Mercedes 722.9

Presented by Dr William (Bill) Henney PhD F.I.M.I
Features

• Electronically Controlled Automatic Gearbox

• 7 Forward and 2 Reverse Gears

• Transmission Control Module is:
  Integrated into the Valve Body and is “Flash” Capable

• Torque Converter operates in Open and Slip Mode in all 7 Forward Gears

• Gear Ratios achieved with 3 Clutches and 4 Brakes (No Free-Wheeling Units)

• 3 Planetary Gearsets 2–Simple and 1-Ravigneaux
Advantages

• Shift comfort and driving pleasure enhanced through improved control of gear changes.

  1. Shorter computer reaction time by 0.1 second
  2. Downshifts shortened by up to 0.2 second
  3. Coast downshifts shortened by 0.4 - 2.5 seconds

• Fuel consumption improved by 4%

• Noise level reduced due to lower engine speeds in higher gears.

• Flexible adaptation to engine and vehicle.
Transmission Applications

• Currently only one size of 722.9 will be produced. A smaller version W7A 700 has been postponed until further notice.

• The transmission is also referred to as:
  NAG 2 (New Automatic Gearbox 2)
  7 G-Tronic


• 722.6 Transmission (NAG 1 or NAG V) will continue to be built until 2012
Variable Shift Programming

• Just like the 722.6 it has two basic shift programs using the S/C button on the ESM Electronic Shifter Module.

  “S” (Sport)          “C” (Comfort)
  1st Gear Starts      2nd Gear Starts
  Normal Shift Points  Earlier Upshifts/Later Downshifts
  Reverse ratio -3.416:1  Reverse ratio -2.231:1

• The Transmission will start in 1st gear if any of the following conditions apply:
  1st gear is manually selected
  75% of full throttle acceleration from start
  Cold Engine Temperature (Pre-Catalytic warm-up)
Transmission Fluid

It is suggested a new fluid should be used referred to as ATF3353. This has a higher thermal stability and friction consistency.

This fluid can be used on 722.3/4/5/6

It requires no scheduled maintenance.

Supplied by Shell & Fuchs Europe in 1 Litre containers.

Mercedes Part No. A001 989 45 03 10
Transmission Fluid Level

• No Dipstick or Dipstick tube.

• Fluid level check using overflow method.

• Oil pan has overflow pipe clipped onto the pan above drain plug.

• Fluid level must be checked at specified temperature.
**Transmission Fluid Level**

- A new oil pan is used and can be identified by its design and Part No. 220 270 09 12

- The white overflow pipe has been increased in length and as a result will hold an extra 0.2 litres of fluid.
Major Components
Major Component Legend

1. Park Pawl
2. Turbine wheel
3. Stator
4. Impeller
5. Transmission Breather
6. Oil pump
7. B1 Brake
8. K1 Clutch
9. Ravigneaux Gearset
10. B3 Brake
11. K2 Clutch
12a. Front Simple Planetary
12b. Rear Simple Planetary
13. BR Brake
14. K3 Clutch
15. B2 Brake
16. Torque Converter Clutch
17. Torque Converter housing
18. Output speed exciter ring
19. Internal speed ring magnet
20. Turbine speed ring magnet
21. Electro-hydraulic control unit
22. Range Selector Lever
Torque Converter

- Same as used in some 722.6 transmissions
- Fluid capacity 4 Litres
- Lock-up can be activated in all 7 gears
- Incorporates damper springs to reduce vibration

1. Lock-up with torsional damper springs
2. Turbine wheel
3. Stator
4. Impeller
**Torque Converter**

- The Torque Converter is never fully locked.

- In 1\(^{st}\) and 2\(^{nd}\) gears if throttle and output speed are in zone A the Torque converter is open.

- If throttle and output speed are in zone B it operates in slip-mode in all 7 forward gears.

- If temperature exceeds 140 Deg C the TCC is switched off and lower gear selected. (DTC 2226)
Transmission Housing

• Torque converter housing is die-cast Aluminium

• Transmission is die-cast magnesium (2Kg weight reduction)

• New aluminium bolts must be used if removed and tightening torques should be adhered to

• Thread repairs to magnesium case is permissible
Transmission Housing

- Housing gasket is made from aluminium sheet coated with elastomer and can be re-used.

- The gasket has a lip that faces forward to direct water away from the casing.

- Salt water can damage magnesium in as little as 8 weeks.
Oil Cooler Pipes

- The transmission cooler pipes are sealed with an O’ring and retained using a bolt.
Oil Pump

• This transmission as like the 722.6 uses a crescent style pump

• The suction side has a recess to help reduce oil intake noise. This is also expected to be phased in on the 722.6

• To improve performance at high temperatures and also reduce weight it is expected that the pump and gears will soon be made from aluminium
Ravigneaux Gear Set

• The advantages of the Ravigneaux Gear set are that it combines two simple planetary sets into one simple unit.

• It increases available gear ratios compared to a simple planetary set. It has two ring gears.
Ravigneaux Gear Set

- The input from the torque converter turbine arrives at the gear set via the small ring gear.
- The long planetary gear transfers drive via the the sun gear or short planetary gear depending upon the applied member.
Multi-Disc Brakes

- B1 & B3 Multi-disc brakes use single sided plates
Multi-Disc Clutches

• All multi-disc clutches use single sided plates
**Shift Application Chart**

- In neutral 2 elements are applied, so only 1 element needs to apply when selecting either D or R

- A gear change is made by applying an element whilst disengaging another

<table>
<thead>
<tr>
<th>GEAR</th>
<th>RATIO</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>BR</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
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<tbody>
<tr>
<td>1</td>
<td>4.377</td>
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<td>3</td>
<td>1.921</td>
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<td>X</td>
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<tr>
<td>5</td>
<td>1.000</td>
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<td>X</td>
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<tr>
<td>N(1)</td>
<td></td>
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<td></td>
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<td>X</td>
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<tr>
<td>R(1)</td>
<td>-3.416</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>R(2)</td>
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<td>X</td>
<td></td>
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<td></td>
<td>X</td>
</tr>
</tbody>
</table>

(1) = S Mode    (2) = C Mode
Power Flow 1st Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
16 Torque converter lockup clutch

A Input
B Output
BR Multi-disk brake BR
B1 Multiple-disc brake B1
B2 Multiple-disc brake B2
B3 Multiple-disc brake B3
K1 Multi-disk clutch K1
K2 Multi-disk clutch K2
K3 Multi-disk clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planet gears
PL9 Planet gears
Power Flow 2nd Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
16 Torque converter lockup clutch

A Input
B Output
BR Multi-disc brake BR
B1 Multiple-disc brake B1
B2 Multiple-disc brake B2
B3 Multi-disc brake B3
K1 Multi-disc clutch K1
K2 Multi-disc clutch K2
K3 Multi-disc clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL5 Planet gears
PL9 Planet gears
Power Flow 3rd Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
15 Torque converter lockup clutch

A Input: BR Multi-disk brake BR
B Output: B1 Multiple-disc brake B1
B2 Multiple-disc brake B2
B3 Multiple-disc brake B3
K1 Multi-disk clutch K1
K2 Multi-disk clutch K2
K3 Multi-disk clutch K3
PL2k Short planet gears
PL2i Long planet gears
PL6 Planet gears
PL9 Planet gears

Note:
In 3rd gear the Ravigneaux gear set is locked as one. If a gear noise is being diagnosed and it goes away when in 3rd gear, then check front gear set.
Power Flow 4th Gear

Note:
In 4th gear the Ravigneaux and rear gear sets are locked as one. If a gear noise is being diagnosed and it only goes away when in 4th gear, then check rear gear set.

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
15 Torque converter lockup clutch
16 Input
17 Output
18 Multi-disc brake B1
19 Multi-disc brake B2
20 Multi-disc brake B3
21 Multi-disc clutch K1
22 Multi-disc clutch K2
23 Multi-disc clutch K3
24 Short planet gears
25 Long planet gears
26 Planet gears
27 Planet gears
Power Flow 5th Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
16 Torque converter lockup clutch

A Input
B Output
BR Multi-disk brake BR
B1 Multi-disc brake B1
B2 Multi-disc brake B2
B3 Multi-disc brake B3
K1 Multi-disc clutch K1
K2 Multi-disc clutch K2
K3 Multi-disc clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planets gears
PL9 Planet gears

Note:
In 5th gear, all gear sets are locked as one. If gear noise is being diagnosed and it only goes away when in 5th gear, then check center gear set.
Power Flow 6th Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear ring
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
16 Torque converter lockup clutch

A Input
B Output
BR Multi-disc brake BR
B1 Multiple-disc brake B1
B2 Multiple-disc brake B2
B3 Multiple-disc brake B3
K1 Multi-disc clutch K1
K2 Multi-disc clutch K2
K3 Multi-disc clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planet gears
PL9 Planet gears
Power Flow 7th Gear

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
15 Torque converter lockup clutch

A Input
B Output
BR Multi-disc brake BR
B1 Multiple-disc brake B1
B2 Multiple-disc brake B2
B3 Multiple-disc brake B3
K1 Multi-disc clutch K1
K2 Multi-disc clutch K2
K3 Multi-disc clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planet gears
PL9 Planet gears
Power Flow Reverse (S mode)

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
15 Torque converter lockup clutch

A Input
B Output
BR Multi-disk brake BR
B1 Multi-disk brake B1
B2 Multi-disk brake B2
B3 Multi-disk brake B3
K1 Multi-disk clutch K1
K2 Multi-disk clutch K2
K3 Multi-disk clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planet gears
PL9 Planet gears
Power Flow Reverse (C mode)

2 Turbine wheel
3 Stator
4 Impeller
5 Small internal-gear wheel
6 Dual planet carrier
7 Sun gear
8 Large internal-gear wheel
9 Internal-gear wheel
10 Planet carrier
11 Sun gear
12 Internal-gear wheel
13 Planet carrier
14 Sun gear
16 Torque converter lockup clutch

A Input
B Output
BR Multi-disk brake BR
B1 Multi-disk brake B1
B2 Multi-disk brake B2
B3 Multi-disk brake B3
K1 Multi-disk clutch K1
K2 Multi-disk clutch K2
K3 Multi-disk clutch K3
PL2k Short planet gears
PL2l Long planet gears
PL6 Planet gears
PL9 Planet gears
Shift Sequences

- In addition to sequentially shifting the 722.9 can downshift skipping gears providing the one element applied, one element released principle

<table>
<thead>
<tr>
<th></th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4th</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>3rd</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Diagram:**
- Release B3 → 7
- Release K2 → 6
- Apply K1 → 6
- Release K2 → 5
- Apply B2 → 5
- Release K1 → 4
- Apply B2 → 4
- Release K1 → 3
- Apply B2 → 3
- Release K1 → 2
- Apply B2 → 2
- Release B3 → 1

**Legend:**
- B1, B2, B3: Shifts
- K1, K2, K3: Clutch Engagement
Electro-hydraulic Module

- Uses same principle as 722.6 of controlling hydraulics with electronics
- The module will adapt for optimal shift quality
- Mounted to the Valve body are components that control, monitor and enable the gear shifts
Electro-hydraulic Module

11 Plug connection
21b Valve body upper
21c Intermediate panel
21d Valve body lower / Shift housing
31 Oil control float 1
32 Oil control float 2
Y3/8 Electric control module
Y3/8n1 Turbine rpm sensor
Y3/8n2 Internal rpm sensor
Y3/8n3 Output rpm sensor
Y3/8n4 Transmission control module
Y3/8s1 Selection range sensor
Y3/8y1 Working pressure control solenoid valve
Y3/8y2 K1 clutch control solenoid valve
Y3/8y3 K2 clutch control solenoid valve
Y3/8y4 K3 clutch control solenoid valve
Y3/8y5 B1 brake control solenoid valve
Y3/8y6 B2 brake control solenoid valve
Y3/8y7 B3 brake control solenoid valve
Y3/8y8 Torque converter lockup clutch control solenoid valve
Electro-hydraulic Module

- Each Valve body is individually tested
- Hydraulic pressures and currents are measured
- Values are evaluated and corresponding algorithms are written to the modules permanent memory
- This ensures that the module is calibrated to that valve body
- Once this process is complete the valve body is installed in the transmission
**Electric Control Module**

- The task of the Electric Control module is to:
  - Evaluate various input signals
  - Calculate shift points according to programming
  - Evaluate gear shifts and attempt to adapt
  - Activate 8 control solenoid valves

“Flashable” capable software using SDS / DAS
Electric Control Module

• As the control module is integrated into the valve body, wiring to the transmission has been greatly reduced

• Electrical plug has only 5 pins
  1. = CAN C High
  2. = CAN C Low
  3. = To diagnostic X11/4
  4. = Circuit 87 (relay & fuse)
  5. = Circuit 31
Electric Control Module

• The plug connector is sealed by two O’rings and one square section seal.
### Electric Control Module

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y3/8n3</td>
<td>Output speed sensor</td>
<td>11</td>
<td>Electrical connector</td>
</tr>
<tr>
<td>Y3/8n1</td>
<td>Input speed sensor</td>
<td>X11/4</td>
<td>Diagnostic socket</td>
</tr>
<tr>
<td>Y3/8n2</td>
<td>Internal speed sensor</td>
<td>Y3/8n4</td>
<td>Electric control module</td>
</tr>
<tr>
<td>Y3/8s1</td>
<td>Range selector sensor</td>
<td>Y3/8y1 – Y3/8y8</td>
<td>Solenoids</td>
</tr>
</tbody>
</table>

![Diagram of the electric control module and its components.](attachment:diagram.png)
Information Received Over CAN C

1. Engine RPM
2. Engine coolant temperature
3. Throttle pedal position
4. Engine load
5. ESP signals
6. Cruise control signals
7. ESM (Shifter position)

Information Received Directly

1. Speed sensors
2. Range selector sensor
3. Transmission fluid temperature
Speed Sensors Y3/8n1 & n2

- Front speed sensor (Y3/8n1) monitors turbine speed (input shaft / small ring gear)
- Centre speed sensor (Y3/8n2) monitors Ravigneaux planet carrier speed
- These sensors are Active speed sensors
- They permit a signal to be read through other Non-ferrous parts
- The magnets are moulded in plastic rings and secured inside aluminium flanges
Speed Sensors Y3/8n1 & n2
The Y3/8n3 sensor measures transmission output speed from a ring attached to the park gear. It is a Hall effect type sensor. Replaces wheel speed information previously used to calculate shift points and detects gear slip. Direct input to electric control module. Improves reaction time to changes in vehicle speed.
Solenoid Valves

- The solenoids are actuated by the transmission control module using variable current
- Each solenoid valve has a filter screen fitted
- The 4 solenoids shown are normally closed. No current / no pressure. Pressure increases with current
Solenoid Valves

- The valves shown are normally open. They produce maximum pressure with no current applied and decrease pressure with current.
- These valves are responsible for limp-home mode when all valves are de-energised.
Hydraulic Diagram

Shown in 2\textsuperscript{nd} gear
## Hydraulic Diagram Legend

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Translated Description</th>
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<tbody>
<tr>
<td>DHV1</td>
<td>Pressure hold valve</td>
</tr>
<tr>
<td>F</td>
<td>ATF Filter</td>
</tr>
<tr>
<td>Getriebebeschirmung</td>
<td>Transmission lubrication</td>
</tr>
<tr>
<td>K</td>
<td>ATF radiator</td>
</tr>
<tr>
<td>Kib</td>
<td>Torque converter lock-up clutch</td>
</tr>
<tr>
<td>KUSV-B2BR</td>
<td>Switchover valve B2 and BR</td>
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<tr>
<td>KUSV-NOT</td>
<td>Limp home switchover valve</td>
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<tr>
<td>M</td>
<td>Measuring point for the hydraulic pressures</td>
</tr>
<tr>
<td>Factory only - sealed off with steel balls</td>
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<tr>
<td>R8-AD</td>
<td>Regulation valve - Working pressure</td>
</tr>
<tr>
<td>R8-B1</td>
<td>Regulation valve - B1 brakes</td>
</tr>
<tr>
<td>R8-B2/BR</td>
<td>Regulation valve - B2 and BR brakes</td>
</tr>
<tr>
<td>R8-B3</td>
<td>Regulation valve - B3</td>
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<tr>
<td>R8-K1</td>
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<td>R8-K2</td>
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<td>R8-K3</td>
<td>Regulation valve - K3</td>
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<td>R8-Kueb</td>
<td>Regulation valve - TC lock-up clutch</td>
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<td>R8-pSchm</td>
<td>Regulation valve - Lubrication pressure</td>
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<td>R8-pvD1</td>
<td>Regulation valve - Valve supply pressure 1</td>
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<td>R8-pvD2</td>
<td>Regulation valve - Valve supply pressure 2</td>
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<tr>
<td>R8-WA</td>
<td>Regulation valve - converter inlet pressure</td>
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<tr>
<td>SS-B1BP3</td>
<td>Shift valve - B1 and B3 brakes</td>
</tr>
<tr>
<td>SS-B2 1</td>
<td>Shift valve - B2 1</td>
</tr>
<tr>
<td>SS-B2 2</td>
<td>Shift valve - B2 2</td>
</tr>
<tr>
<td>SS-K2</td>
<td>Shift valve - K2</td>
</tr>
<tr>
<td>SS-K3</td>
<td>Shift valve - K3</td>
</tr>
<tr>
<td>SS-NOT</td>
<td>Shift valve - Limp home</td>
</tr>
<tr>
<td>VGS-Kühlung</td>
<td>Returning ATF cools lower surface of the ETC</td>
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<tr>
<td>WS</td>
<td>Selection range valve</td>
</tr>
</tbody>
</table>

**Diagram:**
- **B1:** Shift member. B_brake K_clutch
- **M:** Measuring point
- **AD:** Solenoid valve:
  - Normally open
  - Normally closed
- **Return to oil pan**
- **Oil pump**
- **Filter**
- **Oil pan**

**Company:** Autoline GERMANY
Range Selector Sensor (Y38s1)

- The sensor is soldered onto the ribbon cable of the electric control module
- This sensor cannot be replaced separately
- It records the position of the range selection lever
- It is a PLCD, Permanent magnetic Linear Contactless Displacement sensor
- It is constructed of a soft magnetic core surrounded by a wire along it’s length with additional coil at each end
- It has a permanent magnet on the range selector valve which changes it’s magnetic field and output voltage of the sensor

**WARNING**

This sensor must be “learned in” or Limp-home will occur
Fluid Level Control

• This feature reduces the possibility of gear sets running in fluid and causing ATF foaming
• Two floats are used because the transmission is 41mm longer than the 722.6 and fluid has a tendency to run to the front of the case under sharp braking
Check and Diagnosis

- Oil Level Check
- Limp-home Modes
- DTC’s
- EDAC
- Replacement of Transmission or Control Module
- SCN & CVN Coding
Fluid Level

• The fluid level should be checked at specific fluid temperatures using SDS / DAS.
• There are two different oil pan designs with different fill specifications.
• Mercedes recommend using a special filling tool to add fluid via the drain bung.

<table>
<thead>
<tr>
<th></th>
<th>Old Pan Design</th>
<th>New Pan Design</th>
</tr>
</thead>
<tbody>
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<td>WIS document No.</td>
<td>S127.00-P-0002A</td>
<td>S127.00-P-0002B</td>
</tr>
<tr>
<td>Initial fill check</td>
<td>30 deg C</td>
<td>40 deg C</td>
</tr>
<tr>
<td>Level check</td>
<td>30 – 35 deg C</td>
<td>40 – 45 deg C</td>
</tr>
<tr>
<td>Fluid fill total</td>
<td>9.5 Litres</td>
<td>9.7 Litres</td>
</tr>
</tbody>
</table>
Emergency Function / Limp-home Mode

- This transmission has a variety of “Limp-home” modes that allows limited functionality
- If a Shift solenoid is defective the gear or gears effected are blocked
- An example of this would be if the Y3/8y7 (B3) were defective then 1st, 7th and Reverse gear in “S” mode would be blocked
- If an hydraulic fault prevents a gear from engaging then the previous engaged gear is retained
- If a TCM fault occurs whilst driving all solenoids are switched off and the vehicle defaults to 6th gear with full pressure
- After shifting to Park oil pressure from K2 solenoid is directed to B2 / BR solenoid circuit via emergency operation valves
- Oil pressure can now be directed to B2 or BR elements using the Range selector valve  
  D = 2nd gear  
  R = Reverse gear
Diagnostic Trouble Codes (DTC’s)

• The TCM has over 100 possible fault codes

• When these faults occur they have a priority order

• Only a maximum of 16 fault codes can be stored at any one time

• If more than 16 fault codes occur then the 16 with the highest priority will be stored

• Fault codes can be accessed using SDS / DAS
Control Module Software

• The Control Module Software can be “Flashed” using the appropriate update CD Rom disc using SDS / DAS

• This process does not erase the factory settings that were written to the module during manufacture

• Flashing of the control module would be performed after replacing the transmission or the electro-hydraulic valve body. This is part of the installation process to release transport protection and personalise the module

• Once the module is personalised it will not work in another vehicle

• Flashing could also be performed to correct a specific shifting issue
Control Module Software

- European and American legislation requires that control modules be codable with Software Calibration Number (SCN) to prevent manipulation of software

- As of the year 2004 transmission control modules incorporate SCN coding

- SCN coding will need to be entered using SDS / DAS after every software update

- Failure to enter the SCN code after software update may result in the engine not starting. Ensure SCN coding is available before programming a control module

- The SCN code for the transmission can be obtained from the password protected site via NetStar
SCN Coding

• After installing the software with SDS / DAS navigate to this screen for the software version in the vehicle to determine the SCN code.

• The last 4 digits of the MB object number changes with the software version

• This example shows 20 10 software version, the latest software release is _ _ _ _
The End

Thank you