

TOMOE TRITEC Assembly Procedure

Doc. No.

TPB-04-148-H0-00

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Unit in charge: Production Dept.

Enacted: October 23th, 2009

Product name	Tomoe type butterfly valve
Applicable standard	ISO9001 (2008)
Control required	Yes No
Company name	Tomoe Valve Co., Ltd.
Address of headquarters factory	2-6-18, Nishikonoike-cho, Higashi-Osaka City, Osaka, 578-0976, JAPAN

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00	2009.10.23	2009.10.30	New created	'09.10.23 Nagasaka	'09.10.23 Tsuchi	'09.10.23 Narui
No.	Revision date	Implementation date	Contents of revision	Approved by	Checked by	Drafted by

1. Objective

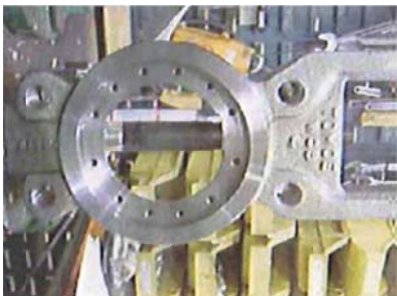

This shall specify the Triple offset valve assembly procedure correctly to be performed.

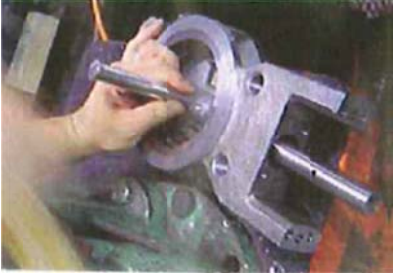

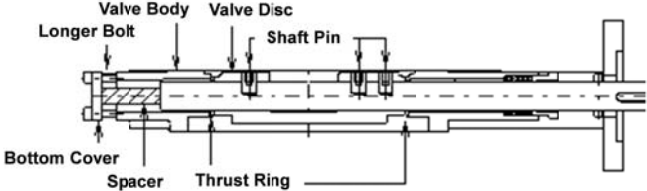

2. Applicable range

Valve Model	Size
TT1, TT2	All

1. Preparation
2. Assembly procedure
3. When non-conformance occurs

3. Working Procedure

No	Procedure	Key point	Jig / Inspection tool / Equipment
	<p>1. Preparation Prepare the Assembly instruction, Manufacturing drawings, Specifications, and Bill of materials check list and confirm the contents.</p> <p>2. Assembly procedure Refer to Attachment-1 of "structural drawing" for parts number.</p>		
1	<p>Insert the bearings (P/No.10A, 10B) into the shaft hole of valve body (P/No.1).</p> 	<p>Refer to the structural drawings regarding bearing material and insert position.</p> <p>In case of Stellite bearing, insert it after applying silicon oil.</p> <p>Insert the lower shaft bearing first.</p> <p>Leave the dimension of thrust ring to be set up the valve body.</p>	Jig for insert
2	<p>Assemble the shaft (P/No.8), the disc (P/No.2) and thrust ring (P/No.11) to the valve body.</p> 	<p>Apply "Molykote" grease to the shaft.</p> <p>If disc and shaft fitting is firm, polish around pin hole with a file etc. (Before putting in the valve body.)</p>	File Sandpaper "Molykote" grease




No	Procedure	Key point	Jig / Inspection tool / Equipment
3	<p>Fit the disc and the shaft pin holes together by eye and insert the shaft pin. After the insertion, crimp three points by the punch.</p> 	<p>Put hat flanges etc. under the disc to be shocked when inserting the shaft pin. Apply "Molykote" grease to the pin.</p>	<p>Hat flange Stick for pin hitting Hammer Punch "Molykote" grease</p>
4	<p>Put in a spacer between the bottom cover and shaft, and then keep pushing up the disc and shaft.</p> 	<p>Tighten the bolts lightly. (approx. 1 to 4 Nm) Make no thrust gap of the upper body - thrust ring - disc. Tighten the bolts so as to be able to open and close the disc by hand.</p> 	<p>Hexagon wrench Spacer</p>
5	<p>Insert the packing retainer (P/No.32) and the gland packing (P/No.33, 34) into the stuffing box of the valve body.</p> 	<p>Put the braided packing (P/No.34) at the lowest and the highest layer, and insert three laminated packing (P/No.33) in the middle. Put each packing in layer by layer, using the Jig. Put the gland packing by 90 degree turning the split.</p>	<p>Pushing Jig for gland packing Plastic hummer</p>



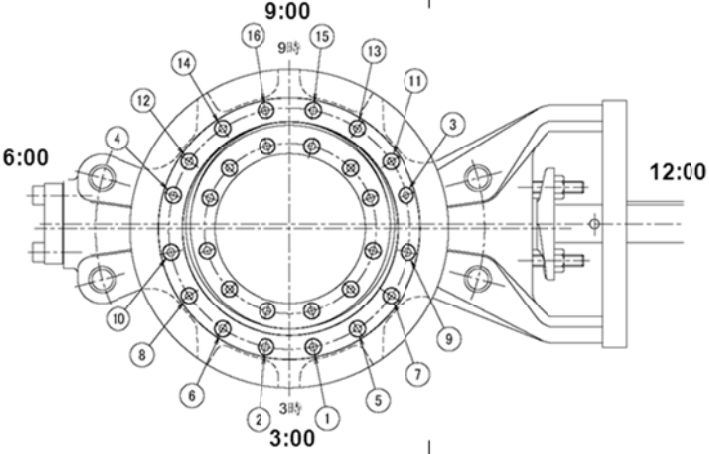
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6	<p>Put the gland bolt (P/No.27) into valve body and, attach gland plate spigot (P/No.16) and gland nut (P/No.29).</p> 	<p>Screw the gland bolt with “Loctite” applied into the valve body. Gland nut shall be tightened with specified torque uniformly. Write down the actual tightened torque on the instruction sheet to confirm it at the inspection.</p>	<p>Torque wrench File Sand paper</p>
7	<p>Assembly of mounting plate: Insert the spring pin (P/No.38) into shaft. Attach the dowel pins (P/No.18) on the valve body. Fix the mounting plate (P/No.17) on the valve body with hexagon socket bolts (P/No.25). Put the shaft key (No.35) into the key-way of shaft.</p> 	<p>Confirm the match of the shaft center and the mounting plate center because the mounting plate has a specified installation. Hexagon socket bolt shall be tightened with the specified torque.</p>	<p>Torque wrench Hexagon bar wrench Plastic hammer</p>
8	<p>Assembly of a manual gear: Put the manual gear on mounting plate with the bolts and nuts for it.</p> 	<p>Confirm that fits for the shaft and the shaft hole of the gear are smooth. Assemble the gear after applied “Molykote” grease to the shaft head. Pay attention to the manual gear orientation.</p>	<p>Spanner Hexagon bar wrench Plastic hammer “Molykote” grease</p>


No	Procedure	Key point	Jig / Inspection tool / Equipment								
9	<p>Put the disc seal on the disc. Tighten the disc seal screws with the specified 3-step torques using a torque wrench. Tighten the screws diagonally.</p> 	<p>Paint the screw heads with a color marker to confirm the material after tightened the screws.</p> <p>Marker color; Black: BUMAX Red : A4-80 Blue : SUS630</p>	<p>Torque wrench</p>								
10	<p>Put the body seat gasket and body seat on the valve body, and close the disc. Stop the disc rotation when the body seat has just been pushed up by the disc.</p> 	<p>When the outside diameter of the body seat touches the inside of the body, grind the O/D of body seat with a sander etc.</p>	<p>Torque wrench</p>								
11	<p>Put the body seat on the valve body, and then tighten it with the specified screws after applied with "Molykote" grease.</p> <p>Screws tightening order; 1) Tighten two screws at 3:00h position and two screws on the centerline left. 2) Tighten the rest screws in order of top and bottom alternately from 3:00h position to 9:00h position. Refer to the order in the following figure for details.</p> <p>Table. Set up Torque for Tightening</p> <table border="1" data-bbox="248 1809 691 1944"> <thead> <tr> <th>Tightening</th> <th>Set up torque</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>Spec. Torque X 50%</td> </tr> <tr> <td>Second</td> <td>Spec. Torque X 75%</td> </tr> <tr> <td>Third</td> <td>Spec. Torque X100%</td> </tr> </tbody> </table>	Tightening	Set up torque	First	Spec. Torque X 50%	Second	Spec. Torque X 75%	Third	Spec. Torque X100%	 <p>Fig. Tightening screw order for body seat</p>	
Tightening	Set up torque										
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11	<p>3) After tightening at third time, confirm each torque with same order and torque.</p> <p>4) Finally tighten all screws again with the specified torque.</p> <p>5) Confirm any light leakage with a flashlight.</p> 	<p>Write down the initial tightened time & date for the disc seal and body seat screws on the instruction sheet (to confirm at the inspection).</p>	<p>Torque wrench</p>
12	<p>Retightening of the body seat screws and disc seal screws;</p> <p>1) Leave the valve more than two hours after the initial tightening.</p> <p>2) Open and close the disc twice or three times.</p> <p>3) Retighten the screws with the specified torque.</p>	<p>Write down the retightened time and date of disc seal and body seat screws on the instruction sheet (to confirm at the inspection).</p> <p>The retightening shall start after more than two hours from the initial tightening.</p>	<p>Torque wrench</p>
13	<p>Tighten the bottom cover finally with the specified torque.</p> <p>3. When non-conformance occurs;</p> <p>Inform the assembly manager about it.</p> <p>Isolate it in the non-conformance area.</p> <p>The assembly manager shall issue a NCR (Non-conformance report).</p>	<p>Write down the tightened time and date of the bottom cover screws on the instruction sheet (to confirm at the inspection).</p>	<p>Torque wrench</p>

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4. Revision history

00	2009.10.23	2009.10.30	Newly created	Nagasaka	Tsuchi	Narui
No	Revision date	Implementation date	Contents of revision	Approved by	Checked by	Prepared by