CLUTCH TECHNICAL GUIDE

TBC91

CSC Fitting Practice

To avoid premature failure (usually leakage) from the CSC, some basic instructions must be followed whilst handling/fitting a new Concentric Slave Cylinder.

1. Handling of new product

On removing the CSC from the box, do not compress the cylinder by hand to replicate the bearing movement.

Some CSCs are pre-charged with oil and manually compressing the CSC can cause damage to the internal hydraulic seal by introducing air into the CSC.

Alternatively, some CSC's may not be pre-charged with oil and manually compressing the CSC will cause the same damage by introducing air into the CSC.

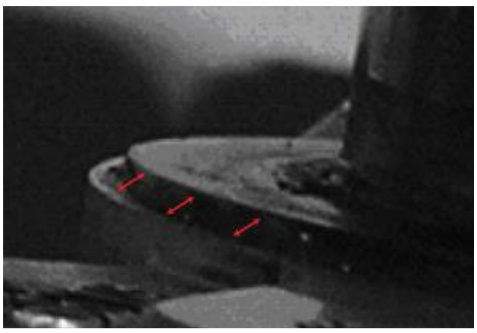
By compressing the cylinder in this way, the increased air pressure can cause the damage illustrated in the image.

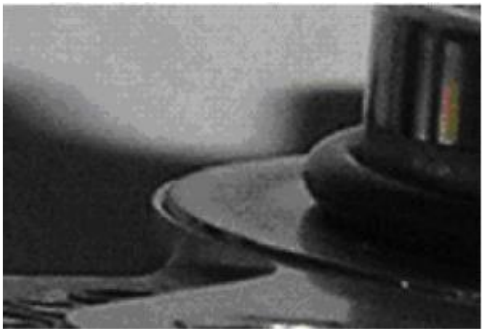
Further damage can occur to the internal seals due to excessive friction on the return stroke when manually depressing the CSC.

2. Fitting environment

The area in which the CSC is positioned needs to be totally clean & free of debris. It must locate cleanly and squarely onto the gearbox case, and any rubber face seal or sealant is only used if the vehicle manufacturer's instructions recommend it.

If the CSC is not seated correctly, the back face can push out as below, which will cause it to leak and fail and is not covered by warranty.

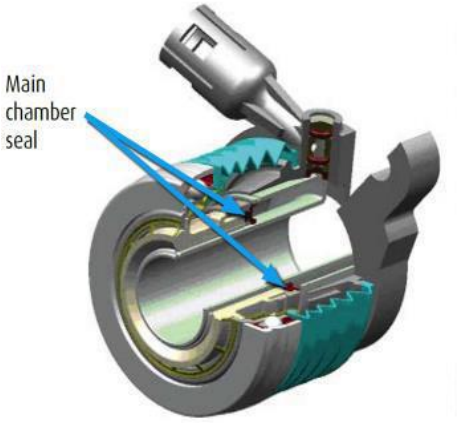




Left: *The CSC has not seated squarely, and hydraulic pressure has forced the back plate out of position.*

Right: *New CSC – no damage to the back face plate.*

3. Fitting

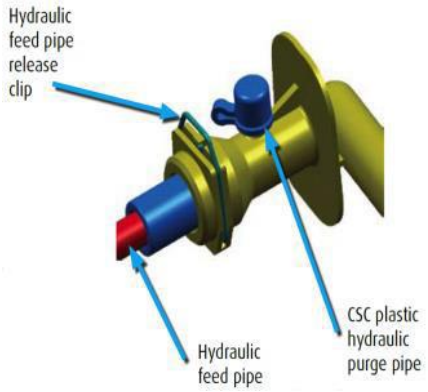


Gently slide the CSC over the gearbox input shaft and slightly rotate it to ensure the correct location on the gearbox case.

Ensure the mounting surface is clean and free from any debris. No sealant should be used on the mounting surface.

Torque down the mounting bolts evenly to the manufacturer's specification.

4. Hydraulic Connections



There are two types of connectors.

- Traditional screw in
- Quick clip connector (more common)

With the traditional type, tighten the screw to manufacturer's specification.

The quick clip connecter can be released by either pulling or pushing the retaining clip, dependent upon type.

5. Bleeding (Purging) the System

Before attempting to bleed/purge or operate the clutch, ensure that the gearbox is fully located in the fitting position. Tighten a few securing bolts to prevent any movement. This will avoid the unit being over-stroked, causing damage to the chamber seal.

Flush the hydraulic system to ensure all contaminants and old sediment is removed from the system. Failure to flush the system may contaminate the new CSC and cause premature failure of the CSC, which is not covered by the warranty.

Bleed the system as per the vehicle manufacturer's instructions. Always use the correct hydraulic fluid as specified by the vehicle manufacturer. Only use a pressure bleeding device if recommended by the vehicle manufacturer.

NOTE: The use power bleeding systems is not recommended, as some systems run high air pressure. This can invert or roll the internal seal, resulting in immediate fluid loss.

6. Troubleshooting

Unable to select gears and no pedal (due to CSC failure). (See Image 1)

The distortion to the retaining ring is a result of the bearing exceeding its maximum travel.

The distorted retainer indicates that the bearing has been forced against the ring during the bleeding process. (See Image 2&3)

This also damages the piston internal seal resulting in the loss of fluid past the seal.

Over-stroking during the bleeding process is the result of the clutch pedal being pumped rapidly, which doesn't allow the cylinder to return to rest before the next pump stroke.

Image 1


Image 2


Image 3

To avoid the cylinder being over-stroked, the pedal should be depressed and then released slowly to allow the cylinder to return to rest before the pedal is depressed again.

In some cases, the bleed nipple/pipe may need to be locked off after every downward stroke of the pedal, until some pressure in the system is achieved.

This process may need to be conducted numerous times before some pressure is felt in the pedal.

This is a common action required when bleeding the system, as an airlock can occur within the clutch master cylinder.