



**ENGINE PERFORMANCE CURVE**

Rating: M3 - 135 hp (101 kW) @ 2500 rpm  
 M2 - 120 hp (90 kW) @ 2400 rpm

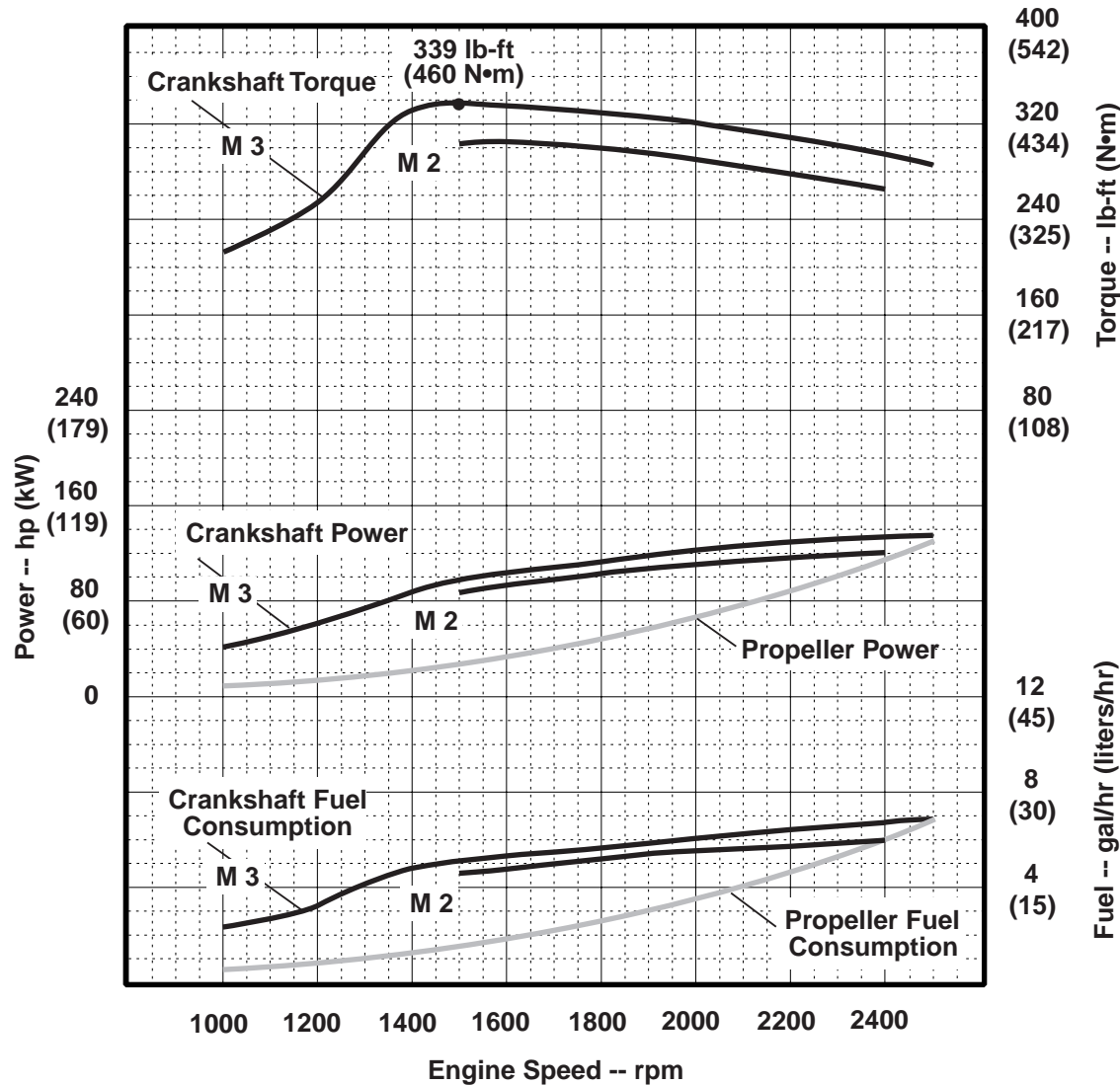
Application: Marine

**POWERTECH 4.5 L Engine**

Model: **4045TFM50**

[Option 16HP / 16HQ]\*

(Propeller Shaft Power Based on 97% Marine Gear Efficiency)



Air Intake Restriction ..... 12 in.H<sub>2</sub>O (3 kPa)  
 Exhaust Back Pressure ..... 30 in.H<sub>2</sub>O (7.5 kPa)

Gross power guaranteed within + or - 5% at SAE J1995 and ISO 3046 conditions:  
 77 °F (25 °C) air inlet temperature  
 29.31 in.Hg (99 kPa) barometer  
 104 °F (40 °C) fuel inlet temperature  
 0.853 fuel specific gravity @ 60 °F (15.5 °C)

Conversion factors:  
 Power: kW = hp x 0.746  
 Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg  
 Torque: N·m = lb-ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes:

|                                    |                                |
|------------------------------------|--------------------------------|
| Tier-1 Emission Certifications:    | Certified by:                  |
| NONE<br>Ref: Engine Emission Label | <i>Neal Seeger</i><br>5 Apr 99 |

\* Revised Data  
 Curve: 4045TFM50135\* ..... Sheet 1 of 3  
 April 1999



**ENGINE PERFORMANCE CURVE**

**POWERTECH 4.5 L Engine**

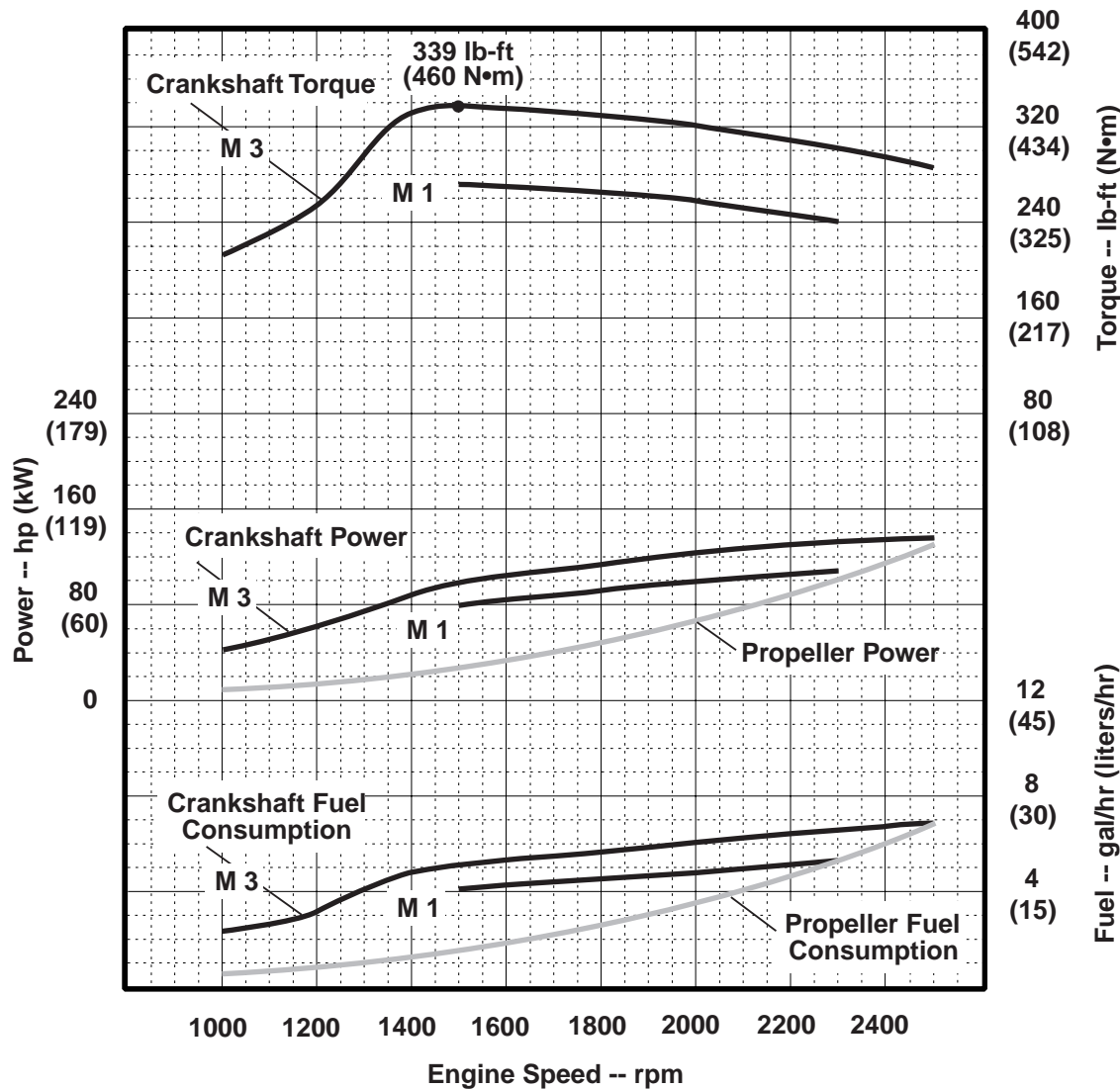
Rating: M3 - 135 hp (101 kW) @ 2500 rpm  
 M1 - 105 hp (78 kW) @ 2300 rpm

Model: **4045TFM50**

[Option 16HP / 16HQ]\*

(Propeller Shaft Power Based on 97% Marine Gear Efficiency)

Application: Marine



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Notes:

|                                    |                                |
|------------------------------------|--------------------------------|
| Tier-1 Emission Certifications:    | Certified by:                  |
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## Common Specifications:

### General Data

Model .....4045TFM50  
 Number of Cylinders ..... 4  
 Bore and Stroke--in.(mm) ..... 4.19 x 5.00 (106 x 127)  
 Displacement--in<sup>3</sup> (L) .....276 (4.5)  
 Compression Ratio ..... 17.2:1  
 Valves per Cylinder -- Intake / Exhaust..... 1 / 1  
 Firing Order..... 1-3-4-2\*  
 Combustion System..... Direct Injection  
 Engine Type..... In-line, 4-Cycle  
 Aspiration..... Turbocharged

### Physical Data

(Includes Engine, Flywheel Housing, Flywheel & Electrics)  
 Length--in.(mm) .....35\* (885)\*  
 Width--in.(mm) .....28 (713)  
 Height--in.(mm) ..... 36 (911)  
 Weight, dry--lb (kg).....1017 (462)  
 Center of Gravity Location  
     From Rear Face of Block (X-axis)--in.(mm) .... 10.6 (270)  
     Right of Crankshaft (Y-axis)--in.(mm)..... 7.4 (189)  
     Above Crankshaft (Z-axis)--in.(mm).....16.8 (428)  
 Max. Allow. Static Bending Moment at Rear Face  
     of Flywhl Hsg w/5-G Load--lb-ft (N•m) .....600 (814)  
 Thrust Bearing Load Limit (Forward)--lb (N) .....900 (4003)  
 Maximum Installed Angle  
     Front Up--degrees..... 15  
     Front Down--degrees ..... 0

### Fuel System

Fuel Injection Pump .....Stanadyne DB-4  
 Governor Type.....Mechanical  
 Governor Regulation--percent ..... 7 to 10  
 Fuel Consumption--gal/hr (L/hr).....6.9 (26.3)  
 Total Fuel Flow--gal/hr (L/hr) .....33 (124)  
 Maximum Leak Off Line Pressure--psi (kPa) .....2 (14)  
 Max. Fuel Transfer Pump Suction Lift--ft (m) fuel .....3 (0.9)  
 Max. Fuel Height Above Transfer Pump--ft (m) .....4.5 (1.4)  
 Fuel Filter Size @98% Efficiency--Micron..... 8

## Engine Specification Data

### Lubrication System

Oil Pressure @ Rated Speed--psi (kPa)..... 50 (345)  
 Oil Pressure @ Low Idle--psi (kPa) ..... 15 (105)  
 Oil Temperature in Pan--°F (°C) ..... 239 (115)  
 Oil Pan Capacity, High--qt (L) ..... 13.7 (13)  
 Oil Pan Capacity, Low--qt (L)..... 12.7 (12)  
 Total Oil Capacity with Filters--qt (L)..... 14.8 (14)  
 Operational Angularity Limit - Any--degrees..... 30  
 Maximum Crankshaft Pressure--in. H<sub>2</sub>O (kPa)..... 2 (0.5)  
 Engine Crankcase Vent System .....Open

### Exhaust System

Exhaust Temperature--°F (°C) ..... 770 (410)  
 Exhaust Gas Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min) ..... 700 (20.1)  
 Maximum Back Pressure--in. H<sub>2</sub>O (kPa) ..... 30 (7.5)  
 Maximum Weight on Turbocharger--lb (kg) .....55 (25)  
 Recommended Minimum Exhaust Outlet Size--in.(mm)  
     Dry ..... 3.0 (75)  
     Wet.....3.25 (84)

### Cooling System

Engine Heat Rejection--BTU/min (kW) ..... 5000 (88)  
 Engine Radiated Heat--BTU/min (kW)..... 750 (13.2)  
 Coolant Flow--gal/min (L/min)..... 47\* (178)\*  
 Minimum Coolant Fill Rate--gal/min (L/min) ..... 3 (11)  
 Thermostat Start to Open--°F (°C)..... 176 (80)  
 Thermostat Fully Open--°F (°C).....201 (94)  
 Maximum Top Tank Temperature--°F (°C) .....212 (100)  
 Minimum Water-to-Boil Temperature--°F (°C)..... 86 (30)  
 Recommended Pressure Cap--psi (kPa)..... 7 (48)  
 Minimum Top Tank Pressure--in. H<sub>2</sub>O (kPa)..... 24 (610)  
 Max. Pressure Drop Across Keel Cooler--psi (kPa) .. 6 (41)  
 Engine Coolant Capacity--qt (L) ..... 15 (14)

### Sea Water System

Sea Water Pump Flow--gal/min (L/min)..... 31 (118)  
 Maximum Inlet Restriction--in. H<sub>2</sub>O (kPa) ..... 120 (30)  
 Maximum Outlet Pressure--psi (kPa)..... 10 (69)  
 Maximum Suction Lift--ft (m)..... 10 (3)

### Air System

Minimum Ventilation Area--in<sup>2</sup> (m<sup>2</sup>) ..... 81 (0.052)  
 Maximum Allowable Air Temperature Rise  
     Ambient to Engine Inlet--°F (°C) ..... 31 (17)  
 Engine Air Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min) ..... 300 (9)  
 Intake Manifold Pressure--psi (kPa) ..... 18 (124)  
 Maximum Air Intake Restriction  
     Dirty Air Cleaner--in. H<sub>2</sub>O (kPa) ..... 25 (6.3)  
     Clean Air Cleaner--in. H<sub>2</sub>O (kPa) ..... 12 (3.0)

### Electrical System

**12 Volt 24 Volt**

Recommended Battery Capacity  
     Cold Cranking Amps @ 32 °F (0 °C)--amp...640 ..... 570  
 Max. Starting Circuit Resistance--Ohms.....0.0012 .. 0.002  
 Starter Rolling Current @ 32 °F (0 °C)--amp ....920 ..... 600

### Performance Data

Rated Power--hp (kW) ..... 135 (101)  
 Rated Power (Metric) Fuel @ 77 °F (25 °C)--PS ..... 137  
 Rated Speed--rpm ..... 2500  
 Rated Torque--lb-ft (N•m).....284 (385)  
 Peak Torque--lb-ft (N•m)..... 339 (460)  
 Peak Torque Speed--rpm..... 1500  
 Torque Rise--percent ..... 20  
 Low Idle Speed--rpm ..... 700  
 BMEP--psi (kPa) ..... 155\* (1076)\*

### Fuel Consumption for Typical Propeller Curve

| Engine rpm | Crank Power hp (kW) | Crank Torque lb-ft (N•m) | Prop Power hp (kW) | Prop Fuel gal/hr(L/hr) |
|------------|---------------------|--------------------------|--------------------|------------------------|
| 2500       | 135 (101)           | 284 (385)                | 131 (98)           | 6.9 (26.3)             |
| 2400       | 134 (100)           | 292 (397)                | 116 (86)           | 6.0 (22.7)             |
| 2200       | 130 (97)            | 310 (420)                | 89 (67)            | 4.6 (17.3)             |
| 2000       | 123 (92)            | 324 (439)                | 67 (50)            | 3.5 (13.1)             |
| 1800       | 114 (85)            | 332 (451)                | 49 (36)            | 2.5 (9.6)              |
| 1600       | 103 (77)            | 338 (459)                | 34 (26)            | 1.8 (7.0)              |
| 1400       | 88 (66)             | 331 (449)                | 23 (17)            | 1.3 (4.8)              |
| 1200       | 58 (43)             | 255 (346)                | 14 (11)            | 0.8 (3.2)              |
| 1000       | 41 (31)             | 217 (295)                | 8 (6)              | 0.5 (2.0)              |

Data based on keel-cooled engine.  
 All values at rated speed and power with standard options unless otherwise noted.

\* Revised Data  
 Curve: 4045TFM50135\* ..... Sheet 3 of 3  
 April 1999