

Telephone:
Fax:
VAT Registration No.:

Name:		Manufacturer:	BMW
Address:		Model:	e38
		Year:	1996
		Registration:	
Tel - Private:		Mileage:	
Tel - Business:		Job number:	

Vehicle identification				
Notes			Specified value	Measured value
	No. of cylinders	Type	12/OHC	
	Capacity (Fiscal)	cc	5379	
	Compression ratio	:1	10,0	
	Suitable for unleaded petrol		Yes	
	Minimum octane rating	RON	95	
	Ignition system	Make	Bosch	
	Ignition system	Type	Motronic M5.2.1	
	Ignition system	Description	Map-i	
	Trigger location		Crankshaft	
	Fuel system	Make	Bosch	
	Fuel System	Type	Motronic M5.2.1	
	Fuel System	Description	MFI-s	
	Air metering	Type	Mass	
	Combined ignition and fuel ECM		Yes	
	Diagnostic socket		Yes	

Ignition system				
Notes			Specified value	Measured value
	Ignition coil supply voltage	+ with ballast V	12,0	
	Primary resistance	Ohm	0,5-0,37	
	Secondary resistance	Ohm	6000-9000	
65	Firing order			

Tuning and emissions				
Notes			Specified value	Measured value
	Ignition timing - basic BTDC	°Engine/rpm	Not adjustable	
	Ignition advance checks	°Engine/rpm	ECM Controlled	
	Idle speed	rpm	600±50 Not adjustable	
	Idle speed - alternative	rpm	AC=700±50 Not adjustable	
	Oil temperature for CO test	°C	60	
	CO level at idle speed - tailpipe	Vol. % CO	0,5 Max Not adjustable	
	HC level at idle speed	ppm	100	
	CO2 level at idle speed	Vol. % CO2	14,5-16	
	O2 level at idle speed	Vol. % O2	0,1-0,5	
	Increased idle speed for CO test	rpm	2500-3000	
	CO content at increased idle speed	Vol. %	0,3	
	Lambda at increased idle	λ	0,97-1,03	

Spark plugs				
Notes			Specified value	Measured value
	Spark plugs	Original equipment	Bosch	
	Spark plug	Type	F9LCR	
	Electrode gap	mm	0,8	
	Spark plugs	Make	Beru	
	Spark plug	Type	UXF79	
	Spark plugs	Make	Bosch	
	Spark plug	Type	F9LCR	
	Electrode gap	mm	0,8	
	Spark plugs	Make	Champion	
	Spark plug	Type	RC9MCC	
	Electrode gap	mm	0,8	
	Spark plugs	Make	NGK	
	Spark plug	Type	ZFR5F-11	
	Electrode gap	mm	1,1	
Fuel system				
Notes			Specified value	Measured value
	System pressure without vacuum	bar	3,5±0,02	
Service checks and adjustments				
Notes			Specified value	Measured value
	Valve clearance -INLET	mm	Hydraulic	
	Valve clearance -EXHAUST	mm	Hydraulic	
	Compression pressure	bar	10-12	
	Oil pressure	bar/rpm	0,5-4,5/600	
	Thermostat opens	°C	95	
Lubricants and capacities				
Notes			Specified value	Measured value
	Engine oil grade - cold climate	SAE	5W/30	
	Engine oil grade - moderate climate	SAE	10W/40	
	Engine oil grade - hot climate	SAE	15W/40	
	Engine oil classification	API/ACEA	SH/A2-96	
	Engine oil grade - alternative - moderate climate	SAE	10W/60 Synth.	
	Engine oil classification - alternative - moderate climate	API/ACEA	SH/A3-96	
	Engine with filter	litres	7,5	
75	Gearbox oil grade	SAE		
	Differential oil grade - rear	SAE	90W	
	Differential rear	litres	1,20	
	Brake fluid	Type	DOT 4	
	Power steering fluid	Type	Dexron II/CHF 7.1/11 S	
Tightening torques				
Notes			Specified value	Measured value
	Cylinder head instructions			
Cylinder head				
		Renew bolts	Yes	
	Stage 1	Tighten	30 Nm	
	Stage 2	Tighten	60°	
	Stage 3	Tighten	60°	
Other tightening torques				
	Main bearings	Renew bolts/nuts	Yes	
36	Main bearings	Stage 1		
	Big end bearings	Renew bolts/nuts	Yes	
	Big end bearings	Stage 1	5 Nm	
	Big end bearings	Stage 2	20 Nm+70°	
	Oil pump to cylinder block		22 Nm	
69	Sump bolts			
70	Sump drain bolt			
37	Flywheel/driveplate			

32	Crankshaft pulley/damper			
28	Camshaft sprocket/gear			
19	Camshaft carrier/cap			
18	Camshaft/rocker cover			
72	Inlet manifold to cylinder head			
73	Exhaust manifold to cylinder head			
	Spark plugs			27-33 Nm
	Front hub			290 Nm
	Rear hub			300 Nm
	Steering track rod end			65 Nm
	Brake disc to hub	Front		16 Nm
	Brake caliper to carrier	Front		30 Nm
	Brake caliper carrier to hub	Front		110 Nm
	Brake disc to hub	Rear		16 Nm
	Brake caliper to carrier	Rear		30 Nm
	Brake caliper carrier to hub	Rear		67 Nm
	Back plate to hub	Rear		65 Nm
	Road wheels			120±10 Nm

Starting and charging

Notes			Specified value	Measured value
	Battery	V/RC(Ah)	12/160 (90)	
	Maximum cranking amps	A	243-297	
	Alternator output at engine speed	A/V/rpm	140/14/3000	

Brake disc and drum dimensions

Notes			Specified value	Measured value
	Minimum disc thickness - ventilated	Front	30,4 mm	
	Minimum disc thickness	Rear	18,4 mm	
	Disc thickness variation	Front	0,010 mm	
	Disc thickness variation	Rear	0,010 mm	
	Disc runout	Front	0,20 mm	
	Disc runout	Rear	0,20 mm	
	Minimum pad thickness	Front	3 mm	
	Minimum pad thickness	Rear	3 mm	
	Minimum shoe thickness	Rear	1,5 mm	
	Handbrake travel	No. of notches	5-10	

Air conditioning

Notes			Specified value	Measured value
	Air conditioning refrigerant	Type	R134a	
87	Air conditioning refrigerant quantity	grams		
	Air conditioning oil	Type	81 229 407 724	
	Air conditioning oil quantity	cm ³	130-190	

Autodata Note 65

Firing order

1-7-5-11-3-9-6-12-2-8-4-10.

Autodata Note 75

Gearbox oil grade

Orange label with ATF oil = Dexron II D

Green label with special oil = Synthetic Mobil SCH630 (BM), part No. 81-22-9-407-305

NOTE: Never fill with synthetic or multi-grade engine oils.

Yellow label with MTF-LT-1 = no oil change necessary

In case of repair only fill with lifetime oil MTF-LT-1, part No. 83-22-9-408-942

With no label = SAE 80 (MIL-L-2105 or API-GL-4)

NOTE: Never fill with synthetic or multi-grade engine oils.

Autodata Note 36

Main bearings

Use new bolts.

M8 = 20 Nm + 45°

M10 = 20 Nm + 70°

M11 = 20 Nm + 100°.

Autodata Note 69

Sump bolts

M6 x 8,8 = 10 Nm

M6 x 10,9 = 12 Nm.

Autodata Note 70

Sump drain bolt

M12 = 25 Nm

M18 = 30 Nm

M22 = 60 Nm.

Autodata Note 37

Flywheel/Driveplate

Use new bolts and tighten to 105 Nm.

Autodata Note 32

Crankshaft damper

Use new bolt. Tighten in the following stages:

1) 100 Nm

2) 60°

3) 60°.

Autodata Note 28

Camshaft sprocket

M6 bolts = 10 Nm

M7 bolts = 15 Nm.

Autodata Note 19

Camshaft carrier/cap

M6 = 10 Nm

M7 = 15 Nm

M8 = 20 Nm.

Autodata Note 18

Camshaft/cover bolts

M6 = 10 Nm

M7 = 15 Nm.

Autodata Note 72

Inlet manifold to cylinder head

M8 = 22 Nm

M7 = 15 Nm

M6 = 10 Nm.

Autodata Note 73

Exhaust manifold to cylinder head

M6 = 10 Nm

M7 = 15 Nm

M8 = 23 Nm.

Autodata Note 87

Refrigerant quantity

94-9.98 = 1185-1235 grams

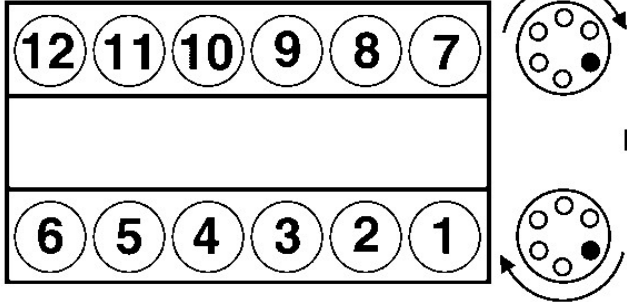
9.98→ = 670-690 grams

L7 models = 1245-1295 grams

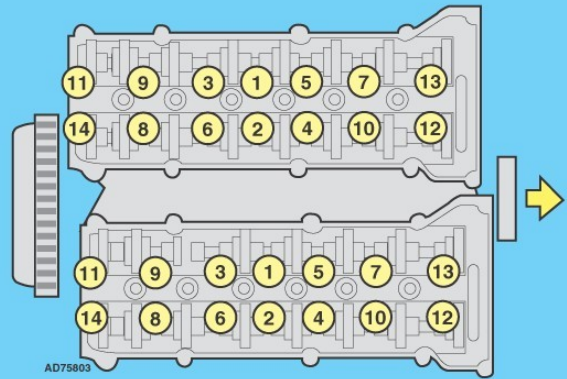
L7 models with rear AC = 1375-1425 grams.

Cylinder layout

AD75130



Tightening sequence



AD75803