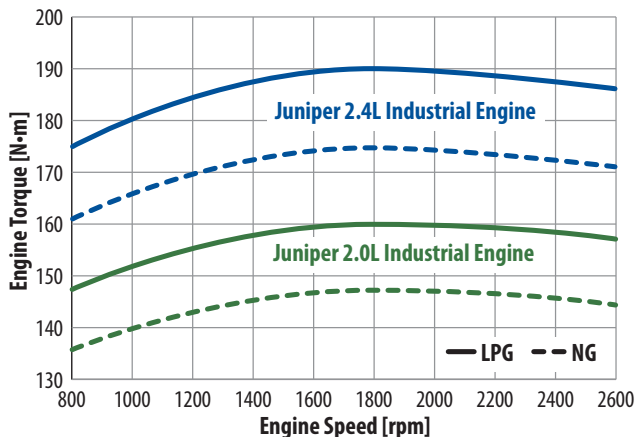


## 2.4 L Industrial Engine

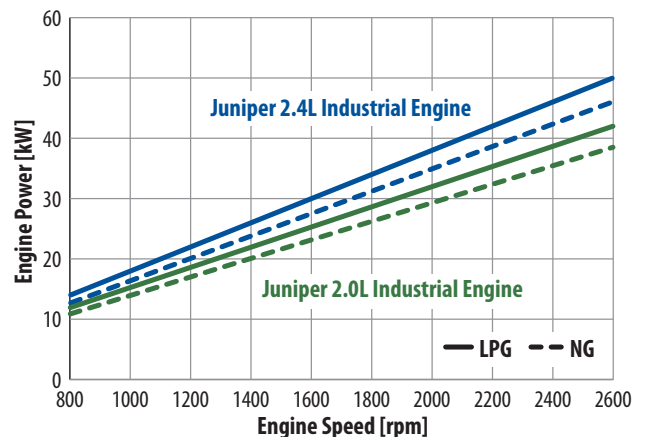
## 2.0 L Industrial Engine

LPG		Natural Gas			LPG		Natural Gas	
52 kW (70 hp)		48 kW (64 hp)		<b>rated output @ 2,700 rpm</b>	45 kW (60 hp)		41 kW (55 hp)	
190 N·m (140 lb-ft)		176 N·m (130 lb-ft)		<b>max. torque @ 1,800 rpm</b>	160 N·m (118 lb-ft)		147 N·m (108 lb-ft)	
174 N·m (128 lb-ft)				<b>low-speed torque @ 800 rpm</b>	147 N·m (108 lb-ft)			
2.359 L				<b>displacement</b>	1.975 L			
10.5				<b>compression ratio</b>	9.4			
multipoint, sequential injection				<b>fuel system</b>	multipoint, sequential injection			
4-stroke, in-line 4				<b>cycle/cylinder</b>	4-stroke, in-line 4			
EPA 2007 & CARB 2010				<b>emissions</b>	EPA 2007 & CARB 2010			

ENGINE TORQUE VS. ENGINE SPEED



ENGINE POWER VS. ENGINE SPEED



# GENERAL ENGINE SPECIFICATIONS

Model name		Juniper 2.4L Industrial Engine	Juniper 2.0L Industrial Engine
Base engine		Hyundai 2.4L Industrial Engine	Hyundai 2.0L Industrial Engine
Cycle		4-stroke	
Cylinder arrangement		In-line 4	
Rotation		Counter-clockwise rotation as viewed from flywheel side	
Displacement		2.359 L	1.975 L
Dry Weight		170 kg (375 lbs)	152 kg (335 lbs)
Dimensions	Length	649 mm (25.6 in)	667 mm (26.3 in)
	Width	603 mm (23.7 in)	541 mm (21.3 in)
	Height	696 mm (27.4 in)	652 mm (25.7 in)
Compression ratio		10.5	9.4
Fuel	Liquid petroleum gas (LPG)	HD-5 recommended	
	Natural gas (NG)	600 – 1,500 BTU/ft <sup>3</sup>	
Performance – LPG	Rated output	52 kW (70 hp) @ 2,700 rpm 36 kW (48 hp) @ 1,800 rpm	45 kW (60 hp) @ 2,700 rpm 30 kW (40 hp) @ 1,800 rpm
	Maximum torque	190 N-m (140 ft-lbs) @ 1,800 rpm	160 N-m (118 ft-lbs) @ 1,800 rpm
Performance – NG	Rated output	48 kW (64 hp) @ 2,700 rpm 33 kW (44 hp) @ 1,800 rpm	41 kW (55 hp) @ 2,700 rpm 28 kW (38 hp) @ 1,800 rpm
	Maximum torque	176 N-m (130 ft-lbs) @ 1,800 rpm	147 N-m (108 ft-lbs) @ 1,800 rpm
Fuel system		Multipoint, sequential injection	
Diagnostics		Integral fault diagnostics	
Throttle Control		Electronic throttle body	
ECU interface		Keyword Protocol 2000	
Emissions control		Closed-loop with O <sub>2</sub> sensor & three-way catalyst	
Emissions regulations	North America	EPA 2007 Tier II Off-road LSI Engine—CARB 2010 Off-road LSI Regulations	
	Blow-by gas ventilation	Closed crankcase system	
Other compliance	North America	UL 558	
Idle speed		800 rpm	
Governor speed		max 2,800 rpm (programmable)	
Starting system		12V—1.4 kW	12V—1.7 kW
Cooling system	Type	Water cooled—2.2L capacity	Water cooled—3.0L capacity
	Thermostat type	Wax type (open 82–95 °C)	
Lubrication system	Type	Oil pan—5.2L	Oil pan—3.9L
	Maximum running temperature	135 °C	
Alternator voltage output		13.5V—70A	13.5V—90A
Allowable operation ambient temperature		-20 °C to 50 °C	
Allowable operation altitude		Unlimited, with performance derate	
Durability	Base engine	20,000 hours	
Maintenance	Oil & oil filter change interval	400 hours (with OEM oil pan)	
	Timing belt/chain	20,000 hours (chain)	4,000 hours (belt)
Warranty	Emissions critical parts	2,500 & 3,500 hours (per CFR 1048)	
Cylinder block		Aluminum	Cast iron
Valve lash adjustment		Mechanical	Hydraulic
Options		Vehicle speed limiter, CAN communication diagnostic interface	

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