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Notes			Specified value	Measured value
Vehicle identification				
	No. of cylinders	Type	6/DOHC	
	Capacity (Fiscal)	cc	2771	
	Compression ratio	:1	10,6	
	Suitable for unleaded petrol		Yes	
	Minimum octane rating	RON	98	
	Ignition system	Make	Bosch	
	Ignition system	Type	Motronic M3.8.2	
	Ignition system	Description	Map-DIS	
	Trigger location		Cam / Crankshaft	
	Fuel system	Make	Bosch	
	Fuel system	Type	Motronic M3.8.2	
	Fuel system	Description	MFI-s	
	Air metering	Type	Mass	
	Combined ignition and fuel ECM		Yes	
	Diagnostic socket		Yes	
Ignition system				
	Ignition coil	Make	Bosch	
	Ignition coil supply voltage	+ with ballast V	11,0	
	Secondary resistance	Ohm	10500-12500	
	Firing order		1-4-3-6-2-5	
	Distributor (ECM)	Make	Bosch	
Tuning and emissions				
47	Tuning conditions			
	Ignition timing - basic BTDC	°Engine/rpm	Not adjustable	
	Ignition advance checks	°Engine/rpm	ECM Controlled	
	Idle speed	rpm	640-760 Not adjustable	
	Oil temperature for CO test	°C	80	
	CO level at idle speed - tailpipe	Vol. % CO	0,5 Max Not adjustable	
	CO level at idle speed - sample pipe	Vol. % CO	0,3-1,2 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	2500-2800	
	CO content at increased idle speed	Vol. %	0,3	
	Lambda at increased idle	λ	0,97-1,03	
Spark plugs				
	Spark plugs	Original equipment	Bosch	
	Spark plug	Type	F7LTCR	
	Electrode gap	mm	1,0	
	Spark plugs	Make	Beru	
	Spark plug	Type	14FGH-7DTURX	
	Electrode gap	mm	1,0	
	Spark plugs	Make	Bosch	
	Spark plug	Type	F7LTCR	

Electrode gap	mm	1,0
Spark plugs	Make	Champion
Spark plug	Type	RC10DMC
Spark plugs	Make	NGK
Spark plug	Type	BKUR6ET-10
Electrode gap	mm	1,0

Fuel system

System pressure	bar	3,8-4,2
Regulated pressure with vacuum	bar	3,2-3,8
Engine coolant temperature (ECT) sensor	Ohm/°C	330/80
Crankshaft position (CKP) sensor/engine speed (RPM) sensor	Ohm	1000
Injector	Ohm	13,5-15,5
Lambda sensor (Oxygen) heater	Ohm	1-5

Service checks and adjustments

Valve clearance -INLET	mm	Hydraulic
Valve clearance -EXHAUST	mm	Hydraulic
Compression pressure	bar	9-14
Oil pressure	bar/rpm	3-5/3000
Radiator cap	bar	1,2-1,5
Thermostat opens	°C	87

Lubricants and capacities

Engine oil options

Ambient temperature range		All temperatures
Engine oil grade	SAE	0W/30
Engine oil classification	OEM	VW 502.00
Ambient temperature range		All temperatures
Engine oil grade	SAE	5W/30, 5W/40
Engine oil classification	OEM	VW 500.00/502.00
Ambient temperature range		-35°C → 15°C
Engine oil grade	SAE	5W/30, 5W/40
Engine oil classification	OEM	VW 501.01
Ambient temperature range		All temperatures
Engine oil grade	SAE	5W/50
Engine oil classification	OEM	VW 501.01
Ambient temperature range		All temperatures
Engine oil grade	SAE	10W/30, 10W/40
Engine oil classification	OEM	VW 500.00/502.00
Ambient temperature range		-20°C → 15°C
Engine oil grade	SAE	10W/30, 10W/40
Engine oil classification	OEM	VW 501.01
Ambient temperature range		All temperatures
Engine oil grade	SAE	10W/50, 10W/60
Engine oil classification	OEM	VW 501.01
Ambient temperature range		-15°C → 40°C
Engine oil grade	SAE	15W/40, 15W/50
Engine oil classification	OEM	VW 501.01
Ambient temperature range		-15°C → 40°C
Engine oil grade	SAE	20W/40, 20W/50
Engine oil classification	OEM	VW 501.01
Engine with filter(s)	litres	5,5

Other lubricants and capacities

Manual gearbox oil grade	SAE	75W/90 Synthetic
123 Manual gearbox	litres	2,2-2,7
Automatic transmission fluid	Type	Dexron II
Automatic transmission (drain & refill)	litres	2,7-3,5
Differential oil grade - front	SAE	75W/90 Synthetic
Differential front/AT	litres	0,7-1,0 (AT)

	Differential oil grade - rear	SAE	75W/90 Synthetic
	Differential rear	litres	1,7
	Cooling system	litres	6,0
	Brake fluid	Type	DOT 4
	Brake fluid	litres	1,0
	Power steering fluid	Type	VW G 002 000
171	Power steering fluid	litres	1,0

Tightening torques

	Cylinder head instructions		
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Cylinder head

		Renew bolts	Yes
	Stage 1	Tighten	40 Nm
	Stage 2	Tighten	60 Nm
	Stage 3	Tighten	90°
	Stage 4	Tighten	90°

Other engine tightening torques

	Main bearings	Renew bolts/nuts	Yes
	Main bearings	Stage 1	60 Nm
	Main bearings	Stage 2	90°
	Big end bearings	Renew bolts/nuts	Yes
129	Big end bearings	Stage 1	
	Oil pump to cylinder block		10 Nm
	Sump bolts		10 Nm
	Sump drain bolt		30 Nm
70	Flywheel/driveplate		
	Clutch to flywheel		20 Nm
62	Crankshaft pulley/damper centre bolt		200 Nm+180°
62	Camshaft sprocket/gear		55 Nm
	Camshaft carrier/cap		10 Nm
	Camshaft/rocker cover		10 Nm
	Inlet manifold to cylinder head		10 Nm
62	Exhaust manifold to cylinder head		25 Nm
62	Exhaust downpipe to manifold		25 Nm
	Spark plugs		30 Nm
	Lambda sensor (Oxygen)		55 Nm
	Knock sensor (KS)		20 Nm

Chassis tightening torques

22	Front hub		
	Steering track rod end		50 Nm
157	Brake caliper to carrier	Front	25 Nm
156	Brake caliper carrier to hub	Front	
62	Brake caliper to carrier	Rear	35 Nm
	Brake caliper carrier to hub	Rear	65 Nm
	Back plate to hub	Rear	30 Nm
	ABS sensor	Front	10 Nm
	ABS sensor	Rear	10 Nm
	Road wheels		120 Nm

Starting and charging

	Battery	V/RC(Ah)	12/110 (63)
	Maximum cranking amps	A	170-208
	Alternator output at engine speed	A/V/rpm	65/14/2000

Brake disc and drum dimensions

	Minimum disc thickness - solid	Front	13 mm
	Minimum disc thickness - ventilated	Front	23 mm
105	Minimum disc thickness	Rear	8 mm
	Maximum drum diameter	Rear	231 mm
	Minimum pad thickness	Front	2 mm
	Minimum pad thickness	Rear	2 mm

	Minimum shoe thickness	Rear	2,5 mm	
Air conditioning				
	Air conditioning refrigerant	Type	R134a	
	Air conditioning refrigerant quantity	grams	775±25	
89	Air conditioning oil	Type		
	Air conditioning oil quantity	cm ³	275±25	

Autodata Note 47

Ignition timing, idle speed and CO level - with Cat and Lambda sensor

Use VAG 1551 or equivalent equipment and initiate basic setting mode before checks.

Autodata Note 123

Gearbox oil capacity

Transfer box = 0,8 litres

Transfer box (01F transmission) = 1,02 litres

Autodata Note 171

Power steering fluid

SLS = 2,5 litres.

Autodata Note 129

Big end bearings

M8 = 30 Nm + 90°

M8.5 = 40 Nm + 90°.

Autodata Note 70

Flywheel/drive plate

Use new bolts coated with locking fluid and tighten as follows:

Single mass flywheel = 60 Nm + 90°

Double mass flywheel = 40 Nm + 180°

Drive plate = 60 Nm + 90°.

Autodata Note 62

Use new bolts/nuts.

Autodata Note 22

Front/rear hub

190 Nm + 180° (use new bolt).

Autodata Note 157

Automatic transmission fluid - drain and refill

Multitronic 01J gearbox = 4,5-5,0 litres.

Autodata Note 156

Brake caliper to carrier

FNR caliper = 30 Nm

HP2 steel caliper = use new bolts and tighten to 25 Nm.

Autodata Note 105

Minimum disc thickness

Ventilated disc = 18 mm.

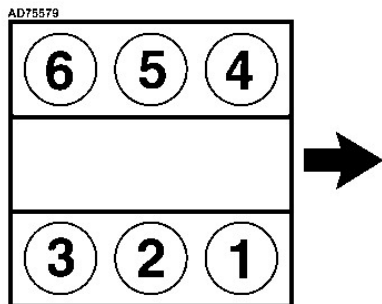
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Oil type

10.92→ Zexel = G052 154 A2

10.92→ Denso = G052 300 A2.

Cylinder layout



Tightening sequence

