

Engine Mechanical Specifications

Engine Mechanical Specifications

Application	Specification	
	Metric	English
General Data		
• Engine Type	Inline 4 Cylinder	
• Displacement	2.0 L	122 CID
• RPO	LNF	
• Liter (VIN)	A, M	
• Bore	85.992–86.008 mm	3.3880–3.3887 in
• Stroke	86 mm	3.388 in
• Compression Ratio	9.2:1	
• Spark Plug Gap	0.9 mm	0.035 in
Balance Shaft		
• Bearing Clearance	0.030–0.060 mm	0.0012–0.0024 in
• Bearing Diameter – Inside – Carrier	20.050–20.063 mm	0.7894–0.7899 in
• Bearing Diameter – Outside – Carrier	41.975–41.995 mm	1.6526–1.6534 in
• Bearing Journal Diameter	20.000–20.020 mm	0.7874–0.7882 in

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• Bushing Clearance	0.033–0.102 mm	0.0013–0.0040 in
• Bushing Diameter – Inside	36.775–36.835 mm	1.4489–1.4512 in
• Bushing Journal Diameter	36.723–36.743 mm	1.4458–1.4466 in
• End Play	0.050–0.300 mm	0.0020–0.0118 in
Block		
• Balance Shaft Bearing Bore Diameter – Carrier	42.000–42.016 mm	1.6535–1.6542 in
• Balance Shaft Bushing Bore Diameter	40.763–40.776 mm	1.6048–1.6054 in
• Crankshaft Main Bearing Bore Diameter	64.068–64.082 mm	2.5224–2.5229 in
• Cylinder Bore Diameter	85.992–86.008 mm	3.3880–3.3887 in
• Cylinder Bore Out-of-Round – Maximum	0.010 mm	0.0004 in
• Cylinder Bore Taper – Maximum	0.010 mm	0.0004 in
• Cylinder Head Deck Surface Flatness – Longitude	0.050 mm	0.002 in
• Cylinder Head Deck Surface Flatness – Overall	0.10 mm	0.0039 in
• Cylinder Head Deck Surface Flatness – Transverse	0.030 mm	0.0012 in
Camshaft		
	0.040–0.307 mm	0.0016–0.0121 in

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<ul style="list-style-type: none"> Camshaft End Play 		
<ul style="list-style-type: none"> Camshaft Journal Diameter 	26.935–26.960 mm	1.0604–1.0614 in
<ul style="list-style-type: none"> Camshaft Journal Diameter – Front 	34.960–34.935 mm	1.3774–1.3764 in
<ul style="list-style-type: none"> Camshaft Thrust Surface – with Camshaft Actuator Installed 	30.020–30.175 mm	1.1828–1.1889 in
Connecting Rod		
<ul style="list-style-type: none"> Connecting Rod Bearing Clearance 	0.029–0.073 mm	0.0011–0.0029 in
<ul style="list-style-type: none"> Connecting Rod Bore Diameter – Bearing End 	52.118–52.134 mm	2.0519–2.05252 in
<ul style="list-style-type: none"> Connecting Rod Bore Diameter – Pin End 	23.007–23.017 mm	0.9058–0.9062 in
<ul style="list-style-type: none"> Connecting Rod Side Clearance 	0.070–0.370 mm	0.0028–0.0146 in
<ul style="list-style-type: none"> Connecting Rod Straightness – Bend – Maximum 	0.021 mm	0.0083 in
<ul style="list-style-type: none"> Connecting Rod Straightness – Twist – Maximum 	0.04 mm	0.0157 in
Crankshaft		
<ul style="list-style-type: none"> Connecting Rod Journal Diameter 	49.000–49.014 mm	1.9291–1.9297 in
<ul style="list-style-type: none"> Crankshaft End Play 	0.050–0.380 mm	0.0012–0.0150 in
<ul style="list-style-type: none"> Crankshaft Main Bearing Clearance 	0.031–0.067 mm	0.0012–0.0026 in
<ul style="list-style-type: none"> Crankshaft Main Journal Diameter 	55.994–56.008 mm	2.2045–2.2050 in

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Cylinder Head		
• Overall Height – Minimum	128.9 mm	5.07 in
• Deck Straightness – in 150 mm (5.91 in)	0.05 mm	0.0019 in
• Deck Straightness – in 25 mm (0.985 in)	0.025 mm	0.0009 in
• Between Head Bolt Holes	0.030 mm	0.0011 in
• Surface Flatness – Block Deck – Longitude	0.050 mm	0.002 in
• Surface Flatness – Block Deck – Overall	0.1 mm	0.004 in
• Surface Flatness – Block Deck – Transverse	0.030 mm	0.0012 in
• Valve Guide Bore – Exhaust	6.000–6.012 mm	0.2362–0.2367 in
• Valve Guide Bore – Intake	6.000–6.012 mm	0.2362–0.2367 in
• Valve Lifter Bore Diameter – Stationary Lash Adjusters	12.013–12.037 mm	0.4730–0.4739 in
• Valve Seat Angle – Relief Surface	30 Degrees	
• Valve Seat Angle – Seating Surface	45 Degrees	
• Valve Seat Angle – Undercut Surface	60 Degrees	
• Valve Seat Roundness – Maximum	0.025 mm	0.0010 in

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• Valve Seat Runout – Maximum	0.080 mm	0.0031 in
• Valve Seat Width – Exhaust Seating Surface	1.600 mm	0.0630 in
• Valve Seat Width – Intake Seating Surface	1.200 mm	0.0472 in
Lubrication System		
• Oil Pressure – Minimum – @1000 RPM @ 90°C (194°F)	206.84–482.63 kPa	30–70 psi
• Oil Capacity	4.8L	5.0 quarts
Piston Rings		
• Piston Ring End Gap – First Compression Ring	0.20–0.35 mm	0.0078–0.0138 in
• Piston Ring End Gap – Second Compression Ring	0.35–0.55 mm	0.014–0.022 in
• Piston Ring End Gap – Oil Control Ring – Rails	0.25–0.75 mm	0.010–0.030 in
• Piston Ring to Groove Clearance – First Compression Ring	0.040–0.080 mm	0.0016–0.0031 in
• Piston Ring to Groove Clearance – Second Compression Ring	0.003–0.068 mm	0.0001–0.0027 in
• Piston Ring to Groove Clearance – Oil Control Ring	0.024–0.176 mm	0.0009–0.0069 in
• Piston Ring Thickness – First Compression Ring	1.170–1.190 mm	0.0461–0.0469 in
• Piston Ring Thickness – Second Compression Ring	1.471–1.490 mm	0.0579–0.0587 in

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<ul style="list-style-type: none"> Piston Ring Thickness – Oil Control Ring – Rail – Maximum 	0.473 mm	0.0186 in
<ul style="list-style-type: none"> Piston Ring Thickness – Oil Control Ring – Spacer 	0.96–1.04 mm	0.0378–0.0409 in
Pistons and Pins		
<ul style="list-style-type: none"> Pin – Piston Pin Clearance to Connecting Rod Bore 	0.009–0.023 mm	0.0004–0.0009 in
<ul style="list-style-type: none"> Pin – Piston Pin Clearance to Piston Pin Bore 	0.005–0.015 mm	0.0002–0.0006 in
<ul style="list-style-type: none"> Pin – Piston Pin Diameter 	22.995–23.000 mm	0.9053–0.9055 in
<ul style="list-style-type: none"> Pin – Piston Pin End Play 	0.320–1.278 mm	0.0126–0.0503 in
<ul style="list-style-type: none"> Piston – Piston Diameter – @14.5 mm up 	85.967–85.982 mm	3.3845–3.3851 in
<ul style="list-style-type: none"> Piston – Piston Pin Bore Diameter 	23.005–23.010 mm	0.9057–0.9059 in
<ul style="list-style-type: none"> Piston – Piston Ring Groove Width – Oil Control 	2.001–2.003 mm	0.0788–0.0789 in
<ul style="list-style-type: none"> Piston – Piston Ring Groove Width – Second 	1.52–1.54 mm	0.0598–0.0606 in
<ul style="list-style-type: none"> Piston – Piston Ring Groove Width – Top 	1.23–1.25 mm	0.0484–0.0492 in
<ul style="list-style-type: none"> Piston – Piston To Bore Clearance 	0.010–0.041 mm	0.0004–0.0016 in
Valve System		
<ul style="list-style-type: none"> Valves – Valve Face Angle 	45 Degrees	

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• Valves – Valve Face Runout – Maximum	0.04 mm	0.0016 in
• Valves – Valve Seat Runout – Maximum	0.080 mm	0.0031 in
• Valves – Valve Face Seat Width – Exhaust	1.6000 mm	0.06299 in
• Valves – Valve Face Seat Width – Intake	1.2000 mm	0.04724 in
• Valves – Valve Head Diameter – Exhaust	29.950–30.250 mm	1.1791–1.1909 in
• Valves – Valve Head Diameter – Intake	34.950–35.250 mm	1.3760–1.4154 in
• Valves – Valve Head O.D. and Chamfer Height – Exhaust	1.1174 mm	0.04399 in
• Valves – Valve Head O.D. and Chamfer Height – Intake	1.0526 mm	0.04144 in
• Valves – Valve Stem Diameter – Exhaust	5.935–5.950 mm	0.2337–0.2343 in
• Valves – Valve Stem Diameter – Intake	5.955–5.970 mm	0.2344–0.2355 in
• Valves – Valve Stem Height – Closed	32.500 mm	1.2795 in
• Valves – Valve Stem to Guide Clearance – Exhaust	0.050–0.077 mm	0.0020–0.0026 in
• Valves – Valve Stem to Guide Clearance – Intake	0.030–0.057 mm	0.0012–0.0022 in
• Valve Lifters – Valve Lifter Diameter – Stationary Lash Adjuster	11.986–12.000 mm	0.0005–0.0020 in

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<ul style="list-style-type: none"> Valve Lifters – Valve Lifter-to-Bore Clearance – Stationary Lash Adjuster 	0.013–0.051 mm	3.2210–3.2299 in
<ul style="list-style-type: none"> Valve Rocker Arms – Rocker Arm Ratio 	1.68 to 1	
<ul style="list-style-type: none"> Valve Rocker Arms – Rocker Arm Roller Diameter 	17.740–17.800 mm	0.6987–0.7008 in
<ul style="list-style-type: none"> Valve Springs – Valve Spring Free Length 	41.400–44.200 mm	1.6299–1.7402 in
<ul style="list-style-type: none"> Valve Springs – Valve Spring Installed Height – Closed 	32.500 mm	1.2795 in
<ul style="list-style-type: none"> Valve Springs – Valve Spring Installed Height – Open 	22.500 mm	0.8858 in
<ul style="list-style-type: none"> Valve Springs – Valve Spring Load – Open – @22.5 mm 	525.0–575.0 N	118–129 lb
<ul style="list-style-type: none"> Valve Springs – Valve Spring Load – Closed – @32.5 mm 	245.0–271.0 N	55–61 lb