

# C7.1 ACERT

## MARINE GENERATOR SET PACKAGE



106, 138, 164 ekW (133, 173, 204 kVA) 60 Hz  
Radiator Cooled

### GENERAL ENGINE SPECIFICATIONS

#### Basic Engine Specifications

|                                           |                                 |
|-------------------------------------------|---------------------------------|
| In-line 6 cylinder, 4-Stroke-Cycle-Diesel |                                 |
| Displacement.....                         | 7.01 L (422.4 in <sup>3</sup> ) |
| Rated engine speed.....                   | 1500 rpm                        |
| Low idle speed (programmable).....        | 1100 rpm                        |
| Bore .....                                | 105 mm (4.13 in)                |
| Stroke.....                               | 135 mm (5.32 in)                |
| Aspiration.....                           | Turbocharged-Aftercooled        |
| Governor .....                            | ECU                             |
| Fuel system type.....                     | Common Rail                     |
| Length (overall).....                     | 2659 mm (105 in)                |
| Width.....                                | 993 mm (39 in)                  |
| Height.....                               | 1583 mm (62 in)                 |
| Weight, net dry (approx.) .....           | 1808-1996 kg (3978-4391 lb)     |
| Rotation (from flywheel end).....         | Counterclockwise                |

#### Tolerances

|                                 |         |
|---------------------------------|---------|
| Power.....                      | +/- 3%  |
| Exhaust Stack Temperature ..... | +/- 8%  |
| Inlet Air Flow .....            | +/- 5%  |
| Intake Manifold Pressure .....  | +/- 10% |
| Exhaust Flow .....              | +/- 6%  |
| Specific Fuel Consumption ..... | +/- 3%  |
| Heat Rejection .....            | +/- 5%  |
| Fuel Rate .....                 | +/- 5%  |

#### Generator

|                             |                       |
|-----------------------------|-----------------------|
| Power Factor.....           | 0.8                   |
| Frame .....                 | 44.2/46.2             |
| Insulation .....            | Class H               |
| Temperature Rise            |                       |
| @ 40°C Ambient (110%) ..... | Class H (150°K)       |
| @ 50°C Ambient (110%) ..... | Class H (140°K)       |
| Winding Pitch Code .....    | 2/3                   |
| Terminals .....             | 12-lead reconnectable |



Cat® C7.1 ACERT  
Marine Generator Set Package  
Image shown may not reflect actual engine

#### Emission Compliance

IMO Tier II  
EPA Marine Tier 3  
CCNR Stage 2

#### Marine Classification Society

ABS – BV – DNV\* – GL – LR – RINA – CCS\* – NKK\*  
(\*Approvals pending)

|                                         |                                  |
|-----------------------------------------|----------------------------------|
| Drip Proof .....                        | IP 23                            |
| Air Flow (44.2 frame).....              | 0.37 m <sup>3</sup> /s (784 cfm) |
| Air Flow (46.2 frame).....              | 0.43 m <sup>3</sup> /s (911cfm)  |
| Excitation System .....                 | AREP                             |
| Voltage Regulation (steady state) ..... | ±0.5%                            |
| Total Harmonic Content LL/LN .....      | <4%                              |
| Wave Form: NEMA=TIF.....                | <50                              |
| Wave Form: I.E.C.=THF .....             | <2%                              |

#### General Remarks

- For installation instructions please refer to drawing number 476-6264, 476-6265, 476-6266 for package and 452-3714 for attachments.
- For detailed information about fuel, oil, and cooling water treatment, please refer to "Caterpillar Commercial Diesel Engine Fluids Recommendations" (SEBU6251).

## AIR SYSTEM

### Combustion Air Inlet System

|                                              |                                                                                                            |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Intake combustion air flow.....              | 14.6 m <sup>3</sup> /min (163 ekW), 14.5 m <sup>3</sup> /min (138 ekW), 13.6 m <sup>3</sup> /min (106 ekW) |
| Intake combustion air flow.....              | 51.6 cfm (163 ekW), 51.2 cfm (138 ekW) 48.0 cfm (106 ekW)                                                  |
| Intake combustion air temperature up to..... | 50°C (122°F)                                                                                               |

## COOLING SYSTEM

### HTC Cooling Water System (Engine Jacket Water)

|                                                          |                                                                        |
|----------------------------------------------------------|------------------------------------------------------------------------|
| Heat rejection to HTC cooling water system.....          | 121.9 kW (163 ekW), 104.0 kW (138 ekW), 81.8 kW (106 ekW)              |
| Heat rejection to HTC cooling water system.....          | 6932 BTU/min (163 ekW), 5914 BTU/min (138 ekW), 4652 BTU/min (106 ekW) |
| HTC cooling water temperature engine out (nominal) ..... | 100°C (212°F)                                                          |
| HTC cooling water refill capacity (Radiator).....        | 40 L (10.5 gal)                                                        |
| Coolant medium .....                                     | Cat® Extended Life Coolant (ELC) or equal                              |
| Expansion tank pressure cap.....                         | 100 kPa (14.5 psi)                                                     |

### Charge Air Cooling System (Aftercooler)\*

|                                     |                                                                      |
|-------------------------------------|----------------------------------------------------------------------|
| Heat rejection to aftercooler ..... | 22.7 kW (163 ekW), 17.3 kW (138 ekW), 14.5 kW (106 ekW)              |
| Heat rejection to aftercooler ..... | 1291 BTU/min (163 ekW), 984 BTU/min (138 ekW), 825 BTU/min (106 ekW) |

### Radiator Fan Data

|                                                  |                         |
|--------------------------------------------------|-------------------------|
| Total radiator airflow (unrestricted) .....      | 6.4 m <sup>3</sup> /sec |
| Total radiator airflow (unrestricted) .....      | 1356 cfm                |
| Total radiator airflow (125Pa restriction) ..... | 5.8 m <sup>3</sup> /sec |
| Total radiator airflow (125Pa restriction) ..... | 1228 cfm                |
| Maximum allowable total duct restriction .....   | 125 Pa                  |
| Maximum allowable total duct restriction .....   | 0.5 in H <sub>2</sub> O |
| Maximum allowable ambient temperature .....      | 50 °C                   |
| Maximum allowable ambient temperature .....      | 122 °F                  |

## EXHAUST SYSTEM

### Exhaust Gas Data

|                                                               |                                                                                                            |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Exhaust gas flow (volume) .....                               | 32.4 m <sup>3</sup> /min (163 ekW), 29.9 m <sup>3</sup> /min (138 ekW), 25.3 m <sup>3</sup> /min (106 ekW) |
| Exhaust gas flow (volume) .....                               | 114.4 cfm (163 ekW), 105.5 cfm (138 ekW), 89.3 cfm (106 ekW)                                               |
| Exhaust stack temperature (within 300mm of turbo outlet)..... | 392.4 °C (163 ekW), 394.7 °C (138 ekW), 371.7 °C (106 ekW)                                                 |
| Exhaust stack temperature (within 300mm of turbo outlet)..... | 738.3 °F (163 ekW), 742.5 °F (138 ekW), 701.1 °F (106 ekW)                                                 |
| Engine exhaust connection .....                               | 63 mm (2.5 in) ID, 6 x 9 mm (0.35 in) holes on 145 mm (5.7 in) PCD                                         |
| Max. allowable system backpressure .....                      | 15 kPa (60 in H <sub>2</sub> O)                                                                            |

*Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."*

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MARINE GENERATOR SET PACKAGE



## FUEL SYSTEM

|                                                |                                                                              |
|------------------------------------------------|------------------------------------------------------------------------------|
| Fuel rate .....                                | 228.5 g/bkW-hr (163 ekW), 223.4 g/bkW-hr (138 ekW), 240.1 g/bkW-hr (106 ekW) |
| Fuel rate .....                                | 40.4 kg/ hr (163 ekW), 36.5 kg/ hr (138 ekW), 30.5 kg/ hr (106 ekW)          |
| Fuel flow transfer pump .....                  | 4.1 L/min (1.1 gal/min)                                                      |
| Fuel pressure static head .....                | +/- 2.8 m (9.2 ft)                                                           |
| Fuel supply line restriction (max.) .....      | 10 kPa (2.9 in Hg) (1.5 psi)                                                 |
| Fuel temperature transfer pump in (max.) ..... | 60°C (140°F)                                                                 |
| Fuel return line restriction (max.) .....      | 10 kPa (2.9 in Hg) (1.5 psi)                                                 |
| Fuel supply / return connections .....         | 11 / 16 in O ring face seal (ORFS)                                           |
| Diesel fuel grade .....                        | ISO-F-DMX/ISO-F-DMA/ISO 8217:1986 (E) Class F                                |

## LUBE SYSTEM

|                                                        |                                                                         |
|--------------------------------------------------------|-------------------------------------------------------------------------|
| Sump type .....                                        | Isolated                                                                |
| Sump capacity (max.) .....                             | 21 L (5.55 gal)                                                         |
| Sump capacity (min.) .....                             | 17.5 L (4.62 gal)                                                       |
| Sump refill capacity (with filter change).....         | 21 L (5.55 gal)                                                         |
| Oil change interval .....                              | 500 Hr<br>(can be extended by S•O•S <sup>SM</sup> testing)              |
| Max. continuous operation angle (any direction) .....  | 25 degrees                                                              |
| Max. intermittent operation angle (any direction)..... | 30 degrees                                                              |
| Quality diesel engine oil (min.) .....                 | CI-4 10W30 or 15W40<br>(compliant with Caterpillar specification ECF-2) |

## STARTING SYSTEM

### Electrical Starting System

|                                 |                                                |
|---------------------------------|------------------------------------------------|
| Electrical starting motor ..... | 24 or 12 VDC                                   |
| Cold starting .....             | 800 CCA<br>[at 0°C (32°F) ambient temperature] |

## SOUND DATA (ISO 8528-10)

| Mechanical Sound Pressure .....         | Mechanical Sound Power ..... |
|-----------------------------------------|------------------------------|
| 163 ekW at distance 1 m (3.28 ft) ..... | 109.0 dB(A)                  |
| 138 ekW at distance 1 m (3.28 ft) ..... | 109.0 dB(A)                  |
| 106 ekW at distance 1 m (3.28 ft) ..... | 108.9 dB(A)                  |
| 163 ekW .....                           | 92.1 dB(A)                   |
| 138 ekW .....                           | 92.1 dB(A)                   |
| 106 ekW .....                           | 92.0 dB(A)                   |

Mechanical Sound Power levels measured according to ISO 8528-10 with engine at 70% load.

Performance data is calculated in accordance with tolerances and conditions stated in this specification sheet and is only intended for purposes of comparison with other manufacturers' engines. Actual engine performance may vary according to the particular application of the engine and operating conditions beyond Caterpillar's control.

Power produced at the flywheel will be within standard tolerances up to 49°C (120°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 52°C (125°F) measured at the fuel filter base. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.

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Materials and specifications are subject to change without notice.  
The International System of Units (SI) is used in this publication.

# C7.1

## MARINE GENERATOR SET PACKAGE



**118,150,175,200 kW (148,188,219,250 kVA) 60 Hz**  
**Heat Exchanger / Keel**

### GENERAL ENGINE SPECIFICATIONS

#### Basic Engine Specifications

In-line-6 cylinder, 4-Stroke-Cycle-Diesel

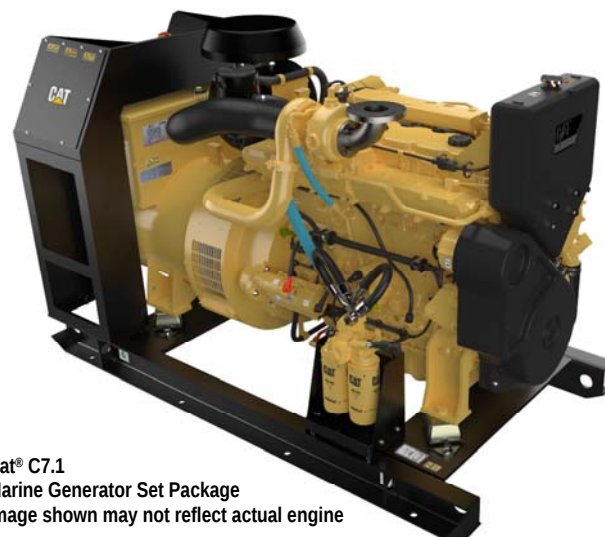
|                                     |                                 |
|-------------------------------------|---------------------------------|
| Displacement .....                  | 7.01 L (422.4 in <sup>3</sup> ) |
| Rated engine speed .....            | 1800 rpm                        |
| Low idle speed (programmable) ..... | 1100 rpm                        |
| Bore .....                          | 105 mm (4.13 in)                |
| Stroke .....                        | 135 mm (5.32 in)                |
| Aspiration .....                    | Turbocharged-Aftercooled        |
| Governor .....                      | ECU                             |
| Fuel system type .....              | Common Rail                     |
| Length (overall) .....              | 2142-2185 mm (84.3-86.0 in)     |
| Width .....                         | 965 mm (38.0 in)                |
| Height .....                        | 1263 mm (49.7 in)               |
| Weight, net dry (approx.) .....     | 1652-1840 kg (3634-4026 lb)     |
| Rotation (from flywheel end) .....  | Counterclockwise                |

#### Tolerances

|                                 |         |
|---------------------------------|---------|
| Power .....                     | +/- 3%  |
| Exhaust Stack Temperature ..... | +/- 8%  |
| Inlet Air Flow .....            | +/- 5%  |
| Intake Manifold Pressure .....  | +/- 10% |
| Exhaust Flow .....              | +/- 6%  |
| Specific Fuel Consumption ..... | +/- 3%  |
| Heat Rejection .....            | +/- 5%  |
| Fuel Rate .....                 | +/- 5%  |

#### Generator

|                             |                       |
|-----------------------------|-----------------------|
| Power Factor .....          | 0.8                   |
| Frame .....                 | 44.2/46.2             |
| Insulation .....            | Class H               |
| Temperature Rise            |                       |
| @ 40°C Ambient (110%) ..... | Class H (150°K)       |
| @ 50°C Ambient (110%) ..... | Class H (140°K)       |
| Winding Pitch Code .....    | 2/3                   |
| Terminals .....             | 12-lead reconnectable |



**Cat® C7.1**  
**Marine Generator Set Package**  
Image shown may not reflect actual engine

#### Emission Compliance

IMO Tier II  
EPA Marine Tier 3  
CCNR Stage 2

#### Marine Classification Society – Certifications Pending

ABS – BV – DNV – GL – LR – RINA – CCS

|                                         |                                   |
|-----------------------------------------|-----------------------------------|
| Drip Proof .....                        | IP 23                             |
| Air Flow (44.2 frame) .....             | 0.44 m <sup>3</sup> /s (932 cfm)  |
| Air Flow (46.2 frame) .....             | 0.51 m <sup>3</sup> /s (1081 cfm) |
| Excitation System .....                 | AREP                              |
| Voltage Regulation (steady state) ..... | ±0.5%                             |
| Total Harmonic Content LL/LN .....      | <4%                               |
| Wave Form: NEMA=TIF .....               | <50                               |
| Wave Form: I.E.C.=THF .....             | <2%                               |

#### General Remarks

- For installation instructions please refer to drawing number 448-1321 for Keel cooled arrangements and drawings number 448-1322 for HEX arrangements.
- For detailed information about fuel, oil, and cooling water treatment, please refer to "Caterpillar Commercial Diesel Engine Fluids Recommendations" (SEBU6251).

## AIR SYSTEM

### Combustion Air Inlet System

|                                              |                                                                                            |
|----------------------------------------------|--------------------------------------------------------------------------------------------|
| Intake combustion air flow.....              | 16.6 m³/min (200 ekW), 16.1 m³/min (175 ekW), 15.0 m³/min (150 ekW), 13.8 m³/min (118 ekW) |
| Intake combustion air flow.....              | 587.9 cfm (200 ekW), 570.3 cfm (175 ekW), 531.3 cfm (150 ekW), 488.8 cfm (118 ekW)         |
| Intake combustion air temperature up to..... | 50°C (122°F)                                                                               |

### Engine Room Ventilation Air

|                                                  |                      |
|--------------------------------------------------|----------------------|
| Heat rejection to atmosphere (all ratings) ..... | 4.0 kw (228 BTU/min) |
|--------------------------------------------------|----------------------|

## COOLING SYSTEM

### HTC Cooling Water System (Engine Jacket Water)

|                                                          |                                                                                                |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Heat rejection to HTC cooling water system .....         | 151.6 kW (200 ekW), 133.7 kW (175 ekW), 117.9 kW (150 ekW), 100.8 kW (118 ekW)                 |
| Heat rejection to HTC cooling water system ...           | 8629 BTU/min (200 ekW), 7610 BTU/min (175 ekW), 6711 BTU/min (150 ekW), 5738 BTU/min (118 ekW) |
| Flow HTC cooling water pump – max. ....                  | 340 L/min (89.9 gal/min)                                                                       |
| min. ....                                                | 310 L/min (81.9 gal/min)                                                                       |
| HTC cooling water temperature engine out (nominal) ..... | 95°C (203°F)                                                                                   |
| HTC cooling water refill capacity (Hex/Keel).....        | 38 L (10 gal)                                                                                  |
| Coolant medium .....                                     | Cat® Extended Life Coolant (ELC) or equal                                                      |
| Expansion tank pressure cap.....                         | 50 kPa (7.25 psi)                                                                              |
| HTC cooling water connection engine inlet.....           | 50.8 mm (2.0 in.) OD                                                                           |
| HTC cooling water connection engine outlet .....         | 50.8 mm (2.0 in.) OD                                                                           |

### LTC Cooling Water System (Aftercooler)\*

|                                                       |                                                                                                |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Heat rejection to LTC cooling water system .....      | 48.6 kW (200 ekW), 43.9 kW (175 ekW), 37.1 kW (150 ekW), 29.3 kW (118 ekW)                     |
| Heat rejection to LTC cooling water system ...        | 2766 BTU/min (200 ekW), 2499 BTU/min (175 ekW), 2112 BTU/min (150 ekW), 1668 BTU/min (118 ekW) |
| Flow LTC cooling water pump 2484130 – max. ....       | 165 L/min (43.5 gal/min)                                                                       |
| min. ....                                             | 139 L/min (36.7 gal/min)                                                                       |
| LTC water temperature engine in (max.) .....          | 40°C (104°F)                                                                                   |
| LTC cooling water refill capacity .....               | 5 L (1.3 gal) <i>Engine only</i>                                                               |
| Coolant medium .....                                  | Cat Extended Life Coolant (ELC) or equal                                                       |
| Expansion tank pressure cap.....                      | 50 kPa (7.25 psi)                                                                              |
| LTC cooling water connection engine inlet (138).....  | 50.8 mm (2.0 in.) OD                                                                           |
| LTC cooling water connection engine outlet (139)..... | 50.8 mm (2.0 in.) OD                                                                           |

\*Heat rejections quoted for eat exchanged models. For keel cooled models, refer to TMI.

## EXHAUST SYSTEM

### Exhaust Gas Data

|                                                     |                                                                                           |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------|
| Exhaust gas flow (wet volume at turbo outlet) ..... | 34.8 m³/min (200 ekW), 32.3 m³/min (175 ekW), 29.1 m³/min (150 ekW) 25.6 m³/min (118 ekW) |
| Exhaust gas flow (wet volume at turbo outlet) ..... | 1222 cfm (200 ekW), 1134 cfm (175 ekW), 1022 cfm (150 ekW) 899 cfm (118 ekW)              |
| Exhaust stack temperature .....                     | 401.7 °C (200 ekW), 379.0 °C (175 ekW), 364.9 °C (150 ekW), 349.6 °C (118 ekW)            |
| Exhaust stack temperature .....                     | 755.1 °F (200 ekW), 714.2 °F (175 ekW), 688.8 °F (150 ekW), 661.3 °F (118 ekW)            |
| Engine exhaust connection .....                     | 63 mm (2.5 in) ID, 6 x 9 mm (0.35 in) holes on 145 mm (50.7 in) PCD                       |
| Max. allowable system backpressure .....            | 15 kPa (60 in H <sub>2</sub> O)                                                           |

Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."

## FUEL SYSTEM

|                                                |                                                                                                        |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Fuel rate .....                                | 217.2 g/bkW-hr (200 ekW), 219.7 g/bkW-hr (175 ekW), 220.1 g/bkW-hr (150 ekW), 234.9 g/bkW-hr (118 ekW) |
| Fuel rate .....                                | 47.5 kg/ hr (200 ekW), 42.0 kg/ hr (175 ekW), 36.1 kg/ hr (150 ekW), 30.3 kg/hr (118 ekW)              |
| Fuel flow transfer pump.....                   | 4.1 L/min (1.1 gal/min)                                                                                |
| Fuel pressure static head .....                | +/- 2.8 m (9.2 ft)                                                                                     |
| Fuel supply line restriction (max.) .....      | 10 kPa (2.9 in Hg) (1.5 psi)                                                                           |
| Fuel temperature transfer pump in (max.) ..... | 60°C (140°F)                                                                                           |
| Fuel return line restriction (max.) .....      | 10 kPa (2.9 in Hg) (1.5 psi)                                                                           |
| Fuel supply / return connections .....         | 11 / 16 in O ring face seal (ORFS)                                                                     |
| Diesel fuel grade .....                        | ISO-F-DMX/ISO-F-DMA/ISO 8217:1986 (E) Class F                                                          |

## LUBE SYSTEM

|                                                |                                                                         |
|------------------------------------------------|-------------------------------------------------------------------------|
| Sump type .....                                | Isolated                                                                |
| Sump capacity (max.) .....                     | 21 L (5.55 gal)                                                         |
| Sump capacity (min.) .....                     | 17.5 L (4.62 gal)                                                       |
| Sump refill capacity (with filter change)..... | 21 L (5.55 gal)                                                         |
| Oil change interval .....                      | 500 Hr<br>(can be extended by S•O•S <sup>SM</sup> testing)              |
| Max. operation angle (any direction).....      | 30 degrees                                                              |
| Quality diesel engine oil (min.) .....         | CI-4 10W30 or 15W40<br>(compliant with Caterpillar specification ECF-2) |

## STARTING SYSTEM

### Electrical Starting System

|                                 |                                                |
|---------------------------------|------------------------------------------------|
| Electrical starting motor ..... | 24 or 12 VDC                                   |
| Cold starting .....             | 800 CCA<br>(at 0°C (32°F) ambient temperature) |

## SOUND DATA (ISO 8528-10)

| Mechanical Sound Pressure.....         | Mechanical Sound Power..... |              |             |
|----------------------------------------|-----------------------------|--------------|-------------|
| 200 ekW at distance 1 m (3.28 ft)..... | 89.2 dB(A)                  | 200 ekW..... | 105.0 dB(A) |
| 175 ekW at distance 1 m (3.28 ft)..... | 88.9 dB(A)                  | 175 ekW..... | 104.7 dB(A) |
| 150 ekW at distance 1 m (3.28 ft)..... | 88.8 dB(A)                  | 150 ekW..... | 104.6 dB(A) |
| 118 ekW at distance 1 m (3.28 ft)..... | 88.6 dB(A)                  | 118 ekW..... | 104.4 dB(A) |

Sound levels measured according to ISO 8528-10 with engine at 70% load.

Performance data is calculated in accordance with tolerances and conditions stated in this specification sheet and is only intended for purposes of comparison with other manufacturers' engines. Actual engine performance may vary according to the particular application of the engine and operating conditions beyond Caterpillar's control.

Power produced at the flywheel will be within standard tolerances up to 49°C (120°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 52°C (125°F) measured at the fuel filter base. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.

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