# Hard shift operations, poor start-off characteristics, uncomfortable jolting

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|---|---|
| Topic number | LI27.60-P-049981 |
| Version | 4 |
| Design group | 27.60 Gearshift, control |
| Date | 07-21-2014 |
| Validity | AMG vehicles with transmission 722.930/722.931/722.971 |
| Reason for change | Validity updated, general revision |
| Reason for block | |

## Complaint:

Revving up during start off and/or occasional uncomfortable jolting during start-off, steady driving, acceleration or in deceleration mode.

Harsh shift operations (coast down shifting)

## Cause:

- Delayed frictional connection during closing of wet start-up clutch (NAK) and/or temporary jamming of control valve for wet start-up clutch (NAK)

- Unmetered air leakage at the engine

## Remedy:

Note:

Check whether the complaint can still be observed between the individual operation/test steps.

1. Check transmission oil level and correct if necessary as per WIS work instructions

2. Check software releases and update if necessary (engine/ transmission) -> If newer software releases are available, the EEPROM data must be retrieved and saved prior to updating

3. Check engine for unmetered air:

Read out engine mixture adaptation data: Self-adjustment of mixture formation at idle must be < 1.0%

=> If the values are > 1.0%, check the engine for unmetered air and repair/seal

For model series 204 and 212 with engine M156 the self-adjustment values are not informative; it is essential to examine the lambda control in these cases

Note:

Even small leaks on the engine may cause deviations from the adaptation data. (Typical value for a leak = lambda <0.9 during injection, perform operations with Star Diagnosis/Xentry)

In order to be able to detect leaks that are difficult to locate, it is effective to perform a test for unmetered air using an low-pressure loss detector operating with smoke and test fluid (e.g. Smoke Wizard GLD-40, Bosch SMT300).


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When checking for unmetered air on M156, pay particular attention to the following points:

- Leak at guide of shaft for intake manifold switchover (Figure 1; item A)

- Vacuum fitting for air shutoff valves not installed (Figure 1; item B)

- Seal between intake manifold and engine leaky (Figure 1; item C)

- Seal between intake manifold upper section and lower section leaky (Figure 1; item D)

- O-ring for brake booster vacuum line connection defective (Figure 2; item E)

- Purge line not plugged in (Figure 2; item F)

- Vacuum line on connection piece for intake manifold switchover has poor support, slips down (Figure 2; item G)

- Seal between air filter branches and intake manifold installed incorrectly (Figure 2; item H)

- Leak on crankcase ventilation (front hose to centrifugal oil separator, rear pressure regulating valve with line. (Figure 3 and 4; item I)

Note:

If a leak is found at the engine, eliminate it and proceed with step 4.1.

If not unmetered air is detected, continue with step 5.

4.1 Perform engine adaptation:

Requirements:

- Engine oil temperature > 80°C

a. Perform engine adaptation:

- Allow engine to run in gear range N for 5 minutes with the service brake operated. (also apply the parking brake)

- Allow engine to run in gear range D for 5 minutes with the service brake operated. (also apply the parking brake)

4.2. Perform transmission adaptation:

Read out transmission adaptation data for comparison before and after the adaptation

a. Fill time adaptation of wet start-up clutch

Requirements for fill time adaptation:

- Bring transmission oil temperature to the temperature data point at which the complaint occurs.

The temperature data points are:

For problems when cold: 30°C - 45°C transmission oil temperature

For problems when warm: 45°C - 75°C transmission oil temperature

For problems when hot: over 75°C transmission oil temperature

- Switch off engine


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- Re-start engine

Note:

The engine must be re-started because adaptation of the wet start-up clutch is only possible after an ignition reset.

With the exception of the interruptions described (ignition off/on), the adaptation (from beginning of fill time adaptation to the end of fill pressure adaptation) should be continuous and uninterrupted.

Perform fill-time adaptation (for vehicles with model year code 809):

Select gear range "D"

- Operate service brake (also apply the parking brake)

- Slightly depress the accelerator (pedal value 3-7%) and leave it depressed for approx. 2-3 seconds.

- Repeat the process 5x

Perform fill time adaptation (for vehicles with model year code 800 and higher):

- Drive for 2 minutes at 30-50 km/h (20-30 mph) in "S" mode, stop, leave transmission in range "D". With the service brake applied, allow the engine to run for 1 minute

- Drive for 50 meters at 30-50 km/h (20-30 mph) in "S" mode, stop, leave transmission in range "D". With the service brake applied, allow the engine to run for 1 minute

b. Fill pressure adaptation for wet start-up clutch

Requirements:

- Restrict the transmission to 1st gear in "S" mode

Perform a fill pressure adaptation:

- Accelerate the vehicle to 15 km/h (9mph)

- Let the vehicle coast down

- Shortly before it comes to a standstill, accelerate with the same pedal value at which the problem occurred when starting off.

- Repeat the process until an improvement is achieved (at least 5 minutes)

- Leave the vehicle in "P" with the engine running for 10 minutes (adaptation values are stored in the control unit)

Read out transmission adaptation data and compare with the initial data

5. If there is still no improvement, create a PTSS case containing the following data at least:

- Initial quick test log

- Control unit log (engine and transmission)

- Engine torque actual value from transmission control unit (important: select transmission mode C, engage gear range and wait for 10 seconds until the value has stabilized for printout)

- Self-adjustment of engine mixture formation

- EEPROM data from transmission (must be in LOG file format)


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Note: EEPROM retrieval instructions can be found in S-B-27.00/123

| Attachments | |
|---|---|
| File | Description |
| Falschluft 1.JPG | Figure 1 |
| Falschluft 2.JPG | Figure 2 |
| Falschluft 3.JPG | Figure 3 |
| Falschluft 4.JPG | Figure 4 |

| Symptoms |
|---|
| Power transmission / Power transmission, function / Jolting/shuddering during start-off |
| Power transmission / Automatic transmission / Automatic transmission - function / Shifts |
| Power transmission / Automatic transmission / Automatic transmission - function / Shifting is rough |
| Power transmission / Automatic transmission / Automatic transmission - function / Shifting is delayed |
| Power transmission / Automatic transmission / Automatic transmission - function / Poor shift quality |

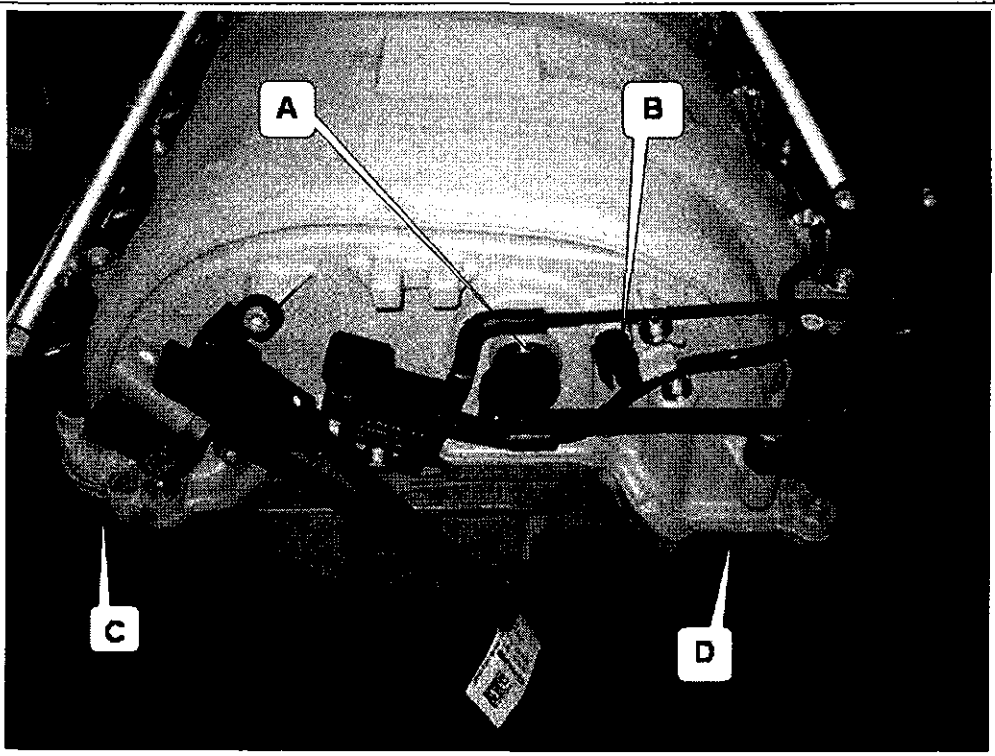
| Validity | | |
|---|---|---|
| Vehicle | Engine | Transmission |
| 204.077 | * | 722.930 |
| 204.277 | * | 722.930 |
| 204.377 | * | 722.930 |
| 212.074 | * | 722.931 |
| 212.075 | * | 722.931 |
| 212.076 | * | 722.971 |
| 212.077 | * | 722.930 |
| 212.092 | * | 722.971 |
| 212.274 | * | 722.931 |
| 212.275 | * | 722.931 |
| 212.276 | * | 722.971 |
| 212.277 | * | 722.930 |
| 212.292 | * | 722.971 |
| 216.374 | * | 722.931 |
| 216.377 | * | 722.930 |
| 217.377 | * | 722.931 |
| 217.378 | * | 722.971 |
| 218.374 | * | 722.931 |
| 218.375 | * | 722.931 |
| 218.376 | * | 722.971 |
| 218.392 | * | 722.971 |
| 218.974 | * | 722.931 |
| 218.975 | * | 722.931 |
| 218.976 | * | 722.971 |


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| | | |
|---|---|---|
| 218.992 | * | 722.971 |
| 219.377 | * | 722.930 |
| 221.074 | * | 722.931 |
| 221.077 | * | 722.930 |
| 221.174 | * | 722.931 |
| 221.177 | * | 722.930 |
| 222.077 | * | 722.931 |
| 222.177 | * | 722.931 |
| 222.178 | * | 722.971 |
| 230.470 | * | 722.930 |
| 231.474 | * | 722.931 |

Attachments

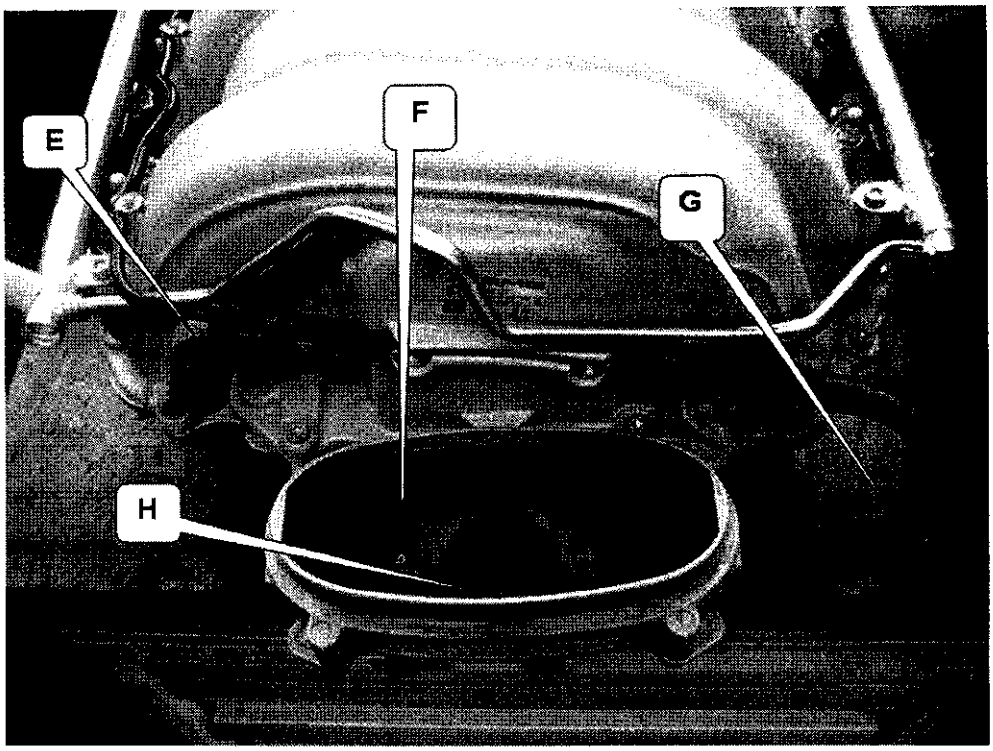
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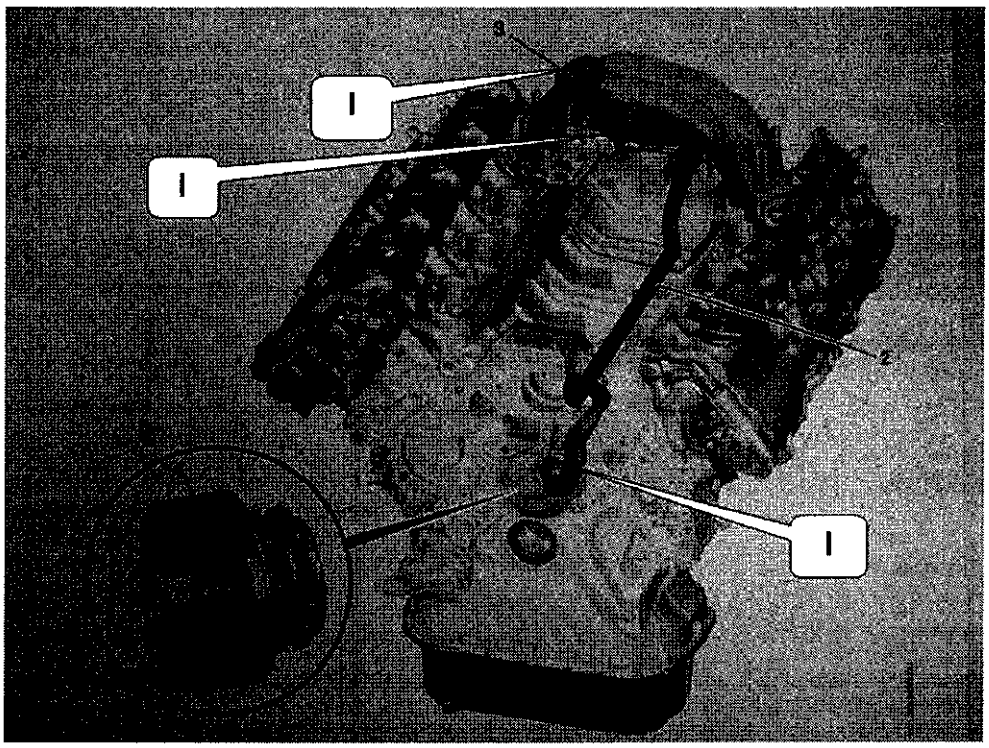


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Falschluft 2.JPG:



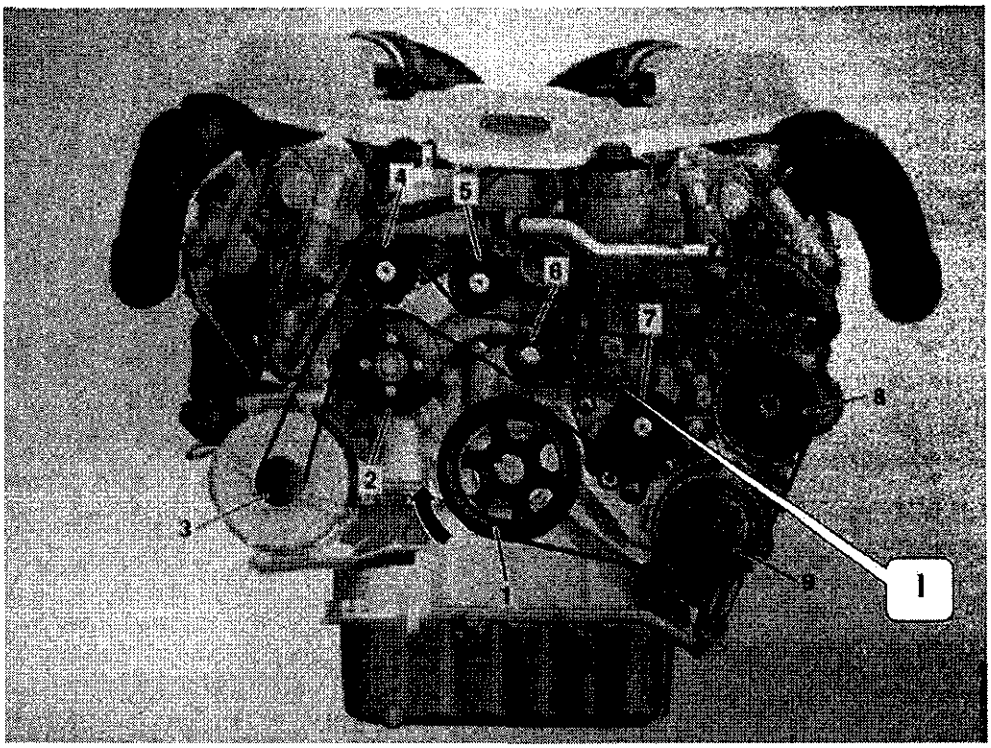

Falschluft 3.JPG:





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Falschluft 4.JPG:





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