

**DAILY**  
**TURBODAILY**  
**TURBODAILY 4X4**

CUSTOMER SERVICE



**IVECO**

---

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 allotted time will be guaranteed, and the operators will also be protected against possible accidents.

Before any repair is commenced, ensure that all normal safety precautions are observed.

All items specified by the safety regulations—goggles, helmet, gloves, boots—should be checked and worn.

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

The data contained in this publication was correct at the time of going to press but, owing to possible modifications made by the Manufacturer for reasons of a technical or commercial nature or for adaptation to the legal requirements of different countries, some changes may have occurred.

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Publication Edited by:  
IVECO S.p.A.  
C.O. - B.U. Customer Service  
Lungo Stura Lazio 49  
10156 Torino (Italy)

Print **603.42.951** - 2nd Ed. - 1997  
**603.42.951A** - 1st Revision **04.1998**

Publication Produced by:  
SATIZ S.p.A.  
EDITORIA TECNICA  
Pubblicazioni Tecniche  
c/o Iveco - Lungo Stura Lazio 49  
10156 Torino

**DAILY** 

**TURBODAILY** 

**TURBODAILY**  **4x4**

**Workshop  
Manual**

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## NOTE

This manual is divided into several sections.

Section numbers are listed on the index page to be found at the beginning of each repair manual.

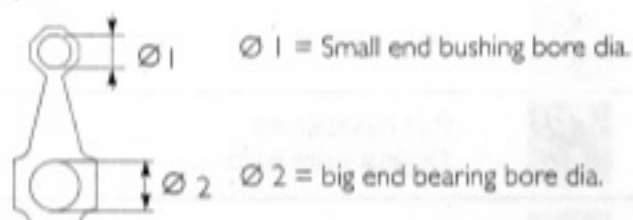
Each section deals generally with one of the main assemblies (engine, transmission etc.)

Each section deals with the following topics:

Specifications and data; Tightening torques; Special tools; Troubleshooting (fault diagnosis); Component removal/refitting; Repair operations.

This manual provides graphs and symbols instead of description of parts, operations or operating procedures (see next page).

## Example



Tighten to specified torque  
Tighten to specified torque +  
angular value

You will also notice that titles and subtitles of operations to be carried out are marked with a 6-figure number, the **Product Code** corresponding codes provided in the REPAIR BASE TIME SCHEDULES and in FAILURE CODES. Below you will find the explanation of each "NUMERICAL CODE" component.



Figures one and two identify the **PRODUCT** as part of the vehicle.

Example:

Product 50 = Chassis;

Product 52 = Axles;

Product 53 = Gearbox etc.



Figures three and four identify the **ASSEMBLY** within the **PRODUCT**

Example:

Product 50 = Chassis;

Assembly 01 = Chassis frame;

Assembly 02 = Antitelescoping bumper etc.



Figures five and six identify **THE SUBASSEMBLY** and a Component of an Assembly within a **PRODUCT**.

















Example:
















Product 50 = Chassis;

Assembly 01 = Chassis frame;

Subassembly 40 = Chassis cross members etc.

## Graphs and symbols

	Disconnection Disconnect
	Reconnection Reconnect
	Disassembly Dismantling
	Assembly
	Tightening torque
	Tightening torque Tightening torque + angular value
	Notching or caulking
	Adjustment Regulation
	Warning Note
	Visual check Fitting position check
	Measurement Dimension reading Check
	Tooling
	Machining surface Finished part
	Interference Force fitting
	Thickness Clearance, play, backlash
	Lubricate Moisten Grease
	Sealant Adhesive
	Air bleeding










	Suction, intake
	Exhaust discharge
	Operation
$\varnothing$	Compression ratio
	Tolerance Load unbalance
	Rolling torque
	Part replacement Original spare parts
	Rotation
	Angle Angle value
	Preloading
	Number of revolutions
	Temperature
	Pressure
$>$	Oversized Less than... Maximum, peak
$<$	Undersized Less than... Minimum
	Selection Class Oversizing
	Temperature below $< 0^{\circ}$ C Cold Winter
	Temperature over $0^{\circ}$ C Warm Summer

**SECTION I****General**

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COMPOSITION OF THE MODELS

UNITS		MODELS																								
		30.8	30.10	35.8	35.10	35.12	40.8	40.10	40.12	45.10	49.10	49.12	59.12	35.10W	40.10W	A40.10	A40.10P	A40.12	A40.12P	A45.10	A45.10P	A45.12	A45.12P	A49.10	A49.10P	
	8140.67F.37.. (PC/NA)	o	o				o																			
	8140.23.37.. (ID/TC)		o	o			o		o	o						o	o			o	o			o	o	
	8140.23.38.. (ID/TC)													o	o											
	8140.43.37.. (ID/TCA)					o		o			o	o						o	o			o	o			
	8140.47R.2790 (ID/TCA-EDC+ EGR + OXICAT)				o						o															
	Single disk 9" 1/4	o	o	o	o		o	o	o	o				o	o	o	o				o	o			o	o
	Single disk 10" 1/2				o	o						o	o					o	o			o	o			
	2826.5	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
	REDUCTION GEAR UNIT B.W. 1356													o	o											
FRONT AXLES																										
	5811	o	o																							
	5812			o	o	o	o	o	o	o	o	o				o	o	o	o	o	o	o	o	o	o	
	5811/2											o														
	5912												o	o												
	450211 (RO407)	o	o																							
	450211/1 (RO407)			o																						
	450211/2 (RO407)			o	o	o																				
	450311 (RO417)				o	o	o																			
	450311/1 (RO417)			o	o	o	o	o	o							o	o	o	o							
	450411/1 (RO427)								o	o	o										o	o	o	o	o	
	450212 (RO407)													o	o											
	450517 (RO537)												o													
	Mechanics	o	o	o																						
	Powered steering				o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
	FRONT MECHANICS: independent with torsion bars																									
	REAR MECHANICS: Parabolic			o	o	o			o	o	o	o				o					o				o	
	Semi-elliptical	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
	REAR TIRES				o	o			o	o	o	o				o	o			o	o		o	o		

- ID = Direct injection
- NA = Induction
- PC = Indirect injection (pre-chamber)
- TC = Supercharged
- TCA = Supercharged with intercooler
- EDC = Injection pump with electronic rpm control unit
- OXICAT = Catalytic exhaust
- o Swiss Market - Swedish M1
- o City version
- Option

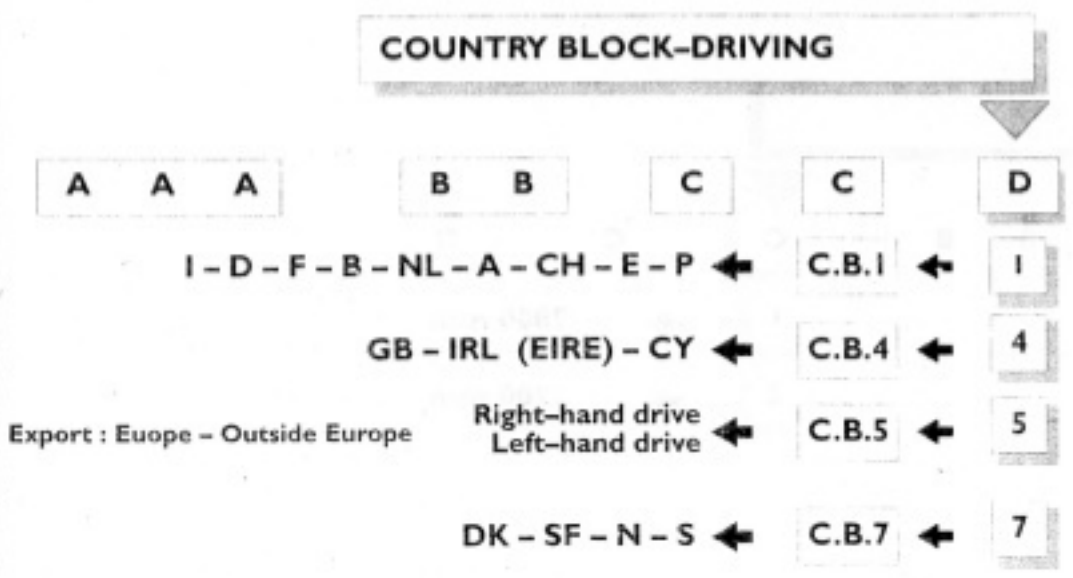
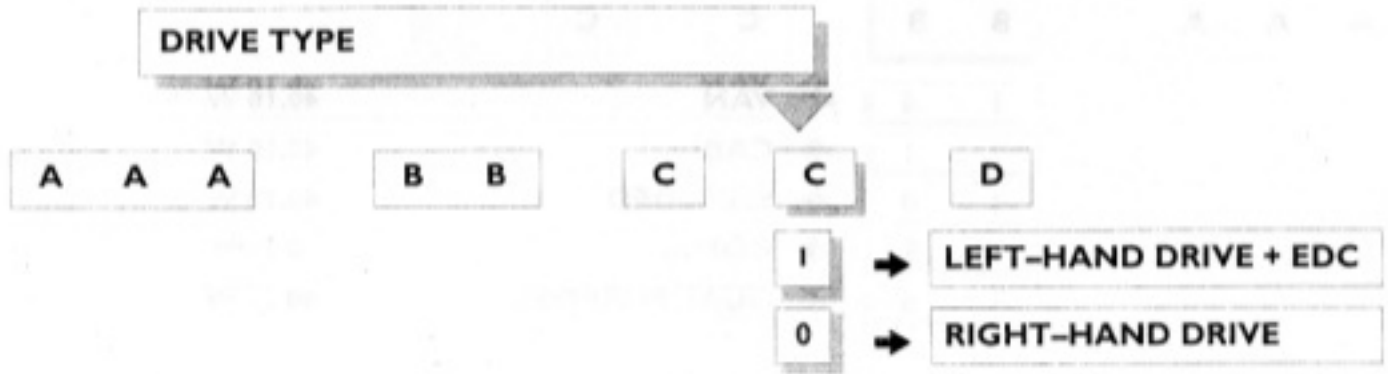
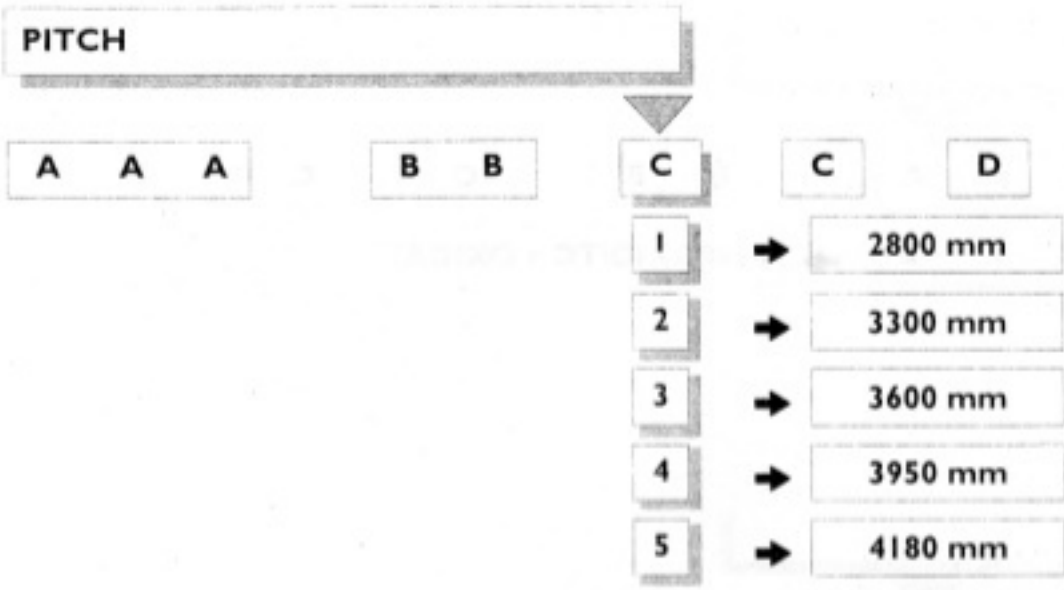
## P.I.C. CODE NUMBERS FOR 4 X 2 VEHICLES

## ENGINE POWER

A	A	A	B	B	C	C	D
1	4	9	→ 8140.67 PC/NA - 82 HP				
1	5	0	→ 8140.23 ID/TC + OXICAT - 103 HP				
1	5	1	→ 8140.43 ID/TCA + OXICAT - 122 HP				
1	5	3	→ ELETRIC				
1	5	4	→ 8140.43 ID/TCA + EGR + OXICAT - 122 HP				
1	5	5	→ 8140.47 ID/TCA+EDC+OXICAT - 109 HP				
1	5	6	→ 8140.23 ID/TC + OXICAT - 103 HP (BOFROST)				

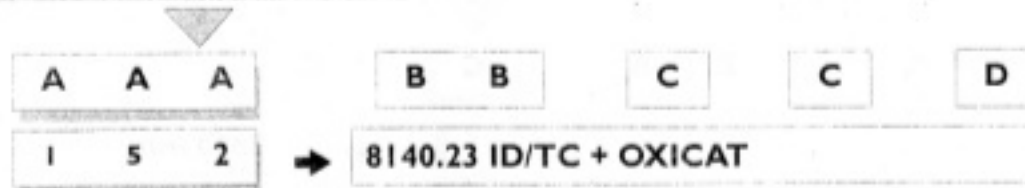
## VERSION

A	A	A	B	B	C	C	D	
1	5	→ COMBI					30.8 - 30.10 - 35.10	EDC
3	5	→ COMBI					35.8 - 35.10 - 35.12	+ EDC (CH)
1	6	→ DUAL PURPOSE					30.8 - 35.10	EDC
3	6	→ DUAL PURPOSE					35.8 - 35.10 - 35.12	+ EDC (CH)
5	6	→ DUAL PURPOSE					49.10 - 49.12	
7	6	→ DUAL PURPOSE					59.12	
1	4	→ VAN					30.8 - 30.10	
3	4	→ VAN					35.8 - 35.10 - 35.12	+ EDC (CH)
5	4	→ VAN					49.10 - 49.12	
1	1	→ CAB					30.8	
3	1	→ CAB					35.8 - 35.10 - 35.12	+ EDC (CH) BOFROST 35.10
5	1	→ CAB					49.10 - 49.12	
7	1	→ CAB					59.12	
1	0	→ SHIELDED					30.8	
3	0	→ SHIELDED					35.8 - 35.10 - 35.12	+ 35.10 EDC
5	0	→ SHIELDED					49.10 - 49.12	
7	0	→ SHIELDED					59.12	

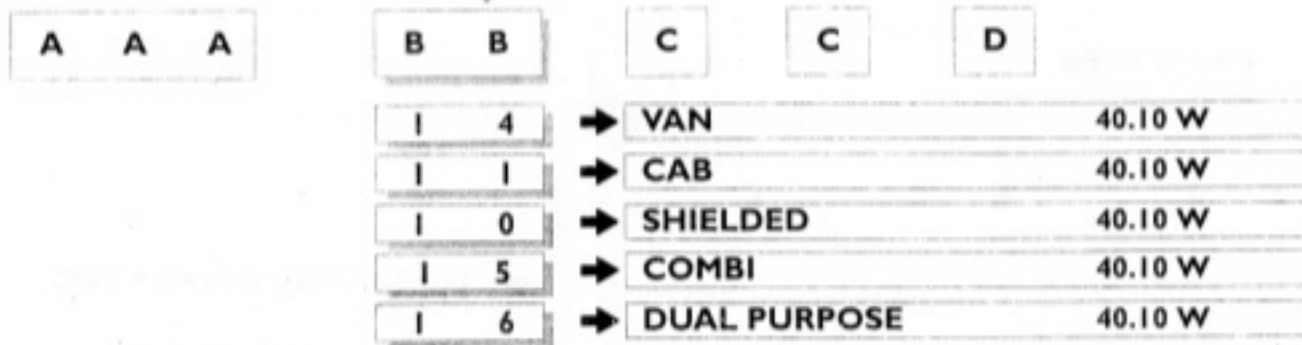


## P.I.C. CODE NUMBERS FOR 4 X 4 VEHICLES

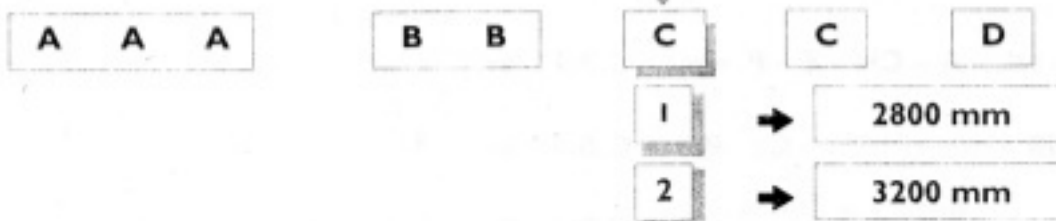
## MODELS



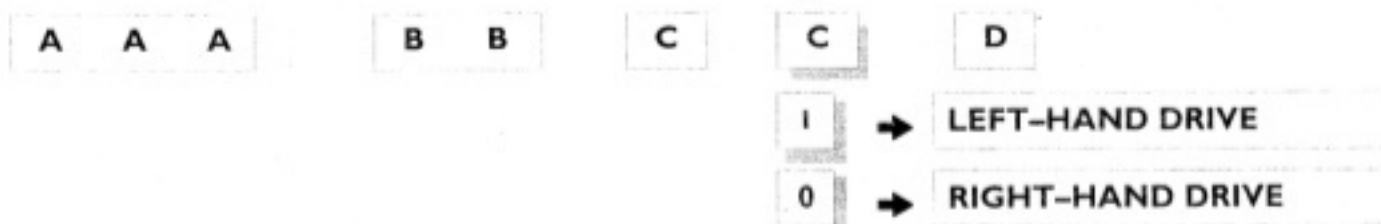
## VERSION



## PITCH



## DRIVE TYPE



### COUNTRY BLOCK-DRIVING



## P.I.C. CODE NUMBERS FOR MOTOR BUS

## MODELS

A	A	A	B	B	C	C	D
9	5	7	→		8140.23 ID/TC 103 HP + OXICAT	Rear mechanical suspension	
9	5	8	→		8140.43 ID/TCA 122 HP + OXICAT	Rear mechanical suspension	
9	5	9	→		8140.23 ID/TC 103 HP + OXICAT	Rear pneumatic suspension	
9	6	9	→		8140.43 ID/TCA 122 HP + OXICAT	Rear pneumatic suspension	

## MODEL

A	A	A	B	B	C	C	D
			1	9	→		A 40.10 - A 40.12
			3	9	→		A 45.10 - A 45.12
			5	9	→		A 49.10

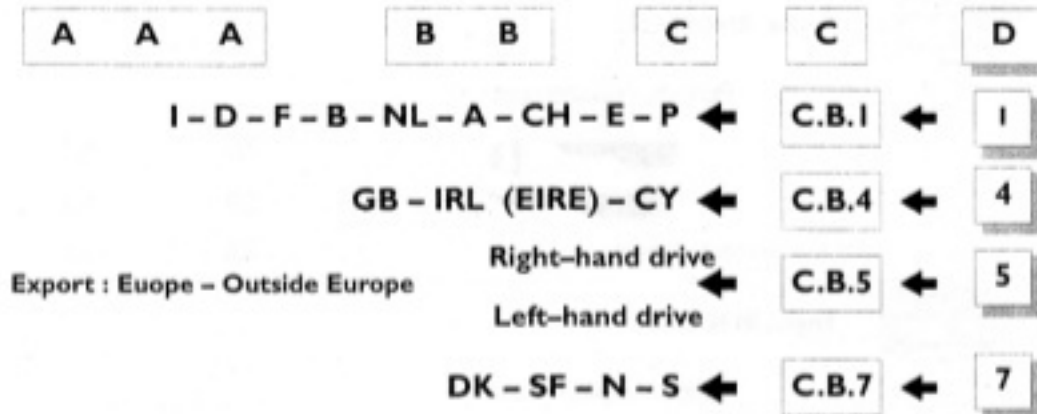
## VERSION

A	A	A	B	B	C	C	D
					1	→ School bus	
					2	→ Public transport bus	
					3	→ Hire bus	

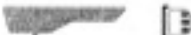


## DRIVE TYPE

A	A	A	B	B	C	C	D
					1	→ LEFT-HAND DRIVE	
					0	→ RIGHT-HAND DRIVE	







## COUNTRY BLOCK-DRIVING



## FILLING UP

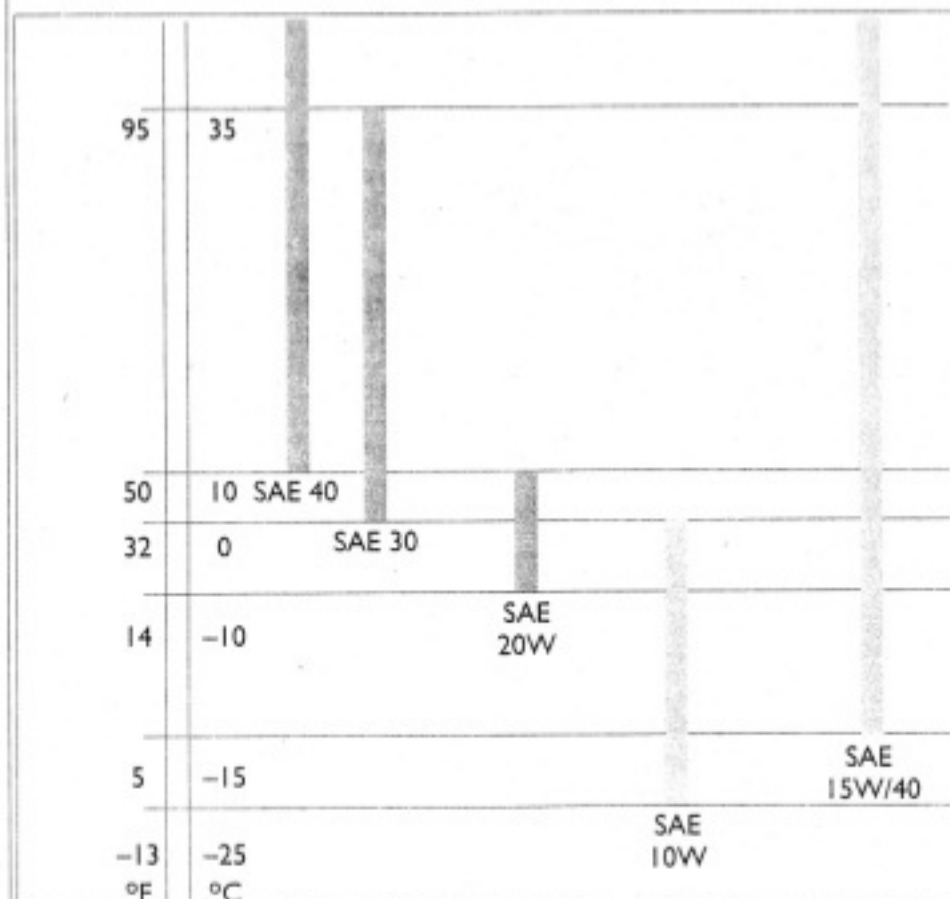
LUBRICANTS RECOMMENDED BY IVECO		PARTS TO BE FILLED UP		Quantity	
				Litres	Kg
	VS MAX Diesel (SAE 15W40)		Engine 8140.67F37..		
Periodic replacement					
				7,0	6,3
				5,9	5,3
Total engine empty capacity				7,6	6,8
	VS MAX Diesel (SAE 15W40)		Engine 8140.23.37..		
Periodic replacement					
				7,0	6,3
				5,9	5,3
Total engine empty capacity				7,6	6,8
	VS MAX Diesel (SAE 15W40)		Engine 8140.23.38..		
Periodic replacement					
				7,2	6,5
				6,1	5,5
Total engine empty capacity				7,8	7
	VS MAX Diesel (SAE 15W40)		Engine 8140.43.37..		
Periodic replacement					
				7,0	6,3
				5,9	5,3
Total engine empty capacity				7,6	6,8
	VS MAX Diesel (SAE 15W40)		Engine 8140.47R.2790		
Periodic replacement					
				7,0	6,3
				5,9	5,3
Total engine empty capacity				7,6	6,8
	Tutela ZC 90		Gear	1,5	1,35
	Tutela G/A		Reduction gear unit	1,4	1,3



LUBRICANTS RECOMMENDED BY IVECO	PARTS TO BE FILLED UP	Quantity	
		Litres	Kg
 Tutela W90/M-DA	Axles: Front		
	5912	3,3	3
	Axles: Rear		
	450211 (RO407)	1,9	1,7
	450211/1 (RO407)	1,9	1,7
	450211/2 (RO407)	1,9	1,7
	450311 (RO417)	1,9	1,7
	450311/1 (RO417)	1,9	1,7
450411/1 (RO427)	1,9	1,7	
450212 (RO407)	2	1,8	
450517 (RO537)	3	2,7	
 Tutela GI/A	 Powered steering	1,4	1,3
 Tutela DOT SPECIAL Tutela DOT4 (S.e.b.)	 Brake circuit	1,1	1
Arexons DPI	Windscreen wipers	2,6	-
 Parafu <sup>11</sup> *	Cooling system	13	

\* = Protective radiator liquid (50% concentration - freezing point -35°C).

International designation of lubricants	Fiat lubricants
<b>Engine oil</b> API CD-CCMC PD2 Service Complies to MIL-L-2104 D specifications	VS MAX Diesel (SAE 15W40)
<b>Oil for differentials and wheel hubs</b> Complies to MIL-L-2105 D-API GL 5 specifications	Tutela W 90/M -DA (Cold climates) Tutela W 140/M -DA (hot and temperate climates)
<b>Oil for mechanical gearbox SAE 80W/90</b> Contains non EP wear resistant additives Complies to MIL-L2105 or API GL 3 specifications	Tutela ZC 90
<b>Oil for reduction gear unit and power steering</b> A.T.F. DEXRON II D	Tutela GI/A
<b>Grease for general use</b> with base of lithium soap consistency N.L.G.I. n.2	Tutela MR 2
<b>Specific grease for bearings and wheel hubs</b> with base of lithium soap consistency N.L.G.I. n.3	Tutela MR 3
<b>Fluids for hydraulic brakes and clutch control</b> Conforming to N.H.T.S.A. Std. SAE J 1703 N. 116 ISO 4925 - CUNA NC 956-01 - Iveco Standard 18-1820	Tutela DOT SPECIAL
<b>Window cleaning liquid</b> mixture of alcohols, water and surface tensioners CUNA NC 956-II	Arexo DPI



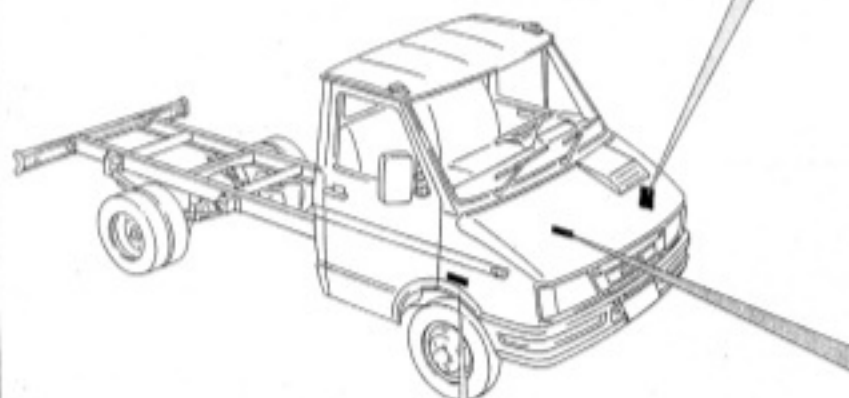
## VEHICLE IDENTIFICATION DATA

## Vehicle identification plate

For vehicle identification in conformity with E.E.C. Directives (inside the engine hood).

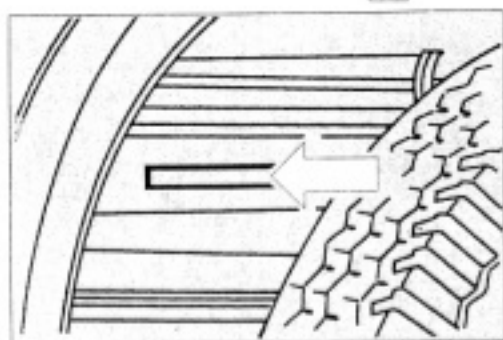
- a) Type approval number; manufacturer's vehicle specification code.
  - b) Total weight of tractor unit.
  - c) Total weight of tractor unit + trailer (where applicable).
  - d) Max. permitted load on front axle.
  - e) Max. permitted load on intermediate axle (where applicable).
  - f) Max. permitted load on rear axle.
  - g) Max permitted load on 4<sup>th</sup> axle. (where applicable)
  - h) Specific type identification.
  - i) Wheelbase (mm).
  - l) Engine type.
  - m) Engine power.
  - n) Number of axles.
  - o) Production plant.
- \* Permitted grade of smoke level

<b>IVECO SPA</b>									
a)	_____								
b)	_____ Kg								
c)	_____ Kg								
d)	1- _____ Kg								
e)	2- _____ Kg								
f)	3- _____ Kg								
g)	4- _____ Kg								
h)	<table border="1" style="width: 100%;"> <tr> <td>Type</td> <td>NP of axle <b>n)</b></td> </tr> <tr> <td>Wheelbase</td> <td> <table border="1" style="width: 100%;"> <tr> <td>Convent. designation</td> <td>*</td> </tr> </table> </td> </tr> <tr> <td>Engine type</td> <td>Engine power KW <b>m)</b></td> </tr> </table>	Type	NP of axle <b>n)</b>	Wheelbase	<table border="1" style="width: 100%;"> <tr> <td>Convent. designation</td> <td>*</td> </tr> </table>	Convent. designation	*	Engine type	Engine power KW <b>m)</b>
Type	NP of axle <b>n)</b>								
Wheelbase	<table border="1" style="width: 100%;"> <tr> <td>Convent. designation</td> <td>*</td> </tr> </table>	Convent. designation	*						
Convent. designation	*								
Engine type	Engine power KW <b>m)</b>								
i)									
l)									
Made in _____ <b>IVECO</b>									
o)									



Engine

Punch marked on engine block right hand side



Chassis

Punch marked at front end of frame right hand side member.

<b>Unit No</b>	_____
<b>Part No</b>	_____
<b>Serial No</b>	_____
<b>P.I.C. No</b>	_____
Made in Italy-Iveco SpA	
<b>IVECO</b>	
9843 8246	

**Product identification plate**  
(inside the engine hood)

This plate shows the P.I.C. (Product Identification Code). This information is necessary for consultation of the spare parts catalogue (electronic catalogue and/or micro-films). The P.I.C. is also shown on the vehicle's warranty certificate.



For consultation of the catalogue, only use the first 8 characters of the product identification code.

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## SECTION 2

## 5401 Engine

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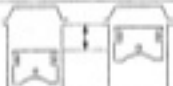






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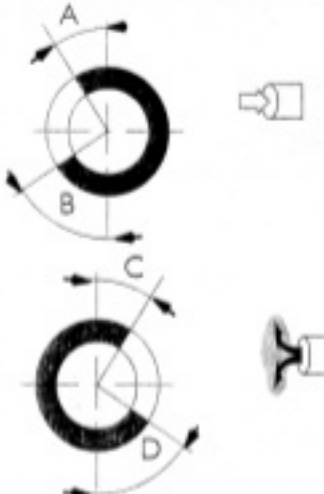
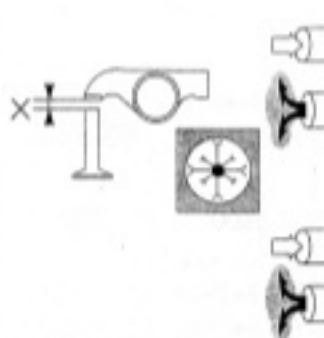
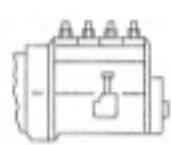


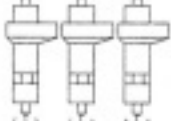

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## GENERAL CHARACTERISTICS

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	Cycle	Diesel 4 strokes					
	Feeding	Aspirated	Supercharged				
	Injection	Indirect	Direct				
	N. of cylinders	4 on-line					
	Diameter	mm	93	94,4		93	
	Stroke	mm	92	100		92	
	Total displacement	cm <sup>3</sup>	2499	2800		2499	
$\rho$	Compression ratio		22 ± 0,5	18,5			
	Max. power	KW (HP)	57+61 77,5+83	75,2+78,2 102,2+106,3	75,2+78,2 102,2+106,3	85,4+88,7 116,2+120,7	77,5 + 83 (105 + 112,8)
		rpm	4200	3600	3600	3600	3800
	Max. torque	Nm (Kgm)	147,2+155 (15+15,8)	232,5+249,2 (23,7+25,4)	232,5+249,2 (23,7+25,4)	270,8+290,4 (27,6+29,6)	229,7 + 250 (23,4+25,5)
		rpm	2400	1900	1900	1900	1700
	Engine idling speed, no load	rpm	775 ± 25	750 ± 25		775 ± 25	
	Maximum engine speed, no load	rpm	4750 ± 50	4200 ± 50		4380 ± 25	
	Pressure at T.D.C.	*bar	20 ± 26				
	Minimum permissible pressure at T.D.C.	*bar	16				








(\*) The pressure value is recorded by turning the engine over with the electric starter motor, with oil temperature at 40°- 50°C and the injection pump in the stop condition.

ID = Direct injection  
 NA = Aspirated  
 PC = Indirect injection (prechamber)  
 TC = Supercharged  
 TCA = Supercharging with intercooler



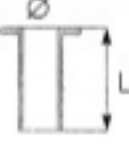



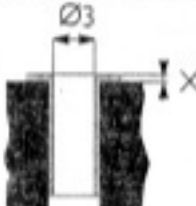
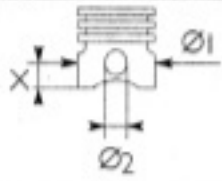

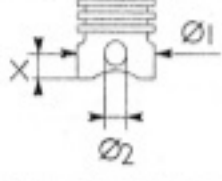


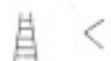
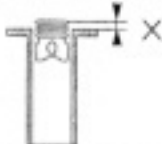


	Type	8140.67. 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA	
	<b>VALVE TIMING</b> opens before T.D.C. A closes after B.D.C. B opens before B.D.C. D closes after T.D.C. C	8° 48° 48° 8°			8° 37° 48° 8°		
	For timing check Running	X { mm mm		0,5 ± 0,05 0,5 ± 0,05			
	<b>FEED</b> Bosch type injection pump Speed governor Cold start	R 675	R 657	R 660	EDC VP37 MSA II	By means of feed pump - rotating injection pump - filters - injectors - thermal starter Mechanical at all speeds K.S.B. electrical, mechanical Electronic -	
	Pump arrangement With piston n. 1 at T.D.C. Start of delivery mm	1 ± 0,04	0,78 ± 0,04	1,15 ± 0,04	0,53 ± 0,04		
	BOSCH injector nozzle type	DNO SD 301	SACLESS DSL A 134 P 604		DSL A 145 P 330		
	Injection order - injection pump - engine	A - B - C - D 1 - 3 - 4 - 2					
	Release pressure bar	120 + 8	240 + 12 *		240 + 8 *		


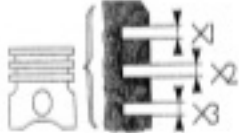
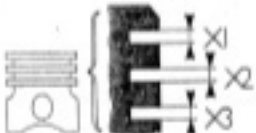





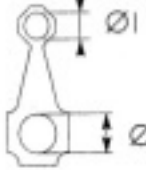
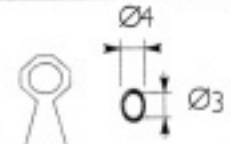



\* When checking, for any values of less than 200 bars, calibrate the injectors at 230 bars.






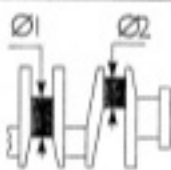




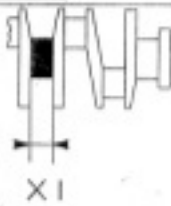
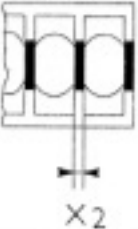
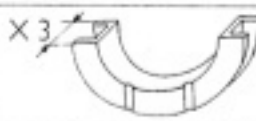



		8140.67.F 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA
	Type					
<b>SUPERCHARGING</b>						
	Turbocharger type	-	MITSUBISHI TFO 35 HM			KKK K414 207066 B/5.82
	Turbocharger shaft radial clearance	-	0,396 + 0,602			0,35
	Turbocharger shaft axial clearance	-	0,034 + 0,106			0,10
	Minimum opening stroke of pressure relief valve	mm	-	1	1	2,25 ± 0,5
	Maximum opening stroke of pressure relief valve	mm	-	5	5	
	Pressure corresponding to the minimum stroke	bar	-	0,84 ± 0,015	0,9 ± 0,015	1,15 ± 0,02
	Pressure corresponding to the maximum stroke	bar	-	0,92 ± 0,030	0,98 ± 0,035	
	Turbocharger type	-	GARRETT GT 1752H			-
	Turbocharger shaft radial clearance	-	0,086 + 0,122			-
	Turbocharger shaft axial clearance	-	0,043 + 0,084			-
	Minimum opening stroke of pressure relief valve	mm	-	1	-	-
	Maximum opening stroke of pressure relief valve	mm	-	4	-	-
	Pressure corresponding to the minimum stroke	bar	-	0,970 ± 0,033	1,1 ± 0,033	-
	Pressure corresponding to the maximum stroke	bar	-	1,070 ± 0,066	1,22 ± 0,066	-
<b>LUBRICATION</b>		Forced feed by gear pump, relief valve, dual action oil filter				
	Oil pressure, engine hot at idling speed	bar	0,8	0,3	0,8	0,8
	at maximum speed	bar	>3,5	3,5	3,5	3,5
<b>COOLING</b>		Via centrifugal pump, thermostat, fan, radiator; heat exchanger, "intercooler" (for engines 8140.43/47R only).				
Water pump control		Using trapezoidal belt				
Thermostat:		79 °C ± 2 °C				
starts to open:		110 °C				
fully open:						
<b>OIL REPLENISHMENT</b>						
Total capacity at 1st filling		liters	7,6	7,6	7,8	7,6
		kg	6,8	6,8	7,0	6,8
	Urania <sup>c</sup>	liters	5,9	5,9	6,1	5,9
	Urania Turbo					
	Urania Turbo LD	kg	5,3	5,3	5,5	5,3
- engine sump						
	Urania <sup>c</sup>	liters	7	7	7,2	7
	Urania Turbo					
	Urania Turbo LD	kg	6,3	6,3	6,5	6,3
- engine sump + filter						

## DATA ON ASSEMBLY CLEARANCES








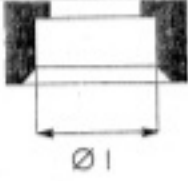
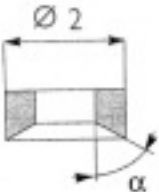
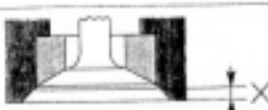
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<b>CYLINDER BLOCK AND CRANK MECHANISM COMPONENTS</b>						
	Bores for cylinder liners $\varnothing 1$	95,90 + 95,94		97,39 + 97,45		95,90 + 95,94
	Cylinder liners: outside diameter $\varnothing$ length L	95,97 + 96,00		97,47 + 97,50 167,00 167,30		95,97 + 96,00
	Cylinder liners - crankcase bores (negative allowance)	0,03 + 0,10		0,02 + 0,11		0,03 + 0,10
 	Outside diameter $\varnothing 2$			0,2		
	Cylinder sleeve inside diameter $\varnothing 3$	93,002 + 93,012		94,402 + 94,432		93,002 + 93,012
	Pistons: supplied as spare parts type: measuring dimension X outside diameter $\varnothing 1$ pin bore $\varnothing 2$	AE GOETZE 13 92,906 + 92,920 32,000 + 32,005		KS 17 94,306 + 94,320 32,003 + 32,009		17 92,914 + 92,930 32,007 + 32,012
	Piston - cylinder sleeve	0,088 + 0,106		0,078 + 0,122		0,072 + 0,098
	Pistons: supplied as spare parts type: measuring dimension X outside diameter $\varnothing 1$ pin bore $\varnothing 2$	13 92,906 + 92,920 32,000 + 32,005		MONDIAL PISTON 17 94,320 + 94,330 32,003 + 32,009		17 92,906 + 92,920 32,007 + 32,012
	Piston - cylinder sleeve	0,088 + 0,106		0,072 + 0,092		0,088 + 0,106
 	Piston diameter $\varnothing 1$			0,4		
	Pistons protrusion X	0,75 + 1,05		0,40 + 0,80		
	Gudgeon pin $\varnothing 3$			31,990 + 31,996		
	Gudgeon pin - pin housing	0,004 + 0,015		0,007 + 0,019		0,011 + 0,022






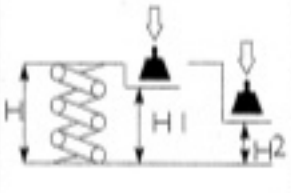
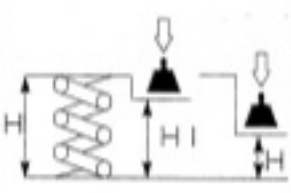
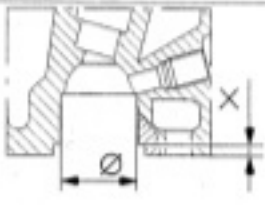
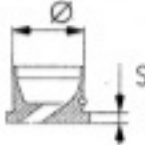

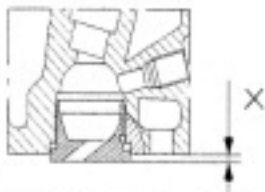

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	Piston type Piston ring grooves X 1* X 2 X 3 * measured on ø of 90 mm	AE GOETZE 3,025 + 3,045	KS 2,685 + 2,715 2,050 + 2,070 3,040 + 3,060			
	Piston type Piston ring grooves X 1* X 2 X 3 * measured on ø of mm	2,685 + 2,715 2,050 + 2,070 3,025 + 3,045 90	MONDIAL PISTON 2,685 + 2,715 2,050 + 2,070 3,040 + 3,060 91,4 90			
	Piston rings S 1* S 2 S 3 * measured on ø of mm	2,568 + 2,597 1,978 + 1,990 2,975 + 2,990 90	2,568 + 2,597 1,970 + 1,995 2,970 + 2,995 91,4 2,568 + 2,597 1,978 + 1,990 2,975 + 2,990 90			
	Piston type Piston rings - grooves 1 2 3	AE GOETZE 0,088 + 0,147 0,060 + 0,092 0,035 + 0,070	KS 0,088 + 0,147 0,060 + 0,092 0,050 + 0,085			
	Piston type Piston rings - grooves 1 2 3	0,088 + 0,147 0,060 + 0,092 0,035 + 0,070	MONDIAL PISTON 0,088 + 0,147 0,055 + 0,100 0,043 + 0,090 0,088 + 0,147 0,060 + 0,092 0,050 + 0,085			
	Piston rings	0,4				
	Piston ring end gap in cylinder liners X1 X2 X3	0,20 + 0,40 0,30 + 0,55 0,30 + 0,60	0,20 + 0,35 0,30 + 0,55 0,30 + 0,55 0,20 + 0,40 0,60 + 0,85 0,30 + 0,60			
	Small end bush housing ø 1 Big end bearing housing ø 2	34,860 + 34,890 60,333 + 60,348				
	Small end bush diameter outside ø 4 inside ø 3	34,970 + 35,010 32,010 + 32,020				
	Big end bearing shell supplied as spare parts S	1,875 + 1,884				
	Small end bush - housing	0,08 + 0,155				
	Piston pin - bush	0,014 + 0,03				


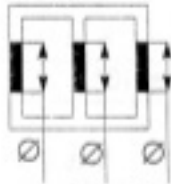
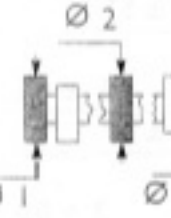








	Type	8140.67.F 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA
 	Big end bearing shells	0,254 + 0,508				
	Measuring dimension X	125				
	Max. connecting rod axis misalignment tolerance	0,07				
	Main journals $\varnothing 1$	80,182 + 80,208 *				
	Crankpins $\varnothing 2$	86,182 + 86,208 **				
	Main bearing shells S1*	56,515 + 56,538				
	Big end bearing shells S2*	2,165 + 2,174				
	* supplied as spare parts	1,875 + 1,884				
	Main bearing housings $\varnothing 3$	84,588 + 84,614 *				
		90,588 + 90,614 **				
	Bearing shells - main journals	0,032 + 0,102				
	Bearing shells - big ends	0,027 + 0,083				
 	Main bearing shells	0,254 + 0,508				
	Big end bearing shells	0,254 + 0,508				
	Main journal, thrust bearing X 1	31,000 + 31,100				
	Main bearing housing, thrust bearing X 2	26,500 + 26,550				
	Thrust washer halves X 3	30,900 + 30,950				
	Crankshaft end float	0,060 + 0,310				

\* Main journals No. 1-2-3-4

\*\* Main journal No. 5

	Type	8140.67.F 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA
<b>CYLINDER HEADS - VALVE GEAR</b>						
	Valve guide housings in the cylinder heads $\varnothing 1$				12,950 + 12,985	
	Valve guide $\varnothing 2$ $\varnothing 3$				8,023 + 8,038 13,012 + 13,025	
	Valve guides and housings in the cylinder heads				0,027 + 0,075	
	Valve guide				0,05 - 0,10 - 0,2	
	Valves:				7,985 + 8,000 60° 15' ± 7' 30" 7,985 + 8,000 45° 30' ± 7' 30"	
	Valve stem and its guide				0,023 + 0,053	
	Housing in head for valve seat				44,025 + 44,075   42,125 + 42,175 37,380 + 37,415	
	Outside diameter of valve seat; angle of valve seat in cylinder head:				44,145 + 44,160   42,245 + 42,260 60° ± 5' 37,495 + 37,510 45° ± 5'	
	Recessing of valve X				1,15 + 1,45   1,2 + 1,5 1,15 + 1,45   1 + 1,3	

	Type	8140.67.F 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA
	Between valve seat and head  	0,070 + 0,145	0,070 + 0,135			
		0,080 + 0,130				
	Valve seats					
	Valve outside spring height: free height H under a load of: kg 43,8 ± 2,5 H1 kg 77,4 ± 4 H2	52				
		38,5				
		28,5				
	Valve inside spring height: free height H under a load of: kg 16,4 ± 1 H1 kg 30 ± 1,5 H2	45,5				
		33,5				
		23,5				
	Precombustion chamber plug seat	∅	30,320 + 30,370			
	Height of precombustion chamber plug base seat X	A	4,480 + 4,505			
		B	4,505 + 4,530			
		C	4,530 + 4,555			
	Precombustion chamber plug seat	∅	30,32 + 30,37			
	Precombustion chamber plug S	A	30,38 + 30,40			
		B	4,50 + 4,52			
		C	4,52 + 4,54			
			4,54 + 4,56			
	Precombustion chamber plug - Cylinder heads		0,010 + 0,080			
	Precombustion chamber position from cylinders heads level surface X		-0,005 + +0,04			
	Injector protrusion X	-	2,230 + 2,690			4,10 + 4,50

		8140.67.F 37.. PC/NA	8140.23. 37.. ID/TC	8140.23. 38.. ID/TC	8140.43. 37.. ID/TCA	8140.47R. 2790 ID/TCA
	Type					
	Camshaft bearing housing normal	∅		33,985 + 34,015		
	oversized	∅		34,185 + 34,215		
	Camshaft bearing journals					
	normal	∅		33,934 + 33,950		
	oversized	∅		34,134 + 34,150		
	Between seats and supporting pins			0,035 + 0,081		
	Tappets housing on cylinder heads	∅ normal		44,000 + 44,025		
	Tappet	∅ normal		43,950 + 43,970		
	Between tappets and seats			0,030 + 0,075		
	Cap			3,25 to 4,45 mm with a progression of 0,05		
	Cam lift:					
	H		10,5		9,5	
	H		10,5		10,5	

## TIGHTENING TORQUE

PART	TORQUE	
	Nm	Kgm
Flanged screw, cylinder head		
Phase 1: pretightening	60 ± 5	6 ± 0,5
Phase 2: pretightening	60 ± 5	6 ± 0,5
Phase 3: angle	180° ± 10°	
Flanged screw, lower to upper cylinder block		
Preliminary torque	50 ± 5	5 ± 0,5
Angle	90° ± 5°	
Connecting rod caps fastening screw		
Preliminary torque	50 ± 5	5 ± 0,5
Angle	63° ± 2°	
Flywheel attachment bolts		
Preliminary torque	30 + 3	3 + 0,3
Angle	90° ± 2°	
Self-locking nut for fastening the electromagnetic joint to the water pump		
Preliminary torque	40	4
Angle	110° ± 10°	
Blanking plug, engine oil main pipe (M18)	40	4
Oil pan/engine block fastening screw **	18	1,8
Accessory equipments support oil duct sealing plug	25	2,5
Flanged screw, auxiliary units mounting (M12)	60	6
M8 Accessory equipments support fastening screw	25	2,5
Accessory equipments support front cover fastening screw	23	2,3
Accessory equipments support rear cover fastening screw	18	1,8
Hexagon socket-head screw, crankshaft oil seal rear cover (Rotostat)	25	2,5
Hexagon socket-head screw, crankshaft oil seal front cover (Rotostat)	7,5	0,75
Camshaft front cover fastening nut	7,5	0,75
Water pump pipe/inlet manifold fastening nut	25	2,5
Cylinder heads rear cover fastening screws and nut	25	2,5
Nut, engine lifting brackets	18	1,8
Inlet and outlet manifold fastening nut	25	2,5
Inlet manifold/crank fastening screw	18	1,8
Fastening, L.D.A. connection to intake manifold and injection pump	10	1
Crankshaft driving pulley fastening screw	200	20
Camshaft caps fastening nut	18	1,8
Camshaft driving gear fastening screw	25	2,5
Toothed bushing fastening nut	{ M12 M14	{ 5,5 8,3
Nut or screw, injection pump	25	2,5
Injection pump driving gear fastening screw	100	10
EGR valve/inlet and outlet manifolds fastening nut	18	1,8
Injector clamps fastening screw	40	4
Feed pump support fastening screw	18	1,8
Nut or screw, fuel feed pump	18**	1,8
Connection, heat exchanger and oil filter cartridge*	80*	8
Oil filter fixing	25	2,5
Oil suction strainer fastening screw	25	2,5

\* Coat thread with IVECO 1905683 sealing compound before assembly

\*\* Excluding engine 8140.23.38.. (chain-driven valve gear)



PART	TORQUE	
	Nm	Kgm
Plug, oil pressure valve spring	65	6,5
Pipe fitting, piston cooling nozzle	40	4
Flanged screw, water pump body to crankcase	50	5
Nut, magnet to water pump	7,5	0,75
Screw, cylinder head water thermostat pipe union	18	1,8
Screw, driven pulley to water pump hub	25	2,5
Screw, alternator mounting to crankcase	50	5
Screw, alternator to mounting	75	7,5
Nut, turbocharger to exhaust manifold	25	2,5
Screw, thermostat water outlet pipe	18	1,8
Nut, power steering pump	35	3,5
M6 screw, vacuum pump	12	1,2
M8 flanged screw, vacuum pump	18	1,8
Plug, auxiliary units front cover	35	3,5
Self-locking nut, alternator belt tightener mounting bracket (engines fitted with air-conditioner compressor excluded)	45	4,5
Nuts, alternator belt tightener mounting bracket to water pump (engines fitted with air-conditioner compressor excluded)	40	4
Screw, belt tightener mounting to cylinder head	25	2,5
Screw, belt tightener mounting to crankcase	25	2,5
Self-locking nut, tappets cover	10	1
Nut, belt tightener bearing **	40	4
Union, turbocharger oil outlet pipe	80	8
Union, turbocharger oil delivery pipe	25	2,5
Flanged screw, oil drain mounting to lower crankcase	40	4
Oil pipe fitting, to crankcase main duct	45	4,5
Fastening, oil pressure sender and switch to pipe fitting	40	4
Flanged screw, gas exhaust pipe to turbocharger	25	2,5
Fastening, fuel inlet/outlet union to injection pump	25	2,5
Flanged screw, accelerator lever and belt cover **	7,5	0,75
Nut, thermostarter plug	35	3,5
Fastening, thermostarter connection to plug	22	2,2
Fastening, solenoid valve union	18	1,8
Screws, heat exchanger pipes to upper crankcase	40	4
Incandescent plugs fastening	25	2,5
Fastening, fuel pipe unions to injection pump and injectors *	33	3,3
Fastening, "OUT" connection to injection pump	25	2,5
Fastening, water temperature taper sender to thermostat unit	30*	3
Fastening, injector fuel return tubes	7	0,7
Fan wire fastening	18	1,8
Crankcase water drain pipe union	35	3,5
Nut, water inlet line to pump	25	2,5
Screw, cover to thermostat box	18	1,8
Nut, alternator mounting to auxiliary units group (engines fitted with air-conditioner compressor only)	25	2,5
Screw, alternator mounting retaining bracket to auxiliary units group (engines fitted with air-conditioner compressor only)	30	3

\* Coat thread with IVECO 1905683 sealing compound before assembly

\*\* Engine 8140.23.38.. excluded (chain timing gear)

PART	TORQUE	
	Nm	Kgm
<b>Only engine 8140.23.38.. (chain-driven valve gear)</b>		
Screw, tightener to timing gear case	7,5	0,75
M8 nut, timing gear case to crankcase	18	1,8
M10 nut, timing gear case to crankcase	30	3
M12 nut, timing gear case to crankcase	35	3,5
M6 nut, timing gear case to crankcase	10	1
M10 nut, timing gear case to crankcase	40	4
Slide pad anchoring pin	18	1,8
Nut, oil seal bush	7,5	0,75
Nut, upper/lower pads	7,5*	0,75
Screw, oil suction rose	25	2,5
M8 screws, engine oil sump	10	1
Nuts and screws, timing gear case top/bottom covers	7,5	0,75
<b>Engine auxiliary units</b>		
Screw, fan distance piece to electromagnetic pulley	13 ± 1	1,3 ± 0,1
Screw, fan to distance piece	6 ± 0,6	0,6
Screw, starter motor	41 ± 4	4,1 ± 0,4

\* Coat thread with IVECO 1905683 sealing compound before assembly

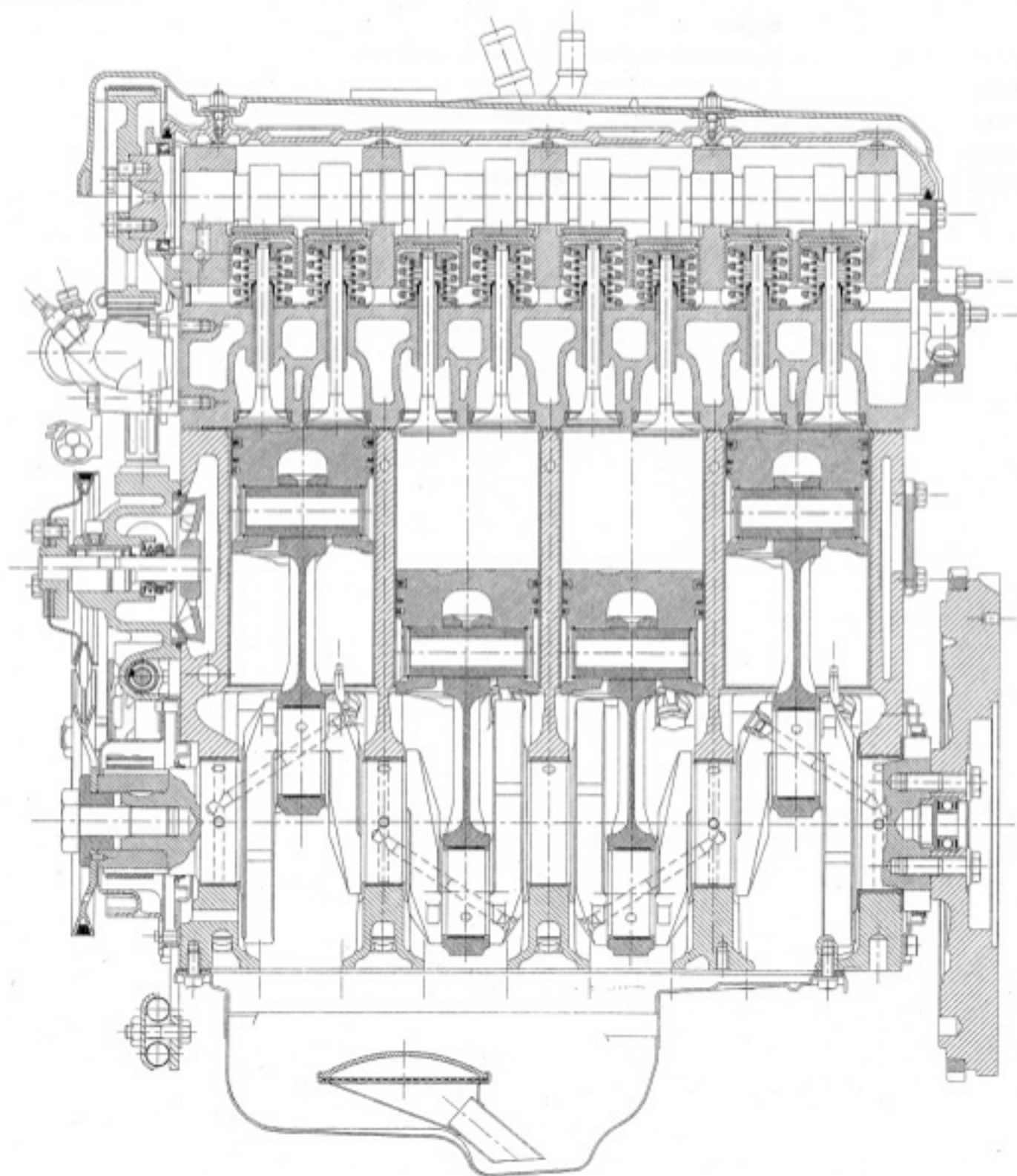
PART	TORQUE	
	Nm	Kgm
<b>Power block suspension</b>		
<b>4x2 Vehicles</b>		
Nut, front cross member to silentblocks fastening screw	29 ± 3	2,9 ± 0,3
Screw, front cross member to crankcase	74,5 ± 3,5	7,4 ± 0,3
Screw, front silentblocks to chassis fastening nut	18 ± 2	1,8 ± 0,2
Nut, rear silentblock to transmission fastening screw	18 ± 2	1,8 ± 0,2
Nut, rear cross member to silentblock fastening screw	18 ± 2	1,8 ± 0,2
Nut, rear cross member to side bracket fastening screw (49.12 vehicles, 3950 mm wheelbase, van and cut-away versions only)	41 ± 4	4,1 ± 0,4
Nut, rear cross member to side silentblocks (49.12 vehicles, 3950 mm wheelbase, van and cut-away versions only)	41 ± 4	4,1 ± 0,4
Nut, rear cross member silentblocks to side brackets (49.12 vehicles, 3950 mm wheelbase, van and cut-away versions only)	41 ± 4	4,1 ± 0,4
Nut, rear cross member side brackets to chassis fastening screw	32,5 ± 3,5	3,2 ± 0,3
<b>4x4 Vehicles</b>		
Nut, engine and cross member to side silentblocks	44,5 ± 4,5	4,4 ± 0,4
Screw, mounting to crankcase	80 ± 8	8 ± 0,8
Nut, engine mounting cross member to chassis fastening screw	44,5 ± 4,5	4,4 ± 0,4
Nut, auxiliary silentblocks fastening screw	6,4 ± 0,6	0,6
Nut, silentblock to transmission	20 ± 2	2 ± 0,2
Nut, transmission mounting cross member to silentblock fastening screw	20 ± 2	2 ± 0,2
Nut, transmission mounting cross member to chassis fastening screw	44,5 ± 4,5	4,4 ± 0,4
Screw, bracket to transfer case	40 ± 4	4 ± 0,4
Nut, transfer case mounting to side members fastening screw	20 ± 2	2 ± 0,2
Nut, transfer case mounting to lower side member wing fastening screw	44,5 ± 4,5	4,4 ± 0,4
Nut, silentblock to chassis and transfer case	44,5 ± 0,5	4,4 ± 0,4

## TOOLS

TOOL No.	DESCRIPTION
	<b>Engine</b>
99305019	Valve seats refacing kit
99305049	Spring load checking tool
99322230	Swivelling telescopic stand
99340205	Percussion extractor
99348004	Universal extractor for internal diameters from 5 to 70 mm
99350114	Wrench for turning camshaft when adjusting valve clearance (bench operation)
99352114	13 mm key for nut screwing/unscrewing, injection pump fastening base side
99360091	Cartridge filters removing tool
99360183	Pliers for installing rings on engine pistons
99360268	Tool for installing and removing engine valves
99360288	Valve guide removing tool
99360291	Valve guide refitting tool (use with 99360288)
99360292	Installing tool for fitting seals on valve guide
99360306	Flywheel retaining tool
99360309	Tappet retaining tool for replacing the cap during valve clearance adjustment
99360333	Hydraulic chain tightener fitting tool (8140.23.38.. engines only)
99360363	Support for injection pump control group and accessory groups fastening during bench overhauling
99360486	Fittings for cylinder compression check (use with 99395682)
99360508	Cylinder block lifting rings
99360549	Engine dismantling and refitting arm
99360605	Ring clamp for inserting standard and oversize pistons into the cylinder
99360607	Parts for checking oil pump shaft driving
99360608	Timing gears positioner
99361004	Supporting tool for cylinder heads during tappets adjustment
99361029	Engine/rotating stand fastening clamps 99322205
99365051	Tool for fitting injector seats into cylinder heads (8140.67F engines only)
99370006	Handle for interchangeable drifts
99370415	Tool for measuring cylinder liner protrusion
99374199	99374199 Crankshaft rear gasket fitting tool (use with 99370006)
99374336	Tool for fitting gasket on camshaft front cover, on injection pump drive shaft and on crankshaft for 8140.23.38.. engines only (use with 99370006)
99387001	Valve clearance caps recovery pliers
99390310	Valve guide sleeker
99394038	Injector rest seat refacing miller (excluding 8140.67F engines)
99395214	Flywheel positioning gauge
99395216	Bolt tightening angle gauge with 1/2" and 3/4" square connections

TOOL No.	DESCRIPTION
	<b>Engine</b>
99395363	Square device for checking connecting rod distortion
99395604	Dial gauge (0 - 10 mm)
99395682	Diesel engine cylinder compression checking device
99395687	Reaming gauge (50 - 178 mm)
99395850	Dynamometer to check belt tension

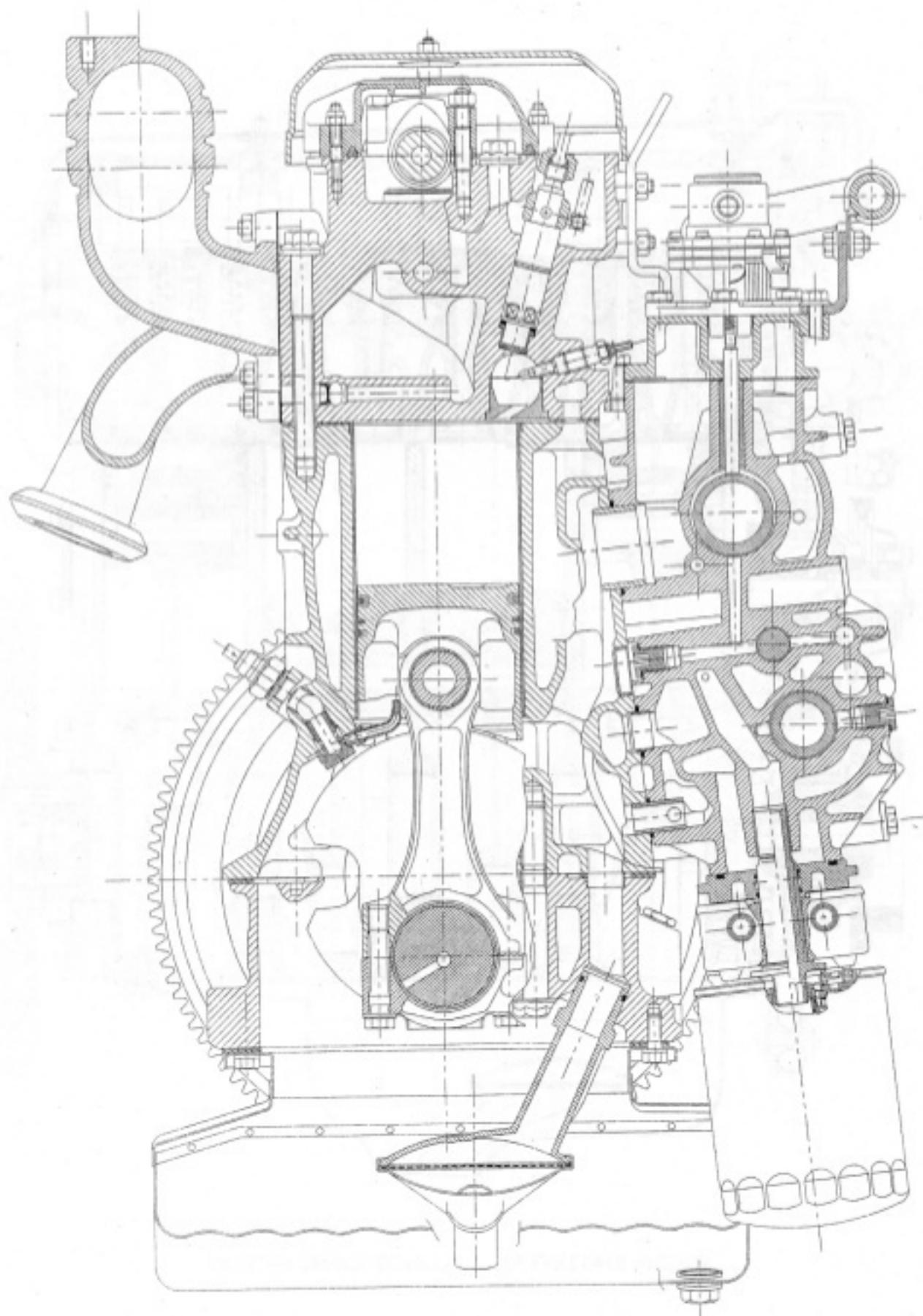
Figure 1



4657

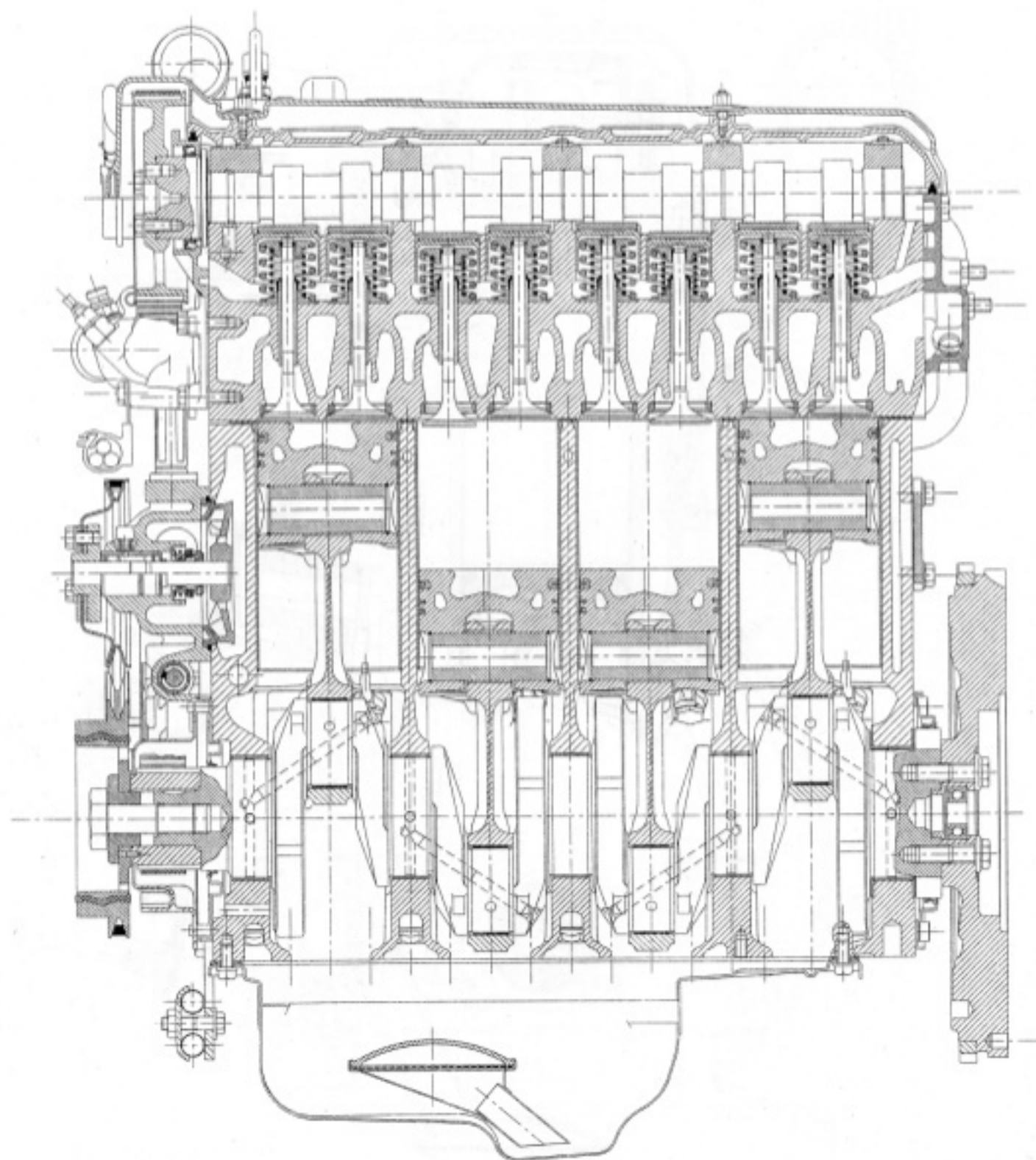
ENGINE 8140.67F.3700 - LONGITUDINAL SECTION

Figure 2



ENGINE 8140.67F.3700 - CROSS SECTION

Figure 3

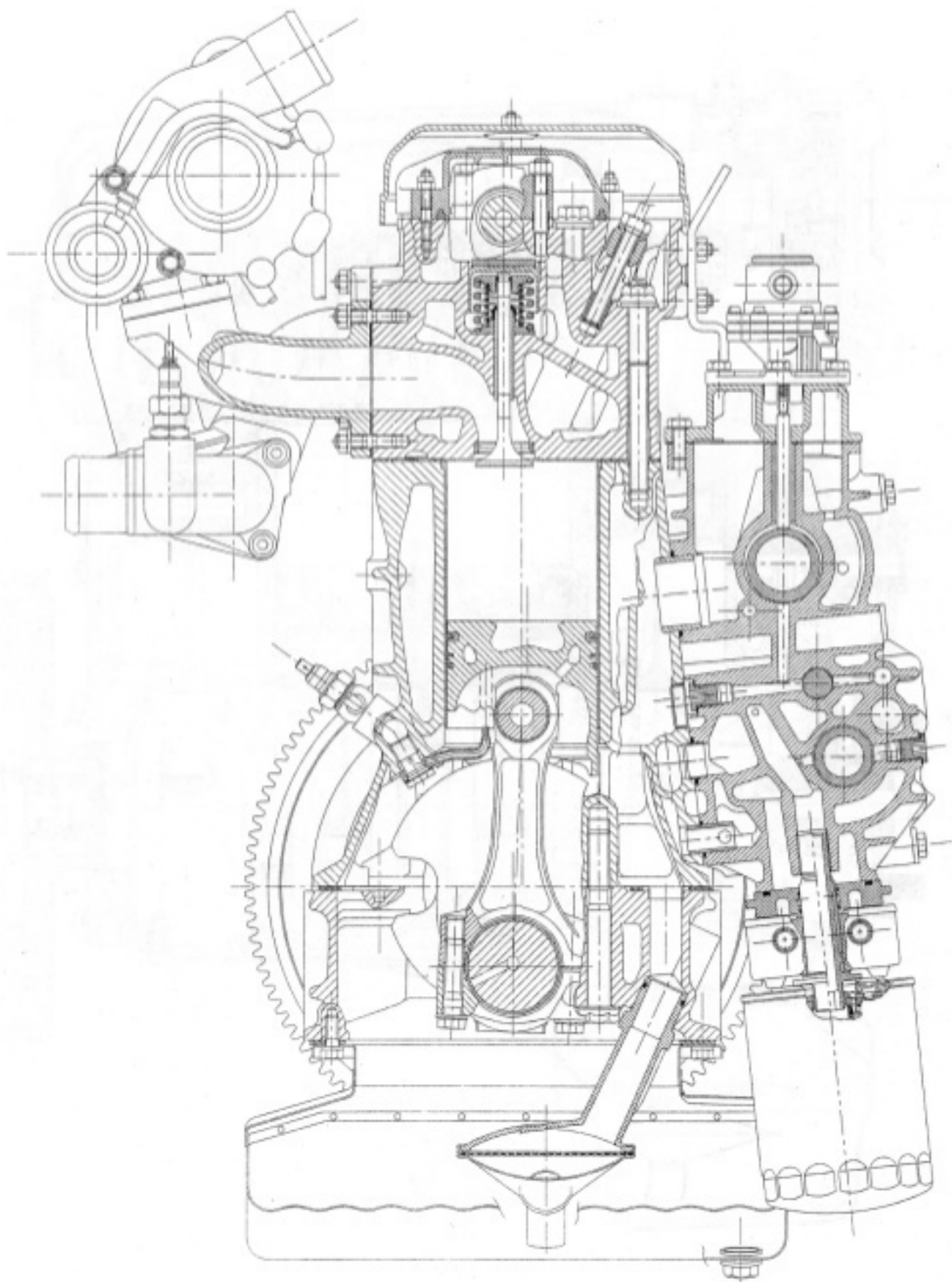


ENGINE 8140.23/43.700 - LONGITUDINAL SECTION

46559



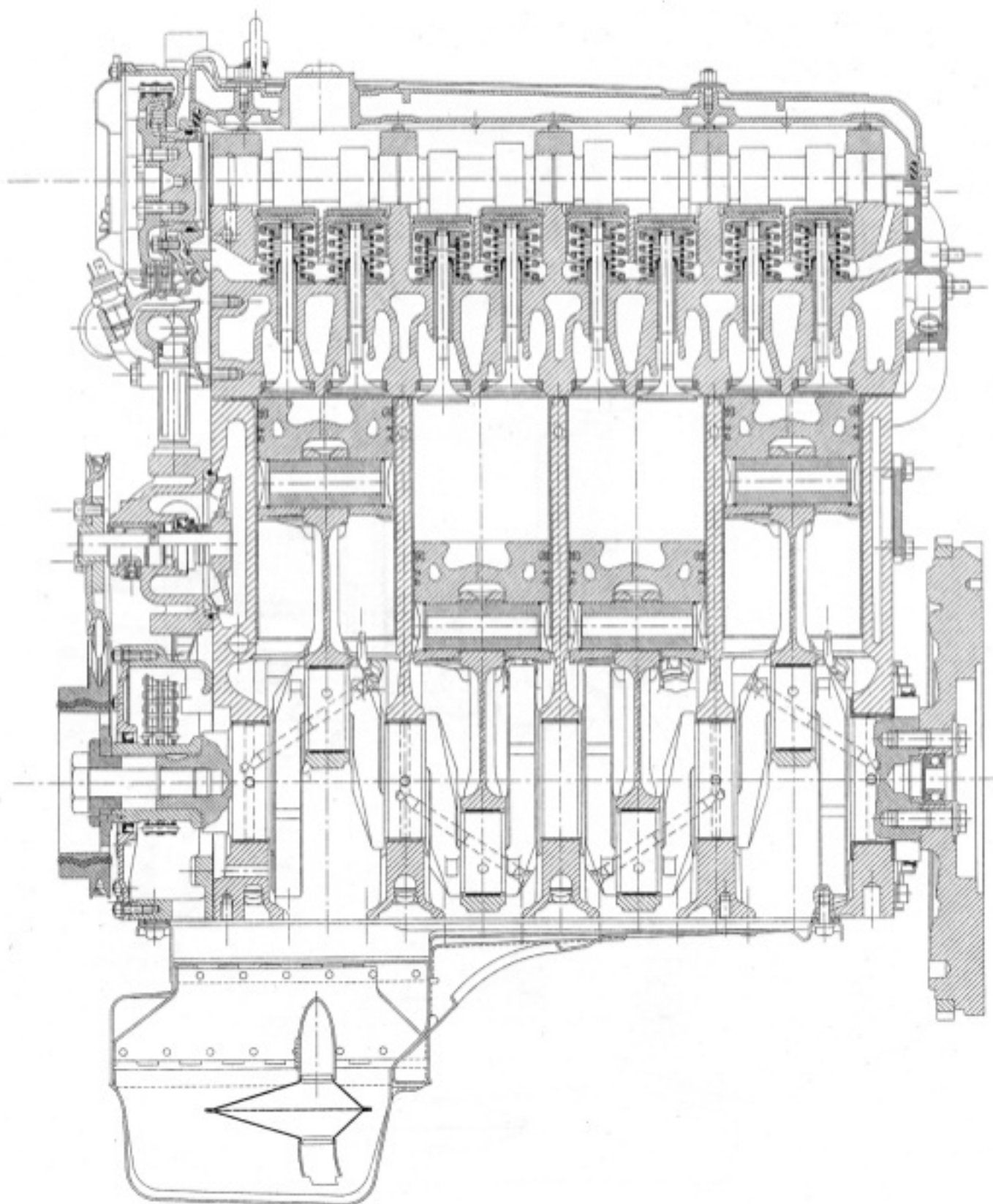
Figure 4



46560

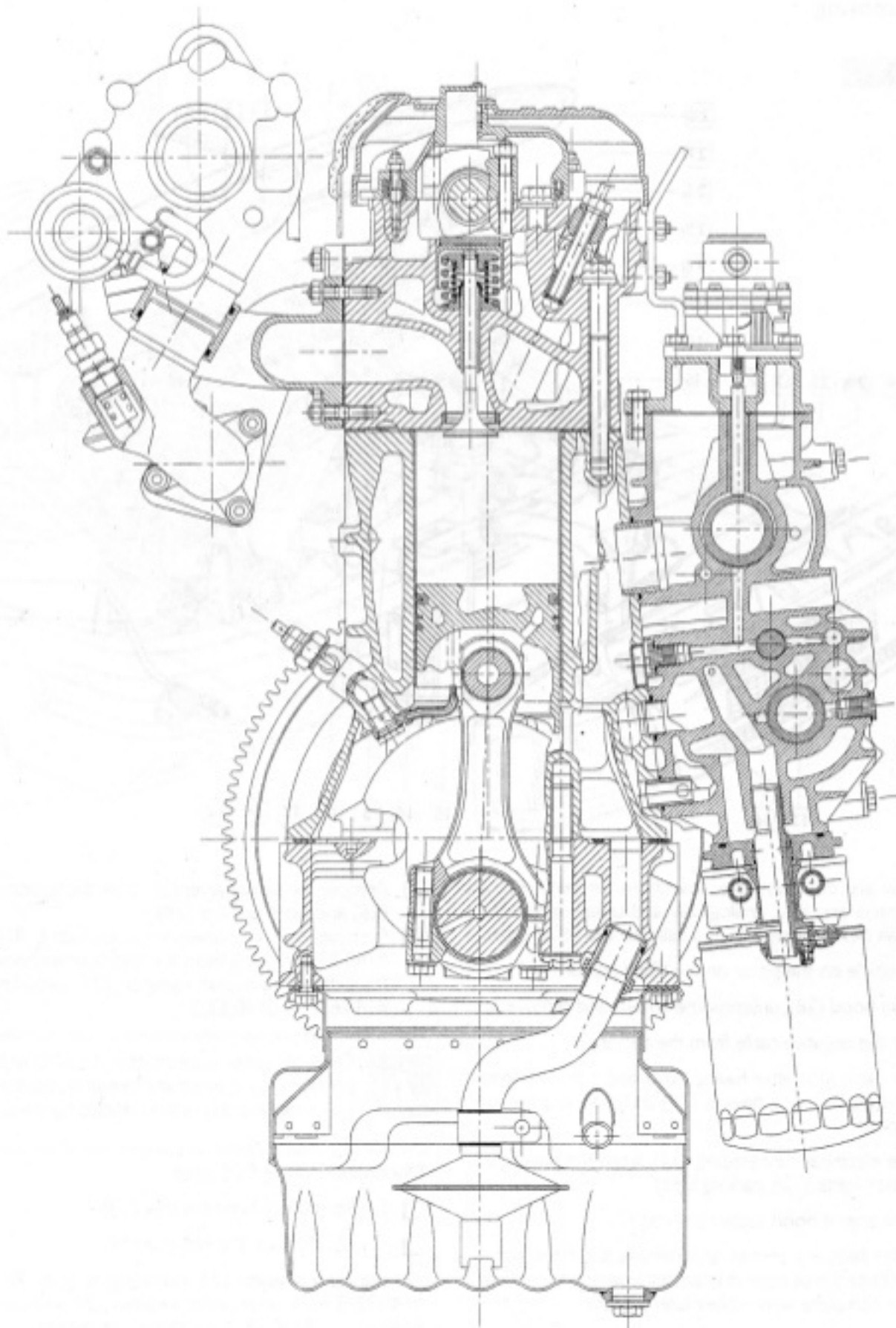
ENGINE 8140.23/43.3700 - CROSS SECTION

Figure 5



ENGINE 8140.23.3800 - LONGITUDINAL SECTION

Figure 6



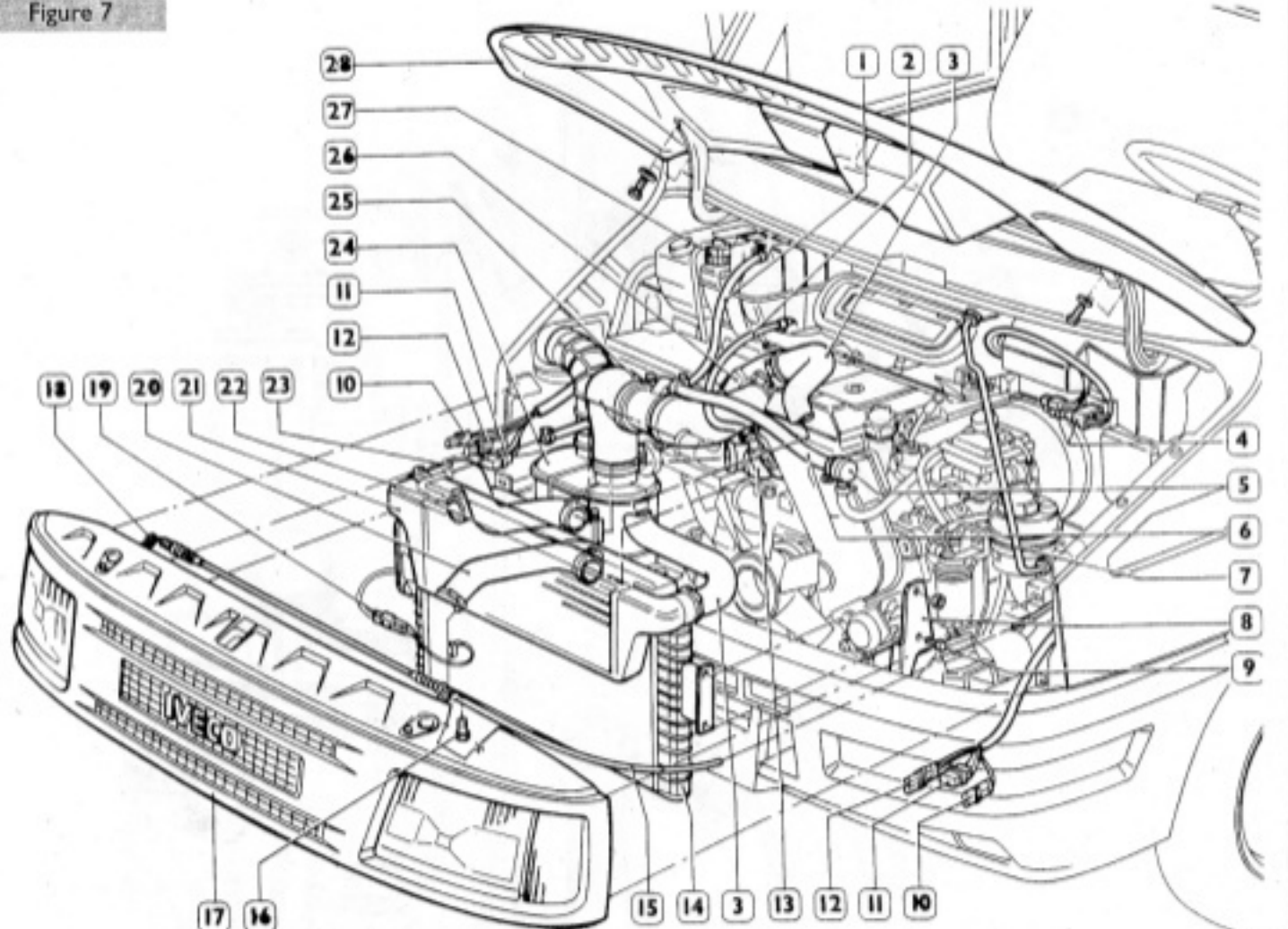
ENGINE 8140.23.3800 - CROSS SECTION

## 4X2 VEHICLES REMOVING-REFITTING THE BOOSTER



## Removing

Figure 7



45136

Here below are described the operations for removing a 8140.43 engine and that, analogically and unless otherwise specified, can be considered as also valid for the other types.

Place the vehicle on the pit or on the lifting platform.

Lift the front hood (28), unscrew the screws and remove it.

Disconnect the negative cable from the battery.

Disconnect cable (15) after having disjointed it from engine hood opening and closing devices (18) and removed the retaining brackets.

Disjoints the electrical connections: (11), from the headlight; (12), direction lights; (10), parking lights.

Remove the engine hood supporting rod (7).

Unscrew the fastening screws and remove the front panel (17). To facilitate the booster dismantling operations, remove the bumper complete with rubber lateral guards.

Remove the plug (27) from the expansion tank.

From below the vehicle:

- remove the soundproof guards (10-11-12-14 Fig. 9)
- remove screw (16) from the radiator (14) and drain the cooling fluid.

- Remove the air conveyer (25) from the turbocompressor (26) and from air filter (24).
- Remove the air conveyer (3 excluding 8140.67F... - 8140.23... engines) from the turbocompressor (26) and from the intercooler radiator (21 excluding engines 8140.67F... - 8140.23...)



Occlude correctly air inlets and outlets of turbocompressor (26) to avoid any foreign matters from entering unintentionally in the turbocompressor damaging it.

Disconnect cooling fluid pipes.

- (2) from the thermostat box (13);
- (1-22-20) from the radiator (14);

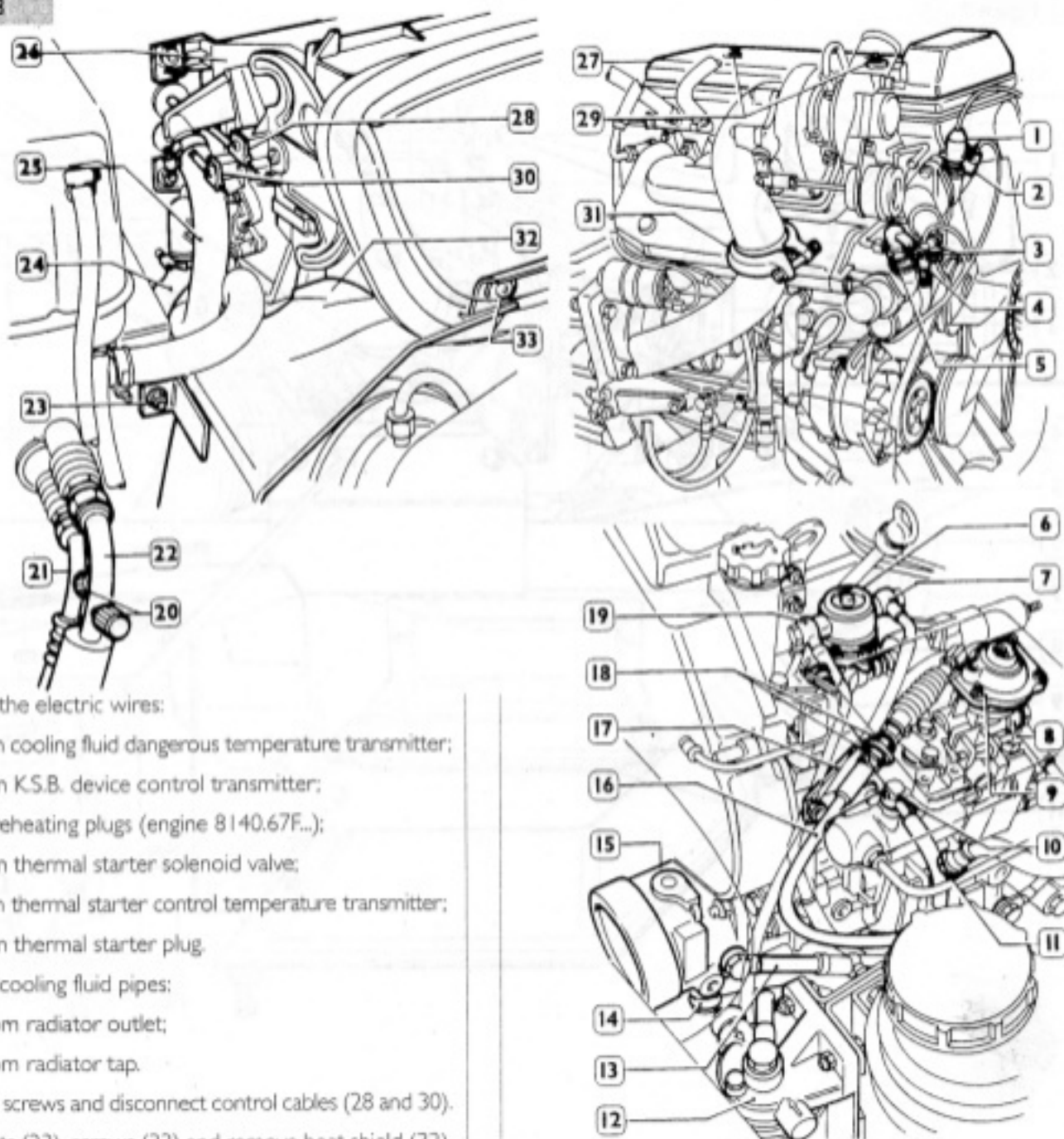
Disjoints air conveyer (23 excluding engines 8140.67F... - 8140.23...) from intercooler radiator (21 excluding engines 8140.67F... - 8140.23...) and from inlet manifold.

Disconnect the electrical connection (19) from solenoid valve control switch.

Unscrew the screws (9) and remove the radiator (17) complete with radiator intercooler (21 excluding engines 8140.67F... - 8140.23...) from the clamps (8).

Disconnect the pipe (6) from flow relief valve (5).

Figure 8



Disconnect the electric wires:

- (1) from cooling fluid dangerous temperature transmitter;
- (2) from K.S.B. device control transmitter;
- from preheating plugs (engine 8140.67F...);
- (3) from thermal starter solenoid valve;
- (4) from thermal starter control temperature transmitter;
- (5) from thermal starter plug.

Disconnect cooling fluid pipes:

- (25) from radiator outlet;
- (24) from radiator tap.

Remove the screws and disconnect control cables (28 and 30).

Unscrew nuts (23), screws (33) and remove heat shield (32).

Disconnect the electrical wires (4, Fig. 7).

Remove the nuts and dismantle the cabin internal conditioning group (26).

Disconnect fuel pipes (19-7) from the feeding pump (6).

Remove accelerator control cable (16) from injection pump (25).

Unscrew nuts (18) and remove cable (16) from supporting clamp (17).

Disconnect pipes (10) of fuel arriving from filter (12); (8) of fuel return to the tank; (11) of vacuum.

Place a pan under hydraulic pump (15) to recover the system oil and disconnect pipes (13-14) of oil inlet and delivery.

Unscrew nuts (29) and remove soundproofing cover (27).

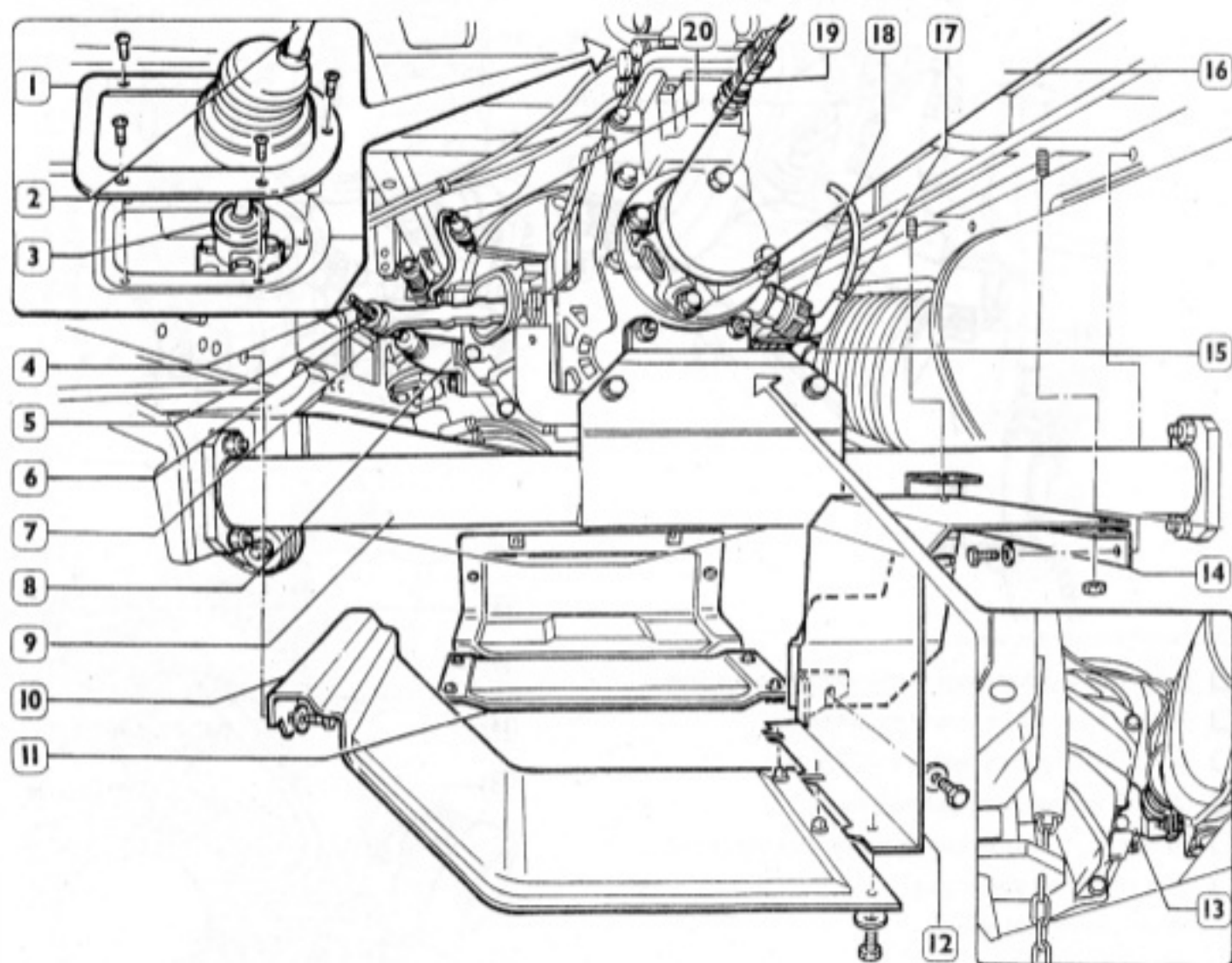
Remove outlet pipes fastening clamps (31).



In case of vehicles with conditioner inside the cabin, unload conditioning system by applying tool 99305146 to unions (20) and disconnect pipes (21-22).

455137

Figure 9



45138

From inside the cab: remove protection boot (1) fastening screws and remove the speed control support (3) from the gearshift complete with speed change lever (2).

From beneath the vehicle:

Unloose exhaust pipes fastening collar (15);

Disconnect:

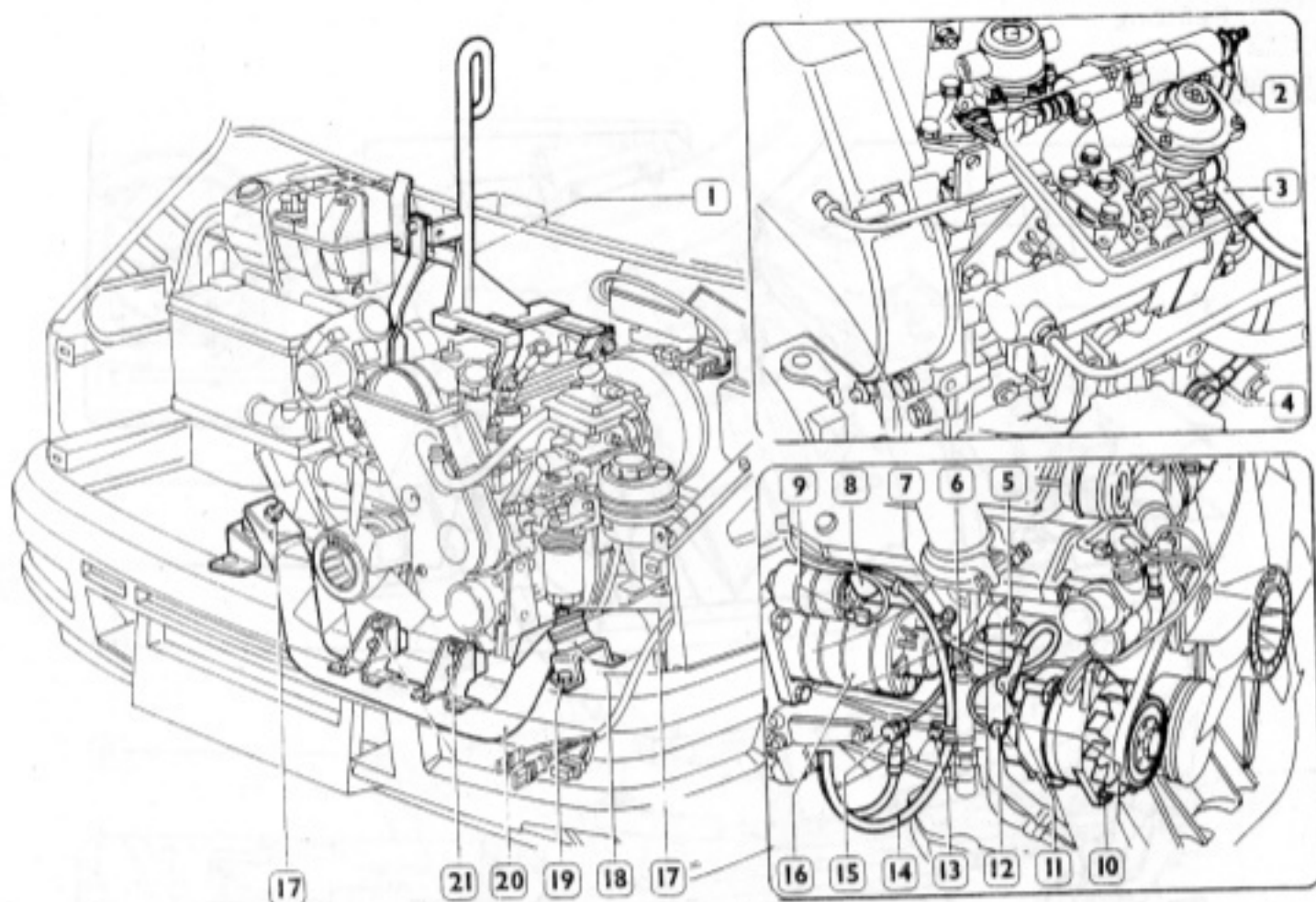
- gearbox/exhaust pipes fastening clamp (13);
- propeller shaft (16) from gearshift;
- crosspiece (9) from gearshift and framework.

Remove the sealing from ring (18), unscrew it and disconnect tachometer control cable (17).

Disconnect the electrical wires: (19) reversing lights – (20) engine revolutions sensor.

Remove nut (5) and flanged nut (6) fastening the cable (4) to the lever (7), friction clutch disengaging and remove the clamp (8).

Figure 10



45139

Apply arm 99360549 (1) to the lifting hooks on the engine, hook this arm to the hoist and set the engine at slight drive.

Remove crosspiece (20) and elastic supports (18) by unscrewing nuts (17) and screws (19).

Lift the booster group.

Draw out partly booster group, from engine compartment, until allowed to disconnect the following parts, from the right side (looking at the figure):

- electric cable (3) from injection pump motor stop device;
- earth cable (4) from crankcase;
- K.S.B. control electric cable (2).

From the left side:

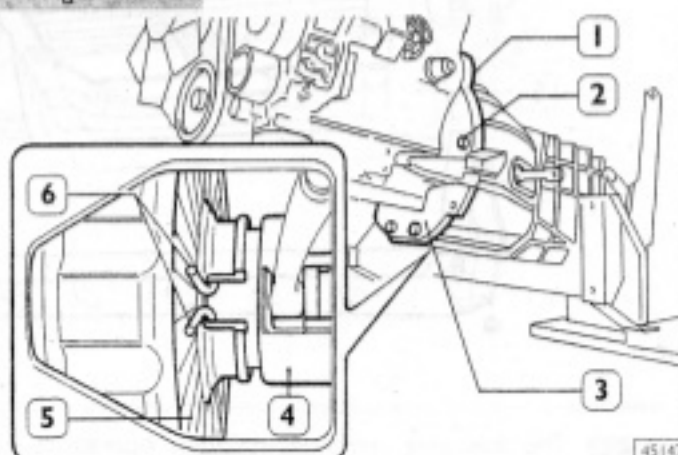
- ring (7) and electric cables (9-8-6) from starter motor;
- electric cables (14) fastening ring (13) and earth cable (15) from crankcase.

Draw out booster group completely.

Dismantle gearshift from engine, proceeding as follows:

- place the engine on a workbench so as it is sufficiently steady and the gearshift inspection hole is accessible;

Figure 11



45147

- remove starting motor (16) and lower guard (3) from gearshift;
- remove screw (2) fastening upper guard (1) to gearshift;
- remove gearshift/engine fastening screws;
- remove inspection cover from gearshift front cover;
- place support 99370620 on a hydraulic lift and apply this support to the gearshift;
- by means of suitable pliers widen elastic ring (6) that secures thrust bearing sleeve (4) to clutch pressure plate (5) and, at the same time, another operator removes gearshift from engine.