Miniature Quick–Change Applicator (Side–Feed Type)

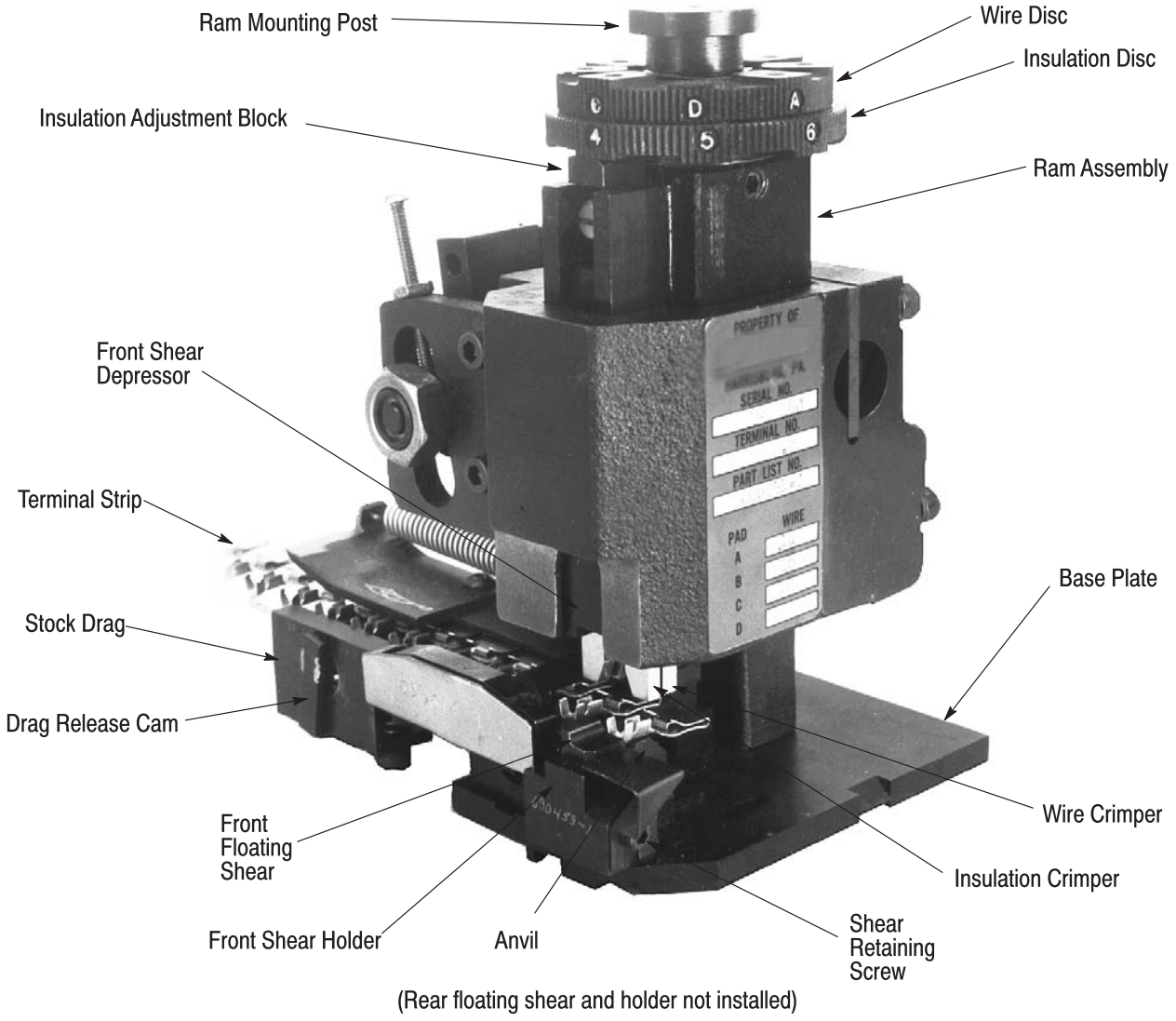

Figure 1

1. INTRODUCTION

Miniature Quick–Change Applicators, of the side–feed type, are designed to crimp side–feed strip terminals to prestripped wires. Each applicator is set up to accept the strip form of certain specific terminals. These terminals are identified on the Applicator Parts List (Applicator Log) for each applicator. The terminal number on the data plate indicates the terminal that was specified when the applicator was ordered.

Although each applicator will accept only certain terminals, a valuable measure of application flexibility is provided by means of a wire crimp that can be readily adjusted for as many as four different wire sizes, and an insulation crimp that can be adjusted to accept eight variations of insulation diameter.

These applicators are adaptable to various machines, provided that the machine has the correct stroke and is properly equipped.

Use this Instruction Sheet, with the parts list and exploded view drawing packaged with the applicator, and the appropriate machine manual (409–5128 for the Basic AMP–O–LECTRIC* Machine, or 409–5289 for the Model “T” Terminating Unit).

NOTE

All dimensions on this document are in metric units [with U.S. customary units in brackets]. Figures and illustrations are for identification only and are not drawn to scale.

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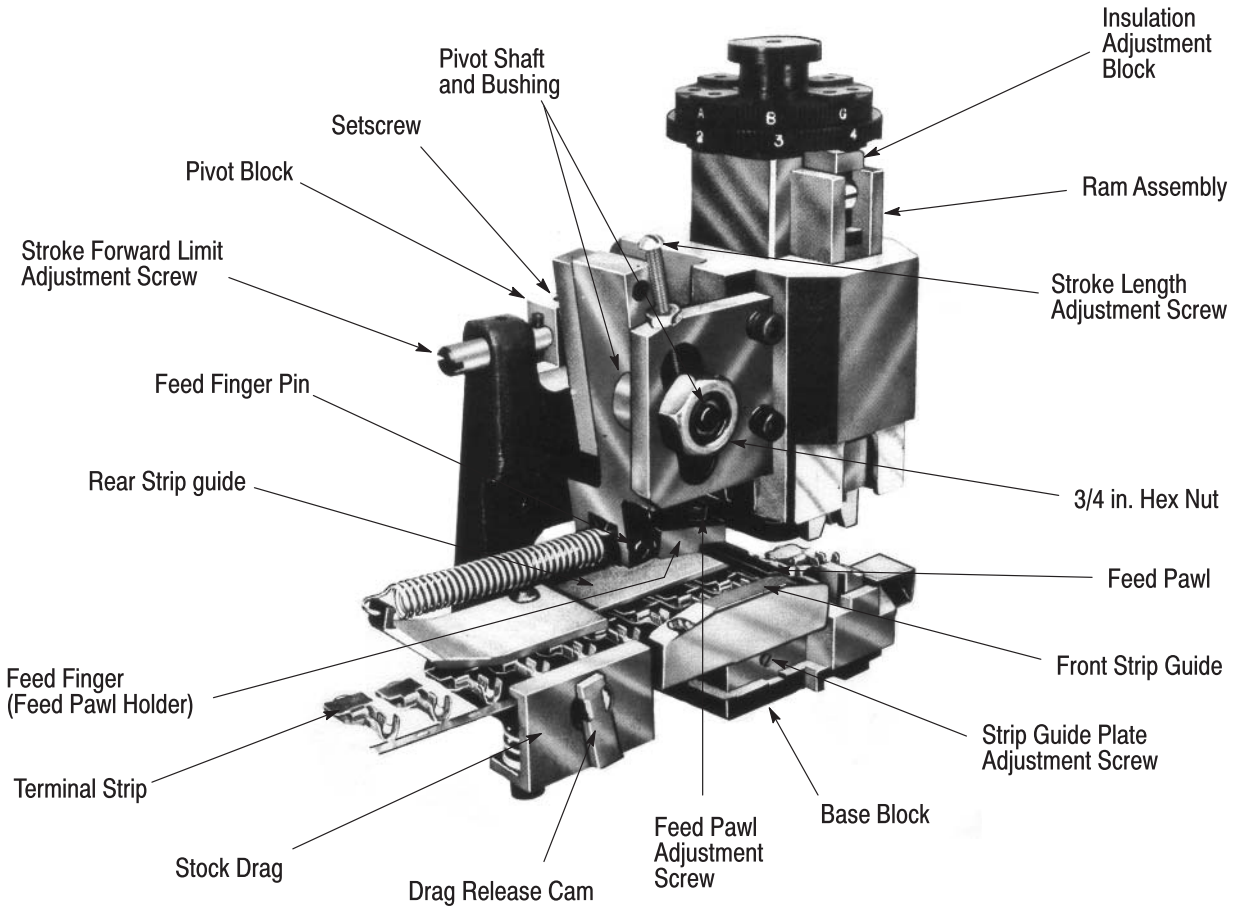

Figure 2

2. APPLICATOR DESCRIPTION

Major components of the applicator are identified in Figures 1 and 2. The terminal strip is inserted into the applicator with the terminal “barrel end” (wire end) toward the stock drag and between the front (outer) and rear (inner) strip guides. It then passes under the stock drag, and the LEAD terminal is positioned over the anvil by the feed pawl. The feed pawl advances the terminal strip one terminal position during each cycle of the machine (unit). This is accompanied by mechanical action between the feed cam on the ram assembly and the feed pawl.

Two lengths of feed cams are available for this applicator, and the feed cam to be used is dependent upon the machine stroke. For example, a machine with a 28.6 mm [1 1/8 in.] stroke MUST use an applicator with a SHORT feed cam (39.7 mm [1 9/16 in.] long), while a machine with a 41.3 mm [1 5/8 in.] stroke MUST use an applicator with a LONG feed cam (52.4 mm [2 1/16 in.] long). Only the short cam is available in the PRE–FEED type, and only the long cam is available in the POST–FEED type. Make special note of the fact that only the LONG POST–FEED type can be used in applicators installed in automated equipment. The POST–FEED type cam advances the lead terminal over the anvil on the DOWNWARD stroke of the ram assembly, which leaves the anvil clear when the machine is in the at–rest position. The PRE–FEED type cam advances the lead terminal over the anvil on the UPWARD movement of the ram assembly, which results in a terminal always being over the anvil when the machine is at rest.

The ram mounting post of the ram assembly (shown in Figure 3) engages with the post adapter of the machine ram, and it is the machine ram that actuates the applicator. Just below the ram mounting post is a wire disc and an insulation disc. The wire disc has as many as four pairs of pads, with each pair being of a different height. By rotating the disc, each of the several pairs can be aligned with the two bosses on the machine ram (post adapter) to vary the depth of stroke of the wire crimper over the anvil (refer to Figure 3).

The insulation disc contains eight pads of differing heights. Rotating this disc aligns the different individual pads with the insulation adjustment block, to vary the insulation crimp height in relation to the ram assembly and wire crimper stroke.

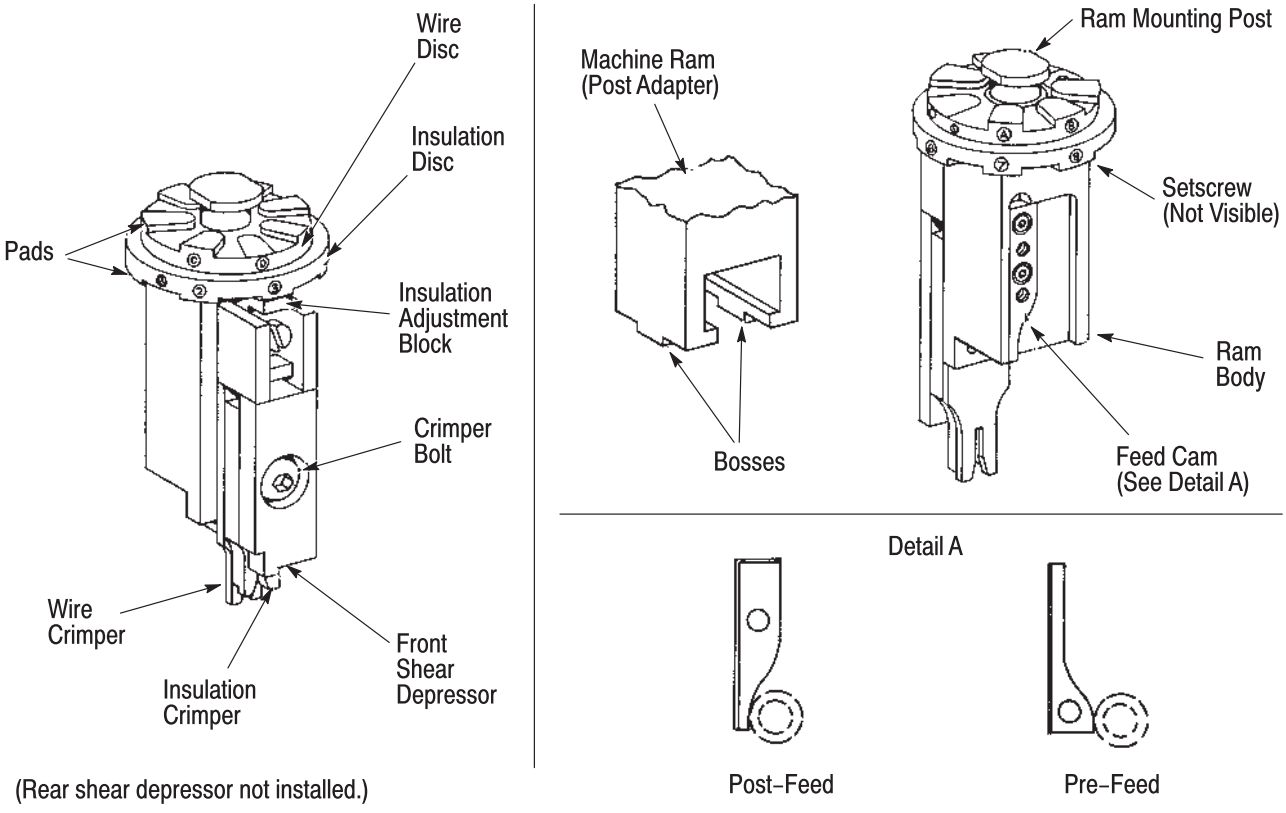

Figure 3

Attached to the bottom of the ram assembly is the wire crimper, retained in a preset position by the crimper bolt. The insulation crimper is also retained by the crimper bolt, but is free to move vertically in order that the insulation crimp may be adjusted in relation to the wire crimp. The front shear depressor causes the shearing of the “barrel end” of the terminal from the carrier strip by depressing the front floating shear.

Terminals with dual carrier strips require a rear shear depressor, spacer, and/or terminal holder. When used, these items are attached to the feed cam side of the ram assembly. The rear shear depressor shears the rear carrier strip, and the terminal holder prevents the terminal from rising during the crimping and shearing process.

The applicator’s mounting surface is its base plate, and it is to this plate that the two strip guides, front shear holder with front floating shear, rear shear holder with rear floating shear (if used), strip guide plate, base block, and anvil are secured. The anvil backs up the terminal during the crimping process, while the floating shear(s) cuts the lead terminal from the carrier strip(s).

3. APPLICATOR INSTALLATION AND REMOVAL

CAUTION

With the applicator installed, NEVER ATTEMPT to cycle machine under power WITHOUT terminals properly loaded, as described in Section 4, APPLICATOR LOADING AND UNLOADING. To do so may result in damage to the tooling.

3.1. AMP–O–LECTRIC Terminating Machine

In order for the applicator to be used in an AMP–O–LECTRIC machine, the machine must first be equipped with Machine Conversion Kit 690675–2. This kit contains all of the necessary parts, and applicator Instruction Sheet 408–8022, which includes the procedures for installation and removal of the applicator.

3.2. Model “T” Terminating Unit

The Model “T” unit MUST be equipped with a Quick–Change Base Plate for Miniature Applicators. Applicator installation and removal is accomplished as follows:

1. Turn “off” or disconnect power to unit (machine).
2. Push IN the release bar on the quick–change base plate. Locking latch will pivot downward.

3. Place applicator on the quick–change base plate, then slide it back until the two notches engage the stops at back of plate. At the same time, guide the ram mounting post into the machine ram (post adapter).

4. Flip locking latch UP to secure applicator in place.

5. To remove applicator, cut strip one or two terminals from entry to strip guides. Then perform Step 2 and slide applicator forward until clear of machine ram.

NOTE

If applicator is not to be immediately reinstalled, prepare for storage as described in Section 8, APPLICATOR STORAGE.

4. APPLICATOR LOADING AND UNLOADING

4.1. Terminal Strip Loading

CAUTION

Before attempting to load the terminal strip in the applicator, be CERTAIN the installed applicator is the proper one for the terminal to be applied. Compare the terminal number with the numbers listed on the applicator parts list.

1. Turn “off” or disconnect power to machine.

2. Be certain ram assembly is fully raised. If necessary, hand–cycle machine to obtain this condition (see applicable machine manual).

3. Release stock drag by rotating drag release cam. Then remove the length of strip left in the applicator by grasping the terminals at the strip guide entry, raising the feed pawl, and pulling the strip straight out until clear.

4. With reel of terminals installed on reel support, feed terminal strip into applicator between strip guides and under stock drag.

CAUTION

Be CERTAIN the terminal strip enters the applicator with the “barrel end” (wire end) toward the stock drag and open side up.

5. Raise feed pawl and continue to feed terminal strip into applicator until LEAD terminal is over anvil and feed pawl engages hold in carrier strip.

6. If applicator is POST–FEED type, raise feed pawl and retract terminal strip the length of one terminal. This will advance the LEAD terminal over the anvil on the downward stroke of the ram assembly.

7. Turn drag release cam to lower stock drag.

8. Check engagement of feed pawl with feed hole in carrier strip.

NOTE

Some carrier strips have an additional hole that is not used for this purpose.

9. Be certain applicator is properly adjusted, as described in Section 5, ADJUSTMENTS, by performing several test cycles.

4.2. Terminal Strip Unloading

1. Cut the terminal strip at or near the entry to the strip guides.

NOTE

It is recommended that the applicator never be unloaded per se, but rather, that a section of terminal strip always be left in the unit. As it is not necessary to remove the strip section for cleaning, lubrication, or repair, its removal will normally occur only as a part of the loading procedure.

2. If terminals are POST–FED, release stock drag, lift feed pawl, and advance the lead terminal into position over the anvil.

5. ADJUSTMENTS

5.1. Wire Crimp Adjustment

1. Refer to data plate, and select pad letter (A, B, C, or D) for AWG wire size to be used.

2. Rotate applicator’s wire disc (upper disc) to align selected pad letter with bosses on machine ram (post adapter). See Figure 3. This will provide proper crimp height for that wire size.

3. After making Insulation Crimp Adjustment described in Paragraph 5.2, perform several test cycles and inspect the terminations CLOSELY for the following:

   a. Evidence of rough and/or sharp edges around crimped barrels, deformed crimps, bent terminals, or other defects caused by worn or broken tooling. If necessary, replace tooling as described in Section 6, REPAIR OR REPLACEMENT OF COMPONENTS.

   b. If terminations appear normal, measure the crimp height of each termination as described in Instruction Sheet 408–7424, packaged with the applicator. Crimp heights must agree with measurement specified on parts list for the particular wire size being used. Record and retain crimp height dimensions for reference.

   c. If crimp heights are INCORRECT, remove applicator and install an applicator that is

KNOWN to produce terminations of CORRECT crimp height, Make several test cycles and repeat Step b, If crimp heights are INCORRECT for this applicator, the problem is the machine shut height, and corrective information may be obtained from the appropriate machine manual, If crimp heights are CORRECT, the problem is in the original applicator, and corrective measures are presented in Paragraph 6.5, Adjustable Crimp Height Repair.

4. During extensive operation, periodically repeat Step 3 to ensure that applicator is producing correct terminations.

5.2. Insulation Crimp Adjustment

To adjust the insulation crimp height, rotate the insulation disc (lower disc) to align the number (1 through 8) with the top of the insulation adjustment block on the ram assembly. No. 8 makes the tightest crimp and No. 1 the loosest, a difference of approximately 1.78 mm [.070 in.], providing a wide variation. To find the desired insulation crimp, start with No. 1 and make test crimps, then increase the setting one number at a time until the proper insulation crimp height is obtained.

5.3. Terminal Strip Feed Adjustment

1. With terminal strip properly loaded in applicator as described in Paragraph 4.1, check position of lead terminal in relation to anvil by actuating the applicator to advance the feed pawl to the forward limit of its stroke. Lead terminal MUST be centered on anvil.

2. If the lead terminal is centered on the anvil, the forward limit adjustment is correct – proceed to Step 5. If NOT centered, continue with Step 3.

3. Loosed setscrew on top of pivot block. Turn the stroke forward limit adjustment screw CLOCKWISE to SHORTEN the forward limit, or COUNTERCLOCKWISE to LENGTHEN the forward limit. Tighten setscrew on top of pivot block.

4. Repeat Steps 1 and 2. When adjustment is correct, proceed to Step 5.

5. Observe movement of the feed pawl as the machine is hand–cycled several times. It should have sufficient – but not excessive – overtravel on the backstroke to pick up the next terminal.

The ideal backstroke will place the feed pawl at the back edge of the hole to be used. Backstroke must NOT exceed this amount, or feed pawl may not drop into the feed hole.

6. If feed pawl stroke length is satisfactory, feed adjustments are complete – otherwise, continue to Step 7.

7. Loosen slightly the 3/4 in. hex nut, on side of applicator, to permit movement of pivot shaft in slot (refer to Figure 2).

8. Loosen locknut on stroke length adjustment screw, and turn the screw IN to SHORTEN the stroke or OUT to LENGTHEN the stroke. Tighten locknut to secure screw.

9. Be certain pivot shaft bushing is UP against the stroke length adjustment screw, then tighten 3/4 in. hex nut. Repeat Step 5 to check for proper stroke length.

10. Repeat Steps 7 through 9 until proper stroke length is achieved.

5.4. Strip Guide Plate and Feed Pawl Adjustments

This procedure moves the plate on which the strip guides are mounted, thereby moving the terminal strip front or back in relation to the crimp and shear tooling. It also involves adjustment of the feed pawl to coincide with any change affecting the location of the front strip guide.

The portion of this procedure dealing with adjustment of the strip guide plate requires that the applicator be removed from the machine. Refer to Paragraph 3.2 for applicator removal. It is advisable to have the machine ram in the raised position.

BEFORE removing the applicator, be CERTAIN that the power to the machine is "off" and/or the power cord is disconnected.

1. From bottom side of base plate, loosen the screw that secures base block to base plate.

2. With LEAD terminal centered over anvil, wedge the feed pawl up to clear the front strip guide.

3. Turn strip guide plate adjustment screw CLOCKWISE to move base block and strip guide plate toward REAR, or COUNTERCLOCKWISE to move toward FRONT, until the insulation barrel of the lead terminal is as close to the floating shear as possible. Tighten screw to secure base block.

4. Loosen screw securing feed pawl to feed finger (feed pawl holder) then move feed pawl in the direction required to enter slot in front strip guide. Retighten screw.

5. Check that shear holder(s) are properly positioned as described in Paragraph 5.6.

5.5. Strip Guide Adjustment

This adjustment is seldom used, as it is called for only when the strip guides are not parallel to each other, or there is a variation in strip width.

NOTE

*The strip guides are correctly located on the strip guide plate during factory assembly, and normally do NOT require adjustment. Do NOT use this procedure for front–to–rear positioning of the strip – refer to Paragraph 5.4, Strip Guide **Plate** and Feed Pawl Adjustment.*

1. Wedge feed pawl up to clear the front strip guide, and loosen screws securing strip guides to strip guide plate.

2. Move the guides in the desired direction, and then tighten screws.

3. Check guides for being parallel, and for free movement of strip without excessing side clearance.

4. Repeat Steps 1 through 3 as necessary.

5. Loosen screw securing feed pawl to fee finger (feed pawl holder) then move feed pawl in direction required to enter slot in front strip guide. Retighten screw.

5.6. Shear / Shear Holder(s) Adjustment

This procedure requires that the applicator be removed from the machine. Refer to Paragraph 3.2 for applicator removal. It is advisable to have the machine ram in the raised position.

NOTE

If the front floating shear is not farther from the anvil than is necessary to move freely up and down, it should not require adjustment. The read shear / shear holder is more likely to require adjustment due to possible variations between terminal strip widths.

1. With lead terminal centered over anvil, check floating shear(s) for cut–off of carrier strip(s) at the specified point. If incorrect, perform the following steps.

NOTE

Steps 2 through 4 apply to front shear holder, and to the rear shear holder (when used).

2. From bottom side of base plate, loosen two screws that secure shear holder to base plate.

3. Move shear holder, with floating shear, in the desired direction.

4. Retighten screws and repeat Step 1.

6. REPAIR OR REPLACEMENT OF COMPONENTS

The following procedures cover those applicator parts that most commonly require repair and/or replacement due to wear. It is necessary to remove the applicator from the press prior to attempting any type of maintenance (refer to Paragraph 3.2).

DANGER

Be CERTAIN power to machine is "off" and/or power cord is disconnected It is advisable to have the machine ram in the raised position.

NOTE

In all procedures involving the removal and replacement of parts, wipe the parts individually with a clean, dry cloth as they are removed. Then, in the process of replacement, wipe the mating surfaces of all parts with your fingers to ensure that all lint and other foreign matter is no longer present.

6.1. Anvil Replacement

1. From bottom side of base plate, remove screw that secures anvil.

2. Release stock drag, raise feed pawl, and pull strip back so lead terminal is between strip guides.

3. Remove anvil from groove in top of base plate.

4. Install anvil using reversed procedure. If a new anvil is required, be sure part number of new anvil corresponds with number on applicator parts list.

5. Realign crimpers as described in Paragraph 6.3.

6.2. Floating Shear Replacement

NOTE

It is not necessary to remove shear holder(s) to replace floating shear(s). Before removing floating shear(s), note orientation for re–installation. The floating shears are spring–loaded, so take precautions during removal.

1. Release stock drag, raise feed pawl, and pull strip back so lead terminal is between strip guides.

2. Apply pressure to top of floating shear, then remove shear retaining screw from side of shear holder.

3. Slowly release pressure on floating shear. Compression spring will raise it out of the shear holder for removal.

4. After removing floating shear, lift compression spring from shear holder.

5. Inspect spring for evidence of damage. If necessary, replace spring. Refer to parts list for correct part number.

6. Reinstall floating shear(s) using reversed procedure. If installing new shear(s), check that part number corresponds with parts list.

7. Raise feed pawl and advance lead terminal to a position over the anvil. Lower stock drag.

8. Check shear holder(s) adjustment as described in Paragraph 5.5.

6.3. Crimper Replacement

1. Remove ram assembly from applicator by pulling upward. It may be necessary to manually actuate the feed pawl forward or back to release the ram assembly.

2. Remove crimper bolt that secures the front shear depressor, insulation crimper, crimper spacer block, and wire crimper to the ram assembly Not position and orientation of parts for reinstallation.

3. Reinstall parts using reversed procedure, but do NOT tighten crimper bolt more than finger tight until specified. Notch in wire crimper MUST mate with pin in ram. Insulation crimpers with legs of equal length, that are identical front and back, may be oriented either way. All other insulation crimpers MUST be oriented with part number facing the direction noted during removal. If new parts are installed, be CERTAIN part numbers are those specified on the applicator parts list.

4. Reinstall ram assembly in applicator, and applicator in machine.3

5. Release stock drag, raise feed pawl, and pull strip back so lead terminal is between strip guides.

6. Form a piece of heavy paper over the anvil, and then hand–cycle machine while observing alignment of crimpers with anvil. When ram assembly has reached bottom of stroke, tighten the crimper bolt. Crimpers MUST move freely over anvil after paper is removed.

6.4. Feed Pawl Replacement

1. Remove feed pawl and adjustment screw, which secures the feed pawl to the feed finger (feed pawl holder).

2. Replace feed pawl using reversed procedure. If new part is installed, be CERTAIN that part number is the number specified on the applicator parts list.

3. Adjust feed pawl as described in Paragraph 5.4.

6.5. Adjustable Crimp Height Repair (Figure 3)

Beneath the insulation disc is a laminated washer which may break and/or compress, thus causing the applicator to produce terminations with a greater crimp height than specified. To correct this problem, perform the following steps:

1. Subtract the specified nominal crimp height from the average crimp height recorded and retained as a part of 5.1, Wire Crimp Adjustment. This difference will be the thickness of washer(s) (No. 690125–1) to be ADDED under the insulation disc.

NOTE

Washer No, 690125–1 is a peel–type, laminated washer consisting of five layers, with each layer being .05 mm [.002 in.] thick.

2. Remove ram assembly from applicator, and loosen setscrew (in side of applicator ram) that secures the ram mounting post.

3. Unscrew ram body from ram mounting post, leaving the wire disc and insulation disc in place. If necessary, the end of the ram mounting post may be secured in a vise to free both hands for turning the ram body.

CAUTION

DO NOT REMOVE wire disc and/or insulation disc from ram mounting post. Detent balls and springs will pop out and may become lost if discs are removed.

4. Place washer(s) of the thickness determined in Step 1 on ram mounting post. If old washer is broken and must be replaced, measure thickness of broken washer with a micrometer. Add this measurement to amount to be added (determined in Step 1), and select new washer(s) of this thickness. Place new washer(s) on ram mounting post.

5. Replace ram body on ram mounting post, and tighten by hand until snug.

6. Check that numbers on wire disc and letters on insulation disc align properly over the insulation adjustment block. Discs are retained in position by ball detents. If necessary, turn ram body back slightly until proper alignment is attained, and then tighten setscrew to secure ram mounting post.

NOTE

Rotate wire and insulation discs individually to other positions. When the ”click” of the detent ball is heard, check for centering of letter or number over the insulation adjustment block.

7. Re–install ram assembly in applicator.

8. Install applicator in machine and make some test crimps. Measure crimp height, and check it against crimp height specified on applicator parts list. If crimp heights are within specified tolerances, the applicator may be placed in operation. If not, repeat this procedure starting with Step 1.

7. CLEANING AND LUBRICATION

For optimum performance and minimum down time, the applicator should be cleaned and inspected after each eight hours of operation, and each time it is removed from the machine to be placed in storage.

7.1. Cleaning

1. Remove applicator from machine as described in Paragraph 3.2.

2. Remove ram assembly from applicator by pulling upward. It may be necessary to manually actuate feed finger to release the ram assembly.

NOTE

It is NOT necessary to remove the section of terminal strip for proper applicator cleaning.

3. Using a clean, dry cloth and/or air hose, remove all evidence of dirt, chips, or other foreign matter from applicator components. If desired, the entire applicator can be immersed in a suitable commercial solvent (that will not affect paint or plastic material) to flush out chips, then dried with an air hose.

DANGER

Compressed air used for cleaning must be reduced to less than 30 psi, and effective chip guarding and personal protective equipment (including eve protection) must be used.

4. Lubricate the applicator, as described in Paragraph 7.2, before reassembling.

5. Replace ram assembly in applicator, and install applicator in machine.

7.2. Lubrication

The applicator components are to be lubricated at the following points using SAE No. 20 motor oil (non–detergent) or – where specified – light grease.

CAUTION

Do NOT use an excessive amount of lubricant on the applicator. Any excess MUST be removed prior to placing the applicator back in service. Avoid lubricants between the wire and insulation discs.

1. With ram assembly removed, apply a thin film of grease to four corners of ram, and to feed cam – after they have been thoroughly cleaned.

2. Lay the applicator carefully on its side and apply one drop of oil to the bushing within the 3/4–in. hex nut. Then apply a drop of oil to the feed finger pin. Wipe excess oil from feed finger pin and hex nut.

3. Set the applicator upright and apply a drop of oil to the stroke forward limit adjustment screw, and to the feed rod into which it is turned.

4. Apply a drop or two of oil to the floating shear(s) in the shear holder(s).

5. Replace ram assembly in applicator, and remove any excess lubricant.

8. APPLICATOR STORAGE

CAUTION

When applicator is to be placed in storage, or removed from the machine for any reason, the following precautions should be taken to prevent tooling damage caused by bottoming of ram assembly.

1. Cut terminal strip one or two terminals from entry to strip guides.

2. Remove applicator from machine as described in Section 3, APPLICATOR INSTALLATION AND REMOVAL. Clean and lubricate as presented in Paragraph 7.

3. Bottom the ram assembly to retain the lead terminal between crimpers and anvil. This will also identify the type of terminal to be used when applicator is reinstalled in machine.

9. REVISION SUMMARY

Revisions to this instruction sheet include:

- Updated document to corporate requirements.
- New format