





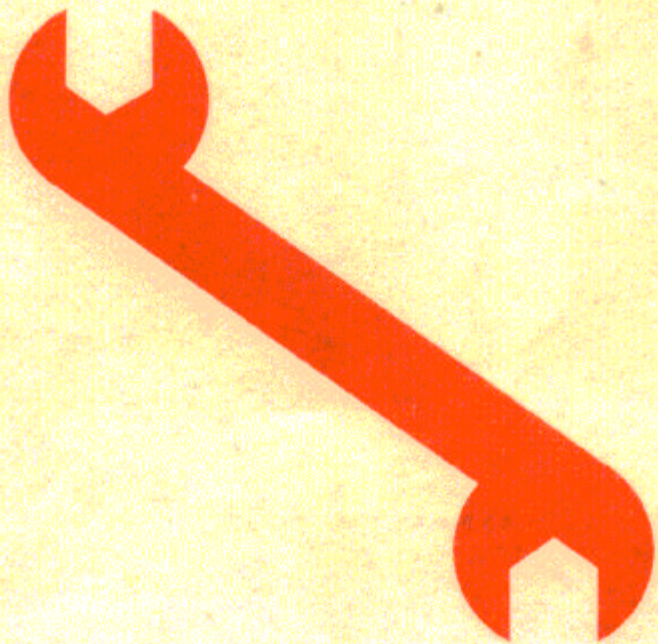
Change to types of engines

	Year	79 - 87	75 - 79	75 - 81	77 - 89	83 - 89
	Model	628 CS i	630 CS	633 CS i	635 CS i	M 6
 ECE - Models with Mechanical transmission	Engine Type	M30 B 28	M30 B 30 M	M30 B 32	M30 B 34	M 88 / 3
		-	-	-	M30 B 35 M	-

	Year	79 - 87	75 - 79	75 - 81	77 - 89	83 - 89
	Model	628 CS i A	630 CS A	633 CS i A	633 CS i A ^S	635 CS i A
 ECE - Models with Automatic transmission	Engine Type	M30 B 28	M30 B 30 M	M30 B 32		M30 B 34
		-	-	-		M30 B 35 M

 US - Models	Year	76 - 77	77 - 84	77 - 84	84 - 89	84 - 89	86 - 88
	Model	630 CS i	633 CS i	633 CS i A	635 CS i	635 CS i A	M 6
	Engine Type	M30 B 30 M	M30 B 32		M30 B 34		M 88 / 3
		-	-		M30 B 35 M		-

 Japanese - Models	Year	78 - 84	78 - 84	84 - 88	84 - 88	86 - 88
	Model	633 CS i	633 CS i A	635 CS i	635 CS i A	M 6
	Engine Type	M30 B 32		M30 B 34		M 88 / 3
		-		M30 B 35 M		-



Change to Overview			Engine Type	M30 B28				M30 B 30 M				M30 B 32		M30 B 34		M30 B 35 M		M 88 / 3	
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT			
Technical Data - Engine			Unit																
11 00 ... Engine in General																			
Bore		mm	86	89				89				93,4		92		93,4			
Stroke		mm	80	80				86				84		86		84			
Displacement	- effective	cm ³	2788	2986				3210				3435		3430		3453			
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	10,5:1	9,8:1						
	> Model 80		-						8,0:1		-								
Power	(to DIN 70020)	kW	135	145	135	129	145	130	160	162	155	210	191						
	at	1/min	5800	5800		5500	5500		5200	5700	5700	6500							
	> Model 80		-					5200		-									
Idle Speed	at	1/min	800 ± 50										-						
Engine speed	max.	1/min	6400 ± 40					6200 ± 40					6900						
Constant engine speed	max.	1/min	6000										6500						
Torque	max.	Nm	240	275	260	260	285	265	310	315	305	340	330						
	at	1/min	4200	4000		4500	4300	4000	4000	4000	4000	4500							
	> Model 80		-					4200		-									
Compression	(approx. same value for all cylinders) - overpressure	bar	11 ÷ 12										10 ÷ 11						
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		93,40±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		93,45±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		93,60±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		93,80±0,01				
Surface finish		Rt (µm)	3 . . . 4																
Cylinder bore out of true	- max.	mm	0,01										± 0,005						
Cylinder bore conicity	- max.	mm	0,01																
11 12 ... Cylinder Head																			
Cylinder head height	- machining limit	mm	128,6										96 ± 0,03						
Volume of combustion chamber with Valves and spark plug	- machining limit	cm ³	-										43 ± 0,5						

Change to Overview

			Engine Type	M30 B28	M30 B 30 M			M30 B 32		M30 B 34		M30 B 35 M		M 88 / 3	
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT	
Technical Data - Engine			Unit												
11 12 ... Valve Guides															
Valve guide diameter	Standard Size	mm											12,00 x 6		
	- Oversize 1	mm											12,20 x 6		
	- Oversize 2	mm											12,40 x 6		
Bore diameter	Standard Size	mm											12,00 H7		
	- Oversize 1	mm											12,20 H7		
	- Oversize 2	mm											12,40 H7		
Overall length		mm											45,0		
Valve guide inside diameter (installed)				not available as spare part											
	Standard Size	mm											8,0 H7		7,0 H7
	- Oversize 1	mm											8,1 H7		7,1 H7
	- Oversize 2	mm											8,2 H7		7,2 H7
11 12 ... Valve seat inserts															
Valve seat insert diameter	Intake		47,15 g6	48,15 g6	47,15 g6				48,15 g6		40,15 g6				
	Oversize 0,2		47,35 g6	48,35 g6	47,35 g6				48,35 g6		40,30 g6				
	Oversize 0,4		47,55 g6	48,55 g6	47,55 g6				48,55 g6		40,45 g6				
Bore dia. (Distance "D")	Intake	mm	47,15 H7	48,00 H7	47,15 H7				48,00 H7		40,00 H7				
	Oversize 0,2	mm	47,35 H7	48,20 H7	47,35 H7				48,20 H7		40,15 H7				
	Oversize 0,4	mm	47,55 H7	48,40 H7	47,55 H7				48,40 H7		40,30 H7				
Valve seat insert diameter	Exhaust		40,15 g6	40,15 g6	40,15 g6				40,15 g6		36,15 g6				
	Oversize 0,2		40,35 g6	40,35 g6	40,35 g6				40,35 g6		36,45 g6				
	Oversize 0,4		40,55 g6	40,55 g6	40,55 g6				40,55 g6		36,75 g6				
Bore dia. (distance "D")	Exhaust	mm	40,15 H7	40,00 H7	40,15 H7				40,00 H7		36,00 H7				
	Oversize 0,2	mm	40,35 H7	40,20 H7	40,35 H7				40,20 H7		36,30 H7				
	Oversize 0,4	mm	40,55 H7	40,40 H7	40,55 H7				40,40 H7		36,60 H7				
Valve Seat insert height	Standard Size	mm											7,5 +0,1		7,00 -0,02
	Oversize 0,2	mm											7,7 +0,1		7,15 -0,02
	Oversize 0,4	mm											7,9 +0,1		7,30 -0,02
Bore depth (distance "H")	Standard Size	mm											7,35 H11		7,20 ± 0,01
	Oversize 0,2	mm											7,55 H11		7,35 ± 0,01
	Oversize 0,4	mm											7,75 H11		7,50 ± 0,01
Installation temperature	Valve seat insert	°C	-150												
	Cylinder head	°C											+ 50		+ 150
				installed valve seat inserts ground flush with cyl. head plane											
Valve seat angle		°	45												
Correction angel		°											75		60
Correction angel		°											15		35
Valve seat width	Intake														
	Exhaust	mm											1,4 ± 0,4		1,2 ± 0,1
	Auslaß	mm											1,7 ± 0,4		1,4 ± 0,1

Change to Overview			Engine Type	M30 B28	M30 B 30 M			M30 B 32		M30 B 34	M30 B 35 M		M 88 / 3	
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT
Technical Data - Engine			Unit											
11 12 ... Timing Case														
Camshaft bearings	Bore dia.	mm	-									30	+0,020	+0,007
Bucket tappets	Bore dia.	mm	-									35	+0,016	
tappet clearance		mm	-									0,025 ... 0,066		
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 32		M30 B 34		M30 B 35 M		M 88 / 3	
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT	
Technical Data - Engine			Unit												
11 21 ... Crankshaft and bearings (Double Classification)															
Ground sizes of main bearing journals															
Standard size - red			mm					60		-0,01					
- blue			mm					60		-0,02					
Undersize 1 (U 0,25)															
- red			mm					59,75		-0,01					
- blue			mm					59,75		-0,02					
Undersize 2 (U 0,50)															
- red			mm					59,50		-0,01					
- blue			mm					59,50		-0,02					
Undersize 3 (U 0,75)															
- red			mm					59,25		-0,01					
- blue			mm					59,25		-0,02					
Crankshaft throw															
			80 ± 0,1				86 ± 0,1		84 ± 0,1		86 ± 0,1		84 ± 0,1		
Max permissible surface finish on bearing journals			Rt (µm)	2											
Ground sizes of crankshaft pilot bearing															
- Standard size			mm					30		+0,064					
- Oversize 1			mm					30,2		+0,064					
- Oversize 2			mm					30,4		+0,064					
- Oversize 3			mm					30,6		+0,064					
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

Change to Overview			Engine Type	M30 B28	M30 B 30 M			M30 B 32		M30 B 34	M30 B 35 M		M 88 / 3		
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT	
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 runout max.		mm	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 35 M		M 88 / 3		
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT	
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	-	93,35						
	- Intermediate size	mm	86,05	-	89,05	89,05	93,43	-	93,4						
	- Oversize 1 (+0,25mm)	mm	86,22	-	89,22	89,22	93,55	-	93,55						
	- Oversize 2 (+0,50mm)	mm	86,47	-	89,47	89,47	93,75	-	93,75						
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									0,03 ... 0,06			
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									0,3 ... 0,55			
	- Flankenspiel	mm	0,04 ... 0,072									0,06 ... 0,09			
2nd Groove	- Typ	mm	taper face ring												
	- End clearance	mm	0,4 ... 0,65									0,3 ... 0,55			
	- Flankenspiel	mm	0,03 ... 0,062									0,06 ... 0,09			
3rd Groove	- Type	mm	bevelled face ring										oil scraper ring		
	- End clearance	mm	0,3 ... 0,6									0,25 ... 0,5			
	- Flankenspiel	mm	0,02 ... 0,055									0,02 ... 0,05			

Change to Overview			Engine Type	M30 B28	M30 B 30 M	M30 B 32	M30 B 34	M30 B 35 M	M 88 / 3				
			Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE
Technical Data - Engine			Unit										
11 31 ... Camshaft													
Drive			single roller chain										
Camshaft bearing play	axial	mm	0,03 ... 0,18								0,1 ... 0,15		
	radial	mm	0,034 ... 0,075								0,027 ... 0,053		
11 31 ... Chain Tensioner Piston													
Piston length		mm	61,8 ... 62,0								-		
Spring length	relaxed	mm	155,5								159 ± 0,5		
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	- Intake	mind. mm	1,3								0,5		
	- Exhaust	mind. mm	2								0,95		
Stem diam.	Standard size	mm	8,0								7,0		
	Oversize 1	mm	8,1								7,1		
	Oversize 2	mm	8,2								7,2		
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								5,0		
	- with filter replacement	l	6,5								5,75		
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 35 M		M 88 / 3	
		Version	ECE	ECE	KAT	USA	ECE	USA	ECE	ECE	KAT	ECE	KAT
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 surface 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								-		
Manufacturer Holset:		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											
Fan speed		1/min	2000 ± 50								2400 ± 100		
Switching on temperature		°C	75 ... 80								82 ± 4		
Switching off temperature		°C	65 ... 70								= 60		
Fan dia.		mm	-								420		
No. of fan blades			-								9		
11 53 ... Thermostat (Coolant)													
Opening temperature (stamped in thermostat)		°C	approx. 80										



Service-Information BMW Automobile



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