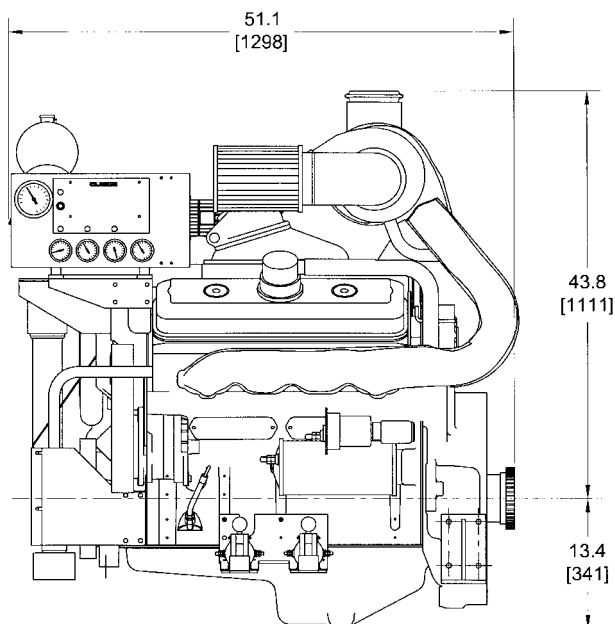


CLARKE FIRE PUMP DRIVERS



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

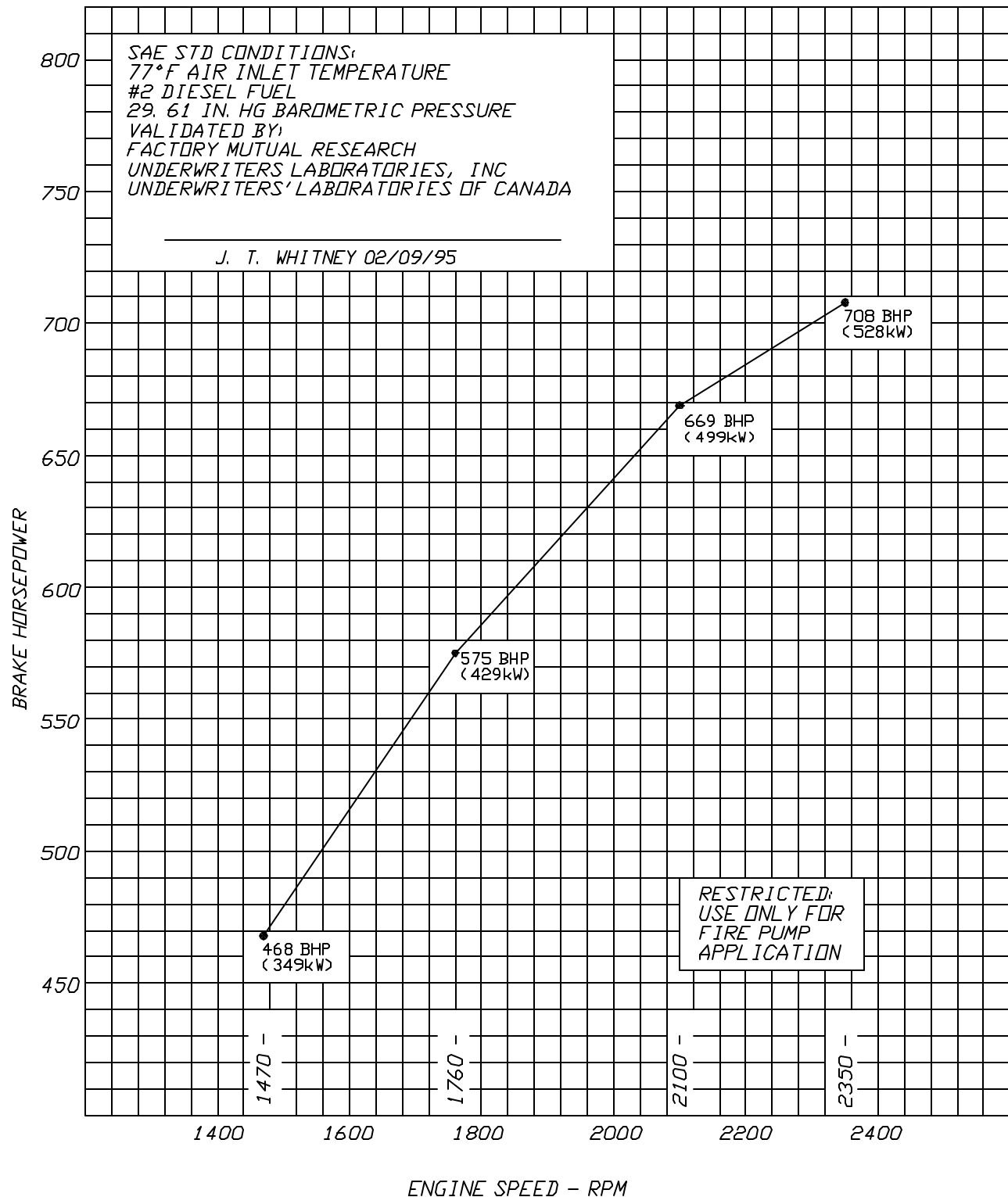
3133 E. Kemper Rd.
 Cincinnati, Ohio 45241
 United States of America
 P 513-771-2200
 F 513-771-0726

CLARKE UK

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



FIRE PUMP MODEL DDFP-08FH
8V92TA INDUSTRIAL
HEAT EXCHANGER COOLED
145 INJECTOR, 1.508 TIMING
TV7512 1.23A/R 23501978 TURBO(2)
JACKET WATER CHARGE COOLING



DDFP-08FH

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. ³ (L)	736 (12.1)
Compression Ratio	15:1
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	1.23 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)	52.75 (1340)
Height - in. (mm) (Above Crankshaft Center Line)	35.01 (889)
Weight, Dry - lb. (kg)	2662 (1208)
Wet - lb. (kg)	2850 (1293)
Installation Drawing	D-433

Cooling System

	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
Heat Exchanger Minimum Flow				
60°F Raw H ₂ O - gal./min. (L/min.)	39 (148)	42 (159)	48 (182)	52 (197)
95°F Raw H ₂ O - gal./min. (L/min.)	64 (242)	66 (250)	70 (265)	72 (273)
Engine H ₂ O Heat - Btu/sec. (kw/sec.)	296 (5.2)	317 (5.6)	371 (6.5)	396 (6.6)
Engine Radiated Heat - Btu/sec. (kw/sec.)		55 (1.0)		
Thermostat, Start to Open - °F (°C)		177 (81)		
Fully Open - °F (°C)		197 (92)		
Engine Coolant Capacity - qt. (L)		63 (57)		
Coolant Pressure Cap - lb./in. ² (kPa)		9 (62)		
Maximum Engine H ₂ O Temperature - °F (°C)		200 (93)		
Minimum Engine H ₂ O Temperature - °F (°C)		160 (71)		
Heat Exchanger Maximum Raw H ₂ O				
Inlet Pressure - lb./in. ² (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-08FH

INSTALLATION & OPERATION DATA (Continued)

Exhaust System

	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
Exhaust Flow - ft. ³ /min. (m ³ /min.)	3295 (93)	3892 (110)	4441 (126)	4787 (136)
Exhaust Temperature - °F (°C)	925 (496)	895 (479)	870 (466)	860 (460)
Maximum Allowable Back Pressure -				
in. H ₂ O (kPa)	19 (4.7)	20 (4.9)	23 (5.7)	25 (6.2)
Minimum Exhaust Pipe Dia. - in. (mm)**		Dual 6.0 (154) Sch. 40		

Fuel System

Fuel Pressure - lb./in. ² (kPa)	58 (400)	62 (428)	64 (442)	65 (449)
Fuel Consumption - gal./hr. (L/hr.)	25 (95)	25 (95)	34 (129)	37 (140)
Fuel Return Rate - gal./hr. (L/hr.)	63 (239)	71 (269)	80 (303)	83 (315)
Total Fuel Flow - gal./hr. (L/hr.)	88 (334)	96 (364)	114 (432)	120 (455)
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 ₂ O (kPa)		82 (20)		
Dirty System - in. H ₂ O (kPa)		164 (40)		
Fuel Filter Micron Size - Primary		30		
Secondary		12		
Fuel Injector/Timing		145/1.508		
Fuel Modulator/Setting		6#/490		

Heater System

	<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

Induction Air System

	<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 ₂ O (kPa)	5.5 (1.4)	6.5 (1.7)	8.0 (2.0)	9.0 (2.3)
Clean Air Cleaner - in. H ₂ O (kPa)	3.5 (0.9)	4.5 (1.1)	6.0 (1.5)	7.0 (1.8)
Engine Air Flow - ft. ³ /min. (m ³ /min.)	1325 (38)	1600 (45)	1860 (53)	2020 (57)
Maximum Allowable Temperature Rise (Ambient Air To Engine Inlet) - °F (°C)		30 (17)		

Lubrication System

	<u>All Speeds</u>
Oil Pressure - normal - lb./in. ² (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)	27 (26)

Performance

	<u>1470</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>
BMEP - lb./in. ² (kPa)	171 (1180)	176 (1214)	171 (1180)	162 (1112)
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 - 03			

**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.)

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

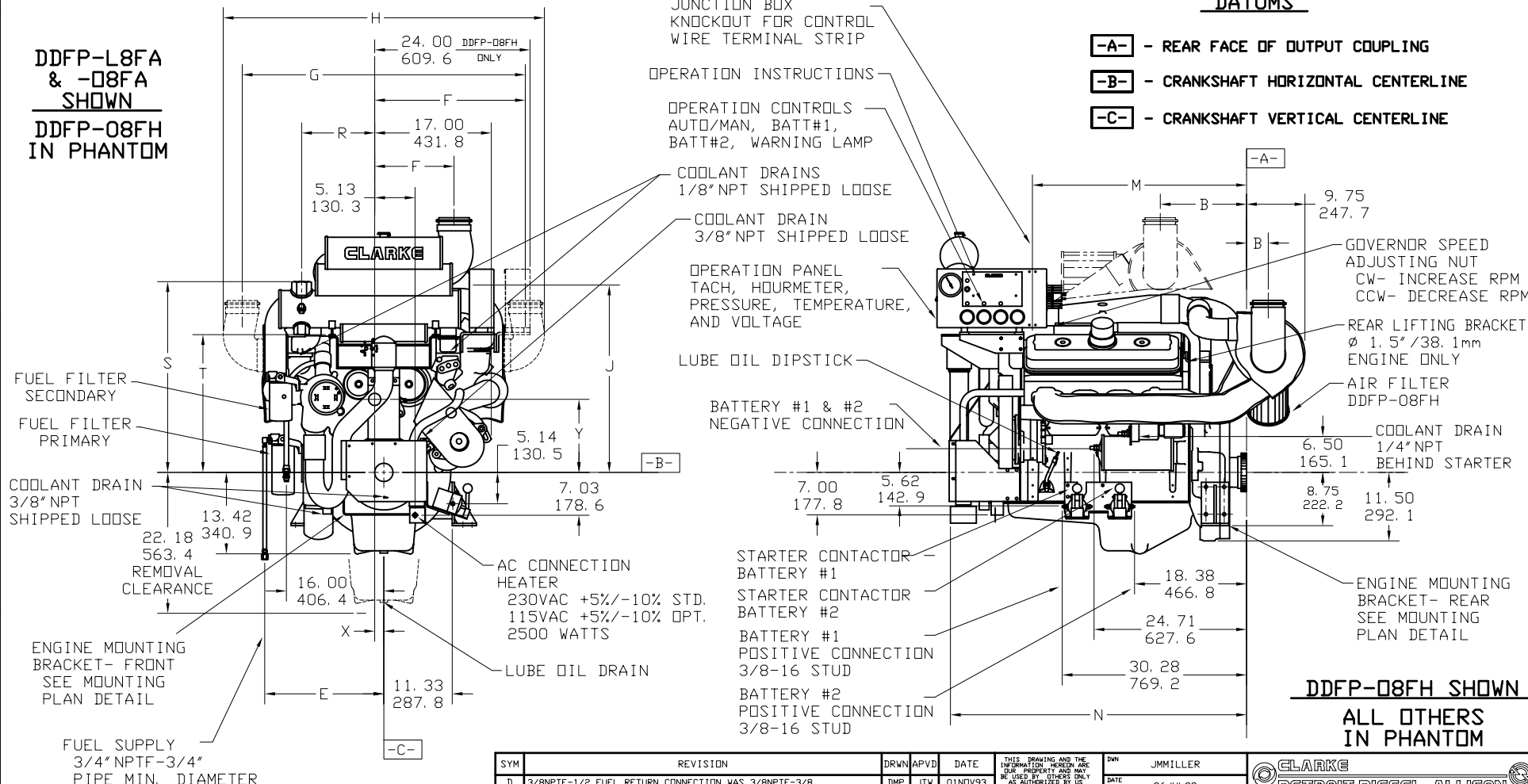
REDUCED DRAWING

DO NOT SCALE UNKNOWN DIMENSIONS

MODEL	B	E	F	G	H	J	M	N	R	S	T	X	Y	
DDFP-L6FA	11. 75 298. 5	18. 67 474. 2	11. 56 293. 6	-0-	41. 02 1041. 9	43. 75 1111. 3	29. 06 738. 1	42. 52 1080. 0	15. 50 393. 7	28. 74 730. 0	25. 85 656. 6	-0. 06 -1. 5	11. 12 282. 5	
DDFP-T6FA		29. 81 757. 2								11. 35 288. 3				
DDFP-O6FA										11. 12 282. 5				
DDFP-O6FH														
DDFP-L8FA		19. 55 496. 6												
DDFP-O8FA														
DDFP-O8FH	3. 55 90. 2	19. 13 485. 9	23. 25 590. 6	46. 50 1181. 1	52. 75 1339. 9	28. 25 717. 6								
							35. 18 893. 6	48. 64 1235. 5	13. 50 342. 9	31. 38 797. 1	22. 63 574. 9	-0. 05 -1. 3	12. 26 311. 4	
												0. 34 8. 64	9. 56 242. 8	

DATUMS

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



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	01NOV93
E	RAW WATER INLET WAS 2" NPT, ADDED MODEL -D6FH			
F	RELOCATED FUEL FILTERS, CORRECTED DIMS 'E', 'L', & 'V'	DMP	JTW	12SEP94
G	MODELS -L6FA, -T6FA WERE -L6VT, -T6VT	DMP	JTW	22NOV94
H	REVISED J.W. HEATER AND ADDED NEW INSTRUMENT PANEL	DMP	DMP	28DEC95
I	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

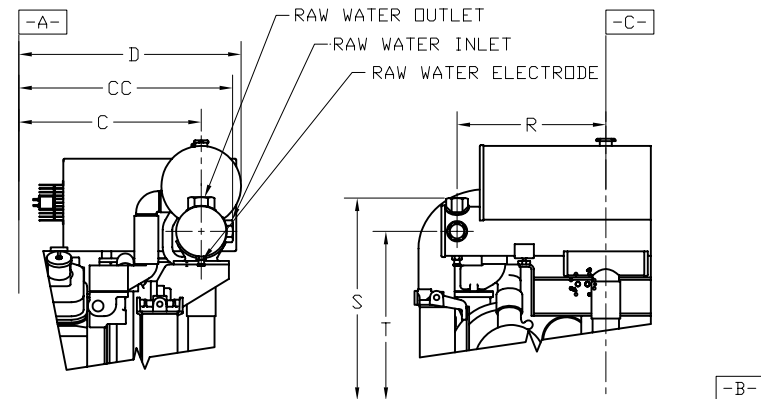
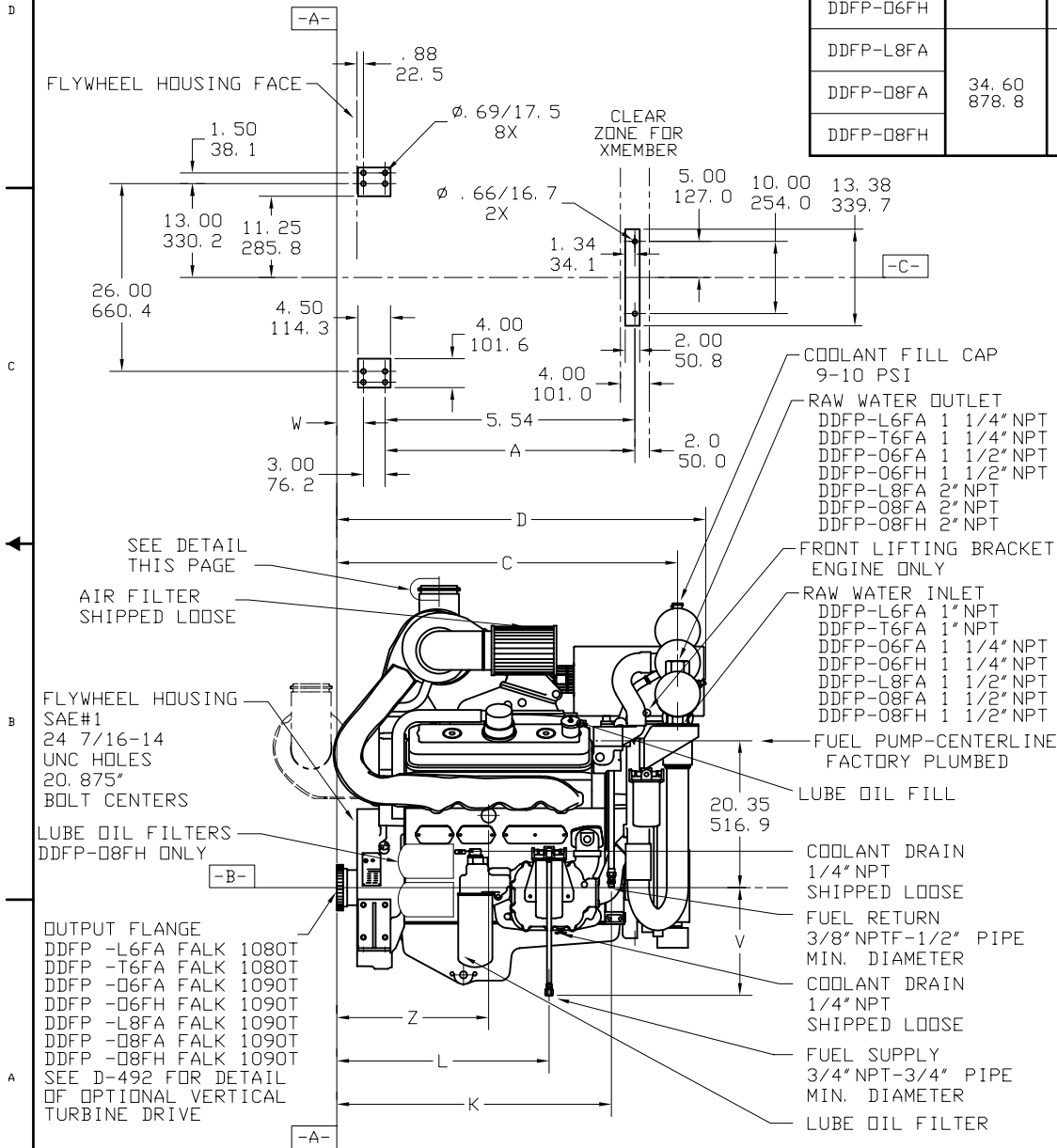
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DATE	26JUL90	
ENGR	JTWHITNEY	
CHK		
USAGE:	8	
INSP	N	
SERIES CODE	BP	
SCALE	3/16	
UNITS	IN	
THIRD ANGLE PROJ.		
SHEET	1	2

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

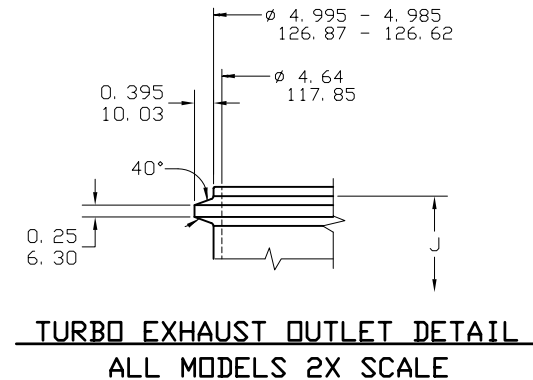
INSTALLATION DRAWING, FIRE PUMP ENGINE-
DDFP-L6FA, -T6FA, -O6FA, -O6FH, -L6FA, -O6FA, & -O6FH

SIZE R PART NO. D-433 REV J

7	6	5	4	3	D-433		J			
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										
DDFP-O6FA										
DDFP-O6FH	34.60 878.8	41.45 1052.8	44.75 1136.7	45.60 1158.2	32.28 819.9	23.65 600.7	15.77 400.6	3.68 93.6	20.31 515.9	
DDFP-L8FA									19.85 504.2	
DDFP-O8FA		47.20 1198.9	-0-	51.10 1297.8	38.03 965.8	29.40 746.8			24.03 610.5	
DDFP-O8FH									22.37 568.2	



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



DRAWING SUBJECT TO CHANGE WITHOUT NOTICE

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

THIS DRAWING AND THE INFORMATION HEREON ARE OUR PROPERTY AND MAY BE USED BY OTHERS ONLY AS AUTHORIZED BY US. UNPUBLISHED - ALL RIGHTS RESERVED UNDER THE COPYRIGHT LAWS.		DWN JMMILLER DATE 26JUL90 ENGR JTWITNEY CHK PART NO. SHIP N SERIES CODE BP SCALE 3/16 UNITS IN IN/MM or MM THIRD ANGLE PROJ. SHEET 2 OF 2	CLARK 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
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DDFP-08FH

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 ₂	EXHAUST		TIMING DEGREES
				HC	NOx	CO	SO ₂	PART.		°F	CFM	
2350	708	36.6	34.2	0.16	8.83	1.91	0.66	0.18	12.2	860	4787	6.5
2100	669	34.0	33.9	0.15	9.94	2.02	0.64	0.17	12.2	870	4441	6.5
1900	618	31.3	34.2	0.15	10.8	2.10	0.64	0.16	12.2	880	4162	6.5
1760	575	24.5	33.7	0.15	10.9	2.61	0.65	0.16	12.1	895	3892	6.5
1470	468	25.1	32.7	0.15	10.4	5.56	0.64	0.15	11.9	925	3295	6.5

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).

8084-7612 Base Model Engine Manufactured by Detroit Diesel Corp.
1.23 A/R Turbocharger
145MM Fuel Injectors @ 1.508 Timing Height