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< Product: GENERATOR SET
 Model: 3456 GENERATOR SET C4G
 Configuration: 3456 Generator Set C4G00001-UP

Operation and Maintenance Manual

3456 Generator Sets

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Refill Capacities and Recommendations

SMCS - 1348; 1395; 7560

Lubrication System

Lubricant Recommendations

Due to significant variations in the quality and in the performance of commercially available oils, Caterpillar recommends the following oils:

- **Cat DEO (Diesel Engine Oil) (10W-30)**
- **Cat DEO (Diesel Engine Oil) (15W-40)**

The proper SAE viscosity grade of oil is determined by the minimum ambient temperature during cold engine start-up, and the maximum ambient temperature during engine operation. To determine the oil viscosity that is required for starting a cold soaked engine, refer to the minimum temperature in Table 1. To select the oil viscosity for operation at the highest anticipated ambient temperature, refer to the maximum temperature in the Table. Use the highest oil viscosity that is available in order to meet the required temperature during start-up.

Table 1

Engine Oil Viscosities for Ambient Temperatures		
	Ambient Temperature	
Viscosity Grade	Minimum	Maximum
SAE 0W-20	-40 °C (-40 °F)	10 °C (50 °F)
SAE 0W-30	-40 °C (-40 °F)	30 °C (86 °F)

SAE 0W-40	-40 °C (-40 °F)	40 °C (104 °F)
SAE 5W-30	-30 °C (-22 °F)	30 °C (86 °F)
SAE 5W-40	-30 °C (-22 °F)	50 °C (122 °F)
SAE 10W-30	-18 °C (0 °F)	40 °C (104 °F)
SAE 10W-40	-18 °C (0 °F)	50 °C (122 °F)
SAE 15W-40	-9.5 °C (15 °F)	50 °C (122 °F)

For additional information on selecting an oil, refer to Special Publication, SEBU6251, "Caterpillar Commercial Diesel Engine Fluids Recommendations".

Lubricant Capacities

The Total Capacity of the Lubrication system equals the capacity of the Engine Crankcase, including the capacity of the oil filters that are installed at the factory, plus the Capacity of the Auxiliary Oil Filter System. Auxiliary oil filter systems (if equipped) will require additional oil. Refer to the specifications that are provided by the OEM of the auxiliary oil filter system.

Table 2

Approximate Refill Capacities		
Compartment or System	Liters	Quarts
Engine Crankcase ⁽¹⁾	36.0	38.0
Capacity of the Auxiliary Oil Filter System ⁽²⁾		
Total Capacity of the Lubrication System ⁽³⁾		

(1) Approximate sump capacity of the crankcase includes a standard oil filter that is factory installed. Engines with auxiliary oil filters will require additional oil. Engines that are equipped with factory installed dual oil filters require an additional 3.7 L (3.9 qt) of oil. If the engine is equipped with another type of auxiliary oil filter, refer to the OEM specifications for the capacity of the auxiliary oil filter.

(2) Fill in the capacity of the auxiliary oil filter system (if equipped) in the space that is provided.

(3) Fill in the total capacity of the lubrication system. Add the auxiliary oil filter system to the correct capacity of the engine crankcase that is for your engine. The final number is the total capacity of the lubrication system.

Fuel

Fuel Recommendations

In North America, diesel fuel that is identified as No. 1-D or No. 2-D in "ASTM D975" generally meet the specifications. These fuels are distilled from crude oil. Diesel fuels from other sources could exhibit detrimental properties that are not defined or controlled by this specification.

Refer to Special Publication, SEBU6251, "Caterpillar Commercial Diesel Engine Fluids Recommendations" for additional information that relates to diesel fuel.

Cooling System

Coolant Recommendations

NOTICE

Do not use a commercial coolant/antifreeze that only meets the ASTM "D3306" specification. This type of coolant/antifreeze is made for light duty automotive applications.

Use only the coolant/antifreeze that is recommended.

The following coolants are the primary types of coolants that are used in Caterpillar Engines:

Preferred - Cat ELC (Extended Life Coolant) or a commercial extended life coolant that meets the Caterpillar EC-1 specification

Acceptable - Cat DEAC (Diesel Engine Antifreeze/Coolant) or a commercial heavy-duty coolant/antifreeze that meets "ASTM D4985" or "ASTM D5345" specifications

Caterpillar recommends a 1:1 mixture of water and glycol. This mixture will provide optimum heavy-duty performance as a coolant/antifreeze.

Note: Cat DEAC DOES NOT require a treatment with an SCA at the initial fill. Commercial heavy-duty coolant/antifreeze that meets "ASTM D4985" or "ASTM D5345" specifications MAY require a treatment with an SCA at the initial fill. Read the label or the instructions that are provided by the OEM of the product.

Mixtures of glycol and water require three to six percent of SCA. **Do not exceed the recommended six percent SCA concentration in mixtures of glycol and water.**

In stationary engine applications and marine engine applications that do not require protection from boiling or freezing, a mixture of SCA and water is acceptable. Caterpillar recommends a minimum of six percent to a maximum of eight percent SCA concentration in those cooling systems. **Do not exceed the recommended eight percent SCA concentration in mixtures of water and SCA.** Distilled water or deionized water is preferred. Water which has the required properties may be used. For the water properties, refer to Special Publication, SEBU6251, "Caterpillar Commercial Diesel Engine Fluids Recommendations" for additional information that relates coolant.

Note: Table 3 is a list of the coolants that are recommended and the service life (calendar) of the

coolants. The service life of coolant is also limited by use (service hours). Refer to the specific engine's Operation and Maintenance Manual, "Maintenance Interval Schedule" (Maintenance Section). **To achieve this service life, the coolants must be properly maintained. The maintenance program includes S·O·S coolant analysis.**

Table 3

Coolant Service Life	
Coolant Type	Service Life ⁽¹⁾
Cat ELC	Six Years
Cat DEAC	Three Years
Commercial Heavy-Duty Coolant/Antifreeze that meets "ASTM D5345"	Two Years
Commercial Heavy-Duty Coolant/Antifreeze that meets "ASTM D4985"	One Year
Cat SCA and Water	Two Years
Commercial SCA and Water	One Year

⁽¹⁾ The service life of coolant is also limited by use (service hours). Refer to the specific engine's Operation and Maintenance Manual, "Maintenance Interval Schedule" (Maintenance Section).

Coolant Capacities

To properly maintain the cooling system, the Total Cooling System capacity must be determined. The Total Cooling System capacity will vary between individual installations. The Total Cooling System Capacity equals the capacity of the Engine (Only) plus the External System Capacity. The External System Capacity includes the following components: expansion tank, heat exchanger, radiator and piping. Refer to the specifications that are provided by Caterpillar or by the OEM of the equipment. Record the capacity of the External System and the capacity of the Total Cooling System in the following Table:

Table 4

Approximate Refill Capacities		
Compartment or System	Liters	Quarts
Engine Only	22.7	24.0
External System		
Total Cooling System		