SUSPENSION, SHOCK DAMPERS, PIVOT PINS AND STUB AXLES

Category 2.

FRONT SUSPENSION.

The fulcrum brackets are fitted to the lower side of the front pan by eight .500" bolts and nuts.

After a certain number of cars were produced it was decided to increase the length of these bolts to accommodate a flat washer under the nut to permit the bolt to spread the load over a greater area. This washer to be fitted under the lock-plate.

The following cars require modification, and Retailers are requested to deal with those in their respective areas.

Bentley "S" Series AN.

B.34, 40, 58, 64, 70, 84, 96, 116, 118, 136, 138, 152, 154, 156, 166, 170, 172, 180, 182, 186 to 192 inclusive. 198, 218, 222, 226, 234 to 240 inclusive, 246 to 256 inclusive, 262 to 276 inclusive, 280, 284, 288 and 294.

The recommended procedure is:-

Unlock and remove the existing bolts as a pair.

Install the new longer bolts (UR.2477), placing the flat washer (UR.2478), between the upper side of the front pan lug and the lock-plate under the nut.

New lock-plates are to be used under the head of the bolts and the nuts.

The necessary Part Numbers are listed below, and Retailers are requested to order these from the London Service Station as required:-

UR.2477	Bolt	- 8 off.
UR.2478	Washer	- 8 off.
UR.1976	Lock-plate	- 8 off.

Time allowance - 2 hours.

CATEGORY 2.

MODIFICATION TO THE "Z" BAR ON THE REAR AXLE OF THE BENTLEY CONTINENTAL.

The directional stability of the Bentley Continental is improved, particularly on the curving and undulating roads, if the "Z" bar is modified to act purely as a rear axle torque arm and give no anti roll action, thus inducing an increase in understeer.

The "Z" bar is to be cut 1" inboard of the outer Silentbloc bush on the axle (A.Fig.1.) and the inner bush mounting discarded. The end of the "Z" bar is to be filed smooth, the edges rounded and finally painted with a first quality air drying chassis black.

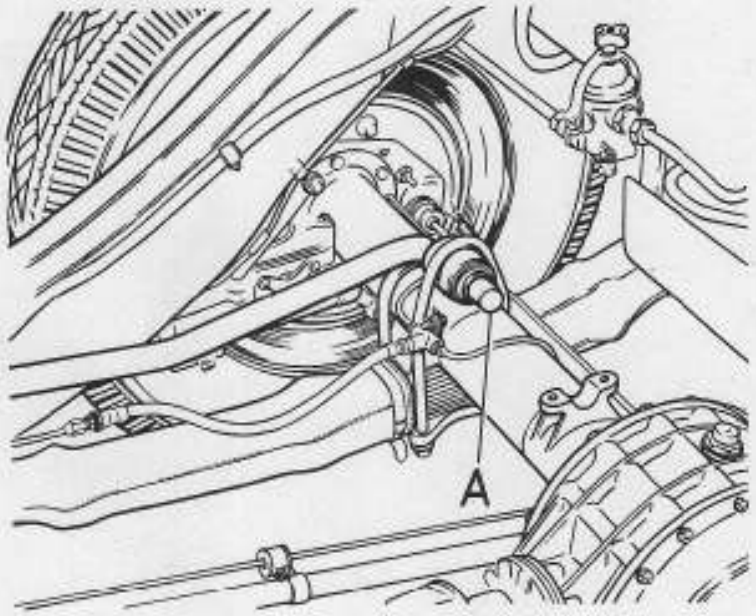

Fig.1. Rear Axle Torque Arm.

Care must be taken not to damage adjacent parts to the "Z" bar when cutting, especially on Mulliner bodied cars which have hydraulic brake piping fixed to the front of the axle.

The time allowance is 1 hour.

Chassis Number.

All chassis up to Bentley Continental.

BC-101-BG.

No.CB-51

CATEGORY 3A

REAR SUSPENSION DAMPER MOUNTING TO THE FRAME

Complaints may arise after continued arduous service of the rear suspension damper working loose due to slackening of the fixing bolts to the frame brackets. This is rectified by fitting plain washers and full nuts in place of the original half nuts, with longer bolts to accommodate the extra length.

Before fitting the new nuts, bolts and washers ensure that no trace of paint whatever exists around the original bolt holes in the brackets to prevent full clamping of the components.

MATERIALS.	PART NO.	NO.OFF.
Bolt (.500" dia.)	UR.4073	2
Nut	UA.305/Z	2
Bolt (.375" dia.)	UR.4055	2
Nut	RE.22428	2

APPLICABLE TO:

Rolls-Royce Silver Cloud

Bentley 'S' Type

Bentley 'S' Continental

FOR INFORMATION

FRONT SUSPENSION SETTINGS

The following information as quoted below, is in addition and in lieu of that given in the Service Data handbook for Silver Cloud and Bentley 'S' Type cars.

	POWER ASSISTED	UN-ASSISTED STEERING
Camber	Zero	Zero
Castor	0° - $\frac{1}{2}^{\circ}$ Positive Difference between the two sides not to exceed $.25^{\circ}$.	$\frac{1}{2}^{\circ}$ - 1° Negative Difference between the two sides not to exceed $.25^{\circ}$.
Toe-In	1/16" - 5/32"	1/16" - 5/32"
Pivot Pin Inclination	$4\frac{1}{2}^{\circ}$ at zero (Camber setting)	$4\frac{1}{2}^{\circ}$ at zero (Camber setting)

CATEGORY 3A

MODIFICATION TO THE FRONT SUSPENSION FULCRUM PIN OIL SEALING AND PIVOT PIN RESTRICTORS.

Extensive servicing experience and continued development have brought about the following improvements in production, which include:- more effective sealing of the "ONE-SHOT" lubricating system by the inclusion of aluminium retaining rings to the fulcrum pin, and bracket, sealing washers. Increased lubrication to the upper pivot pin bearing by increasing the travel of the restrictor pin.

In cases of complaint these should be incorporated in service as detailed below.

1. Increasing the pivot pin restrictor travel by reducing the height of protrusion above the pivot pin face.

2. Fitting aluminium retaining rings centrally to the outer periphery of the fulcrum pin sealing washers, and so preventing any possible displacement of the sealing washer.

Pivot Pin Restrictor Dimensions

(a) Procedure:-

Raise the front end of the car, check to see that there is no excessive wear in the pivot pins and bearings, and that any sign of "heavy steering" can be overcome by increased lubrication to the upper pivot bearing.

Before removal of the Domed Cap located at the axle pivot head, any loose dirt must be cleaned off. The restrictor pin protrusion above the pivot pin top face should not exceed .015". If this dimension is in excess, the restrictor pin should be removed and ground to the correct length.

NB Any sign of restrictor pin tightness in the pivot pin drilling should be rectified.

If the restrictor pin dimensions are correct it is possible that inadequate lubrication to the pivot pin upper bearing is due to ineffective sealing washers.

(b) Fitting Sealing Washers and Retaining Rings

With the front end raised, remove the front wheels, brake

drums, back-plate assemblies and disconnect the "one-shot" lubricating hose, feeding the upper yoke of the axle pivot assembly. Do not disconnect the hydraulic brake hoses.

Fit the suspension coil spring compressor, compressing the spring to remove the load from the fulcrum pins. Disconnect the lower triangle lever and the front lever of the upper triangle to allow removal of the axle pivot assembly.

Fit new rubber sealing rings complete with the aluminium retaining rings to the upper and lower fulcrum pins and to the lower triangle fulcrum brackets, ensuring central positioning of the aluminium retaining rings to the outer periphery of the sealing washers. (A grooved sealing washer and stainless steel retaining ring are awaiting production and these will supersede the aluminium ring and plain sealing washer when available.

Re-assemble, fitting new lockwashers to the (bearing-block-triangle lever) bolts, lockwashers must similarly be fitted to both the front and rear upper shock damper lever securing bolts if not already fitted.

Before tightening the(fulcrum pin-bearing block) nuts it is essential that the sealing washer seating protrusion is equi-distance on either side of the yoke, and that with the bearing blocks in their normal mid-way position, equal pressure is applied to the sealing washers. Re-position the fulcrum pin until this is correct.

Tighten the fulcrum pin nuts (ensuring that the bearing block faces are in line with each other) followed by the front and rear lever securing bolts and finally the bearing block bolts.

NB It is of the utmost importance that the tightening of the fulcrum pin nuts followed by the securing bolts be in the correct sequence as stated above. Replace upper yoke lubricating hose, back-plate assemblies, brake drums and wheels.

Adjust Castor and Camber angles.

Finally test the brakes to ensure satisfactory performance.

(a) Time allowable for Restrictor Pin Modification only, 45 mins.

(b) Time allowable for Sealing Washer and Retaining Ring Renewal, 20 Hrs.

(b) Materials

Part	Part No.		No.Off.
Ring, sealing, bearing block upper	UR.541		4
Ring, sealing, bearing block lower	RF.7661	(.175"thick)	8
Ring, sealing, bearing block lower	UR.2207	(.200"thick)	8
Ring, sealing, bearing block lower	UR.2823	(.150"thick)	8
(select thickness as required)			
Ring, Aluminium Retaining	UR.4018		12
Lockwasher	RF.7608		8
Lockwasher	RF.7609		6

The following grooved sealing washers and stainless steel retaining rings are awaiting production and these will supersede the aluminium ring and plain sealing washers when stocks become available.

Ring, sealing, bearing block upper	UR.4003		4
Ring, sealing, lower triangle	UR.4000	(.150"thick)	8
and bearing block. (Select	UR.4001	(.175"thick)	8
thickness as required)	UR.4002	(.200"thick)	8
Ring, Stainless Steel	UR.3999		12

Applicable to:

Rolls-Royce Silver Cloud
Bentley 'S' Type
Bentley 'S' Type Continental

No. CB.51

CATEGORY 3A

Cancels Bulletin CB.51
dated 16.5.57 Section R
Re-issued to correct Section (H).

REAR SUSPENSION DAMPER MOUNTING TO THE FRAME

Complaints may arise after continued arduous service of the rear suspension damper working loose due to slackening of the fixing bolts to the frame brackets. This is rectified by fitting plain washers and full nuts in place of the original half nuts, with longer bolts to accommodate the extra length.

Before fitting the new nuts, bolts and washers ensure that no trace of paint whatever exists around the original bolt holes in the brackets to prevent full clamping of the components.

MATERIALS.	PART NO.	NO.OFF.
Bolt (.500" dia.)	UR.4073	2
Nut	UA.305/Z	2
Bolt (.375" dia.)	UR.4055	2
Nut	RE.22428	2

APPLICABLE TO:

Rolls-Royce Silver Cloud

Bentley 'S' Type

Bentley 'S' Continental

No. CB.86

FOR INFORMATION.

REAR SHOCK DAMPER SILENTBLOC BUSHES.

The silentbloc bushes retained in the end of the rear damper arms and in the brackets welded to both axle tubes have occassionally collapsed due to excessive torque tightening of the two clamping bolts. New silentbloc bushes with thicker section centre tubes have been produced for fitment in replacement of any failures.

Parts for the old bush assembly are no longer available for this reason; therefore any single part of an old type assembly requiring replacement necessitates complete modification to the new specifications.

The modification entails removal of the thin section centre tubed bushes and fitment of the new thicker section bushes, side links and clamping bolts.

Material required:-

New parts for one damper linkage assembly.

2 Silentbloc bushes.	Part No. UR.3673
2 Side links.	Part No. UR.3767
2 Clamping bolts.	Part No. UR.3674
2 Nuts.	Part No. UA.1104/Z
2 Split pins.	Part No. KB.6860

FOR INFORMATION.

STANDING HEIGHT.

Information contained in the Workshop Manual concerning standing height dimensions is now obsolete and is superseded by the information given in this Bulletin.

There are two sets of dimensions to which a Silver Cloud or Bentley 'S' Type can conform, these come under the headings of "Standard" or "Colonial".

A new car will at first tend to stand higher than the dimensions quoted, but will "settle" after approximately 100 miles. This is due to the various rubber components in the rear suspension taking up their positions.

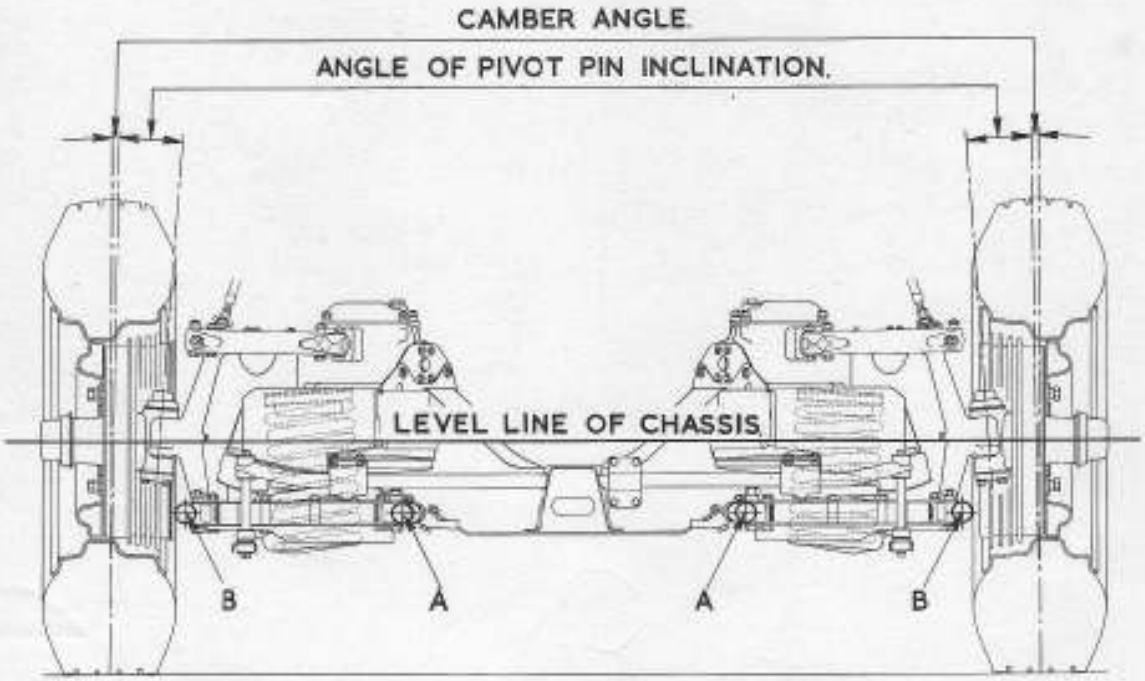

Fig. 1. Front standing height.

To Check Front Suspension Standing Height.

To check front suspension standing height, the car should be standing on a level floor with the tyres inflated to the correct pressures.

The car should also be in an unladen condition, i.e. without driver, passengers and luggage but with five gallons of petrol in the tank.

With the car prepared as stated above, check as follows:-

Standard Car.

Point 'A' should be 0.600" - 1.200" above point 'B' (see fig.1.)

Colonial Car.

Point 'A' should be 1.100" - 1.700" above point 'B' (see fig.1.)

When measuring standing height, the front of the car should be pressed down, then gently released and readings taken.

Raise the front of the car by hand and gently release it, then take a second reading.

The average of these two readings should be compared with the figures quoted above.

To Adjust Front Suspension Standing Height.

Adjustment for standing height is provided by means of special washers (UR.510) fitted between the rubber seat on the spring top spigot and the flat end of the spring.

No adjusting washers are provided on the bottom of this type of spring as was the case on previous models.

To Check Rear Standing Height.

The point for measuring rear spring standing height is shown in figure 2.

Cont'd.....

The clearances between the rear spring bump stop and the axle tube should be checked when the car is in a kerbside condition with no passengers or luggage, but with five gallons of petrol in the tank.

For each gallon over five subtract 0.025" from, or for each gallon under five add 0.025" to the dimension quoted below. The permitted variation from side to side is 0.375".

Standard Car.

Rear standing height. 6.000" + 0.600" - 0.300"

Colonial Car.

Rear standing height. 6.500" + 0.600" - 0.300"

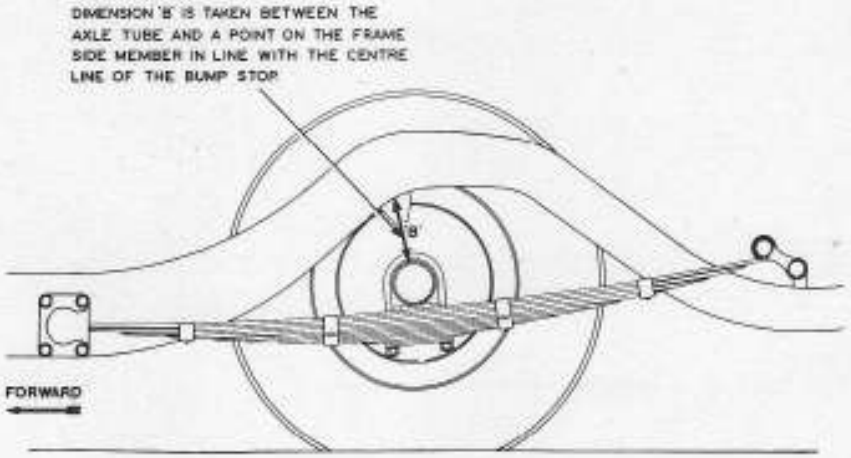

Fig.2. Rear standing height.

In the event of a car being jacked up for any length of time, so that the rear springs are allowed to hang, do not check the standing height until the car has been driven on the road for approximately thirty miles, otherwise an incorrect reading will be obtained.

FOR INFORMATION.

IMPROVED ONE-SHOT LUBRICATION INCORPORATING MODIFIED RUBBER SEALS IN FRONT SUSPENSION FULCRUM PIN AND BRACKET.

In order to provide improved one-shot lubrication of the front suspension fulcrum pins and bearing brackets, current production cars are being fitted with solid stub axle yokes.

These are provided with an external lubricating pipe through which lubricant is fed to the upper and lower fulcrum pins and to the pivot pins, whereas on early cars lubricant was fed through a hollow yoke.

The amount of lubricant fed to the bearing faces is controlled by restrictors which are fitted at the top and bottom of the yoke and to the bearing bracket.

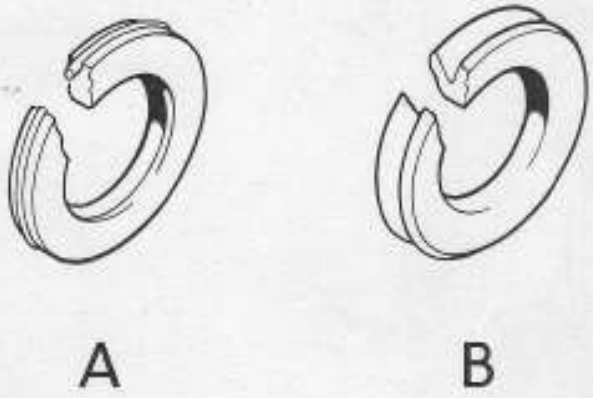

Fig. 1. A - Rubber sealing ring with retaining ring.

B - Modified sealing ring without retaining ring.

A modified type of rubber seal is now fitted to the fulcrum pins and bearing brackets but unlike those fitted to cars with hollow stub axle yokes, the new seals have no retaining rings (see Fig. 1).

The new type seal is designed not only to enable the one-shot lubricant to reach the bearing faces, but also to prevent the ingress of dirt and water.

On earlier cars, where no restrictors were fitted to control the one-shot lubricant pressure, a retaining ring was provided to assist the seal in preventing the escape of lubricant and the ingress of dirt and water.

In certain conditions however, it has been reported that air, trapped between the bearing face and the rubber seal, was unable to escape owing to the resistance of the retaining ring; thus preventing lubricant reaching the bearing face.

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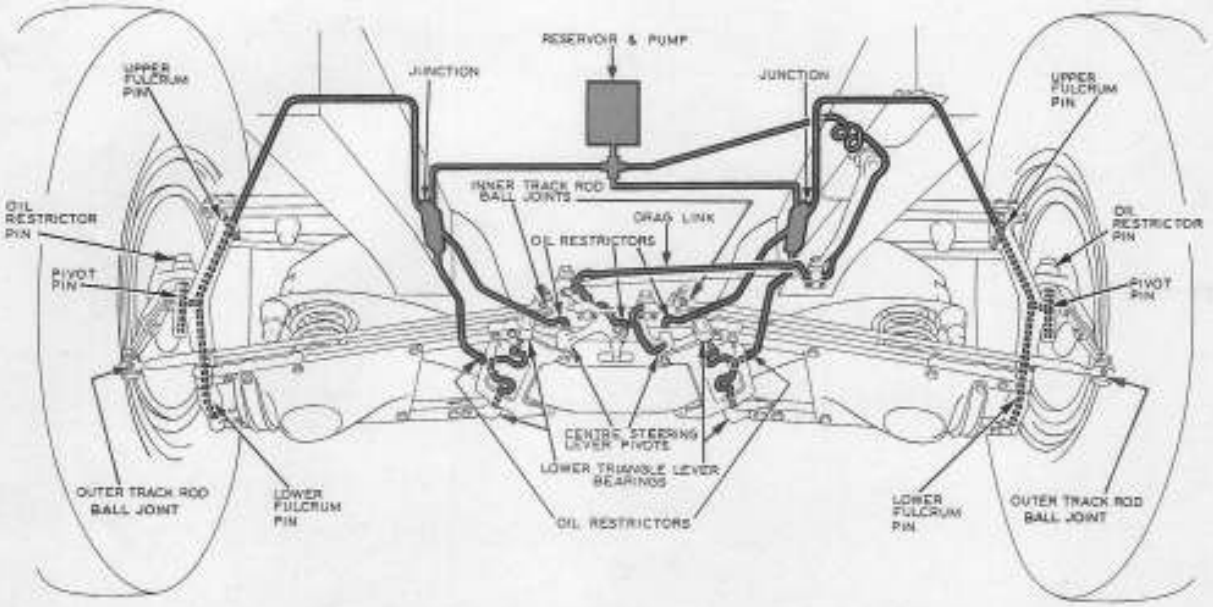

Fig.2. Diagram showing early type one-shot lubrication system and grease lubricated track rods only - HOLLOW stub axle yokes.

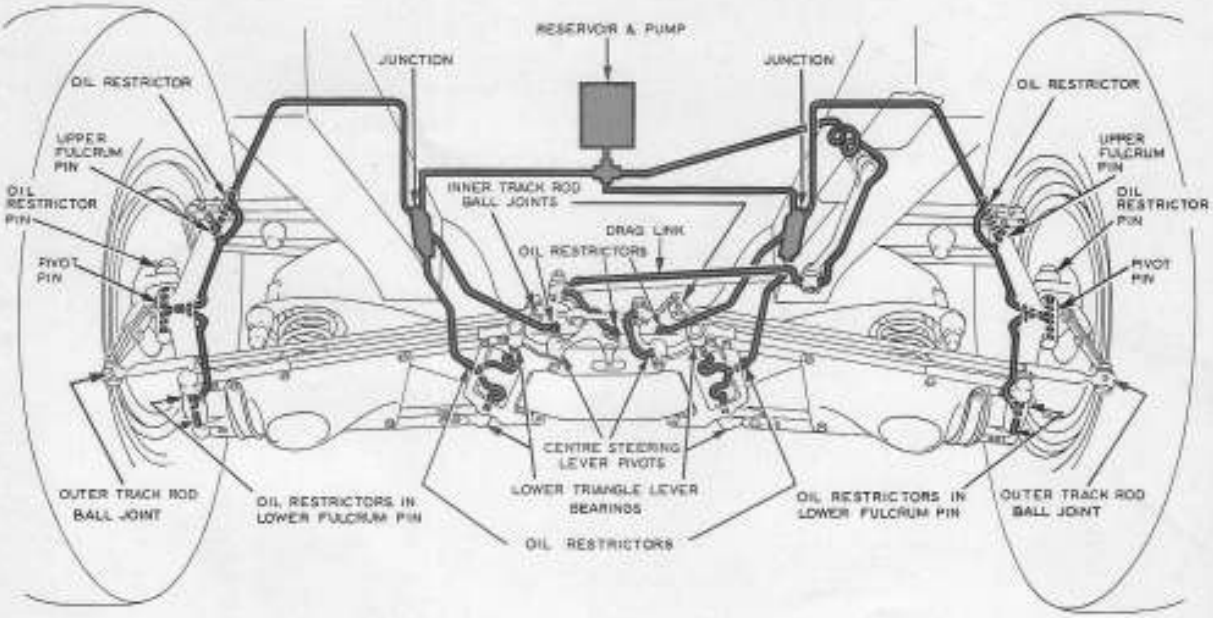

Fig.3. Diagram showing late type one-shot lubrication system and grease lubricated track rods only - SOLID stub axle yokes.

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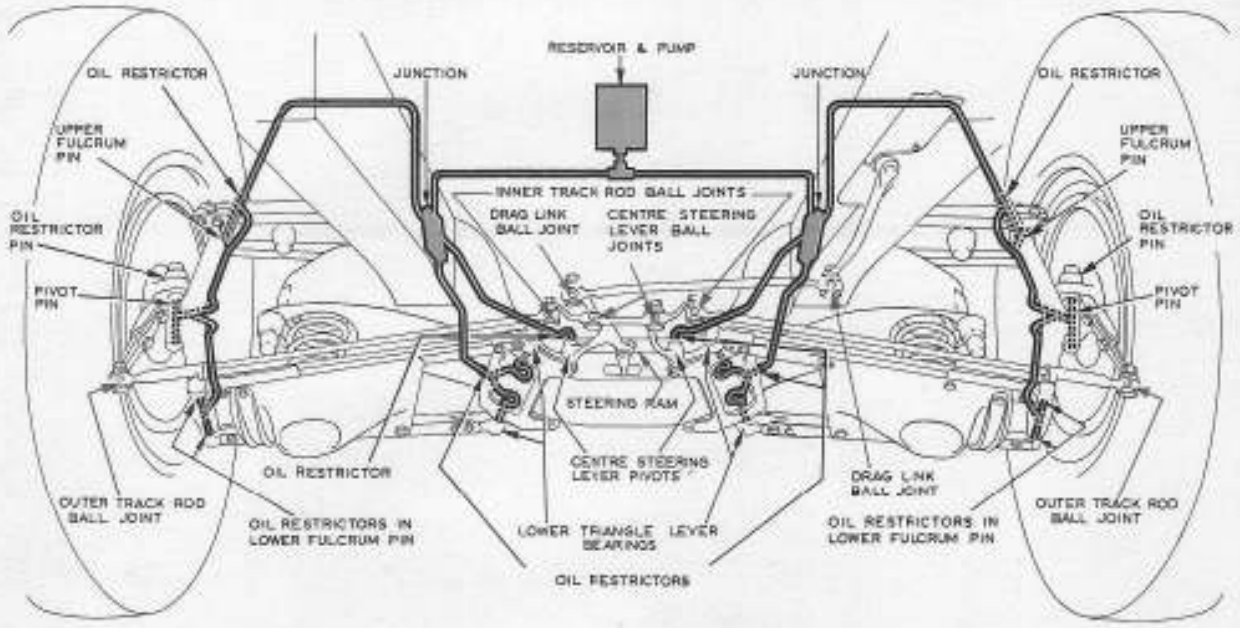

Fig.4. Diagram showing late type one-shot lubrication system and grease lubricated track rods, steering cross beam, drag link and power steering ram yoke - SOLID stub axle yoke.

It is therefore important that under no circumstances must rubber seals (UR.4000, UR.4001, UR.4002, UR.4003) with retaining rings, be fitted to cars with solid stub axle yokes, or that modified rubber seals (UR.3425, UR.3426) without retaining rings, be fitted to cars with hollow yokes.

There are four types of stub axle yokes in service, they are as follows:-

(i) Solid type with 1° castor angle for power assisted steering.

(ii) Solid type with $\frac{1}{2} - 1^{\circ}$ castor angle for manual steering.

(iii) Hollow type with 1° castor angle for power assisted steering.

(iv) Hollow type with $\frac{1}{2} - 1^{\circ}$ castor angle for manual steering.

If for any reason it is necessary to renew a stub axle yoke, a solid type (i) as for power assisted steering must be fitted owing to other types now being out of production.

Note:- In Figures 2, 3 and 4, the arrows shown in black indicate the points which are lubricated by means of the one-shot system and the arrows shown in blue, indicate the points which are lubricated by grease.

When a solid type stub axle yoke has been fitted to a car, care should be taken to ensure that an oil restrictor is fitted in the adaptor situated at the top of the yoke (see Fig.6).

It is essential also that the correct fulcrum pin, together with two oil restrictors, are fitted in the lower end of the yoke (see Fig. 5).

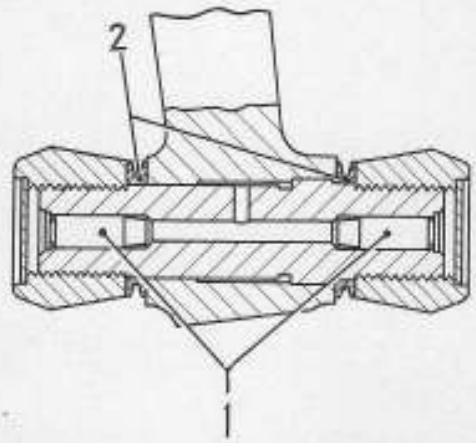

Fig.5. Scrap view of stub axle yoke showing lower fulcrum pin.
1. Oil restrictor.
2. Rubber sealing ring.

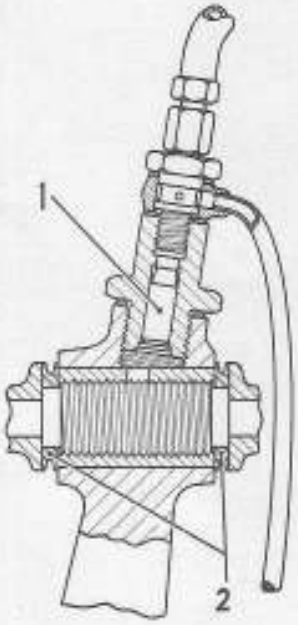

Fig.6. Scrap view of top of stub axle yoke.
1. Oil restrictor.
2. Rubber sealing ring.