

A Best Practice Guide to fitting:
**CLUTCH, DUAL MASS FLYWHEELS
& CONCENTRIC SLAVE CYLINDERS**



0845 603 3636
Over 190 Branches Nationwide

Best Choice in the Clutch Aftermarket

As you would expect from the UK's Largest Parts Supplier, We offer the widest range of Clutch Brands partnered with the World's Leading Component Manufacturers to ensure we bring you a solution to your Clutch & Flywheel needs.



OE Clutch Products - Since 1965 the name LuK has been synonymous with innovation, unsurpassed customer service and the outstanding quality of its range of products for the automotive drive train.



OE Clutch Products - ZF Sachs supplies all the products for and around the clutch - from the master cylinder on the pedal to the dual-mass flywheel at the crank shaft.



OE Clutch Products - One in three vehicles in Europe are fitted with Valeo clutches - Valeo is continuously developing and extending its range for passenger cars, light utility vehicles, trucks and agricultural.



OE Clutch Products - Japan based Exedy is one of the world's largest original equipment manual transmission and automatic transmission manufacturers. OE suppliers to every one of Japans car and truck manufacturers.



OE Clutch Products – The Aisin Group is one of the worlds top 5 OE clutch manufacturers and is part of the Toyota group of companies. Formed in 1943 Aisin has 140 companies and 53,000 employees world wide.



OE Clutch Products - Located in Leamington – UK, AP is a manufacturing company of passenger car and commercial vehicle clutches for both Original Equipment and the Aftermarket.



Clutches in the Exedy Racing Special Performance Range are intended for special applications where a greater level of performance is required. Quality, Performance & Reliability are the hallmarks of an EXEDY clutch.



Aftermarket Clutch Products – Transmech is the UK's No 1 alternative clutch brand, 100% all new and approved to original equipment specification, highly competitive giving excellent value for money. The Transmech brand is exclusive to Euro Car Parts in the UK.



Aftermarket Clutch Products – Unique in the UK parts aftermarket, the Ecotech range of SAC clutch components, UK remanufactured to the highest standards to give optimum value for money. The Ecotech Self Adjusting Clutch range is exclusive to Euro Car Parts

**Full 2 Year 20,000 Mile Guarantee & No Quibble Warranty
on All Euro Car Parts Clutch Ranges**

A Best Practice Guide to fitting: **CLUTCH, DUAL MASS FLYWHEELS & CONCENTRIC SLAVE CYLINDERS**

Before starting any Clutch or Flywheel job, it may help to read this guide. The main aim of this document is to help you to avoid some of the common problems that have been experienced by installers when replacing Clutch & Flywheel Components.

It's very important to road test the car before commencing work as this may highlight symptoms other than those described by the driver. Always ask yourself some questions before starting the job as this can highlight an underlying issue:

Why has this Clutch Failed?

- Is the Failure due to normal Wear & Tear or is there another cause?

Check the vehicle mileage, as this can indicate a premature failure. Modern Clutches usually last between 50,000 and 100,000 miles depending on type of use. Look for clearance issues, judder, noise and pedal pressure. All of these are indicators of additional problems which, if not addressed, will hinder the operation of the new clutch.

Take care to look for further tell-tale signs when dismantling the vehicle. It is bad practice to remove the gearbox quickly, without looking for clues, as this may eliminate some of the evidence.

Also try to differentiate between clearance and drag. With clearance issues, the bite point will be close to the floor, whilst the bite point is likely to remain in the normal position (a third to half way up the pedal) with drag issues.

Common Clutch Symptoms include:

- Clutch Slip
- Clutch Drag
- Poor Gear Selection
- Judder
- Components Chatter
- Noise
- Lack of Drive
- Vibration
- Clearance

Usual Causes include:

- Normal Wear & Tear
- Driver or System Misuse
- Installation Failures & Mistakes
- Other Component Failure
- Manufacturing Defects

General Tips



DO NOT use copper grease on or near any part of the clutch system, use the correct spline grease or any high boiling point MOLY or LITHIUM based grease (One example is CERA-TEC brake grease which boils at 1000 degrees). Copper Slip evaporates at 400 degrees and leaves residue that will inhibit movement rather than lubricate.



USE SPARINGLY – you only need to use a small amount; Many clutch problems have been caused by over-greasing the splines. Apply only a small bead of spline grease, work into the spline with a small brush and remove excess with a wipe, leaving a thin coating in the spline.



ALWAYS use the correct tools. It is recommended to use the SAC fitting tool when replacing a Self-Adjusting Clutch cover. Failure to do so can result in damage to the cover assembly and possible damage to the Dual Mass Flywheel.



DO NOT take a risk with Dual Mass Flywheel (DMF) replacement, change it every time. The DMF is an integral part of a modern clutch system, leaving an old DMF in place and fitting just the new clutch assembly is asking for trouble.



ALWAYS replace the Concentric Slave Cylinder (CSC) release bearing. It is false economy to leave an old CSC in situ when replacing the clutch. The release bearing has covered every single engine revolution throughout the life of the clutch.



DO NOT Pressure wash any parts of the clutch assembly, especially the DMF.



DO NOT use mole grips or small pliers as hydraulic pipe clamps. Ensure that the correct type of clamping tool (VS0558) is used. Failure to use the correct tool often causes damage to the pipes and subsequent clutch actuation problems due to fluid return issues.



ALWAYS check that all the gearbox locating dowels/sleeves/pins are present. Missing dowels will cause gearbox to vibrate around the bolts and wear clutch splines excessively. Especially important on vehicles fitted with the Pull Type Clutch units – as missing dowels will cause premature release bearing failure.



MISSING Flywheel Dowels will put excessive force on the Clutch Bolts, adding strain to the Clutch Cover.



MISSING Gearbox/Engine Dowels will put excessive force on the Gearbox, allowing it to vibrate rotationally and damage the Plate centre hub spines.

Clutch Tips

ALWAYS handle a clutch product with care; do not throw or drop the unit, as this may damage or de-adjust the clutch cover



CHECK the new parts supplied against the old ones you have removed from the vehicle, look for any obvious differences before attempting to fit the unit. There may be differences from one manufacturer to another – if in doubt call one of our field-based technical staff.



CHECK the clutch plate for lateral run-out; this should not exceed 0.5mm. Slide the new clutch plate onto the gearbox splines while the gearbox is out of the vehicle to ensure correct fitment.



Self-adjusting clutches should always be handled with extra care; failure to do so can easily cause the pressure plate to de-adjust.



CHECK that LUK self-adjusting cover assembly surface springs are fully compressed prior to fitting.



ZF Sachs self adjusting clutch covers have a coding on the back of the pressure plate ending in an E..... E stands for extend. This indicates the unit is self adjusting.



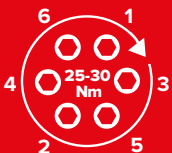
THOROUGHLY clean every cover assembly pressure plate (the surface where the drive plate operates) with brake cleaner every time before fitting the new components to the vehicle. Pressure plate surfaces are usually coated with storage protection.



ENSURE that every clutch plate is fitted using the correct alignment tooling.



ENSURE that all self adjusting clutch cover's are fitted using the SAC clutch fitting tool, this is very important and will eliminate many common problems and warranty claims associated with these units.



All Clutch fitting bolts should be tightened to the correct torque typically (25-30 Nm) on every fitment. It is very important that all clutch retaining bolts are tightened equally, to ensure even diaphragm spring finger pressure. Always check with Autodata.

PLEASE DO NOT USE AIR TOOLS.



EXAMINE fully the vehicle's flywheel before fitting the clutch units. The flywheel surface should be given a thorough inspection. If the unit shows any signs of wear, grooving on the surface or heat cracks then it should be replaced, if in any doubt replace it. This applies to both solid flywheels and dual mass flywheels.

DMF (Dual Mass Flywheel) Tips

The primary function of a DMF is to absorb any vibration created in the engine. This should be taken into account diagnosing any faults or rattles.

- Check the new part supplied against the one you have removed from the vehicle. Look carefully at the rear of the DMF and pay special attention to any timing ring/pick up points that may be fitted. Ensure that the DMFs are exactly the same (and, in particular, that they have the same number of tangs or cut-outs).
- Make sure that there are no parts left attached to the old flywheel that need to be re-installed.
- All DMF running surfaces should be cleaned with brake cleaner prior to fitments. Wipe down the brake cleaner, please do not spray. This will wash out any necessary grease.
- It is recommended that all flywheel mounting bolts are replaced. Refer to manufactures data/Autodata for torque settings.

Always inspect the rear crankshaft oil seal and replace if necessary.

Take care when removing a flywheel from the crankshaft; ensure you have the necessary support as some units can be extremely heavy and difficult to remove.

If you encounter a DMF that has locked itself in a position that covers the mounting bolts making it impossible to locate the removal tool DO NOT use any form of heat (oxy-acetylene) when cutting away the material. (Use an exhaust cutter or grinder)

To determine the amount of DMF wear a professional DMF measurement tool is available. Wear tolerances can be obtained from your local Euro Car Parts branch or our field based technical team.

In certain cases flywheels may fit onto the crankshaft in a variety of different positions. In this case our recommendation is to clearly mark both the flywheel and crank at the same point/position before removal. By making a further mark on the new flywheel in exactly the same position as the mark on the flywheel you have removed, it will be possible to accurately re-align the flywheel and crank during re-fitment.



This specialised Luk DMF measuring tool is available from all Euro Car Parts branches – Part No : 400 77 6250

100% functional test of the Dual Mass Flywheel including testing the characteristics of the Arc Springs during compression. Garages and Transmission specialists are able to determine exact wear dimensions and can demonstrate clearly to their customers the excessive wear within the Dual Mass Flywheel and confirm that replacement is required

Dual Mass Flywheel Failure Guide – Vehicle Check List

The DMF is often mistakenly diagnosed as the cause of vehicle vibration/shake, rattle and other noises, often the cause has been found to be in a completely different area. Therefore it should not be assumed that noise and vibration are being caused by a defective DMF.

It is important that all the relevant vehicle systems are checked for correct function and operation before a new DMF is installed. Some commonly identified problems are listed below. These faults are more likely to occur in vehicles with high mileage.

1. Consider engine fault or flash codes
2. Consider engine camshaft wear
3. Consider the correct operation of fuel injectors and associated wiring harnesses
4. Consider excessive crankshaft end float or lift
5. Consider crankshaft damper damage and operation
6. Consider the function and correct operation of EGR valves
7. Consider the function and correct operation of swirl valves and actuators
8. Consider the condition of turbo boost hoses and pipes
9. Chip tuning / performance enhancements - for vehicles fitted with a DMF this can alter the engines vibrational characteristics causing damage to the DMF
10. Consider wear on the gearbox input shaft and associated bearings
11. Confirm DMF is correct for application by engine code
12. Do not allow vehicle to idle for long periods to run air conditioning or heating
13. Consider battery condition and cold cranking performance
14. Consider the operation of torque limiting valves and frequency modulators
15. Consider the condition of hydraulic systems and cleanliness of hydraulic fluid
16. Avoid incorrect driving techniques, such as pulling away in high gear with low engine revs, frequent stalling of the engine or driving in a gear that is too high
17. Make sure that the correct tooling is used to install the clutch and DMF. Using the recommended specialist tools will ensure that the units are installed without causing damage. Always use the correct tightening torque & sequence
18. Do not use high pressure cleaners, steam jets, cleaning sprays or compressed air when cleaning the DMF. Cleaning of the DMF contact surfaces should be carried out using a clean oil free cloth and a suitable solvent

If vehicle systems are performing correctly this will ensure a prolonged service life for the Dual Mass Flywheel. If possible run live data/ use a Oscilloscope to determine good or poor running.

PLEASE TAKE CARE WHEN REPLACING CLUTCH BOLTS WITH NON GENUINE ONES THAT THE BOLT LENGTH IS CORRECT AND DOES NOT LOCK THE 2 DMF MASSES TOGETHER.

**A Noisy Flywheel is the RESULT of a Problem,
NOT the Cause of it**

Clutch Hydraulics Tips



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 present within the system. One of the most common reported faults after fitting a new CSC is leakage from the seals.



MAKE SURE that any clamping of hoses does not result in the collapse of the pipe – use the correct clamping tool (even better, try not to clamp the pipe at all).



ENSURE the area where the CSC is positioned is totally clean and debris free. Clean the mounting surface thoroughly, make sure the CSC is located squarely onto a clean gearbox case and ensure any rubber face seal or sealant is utilized in accordance with the manufacturer's instructions.



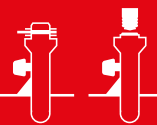
ALWAYS replace the old contaminated fluid with **NEW**.



CHECK the CSC seats squarely and there is no damage to any component. Please check the internal threads/bolts for damage before fitment.



CAREFULLY FIT – Slide the CSC over the gearbox input shaft and slightly rotate to ensure the correct location on the gearbox case. Torque all the fixing bolts evenly using between 8-12Nm force, dependent upon manufacturers specifications.



TAKE CARE with hydraulic connections. There are usually two types of connector, traditional screw-in & quick-clip types. With screw-in types, tighten to a torque of between 10-15Nm dependent upon manufacturers specifications. Quick-clip connectors are released by either pulling or pushing the retaining clip, dependent on the type.



CHECK all pipe connections for old seals, debris etc that may inhibit the fluid return.



CHECK all CSC connection's on the pipe before fitting to gearbox to ensure that the right size female end is being used. The wrong size will not seal and the gearbox will have to be removed in order to rectify the problem.



BEFORE attempting to bleed (purge) the system, or before attempting to operate the clutch, ensure that the gearbox is fully located in the fitted position – tighten a few securing bolts to prevent any movement. This could avoid the unit being over stroked causing damage to the chamber seal. Bleed the system as per the manufacturer's instructions or follow the steps below.



MANUAL BLEEDING (using the clutch pedal) is not now recommended by clutch manufacturers as the pressure needed to depress the cover diaphragm spring fingers is now between 3000 and 7000 Kn. This amount of force is too excessive when trying to expel air from the system. Gravity or low pressure bleeding is the correct method. Any attempt to use high pressure will only compress air and not remove it. Pedals operate at about 10 kilos of pressure by foot, but internal CSC pressure can typically reach 40 bar (580psi).

GRAVITY BLEED OR BACK BLEED THE SYSTEM IF POSSIBLE AS THIS IS THE RECOMMENDED METHOD.

If manual bleeding has to be carried out, use the following process:

- a) Depress clutch pedal
- b) Open bleed valve
- c) Keep clutch pedal depressed until fluid appears; DO NOT RELEASE
- d) Close bleed valve
- e) Release clutch pedal slowly; The clutch bleeding cycle must be repeated 20 to 25 times to guarantee complete bleeding of the system. Top-up the level of fluid in the reservoir between the cycles. The level of fluid must not drop below the minimum mark on the reservoir during bleeding. Do not pump the pedal, use a low pressure bleeder wherever possible.

Warranties

The examples below are not considered a warranty by the manufacturer.



CSC : D/P fitted wrong way round

Effect: Noisy / leaking, CSC and drive plate damaged

Cause: Driven plate fitted the wrong way round, all driven plates are marked with orientation. (See bulletin)



CSC : Overstroked

Effect: Piston forced beyond its normal limit.

Cause: Hydraulic fluid not being allowed to return to reservoir due to rapid bleeding or a blockage



CSC : Cracked

Effect: Leaking

Cause: Overstroked by rapid bleeding or blockage with cap off old pipe (instructions in box)



CSC : Unseated

Effect: Leaking

Cause: Incorrect Seating or Compression before fitment cause the back plate to become unseated and will therefore leak under pressure



SAC : De-adjusted

Effect: No Clutch Operation / Slipping / Not clearing / Heavy pedal
Cause – De-adjusted caused during fitment.
Cause: Not using the SAC Fitting Tool.



Clutch - Contamination

Effect: Slipping
Cause: Oil leak from crankshaft or gearbox oil seal. Should be checked and repaired when clutch removed.



Clutch : Finger Wear

Effect: Inop.
Cause: Misalignment of release bearing to clutch. Missing gearbox dowels, bent fork or worn cross shaft bushes.



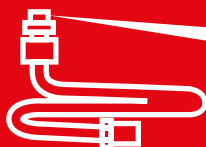
Clutch – Worn or no splines

Effect: Rattling or no drive
Cause: Misalignment of gearbox (missing Dowels), Worn Spigot Bearing, worn input shaft bearing or bent input shaft



DMF : Heat Damage

Effect: Friction face discoloured
Cause: Clutch slip due to driver, release system or damaged clutch (claims should be accompanied by the clutch).



When changing a Vauxhall CSC, make sure the Top Hat Seal is securely fixed to the pipe and **NOT** stuck in the female union at the end of the flexi pipe. Please discard if new style CSC.

DID YOU KNOW WE NOW HIRE OUT THE SELF ADJUSTING CLUTCH TOOL

Self Adjusting Clutches require a special tool for removal and replacement.



528 77 0420

**SAC Clutches - Special tool strongly advised
528 77 0420 - Available for purchase or hire
Failure to use the tool will result in total loss of warranty.**

Other Warranty Disclaimers:

Failure to replace the CSC during clutch replacement will result in total loss of warranty.

Failure to replace the DMF when replacing the clutch units could result in total loss of warranty.

Clutch Tools

Torque Wrench 5-25Nm ¼" Drive

KLA4900

Low torque settings to tighten small clutch bolts to the correct setting



Torque Wrench 20-200Nm ½" Drive

538 77 5201

Higher torque settings to tighten larger flywheel bolts to the correct setting



Klann SAC Clutch Fitting Tool

528 77 0420

Tool kit to install a self adjusting clutch cover correctly, avoiding slip and/or drag issues



Sykes Pickavant DMF Testing Tool

400 77 6350

Testing rig for determining the correct operating tolerances of a DMF



Automatic Clutch Bleeding Kit

538 77 0661

One man clutch/brake bleeding kit



Pneumatic Vacuum Clutch Bleeding Kit

529 77 1311

A vacuum kit for sucking brake fluid down the pipework, operated by an airline



Hand Operated Vacuum Bleeding Kit

538 77 1321

Hand pump for either pushing/pulling fluid through a pipe



Back Bleeding Can

SEATP1000

Used in conjunction with a short piece of leak off pipe for pushing fluid down the line



Electric Bleeding Kit

538 77 5021

Operated by the car battery, up to pressures of 2.2 bar to force fluid down the line



Seal Puller

SEAAK7000

Correctly remove old oil seals without damaging seal housings etc



Seal/Bearing Driver Kit

SEAVS703

Correctly install new seals without damage



Spigot Bearing Puller Kit

SEAAK716

Remove difficult spigot bearings with ease



Clutch Alignment Tool

538 77 0301

Inexpensive tool allowing the fitter to align clutch components



Clutch Alignment Tool Set

940 77 1251

Alignment of clutch components with the spigot bearing



Clutch Tools

Gearoil Extractor

538 77 1531

Hand/air operated fluid removal tool



Gearoil Syringe

SEAVS405

Used to refill gearbox with oil with side fill plugs



Gearoil Pump

SEATP67

Fits 20/25 litre Gearoil containers to refill gearbox with oil



Transmission Jack

SEA600TRQ

600kg transmission jack to support gearbox whilst removing/installing



Auxiliary Stand

SEAES750

For supporting engine, exhaust, gearbox Components whilst replacing clutch



Spline Grease (Cera-Tec)

526 77 0250

Silicone based lubricant with a very high melting point



DSG Clutch Tools

Basic Tool Kit

528 77 3430

Basic tool kit for removal/installation of VAG DSG clutch



VAG Additional Kit

528 77 3460

To be used in conjunction with the basic tool kit for stages 1 & 2 VAG DSG clutch



Renault Additional Kit

528 77 3440

To be used in conjunction with the basic kit to remove/install Renault DSG clutch



Gearbox Filler

KLA028811

Used to refill wet type DSG gearbox with gear



READY OR NOT

- 2CT (DSG) IS COMING YOUR WAY

Millions of vehicles are now operated by twin clutch systems. Are YOU Ready???



Direct Gear Selection has now been on the market since 2003 in 2 different formats.

The earlier type is known as a “WET TYPE” 6 speed clutch as it runs immersed in Gear oil. The need to change this type of clutch will be very small as it rarely wears out.

The later type is known as a “DRY TYPE” clutch as it resembles a traditional clutch plate assembled in a steel cartridge (as per the diagram above).

Both Types of Gearbox operate in a similar way; having two input shafts (One Solid, running down the centre of a hollow Shaft). The Solid shaft runs gears 1, 3, 5 &7. The Hollow Shaft runs Gears 2, 4, 6 & Reverse.

The Clutch kit is running both plates and switches from one to the other in drive terms within a few milli-seconds, making the gear change very smooth and swift.

As the “wet type “ clutch doesn’t need changing, it is not usually available in the aftermarket, and training for this type of clutch is not yet available. Oil **MUST** be changed every 40,000 miles.

The “dry type” clutch requires specialist training available through Euro Car Parts / LUK and comes as an IMI certificated course, and specialist tools are also required.

Both types are used in conjunction with a DUAL MASS FLYWHEEL. This DMF fails with the same regularity as a normal DMF, and can be easily changed by plugging both “Breathers” (oil **MUST NOT** be lost during this procedure),and removing the Gearbox. The Clutch kit is pressed onto the input shaft in both cases and is not bolted to the DMF. The “Wet Clutch” is driven by a short, splined, stub shaft in the centre of the DMF.

The “Dry Clutch” is driven by way of a Toothed Cog around the middle of the DMF. As long as the Clutch Kits are not disturbed, replacement of the DMF is easily changed. If the Clutch is removed, then it **MUST** be replaced with a new kit.

New electronic motor operated systems for the “dry type “ are already on the market for Renault & Ford and again, training is available for these clutches.

If you have any questions regarding Twin Clutch Technology, Please contact your Field Based Trainer who can answer your query.

Notes

Supplier Technical and Helpline Contact Information

LUK	08457 001 100
ZF Sachs	03332 401 123
Valeo	01527 516 955
Exedy	01928 594 883
AP	01926 473 335



Euro Car Parts continually invest in experience, we are the only aftermarket parts supplier in the UK who can offer customers a field based technical support team for transmission products. The Euro Car Parts team have over 50 years of combined transmission experience and can provide you with expert guidance on any Gearbox, Clutch or Dual Mass Flywheel issue. Euro Car Parts specialist teams are there to provide a complete hands on technical support program. See below for details.....

Euro Car Parts Field Based Technical Specialists

Mick Bedford	North	07817 810214	mick.bedford@eurocarparts.com
Craig Waterall	Midlands	07580 995411	craig.waterall@eurocarparts.com
Siti Abdullah	South West	07837 533728	siti.abdullah@eurocarparts.com
Stuart Mann	South East	07580 995406	stuart.mann@eurocarparts.com

Do not hesitate to contact one of us regardless of the source of your clutch product



IMI accredited training courses are available from LuK & ZF Sachs.



In house training is also available from Euro Car Parts Technical Specialists. Euro Car Parts specialised transmission training evenings can be arranged locally.



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