



# ANDHRA PRADESH STATE ROAD TRANSPORT CORPORATION

O/O The VC & MD,  
RTC House, VJA.

No. OP2/462(01)/2024-MED.

## **Circular No. 01/2024:MED, Dt.15.02.2024.**

Sub: **MAINTENANCE** – Maintenance of Steering Knuckle arm Bolts & Tie rod and Drag link Kits - Instructions issued - Reg.

Ref: Cir. No:13/2005 - MED, Dt.07.11.2005 from ED(E).

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Instances have come to notice that buses are failing en-route due to breakage of Steering Knuckle Arm bolts. This will result in loss of control over the steering which will lead to ghastly accidents. The tightening of Steering Knuckle Arm bolts shall be ensured during every SCH-III/IV maintenance to avoid line failures and possible accidents.

Hence, the circular instructions are once again re-iterated for the strict implementation.

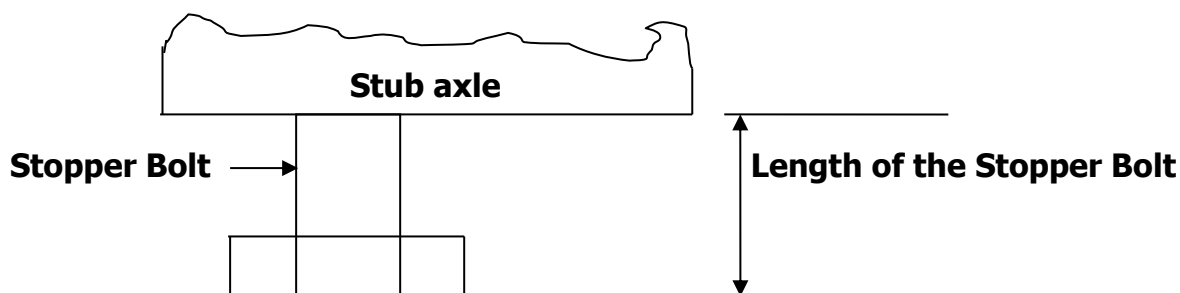
The turning angle is restricted when the stopper bolt touches the Front Axle I-beam in case of manual steering Vehicles. But in case of Power Steering Vehicle, the restriction of turning angle is being done with the steering limiter screws (poppet screws) provided in the Power Steering Box. Thus, there should be a gap of 3mm between the stopper bolt and I-beam.

It is observed that in certain depots, the stopper bolts are touching I-beam indicating that the tampering of steering limiter screw's (poppet screw) adjustment in the Steering Box. This may result in overload on the Knuckle Arm resulting in breakage of Knuckle Arm/ Knuckle Arm Bolts.

The procedure to adjust the poppet screw in case of power steering vehicles and the stopper bolt length to be maintained are reiterated hereunder:

### **1. STOPPER BOLT:**

The stopper bolts provided on the back side of the stub axle is to control the turning angle of the road wheels. It shall be ensured that these stopper bolts should always be present as per the manufacturer's specifications. They should not be removed or tampered.



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**a) Tata Vehicles:**

For LP 52 Vehicles, the projection of the stopper bolt length shall be 48 mm and for LPO 55 Vehicles, it should be 43 mm. These lengths shall be measured from stub axle surface to the bolt head surface as shown in the diagram.

**b) Leyland Vehicles:**

There should be a gap of 1 inch between spring bracket and tyre in the rear portion of the tyre when the wheel is fully turned in one direction. If not, the stopper bolt should be adjusted to get this 1-inch gap.

**2. POPPET SCREW:**

The length of poppet screw from the surface of the Power Steering Box to the end of the screw shall be 17 mm. At this condition, there should be a gap of 3 mm between stopper bolt and front axle I-beam when the road wheels take full turn in one direction.

**a) Function of Puppets:**

Poppets are pressure unloading valves, set to trip just before full turn is reached in each direction. One valve or the other depending on the direction of turn will trip as the steered wheels approach the I-beam. When the procedure is completed correctly, system pressure will be reduced before the stopper bolt comes into contact with the I-beam (which must be set to manufacturers' specifications).

**b) Poppet screw adjustment:**

In normal cases, Poppet Screw adjustment is not required. However, in the following conditions, the poppet screw adjustment is required:

- Changing to a larger tyre.
- Reduction in the Vehicle's wheel cut
- Pitman arm was mis-timed, and has been corrected.
- Steering box is being installed on a different vehicle.
- Stopper bolts were bent or broken or missing.
- Incorrect stopper bolt length.

**c) The poppet screw has to be adjusted as follows whenever necessary:**

- Keep the front wheels in the straight-ahead position.
- Remove pull and push rod connection from the Steering Box drop arm.
- Bring the steering wheel to the centre position.
- Ensure correct alignment of sector shaft and drop arm markings.
- Ensure the pull and push rod end should fit into the drop arm easily without changing the above position.
- Adjust the poppet screws to the specified length of 17 mm.
- The above procedure will automatically ensure a gap of 3 mm between the stopper bolt and I-beam. If not, correct the length of the stopper bolt to the specified length.

Ensure proper condition of the stopper bolts and poppet screws during every SCH-III/IV maintenance including tightening of steering knuckle arm bolts.

**3. Procedure for checking of Knuckle Arm Bolts & Tie rod ends:**

- Remove brake shoes during Sch III/ Sch IV maintenance duly marking Top shoe with marker or paint and inspect the brake shoe rollers & roller seating area condition, S-Cam shafts condition and S-Cam shaft bush play/ end play, attend, if necessary, by replacing the bushes.
- Inspect the condition of knuckle arms for holes oblong or worn out, replace them immediately if any of the holes are found oblonged or worn out.
- Check the knuckle arm bolts & nuts and tighten the nuts duly removing the split pin during every Sch-III/Sch-IV maintenance. When the knuckle arm bolt & nut are found defective or threads worn-out; change them invariably and provide suitable **new split pin** only. Never use rivet nails or other un-suitable pins as seen on most of the Vehicles. Ensure fitment of new correct split pins every time after tightening of the Castle nuts on the Knuckle arm bolts.
- At times, it is also observed that Knuckle arm bolts are fitted with loose nuts by using longer size Knuckle arm bolts when the required size Knuckle arm bolts are not available, which shall be dispensed with immediately.
- Replace the Tie rod and Drag link kits during every alternate Sch-IV maintenance or during every FC attention invariably duly checking the ends condition (change the ends if required). Maintain a register for Tie Rod & Drag link kits replacement invariably.
- Re-fit the brake shoes duly inverse them i.e., Top shoe at bottom side and bottom shoe on top side for even wear & better life of the brake shoe liners.

All the Depot Managers are advised to ensure implementation of the above procedure with respect to Stopper bolts, Poppet screws, steering knuckle arms, Knuckle arm bolts & nuts and Tie rod & Draglink kits without any deviation.

All DPTOs shall ensure the implementation of the above instructions during their depot inspections.

  
15/2/24  
**EXECUTIVE DIRECTOR(E)**

To  
**All the Depot Managers.**

- Copy to: ED(A), ED(O) and FA&CAO for information.
- Copy to: All ED(Zones) for information.
- Copy to: All DPTOs for information & necessary action.
- Copy to: All Dy.CMEs, WMs, COSs for information & necessary action.
- Copy to: All Principals of ZSTCs & TA/VJA for information.
- Copy to: OSD to VC&MD for information.