# ROUTINE

**DEPARTMENT OF THE ARMY TECHNICAL BULLETIN**

## VERTICAL STABILIZER WORKING RIVETS ON AH-64A HELICOPTERS

**Headquarters, Department of the Army, Washington, D.C.**

**15 December 1998**



**NOTE**

**THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.**

**1. Priority Classification. ROUTINE.**

a. Aircraft in Use. Routine. Upon receipt of this Technical Bulletin (TB) the condition status of all affected aircraft is not changed. This TB is to be taken as information only.

b. Aircraft in Depot Maintenance. Same as paragraph 1.a.

c. Aircraft Undergoing Maintenance. Same as paragraph 1.a.

d. Aircraft in Transit. Same as paragraph 1.a.

e. Maintenance Trainers (Category A, B). Same as paragraph 1.a.

f. Spares. N/A.

**2. Task/Inspection Suspense Date.** N/A.

**3. Reporting Compliance Suspense Date**. N/A.

**4. Summary of Problem.**

a. Reports of loose or working Vertical Stabilizer Rivets replaced on fielded AH-64A Helicopters, indicate the need for improved rivets, fastener installation, and inspection criteria.

b. The purpose of this TB is to provide improved inspection criteria and fastener installation procedures for loose or working rivets.

**5. End Items to be inspected.**

a. All AH-64A aircraft, serial numbers 82-23355 and subsequent.

b. Maintenance trainers (category A and B), same as paragraph 5.a.

**6. Assembly Components to be Inspected.**

| *NOMENCLATURE* | *PART NUMBER* | *NATIONAL STOCK NUMBER* |
|---|---|---|
| Spar Box Assembly<br>Vertical Stabilizer | 7-311122601-33 | 1560-01-428-6825 |

**7. Parts to be Inspected.**

| *NOMENCLATURE* | *PART NUMBER* | *NATIONAL STOCK NUMBER* |
|---|---|---|
| Skin, R/H | 7-311122601-4 | 1560-01-288-5620 |
| Skin, L/H | 7-311122601-5 | |

**8. Inspection Procedures.**

a. This procedure requires visually inspecting the Vertical Stabilizer for fretting corrosion (black residue) around the circumference of the Rivet Heads. If black residue is evident perform the following inspection procedure.

**CAUTION**

**Do not use strong solvents (MEK, Trichloroethane, etc.) to clean the stabilizer for this Inspection. Do not forcefully scrub surfaces to be inspected. Protect nearby wiring and exposed parts from splashing or spillage of detergents. Failure to properly clean the inspection surface may result in mis-interpreting soil and soot stains as indications of working rivets.**

b. Clean the vertical stabilizer spar box using washing compound (P-D-410) and aircraft sponges (L-S-626). Rinse the area immediately. The inspection area must be free of all oil and engine exhaust residue.

c. Visually inspect the cleaned area using a 5X (5 power or equivalent) magnifying glass (GG-M-95). Check for black residue around the perimeter of the rivet head(s). If residue is present, perform the rework procedure in paragraph 9.

d. Check suspect rivets for looseness. Use care not to damage rivet heads. If rivets can be rotted by hand, perform the rework procedure in paragraph 9.

e. If no evidence of black residue, rivet rotation or looseness is found, this completes the inspection procedure. No further action is required.

**9. Rework Procedures.**

**CAUTION**

**Rivet replacement shall be accomplished one bay length (rib to rib) per Spar at a time. Exercise extra care during rivet removal not to enlarge the rivet holes. Use temporary fasteners (Cleco fasteners or equivalent) in the surrounding rivet holes, while performing the riveting operation. It is not necessary to retrieve the rivet shop heads from inside the airframe structure.**

a. Remove the suspect rivet(s) lAW, TM 1-1500-204-23-10. Ref. Figure No. 1 for Rivet Removal.

b. Inspect each hole for elongation or damage lAW, TM 1-1500-204-23-10.

c. If the rivet hole(s) are undamaged and concentric, install new rivets as listed below. If the holes are damaged refer to step c.4 of this TB for further instructions.

(1) Clean the hole of oil, debris and burrs.

(2) Inspect each hole for diameter limits per Table no. 1.

**NOTE**

**The standard Gage Rivet Selector (3P5 or equivalent) may be used to determine the grip for the CR6253 rivet.**

(3) Inspect holes for a proper rivet grip length in the clamped-up condition.

**NOTE**

**The rivet called out in Table no. I. are the preferred rivets to use in this procedure. If any of the hole diameters is larger than the ranges of the hole limits described in this table, the holes must be oversized and fasteners installed per Table no. II. If any of the hole diameters a larger than the ranges of the hole limits described in Table no. II, contact technical POC, para 17.**

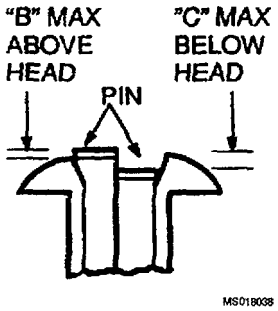
(4) Select the proper diameter, grip length and type of rivet, reference Table I and II. If any of the hole diameters are between the ranges of the hole limits described in Table I and II or if a hole is elongated or damaged, ream and install the next-size-larger rivet(s). If using the Visu-Lok blind fasteners PLT251-5, proceed to paragraph 10 of this procedure.

**CAUTION**

**Do not shave the rivet stem(s) after installation.**

(5) Install the rivets wet with primer (MIL-S-81733), IAW TM 1-1500-204-23-10.

(6) Inspect the installed rivet IAW the installation below. Remove any rivets exceeding this inspection criteria IAW TM 1-1500-204-23.




| Rivet | B Max | C Max |
|---|---|---|
| NAS1398-CW5A(*) | .020 | .010 |
| NAS1398-CW6A(*) | .020 | .010 |
| CR6253-5-(*) | .010 | .020 |

(7) Replace any removed rivets IAW paragraph 9.c. of this TB.

(8) Touch-up rivets and exposed surfaces with primer (MIL-P-23377) and paint (MIL-C-46168), IAW TM 55-1500-345-23.

**10. Visu-Lok\Jo-Bolt Installation Procedure.**

a. This procedure is only to be used in conjunction with the Visu-Lok fastener, PLT251-5.

**CAUTION**

**Visu-Lok blind fasteners are made from hard tool steel. Visu-Loks require the use of special tools for installation and removal (reference paragraph no. 12). Failure to use this tooling, or its improper use, may result in damage to airframe.**

**NOTE**

**In this application, the Visu-Lok fastener are to be installed into interference fit holes. The fastener shall not be turned during the installation.**

b. PLT251-5 fastener require a hole dimension of .1775/.1755 (interference fit).

**NOTE**

**Install the fastener(s) while the primer is in a wet condition. Avoid contaminating the driving head of the fastener with primer, prior to driving the fastener c. Insert the fastener, wet with primer (MIL-P-23377) into the prepared hole. Ensure the full seating of the head before driving the fastener. The fastener may be installed into the hole by one of the methods listed below. Avoid damage to the drive screw or core bolt during seating of the fastener head.**

(1) Tapping the head with a nonmetallic-faced tool.

(2) Tapping the head with a nonmetallic block placed between the tool and the fastener head.

(3) Driving the fastener with a light rivet gun using a flush-type rivet to seat the fastener.

d. Setup the specified Visu-Lok installation tooling (non-powered or powered). Insert the nose adapter to engage the fastener body with the wrench adapter engaging the slabbed portion of the driving screw.

e. Drive the fastener (the screw is wrenched while the hexagon nut is held). The driving screw (core bolt) will snap off when the fastener is fully driven.

f. Inspect the hexagon head(s) of the installed fasteners lAW the following inspection criteria.

(1) The head of the fastener(s) shall be seated (flush) at least 75 percent around the periphery. The remaining gap (if any) shall be no lager than 0.002 inch (0.05mm).

(2) A 0.002 inch feeler gauge must not be able to touch the shank of the fastener.

g. Replace any discrepant bind fasteners by holding the nut with the nose adapter and drilling through the fastener with a number 42 (0.094) drill bit. The PLT254-6 Visu-Loks require a number 35 (0.110) drill bit for removal. Install a replacement fastener IAW paragraph 9.c of this TB.

h. Touch-up the installed fasteners and exposed surfaces with primer (MIL-P-23377) and paint (MIL-C-46168), IAW TM 55-1500-345-23.

**11. Supply/Parts and Disposition:**

a. Expendable supplies required for inspection/rework.

| Nomenclature | Part Number | NSN |
|---|---|---|
| Paint, Polyurethane Coating | MIL-C-46168 | 8010-01-141-2420 |
| Primer Epoxy Coating Kit | MIL-P-23377 | 8010-00-082-2450 |
| Sealing Compound | MILS-81733 | 8030-00-871-8489 |
| Sponge | A-A-2073 | 7920-00-633-9915 |
| Dishwashing Compound, Hand | P-D-410 | 7930-00-880-4454 |

b. Parts which may be required for replacement of defective items as required.

| *NOMENCLATURE* | *PART NUMBER* | *NATIONAL STOCK NUMBER* |
|---|---|---|
| Rivet, Blind | NAS1398CW541 | TBD |
| Rivet, Blind | NAS1398CW5A2 | 5320-01-454-6847 |
| Rivet, Blind | NAS1398CW5A3 | 5320-01-332-2211 |
| Rivet, Blind | NAS1398CW5A4 | 5320-01-332-2212 |
| Rivet, Blind | NAS1398CW5A5 | 5320-01-333-6033 |
| Rivet, Blind | NAS1398CW5A6 | 5320-01-332-2213 |
| Rivet, Blind | NAS1398CW5A7 | 5320-01-332-2214 |
| Rivet, Blind | NAS1398CW5A8 | 5320-01-332-2215 |
| Rivet, Blind | NAS1398CW5A9 | 5320-01-332-8426 |
| Rivet, Blind | NAS1398CW5A10 | 5320-01-332-2216 |
| Rivet, Blind | CR-2663CW5A11 | 5320-01-454-7595 |
| Rivet, Blind | NAS1398CW6A1 | TBD |
| Rivet, Blind | NAS1398CW6A2 | 5320-01-454-6851 |
| Rivet, Blind | NAS1398CW6A3 | 5320-01-333-9940 |
| Rivet, Blind | NAS1398CW6A4 | 5320-01-333-9941 |
| Rivet, Blind | NAS1398CW6A5 | 5320-01-332-1518 |

| *NOMENCLATURE* | *PART NUMBER* | *NATIONAL STOCK NUMBER* |
|---|---|---|
| Rivet, Blind | NAS1398CW6A6 | 5320-01-340-5713 |
| Rivet, Blind | NAS1398CW6A7 | 5320-01-332-8025 |
| Rivet, Blind | NAS1398CW6A8 | 5320-01-332-1519 |
| Rivet, Blind | NAS1398CW6A9 | 5320-01-332-8026 |
| Rivet, Blind | NAS1398CW6A10 | 5320-01-332-2217 |
| Rivet, Blind | NAS1398CW6A11 | 5320-01-454-6855 |
| Rivet, Blind | NAS1398CW6A12 | TBD |
| Rivet, Blind | CR6253-5-01 | TBD |
| Rivet, Blind | CR6253-5-02 | 5320-01-454-7578 |
| Rivet, Blind | CR6253-5-03 | 5320-01-454-7581 |
| Rivet, Blind | CR6253-5-04 | 5320-01-454-7582 |
| Rivet, Blind | CR6253-5-05 | 5320-01-454-7584 |
| Rivet, Blind | CR6253-5-06 | 5320-01-454-7587 |
| Rivet, Blind | CR6253-5-07 | 5320-01-454-7588 |
| Rivet, Blind | CR6253-5-08 | 5320-01-454-7590 |
| Rivet, Blind | CR6253-5-09 | 5320-01-454-7592 |
| Rivet, Blind | CR6253-5-10 | TBD |
| Fastener, Blind | PLT251-5-1 | TBD |
| Fastener, Blind | PLT251-5-2 | 5320-01-016-5565 |
| Fastener, Blind | PLT251 -5-3 | 5320-01-012-9826 |
| Fastener, Blind | PLT251-5-4 | 5320-01-012-9827 |
| Fastener, Blind | PLT251-5-5 | 5320-01-390-1660 |
| Fastener, Blind | PLT251-5-6 | 5320-01-013-9687 |
| Fastener, Blind | PLT251-5-7 | 5320-01-452-9469 |
| Fastener, Blind | PLT251-5-8 | 5320-01-452-9466 |
| Fastener, Blind | PLT251-5-9 | 5320-01-452-9465 |
| Fastener, Blind | PLT251-5-10 | TBD |
| Fastener, Blind | PLT251-5-11 | TBD |

Reference Table No. III for list of possible vendors for CR6253-5 and PLT251-5 fasteners. Reference Figure No. II for a suggested purchase list of fasteners. The list is based on fastener quantities in the area where working rivets are generally found. Actual quantities of each fastener may vary.

**12. Special Tools, Jigs and Fixtures Required:**

a. Standard tools:

| Nomenclature | Part Number | NSN |
|---|---|---|
| Forceps, Sheet Holder | A-A-3087 (Cleco) | 5120-00-221-1597 |
| Gage, Stem Breakoff (or equivalent) | 3P5 | 5220-00-243-7750 |
| Holder, Sheet Metal, 1/8" hole | GGG-H-575 (Cleco) | 5120-00-541-1808 |
| Holder, Sheet Metal, 1/16" hole | GGG-H-575 (Cleco) | 5120-00-242-3791 |
| Magnifying Glass | 10539027 | 6650-00-958-7408 |
| Visu-Lok Stem Break gage | 3P5(PLT251-5-#) | 5220-00-243-7750 |

b. Powered Visu-Lok Installation Tools: A complete tool consists of pneumatic drive one wrench adapter, and one nose adapter ether powered or non-powered.

| Nomenclature | Part Number | NSN |
|---|---|---|
| Pneumatic Adapter Wrench | TD1651 | 5130-00-967-9689 |
| Pneumatic Adapter Wrench | TD2001 | 5130-00-967-9690 |
| Pneumatic Driver (Jo-Bot) | 450MTD | 5130-00-964-9444 |
| Pneumatic Nose Adapter | PW3652 | 5130-00-421-8677 |

c. Non-powered Visu-Lok Installation Tools:

| Nomenclature | Part Number | NSN |
|---|---|---|
| Driver Assembly | HW200 | 5120-00-247-0525 |
| Adapter Wrench | 914 | 5120-00-613-7446 |
| Nose Adapter | 22162 | 5120-00-605-9428 |
| Nose Adapter | 21152 | 5120-00-613-7441 |

d. Powered Cherry Max Installation Tools: A complete tool consists a driver and a pulling head, either powered or non-powered.

| Nomenclature | Part Number | NSN |
|---|---|---|
| Pneumatic Riveter | G-704B | 5130-01-393-1584 |
| Pulling Head, Riveter | H701 B-456 | 5130-01-393-2927 |
| Pulling Head, Riveter | H955-5 | 5130-01-411-2600 |
| Puling Head, Riveter | H955-6 | 5130-01-411-2603 |

e. Non-Powered Cherry Max Installation Tools:

| Nomenclature | Part Number | NSN |
|---|---|---|
| Hand Riveter | C6000-10-32 | 5120-00-224-9296 |
| Pulling Head, Riveter | H749A-456 | 5130-01-104-5370 |

**13. Application.**

a. Category o Maintenance. AVIM. Aircraft downtime will be charged to AVIM.

b. Time Required.

(1) Total of 1.0 manhour using 1 person to inspect.

(2) Total of 6.0 hours downtime per end tem to rework.

c. TB/MWOs to be Applied Prior to or Concurrently with this Inspection. N/A.

d. Publications which will require change as a result of this TB. TM 1-1520-238-23, TM 1-1520-238-23P and TM 1-1500-204-23 shall be changed to reflect this TB. A copy of this TB shall be inserted in the appropriate TM as authority to implement the change until the printed change is received.

**14. References.**

a. TM 1-1520-238-23, Aviation Unit and Intermediate Maintenance Manual for Army AH-64A helicopter, basic dated 16 May 1994.

b. TM 1-1520-238-23P, Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List for Army AH-64A helicopter, basic dated 28 May 1996.

c. TM 1-1520-238-PM, Phase Maintenance Inspection Checklist for Army AH-64A helicopter, basic dated 30 June 1994.

d. TM 1-1500-204-23-Series, Aviation Unit Maintenance and Aviation Intermediate Maintenance, General Aircraft Maintenance 31 July 1992, including all changes.

e. TM 55-1500-345-23, Painting and Marking of Army Aircraft, 12 June 1986.

**15. Recording and Reporting Requirements.**

a. Task/inspection Reporting Suspense Date (Aircraft). N/A

b. Reporting Compliance suspense Date (Spares). N/A

c. Task/Inspection Reporting Suspense Date (Spares). N/A

d. The following forms are applicable and are to be completed in accordance with DA PAM 738-751, 15 June 1992.

(1) DA Form 2408-13, Aircraft Status Information Record.

(2) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.

(3) DA Form 2408-13-2, Related Maintenance Actions Record.

(4) DA Form 2408-15, Historical Record for Aircraft.

(5) DA Form 173/3, Category 1 QDR.

**16. Weight and Balance.** N/A

**17. Points of Contact.**

a. Technical point of contact for this TB is Mr. Kenneth Muzzo, AMSAM-AR-EI-P-A, DSN 897-4812 or commercial (256) 313-4812. Email is muzzo-kw@avrdecr.redstone.army.mil. Datafax is DSN 897-4923 or commercial (256) 313-4923.

b. Logistical point of contact for this TB is Mr. John Patton, SFAE-AV-AAH, DSN 897-4244 or commercial (256) 313-4244, Email is pattonj@peoavn.redstone.army.mil. Datafax is DSN 897-4343 or commercial (256) 313-4343.

c. Forms and records point of contact for this TB is Ms. Ann Waldeck, AMSAM-MMC-RE-FF, DSN 746-5564 or commercial (256) 876-5564, datafax is DSN 746-4904 or commercial (256) 876-9404. Email is waldeck-ab@redstone.army.mil.

d. Safety point of contact for this TB is Mr. Howard Chilton, AMSAM-SF-A, DSN 746-7271 or commercial (256) 876-7271. Datafax is (256) 313-2111. Email is chilton-hl@redstone.army.mil.

e. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should contact CW5 Joseph L. Witstrom, security assistance management, AMSAM-SA, DSN 897-0681 or commercial (256) 313-0681. Email is wittstromj@redstone.army.mil or Mr. Ronnie W. Sammons, AMSAM-SA-CS-NF, DSN 897-0869 or commercial (256) 313-0869. Datafax is DSN 897-0411 or (256) 313-0411. Email is sammons-rw@redstone.army.mil. Huntsville, Al is gmt minus 6 hours.

f. After hours contact AMCOM Command Operations Center (COC) DSN 897-2066/2067 or commercial (256) 313-2066/2067.

**18. Reporting of Errors and Recommending Improvements.** You can help improve this TB. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP Redstone Arsenal, AL 35898-5230. A reply will be furnished to you.

*Table I*

| RIGHT HAND SIDE | | | LEFT HAND SIDE | | |
|---|---|---|---|---|---|
| **RIVET** | **HOLE DIA** | **GRIP RANGE** | **RIVET** | **HOLE DIA** | **GRIP RANGE** |
| CR6253-5-1 | .176/.180 | .031/.062 | NAS1398-CW5A1 | .160/.164 | .031/.062 |
| CR6253-5-2 | .176/.180 | .063/.125 | NAS1398-CW5A2 | .160/.164 | .063/.125 |
| CR6253-5-3 | .176/.180 | .126/.187 | NAS1398-CW5A3 | .160/.164 | .126/.187 |
| CR6253-5-4 | .176/.180 | .188/.250 | NAS1398-CW5A4 | .160/.164 | .188/.250 |
| CR6253-5-5 | .176/.180 | .251/.312 | NAS1398-CW5A5 | .160/.164 | .251/.312 |
| CR6253-5-6 | .176/.180 | .313/.375 | NAS1398-CW5A6 | .160/.164 | .313/.375 |
| CR6253-5-7 | .176/ 180 | .376/.437 | NAS1398-CW5A7 | .160/.164 | .376/.437 |
| CR6253-5-8 | .176/.180 | .438/.500 | NAS1398-CW5A8 | .160/.164 | .438/.500 |
| CR6253-5-9 | .176/.180 | .501/.562 | NAS1398-CW5A9 | .160/.164 | .501/.562 |
| CR6253-5-10 | .176/.180 | .563/.625 | NAS1398-CW5A10 | .160/.164 | .563/.625 |
| | | | CR 2633-CW5A11 | .160/.164 | .626/.687 |

*Table II*

| RIGHT HAND SIDE | | | LEFT HAND SIDE | | |
|---|---|---|---|---|---|
| **RIVET** | **HOLE DIA** | **GRIP RANGE** | **RIVET** | **HOLE DIA** | **GRIP RANGE** |
| NAS1398-CW6A1 | .192/.196 | .031/.062 | PLT251-5-1 | .1755/.1775 | .031/.093 |
| NAS1398-CW6A2 | .192/.196 | .063/.125 | PLT251-5-2 | .1755/.1775 | .094/.156 |
| NAS1398-CW6A3 | .192/.196 | .126/.187 | PLT251-5-3 | .1755/.1775 | .157/.219 |
| NAS1398-CW6A4 | .192/.196 | .188/.250 | PLT251-5-4 | .1755/.1775 | .220/.281 |
| NAS1398-CW6A5 | .192/.196 | .251/.312 | PLT251-5-5 | .1755/.1775 | .282/.344 |
| NAS1398-CW6A6 | .192/.196 | .313/.375 | PLT251-5-6 | .1755/.1775 | .345/.406 |
| NAS1398-CW6A7 | .192/.196 | .376/.437 | PLT251-5-7 | .1755/.1775 | .407/.469 |
| NAS1398-CW6A8 | .192/.196 | .438/.500 | PLT251-5-8 | .1755/.1775 | .470/.531 |
| NAS1398-CW6A9 | .192/.196 | .501/.562 | PLT251-5-9 | .1755/.1775 | .532/.594 |
| NAS1398-CW6A10 | .192/.196 | .563/.625 | PLT251-5-10 | .1755/.1775 | .595/.656 |
| NAS1398-CW6A11 | .192/.196 | .626/.687 | PLT251-5-11 | .1755/.1775 | .657/.719 |
| NAS1398-CW6A12 | .192/.196 | .688/.750 | | | |

*Table III*

| **Fastener Vendors** | | | |
|---|---|---|---|
| **M & M aerospace - FL**<br>**PO Box 025263**<br>**Miami FL 33102**<br>**Tel: 305-592-5155**<br>**Fax: 305-591-8357**<br>**(Fastener Vendor)** | **Wasco Aircraft - AZ**<br>**505 S. 48th St., #103**<br>**Tempe, AZ 85281**<br>**Tel 602-894-5139**<br>**Fax: 602-894-5424**<br>**(Fastener Vendor)** | **TEXTRON Fastening Systems**<br>**1224 E. Warner Ave.**<br>**Santa Ana, CA**<br>**92707-0157**<br>**Tel/Fax: 909-658-2872**<br>**(CR6253 Manufacturer)** | **MONOGRAM Aerospace Fasteners**<br>**3423 S. Garfield Ave.**<br>**PO Box 6847**<br>**Los Angeles, CA**<br>**90022-0547**<br>**Tel: 213-722-4760**<br>**Fax: 213-721-1851**<br>**(PLT251 Manufacturer)** |

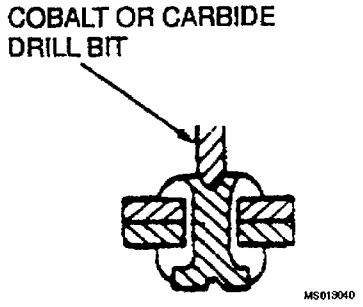
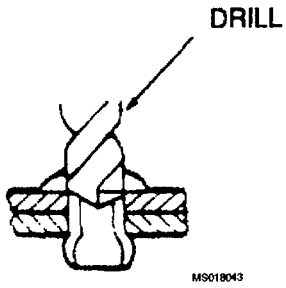
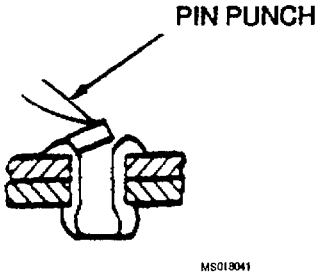
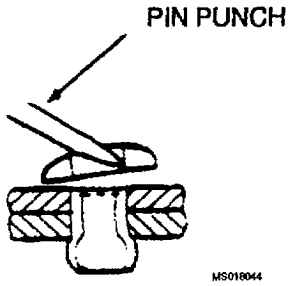
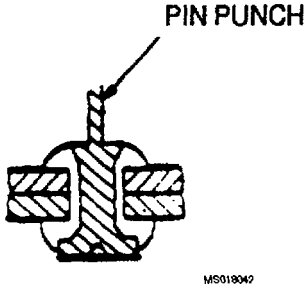
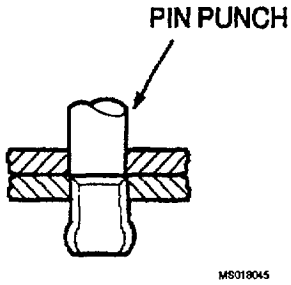
| | |
|---|---|
|  |  |
| 1. Center punch and drill the hardened rivet stem to a depth of the locking collar using a cobalt or carbide drill approximately two sizes smaller than the stem. | 4. Hold the drill perpendicular to the surface and drill nearly through the rivet head using a drill the next size smaller than the rivet shank. |
|  |  |
| 2. Pry the remainder of the locking collar out of the rivet head using a pin punch. | 5. In most cases the rivet head will twist off while drilling, if not, pry off the rivet head using pin punch. |
|  |  |
| 3. Use a pin punch the same size as the stem to punch out the stem. | 6. Drive the remaining rivet shank using a pin punch with diameter equal to or smaller than the rivet shank. |

*Figure No. 1: Rivet Removal*

| PART # | QTY |
|---|---|
| CR6253-5-2 | 9 |
| CR6253-5-3 | 20 |
| CR6253-5-4 | 7 |
| CR6253-5-6 | 47 |
| CR6253-5-7 | 25 |
| CR6253-5-8 | 15 |
| CR6253-5-9 | 5 |
| CR6253-5-8 | 10 |

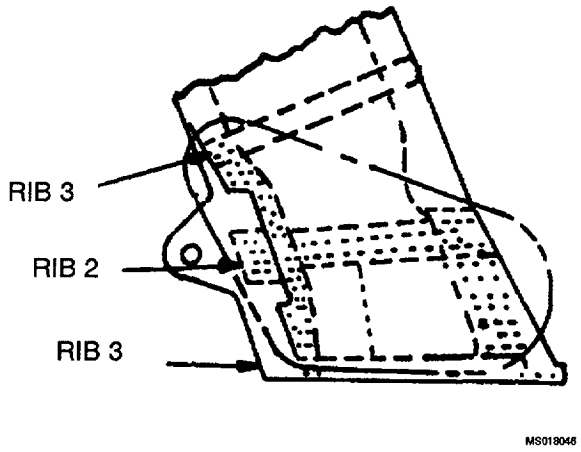
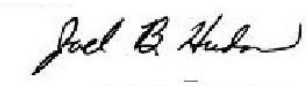



*Figure No. 2: Suggested Fastener Purchase List*

By Order of the Secretary of the ARMY:

DENNIS J. REIMER
*General, United States Army*
*Chief of Staff*

Official:



JOEL B. HUDSON
*Administrative Assistant to the*
*Secretary of the Army*
05481

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# THE METRIC SYSTEM AND EQUIVALENTS

## 'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

## 'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

## CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

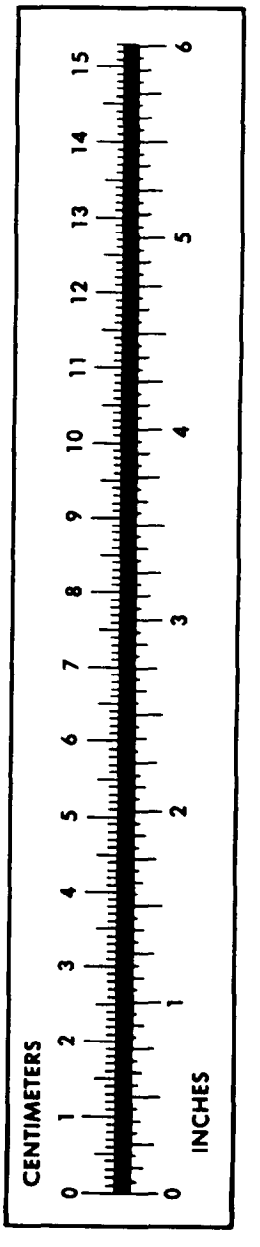
## TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

## APPROXIMATE CONVERSION FACTORS

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Inches | Centimeters | 2.540 |
| Feet | Meters | 0.305 |
| Yards | Meters | 0.914 |
| Miles | Kilometers | 1.609 |
| Square Inches | Square Centimeters | 6.451 |
| Square Feet | Square Meters | 0.093 |
| Square Yards | Square Meters | 0.836 |
| Square Miles | Square Kilometers | 2.590 |
| Acres | Square Hectometers | 0.405 |
| Cubic Feet | Cubic Meters | 0.028 |
| Cubic Yards | Cubic Meters | 0.765 |
| Fluid Ounces | Milliliters | 29.573 |
| ıts | Liters | 0.473 |
| arts | Liters | 0.946 |
| allons | Liters | 3.785 |
| Ounces | Grams | 28.349 |
| Pounds | Kilograms | 0.454 |
| Short Tons | Metric Tons | 0.907 |
| Pound-Feet | Newton-Meters | 1.356 |
| Pounds per Square Inch | Kilopascals | 6.895 |
| Miles per Gallon | Kilometers per Liter | 0.425 |
| Miles per Hour | Kilometers per Hour | 1.609 |

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Centimeters | Inches | 0.394 |
| Meters | Feet | 3.280 |
| Meters | Yards | 1.094 |
| Kilometers | Miles | 0.621 |
| Square Centimeters | Square Inches | 0.155 |
| Square Meters | Square Feet | 10.764 |
| Square Meters | Square Yards | 1.196 |
| Square Kilometers | Square Miles | 0.386 |
| Square Hectometers | Acres | 2.471 |
| Cubic Meters | Cubic Feet | 35.315 |
| Cubic Meters | Cubic Yards | 1.308 |
| Milliliters | Fluid Ounces | 0.034 |
| Liters | Pints | 2.113 |
| Liters | Quarts | 1.057 |
| ers | Gallons | 0.264 |
| ms | Ounces | 0.035 |
| ograms | Pounds | 2.205 |
| Metric Tons | Short Tons | 1.102 |
| Newton-Meters | Pounds-Feet | 0.738 |
| Kilopascals | Pounds per Square Inch | 0.145 |
| lometers per Liter | Miles per Gallon | 2.354 |
| meters per Hour | Miles per Hour | 0.621 |



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