



Martin® Tornado Retrofit Valve for Air Cannons

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Martin® Tornado Retrofit Valves



***Operator's Manual
M3712***

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



Danger: Immediate hazards that will result in severe personal injury or death.



Warning: Hazards or unsafe practices that could result in personal injury.



Caution: Hazards or unsafe practices that could result in product or property damages.



Important: Instructions that must be followed to ensure proper installation/operation of equipment.



Note: General statements to assist the reader.

Installation

IMPORTANT

Read entire section before beginning work. All safety rules defined in your air cannon's documentation, and all owner/employer safety rules, must be strictly followed when installing and servicing this equipment.

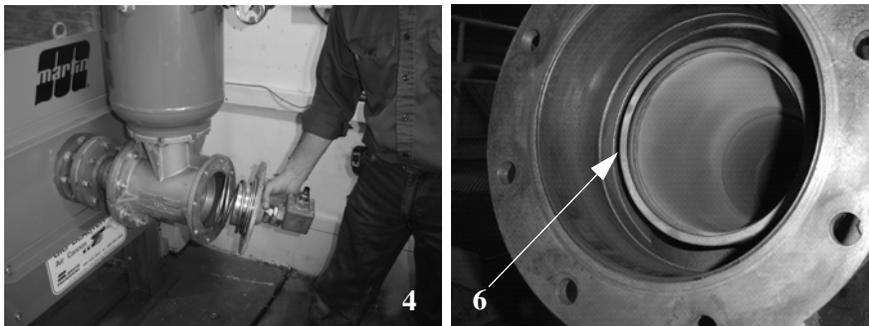


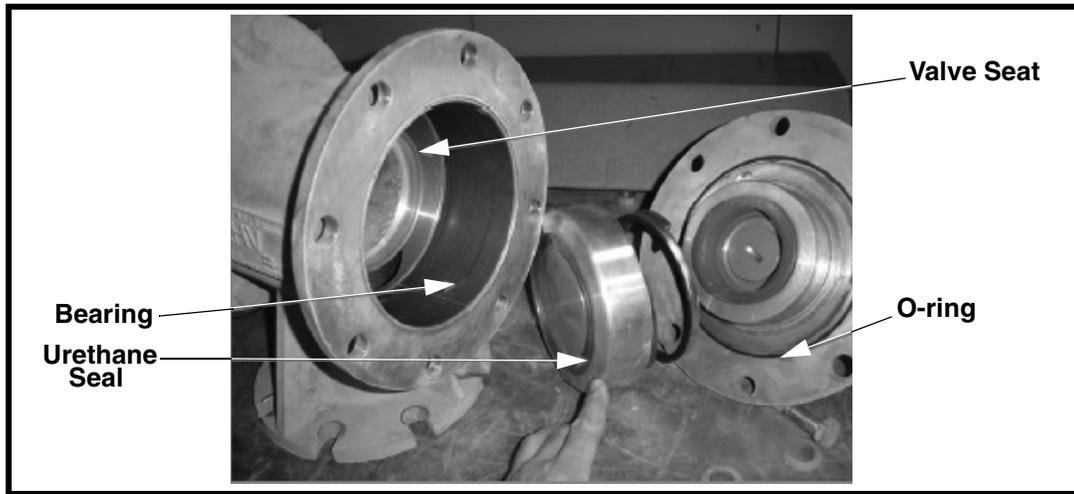
▲ DANGER

Turn off and lock out/tag out air supply and energy source before blasting air cannon to prevent air cannon from refilling.

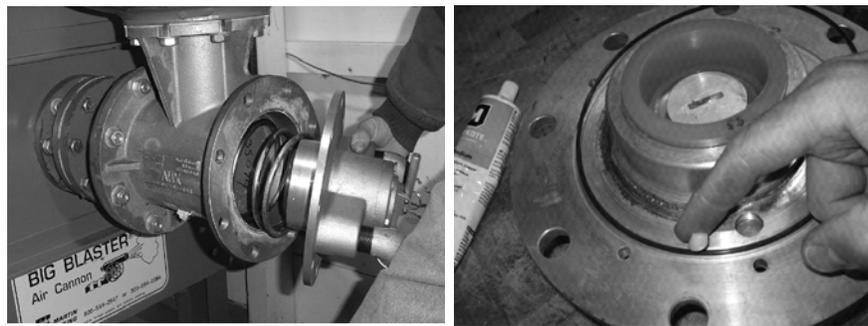
Do not open door/port or enter structure before turning off compressed air source, locking out controls, purging line pressure, and venting air from tank. Opening structure door while cannon is operational can kill you.

1. Turn off and lock out/tag out energy source (A) according to American National Standards Institute (ANSI) z244.1-1982 and Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910.
2. Blast air cannon to remove air from tank. If tank has a relief valve, pull ring to make sure air stored in cannon has been released.
3. Close safety slide gate if equipped with one. If air cannon has an open discharge port, make sure you are safely isolated from free flowing material or hazards inside the discharge area.
4. Disconnect air hoses. Remove standard end cap, spring, and piston.
5. Check to see that the discharge is clear. Any restriction in the discharge path will directly effect the air cannon's performance.
6. Make sure the piston seat has a clean and smooth mating surface for the new piston.





7. Once the valve is clean and dry, install new piston and spring.



8. Apply grease to the o-ring groove. Place the Martin[®] Tornado Retrofit Valve against the spring, and install bolts while making sure o-ring stays secure.
9. Tighten bolts and run air lines to the Martin[®] Tornado Retrofit Valve. Position pipe elbows down so they do not collect any dirt.
 - a. For single solenoid operation follow step 10.
 - b. For solenoid enclosure operation, see Figure 1.



10. The original normally-opened solenoid line will be used as the new air fill line.
11. From the solenoid exhaust port connect the control line.

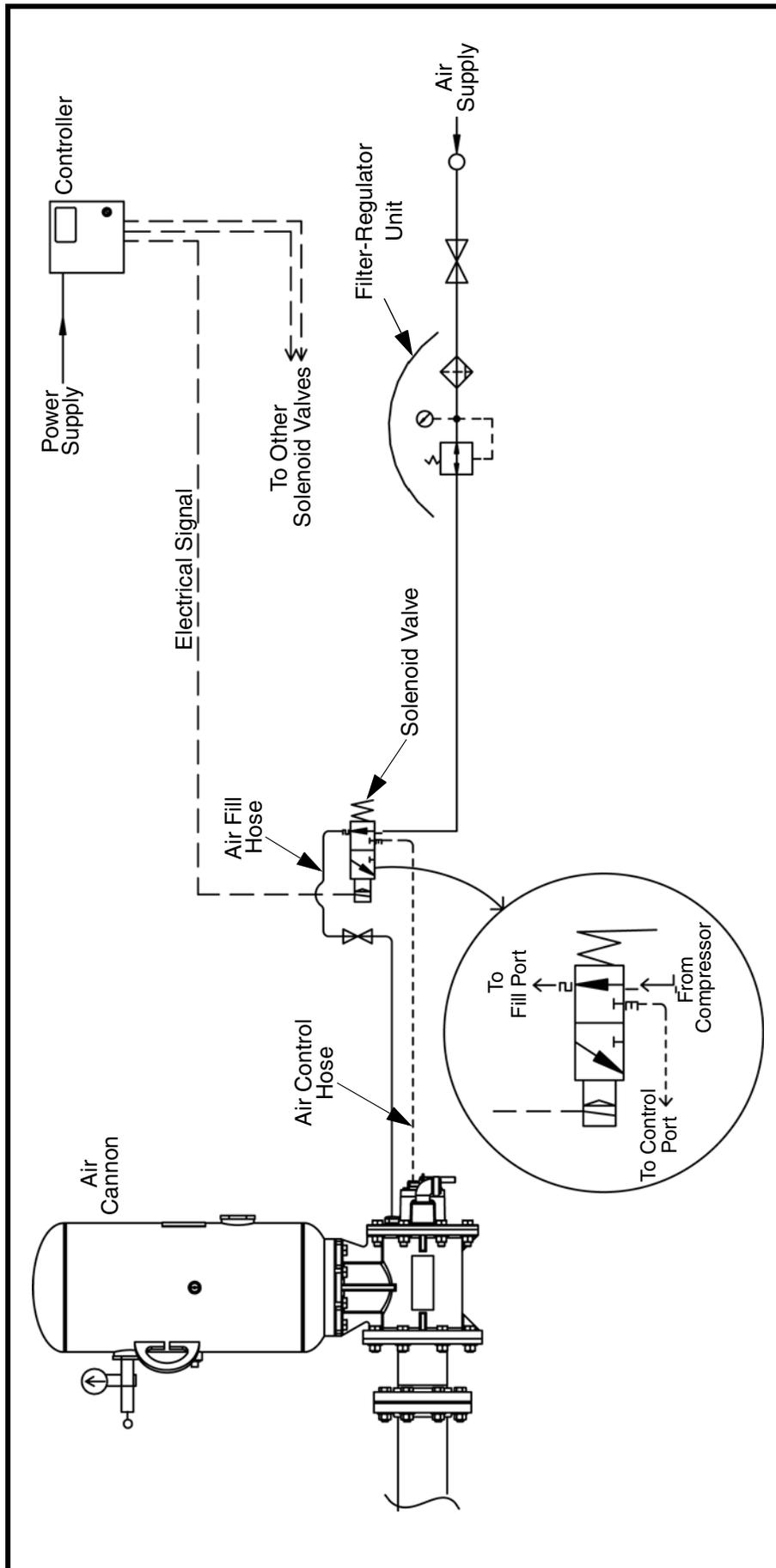
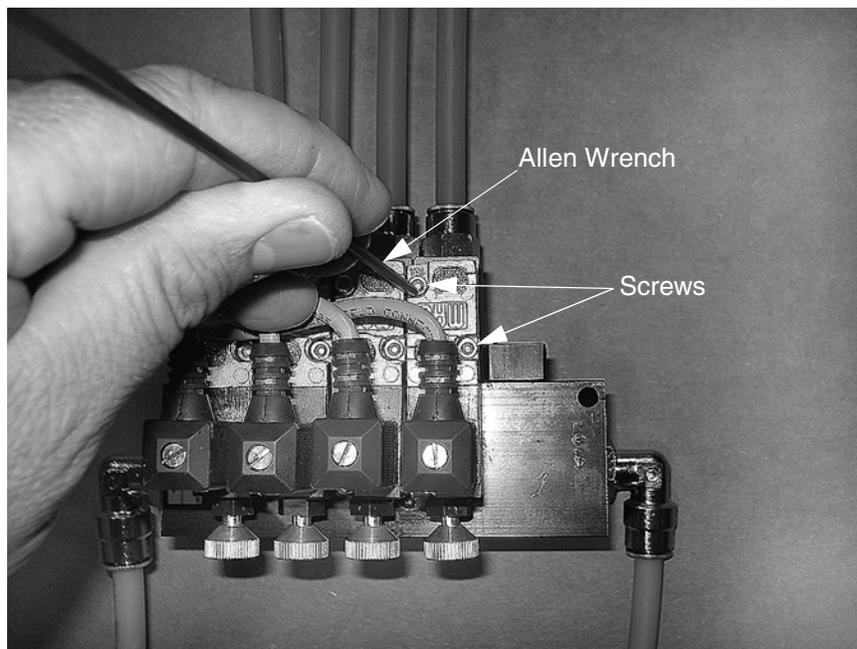
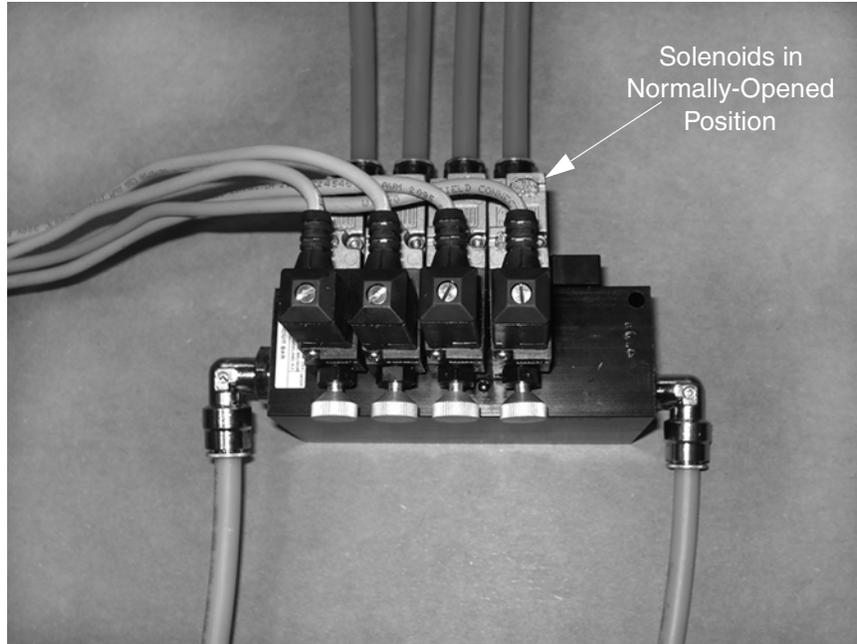


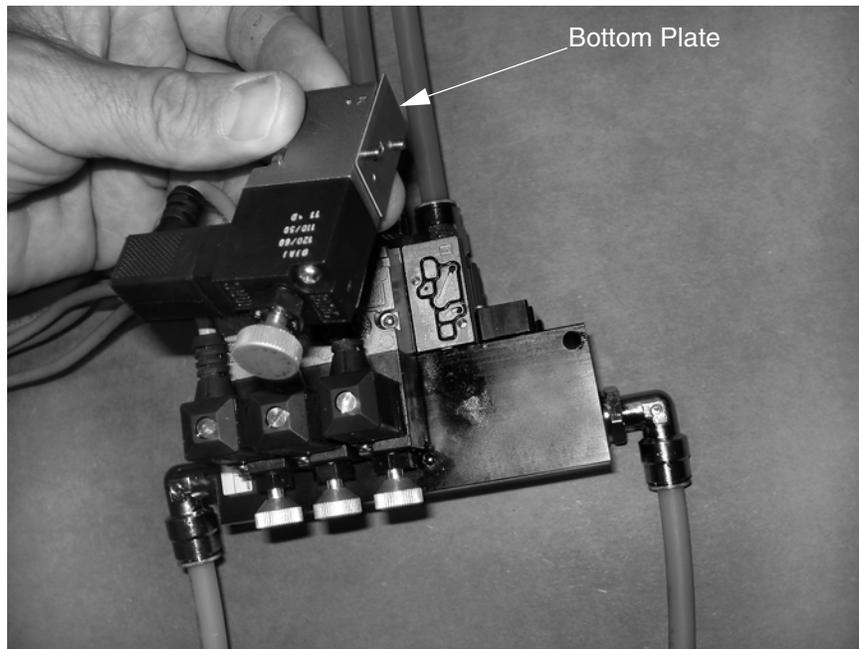
Figure 1. Normally-Opened Solenoid Plumbing Schematic

Solenoid Enclosure Conversion Procedure

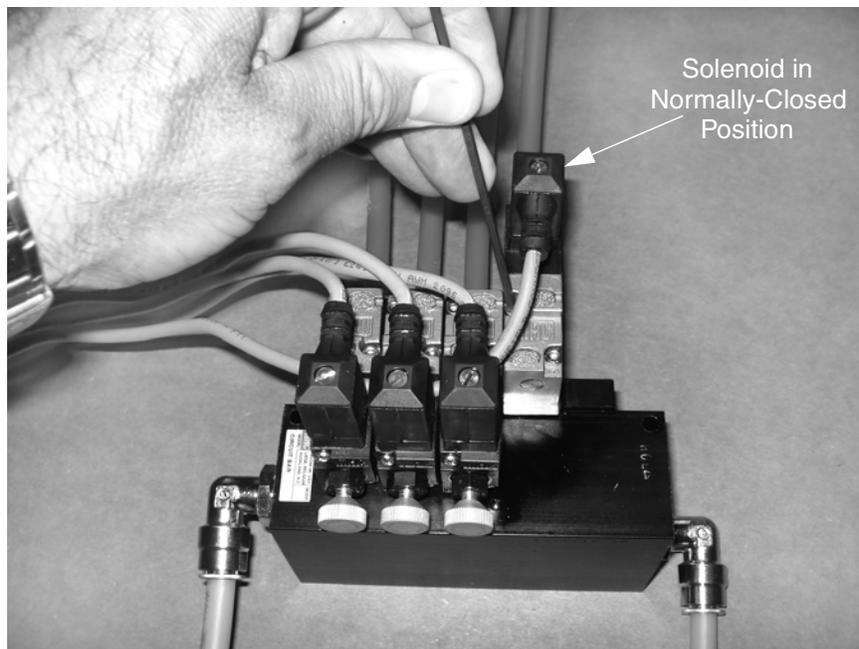
This procedure shows how to convert the normally-opened solenoid enclosure to normally closed, by relocating the pilot valve.



1. Remove two screws from solenoid using a 2.5-mm Allen wrench.



2. Remove the solenoid and bottom plate. Make sure the position of the bottom plate does not change with respect to the solenoid. Leave screws extended through plate to maintain proper position.



3. Rotate solenoid 180 degrees. Reinstall screws and tighten. Repeat this procedure for each solenoid to place all solenoids in the normally-closed position.

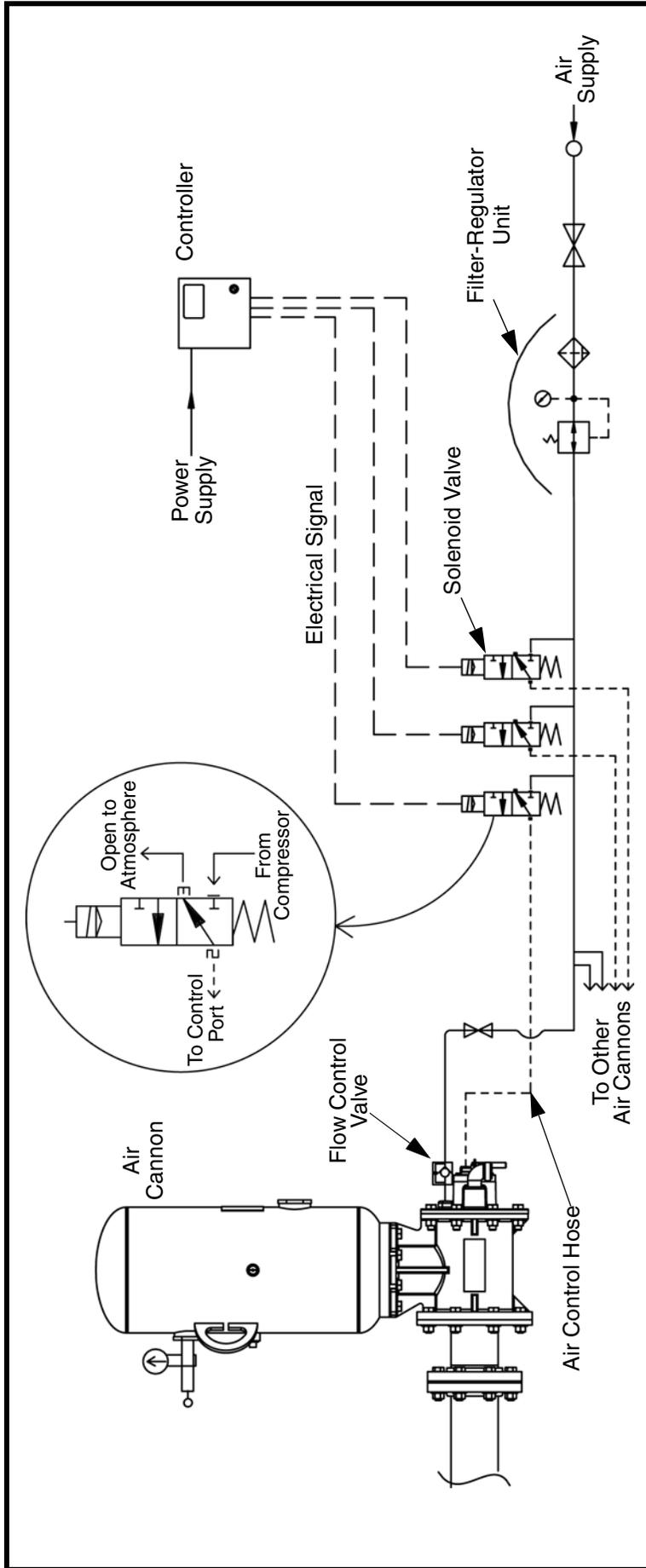


Figure 2. Normally-Closed Solenoid Plumbing Schematic

In the normal state, the solenoid pressurizes the tank through the fill line. When the solenoid is actuated, air is routed through the control line, which fires the Martin[®] Tornado Retrofit Valve.

⚠ WARNING

Do not exceed 125 psi (8.62 bar) maximum working pressure or the pressure relief valve will open. Minimum recommended pressure for most applications is 80 psi (5.52 bar), but lower pressures can be used.

⚠ WARNING

The pressure relief valve may relieve at any point between 90% and 100% of set pressure. Exceeding the Maximum Allowable Working Pressure (MAWP) of the tank can cause it to rupture.

NOTE

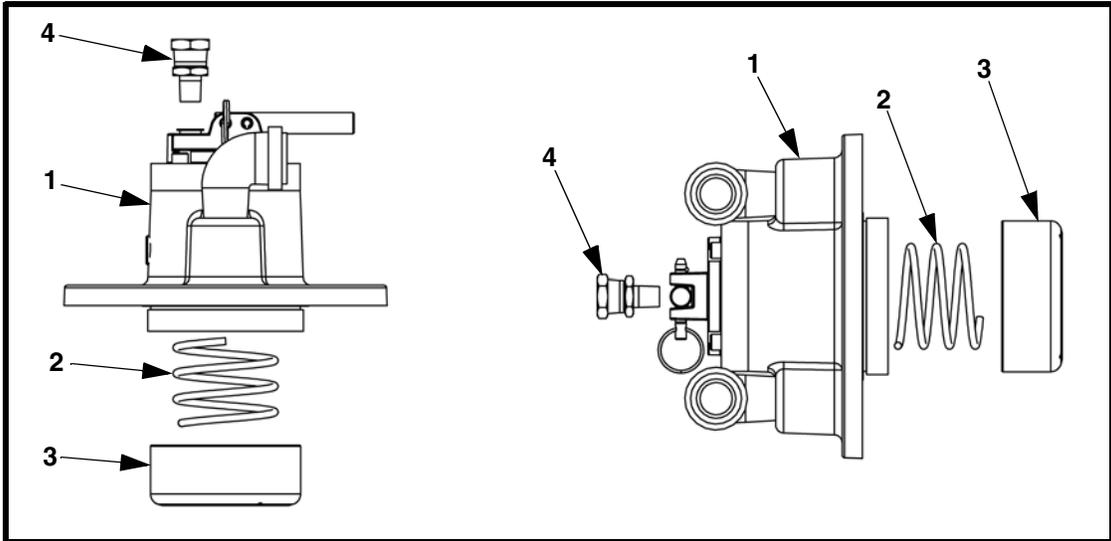
Pressure relief valves of up to 150 psi are available from Martin Engineering. Consult the Maximum Allowable Working Pressure (MAWP) on the tank's name plate before substituting a different pressure relief valve. Never use a pressure relief valve with a set pressure that is higher than the MAWP of the tank.

Charge air cannon to original air pressure specification and check for air leaks in piping system.

⚠ WARNING

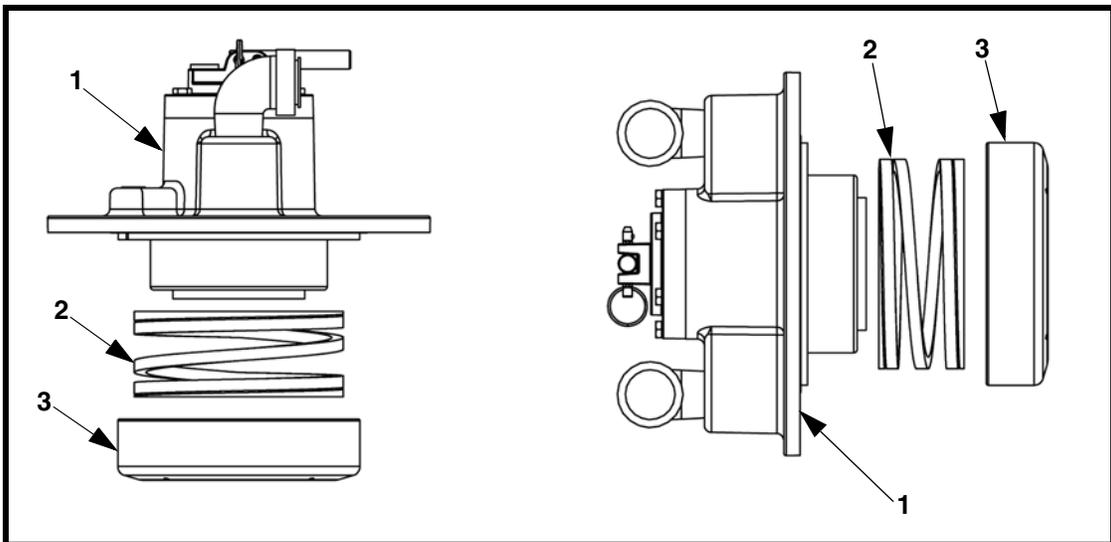
Air cannon may produce loud noise when blasting. Wear ear protection to avoid impairment or loss of hearing.

Blast air cannon five times to ensure proper operation. Allow tank to fill after each blast. If air cannon blasts properly, continue to operate as needed. If air cannon does not blast properly, contact Martin Engineering for assistance.



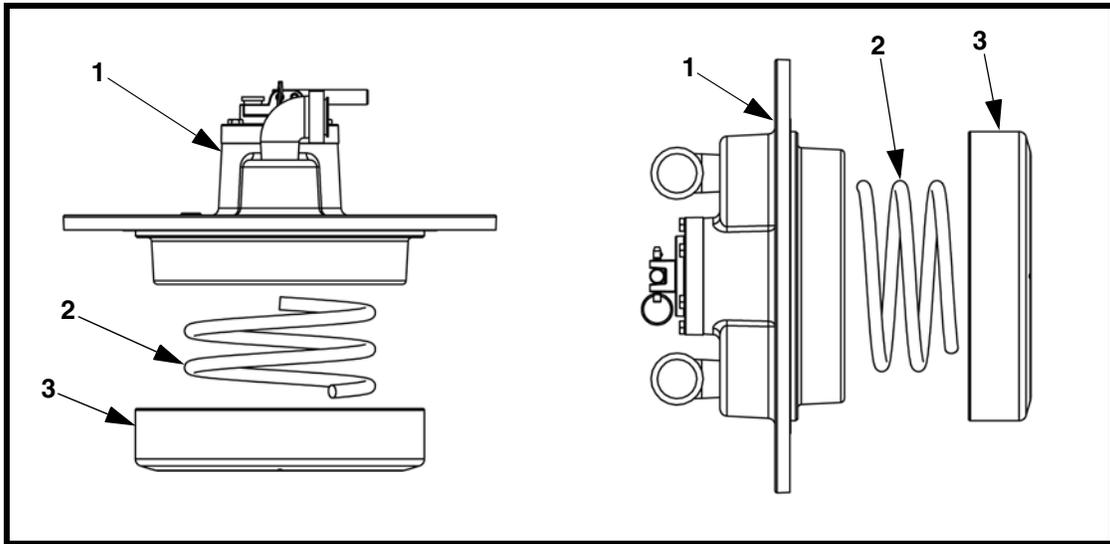
Martin® Tornado Retrofit Valve, P/N 37849

Item	Qty.	Description	Part Number
1	1	2.00" Valve Cap Assembly	37984
2	1	Compression Spring	35865
3	1	Piston with Urethane	37961
4	1	Swivel Fitting 1/4 NPTM x 3/8 NPTF	38010
5	1	Operator's Manual	M3712



Martin® Tornado Retrofit Valve, P/N 37733

Item	Qty.	Description	Part Number
1	1	4.00" Valve Cap Assembly	37985
2	1	Compression Spring	35077
3	1	Piston with Urethane	37962
4	1	Operator's Manual	M3712

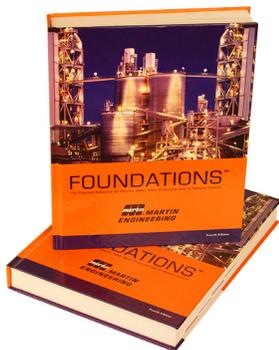


Martin® Tornado Retrofit Valve Upgrade Kit, P/N 37850

Item	Qty.	Description	Part Number
1	1	6.00" Valve Cap Assembly	37986
2	1	Compression Spring	36167
3	1	Piston with Urethane	37963
4	1	Operator's Manual	M3712

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For nearly 20 years, Martin Engineering's Foundations™ Books have taught industry personnel to operate and maintain clean and safe belt conveyors. The Foundations™ Book, fourth edition, focuses on improving belt conveyors by controlling fugitive material. "The Practical Resource for Total Dust and Material Control," is a 576-page hard cover volume that provides information of value to industries where the efficient handling of bulk materials is a key to productivity and profitability.

Expanding upon the book, our Foundations™ Training Program addresses the design and development of more productive belt conveyors, and is offered in three customizable seminars. Attendees gain a better understanding of conveyor safety and performance, helping to justify upgrade investments and increase profitability.



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