

CUSTOMER: _____	NIIGATA-CHIKSAN SWIVEL JOINT	SPECIFICATION NO. No.6CC711-035
LOCATION: _____		INQUIRY/ORDER NO. _____

INSTRUCTION MANUAL
(BDR, BDRK TYPE SWIVEL JOINTS FOR F. R. T.)



TOKYO BOEKI ENGINEERING LTD.

TOKYO, JAPAN

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REV.	DESCRIPTION	DATE	APPR'D	CHK'D	CHK'D	PREP'D	CHK'D
			ENGINEERING DEPARTMENT				

INSTRUCTION MANUAL OF NIIGATA-CHIKSAN • SWIVEL JOINT

This manual explains how to use the BDR, BDRK TYPE NIIGATA-CHIKSAN Swivel Joint for Floating Roof Tank.

You can expect long life of the Swivel Joint if you handle it correctly.

1. Instruction for use

1.1 Lubrication

- (1) Ball race part and sealing part must be always coated with lubrication grease to maintain smooth rotation of the swivel joint as well as to maintain perfect sealing function.
- (2) Use the swivel joint as delivered because it is lubricated with grease before the shipment. In case of normal use, swivel joint must be lubricated when the packing is renewed.
- (3) To seal external pressure, grease nipple is not mounted to swivel joint. Remove square head plug and mount grease nipple (R1/8) when grease is supplied.
- (4) Use lithium based multi-purpose and insoluble grease.
Refer to specifications regarding our use grease.
- (5) Supply grease according to "3.3 (7) Supply of grease".

1.2 Welding

When a swivel joint is attached to the piping by welding, observe "4. Instructions for welding".

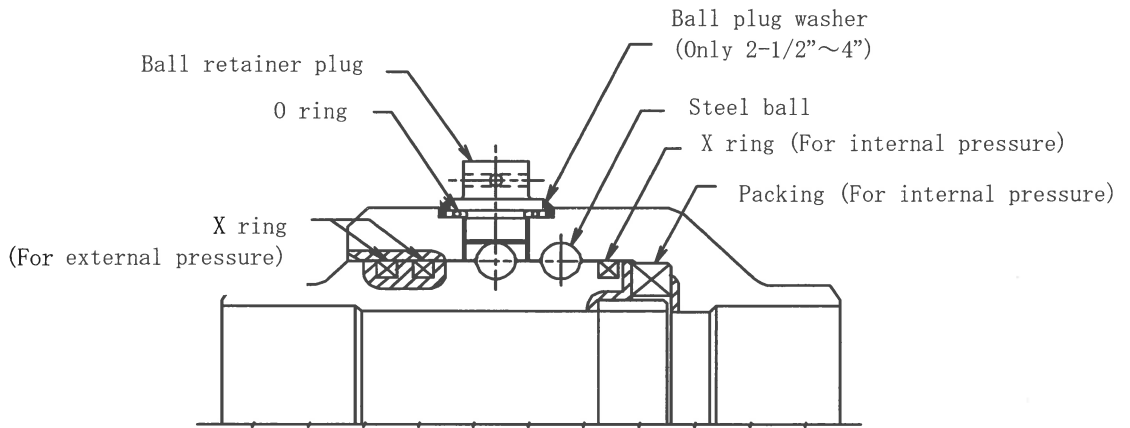
1.3 Check smooth rotation before initial usage

At initial usage of a stored swivel joint after delivery, the movement of swivel joint may be tight. In this case it must be rotated several times before use until it swings smoothly.

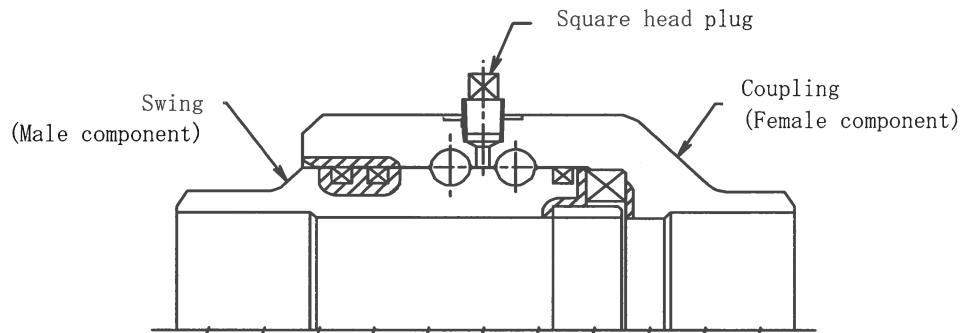
All above are the instructions for general use of swivel joint.

Please contact your dealer for more information.

2. Structure of Swivel Joint



DETAIL OF BALL RETAINER PLUG



DETAIL OF SQUARE HEAD PLUG

3.0 Disassembly and assembly

3.1 Disassembly

(1) Removal of ball retainer plug

Remove DEVCON A (ITW PERFORMANCE POLYMERS & FLUIDS JAPAN CO., LTD.) by using chisel and hammer. The part that can not be removed by them, use scriber etc. to remove it.

And then, pull out wire and remove ball retainer plug by using spanner. Also, remove ball plug washer (Only 2-1/2"~4") and O ring.

(2) Removal of steel ball

Make the holes of ball retainer plug upside down and rotate swing to let steel balls inside roll out. When it is difficult to rotate the swing, rotate the coupling instead to take out the steel balls. If the swivel joint is tight to rotate, pour white gasoline etc. to loosen the tightened part.

 Warning: Danger

When white gasoline etc. is applied, make sufficient ventilation and take enough care not to cause fire.

 Caution

Do not lose disassembled small parts.

(3) Disassembly

After taking out all steel balls, swivel joint can be separated into coupling and swing.

 Caution

Take care not to damage ball race, packing sealing and X ring sealing surface of swivel joint.

(4) Removal of packing

 Caution

Avoid using scriber or similar to remove packing. If sealing surface of swivel joint is even slightly damaged, it may cause leakage.

(5) Removal of X ring

It can be easily removed by carefully slipping it over the swing part not to damage surface of swivel joint.

 Caution

Take care not damage in a same manner as removal of packing.

(6) Removal of square head plug

Remove square head plug with spanner.

3.2 Inspection of removed parts

- (1) Oil, dirt and attachment on the removed parts must be cleaned using suitable cleaner.

 Warning: Danger

Make sufficient ventilation when cleaner is used.

 Caution

Take care not to damage sealing surface and ball race surface.

- (2) Ball race and sealing surface of packing, X ring and O ring

Inspect ball race for crack, brineling, corrosion etc. Very small defect may be removed using fine (more than #600 grade) sandpaper. Also inspect sealing surface of packing, X ring and O ring in a same manner and remove very small defect using fine (more than #600 grade) sandpaper.

Inspect sufficiently other screws and holes etc. moreover.

If the defect is hard to remove with sandpaper, that whole swivel joint shall be replaced.

3.3 Assembly

When swivel joint is assembled after disassembly and inspection, all parts except for the main body of swivel joint shall be replaced with new ones.

Assembly is to be made in the opposite order of disassembly. Take enough care not to include foreign particles attached on ball bearing part as well as on sealing part.

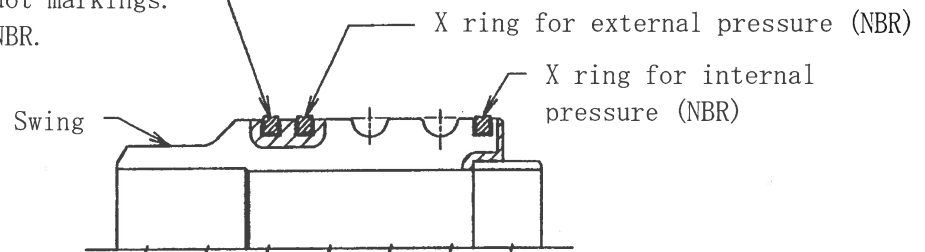
- (1) Lubrication with grease

Apply multi-purpose grease thin and uniform on the packing, X ring for internal pressure, ball race and packing sealing surface. Apply insoluble grease on the X ring for external pressure.

- (2) Mounting of X ring

X ring shall be fitted to the X ring groove so as to slide carefully without damage.

X ring for external pressure (FPM)
There are two white dot markings.
Do not confuse with NBR.



⚠ Caution

X ring shall not be stretched too much.

(3) Insertion of packing

Be sure that outer ring (metal ring) is attached to the circumference of the packing. The outer ring is necessary to prevent the packing from protruding to the ball race side.

i) 2-1/2"~4"

When packing is inserted, make sure that the outer ring faces to the near side (ball race side).

ii) 6"~12"

The packing is allowed to face to either side.

(4) Insertion of steel balls

i) Fix surely the coupling not to move. It makes it easier to mount the swing on the coupling.

⚠ Caution

Avoid labored mounting or protrusion of X ring.

ii) Insert swing so that coupling aligns with ball race of the swing.

⚠ Caution

Avoid inserting the swing too much.

iii) First prepare two steel balls for compressing the packing.

iv) Insert a steel ball by tapping with a rod that makes it easier to insert the next steel ball.

⚠ Caution

When tapping with a rod, take care not to damage the insertion hole.

- v) Necessary number of steel balls shall be surely inserted to fill each ball race full. When the last steel ball is tapped with a rod, the first steel ball comes out.

swivel joint size	2-1/2", 3"	4"	6"	8"	10"	12"
ball size× PCS/Swivel	φ 3/8" ×66 PCS	φ 3/8" ×84 PCS	φ 5/8" ×76 PCS	φ 5/8" ×96 PCS	φ 5/8" ×116 PCS	φ 5/8" ×140 PCS

(5) Mounting of ball retainer plug


Fit Plug washer (Only 2-1/2"~4") and O ring first and then screw ball retainer plug into the body. Apply DEVCON A to around ball retainer plug, and then use a wire to prevent loosening.

(6) Mounting of square head plug

Screw the square head plug with spanner to fix, after apply HERME SEAL No.201 (NIHON HERMETICS Co., Ltd.) for the thread part of square head plug.

(7) Supply of grease

- i) Screw grease nipple (R1/8) into the lubrication hole. Attach grease nipple on a lubrication hole while keeping another hole open.
- ii) Fill a small amount of grease slowly into grease nipple by manual grease gun while keeping the swing rotating slowly.
- iii) Every stroke of grease gun discharge excess grease by pushing the ball at the top of the grease nipple.
- iv) In case swivel joint becomes hard to rotate during lubrication, too much grease may have been filled. Push the ball at the top of grease nipple to discharge excess grease.
- v) When grease comes out from nipple hole, stop supplying grease.
- vi) Rotate swivel joint several times after lubrication, push ball of grease nipple or dismount grease nipple to discharge excess grease and release pressure of grease in the swivel joint.
- vii) Screw square head plug into the nipple hole.

 Caution

Take care not to fill too much grease. If grease pressure remains, the packing may be deformed to cause leakage as well as disturbance of rotation.

3.4 Confirmation of smooth rotation

Confirm swivel joint rotates smoothly after completion of assembly.

4. Instructions for welding

Pay attention to the followings when swivel joint is welded to piping.

4.1 Disassemble swivel joint before welding.

This is necessary to protect packing and X ring from excess heat and to prevent degradation of grease.

Disassembly shall be made according to "3.0 Disassembly and assembly "

4.2 Pipe and swivel joint body are tentatively mounted and welded to confirm neither eccentricity nor tilt exists and then open up full welding

- (1) During welding bind up wet cloth etc. to prevent heating up of the ball race part over 80°C.
- (2) Take care not to damage machined surface of the swivel joint during welding work.
Cover the finished surface not to be attached with spatter of welding.
- (3) After completion of welding, clean the ball race surface, packing and X ring sealing surface with cleaner.

 Warning: Danger

Make sufficient ventilation when cleaner is used.

4.3 Assembly of swivel joint shall be made according to "3.0 Disassembly and assembly".