the uninsured
RELATIVE WORKSHOP inc
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PSB#091098
Amp Fitting (with grommet) on Breakaway Housing
September 10, 1998

Status: "Amp Fittings" improperly swaged to the end of the stainless steel breakaway housings. The Amp fitting could twist off or fall off.

Identification: All Relative Workshop Vector Systems manufactured after January 1, 1996. Any Harness/ container system which utilizes Relative Workshop or ParaStock Metal-Flex breakaway housings which were shipped with Amp Fittings attached after January 1, 1996,

Background: In mid 1997, a worker at Relative Workshop decided to "improve" the way he was swaging the Amp Fittings on the end of the breakaway housings. Instead of correctly using a complete single or double stroke with the NICOPRESS swaging tool, he thought a series of partial strokes, applied in a rotary fashion, looked better. This "improvement" made it through quality control because his handiwork was covered by the standard black shrink tubing, and 99% of the Amp Fittings swaged on by this method pass a straight pull test of 50 lbs. HOWEVER, a large number can be twisted off with finger pressure applied in a certain direction. Because an Amp Fitting coming off in use could cause an unintentional breakaway, fittings attached in this fashion must be identified and re-swaged. While the fix is rather simple and straightforward, The Relative Workshop is sorry for any inconvenience it will cause owners of Vector Systems. Please note we are also including systems produced in 1996 to be sure we locate all affected components.

Tools Required:
1) Dial or digital caliper in inches or millimeters.
2) NICOPRESS TOOL- 64-CGMP or 51-P; or SWAGE-IT TOOL - P-26-0204
Service Bulletin: Inspect the "Amp Fitting" in the following manner:
1) Remove the heat-shrink tubing surrounding the Amp Fitting and housing.
2) Refer to the diagram on Page 2, figures 1 & 2. Determine if your Amp Fitting's swaged indentation resembles these correct diagrams. If so, doub e check by measuring the indentation diameter per figure 2. The correct dimension is 0.40 inches, +/-0.02 inches. (Refer to Page 2 for metric equivalents)
3) If your Amp Fitting resembles the incorrect version, as in Figure 3 & 4, then the Amp Fitting will have to be swaged again using the following procedure.

Note: If the Amp Fitting is completely removed from the housing, it cannot be properly mated with the housing again. A new Amp Fitting and housingmust be used.

Note: As you gain experience inspecting Amp Fittings, you will be able to differentiate a correct swage versus one that is incorrect by looking at the shape and depth of the indentation without removing the shrink tubing.

Swaging Procedure:
1) Using the NICOPRESS TOOL (64-CGMP or 51-P), place the Amp Fitting into the P-groove: or using the SWAGE-IT TOOL, place Amp Fitting into the 1/8 groove.
2) Be sure only 1/16" of the fitting's round end extends beyond the P-groove or 1/8 groove. The fitting must be oriented in the NICOPRESS TOOL as shown in Figure 6 to prevent the Amp Fitting's seam from breaking open.
3) Compress the fitting by closing the NICOPRESS TOOL. One strike is all that is needed with a properly calibrated NICOPRESS TOOL. TheSWAGE-IT TOOL however, should not be closed completely, as this may over swage the AMP Fitting and crush the housing. The housing's ferrule-end should not be incorporated into the swage indentation, otherwise the housing and ferrule may be crushed.
4) Referring to Figure 2, measure the swaged indentation with a set of calipers. The correct dimension is 0.40 inches, +/-0.02 inches.

Product Service Bulletin

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PSB# 091098-B

Amp Fitting (with grommet) on Breakaway Housings

CORRECT

(Fig. 1 & 2)

Correctly Swaged Amp Fitting Has Two, Semicircular Indentations Indicating Full Compression in Nicopress Tool

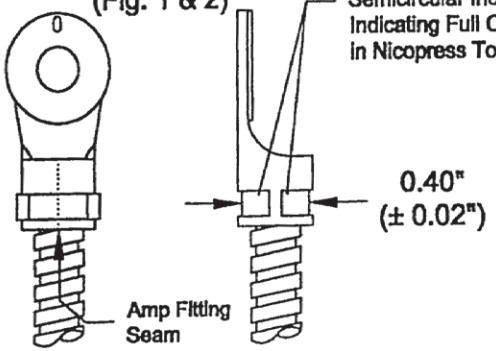

Fig. 1 Fig. 2

INCORRECT

(Fig. 3 & 4)

Incorrectly Swaged Amp Fitting Has Numerous, Small Indentations Around Circumference of Fitting

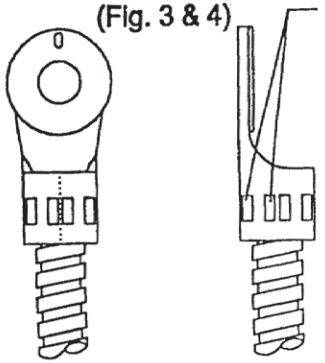

Fig. 3 Fig. 4

Metric Equivalents

0.40" (± 0.02") = 10.2 mm (± 0.5 mm)
0.375" (± 0.025") = 9.525 mm (± 0.635 mm)
1/16" (0.0625") = 1.588 mm

Note: Nicopress Tool has an Allen Head Adjustment Screw which can be tightened or loosened to achieve the correct P-groove dimension shown below.

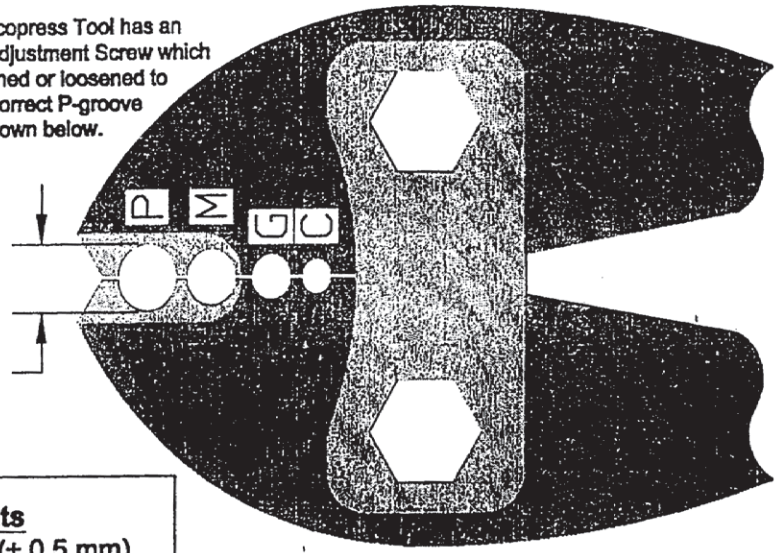

Fig. 5

Nicopress Tool (64-CGMP)
Side View

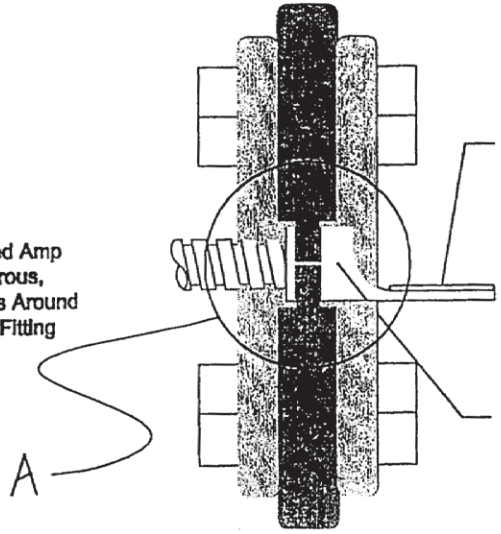

Fig. 6

Nicopress Tool - Front View
Swaging Amp Fitting

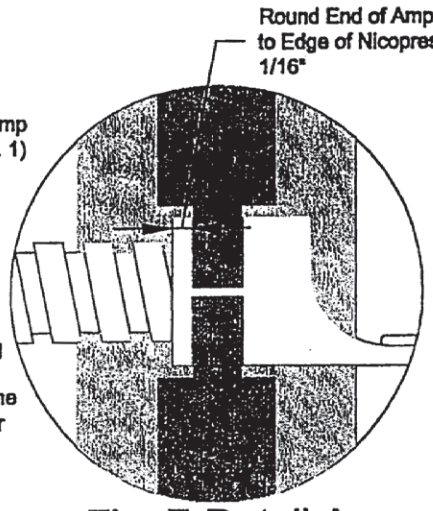

Fig. 7-Detail A

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5) Install the breakaway handle. Be sure the yellow cable's movement is not impeded by the end of the housing with the Amp Fitting.
6) Install new shrink tubing, 1/2" diameter - 1" long. Heat the shrink tubing with a heat gun or a cigarette lighter. Shrink tubing available free from Relative Workshop.

Qualified Personnel: A certificated rigger may inspect and re-swage Amp Fittings using the proper NICOPRESS TOOL or SWAGE-IT TOG:. Document work performed with the data card entry: "Conforms to PSBn091098"

Compliance Date: Immediately, before the next jump.

Authority: Relative Workshop, DeLand, Florida, USA

Distribution: Parachutist, PIA, Skydiving, USPA, FAA, Relative Workshop Web-Page.

Frequently Asked Questions

Q: I have been trying to locate a swage tool, but have had no luck. Where can I find one?

A: Before you go and purchase a swag tool, you may be able to borrow one from a local airplane mechanic, marina or hardware store. They usually have this tool on hand. If you have to purchase a swage tool, the Swage-It should cost around $22 and can be purchased from VER Sales, ask for product number P-26-0204. The Nicopress Tool, 64-CGMP, should cost around $125. They also have a single slot Nicopress Tool, 51-P, which is a slightly less expensive alternative to the 64-CGMP. VER Sales can be reached at 800-229-0518 from inside the US or 818-567-3000 anywhere else. Their fax number is 818-567-3018. These tools can also be found on the VER Sales website or individually at the following: 64-CGMP 51-P Swage-It

Q: Is there anything I can do to prevent crushing the end of the housing while swaging?

A: You can insert a tapered awl or mandrill of a similar diameter (5/32" - 11/64" or 4mm - 4.5mm) into the end of the housing which will support the housing and ferrule. Some Philips screwdrivers with round shanks or drill bits will also work. But, if you follow the instructions in the service bulletin and apply the swage 1 /16" from the round end, you won't have this problem.

Q: I just inspected an AMP Fitting that did not resemble either the correct or incorrect drawings in your notice. What's up with that?

A: At one point, a double swage was approved and used in the production of this component. The purpose was to minimize the size of the protrusions (for cosmetic reasons) on each side of the AMP Fitting. The swaged indentation of the last swage is very noticeable and measurable with calipers. A noticeable circumferential indentation is generally an indication of a good swage, but check it with calipers to be sure.

Q: When 1 look at the drawing of the Nicopress P-groove dimension, 1 read the number.375". When 1 look at the dimension for the swage, I read .40". Why the discrepancy?

A: The Nicopress Tool actually gives a little during the compression of the Amp Fitting. Our studies show if the tool is set at .375", the resulting swage Is .40".

Q: I've inspected good swaging on older Vectors. When 1 put a caliper on them, the swaged diameter is often smaller than the specs called for in your service bulletin. Why is that?

A: Over-swaging is an important consideration. We thought it best to limit the low-end dimensions to reduce the chance of crushing the housing by riggers in the field.

Q: What other rig manufacturers are affected by this PSB?

A: If other systems are affected by this situation, the manufacturer will contact you directly. Fortunately for them, our material stocking company, ParaStock, only sells breakaway housings without the AMP Fittings attached. We have sold about twenty complete housing sets to riggers doing repairs in the field, which were predominantly for Vectors. However, it is possible that a faulty housing was installed on a system that previously had "soft breakaway housings." Or installed on an older Vector that may not be covered in this PSB.

Q: I have an older Vector !1 made in 1992. Could I be affected by this PSB?

A: If you suspect that your original breakaway housings were changed out between 1996-98, then you should be suspicious. The inspection is so easy to do, a qualified rigger understanding this PSB could tell in about 3 seconds. When in doubt, check it out! Q: Can I pull test an AMP Fitting?

A: No, an attempt to twist off or pull test the AMP fitting will most likely result in destroying the housing. Visually check the AMP fitting as stated in the Product Service Bulletin.

Q: I just received my new rig and the date of manufacture is September 10, 1998. Does the Product Service Bulletin apply to me?

A: No, all rigs with a date of manufacture September 10, 1998 or later are not affected by this Product Service Bulletin.

AMP FITTING INFORMATION 9/28/98

* Swage-It Tools are in stock, cost is $20, no discounts apply. Include a free hand-full of (cut) shrink tubing with the tool.

* If the customer seeks the PSB information, we can Fax, Email , Post , it's also on our Web-Site: www.relativeworkshop.com

* If they want to order tools, the web has a link. Just click on it. * Always send the FAQ page with PSB.

* Do Not close the Swage-It Tool completely. This may crush the housing. * Use calipers to determine proper swaging depth.

* When possible, use an awl or mandrill to prevent crushed housings. * We do replace crushed housings for free in most cases.

* Anyone complaining of the cost to fix their rig, or a dealer doing it free, hoping to get compensation from RWS. Those folks need to talk to TK. * Find TK for any other situation that may arise.