



Servo Roll Feed

SRF-125 through SRF-900

Installation Manual



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Introduction

Dear Customer,

Thank you for the trust and confidence you have put in our company by purchasing a *Servo Roll Feed* from P/A. This Installation Manual is aimed to support you in getting familiar with the machine and utilizing it properly. Long standing experience in manufacturing and continuous further development and improvement of our devices have made this *Servo Roll Feed* a top quality product, allowing for safe and easy handling and extremely high operating safety.

Using technical devices, however, is always accompanied by certain hazards, which cannot be eliminated either by design or protective measures. It is, therefore, strongly recommended to read this Manual fully and mindfully. It will provide you with important information as to how to operate the machine safely and properly. Complying with instructions will help you avoid hazards, reduce downtime and repairs cost, and increase the device’s reliability and lifetime.

This manual covers installation and operation procedures for P/A Servo Roll Feeds (from now on in this manual-*the Feeder*), SRF-100 trough SRF-900 models.

IMPORTANT!

Before installing Servo Roll Feeder onto the press read this manual to become familiar with the mechanical design.

1 Mechanical Installation

1.1 Receiving Inspection and unpacking

Before removing unit from its packaging, check for visual damage, especially if crate, skid, or carton has been damaged in transit. Any damage caused in shipment should be immediately reported to the carrier. If unit appears in satisfactory condition, remove all packing. The standard package consists of four components:

1. Feeder assembly;
2. Feeder Adjustable Mounting plate;
3. Feeder Exit plates;
4. Electrical control.

1.2 Transporting to press

In order to be able to transport, assemble and install the feeder properly, two eye bolts are attached to the upper side of the *Feeder's* housing. See **Figure 1**.

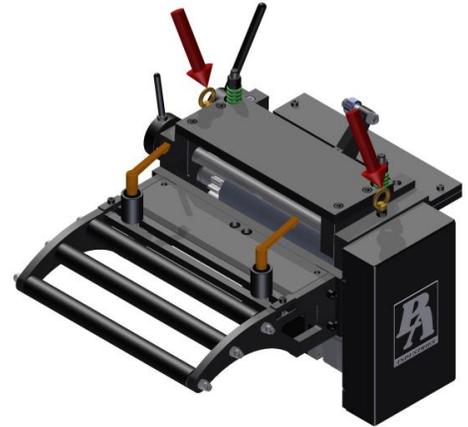


Figure 1

1.3 Mounting on press

Servo Roll Feed (from now on is referred in this manual as the *Feeder*) comes assembled for mounting on the right or left side of the press (Right to Left or Left to Right feed direction) per customer order. Verify that operator levers of the *Feeder* are on the operator side of the press. **Figure 3** shows the *Feeder* assembled for Right to Left direction.

The *Feeder* mounting plate provides simple and secure installation onto the press. It has two sets of through holes for installation on the right and left sides of the press. Bolster plate must be pre-drilled and tapped per **Figure 3** and **Table 1**. Note that, SRF-100 through SRF-300 models have 2 sets of 2 mounting holes, as shown on **Figure 2**, SRF-400 and larger have 2 sets of 4 mounting holes.

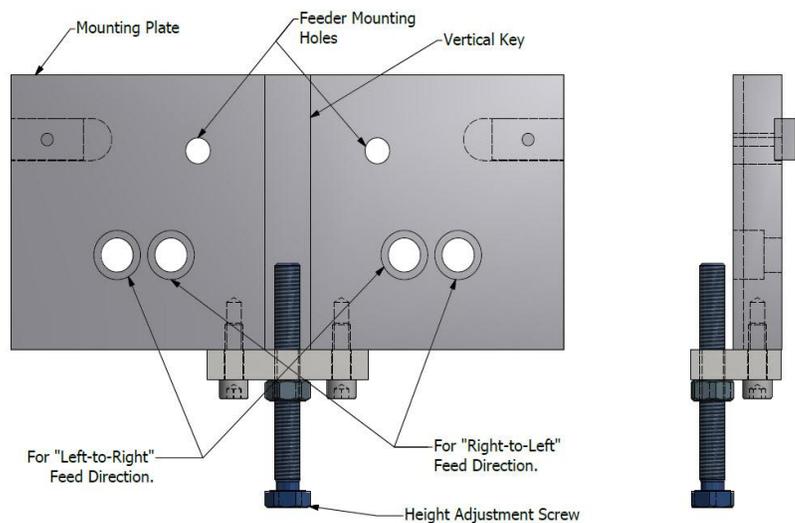


Figure 2

Note: A transition bracket is sometimes required in certain applications

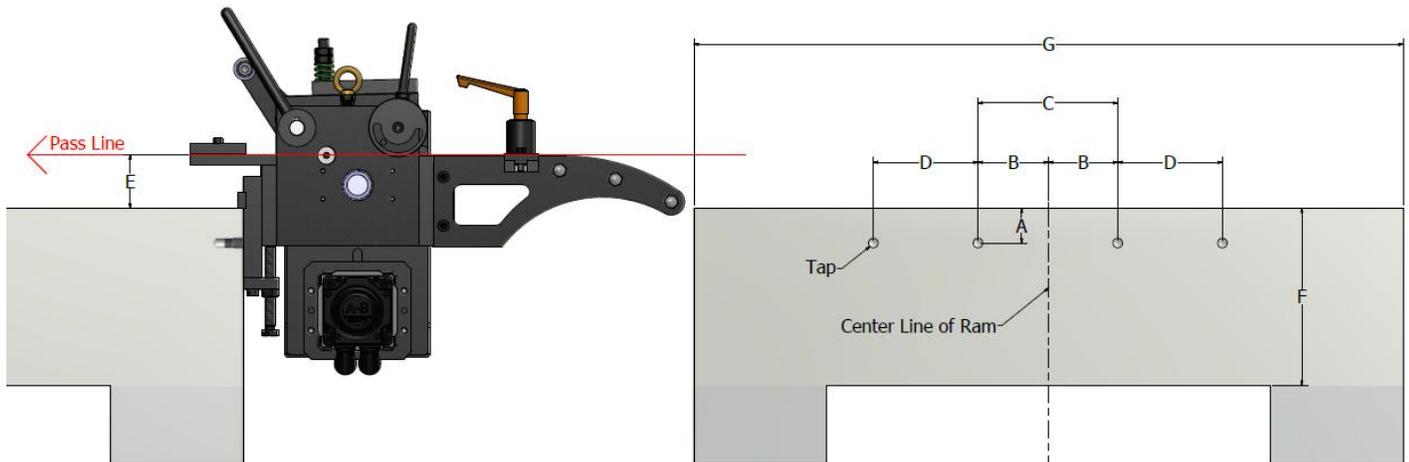


Figure 3

Before you install the *Feeder*, the height adjustment bolt should be turned all the way down. The *Feeder's* alignment with the mounting plate is done by means of the vertical key on the feeder housing back plate. To attach the *Feeder* to the mounting plate use supplied screws and washers.

The *Feeder* should be centered, square, and perpendicular to the pass line of the press. It should be mounted at a height that will accommodate the appropriate die sets. Refer to **Figure 2** and **Tables 1** and **2** for dimensions.

Note: The centerline of the feeder is NOT the centerline of the rolls

Table 1 Mounting holes dimensions [inches]

Dimension	SRF-100	SRF-125	SRF-200	SRF-300	SRF-400 through 900
A	1.18			1.97	
B	1.97	3.15		3.94	
C	3.94	6.30		7.87	
D	-	-	-	-	5.91
E-min	2.2			2.4	
F	4.21			5.71	
G	9.72	12.13	14.88	18.82	22.76 / 26.69 / 30.63 34.57 / 38.50 / 43.19
Screw thread	M14 x 25			M16 x	
Pass Line adjustment	+2.0 / -0.0			+2.4 / -0.0	

Table 2 Mounting holes dimensions [mm]

Dimension	SRF-100	SRF-125	SRF-200	SRF-300	SRF-400 through 900
A	30			50	
B	50	80		100	
C	100	160		200	
D	-	-	-	-	150
E-min	55			60	
F	107			145	
G	247	308	378	478	578 / 678 / 778 878 / 978 / 1097
Screw thread	M14 x 25			M16 x 30	
Pass Line adjustment	+50 / -0			+60 / -0	

1.4 Installing exit plates

The exit plates are mounted on the *Feeder's* exit area with supplied screws. The top surface of the lower plate can be used as a reference point for exact adjustment of the *Feeder's* pass line.

Appropriately thick spacers should be installed between the lower and the upper exit plates exit to accommodate required material thickness.

If the distance between the *Feed* and the die is such that the material sags or bounces, it is recommended to provide a support bridge.

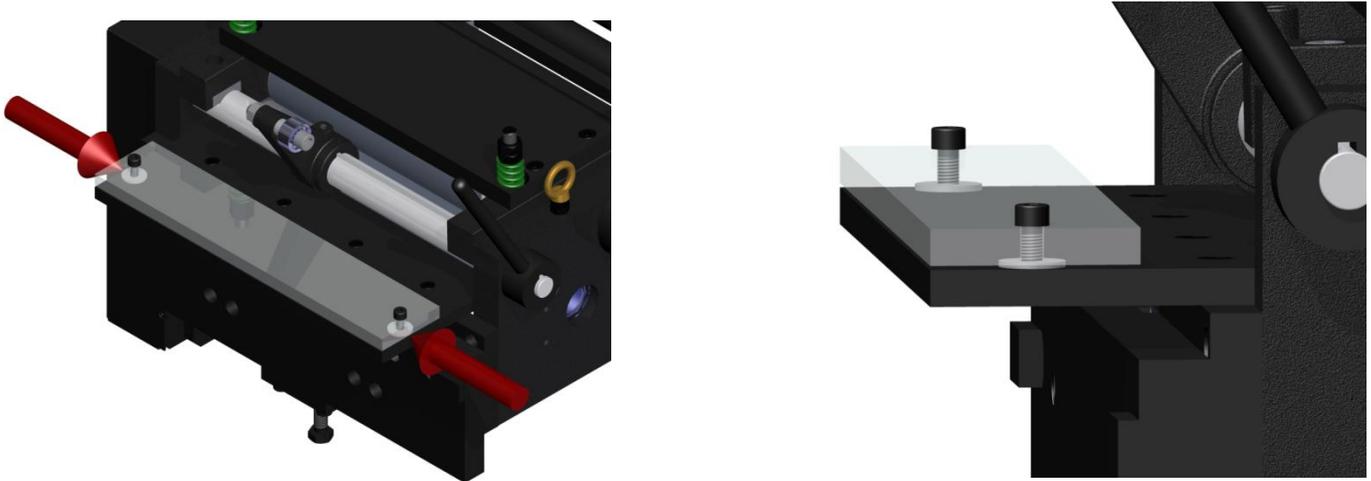


Figure 4

1.5 Verifying Mechanical Functioning

After the *Feeder* is installed on the press, check all its mechanical controls:

- Material Thickness Adjustment Cam rotates from the rolls close position to the maximum material thickness;
- Manual Roll Release Lever can be pushed forward until it latches;
- Roll Pressure Springs are factory set and should not be loose;
- Material Entry Guides can be loosened up and slid across the entry support rolls.

If any of mechanical controls of the *Feeder* is found not functioning properly, report to P/A Service Department, Do Not Operate the *Feeder*.

Refer to the figure xx below for mechanical controls locations.

Read more about the *Feeder* operating procedures in the **Chapter 3.3** "Running the *Feeder*"

1.5 Mechanical Roll Release (Optional)

The **optional** Mechanical Roll Release Arm should be attached to the press ram by two screws M12 / 0.5 inch (not included in the shipping package). It must be mounted in such a way as to provide roll opening at the proper time and be adjustable for different die sets. Refer to Figure x for the dimensions of the Roll Release Arm. Make sure the tip of the threaded rod points at the front part of the release lever roller, as shown in the **Figure 5**.

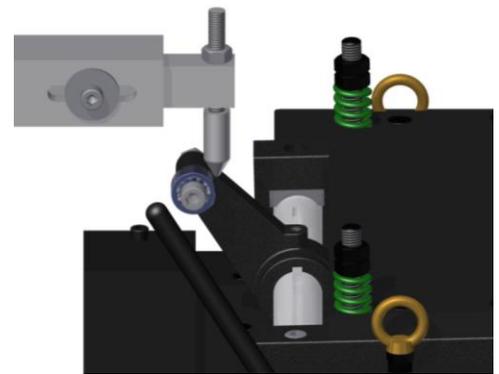


Figure 5

1.6 Electro-Pneumatic Roll Release (Optional)

The **optional** electro-pneumatic Roll Release comes factory pre-installed, all required is a compressed-air line of maximum 6-7 Bar (90-100 PSI) and a proper maintenance unit, including filter, oiler and pressure regulator are required, 6 mm tubing is included in the shipping package.

The pneumatic release mechanism is mounted centrally on the top of the feeder using (4) M8 screws and washers in slotted holes. The slots are to allow proper alignment and adjustment with the release arm and roller. Open the rolls, allowing clearance between the upper roll and the material approximately 0.010"/0.25 mm (Use a shim on top of the material, if needed.), and position the Pilot Release mechanism so that with the cylinder piston fully extended, it is against the roller.

Test Roll Release by pushing valve manual open button, push and twist clockwise to latch, if necessary.

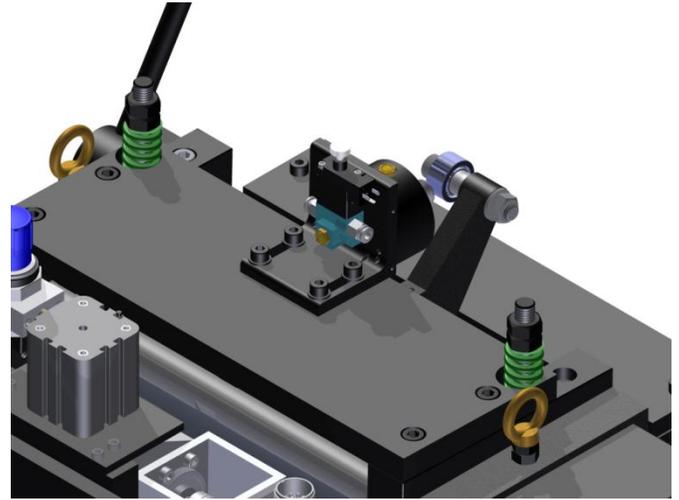


Figure 6

Valve control cable comes pre-wired to the electrical control and disconnected from the valve for the shipping purpose.

Note: Electro-Pneumatic Roll Release requires a cam switch, mechanical or otherwise, for operating of air valve.

Read more about the Roll Release operating procedures in the **Chapter 3.3** "Running the *Feeder*"

1.7 P/A Programmable Limit Switch (PLS)

The **optional Programmable Limit Switch or PLS** consists of the encoder and encoder cable. The encoder must be mounted on the press so its shaft is coupled or belted to the crankshaft with one to one (1:1) ratio. It is strongly recommended to use plastic chain or timing belt and plastic or aluminum sprockets on the encoder shaft. Refer to **Figure 7** for the encoder mounting dimensions. The mounting bracket for **PLS** encoder must provide some flexibility of shafts alignments.

Encoder cable comes pre-wired to the electrical control and disconnected from the encoder for the shipping purpose.

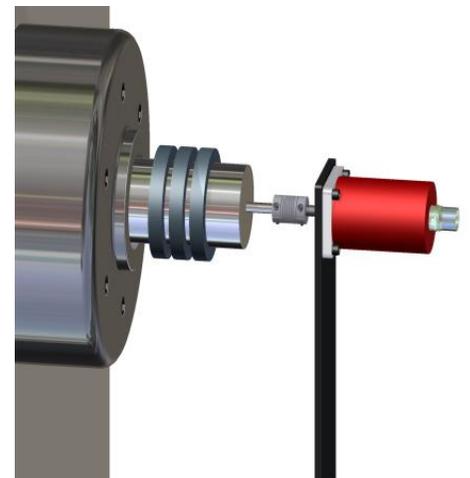


Figure 7

Note: The PLS encoder contains a highly sensitive optical system. Prevent it from being dropped. Do not subject it to a major shock.

1.8 P/A Strip Encoder (STE)

The **optional STE** encoder comes pre-installed on the **Feeder**, all required is a compressed-air line of maximum 6-7 Bar (90-100 PSI) and a proper maintenance unit, including filter, oiler and pressure regulator are required, 6 mm tubing is included in the shipping package.

When air supply is connected, verify using manual air valve that STE slide goes down until STE wheel is on the support roller and up.

STE encoder cable comes pre-wired to the electrical control and disconnected from the valve for the shipping purpose.

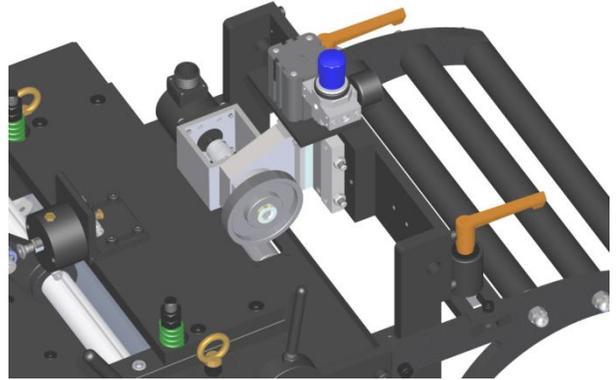


Figure 8

Note: The STE encoder contains a highly sensitive optical system. Prevent it from being dropped. Do not subject it to a major shock.

2. Electrical Control

2.1 Assembly

2.2 Electrical Connections

All the **Feeder** external electrical and electro-mechanical component cables come pre-wired to the electrical control and appropriately labeled. Connect corresponding cables to PLS and STE encoders, Pneumatic Roll Release solenoid valve, STE junction box and the servo motor.

Refer to the supplied electrical schematic and labeling of the electrical control for the main power and input / output requirements.

Apply power line in accordance with local electrical regulations.

Input / output connection wires must be at least 18AWG (1.02 mm²).

NOTE:

A word about electrical “noise” - Most pressroom environments contain considerable electrical noise. It is emitted from electro-mechanical press relays, contacts, and solenoids. While all P/A Servo Roll Feeds have been designed to minimize “self generated” electrical noise, it is difficult to provide protection for all applications. If erratic system behavior is experienced, then the source of the “noise” must be suppressed with either a resistive/capacitive type of suppressor on AC coils, or “Avalanche” type diodes on DC coils.

NOTE:

The electrical control enclosure is supplied with a stand/support, which may be placed in any convenient location. The enclosure may also be mounted in any fixed location as long as the cabling is adequate to reach the feed. It is not recommended that the electrical enclosure be mounted directly to the press. The vibrations caused by the punch press can result in damage to the control system

IMPORTANT

Electrical Control internal 24VDC power supply is capable of providing of 2 Ampere to the external signaling devices such as cam switches, etc. In case, there is a need for more 24VDC power use an additional external 24VDC power supply.

Before switching main power on for the first time read supplied Operation manual and follow its direction.

3. Running the Feed

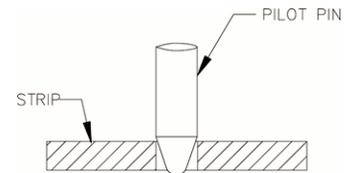
3.1 Loading the feed

Important!

**Prior to this step, the electrical control must be powered up and all needed parameters are loaded.
(Refer to the Operation manual)**

NOTE: This example is based on using PLS (Programmable Limit Switch), but all PLS timing notes can be easily translated to other form of timing.

1. Put the *Feeder* electrical control into “**MANUAL MODE**”. Record the present settings of the Feed Cam, Reset Cam, and Pilot Release Cam into a tool set-up record sheet for future reference to the job.
2. Adjust the roll clamping force by pre-loading the two die springs located on top of the feed housing. Normal setting for the roll force spring pre-load is two full turns clockwise from finger tight (factory preset). Be sure to use the jam nut to lock the setting.
3. Open the *Feeder* rolls by pulling on the Manual Roll Release Lever and latching it in open roll position. Insert the material through the *Feeder* rolls, unlatch and close the *Feeder* rolls by releasing the Manual Roll Release Lever.
4. Adjust for the material thickness using the Material Thickness Adjustment Cam and Adjustable Lock Screw. Make the play at the end of the roll release lever approximately 1/16” (1.5mm).
5. Using the **Jog Forward** button on the jog pendant, advance the material up to the entrance of the die (far enough where the punches would not pierce the material).
6. Check the vertical alignment of the strip. If necessary, adjust the pass line of the *Feeder* so that the material is at the proper height.
7. Assuming that the press shut height and the tool are set up properly, jog the press one or two strokes without the feed working.
8. Jog the press down slowly observing when the longest pilot would engage the pilot hole in the material if the material were there. Note the press positional readout and put this setting into your program for the ‘**Pilot Release On**’ setting. The ‘**Pilot Release Off**’ setting, in most cases, should be 180°. Some drawing applications require the rolls to remain open past 180°.
9. Continue to jog the press slowly until the longest pilot just comes out of the material. Note the press positional readout and put this setting into your program for the ‘**Feed Cam On**’ setting. Set the ‘**Feed Cam Off**’ point so that there is enough time to complete the *Feeder* length and enough time to stop the press, if there is a feed fault. (See Figure 5.)
10. Set the ‘**Reset Cam On**’ for 180 degrees and ‘**Reset Cam Off**’ for 200 degrees. This setting should never need changing. (See Figure 5.)



3.2 Threading the tool

NOTE about Cams:

The Feed Cam (open tool): The feed system uses this press cam for timing the feeder to the press crankshaft. Although no shafting or belts actually connect the press to the feeder, the feed must be "told" when it is safe to move the strip and when the feed move must be completed. This "connection" is an electrical one, and not a mechanical one. This gives the Operator/set-up personnel total flexibility in deciding when the feed progression should take place. Each die set can have a unique 'Feed Angle'. This 'Feed Angle' is dependent upon many variables; pilot and punch length, press stroke, strip forming in the die, etc.

Put the *Feeder* electrical control into "JTL" mode. All the adjustments to the *Feeder* system and press have now been made. The press is at Top Dead Center (TDC) and ready for automatic cycling. Proceed by advancing the material using **Jog Forward** button on the jog pendant until **WAITING FOR PRESS** is seen in the display and inch the press through another stroke, verifying that things are happening at the correct time (Roll Release, etc.). If the system is operating properly, you can make a few more "hits", checking your parts.

3.3 Running the feed

Put the *Feeder* electrical control into "Auto". The *Feeder* will now follow the press until it is stopped by the Operator, counter, emergency stop, or feed error.

NOTES about 'Possible problem tooling':

A tight die, one that is not square, or has other tooling problems, will cause significant difficulty and downtime. Accuracy in feeding is directly related to how easily the feeder can position the strip in the die. Binding, ejection of a bad part, or sticking parts may cause the material to "jam" in the die.

The Servo Roll Feed will "try" to overcome the "jam-up" by applying more power to the rolls.

One of the four outcomes will result:

- 1 The feed will continue to try to move the strip (if the rolls do not slip) until the Feed Cam opens. A Sync fault error will occur and the press will be stopped by the feeder.
- 2 The feed will apply more power to the rolls, causing them to slip on the material. This produces a "short-feed". In reality the feeder did not "miss-feed". The rolls were positioned properly, the strip did not keep up, causing the die to close and a miss-hit is produced.
- 3 The feed applies more power to a thin strip, causing the material to buckle somewhere between the feed and the die set. The feeder positioned the strip accurately, it just did not occur in the die set.
- 4 The feed tries to apply so much power to a heavy strip in order to move it, that excessive current is drawn by the servo drive. This results in the drive shutting down to protect itself and in doing so stops the press.

The feed detected a problem and emergency-stopped the press before the die closed. In using the Advantage Servo Roll Feed, you in fact have added a "die protection" system to your tooling.

A tooling problem is a problem caused by tooling and not the Feeder itself

4 Maintenance

All P/A *Servo Roll Feeds* need very little maintenance to keep the system operating at its optimum performance.

- This precision equipment must be kept as clean as possible. This is especially important if large amounts of air suspended oil mists in combination with “dirty metals” are used. The resulting abrasive dust can attach itself to the feed rolls and other surfaces, leading to premature wear on many parts.
- The roll release system requires a clean, dry air supply.
- Some bearings used on the feeder are fully sealed and maintenance-free roller ball bearings. The exceptions are provided with standard “zerk” type grease fittings. They should be lubricated with a good grade of high pressure bearing grease. The frequency of lubrication will depend on the overall usage of the system. A small “shot” once a day is a good starting point. The feed roll gears set should be coated with a small amount of open gear grease.
- The main drive belt should be checked periodically for tightness. It can be adjusted by loosening the two fasteners on the motor adjuster plate, applying downward pressure on the motor adapter plate, and retightening. **ERRATIC MOTOR BEHAVIOR WILL BE EXPERIENCED IF THE DRIVE BELT IS LOOSE!**
- All of the above guidelines should be added to your existing pressroom Preventive Maintenance (PM) Program

5 Servo Motor Replacement

NEVER!

Never pull or hit servo motor shaft. Even light deformation of motor encoder, mounted directly on the shaft, will result its un-repairable damage.

In order to replace servo motor of **the Feeder**:

1. Turn electrical control power off and put its disconnect switch in off position;
2. Disconnect the servo motor cables;
3. Take the feeder’s belt guard off by undoing four “button head” screws on its vertical sides;
4. Loosened up four bolts holding the servo motor (gear reducer) flange;
5. Push the motor (with gear reducer) up and take the timing belt off THE sprockets.
6. Provide some support to the motor before unscrewing four bolts holding it on the mounting plate.
7. Take the motor (with gear reducer) off and place it (them) on a work bench.
8. If the feeder is equipped with gear reducer:
 - Take out the access cap screw and rotate the sprocket to the point where the coupling screw is visible through the access hole.
 - Loosened up the coupling screw first and unscrew motor mounting bolts.
 - Slide the motor out of gear reducer.
 - Slide the new servo motor shaft into the gear reducer coupling. Do not tighten the coupling screw.
 - Attach the motor to the gear reducer with four, previously taken off, bolts.
 - Tighten the gear reducer coupling screw using a torque wrench.
 - **Due to the variety of gear reducers used, consult P/A service department for the torque proper value.**
 - Replace the access cap screw.
9. If the feeder does not have gear reducer:
 - Record the distance from the sprocket to the motor frame.
 - Loosened up set screws of the servo motor sprocket and slide the sprocket off the motor shaft. In case the sprocket doesn’t slide off the shaft by hand, use sprocket removal tool.
 - **Do not apply any force between the sprocket and the motor frame.**
 - Install the sprocket onto the new motor in reverse direction, positioning it on the shaft with the previously recorded distance from the motor frame.
10. Install the servo motor (with gear reducer) onto the feeder mounting plate and leave all four mounting screws slightly loose, enough to move the motor up and down within slotted holes.
11. Push the motor up and install the timing belt.
12. Apply pressure onto the motor (gear reducer) flange using a lever (crow-bar) and tighten four mounting screws.
13. Install belt guard.
14. Connect motor cables.

5 Roll feed parts list

5.1 Standard assembly

5.2 Optional Strip encoder parts list

WARNING

This equipment offers various means of operating or controlling machines. The operator must not be in or near the point-of-operation of the machine, or the operating parts of any equipment installed on the machine, or bodily injury could result. The EMPLOYER must post adequate warning signs onto the machine with proper warnings for his machine and the specific application to which the machine and equipment are being applied.

Occupational Safety and Health Act (OSHA) Sections 1910.211, 1910.212, and 1910.217 contain installation information on the distance between danger points and point-of-operation guards and devices. No specific references have been made to which paragraph of OSHA 1910.211, 1910.212, 1910.217 or any other applicable sections because the paragraphs may change with each edition of the publication of OSHA provisions.

All equipment manufactured by us is designed to meet the construction standards of OSHA in effect at the time of sale, but the EMPLOYER installs the equipment so the EMPLOYER is responsible for installation, use, application, training, and maintenance, as well as adequate signs on the machine onto which this equipment will be installed.

Remember, OSHA says that the EMPLOYER must use operating methods designed to control or eliminate hazards to operating personnel.

It shall be the responsibility of the EMPLOYER to establish and follow a program of periodic and regular inspections of his machine to insure that all their parts, auxiliary equipment, and safeguards are in a safe operating condition and adjustment. Each machine should be inspected and tested no less than weekly to determine the condition of the machine. Necessary maintenance or repair of both shall be performed and completed before the machine is operated. The EMPLOYER shall maintain records of these inspections and the maintenance work performed.

Our Company is not responsible to notify the user of this equipment of future changes in State or Federal laws, or construction standards.

SAFETY PROGRAM

Accident free operation will result from a well developed, management sponsored and enforced safety program. Of vital importance to any successful program is the proper selection of guards and devices. However, there is no safety device that will bring "automatic" safety to your operation.

Of equal importance to this proper selection of the guard and the device is the training of your personnel. Each person must be trained as to the operation of the guard or safety device, highlighting why they have been provided on the equipment. Rules for safe operating should be written and enforced at all times. A final major concern of an effective safety program is regularly scheduled inspection and maintenance of all of the equipment.

To ensure continued safety at all times, top management, line supervision, safety engineers and all employees must assume their proper share of the responsibility in the program. Only as a group, one that knows your own operation and its problems, can you carry out an effective safety program.

To assist you in the development of and continued use of safety programs, many safety minded groups have made guidelines available to you. However, you must know when and how to apply these guidelines. The manufacturer provides information to assist you in properly adjusting and maintaining your equipment. There is no short cut to proper safety; therefore, it is recommended that you comply with their recommendations at all times.

WARRANTY

We warrant our new parts against defects under normal use and service for a period of 12 months after date of shipment. Our obligation under this warranty is limited to replacing or repairing (at our option) the defective part without charge, F.O.B. our plant in Bloomfield, Connecticut. The defective part must be forwarded to our plant, freight prepaid, for our inspection prior to replacement or repair. EXCEPT AS EXPRESSLY PROVIDED HEREIN, THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Furthermore, the seller does not warrant or represent that the equipment complies with the provisions of any law, particularly including the Occupational Safety and Health Act of 1970, and regulations promulgated thereunder. In no event shall we be liable for special, indirect incidental or consequential damages, however rising.



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