

Motronic self-diagnosis

Read measured value block: Display Groups 01 to 06

Display Group 01: Basic function at idle: (coolant temperature not below +80°C)

Read measured value block 1 ⇒				◀ Display
.... rpm	15 - 28 %	5 - 10 <°	6.0 - 13.5° bef. TDC	
				Ignition timing angle: Engine code ABZ / AEW / AKG / AKJ: 6.0 - 13.5°before TDC Engine code AHC / AKH: 6.0 - 14.25°before TDC
				Throttle angle
				Engine load: Engine code ABZ / AEW / AKG / AKJ: 15 - 28 % Engine code AHC / AKH: 9 - 16 %
				Idling speed (display in increments of 40) Engine code ABZ / AKG: 720 - 800 rpm Engine code AEW / AKJ: 660 - 740 rpm Engine code AHC / AKH: 720 - 800 rpm

Test table, 01 Basic Function

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
1	Below specified value	- Engine under load from auxiliary components - Idling speed stabilisation valve -N71 sticking or defective	- Eliminate load (air conditioner, power steering etc.) - Check idling speed stabilisation =>Page 24-53
	Above specified value	- Idling switch -F60 not closed/defective - Large volume of unmetered air (cannot be compensated by idling speed stabilisation)	- Check/adjust idling switch =>Page 24-59 - Eliminate unmetered air

Test table, 01 Basic Function

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
2	Below specified value	- Lower values can only occur when driving in overrun	
	Above specified value	- Poor idling (not running on all cylinders) - Air mass meter -G70 defective - Idling speed stabilisation valve -N71 defective - Electrical consumers on - Steering wheel at full lock - Gear engaged (automatic gearbox)	- Injector or spark plugs defective - Interrogate fault memory => Page 01-7 - Check idling speed stabilisation =>Page 24-53 - Switch off consumers - Set steering wheel to centre position - Set selector lever to P or N

Test table, 01 Basic Function

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
3	Below 5 <°	- Throttle valve potentiometer -G69 defective or incorrectly adjusted - Throttle cable adjustment	- Interrogate fault memory => Page 24-88 - Adjust throttle cable
	Above 10 <°	- Throttle valve potentiometer -G69 defective or incorrectly adjusted - Throttle valve sticking - Throttle cable adjustment	- Interrogate fault memory => Page 24-88 - Eliminate cause - Adjust throttle cable

Test table, 01 Basic Function

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
4	Below specified value	- Idling speed stabilisation valve -N71 sticking or at stop due to unmetered air	- Carry out final control diagnosis =>Page 24-53
	Above specified value	- Idling speed stabilisation valve -N71 sticking	- Carry out final control diagnosis =>Page 01-79

		- Check idling speed stabilisation =>Page 24-53
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Display Group 02: Basic Function at idle: (coolant temperature not below +80°C)

Read measured value block 2			⇒	◀ Display
.... rpm	15 - 28 %	3.9 - 6.5 g/s	6.0 - 13.5° bef. TDC.	
			Ignition timing angle: Engine code ABZ / AEW / AKG / AKJ: 6.0 - 13.5°before TDC Engine code AHC / AKH: 6.0 - 14.25°before TDC	
			Inducted air mass: Engine code ABZ / AKG: 3.9 - 6.5 g/s Engine code AEW / AKJ: 3.4 - 6.5 g/s Engine code AHC / AKH: 3.9 - 7.1 g/s	
			Engine load: Engine code ABZ / AEW / AKG / AKJ: 15 - 28 % Engine code AHC / AKH: 9 - 16 %	
Idling speed (display in increments of 40)				

Test table, Display Group 02

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
1		- See Display Group 01, - Display zone 1 => Page 01-100	

Test table, Display Group 02

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
2		- See Display Group 01, Display zone 2 => Page 01-100	

3	Below specified value	- Large volume of unmetered air between intake manifold and air mass meter	- Eliminate unmetered air
	Above specified value	- Engine under load from auxiliary components	- Switch off loads (air conditioner, electrical consumers, power steering)
4	Below specified value	- Idling speed stabilisation valve -N71 sticking or at control limit due to unmetered air	- Carry out final control diagnosis =>Page 24-53
	Above specified value	- Idling speed stabilisation valve -N71 sticking	- Carry out final control diagnosis =>Page 24-53

Display Group 03, Basic Function (idling)

Read measured value block 3 ⇒				◀ Display
....	11 - 14.5	85 - 105		
rpm	V	°C	°C	
				Intake air temperature
				Coolant temperature
				Battery voltage
				Idling speed (display in increments of 40)

Test table, Display Group 03

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
1		- See Display Group 01, Display zone 1 => Page 01-100	
2	Below 11 V	- Alternator defective, battery flat - Contact resistance in power supply or earth connection for engine control unit - Power consumption with ignition off	- Check voltage, charge battery - Check power supply relay -J271 for engine control unit => Page 24-84 - Eliminate power consumption

Test table, Display Group 03

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
2	Above specified value	- Voltage regulator on alternator defective - Overvoltage due to jump-starting or fast-charger	- Check voltage and replace voltage regulator if necessary - Interrogate fault memory =>Page 01-7
3	Above specified value	- Radiator dirty - Radiator fan not functioning - Thermostat defective - Coolant temperature sender or wiring to engine control unit	- Clean radiator - Check function - Replace thermostat - Check coolant temperature sender -G62 => Page 24-101
4	Constant 20°C	- Substitute value when fault detected on air intake temperature sender -G42	- Interrogate fault memory => Page 24-105

Display Group 04: Basic Function at idle (coolant temperature not below +80°C)

Read measured value block 4			⇒	◀ Display
5 - 10 <°	0 <°	 ms	Idle	
Operating state (idle, part throttle, full throttle, enrichment, overrun)				
Engine load (injection duration):				
Engine code ABZ / AEW / AKG / AKJ: 2.5 - 3.5				
Engine code AHC / AKH: 1.5 - 3.5				
Throttle angle (learned)				
Throttle angle (absolute)				

Test table, Display Group 04

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
1			- Check and adjust throttle valve potentiometer -G69 => Page 24-88

2	Above 0 <°	- Learning process after adjustment of throttle valve potentiometer not yet completed	
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Test table, Display Group 04

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
3	Below specified value	- High fuel flow from ACF system - Wrong injectors with higher throughput installed	- Check tank breather system => Page 24-70 - Check injection rate => Page 24-25
	Above specified value	- Engine load , e.g. due to electrical consumers, air conditioner or power steering - Fuel pressure - Lambda probe - Gear engaged (autom. gearbox)	- Eliminate load - Check fuel pressure => Page 24-21 - Check lambda probe: Read measured value block, Display Group 10 and 11 => Page 01-120 - Set selector lever to P or N

Display zone	Display on V.A.G 1551	Fault cause	Fault remedy
4	Idling Part throt. Full throt. Enrich. Overrun (only possible above approx.1800 rpm)		

Display Group 05: Idling speed stabilisation at idle (coolant temperature not below +80°C)

Read measured value block 5	⇒	◀ Display
.... .. -0.2 - +0.2		

rpm	rpm	g/s	0 0 0	
				Operating conditions: 1 0 0 AC on / high cooling/heating power 0 1 0 Gear engaged (ignore display on vehicles with manual gearbox) 0 0 1 AC compressor on
				Air mass, idling speed control
				Idling speed (specified)
				Idling speed (actual - display in increments of 10)

Note on Display zone 2:

The display shows the engine speed specified by the engine control unit.

Engine code ABZ / AKG: Idling speeds (rpm)

Gear selector lever	AC requirement (signal)	AC compressor ON	Rear window heater	Idling speed
Neutral	---	Off	Off	approx. 760
Neutral	On	Off	Off	approx. 800
Neutral	---	On	Off	approx. 760
Neutral	---	Off	On	approx. 760
Neutral	---	On	On	approx. 760
Gear engaged	---	Off	Off	approx. 600
Gear engaged	On	Off	Off	approx. 700
Gear engaged	---	On	Off	approx. 700
Gear engaged	---	Off	On	approx. 700
Gear engaged	---	On	On	approx. 700

Note:

Example: If a gear is selected and the air conditioner and the rear window heater are off, the idling speed is approx. 600 rpm. If the rear window heater

is then switched on, the idling speed will remain at approx. 600 rpm and will only adjust to the value specified in the table when the accelerator is pressed briefly.

Engine code AHC/AKH: Idling speed for vehicles with manual gearbox approx. 760 rpm.

Engine code AEW/AKJ: Idling speeds (rpm)

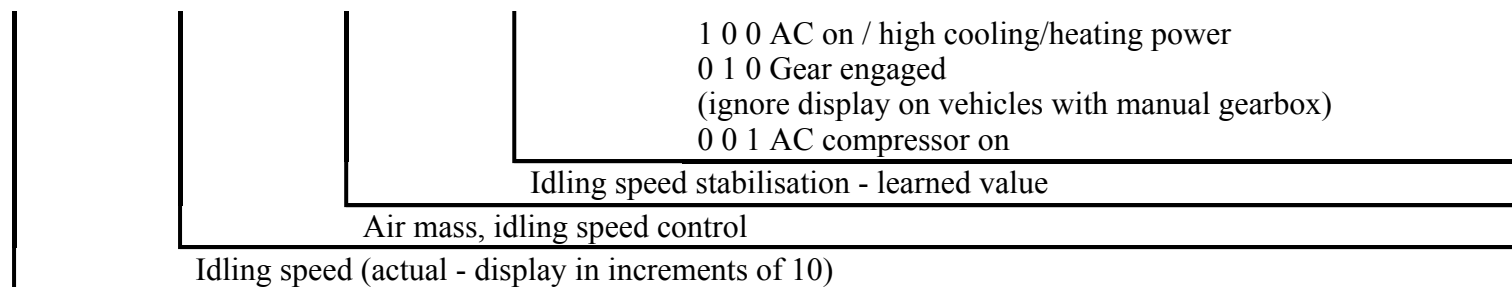
Gear selection	AC requirement (signal)	AC compressor ON	Rear window heater	Idling speed
Neutral	---	Off	Off	approx. 700
Neutral	On	Off	Off	approx. 830
Neutral	---	On	Off	approx. 700
Neutral	---	Off	On	approx. 700
Neutral	---	On	On	approx. 830
Gear engaged	---	Off	Off	approx. 600
Gear engaged	On	Off	Off	approx. 700
Gear engaged	---	On	Off	approx. 700
Gear engaged	---	Off	On	approx. 700
Gear engaged	---	On	On	approx. 700

Note:

Example: If a gear is selected and the air conditioner and the rear window heater are off, the idling speed is approx. 600 rpm. If the rear window heater is then switched on, the idling speed will remain at approx. 600 rpm and will only adjust to the value specified in the table when the accelerator is pressed briefly.

Display Group 06: Idling speed stabilisation at idle (coolant temperature not below +80°C)

Read measured value block 6 ⇒			◀ Display
....	-0.4 - +0.4	-1.4 - +1.4	0 0 0
rpm	g/s	g/s	
Operating conditions:			



Note on Display zone 2:

The varying load conditions at idle alter the quantity of idling air required at constant engine speed. The display shows the change in idling air flow. As soon as this change is compensated by the idling speed stabilisation learning process, the mean value is once again set. The degree of variation from the mean depends on the amount of load change (e.g. switching electrical equipment on and off). The learning process is performed in small steps each time the idling switch is closed. For large variations, several steps are required. To achieve this, the accelerator pedal must be pressed briefly at intervals of approximately 10 seconds to open and close the idling switch. Each press causes a further stage of the learning process to be performed.

Note on Display zone 3:

The display shows how far the idling speed stabilisation has moved away from the design mean as a result of learning. In a new engine the figure is in the positive range due to the higher internal friction; in an engine which has been run-in the figure is in the negative range. Values of -1.4 g/s in conjunction with values in Display zone 2 which are too low indicate unmetered air.