RESET ADAPTATION DATA Selection

The RESET ADAPTATION DATA test and procedure is used to diagnose and service the 722.6 transmission. The 722.6 comes installed on many Mercedes-Benz vehicles manufactured from 1995 to 2001.

The electronic transmission controller (ETC) constantly monitors shift performance. To achieve the best possible shift quality, the ETC modifies the fill pressure used to engage the shift member. The amount of correction the ETC applies at various engine loads and transmission output shaft speeds are collectively called adaptation values.

By examining the current adaptation values, you can evaluate the mechanical condition of the transmission. Reviewing these values is called the RESET ADAPTATION DATA *test*. Perform this test if you suspect a transmission-related problem such as poor shift quality.

After any transmission repair, you will need to perform the RESET ADAPTATION DATA *procedure*. This procedure resets the learned adaptation values. Once these values are reset, you must drive the vehicle through a variety of controlled conditions repeatedly before the ETC relearns the new adaptation values.

NOTE: *Before performing the RESET ADAPTATION DATA procedure, set aside two to four hours after resetting the values to drive the vehicle under controlled conditions. This drive cycle requires a driver and a passenger.*

Reset Adaptation Data *Test*

This test displays twenty-four transmission data parameters useful in diagnosing the 722.6 transmission. These parameters can only be viewed by selecting the Actuator Test RESET ADAPTATION DATA from FUNCTIONAL TESTS. These parameters do not appear after selecting the FAST or MOVIE data display modes from DATA.

Select ACTUATOR TESTS from the FUNCTIONAL TESTS Menu and the Scanner displays the following list:

```
SCROLL TO SELECT A TEST:
>MODULATOR PRESSURE REGULATING SOL. VALVE
 SHIFT PRESSURE REGULATING SOL. VALVE
 PWM TORQ. CONV. LOCK-UP CLUTCH SOL. VALVE
```

Scroll and select RESET ADAPTATION DATA. Press **Y**, and the Scanner displays the first acceleration data parameter:

```
ACCEL. 1-2(Nm)_ _ _ _ _ _ _ _  36 _ _ _  15
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _  12 _ _ _ 102
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ -21 _ _ _   0
                   <NEXT>
```


Press **Y** again, and the Scanner displays the second acceleration data parameter:

```
ACCEL. 2-3(Nm)_ _ _ _ _ _ _ _  33 _ _ _  75
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ -12 _ _ _ -81
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ -12 _ _ _  33
<PREV>              NEXT
```

Scroll the thumbwheel to move the highlighting arrows from PREV to NEXT along the fourth display line. Pressing **Y** with PREV selected causes the Scanner to display the previous data parameter. Pressing **Y** with NEXT selected causes the Scanner to display the succeeding data parameter.

As described on the next several pages, the twenty-four RESET ADAPTATION DATA parameters may be divided into six groups:

- Acceleration from a lower to a higher gear. This group includes the following parameters:

  ACCEL.1-2(Nm) ACCEL.2-3(Nm)
  ACCEL.3-4(Nm) ACCEL.4-5(Nm)

  The Scanner displays six values for each parameter in this group:

```
ACCEL.1-2(Nm) _ _ _ _ _ _ _ _ (A) _ _ _ (B)
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (C) _ _ _ (D)
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (E) _ _ _ (F)
                    <NEXT>
```

The ETC calculates these adaptive torque values based on other inputs, and stores them in memory. As indicated in Table 1, the ETC stored each value during one of six engine load and speed conditions.

	ENGINE SPEED	
ENGINE LOAD	A High Load, Low Speed	B High Load, High Speed
	C Low Load, Low Speed	D Low Load, High Speed
	E Very Low Load, Low Speed	F Very Low Load, High Speed

Table 1.

The value range varies according to the number of engine cylinders:

8- and 12-cylinder	±210 Nm (upper and lower limit)
6-cylinder	±180 Nm (upper and lower limit)
4-cylinder	±150 Nm (upper and lower limit)

Changes from lower to higher values indicate that the ETC is decreasing fill pressure to lengthen the apply. Changes from higher to lower values indicate that the ETC is increasing fill pressure to shorten the apply. When the values reach their limits, shift quality decreases, as the ETC is no longer to compensate for a loose or tight clutch pack. Since the ETC stores six different values according to engine speed and load conditions, you should be able to easily reproduce the problem during a road test.

- Acceleration from a higher to a lower gear. This group includes the following parameters:

  ACCEL.2-1(Nm) ACCEL.3-2(Nm)
  ACCEL.4-3(Nm) ACCEL.5-4(Nm)

  The Scanner displays four values for each parameter in this group:

```
ACCEL.2-1(Nm) _ _ _ _ _ _ _ _ (A) _ _ _ (B)
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (C) _ _ _ (D)

 PREV                    <NEXT>
```

The ETC calculates these adaptive torque values based on other inputs, and stores them in memory. As indicated in Table 2, the ETC stored each value during one of four engine load and speed conditions.

	ENGINE SPEED	
ENGINE LOAD	A Low Load, Low Speed	B Low Load, High Speed
	C Very Low Load, Low Speed	D Very Low Load, High Speed

Table 2.

The value range varies according to the number of engine cylinders:

8- and 12-cylinder	±210 Nm (upper and lower limit)
6-cylinder	±180 Nm (upper and lower limit)
4-cylinder	±150 Nm (upper and lower limit)

Changes from lower to higher values indicate that the ETC is decreasing fill pressure to lengthen the apply. Changes from higher to lower values indicate that the ETC is increasing fill pressure to shorten the apply. When the values reach their limits, shift quality decreases, as the ETC is no longer to compensate for a loose or tight clutch pack. Since the ETC stores four different values according to engine speed and load conditions, you should be able to easily reproduce the problem during a road test.

- Deceleration from a lower to a higher gear. This group includes the following parameters:

  DECEL.1-2(Nm) DECEL. 2-3(Nm)
  DECEL. 3-4(Nm) DECEL. 4-5(Nm)

  The Scanner displays two values for each parameter in this group:

```
DECEL. 1-2(Nm)_ _ _ _ _ _ _ _ _ (A) _ _ _ (B)
DECEL. 2-3(Nm)_ _ _ _ _ _ _ _ _ (A) _ _ _ (B)

 PREV                    <NEXT>
```

The ETC calculates these adaptive torque values based on other inputs, and stores them in memory. As indicated in Table 3, the ETC stored each value during one of two engine load and speed conditions.

	ENGINE SPEED	
ENGINE LOAD	A Very Low Load, Low Speed	B Very Low Load, High Speed
	A Very Low Load, Low Speed	B Very Low Load, High Speed

Table 3.

The value range varies according to the number of engine cylinders:

8- and 12-cylinder	±210 Nm (upper and lower limit)
6-cylinder	±180 Nm (upper and lower limit)
4-cylinder	±150 Nm (upper and lower limit)

Changes from lower to higher values indicate that the ETC is decreasing fill pressure to lengthen the apply. Changes from higher to lower values indicate that the ETC is increasing fill pressure to shorten the apply. When the values reach their limits, shift quality decreases, as the ETC is no longer to compensate for a loose or tight clutch pack. Since the ETC stores two different values according to engine speed and load conditions, you should be able to easily reproduce the problem during a road test.

- Deceleration from a higher to a lower gear. This group includes the following parameters:

  DECEL. 2-1(Nm) DECEL. 3-2(Nm)
  DECEL. 4-3(Nm) DECEL. 5-4(Nm)

  The Scanner displays four values for each parameter in this group:

```
DECEL.2-1(Nm) _ _ _ _ _ _ _ _ _ (A) _ _ _ (B)
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (C) _ _ _ (D)

 PREV                    <NEXT>
```

The ETC calculates these adaptive torque values based on other inputs, and stores them in memory. As indicated in Table 4, the ETC stored each value during one of four engine load and speed conditions.

	ENGINE SPEED	
ENGINE LOAD	A Low Load, Low Speed	B Low Load, High Speed
	C Very Low Load, Low Speed	D Very Low Load, High Speed

Table 4.

The value range varies according to the number of engine cylinders:

8- and 12-cylinder	-210 Nm to 0 Nm (lower and upper limit)
6-cylinder	-180 Nm to 0 Nm (lower and upper limit)
4-cylinder	-150 Nm to 0 Nm (lower and upper limit)

Changes from lower to higher values indicate that the ETC is decreasing fill pressure to lengthen the apply. Changes from higher to lower values indicate that the ETC is increasing fill pressure to shorten the apply. When the values reach their limits, shift quality decreases, as the ETC is no longer to compensate for a loose or tight clutch pack. Since the ETC stores four different values according to engine speed and load conditions, you should be able to easily reproduce the problem during a road test.

- Fill pressure for specific upshifts. This group includes the following parameters:

  FILL PRESSURE 1-2(mbar)_XXXX (range: 0 to 1600 mbar)
  FILL PRESSURE 2-3(mbar)_XXX (range: 0 to 800 mbar)

  The ETC calculates these adaptive values based on the current draw from the solenoid shift and modulated shift pressure valves. This pressure compensates for the tolerances within the values, and for pressure lost through sources such as worn clutch packs, leaking sealing rings, low fluid, and worn bushings.

  Higher values indicate that the ETC is increasing fill pressure to create a harder shift. Lower values indicate that the ETC is decreasing fill pressure to create a softer shift. A value of about 0 mbar means that either the ETC has not stored an adaptive value, or that the shift member does not require correction. A value at the upper limit of the parameter, along with poor shift quality, indicates the need for repair, or insufficient ATF level.

- Fill time for specific clutch and brake pack shift members. This group includes the following parameters:

  FILL TIME K1 IN 2ND GEAR CYCLE_XX (range: 0 to 15 cycles)
  FILL TIME K2 CYCLE_XX FILL TIME K3 CYCLE_XX
  FILL TIME B1 CYCLE_XX FILL TIME B2 CYCLE_XX
  FILL TIME K1 IN 4TH GEAR CYCLE_XX

  These data parameters display adaptations to the length of time it takes to fill the clutch (K) and brake (B) shift members with ATF to remove the clearances just before application. These adaptations compensate for the condition of the clutches, the number of steel plates, and the clearance between the steel plates.

  The ETC sends an amplitude-modulated current to the fill solenoids. The greater the signal amplitude, or difference between the crests and troughs of the signal, the greater the pressure. The ETC can only change signal amplitude once per 20 milliseconds (ms). This prevents overcorrection. Each cycle displayed by these data parameters equals one 20-ms period. If the Scanner reports a fill time adaptation of 3 cycles, this means that it took three periods of 20-ms each (60 ms) to alter pressure enough to accomplish the correct application of the shift member.

  The maximum fill correction time is 15 cycles, or 300 ms. A value of 0 cycles indicates no fill correction was needed.

Reset Adaptation Data *Procedure*

This procedure has two parts: resetting the electronic transmission controller (ETC) adaptation values and teaching the ETC new adaptation values.

Resetting the ETC Adaptation Values

NOTE: *Before resetting the adaptation values, set aside two to four hours afterwards to teach the ETC new adaptation values. This drive cycle requires a driver and a passenger.*

Before resetting the adaptation values, the following engine and transmission operating conditions must be met:

- The engine must be running.
- The transmission oil temperature (ATF) as displayed by the data parameter TRANSMISS. OIL TEMP. R/3/4/3/2/1 must be higher than 140° F (60° C).
- The gear selector must be in "D" or "R."

From the ACTUATOR TESTS menu list, select RESET ADAPTATION DATA and press **Y.** After the Scanner displays a Reset Adaptation data parameter, press **N,** and the following screen appears:

```
RESET ADAPTATION DATA:


PERFORM RESET?          (Y/N)
```

Press **Y,** and the Scanner resets all of the transmission adaptive data parameters to zero, except for one value included with the following data parameters:

ACCEL.2-1(Nm) ACCEL.3-2(Nm)
ACCEL.4-3(Nm) ACCEL.5-4(Nm)

For these data parameters, the Scanner displays a -30 Nm as the value for high load at low engine speed. The following screen displaying the ACCEL. 2-1(Nm) parameter provides an example:

```
ACCEL. 2-1(Nm)_ _ _ _ _ _ _ _ -30 _ _ _  0
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _  0 _ _ _  0

 PREV                  <NEXT>
```

Teaching the ETC New Adaptation Values

Teaching the ETC new adapation values requires the driver to operate the vehicle repeatedly through various loads, speeds, and shifts while maintaining several data parameter values within a specified range. The data parameters for these values include:

- TRANSMISS. OIL TEMP. R/D/4/3/2/1
- GRADE(%)
- ACCELERATOR PEDAL(%)
- ENGINE SPEED(1/min)
- ENGINE TORQUE(Nm)

For 722.6 transmissions follow this procedure:

1. Identify the engine number.
2. Connect the Scanner, and select the FAST data display mode from the DATA selection listed in the transmission Main Menu. View only the data parameters above for the quickest update rate. Have an assistant ride in the passenger seat to monitor these values while you drive.
3. Warm up the vehicle until the automatic transmission fluid has reached a temperature from 140° to 221°F (60° to 105°C). Throughout the drive cycle, monitor the TRANSMISS. OIL TEMP parameter value, and maintain the ATF within this range. Temperatures that range from 176° to 194°F (80° to 90°C) are optimal.
4. Turn the A/C off, and drive the vehicle on a level road with light throttle. Monitor the GRADE(%) and ACCELERATOR PEDAL(%) values to maintain these conditions.
5. Maintain the engine speeds specified in Table 5 for engines M104, M111, and OM606, and the speeds specified in Table 6 for engines M119 and M120. Constantly monitor the ENGINE SPEED(1/min) data parameter value. Adjust speed accordingly.
6. While maintaining the values of the previous parameters within range, drive the vehicle so that the value the Scanner displays for ENGINE TORQUE(Nm) matches the appropriate value in the table for your engine and gear shift.

   After achieving the proper torque value, shift the transmission using the shift lever from and to the prescribed gears in the table. Repeat this procedure for every set of listed gears. Be sure to allow the shift members time to fully apply and release.

7. Repeat step 6 eight times on M119 and M120 engines, and four times on M104, M111, and OM606 engines.
8. Allow the engine to run ten minutes after completing all of the gear shifts to assure the ETC stores the new adaptation values.

	ENGINES			
SHIFTS	**M104.941**	**M111.973**	**M111.974**	**OM606.912**
1-2	14 - 36 Nm	15 - 36 Nm	15 - 28 Nm	14 - 27 Nm
2-3	20 - 59 Nm	20 - 59 Nm	20 - 59 Nm	20 - 55 Nm
3-4	20 - 45 Nm	20 - 45 Nm	20 - 46 Nm	15 - 54 Nm
4-5	0 - 121 Nm	0 - 121 Nm	1 - 82 Nm	0 - 81 Nm
MAX. ENGINE SPEED	2400 rpm			1800 rpm

Table 5. Adapation Torque Requirement Chart: Engines M104.941, M111.973, M111.974, and OM606.912.

	UPSHIFT	DOWNSHIFT	ENGINES	
SHIFT MEMBER	**Very Light Throttle**	**Idle Throttle (w/o shifter)**	**M119 4.2-liter**	**M119 5.0-liter and M120**
K1	1-2	-	20 - 40 Nm	20 - 50 Nm
K2	2-3	-	20 - 70 Nm	20 - 80 Nm
K3	3-4	-	0 to 60 Nm	0 to 140 Nm
B1	4-5	-	0 to 110 Nm	0 to 140 Nm
B2	-	4-3	0 to -50 Nm	0 to -50 Nm
K1	-	5-4	0 to -50 Nm	0 to -50 Nm
MAX. ENGINE SPEED	1800 rpm			

Table 6. Adapation Torque Requirement Chart: Engines M119 and M120.