Tech Note 047

Dual Mass and Single Mass Flywheels

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This Technical Paper seeks to explain more about Dual Mass Flywheel (DMF) technology and includes an outline of alternatives available to you and your customer when it comes time to replace a worn DMF.

What is a Dual Mass Flywheel?

The Dual Mass Flywheel derives its name from the two main components (or masses) that operate independently of each other. The primary component (or mass) is fitted with a ring gear and sensor ring (if applicable) and is attached to the crankshaft. This primary component usually incorporates a dampening mechanism typically made up of torsion springs and friction washers that are ideally suited to absorb torsional vibrations within the drive train. The clutch unit is then bolted onto the secondary component. Quite simply, a DMF is a damper for your drive train.

Why does a DMF fail?

A DMF can fail for a number of reasons, but the most common cause will be wear and tear. Like any other component on a motorcar, the DMF will wear out over time. Other causes of failure may relate to driving technique, overloading the drive train when towing or increasing the engine torque to a point where it exceeds the torque capacity of the flywheel.

How do I know if the DMF needs to be replaced?

Flywheel specifications vary from manufacturer to manufacturer and as such, there is no one test that indicates whether the flywheel has reached the end of its service life. There are however some generic telltale signs that indicate to the installer that the flywheel should be replaced such as grease or oil leaks; or noisy operation. EXEDY recommends that the best and safest option is to replace the DMF each time the clutch is replaced. Furthermore, we strongly recommend that you do not grind, machine or attempt to repair a DMF. These actions are fraught with danger as it is not possible to machine or grind the flywheel surface accurately without removing the secondary component from the primary mass. Attempting to machine or rebuild a worn DMF will usually result in the premature failure of not only the flywheel but the new clutch set as well.

What are the options when it comes to replacing the DMF?

The replacement of a worn DMF system with another DMF and clutch package is an obvious option. However, the cost of this option is sometimes prohibitive and as such EXEDY has developed a range of Single Mass Flywheels (SMF) which are sold together with the clutch cover assembly, clutch disc assembly and release bearing to replace the DMF clutch system. The main advantage of a SMF clutch package is the price - these systems are generally cheaper to purchase. Furthermore, as the SMF has no moving components, they can be machined and re-installed into the vehicle when a subsequent new clutch is fitted thereby reducing the future cost of maintaining the clutch system. The conventional SMF is extremely robust and are for example the preferred choice for vehicles used in racing or commercial applications. Whil the SMF replacement clutch system is a popular choice, it is however important to note that despite the durability and price advantages, these systems do not possess the same dampening characteristics as a DMF and on occasion, may not sound or feel like the DMF system that is being replaced. Therefore, when recommending a replacement clutch and flywheel system you should communicate to your customer the pros and cons of replacin the DMF or of fitting a SMF in its place. This will enable your customer to make an informed decision regarding which replacement system best suits their budget and needs.

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> - EXEDY specialist Mark Davis

Nissan Patrol DMF kit

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EXEDY stocks a wide range of DMF and SMF clutch systems. Further information is available at www.exedy.com.au or by calling 1300 366 592.