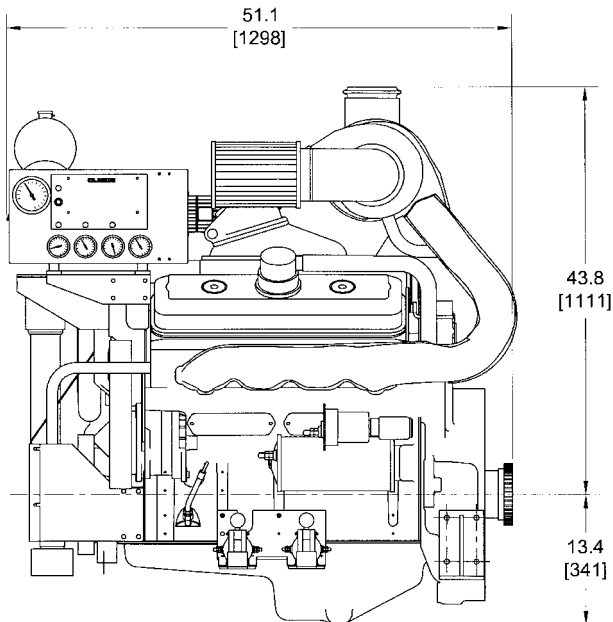


# CLARKE FIRE PUMP DRIVERS



DDFP-08FA  
OVERALL WIDTH  
41.0 [1042]

## MODELS

- DDFP-08FH
- DDFP-08FA
- DDFP-12FH

### APPROVED RATINGS BHP/kw FM-UL-ULC\*

MODEL	SPEED (RPM)			
	1470	1760	2100	2350
DDFP-08FA	420 313	509 380	552 412	570 425
DDFP-08FH	468 349	575 429	669 499	708 528
DDFP-12FH	686 511	830 619	940 700	1000 745

## ENGINE EQUIPMENT

- Air Cleaner** — (S) Direct Mounted, Washable, For Indoor Service Only
- Alternator** — (S) 24V-DC, 40 Ampere, with Belt Guard
- Exhaust Protection** — (S) Blankets On Manifolds & Turbo Charger
- Exhaust Flex Connection** — (O) SS Flex, 150# Flange
- Flywheel Housing** — (S) SAE #1
- Flywheel Power Take Off** — (S) Engine Half Falk Coupling – 08FA/08FH 1090T10; 12FH 1100T10
- Fuel Connections** — (S) Fire Resistant Flexible Supply & Return Lines
- Fuel Filters** — (S) Primary & Secondary
- Engine Heater** —  
(S) 230 V-AC, (O) 115 V-AC, 2500 W (8 Cyl.);  
(S) 230 V-AC, (O) 460 V-AC, 4000 W (12 Cyl.)
- Governor** — (S) Constant Speed Mechanical
- Heat Exchanger** — (S) Tube & Shell Type, Rated 60 PSI w/NPTF Connections
- Instrument Panel** — (S) English & Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure, Two (2) Voltmeters
- Junction Box** — (S) Integral With Instrument Panel For DC Wiring Interconnection To Engine Controller
- Lube Oil Cooler** — (S) Engine Water Cooled, Plate Type
- Lube Oil Filter** — (S) Full Flow w/By-Pass Valve
- Lube Oil Pump** — (S) Gear Driven, Gear Type
- Manual Start Controls** — (S) Per NFPA-20 On Instrument Panel With Control Position Warning Light
- Raw Water Solenoid Operation** — (S) Automatic From Engine Controller & From Energizing Local Control
- Run-Stop Control** — (S) On Instrument Panel With Control Panel Position Warning Light
- Overspeed Control** — (S) Electronic w/Reset & Test On Instrument Panel
- Starter** — (S) One 24V DC Motor
- Throttle Control** — (S) Adjustable Speed Control Tamper Proof
- Water Pump** — (S) Gear Driven, Centrifugal Type

(S) – Standard Equipment

(O) – Optional Equipment



LISTED  
513Y



meets  
NFPA-20  
Requirements



approved  
1333



listed  
C448A

## SPECIFICATIONS

Item	DDFP Model		
	08FA	08FH	12FH
DDC Engine Series	V-92	V-92	V-92
No. Cylinders	8	8	12
Aspiration	TSJWA	TSJWA	TSJWA
Rotation**	Clockwise (CW)		
Displacement – cu. in. (l)*	736 (12.1)	736 (12.1)	1104 (18.1)
Net Wt. – lbs. (kg)	2560 (1161)	2605 (1181)	4690 (2127)
Bore & Stroke – in. (mm)	4.84 x 5.00 (123 x 127)		
Compression Ratio	17:1	15:1	15:1
Installation Drawing	D-433	D-433	D-445

DDC - DETROIT DIESEL CORP.  
 TSJWA - TURBOCHARGED, SUPERCHARGED  
 AND AFTERCOOLED (JACKET WATER)

\*V-92 UNITS ARE 2 STROKE CYCLE  
 \*\*VIEW FROM HEAT EXCHANGER/FRONT OF ENGINE

\*Engines are rated at standard SAE conditions of 29.61 in. (7521 mm) Hg barometer and 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).

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 (5.6°C) above 77°F (25°C) ambient temperature.

Note: Engines certified at any speed between 1470 & 2600. See details on reverse side for linear BHP interpolation.

## CERTIFIED POWER AT ANY SPEED

Although specific FM-UL Certified BHP ratings are shown at four (4) specific speeds, these Clarke engines can be applied to fire pumps at any intermediate speed between 1470 to 2350 RPM. To determine the applicable intermediate certified power, make a linear interpolation of the Clarke FM-UL certified power curve. Contact Clarke or your Pump OEM representative to obtain details.

# CLARKE

*www.clarkefire.com*

*Fire Protection Products*

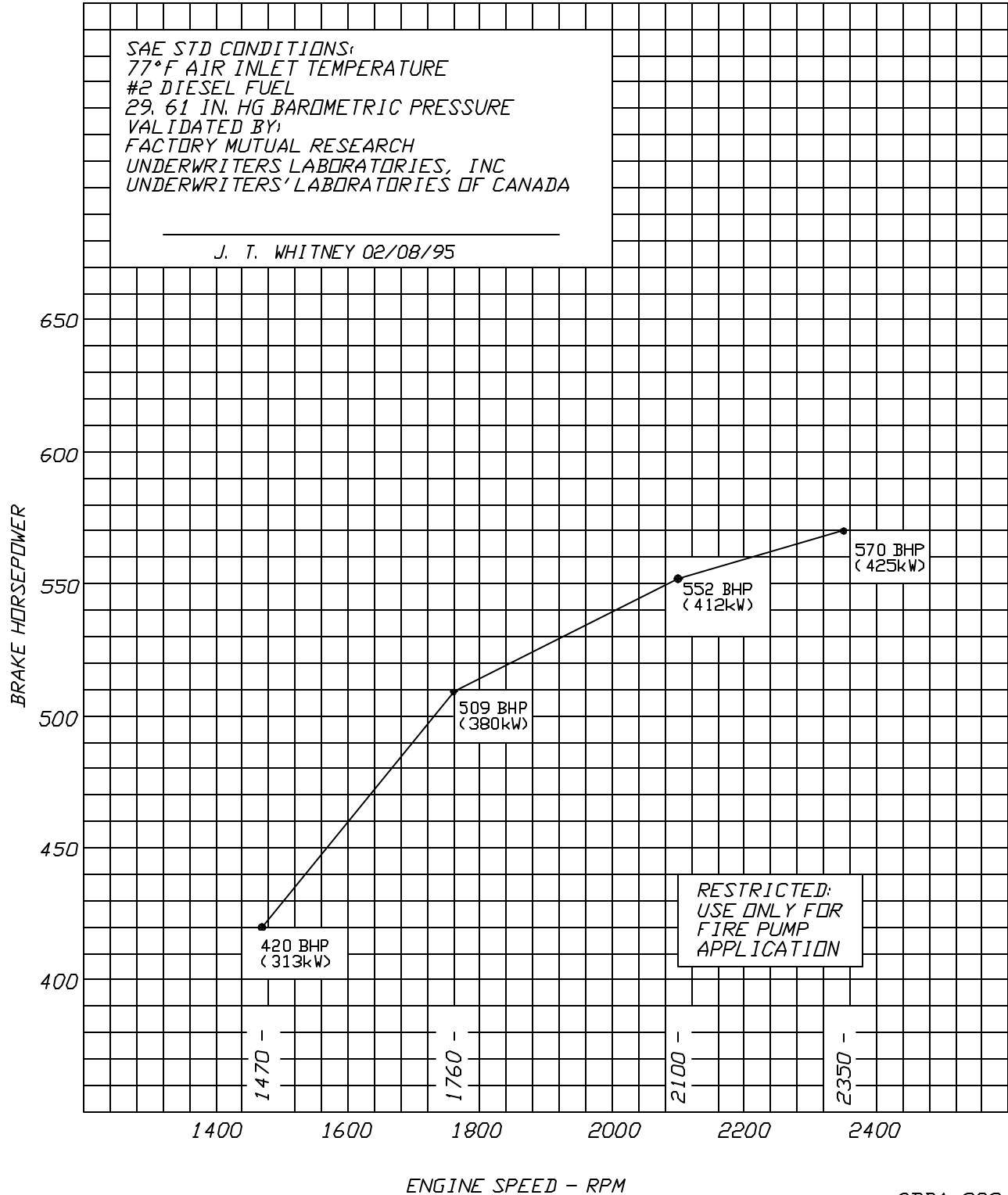
### CLARKE USA

3133 E. Kemper Rd.  
 Cincinnati, Ohio 45241  
 United States of America  
 P 513-771-2200  
 F 513-771-0726

### CLARKE UK

Grange Works, Lomond Rd.  
 Coatbridge, ML5-2NN  
 United Kingdom  
 P 44-1236-429946  
 F 44-1236-427274

FIRE PUMP MODEL DDFP-08FA  
 8V92TA INDUSTRIAL  
 HEAT EXCHANGER COOLED  
 9225 INJECTOR, 1.508 TIMING  
 TV8403 1.39A/R 23504447 TURBO  
 JACKET WATER CHARGE COOLING



# DDFP-08FA INSTALLATION & OPERATION DATA

## Basic Engine Description

Engine Manufacturer .....	Detroit Diesel Corp.
Ignition Type .....	Compression (Diesel)
Number of Cylinders .....	8
Bore and Stroke - in. (mm) .....	4.84 x 5.00 (123 x 127)
Displacement - in. <sup>3</sup> (L) .....	736 (12.1)
Compression Ratio .....	17:1
Valves per Cylinder	
Intake .....	None
Exhaust .....	4
Combustion System .....	Direct Injection
Engine Type .....	63.5° VEE - 2 Cycle
Aspiration .....	Turbocharged
Firing Order (CW Rotation) .....	1L-3R-3L-4R-4L-2R-2L-1R
Turbocharger .....	1.39 A/R
Charge Air Cooling Type .....	Jacket Water
Blower Type .....	Roots By-Pass
Blower Drive Ratio .....	1.95:1
Rotation (Viewed from Front)	
Clockwise .....	Standard
Counter-Clockwise .....	Optional
Engine Crankcase Vent System .....	Open
Dimensions and Weight	
Length - in. (mm) (From Drive Flange) .....	51.10 (1298)
Width - in. (mm) .....	40.34 (1025)
Height - in. (mm) (Above Crankshaft Center Line) .....	43.75 (1111)
Weight, Dry - lb. (kg) .....	2605 (1182)
Wet - lb. (kg) .....	2793 (1268)
Installation Drawing .....	D-433

## All Speeds

## Cooling System

	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
Heat Exchanger Minimum Flow				
60°F Raw H <sub>2</sub> O - gal./min. (L/min.) .....	40 (151)	48 (182)	56 (212)	64 (242)
95°F Raw H <sub>2</sub> O - gal./min. (L/min.) .....	67 (254)	76 (288)	81 (307)	87 (329)
Engine H <sub>2</sub> O Heat - Btu/sec. (kw/sec.) .....	275 (4.8)	312 (5.5)	376 (6.6)	439 (7.7)
Engine Radiated Heat - Btu/sec. (kw/sec.) .....		47 (0.8)		
Thermostat, Start to Open - °F (°C) .....		177 (81)		
Fully Open - °F (°C) .....		197 (92)		
Engine Coolant Capacity - qt. (L) .....		59 (53)		
Coolant Pressure Cap - lb./in. <sup>2</sup> (kPa) .....		9 (62)		
Maximum Engine H <sub>2</sub> O Temperature - °F (°C) .....		200 (93)		
Minimum Engine H <sub>2</sub> O Temperature - °F (°C) .....		160 (71)		
Heat Exchanger Maximum Raw H <sub>2</sub> O				
Inlet Pressure - lb./in. <sup>2</sup> (kPa) .....		60 (414)		

## Electric System - DC

System Voltage (Nominal) .....	<u>All Speeds</u> 24
Battery Capacity for Ambients Above 32°F - CCA @ 0°F .....	900
Voltage (Nominal) .....	12
Qty. per Battery Bank .....	2
SAE size per J537 .....	8D-900
Battery Cable Circuit*, Max Resistance - ohm .....	0.002
Battery Cable Minimum Size	
0-225 in. Circuit* Length .....	No. 00
225-300 in. Circuit* Length .....	No. 000
301-380 in. Circuit* Length .....	No. 0000
Charging Alternator Output - Amp. ....	40
Starter Cranking Amps - @ 40° F .....	668

\*Positive and Negative Cables Combined Length

NOTE: This Engine Is Intended For Indoor Installation Or In A Weatherproof Enclosure.

(Continued)

# DDFP-08FA INSTALLATION & OPERATION DATA (Continued)

<u>Exhaust System</u>	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
Exhaust Flow - ft. <sup>3</sup> /min. (m <sup>3</sup> /min.) .....	2805 (79)	3193 (90)	3494 (99)	3669 (104)
Exhaust Temperature - °F (°C) .....	785 (418)	775 (413)	765 (407)	760 (404)
Maximum Allowable Back Pressure - in. H <sub>2</sub> O (kPa) .....	19 (4.7)	20 (4.9)	23 (5.7)	25 (6.2)
Minimum Exhaust Pipe Dia. - in. (mm)** .....	Single 8.0 (203) Sch. 40			

<u>Fuel System</u>				
Fuel Pressure - lb./in. <sup>2</sup> (kPa) .....	58 (400)	62 (428)	64 (442)	65 (449)
Fuel Consumption - gal./hr. (L/hr.) .....	21 (80)	25 (95)	29 (110)	31 (117)
Fuel Return Rate - gal./hr. (L/hr.) .....	63 (239)	71 (269)	80 (303)	83 (315)
Total Fuel Flow - gal./hr. (L/hr.) .....	84 (318)	96 (363)	109 (413)	114 (432)
Minimum Line Size - Supply - in. (mm)** .....		.75 (19) Sch. 40 - Black		
Return - in. (mm)** .....		.50 (13) Sch. 40 - Black		
Maximum Allowable Fuel Pump Suction				
Clean System - in. H <sub>2</sub> O (kPa) .....		82 (20)		
Dirty System - in. H <sub>2</sub> O (kPa) .....		164 (40)		
Fuel Filter Micron Size - Primary .....		30		
Secondary .....		12		
Fuel Injector/Timing .....		9225/1.490		
Fuel Modulator/Setting .....		None		

<u>Heater System</u>	<u>All Speeds</u>
Jacket Water Heater .....	Standard
Wattage (Nominal) .....	2500
Voltage - VAC, 1P .....	230
Optional Voltage - VAC, 1P .....	115
Lube Oil Heater (Required When Ambient Is Below 50°F (10°C)) .....	Optional
Wattage .....	150

<u>Induction Air System</u>	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
Air Cleaner Type .....	Indoors Service Only - Washable			
Air Intake Restriction Maximum Limit				
Dirty Air Cleaner - in. H <sub>2</sub> O (kPa) .....	9.0 (2.3)	11.0 (2.8)	13.0 (3.3)	14.0 (3.6)
Clean Air Cleaner - in. H <sub>2</sub> O (kPa) .....	7.0 (1.8)	9.0 (2.3)	11.0 (2.8)	12.0 (3.1)
Engine Air Flow - ft. <sup>3</sup> /min. (m <sup>3</sup> /min.) .....	1255 (36)	1440 (41)	1590 (45)	1675 (47)
Maximum Allowable Temperature Rise (Ambient Air To Engine Inlet) - °F (°C) .....		30 (17)		

<u>Lubrication System</u>	<u>All Speeds</u>
Oil Pressure - normal - lb./in. <sup>2</sup> (kPa) .....	40-70 (276-433)
In Pan Oil Temperature - °F (°C) .....	230-245 (110-118)
Oil Pan Capacity - High - qt. (L) .....	23 (22)
Low - qt. (L) .....	17 (16)
Total Oil Capacity with Filters - qt. (L) .....	25 (24)

<u>Performance</u>	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
BMEP - lb./in. <sup>2</sup> (kPa) .....	154 (1061)	156 (1074)	141 (976)	131 (900)
Piston Speed - ft./min. (m/min.) .....	1225 (373)	1467 (447)	1750 (533)	1958 (597)
Noise - dB (A) @ 1m .....	100 (EST)	102 (EST)	104 (EST)	106 (EST)
Power Curve .....	CDDA - 8084 - 02			

\*\*Based On Nominal System. Flow Analysis Must Be Done To Assure Adherence To System Limitations.  
(Minimum Exhaust Pipe Diameter is based on 15 feet of pipe, one elbow, and a silencer  
pressure drop no greater than one half the max. allowable back pressure.)

# DDFP-06FA, -06FH, -L8FA, -08FA, -08FH ENGINE MATERIALS AND CONSTRUCTION

## Air Cleaner

Type ..... Indoor Usage Only  
Oiled Fabric Pleats  
Material ..... Surgical Cotton  
Aluminum Mesh

## Camshaft

Material ..... Steel (SAE 1513)  
Location ..... In Block, 1 Per Bank  
Drive ..... Gear  
Type of Cam ..... Ground

## Camshaft Bearing - End

Journal Diameter ..... 1.50 in. (38.0 mm)  
Length ..... 2.12 in. (53.8 mm)  
Material ..... Steel Backed Bronze

## Camshaft Bearing - Intermediate

Journal Diameter ..... 1.50 in. (38.0 mm)  
Length ..... 1.32 in. (33.5 mm)  
Materials ..... Aluminum

## Connecting Rod

Type ..... Forged I Section  
Material ..... Forged Steel, (SAE 1141)

## Crank Pin Bearings

Type ..... Precision Half Shell  
Number ..... 1 Pair Per Cylinder  
Journal Diameter ..... 3.00 in. (76.2 mm)  
Length ..... 1.20 in. (30.5 mm)  
Projected Area/Bearing ..... 3.60 in.<sup>2</sup> (2323 mm<sup>2</sup>)  
Material ..... Steel Backed Copper Lead

## Crankshaft

Material ..... Steel (SAE 1548)  
Heat Treat ..... Induction Hardened  
Type of Balance ..... Dynamic

## Cylinder Block

Type ..... One Piece  
Material ..... Cast Iron

## Cylinder Head

Type ..... Slab 4 Valve  
Material ..... Cast Iron

## Exhaust Valve

Type ..... Poppet  
Arrangement ..... Overhead Valve  
Number/Cylinder ..... 4  
Operating Mechanism ..... Mechanical Rocker Arm  
Type of Lifter ..... Roller  
Valve Spring  
Number/Valve ..... 1  
Valve Seat Insert  
Material ..... GM3544M

## Heat Exchanger

Type ..... Tube & Shell  
Materials  
Tubes & Headers ..... 90/10 CU/NI  
Shell ..... Copper  
Electrode ..... Zinc

## Liners

Type ..... Wet Liner  
Material ..... Cast Iron  
Ports  
Type ..... Oval  
Number ..... 18

## Main Bearings

Type ..... Precision Half Shells  
Journal Diameter ..... 4.50 in. (114.3 mm)  
Length ..... 1.24 in. (31.5 mm)  
Projected Area/Bearing ..... 5.58 in.<sup>2</sup> (3600 mm<sup>2</sup>)  
Material ..... Steel Backed Copper Lead

## Piston

Type and Material ..... Crosshead Malleable Iron  
Cooling ..... Oil - Cocktail Shaker

## Piston Pin Bushing

Material ..... Steel Backed Bronze

## Piston Rings - Compression

Type  
Top Ring ..... Chrome Faced Keystone  
Remaining 2 ..... Barrel And Chrome Faced

## Piston Rings - Oil

Type ..... Double Scraper with Expander  
Number per Piston ..... 2 Sets  
Location ..... Bottom of Skirt

## Piston Pin

Type ..... Crosshead - Polished & Hardened

**CAUTION**  
 ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT

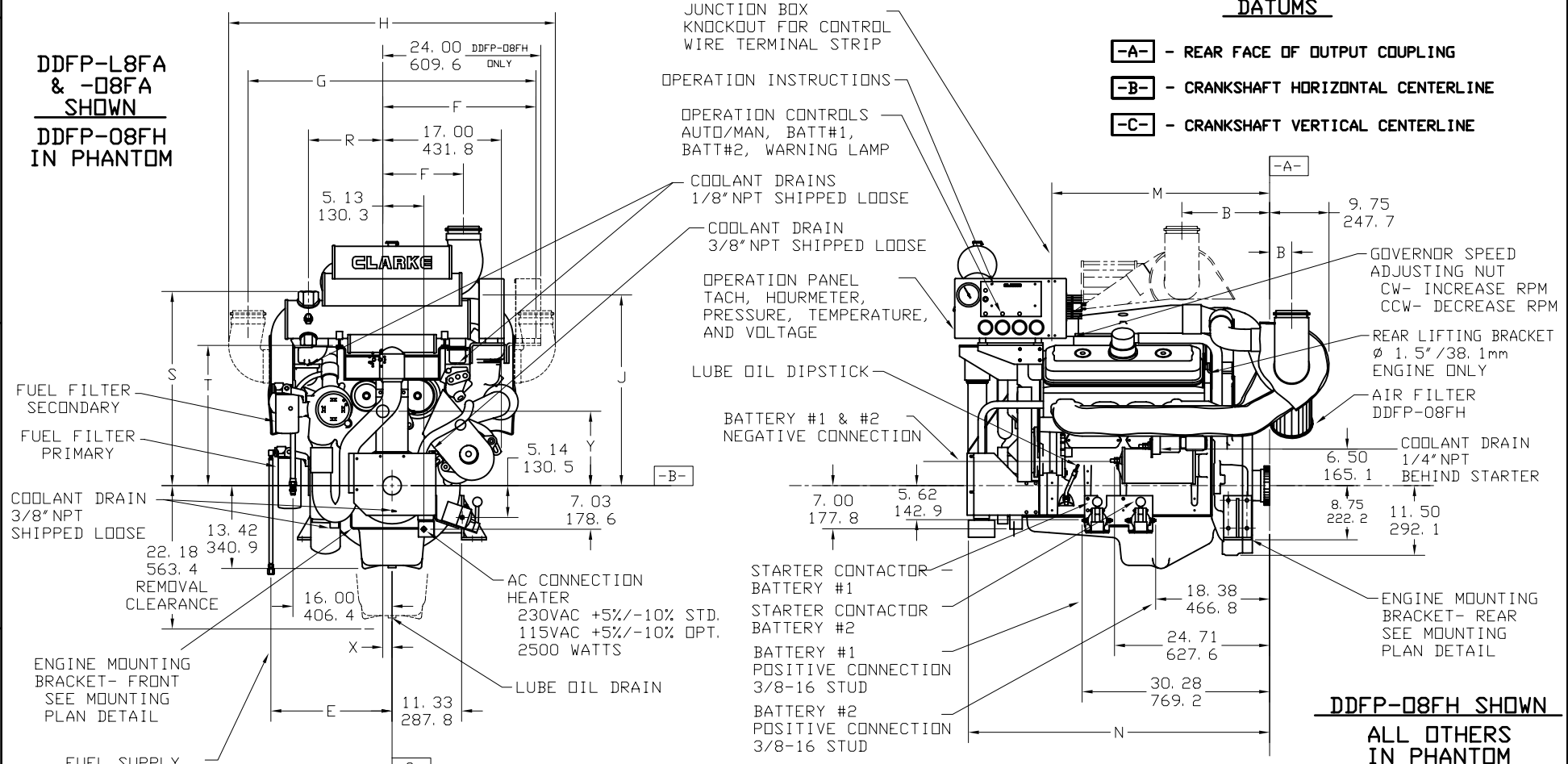
**ATTENTION**  
 REFER TO THE SPECIFIC MODEL 'INSTALLATION AND OPERATION DATA' FOR INSTALLATION GUIDELINES

**REDUCED DRAWING**

DO NOT SCALE UNKNOWN DIMENSIONS

MODEL	B	E	F	G	H	J	M	N	R	S	T	X	Y
DDFP-L6FA		18.67								28.74			11.12
DDFP-T6FA		474.2								730.0			282.5
DDFP-O6FA	11.75		11.56	-0-	41.02	43.75	29.06	42.52	15.50		25.85	-0.06	11.35
DDFP-O6FH	298.5		293.6		1041.9	1111.3	738.1	1080.0	393.7		656.6	-1.5	288.3
DDFP-L8FA		19.55								29.81			11.12
DDFP-O8FA		496.6								757.2			282.5
DDFP-O8FH	3.55	19.13	23.25	46.50	52.75	28.25	35.18	48.64	13.50	31.38	22.63	-0.05	12.26
	90.2	485.9	590.6	1181.1	1339.9	717.6	893.6	1235.5	342.9	797.1	574.9	-1.3	311.4
												0.34	9.56
												8.64	242.8

DDFP-L8FA & -O8FA SHOWN  
 DDFP-O8FH IN PHANTOM



**DATUMS**

- A-** - REAR FACE OF OUTPUT COUPLING
- B-** - CRANKSHAFT HORIZONTAL CENTERLINE
- C-** - CRANKSHAFT VERTICAL CENTERLINE

**DDFP-O8FH SHOWN**  
 ALL OTHERS IN PHANTOM

**DRAWING SUBJECT TO CHANGE WITHOUT NOTICE**

SYM	REVISION	DRWN	APVD	DATE
D	3/8NPTF-1/2 FUEL RETURN CONNECTION WAS 3/8NPTF-3/8, 3/4NPTF-3/4 FUEL SUPPLY CONNECTION WAS 3/8NPTF-1/2, 1 1/2\" NPT	DMP	JTW	01NDV93
E	RAW WATER INLET WAS 2\" NPT, ADDED MODEL -D6FH			
E	RELOCATED FUEL FILTERS, CORRECTED DIMS 'E', 'L', & 'V'	DMP	JTW	12SEP94
F	MODELS -L6FA, -T6FA WERE -L6VT, -T6VT	DMP	JTW	22NDV94
G	REVISED J.W. HEATER AND ADDED NEW INSTRUMENT PANEL	DMP	DMP	28DEC95
H	REVISED TO NEW FORMAT WITH NO OTHER CHANGES	SEN	JTW	25JUN97
J	DIM. 'A' ON PG. 2 WAS 298.5mm IN ERROR	SK	KJK	18APR01

DWN	JMILLER
DATE	26JUL90
ENGR	JTWHITNEY
CHK	
INSP	N
SERIES CODE	BP

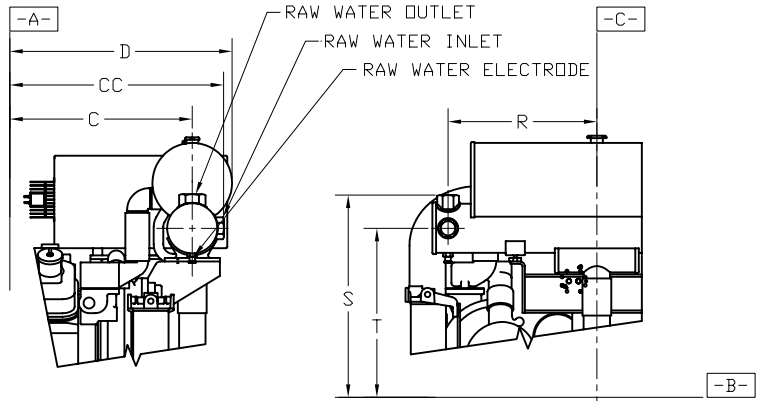
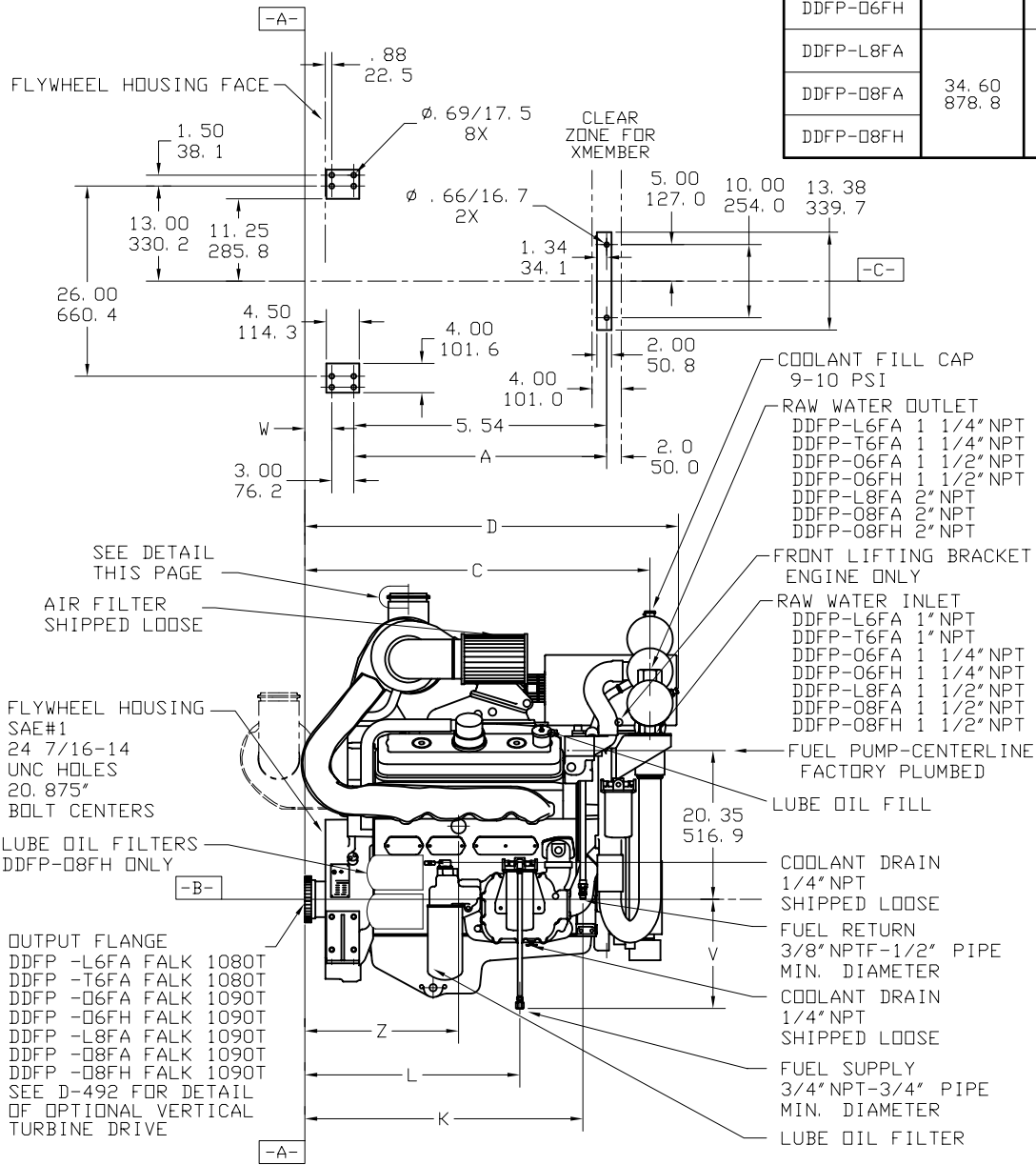
**CLARKE**  
 DETROIT DIESEL-ALLISON  
 3133 EAST KEMPER ROAD, CINCINNATI, OHIO 45241

NAME: **INSTALLATION DRAWING, FIRE PUMP ENGINE-**  
 DDFP-L6FA, -T6FA, -O6FA, -O6FH, -L8FA, -O8FA, & -O8FH

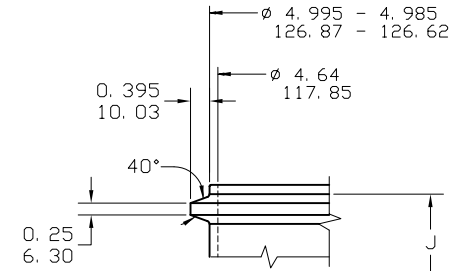
SIZE: **R** PART NO: **D-433** REV: **J**

SCALE: 3/16 UNITS: IN THRU ANGLE PROJ. SHEET OF 1 2

MODEL	A	C	CC	D	K	L	V	W	Z
DDFP-L6FA	28.84 732.5	41.08 1043.4	43.75 1111.3	45.23 1148.8	31.91 810.5	26.51 673.4	14.93 379.2	3.31 84.1	19.85 504.2
DDFP-T6FA		41.45 1052.8	44.75 1136.7	45.60 1158.2	32.28 819.9	23.65 600.7		20.31 515.9	
DDFP-O6FA		47.20 1198.9	-0-	51.10 1297.8	38.03 965.8	29.40 746.8		19.85 504.2	
DDFP-O6FH								3.68 93.6	24.03 610.5
DDFP-L8FA	34.60 878.8	47.20 1198.9	-0-	51.10 1297.8	38.03 965.8	29.40 746.8	15.77 400.6		22.37 568.2
DDFP-O8FA									
DDFP-O8FH									



**DDFP-L6FA, -T6FA, -O6FA, -O6FH  
RAW WATER CONNECTIONS**



**TURBO EXHAUST OUTLET DETAIL  
ALL MODELS 2X SCALE**

**DRAWING SUBJECT TO CHANGE WITHOUT NOTICE**

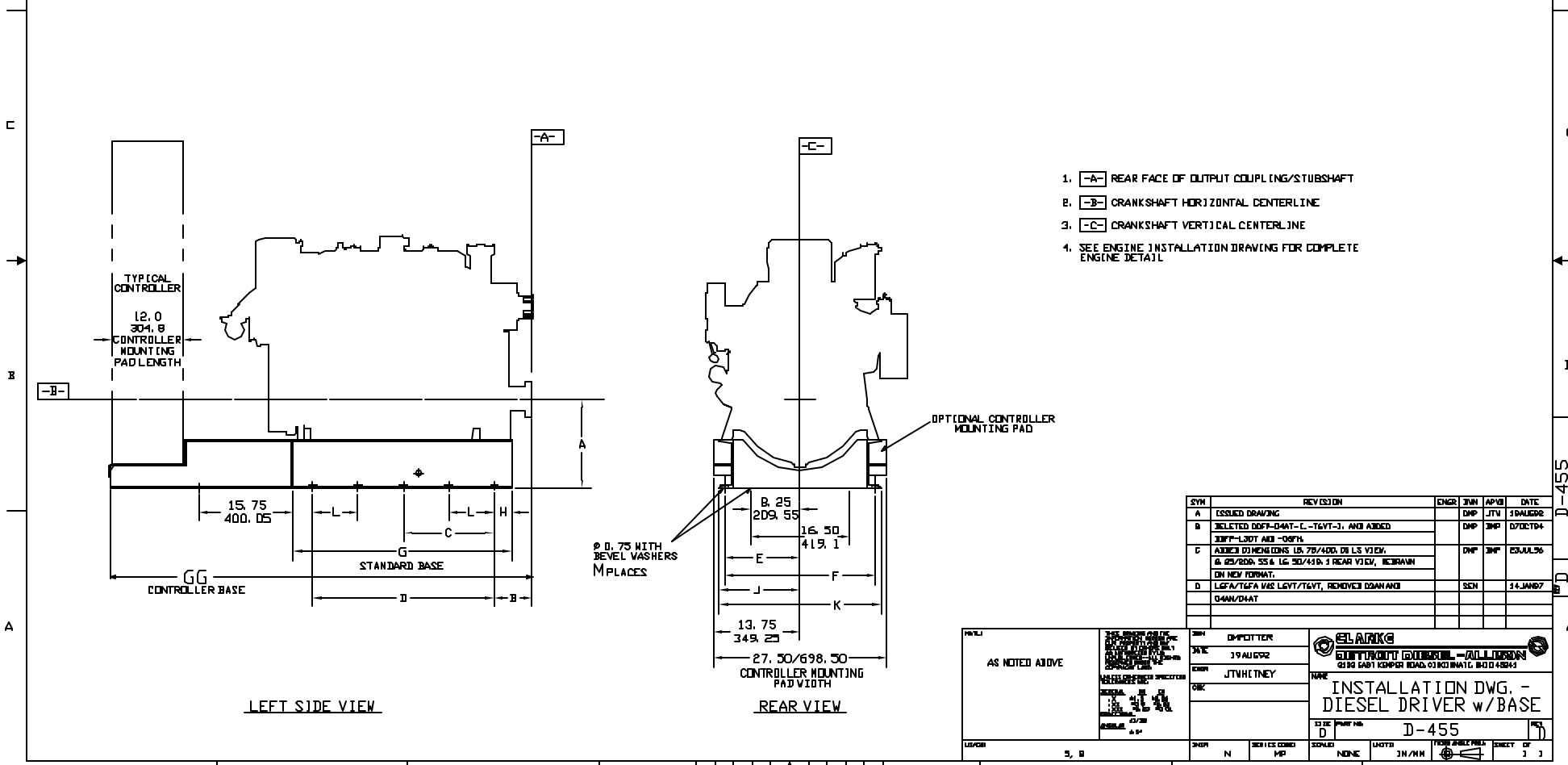
**DDFP-L8FA & -O8FA SHOWN  
DDFP-O8FH IN PHANTOM**

<small>THIS DRAWING AND THE INFORMATION HEREON ARE THE PROPERTY AND MAY BE USED BY OTHERS ONLY AS AUTHORIZED BY US. UNPUBLISHED—ALL RIGHTS RESERVED UNDER THE COPYRIGHT LAWS.</small>		DWN JMMILLER DATE 26JUL90 ENGR JTWHITNEY CHK:	 <b>DETROIT DIESEL-ALLISON</b> 3133 EAST KEMPER ROAD, CINCINNATI, OHIO 45241
NAME:		<b>INSTALLATION DRAWING, FIRE PUMP ENGINE-</b> DDFP-L6FA, -T6FA, -O6FA, -O6FH, -L8FA, -O8FA, & -O8FH	
SIZE: R	PART NO.:	<b>D-433</b>	REV: J
USAGE: 8	INSP: N	SERIES CODE: BP	SCALE: 3/16 UNITS: IN THIRD ANGLE PROJ. SHEET 2 OF 2

REV J D-433



ENGINE M/N	STANDARD BASE OPTION		ENGINE INSTALLATION SNG	DIMENSIONS											CONTROLLER BASE OPTION		DIMENSION	
	ASSM NO	WGT. LB/KG		A	B	C	D	E	F	G	H	J	K	L	M	ASSM NO		WGT. LB/KG
DDFP-03DN DDFP-13DT DDFP-13DT DDFP-13DT	C11289	96.20 43.84	D-436	17.50 444.50	4.25 107.25	-0-	28.91 697.91	19.63 496.20	27.25 692.15	28.91 734.31	3.00 76.20	14.65 372.11	29.30 744.26	---	6 PLC'S	C11803	194.81 454.817	59.91 1321.71
DDFP-16FA DDFP-16FA	C11290	243.1 110.70	D-433	18.75 476.25	2.67 67.64	15.69 398.53	31.98 797.05	17.25 438.15	24.50 619.50	37.38 949.45	3.00 76.20	18.50 469.90	37.00 939.80	---	8 PLC'S	C11806	341.71 867.842	68.39 1526.85
DDFP-06FA DDFP-06FA	C11290	243.1 110.70	D-433	18.75 476.25	2.64 67.06	15.69 398.53	31.98 797.05	17.25 438.15	24.50 619.50	37.38 949.45	3.00 76.20	18.50 469.90	37.00 939.80	---	8 PLC'S	C11808	341.71 867.842	68.39 1526.85
DDFP-16FA DDFP-16FA DDFP-06FH	C11291	292.3 132.99	D-433	18.75 476.25	2.64 67.06	18.57 471.68	37.14 943.26	17.25 438.15	24.50 619.50	43.14 1096.76	3.00 76.20	18.50 469.90	37.00 939.80	---	8 PLC'S	C11809	360.91 9167.11	74.14 1663.16
DDFP-16FT DDFP-16FT	C11292	292.0 132.49	D-443	18.75 476.25	3.63 92.20	-0-	34.00 867.00	17.25 438.15	24.50 619.50	39.02 992.11	3.00 76.20	18.50 469.90	37.00 939.80	18.00 457.20	10 PLC'S	C11331	398.61 892.49	90.02 2006.91



# DDFP-08FA

## FIRE PUMP DRIVER

### EMISSION DATA

*To complete an application for a Permit to Operate, the following data is provided.*

**8 Cylinders**  
**Two Cycle**  
**Lean Burn**  
**Aftercooled**  
**Diesel Oil - Fuel**  
**No - Energy Recovery from Exhaust**  
**No - Emission Control Device**

RPM	BHP	FUEL GAL / HR	AIR/FUEL RATIO	GM / BHP / HR					% O <sub>2</sub>	EXHAUST		TIMING DEGREES
				HC	NOx	CO	SO <sub>2</sub>	PART.		°F	CFM	
2350	570	31.1	33.3	0.26	8.17	1.59	0.75	0.19	12.0	760	3669	10.1
2100	552	28.9	34.2	0.22	8.08	1.66	0.66	0.17	12.2	765	3494	10.1
1900	530	26.8	34.7	0.22	8.72	1.84	0.64	0.16	12.4	770	3323	10.1
1760	509	25.3	35.3	0.22	9.13	2.16	0.63	0.16	12.5	775	3193	10.1
1470	420	20.7	37.6	0.24	9.05	4.76	0.62	0.15	13.0	785	2805	10.1

*For specific RPM & BHP ratings, some of the above data may have been extrapolated from the best available test data.*

*Degrees of timing RETARD for 'beginning of injection' based on comparison with pre-emission controlled engines from the same family.*

*Sulfur Dioxide based on 0.2% sulfur content in fuel (by weight).*

8084-7412 Base Model Engine Manufactured by Detroit Diesel Corp.  
 1.39 A/R Turbocharger  
 125MM Fuel Injectors @ 1.490 Timing Height

