Thinking through DMFs

Malcolm Short, Schaeffler

When a car comes into your garage and you think the Dual Mass Flywheel (DMF) is the cause of the rattle, do you jump right in and change it? Or would you take a few moments and analyse the situation? Schaeffler's Malcolm Short, has some thoughts about what you should be doing.

Firstly, is it the DMF that's rattling? Does the noise go away when you depress the clutch or get worse when driving round corners? Both of these might suggest it is the gearbox rattling rather than the DMF.

Starting and stopping the engine creates the most movement in a DMF, so if you hear noises under these conditions it might suggest a worn DMF, but not exclusively. Does the engine stop cleanly or does it jump up and down on the final gasp? A worn DMF will not cause the engine to perform badly, but a poorly running engine will make a DMF rattle and shorten its life, because it is absorbing more vibration than it should. Likewise, an engine that is cranking slowly due to a poor battery or dodgy starter motor, will not produce a nice clean start and the DMF will be working overtime trying to compensate. Faulty fuel shut-off valves or dribbling injectors, will both create an unsmooth cut-off or worse, an engine deciding to go backwards for the last turn.

So it's starting and stopping cleanly and it looks like it is running OK, but when you increase the revs slightly you get a small noise in the transition period. Is the engine still smooth when doing this, or is it coughing or maybe its the EGR valve that's doing the rattling?

Is the engine running like it was when it left the factory? Cylinder to cylinder imbalance due to compressions or injectors will all contribute to increased vibration going into the DMF.

So it is running OK, it's starting OK, but we still have a rattling DMF (and we are convinced it's the DMF) but it still has relatively low mileage. Do we know this customer, how do they drive it, how do they load the vehicle, are they a 2 tonne plumber with a 1 tonne van, or a builder that uses a Mondeo to move an excavator around, is he a lovely family man that only takes his wife and kids out on a Sunday, all 7 of them all over 14? Vehicle manufacturers carry out extensive testing of their vehicles, including running around at maximum GVW, to make sure they can release the vehicles to the general masses, then we think we can deliver wet concrete in the back of the Transit!

LuK DMF's as OE equipment are tested in the vehicles they are used in at the GVW the vehicle is designed for, using the tune the vehicle manufacturer has chosen. If the vehicle is operated outside of those limits, beyond its design life or with a chip tune to "improve performance", then the DMF will, like most components under those conditions, wear out sooner rather than later.

Equally there are some vehicle specific issues that keep cropping up. The Opel Vectra apparently, has a control unit in front of the battery, that if not clipped in properly with some force, it may fool even the most experienced of mechanics into believing the DMF is rattling. The swirl valves or their control unit is equally a popular cause of DMF rattling, due to misfire on the same vehicle and glow plugs not working properly, may result in excessive cranking to start. A common cause of rattling DMF at idle on the Vectra is the throttle valve sticking open, due to carbon build up. Closing it with your finger after removing the air intake pipe will confirm it.

In reality, the thought process behind all the above is a few minutes to a professional; he has made his assessment, established that it is the DMF that is faulty, and he has advised the customer of the cost of bringing his car back to how it was when it left the factory.

A professional mechanic should inform the budget concious consumer on the pitfalls of converting the vehicle away from its original specifications and changing its fundamental characteristics. Remember that fitting a solid conversion will not remove the original problem that caused the DMF to wear, it will just pass on even more of the vibration into the gearbox.

Items to check before replacing the DMF:

- Is it the DMF making the noise?
- Does the noise change when the clutch is depressed or when you go round corners?
- Does it rattle on start up and shutdown?
- Is the starter cranking at the correct speed?
- Is the engine misfiring or shaking?
- How is the vehicle used or abused?
- Has any work been carried out recently?
- Is the vehicle chipped?

When you have identified the reason behind the wear:

- Don't use conversion kits purporting to do the same job as a DMF, they don't!
- Lock the flywheel before undoing the DMF bolts (to prevent engine damage due to worn timing chains)
- Make sure you rectify any oil leaks before refitting the DMF
- Check the reluctor ring for damage and the correct number of teeth.
- If a vehicle manufacturer specifies a Torque and Angle for the DMF bolt, it should be replaced.
- If there is no complaint of noise, always measure the DMF wear on a vehicle that has come in for a clutch change, as it may still require changing.