## Market
Marine Propulsion

## Application
Pleasure Craft Vessels

## Description
The new C18 marine propulsion engine is now available. With an E rating of 1015 metric horsepower the C18 is intended for applications with a load factor of up to 30% and operating time at rated speed up to 8%. A D rating of 885 metric horsepower is also available.

## Features/Benefits
With phenomenal acceleration and outstanding performance the C18 proves to be a top competitor in the 1000 brake horsepower class.

The new C18 propulsion engine has 25% more power, faster acceleration than the 3406E, and has an excellent power-to-weight ratio of 1.56 kg per metric horsepower or 3.49 lbs per brake horsepower. Even though the C18 has a slightly larger package it weighs approximately the same as the 3406E.

The ADEM III electronic control system is more efficient with improved reliability and expandability, and provides increased engine control and monitoring capabilities.

## General Comments
C18 DITTA Heat Exchanger cooled configurations:

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>C18DM00</td>
<td>C18 DITTA Marine Propulsion — Port (RH service)</td>
<td>1015 mhp (1000 bhp) 746 bkW at 2300 rpm E rating</td>
</tr>
<tr>
<td>C18DM01</td>
<td>C18 DITTA Marine Propulsion — Port (RH service)</td>
<td>885 mhp (875 bhp) 653 bkW at 2300 rpm D rating</td>
</tr>
<tr>
<td>C18DM02</td>
<td>C18 DITTA Marine Propulsion — Starboard (LH service)</td>
<td>1015 mhp (1000 bhp) 746 bkW at 2300 rpm E rating</td>
</tr>
<tr>
<td>C18DM03</td>
<td>C18 DITTA Marine Propulsion — Starboard (LH service)</td>
<td>885 mhp (875 bhp) 653 bkW at 2300 rpm D rating</td>
</tr>
</tbody>
</table>
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Product Description

I-6, 4-Stroke-Cycle-Diesel

Emissions ...................... IMO compliant
Displacement — L (cu in) ...... 18.1 (1106)
Bore — mm (in) ..................... 145 (5.7)
Stroke — mm (in) ................... 183 (7.2)
Aspiration ........................ Turbocharged-Aftercooled
Governor ............................ Electronic

Engine Weight, net dry
(approx.) — kg (lb) ............. 1586 (3496)

Refill Capacities
Cooling System (engine and
expansion tank) — L (qt) ....... 45 (48)
Lube System — L (qt) ............. 49 (52)

Oil Change Interval ............ 250 hours
Rotation (from
flywheel end) .............. Counterclockwise

Dimensions (drawing 207-0024)
Overall Length — mm (in) ...... 1845.2 (72.64)
Length from front to rear face
of block — mm (in) ......... 1401.9 (55.19)
Length from front to end of flywheel
housing — mm (in) ....... 1557.0 (61.30)

Overall Width — mm (in) .... 1057.9 (41.65)
Width from crankshaft centerline to
left side — mm (in) .......... 520.1 (20.48)
Width from crankshaft centerline to
right side — mm (in) ...... 537.8 (21.17)

Overall Height — mm (in) .. 1158.6 (45.62)
Height from crankshaft centerline to
top of engine — mm (in) .. 812.8 (32.00)
Height from crankshaft centerline to
bottom of oil pan — mm (in) .. 345.8 (13.61)

Engineering Model ............... E645
Serial Number Prefix ............. CKH
Performance Number .......... DM6446 (1000 bhp)
DM6445 (872 bhp)

Service Information
Operation & Maintenance ........................ SEBU7689
Parts Book ........................... SEBP3351

Core Engine Arrangement Numbers
201-0563 PA7765 E rating RH Service
226-1190 PA7766 E rating LH Service
227-8204 PA0599 D rating RH Service
227-8205 PA0500 D rating LH Service

Image may not reflect actual engine

C18 Marine Propulsion Engine
Standard Equipment

Adjustable front support
Air cleaner/fumes disposal (closed system)
Coolant recovery system
Corrosion resistant aftercooler core (SWAC)
Crankcase breather
Customer wiring connector
Engine oil cooler
Fuel filter (RH or LH service)
Fuel priming pump
Fuel transfer pump
Gear driven jacket water pump
Instrument panel with electric service meter, start/stop button, emergency stop button, maintenance due lamp, diagnostic lamp, warning lamp, 15 amp and 30 amp breakers, starter motor magnetic switch
Oil filler in valve cover
Oil filter (RH or LH service)
Oil level gauge (RH or LH service)
SAE No.1 flywheel (113 teeth) and flywheel housing
Self-priming centrifugal auxiliary sea water pump with rubber impeller
Service tool connector
Shallow center sump oil pan
Titanium plate heat exchanger with expansion tank
Thermostat and housing
Watercooled exhaust manifold
Watercooled turbocharger
12V or 24V electronic protection system

Optional Equipment

Air Starting Motor
12V 51 Amp, 12V 105 Amp Alternator
24V 35 Amp, 24V 60 Amp Alternator
Alternator Pulley Belt Guard
10 Amp Battery Charger
24V Battery Set
Bilge Pump & Drive
Custom Paint
12V/24V DC Converter
Digital Tachometer
Deep Sump Oil Pan
Electric Starting Motor
Engine Monitoring System
Engine-to-Engine Wiring Harness

Engine Vision Display System
GPS Interface Module
12V Instrument Panel
Jacket Water Heater
Magnetic Pickup
Manual Sump Pump
Marine Power Display
OEM Wiring Harness
Primary Fuel Filter
Pulley and Damper
Seawater Lines
Single Station Control Panel
Throttle Position Sensor
Transmission Oil Cooler
Vibration Isolation Mounting
Engine Features

Excellent Power-to-Weight Ratio
With a 25% increase in power at approximately the same weight of the 3406E, the C18 engine has an outstanding power-to-weight ratio of 1.56 kg per metric horsepower or 3.49 lbs per brake horsepower.

Larger Bore, Stroke, and Displacement
The larger bore and stroke give the C18 24% greater displacement from a slightly larger package size than the 3406E.

Higher Capacity Fuel Injectors
Higher flow fuel injectors provide more fuel for combustion and in turn produce more power.

Faster Response
The two smaller turbochargers require less inertia to engage and thus provide more boost at lower engine speeds.

Outstanding Acceleration and Performance
This additional power provides quicker acceleration and allows the vessel to come up on plane faster.

Electronic Control System
The ADEM III electronic control system provides engine speed governing, automatic air/fuel ratio control, engine parameter monitoring, and system diagnostics, as well as cold start strategy, engine synchronization, trolling mode strategy, and slow vessel mode. The C18 has a 70-pin customer connector compatible with the optional display systems – Marine Power Display, Marine Analog Power Display, and Engine Vision. C18 is also compatible with the Multi-Station Control System when available.

Seawater Aftercooling and Integral Heat Exchanger System
The C18 engine has seawater aftercooling (SWAC) which also contributes to greater power output. The titanium plate heat exchanger incorporates the expansion tank, deaerators, thermostats, shunt line and crossover pipe providing a compact design.

Extremely Low Emissions
The design of the camshaft helps the engine develop higher injection pressures for lower smoke levels. The closed crankcase ventilation system removes oil vapor from the engine room.

Top Quality Appearance
High quality white urethane paint is standard with an optional superior quality custom paint finish available.
C18 and 3406E Comparison

<table>
<thead>
<tr>
<th></th>
<th>3406E</th>
<th>C18</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power — mhp</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bhp</td>
<td>811</td>
<td>1015</td>
<td>+ 204</td>
</tr>
<tr>
<td></td>
<td>800</td>
<td>1000</td>
<td>+ 200</td>
</tr>
<tr>
<td><strong>Bore — mm</strong></td>
<td>137.2</td>
<td>145.0</td>
<td>+ 7.8</td>
</tr>
<tr>
<td><strong>in</strong></td>
<td>5.4</td>
<td>5.7</td>
<td>+ 0.3</td>
</tr>
<tr>
<td><strong>Stroke — mm</strong></td>
<td>165.1</td>
<td>183.0</td>
<td>+ 17.9</td>
</tr>
<tr>
<td><strong>in</strong></td>
<td>6.5</td>
<td>7.2</td>
<td>+ 0.7</td>
</tr>
<tr>
<td><strong>Displacement — L</strong></td>
<td>14.6</td>
<td>18.1</td>
<td>+ 3.5</td>
</tr>
<tr>
<td>cu in</td>
<td>893</td>
<td>1106</td>
<td>+ 213</td>
</tr>
<tr>
<td><strong>Weight — kg</strong></td>
<td>1586</td>
<td>1586</td>
<td>No Change</td>
</tr>
<tr>
<td>lb</td>
<td>3496</td>
<td>3496</td>
<td>No Change</td>
</tr>
<tr>
<td><strong>Power-to-Weight — kg/mhp</strong></td>
<td>1.95</td>
<td>1.95</td>
<td>- 0.39</td>
</tr>
<tr>
<td><strong>lb/bhp</strong></td>
<td>4.37</td>
<td>3.49</td>
<td>- 0.88</td>
</tr>
<tr>
<td><strong>Fuel Consumption at Rated Speed — L/hr</strong></td>
<td>153.5</td>
<td>195.0</td>
<td>+ 43.5</td>
</tr>
<tr>
<td>gph</td>
<td>40.6</td>
<td>52.0</td>
<td>+ 11.5</td>
</tr>
<tr>
<td><strong>BSFC at Rated Speed — g/kW-hr</strong></td>
<td>216.0</td>
<td>220.0</td>
<td>+ 4.0</td>
</tr>
<tr>
<td><strong>lb/hp-hr</strong></td>
<td>.355</td>
<td>.361</td>
<td>+ .006</td>
</tr>
<tr>
<td><strong>Length — mm</strong></td>
<td>1822.7</td>
<td>1845.2</td>
<td>+ 22.5</td>
</tr>
<tr>
<td><strong>in</strong></td>
<td>71.8</td>
<td>72.6</td>
<td>+ 0.8</td>
</tr>
<tr>
<td><strong>Width — mm</strong></td>
<td>953.6</td>
<td>1057.9</td>
<td>+ 104.3</td>
</tr>
<tr>
<td><strong>in</strong></td>
<td>37.5</td>
<td>41.7</td>
<td>+ 4.2</td>
</tr>
<tr>
<td><strong>Height — mm</strong></td>
<td>1177.8</td>
<td>1158.6</td>
<td>- 19.2</td>
</tr>
<tr>
<td><strong>in</strong></td>
<td>46.4</td>
<td>45.6</td>
<td>- 0.8</td>
</tr>
</tbody>
</table>

Competitive Information

<table>
<thead>
<tr>
<th></th>
<th>Rating mhp/bkW @ rpm</th>
<th>Configuration</th>
<th>Max. Power at Cruising Speed mhp @ rpm</th>
<th>Displacement Liters</th>
<th>Fuel System</th>
<th>Weight kg/lb</th>
<th>Dimensions L x W x H mm/in</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cat C18</strong></td>
<td>1015/746 @ 2300</td>
<td>In-line 6</td>
<td>1015 @ 1900</td>
<td>18.1</td>
<td>Full Electronic</td>
<td>1586/3486</td>
<td>1845 x 1058 x 1159 72.6 x 41.6 x 45.6</td>
</tr>
<tr>
<td><strong>MAN D2840 LE 403 EDC</strong></td>
<td>1050/772 @ 2300</td>
<td>V10</td>
<td>966 @ 1900</td>
<td>18.3</td>
<td>Electronic Common Rail</td>
<td>1560/3432</td>
<td>1333 x 1229 x 1033 52.5 x 48.4 x 40.7</td>
</tr>
<tr>
<td><strong>Cat 3406E</strong></td>
<td>811/597 @ 2300</td>
<td>In-line 6</td>
<td>811 @ 1900</td>
<td>14.6</td>
<td>Full Electronic</td>
<td>1586/3486</td>
<td>1823 x 954 x 1178 71.8 x 37.5 x 46.4</td>
</tr>
</tbody>
</table>
Customer Programmable Parameters

Identification Parameters
- Equipment ID: 17 alphanumeric characters
- Engine Serial Number: 8 alphanumeric characters

Engine/Marine Transmission Parameters
- Engine Location: Port, Center, Starboard, Engine #1-5 (default — Port)
- Fuel-to-Air Ratio: Level 1, Level 2, Level 3 (default — Level 2)
- Low Idle Speed: 550 rpm to 750 rpm (default — 700 rpm)
- Max. Engine Trolling Speed: 750 rpm to 1200 rpm (default — 900 rpm)
- Trans. Oil Temperature High Set Point: 50°C (122°F) to 120°C (248°F) [default — 95°C (203° F)]
- Trans. Oil Pressure High Set Point: 700 kPa to 2930 kPa (default — 2412 kPa) [100 psi to 425 psi (default — 350 psi)]
- Trans. Oil Temperature Sensor: Installed/Not Installed (default — Not Installed)
- Trans. Oil Pressure Sensor: Installed/Not Installed (default — Not Installed)
- Fuel Correction Factor: -64 to +63.5
- FLS: -128 to 127
- FTS: -128 to 127

Engine Monitoring Parameters
- Engine Monitoring Mode: Warning or Derate
- Coolant Level Sensor: Installed/Not Installed (default — Installed)

Maintenance Parameters
- PM1 Maintenance Indicator Mode Dependent
- Engine Oil Capacity: 19 L (20 qt) to 76 L (80 qt) [default — 28 L (30 qt)]

Passwords
- Customer Password #1: 8 alphanumeric characters
- Customer Password #2: 8 alphanumeric characters
- 3 Cylinder Cutout: On or Off (default — On)
Maintenance Schedule

When Required
Battery – Replace
Battery or Battery Cable – Disconnect
Engine – Clean
Engine Oil Level Gauge – Calibrate
Fuel System – Prime

Daily
Closed Crankcase Ventilation (CCV) Filter
Service Indicator – Inspect
Cooling System Coolant Level – Check
Engine Air Cleaner Service Indicator – Inspect
Engine Oil Level – Check
Fuel System Primary Filter/Water Separator – Drain
Marine Transmission Oil Level – Check
Walk-Around Inspection

Every 3800 L (1000 U.S. gal) of Fuel or 50 Service Hours
Zinc Rods – Inspect/Replace

Initial Oil Change
Engine Valve Lash – Inspect/Adjust

PM Level 1 – Every 19 000 L (5000 U.S. gal) of Fuel or 250 Service Hours
Aftercooler Condensate Drain Valve – Inspect/Clean
Alternator Belt – Inspect/Adjust/Replace
Auxiliary Water Pump (Rubber Impeller) – Inspect
Battery Electrolyte Level – Check
Cooling System Supplemental Coolant Additive (SCA) – Test/Add
Engine – Clean
Engine Air Cleaner Element – Clean/Replace
Engine Oil Sample – Obtain
Engine Oil and Filter – Change
Fuel System Primary Filter/Water Separator Element – Replace
Fuel System Secondary Filter – Replace
Fuel Tank Water and Sediment – Drain
Hoses and Clamps – Inspect/Replace
Sea Water Strainer – Clean/Inspect

Every 28 500 L (7500 U.S. gal) of Fuel or 750 Service Hours or 2 Years
Closed Crankcase Ventilation (CCV) Fumes Disposal Filter – Replace

PM Level 2 – Every 114 000 L (30 000 U.S. gal) of Fuel or 3000 Service Hours or 2 Years
Heat Exchanger – Inspect
Turbocharger – Inspect

PM Level 3 – Every 228 000 L (60 000 U.S. gal) of Fuel or 3000 Service Hours
Alternator – Inspect
Auxiliary Water Pump (Bronze Impeller) – Inspect
Cooling System Coolant (DEAC) – Change
Cooling System Coolant Extender (ELC) – Add
Cooling System Water Temperature Regulator – Replace
Crankcase Vibration Damper – Inspect
Engine Mounts – Inspect
Engine Valve Lash – Inspect/Adjust
Engine Valve Rotators – Inspect
Starting Motor – Inspect
Water Pump – Inspect

Every 228 000 L (60 000 U.S. gal) of Fuel or 6000 Service Hours or 6 Years
Cooling System Coolant (ELC) – Change

Every 380 000 L (100 000 U.S. gal) of Fuel or 10 000 Service Hours
Cylinder Head Grounding Stud – Inspect/Clean/Tighten

Overhaul
Overhaul Considerations
Sensor Locations — Left Side View

(1) Fuel temperature sensor
(2) Inlet air temperature
(3) Inlet manifold pressure sensor
(4) Electronic control module
(5) Oil pressure sensor
(6) Primary speed/timing sensor
(7) Secondary speed/timing sensor
(8) Coolant temperature sensor
(9) Coolant level sensor
(10) Control panel
(11) Fuel pressure sensor

Top Engine Service

Right Side Engine Service
General Dimension Drawings — 207-0024
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