At first glance, removing and overhauling the driveshafts may seem like a daunting task, but if you work methodically – and know what to expect when you get inside them – it's a project you can tackle without apprehension; **Tim Pollard** *talks us through it...*

Driveshaft rebuild

A: Strip-down

THE FOLLOWING PROCEDURE is based on the rebuild of the driveshafts on my 2003 K-series Roadsport; the car is fitted with the later type driveshafts built by GKN for Caterham, rather than the modified Ford Sierra items used in earlier cars.

Although the driveshaft boots had not split, all four were found to be leaking grease, spraying neat lines on the underside of the boot floor, fuel tank and de Dion tube.

Further investigation revealed tiny pinholes in the boots near the boot clamps – possibly damage caused when the clamp was originally installed.

Parts

Caterham supply a boot kit, part number UL9U004. The kit has all the items needed to rebuild a single joint; thus you will need two kits to rebuild one complete driveshaft.

Tools

Only one special tool is required – a special plier to crimp the smaller boot clamp bands. It may be possible to improvise with some pincers or side cutters, but I used a pair of Laser 4136 CV-boot pliers.

You will also need: external circlip pliers; possibly a small three-legged puller and general mechanic's tools such as pliers, hammer, screwdriver. A clean working area is essential and a vice is useful.

Time required

The time needed to undertake these works will vary due to stubborn bolts, other 'incidental' jobs (for example, I repainted my driveshafts whilst they were out of the car) and garage temperature!

But as a rough guide: removal of driveshafts from the car took one hour; stripping them down for cleaning and inspection took half-an-hour for each shaft; rebuilding, half-an-hour for each shaft and re-installation into the car, one hour.

Driveshaft removal

You should refer to the build manual for more detailed information on removing the driveshafts – it's covered by Section 6 for my car and the the main operations are:

1 With the car still on the ground, in gear and handbrake on (and maybe an assistant pressing the foot-brake), loosen the 41mm hub nuts.
I used a breaker bar and a jack handle for extra leverage. Remember the nearside (left-hand side on a RHD car) is a left-hand thread!

2 Loosen the wheel nuts, jack up and support the car on stands. Remove the road wheels.

3 Remove the brake calipers and tie out of the way. My car has flexible hoses allowing the calipers to be moved out of the way without disconnecting the brake pipes.

4 Remove the hub nut and withdraw the hub and brake disc assembly.

5 It may be possible to remove the drive shaft through the de Dion ear, but the ear is easily removed and I then find it easier to protect the seals on the differential and wheel bearings as the shaft is removed.

6 Pull the drive shaft from the diff, taking care not to damage the oil seals.

A2.1

Step A2: remove the boot clamp
Using a pair of pliers, squeeze the 'nobbles' on the clamp band to release the clamp.

A4.1

Step A4: clean up and mark up
Transfer the mark on the housing to the bottom edge with a centre-punch (*mark circled, above, in red*).

Step A1: get prepared!
Give yourself plenty of clear space to lay everything out in an orderly fashion. Mark each end of the shaft (to help you re-assemble everything correctly). I used masking tape and a marker pen. Prepare a parts tray to carry the parts for each joint.

Step A3: mark and remove the outer housing
Mark the position of the outer housing relative to the boot, this will be transferred to the tripode and shaft in the next step.

Clean the grease from the joint and use a centre punch to mark the position of the tripode on the shaft, using the mark on the boot from Step 3 to ensure that all three punch marks on the housing, tripode and shaft are aligned.

Step A5: remove circlip and withdraw tripode
On my car the outboard (hub end) tripode on both driveshafts was easily removed by hand, the inboard (diff end) required the use of a small puller–*see fig A5.2 on the right*. Prise off the small diameter clamp with a screwdriver and remove the boot from the shaft.


B1


B2

B: Inspection

Unfortunately Caterham have been unable to provide any information for the inspection and tolerances for these components; the following is based on experience and a conversation with the ever-helpful Phil at *Road and Race* – thanks, Phil!

Clean the housing and visually inspect the tripode bearing surfaces. Use a clean finger to 'feel' for ridges or steps on the wearing surfaces (*arrawed in Fig B1, above*).

Insert the tripode and check the clearance with feeler gauges. These joints have done 60,000 miles and the clearance was found to be between 0.05 and 0.07mm. There is no significant play and no signs of wear so it is assumed these joints are serviceable!

C: Re-assembly

C2.1

C2.2

Step C2: dot to dot
Line up the centre punch marks and fit the tripode. Use a suitably-sized socket to drive the tripode onto the splines if it's a tight fit.
Fit the new circlip, supplied in the kit.

C5.1

C5.2

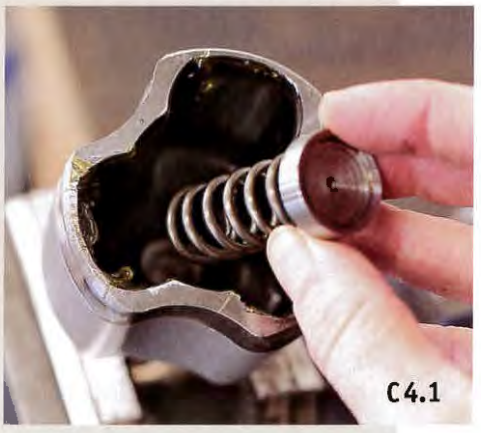
C1.1

C1.2

Step C1: fit the boot
Remember to fit the clamp before sliding the boot into place, but do not crimp the clamp up yet, as the boot may require rotating later.

C3

Step C3: grease up!
Liberally apply grease to the tripode, working into the needle roller bearings. Squeeze the remains of the sachet into the boot.



C4.1

C4.2

Step C4: more grease...
Install the spring and cup into the counter bore in the bottom of the housing. Squeeze the second sachet of grease into the housing and distribute around the tripode bearing surfaces.

C6.1

Step C5: assemble the housing
Align the punch mark on the housing with the shaft and slide onto the tripode, ensuring the cup and spring locate on the end of the shaft. Manipulate the boot onto the housing and install the clamp. Ensure the boot is not twisted – it may be necessary to rotate the boot on the shaft to align with the housing.

Step C6: tighten the clamps
Squeeze the larger diameter clamp with pliers to engage the pressed 'teeth' into the corresponding holes in the clamp. Crimp the small diameter clamp with the special tool.

C6.2

Driveshaft refit

In true Haynes Manual fashion, refitting of the driveshafts is the reversal of the removal...
Ensure all bolts are correctly torqued up. The hub nuts require a massive torque of 270Nm (*or 200 lbf ft – and beyond the range of the typical home-mechanic's torque wrench*).

I tend to nip the nuts up before refitting the road wheels and lowering the car to the ground. Then with hand-brake on, in gear and an assistant applying the foot brake, tighten to a 'guesstimate' torque using a breaker bar with jack handle inserted and a good heave.

Drive the car (gently!) to a local garage and get them to check the torque.
Or you could ask around your local area to see if anyone has an appropriately-large torque wrench.