

TECHNICAL NOTES SERIES

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



Jowett full-hydraulic rear brake modification..

These notes have been assembled in a format that, as much as possible, they assist those who have never attempted such Jowett repair tasks. They have been written to cater for younger Jowett Car Club members who may have limited mechanical knowledge.

If a reader of these notes does not feel confident about the procedure described here, then the brake backing plate and associated parts should be taken to a reputable repair professional.

PART XXXV – REAR BRAKE SHOE SUPPORT FULL-HYDRAULIC BRAKING SYSTEM (A TRIAL SOLUTION) REAR BRAKE SHOE INSTALLATION

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Compiled by Mike Allfrey – April, 2022.

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WARNING!
ASBESTOS COULD BE PRESENT IN
GASKETS, FIBRE WASHERS & BRAKES



INTRODUCTORY COMMENT FOR TECHNICAL NOTES

These introductory notes should be read prior to reading Part XXXV of the Technical Notes Series.

The Jowett Technical Notes Series have been an ongoing activity for several years. That means that some techniques and specifications may have been superseded in later notes on the same, or associated topics in the series. Also be aware that some topics and recommendations may be specific to certain Engine Serial Number ranges. It appears that, in Australia, the various State Main Agents did not carry out Service Bulletin information during Jowett active times. A set of known Service Bulletins is in Part III.

Some of the notes are restorations of what was written by members of the Jowett Car Club (UK), the Jowett Car Club (NZ) and by members of the JCCA.

Over the years of involvement with matters Jowett, and with the dawning of the personal computer age, a personal decision was made to help members of the Jowett Car Club of Australia Inc. with technical information. Included with the Technical Notes are 'restored' versions of the Javelin and Jupiter Maintenance Manuals and the associated Spare Parts Catalogues. Future generations will prefer to flick through images on their personal device screens, rather than leafing through pages in a tattered and oil stained book to access information.

The term 'restored' has been used because it soon became apparent that, as with our efforts in restoring Jowett vehicles, we desire excellent quality of workmanship in the reproduction of Jowett related documentation. Not for us the crude, and crooked, photocopies that have been issued over the years. These have, even though accurate at their time, become partly out of date.

Hence the decision to 'restore' the publications and documents that have come to hand.

It should be noted that the Javelin and Jupiter Spare Parts Catalogue is a combination of all the catalogues that were to hand (from 1948 to 1953).

The Maintenance Manuals were originally written on the assumption that they would be used by skilled motor mechanics who had attended service training courses conducted by Jowett Cars Limited and after works closure, were made available for owners who had reasonable mechanical knowledge of motor car maintenance and overhaul.

Included with the Technical Notes Series is a Lucas Overseas Correspondence Course, which can be of great assistance when trouble-shooting electrical problems related to your Jowett, or any other British vehicle of the same period.

Please be aware that this is an ongoing project

Mike Allfrey – February, 2024

Introduction

First of all and most importantly, the actuation components of a Jowett vehicle's braking system should not be modified. The ramifications of such modifications can be, in the event of an accident where a person is injured, extremely profound. However, the pressed in supports for the brake shoe web do wear over a lengthy period of a vehicle's life. Therefore, a form of repair had to be developed.

As the brake shoes are moved within the brake drum, by the hydraulic brake shoe expander, they rub against the pressed in support. Over time, the rounded surface of the backing plate does wear, to the extent that braking adjustment and performance can be affected. What appears to be a small amount of wear at the brake backing plate, can result in increased foot pedal travel.

In the 1950s and 1960s Massey-Ferguson tractor brakes were of similar type, but somewhat larger, having to hold back heavy trailer loads. When wear took place, the backing plate was repaired in the workshop by drilling a hole through the support centre and welding a nut onto the outside of the plate to align with the drilled hole. A setscrew and jam nut were threaded in and adjusted to properly support the brake shoes in their correct attitude. The Jowett brakes are smaller and, a nut welded to the plate could cause distortion. Another means of adjustment needed to be considered.

During the rebuild of my Jupiter, rivet-nuts were used in several places – to hold bonnet closure guides etc. A convenient hand tool for installing rivet-nuts, is illustrated on the front cover of these notes. To convert a Jowett back plate to an adjustable type support, follow the steps on Page 4.

The Significances Of Brake Shoe Support Wear

Owners, and some service workshops, give scant attention to the wear that occurs at the brake shoe support contact domes. The two springs that hold the floating brake shoes in place, because of their positioning, hold the brake shoes against the backing plate support pressings. This is a design feature that ensures, when all components are new, that the brake lining material is absolutely parallel to the machined inner surface of the brake drum.

Also, the positioning of the hydraulic wheel cylinder is critical. The cylinder is located by a small plate secured by two ¼-in. UNF Nyloc nuts. White grease should be smeared between the wheel cylinder housing and the backing plate, and between the cover plate and the backing plate. The Nyloc nuts should be tightened to just allow the wheel cylinder to slide in its slot, but tight enough to prevent the cylinder from tilting on the backing plate and affecting the brake shoe alignment. The sliding provision is to allow the brake shoes to centralise in the drum as the brakes are applied. A wheel cylinder that cannot slide may give symptoms of uneven brake application, it could also cause some brake grabbing or juddering that can be felt during brake pedal operation.

Over many years of use, and due to road dust finding its way into the brake drum, wear can take place at the supports. When the brake shoes lean further towards the brake backing plate, the initial contact area will be larger than what was intended. This is particularly so when new brake lining material is installed. Such a condition can make brake adjustment difficult, the adjuster square-peg easily overcomes the holding force of the shoe springs and will clamp the lining material firmly against the drum friction surface (assuming it has been skilfully skimmed). With worn brake shoe supports, as the brake shoe adjuster is backed-off (unscrewed) the drum will drag, due to forces exerted by the brake shoe springs tipping the brake lining material to a not-parallel condition, and this condition has to be overcome by further winding back of the brake adjuster square-peg.

Such an adjustment condition will result, eventually, in greatly extended brake pedal and handbrake travel which is not beneficial. In addition to that, frequent gentle application of the brakes will result in uneven wear across the brake lining material.

Jowett vehicles, with full-hydraulic braking systems, are now approaching up to seventy-three years of age and, over that time, wear has taken place at the support points. The bare metal wear area on my Jupiter's backing plate covered an area of about one square centimetre. The repair described in these notes makes the brake shoe alignment adjustable. It is a modification that will enhance the life of brake lining material, it has been used successfully in the past and, in earlier Girling braking (hydro-mechanical) systems, the same style adjustment was provided as original equipment.

Repairing A Worn Backing Plate

It should be noted that the following steps relate to the full-hydraulic rear brakes.

1. Remove the brake backing plates from the rear axle housing. Note the axle shaft end float shim pack and cover the axle bearing with a clean cloth. The plate that is located between the grease seal housing and the backing plate, is a support for the backing plate when the assembly is fully assembled and the four bolts have been tightened. The support plate has a chamfer on one side, that side should face the backing plate.
2. Clean the parts and dry with compressed air. Remove any burrs that may be present with a fine cut file. After cleaning, there will be bare metal wear marks that can be easily identified.
3. With a centre punch, make a pop mark for the drill in the centre of the wear marks.

Right: Figure 1. Drilling the 7 mm hole, using a pedestal drilling machine, the backing plate placed on timber strips for support on drill table.

4. For these notes, it was decided to use 5 mm KLIK Rivet-nuts, for two reasons – first for a neat fit in the backing plate dimples, and second, because that was the size of the remaining rivet-nuts in the tool kit at present.



Drill the holes at 7 mm diameter, and then use a counter sink bit to just suit the lip on the rivet-nut. This drill size is just too small for the rivet-nuts, however, a few strokes with a round file will allow a snug fit for the rivet-nut. The nut should not be loose in the drilled hole, it is strange that the nut shank is not a standard drill size. The tool is North American, but the nearest imperial drill size would be too loose.

5. Thread the rivet-nut on the tool's arbour so that the thread is flush with the end face of the arbour.
6. Turn the arbour positioning knob anti-clockwise until the rivet-nut's flare contacts the tool's nose piece – this is the set position. The knob's setscrew should be tightened against the flat.
7. Apply a light smear of Loctite 263 to the shank of the rivet-nut, to prevent loosening.
8. Place the backing plate on a solid flat surface, with the brake shoe face uppermost, so that the rivet-nut can be held firmly vertical during the Marson KLIK hand tool riveting activity.

Right: Figure 2. The Marson KLIK rivet-nut hand operated tool, in a posed position. Throughout the operation it was held vertical.



9. A rivet-nut works using a similar principle to a pop-rivet, as the threaded end is pulled towards the tool nose, it swells on the far side, thus forming a solid, riveted, fixture.
10. While holding the rivet-nut firmly in vertical position, squeeze the tool's handles together.
11. At first, the rivet-nut will offer quite an amount of resistance to the squeezing action, but once it starts to swell, the handle pressure will tend to yield a little, until the rivet-nut has been pulled fully home. The Marson KLIK tool can then be removed from the rivet-nut by unscrewing the large knurled adjuster knob. Simple!
12. After the rivet-nut was installed, a 5 mm (Grade 8) set-screw, nut and two plain washers were threaded into the rivet-nut and the nut was tightened firmly against the rivet-nut flare. This ensured that the nut installation was properly tight.
13. The backing plate was then turned over and a 20 mm long in-hex Allen head setscrew was threaded in until the end was flush with the raised portion of the backing plate. Before the setscrew was installed, a smear of Penrite Copper Eze was applied to the thread. The assembly was left loose, ready for final adjustment.

Right: Figure 3. Threading in a setscrew with locknut ready to make final adjustment. Longer setscrew shown for illustrative purposes.



14. The backing plate can now be reassembled in readiness for installation on the vehicle.
15. Prior to fitting the brake shoes, ensure that a small dollop of white grease is applied over the adjusting setscrew, to lubricate the brake shoe web as it moves during brake application.

Right: Figure 4. The adjustment setscrew is set flush with the rivet-nut flare.

The flare in the rivet nut will hold enough white grease for brake shoe lubrication.



Brake Shoe Support Adjustment

After the assembly has been fitted to the rear axle the brakes will require bleeding and adjustment. To carry out the procedure, follow the steps:

1. Install the brake drum on the axle shaft, make sure the taper surfaces are free of rust, oil and grease. Make sure that the square key is installed in the shaft. Tighten the castle nut dead tight, lock the drum with the adjuster peg and then tighten further to align the split pin hole. Use a new, good quality split pin.
Release the brake adjuster square-peg and ensure that the drum is free to rotate.
 2. Confirm that the wheel cylinder is just free enough to slide at the backing plate.
 3. At the rear brake adjuster square-peg, screw it inwards until the drum is firmly locked – do not force.
 4. Screw in the brake shoe support adjusting screws until they just contact the webs of the brake shoes and, with the jam nut (*Figure 3*), lock the setscrew gently. Do not over tighten.
 5. Unscrew the brake adjuster square-peg until the drum can be rotated freely.
 6. During normal maintenance, lock the brake drum with the square-peg adjuster, then remove the support set screws, apply a small blob of white grease to the end of the setscrew before setting as described in Steps 3 and 4 above. In doing so, the contact area will be re-lubricated.
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Brake Shoe Installation Technique

The Jowett full hydraulic rear brakes feature leading and trailing brake shoes in each rear brake. All printed material shows only the right hand brake shoe setup on the backing plate assembly. Getting this right for the left hand side can be a bit confusing. There are a few points to watch out for:

- a) There are two ways the brake adjuster tappets (1288-1289-54226-54227) can fit in the brake adjuster housing. Should they be incorrectly installed, the brake drum cannot be fitted. It is wise to place the tappets in labelled plastic bags, and store after dismantling.
- b) Essentially the same applies to the brake shoes, the brake lining material does not cover the whole shoe face. The Spare Parts Catalogue and the Maintenance Manual show the right-hand side only. For the left-hand side, the fit of the brake shoes is the same, but the backing plate is flipped over. This means that, in the direction of wheel rotation, at the wheel cylinder (on both sides) the upper piston is fitted with the brake shoe end that has the shoe portion that is less lining material. The second brake shoe, has the less lining material at the brake adjuster tappet.

The reason for this type of brake shoe installation is to create a wedging action to improve brake performance. Should the brake shoes be reversed, there could be severe brake judder.

- c) When installing brake shoes and their springs, it is safer to hold the backing plate assembly in a solidly mounted bench vice.

The backing plate can be clamped in the vice jaws with two of the backing plate mounting bolts and nuts installed and the nuts firmly clamped. The bolts should be tight, thus making a solid work area for pulling the brake shoes against spring tension.

- d) The longer (yellow) brake shoe spring fits closest to the wheel cylinder, the shorter (green) spring fits closest to the brake adjuster, in the second holes from the end of the brake shoe web.
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Note: In the text that follows, the Item No. and the Part No. are shown thus – (1273-54373).

Description Of The Rear Brake Parts

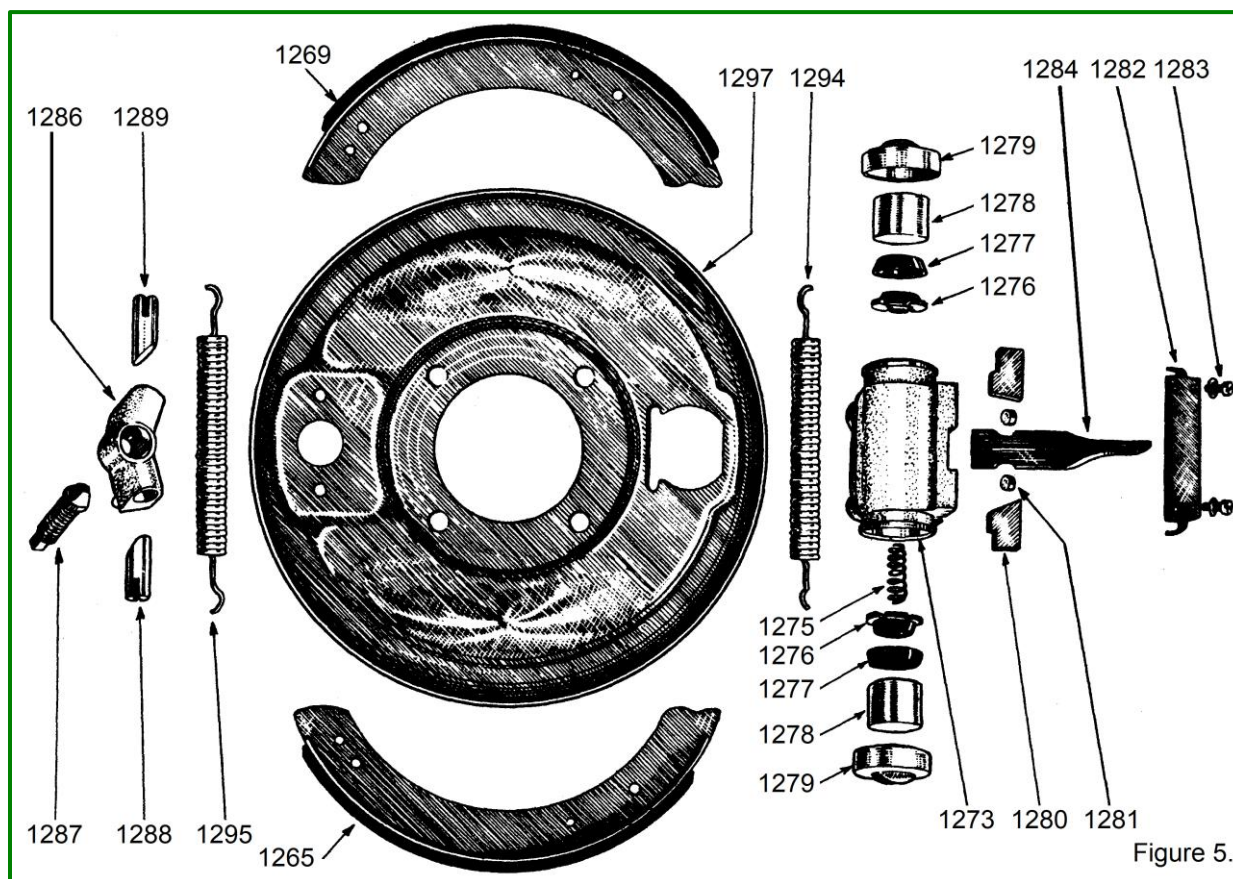


Figure 5.

Above: Figure 5. The rear brake assembly (R.H.S. Shown).

Legend for Figure 5:

Item	Qty.	Part No.	Description
*^1263	1	54099	Rear Brake Complete – L.H. (GB41370)
*^1264	1	54100	Rear Brake Complete – R.H. (GB41371)
*1265	2	54206	Leading Shoe & Lining Assembly – R.H. & L.H. (GB41324BO)
*^1266	2	54220	Leading Shoe Only (GB41328)
*^1267	4	54221	Leading & Trailing Lining Only (GB41331BO)
*^1268	40	54222	Rivets (71-BS-1C)
*1269	2	54207	Trailing Shoe & Lining Assembly – R.H. & L.H. (GB41325BN)
*^1270	2	54223	Trailing Shoe Only (GB41329)
*^1271	1	54209	Wheel Cylinder & Handbrake Mechanism – L.H. (495515) !
*^1272	1	54210	Wheel Cylinder & Handbrake Mechanism – R.H. (495516) !
*1273	1	54373	Wheel Cylinder Body – L.H. Now has Groove for Rubber Boot (412811)!
*^1274	1	54374	Wheel Cylinder Body – R.H. Now has Groove for Rubber Boot (412821)!
*1275	2	54368	Spring (31118)
*1276	4	54375	Air Excluder (469841)
*1277	4	54270	Seal (468315)
*1278	4	54376	Piston – Now Replaced With Included Brake Shoe Notch (480272)
*1279	4	54377	Metal Dust Cover – Now Replaced With Rubber Boot (482747)
*1280	4	54361	Handbrake Tappet (480711)
*1281	4	54378	Roller 0.3125-in. Diameter x 0.1875-in. (27015)
*1282	2	54379	Cover Plate (487143)
*1283	8	54380	Cheese Head Screw – 2BA (13112)

Table Continued

*1284	2	54381	Draw-link (481841)
*^1285	2	54224	Adjuster Unit Assembly – R.H. & L.H. (GB40875)
*1286	2	54224	Adjuster Housing (GB41130)
*1287	2	54225	Adjuster Wedge (GB522)
*1288	2	54226	Tappet – L.H. Bottom (GB40876)
*1289	2	54227	Tappet – L.H. Top (GB40877)
*^1290	4	54213	Adjuster Housing Setscrew (GB41132)
*^1291	4	54214	Grover Washer (GB539)
*^1292	2	54218	Dust Cover Plate (GB40994)
*^1293	4	54215	Slotted Nut ¼-in. ANF – Use Nyloc Nut (GB41158)
*1294	2	54211	Top Shoe Return Spring – Yellow (GB40897)
*1295	2	54212	Bottom Shoe Return Spring – Green (GB40655)
^1296	8	54204	Nut – Slotted ¼-in. ANF (GB41356) – Should be washers for Item 1283?
*1297	2	54228	Rear Backing Plate Assembly (GB41316)

Above: From the May, 1952 Spare Parts Catalogue.

Notes: * Common to Jupiter, ^ Not Illustrated, ! Handed Due to Hydraulic Ports.

Assembling The Rear Brake Components

Refer to *Figure 5* for identification of components. The following procedure should be adopted to ensure that the brake shoes are correctly installed:

1. The grease seal housing, with a new seal installed, and backing plate support should be bolted to the backing plate (1297-54228) with the four ⅜-in. BSF bolts, plain washers and nuts.
2. Assemble the brake adjuster housing (1286-54224) into the backing plate, apply a smear of Penrite Copper Eze to the two housing setscrews. Make sure that the setscrews do not protrude into the bores for the tappets (1288-1289-54226-54227). Coat the thread on the adjuster wedge (1287-54225) with Copper Eze and screw it fully home in the brake adjuster housing. Apply Penrite White Grease at the adjuster wedge cone and the tappet bores in the housing. Ensure that the pair of tappets are located so that the outer ends are closest to the housing, check that they are free to slide easily in their bores. Leave the adjuster wedge in the fully backed-off position.
3. Apply white grease, as a film, between the wheel cylinder assembly (1271-1272-54209-54210) and the backing plate, then install the wheel cylinder and check that it slides freely in its slot, next, apply a smear of white grease on the rear axle side of the backing plate for the dust cover plate (1292-54218), fit the cover using two ¼-in. plain washers and Nyloc ¼-in. UNF nuts, firmly tighten to lock the wheel cylinder body in place – then back-off the two nuts, equally, until the assembly just slides in the backing plate. The wheel cylinder body should not be able to tilt.
4. The wheel cylinder rubber dust covers will hold the pistons in place. If the wheel cylinder body is of the earlier type, then a piece of light gauge wire can be used to hold the metal covers (1279-54377) in place against the load applied by the air excluder spring (1275-54368).

Right: Figure 6. RHS backing plate assembly held firmly in vice with brake shoes installed. Note the leading shoe (right) and trailing shoe at left. The brake adjuster is in between.

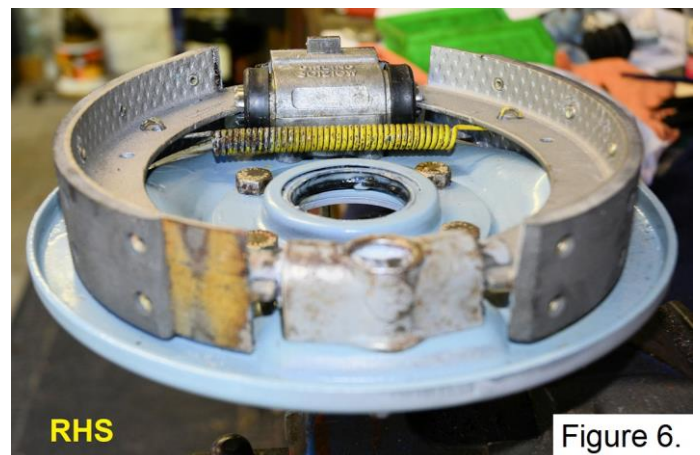


Figure 6.

5. Apply a smear of white grease on the wheel cylinder body where the handbrake mechanism fits. Install the draw-link (1284-54381), tappets (1280-54361) and rollers (1281-54378), smear with white grease before fitting the cover plate (1282-54379).

NOTE: A stripped thread in the wheel cylinder body for cheese head screw (1283-54380) is an ideal tap size for a 5 mm screw thread. The cover will need drilling to 5 mm to match.

6. The assembly should then be firmly clamped at two 3/8-in. backing plate mount nuts, in a bench vice. The bolts should be tight, to hold the backing plate firmly. Refer to *Figures 6, 7*.
7. Apply white grease in slots for ends of the brake shoes.
8. For right hand side, use *Figure 6* as a guide for fitting the brake shoe springs. The yellow spring at wheel cylinder, green spring at adjuster housing end – both springs with clearance to the wheel cylinder body and the adjuster housing.
9. *Figure 7* shows a special tool made up for safely pulling the brake shoes (*Items 1265, 1269*) into their respective notches.

Right: Figure 7. Easy to grip tool for pulling brake shoes cleanly over adjuster and wheel cylinder.

10. Repeat Steps one to nine for the left hand side brake assembly. Be sure that the leading brake shoe has its lining gap in front of the wheel cylinder (in direction of forward rotation), and the trailing brake shoe has its lining gap at the brake adjuster housing.

Right: Figure 8. LHS backing plate assembly held firmly in vice.

11. *Figure 8* also illustrates the correct positioning of the two brake shoe return springs.
12. *Figure 9* shows the brake assembly mounted on the rear axle. This view shows the left hand side installation. The leading shoe is the upper brake shoe and the lower brake shoe is the trailing shoe. This setup provides wedge type brake shoe engagement with the brake drum and is less prone to brake judder concerns.

13. **Installation notes:**

Mount half shaft end float shims on the four securing bolts.

Right: Figure 9. Brake backing plate assembly installed on rear axle, left hand side shown. Installation on Jupiter, Javelin is the same.

As the assembly is offered to the rear axle, it is advisable to ensure that the hydraulic pipe enters the port in the wheel cylinder.

Coat bolts, pipe and union with Penrite Copper Eze to facilitate ease of future removal.

Do not over tighten pipe union nut, pipe flare can widen and, as a consequence, be difficult to remove another time.

14. When connecting the handbrake rod clevis pins, coat the threaded pin with Copper Eze and place a 1/4-in. plain washer between the anti-rattle spring and the draw-link. The split pin hole is placed approximately 90° to the screwdriver slot.

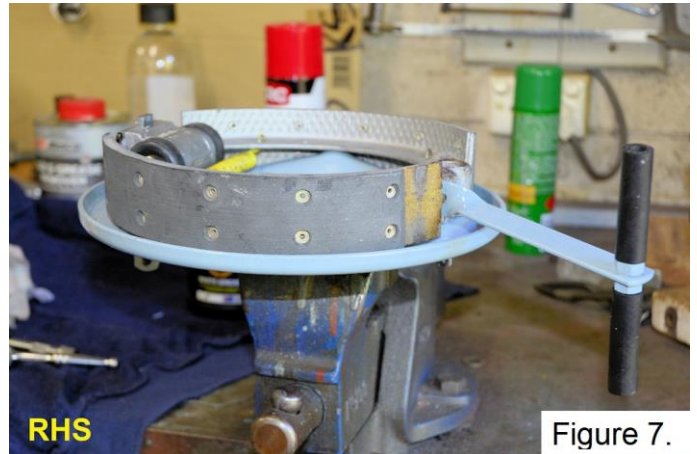


Figure 7.



Figure 8.

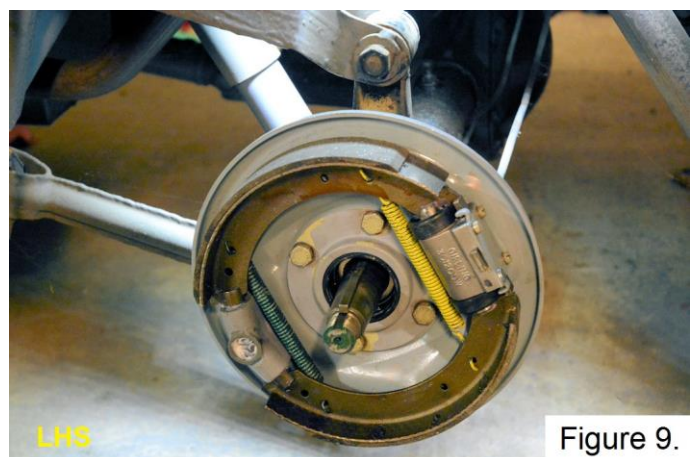


Figure 9.

15. The taper surfaces at axle shaft and brake drum must be grease, oil and rust free. There should not be any burrs at the locating key. During brake drum installation, the brake shoes may require nudging in their notches, or the wheel cylinder sliding, to provide clearance for the brake drum. With the adjuster wedge backed right off, there should be ample clearance for the drum.
 16. Apply Copper Eze at the shaft thread, fit the plain washer and tighten the nut dead tight. A length of square tube with a hole to fit over a wheel stud, and wedged against the floor will assist with the nut tightening.

The split pin hole in the axle shaft is at 90° to the keyway in the shaft. Should it not align with a slot in the nut, tighten the nut further to gain pin access. Install the pin and open the ends out, do not bend right over the nut and shaft. Cut off excess pin length for a neat job.
 17. The entire braking system should have all air bled from the hydraulic components, in accordance with the instructions provided in the Maintenance Manual. Install rubber caps over bleed screws.
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The Importance Of Brake Implementation

Driving in modern day traffic conditions relies extensively on a vehicle's maximum braking ability. Younger drivers of modern vehicles have minimal comprehension about the braking performance of an older motor car being less efficient than that of the ultra-modern vehicle they are driving. A Jowett is not equipped with predictive brake system. All too often, a safe distance from the vehicle in front, is suddenly filled by an impatient vehicle driver, and planned braking distance has vanished.

For such ignorant and impatient driving behaviour conditions, a Jowett's braking system has to be in well-maintained condition at all times. A vital part of good braking performance is minimal brake pedal travel, it is worthwhile experimenting on a quiet country road to find out how far the car has travelled in the time from initiating pedal movement and the brakes actually commencing to retard the car – this can be surprising at varying speeds. Brakes that are properly adjusted and maintained in good condition can have a great effect when having to brake urgently in a confined traffic space.

Think about it!

Mike Allfrey – 3rd April, 2022.
