

## SECTION 4

### ASSEMBLY OF FRONT UPRIGHTS

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#### 4.1 Introduction

1.1 All new kits, both Classic and De Dion, are supplied with the front uprights assembled and ready to fit to the car. This section is still included in the assembly guide for maintenance and service purposes however.

1.2 The front upright fitted on Classic live axle cars is common to the MK IV Triumph Spitfire with the exception of the brake pads. We strongly advise however, that new items are used as both the braking and suspension systems are safety critical. De Dion uprights are unique to Caterham and sections 4.2 and 4.3 below referring to the trunnions do not apply.

#### 4.2 Trunnion Assembly

2.1 The first step applicable to live axle cars only is the assembly of the two front trunnions which are handed left and right. Refer to diagram 4.1 for clarity. Assembly is identical for each side as follows:-

2.2 Lightly grease one of the smaller steel washers and place over the top hat bush, lip facing outwards and press into the trunnion using a vice. Repeat with the second top hat bush into the other side.

2.3 Push the stainless steel bush duly greased through the hole in the top hat bushes, again using a vice.

2.4 Slip a rubber sealing washer over the outside of the top hat bush and clip the larger steel washer, again well greased, around the outside of this so as to leave the bush and rubber seal enclosed and hence dirt proof.

2.5 Hold this assembly together temporarily either with the 7/16" bolt provided or a tywrap until later assembly onto the front wishbone.

2.6 Repeat this exercise for the other side. Note that the trunnion kits include a rubber bush with a steel insert. These are not needed.

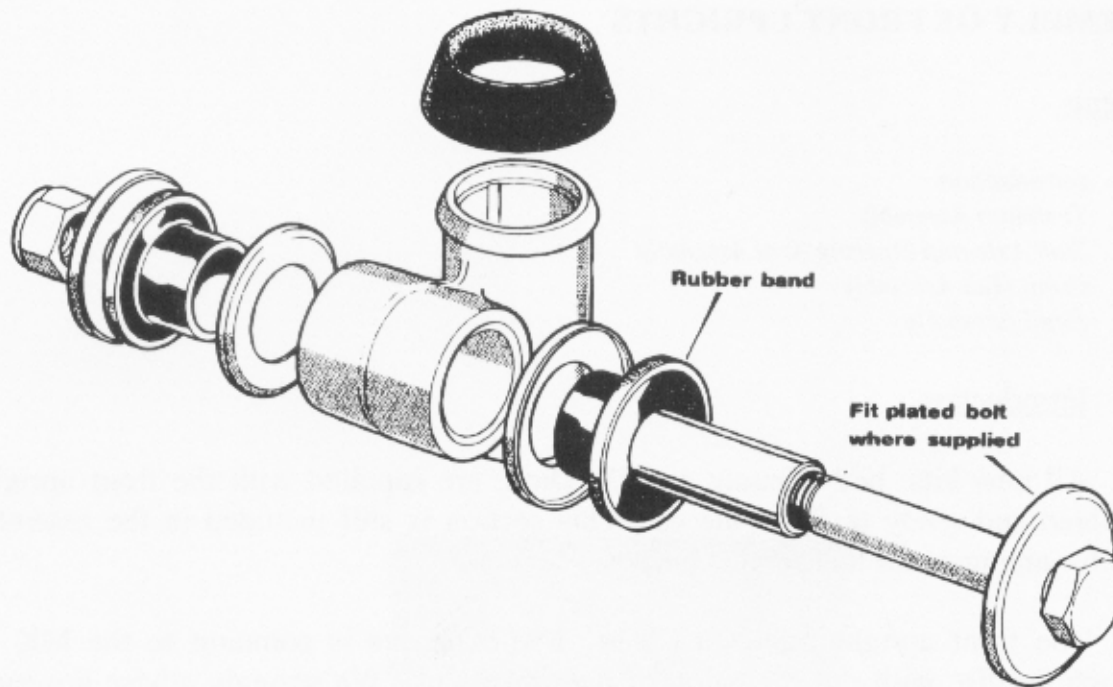


Figure 4.1 Front Trunnion Assembly

2.7 The appropriate trunnion should be half filled with Hypoid 90 oil and then screwed onto the bottom of the upright with the rubber dust cover sandwiched above the trunnion. Please note that the left hand trunnion has a left hand thread. The front uprights are clearly marked L.H. and R.H..

2.8 The trunnion should be wound up by hand to the limit of its travel and then unwound until it can rotate freely. This should only be by about one turn and if at first it seems too stiff, repeated screwing and unscrewing will loosen it.

2.9 The rubber seal at this point should be in firm contact with both trunnion and upright. If there is a gap then the trunnion will need to be wound up further. While this is happening, oil will ooze out around the seal and also the hole for the "grease" nipple.

2.10 When assembled, insert the "grease" nipple and tighten lightly using a  $3/32$ " AF spanner. Fill the trunnion with more oil until it oozes around the seal once again. A good quality grease gun can be filled with oil for this purpose but do not use grease as this will go hard in service leading to premature wear of the trunnion.

#### 4.3 Stub Axle and Steering Arm Assembly

3.1 Degrease one of the stub axles, which are not handed, using petrol or thinners and insert into upright as shown in figure 4.4.

3.2 Select the appropriate steering arm and assemble onto the upright according to the diagram using a 1/2" nyloc nut (3/4 AF spanner) on the end of the stub axle and a 7/16" x 1 7/8" bolt and lock washer to attach the steering arm noting that to obtain the correct spacing one of the red washers supplied should be inserted between the upright and steering arm. The steering arm should face forward in a horizontal position.

Torque settings:	Stub axle	60-65 lbft
	Steering arm to upright	22-27 lbft

3.3 Should cycle wings have been opted for, the stays which locate onto the front upright should be fitted at this stage using a thin 1/2" UNF nyloc fitted to the stub axle in place of the standard thickness nyloc.

#### 4.4 Front Hub Assembly

4.1 Fit both the inner and outer taper roller bearing housings into the hub casting. Referring to figure 4.2., note that the larger bearing fits into the inner housing and both need to be pushed fully home into the hub. This can be done either using a vice or by tapping into place with a hammer and a suitable drift, taking very great care not to damage either the hub or the bearing face.

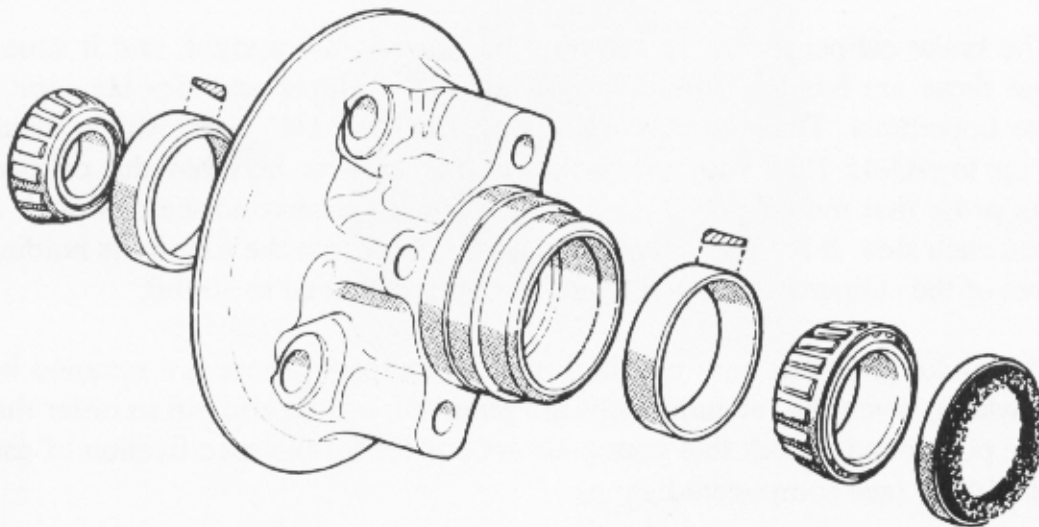


Figure 4.2 Front Hub Assembly

4.2 Pack the inner bearing race liberally with grease, along with its housing, and place in position.

4.3 The dust cover should now be pressed into place retaining this bearing. Note that the metal side should face the bearing and the felt outer acts as a dust seal against the upright when fitted. This is a tight fit and may prove very difficult to achieve with a bench vice and hammer alone. Ideally it should be fitted using a press and if your

local garage cannot help you, Caterham Cars will happily fit this for you on appointment.

4.4 The brake discs should now be relieved of their protective coating, methylated spirit is ideal for this job, and fitted to the hubs using four 3/8" x 1 1/2" bolts with shakeproof washers under the bolt heads. These bolts should be torqued to 22-27 lbft.

#### 4.5. Final Assembly

5.1 The hub/disc assembly can now be fitted onto the stub axle. Push the assembly firmly home and ensure that the outer bearing race is pushed into place in its housing. The large washer with the half-moon centre should be fitted over the hub spindle to locate and protect the bearing and the 1/2" castellated nut screwed into place.

5.2 Because this is a taper roller assembly, the nut should be done up until all trace of free play in the bearings is eliminated, but not so tightly that the free spinning of the hub is restricted.

5.3 The split pin should be fitted through the hole in the hub spindle which should line up with one of the slots in the castellated nut. If it does not, slacken the nut slightly. Check for free running or play, and finally clip the dust cap into place.

5.4 The brake caliper assembly can now be fitted to the upright, and it should be noted that these are handed. In either case the bleed nipple and flexible pipe input should be uppermost. These are secured using 7/16" x 1 1/4" bolts which should be torqued up to 40-45 lbft, with the pink spacing washers between the caliper and upright in order that the caliper is positioned correctly relative to the disc with equal spacing on each side. It is very important that you check that the four bolts holding the two halves of the caliper itself together are correctly tightened to 30 lbft.

5.5 The brake pads can now be fitted into the calipers. These are retained by the two pins which, when the retaining clips are removed, can be slid out in order that the pad can be positioned. Check that your pads are correct for the specification of car that you are building. (see component listing)

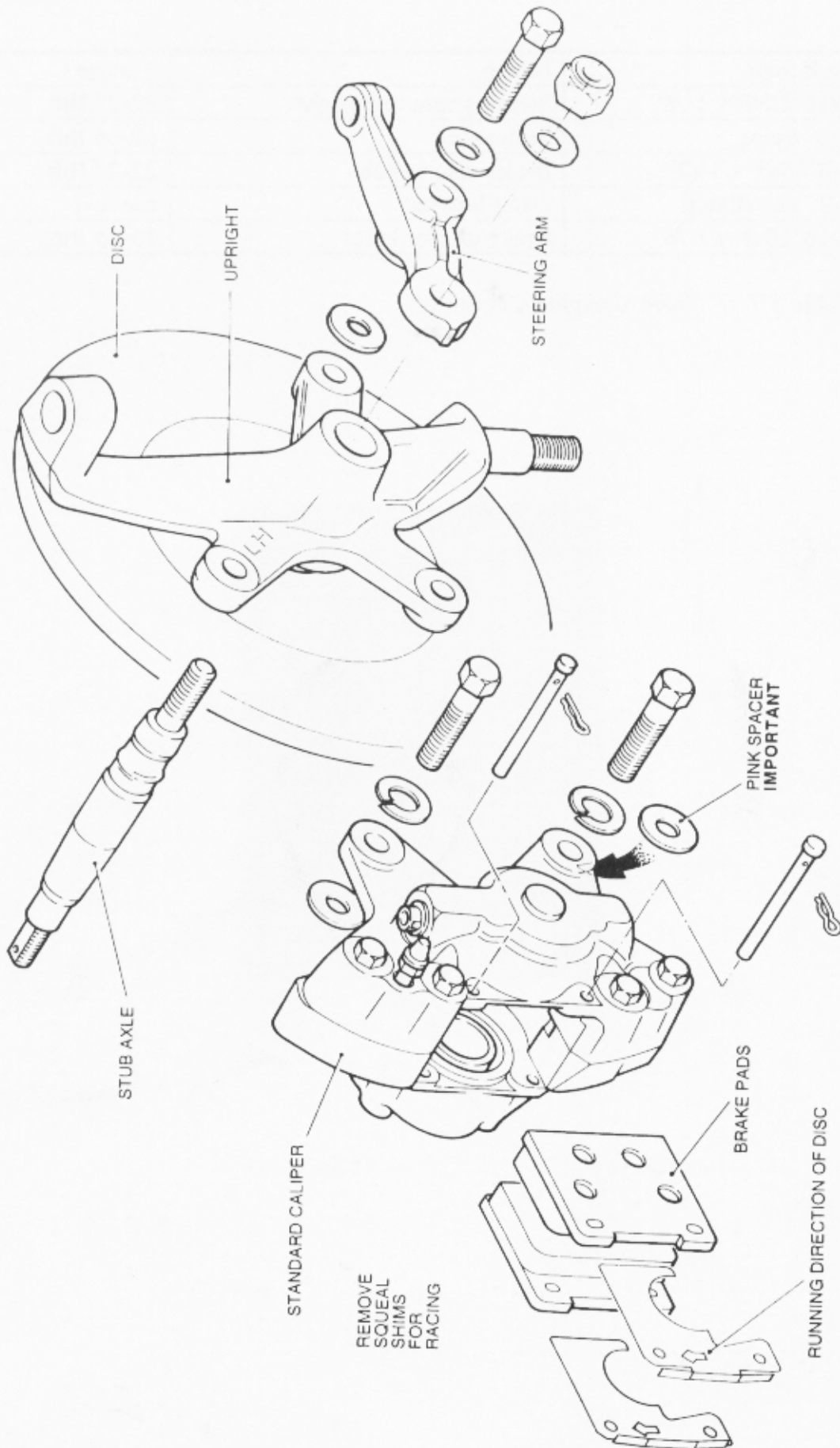
5.6 Use a little copperslip on the edges and back of the pads to prevent seizure and assemble into the caliper. Note that the anti-squeal shims fit between the pad and the caliper piston and ensure that the little arrows stamped on them reflect the normal (forward) direction of travel.

5.7 The retaining pins should be slid into place (it does not particularly matter whether from the inside or outside of the caliper) capturing both shims and pads, and are locked using the spring clips.

5.8 Repeat for the other side and leave in an upright position to prevent leakage of oil from the trunnions.

Bolt Size	Usage	Torque
7/16"UNF x 1 <sup>7</sup> / <sub>8</sub> "	Steering arm to upright	22-27 lbft
1/2" nyloc	Stub axle	60-65 lbft
3/8"UNF x 1 <sup>1</sup> / <sub>2</sub> "	Brake disc to hub	22-27 lbft
1/2" castellated	Front hub nut	see text
7/16"UNF x 1 <sup>1</sup> / <sub>4</sub> "	Brake caliper bolts	40-45 lbft

Table 5.7 Front Uprights - Torques



UPRIGHT ASSEMBLY

Figure 4.3.1 Front Upright Assembly