

DETROIT DIESEL

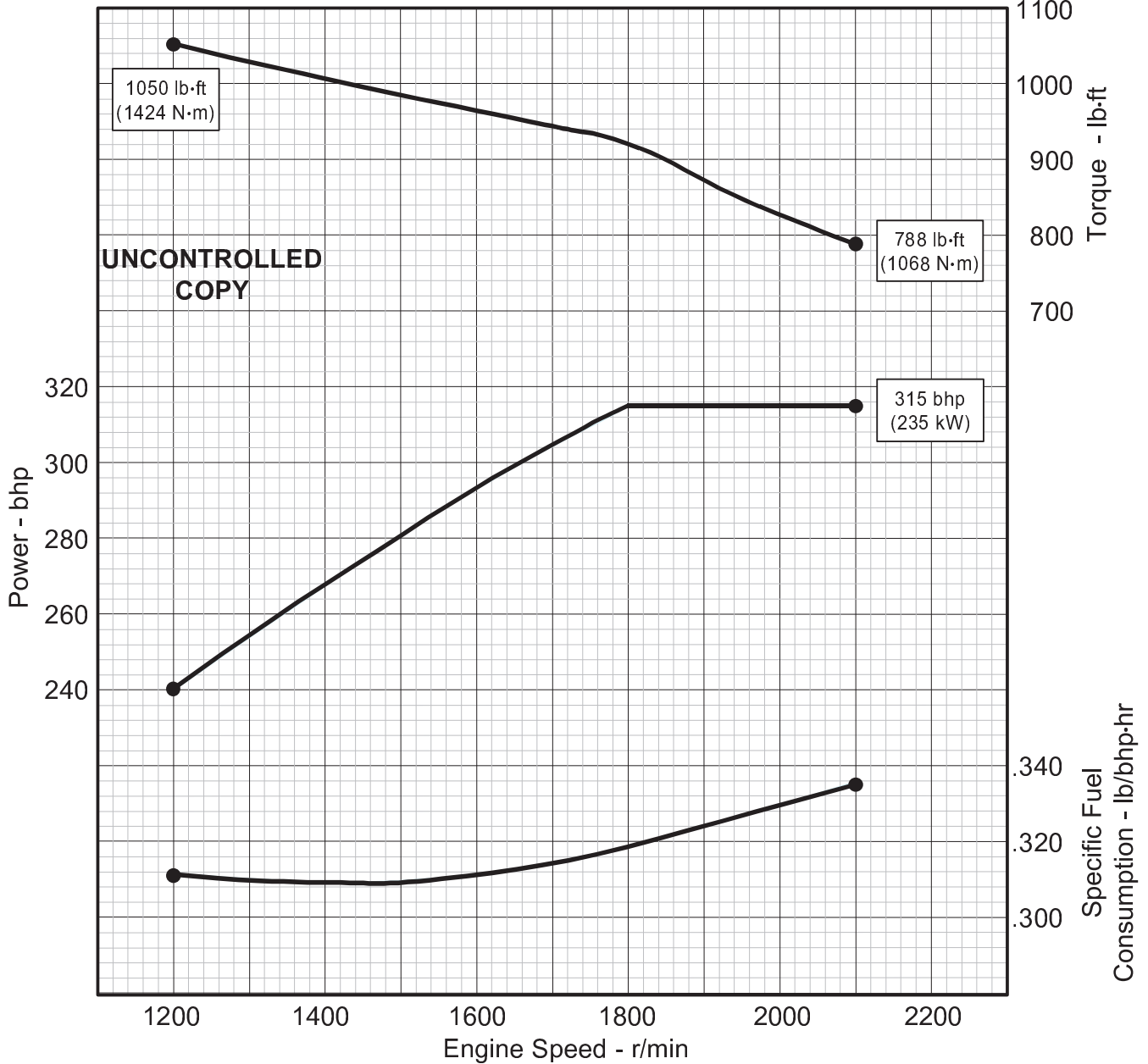
Industrial Power



Model: Series 50®

Rating: 315 bhp @ 2100 r/min
1050 lb·ft @ 1200 r/min

Certification:
1996-98 Nonroad



| | | |
|--|---|---|
| Power output guaranteed within 5% at SAE J1995 conditions: 77°F (25°C) air inlet temperature; 29.31 in. Hg (99kPa) dry barometer; 100°F (38°F) fuel inlet temperature; .653 specific gravity at 60°F (15°C) Charge air cooler system pressure drop: 16 in. H ₂ O (4 kPa) Charge air cooler system temperature out: 97°F (36°C) Air intake restriction: 10 in. H ₂ O (2.5 kPa) Exhaust Back Pressure: 15 in. H ₂ O (3.7 kPa) | Conversion Factors: Power: kW = bhp x 0.746 Fuel: kg/kW · hr = lb/bhp · hr x 0.608 Torque: N · m = lb · ft x 1.356 | Turbo: TV4502 (1.05 A/R) Injector: 5235600 |
|--|---|---|

Certified by: *Phil Rimmer*

Curve No. E4-6043-32-15
Rev. / Date: 3 / 7-21-98
Sheet No. 1 of 2

Performance Curve

CONSTRUCTION AND INDUSTRIAL SPECIFICATION SHEET

General Data

| | |
|--|-------------------------|
| Model..... | 6043-TK33 |
| Number of Cylinders..... | 4 |
| Bore and Stroke – in. x in. (mm x mm)..... | 5.12 x 6.30 (130 x 160) |
| Displacement – in. ³ (L)..... | 519 (8.5) |
| Compression Ratio..... | 15.0:1 |
| Piston Speed – ft/min (m/min)..... | 2205 (672) |
| Intake Valves Per Cylinder..... | 2 |
| Exhaust Valves Per Cylinder..... | 2 |
| Combustion System..... | DIRECT INJECTION |
| Engine Type..... | INLINE 4 CYCLE |
| Aspiration..... | TURBOCHARGED |

Configuration

| | |
|-----------------------------------|-------------------|
| Injection Device..... | EUI |
| Turbocharger..... | TV4502 (1.054A/R) |
| Charge Air Cooling..... | AIR TO AIR |
| Low Idle Speed – r/min..... | 700 |
| High Idle Speed – r/min..... | 2225 |
| Engine Crankcase Vent System..... | OPEN |

Physical Data

| | |
|--|---------------|
| Size: | |
| Length – in. (mm)..... | 44.3 (1125) |
| Width – in. (mm)..... | 35.3 (897) |
| Height – in. (mm)..... | 52.8 (1341) |
| Weight, Dry – lb (kg)..... | 2190 (993) |
| Weight, Wet – lb (kg)..... | 2279 (1034) |
| Center of Gravity Distance: | |
| From R.F.O.B. (x axis) – in. (mm)..... | 16.1 (409) |
| Above Crankshaft (y axis) – in. (mm)..... | 7.0 (178) |
| Right of Crankshaft (z axis) – in. (mm)..... | 1.1 (28.0) |
| Installation Drawing..... | 23515432 Ref. |

Mechanical Data

| | |
|---|--------------|
| Thrust Bearing Load Limit, Continuous – lb (N)..... | 900 (4000) |
| Thrust Bearing Load Limit, Intermittent – lb (N)..... | 1800 (8000) |
| Maximum Static Bending Moment at Rear | |
| Face of Block – lb-ft (N-m)..... | 1000 (1356) |
| Additional Mechanical Data..... | E4-6040-32-1 |

Fuel System

| | |
|--|--------------|
| Fuel Injector..... | 5235600 |
| Injection Timing Height – mm..... | 78.8 |
| Certification Code..... | 5000 |
| Fuel Consumption – lb/hr (kg/hr)..... | 105.5 (47.9) |
| Fuel Consumption – gal/hr (L/hr)..... | 15.1 (57.2) |
| Fuel Spill – lb/hr (kg/hr)..... | 465 (211) |
| Fuel Spill – gal/hr (L/hr)..... | 66.4 (251) |
| Total Fuel Flow – lb/hr (kg/hr)..... | 570 (259) |
| Total Fuel Flow – gal/hr (L/hr)..... | 81.5 (309) |
| Maximum Fuel Inlet Temperature – °F (°C)..... | 140 (60) |
| Maximum Fuel Pump Suction: | |
| Clean System – in. Hg (kPa)..... | 6 (20.3) |
| Dirty System – in. Hg (kPa)..... | 12 (41) |
| Fuel Filter Size, Primary – Microns..... | 25 |
| Fuel Filter Size, Secondary – Microns..... | 8 |
| Fuel Spill Restrictive Fitting – in. (mm)..... | 0.08 (2.03) |

Lubrication System

| | |
|--|-----------|
| Oil Pressure at Rated Speed – lb/in. ² (kPa)..... | 50 (345) |
| Oil Pressure at Low Idle – lb/in. ² (kPa)..... | 12 (83) |
| In Pan Oil Temperature – °F (°C)..... | 235 (113) |
| Oil Flow – gal/min (L/min)..... | 35 (133) |
| Oil Pan Capacity, High Limit..... | 22 (21) |
| Oil Pan Capacity, Low Limit..... | 19 (18) |
| Total Engine Oil Capacity with Filters – qt (L)..... | 28 (26) |
| Oil Filter, Two Full Flow – Microns..... | 28 |
| Engine Angularity Limits, Front Up – Degrees..... | 20 |
| Engine Angularity Limits, Front Down – Degrees..... | 15 |
| Engine Angularity Limits, Side Tilt – Degrees..... | 20 |

Electrical System

| | |
|---|--------|
| Recommended Battery Capacity (CCA @ 0°F): | |
| 12 Volt System..... | 1250 |
| 24 Volt System..... | 625 |
| Maximum Resistance of Starting Circuit: | |
| 12 Volt System – ohms..... | 0.0012 |
| 24 Volt System – ohms..... | 0.002 |

Cooling System

| | |
|--|-------------|
| Engine Heat Rejection to Coolant: | |
| Rated Speed – Btu/min (kW)..... | 4631 (81.4) |
| Peak Torque Speed (1200 r/min) – Btu/min (kW)..... | 4144 (72.9) |
| Charge Air Cooler Heat Rejection: | |
| Rated Speed – Btu/min (kW)..... | 4109 (72.2) |
| Peak Torque Speed (1200 r/min) – Btu/min (kW)..... | 1612 (28.3) |
| Engine Radiated Heat: | |
| Rated Speed – Btu/min (kW)..... | 1251 (22.0) |
| Peak Torque Speed (1200 r/min) – Btu/min (kW)..... | 1148 (20.2) |
| Coolant Flow: | |
| Rated Speed – gal/min (L/min)..... | 95 (360) |
| Peak Torque Speed (1200 r/min) – gal/min (L/min)..... | 53 (201) |
| Thermostat: | |
| Start to Open – °F (°C)..... | 186 (86) |
| Fully Open – °F (°C)..... | 207 (97) |
| Minimum Water Pump Inlet Pressure – lb/in. ² (kPa):..... | 0 (0) |
| Engine Coolant Capacity – qt (L)..... | 17 (16) |
| Minimum Pressure Cap – lb/in. ² (kPa)..... | 9 (62.0) |
| Maximum Coolant Pressure | |
| (Exclusive of Pressure Cap) – lb/in. ² (kPa)..... | 17 (117) |
| Maximum Top Tank Temperature – °F (°C)..... | 210 (99) |
| Minimum Top Tank Temperature – °F (°C)..... | 160 (71) |
| Minimum Coolant Fill Rate – gal/min (L/min)..... | 3 (11.4) |
| Cooling Index (110 °F Ambient w/H ₂ O @ Sea Level): | |
| Max Air to Water Diff. @ Rated Speed – °F (°C)..... | 100 (56) |
| Max Air to Water Diff. @ 1200-1500 r/min – °F (°C)..... | 110 (61) |
| Deaeration, Air Injection Capacity – ft ³ /min (m ³ /min)..... | 0.4 (0.011) |
| Minimum Drawdown Requirement – qt (L)..... | 4 (3.8) |

Air System

| | |
|--|-------------|
| Maximum Ambient to Turbo Compressor Inlet | |
| Temperature Rise – °F (°C)..... | 30 (16.7) |
| Maximum Air Intake Restriction: | |
| Clean Air Cleaner – in. H ₂ O (kPa)..... | 12 (3) |
| Dirty Air Cleaner – in. H ₂ O (kPa)..... | 20 (5) |
| Engine Air Flow: Rated Speed – ft ³ /min (m ³ /min)..... | 890 (25.2) |
| Peak Torque Speed – ft ³ /min (m ³ /min)..... | 440 (12.5) |
| Manifold Pressure – in. Hg (kPa)..... | 64.0 (217) |
| Recommended Intake Pipe Diameter – in. (mm)..... | 4 (102) |
| Maximum Charge Air Cooler System Total | |
| Pressure Drop – in. Hg (kPa)..... | 41.0 (10.2) |
| Maximum Ambient to Intake Manifold Temp. – °F (°C)..... | 150 (66) |
| Maximum Crankcase Pressure – in. H ₂ O (kPa)..... | 3.0 (0.75) |

Exhaust System

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|---|-------------|
| Exhaust Flow: Rated Speed – ft ³ /min (m ³ /min)..... | 1940 (54.9) |
| Peak Torque Speed – ft ³ /min (m ³ /min)..... | 1185 (33.6) |
| Exhaust Temperature Rated Speed – °F (°C)..... | 680 (360) |
| Peak Torque Speed – ft ³ /min (m ³ /min)..... | 930 (499) |
| Maximum Back Pressure – in. Hg (kPa)..... | 3.0 (10.1) |
| Recommended Exhaust Pipe Diameter: | |
| Single – in. (mm)..... | 5 (127) |
| Dual – in. (mm)..... | 4 (102) |

Performance Data

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|--|--------------|
| BMEP – lb/in. ² (kPa)..... | 229 (1577) |
| Friction Power: Rated Speed – fhp (kW)..... | 55 (41) |
| Peak Torque Speed – fhp (kW)..... | 20 (15) |
| Altitude Capability – ft (m)..... | 12000 (3660) |
| Torque Available at 800 r/min – lb-ft (N-m)..... | 578 (784) |

| Engine Speed r/min | Rated Power bhp (kW) | Rated Torque lb-ft (N-m) | Rated BSFC lb/bhp-hr (g/kW-hr) |
|-----------------------|-------------------------|-----------------------------|-----------------------------------|
| 2100 | 315 (235) | 788 (1068) | 0.335 (204) |
| 1950 | 315 (235) | 848 (1150) | 0.326 (198) |
| 1800 | 315 (235) | 919 (1246) | 0.318 (193) |
| 1650 | 299 (223) | 952 (1290) | 0.312 (190) |
| 1500 | 281 (210) | 984 (1334) | 0.309 (188) |
| 1350 | 261 (195) | 1015 (1377) | 0.309 (188) |
| 1200 | 240 (170) | 1050 (1424) | 0.311 (189) |

Emissions Data

| | |
|--|-----------------|
| Certification..... | 1996-98 Nonroad |
| Smoke, Rated Speed – Bosch Number..... | 1.2 |
| Smoke, Peak Torque Speed – Bosch Number..... | 1.9 |
| Noise – dB(A) @ 1..... | 104.0 |
| Additional Noise Data..... | Not Available |

| | 2100 r/min g/hr | 8 Mode Cycle g/bhp-hr |
|-----------------------|--------------------|--------------------------|
| NO _x | 1660 | 6.35 |
| CO..... | 38 | 0.49 |
| HC..... | 13 | 0.07 |
| Particulates..... | 8.6 | 0.04 |

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