# SERVICE BULLETIN

**Bulletin Type.....: Safety Recall**

**Bulletin No.....:** TS-S108

**Bulletin Name.....:** ZF Lower Control Arm

**Bulletin Ref No.....: RL75E working instruction is dated on 25.02.2016**

**NHTSA.....: 16V106**

**Release Date.....:** 15.03.2016

**Vehicle Model.....:** TS 35 C & TS 45

**Fiat Rate Code.....:** TSS108

**Flat Rate Time.....: 4 h (Arm Replacement)**

- Front Axle Allignment Labour Hours / invoice will be claimed to TEMSA separately in detailed.

**Summary :** This Bulletin describes replacement of ZF RL75E Front Axle Lower Control Arms.

- All operators shall be advised to stop using vehicles equipped with affected axles until lower control arms have been replaced.
- No passenger transport shall be allowed until lower control arms have been exchanged.
- Vehicles in service that are stopped and checked having no cracks / defective shapes or fractures as outlined in the updated instructions are allowed to limp home without transporting passengers in order to be rectified.

**Safety Recall/NHTSA Campaign# : 16V106**

**Bulletin Responsible:** ZF Friedrichshafen AG

**Subject:** ZF Lower Control Arms Replacement

**Welding on the Chassis**

• Always disconnect the batteries (starting with the negative lead).

• Disconnect the connectors of electrical and electronic equipment (electronic control units, sensors and actuators) if they are less than 2 meters away from the chassis part to be welded or the earth terminal of the welding equipment.

• The earth terminal should never be attached to vehicle components such as engine, axles and springs. Arcing on these parts is not permitted, because of the risk of damage to bearings, springs, etc.

• The earth terminal must make good contact and be placed as close as possible to the part to be welded.

• Plastic pipes, rubber parts and parabolic springs should be well protected against welding spatter and temperatures higher than 70°.

• The contact switch must not be in the accessory or contact position. The contact key should be removed.

• Reconnect in reversed order of disconnecting. Ensure that a good earth connection is made between chassis, engine and cab.

# SERVICE BULLETIN

Service bulletin expiry dates differ according to service bulletin type.

**Definitions**

**Release Date:** As of this date the bulletin is released and available on E-Doc. Modification parts can be ordered. The time period between the release date and the effective date may vary according to the procurement lead time.

**Effective Date:** As of this date specified amount of the total modification parts will be available on Spare Parts Stock. Modification parts can be ordered and the application can be performed. ( except non-compliance and safety related campaigns, i.e. S-Type Bulletin)

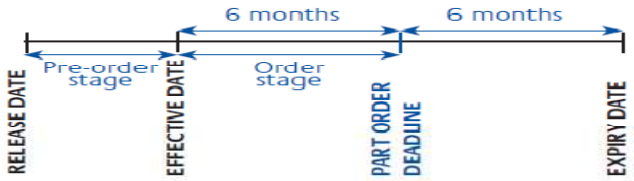
**Part Order Deadline:** Last order date for modification parts. The part orders which will be placed after this date should be approved by Regional Coordinator.

**Expiry Date:** Expiration date for the application.

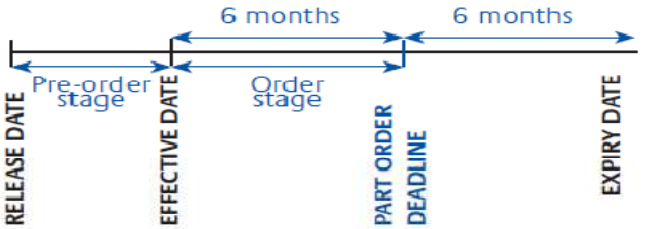
**Bulletin Types**

• **S- Type:** Application period of this bulletin is until this application has been done. S type bulletin is used for Recall Campaigns.

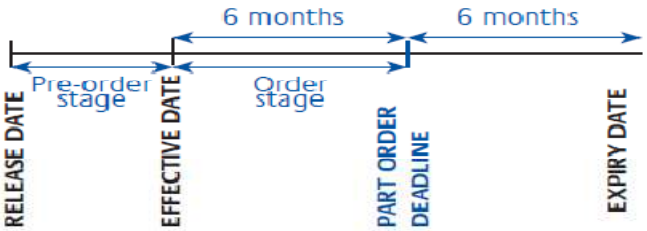
**U-Type :** Application period of this bulletin is 12 months after the date of issue.U type bulletin is used for updates that need to be performed upon customer complaints.




• **C-Type:** Application period of this bulletin is 12 months after the date of issue. C type bulletin is generally used for supplying technical instructions or other type of information to service network.




• **M-Type:** Application period of this bulletin is 12 months after the date of issue. M type bulletin is used for updates that should be implemented without waiting for customer complaints.



# PART LIST

## Installed Parts List

| No | Part No | Part Name | Qty | Unit Of Measure |
|---|---|---|---|---|
| 1 | 0501-218-142 | Axle Arm | 2 | **Piece** |
| 2 | HD114102Y | Bolt (M24x1,5x200-10.9) | 4 | **Piece** |
| 3 | HD114103Y | Hex Locked Nut (M24x1,5-10) | 4 | **Piece** |

## Excluded Parts List

| No | Part No | Part Name | Qty | Unit Of Measure |
|---|---|---|---|---|
| 1 | 0501-218-142 | Axle Arm | 2 | **Piece** |
| 2 | HD114102Y | Bolt (M24x1,5x200-10.9) | 4 | **Piece** |
| 3 | HD114103Y | Hex Locked Nut (M24x1,5-10) | 4 | **Piece** |

**TECHNICAL ORDERS :**

## RL75E Working instruction – Replacement of lower control arms

Left side and right side lower control arm

# RL75E Working instruction – Replacement of lower control arms

## 1. Preparations

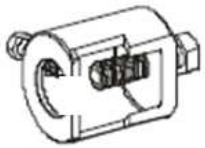
- Prepare recommended/required tools (see section 2) and spare parts
- Lift vehicle and jack it on suitable supports so that the front wheels can be heightened or lowered on the hydraulic wheel lifters independently from the rest of the vehicles (→ simplifies disassembly and assembly of lower control arms) (see example in picture b below)
- Hint: If the wheels are to be heightened or lowered independently the wheels should be secured on the hydraulic wheel lifter in order to avoid them from slipping out of position (see picture a on the right)
- Hint: Air pressure should be released out of the air spring bellows for better movability of the axle parts during the replacement work. If necessary remove the linkage of the height levelling system from the axle in order to be able to release the pressure out of the air bellows.


a


b

# RL75E Working instruction – Replacement of lower control arms

## 2. Tools

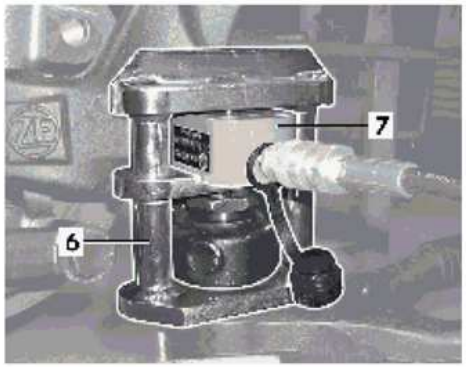


**Forcing device**

**5870 080 052**

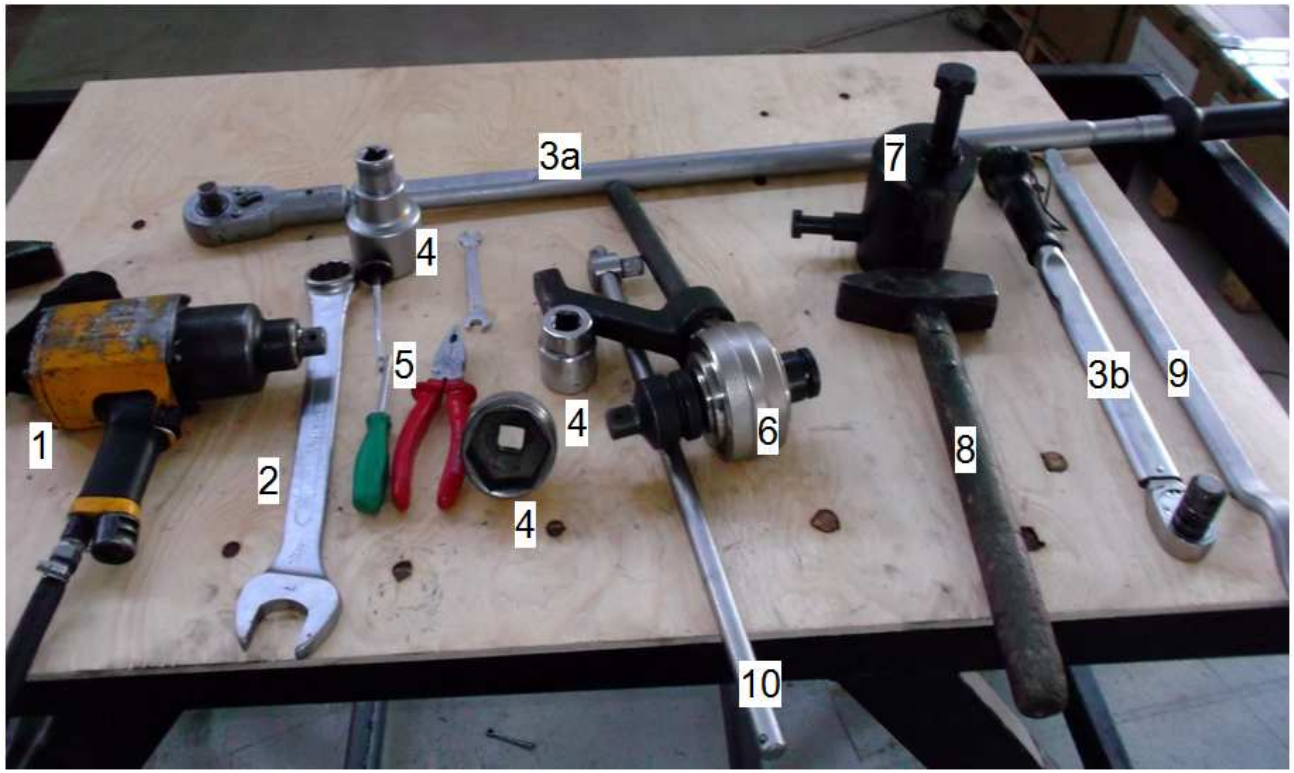
Forcing device: ZF special tool force control arm out of the steering knuckle carrier hole.

Alternative for separating ball joint connections can of course also be used if available (see examples on pictures below).




# RL75E Working instruction – Replacement of lower control arms

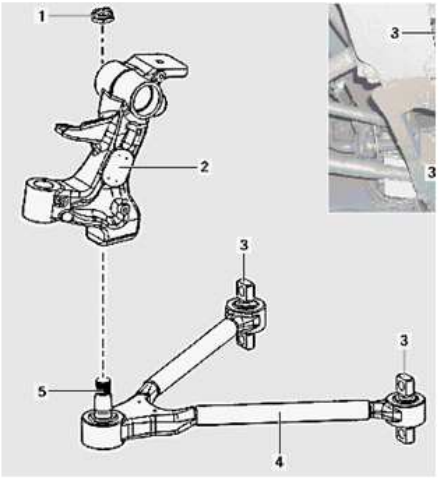
## 2. Tools



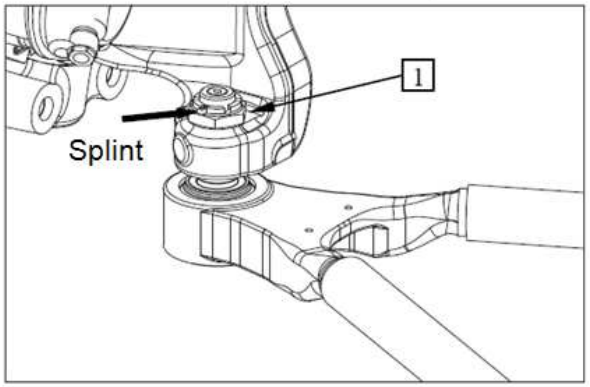

1. Pneumatic power screw driver
2. Flat wrench for vehicle frame sided control arm bolting
3. Torque wrenches
   a) Large, for fixing vehicle frame sided control arm bolting (approx. 1.100 Nm = 812 lbf.ft)
   b) Small, for tightening of castle nut in combination with torque multiplier (approx. up to 200 Nm depending on torque multiplier)
4. Wrench sockets for castle nut on control arm (55 mm), hexagon screw on ZF forcing device, vehicle frame sided control arm bolting (36 mm)
5. Pliers and screw driver for removing split pin on castle nut
6. Torque multiplier (e.g. 1:5) for tightening of castle nut on control arm
7. Forcing device: ZF special tool force control arm out of the steering knuckle carrier hole (see previous slide)
8. Hammer
9. Pry bar (for supporting torque multiplier during tightening of crwon nut)
10. Lever for use in combination with wrench socket and ZF forcing device (7)

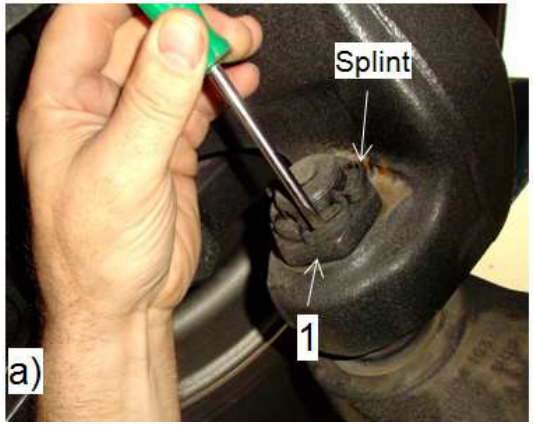
# RL75E Working instruction – Replacement of lower control arms

## 3. Disassembly of lower control arm



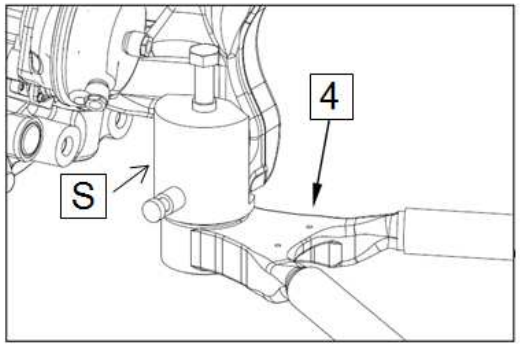

- Lift wheel until control arm is horizontal
- Remove split pin (see arrow picture a) and loosen castle nut (1) from tapered stud (5) of lower control arm (4). Unscrew castle nut (1) until the castle pegs are flush with the threaded end of the tapered stud (5), means do not unscrew completely.
- Hint: In case of problems regarding free travel between nut and knuckle carrier (2) the outer diameter at the lower end of the wrench socket can be reduced a bit by turning (see picture b).

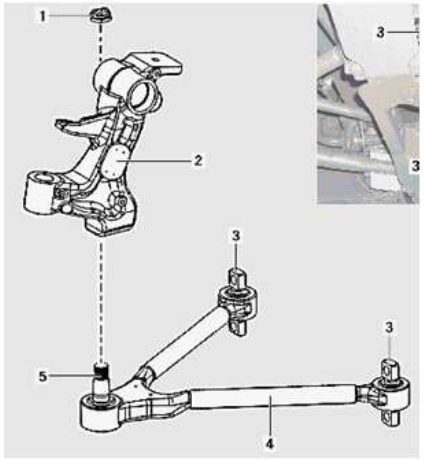



# RL75E Working instruction – Replacement of lower control arms

## 3. Disassembly of lower control arm




Use ZF forcing device (S) (or other suitable tool) to force control arm (4) out of the steering knuckle carrier hole and press out the tapered stud (5) until the cone is detectably released from the knuckle carrier (2).

(S) Forcing device 5870 080 052

**Pay attention that the control arm does not drop!**

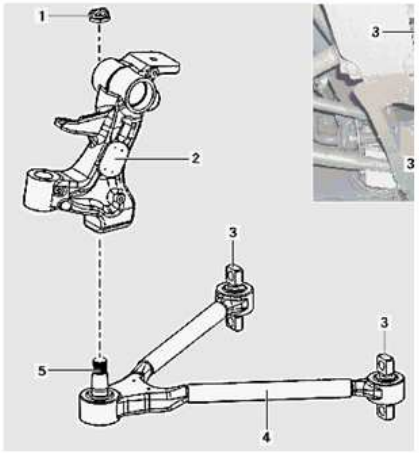
- Remove the forcing device and support the control arm.

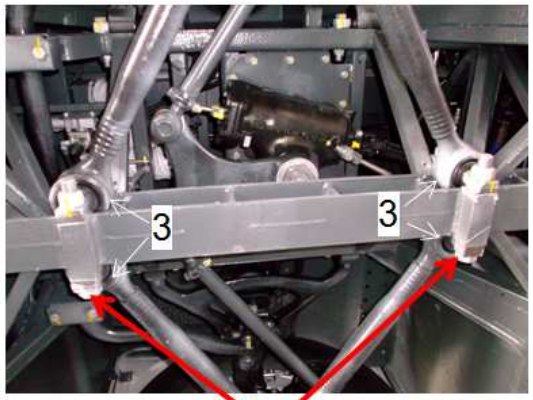
**Warning:**

**Since the left and right transverse control arms are secured to the chassis using the same threaded connections on most vehicle types, the opposing transverse control arm should likewise be supported to prevent it from falling down.**

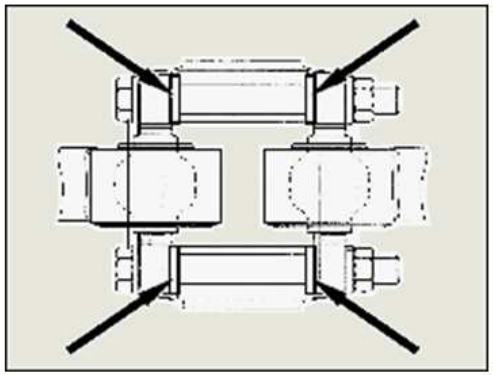
# RL75E Working instruction – Replacement of lower control arms

## 3. Disassembly of lower control arm




- Remove front and rear control arms (3) from the chassis, unscrew the castle nut (1) from the tapered stud (5) and take out the control arms.
- Hint: For taking out the control arms it can be necessary to lift the axle side a bit (by approx. 60 mm) in order to be able to take the tapered stud (5) out of the knuckle carrier (2) (it might be useful to put markings on the hydraulic wheel lifter, see picture a)

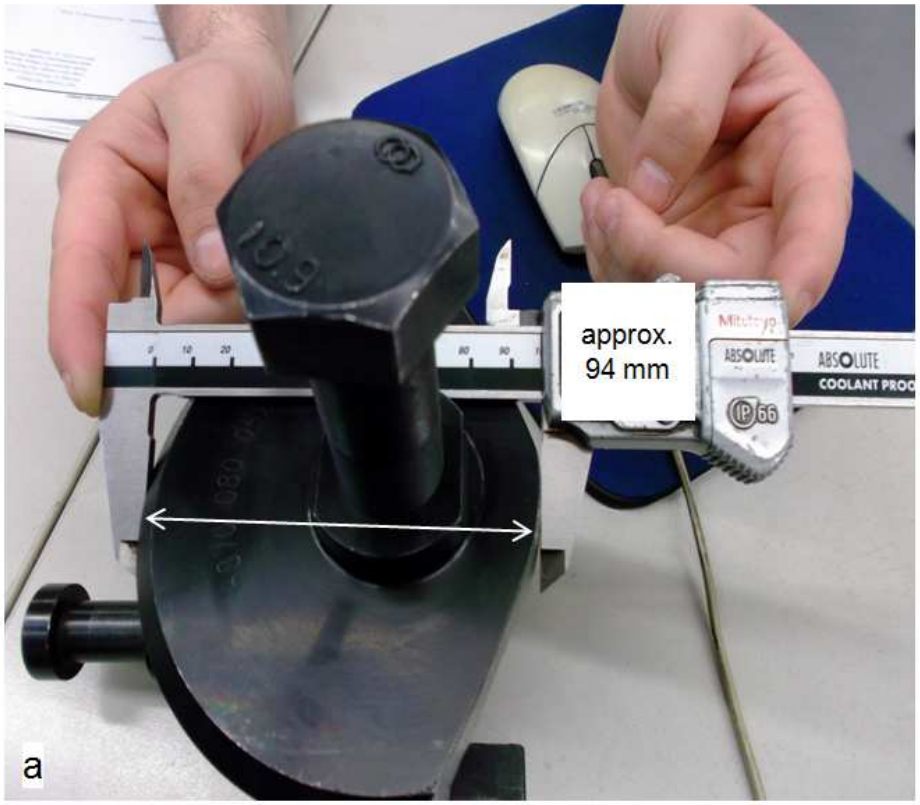
**Warning:**

**When removing the transverse control arm from the chassis be aware of the distance shims (arrows) for the camber setting.**

**Distance shims must be used at the same position when reassembling the new control arm!!!**

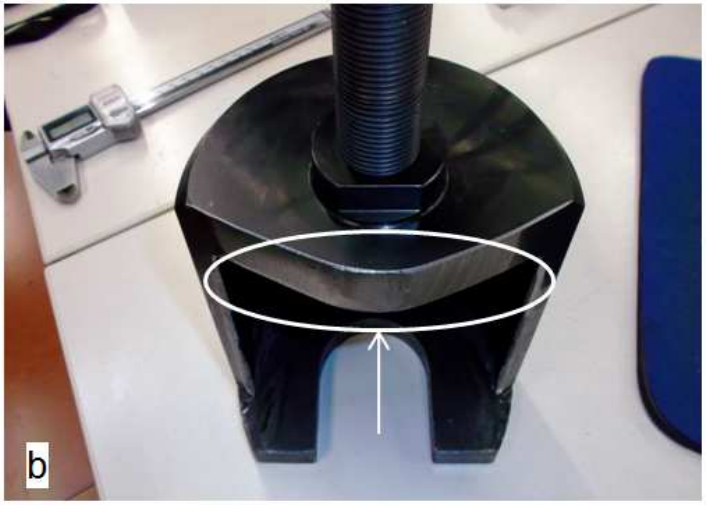
**After installation is completed front alignment must be performed (Observe Annex1)!!!**

# RL75E Working instruction – Replacement of lower control arms
## 3. Disassembly of lower control arm



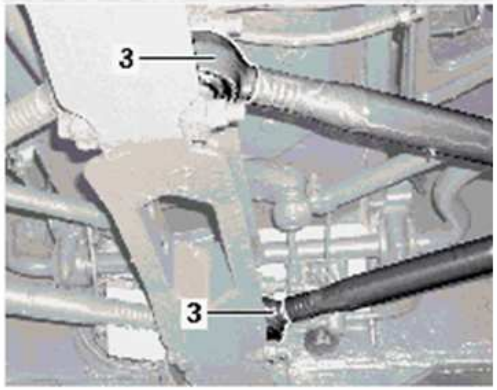

Hint:

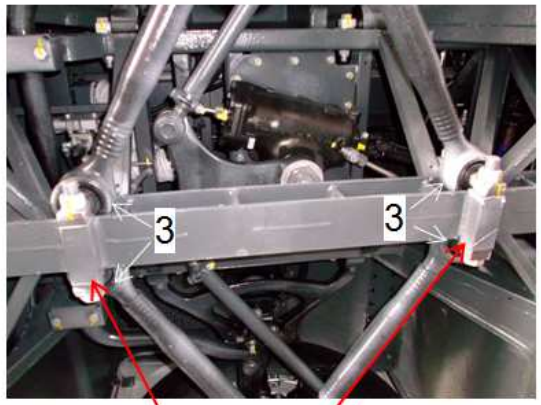
In case of problems regarding free travel between ZF forcing device 5870 080 052 and knuckle carrier (2) the forcing device can be ground on the relevant surface (see picture b). Guideline for correcting dimension see picture a.

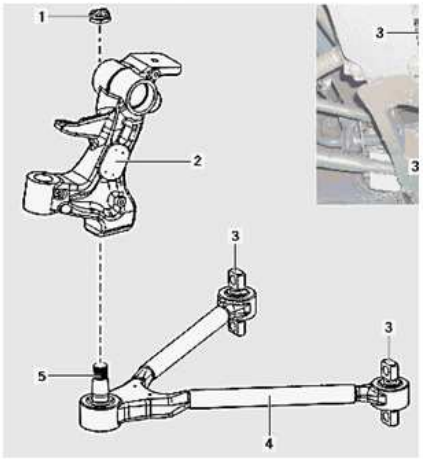


# RL75E Working instruction – Replacement of lower control arms

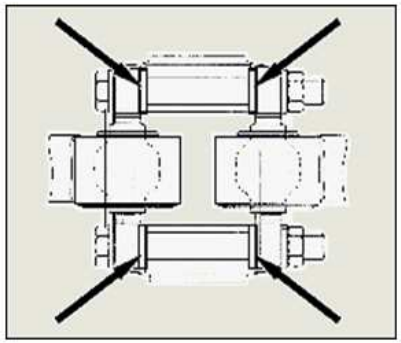
## 4. Assembly of the lower control arm




- **Warning: Tapered stud (5) and tapered bore as well frame sided attachment surfaces must be clean and free of oil and grease.**
- Place the front and rear control arm bearings (3) with the distance shims for camber setting (arrows) on the chassis and tapered stud (5) on the knuckle carrier (2).
- Hint: If the front axle has been lifted during disassembly of the control arm it is now necessary to lower the axle again (by approx. 60 mm) in order to be able to put the tapered stud (5) completely into the knuckle carrier (2) .
- Place the castle nut (1) on the tapered stud (5) of the control arm and nuts on the bolts of frame sided control arm attachments (3).



**Warning:**

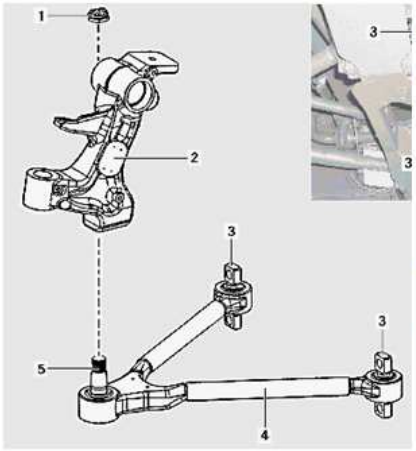
**It must be necessary to renew bolts and flat collar nuts of the frame sided control arm attachments (3) each time they have been loosened.**

**When reassembling ensure the same distance shims are used for the camber setting as were taken off during removal. Fit the same number of distance shims with the same thickness at each of the four threaded connection points of the control arm.**

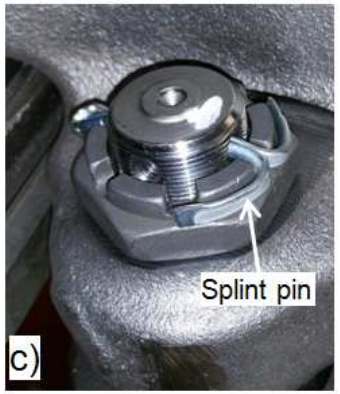
**After installation is completed front alignment must be performed (Observe Annex1)!!!**

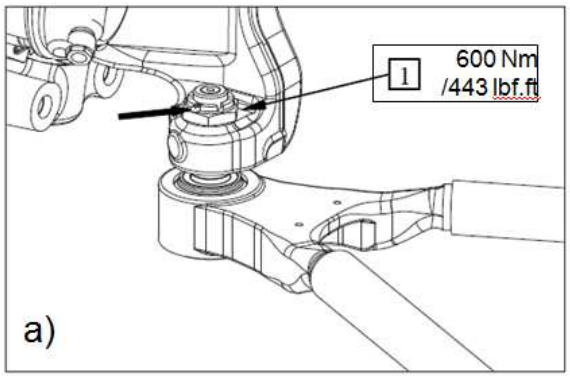
# RL75E Working instruction – Replacement of lower control arms

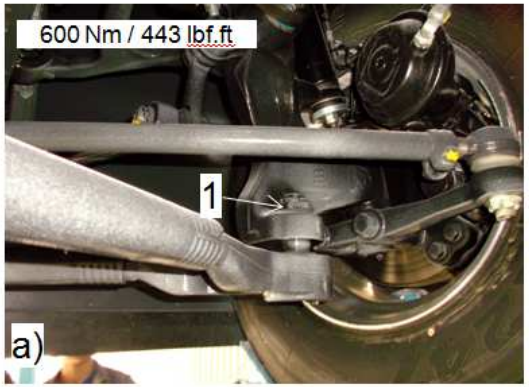
## 4. Assembly of the lower control arm

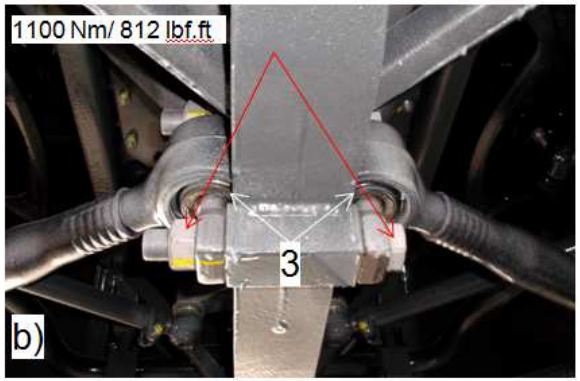



- Tighten the castle nut (1) and threaded connections of the control arm bearings (3).
- **Tightening torques:**
  - a) castle nut (1) / tapered stud lower control arm to knuckle carrier - 600 Nm = 443 lbf.ft
  - b) Bearing lower control arm (3) to chassis – 1100 Nm = 812 lbf.ft
- **Warning: Secure castle nut with split pin (see picture c)!**
- Hint: If it is not possible to insert the split pin after tightening with 600 Nm = 443 lbf.ft, increase the tightening torque until the next possible slot is achieved is given (exact alignment "split pin – groove of castle nut - tapered stud hole")



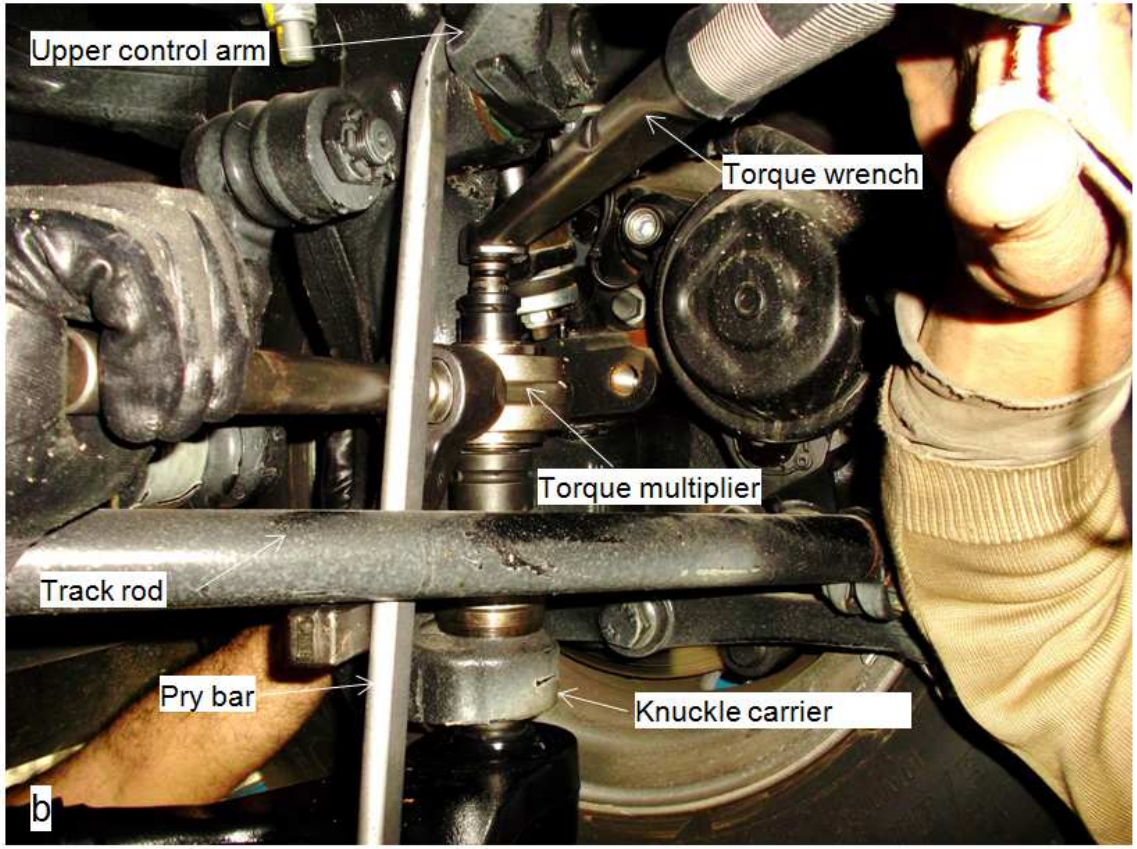



# RL75E Working instruction – Replacement of lower control arms

## 4. Assembly of the lower control arm




**Hints:**

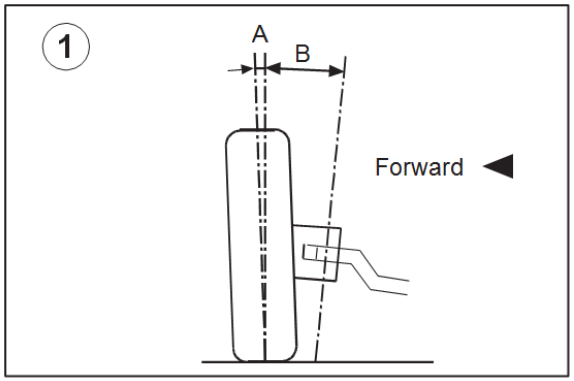
- For tightening the castle nut (1) with 600 Nm / 443 lbf.ft a torque multiplier (e.g. 1:5) can be used as shown in picture (a) below.
- If a torque multiplier is used it needs an abutment to prevent it from turning during tightening. To do so a pry bar can be used which is supported on upper control arm and track rod during tightening (see picture (b) on the left).

# RL75E Working instruction – Replacement of lower control arms
## 5. Final steps

- Unprotected surfaces of the new parts should be treated with an anti-corrosion protection.
- Reassemble the linkage of the height leveling system to the axle.
- Reassemble any further dismantled components according to vehicle manufacturers specifications.
- If the wheels have been secured on the hydraulic wheel lifters remove the fasteners.
- Lower vehicle back on wheels
- Check the front alignment according the vehicle manufacturers specification (Observe Annex1) and correct if necessary.

If the TEMSA service point is equipped for the front alignment process, labor hours for the alignment should be claimed to TEMSA with reference to the Service Bulletin. If the service point is not equipped for front alignment, than invoice for the front alignment must be send to TEMSA with reference to the Service Bulletin.

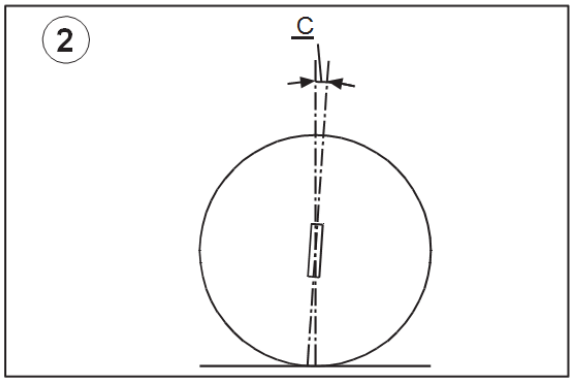
# ANNEX - 1



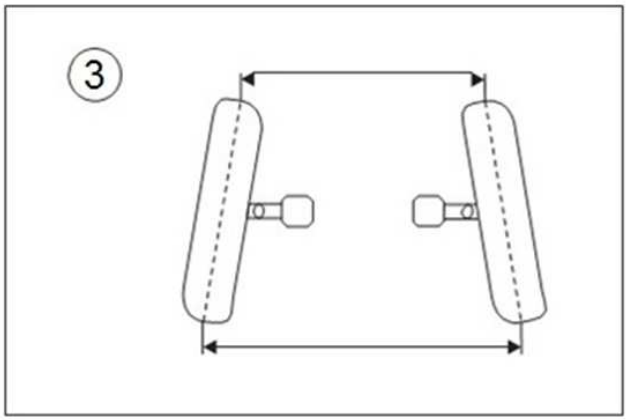

**ON VEHICLE ADJUSTMENT AND INSPECTION**

**ALIGNMENT**

1. A = Camber angle = 0° ± 0,5
   B = King-pin angle = 8° ± 0,5




2. C = Caster Angle = 2,5° ± 0,5




3. Total Toe-in = 1/50" - 3/50" (inner)

## FLAT RATE BREAK DOWN

| | |
|---|---|
| **Total Time** | **4 hours + Alignment** |