1.14 Instrument Cluster (IC)

1.14 Models 129, 140, 170, 202 (as of 06/97)
   Models 208, 210 (as of 03/97)
   with Flexible Service System (FSS)

### Diagnosis
- Function Test ........................................ 11/1
- Diagnostic Trouble Code (DTC) Memory ............... 12/1
- Complaint Related Diagnostic Chart ................ 13/1

### Electrical Test Program
- Component Locations ................................. 21/1
- Preparation for Test ............................... 22/1
- Test Model 129 ...................................... 23/1
- Test Model 140 ...................................... 24/1
- Test Model 170 ...................................... 25/1
- Test Model 202, 208, 210 ........................... 26/1
Bulb test

- Turn the ignition key to position “2”. All malfunction indicator/warning lamps must illuminate.
- Start engine. At engine RPM > 480 all indicator/warning lamps should go off, indicating that all systems monitored are O.K.
- Independent of engine running the following should go off:
  - After 4 seconds, the SRS MIL.
  - After 6 seconds, the safety belt warning indicator.

Should the malfunction indicator/warning lamps remain illuminated and/or come on while in operation, the corresponding system must be checked and/or the fluid level corrected as necessary.

Warning buzzer

- Exterior lamps and parking brake warning
- Ignition key in ignition switch warning
- Safety belt warning for 6 seconds
  - (the warning buzzer will cease if safety belt buckle is latched).
- Oil level too low

Indicator instruments

The indicator instruments must reflect the actual operating conditions.

Photo transistor (models 202, 208 and 210)

With a flash light pointed at the Instrument Cluster’s Photo Transistor, the LCD displays (outside temperature, trip odometer, odometer and electronic clock) will illuminate brighter.

**Instrument cluster with multi-functional display**

If the operational problem occurs (worn brake pads, insufficient engine coolant level, failed exterior lamp etc.) or the system (such as: ABS or SRS) fails a warning message will be displayed in place of the outside temperature, trip odometer, odometer and electronic clock. Based on the severity of the problem, the display will be red or orange in color. Additionally, a warning tone will sound.

**Flexible Service System (FSS)**

- Remaining mileage or time until the next service due can be activated as follows:
  - Turn the ignition key to position 2. Press twice the trip odometer reset button within 1 sec. The tool symbol and the remaining mileage or time will be displayed for 10 sec.

- Oil level display (engines M112 and M113) can be activated as follows:
  - Turn the ignition key to position 2. Wait 10 seconds until the oil can symbol and message “oil level?” comes up and then press the trip odometer reset button twice within 1 second. The message will be displayed whether the oil level is OK or not.

Function test, diagnosis and coding can be accomplished using the Hand Held Tester (HHT).
1. Control module version
2. Diagnostic Trouble Code (DTC) Memory
3. Actual values
4. Activation
5. Version Coding

By pressing the continue key on the HHT, additional information can be recalled for test steps 2, 3 and 5.

**Note regarding version coding:**
The following HHT options are available during version coding:
1. Read out of version code and transfer of IC and FSS information to a new instrument cluster.

2. Setting of:
   1. Oil changes (FSS)
   2. Mileage (forward/backward)
   3. Mistakenly deleted oil changes resetting (FSS)
   4. Flexible Service System
   5. Time setting with battery terminal removed
   6. Setting warning for oil level at minimum

**Note**
Prior to the replacement of a defective instrument cluster, readout and store IC data in the HHT. After installing the instrument cluster download the previously stored values back into the new instrument cluster.

If the readout of the stored version coding is not possible, the download must be performed manually (by utilizing the HHT menu).

If substituting a new instrument cluster for testing, do not set the mileage as it cannot be set back later.
## 1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

### Diagnosis – Complaint Related Diagnostic Chart

<table>
<thead>
<tr>
<th>Complaint/Problem</th>
<th>Possible cause</th>
<th>Test step/Remedy $^1$</th>
</tr>
</thead>
</table>
Model 140: 24 ⇒ 1.0  
Model 170: 25 ⇒ 1.0  
Model 202, 208, 210: 26 ⇒ 1.0 |
| Warning lamps/Indicator lamps are not functioning.                               | Power supply, Instrument cluster (A1)                                         | Model 129: 23 ⇒ 1.0  
Model 140: 24 ⇒ 1.0  
Model 170: 25 ⇒ 1.0  
Model 202, 208, 210: 26 ⇒ 1.0 |
| Communication between HHT and instrument cluster not possible.                   | Wiring, Instrument cluster (A1)                                               | Model 129: 23 ⇒ 2.0  
Model 140: 24 ⇒ 2.0  
Model 170: 25 ⇒ 2.0  
Model 202, 208, 210: 26 ⇒ 2.0 |
| Low engine coolant level (ECL) indicator lamp (A1e11), low windshield washer fluid level indicator lamp (A1e13) illuminated - does not function. | ECL switch (S41)  
Windshield washer fluid level switch (S42)  
Wiring  
Instrument cluster (A1) | Model 129: 23 ⇒ 3.0  
Model 140: 24 ⇒ 3.0  
Model 170: 25 ⇒ 3.0  
Model 202, 208, 210: 26 ⇒ 3.0 |
| Warning lamps/Indicator lamps (brake fluid level, parking brake, brake pad wear, ABS, ETS, ASR, ESP) illuminate simultaneously and speedometer needle rests at the bottom stop. | Traction system control module (N47)                                         | DM, Chassis and Drivetrain, Volume 3, Section 9 and 10 WIS |
| Tachometer needle, ECT needle remain at rest on the bottom stop. Engine oil low level warning lamp illuminates. | Injection control module (N3)                                               | DM, Diesel Engines, Volume 1.1                            |

$^1$ Observe Preparation for Test, see 22.
### 1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

#### Diagnosis – Complaint Related Diagnostic Chart

<table>
<thead>
<tr>
<th>Complaint/Problem</th>
<th>Possible cause</th>
<th>Test step/Remedy ¹)</th>
</tr>
</thead>
</table>
| Warning lamps/Indicator lamps (brake fluid level, parking brake, brake pad wear, oil level, ABS, ETS, ASR, ESP) illuminate simultaneously and tachometer speedometer needle rests at the bottom stop. | CAN Bus disruption | Model 129: 23 ⇒ 4.0  
Model 140: 24 ⇒ 4.0  
Model 170: 25 ⇒ 4.0  
Model 202, 208, 210: 26 ⇒ 4.0 |

¹) Observe Preparation for Test, see 22.

---

**Note regarding diagnosis:**

To narrow the search for the possible fault, the diagnostic chart indicates how the warning lamps or indicators are activated and controlled by a particular system.

If the warning lamps or indicators are displayed for more systems simultaneously, it is almost always the evidence of the faulty CAN Bus.

The A/C system can also be affected by the faulty CAN Bus since the A/C control module receives CAN data over the K1 and K2 information bus from the Instrument Cluster interface.

(For more information on Instrument Cluster refer to the green microfiche, Function Description Instrument Cluster (KI) in SMS or refer to WIS)

---

Following warning lamps/indicators receive the information via CAN Bus from Traction systems control module (N47):

- Odometer, trip odometer
- Electronic speedometer
- Low brake fluid level/parking brake indicator (only parking signal is sent via CAN Bus)
- Warning lamp brake pad wear
- ABS indicator
- ETS, ASR, ESP indicator
- Warning lamp ETS, ASR, ESP

**Note:**

On vehicles with multi-functional Instrument Clusters additionally a message appears in the display area.
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Diagnosis – Complaint Related Diagnostic Chart

Following warning lamps/indicators receive the information via CAN Bus from Injection systems control module (N3):

- Tachometer
- Low oil level warning lamp
- Coolant temperature
- Preglow indicator (diesel only)
- Fuel reserve warning lamp (if a fuel system leak is detected or fuel filler cap is not closed tightly while the engine is running, the warning lamp (A1e4) will blink. Not correcting the problem will cause the "Check Engine" lamp to illuminate).

Flexible Service System (FSS)
- Oil quality
- Oil level
- Oil temperature
- Engine speed, coolant temperature

Note:
On vehicles with multi-functional Instrument Clusters additionally a message appears in the display area.

Instrument cluster receives direct information for the following warning lamps/indicators:

- Outside temperature display
- Fuel gauge
- Oil pressure gauge (models 129 and 140 only)
- Turn signal indicator left
- Turn signal indicator right
- High beam indicator
- Fuel reserve warning lamp
- Low level brake fluid/parking brake warning lamp (only low level brake fluid direct)
- Windshield washer fluid low level warning lamp
- Coolant low level warning lamp
- Battery charging control/warning lamp
- Seat belt warning lamp
- Safety belt/rear seat back latch warning lamp
- Glow plug failure warning lamp
- Hydraulic oil low level warning lamp (model 210 only)
- ADS, suspension warning lamp
- Turn signal audio device
- Seat belt warning buzzer
- Lights on warning buzzer
- Key in ignition warning buzzer
- Retractable hardtop warning buzzer (model 170 only)
- Steering lock warning lamp
Diagnosis – Complaint Related Diagnostic Chart

The Instrument Cluster sends/receives data via the K - information bus to the A/C control module. The following signals are send via K1 serial information bus from IC to the A/C control module:

- Outside temperature
- Coolant temperature
- Vehicle speed
- Terminal 58d signal (illumination)
- Engine speed
- °F/°C switch over
- Full throttle cut-off (diesel)
- Acceleration recognition (gasoline)
- A/C compressor emergency cut-off (engine control module sends the signal via CAN bus to the K1 bus)
- A/C compressor switch off at acceleration (engine control module sends the signal via CAN bus to the K1 bus)

The following signals are send via K2 serial information bus from the A/C control module to the Instrument cluster:

- Refrigerant pressure
- Engine Idle speed increase
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Models 129, 140, 170, 202, 208, 210

---

Figure 1

1  Phototransistor (Model 202, 208, 210)
A1 Instrument Cluster (IC) view of multi-functional Instrument Cluster
B14 Temperature sensor for outside temperature indicator (one or the other version installed)
S11 Brake fluid level switch
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 129

Figure 2

<table>
<thead>
<tr>
<th>Расположение компонентов</th>
<th>Описание</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4</td>
<td>Топливный датчик</td>
</tr>
<tr>
<td>B5</td>
<td>Датчик давления масла (Двигатель 119: правая передняя; двигатель 104, 120: левая задняя)</td>
</tr>
<tr>
<td>F23/1</td>
<td>Контрольная секция</td>
</tr>
<tr>
<td>N3/11</td>
<td>Левая секция управления двигателем (ME-SFI) (12-цилиндровая)</td>
</tr>
<tr>
<td>N3/12</td>
<td>Правая секция управления двигателем (ME-SFI) (12-цилиндровая)</td>
</tr>
<tr>
<td>N16/1</td>
<td>Базовая секция</td>
</tr>
<tr>
<td>N47-5</td>
<td>ESP - SPS контрольная секция</td>
</tr>
<tr>
<td>N51</td>
<td>ADS контрольная секция</td>
</tr>
<tr>
<td>X11/4</td>
<td>Соединитель данных</td>
</tr>
</tbody>
</table>

Diagnostic Manual • Information/Communication • 8/99 1.14 IC 21/2
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Figure 3

B4 Fuel level sensor
B5 Oil pressure sensor
  (Engine 119: right front;
   engine 104, 120: left rear)
F23/1 Control module box
N3/11 Left engine control module (ME-SFI) (12-cylinder)
N3/12 Right engine control module (ME-SFI) (12-cylinder)
N15/3 Transmission control module
N16/1 Base module
N47-5 ESP - SPS control module
Electrical Test Program – Component Locations

Model 170

Figure 4

B4 Fuel level sensor
N3/10 Engine control module (ME-SFI)
N47 Traction systems control module
X11/4 Data link connector
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 170

Figure 5

S11  Brake fluid level switch
S41  ECL switch
S42  Windshield washer fluid level switch
1.14  Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 202

Figure 6

N3  Engine control module
N47  Traction systems control module
S41  ECL switch
S42  Windshield washer fluid level switch
W3  Ground (left front wheel well housing at ignition coil)
X11/4  Data link connector
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 202

Figure 7

B4/1 Left fuel level sensor
B4/1 Right fuel level sensor

The fuel sensors are accessible from underneath of the vehicle.
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 208

Figure 8

N3 Engine control module
N47 Traction systems control module
S41 ECL switch
S42 Windshield washer fluid level switch
W3 Ground (left front wheel well housing at ignition coil)
X11/4 Data link connector
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 210

Figure 9

B4 Fuel level sensor
X11/4 Data link connector (DTC readout)
a Control module box
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Component Locations

Model 210

Figure 10

2  Power steering and leveling system hydraulic fluid container
S41  ECL switch
S42  Windshield washer fluid level switch
S77/2  Hydraulic fluid level switch
1. Battery voltage 11 – 14 V.
2. Check fuses.
3. Systems and fluid levels in order.

⚠️ Caution:
To prevent damage to the control modules, the connectors on the control modules must only be removed or installed with the ignition OFF.

### Electrical wiring diagrams:
See Electric Troubleshooting Manuals, group 54

### Conventional tools, test equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Brand, model, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimeter¹</td>
<td>Sun DMM-5</td>
</tr>
<tr>
<td></td>
<td>Fluke models ¹) 23, 77 III, 87, 88</td>
</tr>
</tbody>
</table>

¹) Available through the MBUSA Standard Service Equipment Program.
1.14 Instrument Cluster (IC) Models 129, 140, 170, 202 (as of 6/97), Models 208, 210 (as of 3/97) with FSS

Electrical Test Program – Preparation for Test

Special Tools

- Electrical connecting set: 201 589 00 99 00
- Ohm decade: 124 589 09 63 00
- Extraction hook: 140 589 02 33 00
- Adapter cable: 210 589 05 63 00
- Adapter cable: 210 589 06 63 00
### Electrical Test Program – Test Model

<table>
<thead>
<tr>
<th>Test scope</th>
<th>Test connection</th>
<th>Test condition</th>
<th>Nominal value</th>
<th>Possible cause/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Instrument cluster (A1) Voltage supply Terminal 30</td>
<td><img src="1A.3" alt="" /> - <img src="1A.11" alt="" /></td>
<td>Ignition: <strong>OFF</strong> Remove A1 Disconnect connector 1 (30-pin)</td>
<td>11 – 14 V</td>
<td>Fuse 14 in fuse and relay box (F1), Wiring, ( \Rightarrow ) 1.1</td>
</tr>
<tr>
<td><strong>1.1</strong> Voltage supply Terminal 15, fused</td>
<td><img src="1A.3" alt="" /> - <img src="1A.9" alt="" /></td>
<td>Ignition: <strong>ON</strong></td>
<td>11 – 14 V</td>
<td>Fuse 10 in fuse and relay box (F1), Wiring, A1</td>
</tr>
<tr>
<td><strong>2.0</strong> HHT interface Connection between A1 and data link connector (X11/4)</td>
<td>X11/4 - <img src="1B.11" alt="" /></td>
<td>Ignition: <strong>OFF</strong> Remove A1, Disconnect connector 1 (30-pin)</td>
<td>5 Ω</td>
<td>Wiring</td>
</tr>
<tr>
<td><strong>3.0</strong> ECL and windshield washer level: ECL level switch (S41), windshield washer level switch (S42) and wiring</td>
<td><img src="1B.6" alt="" /> - <img src="1B.4" alt="" /></td>
<td>Ignition: <strong>OFF</strong> Coolant level and windshield washer fluid level: OK Remove instrument cluster (A1) Disconnect connector 1 (30 pin).</td>
<td>233 - 297 Ω</td>
<td>Wiring ( \Rightarrow ) 3.1 Values O.K.: A1</td>
</tr>
</tbody>
</table>
## Electrical Test Program – Test

<table>
<thead>
<tr>
<th>Test scope</th>
<th>Test connection</th>
<th>Test condition</th>
<th>Nominal value</th>
<th>Possible cause/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 ECL switch (S41)</td>
<td>1 → S41 ← 2</td>
<td>Ignition: OFF Remove expansion tank Disconnect connector at ECL switch (S41). Coolant level OK</td>
<td>102 - 120 Ω</td>
<td>S41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Values O.K.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Windshield washer fluid level</td>
<td>1 → S42 ← 2</td>
<td>Ignition: OFF Disconnect connector at S42. Washer fluid level OK</td>
<td>145 - 185 Ω</td>
<td>S42</td>
</tr>
<tr>
<td>switch (S42)</td>
<td></td>
<td>Values O.K.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0 CAN bus data lines Resistance</td>
<td>1 → A1 ← 10</td>
<td>Ignition: OFF Disconnect connector 1 (All control modules are connected to CAN)</td>
<td>around 60 Ω</td>
<td>CAN: –//–, – – – – –</td>
</tr>
<tr>
<td></td>
<td>(1B.9)</td>
<td></td>
<td></td>
<td>N47 N3</td>
</tr>
<tr>
<td></td>
<td>(1B.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 CAN bus data lines Voltage</td>
<td>← A1 ← 9</td>
<td>Ignition: ON</td>
<td>around 2.3 V</td>
<td>N47 N3</td>
</tr>
<tr>
<td>Low-data line</td>
<td>(1B.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 CAN bus data lines Voltage</td>
<td>← A1 ← 10</td>
<td>Ignition: ON</td>
<td>around 2.6 V</td>
<td>N47 N3</td>
</tr>
<tr>
<td>High-data line</td>
<td>(1B.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Electrical Test Program – Test

Figure 1  6 Cylinder models

- F23/1  Control module box
- K35  O2S 2 (after TWC) heater relay module
- N3/10  Engine control module (ME - SFI)
- N16/1  Base module (BM)
- N47  Traction systems control module
- N59/1  Diagnostic module (OBD II)
- X11/4  Data link connector

Figure 2  8 Cylinder models

- F23/1  Control module box
- N3/10  Engine control module (ME-SFI)
- N16/1  Base module (BM)
- N47  Traction systems control module
- N51  ADS control module
- X11/4  Data link connector

Figure 3  12 Cylinder models

- F23/1  Control module box
- N3/11  Left engine control module (ME-SFI)
- N3/12  Right engine control module (ME-SFI)
- N16/1  Base module (BM)
- N47-5  ESP/SPS control module
- N51  ADS control module
- X11/4  Data link connector
## 1.14 Instrument Cluster (IC)

### Electrical Test Program – Test

<table>
<thead>
<tr>
<th>Test scope</th>
<th>Test connection</th>
<th>Test condition</th>
<th>Nominal value</th>
<th>Possible cause/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Instrument cluster (A1)</td>
<td>Ignition: OFF</td>
<td>11 – 14 V</td>
<td>Fuse 17 in fuse and relay box (F3), Wiring, ⇒ 1.1</td>
</tr>
<tr>
<td>Voltage supply</td>
<td>Terminal 30</td>
<td>(1A.3)</td>
<td>Remove instrument cluster (A1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1A.11)</td>
<td>Disconnect connector 1 (30-pin)</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Voltage supply</td>
<td>Ignition: ON</td>
<td>11 – 14 V</td>
<td>Fuse 24 in fuse and relay box (F3), Wiring, A1</td>
</tr>
<tr>
<td>Terminal 15</td>
<td></td>
<td>(1A.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1A.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>HHT interface</td>
<td>Ignition: OFF</td>
<td>5 Ω</td>
<td>Wiring</td>
</tr>
<tr>
<td>Connection between A1 and data link connector (X11/4)</td>
<td>Remove A1, Disconnect connector 1 (30-pin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>ECL and windshield washer level:</td>
<td>Ignition: OFF</td>
<td>233 - 297 Ω</td>
<td>Wiring ⇒ 3.1</td>
</tr>
<tr>
<td>ECL level switch (S41), windshield washer level switch (S42) and wiring</td>
<td>Coolant level and windshield washer fluid level: OK</td>
<td>Values O.K.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disconnect connector 1 (30 pin)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Electrical Test Program – Test

<table>
<thead>
<tr>
<th>Test scope</th>
<th>Test connection</th>
<th>Test condition</th>
<th>Nominal value</th>
<th>Possible cause/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 ECL switch (S41)</td>
<td>1 → S41 → 2</td>
<td>Ignition: OFF&lt;br&gt;Remove expansion tank&lt;br&gt;Disconnect connector at S41.&lt;br&gt;Coolant level OK</td>
<td>102 - 120 Ω</td>
<td>S41&lt;br&gt;Values O.K.: ⇒ 3.2</td>
</tr>
<tr>
<td>3.2 Windshield washer fluid level switch (S42)</td>
<td>1 → S42 → 2</td>
<td>Ignition: OFF&lt;br&gt;Disconnect connector at S42.&lt;br&gt;Washer fluid level OK</td>
<td>145 - 185 Ω</td>
<td>S42</td>
</tr>
<tr>
<td>4.0 CAN bus data lines&lt;br&gt;Resistance</td>
<td>9 → A1 → 10&lt;br&gt;(1B.9) (1B.10)</td>
<td>Ignition: OFF&lt;br&gt;Disconnect connector 1&lt;br&gt;(All control modules are connected to CAN)</td>
<td>around 60 Ω</td>
<td>CAN: — — — —&lt;br&gt;N47&lt;br&gt;N3&lt;br&gt;Values O.K.: ⇒ 4.1</td>
</tr>
<tr>
<td>4.1 CAN bus data lines&lt;br&gt;Voltage Low-data line</td>
<td>→ A1 → 9&lt;br&gt;(1B.9)</td>
<td>Ignition: ON</td>
<td>around 2.3 V</td>
<td>N47&lt;br&gt;N3&lt;br&gt;Values O.K.: ⇒ 4.2</td>
</tr>
<tr>
<td>4.2 CAN bus data lines&lt;br&gt;Voltage High-data line</td>
<td>→ A1 → 10&lt;br&gt;(1B.10)</td>
<td>Ignition: ON</td>
<td>around 2.6 V</td>
<td>N47&lt;br&gt;N3</td>
</tr>
</tbody>
</table>
1.14 Instrument Cluster (IC)  

Electrical Test Program – Test

Figure 1 6/8 Cylinder models

- F23/1 Control module box
- N3/10 Engine control module (ME - SFI)
- N15/3 Transmission control module
- N16/1 Base module (BM)
- N47 Traction systems control module

Figure 2 12 Cylinder models

- F23/1 Control module box
- N3/11 Left engine control module (ME-SFI)
- N3/12 Right engine control module (ME-SFI)
- N15/3 Transmission control module
- N16/1 Base module (BM)
- N47/5 ESP/SPS control module
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<table>
<thead>
<tr>
<th>Test scope</th>
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</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Instrument cluster (A1) Voltage supply Terminal 30</td>
<td>$3 \leftarrow A1 \rightarrow 11$</td>
<td>Ignition: <strong>OFF</strong> Remove Instrument cluster (A1) Disconnect connector 1 (30-pin)</td>
<td>11 – 14 V</td>
<td>Fuse 34 in fuse and relay box (F1), Wiring, ⇒ 1.1</td>
</tr>
</tbody>
</table>

| **1.1** Voltage supply Terminal 15 | $3 \leftarrow A1 \rightarrow 9$ | Ignition: **ON** | 11 – 14 V | Fuse 37 in fuse and relay box (F1), Wiring, A1 |

| **2.0** HHT interface Connection between A1 and data link connector (X11/4) | $X11/4 \leftarrow A1 \rightarrow 11$ | Ignition: **OFF** Remove A1, Disconnect connector 1 (30-pin) | 5 Ω | Wiring |

| **3.0** ECL and windshield washer level: ECL level switch (S41), windshield washer level switch (S42) and wiring | $12 \leftarrow A1 \rightarrow 4$ | Ignition: **OFF** Coolant level and windshield washer fluid level: OK Remove A1 Disconnect connector 1 (30 pin). | 233 - 297 Ω | Wiring ⇒ 3.1 Values O.K.: A1 |
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<tr>
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<tr>
<td>3.1 ECL switch (S41) Resistance</td>
<td>1 ––– S41 ––– 2</td>
<td>Ignition: OFF&lt;br&gt;Remove expansion tank&lt;br&gt;Disconnect connector at S41&lt;br&gt;Coolant level OK</td>
<td>102 - 120 Ω</td>
<td>S41&lt;br&gt;Values O.K.: ⇒ 3.2</td>
</tr>
<tr>
<td>3.2 Windshield washer fluid level switch (S42) Resistance</td>
<td>1 ––– S42 ––– 2</td>
<td>Ignition: OFF&lt;br&gt;Disconnect connector at S42&lt;br&gt;Washer fluid level OK</td>
<td>145 - 185 Ω</td>
<td>S42</td>
</tr>
<tr>
<td>4.0 CAN bus data lines Resistance</td>
<td>9 ––– A1 ––– 10 (1B.9) (1B.10)</td>
<td>Ignition: OFF&lt;br&gt;Disconnect connector 1&lt;br&gt;(All control modules are connected to CAN)</td>
<td>around 60 Ω</td>
<td>CAN: ––, ⏯ ⏯ –&lt;br&gt;N47&lt;br&gt;N3&lt;br&gt;Values O.K.: ⇒ 4.1</td>
</tr>
<tr>
<td>4.1 CAN bus data lines Voltage Low-data line</td>
<td>––– V+ ––– 2 (2B.1)</td>
<td>Ignition: ON</td>
<td>around 2.3 V</td>
<td>N47&lt;br&gt;N3&lt;br&gt;Values O.K.: ⇒ 4.2</td>
</tr>
<tr>
<td>4.2 CAN bus data lines Voltage High-data line</td>
<td>––– V+ ––– 2 (2B.20)</td>
<td>Ignition: ON</td>
<td>around 2.6 V</td>
<td>N47&lt;br&gt;N3</td>
</tr>
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<tr>
<td>1.1 Voltage supply Terminal 15</td>
<td>Ignition: <strong>ON</strong></td>
<td>11 – 14 V</td>
<td>Model 202: fuse 19 Model 208: fuse 19 Model 210: fuse 7 in fuse and relay box (F1), Wiring, A1</td>
</tr>
<tr>
<td>2.0 HHT interface Connection between A1 and data link connector (X11/4)</td>
<td>Ignition: <strong>OFF</strong> Remove A1, Disconnect connector 1 (30-pin)</td>
<td>5 Ω</td>
<td>Wiring</td>
</tr>
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</table>
| 3.0 ECL and windshield washer level: ECL level switch (S41), windshield washer level switch (S42) and wiring | Ignition: **OFF** Coolant level and windshield washer fluid level: OK Remove instrument cluster (A1) Disconnect connector 1 (30 pin). | 233 - 297 Ω | Wiring

Values O.K.: A1
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<td>3.1</td>
<td>ECL switch (S41) Resistance</td>
<td>1&lt;ref&gt;S41&lt;/ref&gt; ←&lt;ref&gt;V&lt;/ref&gt; ⇆&lt;ref&gt;Ω&lt;/ref&gt; →&lt;ref&gt;V&lt;/ref&gt; 2&lt;ref&gt;Ω&lt;/ref&gt;</td>
<td>Ignition: <strong>OFF</strong> Remove expansion tank Disconnect connector at S41. Coolant level OK</td>
<td>102 - 120 Ω</td>
<td>S41 Values O.K.: ⇒ 3.2</td>
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<td>3.2</td>
<td>Windshield washer fluid level switch (S42) Resistance</td>
<td>1&lt;ref&gt;S42&lt;/ref&gt; ←&lt;ref&gt;V&lt;/ref&gt; ⇆&lt;ref&gt;Ω&lt;/ref&gt; →&lt;ref&gt;V&lt;/ref&gt; 2&lt;ref&gt;Ω&lt;/ref&gt;</td>
<td>Ignition: <strong>OFF</strong> Disconnect connector at S42. Washer fluid level OK</td>
<td>145 - 185 Ω</td>
<td>S42</td>
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<td>4.0</td>
<td>CAN bus data lines Resistance</td>
<td>1&lt;ref&gt;A1&lt;/ref&gt; ←&lt;ref&gt;V&lt;/ref&gt; ⇆&lt;ref&gt;Ω&lt;/ref&gt; →&lt;ref&gt;V&lt;/ref&gt; 2&lt;ref&gt;Ω&lt;/ref&gt; (2B.1) (2B.20)</td>
<td>Ignition: <strong>OFF</strong> Disconnect connector 1 (All control modules are connected to CAN)</td>
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<td>CAN bus data lines Voltage Low-data line</td>
<td>&lt;ref&gt;V&lt;/ref&gt; ←&lt;ref&gt;V&lt;/ref&gt; ⇆&lt;ref&gt;Ω&lt;/ref&gt; →&lt;ref&gt;V&lt;/ref&gt; 2&lt;ref&gt;Ω&lt;/ref&gt; (2B.1)</td>
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<td>N47 N3 Values O.K.: ⇒ 4.2</td>
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<td>4.2</td>
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<td>&lt;ref&gt;V&lt;/ref&gt; ←&lt;ref&gt;V&lt;/ref&gt; ⇆&lt;ref&gt;Ω&lt;/ref&gt; →&lt;ref&gt;V&lt;/ref&gt; 2&lt;ref&gt;Ω&lt;/ref&gt; (2B.20)</td>
<td>Ignition: <strong>ON</strong></td>
<td>around 2.6 V</td>
<td>N47 N3</td>
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