334T,M2 NEF
F4CE0354A-(334T/MT)
(435,450,450CT)
Engine

Service Manual

87458410

CASE CONSTRUCTION

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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/cm^2).

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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ENGINES

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ASSEMBLING PLAY - SPECIFICATIONS

	Type		F4CE0354A *D
CRANK GEAR COMPONENTS AND CYLINDER ASSEMBLY			mm
	Cylinder liners	∅1	104.000 to 104.024
	Pistons: supplied with standard spares		59
	Measurement dimension	X	103.730 to 103.748
	Outer diameter	∅1	38.010 to 38.016
	Pin seat	∅2	
	Piston - cylinder liners		0.252 to 0.294
NEW	Piston diameter	∅1	0.4 - 0.8
	Position of pistons from crankcase	X	0.28 to 0.42
	Gudgeon pin	∅3	37.994 to 38.000
	Gudgeon pin - Pin seat		0.004 to 0.016
	Piston ring slots	X1*	2.705 to 2.735
		X2	2.440 to 2.460
		X3	4.030 to 4.050
	* measured on ∅ of 101 mm		
	Piston rings	S1*	2.560 to 2.600
		S2	2.350 to 2.380
		S3	3.970 to 3.990
	* measured on ∅ of 101 mm		
	Piston rings – Slots	1	0.155 to 0.175
		2	0.060 to 0.110
		3	0.040 to 0.080
NEW	Piston rings		0.4 to 0.8

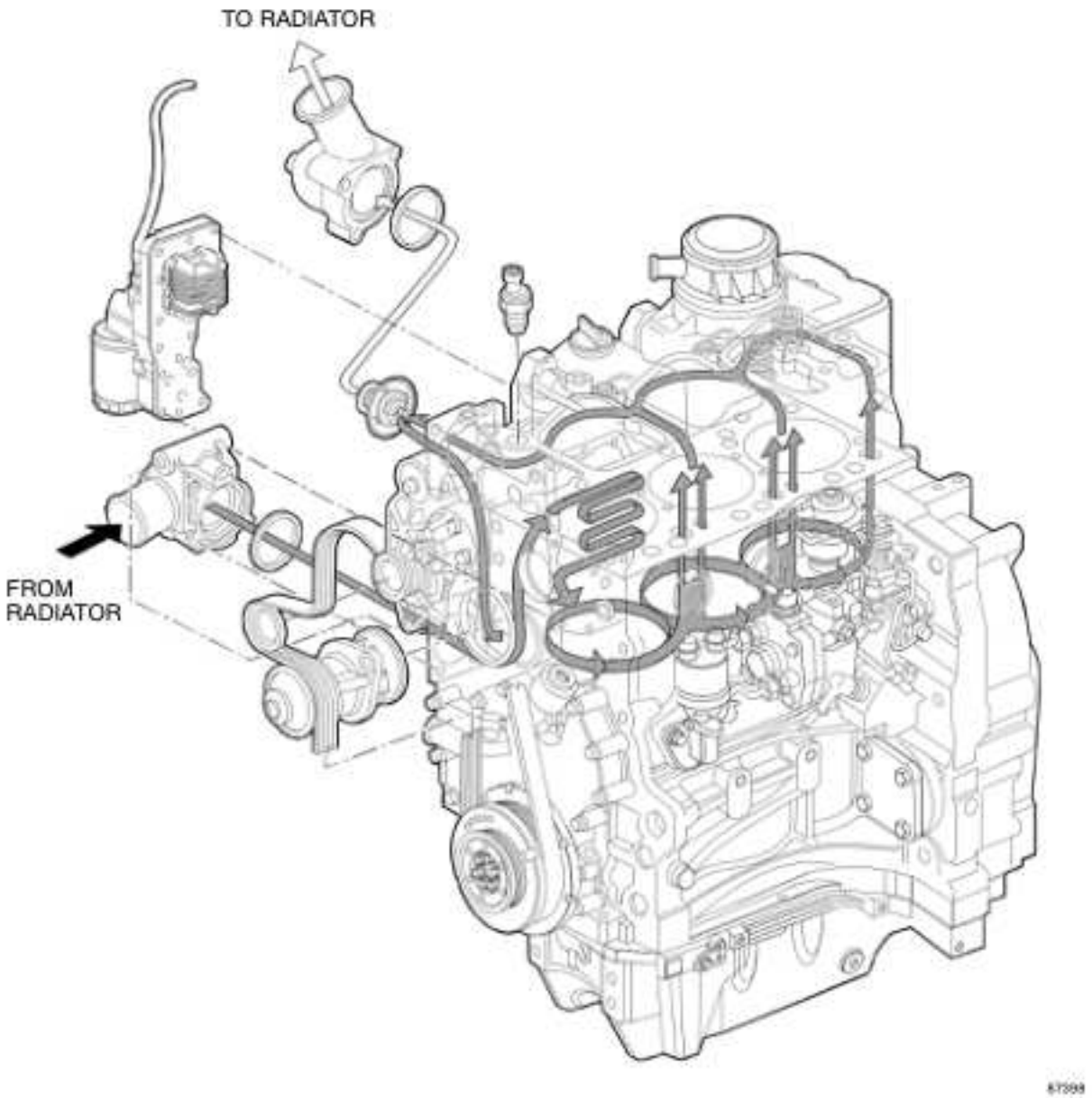
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COOLING

The engine cooling system is of the forced, closed-circuit circulation type and is made up of the following components:

- ❑ heat exchanger, to cool the lubricating oil;
- ❑ centrifugal water pump, housed in the crankcase front part;
- ❑ thermostat, to regulate coolant flow.

Figure 19



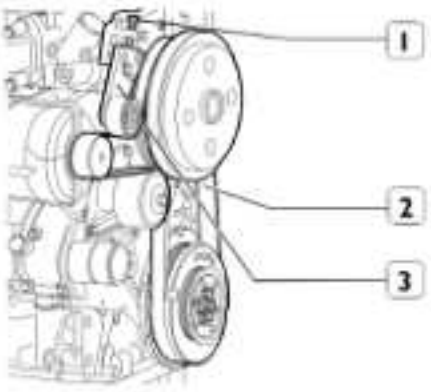
Water flowing out of the thermostat

Water recirculating in the engine

Water flowing into the pump

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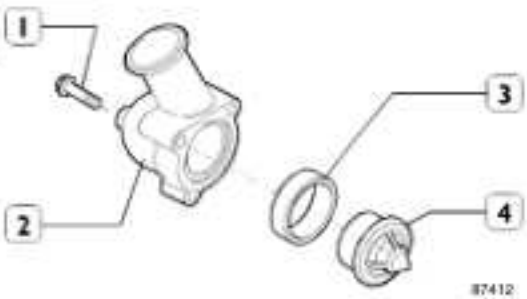
Figure 38



87411

- ❑ Loosen the screw (1) adjusting the belt tightening pulley in order to release the belt (2) until enabling to withdraw it from the convey and drive pulleys.
- ❑ Remove the belt tightening pulley (3).

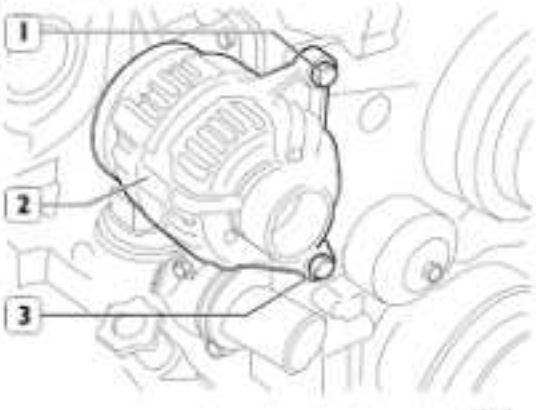
Figure 39



87412

Disassemble thermostat unit; loosen the three fixing screws (1), disassemble the thermostat unit (2) and remove the gasket (3) and the thermostat (4).

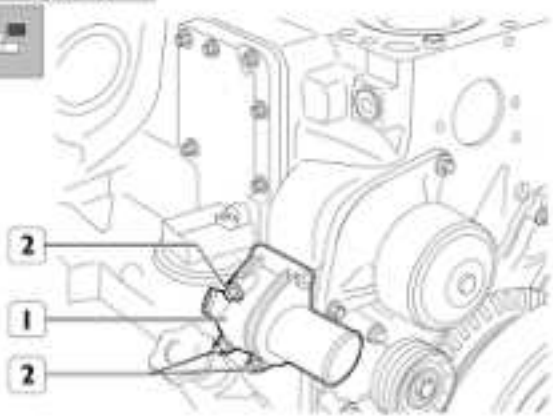
Figure 40



87413

Duly hold the alternator (2) removing it from its support by loosening the screw (3) and from the bracket by loosening the screw (1); recover nuts and washers.

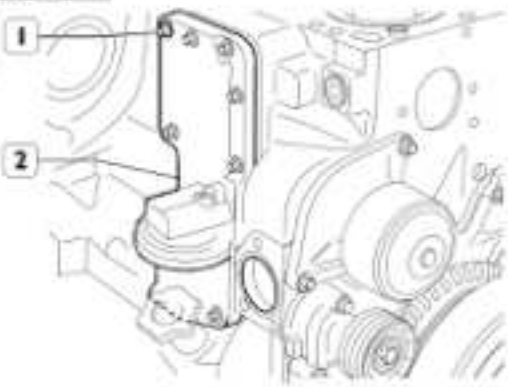
Figure 41



87414

Loosen the screws (1) and withdraw the alternator bearing (2).

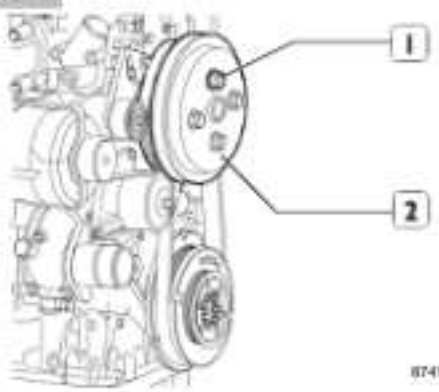
Figure 42



87415

- ❑ Loosen the screws (1) and disassemble the oil filter/heat exchanger bearing (2), the interlayer plate and remove the relating gaskets.
- ❑ Disassemble injection pump (see specific procedure) and the power take-off underneath (if available).

Figure 43

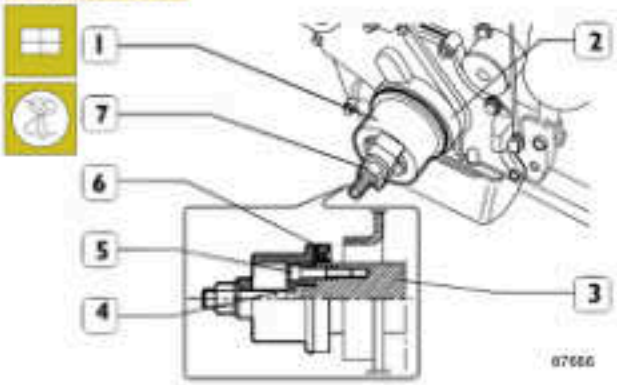


87416

- ❑ Loosen the four screws (1) and disassemble the pulley (2) from the bearing underneath.
- ❑ Proceed disassembling the bearing.

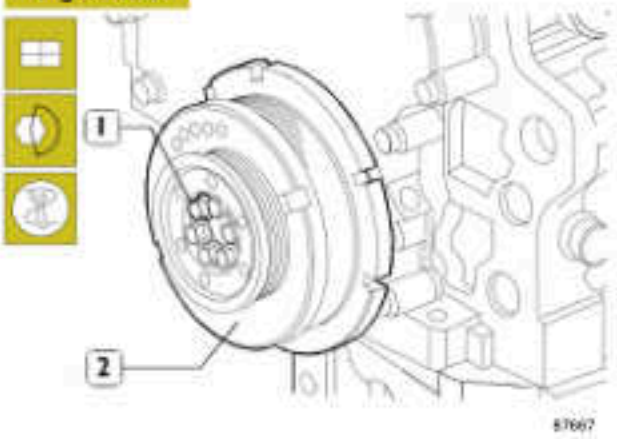
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Figure 137



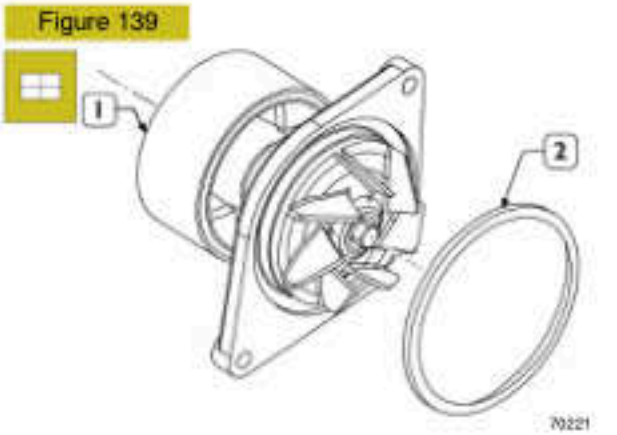
- ❑ Fit part (4) of the tool 380000666 on the front tang (3) of the engine drive shaft; fasten it with the screws (5) and spline the new tight ring on it (6).
- ❑ Fit part (1) on part (4), screw-tighten the nut (7) until the assembly of the tight ring (6) into the front cover (2) is completed.

Figure 138



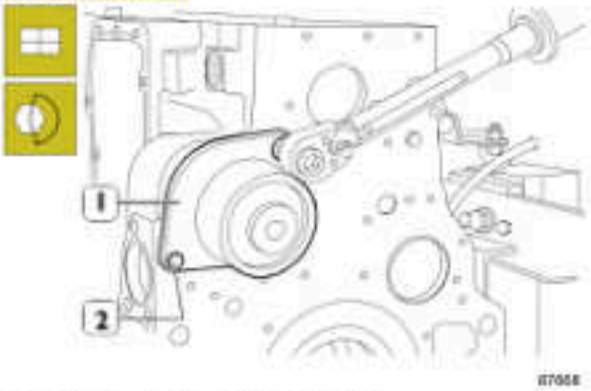
Spline the pulley (2) on the engine drive shaft and tighten the screws to the prescribed pair and angle (1).

Figure 139



Apply to the water pump (1) a new fixing ring (2).

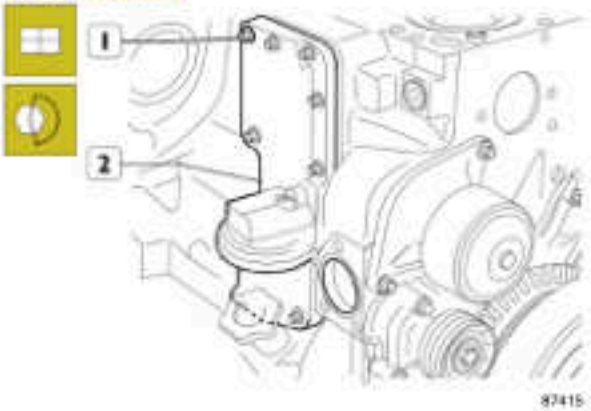
Figure 140



- ❑ Assemble the water pump (1).
- ❑ Tighten the screws (2) and lock them to the prescribed couple.

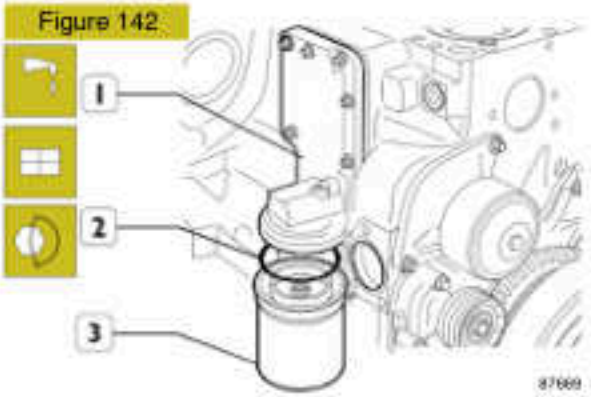
Mounting the water / oil heat exchanger

Figure 141



- ❑ Assemble the following elements to the block: heat exchanger (2), new gasket, oil filter bearing. Tighten the screws (1) and lock them to the prescribed couple.

Figure 142

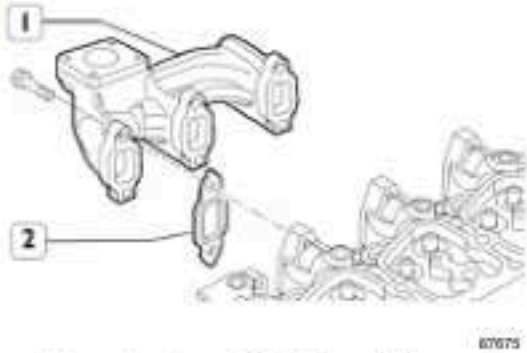


- ❑ Lubricate the fixing ring (2) using engine oil and place it on the oil filter (3).
- ❑ Manually start the oil filter (3) on the bearing union (1) until counter-boring, further screw up the oil filter (3) by 3/4 turn.

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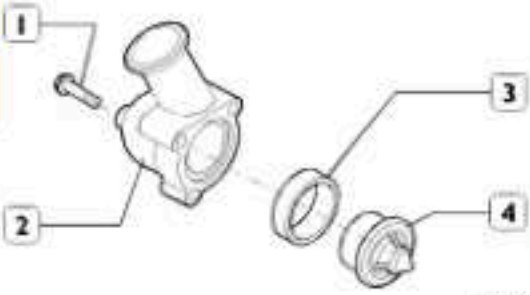
Figure 172



87075

❑ Assemble exhaust manifold (1) providing new gaskets (2).

Figure 173



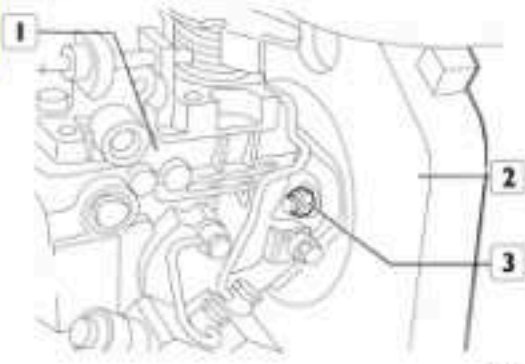
87412

❑ Assemble thermostat unit (2) including thermostat (4) and gasket (3).

❑ Tighten the screws (1) to the prescribed couple.

IMPORTANT - *The gasket must be new.*

Figure 174



87677

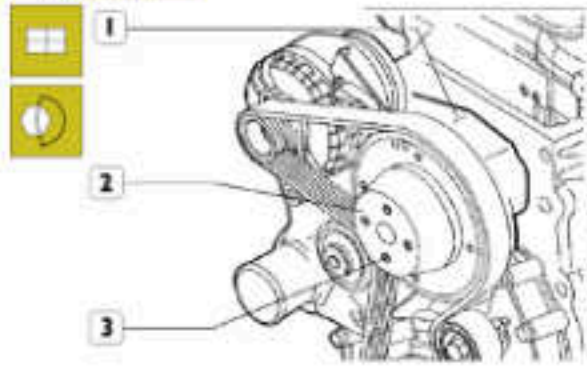
Assemble the injection pump unit (1) into the gearbox housing (2) and fix it, without tightening, throughout the screws (3).

Figure 175



Assemble the support (1) of the fan pulley throughout the screws (2) tightening them to the prescribed pair.

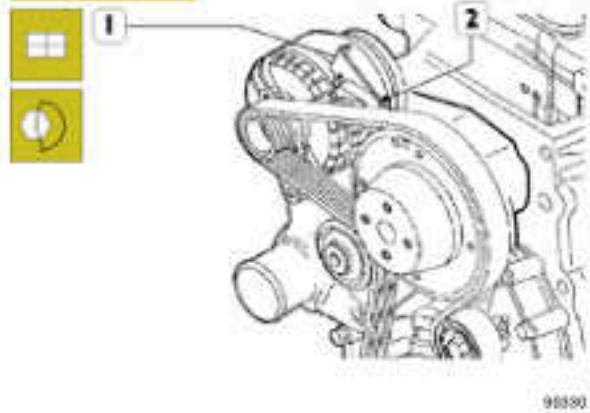
Figure 176



90329

Assemble the fan pulley (2) to the support (1) throughout the screws (3) tightening them to the pair.

Figure 177



90330

Assemble the belt tightening pulley (1) throughout the screw (2) tightening it to pair.

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