

Brian Burgess returns to tell you how to replace the anti-roll bar drop links and tie rods on your S-Type



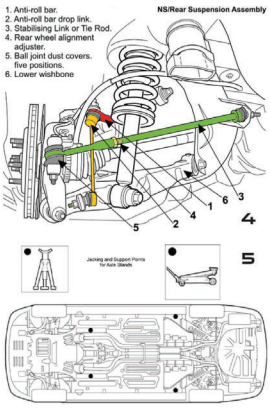
The MoT is an annual test to check how safety-compliant our cars are according to the rules laid down by the DVSA. As owner/enthusiasts, we hope and trust that those cars are roadworthy and will receive a clean bill of health, however, as they age, components wear to the point where they may become unsafe or fail altogether if not regularly checked. The MoT technician's role is to inspect all safety-critical components and report either a PASS or a FAIL.

Test results can sometimes appear contradictory when there are 'advisories'. The technician is required to make a judgement on the condition of those safety-critical components based on his or her understanding/interpretation of the DVSA rules and ultimately his automotive competence.

I recall a recent example of this where on one test the technician identified a split ball-joint dust cover and reported it as an advisory on the test certificate – i.e. not a major fault but get it fixed (incidentally, this was on my Astra daily driver and not one of the S-Types). However, on the next MoT a year later, at a different test station, the split ball-joint dust cover (which I subsequently found had worsened) was not reported at all, even though the previous test results would have been available to the tester – curious! So, when checking the MoT history on my Astra, it appeared that the dust cover had been fixed between the two tests. Not true – it was simply overlooked and didn't appear on the second certificate.

The important thing here is that although the split dust cover was not spotted second time around and was not reported, this does not discharge our responsibility for ensuring that our cars are compliant – and safe. Advisories should be viewed seriously because they are a warning that a safety-critical component needs attention and is most likely to fail if left unattended.

I understand that it's not always possible for the owner/driver to perform a visual pre-MoT inspection or, for that matter, a post-MoT one either, meaning you must rely on the results of the MoT or feedback from regular servicing. Having spent many years around cars in a professional and, latterly, DIY capacity, I cannot stress strongly enough how important it is to adopt a regime of preventive maintenance. One way of achieving this is, of course, regular servicing, either DIY or by a competent service centre.



Fortunately, I own a car lift and can carry out my own servicing as well as mechanical and electrical repairs. It was during a pre-MoT 'health check' on my S-Type that I spotted several split dust covers on a number of rear suspension link ball joints. In light of this, I thought that I would share with you the process of replacing four critical rear suspension components – the left and right rear sway (anti-roll) bar drop links and the left and right rear stabilising links, also known as tie rods. The work was carried out on a 2005 model-year S-Type – from VIN M79146 (diagram 4) – but other years/models will be similar. These components were replaced because the ball-joint dust covers were showing signs of deterioration and splitting.

WHAT THESE LINKS DO

The anti-roll bar drop links connect between each end of the rear anti-roll bar and lower rear suspension wishbone arms. The job of the anti-roll bar is to reduce the body roll of a vehicle during fast cornering or over road irregularities.

The stabilising links (tie rods) provide a fixed and measured connection between the rear suspension subframe and each of the rear wheel hub carriers. Each link has an adjuster that facilitates the 'toe' alignment setting for the rear wheels. It is worth mentioning at this point that after replacing these links, the car will require a full four-wheel laser alignment procedure performed by a competent auto shop with the correct equipment and access to Jaguar alignment settings.

Having said that, there is a short-term work-around for the DIY mechanic that I will explain later, where the settings from the old tie rods (assuming they are correct) can be reproduced on the new ones during the replacement process.

PREPARATION, LIFTING AND SUPPORT EQUIPMENT

Select a flat, level and stable surface such as the garage floor or tarmac driveway. Raise the rear of the car and place it on two axle stands according to the manufacturer's safe working recommendations (diagram 5).

Use a suitable hydraulic jack (a 2-tonne low-profile trolley jack is recommended). Do not use the scissor jack supplied with the car – this is only intended for emergency wheel changes. You will also need a pair of 2-3-tonne axle stands with strong rubber top pads to avoid underbody damage. Place the stands under the recommended chassis support points (5). Remove both rear wheels to access the tie rods and drop links.

TOOLS AND OTHER ITEMS

You will need the following hand tools:
- 18mm ring or ratchet spanner
- 8mm ring or ratchet spanner
- 7mm and 15mm socket 3/8in drive
- 3/8in drive ratchet wrench
- 13mm ring or ratchet spanner
- 15mm ring or ratchet spanner
- 19mm open ended spanner

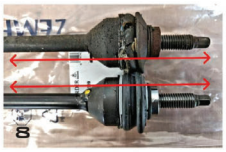
In addition, you will also require:
- two strong cable (zip) ties to hold the park brake cable away from the upper drop link retaining nut during replacement
- a straight edge such as a 12-inch solid steel ruler to aid length and squareness calibration of the new tie rods
- a wire brush, rust penetrator treatment and lube oil for the threads.

REMOVAL: SETTING AND REFITTING THE LINKS

It is always good practice to clean away any excess rust from exposed threads













LINK REPLACEMENT



with a wire brush and treat them with rust-release agent and oil. Leave this to penetrate before attempting to loosen the retaining nuts – it will make the job a lot easier. I also recommend that you replace the links one side at a time. This will ensure that the offside (OS) and nearside (NS) tie rods do not get mixed up. Note, also, that the drop links are right- and left-handed. For the purposes of this article, we will deal with the NS links, however, the procedure for the OS links is identical.

Starting with the NS tie rod (stabilising link), undo the ball joint attached to the sub-frame. Use the 18mm spanner to undo the nut while holding the hex head ball-joint stud with the 8mm spanner to prevent it from rotating.



Undo and withdraw the nut and bolt that secures the tie rod (rose bearing) ball joint to the hub carrier and remove the tie rod (13mm spanner and 15mm socket).

Next, using a strong cable (zip) tie, lift the power brake cable up and away from the top (rubber end) of the NS roll bar drop link and secure it to the suspension coil spring. This will improve access to the top retaining nut. Remove the upper and lower retaining nuts in the same way as the tie rod ball joint using two spanners for each joint. Remove the drop link (7mm socket and 15mm spanner).

I mentioned earlier that there is a short-term work-around regarding the rear wheel alignment, which is controlled by the tie rods. The aim here is to set the overall length of the new tie rod to that of the old one. If this is done correctly, and assuming the old one was correct in the first place, when the new one is fitted the rear wheel alignment for that side will remain unchanged. I have seen this done using a steel tape measure. I don't recommend this method because it's not very accurate and if you manage to get it right, then it's through sheer luck rather than design.

The method I prefer is to bolt the old tie rod to the new one using the nut and bolt from the hub carrier tie rod ball joint (6). The tie rods will need to be spaced using an appropriate size and quantity of washers (7). The tie rods must be parallel with the sub-frame end ball joints and just touching. Straighten the ball joint on each tie rod so that the flat face at the base of each ball joint stud is at 90 degrees to the tie rod shaft (8). This may sound complicated, but the images will make more sense when setting the rods. The next step is to make the new tie rod match the length of the old one by checking the difference in length between the two rods (9). Loosen the alignment adjuster lock nut on the new tie rod (do not alter the old one) and rotate the tie rod shaft clockwise or counterclockwise to adjust its length (10). Use a straight flat edge such as a steel rule across the flat faces of the ball joints to confirm they are of equal length (11). Lastly lock the new tie rod adjuster nut to the tie rod shaft (10). Double-check before fitting to your car. Refit the new tie rod and drop link in the reverse order of removal.

Tighten all nuts to recommended torque settings. Repeat the process for the OS links.

TORQUE SETTINGS

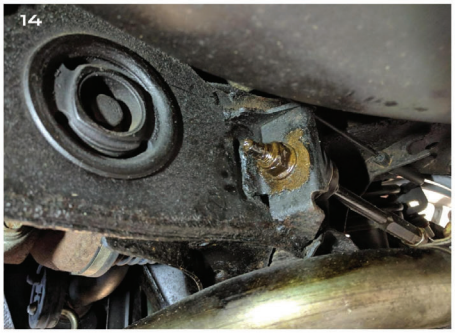
- drop links upper and lower – 48Nm
- tie rods (sub-frame end) 100Nm
- tie rods (hub-carrier end) 55Nm

If you suspect that the rear wheels are out of alignment, look for signs of uneven tyre wear. A good example of this is 'blocking', where the tread blocks appear to have been dragged diagonally across the width of the tyre causing a raised lip on each block (17). Jaguar Cars refers to the condition as 'crabbing', where the vehicle is travelling forwards and a little sideways at the same time.

If you are performing the tie rod replacement on the 4.2-litre supercharged R model S-Type with Brembo brakes, the EPB (Electronic Power Brake) caliper will have to be removed in order to withdraw the tie rod retaining bolt from the rear hub carrier.

There is an optional, less expensive but more labour-intensive alternative to replacing complete links and that is by replacing just the ball joint dust covers. There are many aftermarket size variants available and you will need to check dimensions before buying. However, I would only recommend this option if the ball joints are mechanically serviceable – i.e. showing no appreciable signs of wear (lateral movement in the ball joint). Dust covers can be picked up for a few pounds and include the coiled retaining clips (16). You will also need a suitable grease to repack the ball joints. A bonus is that you won't have the cost of laser aligning your car's wheels because the stabiliser link settings won't have been disturbed. This is, of course, on the assumption that the wheel alignment was correct in the first place.

I chose to replace the roll-bar links and tie rods with completely new ones in order to be MoT compliant and for peace of mind. Aftermarket replacements are inexpensive compared to the Jaguar OEM parts.



REPLACEMENT PARTS

The Lemförder stabiliser links from Autodoc.co.uk, part number 33590 01 (OEM C2C13835 from VIN M79146) are not 'handed' and are currently priced at £55.64 each including VAT. ZF Lemförder is a JLR supplier.

The Febi Bilstein anti-roll bar links from Autodoc.co.uk, part numbers R/H 42244 (OEM XR81692) and L/H 42245 (OEM XR81693), are currently priced at £17.11 each including VAT. The tie rods and drop links are supplied with new Nyloc nuts, which should always be used in preference to the old ones.

Autodoc.co.uk cross-references OEM part numbers against all items in stock so check all part numbers and their suitability for your car before buying.

Equivalent parts can be sourced from SNG Barratt at www.sngbarratt.com.

12 *New O/S-rear tie rod and drop link secured* **13** *N/S-rear tie rod adjuster locked and treated with copper grease* **14** *Sub-frame fixing point for tie rod* **15** *Anti-abrasion rubber block between upper drop link fixing and park brake cable* **16** *Aftermarket ball joint dust covers and retaining coil clips* **17** *Example of 'tread blocking' symptomatic of rear wheel alignment error*





