

## 10.4 Electronic Stability Program (ESP)

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### Diagnosis – Function Test

#### **WARNING!**

Life threatening injuries possible if following protective measures are not followed.

#### **CAUTION!**

Risk of severe injury, due to uneven placement of lift arms/lift arm supports, as well as the support and lifting of vehicle components, there is the possibility of the vehicle slipping while on the lift.

#### **CAUTION!**

Danger of vehicle toppling off of lift due to irregular weight distribution after the removal of components and axles.

#### Protective measures:

- Center vehicle (fore, aft and across) properly on both sides of the lift columns.
- When supporting components while the vehicle is on a lift, ensure that the vehicle is not lifted from the lift arms, therefore secure vehicle to the lift arms as well.
- Ensure that the lift arm supports are even and parallel to each other when lifting the vehicle.

#### Protective measures continued:

- Prior to lift vehicle completely (wheels still in contact with floor), ensure that the lift arm supports are correctly placed onto the vehicle contact points.
- Prior to removing the axles or components from the vehicle while on the lift, secure the vehicle to the lift arms or place sand bags inside the vehicle to ensure proper weight distribution to prevent toppling of the vehicle from the lift.
- Basically obey all the rules/guide lines regarding the lifting of vehicles as stated in the operator's manual by the lift manufacturer.

#### Preparation for Test:

1. Review section 12, 21, 22, 23



#### Control Module Adaption:

After the swap of the ESP/SPS/BAS or ESP/BAS control module (N47-5), it is important to perform the adaption procedure, since the control module must learn the values for the steering ratio. See HHT menu.

Additionally, after replacing either the ESP/SPS control module (N47-5) or the brake booster (A7/7), it is absolutely necessary to perform an adaption of the ESP/SPS control module (N47-5) as well.

The ESP/SPS control module (N47-5) has to learn the values for the BAS solenoid valve (A7/7y1), see HHT menu.

## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – ABS Lateral Acceleration Sensor (B43)

	Procedure	Hints
	<p><b>i</b> This function test applies as of 01/2000 production only</p> <p>The following description of the driving test is to be performed only upon the replacement or swap of the <b>ABS Lateral Acceleration sensor (B43)</b> and/or the <b>Rotating Speed Sensor for ESP (B45)</b>.</p>	<p>Via this driving test, the following faults can be isolated:</p> <ul style="list-style-type: none"><li>• improperly connected connectors of the sensors.,</li><li>• twisted wires of the respective sensors</li><li>• sensors with implausible signals</li></ul>
1	<p><b>Activate Test:</b></p> <p>Release driving test via Star Diagnosis</p>	<p><b>i</b></p> <p><b>Engine is running (idle).</b></p> <p><b>The release of the driving test remains active even after the ignition is switched OFF or ON. The driving test is ended when the driving test procedure is completed or it is deactivated via Star Diagnosis.</b></p> <p>BAS/ESP MIL (A1e47) and ABS MIL (A1e17) are illuminated: Indicating to the driver: ABS: ON                  ESP: OFF</p> <p>Thus after the release, the ESP system is OFF , however the functions of the BAS, ABS, and ASR systems remain active.</p> <p><b>i</b></p> <p>Within the DTC fault memory the following is entered: "Driving Test Active". This DTC will be erased automatically upon completion of the Driving Test.</p>


## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – ABS Lateral Acceleration Sensor (B43) (continued)

	Procedure	Hints
	<p><b>i</b></p> <p>The following description of the driving test is to be performed only upon the replacement or swap of the <b>ABS Lateral Acceleration sensor (B43)</b> and/or the <b>Rotating Speed Sensor for ESP (B45)</b>.</p>	<p>Via this driving test, the following faults can be isolated:</p> <ul style="list-style-type: none"><li>• improperly connected connectors of the sensors.,</li><li>• twisted wires of the respective sensors</li><li>• sensors with implausible signals</li></ul>
2	<p><b>Stationary deviation of the ABS Lateral Acceleration Sensor (B43) and/or Rotating Speed Sensor of ESP (B45):</b> <b>Press ESP switch in direction: ON</b> Vehicle is stationary and the steering wheel is pointed straight ahead.</p>	<p><b>i</b></p> <p>By pressing the ESP switch, a time window of 20 seconds is started, which can be lengthened in time span as desired. BAS/ESP MIL (A1e47) begins to blink as an indication that the stationary deviation test of the ABS Lateral Acceleration Sensor has started. Upon correct procedure, the BAS/ESP MIL (A1e47) will illuminate. This then is the signal to perform the driving test as described in point 3 of the menu. Should the vehicle be moved in any way during the stationary deviation test, the stationary deviation test of the ABS Lateral Acceleration Sensor will not be performed. The BAS/ESP MIL (A1e47) will be illuminated.</p> <p><b>In case of fault:</b> Read out the DTC fault code memory.</p> <p><b>i</b></p> <p>Within the DTC fault memory the following is entered: "Driving Test Active". This DTC will be erased automatically upon completion of the Driving Test.</p>

## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – ABS Lateral Acceleration Sensor (B43) (continued)

	Procedure	Hints
3	<p><b>Dynamic testing of the ABS Lateral Acceleration Sensor (B43) and/or Rotating Speed Sensor of ESP (B45):</b></p> <p>Drive the vehicle in a forward direction at a speed between 5 to 25 km/h (3 to 15 mph).</p> <p>After approx. 20 feet, driving at a constant speed, turn the steering wheel either left or right, (but not more than 360°), continue to drive the vehicle approx. 90° degrees more (semi-circle).</p>	<p> The ESP/BAS control module (N47-5) performs an evaluation of the rotating signals and lateral acceleration signals. After a successful completion, the BAS/ESP MIL (A1e47) and ABS MIL (A1e17) will go out.</p> <p><b>In case of fault:</b></p> <p>ABS MIL (A1e17) is illuminated: Driving test not successful. Repeat the dynamic driving test (menu item 3).</p> <p>BAS/ESP MIL (A1e47) is illuminated: Driving test not successful. Readout DTC memory.</p>

## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – Rotating Speed Sensor for ESP (B45)

	Procedure	Hints
	<p><b>i</b> This function test applies as of 01/2000 production only</p> <p>The following description of the driving test is to be performed only upon the replacement or swap of the <b>ABS Lateral Acceleration sensor (B43)</b> and/or the <b>Rotating Speed Sensor for ESP (B45)</b>.</p>	<p>Via this driving test, the following faults can be isolated:</p> <ul style="list-style-type: none"><li>• improperly connected connectors of the sensors.,</li><li>• twisted wires of the respective sensors</li><li>• sensors with implausible signals</li></ul>
1	<p><b>Activate Test:</b></p> <p>Release driving test via Star Diagnosis</p>	<p><b>i</b></p> <p><b>Engine is running (idle).</b></p> <p><b>The release of the driving test remains active even after the ignition is switched OFF or ON. The driving test is ended when the driving test procedure is completed or it is deactivated via Star Diagnosis.</b></p> <p>BAS/ESP MIL (A1e47) and ABS MIL (A1e17) are illuminated: Indicating to the driver: <b>ABS: ON</b>      <b>ESP: OFF</b></p> <p>Thus after the release, the ESP system is OFF , however the functions of the BAS, ABS, and ASR systems remain active.</p> <p><b>i</b></p> <p>Within the DTC fault memory the following is entered: "Driving Test Active". This DTC will be erased automatically upon completion of the Driving Test.</p>

## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – Rotating Speed Sensor for ESP (B45) (continued)

	Procedure	Hints
	<p><b>i</b></p> <p>The following description of the driving test is to be performed only upon the replacement or swap of the <b>ABS Lateral Acceleration sensor (B43)</b> and/or the <b>Rotating Speed Sensor for ESP (B45)</b>.</p>	<p>Via this driving test, the following faults can be isolated:</p> <ul style="list-style-type: none"><li>• improperly connected connectors of the sensors.,</li><li>• twisted wires of the respective sensors</li><li>• sensors with implausible signals</li></ul>
2	<p><b>Stationary deviation of the ABS Lateral Acceleration Sensor (B43) and/or Rotating Speed Sensor of ESP (B45):</b> <b>Press ESP switch in direction: ON</b> Vehicle is stationary and the steering wheel is pointed straight ahead.</p>	<p><b>i</b></p> <p>By pressing the ESP switch, a time window of 20 seconds is started, which can be lengthened in time span as desired.</p> <p>BAS/ESP MIL (A1e47) begins to blink as an indication that the stationary deviation test of the ABS Lateral Acceleration Sensor has started.</p> <p>Upon correct procedure, the BAS/ESP MIL (A1e47) will illuminate.</p> <p>This then is the signal to perform the driving test as described in point 3 of the menu.</p> <p>Should the vehicle be moved in any way during the stationary deviation test, the stationary deviation test of the ABS Lateral Acceleration Sensor will not be performed. The BAS/ESP MIL (A1e47) will be illuminated.</p> <p><b>In case of fault:</b> Read out the DTC fault code memory.</p>

## 10.4 Electronic Stability Program (ESP)

### Diagnosis – Function Test – Rotating Speed Sensor for ESP (B45) (continued)

	Procedure	Hints
3	<p><b>Dynamic testing of the ABS Lateral Acceleration Sensor (B43) and/or Rotating Speed Sensor of ESP (B45):</b></p> <p>Drive the vehicle in a forward direction at a speed between 5 to 25 km/h (3 to 15 mph).</p> <p>After approx. 20 feet, driving at a constant speed, turn the steering wheel either left or right, but not more than 360°, continue to drive the vehicle approx. 90° degrees more (semi-circle).</p>	<p><b>i</b></p> <p>The ESP/BAS control module (N47-5) performs an evaluation of the rotating signals and lateral acceleration signals. After a successful completion, the BAS/ESP MIL (A1e47) and ABS MIL (A1e17) will go out.</p> <p><b>In case of fault:</b></p> <p>ABS MIL (A1e17) is illuminated: Driving test not successful. Repeat the dynamic driving test (menu item 3).</p> <p>BAS/ESP MIL (A1e47) is illuminated: Driving test not successful. Readout DTC memory.</p>