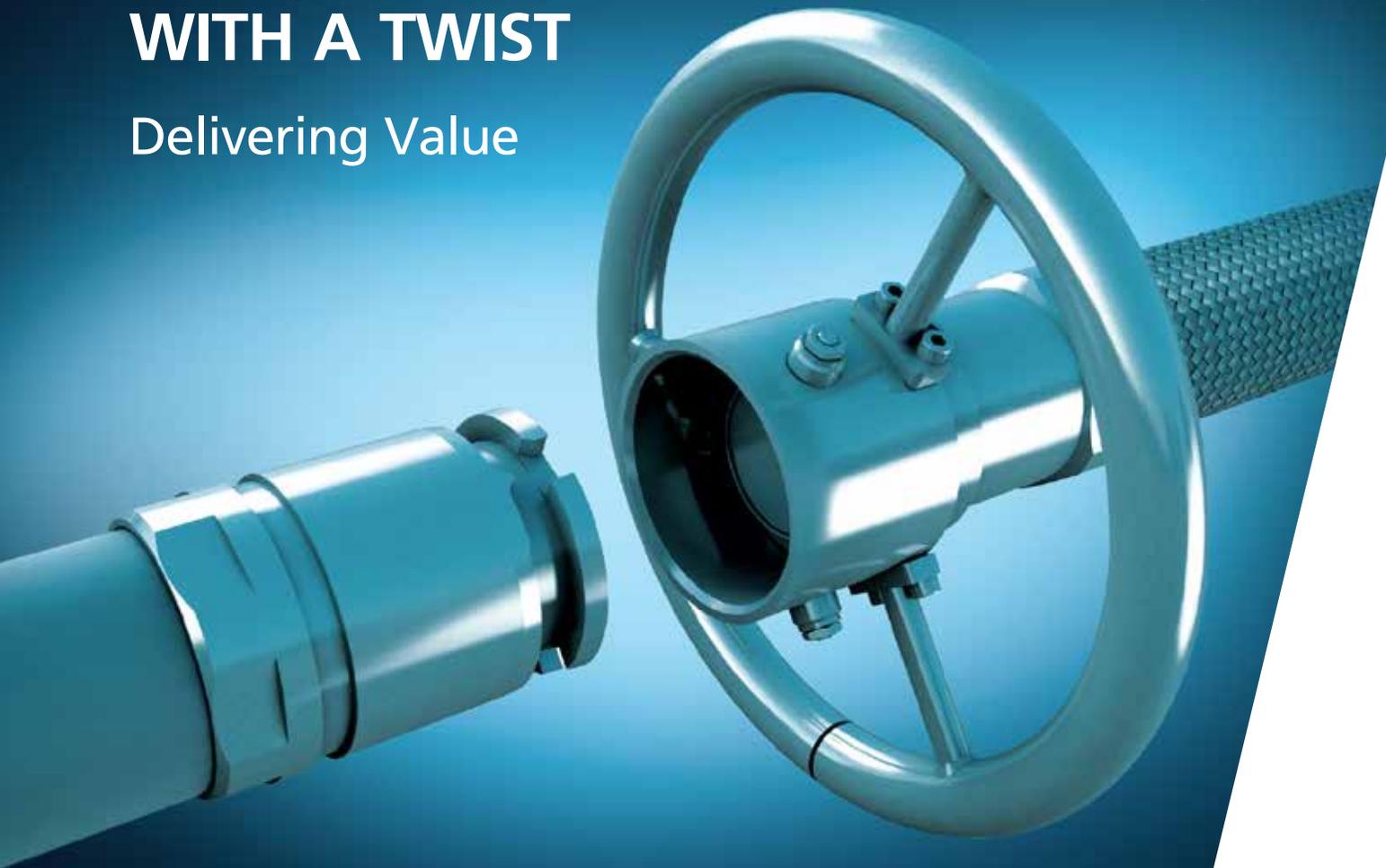


PERFORMANCE WITH A TWIST

Delivering Value

Issue Date:
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Twist-Lok Installation, Operation & Maintenance (IOM) Manual





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.

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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.

Twist-Lok™ Overview

Twist-Lok™ represents the latest addition to OPW's industry-leading range of Dry Disconnect Couplers. With its user-friendly operation and simple handling, the Twist-Lok provides a quick, easy connection with minimal product loss.

Benefits

- **Fully Interchangeable** – with other manufacturers, such as TODO-MATIC, Mann Tek, etc. Manufactured in accordance with NATO STANAG 3756.
- **Pressure Ratings** – up to 360 psi; ideal for LPG and other higher-pressure applications.
- **316 Stainless Steel** – construction AVAILABLE in 1", 2", 3" and 4" sizes. Larger sizes available upon request.
- **Integral Heavy-Duty Swivel** – to aid connection and minimize hose wear.
- **Double Safety** – Fully Interlocked plus locking mechanism in open position.
- **Product Selectivity** – available via mechanical keying – minimizes risk of cross contamination.
- **1", 2", 3" and 4" sizes**
- **Stainless Steel, Alloy 20 or Hastelloy C Construction**
- **Suitable for Vacuum Service**



**Twist-Lok™
Dry Disconnect
Coupler**

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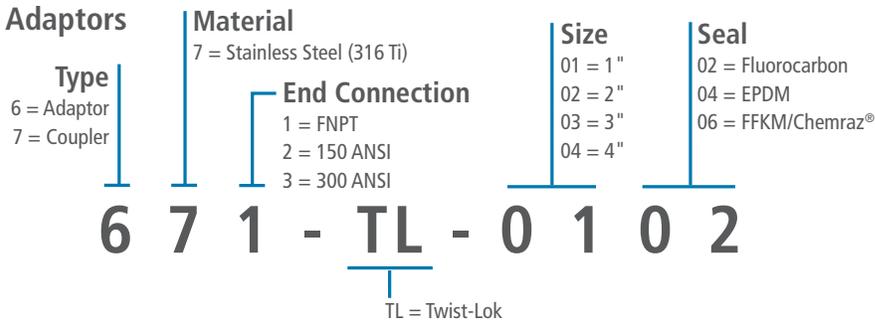
Materials of Construction

Stainless Steel (316Ti) - standard			
Seals	Fluorocarbon Seals (standard), EPDM, FFKM	Connections	FNPT, ANSI Flanges; others upon request
Pressure Rating	Up to 360 psi (25 bar)	Sizes	1", 2", 3", 4"; larger sizes upon request
Temperature Rating	-40°F-350°F (-40°C-177°C)	Approvals	European and American Railcar Approvals AAR Approval No. E989073-A

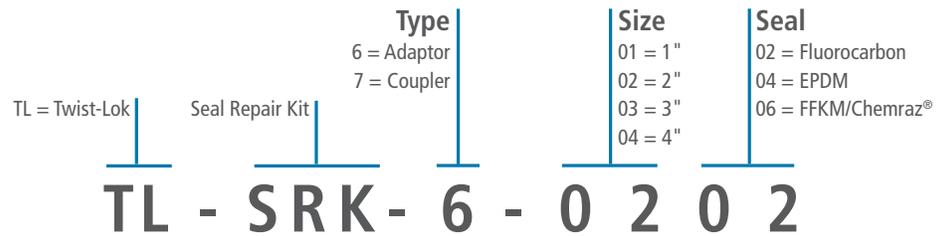
Twist-Lok™ Ordering Guide

Couplers & Adaptors

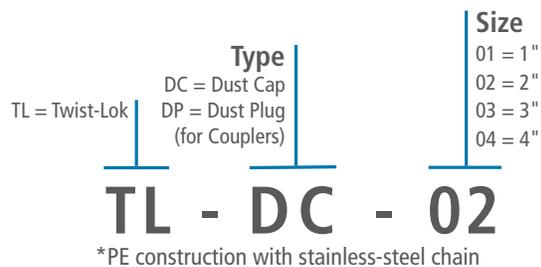
Couplers & Adaptors



Seal Kits



Dust Caps & Plugs



Twist-Lok™ Installation

Cautionary Notes

- Coupler and adaptor should be used in their designated locations and for their designated purposes only
- Local regulations and/or policies for loading and unloading take precedence and must always be followed
- Product flow may result in static electricity; grounding of equipment is required
- OPW instructions should be followed for proper IOM
- Personal protection equipment (PPE) must be used

Instructions

- Secure the device or equipment (PPE) the coupler and adaptor will be attached to (loading arm, hose, pipe, etc.)
- Attach coupler and adaptor to device or equipment
 - For threaded couplers and adaptors, apply appropriate thread sealant prior to attachment

Twist-Lok™ Operation

Connection Instructions

1. Ensure the valve downstream of the adaptor is open prior to connecting the coupler to the adaptor
2. Ensure the adaptor is fixed to facilitate rotation of the coupler
3. With both hands, align the face of the coupler with that of the adaptor; the three notches on the adaptor should line up with the roller pins of the coupler
4. For 2" – 4" couplers, pull the safety pin (aka plunger) prior to rotating the coupler; for 1" couplers, this step can be skipped as the standard configuration does not have a safety pin and can be rotated after step 3
5. Rotate the coupler 120° clockwise to drive the poppet of the coupler forward, forcing the adaptor's poppet to retract and open the system for product to flow (note – the safety pin will pop into the adaptor groove once the coupler is rotated 120°)



Twist-Lok™ Operation

Disconnection Instructions

1. Ensure the adaptor is fixed to facilitate rotation of the coupler
2. For 2" – 4" couplers, pull the safety pin (aka plunger) prior to rotating the coupler; for 1" couplers, this step can be skipped as the standard configuration does not have a safety pin and can be rotated after step 1
3. Rotate the coupler 120° counterclockwise to retract the poppet of the coupler, allowing the adaptor's poppet to return to its spring-loaded position and closing the system
4. Close the valve downstream of the adaptor



Twist-Lok™ Maintenance

Coupler Disassembly Instructions

1. Remove ball bearings (C6) by removing the swivel plug (C7) on the swivel (C2) using an Allen wrench



2. Pull swivel (2) from coupler body (C1), removing the swivel Teflon® washer (C8)



Twist-Lok™ Maintenance

Coupler Disassembly Instructions

3. Remove poppet roller buttons (C9) from poppet rollers (C5)



4. Remove poppet rollers (C5) from poppet axle (C4)



5. Remove poppet axle (C4) from bottom side of poppet (C3)



Twist-Lok™ Maintenance

Coupler Disassembly Instructions

6. Remove poppet roller guides (C15) from bottom side of Poppet (C3)
7. Remove poppet (C3) from body (C1) by pushing down on the poppet; this will lead the poppet to fall out of the face of the coupler body (C1)



8. Remove poppet O-ring (C11) from the poppet (C3) using a plastic seal pick
9. Remove coupler roller pins (C17) from the body (C1) by securing the internal side of the roller pin with a pair of vise-grips; the hex nut and the external housing end of the pin can then be unthreaded



Twist-Lok™ Maintenance

Coupler Disassembly Instructions

10. The same procedure can be followed for the safety pin (C16)
11. Remove the tension ring (C24) subassembly which can then be disassembled further by removing the two tension ring Teflon® washers (C21), wave spring (C22), coupler ring (C23) and brackets (C10)



12. Remove the internal (C14) and external (C13) O-rings in the body using a plastic seal pick



Twist-Lok™ Maintenance

Coupler Disassembly Instructions

13. Remove the face seal (C12) from the top of the tension ring (C24)



Adaptor Disassembly Instructions

1. Place the adaptor assembly on a work bench with the end connection facing up
2. Using a flat-head screwdriver or needle-nose pliers, remove the retaining ring (A6) from the body's (A1) groove



Twist-Lok™ Maintenance

Adaptor Disassembly Instructions

3. Remove bridge (A5) from the body (A1)



4. Remove bearing (A4) from the body (A1)



Twist-Lok™ Maintenance

Adaptor Disassembly Instructions

5. Remove spring (A3) from the body (A1)
6. Remove poppet (A2) from the body (A1)



7. Remove poppet O-ring (A7) from the poppet (A2)



Twist-Lok™ Maintenance

Coupler Assembly Instructions

1. Begin by placing tension-ring brackets (C10) into the grooves of the tension ring (C24)



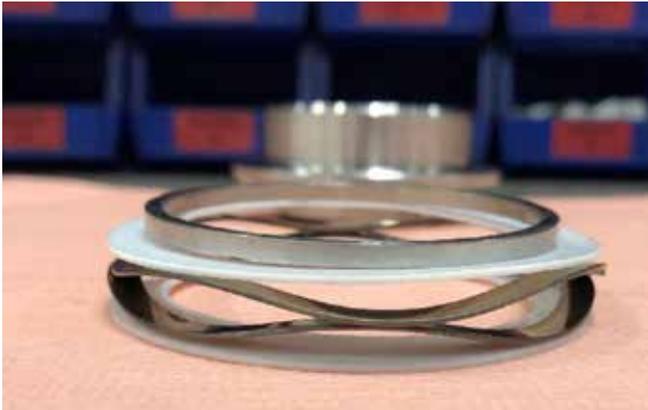
2. Assemble tension-ring's (C24) washer and spring subassembly by placing the two wave springs (C22) on one washer (C21), place the second washer on top of the wave springs, then place the coupler ring (C23) on top of the second washer



Twist-Lok™ Maintenance

Coupler Assembly Instructions

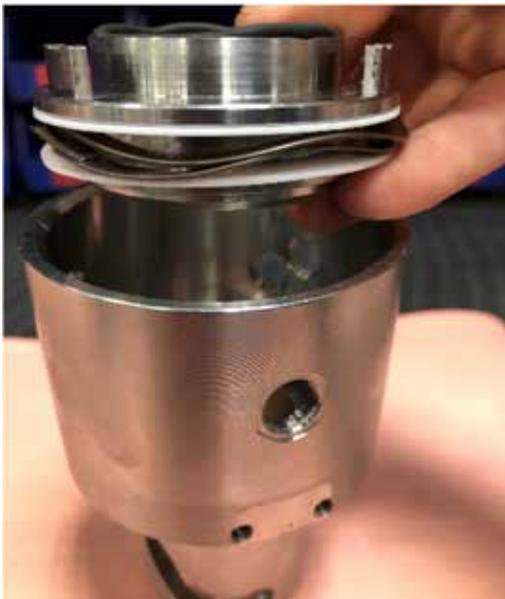
3. Place the subassembly from step 2 on the tension ring (C24)



4. Place the subassembly from step 3 into the body (C1) and press in firmly until the subassembly is secured



5. Build the coupler roller pin (C17) subassembly comprised of a roller, bearing and washer
6. Thread the coupler roller nut (C25) onto the subassembly from step 5



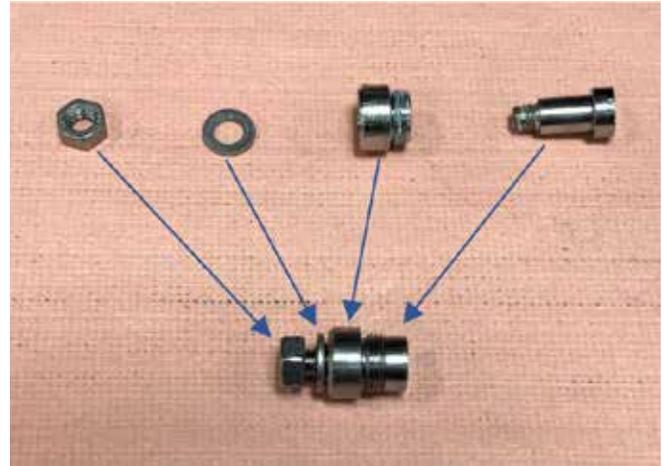
7. Thread subassembly from steps 5 and 6 into the body (C1)
8. Thread safety pin (C16) into the body (C1)



Twist-Lok™ Maintenance

Coupler Assembly Instructions

9. Using an automated press, compress the tension ring (C24) into the body (C1). This will hold the tension ring in place and allow rotation of the body.
10. Rotate the body (C1) such that the roller pins (C17) are directly above the three protruded notches of the tension ring (C24). This holds the roller pin in place.
11. Tighten coupler roller nut (C25) until it is flush with the end of the roller pin (C17)



Twist-Lok™ Maintenance

Coupler Assembly Instructions

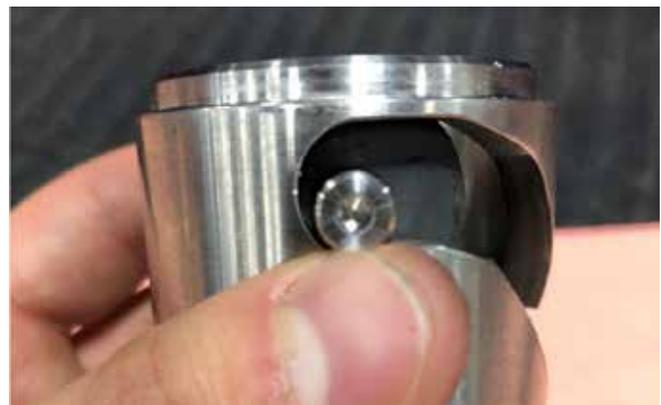
12. Place the poppet (C3) into the body (C1)



13. Insert poppet roller guides (C15) on the bottom side of the poppet (C3)



14. Place poppet axle (C4) into poppet (C3) hole to secure the poppet and guides (C15) in the body (C1)



Twist-Lok™ Maintenance

Coupler Assembly Instructions

15. Place poppet rollers (C5) followed by the buttons (C9) on poppet axle (C4)



16. Place swivel washer (C8) on the rear end of the body



Twist-Lok™ Maintenance

Coupler Assembly Instructions

17. Place coupler swivel (C2) on the rear end of the body and press firmly until the face of the swivel is flush with the body
18. Place ball bearings (C6) in swivel port



19. Position hand-wheel bracket (C19) on body followed by the hand wheel (C18) and thread bolts (C20) to secure wheel



Twist-Lok™ Maintenance

Adaptor Assembly Instructions

1. Work poppet O-ring (A7) into the poppet groove



2. Place adaptor body (A1) face down on workbench, place the poppet (A2) face down into the body, and place the spring (A3) on top of the poppet



Twist-Lok™ Maintenance

Adaptor Assembly Instructions

3. Place bearing (A4) on top of spring followed by the bridge (A5)



4. Compress the spring by pushing down on the bridge (A5); it is recommended to utilize a press to relieve the spring force



5. Using need-nose pliers, work the retaining ring (A6) into the last strut of the body



Twist-Lok™ Inspection & Testing

Inspection Intervals

Independent of the applicable legal regulations, it is recommended that the operator perform periodic inspections according to the inspection interval for system or transport trolleys (typically 5 years). If more frequent inspection intervals are required by internal policies, these must be carried out

Pressure and Seal Inspection of the Coupling Halves

Check male and female parts sequentially for proper sealing of the valves. To do so, attach the couplings on the thread/flange side to the inspection device, apply up to 0.5 bar (air/nitrogen) pressure and check the valves for leaks using leak spray. To inspect the pressure, close the test specimen on one side with a blind fitting/flange, position vertically, fill with fluid, attach test fitting/flange, increase pressure incrementally up to nominal pressure (PN) and check the valves for leaks

Twist-Lok™ Appendix Coupler Component Breakdown



Twist-Lok™ Appendix

Adaptor Component Breakdown





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