

Compatibility of the Ital Axle with the British Leyland parts bin

For many years, “Live Axle “ Caterham Sevens were based around a rear axle taken from the Morris Ital. It’s a tried and tested setup that has been used extensively on both road and track cars. For higher powered applications however, additional strengthening and bracing of the axle is generally recommended.

Elie Boone spoke with renowned Triumph specialists Jigsaw Racing to get some tips on optimising the setup for strength and durability, and to understand more about which components from the British Leyland parts bin can be used with this application.

The Ital axle used in Caterhams is so called ‘banjo axle’. However, for the Caterham application it is strengthened by the addition of a thick metal plate running across it, and it uses different mountings for the dampers. This axle was also used in the Triumph Dolomite 1850 and the 4 speed Triumph TR7.

Within this casing, you can mount the complete diff assemblies as used in the Spitfire, GT6, Dolomite 1850, and the TR7 4 speed without any problem. The only difference with the Spitfire, GT6 and the others is that these former have a extra mounting lug on the pinon side of the casing, but this will not cause a problem with the clearance in the Caterham chassis.

The bearings and CWP are all interchangeable between the 4 BL models listed above, and the same goes for the half shafts off the Dolomite 1850 and TR7 4 speed.

The brake cylinders are also the same from Dolomite 1850 and TR7 4 speed. However, be sure to measure the inside diameter the brake cylinder as there are three or four different sizes available.

Running an Ital axle on a Caterham does need some points of special attention however, especially if you run higher BHP and use sticky tyres. To ensure maximum longevity, you will need to baffle the axle casing, shim



The Ital Axle as prepared for the Caterham application, showing strengthening plate and specific damper mounting points

the half shaft, and pack the half shaft bearing with quality bearing grease.

To baffle an axle you simply weld a plate against the diff tube on the CWP side.

To shim a half shaft, you need to calculate the shim as follows:

- Take the measurement from the threaded end to the raised stop
- Deduct 72.14mm to calculate the thickness of the required shim.
- A machine shop should then have no problem making shims that are a sliding fit on the axle, with the outer diameter of the shim about that of the inner bearing race. You do need a press to remove or

mount the bearing on the half shaft. (NOTE: when shimming, do ensure that the hub taper is still in full contact with the shaft and that it is not being held off by trapping the shims between the bearing and hub).

An alternative upgrade is the half shaft conversion designed and sold by Rakeway. It eliminates the risk of breaking the shaft, (especially if you like to ride the curbs on track!), but a well-shimmed half shaft should be fine, especially if you have an LSD fitted.

To fill the axle with oil, jack up the rear as high as possible. However, it is worth noting that axles supplied by Caterham are fitted with a second oil filler / level plug above the strengthening plate to further raise the oil level so as to help avoid surge on track days. Seven



specialist James Whiting advises against using this higher level (if fitted) if the car is only for road use. This is because the higher oil level then lays in the axle tubes all the time and can seep (and usually does!) past the seals and then contaminate the brake shoes.

Another recommended modification is to the breather that is screwed into the axle. It

is best to replace the simple breather with a connector to a breather bottle to avoid the risk of oil spillage when cornering.

So, how strong can an Ital axle be? Jigsaw Racing has successfully run a GT6 with 180 bhp without any problems, and a Triumph 6 cylinder engine is without doubt going to have more torque than, say, a X Flow in a Seven. Anything

north of around 200 bhp is likely to prove too much for an Ital axle however, unless you have an extremely smooth driving style...

A big thanks go to Mark Field from Jigsaw Racing who took the time to share his expertise while recovering from major surgery, we wish him a full recovery. Thanks also to James Whiting for additional material provided. *LF*

Failure examples:

A broken half shaft with clear signs that the axle was already fractured before it broke, taken from a XFlow-powered Seven running 150 bhp with Toyo R 888 tyres, used only for circuit driving. There is also the possibility that the fracture has been caused by removing the hub or the bearing with inappropriate tools.



An example where an Ital half shaft has had the bearing tack welded in place to stop movement - very poor practice. In this case, it caused total failure of the shaft through metal fatigue. The heat penetration of the weld has affected the molecular structure of the shaft more than halfway through, as witnessed by the discolouration.



Useful contacts:

Jigsaw Racing

Rakeway

James Whiting Sevens

International Triumph Specialists

Caterham Axle Upgrade Kit

Seven service specialists

Jigsawracingservices.com

Rakeway.co.uk

Jameswhiting.com