

we think transport



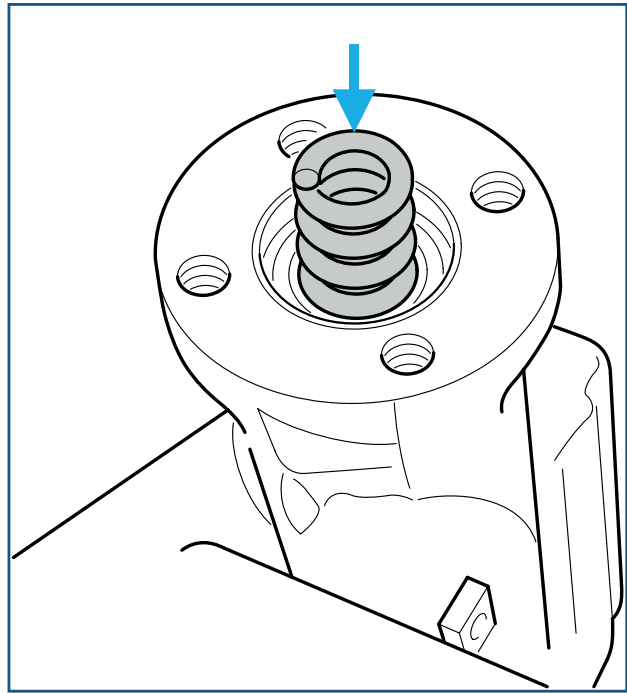
LL SELF-STEERING AXLE

KINGPIN BEARINGS

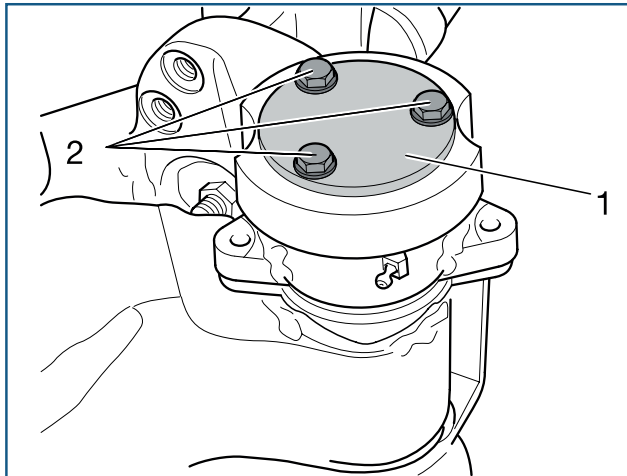
REMOVAL AND REPLACEMENT



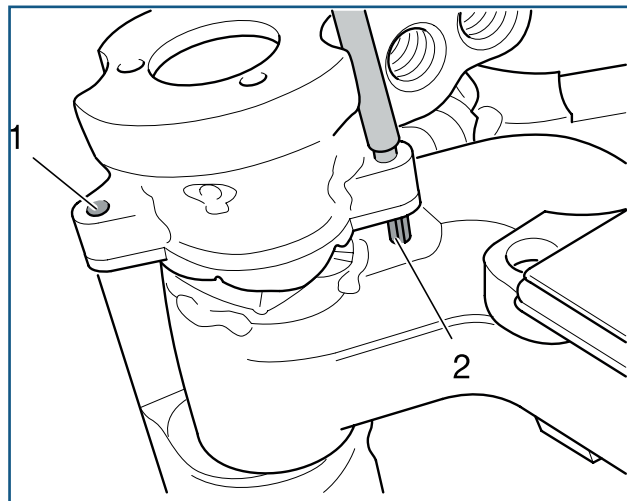
Remove the axle. Take off the hubs and brake parts. Take off the track rod. Remove the base plates or the upper closing plates and take out the compression springs - see arrow.



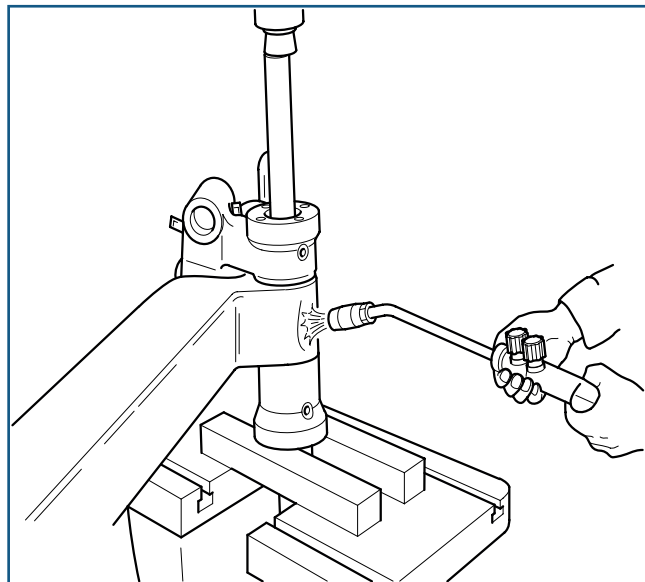
Turn the axle upside down so that the thrust washers are on top. Unscrew the fixing screws (2) of the lower closing plates (1). Take off the plates.



Drive the two front spring pins (1) out of the mounting in the steering swivel. Drive the two rear spring pins (2) as far as possible out of the axle beam.

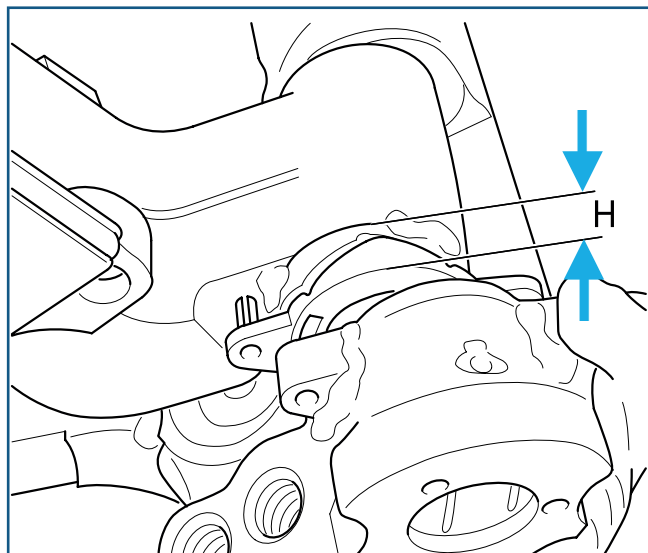


Place the stub axle under a press so that the thrust washers are below and the stub axle is upright (the thrust washers rest against each other). Exert slight pressure on the kingpin with a suitable mandrel. Heat the axle beam on the end face with a large heating torch flame (propane gas) until the kingpin is loosened. Then, using the press, force it out all at once.

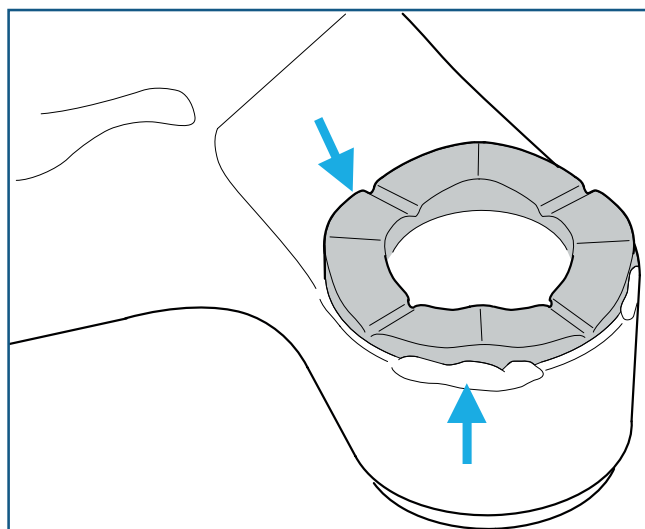


- If the kingpin is pressed out without being heated, the stub axle bore will be destroyed.
- Mark the stub axle and the thrust washers so that later they can be refitted in the same position.

Remove the stub axle and thrust washers. Inspect the kingpin and bushes for wear. Make a visual inspection by opening up the upper and lower bearings. The wear limit of the bushes is reached at a wall thickness of 1.8 mm. If necessary, exchange components. Inspect the thrust washers for wear. If necessary exchange them. (H = 22 mm minimum).

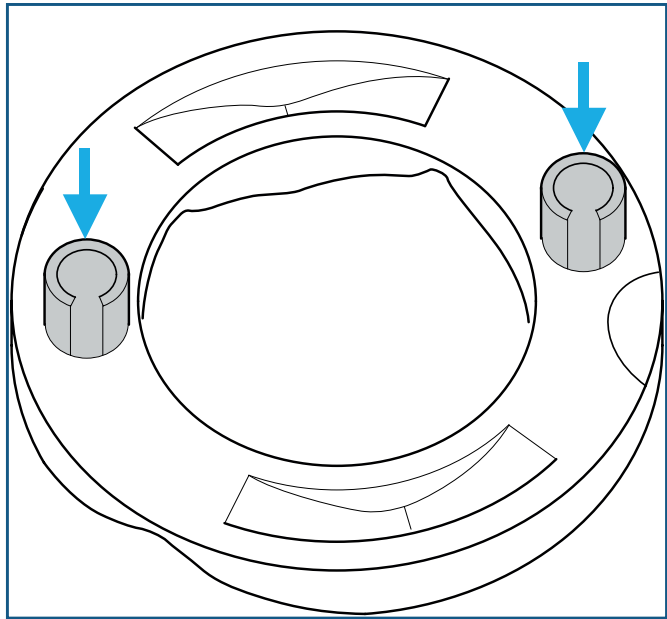


To exchange the thrust washers, grind off the weld seams (see arrows) on the stub axles. Using a chisel, lift the pinned thrust washer off the axle beam. Do not damage the mating surface of the axle beam.

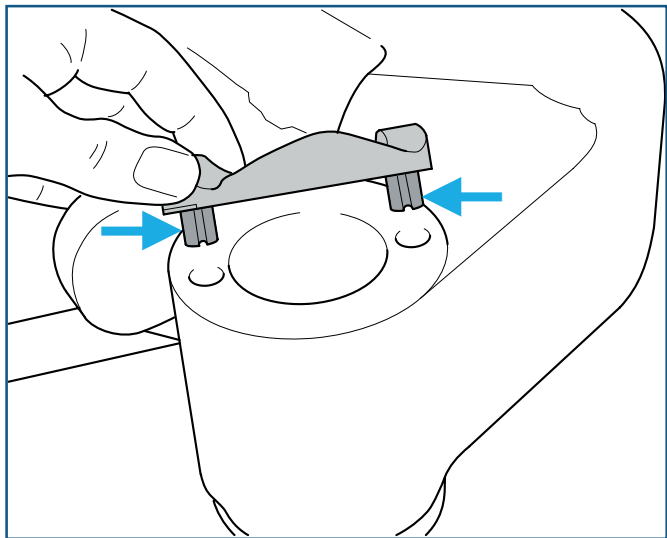


- Shaft thrust washers must always be exchanged in pairs at the top and bottom, and on both sides.

Drive two new large spring pins into the thrust washer so that the slots are illustrated (see arrows). Then, drive the small pins into the large spring pins so that the slots are opposite each other.



Place the thrust washer on the stub axle. The mating surfaces must be clean, free of grease, and flat. Make the spring pins engage in the bores so that the slots (see arrows) in the spring pins face outward. Drive the shaft thrust ring onto its seat with a plastic hammer.

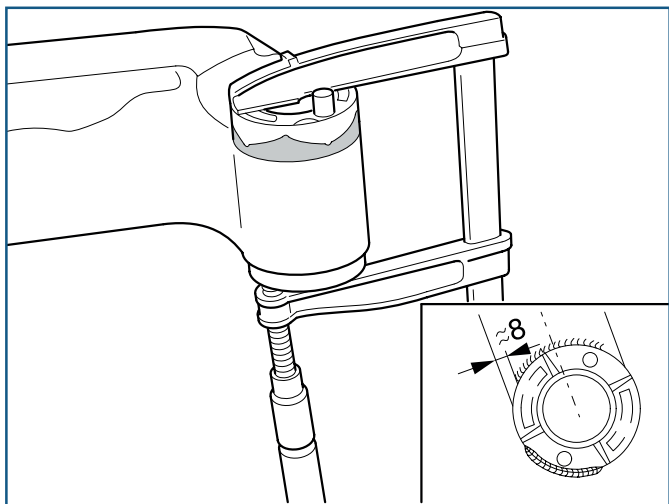


Clamp the thrust washers with the stub axle and weld them into position with a single pass, as shown in the drawing.

Special filler electrodes:
E. 18 8 Mn B20+ DIN 8556.

Weld seam thickness:
3.5 (DIN 1912).

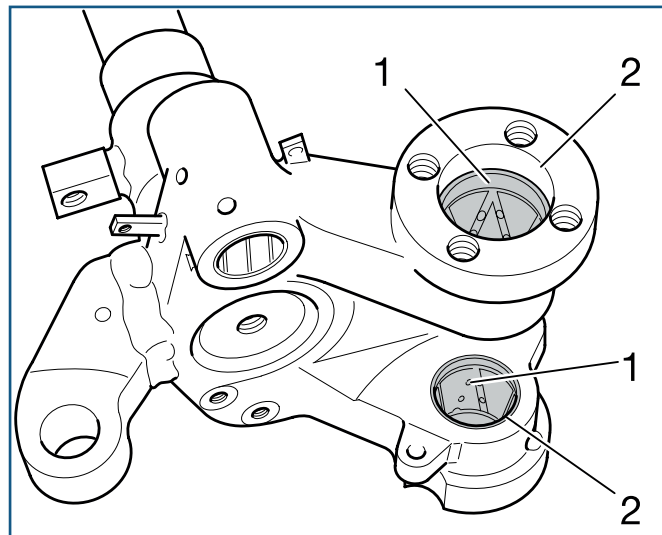
Remove the weld spatter.



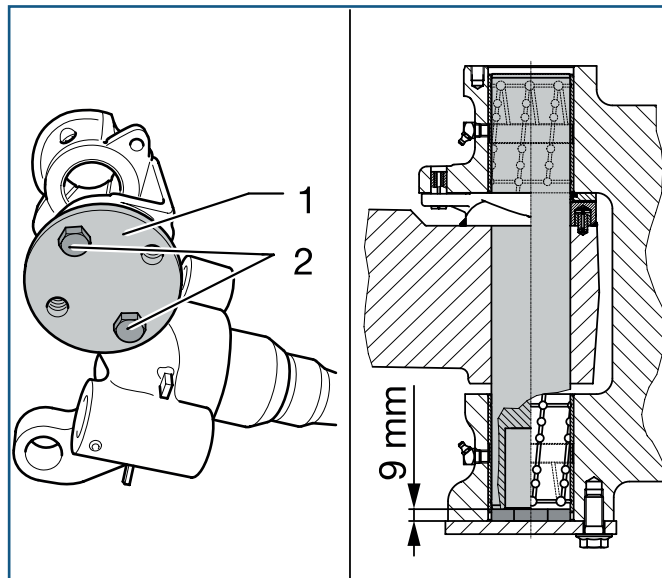
Carefully press in the new bushes for the kingpin with a suitable mandrel and without tilting them until they make full contact with the inner mating surfaces (2) of the kingpin.

- The inner open lubrication passages (1) must face towards the middle of the axle.

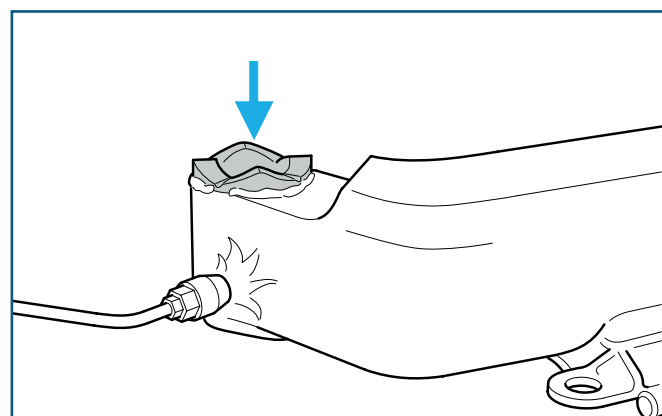
Check whether the kingpin slides smoothly into the bushes. If necessary, rework the bushes.



Since the axle is fitted upside down, a dia. 55 x 8 mm spacer should be placed in the upper kingpin bearing to assist installation. Attach the upper closing plate (1) or base plate (without the compression spring) with two screws (2).

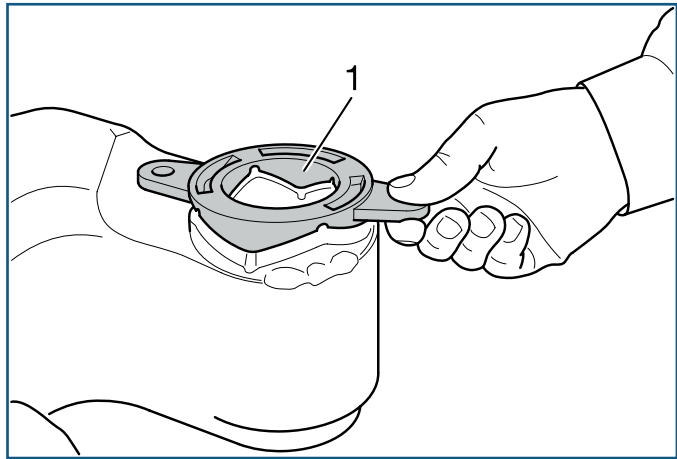


Set up the axle beam in such a way that the thrust washers (see arrow) are on top. Heat the rear of the axle beam on both sides in circles until it is dark red.

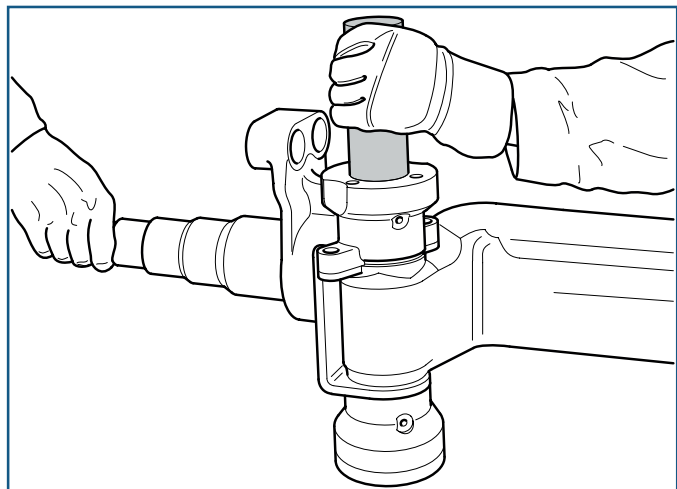


Place the shaft washer in position.

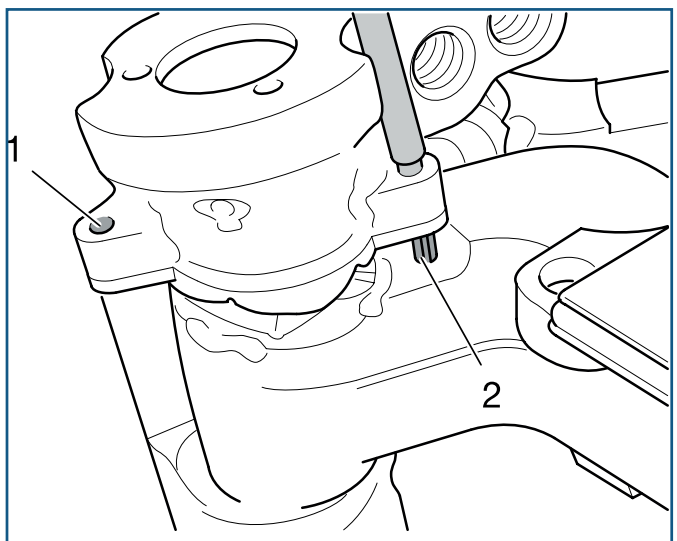
- In the case of older versions of thrust washer, the dish in the middle (1) should face the stub axle.



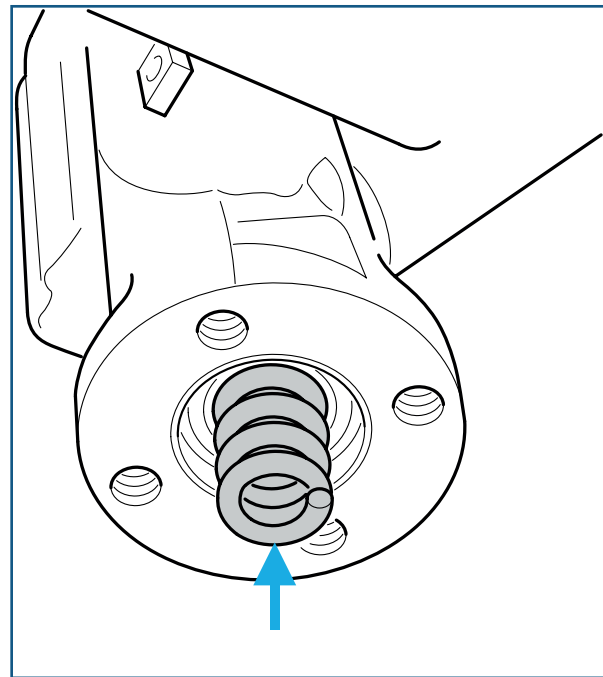
Place the stub axle on the thrust washers. Align all the bores for the kingpin. Press the kingpin into position in one go with the bore for the compression spring facing downwards. If necessary, drive it in with the gentle taps of a hammer.



Drive thick spring pins into the mountings in the steering swivel and the shaft thrust ring in such a way that the slots (1) are always in the direction of rotation of the steering swivel. Then, drive the thin spring pins into the thick spring pins in such a way that the slots are opposite. Continue to drive both spring pins until they project a little at the bottom of the shaft thrust pin (2). Then, drive them back until the shaft thrust ring rests against the steering swivel and the spring pins still project approx. 1 mm. Position the spring pins in the bores of the steering swivel with two blows of a centrepunch.



Fit the lower closing plates with three M10 locking screws or hexagonal screws and spring washers and tighten the screws to the specific torque of 38 Nm. Place the compression spring (arrow) in the bore of the kingpin. Fit the base plate or upper closing plate with locking screws or hexagonal screws and spring washers. Tighten the screws until the compression spring is tensioned.

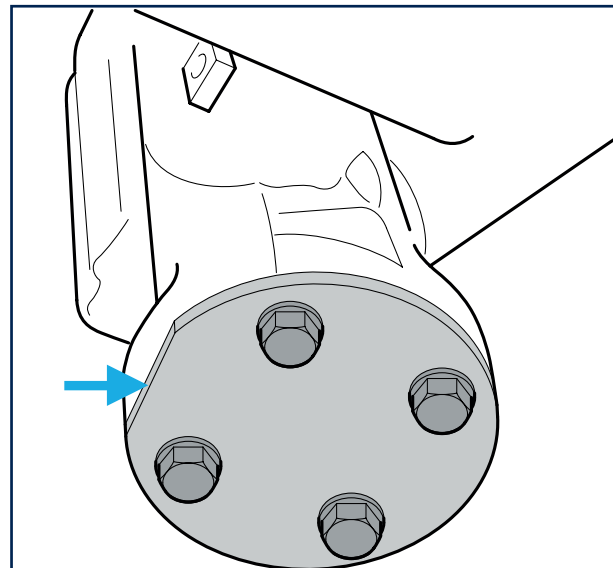


If there is a flat (arrow) on the upper plate, it must face the brake drum.

Fit the tack rod and steering lock. Fit the brakes and hubs.

Lubricate the kingpin bearings and the brake shaft bearings with BPW special longlife grease ECO Li Plus*. Install the axle. Check the tracking.

*Alternatively use BPW ECO Li 91 longlife grease.



Make a functional check, see

- Functional check under the vehicle.

Welding of lower and upper thrust washers and installation of outer and inner roll pins.
Use in conjunction with BPWL Tech Info 2002.04.0023.

LOWER THRUST WASHER (03.128.05.06.0)
OUTER ROLL PIN (02.6006.95.90)
INNER ROLL PIN (02.6016.01.90)



Fit the outer and inner roll pins to locate lower thrust washer. Weld washer to the swivel housing along one side of each tab. (One side shown).

Weld size: 3.5 mm x 30 mm.

UPPER THRUST WASHER (03.128.05.06.0)



Align the thrust washer to the axle beam. Weld on both sides. (One side shown).

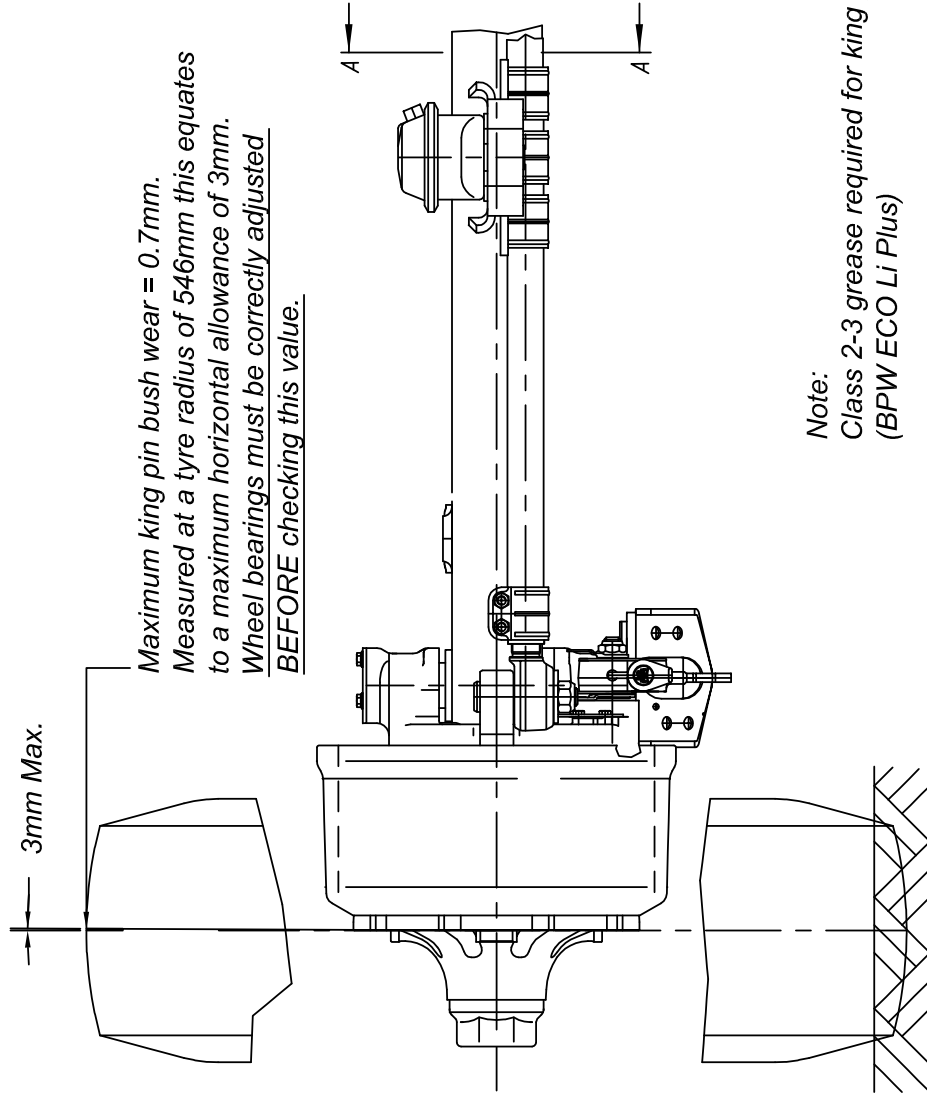
Weld size: 3.5 mm x 50 mm.

REFER TO BPW STEERING AXLE WORKSHOP MANUAL
BPW-WH-LL-L 35351701e FOR FULL INSTRUCTIONS

D:\docs\service\BPWLLaxlethrustwasherinst

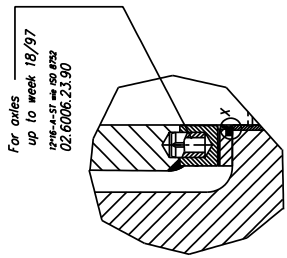
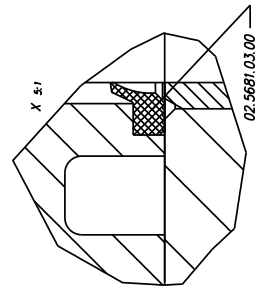


King pin bushing wear limits for BPW "LL" Series self steer axles.

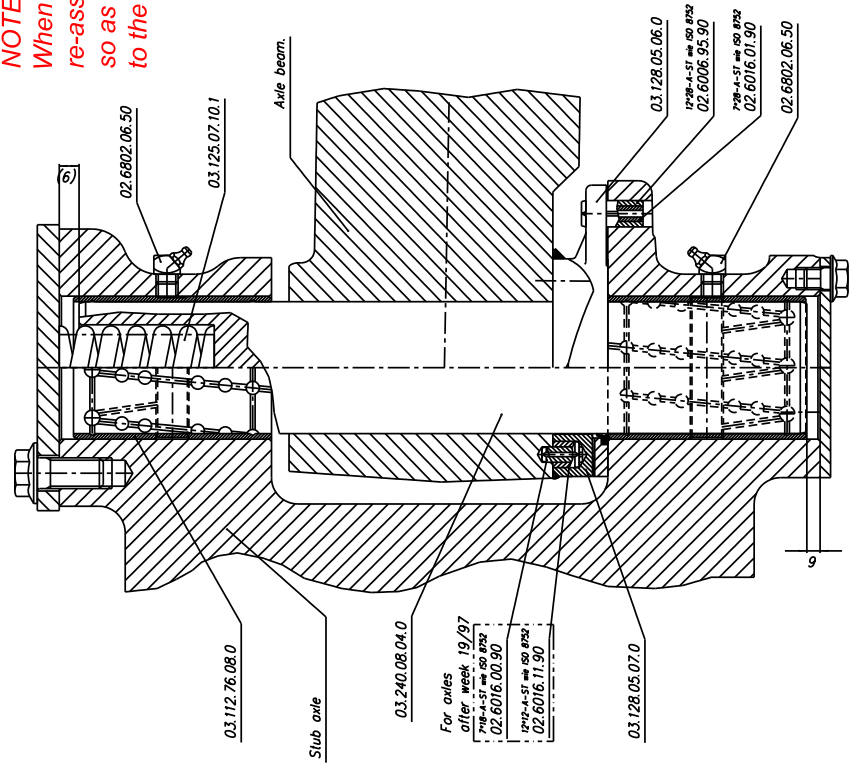


Note:
 Class 2-3 grease required for king pin lubrication.
 (BPW ECO Li Plus)

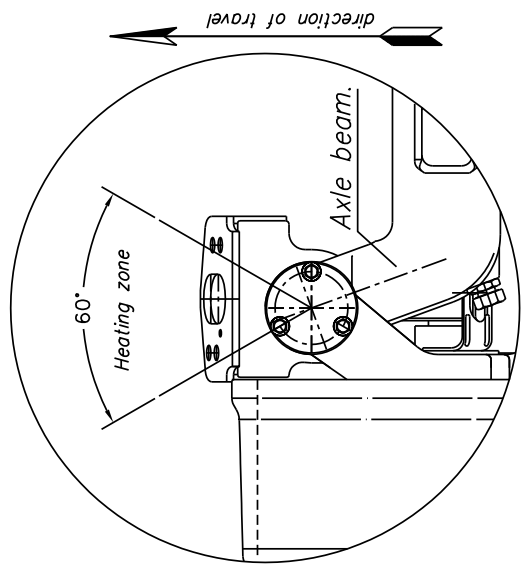
Kingpin repair kit. (Both sides) 03.801.02.35.0
Valid for "LL" axles up to 12t / LE >24 degrees.



NOTE:
When re heating the axle beam for re-assembly concentrate the effect so as to minimise the risk of damage to the seal 02.5681.03.00



For axles
after week 19/97
719-A-57 mm ISO B29
02.6016.00.90
719-A-57 mm ISO B29
02.6016.11.90



Kingpin removal.
The kingpin is a shrink fit into the axle beam and it is necessary to apply heat to release it.
The axle beam should be heated to cherry red concentrating the effect to the area adjacent to the king pin before pressing or driving the kingpin out. (See heating zone.)
Kingpin refit.
The kingpin can be cooled with liquid nitrogen whilst keeping the axle beam at ambient temperature.
Alternatively the axle beam will require re heating to cherry red whilst the kingpin is retained at ambient temperature.
(See note regarding kingpin seal. Part number 02.5681.03.00)

Full work instructions are contained in the "BPW Steering axles workshop manual". Designation: BPW-WHL/94/1def [7001]

A summary of the main assembly check points are as follows:
1. Observe the orientation of the bushing greaseways prior to installation into the stub axle housing.
2. The 6mm clearance dimension between the underside of the kingpin and the lower cover plate **MUST** be held.
3. Clarification of the thrust washer welding is shown on BPWL document D:\tech\docs\service\BPWLL\axlethrustwasherinst
4. Class 2-3 grease **MUST** be used for lubrication purposes.

BPW 27 degree 'LL' series self-steer axle

Thrust washer alignment tool.

When replacing the upper thrust washers ready for welding to the axle beam, it is recommended that the BPW alignment tool is used, part number 016.3.4.00049.

Prior to using the alignment tool, ensure the axle beam is positioned correctly for receiving the new thrust washers and with the steering pivot bushes removed.

Refer to Fig. 1. Remove the bottom bolts and washers by unscrewing from the mandrels. Assemble the upper and lower thrust washers. The lower thrust washers are fastened to the mandrels by using the cap head bolts and nuts.

Adjust the alignment tool mandrel centres by sliding the adjustable mandrel along the shaft until the registers align with the pivot bores of the axle beam.

Keeping both mandrel registers square to the axle beam, lower them into the axle pivot bores and allow the thrust washers to seat fully down onto the axle beam surfaces, refer to Fig. 2. Clamp the thrust washers into position by screwing the bottom bolts, complete with washers, into the bottom of each mandrel and tighten sufficiently to prevent movement.

Weld the upper thrust washers to the axle beam as per instructions for standard BPW 'LL' series self-steer axles. Refer to Fig.3.

Note: Fitting of the lower thrust washers and pivot components are as per existing instructions for standard BPW 'LL' Series steering axles.

Note: The 27 degree LL axle thrust washers are different to those used on the standard 12 - 20 degree LL axles and therefore have different part numbers.

Note: For correct greasing procedure for the thrust washers, refer to Service Bulletin document: 20160118_SB_SSA_001.

Fig 1 - Alignment tool - 016.3.400049

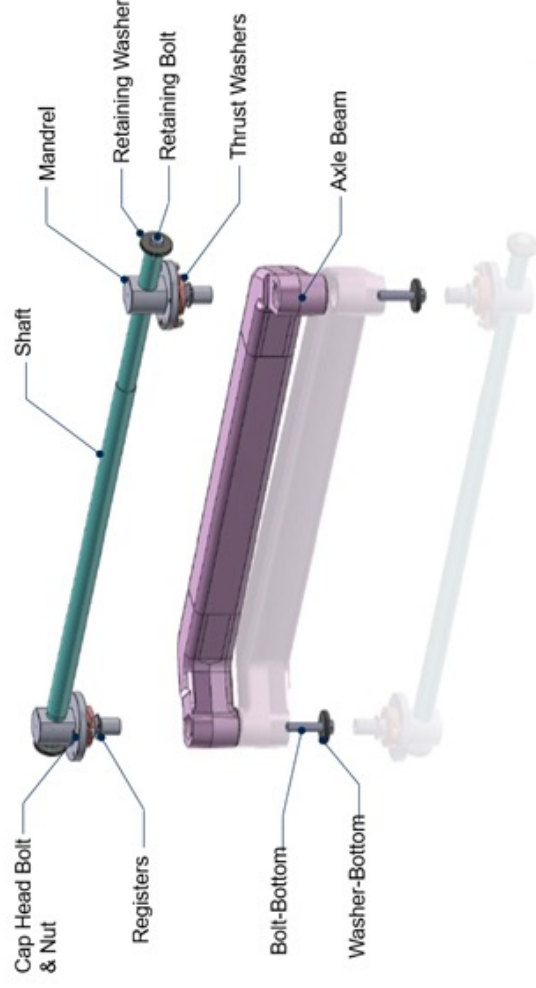
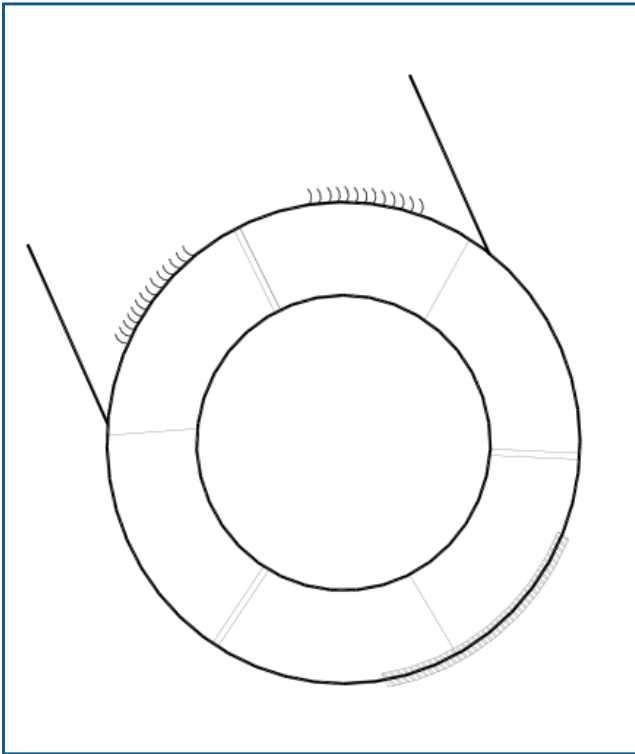


FIG 2. UPPER THRUST WASHER, FULLY SEATED READY FOR WELDING TO THE AXLE BEAM



FIG 3. UPPER THRUST WASHER WELDING TO AXLE BEAM



Rod electrode DIN EN 1600: E 18.8 Mn B22

or alternatively

Cored-wire electrode ISO 17633-A T 18.8 Mn M M 2

Solid-wire electrode ISO 14343-A G 18.8 Mn

Weld seam thickness: a 3.5 ∇ (DIN 1912)

Remove the weld splatter.



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December 2022

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