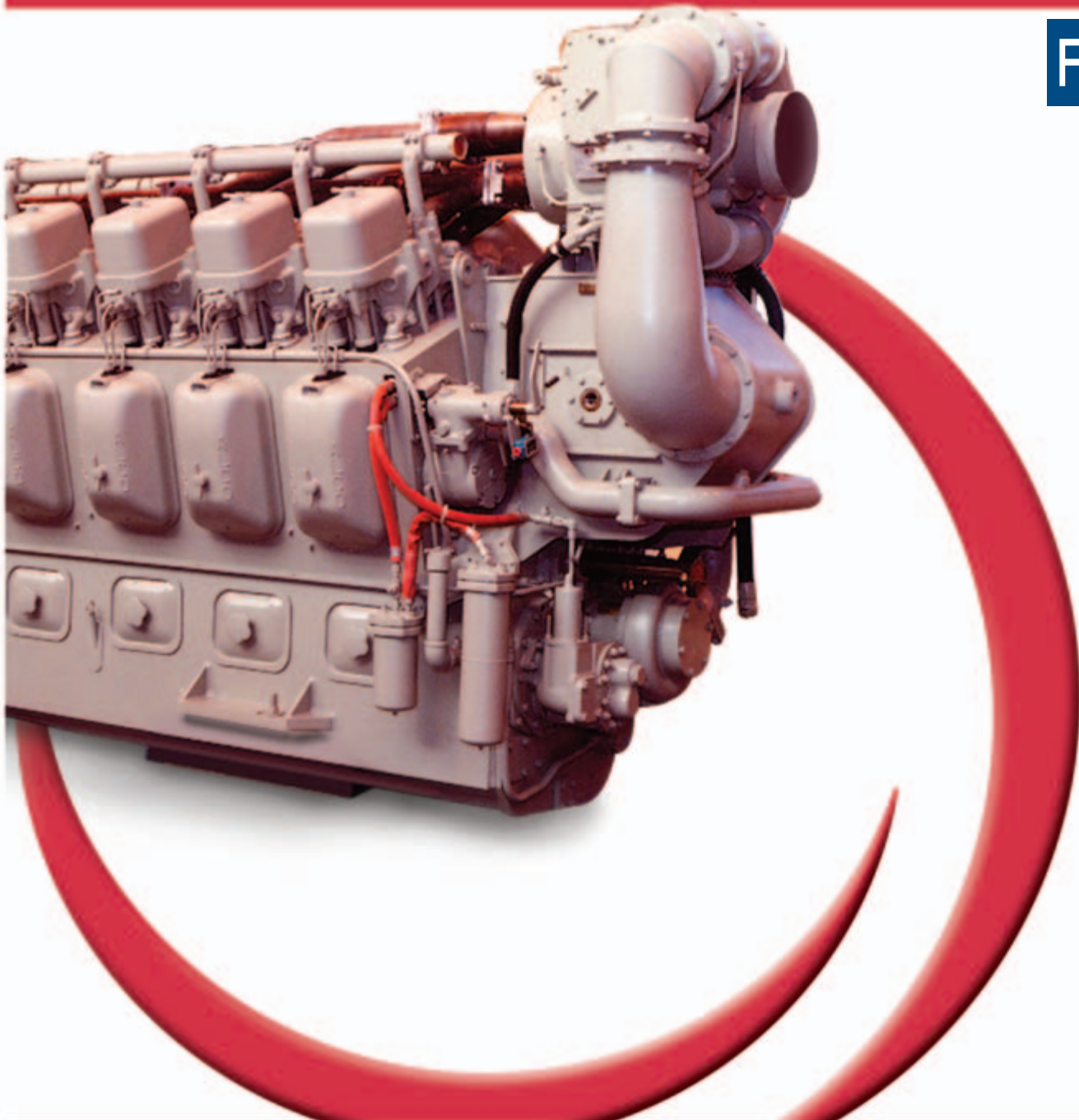


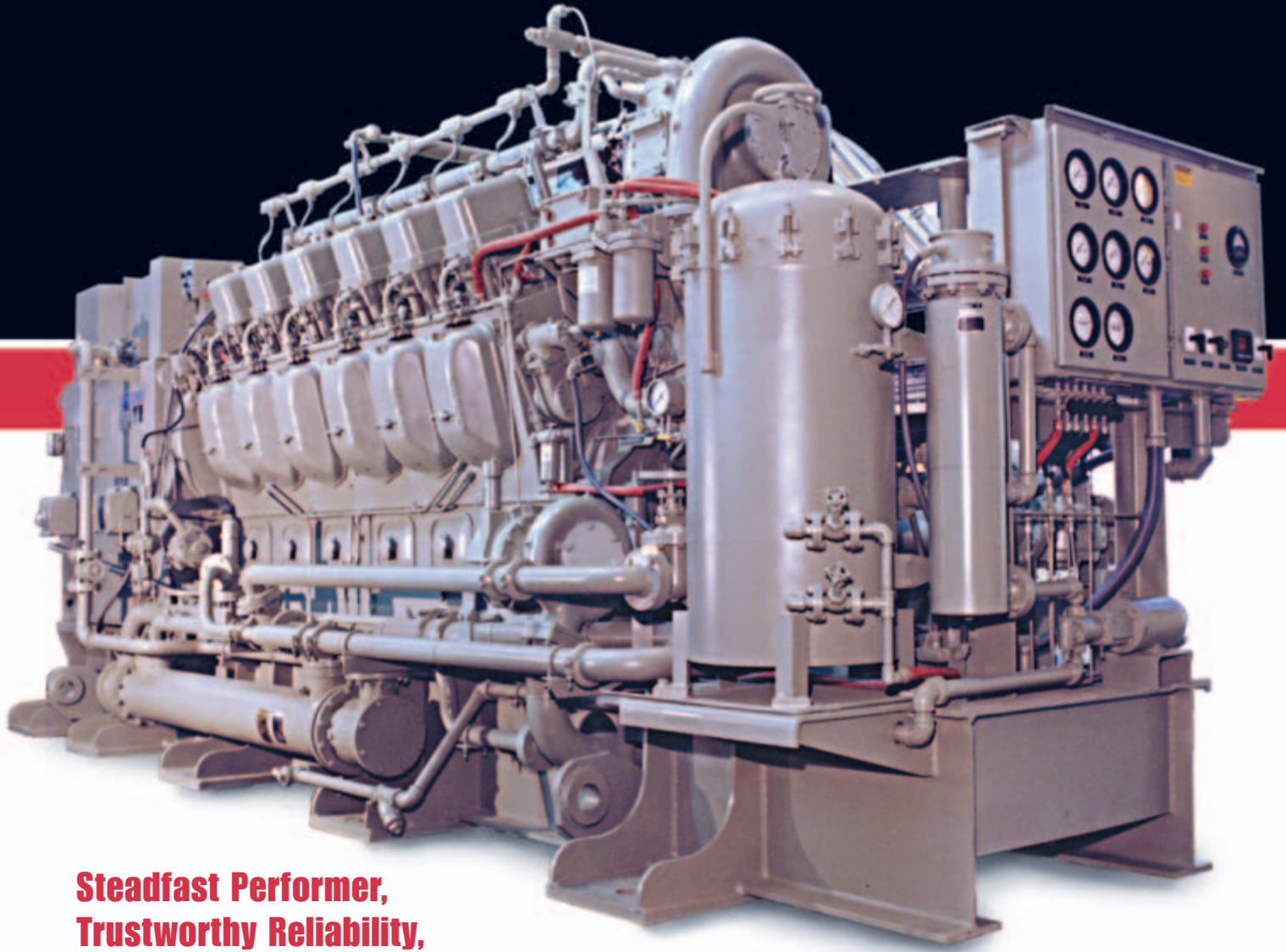
FAIRBANKS  
MORSE  
**ENGINE**

an EnPro Industries company

**POWER** *Solutions*  
**251 DIESEL ENGINES**



**GENERATOR | MARINE | LOCOMOTIVE**



## **Steadfast Performer, Trustworthy Reliability, and Relentless Dependability**

The FM/ALCO engine, a world renowned name well established as a workhorse and prime mover for marine, stationary and locomotive applications. It is found in demanding applications powering icebreakers, tug boats, dredges, pumps, emergency nuclear back-up generators, locomotives, and a host of other applications needing reliable, rugged and dependable power.

All FM/ALCO engines undergo very rigorous factory operation performance testing and evaluation, to ensure that our product engineering specifications and customer requirements are fulfilled.



- **Rugged**
- **Efficient**
- **Reliable**

## 251 Diesel Engines

The FM/ALCO 251 engine is a rugged 4-stroke engine, available in 6, 8, 12, 16, and 18 cylinder configurations covering 1050 to 4500 bhp. All versions feature exceptional commonality of components with 229 mm (9 in) bore and 267 mm (10.5 in) stroke used throughout.

Universally recognized as a reliable power plant, the model 251 diesel engine affords high specific output with low specific fuel consumption. It employs the four-stroke cycle with efficient turbocharging and after cooling. FM/ALCO engines are available as engines only or as completely packaged units.

- Forged alloy crankshaft with nitrided bearings, and welded counterweights.
- Fabricated steel cylinder block with redesigned camshaft bearing supports.
- The underslung crankshaft is carried in forged steel saddles.
- Forged steel piston crowns are bolted to forged aluminum alloy piston bodies.
- The connecting rod is a high strength alloy steel forging mounted in a side by side arrangement on the crankpin.
- Quality iron alloy makes the FM/ALCO cylinder head resist high temperatures and pressures.



- Camshafts are made in replaceable sections.
- "OpenGrain" chrome plated liners ensure adequate oil film thickness yielding very low wear rates while maintaining low lube oil consumption.



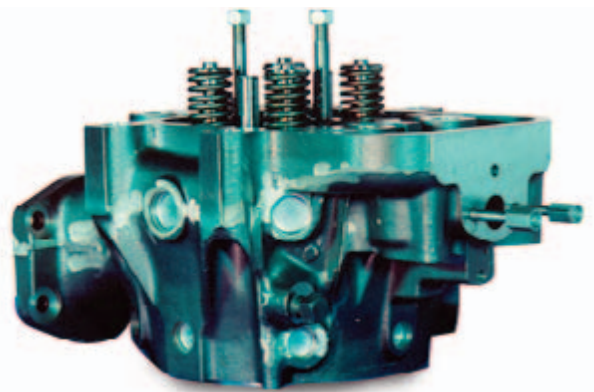
# 251 Plus

## Enhanced Performance

The *251 Plus* package can yield substantial reduction in fuel consumption depending on operating conditions.

At the same horsepower, “*Plus*” technology offers reduced fuel consumption.

If you need additional horsepower, the addition of *251 Plus* cams can allow you to upgrade from “C” rated to the modern “F” rated while retaining the benefits of reduced fuel and lube oil consumption.



**Cylinder Head Conversion** The *251 Plus* cylinder head is made from a stronger, more durable casting, which keeps thermal distortion and mechanical deflection to a minimum.

**Super Bowl Piston** This crown design provides better combustion, which results in increased fuel efficiency without increasing firing pressures.

**OpenGrain Cylinder Liner** A chrome pattern dramatically reduces lube oil consumption while enhancing lubricity between the liner and piston. Resulting in better ring and liner wear rates. A standardized ring pack is thus reducing consumable inventory. Soot deposits are reduced in the oil and emissions. Strainer and filter cleaning intervals are extended.

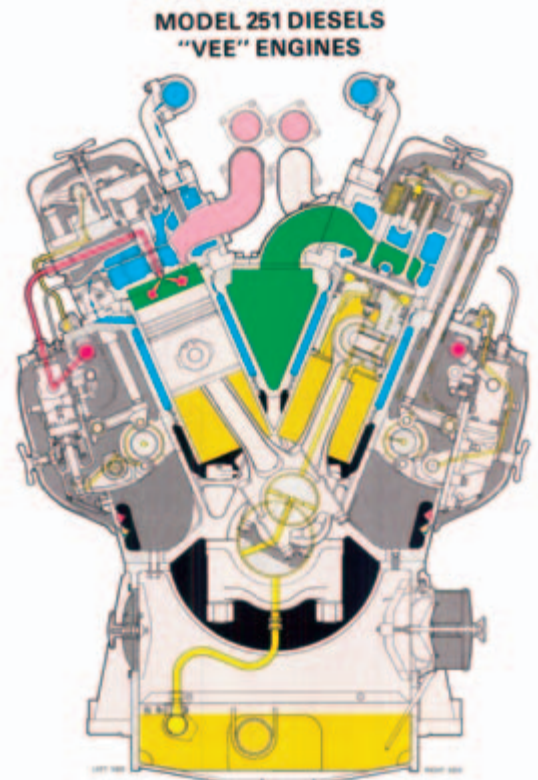




**Camshaft** 251 Plus camshafts are made of a stronger material to increase cam life. Larger diameter lobes and rollers reduce contact stresses, which in turn result in increased reliability of the shaft. These camshafts allow higher velocity at the start of injection and more precise fuel delivery over the injection cycle resulting in lower fuel consumption.



**Fuel Lines** The fuel injection line utilizes a state-of-the-art step in the manufacturing process called "Autofrettage." The Auto frettage process exposes the I.D. of the tube wall to high hydraulic pressures which work-hardens the tube wall leaving a compressive layer on the surface thereby increasing the fatigue limit and closing the micro-fissures which can lead to tube failures. The principal benefit is unsurpassed service life even under the most adverse condition, virtually trouble-free, high-pressure fuel injection line and most importantly unequaled OEM quality.



**LEGEND**  
 ■ Fuel Oil  
 ■ Lube Oil  
 ✖ Exhaust  
 ■ Water  
 ■ Air

# Genuine OEM Replacement Parts

## Unequaled Quality

Only Genuine Fairbanks Morse Engine OEM replacement parts can provide optimal performance and service life for your FM/ALCO engine. Starting with proprietary metallurgical design specifications through precise machining engineered tolerances, genuine replacement FM/ALCO engine parts provide the basis for achieving the highest levels of reliability and availability. Only parts produced to exacting specifications derived from the Original Equipment Manufacturer's (OEM) can meet these demands. The use of genuine FM/ALCO replacement parts is the only way to ensure that design improvements and enhanced fuel consumption and reliability are incorporated into your engines.

An inventory of FM/ALCO genuine parts is available around-the-clock from our warehouse facility adjacent to the Beloit Factory.



## The Fairbanks Morse Quality Pledge

At Fairbanks Morse Engine we are known for our rigorous quality standards, our innovative quality engineering, and our quality customer support.

Our ISO-certified quality assurance program involves in-depth operator inspections, continual internal auditing, the most sophisticated testing equipment available, and rigid supplier standards. At Fairbanks Morse Engine, quality is everyone's responsibility.

# Service Support and Training

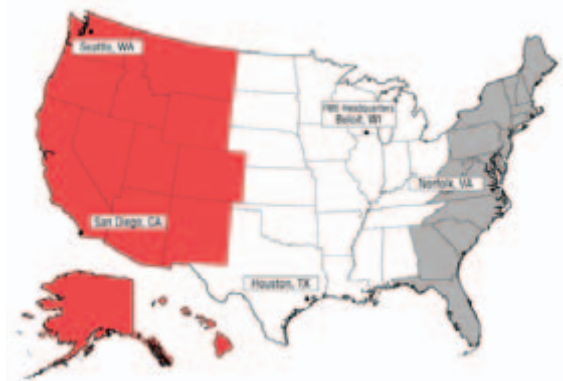
## Commitment

### Factory Service Support

Our commitment to product support and service is the vital link between Fairbanks Morse and you. We have highly qualified service personnel ready to provide on-site customer support, perform minor repairs, troubleshoot, or perform major overhauls on FM/ALCO engines anywhere in the world. Maintenance contracts are offered for customers who prefer that all maintenance on the FM/ALCO engines be handled by the factory.

### Factory Training

Fairbanks Morse Engine Conference & Training Center is equipped to provide the most extensive hands-on training. With a complete FM/ALCO engine, major components and cutaway training aids, your team will learn from instructors with years of experience. Courses include maintenance, minor repair, major repair, major overhaul and diagnostics.



### Parts and Service Centers

630 Tidewater Dr.  
Norfolk, VA 23504  
800.322.7241

12253 FM 529  
Houston, TX 77041  
800.499.3633

18926 13th Place South  
Seattle, WA 98148  
800.443.8461

1545 Tidelands Ave., Suite J  
National City, CA 91950  
877.224.0015

CANADA  
217 Bow Street  
Cochrane, Alberta  
Canada, T4C1A5  
403.932.3230  
Fax: 403.932.4800

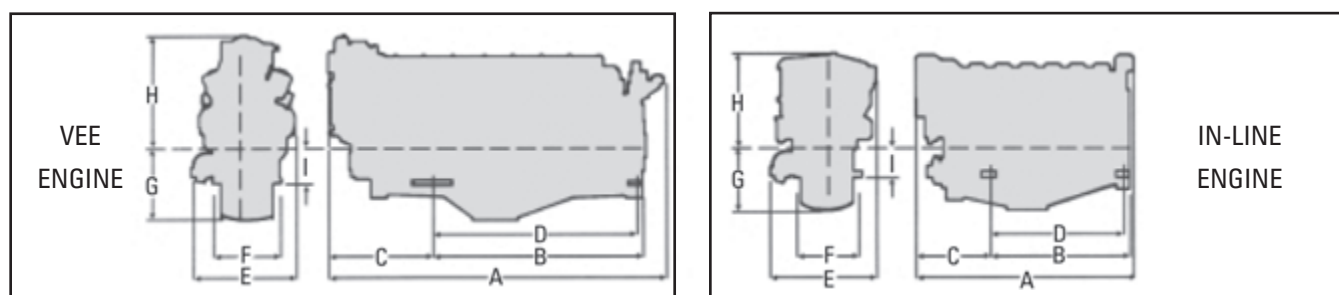
ASIA/PACIFIC AND EUROPE  
608.364.8247  
Fax: 608.364.8417

LATIN AMERICA  
786.845.6960  
Fax: 786.845.9970



# 251 Diesel Engines

## Dimensions



TYPE		A	B	C	D	E	F	G	H	I	DRY WEIGHT	
		6 cylinder	mm	3781	2285	1230	2154	1655	1016	748	1524	499
in-line	in	148.86	89.94	48.44	84.80	65.16	40.00	29.45	60.00	19.63	lb	22500
8 cylinder	mm	3581	2365	1125	2235	1540	1206	789	1622	597	kg	11658
vee	in	141.00	93.11	44.31	87.99	60.63	47.48	31.06	63.88	23.50	lb	25700
12 cylinder	mm	4597	2632	1595	2500	1570	1206	838	1783	597	kg	14969
vee	in	181.00	103.63	62.80	98.44	61.81	47.48	33.00	70.19	23.50	lb	33000
16 cylinder	mm	5407	3413	1656	3283	1540	1206	838	1800	597	kg	19051
vee	in	212.87	134.37	65.19	129.25	60.63	47.48	33.00	70.88	23.50	lb	42000
18 cylinder	mm	6271	3988	1945	3858	1571	1206	864	1845	597	kg	22317
vee	in	246.88	157.00	76.57	151.88	61.85	47.48	34.00	72.63	23.50	lb	49200

Basic engine includes engine-driven jacket water and lube oil pumps.

Free end power take-off options are available.

Universally recognized as a reliable power plant, the model 251 diesel engine affords high specific output with low specific fuel consumption.

# Generator Power

## Specifications

Cylinder Bore mm (in) .....	229 (9.0)
Piston Stroke mm (in) .....	267 (10.5)
Cycle .....	4 stroke
Displacement/Cylinder I (cu in) .....	10.9 (668)
Aspiration .....	Turbocharged –Aftercooled
Rotation .....	CCW or CW
Mean Piston Speed – m/s (ft/s) .....	6.7-10.6 (21.8-35.0)
BMEP Bar (psi)	
Continuous .....	12.7-17.9 (185-260)
Standby .....	4.4-19.4 (210-282)

## Ratings

FREQUENCY		HZ	50		60	
			750	1000	900	1200
RATED SPEED		RPM				
6 cylinder in-line	continuous	kW (elect.)	500	865	730	1000
	standby	kW (elect.)	568	950	810	1100
8 cylinder vee	continuous	kW (elect.)	865	1154	1040	—
	standby	kW (elect.)	950	1269	1144	—
12 cylinder vee	continuous	kW (elect.)	1300	1730	1556	2000
	standby	kW (elect.)	1427	1903	1712	2200
16 cylinder vee	continuous	kW (elect.)	1730	2307	2076	2650
	standby	kW (elect.)	1903	2539	2084	2920
18 cylinder vee	continuous	kW (elect.)	2108	2810	2528	—
	standby	kW (elect.)	2319	3090	2780	—

Ratings are based on 90°F (32.2°C) ambient temperature, 28.25 in. Hg. (71.6 cm Hg) barometric pressure (min), 1500 ft. (457 m) altitude (max).

Nominal 95.5% generator efficiency are assumed for kW, electrical, output.

For ratings not listed or for ratings at actual site conditions, consult Fairbanks Morse Engine Division.

# Marine Power

## Specifications

Cylinder Bore mm (in) .....	229 (9.0)
Piston Stroke mm (in) .....	267 (10.5)
Cycle .....	4 stroke
Displacement/Cylinder I (cu in) .....	10.9 (668)
Aspiration .....	Turbocharged –Aftercooled
Rotation .....	CCW or CW
Mean Piston Speed – m/s (ft/s) .....	8.0-10.6 (26.2-35.0)
BMEP Bar (psi)	
Continuous .....	15.5-16.5 (225-240)
Overload .....	16.9-18.2 (245-264)

## Ratings

RATED SPEED		RPM	900	1000	1100	1200
6 cylinder in-line	continuous	kW (Bhp.)	764 (1025)	906 (1215)	995 (1335)	1044 (1400)
	overload	kW (Bhp.)	839 (1125)	980 (1315)	1078 (1445)	1145 (1535)
8 cylinder vee	continuous	kW (Bhp.)	1089 (1460)	1208 (1620)	—	—
	overload	kW (Bhp.)	1178 (1580)	1309 (1755)	—	—
12 cylinder vee	continuous	kW (Bhp.)	1629(2185)	1812 (2430)	1991 (2670)	2088 (2800)
	overload	kW (Bhp.)	1793 (2405)	1995 (2675)	2192 (2940)	2297 (3080)
16 cylinder vee	continuous	kW (Bhp.)	2174 (2915)	2416 (3240)	2655 (3560)	2778 (3725)
	overload	kW (Bhp.)	2390 (3205)	2658(3565)	2923 (3920)	3057 (4100)
18 cylinder vee	continuous	kW (Bhp.)	2446 (3280)	2718 (3645)	2990 (4010)	—
	overload	kW (Bhp.)	2688 (3605)	2990 (4010)	3288 (4410)	—

Ratings are based on 90°F (32.2°C) ambient temperature, 28.25 in. Hg. (71.6 cm Hg) barometric pressure.

Engines comply with major classification society requirements.

For ratings not listed or for ratings at actual site conditions, consult Fairbanks Morse Engine Division.

# Locomotive Power

## Specifications

Cylinder Bore mm (in) .....	229 (9.0)
Piston Stroke mm (in) .....	267 (10.5)
Cycle .....	4 stroke
Displacement/Cylinder I (cu in) .....	10.9 (668)
Aspiration .....	Turbocharged –Aftercooled
Rotation .....	CCW
Mean Piston Speed – m/s (ft/s) .....	8.8-9.7 (29.2-32.1)

## Ratings

NO. CYLINDER	TYPE	ENGINE SPEED	ENGINE OUTPUT		BMEP	
			gkw	ghp	bar	psi
	<b>251-</b>	<b>RPM</b>				
6 cylinder in-line	B	1025	783	1050	13.9	202
	D	1100	1007	1350	16.7	242
	F	1100	1118	1500	18.6	269
8 cylinder vee	F	1000	1357	1820	18.6	269
12 cylinder vee	B	1000	1454	1950	13.2	192
	C	1050	1603	2150	13.9	202
	CE	1050	1827	2450	15.8	230
	E	1050	1939	2600	16.9	245
	F	1100	2237	3000	18.6	269
16 cylinder vee	B	1000	1939	2600	13.2	192
	C	1050	2274	3050	14.8	215
	E	1050	2461	3300	16.1	233
	F	1100	2983	4000	18.6	269
18 cylinder vee	F	1100	3356	4500	18.6	269

Engine gross output complies with AAR and UIC classification.

For ratings not listed or for ratings at actual site conditions, consult Fairbanks Morse Engine.

# 251 Series Diesel Engines



## **POWER** *Solutions*

Fairbanks Morse Engine, based in Beloit, Wisconsin, U.S.A., is a worldwide leader in engine technology and manufacturing. For over a century, Fairbanks Morse Engine has pioneered advances in engine design and development for marine propulsion, industrial drive applications, and electric power generation.

Quality and customer service are the highest priority at Fairbanks Morse Engine. Our commitment to quality systems has earned us ISO 9001 certification as well as recognition from the nuclear industry for producing products according to the requirements of 10CFR50 Appendix B. It is this commitment that has kept Fairbanks Morse Engine at the forefront of engine manufacturing and customer satisfaction.



Tel. 800.356.6955 • Fax 608.364.0382

**[www.fairbanksmorse.com](http://www.fairbanksmorse.com)**

Data and specifications subject to change without notice.