



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

Engine 104.941/991/992/994 as of 03/94

Engine	104.941	104.991/992/994
Models	202.028	124.032/052/066/092 129.063 140.032/033
HFM-SFI system designation	3.4	3.4
Closed throttle position (CTP), check, adjust (07-2053 or 07-2056) ¹²⁾		
Selector lever position	P/N	P/N
ECT	>80 ° C approx.	>80
Engine speed	600 – 800 rpm	600 – 800
Ignition timing with premium unleaded fuel (91 posted/95 RON)	6 – 10 ¹⁾ °CKA	6 – 10 ¹⁾
On-off ratio	0±10 ²⁾ %	0±10 ²⁾
CTP contact (accelerator pedal not depressed)	HHT display ON	ON

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.

Engine 104.941/991/992/994 as of 03/94

Engine	104.941	104.991/992/994
Models	202.028	129.063 124.032/052/066/092 140.032/033
HFM-SFI system designation	3.4	3.4
Engine, check, adjust (07-1100) ¹²⁾ Page 1		
ECT ° C approx.	>80	>80
Engine speed (selector lever in P/N position) rpm	600 – 800	600 – 800
Injection duration ms	2.5 – 3.8	2.5 – 3.8
Air mass kg/h	16 – 18	16 – 18
Battery voltage V	10	10
O2S 1 voltage mV	–200 to +1000 ⁹⁾	–200 to +1000 ⁹⁾
O2S 1 heater HHT display	ON	ON
O2S 2 voltage mV	–200 to +1000 ⁹⁾	–200 to +1000 ⁹⁾
O2S 2 heater HHT display	ON	ON
Fuel shut-off HHT display	ON	ON
Self adaptation idle air kg/h	±2 ³⁾	±2 ³⁾
Self adaptation lower range of part load Factor	±15 ³⁾	±15 ³⁾
Self adaptation factor lower/upper range of part load HHT display	0.85 – 1.15 ⁴⁾	0.85 – 1.15 ⁴⁾
CTP contact (accelerator pedal not depressed) HHT display	ON	ON
WOT contact (accelerator pedal in WOT) HHT display	ON	ON

³⁾ 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%.

⁴⁾ Base setting part load = 1.0, mixture tendency **rich** <1.0 mixture tendency **lean** > 1.0.

⁹⁾ Oscillates around 300mV after 2 minutes at idle.

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

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Models	202.028	129.063 124.032/052/066/092 140.032/033
HFM-SFI system designation	3.4	3.4
Engine, check, adjust (07-1100) ¹²⁾ Page 2		
Ignition timing with premium unleaded fuel (91 posted/95 RON) °CKA	6 – 10 ¹⁾	6 – 10 ¹⁾
Throttle valve angle °	0.3 – 1.0	0.3 – 1.0
Actual value potentiometer voltage V	3 – 4.2	3 – 4.2
HFM-SFI voltage (Increasing rpm = increasing voltage) V	0.8 – 1.3	0.8 – 1.3
On-off ratio %	0 ± 10 ²⁾	0 ± 10 ²⁾
Clutch actuated HHT display	ON	ON
EA/CC/ISC actuator Output value	255	255
Purge valve on-off ratio %	10 ± 5	10 ± 5
Adjustable camshaft timing solenoid < 2000 rpm HHT display	OFF	OFF
Resonance flap >4000 rpm HHT display	ON	ON
Resonance flap idle HHT display	OFF	OFF
Ignition fault counter HHT display	0	0
Coil fault counter HHT display	0	0
Coil spark duration ms	1.5 – 1.9	1.5 – 1.9
Coil spark voltage ¹⁰⁾ V	34 – 37	34 – 37
Knock control approved HHT display	ON	ON
Knock ignition angle/cylinder °CKA	0.0	0.0

- 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.
- 10) Display only on Bosch control modules.
- 12) Time Guide operation no. and/or SMS job no.

Engine 104.941/991/992/994 as of 03/94

Engine	104.941	104.991/992/994
Models	202.028	124.032/052/066/092 129.063 140.032/033
HFM-SFI system designation	3.4	3.4
Cold start (07-2321) ¹²⁾		
Starter signal circuit 50, during cranking HHT display	ON	ON
Battery voltage V	10	10
ECT at starting ° C ⁵⁾		⁵⁾
ECT ° C ⁵⁾		⁵⁾
After start enrichment < 70° C maximum of 20 seconds HHT display	ON	ON
Engine speed rpm ⁵⁾		⁵⁾
IAT ° C	> 20	> 20
CTP contact HHT display	ON	ON

⁵⁾ Temperature at which complaint occurs.
¹²⁾ Time Guide operation no. and/or SMS job no.

Engine 104.941/991/992/994 as of 03/94

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Models	202.028		124.032/052/066/092 129.063 140.032/033	
HFM-SFI system designation	3.4		3.4	
Warmup (07-2321) ¹²⁾	P/N	D	P/N	D
Transmission selector lever position				
Warmup speed (raised idle speed) time dependent				
ECT <+20° C for approximately 20 seconds after start	rpm	1150±100	1150±100	
Warmup speed (raised idle speed) temperature dependent				
ECT <0° C	rpm	1000±50	1000±50	
ECT 0 – 30° C	rpm	950±50	850±50	950±50 850±50
ECT 30 – 40° C	rpm	750±50	650±50	750±50 650±50
ECT >40° C	rpm	700±50	600±50	700±50 600±50
Warmup	HHT display	<80° C ON >80° C OFF	<80° C ON >80° C OFF	
AIR pump after >20 seconds	HHT display	OFF	OFF	
Selector lever	HHT display	ON	ON	
A/C compressor (not engaged)	HHT display	OFF	OFF	
IAT	° C	>20	>20	
CTP contact (accelerator pedal not depressed)	HHT display	ON	ON	
Catalytic converter heating, idle	HHT display	ON	ON	
Transmission upshift delay	HHT display	ON	ON	

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

**Engine 104.992 as of 03/94
Model 124**

Engine	104.992
Models	124.032/052/066/092
HFM-SFI system designation	3.4
Engine performance ⁶⁾ (07-1203 or 07-1206) ¹²⁾	
Engine speed	rpm 5500
Ignition timing with premium unleaded gasoline (91 posted/95 RON)	°CKA 20 – 24
Injection duration	ms 14 – 17
Air mass	kg/h 580 – 620
WOT recognition	HHT display ON
Camshaft timing adjustment >2000 rpm	HHT display OFF
Intake manifold resonance flap	HHT display ON
VSS	mph (km/h) > 62 (100)
Deceleration shut-off >2100 rpm	HHT display ON
Transmission overload protection switch, TR “D” ¹¹⁾	V < 1
Altitude	mbar refer to barometer
CC operation	HHT display OFF/ON
Output, 4-speed AT, TR 3	hp 160
Ignition fault counter	HHT display 0
Coil fault counter	HHT display 0
Coil spark duration	ms 1.5 – 1.9
Coil spark voltage ¹⁰⁾	V 34 – 37
Knock ignition angle/cylinder	°CKA 0.0

⁶⁾ 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.

¹⁰⁾ Display only on Bosch control modules.

¹¹⁾ On vehicles, which start in 1st gear, drive in transmission range “D” above 12 mph (20 km/h).

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

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

Engine	104.941
Models	202.028
HFM-SFI system designation	3.4
Engine performance ⁶⁾ (07-1203 or 07-1206) ¹²⁾	
Engine speed	rpm 5400
Ignition timing with premium unleaded gasoline (91 posted/95 RON)	°CKA 20 – 24
Injection duration	ms 11 – 14
Air mass	kg/h 520 – 580
WOT recognition	HHT display ON
Camshaft timing adjustment >2000 rpm	HHT display OFF
Intake manifold resonance flap	HHT display ON
VSS	mph (km/h) > 62 (100)
Deceleration shut-off >2100 rpm	HHT display ON
Transmission overload protection switch, TR "D" ¹¹⁾	V < 1
Altitude	mbar refer to barometer
CC operation	HHT display OFF/ON
Output, 4-speed AT, TR 3	hp 141
Ignition fault counter	HHT display 0
Coil fault counter	HHT display 0
Coil spark duration	ms 1.5 – 1.9
Coil spark voltage ¹⁰⁾	V 34 – 37
Knock ignition angle/cylinder	°CKA 0.0

⁶⁾ 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.

¹⁰⁾ Display only on Bosch control modules.

¹¹⁾ On vehicles, which start in 1st gear, drive in transmission range "D" above 12 mph (20 km/h).

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

**Engine 104.991 as of 03/94
Model 129**

Engine	104.991
Models	129.063
HFM-SFI system designation	3.4
Engine performance ⁶⁾ (07-1203 or 07-1206) ¹²⁾	
Engine speed	rpm 5500
Ignition timing with premium unleaded gasoline (91 posted/95 RON)	°CKA 20 – 24
Injection duration	ms 14 – 17
Air mass	kg/h 580 – 620
WOT recognition	HHT display ON
Camshaft timing adjustment >2000 rpm	HHT display OFF
Intake manifold resonance flap	HHT display ON
VSS	mph (km/h) > 62 (100)
Deceleration shut-off >2100 rpm	HHT display ON
Transmission overload protection switch, TR "D" ¹¹⁾	V < 1
Altitude	mbar refer to barometer
CC operation	HHT display OFF/ON
Output, 5-speed AT, TR 3	hp 141
Ignition fault counter	HHT display 0
Coil fault counter	HHT display 0
Coil spark duration	ms 1.5 – 1.9
Coil spark voltage ¹⁰⁾	V 34 – 37
Knock ignition angle/cylinder	°CKA 0.0

⁶⁾ 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.

¹⁰⁾ Display only on Bosch control modules.

¹¹⁾ On vehicles, which start in 1st gear, drive in transmission range "D" above 12 mph (20 km/h).

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

**Engine 104.994 as of 03/94
Model 140**

Engine	104.994
Models	140.032/033
HFM-SFI system designation	3.4
Engine performance ⁶⁾ (07-1203 or 07-1206) ¹²⁾	
Engine speed	rpm 5500
Ignition timing with premium unleaded gasoline (91 posted/95 RON)	°CKA 20 – 24
Injection duration	ms 14 – 17
Air mass	kg/h 580 – 620
WOT recognition	HHT display ON
Camshaft timing adjustment >2000 rpm	HHT display OFF
Intake manifold resonance flap	HHT display ON
VSS	mph (km/h) > 62 (100)
Deceleration shut-off >2100 rpm	HHT display ON
Transmission overload protection switch, TR “D” ¹¹⁾	V < 1
Altitude	mbar refer to barometer
CC operation	HHT display OFF/ON
Output, 5-speed AT, TR 3	hp 141
Ignition fault counter	HHT display 0
Coil fault counter	HHT display 0
Coil spark duration	ms 1.5 – 1.9
Coil spark voltage ¹⁰⁾	V 34 – 37
Knock ignition angle/cylinder	°CKA 0.0

6) 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.

10) Display only on Bosch control modules.

11) On vehicles, which start in 1st gear, drive in transmission range “D” above 12 mph (20 km/h).

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

Engine 104.941/991/992/994 as of 03/94

Engine	104.941	104.991/992/994
Models	202.028	124.032/052/066/092 129.063 140.032/033
HFM-SFI system designation	3.4	3.4
On-off ratio		
Idle speed	rpm 600 – 800	600 – 800
Engine speed	rpm 3500	3500
On-off ratio at WOT and TR 3	% 0 ± 10 constant	0 ± 10 constant
On-off ratio at upper partial load and TR “D”, 75 mph (120 km/h), 32 hp (24 kW)	% ±10 oscillates	±10 oscillates
On-off ratio at upper partial load and TR “D”, 31 mph (50 km/h), 9 hp (7 kW)	% ±10 oscillates	±10 oscillates
Exhaust gas back pressure	mbar < 600	< 700