

TECHNICAL MANUAL

AVUM AND AVIM MAINTENANCE MANUAL

AH-1S (MOD)

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HEADQUARTERS
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OPERATORS MANUAL

HELICOPTER. ATTACK AH-1S

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PREFACE

P-1. General

a. This manual is the official document for Aviation Unit and Intermediate Maintenance of Army Model AH-IS Helicopters.

b. The purpose of this manual is to familiarize you with the maintenance functions to be performed at the Aviation Unit and Intermediate maintenance levels. The Table of Contents for this manual is provided to assist in determining the chapter in the manual in which individual functions are covered. This manual provides all essential information for personnel to accomplish Aviation Unit and Intermediate maintenance on the complete airframe, its components, and systems, excluding armament and avionics subsystem as indicated for Aviation Unit and Intermediate maintenance activities in the Maintenance Allocation chart (MAC). (Refer to Appendix B).

P-2. Quality Assurance/Quality Control(QA/QC).

Information not available.

P-3. Description.

The AH-IS helicopter is a two-place assault type helicopter with a narrow fuselage, single main and tail rotors, short wings, and provisions for a variety of armament. The forward fuselage is built up on two main longitudinal beams with lateral bulkheads, floors, shear panels, and decks of honeycomb panel construction, forming a box beam. Crew compartments are arranged in tandem, with the pilot seated behind and above the gunner, and are covered by a transparent canopy with two doors. Both doors are sections of the canopy, hinged at top, with the gunner's door opening at left and the pilot's door opening at right side. Both seats are protected by armor on backs, seats, and sides of supports. The compartment area is ventilated by forced air from a transmission-driven blower. The short wings provide support for armament mounting pylons and also aid maneuverability by providing lift at higher air speeds.

a. *Tail Boom Section.* The tail boom section, attached to the forward fuselage by four bolts, is a tapered semimonocoque structure with a vertical fin slanting up and aft at the rear end to support the tail rotor. Tail rotor drive shafts and gear

boxes are mounted under covers along the top of the tail boom and front of the vertical fin. A controllable elevator is also mounted on the tail boom.

b. *Propulsion System.* The propulsion system consists of a gas turbine engine, main drive shaft, transmission and mast, main rotor, and the tail rotor with its drive shafts and gear boxes. The transmission and engine are mounted on the forward fuselage aft of the crew compartment, and covered by cowlings and fairing. The engine drives the transmission through the short main drive shaft, rotating the mast and main rotor. Power is also taken off from the transmission to drive the tail rotor, which compensates for main rotor torque to control the helicopter heading. Fuel tanks consist of two interconnected cells, located in the forward fuselage.

c. *Flight Controls.* Flight controls are direct mechanical linkages from sticks and pedals at pilot's and gunner's stations, assisted by hydraulic cylinders powered by transmission-driven hydraulic pumps. A stabilization and control augmentation system is also incorporated in the control linkage to steady the helicopter during use of armament.

d. *Armament Provisions.* Armament provisions include mounting, wiring and hydraulic lines for an armament turret under the forward end of the fuselage, an ammunition compartment immediately aft of the turret location, sights and control panels at crew stations, and mounting pylons for external armament pods on each wing.

e. *Landing Gear.* Landing gear is skid type, with arched cross tubes attached to the fuselage. Exposed portions of cross tubes are covered by streamlined fairings to reduce drag. A tail skid is provided to protect the aft end of the tail boom during a tail-low landing.

P-4. Reporting of Errors.

Every effort is made to keep this publication current and error free. Review conferences with using personnel, and a constant review of accident and flight test reports assure inclusion of the latest data in this publication. However, we cannot correct an error unless we know of its existence. In this regard it is essential that you do your part. Reports of errors, omissions, and recommendations

for improving this publication by you are encouraged. Your letter or DA Form 2028, Recommended Changes to Publications and Blank Forms should be mailed to Commander, U.S. Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798.

P-5. Destruction of Army Material To Prevent Enemy Use.

For destructions of Army materiel to prevent enemy use, refer to TM750-244-1-5.

P-6. Maintenance of Forms and Records.

Maintenance of forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed I by DA Pam 738-751.

P-7. Authority For Substitution.

Substitution or interchange of items of materiel for maintenance of Department of the Army aircraft shall not be authorized, nor shall orders be issued for shipment. Substitution or interchangeability shall only be authorized by US Army Aviation Systems Command.

P-8. Special Tools and Equipment.

Aviation Unit and Intermediate maintenance special tools and equipment will be found in TM55-1520-234-23P (RPSTL) manual. Use of special tools and equipment for complex tasks is described in this manual.

P-9. Calibration.

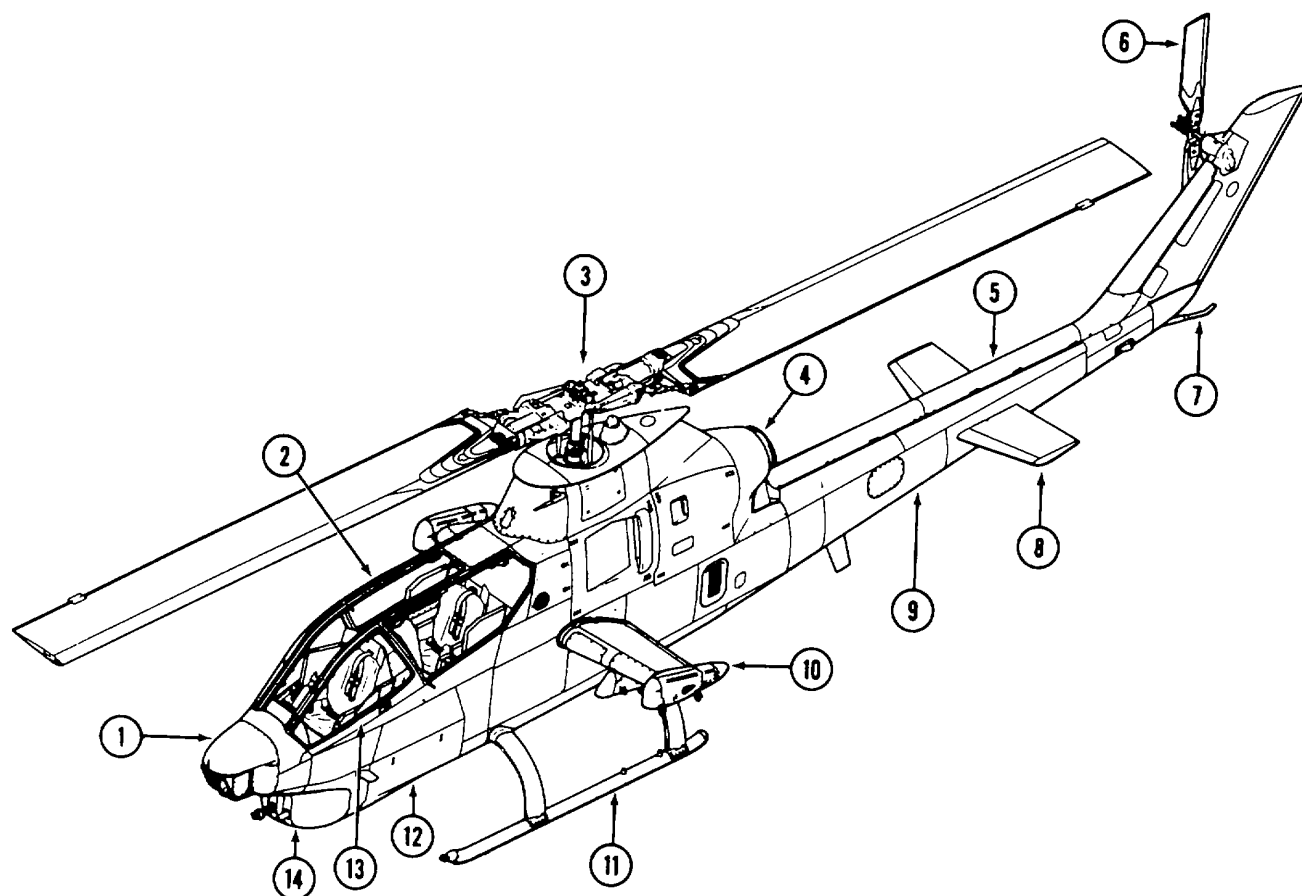
Equipment requiring calibration shall be indicated and reference made to a publication(s) containing the applicable procedures.

a. Aircraft components, accessories, and instruments requiring calibration shall be specified in Chapter 1.

b. Special tools and test equipment shall be calibrated as specified in TB 750-25, Army Metrology and Calibration System.

P-10. Storage.

Refer to TM740-90-1 and Appendix E for Storage of Aircraft.



- | | |
|----------------------------------|----------------------------|
| 1. Forward Fuselage | 8. Controllable Elevator |
| 2. Pilot Door | 9. Tailboom |
| 3. Main Rotor | 10. Wings |
| 4. Engine | 11. Landing Gear |
| 5. Tail Rotor Drive Shaft Covers | 12. Ammunition Compartment |
| 6. Tail Rotor | 13. Gunner Door |
| 7. Tail Skid | 14. Armament Turret |

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Figure P-1. AH-1S Helicopter

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CHAPTER 1 AIRCRAFT GENERAL

Section I. SERVICING

1-1. Servicing - General.

Servicing information and procedures are presented by systems or components in the following paragraphs. Points used in frequent servicing and replenishment of fuels, oils, hydraulic fluid and other materials are shown on a diagram. (See figure 1-1.)

1-2. Fuel System Servicing.

The fuel supply tank consists of two cells, located in the fuselage forward and aft of the wings, interconnected by a crossover and vented through a common outlet line. Each cell has a sump and a fuel pump with drains (1 and 2, figure 1-1) accessible through doors in the fuselage lower skin. The fuel tank filler cap (12) and static ground receptacle (11) serve both tanks. **TOTAL TANK CAPACITY FOR FUEL SYSTEM IS 262 U.S. GALLONS AND NORMAL SERVICE CAPACITY IS 260 U.S. GALLONS.**

WARNING

Servicing personnel shall comply with all safety precautions and procedures specified in FM 10-68 Aircraft Refueling field manual.

NOTE

The fuel system can be serviced by either closed circuit or gravity system.

a. Closed Circuit Refueling (Power Off).

- (1) Refer to Figure 1-1 for fuel filler location.
- (2) Assure fire guard is in position with fire extinguisher.
- (3) Ground servicing unit to ground stake.
- (4) Ground servicing unit to helicopter.
- (5) Ground fuel nozzle to ground receptacle, located adjacent to fuel receptacle on helicopter.
- (6) Remove fuel filler cap, and assure refueling module is in locked position. Refer to figure 1-1A.
- (7) Remove nozzle cap, insert nozzle into fuel receptacle, and lock into position.

(8) Activate flow control handle to ON or FLOW position. Fuel flow will automatically shutoff when fuel cell is full. Just prior to normal shutoff, fuel flow may cycle several times, as maximum fuel level is reached.

(9) Assure flow control handle is in OFF or NO FLOW position and remove nozzle.

(10) Replace fuel nozzle cap.

(11) Replace fuel filler cap.

(12) Disconnect fuel nozzle ground.

(13) Disconnect ground from helicopter to servicing unit.

(14) Disconnect servicing unit ground from ground stake.

(15) Return fire extinguisher to designated location.

b. Gravity or Open-Port Refueling (Power Off).

(1) Refer to figure 1-1 for fuel filler location.

(2) Assure that fire guard is in position with fire extinguisher.

(3) Ground servicing unit to ground stake.

(4) Ground servicing unit to helicopter.

(5) Ground fuel nozzle to ground receptacle located adjacent to fuel receptacle on helicopter.

(6) Remove fuel filler cap.

(7) Using latch tool, attached to filler cap cable open refueling module if equipped with closed circuit receptacle. Refer to figure 1-1A.

(8) Remove nozzle cap and insert nozzle into fuel receptacle.

(9) Activate flow control handle to ON or FLOW position.

(10) Assure flow control handle is in OFF or NO FLOW position and remove nozzle.

(11) Replace fuel nozzle cap.

(12) Close refueling module by pulling cable until latch is in locked position, if equipped with closed circuit receptacle. Refer to figure 1-1A.

(13) Replace fuel filler cap.

(14) Disconnect fuel nozzle ground.

(15) Disconnect ground from helicopter to servicing unit.

(16) Disconnect servicing unit ground from ground stake.

(17) Return fire extinguisher to designated location.

b-A. RAPID (HOT) Refueling (Closed Circuit).

(1) Before RAPID Refueling.

(a) IDLE.

(b) FORCE TRIM Switch - FORCE TRIM.

WARNING

In case of helicopter fire, observe fire emergency procedures in Chapter 9 of TM55-1520-234-10.

(2) During RAPID Refueling. A crewmember shall observe the refueling operation (performed by authorized refueling personnel) and stand fireguard as required. One crewmember shall remain in the helicopter to monitor controls. Only emergency radio transmission should be made during rapid refueling.

(3) Refer to figure 1-1 for fuel filler location.

(4) Assure fireguard is in position with fire extinguisher.

(5) Ground servicing unit to ground stake.

(6) Ground servicing unit to helicopter.

(7) Ground fuel nozzle to ground receptacle located adjacent to fuel receptacle on helicopter.

(8) Remove fuel filler cap, and assure refueling module is in closed position. Refer to figure 1-1A.

(9) Remove nozzle cap and insert nozzle into fuel receptacle and lock into position.

(10) Activate flow control handle to ON or FLOW position. Fuel flow will automatically shutoff when fuel cell is full. Just prior to normal shutoff, fuel flow may cycle several times, as maximum fuel level is reached.

(11) Assure flow control handle is in OFF or NO FLOW position and remove nozzle.

(12) Replace fuel nozzle cap.

(13) Replace fuel filler cap.

(14) Disconnect fuel nozzle ground.

(15) Disconnect ground from helicopter to servicing unit. AFTER RAPID FUELING. The pilot shall be advised, by the refueling crew, that fuel cap is secure and grounding cables have been removed.

(16) Disconnect servicing unit ground from ground stake.

(17) Return fire extinguisher to designated location.

b-B. RAPID (HOT) GRAVITY Refueling.

(1) Before RAPID Refueling.

(a) Throttle - IDLE.

(b) FORCE TRIM Switch - FORCE TRIM.

WARNING

In case of helicopter fire, observe fire emergency procedures in Chapter 9 of TM55-1520-234-10.

(2) During RAPID Refueling. A crewmember, shall observe refueling operation (performed by authorized refueling personnel) and stand fireguard as required. One crewmember shall remain in the helicopter to monitor controls. Only emergency radio transmission should be made during rapid refueling.

(3) Refer to figure 1-1 for fuel filler location.

(4) Assure fireguard is in position with fire extinguisher.

(5) Ground servicing unit to ground stake.

(6) Ground servicing unit to helicopter.

(7) Ground fuel nozzle to ground receptacle located adjacent to fuel receptacle on helicopter.

(8) Remove fuel filler cap.

(9) Using latch tool attached to filler cap cable, open refueling module if equipped with closed circuit rapid refueling receptacle. Refer to figure 1-1A.

WARNING

During RAPID GRAVITY Refueling, exercise extreme caution to prevent fuel splashing from fuel cell or fuel nozzle. Any fuel leakage could be extremely hazardous if ingested into engine air intake.

(10) Remove nozzle cap and insert nozzle into fuel receptacle.

(11) Activate flow control handle to ON or FLOW position. Fuel flow will automatically shutoff when cell is full.

(12) Assure flow control handle is in OFF or NO FLOW position and remove nozzle. Close refueling module by pulling cable until latch is in locked position, if equipped with closed circuit receptacle. Refer to figure 1-1A.

- (13) Replace fuel nozzle cap.
- (14) Replace fuel filler cap.
- (15) Disconnect fuel nozzle ground.
- (16) Disconnect ground from helicopter to servicing unit. AFTER RAPID FUELING. The pilot shall be advised, by the refueling crew, that fuel cap is secure and grounding cables have been removed.
- (17) Disconnect servicing unit ground from ground stake.
- (18) Return fire extinguisher to designated location.

c. *Defueling.*

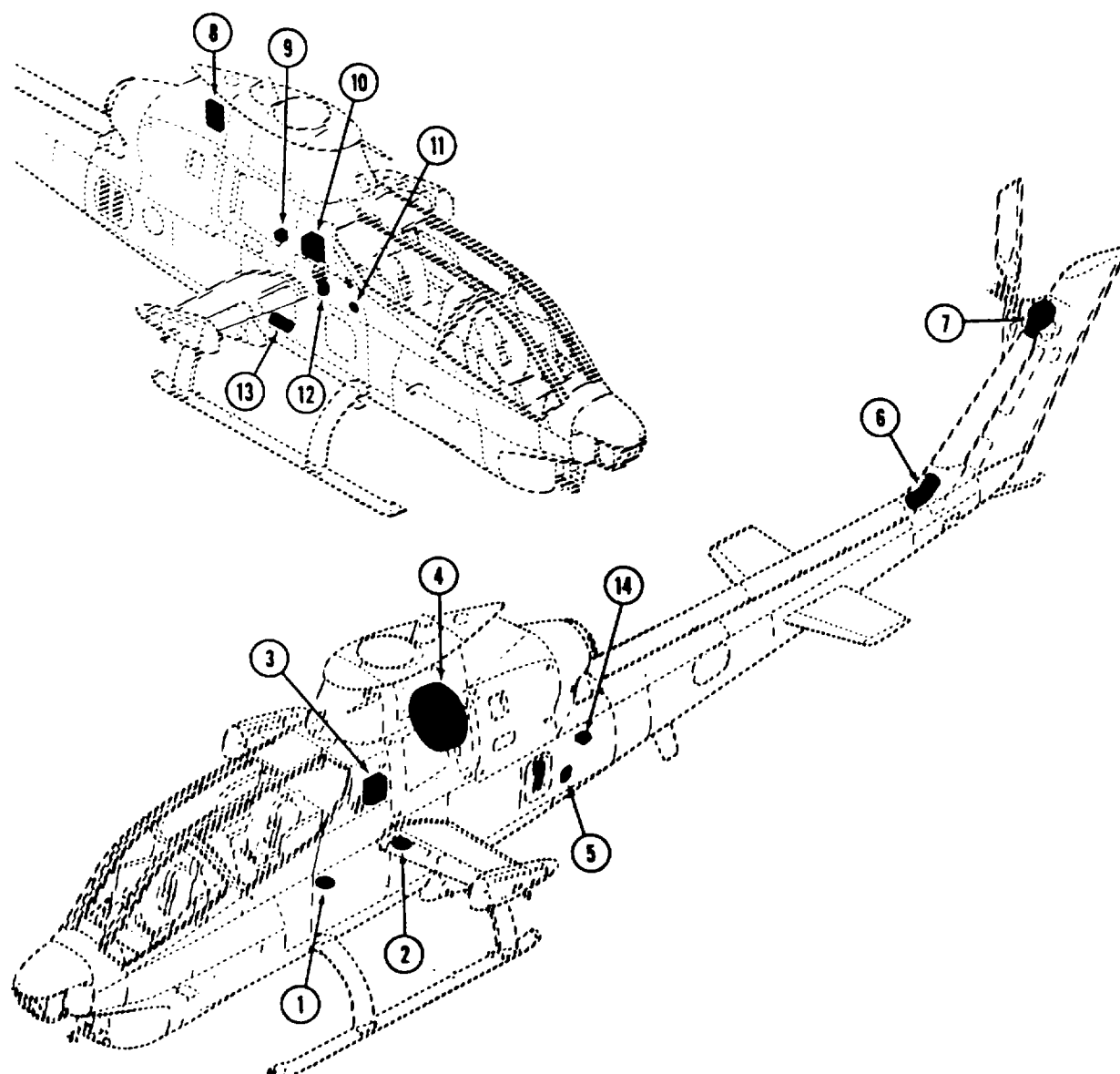
- (1) Remove drain valve from aft fuel cell.

NOTE

Aft fuel drain valve assembly is a two piece valve which will automatically close valve opening when lower valve is removed. Refer to FM 10-68 for defueling procedures.

- (2) Install MS24392D12 fitting, with flexible hose installed, in valve assembly in bottom of cell. Valve will open as fitting is being installed.

- (3) After defueling, remove MS24392D12 fitting. Install lower section of valve and lockwire.



- 1. Fuel Tank Drain, Forward
- 2. Fuel Tank Drain, Aft
- 3. Hydraulic Reservoir, Left Side
- 4. Particle Separator
- 5. External Power Receptacle
- 6. 42 Degree Gearbox
- 7. 90 Degree Gearbox

- 8. Engine Oil Tank
- 9. Transmission Oil Sump
- 10. Hydraulic Reservoir, Right Side
- 11. Static Ground Receptacle
- 12. Fuel Tank Filler Cap
- 13. Emergency Collective Accumulator
- 14. Battery

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Figure 1-1. Servicing points diagram

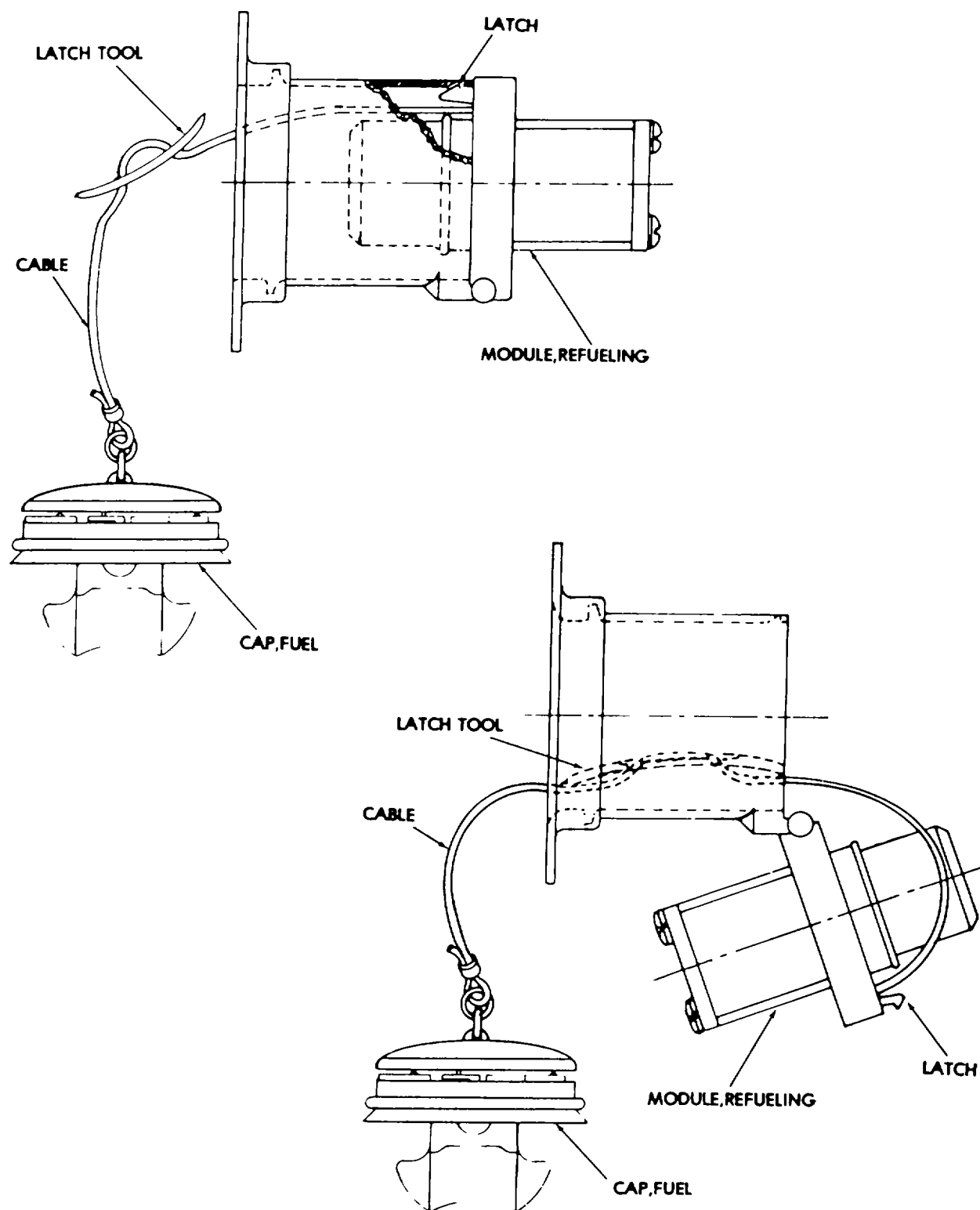


Figure 1-1A. Closed Circuit Refueling System