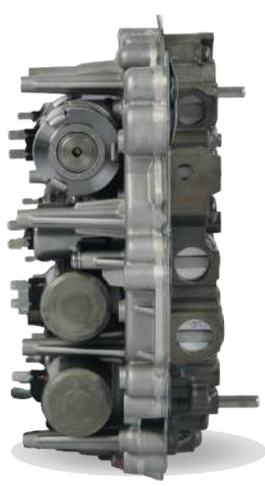
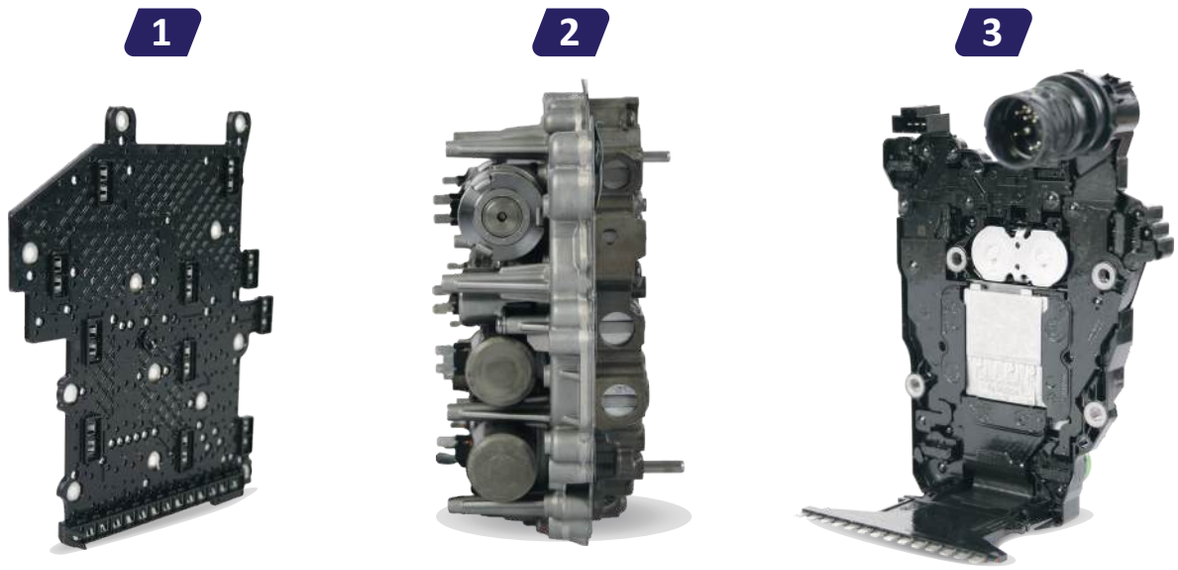
ACTRONICS
REMANUFACTURED TO LAST

DQ500
Mechatronics Disassembly and assembly

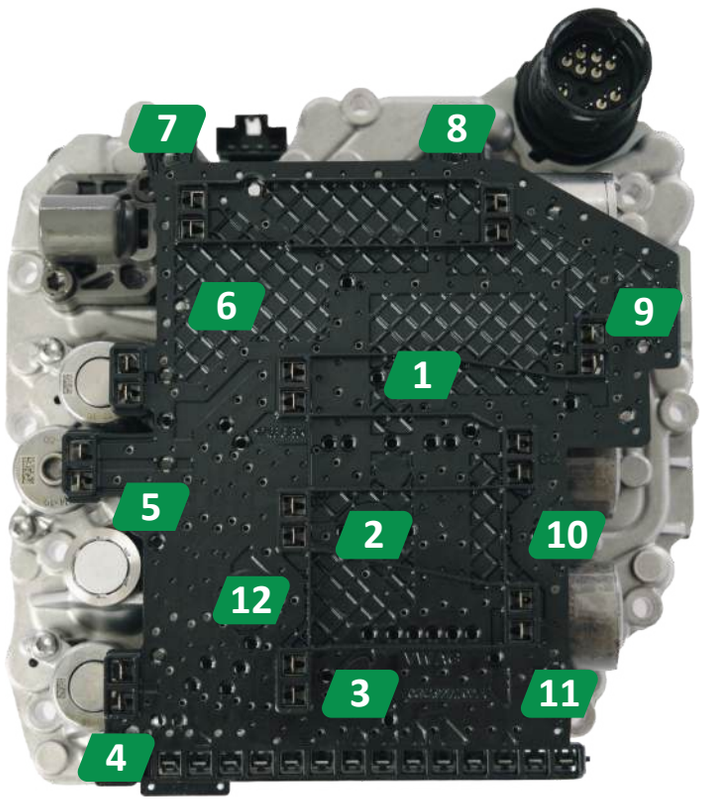




Step 1: Assembly view of the mechatronics. The mechatronics assembly includes the following parts: -1- Contact plate, -2- Electrohydraulic control block, -3- DSG control unit with sensors.

Step 2: Put down mechatronics

Place the mechatronics unit with the contact plate facing upward, as illustrated, into a suitable mounting aid. Be aware that the gearbox control side (underside) contains delicate sensors that must not be touched or damaged. This side must be handled with great care and without applying any pressure.



Step 3: Loosen the contact plate of the mechatronics
Unscrew the contact plate of the mechatronics in the sequence shown in the image.

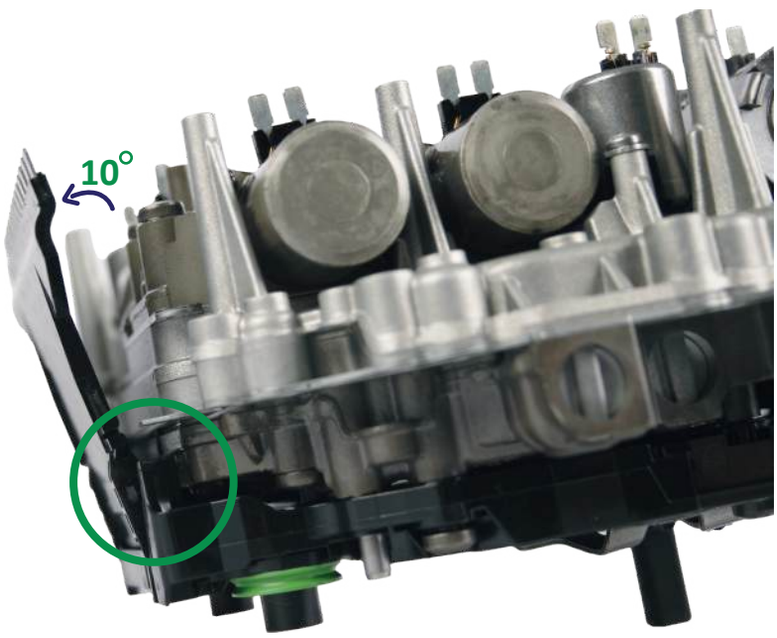
Step 4: Press off the contact plate of the mechatronics at the front
Using both thumbs, gently and evenly press the front contact plate upward beneath the mounting tabs.

Step 5: Position of the contact plate of the mechatronics at the front
The contact plate should not be lifted more than approximately 10 mm from the two front mounting sockets (indicated by the right circles with arrows). This prevents bending of the circuit board and stress on the valve connection contacts. The rear guide of the contact plate in the control unit's contact strip (right circle with arrow) must remain intact. If it breaks, the contact flags have been overstressed.

Step 6: Press off the contact plate of the mechatronics at the rear
Carefully press the rear contact plate upward with your thumb beneath the mounting tabs of the outer rear bracket (see circle).

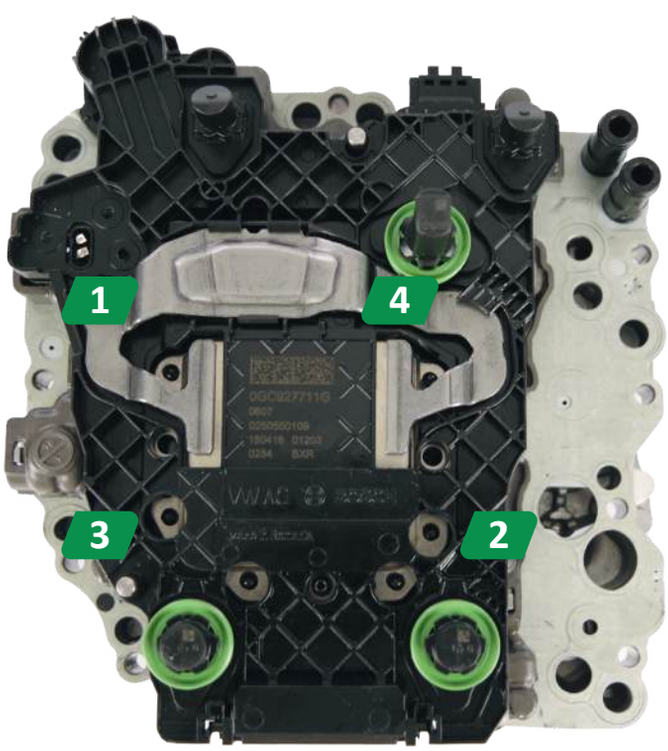
Step 7: Check the position of the mechatronics contact plate
The contact plate is correctly positioned when it is evenly spaced from all mounting points and the contacts of the control unit and valves (see circles and arrows).

Step 8: Remove the contact plate from the mechatronics unit
Gently remove the contact plate with minimal force, ensuring even movement.



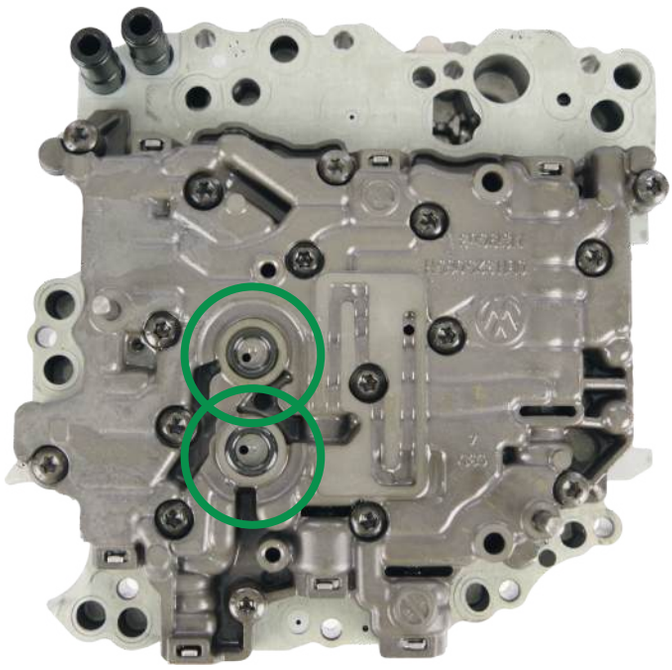
Step 9: Unlock the contact connection tab

Fold the connection tab between the contact plate and the control unit sideways in the direction of the arrow (less than 10°). It will click into place when correctly positioned (see purple arrow and green circle).

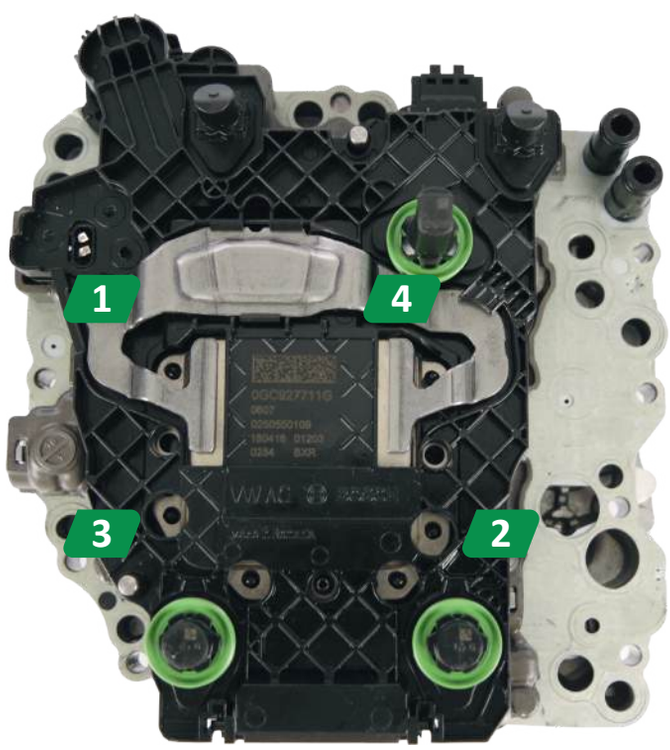


Step 10: Loosen the DSG transmission control unit

Unscrew the four screws (refer to image): screws 1 and 4 are short, screws 2 and 3 are long. Carefully lift the DSG transmission control unit upward to remove it from the mechatronics unit. The force distribution clip between screws 1 and 4 can also be removed.



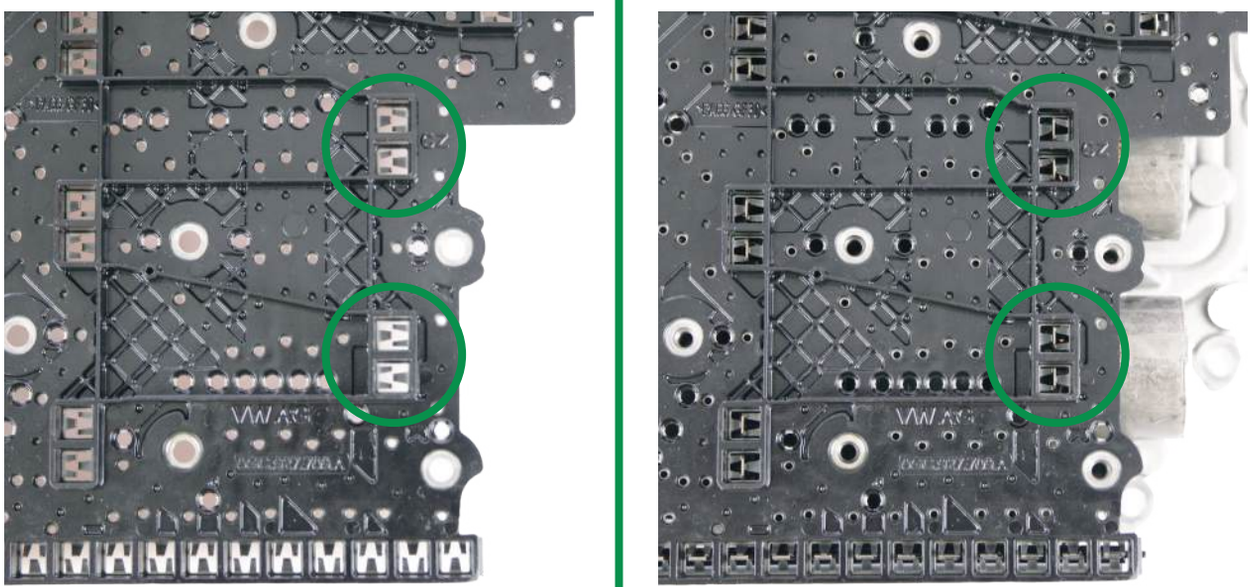
Step 11: Assembly – DSG control unit and electrohydraulic control block
Ensure the sealing rings on the pressure sensors are properly seated.



Step 12: Assembly – Attaching the DSG transmission control unit
The assembly is carried out in the reverse order of disassembly according to the instructions.

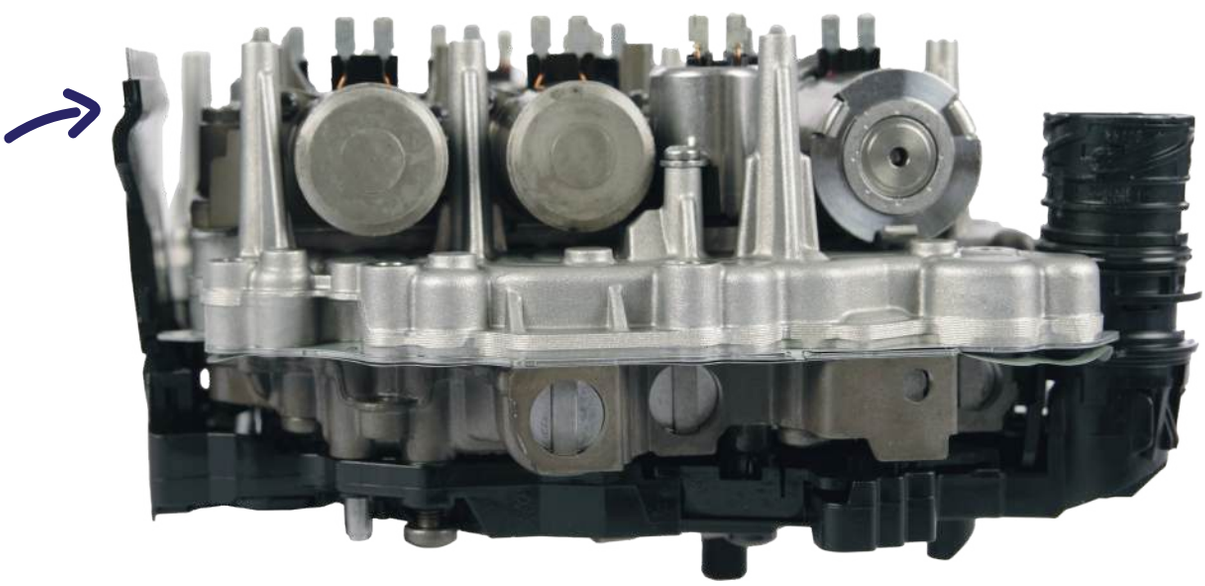
1st tightening stage:
Screws 1 & 4 (short) – 6 Nm
Screws 2 & 3 (long) – 4.5 Nm

2nd tightening stage:
Screws 1 & 4 (short) – 8 Nm + 30°
Screws 2 & 3 (long) – 5 Nm + 25°



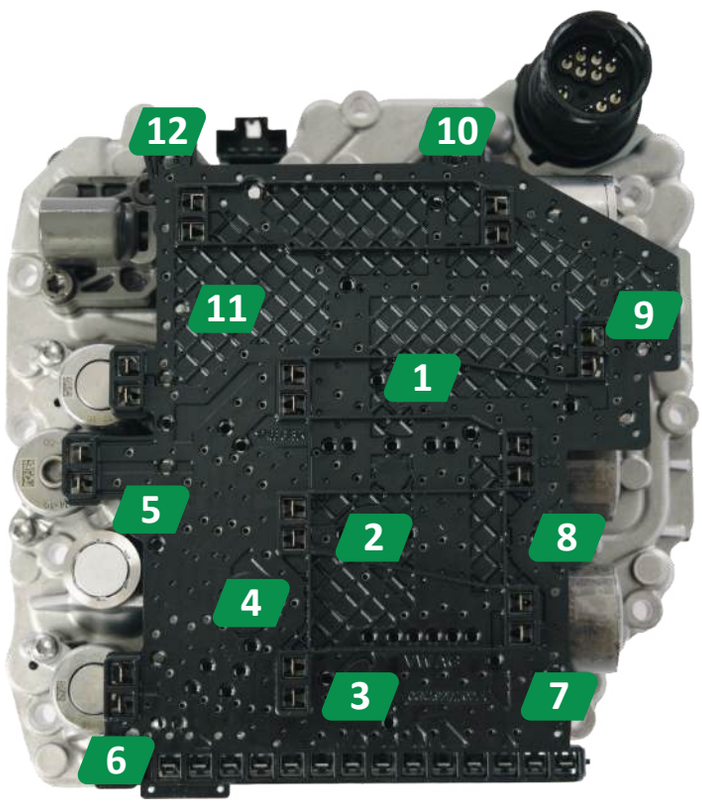
Step 13: Check the contact plate before installation

Ensure that the contact tongues of the electrohydraulic control valves and the contact pairs on the contact plate are centrally aligned within the connection shaft, as indicated by the line in the upper circles of both images. In the lower circles, the upper contact pair is misaligned, causing the bent contact tongue to only touch the left contact spring. Both elements must be carefully adjusted without causing any damage.



Step 14: Attach the contact plate

Tilt the contact connection tab (see arrow) and snap it securely into place. Position the contact plate on top and press it down until it audibly clicks into the contacts. While pressing, make sure all contacts are correctly aligned with the connector plugs and none are bent.



Step 15: Attach the contact plate

Fasten the contact plate using new screws in the specified sequence (see image).

1st tightening stage:	2nd tightening stage:
2 Nm	3 Nm + 30°

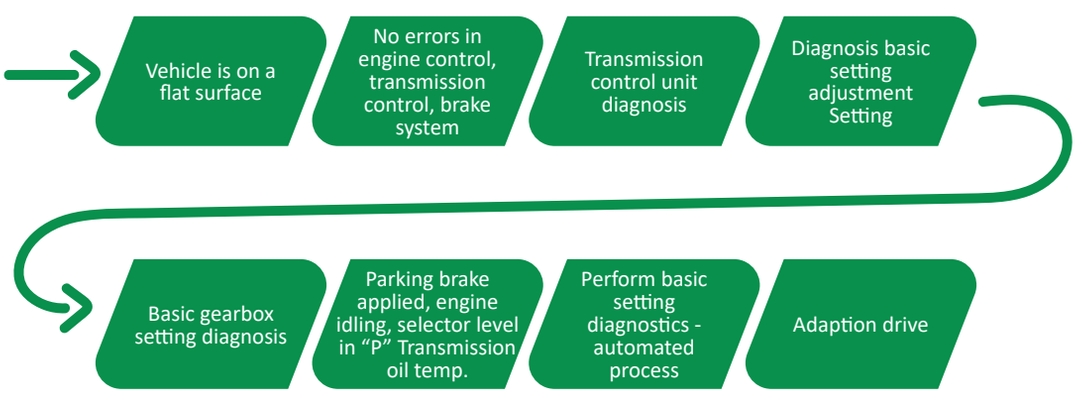
Install the mechatronics unit into the gearbox using a new cover, following the provided instructions.

Basic settings and adaptation drive

Basic setting
Adaptation drive

After installing the mechatronics unit along with the transmission control module, a basic adjustment must be carried out using a compatible diagnostic tool. Without this step, the new tolerances of the transmission and clutch mechanics cannot be properly aligned with the mechatronics. The adaptation values are stored within the transmission control unit.

The basic setting follows a defined procedure under specific conditions, often dictated by the diagnostic system. A general overview is shown in the illustration.



Basic setting

Due to the variety of system versions for DQ381/DQ500 transmission control units and diagnostic tools, requirements for basic settings may vary. Multi-brand diagnostic systems often provide limited or no user guidance, requiring the technician to be familiar with the necessary conditions. The following deviations must be considered, as they may prevent or interrupt the basic setting process if parameters do not meet the required specifications.

Note error memory code entries:

- Not relevant for some systems, as the diagnostic software ignores irrelevant errors or deletes them during progress.
- The error P175F00 – Transmission system basic setting not performed does not lead to the basic setting being aborted.
- Selector lever module error-free
- Selector lever position plausible

Technical conditions:

- Electric parking brake must be applied (deviations may cause termination).
- Selector lever must be in position “P” (deviations may cause termination).
- Engine must be idling, with no pedal input (deviations may cause termination).
- Foot brake may be either pressed or not pressed—both are acceptable depending on the system. Deviations may cause termination or block the process.
- Transmission oil temperature must be between 15°C and 100°C; some systems may require 35–45°C.

Basic setting:

- The process is automated and should not be interrupted.
- Shifting noises may occur during the procedure.
- Interrupt only if no progress is observed for more than one minute.
- System crashes may occur if specifications are not met or if adaptations deviate significantly.
- Restart the procedure after waiting for data storage and cycling the ignition.

Basic setting – save data

- Finally
    - Turn ignition OFF.
    - Wait 10 seconds for the control unit to shut down.
    - Turn ignition ON again.
    - Mechatronics is now operational.

The programmed values are only stored in the control unit once the ignition is switched off.

Basic settings – Problems

The basic setting calibrates all relevant parameters, including gear shift travel, clutch pressure-travel characteristics, and electrohydraulic control behavior. This is necessary after replacing components or when prompted by technical instructions and corresponding error entries.

Error memory entries stored in relevant systems that prevent or interrupt a basic setting:

- Engine control with errors in engine load and torque calculation, such as misfires, load signals, speed signal. Particulate filter regeneration with interruption and power deficiency/error.
- Energy management with high load and speed as well as load shedding due to undervoltage and system consumption.
- Electric parking brake with errors that do not clearly indicate the status of the brake and whether the vehicle is braked.
- ESP with errors that cause torque reduction in engine management and transmission control.
- Selector lever module with errors that do not clearly indicate which gear is requested.

The following functions are started step by step:

- Measurement of temperature, speed, and pressure.
- Modeling of transmission oil pressure, main pressure, clutch pressure, and cooling oil pressure.
- Initialization of synchronization points.
- Learning of gear shift paths (audible due to parking lock).
- Approach to synchronization points.
- Learning of clutch engagement points.

*Remedy, provided none of the above obvious reasons for termination apply:

- Repeat the basic setting, several times if necessary. If unsuccessful, allow the transmission to cool for several hours and try again.
- If the diagnostic device offers a quick adaptation of the clutches, perform this. Then repeat the basic setting.
- Without the basic setting, carefully test drive without much load and try the basic setting again. Pay attention to the transmission oil temperature.
- If all measures are unsuccessful, the clutch may be worn.

Adaptation drive

Note:

The clutch adaptations are performed from 5th gear onwards and at a transmission oil temperature of 15°C.

1. Drive in each gear, including reverse gear.
- Select lever in the tip lane.
- Drive in each gear for at least 3 seconds.

2. Drive alternately in 5th or 7th gear (sub-transmission 1) and 6th gear (sub-transmission 2).
- Selector lever in tip lane.
- Speed range 1800 – 3000 rpm.
- Ten minutes constantly in 5th or 7th gear (sub-transmission 1).
- Drive for ten minutes in 6th gear (sub-transmission 2).

3. Finally, check the shifting behavior.
- Drive in each gear in drive mode D, including reverse gear.
- If the result is negative, repeat step 2.

The control unit should recognize the full throttle value for a brief moment. The maximum speed does not have to be reached. During the adaptation drive, the two clutches are adapted. The number of counters for successful adaptation should be at least 4 for each clutch (measured values 10C9 clutch 1 adaptation kiss point part 1 success counter and 10EA clutch 2 adaptation kiss point part 1 success counter).

If the adaptation run cannot be carried out in the recommended manner or for the required duration, the remaining quick adaptations will be carried out automatically and imperceptibly in the following driving cycles.