

**GW ELECTRIC RLX
REMOTE CONTROL HANDLE with ACS
O. M. 31340**

**DATE OF ISSUE: 08/22
REVISION:**

 **WARNING**

Do not use this equipment before **READING this **MANUAL** and **UNDERSTANDING** its contents.**

These **WARNINGS are included for the health and safety of the operator and those in the immediate vicinity.**

Electronic files include a **Preface containing the same important information as in the orange cover.**

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1.0 INTRODUCTION

1.1 Scope of Manual

1.1.1 This manual covers the installation, operation, maintenance, troubleshooting, and replacement parts for the following Clemco RLX Control Handle with ACS:

Description	Stock No.
GW Electric RLX Control Handle with ACS	31167

1.1.2 This manual covers the GW Electric RLX Remote Control Handle with ACS (abrasive cutoff switch) only, which is the activator of Clemco electric remote control systems. Operator must be trained in the safe operation of the remote control system, blast machine, and all other equipment used. They must be aware of 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 system, and accessories used.

1.1.3 This GW Electric RLX Control Handles with a mating control cord are interchangeable with earlier controls, if they are replaced as a set. Individual RLX handles or control cords are not interchangeable with earlier versions of the RLX or cord.

1.2 Safety Alerts

1.2.1 Clemco uses safety alert signal words based on ANSI Z535.4-2011 to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

NOTICE

Notice indicates information that is considered important, but not hazard-related, if not avoided, can result in property damage.

CAUTION

Caution indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

WARNING

Warning indicates a hazardous situation that, if not avoided, could result in death or serious injury.

DANGER

Danger indicates a hazardous situation that, if not avoided, will result in death or serious injury.

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1.4 General Description

1.4.1 The principal components of the remote control handle are shown in Figure 1. The control handle is the main activator of Clemco electric remote control systems. When the control lever is up, it is in the nonblast position. Pressing the control lever down activates the remote controls.

1.4.2 A remote control system is an OSHA-required safety device. Pressing the control lever down activates the remote controls. When the operator intentionally or unintentionally removes handheld pressure from the control lever, the machine deactivates, stopping air and abrasive flow through the nozzle. The remote control system “fails to safe,” which means the remote controls deactivate the blast machine if any interruption in the control air or electric circuit occurs for reasons such as a break in the control line, the compressor stops running, or if the operator drops the blast hose.

⚠ 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 may occur, which can cause serious injury.

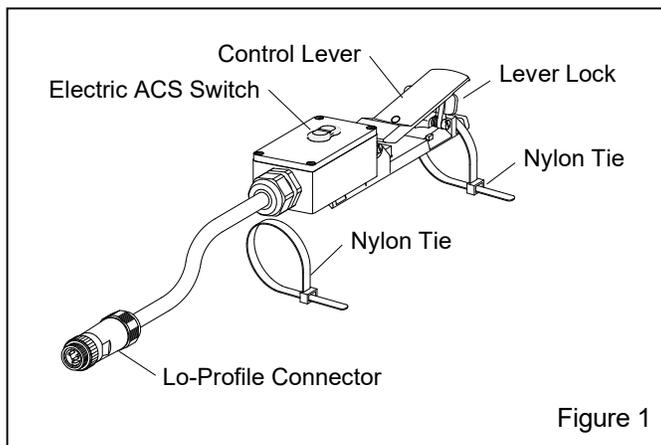


Figure 1

1.5 Operating Principles

1.5.1 Electric (electric over pneumatic) controls are recommended when the nozzle and remote control handle are farther than 100 feet from the blast machine. Pressure drop of pneumatic systems over longer

distances increase response time, which prevents fast, safe operation. Contact your local Clemco Distributor for additional information.

1.5.2 When the control lever is up, control air from the blast machine travels to the electric control panel and stops at the solenoid within the panel. As long as air does not pass through the panel, the remote control system remains inactive. A 12-volt electrical current is sent from the panel, through the control cord, to a switch mounted under the control lever. When the control lever is pressed, it contacts the switch and opens the normally closed solenoids. Doing so passes control air through the panel to activate the pneumatic remote controls, which starts the blasting. When the control lever is released, control air immediately exhausts from the panel, deactivates the remote controls, and blasting stops.

1.6 Abrasive Cutoff Switch (ACS)

1.6.1 The ACS cutoff switch is the rocker switch mounted in the control box situated behind the control handle, as shown in Figure 1. Refer to the remote control systems manual for operating instructions for the remote controls.

1.6.2 The ACS is a separate control that operates 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 for blowdown. If an application requires frequent choking of the blast machine, the line could control an air valve plumbed into the blast machine pusher line, enabling the operator to choke the machine from the control handle.

2.0 INSTALLATION

2.1 Band Control Handle to Blast Hose – Figure 2

2.1.1 Uncoil a coupled length of 50 ft blast hose and lay the 50 ft control cord alongside it.

2.1.2 Band the electric control handle to the blast hose at a comfortable location behind the nozzle holder, as shown in Figure 2. Use the two nylon ties provided or similar means to secure the control handle to the hose. Once the control is firmly attached, clip the tie ends so they do not snag the operator's clothing or interfere with the operation of the control handle.

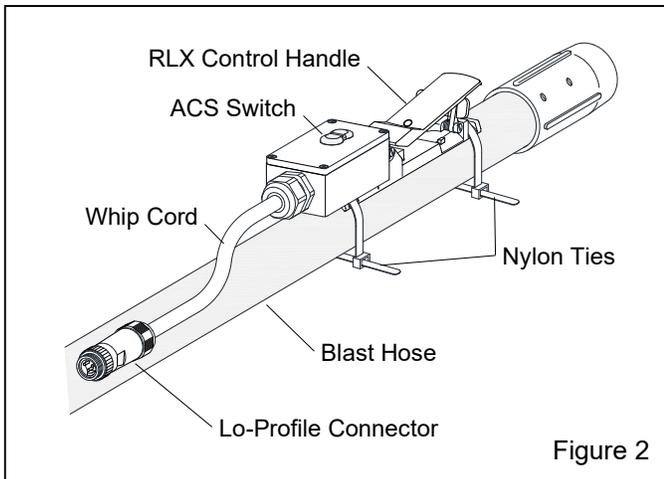


Figure 2

2.2 Connect Control Handle to the Cord and Blast Hose – Figure 3

2.2.1 Connect the control cord to the RLX whip cord and wrap the cords once loosely around the blast hose, as shown in Figure 3. **Note: The initial cord from the control panel comes with a twist-lock connector on one end and a lo-profile connector on the other end. Extension cords have lo-profile connectors on both end. Refer to the remote control operations manual for extension cords.**

2.2.2 Band the cord to the hose on both sides of the cord connections, as shown in Figure 3.

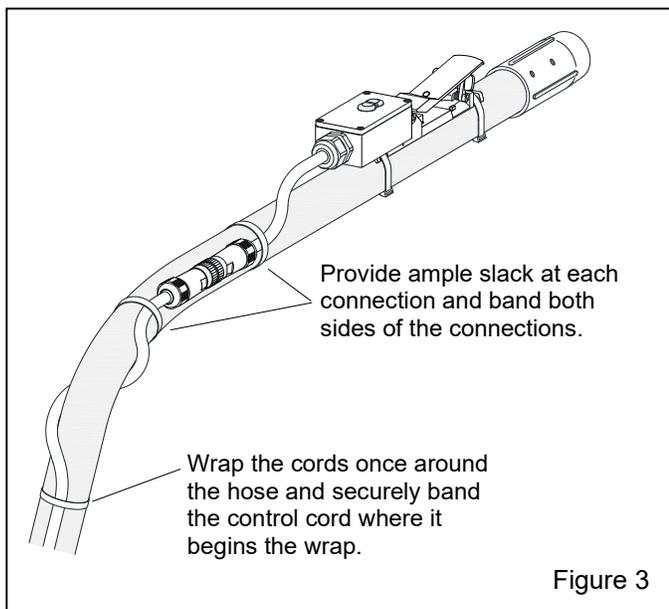


Figure 3

NOTE: Wrapping the cord provides slack. If the cord is not wrapped and securely banded as described, excessive strain will cause the wires to pull out of the connectors or electric switch when the hose is bent or pulled.

2.2.3 Working from the control handle back, band the cord to the blast hose every 4 to 6 feet. Also, band the cord on both sides of each electrical connection.

NOTICE

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

2.2.4 Repeat the process for each section of blast hose and extension cords.

⚠ WARNING

The maximum recommended total length of control cord is 300 feet. Distances greater than 300 feet will cause electrical resistance and may cause the controls to malfunction. If an application requires greater distance, an appropriate cord with larger diameter wire must be provided by the user. Malfunctioning controls can cause serious injury from uncontrolled blasting.

2.3 Connect the Initial Cord to the Control Panel

2.3.1 Refer to the applicable remote control operation manual and connect the twist-lock end of the initial cord to the lead cord on the electric control panel.

3.0 OPERATION

3.1 Setup

3.1.1 Setup the blast machine and remote controls as instructed in the applicable operations manuals.

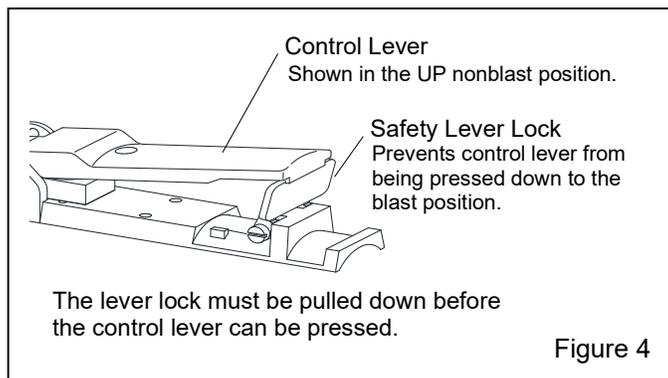
⚠ WARNING

Do not operate this control handle before reading the operations manuals for all related equipment. Severe injury can occur to operators unfamiliar with abrasive blasting equipment.

3.2 Daily Inspection – Figure 4

3.2.1 With the air OFF, before blasting, do the following:

- Make sure the control lever does not engage the switch unless the safety lever lock is intentionally folded down.
- The **control lever** must return to the UP position when released.
- The **safety lever lock** must return to the UP position when the control lever is released.
- Both the control lever and safety lever lock must move freely with no drag or binding.



⚠ WARNING

Malfunctioning control handles can cause unintentional actuation of a blast machine and also prevent a machine from deactivating upon releasing the handle. Malfunctioning control handles must be taken out of service immediately and repaired or replaced. Serious injury or death can result from unintentional blasting.

3.3 Personal Protective Equipment (PPE)

⚠ WARNING

Before blasting, test the coating and substrate for toxic materials, such as lead or other heavy metals, or asbestos. These hazards require special measures to protect the operators and the environment.

Obtain a safety data sheet (SDS) for the blast abrasive to identify hazardous substances. Silica sand (crystalline) can cause silicosis, lung cancer, and breathing problems in exposed workers. Slag abrasives may contain trace amounts of toxic metals such as arsenic, beryllium, and cadmium. Any abrasive dust has potential to cause lung disease.

Abrasive blasting operations can create high levels of dust and noise. No dust is safe to breathe. Abrasive blasting can produce harmful dust. Failure to wear NIOSH-approved respirators can result in serious lung disease or death. The respirators must be properly fitted and maintained NIOSH-approved, Type-CE supplied-air respirators approved for abrasive blasting.

During abrasive blasting, abrasive particles and dust in the area around the blast machine and blast nozzle become airborne. Everyone working in the vicinity of abrasive blasting must wear properly maintained, NIOSH-approved, respiratory protection and eye protection appropriate for the job site hazards.

Loud noise generated by the use of compressed air can cause hearing damage. Everyone in the blasting area must wear approved hearing protection.

It is the employer's responsibility to train employees to identify hazardous substances and to provide suitable policies, procedures, monitoring, recordkeeping, and personal protective equipment.

3.3.1 Operators and anyone else who may be exposed to the hazards generated by the blasting process must wear appropriate protective gear, including abrasive-resistant clothing, leather gloves, eye and hearing protection, and a NIOSH-approved Type-CE supplied-air respirator.

3.3.2 Don protective blasting attire outside the blast area in a clean nonhazardous environment, free of contaminants, and where the air is safe to breathe.

3.3.3 When finished blasting and after cleanup is completed, remove the respirator and protective clothing outside the respirator-use area in a clean environment where the air is safe to breathe.

3.4 Start Blasting

3.4.1 Refer to the blast machine and remote control operations manuals to prepare the blast machine for operation.

3.4.2 Don protective blasting attire (PPE), per Section 3.3.

3.4.3 Clemco remote controls have a safety valve to prevent unintentional blasting. When the blast operator is ready to blast, the operator or the machine tender must close the safety valve. Closing the valve prepares the machine for remote operation and activation by the control lever.

3.4.4 Hold the blast hose securely and point the nozzle only at objects intended to be blasted.

⚠ WARNING

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

3.4.5 Fold down the safety lever lock and press the control lever, as shown in Figure 5. Within seconds, the remote controls will respond, and blasting begins.

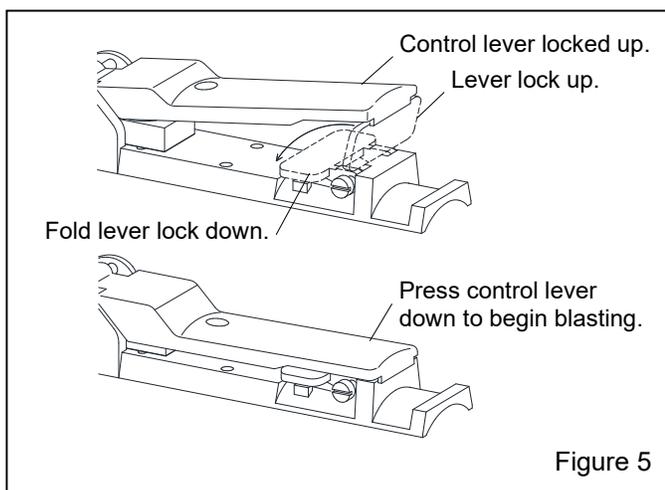


Figure 5

⚠ WARNING

OSHA requires the use of remote controls on all blast machines when an operator controls the nozzle. To comply with OSHA regulations, the control lever must be held down manually. Do not tie down the control 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).

3.5 Operation of the Abrasive Cutoff Switch (ACS)

⚠ WARNING

OSHA sets exposure limits for people and the environment. Airborne dust can increase the exposure levels beyond permissible limits. OSHA prohibits blowing with compressed air as a cleaning method for lead-based paint dust or other hazardous dust, unless the compressed air is used in conjunction with a ventilation system designed to capture the volume of airborne dust created by the compressed air, 29 CFR 1926 (h). The ACS is for blowing abrasive off a blasted surface, NOT as a general area cleanup tool.

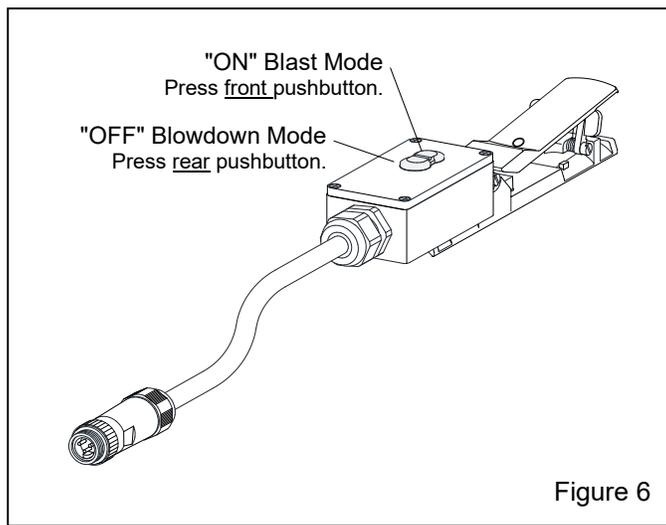
3.5.1 The ACS closes the abrasive metering valve so that air alone without abrasive exits the nozzle. common uses for this feature are:

- Clearing abrasive from the blast hose when finished blasting. This is helpful in many applications and necessary when blasting vertically to prevent abrasive from collecting in low spots in the blast hose, eliminating excessive abrasive slugging at startup.
- Blowing abrasive off the blasted surface. NOTE: Small amounts of residual abrasive may exit the nozzle with the air, requiring additional blowing off or otherwise cleaning the surface outside the blasting area prior to painting.
- When wet blasting with an injector or wetblast attachment, the ACS is used to assist in drying the surface after it is washed down.

3.5.2 The ACS switch is wired into the box at the back of the RLX Control Handle, as shown in Figure 6. The switch may be pressed ON or OFF at any time, but will not operate the metering valve unless the control handle is pressed.

3.5.3 Blast mode: Abrasive flow is ON when the front pushbutton (closest to the nozzle) is pressed. This action sends control air to the abrasive metering valve and opens the valve. The blast machine then operates normally, with air and abrasive coming out the nozzle.

3.5.4 Blowdown mode: The ACS switch is OFF (no abrasive) when the rear pushbutton (farthest from the nozzle) is pressed, cutting off the air supply to the abrasive metering valve, closing the valve, and stopping the abrasive flow. This action allows air alone to exit the nozzle, which is useful for clearing the blast hose before shutting down and for blowing abrasive off the blasted surface.



3.6 Stop Blasting

3.6.1 Before releasing the control lever, the operator may use the ACS switch to shut off the abrasive flow to clear abrasive from the blast hose or to blowdown the work piece. Refer to *Section 3.5: Operation of the Abrasive Cutoff Switch*.

3.6.2 To stop blasting, release the control lever. Blasting stops when the control lever is released, regardless of the position of the ACS. Blasting can also be stopped at the machine by opening the safety valve.

3.6.3 When the control lever is released, the safety lever lock will return to the full UP position to lock the control lever in the up (nonblast) position.

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

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

⚠ WARNING

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

4.0 MAINTENANCE

⚠ WARNING

Malfunctioning control handles can cause unintentional actuation of a blast machine and also prevent a machine from deactivating upon releasing the handle. Malfunctioning control handles must be taken out of service immediately and repaired or replaced. Serious injury or death can result from unintentional blasting.

A service kit is available for the GW RLX Control Handle. To avoid unscheduled downtime, a kit should be kept on hand. Refer to Section 6.0 for replacement parts.

4.1 Inspection

4.1.1 The RLX control handle is a safety device. Inspect it before and after each use to make sure it functions properly.

- The control lever must not engage unless the lever lock is pulled down.
- The **control lever** must raise to the full UP position when released.
- The **lever lock** must return to the UP position when the lever is released.
- Both the lever and safety lever lock must move freely with no drag or binding.

4.2 Cleaning

4.2.1 Periodically clean around the springs, control lever, and lever lock to make sure the unit is free of abrasive and debris that can cause the lever or lever lock to bind.

4.3 Spring Replacement

4.3.1 Follow the instructions in Section 4.4 to replace the lever lock spring and Section 4.5 to replace the control lever spring.

4.4 Lever Lock Replacement – Figure 7

4.4.1 Remove the lock nut from the shoulder screw. Before removing the screw, note the positions of the spacers and spring, as shown in Figure 7. The bent end of the spring is toward the inside, forcing the lever lock up. The straight end is toward the outside, facing down and against the spring tab.

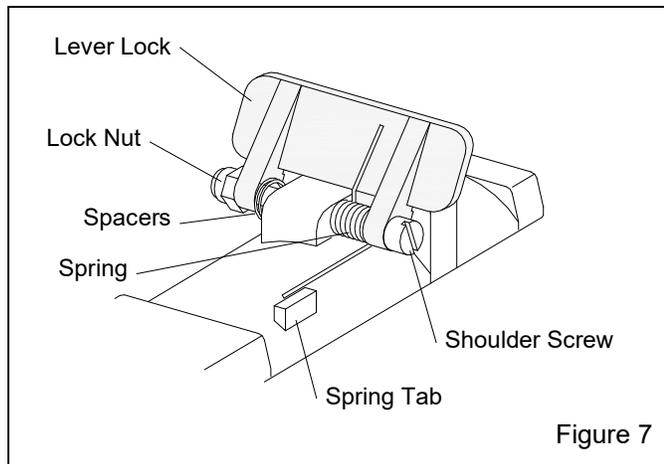


Figure 7

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

4.4.3 Make sure the safety lever lock moves freely, returns to the full UP position, and that the control lever will not engage unless the lever lock is pulled down.

4.5 Control Lever Replacement – Figure 8

4.5.1 Remove the lock nut from the shoulder screw. Before removing the screw, note the positions of the spacers and spring as shown in Figure 8. The bent end of the spring is against the control lever, facing up. The straight end is against the body, facing down. The spring and spacers must be placed correctly when reinstalling the handle.

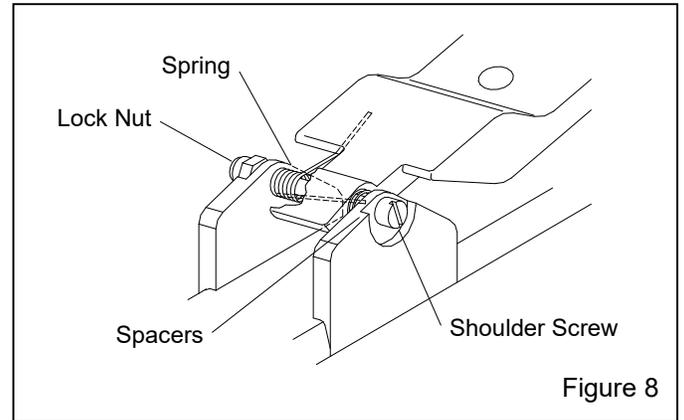


Figure 8

4.5.2 Install a new control lever and spring, and reassemble in reverse order.

4.5.3 Make sure the lever moves freely, raises to full UP position, and does not engage unless the lever lock is pulled down.

4.6 Replacing Lo-Profile Electrical Connector Figure 9

4.6.1 Remove old connector

1. Loosen the dome nut and slide it away from the shell
2. Rotate the front shell until the hole in the shell is aligned with the hole in the head. Insert a 3/32" pin, screwdriver, or hex key, or similar tool through the front shell and into the coupling to prevent it from turning.
3. Turn the back shell counterclockwise to remove. When loose, slide the back shell away from the head.

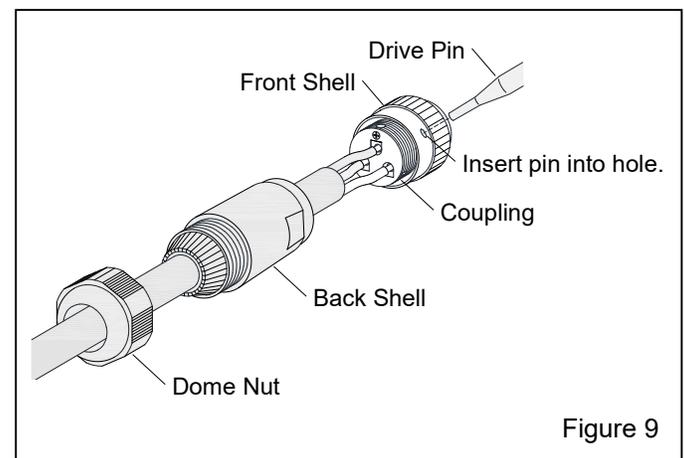


Figure 9

4. Note the positioning of the wires:
 - Black into contact #1
 - Green into contact #2
 - White into contact #3
 Loosen the contact screws and remove the wires.
5. Slide the front and back shells and dome nut from the cord.
6. If the wires are damaged, cut the ends and strip the cord jacket back 1-1/2". Strip 1/4" of insulation from the wires

4.6.2 Install new connector

1. If the wires are damaged, cut the ends and strip the cord jacket back 1-1/2". Strip 1/4" of insulation from the wires
2. Remove the inner grommet from the outer grommet and discard the inner.
3. Pass the cord through the dome nut, outer grommet, and back shell.
4. Insert the stripped wires into the coupling contacts as noted below:
 - Black into contact #1
 - Green into contact #2
 - White into contact #3
5. Tighten the contact screws to 4.4 lbf.
6. Assemble back shell to the coupling, in reverse order, as noted in Section 4.6.1, and tighten to 20 lbf.

4.7 Replacing 3-Prong Twist-Lock Connector

4.7.1 When replacing twist-lock cord connections, observe the following wire and pole coding:

- Black wire to brass pole
- Green wire to green pole
- White wire to silver pole

4.8 Control-Handle Body and Switches

4.8.1 The control handle assembly is factory potted; there are no field-replaceable parts other than those listed in Section 6.0.

5.0 TROUBLESHOOTING

This section troubleshoots symptoms for the remote control handle. Refer to the appropriate operation manuals for malfunctions in the blast machine or remote control system.

5.1 Control Lever Fails to Return Up (nonblast position) When Released

5.1.1 Inspect the lever for damage or abrasive that may cause binding against the body. Clean or replace the lever as necessary.

5.1.2 Inspect the spring for damage or fatigue. Replace the spring as necessary.

5.2 Lever Lock Fails to Return to Fully Up Position When Control Lever Is Released

5.2.1 Inspect the lever lock for damage or buildup of debris or abrasive that can cause binding. Clean or replace lever lock as necessary.

5.2.2 Inspect the spring for damage or fatigue. Replace lever lock spring as necessary.

5.3 Blasting Does Not Start (no air and no abrasive) When the Control Lever is Pressed

5.3.1 Make sure the blast machine is pressurized.

5.3.2 Refer to the remote control operations manual and make sure the safety valve(s) are closed.

5.3.3 Check the nozzle for blockage: Open the safety valve(s) and make sure the control handle is UP, in the nonblast position. Remove the nozzle and check it for an obstruction. When clear of obstruction, replace the nozzle and close the safety valves.

5.3.4 Check for air leaks: With safety valve(s) closed, press the control handle and check for air leaks in all control hoses, tubing, fittings, the control panel, the air valve, and the metering valve. After the control handle is pressed there should be no air leaks anyplace in the air. Any air leak can prevent the control from operating correctly and must be corrected.

5.3.5 Listen to the control panel to determine if the solenoids click when the control handle is pressed and released.

- If it does click, the fault is probably not electrical and in the pneumatic circuit. Refer to the appropriate operations manual to check the operation of the remote controls.

- If it does not click, check the operation of the RLX control handle, per Section 5.3.6, and control cords, per Section 5.3.7. Refer to the appropriate operations manual to check the operation of the control panel and remote controls.

5.3.6 Check operation of the RLX Control Handle:

The easiest way to check the control handle is to substitute it with one that is functioning properly. If that is not possible, turn off the compressed-air supply, disconnect the control handle at the control cord, and use one of the following methods to test the switch:

1. Press the ON front pushbutton (closest to the control lever). Press the control lever and check continuity across Pins 1 and 3 in the lo-profile connector, as shown in Figure 10, and again across Pins 1 and 2. If either pin fails the continuity test, the fault is in the RLX lo-profile connector or switch. Check wire connections in the connector, per Section 4.6. If the switch is faulty, the control handle must be replaced.
2. Press the OFF pushbutton (farthest from the control lever) and repeat the tests. There should be continuity across Pins 1 and 3 in the lo-profile connector, and no continuity across Pins 1 and 2. If either pin fails the continuity test, the fault is in the RLX lo-profile connector or switch. Check wire connections in the connector, per Section 4.6. If the switch is faulty, the control handle must be replaced.
3. If the control handle passes both tests, the handle is good. Refer to the appropriate remote control system operations manual to check for malfunctions in the remote control system.

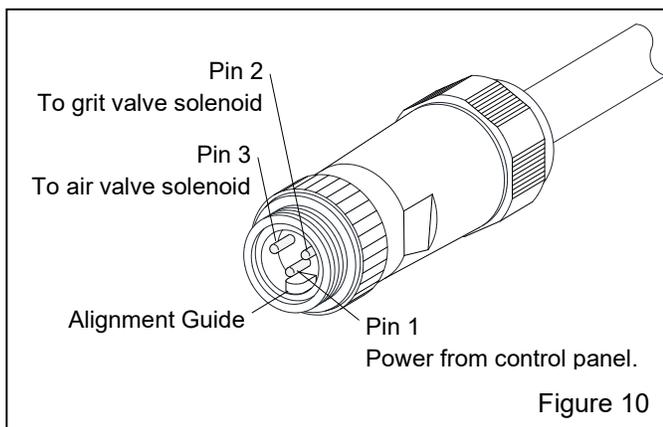


Figure 10

Another method is to remove the control handle from the control cord, listen to the control panel, and short across Sockets 1 and 3 on the extension cord, as shown in Figure 11.

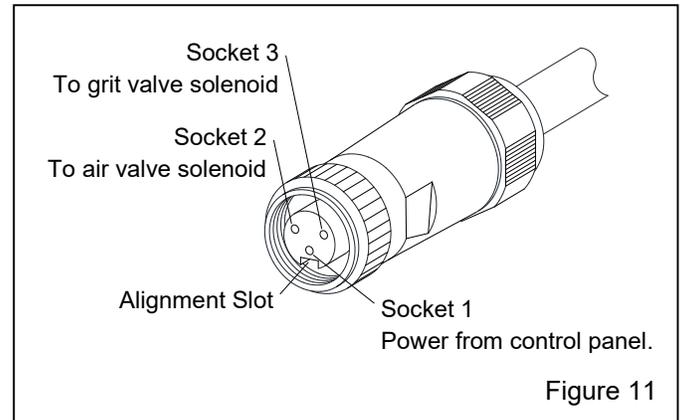


Figure 11

4. If the solenoid within the panel does click, the fault is in the RLX lo-profile connector or switch. Check wire connections in the connector. If the switch is faulty, the control handle must be replaced.
 - If the solenoid does not click, the fault is in the cord or someplace in the remote control system. Check wire connections in the cord connectors and refer to the appropriate remote control system operations manual to check for malfunctions in the remote control system.

5.3.7 Check control cords: The easiest way to check a control cord is to substitute it with one that is functioning properly. If that is not possible, turn off the compressed-air supply, disconnect the control handle at the initial control cord, and check continuity as follows:

1. First, refer to the appropriate remote control operations manual to make sure the control panel is operating correctly.
2. Connect each cord one at a time going back to the panel, and jump across the lo-profile pins, as explained in Section 5.3.6. If the solenoids do not click, check the connections in both (male and female) lo-profile connectors, per Section 4.6

Check all extension cords in like manner.

5.4 Blasting Does Not Stop When the Control Lever is Released

5.4.1 Make sure the control lever disengages the switch when it is released.

5.4.2 Make sure the return spring raises the control lever fully up.

5.4.3 Remove the control handle from the cord.

- If the system deactivates, the fault is in a connector or switch. Check wire connections in the connector. If the switch is faulty, the control handle must be replaced.
- If the controls do not deactivate, there is a short in the control cord or the fault is someplace in the system. Check cord connections, per Section 4.6, or refer to the appropriate remote control system operations manual to check for malfunctions in the remote control system.

5.5 No Abrasive Flow When the ACS Switch Is ON – Blast Mode

- 5.5.1** Make sure the machine contains abrasive.
- 5.5.2** Make sure the metering segment of the metering valve is not closed.
- 5.5.3** Check for leaks or blockage in the hose or fittings from the control panel to the metering valve.
- 5.5.4** Inspect the solenoid operating the metering valve, per instructions in the electric remote-control-system operations manual.
- 5.5.5** Test the ACS switch, per Section 5.3.6, Paragraph 1.
- 5.5.6** Abrasive blockage in the abrasive metering valve or the valve requires service. Refer to the metering valve operations.

5.6 Abrasive Flow Does Not Stop When the ACS Is Moved to Off – Blowdown Mode

The ACS will not function unless the control handle is pressed.

5.6.1 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. Refer to the remote control operations manual.
- Faulty ACS switch. Test the switch, per Section 5.3.6, Paragraph 2.
- Faulty solenoid. Refer to the remote control operations manual.
- Metering valve requires service. Refer to the metering valve manual to service the valve.

6.0 REPLACEMENT PARTS – Figure 12

Item	Description	Stock No.
1.*	GW Electric RLX Control Handle with ACS	31167
2.	Lever, control	10573
3.	Lever lock	10564
4.	Connector, lo-profile male	31147
5.	Tie, nylon wire	02195
6.	Service kit, GW Electric RLX, w/ACS, quantities of kit items are shown in parentheses ()... 31216	
	a. Spring, lever and lever lock	(2)
	b. Nut, 8-32 lock, ss	(2)
	c. Spacer washer, stainless steel	(4)
	d. Screw, 3/16" X 1-1/4" shoulder	(2)

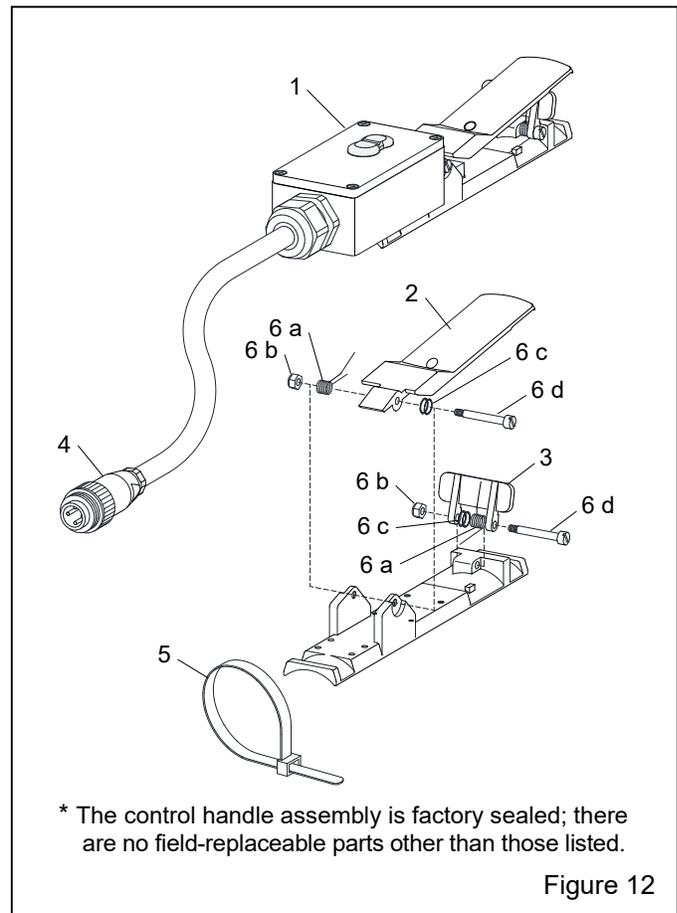


Figure 12