

APPENDIX 6.2-G- SPECIFICATIONS FOR FIREPUMP ENGINE

October 2, 2007

Rev.#1

Industrial Construction Company
10060 Brecksville Road
Brecksville, OH 44141

Attention: Hans Kern

Reference: Orange Grove Peaker Plant, Pala, California
ITT-AC Fire Pump Skid Package

With reference to the above, we are pleased to offer the following:

Engine Driven Fire Pump- 3000GPM @ 125 PSI:

One (1) Allis Chalmers model 12 x 10 x 18F, Series 8100, horizontal, centrifugal Fire Pump, UL listed and FM approved, rated 3000 GPM at 125 PSI. The Fire Pump is driven at 1770 RPM by a Cummins Model CFP11E-F10 diesel engine. The pump and engine will be mounted on a fabricated steel base plate, complete with flexible coupling and coupling guard.

Also included are the following:

- (2) sets lead-acid batteries with battery racks and cables
- (1) residential muffler (shipped loose for field installation)
- (1) 500 gallon double wall fuel tank
- (1) fuel tank, fuel spill alarm switch
- (1) 10" outside test header with twelve (12), 2-1/2" brass angle hose valves with caps & chains. NST threads.
- (1) 1/2" ball drip valve
- (1) 8" pilot operated relief valve
- (1) 8" x 12" enclosed cone
- (1) 1/2" automatic air release valve
- (1) 3-1/2" suction and discharge gauges
- (1) ITT-AC Model 2SV-9 stage jockey pump rated 25 GPM @ 125 PSI. 3 HP, 3500 RPM, 480 volt, 3 phase, 60 cycle, TEFC motor.
- (1) Cutler Hammer Jockey Pump Controller

Cutler Hammer Diesel Engine Fire Pump Controller with:

- All features required by NFPA #20
- Low fuel level alarm & switch
- Fuel spill at storage tank
- Three sets of alarm contacts for: engine running, switch off and common trouble.

Electric Fire Pump 3000 GPM:

We offer one (1) Allis Chalmers model 12x10x18F, Series 8100, horizontal split case, centrifugal Fire Pump, UL listed and FM approved, rated 3000 GPM at 125 PSI. 300 HP, 1785 rpm, 480 volt, 3 phase, 60 cycle, ODP motor.

Also included are the following:

- (1) Cutler Hammer Model FD-30, Across-The-Line Type, Fire Pump Controller with 100,000 AIC, built in pressure recorder
- (1) ¾" casing relief valve
- (1) ½" automatic air release valve
- (1) 3-1/2 suction and discharge gauges

Fire Pump Skid Package

(1) ITT-AC Skid Package consisting of the equipment listed above mounted, piped and wired including:

Condition Point: **3000GPM @ 125 PSI**

- (1) Jockey pump piping: (2) gate valves and (1) check valve
- (1) Fuel tank piping with cross bracing.
- (2) 12" UL/FM OS&Y Flanged suction gate valve with tamper switch
- (2) 12" UL/FM wafer style discharge check valve
- (2) 12" UL/FM Model discharge wafer style butterfly isolation valve with tamper switch
- (2) Concentric discharge increaser 125#
- (1) Hose valve header connection 10" with: tee, elbow, manual drain valve, (1) UL/FM wafer style butterfly isolation valve (hose valve header, hose valve, caps & chains – **shipped loose for installation at the job site.**)
- (1) steel perimeter skid base with all necessary hard copper sensing lines, pipe supports, and wiring for complete package.
- (1) Common suction and discharge headers
- (1) Piping for main relief valve and waste cone
- (1) Single point power connection with all wiring complete at the factory
- (1) All drains to common point

Unit to be factory primed and painted

All welding to be done by ASME Section 9 certified welders

State PE stamp and seismic calculations for zone 4

Estimated skid size is 38" long x 13" wide. Approximate weight 36, 000 lbs.

If you have any questions, please do not hesitate to contact our office.

Sincerely,

Bill Smith



Fire Power

Engine Specification Sheet

Cummins Fire Power

DePere, WI 54115

<http://www.cumminsfirepower.com>

Basic Engine Model

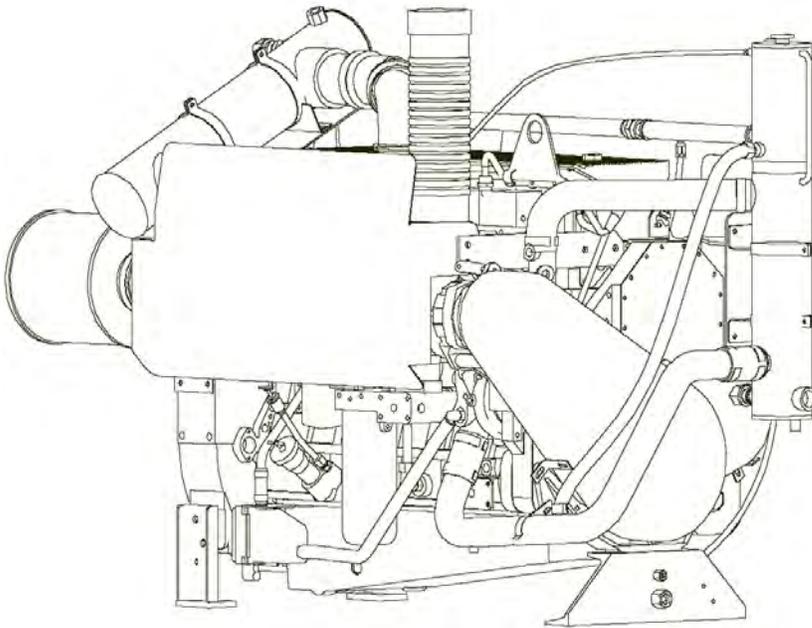
CFP11E-F20, F10

Curve Number:

FR - 20091

Revision Date:

August 2006



Equipment	Standard	Optional
Air Cleaner	Direct Mounted, Disposable, Indoor Service	Disposable, Treated for High Humidity, Indoor Service
Alternator	12V-DC, 100 Amps; With Belt Guard	24V-DC, 70 Amps; With Belt Guard
Cooling Loop	N/A	Maximum Pressure of 400 PSI
Exhaust Protection	Metal Guards on Manifolds and Turbo	N/A
Exhaust Flex Connection	SS Flex, NPT	SS Flex, 150# Flange
Flywheel Power Take-Off	Flywheel with Mounting for Coupler	<ul style="list-style-type: none"> • Drive Shaft System • Stub Shaft
Fuel Connections	Fire Resistant Flexible Supply and Return Lines	N/A
Fuel Injection	Direct Injection	N/A
Fuel Filter	Primary Filter with Priming Pump	N/A
Engine Heater	120V-AC, 2250 Watts	240V-AC, 2250 Watts
Governor, Speed	Constant Speed	N/A
Heat Exchanger	Tube & Shell Type, 60 PSI with NPTF Connections	N/A
Instrument Panel	English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure & Two (2) Voltmeters	N/A
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	N/A
Lube Oil Cooler	Engine Water Cooled, Plate Type	N/A
Lube Oil Filter	Full Flow with By-Pass Valve	N/A
Lube Oil Pump	Gear Driven	N/A
Manual Start	On Instrument Panel	N/A
Overspeed Controls	Electronic with Reset & Test on Instrument Panel	N/A
Raw Water Solenoid Operation	Automatic from Engine Controller & from Emergency Local Control	N/A
Run-Stop Control	On Instrument Panel with Control Position Warning Light	N/A
Run Solenoid	12V-DC	24V-DC
Starters	12V-DC	24V-DC
Throttle Control	Adjustable Speed Control	N/A
Water Pump	Poly-Vee Belt Drive with Guard	N/A

Operating Speed (RPM)

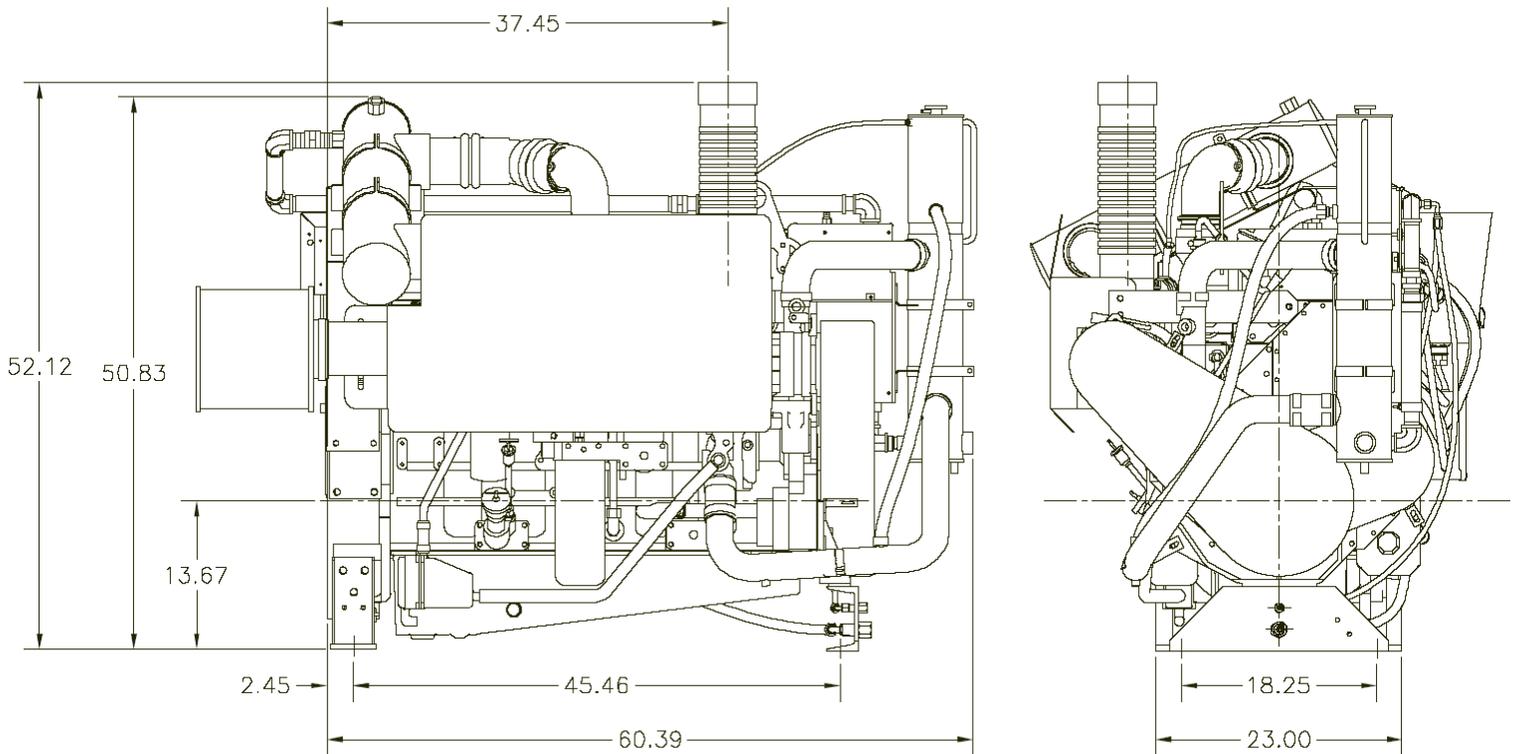
Model	1470	1760	2100
CFP11E-F20	364 (271)	424 (316)	360 (268)
CFP11E-F10	320 (239)	373 (278)	331 (247)

Ratings are: HP (kW)

Specifications

Aspiration.....	Turbocharged and Charge Air Cooled
Rotation.....	Clockwise
Weight - lb (kg).....	2795 (1258)
Displacement - in ³ (litre).....	660 (10.8)
Engine Type.....	4 Cycle; In-Line, 6 Cylinder
Engine Series.....	Cummins QSM11 Series
Exhaust Emissions.....	EPA/CARB Tier 2





Engine Ratings Baselines

- Engines are rated at standard SAE conditions of 29.61 in. (7521 mm) Hg barometer and 77 °F (25°C) inlet air temperature (approximates 300ft. (91.4 m) above sea level) by the testing laboratory (see SAE Standard J1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m).
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F above 77°F (24°C) ambient temperature.

Certified Power

This Cummins Fire Power fire pump driver is built to comply with NFPA-20, and is UL listed and FM approved. Although FM-UL Certified BHP ratings are shown at specific speeds, this Cummins engine can be applied at any intermediate speed. To determine the intermediate certified power, make a linear interpolation from the Cummins FM-UL certified power curve. Contact Cummins Fire Power or your pump OEM representative to obtain details.

For additional information, click the hyperlinks below.

[CFP11E-F10](#)

[CFP11E-F20](#)



California ATCM Tier 2 Emission Data
EPA Tier 2 Emission Data

CFP11E-F10 Fire Pump Driver

Type: 4 Cycle; In-Line; 6 Cylinder
Aspiration: Turbocharged, Charge Air Cooled

15 PPM Diesel Fuel													
RPM	BHP	Fuel Consumption		D2 Cycle Exhaust Emissions						Exhaust			
		Gal/Hr	L/hr	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
				NMHC+NOx	CO	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec
1470	320	15.1	57.2	3.841	0.746	0.091	5.151	1.000	0.123	946	508	1663	785
1760	373	17.8	67.4							917	492	1943	917
2100	331	16.0	60.6							779	415	1857	877

The emissions values above are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

300-500 PPM Diesel Fuel													
RPM	BHP	Fuel Consumption		D2 Cycle Exhaust Emissions						Exhaust			
		Gal/Hr	L/hr	Grams per BHP - HR			Grams per kW - HR			Temperature		Gas Flow	
				NMHC+NOx	CO	PM	NMHC+NOx	CO	PM	°F	°C	CFM	L/sec
1470	320	15.1	57.2	4.183	0.746	0.104	5.610	1.000	0.140	946	508	1663	785
1760	373	17.8	67.4							917	492	1943	917
2100	331	16.0	60.6							779	415	1857	877

QSM11 Base Model Manufactured by Cummins Inc.
- Using fuel rating 20091 (combination of FR2912 and FR 2940)

Reference EPA Standard Engine Family: 4CEXL0661AAD

No special options needed to meet current regulation emissions for all 50 states

Test Methods:

EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A, for Constant Speed Engines (ref. ISO8178-4, D2).

Diesel Fuel Specifications:

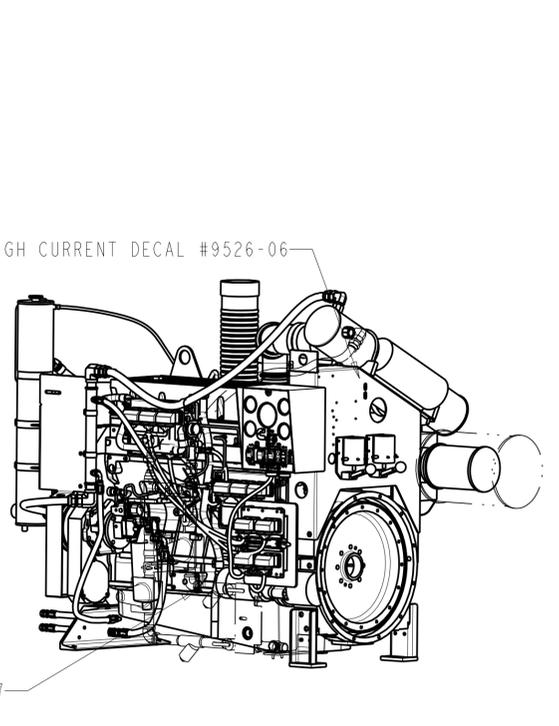
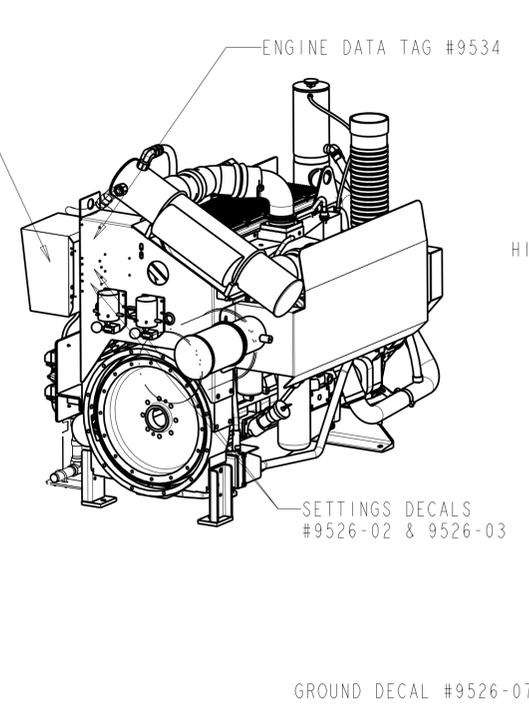
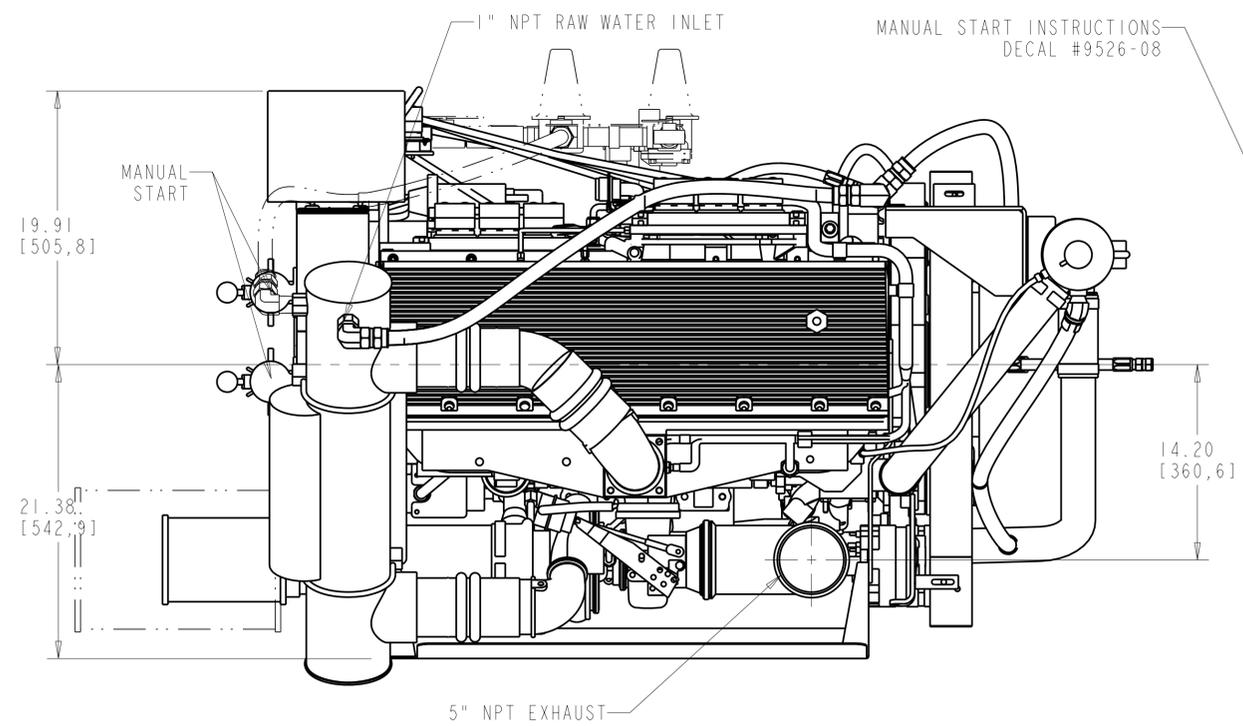
Cetane Number: 40-48
Reference: ASTM D975 No. 2-D

Reference Conditions:

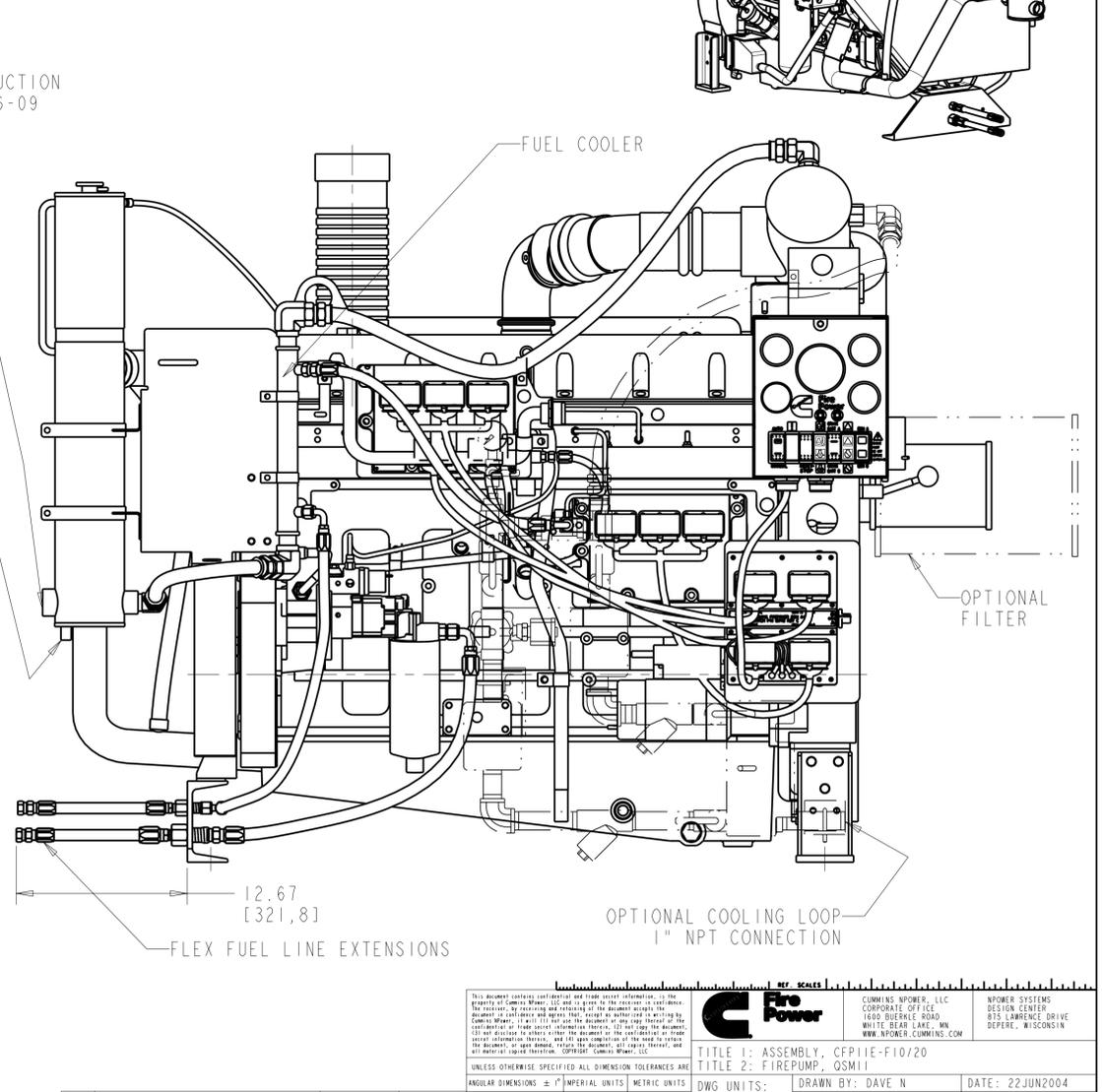
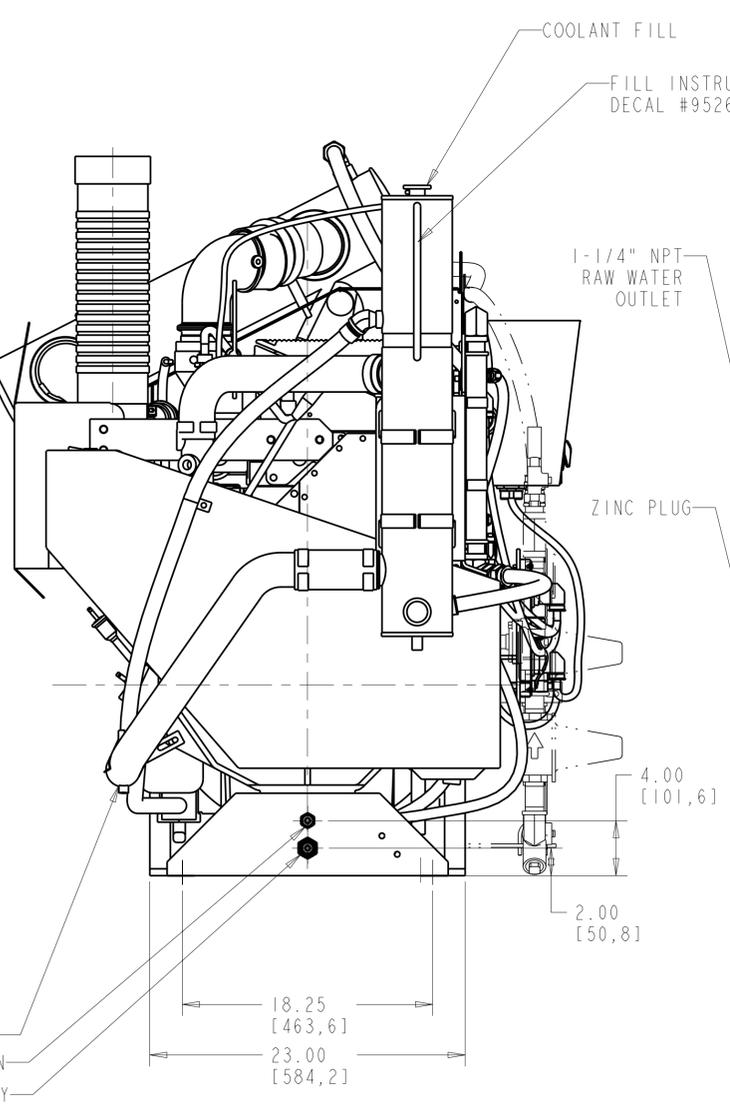
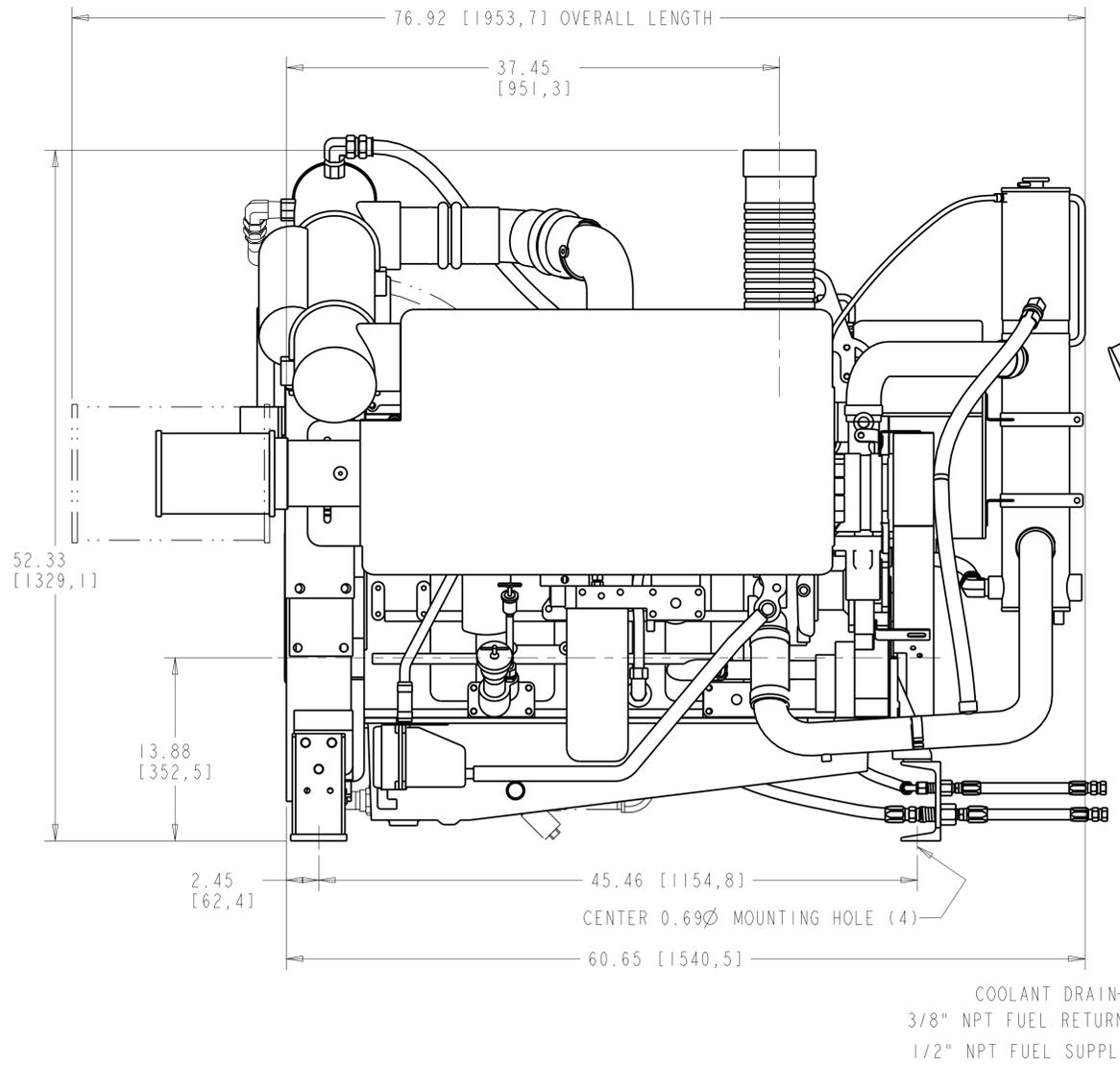
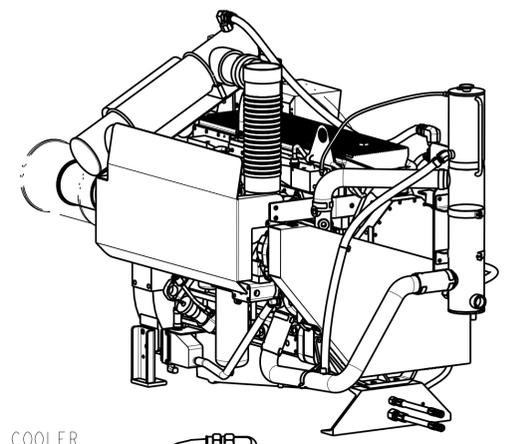
Air Inlet Temperature: 25°C (77°F)
Fuel Inlet Temperature: 40°C (104°F)
Barometric Pressure: 100 kPa (29.53 in Hg)
Humidity: 10.7 g/kg (75 grains H₂O/lb) of dry air; required for NO_x corrector
Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.

The data was obtained by using two fuel ratings 2912 (for the 2100 rating) and 2940 (for the 1470 and 1760 ratings). The highest exhaust emissions for either fuel rating are stated above.



BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	ASSEMBLY, ENGINE, OSM11, FIREPUMP	8740
2	1	ASSEMBLY, MOUNTING, ENGINE, CFP11E, FIREPUMP	8773
3	1	ASSEMBLY, HEAT EXCHANGER, CFP11E, FIREPUMP	8792
4	1	ASSEMBLY, COOLANT HEATER, CFP11E, FIREPUMP	8950
5	1	ASSEMBLY, CHARGE AIR COOLER, CFP11E, FIREPUMP	8969
6	1	ASSEMBLY, OPERATORS STATION, CFP11E, FIREPUMP	9510
7	1	ASSEMBLY, TURBO GUARD, CFP11E, FIREPUMP	9515
8	1	ASSEMBLY, AIR CLEANER, CFP11E, FIREPUMP	9518
9	1	ASSEMBLY, SENSOR PACKAGE, FIREPUMP	9572
10	1	ASSEMBLY, FUEL LINE, CFP11E, FIREPUMP	9594
11	1	ASSEMBLY, PULLEY GUARD, CFP11E, FIREPUMP	9631
12	1	COOLING LOOP, 1", UPPER HX ORIENTATION, FIREPUMP	9659
13	1	FUEL LINE, #10, 1/2" NPT X 12" LG	10233
14	1	FUEL LINE, #8, 3/8" NPT X 12" LG	10234
15	1	ASSEMBLY, CAC WATER CONNECTION, CFP11E, FIREPUMP	11048
16	1	ASSEMBLY, MISC PIPING, CFP11E, FIREPUMP	11049
17	1	ASSEMBLY, SECONDARY ECM, CFP11E, FIREPUMP	11057
18	1	FLEX, EXHAUST, 5" W/ ELBOW, FIREPUMP	9514



UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS/TOLERANCES ARE:

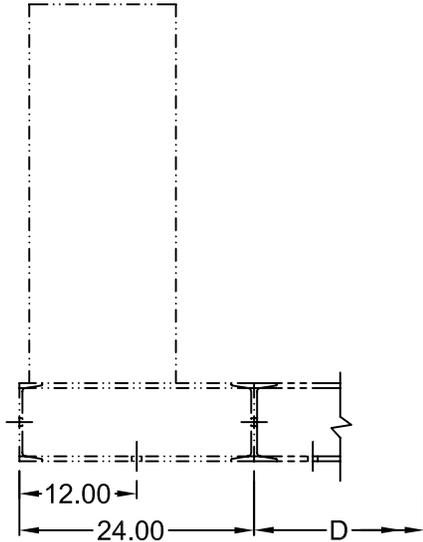
ANGULAR DIMENSIONS	± 1°	IMPERIAL UNITS	METRIC UNITS
THIRD ANGLE PROJECTION	AS SHOWN	INCHES	MILLIMETERS
		± 0.005	± 0.15
		± 0.010	± 0.30
		± 0.015	± 0.45
		± 0.030	± 0.75

Cummins Power
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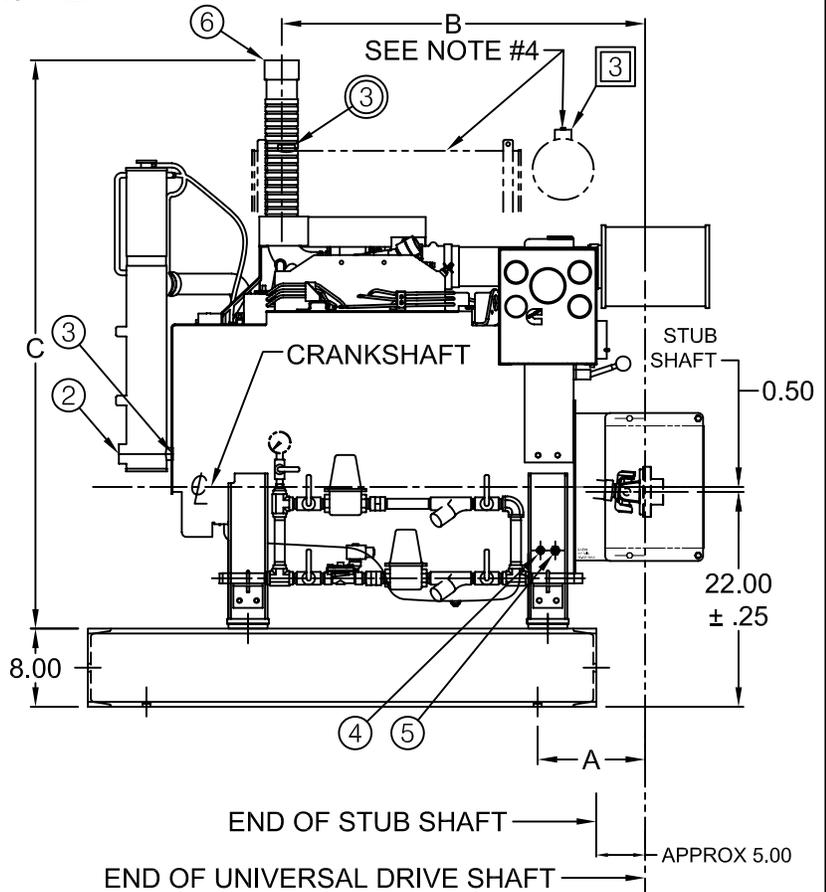
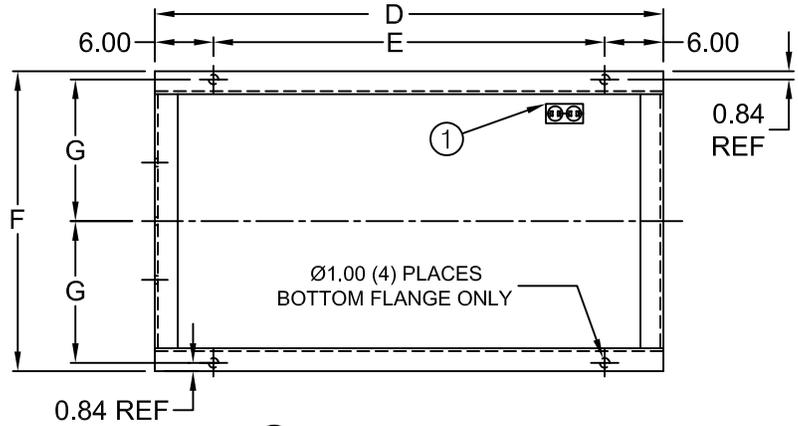
NPPOWER SYSTEMS
 BOSTON CENTER
 835 LAWRENCE DRIVE
 DEPERE, WISCONSIN

TITLE 1: ASSEMBLY, CFP11E-F10/20
 TITLE 2: FIREPUMP, OSM11
 DRAWN BY: DAVE N
 APPD BY:
 DATE: 22JUN2004
 DATE:
 EST WEIGHT: 2795.000
 SCALE: 0.150
 DO NOT SCALE
 SHEET 10/1
 DRAWING NO: 8712
 REV: G

REV	DESCRIPTION OF REVISION	REV BY	DATE
G	REV PER OP STATION, AIR CLEANER	DAVE N	15DEC06



OPTIONAL: BASE MOUNTED CONTROLLER ADD 24" TO "BB" (LENGTH OF BASE) AND 2 ADDITIONAL 1.00 DIA HOLES



Item No.	Description	CFP33	CFP39/59/6E	CFP83/8E	CFP10/11E
⑥	Exhaust Outlet Conn.	3" NPTM	3" NPTM	4" NPTM	4"/ 5" NPTM
⑤	Fuel Supply Conn.	1/4" NPTF	1/4" NPTF	3/8" NPTF	1/2" NPTF
④	Fuel Return Conn	1/4" NPTF	1/4" NPTF	1/4" NPTF	3/8" NPTF
③	CFP11E Raw Water Inlet				1" NPTF
③	CFP8E Raw Water Inlet			1" NPTF	
③	CFP6E Raw Water Inlet		3/4" NPTF		
③	Raw Water Inlet	3/4" NPTF	3/4" NPTF	1" NPTF	1" NPTF
②	Raw Water Outlet	1" NPTF	1" NPTF	1-1/4" NPTF	1-1/4" NPTF
①	Heater Receptacle	120v	120v	120v	120v

See drawing 11537 for drive-shaft alignment instructions

NOTES

1. CFP6E, CFP8E, CFP83-F40, CFP11E REQUIRE UPPER CHARGE AIR HEAT EXCHANGER. RAW WATER PIPING TO JACKET WATER HEAT EXCHANGER IS PROVIDED.

ENGINE	"A"	"B"	"C"	"D"	"E"	"F"	"G"
CFP33-F10,20,30	13.80	31.41	53.69	40	28	24.69	11.50
CFP33-F25,35	14.93	32.14	53.69	40	28	24.69	11.50
CFP39	11	27.70	57.67	42.50	30.50	30.69	14.50
CFP59	11	37.15	57.67	52	40	30.69	14.50
CFP6E	11	37.15	57.67	52	40	30.69	14.50
CFP83	11	36.28	60.39	60	48	30.69	14.50
CFP8E	11	36.28	60.39	60	48	30.69	14.50
CFP11E	12.40	47.70	52.12	66	54	30.69	14.50

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	DWG SCALE: 1/20	DRAWN BY: DAVE N	DATE: 20JAN2005		
	PLOT SCALE:	APPD BY:	DATE:		
	DESCRIPTION GENERAL LAYOUT, SHORT FRAME				
REV	REV PER "A,B,C" DIMENSION	DAVE N	22SEP2005	REFERENCE: ALL MODELS	DRAWING NUMBER: GEN_SHORT_ALL