

## ENGINE MECHANICAL SPECIFICATIONS (LTG)

Application	Specification	
	Metric	English
General Data		
• Engine Type	Inline 4 Cylinder	
• Displacement	2.0 L	122 CID
• RPO	LTG	
• VIN	-	
• Bore	85.992-86.008 mm	3.3855-3.3861 in
• Stroke	86 mm	3.386 in
• Compression Ratio	9.50	
• Spark Plug Gap	0.95-1.10 mm	0.037-0.043 in
Block		
• Crankshaft Main Bearing Bore Diameter	60.862-60.876 mm	2.3961-2.3967 in
• Cylinder Bore Diameter	85.992-86.008 mm	3.3855-3.3861 in
• Cylinder Bore Out-of-Round - Maximum	0.013 mm	0.0005 in

Application	Specification	
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<ul style="list-style-type: none"> <li>Cylinder Head Deck Surface Flatness - over 25 mm length</li> </ul>	0.025 mm	0.001 in
<ul style="list-style-type: none"> <li>Cylinder Head Deck Surface Flatness - over 150 mm length</li> </ul>	0.050 mm	0.002 in
Engine Block to Bedplate Flatness - overall	0.1 mm	0.0039 in
Engine Block to Bedplate Flatness - straightness	0.050 mm in 100 mm	0.002 in in 3.937 in
Piston Deck Height - Below Deck	1.155-1.725 mm	0.0455-0.0679 in
Camshaft		
<ul style="list-style-type: none"> <li>Camshaft End Play</li> </ul>	0.040-0.307 mm	0.0016-0.0121 in
<ul style="list-style-type: none"> <li>Camshaft Journal Diameter - Journal 1</li> </ul>	34.935-34.960 mm	1.3754-1.3764 in
<ul style="list-style-type: none"> <li>Camshaft Journal Diameter - Journal 2 thru 5</li> </ul>	26.935-26.960 mm	1.0604-1.0614 in
<ul style="list-style-type: none"> <li>Camshaft Thrust Width - Camshaft with Phaser installed</li> </ul>	30.025-30.175 mm	1.1821-1.1880 in
<ul style="list-style-type: none"> <li>Camshaft Thrust Width - Cylinder Head</li> </ul>	29.868-29.890 mm	1.1759-1.1768 in
Connecting Rod		
<ul style="list-style-type: none"> <li>Connecting Rod Bearing to Crankpin Clearance</li> </ul>	0.030-0.073 mm	0.0012-0.0029 in
<ul style="list-style-type: none"> <li>Connecting Rod Bore Diameter - Bearing End</li> </ul>	52.118-52.134 mm	2.0519-2.05252 in
<ul style="list-style-type: none"> <li>Connecting Rod Bore Diameter - Pin End</li> </ul>	24.007-24.017 mm	0.9452-0.9455 in
<ul style="list-style-type: none"> <li>Connecting Rod Side Clearance</li> </ul>	0.070-0.370 mm	0.0028-0.0146 in
<ul style="list-style-type: none"> <li>Connecting Rod Straightness - Bend - Maximum</li> </ul>	0.017 mm	0.0007 in
<ul style="list-style-type: none"> <li>Connecting Rod Straightness - Twist - Maximum</li> </ul>	0.040 mm	0.0016 in
Crankshaft		
<ul style="list-style-type: none"> <li>Connecting Rod Pin Diameter</li> </ul>	48.999-49.015 mm	1.9291-1.9297 in
<ul style="list-style-type: none"> <li>Crankshaft End Play</li> </ul>	0.040-0.270 mm	0.0016-0.0106 in
<ul style="list-style-type: none"> <li>Crankshaft Main Bearing Clearance</li> </ul>	0.020-0.048 mm	0.0008-0.0019 in

Application	Specification	
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• Crankshaft Main Journal Diameter	55.993-56.009 mm	2.2044-2.2051 in
• Crankshaft Thrust Bearing Width	20.30-20.45 mm	0.799-0.805
Cylinder Head		
• Surface Flatness - Block Deck - in 25 mm	0.025 mm	0.0001 in
• Surface Flatness - Block Deck - in 150 mm	0.050 mm	0.0019 in
• Surface Flatness - Block Deck - between bolts	0.030 mm	0.0012 in
• Surface Flatness - Block Deck - Overall	0.100 mm	0.0039 in
• Valve Guide Bore - Exhaust	6.000-6.020 mm	0.2362-0.2370 in
• Valve Guide Bore - Intake	6.000-6.020 mm	0.2362-0.2370 in
• Valve Lifter Bore Diameter - Stationary Lash Adjusters	12.008-12.030 mm	0.4728-0.4736 in
• Valve Seat Angle - Relief Surface	30 Degrees	
• Valve Seat Angle - Seating Surface	45 Degrees	
• Valve Seat Angle - Undercut Surface	60 Degrees	
• Valve Seat Runout - Maximum	0.080 mm	0.0031 in
Lubrication System		
• Oil Pressure - @700 RPM 100 $\tilde{\text{A}}$ , $\hat{\text{A}}^{\circ}\text{C}$	140-200 kPa	20-29 psi
Piston Rings		
• Piston Ring End Gap - Top	0.20-0.35 mm	0.008-0.014 in
• Piston Ring End Gap - Second	0.35-0.55 mm	0.014-0.022 in
• Piston Ring End Gap - Oil Control	0.25-0.75 mm	0.010-0.030 in
• Piston Ring to Groove Clearance - Top	0.04-0.08 mm	0.0015-0.0031 in

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• Piston Ring to Groove Clearance - Second	0.030-0.070 mm	0.0012-0.0030 in
• Piston Ring to Groove Clearance - Oil Control	0.024-0.176 mm	0.0009-0.0069 in
• Piston Ring Thickness - Top	1.170-1.190 mm	0.0461-0.0469 in
• Piston Ring Thickness - Second	1.470-1.490 mm	0.0579-0.0587 in
• Piston Ring Thickness - Oil Control - Rail	0.447-0.473 mm	0.0176-0.0186 in
• Piston Ring Thickness - Oil Control - Spacer	0.960-1.040 mm	0.0378-0.0409 in
<b>Pistons and Pins</b>		
• Pin - Piston Pin Clearance to Connecting Rod Bore	0.007-0.020 mm	0.0003-0.0008 in
• Pin - Piston Pin Clearance to Piston Pin Bore	0.005-0.013 mm	0.0002-0.0005 in
• Pin - Piston Pin Diameter	23.997-24.000 mm	0.9448-0.9449 in
• Pin - Piston Pin End Play	0.263-1.164 mm	0.0104-0.0458 in
• Piston - Piston Diameter - @14.8 mm up	85.968-85.982 mm	3.3846-3.3851 in
• Piston - Piston Pin Bore Diameter	24.005-24.010 mm	0.9451-0.9453 in
• Piston - Piston Ring Groove Width - Top	1.23-1.25 mm	0.0484-0.0492 in
• Piston - Piston Ring Groove Width - Second	1.52-1.54 mm	0.0598-0.0606 in
• Piston - Piston Ring Groove Width - Oil Control	2.01-2.03 mm	0.0791-0.0799 in
• Piston - Piston to Bore Clearance - w/o polymer	0.010-0.041 mm	0.0004-0.0016 in
<b>Valve System</b>		
• Valves - Valve Face Angle	45 Degrees	
• Valves - Valve Face Runout - Maximum	0.040 mm	0.0016 in
• Valves - Valve Seat Runout - Maximum	0.080 mm	0.0031 in

Application	Specification	
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• Valves - Valve Seat Gauge Ball Height - Exhaust	12.746-12.976 mm	0.4912-0.5038 in
• Valves - Valve Seat Gauge Ball Height - Intake	12.425-12.653 mm	0.4892-0.4981 in
• Valves - Valve Stem Diameter - Exhaust	5.945-5.965 mm	0.2341-0.2348 in
• Valves - Valve Stem Diameter - Intake	5.955-5.975 mm	0.2344-0.2352 in
• Valves - Valve Stem Installed Height	Check and Record	
• Valves - Valve Stem to Guide Clearance - Exhaust	0.038-0.082 mm	0.0015-0.0032 in
• Valves - Valve Stem to Guide Clearance - Intake	0.030-0.057 mm	0.0012-0.0022 in
• Valve Lash Adjusters - Valve Lash Adjuster Diameter - Stationary Lash Adjuster	11.986-12.000 mm	0.0005-0.0020 in
• Valve Lash Adjusters - Valve Lash-Adjuster-to-Bore Clearance - Stationary Lash Adjuster	0.013-0.051 mm	3.2210-3.2299 in
• Valve Springs - Valve Spring Installed Height	35.0 mm	1.3779 in
• Valve Springs - Valve Spring Load - Closed - @35 mm	247-273 N	56-61 lb
• Valve Springs - Valve Spring Load - Open - @24 mm	598-662 N	134-149 lb

### ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS (LTG)

Application	Type of Material	GM Part Number	
		United States	Canada
Balance Shaft Bearings	5W-30	19293000	19286321
Cam Lobes	5W-30	19293000	19286321
Camshaft Cover <sup>1</sup>	Sealant	12378521	88901148
Crank Sensor O-ring	5W-30	19293000	19286321
Cylinder Bores	5W-30	19293000	19286321
Cylinder Head Plugs	Threadlocker	12345382	10953489
Engine Block Threaded Plugs	Sealant	12346004	10953480
Engine Block to Bedplate <sup>1</sup>	Sealant	12378521	88901148
Engine Front Cover <sup>1</sup>	Sealant	12378521	88901148
Engine Oil	5W-30	19293000	19286321
Fuel Injection Pump Bolt	Threadlocker	12345382	10953489

Application	Type of Material	GM Part Number	
		United States	Canada
Fuel Injector O-rings	5W-30	19293000	19286321
Fuel Injector Tip Insulators, for Multiple Port Injection Only	5W-30	19293000	19286321
Hydraulic Lash Adjusters	5W-30	19293000	19286321
Ignition Coils	Lubricant	19260901	19260902
Intake and Exhaust Valve Stems	5W-30	19293000	19286321
Lower Oil Pan <sup>1</sup>	Sealant	12378521	88901148
Main Bearings	5W-30	19293000	19286321
Oil Filter - Threads and O-ring Lead-in Chamfers	5W-30	19293000	19286321
Oil Level Indicator Tube O-ring	Lubricant	88862586	88862827
Oil Pan to Bedplate Joint <sup>1</sup>	Sealant	12378521	88901148
Oil Pump- Pump Elements	5W-30	19293000	19286321
Oxygen Sensor Threads	Anti-seize	88862477	88862478
Piston Pin to Piston/Rod- Pin Bores of Piston and Rod	5W-30	19293000	19286321
Rod Bearings- Rod Pins of Crankshaft	5W-30	19293000	19286321
Thread Repair Cutting Oil	Lubricant	1052864	992881
Thread Repair	Cleaner	88862650	88901247
Timing Chain Tensioner Cover	Sealant	12378521	88901148
Valves	Parts Immersion Solvent	12345368	10953514
Valve Rocker Arm/Valve Tip	5W-30	19293000	19286321
Water Feed Tube O-rings	Lubricant	19260901	19260902

<sup>1</sup> Ensure proper use of room temperature vulcanizing (RTV) sealant. [Use of Room Temperature Vulcanizing \(RTV\) and Anaerobic Sealant](#)