



### Engine Technical Data

Unit	4TNV88-DSA	4TNV88-DSA2	4TNV88-DSA3
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#### General Data

Number of Cylinders	-	4	
Engine Type	-	Inline, Water-Cooled, 4 Stroke Diesel	
Bore x Stroke	mm x mm	88 x 90	
Total Displacement	cc	2189	
Combustion type	-	Direct Injection	
Aspiration	-	Naturally Aspirated	
Valves per Cylinder	-	2	
Compression ratio	-	19.1	
Firing Order	-	1-3-4-2	

#### Performance Data

Net Intermittent Power	HP [kW] / rpm]	47.5 [35.4]/3000	
Net Continuous Power	HP [kW] / rpm]	--	
Net Max Torque	lb-ft [Nm]/rpm]	104.1 [141]/1200	
Low Idle Speed	rpm	1000+/-25	
High Idle Speed	rpm	3210+/-25	
BMEP, Net Power	Psi [kPa]	93.8 [647]	
BMEP, Cont. Power	Psi [kPa]	--	

#### Physical Data

Direction of rotation	-	Counter Clockwise (view from flywheel)		
Length - Inches	Inches [mm]	28.39 [721]	26.65 [677]	26.34 [669]
Width - Inches	Inches [mm]	20.20 [513]		
Height - Inches	Inches [mm]	25.47 [647]		
Dry Weight	lbs [kg]	434 [197]	410 [186]	395 [179]
Center of Gravity:	-			
From Rear Face of Block	Inches [mm]	7.32 [186]		
From Crankshaft to Exhaust Side	Inches [mm]	0.18 [4.6]		
Above Crankshaft	Inches [mm]	3.62 [92]		

#### PTO System

Flywheel	-	SAE #5	Semi SAE #5	Semi SAE #5
Flywheel Housing	-	SAE #5 (Depth 124)	Semi SAE #5 (Depth 80)	Back Plate
Gear Case	-	with SAE Hydraulic Pump Flange		

#### Lubrication System

Inclination, Continuous	degree	30	
Inclination, 3 minutes Max.	degree	35	
Oil Pan Style	-	Deep	
Lubrication Oil Filter Type	-	Paper Element	
Temperature Limit ( main oil pressure passage)	°F [°C]	248 [120]	
Nominal Oil Pressure	psi [kgf/cm2]	64 [4.5]	
Oil Capacity, Effective	Liters	3.4	
Total System Capacity	Liters	7.4	
Oil Change Interval, Hours	hr	250 (50, initial)	
Recommended Oil Type	API	CD, CF or higher grade	

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#### Cooling System

Fan Type	-	Puller
Fan Diameter	Inches [mm]	14.96 [380]
Number of Blades	-	7
Fan Pulley Diameter	Inches [mm]	4.33 [110]
Crank Pulley Diameter	Inches [mm]	4.33 [110]
Fan Spacer Thickness - Inches [mm]	Inches [mm]	0.98 [25]
Max. Coolant Temp.	°F [°C]	221 [105]
Thermostat Starts Opening	°F [°C]	160±2.7 [71 ± 1.5]
Thermostat Fully Open	°F [°C]	185 [85]
Coolant Capacity (Engine)	Liters	2.7
<b>Coolant Flow (C. W. Pump)</b>	Liters / min	52.6
Heat Rejection at Rated Power	BTU/hr [kcal/hr]	86500 [21800]

#### Fuel System

Fuel Filter Type	-	Paper Element
Fuel Injection Pump Type	-	Distributor Type
<b>Water Separator (Standard)</b>	-	<b>Mesh size: 100-mesh/inch, water reservoir 150 cc</b>
Max. Suction Head (Fuel pickup to Injection pump)	Inches [mm]	40 [1000]
Fuel Feed Pump Type	-	Electrical
<b>Fuel Flow (Feed pump)</b>	Liters / hr	60
Max. Allowable Fuel Temperature	° F [°C]	176 [80] Fuel Injection In
Required Separation Distance Between Pickup & Return	Inches [mm]	min. 4 [100]
Fuel Consumption at Net Inter. Power	lb/hp-hr [g/kW hr]	0.41 [252]

#### Intake System

Max. Air Intake Restriction, initial	Inch Aq [kPa]	11.8 [2.9]
Max. Air Intake Restriction, replace element	Inch Aq [kPa]	25 [6.2]
Crankcase Ventilation Type	-	Closed
Engine Air Flow (For sizing air cleaner)	ft <sup>3</sup> / min. [m <sup>3</sup> /min]	104 [3.0]@3000 rpm

#### Exhaust System

Max. Allowable Back Pressure, initial	Inch Aq [kPa]	51.1 [12.7]
Max. Allowable Back Pressure, cleaning	Inch Aq [kPa]	61.4 [15.3]
<b>Exhaust Air Flow @ Max. Power Exhaust Temp.</b>	ft <sup>3</sup> / min. [m <sup>3</sup> /min]	389 [11.0]
Exhaust Temperature at Max. Power	° F [°C]	1238 [670]
Exhaust Temperature at Max. Torque	° F [°C]	896 [480]

#### Electrical System

System Voltage	Volts	12 V
Electric Stop Device	-	Stop Solenoid
Alternator	-	12V-40A
Starting Aid Device	-	Air Heater, 12V 400W
Standard pre-heat time	Seconds	15
<b>Engine Block Heater Port</b>	-	Exhaust Side
Starting Motor Type	-	Reduction
Starting Motor Power	kW	2.3
Maximum Starter Cable Resistance	Ohm (Ω)	0.05
Maximum Battery Cable Resistance	Ohm (Ω)	0.0012

**Revision: 2**

History:

Revision 2, 07/196/2004

Rearranged table

Corrected the Exhaust Air Flow @32 oF(0 oC) to Max. Power Exhaust Temp.

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