EMD Power Generation

Utilizing Electro-Motive Diesel’s EMD 710—the world’s only Tier 2 emissions certified two-cycle medium speed diesel engine—Stewart & Stevenson designs, manufactures and delivers tested turnkey power generation systems ready for installation and immediate use.

Custom engineered to meet specific requirements, these high reliability power generation systems serve semi-submersible and drillship applications, provide prime power in remote locations and emergency standby power where 24/7 power availability is mandatory.

As the leading manufacturer of EMD-powered generator systems, Stewart & Stevenson meets the power needs of customers around the globe:

- Major governments for both civil and defense installations
- Electric utilities
- Oil and gas exploration and production companies
- Industrial and institutional facilities
- Engineering and construction firms

In locations as varied as a water desalinization plant in the Middle East, the drainage pumping system in New Orleans, a municipal water treatment plant in Florida, at government facilities throughout the country, and on drillships and semi-submersibles around the world, Stewart & Stevenson-built EMD powered generators are at work providing prime and standby power.
The EMD 710 Series
Two-Cycle Advantage
Stewart & Stevenson builds power generation packages using 8, 12, 16 and 20 cylinder EMD 710 engine configurations. The EMD engines offer continuous power ratings ranging from 2000 up to 5400 horsepower. Advantages of the EMD 710 engine include:

- Lower piston speed—900 rpm: 1650 ft/min
- Lower BMEP—nominal: 155 psi
- Lower thermal loading (Power Assemblies)
- Exceptional fuel economy
- Excellent engine response to rapid load application (single, 100% step load capability)
- Ease of inspection and maintenance
- Interchangeability of parts, less replacement cost
- Serviceable crankcase and oil pan
- Favorable weight to BHP ratio
- U.S. EPA Tier 2 and IMO Tier 2 Emissions Compliance
- Worldwide parts and service support, 24/7
- EMD Factory Training and Stewart & Stevenson Training

Stewart & Stevenson EMD Power Generation Models

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DM1440E</th>
<th>DM2150E</th>
<th>DM2865E</th>
<th>DM3580E</th>
<th>DM3865E9C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratings</td>
<td>60 Hz</td>
<td>50 Hz</td>
<td>60 Hz</td>
<td>50 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Continuous kWe output</td>
<td>1432</td>
<td>1200</td>
<td>2148</td>
<td>1787</td>
<td>2865</td>
</tr>
<tr>
<td>Continuous Power output (bhp)</td>
<td>2000</td>
<td>1675</td>
<td>3000</td>
<td>2495</td>
<td>4000</td>
</tr>
<tr>
<td>Speed, rated (rpm)</td>
<td>900</td>
<td>750</td>
<td>900</td>
<td>750</td>
<td>900</td>
</tr>
<tr>
<td>Engine manufacturer</td>
<td>EMD</td>
<td>EMD</td>
<td>EMD</td>
<td>EMD</td>
<td>EMD</td>
</tr>
<tr>
<td>Engine model</td>
<td>8-710</td>
<td>12-710</td>
<td>16-710</td>
<td>20-710</td>
<td>20-710</td>
</tr>
</tbody>
</table>

EMD features:
- Proven offshore reliability
- Durable medium speed engines
- Extended TBO intervals
- EPA Tier 2 and IMO Tier 2 Certification for 60 Hz Ratings
- Less maintenance = higher availability
- Powerful, responsive two-cycle design

1According to ISO 3046/1 conditions and based on generator efficiencies 95-97%. All data is subject to change without notice.
The Stewart & Stevenson Advantage
Stewart & Stevenson combines innovative product engineering with quality manufacturing processes to produce reliable, high performance power generation systems.

Comprehensive Engineering
Mechanical and electrical engineers, CAD designers and configuration administrators provide a 3-D engineering documentation package that includes system schematics for all electrical and mechanical operating systems, general arrangement and interface control diagrams to assist with location critical installation details, and interactive CD-ROM technical manuals that facilitate operating, troubleshooting and training.

Stewart & Stevenson’s engineering team provides finite element analysis to ensure design integrity, virtual prototyping to enable flexible and fast configuration changes, and design assistance with vessel arrangement to ensure proper installation of all equipment subsystems. If requested, 3-D models are provided.

Advanced Control System Design
Advanced control system designs increase the durability, efficiency and safety of our power generation products. Among them:

- PLC-based control systems housed in stainless steel NEMA 4x enclosures
- Color touch screen HMI panels permit clear and intuitive access to all genset control and monitoring functions
- MODBUS and other protocols enable remote monitoring and diagnostics of all vital generator functions

Manufacturing
Stewart & Stevenson’s ISO 9001 certified manufacturing facility features six-station flowline assembly that ensures product design integrity and consistent quality unit after unit.

- Kanban Pull Scheduling improves production efficiency
- Non-Conformance Reporting System tracks and corrects design, manufacturing and supplier quality issues
- Certified Project Management (PMP) staff ensure performance to contractual elements and act as customer’s liaison during and after project execution

EMD power generation units are produced to the following standards:

- Fluid handling lines smaller than 2 inches made of ASTM 304 stainless steel tubing ensures long service life for vital systems
- Steel piping manufactured in accordance with ASME B31.1 and B31.3, as applicable
- Structural welding performed in accordance with ANSI/AWS D1.1/D1.1M:2006
- Critical structural welds receive NDE magnetic article testing
- Marine grade three-coat paint (S&S Specification ES-502) for lifetime corrosion protection
- Mechanical gauges provide redundant instrumentation of critical operating parameters
- Electrical control interfaces in stainless steel NEMA 4x junction boxes

Testing
Each power generation unit is thoroughly tested before shipping. Our two-bay indoor test facility permits uninterrupted testing year round. It features:

- Full load test capacity via PC-controlled resistive/reactive load bank
- Generator output voltages from 480 V to +15 kV
- Data Acquisition System records all vital operating parameters during the Factory Acceptance Test
- Data records are archived for future reference and comparison with onsite performance

Added Value…

- Equipment Commissioning
- Operator Training
- Aftermarket Service and Parts 24/7
Engine Response to Load Application

The EMD engine has an excellent response to rapid load application, being far better than a 4-cycle engine performance because:

- The EMD 2-cycle engine firing once per engine revolution results in a shorter firing interval in the engine firing order. Because of the higher frequency of torque impulses, the input to the crankshaft is smoother and a lower inertial flywheel can be utilized, which avoids deceleration between torque impulses.

- The EMD 2-cycle engine positive supply of combustion air at all times is achieved by the unique turbocharger/supercharger design, which is directly driven from the engine gear train through an over-running clutch until increased power levels are reached. The EMD engine does not have the restricting influence of the turbocharger thermal lag in supplying adequate combustion, as does the four-stroke engine.

By operating the EMD Generator Sets in accordance with the Power Plant Load Management Chart you will properly utilize and manage your cylinders. The resulting benefits include world class fuel economy and performance, reduced lube oil consumption, superior engine component longevity and less down time.

Power Plant Load Management Study

Engine Operating Region Key

- Low Load Range: Limited Operation Recommended
  Poor Fuel Economy
- Normal Range: Continuous Operation Recommended
  Best Fuel Consumption & Operational Performance
- Cautionary Range: Continuous Operation Permitted
  Insufficient Reserve for Unexpected Generator Trip Off-Line
- Governing Range (ISO 8528-1): Limited Operation Recommended
  Insufficient Reserve for Unexpected Generator Trip Off-Line
- Excessive Load Range: Not Recommended
  Exceeds Engine Maximum Power Rating

By operating the EMD Generator Sets in accordance with the Power Plant Load Management Chart you will properly utilize and manage your cylinders. The resulting benefits include world class fuel economy and performance, reduced lube oil consumption, superior engine component longevity and less down time.

Note: 1 “Drilling” Service rating (available on-demand) equals 110% of Continuous Rating provided vessel power management system normal operating modes include load limits not to exceed Normal Range.

For Sales and Service, contact:

**Houston**
8631 East Freeway
Houston, TX 77029
713-671-6220

**Houston Manufacturing**
10750 Telge Road
Houston, TX 77095
281-345-5100

**International Sales**
1000 Louisiana, Suite 4950
Houston, TX 77002
713-751-2649

**New Orleans**
1400 Destrehan Ave.
Harvey, LA 70058
504-347-4326

Copyright © 2010 Stewart & Stevenson 10-04-002