

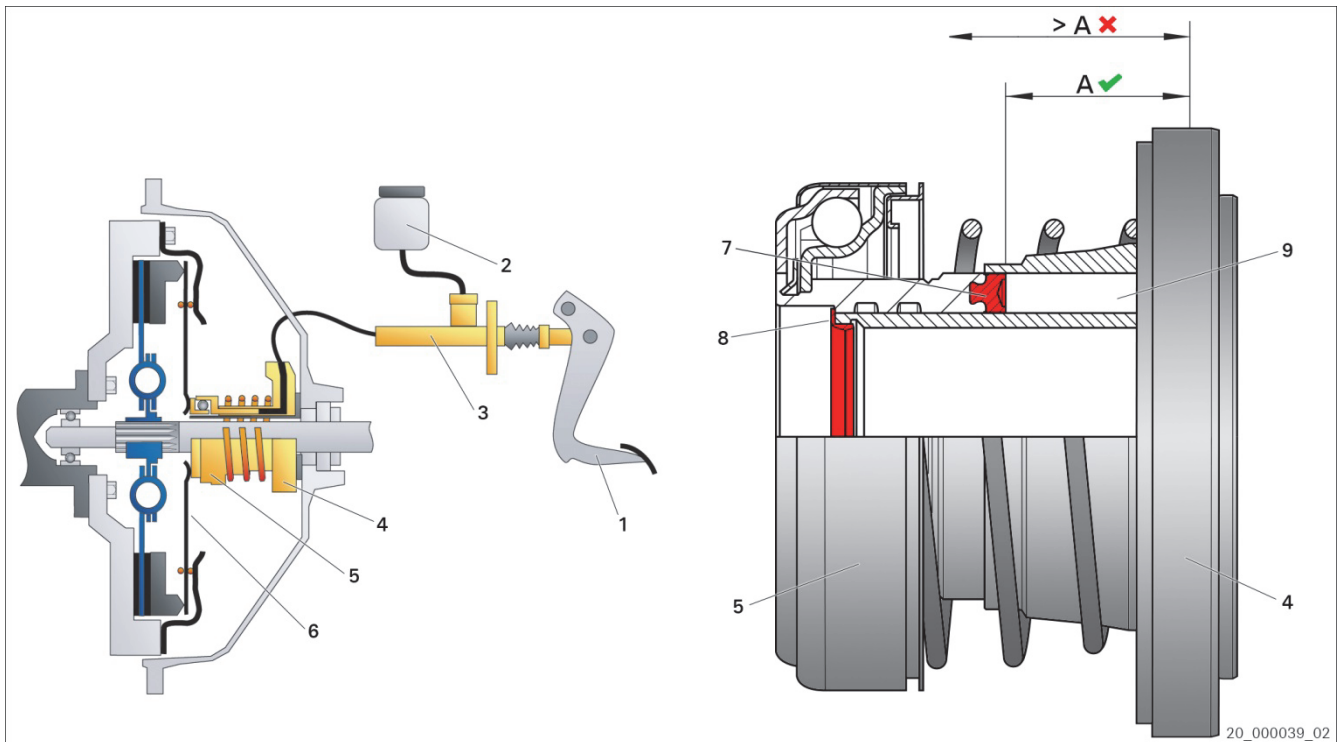


Fig. 1: Concentric slave cylinder (CSC, schematic representation)

- | | | | |
|-----|-------------------------|---|---------------------------------|
| 1 | Clutch pedal | 2 | Compensating reservoir |
| 3 | Master cylinder | 4 | Concentric slave cylinder (CSC) |
| 5 | Release bearing | 6 | Diaphragm spring |
| 7 | Lipped seal ring | 8 | Transport safety device |
| 9 | Cylinder space | A | Release travel (maximum) |
| > A | Release travel exceeded | | |

How the hydraulic release system functions

When the clutch pedal (1) is **not** pressed, the release system is connected to the compensating reservoir (2): → Pressure is equalized in the release system.

When the clutch pedal (1) is pressed, the master cylinder (3) releases a set volume of hydraulic fluid into the CSC's (4) cylinder (9). The hydraulic fluid moves the release bearing (5) of the CSC (4) no further than its release travel (A) provided in the design, e.g. 8 mm for a passenger car. When the release travel (A) is correct, the end of the guide tube or the end of the hydraulic cylinder will **not** be touched.

When the clutch pedal (1) is released, the release bearing (5) will be pushed back to its original position by the return force of the diaphragm spring (6). → Pressure is equalized in the release system.

NOTICE

Material damage may occur.

→ Only activate the CSC when it has been fully installed on the transmission and the engine and transmission are fixed to each other.

The transport safety device (8) holds the components of the CSC together during transportation and installation, until the engine and transmission are fixed to each other. The transport safety device (8) does **not** constitute an end stop for the CSC (4).

Characteristics of damage caused by exceeding the release travel



Fig. 2: Lipped seal ring is sheared

Fig. 3: Lipped seal ring is everted

Fig. 4: Transport safety device is rippled

Causes for exceeding the release travel provided in the design (> A)

The volume of hydraulic fluid released into the CSC is too large or pressure was not fully equalized in non-actuated state.

Possible causes:

- Line or hose is damaged or impaired (i.e. bent or swollen).
- Vent bore in master cylinder is periodically blocked by dirt.
- Hydraulic line is partly blocked e.g. due to old seal remnants in the connecting piece.
- The pedals have been set incorrectly.
- The hydraulic system has not been bled in accordance with the vehicle manufacturer's instructions: primary pressure via bleeding equipment and simultaneous pumping on the clutch pedal, for example.
- ...

Release bearing (5) was already in the wrong starting position in non-actuated state.

Possible causes:

- Clutch pedal was pressed before the engine and transmission were bolted together.
- Wrong clutch or wrong CSC has been installed.
- System has been bled before engine and transmission were bolted to each other.
- ...



Exceeding the release travel (> A) always results in damage to the CSC. Depending on the CSC model, the following characteristics or damage may be present:

- Lipped seal ring (7) sheared (Fig. 2)
- Lipped seal ring (7) everted (Fig. 3)
- Transport safety device is rippled, funnel-shaped, loose or torn (Fig. 4)
- Housing is cracked or broken.

➔ Comply with service information:

Concentric slave cylinder (CSC) - Causes of leakage (12040 EN).



www.aftermarket.zf.com/serviceinformation