

ANDHRA PRADESH STATE ROAD TRANSPORT CORPORATION

Office of the VC & MD
Mushierabad, Hyd – 20

No.OP2/462(18)/2006-MED

CIRCULAR No:02/2007-MED, Dt.23.01.2007

Sub : MAINTENANCE – Maintenance of Air Suspension system on vehicles –
Stocking of essential spares at Depots – Reg.

Ref : 1. Cir No.6/2004-MED, Dt.08.04.2004.
2. Cir No.7/2004-MED, Dt.08.04.2004

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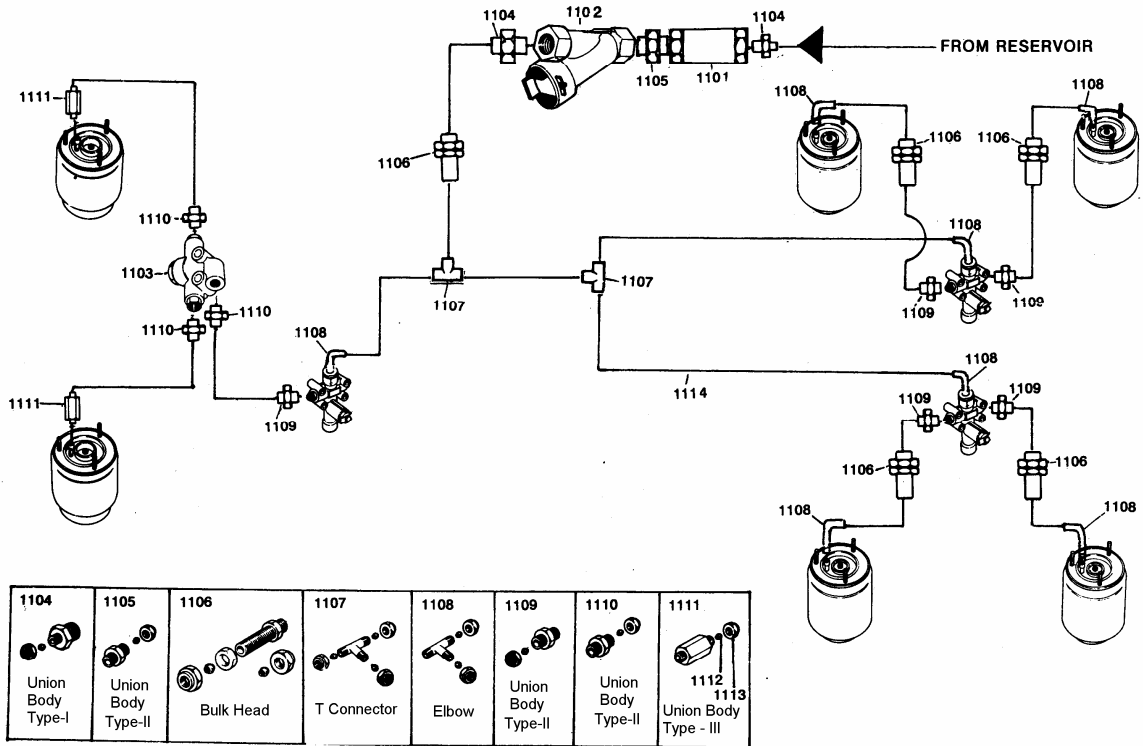
Vide circular cited, detailed guidelines have been issued on maintenance of Air Suspension system at Depots.

Recently, instances have come to the notice that the vehicles are being kept offroad at Depots for want of Air Bellows and other spares required for repairs/ replacement in the event of failure. At present, the Depots are procuring the spares from the authorized Dealers of M/s Wheels India Ltd as and when the spare parts are required for replacement, which is a time consuming process. In the mean time, the vehicles are being kept offroad, resulting in loss of earnings.

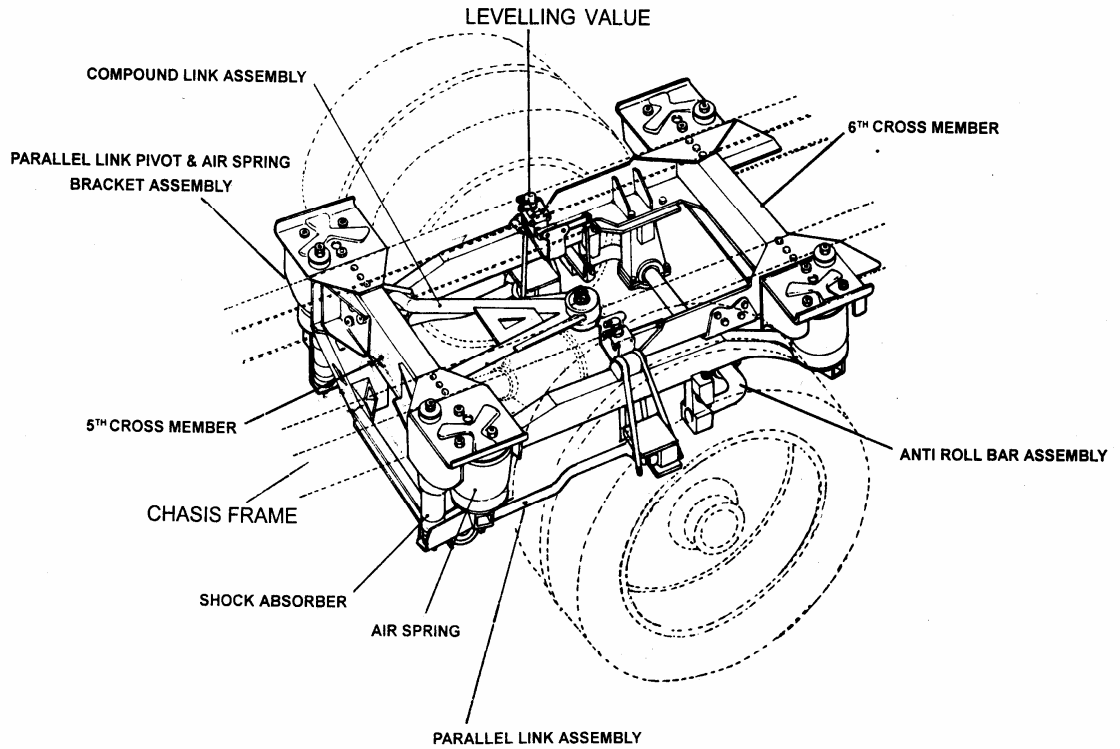
In order to avoid delays in procurement of spares and offroad of vehicles for want of spares it is proposed to keep the following important spare parts as stock items at Depot Stores for timely repairs/replacement.

S. No.	Description	Part Number	Qty to be Stocked
1	12" Rolling Diaphragm (Rubber Bellow)	552140000200	2 nos
2	Minor Kit for Levelling valve	552150000800	4 nos
3	Major Kit for Levelling valve	552150000700	1 no
4	Rubber Connector assy for Levelling Valve	552250000300	8 nos
5	Spherilastic Bush for	552260002500	2 nos
6	Spherilastic Bush for	552260004300	8 nos
7	M.R.Split Bush	552260005500	16 nos
8	Hex Bolt M16 x 2 x 120mm	552411004500	4 nos
9	Hex Bolt M16 x 2 x 140mm	552411006100	4 nos
10	Hex Nut M16 x 2	552421000700	8 nos
11	Spring Washer M16	552432000600	24 nos
12	Rubber pads	552260001200	8 nos

SCHEMATIC LAY OUT OF AIR CIRCUIT FOR AIR SUSPENSION SYSTEM

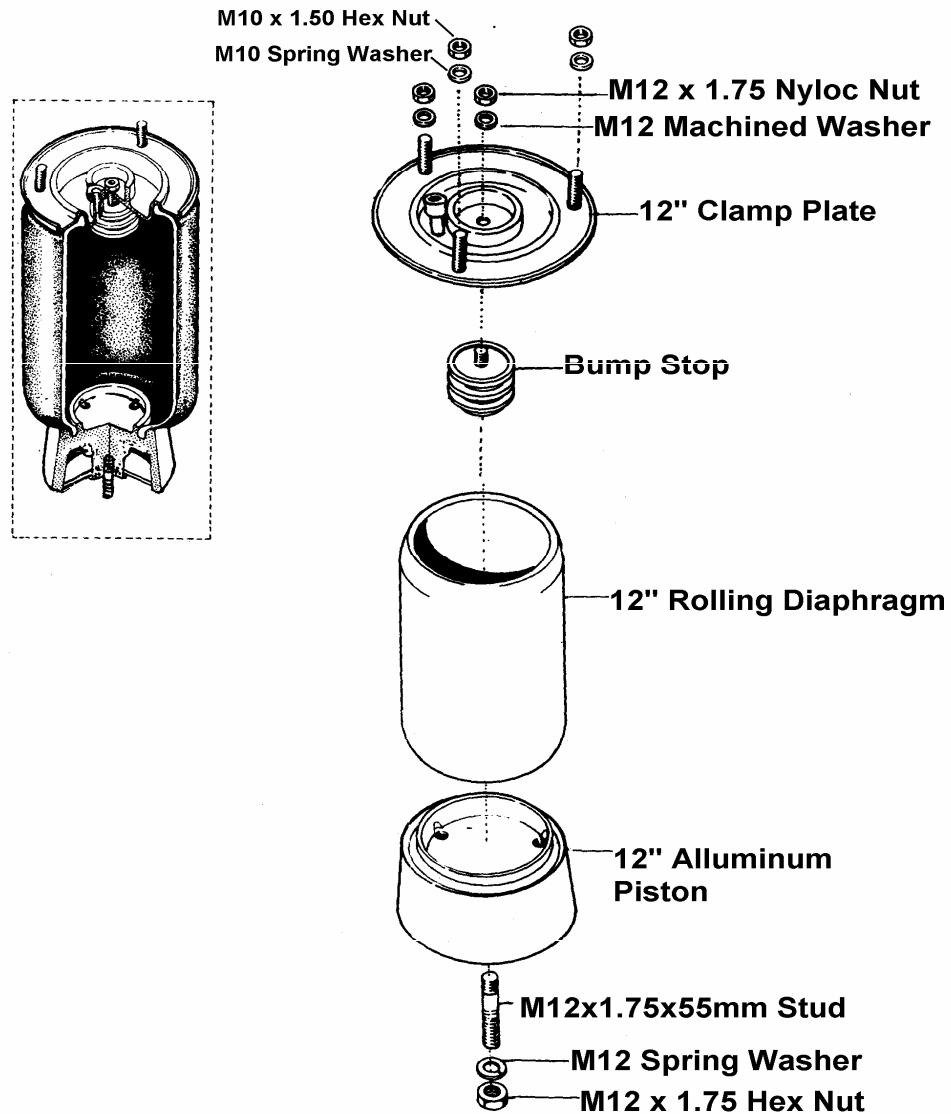


AIR SUSPENSION SYSTEM - DRIVE AXLE ASSEMBLY



1.0). SERVICE INSTRUCTIONS FOR AIR SPRING ASSEMBLY :

12" AIR SPRING ASSEMBLY



1.1). REMOVAL OF AIR SPRING ASSEMBLY FROM THE VEHICLE:

- a) If air is available to the vehicle suspension, disconnect the Leveling Valve connecting rod, push the lever up, charge the system and support the chassis on both sides using suitable stands at static height. (Static ride height of Air spring assembly is measured from the bottom surface of the Air spring piston to the top surface of the clamp plate when the vehicle is positioned on level ground and the vehicle air system is fully charged. The static ride height is 295mm for Front and 265mm Rear).
- b) Exhaust the air from the system by pulling the lever of the valve downwards. If air is not available, jack both sides of the vehicle (chassis) up, and then support on stands.

- c) Remove the inlet connection, mounting nuts from air spring assembly and remove the air spring from vehicle without causing any damage to the mounting fasteners.

1.2) Dismantling :

- a) Using a soft nose mallet, knock off the clamp plate assembly from the diaphragm for dismantling.
- b) Remove diaphragm from the piston using a blunt instrument levering between piston and diaphragm until the joint breaks. Be careful not to damage the diaphragm bead area and piston while removing the diaphragm.

1.3). Inspection :

- a) Check for damage to the sealing bead profile at both ends of the diaphragm
- b) Clean all metal components, remove any difficult contaminants without damage to the parts, and thoroughly dry.
- c) Inspect metal parts for excessive corrosion, distortion or damage, notably at the sealing bead diameters on both piston and clamp plate.
- d) Replace components as necessary.

1.4). Assembly :

- a) Apply soap solution to diaphragm seating bead and place rolling diaphragm on to the top of piston. Make sure bead area is seating properly by hammering the inside of the bead circumference with a wooden hammer.
- b) Fold and roll the diaphragm bottom around piston until the bump stop touches the piston top.
- c) Apply soap solution to the upper sealing bead of the diaphragm. Fix the clamp plate assembly to the top of the diaphragm.

1.5). Fitment to Vehicle :

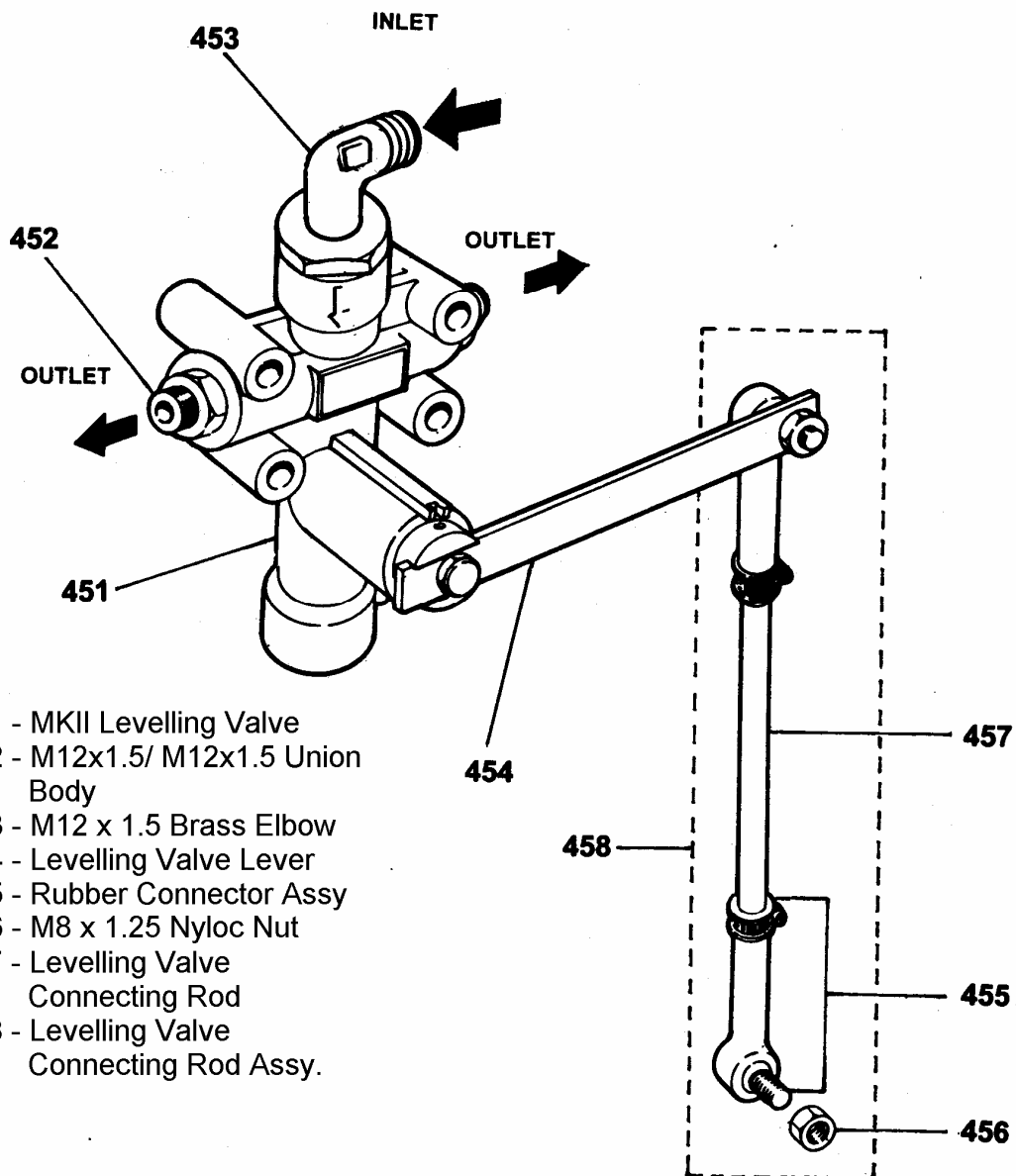
- a) Fitting is reversal to the removal (section 1.1) and tighten the mounting bolts and nuts.
- b) Check the air spring assembly for leaks.
- c) Check the static height as explained at section 1.1.a).

1.6). Inspection after Installation:

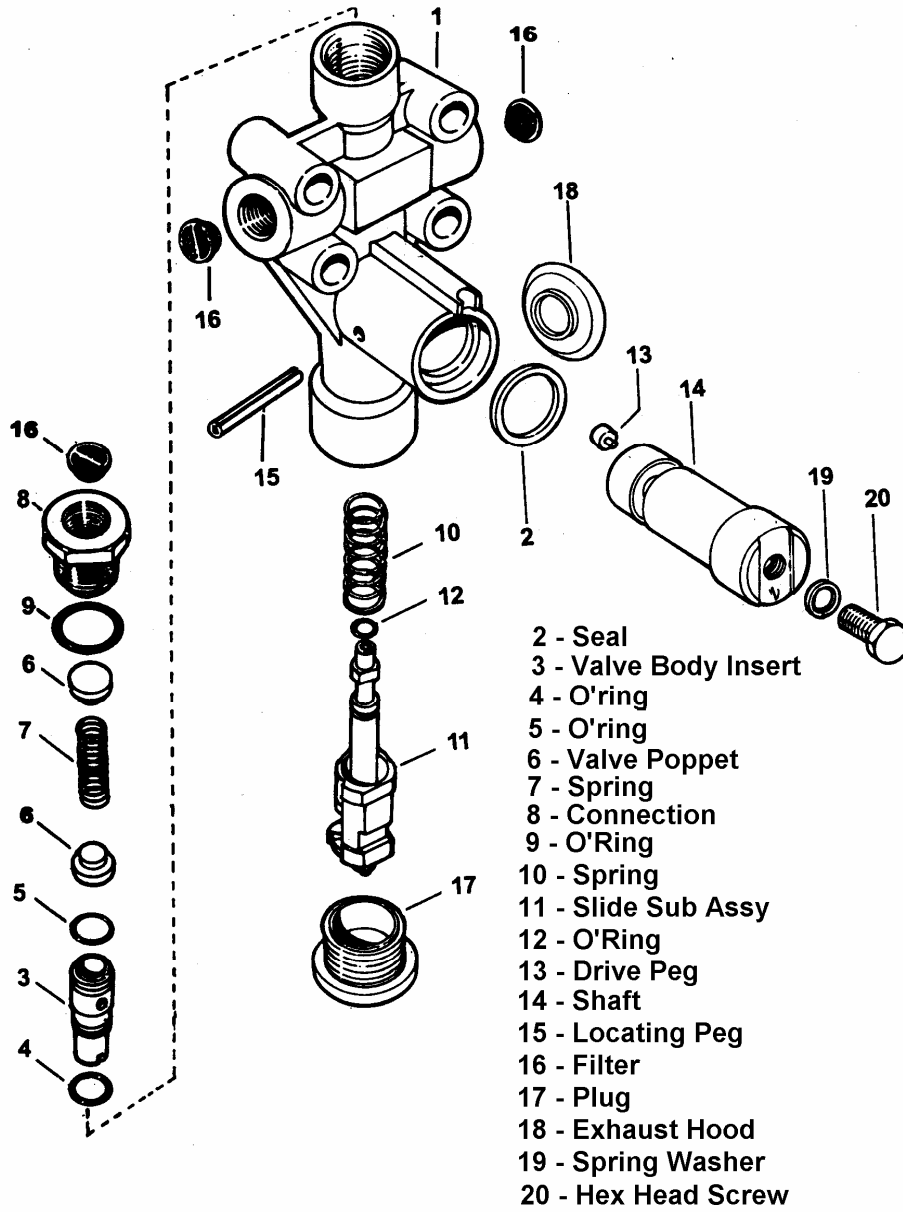
With the Air spring assembly still on the vehicle and pressurized to the static ride height, inspect the following;

- a) Using a soap solution check for air leaks around the inlet connections in the clamp plate at the top of the Air spring.
- b) Check for leaks from the sealing beads by soaping between diaphragm and piston at the bottom, diaphragm and clamp plate at the top.
- c) Visually inspect the diaphragm for splits, tears and perforation that have split the outer rubber case exposing the cord.

REAR LEVELLING VALVE ASSEMBLY



EXPLODED VIEW OF LEVELLING VALVE ASSEMBLY



Minor Kit – Part No : 552 150000800 consists of sl.No.4,5,9,12 & 16

Major Kit – Part No : 552150000700 consists of Sl.No.2,4,5,6,7,9,
10, 12,13,16,17 & 18

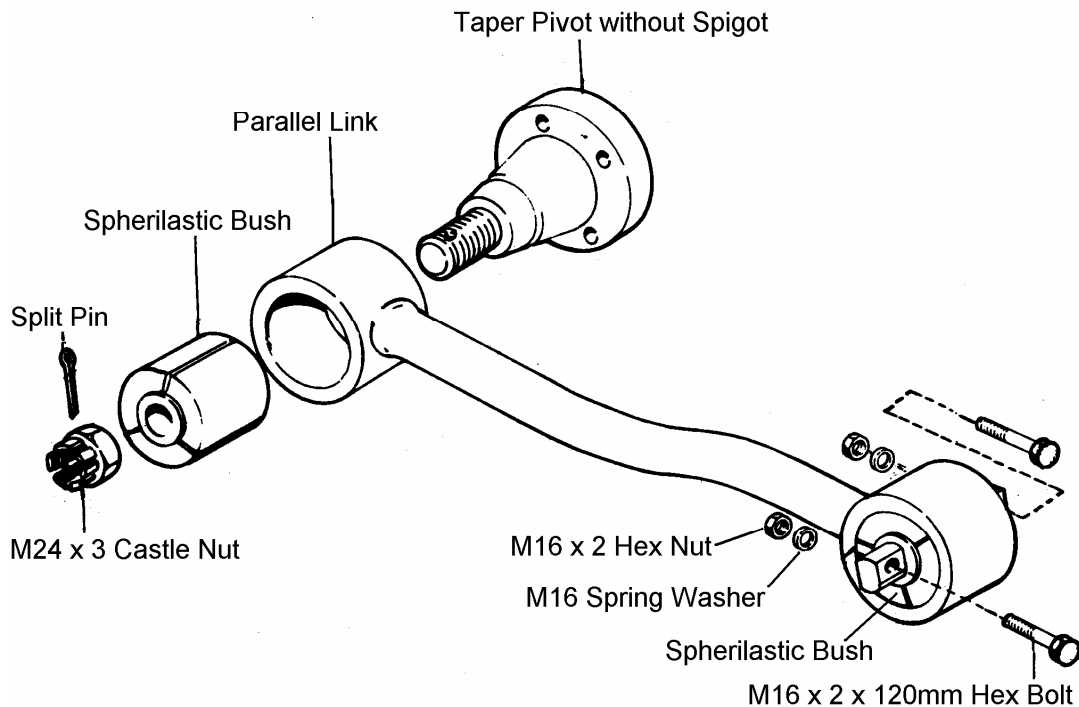
2.1) LEVELING VALVE REMOVAL & FITMENT :

- a) For removal, disconnect the leveling valve connecting rod from axle end and lower the leveling valve control lever to approximately 30 degrees below the neutral position. Hold in this position until the body rests over the bump stop rigidly. In case of rear leveling valves, operate the leveling valves available in both sides (LH & RH) simultaneously, until the bump stop rests over the top of the piston.
- b) Remove the inlet and delivery pipes from their respective leveling valve posts. Precaution must be taken to prevent foreign matter entering the air lines.
- c) Remove the nuts that retain the leveling valve to the mounting bracket and remove the valve from the vehicle.
- d) Recondition the leveling valve with new repair kits
- e) Fitment of the leveling valve to the vehicle should be carried out by reversing the removal procedure.
- f) Check the disturbed pipe connections for air leaks and reset the static height of the Air Springs if necessary.

2.2). Checking of the valve operation :

- a) Disconnect the valve connecting rod from axle end. Ensure the vehicle air supply is being maintained at 6 kg/sq.cm pressure.
- b) Raise the Levelling valve control lever to approximately 30 degrees above the neutral position. Maintain this position, until the air spring assemblies are seen to inflate. Take care not to overinflate. Return the control lever to the neutral position and observe that the air spring inflation stops.
- c) Lower the leveling valve control lever to approximately 30 degrees below the neutral position. Hold in this position until air is heard passing through the valve's exhaust port and the air spring assemblies are seen to deflate. Return the control lever to the neutral position and observe that exhausting and air spring deflation stops.
- d) If the leveling valve test is satisfactory, connect the leveling valve to the axle connecting rod. Check for air leaks and check the static height of the air spring assemblies.

PARALLEL LINK ASSEMBLY



3.0) REMOVAL AND FITMENT OF PARALLEL LINK ASSEMBLY :

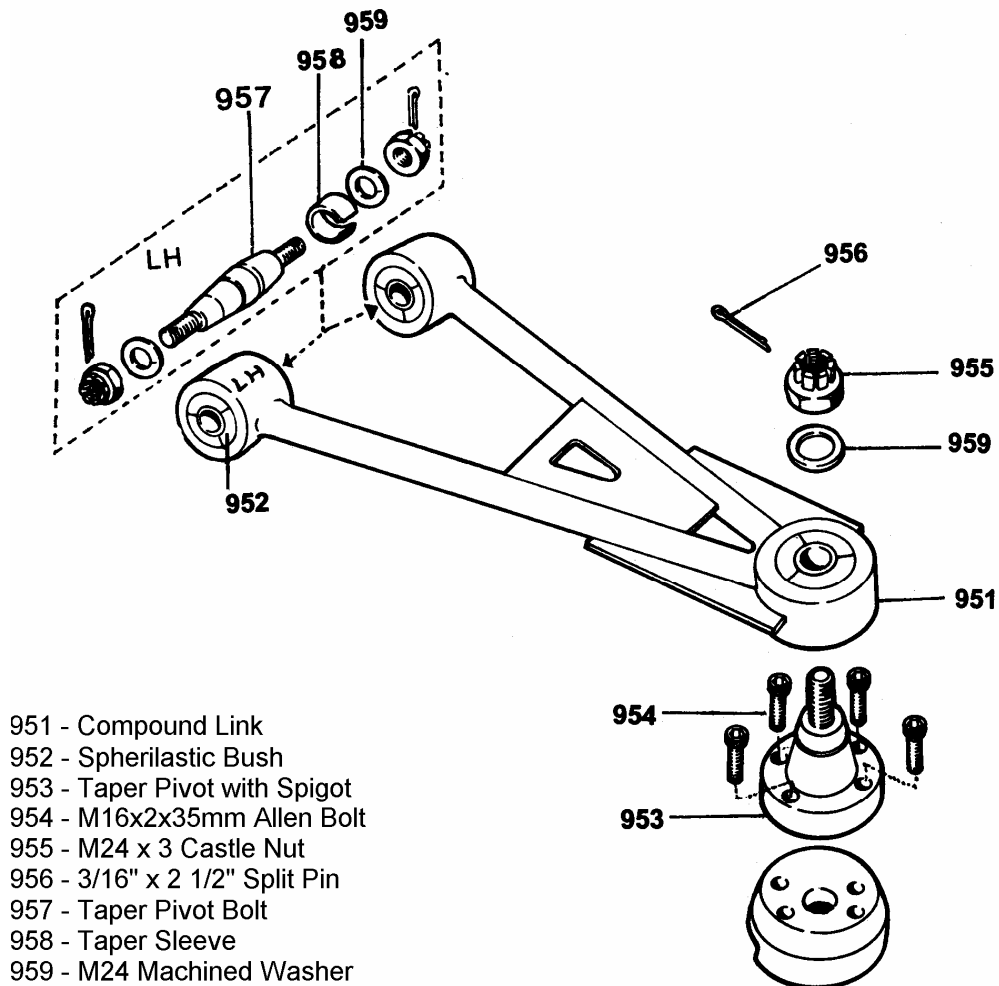
3.1) AXLE END :

- a) For removal of parallel link assembly at axle end, remove the two bolts which secure the parallel link pin with pivot bracket of axle bottom.
- b) For fitment, reverse the procedure and tighten the bolts.

3.2). CHASSIS END :

- a) Remove the nuts, which secure the parallel link with pivot bracket frame assembly.
- b) Insert the puller between taper pivot and parallel link assembly.
- c) Remove the parallel link by tightening the puller bolt.
- d) For fitment, locate the parallel link over taper pivot and tighten the nut. Use the split pin for locking.

COMPOUND LINK ASSEMBLY



4.0) REMOVAL AND FITMENT OF COMPOUND LINK ASSEMBLY :

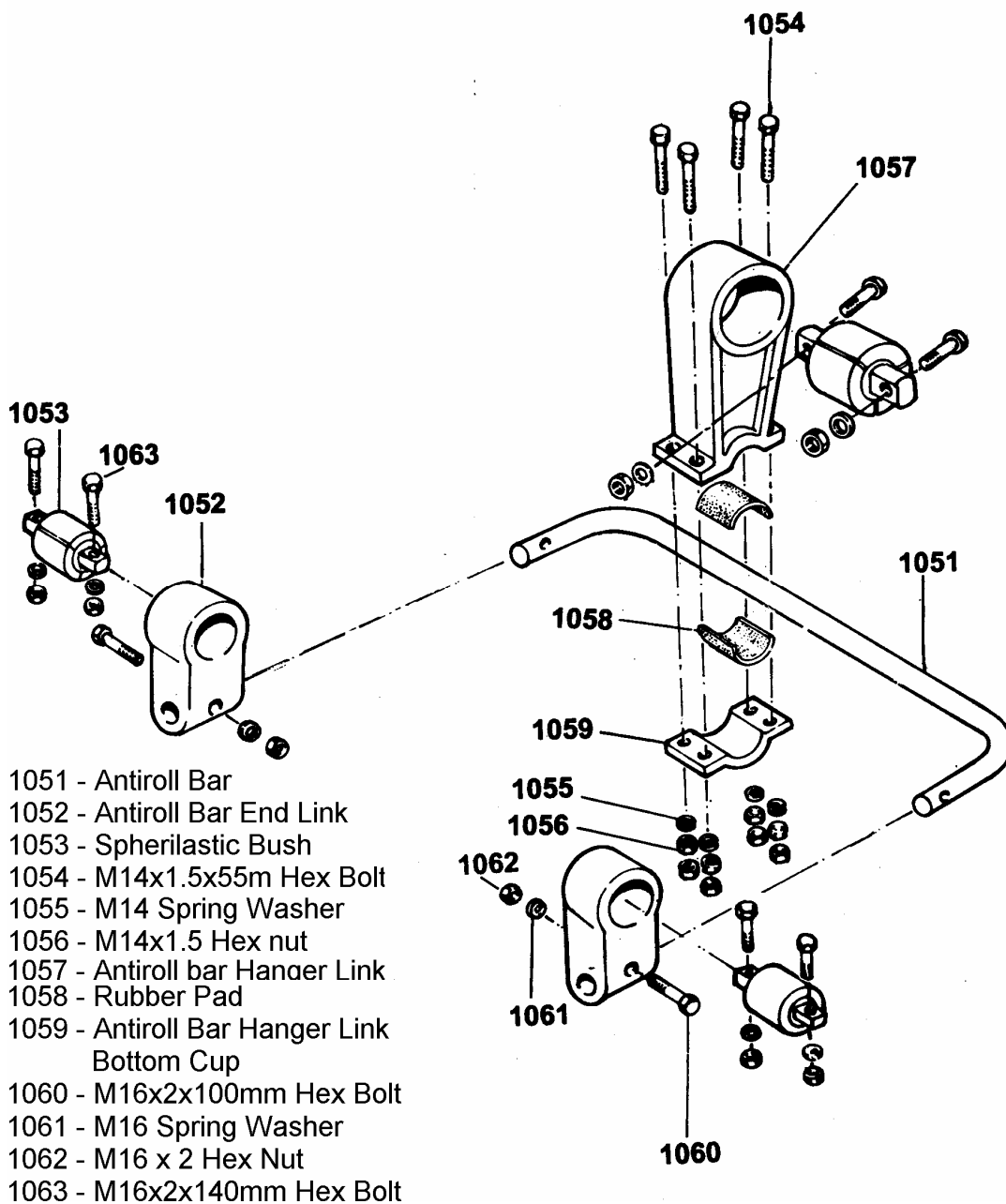
4.1). AXLE END :

- a) Remove the Split pin & nut, which secure the Compound link eye with the taper pivot.
- b) Insert the puller in between the link and taper pivot and tighten at the puller bolt to facilitate removal
- c) For fitment, insert the Compound Link eye in taper pivot and tighten the nut, Lock the nut with split pin.

4.2) CROSS MEMBER END:

- a) Remove the nuts from both the ends of pivot bolt only after removal of split pins
- b) Insert the puller at the right end of the pivot bolt in such a way that the slot puller guided by the rib provided in the bracket.
- c) Remove the Taper pivot by tightening the nut over the puller face
- d) For fitment, keep the compound link in position and insert to taper pivot from right side.
- e) Drive taper pivot with soft faced light weight hammer, to enable to tighten the nut from left side.
- f) Insert the sleeve from right side and tighten the nut.

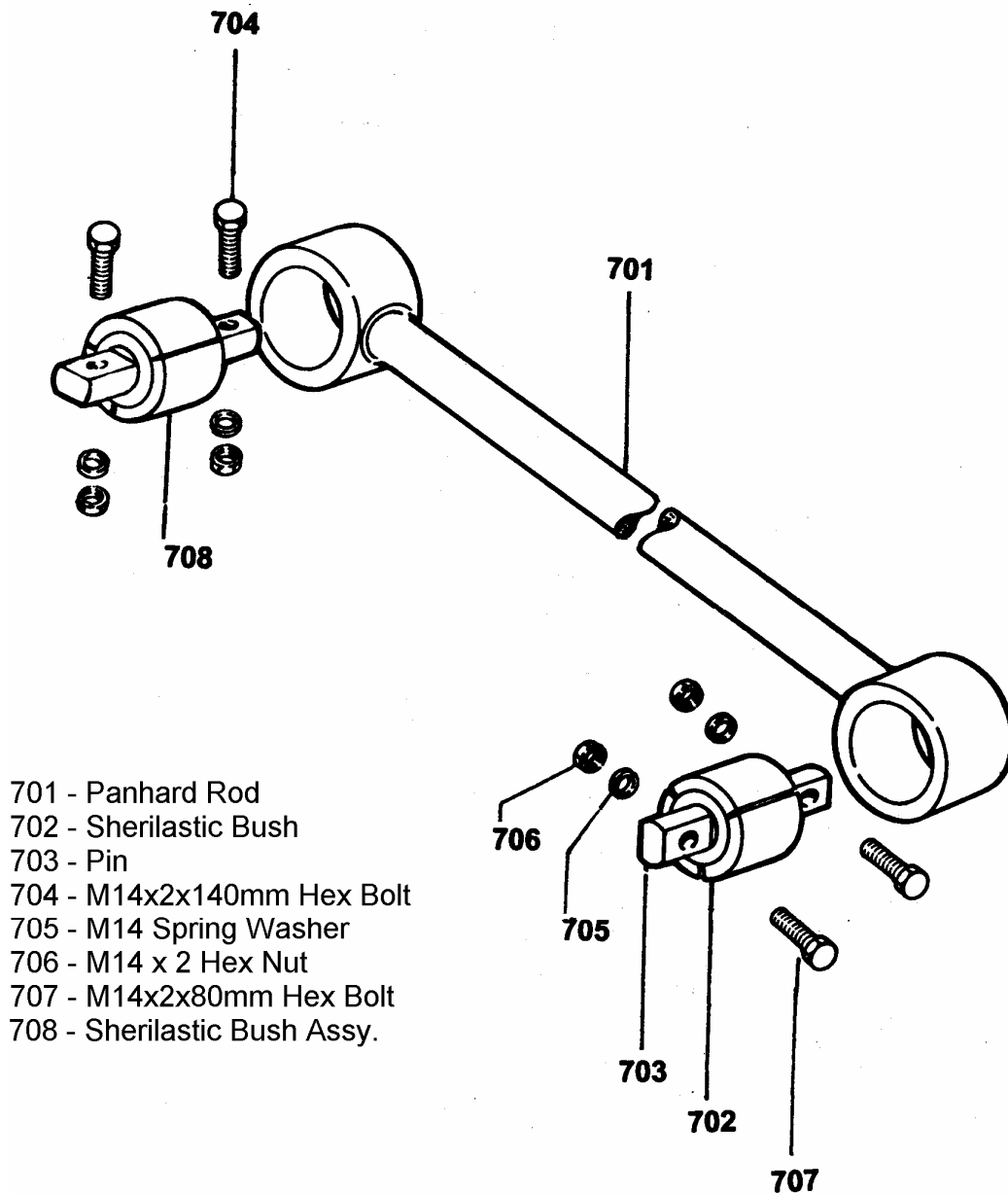
ANTI ROLL BAR ASSEMBLY



5.0). REMOVAL AND FITMENT OF ANTIROLL BAR ASSEMBLY :

- a) Park the vehicle in plain ground and remove the nuts (4nos each in LH & RH side) which secure the Antiroll bar with the Roll Bar Link, with Rubber pad.
- b) Inflate the air spring assembly and raise the chassis height to facilitate the removal of the Rubber Pad.
- c) In the case of damage or wear out of old rubber pad, replace with new one.
- d) For the removal of Antiroll bar, remove the bolts (2nos each from RH & LH) which secure the end link bush pin with the block in subframe assembly.
- e) For fitment, reverse the above steps and tighten the bolts to the recommended torque level.

PANHARD ROD ASSEMBLY



6.0). REMOVAL AND FITMENT OF PANHARD ROD ASSEMBLY :

- a) Park the vehicle on a plain ground at static height
- b) Remove the bolts (2 nos on each side) which secure the Panhard rod pin with respective bracket).
- c) Reverse the procedure for fitment and make sure that all the bolts are tightened.

7.0 SHOCK ABSORBER ASSEMBLY :

If during examination of the Shock Absorber, signs of fluid loss or loss of its damping qualities are noted, then replace the Shock Absorber.

- a. Hold the body of Shock Absorber with service tool and remove the nuts/ bolts securing the Shock Absorber top and bottom.
- b. Within the vehicle's, air supply system fully charged and the air spring assemblies at their static height as described in Section 1.1a, or alternatively by raising the chassis, it is possible to compress the damper sufficiently to facilitate removal.
- c. Fitment of the replaced unit should be carried out in the reverse order to the removal instructions.
- d. Tighten the bolts/ nuts. Ensure vehicle is at the static ride height.

SPECIAL TOOLS FOR WORKING WITH AIR SUSPENSTION SYSTEM :

The following tools are being supplied along with the vehicle for removal of Compound Link, Pivot bolt and clamp for Shock Absorber.

S. No.	Description	Part Number	Qty
1	Compound Link Puller	555611000100	1
2	Pivot Bolt Puller	555611000400	1
3	Shock Absorber Clamp	555611000200	1

The COS' of Zonal Stores are advised to procure and supply the required spares to the Depots to facilitate the depots to undertake repairs & maintenance on air suspension system and avoid vehicles going offroad.

The Depot Managers and Maintenance incharges are advised to take up the repairs in Air suspensions system like replacement of defective Air springs, leveling valves, replacement of rubber bushes etc, at Depot level duly educating the maintenance staff on the procedures to be followed in removal/ fitment as explained above.

The Regional Managers, Divisional Managers and Dy.CMEs are advised to follow up the implementation of the instructions at Depots with regard to maintenance of Air Suspension system on vehicles.

EXECUTIVE DIRECTOR (ENGG)

To

All Depot Managers.

Copy to : VC & MD for information.

Copy to : Dir (V&S), ED(O), ED(A), ED(IT&MS), ED(HRD), FA & CAO for information

Copy to : ED(H&K), ED(V&V) and ED(C&N) for favour of infmn.

Copy to : All RMs for necessary action.

Copy to : CME(O), CME(C&B) & CCOS for necessary action.

Copy to : CTM, CMM, CCM, CE(IT & MS), CA, CPM, CPM (HRD) for information.

Copy to : All DVMs, WMs, COS', Dy.CAO's for n.action.

Copy to : Dy.CME(O), Dy.CME(P), Dy.CME(C&B), Dy.CME(IEU),
COS©-I and COS©-II and CSTO for necessary action.

Copy to : All Principals of ZSTC's and TA/HPT & BTC/HPT for Information.

Copy to : All Maintenance incharges for necessary action.

Copy to : Manual section for record.

ANDHRA PRADESH STATE ROAD TRANSPORT CORPORATION

NOTE FILE

Office of the VC & MD
Section : Dy.CME(O)

Case No.OP2/462()/2006-MED
Date opened : 5-12-2006.

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M/s Wheels India Ltd have been supplying the Pullers along with the vehicles for removing the Compound Link, Pivot bolt and clamp for Shock Absorber.

Accordingly, a draft circular explaining the service instructions for carrying out certain repair works like replacement of Air Springs, Levelling Valves, Rubber bushes

etc, and list of items required for stocking at Depot level is prepared and put up for approval.

DY.CME(O)

CME(O)

ED(E)