

11 00 Engine in general N47 / N47S D20

Cylinder		4
Bore hole	mm	84
Stroke	mm	90
Effective displacement	cm ³	1995
Compression ratio	:1	16,0
Cutoff speed	1/min	5000
Permissible constant speed	1/min	4400
Compression pressure (of all cylinders roughly same value)	bar	>>16...

11 00 Engine in general N47T D20 Top power stage 1

Cylinder		4
Bore hole	mm	84
Stroke	mm	90
Effective displacement	cm ³	1995
Compression ratio	:1	16,5
Cutoff speed	1/min	5000
Permissible constant speed	1/min	4400
Compression pressure (of all cylinders roughly same value)	bar	>>16...

11 11 Engine Block, Cylinder Crankcase N47 / N47S D20

Bore $\varnothing$ stage 0 ^{a)}	mm	84,000 $\pm$ 0,01
Bore $\varnothing$ stage 00 a)	mm	%
Bore $\varnothing$ stage 1 a)	mm	84,250 $\pm$ 0,01
Permitted out-of-round of cylinder bore a)	mm	0,01
Permitted conicity of cylinder bore a)	mm	0,01
Permissible total wear tolerance between piston and cylinder (engine operated)	mm	0,15

^{a)} Newcondition or reworking

11 11 Engine Block, Cylinder Crankcase N47T D20 Top power stage 1

Bore $\varnothing$ stage 0 ^{a)}	mm	84,000 ^{+0,02}
Bore $\varnothing$ stage 00 a)	mm	%
Bore $\varnothing$ stage 1 a)	mm	84,250 ^{+0,02}
Permitted out-of-round of cylinder bore a)	mm	0,01
Permitted conicity of cylinder bore a)	mm	0,01
Permissible total wear tolerance between piston and cylinder (engine operated)	mm	0,15

^{a)} Newcondition or reworking

11 12 Cylinder head with lid N47 / N47S D20

Cylinder head height: Original dimension	mm	No machining possible
Machining limit, valve-inset clearance	mm	0,8 $\hat{A}$ ± 0,1
Valve guides are not available as replacement parts.		
Inner diameter of installed valve guide		
Original	mm	5,0-0,2
Tilt clearance, maximum (wear between valve and valve guide)	mm	can't be measured

11 12 Cylinder Head with Valve Seat Cover N47 / N47S D20

Valve seat angle	°	45
Correction angle: outer	°	15
Correction angle: inner	°	60
Valve seat width: Intake	mm	1,0 +0,1
Valve seat width: Exhaust	mm	1,3 +0,1
∅ Valve seat		
Valve seat surface: Outside dia. inlet	mm	24,5+0,1
Valve seat surface: Outside dia. exhaust	mm	27,3+0,1

11 12 Cylinder Head with Valve Seat Cover N47T D20 Top power stage 1

Valve seat angle	°	45
Correction angle: outer	°	15
Intake and exhaust		
Correction angle: inner	°	36
Intake		
Correction angle: inner	°	60
Exhaust		
Valve seat width: Intake	mm	1,2 ±0,25
Valve seat width: Exhaust	mm	1,4 ±0,25
∅ Valve seat		
Valve seat surface: Outside dia. inlet	mm	25,9 ^{+0,1}
Valve seat surface: Outside dia. exhaust	mm	23,2 ^{+0,1}

11 12 Cylinder head N47T D20 Top power stage 1

Cylinder head height	mm	No machining possible
Machining limit for valve support	mm	0,8 $\hat{A}$ ± 0,1
Valve guides are not available as replacement parts.		
Inner diameter of installed valve guide		
Original	mm	5,0-0,015
Tilt clearance, maximum (wear between valve and valve guide)	mm	can't be measured

11 21 Crankshaft and Bearings N47 / N47S D20

Grinding stages, crankshaft guide bearing		
Original	mm	25,00 ^{+0,020} _{+0,066}
Level 1	mm	25,20 ^{+0,020} _{+0,066}
Level 2	mm	25,40 ^{+0,020} _{+0,066}
Crankshaft side clearance	mm	0.060 ... 0.250

11 21 Crankshaft and Bearings N47 / N47S D20

Grinding stages connecting rod bearing journals		
Original 0	mm	50,00 -0,009 -0,025
Level 1	mm	49,75 -0,009 -0,025
Level 2	mm	49,50 -0,009 -0,025
Radial connecting-rod bearing play	mm	0,015 ... 0,050

11 21 Crankshaft and Bearings N47 / N47S D20

Grinding stage of main bearing journals		Main bearing journal / guide bearing journal
Stage 0 K1 (colour Yellow)	mm	54,984 ... 54,990
Stage 0 K2 (colour Green)	mm	54,977 ... 54,983
Stage 0 K3 (colour white)	mm	54,971 ... 54,976
Grinding stage 1 K1 (colour Yellow)	mm	54,734 ... 54,740
Grinding stage 1 K2 (colour Green)	mm	54,727 ... 54,733
Grinding stage 1 K3 (colour White)	mm	54,721 ... 54,726
Grinding stage 2 K1 (colour Yellow)	mm	54,484 ... 54,489
Grinding stage 2 K2 (colour Green)	mm	54,477 ... 54,483
Grinding stage 2 K3 (colour White)	mm	54,471 ... 54,476
Crankshaft bearing clearance, radial	mm	0,023...0,054
Crankshaft bearing clearance, axial	mm	0.060 ... 0.210
Maximum crankshaft friction coefficient, bearing section bolted	Nm	Â 2

11 21 Crankshaft and Bearings N47T D20 Top power stage 1

Grinding stage of main bearing journals		Main bearing journal / guide bearing journal
Stage 0 K1 (colour Yellow)	mm	54,984 ... 54,990
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Crankshaft bearing play, radial	mm	0,023 ... 0,054
Crankshaft bearing play, axial	mm	0,060 ... 0,210
Maximum crankshaft coefficient of friction, bearing section bolted	Nm	Â 2

11 21 Crankshaft and Bearings N47T D20 Top power stage 1

Grinding stages, crankshaft guide bearing		
Original	mm	25,00 ^{+0,020} _{+0,053}
Level 1	mm	25,20 ^{+0,020} _{+0,053}
Level 2	mm	25,40 ^{+0,020} _{+0,053}
Crankshaft side clearance	mm	0.060 ... 0.250

11 21 Crankshaft and Bearings N47T D20 Top power stage 1

Grinding stages connecting rod bearing journals		
Original 0	mm	50,00 -0,009 -0,025
Level 1	mm	49,75 -0,009 -0,025
Level 2	mm	49,50 -0,009 -0,025
Radial connecting-rod bearing play	mm	0,015 ... 0,050

11 23 Vibration damper N47 / N47S D20

Max. permitted radial runout	mm	0,40
Max. permitted lateral runout	mm	0,40

11 23 Vibration damper N47T D20 Top power stage 1

Max. permitted radial runout	mm	0,40
Max. permitted lateral runout	mm	0,40

11 24 Connecting Rods and Bearings N47 / N47S D20

∅ Large connecting rod eye (without bearing)	mm	53,600....53,619
Conrod bush: Inner diameter	mm	31,500 ^{+0,05} _{-0,05}
Permissible total deviation of connecting rods in one engine (without bearing shells)	g	± 4

11 24 Connecting Rods and Bearings N47T D20 Lower power stage 1

∅ Large connecting rod eye (without bearing)	mm	53,600 ... 53,619
Conrod bush: Inner diameter	mm	27,700 ^{+0,05} _{-0,05}
Permissible total deviation of connecting rods in one engine (without bearing shells)	g	± 4

11 24 Connecting Rods and Bearings N47T D20 Top power stage 1

∅ Large connecting rod eye (without bearing)	mm	53,600 ... 53,619
Conrod bush: Inner diameter	mm	31,700 ^{+0,05} _{-0,05}
Permissible total deviation of connecting rods in one engine (without bearing shells)	g	± 4

11 25 Pistons with Rings and Pins N47 / N47S D20

1st groove		
End clearance	mm	0,20...0,30
Side clearance	mm	0,13...0,17
2st groove		
End clearance	mm	0,30...0,45
Side clearance	mm	0,06...0,10
3rd groove		
End clearance	mm	can't be measured
Side clearance	mm	can't be measured

11 25 Pistons with Rings and Pins N47 / N47S D20

Piston and pin are paired to each other - replace together only.		
Piston diameter at measuring point "A"	mm	15,5
Original (new dimension)	mm	83,95 ... 83,97
Repair stage (new dimension)	mm	%
Oversize (new dimension)	mm	84,20 ... 84,22
Piston installation clearance (piston new)	mm	0,03...0,07
Piston installation clearance (piston worn)	mm	0,02...0,05
Permissible total wear tolerance between piston and cylinder (engine operated)	mm	0,15

11 25 Pistons with Rings and Pins N47T D20 Top power stage 1

1st groove		
End clearance	mm	0,20...0,30
Side clearance	mm	0,13...0,17
2st groove		
End clearance	mm	0,30 ... 0,45
Side clearance	mm	0,08 ... 0,12
3rd groove		
End clearance	mm	can't be measured
Side clearance	mm	can't be measured

11 25 Pistons with Rings and Pins N47T D20 Top power stage 1

Piston and pin are paired to each other - replace together only.		
Piston diameter at measuring point "A"	mm	17
Original (new dimension)	mm	83,95 ... 83,97
Repair stage (new dimension)	mm	%
Oversize (new dimension)	mm	84,20 ... 84,22
Piston installation clearance (piston new)	mm	0,03...0,17
Piston installation clearance (piston worn)	mm	0,20...0,20
Permissible total wear tolerance between piston and cylinder (engine operated)	mm	0,25

11 31 Camshaft N47 / N47S D20

Radial runout	mm	0,047 ... 0,068
Side clearance	mm	0,033... 0,150

11 31 Camshaft N47T D20 Top power stage 1

Radial runout	mm	0,047 ... 0,068
Side clearance	mm	0,033... 0,150

11 40 Oil supply E81 / E82 / E87 / E88 / E84 / N47 D20

Oil grades and consumption: see recommended engine oils for BMW Group engines		
Filling capacity, engine oil change with oil filter element	Liter	5,20

11 41 Oil pump with strainer and motor N47 / N47S D20

Oil pressure at idle speed with engine at operating temperature	min bar	1,3
Control pressure with engine at operating temperature	bar	4,0 ... 6,0

11 41 Oil pump with strainer and motor N47T D20 Top power stage 1

Oil pressure at idle speed with engine at operating temperature	min bar	1,1
Control pressure with engine at operating temperature	bar	3,2... 6,0