

3-2 ENGINE AND ENGINE OVERHAUL

ENGINE MECHANICAL

3.8L ENGINE MECHANICAL SPECIFICATIONS

Description	English Specifications	Metric Specifications
Pistons		
Piston-to-bore clearance	0.0005-0.0027 in.	0.022-0.069 mm
Piston bore diameter		Piston Required
Ring groove width	0.0610-0.0602 in.	1.550-1.530 mm
Upper compression ring	0.0610-0.0602 in.	1.550-1.530 mm
Lower compression ring	0.1357-0.1356 in.	4.030-4.055 mm
Oil control ring		
Ring width		
Upper compression ring	0.0575-0.0587 in.	1.460-1.490 mm
Lower compression ring	0.0575-0.0587 in.	1.463-1.490 mm
Oil control ring	3.012-3.038 in.	76.5-77.2 mm
Piston pin length	0.9119-0.09124 in.	23.162-23.175 mm
Piston pin diameter		
Pin-to-piston clearance	0.0002-0.0005 in.	0.005-0.012 mm
Lubrication System		
Oil pump type		Gerador
Oil Pump Gear Backlash	0.006-0.012 in.	0.02-0.03 mm
Relief Valve Spring Tension	17.1-15.2 lbs @ 1.20 in.	76.2-67.6 N @ 30.5 mm
Relief Valve to Bore Clearance	0.0023-0.0017 in.	0.073-0.043 mm
Diver Shaft to Housing Clearance	0.0030-0.0015 in.	0.076-0.038 mm

4.8L ENGINE MECHANICAL SPECIFICATIONS

Description	English Specifications	Metric Specifications
General Information		
Type	281 cc	Liquid Cooled, Overhead Camshaft
Displacement		4.8L
Number of cylinders	8	
Bore	3.55 in.	90.2 mm
Stroke	3.54 in.	90.0 mm
Compression ratio		
Firing order	1-3-7-2-5-4-8	
Oil Pressure	20-45 psi @ 1500 RPM (engine hot)	
Cylinder Head and Valve Train		
Valve guide bore diameter	0.3443-0.3433 in.	8.745-8.720
Valve seat width		
Intake	0.074-0.083 in.	1.9-2.1 mm
Exhaust	0.074-0.083 in.	1.9-2.1 mm
Valve seat angle		
Valve seat run-out	0.00084 in.	0.025 mm
Valve stem-to-guide clearance		
Intake	0.00075-0.00272 in.	0.020-0.069 mm
Exhaust	0.018-0.0037 in.	0.046-0.095 mm
Valve guide inner diameter	0.2773-0.2762 in.	7.044-7.015 mm
Intake	1.75 in.	44.5 mm
Exhaust	1.34 in.	34.0 mm
Valve face run-out limit	0.001 in.	0.05 mm
Valve face angle		
Valve stem diameter		
Intake	0.275-0.2746 in.	6.994-6.975 mm
Exhaust	0.274-0.2736 in.	6.974-6.949 mm
Free length		
Intake	1.976 in.	50.2 mm
Exhaust	1.976 in.	50.2 mm
Valve spring assembled length	1.566-1.637 in.	39.8-41.6 mm
Rocker arm ratio		1.75:1
Valve tappet diameter	0.63-0.629 in.	16.0-15.98 mm
Valve tappet-to-bore clearance	0.00071-0.00272 in.	0.018-0.069 mm
Valve tappet service limit	0.00063 in.	0.016 mm
Valve tappet leakdown rate		5-25 seconds
Valve tappet collapsed tappet (app) (desired)	0.0035-0.0177 in.	0.85-0.45 mm
Camshaft		
Lobe lift		
Intake	0.2594 in.	6.59 mm
Exhaust	0.2594 in.	6.59 mm
Lobe wear limit (all)	0.005 in.	0.127 mm
Theoretical valve lift (at zero lash (all))	0.472 in.	12.0 mm
End-play	0.00098-0.0065 in.	0.025-0.165 mm
End-play wear limit	0.00075 in.	0.190 mm
Bearing-to-journal clearance	0.00098-0.003 in.	0.025-0.076 mm
Bearing-to-journal clearance service limit	0.004 in.	0.127 mm
Journal diameter	1.061-1.060 in.	26.962-26.936 mm

3.8L ENGINE MECHANICAL SPECIFICATIONS

Description	English Specifications	Metric Specifications
General Information		
Type	90° V Iron Block, Liquid Cooled, Overhead Valve	3.8L (3802cc)
Displacement	232 cc	
Number of cylinders	6	
Bore	3.81 in.	96.8 mm
Stroke	3.38 in.	86.0 mm
Compression ratio		
Firing order	1-4-2-5-3-6	
Oil pressure	40-60 psi @ 2500 rpm	
Cylinder Head and Valve Train		
Valve-to-valve guide clearance	0.0007-0.0027 in.	0.018-0.069 mm
Valve clearance-intake valve	0.001-0.0028 in.	0.026-0.071 mm
Valve clearance-exhaust valve	0.0015-0.0033 in.	0.038-0.083 mm
Combustion Chamber volume (cc)	61.46-64.48	
Valve guide bore diameter (IC)		
Intake	0.3443-0.3433 in.	8.745-8.720 mm
Exhaust	1.8532-1.8542 in.	47.072-47.097 mm
Head gasket surface flatness	1.5845 in.	39.739 mm
Head face surface finish	0.007 in.	0.18 mm
Valve head diameter		
Intake	1.78 in.	45.3 mm
Exhaust	1.46 in.	37.1 mm
Valve face run-out limit		
Intake	0.002 in.	0.05 mm
Exhaust	0.002 in.	0.05 mm
Valve face angle		
Valve stem diameter		
Intake	0.3423-0.3415 in.	8.694-8.674 mm
Exhaust	0.3418-0.3410 in.	8.662-8.662 mm
Valve spring compression		
Valve Open	220 lbs @ 1.18 in.	979 Nm @ 30.0 mm
Valve Closed	85 lbs @ 1.65 in.	379 Nm @ 41.9 mm
Free length	1.97 in.	50.0 mm
Pressure lost @ specific height		10% Force Loss @ Specified Length
Rocker Arm		
Ratio		1.73:1
Valve Tappet-Hydraulic Diameter	0.8740-0.8745 in.	22.200-22.212 mm
Clearance to Bore	0.0007-0.0027 in.	0.018-0.069 mm
Camshaft		
Lobe lift		
Intake	0.245 in.	6.22 mm
Exhaust	0.259 in.	6.57 mm
Theoretical valve maximum lift		
Intake	0.426 in.	10.67 mm
Exhaust	0.446 in.	11.37 mm
End-play service limit	0.001-0.006 in.	0.025-0.150 mm
Bearing journal diameter	2.0915-2.0905 in.	52.108-52.062 mm
Camshaft bearing runout limit	0.002 in.	0.05 mm
Cylinder Block		
Cylinder bore diameter	3.8 in.	96.8 mm
Piston selection		
Red	3.8110-3.8122 in.	96.799-96.830 mm
Blue	3.8122-3.8134 in.	96.830-96.860 mm
Yellow	3.8134-3.8146 in.	96.860-96.891 mm
Piston-to-cylinder bore clearance	0.0009-0.0027 in.	0.022-0.069 mm
Surface Finish (RMS)		
Out-of-round limit	0.001 in.	0.025 mm
Taper limit (max.)	0.002 in.	0.050 mm
Main bearing bore diameter	2.7192-2.7173	68.895-68.945 mm
Crankshaft		
Main bearing journal diameter	2.5160-2.5198 in.	63.963-64.003 mm
Out-of-Round Limit	0.0003 in.	0.008 mm
Maximum @ 45°	0.006 in.	0.15 mm
Taper Limit	0.003 in.	0.076 mm
Journal Runout Limit	0.002 in.	0.05 mm
Connecting Rod		
Connecting rod bearing		
Connecting rod bearing journal diameter	2.3103-2.311 in.	58.682-58.702 mm
Clearance-to-crankshaft	0.0047-0.014 in.	0.11-0.29 mm
Connecting rod piston pin bore diameter	0.9066-0.912 in.	23.105-23.145 mm
Crankshaft bearing bore diameter	2.4266-2.4274 in.	61.635-61.655 mm