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Engine Description

SMCS Code: 1000

The Caterpillar C7.1 Industrial Engine has the following characteristics.

- In-line Six cylinder
- Four stroke cycle
- Series turbocharged charge cooled

Engine Specifications

Note: The front end of the engine is opposite the flywheel end of the engine. The left and the right sides of the engine are determined from the flywheel end. The number 1 cylinder is the front cylinder.

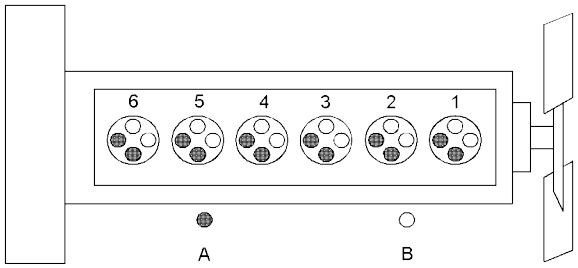

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Illustration 23

Cylinder and valve location

(A) Exhaust valves
(B) Inlet valves

Table 1

C7.1 Engine Specifications	
Operating Range (rpm)	900 to 2800[1]
Number of Cylinders	6 In-Line
Bore	105 mm (4.13 inch)
Stroke	135 mm (5.31495 inch)
Power	225 kW (301.72 hp)
Aspiration	Turbocharged charge cooled
Compression Ratio	16.5:1
Displacement	7.01 L (428 in^3)
Firing Order	1-5-3-6-2-4
Rotation (flywheel end)	Counterclockwise

(1) The operating rpm is dependent on the engine rating, the application, and the configuration of the throttle.

Electronic Engine Features

The engine operating conditions are monitored. The Electronic Control Module (ECM) controls the response of the engine to these conditions and to the demands of the operator. These conditions and operator demands determine the precise control of fuel injection by the ECM. The electronic engine control system provides the following features:

- Engine monitoring
- Engine speed governing
- Control of the injection pressure
- Cold start strategy
- Automatic air/fuel ratio control
- Torque rise shaping
- Injection timing control
- System diagnostics
- Aftertreatment regeneration control
- NOx reduction system control

For more information on electronic engine features, refer to the Operation and Maintenance Manual, “Features and Controls” topic (Operation Section).

Engine Diagnostics

The engine has built-in diagnostics in order to ensure that the engine systems are functioning correctly. The operator will be alerted to the condition by a “Stop or Warning” lamp. Under certain conditions, the engine horsepower and the vehicle speed may be limited. The electronic service tool may be used to display the diagnostic codes.

There are three types of diagnostic codes: active, logged, and event.

Most of the diagnostic codes are logged and stored in the ECM. For additional information, refer to the Operation and Maintenance Manual, “Engine Diagnostics” topic (Operation Section).

The ECM provides an electronic governor that controls the injector output in order to maintain the desired engine rpm.

Engine Cooling and Lubrication

The cooling system and lubrication system consists of the following components: