

June 2015

# Type P810 Electrical Release for Type N550/ N551 Emergency Shutoff Valve (ESV) Anhydrous Ammonia (NH<sub>3</sub>) Service



## WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Equipment must be installed, operated and maintained in accordance with federal, state and local codes and these instructions. The installation in most states must also comply with NFPA No. 70 and ANSI K61.1, (CGA G-2.1) standards or local authority having jurisdiction.

Only personnel trained in the proper procedures, codes, standards and regulations of the applicable industries shall install and service this equipment.

The Type P810 electrical release can be used for Anhydrous Ammonia applications only. Do not use with any indoor or enclosed NH<sub>3</sub> application, any LPG application or any other hazardous location.

## Things to Tell the Customer:

1. Type P810 electrical release can be used for OUTDOOR ANHYDROUS AMMONIA APPLICATIONS ONLY. Do not use with any indoor or enclosed NH<sub>3</sub> application or with any LPG application.
2. Inform the customer that the electromagnet and strike plate contact surfaces must remain clean. Check that contact surfaces are clean of any dirt, grease, oil or debris before opening valve and latching of the handle.



Figure 1. Type P810 Parts Kit

## Introduction

### Scope of the Manual

This instruction manual covers installation and parts ordering information for the Type P810 electrical release for Type N550/N551 emergency shutoff valves in outdoor Anhydrous Ammonia (NH<sub>3</sub>) applications.

### Description

Type P810 Kit (Figure 1) is designed to assemble onto any size of Type N550/N551 ESV. Type P810 electrical release is an electromagnetic release mechanism designed to latch open the Type N550/N551 in the energized state. When Type P810 is de-energized, it unlatches the handle from the electromagnet to quickly close the Type N550/N551 emergency shutoff valve.

# Type P810

## Specifications

The Specifications section lists specification for the Type P810 Electrical Release Actuator that is designed for Anhydrous Ammonia (NH<sub>3</sub>) service at ambient temperatures. For a copy of instructions or additional inquiries, please call Squibb-Taylor at + 1 800 345 8105.

### Electrical Specifications

**Rated Voltage:** 12 VDC  
**Operating Voltage Range:** 11 to 13.2 VDC  
**Resistance:** 20.5 ohms ± 10% at 68°F / 20°C  
**Ampere at Rated Volts:** 0.58 A at 68°F / 20°C  
**Watts at Rated Volts:** 7.0 W at 68°F / 20°C  
**Holding Force:** 140 lbf at 68°F / 20°C  
**Duty Cycle:** Continuous

### Electromagnet Wire Lead Specifications

**Complies with:** UL 1015  
**Cable Type:** Stranded Conductor  
**Cable Specifications:** AWG 18  
**Maximum Amperage:** 3.7 A  
**Maximum Resistance at 71°F:** 6.64 Ω/1000 ft

### Customer Wiring Requirements<sup>(1)</sup>

See Recommended Wire Size (AWG) gauge in Table 1 or per local electrical codes and authority having jurisdiction.

### Connection of Electromagnet Wire Lead to Customer Wiring Requirement<sup>(1)</sup>

Connections shall be per ANSI/NFPA 70, National Electrical Code or local electrical codes and authority having jurisdiction.

### Operating Temperature<sup>(2)</sup>

-40 to 140°F / -40 to 60°C

1. Electrical equipment and wiring for use in ammonia installations shall be general purpose or weather resistant as appropriate.
2. The temperature limits in this Instruction Manual and any applicable standard limitation should not be exceeded.

**Table 1. Recommended Wire Size (AWG) Per Number of Units Installed at Distance**

RECOMMENDED MINIMUM WIRE SIZE <sup>(2)(3)</sup> [AWG]																	
	One-Way Length of Wire <sup>(1)</sup> (ft)																
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150		
NUMBER OF UNITS	1	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0.58
	2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1.16
	3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1.74
	4	12	12	12	12	12	12	12	12	12	12	12	12	12	10	10	2.32
	5	12	12	12	12	12	12	12	12	12	12	10	10	10	10	10	2.90
	6	12	12	12	12	12	12	12	12	12	10	10	10	10	10	8	3.48
	7	12	12	12	12	12	12	12	10	10	10	10	10	8	8	8	4.06
	8	12	12	12	12	12	12	10	10	10	10	8	8	8	8	8	4.64
	9	12	12	12	12	12	12	10	10	10	8	8	8	8	8	8	5.22
	10	12	12	12	12	12	10	10	10	8	8	8	8	8	6	6	5.80
	11	12	12	12	12	10	10	10	8	8	8	8	8	6	6	6	6.38
	12	12	12	12	12	10	10	10	8	8	8	8	6	6	6	6	6.96
	13	12	12	12	12	10	10	8	8	8	8	6	6	6	6	6	7.54
	14	12	12	12	10	10	10	8	8	8	6	6	6	6	6	6	8.12
	15	12	12	12	10	10	8	8	8	8	6	6	6	6	6	4	8.70

- Gray areas indicate that the AWG values are limited by NFPA 70 recommended minimum wire size, check local code for requirements.  
 1. Wire length is measured from the electromagnet(s) to the power source, in-and-out nature of circuits is accounted for.  
 2. Wire resistivity based on solid copper wire at 68°F / 20°C.  
 3. Wire size based on 1 VDC allowable voltage drop with 12 VDC nominal supply.

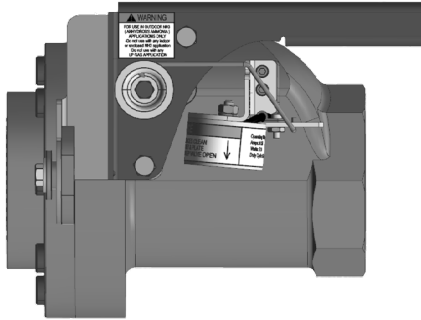


Figure 2. "Closed" / De-Energized Unlatched Position

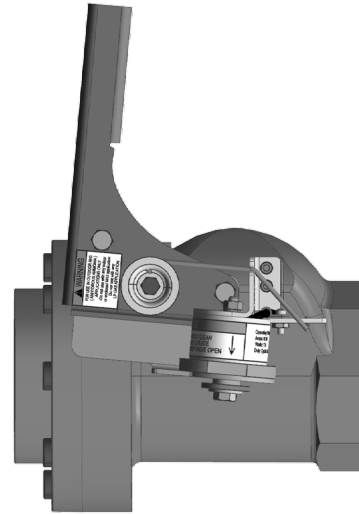


Figure 3. "Open" / Energized Latched Position

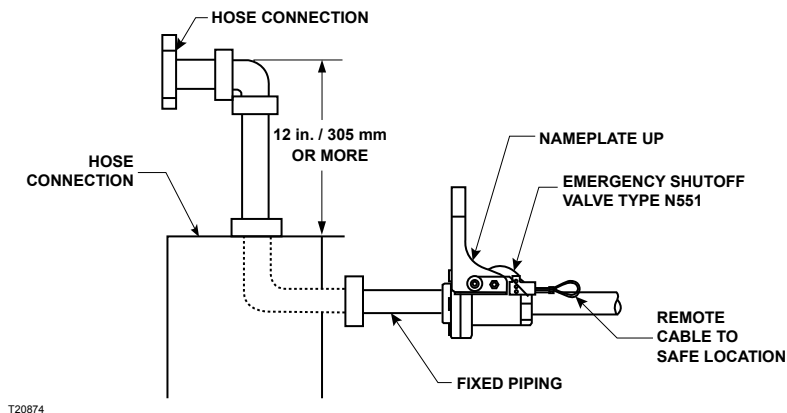


Figure 4. Typical Installation of Type N551 Using Remote Cable Release

## Operation



The Type N550/N551 handle and shaft may break if the valve is forced open against the gas flow and before pressure is equalized on each side of the main valve disk.

Because the valve is spring closed (aided by pressure), the handle can snap down with considerable force when closing. Keep hands and fingers away from the handle as it closes when electrical power is turned off.

### To Open a Closed Valve:

Close a shutoff valve downstream of the Type N550/ N551. Turn the electrical power on. Pull the Type N550/ N551 handle counterclockwise. There is an opening as

inlet pressure helps hold the valve disk closed against the seat. The initial opening force applied to the handle causes a pilot valve on the main disc to open, permitting pressure to build-up downstream. When differential pressure across the main disk has been reduced, the Type N550/N551 can be opened without further difficulty by continuing to rotate the handle to the open position. When the handle is fully open (handle perpendicular to the pipe), the electromagnetic force of the magnet latches against the strike plate and holds the valve open.

### To Close an Opened Valve:

Pushing the handle down (handle parallel to the pipe) closes the valve. From a remote location, turn the electrical power off. The electromagnet de-energizes causing the magnet to lose its magnetic field. Due to loss of magnetic field, the magnet unlatches from the strike plate. The closing spring causes the valve to close.

# Type P810

## Installation



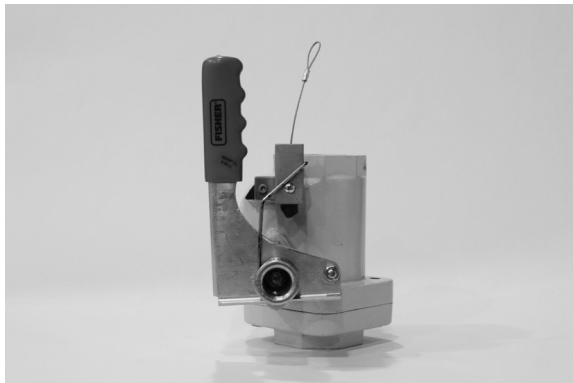
### WARNING

Before starting any type of maintenance, close off the upstream valves and remove all Anhydrous Ammonia (NH<sub>3</sub>) pressure from both the inlet and outlet of the Type N550/N551 Emergency Shutoff Valve.

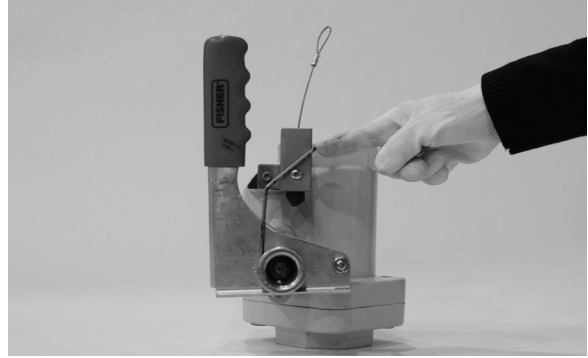
Do not remove the two Type N550/N551 bolts retaining the steel packing retainer plate. If other maintenance or repairs are to be made on the Type N550/N551, then isolate the valve and remove all the pressure before making those repairs.

The Type N550/N551 valve must be in the closed position (handle parallel to pipe) before removing any bolts or cap screws during the installation procedure.

**Installation of a Type P810 Retrofit Kit on a Type N550/N551 ESV with Remote Cable Release. Installation is illustrated with the ESV mounted vertically with outlet down.**



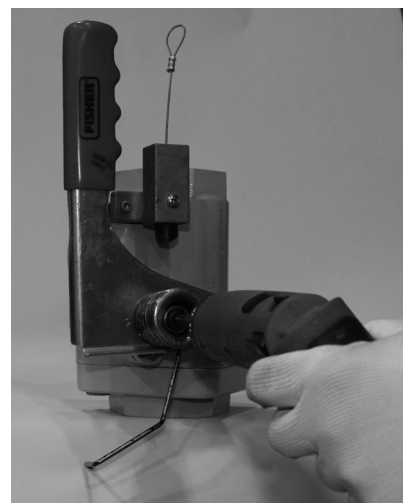
**Step 1.** Close the Type N550/N551 valve. Handle is parallel to the pipe.



**Step 2.** Remove long end of spring from latch block. Allow long end of spring to unwind approximately 1/2-turn counterclockwise, relaxing tension on external spring.

#### Note

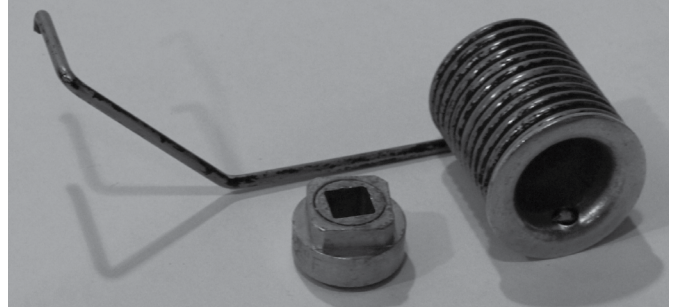
Before unwinding the spring, the position of the spring engaged in the spring mandrel will be to the right or down towards the outlet connection.



**Step 3.** Remove the mandrel bolt that holds the spring mandrel and handle to the shaft. Use a 7/16-inch shallow socket to remove the mandrel bolt.



**Step 4.** Save the mandrel/handle bolt. It will be reused during reassembly of the spring mandrel to the new handle assembly.



**Step 7.** Save spring mandrel, torsion spring and fuse link, as they will be reused during re-assembly.

**Note**

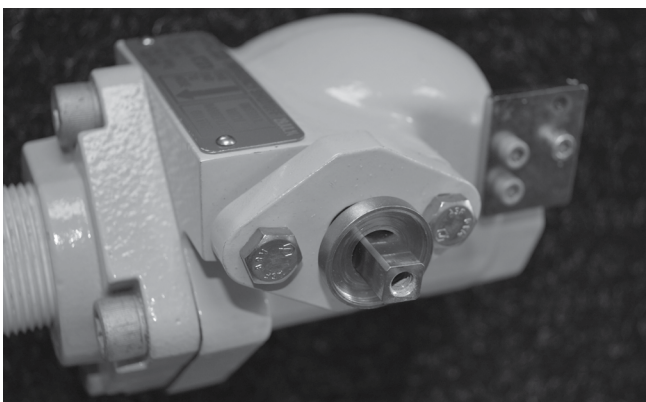
**Inspect the internal and external parts of the fuse link for wear and/or corrosion. Replace if necessary.**



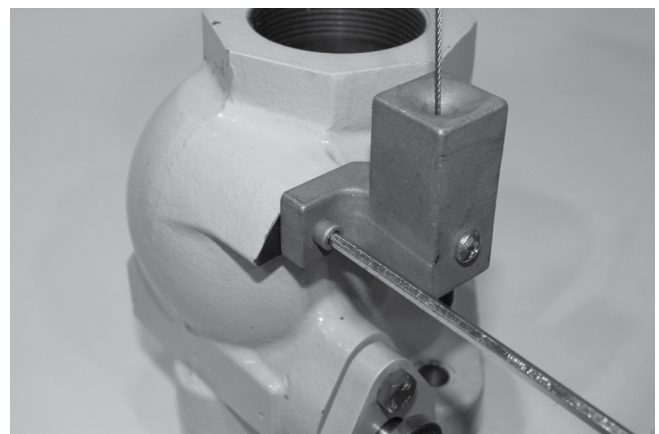
**Step 5.** Remove spring mandrel, torsion spring, fuse link and handle.



**Step 8.** Discard aluminum handle, Optional: Red plastic handle cover may be saved for reassembly onto new Type P810 green handle.



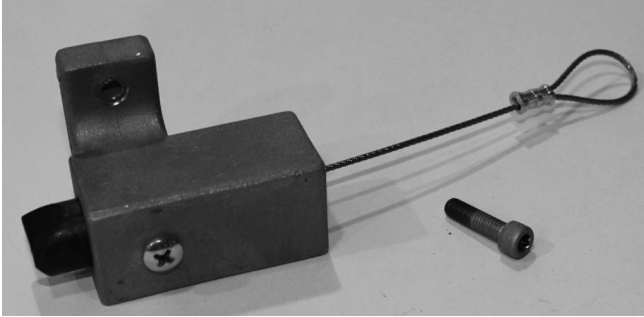
**Step 6.** Leave circular retainer on shaft.



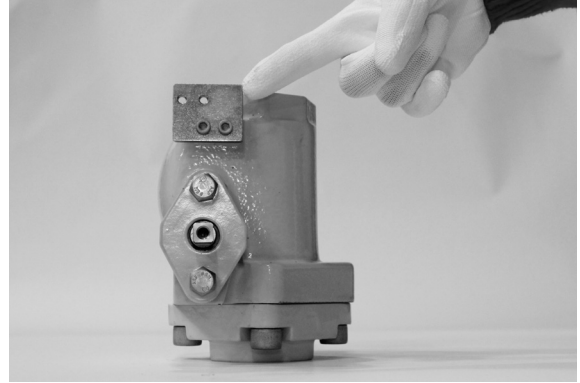
**Step 9.** Remove bolt from latch block using a 5/32-inch Allen head wrench.



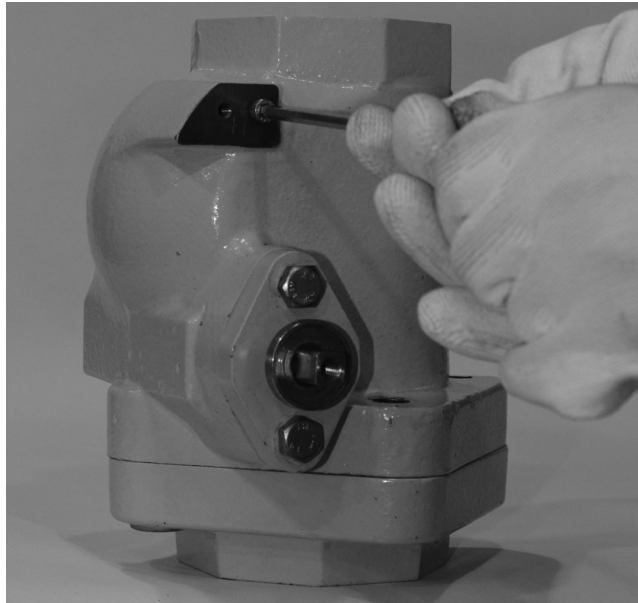
# Type P810



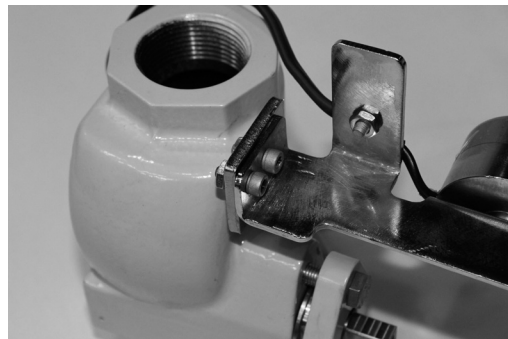
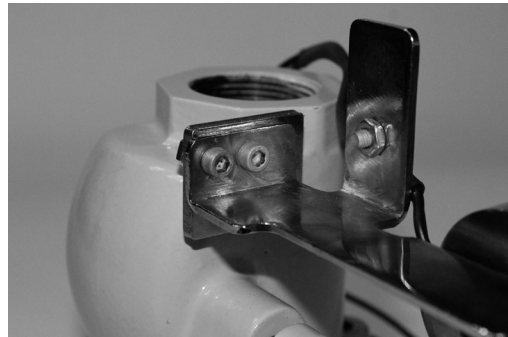
**Step 10.** Discard the 3/4-inch screw and latch block.



**Step 13a.** When assembling the Type P810 onto a 1-1/4-inch Type N550/N551-10 ESV, retain the use of the existing adaptor plate and the two cap screws that hold the adaptor plate onto the 1-1/4-inch body.



**Step 11.** Remove secondary positioning bolt on body using a 5/32-inch Allen head wrench.

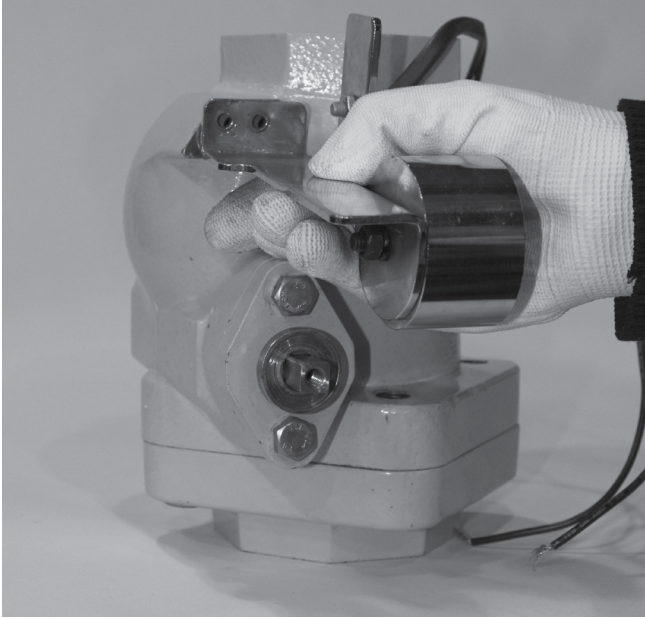


**Step 12.** Discard the 1/4-inch screw.

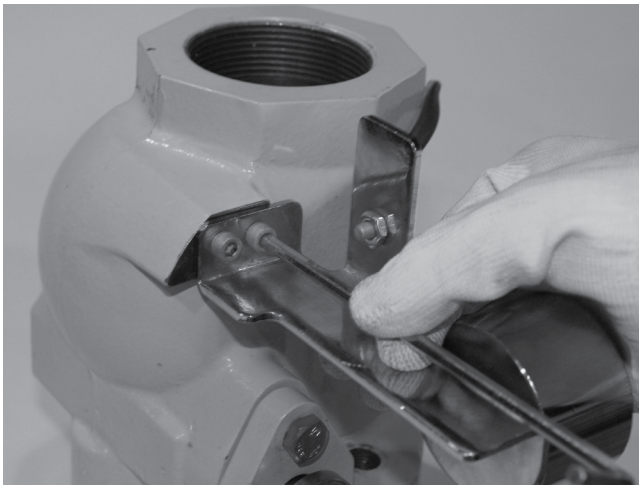
**Step 13b.** Assemble electromagnet support bracket (key 1) onto existing adapter plate's top two holes with two new hex head cap screws (key 2) and hex nuts (key 3). Firmly tighten screws and nuts using a 5/32-inch Allen head wrench, with 35 to 55 inch-lbs / 4 to 6 N•m of torque. For Type N550/N551-10, skip to Step 16.

## Note

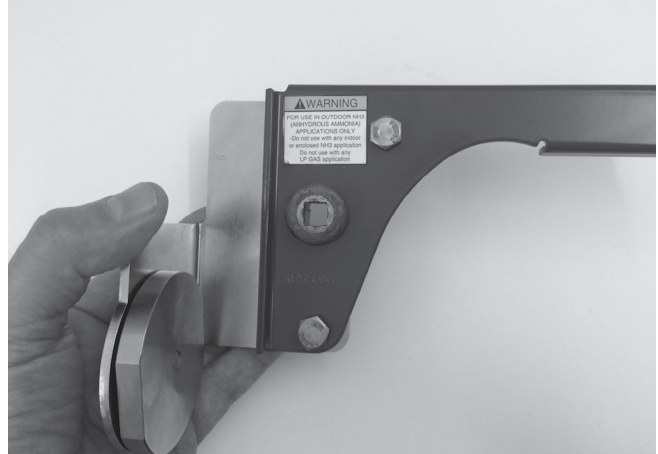
When assembling on a 1-1/4-inch size Type N550/N551-10 ESV, follow steps 13a to 13b. If assembling with a Type N550/N551-16 (2 inch) or Type N550/N551-24 (3 inch) ESV, skip to Step 14.



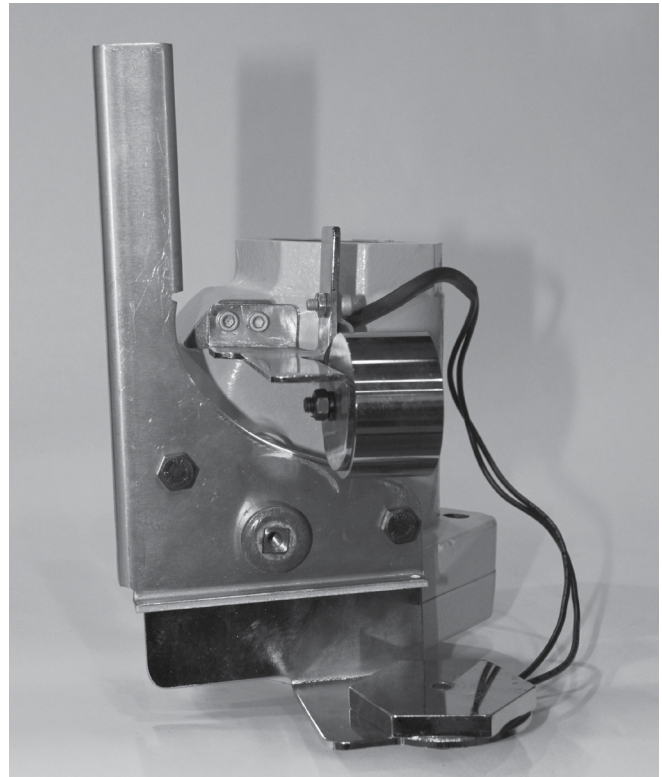
**Step 14.** Place electromagnet bracket support (key 1) onto the valve body with magnet to the right and assembly holes tab upward, when the ESV is mounted vertically and outlet is on bottom. Check holes in bracket for alignment with holes in valve body.



**Step 15.** Install two each 1/2-inch / 13 mm length screws (key 2) through the support holes and firmly tighten them with 35 to 55 inch-lbs / 4 to 6 N•m of torque, using a 5/32-inch Allen head wrench.



**Step 16.** Place square end of fuse link into new handle assembly (key 12) that has strike plate assembled. Insert the fuse link into the handle side with the WARNING label and strike plate.



**Step 17.** Place handle and fuse link over valve shaft. Be sure that the circular retainer is still in place on the valve shaft before assembling new handle/strike plate assembly. **Handle must point towards valve inlet, parallel with the piping.**

# Type P810

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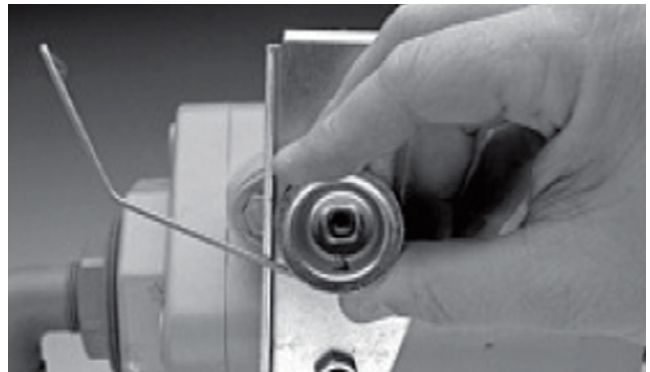


**Step 18.** Install spring mandrel and external torsion spring so that the square end of the spring mandrel fits in the square hole in the fuse link.

**Step 19. Important:**

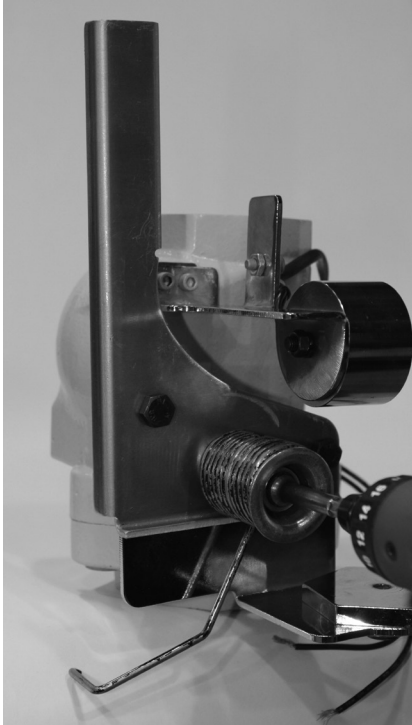


**For Mounting Vertically** - The side hole holding the short torsion spring end inside the mandrel should be pointed to the right, when the ESV handle is parallel with the piping with the ESV inlet up and outlet down, before affixing the spring mandrel bolt.

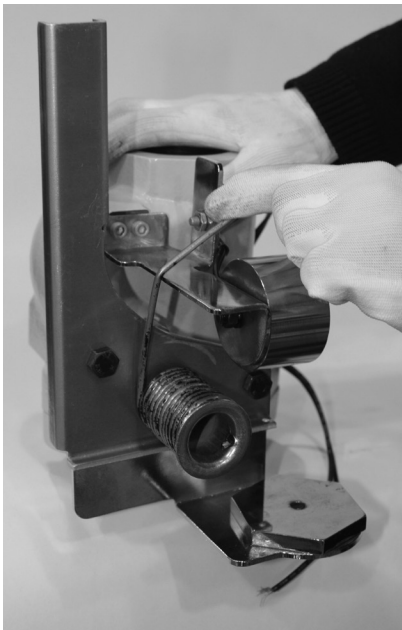


**For Mounting Horizontally** - The side hole holding the short torsion spring end inside the mandrel should be pointed down, when the ESV handle is parallel with the piping.

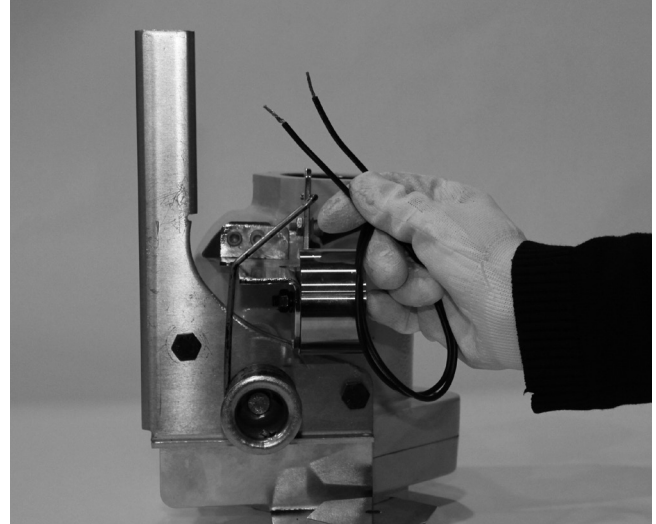




**Step 20.** Reinstall the spring mandrel bolt and firmly tighten with 8 to 11 ft-lbs / 11 to 15 N•m of torque, using a 7/16-inch shallow socket.



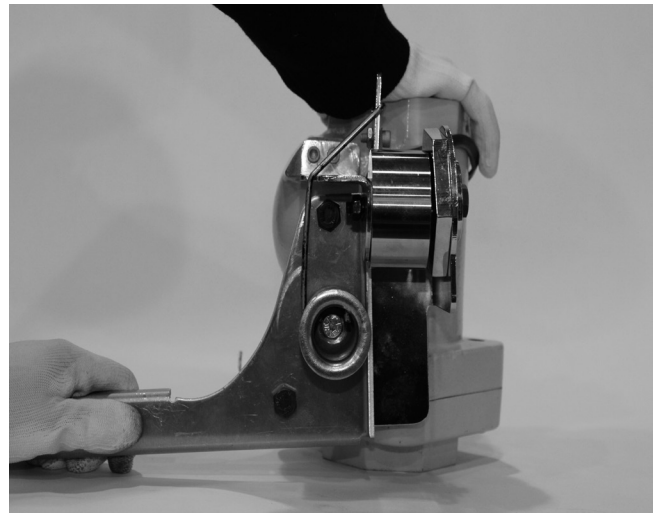
**Step 21.** Reassemble long end of spring to the far side of the electromagnetic support by rotating 180 degrees clockwise and latching external spring onto electromagnetic bracket (key 1), near and just above cable clamp (key 9).



**Step 22.** Connect electromagnet cable to the 12 V DC system and turn on voltage to the electromagnet (key 4).

 **CAUTION**

**Handle closes quickly and with extreme force. Keep hands and fingers away from handle as it closes.**



**Step 23.** Rotate handle counterclockwise to open valve. Strike plate (key 17) should latch against surface of electromagnet and stay attached to surface of strike plate while voltage is applied. Valve must stay open. **UPON DE-ENERGIZING THE ELECTROMAGNET, THE HANDLE AND VALVE MUST QUICKLY “SNAP” CLOSED.** The handle and valve must quickly rotate and close either when (a) the power source is turned off or (b) the handle is pushed closed from the latched open position.

# Type P810

## Maintenance



### WARNING

**Before starting any type of maintenance or repair, close off the upstream valves and remove all Anhydrous Ammonia (NH<sub>3</sub>) pressure from both the inlet and outlet of the Type N550/N551 Emergency Shutoff Valve.**

**A Type P810 electrical release that has been disassembled for repair must be tested for proper operation before being returned to service.**

**At least once a month, inspect and check the following things:**

1. See that the electrical release is properly connected, works freely and is not worn. Make sure that the handle and strike plate are working smoothly.
2. Make sure there are no obstructions or debris to block the valve and handle from closing when the electromagnet is de-energized.
3. When opening the valve make sure there are no impurities or debris on the contact surface between the electromagnet and strike plate.
4. Turn on the voltage to the Type P810 electrical release, rotate the handle counterclockwise to open the valve. Verify that the strike plate remains latched against the surface of the electromagnet and stays attached to the surface of the electromagnet while voltage is applied. Then interrupt the power to the electromagnet. Turn off the voltage supplied to the electromagnet and verify that the handle and valve quickly snaps closed.

## Replacing Parts

The Type P810 electrical release can be repaired in the field. However, due to the special electrical and assembly techniques required, contact Squibb-Taylor for information and assistance, 1-800-345-8105 if repair should become necessary.

Only parts provided by Squibb-Taylor should be used for the repair of the Type P810 electrical release. Be sure to give the complete type number when corresponding with your local distributor.

## Parts Ordering

When corresponding with your local Sales Distributor about this equipment, be sure to include the type number and other information stamped on the nameplate.

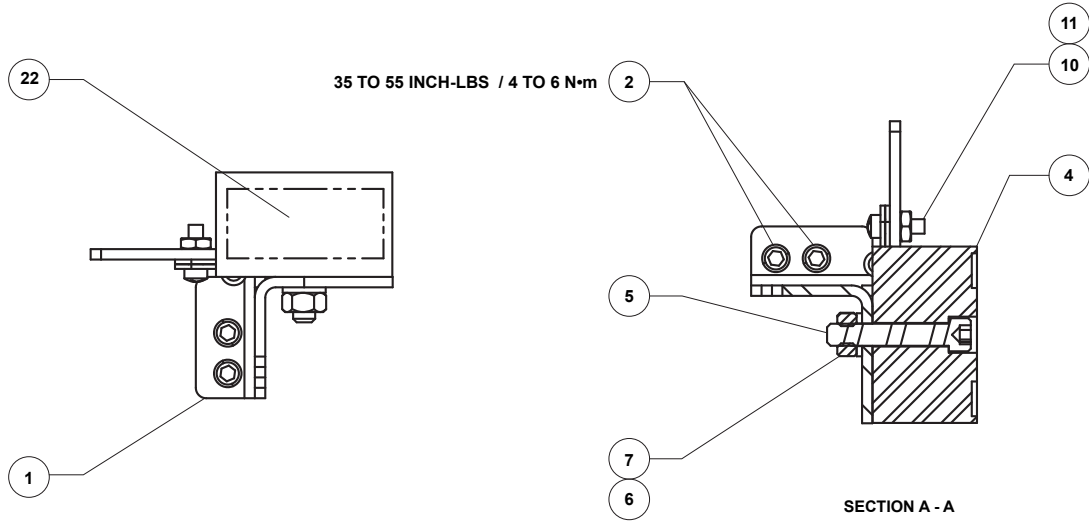
## Parts List

### Electromagnet Support Assembly (Figures 5a and 5b)

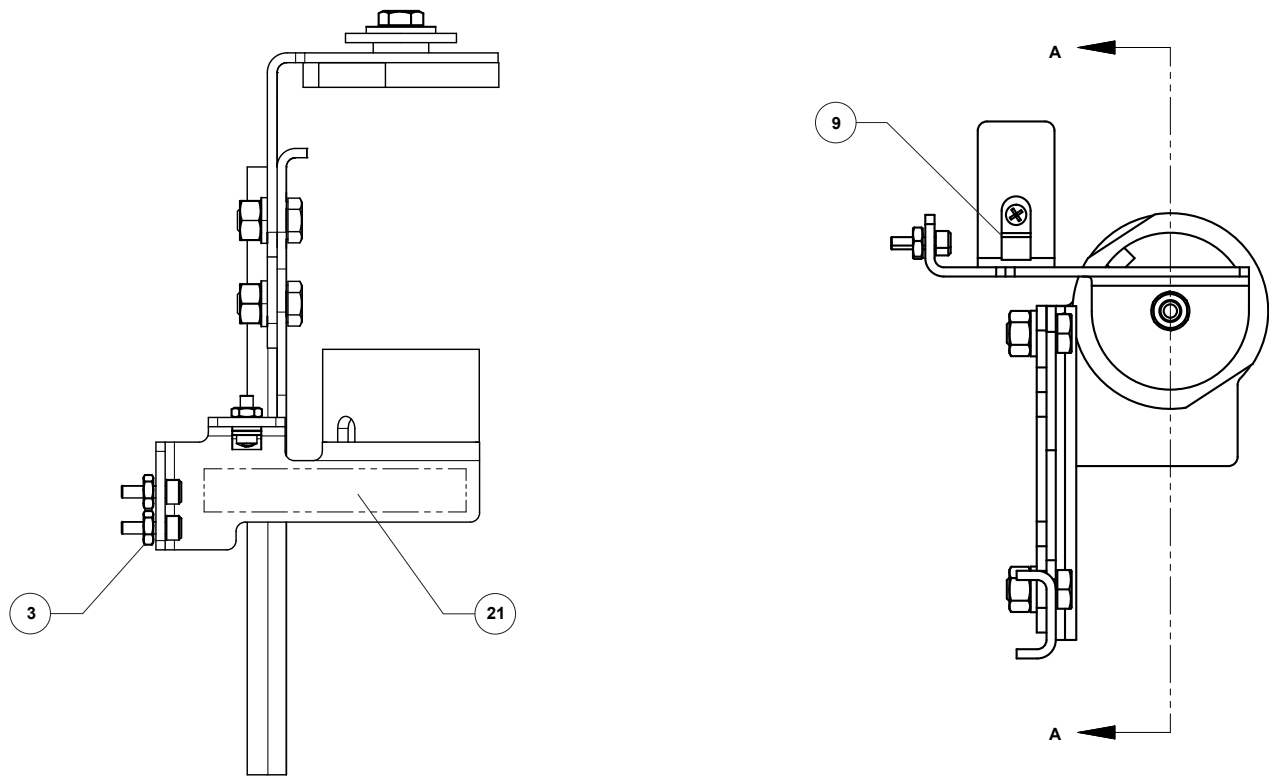
Key	Description
1	Electromagnet Support, Carbon steel
2	Cap screw, Steel (2 required)
3	Hex Nut, Carbon steel (2 required; Type N550/N551-10 only)
4	Electromagnet Assembly
5	Cap Screw, Stainless steel
6	Spring Lockwasher, Stainless steel
7	Hex Nut, Stainless steel
9	Cable Clamp, Nylon (PA)
10	Machined Screw, Carbon steel
11	Hex Nut, Carbon steel
21	Label, Caution
22	Label, Notice

### Strike Plate and Handle Assembly (Figure 6)

Key	Description
12	Handle, Aluminum, (Green)
13	Strike Plate Bracket, Carbon steel
14	Hex Head Cap Screw, Stainless steel (3 required)
15	Lock Spring Washer, Stainless steel (2 required)
16	Hex Nut, Stainless steel (2 required)
17	Strike Plate, Carbon steel
18	Strike Plate Retainer, Steel
19	Plain Washer, Carbon steel
23	Label, Warning

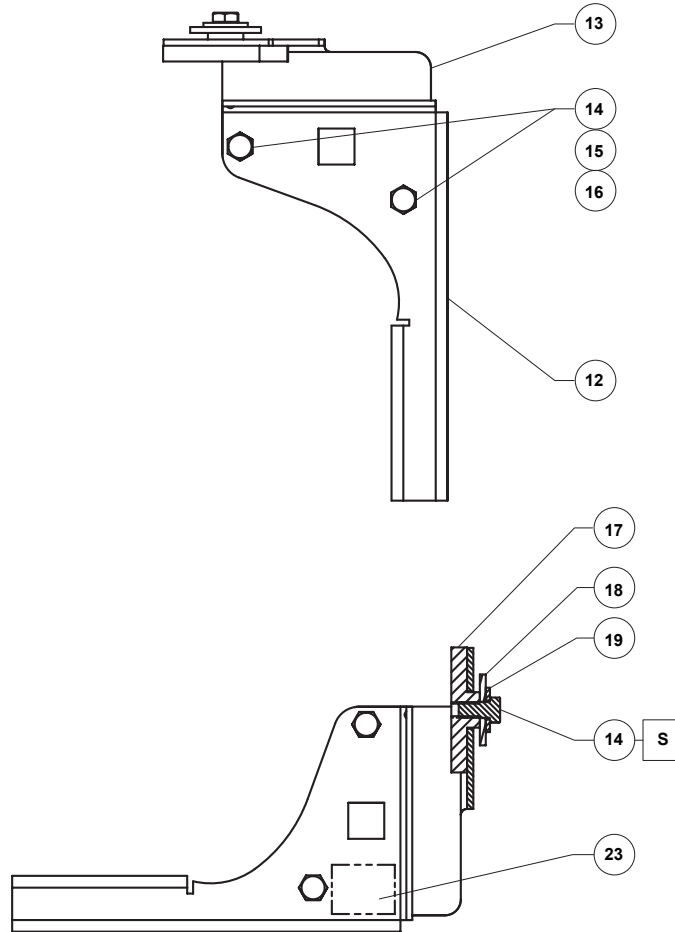


**Figure 5a. Electromagnet Support Assembly**



**Figure 5b. Electromagnet Support and Strike Plate/Handle Assembly**

# Type P810



□ APPLY SEALANT<sup>(1)</sup>:

S = MEDIUM STRENGTH THREADLOCKER

1. Sealant must be selected such that they meet the temperature requirements.

**Figure 6. Strike Plate and Handle Assembly**

**Manufactured for Squibb-Taylor**

**For a copy of instructions or additional inquiries, please call Squibb-Taylor at + 1 800 345 8105.**

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