1.1 HFM Sequential Multiport Fuel Injection/Ignition System (HFM-SFI)  

Electrical Test Program – Preparation for Test

Preliminary work:
Diagnosis - Malfunction Memory .................................. 11

Preparation for Test
1. Ignition: OFF
2. Connect test cable with socket box to engine control module (N3/4) according to connection diagram.

Electrical wiring diagrams, see Electrical Troubleshooting Manual.
Model 124
Model 129
Model 140
Model 202
Model 210

• If installing an engine control module from another vehicle (only possible on vehicles without drive authorization system (DAS) stage 2 up to the end of model year 1995), the control module’s memory must be erased and the control module must be reactivated, see 11/5.

Note regarding “Test Connection” column:
The numbers indicated in parentheses, for example, ⇒ 1.0 (1.23) signify:
1= Connector 1 on wiring diagram,
23= Socket 23 on wiring diagram.
Electrical Test Program – Preparation for Test

Special Tools

- Test cable: 102 589 04 63 00
- 82-pin test cable CAN: 124 589 45 63 00
- Electrical connecting set: 201 589 00 99 00
- Tester: 201 589 13 21 00
- 126-pin socket box: 129 589 00 21 00
- Ohm decade: 124 589 09 63 00
- CAN 140 82-pin test cable: 140 589 29 63 00

Conventional tools, test equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Brand, model, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimeter ¹)</td>
<td>Fluke models 23, 83, 85, 87</td>
</tr>
<tr>
<td>Engine analyzer ¹)</td>
<td>Bear DACE (Model 40-960)</td>
</tr>
<tr>
<td></td>
<td>Sun Master 3</td>
</tr>
<tr>
<td></td>
<td>Sun MEA-1500MB</td>
</tr>
</tbody>
</table>

¹) Available through the MBUSA Standard Equipment Program.
To Avoid Damage to the Ignition System

- To avoid damage to the engine control module (N3/10), connect/disconnect the control module connectors only with the ignition: **OFF**.
- Do not connect a test lamp to circuit 1 or 15 of the ignition coil.
- Do not disconnect or ground any spark plug connector at cranking or idle speed.
- The high output side of the ignition system must carry at least 2 kΩ of load (spark plug connector).
- To avoid damaging the ignition coils during individual testing, do not load the coil with more than 28 kV.
- If assisting a disabled vehicle and it becomes necessary to perform an ignition spark test, perform this test only with a spark plug on one ignition cable. Ensure good ground connection to the spark plug.

**WARNING!**  
High Voltage!

- Primary connections carry a voltage of up to 400 V. The iron core bracket of the ignition coils must always be connected to vehicle ground.
- Persons with pacemakers should not work on this type of ignition system.

Using Test Equipment

- **Ensure that the engine and ignition are turned off when connecting/ disconnecting equipment such as voltage signal pick-up on respective ignition cables and trigger pick-up on cylinder 1.**

See Service Microfiche System (SMS), Repair Instructions, group 15 for further safety precautions.
Electrical Test Program – Component Locations

Connection Diagram - Socket Box
Models 124, 202, 210 as well as Model 129, 140 starting Model Year 1996

Figure 1
003 Multimeter
050 Socket box (126-pole)
088 Test cable
N3/4 Engine control module (HFM-SFI)
Electrical Test Program – Component Locations

Connection Diagram - Socket Box
Models 129 and 140 up to Model Year 1995

Figure 2
003 Multimeter
050 Socket box (126-pole)
096 Test cable
N3/4 Engine control module (HFM-SFI)
Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector “1” – Interior

Figure 3

1 – 3  Not used
4  Fuel safety shut-off from EA/CC/ISC control module
     Fuel safety shut-off from CC/ISC control module (model 202, 210)
5  –
6  –
7  Fuel consumption signal
8  VSS from ABS control module (automatic 5-speed transmission only)
9  Transmission overload protection switch
10 CTP recognition from EA/CC/ISC control module
11 Not used
12 – 14 Not used
15 OS2 1 (before TWC) signal (except model 124)
16 OS2 2 (after TWC) signal (except model 124)
17 CMP sensor output signal (except model 124)
18 TN-signal (engine rpm output signal)
19 Diagnostic wire
20 Starter lock-out and backup lamp switch (transmission range P/N recognition) (4-speed automatic only)
21 Starter signal, circuit 50
22 Not used
23 Not used
24 OS2 2 (after TWC) ground (except model 124)
25 OS2 2 (after TWC) signal (except model 124)
26 OS2 2 (after TWC) insulation (except model 124)
27 Voltage supply (circuit 87M)
1.1 HFM Sequential Multiport Fuel injection/Ignition System (HFM-SFI)

Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector “1” – Interior (continued)

Figure 3a

28 Not used
29 FP relay module, on model 210 relay module (K40)
30 OS2 1 heater
31 OS2 2 (after TWC) heater relay module (except model 124, 210)
32 Electronics ground (W10/1) (model 124)
33 Battery ground (W10) (model 124)
34 OS2 1, ground
36 OS21, wire insulation (until 11/94)
37 Not used
38 Not used
39 Voltage supply (circuit 87U)
40 Voltage supply (circuit 30)
41 OS2 2 (after TWC) heater (except model 124)
42 Transmission upshift delay switchover valve
43 Purge switchover valve
44 Ground for OS2 2 signal (until 7/93, except model 124)
L CAN (–) Controller area network (HFM-SFI, RCL [as of MY 1996], EA, CC, ETC, Diagnostic module)
H CAN (+) Controller area network (HFM-SFI, RCL [as of MY 1996], EA, CC, ETC, Diagnostic module)
Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector “2” – Engine Compartment

Figure 4
1  Adjustable camshaft timing solenoid
2  Injector 3
3  Injector 4
4  Not used
5  MAF sensor signal
6  Not used
7  Not used
8  CMP sensor signal
9  Ignition coil T1/1 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
   Ignition coil T1/2 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
10 Ignition coil T1/2 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
   Ignition coil T1/3 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
11 Not used
12 Injector 5
13 Injector 2
14 Resonance intake manifold switchover valve
15 Electromagnetic AIR pump clutch or AIR relay module (K17)
16 – 17 Not used
18 Not used
19 CMP sensor ground
20 Not used
21 Ignition coil T1/3 (terminal 1) (Models 124, 129, 140, 202 up to Model Year 1995)
   Ignition coil T1/1 (terminal 1) (Models 129, 140, 202, 210 starting Model Year 1996)
22 Electronics ground (W10/1) (model 124)
   Ground (electronics - right footwell, W15/1) (models 129 and 140)
   Ground (component compartment - right, W16/6) (models 202, 210)
Electrical Test Program – Preparation for Test

Layout
Engine Control Module Connector “2” – Engine Compartment (continued)

Figure 4a

23  Injector 1
24  Injector 6
25  EGR switchover valve
26  Not used
27  MAF sensor signal ground
28  ECT sensor ground
29  CKP sensor ground
30  CKP sensor signal
31  Not used
32  Not used
33  Not used
34  Not used
35  Not used
36  ECT sensor
37  IAT sensor
38  Not used
39  Not used
40  KS 1 ground
41  KS 1 signal
42  KS 2 ground
43  KS 2 signal
44  Not used