

Premature starter failure from contamination

Contamination from foreign material and fluids can cause damage to the internal parts of a starter, often bringing about an premature failure of the starter. Rotating electrics specialist Rhino Automotive has advice, on what to look out for, to prevent a replacement starter from falling victim to the same fault that damaged the first starter.

Mitsubishi Pajero Starter Diesel Contamination

The Mitsubishi Pajero has several variants of starter motor, depending on year of manufacture, engine size, gearbox type etc. However, they are all basically a reduction geared design with a high speed motor and wound field coils. Earlier models featured an open faced self supported pinion drive.

Most will carry on happily until they wear out. Unfortunately, mounted directly above the starter motor is the main diesel filter and an array of associated pipework.

As a result, it is common to encounter starters that have been contaminated with diesel. This seems to happen due to either leaks from the pipework, or more usually, they get doused in diesel during a filter change.

The effects of contamination may take time to appear, it generally starts with laziness, gradually getting worse until total failure to start occurs.



Diesel contamination had caused this Pajero starter to fail

Diagnosis is straightforward – anything other than a bone dry starter motor points to external contamination.

To avoid contamination, take measures to either remove the starter motor, or cover it completely prior to changing the diesel filter, and ensure there are no leaks after fitting. Even a slow drip will cause a starter motor to fail over time.

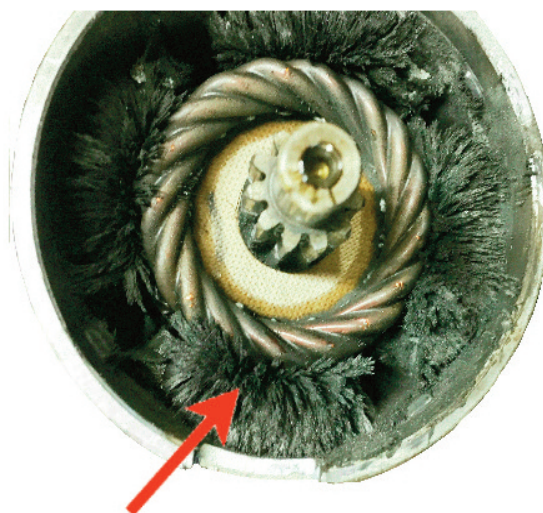
2000-06 Ford Transit Iron Filings Contamination from DMF

The starter motor fitted to this range of Ford Transit was manufactured by Visteon and is a typical modern design, with permanent magnets instead of wound copper field coils and a high speed motor driving the pinion through an epicyclical reduction gearset.

It is a robust and proven reliable design, it is rare to find one worn out, they usually fail due to external contamination.

The most common failure is caused by the presence of metal filings. These vehicles are fitted with a dual mass flywheel. When the flywheel fails, the two steel parts of the flywheel come into contact with each other – the resultant chafing produces iron filings, lots of them.

Centrifugal force, from the rotating flywheel, flings the iron filings outwards, lining the bellhousing and the drive housing of the starter motor. The presence of strong permanent magnets inside the starter result in these filings being “sucked” into the motor part of the starter. A build up of metal filings will cause the starter to eventually fail.



Metallic filings from a failing DMF will cause a premature failure on some Ford starters

The issue with iron filings/ clutch dust (also referred to as swarf) contaminating the 2000 to 2006 Ford Transit and Mondeo starter is well known by experienced mechanics, who would have dealt with many of these over the years, but it's less well known by newer mechanics and staff in motor factors as the 00-06 models has been replaced by newer models which don't suffer nearly as much from this issue. There are still enough of these models out there to warrant a reminder of what to look out for.

Diagnosis is a visual inspection of the starter, for the presence of filings, with stiff or sticking pinion (on occasion damaged pinion) and travel along its shaft.

NB: It is very important to clean the bellhousing when the flywheel is being replaced. There have been many cases of new starters being contaminated by old filings.

