

**SPRINGS AND STUDS OF DZUS FASTENERS
USED IN THE N1 CARRIER TELEPHONE SYSTEM
PIECE-PART DATA AND REPLACEMENT PROCEDURES**

1. GENERAL

- 1.01 This section covers the procedures for replacing springs and studs of Dzus fasteners used to secure plug-in units and covers in the N1 carrier telephone equipment.
- 1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.
- 1.03 Deformation and breakage of Dzus fastener springs and studs result from improperly attempting to secure units in their mountings with these devices or to loose rivets securing the springs in place. Fastener springs may be deformed or studs become mutilated for any of the reasons covered in 1.04.
- 1.04 Rough handling or attempts to mount a unit with the slot in the stud of a fastener at right angles to the associated spring may cause overstressing and permanent damage to the spring. With the stud slot in the fasteners straddling their associated springs, failure to press a plug-in unit fully into position before locking the fasteners may overstress or break the spring. The light fastener springs used initially to hold the bottom of the channel unit in place may be damaged by attempting to turn the associated studs beyond their locked position. Burring of studs may result from engagement with damaged fastener springs.

<u>Code or Spec. No.</u>	<u>Description</u>
-	2-32 Nail Set
-	3" Cabinet Screwdriver
-	4" Regular Screwdriver
-	No. 1 Phillips Screwdriver
*-	Dzus FRST 4 Tool <i>Conroe & Vacuum Cleaner</i>

Piece Parts (Used for Replacement Purposes)

For Fastener Springs

P-377782	Bracket Assembly (Channel Unit)
P-377784	Bracket Assembly (Channel Unit)
P-37A959	Bracket Subassembly (Channel Unit)
P-37A960	Bracket Subassembly (Channel Unit)
P-298849	Hexagonal Nuts
P-162129	0.086"-56x1/4" F.H.M. Screws
P-180697	0.086"-56x1/4" B.H.M. Screws
*SD3-175	Spring (Cover of Repeater Unit)
*S4-225	Spring (Bottom of Group Units)
*S4-200	Spring (All other Places)
-	Type F R.H. Phillips Head 8-32x3/8" Self-tapping Screws

For Fastener Studs

*AJ4-35	Fastener Stud (Channel Units J98703F and FA)
*AJ4-40	Fastener Stud (Repeater Unit J98703L, M, LA, and MA)
*AJ4-35	Fastener Stud (High Group Transmitting J98703G (top only))

2. LIST OF TOOLS AND PIECE PARTS

<u>Code or Spec. No.</u>	<u>Description</u>
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Tools

R-1640	Center Punch
P-36A921	Drill Guide
-	No. 757 Carbon Machine Screw Counterbore, Size 0.187 inch - 0.086 inch (Morse Screw and Machine Tool Co.)
-	No. 38 Twist Drill
-	3/32" Twist Drill
-	5/32" Twist Drill
-	3/16" Twist Drill
-	Power Drill
-	1-lb Ball-peen Hammer
-	P-long-nose Pliers

<u>Code or Spec. No.</u>	<u>Description</u>
<u>For Fastener Studs (Contd)</u>	
*AJ4-35	Fastener Stud (Low Group Transmitting (top only))
*AJ4-50	Fastener Stud (Low Group Transmitting (bottom only))
*AJ4-35	Fastener Stud (High Group Receiving (top only))
*AJ4-35	Fastener Stud (Low Group Receiving (top only))
*AJ4-50	Fastener Stud (Low Group Receiving (bottom only))
XSC-115	Retaining Rings (National Lock Washer Co.)

*These tools and piece parts are manufactured by the Dzus Fastener Co.

3. PREPARATION

3.01 Preparation of Drill (When Replacing Springs on Channel Units): Insert a 5/32" twist drill loosely into the drill chuck. Place the P-36A921 drill guide over the drill as shown in Fig. 1 with the guide touching the chuck. Set the drill securely in the chuck with the tip of the drill extending 1/8" beyond the end of the drill guide.

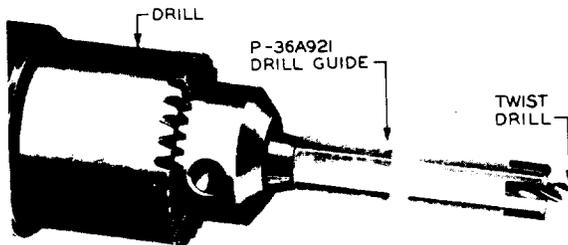


Fig. 1 - Mounting Drill Guide and Drill for Removing Rivets

4. PROCEDURES FOR REPLACING DZUS FASTENER SPRINGS AND RIVETS

CHANNEL UNIT FASTENER SPRINGS AND RIVETS

A. General

4.01 Make-busy Information: Before removing any unit from its mounting, make the circuit busy in accordance with approved procedures. After completing the work, restore the unit to service.

4.02 Removal of Fuses: Before starting to make any replacement of parts, remove all terminal mounting distribution fuses associated with the equipment on which the work is to be done. After completing the work, remount the fuses.

4.03 Removal and Remounting of Channel Unit: Remove the channel unit on which springs are to be replaced as follows. Turn the fastener studs (Fig. 3), securing the unit, 90 degrees counterclockwise, using the 4" regular screwdriver, and pull the unit straight out. After making the necessary replacement of parts, remount the unit. Take care in doing this that the plug on the unit fully engages the jack shown on Fig. 3. Turn the fastener studs 90 degrees clockwise so that they engage their associated springs. Take care in doing this not to turn the fastener studs beyond their locked positions or the springs may be overstressed.

4.04 Covers: When difficulty is experienced in removing or remounting a cover that had previously been removed to replace any part or make any adjustment, the trouble may be due to distortion of the cover during previous handling. To correct, press the sides of the cover inward with the hands, giving it a slight permanent inward set.

B. At Bottom of Unit

4.05 General: Where less than four fastener springs require replacement, proceed as covered in 4.06 to 4.13 if the bracket subassembly on which the spring is located is riveted in place, or as covered in 4.14 if the subassembly is secured by Phillips screws. Otherwise proceed as covered in 4.15 to 4.21 inclusive.

Replacing Less than Four Fastener Springs on Riveted Bracket Subassemblies

4.06 Insert the P-long-nose pliers into the hole in the fastener spring bracket and bend the bracket as shown in Fig. 2. Then twist the bracket as shown in Fig. 3. This is done to gain access to the bracket mounting rivets which must be removed.

4.07 Using the drill and drill guide assembled as covered in Part 3, place the guide over a rivet to be removed. Then, while holding the guide firmly against the surface surrounding the rivet as shown in Fig. 4, drill out the rivet head. *Before drilling cover surrounding area with carbon to catch*

4.08 After removing both rivet heads, bend the bracket off the rivet stubs and discard the bracket. *filing, Have Vacuum*

4.09 Using a 2-32 nail set and the hammer, tap the rivet stubs gently through the holes in the mounting bracket assembly onto the shelf as shown in Fig. 5. The stubs will drop onto the shelf behind the mounting *cleaner, remaining to catch chips.*

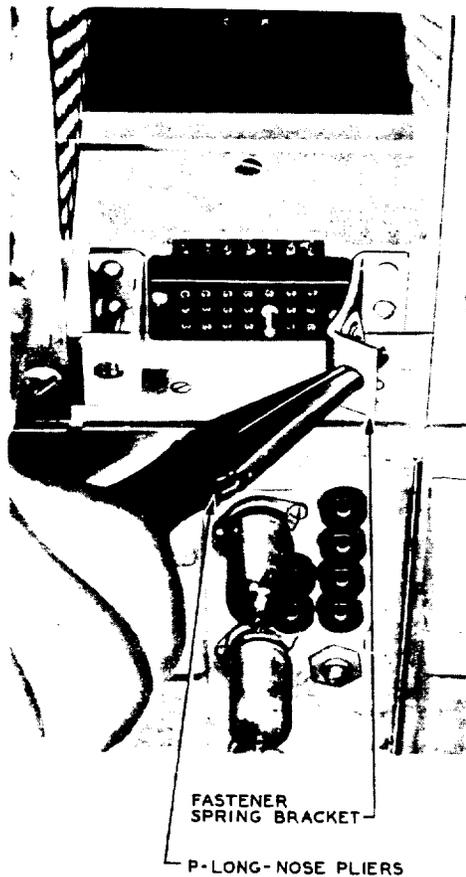


Fig. 2 - Method of Bending Bracket to Gain Access to Rivet

bracket assembly end will not cause any trouble if they are left there indefinitely.

- 4.10 Remove any metal chips, using a vacuum cleaner.
- 4.11 Place the bracket subassembly to be used to replace the subassembly that was removed in a vise and enlarge the mounting holes, using a $3/16$ " drill. P-37A960 bracket subassemblies are used when replacing the bracket on the right side of channel 11 and P-27A959 in all other cases.
- 4.12 Tap the holes in the mounting bracket assembly, using a Phillips self-tapping screw, Type F, 8-32 x $3/8$ " R.H. and a No. 1 Phillips screwdriver. Remove the screw after tapping the hole.
- 4.13 Hold the replacing fastener spring bracket in position and insert a screw into one of the holes in the bracket. This operation will be facilitated by looping a short length of wire around the screw to guide it into position as shown in Fig. 6. Then tighten the screw, removing the wire before the screw is tight. Repeat for the other mounting screw.

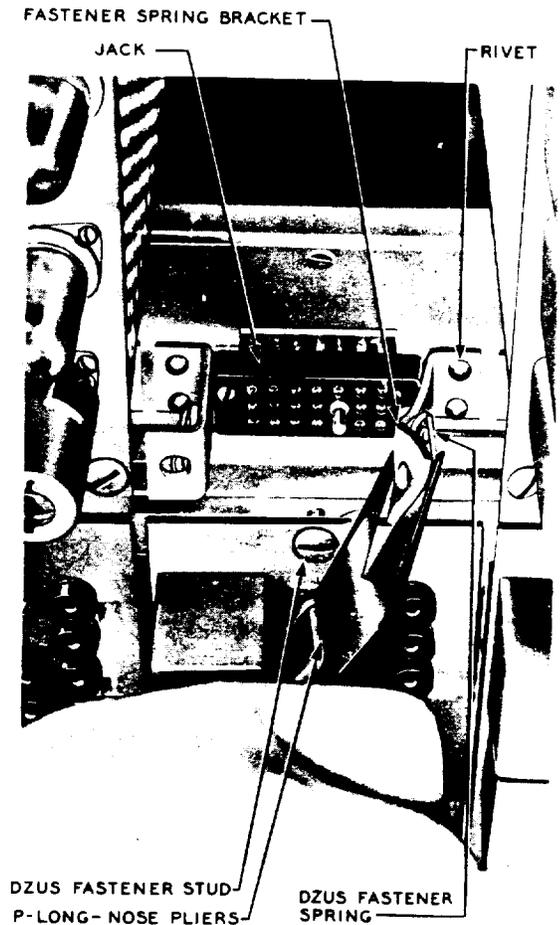


Fig. 3 - Method of Bending Bracket to Gain Access to Rivet

Replacing Less than Four Fastener Springs on Screw-mounted Bracket Subassemblies

- 4.14 Remove the bracket mounting screws, using the No. 1 Phillips screwdriver. Make the necessary replacement of springs, and securely tighten the mounting screws.

Replacing More than Four Fastener Springs

- 4.15 Where four or more fastener springs are to be replaced, replace the bracket assembly on the terminal frame. To do this, remove all channel units from the bracket assembly as covered in 4.03.
- 4.16 Remove the jack mounting screws for all KS-14173 jacks mounted on the bracket assembly, using the 3" cabinet screwdriver.
- 4.17 Remove the five flat-head screws used to secure the bracket assembly, using the 4" regular screwdriver.

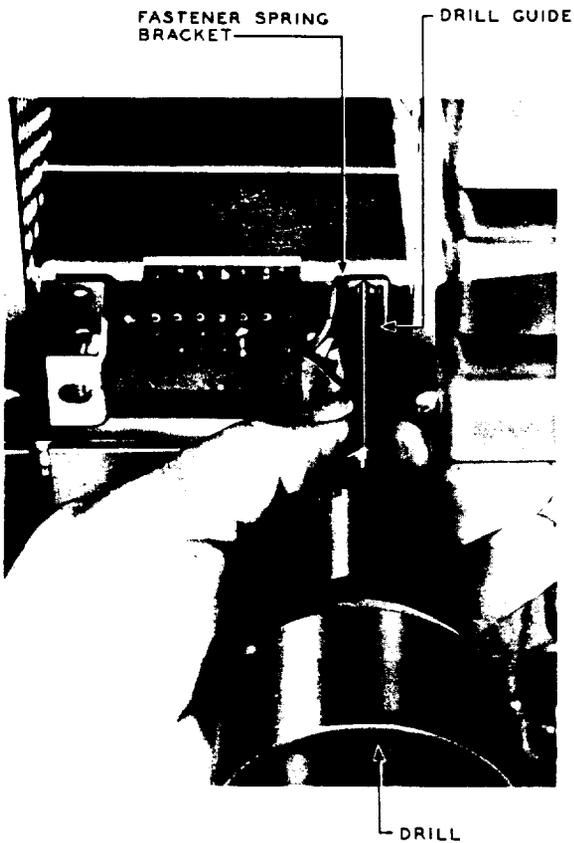


Fig. 4 - Method of Removing Rivet Heads Using Drill Guide

4.18 Lift the bracket assembly from the shelf. Then, while holding the assembly, carefully pull each KS-14173 jack forward, turn the jack end first, and push it through the rectangular slot in the bracket assembly. Take care while doing this not to break or damage the wires.

4.19 Discard the bracket assembly and substitute a new one.

4.20 Insert the jacks, end first, through the rectangular openings. Insert and securely tighten the jack mounting screws. Then check that the wiring is satisfactory.

4.21 Place the bracket assembly in position on the shelf. Insert and securely tighten the bracket mounting screws.

C. At Top of Unit

4.22 Before proceeding with the replacement of fastener springs or associated rivets, remove the unit above the one that was removed for replacement of parts as covered in 4.03. Where a rivet is loose, replace only the loose rivet by the proper mounting screw as covered in 4.23 unless the



Fig. 5 - Method of Removing Rivet From Bracket

associated spring is deformed or broken. Where the spring is deformed or broken, replace both rivets by proper mounting screws as covered in 4.24.

4.23 Replacing Loose Rivets: Where a rivet used to secure a spring is loose, remove it with the P-long-nose pliers and substitute a screw as covered in 4.25.

4.24 Replacing Defective Springs: Where a spring is to be replaced and the rivets are loose, remove the rivets as covered in 4.23. If the rivets are tight, carefully drill out the turned-over portion of the rivet, using a 3/32" drill. With the rivets removed, proceed as covered in 4.25.

4.25 Where the rivet hole is countersunk, replace the rivet by a P-162129 F.H.M.

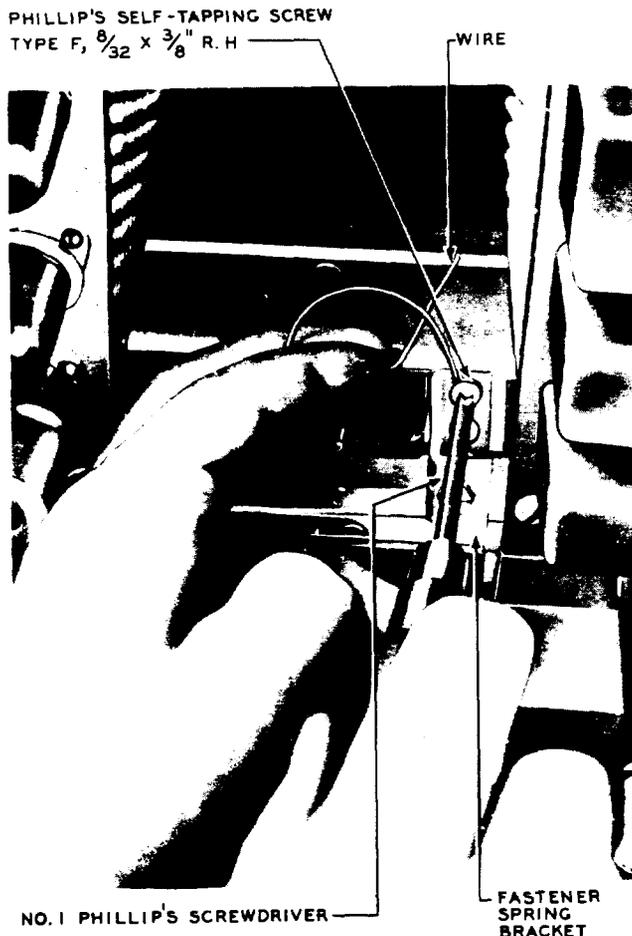


Fig. 6 - Method of Guiding Screws Into Place

screw, and where the hole is counterbored, replace the rivet by a P-180697 B.H.M. screw. In both cases insert the screw into the hole from the face of the frame. Where a spring was removed, remount the spring, if satisfactory, or mount a new spring, if necessary, over the screw with the closed loop in the spring against the rear of the frame. Place a P-298849 hexagonal nut on the screw and tighten the screw to the frame, using the 3" cabinet screwdriver, so that the nut holds the spring securely against the fastener. Where both rivets are replaced, repeat for the other end of the spring.

D. On Cover of Unit

4.26 Remove the cover from the unit by turning the fastener stud 90 degrees counterclockwise, using the 4" regular screwdriver, and then remove the cover.

4.27 Using the K-1640 center punch, carefully center punch the heads of both rivets that secure the spring.

4.28 Then, using a 3/32" drill, carefully drill out the rivet heads. Take care in doing this not to drill into the casting. Remove the rivets.

4.29 Where the rivet hole is countersunk, use a P-162129 F.H.M. screw to mount the new spring, or where the hole is counterbored, use a P-180697 B.H.M. screw. On J98703FA channel units, it may be necessary to deepen the counterbore to completely recess the head of the screw. To deepen the counterbore, proceed as follows. Increase the diameter of the screw hole in the channel, using a No. 38 drill. Then increase the diameter of the counterbore, using a No. 757 machine screw counterbore. Take extreme care that the drilling and counterboring is done in line with the existing holes.

4.30 Insert the screw into a hole and mount the new spring over the screw with the closed loop in the spring against the bracket. Place a P-298849 hexagonal nut on the screw and tighten the screw to the frame, using the 3" cabinet screwdriver, so that the nut holds the spring securely against the fastener. Repeat for the other end of the spring.

4.31 Remount the cover. Turn the fastener stud 90 degrees in a clockwise direction so that the stud engages the spring. Take care in doing this not to turn the stud beyond its locked position or the spring may be overstressed.

REPEATER UNIT FASTENER SPRINGS AND RIVETS

A. General

4.32 Make-busy Information: Dzus fasteners associated with repeaters may be mounted on the repeater unit, the associated repeater mounting shelf, the repeater mounting top support, or the repeater mounting bracket.

(a) When replacing springs or rivets on the repeater unit or repeater mounting top support, the parts may be replaced without interrupting service. To do this, replace the repeater unit by a spare, using the repeater switching set before removing the unit. If a spare repeater unit is not available, arrange with the personnel at both terminal offices associated with the unit to remove all associated channel circuits from service.

(b) When replacing springs or rivets on the repeater mounting shelf, the parts may be replaced without interrupting service. To do this, replace the repeater unit mounted in the position on which the work is to be done and the repeater unit mounted directly above it by spares, using the repeater switching set before removing either repeater unit. If a spare repeater unit is not available in either case,

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Arrange with the personnel at both terminal offices associated with each unit to remove all associated channel circuits from service.

(c) When replacing springs or rivets on the repeater mounting bracket, it is necessary to interrupt service as all fuses on the distribution fuse panel should be removed before work is started. Arrange with the personnel at both terminal offices associated with the unit to remove all associated channel circuits from service.

4.33 Removal and Remounting of Repeater

Unit: Remove the repeater unit on which springs are to be replaced as follows. Turn the fastener studs, securing the unit 90 degrees counterclockwise, using the 4" regular screwdriver, and pull the unit straight out. After making the necessary replacement of parts, remount the unit. Take care in doing this that the plug fully engages the associated jack. Turn the fastener stud 90 degrees clockwise so that it engages the associated spring. Take care in doing this not to turn the fastener stud beyond its locked position or the spring may be overstressed.

B. On Repeater Mounting Bracket

4.34 Protect the equipment below the unit bracket to prevent metal chips from the following drilling operation falling on the equipment.

4.35 Using the R-1640 center punch, carefully center punch the heads of both rivets that secure the spring.

4.36 Then, using a 3/32" drill, carefully drill out the rivet heads.

4.37 Using the 3" cabinet screwdriver, remove the repeater bracket mounting screws. Turn the front of the bracket up to gain access to the spring side of the bracket.

4.38 Remove the springs, rivets, and associated washers.

4.39 Insert a P-180697 B.H.M. screw into one of the holes and then the new spring over the screw with the closed loop in the spring against the bracket. Place a P-298849 hexagonal nut on the screw and tighten it so that the nut holds the spring securely against the washer, using the 3" cabinet screwdriver. Repeat for the other end of the spring.

4.40 Remount the bracket securely in place.

4.41 Remove the protection from the equipment.

C. On Repeater Mounting Shelf and Repeater Mounting Top Support

4.42 Where a rivet is loose, replace only the loose rivet by the proper mounting screw as covered in 4.43 unless the associated spring is deformed or broken. Where the spring is deformed or broken, replace both rivets by proper mounting screws as covered in 4.44.

4.43 Replacing Loose Rivets: Where a rivet used to secure a spring is loose, remove it with the P-long-nose pliers and substitute a screw as covered in 4.45.

4.44 Replacing Defective Springs: Where a spring is to be replaced and the rivets are loose, remove the rivets as covered in 4.43. If the rivets are tight, carefully drill out the turned-over portion of the rivet, using a 3/32" drill. With the rivets removed, proceed as covered in 4.45.

4.45 Where a rivet hole is countersunk, replace the rivet by a P-162129 F.H.M. screw, and where the hole is counterbored, replace the rivet by a P-180697 B.H.M. screw. In both cases, insert the screw into the hole from the face of the frame. Where a spring was removed, remount the spring, if satisfactory, or mount a new spring, if necessary, over the screw with the closed loop in the spring against the rear of the frame. Place a P-298849 hexagonal nut on the screw and tighten the screw so that the nut holds the spring securely against the fastener. Where both rivets are replaced, repeat for the other end of the spring.

D. On Cover of Unit

4.46 Place the unit on a bench, taking care that it is supported.

4.47 Remove the cover from the unit by turning the fastener stud 90 degrees counterclockwise, using the 4" regular screwdriver, and remove the cover.

4.48 Remove the repeater unit assembly screw, using the 4" regular screwdriver. Separate the unit into its three component parts.

4.49 Remove the shield separating the sub-assemblies and mount it securely in a vise.

4.50 Using the R-1640 center punch, carefully center punch the heads of both rivets that secure the spring.

4.51 Then, using a 3/32" drill, carefully drill out the rivet heads.

4.52 Remove the springs, rivets, and associated washers, taking care not to lose the washers.

4.53 Insert a P-180697 B.H.M. screw into one of the holes and mount the washer that was removed and then a new DZUS SD3-175 spring over the screw with the closed loop in the spring against the shield. Place a P-298849 hexagonal nut on the screw and tighten it so that the nut holds the spring securely against the washer, using the 3" cabinet screwdriver. Repeat for the other end of the spring.

4.54 Assemble the component parts and insert and securely tighten the repeater unit assembly screws.

4.55 Remount the cover. Turn the fastener stud 90 degrees in a clockwise direction so that the stud engages the spring. Take care in doing this not to turn the stud beyond its locked position or the spring may be overstressed.

GROUP UNIT FASTENER SPRINGS AND RIVETS

A. General

4.56 Make-busy Information: Before removing any unit or cover from the equipment, make the unit busy in accordance with approved procedures. After completing the work, restore the unit to service.

4.57 Removal of Fuses: Before starting to make any replacement of parts, remove all terminal mounting distribution fuses associated with the equipment on which the work is to be done. After completing the work, remount the fuses.

4.58 Removal and Remounting of Group Units: Remove the group units as required by turning the fastener studs, securing each unit 90 degrees counterclockwise, using the 4" regular screwdriver, and pull the unit straight out. After making the necessary replacement of parts, remount the units that were removed. Take care in doing this that the plug fully engages the associated jack. Turn the fastener studs 90 degrees clockwise so that they engage their associated springs. Take care in doing this not to turn the fastener studs beyond their locked positions or the springs may be overstressed.

B. On Terminal Mounting Framework

4.59 Where a rivet is loose, replace only the loose rivet by the proper mounting screw as covered in 4.60 unless the associated spring is deformed or broken. Where the spring is deformed or broken, replace both rivets by proper mounting screws as covered in 4.61.

4.60 Replacing Loose Rivets: Where a rivet used to secure a spring is loose, remove it with the P-long-nose pliers and substitute a screw as covered in 4.62.

4.61 Replacing Defective Springs: Where a spring is to be replaced and the rivets are loose, remove the rivets as covered in 4.60. If the rivets are tight, carefully drill out the turned-over portion of the rivet, using a 3/32" drill. With the rivets removed, proceed as covered in 4.62.

4.62 Where a rivet hole is countersunk, replace the rivet by a P-162129 F.H.M. screw, and where the hole is counterbored, replace the rivet by a P-180697 B.H.M. screw. In both cases, insert the screw into the hole from the face of the frame. Where a spring was removed, remount the spring, if satisfactory, or mount a new spring, if necessary, over the screw with the closed loop in the spring against the rear of the frame. Place a P-298849 hexagonal nut on the screw and tighten the screw so that the nut holds the spring securely against the fastener. Where both rivets are replaced, repeat for the other end of the spring.

C. On Cover of Group Unit

4.63 Remove the cover from the unit by turning the fastener stud 90 degrees counterclockwise, using the 4" regular screwdriver, and remove the cover.

4.64 Where a rivet is loose, replace only the loose rivet by the proper mounting screw as covered in 4.65 unless the associated spring is deformed or broken. Where the spring is deformed or broken, replace both rivets by mounting screws as covered in 4.66.

4.65 Replacing Loose Rivets: Where a rivet used to secure the spring is loose, remove it with the P-long-nose pliers and substitute a screw as covered in 4.67.

4.66 Replacing Defective Springs: Where a spring is to be replaced and the rivets are loose, remove the rivets as covered in 4.65. If the rivets are tight, carefully drill out the turned-over portion of the rivet, using a 3/32" drill. With the rivets removed, proceed as covered in 4.67.

4.67 Insert a P-162129 F.H.M. screw into one of the holes from the face of the frame. Where a spring was removed, remount the spring, if satisfactory, or mount a new spring, if necessary, over the screw with the closed loop in the spring against the frame. Place a P-298849 hexagonal nut on the screw and tighten it so that the nut holds the spring securely against the frame, using the 3" cabinet screwdriver. Where both rivets are replaced, repeat for the other end of the spring.

4.68 Remount the cover. Turn the fastener stud 90 degrees in a clockwise direction so that the stud engages the spring. Take care in doing this not to turn the stud beyond its locked position or the spring may be overstressed.

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5. PROCEDURES FOR REPLACING DZUS FASTENER STUDS

Stud Mounted on Unit

- 5.01 To replace a Dzus fastener stud, remove the associated plug-in unit as described in Part 4.
- 5.02 Remove the retaining ring that holds the stud in place, using the P-long-nose pliers.
- 5.03 Remove and discard the stud. Substitute a new stud and mount it in place.
- 5.04 Insert the plug of the DZUS FRST 4 tool into the stud. Place the XSC-115 retaining ring over the plug as shown in Fig. 7.
- 5.05 Brace the slotted head of the stud against a firm support and push the FRST 4 tool over the plug until the ring is forced onto the stud. In doing this, first align the split in the ring with the uncut portion of the stud. See dotted line.
- 5.06 Remount the associated plug-in unit as covered in Part 4 and restore it to service.

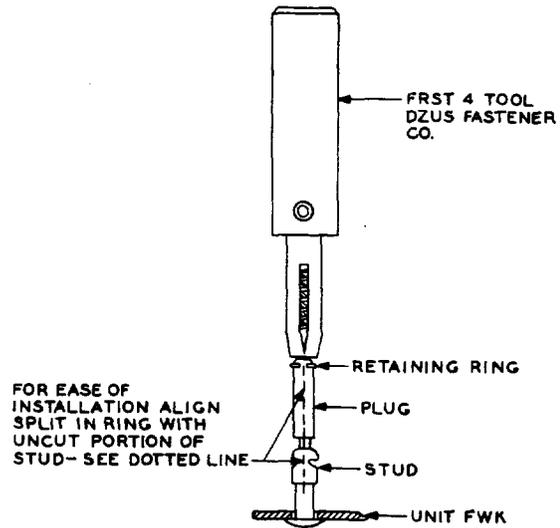


Fig. 7 - Method of Mounting Stud

Stud Mounted on Cover

- 5.07 If it is necessary to replace a Dzus fastener stud mounted on a cover, replace the cover since the stud cannot be removed.