Clutch & Flywheel Diagnostic & Tool Guide

Diagnostic Table

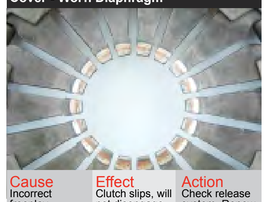
Cover - Bent Cover

Cause	Effect	Action
Cover incorrectly located on the dowel pins.	Clutch drags, slips, shudder (judders), pedal vibration. Release issues.	Fit new clutch & check position of flywheel dowels.

Cover - Bent Straps

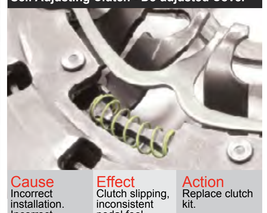
Cause	Effect	Action
The cover has been dropped. Incorrect driving.	Clutch fails to disengage, clutch drags, difficulty changing gears.	Renew the clutch. Renew the pressure plate. Check straps prior to fitment. Educate customer about driving.

Cover - Worn Diaphragm



Cause	Effect	Action
Incorrect freeplay. Incorrect adjustment. Misalignment. Driver error.	Clutch slips, will not disengage. Metallic noise at the bottom of pedal travel.	Check release system. Renew the clutch.

Self Adjusting Clutch - De-adjusted Cover



Cause	Effect	Action
Incorrect installation. Incorrect hydraulic travel.	Clutch slipping, inconsistent pedal feel.	Replace clutch kit.

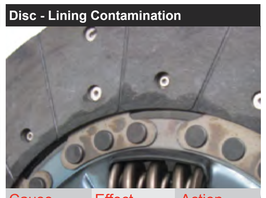
Flywheel - Thermal Loading

Cause	Effect	Action
Incorrect clutch use. Overloading the clutch.	Slipping.	Machine/ Replace the flywheel. Do not machine the facing surface of a Dual Mass Flywheel.

Disc - Bent Disc

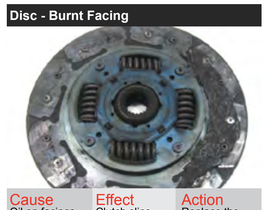
Cause	Effect	Action
The transmission has been allowed to hang unsupported. Incorrect installation. Incorrect handling (dropped.)	Clutch fails to release. Poor release. Incorrect clutch disengagement.	Replace disc. Check plate lateral run-out (max. 0.5mm) before fitting.

Disc - Lining Contamination



Cause	Effect	Action
Leaking oil seals. Excessive grease on splines & release bearing.	Clutch shudder (judders) Grabbing, Chattering. Clutch Slips.	Leaking oil seals should be rectified before fitting. Renew clutch kit.

Disc - Burnt Facing



Cause	Effect	Action
Oil on facings. Faulty release system, Overloading the clutch causing thermal loading.	Clutch slips.	Replace the clutch kit & machine/replace flywheel.

Contaminated Clutch Hydraulic Fluid

Cause	Effect	Action
Moisture in system. Incorrect fluid for application. Fluid exceeded service life. Foreign particles in hydraulic fluid.	Inconsistent pedal feel. Slipping. Gear selection problem. Hydraulic actuation system failure (leaking).	Flush hydraulic system. Replace components if necessary. Use only fluid recommended by the manufacturer.

Flywheel - Dual Mass Flywheel Failure

Cause	Effect	Action
Flywheel exceeds the manufacture's specifications. As a guide 30mm rotational movement and 2mm lateral movement.	Vibration and metallic noises on start up. Vibration and knocking noise on acceleration and de-acceleration.	Replace Dual Mass Flywheel.

Concentric Slave Cylinder - Leaking

Cause	Effect	Action
Damage during fitment. CSC seal. contamination. Incorrect bleed procedure. Incorrect handling.	CSC losing fluid in operation. Low pedal release. No "pedal feel".	Replace CSC.

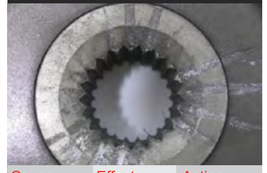
Concentric Slave Cylinder - Cracked

Cause	Effect	Action
Incorrect fitting practice. Over torqued fitting bolts. Incorrectly located.	CSC leaking. No "pedal feel".	Replace CSC.

Thrust Bearing - Damaged Bearing

Cause	Effect	Action
Release mechanism defective. Insufficient free play. Incorrect bearing preload. Dry or damaged fork pivots.	Bearing noise.	Renew bearing (replace bearing with every clutch replacement). Lubricate the bearing/pivot points.

Disc - Worn Splines



Cause	Effect	Action
Incorrect fitting. Gearbox input shaft & hub splines have not been correctly aligned. Worn or missing spigot bearing. Damaged input shaft.	Clutch fails to disengage. Clutch hub failure.	Replace clutch kit.

Disc - Excessive Lubrication

Cause	Effect	Action
Over greasing of the input shaft and/or clutch disc.	Grease on the clutch linings can cause the clutch to shudder and/or slip.	Clean input shaft of excessive grease. Replace clutch, clean and machine flywheel. ACS supplies grease in all kits.

THE PARTS IN THE BOX DON'T LOOK THE SAME?

Sometimes it's OK to be different!

With today's technologies forever evolving ACS and CLUTCH PRO have implemented many product changes to improve driver comfort and customer satisfaction. Here are some examples.

Self Aligning Release Bearings

Self-aligning bearings are designed to contact the clutch diaphragm or release fingers and align itself to the clutch centre.

- Self-aligning bearings help in the reduction of eccentricities between the engine crankshaft and the transmission input shaft during rotation.
- Self-aligning bearings reduce noise and vibration during operation.
- Self-aligning bearings reduce diaphragm lever tip wear by evenly distributing the clutch release load.

Finger Height Variations

Clutch covers may differ between different manufacturers. When identifying the difference between samples it is important all variations in finger heights are benchmarked in the "installed" position. This is taken with the new clutch disc mounted and the clutch cover is torqued to the flywheel.

Diaphragm Clutch Covers v's Lever and Coil Spring Clutch Covers

Diaphragm clutch covers are an upgrade from the traditional lever and coil spring clutch cover.
Diaphragm Benefits

- Reduced pedal effort.
- Smoother engagement.
- Higher clamping force.

SAC Clutch v's Non-SAC Clutch

The self adjusting clutch (SAC) was introduced to improve driver comfort, however a Non-SAC clutch may be a cost effective measure for many motor vehicles.

SAC Benefits

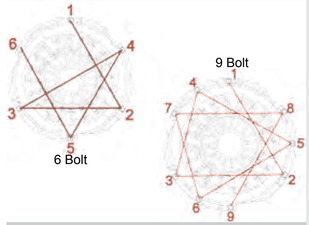
- Consistent pedal feel.
- Reduced maintenance on the clutch actuation parts (Clutch free travel)

NON-SAC Benefits

- Mainly used in performance based applications.
- Cheaper alternative to a SAC.

Tools & Handling Guide

Tightening Clutch Cover - Procedure

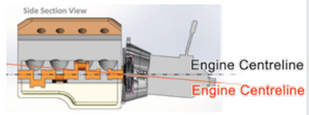


Slowly tighten the clutch cover bolts in a diagonal sequence until bolted up.
When tight, torque to recommended specs in the same sequence.

Handling Concentric Slave Cylinder - Procedure

Do not depress a CSC by hand prior to fitting – NEVER compress a CSC by hand to replicate the bearing movement, this can damage the internal seals, as the cylinder has no hydraulic fluid within the system.

Transmission Misalignment



Misalignment occurs when a gearbox is not bolted up square. This will put the crank centreline and the gearbox input shaft skewed on their rotational axis.

This can occur when a gearbox/bell housing adapter has not been made square and central.

This will cause damage to the hub and spline section on the clutch disc.
Premature wear in a sprung disc and operation issues will be experienced.

Lubrication & Thread Sealant

Lube and Sealant Table

Area/Part	Lube/Sealant	ACS part No.
Pivot ball, Fork Pivots, Bearing Pivots, Bearing Slide, Input Shaft (splines)	High Temperature Grease	SPG1, 1ml Sachet
Spigot Bearing (inside diameter)		SPG3, 70ml Tube

SAC Tool

Part number: ACT-SACTOOL

When installing a Self Adjusting Clutch, the use of this tool is needed to prevent premature rotation of the adjustment ring.

DMF Testing Tool

Part number: ACT-DMFTOOL

Over time and use, the arc springs inside a Dual Mass Flywheel become worn and begin to create free-play. This tool measures the amount of free-play and rock within the DMF.

Bleeding Tool

Part number: ACS-BLEEDER

Clutch and Brake bleed tool can perform reverse, pressure, vacuum and bench bleeding. One person can bleed a hydraulic system in under 10 minutes.

Alignment Tool

Part number: ACT-KIT

An alignment tool is used to align the gearbox and reduce the risk of damage to the clutch or gearbox.
ACS can provide a kit containing the top 15 alignment tools.

Fitment Guide

Basic Clutch Fitment Guide

- Check the vehicle has all the gearbox to engine block locating dowels. If damaged replace.
- Clean and inspect the gearbox mounting surface and the rear of the engine ensuring they are clean.
- Clean the bellhousing thoroughly. Make sure there is no oil leakage or other contamination.

- Clean the friction surface of clutch cover with a clean cloth and a non-oil based solvent.
- Check the clutch cover fits the flywheel and the bearing fits the fork.
- Ensure the flywheel surface is machined for a SMF or replaced if it is a DMF. **Failure to machine the SMF or replace the DMF may void warranty.**
- It is recommended that all pilot bearings (where listed) be replaced when servicing a clutch

- Re-fit the clutch using an ACS aligning tool.
- Never "hang" the gearbox on the clutch disc or use excessive force to align the gearbox.
- Bleed the clutch hydraulics. Refer Technical Bulletin TSB-CSC01 for correct bleeding of the CSC.
- **Warning; never over pressurize the hydraulic system by pumping the clutch pedal**

- Clutch adjustment needs to be checked and adjusted to the vehicle manufacturer' s specifications
- Road test the vehicle to inspect the vehicles performance.
- Do not abuse a new clutch, bed in period is 1000km's.
- Check the clutch adjustment after this period every 10,000km's

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AUSTRALIAN CLUTCH SERVICES
CLUTCH AND FLYWHEEL SPECIALISTS

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