REGO®

R-500 Catalog

Railroad Tank Car Equipment

AAR Approved

(336) 449-7707
regoproducts.com

MADE IN THE USA

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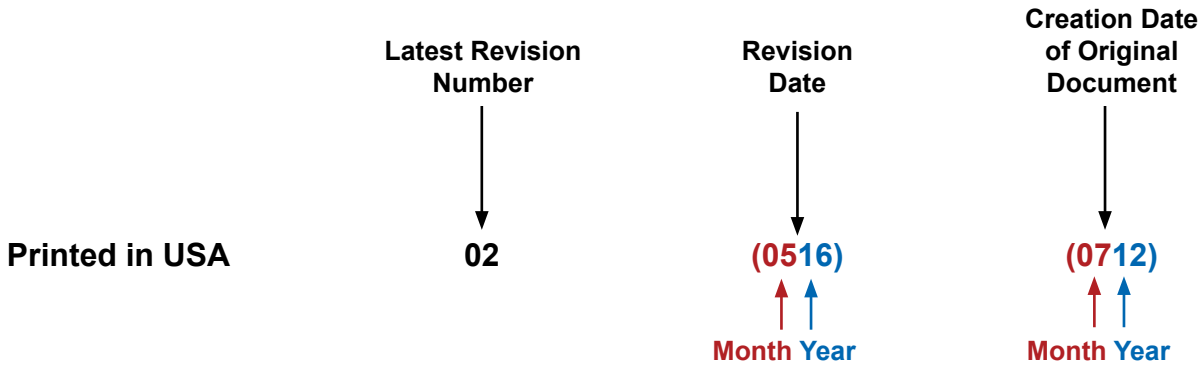


NOTE: LATEST REVISION DATE CODE IS LOCATED ON THE BOTTOM RIGHT HAND CORNER OF THE LAST PAGE OF THE INSTRUCTION SHEET.

Relief Valves for Railroad Tank Cars A8890S-Series

Application

AAR Approval # E232117

Suitable for use on pressurized railroad tank cars with a variety of liquefied gasses including butane butadiene, propane and anhydrous ammonia. RegO invented pop-action relief valves and has manufactured millions of relief valves for LP-gas and anhydrous ammonia.

Features

- Very high flow as product flows through the inlet port and not through the spring coils. Since the flow path is in the vapor space of the tank it is less likely to discharge liquid to the atmosphere.
- Intermediate guide design provides for better guiding of the seat and more reliable seating performance.
- Large diameter, high tensile alloy stem will not bend.
- Unique dual spring design provides less stress as each absorbs half the load-resulting in more accurate set points and reliable re-seatability. In addition, the springs are less susceptible to fatigue fracture. Valve is designed to reseal if needed with only one spring.
- Non-corrosive epoxy coating on springs resists against pitting and corrosion, especially in anhydrous ammonia service. Epoxy coating will provide longer service life.
- Color-coded springs provide easy identification of the valves relief setting.
- Stainless steel seat.
- Contoured upper stem guide allows easy access to the mounting bolts. Mounting bolts are easily reached with an open-end wrench.
- In an emergency-the upper poppet can be removed and serviced even with product in the tank.
- Identification system includes two identification plates-one riveted to the valve body and one on the upper security wire.
- Redundant security system includes upper and lower wire ties and seals.
- Available in a variety of relief settings.
- Light and short with a shipping weight of 62 pounds and overall length of 25 inches.
- Every valve is equipped with a polymer-resin cap to protect the valve from the elements during loading and unloading.

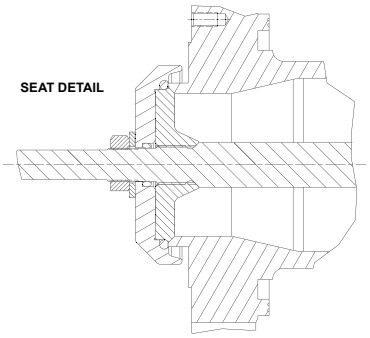
REGO 10 YEAR WARRANTY

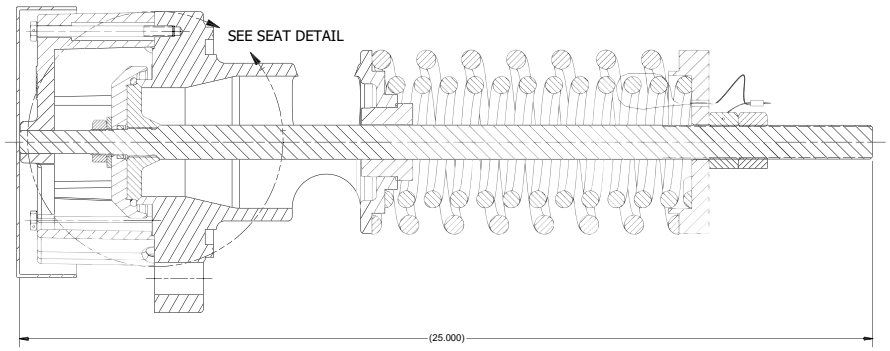
Relief Valves for Railroad Tank Cars A8890S-Series

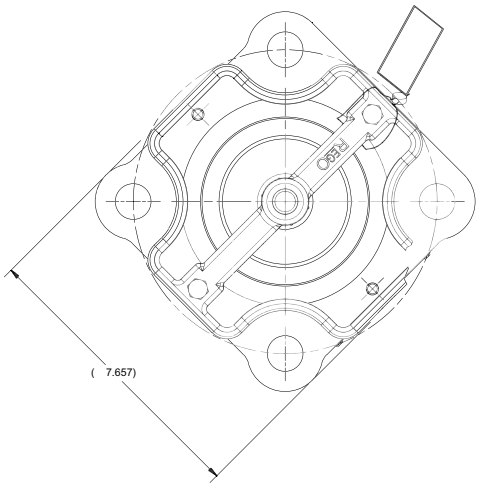
Materials

Body . . . . . 304 Stainless Steel
Stem . . . . . 17-4 Stainless Steel
Rings . . . . . .EPDM, Neoprene, Buna-N or Viton
Upper Stem Guide . . . . . Ductile Iron
Seat . . . . . 304 Stainless Steel
Upper Poppet . . . . . 303 Stainless Steel
Lower Poppet . . . . . 304 Stainless Steel
Lower Spring Retainer . . . . . Steel
Stem Guide Bushing. . . . . Ductile Iron
Springs . . . . . E Coated Alloy Steel

AAR Approval # E232117







Mounting Dim Per:
AAR M-1002, Appendice E, PG C-III-256

REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Seat Material	Set Pressure (PSIG)	Flow Data At 110% of Set Pressure (SCFM Air)	Protective Cap	Rebuild Kit
A8890S-225	Buna-N	225	28,563	8890-54	A8890S-50
A8890S-247		247.5	31,187		
A8890S-280		280.5	34,849		
A8890S-300		300	37,392		
VA8890S-225	Viton B	225	28,563		VA8890S-50
VA8890S-247		247.5	31,187		
VA8890S-280		280.5	34,849		
VA8890S-300		300	37,392		
VSA8890S-225	GFLT-S Viton	225	28,563		VSA8890S-50
VSA8890S-247		247.5	31,187		
VSA8890S-280		280.5	34,849		
VSA8890S-300		300	37,392		
NA8890S-225	Neoprene	225	28,563		NA8890S-50
NA8890S-247		247.5	31,187		
NA8890S-280		280.5	34,849		
NA8890S-300		300	37,392		
EA8890S-225	EPDM	225	28,563		EA8890S-50
EA8890S-247		247.5	31,187		
EA8890S-280		280.5	34,849		
EA8890S-300		300	37,392		

WARNING: Installation, disassembly, repair and maintenance MUST be performed only by qualified personnel. All gas MUST be evacuated from the system before starting repairs.

Installation, usage and maintenance of this product must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA #54, NFPA #58, DOT, ANSI, all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

ECI EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY – UNDER ANY THEORY, WHETHER CONTRACT, WARRANTY, TORT OR OTHERWISE – RELATING IN ANY MANNER TO ANY RAIL TANK CAR EQUIPMENT REPAIRED USING ANY PRODUCTS NOT MANUFACTURED BY ECI.

USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

A8890S-50 Series Rebuild Kit for A8890S and A8890W Series Railcar Pressure Relief Valves

REGO 10 YEAR WARRANTY

Disassembly and Rebuild Procedure

CAUTION: READ THROUGH ALL OF THESE INSTRUCTIONS, INCLUDING THE NOTICE AND WARNINGS ON THE BACK OF THIS SHEET, BEFORE BEGINNING ANY DISASSEMBLY OR REPAIR.

NOTE: Repairs must be performed in a clean area. Hands, clothing, tools and work area must be completely free of oil, grease and foreign matter to prevent contamination of component parts and valves. Take care to prevent damage to the epoxy coating on the springs.

Normal Service

Evacuate LP-Gas from tank prior to disassembling.

Disassembly - See Figure 1 & 2

1. Remove valve from railcar and place on a stable work surface.
2. Remove and discard cable and tie assembly from the 5/16" hex head cap screw.
3. Remove and retain the two 5/16" hex head cap screws and stem guide.
4. Using a 1-1/8" wrench and turning counterclockwise, remove and retain the 3/4" hex nut and washer that secures the upper poppet to the stem assembly.
5. Remove the upper poppet and retain.
6. Remove and discard the stem and poppet o-rings.
7. Clean threads below 1" jam nut with wire brush.
8. Using a 1-1/2" wrench and turning counterclockwise, remove and retain the 1" hex jam nut from the valve stem.
9. Place valve in a press. Compress against spring retainer to compress springs.
10. Remove and discard cable and tie assembly from the 1" hex adjusting nut and slowly back off.
11. Slowly remove pressure from spring retainer and springs and remove from press.
12. Remove springs and spring retainer, retain.

CAUTION: Handle springs with care to prevent damage to epoxy coating.

13. Slowly remove lower poppet and stem assembly from body.
14. Remove the 5/16" cap screws from the seat clamp ring. (For A8890W series valves only).
15. Remove the seat clamp ring and seat. (For A8890W series valves only).

Inspection

*Note: Inspect all retained parts for signs of wear and deterioration. Pay special attention to the surface finish of the valve seat** and stem** as well as the condition of the springs**, stem guide** and bushing**. Replace parts as necessary.*

1. Check stem straightness. Total indicated runout between lower poppet and 1" threads to be no greater than 0.125". Replace if non-conforming.
2. Inspect weld at stem and lower poppet. Using dye penetrant testing, verify the integrity of the weld. If any cracks are observed, replace.
3. For A8890W series valves, inspect seat weld. Using dye penetrant testing, verify the integrity of the weld. If any cracks are observed, replace.
4. Inspect the following for signs of pitting, nicks and/or corrosion:
   a. Seat face.
   b. Upper and lower poppet O-ring grooves.

   Damage in these areas can cause improper sealing of the valve. During testing, if set pressure cannot be obtained, replace ALL damaged components listed above.
5. Inspect the springs for signs of corrosion or damage to the epoxy coating, If detected, the springs must be replaced.
6. Inspect the bore of the stem guide and bushing. If the inner diameter of the stem guide is greater than .688", replace. If the inner diameter of the bushing is greater than 1.018", replace.

Reassembly-See Figures 1 & 2.

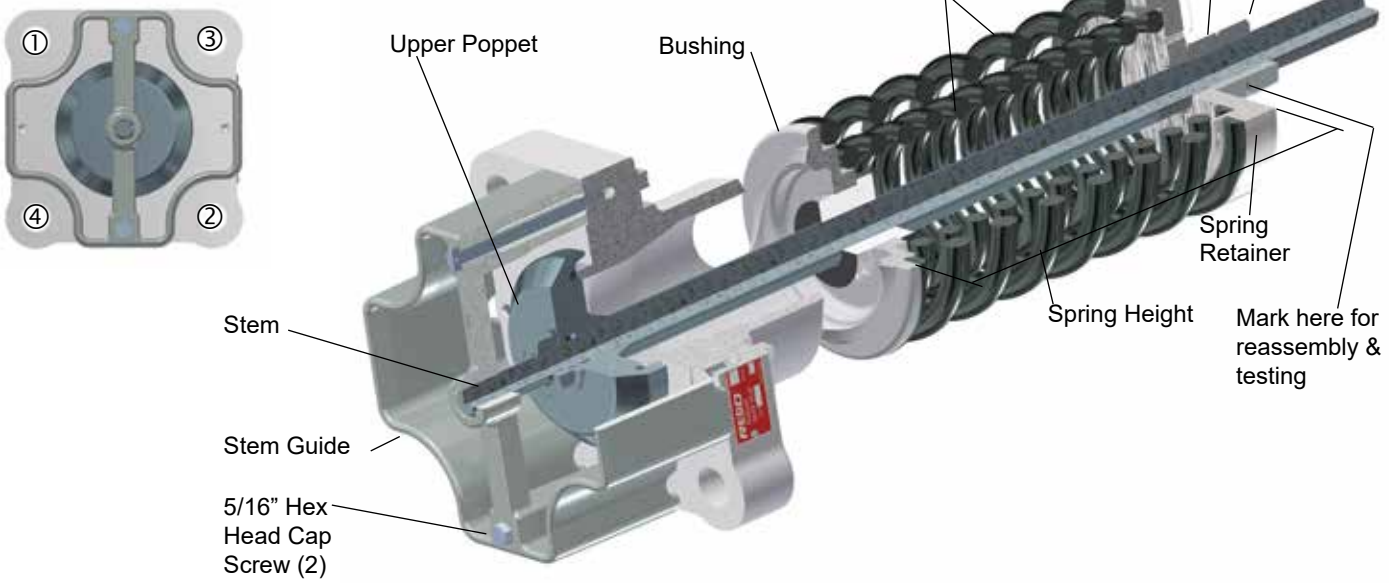
Note: Where lubrication is noted use Parker Super-O-Lube® or compatible silicon based grease.

1. **(For A8890W Series valves only)**

   Apply lubricant liberally to underside of seat clamp ring. Apply a thin strip of Loctite 242® thread locking compound to threads

Figure 1 - A8890S Series Valve

Tightening Squence



* These items form the A8890S-50 Series Kits, recommended for rebuilds.

** Must be ordered separately from RegO®.

of the 5/16” cap screws. Install seat clamp and secure with the 5/16” cap screws, turning clockwise, torque 150-160 in-lbs.

2. Coat the o-ring seat area on stem with lubricant (do not get on threads) and install stem o-ring onto stem.
3. Apply lubricant to outside of stem o-ring.
4. Stretch poppet o-ring to ensure snug fit inside upper poppet.
5. Apply a liberal amount of lubricant to the poppet o-ring and install in the upper poppet.
6. Install upper poppet with o-ring onto stem assembly. Apply Loctite 242® thread locking compound to stem threads and secure upper poppet to lower poppet with 3/4” hex nut and washer. Torque to 50-60 ft-lbs.
7. Paying special attention not to contact the seat, slowly reinstall the stem assembly through the bushing until the poppet o-ring contacts the seat.
8. Apply non-detergent grease to stem threads.
9. Reinstall the springs and spring retainer. Align spring ends so they start 180° apart.
10. Install the valve in a press (recommended), compress spring retainer to compress the springs to a height of 9.63”. See figure 1.
11. Using ONLY the 1” adjusting nut, engage until nut contacts spring retainer.

DO NOT INSTALL 1” HEX JAM NUT UNTIL AFTER TESTING IS COMPLETE.

12. Reinstall spring guide using two 5/16” hex head cap screws. Torque to 150-160 in-lbs.
13. Tighten the bolt studs & nuts gradually in an alternate and opposite sequence around the flange. Follow the sequence shown in Figure 1 Tightening Sequence.

Testing

NOTE: Valve should be tested no sooner than 24 hours after assembly to allow for proper seat compression.

1. Attach valve to test fixture.
2. Fill spring guide with water and observe pressure gauge as pressure is raised. After pressure is raised to within 25 psi of the set pressure marked on the valve, begin to increase pressure at a rate no greater than 2 psi per second, until the first bubbles through the water seal are observed. If bubbles do not appear at proper start-to-discharge pressure, tighten or loosen the adjusting nut until bubbles indicate proper setting.
3. After correct start-to-discharge pressure is reached, shut off inlet pressure, observe and note at what pressure valve seals off. Valve must reseal by 80% of start-to-discharge setting.
4. Exhaust air pressure and remove valve from fixture.
5. Now that the valve is set, measure the spring height.
   - For valves with set pressures of 225, 247.5 & 280.5 psi: the spring height must not be less than 7 3/8”.
   - For valves with a set pressure of 300 psi: the spring height must not be less than 8 3/4”.

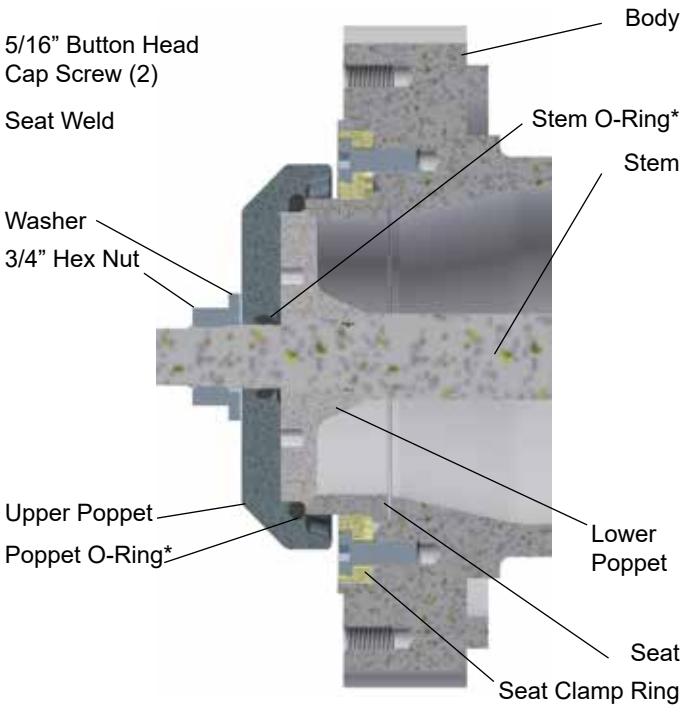
NOTE: If the spring height is less than these, the valve must be disassembled and both springs must be replaced.

6. Install and tighten 1” hex jam nut, being careful not to turn the adjusting nut.
7. Install a new cable and tie assembly onto one of the 5/16” hex head cap screw and around the adjacent arm on the stem guide. Install new cable and tie assembly onto the 1” adjusting nut, looping the free end of cable through the hole in the spring retainer, around coil of inner spring, back through hole in spring retainer, and then back through the tie. Proper cable and ties assembly installation is shown in figure 1.

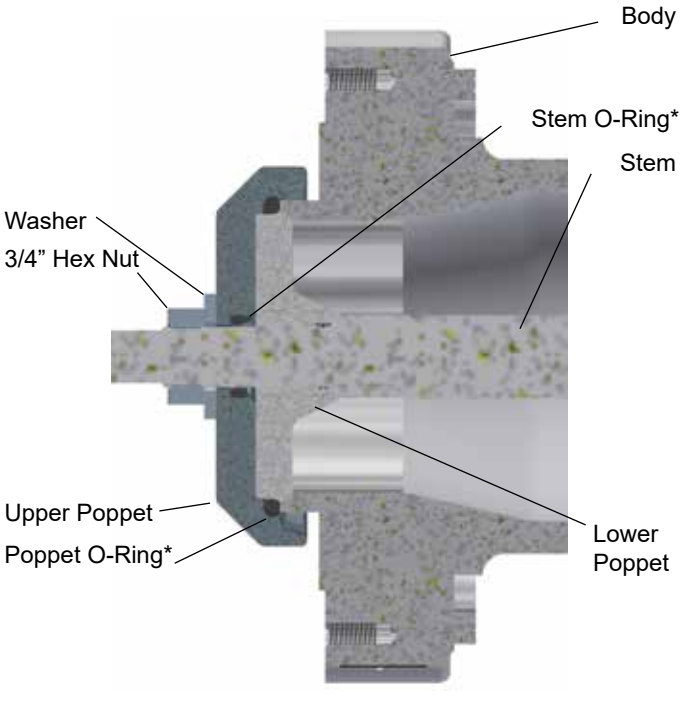
Emergency Field Repair

NOTE: “Emergency Field Repair” is considered repair and/or replacement of any resilient components while the valve is installed on a pressurized tank car. ***This procedure should be performed only when ABSOLUTELY NECESSARY and when evacuating the tank car is impractical.*** *Take caution during this repair and avoid open flames, as it is possible that some product vapor will escape. The venting of SOME product during the repair procedure is normal.*

Figure 2 - Poppet & Stem Assembly



A8890W Series



A8890S Series

Inspect all retained parts for signs of wear and deterioration. Replace parts as necessary.

1. Remove and discard cable and tie assembly from the 5/16" hex head cap screw.
2. Remove and retain the two 5/16" hex head cap screws and stem guide.
3. Using a 1-1/8" wrench and turning counterclockwise, SLOWLY remove the 3/4" hex nut and washer that secures the upper poppet. Remove upper poppet.

NOTE: Before completely removing the nut & washer, note the amount of product vapor escaping (if any) from the seat. If the amount is excessive or progressively getting worse, retighten the nut and perform a normal service after the tank is evacuated.

4. Remove & discard the stem o-ring and poppet o-ring.
5. Coat the o-ring seat area on stem with lubricant (do not get on threads) and install stem o-ring onto stem.
6. Apply lubricant to outside of stem o-ring.
7. Stretch poppet o-ring to ensure snug fit inside upper poppet. Apply a liberal amount of lubricant to the poppet o-ring and install in the upper poppet.
8. Install upper poppet and o-ring onto stem and lower poppet assembly and secure with the 3/4" hex nut and washer. Torque to 50-60 ft-lbs.
9. Reinstall spring guide with two 5/16" hex head cap screws. Torque to 150-160 in-lbs.
10. Install new cable and tie assembly onto 5/16" hex head cap screw and around the adjacent arm on the stem guide. See figure 1.

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such causes be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO® for technical advice base upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

The benefits given by the Limited Warranty above are in addition to any other rights and remedies to which you may be entitled by law.

NOTE TO AUSTRALIAN PURCHASERS: The following applies if you purchased this product as a "consumer" as defined in the Australian Consumer Law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Information regarding how to return a product and make a claim under this Limited Warranty is set forth below.

Nothing in this document purports to modify or exclude your rights if any under the Australian Consumer Law, or other laws which cannot be lawfully be modified or excluded.

WARNING

All RegO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and in industrial safety procedures.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO® products. Since most users have purchased these products from RegO® distributors, to make a claim under this Limited Warranty the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product (at the user's expense) to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to RegO®, pursuant to this Limited Warranty. Failure by buyer to give such written notice and return the product within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO®'s distributor for replacement or repairs under the terms of RegO®'s Limited Warranty in no way determines RegO®'s obligations under this Limited Warranty.

Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

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Instruction Sheet A8890S-301

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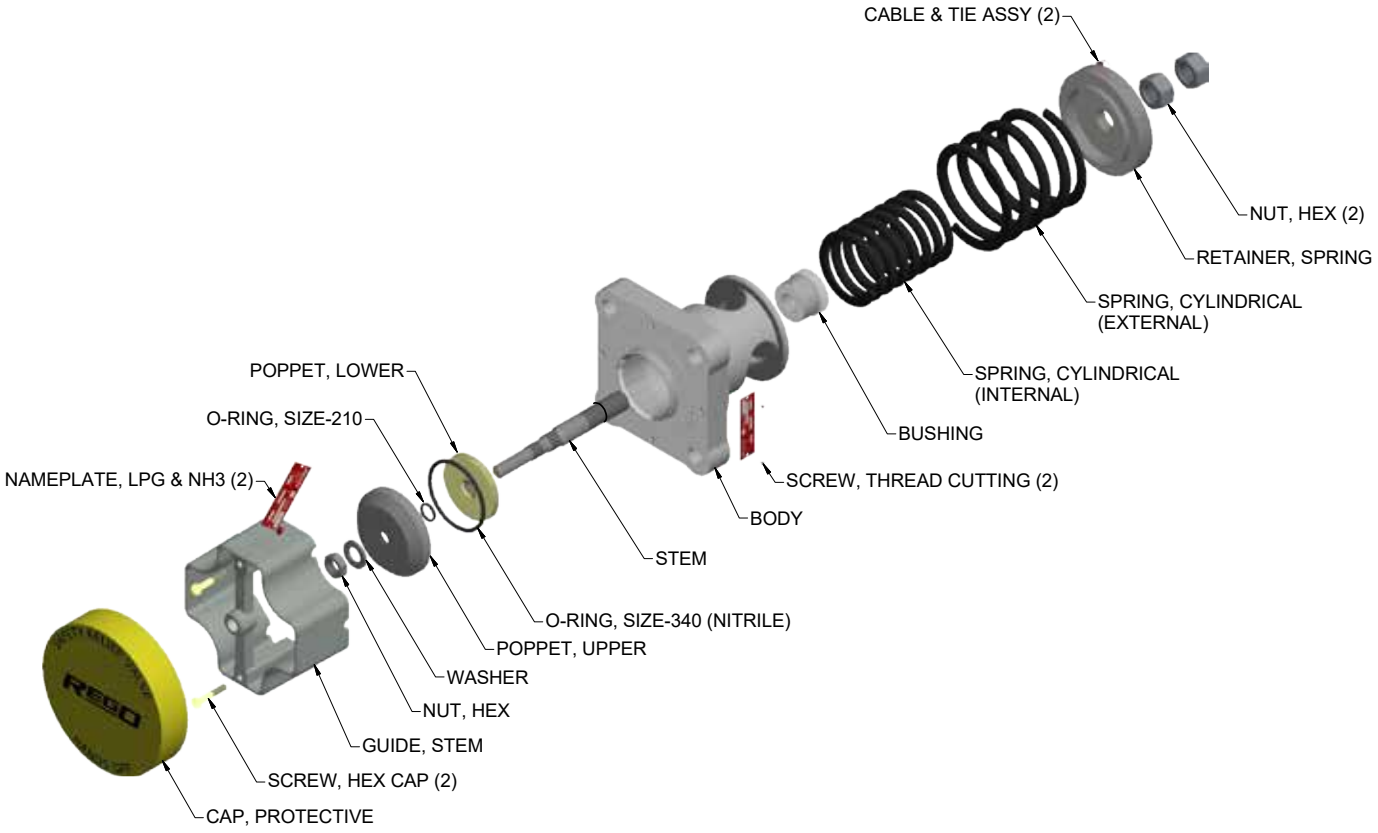


See quick reference tables on page 44 for rebuild kit.

Tank Car Angle Valves for Railroad Tank Cars TA7894P

Application

AAR Approval # E232122

Designed especially for transfer of LP-Gas and anhydrous ammonia in pressure car service.

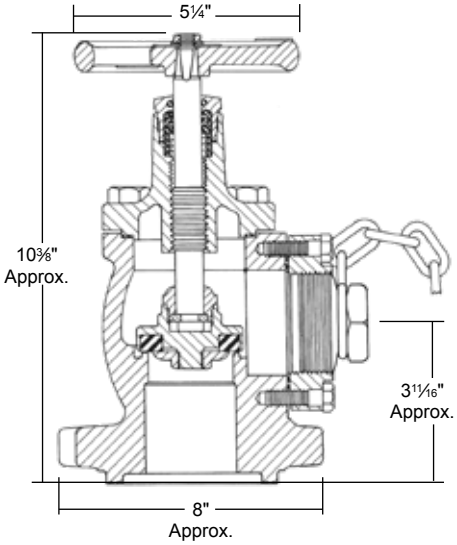
The combined heavyweight ductile iron castings and precision machining provide ruggedness and superior performance in working pressures up to 400 PSIG.

Features

- "V"-ring spring-loaded pressure seal design provides dependable, leak-free operation. No packing to retighten or replace.
- Wiper o-ring eliminates entrance of dirt and grit into stem area that can prohibit smooth operation.
- Heavy duty ACME stem threads give quick action and are hardened for long service life.
- Swivel seat reduces scoring of seat disc and provides positive shut-off.
- Full diameter seat provides greater flow capacity and low pressure drop.
- Plugged ¼" NPT boss on downstream side of valve accommodates vent valve or hydrostatic relief valve.
- Equipped with a malleable iron plug and chain installed in the valve outlet.

Materials

Body	Ductile Iron
"V"-Rings	Teflon
O-Ring	Synthetic Rubber
Stem	Stainless Steel
Bonnet	Ductile Iron
Seat Disc	Teflon
Handwheel	Cadmium Plated Ductile Iron



REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Inlet Connection	Outlet Connection (F.NPT)	Flow At 1 PSIG (Cv) Pressure Drop*	Accessories		Rebuild Kit
				Hydrostatic Relief Valve	Vent Valve	
TA7894P**	Tank Car Flange	2"	112	SS8001U	TSS3169	TA7894-50

* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: TA7894P @ 9 PSIG = 112 x $\sqrt{9}$ = 336 GPM/propane. For NH_3 flow, multiply propane flow by .90.

**TA7894PB is this valve with brass outlet plug.

100 RegO Dr. Elon, NC 27244 USA www.regoproducts.com

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USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

TA7894-50 and TA7894P-51 Rebuild Kits For TA7894P Tank Car Valves

A. Disassembly

CAUTION: EVACUATE ALL GAS FROM THE SYSTEM BEFORE ANY DISASSEMBLY OR REPAIR.

1. Remove 2" plug from valve outlet.
2. Turn handwheel counterclockwise as far as it will go to release any gas remaining in the container.

CAUTION: Do not apply force after valve is fully open.

3. Remove flange by removing the 9/16” (8) flange cap screws. Set all aside.
4. Remove and discard the flange gasket.
5. Using a 13/16" wrench, remove four cap screws from bonnet and set aside for reassembly. Carefully remove bonnet assembly from valve body. Set bonnet assembly aside.
6. Remove body gasket and discard.
7. Clamp the square section of bonnet in a vise.
8. Remove handwheel locknut with a small wrench to allow removal of washer, information disc and handwheel. Set items aside.
9. Using a 1-3/8" wrench with a handle of sufficient length to develop a minimum of 1000 in-lbs (83 ft-lbs) torque, carefully remove seal housing from bonnet.

CAUTION: Do not mar finish of stem.

10. Remove and discard (2) pressure seal rings, jam ring and wiper o-ring from seal housing.
11. Using a small wrench on the square section of the stem, unscrew stem down and out through the bottom of bonnet by turning clockwise (as viewed from top).

CAUTION: Stem inspection required.

12. Inspect the stem closely for definite signs of wear, nicks or scratches, in the Stem Sealing Area, see Figure 1. If any mechanical cleaning is needed, use emery cloth or paper (500-1000 grit) and polish stem sealing area using a circular motion.

CAUTION: Raised or sharp edges on the stem can damage and expand the packing seals when pressing onto the stem.

13. Continue to inspect the handwheel resting location where the stem changes from square to round, see Figure 1 Handwheel Resting Location. Remove any raised edges or burrs using a fine file and emery cloth that are higher than the stem diameter. Using an old seal, press seal on and off this area to determine if any resistance is felt. Resistance may require additional clean up. If stem is found to be in good condition, continue section B-1 of the rebuild instructions.

Figure 1-TA7894P

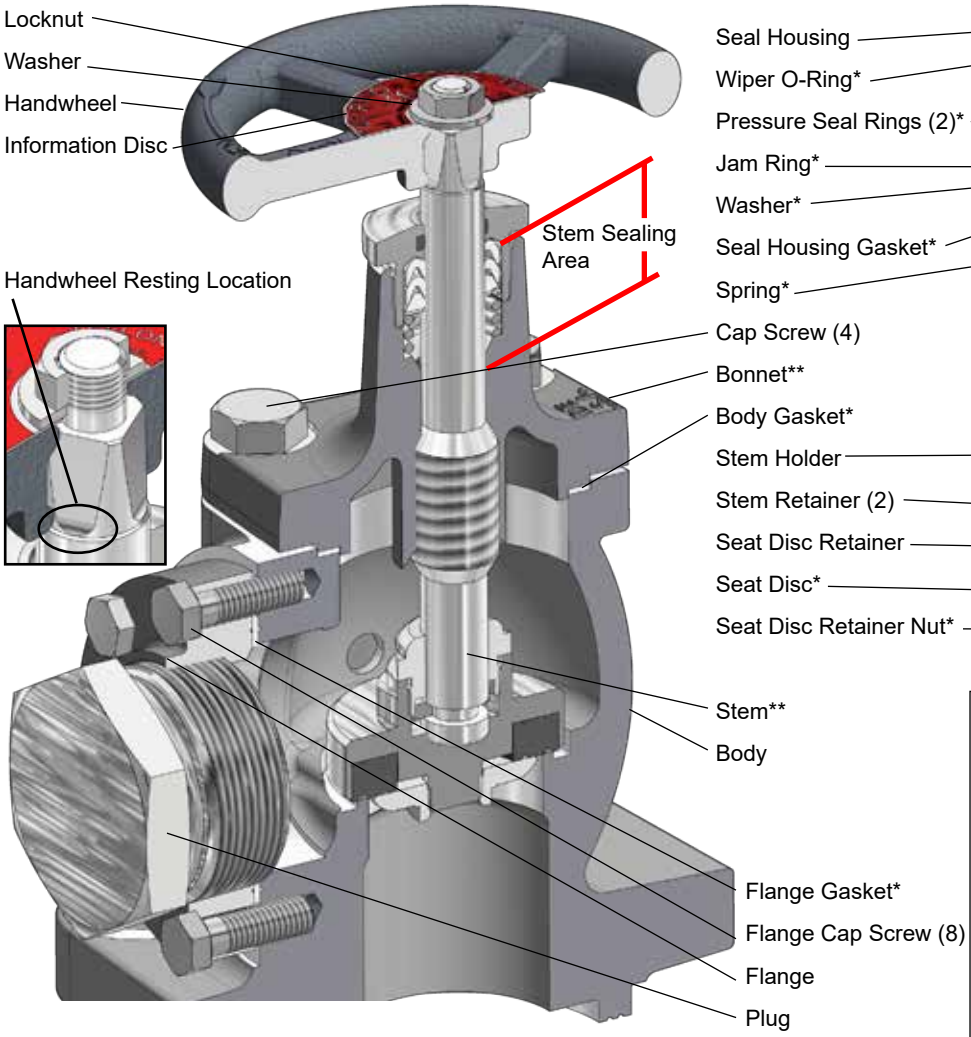


Figure 2-Seal Housing Assembly

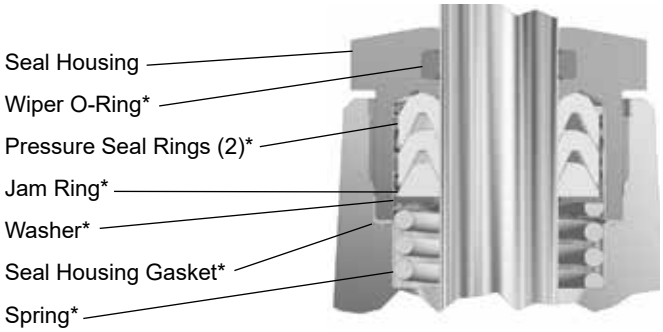


Figure 3-Seat Disc and Retainer Assembly

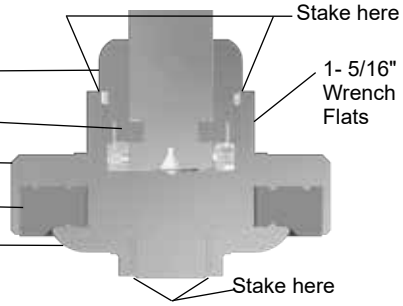
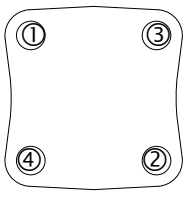


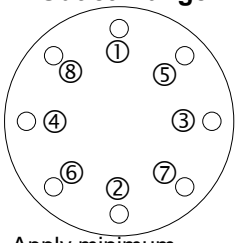
Figure 4-Screw Tightening Sequence

Bonnet Flange



Apply minimum 540±25 in-lbs (45±2 ft-lbs) torque using a tightening sequence of alternating bolts in a crisscross pattern.

Outlet Flange



Apply minimum 300±25 in-lbs (25±2 ft-lbs) torque using a tightening sequence of alternating bolts in a crisscross pattern.

›mmended for valve rebuild.

** Must be ordered separately from RegO®.

NOTE: If any permanent damage is found discard the stem and seal housing. Use TA7894P-51 Stem Kit and follow the alternate steps outlined in section B-2 Titled Angle Valve Reassembly Instructions with the TA7894P-51 Stem Kit.

*NOTE: Inspect stem** threads and mating threads in bonnet**. If any threads show definite wear, discard part, and install a new one.*

14. Remove seat disc retainer nut by using 1-5/16"wrench to secure retainer and another wrench to remove nut.
15. Remove and discard seat disc.

B-1 Angle Valve Reassembly See Figures 1,2 & 3

1. Apply non-detergent grease liberally to the threads of the stem.
2. Screw the stem clockwise (as viewed from seat disc) into the bottom of the bonnet with great care to avoid damaging the stem finish.
3. Install new seat disc into seat disc retainer by pressing into the recess of seat disc retainer as shown in Figure 3.
4. Apply Loctite 271® thread locking compound to the first three threads of seat disc retainer.

CAUTION: Do not allow Loctite to contact seat disc.

5. Thread on disc retaining nut and tighten with a wrench to 240-270 in-lbs (20-22.5 ft-lbs) torque. Stake nut in two places at retainer threads to prevent loosening. See Figure 3. Set assembly aside.
6. Install new seal housing gasket, new spring, new washer and jam ring over stem and into bonnet.
7. Install new wiper o-ring in groove of seal housing.
8. Apply a thin film of non-detergent grease to the pressure seal rings and carefully insert one at a time into the full depth of the seal housing.
9. Apply 1/8" stripe Loctite 271® thread locking compound across threads in three places equally spaced around seal housing.
10. Place seal housing carefully over the stem to avoid damaging the edges of seal rings and thread into bonnet. Tighten to 800 in-lbs (67 ft-lbs) torque, using a 1-3/8" wrench with a handle of appropriate length.
11. Apply non-detergent grease to each side of new body gasket and install into body.

CAUTION: Using the handwheel, verify the stem is in the full open (valve back seated) position to prevent seat disc from being forced against seat when bonnet is assembled to valve body.

12. Place bonnet over body and align holes for cap screws.
13. Install (4) cap screws, hand tight.
14. Using 13/16” wrench, tighten bonnet cap screws to 540 in-lbs (45 ft-lbs) torque using a crisscross tightening sequence. See Figure 4.
15. Place handwheel and information disc on stem, secure with washer and locknut and tighten firmly with a small wrench.
16. Apply non-detergent grease to each side of flange gasket then install in body.
17. Reinstall flange to outlet and hand tighten (8) flange cap screws.
18. Torque each flange cap screw using 9/16” wrench to 300 in-lbs (25 ft-lbs) minimum using a crisscross tightening sequence. See Figure 4.
19. Turn handwheel to closed position for Bench Test.

B-2 Angle Valve Reassembly With TA7894P-51 Stem Kit See Figures 1,2 & 3

NOTE: If replacing stem, follow disassembly steps 1A - 1D found below then continue with reassembly.

1A. Using 1-1/8” wrench on the stem holder (left hand threads) and a 1-5/16” wrench on seat disc retainer (left hand threads) turn clockwise (left hand threads) (as shown in Figure 1) to loosen the stem holder from the seat disc retainer.

1B. Remove and retain the two stem retainers (crescent shaped) once the stem holder and seat disc retainer are separated.

1C. Remove the stem holder from the old stem and set the stem holder aside.

1D. Discard the old stem and old seal housing.

2. Apply non-detergent grease liberally to the threads of the new stem.
3. Screw the new stem clockwise (as viewed from seat disc) into the bottom of the bonnet with great care to avoid damaging the stem finish.
4. Install the new seal housing gasket, new spring, new seal housing washer and jam ring over the stem and into the bonnet.
5. Install the new wiper o-ring in the groove of the new seal housing.
6. Apply a thin film of non-detergent grease to the pressure seal rings and carefully insert one at a time into the full depth of the new seal housing.
7. Apply 1/8” stripe of Loctite 271® thread locking compound across the threads in three places equally spaced around the new seal housing.
8. Place the new seal housing carefully over the stem to avoid damaging the edges of the seal rings and thread into the bonnet clockwise. Tighten to 800±25 in-lbs (67±2 ft-lbs) torque, using a 1-3/8” wrench with a handle of appropriate length.
9. Place the handwheel and information disc on the stem, secure with the washer and locknut and tighten firmly with a 9/16” wrench.
10. Install the stem holder on the new stem.
11. Install the two (crescent shaped) stem retainers on the main stem.
12. Apply Loctite 271® thread locking compound to the stem holder external threads and tighten into the seat disc retainer. Using 1-1/8” wrench on the stem holder and 1-5/16” wrench on the seat disc retainer, torque the connection to insure metal to metal contact between the two. Stake as shown in Figure 3 (two places).
13. Install new seat disc by pressing it into the seat disc retainer.
14. Apply Loctite 271® thread locking compound to the first three threads of the seat disc retainer.

CAUTION: Do not allow Loctite to contact the seat disc.

15. Thread on the seat disc retaining nut and tighten with a wrench to 240-270 in-lbs (20-22.5 ft-lbs) torque. Stake the nut in two places at the retainer threads (See Figure 3) to prevent loosening.
16. Apply non-detergent grease to each side of new body gasket and install into body.

CAUTION: Using the handwheel, verify the stem is in the full open (valve back seated) position to prevent seat disc from being forced against seat when bonnet is assembled to valve body.

17. Place bonnet over body and align holes for cap screws.
18. Install (4) cap screws, hand tight.
19. Using 13/16” wrench, tighten bonnet cap screws to 540 in-lbs (45 ft-lbs) torque using a crisscross tightening sequence. See Figure 4.

20. Apply non-detergent grease to each side of flange gasket then install in body.
21. Reinstall flange to outlet and hand tighten (8) flange cap screws.
22. Torque each flange cap screw with a 9/16" wrench to 300 in-lbs (25 ft-lbs) minimum using a crisscross tightening sequence. See Figure 4.
23. Turn handwheel to closed position for Bench Test.

Bench Test

1. Torque handwheel to 400 in-lbs (33 ft-lbs). Verify outlet is open.
2. Pressurize valve to 300-500 psi (through the inlet connection) and check valve for leakage, when looking into the outlet port, by applying a high quality leak detection solution around seat area and seat cavity. Observe for one minute to detect leaks.
3. Release 300-500 psi, apply 15-20 psi and look for any leakage as above.
4. Install outlet plug, again apply 300-500 psi and slowly open valve by turning handwheel 1/4 turn incrementally. Check valve for leakage by applying a high quality leak detection solution around stem, seal housing and bonnet joint. Continue to rotate handwheel 1/4 turn incrementally until valve is fully open (not back seated). Observe for one minute to detect leaks.

CAUTION: Wrenches must never be used to operate valves equipped with handwheels designed for hand operation.

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such causes be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO® for technical advice base upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

The benefits given by the Limited Warranty above are in addition to any other rights and remedies to which you may be entitled by law.

NOTE TO AUSTRALIAN PURCHASERS: The following applies if you purchased this product as a "consumer" as defined in the Australian Consumer Law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Information regarding how to return a product and make a claim under this Limited Warranty is set forth below.

Nothing in this document purports to modify or exclude your rights if any under the Australian Consumer Law, or other laws which cannot be lawfully be modified or excluded.

WARNING

All RegO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and in industrial safety procedures.

NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO® products. Since most users have purchased these products from RegO® distributors, to make a claim under this Limited Warranty the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product (at the user's expense) to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to RegO®, pursuant to this Limited Warranty. Failure by buyer to give such written notice and return the product within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO®'s distributor for replacement or repairs under the terms of RegO®'s Limited Warranty in no way determines RegO®'s obligations under this Limited Warranty.

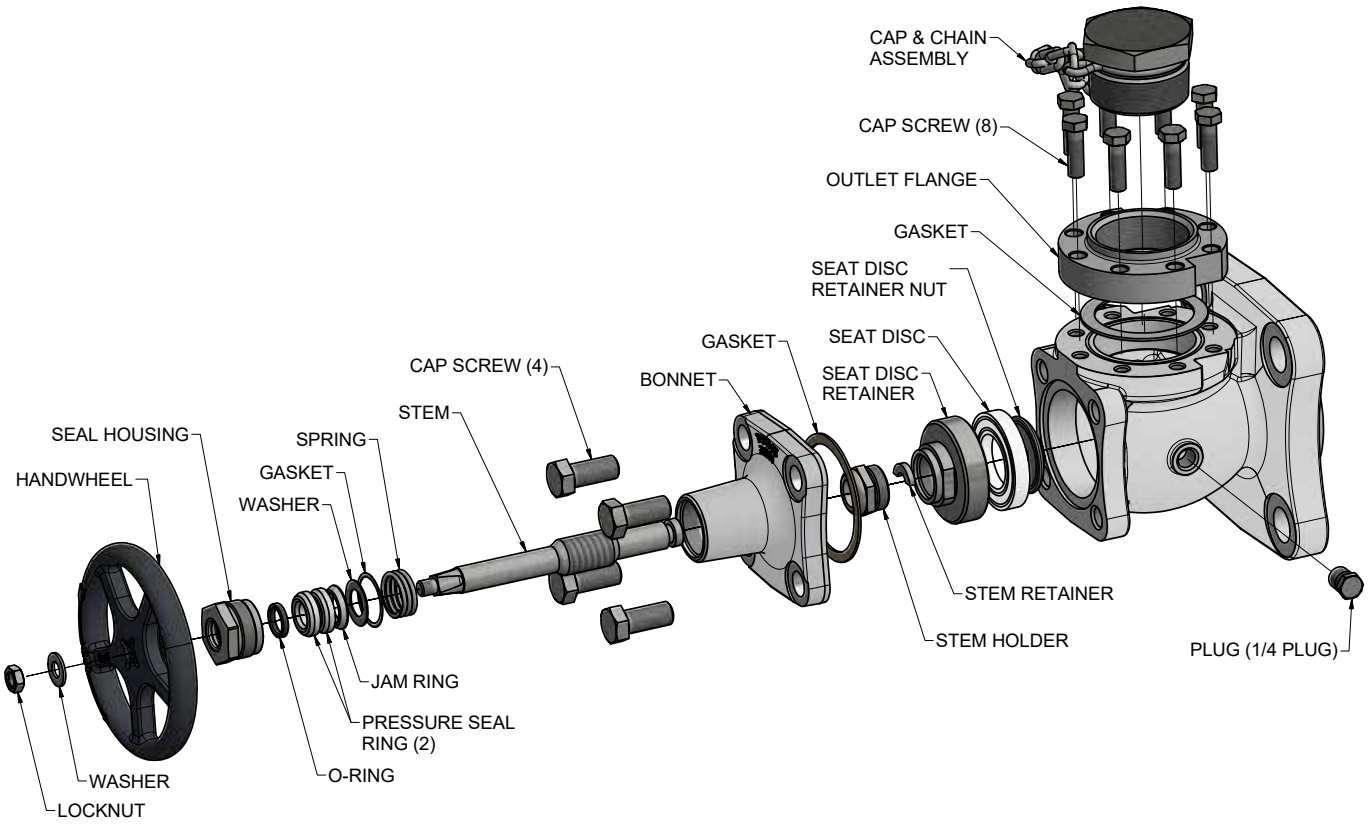
Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

Printed in USA REV T 16-0923-0281
Instruction Sheet TA7894-300

100 RegO Dr. Elon, NC 27244 USA www.regoproducts.com

Tank Car Angle Valves for Railroad Tank Cars TA7894P

AAR Approval # E232122



See quick reference tables on page 44 for rebuild kit.

3” Excess Flow Check Valves for Railroad Tank Cars A7839A

Application

AAR Approval # E232121

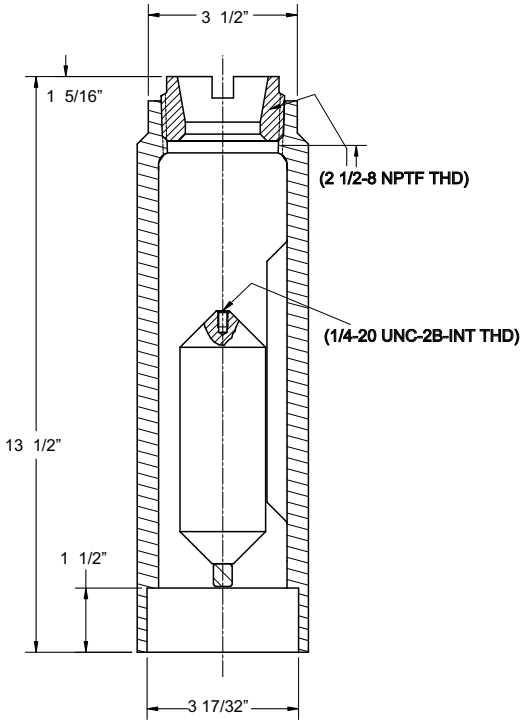
Designed for top mounting in manway cover. May be used for flow in either direction. The exceptionally low pressure drop makes this valve ideal for applications where a rapid transfer of product is desired.

Features

- Generous flow channels provide low pressure drop.
- Low pressure drop results in faster loading and unloading time, especially when used with the RegO angle valve.
- Threaded ¼” opening in check allows insertion of a standard bolt for easier removal and inspection.

Materials

Body . . . . . Carbon Steel
Seat . . . . . 12L14 Steel
Check . . . . . 12L14 Steel



REGO 10 YEAR WARRANTY

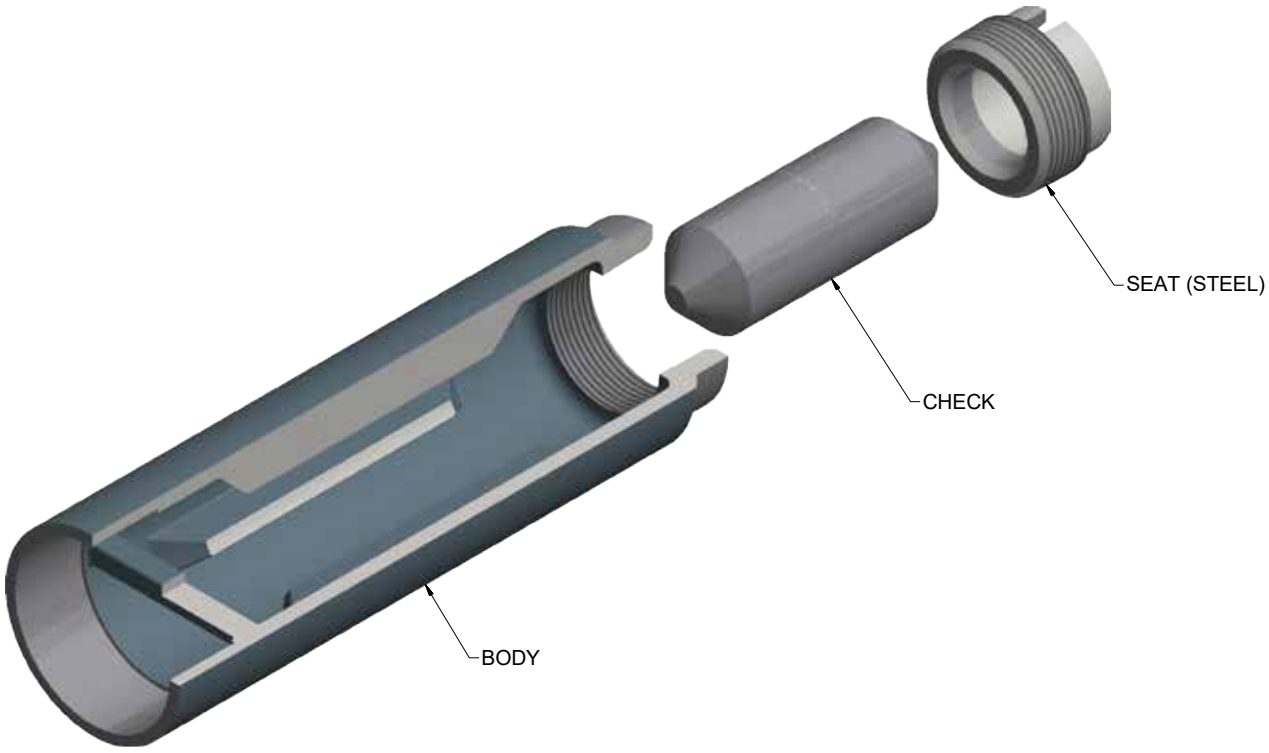
Ordering Information

Part Number	Connection	Closing Flow GPM Water	Closing Flow GPM Propane	Closing Flow GPM NH_3
A7839A	3” Welded Pipe	250	350	320

100 RegO Dr. Elon, NC 27244 USA www.regoproducts.com

3” Excess Flow Check Valves for Railroad Tank Cars A7839A

AAR Approval # E232121



2” Excess Flow Check Valves for Railroad Tank Cars A7837A

Application

AAR Approval # E232119

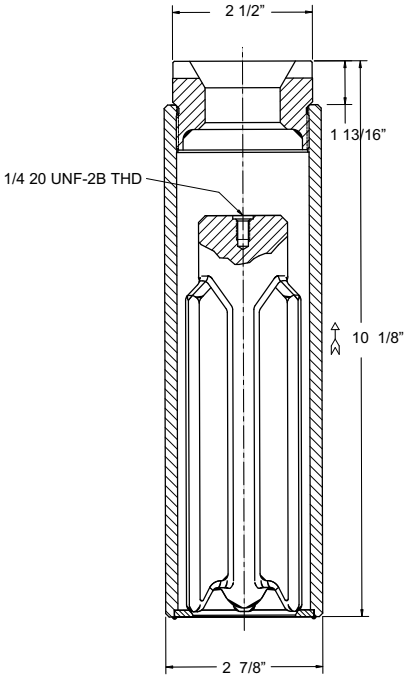
Designed for top mounting in manway cover. May be used for flow in either direction. The exceptionally low pressure drop makes this valve ideal for applications where a rapid transfer of product is desired.

Features

- Generous flow channels provide low pressure drop.
- Low pressure drop results in faster loading and unloading time, especially when used with the RegO angle valve.
- Threaded ¼” opening in check allows insertion of a standard bolt for easier removal and inspection.
- Stainless steel check provides consistent closing and resists corrosion and fracture.

Materials

Body . . . . . Carbon Steel
Seat . . . . . 12L14 Steel
Check . . . . . 316 Stainless Steel
Retainer . . . . . 12L14 Steel



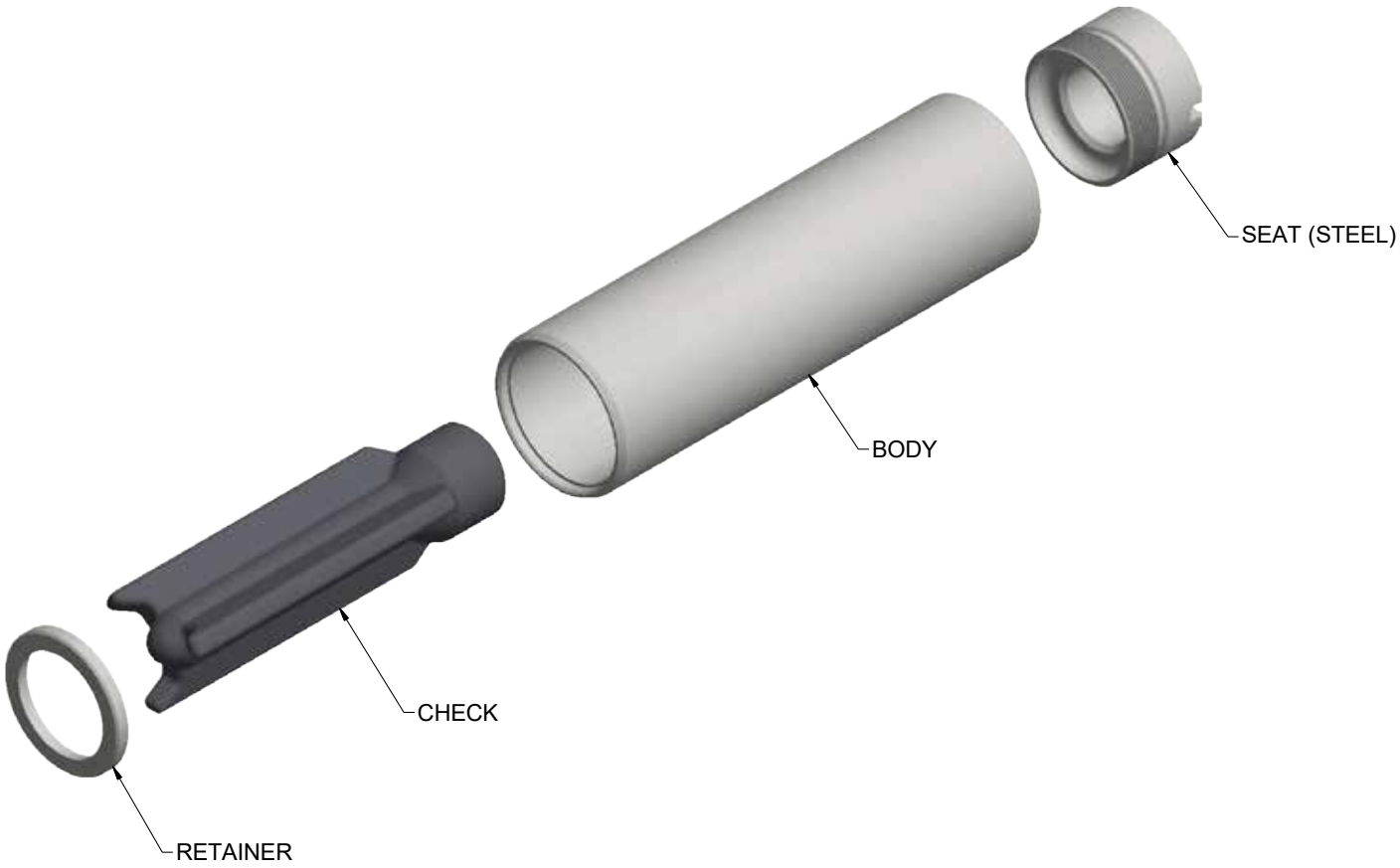
REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Connection	Closing Flow GPM Water	Closing Flow GPM Propane	Closing Flow GPM NH_3
A7837A	2” Welded Pipe	130	180	162
A7837J	J - Deflector			
A7837L	45° - Deflector			

2” Excess Flow Check Valves for Railroad Tank Cars A7837A

AAR Approval # E232119



¾” Excess Flow Valves for Railroad Tank Cars A7835 Series

Application

AAR Approval # E232120

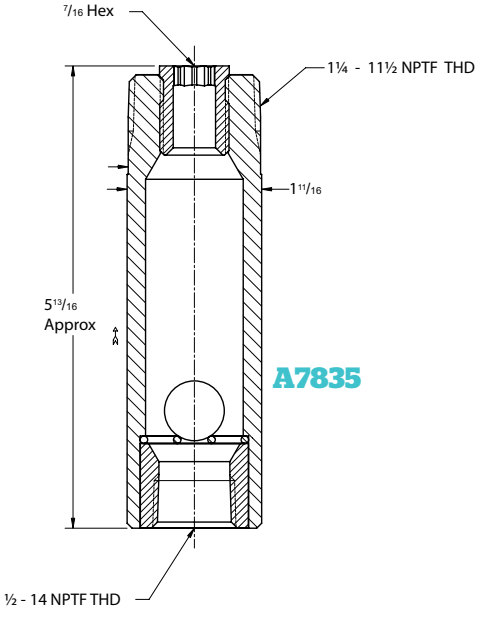
Designed for top mounting in manway opening under a sample valve. This valve can provide excess flow protection in the event of sample valve failure or shear off due to accident

Features

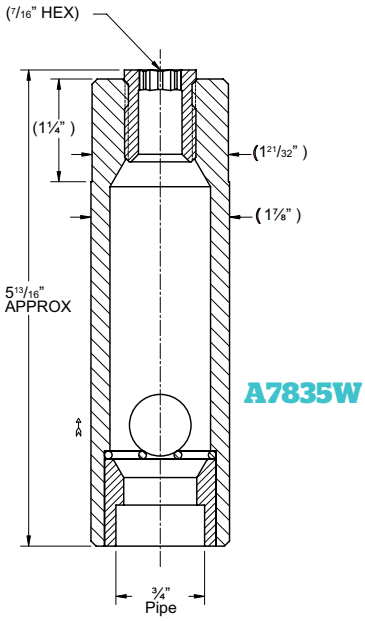
- All stainless steel design for long service life.
- Special magnetized ball can be easily removed through the valve outlet for inspection and cleaning.

Materials

Body	303 Stainless Steel
Ball	400 Stainless Steel
Seat	303 Stainless Steel
Seat Retainer	302 Stainless Steel
Inlet Adapter	303 Stainless Steel



A7835



A7835W

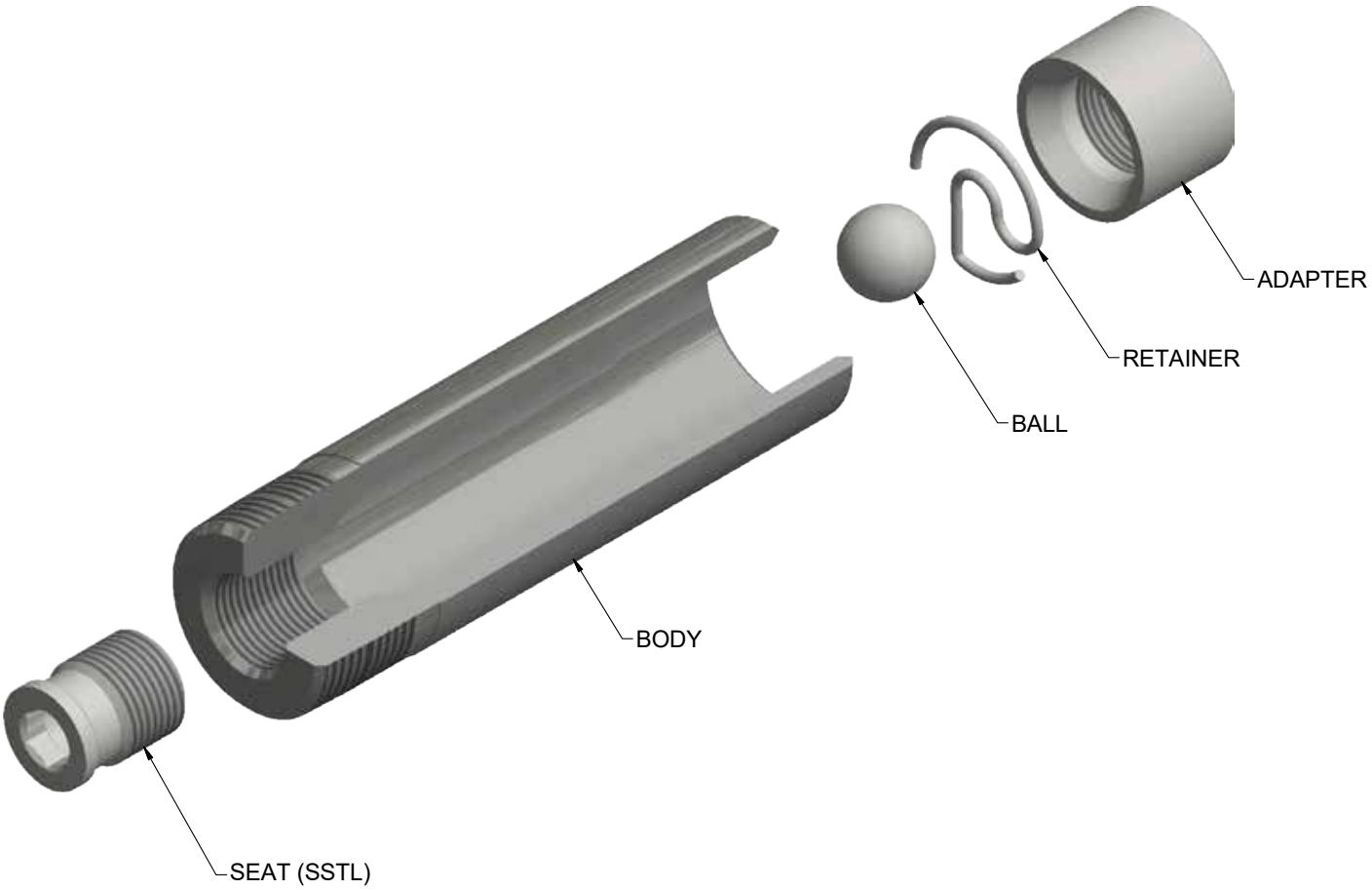
REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Inlet Connection	Outlet Connection (F.NPT)	Closing Flow Water	Closing Flow Propane	Closing Flow NH3
A7835	¾” NPFT THD	1¼” NPTF THD	18 GPM	25 GPM	23 GPM
A7835W	Socket Weld	Weld			

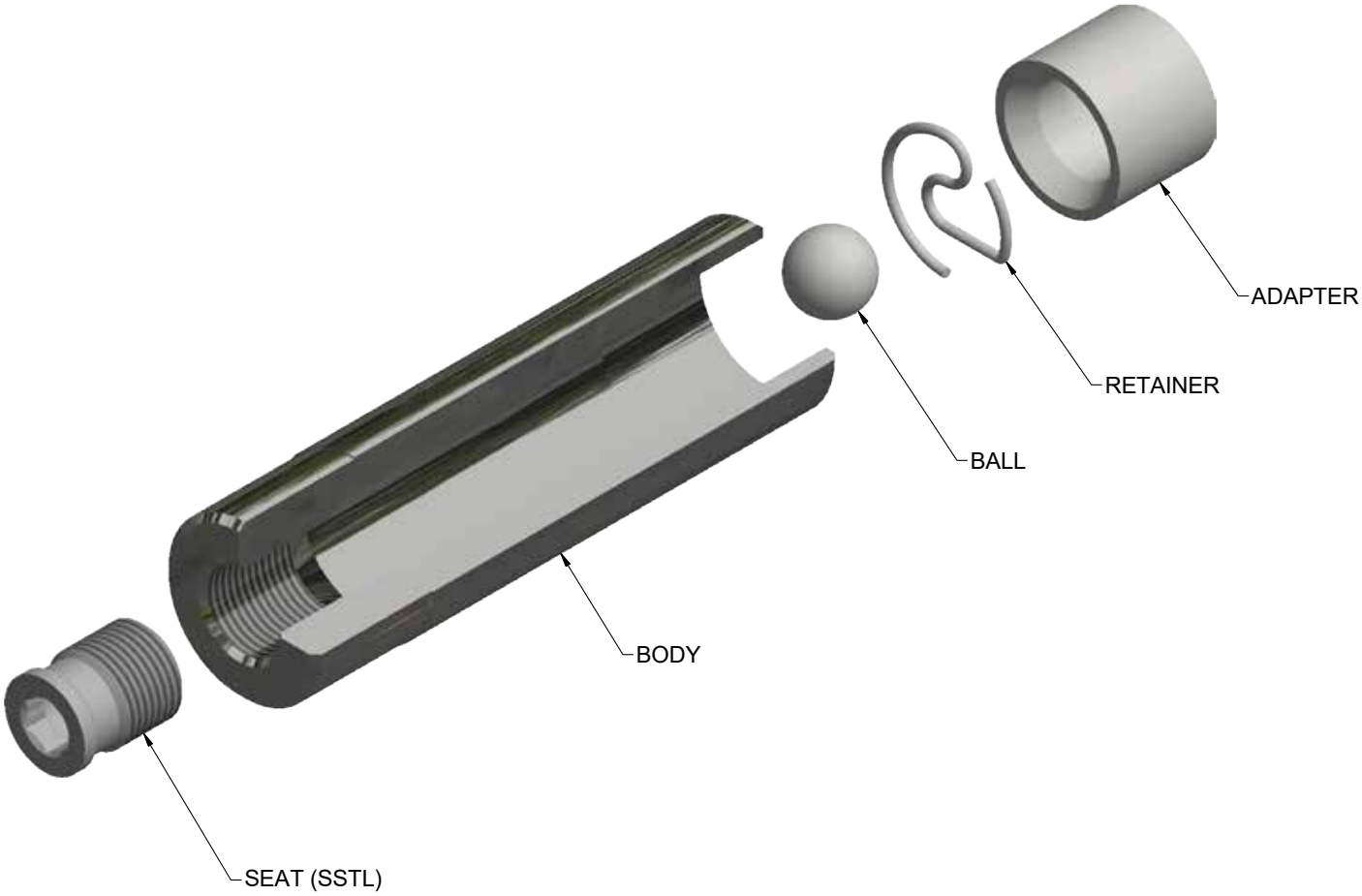
¾” Excess Flow Valves for Railroad Tank Cars A7835 Series

AAR Approval # E232120



¾” Excess Flow Valves for Railroad Tank Cars A7835 Series

AAR Approval # E232120



Thermowells For Railroad Tank Cars A7833 Series

Application

AAR Approval # E232118

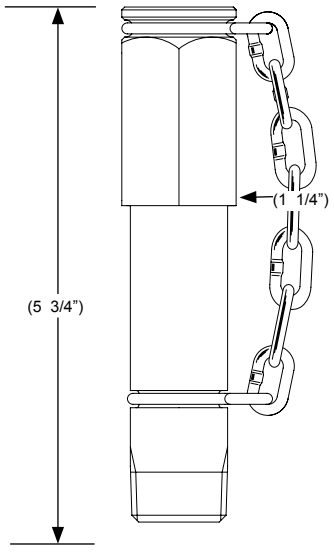
Designed for top mounting in manway cover.

Features

- Chain swivels at the cap and body to prevent twisting and binding.
- Special machined groove on the outlet threads improves safety by venting any product before the cap is entirely removed.
- Wire seal security hole is provided on the cap.

Materials

Body . . . . . 12L14 Steel
Cap . . . . . 12L14 Steel



REGO 10 YEAR WARRANTY

Ordering Information

Part Number	O-ring	End connector	Replacement O-rings
A7833A	Buna-N	¾" NPT	A7515-25
VA7833A	Viton		A7833-25V
EA7833A	EPDM		A7833-25E
GA7833A	GFLT-S Viton		A7833-25G
GFA7833A	GF-S Viton		A7833-25GF
VB7833A	Viton "B"		A7833-25VB

Sample Valve TA7806AP

Application

AAR Approval # E222100

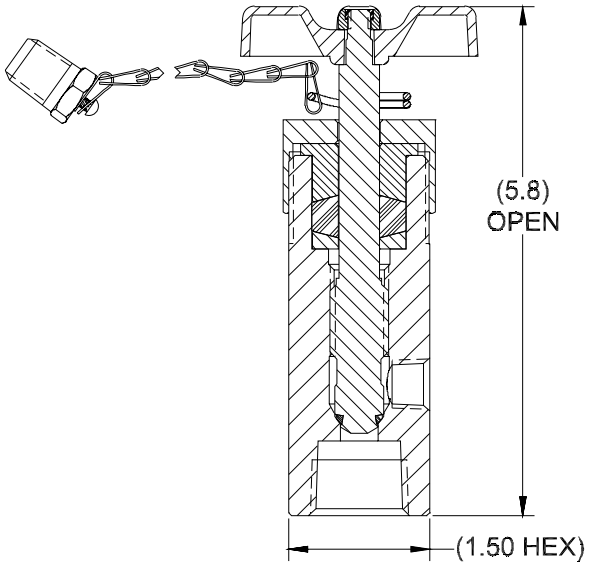
Sample Valve for LPG Railcars

Features

- Ergonomic Handwheel
- All Stainless Steel
- Teflon Seals

Materials

Body ..... 304 Stainless Steel
Stem ..... 303 Stainless Steel
Packing.....Virgin Grade Teflon
Seat .....Virgin Grade Teflon
Handwheel..... Aluminum



REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Connection	Outlet
TA7806AP	¾" NPT	¼" NPT

WARNING: Installation, disassembly, repair and maintenance must be performed only by qualified personnel.

All gas MUST be evacuated from the system before starting repairs.

Installation, usage and maintenance of this product must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA #54, NFPA #58, DOT, ANSI, all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

ECI EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY – UNDER ANY THEORY, WHETHER CONTRACT, WARRANTY, TORT OR OTHERWISE – RELATING IN ANY MANNER TO ANY RAIL TANK CAR EQUIPMENT REPAIRED USING ANY PRODUCTS NOT MANUFACTURED BY ECI.

USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

Disassembly and Rebuild Procedure

CAUTION: READ THROUGH ALL OF THESE INSTRUCTIONS, INCLUDING THE NOTICE AND WARNINGS ON THE BACK OF THIS SHEET BEFORE BEGINNING ANY DISASSEMBLY OR REPAIR.

TA7806-50 Kit for TA7806AP Needle Valve

NOTE: Repairs must be performed in a clean area. Hands, clothing, tools, and work area must be completely free of oil, grease, and foreign matter to prevent contamination of component parts and valves.

A. Disassembly

CAUTION: EVACUATE ALL GAS FROM THE SYSTEM BEFORE ANY DISASSEMBLY OR REPAIR.

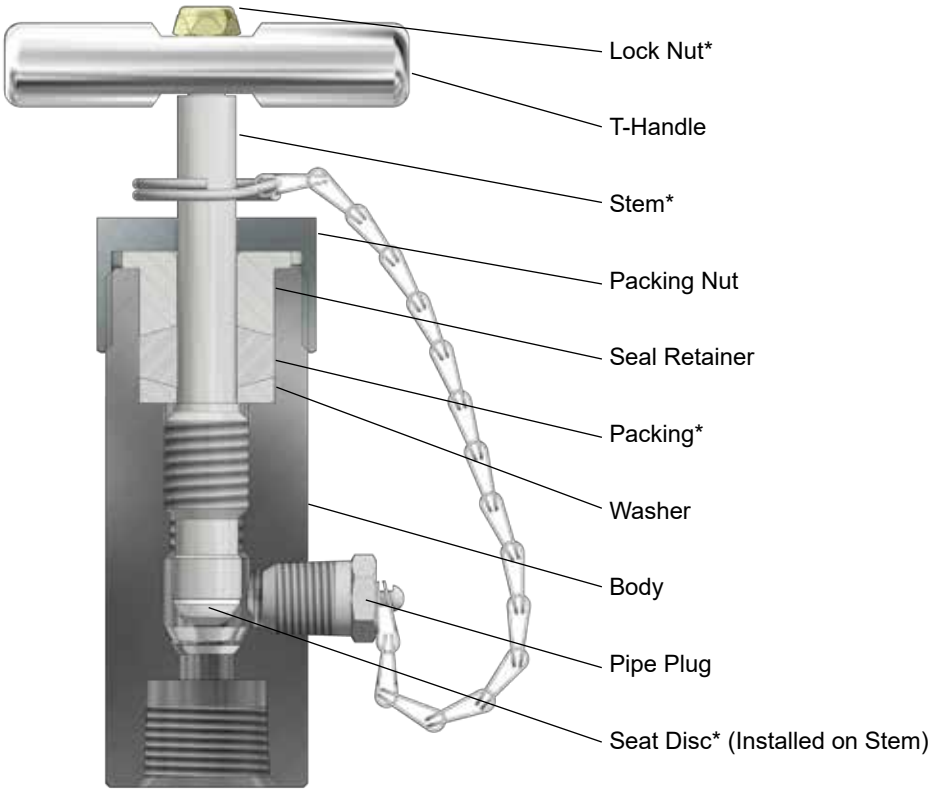
1. Remove and discard lock nut using a 7/16” suitable wrench or socket.
2. Remove “T” Handle and set aside.
3. Remove pipe plug assembly from body and stem with a 5/8” suitable wrench, set aside.
4. Remove packing nut with a 1-5/8” suitable wrench and set aside.
5. Remove seal retainer and set aside.

CAUTION: Do not mar or scatch internal cavity of body.

6. Turn stem counterclockwise until it can be pulled out from the top of the body with packing and washer still on stem.
7. Remove and discard packing from stem.
8. Remove washer from stem and set aside.
9. Discard stem.

B. Reassembly

1. Apply Shell Gadus S2 V220 1 Grease to stem threads and seat disc.
2. Insert new stem into body, carefully protecting the seat from



REGO 10 YEAR WARRANTY

* These items form the rebuild kit for TA7806AP.

body threads. Screw stem in clockwise until seat disc is seated against body seat.

3. Install new washer and slide over stem into body.
4. Install new packing, sliding over stem and pressing fully into body against washer.
5. Install seal retainer over stem into body.
6. Install packing nut over stem and thread into body. Tighten to 110-130 in-lbs (9-10 ft-lbs) using 1-5/8" wrench.
7. Retrieve pipe plug and chain assembly and apply Teflon tape to the pipe plug threads. Slide split ring over stem and install plug into body handtight.
8. Install T-handle onto stem.
9. Install lock nut using a 7/16" suitable wrench or socket until tight.

Bench Test

1. Assemble valve to test fixture with the outlet unplugged.
2. Close valve stem.
3. Apply 500 psi air pressure to the inlet of the valve.
4. Submerge valve into water.
5. Test for seat leakage.
6. Remove valve from water.
7. Install pipe plug into outlet and handtighten, then apply 2 to 3 turns using a 5/8" wrench.
8. Submerge valve into water.
9. Open the valve using the "T" handle (Do Not Backseat) with 500 psi maintained and check for leakage at the outlet pipe plug joint, packing nut joint or stem seal housing joint.
   a. If leakage is noted at the packing nut joint or stem seal joint the packing nut may be re-torqued. (Reference Step 6 of Reassembly Instructions). Repeat bench test step 8
   b. If leakage is noted at the pipe plug joint repeat bench test steps 6 & 7. Repeat bench test step 8.
10. Operate valve from closed to open range without back seating valve and check for leaks.
11. If no leaks are found release test pressure and remove from test fixture.

CAUTION: Wrenches must never be used to operate valves equipped with handwheels or "T" handles designed for hand operation.

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such causes be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO® for technical advice base upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

The benefits given by the Limited Warranty above are in addition to any other rights and remedies to which you may be entitled by law.

NOTE TO AUSTRALIAN PURCHASERS: The following applies if you purchased this product as a "consumer" as defined in the Australian Consumer Law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Information regarding how to return a product and make a claim under this Limited Warranty is set forth below.

Nothing in this document purports to modify or exclude your rights if any under the Australian Consumer Law, or other laws which cannot be lawfully be modified or excluded.

WARNING

All RegO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and in industrial safety procedures.

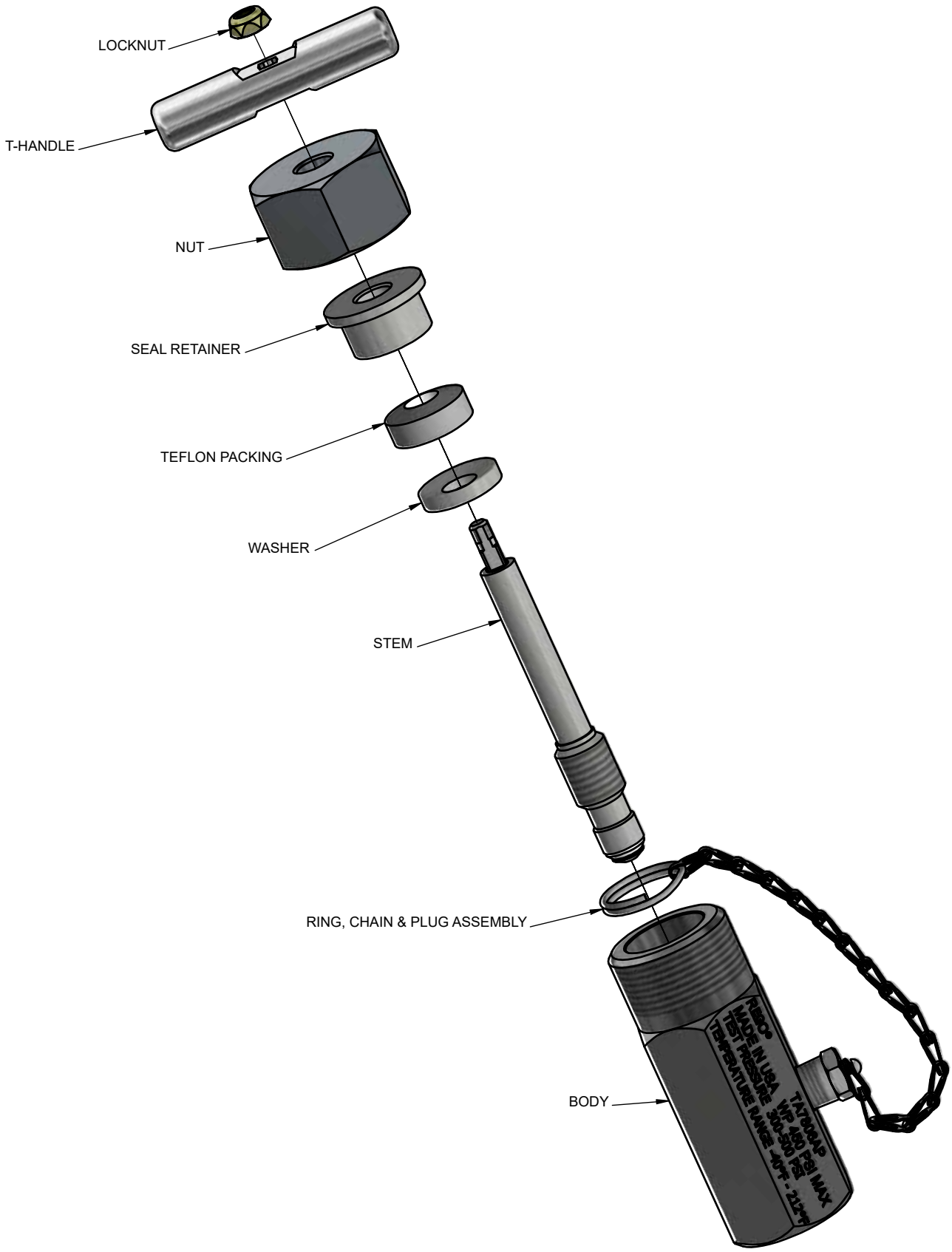
NOTICE TO USERS OF PRODUCTS

The Limited Warranty stated above is a factory warranty to the first purchasers of RegO® products. Since most users have purchased these products from RegO® distributors, to make a claim under this Limited Warranty the user must within thirty (30) days after the user's discovery of what user believes is a defect, notify in writing and return the product (at the user's expense) to the distributor from whom he purchased the product/part. The distributor may or may not at the distributor's option choose to submit the product/parts to RegO®, pursuant to this Limited Warranty. Failure by buyer to give such written notice and return the product within thirty (30) days shall be deemed an absolute and unconditional waiver of buyer's claim for such defects. Acceptance of any alleged defective product/parts by RegO®'s distributor for replacement or repairs under the terms of RegO®'s Limited Warranty in no way determines RegO®'s obligations under this Limited Warranty.

Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

Printed in U.S.A. REV A 01-0721-0721
Instruction Sheet TA7806-300

Sample Valve TA7806AP



Next Generation Relief Valve A8434F Series

Application

AAR Approval # PRD-172103

Designed for use on next generation tank cars.

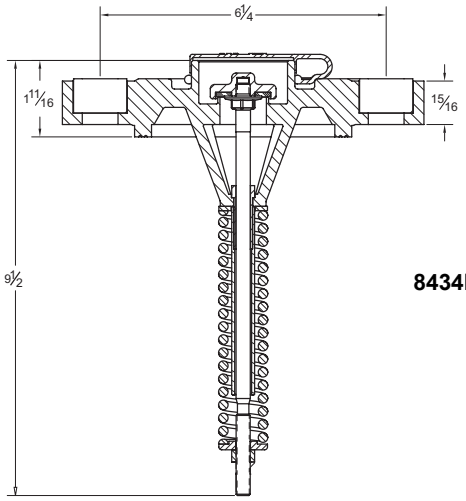
Features

- Low profile design assures maximum protection against shearing.
- Longer spring size designed to minimize stress cracking.
- Simple to service and rebuild

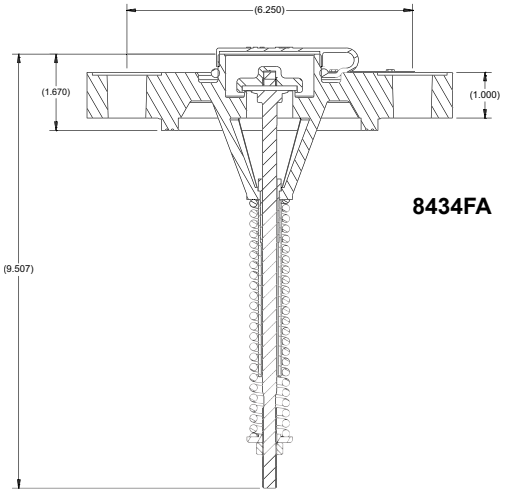
Materials

Body	Stainless Steel
Spring	Stainless Steel
Stem	Stainless Steel
Stem Bushing	17 - 4PH Stainless Steel

8434F



8434F



8434FA

REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Seat Material	Set Pressure (PSIG)	Flow Data (SCF/M Air)	Protective Cap	Rebuild Kit
A8434F075 - A8434FA075	Buna-N	75	800	7585-40X	A8434F-50
A8434F165 - A8434FA165		165	2238		
A8434F280 - A8434FA280		280.5	3459		
NA8434F075	Neoprene	75	800		
NA8434F165		165	2238		
NA8434F280		280.5	3459		
VA8434F075	Viton "B"	75	800		VA8434F-50
VA8434F165		165	2238		
VA8434F280		280.5	3459		

WARNING: Installation, disassembly, repair and maintenance MUST be performed only by qualified personnel. All gas MUST be evacuated from the system before starting repairs.

Installation, usage and maintenance of this product must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA #54, NFPA #58, DOT, ANSI, all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

ECI EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY – UNDER ANY THEORY, WHETHER CONTRACT, WARRANTY, TORT OR OTHERWISE – RELATING IN ANY MANNER TO ANY RAIL TANK CAR EQUIPMENT REPAIRED USING ANY PRODUCTS NOT MANUFACTURED BY ECI.

USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

A8434F-50 (Nitrile) and VA8434F-50 (Viton) Rebuild Kits for A8434F and A8434FA Series Flange Mount Internal Relief Valves

Disassembly and Rebuild Procedure

CAUTION: READ THROUGH ALL OF THESE INSTRUCTIONS, INCLUDING THE NOTICE AND WARNINGS ON THE BACK OF THIS SHEET, BEFORE BEGINNING ANY DISASSEMBLY OR REPAIR.

NOTE: Repairs must be performed in a clean area. Hands, clothing, tools and work area must be completely free of oil, grease and foreign matter to prevent contamination of component parts and valves.

Disassembly

1. Evacuate contents of tank prior to disassembly.
2. Remove valve from railcar and place on a stable surface.
3. Using a 1/2” wrench, turn the adjusting hex nut clockwise to compress the spring.
4. Continue to turn the hex nut until there is enough room between the nuts to allow the stem to be cut.
5. Cut the stem between the two nuts and discard the cut end.
6. Place the valve in a press. Compress against the spring retainer to compress the spring.
7. Remove the hex nut from the stem and discard.
8. Slowly remove pressure from the spring retainer and spring and remove valve from the press.
9. Remove the spring, spring retainer and washer (if present) and retain.
10. Slowly remove the poppet and stem assembly from the body and discard.

CAUTION: Make sure not to damage the seat area in the body when removing the poppet.

Inspection

Inspect all retained parts for signs of wear and deterioration. Pay special attention to the surface finish of the valve seat as well as the condition of the spring. Replace parts as necessary**.

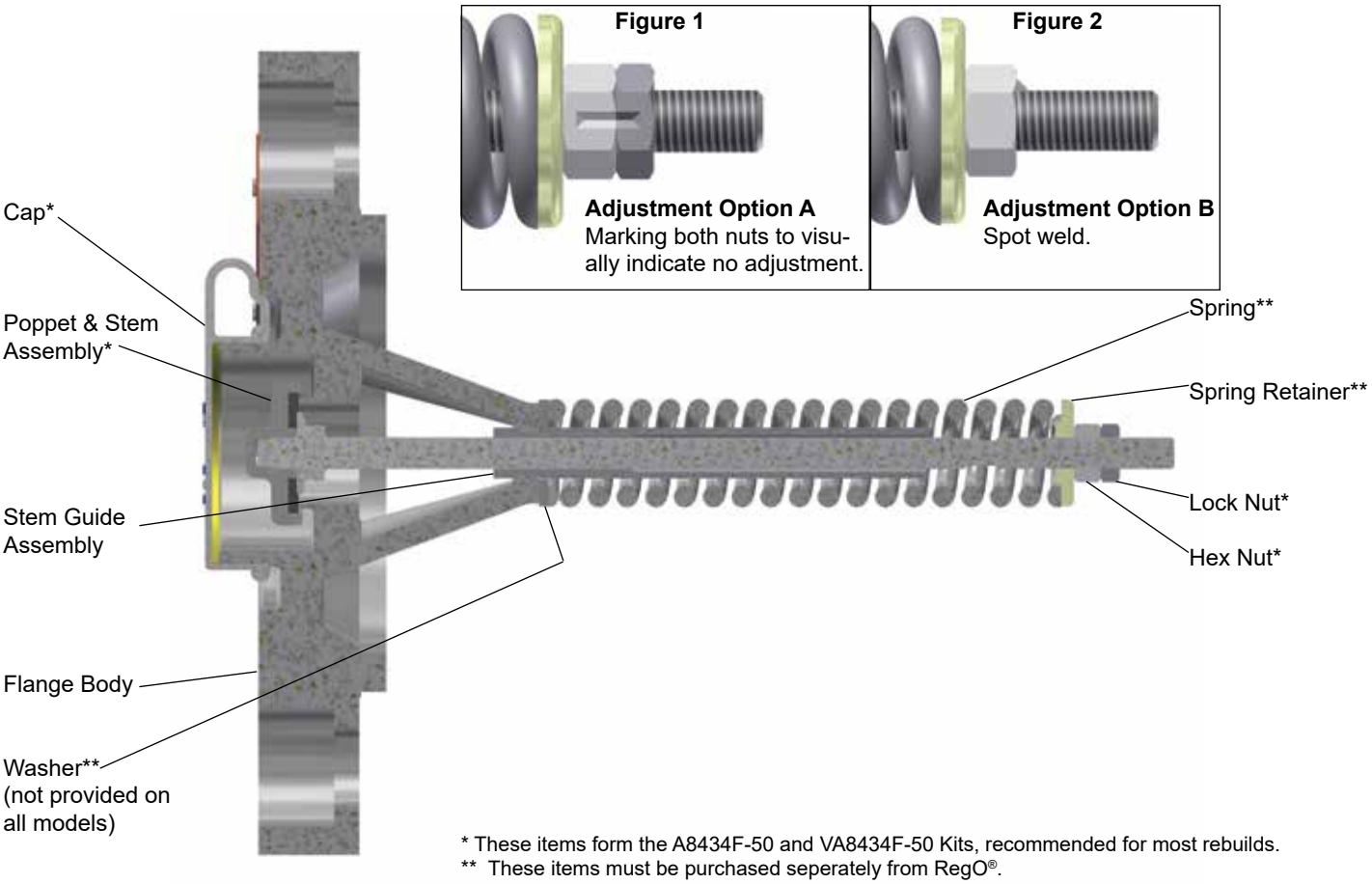
Reassembly

1. Paying special attention not to contact the seat, slowly install the new stem assembly through the body seat and stem guide until the poppet seal contacts the seat.
2. Reinstall the washer (if present), spring and spring retainer.
3 Install valve in a press (recommended) and compress the spring retainer to compress the spring to a height of 4.75”.
4. Using only the hex nut, engage until nut contacts spring retainer.
5. Remove the valve from the press.

Testing

1. Allow valve to sit at least 24 hrs after assembly to allow for proper seat compression.
2. Attach valve to test fixture.
3. Fill outlet with water and observe pressure gauge as pressure is raised. After pressure is raised to within 25 psi of the set pressure marked on the valve, begin to increase pressure at a rate no greater than 2 psi per second until the first bubbles through the water seal are observed. If bubbles do not appear at proper start-to-discharge pressure, tighten or loosen the hex nut until bubbles indicate proper setting.
4. After correct start-to-discharge pressure is reached, shut off inlet pressure. Observe at what pressure valve seals off. Valve must reseal by 80% of start-to-discharge setting.
5. Exhaust air pressure and remove valve from fixture.
6. Affix hex nut in place using one of the following methods:
   a. Install lock nut and torque to 65-70 in-lbs, then mark both nuts to ensure no adjustment upon inspection. See Figure 1.
   b. Spot weld hex nut to stem per approved WPS. No lock nut shall be used with this method. See Figure 2.
7. Reinstall the rain cap.

REGO 10 YEAR WARRANTY



* These items form the A8434F-50 and VA8434F-50 Kits, recommended for most rebuilds.
** These items must be purchased seperately from RegO®.

NOTICE

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LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

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LIMITATION OF LIABILITY

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NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

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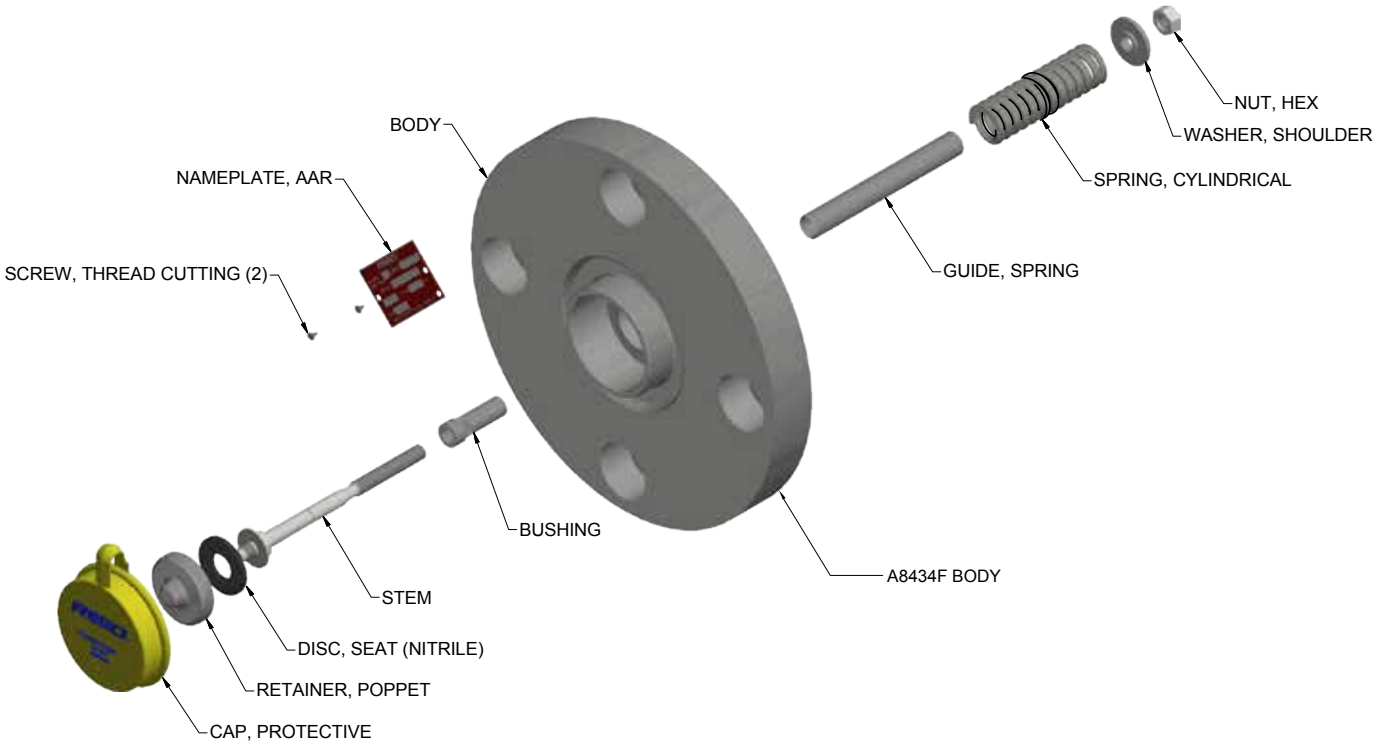
Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

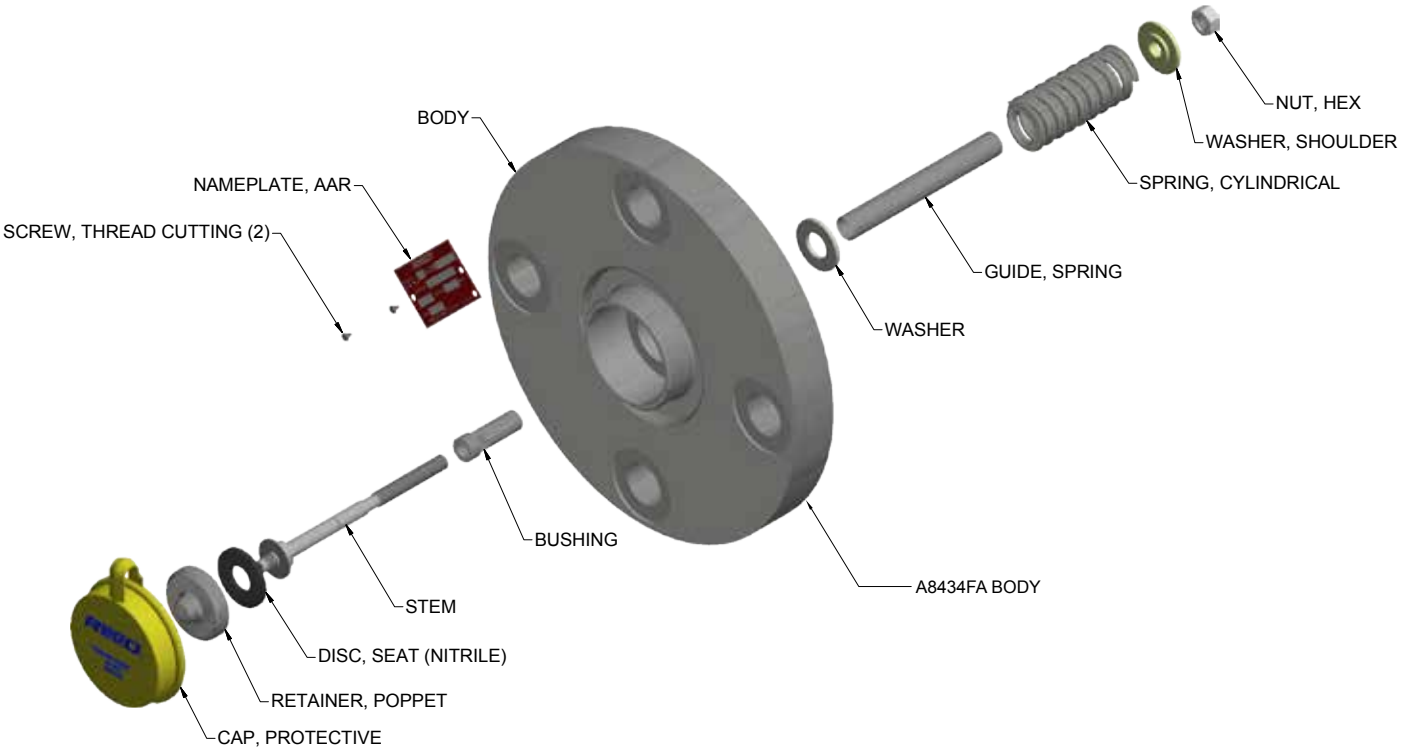
Printed in USA REV E 05-0919-0712
Instruction Sheet A8434F-301

AAR Approval # PRD-172103



See quick reference tables on page 44 for rebuild kit.

AAR Approval # PRD-172103



See quick reference tables on page 44 for rebuild kit.

Next Generation Tank Car Angle Valves for Railroad Tank Cars A7814

Application

Designed especially for transfer of LP-Gas and anhydrous ammonia in pressure car service.

The combined heavyweight ductile iron castings and precision machining provide ruggedness and superior performance in working pressures up to 400 PSIG.

Features

- "V"-ring spring-loaded pressure seal design provides dependable, leak-free operation. No packing to retighten or replace.
- Wiper o-ring eliminates entrance of dirt and grit into stem area that can prohibit smooth operation.
- Heavy duty ACME stem threads give quick action and are hardened for long service life.
- Swivel seat reduces scoring of seat disc and provides positive shut-off.
- Full diameter seat provides greater flow capacity and low pressure drop.
- Plugged ¼" NPT boss on downstream side of valve accommodates vent valve or hydrostatic relief valve.
- Equipped with a malleable iron plug and chain installed in the valve outlet.

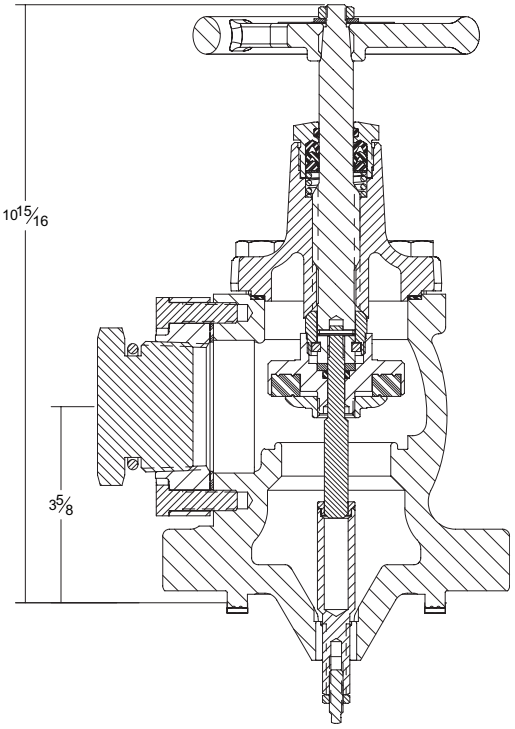
Materials

Body . . . . . Ductile Iron
"V"-Rings . . . . . Teflon
O-Ring . . . . . Synthetic Rubber
Stem . . . . . Stainless Steel
Bonnet . . . . . Ductile Iron
Seat Disc . . . . . Teflon
Handwheel . . . . . Cadmium Plated Ductile Iron

REGO 10 YEAR WARRANTY

TA7814 Series (A7814 + A3214)
AAR Approval # E232125

TA7814



Ordering Information

Part Number	Inlet Connection	Outlet Connection (F.NPT)	Flow At 1 PSIG (Cv) Pressure Drop	Accessories		Rebuild Kit
				Hydrostatic Relief Valve	Vent Valve	
A7814	Tank Car Flange	2"	112	SS8001U	TSS3169	TA7814-50
EA7814						EA7814-50

* To obtain approximate flow at other than 1 PSIG pressure drop, multiply flow in table by square root of pressure drop. Example: TA7894P @ 9 PSIG = 112 x $\sqrt{9}$ = 336 GPM/propane. For NH_3 flow, multiply propane flow by .90.

WARNING: **Installation, disassembly, repair and maintenance MUST be performed only by qualified personnel. All gas MUST be evacuated from the system before starting repairs.**

Installation, usage and maintenance of this product must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA #54, NFPA #58, DOT, ANSI, all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

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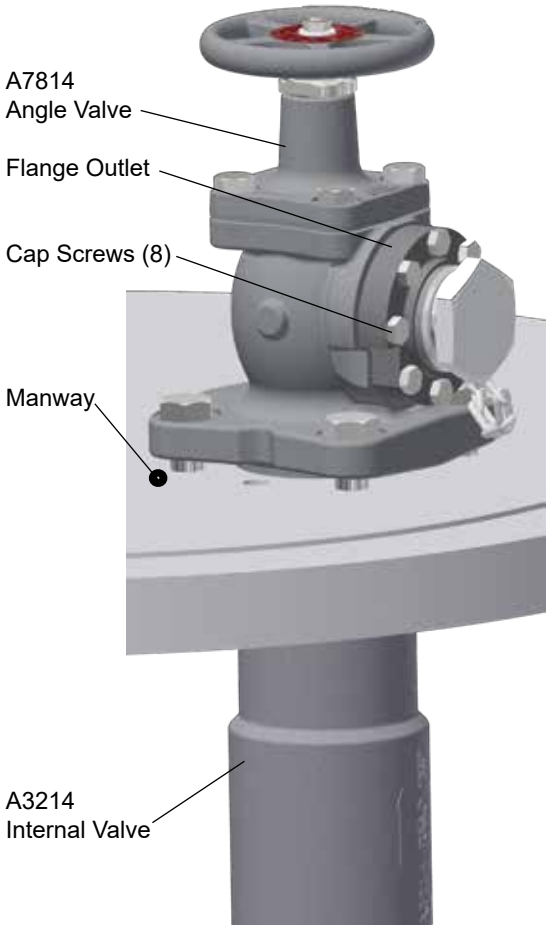
USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

TA7814-50 Rebuild Kit for TA7814 Tank Car Valves with A7814 Angle Valve and A3214 Internal Valve

TA7814 Tank Car Valve
Figure 1



Disassembly and Rebuild Procedure

CAUTION: READ THROUGH ALL OF THESE INSTRUCTIONS, INCLUDING THE NOTICE AND WARNINGS ON THE BACK OF THIS SHEET, BEFORE BEGINNING ANY DISASSEMBLY OR REPAIR.

NOTE: Repairs must be performed in a clean area. Hands, clothing, tools and work area must be completely free of oil, grease and foreign matter to prevent contamination of component parts and valves.

A. Angle Valve Disassembly - See Figures 1,2 & 3

1. **EVACUATE ALL GAS FROM THE SYSTEM BEFORE ANY DISASSEMBLY OR REPAIR. Turn handwheel counterclockwise as far as it will go to release any gas remaining in the container.**
   CAUTION: Do not apply force after valve is fully open.
2. Using a 13/16" wrench, remove the four cap screws from the bonnet by turning counterclockwise. Remove the bonnet assembly from the valve body by carefully pulling upward using the handwheel. Carefully place the bonnet assembly on its side to prevent any damage to the drive stem. See Figure 2.
3. Remove the body gasket and discard.

Seat Disc Replacement:

4. Clamp the square section of the bonnet in a vise.
5. Using 1-1/8" wrench on the stem holder (left hand threads) and a 1-5/16" wrench on seat disc retainer (left hand threads) turn clockwise (left hand threads) (as shown in Figure 3) to loosen the stem holder from the seat disc retainer.
6. Remove and retain the two stem retainers (crescent shaped) once the stem holder and seat disc retainer are separated.
7. Carefully support the main stem while using a punch to remove the 3/32" stainless steel spring pin from the drive stem (See Figure 3). Discard the pin after removal.
8. Use a 3/8" wrench on the hex portion of the drive stem, turn clockwise (left hand threads) to separate the drive stem from the main stem. Retain the drive stem for reassembly. Clean the old Loctite from all threads.

NOTE: It is helpful to hold the handwheel to aid in the removal of the drive stem.

9. Remove and discard the old thrust washer and old o-ring.
10. While holding the wrench flat section of the seat disc retainer with a 1-5/16" wrench, use another wrench to remove the seat disc retainer nut.
11. Remove and discard the seat disc. Install a new one by pressing it into the recess of the seat disc retainer as shown in Figure 3.
12. Apply Loctite 271® thread locking compound to the first three threads of the seat disc retainer.

CAUTION: Do not allow Loctite to contact the seat disc.

13. Thread on the seat disc retaining nut and tighten with a wrench to 240-270 in-lbs (20-22.5 ft-lbs) torque. Stake the nut in two places at the retainer threads (See Figure 3) to prevent loosening.

Packing Replacement:

14. Remove the handwheel locknut by turning counterclockwise with a small wrench to allow removal of the washer, information disc and handwheel. Retain all parts.
15. Using a 1-3/8" wrench with a handle of sufficient length to develop a minimum of 1000 in-lbs (83 ft-lbs) torque, turn the seal housing counterclockwise and carefully remove from the bonnet and stem.

CAUTION: Do not mar finish of stem.

16. Remove and discard (2) pressure seal rings, jam ring and wiper o-ring from seal housing and set seal housing aside.
17. Using a suitable wrench on the square section of the stem, unscrew stem down and out through the bottom of bonnet by turning clockwise (as viewed from top).

CAUTION: Stem inspection required.

18. Inspect the stem closely for definite signs of wear, nicks or scratches, in the Stem Sealing Area, see figure 2. If any mechanical cleaning is needed, use emery cloth or paper (500-1000 grit) and polish stem sealing area using

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a circular motion.

CAUTION: Raised or sharp edges on the stem can damage and expand the packing seals when pressing onto the stem.

19. Continue to inspect the handwheel resting location where the stem changes from square to round, *see figure 2 Handwheel Resting Location*. Remove any raised edges or burrs using a fine file and emery cloth that are higher than the stem diameter. Using an old seal, press seal on and off this area to determine if any resistance is felt. Resistance may require additional clean up. If stem is found to be in good condition, continue section B-1 of the rebuild instructions.

NOTE: If any permanent damage is found discard the stem, drive stem, driver weldment and seal housing. Use TA7814-51 Stem Kit and follow the alternate steps outlined in secton B-2 Titled Angle Valve Reassembly Instructions with the TA7814-51 Stem Kit.

20. Remove and discard seal housing gasket, washer, and spring from bonnet.

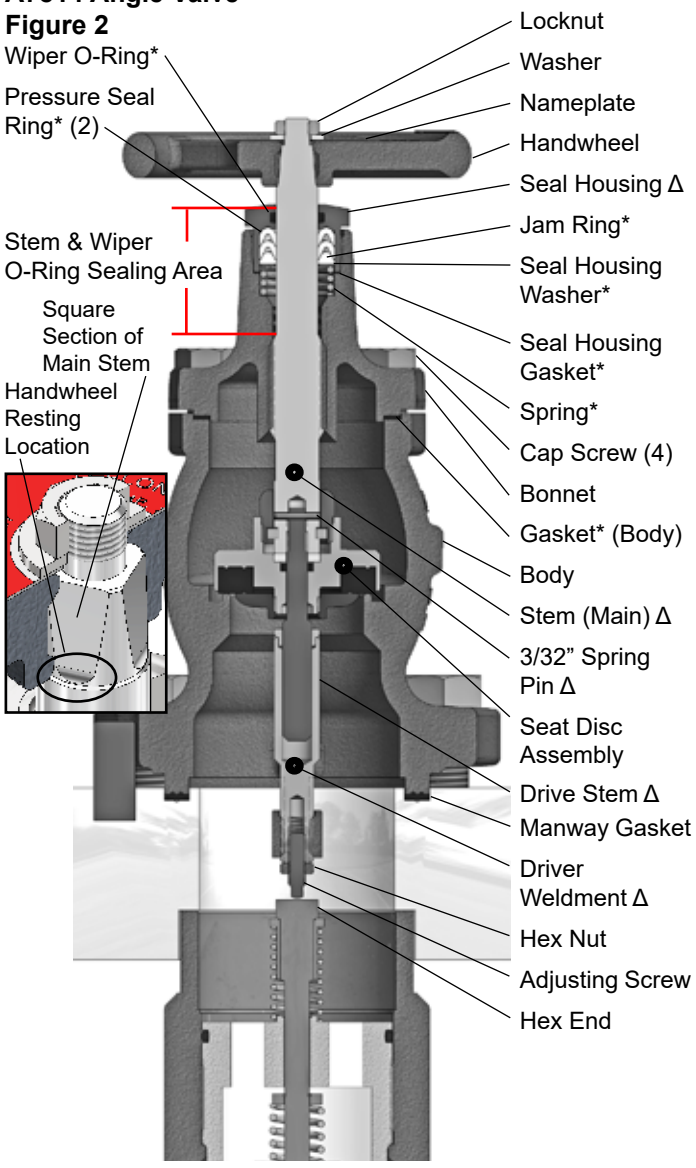
*NOTE: Inspect stem$^{\Delta}$ threads and mating threads in bonnet**. If any threads show definite wear, discard part and install a new one.*

21. Remove adjusting screw and hex nut from the driver weldment and retain.
22. Remove the driver weldment and inspect the threads for wear, chips, etc. Replace as needed.
23. Remove and retain eight cap screws securing the flange outlet using a 9/16" wrench. Remove and discard flange gasket, see figure 1.

B-1. Angle Valve Reassembly - See Figures 1,2 & 3

1. Apply non-detergent grease liberally to the threads of the main stem.

A7814 Angle Valve
Figure 2



2. Screw the main stem clockwise (as viewed from seat disc) into the bottom of the bonnet with great care to avoid damaging the stem finish.
3. Install the new seal housing gasket, new spring, new washer and jam ring over the main stem and into the bonnet.
4. Install the new wiper o-ring in the groove of the seal housing.
5. Apply a thin film of non-detergent grease to the pressure seal rings and carefully insert one at a time into the full depth of the seal housing.
6. Apply 1/8" stripe of Loctite 271® thread locking compound across the threads in three places equally spaced around the seal housing.
7. Place the seal housing carefully over the main stem to avoid damaging the edges of the seal rings and thread into the bonnet clockwise. Tighten to 800±25 in-lbs (67±2 ft-lbs) torque, using a 1-3/8" wrench with a handle of appropriate length.
8. Place the handwheel and information disc on the stem, secure with the washer and locknut and tighten firmly with a 9/16" wrench.

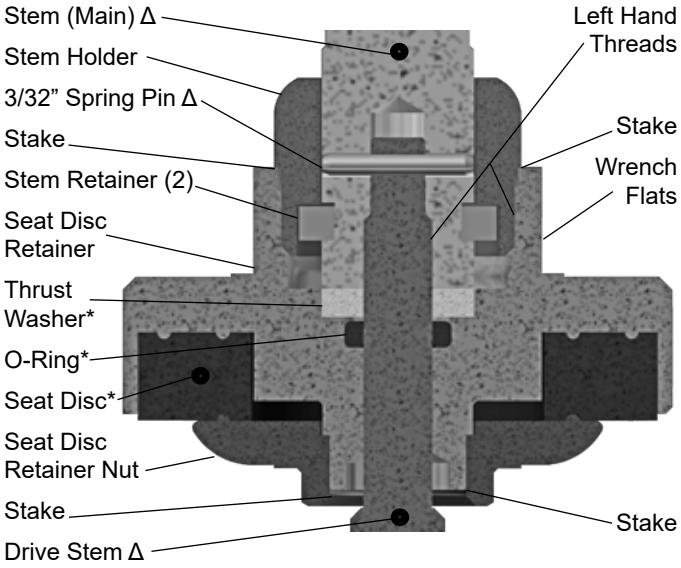
Stem and Seat Disc Retainer Reassembly

9. Apply fluorinated grease to the new o-ring, thrust washer and old drive stem.
10. Install the stem holder on the main stem.
11. Insert the drive stem though the seat disc retainer and carefully install the o-ring and thrust washer over the drive stem and slide them down into the seat disc retainer cavity.

CAUTION: Do not cut the o-ring or thrust washer on the threads of the drive stem. The threads can be "masked" to prevent damage using tape or equivalent.

12. Remove any grease from the drive stem threads.
13. Apply Loctite 271® thread locking compound to the drive stem threads and tighten counterclockwise into the main stem (left hand threads). Align the cross drilled holes in the main stem and drive stem. A small rotation might be necessary to align the holes once the new drive stem is tightened.
14. Install the new 3/32" spring pin flush with the edge of the main stem.
15. Install the two (crescent shaped) stem retainers on the main stem.
16. Apply Loctite 271® thread locking compound to the stem holder external threads and tighten into the seat disc retainer. Using 1-1/8" wrench on the stem holder and 1-5/16" wrench on the seat disc retainer, torque the connection to insure metal to metal contact between the two. Stake as shown in Figure 3 (two places).
17. Apply non-detergent grease to the driver weldment threads, then tighten (left hand threads) clockwise until seated against the "web" in the valve body. Replace the adjusting screw and hex nut on the driver weldment (See Figure 6) for installing new ones. Verify the main stem and seat assembly is back seated in the bonnet assembly.
18. Apply non-detergent grease to each side of the new gasket and

TA7814 Seat Disc Assembly
Figure 3



install the gasket in the body (between the bonnet & body).

CAUTION: Main stem must be in the full open (valve back seated) position to prevent seat disc from being forced against the body seat when the bonnet is assembled to the valve body.

19. Place the bonnet assembly over the body and align the holes for the cap screws. Using handwheel to verify the drive stem and the driver weldment nest properly together. Slight adjustment is allowed to assemble the bonnet to the body.
20. Using a 13/16" wrench, partially tighten one cap screw, then move diagonally across the bonnet to tighten the second cap screw. Continue until all four cap screws are tightened to 540±25 in-lbs (45±2 ft-lbs) torque. See Figure 4A.
21. Turn handwheel clockwise to the closed position.
22. Apply non-detergent grease to each side of the new outlet flange gasket and install. Torque each cap screw 300±25 in-lbs (25±2 ft-lbs) minimum using a crisscross tightening sequence. See Figure 4B.

B-2. Angle Valve Reassembly With TA7814-51 Stem Kit- See Figures 1,2 & 3

1. Discard the stem, drive stem, driver weldment, and seal housing.
2. Apply non-detergent grease liberally to the threads of the new main stem.
3. Screw the new main stem clockwise (as viewed from seat disc) into the bottom of the bonnet with great care to avoid damaging the stem finish.
4. Install the new seal housing gasket, new spring, new seal housing washer and jam ring over the main stem and into the bonnet.
5. Install the new wiper o-ring in the groove of the new seal housing.
6. Apply a thin film of non-detergent grease to the pressure seal rings and carefully insert one at a time into the full depth of the new seal housing.
7. Apply 1/8" stripe of Loctite 271® thread locking compound across the threads in three places equally spaced around the new seal housing.
8. Place the new seal housing carefully over the main stem to avoid damaging the edges of the seal rings and thread into the bonnet clockwise. Tighten to 800±25 in-lbs (67±2 f-lbs) torque, using a 1-3/8" wrench with a handle of appropriate length.
9. Place the handwheel and information disc on the new stem, secure with the washer and locknut and tighten firmly with a 9/16" wrench.

Stem and Seat Disc Retainer Reassembly

10. Apply fluorinated grease to the new o-ring, thrust washer and new drive stem.
11. Install the stem holder on the main stem.
12. Insert the drive stem though the seat disc retainer and carefully install the o-ring and thrust washer over the drive stem and slide them down into the seat disc retainer cavity.

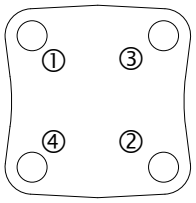
CAUTION: Do not cut the o-ring or thrust washer on the threads of the new drive stem. The threads can be "masked" to prevent damage using tape or equivalent.

13. Remove any grease from the drive stem threads.
14. Apply Loctite 271® thread locking compound to the new drive stem threads and tighten counterclockwise into the main stem (left hand threads). Align the cross drilled holes in the new main stem and new drive stem. An additional counterclockwise rotation (approximately 60 in-lbs (5 ft-lbs)) might be necessary to align the holes once new drive stem is tightened.
15. Install the new 3/32" spring pin flush with the edge of the new main stem.
16. Apply non-detergent grease to the two (crescent shaped) stem retainers. Install these on the new main stem.
17. Apply Loctite 271® thread locking compound to the stem holder external threads and tighten into the seat disc retainer. Using 1-1/8" wrench on the stem holder and 1-5/16" wrench on the seat disc retainer, torque the connection to insure metal to metal contact between the two. Stake as shown in Figure 3 (two places).
18. Apply non-detergent grease to the new driver weldment threads, then tighten (left hand threads) clockwise until seated against the "web" in the valve body. Replace the adjusting screw and hex nut on the new driver weldment (See Figure 6) for installing new ones. Verify the new main stem and seat assembly is back seated in the bonnet assembly.
19. Apply non-detergent grease to each side of the new gasket and

TA7814 Angle Valve Bonnet Tightening Sequence Figure 4A

1 - 3 - 2 - 4

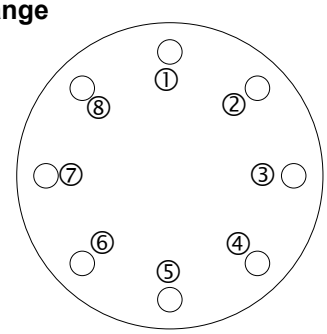
Apply a minimum of 540±25 in-lbs (45±2 ft-lbs) torque using a tightening sequence of alternating bolts in a crisscross pattern.



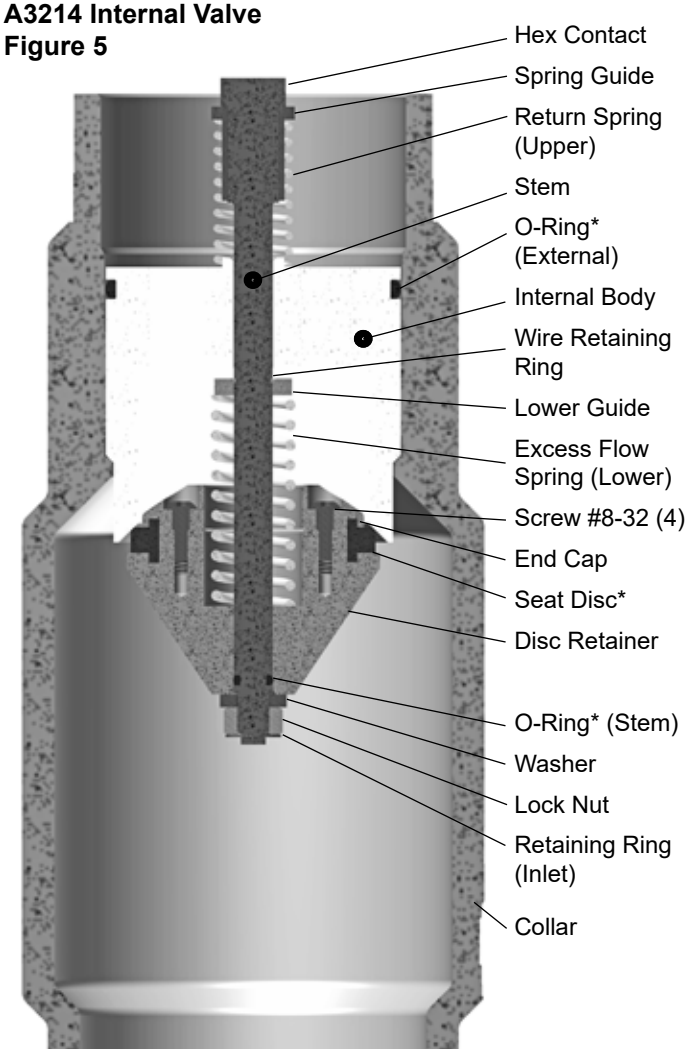
TA7814 Angle Valve Flange Tightening Sequence Figure 4B

1 - 5 - 2 - 6 - 3 - 7 - 4 - 8

Apply a minimum of 300±25 in-lbs (25±2 ft-lbs) torque using a tightening sequence of alternating bolts in a crisscross pattern.



A3214 Internal Valve Figure 5



Kit Item Details Reference Figures 2, 3 & 5

* Items supplied in the TA7814-50 kit. (Items are NOT offered separately.)
Δ Items supplied in the TA7814-51 kit. (Items are NOT offered separately.)
** Must be ordered separately from RegO®.

install the gasket in the body (between the bonnet & body).

CAUTION: Main stem must be in the full open (valve back seated) position to prevent seat disc from being forced against the body seat when the bonnet is assembled to the valve body.

20. Place the bonnet assembly over the body and align the holes for the cap screws. Using handwheel to verify the new drive stem and the new driver weldment nest properly together. Slight adjustment is allowed to assemble the bonnet to the body.
21. Using a 13/16" wrench, partially tighten one cap screw, then move diagonally across the bonnet to tighten the second cap screw. Continue until all four cap screws are tightened to 540±25 in-lbs (45±2 ft-lbs) torque. See Figure 4A.
22. Turn handwheel clockwise to the closed position.
23. Apply non-detergent grease to each side of the new outlet flange gasket and install. Torque each cap screw 300±25 in-lbs (25±2 ft-lbs) minimum using a crisscross tightening sequence. See Figure 4B.

Bench Test

1. Torque handwheel to 400 in-lbs (33 ft-lbs). Verify outlet is open.
2. Pressurize valve to 300-500 psi (through the inlet connection) and check valve for leakage, when looking into the outlet port, by applying a high quality leak detection solution around seat area and seat cavity. Observe for one minute to detect leaks.
3. Release 300-500 psi, apply 15-20 psi and look for any leakage as above.
4. Install outlet plug, again apply 300-500 psi and slowly open valve by turning handwheel 1/4 turn incrementally. Check valve for leakage by applying a high quality leak detection solution around stem, seal housing and bonnet joint. Continue to rotate handwheel 1/4 turn incrementally until valve is fully open (not back seated). Observe for one minute to detect leaks.

CAUTION: Wrenches must never be used to operate valves equipped with handwheels designed for hand operation.

C. Removal of A3214 Internal Valve - See Figures 2 & 5

1. If applicable, remove the TA7814 Angle Valve from the manway cover and set aside in a manner to avoid damage to adjusting screw.
2. Use a spanner wrench or equivalent to remove the internal valve from the collar.
3. Remove and discard the external o-ring.
4. Remove and retain the retaining ring from the inlet side of the main stem.
5. Using a 1/2" wrench on the hex nut at the end of the stem and a 9/16" or a 11/16" socket on the hex contact (may have either size), remove the hex nut from the stem by loosening counterclockwise.

CAUTION: Seat disc retainer is under a spring load and must be retained and slowly released to prevent possible injury or damage to parts.

6. Remove and retain the washer.

Seat Disc Replacement:

7. Depress the hex contact of the stem while holding seat retainer in closed position to enable the removal of the stem o-ring. Remove and discard the o-ring.
8. Slide the seat disc retainer assembly from the stem.
9. Remove and retain the six #8-32 screws and the end cap from the assembly,
10. Remove and discard the old seat disc.
11. Install the new seat disc and replace end cap using the six #8-32 screws. Apply Loctite TL222® thread locking compound to threads of each screw and securely tighten to insure metal to metal contact between the end cap and the poppet body.

NOTE: The stem does not need to be removed unless significant wear is visible or if the valve binds during closing and opening.

12. Inspect the stem for damage. If it is necessary to completely remove the stem from the body go to step 13. If the stem does not need to be removed, skip step 13.
13. **Remove the Stem from the Body**:
    a. Remove and retain the lower spring (excess flow).
    b. Remove and retain the lower guide.
    c. Depress the hex contact on stem and remove the wire retaining ring and discard.

CAUTION: Do not damage the stem by scratching, nicking or gouging.

    d. Remove and retain the stem and the upper spring (return) for reassembly.

*NOTE: If the stem** is scratched or scored, a new one must be installed.*

    e. Install the spring guide and upper spring (return) on to the stem, then insert the stem into the internal valve body.
    f. Depress the hex contact of the stem and insert the new wire retaining ring.
    g. Install the lower guide.
    h. Install the lower spring (excess flow).

14. Install the seat disc retainer assembly carefully over the stem.
15. Depress the hex contact of the stem while holding seat retainer in closed position to enable the installation of the stem o-ring. Lubricate the new o-ring with fluorinated grease and carefully install on the stem. Careful not to cut the o-ring on any edges, corners or threads of the stem.

NOTE: Masking edges, threads and corners is an acceptable method to prevent o-ring damage.

16. Apply Loctite 271® thread locking compound to male threads on the end of the stem.

CAUTION: Do not get Loctite on the o-ring.

17. Install the washer and hex nut. Torque to 25-35 in-lbs (2-3 ft-lbs).
18. Install the old retaining ring (inlet).
19. Lubricate the external o-ring with Parker Super O-Lube® or equivalent fluorinated grease and install into the o-ring groove of internal valve.
20. Apply appropriate anti-seize compound to the male threads of the valve body according to manufacturer's specifications. Thread the internal valve assembly into the collar and hand tighten to full engagement. Once the assembly bottoms out against the internal stop in the collar, no further torque is required or recommended.

NOTE: No antiseize compound can be transferred to the o-ring.

D. Reassembly to the Manway - See Figures 1 & 6

Internal Valve Measurement Check and Installation

1. Thread the Internal Valve body and poppet assembly into the collar and hand tighten until it bottoms out, indicating full engagement.
2. Measure from the top of the manway cover to the top face of the hex contact, see distance "**A**". "**A**" should measure between 1.665" min and 1.725" max if the Internal Valve is properly installed.
3. If "**A**" distance is not correct, recheck that the body and poppet assembly was installed correctly in the collar and the Internal Valve is positioned correctly.

NOTE: There is no adjustment allowed to the Internal Excess Flow Valve.

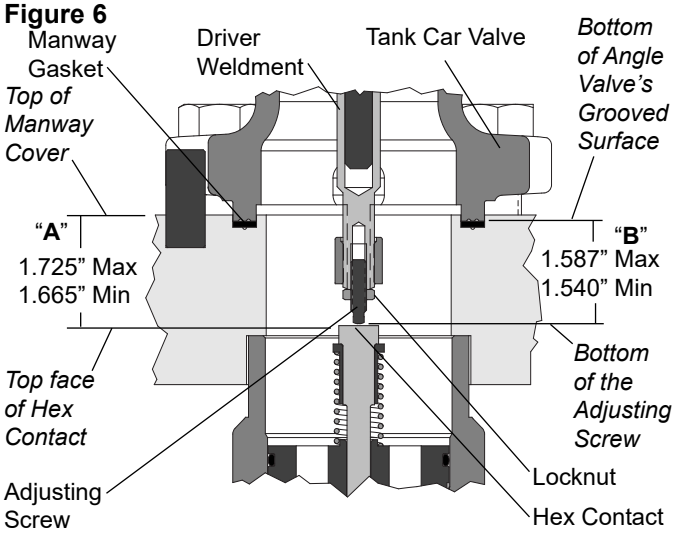
Angle Valve Measurement Check and Installation

NOTE: Verify that the Angle Valve is fully closed.

4. Measure from the bottom of the Tank Car Valve's grooved surface to the bottom of the adjusting screw, see distance "**B**". "**B**" should measure between 1.540" min and 1.587" max, as preset by factory.

   If distance "**B**" does not fall within the specified range, loosen

TA7814 Tank Car Valve Measurement Check
Figure 6



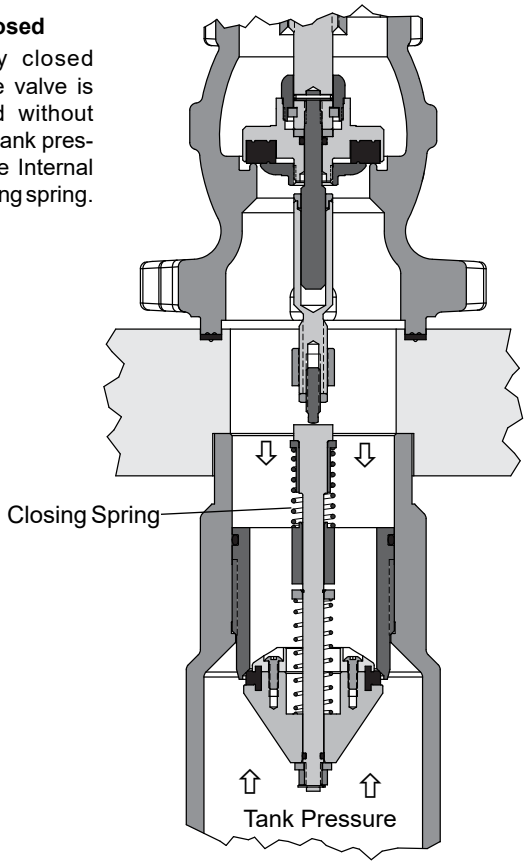
Proper clearance must be held between the globe valve adjusting screw and the internal valve hex contact.

A3214 Internal Valve - How the Valve Works - Figure 7

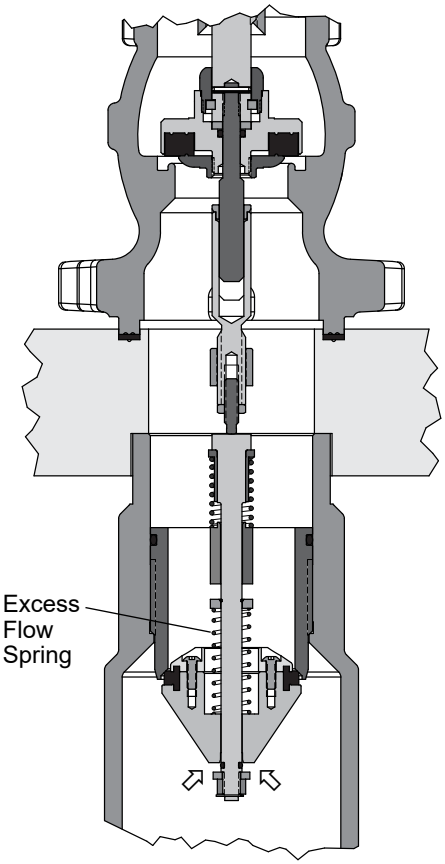
Tank Car & Internal Valve in Fully Closed Position

1. Fully Closed

In the fully closed position, the valve is held closed without leakage by tank pressure and the Internal Valve's closing spring.



Tank Car & Internal Valve in Mid-Point Position



2. Rapid Bleed

Actuation of the operating handwheel alone does not open the valve, it only allows pressure to equalize between the inlet and outlet of the valve by rapid bleeding of the product downstream. This equalized pressure then allows the valve to open via the excess flow spring.

The valve is opened by moving the handwheel to mid-point. This moves the actuator to the equalizing position which allows product to bleed downstream.

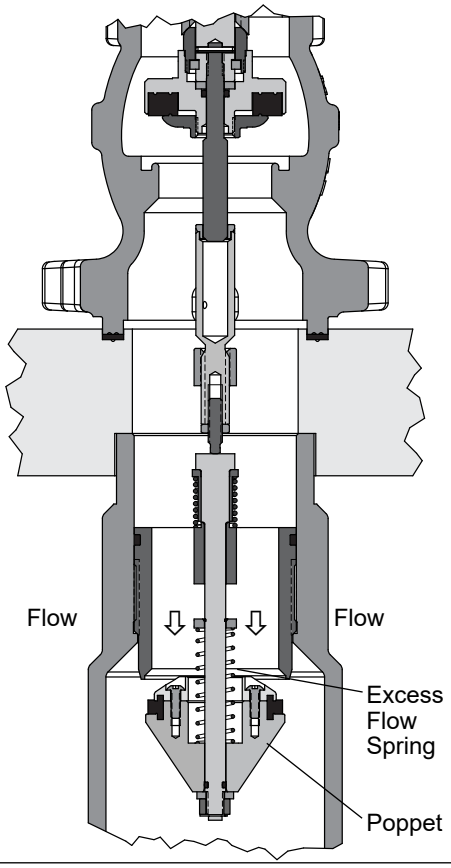
The equalizing position allows more product to bleed downstream than if the handwheel was fully open.

Tank Car & Internal Valve in Fully Open Position

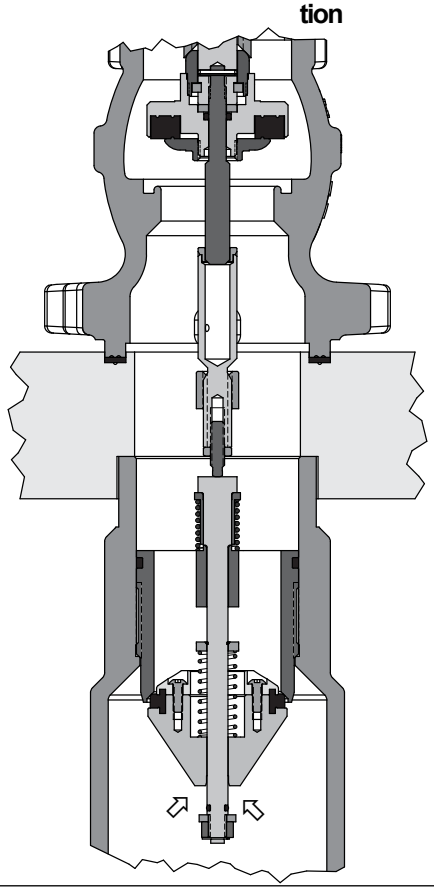
3. Fully Open

In a few seconds, the tank and downstream pressure will be equalized, allowing the excess flow spring to push the poppet to the open position. The handwheel should then be moved to the fully opened position.

If the handwheel is quickly moved to the fully opened position, the equalization passage allows a small amount of bleed downstream, but much less than during the rapid bleed. This results in a longer pressure equalizing time before the valve can open. **NOTE: The poppet will not open until outlet pressure approximates tank pressure!**



Tank Car in Fully Open & Internal Valve in Partial Closed Position



4. Limit Bleed

Once the poppet is open, flow greater than the excess flow spring rating, or a sufficient surge in force of the flow, forces the poppet closed against the excess flow spring. The equalization passage in this position is open and allows a small amount of bleed downstream, but much less than during rapid bleed. When the operating handwheel is moved to the closed position, the valve closes and a tight, leakproof seal is re-established as seen in Step 1.

the locknut, then adjusting screw until "**B**" distance is achieved. Hold adjusting screw and tighten locknut. Verify that the distance is unchanged after tightening the locknut. This will provide the necessary clearance needed for proper operation of the valve.

5. Apply high quality non-detergent grease to the bottom of the adjusting screw of the Angle Valve before installing onto the manway cover.
6. Install manway gasket (not provided) then, install the Angle Valve on the manway cover carefully aligning with dowel pin in manway and attach using 4-7/8" cap screws (not provided). Tighten to ensure a leak tight joint.
7. Pressurize the system to systematically check all valves, joints, connections and seals to verify leak tight connections are intact using a high quality leak detection solution.

Filling and Withdrawal of Product - See Figure 8

Please read and follow all instructions regarding filling and withdrawal of product from the container utilizing the A7814 Angle Valve and A3214L-2 or A3214V-2Internal Excess Flow Valve.

If the filling or withdrawal instructions are not explicitly followed then the Internal Valve's excess flow feature will activate. Improper usage resulting in repeated closing of the Internal Valve during filling, evacuating or disconnecting will cause significant damage to the valve's seat.

The filling and withdrawal instructions are show in Figure 8.

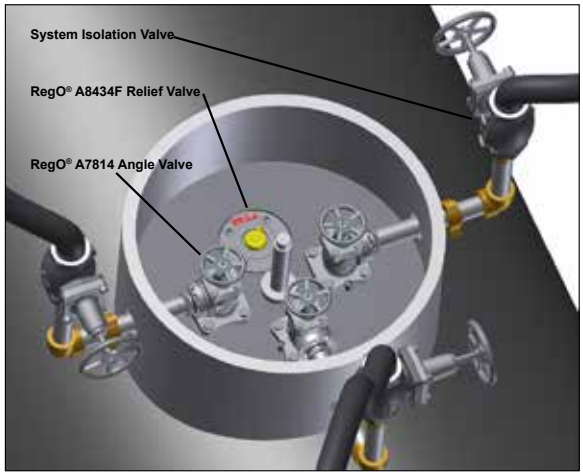
To fully understand how the excess flow feature works please see explanation and figure 7. This explains how the valve is designed to operate in the four possible conditions.

TA7814 Filling and Withdrawal of Product Figure 8

This decal can be purchased separately under part number TA7814-72.

DANGER READ FIRST **WARNING**

EXPOSURE TO ANHYDROUS AMMONIA IS CORROSIVE TO HUMAN TISSUE. IT CAN BE LIFE THREATENING AND MAY EVEN CAUSE DEATH. IT IS CLASSIFIED AS AN INHALATION HAZARD. USE PROPER SAFETY EQUIPMENT TO PROTECT AGAINST CONTACT WITH ANHYDROUS AMMONIA.



RegO® Valve Operation

1. Connect the appropriate piping to the outlet of all RegO® A7814 Angle Valves.
   *****THE SYSTEM ISOLATION VALVES MUST BE CLOSED*****
2. Open each Angle Valve two (2) full turns counterclockwise.
3. Allow 20 seconds for the pressure to equalize.
4. Once the pressure equalizes, open the RegO® Angle Valves by turning counterclockwise completely to back seat the valves.
5. Open the System Isolation Valves.
6. Begin loading/unloading product from the railcar.

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such causes be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO® for technical advice base upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

The benefits given by the Limited Warranty above are in addition to any other rights and remedies to which you may be entitled by law.

NOTE TO AUSTRALIAN PURCHASERS: The following applies if you purchased this product as a "consumer" as defined in the Australian Consumer Law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Information regarding how to return a product and make a claim under this Limited Warranty is set forth below.

Nothing in this document purports to modify or exclude your rights if any under the Australian Consumer Law, or other laws which cannot be lawfully be modified or excluded.

WARNING

All RegO® products are mechanical devices that will eventually become inoperative due to wear, corrosion and aging of components made of materials such as rubber, etc. The environment and conditions of use will determine the safe service life of these products. Periodic inspection and maintenance are essential to avoid serious injury and property damage.

Many RegO® products are manufactured components which are incorporated by others on or in other products or systems used for storage, transport, transfer and otherwise for use of toxic, flammable and dangerous liquids and gases. Such substances must be handled by experienced and trained personnel only, using accepted governmental and in industrial safety procedures.

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Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

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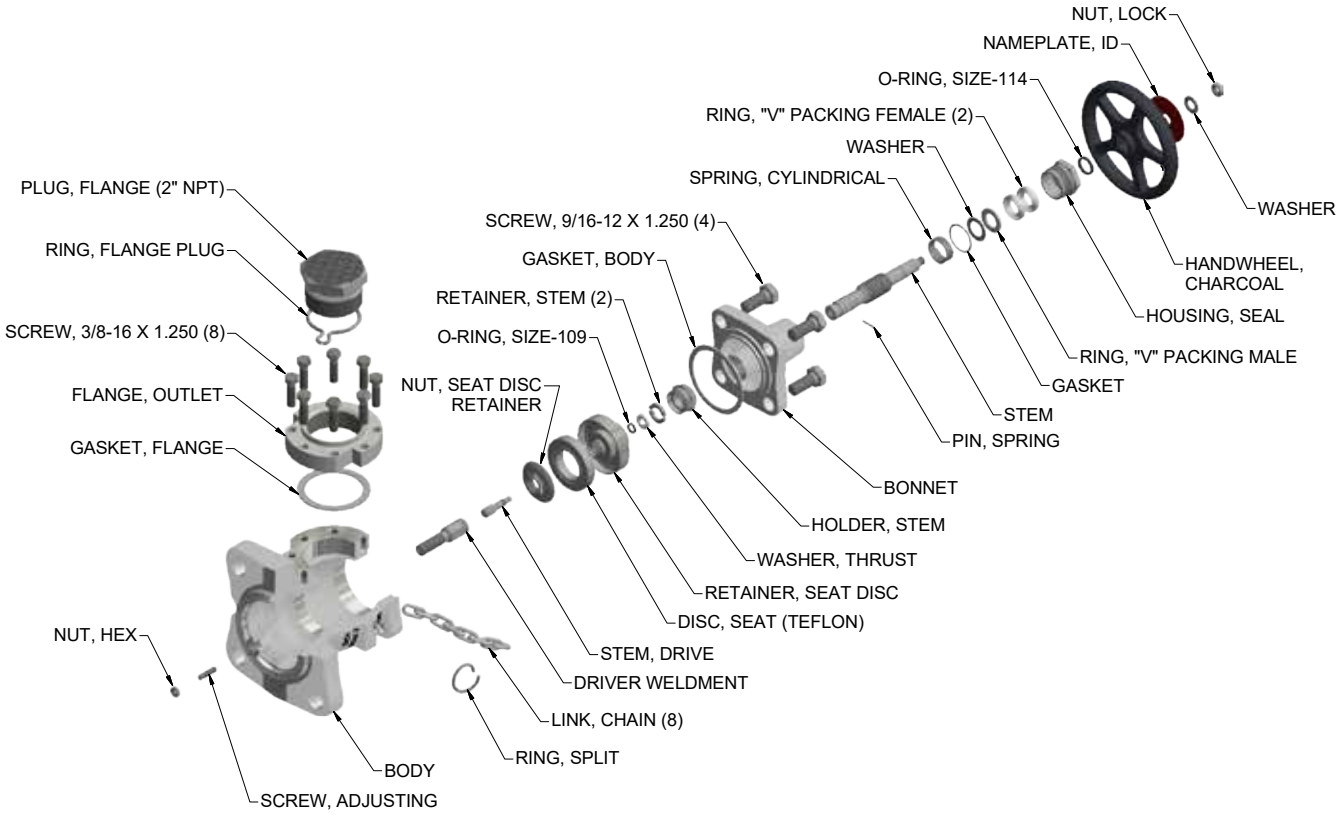
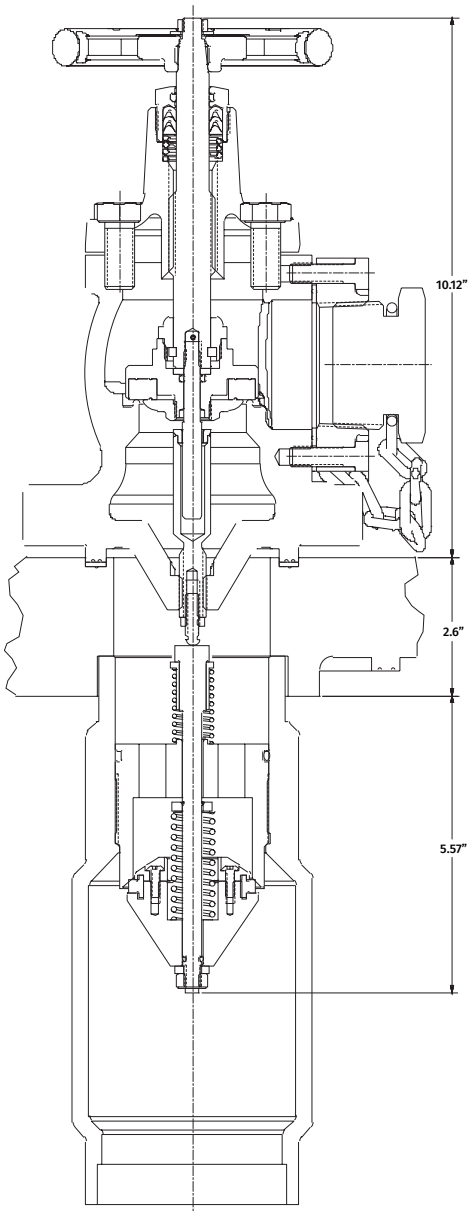
Instruction Sheet TA7814-301

Elon, N.C. 27244 U.S.A. Phone +1 (336) 449-7707 Fax (336) 449-6594 www.regoproducts.com

TA7814 Series (A7814 + A3214)
AAR Approval # E232125



See quick reference tables on page 44 for rebuild kit.



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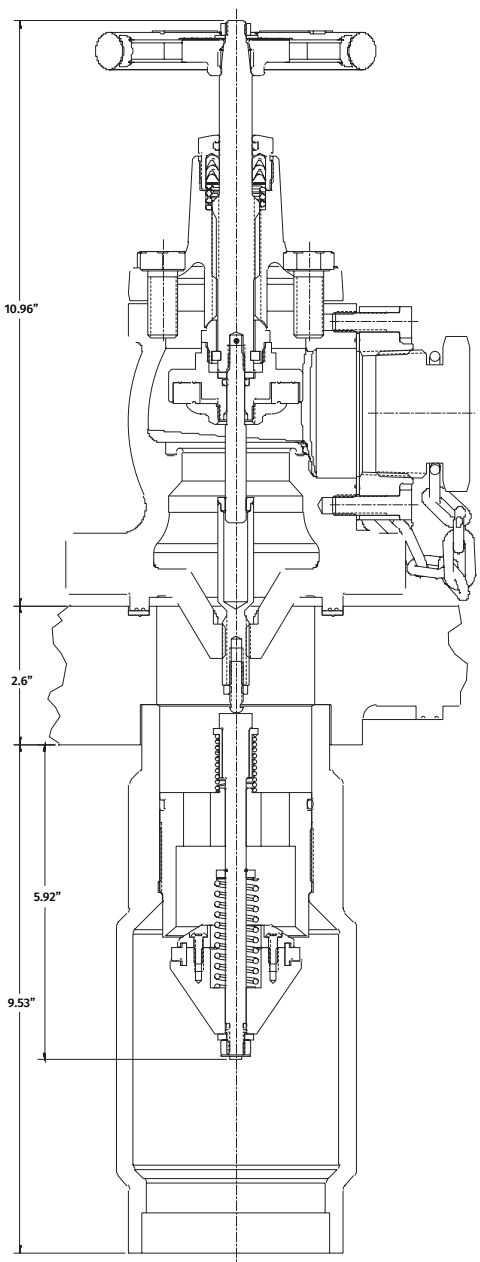


OPEN

Next Generation Product Containment System A3214 Series

Application

Design for use on next generation tank cars.

TA7814 Series (A7814 + A3214)
AAR Approval # E232125

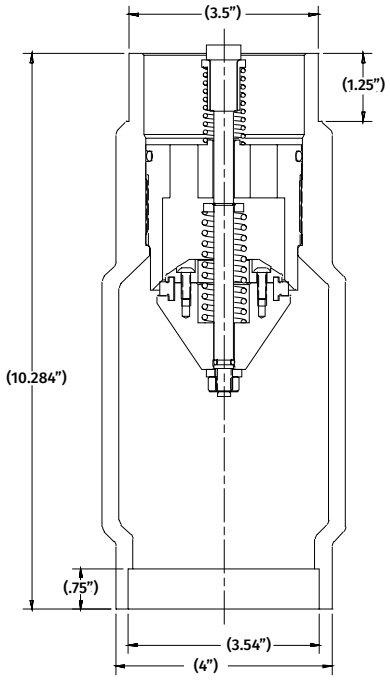
Features

- The primary seat is below the pressure plate.
- This valve also features an excess flow to enhance safety during the loading and unloading operation.

A3214

Materials

Body . . . . . Cast Steel
Stem . . . . . Stainless Steel
Seals. . . . . Buna N or EPDM
Poppet . . . . . Stainless Steel



REGO 10 YEAR WARRANTY

Ordering Information

Part Number	Seat Material	Closing Flow Water GPM	Closing Flow NH3 GPM	Rebuild Kit
A3214V	Buna-N	130	162	A3214V-50A
EA3214V	EPDM			A3214V-50EA
A3214L	Buna-N	250	320	A3214L-50A
EA3214L	EPDM			A3214L-50EA
A3214J*	Buna-N	130	162	
EA3214J*	EPDM			

*J Tube Configuration

WARNING: Installation, disassembly, repair and maintenance MUST be performed only by qualified personnel. All gas MUST be evacuated from the system before starting repairs.

Installation, usage and maintenance of this product must be in compliance with all RegO® instructions as well as requirements and provisions of NFPA #54, NFPA #58, DOT, ANSI, all applicable federal, state, provincial and local standards, codes, regulations and laws.

Inspection and maintenance on a periodic basis is essential.

Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

ECI EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY – UNDER ANY THEORY, WHETHER CONTRACT, WARRANTY, TORT OR OTHERWISE – RELATING IN ANY MANNER TO ANY RAIL TANK CAR EQUIPMENT REPAIRED USING ANY PRODUCTS NOT MANUFACTURED BY ECI.

USE OF ANY PRODUCTS NOT MANUFACTURED BY ECI TO REPAIR ANY RAIL TANK CAR EQUIPMENT WILL INVALIDATE ANY AND ALL WARRANTIES OF THE RAIL TANK CAR EQUIPMENT, WHETHER EXPRESS OR IMPLIED.

CAUTION: Contact or inhalation of liquid propane, ammonia and their vapors can cause serious injury or death! NH_3 and LP-Gas must be released outdoors in air currents that will insure dispersion to prevent exposure to people and livestock. LP-Gas must be kept far enough from any open flame or other source of ignition to prevent fire or explosion! LP-Gas is heavier than air and may not disperse or evaporate rapidly if released in still air.

Disassembly and Rebuild Procedure

CAUTION: READ THROUGH ALL OF THESE INSTRUCTIONS, INCLUDING THE NOTICE AND WARNINGS ON THE BACK OF THIS SHEET, BEFORE BEGINNING ANY DISASSEMBLY OR REPAIR.

NOTE: Repairs must be performed in a clean area. Hands, clothing, tools and work area must be completely free of oil, grease and foreign matter to prevent contamination of component parts and valves.

DISASSEMBLY - See Figure 2

Excess Flow Assembly

1. Remove Body assembly from Collar, as not to damage the Poppet.
2. Remove external O-Ring from Body, and discard.
3. Remove Retaining Ring from top of Stem and discard.
4. Remove Washer and Hex Nut and set aside for reassembly.
5. Carefully slide the Poppet Assembly off the Stem while holding the Excess Flow Spring in place. Set the Poppet Assembly aside for disassembly.
6. Remove and discard the Excess Flow Spring.
7. Remove and retain the Lower Guide.
8. Remove and discard the Wire Retaining Ring from the Stem.
9. Remove and carefully retain Body from remaining assembled items. Do not damage threads or seat area.
10. Carefully remove and discard the Return Spring from the Stem.
11. Remove and retain the Stem Guide.
12. Carefully remove the O-Ring from the Stem without damaging the Stem, then discard the O-Ring.

CAUTION: Inspect Body seat area and Stem** for signs of excessive wear and replace if necessary.**

13. Take note of "L" or "V" on the top of the excess flow body. "L" signifies a liquid excess flow, while "V" signifies a vapor excess flow. Use this to determine which repair kit to use during reassembly. (See Figure 1).

Poppet & Seat Disassembly

14. Remove the six #8-32 Button Cap Screws holding the End Cap to the Poppet and discard
15. Remove the End Cap from the Poppet Assembly, and set aside for reassembly.

REGO 10 YEAR WARRANTY

A3214L-50A, A3214L-50EA, A3214V-50A, A3214V-50EA Rebuild Kits for A3214 Series Internal Excess Flow Valves

16. Remove and discard the Seat Disc.

REASSEMBLY - See Figure 2

NOTE: Be sure all parts have been cleaned prior to reassembly. Where lubrication is required, use non-detergent grease.

Poppet & Seat Assembly

1. Install the Seat Disc onto the Poppet and place the End Cap on top.
2. Apply Loctite® TL222 thread locking compound to the threads of the six Screws and install into Poppet Assembly hand-tight.

CAUTION: Thread locking compound must not contact Seat Disc.

Excess Flow Assembly

3. Install the Spring Guide onto the Stem.
4 Install the Return Spring onto the Stem.
5. Carefully slide the Body onto Stem, aligning the Body to the Spring.
6. Install the Wire Retaining Ring to the Stem down in the Body.
7. Install the Lower Guide onto Stem until it rests on the Retaining Ring.
8. Apply LPG resistant Petro-Canada SVG102 or Mobil Centaur Moly 1 grease to the top two inches of the upper stem.
9. Install the Excess Flow Spring onto the Stem and let it rest on the Lower Guide.

NOTE: Take special care to choose the Excess Flow Spring that corresponds to the "L" or "V" on the body.

10. Lubricate O-Ring and carefully install onto the Stem.
11. Carefully install the Poppet Assembly onto the Stem, over the Excess Flow Spring as to not damage the stem O-ring.
12. Install Washer.
13. Apply Loctite 271® thread locking compound to Stem threads and install Hex Nut to the Stem and hand-tight.

CAUTION: Thread locking compound must not contact O-Ring.

14. Install the Retaining Ring to the end of the Stem.

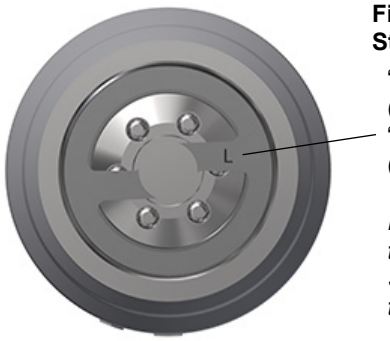
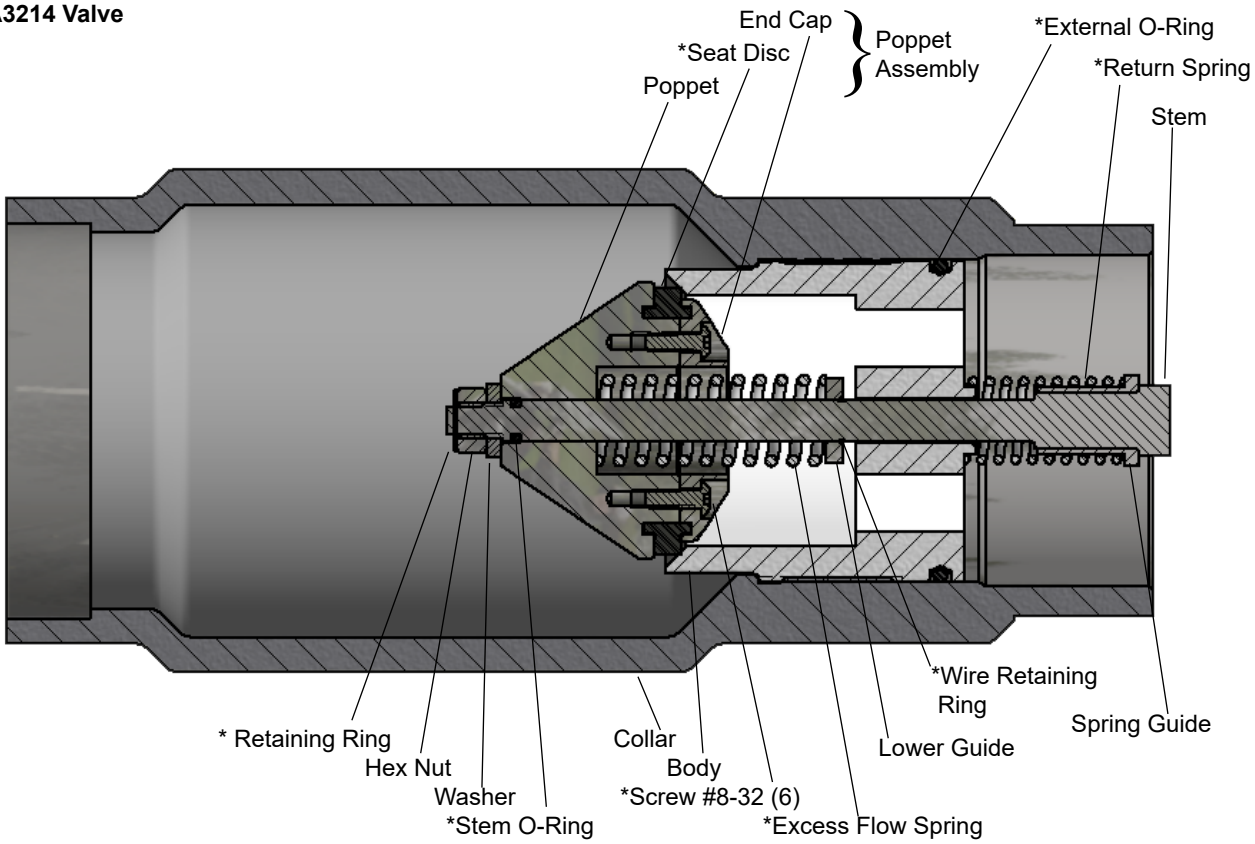


Figure 1 - Liquid or Vapor Stamp

"L" = Liquid
(Red Stripe on Spring)
"V" = Vapor
(White Stripe on Spring)

NOTE: Take special care to choose the Excess Flow Spring that corresponds to the "L" or "V" on the body.

Figure 2 - A3214 Valve



*Items included in kit recommended for most rebuild.

** Must be ordered separately from RegO.

15. Lubricate External O-Ring and carefully install onto the Body.

Test

Pressurize the inlet side of the valve (cone side) to 500 psig with compressed air, nitrogen, or other inert gas. On the outlet side of the valve apply a suitable leak detection solution to the area where the seat disc meets up with the valve seat; if a leak is indicated the valve must be reassembled or replaced.

NOTICE

LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO® parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO® assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

LIMITED 10 YEAR WARRANTY

RegO® warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO® at 100 RegO Drive, Elon, N.C. 27244, RegO®, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO® to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

This warranty does not extend to any product or part that is not installed and used continuously after installation in accordance with RegO®'s printed instructions, all applicable state and local regulations, and all applicable national standards, such as those promulgated by NFPA, DOT and ANSI. This warranty does not extend to any product or part that has been damaged by accident, misuse, abuse, failure to maintain, or neglect, nor does it extend to any product or part which has been modified, altered, disassembled, or repaired in the field. This warranty does not cover any cosmetic issues, such as scratches, dents, marring, fading of colors or discoloration.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, AND SUBJECT TO THE LIMITATION OF LIABILITY BELOW, REGO® MAKES NO OTHER WARRANTY, AND EXPRESSLY DISCLAIMS, ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND PARTS, WHETHER USED ALONE OR IN COMBINATION WITH OTHERS. REGO® DISCLAIMS ALL WARRANTIES NOT STATED HEREIN.

This Limited Warranty is given by Engineered Controls International LLC, of 100 RegO Drive Elon, NC 27244 USA, (336) 449-7707.

LIMITATION OF LIABILITY

RegO® total liability for any and all losses and damages arising out of any cause whatsoever shall in no event exceed the purchase price of the products or parts in respect of which such cause arises, whether such causes be based on theories of contract, negligence, strict liability, tort or otherwise.

RegO® shall not be liable for incidental, consequential or punitive damages or other losses. RegO® shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO® for technical advice base upon limited facts disclosed to RegO®. If RegO® furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO® shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

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WARNING

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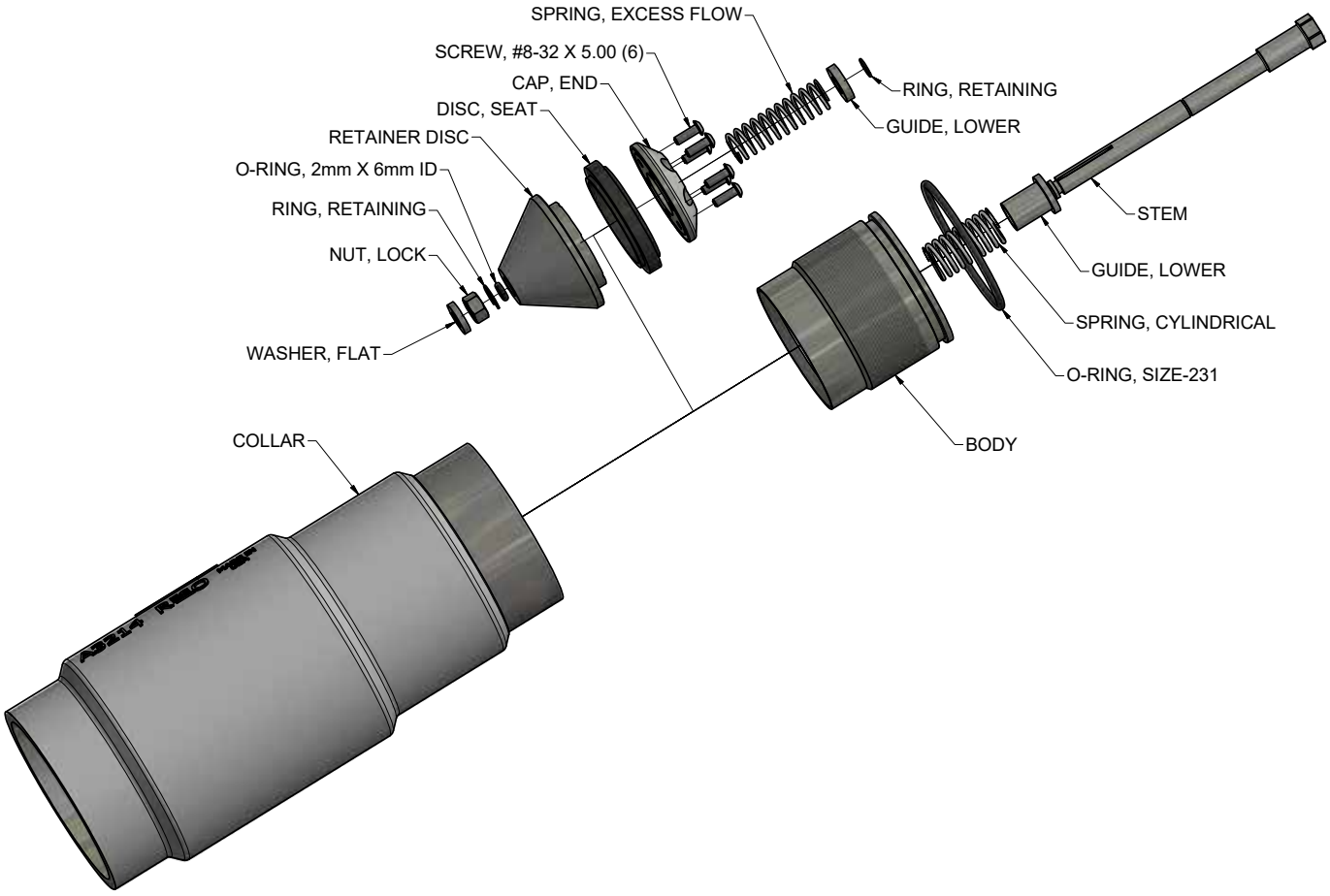
Because of a policy of continuous product improvement, RegO® reserves the right to change designs, materials or specifications without notice.

Printed in the U.S.A. REV E 05-1120-0817
Instruction Sheet A3214-302

TA7814 Series (A7814 + A3214)
AAR Approval # E232125



See quick reference tables on page 44 for rebuild kit.

Limited 10 Year Warranty and Limitation Of Liability

NOTICE
LP-Gas is extremely flammable and explosive. Failure to install parts exactly as described in the instructions could result in a product that will not perform satisfactorily. Even if parts are correctly installed, the product might fail to perform satisfactorily, if other parts are worn, corroded or dirty. Improper repair can cause leaks and malfunction, which could result in bodily injury and property damage. Any such use or installation of parts must ONLY be done by experienced and trained personnel using accepted governmental and industrial safety procedures.

Most RegO® products are listed with Underwriters Laboratories as manufactured. If repaired, the continued validity of the UL listing is contingent upon proper inspection to determine what needs repairing, proper repair using RegO parts and procedures, and proper testing for leakage and performance following repairs and installation.

RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures; and proper testing for leakage and performance following repairs and installation.

RegO assumes no responsibility or liability for performance of products repaired in the field. It must be clearly understood that the person or organization repairing the product assumes total responsibility for performance of the product.

ECI EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY – UNDER ANY THEORY, WHETHER CONTRACT, WARRANTY, TORT OR OTHERWISE – RELATING IN ANY MANNER TO ANY RAIL TANK CAR EQUIPMENT REPAIRED USING ANY PRODUCTS NOT MANUFACTURED BY ECI.

LIMITED 10 YEAR WARRANTY
RegO warrants to the original purchasers the products and repair kits manufactured by it to be free from defects in materials and workmanship under normal use and service for a period of 10 years from the date of manufacture. If within thirty days after buyer's discovery of what buyer believes is a defect, buyer notifies in writing and ships (at buyer's expense) the product to RegO at 100 RegO Drive, Elon, N.C. 27244, RegO, at its option, and within forty-five days of receipt, will repair, replace F.O.B. point of manufacture, or refund the purchase price of that part or product found by RegO to be defective. Failure of buyer to give such written notice and ship the product within thirty days shall be deemed an absolute and unconditional waiver of any and all claims of buyer arising out of such defect.

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RegO shall not be liable for incidental, consequential or punitive damages or other losses. RegO shall not be liable for, and buyer assumes any liability for all personal injury and property damage connected with the handling, transportation, possession, further manufacture, other use or resale of products, whether used alone or in combination with any other products or materials.

From time to time buyers might call to ask RegO for technical advice base upon limited facts disclosed to RegO. If RegO furnishes technical advice to buyer, whether or not a buyer's request, with respect to application, further manufacture or other use of the products and parts, RegO shall not be liable for such technical advice or any such advice provided to buyer by any third party and buyer assumes all risks of such advice and the results thereof.

NOTE: Some states do not allow the exclusion or limitation of incidental, consequential or punitive damages, so the above limitation or exclusion may not apply to you. The warranty gives you specific legal rights, and you may have other rights that vary from state to state. The portions of the limited warranty and limitation of liability shall be considered severable and all portions which are not disallowed by applicable law shall remain in full force and effect.

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RegO Rebuild Kit Quick Reference Table

SAFETY RELIEF VALVES	REBUILD KIT	SEAT MATERIAL
A8890 "S" SERIES	A8890S-50	BUNA "N"
VA8890 "S" SERIES	VA8890S-50	VITON "B"
VSA8890 "S" SERIES	VSA8890-50	GFLT-S VITON
NA8890 "S" SERIES	NA8890S-50	NEOPRENE
EA8890 "S" SERIES	EA8890S-50	EPDM
All 8890 SERIES RELIEFS	A8890S-80	STEM ONLY
A8434 "F" SERIES	A8434F-50	BUNA "N"
NA8434 "F" SERIES	NA	NEOPRENE
VA8434 "F" SERIES	VA8434F-50	VITON "B"
A8434 "FA" SERIES	A8434F-50	BUNA "N"
VA8434 "FA" SERIES	VA8434F-50	VITON "B"

CHECK VALVES	REBUILD KIT	SEAT MATERIAL
A3214L	A3214L-50A	BUNA "N"
EA3214L	A3214L-50EA	EPDM
A3214V	A3214V-50A	BUNA "N"
EA3214V	A3214V-50EA	EPDM
A3214J	A3214V-50A	BUNA "N"
EA3214J	A3214V-50EA	EPDM
A7835	NA	NA
A7835W	NA	NA
A7837A	NA	NA
A7837J	NA	NA
A7837L	NA	NA
A7839A	NA	NA

THERMOWELL	O-Ring	O-RING MATERIAL
A7833A	A7515-25	Buna “N”
VA7833A	A7833-25V	Viton “A”
VB7833A	A7833-25VB	Viton “B”
EA7833A	A7833-25E	EPDM
GA7833A	A7833-25G	GFLT-S Viton
GFA7833A	A7833-25GB	GF-S Viton

ANGLE VALVES	REBUILD KIT	SEAT MATERIAL	O-RING MATERIAL
TA7894P	TA7894-50	TEFLON	BUNA "N"
A7814	TA7814-50	TEFLON	BUNA "N"
TA7814	TA7814-50	TEFLON	BUNA "N"
EA7814	EA7814-50	TEFLON	EPDM

RegO Propane Package

RegO Anhydrous Ammonia Shear-Off Package

NOTES

NOTES

NOTES

TRANSQUIP USA

Jacksonville, Florida (HQ)

3360-C Lake Shore Boulevard
Jacksonville, Florida
Phone: (904)-388-6699
Fax: (904)-388-3377
sales@transquip.com

Dallas, Texas

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Forestburg TX 76239
Phone: (940)-231-0809
Fax: (940)-239-5160
jbecherer@transquip.com

Houston, Texas (Logistics)

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Fax: (281)-442-8008
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mtierney@transquip.com

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Lynchburg, VA
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Baton Rouge, LA

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Livonia, LA 70755
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Calgary Canada

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Chestermere,
Ab Canada T1X0N6
Phone: 403-660-9794
jsmyth@transquip.com

For the most up to date information on RegO Rail Car products & IMO Instructions please visit www.transquip.com

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