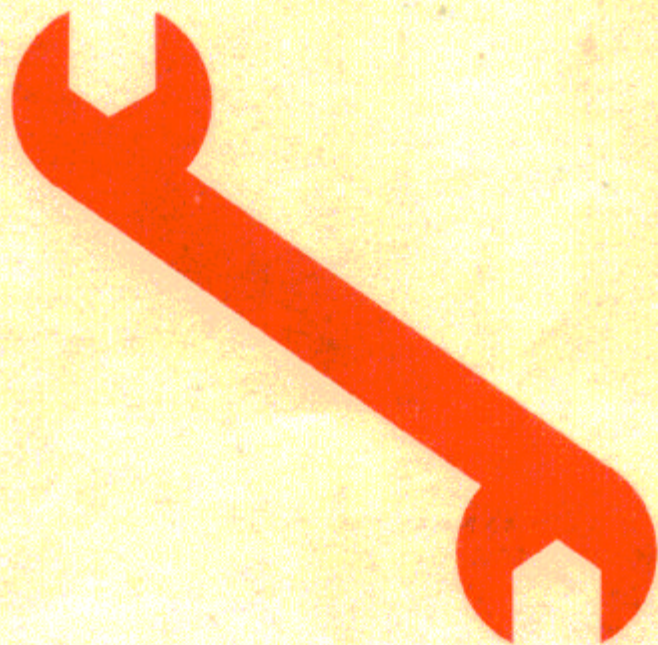




Change to types of engines		Year	77 - 79	76 - 79	77 - 86	79 - 86	76 - 82	79 - 86	
		Model	728	730	728 i	732 i	733 i	735 i	
	ECE - Models with Mechanical transmission	Engine Type	M30 B 28	M30 B 30 M	M30 B 28	M30 B 32	M30 B 32	M30 B 34	
	ECE - Models with Automatic transmission	Year	77 - 79	76 - 79	77 - 86	79 - 86	76 - 82	79 - 86	79 - 86
		Model	728 A	730 A	728 i A	732 i A	733 i A	735 i A	745 i A
		Engine Type	M30 B 28	M30 B 30 M	M30 B 28	M30 B 32	M30 B 32	M30 B 34	M102 turbo
								M30 B 35 M	M106 turbo
	US - Models	Year	77 - 84	77 - 84	84 - 86	84 - 86			
		Model	733 i	733 i A	735 i	735 i A			
		Engine Type	M30 B 32	M30 B 32	M30 B 34	M30 B 34			
					M30 B 35M	M30 B 35 M			
	Japanese - Models	Year	78 - 84	84 - 86	84 - 86				
		Model	733 i A	735 i A	745 i A				
		Engine Type	M30 B 32	M30 B 34	M102 turbo				
				M30 B 35 M	M106 turbo				

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo		B34 turbo	
			Version	ECE		ECE	KAT	USA	ECE	USA	ECE		ECE	KAT	ECE		ECE
Technical Data - Engine			Unit														
11 00 ... Engine general																	
Bore		mm	86	89			89		93,4		92		89		92		
Stroke		mm	80	80			86		84		86		86		86		
Displacement	- effective	cm³	2788	2986			3210		3435		3430		3210		3430		
Compression ratio	i		9,3:1	9,2:1	9,0:1	8,1:1	9,3:1	8,4:1	9,3:1	9,2:1	9,0:1	7,0:1		8,0:1			
> Model 80								8,0:1									
Power	(to DIN 70020)	kW	135	145	135	129	145	130	160	162	155	185		185			
at		1/min	5800	5800	5500	5500		5200	5700	5700	5200		4900				
> Model 80								5200									
Idle Speed	at	1/min	800 ± 50											-	-		
Engine speed	max.	1/min	6400 ± 40					6200 ± 40					6200		6100		
Constant engine speed	max.	1/min	6000														
Torque	max.	Nm	240	275	260	260	285	265	310	315	305	380		380			
at		1/min	4200	4000	4500	4300	4000	4000	4000	4000	2600...4000		2200				
> Model 80								4200									
Compression	(approx. same value for all cylinders) - overpressure	bar	11 ÷ 12														
11 11 ... Crankcase																	
Bore	Original	mm	86,015±0,005	89,00 + 0,01			89,015 ± 0,005		93,40±0,005		92,00 + 0,01		89,015 ± 0,005		92,00 + 0,01		
Bore - intermediate size		mm	86,095±0,005	89,08 + 0,01			89,015 ± 0,005		93,48±0,005		92,08 + 0,01		89,015 ± 0,005		92,08 + 0,01		
1st ground size		mm	86,265±0,005	89,25 + 0,01			89,015 ± 0,005		93,60±0,005		92,25 + 0,01		89,015 ± 0,005		92,25 + 0,01		
2nd ground size		mm	86,515±0,005	89,50 + 0,01			89,015 ± 0,005		93,80±0,005		92,50 + 0,01		89,015 ± 0,005		92,50 + 0,01		
Surface finish		Rt (µm)	3 ... 4														
Cylinder bore out of true	- max.	mm	0,01														
Cylinder bore conicity	- max.	mm	0,01														
11 12 ... Cylinder Head																	
Cylinder head height	- machining limit	mm	128,6														
11 12 ... Valve Guides																	
Valve guide inside diameter (installed)			not available as spare part														
Standard Size		mm	8,0 H7														
- Oversize 1		mm	8,1 H7														
- Oversize 2		mm	8,2 H7														

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo		B34 turbo		
			Version	ECE		ECE	KAT	USA	ECE	USA	ECE		ECE	KAT	ECE		ECE	
Technical Data - Engine			Unit															
11 12 ... Valve seat inserts																		
Valve seat insert diameter	Intake		47,15 g6	48,15 g6	47,15 g6				48,15 g6		47,15 g6		48,15 g6					
	Oversize 0,2		47,35 g6	48,35 g6	47,35 g6				48,35 g6		47,35 g6		48,35 g6					
	Oversize 0,4		47,55 g6	48,55 g6	47,55 g6				48,55 g6		47,55 g6		48,55 g6					
Bore dia. (Distance "D")	Intake	mm	47,15 H7	48,00 H7	47,15 H7				48,00 H7		47,15 H7		48,00 H7					
	Oversize 0,2	mm	47,35 H7	48,20 H7	47,35 H7				48,20 H7		47,35 H7		48,20 H7					
	Oversize 0,4	mm	47,55 H7	48,40 H7	47,55 H7				48,40 H7		47,55 H7		48,40 H7					
Valve seat insert diameter	Exhaust		40,15 g6	40,15 g6	40,15 g6				40,15 g6		40,15 g6		40,15 g6					
	Oversize 0,2		40,35 g6	40,35 g6	40,35 g6				40,35 g6		40,35 g6		40,35 g6					
	Oversize 0,4		40,55 g6	40,55 g6	40,55 g6				40,55 g6		40,55 g6		40,55 g6					
Bore dia. (distance "D")	Exhaust	mm	40,15 H7	40,00 H7	40,15 H7				40,00 H7		40,15 H7		40,00 H7					
	Oversize 0,2	mm	40,35 H7	40,20 H7	40,35 H7				40,20 H7		40,35 H7		40,20 H7					
	Oversize 0,4	mm	40,55 H7	40,40 H7	40,55 H7				40,40 H7		40,55 H7		40,40 H7					
Valve Seat insert height	Standard Size	mm	7,5 +0,1															
	Oversize 0,2	mm	7,7 +0,1															
	Oversize 0,4	mm	7,9 +0,1															
Bore depth (distance "H")	Standard Size	mm	7,35 H11															
	Oversize 0,2	mm	7,55 H11															
	Oversize 0,4	mm	7,75 H11															
Installation temperature	Valve seat insert	°C	-150															
	Cylinder head	°C	+ 50															
			installed valve seat inserts ground flush with cyl. head plane															
Valve seat angle			°		45													
Correction angel			°		75													
Correction angel			°		15													
Valve seat width																		
			Intake	mm	1,4 ± 0,4													
			Exhaust	mm	1,7 ± 0,4													

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34	M30 B 35M		B32 turbo	B34 turbo
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	ECE
Technical Data - Engine			Unit											
11 21 ... Crankshaft and bearings (Triple Classification)														
Ground sizes of main bearing journals														
Standard size	- yellow	mm	59,987 ± 0,003											
	- green	mm	59,977 ± 0,003											
	- white	mm	59,974 ± 0,003											
Undersize 1 (U 0,25)	- yellow	mm	59,737 ± 0,003											
	- green	mm	59,73 ± 0,003											
	- white	mm	59,724 ± 0,003											
Undersize 2 (U 0,50)	- yellow	mm	59,487 ± 0,003											
	- green	mm	59,48 ± 0,003											
	- white	mm	59,474 ± 0,003											
Undersize 3 (U 0,75)	- yellow	mm	59,237 ± 0,003											
	- green	mm	59,23 ± 0,003											
	- white	mm	59,224 ± 0,003											

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo		B34 turbo	
			Version	ECE		ECE	KAT	USA	ECE	USA	ECE		ECE	KAT	ECE		ECE
Technical Data - Engine			Unit														
11 21 ... Crankshaft and bearings (Double Classification)																	
Ground sizes of main bearing journals																	
Standard size		- red	mm	60 -0,01 -0,02													
Undersize 1 (U 0,25)		- blue	mm	60 -0,02 -0,029													
		- red	mm	59,75 -0,01 -0,02													
Undersize 2 (U 0,50)		- blue	mm	59,75 -0,02 -0,029													
		- red	mm	59,50 -0,01 -0,02													
Undersize 3 (U 0,75)		- blue	mm	59,50 -0,02 -0,029													
		- red	mm	59,25 -0,01 -0,02													
		- blue	mm	59,25 -0,02 -0,029													
		- red	mm														
Crankshaft throw				80 ± 0,1				86 ± 0,1		84 ± 0,1		86 ± 0,1		86 ± 0,1			
Max permissible surface finish on bearing journals			Rt (µm)	2													
Ground sizes of crankshaft pilot bearing																	
Standard size		mm		30 +0,064 +0,025													
Oversize 1		mm		30,2 +0,064 +0,025													
Oversize 2		mm		30,4 +0,064 +0,025													
Oversize 3		mm		30,6 +0,064 +0,025													
Axial crankshaft play				0,085 . . . 0,174													
Ground sizes of conrod bearing journals																	
Standard size		mm		47,983 ± 0,008													
Undersize 1 (U 0,25)		mm		47,733 ± 0,008													
Undersize 2 (U 0,50)		mm		47,483 ± 0,008													
Undersize 3 (U 0,75)		mm		47,233 ± 0,008													
Conrod bearing play - radial			mm	0,020 ... 0,055													

Change to Overview		Engine Type	M30 B28	M30 B 30 M		M30 B 32		M30 B 34	M30 B 35M		B32 turbo	B34 turbo		
		Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	ECE	
Technical Data - Engine		Unit												
11 22 ... Flywheel														
max. axial runout measured on outside diameter		mm	0,1											
Min. flywheel thickness (distance "A")		mm	26,6 - 0,1											
11 23 ... Vibration Damper														
Radial runout max.		mm	0,2											
Axial tunout max.			0,4											
11 24 ... Connecting Rods and bearings														
Big conrod end dia.		- red	52,000 + 0,008											
		- blue	52,009 + 0,007											
Conrod bushing		- Outside dia.	mm	24,060 ... 24,1										
		- Inside dia.	mm	22 ^{+0,008} ^{+0,003}										
Deviation in parallel of conrod bores with bearing shells at distance of 150mm		mm	= 0,04											
Displacement to one side		max. °	0° 30'											
Max. deviation in weight of all connecting rods in one engine (without bearing shells)		g	± 4											
		Big end	g	± 2										
		Small end	g	± 2										

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo		B34 turbo	
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	ECE			
Technical Data - Engine			Unit														
11 25 ... Pistons																	
Weight class		- inscribed or stamped		+ or -													
Difference in weight of pistons		max.	g	10													
only use pistons of the same weight class (+ or -)																	
Identification on piston				Piston diameter and arrow for installed direction													
				up to model ' 80 also type of engine and compression ratio													
Piston - dia.	- Standard size	mm		85,97	-	88,97	88,97	93,35	88,97	93,35	91,98						
	- Intermediate size	mm		86,05	-	89,05	89,05	93,43	89,05	93,4	92,06						
	- Oversize 1 (+0,25mm)	mm		86,22	-	89,22	89,22	93,55	89,22	93,55	92,23						
	- Oversize 2 (+0,50mm)	mm		86,47	-	89,47	89,47	93,75	89,47	93,75	92,48						
Piston - dia. (KS)	- Standard size	mm		-	88,98	-	-	-	-	-	-						
	- Intermediate size	mm		-	89,06	-	-	-	-	-	-						
	- Oversize 1 (+0,25mm)	mm		-	89,23	-	-	-	-	-	-						
	- Oversize 2 (+0,50mm)	mm		-	89,48	-	-	-	-	-	-						
Piston - dia. (Alcan)	- Standard size	mm		-	88,97	-	-	-	-	91,972	-	-					
	- Intermediate size	mm		-	89,05	-	-	-	-	92,052	-	-					
	- Oversize 1 (+0,25mm)	mm		-	89,22	-	-	-	-	92,222	-	-					
	- Oversize 2 (+0,50mm)	mm		-	89,47	-	-	-	-	92,472	-	-					
Piston - dia. (Mahle)	- Standard size	mm		-	-	-	-	-	-	91,98	-	-					
	- Intermediate size	mm		-	-	-	-	-	-	92,06	-	-					
	- Oversize 1 (+0,25mm)	mm		-	-	-	-	-	-	92,23	-	-					
	- Oversize 2 (+0,50mm)	mm		-	-	-	-	-	-	92,48	-	-					
Piston installed clearance		mm		0,02 ... 0,05													
Max. total wear clearance between piston and cylinder		mm		0,15													
11 25 ... Piston Rings																	
1st Groove	- Type			plain compression ring													
	- End clearance	mm		0,2 ... 0,45													
	- Side clearance	mm		0,04 ... 0,072													
2nd Groove	- Typ	mm		taper face ring													
	- End clearance	mm		0,4 ... 0,65													
	- Side clearance	mm		0,03 ... 0,062													
3rd Groove	- Type	mm		bevelled face ring													
	- End clearance	mm		0,3 ... 0,6													
	- Side clearance	mm		0,02 ... 0,055													

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo	B34 turbo
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	ECE	
Technical Data - Engine			Unit												
11 31 ... Camshaft				single roller chain											
Drive															
Camshaft bearing play	axial	mm	0,03 ... 0,18												
	radial	mm	0,034 ... 0,075												
11 31 ... Chain Tensioner Piston															
Piston length		mm	61,8 ... 62,0												
Spring length	relaxed	mm	155,5												
11 33 ... Rocker Arms															
Radial clearance		mm	0,016 ... 0,052												
11 34 ... Valves															
Valve clearance															
Intake + exhaust valves	max. 35°C coolant temperature	mm	0,3												
	operating temperature	mm	0,35												
Valve head edge thickness															
- Machining limit	mind.	mm	1,3												
	mind.	mm	2												
Stem diam.	Standard size	mm	8,0												
	Oversize 1	mm	8,1												
	Oversize 2	mm	8,2												
Max. wear clearance between valve stem and valve guide		mm	0,8												
11 40 ... Oil Supply															
Lubrication System				forced oil circulation system											
				Pressure regulating valve in filtered oil circuit											
Oil grade and viscosity at different outside temperatures				see BMW Service Information											
Oil volume	- without filter replacement	l	5,75												
	- with filter replacement	l	6,5												
Oil consumption	max.	ltr / 100km	0,15												

Change to Overview			Engine Type	M30 B28		M30 B 30 M		M30 B 32		M30 B 34		M30 B 35M		B32 turbo		B34 turbo		
			Version	ECE		ECE	KAT	USA	ECE	USA	ECE		ECE	KAT	ECE		ECE	
Technical Data - Engine			Unit															
11 41 ... Oil pump																		
Type			Eaton (rotor oil pump)															
Oil pressure																		
- at idle speed			bar	0,5 ... 2,0														
- at maximum speed			bar	4,0 ... 6,0														
Radial play of outer rotor / pump body			mm	0,1 ... 0,15														
Axial play of rotor / pump body			mm	0,04 ... 0,1														
Inner / outer rotor clearance			mm	0,12 ... 0,20														
Length of spring relaxed			mm	68														
Distance between flange and inner rotor			mm	44,3 ± 0,1														
11 42 ... Oil Filter																		
Type			full flow oil filter															
Bypass valve opening pressure			bar	2,3 ... 2,7														
11 51 ... Water Pump																		
Gap between cover in body and impeller			mm	0,4 ... 1,2														
Distance from water pump sealing to upper edge of flange			mm	99,8														
Impeller dia.			mm	78,0														
11 52 ... Fan coupling																		
Manufacturer Holset:		Switching on max. speed (9 blades)																
		hot	1/min	2000 ... 2400														
		cold	1/min	2300 ... 2700														
		Switching on max. speed (8 blades)																
		hot	1/min	2600 ... 3400														
		cold	1/min	2900 ... 3700,														
		Axial play rotor max.	mm	0,4														
		Radial play rotor	mm	0,5														
Manufacturer Behr:		Fan speed		1/min	2000 ± 50													
		Switching on temperature		°C	75 ... 80													
		Switching off temperature		°C	65 ... 70													
		Fan dia.		mm	-													
		No. of fan blades			-													
11 53 ... Thermostat (Coolant)																		
Opening temperature		(stamped in thermostat)	°C	approx. 80														
11 65 ... Turbocharger																		
Charging pressure		- at 3000 ... 4500 rpm	bar	-										0,5 ... 0,58		0,4 ... 0,5		



Service-Information BMW Automobile



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Service-Information BMW Automobile

All Service Informations are saved in german language, please find them in the german manual.

Tightening Torques		Nm		mkp	
		from	to	from	to
Engine					
11 11 ... Engine Block					
Main bearing cap bolts (Cleaned and lubricated)		60		6	
Struts/bracing shell		20		2	
	M 10	43		4,3	
Coolant drain plug in crankcase	M 8	22		2,2	
	M 12 x 1,5	30		3	
Main oil bore plugs	M 16 x 1,5	34		3,4	
11 12 ... Cylinder Head and Cover					
Cylinder head bolts (Replaced, washed and oiled)	M10	1st Torque 58 62 5,8 6,2 20 min. setting time			
		2nd Torque 78 82 7,8 8,2 25 min. warmrunning time			
		3rd Torque angle 35° ± 5°			
Cylinder head bolts (Replaced, washed and oiled)	M12	1st Torque 50 5 0			
		2nd Torque 80 8 0 15 min. setting time			
		3rd Torque 100 10 0			
Cylinder head cover	M 6	10		1	
	M 7	15		1,5	
Timing case to cylinder head	M 7	15		1,5	
	M 8	20		2	

Tightening Torques			Nm		mkp	
			from	to	from	to
Engine						
11 13 ... Oil pan						
Oil drain plug		SW 17 M 12 x 1,5	35		3,5	
		SW 19 M 22 x 1,5	60		6	
11 14 ... Housing covers						
Timing chain cover, upper and lower		M 6	10		1	
		M 8	22		2,2	
		M 10	47		4,7	
Front/ rear end cover to engine block		M 6	10		1	
		M 8	22		2,2	
11 22 ... Flywheel						
Flywheel to crankshaft			105		10,5	
11 23 ... Vibrations Damper						
Vibration damper hub to crankshaft		M 24 x 1,5	440		44	
V-belt pulley and harmonic balancer at hub		M 8 10.9	22		2,2	
11 24 ... Connecting rods and bearings						
Rod bolts (Replaced, cleaned and lubricated)			55		5,5	
11 31 ... Camshaft						
Camshaft bearing cap		M 6	10		1	
		M 7	15		1,5	
		M 8	20		2	
Toothed-belt pulley to camshaft		M 6	10		1	
Chain sprocket to camshaft flange		M 7	15		1,5	
			145		14,5	
Chain tensioner screw plug		M 22 x 1,5	40		4	
Cylinder for chain tensor plunger		M 26 x 1,5	50		5	

Tightening Torques		Nm		mkp	
		from	to	from	to
Engine					
11 33 ... Rocker arms and bearings					
Lock screw in rocker arm	M 6	10		1	
11 41 ... Oilpump with filter screen and dribe					
Screw plug for pressure-relief valve		40		4	
Oil pump to engine block	M 8	22		2,2	
Oil pump cover	M 6	10		1	
11 42 ... Oil filter and lines					
Disposable filter (cartridge)		hand tight (acc. to manif. instr.)			
Full-flow filter element (cover)	M 8	22		2,2	
	M 10	33		3,3	
	M 12	33		3,3	
	Cover bolt	25		2,5	
Oil filter housing (line) to block	M 8	22		2,2	
Oil lubrication line to bearing and camshaft	M 6	10		1	
Oil line to cylinder head for camshaft	M 8 x 1	10			
lubrication	M 5	5		0,5	
Oil radiator oil lines to oil filter housing	M 8	22			
Oil lines to turbocharger	M 8	22			
Oil lines from turbocharger to engine block	Banjo bolt M16x1,5	40		4	
Oil line to turbocharger	Banjo bolt	25		2,5	
	Union nut	30		3	
11 51 ... Waterpump and drive					
Water pump to engine block	M 8	22		2,2	
	M 6	10		1	

Tightening Torques		Nm	mkp
		from	to
Engine			
11 52 ... Fan			
Fan clutch to water pump (union nut)	left-hand thread	40	4
11 53 ... Thermostat and connections			
Thermostat housingse	M 6	10	1
Bleed screw	M 8	8	0,8
11 61 ... Intake manifold			
Intake manifold to cylinder head	M 8	22	2,2
	M 7	15	1,5
	M 6	10	1
11 62 ... Exhaust manifold			
Exhaust manifold to cylinder head (Apply Molykote HSC paste to exhaust nuts and bolt)	M 6	10	1
	M 7	15	1,5
	M 8	22	2,2
11 65 ... Intake boost nit with control device			
Turbocharge to exhaust manifold	M10	45	4,5
Bypass valve to charge tract	M8	25	2,5
Ring nut to exhaust manifold		220	22
Bolts on recirculation valve	M6	10	1
Chatge tract to exhaust manifold	M8	22	2,2
Oil return flange to turbocharger	M8	22	2,2
Threaded plug to oil return	M16	45	4,5
Control line to bypass valve / turbocharger		30	3

Tightening Torques		Nm	mkp
		from	to
Engine			
11 66 ... Vacuum pump			
Vacuum pump to cylinder head	M 6	10	1
11 78 Emissio-control, Labda oxygen sensor			
Lambda sensor		55	5,5
11 81 Engine mounts			
Rubber bushing to front suspension subframe	M 8	22	2,2
	M 10	42	4,2
Rubber bushing to engine support bracket	M 8	22	2,2
	M 10	42	4,2
Engine support bracket to engine	M 8	22	2,2
	M 10	42	4,2