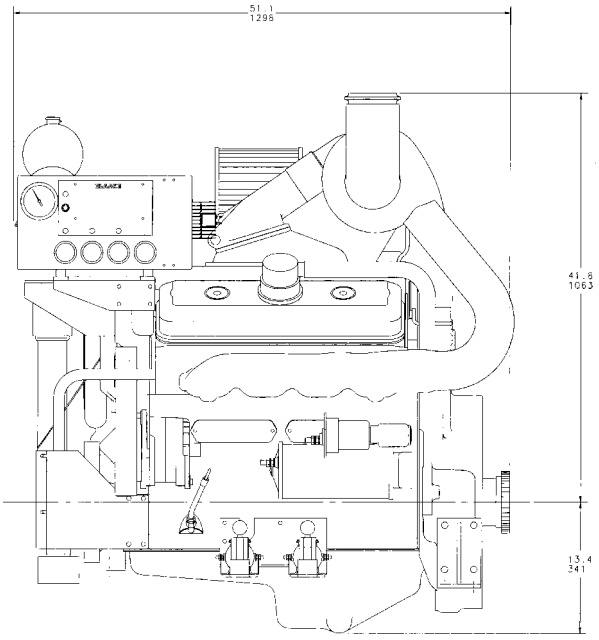
CLARKE FIRE PUMP DRIVERS



DDFP-08FA
OVERALL WIDTH
41.02 (1041.86)

MODELS

DDFP-T6FA DDFP-06FA
DDFP-06FH DDFP-L8FA
DDFP-08FA DDFP-08FH
DDFP-12FH

APPROVED RATINGS BHP/kw FM-UL-ULC*

MODEL	SPEED (RPM)			
	1470	1760	2100	2350
DDFP-T6FA	**254** 189	**302** 225	**341** 254	**348** 259
DDFP-06FA	**315** 235	**368** 275	**412** 307	**443** 331
DDFP-06FH	**350** 260	**425** 316	**460** 343	**465** 346
DDFP-L8FA	**380** 283	**460** 343	**500** 373	**515** 384
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

*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.

STANDARD EQUIPMENT

Air Cleaner — Direct Mounted, Washable, For Indoor Service Only
Alternator — Integral Regulator, 24V-DC, 40 Ampere, with Belt Guard
Cooling Water Control — Automatic At Local Control Panel
Exhaust Blankets — For Manifolds & Turbo Charger
Flywheel Housing — SAE #1
Fuel Check Valve — Per NFPA-20
Fuel Pump — Gear Driven, Gear Type
Fuel Filters — Primary & Secondary
Engine Heater — 230 Voltage (AC), w/Thermostat 2500 W (6 & 8 Cyl.); 4000 W (12 Cyl.)
Governor — Mechanical 10%
Heat Exchanger — NPTF Connections, Tube & Shell Type, Rated 60 PSI
Instrument Panel — English & Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure, Voltmeter (2)
Junction Box — Integral With Instrument Panel. For Customer Wiring (DC) To Match NFPA Controller
Lube Oil Cooler — Engine Water Cooled, Plate Type
Lube Oil Filter — Full Flow W/By-Pass Valve
Lube Pump — Gear Driven, Gear Type
Manual Start Controls — Per NFPA-20
Power Take Off — Includes Engine Half of Falk T10 Coupling
Run-Stop Control — On Instrument Panel With Control Position Warning Light.
Overspeed Control — Electronic w/Reset
Starter 24 VDC — High Torque, Prewired To Manual Contactors
Throttle Control — Tamper Proof
Water Pump — Gear Driven, Centrifugal Type

UL LISTED 513Y c UL

meets NFPA-20 Requirements

FM approved 1333

ULC listed C448A

SPECIFICATIONS

	DDFP-T6FA DDFP-06FA	DDFP-06FH	DDFP-L8FA DDFP-08FA	DDFP-08FH	DDFP-12FH
DDC Engine Series	V-92	V-92	V-92	V-92	V-92
No. Cylinders	6	6	8	8	12
Aspiration	TA	TA	TA	TA	TA
Rotation**	CLOCKWISE (CW)				
Displacement (cu. in.)*	552	552	736	736	1104
Net Wt. (lbs.)	2217	2217	2560	2605	4690
Bore (in.)	4.84	4.84	4.84	4.84	4.84
Stroke (in.)	5.0	5.0	5.0	5.0	5.0
Compression Ratio	17:1	15:1	17:1	15:1	15:1
Installation Drawing	D-433	D-433	D-433	D-433	D-445

DDC - DETROIT DIESEL CORP.
TA - TURBOCHARGED AND AFTERCOOLED

*V-92 UNITS ARE 2 STROKE CYCLE
**VIEW FROM FRONT

DESIGN FEATURES

- Direct Mounted Drive Coupling Hub
- Direct Attachment For Driveshaft Available
- 24 Volt DC Starting System
- Low Watt Density Coolant Heater
- Compact Size
- High Horsepower To Weight Ratio
- Jacket Water Cooled Aftercooler
- Direct Injection
- Individual Cylinder Fuel Injectors
- Roller Camshaft Lifters
- By-Pass Type Blower
- Replaceable Cylinder Liners
- Crosshead Pistons To Eliminate Side Load Wear

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

Fire Protection Products

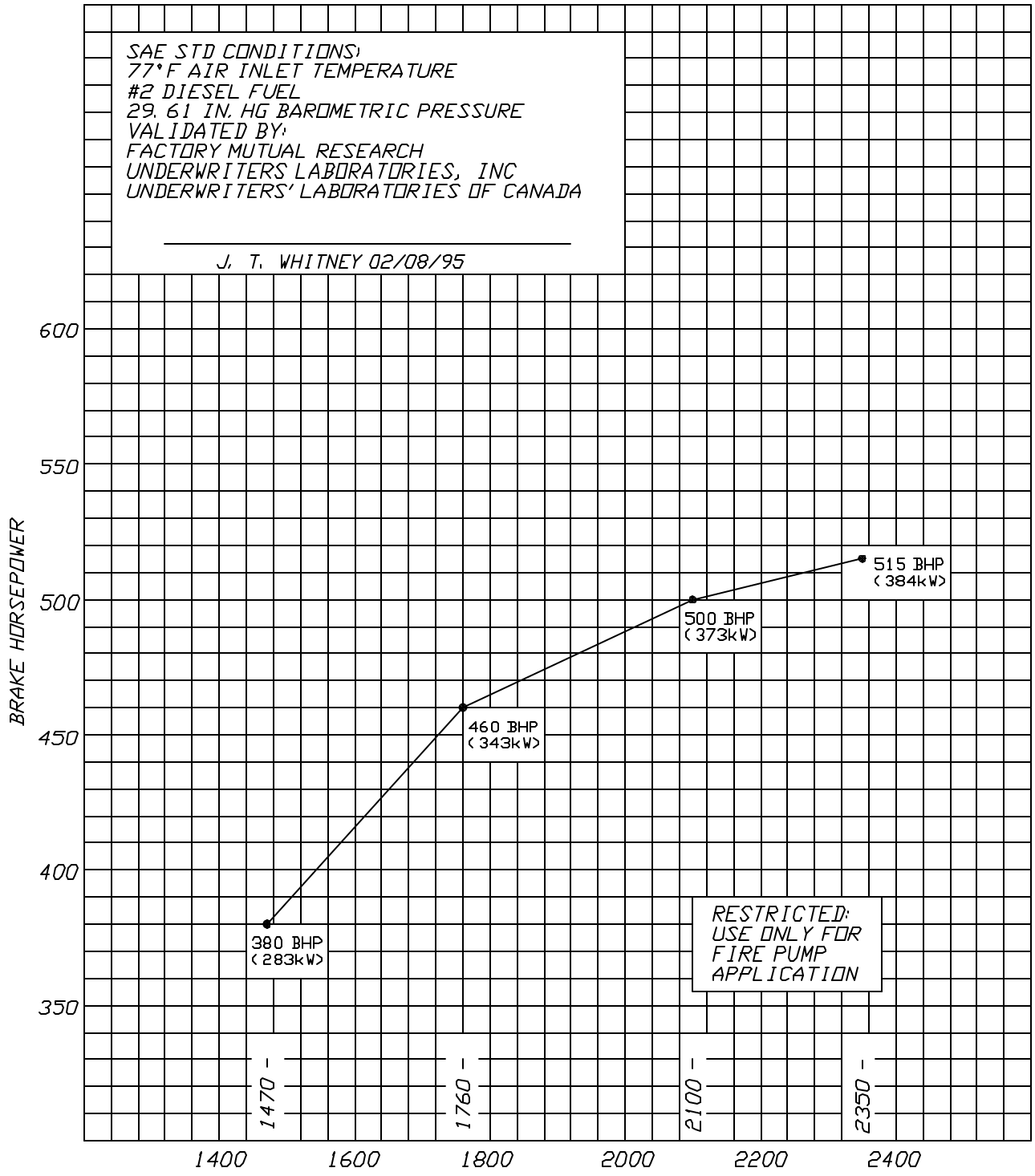
3133 East Kemper Rd., Cincinnati, Ohio 45241-1565 USA ~ Phone 513-771-2200 Fax 513-771-0726

(3/99)

Printed in U.S.A.

CLARKE
DETROIT DIESEL-ALLISON

FIRE PUMP MODEL DDFP-L8FA
8V92TA INDUSTRIAL
HEAT EXCHANGER COOLED
9225 INJECTOR, 1.490 TIMING
TV8403 1.39A/R 23504447 TURBO
JACKET WATER CHARGE COOLING



CDDA-8084-01
02/08/95

ENGINEERING TECHNICAL DATA DEPT.

DDFP-L8FA
INSTALLATION & OPERATION DATA

Basic Engine Description	**All Speeds**
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	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

Cooling System	**1470**	**1760**	**2100**	**2350**
Heat Exchanger Minimum Flow				
60˚F Raw H_2O - gal./min. (L/min.)	36 (136)	43 (163)	51 (193)	58 (220)
95˚F Raw H_2O - gal./min. (L/min.)	61 (231)	69 (261)	73 (276)	79 (299)
Engine H_2O Heat - Btu/sec. (kw/sec.)	249 (4.4)	283 (5.0)	340 (6.0)	397 (7.0)
Engine Radiated Heat - Btu/sec. (kw/sec.)		45 (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 - $lb./in.^2$ (kPa)		9 (62)		
Maximum Engine H_2O Temperature - ˚F (C)		200 (93)		
Minimum Engine H_2O Temperature - ˚F (˚C)		160 (71)		
Heat Exchanger Maximum Raw H_2O				
Inlet Pressure - $lb./in.^2$ (kPa)		60 (414)		

Electric System - DC	**All Speeds**
System Voltage (Nominal)	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*

(Continued)

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

DDFP-L8FA
INSTALLATION & OPERATION DATA (Continued)

Exhaust System	**1470**	**1760**	**2100**	**2350**
Exhaust Flow - ft.^{3}/min. (m^3/min.)	2584 (73)	2987 (85)	3283 (93)	3461 (98)
Exhaust Temperature - ˚F (˚C)	765 (407)	750 (399)	735 (391)	730 (388)
Maximum Allowable Back Pressure - in. H_2O (kPa)	19 (4.7)	26 (6.6)	28 (7.1)	30 (7.6)
Minimum Exhaust Pipe Dia. - in. (mm)**	Single 8.0 (203) Sch. 40			

Fuel System				
Fuel Pressure - lb./in.^{2} (kPa)	58 (400)	62 (428)	64 (442)	65 (449)
Fuel Consumption - gal./hr. (L/hr.)	19 (72)	23 (87)	26 (99)	28 (106)
Fuel Return Rate - gal./hr. (L/hr.)	63 (239)	71 (269)	80 (303)	83 (315)
Total Fuel Flow - gal./hr. (L/hr.)	82 (311)	94 (356)	106 (402)	111 (420)
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_2O (kPa)	82 (20)			
Dirty System - in. H_2O (kPa)	164 (40)			
Fuel Filter Micron Size - Primary	30			
Secondary	12			
Fuel Injector/Timing	9225/1.490			
Fuel Modulator/Setting	None			

Heater System	**All Speeds**
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	**1470**	**1760**	**2100**	**2350**
Air Cleaner Type	Indoors Service Only - Washable			
Air Intake Restriction Maximum Limit				
Dirty Air Cleaner - in. H_2O (kPa)	9.0 (2.3)	11.0 (2.8)	13.0 (3.3)	14.0 (3.6)
Clean Air Cleaner - in. H_2O (kPa)	7.0 (1.8)	9.0 (2.3)	11.0 (2.8)	12.0 (3.1)
Engine Air Flow - ft.^{3}/min. (m^3/min.)	1175 (33)	1375 (39)	1530 (43)	1620 (46)
Maximum Allowable Temperature Rise (Ambient Air To Engine Inlet) - ˚F (˚C)	30 (17)			

Lubrication System	**All Speeds**
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)	25 (24)

Performance	**1470**	**1760**	**2100**	**2350**
BMEP - lb./in.^{2} (kPa)	139 (960)	141 (970)	128 (884)	120 (813)
Piston Speed - ft./min. (m/min.)	1225 (373)	1467 (447)	1750 (533)	1958 (597)
Noise - dB (A) @ 1m	99 (EST)	101 (EST)	103 (EST)	105 (EST)
Power Curve	CDDA - 8084 - 01			

***Based On Nominal System. Flow Analysis Must Be Done To Assure Adherance 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.^{2} (2323 mm^2)
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.^{2} (3600 mm^2)
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

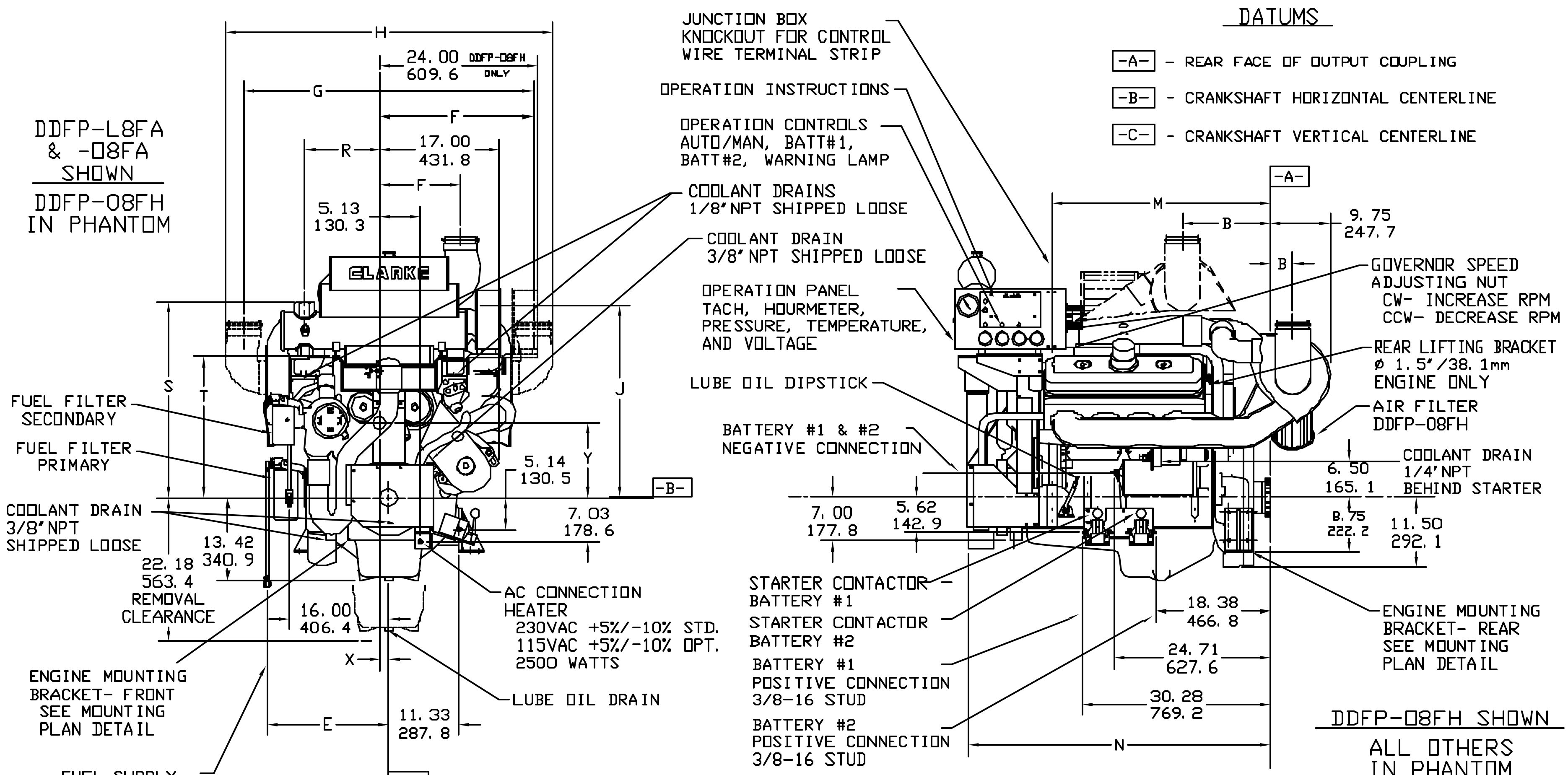
MODEL	B	E	F	G	H	J	M	N	R	S	T	X	Y
DDFP-L6FA	11.75 298.5	18.67 474.2	11.56 293.6	-0-	41.02 1041.9	43.75 1111.3	29.06 738.1	42.52 1080.0	15.50 393.7	28.74 730.0	25.85 656.6	-0.06 -1.5	11.12 282.5
DDFP-T6FA													
DDFP-06FA		19.55 496.6								29.81 757.2			11.35 288.3
DDFP-06FH													11.12 282.5
DDFP-L8FA							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
DDFP-08FA													
DDFP-08FH	3.55 90.2	19.13 485.9	23.25 590.6	46.50 1181.1	52.75 1339.9	28.25 717.6						0.34 8.64	9.56 242.8

DATUMS

-A- - REAR FACE OF OUTPUT COUPLING

-B- - CRANKSHAFT HORIZONTAL CENTERLINE

-C- - CRANKSHAFT VERTICAL CENTERLINE


DDFP-L8FA & -08FA SHOWN
DDFP-08FH IN PHANTOM
H
24.00 609.6 DDFP-08FH ONLY
G
F
R
17.00 431.8
F
5.13 130.3
CLARKE
S
T
J
Y
5.14 130.5
-B-
7.03 178.6
FUEL FILTER SECONDARY
FUEL FILTER PRIMARY
COOLANT DRAIN 3/8"NPT SHIPPED LOOSE
13.42 340.9
22.18 563.4 REMOVAL CLEARANCE
16.00 406.4
X
E
11.33 287.8
-C-
ENGINE MOUNTING BRACKET- FRONT SEE MOUNTING PLAN DETAIL
FUEL SUPPLY 3/4"NPTF-3/4" PIPE MIN. DIAMETER
COOLANT DRAINS 1/8"NPT SHIPPED LOOSE
COOLANT DRAIN 3/8"NPT SHIPPED LOOSE
AC CONNECTION HEATER 230VAC +5%/-10% STD. 115VAC +5%/-10% OPT. 2500 WATTS
LUBE OIL DRAIN
JUNCTION BOX KNOCKOUT FOR CONTROL WIRE TERMINAL STRIP
OPERATION INSTRUCTIONS
OPERATION CONTROLS AUTO/MAN, BATT#1, BATT#2, WARNING LAMP
OPERATION PANEL TACH, HOURMETER, PRESSURE, TEMPERATURE, AND VOLTAGE
LUBE OIL DIPSTICK
BATTERY #1 & #2 NEGATIVE CONNECTION
7.00 177.8
5.62 142.9
STARTER CONTACTOR BATTERY #1
STARTER CONTACTOR BATTERY #2
BATTERY #1 POSITIVE CONNECTION 3/8-16 STUD
BATTERY #2 POSITIVE CONNECTION 3/8-16 STUD
-A-
M
B
9.75 247.7
B
GOVERNOR SPEED ADJUSTING NUT CW- INCREASE RPM CCW- DECREASE RPM
REAR LIFTING BRACKET ø 1.5"/38.1mm ENGINE ONLY
AIR FILTER DDFP-08FH
COOLANT DRAIN 1/4"NPT BEHIND STARTER
6.50 165.1
8.75 222.2
11.50 292.1
18.38 466.8
24.71 627.6
30.28 769.2
N
ENGINE MOUNTING BRACKET- REAR SEE MOUNTING PLAN DETAIL

DDFP-08FH 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 RAW WATER INLET WAS 2"NPT. ADDED MODEL -06FH	DMP	JTV	01NOV93
E	RELOCATED FUEL FILTERS, CORRECTED DIMS 'E', 'L', & 'V'	DMP	JTV	12SEP94
F	MODELS -L6FA, -T6FA WERE -L6VT, -T6VT	DMP	JTV	22NOV94
G	REVISED J.W. HEATER AND ADDED NEW INSTRUMENT PANEL	DMP	DMP	28DEC95
H	REVISED TO NEW FORMAT WITH NO OTHER CHANGES	SEN	JTV	25JUN97

DRN JMMILLER · DATE 26JUL90 · CHKD JTWHITNEY

CLARKE
DETROIT DIESEL-ALLISON
3122 EAST KEMPER ROAD, CINCINNATI, OHIO 45241

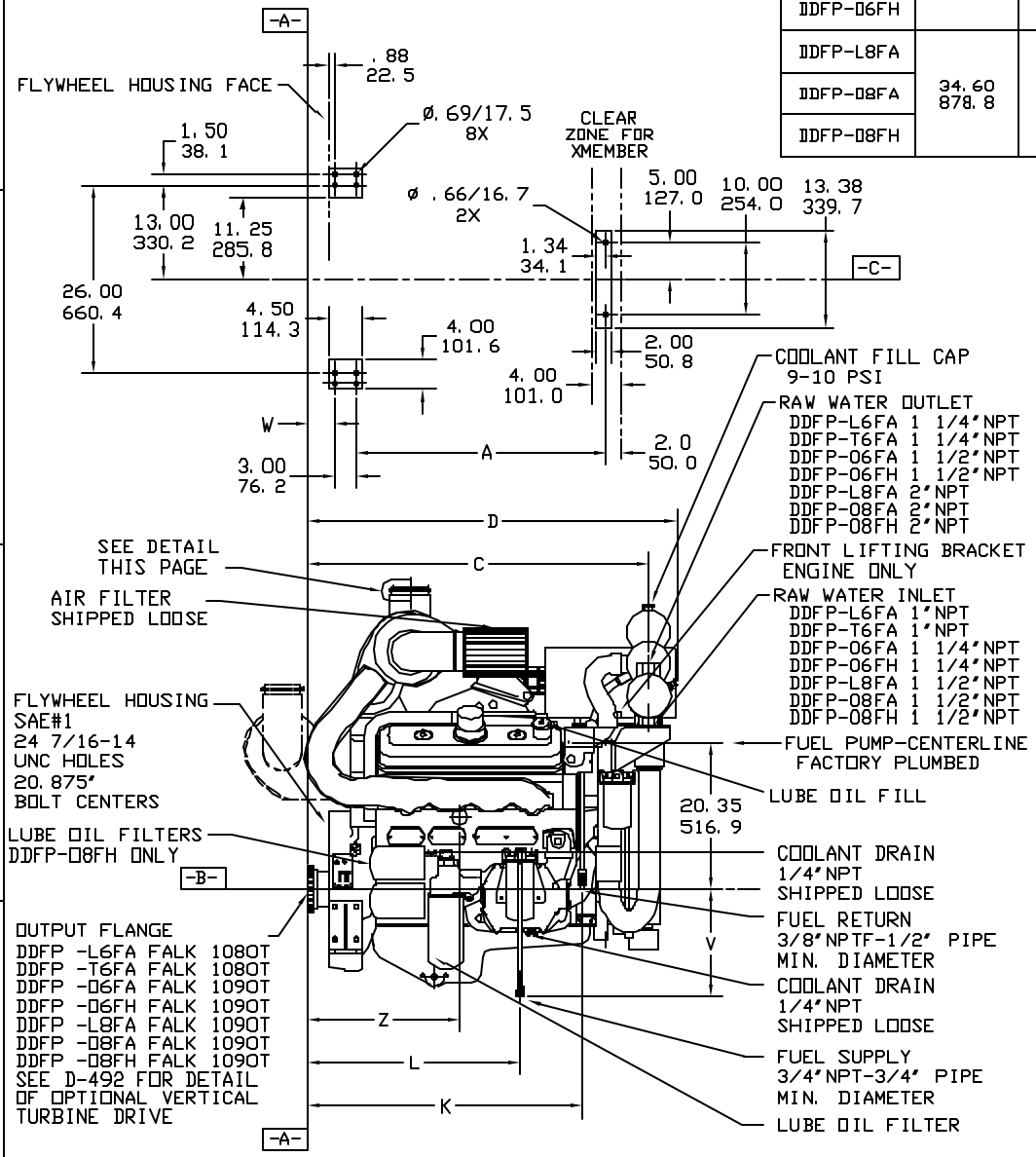
INSTALLATION DRAWING, FIRE PUMP ENGINE- DDFP-L6FA, -T6FA, -06FA, -06FH, -L8FA, -08FA, & -08FH

SIZE R · PART NO. D-433 · REV H · SCALE 3/16 · UNITS IN/MM or MM · SHEET 1 OF 2

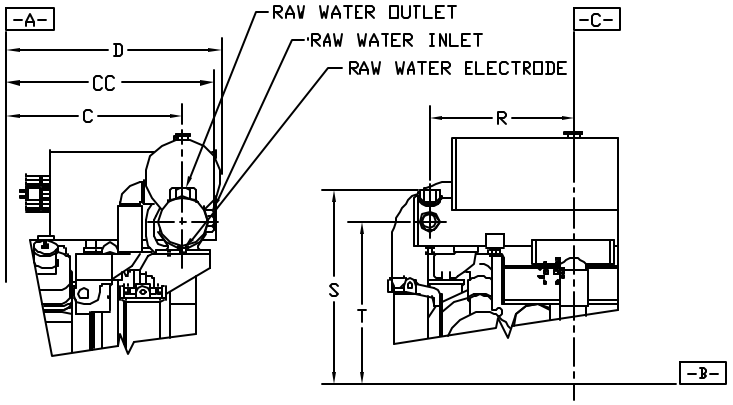
D-433 H

D-433 H

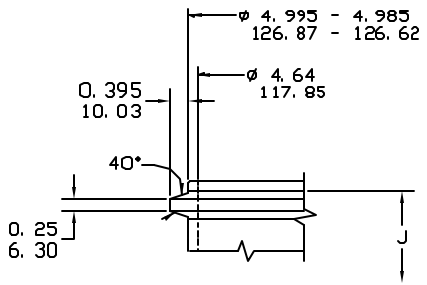
MODEL	A	C	CC	D	K	L	V	W	Z
DDFP-L6FA	28.84 298.5	41.08 1043.4	43.75 1111.3	45.23 1148.8	31.91 810.5	26.51 673.4	14.93 379.2	3.31 84.1	19.85 504.2
DDFP-T6FA									
DDFP-06FA		41.45 1052.8	44.75 1136.7	45.60 1158.2	32.28 819.9	23.65 600.7		3.68 93.6	20.31 515.9
DDFP-06FH									19.85 504.2
DDFP-L8FA	34.60 878.8	47.20 1198.9	-D-	51.10 1297.8	38.03 965.8	29.40 746.8			24.03 610.5
DDFP-08FA									
DDFP-08FH							15.77 400.6		22.37 568.2



DDFP-L8FA & -08FA SHOWN
DDFP-08FH IN PHANTOM



DDFP-L6FA, -T6FA, -06FA, -06FH
RAW WATER CONNECTIONS



TURBO EXHAUST OUTLET DETAIL
ALL MODELS 2X SCALE

DRAWING SUBJECT
TO CHANGE
WITHOUT NOTICE

BY	JMMILLER	CLARK DETROIT DIESEL-ALLISON, 3160 EAST KEMPER ROAD, CINCINNATI, OHIO 45241
DATE	26JUL90	NAME: INSTALLATION DRAWING, FIRE PUMP ENGINE- DDFP-L6FA, -T6FA, -06FA, -06FH, -L8FA, -08FA, & -08FH
ENGR	JTWHITNEY	SIZE R, PART NO. D-433, REV H
CHK		SCALE 3/16, UNITS IN/MM, SHEET 2 OF 2

D-433 H

DDFP-L8FA

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*

		FUEL	AIR/FUEL	GM / BHP / HR					%	EXHAUST		TIMING
RPM	BHP	GAL / HR	RATIO	HC	NOx	CO	SO_2	PART.	0_2	°F	CFM	DEGREES
2350	515	28.2	35.7	0.27	7.70	1.13	0.70	0.18	12.6	730	3461	11.8
2100	500	26.2	36.2	0.24	8.23	1.27	0.66	0.17	12.7	735	3283	11.8
1900	480	24.2	36.9	0.25	8.79	1.42	0.64	0.16	12.8	740	3102	11.8
1760	460	22.8	37.3	0.27	9.20	1.70	0.63	0.16	12.9	750	2987	11.8
1470	380	18.7	38.9	0.30	9.08	3.03	0.63	0.15	13.2	765	2584	11.8

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

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