Issue Date: October 22, 2019

DRYLOK® DRY DISCONNECT SYSTEM

Drylok® Installation, Operation & Maintenance (IOM) Manual

OPW®
ENGINEERED SYSTEMS
a DOVER company

opw-es.com

ENGINEERING | WHAT'S NEXT

OPW ENGINEERED SYSTEMS
a DOVER company

OPW Engineered Systems specializes in the engineering, designing and manufacturing of systems for the safe and efficient loading and unloading of critical hazardous materials: loading systems, swivel joints, instrumentation, quick and dry disconnect systems and safety breakaways.

Contents

Drylok® Dry Disconnect System – Product Overview

Drylok® is designed to safely transfer hazardous, corrosive and volatile liquids such as acids, solvents and petrochemicals. Rugged design, excellent flow with little product loss makes the Drylok ideal for the most challenging loading-rack environments. The Drylok has become the coupler of choice in many of the most critical loading applications.

Drylok® Couplings

Benefits

- **Very Low Product Loss –** Flat Poppet Face design ensures minimal loss at disconnect
- **Fully Interlocked –** Double Safety System. Cannot be opened unless connected to mating fitting. Can be coupled in any orientation – 360°.
- **Optimal Flow –** Less obstruction and greater flow area provides better flow characteristics in high-pressure or high-viscosity applications.
- **Rugged –** Designed to withstand everyday use/abuse at the loading rack.
- **Ease of Maintenance –** Standard O-Ring seals make maintenance simple, easy and cost-effective.
- **150-psi (10-bar) Pressure Rating**
- **1", 2" & 3" sizes**
- **Stainless-Steel, Alloy 20 or Hastelloy C Construction**
- **AAR Approved**
- **CRN Approved**

IMPORTANT: OPW products should be used in compliance with applicable federal, state, provincial, and local laws and regulations. Product selection should be based on physical specifications and limitations and compatibility with the environment and materials to be handled. **OPW MAKES NO WARRANTY OF FITNESS FOR A PARTICULAR USE.** All illustrations and specifications in this literature are based on the latest product information available at the time of publication. OPW reserves the right to make changes at any time in prices, materials, specifications and models, and to discontinue models without notice or obligation.

Selection Guide

5670 – V720N

Type
56 = Adaptor
57 = Coupler

O-Ring Seal
C = FLUOROCARBON E
E = EPDM
F = PTFE ENCAPSULATED FLUOROCARBON
N = BUNA N
T = PTFE ENCAPSULATED SILICONE
V = FLUOROCARBON GFLT
Y = KALREZ 4079
Z = KALREZ 6375

Construction Material
7 = 316 Stainless Steel
8 = Alloy 20®
9 = Hastelloy C

Size
10 = 1"
20 = 2"
30 = 3"

Style
A = ANSI Flange 150 Lbs.
B = Female BSPT
C = Cutaway
N = Female NPT
P = Sanitary Triclamp
T = ANSI Flange 300 Lbs.
W = Butt Weld
X = Parking Adaptor
SW = Socket Weld

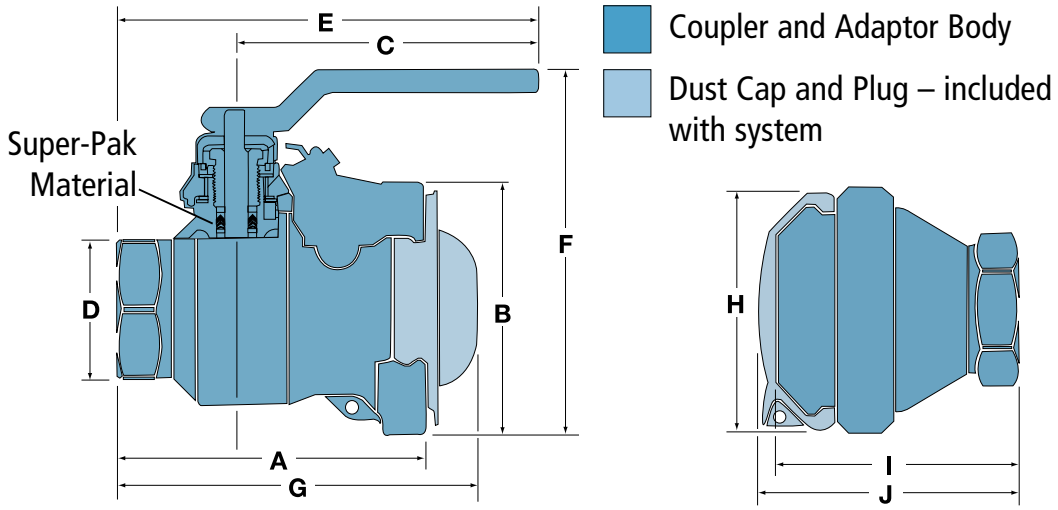
OPW ENGINEERED SYSTEMS
a DOVER company

Drylok® Dry Disconnect – Product Specifications

Dimensions

Size	A	B	C	D	E	F	G	H	I	J	Connected
1"	3-21/64" 85.6mm	23-15/32" 62.7mm	5-3/8" 136.5mm	1-7/8" 47.6mm	6-3/4" 171.5mm	4-37/64" 116.3mm	3-33/64" 89.3mm	2-5/32" 54.9mm	3-3/16" 81mm	3-3/4" 95.3mm	6-1/16" 153.9mm
2"	6-3/16" 173mm	5" 127mm	6" 152.4mm	2-3/4" 69.9mm	8-3/8" 212.7mm	7-1/4" 184.2mm	7-7/32" 183.4mm	5" 127mm	4-15/16" 125.4mm	5-5/16" 134.9mm	10-1/6" 258.3mm
3"	7-3/4" 196.9mm	6-3/16" 157.2mm	8-3/4" 222.3mm	4" 101.6mm	12" 304.8mm	8-31/32" 227.8mm	8-49/64" 197.3mm	5-1/2" 139.7mm	6-7/8" 174.6mm	7-17/64" 184.7mm	13-3/8" 339.7mm

Size indicates NPT Pipe Thread



Technical Specification

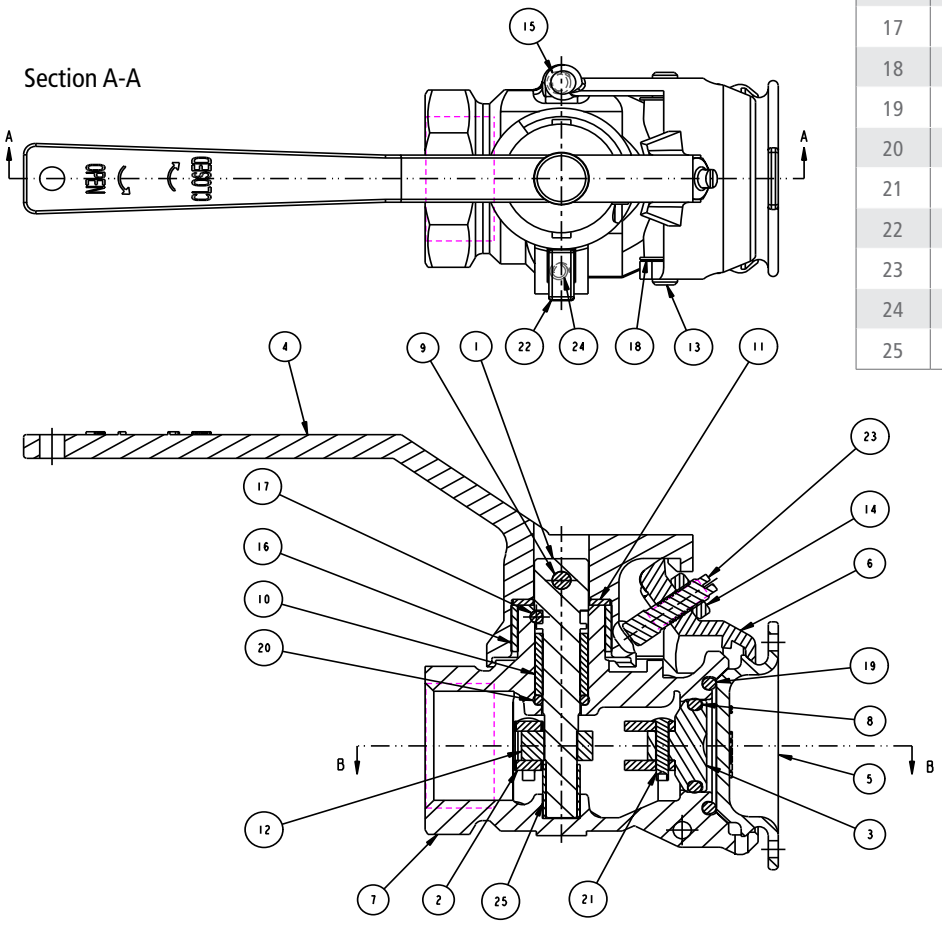
	Max Pressure (psi/bar)	Weight Coupler (lbs/kg)	Adaptor (lbs/kg)	Temps PTFE/ FFKM (F / C)	Temps Fluorocarbon	Temps EPDM	Temps Buna
1"	150 (10 bar)	2.25 (1.0)	1.25 (.6)	0°F-350°F (-18°C-177°C)	-20°F-350°F (-29°C-177°C)	-40°F-280°F (-40°C-138°C)	-40°F-225°F (-40°C-107°C)
2"	150 (10 bar)	10.25 (4.6)	7.5 (3.4)	0°F-350°F (-18°C-177°C)	-20°F-350°F (-29°C-177°C)	-40°F-280°F (-40°C-138°C)	-40°F-225°F (-40°C-107°C)
3"	150 (10 bar)	14.5 (6.5)	11.75 (5.3)	0°F-350°F (-18°C-177°C)	-20°F-350°F (-29°C-177°C)	-40°F-280°F (-40°C-138°C)	-40°F-225°F (-40°C-107°C)

OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – 1" Coupler

Drylok® Dry Disconnect 1" Coupler – H-31297-PA

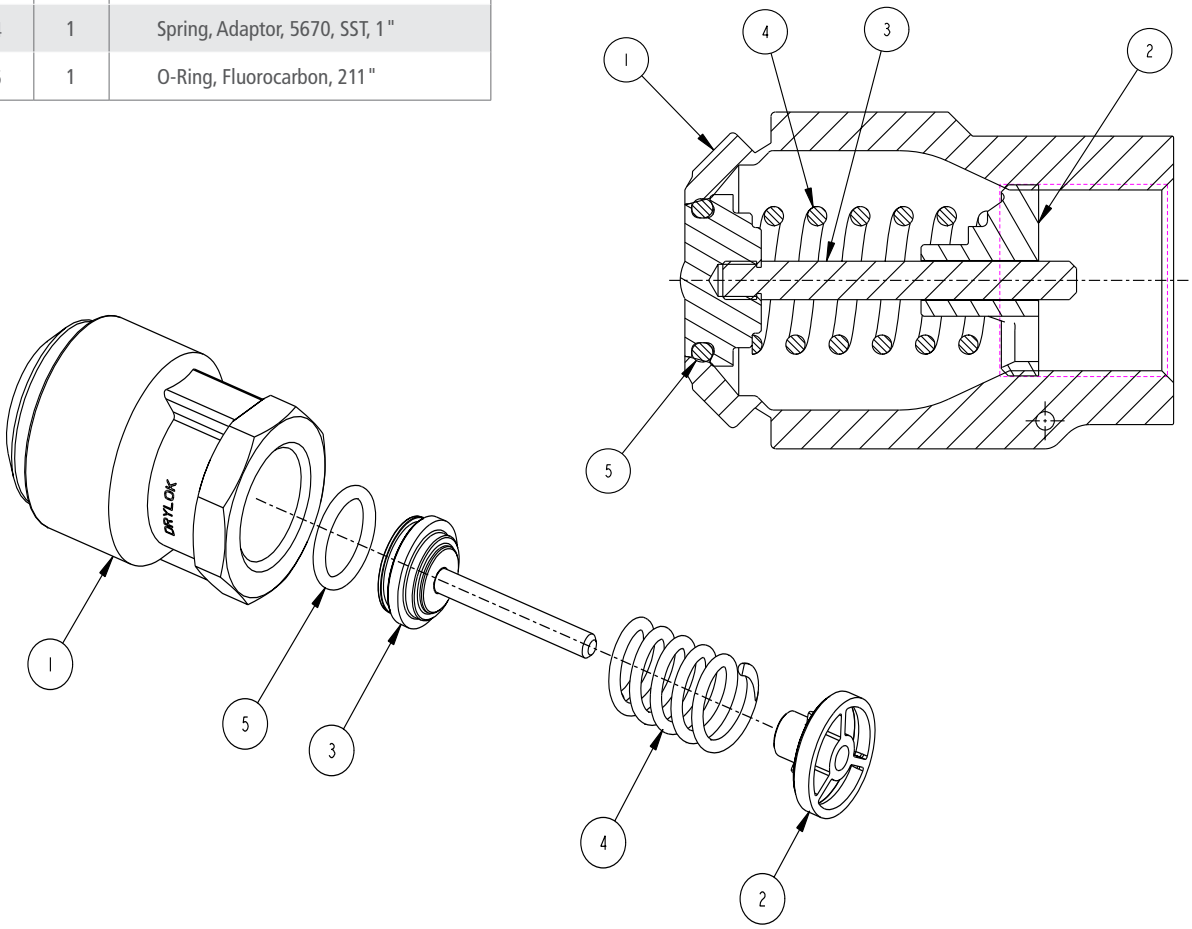
ITEM	QTY	DESCRIPTION
1	1	Shaft, 1" Drylok Coupler
2	2	Poppet Link, 1" Drylok
3	1	Poppet, 1" Drylok Coupler
4	1	Ramp/Handle, 1" Drylok
5	1	Dust Plug
6	1	Clamp, 1" Drylok Coupler
7	1	Body, 1" Drylok Coupler
8	1	O-Ring, Poppet #210
9	1	Groove Pin, Coupler Shaft
10	1	Bushing, Coupler Shaft
11	1	Washer, Ramp/Handle
12	1	Shaft Link, 1" Drylok
13	2	Retaining Pin, Clamp
14	1	Jam Nut, Safety Adjustor Screw
15	1	Spring, Clamp
16	1	Bearing, Handle
17	1	Groove Pin, Body/Shaft
18	2	E-Ring, Clamp Retaining Pin
19	1	O-Ring, Coupler Face Seal #217
20	1	O-Ring, Coupler Shaft #110
21	2	Rivet, Poppet Link
22	1	Safety Release Button
23	1	Safety Adustor Screw
24	1	Spring, Safety Release Button
25	1	Spacer/Bearing, Coupler Shaft



Drylok® Dry Disconnect – 1" Adaptor

Drylok® Dry Disconnect 1" Adaptor – H-31296-PA

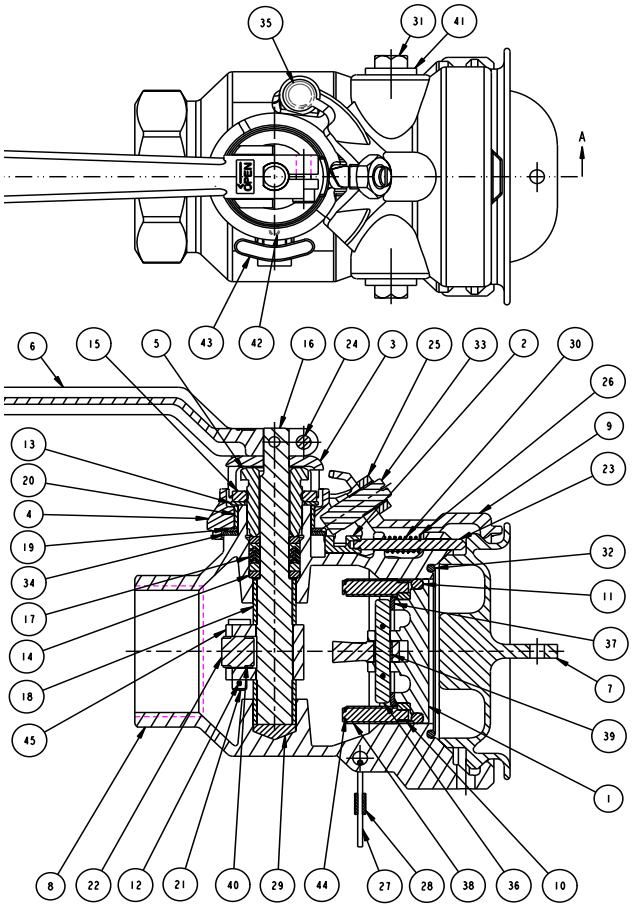
ITEM	QTY	DESCRIPTION
1	1	Body, Adaptor, 5670, FNPT, SST, 1"
2	1	Bridge, Adaptor, 5670, SST, 1"
3	1	Poppet ASM, Adaptor, 5670, SST, 1"
4	1	Spring, Adaptor, 5670, SST, 1"
5	1	O-Ring, Fluorocarbon, 211"

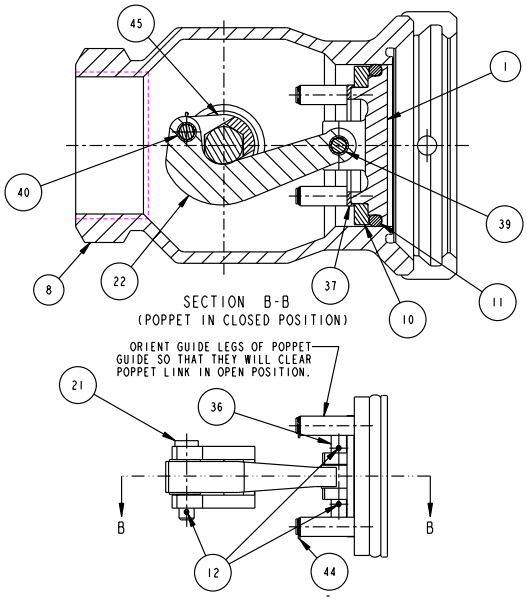


OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – 2" Coupler Drawings

Drylok® Dry Disconnect 2" Coupler – H-20905-PA

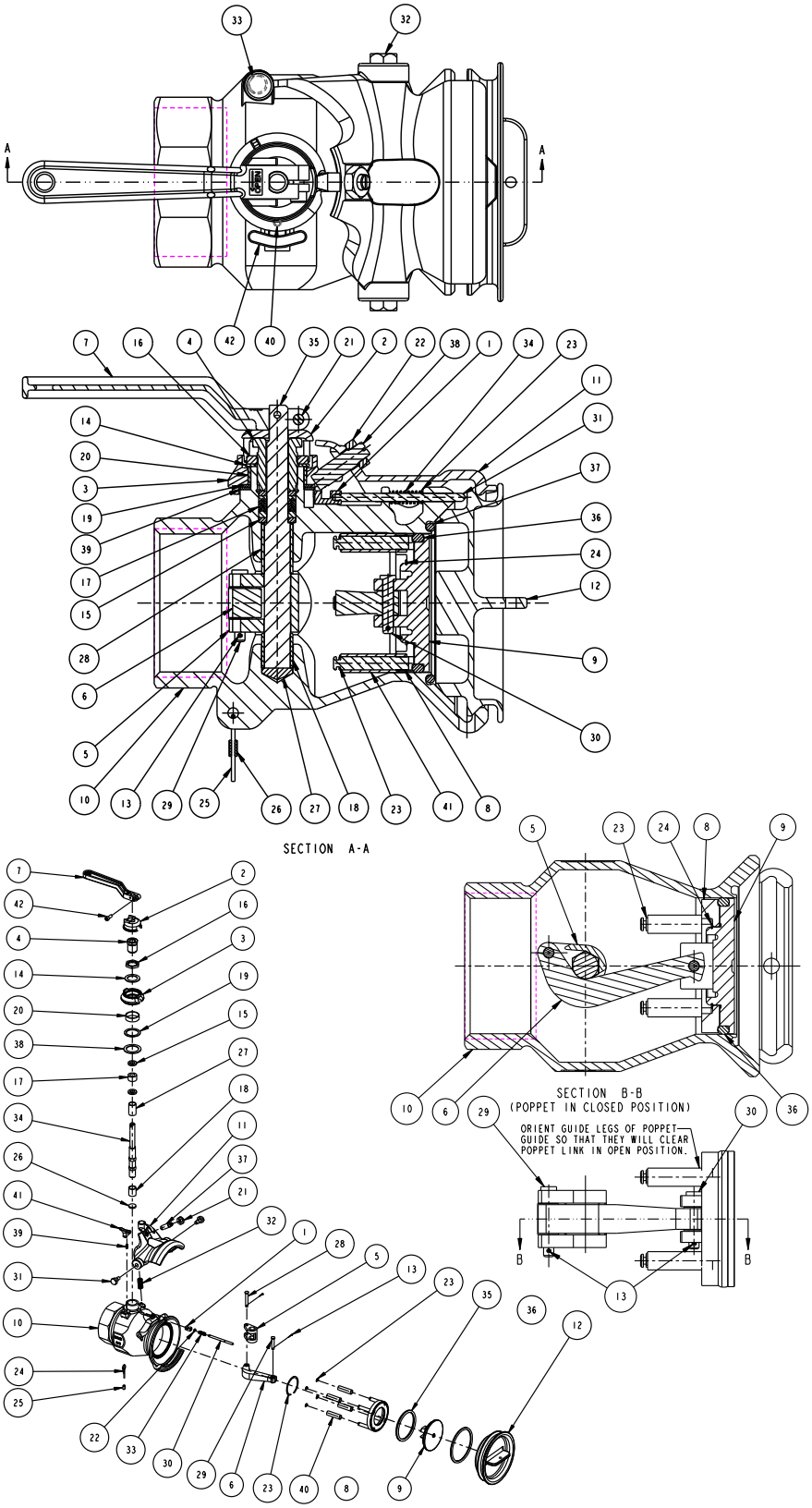




ITEM	QTY	DESCRIPTION
1	1	Poppet, 2" Drylok Coupler
2	1	Latch, 2"& 3" Drylok
3	1	Handle Extension, Drylok Coupler
4	1	Ramp, 2"& 3" Drylok
5	1	Screw, 2"& 3" Drylok
6	1	Handle, 2"& 3" Drylok
7	1	Dust Plug
8	1	Body, 2" Drylok Coupler
9	1	Clamp, 2" Drylok Coupler
10	1	Poppet Guide, 2" Drylok
11	1	O-Ring, Poppet - #331
12	3	Cotter Pin
13	1	Washer, Jam Nut
14	2	Washer, Packing
15	1	Jam Nut, Screw - 2" & 3" Drylok
16	1	Shaft, - 2" Drylok Coupler
17	1	Packing
18	2	Bearing, Coupler Shaft
19	1	Washer, Ramp - Teflon
20	1	Bearing, Ramp
21	1	Clevis Pin, Shaft Link/Poppet Link
22	1	Poppet Link, 2" Drylok
23	1	Shaft, Latch
24	1	Socket HD. Screw
25	1	Socket HD. Screw
26	1	E-Ring, Latch Shaft
27	1	Cable
28	2	Oval Sleeve
29	1	Plug
30	1	Spring, Latch
31	2	Shoulder Screw, Clamp
32	1	O-Ring, Coupler Face Seal #233
33	1	Safety Adjusting Screw
34	1	Washer, Ramp
35	1	Spring, Clamp
36	1	Lock Pin, Poppet
37	1	Lock Ring, Poppet
38	4	Sleeve, Guide Leg
39	1	Bearing, Small End Of Poppet Link
40	1	Bearing, Large End Of Poppet Link
41	2	Washer, Clamp Shoulder Screw
42	1	Spring, Safety Release Button
43	1	Safety Release Button
44	4	E-Ring, Guide Legs
45	1	Shaft Link, 2" Drylok

Drylok® Dry Disconnect – 3" Coupler Drawing

Drylok® Dry Disconnect 3" Coupler – H-52295-PA



ITEM	QTY	DESCRIPTION
1	1	Latch, 2"& 3" Drylok
2	1	Handle Extension, Drylok Coupler
3	1	Ramp, 2"& 3" Drylok
4	1	Screw, 2"& 3" Drylok
5	1	Shaft Link, 3" Drylok
6	1	Poppet Link, 3" Drylok
7	1	Handle 2 & 3" Drylok
8	1	Poppet Guide, 2 & 3" Drylok
9	1	Poppet, 2 & 3" Drylok Coupler
10	1	Body, 2 & 3" Drylok Coupler
11	1	Clamp, 2 & 3" Drylok Coupler
12	1	Dust Plug
13	2	Cotter Pin
14	1	Washer, Jam Nut
15	1	Washer, Packing
16	1	Jam Nut, Screw - 2" & 3" Drylok
17	1	Packing
18	2	Bearing, Shaft - Lower
19	1	Washer, Ramp - Teflon
20	1	Bearing, Ramp
21	1	Socket HD. Screw
22	1	Jam Nut, Safety Adjusting Screw
23	5	E-Ring
24	1	Retaining Ring, Poppet Guide
25	1	Cable
26	2	Oval Sleeve
27	1	Plug
28	1	Bearing, Shaft – Upper
29	1	Clevis Pin, Shaft Link/Poppet Links
30	1	Clevis Pin, Poppet Link/Poppet
31	1	Shaft, Latch
32	2	Shoulder Screw, Clamp
33	1	Spring, Clamp
34	1	Spring, Latch
35	1	Shaft, 3" Drylok Coupler
36	1	O-Ring Poppet – Metric
37	1	O-Ring, Coupler Face Seal #340
38	1	Safety Adjusting Screw
39	1	Washer, Ramp
40	1	Spring, Safety Release Button
41	4	Sleeve, Guide Leg
42	1	Safety Release Button

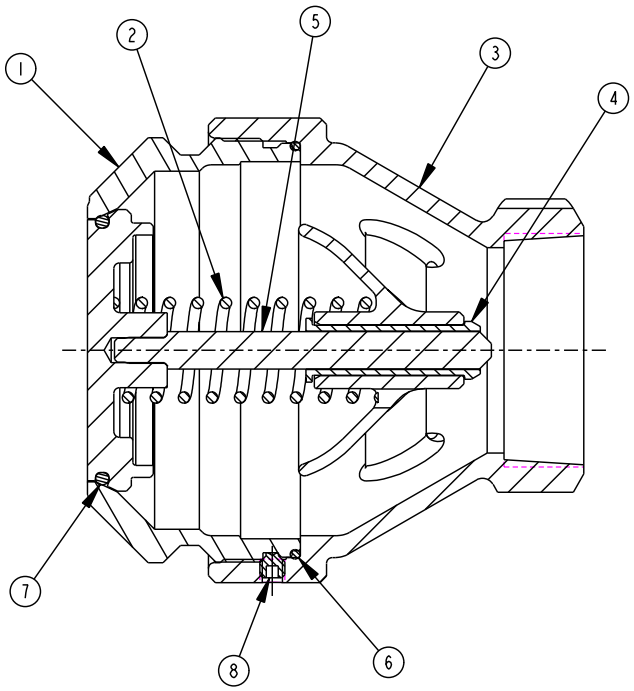
OPW ENGINEERED SYSTEMS a DOVER company

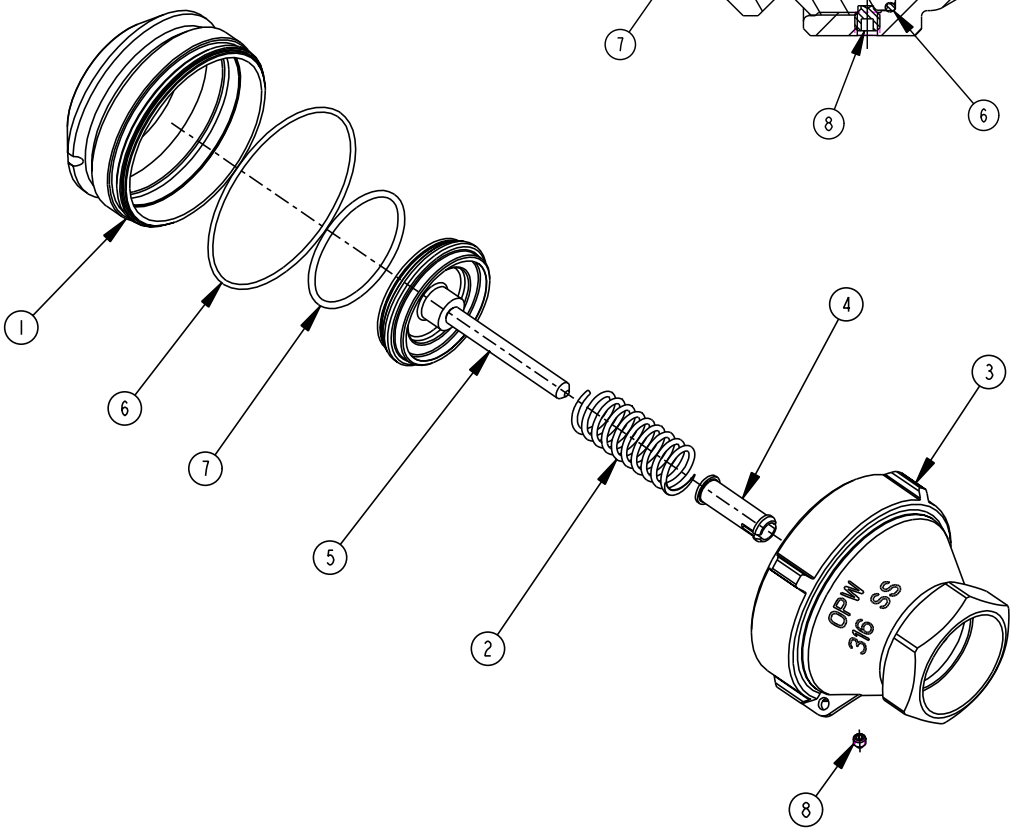
Drylok® Dry Disconnect – 2" & 3" Adaptor Drawing

Drylok® Dry Disconnect 2" Adaptor – H-20906-PA

Drylok® Dry Disconnect 3" Adaptor – H-52294-PA

ITEM	QTY	DESCRIPTION
1	1	Nose, Adaptor, 5670, SST, 2" 3"
2	1	Spring, Adaptor, LOK, SST
3	1	Bridge, Adaptor, 5670, SST, 2" 3"
4	1	Bearing, Adaptor, LOK, TPE
5	1	Poppet ASM, Adaptor, 5670, SST, 2" 3"
6	1	O-Ring, Fluorocarbon, GFLT, 229
7	1	O-Ring, Fluorocarbon, GFLT, 155
8	1	Screw, Set, SH, KNURL, SST, 1/4"- 20 x 1/4"





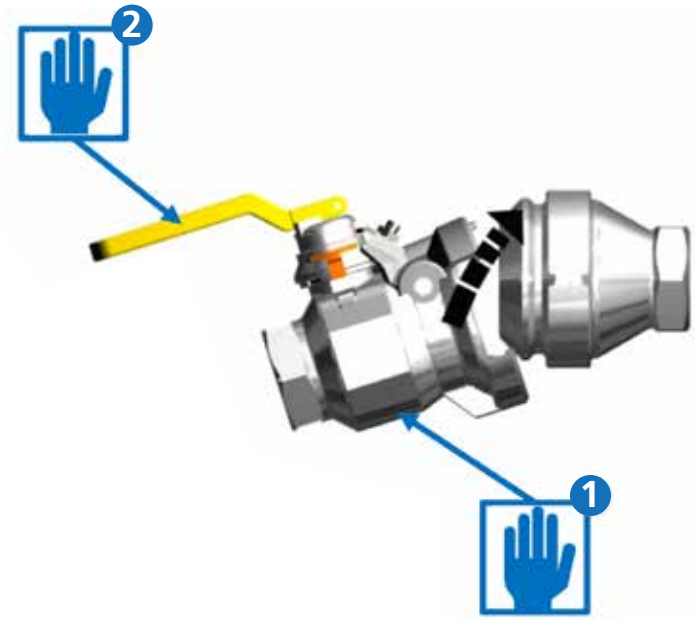
Drylok® Dry Disconnect – Operating Instructions

Drylok® Operating Instructions

WARNING Read and understand these instructions before starting installation or dismantl

1. Prior to connecting the coupler to the adaptor, lift the coupler using both hands: place one hand underneath the coupler **(1)** and the other on the handle **(2)**

2. Lift the coupler, angling the mating end upward



3. Bring the coupler towards the adaptor mating end at that upward angle, where the coupler's jaw would engage the bottom of the adaptor's nose first

4. Once the jaw is engaged to the bottom of the nose, bring the body of the coupler in line with the adaptor by using the handle and push to engage the clamp to the top of the adaptor's nose

5. To lock the connected system in a closed position, view the connected system from the top, where the coupler is on the left and the adaptor is on the right, turn the handle counterclockwise until the lock engages

OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – Operating Instructions

Drylok® Operating Instructions

6. To open the system for product flow, press the safety release button on coupler down and turn handle counterclockwise until it locks

7. To close the system, press the safety release button on the coupler and rotate the handle clockwise until it locks

8. To disconnect the system, press the safety release button on the coupler and turn the handle clockwise so that it is parallel with the coupler. Press down on the clamp's tab (opposite side of safety release button) and push down on the handle to disengage the system

Drylok® Dry Disconnect – 1" Coupler Maintenance

1" DRYLOK COUPLERS 5770 SERIES:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

NOTE: Remove coupler from service and clean before attempting to disassemble unit. Do not leave pipe or fittings attached to coupler because it will be necessary to reach in the threaded end of the coupler to disassemble. It is suggested that the coupler be secured in a vice or similar fixture to facilitate working on the unit. Flats on the sides of the coupler are provided for this purpose.

TEAR DOWN INSTRUCTIONS:

1. Remove the RAMP/HANDLE (4), by removing GROOVE PIN (9). (**NOTE:** This pin will only come out one way. It is larger in diameter on one end for retaining purposes). With the GROOVE PIN (9) removed, the RAMP/HANDLE can be lifted off. With the RAMP/HANDLE (4) removed, WASHER (11) and BEARING/HANDLE (16) can be removed and discarded. Next, remove GROOVE PIN (17). Take caution, as stated above when removing this pin.
2. It is now possible to pull SHAFT (1) out of the coupler BODY (7). Insert a small bar through the .19" diameter hole in the SHAFT (1) to simulate a "T" handle. Now it is possible to pull the shaft with a significant force to dislodge it. It may be necessary to reach into the threaded end of the coupler and wiggle the POPPET LINKAGE (2) and perhaps even rotate the SHAFT to alleviate any binding that may occur when trying to pull out the SHAFT.
3. Once the SHAFT (1) is removed, the poppet sub-assembly can be pushed out the front end of the coupler by tapping or pushing on the linkage from the threaded end.

WARNING Do not push the poppet sub-assembly into the coupler BODY (7)! In other words, do not push it the wrong way! The poppet sub-assembly will get stuck in the BODY and subsequent attempts at removal may damage the seal seat.

4. With the **SHAFT (1)** removed, **O-RING, SHAFT (20), BUSHING (10)** and **SPACER/BEARING (25)** can be removed and discarded.

SEAL REPLACEMENT:

There are only three possible leak paths where there are seals in the coupler body:

- Coupler O-RING, FACE SEAL (19)
- Poppet O-RING (8)
- Coupler O-RING, SHAFT (20)

COUPLER O-RING, FACE SEAL (19) REPLACEMENT:

1. Replacement of the coupler O-RING, FACE SEAL (19) is possible with no disassembly of the coupler. Furthermore, it is not necessary to remove the coupler from service

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. To remove old o-ring, it is best to simply stick it with a thin, sharp object and pry the local area out of the groove. To avoid scratching the seal seat, avoid pushing the sharp object completely through the o-ring.
3. Grab the pried out section of the o-ring and pull completely out.
4. Clean groove and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace unit if scratches are found.
5. To install new O-RING, FACE SEAL (19), align o-ring with groove and push four local areas of the o-ring into the groove at approximately 12 o'clock, 3, 6 and 9 o'clock. Then work the rest of the o-ring into the groove between the already pushed in sections. If this step is ignored, and the o-ring is worked in from a single location, a loop may develop in the o-ring. It will appear the o-ring is too long to fit in the groove.

HINT: Recurring O-RING, FACE SEAL failures are a result of failure to clean coupler and adaptor mating surfaces before coupling, or a raised surface on the adaptor resulting from a nick or embedded dirt.

OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – 1" Coupler Maintenance

1" DRYLOK COUPLERS 5770 SERIES:

POPPET O-RING (8) REPLACEMENT:

1. With the poppet sub-assembly removed from the unit (see "TEAR DOWN INSTRUCTIONS"), replacement of the O-RING, POPPET (8) is possible.

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. To remove old o-ring, it is best to simply stick it with a thin, sharp object and pry the local area out of the groove. To avoid scratching the seal seat, avoid pushing the sharp object completely through the o-ring.
3. Grab the pried out section of the o-ring and pull completely out.
4. Clean groove and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace poppet if scratches are found.
5. To install new O-RING, POPPET (8), pass o-ring over back of poppet sub-assembly (i.e. over SHAFT LINK (12) and POPPET LINKS (2) to the backside of the POPPET (3). At this point, the O-RING, POPPET (8) can be rolled up the chamfer on the backside of the POPPET (3), and aligned with groove. Push four local areas of the o-ring into the groove at approximately 12 o'clock, 3, 6 and 9 o'clock. Then work the rest of the o-ring into the groove between the already pushed in sections. If this step is ignored, and the o-ring is worked in from a single location, a loop may develop in the o-ring. It will appear the o-ring is too long to fit in the groove.
6. Coupler poppet assembly is now ready to be reinstalled into the coupler.

O-RING, SHAFT (20) REPLACEMENT AND ASSEMBLING POPPET SUB-ASSEMBLY & SHAFT (1) INTO BODY (7):

NOTE: For this stage of assembly, you will need a "dummy adaptor". This is nothing more than the nose end of a 5670 Drylok Adaptor. To get a dummy adaptor, please contact OPW.

1. With the coupler BODY (7), securely held, replace SPACER/BUSHING (25) by using SHAFT (1) as an installation tool. Install SPACER/BEARING (25) on the end of SHAFT (1). Guide SPACER/BEARING through bore in top of coupleBODY and seat SPACER/BEARING into bore in bottom of coupler BODY. Use a finger to keep SPACER/BEARING seated and pull SHAFT (1) back out through coupler bore. Then assemble a Dummy Adaptor end into fixed jaw of BODY (7). (Note: O-RING, FACE SEAL (19) cannot be in the BODY at this point of the assembly process). The dummy adaptor has the lead-in that allows the O-RING, POPPET (8) to slide into the bore of the BODY (7). The dummy adaptor must fit snug against its mating surface of the BODY in order for the lead-in to align with the BODY bore. An o-ring at the face seal will not allow proper alignment between the dummy adaptor and BODY bore. Assembling the poppet sub-assembly into the BODY without a dummy adaptor properly aligned, or without one at all risks o-ring damage that you may not detect.
2. After old BUSHING (10) and O-RING, SHAFT (20) have been discarded, clean the surface of the SHAFT (1) in the o-ring area and check for scratches. Any deep scratches in the O-RING, SHAFT area will cause even a new o-ring to leak. Replace SHAFT (1) if scratches are found. Install new O-RING, SHAFT (20) into coupler BODY bore.

NOTE: Take care to avoid contacting edges of GROOVE PIN (17) hole in coupler BODY, as this could damage the o-ring. Next, install new BUSHING (10) into bore of coupler BODY. Push BUSHING (10) all the way into coupler bore to fully seat O-RING, SHAFT (20) at bottom of bore.

3. With the dummy adaptor in place and the POPPET LINKS (2) oriented as pictured in SECTION B-B of this drawing (when looking down from above), slide the poppet sub-assembly into the dummy adaptor. Look into the shaft hole in top of the BODY (7) (and refer to SECTION B-B on drawing H-31297-PA). Align the hole in the SHAFT LINK (12) with the bore through the coupler BODY (7). NOTE: The POPPET LINKS (2) of the poppet sub-assembly must be positioned as shown in SECTION B-B for the coupler to operate properly. SHAFT LINK (12) of the poppet sub-assembly should be lying atop SPACER/BUSHING (25), previously inserted into BODY (7).

Drylok® Dry Disconnect – 1" Coupler Maintenance

1" DRYLOK COUPLERS 5770 SERIES:

4. When inserting the SHAFT (1) into the BODY (7) and through the SHAFT LINK (12), the flat on the SHAFT must align with the flat on the SHAFT LINK. It may be necessary to rotate the SHAFT around to get these flats aligned. Once aligned, push the SHAFT (1) all the way into the coupler BODY. You can now turn the SHAFT (1) clockwise to draw the POPPET (3) into coupler BODY (7) until it is possible to remove dummy adaptor. Poppet face should be parallel to, and about .06" below BODY face.

At this point, the flat on the SHAFT (1) should be facing forward (toward the fixed jaw end of the coupler). The POPPET (3) should be about .06" below the front face of the coupler, which is basically, in all the way. Looking in the back (threaded end) of the coupler, you should see the SHAFT (1) inserted through the SHAFT LINK (12) and BUSHING (10).

5. Position the SHAFT (1) so that the groove in the SHAFT is aligned with GROOVE PIN (17) hole. Install GROOVE PIN (17), smaller end of the pin first, into coupler BODY (7).ses). With the GROOVE PIN (9) removed, the RAMP/HANDLE can be lifted off. With the RAMP/HANDLE (4) removed, WASHER (11) and BEARING/HANDLE (16) can be removed and discarded. Next, remove GROOVE PIN (17). Take caution, as stated above when removing this pin.

RAMP/HANDLE RE-INSTALLATION:

1. With SHAFT (1) reinstalled, place new BEARING, HANDLE (16) over machine turn of coupler BODY. Install new WASHER (11) over SHAFT (1) and onto top of coupler BODY.
2. While compressing CLAMP (6) by pressing at SPRING, CLAMP (15), install RAMP/HANDLE (4) over SHAFT (1), aligning the GROOVE PIN (9) holes. RAMP/HANDLE (4) should be aligned axially with the coupler BODY, with the handle end towards the threaded end of the coupler. The top of the CLAMP (6) should be positioned underneath the RAMP/HANDLE (4).

COUPLER / ADAPTOR INTERFACE ADJUSTMENT:

This interface is critical to proper operation of the Drylok coupler. Keeping the interface clean and adjusted will help maximize the life of the coupler poppet seal and will reduce the chance of leaks developing at the coupler / adaptor interface.

1. Couple coupler and adaptor together and open to first button lock, as per operation instructions.
2. Look at the interface where the coupler face contacts adaptor. This is viewable on either side of the coupler, in a radial location between the fixed and movable jaws of the coupler. There should be no gap at all between the coupler and adaptor. For a positive check, you should not be able to insert a .002" (or larger) feeler gage between the coupler and adaptor faces when coupled.
3. If a gap exists, you can close it by a simple adjustment that is located on the movable jaw (CLAMP (6)) near the handle. Loosen JAM NUT (14) and tighten the slotted SAFETY ADJUSTOR SCREW (23) until the gap between the coupler and adaptor closes (approximately 6 inch-pounds of torque). Retighten JAM NUT (14) while holding the SAFETY ADJUSTOR SCREW (23) in its adjusted position.

WARNING Do not forget to retighten JAM NUT (14) over the SAFETY ADJUSTOR SCREW (23).

TEST PROCEDURE:

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the O-RING, POPPET (8) and O-RING, SHAFT (20). Place coupler under water, tapping and rotating it to release any trapped air. Pressurize the valve to 2 PSI, and check inspection points. Then, increase pressure to 80 PSI and check inspection points again. Check for leaks in the following areas:

A) RAMP/HANDLE (4)

B) POPPET/COUPLER interface (place coupler with POPPET face up and pour water on it).

Reduce air pressure to 0 PSI. Insert Drylok test fixture into coupler.

NOTE: The Drylok test fixture is a fully operational, leak-proof adaptor, fitted with a nipple and cap. Adjust coupler/adaptor interface as stated above. Depress SAFETY RELEASE BUTTON (22) and open coupler to first button lock. Check for interface gaps and adjust as required. Fully open coupler and pressurize to 2 PSI. Check for leaks at the inspection points listed above. Also check for leaks at the coupler/adaptor interface. Increase pressure to 80 PSI and check for leaks again. If leaks occur at coupler/adaptor interface, retighten adjusting screw as stated above and retest.

Drylok® Dry Disconnect – 1" Adaptor Maintenance

1" DRYLOK ADAPTORS:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

TEAR DOWN INSTRUCTIONS:

1. Clamp the ADAPTOR (1) in vise with soft jaws, with the threaded end pointing up towards you. Take care not to mar machined surfaces of ADAPTOR NOSE (1).
2. Using needle nose pliers, unthread BRIDGE (2) from ADAPTOR (1), exercising care and caution. POPPET ASS'Y (3) in valve is spring loaded. SPRING force on the 1" Drylok adaptor is approximately 28 pounds.
3. Remove POPPET ASS'Y (3) and SPRING (4).The POPPET ASS'Y is not included in the Repair Parts Kit. It will be necessary to replace the old O-RING (5).
4. Position POPPET ASS'Y (3) in collet or vise with soft jaws. Carefully pry O-RING (5) out of the POPPET ASS'Y groove (be careful not to scratch the groove seat with the prying tool. This could result in an O-RING leak). Discard old O-RING.

RE-ASSEMBLE INSTRUCTIONS:

5. Re-assemble POPPET ASS'Y (3) and new ORING (5) in the following manner:

    a) Position new O-RING (5) on top of POPPET ASS'Y (3).

    b) With your thumb, press a section of the O-RING into the groove.

    c) Press the O-RING around the POPPET ASS'Y and over the groove lip (it is necessary to slightly stretch the O-RING to accomplish this).

    d) Continue pressing the O-RING around the POPPET ASS'Y until the O-RING is seated in the groove.

NOTE: Teflon encapsulated O-RINGS should be heated in hot water for easier installation.

6. Install rebuilt POPPET ASS'Y (3) with O-RING (5) into ADAPTOR (1). Install SPRING (4) behind POPPET ASS'Y (3). Thread BRIDGE (2) into ADAPTOR (1). Poppet shaft should fit into BRIDGE (2) bore freely.
7. Once started, thread BRIDGE (2) all the way into ADAPTOR (1) until it abruptly stops and will tighten no further. Again, take care not to mar machined surfaces of ADAPTOR (1). TEST PROCEDURE

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the POPPET seat. Air pressure must not exceed 30 PSI. If pressurized air is not available, low pressure leaks could be checked by submerging the entire ADAPTOR face up in a container of clear water. Air trapped inside the VALVE will bubble through or around the POPPET if the seal is not proper. This test should be repeated three or four times to ensure that the seal does not leak. Depress and release the POPPET each time before submerging the unit into water.

Drylok® Dry Disconnect – 2" Coupler Maintenance

2" DRYLOK COUPLERS 5770 SERIES:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

NOTE: The number in parentheses ( ) refer to balloon numbers on the enclosed drawings. Numbers in quotes " " refer to other assembly steps of this procedure.

Drylok coupler repair kit should contain ten items as follows (see drawings): O-RING (11), two COTTER PINS (12), PACKING (17), two BEARINGS (18), WASHER, TEFLON (19), BEARING (20), O-RING (32) and SAFETY ADJUSTING SCREW (33).

TEAR DOWN INSTRUCTIONS:

NOTE: Remove coupler from service and clean before attempting to disassemble unit. Do not leave pipe or fittings attached to coupler because it will be necessary to reach in the threaded end of the coupler to disassemble. It is suggested that the coupler be secured in a vice or similar fixture to facilitate working on the unit. Flats on the sides of the coupler are provided for this purpose.

1. Remove HANDLE (6), by loosening SOCKET HD. SCREW (24). It may be necessary to gently pry handle off using a flathead screwdriver. HANDLE EXTENSION (3) can be lifted off once HANDLE is removed.
2. Loosen JAM NUT (15) and remove SCREW (5) and JAM NUT (15) from coupler BODY (8). Once this is done, it is possible to lift off RAMP (4), WASHER (13), WASHER, TEFLON (19), BEARING (20), WASHER (34), SAFETY RELEASE BUTTON (43) and SPRING (42). This can be done without removing CLAMP (9).
3. It is now possible to pull SHAFT (16) out of BODY (8). Reinstall HANDLE (6) back onto SHAFT (16). Snug SOCKET HD. SCREW (24). Rotate HANDLE (6) counter-clockwise to "open" position. This moves POPPET (1) out of coupler BODY and unbinds the poppet sub-assembly linkage. Lightly tap on underside of HANDLE (6) with a hammer to remove SHAFT (16), upper BEARING (18), two WASHERS (14) and PACKING (17), all at the same time.
4. Once the SHAFT (16) is removed, the poppet linkage sub-assembly can be pulled out the front (fixed jaw) end of the coupler BODY. Remove lower BEARING (18) and PLUG (29) from coupler BODY. Do not discard PLUG (29). It will be reinstalled at a later time. Remove HANDLE (6), PACKING (17), WASHERS (14) and upper BEARING (18) from SHAFT (16).

WARNING Do not push the poppet sub-assembly into the coupler BODY (8)! In other words, do not push it the wrong way! The poppet linkage sub-assembly will get stuck in the BODY and subsequent attempts at removal may damage the seal seat.

5. You are now able to replace all seals, bearings and washers that need to be replaced.

SEAL REPLACEMENT:

There are only three possible leak paths where there are seals in the coupler body:

- Coupler O-RING, FACE SEAL (32)
- Poppet O-RING (11)
- PACKING (17) around the SHAFT (16)

COUPLER O-RING, FACE SEAL (32) REPLACEMENT:

1. Replacement of the coupler O-RING, FACE SEAL (32) is possible with no disassembly of the coupler. Furthermore, it is not necessary to remove the coupler from service.

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. To remove old o-ring, it is best to simply stick it with a thin, sharp object and pry the local area out of the groove. To avoid scratching the seal seat, avoid pushing the sharp object completely through the o-ring.
3. Grab the pried out section of the o-ring and pull completely out.
4. Clean groove and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace unit if scratches are found.
5. To install new O-RING, FACE SEAL (32), align o-ring with groove and push one area of the o-ring into the groove. Next, work the rest of the o-ring into the groove by applying pressure with thumbs.

HINT: Recurring O-RING, FACE SEAL failures are a result of failure to clean coupler and adaptor mating surfaces before coupling, or a raised surface on the adaptor resulting from a nick or embedded dirt.

OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – 2" Coupler Maintenance

2" DRYLOK COUPLERS 5770 SERIES:

POPPET O-RING (11) REPLACEMENT:

1. With the poppet linkage sub-assembly removed from the unit (see "TEAR DOWN INSTRUCTIONS"), replacement of the O-RING, POPPET (11) is possible. Refer to SH. 2 of 2, drawing H-20905-PA.

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. Remove COTTER PINS (12) from LOCK PIN (36) and remove LOCK PIN from poppet linkage sub-assembly. With the LOCK PIN removed, LOCK RING (37) can slide off the backside of POPPET (1). POPPET GUIDE (10) is now free to slide off POPPET (1). No further disassembly of the poppet linkage sub-assembly is required.
3. Remove old O-RING (11). It should easily slide off POPPET (1). Use of sharp tools is not recommended.
4. Clean o-ring sealing surfaces of POPPET (1) and POPPET GUIDE (10) and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace poppet if scratches are found.
5. To install new O-RING (11), slide o-ring over backside of POPPET (1). Re-assemble POPPET GUIDE (10) onto its diameter in the coupler POPPET. It is best to position the guide legs of the POPPET GUIDE so that they will clear the POPPET LINK (22) when in the "open" position (refer to SH. 2 of 2 on drawing H-20905-PA). Install LOCK RING (37) over POPPET, behind POPPET GUIDE. Install one COTTER PIN (12) through hole in LOCK PIN (36). Next, install end of LOCK PIN (36) without COTTER PIN (12) behind LOCK RING (37), through POPPET (1) and POPPET LINK (22)/BEARING (39). Position LOCK PIN so that open hole for COTTER PIN is accessible. Install second COTTER PIN (12) through open hole of LOCK PIN (36).
6. Coupler poppet linkage sub-assembly is now ready to be reinstalled into the coupler.

ASSEMBLING POPPET LINKAGE SUB-ASSEMBLY AND SHAFT (16) INTO BODY (8):

NOTE: For this stage of assembly, you will need a "dummy adaptor". This is nothing more than the nose end of a 5670 Drylok Adaptor. To get a dummy adaptor, please contact OPW.

1. With coupler BODY (8) standing upright, sitting on threaded end, assemble a dummy adaptor end into fixed jaw of BODY (8). (Note: O-RING, FACE SEAL (32) cannot be in BODY at this point of the assembly process). The dummy adaptor has the lead-in that allows the O-RING, POPPET (11) to slide into the bore of BODY (8). The dummy adaptor must fit snug against its mating surface of BODY in order for the lead-in to align with BODY bore. An o-ring at the face seal will not allow proper alignment between the dummy adaptor and BODY bore. Assembling the poppet linkage sub-assembly into the BODY without a dummy adaptor properly aligned, or without one at all, risks o-ring damage that may not be detected.
2. With the dummy adaptor in place and POPPET LINK (22) oriented as pictured in SECTION B-B of drawing H-20905-PA SH. 2 of 2 (when looking down from above), slide poppet linkage sub-assembly through dummy adaptor, allowing it to drop into coupler BODY (8).
3. Next, lay coupler BODY down in horizontal position and locate SHAFT LINK (45) by looking into shaft hole in top of BODY. Install SHAFT (16) into BODY and through SHAFT LINK. Reinstall HANDLE (6) onto SHAFT and turn clockwise to pull POPPET (1) back into the coupler BODY.
4. The dummy adaptor can now be removed. At this point, POPPET (1) face should be parallel to, and approximately .06" below coupler BODY face. Remove SHAFT (16) from the coupler BODY. To do this, it may be necessary to wiggle SHAFT back and forth. Be careful not to allow POPPET to come out of coupler BODY.
5. With SHAFT (16) removed, reinstall PLUG (29), with the flat side up, into the boss in the bottom of coupler BODY. Insert one BEARING (18) into coupler BODY boss, on top of PLUG. Slide second BEARING (18) over top of SHAFT (16).
6. To reinstall SHAFT (16), look into top of coupler BODY and fold SHAFT LINK (45) as shown in SECTION B-B. It may be necessary to make some poppet linkage sub-assembly adjustments, but try to get the hex in SHAFT LINK concentric to the hole in the coupler BODY. Note that when folded up, the front most flat in the SHAFT (45) hex should be perpendicular to the BODY centerline. NOTE: POPPET LINK (22) of the poppet linkage sub-assembly must be positioned as shown in SECTION B-B for the coupler to operate properly. SHAFT LINK (45) of the poppet linkage sub-assembly should be lying on top of BEARING (18), previously inserted into BODY.
7. Note the single flat on the top portion of the SHAFT (16). When inserting the SHAFT (16) into the BODY (8) and through the SHAFT LINK (45), this flat on the SHAFT must be facing the threaded end of the coupler. It may be necessary to reinstall HANDLE (6) onto SHAFT to aid in SHAFT installation. Wiggle HANDLE and SHAFT while firmly pushing SHAFT down through the SHAFT LINK and into coupler BODY.

At this point, the flat on SHAFT (16) must be facing back toward the threaded end of the coupler. POPPET (1) should be about .06" below the front face of the coupler, which is basically, in all the way. Looking in the back (threaded end) of the coupler, you should see SHAFT (16) inserted through SHAFT LINK (45) and lower BEARING (18).

Drylok® Dry Disconnect – 2" Coupler Maintenance

2" DRYLOK COUPLERS 5770 SERIES:

PACKING REPLACEMENT:

1. With coupler BODY (8) securely held, assemble one WASHER (14) and PACKING (17) over top of SHAFT (16), followed by an additional WASHER (14). PACKING assembly must be installed with the "V" notches of the PACKING pointing up towards you. WASHERS and PACKING may be pushed into coupler BODY (8) using SCREW (5).
2. Install SAFETY RELEASE BUTTON (43) and SPRING (42) onto coupler BODY. Assemble WASHER (34) and WASHER, TEFLON (19) over boss on BODY, making sure SAFETY RELEASE BUTTON (43) remains underneath. Assemble BEARING (20) into RAMP (4) ID, then slide RAMP & BEARING together onto boss on BODY. The hole in the RAMP (4) must be facing the front (fixed jaw end) of the coupler BODY. Push RAMP down until it locks together with LATCH (2). Install WASHER (13) on top of RAMP (4).
3. Thread JAM NUT (15) all the way to the top of SCREW (5). Thread this combination into BODY over SHAFT (16). Tighten until you feel it bottom out. Turn an additional quarter turn and back out a few turns. Repeat this process once or twice (this helps set PACKING). Finally, tighten SCREW (5) again until it bottoms out and then snug tight.
4. Holding SCREW (5) in final position, thread JAM NUT (15) down SCREW (5) until it contacts WASHER (13), and tighten to approximately 25 foot-pounds of torque.
5. Place HANDLE EXTENSION (3) over SHAFT (16) and down onto RAMP (4). Cast flat in HANDLE EXTENSION (3) must align with flat on SHAFT.
6. Place HANDLE (6) over SHAFT and nest it down between the raised parts of the HANDLE EXTENSION (3). Wedging a screwdriver in the slot of the HANDLE to open up the hole makes it easier to slide the HANDLE over the SHAFT end. It may be necessary to lightly tap HANDLE down with a hammer.
7. Properly assembled, the HANDLE (6) will nest against the HANDLE EXTENSION (3), and the HANDLE EXTENSION (3) will nest against the RAMP (4). Tighten SOCKET HD. SCREW (24).
8. If it is necessary to replace SAFETY ADJUSTING SCREW (33), uninstall CLAMP (9) by removing both SHOULDER SCREWS (31) and WASHERS (41). Take care not to lose SPRING (35). Remove JAM NUT (25) and unthread SAFETY ADJUSTING SCREW (33) from CLAMP (9). Install new SAFETY ADJUSTING SCREW (33) by threading all the way into CLAMP (9) from its underside. Thread JAM NUT (25) onto SAFETY ADJUSTING SCREW (33).
9. Place SPRING (35) into the boss on CLAMP (9) and assemble to BODY (8) with SHOULDER SCREWS (31) and WASHERS (41). Tighten SHOULDER SCREWS (31) to approximately 25 foot-pounds torque. CLAMP (9) should rock freely back and forth.

COUPLER / ADAPTOR INTERFACE ADJUSTMENT:

This interface is critical to proper operation of the Drylok coupler. Keeping the interface clean and adjusted will help maximize the life of the coupler poppet seal and will reduce the chance of leaks developing at the coupler / adaptor interface.

1. Loosen SAFETY ADJUSTING SCREW (33) and JAM NUT (25). Couple dummy adaptor into fixed jaw of coupler BODY and turn HANDLE (6) to first SAFETY RELEASE BUTTON (43) lock, as per operation instructions.
2. Use a flathead screwdriver to tighten SAFETY ADJUSTING SCREW (33) until it makes contact with RAMP (4). Then, continue to tighten one complete turn. Push SAFETY RELEASE BUTTON (43) and turn HANDLE (6) to full "open" position. Next, holding the SAFETY RELEASE BUTTON (43) down, turn HANDLE back and forth two or three times to properly seat SAFETY ADJUSTING SCREW (33).
3. Now turn HANDLE (6) and lock in full "open" position. Loosen SAFETY ADJUSTING SCREW (33), backing it completely off RAMP (4). Retighten SAFETY ADJUSTING SCREW (33) until it just makes contact with RAMP. Tighten SAFETY ADJUSTING SCREW one and a quarter turns or set to approximately 12 inch-pounds of torque.
4. Tighten JAM NUT (25) down against CLAMP (9) to lock SAFETY ADJUSTING SCREW (33) in place.

WARNING Failure to retighten JAM NUT (25) over the SAFETY ADJUSTING SCREW (33) may cause coupler/adaptor interface leakage and/or coupler failure.

TEST PROCEDURE:

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the O-RING, POPPET (11) and PACKING (17). Place coupler under water, tapping and rotating it to release any trapped air. Pressurize the valve to 2 PSI, and check inspection points. Then, increase pressure to 80 PSI and check inspection points again. Check for leaks in the following areas:

A) RAMP (4)/HANDLE EXTENSION (3) area

B) POPPET (1)/coupler interface (hold coupler vertically, with POPPET (1) face up and fill coupler face with water).

Reduce air pressure to 0 PSI. Insert Drylok test fixture into coupler. Note: The Drylok test fixture is a fully operational, leak-proof adaptor, fitted with a nipple and cap. Depress SAFETY RELEASE BUTTON (43), open coupler to fully open position and pressurize to 2 PSI. Check for leaks at the inspection points listed above. Also check for leaks at the coupler/adaptor interface. Increase pressure to 80 PSI and check for leaks again. If leaks occur at coupler/adaptor interface, reset adjusting screw as stated above and retest.

Drylok® Dry Disconnect – 2" Adaptor Maintenance

2" DRYLOK ADAPTORS:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

RECOMMENDED TOOLS FOR REPAIR: Adaptor assembly wrench C20461 (Consult factory), torque wrench with 1/8" hexdriver, small flathead screwdriver or knife.

TEAR DOWN INSTRUCTIONS:

1. Clamp the BRIDGE (3) end of the adaptor in vise with soft jaws. Take care not to mar machined surfaces of ADAPTOR NOSE (1).
2. Remove (if applicable) SET SCREW (8) from BRIDGE (3).
3. Using adaptor nose tool (C20461) or strap wrench, unthread ADAPTOR NOSE (1) from BRIDGE (3), exercising care and caution. POPPET in valve is spring loaded. Exert pressure on POPPET ASS'Y (5) to relieve spring force against the ADAPTOR NOSE (1). SPRING force on the 2" Drylok adaptor is approximately 35 pounds.
4. Remove POPPET ASS'Y (5), SPRING (2), THREAD SEAL (6) and BEARING (4). Old THREAD SEAL (6) and BEARING (4) can be discarded. The POPPET S/A is not included in the Repair Parts Kit. It will be necessary to replace the old O-RING (7).
5. Position POPPET ASS'Y (5) in collet or vise with soft jaws. Carefully pry O-RING (7) out of the POPPET ASS'Y (5) groove (be careful not to scratch the groove seat with the prying tool. This could result in an O-RING leak). Discard old O-RING.

RE-ASSEMBLE INSTRUCTIONS:

6. Re-assemble POPPET ASS'Y (5) and new O-RING (7) in the following manner:
    a) Position new O-RING (7) on top of POPPET ASS'Y (5).
    b) With your thumb, press a section of the O-RING (7) into the groove.
    c) Press the O-RING (7) around the POPPET ASS'Y (5) and over the groove lip (it is necessary to slightly stretch the O-RING (7) to accomplish this).
    d) Continue pressing the O-RING (7) around the POPPET ASS'Y (5) until the O-RING (7) is seated in the groove.

NOTE: Teflon encapsulated O-RINGS should be heated in hot water for easier installation.

7. Lubricate new THREAD SEAL (6) and position on the machined shoulder on the ADAPTOR NOSE (1). Important: All lubricating greases must be compatible with seal materials and liquid products flowing through valve to avoid destruction of elastomeric properties, or contamination.
8. Insert new BEARING (4) into BRIDGE (3) with flat, larger diameter end facing toward poppet end, and cut end toward threaded end.
9. Install SPRING (2) into deflector cup of BRIDGE (3). Install rebuilt POPPET ASS'Y (5) with O-RING (7) into SPRING (2). POPPET shaft should fit into BEARING (4) bore freely.
10. Coat threads of ADAPTOR NOSE (1) with suitable heavy grease to avoid galling of threads during assembly.
11. Place ADAPTOR NOSE (1) over POPPET ASS'Y (5) and push it into contact with BRIDGE (3). Spring force will have to be overcome to get threads started.
12. Once started, thread ADAPTOR NOSE (1) all the way into BRIDGE (3) until it stops. Generally, the ADAPTOR NOSE (1) will stop threading when the THREAD SEAL (6) starts to get squeezed. At this point, it will be necessary to use the adaptor nose tool (C20461) or a strap wrench to further tighten adaptor. Tighten adaptor until it abruptly stops and will tighten no further. Again, take care not to mar machined surfaces of ADAPTOR NOSE (1). If adaptor uses SET SCREW (8), apply Loctite™ 242 or 243 to threads of SET SCREW (8). Reinstall SET SCREW (8) into BRIDGE (3). Tighten SET SCREW (8) using a torque wrench with 1/8" hex driver. Torque to 60 inch-pounds.

TEST PROCEDURE:

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the POPPET seat and around the large threaded joint. Place VALVE under water, tapping and rotating it to release any trapped air. Pressurize the valve to 2 PSI, and check inspection points. Then, increase pressure to 80 PSI and check inspection points again. If pressurized air is not available, low pressure leaks could be checked by submerging the entire ADAPTOR face up in a container of clear water. Air trapped inside the VALVE will bubble through or around the POPPET if the seal is not proper. This test should be repeated three or four times to ensure that the seal does not leak. Depress and release the POPPET each time before submerging the unit into water.

Drylok® Dry Disconnect – 3" Coupler Maintenance

3" DRYLOK COUPLERS 5770 SERIES:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

Recommended tools for repair: Blind adaptor 5671-0730 (consult factory), 5/8" and 11/16" hex wrench, 1" and 1-1/4" socket wrench, 3/16" Allen wrench, torque wrench with flathead screwdriver attachment, hammer, and needle-nose pliers.

NOTE: The number in parentheses ( ) refer to balloon numbers on the enclosed drawings. Numbers in quotes " " refer to other assembly steps of this procedure.

Drylok coupler repair kit should contain eight items as follows (see drawings): PACKING (17), BEARING (18), WASHER, TEFLON (19), BEARING (20), BEARING (28), O-RING (36), O-RING (37) and SAFETY ADJUSTING SCREW (38).

TEAR DOWN INSTRUCTIONS:

NOTE: Remove coupler from service and clean before attempting to disassemble unit. Do not leave pipe or fittings attached to coupler because it will be necessary to reach in the threaded end of the coupler to disassemble. It is suggested that the coupler be secured in a vice or similar fixture to facilitate working on the unit. Flats on the sides of the coupler are provided for this purpose.

1. Remove HANDLE (7), by loosening SOCKET HD. SCREW (21). It may be necessary to gently pry handle off using a flathead screwdriver. HANDLE EXTENSION (2) can be lifted off once HANDLE is removed.
2. Loosen JAM NUT (16) and remove SCREW (4) and JAM NUT (16) from coupler BODY (10). Once this is done, it is possible to lift off RAMP (3), WASHER (14), WASHER, TEFLON (19), BEARING (20), WASHER (39), SAFETY RELEASE BUTTON (42) and SPRING (40). This can be done without removing CLAMP (11).
3. It is now possible to pull SHAFT (35) out of BODY (10). Reinstall HANDLE (7) back onto SHAFT (35). Snug SOCKET HD. SCREW (21). Rotate HANDLE (7) counter-clockwise to "open" position. This moves POPPET (9) out of coupler BODY and unbinds the poppet sub-assembly linkage. Lightly tap on underside of HANDLE (7) with a hammer to remove SHAFT (35), BEARING (28), two WASHERS (15) and PACKING (17), all at the same time.
4. Once the SHAFT (35) is removed, the poppet sub-assembly can be pulled out the front (fixed jaw) end of the coupler BODY. Remove BEARING (18) and PLUG (27) from coupler BODY. Do not discard PLUG (27). It will be reinstalled at a later time. Remove HANDLE (7), PACKING (17) and WASHERS (15) and BEARING (28) from SHAFT (35).

ATTENTION Do not push the poppet sub-assembly into the coupler BODY (10)! In other words, do not push it the wrong way! The poppet linkage sub-assembly will get stuck in the BODY and subsequent attempts at removal may damage the seal seat.

5. You are now able to replace all seals, bearings and washers that need to be replaced.

SEAL REPLACEMENT:

There are only three possible leak paths where there are seals in the coupler body:

- Coupler O-RING, FACE SEAL (37)
- Poppet O-RING (36)
- PACKING (17) around the SHAFT (35)

COUPLER O-RING, FACE SEAL (37) REPLACEMENT:

1. Replacement of the coupler O-RING, FACE SEAL (37) is possible with no disassembly of the coupler. Furthermore, it is not necessary to remove the coupler from service.

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. To remove old o-ring, it is best to simply stick it with a thin, sharp object and pry the local area out of the groove. To avoid scratching the seal seat, avoid pushing the sharp object completely through the o-ring.
3. Grab the pried out section of the o-ring and pull completely out.
4. Clean groove and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace unit if scratches are found.
5. To install new O-RING, FACE SEAL (37), align o-ring with groove and push one area of the o-ring into the groove. Next, work the rest of the o-ring into the groove by applying pressure with thumbs.

HINT: Recurring O-RING, FACE SEAL failures are a result of failure to clean coupler and adaptor mating surfaces before coupling, or a raised surface on the adaptor resulting from a nick or embedded dirt.

OPW ENGINEERED SYSTEMS a DOVER company

Drylok® Dry Disconnect – 3" Coupler Maintenance

3" DRYLOK COUPLERS 5770 SERIES:

POPPET O-RING (36) REPLACEMENT:

1. With the poppet linkage sub-assembly removed from the unit (see "TEAR DOWN INSTRUCTIONS"), replacement of the O-RING, POPPET (36) is possible. Refer to SH. 2 of 2, drawing H-52295-PA.

CAUTION Fluid in the coupler will have worked its way into the o-ring groove behind the o-ring. The backside of the o-ring will be coated with this fluid even if the unit was cleaned. Take appropriate measures.

WARNING Improper removal of o-ring could result in scratched seal surface in the seal groove. Follow instructions carefully!

2. Remove RETAINING RING (24) from the poppet linkage sub-assembly. POPPET GUIDE (8) is now free to slide off POPPET (9). POPPET GUIDE will clear the poppet linkage sub-assembly without further disassembly.
3. Remove old O-RING (36). It should easily slide off POPPET (9). Use of sharp tools is not recommended.
4. Clean o-ring sealing surfaces of POPPET (9) and POPPET GUIDE (8) and check for scratches. Any deep scratches will cause even a new o-ring to leak. Replace poppet if scratches are found.
5. To install new O-RING (36), pass o-ring over back of poppet linkage sub-assembly (i.e. over SHAFT LINK (5) and POPPET LINK (6)) to the backside of POPPET (9). Re-assemble POPPET GUIDE (8) onto its diameter in the coupler POPPET. It is best to position the guide legs of the POPPET GUIDE so that they will clear the POPPET LINK (6) when in the "open" position (refer to SH. 2 of 2 on drawing H-52295-PA). Install RETAINING RING (24) into groove in POPPET, behind the POPPET GUIDE. Make sure RETAINING RING completely snaps into the groove.
6. Coupler poppet linkage sub-assembly is now ready to be reinstalled into the coupler.

ASSEMBLING POPPET LINKAGE SUB-ASSEMBLY AND SHAFT (35) INTO BODY (10):

NOTE: For this stage of assembly, you will need a "dummy adaptor". This is nothing more than the nose end of a 5670 Drylok Adaptor. To get a dummy adaptor, please contact OPW.

1. With coupler BODY (10) standing upright, sitting on threaded end, assemble a dummy adaptor end into fixed jaw of BODY (10). (Note: O-RING, FACE SEAL (37) cannot be in BODY at this point of the assembly process). The dummy adaptor has the lead-in that allows the O-RING, POPPET (36) to slide into the bore of BODY (10). The dummy adaptor must fit snug against its mating surface of BODY in order for the lead-in to align with BODY bore. An o-ring at the face seal will not allow proper alignment between the dummy adaptor and BODY bore. Assembling the poppet linkage sub-assembly into the BODY without a dummy adaptor properly aligned, or without one at all, risks o-ring damage that may not be detected.
2. With the dummy adaptor in place and POPPET LINK (6) oriented as pictured in SECTION B-B of drawing H-52295-PA SH. 2 of 2 (when looking down from above), slide poppet linkage sub-assembly through dummy adaptor, allowing it to drop into coupler BODY (10).
3. Next, lay coupler BODY down in horizontal position and locate SHAFT LINK (5) by looking into shaft hole in top of BODY. Install SHAFT (35) into BODY and through SHAFT LINK. Reinstall HANDLE (7) onto SHAFT and turn clockwise to pull POPPET (9) back into the coupler BODY.
4. The dummy adaptor can now be removed. At this point, POPPET (9) face should be parallel to, and approximately .06" below coupler BODY face. Remove SHAFT (35) from the coupler BODY. To do this, it may be necessary to wiggle SHAFT back and forth. Be careful not to allow POPPET to come out of coupler BODY.
5. With SHAFT (35) removed, reinstall PLUG (27), with the flat side up, into the boss in the bottom of coupler BODY. Insert BEARING (18) into coupler BODY boss, on top of PLUG. Slide BEARING (28) over top of SHAFT (35).
6. To reinstall SHAFT (35), look into top of coupler BODY and fold SHAFT LINK (5) as shown in SECTION B-B. It may be necessary to make some poppet linkage sub-assembly adjustments, but try to get the hex in SHAFT LINK concentric to the hole in the coupler BODY. Note that when folded up, the front most flat in the SHAFT (35) hex should be perpendicular to the BODY centerline. **NOTE: POPPET LINK (6) of the poppet linkage sub-assembly must be positioned as shown in SECTION B-B for the coupler to operate properly.** SHAFT LINK (5) of the poppet sub-assembly should be lying on top of BEARING (18), previously inserted into BODY.
7. Note the single flat on the top portion of the SHAFT (35). When inserting the SHAFT (35) into the BODY (10) and through the SHAFT LINK (5), this flat on the SHAFT must be facing the threaded end of the coupler. It may be necessary to reinstall HANDLE (7) onto SHAFT to aid in SHAFT installation. Wiggle HANDLE and SHAFT while firmly pushing SHAFT down through the SHAFT LINK and into coupler BODY.

At this point, the flat on the SHAFT (35) must be facing back (toward the threaded end of the coupler). POPPET (9) should be about .06" below the front face of the coupler, which is basically, in all the way. Looking in the back (threaded end) of the coupler, you should see SHAFT (35) inserted through SHAFT LINK (5) and BEARING (18).

Drylok® Dry Disconnect – 3" Coupler Maintenance

3" DRYLOK COUPLERS 5770 SERIES:

PACKING REPLACEMENT:

1. With coupler BODY (10) securely held, assemble one WASHER (15) and PACKING (17) over top of SHAFT (35), followed by an additional WASHER (15). PACKING assembly must be installed with the "V" notches of the PACKING pointing up towards you. WASHERS and PACKING may be pushed into coupler BODY (10) using SCREW (4).
2. Install SAFETY RELEASE BUTTON (42) and SPRING (40) onto coupler BODY. Assemble WASHER (39) and WASHER, TEFLON (19) over boss on BODY, making sure SAFETY RELEASE BUTTON (42) remains underneath. Assemble BEARING (20) into RAMP (3) ID, then slide RAMP & BEARING together onto boss on BODY. The hole in the RAMP (3) must be facing the front (fixed jaw end) of the coupler BODY. Push RAMP down until it locks together with LATCH (1). Install WASHER (14) on top of RAMP (3).
3. Thread JAM NUT (16) all the way to the top of SCREW (4). Thread this combination into BODY over SHAFT (35). Tighten until you feel it bottom out. Turn an additional quarter turn and back out a few turns. Repeat this process once or twice (this helps set PACKING). Finally, tighten SCREW (4) again until it bottoms out and then snug tight.
4. Holding SCREW (4) in final position, thread JAM NUT (16) down SCREW (4) until it contacts WASHER (14), and tighten to approximately 25 foot-pounds of torque.
5. Place HANDLE EXTENSION (2) over SHAFT (35) end and down onto RAMP (3). Cast flat in HANDLE EXTENSION must align with flat on SHAFT.
6. Place HANDLE (7) over SHAFT and nest it down between the raised parts of the HANDLE EXTENSION (2). Wedging a screwdriver in the slot of the HANDLE to open up the hole makes it easier to slide the HANDLE over the SHAFT end. It may be necessary to lightly tap HANDLE down with a hammer.
7. Properly assembled, the HANDLE (7) will nest against the HANDLE EXTENSION (2), and the HANDLE EXTENSION will nest against the RAMP (3). Tighten SOCKET HD. SCREW (21).
8. If it is necessary to replace SAFETY ADJUSTING SCREW (38), uninstall CLAMP (11) by removing both SHOULDER SCREWS (32). Take care not to lose SPRING (33). Remove JAM NUT (22) and unthread SAFETY ADJUSTING SCREW (38) from CLAMP (11). Install new SAFETY ADJUSTING SCREW (38) by threading all the way into CLAMP (11) from its underside. Thread JAM NUT (22) onto SAFETY ADJUSTING SCREW (38).
9. Place SPRING (33) into the boss on CLAMP (11) and assemble to BODY (10) with SHOULDER SCREWS (32). Tighten SHOULDER SCREWS (32) to approximately 25 foot-pounds torque. CLAMP (11) should rock freely back and forth.

COUPLER/ADAPTOR INTERFACE ADJUSTMENT:

This interface is critical to proper operation of the Drylok coupler. Keeping the interface clean and adjusted will help maximize the life of the coupler poppet seal and will reduce the chance of leaks developing at the coupler / adaptor interface

1. Loosen SAFETY ADJUSTING SCREW (38) and JAM NUT (22). Couple dummy adaptor into fixed jaw of coupler BODY and turn HANDLE (7) to first SAFETY RELEASE BUTTON (42) lock, as per operation instructions.
2. Use a flathead screwdriver to tighten SAFETY ADJUSTING SCREW (38) until it makes contact with RAMP (3). Then, continue to tighten one complete turn. Push SAFETY RELEASE BUTTON (42) and turn HANDLE (7) to full "open" position. Next, holding the SAFETY RELEASE BUTTON (42) down, turn HANDLE back and forth two or three times to properly seat SAFETY ADJUSTING SCREW (38).
3. Now turn HANDLE (7) and lock in full "open" position. Loosen SAFETY ADJUSTING SCREW (38), backing it completely off RAMP (3). Retighten SAFETY ADJUSTING SCREW (38) until it just makes contact with RAMP. Tighten SAFETY ADJUSTING SCREW one and a quarter to one and a half turns or approximately 18 inch-pounds of torque.
4. Tighten JAM NUT (22) down against CLAMP (11) to lock SAFETY ADJUSTING SCREW in place.

WARNING Failure to retighten JAM NUT (22) over the SAFETY ADJUSTING SCREW (38) may cause coupler/adaptor interface leakage and/or coupler failure.

TEST PROCEDURE:

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the O-RING, POPPET (36) and PACKING (17). Place coupler under water, tapping and rotating it to release any trapped air. Pressurize the valve to 2 PSI, and check inspection points. Then, increase pressure to 80 PSI and check inspection points again. Check for leaks in the following areas:

A) RAMP (3)/HANDLE EXTENSION (2) area.

B) POPPET (9)/coupler interface (hold coupler vertically, with POPPET (9) face up and fill coupler face with water).

Reduce air pressure to 0 PSI. Insert Drylok test fixture into coupler. Note: The Drylok test fixture is a fully operational, leak-proof adaptor, fitted with a nipple and cap. Depress SAFETY RELEASE BUTTON (42), open coupler to fully open position and pressurize to 2 PSI. Check for leaks at the inspection points listed above. Also check for leaks at the coupler/adaptor interface. Increase pressure to 80 PSI and check for leaks again. If leaks occur at coupler/adaptor interface, retighten adjusting screw as stated above and retest.

Drylok® Dry Disconnect – 3" Adaptor Maintenance

3" DRYLOK ADAPTORS:

WARNING OPW ENGINEERED SYSTEMS cannot be held responsible for the integrity of a Field rebuilt product. To minimize the possibility of physical injury and obtain the best possible functioning product after rebuilt, it is strongly recommended that the procedures outlined be followed to Tear down, Re-assemble and Test the product before placing the unit back into service. Reference the enclosed illustrations to facilitate identification of parts.

RECOMMENDED TOOLS FOR REPAIR: Recommended tools for repair: Adaptor assembly wrench C20462 (Consult factory), torque wrench with 1/8" hex driver, small flathead screwdriver or knife.

TEAR DOWN INSTRUCTIONS:

1. Clamp the BRIDGE (3) end of the adaptor in vise with soft jaws. Take care not to mar machined surfaces of ADAPTOR NOSE (1).
2. Remove (if applicable) SET SCREW (8) from BRIDGE (3).
3. Using adaptor nose tool (C20462) or strap wrench, unthread ADAPTOR NOSE (1) from BRIDGE (3), exercising care and caution. POPPET in valve is spring loaded. Exert pressure on POPPET ASS'Y (5) to relieve spring force against the ADAPTOR NOSE (1). SPRING force on the 3" Drylok adaptor is approximately 45 pounds.
4. Remove POPPET ASS'Y (5), SPRING (2), THREAD SEAL (6) and BEARING (4). Old THREAD SEAL and BEARING can be discarded. The POPPET S/A is not included in the Repair Parts Kit. It will be necessary to replace the old O-RING (7).
5. Position POPPET ASS'Y (5) in collet or vise with soft jaws. Carefully pry O-RING (7) out of the POPPET ASS'Y (5) groove (be careful not to scratch the groove seat with the prying tool. This could result in an O-RING leak). Discard old O-RING.

RE-ASSEMBLE INSTRUCTIONS:

6. Re-assemble POPPET ASS'Y (5) and new O-RING (7) in the following manner:
   a) Position new O-RING (7) on top of POPPET ASS'Y (5).
   b) With your thumb, press a section of the O-RING (7) into the groove.
   c) Press the O-RING (7) around the POPPET ASS'Y (5) and over the groove lip (it is necessary to slightly stretch the O-RING (7) to accomplish this).
   d) Continue pressing the O-RING (7) around the POPPET ASS'Y (5) until the O-RING (7) is seated in the groove.

NOTE: Teflon encapsulated O-RINGS (7) should be heated in hot water for easier installation.

7. Lubricate new THREAD SEAL (6) and position on the machined shoulder on the ADAPTOR NOSE (1). Important: All lubricating greases must be compatible with seal materials and liquid products flowing through valve to avoid destruction of elastomeric properties, or contamination.
8. Insert new BEARING (4) into BRIDGE (3) with flat, larger diameter end facing toward poppet end, and cut end toward threaded end.
9. Install SPRING (2) into deflector cup of BRIDGE (3). Install rebuilt POPPET ASS'Y (5) with O-RING (7) into SPRING (2). POPPET shaft should fit into BEARING (4) bore freely.
10. Coat threads of ADAPTOR NOSE (1) with suitable heavy grease to avoid galling of threads during assembly.
11. Place ADAPTOR NOSE (1) over POPPET ASS'Y (5) and push it into contact with BRIDGE (3). Spring force will have to be overcome to get threads started.
12. Once started, thread ADAPTOR NOSE (1) all the way into BRIDGE (3) until it stops. Generally, the ADAPTOR NOSE (1) will stop threading when the THREAD SEAL (6) starts to get squeezed. At this point, it will be necessary to use the adaptor nose tool (C20461) or a strap wrench to further tighten adaptor. Tighten adaptor until it abruptly stops and will tighten no further. Again, take care not to mar machined surfaces of ADAPTOR NOSE (1). If adaptor uses SET SCREW (8), apply Loctite™ 242 or 243 to threads of SET SCREW. Reinstall SET SCREW into BRIDGE (3). Tighten SET SCREW using a torque wrench with 1/8" hex driver. Torque to 60 inch-pounds.

TEST PROCEDURE:

It is recommended that the VALVE be pressure tested utilizing the air under water method, checking for leaks in the area of the POPPET seat and around the large threaded joint. Place VALVE under water, tapping and rotating it to release any trapped air. Pressurize the valve to 2 PSI, and check inspection points. Then, increase pressure to 80 PSI and check inspection points again. If pressurized air is not available, low pressure leaks could be checked by submerging the entire ADAPTOR face up in a container of clear water. Air trapped inside the VALVE will bubble through or around the POPPET if the seal is not proper. This test should be repeated three or four times to ensure that the seal does not leak. Depress and release the POPPET each time before submerging the unit into water.

OPW
ENGINEERED SYSTEMS
a DOVER company

www.opw-es.com ◆ 2726 Henkle Drive ◆ Lebanon, Ohio 45036 ◆ Phone: (513) 932 9114 ◆ Fax: (513) 932 9845

ES-DLCAT • 010/19 • 1K