

# URGENT

TB 1-1520-240-20-141

## DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

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### INSPECTION OF THE ROTARY WING HEAD TIE BAR ASSEMBLY AND ROTOR TACHOMETER ON ALL CH-47D, MH-47D AND MH-47E AIRCRAFT

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Headquarters, Department of the Army, Washington, D. C.  
31 January 2002

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**DISTRIBUTION STATEMENT A:** Approved for public release; distribution is unlimited.

#### NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

#### 1. Priority Classification. Urgent

#### NOTE

In accordance with AR 95-1, paragraph 6-6A, MACOM Commanders may authorize temporary exception from message requirements. Exception may only occur when combat operations or matter of life or death in civil disasters or other emergencies are so urgent that they override the consequences of continued aircraft operation.

a. Aircraft in Use. Upon receipt of this Technical Bulletin, make the following entries on the DA Form 2408-13-1. Commanders who are unable to comply with the requirements of this Technical Bulletin within the time frame specified will upgrade the affected aircraft status symbol to a red // X //.

(1) For all H-47 – Enter a red horizontal dash //--// status symbol with the following statement: "Inspect tie bar assemblies in accordance with CH-47-02-03 (TB 1-1520-240-20-141) prior to the next flight."

(2) For all H-47 – Enter a circled red //X// status symbol with the following statement: "Aircraft restricted to 111 percent transient rotor speed in accordance with CH-47-02-03 (TB 1-1520-240-20-141)."

(3) For H-47D and H-47F only -- Enter a red diagonal \\\ status symbol with the following statement: "Rework all rotor tachometers in accordance with CH-47-02-03 (TB 1-1520-240-20-141) no later than 26 February 2002."

b. Aircraft in Maintenance Facility –

(1) Aircraft in AVUM, AVIM, or Depot – Same as paragraph 1a.

(2) Aircraft at Contractor Facility – Boeing will inspect DD250 aircraft prior to those aircraft departing for ferry to final destination.

This TB supersedes USAAMCOM Message 252045Z JAN 02 SOF CH-47-02-03

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### c. Aircraft in Transit --

#### NOTE

For aircraft away from home station, this Technical Bulletin authorizes a one time flight, with intermediate stops, to return to the nearest secured maintenance facility/home station.

(1) Surface/Air Shipment -- Same as paragraph 1a.

(2) Ferry Status -- Same as paragraph 1a.

### d. Maintenance Trainers (Category A and B) -- Comply no later than 25 January 2004.

e. Components/Parts in Stock at All Levels (Depot and Others) including War Reserves – Upon receipt of this Technical Bulletin, Depot and Materiel Activity Commanders will ensure the materiel condition tags of all items in all condition codes listed in paragraphs 6 and 7 are annotated to read: "CH-47-02-03 (TB 1-1520-240-20-141), inspection of the tie bar assemblies and rotor tachometers not complied with."

(1) Wholesale Stock – N/A.

(2) Retail Stock – Upon receipt of this message, Commanders and Facility Managers maintaining retail stock at installation level and below shall contact the supported aviation unit to perform the procedures required in accordance with paragraphs 8 and 9 on suspect materiel. Dispose of discrepant materiel in accordance with paragraph 10. Report compliance with this Technical Bulletin in accordance with paragraph 14c (2) no later than 8 February 2002.

f. Components/Parts in Work (Depot Level and Others) – Depot and other Maintenance Activity Commanders will ensure items in paragraphs 6 and 7 are not issued until they are in compliance with this Technical Bulletin.

## 2. Task/Inspection Suspense Date.

a. Complete the inspection in accordance with paragraph 8a prior to the next flight.

b. Complete the inspection in accordance with paragraph 8b at the next rotor head removal, but no later than the next phase inspection or 25 January 2004, whichever occurs first.

c. Complete the inspection for all H-47D/F aircraft in accordance with paragraph 8c no later than 25 February 2002.

3. **TAMMS Reporting Compliance Suspense Date.** Report compliance in accordance with paragraph 14a (1 ) no later than 31 January 2002.

## 4. Summary of the Problem.

a. History – CH-47-02-02 was issued on 24 January 2002 requiring inspection of the tie bar assembly and rotor tachometer. This message superceded the requirements in CH-47-02-02. Changes have been made to paragraph 1c, 8a, 8b, 9a and 10d.

(1) Tie Bar Plate Failure – Reports from the field on tie bar assemblies indicate that tie bar plate cracks have occurred much earlier than the retirement life of 8693 hours. Even though the tie bar assembly is currently inspected at 1200 hours and at the 2400 hour overhaul, it is possible that some fielded tie bars may have tie bar plates which have cracked.

(2) Tie Bar Over Speed Damage -- Testing has shown that initial deformation of the rotary wing head tie bar assembly may occur at a point just above 111 percent rotor RPM. Currently, the 145ES008 rotor tachometers (all H-47D/F) and multi function displays (MFD) (MH-47E) indicate 115 percent RPM as the maximum transient rotor speed limit. Because of this, some tie bar assemblies may have already been damaged due to exceeding 111 percent RPM.

b. Manpower/Downtime and Funding impacts -- see paragraph 12.

c. The purpose of this Technical Bulletin is to –

(1) Tie Bar Assembly --

- (a) Reduce the retirement life of the assembly to 4800 hours time since new (TSN).
- (b) Replace all assemblies with more than 4800 hours TSN.
- (c) Inspect all assemblies with less than 4800 hours TSN for cracks.
- (2) Maximum Transient Rotor Speed Limit –
  - (a) Require rework of all 145ES008 rotor tachometers (all H-47D/F) and update software (MH-47E) to indicate the max transient rotor speed of 111 percent RPM.
  - (b) Change the max transient rotor speed to be 111 percent RPM in the operator's manuals.
  - (c) Establish a conditional inspection of the tie bar assembly if 111 percent rotor speed is exceeded.

5. **End Items to be inspected.** All H-47 series aircraft.

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

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
ROTOR HEAD ASSEMBLY	145R2003 – ALL	ALL
ROTOR HEAD ASSEMBLY	145R2004 – ALL	ALL
TIE BAR ASSEMBLY	114R2155-1	1615-00-740-6480

7. **Parts to be Inspected.** –

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
TACHOMETER INDICATOR	145ES008-2	6680-01-127-2481

8. **Inspection Procedures.**

**NOTE**

Read and complete all paragraph 8 inspection procedures for each part prior to proceeding to the correction procedures in paragraph 9.

a. Prior to the next flight, inspect the rotor head DA Form 2408-16 to determine the TSN of all tie bar assemblies.

(1) If TSN is less than 4800 hours –

(a) Change the rotor head DA Form 2408-16 to indicate a new retirement life for the tie bar assembly of 4800 hours TSN.

(b) Clear the red horizontal dash //--// entry required in accordance with paragraph 1a(1) of this Technical Bulletin and enter a new red horizontal dash //--// status symbol with the following statement: "Inspect all tie bar assemblies in accordance with paragraph 8b, CH-47-02-03 (TB 1-1520-240-20-141) at the next rotor head removal, but no later than the next phase inspection or 25 January 2004."

(2) If TSN is equal to or greater than 4800 hours, correct in accordance with paragraph 9a.

**NOTE**

Rotors heads received from supply after the message dating which have zero hours time since overhaul (TSO) do not require inspection of the tie bar assemblies in accordance with paragraph 8b.

b. At the next rotor head removal, but no later than the next phase inspection or 25 January 2004, whichever occurs first, inspect the tie bar assemblies as follows –

(1) Remove tie bar assemblies in accordance with TM 55-1520-240-23, Task 5-23.1 (H-47D/F) or TM 1-1520-252-23, Task 5-30 (MH-47E).

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### NOTE

The procedure in paragraph 8b(2) is in accordance with Change Number 47 for the H-47D/F, and Change Number 17 for the MH-47E.

- (2) Inspect tie bar assemblies in accordance with TM 55-1520-240-23, Task 5-23.1.1 (H-47D/F), or TM 1-1520-252-23, Task 5-31 (MH-47E).
- (3) Using 10X magnification, visually inspect tie bar plates for cracks. No cracks allowed.
- (4) Inspect the four tie bar slots as follows -- using a borescope with a rigid right angle probe, insert the borescope probe in each slot. Examine the slots for cracks along the full depth and span. Recommend the probe not exceed 0.110 inch diameter. If a suitable borescope and probe are not available, visually inspect each slot using a light source.
- (5) If a tie bar assembly fails an inspection in accordance with paragraph 8b, correct in accordance with paragraph 9a.
- (6) If no damage is found --
  - (a) Reinstall the rotary wing head tie bar assemblies in accordance with TM 55-1520-240-23, Task 5-23.2 (H-47D/F) or TM 1-1520-252-23, Task 5-32 (MH-47E).
  - (b) Clear the red horizontal dash //--// entry.
- c. Prior to 25 February 2002, inspect the aircraft rotor tachometer --
  - (1) For the 145ES008-2 rotor tachometer (H-47D/F) -- correct in accordance with paragraph 9b.

### NOTE

Currently all 145ES008-2 rotor tachometers are marked to indicate the maximum transient rotor speed at 115 percent. Eventually new rotor tachometers will be available that will be marked at 111 percent.

- (2) For the multi-function display (MFD) software (MH-47E) -- correct in accordance with paragraph 9c.

## 9. Correction Procedures.

### NOTE

Ensure that replacement tie bar assemblies are inspected and in compliance with this Safety of Flight (SOF) prior to installation.

- a. If the TSN is equal to or more than 4800 hours, or if a tie bar assembly fails an inspection in accordance with paragraph 8b --
  - (1) Change the rotor head DA Form 2408-16 to indicate a new retirement life for tie bar assembly of 4800 hours TSN.
  - (2) Clear the red horizontal dash //--// entry and enter a red //X// status symbol with the following statement: "Replace the rotary wing head tie bar assemblies in accordance with CH-47-02-03 (TB 1-1520-240-20-141)."
  - (3) Submit a category I deficiency report on any tie bar assembly that has failed the inspection required in accordance with paragraph 8b due to cracks.
  - (4) If TSN is equal to or more than 4800 hours, contact the Technical point of contact in paragraph 16a for disposition instructions.
  - (5) Reinstall the rotary wing head tie bar assemblies in accordance with TM 55-1520-240-23, Task 5-23.2 (all H-47D/F) or TM 1-1520-252-23, Task 5-32 (MH-47E).
  - (6) Clear the red //X// entry.
- b. For all H-47D and H-47F Helicopters -- Rework all rotor tachometers as follows --
  - (1) Remove rotor tachometers from the aircraft in accordance with TM 55-1520-240-23, Task 8-88.

- (2) On a suitable workbench, clean glass cover with isopropyl alcohol, TT-I-735 (or equivalent).
- (3) Apply a 3/16-inch high by 1/16-inch wide piece of red tape (NSN 7510-00-550-7126 or equivalent) at the 111 percent RPM range marking on the glass face of each rotor tachometer.
- (4) Paint a white index mark not over 1/16 inch wide across the joint between the glass and the case at the bottom of the center (6 o'clock) position using MIL-L-19537 white lacquer (or equivalent).
- (5) Apply a coat of MIL-V-173 varnish (or equivalent) over the tape and allow to dry.
- (6) Reinstall the rotor tachometers in the aircraft in accordance with TM 55-1520-240-23, Task 8-89.
- (7) After completion of the modification of both rotor tachometers, the red diagonal \\ and circled red //X// entries will be cleared.

c. For all MH-47E Helicopters –

- (1) A software change will be developed to incorporate the 111 percent maximum transient rotor speed limit.
- (2) After installation of the new avionics suite, the circled red //X// entries will be cleared.

**10. Supply/Parts and Disposition.**

- a. Parts Required. Items cited in paragraph 6 may be required to replace defective items.
- b. Requisitioning Instructions. Requisition replacement parts using normal supply procedures. All requisitions shall use project code (CC 57-59) "X13" (X-Ray, One, Three).

**NOTE**

Project Code "X13" is required to track and establish a data base of stock fund expenditures incurred by the field as a result of message actions.

- c. Bulk and Consumable Materials. The following materials will be required –
  - (1) Tape, pressure sensitive adhesive, color red, P/N L-T-90, NSN 7510-00-550-7126 (or equivalent).
  - (2) Varnish, P/N MIL-V-173, (or equivalent), NSN 8010-00-180-6343.
  - (3) Lacquer, white, color no. 17925 (or equivalent), P/N MIL-L-19537 (or equivalent), NSN 8010-00-935-6608.
  - (4) Alcohol, isopropyl, commercial grade, P/N TT-I-735 (or equivalent), NSN 6810-00-753-4993.
  - (5) Bolt, P/N 114R2162-1, NSN 5306-00-926-5684.
  - (6) Nut, self-lock, P/N MS21083N4, NSN 5310-00-903-8282.
  - (7) Bolt, P/N AN4H30A, NSN 5306-00-182-2022.
  - (8) Seal, P/N 114R2142-3, NSN 5330-00-913-0933.
  - (9) Seal, P/N 114RS215-1, NSN 5330-00-248-5142.
- d. Disposition.
  - (1) If cracks are found in the tie bar assembly, disposition instructions will be provided upon receipt of the Category I Deficiency Report.
  - (2) Contact the Logistical point of contact in paragraph 16b for disposition instruction for all other tie bar assemblies that fail the inspections in accordance with paragraph 8 of this Technical Bulletin.
  - (3) If tie bar assembly TSN is equal to or more than 4800 hours, contact the Technical point of contact in paragraph 16a for disposition instructions.
- e. Disposition of Hazardous Material. N/A.

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**11. Special Tools and Fixtures Required.** As required.

**12. Application.**

- a. Category of Maintenance. AVUM. Aircraft downtime will be charged to AVUM maintenance.
- b. Estimated Time Required-
  - (1) Time to complete the records inspection -- Total of 0.5 man-hours using 1 person.
  - (2) Time to complete inspection of the tie bar assembly --
    - (a) Total of 124 man-hours using 8 persons.
    - (b) Total of 20.0 hours downtime for one end item. Down time includes time required maintenance test flight.
  - (3) Time for Tachometer Rework –
    - (a) Total of 1 man-hours using 1 person.
    - (b) Total of 1 hour downtime for one end item.
- c. Estimated Cost Impact to the Field.

NOMENCLATURE	PART NO. / NSN	QUANTITY	COST EACH	TOTAL \$
TIE BAR ASSEMBLY	114R155-1/ 1615-00-740-6480	6	\$5675.15	\$34,050.90
TIE BAR PIN	114R2168-3/ 1615-00-740-6477	6	33.34	200.04
TIE BAR PIN	114R2168-4/ 1615-01-115-3619	6	63.05	378.30

TOTAL COST PER AIRCRAFT = \$34,692.24

- d. TB/MWOs to be Applied Prior to or Concurrently with this Inspection. N/A.
- e. Publications Which Require Change as a result of this Inspection – The following publications shall be changed to reflect this Technical Bulletin. A copy of this Technical Bulletin shall be inserted in the appropriate TM as authority to implement the change until the printed change is received.
  - (1) TM 55-1520-240-10, Operator’s Manual for Army CH-47D Helicopter – Change maximum transient rotor speed limit to 111 percent RPM.
  - (2) TM 55-1520-240-23, Aviation Unit and Aviation Intermediate Maintenance Manual, CH-47D Helicopter –
    - (a) Task 1-91, page 1-284, change the retirement schedule hours for the forward and aft tie bar assembly, P/N 114R2155-1, to be 4800 hours TSN.
    - (b) Add the following conditional inspection to Task 1-92 –
      - 1 The inspection frequency shall read – “When rotor RPM exceeds 111 percent, but does exceed 115 percent RPM.”
      - 2 The inspection requirement shall read -- “Inspect the rotor head tie bar assemblies per task 5-23.1.1 at the next rotor head removal, but no later than completion of next phased maintenance.”
    - (c) Task 1-92, Reference 55 – change “Speed” to read “RPM”.
    - (d) Task 5-23.1.1, page 5-94.2.1, add “Borescope” to tools list.

(e) Task 5-23.1.1, page 5-94.2.1, change paragraph 2.a. to read as follows -- " Using 10X magnification, visually inspect tie bar plates for cracks. No cracks allowed."

(f) Task 5-23.1.1, page 5-94.2.1, add paragraph 3 as follows -- "3. Inspect the four slots in the tie bar assembly as follows --

- a Using a borescope with a rigid right angle probe, insert the borescope probe in each slot. Examine the slots for cracks along the full depth and span.

**NOTE**

Recommend the probe not exceed 0.110 inch diameter

- b If a suitable borescope and probe are not available, visually inspect each slot using a light source.
- c Reject tie bar assembly if any cracks are detected."

(3) TM 1-1520-252-10, Operator's Manual for Army MH-47E Helicopter -- Change maximum transient rotor speed limit to 111 percent RPM.

(4) TM 1-1520-252-23, Aviation Unit and Aviation Intermediate Maintenance Manual, MH-47E Helicopter --

(a) Task 1-99, page 3, change the retirement schedule hours for the forward and aft tie bar assembly, P/N 114R2155-1, to be 4800 hours TSN.

(b) Add the following conditional inspection to Task 1-100.

- 3 The inspection frequency shall read -- "When rotor RPM exceeds 111 percent, but does not exceed 115 percent RPM."
- 4 The inspection requirement shall read -- "Inspect the rotor head tie bar assemblies per Task 5-31 at the next rotor head removal, but no later than completion of next phased maintenance."

(c) Task 1-100, Reference 56 -- change "Speed" to read "RPM".

(d) Task 5-31, page 2, change paragraph 2.a. to read as follows: "Using 10X magnification, visually inspect tie bar plates for cracks. No cracks allowed."

**13. References.**

- a. DA PAM 738-751, 15 Mar 99.
- b. TM 55-11520-240-23, Aviation Unit and Aviation Intermediate Maintenance Manual, CH-47D Helicopter.
- c. TM 55-1520-240-10, Operator's Manual for Army CH-47D Helicopter.
- d. TM 1-1520-252-23, Aviation Unit and Aviation Intermediate Maintenance Manual, MH-47E Helicopter.
- e. TM 1-1520-252-10, Operator's Manual for Army MH-47E Helicopter.

**14. Recording and Reporting Requirements.**

a. Aircraft --

(1) TAMMS Reporting Compliance Suspense Date -- Upon entering requirements of this Technical Bulletin on DA Form 2408-13-1 for all effected aircraft, Commanders will forward a priority message, fax or e-mail to Commander, AMCOM, ATTN: AMSAM--SF--A (SOF Compliance Officer), Redstone Arsenal, AL 35898-5000, in accordance with AR 95-1, no later than date specified in paragraph 3. Fax number is DSN 897-2111 or commercial (256) 313--2111. E-Mail address is "safeadm@redstone.army.mil". The report will cite this message and TB number, date of entry in DA Form 2408-13-1, the aircraft mission design series and serial numbers of aircraft in numerical order.

(2) Task/Inspection Reporting Suspense -- N/A.

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b. Wholesale Spare Parts/Assemblies -- N/A.

c. Retail Spare Parts/Assemblies –

(1) Reporting Message Receipt – N/A.

(2) Task/Inspection Reporting Suspense – Commanders and Facility Managers will report inspection results to the Logistical point of contact in paragraph 16b no later than date specified in paragraph 1e (2). Report the quantity inspected by condition code and the resulting condition code. Report by email or fax and provide local point of contact.

d. The following forms are applicable and are to be completed in accordance with DA PAM 738-751, 15 MAR 99 –

### NOTE

ULLS-A users will use applicable "E" Forms.

(1) DA Form 2408-5-1, Equipment Modification Record. (Rotor Head Assembly).

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

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

(4) DA Form 2408-15, Historical Record For Aircraft. (To record of Rotor Tachometer Portion of Message).

(5) DA Form 2408-16, Aircraft Component Historical Record.

(6) DA Form 2410, Component Removal and Repair/Overhaul Record (only if rotor head or tie bar assemblies are removed/replaced).

(7) DD Form 1574/DD Form 1574-1, Serviceable Tag/Label – Materiel (color yellow). Annotate remarks block with "Inspected serviceable in accordance with CH-47-02-03 (TB 1-1520-240-20-141)."

(8) DD Form 1577-2/DD Form 1577-3, Unserviceable (repairable) Tag/Label -- Materiel (color green). Annotate remarks block with "Unserviceable in accordance with CH-47-02-03 (TB 1-1520-240-20-141)."

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

### 16. Points of Contact.

a. Technical point of contact for this Technical Bulletin is Mr. Steve Prosize, AMSAM-RD-AE-I-P-C, DSN 897-3377 or commercial (256) 313-3377, fax is DSN 897-4348 or commercial (256) 313-4348 . E-mail is "steve.prosize@redstone.army.mil".

b. Logistical point of contact is Mr. Bill Olson, SFAE-AV-CH-L, DSN 897-3379 or commercial (256) 313-3379, fax is DSN 897-4348 or commercial (256) 313-4348. E-mail is "william.olson@peoavn.redstone.army.mil".

c. Wholesale Materiel point of contact (SPARES) is Miguel Rodriguez, AMSAM-MMC-AV-CA, DSN 788-6747 OR (256) 842-6747, FAX is DSN 897-1106. Email is "miguel.rodriguez@redstone.army.mil".

d. Forms and Records point of contact is Ms. Ann Waldeck, AMSAM-MMC-MA-NM, DSN 746-5564 or commercial (256) 876-5564, fax is DSN 746-4904. E-mail is "ann.waldeck@redstone.army.mil".

e. Safety points of contact are –

(1) Primary – Mr. Harry Trumbull (SAIC), AMSAM-SF-A, DSN 897-2095 or commercial (256) 313-2095, fax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "harry.trumbull@redstone.army.mil".

(2) Alternate – Mr. Russ Peusch, AMSAM-SF-A, DSN 788-8632 or 897-2091, commercial (256) 842-8632 or (256) 313-2091, fax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "rus-sel.peusch@redstone.army.mil".

f. Foreign Military Sales recipients requiring clarification of action advised by this Technical Bulletin should contact –

(1) Primary – Mr. Ronnie W. Sammons, AMSAM-SA-CS-NF, DSN 897-6856 or commercial (256) 313-6856, fax is DSN 897-6630 or commercial (256) 313-6630.  
E-mail is "ronnie.sammons@redstone.army.mil".

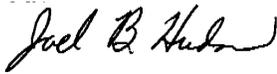
(2) Alternate – Mr. Paul W. Tarr, AMSAM-SA-CS-NF, DSN 897-6861 or commercial (256) 313-6861, Datafax is DSN 897-6630 or commercial (256) 313-6630.  
Email is "tarrpw@redstone.army.mil".

g. After hours contact the AMCOM COMMAND OPERATIONS CENTER (COC) DSN 897-2066/7 or commercial (256) 313-2066/7.

By Order of the Secretary of the Army:

**ERIC K. SHINSEKI**  
*General, United States Army*  
*Chief of Staff*

Official:



**JOEL B. HUDSON**  
*Administrative Assistant to the*  
*Secretary of the Army*  
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**TB 1-1520-240-20-141**

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>

To: <2028-@redstone.army.mil>

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840--229-23
9. **Pub Title:** TM
10. **Publication Date:** 04--JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123--1234
17. **Problem: 1**
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.