


Edition: 02/2000		Technology	
>> Technical Data Booklet			

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Technical Data Booklet



1. Introduction

This Technical Data Booklet is intended to serve as reference material for workshop personnel in charge of servicing and repairing smart cars. It may be printed out, and is a supplement to the Electronic Repair Manual ERM and Electronic Parts Catalogue EPC of our Technical Information System TIS.

The Data Booklet contains the most important data and settings required for normal workshop use, arranged by component group and in tabular form.

The information was correct as at February 2000.

Therefore, please always observe the updated information in the TIS.

The greatest possible care was taken in the compilation of these data. However, we cannot assume liability for incorrect or missing information.

If you, as a member of technical workshop personnel, should discover any mistakes or have any requests regarding changes or additions to this booklet, please contact us at the address below. We will check your information and take it into consideration in our next edition.

Information on torque values:

'First tightening' refers to the tightening of new bolts/screws on new components; 're-tightening' to the tightening of used bolts/screws on used components.

MCC smart GmbH
MS/SER
Benzstrasse 14
D-71272 Renningen

Technical Data Booklet



2. General technical data

General engine data

Engine	Petrol 33 kW	Petrol 40 kW	Diesel
Designation	B02	B01	D01
Engine type/injection system	In-line 3-cylinder engine with turbocharger and Motronic injection system	In-line 3-cylinder engine with turbocharger and Motronic injection system	In-line 3-cylinder engine with turbocharger and common rail direct injection
Power (kW/bhp)	33/45	40/55	30/41
at a speed of (rpm)	5250	5250	4200
Torque (Nm)/overboost	70	80/88	100
at a speed of (rpm)	3000	2000-4500	1800-2800
No. of cylinders	3	3	3
Valves per cylinder	2	2	2
Spark plugs per cylinder	2	2	-
Displacement cc	599	599	799
Engine weight, dry (kg)	59	59	74
Top speed (km/h)	135	135	135

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2. General technical data

Service fluids

Service fluid	Specification	Quantity
Engine oil (petrol engine)	SAE 10W-40	2.7 l *
Engine oil (Diesel engine)	SAE 10W-40	2.5 l *
Petrol	Premium unleaded to EN 228 (min. 95 RON)	22 l
Diesel	Diesel to EN 590	22 l
Coolant	Ratio of anti-corrosion agent/antifreeze to water: 1:2	4.2 l
Windscreen washer	-	3 l
Refrigerant (AC)	R134a	620 g
Compressor oil (AC)	SK 20	0.180 l
Transmission oil	ATF DEXRON D-21065	1.4 l
Brake fluid	DOT 4+	0.5 l

* Refill quantity

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2. General technical data

Fuel consumption

Litres per 100 km, measured in accordance with Directive 93/116/EC

Petrol engine (B01/B02)	Softip	Softouch
Urban	5.8	5.8
Extra-urban	4.2	4.5
Total	4.8	5.0

Diesel engine (D01)	Softouch
Urban	3.8
Extra-urban	3.2
Total	3.4

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2. General technical data

Emission control/emission standard/emissions

Engine	Emission control	Emission standard	CO ₂ emissions (g/km)
Petrol	3-way catalytic converter	Euro II/D3	115 (softip) or 119 (softouch)
Diesel	Oxidising converter	Euro II/D3	≤90

Acceleration

Petrol engine (B01/B02)	Softip/40 kW (B01)	Softouch/40 kW (B01)	Softip/33 kW (B02)
0 to 60 km/h	7.0 s	7.7 s	7.2 s
0 to 100 km/h	17.2 s	17.5 s	18.9 s
60 to 100 km/h (5th gear)	11.8 s	11.8 s	14.7 s
80 to 120 km/h (6th gear)	30.3 s	30.3 s	40.3 s

Diesel engine (D01)	Softip	Softouch
0 to 60 km/h	7.8 s	8.2 s
0 to 100 km/h	19.8 s	20.8 s
60 to 100 km/h (5th gear)	13.5	
80 to 120 km/h (6th gear)	30.4	

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2. General technical data

Vehicle weight (kg)

	Petrol engine (B01/B02)	Diesel engine (D01)
Kerb weight without driver	720	730
Kerb weight with driver and service fluids	795	805
Kerb weight, dry	691	701
Maximum axle load, front	427	427
Maximum axle load, rear	610	610
Gross vehicle weight	980	990

Vehicle dimensions (mm)

	Petrol engine (B01/B02)	Diesel engine (D01)
Total length	2500	2500
Total width (without exterior rearview mirrors)	1515 / 1537*	1515
Total width (with 2 exterior rearview mirrors)	1722	1722
Height	1529 / 1549*	1549
Wheelbase	1812	1812
Track width, front	1268	1272
Track width, rear	1354	1354

* Cabrio

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3. Engine

Tightening torques of engine components

Component	Torque	Petrol engine (B01/B02)	Diesel engine (D01)
Cylinder head	First tightening	20.0 ** 27.0 **	30 Nm + 3x90°
	Re-tightening	20.0 ** 27.0 **	30 Nm + 3x90°
Cylinder head cover	First tightening	11.0	12.0
	Re-tightening	11.0	9.5
Oil pan	First tightening	12.0	12.0
	Re-tightening	9.5	9.5
Water pump (on auxiliary-unit support)	First tightening	10.0	10.0
	Re-tightening	10.0	10.0
Intake manifold	First tightening	11.0	11.0
	Re-tightening	11.0	11.0
Exhaust manifold	First tightening	4.0	15.0
	Re-tightening	4.0	15.0 *
Turbocharger	First tightening	16.0	23.0
	Re-tightening	16.0	23.0
Water drain plug	First tightening	10.0	10.0
	Re-tightening	10.0	10.0

(Values in Nm)

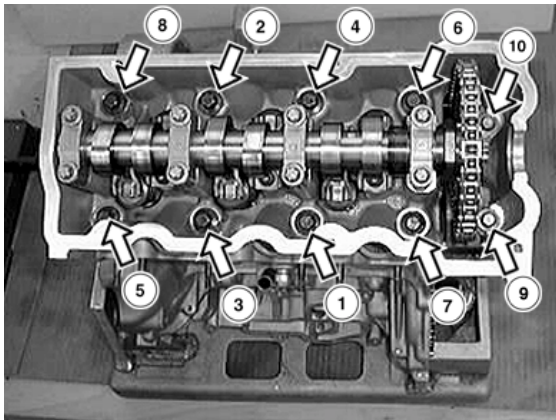
* Please read the notes in the ERM (Repair Manual) regarding installation of the exhaust gas recirculation (EGR) pipe.

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3. Engine

Tightening sequence of cylinder head bolts



Petrol engine (B01, B02)

** Bolts 1-8: 20 Nm

Bolts 9 + 10: 27 Nm

Not yet available!

Diesel engine (D01)

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3. Engine

Engine technical data

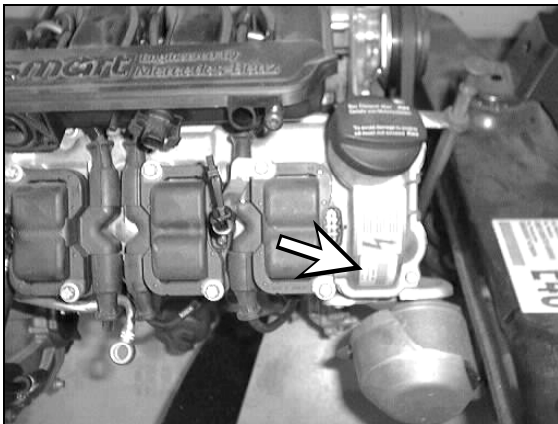
Engine	Petrol (B01, B02)	Diesel (D01)
Stroke	63 mm	79 mm
Bore	63.5	65.5
Bore/stroke ratio (s/d)	0.99	1.21
Length of connecting rod	114 mm	130 mm
Piston height	27 mm	60 mm
Distance between cylinders	73 mm	73 mm
Valve angle	Intake 9° Exhaust 9°	Intake 0° Exhaust 0°
Valve diameter	Intake: 30 mm Exhaust: 25 mm	27.6 25.3
Maximum mean pressure	16.8 bar; overboost: 18.5 bar	15.8 bar
Boost pressure control	Map-controlled	Map-controlled
Maximum boost pressure	1.8 bar; overboost: 2.0 bar	1.2 bar
Compression ratio	9.5:1	18.5:1
Compression	12 bar	18.5 bar
Fuel pressure at idle	3.2 to 3.6 bar	2 bar (low pressure) 210 ± 20 bar (high pressure)
Firing sequence	1,2,3	1,2,3

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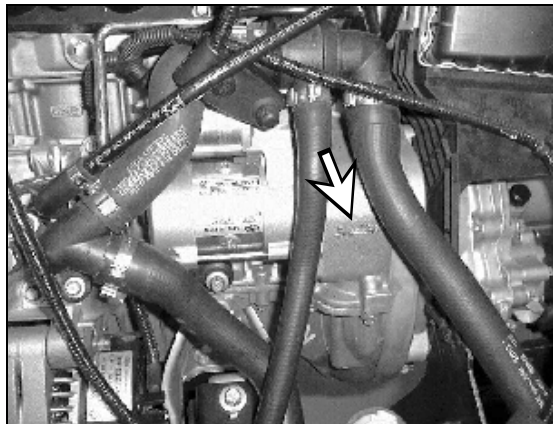


3. Engine

Location of engine identification number



Adhesive label on valve cover
(petrol and Diesel engines)



Stamped onto starter
(petrol and Diesel engines)

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3. Engine

Emissions test setpoints (petrol engine B01, B02)

Engine temperature (coolant)	80 °C
Conditioning	Unnecessary
Idle speed	750 - 950 rpm
Ignition timing	Cannot be tested
Dwell angle	Breakerless
CO at idle	< 0.5 vol.%
CO at increased idle	< 0.3/2500..2800 vol.% rpm
λ value at speed	0.97-1.03/2500...2800 λ /rpm
Test of control loop acc. to basic procedure	Cannot be performed, only acc. to substitute procedure
Change in λ value following disturbance	Cannot be performed
Disturbance at speed	Cannot be performed

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3. Engine

Setting data (petrol engine B01, B02)

Valve clearance	Hydraulic compensation
Spark plug designation	NGK - BKR6EKE
Electrode gap	0.65 ± 0.05 mm
Ignition timing	Non-adjustable
Dwell angle	Breakerless
Idle speed	Non-adjustable

Emissions test setpoints (Diesel engine)

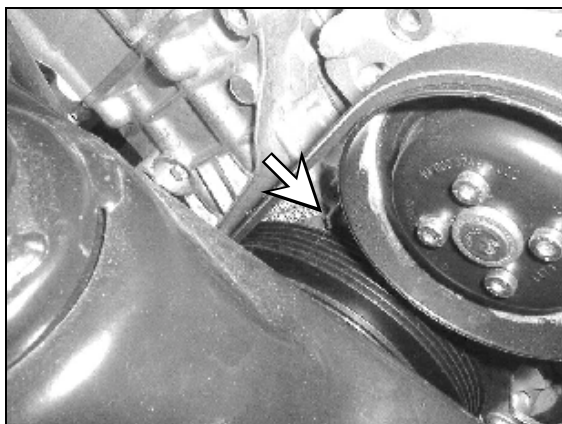
Engine temperature (coolant)	80 °C
Conditioning	Press accelerator 5x to 4000 rpm
Idle speed	720 - 920 rpm
Breakaway speed	4600 - 4900 rpm
Opacity value	Max. 1.9 m ⁻¹
Measuring time proportion (TX)	0.5 sec
Test mode	B
Probe no.	1

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3. Engine

TDC mark, petrol engine



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4. Tyres/wheels

Tyre pressure, summer tyres

Engine	Tyre size	Tyre pressure (bar)	
		Front	Rear
Petrol	135/70 R15	1.6	-
	145/65 R15	1.6	-
	175/55 R15	-	2.1*/2.5
Diesel	135/70 R15	2.0	-
	175/55 R15	-	2.5

* Model codes V, W and X only, shown as the 10th character of the vehicle identification number
(see vehicle registration document or adhesive label under insulating mat in engine compartment)

Tyre pressure, snow tyres

Engine	Tyre size	Tyre pressure (bar)	
		Front	Rear
Petrol	135/70 R15	1.6*/2.0	-
	145/65 R15	1.6	-
	175/55 R15	-	2.5
Diesel	135/70 R15	2.0	-
	175/55 R15	-	2.5

* Model codes V, W and X only, shown as the 10th character of the vehicle identification number
(see vehicle registration document or adhesive label under insulating mat in engine compartment)

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4. Tyres/wheels

Tyre pressure, spare tyre

Tyre size	Tyre pressure (bar)
115/70 R15	4.2

Tightening torques of wheel nuts

Wheel	Nm
Steel wheel	110
Alloy wheel	110

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5. Transmission

General transmission data

Type:	Automated 6-speed sequential transmission
Designation:	ASG 6
Oil fluid level	Up to lower edge of filler hole

Overall gear ratios

	Petrol engine	Diesel engine
Final drive 1st to 3rd gear	4.208	3.667
Final drive 4th to 6th gear	1.667	1.353
1st gear	14.203	12.375
2nd gear	10.310	8.983
3rd gear	7.407	6.453
4th gear	5.625	4.566
5th gear	4.083	3.315
6th gear	2.933	2.381
Reverse gear	12.888	11.569

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5. Transmission

Shift points

Upshift (km/h)*					
Accelerator position	Gearshift				
	1-2	2-3	3-4	4-5	5-6
0 %	16	22	28	42	68
50 %	22	32	42	62	82
100 %	32	44	64	100	122

Downshift (km/h)*					
Accelerator position	Gearshift				
	2-1	3-2	4-3	5-4	6-5
0 %	10	14	25	30	46
50 %	12	16	28	38	74
100 %	18	25	36	55	104

* Approximate values

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5. Transmission

Tightening torques of transmission

Component	Torque	Nm (petrol and Diesel engines)
Transmission oil filler plug	First tightening	43.0
	Re-tightening	43.0
Transmission oil drain plug	First tightening	43.0
	Re-tightening	43.0
Transmission to engine	First tightening	23.0
	Re-tightening	23.0
Engine mount to transmission	First tightening	28.0
	Re-tightening	28.0
Engine mount to multi-element support	First tightening	58.0
	Re-tightening	58.0
Starter to transmission	First tightening	23.0
	Re-tightening	23.0
Clutch release system to transmission	First tightening	10.0
	Re-tightening	10.0
Clutch module to flexplate	First tightening	20 Nm + 90°±5°
	Re-tightening	20 Nm + 90°±5°

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6. Chassis

Axle setting values

Front axle	
Camber	10'±30', Δle/ri max. 20'
Castor	7°00' ±1°00'
Toe-in per wheel	12' ±5'
Kingpin inclination	14°35' ±20'
Toe-out on turns	2°00' ±20'
Wheel offset	0' ±20'

Rear axle	
Kingpin inclination	14°35' ±20'
Toe-out on turns	2°00' ±20'
Wheel offset	0' ±20'

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6. Chassis

Tightening torques of chassis

Component	Torque	Nm
Tie-rod end to pivot bearing	First tightening	40
	Re-tightening	40
Brake calliper to pivot bearing	First tightening	115
	Re-tightening	115
Wheel bearing screws front/rear	First tightening	120
	Re-tightening	120
Front-axle shock absorber to support bearing	First tightening	60
	Re-tightening	60
Front-axle shock absorber to pivot bearing	First tightening	46
	Re-tightening	46
Rear-axle shock absorber to multi-element support	First tightening	65
	Re-tightening	65
Rear-axle shock absorber to axle tube	First tightening	65
	Re-tightening	65

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7. Belt drive

Poly-V-belt of alternator

Dimensions	
No. of ribs	5
Length	768 mm
Width	17.8 mm

Setting values	With Clavis measuring instrument	With Krikkit measuring instrument
First assembly	250 Hz	approx. 450 N
Re-assembly	240 Hz	approx. 410 N
Minimum tension	170 Hz	approx. 215 N

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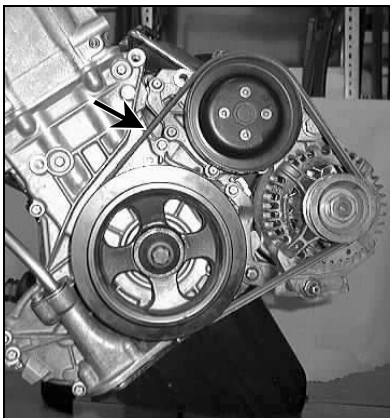
7. Belt drive

Poly-V-belt of AC compressor

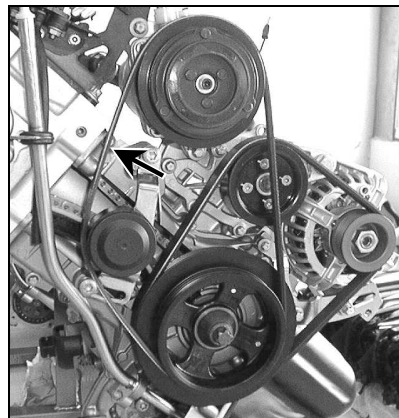
Dimensions	
No. of ribs	3
Length	852 mm
Width	10.68 mm

Setting values	With Clavis measuring instrument	With Krikrit measuring instrument
Assembly	190 Hz	approx. 400 N
Minimum tension	140 Hz	approx. 220 N

Belt drive of alternator



Belt drive of AC compressor



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8. Electrical system

Battery

Installed in:	Type
Petrol engine (without AC or antitheft)	12V - H4 36 Ah
Petrol engine (with AC or antitheft)	12V - H4 44 Ah
Petrol engine, service	12V - H4 44 Ah (dry)
Diesel engine	12V - H5 61 Ah

Alternator

Installed in:	Type
Petrol engine without AC	65 A
Petrol engine with AC	75 A
Diesel engine	85 A

Starter

Installed in:	Power (kW)
Petrol engine	0.8
Diesel engine	1.0