

Piston to Cylinder Wall Clearance

Choose Your Specs from appropriate row

BMW Engine Code			Metric Mechanic HiFlo ST Engines	Cylinder Clearance					
				1	2	3	4	5	6
BMW 4 Cylinder Engines				1	2	3	4	5	6
M10	2002 & tii 320i 318i	1968 - 1976 1977 - 1983 1984 - 1986	2.2/2.4 L Sport Engine	.0025	.0022	.0022	.0025		
			2.2/2.4 L Rally Engine	.0027	.0025	.0025	.0027		
			2.2/2.4 L Race Engine	.0035	.0030	.0030	.0035		
S14	M3 (E30)	1988 - 1991	2.5 L Sport Engine	.0030	.0027	.0027	.0030		
			2.5 L Rally Engine	.0033	.0030	.0030	.0033		
			2.5 L Race Engine	.0038	.0033	.0033	.0038		
M42	E30 318is, E36 318 Z3	1990 - 1991 1992 - 1995 1995 Only	2.0 L Sport Engine	.0025	.0020	.0020	.0025		
			2.0 L Rally Engine	.0028	.0023	.0023	.0028		
			1.9 L *FI Engine Low Boost	.0030	.0025	.0025	.0030		
			1.9 L *FI Engine High Boost	.0035	.0030	.0030	.0035		
			2.1 L *FI Engine Low Boost	.0030	.0025	.0025	.0030		
2.1 L *FI Engine High Boost	.0035	.0030	.0030	.0035					
M44	E36 318ti E36 318i Z3	1996 - 1998 1996 - 1998 1996 - 1999	2.0 L Sport Engine	.0025	.0020	.0020	.0025		
			2.1 Rally Engine	.0028	.0023	.0023	.0028		
			2.0 L *FI Engine Low Boost	.0030	.0025	.0025	.0030		
			2.0 L *FI Engine High Boost	.0035	.0030	.0030	.0035		
			2.1 L *FI Engine Low Boost	.0030	.0025	.0025	.0030		
2.1 L *FI Engine High Boost	.0035	.0030	.0030	.0035					
BMW 6 Cylinder Engines				1	2	3	4	5	6
M20	325i 325e 528e 323i Euro	1987 - 1991 1984 - 1988 1982 - 1988 1978 - 1985	2.9/3.2 L Sport Engine	.0025	.0022	.0020	.0020	.0022	.0025
			2.9/3.2 L Rally Engine	.0030	.0027	.0025	.0025	.0027	.0030
			2.9/3.2 L Race Engine	.0035	.0032	.0030	.0030	.0032	.0035
			2.9/3.2 L *FI Engine Low Boost	.0030	.0027	.0025	.0025	.0027	.0030
			2.9/3.2 L *FI Engine High Boost	.0035	.0032	.0030	.0030	.0032	.0035
M30	5, 6 & 7 Series Bavaria, 3.0, 3.0si 2800, 2500 3.0cs, 2800cs, 3.0csi Euro	1975 - 1991 1968 - 1976	3.7/4.0 L Sport Engine	.0027	.0024	.0022	.0022	.0024	.0027
			3.7/4.0 L Rally Engine	.0030	.0027	.0025	.0025	.0027	.0030
		1968 - 1973	3.7/4.0 L Race Engine	.0035	.0032	.0030	.0030	.0032	.0035
S38	M5, M6 M5, M635 Euro	1985 - 1991	3.7/3.9 L Sport Engine	.0030	.0027	.0025	.0025	.0027	.0030
			3.7/3.9 L Rally Engine	.0033	.0030	.0028	.0028	.0030	.0033
			3.7/3.9 L Race Engine	.0038	.0035	.0033	.0033	.0035	.0038
M50 M52 M54	3 Series 5 Series	1992 - 2004 1991 - 2004	3.0/3.2 L Sport Engine	.0027	.0024	.0022	.0022	.0024	.0027
			3.0/3.2 L Rally Engine	.0030	.0027	.0025	.0025	.0027	.0030
			3.0/3.2 L Race Engine	.0035	.0032	.0030	.0030	.0032	.0035

*FI = Forced Induction

Low Boost = 7 - 12 lbs.

High Boost = 13 - 25 psi

See Next Page for Illustration & Text

MEASURING PISTONS FOR FIT

Measure the piston at the bottom of the pin bore and perpendicular to the pin axis. Using a felt tip marker, write the piston diameter size on the piston. Arrange the pistons with the smallest piston to the front and back cylinders and the largest pistons to the middle cylinders. If you examine the **Piston to Cylinder Wall Clearance Chart** (shown on the first page), you'll see that more clearance is added to the front and back cylinders than the middle cylinders; usually .0003" to .0005". Why? The front and rear cylinders run cooler on a 4 and 6 cylinder BMW engine because the water pump is located in front of the #1 cylinder and water discharging from the pump cools it off the most. Next, water flows along the intake side of the block to the rear cylinder and then takes a 180° turn around to the rear cylinder which causes it to run cooler than the middle cylinders.

BORING & HONING INSTRUCTIONS

- 1) Bore the block to .001" (.025mm) under piston size. Bore to a depth of approximately 3/4" (20mm) below the cylinder. This makes it possible to pass the honing stones through the bottom of the cylinder. This is done to avoid tighter clearances at the bottom of the cylinder:
- 2) Rough hone the cylinder using 220 or 280 grit stones to within .0008" (.020mm)
- 3) Use 400 finishing stones for final sizing - see **Piston to Cylinder Wall Clearance Chart** (shown on the first page).
- 4) Use plateau brushes to set-up the final sheen of the cylinder.
- 5) Maximum wall taper allowed from top to bottom and out of round is .0003" (.0075mm)

