NEF SERIES

Industrial application

N40

N40 ENT

IVECO MOTORS

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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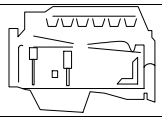
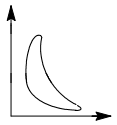
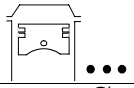
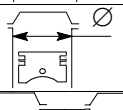
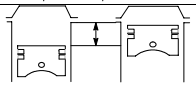
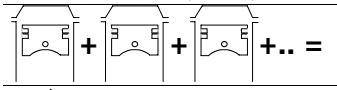
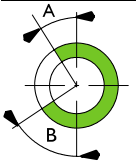
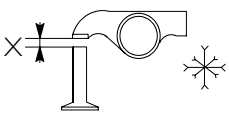
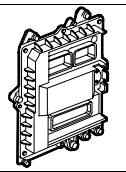
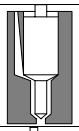
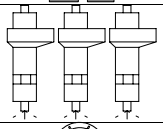
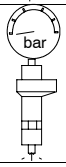
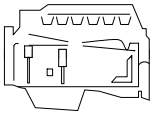
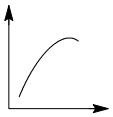
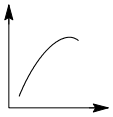
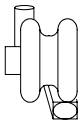
CORRESPONDENCE BETWEEN TECHNICAL CODE AND COMMERCIAL CODE

Technical Code	Commercial Code
F4AE0484B*D1..	N40 ENT
F4AE0684C*D1..	N60 ENT

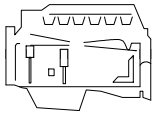
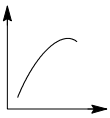
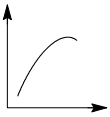
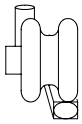
SPECIFICATIONS

			N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
	Type			
	Cycle		Four-stroke diesel engine	
	Power		Turbocharged with intercooler	
	Injection		Direct	
	Number of cylinders		4 in-line	6 in-line
	Bore	mm	102	
	Stroke	mm	120	
	Total displacement	cm^3	3920	5880
 	**TIMING**			
	start before T.D.C. end after B.D.C.	A B	18.5° 29.5°	
	start before B.D.C. end after T.C.	D C	67° 35°	
	Checking timing X	mm mm	- -	
	Checking operation X	mm mm	0.20 to 0.30 0.45 to 0.55	
	**FUEL FEED** Injection Type:	 Bosch	 high pressure common rail EDC7 ECU	
	Nozzle type		Injectors	
	Injection sequence		1 - 3 - 4 - 2	1 - 5 - 3 - 6 - 2 - 4
	Injection pressure bar		250 - 1450	

4 cyl. engines - N40 ENT Series			TECHNICAL CODE
	Type		F4AE0484B * D1..
ϱ	Compression ratio		17 : 1
 	Max. output	kW (HP) rpm	107 145 2300
 	Max. torque	Nm (kgm) rpm	490 49.0 1200
	Loadless engine idling	rpm	-
	Loadless engine peak	rpm	-
	Bore x stroke		102 x 120
	Displacement		3920
	**TURBOCHARGING**		with intercooler
	Turbocharger type		GARRETT GT 22
 	**LUBRICATION**		Forced by gear pump, relief valve single action oil filter
	Oil pressure (warm engine)		
	- idling	bar	0.7
	- peak rpm	bar	4.0
	COOLING		By centrifugal pump, regulating thermostat, heat exchanger, intercooler
	Water pump control		Through belt
	Thermostat		
	- start of opening	°C	82.2
 15W40 ACEA E3	**FILLING**		
	engine sump	liters	5.3
	engine sump + filter	liters	6.3

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

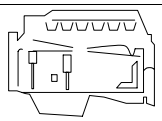
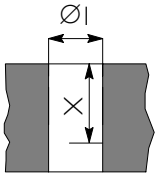
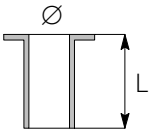
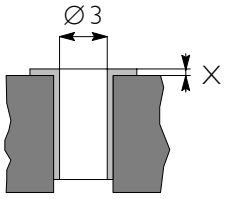
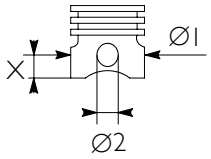
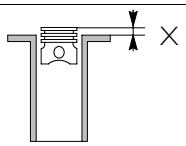
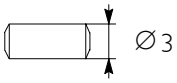
Furthermore, the use of the unit after overhaul showd conform to the original specified power and engine rev/min for which the engine has been designed.

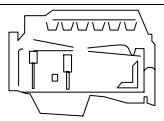
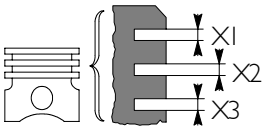
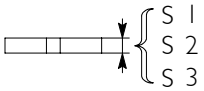
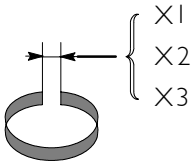
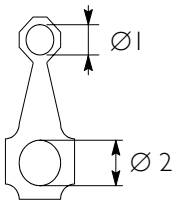
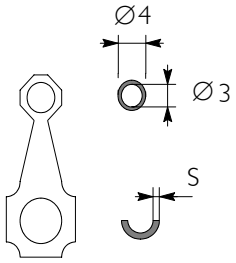
6 cyl. engines - N60 ENT Series			TECHNICAL CODE
	Type		F4AE0684C * D1..
ϱ	Compression ratio		17 : 1
 	Max. output	kW (HP) rpm	155 210 2300
 	Max. torque	Nm (kgm) rpm	810 81.0 1250
	Loadless engine idling	rpm	-
	Loadless engine peak rpm	rpm	-
	Bore x stroke Displacement		102 x 120 5880
	**TURBOCHARGING** Turbocharger type		with intercooler HOLSET HX35W
 	**LUBRICATION** **Oil pressure (warm engine)** - idling - peak rpm	 bar bar	Forced by gear pump, relief valve single action oil filter 1.2 3.8
	COOLING **Water pump control** **Thermostat** - start of opening	 °C	By centrifugal pump, regulating thermostat, heat exchanger, intercooler Through belt 81 ± 2
 15W40 ACEA E3	**FILLING** engine sump engine sump + filter	 liters liters	 15 15 + 1

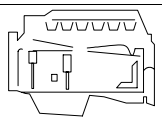
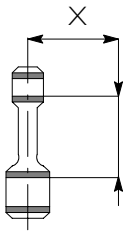
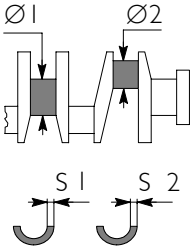
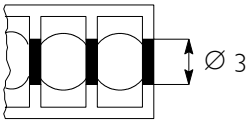
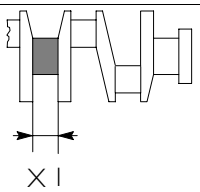
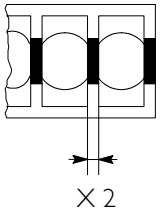
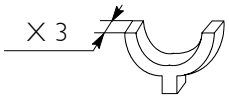
Data, features and performances are valid only if the technician fully complies with all the installation requirements provided by Iveco Motors.

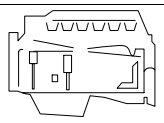
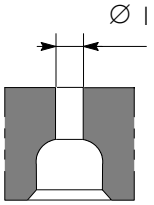
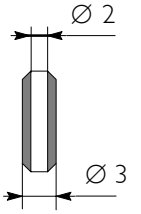
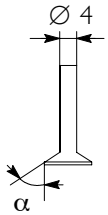
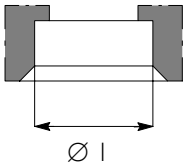
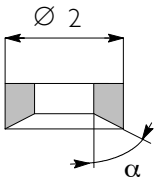
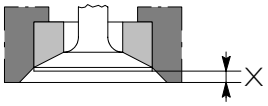
Furthermore, the use of the unit after overhaul showd conform to the original specified power and engine rev/min for which the engine has been designed.

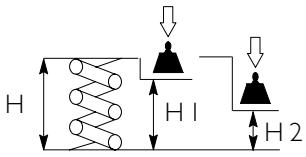
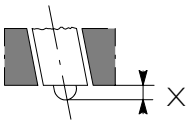
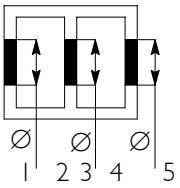
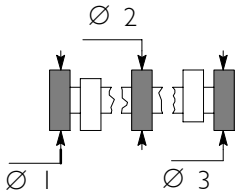
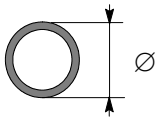
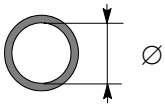
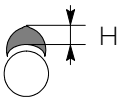
CLEARANCE DATA

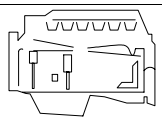
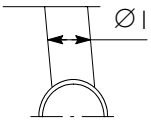
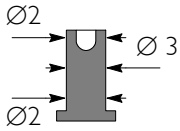
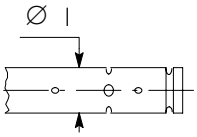
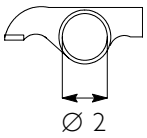
	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		mm	
	Cylinder barrels Ø1	102.01 to 102.03	
	Cylinder barrels: outside diameter Ø 2 length L	 - -	
	Cylinder barrels – housings on engine block (interference)	-	
	Outside diameter Ø 2	-	
	Cylinder barrels: inside diameter Ø 2	-	
	Spare pistons type: Size X Outside diameter Ø 1 Pin housing Ø 2	 12 101.883 to 101.897 40.008 to 40.014	
	Piston – cylinder barrels	0.113 to 0.147	
	Piston diameter Ø 1	0.5	
	Piston protrusion X	0.28 to 0.52 0.28 to 0.52	
	Piston pin Ø 3	39.9968 to 40.0032	
	Piston pin – pin housing	0.0048 to 0.0172	

	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		**mm**	
	Split ring slots X1*	2.705 to 2.735	
	X 2	2.420 to 2.440	
	X 3	4.020 to 4.040	
	* measured on 98 mm Ø 4 cyl. * measured on 99 mm Ø 6 cyl. * measured on 101 mm Ø F4HE		
	Split rings S 1	2.560 to 2.605	
	S 2	2.350 to 2.380	
	S 3	3.975 to 4.000	
	Split rings - slots 1	0.100 to 0.175	
	2	0.040 to 0.900 / 0.060 to 0.110	
	3	0.020 to 0.065 / 0.040 to 0.083	
	Split rings	0.5	
	Split ring end opening in cylinder barrel:		
	X 1	0.22 to 0.32 / 0.30 to 0.40	
	X 2	0.60 to 0.85 / 0.60 to 0.80	
	X 3	0.25 to 0.55	
	Small end bush housing Ø 1	42.987 to 43.013	
	Big end bearing housing Ø 2	72.987 to 73.013	
	Small end bush diameter		
	Outside Ø 4	43.279 to 43.553	
	Inside Ø 3	40.019 to 40.033	
	Spare big end half bearings S	1.955 to 1.968	
	Small end bush – housing	0.266 to 0.566	
	Piston pin – bush	0.0362 to 0.0158	
	Big end half bearings	0.250 to 0.500	

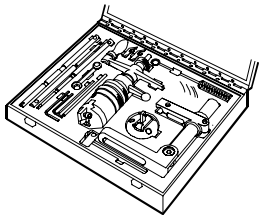
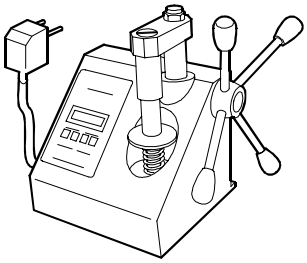
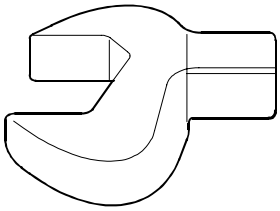
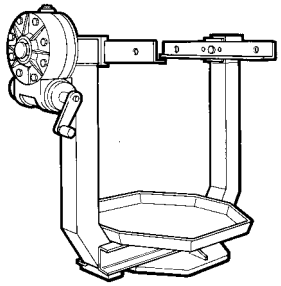
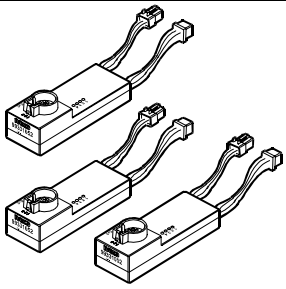
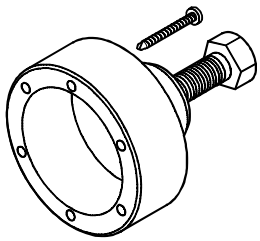
	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER UNIT AND CRANKSHAFT COMPONENTS		**mm**	
	Size X	-	
	Max. tolerance on connecting rod axis alignment =	-	
	Journals Ø 1 Crankpins Ø 2	82.99 to 83.01 68.987 to 69.013	
	Main half bearings S 1* Big end half bearings S 2*	2.456 to 2.464 1.955 to 1.968	
	*provided as spare part		
	Main bearings No. 1–5 / 1-7 Ø 3 No. 2–3–4/2-3-4-5-6 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	 0.041 to 0.119 0.041 to 0.103	
	Half bearings - Crankpins	0.033 to 0.041	
	Main half bearings Big end half bearings	+ 0.250; + 0.500	
	Shoulder journal X 1	37.475 to 37.545	
	Shoulder main bearing X 2	25.98 to 26.48	
	Shoulder half-rings X 3	37.28 to 37.38	
	Output shaft shoulder	0.068 to 0.410	

	Type	N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM		**mm**	
	Valve guide seats on cylinder head Ø 1	7.042 to 7.062 7.042 to 7.062	
	Valve guides Ø 2 Ø 3	- -	
	Valve guides and seats on head	-	
IVECO PARTS >	Valve guides	-	
	Valves: Ø 4 α Ø 4 α	6.970 to 6.999 60° ± 0.25° 6.970 to 6.999 45° ± 0.25°	
	Valve stem and guide	0.043 to 0.092	
	Housing on head for valve seat: Ø1 Ø1	34.837 to 34.863 34.837 to 34.863	
	Valve seat outside diameter; valve seat angle on cylinder head: Ø 2 α Ø 2 α	34.917 to 34.931 60° 34.917 to 34.931 45°	
	Sinking X X	0.59 to 1.11 0.96 to 1.48	
	Between valve seat and head	0.054 to 0.094 0.054 to 0.094	
IVECO PARTS >	Valve seats	-	

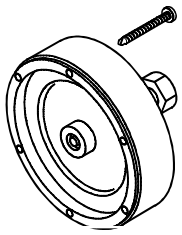
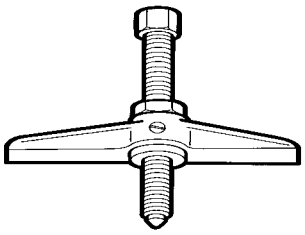
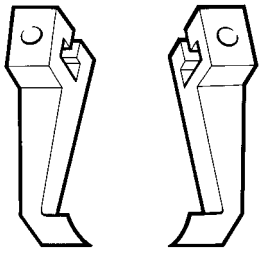
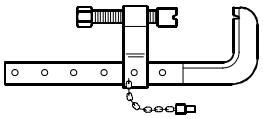
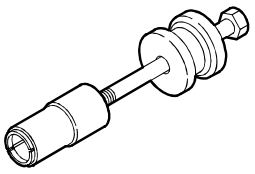
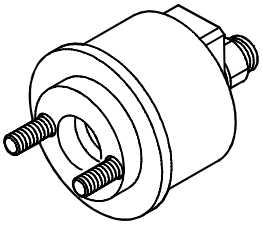
	Type		N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM			**mm**	
	Valve spring height: free spring under a load equal to: 339.8 ± 19 N 741 ± 39 N	 H H1 H2	 47.75 35.33 25.2	
	Injector protrusion	X	-	
	Camshaft bush housings No. 1-5/1-7 Camshaft housings No. 2-3-4/2-3-4-5-6		59.222 to 59.248 54.089 to 54.139	
	Camshaft journals: 1 ⇒ 5 1 ⇒ 7	 Ø Ø	53.995 to 54.045	54.005 to 54.035
	Camshaft bush outside diameter:	Ø	-	
	Bush inside diameter	Ø	54.083 to 54.147	
	Bushes and housings on block		-	
	Bushes and journals		0.038 to 0.162	
	Cam lift:  	 H H	 6.045 7.582	

	Type		N40 ENT SERIES 4 CYLINDERS Engines	N60 ENT SERIES 6 CYLINDERS Engines
CYLINDER HEAD – TIMING SYSTEM			**mm**	
	Tappet cap housing on block	Ø 1	16.000 to 16.030	
	Tappet cap outside diameter:	Ø 2 Ø 3	15.924 to 15.954 15.960 to 15.975	
	Between tappets and housings		0.025 to 0.070	
	Tappets		-	
	Rocker shaft	Ø 1	21.965 to 21.977	
	Rockers	Ø 2	22.001 to 22.027	
	Between rockers and shaft		0.024 to 0.062	

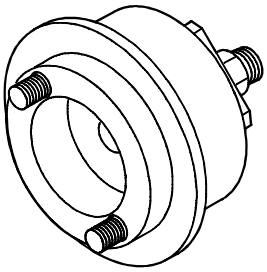
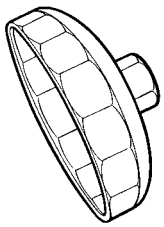
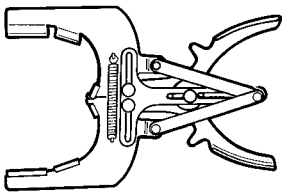
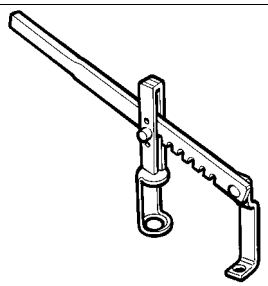
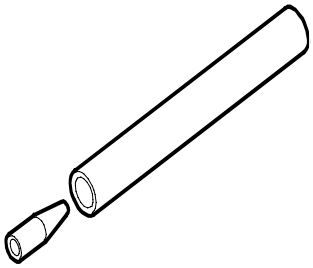
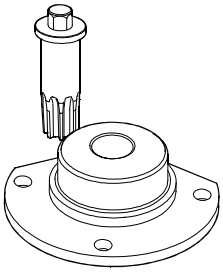
TOOLS

TOOL NO.		DESCRIPTION
99305018		Kit for valve seat regrinding
99305047		Spring load tester
99317915		Set of 3 pin wrenches (14 - 17 - 19 mm)
99322205		Revolving stand for overhauling units (700 daN/m capacity, 120 daN/m torque)
99331052		Adapter for measures on engine injectors (use with 99395872)
99340055		Tool to remove output shaft front gasket

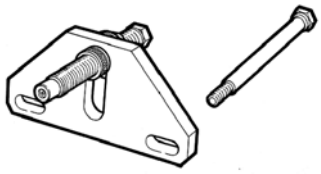
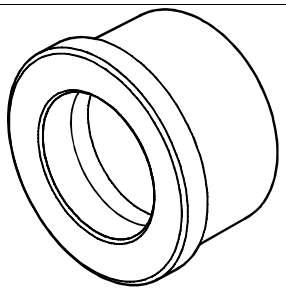
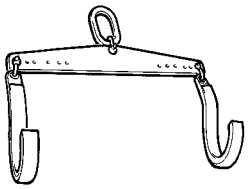
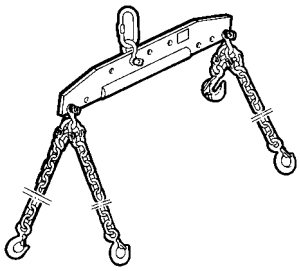
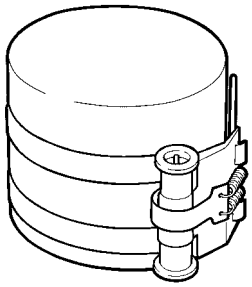
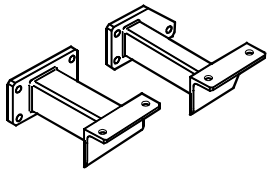
TOOLS

TOOL NO.		DESCRIPTION
99340056		Tool to remove output shaft rear gasket
99341001		Double acting puller
99341009		Pair of brackets
99341015		Press
99342101		Tool to remove injectors
99346252		Tool for fitting output shaft front gasket

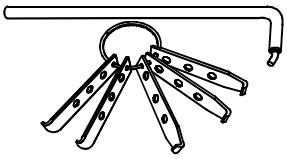
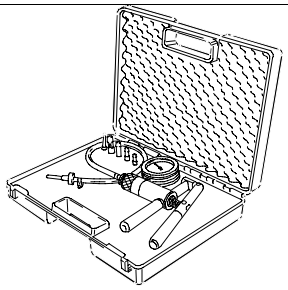
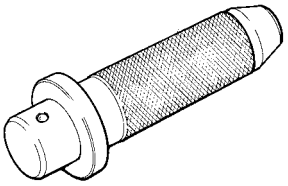
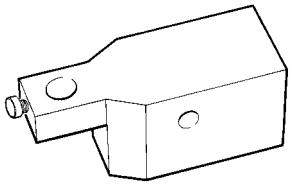
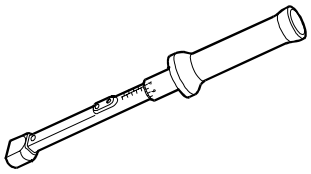
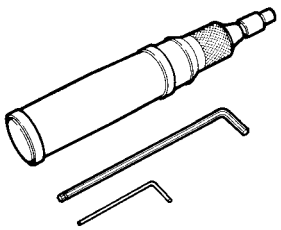
TOOLS

TOOL NO.		DESCRIPTION
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
99360292		Keying device for seal assembly on the valve guide
99360339		Tool for rotating/stopping the engine flywheel

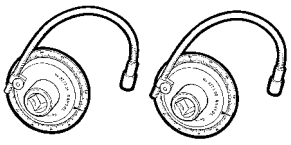
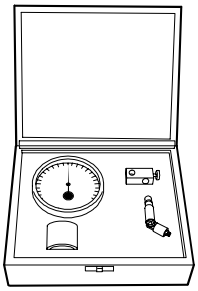
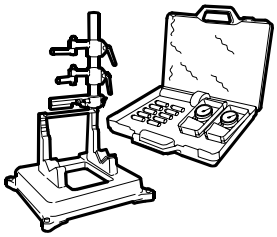
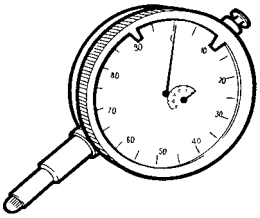
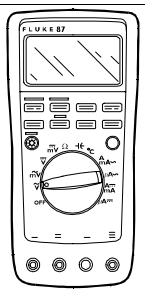
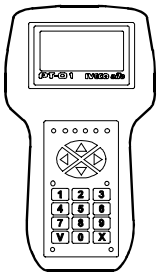
TOOLS

TOOL NO.		DESCRIPTION
99360351		Equipment for flywheel holding
99360362		Beater for removing/refitting camshaft bushes (to be used with 993700069)
99360500		Tool for lifting the output shaft
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

TOOLS

TOOL NO.		DESCRIPTION
99363204		Tool to remove gaskets
99367121		Manual pump for pressure and depression measures
99370006		Handgrip for interchangeable beaters
99370415		Gauge base for different measurements (to be used with 99395603)
99389829		Dog type dynamometric wrench 9x12 (5-60 Nm)
99389834		Torque screwdriver for injector solenoid valve connector stop nut setting

TOOLS

TOOL NO.		DESCRIPTION
99395216		Pair of gauges with ½" and ¾" square head for angle tightening
99395220		Universal goniometer/inclinometer
99395363		Complete bush testing square
99395603		Dial gauge (0 – 5 mm)
99395872		Analog to digital multimeter for voltage, current intensity, resistance, diodes, frequencies, capacity and registration of the minimum, average and maximum values
8093731		Tester PT01