



Refer to Parts Microfiche Gr. 54 to identify control modules.

**Engine 104.995**

Engine	104.995
Models	210.055
HFM-SFI system designation	4.1
<b>Closed throttle position (CTP), check, adjust</b> (07-2053 or 07-2056) <sup>12)</sup>	
Engine oil temperature .....	°C >60
Selector lever position .....	P/N
ECT .....	° C approx. >80
Engine speed .....	rpm 600 – 800
Ignition timing with premium unleaded fuel (91 posted/95 RON) .....	°CKA 6 – 10 <sup>1)</sup>
On-off ratio .....	% 0±10 <sup>2)</sup>
CTP contact (accelerator pedal not depressed) .....	HHT display <b>ON</b>

- 1) The ignition timing is also used for idle speed stabilization. In extreme cases the timing can briefly vary by ±10° from specification.
- 2) In case of complaint, on-off ratio must be measured at idle speed and at 2500 rpm with purge line to engine disconnected and plugged.
- 12) Time Guide operation no. and/or SMS job no.

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Models	210.055
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<b>Engine, check, adjust</b> (07-1100) <sup>12)</sup> Page 1	
Engine oil temperature .....	° C >60
ECT .....	° C approx. >80
Engine speed (selector lever in P/N position) .....	rpm 600 – 800
Injection duration .....	ms 2.5 – 3.8
Air mass .....	kg/h 15 – 18
Battery voltage .....	V 10
O2S 1 voltage .....	mV –200 to +1000 <sup>10)</sup>
O2S 1 heater .....	HHT display <b>ON</b>
O2S 2 voltage .....	mV –200 to +1000 <sup>10)</sup>
O2S 2 heater .....	HHT display <b>ON</b>
WOT (accelerator pedal in WOT) .....	HHT display <b>ON</b>
Fuel shut-off .....	HHT display <b>OFF</b>
Self adaptation .....	HHT display <b>OFF/ON</b> <sup>13)</sup>
Self adaptation idle air .....	kg/h 0±2 <sup>4)</sup>
Self adaptation lower range of part load .....	Factor 0.85 – 1.15 <sup>5)</sup>
Ignition timing .....	°CKA 6 – 10 <sup>1)</sup>
Throttle valve angle .....	° 0.3 – 1.8
MAF sensor voltage (increasing rpm, increasing voltage) .....	V 0.8 – 1.3
On-off ratio .....	% 0±10 <sup>2)</sup>
Purge valve on-off ratio .....	% 10±5

- 1) The ignition timing is also used for idle speed stabilization. In extreme cases the timing can briefly vary by ±10° from specification.
- 2) In case of complaint, on-off ratio must be measured at idle speed and at 2500 rpm with purge line to engine disconnected and plugged.
- 4) Base setting idle, 0.0 kg/h (Bosch) or 0.0% (VDO), mixture tendency **rich**, < 0.0 kg/h or 0.0%, mixture tendency **lean** > 0.0 kg/h or 0.0%.
- 5) Base setting part load = 1.0, mixture tendency **rich** <1.0 mixture tendency **lean** > 1.0.
- 10) Oscillates around 300mV after 2 minutes at idle.
- 12) Time Guide operation no. and/or SMS job no.
- 13) HHT display ON if self adaptation is required.

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<b>Engine, check, adjust</b> (07-1100) <sup>12)</sup>	Page 2
Camshaft adjustment solenoid <2000 rpm	HHT display <b>OFF</b>
Camshaft adjustment solenoid >2000 rpm	HHT display <b>ON</b>
Camshaft adjustment solenoid >4000 rpm	HHT display <b>OFF</b>
Intake manifold switchover valve CTP	HHT display <b>OFF</b>
Intake manifold switchover valve >4000 rpm	HHT display <b>ON</b>
DTC counter ignition cylinders 1 – 6	Count 0
DTC counter ignition coil T1/1, cylinders 2/5	Count 0
DTC counter ignition coil T1/2, cylinders 3/4	Count 0
DTC counter ignition coil T1/3, cylinders 1/6	Count 0
Spark duration ignition coil T1/1, cylinders 2/5	ms 1.5 – 1.9
Spark duration ignition coil T1/2, cylinders 3/4	ms 1.5 – 1.9
Spark duration ignition coil T1/3, cylinders 1/6	ms 1.5 – 1.9
Spark voltage ignition coil T1/1, cylinders 2/5 <sup>11)</sup>	V 34 – 37
Spark voltage ignition coil T1/2, cylinders 3/4 <sup>11)</sup>	V 34 – 37
Spark voltage ignition coil T1/3, cylinders 1/6 <sup>11)</sup>	V 34 – 37
Knock control approved	HHT display <b>OFF/ON</b> <sup>14)</sup>
Knock ignition angle, cylinders 1 – 6	°CKA 0

11) Display only on Bosch control modules.  
 12) Time Guide operation no. and/or SMS job no.  
 14) HHT display ON if knock control is required.

**Engine 104.995**

Engine	104.995
Models	210.055
HFM-SFI system designation	4.1
<b>Cold start</b> (07-2321) <sup>12)</sup>	
Starter signal circuit 50, during cranking .....	HHT display <b>ON</b>
Battery voltage .....	V 10
ECT at starting .....	° C <sup>7)</sup>
ECT .....	° C <sup>7)</sup>
After start enrichment < 70° C maximum of 20 seconds .....	HHT display <b>ON</b>
IAT .....	° C <sup>7)</sup>
CTP contact (accelerator pedal not depressed) .....	HHT display <b>ON</b>

<sup>7)</sup> Temperature at which complaint occurs.

<sup>12)</sup> Time Guide operation no. and/or SMS job no.

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Engine	104.995	
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<b>Warmup</b> (07-2023) <sup>12)</sup>		
Transmission selector lever position .....	P/N	D
Warmup speed (raised idle speed) <sup>15)</sup> .....	rpm	1150±100
Warmup speed (raised idle speed) temperature dependent		
ECT <0° C .....	rpm	1000±50
ECT 0 – 30° C .....	rpm	950±50      850±50
ECT 30 – 40° C .....	rpm	750±50      650±50
ECT >40° C .....	rpm	700±50      600±50
Warmup .....	HHT display	<80° C <b>ON</b> >80° C <b>OFF</b>
AIR pump after >20 seconds .....	HHT display	<b>OFF</b>
A/C compressor (not engaged) .....	HHT display	<b>OFF</b>
IAT .....	° C	>20
CTP contact (accelerator pedal not depressed) .....	HHT display	<b>ON</b>
Catalytic converter heating, idle .....	HHT display	<b>ON</b> <sup>15)</sup>

<sup>12)</sup> Time Guide operation no. and/or SMS job no.

<sup>15)</sup> Raised idle speed if ECT < =20 °C for approx. 20 seconds after start.

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Engine	104.995
Models	210.055
HFM-SFI system designation	4.1
<b>Engine performance</b> <sup>7)</sup>	Page 1
Engine speed	rpm 5300
Ignition timing with premium unleaded gasoline (91 posted/95 RON)	°CKA 20 – 24
Injection duration	ms 14 – 17
Air mass	kg/h 510 – 540
WOT recognition	HHT display <b>ON</b>
Output, 4-speed AT, TR 3	hp 162
Exhaust gas back pressure	mbar <300
Camshaft timing adjustment <2000 rpm	HHT display <b>OFF</b>
Camshaft timing adjustment >2000 rpm	HHT display <b>ON</b>
Camshaft timing adjustment >4000 rpm	HHT display <b>OFF</b>
Intake manifold switchover valve at CTP	HHT display <b>OFF</b>
Intake manifold switchover valve at >4000 rpm	HHT display <b>ON</b>
VSS	mph (km/h) > 62 (100)
Deceleration shut-off >2100 rpm	HHT display <b>OFF</b>
Transmission overload protection switch, 4-speed AT	V 3 – 5
Altitude	mbar refer to barometer
CC operation	HHT display <b>OFF</b>

<sup>7)</sup> These are minimum performance values. Do not exceed speed of 80 mph. It is not possible to simulate coolant and intake air temperature as these are determined by the HFM-SFI system. Provide adequate cooling using external fan when checking wide open throttle performance.

**Engine 104.941 as of 03/94  
Model 202**

Engine	104.941	
Models	202.028 [C 36 AMG]	
HFM-SFI system designation	3.4	
<b>Engine performance</b> <sup>7)</sup>	Page 2	
DTC counter ignition cylinders 1 – 6	Count	0
DTC counter ignition coil T1/1, cylinders 2/5	Count	0
DTC counter ignition coil T1/2, cylinders 3/4	Count	0
DTC counter ignition coil T1/3, cylinders 1/6	Count	0
Spark duration ignition coil T1/1, cylinders 2/5	ms	1.5 – 1.9
Spark duration ignition coil T1/2, cylinders 3/4	ms	1.5 – 1.9
Spark duration ignition coil T1/3, cylinders 1/6	ms	1.5 – 1.9
Spark voltage ignition coil T1/1, cylinders 2/5 <sup>11)</sup>	V	34 – 37
Spark voltage ignition coil T1/2, cylinders 3/4 <sup>11)</sup>	V	34 – 37
Spark voltage ignition coil T1/3, cylinders 1/6 <sup>11)</sup>	V	34 – 37
Knock control approved	HHT display	<b>OFF/ON</b> <sup>14)</sup>
Knock ignition angle, cylinders 1 – 6	°CKA	0

- 7) These are minimum performance values. Do not exceed speed of 80 mph. It is not possible to simulate coolant and intake air temperature as these are determined by the HFM-SFI system. Provide adequate cooling using external fan when checking wide open throttle performance.
- 11) Display only on Bosch control modules.
- 14) HHT display ON if knock control is required.

**Engine 104.995**

Engine	104.995
Models	210.055
HFM-SFI system designation	4.1
<b>On-off ratio</b>	
Idle speed .....	rpm 600 – 800
Engine speed .....	rpm 3500
On-off ratio at WOT and TR 3 .....	% 0 ± 10 constant
On-off ratio at upper partial load and TR “D”, 75 mph (120 km/h), 32 hp (24 kW) .....	% ±10 oscillates
On-off ratio at upper partial load and TR “D”, 31 mph (50 km/h), 9 hp (7 kW) .....	% ±10 oscillates
Exhaust gas back pressure .....	mbar < 300