

# DETROIT DIESEL

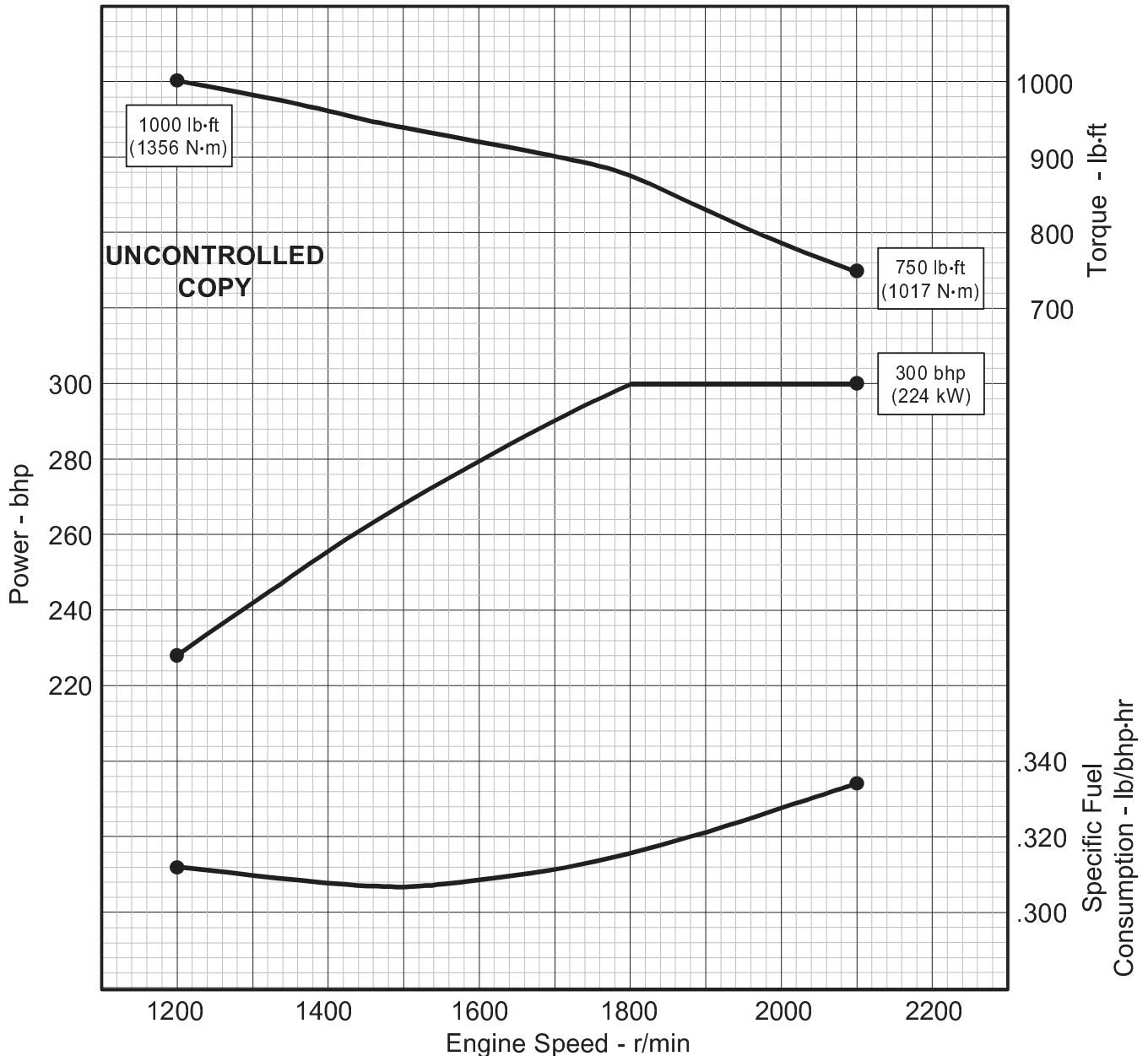
Industrial Power



**Model:** Series 50®

**Rating:** 300 bhp @ 2100 r/min  
1000 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 <sub>2</sub> O (4 kPa) Charge air cooler system temperature out: 97°F (36°C) Air intake restriction: 10 in. H <sub>2</sub> O (2.5 kPa) Exhaust Back Pressure: 15 in. H <sub>2</sub> O (3.7 kPa)	<b>Conversion Factors:</b> Power: kW = bhp x 0.746 Fuel: kg/kW · hr = lb/bhp · hr x 0.608 Torque: N · m = lb · ft x 1.356	<b>Turbo:</b> TV4502 (1.05 A/R) <b>Injector:</b> 5235600
--	--	---

Certified by: *Paul Rimmer*

**Curve No.** E4-6043-32-14  
**Rev. / Date:** 3 / 7-21-98  
**Sheet No.** 1 of 2

## Performance Curve

All information subject to change without notice.  
 Detroit Diesel and Spinning Arrows Design® and Series 50® are registered trademarks of Detroit Diesel Corporation.  
 © 1998 DETROIT DIESEL CORPORATION

# 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. <sup>3</sup> (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.....	5001
Fuel Consumption – lb/hr (kg/hr).....	100.2 (45.5)
Fuel Consumption – gal/hr (L/hr).....	14.3 (54.3)
Fuel Spill – lb/hr (kg/hr).....	470 (213)
Fuel Spill – gal/hr (L/hr).....	67.2 (254)
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. <sup>2</sup> (kPa).....	50 (345)
Oil Pressure at Low Idle – lb/in. <sup>2</sup> (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).....	4537 (79.6)
Peak Torque Speed (1200 r/min) – Btu/min (kW).....	4115 (72.4)
Charge Air Cooler Heat Rejection:	
Rated Speed – Btu/min (kW).....	3813 (67.0)
Peak Torque Speed (1200 r/min) – Btu/min (kW).....	1463 (25.7)
Engine Radiated Heat:	
Rated Speed – Btu/min (kW).....	1226 (21.6)
Peak Torque Speed (1200 r/min) – Btu/min (kW).....	1140 (20.0)
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. <sup>2</sup> (kPa):.....	0 (0)
Engine Coolant Capacity – qt (L).....	17 (16)
Minimum Pressure Cap – lb/in. <sup>2</sup> (kPa).....	9 (62.0)
Maximum Coolant Pressure	
(Exclusive of Pressure Cap) – lb/in. <sup>2</sup> (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 <sub>2</sub> 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 <sup>3</sup> /min (m <sup>3</sup> /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 <sub>2</sub> O (kPa).....	12 (3)
Dirty Air Cleaner – in. H <sub>2</sub> O (kPa).....	20 (5)
Engine Air Flow: Rated Speed – ft <sup>3</sup> /min (m <sup>3</sup> /min).....	860 (24.4)
Peak Torque Speed – ft <sup>3</sup> /min (m <sup>3</sup> /min).....	420 (11.9)
Manifold Pressure – in. Hg (kPa).....	61.8 (209)
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 <sub>2</sub> O (kPa).....	3.0 (0.75)

## Exhaust System

Exhaust Flow: Rated Speed – ft <sup>3</sup> /min (m <sup>3</sup> /min).....	1840 (52.1)
Peak Torque Speed – ft <sup>3</sup> /min (m <sup>3</sup> /min).....	1120 (31.7)
Exhaust Temperature Rated Speed – °F (°C).....	660 (349)
Peak Torque Speed – ft <sup>3</sup> /min (m <sup>3</sup> /min).....	920 (493)
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

BMEP – lb/in. <sup>2</sup> (kPa).....	218 (1502)
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	300 (224)	750 (1017)	0.334 (203)
1950	300 (224)	808 (1096)	0.324 (197)
1800	300 (224)	875 (1187)	0.315 (191)
1650	285 (213)	907 (1230)	0.309 (188)
1500	268 (200)	938 (1272)	0.306 (186)
1350	249 (186)	969 (1313)	0.308 (188)
1200	228 (170)	998 (1353)	0.312 (190)

## Emissions Data

Certification.....	1996-98 Nonroad
Smoke, Rated Speed – Bosch Number.....	1.1
Smoke, Peak Torque Speed – Bosch Number.....	1.7
Noise – dB(A) @ 1.....	103.9
Additional Noise Data.....	Not Available

	2100 r/min g/hr	8 Mode Cycle g/bhp-hr
NO <sub>x</sub> .....	1550	6.35
CO.....	38	0.49
HC.....	13	0.07
Particulates.....	8.4	0.04

**UNCONTROLLED  
COPY**

Curve No. E4-6043-32-14  
Rev. / Date: 3 / 7-21-98  
Sheet No. 2 of 2