

ENGINES CURSOR
Tier3 F2CE9684, F3AE9684
Service Manual

84314715 5/2010
Replaces 87686520



Contents

INTRODUCTION

HYDRAULIC - PNEUMATIC - ELECTRICAL - ELECTRONIC SYSTEMS A

ELECTRICAL POWER SYSTEM A.30.A

ENGINE AND PTO IN B

ENGINE B.10.A

FUEL AND INJECTION SYSTEM..... B.20.A

AIR INTAKE SYSTEM..... B.30.A

EXHAUST SYSTEM..... B.40.A

ENGINE COOLANT SYSTEM B.50.A

LUBRICATION SYSTEM B.60.A

STARTING SYSTEM B.80.A



INTRODUCTION

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>

Contents

INTRODUCTION

Foreword	3
Safety rules	4

Foreword

This publication contains data, features instructions and methods for performing repair operations on the assembly and its components and is addressed to qualified, specialized personnel.

Check to make sure you have the right publication related to the component you are about to work on before you start. Make sure that you have all the necessary safety equipment: safety glasses, helmet, gloves, footwear, etc. Check that the working lifting and transport equipment is available and in working order. Make sure that vehicle is secured. Proceed by carefully observing the instructions contained in this publication and use the indicated specific tools to ensure correct repair procedures and safety of operators.

Safety rules

Standard safety precautions

Be informed and notify personnel of the laws in force regulating safety, and provide documentation available for consultation.

- Keep working areas as clean as possible.
- Ensure that working areas are provided with emergency boxes. They must be clearly visible and always contain adequate sanitary equipment.
- Fire extinguishers must be properly identified and always be clear of obstructions. Their efficiency must be checked on a regular basis and personnel must be trained on proper interventions and priorities.
- Keep all emergency exits free of obstructions and clearly marked.
- Smoking in working areas subject to fire danger must be strictly prohibited.

Prevention of injury

- Wear suitable work attire and safety glasses with no jewelry such as rings and chains when working close to engines and equipment in motion.
- Wear safety gloves and goggles when performing the following operations:
 - Topping off or changing lubrication oils.
 - Using compressed air or liquids at a pressure greater than **2 bar (29 psi)**.
- Wear a safety helmet when working close to hanging loads or equipment working at head level.
- Always wear safety shoes and fitting clothes.
- Use protection cream for hands.
- Change wet clothes as soon as possible.
- In the presence of voltages exceeding **48 - 60 V**, verify the efficiency of the ground and mass electrical connections. Ensure that hands and feet are dry and use isolating foot boards. Workers should be properly trained to work with electricity.
- Do not smoke or start an open flame close to batteries and any fuel material.
- Place soiled rags with oil, diesel fuel or solvents in specially provided anti-fire containers.
- Do not use any tool or equipment for any use other than what it was originally intended for. Serious injury may occur.
- If running an engine indoors, make sure there is a sufficient exhaust fan in use to eliminate exhaust fumes.

During maintenance

- Never open the filler cap of the cooling system when the engine is hot. High temperature liquid at operating pressure could result in serious danger and risk of burn. Wait until the temperature decreases under **50 °C (122 °F)**.
- Never add coolant to an overheated engine and use only appropriate liquids.
- Always work when the engine is turned off. Certain circumstances require maintenance on a running engine. Be aware of all the risks involved with such an operation.
- Always use adequate and safe containers for engine fluids and used oil.
- Keep engine clean of any spilled fluids such as oil, diesel fuel, and or chemical solvents.
- Use of solvents or detergents during maintenance may emit toxic vapors. Always keep working areas aerated. Wear a safety mask if necessary.
- Do not leave soiled rags that may contain any flammable substances close to the engine.
- Always use caution when starting an engine after any work has been performed. Be prepared to cut off intake air in case of engine runaway.
- Never disconnect the batteries while the engine is running.

- Disconnect the batteries prior to performing any work on the equipment.
- Disconnect the batteries to place a load on them with a load tester.
- After any work is performed, verify that the battery clamp polarity is correct and that the clamps are tight and safe from accidental short circuit and oxidation.
- Before disconnecting any pipelines (pneumatic, hydraulic, fuel pipes, etc.), verify that all pressure has been released. Take all necessary precautions bleeding and draining residual pressure. Always wear the proper safety equipment.
- Do not alter the lengths of any wires.
- Do not connect any electronic service tool to the engine electrical equipment unless specifically approved by Iveco.
- Do not modify the fuel system or hydraulic system unless approved by Iveco, Any unauthorized modification will compromise warranty assistance and may affect engine operation and life span.

For engine equipped with an electronic control unit

- Do not weld on any part of the equipment without removing the control unit.
- Remove the in case of work requiring heating over **80 °C (176 °F)**.
- Do not paint the components and the electronic connections.
- Do not alter any data filed in the electronic control unit driving the engine. Any manipulation or alteration of electronic components will void engine warranty assistance and may affect the correct working order and life span of the engine.

Respect of the Environment

- Respect of the environment should be of primary importance. Take all necessary precautions to ensure personnel's safety and health.
- Inform the personnel of the laws regarding the dispensing of used engine fluids.
- Handle batteries with care, storing them in a well ventilated environment and within anti-acid container.



**HYDRAULIC - PNEUMATIC - ELECTRICAL -
ELECTRONIC SYSTEMS - A**

ELECTRICAL POWER SYSTEM - 30.A

**Cursor 10
Cursor 9**

Contents

HYDRAULIC - PNEUMATIC - ELECTRICAL - ELECTRONIC SYSTEMS - A

ELECTRICAL POWER SYSTEM - 30.A

FUNCTIONAL DATA

Alternator

Overview	3
F2CE9684A*E004, F2CE9684A*E009, F2CE9684B*E001, F2CE9684C*E001, F2CE9684D*E001, F2CE9684H*E010, F2CE9684L*E005, F2CE9684N*E005, F2CE9684P*E006, F2CE9684P*E008, Cursor 10	
Overview	4
F2CE9684C*E002, F2CE9684E*E002	
Overview	5
F2CE9684H*E003	

SERVICE

Alternator

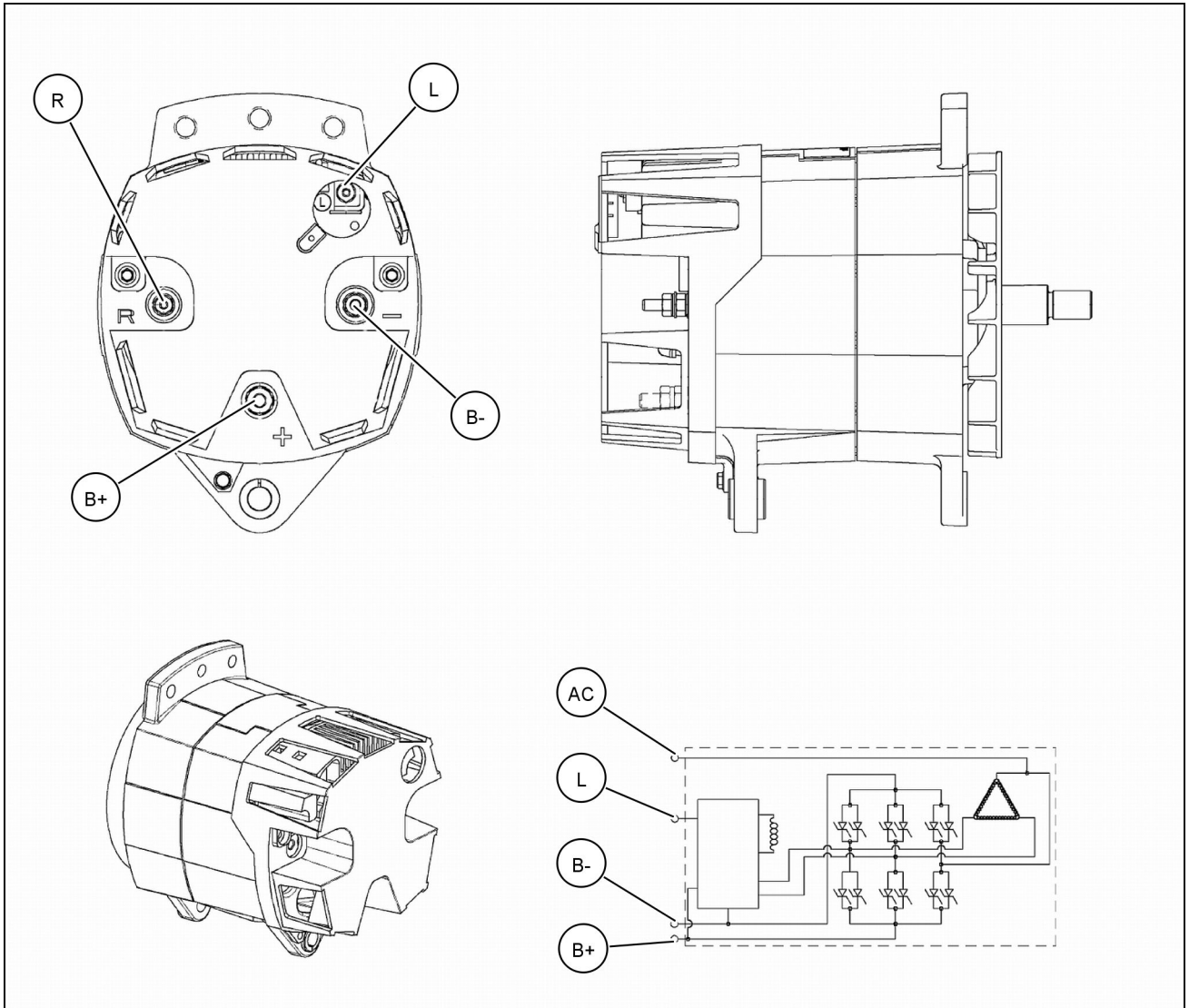
Remove	6
Cursor 10	
Install	7
Cursor 10	
Remove	8
Cursor 9	
Install	9
Cursor 9	

Alternator - Overview

F2CE9684A*E004, F2CE9684A*E009, F2CE9684B*E001, F2CE9684C*E001, F2CE9684D*E001, F2CE9684H*E010, F2CE9684L*E005, F2CE9684N*E005, F2CE9684P*E006, F2CE9684P*E008, Cursor 10

Specifications

- Manufacturer - LEECE NEVILLE
- Rating - **12 V; 185 A**



ALTERNATOR2 1

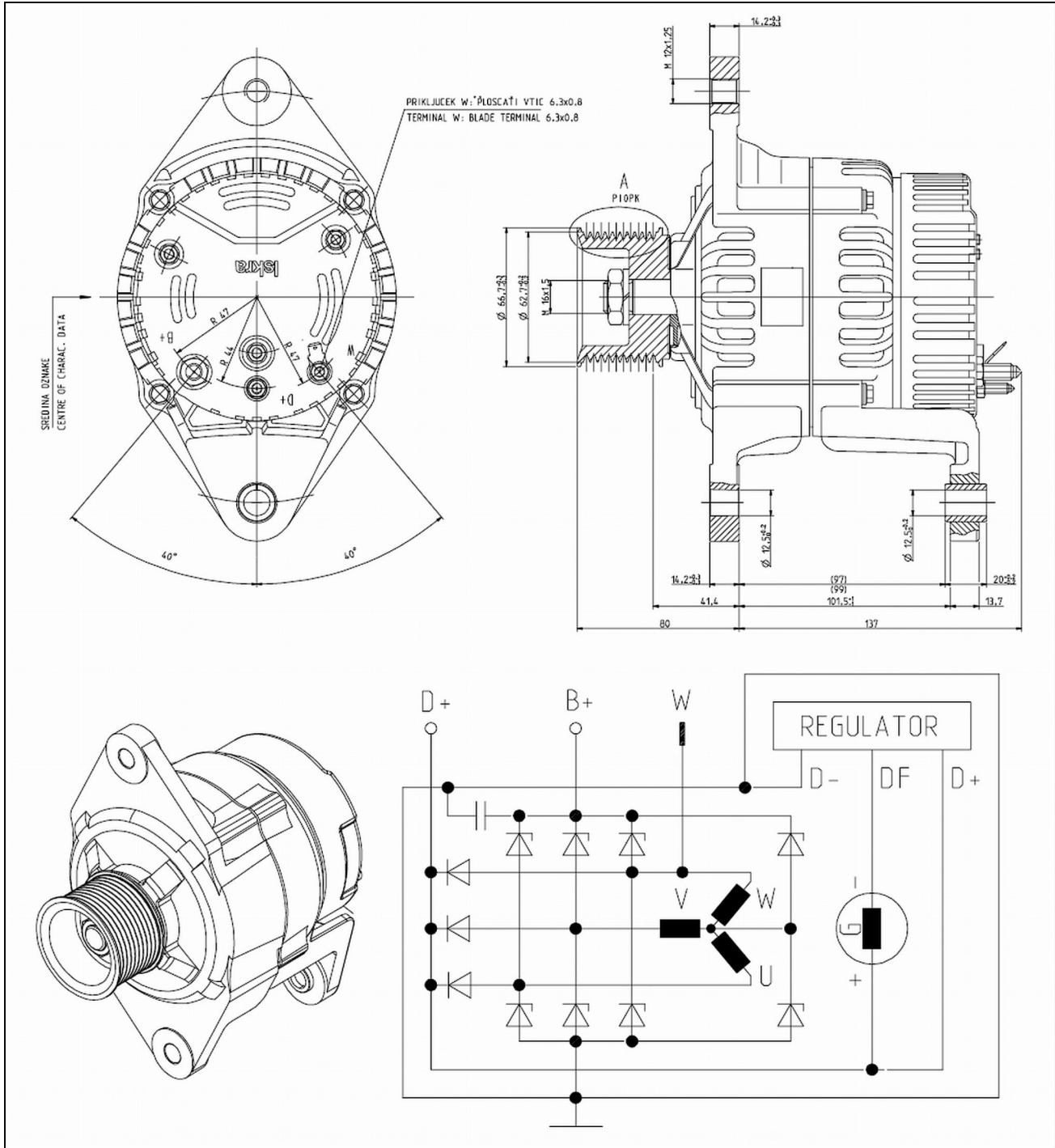
Pin	Description
(R)	AC connector
(L)	Driver warning light connector
(B-)	Negative
(B+)	Positive

Alternator - Overview

F2CE9684C*E002, F2CE9684E*E002

Specifications

- Manufacturer - ISKRA
- Rating - 12 V; 120 A



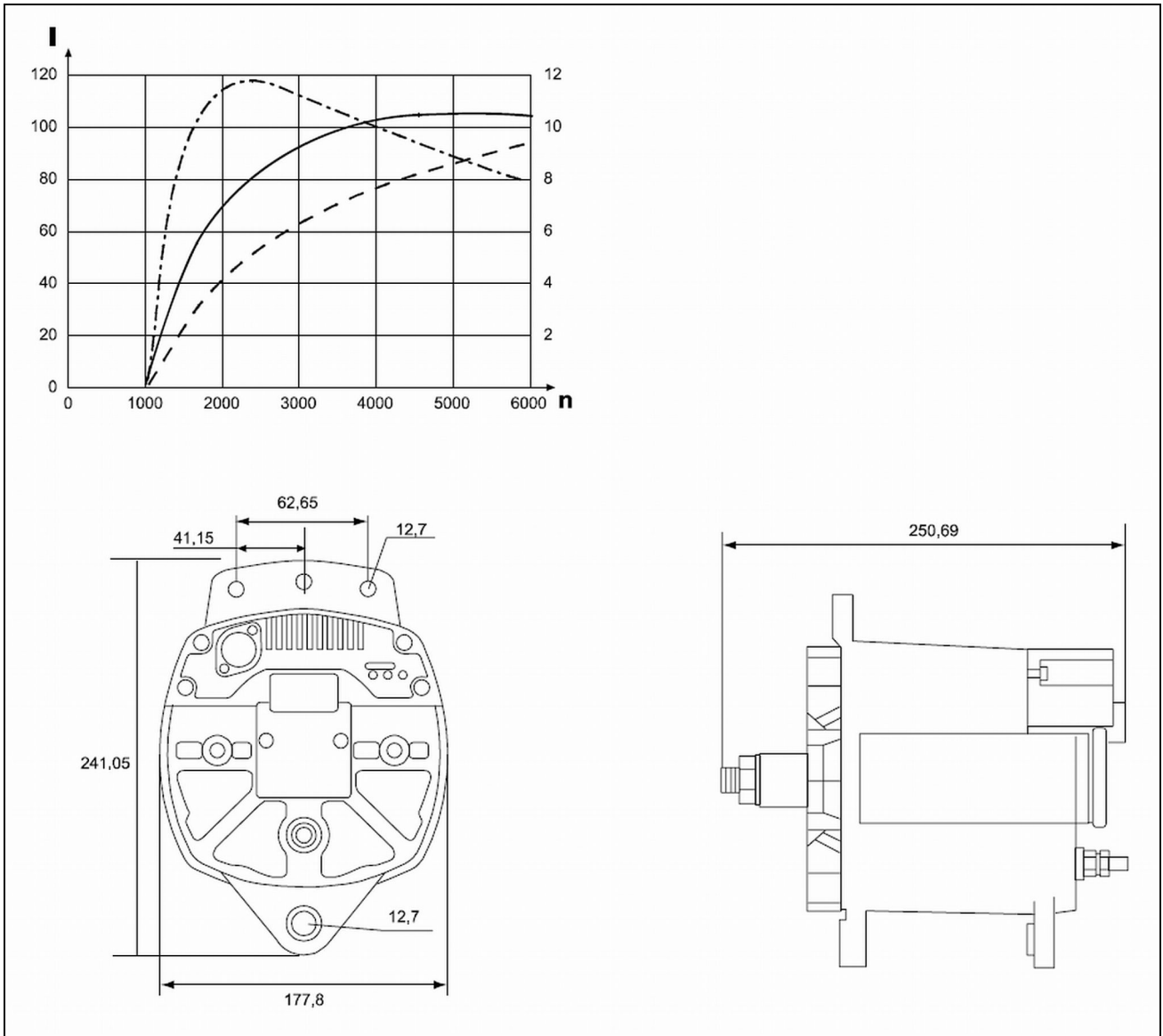
ALTERNATOR 1

Alternator - Overview

F2CE9684H*E003

Specifications

- Manufacturer - LEECE NEVILLE
- Rating - **24 V; 100 A**



ALTERNATOR2 1

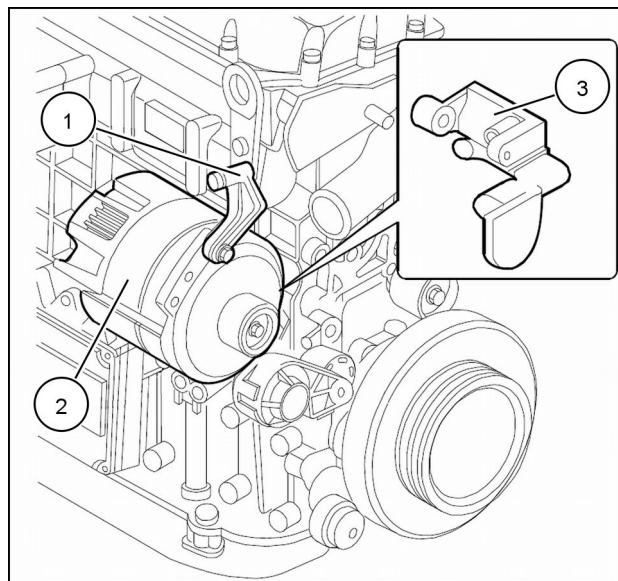
Alternator - Remove

Cursor 10

Prior operation:

Fan and drive Belt - Remove (B.50.A)

1. Remove the alternator (2) and its supporting brackets (1) and (3).



ALTERNATOR 1

Next operation:

Alternator - Install (A.30.A)

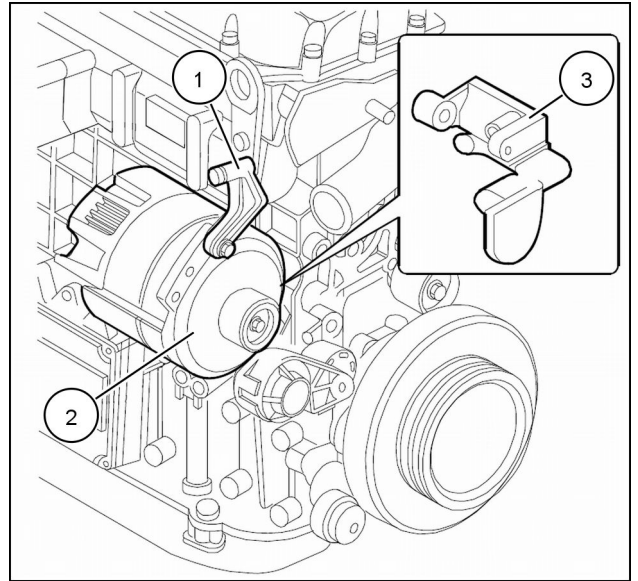
Alternator - Install

Cursor 10

Prior operation:

Alternator - Remove (A.30.A)

1. Install the alternator supports (1) and (3).
2. Install the alternator (2) and tighten the screws to the required torque.



ALTERNATOR 1

Next operation:

Fan and drive Belt - Install (B.50.A)

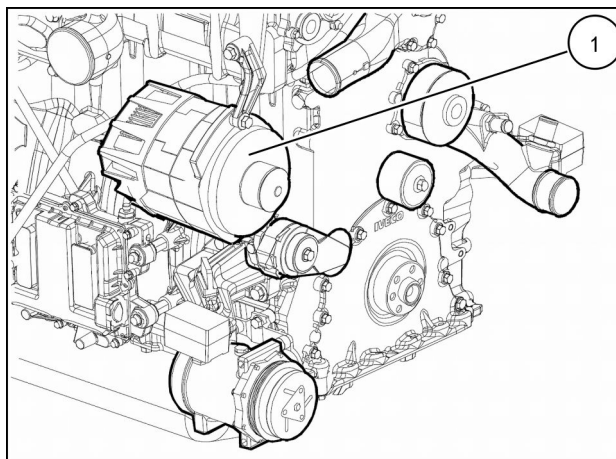
Alternator - Remove

Cursor 9

Prior operation:

Fan and drive Belt - Remove (B.50.A)

1. Remove the alternator (1).



FRONTVIEW6 1

Next operation:

Alternator - Install (A.30.A)

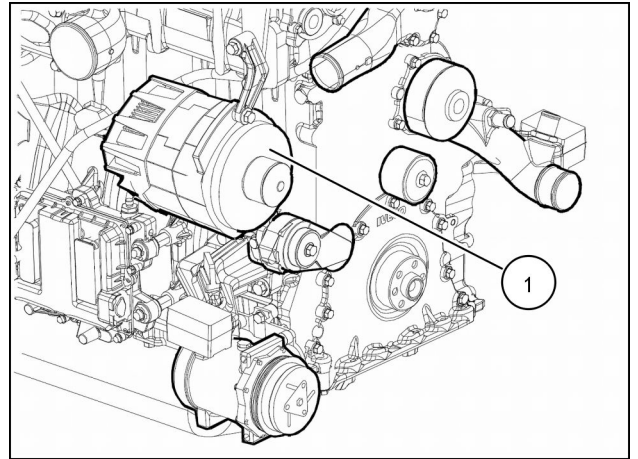
Alternator - Install

Cursor 9

Prior operation:

Alternator - Remove (A.30.A)

1. Install the alternator (1).



FRONTVIEW6 1

Next operation:

Fan and drive Belt - Install (B.50.A)

Index

HYDRAULIC - PNEUMATIC - ELECTRICAL - ELECTRONIC SYSTEMS - A

ELECTRICAL POWER SYSTEM - 30.A

Alternator - Install	7
Cursor 10	
Alternator - Install	9
Cursor 9	
Alternator - Overview	3
F2CE9684A*E004, F2CE9684A*E009, F2CE9684B*E001, F2CE9684C*E001, F2CE9684D*E001, F2CE9684H*E010, F2CE9684L*E005, F2CE9684N*E005, F2CE9684P*E006, F2CE9684P*E008, Cursor 10	
Alternator - Overview	4
F2CE9684C*E002, F2CE9684E*E002	
Alternator - Overview	5
F2CE9684H*E003	
Alternator - Remove	6
Cursor 10	
Alternator - Remove	8
Cursor 9	



ENGINE AND PTO IN - B

ENGINE - 10.A

Cursor 10
Cursor 9

Contents

ENGINE AND PTO IN - B

ENGINE - 10.A

TECHNICAL DATA

ENGINE

General specification	8
F2CE9684A*E004	
General specification	13
F2CE9684A*E009	
General specification	19
F2CE9684B*E001	
General specification	24
F2CE9684C*E001, F2CE9684C*E002	
General specification	30
F2CE9684D*E001	
General specification	36
F2CE9684E*E002	
General specification	41
F2CE9684H*E003, F2CE9684H*E010	
General specification	47
F2CE9684L*E005, F2CE9684N*E005	
General specification	53
F2CE9684P*E006, F2CE9684P*E008	
General specification	58
F3AE0684L*E906	
General specification	64
F3AE0684N*E907	
General specification	70
F3AE0684P*E904, F3AE0684P*E905, F3AE0684P*E906	
General specification	76
F3AE0687S*E908	
Special tools	82
Service limits Maintenance Planning	95
Torque	96
Cursor 9	

FUNCTIONAL DATA

ENGINE

Detailed view	100
F3AE0684P*E904	
Detailed view	105
F3AE0684L*E906, F3AE0684P*E905, F3AE0684P*E906, F3AE0687S*E908	
Detailed view	110
F3AE0684N*E907	

Detailed view	115
F2CE9684A*E004, F2CE9684A*E009, F2CE9684B*E001, F2CE9684C*E001, F2CE9684C*E002, F2CE9684D*E001, F2CE9684E*E002, F2CE9684P*E008	
Detailed view	120
F2CE9684L*E005, F2CE9684N*E005, F2CE9684P*E006	
Valve drive	
Rocker assembly - Overview	125
Cursor 10	
Timing gear	
Overview	128
Cursor 10	
Overview	131
Cursor 9	
Connecting rod and piston	
Exploded view	133
Flywheel	
Detailed view	134
F3AE0684L*E906, F3AE0684P*E904, F3AE0684P*E905, F3AE0684P*E906, F3AE0687S*E908	
Detailed view	135
F3AE0684N*E907	
Detailed view	136
Cursor 9	
Wiring harness	
Detailed view	137
Cursor 9	
Electronic control	
Control module - Overview	139
Cursor 10	
Control module - Overview	147
Cursor 9	
Sensing system	
Overview	155
F3AE0684L*E906, F3AE0684P*E905, F3AE0684P*E906, F3AE0687S*E908	
Overview	157
F3AE0684P*E904	
Overview	159
F3AE0684N*E907	
Drawing	161
Cursor 10	
Flywheel speed sensor - Overview	162
Camshaft speed sensor - Overview	163
Overview	164
Cursor 9	
SERVICE	
ENGINE	
Place on stand	165
Service instruction Finding T.D.C.	166
Valve drive	
Camshaft Gear - Remove	167
Cursor 10	
Rocker assembly - Remove	168
Cursor 10	

Camshaft - Remove	169
Cursor 10	
Camshaft - Install	170
Cursor 10	
Camshaft Gear - Install	171
Cursor 10	
Camshaft Gear - Backlash	172
Cursor 10	
Rocker assembly Crosshead - Install	173
Cursor 10	
Rocker assembly - Install	174
Cursor 10	
Camshaft - Timing check	175
Cursor 10	
Camshaft - Timing adjust	176
Cursor 10	
Camshaft Timing plate - Alignment	178
Cursor 10	
Rocker assembly Rocker arm - Clearance	179
Cursor 10	
Valve assembly Valve - Cleaning	181
Cursor 10	
Valve assembly Valve - Measure	182
Cursor 10	
Camshaft - Measure	183
Camshaft Bushing - Replace	184
Cursor 10	
Valve assembly Spring - Check	187
Cursor 10	
Camshaft Gear - Remove	188
Cursor 9	
Rocker assembly - Remove	189
Cursor 9	
Camshaft - Remove	190
Cursor 9	
Camshaft - Install	191
Cursor 9	
Camshaft - Timing check	192
Cursor 9	
Camshaft - Timing adjust	193
Cursor 9	
Rocker assembly Crosshead - Install	194
Cursor 9	
Rocker assembly - Install	195
Cursor 9	
Camshaft Timing plate - Alignment	196
Cursor 9	
Rocker assembly Rocker arm - Clearance	197
Cursor 9	
Valve assembly Valve - Measure	199
Cursor 9	
Valve assembly Spring - Check	200
Cursor 9	

Auxiliary drive

Remove	201
Cursor 10	
Install	202
Cursor 10	
Crankshaft	
Front seal - Remove	203
Cursor 10	
Rear seal - Remove	204
Front seal - Install	205
Cursor 10	
Rear seal - Install	206
Remove	207
Main bearing - Remove	208
Measure	209
Cursor 10	
Gear - Replace	220
Journal - Clearance	221
Cursor 10	
End play	224
Front seal - Remove	225
Cursor 9	
Front seal - Install	226
Journal - Clearance	227
Cursor 9	
Timing gear	
Remove	229
Cursor 10	
Install	230
Cursor 10	
Remove	231
Cursor 9	
Install	232
Cursor 9	
Connecting rod and piston	
Remove	234
Disassemble	235
Piston - Measure	237
Cursor 10	
Piston Pin - Measure	238
Cursor 10	
Connecting rod - Measure	239
Cursor 10	
Piston Ring - Measure	242
Cursor 10	
Assemble	244
Install	246
Cursor 10	
Piston - Measure	248
Cursor 9	
Connecting rod - Measure	249
Cursor 9	

Install	251
Cursor 9	
Flywheel	
Remove	253
Install	254
Cursor 10	
Install	255
Cursor 9	
Vibration damper	
Remove	256
Cursor 10	
Install	257
Cursor 10	
Remove	258
Cursor 9	
Install	259
Cursor 9	
Cylinder block	
Under block - Remove	260
Liner - Measure	261
Cursor 10	
Liner - Remove	264
Liner - Install	265
Cursor 9, F3AE0684L*E906, F3AE0684N*E907, F3AE0684P*E904, F3AE0684P*E905, F3AE0684P*E906, F3AE0687S*E908	
Liner - Measure Protrusion	266
Cursor 10	
Under block - Install	267
Cursor 10	
Liner - Measure	272
Cursor 9	
Liner - Measure Protrusion	274
Cursor 9	
Cylinder head	
Remove	275
Cursor 10	
Install	276
Cursor 10	
Disassemble	278
Check	279
Valve seat - Replace	280
Cursor 10	
Valve guide - Replace	282
Cursor 10	
Injector Cup - Replace	283
Cursor 10	
Assemble	290
Remove	291
F2CE9684A*E004, F2CE9684A*E009, F2CE9684B*E001, F2CE9684C*E001, F2CE9684C*E002, F2CE9684D*E001, F2CE9684E*E002, F2CE9684H*E003, F2CE9684H*E010, F2CE9684L*E005, F2CE9684N*E005, F2CE9684P*E006, F2CE9684P*E008	
Install	292
Cursor 9	

Valve seat - Replace	294
Cursor 9	
Valve guide - Replace	296
Cursor 9	
Injector Cup - Replace	297
Cursor 9	
Valve cover	
Remove	304
Cursor 10	
Install	305
Cursor 10	
Remove	306
Cursor 9	
Install	307
Cursor 9	
Front cover	
Remove	308
Cursor 9	
Install	309
Cursor 9	
Rear cover	
Remove	310
Cursor 10	
Install	311
Cursor 10	
Remove	312
Cursor 9	
Install	313
Cursor 9	
Wiring harness	
Install	314
Cursor 9	
Electronic control	
Control module - Remove	315
Cursor 10	
Control module - Install	316
Cursor 10	
Control module - Remove	317
Cursor 9	
Control module - Install	318
Cursor 9	
Sensing system	
Camshaft speed sensor - Remove	319
Cursor 9	

ENGINE - General specification

F2CE9684A*E004

Engine Ratings	
Power @ Rated speed	260 kW (354 Hp) @ 2100 RPM
Maximum Power	290 kW (394 Hp) @ 1800 RPM
Maximum Torque	1600 Nm (1180 lb ft) @ 1500 RPM
Engine RPM	975 - 1025 RPM
<ul style="list-style-type: none"> Idle (no load) Peak (no load) 	2100 RPM

Engine Specifications	
Compression Ratio	15.9: 1
Bore	117 mm (4.6 in)
Stroke	135 mm (5.3 in)
Displacement	8710 cm³
Turbocharging	Inter-cooled, Direct injection
Turbocharger type	HX40
Lubrication	Forced by gear pump, relief valve single action oil filter
Oil Pressure (Warm engine)	
<ul style="list-style-type: none"> Idling Peak RPM 	4 bar (58 psi) 5 bar (73 psi)
Cooling	Liquid cooled
Water pump control	Belt driven
Thermostat	
<ul style="list-style-type: none"> Start of opening 	83.5 - 86.5 °C (182.3 - 187.7 °F)
Valve Timing	
<ul style="list-style-type: none"> Intake <ul style="list-style-type: none"> Opens before TDC Closes after BDC Exhaust <ul style="list-style-type: none"> Opens before BDC Closes after TDC 	17 ° 31 ° 48 ° 9 °
Valve lash setting (when engine is cold)	
<ul style="list-style-type: none"> Intake Exhaust 	0.35 - 0.45 mm (0.014 - 0.018 in) 0.55 - 0.65 mm (0.022 - 0.026 in)
Firing Order	1 - 4 - 2 - 6 - 3 - 5
Injection pressure	1800 bar (26100 psi)
Injector calibration	290 - 302 bar (4205 - 4379 psi)
Cylinder Block and Crank Mechanism Components	

ENGINE AND PTO IN - ENGINE

Bores for cylinder liners:	
• Upper	130.500 - 130.525 mm (5.138 - 5.139 in)
• Lower	129.510 - 129.535 mm (5.099 - 5.100 in)
Cylinder liners external diameter:	
• Upper	130.461 - 130.486 mm (5.136 - 5.137 in)
• Lower	129.475 - 129.500 mm (5.097 - 5.098 in)
Clearance between the OD of liners and ID of bores	
• Upper	0.014 - 0.064 mm (0.001 - 0.003 in)
• Lower	0.010 - 0.060 mm (0.0004 - 0.0024 in)
Cylinder liner	
• ID	117.000 - 117.012 mm (4.606 - 4.607 in)
• ID	117.010 - 117.022 mm (4.607 - 4.607 in)
• Protrusion	0.035 - 0.065 mm (0.001 - 0.003 in)
Pistons	
• Measuring dimension	15 mm (0.591 in)
• External diameter (supplied as spares)	116.894 - 116.906 mm (4.602 - 4.603 in)
• External diameter (production only)	116.904 - 116.916 mm (4.603 - 4.603 in)
• Pin bore	52.016 - 52.022 mm (2.048 - 2.048 in)
OD of piston - ID of cylinder liner	0.094 - 0.118 mm (0.004 - 0.005 in)
Piston protrusion	0.873 - 1.117 mm (0.034 - 0.044 in)
Piston pin diameter	51.994 - 52.000 mm (2.047 - 2.047 in)
Piston pin OD - pin bore	0.016 - 0.028 mm (0.0006 - 0.0011 in)
Piston ring grooves	
• Top	3.120 - 3.140 mm (0.123 - 0.124 in)
• Middle	2.550 - 2.570 mm (0.100 - 0.101 in)
• Bottom	4.02 - 4.04 mm (0.158 - 0.159 in)
Piston rings	
• Combustion ring	3.000 mm (0.118 in)
• Intermediate ring	2.470 - 2.500 mm (0.097 - 0.098 in)
• Oil control ring	3.970 - 3.990 mm (0.156 - 0.157 in)
Clearance between piston rings and grooves	
• Combustion ring	-
• Intermediate ring	0.050 - 0.100 mm (0.002 - 0.004 in)
• Oil control ring	0.030 - 0.070 mm (0.001 - 0.003 in)

ENGINE AND PTO IN - ENGINE

Piston ring end gap in cylinder liners	
<ul style="list-style-type: none"> • Combustion ring • Intermediate ring • Oil control ring 	<p>0.3 - 0.4 mm (0.012 - 0.016 in)</p> <p>0.60 - 0.75 mm (0.024 - 0.030 in)</p> <p>0.35 - 0.65 mm (0.014 - 0.026 in)</p>
Connecting rod	
<ul style="list-style-type: none"> • Small end bush housing <ul style="list-style-type: none"> • Nominal • Big end bearing housing <ul style="list-style-type: none"> • Nominal • Class 1 • Class 2 • Class 3 	<p>55.700 - 55.730 mm (2.193 - 2.194 in)</p> <p>85.987 - 86.013 mm (3.385 - 3.386 in)</p> <p>85.987 - 85.996 mm (3.385 - 3.386 in)</p> <p>85.997 - 86.005 mm (3.386 - 3.386 in)</p> <p>86.006 - 86.013 mm (3.386 - 3.386 in)</p>
Small end bush diameter	
<ul style="list-style-type: none"> • Outside • Inside 	<p>55.780 - 55.820 mm (2.196 - 2.198 in)</p> <p>52.015 - 52.030 mm (2.048 - 2.048 in)</p>
Big end bearing shell thickness	
<ul style="list-style-type: none"> • Red • Green • Yellow 	<p>1.994 - 2.002 mm (0.079 - 0.079 in)</p> <p>2.002 - 2.010 mm (0.079 - 0.079 in)</p> <p>2.010 - 2.018 mm (0.079 - 0.079 in)</p>
Clearance between small end bush and housing	0.05 - 0.12 mm (0.002 - 0.005 in)
Clearance between piston pin and bush	0.015 - 0.036 mm (0.001 - 0.001 in)
Connecting rod weight	
<ul style="list-style-type: none"> • Class A • Class B • Class C 	<p>3450 - 3470 g (121.7 - 122.4 oz)</p> <p>3471 - 3490 g (122.4 - 123.1 oz)</p> <p>3491 - 3510 g (123.1 - 123.8 oz)</p>
Maximum connecting rod axis misalignment tolerance	0.08 mm (0.003 in)
Crankshaft main journals	
<ul style="list-style-type: none"> • Rated value • Class 1 • Class 2 • Class 3 	<p>92.970 - 93.000 mm (3.6602 - 3.6614 in)</p> <p>92.970 - 92.979 mm (3.6602 - 3.6606 in)</p> <p>92.980 - 92.989 mm (3.6606 - 3.6610 in)</p> <p>92.990 - 93.000 mm (3.6610 - 3.6614 in)</p>

Crankpins	
• Rated value	81.915 - 81.945 mm (3.225 - 3.226 in)
• Class 1	81.915 - 81.925 mm (3.225 - 3.225 in)
• Class 2	81.915 - 81.925 mm (3.225 - 3.225 in)
• Class 3	81.925 - 81.935 mm (3.225 - 3.226 in)
	81.935 - 81.945 mm (3.226 - 3.226 in)
Main bearing shells	
• Red	2.968 - 2.978 mm (0.117 - 0.117 in)
• Green	2.978 - 2.988 mm (0.117 - 0.118 in)
• Yellow	2.988 - 2.998 mm (0.118 - 0.118 in)
Big end bearing shells	
• Red	1.994 - 2.002 mm (0.079 - 0.079 in)
• Green	2.002 - 2.010 mm (0.079 - 0.079 in)
• Yellow	2.010 - 2.018 mm (0.079 - 0.079 in)
Main bearing housings	
• Rated value	99.000 - 99.030 mm (3.8976 - 3.8988 in)
• Class 1	99.000 - 99.009 mm (3.8976 - 3.8980 in)
• Class 2	99.010 - 99.019 mm (3.8980 - 3.8984 in)
• Class 3	99.010 - 99.019 mm (3.8980 - 3.8984 in)
	99.020 - 99.030 mm (3.8984 - 3.8988 in)
Clearance between bearing shells and main journals	0.050 - 0.090 mm (0.0020 - 0.0035 in)
Clearance between bearing shells and big ends	0.040 - 0.080 mm (0.0016 - 0.0031 in)
Main journal, thrust bearing	39.96 - 40.04 mm (1.573 - 1.576 in)
Main bearing housing, thrust bearing	38.94 - 38.99 mm (1.533 - 1.535 in)
Thrust bearing thickness	3.38 - 3.43 mm (0.133 - 0.135 in)
Crankshaft end play	0.10 - 0.30 mm (0.0039 - 0.0118 in)
Main journals and Crankpins	
• Alignment	-
• Ovalization	0.04 mm (0.002 in)
• Taper	-
Cylinder Head and Valve Train	
Valve guide housing in cylinder head	12.980 - 12.997 mm (0.511 - 0.512 in)
Valve guide	
• Inside diameter	8.023 - 8.038 mm (0.316 - 0.316 in)
• Outside diameter	13.012 - 13.025 mm (0.512 - 0.513 in)
Valve guides - housings in the cylinder head	0.015 - 0.045 mm (0.0006 - 0.0018 in)

ENGINE AND PTO IN - ENGINE

Valves	
<ul style="list-style-type: none"> • Intake <ul style="list-style-type: none"> • Valve stem diameter • Valve face angle • Exhaust <ul style="list-style-type: none"> • Valve stem diameter • Valve face angle 	<p>7.970 - 7.985 mm (0.314 - 0.314 in)</p> <p>60 °</p> <p>7.970 - 7.985 mm (0.314 - 0.314 in)</p> <p>45 °</p>
Clearance between valve guide and valve stem	0.040 - 0.070 mm (0.0016 - 0.0028 in)
Valve seat in cylinder head.	
<ul style="list-style-type: none"> • Intake • Exhaust 	<p>41.985 - 42.020 mm (1.653 - 1.654 in)</p> <p>40.985 - 41.020 mm (1.614 - 1.615 in)</p>
Outside diameter of valve seat:	
<ul style="list-style-type: none"> • Intake • Exhaust 	<p>42.060 - 42.075 mm (1.656 - 1.656 in)</p> <p>41.060 - 41.075 mm (1.617 - 1.617 in)</p>
Valve seat angle	
<ul style="list-style-type: none"> • Intake • Exhaust 	<p>60 °</p> <p>45 °</p>
Recessing of the valves:	
<ul style="list-style-type: none"> • Intake • Exhaust 	<p>0.5 - 0.8 mm (0.020 - 0.031 in)</p> <p>1.6 - 1.9 mm (0.063 - 0.075 in)</p>
Clearance between valve seat and cylinder head	
<ul style="list-style-type: none"> • Intake • Exhaust 	<p>0.040 - 0.090 mm (0.0016 - 0.0035 in)</p> <p>0.040 - 0.090 mm (0.0016 - 0.0035 in)</p>
Valve spring height:	
<ul style="list-style-type: none"> • Free Height • Under a load of: <ul style="list-style-type: none"> • 437 - 483 N (98 - 109 lb) • 707 - 773 N (159 - 174 lb) 	<p>70.77 mm (2.786 in)</p> <p>51.00 mm (2.008 in)</p> <p>39.00 mm (1.535 in)</p>
Injector protrusion	1.2 - 1.5 mm (0.047 - 0.059 in)
Camshaft bushing housing in the cylinder head	69.000 - 69.030 mm (2.717 - 2.718 in)
Camshaft bearing journals	64.924 - 64.940 mm (2.556 - 2.557 in)
O.D. of the camshaft bushings	69.090 - 69.155 mm (2.720 - 2.723 in)
I.D. of the camshaft bushings	64.990 - 65.045 mm (2.559 - 2.561 in)
Clearance between bushings and housings in the cylinder head	0.060 - 0.115 mm (0.002 - 0.005 in)



Suggest:

For more complete manuals. Please go to the home page.

<https://www.ebooklibonline.com>

If the above button click is invalid. Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

Clearance between bushings and bearing journals	0.050 - 0.122 mm (0.002 - 0.005 in)
Cam lift:	
• Intake lobe	7.4034 mm (0.2915 in)
• Exhaust lobe	8.2108 mm (0.3233 in)
Diameter of the rocker shaft	31.964 - 31.980 mm (1.258 - 1.259 in)
Bushing housing in the rocker arms	
• Intake	32.025 - 32.041 mm (1.261 - 1.261 in)
• Exhaust	32.025 - 32.041 mm (1.261 - 1.261 in)
Clearance between bushings and housings	
• Intake	0.074 - 0.130 mm (0.0029 - 0.0051 in)
• Exhaust	0.081 - 0.140 mm (0.0032 - 0.0055 in)
• Injector	0.050 - 0.091 mm (0.0020 - 0.0036 in)
Clearance between bushings of rocker arms and shaft	
• Intake	0.045 - 0.077 mm (0.002 - 0.003 in)
• Exhaust	0.045 - 0.077 mm (0.002 - 0.003 in)

ENGINE - General specification

F2CE9684A*E009

Engine Ratings	
Power @ Rated speed	260 kW (354 Hp) @ 2100 RPM
Maximum Power	290 kW (394 Hp) @ 1800 RPM
Maximum Torque	1600 Nm (1180 lb ft) @ 1500 RPM
Engine RPM	
• Idle (no load)	975 - 1025 RPM
• Peak (no load)	2100 RPM

Engine Specifications	
Compression Ratio	15.9: 1
Bore	117 mm (4.6 in)
Stroke	135 mm (5.3 in)
Displacement	8710 cm³
Turbocharging	Inter-cooled, Direct injection
Turbocharger type	HX55
Lubrication	Forced by gear pump, relief valve single action oil filter

ENGINE AND PTO IN - ENGINE

Oil Pressure (Warm engine)	
• Idling	4 bar (58 psi)
• Peak RPM	5 bar (73 psi)
Cooling	Liquid cooled
Water pump control	Belt driven
Thermostat	
• Start of opening	83.5 - 86.5 °C (182.3 - 187.7 °F)
Valve Timing	
• Intake	
• Opens before TDC	17 °
• Closes after BDC	
• Exhaust	
• Opens before BDC	31 °
• Closes after TDC	
	48 °
	9 °
Valve lash setting (when engine is cold)	
• Intake	0.35 - 0.45 mm (0.014 - 0.018 in)
• Exhaust	0.55 - 0.65 mm (0.022 - 0.026 in)
Firing Order	1 - 4 - 2 - 6 - 3 - 5
Injection pressure	1800 bar (26100 psi)
Injector calibration	290 - 302 bar (4205 - 4379 psi)
Cylinder Block and Crank Mechanism Components	
Bores for cylinder liners:	
• Upper	130.500 - 130.525 mm (5.138 - 5.139 in)
• Lower	129.510 - 129.535 mm (5.099 - 5.100 in)
Cylinder liners external diameter:	
• Upper	130.461 - 130.486 mm (5.136 - 5.137 in)
• Lower	129.475 - 129.500 mm (5.097 - 5.098 in)
Clearance between the OD of liners and ID of bores	
• Upper	0.014 - 0.064 mm (0.001 - 0.003 in)
• Lower	0.010 - 0.060 mm (0.0004 - 0.0024 in)
Cylinder liner	
• ID	117.000 - 117.012 mm (4.606 - 4.607 in)
• ID	117.010 - 117.022 mm (4.607 - 4.607 in)
• Protrusion	0.035 - 0.065 mm (0.001 - 0.003 in)

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>