



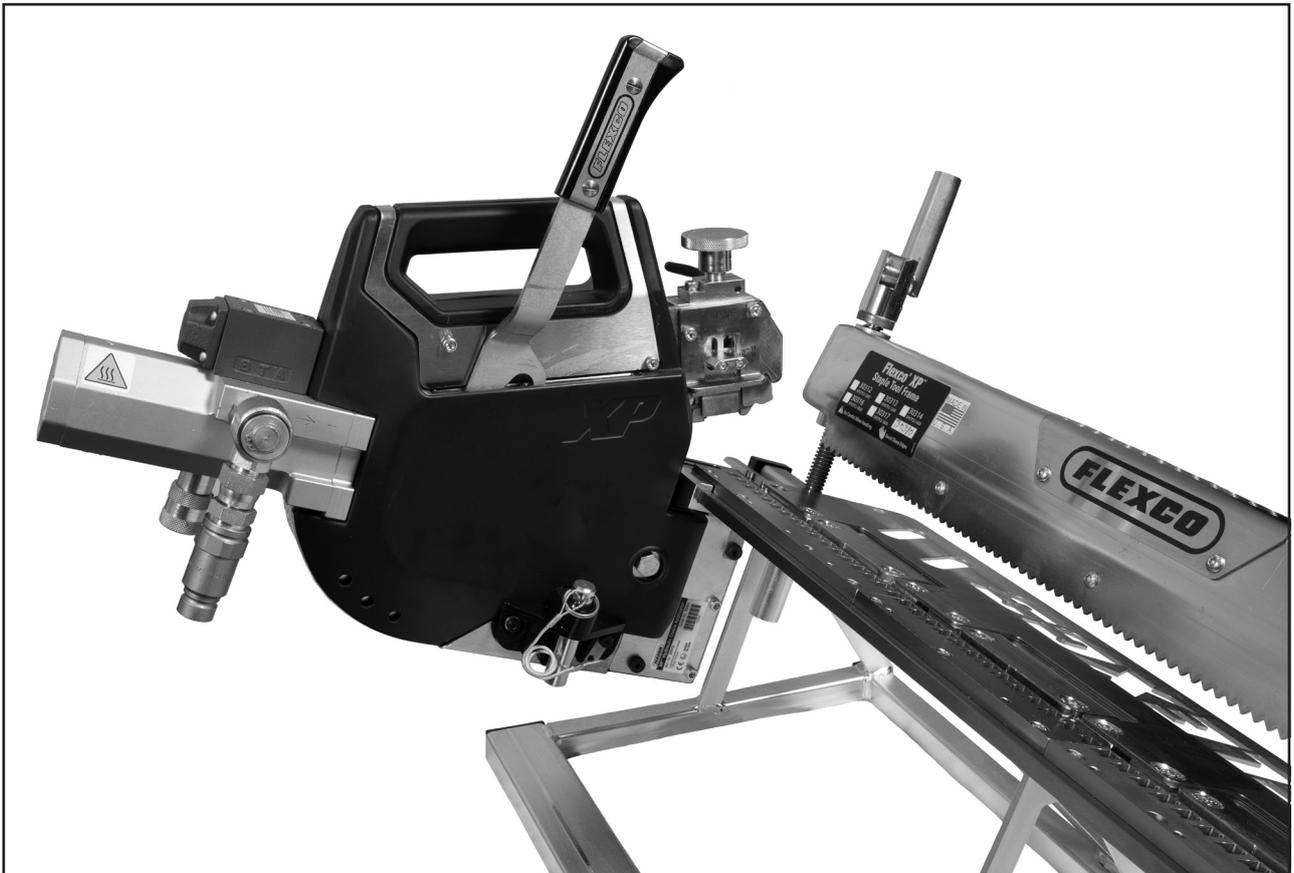
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# Hydraulic Flexco® XP™ Staple Fastener Installation System



Safety, Operation, and Maintenance Manual

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## **WARNING**

Improper use of this tool can result in serious bodily injury! This manual contains important information about product function and safety. Please read and understand this manual **BEFORE** operating the tool. Please keep this manual available for other users and owners before they use the tool. This manual should be stored in a safe place.

Patents: [www.flexco.com/patents](http://www.flexco.com/patents)

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## **Limited Warranty**

Flexco warrants to the original purchaser that this product is free from defects in material and workmanship, and agrees to repair or replace, at Flexco's option, any defective product within 1 year from the date of purchase. This warranty is not transferable. It only covers damage resulting from defects in material or workmanship, and it does not cover conditions or malfunctions resulting from normal wear, neglect, abuse, accident or repairs attempted or made by other than our regional repair center or authorized warranty service center.

To obtain warranty service, return the product at your expense together with proof of purchase to Flexco or a Flexco authorized distributor.

# Hydraulic Flexco® XP™ Staple Fastener System

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## Introduction

### Role of Applicator

The Hydraulic Staple Applicator is designed to be used with Flexco® XP Staple Fasteners.

### Precision Built

Flexco tools are precision-built tools designed for precise, high volume installation. These tools will deliver efficient, dependable service when used correctly and with care. As with any fine power tool, for best performance, the manufacturer's instructions must be followed. Please study this manual before operating the tool and understand the safety warnings and cautions. The instructions on installation, operation, and maintenance should be read carefully, and the manual kept for reference.

## Flexco® XP™ Hydraulic Staple Applicator Specifications

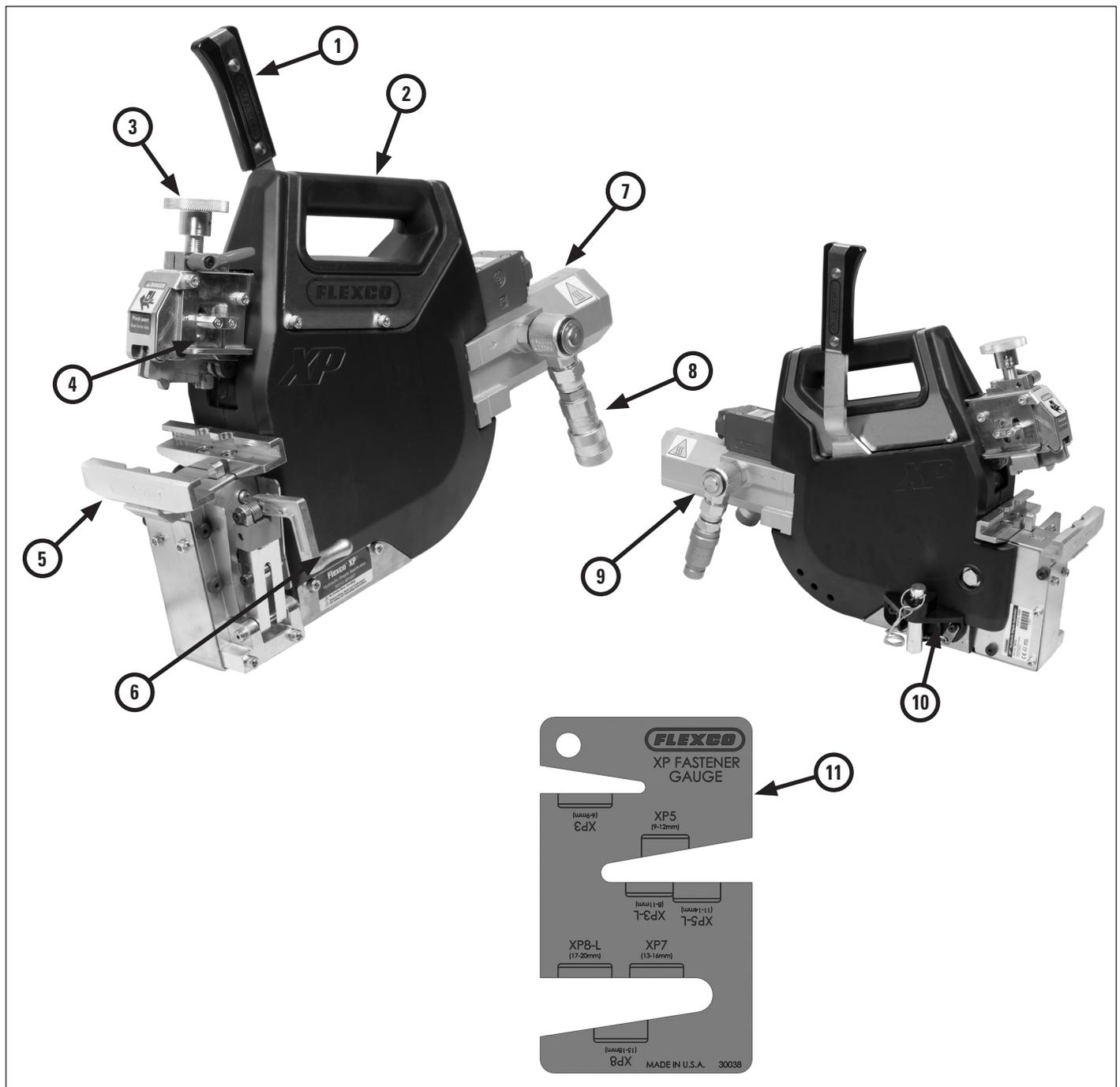
Overall weight	26 kg, 57 lbs
Overall dimensions	559 mm x 482 mm, (22"x 19")
Operating pressure	115 bar, 11.5 Mpa, 1650 psi
Min. pressure	103 bar, 10.3 Mpa, 1500 psi
Max. pressure	117 bar, 11.7 Mpa, 1700 psi
Flow rate	8-12 L/m, 2-3 GPM
Hydraulic fluid	MSHA approved fire resistant hydraulic fluid, MA approved #46 or equivalent (not included)
Coupling	ISO 16028 compliant couplings, flat face quick release coupling High pressure in: Female 3/8" body size Low pressure return: Male 1/2" body size
Max. hose length (hoses included with Flexco power source purchase)	10 meters, 32.8 feet High pressure hose (smaller hose OD), each end has factory installed male and female 3/8" body size couplings Low pressure return hose (larger hose OD), each end has factory installed male and female 1/2" body size couplings



# Hydraulic Flexco® XP™ Staple Fastener System

## System Components

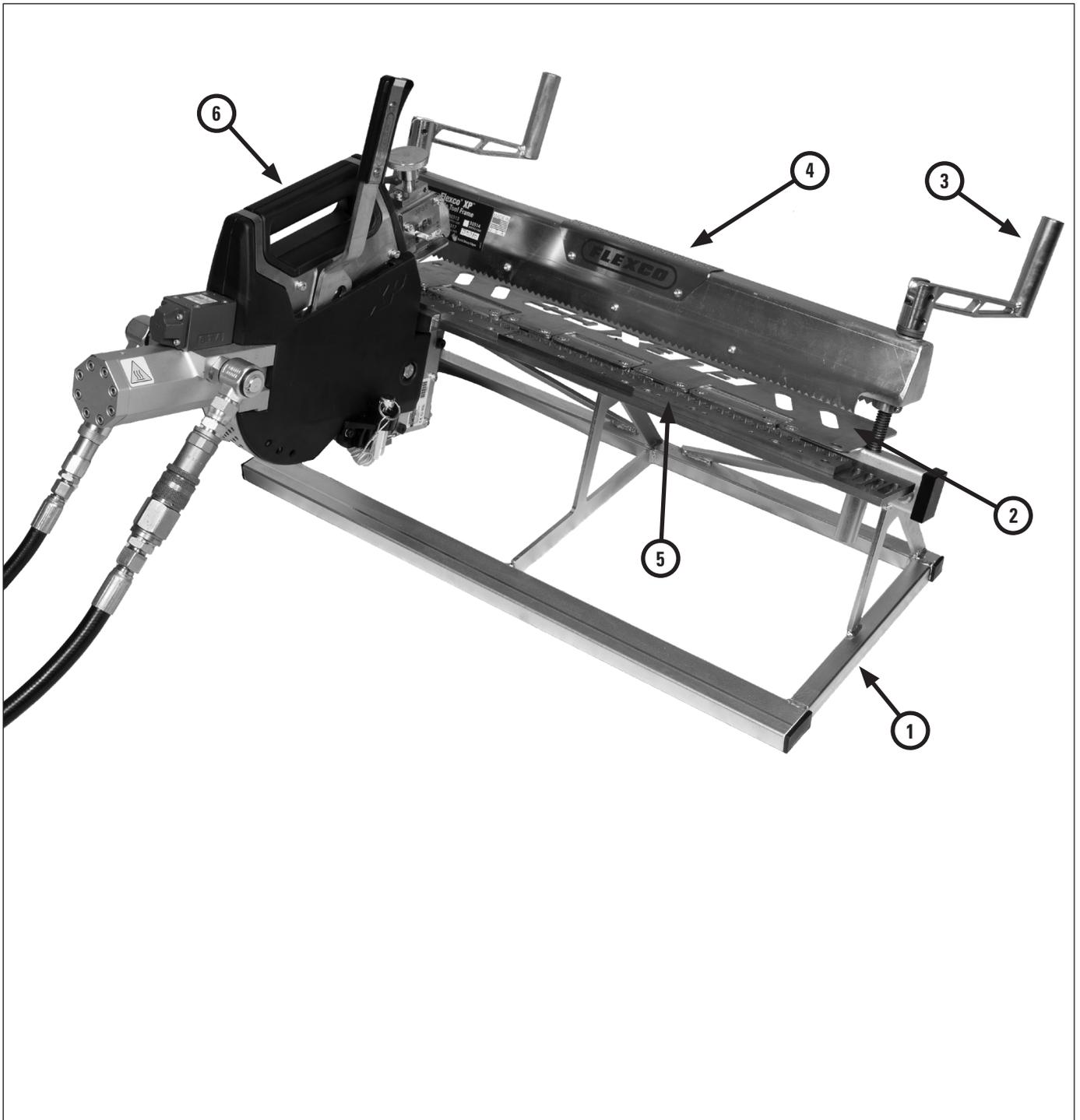
Flexco® XP™ Hydraulic Staple Applicator	
1. Advance/actuation handle	7. Hydraulic cylinder
2. Carrying handle	8. High pressure in: 3/8" Female quick release coupling
3. Fastener compression adjustment knob and lock	9. Low pressure return: 1/2" Male quick release coupling
4. Integrated belt thickness gauge	10. Two-Step Stop Pin
5. Mounting bracket	11. Fastener Selection Gauge
6. Advance mechanism lever	



## Hydraulic Flexco® XP™ Staple Fastener System

# System Components

Flexco® XP™ Staple Tool Frame	
1. Frame	4. Clamp bar
2. Belt guide plate	5. Bed
3. Clamp bar handle	6. Hydraulic staple applicator



# System Components

**Flexco® XP™ Staple Fasteners**

- 1. Fastener Strips
- 2. Hinge Pin



**Protective Equipment**

- 1. Safety Glasses
- 2. Gloves
- 3. Hearing Protection
- 4. Safety Shoes



**Power Source**

- |   |        |   |
|---|--------|---|
| Immediate Need Power Pack<br>– For mobility throughout the mine | – OR – | Power Take-off Unit (PTO)<br>– For diverting hydraulic power from your conveyor at the mine |
|---|--------|---|

# General Safety Rules – Save These Instructions

## Signal words

“DANGER” indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury. The signal word is limited to the most extreme situations.

“WARNING” indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

“CAUTION” indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury. It may also be used to alert against unsafe practices.

## International Safety Symbol



This international safety symbol is used to identify and call attention to specific safety matters.

## Safety Information

To Avoid Severe Personal Injury or Property Damage, read carefully and understand the following Safety Precautions.

### 1. WORK AREA SAFETY

#### **! DANGER**

Never repair conveyors before applying OSHA Lock-Out/Tag-Out protocols, see 29 CFR 1910.147(a)(1) (i).

Do not allow bystander, visitor, or children in work area during tool operation.

#### **! WARNING**

Store tools outside the reach of children and untrained persons. Tools are dangerous in the hands of unskilled users.

#### **! CAUTION**

Keep work area clean and well lit. Clutter and dark areas invite accidents.

### 2. PERSONAL PROTECTIVE EQUIPMENT

#### **! WARNING**

**EYE PROTECTION** which conforms to ANSI specifications and provides protection against flying particles both from the FRONT and SIDE should ALWAYS be worn by the operator and others in the work area. Eye protection is required to guard against flying debris, which could cause severe eye injury.

The employer and/or user must ensure that proper eye protection is worn. Eye protection equipment must conform to the requirements of the American National Standards Institute, ANSI Z87.1 and provide both frontal and side protection. NOTE: Non-side shielded spectacles and face shields alone do not provide adequate protection.

#### **! CAUTION**

**HEARING PROTECTION** will be required in some environments. For example, the working area may include exposure to noise level which can lead to hearing damage. The employer and user must ensure that any necessary hearing protection is provided and used by the operator and others in the work area.

#### **! CAUTION**

**HEAD PROTECTION** – Some environments will require the use of head protection equipment. When required, the employer and user must ensure that head protection conforming to ANSI Z89.1 is issued.

**FOOT PROTECTION** – Safety footwear should always be worn. Operators must be protected against falling tools and slippery conditions.

**HAND PROTECTION** – Safety gloves should always be worn against hot surfaces and other sharp objects.

## General Safety Rules

### 3. PERSONAL SAFETY

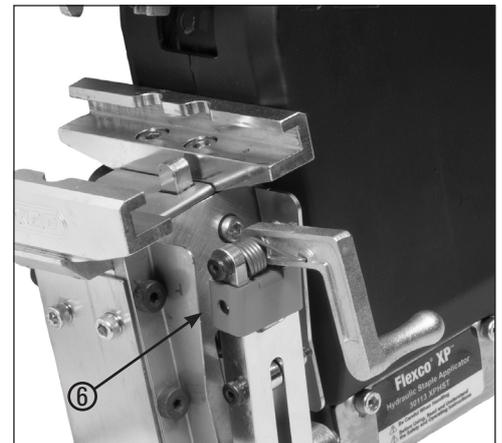
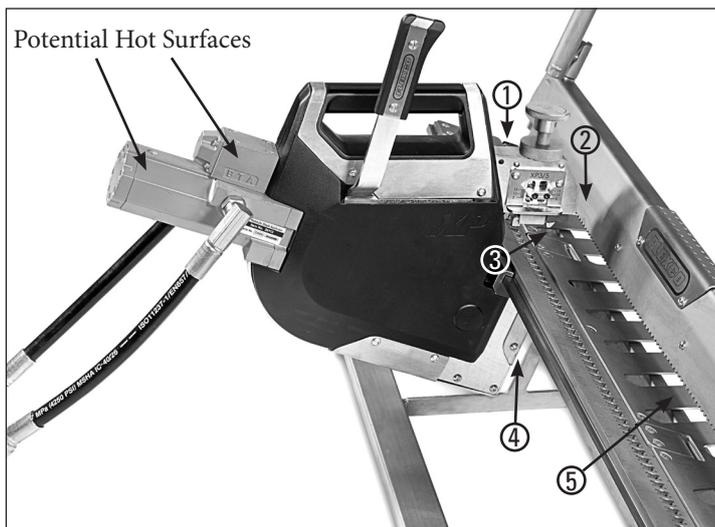
## ⚠ WARNING

Do not use in explosive environments as this may result in serious personal injury.

Always handle the tool with care: 1.) Never engage in horseplay; 2.) Never pull the advance/actuation handle unless the applicator is loaded onto the bed/frame base; 3.) Keep others a safe distance from the tool while tool is in operation as accidental actuation may occur, possibly causing injury; 4.) Never place a hand or any part of body in the downward path of the head applicator.

#### Potential Pinch Points

- |                                 |                               |                               |
|---------------------------------|-------------------------------|-------------------------------|
| 1. Adjustment Knob & Tool Cover | 3. Tool Head & Bed (Fastener) | 5. Clamp Bar & Bed (Belting)  |
| 2. Tool Head & Clamp Bar        | 4. Hydraulic Tool & Frame     | 6. Tool Advance & Cover Plate |



Do not operate the equipment if you are:

- 1.) Taking medication, feeling drowsy, feeling unwell or feeling tired;
  - 2.) Under the influence of drugs or alcohol;
  - 3.) Experiencing pain in hands, feet, lower back, or other parts of your body hurt or are injured.
- Failure to observe this precaution can result in serious injury or even death.

## ⚠ CAUTION

Do not touch the machine with your bare hands: 1.) The oil tank may become hot under continuous running; 2.) Tools may become hot under continuous use, make sure to wear safety gloves before any contact with the tools. Failure to observe this precaution can result in burn injuries.

When lending someone the equipment, make sure the safety instructions have been thoroughly read and fully understood by the person who is going to use the equipment.

# General Safety Rules

## 4. HYDRAULIC SAFETY

### **DANGER**

This hydraulic tool is only designed to be used to install Flexco XP staple fasteners. DO NOT operate this hydraulic tool when: 1.) Part of the tool or whole tool has been drenched in water or seawater; 2.) The power source exceeds the oil flow and pressure range prescribed; 3.) Operating with oil temperature below 10°C or over 100°C.

Do not operate hydraulic applicator unless it is loaded onto the bed/frame base.

### **WARNING**

At the beginning of each shift, conduct a TOOL OPERATION CHECK: 1) Remove all fasteners from tool before performing tool operation check; 2.) Do not use if there is any oil leakage from hoses or tool itself; 3) Do not use if there is damage to the tool.

Spilled hydraulic oil can cause burns, accidents due to slippery conditions, and will also harm the environment: 1) Take care of all spilled oil and handle it according to your safety and environmental regulations; 2) Avoid getting hydraulic oil on your hands; 3) Always use protective gloves when working with hydraulic oil; 4) Wash hands after contact with hydraulic oil.

When using the machine to perform work-related activities, you may experience discomfort in the hands, arms, shoulders, neck, or other parts of the body: 1) Adopt a comfortable posture while maintaining secure footing and avoid awkward off-balanced postures; 2) Changing posture during extended tasks may help avoid discomfort and fatigue; 3) In case of persistent or recurring symptoms, consult a qualified health professional.

Do not store tool in a cold weather environment to prevent frost or ice formation on the tool's operating valves and mechanisms that could cause tool failure.

At the end of operation, secure the tool to prevent unauthorized use. Never assume you will find the equipment in the same condition in which you left it.

Never leave a tool unattended with the hoses attached.

### **CAUTION**

Always carry the tool by a handle.

Do not alter or modify this tool from the original design or function without approval from FLEXCO.

Always be aware that misuse and improper handling of this tool can cause injury to yourself and others.

## 5. MAINTENANCE SAFETY

### **DANGER**

Always disconnect hydraulic hoses at tool and electric supply at power pack when servicing the tool or before making adjustments.

### **CAUTION**

REPLACEMENT PARTS:

FLEXCO replacement parts are recommended. Do not use modified parts or parts which will not give equivalent performance to the original equipment.

# Operational Instructions

### Guidelines

1. When using hydraulic power units not manufactured by Flexco, make sure the operating pressure of the power unit is 115 bar, 11.5 Mpa, 1650 psi and flow rate is in the range of 8-12 L/m (2-3 gpm).
2. When connecting and disconnecting couplings, make sure dirt, dust, and other foreign substances do not enter or attach to coupling and hoses.
-  3. Make sure the power unit is OFF when connecting the hydraulic tool to the power unit.
4. If the oil temperature is below 10°C, warm up the hydraulic tool before operating.
-  5. Do not trip over the hydraulic hoses.
-  6. Make sure there are no jobsite obstacles.
-  7. Be cautious not to injure your back while lifting the hydraulic tool.
-  8. In case of sudden hydraulic hose breakage STOP the power unit IMMEDIATELY.
9. Replace with new hoses when they are worn or when oil exudes from them.
10. When couplers detach, a small amount of oil may leak out. Make sure that surrounding area does not get drenched in oil.
11. To prevent dirt from entering the quick release couplings, be sure to clip couplings together after disconnecting driver. Couplings should be wiped down before clipping them together.
12. When detached from power source, attach two hoses to each other. Couplings should be wiped down before clipping them together.
13. When frequently attached and detached to the power unit, hydraulic oil will decrease accordingly. Always check the hydraulic oil level before operating and refill if necessary.

### Tool Inspection

Examine the tool before applying fasteners.

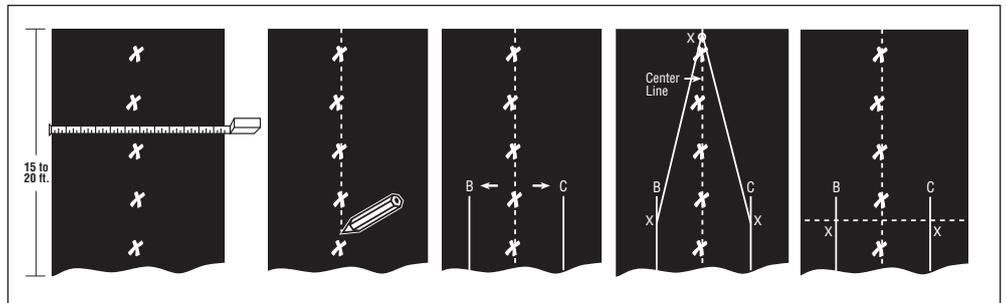
- Clean any dirt build-up from the bed rails.
- Check the hydraulic applicator to make sure the mounting brackets are free from dirt build-up.
- Check for any nicks in the bed that may interfere with the movement of the head. Should any nicks be found, they should be filed off before using the tool.
- Ensure applicator moves freely on bed. If not spray SLP5 GLIDE silicone lubricant on bed rails and mounting brackets for smoother operation.
- Inspect swipe arms, pusher tip and front/rear locator prongs for damage, chips or cracking. Replace damaged parts by authorized distributor.

# Belt Fastener Selection

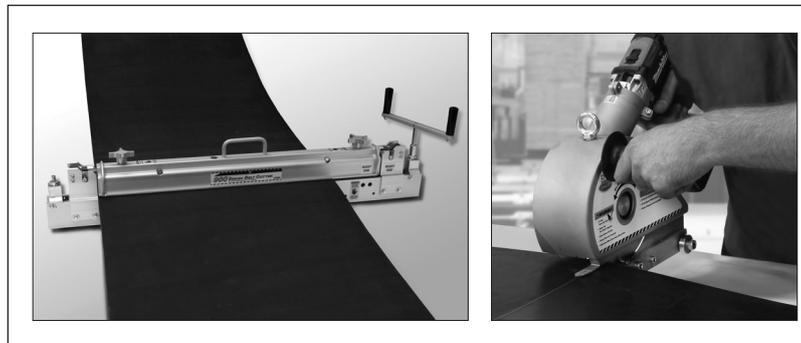
Flexco® XP Staple Belt Fastener Selection Chart								
Fastener Size	Belt Strength up to	Tension Rating up to	Belt Thickness After Skive		Recommended Min. Pulley Diameter		Max. Hinge Pin Diameter	
	kN/m	PIW	mm	in.	mm	in.	mm	in.
XP3	1400	800	6-9	1/4 – 11/32	250	10	5.5	7/32
XP3-L	1400	800	8-11	5/16 – 7/16	250	10	5.5	7/32
XP5	2000	1150	9-12	11/32 - 15/32	350	14	8.1	5/16
XP5-L	2000	1150	11-14	7/16 - 9/16	350	14	8.1	5/16
XP7	3500	2000	13-16	1/2 - 5/8	500	20	10.3	13/32
XP8	3500	2000	15-18	19/32 - 23/32	500	20	11.0	7/16
XP8-L	3500	2000	17-20	21/32 - 25/32	500	20	11.0	7/16

## Belt Preparation

1. Square belt ends using the centerline method.



2. Cut each belt end at the square line
  - Cut belt at least 6" (150 mm) behind old splice using Flexco belt cutting tool

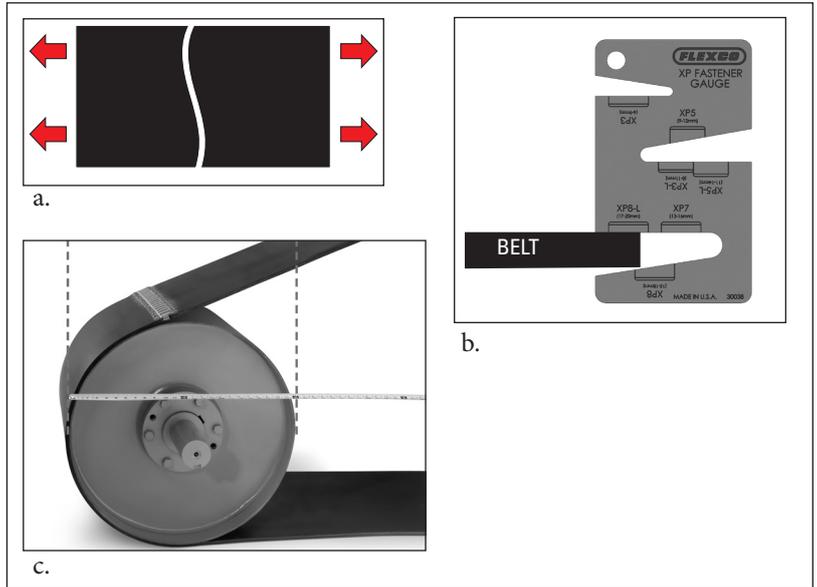


3. Skive each belt end
  - Use fastener selection gauge to determine how much to skive if only one fastener size is available
  - Leave a minimum of 1/16" (1.5mm) cover **after** skive
  - Skive to correct fastener size/width



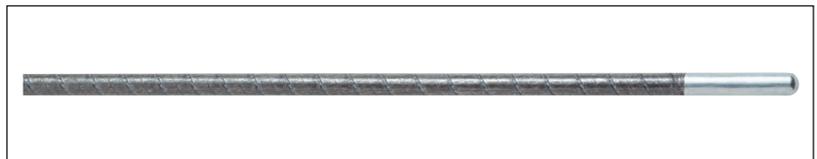
## Product Selection

1. Select the correct fastener size and material for the application (refer to fastener selection chart on page 11).
  - a. Use belt strength or tension rating
  - b. Measure belt thickness after skive
    - Use the fastener selection gauge to determine correct fastener size
  - c. Determine minimum pulley diameter (90° or greater wrap)



2. Select the correct size hinge pin and material for the application.

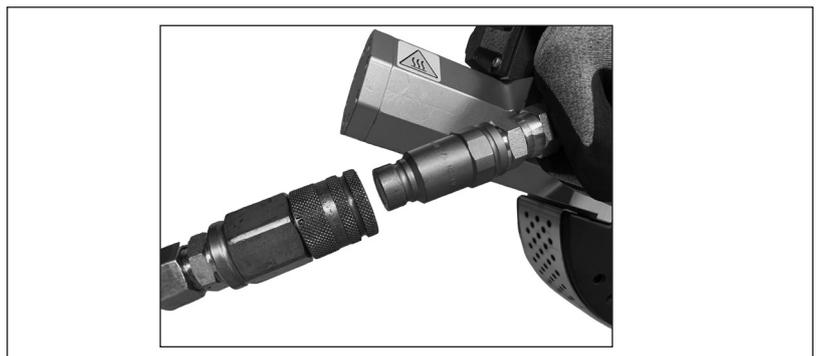
**NOTE:** Never cut the hinge pin ends shorter unless the ends are re-welded. This can cause the armor cable to loosen.



## Tool Setup

1. Connect the hydraulic hoses from the hydraulic power source.
  - If quick release couplings are difficult to join, bleed the excess pressure.
  - Turn on hydraulic power source.

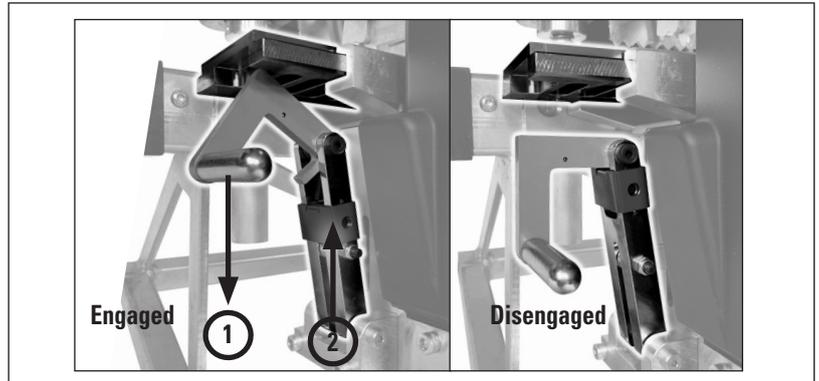
**NOTE:** Make sure to read the power source (Power pack or PTO) manual prior to operating the equipment.



# Basic Tool Operations

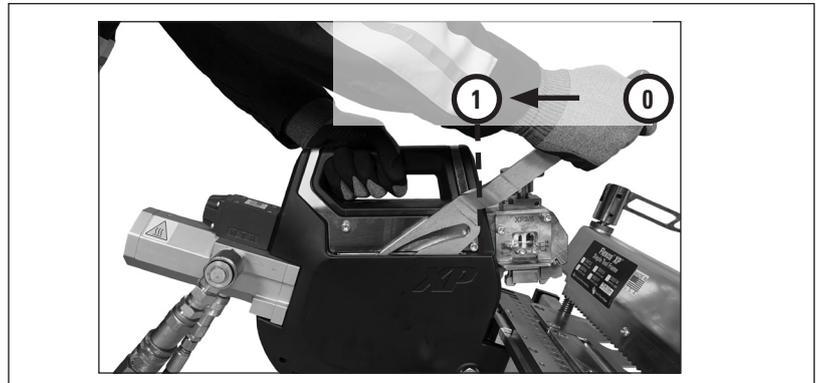
1. How to move the applicator tool on the bed.
  - Slide the tool to the right by continuing to push it across the bed.
  - Slide the tool to the left by disengaging the advance mechanism lever and pushing the tool to the left.

**NOTE: Ensure the advance/actuation handle is in the start position or the tool will not slide.** (See next step.)

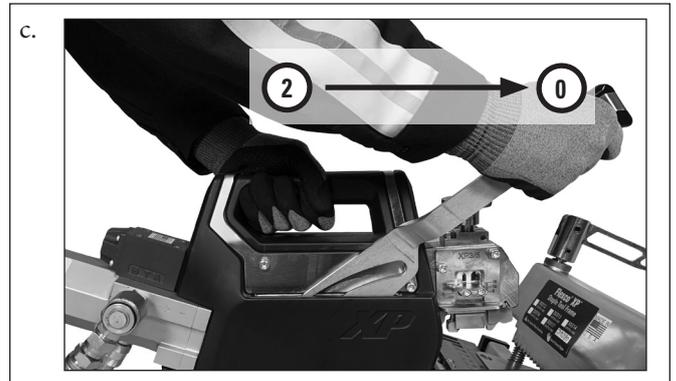
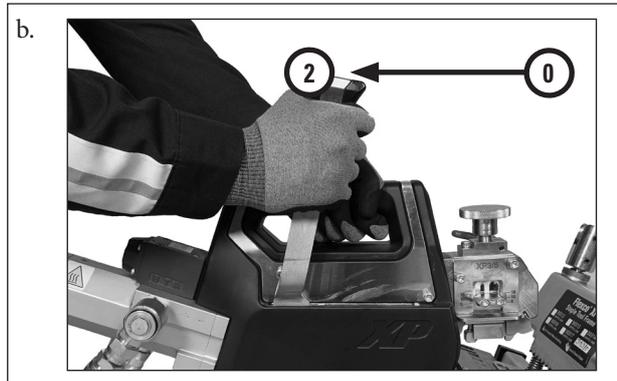
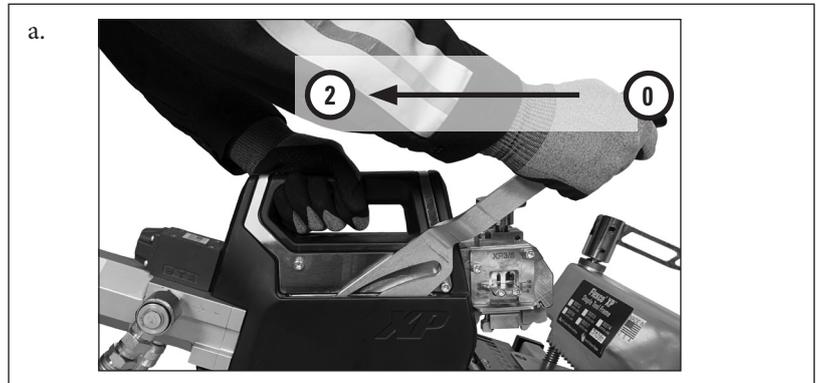


2. How to rapid advance the tool.
  - To use the rapid advance feature, move the advance/actuation handle from start position “0” to position “1” and repeat to quickly advance the tool.

**NOTE: If tool binds during advance – spray bed with SLP5 GLIDE.**

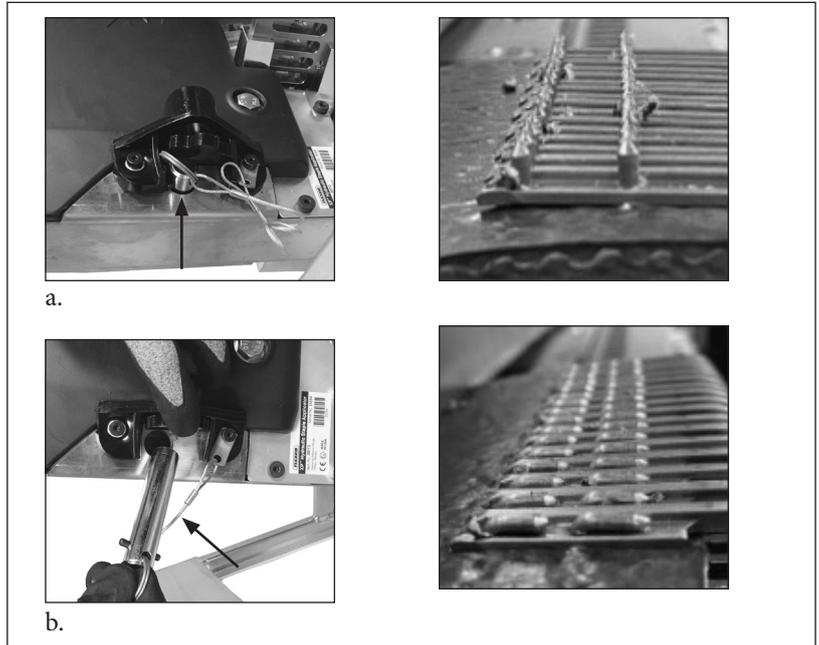


3. How to operate the tool for fastener installation.
  - Position tool so it is one H-hole before first fastener plate.
    - a. Move the advance/actuation handle from position “0” to end of travel (position “2”).
    - b. **Hold handle in position “2” until feedback in handle is felt**
    - c. Push the advance/actuation handle forward (position “0”). This action completes the drive cycle.



# Basic Tool Operations *(continued)*

4. Two-Step Feature (Optional) may help with challenging installs to minimize belt compression for better installation results.
- Lift protective cover and insert the stop pin. Move handle as directed above to drive the staples through the plates without swiping them.
  - Remove stop pin and store. Fully cycle the tool to complete the installation.

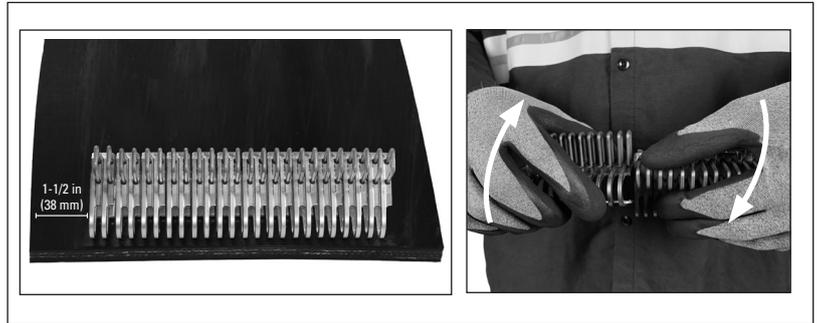


## Best Practices

- Use XPLT XP-LOK™ Tensioner and XPLW-120 XP-LOK™ Belt Wire to prevent belt wave and ripple on rubber plied belting.
- Always perform a test sample to verify proper belt thickness setting before completing final installation. A final adjustment may be necessary after the first few fasteners have been installed. The leading edge of the fastener must be set tight on the belt – **Do not over compress.**

## Installation Instructions

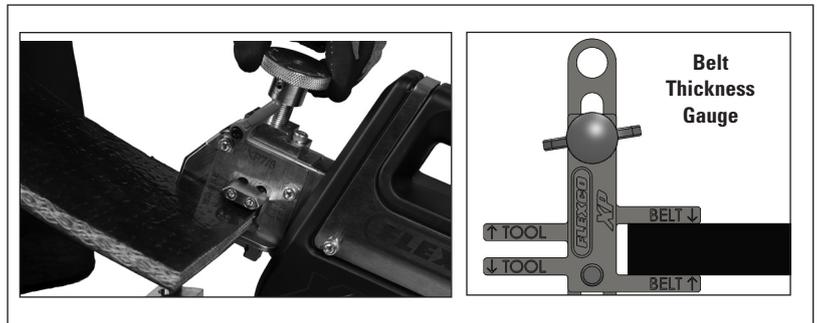
1. Determine the exact number of fasteners needed for the belt width.
  - Lay fastener strips across the belt width. Center fasteners so that approximately 1-1/2 inches (38 mm) of belt extends beyond the fasteners on each edge.
  - If a shorter fastener strip is needed, hold strip in one hand and carefully twist the strip with the other hand.



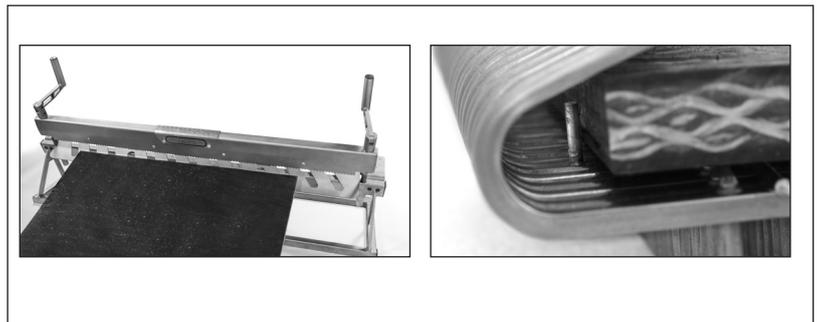
2. Load the fastener strips in the tool bed.
  - **Without XP-LOK™** Make sure the fastener strips are **centered** on the tool bed.
  - **With XP-LOK™** Make sure the fastener strips are placed **on the right side** of the tool bed – **leave 2-3 empty H-holes**.
  - Make sure the fastener strips are fully seated down in the tool bed.



3. Set the applicator tool for correct belt thickness **after skive**.
  - Use scrap belt from conveyor that matches each belt end or use the actual belt on the conveyor (Alternatively: use Belt Thickness Gauge if available).
  - Use the correct side of the belt thickness gauge for the corresponding fastener size.
  - **Set tool for every belt end** and check thickness on **ends and middle of the belt**. (Belt thickness may vary due to wear and manufacturer).



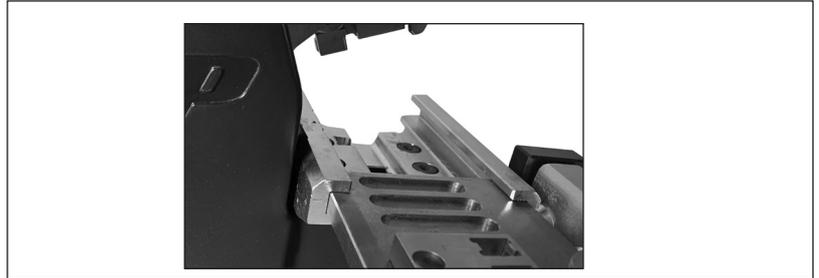
4. Load the belt into the fasteners.
  - Slide the belt on the extended guide plate into the fastener belt stops.
  - Make sure the belt is centered within the fasteners.
  - Tighten clamp bar evenly and securely.



## Installation Instructions *(continued)*

5. Load applicator tool on the tool bed.

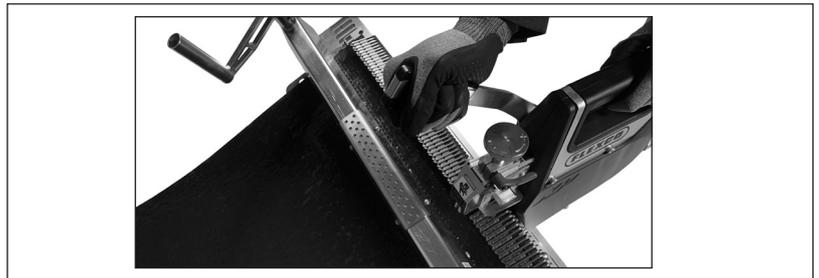
- Ensure the advance/actuation handle is in the start position.



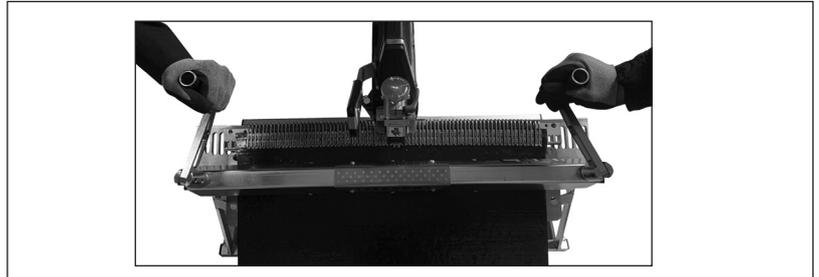
6. Install fasteners with the applicator tool.

- Make sure applicator tool cycles completely.
- Examine the first fasteners to ensure good fastener compression.

**NOTE:** If belt is worn the belt thickness gauge on the tool may need to be adjusted tighter for the thinner areas.



7. Loosen the belt clamp bar and remove the belt from the tool bed.



8. Repeat steps for the other belt end.

**Make sure to set the applicator tool for the correct belt thickness on the other belt end**

9. Turn off the hydraulic power source when finished and disconnect the hydraulic hoses.

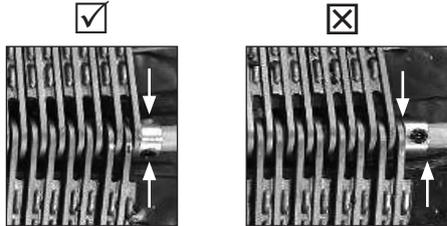
- Pull back on lock collar to disconnect the hydraulic hoses.
- If quick release couplings are difficult to disconnect, bleed the excess pressure.



## Installation Instructions *(continued)*

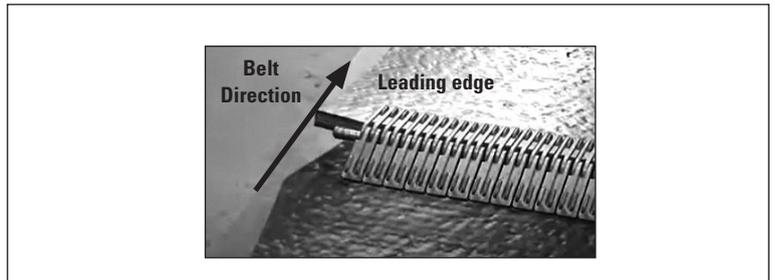
10. Bring both belt ends together and insert the hinge pin.

- **Make sure the fastener plates match up on both belt ends** – Correct fastener matching allows the splice to flex without restriction while troughing.



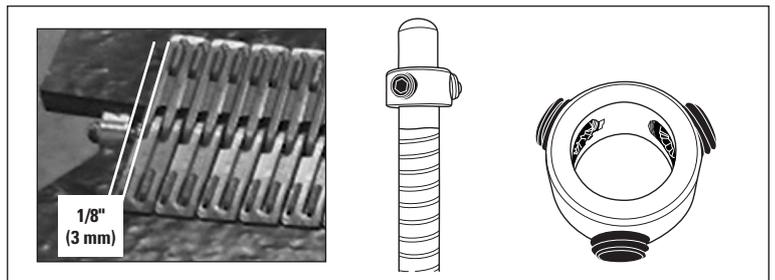
11. Notch the **trailing edge** of the belt only.

- Notching is important to prevent the belt ends from catching on structure if belt mistracks.
- Only notch the trailing edge so the leading edge can protect the splice from belt mistracking damage.



12. Install hinge pin retaining collars on each end of the splice.

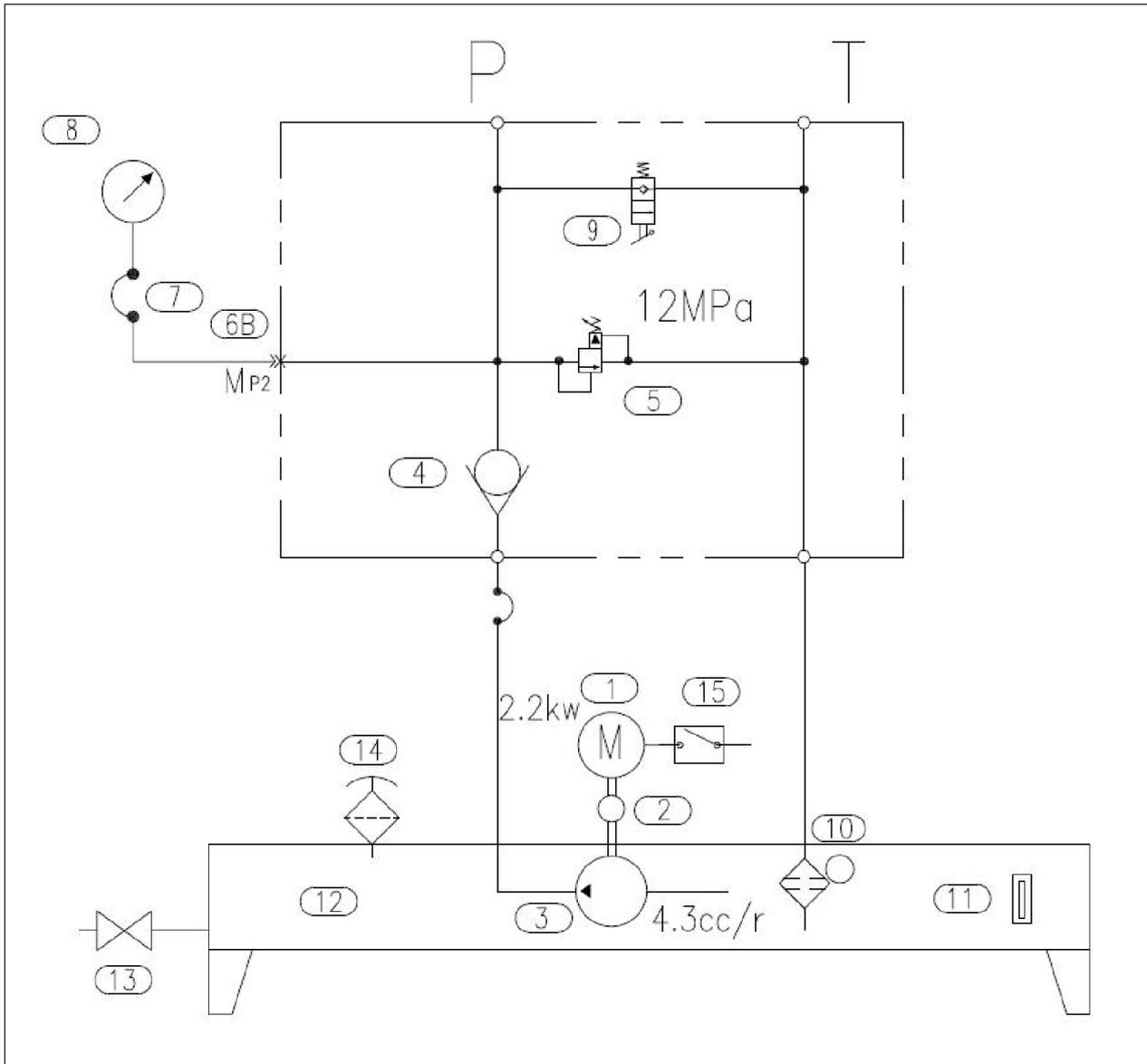
- Leave a **minimum of 1/8" (3 mm)** spacing from edge of fastener plate to edge of collars.
- This spacing allows the splice to flex without restriction while troughing.



# Troubleshooting

Problem	Cause	Correction
Pull advance/actuation handle but applicator does not advance	<ol style="list-style-type: none"> <li>1. Advance mechanism lever was in disengage position</li> <li>2. Advance/setting handle was not pulled down to position "1" to complete advance cycle</li> <li>3. Advance/setting handle was not fully pushed forward (position "0") to engage advance mechanism</li> <li>4. Bed rails are dirty</li> <li>5. Advance mechanism lever spring was not in position or damaged (Rare)</li> </ol>	<ol style="list-style-type: none"> <li>1. Engage advance mechanism lever</li> <li>2. Pull handle down to position "1"</li> <li>3. Push handle forward all the way to complete cycle</li> <li>4. Clean surfaces and spray SLP5 GLIDE silicone lubricant on bed rails and mounting brackets</li> <li>5. Adjust or replace spring</li> </ol>
Pull advance/actuation handle down but applicator does not actuate	<ol style="list-style-type: none"> <li>1. Power pack unit is not turned ON</li> <li>2. Hoses are not connected</li> <li>3. Couplings are not connected properly</li> <li>4. Power source relief valve pressure is set too low</li> <li>5. No hydraulic pressure due to incorrect electric cable connection at motor</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn ON power pack unit</li> <li>2. Connect hoses</li> <li>3. Check if couplings have been connected properly</li> <li>4. Adjust pressure to 115 bar, 11.5 Mpa, 1650 psi</li> <li>5. Check proper electric cable connection, voltage, and phases</li> </ol>
Functioning but weak or low speed	<ol style="list-style-type: none"> <li>1. Low fluid flow rate from power source unit</li> <li>2. Relief valve pressure set too low</li> <li>3. Back pressure is too high</li> <li>4. Over-heated hydraulic fluid</li> </ol>	<ol style="list-style-type: none"> <li>1. Check electric cable connection, voltage, and phases</li> <li>2. Adjust pressure to 115 bar, 11.5 Mpa, 1650 psi</li> <li>3. Use bigger diameter hose for return hose</li> <li>4. Turn OFF power pack approximately one hour to allow hydraulic fluid to cool</li> </ol>
Oil leakage from cylinder, hydraulic hose, coupling	<ol style="list-style-type: none"> <li>1. Damage, wear or hardened O-ring</li> <li>2. Damaged hose</li> <li>3. Damaged connection at coupling</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace O-ring by authorized distributor</li> <li>2. Replace hose assembly</li> <li>3. Replace hose assembly</li> </ol>
Power pack motor runs but there is no pressure at the outlet	<ol style="list-style-type: none"> <li>1. Motor turns in wrong direction due to incorrect electric cable connection</li> <li>2. Relief valve pressure is set too low</li> <li>3. Relief valve stuck/malfunction</li> <li>4. Low hydraulic fluid level</li> </ol>	<ol style="list-style-type: none"> <li>1. Check proper electric cable connection, voltage, and phases</li> <li>2. Adjust pressure to 115 bar, 11.5 Mpa, 1650 psi</li> <li>3. Replace relief valve by authorized distributor</li> <li>4. Add hydraulic fluid accordingly</li> </ol>
Staple legs are pushed up but staples are only partially bent over	<ol style="list-style-type: none"> <li>1. Operator did not wait for handle feedback at end of the pull (position "2") before returning handle to start position "0"</li> </ol>	<ol style="list-style-type: none"> <li>1. Pull advance/actuation handle down to position "2" and wait for handle feedback prior to releasing</li> </ol>
Staple legs are pushed up but staples are not completely set	<ol style="list-style-type: none"> <li>1. Fastener compression was incorrectly set (under-compress)</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust fastener compression by turning the adjustment knob ¼ turn to right (clockwise) and repeat as necessary</li> </ol>
Belt has too much ripple or wave	<ol style="list-style-type: none"> <li>1. Fastener compression was incorrectly set (over-compress)</li> <li>2. Using rubber plied belting</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust fastener compression by turning the adjustment knob ¼ turn to left (counter-clockwise) and repeat as necessary</li> <li>2. Use XPLT XP-LOK™ Tensioner and XPLW-120 XP-LOK™ Belt Wire to prevent belt wave and ripple</li> </ol>
Staple legs are pushed up but staples are not bent over	<ol style="list-style-type: none"> <li>1. Damaged swipe arms</li> <li>2. Damaged swipe linkages</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace swipe arms by authorized distributor</li> <li>2. Replace swipe linkages by authorized distributor</li> </ol>
Cannot load applicator onto frame	<ol style="list-style-type: none"> <li>1. Pilot punch is in up position</li> <li>2. Mounting brackets are not aligned properly</li> </ol>	<ol style="list-style-type: none"> <li>1. Push advance/actuation handle to position "0" prior to loading onto frame</li> <li>2. Inspect and verify mounting bracket are properly installed</li> </ol>

# Power Diagram



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