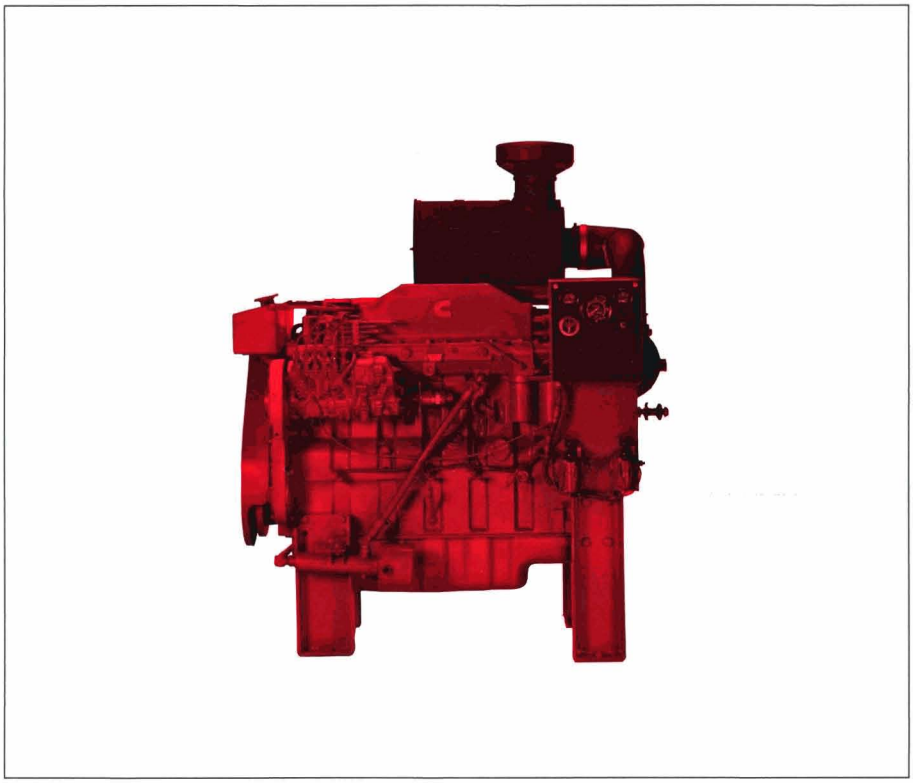

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

SPECIFICATIONS

Four Stroke Cycle, Turbocharged-Aftercooled, In-Line, 6 Cylinder Diesel Engine

Bore and Stroke	4.49 x 5.32 in.	(114X135 mm)
Displacement	504.5 cu. in.	(8.27 L)
Oil System Capacity	25.2 U.S. qts.	(23.8 L)
Engine Coolant Capacity	7 U.S. gal.	(26.5 L)
Net Weight, with Std. Accessories, Dry	1,500 lb.	(680 kg)

INSTALLATION CONSIDERATIONS

Maximum raw water pressure must not exceed 20 PSI (137 kPa). Minimum acceptable raw water flow at 90° F (32° C) raw water temperature and 100° F (38° C) ambient air temperature should be at least 44 G.P.M. (166 L/min.) at the 2100 RPM listed rating.

Ventilation air required for engine combustion is 550 CFM (287 L/sec.) at 2100 RPM rating. This is for engine air combustion only and does not take into consideration additional air required for normal room cooling.

This symbol on the nameplate means the product is Listed by Underwriters' Laboratories, Inc.

This symbol on the nameplate means the product is approved by the Factory Mutual Research Corporation.

This symbol on the nameplate means the product is Listed by Underwriters' Laboratories of Canada.

LISTED AGENCY RATINGS

300 HP @ 2100 RPM F3
270 HP @ 2100 RPM F2
240 HP @ 2100 RPM F1

All of the above ratings are listed by the following agencies:

Underwriters' Laboratories Inc.

Factory Mutual

Underwriters' Laboratories of Canada

The agency-approved horsepower ratings published are already derated for fire pump service. The ratings show horsepower available for driving the fire pump at standard SAE J1995 conditions of 29.61 in. (752 mm) Hg barometer and 77° F (25° C) inlet air temperature (approximately 300 ft. [91.4 m] above sea level). The only additional deration necessary is for higher ambient temperatures and elevations as follows: 3% for each 1000 ft. (305 m) above 300 ft. (91.4 m) and 1% for each 10° F (5.6° C) above 77° F (25° C) in accordance with National Fire Association Pamphlet No. 20.

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

DESIGN FEATURES

Aftercooler: Large capacity aftercooler results in cooler, denser air for more efficient combustion and reduced internal stress for longer life.

Bearing: Replaceable, precision type aluminum steel backed. Seven main bearings, 3.86 in. (98 mm) diameter. Connecting rod bearings 2.99 in. (76 mm) diameter.

Camshaft: Hardened cast iron for increased wear resistance and long life. Seven replaceable type precision bushings 2.36 in. (60 mm) diameter.

Connecting Rods: Drop forged I-beam section 8.50 in. (216 mm) center-to-center length. Rod is tapered on piston pin end to reduce unit pressures.

Crankshaft: Eight counterweight fully balanced high tensile strength steel forging with induction hardened fillets and journals.

Cylinder Block: Alloy cast iron with removable wet liners.

Cylinder Head: One piece cross flow cylinder head for short length and maximum structural stiffness of block/head assembly. Contains replaceable valve guides and seat inserts.

Cylinder Liners: Mid-stop replaceable wet liners feature a new liner clamping method which seals at the middle of the liner with a press fit at the top. This design eliminates the need for packing rings and crevice seals.

Two Valves Per Cylinder: With single valve springs, for fewer parts.

Water Cooled Exhaust Manifold and Water Cooled Turbocharger: Configured for rear-out exhaust for lower profile.

STANDARD EQUIPMENT

Air Cleaner: 12.5 inch (318 mm) diameter dry air cleaner.

Belt and Damper Shield Guard: Protection from alternator, accessory drive, and water pump belts and vibration damper.

Coolant Pump: Belt driven, centrifugal type.

Electrical Equipment: 12 volt negative ground system, including: a 12 volt starting motor; a 12 volt, 145 alternator; manually operable contactors; and a junction box with enclosed terminal strip.

Engine Support: Pedestal type, front and rear.

Exhaust Manifold: Wet.

Exhaust Outlet: 4 in. (101 mm) diameter, 90° elbow.

Filters: Spin-on, replaceable lubricating oil filter. Single spin-on, replaceable fuel filter.

Flywheel: Machined for stubshaft mounting.

Flywheel Housing: SAE No. 1 with industrial supports.

Governor: Mechanical flyweight, mechanical variable speed type.

Heat Exchanger: Copper nickel tube bundle, mounted.

Instrument Panel: Mounted. Electrical instruments only. Includes amp meter, tachometer, hour meter, water temperature gauge, and lubricating oil pressure gauge.

Lubricating Oil Cooler: Tubular type, jacket water cooled.

Oil Pan: Steel stamp, center sump type, 18 U.S. quarts (17 litre) capacity.

Oil Pressure Switch: Provides signal to activate alarm (not included) for low oil pressure.

Overspeed Switch: Mounted, overspeed shutdown with manual reset, stop crank contacts.

Stubshaft: Mounted on flywheel

Throttle Control: Hydraulic, with manual override.

Vibration Damper: Viscous type.

Water Jacket Heater: Mounted beside oil pan, 120/240 volt, 1500 watt.

Water Temperature Switch: Provides signal to activate alarm (not included) for high water temperature.

Cummins has always been a pioneer in product improvement. Thus specifications may change without notice. Illustrations may include optional equipment.

Cummins Engine Company, Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

CUMMINS ENGINE COMPANY, INC.
Engine Data Sheet

Engine Model: FIRE PUMP 6CTA8.3 F1
Gross Power BHP (kW): 240 (179) @ 2100
Configuration Number: D413018FX02

Data Sheet: DS-90301
Date: 12May97
CPL Code: 1366

GENERAL ENGINE DATA

Type	4 cycle, Inline, 6 cylinder
Aspiration:	Turbocharged Aftercooled
Bore - in. (mm) & Stroke - in. (mm)	114 (4.49) x 135 (5.32)
Displacement - $in.^3$ (litre)	8.27 (504.5)
Compression Ratio	15.5:1
Valves per Cylinder: - Intake	1
- Exhaust	1
Engine Weight & Center of Gravity (With Standard Accessories)	
Reference Installation Diagram	3884598
Dry Weight - lb. (kg)	1500 (680)
Wet Weight - lb. (kg)	1575 (714)
C.G. Distance from F.F.O.B. - in. (mm)	21.6 (549)
C.G. Distance Above Crankshaft Centerline - in. (mm)	15.09 (383)
Maximum Allowable Bending Moment @ Rear Face of Block - lb.-ft. (N•m)	1000 (1350)

AIR INDUCTION SYSTEM

Maximum Allowable Temperature Rise Between Ambient Air and Engine Air Inlet (Ambients 32°F [0°C] to 100°F [38°C]) - °F (°C)	30 (15)
Maximum Allowable Intake Restriction With a Dirty Air Filter Element in. H_2O (mm H_2O)	25 (635)
Part Number of Standard Air Filter Element (Dry Type)	AF-4669

LUBRICATION SYSTEM

Oil Pressure @ Rated Speeds - PSI (kPa)	30 - 50 (201 - 345)
Oil Pan Capacity (High - Low) U.S. quarts (litre)	16 - 20 (15.04 - 18.8)
Full Flow Lube Oil Filter Capacity - U.S. quarts (litre).	25.2 (23.8)
Part Number of Standard Oil Pan	3914015
Part Number of Standard Oil Filter Element	3318853

COOLING SYSTEM

Heat Exchanger Cooled (Shell & Tube Type)	
Part Number of Tube Bundle	3919724
Raw Water Working Pressure Range at Heat Exchanger - PSI (kPa)	60 (414) MAX
Recommended Minimum Water Supply Pipe Size to Heat Exchanger (Reference Only) - in. (mm) dia	1.0 (25.4)
Recommended Minimum Water Discharge Pipe Size From Heat Exchanger (Reference Only) - in. (mm) dia	1.25 (31.75)
Coolant Water Capacity (Engine Side) - U.S. gal (litre)	7 (26.5)
Standard Thermostat - Type	Modulating
- Range - °F (°C)	181-203 (83-95)
Minimum Raw Water Flow with Water Temperatures to 90°F (32°C) - U.S. GPM (litre/s)	44 (20.7)

EXHAUST SYSTEM

Maximum Allowable Back Pressure Imposed by Piping & Silencer - in. Hg (mm Hg)	3 (75)
Exhaust Pipe Size Normally Acceptable - in. (mm) dia	4

A jacket water heater is mandatory on this engine. The recommended heater wattage is 1000 down to 40°F (4°C).

FUEL SYSTEM

Supply Line Size - in. (mm)	0.25 (6)
Drain Line Size - in. (mm)	0.25 (6)
Maximum Fuel Line Length Between Supply Tank & Fuel Pump - ft. (m)	40 (12)
Maximum Fuel Height Above CL Crankshaft - in. (mm)	80 (2030)
Part Number of Standard Fuel Filter	3843760
Part Number of Standard Fuel Filter Element	FS1251
Maximum Allowable Restriction to	
Fuel Pump with Dirty Filter - in. Hg (mm Hg)	3.5 (89)
Maximum Allowable Return Line Restriction - in. Hg (mm Hg)	5.0 (127)

ELECTRICAL SYSTEM

Battery Voltage	12 (24 Optional)	
Battery Cable Size (Maximum Cable Length Not to Exceed 10 ft. (3.0 m) AWG)	00	
Wiring for Automatic Starting (Negative Ground)	Standard	
Alternator (Standard), Internally Regulated - Ampere	12 Volt--60,	24 Volt--35
Manually Operable Contactors	Standard	
Minimum Recommended Battery Capacity	12 Volt	24 Volt
70°F (21°C) Minimum Temperature - CCA	750	375
32°F (0°C) Minimum Temperature - CCA	975	490
Reference Wiring Diagram Number	3884598	

PERFORMANCE DATA

All data is based on the engine operating with fuel system, water pump, lubricating oil pump, air cleaner, and alternator; not included are compressor, fan, optional equipment and driven components. Data is based on operation at SAE standard J1995 conditions of 300 ft. (91 m) altitude (39.61 in. [752 mm] Hg dry barometer), 77°F (25°C). All data is subject to change without notice.

Altitude Above Which Output Should be Limited - ft. (m)	300 (91)
Correction Factor per 1000 ft. (300 m) above Altitude Limit	3%
Temperature Above Which Output Should be Limited -°F (°C)	77 (25)
Correction Factor per 10°F (11°C) Above Temperature Limit	1% (2%)

FM Approved and UL Listed Ratings For: 6CTA8.3 F1

Listed/ Approved Ratings BHP (kW)	Engine Speed RPM	Ventilation Air Required for Combustion CFM (litre/s)	Heat Rejection to Coolant BTU/min (kW)	Heat Rejection to Ambient Air* BTU/min (kW)	Exhaust Gas Flow CFM (litre/s)	Exhaust Gas Temp. °F (°C)	Fuel Consumption Gal/h (litre/h)
240 (179)	2100	329 (155)	9300 (163)	1288 (23)	820 (387)	826 (440)	11.9 (45)

* - Does not include exhaust piping.

Cummins Engine Company, Inc.

Exhaust Emissions Data Sheet

Data Sheet: DS-90301
Date: 12May97

Engine

Model:	6CTA8.3-F1	**Application:**	Firepump
Type:	4 cycle, In-Line, 6 Cylinder Diesel	**Config. Number:**	D413018FX02
Aspiration:	Turbocharged	**Bore:**	4.49 in. (114 mm)
Compression Ratio:	15.5:1	**Stroke:**	5.32 in. (135 mm)
Emissions Control Device:	Turbocharger	**Displacement:**	504.5 cu. in. (8.3 liters)

Performance Data	**2100 RPM**
BHP	240
Fuel Consumption (gallons/hour)	11.9
Air to Fuel Ratio	17.2
Exhaust Gas Flow (CFM)	820
Exhaust Gas Temperature (^{o}F)	826

Exhaust Emissions Data

(All values are grams/hp-hour)

Component		**2100 RPM**
HC	(Total Unburned Hydrocarbons)	0.93
NOx	(Oxides of Nitrogen as NO_2)	5.03
CO	(Carbon Monoxide)	2.78
PM	(Particulate Matter)	0.25
SO_2	(Sulfur Dioxide)	0.62
CO_2	(Carbon Dioxide)	510
N_2	(Nitrogen)	2100
O_2	(Oxygen)	110
H_2O	(Water Vapor)	180

Test Conditions

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (± 2%). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.2% sulfur content (by weight) and 42-50 cetane number.
Fuel Temperature:	99^{o} F ± 9^{o} (at fuel pump inlet)
Intake Air Temperature:	77^{o} F ± 9^{o}
Barometric Pressure:	29.6 in. Hg ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H_2O/lb. dry air

The HC, NOx, and CO emissions data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimates. This data is subject to instrumentation, measurement, and engine-to-engine variability. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

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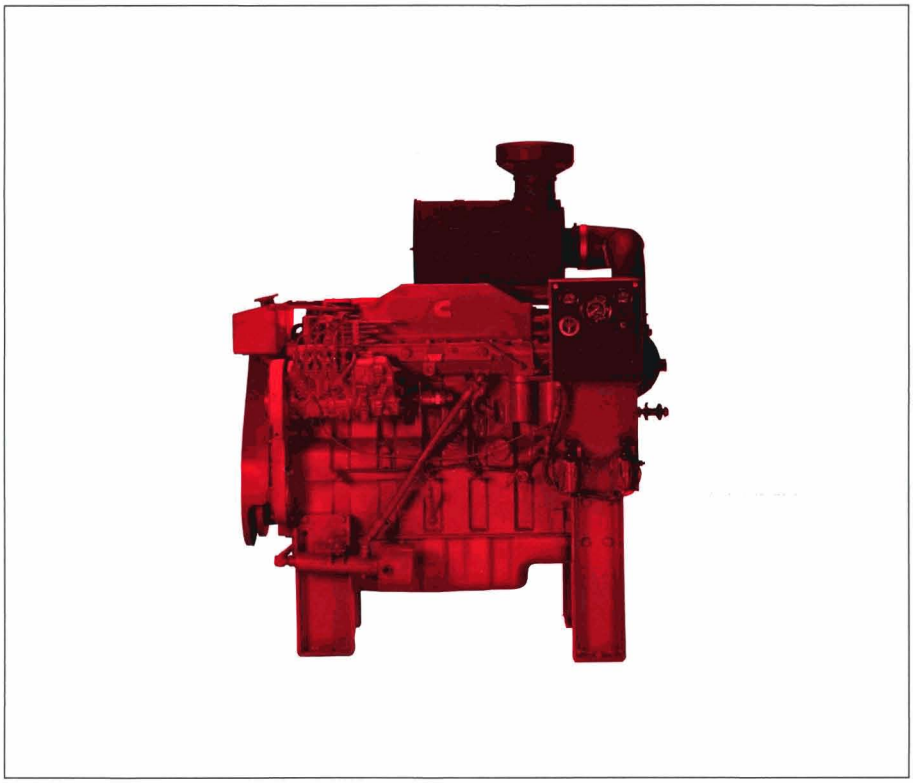

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

SPECIFICATIONS

Four Stroke Cycle, Turbocharged-Aftercooled, In-Line, 6 Cylinder Diesel Engine

Bore and Stroke	4.49 x 5.32 in.	(114X135 mm)
Displacement	504.5 cu. in.	(8.27 L)
Oil System Capacity	25.2 U.S. qts.	(23.8 L)
Engine Coolant Capacity	7 U.S. gal.	(26.5 L)
Net Weight, with Std. Accessories, Dry	1,500 lb.	(680 kg)

INSTALLATION CONSIDERATIONS

Maximum raw water pressure must not exceed 20 PSI (137 kPa). Minimum acceptable raw water flow at 90° F (32° C) raw water temperature and 100° F (38° C) ambient air temperature should be at least 44 G.P.M. (166 L/min.) at the 2100 RPM listed rating.

Ventilation air required for engine combustion is 550 CFM (287 L/sec.) at 2100 RPM rating. This is for engine air combustion only and does not take into consideration additional air required for normal room cooling.

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This symbol on the nameplate means the product is approved by the Factory Mutual Research Corporation.

This symbol on the nameplate means the product is Listed by Underwriters' Laboratories of Canada.

LISTED AGENCY RATINGS

300 HP @ 2100 RPM F3
270 HP @ 2100 RPM F2
240 HP @ 2100 RPM F1

All of the above ratings are listed by the following agencies:

Underwriters' Laboratories Inc.

Factory Mutual

Underwriters' Laboratories of Canada

The agency-approved horsepower ratings published are already derated for fire pump service. The ratings show horsepower available for driving the fire pump at standard SAE J1995 conditions of 29.61 in. (752 mm) Hg barometer and 77° F (25° C) inlet air temperature (approximately 300 ft. [91.4 m] above sea level). The only additional deration necessary is for higher ambient temperatures and elevations as follows: 3% for each 1000 ft. (305 m) above 300 ft. (91.4 m) and 1% for each 10° F (5.6° C) above 77° F (25° C) in accordance with National Fire Association Pamphlet No. 20.

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

DESIGN FEATURES

Aftercooler: Large capacity aftercooler results in cooler, denser air for more efficient combustion and reduced internal stress for longer life.

Bearing: Replaceable, precision type aluminum steel backed. Seven main bearings, 3.86 in. (98 mm) diameter. Connecting rod bearings 2.99 in. (76 mm) diameter.

Camshaft: Hardened cast iron for increased wear resistance and long life. Seven replaceable type precision bushings 2.36 in. (60 mm) diameter.

Connecting Rods: Drop forged I-beam section 8.50 in. (216 mm) center-to-center length. Rod is tapered on piston pin end to reduce unit pressures.

Crankshaft: Eight counterweight fully balanced high tensile strength steel forging with induction hardened fillets and journals.

Cylinder Block: Alloy cast iron with removable wet liners.

Cylinder Head: One piece cross flow cylinder head for short length and maximum structural stiffness of block/head assembly. Contains replaceable valve guides and seat inserts.

Cylinder Liners: Mid-stop replaceable wet liners feature a new liner clamping method which seals at the middle of the liner with a press fit at the top. This design eliminates the need for packing rings and crevice seals.

Two Valves Per Cylinder: With single valve springs, for fewer parts.

Water Cooled Exhaust Manifold and Water Cooled Turbocharger: Configured for rear-out exhaust for lower profile.

STANDARD EQUIPMENT

Air Cleaner: 12.5 inch (318 mm) diameter dry air cleaner.

Belt and Damper Shield Guard: Protection from alternator, accessory drive, and water pump belts and vibration damper.

Coolant Pump: Belt driven, centrifugal type.

Electrical Equipment: 12 volt negative ground system, including: a 12 volt starting motor; a 12 volt, 145 alternator; manually operable contactors; and a junction box with enclosed terminal strip.

Engine Support: Pedestal type, front and rear.

Exhaust Manifold: Wet.

Exhaust Outlet: 4 in. (101 mm) diameter, 90° elbow.

Filters: Spin-on, replaceable lubricating oil filter. Single spin-on, replaceable fuel filter.

Flywheel: Machined for stubshaft mounting.

Flywheel Housing: SAE No. 1 with industrial supports.

Governor: Mechanical flyweight, mechanical variable speed type.

Heat Exchanger: Copper nickel tube bundle, mounted.

Instrument Panel: Mounted. Electrical instruments only. Includes amp meter, tachometer, hour meter, water temperature gauge, and lubricating oil pressure gauge.

Lubricating Oil Cooler: Tubular type, jacket water cooled.

Oil Pan: Steel stamp, center sump type, 18 U.S. quarts (17 litre) capacity.

Oil Pressure Switch: Provides signal to activate alarm (not included) for low oil pressure.

Overspeed Switch: Mounted, overspeed shutdown with manual reset, stop crank contacts.

Stubshaft: Mounted on flywheel

Throttle Control: Hydraulic, with manual override.

Vibration Damper: Viscous type.

Water Jacket Heater: Mounted beside oil pan, 120/240 volt, 1500 watt.

Water Temperature Switch: Provides signal to activate alarm (not included) for high water temperature.

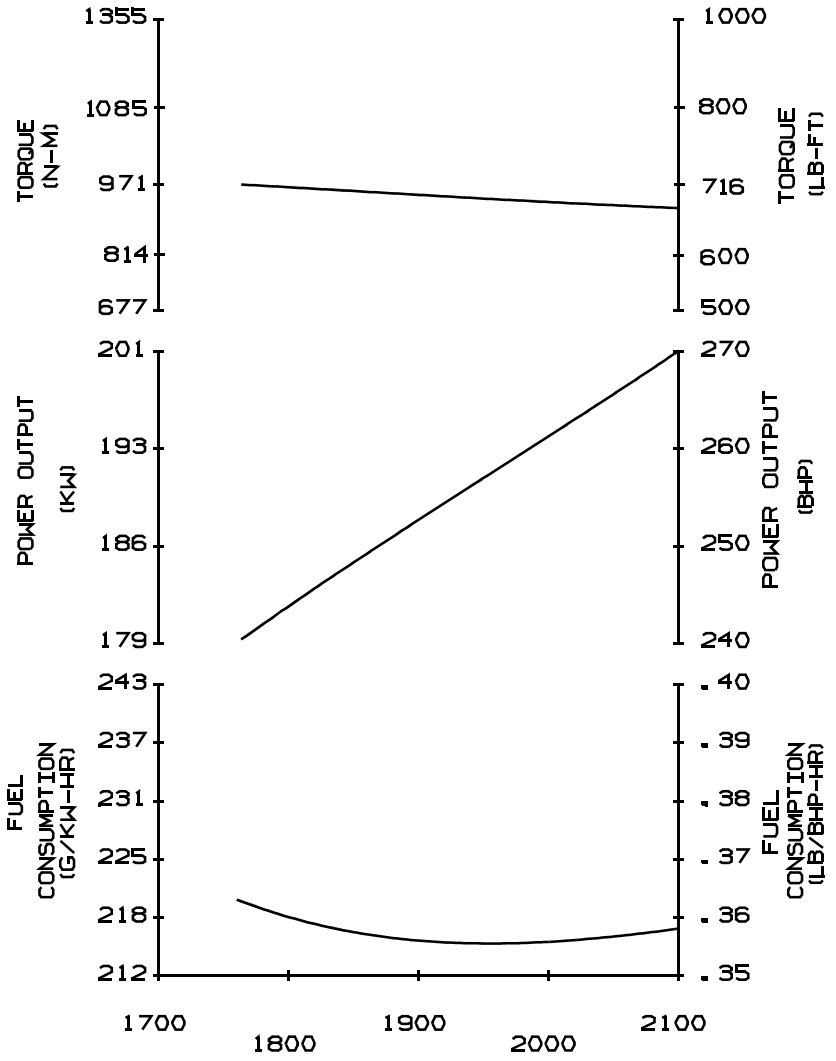
Cummins has always been a pioneer in product improvement. Thus specifications may change without notice. Illustrations may include optional equipment.

Cummins Engine Company, Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

CUMMINS ENGINE COMPANY, INC Columbus, Indiana 47202-3005 **Engine Performance Curve**	Basic Engine Model: **6CTA8.3F2**		Curve Number: **FR-90300**	*Firepump Pg. No.* **FP 17**
	Engine Family: **D41**	CPL Code: **1366**	Date: **12May97**	

Displacement:	**504.5 in.^{3} 8.27 (litre)**	Aspiration:	**Turbocharged, Aftercooled**		
Bore:	**4.49 in. 114 (mm)**				BHP (kW)@ RPM
Stroke:	**5.32 in. 135 (mm)**	No. of Cylinders:	**6**	Advertised BHP	**270 (201) 2100**
Emission Control		Fuel System:		Governed Speed	**2100**

All data are based on the engine operating with fuel system, water pump, lubricating oil pump, 10 in. H_2O (250 mm) inlet air restriction and 2.0 in. Hg (50 mm) exhaust restriction; not included are alternator, fan, optional equipment and driven components.



Maximum Full Load Governed Speed =2100 RPM
Maximum No Load Governed Speed = 2300 RPM
Brake Horsepower = 0 @ 2300 RPM

TORQUE

RPM	lb.-ft.	N•m
1760	716	(971)
1800	712	(965)
1850	704	(955)
1900	698	(946)
1950	692	(938)
2000	685	(929)
2050	681	(923)
2100	675	(915)

POWER OUTPUT

RPM	BHP	kW
1760	240	(179)
1800	244	(182)
1850	248	(185)
1900	253	(189)
1950	257	(192)
2000	261	(195)
2050	266	(198)
2100	270	(201)

FUEL CONSUMPTION

RPM	lb/BHP-HR	g/kW•hr
1760	.363	(221)
1800	.360	(219)
1850	.358	(218)
1900	.356	(217)
1950	.355	(216)
2000	.356	(217)
2050	.357	(217)
2100	.358	(218)

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of 29.61 in. Hg (100 kPa) barometric pressure [300 ft. (91 m) altitude], 77°F (25°C) inlet air temperature, and 0.30 in. Hg (1 kPa) water vapor pressure with No.2 diesel fuel. The engine may be operated without changing the fuel setting up to 1000 ft. (300 m) altitude. For sustained operation at high altitudes, the fuel rate of the engine should be adjusted to limit performance by 3% per 1,000 ft. (305 m) above 1000 ft. (300 m) altitude and 1% per 10°F above 77°F (2% per 11°C above 25°C).

TECHNICAL DATA DEPT. **CERTIFIED WITHIN 5%** **CHIEF ENGINEER**

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CUMMINS ENGINE COMPANY, INC.

Engine Data Sheet

Engine Model:	**Fire Pump 6CTA8.3F2**	**Data Sheet:**	**DS-90300**
Date:	**12May97**	**Curve No.:**	**FR-90300**

GENERAL ENGINE DATA

Type ..... 4 cycle, Inline, 6 cylinder
Aspiration: ..... Turbocharged Aftercooled
Bore - in. (mm) & Stroke - in. (mm) ..... 114 (4.49) x 135 (5.32)
Displacement - $in.^3$ (litre) 8.27 (504.5)
Compression Ratio 15.5:1
Valves per Cylinder: - Intake 1
- Exhaust 1
Engine Weight & Center of Gravity (With Standard Accessories)
Reference Installation Diagram 3884598
Dry Weight - lb. (kg) 1500 (680)
Wet Weight - lb. (kg) 1575 (714)
C.G. Distance from F.F.O.B. - in. (mm) 21.6 (549)
C.G. Distance Above Crankshaft Centerline - in. (mm) 15.09 (383)
Maximum Allowable Bending Moment @ Rear Face of Block - lb.-ft. (N•m) 1000 (1350)

AIR INDUCTION SYSTEM

Maximum Allowable Temperature Rise Between Ambient Air and Engine Air Inlet
(Ambients 32°F [0°C] to 100°F [38°C]) - °F (°C) 30 (15)
Maximum Allowable Intake Restriction With a Dirty Air Filter Element
in. H_2O (mm H_2O) 25 (635)
Part Number of Standard Air Filter Element (Dry Type) AF-4669

LUBRICATION SYSTEM

Oil Pressure @ Rated Speeds - PSI (kPa) ..... 30 - 50 (201 - 345)
Oil Pan Capacity (High - Low) U.S. quarts (litre) ..... 16 - 20 (15.04 - 18.8)
Full Flow Lube Oil Filter Capacity - U.S. quarts (litre). 25.2 (23.8)
Part Number of Standard Oil Pan 3914015
Part Number of Standard Oil Filter Element 3318853

COOLING SYSTEM

Heat Exchanger Cooled (Shell & Tube Type)
Part Number of Tube Bundle 3919724
Raw Water Working Pressure Range at Heat Exchanger - PSI (kPa) ..... 60 (414) MAX
Recommended Minimum Water Supply Pipe Size to
Heat Exchanger (Reference Only) - in. (mm) dia 1.0 (25.4)
Recommended Minimum Water Discharge Pipe Size From
Heat Exchanger (Reference Only) - in. (mm) dia 1.25 (31.75)
Coolant Water Capacity (Engine Side) - U.S.gal.(litre) 7 (26.5)
Standard Thermostat - Type ..... Modulating
- Range - °F (°C) 181-203 (83-95)
Minimum Raw Water Flow with Water
Temperatures to 90°F (32°C) - U.S. GPM (litre/s) 44 (20.7)

EXHAUST SYSTEM

Maximum Allowable Back Pressure Imposed by Piping &
Silencer - in. Hg (mm Hg) 3 (75)
Exhaust Pipe Size Normally Acceptable - in. (mm) dia. 4

A jacket water heater is mandatory on this engine. The recommended heater wattage is 1000 down to 40°F (4°C).

FUEL SYSTEM

Supply Line Size - in. (mm).....0.25 (6)
Drain Line Size - in. (mm).....0.25 (6)
Maximum Fuel Line Length Between Supply Tank & Fuel Pump - ft. (m).....40 (12)
Maximum Fuel Height Above ^{C}L Crankshaft - in. (mm).....80 (2030)
Part Number of Standard Fuel Filter.....3843760
Part Number of Standard Fuel Filter Element.....FS1251
Maximum Allowable Restriction to
Fuel Pump with Dirty Filter - in. Hg (mm Hg).....3.5 (89)
Maximum Allowable Return Line Restriction - in. Hg (mm Hg).....5.0 (127)

ELECTRICAL SYSTEM

Battery Voltage .....12 (24 Optional)
Battery Cable Size (Maximum Cable Length Not to Exceed 10 ft. (3.0 m) AWG) 00
Wiring for Automatic Starting (Negative Ground) .....Standard
Alternator (Standard), Internally Regulated - Ampere 12 Volt--60, 24 Volt--35
Manually Operable Contactors .....Standard

Minimum Recommended Battery Capacity	12 Volt	24 Volt
70°F (21°C) Minimum Temperature - CCA	750	375
32°F (0°C) Minimum Temperature - CCA	975	490

Reference Wiring Diagram Number.....3884598

PERFORMANCE DATA

All data is based on the engine operating with fuel system, water pump, lubricating oil pump, air cleaner, and alternator; not included are compressor, fan, optional equipment and driven components. Data is based on operation at SAE standard J1995 conditions of 300 ft. (91 m) altitude (39.61 in. [752 mm] Hg dry barometer), 77°F (25°C). All data is subject to change without notice.

Altitude Above Which Output Should be Limited - ft. (m) 300 (91)
Correction Factor per 1000 ft. (300 m) above Altitude Limit.....3%
Temperature Above Which Output Should be Limited -°F (°C) 77 (25)
Correction Factor per 10°F (11°C) Above Temperature Limit.....1% (2%)

FM Approved and UL Listed Ratings For: 6CTA8.3F2

Listed/ Approved Ratings BHP (kW)	Engine Speed RPM	Ventilation Air Required for Combustion CFM (litre/s)	Heat Rejection to Coolant BTU/min (kW)	Heat Rejection to Ambient Air* BTU/min (kW)	Exhaust Gas Flow CFM (litre/s)	Exhaust Gas Temp. °F (°C)	Fuel Consumption Gal/h (litre/h)
270 (201)	2100	502 (236)	10462 (183)	1462 (26)	1284 (606)	860 (460)	13.5 (51)
See Curve FR2-9626 for allowable intermediate speed/power ratings.							
240 (179)	1760	353 (184)	10692 (187)	1480 (27)	1046 (493)	1056 (568)	12.1 (46)

* - Does not include exhaust piping.

All Data is Subject to Change Without Notice. *Data Sheet : DS-90300*

CUMMINS ENGINE COMPANY, INC., Columbus, IN 47202-3005 U.S.A.

Cummins Engine Company, Inc.

Exhaust Emissions Data Sheet

Data Sheet: DS-90300
Date: 12May97

Engine

Model:	6CTA8.3-F2	**Application:**	Firepump
Type:	4 cycle, In-Line, 6 Cylinder Diesel	**Config. Number:**	D413018FX02
Aspiration:	Turbocharged	**Bore:**	4.49 in. (114 mm)
Compression Ratio:	15.5:1	**Stroke:**	5.32 in. (135 mm)
Emissions Control Device:	Turbocharger	**Displacement:**	504.5 cu. in. (8.3 liters)

Performance Data	**1760 RPM**	**2100 RPM**
BHP	240	270
Fuel Consumption (gallons/hour)	12.1	13.5
Air to Fuel Ratio	18.9	23.1
Exhaust Gas Flow (CFM)	1046	1284
Exhaust Gas Temperature (^{o}F)	1056	860

Exhaust Emissions Data

(All values are grams/hp-hour)

Component		**1760 RPM**	**2100 RPM**
HC	(Total Unburned Hydrocarbons)	0.50	0.82
NOx	(Oxides of Nitrogen as NO_2)	4.36	5.45
CO	(Carbon Monoxide)	1.91	3.11
PM	(Particulate Matter)	0.25	0.25
SO_2	(Sulfur Dioxide)	0.61	0.62
CO_2	(Carbon Dioxide)	500	510
N_2	(Nitrogen)	2400	2900
O_2	(Oxygen)	190	330
H_2O	(Water Vapor)	180	190

Test Conditions

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (± 2%). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.2% sulfur content (by weight) and 42-50 cetane number.
Fuel Temperature:	99^{o} F ± 9^{o} (at fuel pump inlet)
Intake Air Temperature:	77^{o} F ± 9^{o}
Barometric Pressure:	29.6 in. Hg ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H_2O/lb. dry air

The HC, NOx, and CO emissions data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimates. This data is subject to instrumentation, measurement, and engine-to-engine variability. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

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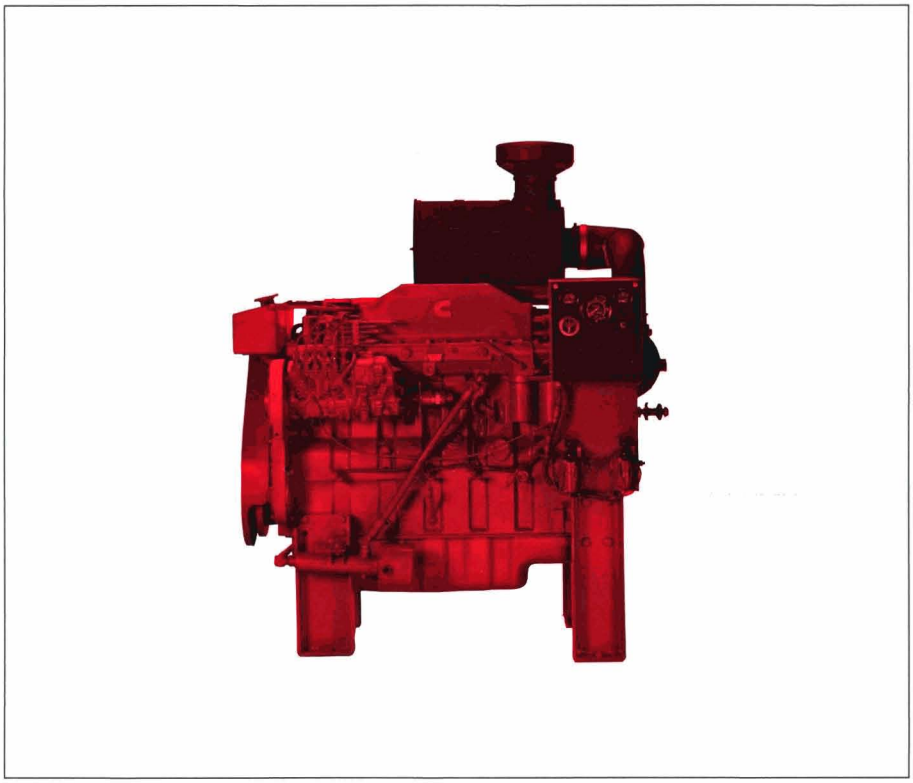

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

SPECIFICATIONS

Four Stroke Cycle, Turbocharged-Aftercooled, In-Line, 6 Cylinder Diesel Engine

Bore and Stroke	4.49 x 5.32 in.	(114X135 mm)
Displacement	504.5 cu. in.	(8.27 L)
Oil System Capacity	25.2 U.S. qts.	(23.8 L)
Engine Coolant Capacity	7 U.S. gal.	(26.5 L)
Net Weight, with Std. Accessories, Dry	1,500 lb.	(680 kg)

INSTALLATION CONSIDERATIONS

Maximum raw water pressure must not exceed 20 PSI (137 kPa). Minimum acceptable raw water flow at 90° F (32° C) raw water temperature and 100° F (38° C) ambient air temperature should be at least 44 G.P.M. (166 L/min.) at the 2100 RPM listed rating.

Ventilation air required for engine combustion is 550 CFM (287 L/sec.) at 2100 RPM rating. This is for engine air combustion only and does not take into consideration additional air required for normal room cooling.

This symbol on the nameplate means the product is Listed by Underwriters' Laboratories, Inc.

This symbol on the nameplate means the product is approved by the Factory Mutual Research Corporation.

This symbol on the nameplate means the product is Listed by Underwriters' Laboratories of Canada.

LISTED AGENCY RATINGS

300 HP @ 2100 RPM F3
270 HP @ 2100 RPM F2
240 HP @ 2100 RPM F1

All of the above ratings are listed by the following agencies:

Underwriters' Laboratories Inc.

Factory Mutual

Underwriters' Laboratories of Canada

The agency-approved horsepower ratings published are already derated for fire pump service. The ratings show horsepower available for driving the fire pump at standard SAE J1995 conditions of 29.61 in. (752 mm) Hg barometer and 77° F (25° C) inlet air temperature (approximately 300 ft. [91.4 m] above sea level). The only additional deration necessary is for higher ambient temperatures and elevations as follows: 3% for each 1000 ft. (305 m) above 300 ft. (91.4 m) and 1% for each 10° F (5.6° C) above 77° F (25° C) in accordance with National Fire Association Pamphlet No. 20.

6CTA

6CTA8.3-F

FIRE PUMP ENGINE

DESIGN FEATURES

Aftercooler: Large capacity aftercooler results in cooler, denser air for more efficient combustion and reduced internal stress for longer life.

Bearing: Replaceable, precision type aluminum steel backed. Seven main bearings, 3.86 in. (98 mm) diameter. Connecting rod bearings 2.99 in. (76 mm) diameter.

Camshaft: Hardened cast iron for increased wear resistance and long life. Seven replaceable type precision bushings 2.36 in. (60 mm) diameter.

Connecting Rods: Drop forged I-beam section 8.50 in. (216 mm) center-to-center length. Rod is tapered on piston pin end to reduce unit pressures.

Crankshaft: Eight counterweight fully balanced high tensile strength steel forging with induction hardened fillets and journals.

Cylinder Block: Alloy cast iron with removable wet liners.

Cylinder Head: One piece cross flow cylinder head for short length and maximum structural stiffness of block/head assembly. Contains replaceable valve guides and seat inserts.

Cylinder Liners: Mid-stop replaceable wet liners feature a new liner clamping method which seals at the middle of the liner with a press fit at the top. This design eliminates the need for packing rings and crevice seals.

Two Valves Per Cylinder: With single valve springs, for fewer parts.

Water Cooled Exhaust Manifold and Water Cooled Turbocharger: Configured for rear-out exhaust for lower profile.

STANDARD EQUIPMENT

Air Cleaner: 12.5 inch (318 mm) diameter dry air cleaner.

Belt and Damper Shield Guard: Protection from alternator, accessory drive, and water pump belts and vibration damper.

Coolant Pump: Belt driven, centrifugal type.

Electrical Equipment: 12 volt negative ground system, including: a 12 volt starting motor; a 12 volt, 145 alternator; manually operable contactors; and a junction box with enclosed terminal strip.

Engine Support: Pedestal type, front and rear.

Exhaust Manifold: Wet.

Exhaust Outlet: 4 in. (101 mm) diameter, 90° elbow.

Filters: Spin-on, replaceable lubricating oil filter. Single spin-on, replaceable fuel filter.

Flywheel: Machined for stubshaft mounting.

Flywheel Housing: SAE No. 1 with industrial supports.

Governor: Mechanical flyweight, mechanical variable speed type.

Heat Exchanger: Copper nickel tube bundle, mounted.

Instrument Panel: Mounted. Electrical instruments only. Includes amp meter, tachometer, hour meter, water temperature gauge, and lubricating oil pressure gauge.

Lubricating Oil Cooler: Tubular type, jacket water cooled.

Oil Pan: Steel stamp, center sump type, 18 U.S. quarts (17 litre) capacity.

Oil Pressure Switch: Provides signal to activate alarm (not included) for low oil pressure.

Overspeed Switch: Mounted, overspeed shutdown with manual reset, stop crank contacts.

Stubshaft: Mounted on flywheel

Throttle Control: Hydraulic, with manual override.

Vibration Damper: Viscous type.

Water Jacket Heater: Mounted beside oil pan, 120/240 volt, 1500 watt.

Water Temperature Switch: Provides signal to activate alarm (not included) for high water temperature.

Cummins has always been a pioneer in product improvement. Thus specifications may change without notice. Illustrations may include optional equipment.

Cummins Engine Company, Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

CUMMINS ENGINE COMPANY, INC.
Engine Data Sheet

Engine Model:	**FIRE PUMP 6CTA8.3 F3**	**Data Sheet:**	**DS-9626**
Gross Power BHP (kW):	**300 (223) @ 2100**	**Date:**	**12May97**
Configuration Number:	**D413018FX02**	**CPL Code:**	**1366**

GENERAL ENGINE DATA

Type ..... 4 cycle, Inline, 6 cylinder
Aspiration: ..... Turbocharged Aftercooled
Bore - in. (mm) & Stroke - in. (mm) ..... 114 (4.49) x 135 (5.32)
Displacement - $in.^3$ (litre) 8.27 (504.5)
Compression Ratio 15.5:1
Valves per Cylinder: - Intake 1
- Exhaust 1
Engine Weight & Center of Gravity (With Standard Accessories)
Reference Installation Diagram 3884598
Dry Weight - lb. (kg) 1500 (680)
Wet Weight - lb. (kg) 1575 (714)
C.G. Distance from F.F.O.B. - in. (mm) 21.6 (549)
C.G. Distance Above Crankshaft Centerline - in. (mm) 15.09 (383)
Maximum Allowable Bending Moment @ Rear Face of Block - lb.-ft. (N•m) 1000 (1350)

AIR INDUCTION SYSTEM

Maximum Allowable Temperature Rise Between Ambient Air and Engine Air Inlet
(Ambients 32°F [0°C] to 100°F [38°C]) - °F (°C) 30 (15)
Maximum Allowable Intake Restriction With a Dirty Air Filter Element
in. H_2O (mm H_2O) 25 (635)
Part Number of Standard Air Filter Element (Dry Type) AF-4669

LUBRICATION SYSTEM

Oil Pressure @ Rated Speeds - PSI (kPa) ..... 30 - 50 (201 - 345)
Oil Pan Capacity (High - Low) U.S. quarts (litre) ..... 16 - 20 (15.04 - 18.8)
Full Flow Lube Oil Filter Capacity - U.S. quarts (litre). 25.2 (23.8)
Part Number of Standard Oil Pan 3914015
Part Number of Standard Oil Filter Element 3318853

COOLING SYSTEM

Heat Exchanger Cooled (Shell & Tube Type)
Part Number of Tube Bundle 3919724
Raw Water Working Pressure Range at Heat Exchanger - PSI (kPa) ..... 60 (414) MAX
Recommended Minimum Water Supply Pipe Size to
Heat Exchanger (Reference Only) - in. (mm) dia 1.0 (25.4)
Recommended Minimum Water Discharge Pipe Size From
Heat Exchanger (Reference Only) - in. mm) dia 1.25 (31.75)
Coolant Water Capacity (Engine Side) - U.S. gal (litre) 7 (26.5)
Standard Thermostat - Type ..... Modulating
- Range - °F (°C) 181-203 (83-95)
Minimum Raw Water Flow with Water
Temperatures to 90°F (32°C) - U.S. GPM (litre/s) 44 (20.7)

EXHAUST SYSTEM

Maximum Allowable Back Pressure Imposed by Piping &
Silencer - in. Hg (mm Hg) 3 (75)
Exhaust Pipe Size Normally Acceptable - in. (mm) dia 4

A jacket water heater is mandatory on this engine. The recommended heater wattage is 1000 down to 40°F (4°C).

FUEL SYSTEM

Supply Line Size - in. (mm) 0.25 (6)
Drain Line Size - in. (mm) 0.25 (6)
Maximum Fuel Line Length Between Supply Tank & Fuel Pump - ft. (m) 40 (12)
Maximum Fuel Height Above ^{C}L Crankshaft - in. (mm) 80 (2030)
Part Number of Standard Fuel Filter 3843760
Part Number of Standard Fuel Filter Element FS1251
Maximum Allowable Restriction to
Fuel Pump with Dirty Filter - in. Hg (mm Hg) 3.5 (89)
Maximum Allowable Return Line Restriction - in. Hg (mm Hg) 5.0 (127)

ELECTRICAL SYSTEM

Battery Voltage ..... 12 (24 Optional)
Battery Cable Size (Maximum Cable Length Not to Exceed 10 ft. (3.0 m) AWG) 00
Wiring for Automatic Starting (Negative Ground) ..... Standard
Alternator (Standard), Internally Regulated - Ampere 12 Volt--60, 24 Volt--35
Manually Operable Contactors ..... Standard

Minimum Recommended Battery Capacity	12 Volt	24 Volt
70°F (21°C) Minimum Temperature - CCA	750	375
32°F (0°C) Minimum Temperature - CCA	975	490

Reference Wiring Diagram Number 3884598

PERFORMANCE DATA

All data is based on the engine operating with fuel system, water pump, lubricating oil pump, air cleaner, and alternator; not included are compressor, fan, optional equipment and driven components. Data is based on operation at SAE standard J1995 conditions of 300 ft. (91 m) altitude (39.61 in. [752 mm] Hg dry barometer), 77°F (25°C). All data is subject to change without notice.

Altitude Above Which Output Should be Limited - ft. (m) 300 (91)
Correction Factor per 1000 ft. (300 m) above Altitude Limit 3%
Temperature Above Which Output Should be Limited -°F (°C) 77 (25)
Correction Factor per 10°F (11°C) Above Temperature Limit 1% (2%)

FM Approved and UL Listed Ratings For: 6CTA8.3F3

Listed/ Approved Ratings	Engine Speed	Ventilation Air Required for Combustion	Heat Rejection to Coolant	Heat Rejection to Ambient Air*	Exhaust Gas		Fuel Consumption
					Flow	Temp.	
BHP (kW)	RPM	CFM (litre/s)	BTU/min (kW)	BTU/min (kW)	CFM (litre/s)	°F (°C)	Gal/h (litre/h)
300 (223)	2100	550 (258)	11625 (204)	1666 (29)	1435 (677)	887 (475)	15.4 (58)

* - Does not include exhaust piping.

Cummins Engine Company, Inc.

Exhaust Emissions Data Sheet

Data Sheet: DS-9626
Date:12May97

Engine

Model:	6CTA8.3-F3	**Application:**	Firepump
Type:	4 cycle, In-Line, 6 Cylinder Diesel	**Config. Number:**	D413018FX02
Aspiration:	Turbocharged	**Bore:**	4.49 in. (114 mm)
Compression Ratio:	15.5:1	**Stroke:**	5.32 in. (135 mm)
Emissions Control Device:	Turbocharger	**Displacement:**	504.5 cu. in. (8.3 liters)

Performance Data	**2100 RPM**
BHP	300
Fuel Consumption (gallons/hour)	15.4
Air to Fuel Ratio	22.2
Exhaust Gas Flow (CFM)	1435
Exhaust Gas Temperature (^{o}F)	887

Exhaust Emissions Data

(All values are grams/hp-hour)

Component		**2100 RPM**
HC	(Total Unburned Hydrocarbons)	0.73
NOx	(Oxides of Nitrogen as NO_2)	5.89
CO	(Carbon Monoxide)	3.55
PM	(Particulate Matter)	0.25
SO_2	(Sulfur Dioxide)	0.64
CO_2	(Carbon Dioxide)	530
N_2	(Nitrogen)	2800
O_2	(Oxygen)	300
H_2O	(Water Vapor)	190

Test Conditions

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (± 2%). Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.2% sulfur content (by weight) and 42-50 cetane number.
Fuel Temperature:	99^{o} F ± 9^{o} (at fuel pump inlet)
Intake Air Temperature:	77^{o} F ± 9^{o}
Barometric Pressure:	29.6 in. Hg ± 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H_2O/lb. dry air

The HC, NOx, and CO emissions data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimates. This data is subject to instrumentation, measurement, and engine-to-engine variability. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

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