CURSOR TIER 3 SERIES

Industrial application

C87

CURSOR 87 TE X

This publication provides unit and relevant component repair data, specifications, instructions and methodologies.

This publication has been drawn up for qualified and specialised personnel.

Before performing any operation check that the part relevant to the unit on which you must work is available along with all safety devices for accident-prevention, such as, goggles, helmet, gloves, shoes, etc. and hoisting and transporting equipment.

Operations are to be performed by following the indications included here, using the special equipment indicated and assuring proper repair, compliance with schedule and operator's safety requirements.

Each repair must aim to restore operating efficiency and safety in compliance with the FPT provisions.

FPT cannot be held liable for modifications, alterations or other interventions non authorised by FPT on the vehicle and if the unit is warranted the above mentioned interventions will cause its expiration.

FPT is not liable for repairing interventions.

FPT will provide further details required to carry out the interventions and all the instructions that are not included on this publication.

Data included in this publication may not be up-to-date therefore subject to Manufacturer's modifications that can be added at any time for technical or commercial purposes and also to meet new law regulations in other Countries.

If issues on this publication differ from what is actually noticed on the unit, please get in touch with the FPT network before starting any intervention".

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CURSOR 87 TE X Series

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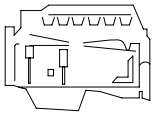
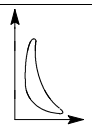
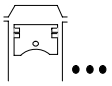
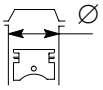
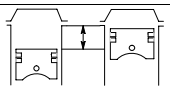
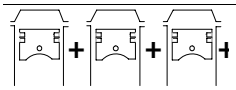
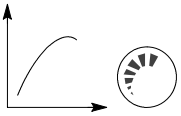
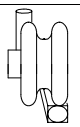
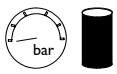
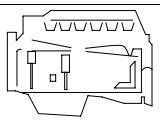
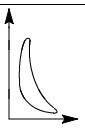
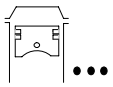
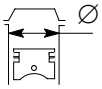
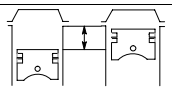
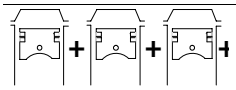
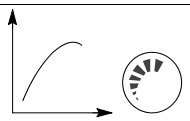
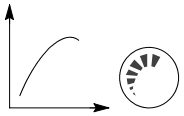
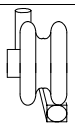
CORRESPONDENCE BETWEEN TECHNICAL CODE AND COMMERCIAL CODE

Technical Code	Commercial Code
F2CE9685A*E001	CURSOR 87 TE X
F2CE0685B*E002	

GENERAL CHARACTERISTICS			TECHNICAL CODE
	Type		**F2CE9685A*E001**
	Cycle		4-stroke Diesel engine
	Fuel feed		Turbocharged
	Injection		Direct
	No. of cylinders		6 in line
	Bore	mm	117
	Stroke	mm	135
	Total displacement	cm^3	8717
	Compression ratio		1: 15.9 ± 0.8
	**Europe market** Max output Max. torque	kW (HP) rpm Nm (kgm) rpm	 263 (358) 1500 1675 (170,7) 1500
	**SUPERCHARGING** Turbocharger type		 Intercooler Direct injection
	**LUBRICATION** Oil pressure (warm engine) - idling - peak rpm	 bar bar	 Forced by gear pump, relief valve single action oil filter - -
	COOLING Water pump control **Thermostat** - start of opening	 °C	Liquid Through belt 85 ± 1.5

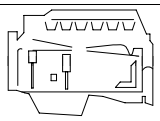
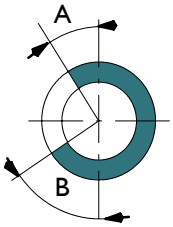
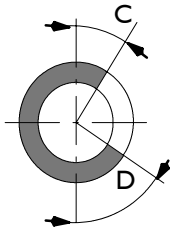
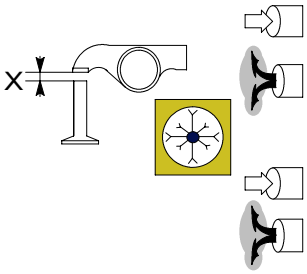
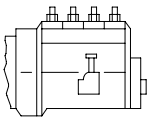
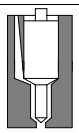
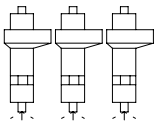
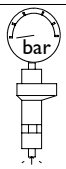
NOTE Data, features and performances are valid only if the setter fully complies with all the installation prescriptions provided by FPT.

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.

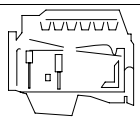
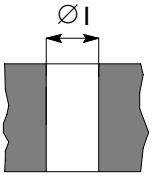
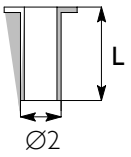
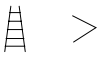
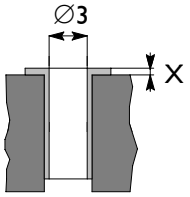
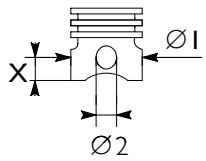
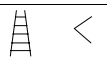
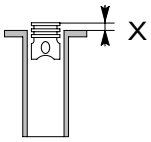
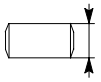
		TECHNICAL CODE
	Type	**F2CE0685B*E002**
	Cycle	4-stroke Diesel engine
	Fuel feed	Turbocharged
	Injection	Direct
	No. of cylinders	6 in line
	Bore mm	117
	Stroke mm	135
	Total displacement cm^3	8717
	Compression ratio	1: 15.9 ± 0.8
	**USA market** Max output kW (HP) rpm	 290 (401) 1800
	Max. torque Nm (kgm) rpm	1539 (156,9) 1800
	**SUPERCHARGING** Turbocharger type	Intercooler Direct injection
	**LUBRICATION** Oil pressure (warm engine) - idling bar - peak rpm bar	 Forced by gear pump, relief valve single action oil filter - -
	COOLING Water pump control **Thermostat** - start of opening °C	Liquid Through belt 85 ± 1.5

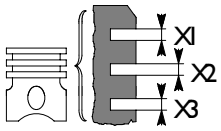
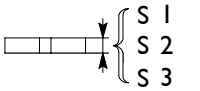
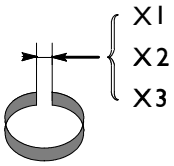
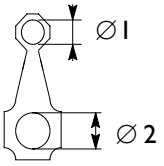
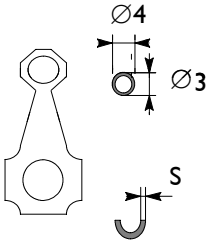
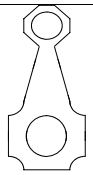
NOTE Data, features and performances are valid only if the setter fully complies with all the installation prescriptions provided by FPT.

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.

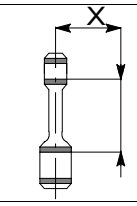
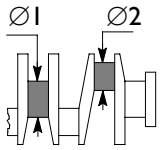
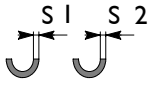
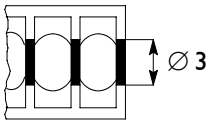
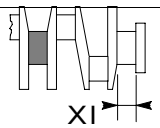
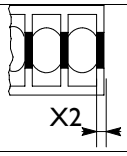
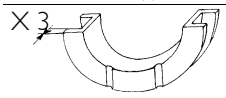
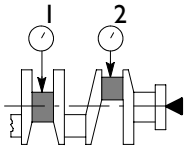
			TECHNICAL CODE
	Type		**F2CE9685A*E001**
			F2CE0685B*E002
	VALVE TIMING		
	opens before T.D.C.	A	17°
	closes after B.D.C.	B	31°
	opens before B.D.C.	D	48°
	closes after T.D.C.	C	9°
	For timing check		
	X	mm	-
		mm	-
	Running		
	X	mm	0.35 to 0.45
		mm	0.55 to 0.65
	FEED		Bosch Common Rail with CRIN2 injectors and high pressure pump CP3.3
	Nozzle type		DLLA 137
	Injection order		1 - 4 - 2 - 6 - 3 - 5
	Injection pressure	bar	1800
	Injector calibration	bar	

ASSEMBLY CLEARANCE DATA

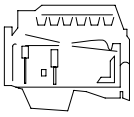
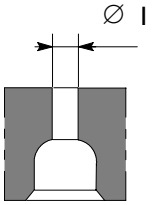
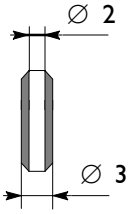
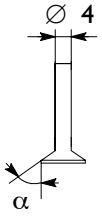
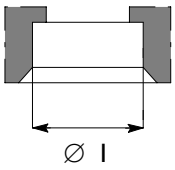
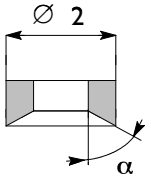
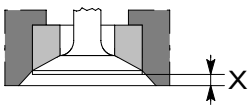
	Type	CURSOR 87 TE X
CYLINDER BLOCK AND CRANKMECHANISM COMPONENTS		mm
	Bores for cylinder liners: Ø1 upper Ø1 lower	 130.500 to 130.525 129.510 to 129.535
	Cylinder liners: external diameter: Ø2 upper Ø2 lower length L	 130.461 to 130.486 129.475 to 129.500 226,15 226.15
	Cylinder liners - crankcase bores upper lower	 0.014 to 0.064 0.010 to 0.060
	External diameter Ø2	-
 * Selection class	Cylinder sleeve inside diameter Ø3A* inside diameter Ø3B* Protrusion X	 117.000 to 117.012 117.010 to 117.022 0.035 to 0.065
	Pistons: measuring dimension X external diameter Ø1A external diameter Ø1B pin bore Ø2	 15 116.894 to 116.906 116.904 to 116.916 52.010 to 52.016
 * Selection class	Piston - cylinder sleeve A* B*	 0.094 to 0.118 0.094 to 0.118
	Piston diameter Ø1	-
	Pistons protrusion X	0.873 to 1.117
	Gudgeon pin Ø3	51.994 to 52.000
	Gudgeon pin - pin housing	0.010 to 0.022

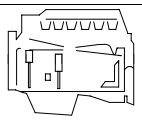
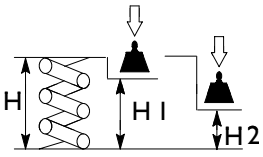
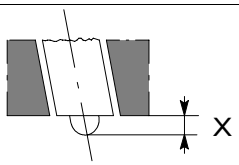
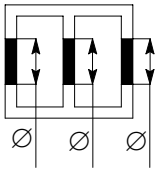
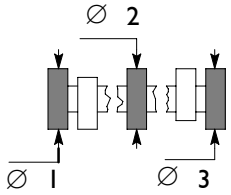
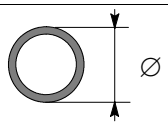
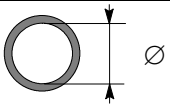
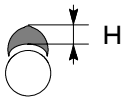
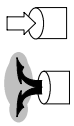
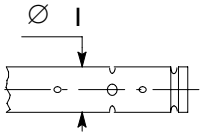
	Type		CURSOR 87 TE X
			mm
	Piston ring grooves	X1 X2 X3	3,120 ÷ 3,140 3.120 to 3.140 2.550 to 2.570 4.020 to 4.040
	Piston rings: trapezoidal seal lune seal milled scraper ring with slits and internal spring	S1 S2 S3	3.000 2.470 to 2.500 3.970 to 3.990
	Piston rings - grooves	1 2 3	- 0.050 to 0.100 0.030 to 0.070
	Piston rings		-
	Piston ring end gap in cylinder liners	X1 X2 X3	0.3 to 0.4 0.60 to 0.75 0.35 to 0.65
	Small end bush housing Big end bearing housing Selection classes	Ø1 Ø2 1 2 3	55.700 to 55.730 85.987 to 86.013 85.987 to 85.996 85.997 to 86.005 86.006 to 86.013
	Small end bush diameter outside inside Big end bearing shell Red Green Yellow ●	 Ø4 Ø3 S	 55.780 to 55.820 52.015 to 52.030 1.994 to 2.002 2.002 to 2.010 2.010 to 2.018
	Small end bush - housing		0.05 to 0.08
	Piston pin - bush		0.015 to 0.036
	Big end bearing		0.127 - 0.254 - 0.508
	Connecting rod weight	A	g
	Class	A B C	3450 to 3470 3471 to 3490 3491 to 3510

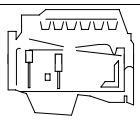
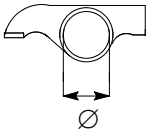
● Fitted in production only and not supplied as spares

	Type		CURSOR 87 TE X
			mm
	Measuring dimension	X	125
	Max. connecting rod axis misalignment tolerance	⫽	0.08
	Main journals	Ø1	
	- nominal		92.970 to 93.000
	- class	1	92.970 to 92.980
	- class	2	92.980 to 92.990
	- class	3	92.990 to 93.000
	Crankpins	Ø2	
	- nominal		81.915 to 81.945
	- class	1	81.915 to 81.925
	- class	2	81.925 to 81.935
	- class	3	81.935 to 81.945
	Main bearing shells	S1	
	Red		2.968 to 2.978
	Green		2.978 to 2.988
	Yellow*		2.988 to 2.998
	Big end bearing shells	S2	
	Red		1.994 to 2.002
	Green		2.002 to 2.010
	Yellow*		2.010 to 2.018
	Main bearing housings	Ø3	
	- nominal		99.000 to 99.030
	- class	1	99.000 to 99.009
	- class	2	99.010 to 99.019
	- class	3	99.020 to 99.030
	Bearing shells - main journals		0.050 to 0.090
	Bearing shells - big ends		0.040 to 0.080
	Main bearing shells		0.127 - 2.254 - 0.508
	Big end bearing shells		0.127 - 2.254 - 0.508
	Main journal, thrust bearing	X1	39.96 to 40.04
	Main bearing housing, thrust bearing	X2	38.94 to 38.99
	Thrust washer halves	X3	3.38 to 3.43
	Crankshaft end float		0.10 to 0.30
	Alignment	⫽ 1 - 2	-
	Ovalization	◯ 1 - 2	0.04
	Taper	⟋ 1 - 2	-

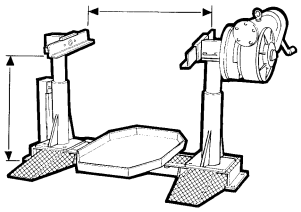
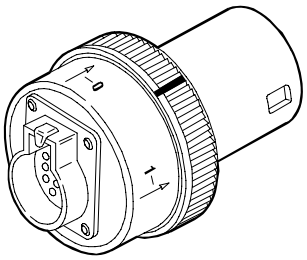
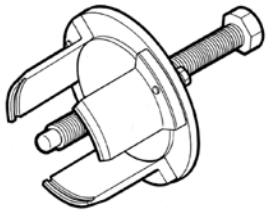
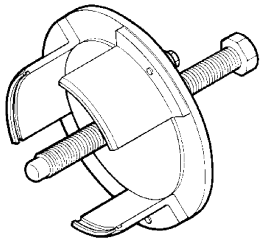
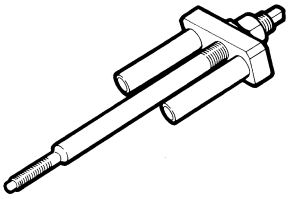
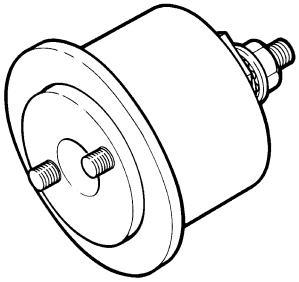
* Fitted in production only and not supplied as spares

	Type	**CURSOR 87 TE X**
CYLINDER HEAD - VALVE TRAIN		mm
	Valve guide housings in cylinder head Ø1	12.9800 to 12.997
	Valve guide Ø2 Ø3	8.023 to 8.038 13.012 to 13.025
	Valves guides - housings in the cylinder heads	0.015 to 0.045
	Valve guide	0.2 - 0.4
	Valves: Ø4 α Ø4 α	7.970 to 7.985 60° 30′ ± 7′ 30″ 7.970 to 7.985 45° +15′ -0′
	Valve stem and its guide	0.040 to 0.070
	Valve seat in head Ø1 Ø1	41.985 to 42.020 40.985 to 41.020
	Outside diameter of valve seat; angle of valve seat in cylinder head: Ø2 α Ø2 α	0' -0,5' 42.060 to 42.075 60° - 30′ 0' -0,5' 41.060 to 41.075 45° - 30′
	Recessing of valve X X	0.5 to 0.8 1.6 to 1.9
	Between valve seat and head	0.040 to 0.090

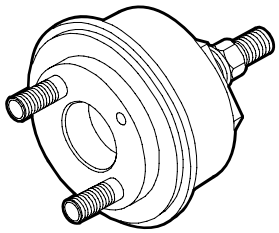
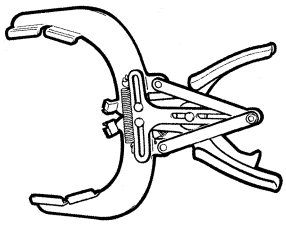
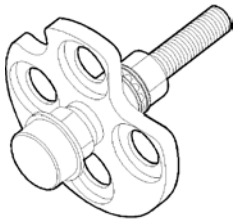
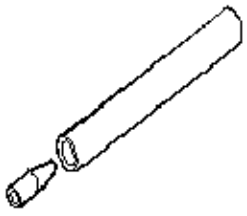
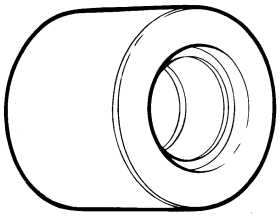
		CURSOR 87 TE X	
	Type	mm	
	Valve spring height:	**A**	**B**
	free height H	70.77	-
	under a load of:		
	N 460 ± 23 H1A N 460 ± 22 H1B	51	
	N 740 ± 33 H2A N 731,4 ± 42 H2B	39	
	Injector protrusion X	1.2 to 1.5	
	Camshaft bushing housing in the cylinder head: 1 ⇒ 7 Ø	69.000 to 69.030	
	Camshaft bearing journals: 1 ⇒ 7 Ø	64.924 to 64.080	
	Outer diameter of camshaft bushings: Ø	69.090 to 69.130	
	Inner diameter of camshaft bushings: Ø	65.080 to 65.116	
	Bushings and housings in the cylinder head	0.060 to 0.130	
	Bushings and bearing journals	0.100 to 0.192	
	Cam lift: 	7.4034 8.2108	
	Rocker shaft Ø1	31.964 to 31.980	

 Type	CURSOR 87 TE X
	mm
 Bushing housing in rocker arms	
	32.025 to 32.041
	32.025 to 32.041
 Between bushings and housings	
	0.045 to 0.077
	0.045 to 0.077
TURBOCHARGER	
Type	HX55
End float	-
Radial play	-

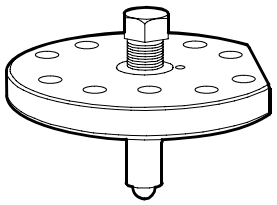
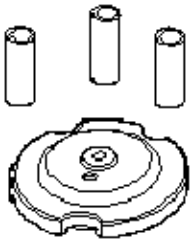
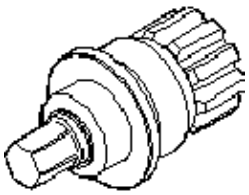
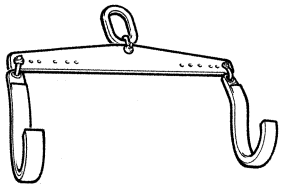
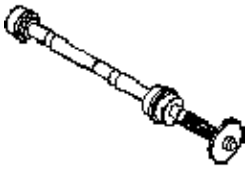
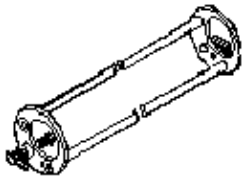
TOOLS

TOOL NO.		DESCRIPTION
99322230		Rotary telescopic stand (range 2000 daN, torque 375 daNm)
99331043		Tool to rotate engine flywheel (to be used with 99360325)
99340051		Extractor for crankshaft front gasket
99340054		Extractor for crankshaft rear gasket
99342149		Extractor for injector-holder
99346245		Tool to install the crankshaft front gasket

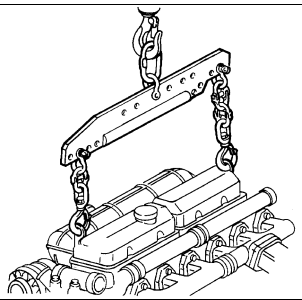
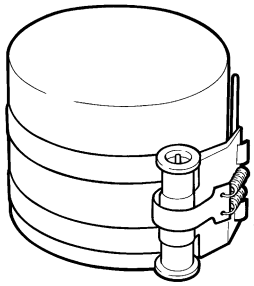
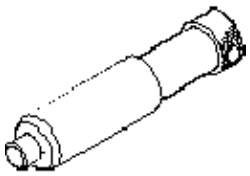
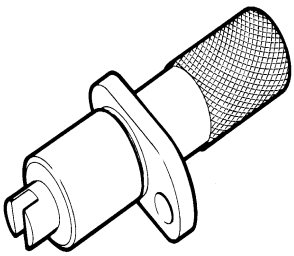
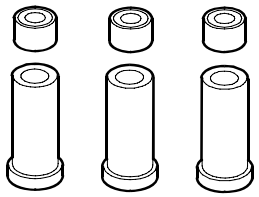
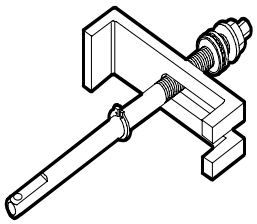
TOOLS

TOOL NO.		DESCRIPTION
99346260		Percussion extractor
99360184		Pliers for assembling and disassembling piston split rings (105-106 mm)
99360264		Universal extractor for 5 to 70 mm internal components
99360288		Box wrench for block junction bolts to the underblock
99360292		Box wrench for block junction bolts to the underblock
99360294		Tool to fit back valve guide (to be used with 99360481)

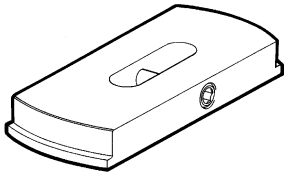
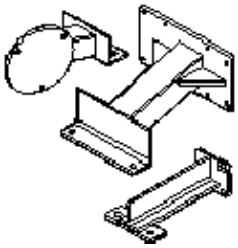
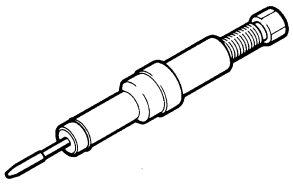
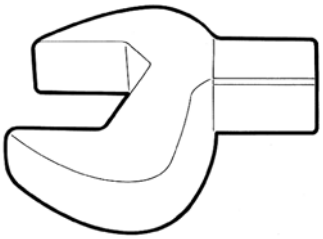
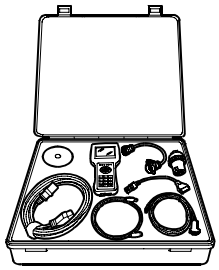
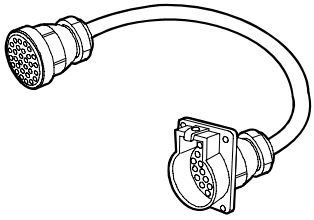
TOOLS

TOOL NO.		DESCRIPTION
99360334		Compression tool for checking the protrusion of cylinder liners (to be used with 99370415-99395603 and special plates)
99360335		Cylinder liner compression plate (to be used with 99360334-99360336)
99360341		Cylinder liner compression plate (to be used with 99360334-99360336)
99360500		Tool to lift crankshaft
99360505		Tool to lift crankshaft
99360558		Percussion extractor

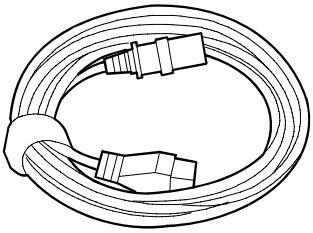
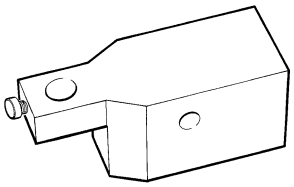
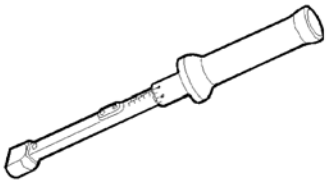
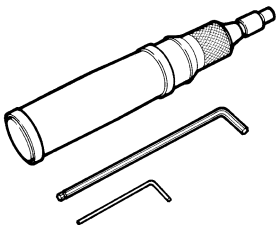
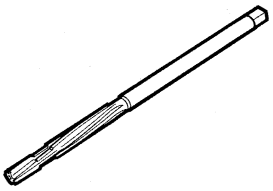
TOOLS

TOOL NO.		DESCRIPTION
99360585		Swing hoist for engine disassembly assembly
99360605		Belt to insert piston in cylinder liner (60 - 125 mm)
99360612		Tool for positioning engine P.M.S.
99360613		Tool for timing of phonic wheel on timing gear
99360703		Tool to stop cylinder liners
99360706		Tool to extract cylinder liners (to be used with specific rings)

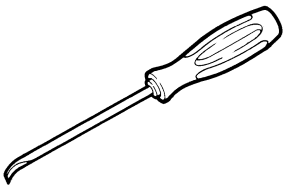
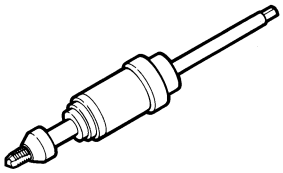
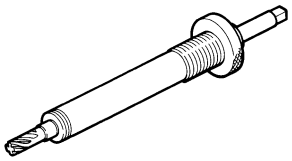
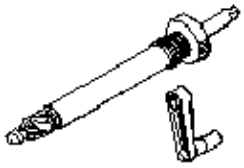
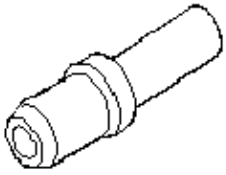
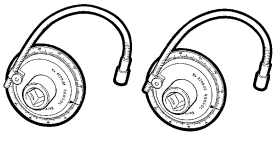
TOOLS

TOOL NO.		DESCRIPTION
99360724		Ring (135 mm) (to be used with 99360706)
99361042		Tool to take down-fit engine valves (to be used with special plates)
99365054		Tool for injector holder heading
99368542		Tool to take down-fit engine valves (to be used with special plates)
99368554		Tool to take down-fit engine valves (to be used with special plates)
99368555		Tool to take down-fit engine valves (to be used with special plates)

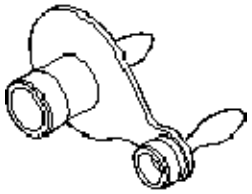
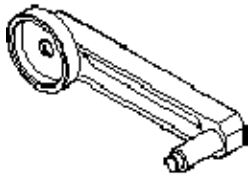
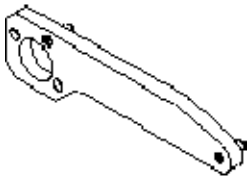
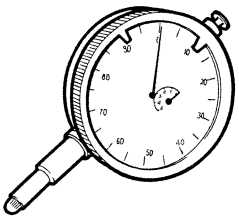
TOOLS

TOOL NO.		DESCRIPTION
99368556		Tool to take down-fit engine valves (to be used with special plates)
99368558		Tool to take down-fit engine valves (to be used with special plates)
99370415		Base supporting the dial gauge for checking cylinder liner protrusion (to be used with 99395603)
99389833		Base supporting the dial gauge for checking cylinder liner protrusion (to be used with 99395603)
99389834		Torque screwdriver (1-6 Nm) for calibrating the injector solenoid valve connector check nut
99390310		Valve guide sleeker

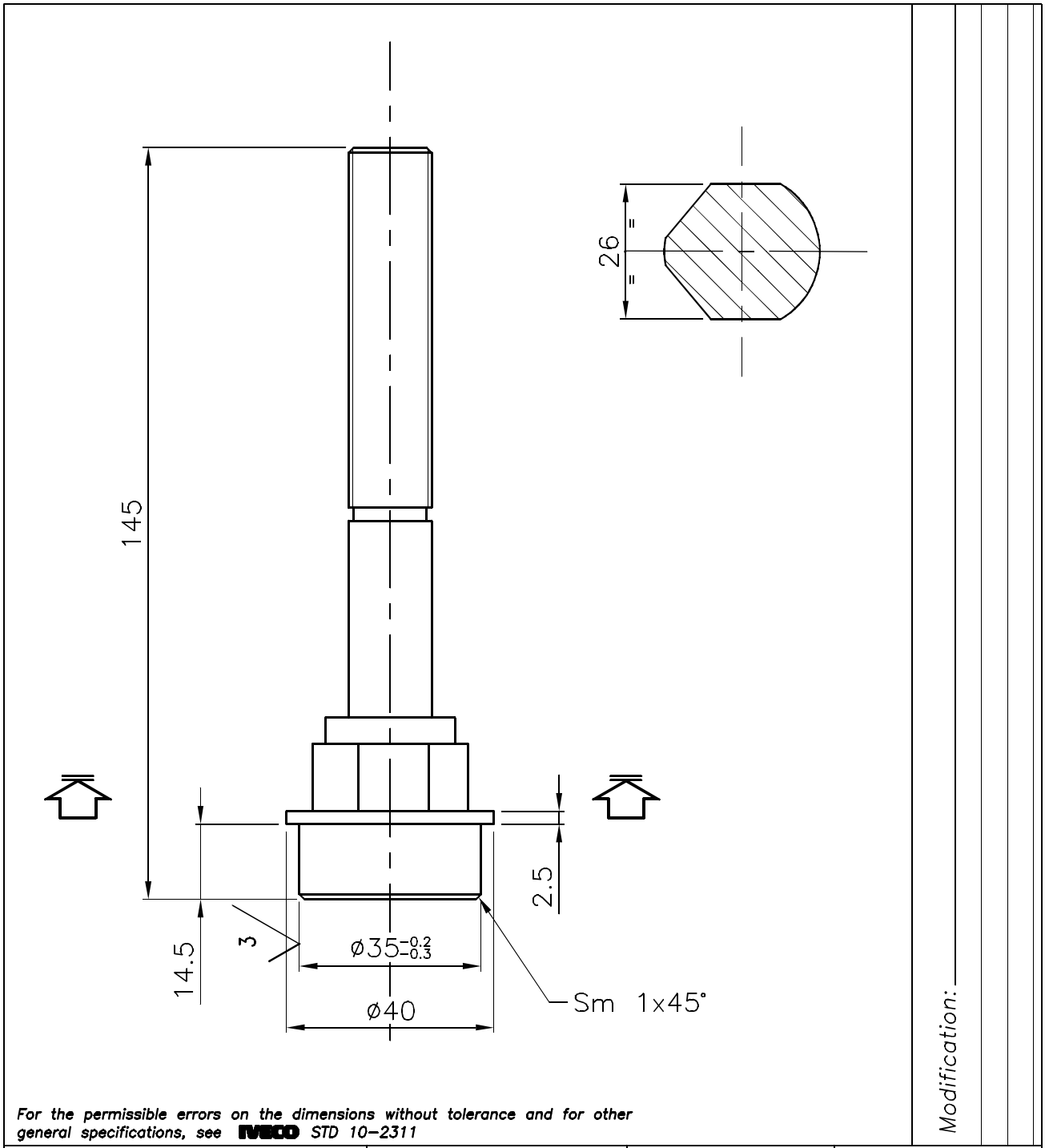
TOOLS

TOOL NO.		DESCRIPTION
99390772		Tool for removing injector holding case deposits
99390804		Tool for threading injector holding cases to be extracted (to be used with 99390805)
99394043		Reamer to rectify injector holder lower side (to be used with 99394015)
99394044		Reamer to rectify injector holder lower side (to be used with 99394015)
99394045		Reamer to rectify injector holder lower side (to be used with 99394015)
99395216		Measuring pair for angular tightening with 1/2" and 3/4" square couplings

TOOLS

TOOL NO.		DESCRIPTION
99395221		Tool to take down-fit engine valves (to be used with special plates)
99395222		Plate for take down-fit engine valves (to be used with 99360261)
99395223		Tool to remove oil filter (engine)
99395603		Dial gauge (0 - 5 mm)

EQUIPMENT MODIFIED FOR ADAPTATION TO CURSOR 9 ENGINE

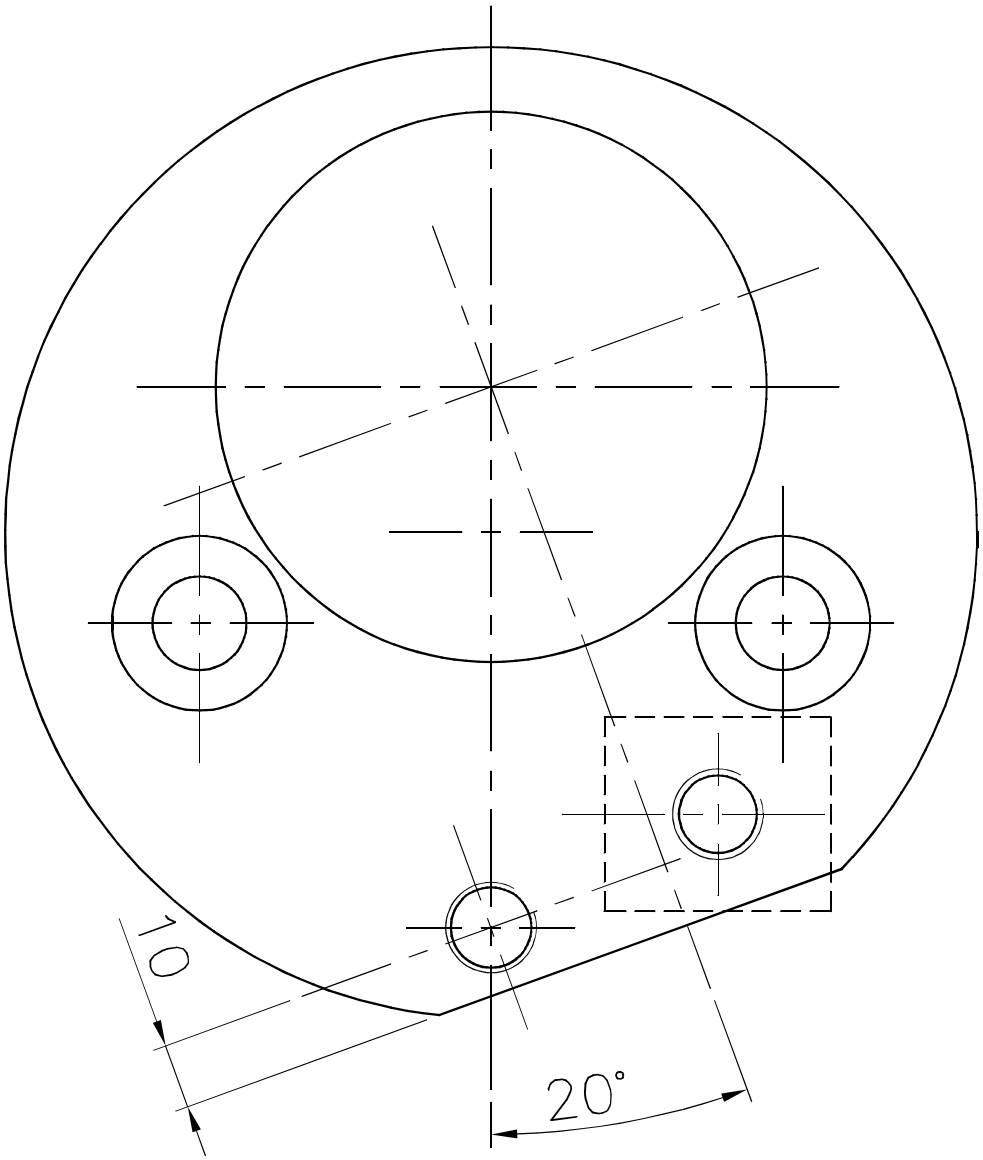


For the permissible errors on the dimensions without tolerance and for other general specifications, see IVECO *STD 10-2311*

Modification:

MAT.	COVER.	DRAWN	N°DRAWING
		UTS /	99360264

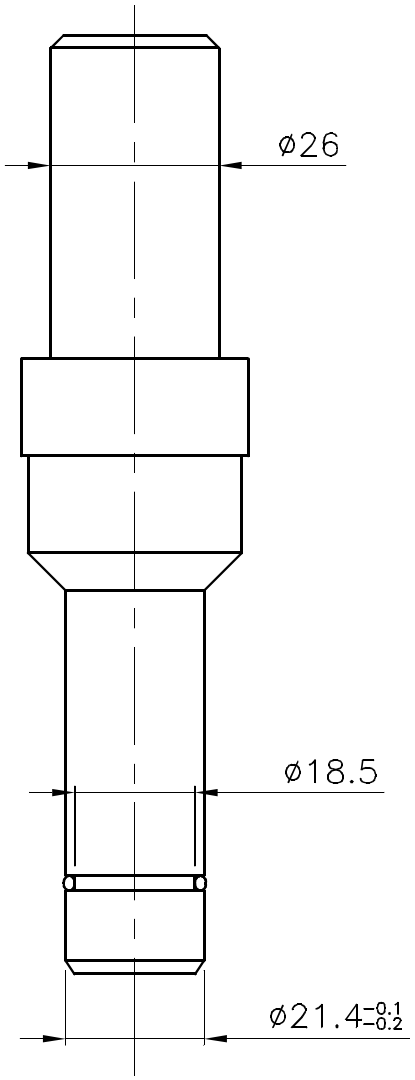
Modifica per adeguamento	APPROVED	EXPER.	SIZE A4
attrezzo a motore	DATE	SHEET	
CURSOR 9	SUPERSEDES		
	SCALE 1:1	IVECO	
C/=0 I.S. 18-0011	Q.TY 1		02



Modification:

For the permissible errors on the dimensions without tolerance and for other general specifications, see IVECO *STD 10-2311*

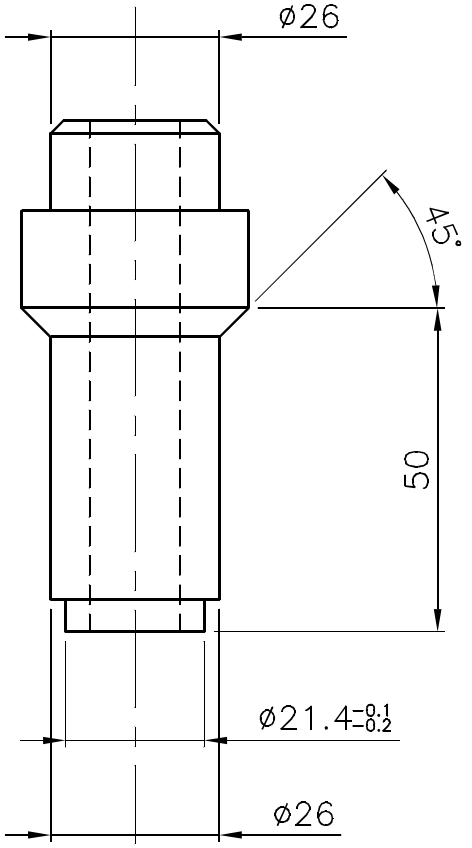
MAT.	COVER.	DRAWN UTS /	N°DRAWING 99360558	
	Modifica per adeguamento	APPROVED	EXPER.	SIZE A4
	attrezzo a motore	DATE	SHEET	
	CURSOR 9	SUPERSEDES		
C/=0 I.S. 18-0011		SCALE 1:1	IVECO	
		Q.TY 1		02



Modification:

For the permissible errors on the dimensions without tolerance and for other general specifications, see IVECO *STD 10-2311*

MAT.	COVER.	DRAWN UTS /	N°DRAWING 99365054
	Modifica per adeguamento	APPROVED	EXPER. / SIZE A4
	attrezzo a motore	DATE	SHEET
	CURSOR 9	SUPERSEDES	
C/=0 I.S. 18-0011		SCALE 1:1	IVECO
		Q.TY 1	02



Modification:

For the permissible errors on the dimensions without tolerance and for other general specifications, see IVECO *STD 10-2311*

MAT.	COVER.	DRAWN	N°DRAWING
		UTS /	99390804

Modifica per adeguamento	APPROVED	EXPER.	SIZE A4
attrezzo a motore	DATE	SHEET	
CURSOR 9	SUPERSEDES		
C/=0 I.S. 18-0011	SCALE 1:1	IVECO	
	Q.TY 1		02