover and case fastening screw				25 ± 5	(2.5 ± 0.5)
Container fastening screw				25 ± 5	(2.5 ± 0.5)
Intake manifold fastening screw				25 ± 5	(2.5 ± 0.5)
Fuel pump fastening screw				25 ± 5	(2.5 ± 0.5)
Exhaust manifold fastening screw				53 ± 5	(5.3 ± 0.5)
Tappet cover fastening nut				25 ± 5	(2.5 ± 0.5)
Rocker arm support fastening screw				48 ± 8	(4.8 ± 0.8)
Nut for rocker arm adjusting screw				25 ± 5	(2.5 ± 0.5)
Screw fastening the pulley on drive shaft		pre-tighten		50 ± 5	(5 ± 0.5)
		Angle		90°	
Distributing shaft shoulder plate fastening screw				25 ± 5	(2.5 ± 0.5)
Fan support fastening screw				25 ± 5	(2.5 ± 0.5)
Injection pump fastening screw				12 ± 5	(1.2 ± 0.5)
Fan pulley fastening screw				45 ± 5	(4.5 ± 0.5)
Turbocompressor fastening screw				25 ± 5	(2.5 ± 0.5)
Heat exchanger fastening screw				25 ± 5	(2.5 ± 0.5)
Oil pump and front cover fastening screw				25 ± 5	(2.5 ± 0.5)
Starter motor fastening screw				55 ± 5	(5.5 ± 0.5)
Alternator fastening screw				45 ± 5	(4.5 ± 0.5)
Water pump fastening screw				25 ± 5	(2.5 ± 0.5)
Oil filter				contact + 3/4 turn	
Belt stretcher fastening screw				45 ± 5	(4.5 ± 0.5)

▲ - Lubrication with oil

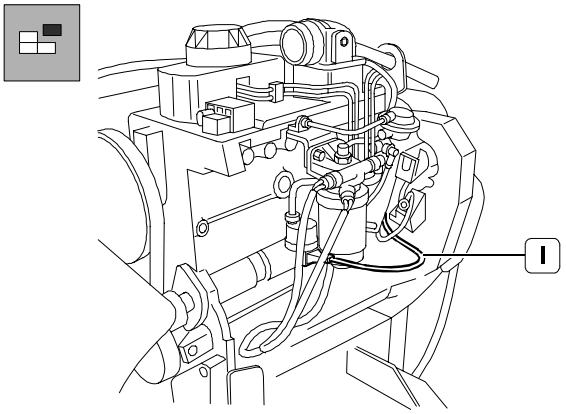
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ENGINE BENCH-OVERHAUL

Disassembling the engine

Figure 30



84252

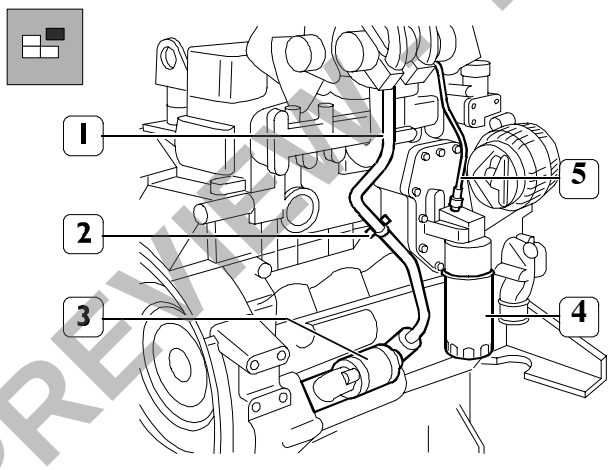
Drain the engine oil by taking the cap off the sump and the oil filling cap off the head cover.

In order to be able to fit bracket 380000995 (which fastens the engine to the overhaul stand) to the crankcase, it is necessary to:

- ❑ remove electric wiring (1).

from the engine left side.

Figure 31



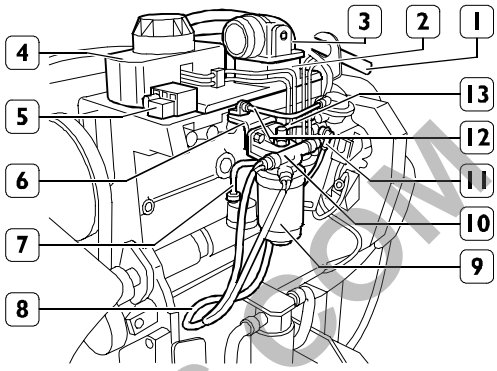
86463

To fit bracket 380000995 to the engine block on the right-hand side, remove:

- ❑ the fastening bracket (2) of the harness (1);
- ❑ the harness (1);
- ❑ the starter motor (3);
- ❑ Turbine lubrication delivery hose (5).
- ❑ Heat exchanger with oil filter (4).

Secure the engine to rotary stand 380000978.

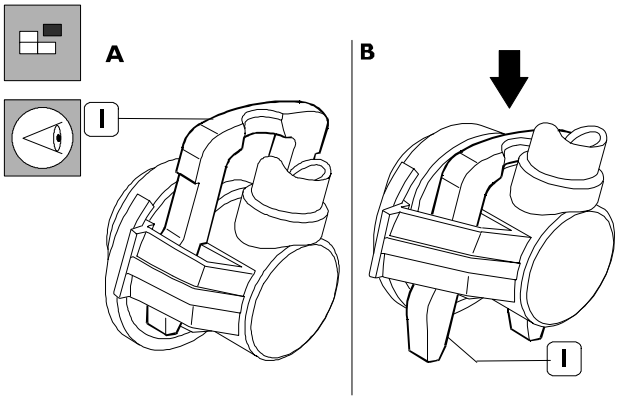
Figure 32



84254

- ❑ disconnect the engine oil vapour recovery pipe from blow-by (1);
- ❑ take off tappet covers (4);
- ❑ disconnect electric wiring (8);
- ❑ take off fuel filter (9);
- ❑ take off intake manifold (3);
- ❑ take off container (2);
- ❑ take off container control unit (5);
- ❑ disconnect the piping from L.D.A. system (13);
- ❑ disconnect quick-coupling pipes (7), (10), (11) and (13), by following the indications given in Figure 33;
- ❑ take off fuel filter support (6).

Figure 33



70126

Act on fork (1) as shown in the figure (detail A), then remove the adapter. To avoid damaging the same, bring fork (1) back to the locking position (detail B) after the adapter has been removed.

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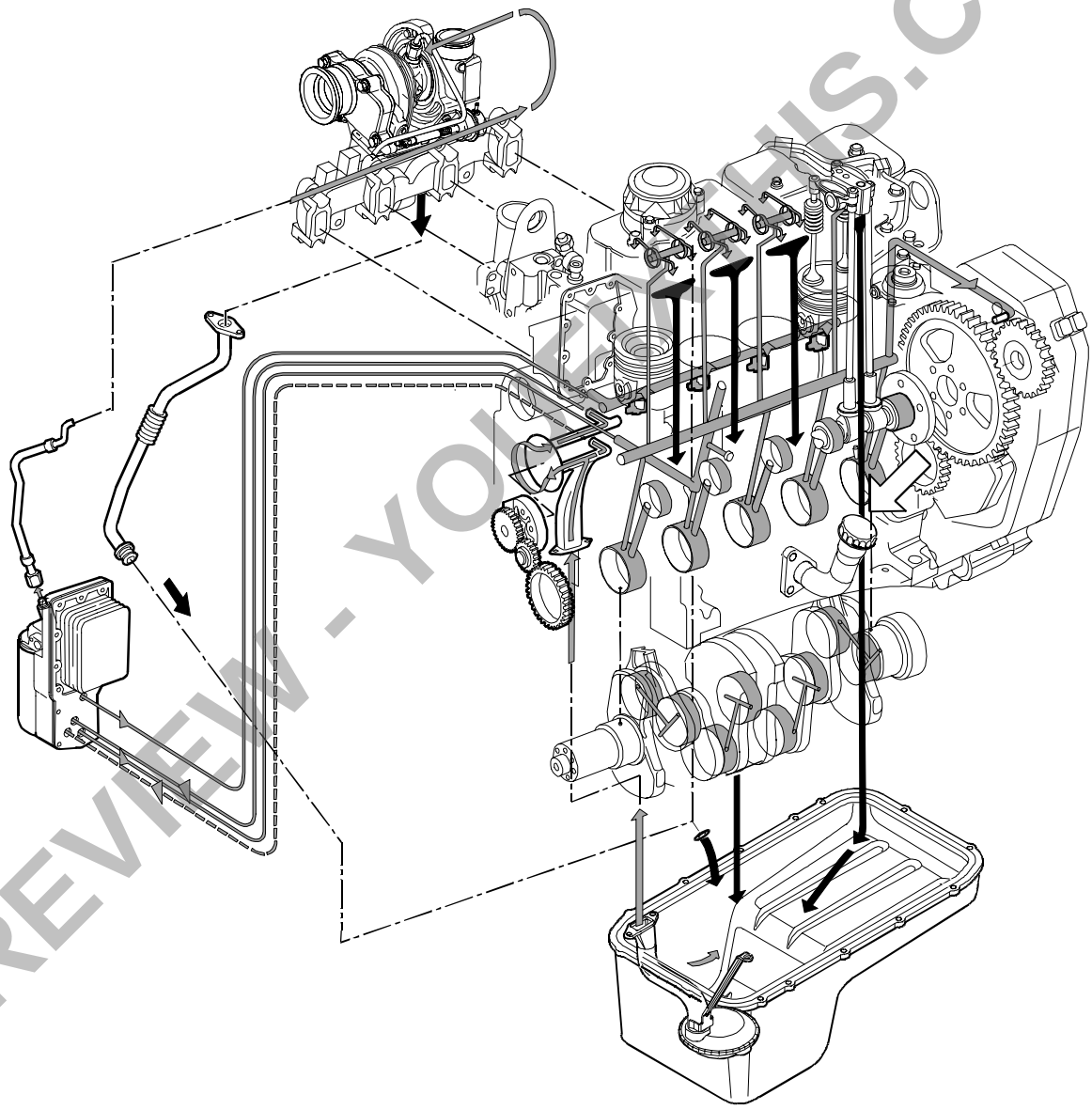
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LUBRICATION

Forced circulation lubrication is performed by the following components:

- ❑ rotor-equipped oil pump housed in the crankcase front part, controlled by the straight-tooth gear force-fitted on the drive shaft shank;
- ❑ water / oil heat exchanger housed in the crankcase;
- ❑ oil pressure control valve;
- ❑ by-pass valve for clogged oil filter cut-off, built into the oil filter adapter;
- ❑ cartridge-type oil filter.

Figure 15



86599

Oil return drop-type path

Pressure oil path

Oil supply

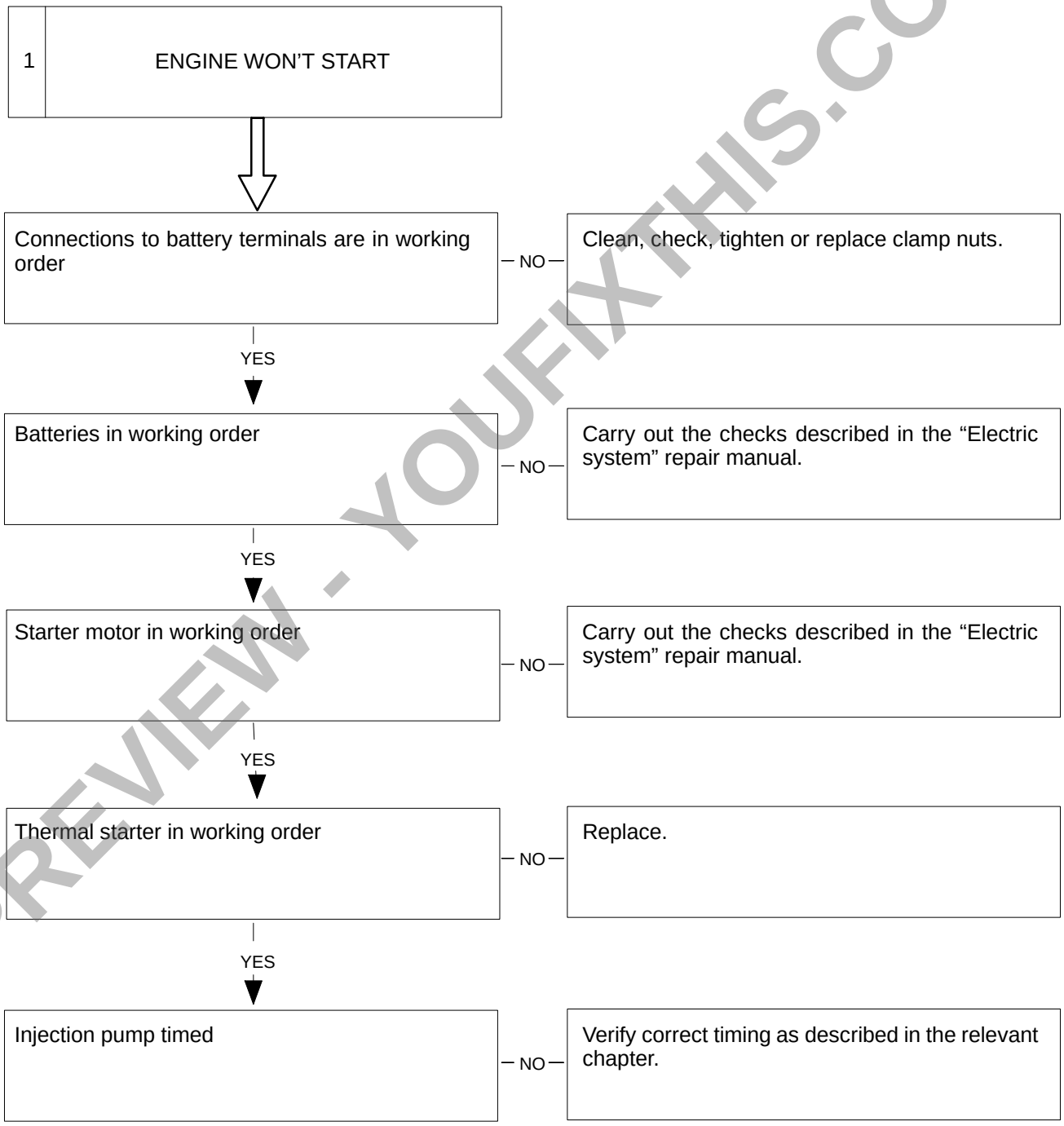
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DIAGNOSTICS

Main engine operating anomalies:

1 – Engine won't start;
2 – Engine overheats;
3 – Engine lacks power and works erratically;
4 – Engine exhaust smoke black or dark grey;
5 – Engine exhaust smoke grey (verging on white);
6 – Engine exhaust smoke light blue;
7 – Engine knocks irregularly;
8 – Engine stops;
9 – Engine exceeds max. revs number;
10 – Excessive or insufficient oil pressure;
11 – Excessive fuel consumption;
12 – Engine won't stop.



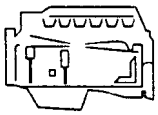
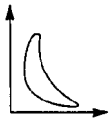
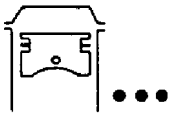
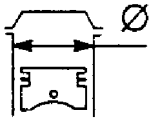
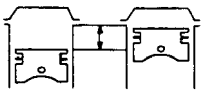
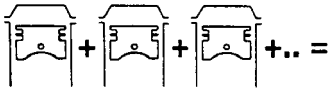
(to be continued)

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ENGINE F4GE0484E OVERHAUL

GENERAL ENGINE FEATURES

	Type		**F4GE0484**
			***D601**
	Cycle		4-stroke diesel engine
	Feeding		Boosted by intercooler
	Injection		Direct
	Number of cylinders		In-line, 4-cylinder
	Bore	mm	104
	Stroke	mm	132
	Total displacement	cm^3	4485
	Compression ratio		17.5 : 1
	Max. rating	kW min^{-1}	89 2000
	Max. torque	Nm min^{-1}	480 1400
	No-load idle rpm	min^{-1}	800
	No-load peak rpm	min^{-1}	-
	BOOSTING Type of turbocompressor:		With intercooler HOLSET HX25W
	LUBRICATION		Forced by means of gear pump, pressure relief valve, oil filter
	Oil pressure with hot engine: at idle rpm at peak rpm	 bar bar	 1.2 3.8

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ENGINES

INDEX OF SECTIONS



Section 1 – Diagnostics EW–1–1



Section 2 – Engine F4GE0484E overhaul EW–2–1



Section 3 – Engine F4GE0684F – F4HE0684J overhaul EW–3–1

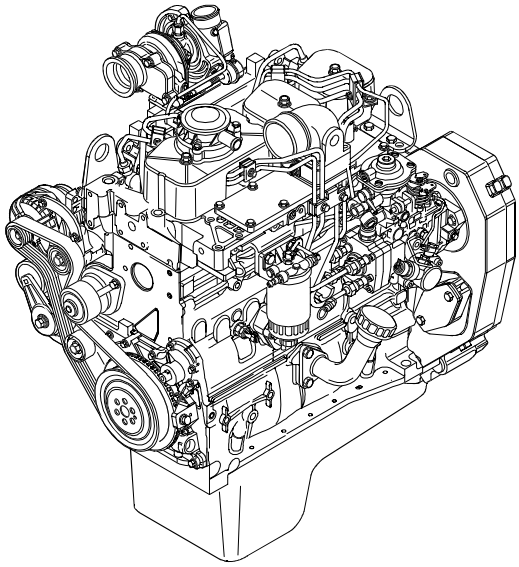


Section 4 – Recharging and start–up EW–4–1

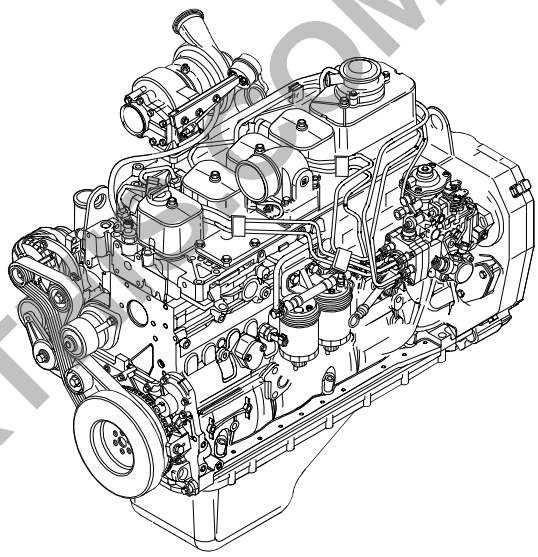
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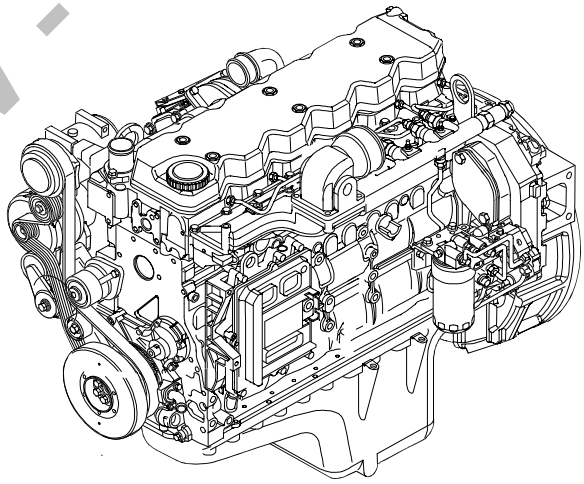
REPAIR MANUAL FOR ENGINES
F4GE0484E - F4GE0684F - F4HE0684J



F4GE0484E



F4GE0684F



F4HE0684J

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Every information, illustration and specification contained in the present manual is based on the most recent information available at the time of printing.

CNH France S.A. reserves the right, to modify the text at any time without prior communication.

Edition – June 2003

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UNIT OF MEASURE

This manual adopts the units of measure based on the International System.

The MKSA system units of measure are indicated within brackets after the units of measure of the International System.

Example: 24.5 Mpa (250 kgf/cm2).

The following table converts the International System units of measure in some of the main units belonging to other systems.

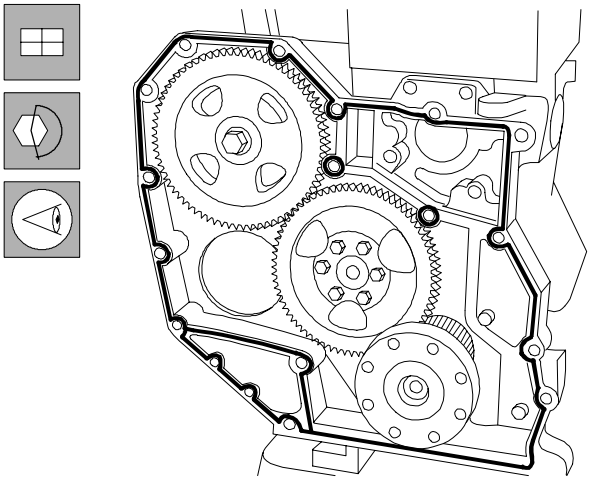
Quantity	To convert from (IS)	in (Others)	Multiply by
Length	mm	in	0.03937
	mm	ft	0.003281
Volume	L	US gal	0.2642
	L	US qt	1.057
	m^3	yd^3	1.308
Mass	kg	lb	2.205
Force	N	kgf	0.10197
	N	lbf	0.2248
Torque	N.m	kgf.m	0.10197
	N.m	lbf.ft	0.7375

Quantity	To convert from (IS)	in (Others)	Multiply by
Pressure	MPa	kgf/cm^2	10.197
	MPa	psi	145.0
Power	kW	PS	1.360
	kW	HP	1.341
Temperature	°C	°F	°C x 1.8 + 32
Speed	km/h	mph	0.6214
	min^{-1}	rpm	1.0
Capacity	L/min	US gpm	0.2642
	mL/rev	cc/rev	1.0

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Figure 125



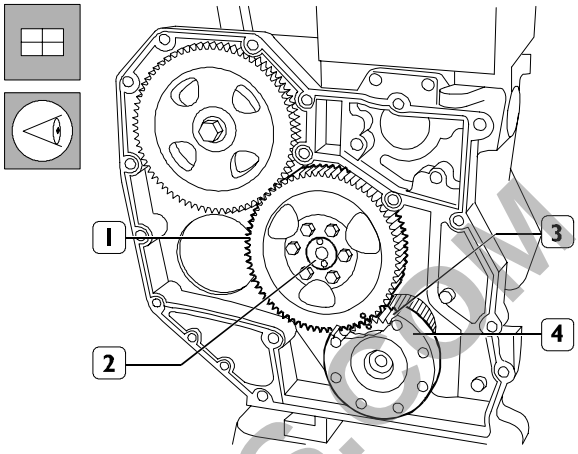
84106

SCHEME FOR REAR GEARBOX CASE FASTENING SCREW TIGHTENING SEQUENCE

Reassemble case to the crankcase.

Tighten the fastening screws in the same positions they had prior to being taken off, then fasten the screws to the specified torque.

Figure 127

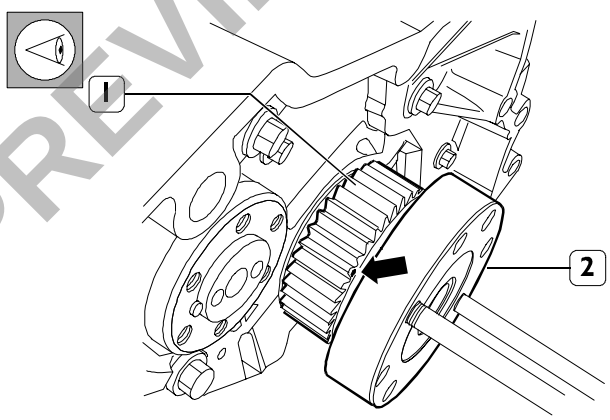


84107

Turn drive shaft (4) and distributing shaft (2) in such a direction that when mounting driven gear (1) on the distributing shaft, the stamped marks on gears (1 and 3) correspond to each other.

Valve timing

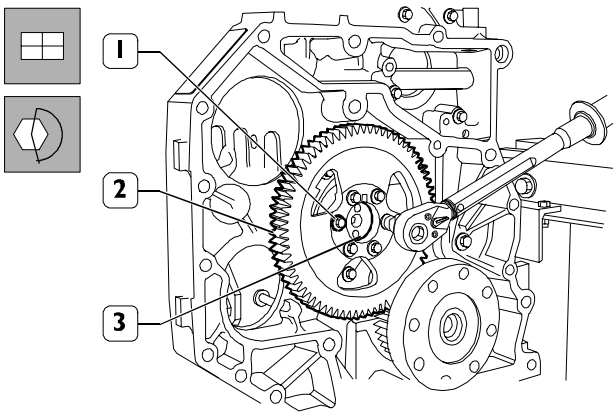
Figure 126



70211

Mark, with a felt-tip pen, the tooth of drive gear (1) mounted on drive shaft (2), the side surface of which bears a stamped notch (→) for timing.

Figure 128



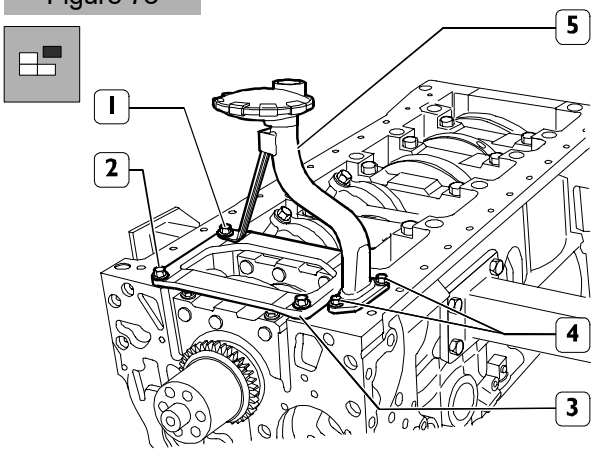
70213

Tighten gear (2) fastening screws (1) to distributing shaft (3), then fasten them to the specified torque.

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Figure 75

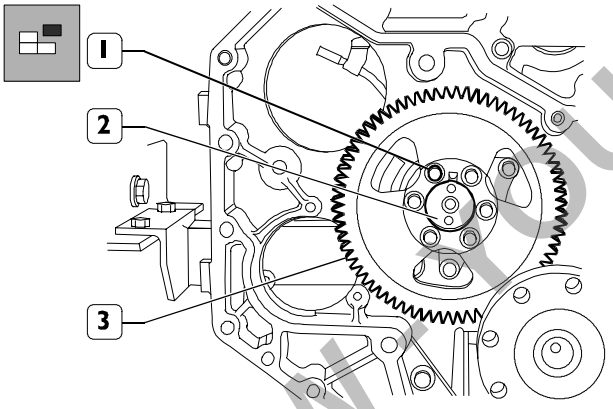


86516

Remove screws (1) and (4) and dismantle oil suction strainer (5).

Remove screws (2) and dismantle stiffening plate (3).

Figure 76

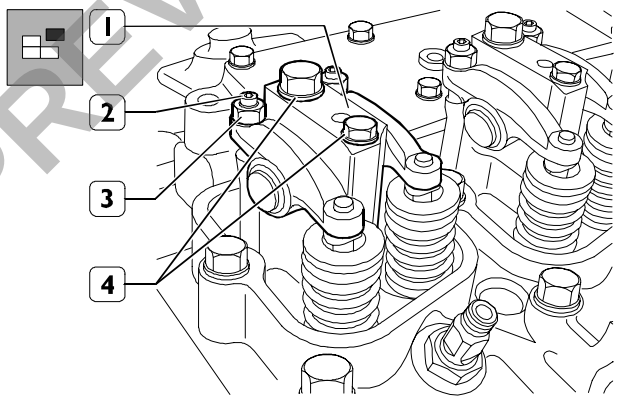


70156

Remove screws (1) and take gear (3) off distributing shaft (2).

Removing the rocker arm assembly

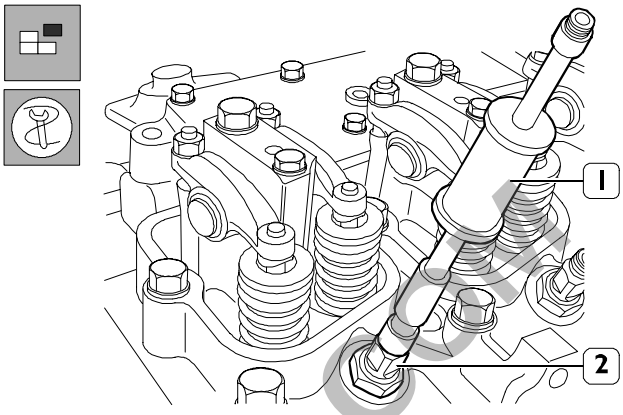
Figure 77



84081

For each cylinder, remove rocker arm assembly (1), loosen adjusting nuts (3), unscrew registers (2) and remove screws (4).

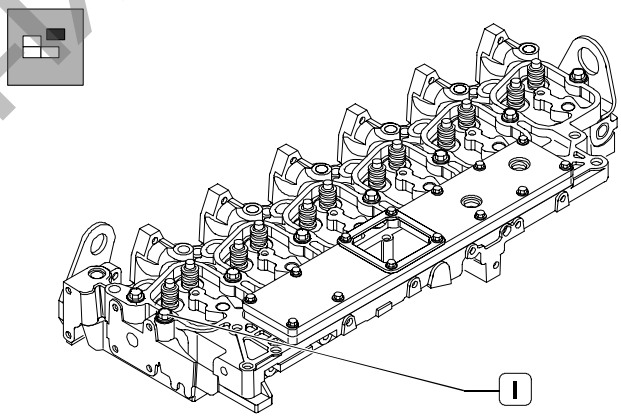
Figure 78



84082

Take out injectors (2) by means of tool (1) 380000982.

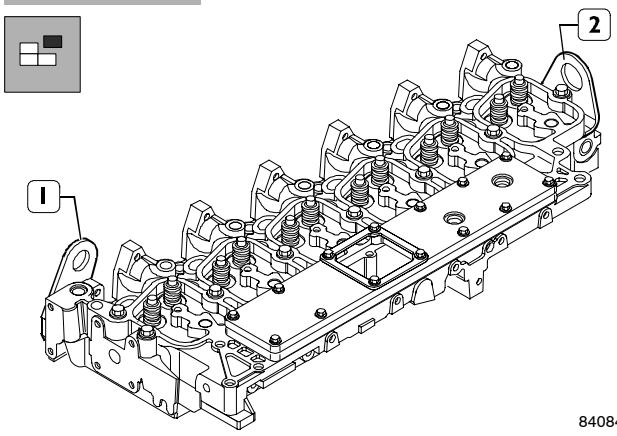
Figure 79



84083

Remove screws (1) securing the head to the crankcase.

Figure 80



84084

Hook the wire ropes to brackets (1) and (2), then separate the cylinder head from the crankcase by means of a hoist.

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