



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.

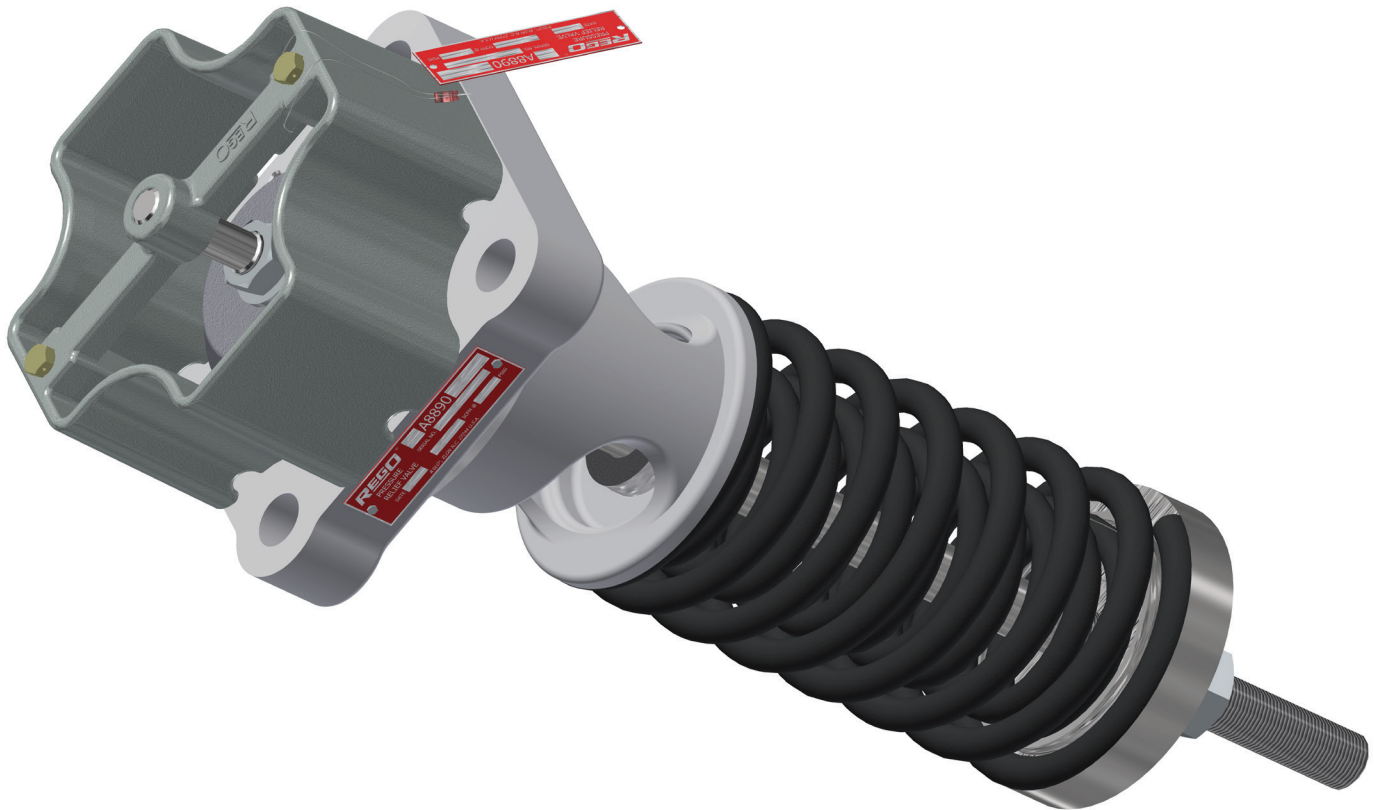
RegO Rail Tank Car equipment is AAR approved. If repaired, the continued validity of the AAR approval is contingent upon proper inspection to determine what needs to be repaired; proper repair using RegO OEM parts and procedures, proper testing for leakage and performance following repairs and installation.

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! NH₃ 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



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.

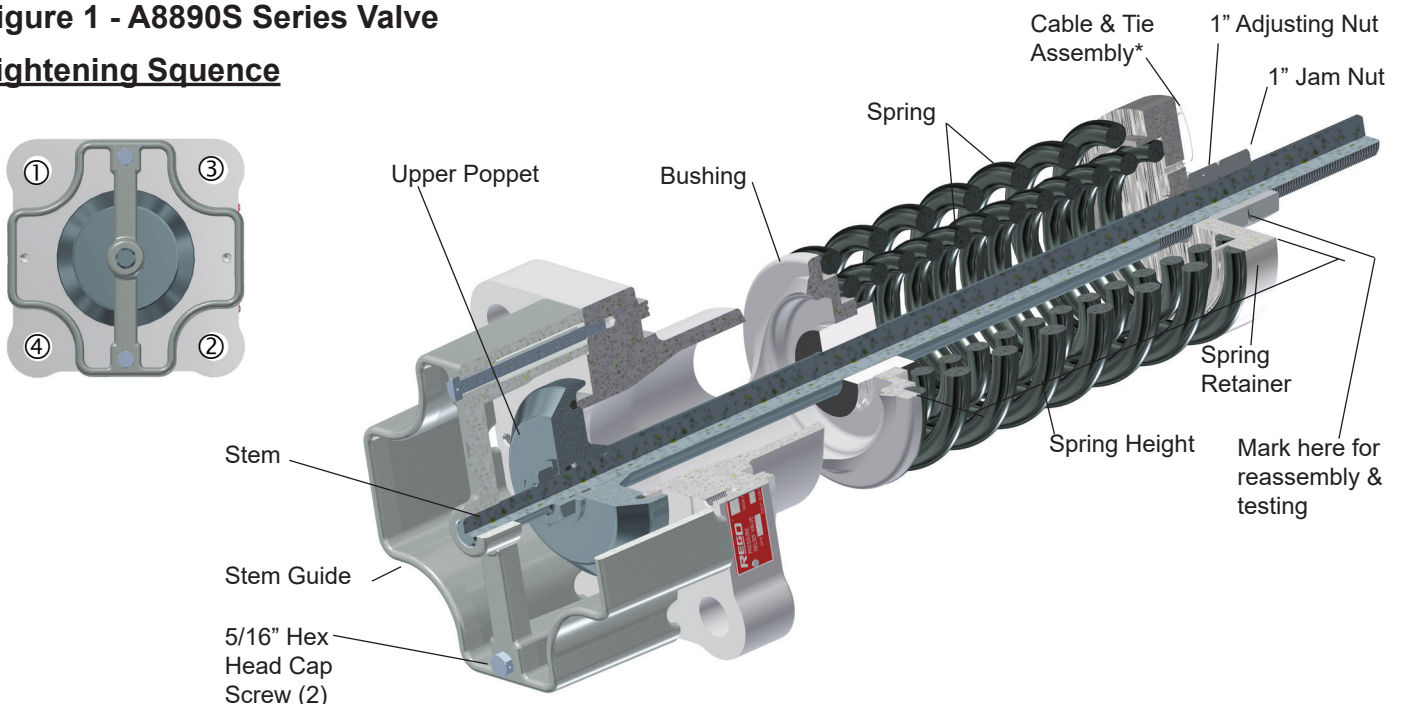
Note: Where lubrication is noted use Parker Super-O-Lube® or compatible silicon based grease.

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 Sequence



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

** Must be ordered separately from RegO®.

Rain Cap and Cable & Tie Assembly*
(Not Shown)

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".

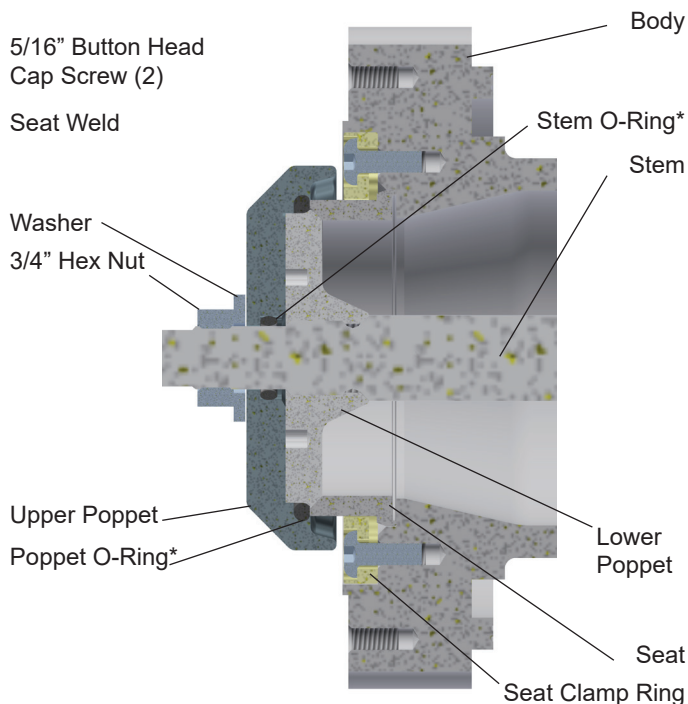
NOTE: If the spring height is less than these, the valve must be disassembled and both springs must be replaced.

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.

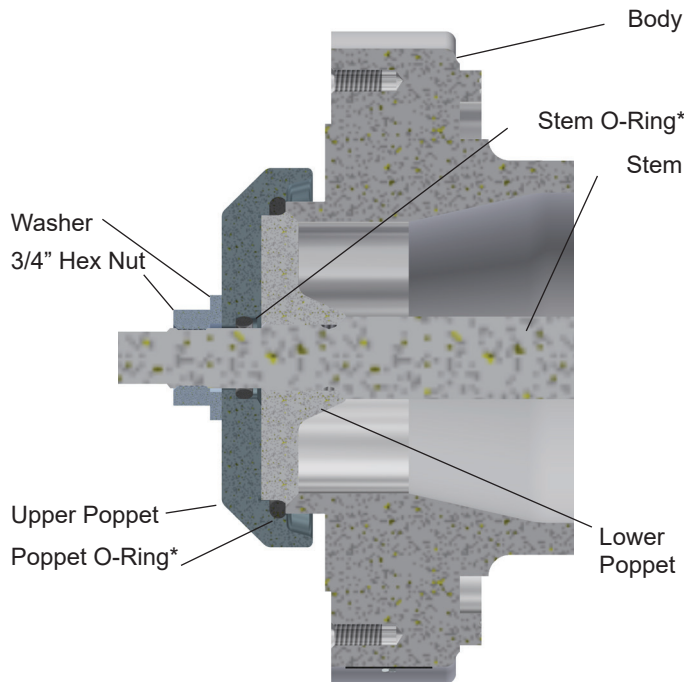
Emergency Field Repair

*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 based 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 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.

