

SERVICE MANUAL

E18C Mini Excavator

Part number 48139720
English
June 2017





SERVICE MANUAL

**E18C Cab - Tier IV engine
E18C Canopy - Tier IV engine**

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INTRODUCTION

Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your NEW HOLLAND CONSTRUCTION Sales and Service Networks.

Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - General information

Cleaning

Clean the metal parts with cleaning solution that meets the standard and steam cleaning. (except for bearings)

After cleaning, dry well, and inject oil in all parts.

Also inject oil into the bearings after drying.

Inspection

When disassembling parts, check all the parts.

If there are any worn or damaged parts, replace them.

Inspect carefully to prevent initial breakdowns.

Bearing

Replace any loose bearings.

Air dry bearings before installing them.

Needle bearing

When inserting needle bearings, be very careful not to damage them.

Apply grease to the section where the needle bearing will be inserted.

Gear

Check that there is no wear and no damage.

Oil seal, O-ring, gasket

Always install new oil seals, O-rings, and gaskets.

Apply grease to sections where oil seals and O-rings will be inserted.

Shaft

Check that there is no wear and no damage.

Check the bearings and check for damaged oil seals on the shaft.

Service parts

Install NEW HOLLAND CONSTRUCTION genuine service parts.

When placing an order, check the parts catalog. It contains the NEW HOLLAND CONSTRUCTION genuine part numbers.

Any breakdowns arising from the installation of non-genuine parts are not covered by the warranty.

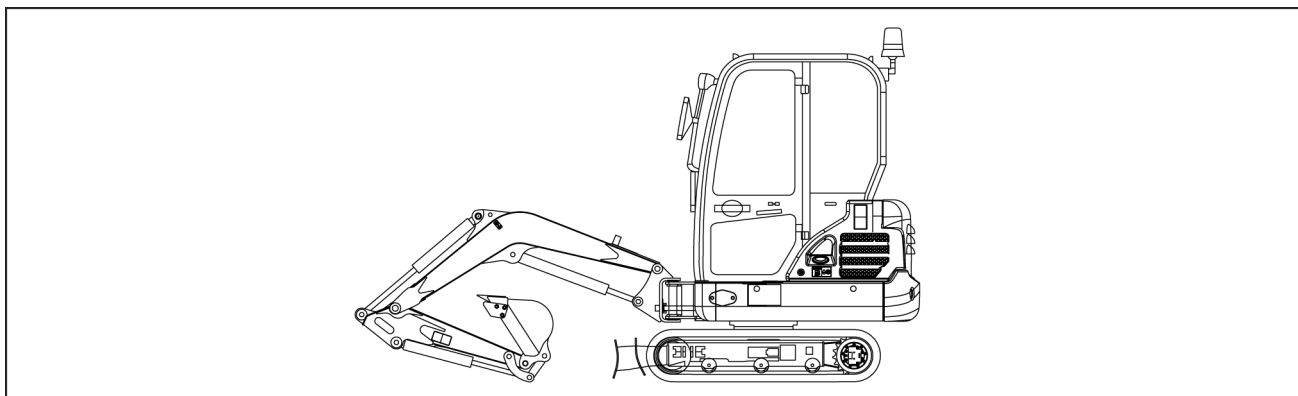
Lubricants (fuel, hydraulic oil)

Use the oil from the specified company or specified in the operator's manual or service Manual.

Any breakdowns arising from any fuel or hydraulic oil other than those specified are not covered by the warranty.

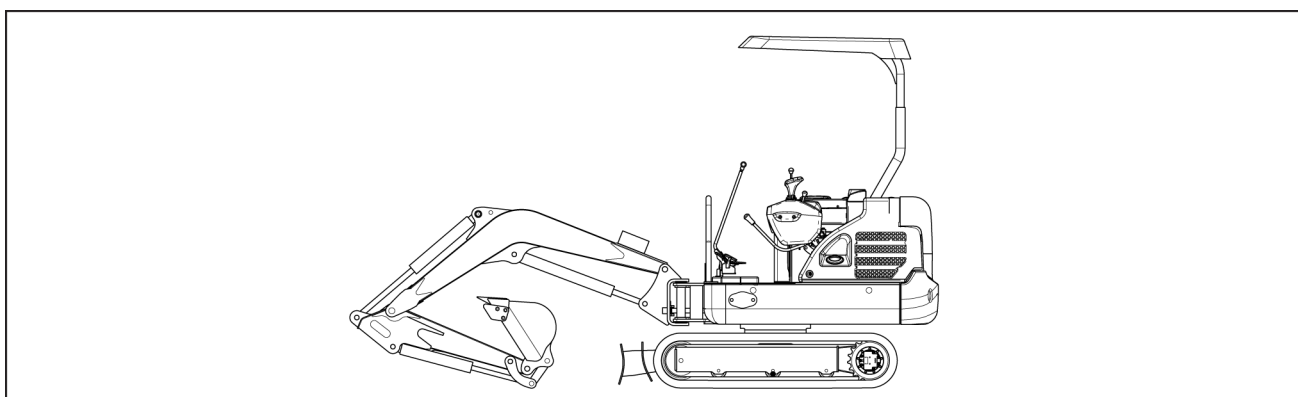
Product identification

Your machine is a hydraulic excavator. It consists of an undercarriage fitted with tracks and a swing bearing which supports the upper-structure frame. The upper-structure frame supports the attachment at the front end of the machine, plus the engine, hydraulics and the cab/canopy. When the operator works the controls, the engine-driven pump delivers hydraulic fluid to the control valves. The control valves distribute the hydraulic fluid to the various cylinders and hydraulic motors employed. A cooling system maintains the hydraulic fluid at normal operating temperature.



SMIL16MEX3242EA 1

Cab version



SMIL16MEX2263EA 2

Canopy version

When ordering parts, obtaining information, or seeking assistance, always supply your NEW HOLLAND CONSTRUCTION Dealer with the type and Product Identification Number (PIN) of your machine or accessories.

Write the following in the spaces below:

- Machine Type
- Machine PIN
- Machine year of manufacture
- Serial numbers of hydraulic and mechanical components



SERVICE MANUAL

Engine

**E18C Cab - Tier IV engine
E18C Canopy - Tier IV engine**

Engine - General specification

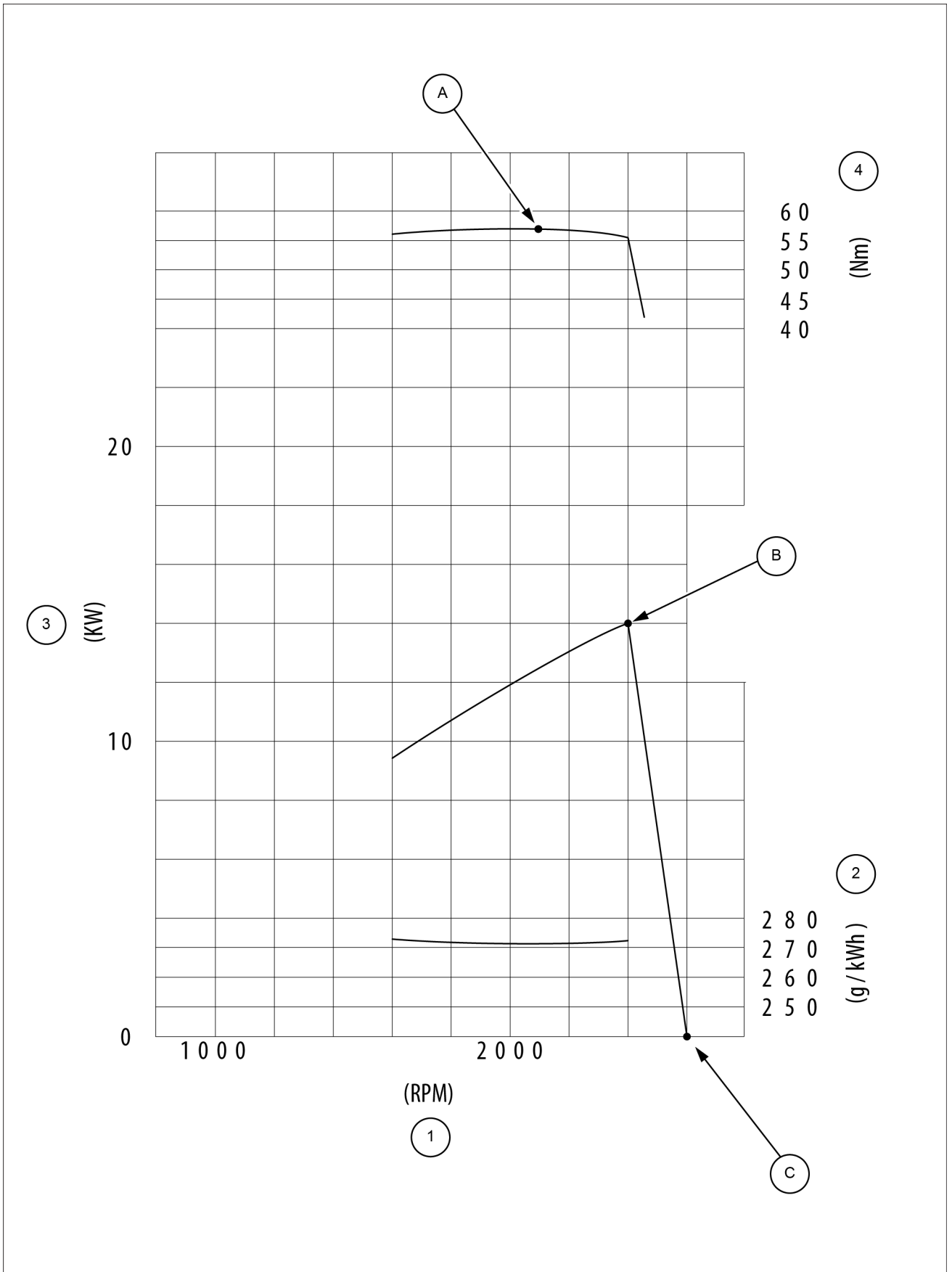
Engine model			Mitsubishi L3E	
Main specifications	Type		Vertical type, water-cooled, 4 cycle diesel	
	Number of cylinders		3	
	Combustion type		Swirl chamber type	
	Valve mechanism		Overhead valve type	
	Cylinder bore x stroke		76 mm (3.0 in) x 70 mm (2.8 in)	
	Total displacement		0.952 L (0.251 US gal)	
	Compression ratio		23 : 1	
	Order of ignition		1 – 3 – 2	
	Direction of rotation		Counterclockwise as viewed from flywheel side	
	Dry mass		75 kg (165 lb)	
Basic engine	Piston ring	Number	Compression ring: 2 Oil rings (with expander): 1	
	Valve timing (when warm)	Inlet valve	Open	BTDC 18°
			Close	ABDC 46°
		Exhaust valve	Open	BBDC 46°
			Close	ATDC 18°
Starting system		Electric starting		
Fuel system	Fuel injection pump	Type	ND-PFR type	
		Plunger diameter	5.5 mm (0.22 in), 6.0 mm (0.24 in)	
		MS retard (crank angle)	4°, 8°	
		Cam lift	6.0 mm (0.24 in)	
	Governor	Speed governing type	Centrifugal weight system	
	Fuel injection nozzle	Type	Throttle type	
		Spray angle	15°	
		Valve opening pressure	12.73 – 14.73 MPa (1846.49 – 2136.59 psi)	
	Fuel filter	Type	Paper-element cartridge or paper-element switch cock	
	Fuel pump	Type	Electromagnetic plunger type	
		Discharge rate	1 L/min (0.26 US gpm) or more (at 12 V - 1.5 A)	
	Fuel pump (option)	Type	Electromagnetic plunger type (compact type)	
Discharge rate		0.4 L/min (0.11 US gpm) or more (at 12 V - 1.5 A)		
Lubrication system	Lubrication system		Pressure feed, full flow filter system	
	Engine oil	Capacity (engine total)	Upper limit: 4.2 L (1.11 US gal) Lower limit: 3.0 L (0.79 US gal)	
			(Upper limit: 4.7 L (1.24 US gal) Lower limit: 3.5 L (0.92 US gal))	
	Oil pump	Type	Gear type (internal and external teeth engagement), built into gear case	
		Discharge rate	3 L/min (0.79 US gpm) or more (at 1000 RPM)	
	Relief valve	Type	Plunger valve type	
		Valve opening pressure	0.261 – 0.319 MPa (37.858 – 46.271 psi) (1000 RPM)	
Oil filter	Type	Paper-element cartridge		

Engine - Engine and crankcase

Engine model		Mitsubishi L3E	
Cooling system	Cooling system	Forced-feed circulation type	
	Coolant capacity (main unit of engine)	1.8 L (0.48 US gal)	
	Water pump	Type	Centrifugal volute type
		Discharge rate	50 L/min (13.21 US gpm) at pump rotation of 4500 RPM
	Thermostat	Type	Wax pellet
		Valve opening pressure	75 – 78 °C (167 – 172 °F)
	Cooling fan	Type	Suction (PP fan)
Outside diameter		320 mm (12.6 in)	
Inlet system	Air cleaner	Type Paper element	
Electrical system	Engine starter	Type	M001T68381
		Pinion engagement type	Pinion shift (reduction type)
		Output	12 V - 1.7 kW
		Number	1
		Pinion/ring gear ratio	14 / 106
	Alternator	Type	A007TA0171B
		Type	Three-phase current generator, integral with IC regulator
		Output	12 V - 40 A
		Rated voltage generating speed	5000 RPM at 13.5 V, 37 A , when hot
		Regulator adjusting voltage	14.4 – 15 V
	Glow plug	Type	Sheathed
		Rated voltage - current	10.5 V, 8.7 – 10.7 A (30 seconds duration)
	Stop solenoid	Working voltage	12 V
		Insulation resistance	100 MΩ or more at DC 500 V megger (normal temperature, normal relative humidity)
		Stroke	9.5 – 10.5 mm (0.374 – 0.413 in)
		Ambient temperature for use	-30 – 120 °C (-22 – 248 °F)

Engine - Engine horse power

Performance curve



SMIL17MEX1190HB 1

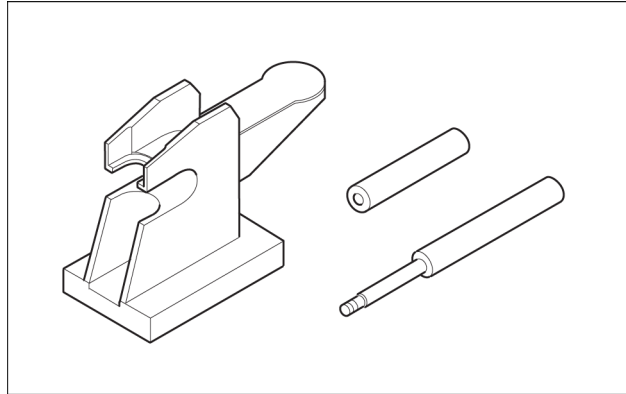
1. Engine speed (RPM)
 2. Fuel consumption (g/kWh)
 3. Output (kW)
 4. Torque (Nm)
- A. **57.1 N·m / 2100 RPM**
 - B. **14 kW / 2400 RPM**
 - C. **NL / 2570 – 2630 RPM**

Engine - Special tools

Piston pin setting tool

Part number: 30L91–10010

For pulling out and press fitting the piston pins

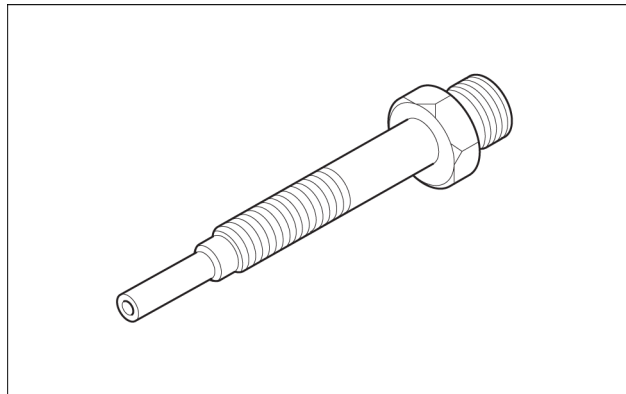


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Compression gauge adapter

Part number: ST332270

For measuring compression

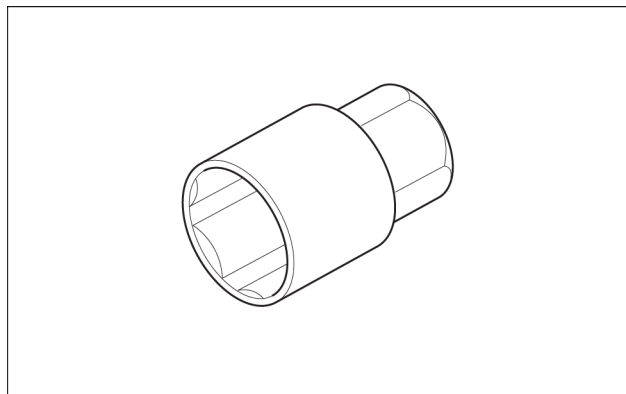


SMIL17MEX1278AA 2

Oil pressure switch socket wrench

Part number: MD998054

For removal and installation of oil pressure switch

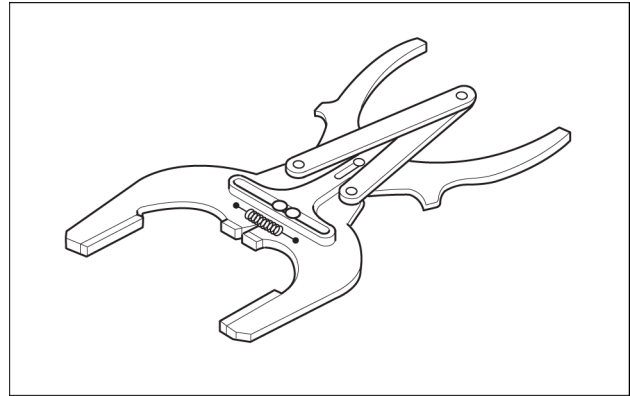


SMIL17MEX1279AA 3

Piston ring pliers

Part number: 31391-12900

Range applicable for removal and installation of the piston rings: **60 – 95 mm (2.36 – 3.74 in)**



SMIL17MEX1280AA 4

Engine - Service limits

Item		Standard	Limit	Remark
Compression pressure at 280 RPM		2.7 MPa (391.6 psi)	Not acceptable at or below 2.2 MPa (319.1 psi)	When oil and water temperatures at 20 – 30 °C (68 – 86 °F)
Lubricating oil pressure	Rotating speed	0.29 – 0.39 MPa (42.06 – 56.57 psi)		Oil temperature at 60 – 70 °C (140 – 158 °F)
	Low idling	0.1 MPa (14.5 psi)		
Valve timing	Inlet open	BTDC 18°		Values for checking valve timing Different from actual valve opening and closing timing
	Inlet open	ABDC 46°		
	Exhaust open	BBDC 46°		
	Exhaust open	ATDC 18°		
Valve clearance	Inlet	0.25 mm (0.01 in)		When engine is cold
	Exhaust	0.25 mm (0.01 in)		
Fuel injection timing (before TDC)		(Varies depending on specification)		

ABCD – After Bottom Dead Center
 BBDC – Before Bottom Dead Center
 ATDC – After Top Dead Center
 BTDC – Before Top Dead Center



Suggest:

If the above button click is invalid.

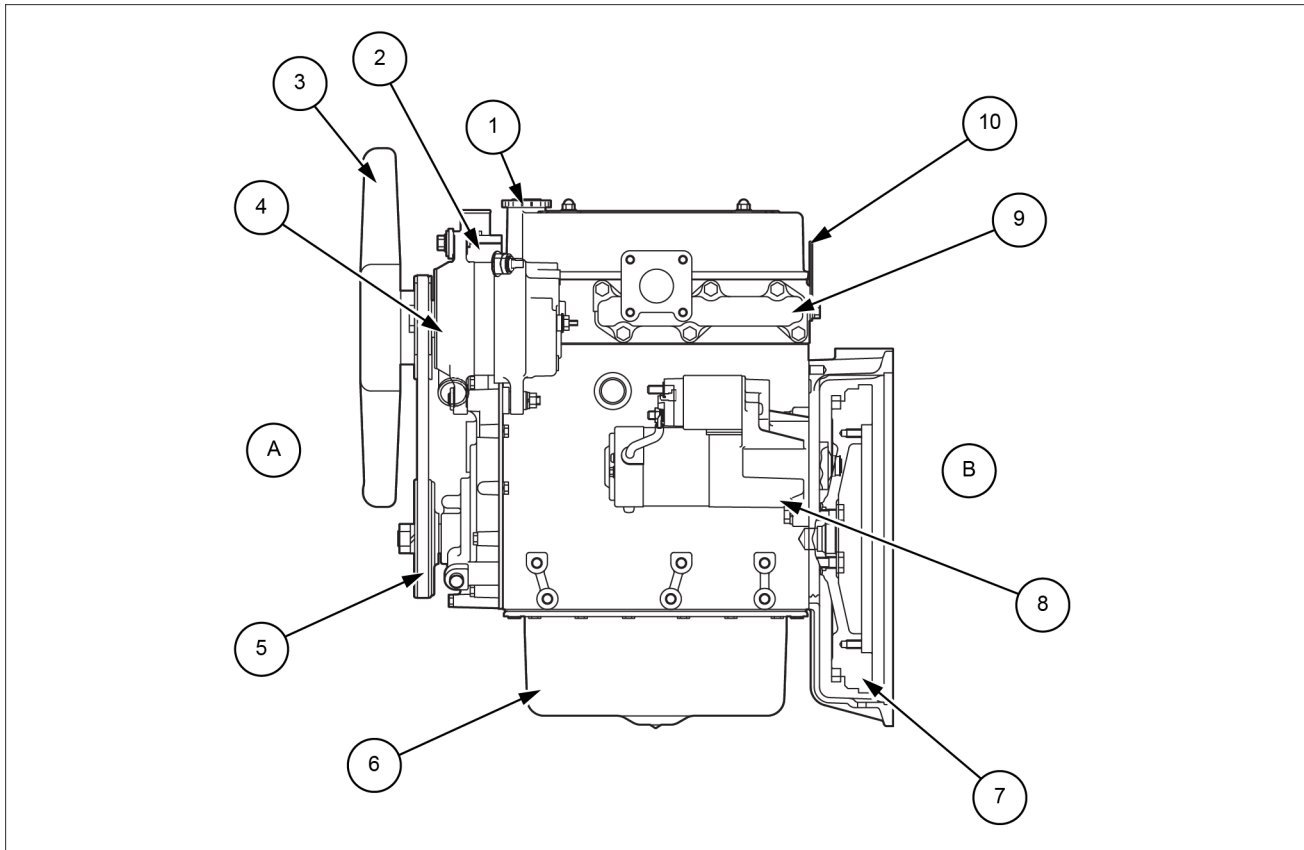
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Engine - Component identification



SMIL17MEX1271FB 1

Left-hand view

- A. Front
- B. Rear
- 1. Oil filler
- 2. Thermostat
- 3. Fan
- 4. Alternator

- 5. V-belt
- 6. Oil pan
- 7. Flywheel
- 8. Engine starter
- 9. Exhaust manifold
- 10. Rear eye-bolt

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