ENGINE

SERVICE MANUAL

Iseki Three-Cylinder Diesel Engine
(Effective 2005 Production)

TO OUR CUSTOMER:

Congratulations on your selection of an AGCO® Product. We believe you have exercised excellent judgment in the purchase of your AGCO® machine. We are most appreciative of your patronage.

Your Dealer has performed the pre-delivery service on your new machine.

He will discuss with you the operating and maintenance instructions given in this manual, and instruct you in the proper and varied applications of this machine. Call on him at any time when you have a question or need equipment related to the use of your machine.

We recommend that you carefully read this entire manual before operating the unit. Also, time spent in becoming fully acquainted with it's performance features, adjustments, and maintenance schedules will be repaid in a long and satisfactory life of the product.

This equipment is covered by a written warranty which will be provided to you by your AGCO® Dealer at time of purchase.

CALIFORNIA
Proposition 65 Warning

WARNING: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. Wash hands after handling.

AGCO®
Iseki Three-Cylinder Diesel Engine
4283035M2
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ISEKI THREE-CYLINDER DIESEL ENGINE

INTRODUCTION

General Information

This manual has been prepared to provide information concerning the servicing and overhaul of the following ISEKI engines, assuming that trained mechanics perform this work at workshops outfitted with the required equipment.

Tractor / Engine Cross Reference	
GC2300 / GC2310 / GC2400 / ST22A *	E3112-VB19 (282)
1523 / ST24A / MT225B	E3112-VB21 (306)
1423 / ST25 / MT225 **	E3112-B11 (244)
1528 / ST28A / MT255B	E3CF-WB01 (294)
1531 / ST33A	E3CD-WB20 (293)
1533 / ST34A / MT265B	E3CD-WB13 (313)
1540 / ST41A / MT275B	E3CD-WTB01 (314)
ZT29	E3CF-VG (326)
ZT33	E3CD-VG02 (325)
GC2600	E3112-XB (371)
GC1715	E3112-XB (440)
GC1705	E3112-XB01 (441)

E3CD and E3CF engines are basically the same from one another except for the piston sizes. But tractor versions have different exterior views from each other. The E3112 engine is also basically the same except for the piston sizes and components of the fuel injection systems.

This manual does not apply to field work where adequate service tools and equipment are not available. The contents of this manual cover all of the necessary information which would be required for operations in a workshop. These include construction, the functions of major components, specifications, disassembly and reassemble instructions, inspection and adjustment instructions, troubleshooting, etc. Figures mentioned in this manual are standard values established by ISEKI for the E3C and E3100 series. Consequently, when a non-ISEKI part has been installed on the engine or

adjustments and repairs have been made in a manner other than as specified in this manual, the values mentioned herein are inapplicable and useless. Consequently, ISEKI does not assume responsibility for any problems or damage caused by a value deviation due to maladjustment or by the use of unauthorized parts.

Be sure to follow the instructions mentioned in this manual when servicing the engines in a workshop. Values necessary for servicing the engines are mentioned in each instruction section, besides which all of the service reference values are summarized in the SERVICE STANDARDS TABLE. Please refer to this table before commencing service work to assure efficient maintenance and operation. Prompt and reliable servicing is a critical factor in following the operating Procedures and precautions included in this manual, while keeping safety in mind at all times. The ultimate objective of this manual is to provide you with adequate information to service the engines most effectively and economically, and in the end to gain a favorable reputation for ISEKI products among its users.

NOTE: All information, illustrations, and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

*NOTE: *For engine service information on models prior to tractor serial number JNA25201, please use engine manual 1449395M3.*

*NOTE: **For engine service information on models prior to tractor serial number NM3601, please use engine manual 1449395M3.*

GENERAL INFORMATION AND SPECIFICATIONS

Specifications

TRACTORS	GC2300 / GC2310 / ST22A / GC2400 / GC2410 1523 / ST24A / MT225B	GC2600 / GC2610	GC1705 / GC1710	GC1715 / GC1720
Engine Models	E3112			
Type	4-cycle, over-head valve, diesel with swirl type combustion chambers			
Cylinder - Bore x Stroke mm (in)	3 - 78.2 x 78 (3 - 3.08 x 3.07)			
Total Displacement cc (cu in)	1123 (68.5)			
Compression ratio	22.5:1			
Rated output ps (kW) / engine rpm	21.5 (16.0) / 2500	24.0 (17.9) / 3000	21.5 (16.0) / 2500	24.0 (17.9) / 3000
Fuel consumption g/ps-h	205	216	205	216
Maximum power rpm (Gross HP)	16.5 (22.5) / 2600	24.5 (18.3) / 3000	16.5 (22.5) / 2600	24.5 (18.3) / 3000
Unloaded maximum speed rpm	2810 +/- 50	3220 +/- 50	2810 +/- 50	3220 +/- 50
Unloaded minimum speed rpm	1275 +/- 25			
Fuel	Diesel			
Dry Weight kg (lb)	88 (193)		94 (267)	
Dimensions (HxWxH) mm (in)	491 x 431 x 561 (19.4 x 17.0 x 22.2)		537 x 432 x 561 (21.2 x 17.1 x 22.2)	
Fuel Injection order	1-3-2			
Direction of rotation	Clockwise viewed from fan			
Fuel injection system: Fuel injection pump	Bosch, PFR type pump			
Model	ND-PFR3M			
Plunger (dia. x stroke) mm (in)	5.75 x 7.0 (0.23 x 0.28)			
Injection nozzle	Throttle type			
Governor	Centrifugal, all speed governor			

ISEKI THREE-CYLINDER DIESEL ENGINE

TRACTORS	GC2300 / GC2310 / ST22A / GC2400 / GC2410 / 1523 / ST24A / MT225B	GC2600 / GC2610	GC1705 / GC1710	GC1715 / GC1720
Engine Models	E3112			
Supercharger system	None			
Lubrication system	Forced Lubrication			
Oil Pump	Trochoid type			
Filtering method	Full-flow type			
Cooling System: Cooling method	Water Cooling			
Cooling fan mm (in)	Ø320 (12.6)			
Driving method	Belt-drive			
Pulley ration Crank p.: fan p.	1.29			
Starter Motor:	Engaging magnet type			
Voltage V	12			
Output kW	1.1			
Engine Stopping System	Fuel cut-off type			
Preheating System	Sheathed glow plugs			
Generator: Voltage V	12			
Output amp	40			
Regulator	Transistorized (installed in generator)			
Reference Data: Oil pan capacity liter (U.S. gallon)	2.6 (0.68)			
Valve timing:				
Intake Opening	10 degrees BTDC			
Intake Closing	46 degrees ABDC			
Exhaust Opening	46 degrees BBDC			
Exhaust Closing	10 degrees ATDC			
Valve clearance mm (in)	0.25 (0.0098)			
Fuel injection timing	19 degree BTDC			
Compression pressure kg/cm2 (psi) / 300 rpm	30 (427)			

TRACTORS	1528 / ST28A / MT255B	1531 / 1533 / ST33A / ST34A / MT265B	1540 / ST41A / MT275B
Engine Models	E3CF	E3CD	E3CD-T
Type	4-cycle, over-head valve, diesel with swirl type combustion chambers		
Cylinder - Bore x Stroke mm (in)	3 - 86 x 84 (3 - 3.37 x 3.3)	3-87 x 84 (3 - 3.4 x 3.3)	
Total Displacement cc (cu.in)	1463 (89.27)	1498 (91.41)	
Compression ratio	21.7:1	21.7:1	
Rated output ps (kW) / engine rpm	28 (20.6)/2500	32 (23.5) / 2500	38 (27.9) / 2500
Fuel consumption g/ps-h	203	205	200
Maximum power rpm (Gross HP)	28 (20.2) / 2500	24.6 (33) / 2600	29.9 (40.1 / 2600
Unloaded maximum speed rpm	2700 +/- 50	2810 +/- 50	2810 +/- 50
Unloaded minimum speed rpm	950 +/- 20	1000 +/- 20	1000 +/- 20
Fuel	Diesel		
Dry Weight kg (lb)	128 (197) - FH 125 (185) - F	144 (318)	147 (324)
Dimensions (HxWxH) mm (in)	584 x 475 x 650 (22.9 x 21.2 x 25.6) - FH 568 x 475 x 650 (22.4 x 21.2 x 25.6) - F	618 x 470 x 683 (24.3 x 18.5 x 26.9)	612 x 506 x 683 (24.1 x 19.9 x 26.9)
Fuel Injection order	1-3-2		
Direction of rotation	Clockwise viewed from fan		
Fuel injection system: Fuel injection pump	Bosch, PFR type pump		
Model	ND-PFR3KX	ND-PFR3KX	
Plunger (dia. x stroke) mm (in)	6.5 x 7.0 (0.26 x 0.28)	6.5 x 7.0 (0.26 x 0.28)	6.0 x 7.0 (0.24 x 0.28)
Injection nozzle	Throttle type		
Governor	Centrifugal, all-speed governor		

ISEKI THREE-CYLINDER DIESEL ENGINE

TRACTORS	1528 / ST28A / MT255B	1531 / 1533 / ST33A / ST34A / MT265B	1540 / ST41A / MT275B
Engine Models	E3CF	E3CD	E3CD-T
Supercharger system	None	None	Exhaust Turbo Charger
Lubrication System:	Forced lubrication		
Oil Pump	Trochoid type		
Filtering method	Full-flow type		
Cooling System: Cooling method	Water Cooling		
Cooling fan mm (in)	360 (14.3)	380 (15.0)	
Driving method	Belt-drive		
Pulley ration Crank p.: fan p.	1.2	1.10	1.23
Starter Motor:	Engaging magnet type		
Voltage V	12		
Output kW	1.4		
Engine Stopping System	Fuel cut-off type		
Preheating System	Sheathed glow plugs		
Generator: Voltage V	12		
Output	40		
Regulator	Transistorized (installed in the generator)		
Reference Data: Oil pan capacity liter (U.S. gallon)	3.6 (0.95)	4.7 (1.25)	
Valve timing:			
Intake Opening	8 degrees BTDC		
Intake Closing	40 degrees ABDC		
Exhaust Opening	48 degrees BBDC		
Exhaust Closing	12 degrees ATDC		
Valve clearance mm (in)	0.35 (0.013)		
Fuel injection timing	17 degrees BTDC	20 degress BTDC	17 degrees BTDC
Compression pressure kg/cm2 (psi)/300 rpm	31 (441)		

TRACTORS	ZT29	ZT33	1529
Engine Models	E3CF	E3CD	E3CD-T
Type	4-cycle, over-head valve, diesel with swirl type combustion chambers		
Cylinder - Bore x Stroke mm (in)	3 - 86 x 84 (3 - 3.37 x 3.3)	3-87 x 84 (3 - 3.4 x 3.3)	
Total Displacement cc (cu.in)	1463 (89.27)	1498 (91.41)	
Compression ratio	21.7:1	21.7:1	
Rated output ps (kW) / engine rpm	28 (20.2)/2500	33 (24.2) / 2600	28 (20.6) / 2500
Fuel consumption g/ps-h	205	205	186
Maximum power rpm (Gross HP)	28 (20.2) / 2500	33 (24.2) / 2600	28 (20.6) / 2500
Unloaded maximum speed rpm	2700 +/- 50	2810 +/- 50	2810 +/- 50
Unloaded minimum speed rpm	1400 +/- 25	1400 +/- 25	1400 +/- 25
Fuel	Diesel		
Dry Weight kg (lb)	125 (275)	125 (275)	137 (301)
Dimensions (HxWxH) mm (in)	598 x 490 x 619 (22.8 x 19.3 x 24.3)	598 x 490 x 619 (22.8 x 19.3 x 24.3)	618 x 470 x 660 (24.3 x 18.5 x 26.0)
Fuel Injection order	1-3-2		
Direction of rotation	Clockwise viewed from fan		
Fuel injection system: Fuel injection pump	Bosch, PFR type pump		
Model	ND-PFR3KX	ND-PFR3KX	
Plunger (dia. x stroke) mm (in)	6.5 x 7.0 (0.26 x 0.28)	6.5 x 7.0 (0.26 x 0.28)	6.5 x 7.0 (0.26 x 0.28)
Injection nozzle	Throttle type		
Governor	Centrifugal, all-speed governor		

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TRACTORS	ZT29	ZT33	1529
Engine Models	E3CF	E3CD	E3CD-T
Supercharger system	None	None	Exhaust Turbo Charger
Lubrication System:	Forced lubrication		
Oil Pump	Trochoid type		
Filtering method	Full-flow type		
Cooling System: Cooling method	Water Cooling		
Cooling fan mm (in)	360 (14.3)		380 (15.0)
Driving method	Belt-drive		
Pulley ration Crank p.: fan p.	1.23	1.10	1.1
Starter Motor:	Engaging magnet type		
Voltage V	12		
Output kW	1.4		
Engine Stopping System	Fuel cut-off type		
Preheating System	Sheathed glow plugs		
Generator: Voltage V	12		
Output	40		
Regulator	Transistorized (installed in the generator)		
Reference Data: Oil pan capacity liter (U.S. gallon)	3.0 (0.79)		
Valve timing:			
Intake Opening	8 degrees BTDC		
Intake Closing	40 degrees ABDC		
Exhaust Opening	48 degrees BBDC		
Exhaust Closing	12 degrees ATDC		
Valve clearance mm (in)	0.35 (0.013)		
Fuel injection timing	20 degress BTDC		
Compression pressure kg/cm2 (psi)/300 rpm	31 (441)		

Performance Curves

FIG. 1: GC2300 / GC2310 / 1523 / ST22A / ST24A / MT225B.

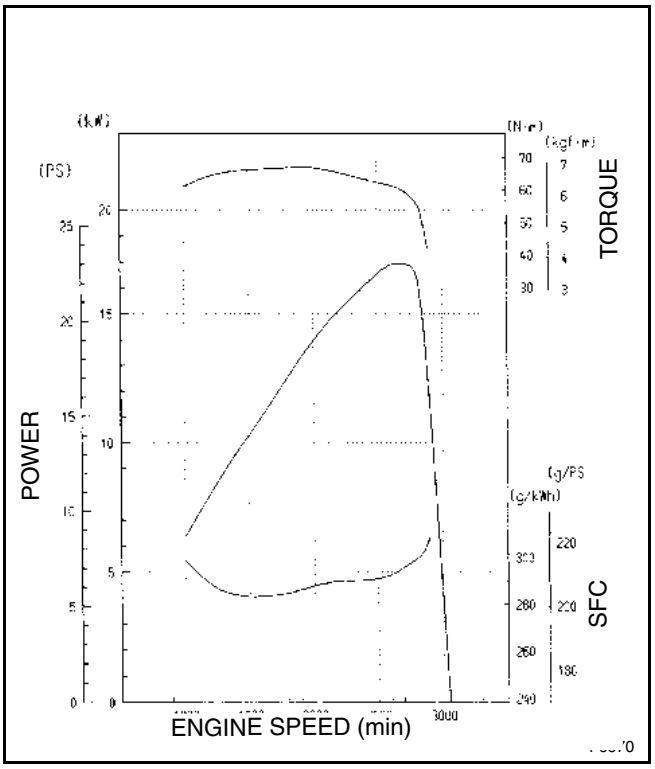

FIG. 1

FIG. 2: 1528 / ST28A / MT255B / ZT29.

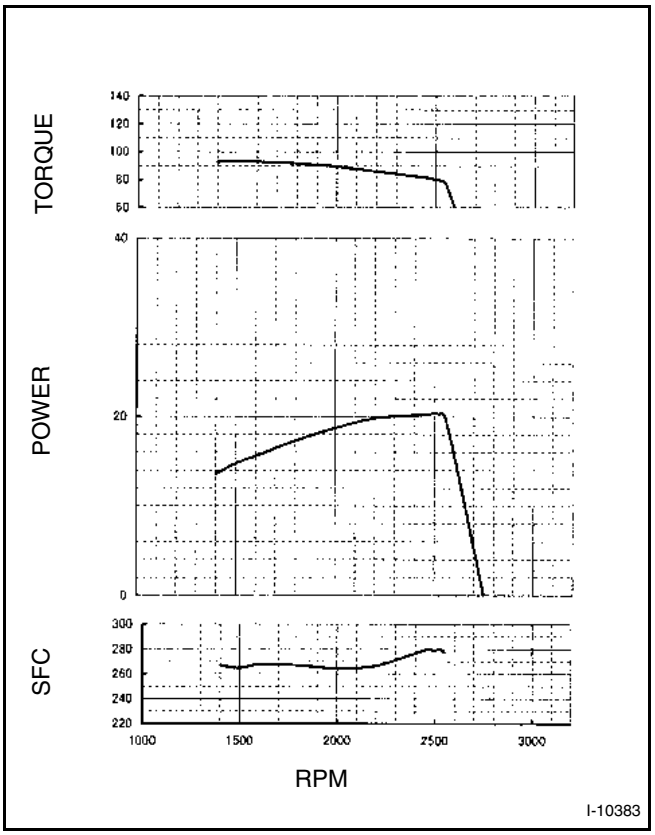

FIG. 2

FIG. 3: 1531 / 1533 / ST33A / ST34A / MT265B / ZT33.

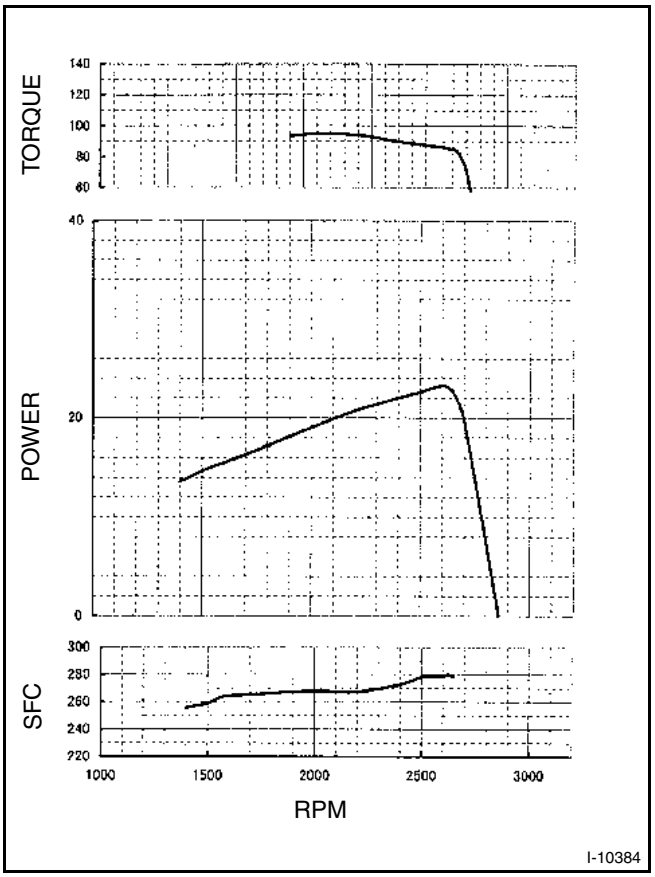

FIG. 3

FIG. 4: 1540 / ST41A / MT275B.

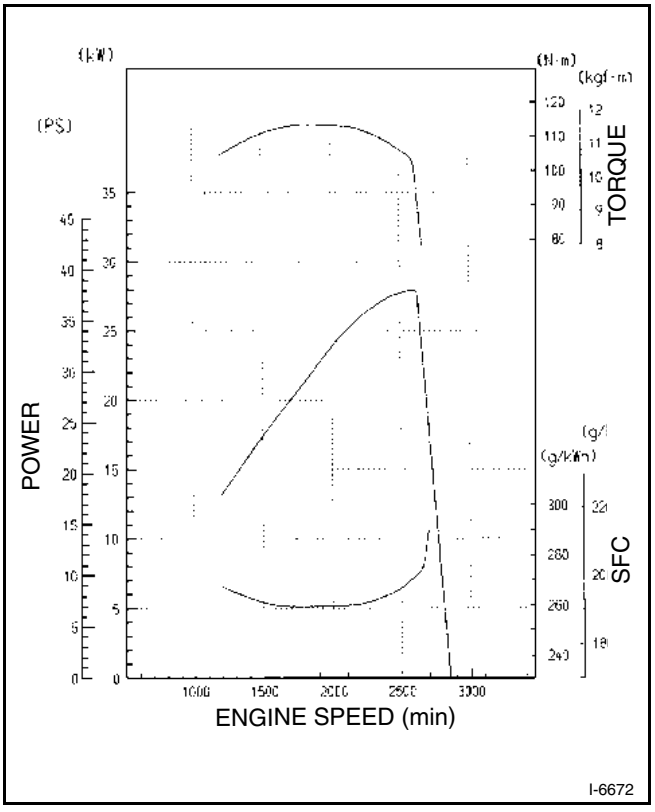

FIG. 4

FIG. 5: GC1705 / GC1710.

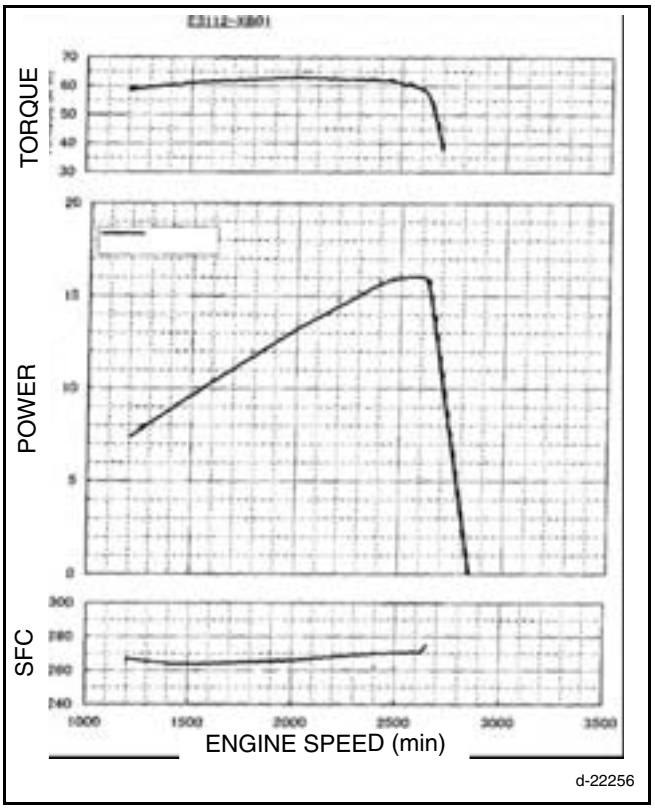

FIG. 5

FIG. 6: GC1715 / GC1720.

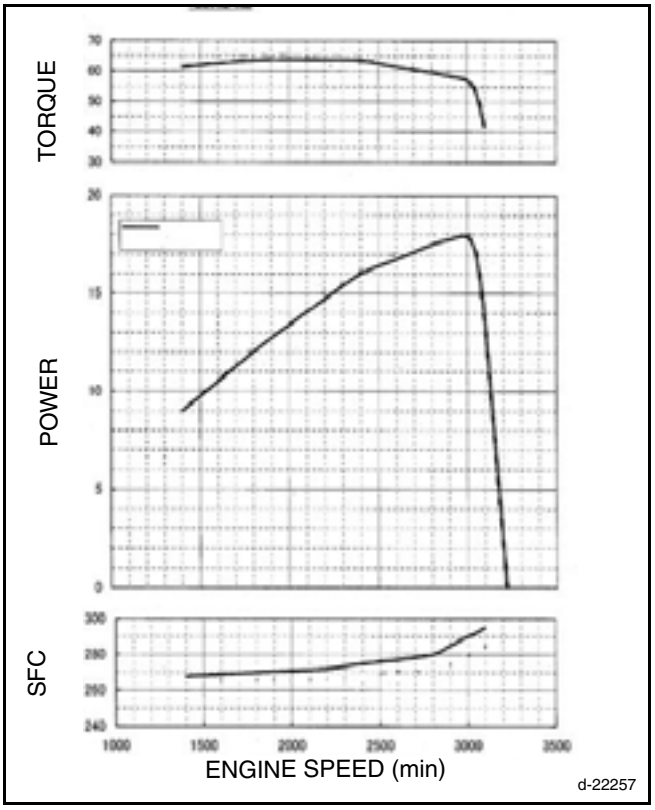

FIG. 6

Exterior Views and Identification Numbers

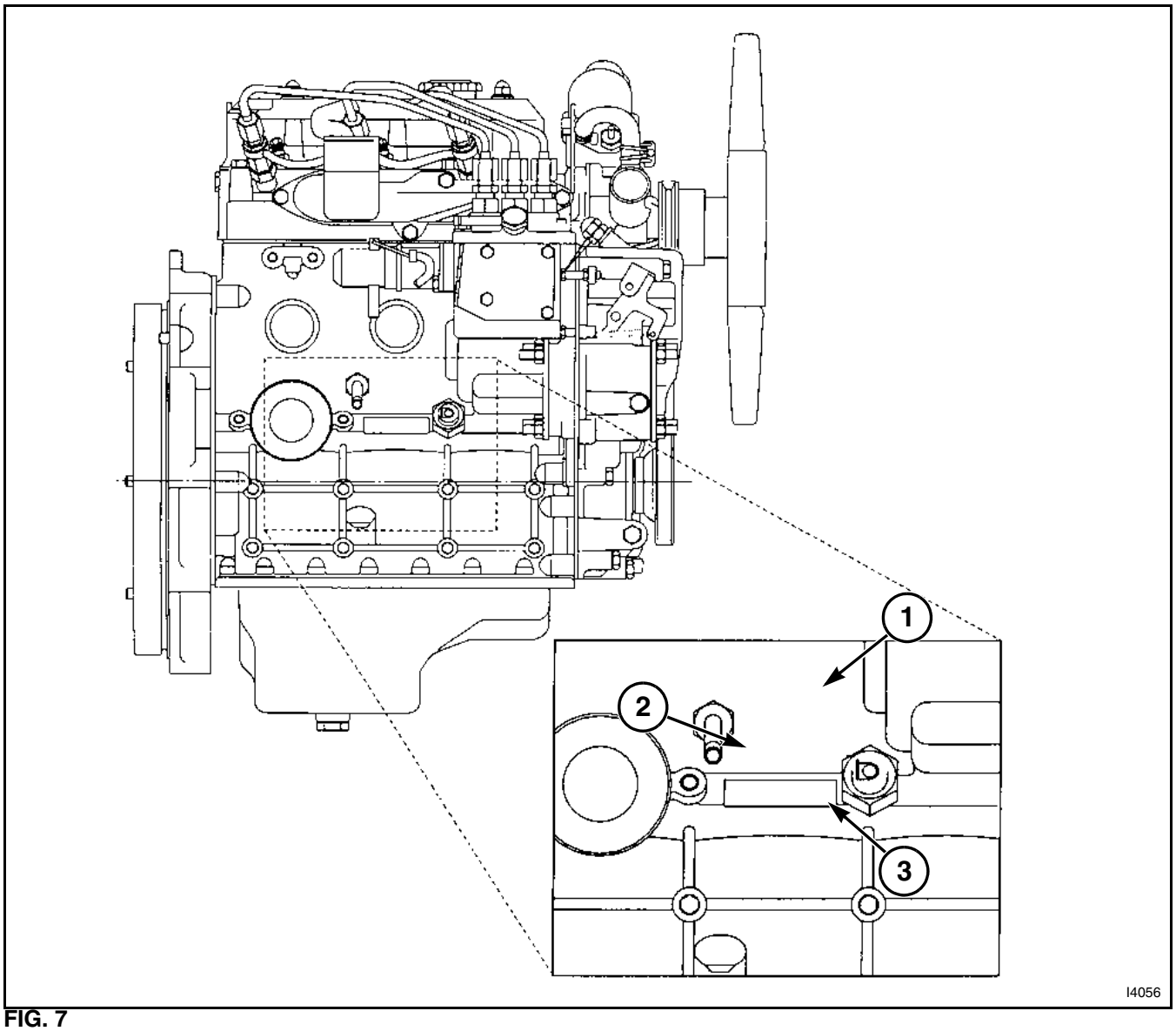

FIG. 7

FIG. 7: Right side view: (All other models)

Left side view: (ZT / GC2300 / GC2310 / ST22A)

1. Engine Model Name
2. Piston Displacement (Liter)
3. Serial Number

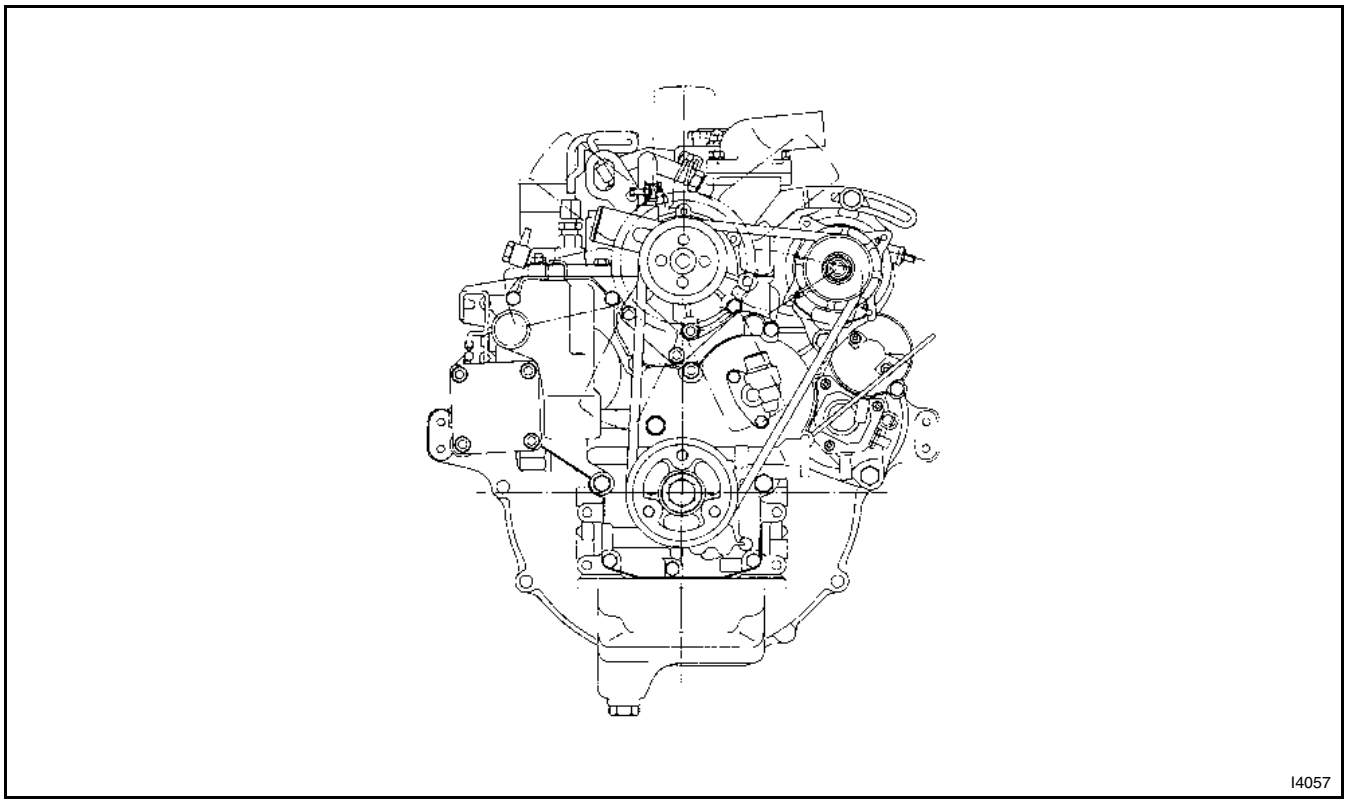

FIG. 8

FIG. 8: Front end view.

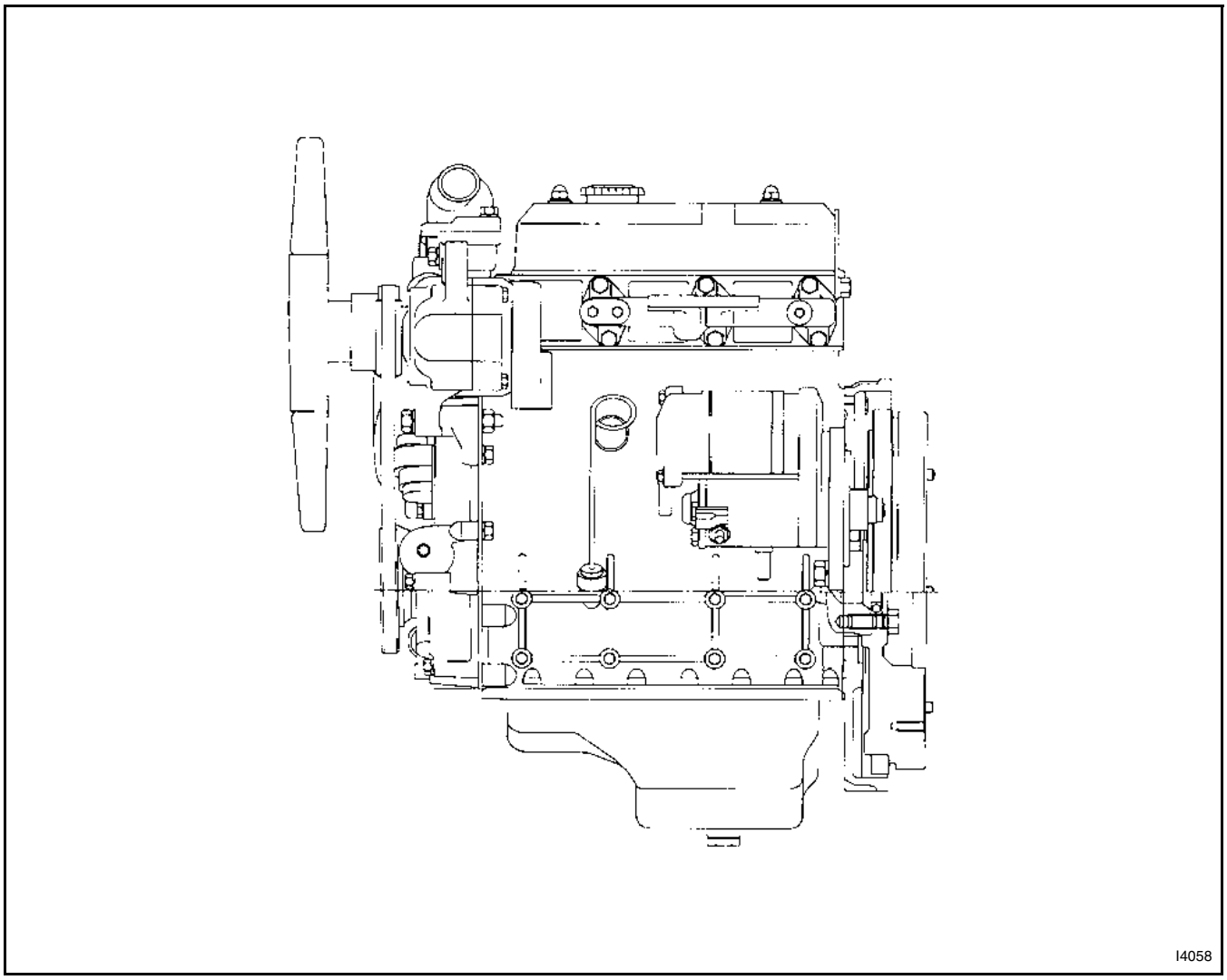

FIG. 9

FIG. 9: Left side view. (All other models)

Right side view: (ZT29 / ZT33 / GC2300 / GC2310 / ST22A)

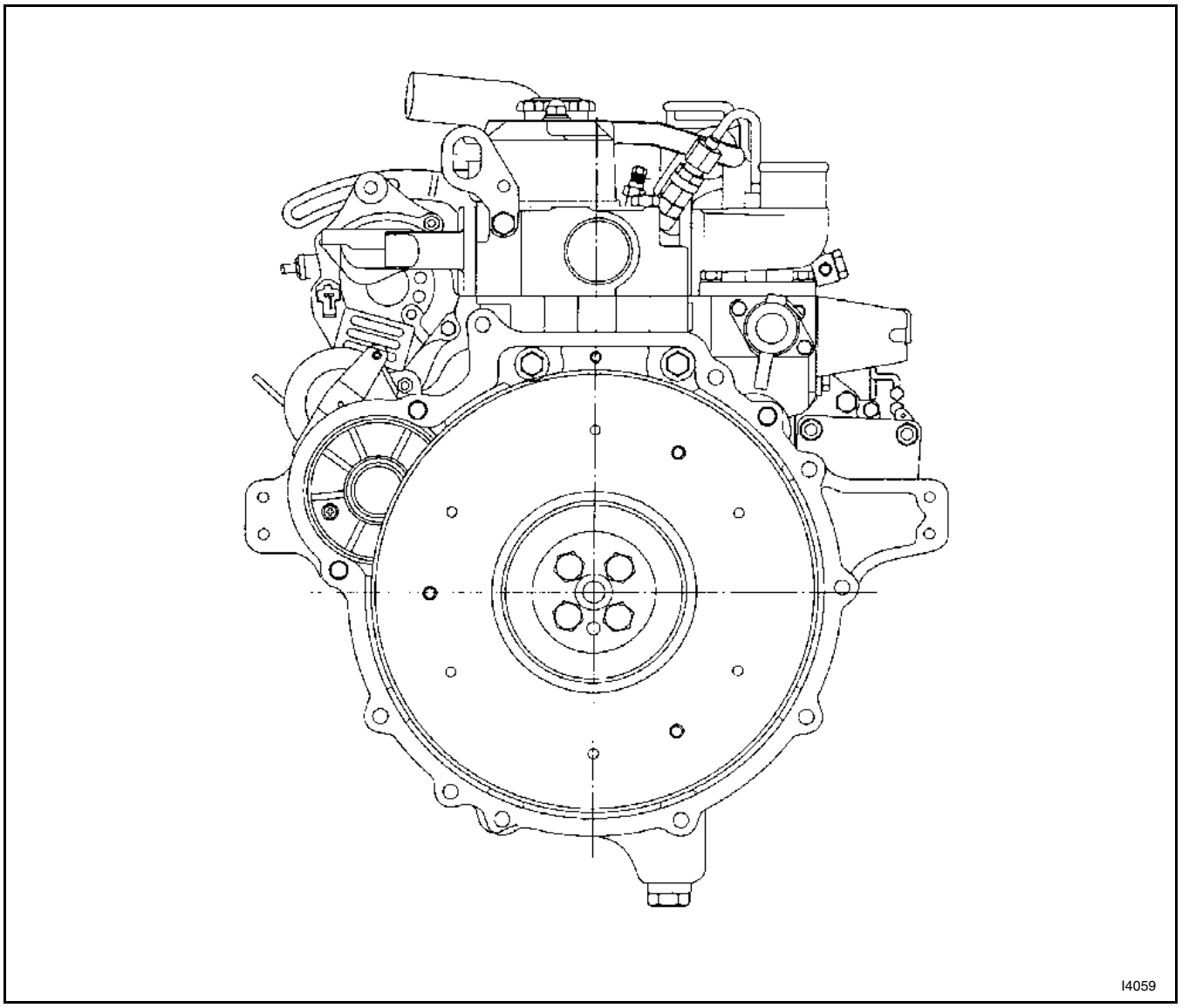

FIG. 10

FIG. 10: Rear end view.

Sectional Views

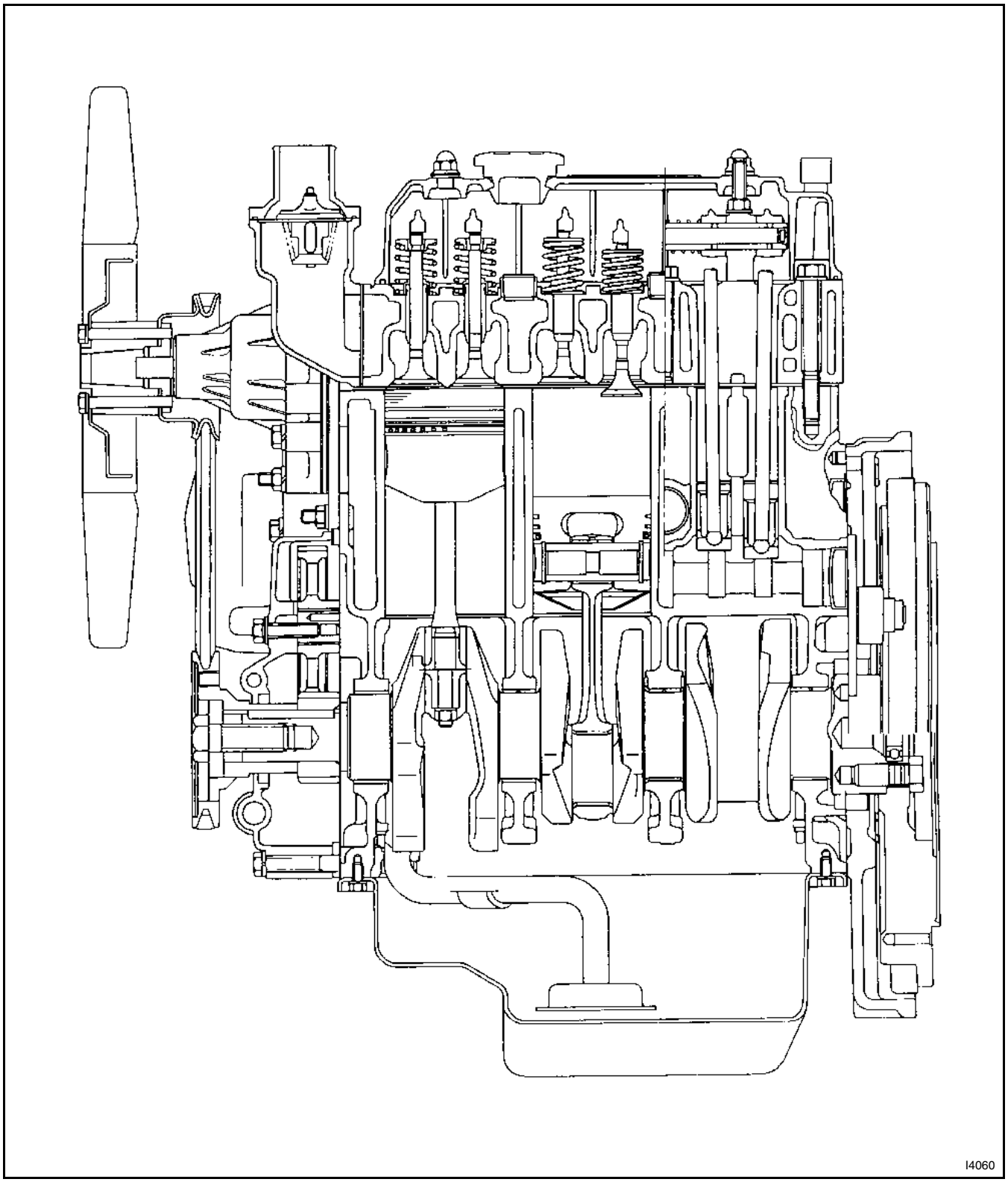

FIG. 11

FIG. 11: Lateral view.