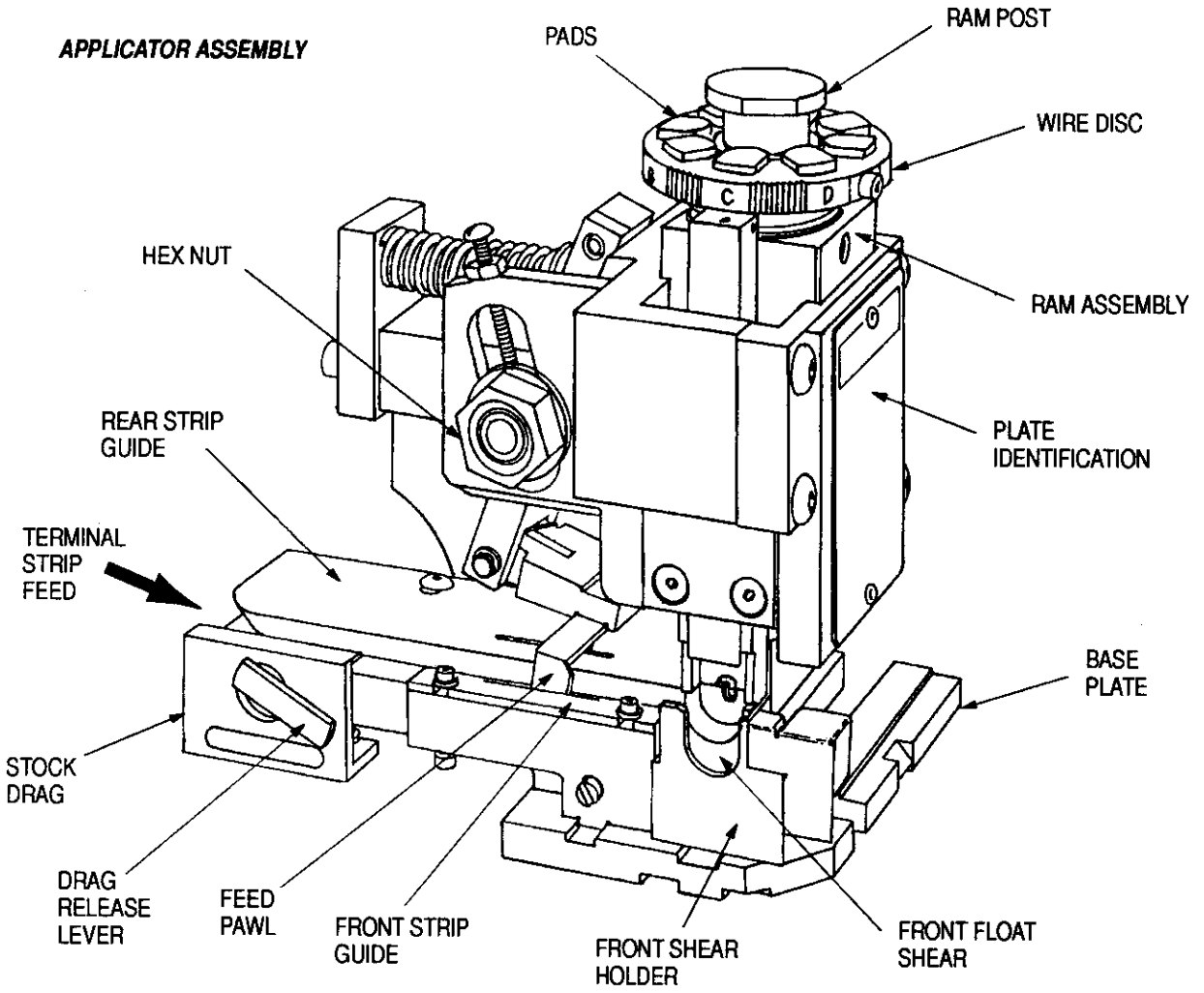

Figure 1 94-354

1. INTRODUCTION

The AMP Heavy Duty Miniature Quick-Change Applicator (side-feed type) with mechanical feed system applies side-feed strip terminals to pre-stripped wires. Each applicator accepts the strip form of certain terminals, which are identified on the applicator parts list and exploded view drawing (Applicator Log) for each applicator. The terminal listed on the data plate is the one that was specified when the applicator was ordered.

This applicator instruction sheet, and instruction sheet (408-8022) explains an applicator with mechanical feed is installed, along with the parts list and exploded view drawing packaged with the applicator, and the appropriate customer manual (409-5128) for the basic AMP-O-LECTRIC* Model "K" Terminating Machine and the appropriate customer manual (409-5842) for the basic AMP-O-LECTRIC Model "G" Terminating Machine, provide all the information required to operate and maintain the applicator and machine.

2. APPLICATOR DESCRIPTION

The side-feed applicators now feature a heavier, more rugged construction than the previous models. This lets them stand up to the higher crimping pressures needed to apply terminals to the larger wire sizes.

Although these applicators accept only certain terminals, they provide valuable application flexibility. The wire crimp can easily be adjusted for as many as four different wire sizes.

*Trademark

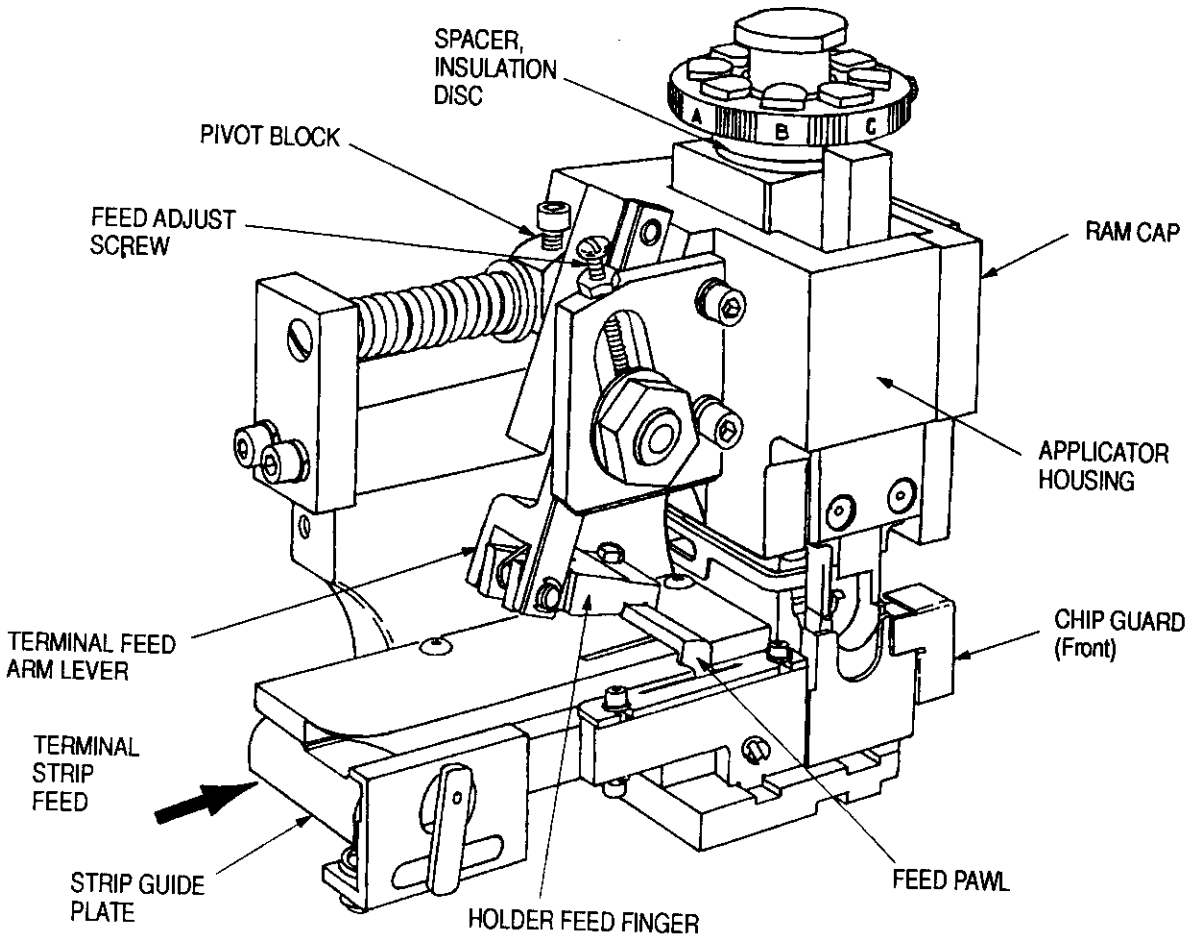

Figure 2

94-355

These applicators can be used in various machines, provided that the machines have the proper stroke length and all the necessary equipment.

The main components of the applicators are identified in Figures 1 and 2. The ram assembly is shown in detail in Figure 3.

The terminal strip is fed into the applicator with the barrel (wire) end first, between the front (outer) and rear (inner) strip guides. It passes the stock drag, and the LEAD terminal is positioned over the anvil (for PRE-FEED applicators). The feed pawl feeds one terminal during each cycle of the machine. The terminals are fed by the action of the feed cam and a series of rods and levers which move the feed pawl.

The ram post (also referred to as the ram mounting post) engages the post adapter of the machine ram, and it is the machine ram that actuates the applicator.

Just below the ram post is the wire disc. The wire disc has as many as four pair of pads, depending on the number of different wire sizes the terminals will accept. Each pair of pads has a different height. By rotating the disc, each pair of pads can be lined up with the two bosses on the ram post adapter (see Figure 3) to change the length of stroke of the wire crimper over the anvil.

The wire crimper is held in a pre-set position by two pins on the ram assembly and by the crimper bolt. The front shear depressor is also held by the crimper bolt. The front shear depressor pushes the front floating shear down to cut the crimped terminal from the strip.

A spring-loaded depressor insert which functions in conjunction with the main guard is nested in the shear depressor. The depressor insert partially covers the area where the stripped wire is introduced into the floating shear and serves as a deterrent for entering a pinch point area.

The product retainer is attached to the ram and is used to keep the terminal in position after shearing but prior to crimping. It also serves to push the terminal down on the anvil during crimping.

NOTE *If more than one crimp height is specified for the applicator, it may be necessary to have alternate retainers for the other crimp heights.*

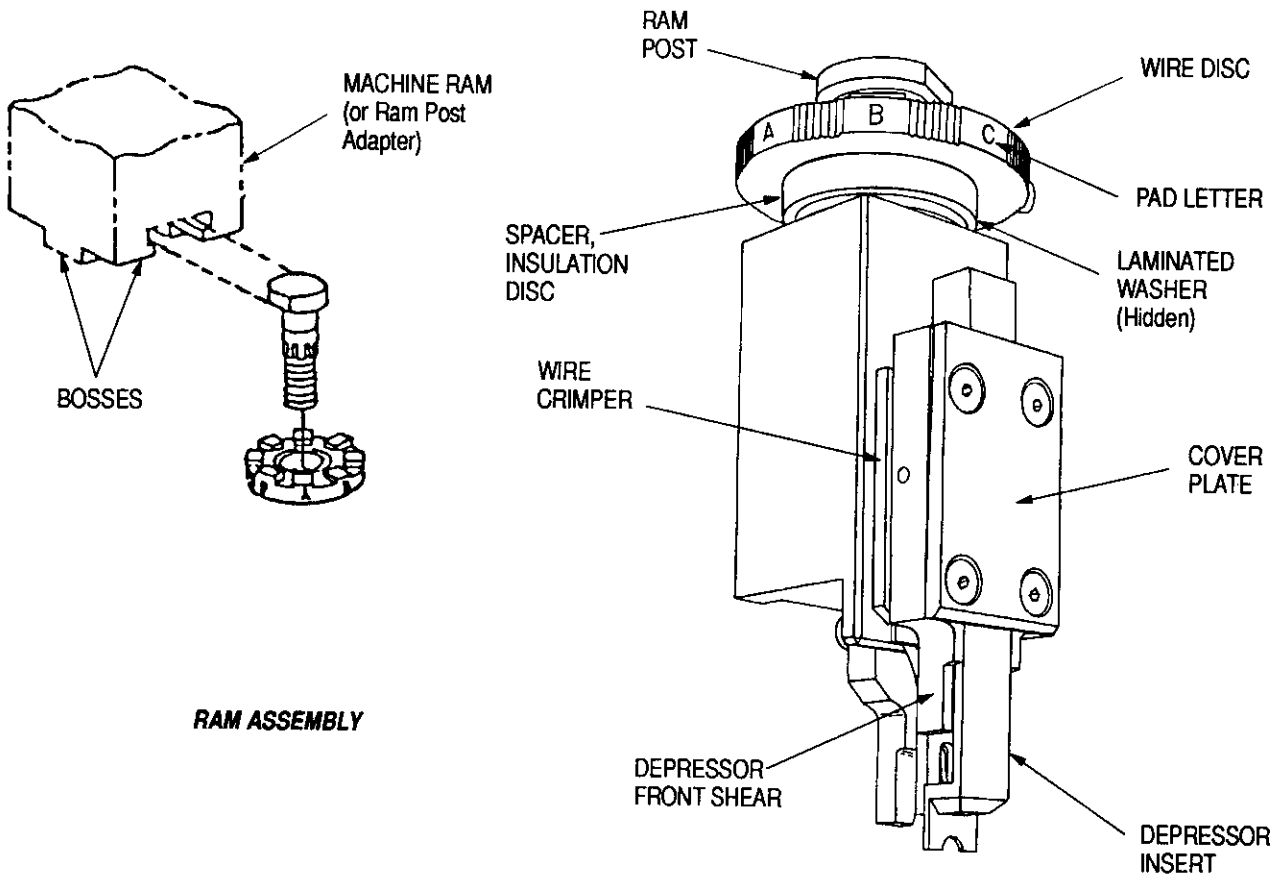

Figure 3 94-358, 94-356

The applicator's mounting surface is its base plate. The anvil, the front shear holder, the terminal support, the strip guide adjustment block, and the applicator housing are mounted on the base plate. The strip guide plate is fastened to the strip guide adjustment block. The stock drag, the strip guide cover plate, and both strip guides are mounted on the strip guide plate.

The PRE-FEED cam is used in side-feed type applicators installed in semi-automatic bench machines. The PRE-FEED cam advances the lead terminal over the anvil on the UPWARD stroke of the ram assembly, so that a terminal is over the anvil when the machine is at rest.

NOTE *All dimensions on this document are in metric units [with U.S. customary units in brackets].*

Two lengths of feed cams are available for these applicators. The length of the feed cam to be used is determined by the length of the machine stroke. For example, the AMP-O-LECTRIC Model "K" Terminating Machine (28.58 [1.125] stroke) must use a short feed cam; also the AMP-O-LECTRIC Model "G" Terminating Machine (41.28 [1.625] stroke) must use a long feed cam.

3. APPLICATOR INSTALLATION AND REMOVAL

DANGER *To prevent injury, isolate the AMP-O-LECTRIC machine from all sources of power and disconnect air supply BEFORE installing or removing applicator.*

CAUTION *With applicator in the machine, NEVER attempt to cycle the machine under power WITHOUT terminals properly loaded, as described in SECTION 4; otherwise the tooling may be damaged.*

3.1. Installation

Applicator instruction sheet 408-8022 explains how an applicator with mechanical feed is installed in the machine.

3.2. Removal

1. Turn machine OFF and disconnect power.

2. Unload applicator as described in Section 4. Remove hold-down bracket and movable stop, then slide applicator away from stop on base mount until ram post is clear of machine ram.

4. TERMINAL STRIP LOADING AND UNLOADING

4.1. Terminal Strip Loading

Before loading terminal strip in applicator, BE SURE the installed applicator is the right one for the terminal to be applied. Compare terminal number on reel with numbers listed on applicator parts list.

1. Turn machine OFF and disconnect power.

2. Be sure ram assembly is all the way up. If necessary, hand-cycle machine to raise ram. (Refer to customer manual for machine.)

3. Remove applicator guard assembly.

4. Raise stock drag by turning drag release lever upward. Remove length of terminal strip left in applicator by grasping terminals at the strip guide entry, raising the feed pawl, and pulling strip straight out of applicator.

5. With reel of terminals installed on reel support, feed terminal strip into applicator between guide strips.

CAUTION *Be sure terminal strip enters strip guides with barrel (wire) end toward the stock drag and the open side up.*

6. Raise feed pawl and continue to feed terminal strip until lead terminal is over anvil and feed pawl engages hole in carrier strip.

7. Turn drag release lever downward to lower the stock drag.

8. Be sure tip of feed pawl is in feed hole in carrier strip.

CAUTION *Some carrier strips have additional holes which are not used for feed purposes.*

9. Hand-cycle the machine several times to make sure the applicator is properly adjusted as described in Section 5.

10. Re-install applicator guard assembly.

4.2. Terminal Strip Unloading

Cut terminal strip one or two terminals from end of applicator. Leave strip of terminals in applicator.

NOTE *Applicator should never be unloaded unnecessarily. A section of terminal strip should always be left in the unit. Since it is not necessary to remove strip section for cleaning, lubrication, or repair, it should only be removed as a part of the loading procedure.*

5. ADJUSTMENTS

5.1. Wire Crimp Adjustments

1. Select pad letter (A, B, C, or D) from data plates for AWG wire size to be used.

2. Turn wire disc to line up selected pad letter with bosses on machine ran , (or ram post adapter). See Figure 3. This provides the proper crimp height for that wire size.

3. Make several test cycles and inspect terminations closely.

a. Look for rough or sharp edges around crimped barrels (flash), deformed crimps, bent terminals, or other defects caused by worn or broken tooling. If necessary, replace tooling as described in Section 6.

b. If terminations appear normal, measure crimp height of each termination as described in instruction sheet 408-7424, packaged with the applicator. Crimp height must agree with measurement specified on parts list for wire size being used. Record crimp height dimensions for reference.

c. If crimp height is incorrect, remove applicator and install one that is known to produce terminations of correct crimp height. Make several test cycles and repeat Step b. If crimp height is incorrect, for this applicator, the problem is machine crimp height, and corrective information can be found in the appropriate machine customer manual. If crimp height is correct, the problem is in the original applicator, and corrective measures are presented in Paragraph 6.5, Adjustable Crimp Height.

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

5.2. Terminal Strip Feed Adjustment

1. With terminal strip properly loaded, check position of lead terminal over anvil by actuating the applicator to move the feed pawl to the forward limit of its stroke. Lead terminal must be centered on anvil.

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

3. Loosen screw on top of pivot block (see Figure 2). Turn the stroke forward limit adjustment screw COUNTERCLOCKWISE to move the forward limit toward anvil, or CLOCKWISE to move the forward limit away from the anvil. Tighten screw on top of pivot block.

4. Repeat Steps 1, 2, and 3 as required. When adjustment is correct, go on to Step 5.

5. Watch the feed pawl as the machine is hand-cycled several times. It should have enough - but not too much - overtravel on the backstroke to pick up the next terminal.

NOTE *At the end of its backstroke, the feed pawl should be at the back edge of the feed hole to be used. The backstroke MUST NOT be longer than this, or the feed pawl might not drop into the feed hole.*

6. If feed pawl stroke length is satisfactory, feed adjustments are complete. If not, continue with Step 7.

7. Loosen slightly the hex nut on side of applicator, to allow the pivot shaft to move in slot (see Figure 2).

8. Loosen locknut on stroke length adjustment screw, and turn the screw CLOCKWISE to shorten the backstroke or COUNTERCLOCKWISE to lengthen the backstroke. Tighten locknut to secure screw.

9. Be sure pivot shaft bushing is up against the stroke length adjustment screw. Tighten the hex nut. Repeat Step 5 to check stroke length.

10. Repeat Steps 7 through 9 until stroke length is correct.

5.3. Strip Guide Plate and Feed Pawl Adjustments

This procedure moves the plate on which the strip guides are mounted. Since the terminal strip is fed into the applicator between the strip guides, it is moved front and back over the anvil as the strip guides are moved.

The adjustment of the feed pawl to match any change in the position of the front strip is also described here.

1. From bottom side of strip guide plate, loosen the screw that holds the strip guide adjustment block to the strip guide plate.

2. With the lead terminal centered over anvil, lift and hold (or block) the feed pawl up to clear the front strip guide.

3. Turn strip guide plate adjustment screw CLOCKWISE to move strip guide plate toward rear, or COUNTERCLOCKWISE to move it toward front. The wire barrel of the lead terminal should be as close as possible to the floating shear. Tighten screw to hold strip guide plate in position.

4. Loosen screw holding feed pawl to feed finger (feed pawl holder). Move feed pawl until its tip drops into feed hole in front strip guide. Retighten screw.

5. Hand-cycle terminating unit, check for proper terminal feed and strip guide plate alignment.

6. If necessary, reposition shear holder(s) as described in Paragraph 5.5.

5.4. Strip Guide Adjustment

This adjustment is not used very often, because it is only needed when the rear strip guide is not parallel to the strip guide plate, the strip guides are not parallel to each other, or there is a variation in strip width.

NOTE *The strip guides are correctly positioned on the strip guide plate when the applicator is built, and normally do NOT need adjustment. DO NOT use this procedure for front-to-rear positioning of strip; refer to Paragraph 5.3, Strip Guide Plate and Feed Pawl Adjustments.*

1. Lift and hold (or block) the feed pawl up to clear the front strip guide, and loosen screws holding strip guides to strip guide plate.

2. Move the rear strip guide in the desired direction, making sure it is parallel to the strip guide plate, and then retighten the holding screws.

3. Align the front strip guide with holes in the terminal carrier strip, but be sure the strip guides are parallel, and that the terminal strip can move freely with a minimum of side clearance. Retighten the screws.

NOTE *If feed pawl is not aligned with the front strip guide, refer to Paragraph 5.3, Step 4.*

4. Hand-cycle terminating unit, checking for proper terminal feed and strip guide alignments.

5.5. Adjustment of Shear(s) and Shear Holder(s)

With lead terminal centered over anvil, check to see if floating shear(s) cuts the terminal from the carrier strip(s) correctly. If necessary, make the following adjustments.

NOTE *The applicator must be removed from the terminating unit for this procedure. See removal procedure under Paragraph 3.2. Remove the applicator ram before proceeding.*

1. From the bottom of the base plate, loosen the two screws that secure the shear holder to the base plate.

2. Move the shear holder and floating shear in the desired direction, and retighten the screws.

NOTE *There should be minimal clearance between the floating shear and the anvil; the shear must move up and down freely, and must be square to the back of the anvil.*

3. With the applicator ram replaced and the lead terminal centered over the anvil, check that the floating shear correctly cuts the terminal from the carrier strip. If shearing action is not correct, repeat Steps 1 and 2 or check for worn or damaged tooling.

6. REPAIR AND REPLACEMENT OF PARTS

These procedures cover the applicator parts which most often need repair or replacement because of wear. Remove the applicator from the machine before doing any maintenance work. Refer to the exploded view drawing and parts list packaged with the applicator for identification of parts. Be sure to order replacements for parts used from spare parts stock, so that they will be available when needed.

DANGER *To prevent injury, isolate machine from all sources of power and disconnect air supply BEFORE installing or removing the applicator. The machine ram should be in the raised position.*

NOTE *Wipe parts with a clean, dry cloth as they are removed from the applicator. Then, when putting them back into the applicator, wipe mating surfaces with your fingers to make sure that all lint and other foreign matter have been removed.*

6.1. Anvil Replacement

1. From bottom of base plate, remove screw that holds anvil to base plate.

2. Turn drag release lever upward, 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 needed, be sure the part number of the new anvil agrees with the number on the applicator parts lists.

NOTE *When the anvil is replaced, the front shear and holder must be aligned. See Paragraph 5.5.*

5. Re-align 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. Before removing floating shear(s), note orientation for re-installation. The floating shears are spring-loaded, so be careful during removal.*

1. Turn drag lever upward, raise feed pawl, and pull strip back so lead terminal is between strip guides.

2. Push down on the floating shear, then remove shear retaining screw from side of shear holder.

3. Slowly release pressure on floating shear. Compression spring will push it out of shear holder.

4. After removing floating shear, lift compression spring out of shear holder.

5. Inspect spring for damage and replace it if necessary. Refer to parts list for correct number.

6. Re-install floating shear(s) using reversed procedure. If installing new shear, be sure part number agrees with the number on the parts list.

7. Raise feed pawl and move lead terminal over the anvil. Turn drag release lever down to lower stock drag.

8. Check shear holder 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 move the feed finger forward to release the ram assembly.

2. Remove the four screws which hold the cover plate in place. Remove depressor insert from slot (do NOT remove spring).

3. Remove crimper bolt which holds the front shear depressor, front shear depressor spacer, and wire crimper in place on the ram assembly. Note position of parts for re-installation.

4. Re-install the front shear depressor, front shear depressor spacer, and loose crimper. The upper end of the wire crimper must be up against the pins on the ram assembly, and the top hole on the crimper must mate with the roll pin in the ram assembly. Tighten the crimper bolt ONLY finger tight. Place the ram assembly in applicator and position the depressor insert (with spring attached) so it is perpendicular to the ram, and does not enter the opening in the applicator. Allow the ram to enter the slot until the components are properly aligned for free movement. Then tighten the crimper bolt.

5. Remove the ram from the applicator. Position the depressor insert in the slot of the front shear depressor. Fasten cover plate to depressor with four screws.

6. Put ram assembly back into applicator, and install applicator into machine.

7. Lift feed pawl and pull terminal strip back until lead terminal is between strip guides.

8. Form a piece of heavy paper, which acts as a spacer or gauge, over the anvil, then slowly hand-cycle machine while watching alignment of crimpers with the anvil. Crimpers must move freely over anvil after paper is removed.

9. If crimper interferes with anvil, repeat Steps 2 through 8 until the crimper moves freely over the anvil.

6.4. Feed Pawl Replacement

1. Remove the adjustment screw which holds the feed pawl to the feed finger (feed pawl holder).

2. Replace feed pawl using reversed procedure. If new pawl is installed, be SURE the part number agrees with the number on the parts list.

3. Adjust feed pawl as described in Paragraph 5.3.

6.5. Adjustable Crimp Height

Under the wire disc is a laminated washer which may break or compress after extensive use. This could cause the applicator to produce terminations with a different crimp height than specified. To correct this problem, use the following procedure:

1. Subtract specified nominal crimp height from average height recorded as a part of Paragraph 5.1, Wire Crimp Adjustments. This difference will be the thickness of washers(s) (Part No. 690125-1) to be ADDED under the wire disc.

NOTE *Washer 690125-1 is a peel-type, laminated washer consisting of five layers, with each layer being 0.05 mm [.002 in.] thick.*

2. Remove ram assembly from applicator, and loosen ram post locking screw in the side of applicator ram (see Figure 1).

3. Hold ram assembly with ram post pointing down, and unscrew ram from ram post, leaving wire disc in place. If necessary, the end of the ram post may be placed in a vise to free both hands for turning ram.

CAUTION *DO NOT REMOVE wire disc from ram post. Detent balls and springs may pop out and become lost if disc is removed.*

4. Place washer(s) of thickness determined in Step 1 on ram 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 post.

5. Hold ram with hole facing downward, screw ram post into ram, and tighten by hand until snug.

6. Be sure letters on wire disc line up properly. Disc is held in position by ball detent. If necessary, turn ram post back slightly until letters line up, then tighten ram post locking screw to hold ram post in position.

7. Put ram assembly back into 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 height is within specified tolerances, applicator may be placed in service. If not, repeat this procedure, starting with Step 1.

7. CLEANING AND LUBRICATION

For best performance and minimum downtime, applicator should be cleaned, inspected, and lubricated after each eight hours of operation, and each time it is taken out of the machine to be placed in storage.

DANGER *To prevent injury, isolate machine from all sources of power and disconnect air supply BEFORE installing or removing the applicator. The machine ram should be in the raised position.*

7.1. Cleaning

1. Remove applicator from machine.

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

3. Using a clean, dry cloth, remove dirt, chips, etc, from applicator. The entire applicator may be immersed in a suitable commercial solvent (one that won't affect paint or plastic) once a month to flush out chips.

4. Lubricate applicator as described in Paragraph 7.2 before re-assembling.

7.2. Lubrication

Lubricate the applicator each eight hours at the following points with SAE No. 20 motor oil (non-detergent), or - where specified - light grease.

CAUTION *Do NOT use too much oil or grease on the applicator. Any excess lubricant MUST be wiped off before placing the applicator back in service. Do not put lubricants between the wire and insulation disc.*

1. Take ram assembly out of applicator, clean ram and feed cam, and apply a thin coat of grease to each corner of the ram and to the feed cam.

2. Carefully lay the applicator on its side and put one drop of oil on the feed finger pin. Wipe feed finger to remove excess oil.

3. Set the applicator upright and put a drop of oil on each of the following: stroke forward limit adjustment screw, the feed rod (into which the adjustment screw is turned), and the bushing inside the 3/4-in. hex nut. Wipe off excess oil.

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

5. Put the ram assembly back into the applicator, and wipe off excess oil or grease.

8. APPLICATOR STORAGE

CAUTION *When storing the applicator, or taking it out of the machine for any reason, use the following procedure to keep the tooling from being damaged by bottoming of the ram assembly.*

1. Cut terminal strip one or two terminals from end of applicator.

2. Take applicator out of machine as described in SECTION 3. Clean and lubricate it as described in SECTION 7.

3. Lower the ram assembly to hold lead terminal between crimpers and anvil. This will also identify the type of terminal to be used when the applicator is put back in service.

9. REPLACEMENT AND REPAIR

Refer to the applicator assembly drawings shipped with the applicator for a list of recommended spare parts. The parts are customer-replaceable. Order replacement parts through your AMP representative, or call 1-800-526-5142, or send a facsimile of your purchase order to 1-717-986-7605, or write to:

CUSTOMER SERVICE (38-35)
AMP INCORPORATED
P.O. BOX 3608
HARRISBURG, PA 17105-3608

Applicators may be returned to AMP for evaluation and repair. For repairs, send applicator, with a written description of the problem, to:

CUSTOMER REPAIR (O1-12)
AMP INCORPORATED
1523 NORTH 4TH STREET
HARRISBURG, PA 17102-1604