D E P A R T M E N T O F T H E A R M Y T E C H N I C A L B U L L E T I N

INSPECTION FOR PROPER OPERATION OF SHEAR PIN ACTUATED DECOUPLER(SPAD) MICROSWITCHES ON AH-64A HELICOPTERS EQUIPPED WITH BACKUP CONTROL SYSTEM (BUCS)

Headquarters, Department of the Army, Washington, D. C.
14 October 1995

NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL SUBJECT AH-64A AIRCRAFT HAVE BEEN INSPECTED, UNLESS SOONER RESCINDED OR SUPERSEDED.

1. Priority Classification. URGENT

a. Aircraft in Use. Upon receipt of this Technical Bulletin (TB) the condition status symbol of the cited aircraft will be changed to a ***red "x"*** . The ***red "x",*** may be cleared when the inspection of paragraph 8 below is completed. The affected aircraft shall be inspected in accordance with this TB at next phase inspection.

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

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

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

(1) Surface/Air Shipment. Prior to first flight.

(2) Ferry Status. Inspect at final destination.

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

f. Component/Parts in Stock Including War Reserves at All Levels (Depot and Others). Same as para 1.a. Spare SPAD assemblies shall be inspected (bench tested) for proper switch function, and security as called out in this TB.

This TB replaces TB 1 -1520-238-20-45, dated 3 November 1992

2. Task/Inspection Suspense date. Prior to next flight.

3. Reporting Compliance Suspense Date. Within 15 working days of the date of this Technical Bulletin per paragraph 14.d.

4. Summary of the Problem.

a. A recent AH-64A mishap investigation determined the presence of an improperly adjusted SPAD's microswitch. This condition prevented the BUCS from activating when a SPAD shear pin was broken. A number of aircraft were subsequently inspected and several shown to have relatively minor quality errors.

b. For manpower/downtime and funding impacts, see paragraph 12.

c. The purpose of this TB is to direct an inspection for security and adjustment of the BUCS microswitches located in the SPADS. This inspection will also be required at every Phase Maintenance Inspection.

5. End Items to be inspected. AH 64A aircraft, serial numbers 85-25477, 88-0200 and subsequent. All BUCS active AH-64A aircraft currently located at McDonnell Douglas Helicopter Systems, Mesa. AZ will be inspected/corrected by the contractor.

6. Assembly Components to be Inspected.

NOMENCLATURE	PART NUMBER	STOCK NUMBER
CPG Collective Arm Assembly	7-311513004 5	N/A
CPG Collective Arm Assembly	7-311513005 5	1680-01-203-7964
CPG Directional SPAD	7-311516077-7	1560-01-269-2729
CPG Lateral Ann Assembly	7-311514088-23	N/A
CPG Longitudinal Assembly	7-311515081	1560-01-172-5054
Pilot Collective Arm Assembly	7-311 412087-5	N/A
Pilot Directional SPAD	7-311517067-9	1560-01-269-2730
Pilot Lateral Arm Assembly	7-311514088-19	N/A
Pilot Longitudinal Assembly	7-311517069-7	1560-01-269-2732

7.Parts to be Inspected.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
SPAD Shear Pin (typical)	7-211514082	5315-01-170-6969

8. Inspection Procedures.

a. This task directs a special maintenance inspection of the BUCS subsystem. This requires a visual inspection of each SPAD Assembly in the aircraft (8 places). This inspection focuses on the mounting security and function of the SPAD micro switches. The proper function of the switches shall be determined by removing the SPAD Shear Pins; manually engaging the BUCS mode (rotating the Mechanical Cam); and verifying electrical continuity through both SPAD switches (2 per SPAD). Reference figure no. 2 of this TB for a depiction of a typical SPAD Assembly.

(1) Perform a BUCS Self Test, I/A/W Reference c., pare 8-26, page 8-9. Follow message prompts.

(2) Perform the DASE Interactive FD/LS Check (DASE02), I/A/W Reference b. task 4-2, page 4-5. Follow the message prompts and/or any corrective action messages.

b. Copilot/Gunners Station SPAD Inspections:

c.

NOTE

Observe all task preconditions, notes, cautions and warnings or damage to the personnel or the aircraft may result. Retain all fastening hardware for reinstallation.

Inspect removed shear pins for straightness (bent/bowed) and deep material scratches -- none allowed. Minor surface scratches along the pin shank are permitted, as are tooling marks and gouges, resulting from the removal process on the ends of the pin (head/taper).

CPG Directional SPAD

(1) Remove the 30mm Gun Barrel from the Gun Receiver I/A/W reference d., task 4-7-4, in preparation for de-paneling.

(2) Gain access to the CPG's Directional SPAD Assembly by removing panel B60, L60 and B65L (reference a., task 2.2). Refer to reference a., task 11.146 disconnect plug P118 to gain access to the shear pin retainer.

NOTE

The following SPAD Switch inspection criteria is typical for all SPAD switches in the aircraft. The tasks referenced throughout this procedure refer to TM 1-1520-238-23 (reference a.), unless otherwise indicated. Use inspection mirrors and flashlights as required.

If a shear pin(s) cannot be removed by conventional means after repeated attempts from any of the SPAD Assemblies (CPG or Pilot), deliberately shearing the shear pin is permitted. Ensure both ends of the pin are removed. Prevent foreign object damage (FOD).

If either/both SPAD microswitches fail the following mounting security check or electrical continuity test, contact the MDHC CFSR for optimized SPAD removal and installation procedures.

(3) Visually inspect the SPAD microswitches (designated S1 & S2) for mourning security. Confirm mounting security.

NOTE

The following inspector is for information and recording purposes only. If the characteristics listed below are evident, or are not in evidence--these factors are not cause for rejection of the SPAD Assembly.

(4) Inspect the micro switches for the following characteristics and record results only.

- Torque strip on fastening hardware (mounting plate to SPAD Assembly.
- Bent switch arms (roller arms).
- Potting compound visible on one of the fasteners (nut/bolt) for the switch mounting plate (mounting) plate to SPAD Assembly).

(5) Remove the SPAD Shear Pin for the SPAD Assembly (task 11.146, step b.). It is not necessary to remove the Directional Push/Pull Rod. Inspect/retain the shear pin for later use.

(6) Allow the Mechanical Cam (spring loaded) to rotate, moving the roller-arms of the micro switches activating (dosing) the switches (normally open contacts).

CAUTION

Use only 22 AWG electrical contact pins (MS27493-22D) to perform the following continuity check. Do not use safety wire or facsimile, or damage to the DASE Plugs may result (spread contacts).

(7) Pull (Open) the BUCS circuit breaker located on the Pilots center circuit breaker panel.

(8) Gain access to the Aft Avionics Bay Door by opening door R295. Remove connectors P688, P686 and P682 from the DASE Computer (7-211 D00005-21/23). Locate pin 66 on P682, insert a electrical pin. Locate pins 125 (51) and 126 (52) on P686 - insert electrical pins Reference figure 1 for depiction of these connector socket contacts, each connector has the same contact pattern.

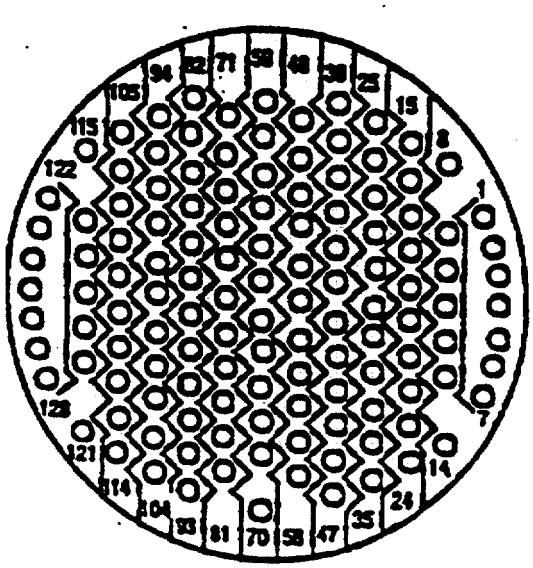

Figure 1. End View of DASE Connectors
P688, P686 and P682

(9) Check for continuity (multimeter) from pin 66 (common) on P682, to pin 125 (S1) and then 126 (S2) on P686.

(10) If continuity is present proceed to paragraph 8.b.(11). If it is not, proceed to paragraph 8.b.(12).

(11) Rotate the SPAD Mechanical Cam from its present position, to the opposite side of the Cam Stop (other direction). Re-check the function of the switches by performing paragraph 8.b.(9).

(12) Failure of either/both switches is cause for rejection. Contact your local MDHS representative for disposition instructions.

CPG Lateral SPAD

(13) Visually inspect the switches for security using a flashlight and inspection mirror. Reference paragraphs 8.b. (3) and 8.b. (4) for inspection criteria.

(14) Remove the SPAD Shear Pin I/A/W task 11.83 step d., retain the pin for later installation. Allow the Mechanical Cam to rotate, closing the SPAD switches.

(15) Check for continuity from pin 66 (common) on P682 to pins 123 (S1) and then 124 (S2) on P686 (aft avionics bay). If continuity is present rotate the Mechanical Cam in the other direction (opposite). Re-check continuity (Pin 66 to 123 and then to 124).

(16) If continuity is not present refer to paragraph 8.b.(12) for corrective action.

CPG Longitudinal SPAD

(17) Visually inspect the switches for security using a flashlight and inspection mirror. Reference paragraphs 8.b.(3) and 8.b.(4) for inspection criteria.

(18) Remove the SPAD Shear Pin I/A/W task 11.56, step a., retain the pin for later installation. Allow the Mechanical Cam to rotate, closing the SPAD switches.

(19) Check for continuity from pin 66 (common) on P682 to pins 115 (S1) and then 1 22 (S2) on P686 (aft avionics bay). If continuity is present rotate the Mechanical Cam in the other direction (opposite). Re-check continuity (Pin 66 to 115 and then to 122).

CPG Collective SPAD

CAUTION

Ensure that the Collective LVDT connector (J234/P234) is re-connected after removing the Collective Cover prior to "power-on testing."

(20) Gain access to the CPG's Collective SPAD Assembly by removing the CPG Collective Stick Cover, task 11.44.

(21) If continuity is not present refer to paragraph 8.b. (12) for corrective action.

(22) Visually inspect switches (S1 & S2) for security using a flashlight and inspection mirror. Reference paragraphs 8.b. (3) and 8.b. (4) for inspection criteria.

(23) Remove the SPAD Shear Pin I/A/W task 11.43 step b., retain the pin for later installation. Allow the Mechanical Cam to rotate, closing the SPAD switches.

(24) Check for continuity from pin 66 (common) on P682 to pins 127 (S1) and then 128 (S2) on P686. If continuity is present rotate the Mechanical Cam in the other direction (opposite). Recheck continuity (Pin 66 to 127 and then to 128).

(25) If continuity is not present refer to paragraph 8.c. (10) for corrective action.

(26) Reconnect the DASE Computer connectors (P682, P686 & P688). Reset (close) the BUCS circuit breaker in the Pilots station (center C/B Panel).

CAUTION

Do not attempt to move the pilots controls with the CPG'S SPAD shear pins removed. Manual movement of the Pilots controls may break/ shear the SPAD shear pins in that station. Ensure no BUCS locks (pins) are installed. The pilots station controls will move (powered) during the following procedures.

(27) Verify that the aircraft is cleared for flight control movement. Apply primary hydraulic and electrical power. Verify that the "BUCS ON" a caution/warning light is "ON."

(28) Move the CPG's Cyclic Stick in one control axis at a time (Lateral [side to side], Longitudinal fore & aft]). Visually confirm the movement of the Main Rotor Head (swashplate) in response to the cyclic control inputs. Continue to verify individually, the control responses for the Collective and Directional (pedal) controls. If the controls do not respond correctly, troubleshoot I/A/W reference e., apply corrective action and retest.

(29) If the controls responded properly, move (depress) the left directional control pedal forward,

and move the cyclic stick to the full aft position prior to shutting down power; this orients; the pilot station

SPAD's for inspection purposes. Remove hydraulic and electrical power. Proceed to paragraph 8.b.(30).

CAUTION

The Mechanical Cam contained in each SPAD must be repositioned to the center or armed position (switch detent aligned with indicator); and held momentarily to install the shear pin. Failure to reset/arm the cam renders the SPAD inoperative.

NOTE

Ensure that the "shear point" (notch) in the shear pin is properly located in each SPAD Assembly (visible between the moveable arms).

(30) Install the shear pins in each SPAD Assembly in the CPGs Station. Refer to tasks 11.43 for the collective SPAD; 11.46 for the Directional SPAD; 11.83 for the Lateral SPAD; and 11.82 for the Longitudinal SPAD.

(31) Re- connect plug P118/J118 adjacent to CPG's Directional SPAD (panel B60).

(32) Installation of the access panels for the CPG Station SPAD's may be deferred until completion of the Pilots Station SPAD's.

c. Pilots station SPAD inspections:

NOTE

Observe all task preconditions, notes, cautions and warnings or damage to the personnel or the aircraft may result. Retain all fastening hardware for reinstallation. Inspect removed shear pins for straightness (bent/bowed) and deep material scratches - none allowed. Minor surface scratches along the pin shank are permitted, as are tooling marks and gouges, resulting from the removal process on the ends of the pin (head/taper).

(1) Remove the Pilots Foot Guard/Shield (7-311180008), I/A/W task 2.189.

NOTE

Removal of the pilots seat from the aircraft is optional (discretionary) for inspection purposes -it is not a requirement.

(2) Remove the Pilots Seat I/A/W, task 11.46. Remove the panel (7-311113683-31) directly aft of the cyclic (task 11.181).

CAUTION

Ensure that no fasteners, tools or debris (FOD) is allowed to drop down into any open access covers above the foward fuel cell. Failure to do so may result in removal of the Foward Fuel Cell to retrieve foreign objects.

(3) Remove the Pilots Cyclic Stick Cover I/A/W, task 11.46. Remove the panel (7-311113683-31) directly aft of the cyclic (task 11.181).

(4) Remove the Pilots left hand (L/H) Scuff Plate (7-311180010-19), I/A/W task 2.182.

(5) Remove the SPAD Access Cover (7-311111110-25), underneath the Scuff Plate.

Pilots Directional SPAD

CAUTION

Ensure that no fasteners, tools or debris (FOD) is allowed to drop down into any open access covers above the Gun Turret. Failure to do so may result In removal of the Gun Turret to retrieve foreign objects.

(6) The Directional SPAD may be viewed through the Pilots Directional SPAD Access Cover opening (removed). Visually inspect the micro switches for security using a flashlight and inspection mirror. Reference paragraph 8.c.(7) below for inspection criteria.

NOTE

The following SPAD Switch inspection criteria is typical for all the SPAD switches in the aircraft. The tasks referenced throughout this procedure refer to TM 1-1520-238-23. Use inspection mirrors and flashlights as required.

If a shear pin(s) cannot be removed by conventional means after repeated attempts from any of the SPAD Assemblies (CPG or Pilot), deliberately shearing the shear pin is permitted. Ensure both ends of the pin are removed. Prevent foreign object damage (FOD).

If either/both SPAD microswitches fail the following mounting security check or electrical continuity test, contact your local ATCOM LAR or MPHC CFSR for disposition instructions.

(7) Visually inspect the SPAD microswitches (designated S1 & S2) for mounting security.

NOTE

The following inspection is for information and recording purposes only. It the characteristics listed below are evident, or are not in evidence - these factors are not cause for rejection of the SPAD Assembly.

(8) Inspect the microswitches for the following characteristics and record results - only.

- Torque stripe on fastening hardware (mounting plate to SPAD Assembly).
- Bent switch arms (roller arms).
- Potting visible on one of the fasteners (nut/bolt) for the switch mounting plate (mounting *plate to* SPAD Assembly).

Record the inspection results of these three factors on a separate DA Form 2404, and forward a copy to your local ATCOM LAR or MDHC CFSR. Maintain one copy at the Unit location for each aircraft.

(9) Remove the SPAD Shear Pin from the SPAD Assembly (task 11.172, step b.). It is not necessary to remove the Directional Push/Pull Rod. Retain the shear pin for later use.

(10) Allow the Mechanical Cam (spring loaded) to rotate, moving the roller-arms of the microswitches activating (closing) the switches (normally open contacts).

CAUTION

Use only 22 AWG electrical contact pins (MS27493-22P) to perform the following continuity check. Do not use safety wire or facsimile, or damage to the DASE Plugs may result (spread contacts).

(11) Pull (open) the BUCS circuit/breaker located on the Pilot's center circuit breaker panel.

(12) Remove connectors P688, P686 and P682 from the DASE Computer (7-211D00005-21/23). Locate pin 66 on P682, insert a electrical pin. Locate pins 125 (S1) and 126 (S2) on P688 (different connector from CPG's inspection) - insert electrical pins.

(13) Check for continuity (multimeter) from pin 66 (common) on P682 to pin 125 (S1) and then 126 (S2) on P688.

(14) If continuity is present proceed to paragraph 8.c.(15). If it is not, proceed to paragraph 8.c(16).

(15) Rotate the SPAD Mechanical Cam from its present position, to the opposite side of the Cam Stop (other direction). Re-check the function of the switches by performing paragraph 8.c(13).

(16) Failure of either/both switches is cause for rejection. Contact your local MDHC representative for disposition instructions.

Pilot Lateral SPAD

(17) Visually inspect the switches for security using a flashlight and inspection mirror. Reference paragraphs 8.c.(7) and 8.c.(8) for inspection criteria.

(18) Remove the SPAD Shear Pin I/A/W task 11.56, step a, retain the pin for later installation. Allow the Mechanical Cam to rotate, closing the SPAD switches.

(19) Check for continuity from pin 66 (common) on P682 to pins 123 (S1) and then 124 (S2) on P688 (aft avionics bay). If continuity is present rotate the Mechanical Cam in the other direction (opposite). Recheck continuity (Pin 66 to 123 and then to 124).

(20) If continuity is not present refer to paragraph 8.c.(16) for corrective action.

Pilots Longitudinal SPAD

(21) Visually inspect the switches for security using a flashlight and inspection mirror. The control arms of this SPAD may be removed manually to assist in viewing the switches (hidden). Reference paragraphs 8.c.(7) and 8.c(8) for inspection criteria.

(22) Remove the SPAD Shear Pin I/A/W task 11.173 step c, retain the pin for later installation. Allow the Mechanical Cam to rotate, closing the SPAD switches.

(23) Check for continuity from pin 66 (common) on P682 to pins 115 (S1) and then 122 (S2) on P688 (aft avionics bay). If continuity is present rotate the Mechanical Cam in the ether direction (opposite). Recheck continuity (Pin 66 to 115 and then to 122).

(24) If continuity is not present refer to paragraph 8.c.(16) for corrective action.

Pilots Collective SPAD

CAUTION

Ensure that the Collective LVDT connector (J230/P230) is reconnected after removing the Collective Cover prior to "power-on testing."

(25) Gain access to the Pilots Collective SPAD Assembly by reworking the Pilots Collective Stick Cover, task 11.44. Also, remove access cover L160, reference task 2.3.

(26) Visually inspect the switches (S1 & S2) for security using a flashlight and inspection mirror. Reference paragraphs 8.c.(7) and 8.c.(8) for inspection criteria.

(27) Check for continuity from pin 66 (common) on P682 to pins 127 (S1) and then 128 (S2) on P688. Reference figure 2. If continuity is present rotate the Mechanical Cam in the other direction (opposite). Recheck continuity (Pin 66 to 127 and then to 128).

(28) If continuity is not present refer to paragraph 8.c(16) for corrective action.

(29) Reconnect the DASE Computer connectors (P682, P686 & P688). Reset (close) the BUCS circuit breaker in the Pilot's station (center C/B Panel).

CAUTION

Do not attempt to move the CPG'S controls with the Pilots SPAD shear pins removed. Movement of the CPG'S controls may break/shear the SPAD shear pins in that station. Ensure no BUCS Locks (pins) are installed. The CPG's station controls will move (powered) during the following procedures.

(30) Verify that the aircraft is cleared for flight control movement. Apply primary hydraulic and electrical power. Verify that the "BUCS ON" caution/warning light is "ON."

(31) Move the Pilot's Cyclic Stick in one control axis at a time (Lateral [side to side], Longitudinal fore & aft]]. Visually confirm the movement of the Main Rotor Head (swashplate) in response to the cyclic control inputs. Continue to verify individually, the control responses for the Collective and Directional (pedal) controls. If the controls do not respond correctly, troubleshoot I/A/W reference e., apply corrective action and retest.

(32) If the controls responded properly remove hydraulic and electrical power, proceed to paragraph 8.c.(33). If a fault was detected troubleshoot I/A/W reference e.

CAUTION

The Mechanical Cam contained In each SPAD must be repositioned to the center or armed position (switch detent aligned with indicator); and held momentarily to install the shear pin. Failure to re-set/arm the cam renders the SPAD Inoperative.

NOTE

Ensure that the "shear point" (notch) in the shear pin is properly located in each SPAD Assembly (visible between the moveable arms).

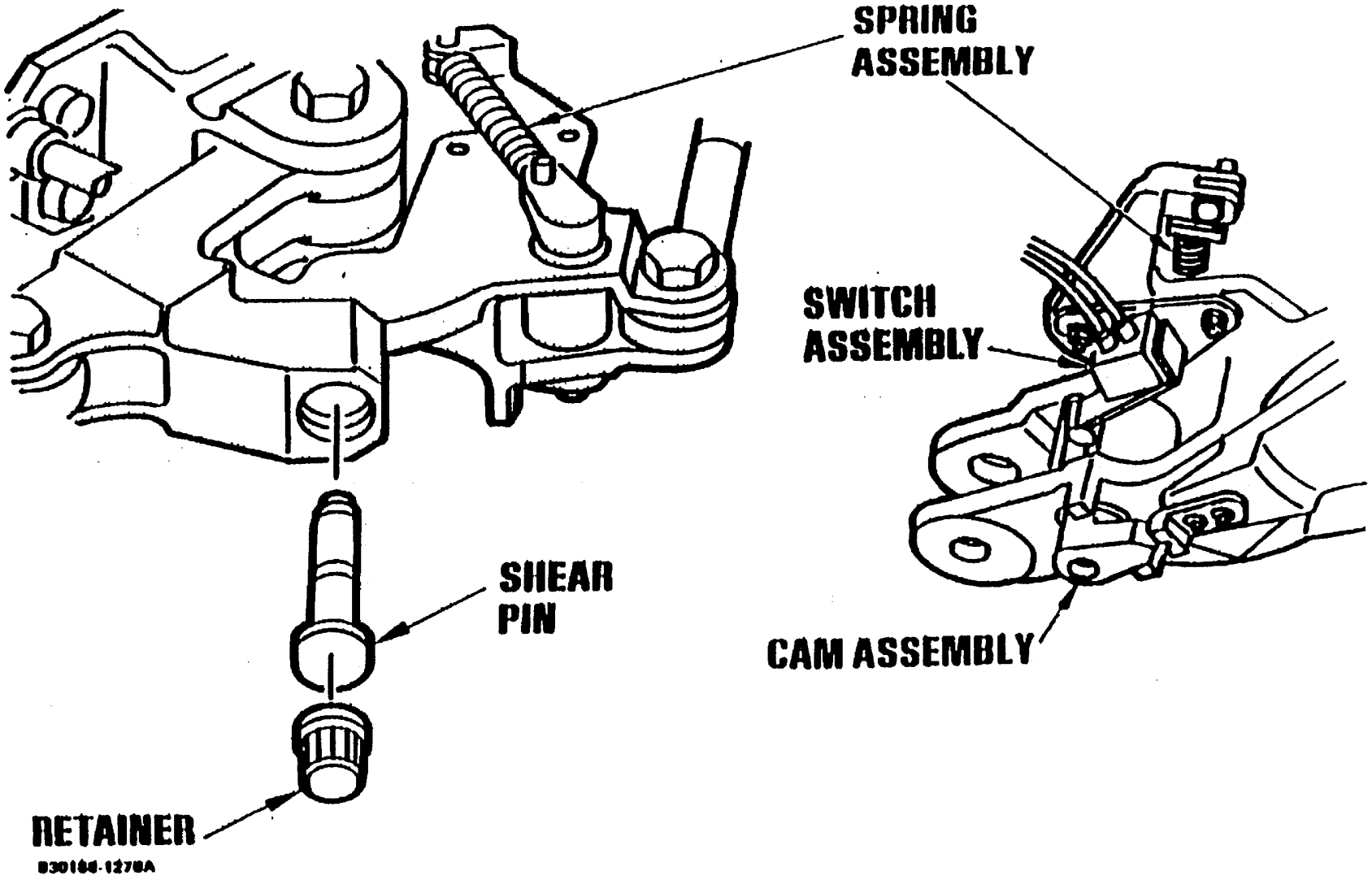

Figure 2. Typical SPAD Assembly.

(33) Install the shear pins in each SPAD Assembly in the Pilots Station. Refer to tasks 11.23 for the collective SPAD; 11.155 for the Directional SPAD; 11 .56 for the Lateral SPAD; and 11.173 for the Longitudinal SPAD.

(34) Perform a BUCS Self Test, I/A/W reference c. page P-1. Follow message prompts.

(35) Perform the DASE Interactive FD/LS Check (DASE2), I/A/W reference b., task 4-2, page 4-5. Follow the message prompts and/or any corrective action messages.

(36) If both tests pass, the inspection is complete, proceed to paragraphs 8.d. and 8.e. for re-assembly either test fails, troubleshoot I/A/W reference e.

d. Pilot station re-assembly:

CAUTION

Ensure that no fasteners, tools or debris (FOD) are allowed to drop down into any open access covers above the Gun Turret/Forward Fuel Cell. Failure to do so may require removal of the Gun Turret/ Forward Fuel Cell to retrieve foreign objects. (1) Remove the Pilots Foot Guard/Shield (7-311180008), I/A/W task 2.189. NOTE

Ensure that the LVDT connector J230 is reconnected to plug P230 (Pilots Station Collective Cover) or a "BUCS FAIL" will result, reference task 11.44.

(2) Install the Pilots Collective Stick Cover, I/A/W task 11.44.

(3) Install the SPAD Access Panel (7-311111110-25) underneath the Pilots L/H Scuff Plate position.

(4) Install the Pilots left-hand (L/H) Scuff Plate (7-311180010-19), I/A/W 2.182.

(5) Install the Pilots Cyclic Stick Cover I/A/W task 11.46. Install the panel (7-311113683-31) directly aft of the cyclic (task 11.188).

(6) Install the Pilots Seat (if removed) I/A/W task 2.161. Observe all equipment preconditions, cautions and warnings.

(7) Install the Pilots Foot Guard/Shield (7-311180008), I/A/W task 2.189.

(8) Access the Aft Avionics Bay, ensure the DASE Computer connectors P688, P686 and P682 are secure, close access door R295.

e. TM 1-1 520-238-23-T-7, Aviation Unit and Intermediate Troubleshooting Manual for army Model AH-64 Helicopter.

NOTE

Ensure that the LVDT connector J234 is re-connected to plug P234 (CPG Collective Cover) or a "BUCS Fail" will result, reference task 11.44.

(1) Install the CPG's Collective Stick Cover, task 11.44.

(2) Verify the connection of P118/J118 and secure access panel B60, L60 and B65L, I/A/W task

(3) Install the 30mm Gun Barrel into the Gun Receiver, I/A/W reference d.

f. FINAL RE-ASSEMBLY MOC:

(1) Perform a BUCS Self Test, I/A/W reference c., page P-1. Follow message prompts.

(2) Perform the DASE Interactive FD/LS Check (Dase 02) I/A/W reference b., task 4-2, page 4-5. Follow the message prompts and/or any corrective action messages.

9. Correction Procedures. Contact MDHS CFSR.

10. Supply/Parts and Disposition.

a. Parts Required. Items cited in paragraph 6 and 7 may be required to replace unserviceable items.

b. Requisitioning Instructions. Contact point of contact in paragraph 16.d. to provide units document number. Requisition replacement parts through normal supply channels using normal supply procedures. Replacement parts will be released on a priority basis. Mandatory entries on requisitions and turn-in documents are:

(1) Signal Code (CC51) shall be "C" (Charlie) or "L" (Lima).
(2) Fund Code (CC52-53) shall be "H1" (Hotel-one).
(3) Project code (CC57-59) shall be "XXX" (XXXXX-XXXXXX-XXXXXXX).

NOTE

Project code and fund codes will direct free issue of depot level repairables and consumable items addressed in safety messages. They will also provide a means to collect historical data to support future budget submissions. Use other signal codes, fund codes or project codes will result in the customer paying for the part or a requisition rejection. Codes listed in paragraph 10.b.(1) - (3) must appear on both the requisition and turn-in documents.

c. Bulk and Consumable Materials. N/A.

d. Disposition. A QDR is required. Hold any unserviceable part/component pending disposition instructions from technical/logistics point of contact per paragraph 16.

e. Disposition of Hazardous Material. N/A.

11.Special Tools, Jigs and Fixtures Required. N/A.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Contacts, Electrical, 22 AWG	MS27493-22D	5999-00-320-7459

12.Application.

a Category of Maintenance. AVUM. Aircraft downtime will be charged to AVUM.

b. Time Required.

(1) Total of 16.0 man-hours using 2 persons.
(2) Total of one day downs me for one end item.

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

d. Publications which require change as a result of this Inspection. TM 1-1520-238-23, TM 1-1520-238-T-7, TM 1-1520-238-PM, and TM 1-1520-238-10 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.

13. References

a. TM 1-1520-238-23, Aviation Unit and Intermediate Maintenance Manual for Army AH-64 Helicopter

b. TM 1-1520-238-T-1, Technical Manual Aviation Unit Maintenance Manual for Army AH-64 Helicopter Fault Detection/Location System.

c. TM 1-1520-238-CL Operator and Crewmember's Checklist for AH 64 Helicopter.

d. TM 9-1090-208-23-1 -1, Aviation Unit and Intermediate Maintenance Manual for Armament Subsystem, Helicopter: M139 Gun Automatic, 30-Millimeter: M230 Rocket Management Subsystem, Inventory - Deployment: M140.

e. TM 1 -1520-238-23-T-7, Aviation Unit and Intermediate Troubleshooting Manual for army Model AH-64 Helicopter.

14. Recording and Reporting Requirements.

a. Reporting Compliance Suspense date (Aircraft). Upon entering requirements of this message in DA Form 2408-13, forward a priority message, datafax or E-mail to Commander, ATCOM, ATTN: AMSAT-C-XS (SOF Compliance Officer), per AR 95-3. Datafax number is DSN 693-2064 or commercial (314)263-2064. E-mail address is "AMSATCXSF (AT SIGN) ST-LOUIS-EMH4.ARMY.MIL". The report will cite this message number, date of entry in DA Form 2408-13, the aircraft mission design series and serial numbers of aircraft in numerical order.

b. Task/Inspection Reporting Suspense Date (Aircraft). Upon completion of inspection, units will forward a priority message to Commander, ATCOM, ATTN: AMSAT-R-EIA. The report will cite this message number, date of inspection, aircraft serial number, aircraft and component hours, and results of the inspection. Inspection and reports will be completed no later than 10 days after task/inspection suspense date.

c. Reporting Compliance Suspense Date (Spares). Depot Commanders and others holding assets referenced in paragraph 6. shall contact by telephone or forward a priority message to the POC in paragraph 14.a. confirming message receipt.

d. Task/Inspection Reporting Suspense Date (Spares). Upon completion of the inspection depot Commanders and others holding stock shall forward a priority message report of results of this inspection to logistics point of contact in paragraph 16b. NLT 15 days after receipt of this message. The report shall include quantity on hand, Quantity which passed inspection and quantity which failed inspection.

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

(1) DA Form 2408-5, Equipment Modification Record.
(2) DA Form 2408-13, Aircraft Inspection and Maintenance Record.
(3) DA Form 2408-15, Historical Record for Aircraft.
(4) DA Form 2408-16, Aircraft Component Historical Record.
(5) DA Form 2408-18, Equipment Inspection List.
(6) DA Form 2410, Component Removal and Repair/Overhaul Record.

15. Weight and Balance. N/A

16. Points of Contact.

a. Technical point of contact for this TB is Mr. Ken Wegrzyn, AMSAT-R-EIA, DSN 693-1679 or commercial (314)263-1679.

b. Logistical point of contact for this TB is Mr. Lloyd Johnson, SFAE-AV-AAH-LS, DSN 693-1946 or commercial (314)263-1946.

c. Forms and records point of contact for this TB is Mr. Ronnie Sammons, AMSAT-I-MMD, DSN 693-1955 or commercial (314)263-1955.

d. Point of contact for this TB is Mr. Dong Nyung, AMSAT-XSOF, DSN 693-9089 or commercial (314)263-9089.

e. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should contact Mr. Ron Van Rees, AMSAV-IOA, DSN 693-2626 or commercial (314)263-2626.

f. After hours contact ATCOM Command Operations Center (COC) DSN 693-2066/7 or commercial (31 4)263-2066/7.

17. 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 Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

By Order of the Secretary of the Army:

Official:

YVONNE M. HARRISON
Administrative Assistant to the Secretary of the Army

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

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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

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

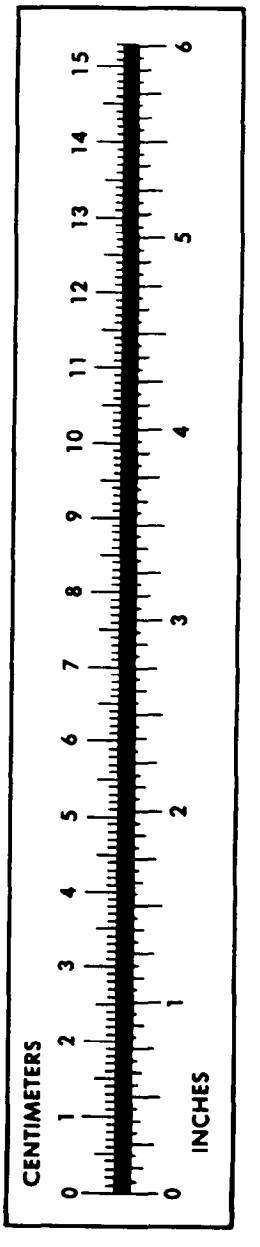
TEMPERATURE

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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