

NEF SERIES

Industrial application

N45

N45 MNA - N45 MNS - N45 MNT
N45 MSA - N45 MSS - N45 MST



This publication describes the characteristics, data and correct methods for repair operations on each component of the vehicle.

If the instructions provided are followed and the specified equipment is used, correct repair operations in the programmed time will be ensured, safeguarding against possible accidents.

Before starting to perform whatever type of repair, ensure that all accident prevention equipment is available and efficient.

All protections specified by safety regulations, i.e.: goggles, helmet, gloves, boot, etc. must be checked and worn.

All machining, lifting and conveying equipment should be inspected before use.

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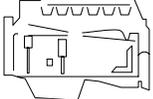
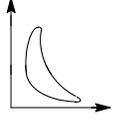
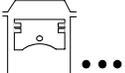
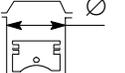
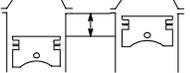
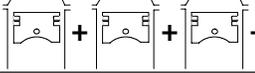
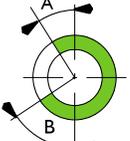
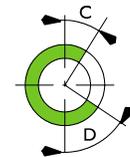
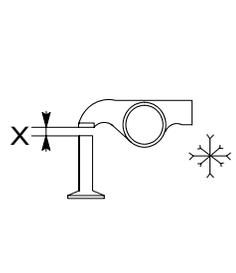
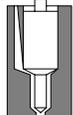
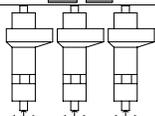
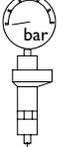


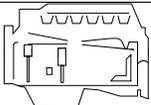
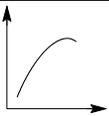
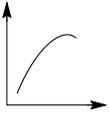
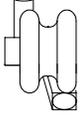
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CORRESPONDENCE BETWEEN TECHNICAL CODE AND COMMERCIAL CODE

Technical Code	Commercial Code
F4GE0404A*D6..	N45 MNA - MSA
F4GE0454A*D6..	N45 MNS - MSS
F4GE0484C*D6..	N45 MNT - MST
F4GE0484G*D6..	N45 MST
F4GE0604A*D6..	N67 MNA - MSA
F4GE0684C*D6..	N67 MNT - MST

SPECIFICATIONS

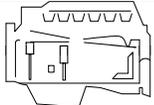
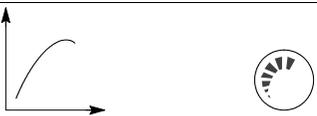
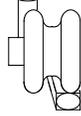
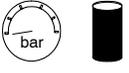
	Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines	
	Cycle	Four-stroke diesel engine		
	Power	See properties described in Section 3		
	Injection	Direct		
	Number of cylinders	4 in-line	6 in-line	
	Bore	mm	104	
	Stroke	mm	132	
	Total displacement	cm ³	4485	6728
TIMING				
	 start before T.D.C. end after B.D.C.	A B	15° 35°	
	 start before B.D.C. end after T.D.C.	D C	69° 21°	
	Checking timing	X { mm mm	- -	
	Checking operation		X { mm mm	0.25 ± 0.05 0.50 ± 0.05
FUEL FEED				
Type: rotary Bosch in Bosch line		VE 4/12 F	VE 6/12 F PES 6A	
	Nozzle type	Injectors DSL A 145 P		
	Injection sequence	1 - 3 - 4 - 2	1 - 5 - 3 - 6 - 2 - 4	
	Injection pressure	bar	-	

4 cyl. engines - N45 Series			TECHNICAL IVECO				
			F4GE0404	F4GE0454	F4GE0484		
	Type		A*D6..	A*D6..	C*D6..	D*D6..	
	Compression ratio		17.5 : 1				
	Max. output	kW (HP)	60 (81)	74 (100)	94 (128)	82 (111)	
		rpm	2300	2300	2300	2200	
	Max. torque	Nm (kgm)	320 (32.0)	398 (39.8)	500 (50.0)	480 (48.0)	
		rpm	1400	1400	1400	1400	
	Loadless engine idling	rpm	850	850	850	-	
	Loadless engine peak	rpm	2300	2300	2300	-	
	Bore x stroke	mm	104 x 132				
	Displacement	cm ³	4485				
	SUPERCHARGING		Direct injection intake	without intercooler Direct injection	with intercooler		
	Turbocharger type		-	HOLSET HX25W	HOLSET HX25W	HOLSET HX27W	
	LUBRICATION		Forced by gear pump, relief valve single action oil filter				
	Oil pressure (warm engine)		0.70				
		- idling	bar	3.50			
		- peak rpm	bar				
	COOLING		By liquid				
	Water pump control		Through belt				
	Thermostat						
	- start of opening	°C	81 ± 2				
	FILLING						
	engine sump*	liters	13		-		
	15W40 ACEA E3						
	engine sump + filter*	liters	14		-		
	* First filling operation						



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.

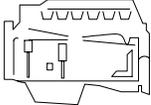
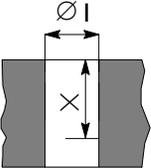
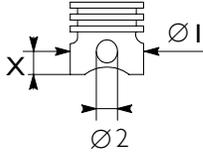
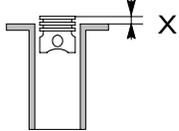
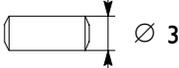
6 cyl. engines - N67 Series			TECHNICAL IVECO	
			F4GE0604	F4GE0684
	Type		A*D6..	C*D6..
	Compression ratio		17.5 : 1	
	Max. output	kW (HP)	81 (110)	129 (175)
	Max. torque	Nm (kgm)	440 (44.0)	700 (70.0)
		rpm	2500	2300
		rpm	1400	1400
	Loadless engine idling	rpm	-	850
	Loadless engine peak	rpm	-	2500
	Bore x stroke	mm	104 x 132	
	Displacement	cm ³	6728	
	SUPERCHARGING		Direct injection intake	without intercooler Direct injection
	Turbocharger type		.	HOLSET HX35W
	LUBRICATION		Forced by gear pump, relief valve single action oil filter	Forced by gear pump, relief valve single action oil filter
	Oil pressure (warm engine)			
	- idling	bar	1.2	0.70
	- peak rpm	bar	3.8	3.50
	COOLING		By liquid Through belt	
	Water pump control			
	Thermostat			
	- start of opening	°C	81 ± 2	
	FILLING			
15W40 ACEA E3	engine sump	liters	-	15
	engine sump + filter	liters	-	16

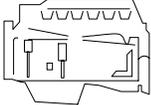
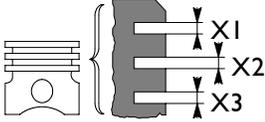
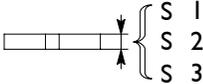
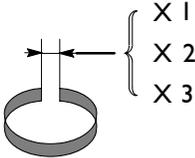
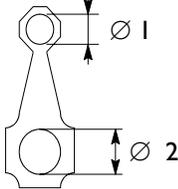
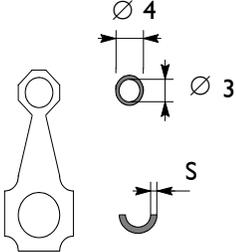


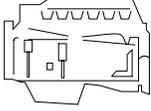
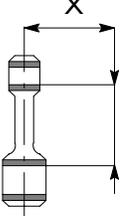
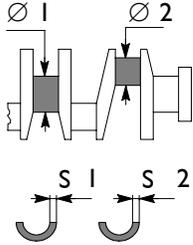
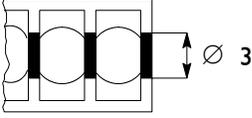
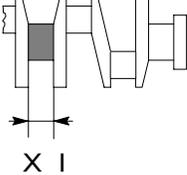
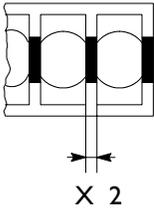
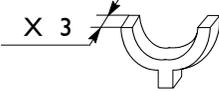
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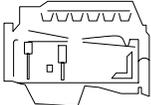
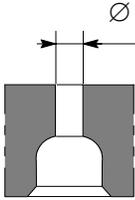
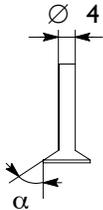
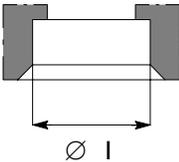
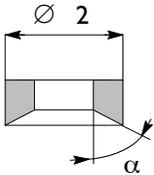
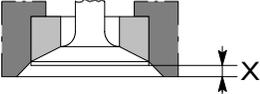
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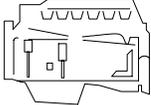
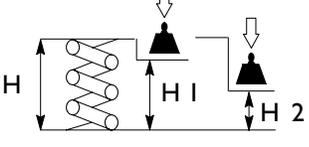
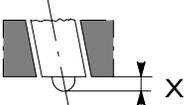
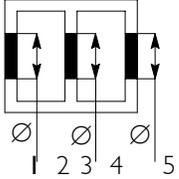
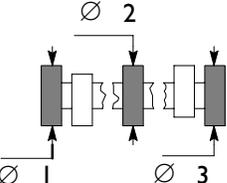
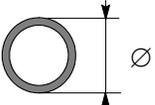
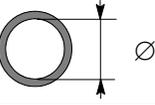
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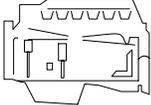
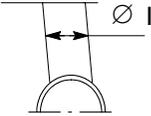
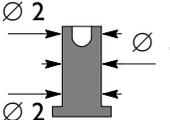
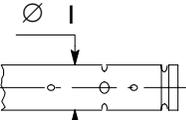
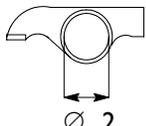
 Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines	
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		mm	
 Cylinder barrels  Ø1	104.000 to 104.024		
 Spare pistons type: Size X Outside diameter Ø 1 Pin housing Ø 2	55.9 103.730 to 103.748 38.010 to 38.016		
 Piston – cylinder barrels	0.252 to 0.294		
 Piston diameter Ø 1	0.4; 0.5, 0.8		
 Piston protrusion X	0.28 to 0.52		
 Piston pin Ø 3	37.994 to 38.000		
 Piston pin – pin housing	0.010 to 0.022		

	Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS			
mm			
	Split ring slots * measured on a \varnothing of 98.75 + 99.00 mm	X1 X2 X3	2,705 to 2,735 2,440 to 2,460 4,030 to 4,050
	Split rings	S 1 S 2 S 3	2.560 to 2.605 2.350 to 2.380 3.970 to 3.990
	Split rings - slots	1 2 3	0.100 to 0.175 0.060 to 0.110 0.040 to 0.080
	Split rings		0.4; 0.8
	Split ring end opening in cylinder barrel:	X 1 X 2 X 3 X 1 X 2 X 3	0.30 to 0.40 0.60 to 0.80 0.30 to 0.55
	Small end bush housing Big end bearing housing	\varnothing 1 \varnothing 2	40.987 to 41.013 72.987 to 73.013
	Small end bush diameter Outside Inside Spare big end half bearings	\varnothing 4 \varnothing 3 \varnothing 4 \varnothing 3 S	40.987 to 41.013 38.019 to 38.033 1.955 to 1.968
	Small end bush – housing		-
	Piston pin – bush		0.019 to 0.039
	Big end half bearings		0.250 to 0.500

	Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		mm	
	Size X Max. tolerance on connecting rod axis alignment =	-	
	Journals Ø 1 Crankpins Ø 2 Main half bearings S 1 Big end half bearings S 2	82.99 to 83.01 68.987 to 69.013 2.456 to 2.464 1.955 to 1.968	
	Main bearings No. 1 – 5 Ø 3 No. 2 – 3 – 4 Ø 3	87.982 to 88.008 87.977 to 88.013	
	Half bearings – Journals No. 1-5 / 1-7 No. 2-3-4 / 2-3-4-5-6 Half bearings - Crankpins	0.064 to 0.095 0.059 to 0.100 0.064 to 0.090	
	Main half bearings Big end half bearings	+ 0.250 to + 0.500	
	Shoulder journal X 1	37.350 to 37.650	37.475 to 37.545
	Shoulder main bearing X 2	31.730 to 32.280	
	Shoulder half-rings X 3	37.28 to 37.38	
	Output shaft shoulder	0.095 to 0.270	

 Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		
mm		
 Valve guide seats on cylinder head	$\varnothing 1$	8.019 to 8.039
 Valves:	 $\varnothing 4$ α  $\varnothing 4$ α	7.943 to 7.963 60° 7.943 to 7.963 45°
 Valve stem and guide		0.056 to 0.096
 Housing on head for valve seat:	 $\varnothing 1$  $\varnothing 1$	46.987 to 47.013 43.637 to 43.663
 Valve seat outside diameter; valve seat angle on cylinder head:	 $\varnothing 2$ α  $\varnothing 2$ α	47.063 to 47.089 60° 43.713 to 43.739 45°
 Sinking	 	0.356 to 1.102 0.104 to 0.840
 Between valve seat and head	 	0.050 to 0.102 0.050 to 0.102
   Valve seats		-

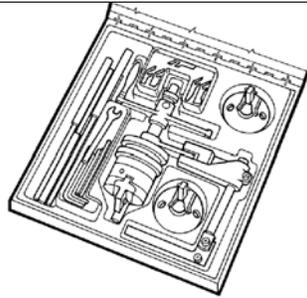
 Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		
mm		
 Valve spring height: free spring H under a load equal to: 329 N H1 641 N H2		63.50 49.02 38.20
 Injector protrusion X		-
 Camshaft bush housings No. 1-5 Camshaft housings No. 2-3-4		59.222 to 59.248 54.089 to 54.139
 Camshaft journals: 1 ⇒ 5 Ø 1 ⇒ 7 Ø		53.995 to 54.045
 Camshaft bush outside diameter: Ø		59.222 to 59.248
 Bush inside diameter Ø		54.083 to 54.147
 Bushes and housings on block		-
 Bushes and journals		0.038 to 0.162
Cam lift: 		11.02 10.74

 Type	N45 SERIES 4 CYLINDERS Engines	N67 SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM	mm	
 Tappet cap housing on block Ø 1	-	-
 Tappet cap outside diameter: Ø 2 Ø 3	15.924 to 15.954 15.965 to 15.980	-
 Between tappets and housings	-	-
 Tappets	-	-
 Rocker shaft Ø 1	18.963 to 18.975	-
 Rockers Ø 2	19.000 to 19.026	-
 Between rockers and shaft	0.025 to 0.063	-

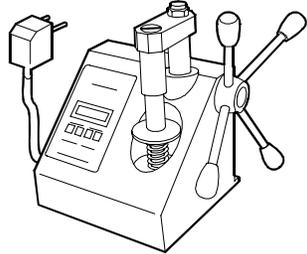
TOOLS

TOOL NO.

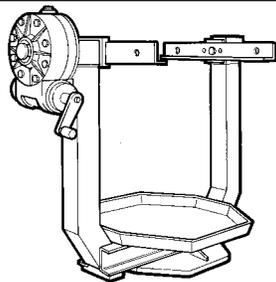
DESCRIPTION

99305019

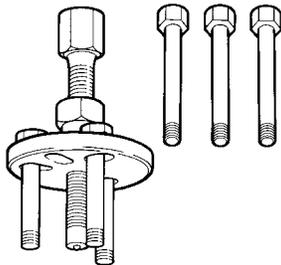
Kit for valve seat regrinding

99305047

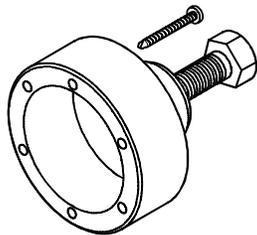
Spring load tester

99322205

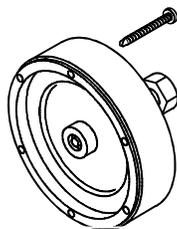
Revolving stand for overhauling units (700 daN/m capacity, 120 daN/m torque)

99340035

Injection pump gear extractor.

99340055

Tool to remove output shaft front gasket

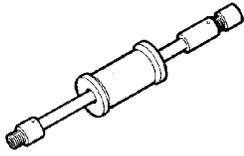
99340056

Tool to remove output shaft rear gasket

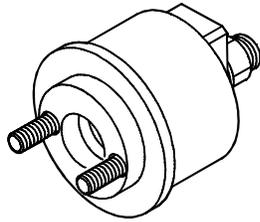
TOOLS

TOOL NO.

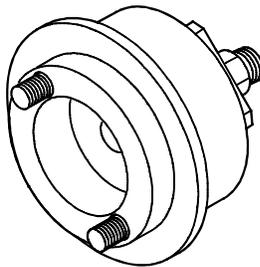
DESCRIPTION

99340205

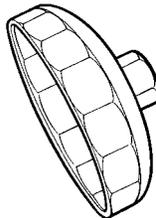
Tool to remove injectors

99346252

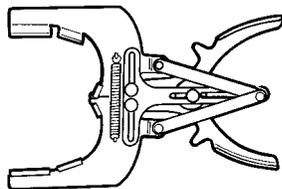
Tool for fitting output shaft front gasket

99346253

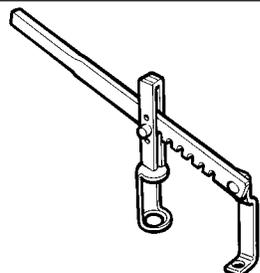
Tool for fitting output shaft rear gasket

99360076

Tool to remove oil filter (engine)

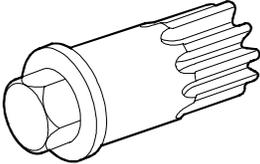
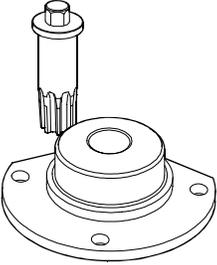
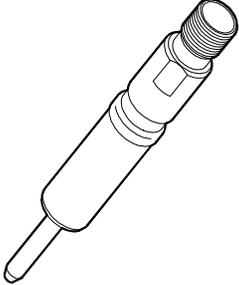
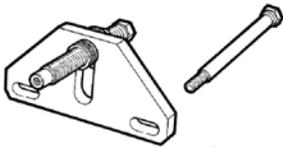
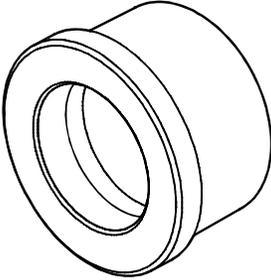
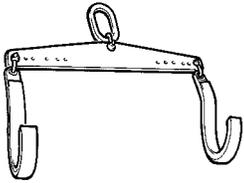
99360183

Pliers for removing/refitting piston rings (65 – 110 mm)

99360268

Tool for removing/refitting engine valves

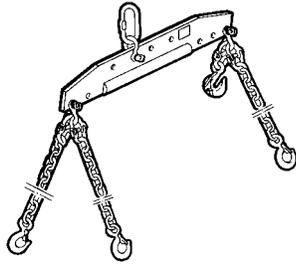
TOOLS

TOOL NO.	DESCRIPTION
99360330	 Flywheel crank handle (*)
99360339	 Tool for stopping the engine flywheel (**)
99360344	 Adapter, cylinder compression test (use with 99395682)
99360351	 Tool for flywheel holding (***)
99360362	 Beater for removing/refitting camshaft bushes (to be used with 993700069)
99360500	 Tool for lifting the output shaft

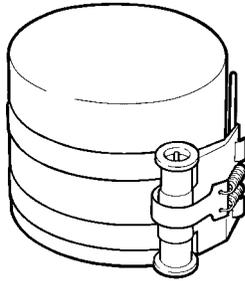
TOOLS

TOOL NO.

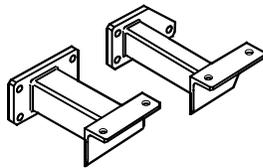
DESCRIPTION

99360595

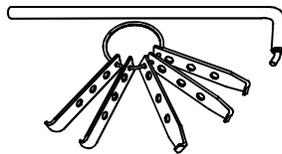
Lifting rig for engine removal/refitting

99360605

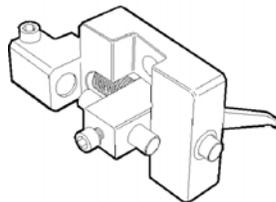
Band for fitting piston into cylinder barrel (60 – 125 mm)

99361037

Brackets for fastening engine to revolving stand 99322205

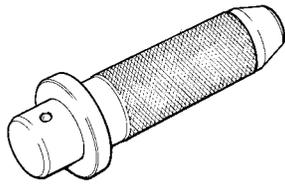
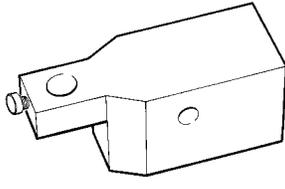
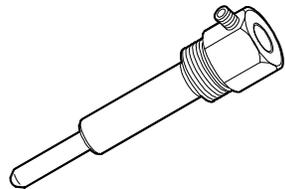
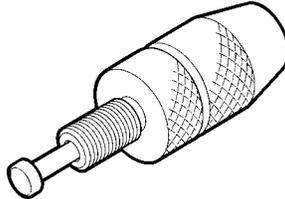
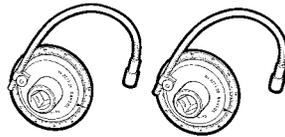
99363204

Tool to remove gaskets

99365195Comparator holder tool for injection pump timing
(to be used with 99395604)**99367121**

Tool to remove gaskets

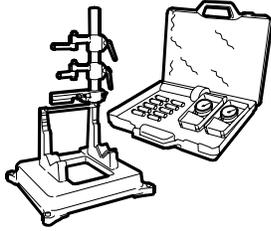
TOOLS

TOOL NO.	DESCRIPTION	
99370006	 A cylindrical tool with a textured, knurled central section and smooth ends.	Interchangeable willow handgrip
99370415	 A rectangular metal block with a protruding cylindrical part on one side and a small hole on the top surface.	Gauge base for different measurements (to be used with 99395603)
99395097	 A long, thin metal rod with a hexagonal base and a small hole at the end.	Tool to check top dead centre (use with 99395604)
99395100	 A cylindrical tool with a textured, knurled section and a threaded end.	Dial gauge holder for rotary injection pump timing (use with 99395603)
99395216	 Two circular gauges with square heads and curved handles.	Pair of gauges with 1/2" and 3/4" square head for angle tightening
99395220	 A rectangular box containing a dial gauge and other accessories.	All-purpose goniometer/Inclinometer

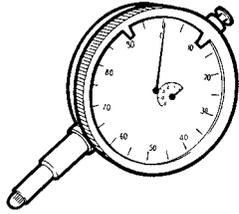
TOOLS

TOOL NO.

DESCRIPTION

99395363

Complete bush testing square

99395603

Dial gauge (0 – 5 mm)

99395604

Dial gauge (0 – 10 mm)

99395682

Diesel fuel engine cylinder compression control device

(*) for engines	F4GE0404B*D650 F4GE0404H*D65 I F4GE0454G*D65 I F4GE0454G*D666 F4GE0454H*D65 I F4GE0484G*D660 F4GE0484G*D666 F4GE0654A*D65 I F4GE0684Q*D650 F4GE0404B*D65 I F4GE0454B*D65 I F4GE0454E*D65 I	(****) for engines	F4GE0404B*D650 F4GE0454A*D606 F4GE0484C*D650 F4GE0484G*D660 F4GE0484G*D666 F4GE0604A*D60 I F4GE0684F*D60 I F4GE0684G*D600 F4GE0684Q*D650 F4GE0454A*D6 I0 F4GE0454A*D605 F4GE0454B*D65 I
(**) for engines	F4GE0404A*D600 F4GE0454A*D606 F4GE0684F*D60 I F4GE0684G*D600 F4GE0454A*D6 I0 F4GE0454A*D605		
(***) for engines	F4GE0454A*D6 I0 F4GE0484C*D650 F4GE0484G*D666 F4GE0684A*D60 I F4GE0684C*D65 I F4GE0684F*D60 I F4GE0684G*D600		

INJECTION PUMP PUMPING ELEMENT PRE-LIFT TABLE

	Technical Code	Commercial Code	Pre-lift (mm)
4-CYLINDER ENGINES	F4GE0404A*D6..	N45 MNA - MSA	1.15 ± 0.05
	F4GE0454A*D6..	N45 MNS - MSS	1 ± 0.05
	F4GE0484C*D6..	N45 MNT - MST	1 ± 0.05
	F4GE0484G*D6..	N45 MST	1 ± 0.05
6-CYLINDER ENGINES	F4GE0604A*D6..	N67 MNA - MSA	1.15 ± 0.05
	F4GE0684C*D6..	N67 MNT - MST	1 ± 0.05

NOTE INJECTION PUMP CALIBRATION

Overhaul and calibration interventions are up to BOSCH assistance network.

The contract technical specification containing the data to calibrate the pump at the bench is identified by the code shown on injection pump body and is available at BOSCH technical assistance network.

Otherwise, refer to IVECO MOTORS Technical Assistance Service.