



WHO OR WHAT IS DIXIE?
FIRST, SOME important explanations about the vehicle being converted. My Defender, known in **LRM** as Dixie, was built in 2006 as one of the last export-only 300Tdi Defenders. It was never sold and was re-imported in 2008 when I bought it. It was then possible to make a left-hand drive imported Land Rover street-legal by putting it through the Single Vehicle Approval scheme (SVA), the one used to approve kit cars. So, although the 300Tdi was last officially sold for the UK market in 1999, mine is a genuine, factory-built, 2008-registered 300Tdi, which we later (and quite legally) converted to right-hand drive at Nene Overland.



AUTOMATICALLY YOURS

An automatic transmission has many advantages both on-road and off. We show you how to convert a 300Tdi manual to an Ashcroft Transmission auto

CONVERTING A Defender to automatic transmission is certainly a big enough job, but the world-famous Ashcroft Transmissions have developed the ultimate in conversion kits for all models of Defender from 300Tdi right up to the latest 'Puma'-engineered versions. Here's the first instalment on how a kit was fitted to Lindsay's 2006-built Defender.

Ashcroft Transmissions' kits are available for DIY or specialist fitting, or you can have Ashcroft convert your Defender for you. The majority of vehicles now being converted are, unsurprisingly, the latest Puma-engined vehicles and the same electronic ZF auto box can be fitted to all versions of Defender. Alternatively, pre-Td5 models can be fitted with the non-electronic version of the automatic gearbox shown here.

Indeed, since the 300Tdi lacks electronic controls, the electronically controlled gearbox can only be fitted by using a Compushift electronic control unit, developed by Ashcroft, to allow a wide range of user settings. We'll go into it a bit more deeply in a later episode when we deal with fitting and setting up the Compushift system. In this, the first of three episodes, we'll show how one of the fitting stations that Ashcroft's use started to fit the up-rated

Ashcroft Stage 2 ZF gearbox and the heavy-duty torque converter that I chose for my conversion – several times a year, I tow the full 3.5 tonnes and there are some fierce hills around here, so I wanted to be sure the auto transmission would bear up under the strain.

At the point where we start, the manual transmission assembly has already been removed in the conventional way, as described in the workshop manual.

background information

Originally, Ashcroft converted Defenders to auto by using a Disco Td5 autobox but rebuilding it with hydraulic control as opposed to electronic control and fitting a linkage to the throttle pedal to pull the kickdown cable. With the arrival of the Compushift programmable electronic control unit, they are now able to use the stock Disco Td5 autobox, to keep it electronic and use the Compushift to control it. Both routes have their pros and cons.

Looking at the hydraulic control option first, the disadvantage is that, as with any other hydraulically controlled autobox, you have a shift pattern that is pretty well fixed. The advantage is lower cost and simplicity – some people just don't want

any electronics.

The disadvantage of the electronic option is that it costs a bit more. But there are quite a few advantages such as:

- You can adjust the Compushift to make the autobox shift exactly as you want it, lock up when you want it, or even operate it with a 'paddle' or switch-shift.
- When set-up correctly it drives perfectly, just like a factory vehicle, and far better than the hydraulic option.
- You are now able to use the stock Disco Td5 autobox so if you are on a budget, you can get the autobox, converter, starter ring, cooler etc from a breaker and just buy the Compushift and console from Ashcroft to complete the job.

PICTURE 1 Because Dixie was effectively new when I bought it and we want to keep it 'forever', I wanted to start with a brand new gearbox rather than a second-hand one. Ours came from Bearmach who were very helpful in supplying the exactly correct ZF 4HP22 electronic unit as specified by Ashcroft Transmissions.

stage 1 upgrade

PICTURE 2 There is a Stage 1 upgrade option to the 4HP22 autobox at an

additional cost of £250: Ashcroft can fit the centre section of the box with the bigger 4HP24-type (right) being much stronger than that of the 4HP22 gearbox (left). Just the internals are changed so the gearbox stays the same externally.

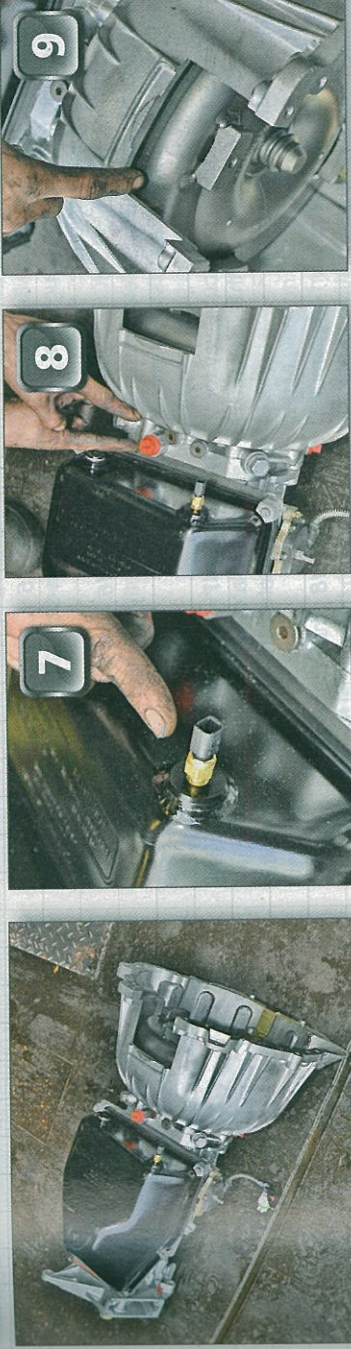
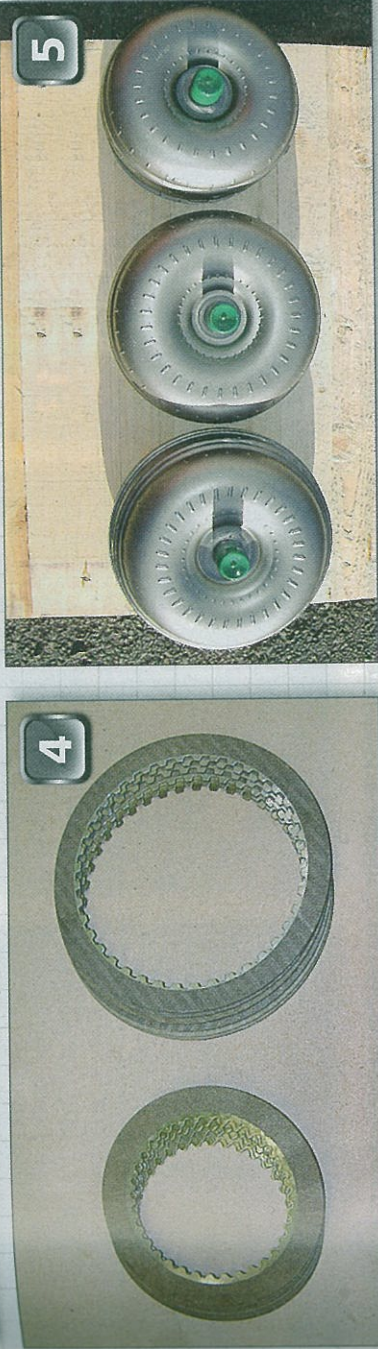
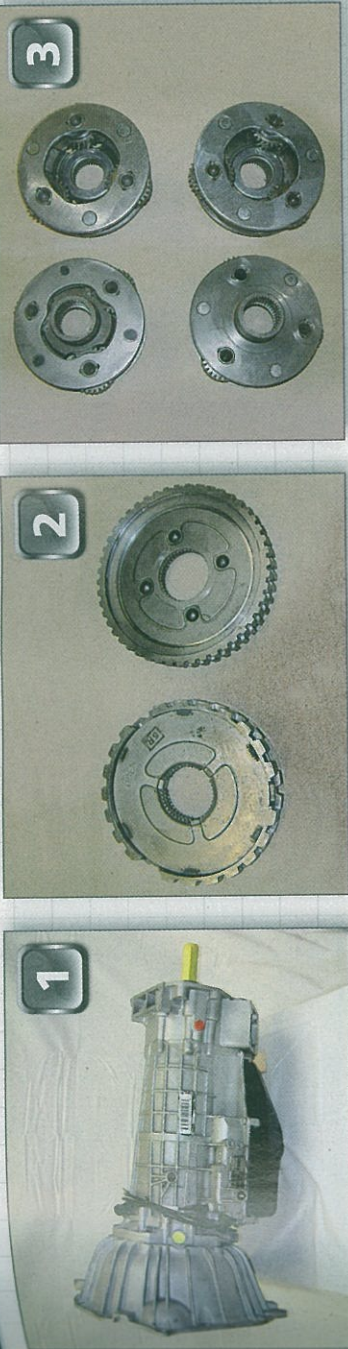
PICTURE 3 Another upgrade in the Stage 1 option is the planetary gearset, the solid 4HP24-type (right) being much stronger than that of the 4HP22 gearbox (left). Just the internals are changed so the gearbox stays the same externally.

stage 2 upgrade

PICTURE 4 The box can be built with both of the internals, as above, but also with the 4HP24's front end which provides the added strength of having the larger A-clutch (right), which is also a weak point on the 4HP22 gearbox (left). This upgrade is an additional £500.

torque converter upgrades

PICTURE 5 The ZF auto used in Land Rover vehicles uses three different diam-



eters of torque converter: small, medium and large.

The small one is used on the 300Tdi, P38 diesel Range Rover and the Td5. The medium is used on the 3.9, 4.0 and the later 4.6 P38 Range Rovers. Finally, the large is used on the early 4.6-litre P38 Range Rover.

Each converter has a lock-up clutch inside it. According to Dave Ashcroft, and he should know, the smaller one struggles to cope even with a stock engine, never mind a tuned one. If you have a tuned engine, in addition to the Stage 1 or 2 options mentioned above, Ashcroft are able to replace the 'small' diameter torque converter for the 'medium' diameter one.

This gives you the benefit of the larger lock-up clutch and the lower stall speed V8 torque converter which will take up drive earlier. This option is an additional £200, recommended for a tuned engine or a vehicle which is used to tow.

You do have to bear in mind, however, that the power loss through a larger torque converter will always be greater than that through a smaller torque

converter – a point worth considering with a standard, un-tuned 300Tdi engine, which has significantly less power than a Td5 unit.

PICTURE 6 The medium torque converter is okay for the Td5 engine's bellhousing but, for my 300Tdi engine, it was necessary for Ashcroft to use a V8 engine's bellhousing, specially converted. And here it is, built up and ready to go. Well, almost...

PICTURE 7 There's also a special adapter fitted to the sump to accept the fluid temperature sender unit.

PICTURE 8 This is the heavier-duty 4HP24's front end to provide added strength. The transmission unit now becomes 15mm longer than standard so there may be fitting implications, such as having to adapt or elongate transmission mountings.

PICTURE 9 If you were to use a standard V8 bellhousing with this combination of engine and gearbox, it wouldn't be possible to tighten the torque converter bolts when fitting the transmission. A special cut-out has been machined...