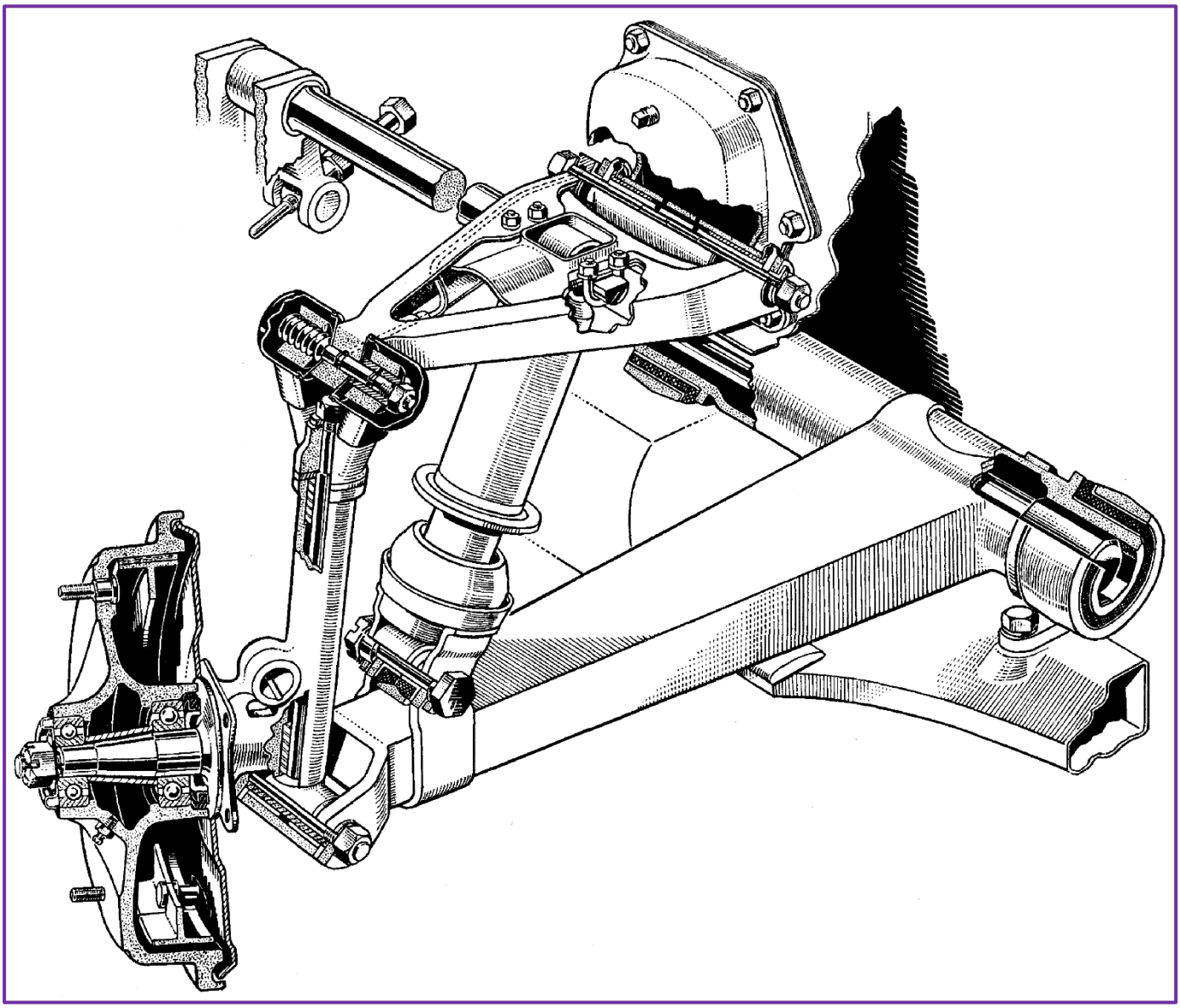
TECHNICAL NOTES SERIES

JOWETT JAVELIN – PA, PB, PC & PD
JOWETT JUPITER – SA



Above: Multi-section layout for Jowett Javelin front suspension. Jupiter is similar, but has certain differences. Early version illustrated, showing oil feed to the swivel pin yoke.

The Jowett front suspension, if well-maintained, is simple to overhaul.

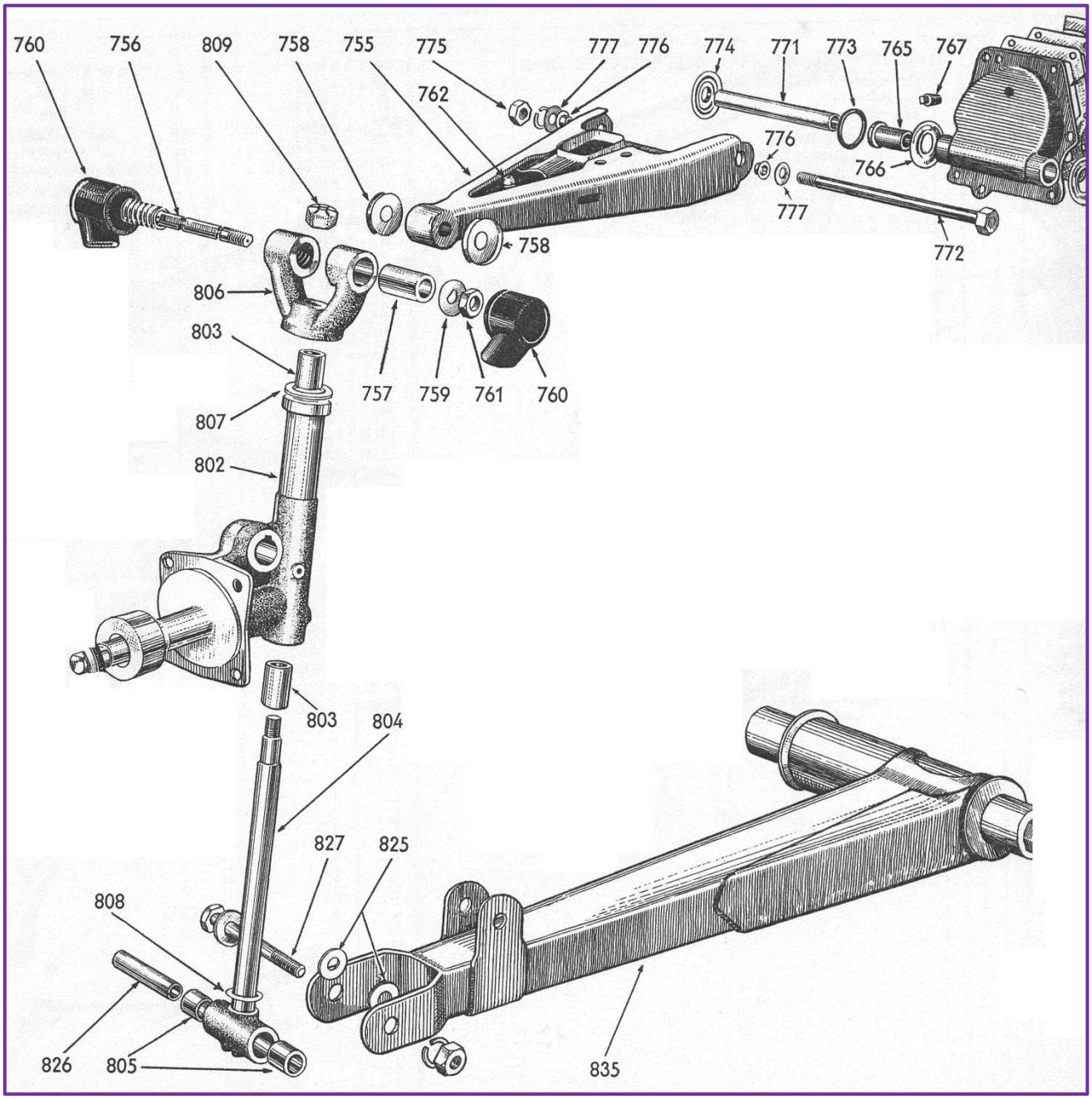
These notes have been assembled in a format that, as much as possible, they assist those who have never attempted a Jowett Javelin/Jupiter front suspension overhaul, and for those who cannot realise what the sketches and sectioned drawings relate to.

PART XLI – SWIVEL PIN YOKE & UPPER LINK

Compiled by Mike Allfrey – November, 2021.

CONTENTS

1. – DESCRIPTION OF THE PARTS



Above: Figure 1. Illustration taken from the Spare Parts Catalogue, dated January, 1951.

Legend for the illustration:

Item	Qty.	Part No.	Description
755	2	50279	Upper Link
756	2	50286	Upper Link Pin (fits in *Item 806*)
757	2	50287	Upper Link Bush
758	4	50288	Upper Link Seal Washer
759	2	50289	Upper Link Pin ‘D’ Tab Washer
760	4	50290	Upper Link Seal
761	2	FN208K	Lock (thin) Nut ½-in. BSF
762	2	52719	Greaser, Upper Swivel Pin Yoke
763	1	50291	Upper Link Bracket – LHS (not illustrated)

Item	Qty.	Part No.	Description (Continued)
764	1	50292	Upper Link Bracket – RHS
765	4	50297	Upper Link Trunnion Bush
766	4	50298	Upper Link Seal Retainer
767	2	50299	Upper Link Bracket Plug
768	12	FB105/5	Upper Link Bracket Mounting Bolt (not illustrated)
769	AR	52084	Upper Link Bracket Shim (quantity as required)
770	AR	54023	Upper Link Bracket – Half Shim (can help align with swivel pin)
771	2	50300	Upper Link Bracket Trunnion Tube
772	2	52716	Upper Link Bracket Trunnion Pin
773	4	50496	Upper Link Bracket Trunnion Seal (‘O’ ring)
774	4	50302	Upper Link Bracket Trunnion Washer
775	2	FN107/K	Nut 7/16-in. BSF (Unscrew this Nut Before Removing *Item 764*)
776	4	50990	Sealing Sleeve (this aligns *Item 774* with *Item 755*)
777	4	50988	Copper Washer (seals ends of *Item 772*, use new washers)
801	1	54082	Stub Axle – LHS (not illustrated)
802	1	54083	Stub Axle – RHS
803	4	50275	Bush, Swivel Pin
804	2	50276	Swivel Pin
805	4	52590	Swivel Pin Bush, Lower
806	2	50278	Swivel Pin Yoke
807	2	52392	Swivel Pin Thrust Washer (Grease Groove Faces Stub Axle)
808	AR	52591	Shim, Swivel Pin (0·005-in., 0·010-in., 0·020-in.)
809	4	52704	Nut, Nyloc ½-in. BSF
810	2	50411	Greaser, Swivel Pin (not illustrated)
825	4	50312	Spring Arm Washer
826	2	50313	Spring Arm Distance Tube
827	2	50311	Spring Arm Pin
828	AR	52241	Shim, Spring Arm Pin (0·002-in., 0·005-in. – not illustrated)
834	1	50303	Front Spring Arm – LHS (not illustrated)
835	1	50304	Front Spring Arm – RHS

Quantities – per vehicle.

2. DISMANTLING THE FRONT SUSPENSION – UPPER SWIVEL PIN YOKE

One side of the car is being described here. Keep the parts for each side separate, this will keep major components in their original positions. Follow the steps below:

1. Before removing any parts, with a white permanent marker, mark the outboard side of the swivel pin (*Item 804*) so that it can be returned to its original position at reassembly.
2. Loosen the spring arm pin (*Item 827*) taking note of the position of the angled steering stop.
3. At the top of the swivel pin (*Item 804*), loosen off the self-locking nut (*Item 809*). Cut the copper wire (or cord) used to secure the rubber seals (*Item 760*), and fold both seals below the upper link pin (*Item 756*). This provides access to the pin’s securing nut and tab washer.

4. The original installation featured a tab washer with a ‘D’ shaped centre (*Item759*) and a plain thin nut (*Item 761*). This nut should be dead tight.
5. Using a ¼-in. Whitworth open end spanner, or an eight-point socket, at the square end of the upper link pin (*Item 756*), unscrew the pin completely out of the swivel pin yoke (*Item 806*). The nut (*Item 809*), ½-in. BSF, can be removed using a heavy duty ring spanner. The rubber seals (*Item 760*) and their special washers (*Item 758*) can then be removed from the yoke.
6. At the steering arm, measure the amount of thread, for ball joint, protruding beneath the steering arm and record the dimension for future reference. Loosen off the clamp bolt for the steering ball joint and unscrew the ball joint and tie the steering rod clear of work area.
7. The stub axle (*Item 802*) can be lifted away from the swivel pin. Keep the shims (*Item 808*) in a safe place. The swivel pin thrust washer (*Item 807*) should be examined for wear, the washer contains a grease groove. Wear could have taken place at the thrust washer, swivel pin yoke and the upper surface of the stub axle.
8. The swivel pin (*Item 804*) can then be removed from the spring arm (*Item 835*). The spring arm distance tube (*Item 826*) and the two bushes (*Item 805*) should be inspected for wear. At the same time, the swivel pin pivot journals and bushes (*Item 803*) require careful inspection.
9. It is best to remove the upper link bracket (*Item 764*) from the vehicle’s dash panel for repairs to the trunnion parts. It will also provide a chance to inspect the inboard face of the upper link bracket. The oil reservoir is formed by a plate soldered into the housing’s pressed shape.

   NOTE: There will, most likely, be no oil in the reservoir that forms the upper link bracket.

3. DISMANTLING THE FRONT SUSPENSION – UPPER LINK AND BRACKET

To remove the upper link bracket (*Item 764*), proceed as follows:

10. Disconnect the swivel pin yoke (description in Steps 2 to 5) from the swivel pin and support the stub axle assembly so that the brake hose does not carry weight. Unscrew the nut (*Item 775*) before removing the upper link bracket (*Item 764*) from the dash panel. Remove the two ‘U’ bolts securing the shock absorber to the upper link (*Item 755*).
11. Detach the upper link bracket from the dash side panel, taking care to note the number of shims (*Item 769*) inboard of the bracket, temporarily with one bolt attach the shims to the dash side, remove the upper link and bracket assembly, which should be gripped in a suitable soft jawed vice. The bracket should be clamped in such a manner that the upper link pin (*Item 772)* can be easily removed.
12. Release the nut securing the upper link pin (*Item 772*) – it should be noted that the pin is actually a high-tensile stud with a nut welded at one end, and screw (or drive) out the pin. The pin may require to be driven out through the upper link trunnion tube (*Item 771*) due to rust. Withdraw the upper link, remove and save the sealing sleeves (*Item 776*) fitted into the drillings at the inboard end of the upper link and the trunnion washers (*Item 774*). Remove the trunnion rubber seals. Drift the trunnion tube from the upper link bracket and renew if necessary.
13. Step 12 has been written as a simple operation, however, it may not be that simple. Firstly, the upper link trunnion pin (*Item 772*) may be severely rusted into the upper link trunnion tube (*Item 771*), making it difficult to remove the trunnion pin and possibly requiring a press for its removal. Should a press be required, then the head of the arm will need to be supported on a tube with an inside diameter that will allow the sealing sleeve (*Item 776*) to follow through. Secondly, the upper link (*Item 755*) may require some leverage for its removal from the upper link bracket (*Item 764*). Should leverage assistance be required, care must be taken to ensure that the reservoir is not distorted. Some distortion could result in the upper link trunnion bushes (*Item 765*) not being in perfect alignment. Such a condition could make reassembly of the components difficult. Before attempting to lever the upper link away from the bracket, the seals (*Item 773*) should be well-lubricated and that the pivot movement of the upper link is completely free.

NOTE: Should the upper link trunnion seals (*Item 773*) have become hardened due to age, but are still of original ring section diameter, the upper link (*Item 755*), the upper link trunnion washers (*Item 774*) and the upper link sealing sleeves (*Item 776*) can be difficult to lever from the upper link bracket (*Item 764*) due to the rubber rings being stubborn to compress and let the trunnion washers slide over them.

14. When the upper link (*Item 755*) has been withdrawn from the upper link bracket (*Item 764*), the grease nipple (*Item 762*) should be removed and the drilling cleared to ensure lubrication.
15. Examine the bushes (*Item 765*) and the tube for wear, and also check that the oil drillings (early upper link assemblies) in the pin are clear. Be prepared to remove and replace the rubber 'O' ring seals (*Item 773*) if these have perished or are worn.
16. Should the upper link trunnion tube (*Item 771*) be worn at the two points where the upper link trunnion bushes (*Item 765*) pivot, the tube and bushes should be replaced. It is highly likely that a new upper link trunnion tube (*Item 771*) will have to be made.

    NOTE: The length of the trunnion tube is critical.
17. The worn trunnion bushes can be driven from the upper link bracket with a suitable drift, or the inside diameter can be fine thread-tapped with a fine pitch thread to facilitate drawing out with a setscrew, nut and spacer that provides clearance at the shoulder on the bush (*Item 765*).
18. Check that the seal washers (*Item 774*) are a good fit against the side faces of the upper link, correct any distortion, or re-place if necessary. Examine the side faces of the upper link and clean up if necessary. With the upper link bracket pin (*Item 772*) withdrawn, and the two seals (*Item 773*) worn, it should be possible withdraw the upper link (*Item 755*) with comparative ease. The upper link seal retainers (*Item 766*) require treating with carefulness during this procedure.
19. There are two dowel-type locating pegs (not illustrated and have no Item No.) in the arms of the upper link (*Item 755*) that fit into holes drilled into the upper link trunnion washer (*Item 774*) to rotate the washer as the upper link oscillates with suspension movement. These pegs may require driving out to assist removal or installation of new seals. Not sure at this stage how the dowel-pegs can be driven out to 'assist upper link removal'. From memory they are held in place by the sealing sleeves (*Item 776*) which cannot be easily removed, due to their fit in the upper link (*Item 755*) arms. Keep them in a safe place.

4. INSPECTION OF COMPONENTS

Depending on how the car was maintained, front suspension components can be caked in oil and dust which entails thorough cleaning of all parts – this instruction includes inside the oil reservoir.

The upper link brackets were prolific leakers of oil from the reservoir, this was probably due to the sealing rings (*Item 773*) having all manner of road grime thrown at them while the suspension is in constant movement. Therefore, it is important that the outer upper link trunnion washers (*Item 774*) and the inner seal retainers (*Item 766*) are carefully examined for wear and corrosion. The sealing rings require smooth surfaces for them to operate on, and thus help eliminate oil leakage.

The upper link brackets did suffer from solder joint breakage, these can be repaired by thorough cleaning and resoldering. Another method for sealing the reservoir is to make a solid camber shim (without the large opening) of the same thickness as one of the original shims. The 'solid' shim can be sealed to the inboard face of the upper link bracket by cleaning the contact faces with Loctite 7471 cleaner/activator. Allow to dry and then apply a small continuous bead of Loctite Blue RTV sealant and bolt the two pieces firmly together, using the remainder of the shim pack as a stiffener, allow to cure before oil is poured in.

As mentioned previously, the upper link trunnion tube (*Item 771*) diameter must be measured at the ends that pivot in the upper link trunnion bushes (*Item 765*), a small amount of wear at this location multiplies considerably at the outer end of the upper link. The trunnion tube cannot be successfully rotated to present an unworn surface to the trunnion bushes – the upper link would still exhibit excessive movement at its outer end.

The trunnion tube (*Item 771*) should project beyond the pressed in bushes (*Item 765*), with their shoulders firmly holding the upper link seal retainers (*Item 766*), the total end-float should be 0·003 to 0·005-in. (0·076 to 0·127 mm). The tube is not shim adjustable.

5. LUBRICANTS

The Penrite Oil Company can supply an oil product called Penrite Steering Box Lube. This is a very thick oil, close to being a type of light grease. It is an excellent product for filling the upper link bracket to the oil level fill hole.

The upper yoke (*Item 806*) should be greased with a decent quality wheel bearing grease, as should the swivel pin bushes. Herschell wheel bearing grease is recommended.

For assembly purposes, Nulon L90 Assembly Paste should be employed – that means its use at all pivot points. For the upper link trunnion pin (*Item 772*), where it fits through the upper link (*Item 755*), the seal washers (*Items 766*, *774*), the sleeves (*Item 776*) and they in turn fit into the upper link (*Item 755*) Loctite 771 Anti-seize should be applied during assembly.

6. ASSEMBLING THE UPPER LINK AND UPPER LINK BRACKET

1. Press replacement upper link trunnion bushes (*Item 765*) into the upper link bracket (*Item 764*), making sure that the seal retainers (*Item 766*) are fitted between the flanges of the bushes and the bracket.
2. Re-assembly is a reversal of the routine detailed in Section 3, but the following points should be given attention.

   It is good practice to assemble the upper link (*Item 755*) on the upper link bracket (*Item 764*) and all related components, less the rubber seals, to ensure that the upper link is free to pivot when the upper link trunnion pin (*Item 772*) nut has been tightened. This procedure is a good rehearsal for installing the rubber seals (*Item 773*).
3. It will ease fitting if the trunnion seals (*Item 773*) are fitted to the seal retainers first, and the locating pegs (not illustrated) in the upper link are removed or driven back before the upper link is fitted to the bracket. The seals and the retainers should be lubricated with Nulon L90 Assembly Paste during installation.
4. Both ends of the trunnion tube (*Item 771*) should be slightly proud 0·003 to 0·005-in. (0·076 to 0·127 mm total) of the flanges on the trunnion bushes. The sealing sleeves (*Item 776*) must be a good fit in the trunnion washers (*Item 774*).
5. New trunnion rubber seals (*Item 773*) should always be fitted and the fit and location of the trunnion washers should be very carefully checked. The head of the trunnion pin (*Item 772*) must be fitted against a new copper washer (*Item 777*) at the rear of the upper link. The nut must be fully tightened against its copper washer so that the upper link rotates as a unit with the trunnion pin and the trunnion tube (*Item 771*) in the upper link bracket (*Item 764*).
6. The upper link bracket trunnion washer (*Item 774*) should be set so that the dowel peg holes align and the pegs then driven home.
7. It is important that the shims (*Item 769*) inboard the upper link bracket (*Item 764*) are refitted in their original positions, when the upper link bracket is bolted to the dash panel, so that the correct castor and camber angle is maintained.

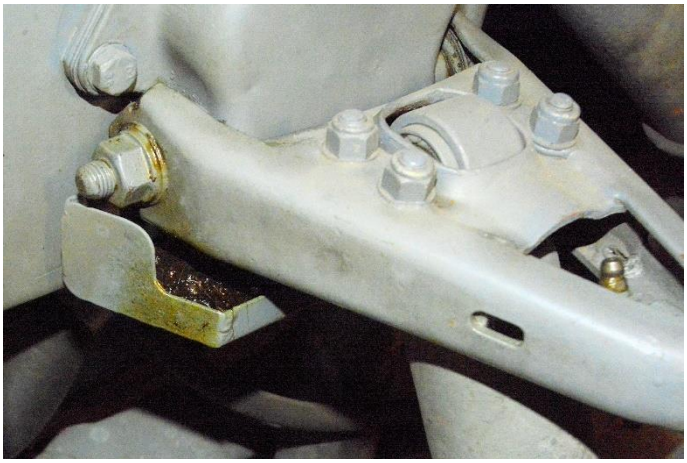
   IMPORTANT! The camber should always be checked as detailed in the Steering Gear Chapter (in the Maintenance Manual) after re-assembly.
8. Install the upper link seals (Item 760) and hold them at the bottom of the yoke arms. Install the bush (*Item 757*), lubricated with Nulon L90 into the yoke (*Item 806*). Locate the upper link (*Item 755*), and the seal washers (*Item 758*), with cupped faces towards the arms, between the arms of the yoke (*Item 806*) with the threaded arm to the rear, and fit the lubricated pin (*Item 756*) threading it into the tapped arm of the yoke. It is important that the seal washer surfaces that contact the upper link are perfectly flat before assembly commences. Fit the washer (*Item 759*) and ½-in. BSF thin nut (*Item 761*), and tighten up fully, setting the pin as necessary in the yoke

so that when the nut is fully tightened against the bush the upper link is central between the arms of the yoke.

New yoke, pin and bushing assemblies supplied by the JCC (UK) are provided with a black steel (toughened) washer and a Nyloc nut. The nut must be tightened dead tight.

9. The yoke, pin, bush and upper link should be relaxed in their positions. Tighten the spring arm pin (*Item 827*) into its nut. Note the position of the full-lock steering stop.
10. Place the selected shims (*Item 808*) at the base of the swivel pin (*Item 804*). Ensure that the shims and entire length of the swivel pin are well lubricated.
11. Slide the stub axle (*Item 802*) over the swivel pin. Lubricate and install the swivel pin thrust washer (*Item 807*).
12. Lower the upper link yoke (*Item 806*) over the threaded end of the swivel pin. Install a flat washer and then tighten the yoke securing nut (*Item 809*) with a ring spanner till it is dead tight. The stub axle should be free to rotate on the swivel pin, if it is tight, the shimming at the base of the swivel pin will need to be reduced (if there is too much clearance between the thrust washer and the brass yoke, extra shims will be required). This clearance should be minimal.

    The thrust washer (*Item 807*) should be installed with the grease groove (scroll) facing the stub axle (*Item 802*).
13. With a grease gun, apply grease at the swivel pin greaser (*Item 762*) at the upper link, and at the stub axle greaser to ensure that the lubricant is reaching the yoke and the swivel pin bushes. It is important to ensure that the grease is reaching both arms of the yoke (*Item 806*).
14. Secure the rubber seals (*Item 760*) to the seal washers (*Item 758*) with with small-section black nylon zip ties and, if necessary seal the arms of the yoke to the rubber seals with black self-curing sealant.
15. Using a small grease gun, fill the upper link bracket (*Item 764*) to the level of the oil filler hole with Penrite Steering Box Lube. Install the plug, do not over-tighten.
16. Wait for the oil to leak at the seals!



Right: Figure 2. Oil catch tray, requires cleaning.

17. A solution to oil leakage is to employ the ‘total loss oiling system’. To do this fabricate a steel tray to bolt to the bottom row of upper link bracket bolts. Once in place, cut a piece of thick felt to absorb oil drips. Twice per year, remove the felt pad and wash with degreasing fluid, rinse and dry before replacing in tray.

    A bonus of using the catch tray and pad is that there is proof that the oil is reaching the trunnion bushes and is periodically replaced when the oil level is topped up.
18. Replace the brake drum, tighten the castle nut dead tight, and then tighten further to align with the split pin hole in the stub axle shaft. Use a superior quality split pin and replace the hub cover and gasket (full hydraulic braking system).
19. Apply grease to the front hubs.

Please note that, even though there is an upper link and bracket in the writer’s workshop, the upper link pin is firmly seized inside the assembly components. Currently, the assembly is soaking in a pan of Kerosene in the hope of loosening the pin. Hence, step by step photographs are not available for those who may need them.

A major proportion of these notes have been taken from memory, therefore, there could be some gaps within the instructions.

Prepared by Mike Allfrey – November, 2021.