

FM-UL-cUL APPROVED RATINGS BHP/KW

JU4H MODEL	RATED SPEED								US-EPA (NSPS) Available Until
	1760		2100		2350		2400		
UFAD5G	110	82	113	84	118	88	118	88	No Expiration
UFADP0	121	90	125	93	130	97	130	97	No Expiration
UFADR0	113	84	136	101	140	104	140	104	No Expiration
UFADW8	144	107							No Expiration
UFADY8	157	117							No Expiration
UFAD98	175	131							No Expiration

● USA EPA (NSPS) Tier 3 Emissions Certified Off-Road (40 CFR Part 89) and NSPS Stationary (40 CFR Part 60 Sub Part III). Meet EU Stage IIIA emission levels.

◆ All Models available for Export



Picture shown represents JU4H-TRWA engine model

SPECIFICATIONS

ITEM	JU4H MODELS					
	UFAD5G	UFADP0	UFADR0	UFADW8	UFADY8	UFAD98
Number of Cylinders	4					
Aspiration	TRWA					
Rotation*	CW					
Overall Dimensions in. (mm)	59.9 (1523) H x 44.4 (1127) L x 37.3 (949) W					
Crankshaft Centerline Height – in. (mm)	14 (356)					
Weight – lb (kg)	1490 (676)					
Compression Ratio	19.0:1					
Displacement – cu. in. (l)	275 (4.5)					
Engine Type	4 Stroke Cycle – Inline Construction					
Bore & Stroke – in. (mm)	4.19 x 5.00 (106 x 127)					
Installation Drawing	D630					
Wiring Diagram AC	C07651					
Wiring Diagram DC	C071367, C072146, C071361					
Engine Series	John Deere 4045 Series Power Tech E					
Speed Interpolation	N/A					

Abbreviations: CW – Clockwise TRWA – Turbocharged with Raw Water Aftercooling N/A Not Available L – Length W – Width H – Height

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance.
- FM-UL power ratings are shown at specific speeds, Clarke engines can be applied at these single rated RPM settings with a speed adjustment of ± 50 RPM.

ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 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.

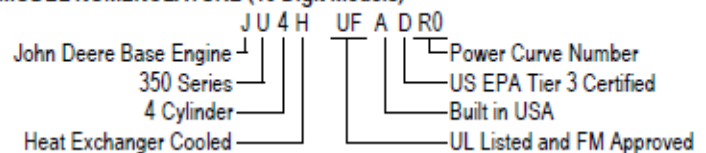


ENGINE EQUIPMENT

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage (Cyclonic)
Alarms	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	12V-DC, 42 Amps with Poly-Vee Belt and Guard	24V-DC, 40 Amps with Poly-Vee Belt and Guard
Coupling	Bare Flywheel	UL Listed Driveshaft and Guard, JU4H-UFAD5G, P0, R0, W8, Y8 – CDS30-S1; JU4H-UFAD98 – CDS-50
Electronic Control Module	12V-DC, Energized to Stop, Primary ECM always Powered on	24V-DC, Energized to Stop, Primary ECM always Powered on
Engine Heater	115V-AC, 1000 Watt	230V-AC, 1000 Watt
Exhaust Flex Connection	SS Flex, NPT(M) Connection, 4"	SS Flex, 150# ANSI Flanged Connection, 5"
Exhaust Protection	Metal Guards on Manifolds and Turbocharger	
Flywheel Housing	SAE #3	
Flywheel Power Take Off	11.5" SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistant, Flexible, USA Coast Guard Approved Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary Filter with Priming Pump	
Fuel Injection System	High Pressure Common Rail	
Governor, Speed	Dual Electronic Control Modules	
Heat Exchanger	Tube and Shell Type, 60 PSI (4 BAR), NPT(F) Connections – Sea Water Compatible	
Instrument Panel	Multimeter to Display English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure and One (1) Voltmeter with Toggle Switch, Front Opening	
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate Type	
Lube Oil Filter	Full Flow with By-Pass Valve	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set, Not Field Adjustable	
Raw Water Cooling Loop w/Alarms	Galvanized	Seawater, All 316SS, High Pressure
Raw Water Cooling Loop Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	Not Supplied (for Vertical Turbine Fire Pump Applications)
Run – Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	Two (2) 12V-DC	Two (2) 24V-DC
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof in Instrument Panel	
Water Pump	Centrifugal Type, Poly-Vee Belt Drive with Guard	

Abbreviations : DC – Direct Current, AC – Alternating Current, SAE – Society of Automotive Engineers, NPT(F) – National Pipe Tapered Thread (Female), NPT(M) – National Pipe Tapered Thread (Male), ANSI – American National Standards Institute, SS – Stainless Steel

MODEL NOMENCLATURE (10 Digit Models)

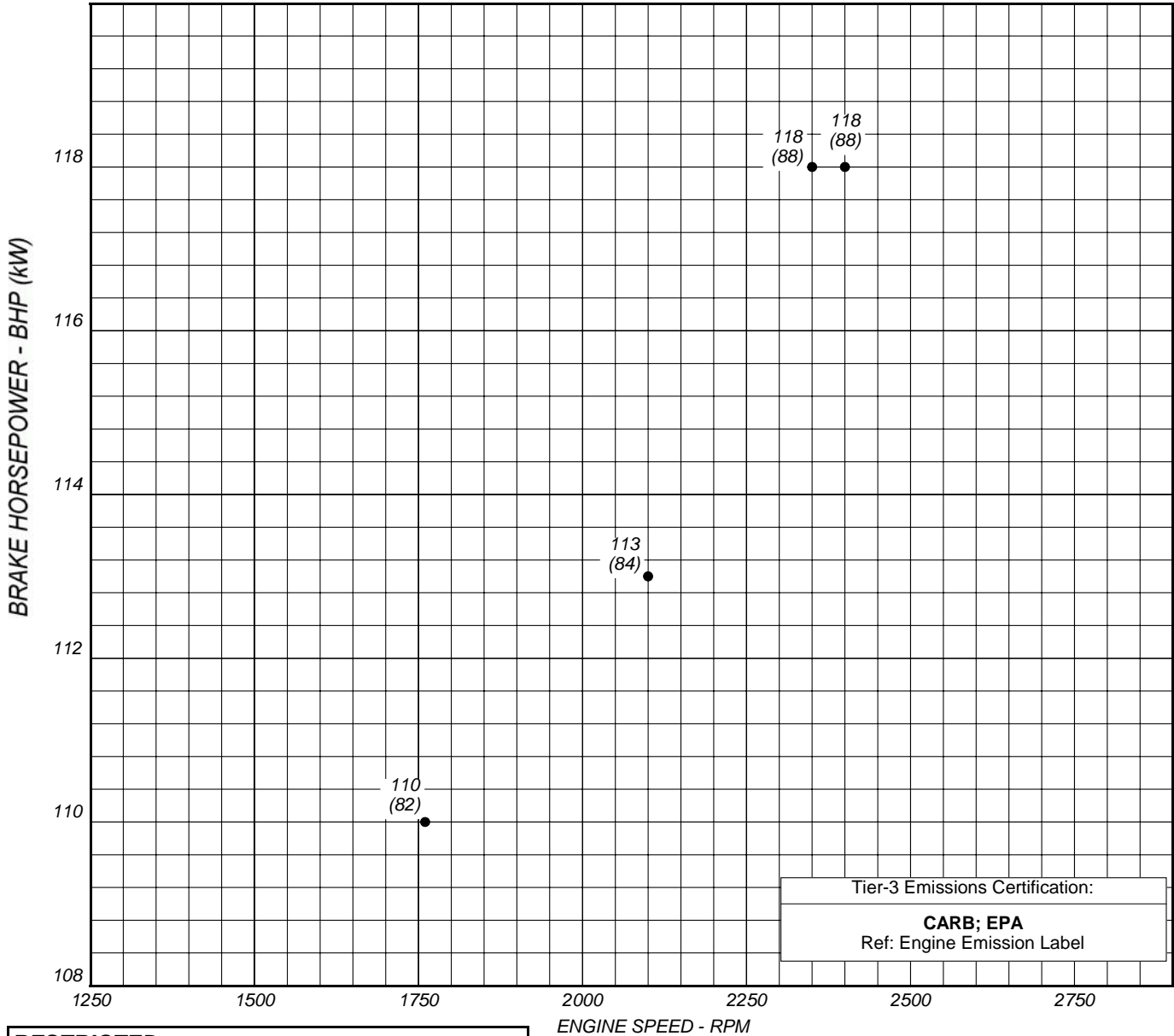


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Fire Protection Products, Inc.
FIRE PUMP MODEL: JU4H-UFAD5G
Heat Exchanger Cooled
Turbocharged
4.5L 4 Cylinder



RESTRICTED:
 USE ONLY FOR STAND-BY FIRE PUMP APPLICATIONS

ENGINE PERFORMANCE:
 STANDARD CONDITIONS: (SAE J1349, ISO 3046)
 77°F (25°C) AIR INLET TEMPERATURE
 29.61 IN. (751.1MM) HG BAROMETRIC PRESSURE
 #2 DIESEL FUEL (SEE C13940)

KEVIN KUNKLER 14SEP09

● — ● NAMEPLATE BHP (MAXIMUM PUMP LOAD)

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CREATED	<i>KFE</i>	DATE CREATED	09/14/09
ENGINE MODEL JU4H-UFAD5G			
DRAWING NO.	C133150	REV	A

JU4H-UFAD5G

INSTALLATION & OPERATION DATA (I&O Data)
USA Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	4
Bore and Stroke - in (mm)	4.19 (106) X 5 (127)
Displacement - in ³ (L)	275 (4.5)
Compression Ratio	19.0:1
Valves per cylinder	
Intake	1
Exhaust	1
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, High Pressure Common Rail
Firing Order (CW Rotation)	1-3-4-2
Aspiration	Turbocharged
Charge Air Cooling Type	None
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D630
Weight - lb (kg)	1490 (676)

Power Rating

	1760	2100	2350	2400
Nameplate Power - HP (kW)	110 (82)	113 (84)	118 (88)	118 (88)

Cooling System - [C051386]

	1760	2100	2350	2400
Engine Coolant Heat - Btu/sec (kW)	47 (49.6)	48 (50.6)	55 (58)	55 (58)
Engine Radiated Heat - Btu/sec (kW)	25 (26.4)	26 (27.4)	27 (28.5)	27 (28.5)
Heat Exchanger Minimum Flow				
60°F (15°C) Raw H ₂ O - gal/min (L/min)	6.7 (25.4)	6.8 (25.7)	5.9 (22.3)	6 (22.7)
100°F (37°C) Raw H ₂ O - gal/min (L/min)	10.7 (40.5)	18.5 (70)	14 (53)	14.3 (54.1)
Heat Exchanger Maximum Cooling Raw Water				
Inlet Pressure - psi (bar)	60 (4.1)			
Flow - gal/min (L/min)	40 (151)			
Typical Engine H ₂ O Operating Temp - °F (°C) ^[1]	180 (82.2) - 195 (90.6)			
Thermostat				
Start to Open - °F (°C)	180 (82.2)			
Fully Opened - °F (°C)	203 (95)			
Engine Coolant Capacity - qt (L)	15.3 (14.5)			
Coolant Pressure Cap - lb/in ² (kPa)	15 (103)			
Maximum Engine Coolant Temperature - °F (°C)	230 (110)			
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)			
High Coolant Temp Alarm Switch - °F (°C) ^[2]	235 (113) - 241 (116)			

Electric System - DC

	Standard		Optional	
System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 32°F (0°C)				
Voltage (Nominal)	12	[C07633]	24	[C07633]
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ 0°F (-18°C)	1400		1400	
Reserve Capacity - Minutes	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0012		0.0012	
Battery Cable Minimum Size				
0-120 in. Circuit Length ^[3]	00		00	
121-160 in. Circuit Length ^[3]	000		000	
161-200 in. Circuit Length ^[3]	0000		0000	
Charging Alternator Maximum Output - Amp,	40	[C071363]	55	[C071366]
Starter Cranking Amps, Rolling - @60°F (15°C)	345	[RE59595/RE59589]	250	[C07819/C07820]

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. ¹Engine H₂O temperature is dependent on raw water temperature and flow. ²High Coolant Switch threshold varies with engine load. ³Positive and Negative Cables Combined Length.

JU4H-UFAD5G

INSTALLATION & OPERATION DATA (I&O Data)

USA Produced

<u>Exhaust System</u>	<u>1760</u>	<u>2100</u>	<u>2350</u>	<u>2400</u>
Exhaust Flow - ft. ³ /min (m ³ /min) -----	585 (16.6)	694 (19.7)	754 (21.4)	769 (21.8)
Exhaust Temperature - °F (°C) -----	1020 (549)	864 (462)	830 (443)	813 (434)
Maximum Allowable Back Pressure - in H ₂ O (kPa) -----	30 (7.5)	30 (7.5)	30 (7.5)	30 (7.5)
Minimum Exhaust Pipe Dia. - in (mm) ^[4] -----	4 (102)	4 (102)	4 (102)	4 (102)
 <u>Fuel System</u>	 <u>1760</u>	 <u>2100</u>	 <u>2350</u>	 <u>2400</u>
Fuel Consumption - gal/hr (L/hr) -----	8.7 (32.9)	8.6 (32.6)	10.4 (39.4)	10.6 (40.1)
Fuel Return - gal/hr (L/hr) -----				
Fuel Supply - gal/hr (L/hr) -----				
Fuel Pressure - lb/in ² (kPa) -----	3 (20.7) - 6 (41.4)			
Minimum Line Size - Supply - in. -----	.50 Schedule 40 Steel Pipe			
Pipe Outer Diameter - in (mm) -----	0.848 (21.5)			
Minimum Line Size - Return - in. -----	.375 Schedule 40 Steel Pipe			
Pipe Outer Diameter - in (mm) -----	0.675 (17.1)			
Maximum Allowable Fuel Pump Suction Lift with clean Filter - in H ₂ O (mH ₂ O) -----	80 (2)			
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m) -----	6.6 (2)			
Fuel Filter Micron Size -----	2 (Secondary)			
 <u>Heater System</u>	 <u>Standard</u>		 <u>Optional</u>	
Engine Coolant Heater				
Wattage (Nominal) -----	1000		1000	
Voltage - AC, 1 Phase -----	115 (+5%, -10%)		230 (+5%, -10%)	
Part Number -----	[C122188]		[C122192]	
 <u>Air System</u>	 <u>1760</u>	 <u>2100</u>	 <u>2350</u>	 <u>2400</u>
Combustion Air Flow - ft. ³ /min (m ³ /min) -----	210 (6)	290 (8.2)	328 (9.3)	335 (9.5)
Air Cleaner	<u>Standard</u>		<u>Optional</u>	
Part Number -----	[C03396]		[C03327]	
Type -----	Indoor Service Only, with Shield		Canister, Single-Stage	
Cleaning method -----	Washable		Disposable	
Air Intake Restriction Maximum Limit				
Dirty Air Cleaner - in H ₂ O (kPa) -----	12 (3)		12 (3)	
Clean Air Cleaner - in H ₂ O (kPa) -----	6 (1.5)		5 (1.2)	
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C) ^[5] -----	130 (54.4)			
 <u>Lubrication System</u>				
Oil Pressure - normal - lb/in ² (kPa) -----	40 (276) - 60 (414)			
Low Oil Pressure Alarm Switch - lb/in ² (kPa) ^[6] -----	30 (207) to 35 (241)			
In Pan Oil Temperature - °F (°C) -----	220 (104) - 245 (118)			
Total Oil Capacity with Filter - qt (L) -----	15.5 (14.7)			
 <u>Lube Oil Heater</u>	 <u>Optional</u>		 <u>Optional</u>	
Wattage (Nominal) -----	150		150	
Voltage -----	120V (+5%, -10%)		240V (+5%, -10%)	
Part Number -----	C04430		C04431	
 <u>Performance</u>	 <u>1760</u>	 <u>2100</u>	 <u>2350</u>	 <u>2400</u>
BMEP - lb/in ² (kPa) -----	180 (1240)	155 (1070)	145 (1000)	142 (979)
Piston Speed - ft/min (m/min) -----	1467 (447)	1750 (533)	1958 (597)	2000 (610)
Mechanical Noise - dB(A) @ 1m -----	C133366			
Power Curve -----	C133150			

⁴Based on Nominal System. Back pressure flow analysis must be done to assure maximum allowable back pressure is not exceeded. (Note: minimum exhaust Pipe diameter is based on: 15 feet of pipe, one 90° elbow, and a silencer pressure drop no greater than one half of the maximum allowable back pressure.) ⁵Review for horsepower derate if ambient air entering engine exceeds 77°F (25°C). ⁶Low Oil Pressure Switch threshold varies w/engine speed. [] indicates component reference part number.

CLARKE®

JU4H, JU4R & JU6H, JU6R ENGINE MODELS ENGINE MATERIALS AND CONSTRUCTION

Air Cleaner

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

Air Cleaner - Optional

Type..... Canister
Material..... Pleated Paper
Housing..... Enclosed

Camshaft

Material..... Cast Iron
Chill Hardened
Location..... In Block
Drive..... Gear, Spur
Type of Cam..... Ground

Charge Air Cooler (JU6H-60,62,68,74,84, ADK0, AD58, ADNG, ADN0, ADQ0, ADR0, AAQ8, AARG, ADP8, ADP0, ADT0, AD88, ADR8, AD98, ADS0, ADW8, ADX8, AD98 only)

Type..... Raw Water Cooled
Materials (in contact with raw water)
Tubes..... 90/10 CU/NI
Headers..... 36500 Muntz
Covers..... 83600 Red Brass
Plumbing..... 316 Stainless Steel/ Brass
90/10 Silicone

Charge Air Cooler (JU6R-AA67, 59, 61, PF, Q7, RF, S9, 83 only)

Type..... Air to Air Cooled
Materials
Core..... Aluminum

Coolant Pump

Type..... Centrifugal
Drive..... Poly Vee Belt

Coolant Thermostat

Type..... Non Blocking
Qty..... 1

Cooling Loop (Galvanized)

Tees, Elbows, Pipe..... Galvanized Steel
Ball Valves..... Brass ASTM B 124,
Solenoid Valve..... Brass
Pressure Regulator..... Bronze
Strainer..... Cast Iron (1/2" - 1" loops) or
Bronze (1.25" - 2" loops)

Cooling Loop (Sea Water)

Tees, Elbows, Pipe..... 316 Stainless Steel
Ball Valves..... 316 Stainless Steel
Solenoid Valve..... 316 Stainless Steel
Pressure Regulator/Strainer Cast Brass ASTM B176
C87800

Cooling Loop (316SS)

Tees, Elbows, Pipe..... 316 Stainless Steel
Ball Valves..... 316 Stainless Steel
Solenoid Valve..... 316 Stainless Steel
Pressure Regulator/Strainer 316 Stainless Steel

Connecting Rod

Type..... I-Beam Taper
Material..... Forged Steel Alloy

Crank Pin Bearings

Type..... Precision Half Shell
Number..... 1 Pair Per Cylinder
Material..... Wear-Guard

Crankshaft

Material..... Forged Steel
Type of Balance..... Dynamic

Cylinder Block

Type..... One Piece with
Non-Siamese Cylinders
Material..... Annealed Gray Iron

Cylinder Head

Type..... Slab 2 Valve
Material..... Annealed Gray Iron

Cylinder Liners

Type..... Centrifugal Cast, Wet Liner
Material..... Alloy Iron Plateau, Honed

Fuel Pump

Type..... Diaphragm
Drive..... Cam Lobe

Heat Exchanger (USA) - JU4H & JU6H Only

Type..... Tube & Shell
Materials
Tube & Headers..... Copper
Shell..... Copper
Electrode..... Zinc

Heat Exchanger (UK) - JU4H & JU6H Only

Type..... Tube & Bundle

Materials

Tube & Headers..... Copper
Shell..... Aluminum

Injection Pump

Type..... Rotary
Drive..... Gear

Lubrication Cooler

Type..... Plate

Lubrication Pump

Type..... Gear
Drive..... Gear

Main Bearings

Type..... Precision Half Shells
Material..... Steel Backed-Aluminum
Lined

Piston

Type and Material..... Aluminum Alloy with
Reinforced Top Ring Groove
Cooling..... Oil Jet Spray

Piston Pin

Type..... Full Floating - Offset

Piston Rings

Number/Piston..... 3
Top..... Keystone Barrel Faced -
Plasma Coated
Second..... Tapered Cast Iron
Third..... Double Rail Type
w/Expander Spring

Radiator - JU4R & JU6R Only

Type..... Plate Fin

Materials

Core..... Copper & Brass
Tank & Structure..... Steel

Optional

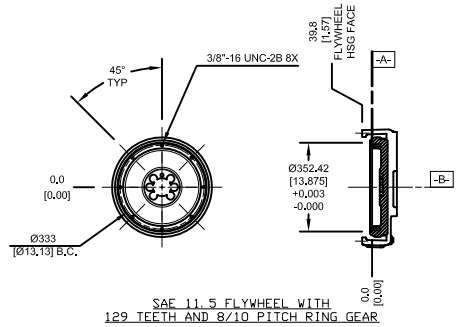
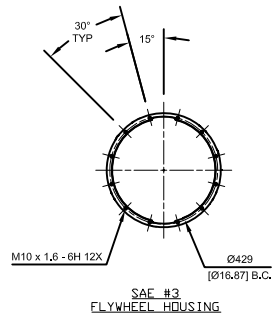
Marine Coating..... Baked Phenolic

Valves

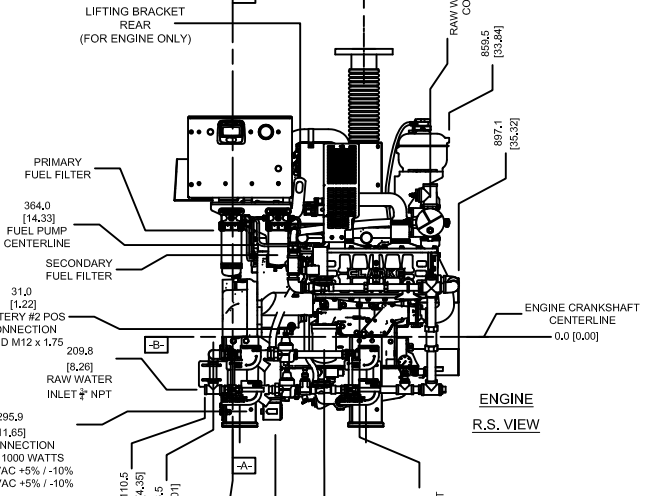
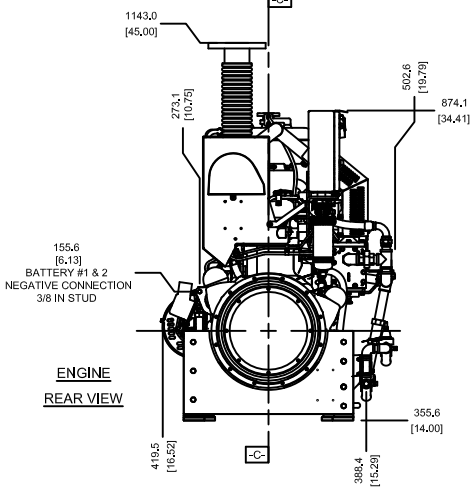
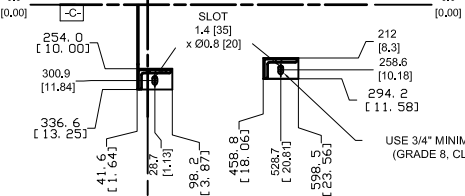
Type..... Poppet
Arrangement..... Overhead Valve
Number/Cylinder..... 1 intake
1 exhaust
Operating Mechanism..... Mechanical Rocker Arm
Type of Lifter..... Large Head
Valve Seat Insert..... Replaceable

**DRAWING SUBJECT
TO CHANGE
WITHOUT NOTICE
DO NOT SCALE**

DETAIL DATUM -A-



**ENGINE MOUNTING FEET
SYMMETRICAL ABOUT CRANKSHAFT
CENTERLINE: DATUM - C -**

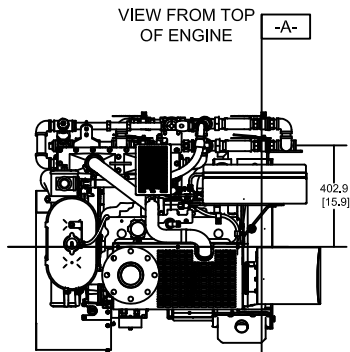
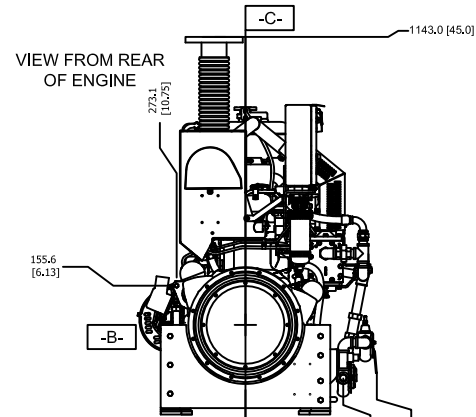


***FOR ENGINES BUILT IN USA
BEGINNING DECEMBER 2012**

FOR ENGINE SPECIFIC OPTIONS
SEE www.CLARKEFIRE.com

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CONTROLLED DRAWING	DRAWN: DPOTTER	NAME: INSTALLATION DRAWING	
DATE: 11SEP09	ERROR: KKUNKLER	MODEL: DIESEL FIRE PUMP DRIVER	
MATERIAL:	PART NO.: D630	SCALE: NTS	
REFERENCE: EC1626	DIMS: MM [INCH]	PAGE: 2	OF: 3

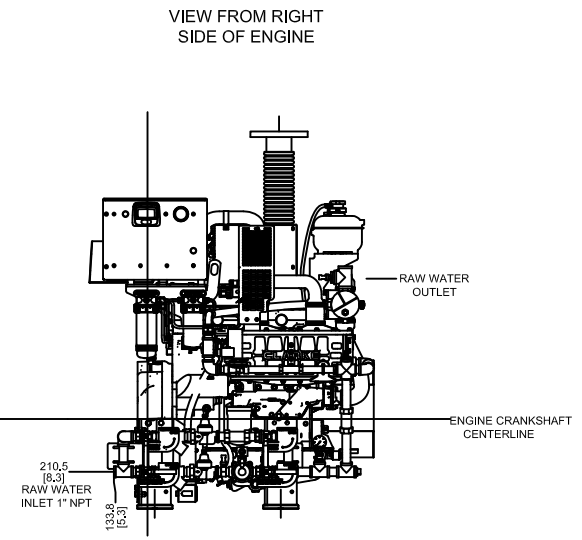
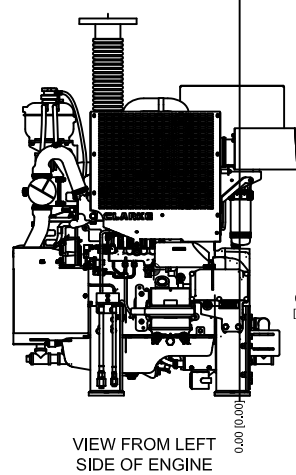
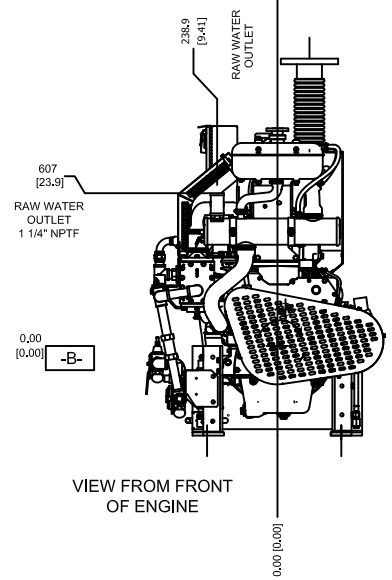
DO NOT SCALE



TRWA WITH 1" LOOP MODELS	JU4H-UFADR0*
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**FOR ALL OTHER MODELS
SEE PAGE 2**

- DATUMS**
- A- - MOUNTING FACE OF FLYWHEEL
 - B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE
 - C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE
 - ⊕ - CENTER OF GRAVITY OF ENGINE
 - ↻ - CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE



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DESIGNED BY: DPOTTER DATE: 11SEP09 DRAWN BY: KUNKLER		TITLE: INSTALLATION DRAWING DIESEL FIRE PUMP DRIVER MODEL JU4H T3 PTE		PART NO.: D630	
REFERENCE: EC1626		SCALE: NTS		SHEET: 3 OF 3	

JU4H-UFAD5G FIRE PUMP DRIVER NOISE DATA

Mechanical Engine Noise *

RPM	BHP	OVERALL dB(A)	Octave Band									
			31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
1760	110	103.5	65.0	68.8	70.1	87.6	94.7	95.8	97.9	97.6	92.9	79.9
2100	113	103.9	63.5	66.0	81.4	85.9	94.0	95.5	98.3	98.1	95.8	84.0
2350	118	105.6	64.2	68.1	81.5	86.3	94.5	96.9	100.2	99.9	97.7	86.2

Raw Exhaust Engine Noise **

RPM	BHP	OVERALL dB(A)	Octave Band									
			31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
1760 - 2100	110 - 118	106.4		96.2	100.6	95.3	97.5	97.1	99.8	96	86.7	80.3

* Values above are provided at 3.3ft (1m) from engine block and do not include the raw exhaust noise.

** Values above are provided at 23ft (7m), 90° horizontal, from a vertical exhaust outlet and does not include noise created mechanically by the engine.

The above data reflects values for a typical engine of this model, speed and power in a free-field environment.

Installation specifics such as background noise level and amplification of noise levels from reflecting off of surrounding objects, will affect the overall noise levels observed. As a result of this, Clarke makes no guarantees to the above levels in an actual installation.