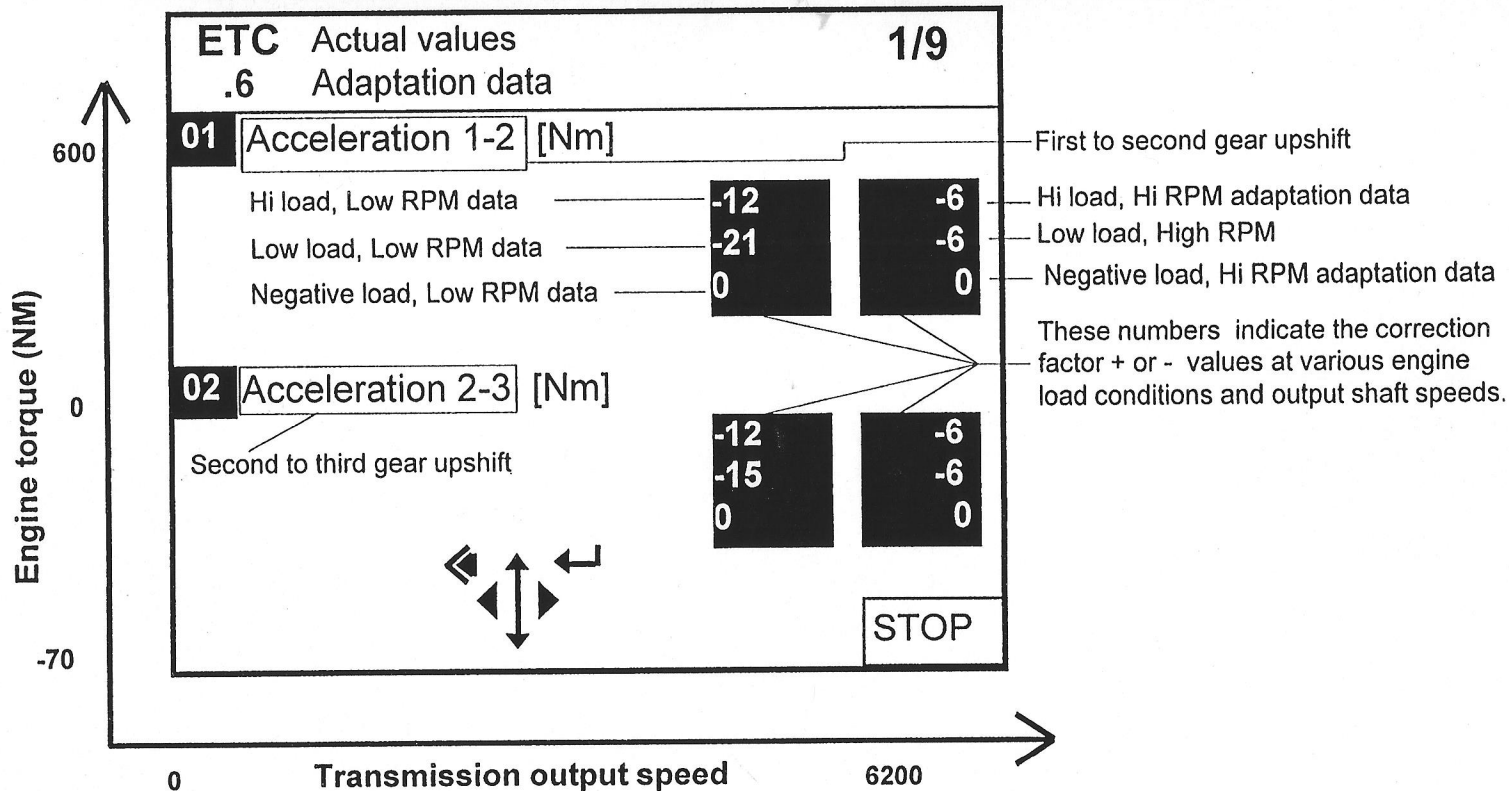


722.6 Diagnostic Guide

This guide was designed to be used in supervised training sessions by qualified M-B technicians. The procedures and values may change without notice. Always refer to the latest Diagnostic Directory and M-B Net messages.

Analyzing Adaptation for Shift Time Data on the HHT



There are no ideal numbers to achieve, however, a zero (0) indicates that a shift member does not require adaptation or the shift member has not yet adapted. If an adaptation value is at its **maximum value**, and the shift is unacceptable repair work may be required.

Maximum values in Nm

Additional adaptation cannot be achieved when the following values are reached.

- 8 and 12 cylinder engines + or - 210 Nm
- 6 cylinder engines + or - 180 Nm
- 4 cylinder engines + or - 150 Nm

Analyzing the HHT screen above:

The 1 - 2 shift is satisfactory, therefore we can conclude that the clearance value for K1 was set near the middle of the specification tolerances. The low numbers on the HHT screen indicate that a small amount of adaptation was required to optimize the shift.

Adaptation: Refer to the Diagnostic Directory for detailed Adaptation procedures.

The following key points must be observed when performing an adaptation on a 722.6

1. Transmission oil temperature 60 to 105 °C. **(80 to 90 °C is optimal)**
2. Connect the HHT. Have an assistant read the HHT data while you drive the vehicle.
3. Turn **A-C OFF** and drive the vehicle on a **level road** with **light throttle**.
4. Do Not exceed the maximum engine RPM during shift process, refer to charts.
5. Refer to the "Adaptation Torque Requirement" charts.
6. Let **engine run for ten minutes after adaptation process** or you will lose the new adaption data.
7. To assure effective adaption, shift members must apply and release: (The shift lever may used to cause shifts)
 - **Eight times on M119,M120**
 - **Four times on M104, M111 and OM606.**

Adaptation Torque Requirement chart for Shift Time - M104, M111 and OM606				
Shift	Torque	Torque	Torque	Torque
Engine	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	0 - 82 Nm	0 - 81 Nm
Max. engine speed	2400 RPM	2400 RPM	2400 RPM	1800 RPM
Adaptation Torque Requirement chart for Shift Time - M119 and M120				
Shift Member	Upshift Very Light Throttle	Downshift Idle Throttle (w/o shifter)	Permissible Engine Torque During the shift process. M119 4.2 liter	Permissible Engine Torque During the shift process. M119 5.0 liter and M120
K1	1 - 2	-	20 to 40 Nm	20 to 50 Nm
K2	2 - 3	-	20 to 70 Nm	20 to 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 -50Nm	0 to -50 Nm
K1	-	5 - 4	0 to -50 Nm	0 to -50 Nm
Max. engine speed	1800RPM			



Automatic Transmission 722.6

Adaption values: (Automatic transmission 722.6)

A) Shifting time

1. Upshifts under acceleration (with load).
 - HHT menu shows 2 frames with 3 Nm values in each frame.
2. Upshifts under deceleration (no load).
 - HHT menu shows 2 frames with 1 Nm value in each frame.
3. Downshifts under acceleration (with load).
 - HHT menu shows 2 frames with 2 Nm values in each frame.
4. Downshifts under deceleration (no load).
 - HHT menu shows 2 frames with 2 Nm values in each frame.

Maximum value in Nm for shifting time:

- ± 210 Nm = transmissions for 8 and 12 cylinder engines.
- ± 180 Nm = transmissions for 6 cylinder engines.
- ± 150 Nm = transmissions for 4 cylinder engines.
- ± 180 Nm = transmissions for 250 D and 300D Turbodiesel engines.

*Make clearance of Pack
At Middle of Spec.
OR on lower side*

B) Filling pressure

- HHT menu with 1 frame and with 1 value in mbar.

Maximum value in mbar:

- upshift 1-2 = ± 1600 mbar.
- upshift 2-3 = ± 1600 mbar.

Hint: No values available for upshifts 3-4 / 4-5 due of KÜB function!

C) Filling time

- HHT menu shows 1 frame and with 1 value in cycles.

Maximum value in cycles:

- Filling time K1 = 15 cycles, for 2nd gear.
- Filling time K2 = 15 cycles.
- Filling time K3 = 15 cycles.
- Filling time B1 = 15 cycles.
- Filling time B2 = 15 cycles
- Filling time K1 = 15 cycles, for 4th gear.

Important hints:

- Adaptions take place only, when ATF fluid temperature remains between 60°C and 100°C.
- As soon as maximum values in Nm/mbar or cycles are reached, further adaption is not possible.
- Dont start reparation when maximum values are reached.
- Start activities in case of complaint only!!!



Automatic Transmission 722.6

HHT Programm

Pos.	Module 6511 2600 02, Status 12/95	Pos.																									
1	<p>EGS Actual values 1/9 Adaptation data</p> <p>01 Acceleration 1-2 [Nm]</p> <table border="1"> <tr><td>-12</td><td>0</td></tr> <tr><td>-21</td><td>-0.0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>02 Acceleration 2-3 [Nm]</p> <table border="1"> <tr><td>-12</td><td>-0.0</td></tr> <tr><td>-15</td><td>-0.0</td></tr> <tr><td>0</td><td>0.0</td></tr> </table> <p>↕ STOP</p>	-12	0	-21	-0.0	0	0	-12	-0.0	-15	-0.0	0	0.0	6	<p>EGS Actual values 6/9 Adaptation data</p> <p>13 Deceleration 2-1 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>14 Deceleration 3-2 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>15 Deceleration 4-3 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0	0	0	0	0	0	0	0	0
-12	0																										
-21	-0.0																										
0	0																										
-12	-0.0																										
-15	-0.0																										
0	0.0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
2	<p>EGS Actual values 2/9 Adaptation data</p> <p>03 Acceleration 3-4 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>04 Acceleration 4-5 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0	0	0	0	0	0	0	0	0	7	<p>EGS Actual values 7/9 Adaptation data</p> <p>16 Deceleration 5-4 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0								
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
3	<p>EGS Actual values 3/9 Adaptation data</p> <p>05 Deceleration 1-2 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> </table> <p>06 Deceleration 2-3 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> </table> <p>07 Deceleration 3-4 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> </table> <p>08 Deceleration 4-5 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0	0	0	0	0	8	<p>EGS Actual values 8/9 Adaptation data</p> <p>17 Filling pressure 1-2</p> <table border="1"> <tr><td>0</td><td>mbar</td></tr> </table> <p>18 Filling pressure 2-3</p> <table border="1"> <tr><td>0</td><td>mbar</td></tr> </table> <p>19 Filling time K1 in 2nd gear</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>20 Filling time K2</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>21 Filling time K3</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>↕ STOP</p>	0	mbar	0	mbar	0	Cycle	0	Cycle	0	Cycle						
0	0																										
0	0																										
0	0																										
0	0																										
0	mbar																										
0	mbar																										
0	Cycle																										
0	Cycle																										
0	Cycle																										
4	<p>EGS Actual values 4/9 Adaptation data</p> <p>09 Acceleration 2-1 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>10 Acceleration 3-2 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>11 Acceleration 4-3 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0	0	0	0	0	0	0	0	0	9	<p>EGS Actual values 9/9 Adaptation data</p> <p>22 Filling time B1</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>23 Filling time B2</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>24 Filling time K1 in 4th gear</p> <table border="1"> <tr><td>0</td><td>Cycle</td></tr> </table> <p>↕ STOP</p>	0	Cycle	0	Cycle	0	Cycle						
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	0																										
0	Cycle																										
0	Cycle																										
0	Cycle																										
5	<p>EGS Actual values 5/9 Adaptation data</p> <p>12 Acceleration 5-4 [Nm]</p> <table border="1"> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </table> <p>↕ STOP</p>	0	0	0	0	10	<p>EGS Adaptation data</p> <p>Reset adaptation data?</p> <p>YES NO</p>																				
0	0																										
0	0																										