

**Haynes**
*shows you how***BMW 3-Series (92-98) & Z3 (96-98) Haynes Online Manual**

Specifications

Cylinder head

Maximum gasket face distortion (warpage)	0.0012 inch
Maximum gasket face machining limit*	0.010 to 0.014 inch
New cylinder head height	5.508 to 5.516 inches
Minimum cylinder head height after machining	5.494 inches

*If 0.012 inch (0.30 mm) of metal or more is removed from the cylinder head gasket face, a 0.012 inch (0.30 mm) thicker cylinder head gasket must be used when installing the cylinder head.

Valves

Valve face angle	45-degrees
Valve head diameter	
Intake	1.299 inches
Exhaust	1.201 inches
Valve stem diameter	
1992	0.275 inch
1993 and later	
Intake	0.235 inch
Exhaust	0.234 inch
Stem-to-guide clearance (measured at valve head with top of valve stem flush with guide)	0.020 inch

Cylinder block

Cylinder bore diameter	
Standard	3.3071 inches
Intermediate	3.3103 inches
1st oversize	3.3170 inches

2nd oversize	3.3268 inches
Maximum cylinder bore out-of-round	0.0004 inch
Maximum cylinder bore taper	0.0004 inch

Crankshaft and connecting rods

Crankshaft endplay	0.0031 to 0.0064 inch
Maximum run-out	0.006 inch
Connecting rod side clearance	0.0016 to 0.010 inch
Main bearing journal diameter	
Standard	
Yellow	2.3616 to 2.3618 inches
Green	2.3613 to 2.3615 inches
White	2.3611 to 2.3613 inches
1st undersize (0.001 inch)	
Yellow	2.3518 to 2.3520 inches
Green	2.3515 to 2.3517 inches
White	2.3512 to 2.3514 inches
2nd undersize (0.023 inch)	
Yellow	2.3419 to 2.3421 inches
Green	2.3416 to 2.3418 inches
White	2.3414 to 2.3416 inches
Connecting rod bearing journal diameter	
Four-cylinder engine	
Standard	1.7720 to 1.7726 inches
1st undersize	1.7622 to 1.7628 inches
2nd undersize	1.7523 to 1.7530 inches
Six-cylinder engine	
1992	
Standard	1.7720 to 1.7727 inches
1st undersize	1.7622 to 1.7628 inches
2nd undersize	1.7523 to 1.7530 inches
1993 and later	
Standard	1.7707 to 1.7634 inches
1st undersize	1.7608 to 1.7614 inches
2nd undersize	1.7509 to 1.7516 inches
Main bearing oil clearance	0.0008 to 0.0023 inch
Connecting rod bearing oil clearance	0.0008 to 0.0023 inch

Pistons and piston rings

Piston diameter

Standard	3.3063 inches
Intermediate	3.3094 inches
1st oversize	3.3161 inches
2nd oversize	3.3260 inches

Piston-to-cylinder bore clearance	0.0004 to 0.0016 inch
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Piston ring end gaps

Four-cylinder engine

Top compression ring	0.008 to 0.016 inch
Second compression ring	0.008 to 0.016 inch
Oil control ring	0.008 to 0.018 inch

Six-cylinder engine

Top compression ring	0.008 to 0.016 inch
Second compression ring	0.008 to 0.016 inch
Oil control ring	0.008 to 0.018 inch

Piston ring-to-groove clearance

Four-cylinder engine

Top compression ring	0.0008 to 0.0020 inch
Second compression ring	0.0008 to 0.0020 inch
Oil control ring	0.0008 to 0.0022 inch

Six-cylinder engine

1992

Top compression ring	0.0008 to 0.0020 inch
Second compression ring	0.0008 to 0.0020 inch
Oil control ring	0.0008 to 0.0022 inch

1993 and later

Top compression ring	0.0008 to 0.0023 inch
Second compression ring	0.0008 to 0.0025 inch
Oil control ring	0.0008 to 0.0020 inch

Ft-lbs

Torque specifications*

Connecting rod bearing cap bolts

Step 1	15
Step 2	Tighten an additional 70-degrees

Main bearing cap bolts

1995 and earlier**Step 1****15****Step 2****Tighten an additional 50-degrees****1996 on****Step 1****15****Step 2****Tighten an additional 70-degrees*****>Refer to Chapter 2Aor 2Bfor additional specifications**