

**RLX II CONTROL HANDLE  
MANUAL #10574**

**MC FILE NUMBER: 733-0186  
DATE OF ISSUE: 01/86  
REVISION: G. 01/99**

** WARNING**

**Do not proceed with these instructions until you have READ the orange cover of this MANUAL and YOU UNDERSTAND its content.\* These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.**

**\*If you are using a Clemco Distributor Parts and Maintenance Guide refer to the orange warnings insert preceding the Index before continuing with the following instructions.**

© CLEMCO INDUSTRIES CORP.  
One Cable Car Drive  
Washington, MO 63090  
Phone (636) 239-4300  
Fax (636) 239-0788  
[www.clemcoindustries.com](http://www.clemcoindustries.com)



**1.0 INTRODUCTION**

**1.1 Scope**

**1.1.1** This Owner’s Manual covers the installation, operation and maintenance of the following models of Clemco RLX Pneumatic and Electric Control Handles.

<b>Description</b>	<b>Stock no.</b>
RLX II Pneumatic .....	10565
RLX II Pneumatic with ACS Toggle Switch .....	07625
RLX Electric assembly w/Lo-Profile connector .....	10840
RLX Electric assembly w/Twist-Lock connector ...	05801

**1.1.2** This manual contains instructions common to both the pneumatic and electric control handles. Read them before proceeding to the section relating specifically to electric or pneumatic model.

**1.1.3** This manual covers the RLX Remote Control Handle only. The operator must be trained in the safe operation of remote control system, blast machine, and all other equipment used. The operator must know about the hazards associated with abrasive blasting. To ensure safe blasting, before using the control handle, read the manuals for the specific blast machine, remote controls and accessories used.

**1.1.4** The RLX II Pneumatic, the RLX, and the earlier RLV Recova-Loks are interchangeable when used as complete units. The spare parts for these units, however, are not interchangeable.

**1.2 Hazard Alerts**

**1.2.1** Clemco uses signal words, based on ANSI Z535.2-1991, to alert the user of potentially hazardous situations that may be encountered while operating this equipment. ANSI’s definitions of the signal words are as follows:

---

**! NOTICE**

---

**“Notice” is used to indicate a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.**

---



---

**! CAUTION**

---

**“Caution” is used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

---

**! WARNING**

**“Warning” is used to indicate a potentially hazardous situation which if not avoided, could result in death or serious injury.**

---

**! DANGER**

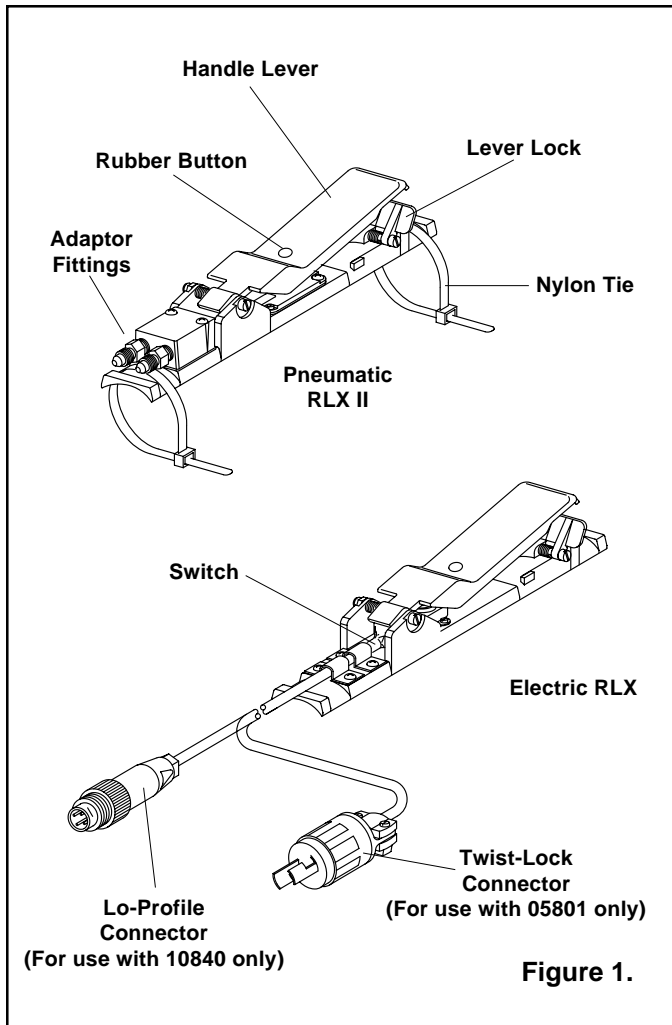
**“Danger” is used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

---

**1.3 General Description**

**1.3.1** The principal components of the control handle are shown in Figure 1. The control handle, located near the blast nozzle, is the main activator of Clemco remote control systems. When the control handle lever is up, it is in the non-blast position. Pressing the control handle lever down activates the remote controls.

**1.3.2** A remote control system is an OSHA-required safety device, and is required on all blast machines. Pressing the RLX control handle lever down activates the remote controls, to begin blasting. When the operator intentionally or unintentionally removes hand-held pressure from the remote control handle, the machine deactivates, stopping the blast process. The remote control system “fails to safe”, which means that any interruption in the control-air circuit, for any reason, deactivates the blast machine. Interruptions could be caused by, break in the remote control air lines, loss of air pressure, or loss of control of the blast hose by the operator



## ! WARNING

**Never modify or substitute remote control parts. Parts from different manufacturers are not compatible with Clemco equipment. If ANY part of the remote control system is altered, involuntary activation, which may cause serious injury, can occur.**

### 1.3.3 Pneumatic control

**1.3.3.1** Pneumatic remote controls operate on the return-air or completed-circuit principle. When the control handle lever is up, control air from the blast machine travels along the outbound twinline hose, and escapes through an opening located under the control handle lever. As long as

air escapes through the opening, the remote control system remains inactive. When the control handle lever is pressed, the opening is sealed, and air in the outbound line returns through the inbound line to activate the remote control valves, which start the blasting. When the handle lever is released, air exhausts from the return line, the remote control system deactivates and blasting stops.

### 1.3.4 Electric control

**1.3.4.1** Electric remote controls are electro-pneumatic. When the control handle lever is up, control air from the blast machine travels to the control box and stops. As long as air does not pass through the box, the remote control system remains inactive. From the box, a 12-volt electrical current is sent through the control cord to a switch mounted under the control handle lever. When the control handle lever is pressed, it makes contact with the switch, engages solenoids in the control box to permit air to pass through the box to activate the pneumatic remote controls, which starts the blasting. When the handle lever is released, it immediately disengages the control box, cuts off incoming control air, and simultaneously opens the control box exhaust port so blasting stops.

### 1.3.5 Abrasive Cut-off (ACS) Option

**1.3.5.1** The ACS is a separate control that is usually used to operate an air-actuated abrasive metering valve. The ACS closes the metering valve independently of the blasting, so air without abrasive exits the nozzle. The operator uses this feature to blow-off abrasive from the blasted surface. If an application requires frequent choking of the blast machine, the ACS line could control a valve to remotely choke the machine.

**1.3.5.2** Pneumatic control: The pneumatic abrasive cut-off switch is mounted on the control handle. A separate air line connects to the ACS switch to operate the valve. Refer to the remote control systems manual for instructions.

**1.3.5.3** Electric control: The ACS cut-off switch on electric systems is an integral part of the control cord, not the control handle. The system utilizes a standard electric RLX. Refer to the remote control systems manual for instructions.

## 2.0 INSTALLATION

### ! WARNING

Moist air that freezes could cause blockage at the control handle or in the control lines. Blockage could cause involuntary activation of the remote controls, or prevent the controls from deactivating upon release of the control handle. This situation could result in serious injury or death. If remote controls are operated in freezing or near freezing weather, install a Clemco Anti-Freeze Injector, stock no. 05537, on the remote control air supply line. Clemco Electric Remote Controls have anti-freeze injectors mounted on the control box.

**2.1** Band the control handle to the blast hose close to the nozzle holder, using the two nylon ties provided. Once the control is firmly attached, clip the tie ends so they will not snag the operator's clothing or interfere with the operation of the control handle.

## 2.2 Pneumatic Controls

### ! NOTICE

Electric remote controls (electro-pneumatic) are recommended when the nozzle and remote control handle are farther than 100 feet from the blast machine. Pressure loss with pneumatic systems over longer distances increases actuation time, which prevents fast, safe operation. Contact your local Clemco Distributor for more information.

**2.2.1** Attach the 50-foot twinline hose to the two adaptor fittings on the control handle. Either side of the hose can be attached to either fitting.

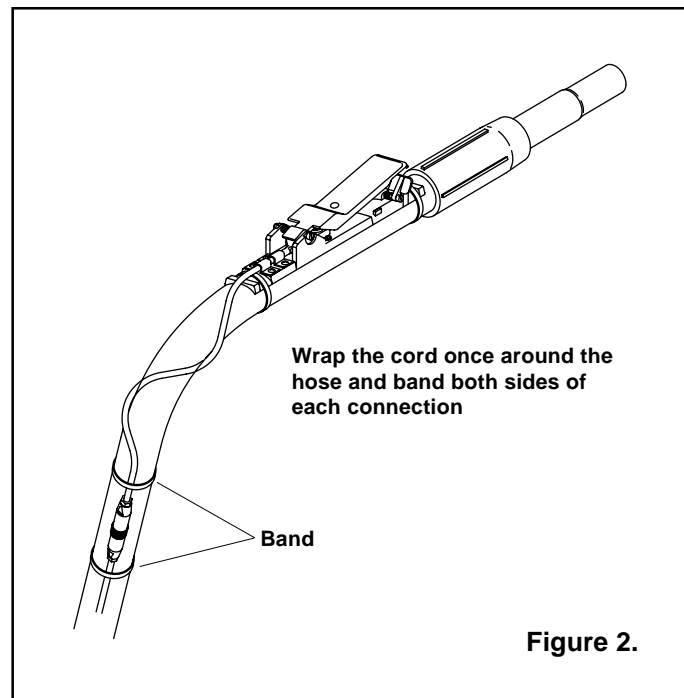
**2.2.2** Working from the control handle back, band or tape the twinline hose to the blast hose every four to six feet, and as close to the couplings as possible.

## 2.3 Electric Controls

### ! NOTICE

The maximum recommended total length of control cord is 300 feet. Distances greater than 300 feet will offer too much electrical resistance, and may cause the controls to malfunction. If an application requires greater distance, we suggest that appropriate cord with larger diameter wire, and compatible connectors be provided by the user.

**2.3.1** Wrap the whip cord from the electric control handle once around the blast hose as shown in Figure 2, and then connect it to the control cord. If the cord is not wrapped as described, when the hose is bent excessive strain will cause the wires to pull out of the connectors or electric switch.



### ! NOTICE

Provide sufficient slack at all cord connections to prevent the cord from pulling out of the connectors when the blast hose is pulled or dragged. Band the cord to the blast hose on both sides of all connections.

**2.3.2** Working from the control handle back, band the cord to the blast hose every 4 to 6 feet, and on both sides of each cord connection.

## 3.0 OPERATION

### 3.1 Set-Up

**3.1.1** Set up the blast machine and remote controls per the instructions in the corresponding manuals.

## !WARNING

**Do not operate this equipment before reading the instruction manuals for all equipment.**

### 3.2 Daily Check

**3.2.1** Check the following with the air off, before beginning blasting:

**3.2.1.1** Make sure that the handle lever will not seal the opening on pneumatic controls, or will not engage the switch on electric controls, unless the safety lever lock is pulled down.

**3.2.1.2** Make sure that the control handle lever and lever lock return to the “up” position when the handle is released.

**3.2.1.3** Both the handle lever and safety lever lock must move freely with no drag or binding.

**3.2.1.4** Before applying air be certain the handle lever and lever lock are in the up (no-blast) position.

## !WARNING

**Malfunctioning control handles could cause unintentional actuation of a blast machine, or prevent a machine from deactivating upon release. Malfunctioning control handles must be taken out of service immediately and repaired or replaced. Serious injury or death can result from unintentional blasting.**

**3.2.2** With the air on and while blasting, check the pneumatic control handle for leaks.

### 3.3 Blasting

**3.3.1** Operators must wear appropriate protective gear, including: abrasive-resistant clothing, leather gloves, eye and hearing protection, and a NIOSH-approved, Type CE Supplied-Air Respirator.

## !WARNING

**Failure to wear approved respirators could result in serious lung disease or death. Abrasive blasting produces harmful dust. Do not blast without the use of a properly fitted and maintained NIOSH-approved, type CE Supplied-Air Respirator that is approved for abrasive blasting. Everyone in the blasting area must wear an approved respirator.**

**Abrasive blasting can cause abrasive particles around the blast machine and blast nozzle to become airborne. The loud sounds of air released at the blast machine and nozzle could cause hearing damage. Anyone in the blasting area must wear approved eye protection and hearing protection.**

**3.3.2** Hold the blast hose securely and point the nozzle only at objects intended to be blast cleaned.

**3.3.3** Pull back the safety lever lock and depress the remote control handle. Within a few seconds the remote controls will respond and blasting will begin.

## !CAUTION

**Be prepared for the recoil from the blast hose. Blasting will begin within a few seconds after pressing the control handle lever.**

## ! WARNING

OSHA requires the use of remote controls on all blast machines. To comply with OSHA regulations, the remote control handle which starts and stops the flow of air and abrasive, must be held down manually. Do not tie down the control handle lever or attempt to bypass any part of the remote control system. Doing so will defeat the purpose of the fail-to-safe feature of the remote control. Serious injury or death can result from uncontrolled blasting. Ref. 29 CFR 1910.244 (b)

### 3.4 Stop Blasting

3.4.1 To stop blasting, release the handle lever.

3.4.2 When the control handle lever is released, the safety lever lock will flip up to lock the handle lever in the up (open) position.

3.4.3 Make sure that the control handle safety lever lock is up, and that it prevents the handle lever from engaging.

3.4.4 Always open the safety petcock during work breaks and before filling the blast machine. Opening the petcock prevents unintentional blasting. Refer to the remote control owners manual for the location of the safety petcock.

## ! WARNING

When approaching an idle blast machine, and before loading the blast machine with abrasive, always check to make sure the safety petcock is open. This step is especially important if one worker (a machine tender) loads the machine with abrasive while another worker (the blast operator) controls the blasting. The blast operator could pressurize the machine before the machine tender has moved away from the machine. During pressurization abrasive could be forced out of the top of the machine, and cause injury.

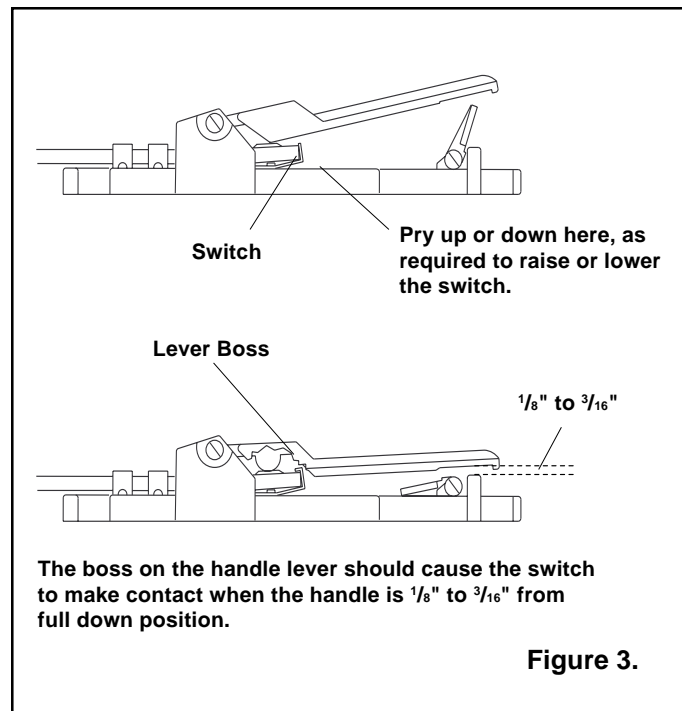
### 4.0 ADJUSTMENTS

Note: There is no adjustment on the pneumatic control handle.

#### 4.1 Switch Contact, Figure 3

4.1.1 The handle lever should engage the switch when it is approximately  $1/8"$  to  $3/16"$  from full down position. If the handle lever is too far up when it engages, it will cause excessive pressure on the switch and damage it.

4.1.2 Use a screw driver or similar object to pry the metal switch bracket up or down as required so the boss on the handle lever makes contact with the switch within  $1/8"$  to  $3/16"$  window.



4.1.3 Check the adjustment by listening for the switch to click as the handle lever is lowered. It should engage within the specified window. If resistance is felt after the switch is engaged, and before the handle lever bottoms, the switch is too high and should be lowered to prevent damage to the switch.

### 5.0 MAINTENANCE

#### 5.1 Inspection

5.1.1 The RLX Control Handle is a safety device. Inspect it before and after each use to ensure the lever lock and handle lever function properly.

- The handle lever must not engage unless the lever lock is pulled down.
- The handle lever must return to the full up position when released.
- The lever lock must return to the up position when the handle lever is released.

- Both the handle lever and lever lock must move freely with no drag or binding.

## 5.2 Cleaning

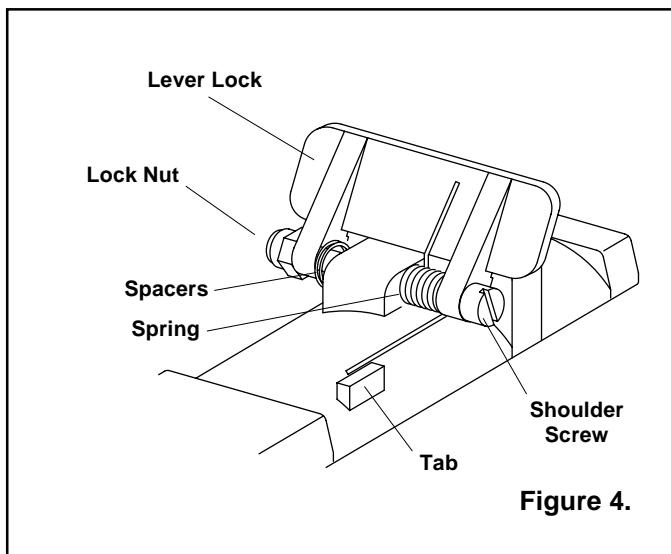
**5.2.1** The control handle is the actuator of the remote control system. Periodically clean around the springs, handle lever, and lever lock to ensure that the unit is free of abrasive and debris that could cause the handle lever or lever lock to bind.

## 5.3 Spring Replacement

**5.3.1** Follow the instructions in Section 5.4 to replace the lever lock spring, and Section 5.5 to replace the handle lever spring.

## 5.4 Lever Lock Replacement, Figure 4

**5.4.1** Remove the lock nut from the shoulder screw. Before removing the screw, note the positions of the spacers and spring as shown in Figure 4. The bent end of the spring is toward the inside and forcing the lever lock up. The straight end is toward the outside facing down and against the tab.

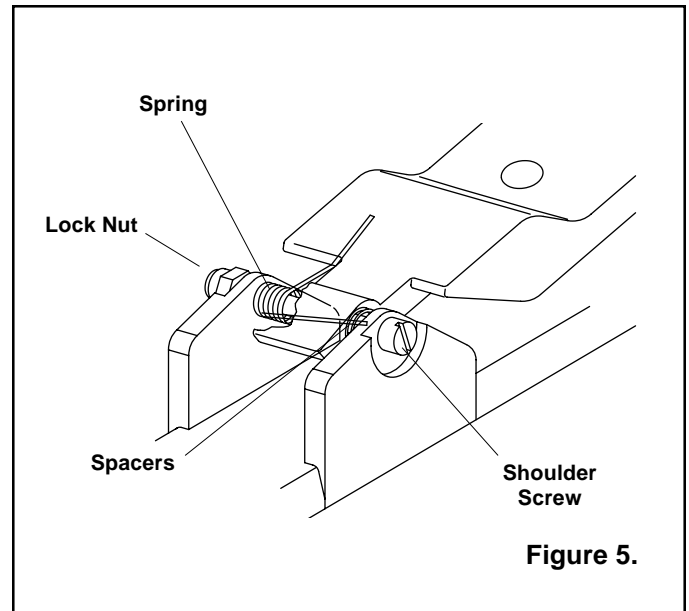


**5.4.2** Install a new lever lock and spring, and reassemble in reverse order.

**5.4.3** Check that the lever lock moves freely, raises to full up position, and that the handle lever will not engage unless the lever lock is pulled down.

## 5.5 Handle Lever Replacement, Figure 5

**5.5.1** Remove the lock nut from the shoulder screw. Before removing the screw, note the positions of the spacers and spring as shown in Figure 5. The bent end of the spring is against the handle lever and facing up. The straight end is against the body and facing down.



**5.5.2** Install a new handle lever and spring, and reassemble in reverse order.

**5.5.3** Check that the handle lever moves freely, raises to full up position, and will not engage unless the lever lock is pulled down.

## 5.6 Pneumatic Control Handle

**5.6.1** Rubber button replacement.

**5.6.1.1** Remove the old button.

**5.6.1.2** Push the new button, stem first, up from the bottom of the handle lever. Pull the stem to seat the button.

**5.6.1.3** Trim the button stem flush with the top of the handle lever.

## 5.6.2 Gasket replacement

**5.6.2.1** Remove the handle lever per Section 5.5.

**5.6.2.2** Remove the six screws holding the pneumatic adaptor to the body.

**5.6.2.3** Install a new gasket.

**5.6.2.4** Place the pneumatic adaptor on the gasket and hand tighten all screws before tightening them in sequence to uniformly compress the gasket.

**5.6.2.5** Reassemble the handle lever, making sure the spacers and spring are in place.

**5.6.2.6** Check that the handle lever moves freely, raises to full up position, and will not engage unless the lever lock is pulled down.

## 5.7 Electric Control Handle

### 5.7.1 Switch replacement

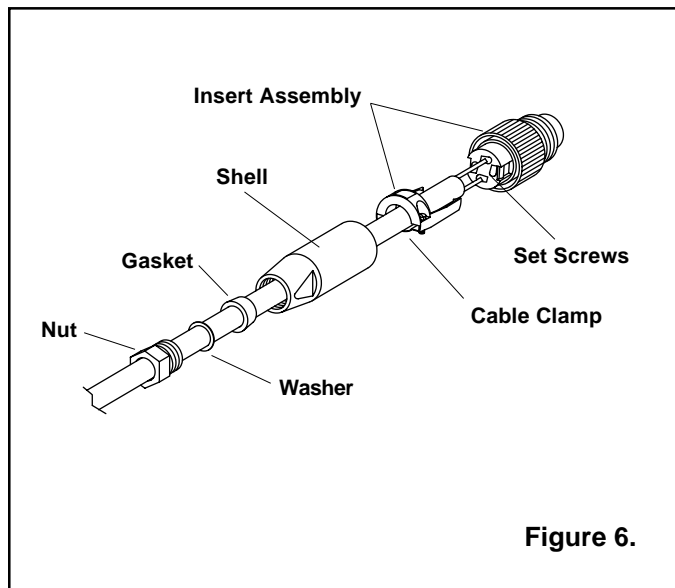
**5.7.1.1** Remove the handle lever per Section 5.5.

**5.7.1.2** Remove screws holding the switch and cord clamps.

**5.7.1.3** Follow instructions in Section 5.8.2 for Lo-Profile connector, or Section 5.8.3 for Twist-Lock connector.

### 5.7.2 Lo-Profile connector: Ref. Figure 6

**5.7.2.1** Remove the compression nut, thrust washer and gasket from the connector shell.



**Figure 6.**

**5.7.2.2** Remove the shell from the coupling insert assembly.

**5.7.2.3** Loosen the cable clamp and set screws holding the cord, and remove the cord from the assembly.

**5.7.2.4** Install a new switch and cord assembly using Terminals No. 1 and 3.

**5.7.2.5** Adjust switch per Section 4.1.

**5.7.2.6** Reassemble in reverse order. Check that the springs are in place, the handle lever and lever lock move freely, and the handle lever will not engage unless the lever lock is down.

### 5.7.3 Twist-Lock connector

**5.7.3.1** Loosen the screws clamping the cord, and the front of the connector.

**5.7.3.2** Pull the shell off the plug, and remove the two leads from the screw terminals.

**5.7.3.3** Install a new switch and cord assembly. Either lead can go on either terminal.

**5.7.3.4** Adjust switch per Section 4.1.

**5.7.4.5** Reassemble in reverse order. Check that the springs are in place, the handle lever and lever lock move freely, and the handle lever will not engage unless the lever lock is down.

## 6.0 TROUBLESHOOTING

# !NOTICE

**Section 6.1 troubleshoots common symptoms for both the pneumatic and electric control handles. See Section 6.2 for symptoms pertaining to the pneumatic control handle, or Section 6.3 for the electric control handle. Section 6.4 is for optional ACS feature.**

**6.1.1** Handle lever fails to return to the non-blast position (up) when released.

**6.1.1.1** Check the handle lever for damage or abrasive that may cause binding against the body.

**6.1.1.2** Check the spring for damage or fatigue.

**6.1.1.3** Replace the handle lever or spring as necessary.

**6.1.2** Lever lock fails to pop up when the handle is released.



**6.1.2.1** Check for damage, or build up of debris or abrasive.

**6.1.2.2** Check the spring for damage or fatigue.

**6.1.2.3** Replace lever lock or spring as necessary.

## **6.2 Pneumatic Control Handle**

**6.2.1** Remote controls do not activate when the handle lever is pressed.

**6.2.1.1** Check that the rubber button is not worn or damaged, and that it seals the orifice in the pneumatic adaptor.

**6.2.1.2** Press the handle lever and check the pneumatic adaptor gasket for leaks.

**6.2.1.3** Press the handle lever and feel and listen for air leaks anywhere on the handle. When the handle lever is pressed, no air should escape. If there is a leak, it must be located and repaired. If no air escapes when the handle lever is down, the problem is not in the control handle.

**6.2.1.4** Refer to the appropriate remote control manual for malfunctions in the remote control system.

**6.2.2** Remote controls do not deactivate when the handle lever is released.

**6.2.2.1** Check that the pneumatic adaptor gasket is not swollen, restricting air flow through the handle orifice.

**6.2.2.2** Refer to the appropriate remote control manual for malfunctions in the remote control system.

## **6.3 Electric control handle**

**6.3.1** Remote controls do not activate when the handle lever is pressed.

**6.3.1.1** Switch may require adjustment. See Section 4.1.

**6.3.1.2** Switch faulty. The easiest method to check the switch is to substitute the control handle with one that is functioning properly. If this isn't possible; turn off the compressed air supply. Disconnect the control handle at the control cord. With the handle lever down, check continuity across pins No. 1 and 3 in the Lo-Profile connector, or the two prongs if Twist-Lock connectors are used. Another method is to listen to the control box and short across socket No. 1 and 3 on the extension cord. If the box clicks, the fault is in the switch. Remove the old switch and install a replacement.

**6.3.1.3** Refer to the appropriate remote control manual for malfunctions in the remote control system.

**6.3.2** Remote controls do not deactivate when the handle lever is released.

**6.3.2.1** Check that handle lever disengages the switch when it is released. See Section 4.1.

**6.3.2.2** Check that the return spring raises the handle lever fully up.

**6.3.2.3** Refer to the appropriate remote control manual for malfunctions in the remote control system.

## **6.4 Optional ACS Feature**

**6.4.1** No abrasive flow when the ACS toggle is turned on.

### **6.4.1.1 Pneumatic**

- Check that metering valve is not closed.
- Check for leak or blockage in the single line hose or fittings from the control handle to the metering valve.
- Obstruction in abrasive valve, or valve requires service. Refer to the metering valve manual for operation of the valve.
- Machine empty of abrasive.

### **6.4.1.2 Electric**

- Check that the metering valve is not closed.
- Check for leaks or blockage in the hose or fittings from the control panel to the metering valve.
- Check the solenoid operating the metering valve per instructions in the electric remote control system manual.
- Check the ACS switch per instructions in the electric remote control system manual.
- Check that the machine contains abrasive.
- Metering valve requires service. Refer to the metering valve manual for operation of the valve.

**6.4.2** Abrasive flow does not stop when ACS switch is off.

### **6.4.2.1 Pneumatic**

- Brass filter on ACS switch clogged.
- Metering valve requires service. Refer to the metering valve manual for operation of the valve.

6.4.2.2 Electric

- Check the exhaust port on the bottom of the panel, air should momentarily exhaust from the port when the ACS switch is turned off. If it does not, check the following:
- Obstruction in the line between the metering valve and the "GRIT VALVE" connection on the panel.
- Faulty ACS switch.
- Faulty solenoid.
- Metering valve requires service. Refer to the metering valve manual for operation of the valve.

7.0 REPLACEMENT PARTS, FIGURE 7

7.1 RLX II Pneumatic

ITEM	DESCRIPTION	STOCK NO.
(-)	RLX II Pneumatic Control Handle Assembly	10565
1.	Handle lever	10573
2.	Body	10568
3.	Lever lock	10564
4.	Pneumatic adaptor	10562
5.	Spring (2 required)	05823
6.	Nut, 8-32 lock, ss (2 required)	05815
7.	Spacer washer, ss (4 required)	05434
8.	Screw, 3/16" x 1-1/4" shoulder (2 required)	05817
9.	Screw, 8-32 x 1" rd. hd. (2 required)	05819
10.	Screw, 4-40 x 3/8" fillister head (2 required)	05818
11.	Rubber button	05821
12.	Gasket, pneumatic adaptor	10563
13.	Adaptor, 1/8" nps (2 required)	01940
14.	Screw, 8-32 x 3/8" rd. hd. (2 required)	05814
15.	Tie, nylon wire	02195

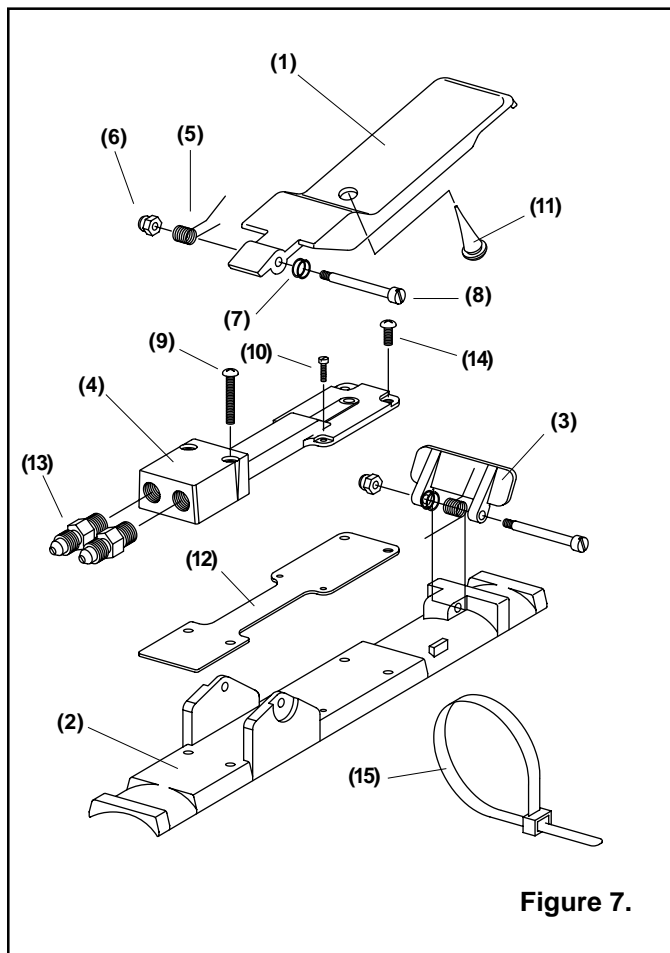


Figure 7.

**7.2 RLX Pneumatic handle with ACS, Figure 8**

Note: See Section 7.1 for RLX replacement parts.

ITEM	DESCRIPTION	STOCK NO.
(-)	RLX Control Handle Assembly w/ ACS ...	07625
1.	RLX II Control Handle (standard) .....	10565
2.	Switch assembly, ACS pneumatic .....	07654
3.	Elbow, 1/8" npt male .....	03085
4.	Tee, 1/8" npt brass .....	02171
5.	Adapter, 1/8" npt .....	01940
6.	Guard, ACS pneumatic switch .....	07655
7.	Breather muffler, 1/8" npt .....	07657
8.	Switch only, ACS .....	07658
9.	Connector, 1/8" npt brass .....	01962

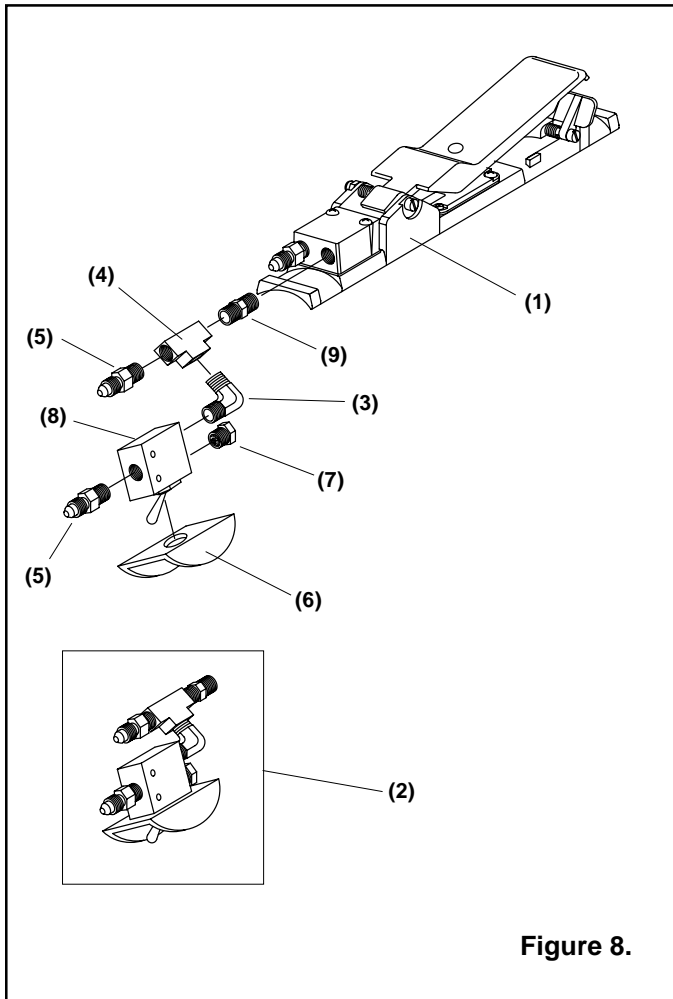


Figure 8.

**7.3 RLX Electric, Figure 9**

ITEM DESCRIPTION	STOCK NO.
(-) RLX Electric Control Handle w/ Lo-Profile Connector .....	10840
(-) RLX Electric Control Handle w/ Twist-Lock Connector .....	05801
1. Handle lever .....	10573
2. Body .....	10568
3. Lever lock .....	10564
4. Clamp, switch cord (2 required) .....	05810
5. Spring, lever (2 required) .....	05823
6. Switch with cord .....	05813
7. Screw, 8-32 x 3/8" rd. hd. (4 required) .....	05814
8. Nut, 8-32 lock, ss (2 required) .....	05815
9. Spacer washer, ss (4 required) .....	05434
10. Screw, 3/16" x 1-1/4" shoulder (2 required) .....	05817
11. Screw, 4-40 x 3/8" fillister head (2 required) .....	05818
12. Ties, nylon wire .....	02195
13. Connector, Lo-Profile male (for 10840 only) .....	10828
14. Connector, Twist-Lock male (for 05801 only) .....	02899

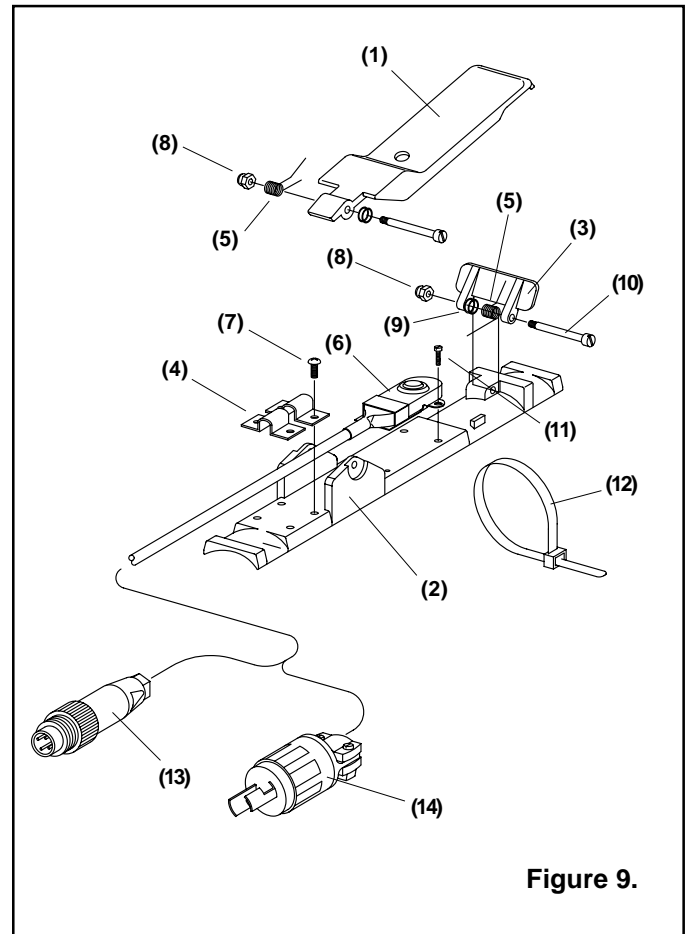


Figure 9.