MIKE GOODBUN'S DEFENDER 110

Editor Mike's 2012 110 Utility Wagon is gradually receiving upgrades to improve its usability and longevity, along with a few other choice modifications. This month it's having the troublesome gearbox extension shaft and drive cup replaced with uprated parts from Ashcroft Transmissions.

HOW LONG?
Three hours

HOW MUCH?
- MT82 output shaft kit, £342 (ashcroft-transmissions.co.uk, 01582 496040)

HOW HARD?

Fit uprated output shaft

Eliminate the weak link in your Defender's driveline with this Ashcroft kit

Many owners of older Land Rovers will no doubt be familiar with the dreaded gearbox mainshaft and transfer box input gear issue. Lack of lubrication to the splines mating the gearbox and transfer box means, over time, wear can develop. This gets worse and worse as the components clunk against each other on acceleration and deceleration until, finally, drive is lost altogether. This was remedied in 1996 with the addition of a cross-drilled input gear, allowing oil up to the splines.

Being all about tradition, Land Rover reinstated this flaw with the TDCi Defender, some 10 years after solving the problem. This time, the splines of a cup at the gearbox end of the output shaft wear, upon joining an extension shaft rather than where it enters the transfer box – it's most apparent on Defenders that tow regularly. If red dust can be seen through a 'tell-tale' hole in the bottom of the gearbox's extension housing, wear is present.

I recall one customer of the dealer I worked at who used a 110 double cab to tow a large fencing trailer: this vehicle had no fewer than three extension shafts and cups replaced under warranty!

Happily, transmission guru Ashcroft makes a full kit to fix this problem, comprising modified OEM parts and a custom housing that allows oil to lubricate the affected splines, preventing wear.

Tools and kit used

- Basic toolkit, pillar jack, lever bar, puller, drift, hammer, screwdrivers, side cutters, brake cleaner, impact gun (optional), bungee cords.

Safety advice

- Wear eye protection when underneath vehicles. Take care when lifting heavy objects – wear protective clothing and steel toe-capped boots.

The Experts Gary Kavanagh & Sid Yateman

Technicians Gary (left) and Sid carried out the installation work on behalf of Ashcroft Transmissions. They work at Landers Garage, a busy independent Land Rover specialist in Bedfordshire (landersgarage.co.uk, 01582 675500).

Seeing red?

1 This hole between the main gearbox casing and the extension housing can be a good indicator if wear is present. Any red dust or staining could point to a worn drive coupling. Excessive driveline slop when driving is also a symptom of wear, so check periodically.

Remove propshafts

2 Sid uses an air gun with special propshaft bolt attachment and 9/16in spanner to loosen all the fixings. Take care not to let the prophaft ends drop from the diff flanges, as this could damage the universal joints. Lift the shafts away and place aside.

Remove handbrake drum

3 With the props out of the way, undo the Phillips screw securing the handbrake drum; use an impact driver if the screw is very tight. Remove the drum, ensuring the handbrake is released first! You may need to back off the adjuster if it's stubborn to come off.

Unbolt the mechanism

4 The handbrake mechanism is secured to the back of the transfer box with four 15mm bolts. Undo the bolts and manoeuvre the assembly away. To avoid messing with the cable, Sid uses a bungee cord to hold the handbrake safely out of harm's way.

Unplug speedometer drive

5 Unlike earlier models, TDCi Defenders use an electronic speedo feed. Push the tab in on the connector and withdraw it from the speed sensor. Follow the wiring up above the transfer box and release the harness from the metal brackets.

Reposition exhaust

6 Undo the nuts securing the exhaust centre section to the downpipe; two mounts must be released. The rearmost rubber can be shifted with a lever bar; the front one can be unbolted from the chassis. Push the exhaust to one side and secure with wire or a bungee.

Disconnect linkages

7 Looking towards the rear of the vehicle, undo the high-low-range selector rod by pushing the plastic button in and popping the cup off its balljoint. Use a ring spanner to undo the 13mm nut on top of the diff lock pawl and release the selector arm.

Connectors and breather

8 In the same area, release the two electrical connectors from the bracket and unplug them; they can be fiddly. Use a 14mm socket to undo the transfer box breather pipe, taking care not to lose the copper sealing washers from the banjo bolt.

Unbolt earth straps

9 There are two earth strap locations on the LT230. One is on a stud on the nearside of the box, attached to one of the fixing bolts. The smaller one (which is easy to forget!) is above the offside gearbox mount. Undo the 10mm bolt and tuck the wiring aside.

Release mountings

10 Undo the four 15mm bolts securing the bracket to the transfer box. Remove the nut on the nearside mount's stud; don't unbolt the bracket as it's attached to the gearbox rather than the transfer box. This allows enough movement for the assembly to be jacked up.

Unbolt from gearbox

11 Now separate the transfer box from the gearbox. Note which bolt comes from where, as they're different lengths. There are four bolts and two nuts; four fixings run from the back of the transfer box to the front, and the other two from the front to the back.

Prevent leakage

12 Sid shows me a handy trick. One of the bolts goes into the main chamber of the LT230, so oil leaks out when removed. By replacing the bolt with a stud, the hole is plugged while still allowing the box to be removed. This saves the mess of draining and refilling.

Jack-of-all-trades

13 The transfer box won't come off without some persuasion, as the gearbox shaft and its studs hold it. A pillar jack and block of wood is used to raise the boxes off their mounts. Don't jack it up too far, though – just enough for the transfer box to clear.

Remove transfer box

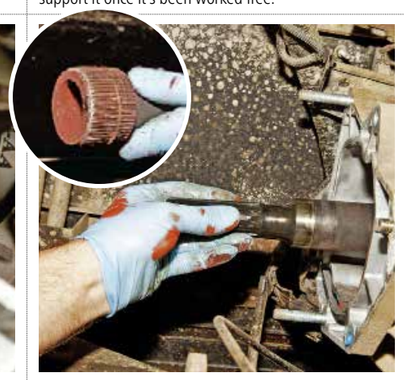
14 With the help of an assistant or another jack, slide the transfer box off the gearbox and lower it to the ground. It may need a lever with a bar or strong screwdriver to get going, so make sure you're ready to support it once it's been worked free.

What's in the box?

15 The comprehensive Ashcroft kit includes a new drive cup with drilled oil channels and threaded outer, new extension shaft and custom oil housing. It also includes a special tool to wind the housing into place and a bottle of threadlock to install the parts.

Cut all ties

16 The first thing you are presented with in the gearbox extension housing is a black dust cover, held in place with a white cable tie. Snip the cable tie with a pair of side cutters and slide the dust cover off, then throw it away.



Remove extension shaft

17 The gearbox extension shaft is held into the cup with a spring clip, so a good pull should free it. When removed you can tell how worn the splines are. Ours weren't too bad, but the amount of red dust and corrosion shows they were starting to wear.

Unbolt drive cup

18 Undo the large bolt securing the drive cup to the gearbox. Once that's out, take note of the distance between the inner face of the cup and the end of the shaft it sits over; the new cup must sit the same depth when installed.

Pulling power

19 The cup is an interference fit on the gearbox mainshaft, so will need removing with a puller. Loosely refit the centre bolt to give the puller something to act on, then wind the cup off the gearbox mainshaft. Wind the bolt out again and withdraw the cup.

Clean the area

20 Give the inside of the extension housing a good wipe-down with a rag and some brake cleaner. Any debris left inside could contaminate the shafts and reappear at the tell-tale hole, giving the impression wear is still present despite the modified parts being fitted.

New drive cup

21 Here the difference between old and new lies. Slots spark-eroded into the splined portion of the cup allow oil to 'leak' from the main gearbox into the coupling, providing lubrication. The oil is then contained by two O-rings inside the housing.

Prepare for installation

22 Apply a smear of rubber grease to the O-rings, to prevent them pinching when everything goes together. Clean any old threadlock off the drive cup bolt, then apply a bead of new compound from the supplied bottle.

Fit the modified cup

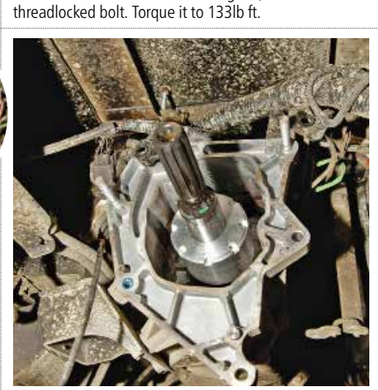
23 Apply some clean oil to the splines and then, using a suitable drift, gradually knock the new drive cup into place. Make sure the cup is set on to the shaft the same distance as the original, then fit the threadlocked bolt. Torque it to 133lb ft.

Fit new output shaft

24 Ensure the spring clip is fitted correctly and central on the shaft, then oil the splines. Line up the new extension shaft and tap it into the new drive cup with a soft-faced hammer until fully home. Tug it to make sure the spring clip has locked into place properly.

Install the housing

25 With the seals lubricated and threadlock applied, the housing can be slid over the extension shaft and wound on to the threads of the new drive cup. The housing must then be tightened using the special tool; Gary uses a long extension bar to apply extra leverage.



The finished article

26 Oil gets into the aluminium housing from the gearbox via slots in the splined parts of the drive cup and extension shaft. The housing seals over the shaft and prevents gearbox oil spraying out as the vehicle is driven, while keeping the splines wet.

Rebuild and test

27 All that's left is to refit the transfer box, props and exhaust and go for a drive. Even though the splines in Mike's 110 were only starting to wear, driveline slop is much reduced and the peace of mind from having fixed it early on is worth the money. LRO