



2612 Howard Street
Box 32160, Louisville, Ky. 40232-2160
Telephone (502)-774-6011

PRODUCT ENGINEERING PROCEDURE
TT-21-018 REV. 0

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**STRESS RELIEVING INSTRUCTIONS
FOR
DOUBLE-BOLT CLOSURES WITH YOKE SUPPORT ROLLERS AND/OR HINGE BEARINGS**

1.0 SCOPE

- 1.1 This procedure describes the steps required to prevent or reduce the distortion of the closure during heat treatment.
- 1.2 Specific customer requirements via the Sales Order take precedence if they conflict with this procedure.

2.0 TERMINOLOGY

- 2.1 **Hinge Bearings** - Roller bearings at the ends of the Hinge Rod to facilitate the opening and closing of the Head/Door.
- 2.2 **Yoke Support Rollers** - Rollers with roller bearings to support the weight and facilitate the opening and closing of the Yoke.

3.0 APPLICABLE DOCUMENTS

- 3.1 Bulletin No. TT720
 - 3.1.1 YOKE TYPE HINGED CLOSURES - Installation, Operation & Maintenance

4.0 PROCESS

NOTE: When the closure attachment weld must be stress relieved, local stress relief treatment is recommended. Careful control is required during this operation to assure that the fabricator does not warp the closure. The use of proven procedures is required. If care is exercised, local stress relief can eliminate the need for disassembly and reassembly of the unit. However, the closure must be tightly closed until the entire unit has completely cooled.

When it is necessary to stress relieve the entire vessel, the following steps should be taken to prevent distortion of the closure during heat treatment.

- 4.1 Read and follow all applicable instructions in the Yoke-Type IOM (Bulletin TT720)

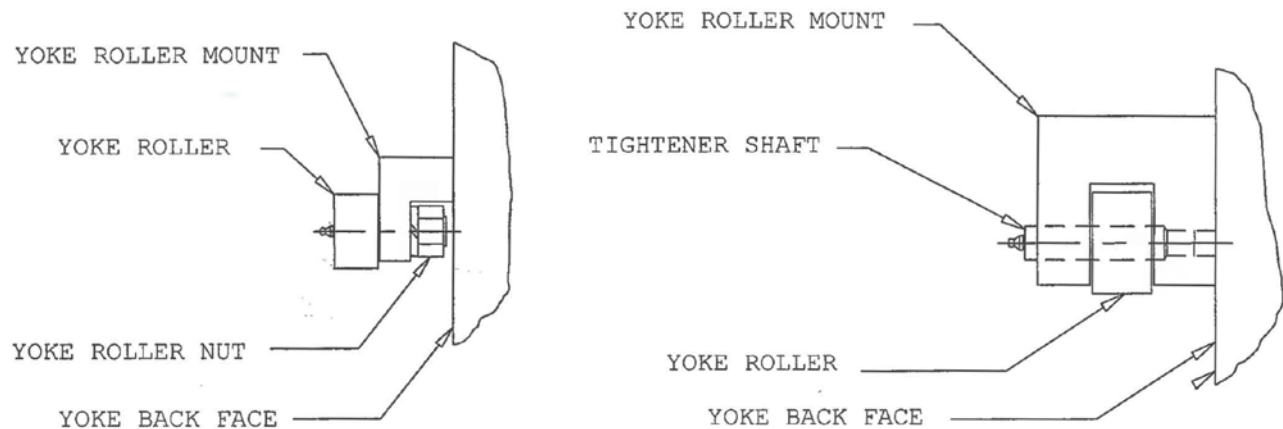
4.2 YOKE ROLLER SUPPORT REMOVAL

- 4.2.1 Rotate the closure and the attached pipe/vessel until the hinge is on top (the centerline of the Hinge Rod should be horizontal).

4.2.2 Remove the Pressure Warning Device Holding Nuts.

4.2.3 Open Yoke completely.

4.2.4 Remove the Yoke Support Rollers. There is one Roller on each Yoke half. The rollers are cam followers mounted on a straight bracket, in an "L" shaped bracket, or in a "C" shaped bracket and secured with a nut. "L" and "C" brackets shown below.



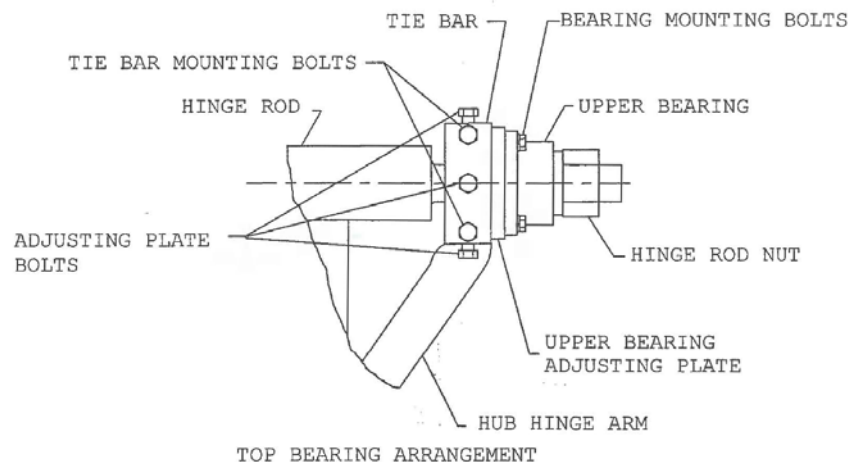
4.2.4.1 On the straight or "L" brackets, loosen the nut and remove the Roller.

4.2.4.2 On the "C" bracket, loosen the Tightener Shaft and remove the Roller.

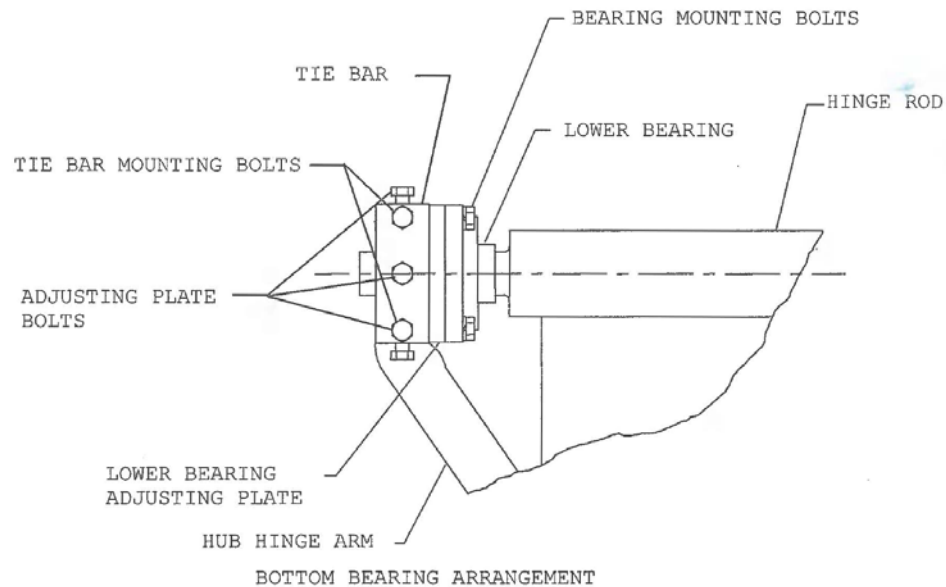
4.3 HINGE BEARING REMOVAL

4.3.1 With the closure still oriented as in section 4.2.1 above, place a double sling on the Hinge Rod and tension it to support the Head subassembly.

4.3.2 Remove the Upper (Top) Bearing (see graphic below)



- 4.3.2.1 Loosen the Allen head set screws on the bearing.
 - 4.3.2.2 Remove the Hinge Nut.
 - 4.3.2.3 Remove the Tie Bar.
 - 4.3.2.4 Loosen the Adjusting Plate Bolts.
 - 4.3.2.5 Slide the Bearing off the Hinge Rod
- 4.3.3 Remove the Lower (Bottom) Bearing (see graphic below)



- 4.3.3.1 Loosen the Allen head set screws on the bearing.
- 4.3.3.2 Remove the Tie Bar.
- 4.3.3.3 Loosen the Adjusting Plate Bolts.
- 4.3.3.4 While the Head is supported by the slings, swing the Head forward until Lower Bearing Adjusting Plate and Lower Bearing clear the Hub Hinge Arm.
- 4.3.3.5 Slide the Lower Bearing Adjusting Plate and Lower Bearing off the Hinge Rod.
- 4.3.3.6 Remove the Bearing Mounting Bolts and the Bearing from the Adjusting Plate.
- 4.3.3.7 Reinstall the Lower bearing Adjusting Plate onto the Hinge Rod.
- 4.3.3.8 Slide both Upper and Lower Adjustment Plates into the Hinge Arms.
- 4.3.3.9 Reinstall both Tie Bars.

- 4.3.4 Align the Head with the Hub.
 - 4.3.4.1 The adjusting plate bolts and the sling tension can be used to achieve the proper alignment.
 - 4.3.4.2 The radial (edge to edge) mismatch between the head and hub should not exceed 1/8".
 - 4.3.4.3 Any gap between the head and hub faces should not exceed 1/8".
- 4.3.5 Close the Yoke evenly and tighten the Yoke Bolts to the recommended torque.
 - 4.3.5.1 The splits between the Yoke halves should measure the same within 1/16".
- 4.3.6 Loosen Yoke Bolts to remove tension **ONLY. DO NOT ALLOW YOKE HALVES TO MOVE.**
- 4.3.7 REMOVE Yoke Bolts and replace with substitute bolting with Heavy Hex Nuts.
 - 4.3.7.1 Thread nuts on each end of the bolting, slip the bolting unit into the "U" shaped cutout in the Nut Pockets, and tighten the nuts onto the outside of the Nut Pockets.
- 4.3.8 STRESS RELIEVE.
 - 4.3.8.1 Using the lowest possible stress relieving temperature and a corresponding increase in holding time tends to minimize possible distortion in the closure components.
- 4.3.9 After stress relieving is complete, remove substitute bolting and replace original Yoke Bolts.
- 4.3.10 Rotate the closure and the attached pipe until the hinge is on top (the centerline of the Hinge Rod should be horizontal).
- 4.3.11 Place a double sling on the Hinge Rod and tension it to support the Head subassembly.
- 4.3.12 Reversing steps in sections 4.3.2 and 4.3.3, reinstall the Bearings and Yoke Support Rollers.
- 4.3.13 Close the Yoke.
- 4.3.14 Rotate the closure and the attached pipe/vessel until the centerline of the Hinge Rod is vertical.
- 4.3.15 Open the Yoke.

4.3.16 Align the Head with the Hub to the requirements in steps 4.3.4.2 and 4.3.4.3.

4.3.16.1 See drawing 99.755-B37 for instructions.

4.3.17 Replace PWD Gaskets.

4.3.18 Replace the Pressure Warning Device Holding Nuts.

4.3.19 Replace O-ring.

Revision Block					
Rev Level	Revision Description	Requested By	Request Date	Approved By	Approve Date
0	Original Issue – adapted from 09.8127 R0	Cody Royer Regional Mgr.	25-Jul-2022	MHWood Sr. Project Engineer	27-Jul-2022