N SERIES
EU/2002/88/CE

G-DRIVE application

N45

NEF45 AM1
NEF45 SM1 - NEF45 SM2 - NEF45 TM1
NEF45 TM2

N67

NEF67 TE2 - NEF67 TM2 - NEF67 TM3

IVECO

Technical and Repair manual

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Introduction

Page

PREFACE TO USER'S GUIDELINE MANUAL 3

SYMBOLS 5

❑ Warnings 3

❑ Service operations 3

GENERAL WARNINGS 5

GENERAL WARNINGS ON THE ELECTRIC SYSTEM 7

❑ Bonding and screening 8

CONVERSIONS BETWEEN THE MAIN UNITS OF MEASUREMENT OF THE INTERNATIONAL SYSTEM AND MOST USED DERIVED QUANTITIES 9

KEY OF LECTURE OF THE HEADINGS AND FOOTNOTES 10

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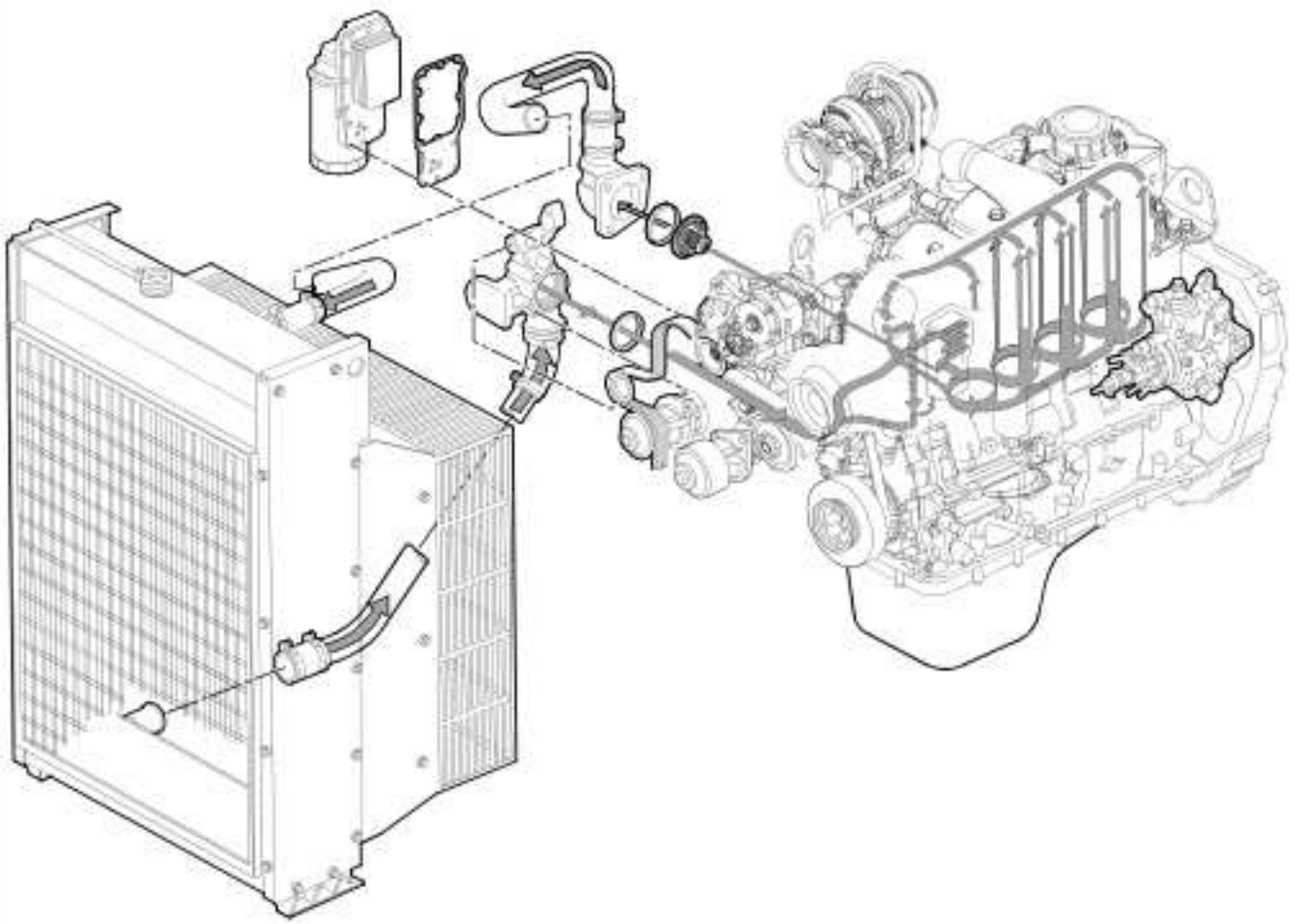
COOLING SYSTEM

The engine cooling system, closed circuit forced circulation type, generally incorporates the following components:

- Expansion tank; placement, shape and dimensions are subject to change according to the engine's equipment.
- Radiator, which has the duty to dissipate the heat subtracted to the engine by the cooling liquid. Also this component will have specific peculiarities based on the equipment developed, both for what concerns the placement and the dimensions.
- Viscous pusher fan, having the duty to increase the heat dissipating power of the radiator. This component as well will be specifically equipped based on the engine's development.
- Heat exchanger to cool the lubrication oil: even this component is part of the engine's specific equipment.
- Centrifugal water pump, placed in the front part of the engine block.
- Thermostat regulating the circulation of the cooling liquid.
- The circuit may eventually be extended to the compressor, if this is included in the equipment.

Version with turbocharger (4 cylinders)

Figure 5



125304

DIAGRAM OF THE COOLING SYSTEM

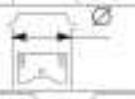
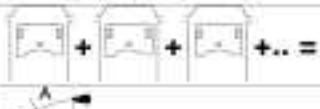
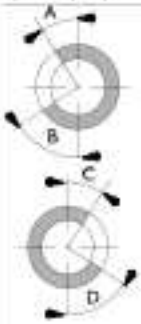
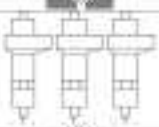
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ANOMALY	POSSIBLE CAUSE	REMEDY	NOTE
The engine overheats	Faulty water pump.	Check the unit and replace if necessary. Replace the gasket.	
	Malfunctioning thermostat.	Replace the thermostat.	
	Fouling in coolant openings in the cylinder head and cylinder groups.	Wash following the standards specified for the type of descaling product used.	
	Water pump drive belt slack.	Check and adjust the tightness of the belt.	On applications provided with automatic tensioner, check correct worching of such device.
	Coolant level too low.	Top-up radiator with coolant.	
	Incorrect engine timing.	Check timing and tune correctly.	
	Incorrect calibration of injection pump.	Correct the delivery rate of the pump on a bench so that the injection is at the specified rate.	See your FPT dealer.
	Dry air cleaner blocked.	Clean the air filter or replace if necessary.	
Engine operation is irregular and lacks power	Incorrect timing of injection pump.	Check timing and correctly set pump.	
	Faulty automatic advance variator.	Check operation on injection pump test setup; if values found do not correspond to requirements, change variator spring.	See your FPT dealer.
	K.S.B. automatic cold advance device malfunctioning.	Check or replace injection pump.	
	Excessive piston wear.	Overhaul the engine and replace any worn parts.	
	Incorrect calibration of speed regulator.	Check and correctly calibrate the regulator.	See your FPT dealer.

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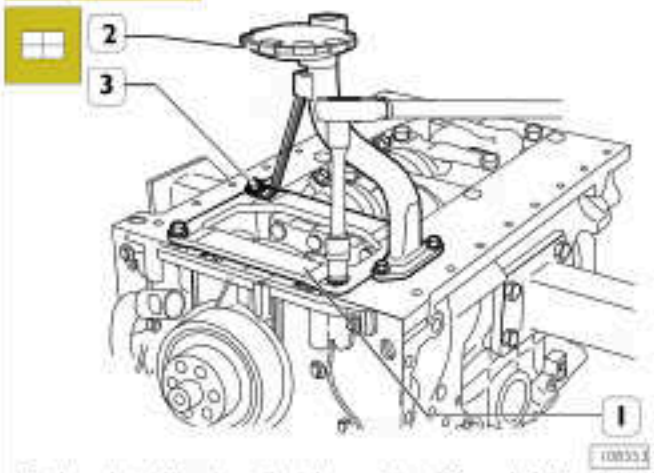
GENERAL SPECIFICATIONS

F4HE0685 Engine

	Type		6 CYLINDERS
	Cycle		Four-stroke diesel engine
	Power		Supercharged with intercooler
	Injection		Direct
	Number of cylinders		6
	Bore	mm	104
	Stroke	mm	132
	Total displacement	cm^3	6728
	**TIMING**		
	start before T.D.C.	A	-
	end after B.D.C.	B	-
	start before B.D.C.	D	-
	end after T.D.C.	C	-
	Checking timing		
	X	mm	0.20 to 0.30
	X	mm	0.45 to 0.55
	FUEL FEED		
	Injection Type:	Bosch	high pressure common rail
	Nozzle type		Injectors
	Injection sequence		1 - 5 - 3 - 6 - 2 - 4
	Injection pressure	bar	1400

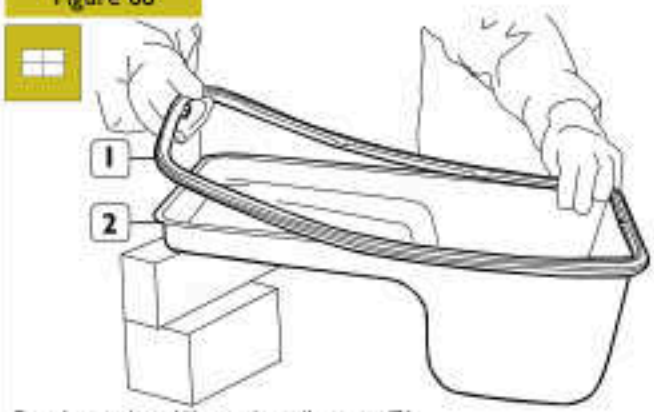
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Figure 67



Fit the plate (1), the oil pick up tube (2) and tighten the fastening screws (3) to the specified torque.

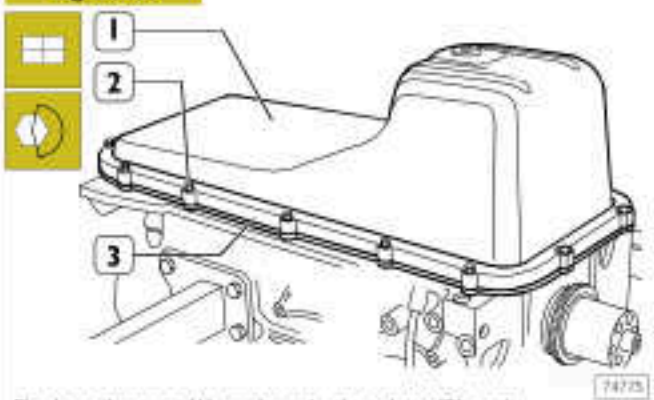
Figure 68



Set the gasket (1) on the oil sump (2).

NOTE The pictures of the instructions relating to the oil pan and to thesuction rose may not reflect the actual shape and dimensions of your engine equipment. However the procedures described are still applicable.

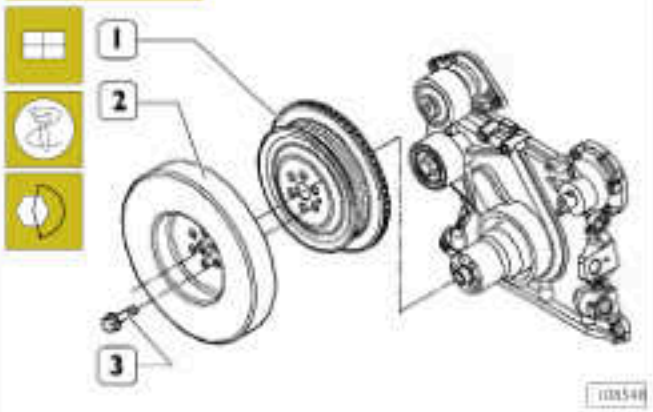
Figure 69



Fit the oil sump (1) and apply the plate (3) to it. Tighten the screws (2) to the specified torque.

NOTE Before any assembly operation always verify that the hole and screw threads have no evidence of wear or dirt.

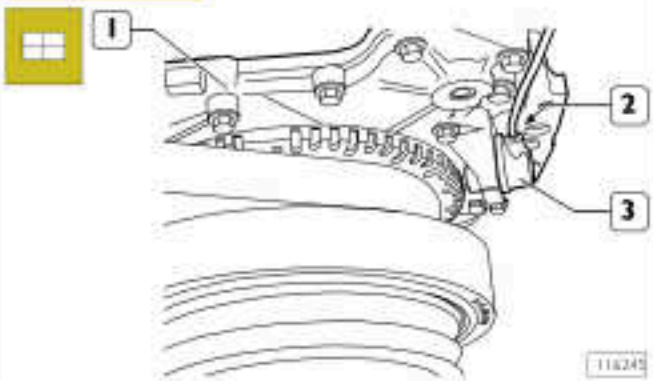
Figure 70



Assemble the pulley (1) and the damping flywheel (2) to the driving shaft.

Tighten the fixing screws (3) and clamp them to the couple 68 ± 7 Nm.

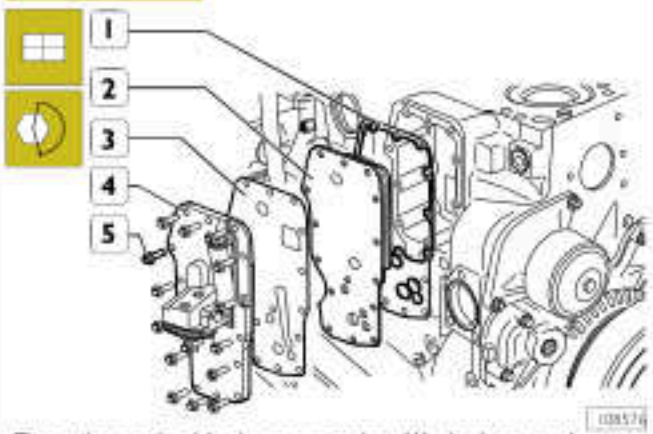
Figure 71



Fit a new sealing ring on the speed sensor (3).

Fit the speed sensor (3) on the front cover (1) and tighten the screw (2) to the specified torque.

Figure 72



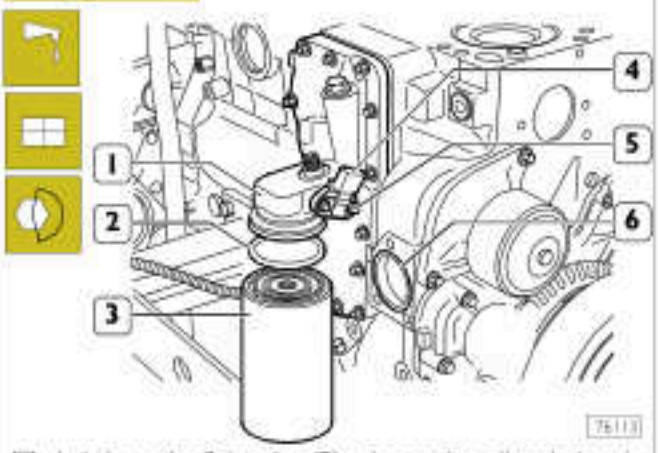
Fit on the engine block a new gasket (1), the heat exchanger (2) a new gasket (3) and the oil filter support (4).

Tighten the screws (5) to the specified torque.

NOTE Before any assembly operation always verify that the hole and screw threads have no evidence of wear or dirt.

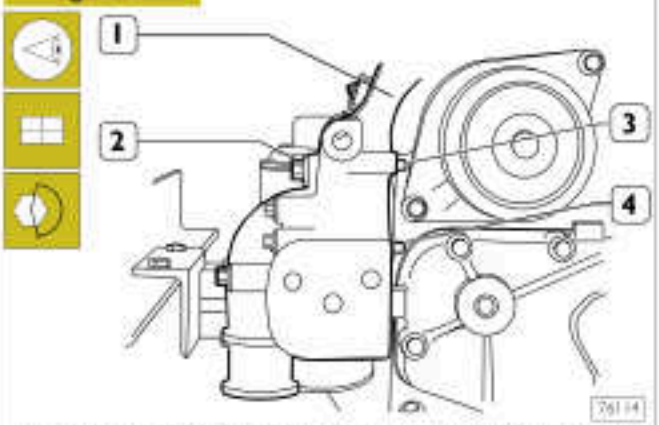
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Figure 85



- ❑ Lubricate the fixing ring (2) using engine oil and place it on the oil filter (3).
- ❑ Manually start the oil filter (3) on the bearing union (1) until counter-boring, further screw up the oil filter (3) by 3/4 turn.
- ❑ Place a new fixing ring on the block housing (6).
- ❑ Apply, (if needed) new fixing ring on the oil temperature/pressure sensor (4) and assemble it to the bearing (1) tightening the fixing screws to the prescribed couple.

Figure 86

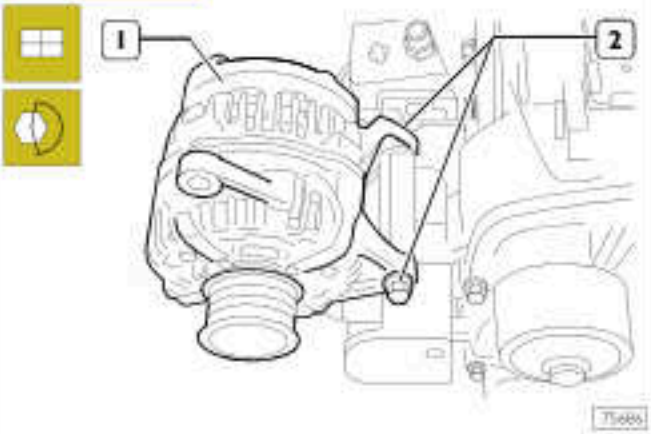


- ❑ Assemble the alternator bearing (1) ensuring that the pins (3 and 4) are against the engine block.
- ❑ Tighten the screws (2) and lock them to the prescribed couple.

NOTE The shape and the dimensions of the alternator support vary according to the use of the engine. Therefore the relevant pictures provide a general guideline of the intervention that is to be carried out. However the procedures described are applicable.

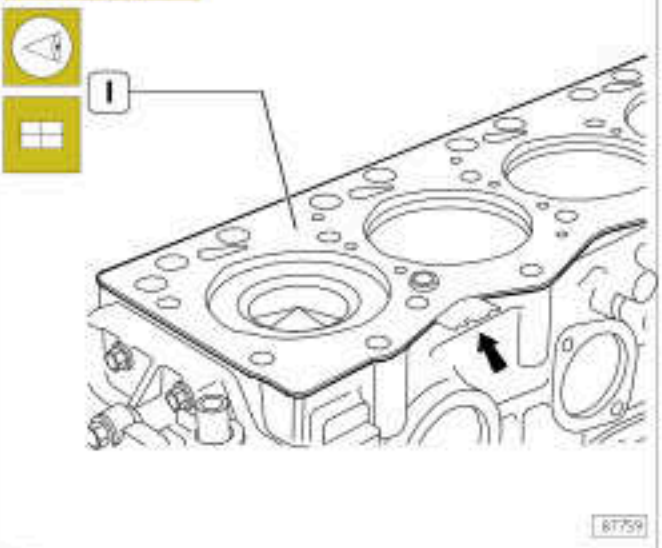
NOTE Before assembly, always check that the threads of the ports and of the screws have no evidence of tear and wear nor dirt.

Figure 87



- ❑ Connect the alternator (1) to the support.
- ❑ Tighten the screw without locking it (2).

Figure 88



- ❑ Place the gasket (1) over the block.
  The choice of the gasket's thickness shall be made in consideration of the cylinder protrusion measured with respect to the block's upper surface.

NOTE Verify that the engine block stand is clean.

Do not grease the gasket. It is recommended to keep the gasket inside packaging until assembly to the cylinder head.

Gasket assembly shall be made following the direction of wording printed on the gasket itself so that this will be readable as indicated in the picture.

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