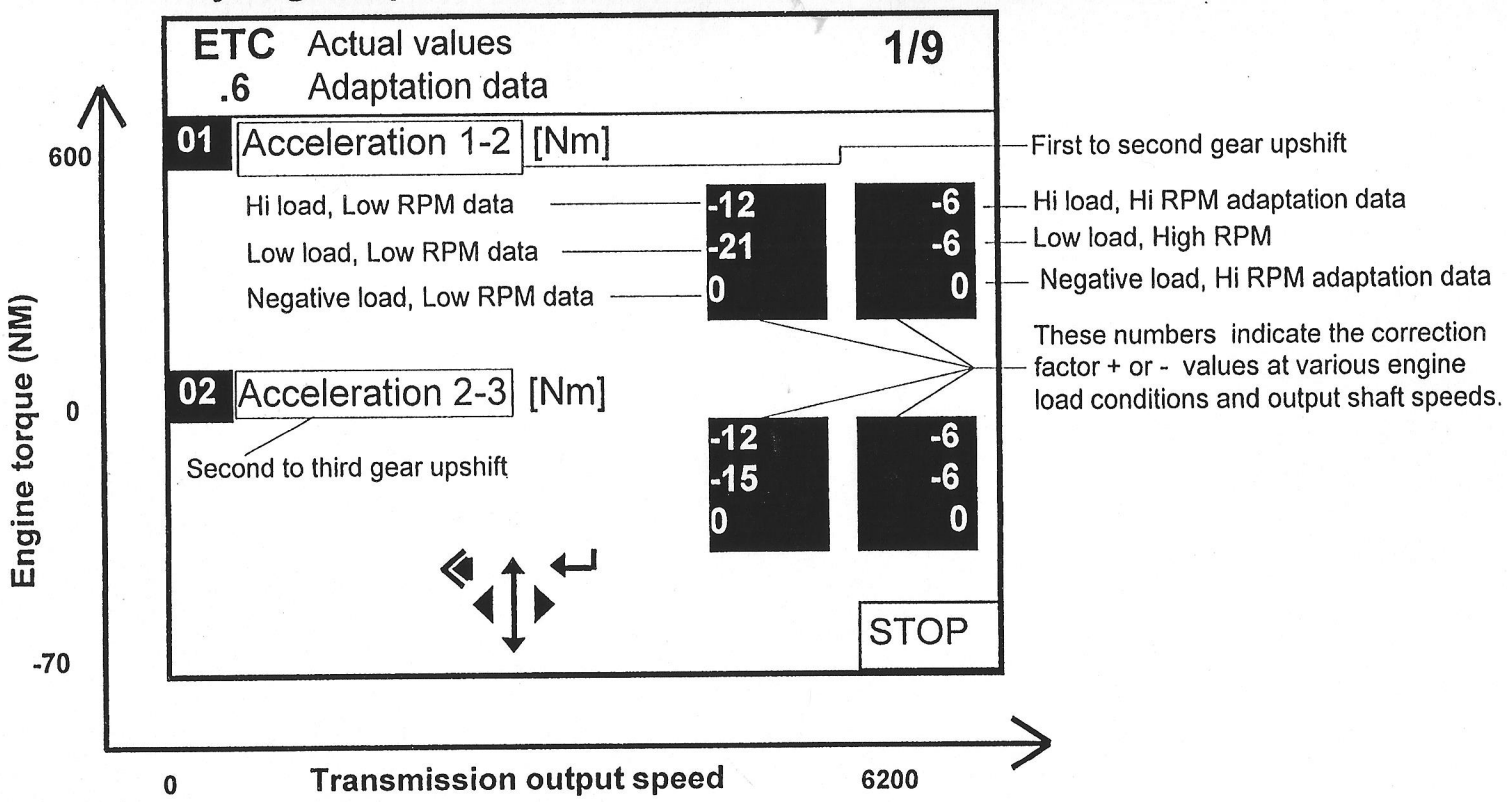
## Analyzing Adaptation for Shift Time Data on the HHT




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 adaptated. 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 menue shows 2 frames with 3 Nm values in each frame.
2. Upshifts under deceleration (no load).
   - HHT menue shows 2 frames with 1 Nm value in each frame.
3. Downshifts under acceleration (with load).
   - HHT menue shows 2 frames with 2 Nm values in each frame.
4. Downshifts under deceleration (no load)
   - HHT menue 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 Packs AT Middle of Spec. OR on Lower Side

### B) Filling pressure

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

Maximum value in cycles:

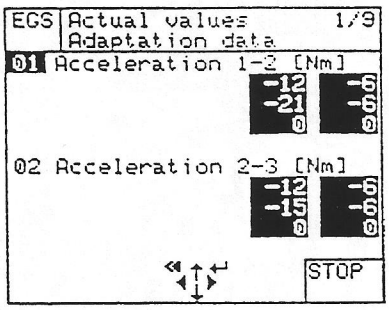
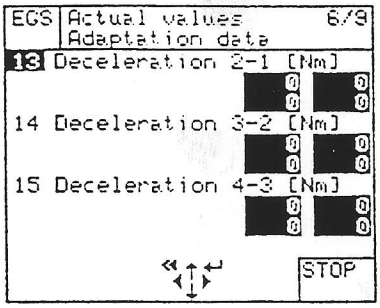
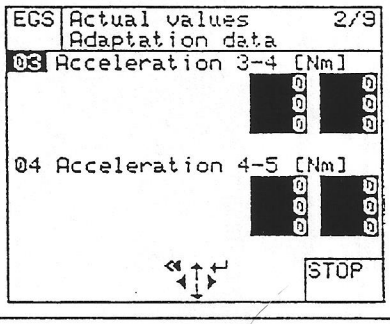
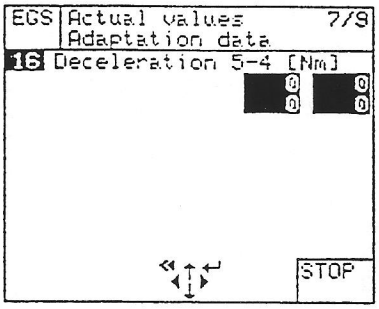
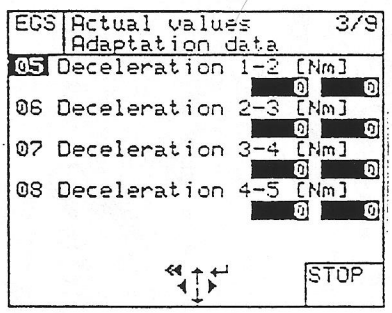
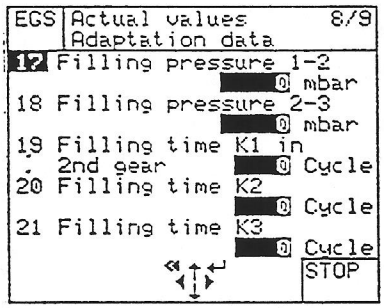
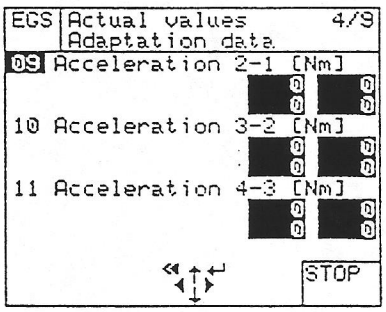
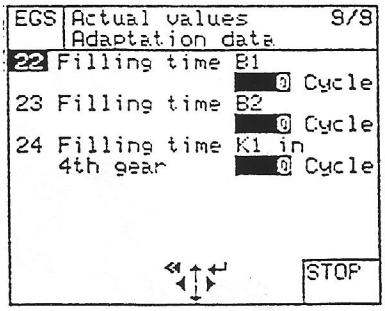
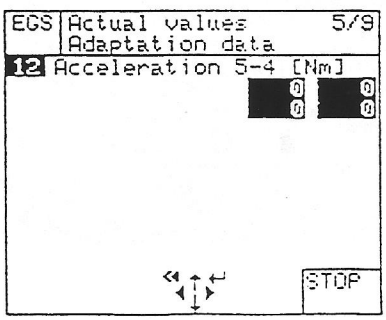
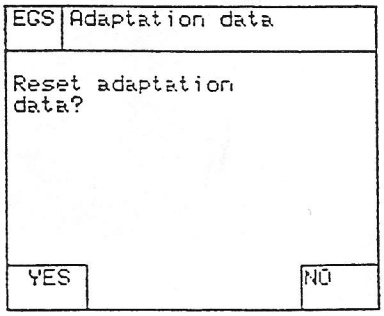
- Filling time K1 = 15 cycles, for 2nd gear.
- Filling time K2 = 15 cycles.
- Filling time K3 = 15 cycles.
- Filling time B1 = 15 cycles.
- Filling time B2 = 15 cycles
- Filling time K1 = 15 cycles, for 4th gear.

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 |  | 6 |  |
| 2 |  | 7 |  |
| 3 |  | 8 |  |
| 4 |  | 9 |  |
| 5 |  | 10 |  |