



## DIFF DIY

Fitting axle differential locks can seriously improve your motor's off-road ability, but it is quite a task and one best left to those who know what they're doing...

**Story: Kevin Baldwin Photos: Wayne Mitchelson**

If you're deadly serious about your off-roading, probably one of the most effective add-ons to enhance the off-road performance of your vehicle are axle differential-locks or 'lockers'. Your coil sprung Land Rover may well be fitted with a centre diff-lock (with the exception of the Series II Discovery), but this device alone won't be enough to keep you moving when the going gets really tough.

No matter that you've got the centre diff-lock engaged, power transmitted through your axles will always look for the least line of resistance. That means if you've one wheel with grip and the opposite wheel of the same axle without a decent hold on terra firma, the characteristics of an 'open-diff' mean that the power will always go where it is least needed. The result is spinning wheels, flying

mud and your familiar 'cross-axle' situation. 'Locking' the action of the diff means you can ensure that drive is split equally across the axle and, providing one tyre has something to get its teeth into, cross-axle situations become a thing of the past. Lock up both front and rear axles and, if one tyre has sufficient grip and your drivetrain will stand it, you should theoretically be able to keep crawling forward with one-wheel drive. Remember, diff-locks are not the solution to every off-roading problem. It's all fine and dandy having the ability to travel up, over, and further than ever before, but when it all goes horribly wrong, you're likely to find yourself even deeper in the 'you know what'.

### DIFFERENT TYPES

Axle differential-locks come in various guises – automatic

(such as Detroit), vacuum-operated (such as Maxidrive) and cable-operated (such as KAM). They all have their own advantages, and arguments about the various merits of each type will no doubt continue to provide barstool debate. However, by far the most

popular type of diff-lock is the compressed air-activated type made by respected Australian off-road specialists ARB. These work as normal open-diffs when driving on the road and engage 'on demand' with the meshing of a dog clutch in the ARB replacement diff-centre when charged with compressed air. Our man Mitchelson had acquired a pair of ARB 'lockers' for his vehicle, so it made perfect sense to have them fitted at the UK's largest supplier of such lockers – Devon 4x4.

With Wayne's 110 on the ramps, Devon 4x4's resident ARB wizard, Martin Kingdom, begins stripping the front axle and it isn't too long before he is shaking his head and



**1** Rover diff-centre is on the right with the much larger (and stronger) Salisbury unit shown on the left



**4** Drill diff-case on the opposite side to where the crownwheel runs and tap hole to take the airline union required to initiate diff-lock. Hole should be drilled on the top of casing and not on the bottom...



**5** Setting up the preload with the dial-gauge. This needs to be spot on, so refer to a workshop manual for correct figures. Don't try to guess

## CAMEL DEFENDER Fitting ARB lockers

sucking air through his teeth, as he consigns most of our previously 'dealer-maintained' 110's front axle to the scrap bin. After dropping the (knackered) front prop, he grabs hold of the diff's prop flange and immediately detected excessive play in the (knackered) pinion. Removing the (knackered) front half-shafts, Martin takes one look at the (knackered) drive flanges and the (knackered) CV joints and decides that our axle is essentially nothing more than a hollow steel tube full of scrap metal. We haven't even got the diff out of the vehicle and already the bill has risen by a couple of hundred quid. The state of Wayne's axle

### Something new

To equip ARB's to a pair of Rover axles, Devon 4x4 offers a complete 'drive in and out' installation service for £1,399. Owing to the added complexity of the Salisbury axle fitment, time spent on it can vary hugely, therefore each job is costed individually.

As we found with our own vehicle, always budget for unforeseen extras like bearings and shafts. If you reckon you're up to the task of installing the ARB's yourself, Devon 4x4 can supply the ARB units for £468 each with the price of the compressor

adding another £149 to the job. Each kit comes complete with all wiring, air pipes and switches and carries a two-year warranty. All prices exclude VAT.

Another option that may be of interest to keen DIY people is to let Devon 4x4 do the tricky bit and build up your diffs for you, so you can then go home and install them and the compressor yourself. Diffs are heavy things, so it goes without saying that self-delivery and collection will help prevent weighty carriage costs.

may well be an extreme case, but it is still an excellent example of why you should always factor in the very serious possibility of incurring additional expense of a similar nature when fitting lockers to your own car. Lockers will double the stresses normally

heaped on your drivetrain, so don't kid yourself and skimp on the installation by re-fitting relatively cheap items like worn half-shaft drive flanges and bearings. Murphy's law dictates that they will always fail in a bottomless bog on a Welsh mountainside on a late

afternoon in rainy December when you've forgotten to take a single spanner with you.

### INSTALLATION

Each ARB comes with its own 40-page installation manual so as you can appreciate, trying to show



**2** ARB diff-centre fitting kit with switch and compressor switch solenoid. Instructions run to 40 pages so this is no lunchtime fix – you have been warned



**3** Original crownwheel being fitted to new ARB diff-centre. Bolts should be tightened diagonally, 'loctited' and torqued down to correct figures. It may be necessary to warm crownwheel on a slow heat. Do not be tempted to use direct heat (oxy-acetylene torch), this will affect the tempering and hardness of the gear



**6** Fitting new diff-bearings is a wise move at this stage of proceedings, could save time and money later



**7** Seal housing that actuates locking action is shown here, together with air supply pipe. Make sure this pipe doesn't foul on any of the cogs

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