



**FREELANDER
SUSPENSION**

Most moving suspension components rely on flexible bushings that are carefully designed to provide freedom of movement while retaining accurate alignment and affording some degree of cushioning from road shocks. The most usual type is the cylindrical bush with a hole down the centre through which a steel tube is inserted and a bolt to secure it to one suspension component.

The adjacent component forms a housing around the outside of the bush, thus linking the two parts together, with the flexible rubber bush that sits between them preventing metal-to-metal contact.

The characteristics of the rubber, such as hardness, torsional resistance and its ability to compress and stretch, directly affect the performance of the suspension system and the handling characteristics of the vehicle. You can vary the performance characteristics of the bush with the specification of the rubber or by using other materials – such as polyurethane.

Graded performance

Wrexham-based Polybush produces different grades of polyurethane bushes for Land Rover models. The bushes are graded by their colour: blue for comfort when touring, red for uprated performance that stiffens up the suspension for better handling and, in the case of the Freelander, an intermediate orange grade.

The company also makes bush kits for leaf-sprung Series Land Rovers, the Ninety/One Ten and Defender range, Discovery Series I and Range Rover. Polybush kits are developed using feedback from vehicle owners.

The science comes into play in producing the right specification of polyurethane to provide the kind of characteristics you want and the right wear rates through the material's mechanical performance. That, in turn, is affected by the physical dimensions of the bush, providing exactly the right amount of compression when the bush is assembled with the suspension components.

Freelander development

The bush pack for Freelander was developed and refined in conjunction with independent Land Rover specialist Famous Four in Louth, Lincolnshire, using its 1.8-litre Freelander development vehicle.

That's the vehicle I now own and, in my opinion, the bush kit enhances the standard Freelander's already excellent handling, giving a very positive feel and improved steering response. Polybush states the material is oil-, diesel- and petrol-resistant and it doesn't age, so the bushes should be long-lasting. That fact

Tight handler

The Freelander is a fine on-road performer, but there's a bushing kit – new on the market – that can add even more tightness, agility and responsiveness. Whether you're replacing bushes or other parts, read on to understand more about your Freelander's suspension



How hard? How easy?

How difficult?
You need a good deal of experience and decent workshop skills to complete this job. The work took a full day for a professional technician with Frogs Island's workshop facilities on hand. However, it's the type of job that could be done in stages, doing one section at a time.

Special tools needed? Land Rover tool LRT-64-002 (designed for removal of the rear trailing arm rear bush from the hub casting); ball joint extractor; hydraulic press; suitable formers.

3-spanner rating

In suspense: Camel Freelander owners Victoria Cumming and Julian Read examine the Polybushes prior to installation on their vehicle at Frogs Island

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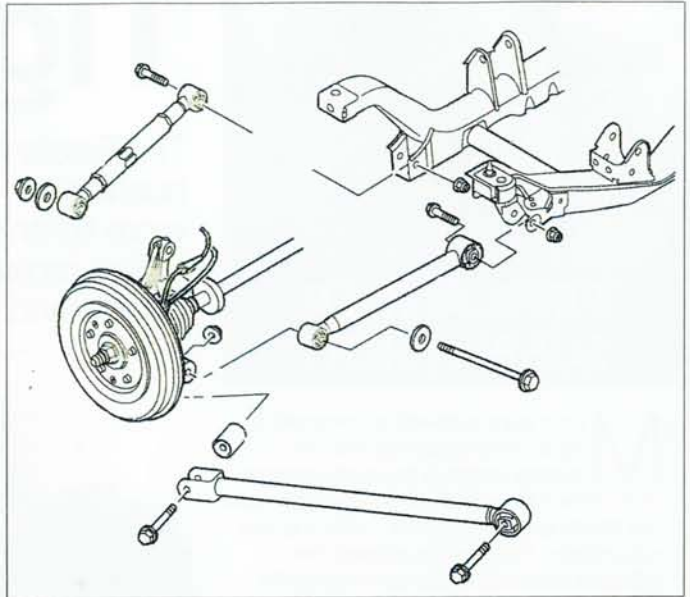
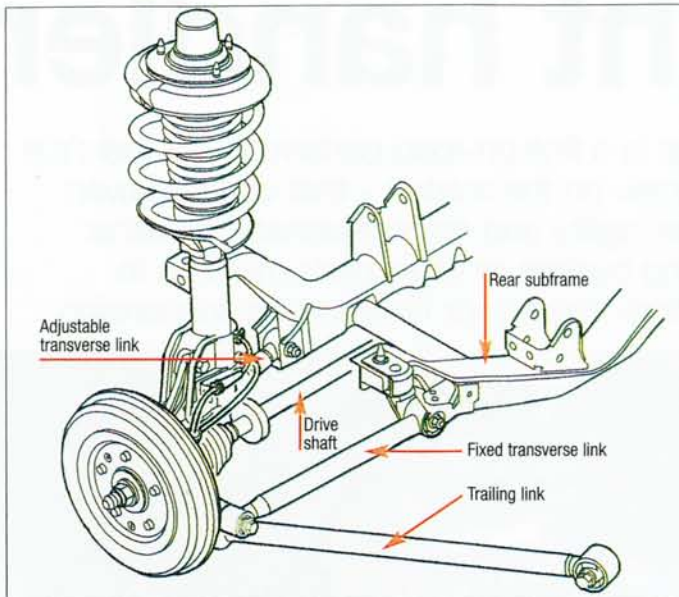
is borne out by my own Freelander, which has covered 12,000 miles on the bushes – with no sign of looseness.

The Freelander Polybush kit has now been extended to include the newly developed front wishbone rear mountings that weren't fitted to my car. First to try the new product were enthusiasts Victoria Cumming and Julian Read, respectively secretary and chairman of the Freelander Club and joint owners of an ex-Camel Trophy press vehicle.

I caught up with them at Frogs Island 4x4 in Abingdon, Oxfordshire, where Frogs Island technician Matt Smith carried out the installation. The pictures show the bushes being installed on one side of the vehicle, though the procedure is similar on each side.

● Thanks to Frogs Island 4x4 for the opportunity to photograph this installation, and especially to technician Matt Smith who installed the kit.

REAR SUSPENSION LINKS



1 The Freelander's rear suspension is located by two transverse links which connect the front and rear of the hub assembly to the rear subframe, and a trailing link that gives added fore and aft stability (right-hand side shown)

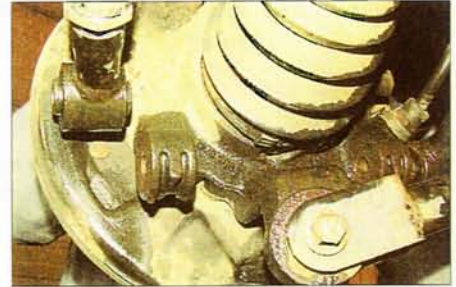
2 Just the one through-bolt with a nut holds the transverse links to the hub assembly. The rearmost transverse link is length-adjustable for tracking. All the link ends are bushed – so that means there are six bushes altogether



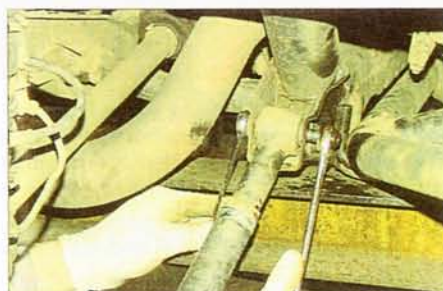
3 Frogs Island technician Matt Smith made a start on the vehicle's rear left suspension, first removing the nut from the hub assembly thro-bolt, then working the bolt loose from the forward end



4 Corrosion had tightened the bolt where it goes through the steel tubes in the bushes. Despite Matt's using release oil and easing it gently back and forth, it still needed to be drifted out carefully



5 This left the outer ends of both transverse links detached from the hub assembly (the rear adjustable link has sprung upwards). The trailing link bush (centre, lower one) will be tackled later



6 The bolts and nuts holding the inboard ends of both transverse links to the subframe were, luckily, easier to remove. The exhaust pipe was manoeuvred to withdraw to this rear link bolt



7 This is the rear transverse link. The bushes will be removed and the new Polybushes inserted, using a hydraulic press. A typical used bush is also shown, so that you can compare it with the new



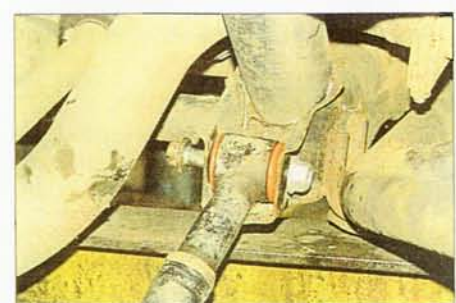
8 Before pressing the bush out, a steel die is inserted into the bush. The hydraulic ram will press on the die to drive the bush out cleanly and squarely without damaging the suspension link



9 The new Polybush is carefully lined up over the eye of the transverse link before working the press pump to force it gently into position. Accurate alignment is essential as the bush is pressed home



10 All four bushes have been cleanly installed without damage either to the transverse links or to the bushes. The outer lips of the bushes fill out over the edge of the link eyes on each side



11 The transverse links are now refitted to the subframe using new locking nuts, not fully tightened yet. Outboard ends are left detached from the hub while the trailing link is tackled

LAND ROVER WORKSHOP
FREELANDER SUSPENSION
 continued



12 The trailing link's forward mounting bolt is now removed from the underbody bracket that hides the captive nut in the body. This one is probably the most accessible bolt of all to tackle



14 With Polybush installed (tapered end first), the link is refitted to the forward bracket. If the new bush is a tight squeeze, you can ease the bracket open for it by releasing this forward bolt



16 A small, air-powered saw is a useful tool to cut the rubber bush away, and then to split carefully the remaining outer steel casing that had surrounded the rubber bush inside the housing



18 The good news is that the Polybush is supplied in two halves, which are easily inserted from each side of the housing. The centre aluminium bush is slid in through the two halves



20 A new long through-bolt is greased up to stop it corroding, before being slid through the hub and the two transverse link outer bushes. As always, you should fit a brand new locknut here



13 After you remove the nut and bolt that hold the rear of the trailing link on to the hub assembly, the link can be withdrawn. Note here that the rear bush is housed in the hub casting



15 The removal of the trailing link rear bush from the hub casting turns out to be the most difficult part of the job. This corroded tubular insert is first forced out from inside the bush



17 The steel external shell of the bush is finally removed. It's not a job for the faint-hearted, but it's much quicker than dismantling the hub and driveshaft assembly in order to use the press



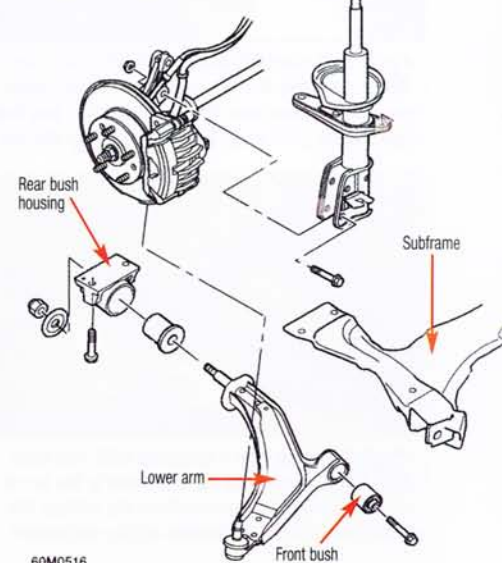
19 The trailing arm link is then re-attached to the hub assembly using a new bolt (the original one here was corroded on its shank) and a new locknut, too. Final tightening will follow later



21 Finally, with the vehicle weight resting on the wheels, all bolts and nuts are tightened to their respective specified torque settings. Use some locking fluid on the trailing link forward bolt

FRONT SUSPENSION LINKS

22 The front lower suspension arm pivots on the subframe through two inboard bushes. Its outer end is connected by a ball joint to the hub assembly (right side shown)



29 Tailor-made tubular ferrules allow you to support the housing in the press while the existing bush is removed and replaced with the brand new Polybush one



33 The ball joint is reconnected, and all nuts and bolts tightened to specified torques. Those securing bushes and the rear housing should be tightened with the vehicle weight on the suspension

YOU NEED TO KNOW...

- Buy in replacement locknuts – original locknuts and lock washers should not be re-used.
- Apply easing oil to all bolts and nuts at least a day before starting the job.
- After removing old bushes, thoroughly clean their housings and through-bolts.
- If any bush eyes are worn, corroded or otherwise damaged so that the new bush is not a tight fit, renew the component.
- Use soap and water to help new Polybushes slide into place. Grease or oil should not be used.
- Some bushes can be fitted into components using a vice or G-clamp, or drawn in using a heavy bolt with large washers and tightening the nut. Others will need a hydraulic press.
- When fitting bushes that are supplied in two halves, take care that one half is not dislodged when inserting the centre tube.
- Never cut or trim bushes to ease fitting.



23 Matt starts off on the front left-hand side by removing the nut from the ball joint which secures the lower arm to the hub casting, and then splitting the joint away in order to free up the arm



24 The forward, inner-mounting for the arm is secured by a single bolt to a captive nut in the subframe. When this is withdrawn, the arm will stay in place while the rear bush is tackled



25 The rear of the lower arm locates through a bush inside a housing that is bolted to the Freelander's underbody. The housing is unbolted from the body, leaving it attached to the arm



26 The lower arm – complete with rear bush and its housing, still attached to the arm's stud – can now be removed from the vehicle. It's finally ready to be dismantled on the workbench



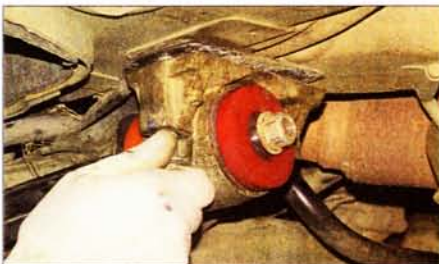
27 The arm is an awkward shape to be held in the press. Careful selection of supports and regular checks of alignment ensure the old front bush is withdrawn and the new is fitted cleanly



28 With the nut and snub washer removed, the rear bush and housing can now be worked off the arm. A replacement washer (which is a different design) is provided in the Polybush kit



30 The housing is refitted to the rear stud on the lower arm. The special, matching snub washer is fitted over the stud and secured (loosely, at this stage) with a new locknut and its washer



31 The re-bushed lower arm is now positioned into the subframe, engaging the forward bush and inserting its bolt with locking fluid. You can then fit the two rear housing bolts in place



32 The bolts that are screwed into captive nuts (the forward mounting and the two, larger rear housing bolts) should be treated with some thread-locking fluid before you assemble them

ANTI-ROLL-BAR BUSHES



34 The two anti-roll-bar bushes are quite uncomplicated for you to change. A clamp is bolted over each bush, keeping the bush and the anti-roll bar in place on top of the subframe



35 After removing two bolts, the clamp plate will lift off. Access is altogether reasonable, although you'll find that it's difficult to see these bolts clearly, when you're in such a confined space



36 The rubber bush is split along its length, which is helpful, enabling it to be prised easily off the anti-roll bar. And lifting the bar slightly clear of the subframe will help removal



37 Before you commence reassembly, treat the bolt threads to a thorough clean; and remove any encrustation from inside the clamp and from the top surface of the subframe



38 The Polybush is also split longitudinally, so enabling it to be clipped easily in place, right up against the stop collar on the anti-roll bar. That being done, you can now refit the clamp plate



39 Finally, tighten the two bolts down evenly, then finish off to the specified torque. The pictures show the right-hand-side bush – and the procedure is exactly the same for the left side