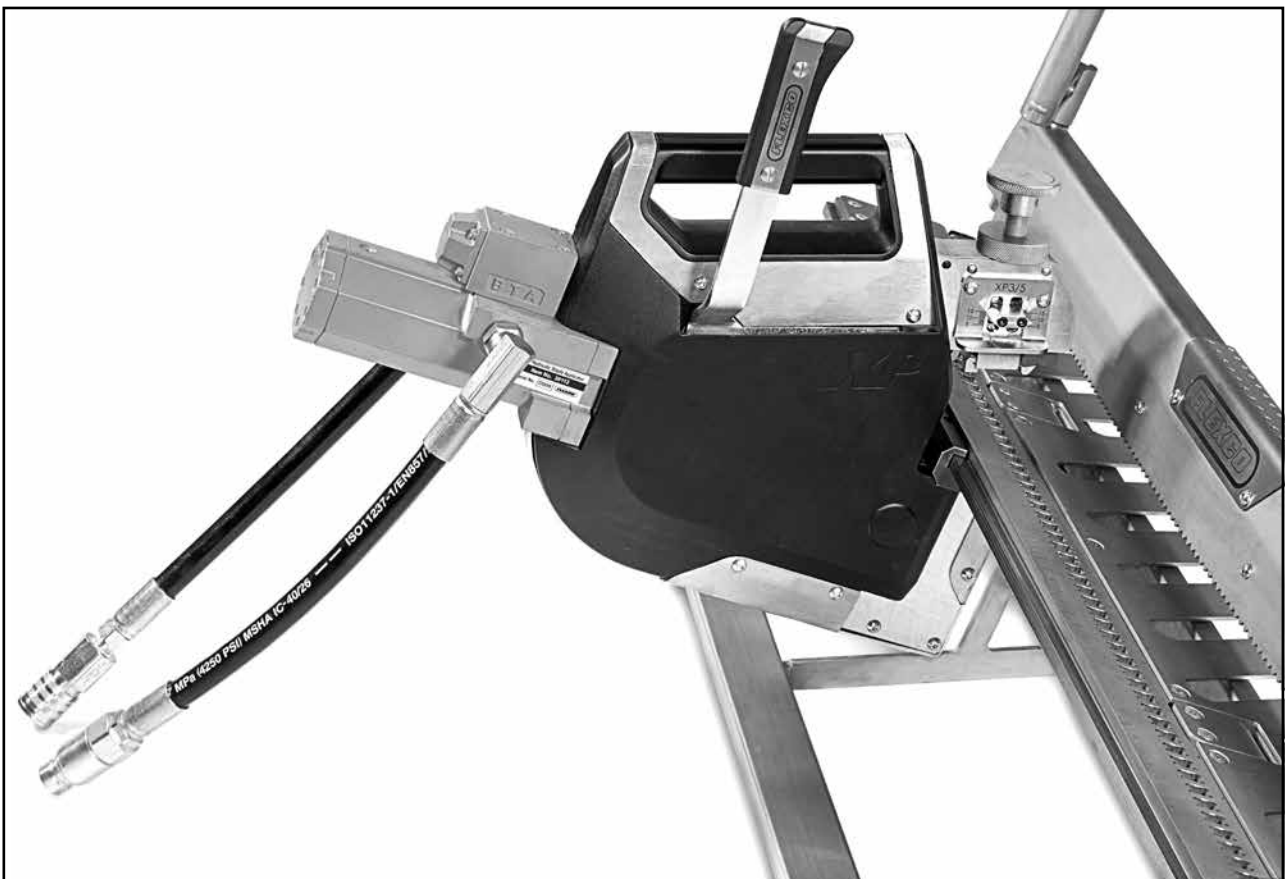




Hydraulic Flexco® XP™ Staple Fastener Installation System



Safety, Operation, and Maintenance Manual



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.

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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.

Introduction

Role of Applicator

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

Precision Built

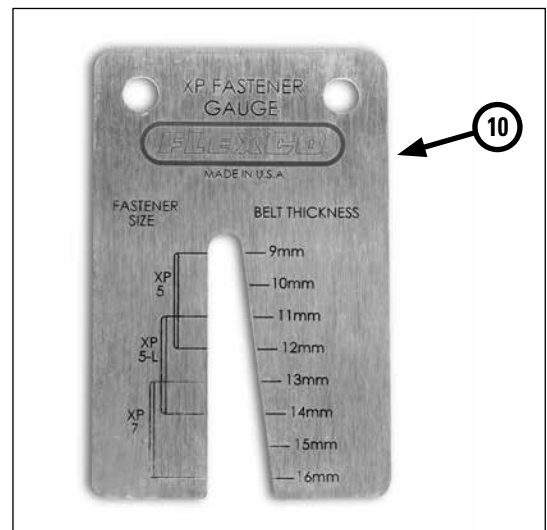
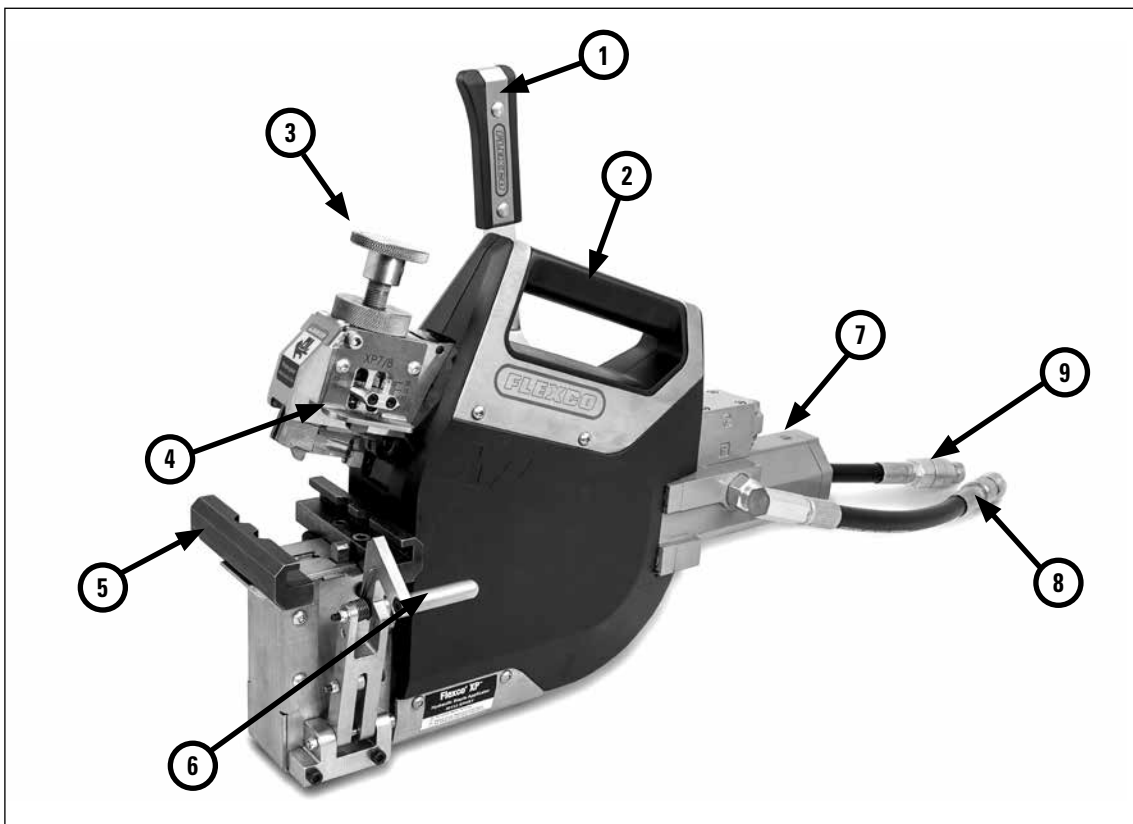
Flexco tools are precision-built tools designed for precise, high volume installation. These tools will deliver efficient, dependable service when used correctly and with care. As with any fine power tool, for best performance, the manufacturer's instructions must be followed. Please study this manual 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
Overall dimensions	559 mm x 482 mm
Operating pressure	110 bar, 11 Mpa, 1600 psi
Min. pressure	103 bar, 10.3 Mpa, 1500 psi
Max. pressure	117 bar, 11.7 Mpa, 1700 psi
Flow rate	7-9 L/m, 1.5-2 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

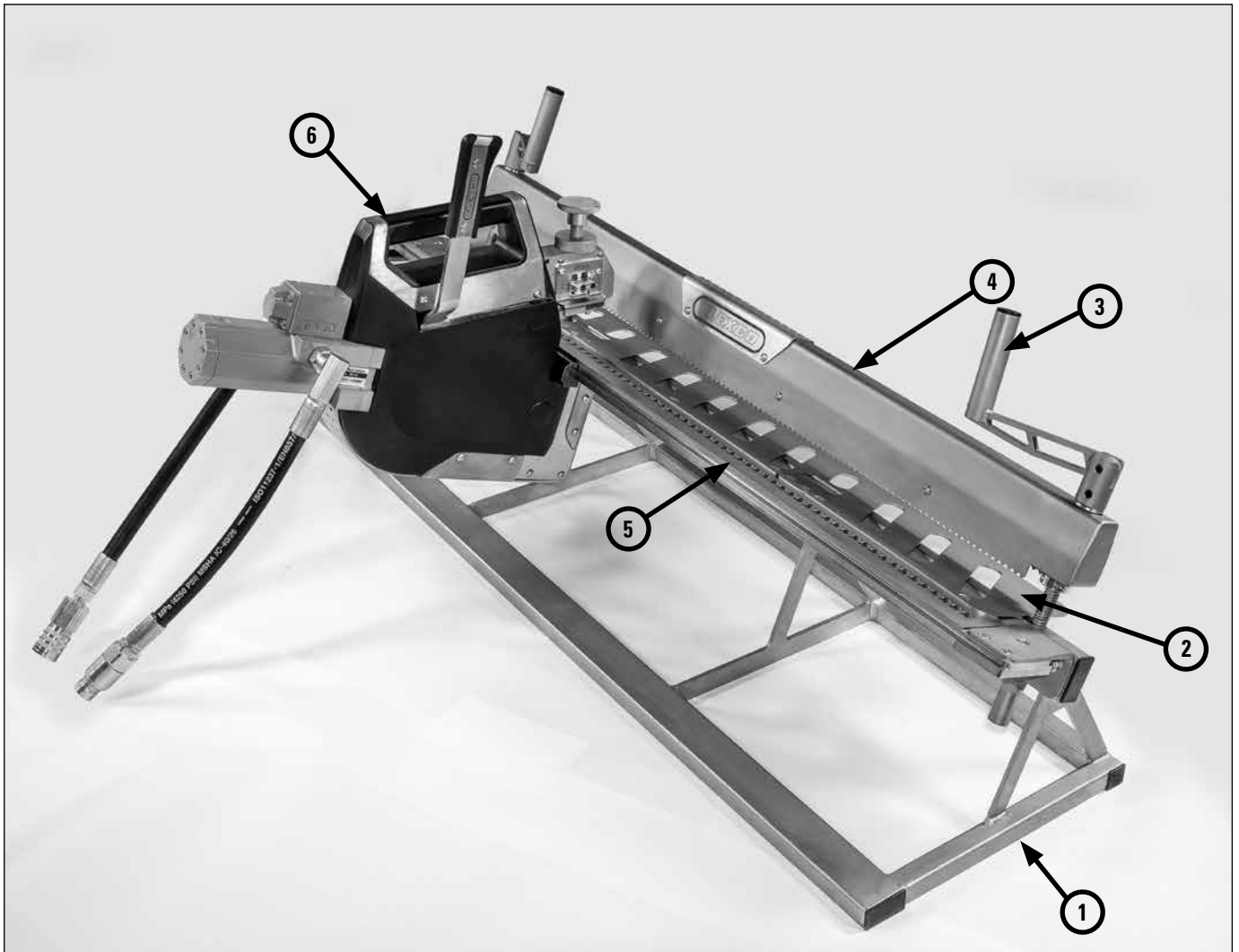
System Components

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



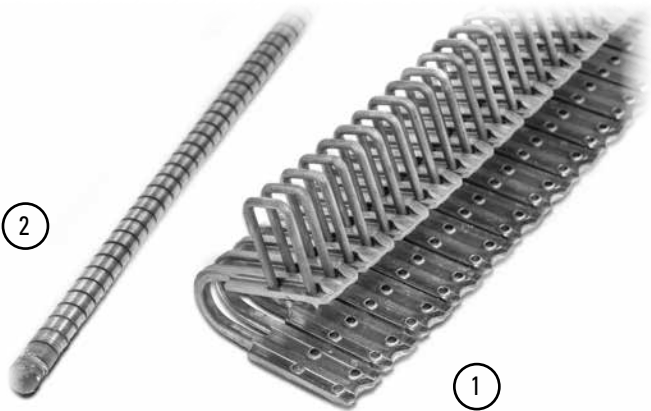
System Components

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

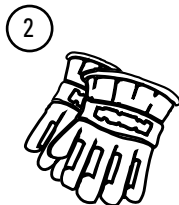
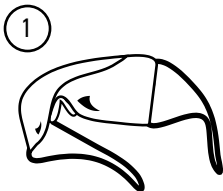


System Components

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 – For mobility throughout the mine	– OR – Power Take-off Unit (PTO) – 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.

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

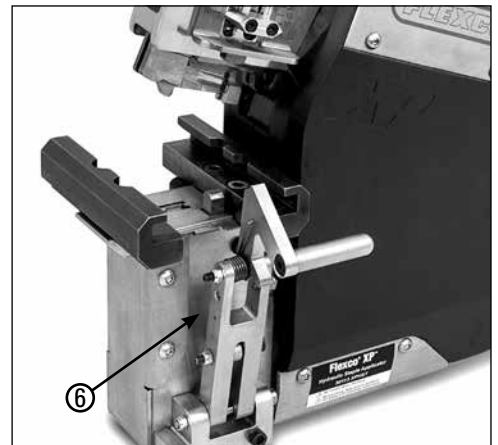
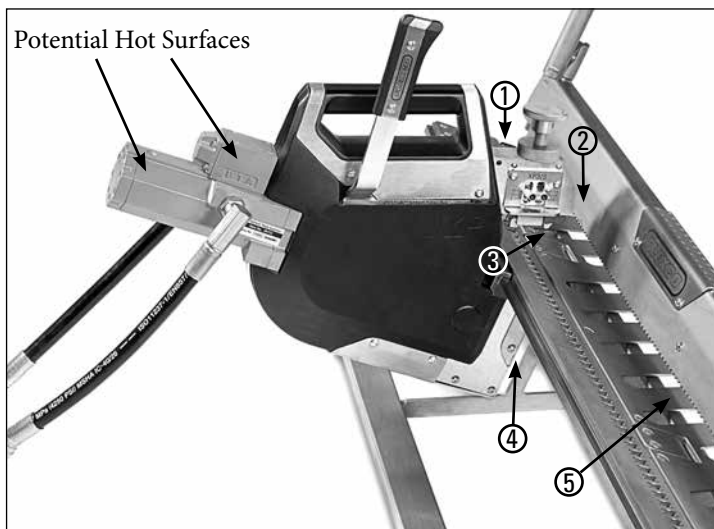
! WARNING

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 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

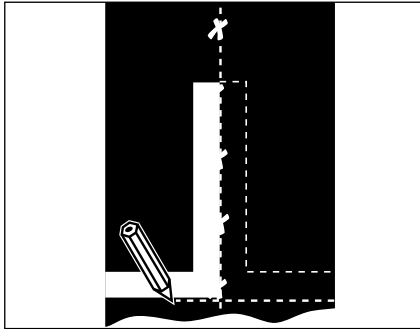
1. When using hydraulic power units not manufactured by Flexco, make sure the operating pressure of the power unit is 110 bar, 11 Mpa, 1600 psi and flow rate is in the range of 7-9 L/m (1.5-2 gpm).
2. When connecting and disconnecting couplings, make sure dirt, dust, and other foreign substances do not 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

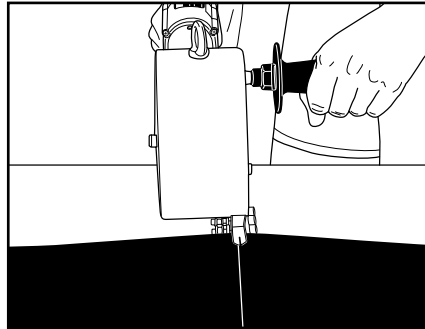
Examine the tool before applying fasteners.

- 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.

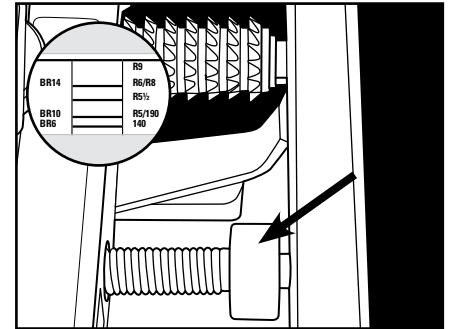
Belt Preparation



1. Square belt using centerline method.



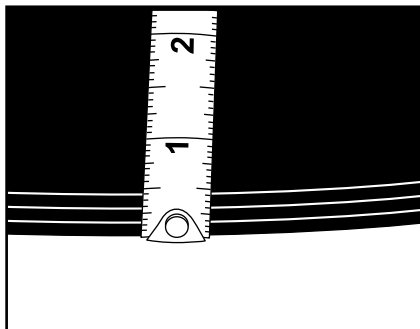
2. Cut belt at least 4" (100 mm) behind old splice using Flexco belt cutting tool.



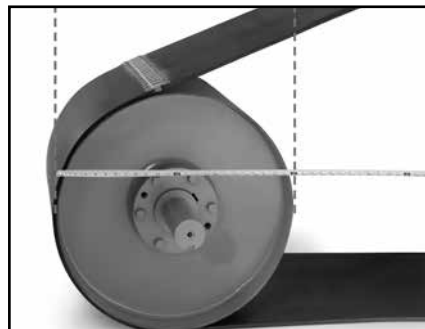
3. Skive belt when top cover permits. Adjust fence on FSK2 skiver to the R5 setting for XP5/XP5-L, half way between R5 and R5 1/2 for XP7, and to the R5 1/2 setting for XP8.

Installation Instructions

1. Select the Proper Fastener and Hinge Pin



a. Measure the belt thickness from cut edge using belt gauge or tape measure.



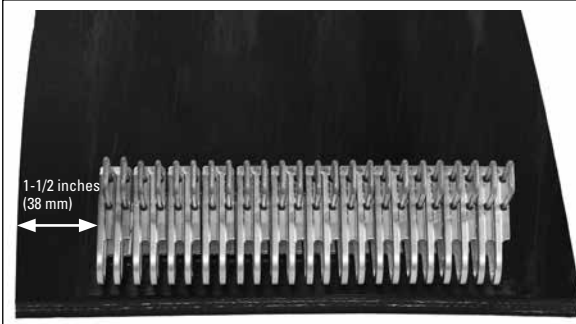
b. determine the diameter of the smallest pulley in the system which the belt will wrap at least 90° (including the belt take up and storage unit) and the mechanical fastener rating of the belt.

Flexco® XP Staple Belt Fastener Selection Chart					
Fastener Size	A		B	C	D
	Belt Strength	Tension Rating	Belt Thickness Range	Recommended Min. Pulley Diameter	Max. Hinge Pin Diameter
	kN/m	P.I.W.	mm	mm	mm
XP5	2000	1150	9-12	350	8.1
XP5-L	2000	1150	11-14	350	8.1
XP7	3500	2000	13-15	500	10.3
XP8	3500	2000	15-18	500	11.0
XP8-L	3500	2000	17-20	500	11.0

c. Refer to the table above to select the proper size fastener.

Installation Instructions *(continued)*

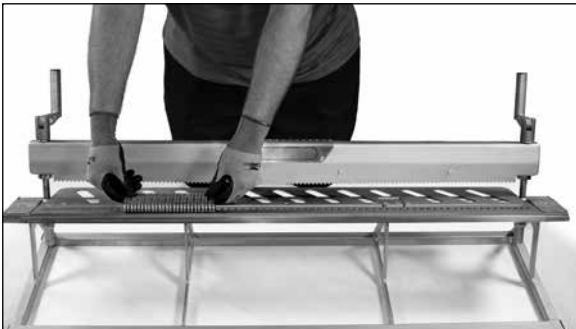
2. Load the Fasteners



a. Determine the exact number of fasteners needed for the belt by laying strips of fasteners across the belt end. Center fasteners so that approximately 1-1/2 inches (38 mm) of belt extends beyond the fasteners on each edge.



b. If a shorter fastener strip is needed, hold strip in one hand and carefully twist the strip with the other hand. Prior to placing in tool bed, trim any welded wire that remains at the end of the shortened strip so wire is flush with end fastener.

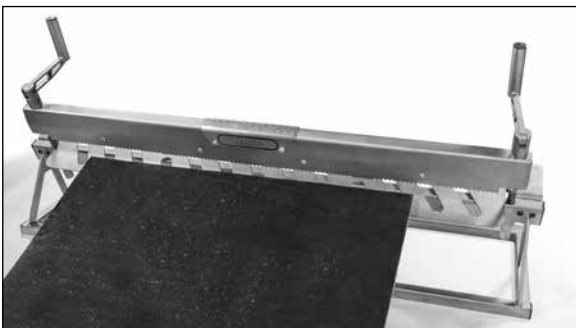


c. Center fastener strips within the bed.

- Insert the fasteners, with the open end of the fasteners toward the clamp bar. The heads (crowns) of the staple will fit into the slots in the bed.
- Use rocking motion to guide staple pairs (two staples per fastener plate) into each individual bed opening.
- Make sure there are no empty slots between fastener strips.

3. Load the Belt

BEST PRACTICE: Run crown side of staples on the carry side of the belt for optimal belt cleaner interface. Place carry side of belt facing down in frame for installation.



a. Place belt on belt guide plate and slide the belt end under the clamp bar and into the fastener.



b. Push the belt end into the fasteners until it is tight against the belt stops which are built into the fasteners. If belt end rises above the belt stop push the belt back so it is properly aligned.

Installation Instructions *(continued)*

3. Load the Belt *(Continued)*



c. Center the belt so that approximately 1-1/2 inches (38 mm) of belt extends beyond the fasteners on each edge.



d. Secure the belt in this position by evenly tensioning the clamp bar handle on both ends of the clamp bar until the belt is securely clamped.

4. Load the Applicator

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



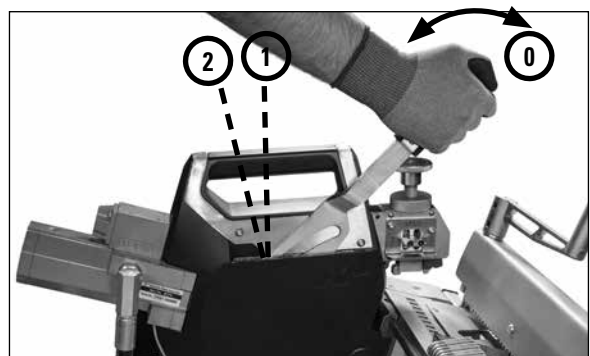
a. Attach the hydraulic applicator to the bed by sliding the mounting brackets located on the applicator onto the left end of the bed rail. **Ensure the advance/actuation handle is in the forward position "0".**



b. Push the applicator firmly to the right until the tool is solidly on the bed. **Verify hydraulic hoses are not connected.**



c. The applicator can be moved to the right either by continuing to push it across the bed or by using the handle to rapidly advance the head along the tool bed. The applicator can be moved to the left by disengaging the advance mechanism lever and pushing the head to the left.



d. 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. Position the applicator over the first two fasteners in the fastener strip.

Installation Instructions *(continued)*

5. Set the Belt Thickness Gauge



a. Insert sample belt end into the belt thickness gauge located on the sides of the head. The side used is determined by the fastener size that will be applied. For an XP7 fastener use the left side belt gauge marked “XP7/XP8”. For an XP5 or XP5-L fastener use the right side belt gauge marked “XP3/XP5”.



b. Adjust the fastener compression knob until the belt just slides in the gauge opening. Turn clockwise to tighten. Turn counter-clockwise to loosen.

NOTE: If the belt doesn't fit into the gauge, the gauge is probably set from a previous use.

- Loosen the locking knob and open the gauge by turning the compression knob counter-clockwise several turns.
- Lock gauge in place by tightening the locking knob and remove belt from gauge. This setting is approximate.



c. Use the stand alone belt thickness gauge as an alternative when a belt sample is not available. Correlate the belt thickness reference number marked on the gauge and adjust fastener compression knob accordingly.

BEST PRACTICE: 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.

Installation Instructions *(continued)*

6. Connect Hydraulic Power



a. Make sure the hydraulic power source is in "OFF" position.

1. Connect the low pressure return hose (1/2" ID):

- Connect the male nipple (hose) to the female coupler at the power pack.
- Connect the female coupler (hose) to the male nipple at the hydraulic tool.

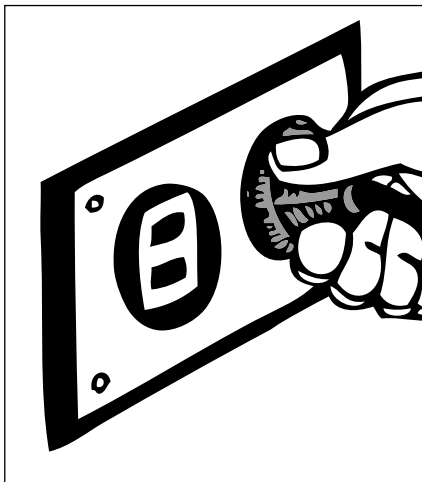
2. Then connect the high pressure hose (3/8" ID):

- Connect the female coupler (hose) to the male nipple at the power pack.
- Connect the male nipple (hose) to the female coupler at the hydraulic tool.

NOTE: If quick release couplings are difficult to join, excess pressure has built up in the line. To relieve the pressure either turn the power pack off and on again or move the advance/actuation handle one full cycle.

3. When making connections, do not over stretch the hoses or bend them at a sharp angle.

4. To disconnect the hose, pull the locking collar to release the connection at the hydraulic tool. Do not disconnect hose at power pack unless necessary. Fluid spillage will result.



b. Connect hydraulic power pack to appropriate electric source. **WARNING:** Make sure the power source is not energized and follow proper Lock-Out/Tag-Out protocols.

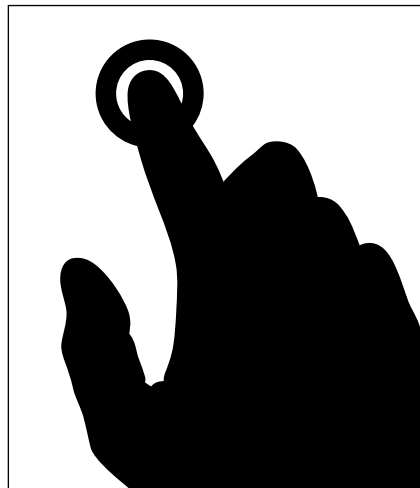
Electrical examples (reference only):

Canada: 480VAC/575VAC, 3 phase, 60Hz

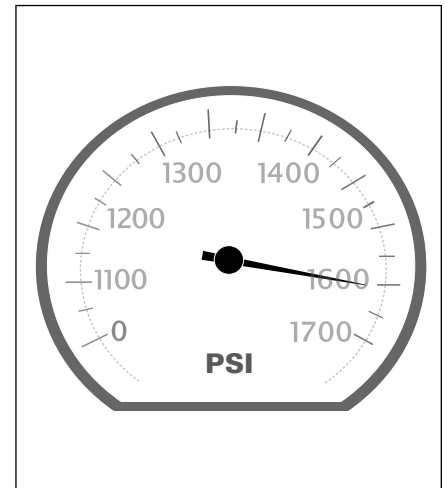
China: 380VAC/660VAC, 3 phase, 50Hz

Europe: 380VAC, 3 phase, 50Hz

US: 480VAC, 3 phase, 60Hz



c. Turn on the power source.



d. Inspect gauges when tool is in idle mode. The pressure gauge should read 110 bar, 11 Mpa, 1600 psi. If the pressure gauge shows no pressure, turn off the power source immediately. Examine the power source connect with correct wiring.

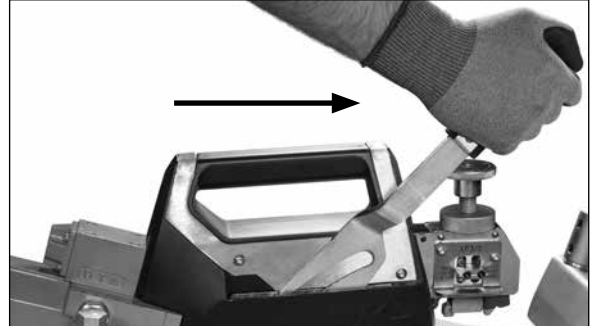


Installation Instructions *(continued)*

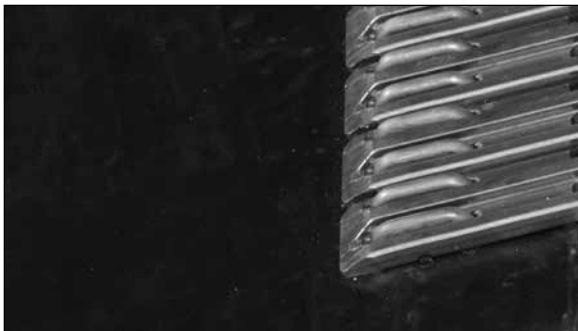
7. Fastener Installation



a. Move the advance/actuation handle from position "0" to end of travel (position "2"). This action will result in the following sequence of events: advance applicator to the next fastener, compress top plate, drive staples, fold and swipe staple legs. Hold handle in position "2" until feedback in handle is felt.

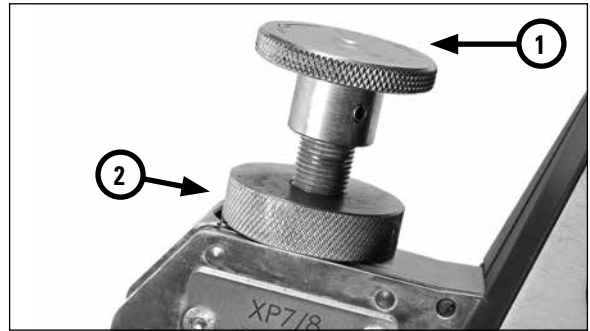


b. Push the advance/actuation handle forward (position "0"). This action completes the drive cycle. Completed cycle time is about two seconds.



c. Examine the first fasteners to ensure that the staple legs are properly set. The leading edge of the fastener must be set tight on the belt to reduce the fastener's exposure to cleaner blades, skirt rubbers, and return idlers.

NOTE: To prevent belt ripple, do not over compress fasteners on the belt.



d. Because belt thicknesses may vary across the width of the belt, it is important to examine the fasteners as they are applied. If the top plate of the fasteners is not tight on the belt, adjust the compression by turning the adjustment knob (1) 1/4 turn to the right (clockwise), check and repeat as necessary. If the applied fasteners appear to create a "ripple" in the belt, the fasteners are over compressed. Adjust the compression by turning the adjustment knob (1) 1/4 turn to the left (counter-clockwise), check and repeat as necessary. Hold the compression position by tightening the adjustment knob's locking knob. (2).



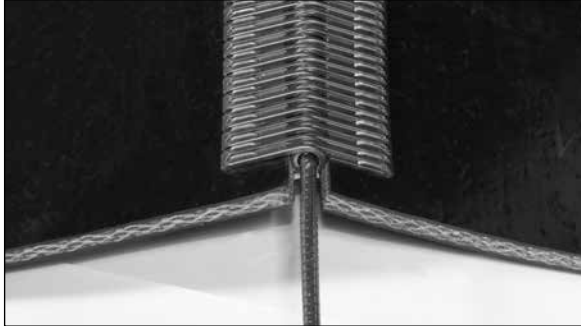
e. Loosen clamp bar, remove belt, and repeat the fastener installation procedure on the mating belt end.



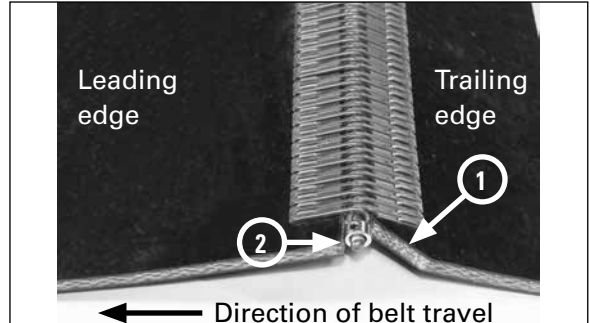
f. When finished, turn off the power source. Pull back on lock collar to disconnect hydraulic hoses.

Installation Instructions *(continued)*

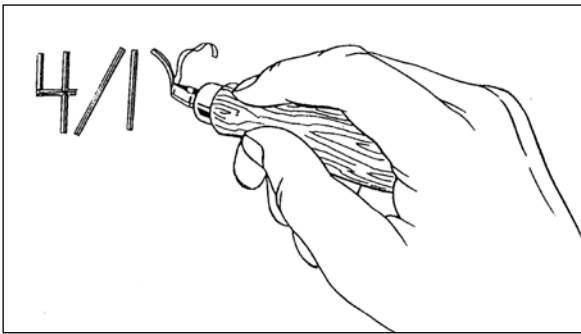
8. Complete the Splice



a. Insert the hinge pin. For ease of hinge pin insertion, overlap both belt ends. Tent both ends and start to join loops from one side. Insert hinge pin and continue to join the rest of loops.



b. Notch the trailing belt edge (1) and attach Flexco Hinge Pin Retaining Collars (2) to maintain proper hinge pin position.



c. Mark the splice date on the belt using the Flexco Belt Identification Tool or other comparable method and record it in your belt maintenance record.

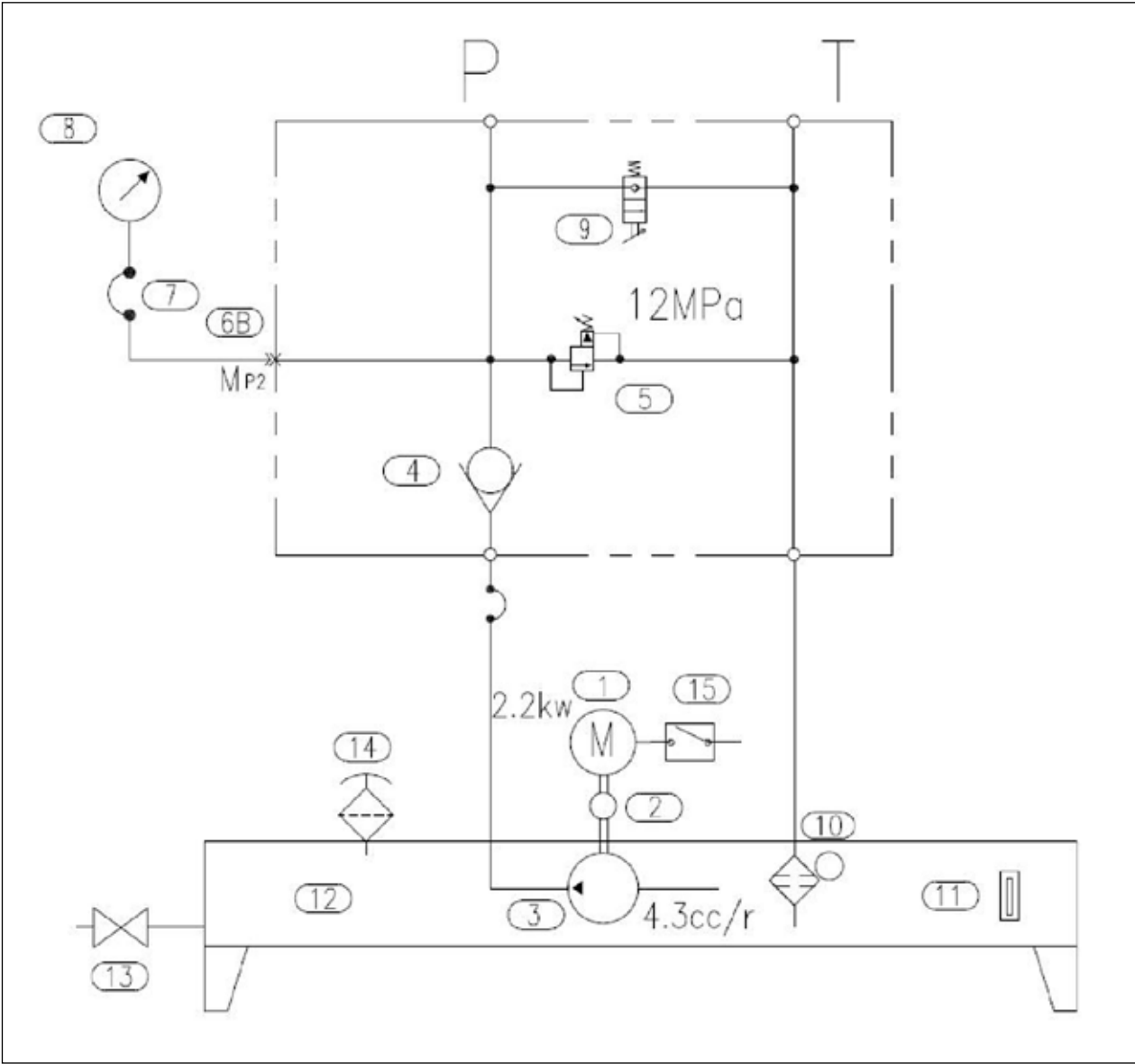
9. Tool Transport

NOTE: When transporting the tool over any distance, it is recommended that the hydraulic applicator be removed and carried separately. If you need to move the tool a short distance or reposition it, it can be carried. Take care to keep the tool level and use two people to move it as the weight may not be evenly distributed.

Troubleshooting

Problem	Cause	Correction
Pull advance/actuation handle but applicator does not advance	<ol style="list-style-type: none"> 1. Advance mechanism lever was in disengage position 2. Advance/setting handle was not pulled down to position "1" to complete advance cycle 3. Advance/setting handle was not fully pushed forward (position "0") to engage advance mechanism 4. Bed rails are dirty 5. Advance mechanism lever spring was not in position or damaged (Rare) 	<ol style="list-style-type: none"> 1. Engage advance mechanism lever 2. Pull handle down to position "1" 3. Push handle forward all the way to complete cycle 4. Clean surfaces and spray SLP5 GLIDE silicone lubricant on bed rails and mounting brackets 5. Adjust or replace spring
Pull advance/actuation handle down but applicator does not actuate	<ol style="list-style-type: none"> 1. Power pack unit is not turned ON 2. Hoses are not connected 3. Couplings are not connected properly 4. Power source relief valve pressure is set too low 5. No hydraulic pressure due to incorrect electric cable connection at motor 	<ol style="list-style-type: none"> 1. Turn ON power pack unit 2. Connect hoses 3. Check if couplings have been connected properly 4. Adjust pressure to 110 bar, 11 Mpa, 1600 psi 5. Check proper electric cable connection, voltage, and phases
Functioning but weak or low speed	<ol style="list-style-type: none"> 1. Low fluid flow rate from power source unit 2. Relief valve pressure set too low 3. Back pressure is too high 4. Over-heated hydraulic fluid 	<ol style="list-style-type: none"> 1. Check electric cable connection, voltage, and phases 2. Adjust pressure to 110 bar, 11 Mpa, 1600 psi 3. Use bigger diameter hose for return hose 4. Turn OFF power pack approximately one hour to allow hydraulic fluid to cool
Oil leakage from cylinder, hydraulic hose, coupling	<ol style="list-style-type: none"> 1. Damage, wear or hardened O-ring 2. Damaged hose 3. Damaged connection at coupling 	<ol style="list-style-type: none"> 1. Replace O-ring by authorized distributor 2. Replace hose assembly 3. Replace hose assembly
Power pack motor runs but there is no pressure at the outlet	<ol style="list-style-type: none"> 1. Motor turns in wrong direction due to incorrect electric cable connection 2. Relief valve pressure is set too low 3. Relief valve stuck/malfunction 4. Low hydraulic fluid level 	<ol style="list-style-type: none"> 1. Check proper electric cable connection, voltage, and phases 2. Adjust pressure to 110 bar, 11 Mpa, 1600 psi 3. Replace relief valve by authorized distributor 4. Add hydraulic fluid accordingly
Staple legs are pushed up but staples are only partially bent over	<ol style="list-style-type: none"> 1. Operator did not wait for handle feedback at end of the pull (position "2") before returning handle to start position "0" 	<ol style="list-style-type: none"> 1. Pull advance/actuation handle down to position "2" and wait for handle feedback prior to releasing
Staple legs are pushed up but staples are not completely set	<ol style="list-style-type: none"> 1. Fastener compression was incorrectly set (under-compress) 	<ol style="list-style-type: none"> 1. Adjust fastener compression by turning the adjustment knob ¼ turn to right (clockwise) and repeat as necessary
Belt has too much ripple or wave	<ol style="list-style-type: none"> 1. Fastener compression was incorrectly set (over-compress) 2. Using rubber plied belting 	<ol style="list-style-type: none"> 1. Adjust fastener compression by turning the adjustment knob ¼ turn to left (counter-clockwise) and repeat as necessary 2. Use XPLT XP-LOK™ Tensioner and XPLW-120 XPLOK™ Belt Wire to prevent belt wave and ripple
Staple legs are pushed up but staples are not bent over	<ol style="list-style-type: none"> 1. Damaged swipe arms 2. Damaged swipe linkages 	<ol style="list-style-type: none"> 1. Replace swipe arms by authorized distributor 2. Replace swipe linkages by authorized distributor
Cannot load applicator onto frame	<ol style="list-style-type: none"> 1. Pilot punch is in up position 2. Mounting brackets are not aligned properly 	<ol style="list-style-type: none"> 1. Push advance/actuation handle to position "0" prior to loading onto frame 2. Inspect and verify mounting bracket are properly installed

Power Diagram



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