

DEUBLIN®

Instructions for
Installation and Maintenance

Installation Instructions

040-535

For

DEUBLIN Unions

H57 – H67 – H87

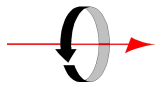
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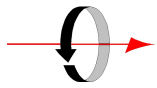
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1. TECHNICAL SPECIFICATIONS

1.1. H Series Union has been designed for Steam and Hot Oil applications.

1.2. Design Features:

1.2.1. Mono and Duo Flow

1.2.2. Self-Supported

1.2.3. Cast Iron Housing

1.2.4. Stainless Steel Rotor

1.2.5. Dual Radial Support Bushings

1.2.5.1. Anti-Rotational System

1.2.6. Threaded or Flange Rotor Connections

1.2.7. Pressure Type Spherical Carbon Seal vs. Spherical Stainless Steel Counter Face

1.2.8. External Spherical Carbon Seal wear indicator on rotor

1.2.9. End Cap Sight Glasses (Optional)

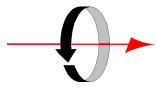
1.2.10. Secondary Seal for Duo Flow Models

1.2.11. Operating Data, see Table #1

Table #1		
Saturated Steam Max. Pressure	150 PSI	10 bar
Max. Temperature	365 °F	185 °C
Max. Rotational Speed	180 RPM	180 min ⁻¹
Hot Oil Max. Pressure	90 PSI	7 bar
Max. Temperature	450° F	232°C
Max. Rotational Speed	350 RPM	350 min ⁻¹

2. WARNINGS

- 2.1. Before proceeding with installation, it is suggested you read the complete instructions, identifying all the mentioned parts and checking them against related drawings and tables.
- 2.2. It is suggest that you prepare a suitable space where to open the crates and separate all the particular contents.
- 2.3. All sacks, boxes and other containers, are labelled in a clear and legible manner with codes of the particular contents. These codes are listed in the BOM e that can be directly identified on the set of drawings or attached through separate documentation.
- 2.4. Do not confuse, by mixing screws, bolts, nuts and washers; these items are supplied in the exact quantity necessary to the installation of the purchased material.
- 2.5. If, for any reason, one or more item should be missing, identify the component through the code, in order to be able to reorder the missing part.
- 2.6. All necessary components are described according to their type, material and possible dimensions to facilitate the search at our distributors and local warehouses.
- 2.7. In case of doubts, lack of understanding or for any other question, contact the nearest DEUBLIN Group's professional.



3. TECHNICAL NOTES

- 3.1. These instructions should be used in conjunction with specific installation drawings.
- 3.2. It is advisable to use some type of anti-seize compound on all bolts and screws in this installation.
- 3.3. The compound should be applied as per the manufacturers recommendations.
- 3.4. Preparation:
 - 3.4.1. Remove existing steam joint and journal flange, if necessary.
 - 3.4.2. Clean the end of the dryer journal or journal flange, removing any residual gasket material.
 - 3.4.2.1. Most soft cut gaskets are installed in a dry state, the use of jointing compound is not recommended. Releasing agents such as grease or oil containing compounds are not required and can adversely effect the material, lowering torque retention properties. To aid gasket removal most gasket materials have anti-stick finish.
 - 3.4.3. Carefully install gaskets taking care not to damage the material surfaces.
 - 3.4.4. Bolt Torque, see Table #2
 - 3.4.4.1. Clean and lubricate bolts and nuts and ensure that the nut can be freely run down the thread. Any debris on the threads can affect the final clamping load applied to the gasket.
 - 3.4.4.2. A minimum of three tightening passes should be used plus an additional pass in a clockwise sequence.
 - 3.4.4.3. Torque should be applied to the bolts using correctly calibrated torque wrench in a diametrically opposed sequence, see Fig #1.

Table #2		
Nominal screw (Ø)	Torque moment (N m)	Torque moment (lb ft)
6	8,8	6.5
8	21,6	15.9
10	44,2	32.6
12	73,6	54.3
14	120	88
16	206	152
18	255	188
20	363	268

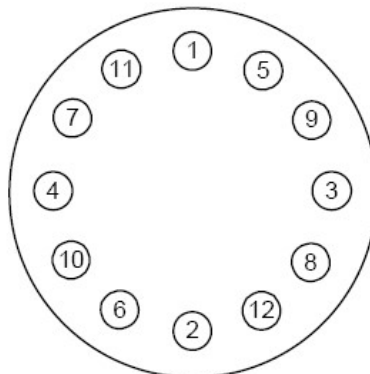


Fig. #1

4. MONO FLOW UNION

4.1. Installation

4.1.1. Journal Flange

4.1.1.1. Secure, if present, the journal flange onto the journal.

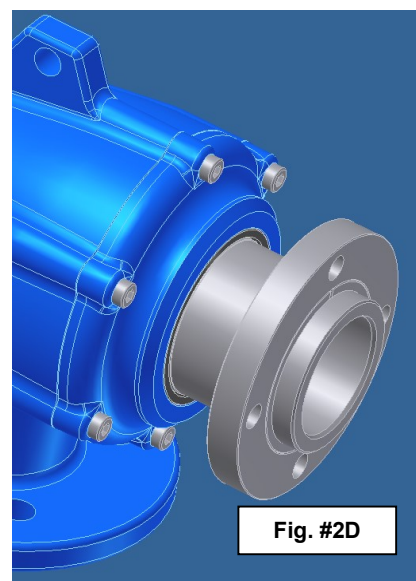
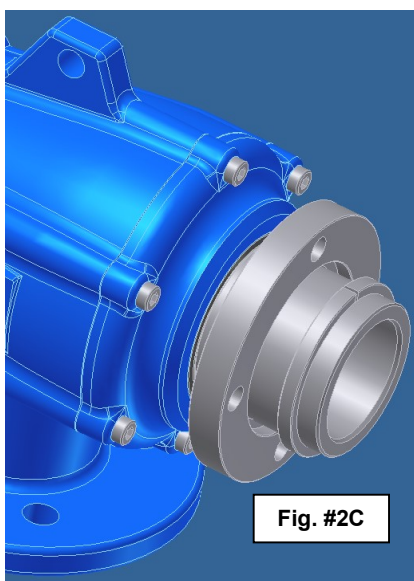
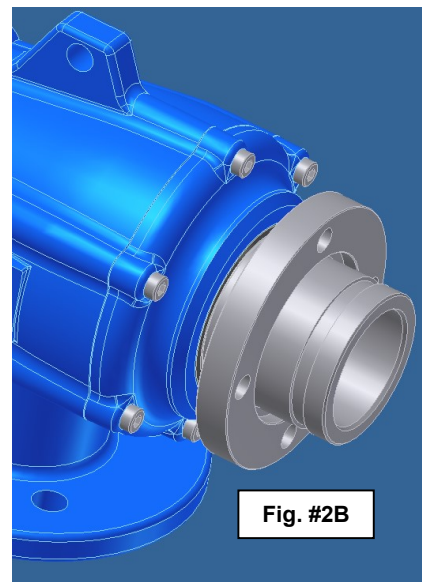
4.1.1.2. Place a new or previously lubricated gasket with an anti-seize compound (Grafoil, Molikore or similar) between journal and journal flange.

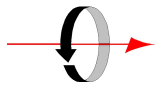
4.1.2. Flanged Rotor, see Fig. #2A - 2D

4.1.2.1. Place the rotor flange over the rotor.

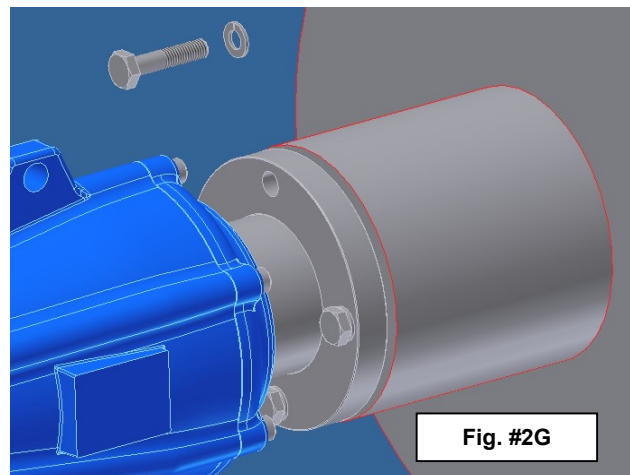
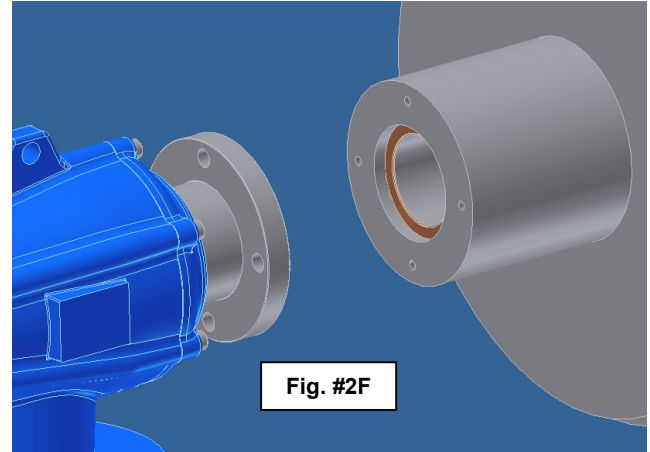
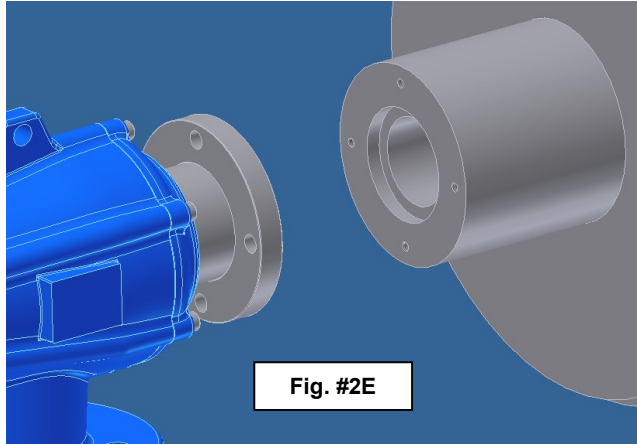
4.1.2.2. Position the split rings in the rotor groove.

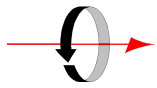
4.1.2.3. Slide the rotor flange forward, over the split rings, securing the rings in place.





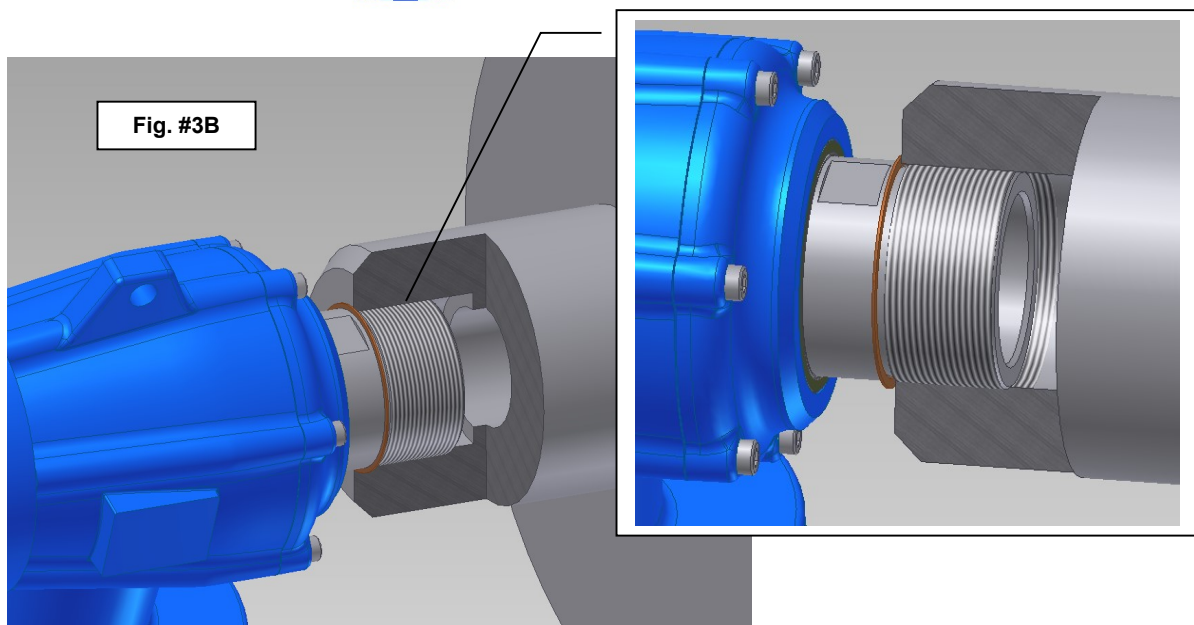
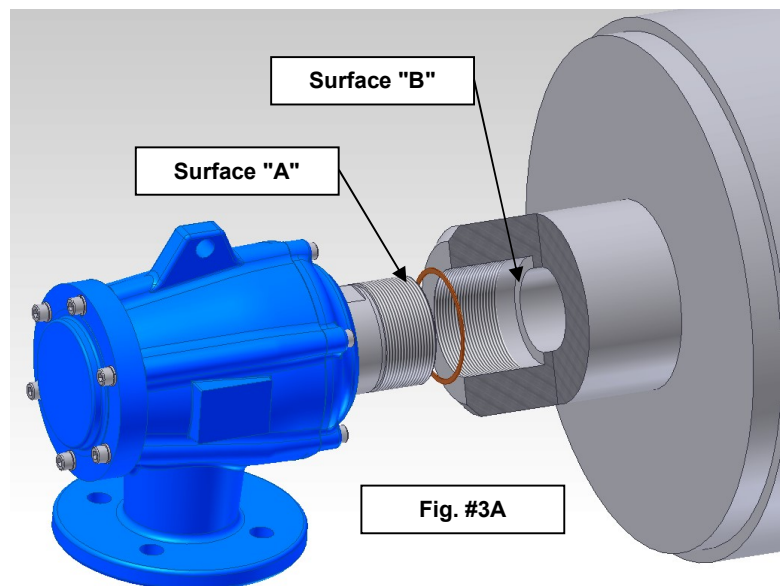
- 4.1.2.4. Bring the union near to journal, see Fig. #2E - 2G.
- 4.1.2.5. Place the rotor gasket in the recess of the journal flange.
- 4.1.2.6. Position the rotor into the journal flange pilot and secure the rotor flange to the journal flange with hex head screws and lockwashers using a uniform locking pattern.
- 4.1.2.7. With a feeler gauge, verify that the journal plane and the rotor flange are parallel.
 - 4.1.2.7.1. Verify the clearance is uniform between them.

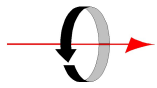




4.1.3. Threaded Rotor, see Fig. #3A - 3C

- 4.1.3.1. The procedure for installing the union's threaded version varies only in rotor fixing which takes place through the journal's internal thread.
- 4.1.3.2. Union is supplied with copper gasket and provides a seal between rotor shoulder and front surface of journal counterbore.
 - 4.1.3.2.1.1. To ensure copper gasket is properly compressed, avoid contact between union rotor end (Surface "A") and bottom of journal counterbore (Surface "B").
See Fig. #3C for rotor dimensions
 - 4.1.3.2.2. An alternative solution, Teflon tape or suitable sealing paste can be applied over the rotor thread.
- 4.1.3.3. Use an appropriate wrench, placed on rotor's flats (see relevant drawing for correct dimensions).





H87

H67

H57

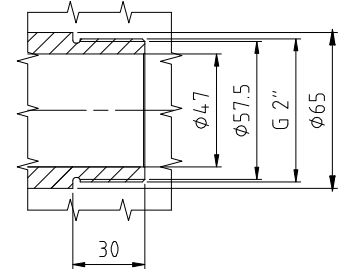
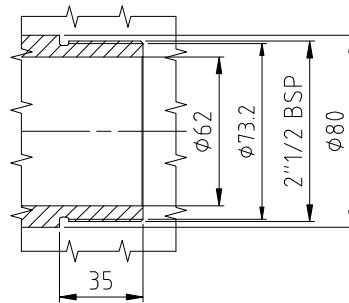
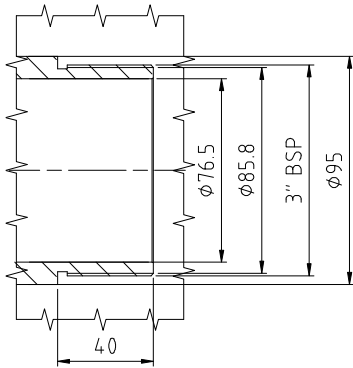
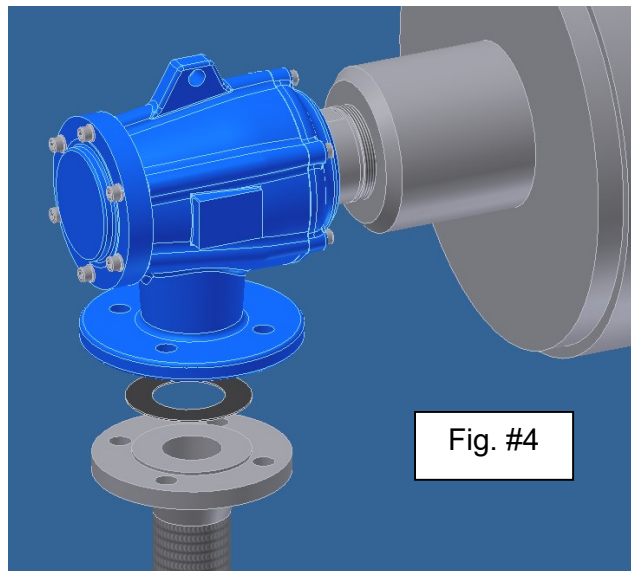


Fig. #3C

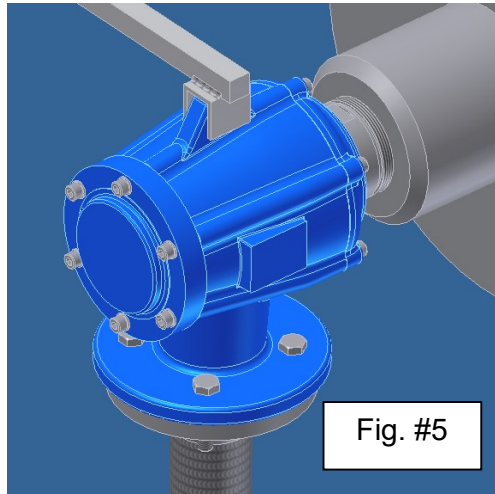
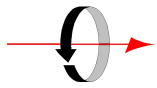
4.1.4. Hose Connection, see Fig. #4

- 4.1.4.1. Fix the hoses so that no tension or compression may be applied on the union.
- 4.1.4.2. Do not forget hose flange gasket.
- 4.1.4.3. Do not stress union while tightening a threaded hose connection.



4.1.5. Anti-rotation Device, see Fig. #5

- 4.1.5.1. For a correct installation it is necessary to provide an anti-rotation device so that the torque does not apply directly on hoses.
- 4.1.5.2. The anti-rotation system will interface with union anti-rotation lug
 - 4.1.5.2.1. This will allow the union to maintain axial and radial movements.
- 4.1.5.3. A robust fork-shaped anti-rotation device is suitable for the application.



4.1.5.4. After two or three hours from start-up, we suggest that you verify all fixing screws tightening in order to compensate possible thermal dilations.

4.2. Maintenance / Repair

4.2.1. Carbon Seal Wear

4.2.1.1. Maintenance activity is necessary only when the Carbon Seal is worn.

4.2.1.2. The wear may be verified while the machine is stopped and cold.

4.2.1.3. The seal wear indicator (groove), on the rotor, identifies the Carbon Seal's state of wear thus providing the necessary time to organise an appropriate maintenance.

4.2.1.4. The Union Housing moves away from the seal wear indicator as the Carbon Seal wears.

4.2.1.5. Table #3 lists the maximum Carbon Seal wear for various models.

4.2.1.5.1. When these limits are reached, the union should be repaired or rebuilt.

Table #3	
H model	Maximum wear (mm)
H57	8
H67	8
H87	10

4.2.2. Steam Application (GA)

4.2.2.1. The repair procedure will require the disassembly of the union from the journal in the following step by step process:

4.2.2.1.1. Remove the half-rings and the rotor flange

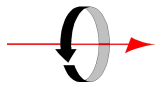
4.2.2.1.2. Disassemble the rear cover

4.2.2.1.3. Disassemble spherical counterface by removing relevant screws

4.2.2.1.3.1. To facilitate union's assembling and disassembling phase, replace two counterface's screws (at 180°) with two tie rods; use them with nuts to unload spring softly)

4.2.2.1.4. Open the union and disassemble all internal components

4.2.2.1.5. These instructions are general instructions only.



4.2.2.1.6. Please refer to the installation drawing for specific information pertaining to each installation.

4.2.2.1.7. Refer to Fig. #6 and Table #4 to identify the components that must be replaced.

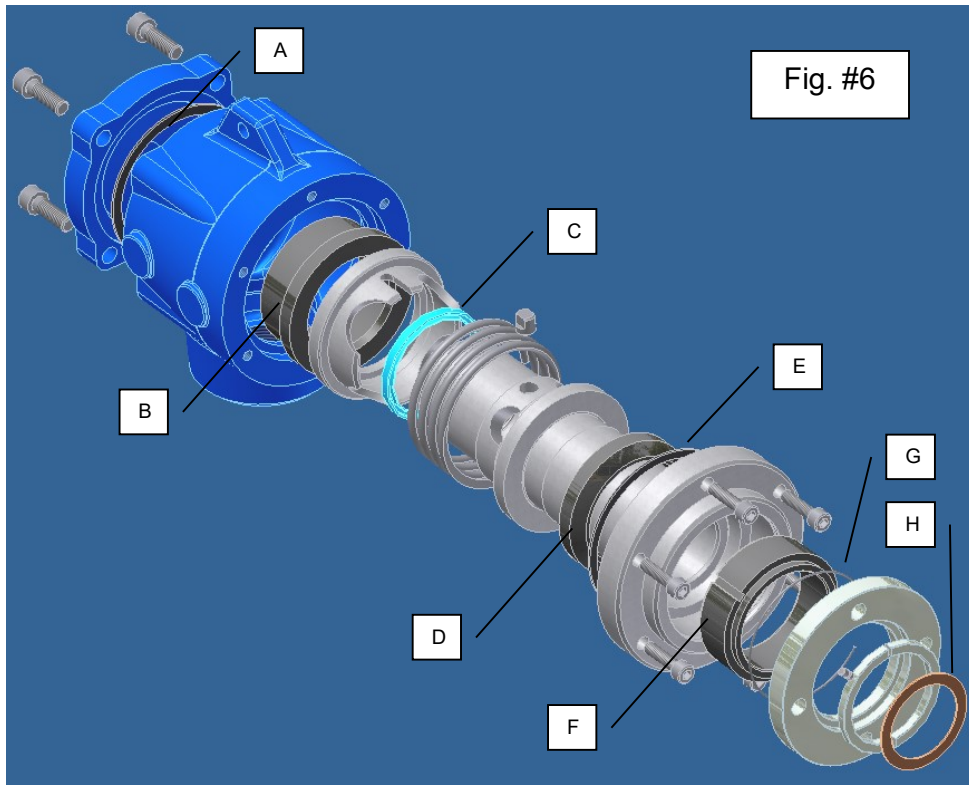


Table #4
SPARE PARTS CHART

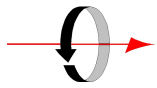
A	Head gasket
B	Rear carbon ring
C	C-ring
D	Spherical carbon seal
E	Counterface gasket
F	Front carbon ring
G	Elastic ring
H	Rotor gasket

4.2.2.1.8. With a light emery cloth, polish the bearing support areas on each end of the rotor.

4.2.2.1.9. Lightly polish the sealing face on the rotor. If the sealing face on the rotor is pitted, the rotor should be replaced.

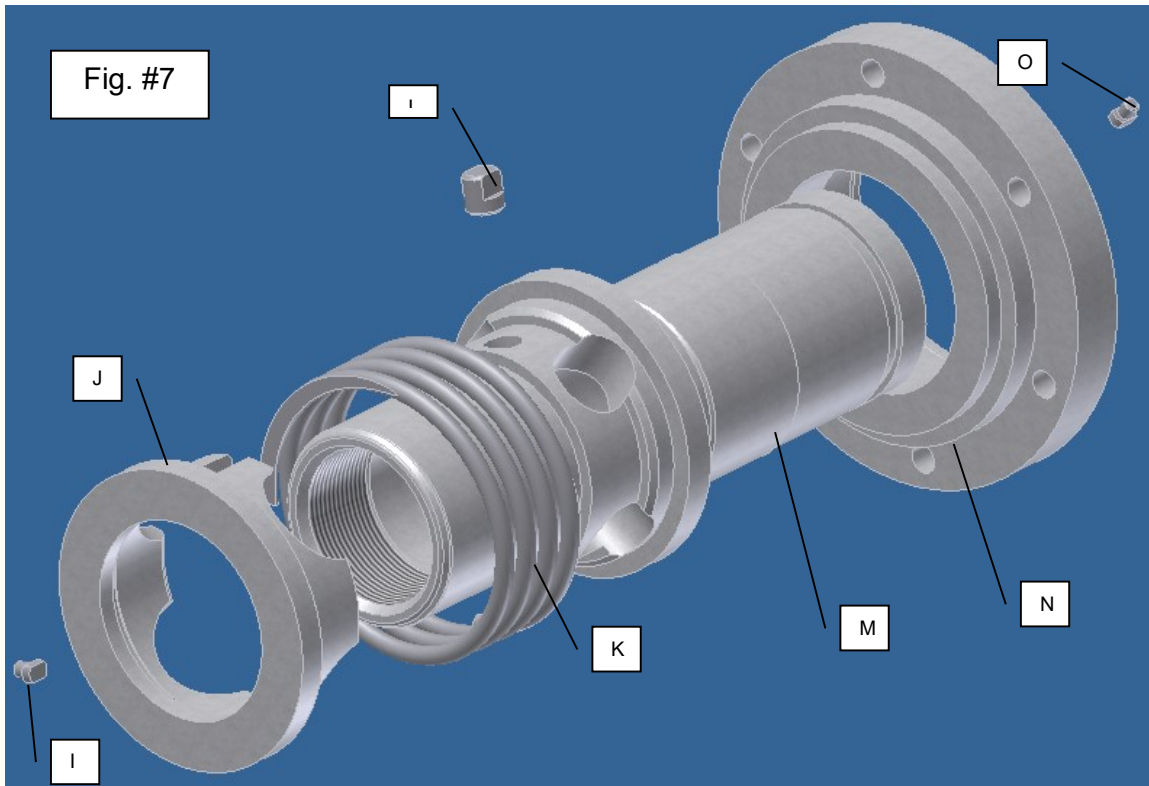
4.2.2.1.10. Inspect the sealing surfaces of the flat and spherical counterfaces. Polish these with a light emery cloth. If these components are pitted, they should be replaced.

4.2.2.1.11. Clean all residual gasket material from the housing, end cap and counterface.

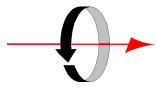


4.2.2.1.12. In case of deep wear of the union, many other components can be replaced.

4.2.2.1.13. Refer to the Fig. #7 and Table #5 to identify the components that must be replaced.



I	Rear anti-rotation key
J	Plane counterface
K	Spring
L	Rotor anti-rotation key
M	Rotor
N	Spherical counterface
O	Front anti-rotation key



4.2.3. Oil Application (HT)

4.2.3.1. The HT series of the H union is designed for Hot Oil applications.

4.2.3.2. Listed below are main differences between Steam and Oil Unions:

4.2.3.2.1. Use Packings instead of Teflon C-rings

4.2.3.2.2. Drainage holes in the counterface

4.2.3.2.3. Spring with higher spring rate

4.2.3.2.4. Spacer between spring and counter-face

4.2.3.2.5. Spherical counter-face and carbon seal match lapped

4.2.3.3. The repair procedure is almost the same as for Steam union.

4.2.3.3.1. Refer to the Fig. #8 and Table #6 to identify the components that must be replaced.

4.2.3.3.2. Refer to the installation drawing for specific information pertaining to each installation.

4.2.3.3.3.

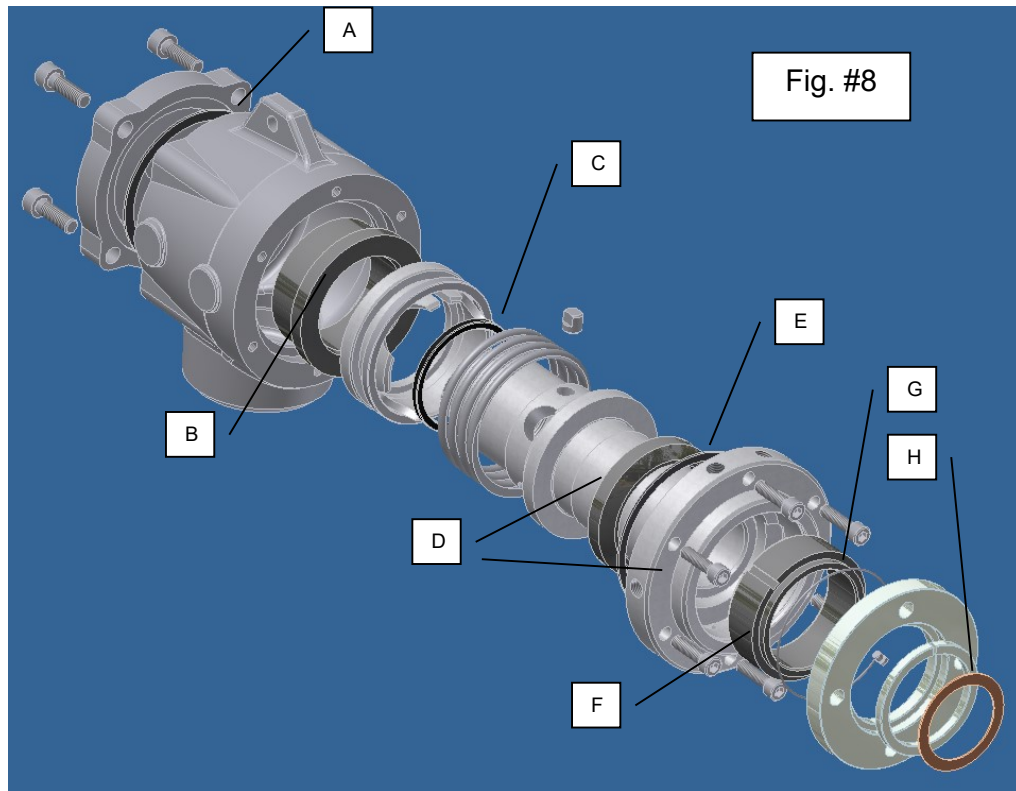
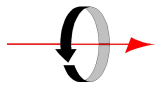
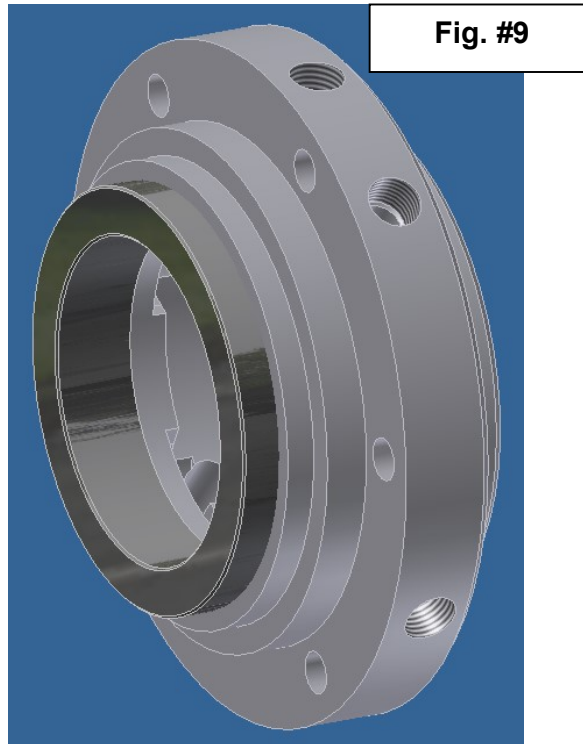


Table #6 SPARE PARTS CHART	
A	Head gasket
B	Rear carbon ring
C	Packing
D	Seal kit "3000" series
E	Counterface gasket
F	Front carbon ring
G	Elastic ring
H	Rotor gasket



4.2.3.4. The wearing part list is almost the same as for Steam union.

4.2.3.4.1. The main difference is that spherical carbon ring and spherical counterface are manufactured and supplied together as "3000" group, see Fig. #9



4.3. Start-up & Shut down

4.3.1. Steam Application (GA)

4.3.1.1. Never run the seals dry (without steam on).

4.3.1.2. The seals may leak for the first few hours of operation until the faces wear in.

4.3.1.3. Check all bolts to ensure they are tight.

4.3.1.4. After shut down DO NOT USE A HOSE TO COOL THE UNION.

4.3.2. Oil Application (HT)

4.3.2.1. Never run the seals dry (without OIL)

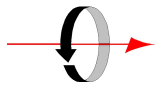
4.3.2.2. Ensure that the oil is properly filtered and free of particles.

4.3.2.3. The seal may leak for the first few hours of operation until the faces wear in.

4.3.2.4. Check that drainage holes are properly positioned and / or connected with drainage hose (if necessary)

4.3.2.5. Check all bolts to ensure they are tight.

4.3.2.6. After shut down DO NOT USE A HOSE TO COOL THE UNION.



5. DUO FLOW UNION

5.1. Installation

5.1.1. Journal Flange

5.1.1.1. Installation procedure is the same as for mono flow union, so proceed as described above under 4.1.1.

5.1.2. Flanged Rotor

5.1.2.1. Installation procedure is the same as for mono flow union, so proceed as described above under 4.1.2.

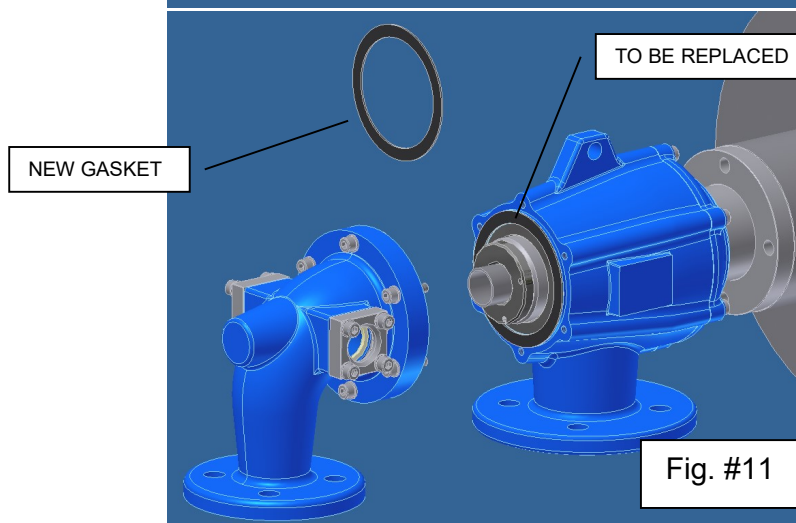
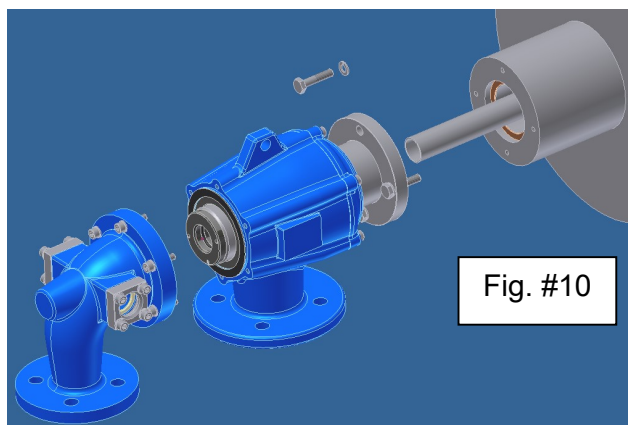
5.1.2.2. Duo flow unions are provided with end cap and rotor internal bushing to fit siphon's end.

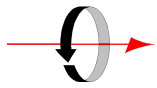
5.1.2.2.1. Verify the siphon pipe size matches the rotor's bushing diameter (or thread) and axial extension. See specific drawing.

5.1.2.2.2. Read carefully the "Siphon's Bushing" paragraph under 5.1.4 before installing a Duo flow union.

5.1.2.2.3. It is recommended to remove union's end cap to have a better control on siphon's fitting with rotor's bushing, see Fig. #10.

5.1.2.2.4. When removing union's end cap, pertinent gasket must be replaced with a new one to ensure proper sealing. New end cap gasket is included in union's supply, see Fig. #11.





5.1.3. Threaded Rotor

5.1.3.1. Installation procedure is the same as for mono flow union, so proceed as described above under 4.1.3.

5.1.3.2. Also reference Duo flow Union Flanged Rotor under 5.2.2 for Siphon Bushing and End Cap Gasket information.

5.1.4. Siphon Bushing, see Fig. #12

5.1.4.1. E-Type (o-ring)

5.1.4.1.1. This type of bushing is utilized when it is necessary to install a rotating siphon.

5.1.4.1.2. In the bushing seat there are two O-rings (or two packing in HT version) which allow the siphon pipe to move axially to compensate thermal growth.

5.1.4.1.3. Be sure not to damage O-ring while installing union.

5.1.4.2. R-Type (threaded)

5.1.4.2.1. This type of bushing is utilised when it is necessary to install a rotating siphon which is connected to this threaded bushing and screwed on the rotor.

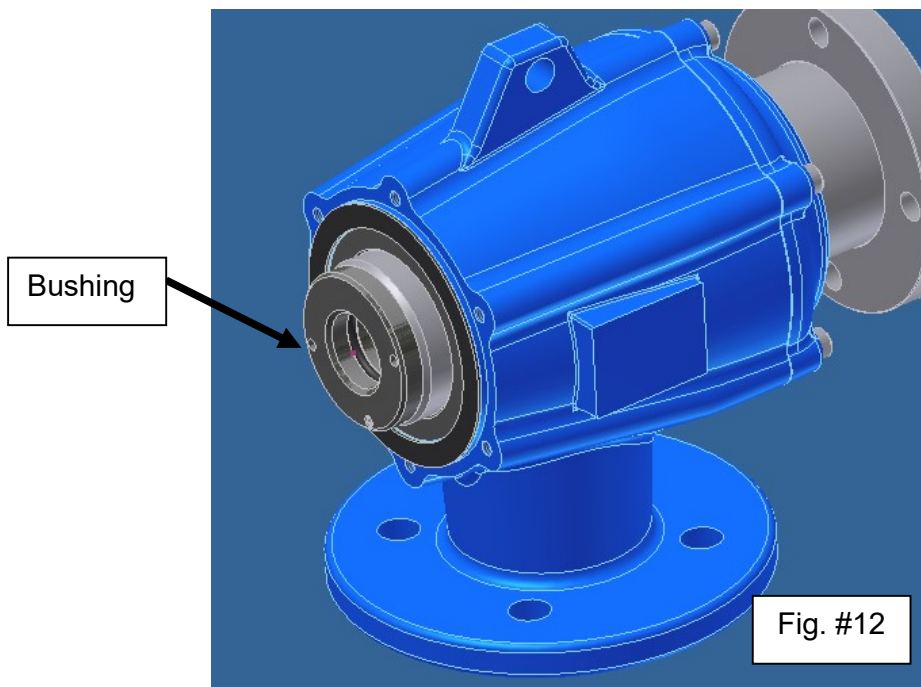
5.1.4.2.2. Be sure to tighten siphon on bushing prior to install union on journal.

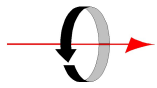
5.1.5. Hose Connection

5.1.5.1. Installation procedure is the same as for mono flow union, so proceed as described above under 4.1.4.

5.1.6. Anti-rotation Device

5.1.6.1. Installation procedure is the same as for mono flow union, so proceed as described above under 4.1.5.





5.2. Maintenance / Repair

5.2.1. Procedure is the same as for mono flow union, so proceed as described above under 4.2.

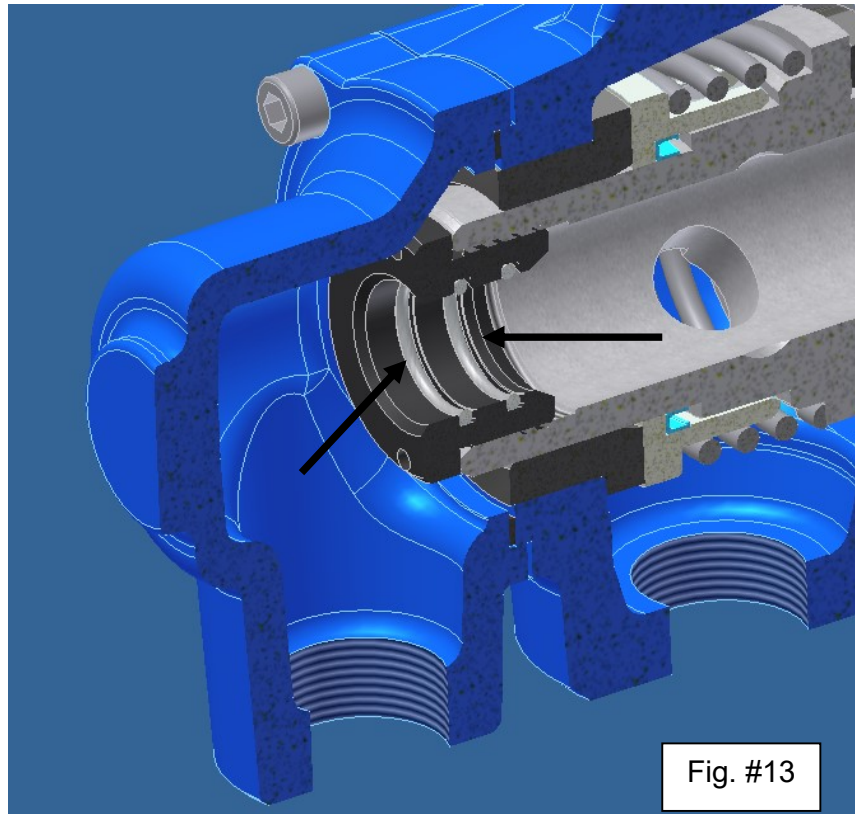
5.2.2. In duo flow unions you will find a bushing assembled onto the rotor, see Fig. #13.

5.2.2.1. Steam Application (GA)

5.2.2.1.1. Replace the o-rings in the siphon bushing

5.2.2.2. Oil Application (HT)

5.2.2.2.1. Replace the packing in the siphon bushing



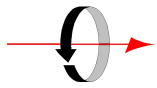
5.3. Start-up & Shut down

5.3.1. Steam Application (GA)

5.3.1.1. Start up and shut down procedure is the same as for mono flow union, so proceed as described above under 4.3.1

5.3.2. Oil Application (HT)

5.3.2.1. Start up and shut down procedure is the same as for mono flow union, so proceed as described above under 4.3.2



5.4. Condensate Sight Glasses

- 5.4.1. In case of union equipped with the integrated condensate discharge viewer installed on end cap, it could be necessary to replace them if worn out.
- 5.4.2. Fig. #14 and Table #7, represents all details regarding the Condensate Discharge Viewer.

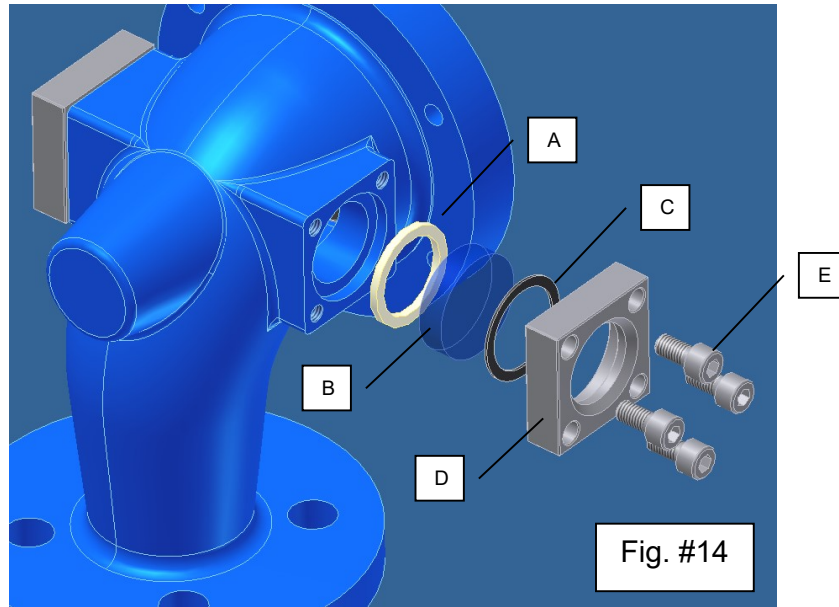
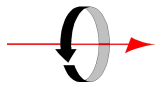
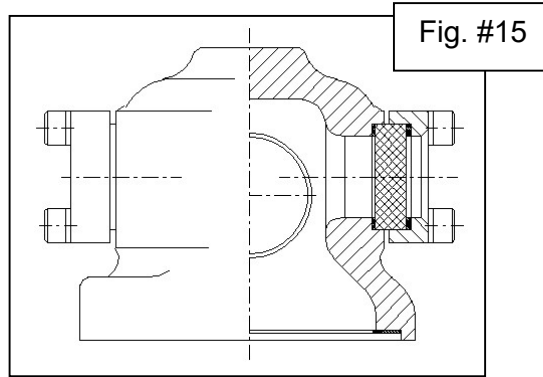


Table #7 PARTS CHART	
A	Goretex gasket
B	Glass
C	Gasket
D	Glass flange
E	Screws

- 5.4.3. It is rather difficult to forecast the life expectancy of such viewers. The material used in producing them is boron silicate glass and presents high resistance features. It may, however, be eroded by the continuous passage of condensate and its chemical additives. When it becomes necessary to replace the viewers, follow the instructions.
 - 5.4.3.1. After removing the viewer's flange, the old viewer and gaskets, clean the housing accurately.
 - 5.4.3.2. Remove any gasket's particles and verify if the seat has sustained damages.
 - 5.4.3.3. In case the end cap seat shows damages, provide restoration to the original condition and only in case that it is not possible replace end cap.
 - 5.4.3.4. Once the end cap has been cleaned, position the first Goretex gasket (the white one) on the viewer house.
 - 5.4.3.5. Then position the glass.
 - 5.4.3.6. Lastly, position the external gasket (the dark one) and fix the flange.

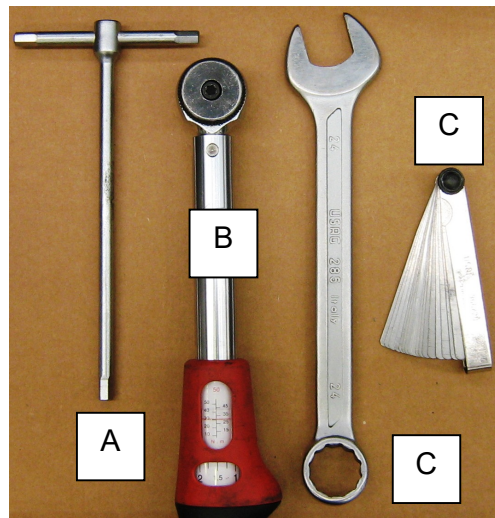


- 5.4.3.7. Complete installation by tightening with care the screws with a proper torque wrench. Note that the Goretex gasket is soft and noticeably thick, therefore do not exceed the screws tightening.
- 5.4.3.8. See Fig. #15, illustrating end cap with condensate discharge viewers as they appear after installation.



6. EQUIPMENT, see Fig. #16 & Table #8

- 6.1. A torque wrench is required to apply the correct tightening torque to certain fixings, as specified.
- 6.2. A feeler gauge is recommended to ensure parallelism between rotor's flange and journal face.
- 6.3. The wrench's size may vary depending on the joint/siphon system.
- 6.4. Identify the exact screws size on the set of drawings.



	TOOL	WHERE USED
A	Allen key	Socket screw
B	Torque wrench	Rotor flange fixing screws
C	Open-end spanner	Hexagonal headed screw
D	Feeler gauge	Parallelism between surfaces