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TECHNICAL CIRCULAR No.38 (Rev.02)

No.EL/3.2.119

Date: 12-01-2001

Chief Electrical Engineer

- ◆ Central Railway, Mumbai CST-400001
- ◆ Eastern Railway, fairlie Place, Calcutta-700001
- ◆ Northern Railway, Baroda House, N/Delhi-110001
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- ◆ South Central Railway, Rail Nilayam, Secunderabad-500371
- ◆ Western Railway, Churchgate, Mumbai-400020
- ◆ Chittaranjan Locomotive Works, Chittaranjan-713319

Sub: Locomotive side buffer : Maintenance Instructions.

Ref: Technical Circular No. 38 (Rev. 01) issued vide letter no. EL/3.2.119 dt. 30-8-99.

Railways expressed reservation on the issue of periodicity of side buffer overhauling as recommended in RDSO MP. MI no. 116/82 (Revision 01) August'99. Based on the discussion and subsequent feedback obtained from Railways, the issue has been reviewed by RDSO. Accordingly, ``Dismantling and repair schedule'' given in clause 3 of MI (Revision 01) has been amended and incorporated in Revision 02 of this MI. **The revision has been approved by Rly. Board vide their letter no. 99/M (W) 964/102 dt 20-10-2000.**

The revised MP.MI. 116/82 (Rev 02) has been circulated by Motive Power Dte. Vide letter no. SD.DFM.A.10.1 dt 24/28-11-2000 to GM (Mech/Elec) of all Railways with copies to CWMs, electric and diesel loco.

With a view to ensure availability of the documents it is being reiterated in the form of Technical Circulars for guidance of the Railways.

DA: As above

CC: Secretary (Elect), Railway Board, Rail Bhawan, New Delhi-110001.

(Kind Attn: Shri I.C. Sharma, EDEE/RS)

For information, please.

शुभा

(A.K. Gupta)

for Director General/Elect,

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(A.K. Gupta)

for Director General/Elect,



सत्यमेव जयते

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**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

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**MAINTENANCE INSTRUCTIONS FOR LOCOMOTIVE SIDE BUFFERS TO
DRG. NO. LA/BD-153/M**

**pk-'k-,e-vkbZ- la- 116 @ 82 ¼la'kkss/ku&02½
uoacj] 2000**

MP MI NO. 116/82 (REVISION 02)

NOVEMBER, 2000

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RESEARCH DESIGNS & STANDARDS ORGANISATION

MANAK NAGAR, LUCKNOW-226 011

1. SCOPE

1.1 This maintenance instruction covers the details of repair schedule, dismantling, examination & repair and assembly of locomotive side-buffers to drawing No. LA/BD-153/M.

2. GENERAL

- 2.1 Side buffers of locomotive and of its adjacent vehicle should touch each other after coupling the vehicle with loco screw coupling. This is necessary to minimise the effect of sudden/snatch load on loco screw coupling. Existence of gaps between side buffers of locomotive and its adjacent vehicle may be noticed, if the amount of permanent set of buffer springs caused during service exceeds the slack take-up capacity of transition screw coupling. Such gaps will result in application of sudden/snatch load on the coupling components while starting, sudden braking and also while shuttling during run due to speed differential of locomotive and its adjacent vehicle. This may lead to failure of the screw coupling and may cause train parting. Drivers and running staff should therefore, immediately bring it to the notice of maintenance staff, the instances of gaps between buffers noticed during coupling. Buffers should be periodically dismantled for resetting of springs, checking, repair and overhaul of all its components. The dismantling of buffers may even be necessary before POH schedule of locomotives in shops. Sheds should therefore build up separate section for buffer assemblies where these are opened up.
- 2.2 General assembly of loco side buffer is shown in Fig. 1. Reference to the same may please be made for item numbers mentioned in this M.I. Dismantling and assembly sequences of buffer components are shown in Fig. 2 and 3 respectively.

3. DISMANTLING & REPAIR SCHEDULE

3.1 Attention to be given to side buffer at different schedules are as follows :

- (a) **During POH schedule :** The Buffers shall be dismantled for checking, repair and overhaul of all its components and reassembled as per this MI.
- (b) **During TY/IOH, YR/AOH, HY/IC, QY/IB, MY/IA schedule :**

The general condition of buffer assembly including permanent set (Max. permissible 20 mm), visible cracks, damage, looseness, missing components, holding nuts etc. of buffer assembly shall be thoroughly checked after proper cleaning. Free movement / functioning of Buffers during compression and release shall be ensured. If considered essential the Buffer shall be dismantled from locomotive head-stock for proper checking to ensure no

defects. In case any defects or defective functioning is observed / doubted, the buffer assembly shall be checked and defects rectified as per this MI. However, if the facilities for repair /overhauling are not available in Sheds, the defective Buffer Assembly shall be sent to POH Shop for repair and the loco be fitted with new repaired/overhauled Buffers. Under no circumstances defective Buffers shall be allowed to remain in service.

- 3.2 Amount of permanent set of buffer springs can be known by measuring the length of buffer (from plunger head to buffer-base bottom). The length of buffer in new condition is 635 mm. This will be reduced to 615 mm when the springs undergo a permanent set of 20 mm. While measuring this length, the thickness of packing piece put between buffer base and loco buffer beam should not be considered at all.

4. DISMANTLING OF BUFFER ASSEMBLY

- 4.1 Remove the buffer assembly from locomotive head stock by unscrewing the four nuts. The dismantling of buffer assembly may be done in the following sequences : (Refer fig. 2)
- (a) Insert two long hex-head bolts through the two diagonally opposite holes provided on the flange of buffer casing (item 2). Fasten the buffer-base plate (item 3) with buffer-casing (item 2) by tightening nuts on these bolts. Insert distance piece.
 - (b) Remove the four rivets (items 10) in the buffer base by drilling or by chiseling its head and drift out the cut rivets.
 - (c) Keep the assembly vertical with the plunger-head resting on the floor/table. Unscrew the two nuts, mentioned in para (a) above, one after other by small amount until the spring pressure is released and 'Buffer-base plate' (item 3) is safely taken out. Buffer casing (item 2) will slide down the plunger (item 1) when the buffer base plate (item 3) and distance piece have been removed.
 - (d) Remove Buffer spring R.H. coil (item 9), Buffer spring seat center (item 6), buffer spring L.H. Coil (item 8) and Buffer spring seat front (item 7) from the assembly.
 - (e) Separate 'check-sleeve' (item 5) slightly opening it out from plunger (item1).
 - (f) Take out the 'Buffer-casing' (item 2).

5. EXAMINATION & REPAIR

5.1 After the buffer assembly is dismantled, each component shall be thoroughly cleaned from dust, dirt etc. and be closely examined for defects, repaired, if necessary and re-use if found O.K.

(a) Buffer-base (item 3/3A)

Check buffer base for wear, bent, cracks and breakages. If worn out by 3 mm or bent badly, cracks and breakages are noticed, change it. Check the buffer base bolt holes for sizes, centers, ovality etc. Remove the ovality by welding with class-B electrodes and re-drill, if necessary. If it is of fabricated type in which buffer spring base guide (item 4) is fixed to buffer base plate (item 3) by a 24 mm rivet (item 11), check the condition of rivet also. If the rivet is loose, heat and re-rivet and, if badly worn out, re-new the rivet.

(b) Buffer Spring L.H. & R.H. Coil (items 8 & 9)

The springs shall be examined for material defects on their surface and any spring found with surface defects, shall be rejected.

Check the free-height, re-set, re-heat-treat and send for scrag test, load-test as per drg. & IRS Specn. R. 2 Re-use if found. O.K.

(c) Check sleeve (item 5)

Check the check sleeve for wear, cracks and breakage. It must be ensured by the Supervisor that the fitment of check sleeve on buffer plunger recess (item 1) is in order and the check-sleeve forms a positive locking device to hold the buffer-casing (item 2) and plunger (item 1) together in position. Supervisor concerned should also ensure that it conforms to applicable drawing and free from all defects. Defective check sleeve shall be re-placed.

(d) Buffer-spring seat center & front (items 6 and 7)

Check them for wear, cracks and breakage. If there is wear, build up by welding, grind them to restore to nominal size and re-use else replace the defective seats. Cracked, defective and broken buffer-spring-seats shall be replaced.

(e) Buffer casing (item 2)

Check the buffer casing bolt-holes for sizes, centers ovality etc. Remove ovality by welding with class B electrodes and re-drill if necessary. Check the casing for wear, cracks and damages and ensure smoothness of rubbing surfaces. Condemnation on account of wear may be made on condition basis, based on experience. Cracked, damaged and defective buffer casing shall be replaced.

(f) Buffer Plunger (item 1)

Check the plunger for wear, cracks and damages. It shall be checked for trueness and free travel. Check plunger face thickness, weld if worn out. Ensure smoothness of all rubbing surfaces. Condemnation on account of wear may be made on condition basis, based on experience. Cracked, damaged and defective plunger shall be replaced.

6. PROCEDURE FOR DETECTION OF IN-SERVICE CRACKS

6.1 Following procedure shall be adopted for detection of in-service cracks of buffer components except springs mentioned in para 5.

- a) All the components of buffer assembly shall be thoroughly cleaned so as to ensure freedom from dust, dirt etc. with the help of cleaning agent (detergents, organic solvents or alkali solutions) and allow them to get dry. Ensure no water or cleaning agents remains on the test surface.
- b) The surface of the components so cleaned shall be examined visually with the help of a magnifying glass for the presence of in-service defects and cracks.
- c) After visual examination, all the component surfaces including vulnerable location such as areas having change of sections shall be examined by liquid penetrant testing method. The penetrant used shall be "Red dye" obtained from RDSO approved sources of supply and conforming to RDSO specification No.RDSO/M&C/NDT/4/91/APPD.
- d) Allow the penetrant to enter into the defects, if any for a period of 15 minutes minimum.
- e) Remove the penetrant with the help of cleaning solution gently.
- f) Care should be taken not to apply excessive rubbing action so as to affect indication of defects.
- g) Apply developer on the entire surface and allow to dry up for a period of 5 minutes.
- h) Observe presence of defect on the surface under ambient/sufficient light.

Components found to have surface defects and cracks shall not be used in service.

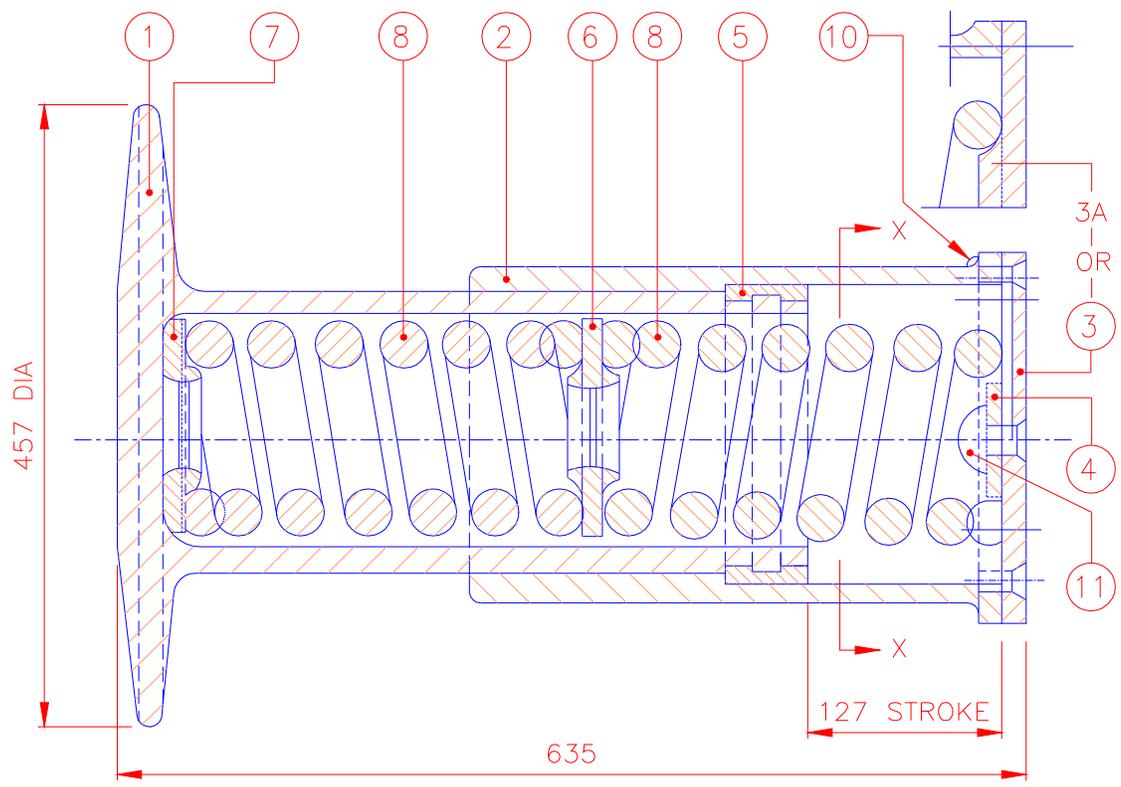
7. ASSEMBLY OF BUFFER COMPONENTS

7.1 General assembly of loco side buffer is shown in fig. 1. Before undertaking assembly it must be ensured that all its components conform to drawings and specification (IRS R-25) requirements

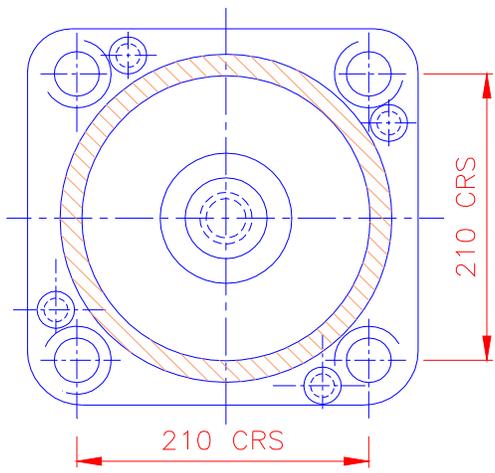
and are fit to be re-used. The assembly may be made in the following sequences : (Please refer fig.-3)

- (a) Rivet buffer-base plate (item 3) with buffer spring base guide (item 4) if integral cast steel buffer base to Drg. L/BD-652/M is not available.
- (b) Keep the plunger (item 1) vertical with its head resting on floor/table. Apply graphite grease in the rubbing surfaces of plunger except on its check-sleeve seat.
- (c) Insert buffer casing (item 2) with its base upwards on to the plunger (item 1) after applying graphite grease on its rubbing surface.
- (d) Mount the check-sleeve (item 5) properly in the recess of the plunger (item 1). The split provided in the check sleeve may be opened a bit for easy insertion/mounting of the check-sleeve into plunger recess. Concerned Supervisor must ensure that the check-sleeve is properly fitted in the recess of the buffer-plunger.
- (e) Pull the buffer casing (item 2) up until the inside edge of check-sleeve butts against the stepped shoulder of buffer-casing bore. Supervisor concerned must ensure that the check-sleeve forms a positive locking device to hold the buffer casing (item 2) and plunger (item 1).
- (f) Insert a distance-piece between the back face of plunger head (item 1) and front-end of buffer casing (item 2), as shown in fig. 3 so that the buffer casing (item 2) cannot slide down the plunger.
- (g) Insert Buffer spring seat front (item 7), buffer spring L.H. (item 8), Buffer spring seat center (item 6) and buffer spring R.H. coil (item 9) into the Plunger (item 1) bore concentrically one after the other in such order.
- (h) Put the Buffer base plate (item 3/3A) over the springs keeping its flat surface upwards. Position shall be such that its four bolt-holes align with corresponding bolt-holes of 'Buffer-casing' (item 2).
- (I) Insert two long hex head bolts from the bottom (ref. fig. 3) through the two diagonally opposite holes out of 4-28 mm holes provided on the flange of buffer-casing (item 2) and press the buffer-base plate (item 3/3A) against the spring pressure by tightening the nuts over these bolts (the nuts should be tightened one after another by small amount) until the buffer base plate sits properly against the buffer-casing base. Remove distance piece.

- (j) Check the length of buffer (from plunger front face to back of buffer base plate). It should be $635^{+2.0}_{-1.5}$ mm
- (k) Move the assembly for riveting.
- (l) Rivet (four rivets, item 10) buffer base (item 3/3A) with buffer casing (item 2).
- (m) Unscrew the nuts and remove two hex-head bolts referred to in para (i) above.



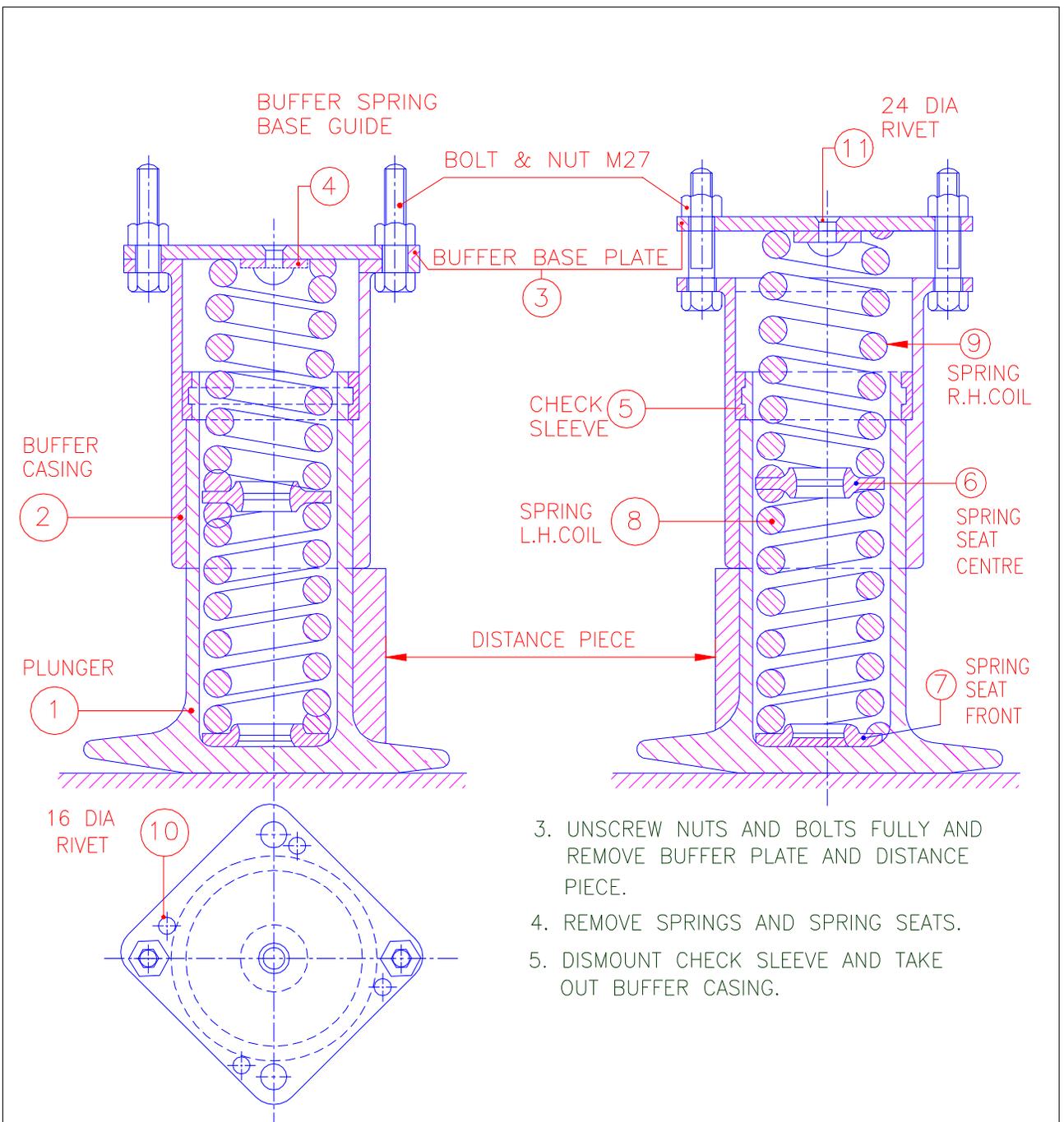
11	B	24 DIA RIVET SNAP HEAD 60 mm LG. (STEEL I.S. 1148)	1
10	A	16 DIA RIVET SNAP HEAD 50 mm LG. (STEEL I.S. 1148)	4
9	W/BD-457	BUFFER SPRING (R. H. COIL)	1
8	W/BD-357	BUFFER SPRING (L. H. COIL)	1
7	L/BD-657/M	BUFFER SPRING SEAT FRONT	1
6	L/BD-656/M	BUFFER SPRING SEAT CENTRE	1
5	L/BD-655/M	CHECK SLEEVE (FOR BUFFER PLUNGER)	1
4	L/BD-654/M	BUFFER SPRING BASE GUIDE	1
3	L/BD-653/M	BUFFER BASE PLATE	1
3A	L/BD-652/M	BUFFER BASE (CAST STEEL)	
2	L/BD-651/M	BUFFER CASING (FORGED STEEL)	1
	L/BD-650/M	BUFFER CASING (CAST STEEL)	
1	L/BD-649/M	BUFFER PLUNGER (FORGED STEEL)	1
	L/BD-648/M	BUFFER PLUNGER (CAST STEEL)	
REF. NO.	I.R. PART NO.	DESCRIPTION	NO. PER UNIT



SECTION "X-X"

LOCO. SIDE BUFFER (B.G.)
(HELICAL SPRING TYPE)

REF:LA/BD-153/M
FIG.-1



3. UNSCREW NUTS AND BOLTS FULLY AND REMOVE BUFFER PLATE AND DISTANCE PIECE.
4. REMOVE SPRINGS AND SPRING SEATS.
5. DISMOUNT CHECK SLEEVE AND TAKE OUT BUFFER CASING.

1. FASTEN THE BUFFER BASE PLATE AND BUFFER CASING BY ONE PAIR OF BOLTS AND NUTS AS SHOWN AND INSERT DISTANCE PIECE.
2. CUT AND REMOVE FOUR 16 DIA RIVETS.

FIG-2
DISMANTLING OF BUFFER ASSEMBLY
(REFER PARA-4)

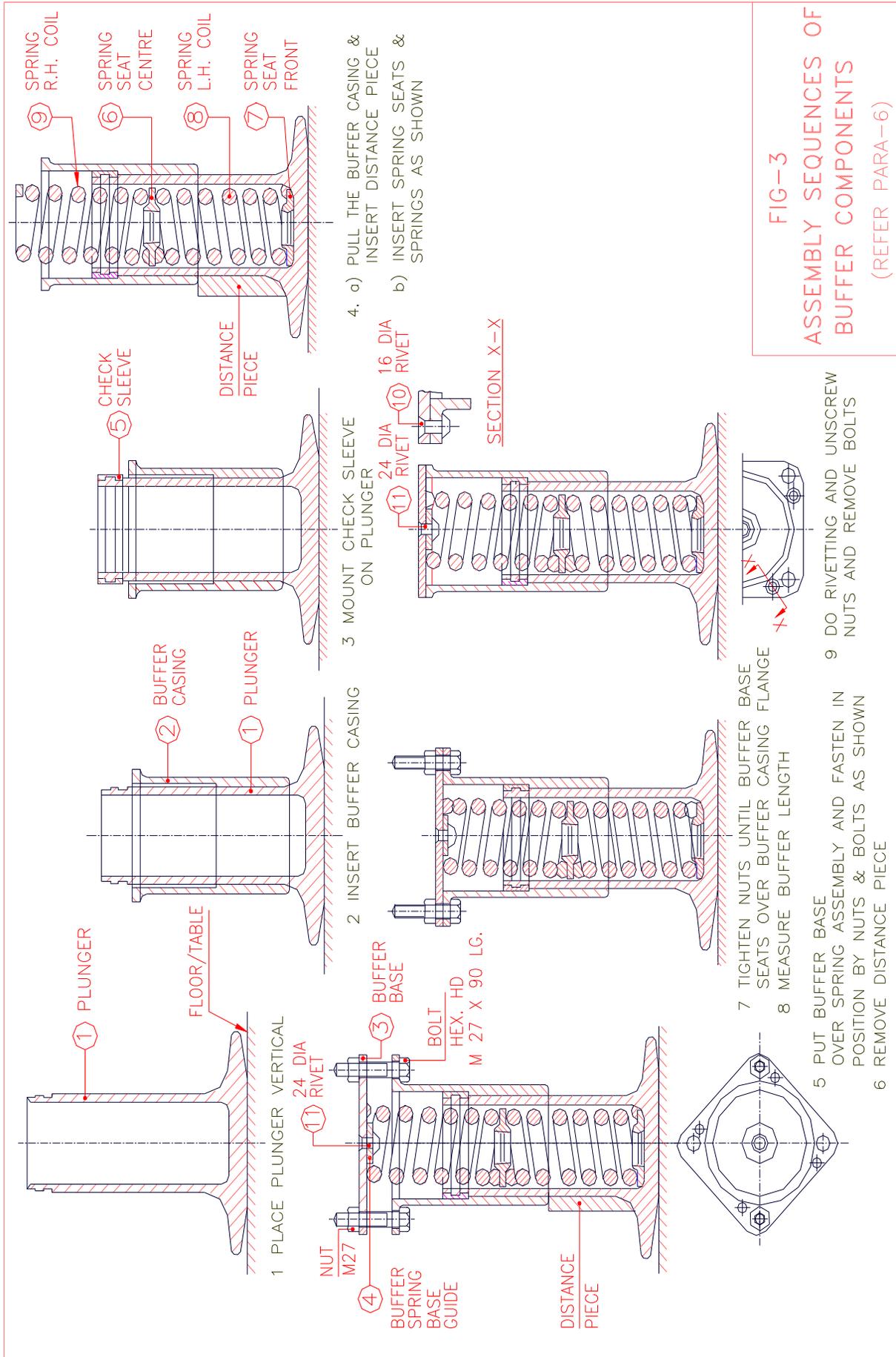


FIG--3
**ASSEMBLY SEQUENCES OF
 BUFFER COMPONENTS**
 (REFER PARA-6)