CLARKE®

FIRE PUMP ENGINES

MODELS

JU4H-UF04 JU4H-UF10 JU4H-UF14 JU4H-UF20 JU4H-UF24 JU4H-UFH2 JU4H-UF34 JU4H-UF40 JU4H-UFH0 JU4H-UF42 JU4H-UF50 JU4H-UF52 JU4H-UF54

UK Purchased

FM-UL-cUL APPROVED RATINGS KW/*BHP*

JU4H MODEL	RATED SPEED 1470		1760		2100		2350		2600		2800		3000	
UF04							3	50	41	55	45	60	45	60
UF10			31	41	38	51	7	55						
UF12							4	55	4	5				
UF14							1	55	4	9	52	70	53	71
UF20			45	60	50	67	4	72	4	5				
UF22							1	72	4	9				
UF24							4	72	6	5	6	80	62	83
UF34							1	85	5	7	0	104	86	115
UFH0			54	73	66	88	5	98	6	5	7			
UFH2							4	98	6	8	8			
UF40			70	94	78	105	5	106	3	5				
UF42							4	106	79	106				
UF50	59	79	82	110	97	130	5	127						
UF52							4	127	95	12				
UF54							6	122	104	7	108	145	108	145
							3			13				
							7			9				
							3							
							7							
							3							
							7							
							9							
							7							
							9							
							5							
							9							
							5							
							9							
							1							

Picture shown represents a JU4H-NA engine model

SPECIFICATIONS

ITEM	JU4H MODELS UF04/10/12/14	UF20/22/24	UF34	UFH0/H2	UF40/42	UF50/52/54
Number of Cylinders	4					
Aspiration	NA		T			
Rotation*	CW					
Overall Dimensions –mm (in.)	989 (39) H x 1226 (48) L x 916 (36.1) W		1166 (45.9) H x 1357 (53.4) L x 934 (36.8) W			
Crankshaft Centerline Height –mm (in.)	356 (14)					
Weight –kg (lb)	413 (910)		424 (935)			
Compression Ratio	17.6:1		17.0:1			
Displacement –l (cu. in.)	4.5 (275)					
Engine Type	4 Stroke Cycle –Inline Construction					
Bore & Stroke –mm (in.)	106 x 127 (4.19 x 5.00)					
Installation Drawing	D545					
Wiring Diagram AC	C07651					
Wiring Diagram DC	C072145					
Engine Series	John Deere 4045 Series					

Abbreviations: CW –Clockwise NA –Naturally Aspirated T –Turbocharged 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.
- Although FM-UL ratings are shown at specific speeds, Clarke engines can be applied at any intermediate speed. To determine the intermediate speed power make a linear interpolation from the Clarke FM-UL power curve. Contact Clarke or your Pump OEM Representative to obtain details.

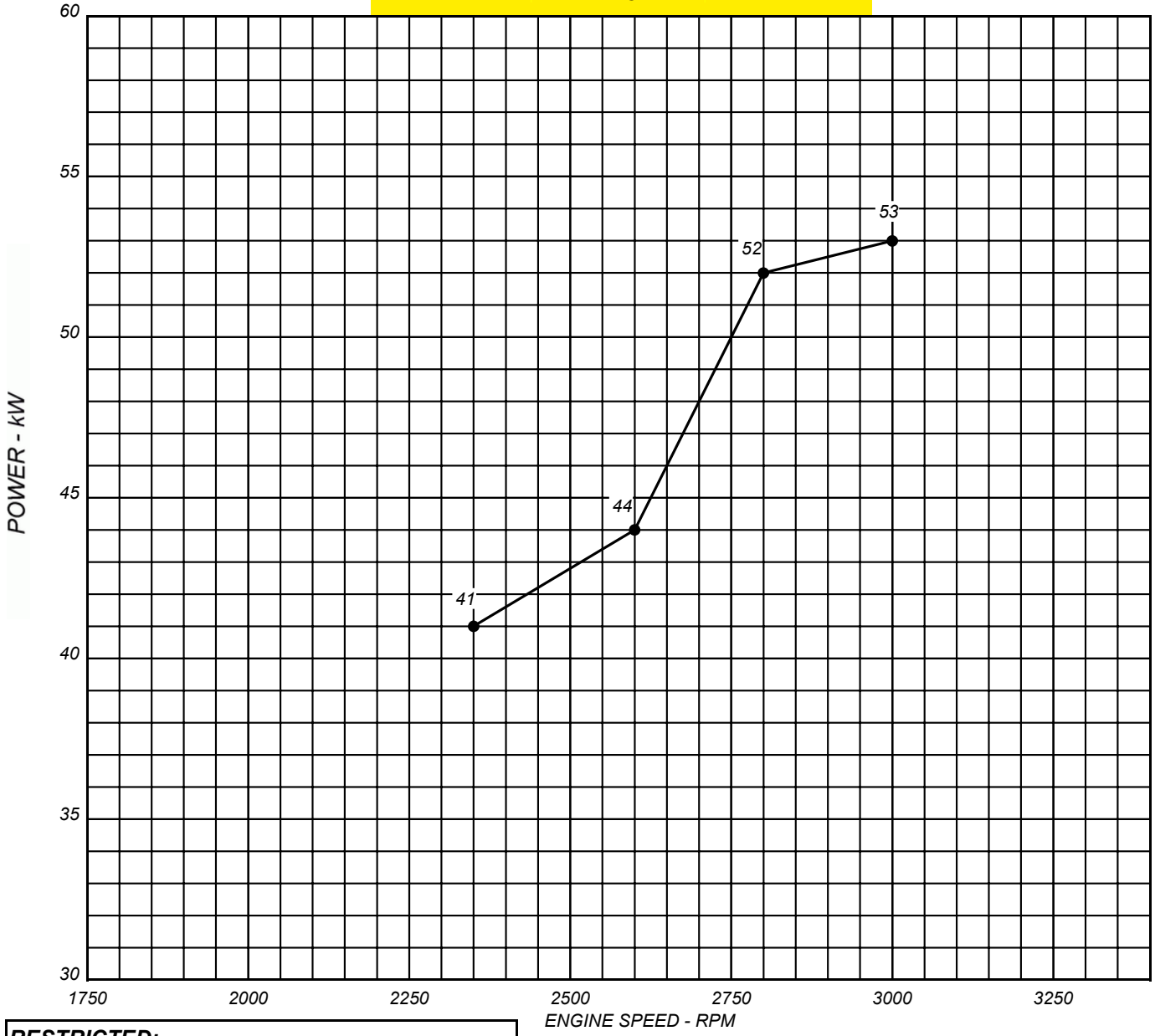
ENGINE RATINGS BASELINES

- Engines are to be usedforstationaryemergency standby fire pump service only. Engi 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 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions 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 SA conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25° ambient temperature.

CLARKE UK, LTD.

Fire Protection Products

FIRE PUMP MODEL: JU4H-UF14
Heat Exchanger Cooled
Naturally Aspirated
4.5L 4 Cylinder



RESTRICTED:
USE ONLY FOR STAND-BY FIRE PUMP APPLICATIONS

ENGINE PERFORMANCE:
STANDARD CONDITIONS:(SAEJ1349, ISO 3046)
77°F (25°C) AIR INLET TEMPERATURE
29.61 IN.(751.1MM)HG BAROMETRIC PRESSURE
#2 DIESEL FUEL (SEE C13940)

Ken Wauligman

KEN WAULIGMAN 27OCT06

NAMEPLATE kW (MAXIMUM PUMP LOAD)

CREAT ED	DATE CREATED
KJK	05/19/04

ENGINE MODEL JU4H-UF14 REV

DRAWING NO.	
C131943	B

JU4H-UF14
INSTALLATION & OPERATION DATA (I&O Data)
UK Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	4
Bore and Stroke - mm (in)	106 (4.19) X 127 (5)
Displacement - L (in³)	4.5 (275)
Compression Ratio	17.6:1
Valves per cylinder	
Intake	1
Exhaust	1
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Mechanical, Rotary Pump
Firing Order (CW Rotation)	1-3-4-2
Aspiration	Natural
Charge Air Cooling Type	None
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D545
Weight - kg (lb)	413 (910)

Power Rating	2350	2600	2800	3000
Nameplate Power - kW (HP)[1]	41 (55)	44 (59)	52 (70)	53 (71)

Cooling System - [C051001]	2350	2600	2800	3000
Engine Coolant Heat - kW (Btu/sec)	31.7 (30)	33.8 (32)	35.9 (34)	38 (36)
Engine Radiated Heat - kW (Btu/sec)	7.4 (7)	7.8 (7.4)	8.8 (8.3)	8.9 (8.4)
Heat Exchanger Minimum Flow				
15°C (60°F) Raw H_2O - L/min (gal/min)	30.3 (8)	34.1 (9)	37.9 (10)	41.6 (11)
37°C (100°F) Raw H_2O - L/min (gal/min)	37.9 (10)	41.6 (11)	45.4 (12)	49.2 (13)

Heat Exchanger Maximum Cooling Raw Water	
Inlet Pressure - bar (psi)	14 (203)
Flow - L/min (gal/min)	98.4 (26)
Typical Engine H_2O Operating Temp - °C (°F)	76.7 (170) - 87.8 (190)
Thermostat	
Start to Open - °C (°F)	76.7 (170)
Fully Opened - °C (°F)	87.8 (190)
Engine Coolant Capacity - L (qt)	14 (14.79)
Coolant Pressure Cap - kPa (lb/in²)	68.9 (10)
Maximum Engine Coolant Temperature - °C (°F)	93.3 (200)
Minimum Engine Coolant Temperature - °C (°F)	71.1 (160)
High Coolant Temp Alarm Switch - °C (°F)	96.1 (205)

Electric System - DC	Standard		Optional	
System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 0°C (32°F)				
Voltage (Nominal)	12	{C07633}	24	{C07633}
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ -18°C (0°F)	1400		1400	
Reserve Capacity - Minutes	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0012		0.0012	
Battery Cable Minimum Size				
0-3.1m Circuit Length[2]	00		00	
3.1m-4.1m Circuit Length[2]	000		000	
4.1m-5.1m Circuit Length[2]	0000		0000	
Charging Alternator Maximum Output - Amp,	40	{C071363}	55	{C071366}
Starter Cranking Amps, Rolling - @15°C (60°F)	225	{C07888/C07889}	250	{C07819/C07820}

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. [1]Derate 3% per every 1000 ft. [304.8 m] above 300 ft. [91.4 m] and derate 1% for every 10 °F [5.55 °C] above 77° [25°C]. [2]Positive and Negative Cables Combined Length.

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JU4H-UF14
INSTALLATION & OPERATION DATA (I&O Data)
UK Produced

Exhaust System (Single Exhaust Outlet)	2350	2600	2800	3000
Exhaust Flow - m³/min (ft.³/min)	13.3 (469)	15 (531)	16.5 (581)	17.8 (630)
Exhaust Temperature - °C (°F)	584 (1083)	568 (1055)	556 (1033)	543 (1010)
Maximum AllowableBackPressure - kPa (in H_20)	7.5 (30)	7.5 (30)	7.5 (30)	7.5 (30)
Minimum Exhaust Pipe Dia. - mm (in)[3]	76.2 (3)	76.2 (3)	76.2 (3)	76.2 (3)

Fuel System	2350	2600	2800	3000
Fuel Consumption - L/hr (gal/hr)	11.7 (3.1)	12.9 (3.4)	13.6 (3.6)	14.8 (3.9)
Fuel Return - L/hr (gal/hr)	34.1 (9)	36 (9.5)	37.5 (9.9)	39 (10.3)
Fuel Supply - L/hr (gal/hr)	45.8 (12.1)	48.8 (12.9)	51.1 (13.5)	53.7 (14.2)
Fuel Pressure - kPa (lb/in²)	20.7 (3) - 41.4 (6)			
Minimum Line Size - Supply - in.	.50 Schedule 40 Steel Pipe			
Pipe Outer Diameter - mm (in)	21.5 (0.848)			
Minimum Line Size - Return - in.	.375 Schedule 40 Steel Pipe			
Pipe Outer Diameter - mm (in)	17.1 (0.675)			
Maximum Allowable Fuel Pump Suction Lift with clean Filter - mH_20 (in H_20)	0.8 (31)			
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - m (ft)	1.4 (4.5)			
Fuel Filter Micron Size	2			

Heater System	Standard	Optional
Engine Coolant Heater		
Wattage (Nominal)	1000	1000
Voltage - AC, 1 Phase	230 (+5%, -10%)	115 (+5%, -10%)
Part Number	{C122192}	{C122188}

Air System	2350	2600	2800	3000
Combustion Air Flow - m³/min (ft.³/min)	4.7 (166)	5.3 (186)	5.7 (202)	6.2 (218)
Air Cleaner	Standard		Optional	
PartNumber	{C03249}		{C03327}	
Type	Indoor Service Only, with Shield		Canister, Single-Stage	
Cleaning method	Washable		Disposable	
Air Intake Restriction Maximum Limit				
Dirty Air Cleaner - kPa (in H_20)	2.5 (10)		2.5 (10)	
Clean Air Cleaner - kPa (in H_20)	1.2 (5)		1.2 (5)	
Maximum Allowable Temperature (Air To Engine Inlet) - °C (°F)<*>	54.4 (130)			

Lubrication System	
Oil Pressure - normal - kPa (lb/in²)	345 (50) - 655 (95)
Low Oil Pressure Alarm Switch - kPa (lb/in²)	138 (20)
In Pan Oil Temperature - °C (°F)	104 (220) - 118 (245)
Total Oil Capacity with Filter - L (qt)	14.7 (15.5)

Lube Oil Heater	Optional	Optional
Wattage (Nominal)	150	150
Voltage	240V (+5%, -10%)	120V (+5%, -10%)
Part Number	C04431	C04430

Performance	2350	2600	2800	3000
BMEP - kPa (lb/in²)	462 (67)	448 (65)	496 (72)	469 (68)
Piston Speed - m/min (ft/min)	597 (1958)	661 (2167)	711 (2333)	762 (2500)
Mechanical Noise - dB(A) @ 1m	C131536			
Power Curve	C131943			

[3]Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assureengine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator onwww.clarkefire.com.

{ } indicates componentreference part number.

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…….. ……RawWaterCooled
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……Airto AirCooled
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/StrainerCast 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/Strainer316 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……W ear-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

P iston
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

JU4H-UF14

Stationary FirePumpEngine Driver
EMISSION DATA
EPA40 CFRPart60

4 *Cylinders*
Four *Cycle*
Lean *Burn*
Naturally Aspirated

500 PPM SULFUR#2DIESELFUEL								
RPM	BHP (3)	FUEL GAL/HR (L/HR)	GRAMS / HP- HR				EXHAUST	
			NMHC	NOx	CO	PM (4)	°F (°C)	CFM (m^3/min)
2800	70	3.6 (13.6)	0.77 0.83	3.79	2.38	0.16	1033 (556)	581 (16)
3000	71	3.9 (14.8)		3.64	2.80	0.18	1010 (543)	630 (18)

Notes:

1)4045DF159 Base Engine Model manufactured by John Deere Corporation.
For John Deere Emissions Conformance to EPA 40 CFR Part 60 see Page 2 of 2.

2)The Emission Warranty for this engine is provided directly to the owner by John Deere Corporation. A copy of the John Deere Emission Warranty can be found in the Clarke Operation and Maintenance Manual.

3)Engines are rated at standard conditions of 29.61in. (7521 mm) Hg barometer and 77°F (25° C) inlet air temperature. (SAE J1349)

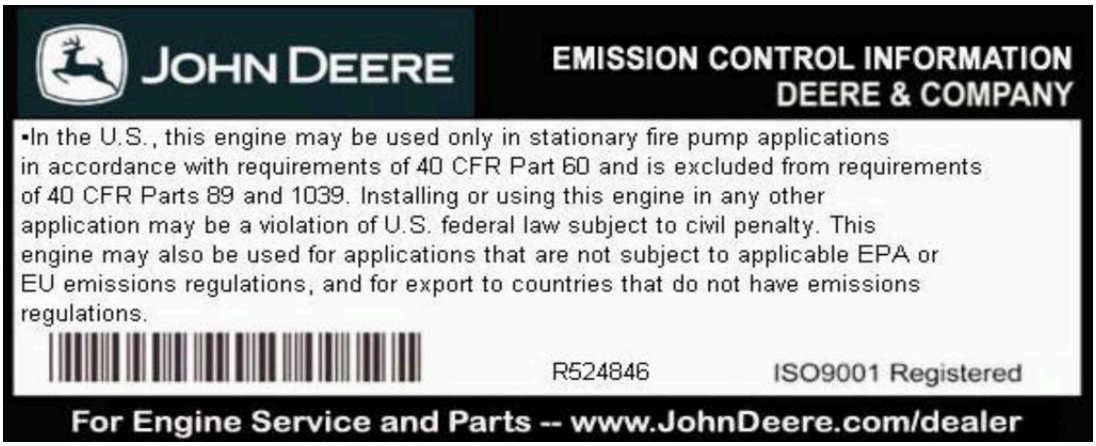
4)PM is a measure of total particulate matter, including PM_{10}.

John Deere Power Systems
3801 W. Ridgeway Ave., PO Box 5100
Waterloo, Iowa USA 50704-5100

31 October 2007

Subject: Fire Pump Ratings – Conformance to EPA 40 CFR Part 60 (NSPS requirements)

All John Deere stationary fire pump engines conform to the requirements of 40 CFR Part 60. All such engines include an emission label, stating the engine conforms to the requirements of 40 CFR Part 60. An example of the emission label is show below:



This label applies to all of the following engine models, sold to Clarke Fire Protection, for use in stationary fire pump applications:

John Deere Engine Model
4045DF120
4045DF159
4045TF252
4045TF254
4045TF220
6068TF252
6068TF254
6068HF252
6068HF254
6068HF120
6068TF220
6081AF001
6081HF001
6125AF001
6125HF070

All engines conforming to 40 CFR Part 60 (identified by emission label, as shown above) are covered under the emissions warranty of 40 CFR Part 89.

Si ncerely,

Kyle J. Tingle
Regional Sales Manager, JDPS

CLARKE

www.clarkefire.com

Fire Protection Products

JU4H-UF14
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)
				69.7	86.4	85.8		97.2	95.5	92.3	84.3	73.1
2800	70	101.6	64.0				92.4					
				70.5	85.2	86.6		98.2	97.0	96.0	87.5	73.8
3000	71	102.6	63.9				94.8					

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)
				93.8	98.2	92.9		94.7	97.4	93.6	84.3	77.9
2800-3000	70-71	104					95.1					

** 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.