



GENERAL MAINTENANCE MANUAL

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The purpose of this General Maintenance Manual (GMM) is to provide comprehensive instruction to those maintaining Yankee Air Force (YAF) aircraft.

This manual will describe YAF's aircraft, and how they are operated; the organizational structure of the maintenance operation, those within that structure and their responsibilities. It will describe the workforce and their training; the aircraft maintenance program, and the record keeping process. It will provide samples of documents used and their instructions for use, which can be found in the attachments to this manual.

Additional subject matter, important to the overall maintenance operation will also be presented.

The general repair or alteration of products will be performed in accordance with current FAR's, manufacturers data, drawings, specifications, bulletins, and other technical data approved by the administrator.

This GMM supplements the YAF General Operations Manual (GOM) and serves to define the maintenance requirements and describe the policies and procedures, none of which are contrary to any applicable Federal Regulation (*CFR Title 14, Chapter 1*).

This GMM has been written for use by all members of the YAF aircraft maintenance workforce in the course of their duties of maintaining YAF aircraft.

All members of this workforce are required to be familiar with this manual and will comply with its contents. The Director of Maintenance will ensure that a copy of this manual is readily available for review at the hangar, and that a copy is kept aboard all YAF aircraft.

This manual will also be accessible on the YAF flight operations web page.

<https://sites.google.com/yankeeairmuseum.org/flightops>

A copy of this manual, including all changes and updates, has been furnished to and has been coordinated with the East Michigan FSDO.

This manual is applicable to all maintenance operations of all YAF flyable aircraft.

Conflicts with existing policies or regulations, or suggestions for improvement, are to be brought to the attention of the Director of Maintenance.

All personnel within YAF aircraft maintenance operations are expected to suggest revision of this manual when the need is apparent. An appendix to this manual describes the revision process.

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Yankee Air Force

Kevin Walsh
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Yankee Air Force

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YANKEE AIR FORCE AIRCRAFT

Following is a listing of the aircraft which are owned and operated by YAF and maintained under this General Maintenance Manual.

<u>Manufacturer</u>	<u>Model</u>	<u>Mfr Date</u>	<u>Serial Number</u>	<u>Registration</u>	<u>Classification</u>	<u>Operation</u>
Boeing	B-17G	1944	77255	N3193G	Limited	LHFE
North American	B-25D/C-35 (B-25C)	1943	43-3634	N3774	Limited	LHFE
Bell	UH-1H	1966	66- 01126	N240GH	Experimental	LHFE
Douglas	C47 (DC3C-S4C4G)	1944	33048	N8704	Standard	Air Tour LOA
Ford	4-AT-B	1928	42	N9610	Standard	Air Tour LOA

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AIRCRAFT MAINTENANCE
ORGANIZATIONAL STRUCTURE

AIRCRAFT MAINTENANCE ORGANIZATIONAL STRUCTURE

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Director of Maintenance

A Director of Maintenance (DOM) is responsible for oversight of YAF's aircraft. In doing so, regular vigilance must be maintained over the current condition of the aircraft, inspection schedule status, calendar & time items, AD compliance, and maintenance progress.

The DOM also supervises the workforce in the accomplishment of varied tasks, all interrelated to the airworthiness of these aircraft. Prioritizing these tasks and assigning same to qualified individuals of the workforce, while confirming licensed supervision as required, proper maintenance recordkeeping, and satisfactory job completion are all included in DOM responsibilities.

Lead Mechanic

A Lead Mechanic (LM) assists the DOM and may be delegated all of the same responsibilities. The Lead Mechanic will assume these responsibilities in the DOM's absence.

Crew Chief

Crew Chiefs are responsible for the aircraft of which they are assigned and are expected to report aircraft status to the DOM.

******A more detailed description of Duties, Responsibilities and Job Qualifications for each of these positions can be found in the YAF General Operations Manual.

Parts Room Managers

An important component of aircraft maintenance is the procurement, repair of, and organization of spare parts. This inventory and control of spares is handled by the Parts Room Manager(s).

The Parts Room Managers forward component purchase and repair requests, inventory updates, supplies status, and such to the DOM (See Parts Management section of this Manual).



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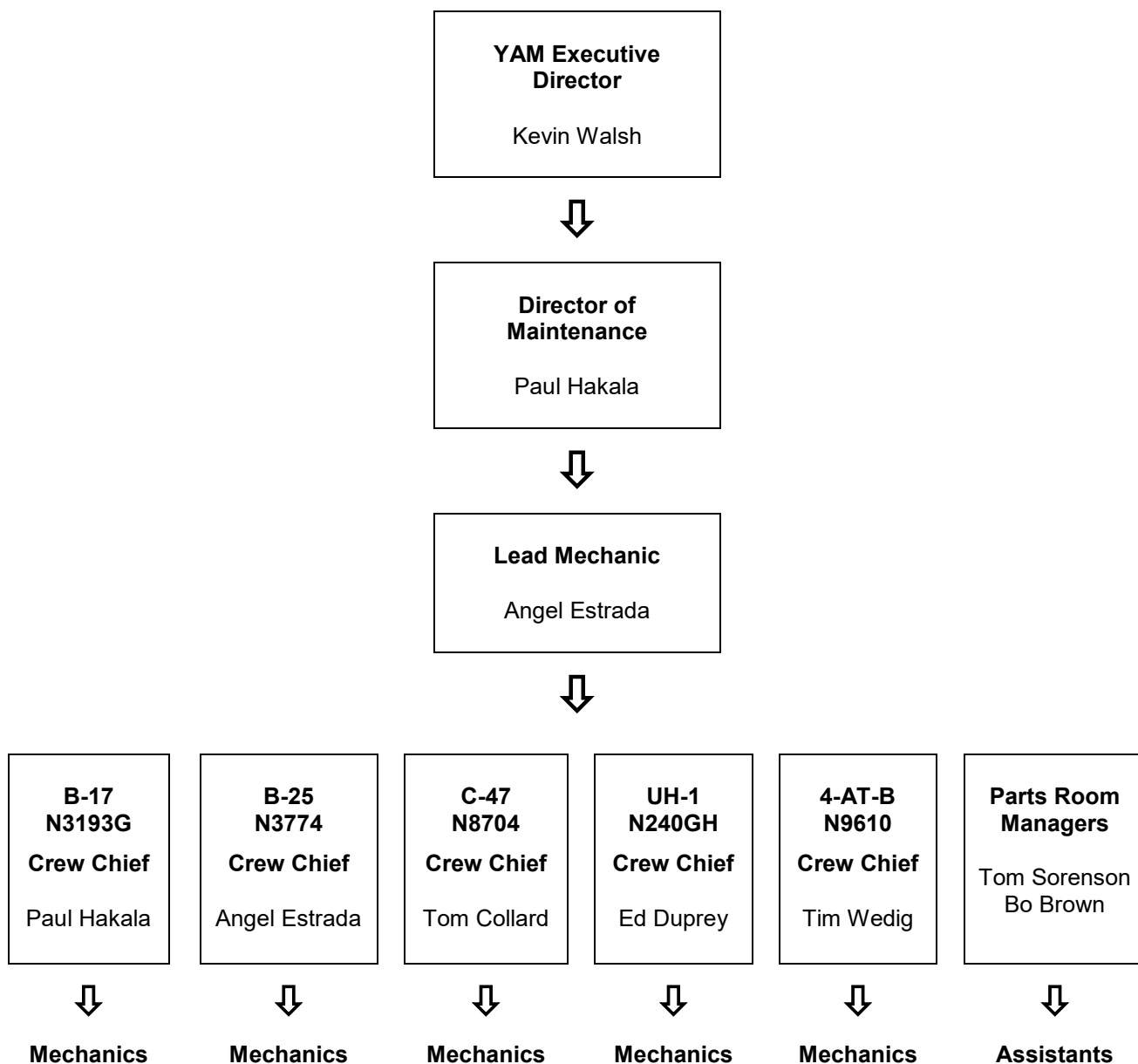
Aircraft Maintenance Organizational Chart

The following page presents the individuals in these positions in a hierarchal organizational chart format. Some names appear more than once as the responsibilities of these individuals vary.

Each of the aircraft maintenance crew chiefs are designated as the responsible person for that specific aircraft.

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AIRCRAFT MAINTENANCE ORGANIZATIONAL CHART



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WORKFORCE

WORKFORCE

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Workforce

The YAF aircraft maintenance workforce is all inclusive, made up of mechanics and support workers, which include compensated staff and volunteers.

Objective

The ultimate objective of the YAF aircraft maintenance workforce is to ensure that the aircraft are in a safe and airworthy condition for flight, and to provide support of the flight operations as necessary.

Maintenance Crew

The regular staff is made up of a Director of Maintenance (DOM), a Lead Mechanic (LM) and a Crew Chief (CC).

Licensed volunteer mechanics are assigned the crew chief positions on the remaining aircraft.

The aircraft maintenance crew (mechanics) is comprised of those individuals that actually perform work on the aircraft.

A number of the mechanics, including all of the paid staff, hold an FAA mechanic certificate with airframe and powerplant (A&P) ratings, while some of the mechanics are unlicensed.

The support staff includes aircraft parts room management and facilities upkeep.

Work Schedule

YAF aircraft maintenance regular staff works a full-time work week, while the volunteers have varied part-time work schedules.

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Responsibilities

The Director of Maintenance, Lead Mechanic and Crew Chiefs assign tasks and provide direction to the members of the aircraft maintenance workforce.

The unlicensed mechanics assist by preparing the aircraft for inspection, correcting discrepancies, servicing and performing functional checks, all under the supervision of a licensed mechanic (*Ref. § 65.81*).

Any inspection items within the inspection programs will be signed off only by the licensed mechanic.

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TRAINING OF WORKFORCE

TRAINING OF WORKFORCE

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TRAINING OF WORKFORCE

Ground School

YAF classroom training of the aircraft maintenance workforce currently is comprised of annual ground schools. These ground schools are aircraft specific, with each being presented on a different day, by varied instructors.

Subjects covered include the detailed description of all aircraft systems and associated component locations, normal and abnormal operations of these systems, and common faults and troubleshooting.

This ground school originated as a pilot preparatory and recurrent training requirement, but has always been attended by maintenance staff. Over the years, often because of input from the mechanics, it has evolved to provide more of a well rounded training presentation for both operations and maintenance, no longer only focusing on the regulatory requirements for the pilots.

Interaction between pilots and mechanics during these sessions has proven educational for both, adding value to this combined training.

Some of the non-aircraft specific subject matter presented during this ground school includes YAF policies and organization, the General Operations Manual, this General Maintenance Manual, YAF's Safety Management System, and FAA regulations.

In Cabin Crew Training

In supplement of the annual ground schools, aircraft flight crewmembers receive specialized, practical "In-Cabin Crew Training" which addresses normal procedures during ground, flight and passenger operations; abnormal and emergency procedures during airborne operations, and emergency evacuation. All mechanics participate in this training.

Records of attending the ground school and cabin crew training are filed and maintained within the museum. [See Example of Cabin Crew Training Record in Attachments Section of this Manual]

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TRAINING OF WORKFORCE

On the Job Training

Much of the hands-on maintenance training currently in use has been, and will continue to be of the On-the-Job (OJT) type. This includes reference to applicable maintenance manuals, verbal instruction, demonstration, then practical application. The value of actual hands-on experience cannot be overstated.

OJT training is logged in personal folders for each mechanic. These training records are filed at the hangar. [See Example of Aircraft Maintenance Training Record in Attachments Section of this Manual]

Upcoming Training

Additional classroom training courses, are currently being developed, will be included in the aircraft maintenance training program and will be presented as they are completed.

These will address general aircraft maintenance procedures, as well as aircraft specific subject matter.

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FAA REGULATION UNDER WHICH
YAF AIRCRAFT ARE OPERATED

FAA REGULATIONS UNDER WHICH YAF AIRCRAFT ARE OPERATED

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FAA REGULATION UNDER WHICH
YAF AIRCRAFT ARE OPERATED

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Aircraft Use

Rides and walk-through tours are given to the general public in YAF aircraft; these aircraft make air show appearances, and perform overflights; and they are used for special projects, such as movies and event static displays.

Authorization

The B-17, B-25 & UH-1 are all operated under an FAA-granted exemption which allows YAF to carry passengers for compensation or hire, which they would not normally be allowed to do per the limited or experimental classification of these aircraft.

This authorization is in accordance with the FAA Policy for Living History Flight Experiences (LHFE), and is subject to the conditions and limitations described within the exemption. An aircraft has to meet certain eligibility requirements to operate under a LHFE. In addition, the exemption is effective for a limited period, has an expiration date, and must be renewed periodically.

YAF's C47 & 4-AT-B both have a standard airworthiness certificate. A Letter of Authorization (LOA) was required from the FAA to use these aircraft to give sightseeing rides for compensation. Random Drug/Alcohol testing is required of licensed mechanics and pilots maintaining or operating these aircraft under the LOA. This Letter of Authorization has no expiration date.

The above mentioned documents (*LHFE exemption, LOA, drug/alcohol test records*) are all maintained and filed in YAF main office.

Copies of the LHFE and the LOA are also included with other important documents onboard the associated aircraft.

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HOW THE AIRCRAFT
ARE MAINTAINED

HOW THE AIRCRAFT ARE MAINTAINED

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How the Aircraft are Maintained

The ultimate objective of the YAF aircraft maintenance workforce is to insure that the aircraft which they are responsible for are in a safe and airworthy condition for flight.

This is accomplished by performing regularly scheduled inspections; the completion of repairs based on inspection findings; and the compliance with airworthiness directives, mandatory service bulletins, and instructions for continued airworthiness (*ICA as stated in applicable FAA Forms 337*).

Inspection Programs

Each aircraft is maintained in accordance with the inspection program selected for that specific aircraft.

- YAF's Boeing B-17, North American B-25, and Douglas C-47 are all maintained under individual FAA Approved Aircraft Inspection Programs (AAIP) which have been developed by YAF and are unique and specific to the aircraft for which they are intended.
- YAF's Bell UH-1 is maintained under an FAA Approved Aircraft Inspection Program (AAIP) based upon the military U.S. Army Phased Maintenance Inspection Program.
- YAF's Ford 4-AT-B is maintained by means of an Annual and 100-Hour Inspection program per Appendix D to FAR Part 43.

Inspection Package

Checklists and forms found within these inspection programs describe and offer instruction for the maintenance crew in accomplishing the inspection items and functional checks.

Forms for recording inspection findings, known as Discrepancy Sheets become part of the inspection package. The Discrepancy Sheets are used primarily during maintenance on the fixed wing aircraft. (See Completion of the Discrepancy Sheet in Record Keeping section of this Manual)

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The UH-1H Phase Inspection Checklist incorporates a section to record inspection findings, and is the rotary wing equivalent of the Discrepancy Sheet. (See Completion of the Phase Inspection Checklist in Record Keeping section of this Manual)

These along with regular reference to the manufacturers' technical documents (*maintenance & operator's manuals, parts catalog and structural repair manual*), as well as FAA Advisory Circular 43.13-1B, provide essential information necessary for maintaining the aircraft.

The inspection package consists of:

- The required inspection checklists
- Forms of which results of checks associated with the inspection are recorded
- Discrepancy sheets describing inspection findings and corrective actions
- Any other checklists or forms used during the inspection that are of value, such as prop removal/install checklist

The inspection package when complete, checklists signed off, and all appropriate logbook entries made, is filed with the associated aircraft's inspection records.

Record of inspection completion and any component changes that are specific to an engine or propeller of the fixed wing, or powertrain component of the rotary wing, will be entered in the associated Logbook or Component Historical Service Record.

Completion of inspections performed is recorded as a log entry on the current Flight Log sheet for the fixed wing aircraft, and within the Helicopter Maintenance Log for the rotary wing aircraft.

The entry will identify:

- The inspection(s) performed
- List any airworthiness directive complied with
- Calendar date and time items were accomplished
- Describe other significant maintenance actions such as component changes

The licensed mechanic certifying the aircraft to be found in a condition for safe operation will complete the entry by signing, dating, and entering the aircraft total time, his certificate type and number.

The inspection package is retained for one year, after which it is placed into a historical file, separate from current files.

The entries onto the airplane Flight Log sheet, and into the Helicopter Maintenance Log book become a part of the permanent records for the life of the aircraft.

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Maintenance Classifications

Maintenance performed on YAF aircraft is classified as either scheduled or unscheduled.

Scheduled Maintenance is performed at prescribed intervals, measured either by accumulated calendar days, aircraft flight hours, or cycles. Replacement of life-limited components is included under scheduled maintenance.

YAF's fixed wing aircraft utilize a Calendar & Time Item form, whereas the rotary wing aircraft uses an Equipment Inspection List (Form 2408-18) to manage this maintenance.

All YAF aircraft have an Airworthiness Directive Compliance Record or Report.

Though information may be displayed differently on these documents, the purpose of each is to list and track recurrent maintenance. This includes inspections, servicing, equipment certification, checks and tests.

These important documents display current compliance status, provide due times, are updated whenever listed items are accomplished, and must absolutely be kept current.

These forms are filed with the associated aircraft's inspection records and are retained and transferred with other records when the aircraft changes ownership.

Unscheduled Maintenance consists of tasks generated by inspection and scheduled maintenance findings, pilot discrepancy write-ups, or other observations identifying a need for maintenance. Unscheduled maintenance is a reactive measure to restore airworthiness of the aircraft.

Jacking the Aircraft

Certain maintenance procedures require raising the aircraft off of the floor, or jacking the aircraft. Repairs, or functional checks of the landing gear, tire and/or brake changes, and weighing the aircraft are some examples.

As with any maintenance procedure, risks are involved and certain precautions must be taken. The maintenance manual will be referred to for these precautions and in identifying jacking points, lifting, and weighing procedures. The structural repair manual may provide additional useful information related to jacking point locations.

A minimum of four people should be involved in jacking YAF's fixed wing aircraft, and five people for the UH1 helicopter.

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The fixed wing aircraft require three jacks for this operation, whereas the helicopter requires four jacks. One person will be positioned at, and control each hydraulic jack, while one person supervises and oversees the operation.

Both while raising and lowering the aircraft, the supervisor is responsible for observing the operation to ensure even, level movement of the aircraft, while communicating progress and adjustments to the jack operators.

Daily Check

Daily checks will be accomplished of each aircraft regardless of whether or not flights are scheduled for that day. This check is a cursory inspection to look for abnormalities or damage. As continuous surveillance of the aircraft is impractical, the value of the daily check is realized when a flat strut or tire is observed; a puddle of fuel, oil or hydraulic fluid is discovered; or physical damage is found.

Similar in importance to a post-flight check of an aircraft, the daily check allows the maintenance crew time to correct a problem, rather than to find it during a pre-flight check when a flight is scheduled and repair time is limited.

The post-flight check list can be referenced in performing the daily check, with only verbal confirmation of completion required. If discrepancies are discovered, they will be recorded in the usual manner.

Maintenance Away from Home Base

Special operational considerations must be taken when operating YAF aircraft at a location other than home base, especially where the aircraft is left unattended overnight.

The preflight inspection performed when in this situation must be more thorough than that performed when operating out of a secure hangar at Willow Run.

Though these are all areas typically checked during a preflight, special attention should be given to the interior of landing gear wheel wells, the accessible areas of nacelles and cowling for blown-in debris or trash, and of the aircraft exterior for evidence of damage caused by a vehicle, another aircraft, or ground support equipment contact. If subjected to extreme weather such as hail or gusting winds, special focus on flight control surfaces and systems must be included.

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If an aircraft requires any type of unexpected maintenance while away from the home base, and the accompanying crew members don't include a licensed mechanic, the Pilot-in-Command (PIC) will contact the DOM to discuss the discrepancy and the proper course of action to be taken.

Flight Scheduling

The YAF flying season typically runs from April through October, with the major scheduled maintenance/inspections, commencing when the season is over.

Consideration of scheduled maintenance is part of the YAF flight season booking process to provide ample time in which to accomplish the lesser inspections within the flying schedule.

Careful forethought is also exercised in an effort to avoid overextending when scheduling aircraft. This is to avoid a situation where the accumulating flight hours approach the due time of a major inspection prior to completing flying commitments, risking possible last minute cancellations.

Extension Request

If however, it becomes apparent that due to unforeseen circumstances, the aircraft flight hours approach the inspection due time sooner than expected, and downtime required to accomplish such an inspection would significantly impact the scheduled flying, a request for an extension of the inspection due time must be submitted as soon as possible to the local FSDO. This request should be made by means of an email sent to YAF's assigned Principal Maintenance Inspector. It is understood that an extension approval from the FSDO is by no means guaranteed.

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35.5.1
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WORK ASSIGNMENTS

WORK ASSIGNMENTS

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35.5.2
Original
WORK ASSIGNMENTS

Maintenance Briefing

As often as possible, on a daily basis, the regular aircraft maintenance staff will meet informally at the beginning of the work day to discuss progress on the aircraft of which they are responsible for.

The discussion generally consists of a preliminary plan for the day, which includes upcoming flight and maintenance schedules, planned and ongoing maintenance, parts needs, volunteer task assignments, problems encountered, etc.

The requirement for oversight of maintenance being performed by unlicensed individuals is emphasized, but also the opportunities for on-the-job (OJT) training for the same individuals.

Maintenance Staff

The YAF maintenance staff is made up of a Director of Maintenance, a Lead Mechanic and Crew Chiefs. All of these individuals hold an FAA issued mechanics license with Airframe and Powerplant ratings.

Volunteers make up the remainder of the aircraft maintenance workforce.

Work Assignment

Staff and volunteers will receive their daily assignments verbally from the Director of Maintenance, or in his absence, the Lead Mechanic and Crew Chiefs.

As daily volunteer work schedules can be irregular, volunteers showing up later in the day are expected to report to the crew chief of the aircraft which they have been working on, or to the Director of Maintenance for assignment.



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WORK ASSIGNMENTS

Responsibilities

Any individual who has been assigned an aircraft maintenance task, shall always refer to the applicable technical publication for instructions as required. If instructions are unclear, do not exist, or the task proves to be exceptionally challenging, it is essential that experienced mechanics be consulted with before proceeding.

This should always be the approach for all aircraft maintenance crewmembers within the hangar, if found in a similar dilemma.

During extensive maintenance, or complex work that cannot be completed prior to leaving for the day, both volunteers and paid mechanics are asked to complete a Work Progress Turnover Form before departing. (See Work Turnover section in this Manual)

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CORRECTIVE ACTION / SIGN OFFS

CORRECTIVE ACTION / SIGN OFFS

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CORRECTIVE ACTION / SIGN OFFS

Reporting Discrepancies

The YAF aircraft maintenance crew is made aware of discrepancies by means of flight crew write-ups in the Maintenance Difficulties section of the flight log sheet, or by write-ups on a Discrepancy Sheet of findings associated with an inspection.

Clearing Discrepancies

Corrective action must be taken so that the discrepancy no longer exists.

If the write-up was entered in the flight log, the pilot should be questioned for additional details that could be helpful in understanding the problem, but also in troubleshooting, especially if a system or component malfunction occurred.

If possible, the discrepancy should be confirmed and/or the malfunction duplicated. This is important, because after steps are taken to remedy it, a functional check can then be made to verify that the problem no longer exists.

If the discrepancy is a flight crew write-up on a flight log sheet, the corrective action is also recorded on the same flight log sheet, but in the Maintenance Accomplished section.

This entry will include:

- A description of the work performed
- The date of which the work was completed
- The total airframe time
- The signature, certificate number, and kind of certificate of the mechanic approving the work.

The log sheet is retained and filed as part of the aircraft's permanent records.

If the write-up was recorded on a Discrepancy Sheet associated with an inspection, the mechanic shall enter a brief but concise description of what was accomplished to correct the problem in the corrective action field of the Discrepancy Sheet. The mechanic who performed the corrective action will enter his/her initials and date in the appropriate box adjacent the repair description. This discrepancy sheet will be retained within that inspection package. The approval of work performed, as described on the Discrepancy Sheet, is validated as a line item in the Completion block (*last page of inspection*) and then approved for return to service with the Maintenance Release sign off.

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CORRECTIVE ACTION / SIGN OFFS

If any repair involves a component replacement, it must be identified by part number in the description of corrective action. If the component replaced is a rotatable, the part number and serial number of the part removed and the part installed must both be recorded.

Intermittent Problems

At times, an intermittent in-flight malfunction may occur where symptoms cannot be duplicated in the hangar, and potential causes cannot be found after a thorough inspection. Depending on which system experienced the malfunction, a landing gear swing, engine run-up, or a maintenance test flight may be required as part of the troubleshooting process. If a suspect component was changed, these subsequent checks may confirm a successful repair.

Airplane Engine and Propeller Log Entries

If the repair was made to an engine or propeller, a description of the corrective action will also be entered into the associated logbook. The entry will include the date of which the work was completed; the total airframe time; the engine or propeller time; and the signature, certificate number, and kind of certificate of the mechanic approving the work.

NOTE: This step is *in addition to* recording maintenance tasks in a Flight Log or on a Discrepancy Sheet within an inspection package.

Helicopter Engine and Powertrain Log Entries

If work is accomplished on a helicopter component, of which a Commercial Historical Service Record exists, the description of, and information pertaining to this work will be entered on this form.

NOTE: This step is *in addition to* recording maintenance tasks in a Flight Log or on a Discrepancy Sheet within an inspection package.

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COMPONENT CHANGE

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COMPONENT CHANGE

Component Change

When a component is damaged, worn, suspected of not working properly or determined to be inoperative, it must be repaired or replaced with a properly operating, serviceable component of the same model or type.

A flight crew write-up of a malfunction in the flight log, an unsuccessful functional check, or observation during an inspection are some reasons that may necessitate a component change.

Component Removal

The instructions for changing a component are often found in the appropriate maintenance manual, with reference to the associated Illustrated Parts Catalog (IPC). The Maintenance Manual will provide detailed instructions in a sequential manner for the removal and installation of a component. Functional checks and adjustment procedures may also be provided if applicable. The IPC will often provide information to confirm the correct model/type/part number that is used in the particular application, as well as an exploded illustration of the component and its relationship to its installed configuration. The IPC will also list the appropriate fasteners, seals, gaskets, etc. required for the installation.

After the suspect or confirmed bad component has been removed and thoroughly cleaned, it needs to be properly tagged. If it has been decided that the component will be sent to a repair facility, a green Repairable Tag must be filled out by the mechanic who removed the component from the aircraft.

The information that needs to be entered onto the Repairable Tag will include:

- Component name
- Part number
- Serial number
- Description of the problem or observed symptoms
- Requested work to be completed
(*For example: Bench Test, Inspect and Repair as Necessary; Overhaul, Reseal, etc.*)
- In the upper left corner, enter the tail number of the aircraft it was removed from, the total airframe time and the date
- In the upper right corner, enter the position on the aircraft, such as #2 Engine, Left Main Landing Gear, Copilot's Side, etc. from which the component was removed

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COMPONENT CHANGE

Creative abbreviations used in the description/symptoms of problem are acceptable, as long as they can be deciphered by others. The information placed in the upper corners of the Repairable Tag is for YAF record keeping purposes. A copy of this tag should be applied to the reverse side of the retained Packing List for YAF record of the transaction, as well as for other purposes.

Component Installation

Prior to installing a new or serviceable replacement component, the mounting surfaces (if applicable), should be thoroughly cleaned and inspected for any abnormalities or damage. Such findings need to be addressed before proceeding.

It must be determined that the replacement component is correct for the application. When possible or if required, new sealing parts (gaskets, o-rings, approved sealants) will be used. If available, and appropriate, new mounting fasteners should be used. This is especially the case where a self-locking nut is used in the securing process.

Even with a yellow Serviceable Tag attached, the component to be installed should be inspected prior to installation.

Once determined acceptable to install, the yellow Serviceable Tag will be removed and retained with the specific aircraft's records. Similar to the information entered into the upper corners of the green Repairable Tag, the aircraft tail number, total airframe time, date of installation, and position of the installed component needs to be entered onto the Serviceable Tag. The Serviceable Tag and any attached airworthiness, or certification documents will then be given to the DOM to file with the appropriate aircraft records.

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FLIGHT CRITICAL SYSTEMS

FLIGHT CRITICAL SYSTEMS

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50.5.2
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FLIGHT CRITICAL SYSTEMS

Flight Critical Systems - Definitions

A Flight Safety Critical Aircraft Part (FSCAP) is any aircraft part, assembly, or installation procedure with one or more critical characteristics, whose failure, malfunction, or absence could cause a catastrophic failure resulting in engine shut-down; serious damage or loss of aircraft; or serious injury or loss of life.

A Required Inspection Item (RII) is a specific inspection of any maintenance action that, if improperly done, could result in immediate danger to an aircraft. Examples would be the rigging of engine or flight controls; installing a propeller or tail rotor; or performing another maintenance action that affects flight critical systems.

Therefore, any FSCAP should be considered an RII.

Flight Safety Critical Systems

It is important that all work performed on an aircraft be done correctly.

However, certain systems and components are more critical to the safety of flight than others, and it is extremely crucial that any maintenance performed on these items be accomplished with the utmost attention to detail.

This maintenance may involve the replacement of components, performance of tests, adjustments, servicing, etc.

Following are systems and components of YAF aircraft that are considered Flight Safety Critical:

Rotary Wing (UH-1) Flight Safety Critical Aircraft Parts/Systems

- Main Rotor, Tail Rotor and Elevators (Includes All components of these flight control systems)
- Engine (Includes All components of the engine & its control systems)
- All components of the powertrain indication systems
- All components of flight instrumentation systems

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FLIGHT CRITICAL SYSTEMS

NOTE: A detailed listing of individual parts of the above mentioned systems can be found in technical document TM 55-1520-210-23-1, Department of the Army Technical Manual, dated 30 September 1987 "Aviation Unit and Intermediate Maintenance Instructions, Army Model UH-1H/V/EH-1H/X Helicopters", Chapter 1 - Introduction, Section VI - Flight Safety Critical Aircraft Parts, Table 1-9, pages 1-115 thru 1-125.

Fixed Wing (B-17, B-25, C-47, 4-AT-B) Safety Critical Aircraft Parts/Systems

- Ailerons, Elevators and Rudder (Includes All components of these flight control systems)
- Engines (Includes All components of the engine & its control systems)
- Propellers (Includes All components of the propeller & its control systems)
- Wing Flap System (Includes All components of this system)
- Landing Gear System (Includes All components of this system)
- All components of the engine indication systems
- All components of the flight instrumentation systems

Maintenance involving any disassembly, reassembly, component replacement, rigging or other maintenance of the above identified systems must be inspected by an authorized RII inspector prior to the work being approved and the aircraft returned to service.

Follow-Up Inspection Requirement

To reduce the risk of this maintenance being improperly performed, or something overlooked on these flight critical systems, any work of this type may require oversight during critical stages of work progression, but in all cases, will require a final inspection by a qualified individual. This maintenance receiving this extra scrutiny, are considered required inspection items (RII).

RII Inspector Qualification

The inspector authorized to perform any intermediate, and final inspection of an RII, must be a licensed A&P mechanic who has received training specific to the flight critical system of which he will be inspecting.



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FLIGHT CRITICAL SYSTEMS

The training of the RII inspectors will be provided by the crew chief of the aircraft of which the flight critical systems are a part of. Results of this training will be filed with the individuals training records.

These inspectors will be listed with type aircraft, and specific systems of which they've received instruction on, as authorized RII inspectors. [See Example of Authorized RII Inspector in Attachments Section of this Manual]

The RII inspector is not permitted to inspect and sign off in the maintenance records any work which he himself had accomplished

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WORK TURNOVER

WORK TURNOVER

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WORK TURNOVER

Work Turnover

Typically, an individual on the YAF aircraft maintenance crew will work a task from start to finish. Exceptions do occur during major maintenance events, such as an engine change, where an unfinished task will be handed over to other crew members to be continued or completed.

Since some volunteer aircraft maintenance crew may not keep a regular weekly schedule, it is crucial that any of the work that they have accomplished be clearly communicated to others and be signed off on the discrepancy sheet, or initialed on an inspection checklist. This must include detailed information on the status of the repair, the installation, troubleshooting, and other pertinent information to ensure efficient completion of the task.

Work Turnover Procedures

The Work Progress Turnover Form has been developed as a means of communicating a workers progress on a task, and the remaining steps to be accomplished. This form can be used for all aircraft. It's used primarily for major maintenance tasks that are not complete at the end of the same work day in which they were started. This form provides a means of work continuation by possibly different individuals. If it happens that the same worker(s) continue on task the next work day, this completed form is a reminder of where work was paused. [See Example of Work Progress Turnover Form in Attachments Section of this Manual]

This form is not considered a formal maintenance record because the normal means of recording work performed will still be used. Once the primary task in progress is complete, this form(s) can be discarded. The completion of this form may not be required if maintenance status is to be updated on a Discrepancy Sheet (*Fixed Wing*), Form 2408-13 (*UHI*) or by sign offs on an inspection checklist. [See Examples of Discrepancy Sheet, and Form 2408-13 in Attachments Section of this Manual]

To expand upon the previous paragraph, a somewhat simpler way of indicating where work ceased, especially when working on a less complex task, is with the use of a tag, a Discrepancy Sheet, or Form 2408-13.

The Discrepancy Sheet or 2408-13 entry should describe progress, what's remaining of the task, and include the date, time and worker's initials. If using a tag, it will include the same information as the above mentioned forms, be attached in the location where work was progressing so that it is easily visible, and not likely to be inadvertently removed or destroyed. Depending upon the task, the crew chief, chief mechanic or director of maintenance (DOM) may also request a verbal update on progress and what remains of the task.

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WORK TURNOVER

Tag Usage

In addition to communicating work progress, tags may also be employed as a warning device. Warning or caution tags must be employed when working on an aircraft system that, if unexpectedly energized, actuated, or disturbed, would cause an unsafe condition, damage, or create additional, unnecessary work.

Important Note: As with general worker safety “Lock Out/Tag Out” procedures, the person who secured the tag should be the person who removes the tag when it's no longer needed. The person producing a tag needs to include the date and time when the tag was placed, and his name or initials on the tag.

Examples of where warning tags should be used:

- When working on the electrical system where it is essential that the batteries remain off, a tag stating "Do Not Turn On Batteries" will be secured at the battery switches.
- When adjusting cable rigging on the engine or flight controls and inadvertent control movement would present a risk of injury and may impact the outcome of the procedure. A tag stating "Do Not Move Throttle" or "Do Not Move Control Yoke" will be secured in the appropriate location.

Tagging Empty Tanks

When major maintenance is being performed on aircraft, there are times when the engine oil, turbocharger oil, or hydraulic fluid are drained from the tanks that normally hold these fluids.

Whenever these tanks are drained, for whatever the reason, a maintenance write-up shall be made on the appropriate form, and a tag will be attached so that it is easily visible, and not likely to be inadvertently removed or destroyed. The tag should state what fluid was drained, on what date, and by whom. It shall be attached to the aircraft in a logical/obvious location, so as not to be overlooked.

The write up will be made on either a Discrepancy Sheet for the fixed wing, or Form 2408-13 for the helicopter, and should include the reason as to why the fluid was drained.

The tag will only be removed once the tank has been properly serviced, is in its normal configuration within the system of which it is a component of, and the write-up showing that the tank was drained, shows a corrective action of the tank having been serviced.

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TECHNICAL PUBLICATIONS

TECHNICAL PUBLICATIONS

GENERAL MAINTENANCE MANUAL

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TECHNICAL PUBLICATIONS

Technical Publications

It is essential that the entire aircraft maintenance workforce (paid and volunteer) be familiar with the location and use of the following described reference materials, as they provide the necessary information required for properly maintaining YAF's aircraft.

Location of Manuals

Technical publications for YAF's B-17, B-25, C-47 & 4-AT-B can be found on a bookshelf in a dedicated location within the hangar. These publications consist of maintenance, parts, structural repair, and operator's manuals. They cover the airframe, engines and propellers. Other technical publications include maintenance, operations and parts for various aircraft subassemblies, components, and accessories such as generators, wheels, brakes, etc. Additional reference material such as general aircraft maintenance training textbooks and advisory circulars are available in the same location.

Certain duplicate manuals are located onboard the aircraft during the flying season. Some of these publications have been scanned and are accessible on electronic devices.

The UH-1 technical publications are all in a digital format (*scanned*) and represent maintenance, parts, structural repair, and operator's manuals for the airframe, engines and rotors. The Phased Maintenance Checklist (Inspection Program) is also included in this collection of technical publications which are all accessible on electronic devices.

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DOCUMENTING WORK PERFORMED
ON THE AIRCRAFT

DOCUMENTING WORK PERFORMED ON THE AIRCRAFT

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Aircraft Maintenance Record Keeping

Aircraft maintenance record keeping is the documenting of work performed on the aircraft, which contains the when, the how, and by whom it was accomplished.

Work performed would include repairs, alterations, component changes, inspections performed, AD compliance, functional checks, etc.

Maintenance Event Occurrence

A significant piece of information attached to these records of work performed, is when the work took place, referenced to the total airframe time, and the date.

In the case of landing gear maintenance, the total number of landings, or cycles on the aircraft is also recorded.

This information is valuable, as it places a timestamp on the maintenance event that can be used to determine when the next time this particular maintenance is due, if it's recurring.

If a component change took place, knowing the install history will allow for the time or cycles on that component to be considered in predicting service life, or for warranty purposes.

In the case of the UH-1 helicopter, which has hard overhaul times on components, and life limited parts, the tracking of hours and cycles is extremely important.

Fixed Wing Flight Log Update

Once the fixed wing time flown is logged, the aircraft hours, engine hours, and number of landings are updated at the completion of the flight day. These numbers are recorded, and can be found on the Flight Log Sheet. [See Example of Flight Log Sheet in Attachments Section of this Manual]

The fixed wing aircraft crew chief or his designee, is responsible for updating the Flight Log sheet at the end of each flight day. This is done by entering the "Total Flight" time* (*upper right page*) onto the "Today" line, of the "Airplane Total Time" and "Engine Hours Since Overhaul" columns (*upper left page*). This value is then added to the times on the "BRT FWD" line, with the resultant new/current time entered on the "TOTAL" line.

These TOTAL times will be entered in the appropriate column on the "BRT FWD" line of the new Flight Log sheet. The total number of landings, as displayed in the LNDGS column (*right side page*) of the Flight Log sheet, are then entered in the LANDINGS column (*center page*), on the TODAY line. As with the flight times, the landings are added for a new total, which is also brought forward onto the following Flight Log sheet.

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** The "Total Flight" time is calculated and entered by the pilot in command at the conclusion of the flight day. The right/upper half of the Flight Log sheet is used by the pilots to record flight & block times, instrument approaches and landings.*

Also entered within the flight log is any servicing of the aircraft, which includes fuel and oil added, and the locations where the servicing was performed.

Rotary Wing Flight Log Update

The helicopter flight data is logged and updated after each flight day and can be found recorded on the Pilot Flight Log, YAM Form 2408-12. Unlike the fixed wing, the Hobbs flight time is only recorded. This total Hobbs time is used to calculate aircraft total time, as well as to update component Time/Cycles Remaining; Inspection, Overhaul, and Retirement schedule records. Any servicing of the aircraft will also be described and entered on the Pilot Flight Log. [See Example of Pilot Flight Log Form 2408-12 in Attachments Section of this Manual]

The helicopter crew chief or his designee, will be responsible for updating the Aircraft Inspection and Maintenance Record, YAM Form 2408-13 at the end of each flight day, using the Hobbs Total from the Pilot Flight Log.

Reporting a Maintenance Need

There are several different sources by which the need for aircraft maintenance is presented. There are also differences in the forms used to record these maintenance requests. YAF's fixed wing aircraft utilize customized Flight Log and Discrepancy Sheets to record the need for maintenance, and the corrective actions taken, whereas YAF's UH-1 helicopter utilizes forms which are part of the U.S. Army Inspection program under which it is maintained.

Following are the various means by which maintenance requests are documented. You will note that the fixed and rotary wing aircraft utilize different forms for the same purpose. Instructions for completing these different forms are presented next, along with the final administrative placement of these documents.

DOCUMENTING WORK PERFORMED
ON THE AIRCRAFT

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Methods for requesting maintenance for YAF'S FIXED WING (B-17, B-25, C-47, 4-AT-B) aircraft .

- As a pilot write-up of a Maintenance Difficulty occurring during flight operations on the FLIGHT LOG SHEET
- By a mechanic write-up of a Maintenance Difficulty detected during a pre- or post-flight check on the FLIGHT LOG SHEET
- By a mechanic write-up of Maintenance due per the Calendar and Time Items form on the FLIGHT LOG SHEET
- By a mechanic write-up on a DISCREPANCY SHEET of an Inspection finding, a servicing requirement, or to record a condition that must not be overlooked, such as unanticipated disassembly to facilitate other maintenance.

⇒ Instructions for completing the maintenance sections of the FLIGHT LOG SHEET are as follows:

1. In the "Maintenance Difficulties" column, a description of the problem, or the maintenance due is entered. If there is more than one entry, they must be sequentially numbered.
2. In the "Maintenance Accomplished" column, a description of the action taken to correct the problem is entered. If a component change took place, the part and serial numbers of items removed and installed should also be entered.
3. Complete the Maintenance Accomplished with the date of completion, the total time of the aircraft, the signature and certificate type and number of the person approving the corrective action(s).

Note: As with numbering more than one Maintenance Difficulty, the associated Maintenance Accomplished needs to also be numbered correspondingly.

4. In the case of an inspection, the licensed mechanic approving the aircraft for return to service will identify the inspection(s) performed, the date of completion, the total time of the aircraft, and enter his signature, certificate type and number.

DOCUMENTING WORK PERFORMED
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5. When the maintenance entries have been completed on the Flight Log Sheet, and the subsequent sheet is put into use for the next flight, this sheet will be filed in the usual manner, and becomes part of the permanent aircraft records.

⇒ Instructions for completing the Discrepancy Sheet is as follows:

1. A description of the problem or maintenance due (discrepancy), is entered on the two lines across from "Insp/Mech"
2. The person who enters this discrepancy, then initials and dates the box to the left of the entry.
3. The mechanic performing the corrective action enters a description of what was accomplished to resolve the problem below the discrepancy, on the two lines across from "Mech". If a component change took place, the part and serial numbers of items removed and installed should also be entered.
4. The mechanic, then initials and dates the box to the left of the entry.
5. As part of the inspection documentation, the work described on the Discrepancy Sheet is approved as follows. The licensed mechanic confirms the completion of all Discrepancy Sheets by means of placing his initials on the last page within the inspection package; then by signing the maintenance release, he accepts responsibility for the maintenance performed as stated on the Discrepancy Sheets.
6. When the maintenance entries have been completed on the Discrepancy Sheet, it remains part of the inspection package, which is moved to a dead file at the conclusion of the next equivalent inspection.

Methods for requesting maintenance for YAF'S ROTARY WING (UH-1) aircraft.

- As a pilot write-up of a Fault occurring during flight operations on FORM 2408-13
- By a mechanic write-up of a Fault detected during a PMD on FORM 2408-13, a servicing requirement, or to record a condition that must not be overlooked, such as unanticipated disassembly to facilitate other maintenance.
- By a mechanic write-up of Component Overhaul or Retirement Due on FORM 2408-13

DOCUMENTING WORK PERFORMED
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- By a mechanic write-up of a Fault detected during an inspection on a PHASE INSPECTION CHECKLIST form
- By a mechanic write-up of Maintenance due per Form 2408-18, on a PHASE INSPECTION CHECKLIST form

⇒ Instructions for completing FORM 2408-13

1. In the information block in the "Part I - Fault Information" column, describe the problem or maintenance due in the "Fault/Remarks" field, fill in the remaining boxes, and include the signature of the person completing this entry.
2. In the information block in the " Part II - Correction Information" column, describe the corrective action taken in the appropriate field, fill in the remaining boxes as applicable, and include the signature, certificate type and number of the mechanic approving the corrective action.
3. When the maintenance entries have been completed on the Flight Log Sheet, and the subsequent sheet is put into use for the next flight, this sheet will be filed in the usual manner, and becomes part of the permanent aircraft records.

⇒ Instructions for completing the PHASE INSPECTION CHECKLIST form

1. In the "Faults and/or Remarks" column, a description of the problem, or the maintenance due is entered.
2. In the "Action Taken" column, a description of the corrective action taken is entered.
3. In the column adjacent the corrective action, enter the initials of the mechanic approving the corrective action.
4. When the maintenance entries have been completed on the Phase Inspection Checklist form, it remains part of the inspection package, which is moved to a dead file at the conclusion of the next equivalent inspection.

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⇒ Instructions for completing the certifying the completion of a Phase Inspection

1. In the Helicopter Maintenance Log, the mechanic shall make an entry describing the inspection phase and maintenance accomplished. If the helicopter is approved for return to service, the following statement "I certify that this aircraft has been inspected on [date] per [inspection program] and found to be in a condition for safe operation.
2. The mechanic will then enter the total time of the aircraft, enter his signature, certificate type and number.

Commercial Historical Service Record

When a UH-1 component which has a Commercial Historical Service Record is replaced, the specifics of the removal and the installation will be entered on this component card. This card will accompany the associated removed component when sent out for servicing. The card for the installed component will be retained with the aircraft records.

Repairs and Alterations

In the case of repairs or alterations, a determination must first be made as to whether it is major or minor. *(Refer to Appendix A to Part 43 - Major Alterations, Major Repairs, and Preventive Maintenance, in the FAR's for guidance in this determination)*

If it is considered to be major, FAA Form 337 will be used to record the work.

(Refer to Appendix B to Part 43 - Recording of Major Repairs and Major Alterations, and Advisory Circular 43.9-1G which provide instruction for the completion and administrative processing of FAA Form 337)

The approval for return to service will be made by a licensed mechanic with an Inspection Authorization.

A copy of the completed FAA Form 337 will be retained with the aircraft's permanent records.



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Logbooks other than Airframe

When an inspection is performed on the aircraft, and the engines and propellers are included in that inspection, an entry in the appropriate airframe, engine and propeller logbook needs to be made showing accomplishment of this inspection.

Record of significant maintenance such as a component change, special inspection or repair performed on an engine or propeller, must also be entered in the associated engine or propeller logbook.

Logbook entries can be handwritten or printed on a sticker sheet or label and adhered onto a page in the logbook. Printed stickers are often much more legible than hand written entries, but the mechanic accomplishing the work will still need to place his signature for the work onto the sticker.

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TOOL CARE AND CALIBRATION

TOOL CARE AND CALIBRATION

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TOOL CARE AND CALIBRATION

Tool Care and Calibration

In the course of performing maintenance on YAF's aircraft, various hand, power, and special tools are required. Most importantly, these tools need to all be accounted for at the end of a task or work day. A forgotten tool left in the wrong place on an aircraft can lead to devastating results.

Routine Care

Hand, power, and special tools, whether personally owned or YAF provided, need to be properly maintained.

In the case of YAF provided hand and special tools, they must be returned to their designated storage location promptly after use, but only after they have been properly cleaned. Stationary machining tools such as the drill press, band saw, grinder, belt/disk sander, etc. must be cleaned after each use, as well as their immediate areas.

When using YAF tools, keep in mind that there is not a more frustrating work interruption than to find that a needed tool is not where it's supposed to be, or finding it covered in dirt, grease or oil. Any deficient YAF tool must be reported to the DOM and corrective measures taken. In addition, it is incumbent upon the user to utilize each tool properly and for its intended use, to use it safely, and to do so using the proper personal protective equipment as necessary.

Care and proper use is especially important when using YAF's test and inspection equipment. The majority of this equipment is used for troubleshooting and reference. One such tool, the torque wrench, is used to properly tighten spark plugs, exhaust stack nuts, engine mount hardware, and fasteners throughout the drive train of the UH-1H, per manufacturers' specifications. Torque wrenches are also used in other applications where a standard torque must be adhered to.

Periodic Calibration

Due to the importance of applying the correct fastening torque, the calibration of YAF's torque wrenches are checked at least annually. This is performed in-house using a digital torque measuring standard.

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TOOL CARE AND CALIBRATION

The calibration of the digital torque measuring standard is also checked annually using varied length bars and known weights.

Record of the torque wrench and digital standard calibration checks are entered on a form and placed in a folder labeled Torque Wrench Calibration Log. This folder is kept in the Parts Room in the same storage locker as the torque wrenches. [See Example of Torque Wrench Calibration Log in Attachments Section of this Manual]

If a torque wrench is found to exceed the tolerance for the particular torque range, it will be green tagged as repairable and sent out for servicing, or eliminated from the facility.

Important Torque Wrench Notes:

- Torque wrenches must always be cleaned and adjusted to the lowest indicated setting when returned to storage.
- If a torque wrench is dropped, a calibration check must be performed with passing results prior to continued use.

As more test and measurement equipment are added to YAF's special tools inventory, where accuracy checks are required, these items will be included in the calibration check schedule.

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PARTS MANAGEMENT

GENERAL MAINTENANCE MANUAL

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General

During the process of maintaining YAF's aircraft, the maintenance workforce inspect the aircraft, service systems, troubleshoot problems, perform functional tests, replace components, and complete other related tasks. The means of accomplishing all of this requires tools, test equipment, parts, and other associated supplies.

The parts and supplies used to maintain the aircraft are categorized as rotables, expendables, and consumables.

Rotables are aircraft parts or components usually identified by a serial number. They are parts that can be repaired, rebuilt or overhauled, then reinstalled on the aircraft or placed in stock as a spare. Some examples of a rotatable would be an altimeter, radio, carburetor, engine, propeller, etc. Rotable parts, unless installed in the aircraft, will always be tagged for identification and to show their condition.

Expendables are usually throw-away, non-serialized parts. However, they can often be reused if inspected and determined by the DOM or a licensed mechanic to be in serviceable condition. Some examples of expendables would be relays, spark plugs, wheel bearings, bolts, etc. Expendable parts, unless installed in the aircraft, will normally be tagged for identification and condition.

Consumables are items that are rendered unsuitable for reuse after having been installed, which are then discarded upon removal. Some examples of consumables would be gaskets, sealants, grease, oil, safety wire, etc.

These parts and supplies, excluding flammable materials, are stored in an area within the hangar designated for this purpose and identified as the Parts Room.

A tagging system is employed to ease identification of a part and its condition. These are known as Serviceable (yellow), Repairable (green), Rejected (red) and Identification (white or tan) tags. Their use is described in more detail later in this section.

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The Parts Room is arranged and maintained by Parts Room Managers (PRM).

The PRM are responsible for:

- Providing organized and suitable storage of parts and supplies
- Replenish these as necessary
- Maintain the cataloging of rotatable, expendable, and aircraft-specific consumable parts
- Keep the inventory records current, showing quantity and location

These records will also indicate when a component has been sent to a repair facility, which repair facility, the purpose for which it was sent there, and when it has been received back into YAF inventory. Other information associated with the part such as cost, may also be included.

Parts Purchasing

Based upon periodic review of parts quantities, the PRM will requisition the purchase of items to replenish inventory.

When a parts request is made by a mechanic or DOM, the PRM will research, then request quotes from both current and new vendors prior to requisitioning the purchase. Depending on the urgency of the part request, the PRM may forego any comparison shopping. To as reasonable an extent possible, research of vendor history, reputation, customer satisfaction, and pricing comparison should be made prior to making a purchasing decision. This is especially important when acquiring extremely expensive items.

The current parts requisition process includes the above described research, with results presented to the DOM or designee to approve and proceed with the purchase request to the vendor.

Parts Receiving and Inspection

When receiving parts, whether new or returned after servicing, the PRM will immediately inspect the packaging for damage incurred during shipping. This is important, as damage during shipping should be addressed as soon as possible.

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Next, the PRM will inspect the part and confirm that the component or parts are as expected.

In the case of a component being returned after servicing, the DOM will be notified of receipt of such items upon arrival for his/her immediate attention. Refer to a copy of the YAF original packing list to confirm that the part and serial numbers match those on the component data plate, and that the work accomplished was what was requested. The work accomplished and resultant condition will be identified on an accompanying FAA Form 8130-3 Airworthiness Approval, or similar maintenance release or work order from an authorized repair facility.

If the part is a new purchase, make certain the part or model number is what was ordered. When receiving items such as fasteners, supplies, materials, etc., inventory the items received and compare to the original order documents. This is to ensure the correct products and quantities have been shipped. If it is found that receipt of components or items is incorrect, initiate the process with the vendor to resolve the error. In all cases, inspect the items received.

Note: If something appears abnormal with the part received, investigate prior to entering the item into stock. Unapproved and counterfeit components and fasteners have been circulated in the past. The results of such a part used in a critical application could be devastating. If a part is determined to not meet its design specifications, one course of action is to complete and submit FAA Form 8120-11, Suspected Unapproved Parts Report. Regardless, it is important to report any suspicion to the DOM. (*Refer to FAA Advisory Circular AC 21-29D*)

Tagging and Placing in Inventory

A aircraft parts tagging system is used to identify and show the condition of a particular part. This is always the case with rotatable components, but is often found also in use with expendables. The tags are different colors, which signify the condition of the part. [See Example of Aircraft Part Tags in Attachments Section of this Manual]

A yellow Serviceable Tag will include descriptive information about the part to which it is attached, such as part number, description, and serial number. It will often have a copy of an FAA Form 8130-3 Airworthiness Approval stapled to it. The presence of a yellow Serviceable Tag attached to a part indicates that it can be installed on the aircraft.

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A green Repairable Tag will include descriptive information about the part to which it is attached, such as part number, description, and serial number. It will also show why the part is not in a condition for use. It may describe symptoms and work requested for returning the part to a serviceable condition once again. Some examples of work that might be requested are: Perform Bench Test, Inspect and Repair as Necessary (IRAN), Reseal, Overhaul, etc.

The presence of a green Repairable Tag attached to a part indicates that the part cannot be used on any aircraft in its current condition. Repairable items are segregated in a designated location away from the general inventory.

A red Rejected Tag will also include descriptive information about the part to which it is attached. The presence of a red Rejected Tag on a part indicates that it will never be used on any aircraft again. This part must be removed from active inventory and discarded. At times, a condemned part may be retained to use as an illustrative example for training purposes. At no time should a red tagged item be present in the general inventory.

A white or tan identification tag does just that. It identifies the item to which it's attached, and may include notes as to how, and to which aircraft the part belongs. This tag does not specify the condition of the part. An example of where this tag may be used could be when attached to a headset identifying the aircraft and crew position from which it was removed.

When a part is received from a supplier or repair facility, and the parts receiving inspection is complete and satisfactory, the part needs to be tagged, the inventory spreadsheet updated, and the part placed in the proper location within the Parts Room. Updating the inventory may require a new entry or changing an "Out-For-Service" status to "In-Stock" with condition stated.

Currently, only the DOM or a licensed mechanic will review documents received with the component, and enter the appropriate information, sign and date the yellow Serviceable tag. Documents that should be expected to accompany a component showing airworthiness certification consist of an FAA Form 8130-3 Airworthiness Approval, or similar maintenance release or work order from the authorized repair facility.

In the case of purchased parts, traceability documents should be included. This form, and/or a certificate of conformity, will then be stapled to the yellow Serviceable Tag, and attached in a secure manner to the component prior to it being shelved.

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The rotables, expendables, and aircraft-specific consumables are inventoried and placed in an organized manner, by ATA code. Locations are identified by shelving unit, shelf number, and bin number. Part descriptions, locations, and quantities are cataloged using an Excel spreadsheet file stored in the Parts Room computer. A copy is made of this file on a regular basis and retained on removable media and/or a remote computer.

Non-aircraft-specific consumables are organized by like-items and are stored in various locations in the Parts Room. Likewise, aviation grade fasteners, such as AN, NAS, and MS hardware, are segregated from non-aviation grade hardware. Flammable storage cabinets, a flammable storage room, and an oil storage room are maintained separately from the Parts Room.

Miscellaneous Materials and Supplies

In addition to aircraft component parts and aviation grade fasteners, materials may need to be occasionally procured from non-aviation suppliers. An example might be bulk gasket material purchased from McMaster-Carr.

These materials must meet the technical requirements for the specific application and environment in which it will be used. Two copies of the Material Certification Statement and Specifications for these materials will be made. One copy will be filed, and the other will be attached to, and remain with the product until it is completely consumed.

In the case of potentially hazardous chemicals such as paints, adhesives, solvents, etc. requiring a Material Safety Data Sheet, a copy of the MSDS will be acquired and maintained in a separate file in the Parts Room.

Parts Distribution

A Parts Sign-Out sheet is used to record the removal of inventoried parts from stock by the mechanic. The PRM will update the inventory records on a regular basis by referring to the Parts Sign-Out sheet. If a part is removed from the Parts Room to be placed onboard an aircraft as a spare, the inventory records will show that specific aircraft as its location, with disposition as onboard spare. [See Example of Parts Sign-Out Sheet in Attachments Section of this Manual]

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Parts Shipping

Often there is a need to ship aircraft components to repair facilities to be tested, repaired or overhauled. Sometimes a component is sent as a core for a serviceable or overhauled exchange part. The repair facilities to which the YAF sends components have been researched to verify that they are qualified to work on the equipment which we are sending them.

YAF is regularly looking for new repair facilities to support our operation. Prior to adding to our authorized repair facilities list, a review process will take place that will include at a minimum, a repair station search via [faa.gov](https://www.faa.gov) website, facility website assessment, and phone communication with a facility representative regarding their capabilities as they relate to the component(s) we intend to send them for servicing.

It is of the utmost importance that the component be packaged properly for shipping. There is the potential for critical, hard-to-find and expensive components to be irreparably damaged. A rule-of-thumb in packing an item to ship is to support the component in the center core of the shipping box.

Common sense and experience should determine the size of the box to be used, and how much and what type of packing material should be used, based on the size, shape and weight of the component to be shipped. Assume that the package will never be positioned the same way during shipping, and know that a heavy component will always settle into the packing material. In other words, minimal packing material at the top of the box may be where the component finds its way out of the box.

This means that there will be packing material, such as crumpled packaging paper or newspaper, dense pieces of foam, bubble wrap, corrugated cardboard, etc. on all sides of the component in such a manner that no part of the component can ever make contact with any side of the box. When shipping a heavier, unusual shaped component, consider wedging it into a smaller box with packing material, then placing the smaller box with part sealed inside, secured in the core of a larger box with packing material. (*Double boxing*)

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Important Shipping Note: If the component ever had any type of fluid in it such as hydraulic fluid, oil, or fuel, it must be completely drained, thoroughly cleaned, and allowed to dry prior to packaging. This is a very important shipping requirement that cannot be overemphasized! If practical, and if unlikely to cause damage, purging with low pressure compressed air or nitrogen may be considered. Caps, plugs and covers will be used to seal all openings. It shall then be sealed in a plastic bag, before being packaged in a shipping box. It is also possible that the repair facility will reject the work or add a surcharge if the part is received in an unacceptable condition.

Two copies of a packing list will need to be created to:

- Identify the contents of the package
- The shipper (YAF) with contact name/phone/email
- The destination
- A description of work requested

[See Example of Packing List in Attachments Section of this Manual]

One copy of the packing list will be placed inside the box, and one copy will be retained to record the specifics of the shipment. On the reverse side of the retained packing list, a copy of the green Repairable Tag should be made.

A shipping label will then be printed and applied to the outside of the box. Make sure that previous labeling and shipper barcodes have been removed or blacked out, then apply tape abundantly. [See Example of Shipping Label in Attachments Section of this Manual]

The shipping label, and any other applied labels such as "Fragile", "This End Up", etc. should be covered with clear packing tape.

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LOADING / WEIGHT & BALANCE

LOADING / WEIGHT & BALANCE

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LOADING / WEIGHT & BALANCE

General

YAF aircraft are not normally loaded with any added equipment, supplies, or baggage when flying locally to/from home base (YIP) such as for the purpose of pilot training, check rides, passenger rides, airshow passes or event overflights.

In this case, the only weight and balance considerations will be with passenger and fuel load. Any weight and balance calculations will be the PIC's responsibility.

Loading for a Trip

In the case where an aircraft is transiting to a remote location for an overnight or longer event, additional equipment, supplies, and baggage will be loaded into the aircraft for the trip.

The aircraft crew chief, with direction from the Event/Flight Coordinator for the trip, will ensure that the aircraft is properly loaded, and will report the loaded configuration to the PIC for the trip.

Passenger Compartment

All loaded equipment, supplies, and baggage placed in the aircraft passenger compartments will be secured in the most practical means possible to prevent shifting in case of inflight turbulence or in the case of an abnormal landing.

When properly stowed, the risk of a crewmember being struck by an unsecured item is reduced, but most importantly, that these items do not end up obstructing any means of egress.

Bomb Bays

Equipment and supplies that are secured in the bomb bays of the B-17 and the B-25 must be loaded by only those with prior experience loading the particular aircraft. The security of equipment in the loaded bomb bay will be inspected by the crew chief prior to flight.

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AIRCRAFT MOVEMENT
AND TOWING

AIRCRAFT MOVEMENT AND TOWING

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Aircraft Movement and Towing

Moving aircraft out of and back into the hangar is a regular occurrence during YAF's flying season and at various times during routine annual maintenance. This is accomplished using a tug, aircraft specific towbars, and ground handling wheels for the helicopter.

Authorized Personnel

- Only trained and authorized individuals will operate the tugs to move the aircraft.
- This authorization is aircraft and site specific (ramp or hangar).
- The YAF ramp crew receives training on towing aircraft, but this training is limited to moving the aircraft to and from parking spots outside of the hangar.
- Training, and subsequent authorization for towing the aircraft within the hangar is independent of the ramp crew training and is provided only to certain individuals of the aircraft maintenance workforce and the ramp crew by direction of the DOM or his designee.

Required Personnel

At least two individuals are required to move YAF's fixed wing aircraft; the authorized tug driver and a safety observer, often called the wing walker. Both are required to connect the towbar properly to the aircraft, after which the safety observer guides the tug driver and connects the towbar to the tug.

In the case of towing YAF's rotary wing aircraft, at least three people are required; the authorized tug driver, a safety observer, and a person supporting the tail skid. As with the fixed wing aircraft, two people are required to connect the towbar properly to the helicopter. Once the towbar is connected to the helicopter, the tug is guided in and connected to the towbar. The ground handling wheels attached to the skids can now be extended simultaneously, raising the helicopter while a person is supporting the tail skid to maintain the aircraft in a level attitude. At least four inches of clearance between the skids and surface is desired prior to movement.

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Preparation for Movement

- When preparing to move the C-47, once the tow bar is connected to the aircraft, always manually swing the towbar about thirty degrees to either side of center prior to connecting it to the tug. This checks that the tail wheel lock has been disengaged and that its control cable is intact.
- When preparing to move the B-17, visually confirm that the tail wheel lock is disengaged. If the locking pin appears too close to or is touching the lock plate, the control cable should be checked to see if it is slack. A slack cable indicates that the tail wheel lock control lever is in the 'locked' position, or it could mean that the cable has failed. In either case, the cause must be identified and resolved prior to any aircraft movement.
- When preparing to move the B-25, ensure that the anti-shimmy damper disengage wedge is completely through the extended locking pin with the quick disconnect pin installed, preventing the wedge from falling out. An outward tug on the towbar at its connection to the nose gear strut prior to connecting to the tug confirms secure engagement.

With towbars connected to the aircraft and tug, other equipment such as oil drip pans and wheel chocks are to be repositioned out of the path of movement.

Aircraft Movement

Having additional safety observers involved is highly recommended, especially when in tight quarters. It is important that all involved know the proper hand signals, as well as have experience in watching aircraft, judging obstacle clearances, and being able to anticipate the path of the aircraft to provide adequate warning of potential conflict. Warnings should not be delayed until contact is imminent.

When the aircraft and tug are properly configured to begin movement, the tug driver will tap the horn to signal that movement is about to begin. The safety observer(s) will maintain a position so that he can easily view any part of the aircraft that may be at risk of contacting an object, but also remain in clear view of the tug driver to be able to signal him as necessary. A thumbs-up gesture will indicate the aircraft is safe to continue movement. If any verbal or hand signals are not clear to the tug driver, he will stop the tug immediately and discuss with the safety observer(s) for clarification.

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Anytime the tug driver is uncomfortable with the progress of the aircraft movement, for any reason, he should stop the tug, take it out of gear, and set the parking brake. Depending on the situation, he may want to turn off the tug's engine. He can then walk around the aircraft to get a better picture regarding clearances and required positioning. He should also advise the safety observers of his concerns and intentions before proceeding.

Once the aircraft is in the desired position, whether inside the hangar or on the ramp, the tug driver should tap the horn to signal as such, and direct the safety observer to position the wheel chocks, or set the aircraft brakes.

The tug will always be disconnected from the tow bar first, then the tow bar disconnected from the aircraft.

For rotary wing aircraft, the safety observer will maintain a position so that he can easily view any part of the helicopter that may be at risk of contacting an object, but also remain in clear view of the tug driver to be able to signal him as necessary. It's crucial that the forward-most main rotor blade and the tail rotor are watched closely during movement in close proximity to obstacles. This is especially important when pushing the helicopter backwards, as the tug driver has absolutely no view of the tail, and a slight left/right input from the tug will swing the tail significantly.

A thumbs-up gesture will indicate the aircraft is safe to continue movement. Once positioned, the ground handling wheels will be lowered gradually and simultaneously while the tail skid continues to be supported. After the tug is disconnected from the towbar, the towbar and ground handling wheels can be removed from the skids. Ground handling wheels may remain attached to the skids when the aircraft is parked inside the hangar.

Positioning of Aircraft on Ramp

If towing an aircraft onto the ramp is for the purpose of being fueled, pay attention to other aircraft in the vicinity of your intended fueling location. If it appears that they may be close to starting engines, either wait until they have taxied out, or choose a different fueling location.

In the case where the aircraft being towed is to start engines, either for flight or for a maintenance run, be conscious of other aircraft, vehicles, or buildings in the immediate area that may be affected by your aircraft's prop blast, and position appropriately.

- If it's reasonable to do so, always try to park an aircraft nose into the wind.
- Consider other aircraft or vehicles on the ramp in the final positioning of the aircraft.



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Marshalling

Marshalling the aircraft out of/into a parking spot is typically performed by YAF ramp crew when at home base. If at a remote location, marshalling is often provided by FBO (Fixed Base Operator) staff or host ramp crew in the case of an air show appearance.

At times, marshallers are unavailable and the aircraft needs to maneuver into or through tight quarters. If this is the case, a crewmember will need to exit the aircraft and provide marshalling and clearance directions to the pilots.

This crewmember should be trained in basic marshalling skills.

If there is any doubt as to whether the aircraft can negotiate a narrow taxiway or congested ramp, the pilot in command should be advised of such, and consider shutting down engines to personally assess the situation outside of the aircraft before proceeding.

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AIRCRAFT FUELING

AIRCRAFT FUELING

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AIRCRAFT FUELING

Aircraft Fueling

Fueling YAF's aircraft is a regular procedure performed during flight operations and occasionally during maintenance. All YAF aircraft will only be fueled by trained and competent YAF personnel. This means that the person who is actually controlling the fueling nozzle at the fuel tank opening (the Fueler), will be a YAF maintenance crew member, and not the operator of the fuel delivery truck, or an FBO employee.

This training to fuel YAF aircraft is primarily hands-on and is received while assisting in the fueling process under the supervision of a YAF maintenance crew member who is experienced in fueling exclusively YAF's aircraft.

The procedures for fueling each of YAF's aircraft are unique, and those assisting must be familiar with the following differences:

- Procedure to properly open and secure the fuel tank inlet.
- Determining the current fuel quantity in each tank, then calculating how much will need to be added.
- The proper sequence in which multiple tanks are fueled, especially when the tanks are interconnected.
- The process in which the fuel nozzle and hose are drawn to and positioned at each tank filler opening.
- The electrical bonding points of each aircraft.

Description / YAF Fueling Standards

At least two YAF maintenance crew members are desired for fueling the aircraft. They include the Fueler and the Safety Observer. The Fueler and any potential assistant must be familiar with safety precautions while working on top of the wing. All YAF aircraft, with the exception of the UH-1H helicopter, are fueled over-the-wing, with the fuel hose handed to the Fueler up from in front of the leading edge of the wing. The fuel hose will not be dragged across the fuselage to service tanks on the opposite side of the aircraft.

Fueling Participants

- Fueler - Person holding and controlling the fuel nozzle as fuel enters the aircraft fuel tank
- Safety Observer - Person who assists and watches for any abnormal occurrences during the fueling operation
- Pump Operator - Person who turns ON or OFF the pump, pressurizing the fuel hose (typically an FBO employee)

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AIRCRAFT FUELING

Fueling Participant Responsibilities

The responsibilities of those fueling the aircraft include:

Fueler Responsibilities

- Opens the fuel tank filler (Cover/Cap).
- Confirms that the truck or hydrant for fuel delivery is labeled with the proper fuel type and grade required.
- Operates the fuel nozzle to control the flow of fuel into the aircraft tank.
- Maintains vigilance to avoid overfilling and causing a fuel spill.
- Secures the fuel tank filler opening after fueling is complete.

Safety Observer Responsibilities

- Ensures that the aircraft brakes are set, or chocks positioned (*if not connected with a towbar to a tug*).
- Directs the fuel pump operator in the positioning of fuel truck.
- Confirms that the truck or hydrant for fuel delivery is labeled with the proper fuel type and grade required.
- Identifies the electrical bonding point on the aircraft and ensures it is properly connected to the fueling source (Truck or Hydrant).
- Supports the ladder as the Fueler climbs on and off the wing.
- Instructs pump operator how to present the fuel nozzle and hose to the Fueler who will be on top of the wing.
- Confirms the correct quantity of fuel is pumped by observing the fuel truck meter.
- Maintains oversight of the operation and assists as needed.

Fuel Requirement

Prior to fueling, confirm that the fueling truck or hydrant is labeled with the correct grade/type fuel requested.

- Fixed wing aircraft: 100 octane, low-lead aviation gasoline (100LL avgas)
- Rotary wing aircraft: Jet A aviation turbine fuel

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AIRCRAFT FUELING

Important Fuel Check Note: In spite of precautions employed, mis-fueling incidents and accidents still occur and must be prevented. One method of double checking that the fuel is correct before proceeding with the fueling is for the Fueler to dispense a small amount of fuel on his fingers at the tank opening. What will be obvious is the smell and the quick evaporation rate of the 100LL. 100LL avgas also has a blue dye added which may or may not be evident during this check. Jet A turbine fuel will smell like kerosene, have an oily feel, and will not readily evaporate. All involved in the fueling process must know these differences.

Misfuel Warning: It is IMPERATIVE that no turbine engine fuel ever be dispensed into the tanks of an aircraft with reciprocating engines.

Determining Tank Quantity

Determining fuel quantity onboard the aircraft is the responsibility of the acting crew chief or trained designee.

Regardless of what the cockpit fuel gauge is indicating, fuel quantity in each fuel tank will always be confirmed using the appropriate calibrated fuel tank dip stick.

An exception to using a fuel stick is with the UH-1H. A fuel dip stick cannot physically be used to measure the fuel level in the helicopter's tank, and should never be attempted.

Often the YAF aircraft fuel tanks will be filled or topped off. This is typically the case with the B-25, the C-47, the 4-AT-B, and the UH-1H. (Note: The B-17 fuel tanks are rarely completely filled).

When topping off the tanks, though not absolutely necessary, it is recommended that the fuel quantity first be measured with a fuel stick prior to filling. Knowing the beginning quantity in the tank allows one to anticipate the quantity of fuel required to fill the tanks to the desired level, but also to establish the rate of fuel consumption of each engine. This information is valuable for flight planning, engine performance comparison, and troubleshooting engine problems.

Fuel and oil quantity will be checked prior to the first flight of the day. Often, the aircraft fuel and oil servicing is accomplished the day prior to a scheduled flight. If this is the case, and there is no obvious indication of any abnormality or the aircraft being tampered with, another fluid level check prior to the first flight of the day after servicing is not required.

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Fuel Request

YAF maintenance staff will carry out fueling of the aircraft based on flight crew requests. The Pilot-in-Command (PIC) will determine the amount and type of fuel that will be required for the scheduled flight and place the order for it with the Crew Chief or designee. It is then the responsibility of the Crew Chief to request fuel from the fuel supplier. If the flight crew's departure fuel request is for less than the aircraft's full fuel capacity, the Crew Chief must first determine what is currently in the tanks then calculate what amount needs to be added to each tank.

Aircraft Placement / Preparation

Aircraft fueling operations will always take place outside of the hangar, with the aircraft preferably a minimum of 25 feet from the nearest building. If the aircraft will be repositioned after receiving fuel, the tow bar and tug may remain connected.

The fueling Crew Chief will verify that all aircraft electrical switches are placed in the off position prior to fueling and remain so for the duration of the fueling procedure. The fueling crew will verify that a fire extinguisher is available in the immediate vicinity and strict 'No Smoking' and no open ignition source rules are enforced.

If chocks are used to secure the aircraft, they will be positioned several inches away from the tire so that the effect of the added weight of the fuel will not pinch a chock under a tire so that it cannot easily be removed. Likewise, the fueling source bonding cable must not be laid too near a tire.

Fuel Truck Placement

The fuel provider (FBO) will position the fueling truck per directions from the YAF aircraft maintenance crew member. The maintenance crew member will ensure that the truck be positioned properly and with adequate clearance from the aircraft.

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AIRCRAFT FUELING

Fueling from a Fuel Hydrant or Self-Serve Pump

When fueling a YAF aircraft from a hydrant or stationary fuel pump (not a fuel truck), it is important to examine the location to determine feasibility and the ability to fuel safely.

Issues to address before attempting to fuel from a hydrant or stationary pump:

- Will the fuel hose reach all tank filler openings?
- Can the aircraft be safely positioned close enough to the pump, and then able to be safely moved away from the pump?
- Can the aircraft be taxied in and out of position, or will it have to be towed?
- Is there a grade or slope approaching the pump that may have an effect on aircraft positioning?
- Is there an electrical bonding cable, and is it long enough to attach to the preferred bonding point on the aircraft?
- Is there a portable fire extinguisher available nearby?

Electrical Bonding

The fuel truck and aircraft must be bonded electrically with a cable prior to placing the fueling nozzle into the tank opening. Some fuel hoses have a bonding cable attached to the nozzle so that it can be attached to the aircraft near the tank filler opening. If this is the case, a separate primary bonding cable from the fueling source (truck or hydrant) to the aircraft is still desired. If a nozzle-attached secondary bonding cable is to be used, ensure that the primary cable is attached first before plugging in, or clamping on, the secondary cable. If possible, the secondary cable should be attached at the furthest point available from the fuel filler opening, without applying a tension on the nozzle.

Pumping Operation

Once the aircraft and fueling source are electrically bonded and the Fueller is safely positioned on the wing with the hose and nozzle at the fuel tank filler opening, the pump operator can be signaled that the pump can be turned on and fueling commence.

The pump operator should always be ready to turn off the pump if a problem occurs. It's good practice for the Safety Observer to be aware of how to turn the pump off in an emergency.

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AIRCRAFT FUELING

Some of YAF aircraft will typically have fuel tanks topped off when fueling; others will require a specific amount of fuel be pumped into each tank. When completely filling, or topping off a tank, the final fuel level should not be less than approximately 1 inch below the filler neck. The reason for this is to reduce the likelihood that fuel will siphon out of the tank in flight or start venting out of the plane on the ground, especially in warmer temperatures.

The Fueler will always confirm that fuel caps are properly secured when finished fueling.

Precautions / Safety

- The Fueler and any assistants must be familiar with precautions for walking on the wing and safe practices for working at heights.
- Fueling a YAF aircraft with its engine running (known as hot fueling), is prohibited.
- Refueling operations with a thunderstorm in the vicinity is prohibited.
- The Fueler must secure items such as cell phones, pens or pencils, sunglasses, etc. to prevent them from falling out of a pocket and into an open fuel tank.
- The Fuel Truck Operator, Fueler, and Safety Observer must be in visual contact at all times the pump is running.
- Ensure that the aircraft is electrically bonded to the fueling source, and that all cell phones are turned off.
- No passenger will be allowed onboard the aircraft during the fueling operation, and they will need to remain at least 100 feet away until refueling has been completed.
- Awareness must be maintained to ensure that no person is smoking and that there is no lighted flame or source of spark within 100 feet of the aircraft while fueling.
- Always confirm that fuel caps and access doors are properly secured when fueling is complete.

Fuel Spills

Any fuel spills should be immediately addressed. Depending on size of spill, the appropriate action should be taken as to how the clean-up process is to proceed. The type and quantity of spill response materials and their location should be known before any fueling operations commence. If the spill is large or a continuous flow, the fire department must be notified immediately.



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AIRCRAFT FUELING

Recordkeeping

Fuel tank servicing must always be recorded on the current flight log page in use.

The information recorded must include:

- The airport identifier where the aircraft was fueled.
- The total quantity of fuel added to the tank.
- The resultant total fuel onboard after fueling is complete.
- The date and initials of the YAF Crew Chief who accomplished or oversaw the fueling process.

The fuel receipt will be forwarded to the YAF accountant.

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DECEMBER 1, 2021

95.5.1
Original
AIRCRAFT MAINTENANCE SAFETY

AIRCRAFT MAINTENANCE SAFETY

DECEMBER 1, 2021

AIRCRAFT MAINTENANCE SAFETY

General

An important consideration of any operation, but especially of an aircraft maintenance operation, is safety. Working in a hangar environment, on and around aircraft has many hazards. Those who have been involved in aircraft maintenance know of the many ways one can injure themselves.

In the YAF organization, many of the volunteers who are part of the aircraft maintenance workforce may have never before worked in a hangar, or on an aircraft. The following will help the unfamiliar to recognize potential hazards, while providing a review for the rest of us.

Probably the one most important characteristic one can have to remain injury free in an aircraft maintenance environment is awareness. Awareness of your surroundings, of potential hazards, and the risk of injury caused by these hazards.

Following is a partial list of hazards one may encounter working in an aircraft maintenance environment, and suggestions for reducing the risk of injuring oneself or others. Hopefully it will help a person to recognize a potential hazard, be cautious, and compel them to eliminate the hazard.

Aircraft Maintenance Environment Hazards

HEAD INJURY

➤ Possible Causes:

- Walking into protrusions (*antennas, drains, vents, open hinged panels*) on underside of aircraft
- Walking into a propeller, flight control surface, or flap
- Trip and fall due to improperly laid hose, extension cord or object in path
- Slip and fall due to fluid or absorbent remaining on floor
- Missing last step coming down a ladder and falling
- Falling off of, or coming down with a failed or improperly set/positioned ladder
- Falling off of, or coming down with kicked-out ladder positioned too far from work

➤ Corrective/Preventative measures:

- Maintain awareness of your surroundings, and path of movement
- Exercise deliberate, unhurried movement
- Flag protrusions from aircraft
- Flag corners of abnormally positioned flaps or control surfaces

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AIRCRAFT MAINTENANCE SAFETY

- Reposition (*Dress*) propeller if moved to facilitate other maintenance
- Flag obstructions on floor
- Recognize and eliminate slip and trip hazards
- Proper ladder placement, then readjust when necessary

EYE INJURY

- Possible Causes:
 - Flying pieces of safety wire when being cut
 - Metal chips, turnings or shavings from drill press, air drill, lathe or mill
 - Metal filings or dust from band saw, grinder or sander
 - Broken machining or drill bit
 - Fluid spray from fluid line fitting/hose leak under pressure
- Corrective/Preventative Measures:
 - Use of safety glasses, full face shield, equipment mounted shields
 - Proper tool use/technique

HAND OR FINGER INJURY

- Possible Causes:
 - Unexpected aircraft control movement
 - Rivet squeezer, sheetmetal shear, sheetmetal break
 - Protruding cotter pins or safety wire, sharp cut zip-tie ends
 - Sharp edges of sheetmetal
 - Mill, lathe, band saw, drill press, air drill, grinder or sander
- Corrective/Preventative Measures:
 - Use protective gloves (*but not when using mill or lathe*)
 - Proper tool use/technique
 - Remain attentive/focused
 - Communicate to others when systems are being operated
 - Cease operation when distracted

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AIRCRAFT MAINTENANCE SAFETY

INJURY TO LIMB

- Possible Causes:
 - Trip and fall due to improperly laid hose, extension cord or object in path
 - Slip and fall due to fluid or absorbent remaining on floor
 - Missing last step coming down a ladder and falling
 - Falling off of, or coming down with a failed or improperly set/positioned ladder
 - Falling off of, or coming down with kicked-out ladder positioned too far from work
- Corrective/Preventative Measures:
 - Maintain awareness of your surroundings, and path of movement
 - Exercise deliberate, unhurried movement
 - Recognize and eliminate slip and trip hazards
 - Draw out hoses and extension cords flat on floor without loops
 - Coil excess hoses or extension cords and flag or place out of walkway
 - Proper ladder placement, then readjust when necessary

INJURY TO THE BACK

- Possible Causes:
 - Improper or unassisted lifting (*tire, generator, cylinder, prop dome*)
 - Trip and fall due to improperly laid hose, extension cord or object in path
 - Slip and fall due to fluid or absorbent remaining on floor
 - Falling off of, or coming down with a failed or improperly set/positioned ladder
 - Falling off of, or coming down with kicked-out ladder positioned too far from work
- Corrective/Preventative Measures:
 - Practice proper lifting techniques
 - Use of lifting back brace
 - Maintain awareness of your surroundings, and path of movement
 - Exercise deliberate, unhurried movement
 - Recognize and eliminate slip and trip hazards
 - Proper ladder placement, then readjust when necessary

Summary/Recommendations

- Safety in the workplace is closely related to housekeeping, and maintaining an organized work environment.
- Eliminate a potential safety hazard by recognizing and correcting it when you first come upon it.

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AIRCRAFT MAINTENANCE SAFETY

- Often injuries occur when using equipment that a person has not received training on, or are using in a careless manner.
- Reduce the following frequently observed trip hazards by laying out hose and extension cords flat on the floor, eliminating all protruding loops. Make sure they extend from the electrical outlet or hose receptacle at the wall straight down to the floor, not at an angle across a walkway. A better method is to use an overhead cable/hose support arm that holds cords and hoses above the walkway.
- Move unused ladders away from work activity, fold and lay them down on the floor.
- When positioning ladders, make certain the feet are solid on the floor.
- When on a ladder, if you find yourself reaching for what you are working on, reposition the ladder! A person has a tendency to apply outward pressure on the ladder when reaching, increasing the risk of kicking the ladder out and away, and tipping over.
- When working on flight or engine controls, or any other system that could cause injury to someone unaware of the maintenance being performed, tag or apply signage in hazardous locations to caution that the system components should not be disturbed, and that they may activate at any time (*move, pressurize, energize, etc*).
- When leaving open, normally closed, hinged access panels under the wing for a lengthy time period, flag the panel.
- Hang brightly colored streamers or tape on sharp corners that may not normally be exposed, except during heavy maintenance.
- Consider removing fuses or opening circuit breakers in the aircraft when working on associated systems.

The information presented within this section of the GMM, is not intended to impose procedures or safety measures, but instead to heighten one's awareness as to the inherent health risks they may encounter.

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DECEMBER 1, 2021

100.5.1
Original
ATTACHMENTS

ATTACHMENTS

DECEMBER 1, 2021

B-17 Cabin Crew Training Record			DATE OF INSTRUCTION:		
			LOCATION:		
NAME (Last, First, Middle Initial):			EMAIL:		
YANKEE AIR MUSEUM MEMBERSHIP NUMBER		#			
NAME OF INSTRUCTOR/CERTIFICATE NUMBER IF APPLICABLE			INSTRUCTOR SIGNATURE:		
TRAINING TOPICS NOTES: Column A - Training covered in Annual Ground School Column B - Training covered in the aircraft					
NORMAL PROCEDURES	A	B	ABNORMAL AND EMERGENCY PROCEDURES	A	B
GROUND OPERATIONS			AIRBORNE OPERATIONS		
PREFLIGHT OPERATIONS		*	FUEL TRANSFER OPERATIONS		*
FUEL AND OIL TANK CHECKS		*	EMERGENCY GEAR EXTENSION		*
START PROCEDURES		*	CABIN FIRE	*	*
FIRE ON ENGINE START PROCEDURES	*		COCKPIT FIRE	*	*
AWARENESS DURING TAXI OPERATIONS	*		NOSE COMPARTMENT FIRE	*	*
GROUND HAND SIGNALS	*		EMERGENCY CHECKLIST COORDINATION	*	*
TAIL WHEEL LOCK LEVER OPERATION		*	FIRST AID KIT LOCATIONS		*
STERILE COCKPIT RULES	*		HYDRAULIC PUMP MALFUNCTIONS		*
CREW COORDINATION/CHECKLIST MONITORING	*		INCAPACITATED CREWMEMBER	*	
RAMP AREA SAFETY CHECK	*		INCAPACITATED PASSENGER	*	
			HUACKING	*	
			BALL TURRET JETTISON PROCEDURES		*
PASSENGER OPERATIONS			GROUND OPERATIONS		
NORMAL PASSENGER BRIEFINGS	*	*	EMERGENCY EVACUATION	*	*
PASSENGER MOVEMENT IN CABIN	*	*			
PASSENGER PROTOCOL	*				
FUGHT OPERATIONS			REMARKS: This training conducted in accordance with LHM Exemption 18526. This training is required by FAA Exemption for LHM passenger flights. I certify that I have received training in the items listed on this form. Signature _____ Date _____		
ENGINE CONTROLS FUNCTION AND OPERATION		*			
HEADSET PROCEDURES		*			
ENGINE INSTRUMENT MONITORING/AWARENESS		*			
CREW COORDINATION/CHECKLIST MONITORING		*			
MISCELLANEOUS					
SAFETY MANAGEMENT SYSTEM	*				
HAZARD FORMS AND REPORTS	*				
FLIGHT LOG COMPLETION	*	*			
WHITE BOOK CONTENT AND LOCATION	*	*			
FLIGHT OPS WEB SITE REVIEW	*				
YAF Form 100A			1 April 2021		

DECEMBER 1, 2021

100.5.3
Original
AIRCRAFT MAINTENANCE
TRAINING RECORD

YANKEE AIR MUSEUM AIRCRAFT MAINTENANCE TRAINING RECORD

NAME	<input type="checkbox"/> Volunteer <input type="checkbox"/> Employee	<input type="checkbox"/> Licensed Mechanic <input type="checkbox"/> Unlicensed Mechanic	CERTIFICATE NUMBER
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DATE	TAIL NUMBER	<input type="checkbox"/> Airframe <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	MAKE / MODEL	TASK / TRAINING HRS	MECH INIT
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DESCRIPTION OF TASK PERFORMED OR TRAINING SUBJECT PRESENTED					
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SIGNATURE & CERTIFICATE NUMBER SUPERVISING WORK OR VALIDATING TRAINING



DATE	TAIL NUMBER	<input type="checkbox"/> Airframe <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	MAKE / MODEL	TASK / TRAINING HRS	MECH INIT
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DESCRIPTION OF TASK PERFORMED OR TRAINING SUBJECT PRESENTED					
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SIGNATURE & CERTIFICATE NUMBER SUPERVISING WORK OR VALIDATING TRAINING

DATE	TAIL NUMBER	<input type="checkbox"/> Airframe <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	MAKE / MODEL	TASK / TRAINING HRS	MECH INIT
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DESCRIPTION OF TASK PERFORMED OR TRAINING SUBJECT PRESENTED					
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SIGNATURE & CERTIFICATE NUMBER SUPERVISING WORK OR VALIDATING TRAINING

DATE	TAIL NUMBER	<input type="checkbox"/> Airframe <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	MAKE / MODEL	TASK / TRAINING HRS	MECH INIT
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DESCRIPTION OF TASK PERFORMED OR TRAINING SUBJECT PRESENTED					
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SIGNATURE & CERTIFICATE NUMBER SUPERVISING WORK OR VALIDATING TRAINING

DECEMBER 1, 2021

YAF AUTHORIZED RII INSPECTOR

The following named mechanic has received training on the inspection processes of the following (7) listed systems of the Bell UH-1H Helicopter, N240GH.

The training received presented an overview of the particular system, normal operational characteristics, and potential failure modes.

The training included familiarity of all components of the system, their physical location and purpose within the system.

The training described evidence of impending faults, and detailed explanation of the inspecting process.

All of this is based not only on instruction and data from technical publications, but most importantly, the experience of the instructor.

The instructor is the aircraft Crew Chief, and is the most experienced in regards to maintaining the aircraft.

A record of the above described training will be entered in the named mechanics personal training file.

	PRINTED NAME	CERTIFICATE TYPE & NUMBER	SIGNATURE	DATE
Mechanic/RII Inspector:				

	PRINTED NAME	CERTIFICATE TYPE & NUMBER	SIGNATURE	DATE
Instructor/Crew Chief:				

The following have been identified as Flight Safety Critical Systems which require special follow-up inspection after any maintenance involving disassembly, reassembly, component replacement, rigging or other maintenance

Instructor's Initials in the box following each Flight Safety Critical System signifies successful completion of training on the inspection procedures specific to that system, and certifies the mechanic as an RII Inspector for that specific system.

ITEM	FLIGHT SAFETY CRITICAL SYSTEMS	INSTRUCTORS INITIALS
1	Main Rotor and Controlling Components thereof, includes Collective and Cyclic	
2	Tail Rotor and Controlling Components thereof including Anti-Rotation Pedals	
3	Elevators and Controlling Components thereof including Cyclic	
4	Engine and Controlling Components thereof including Throttle and Fuel Control	
5	All Engine Driven Accessories	
6	Powertrain Indication Systems and All Components thereof	
7	Flight Instrumentation Systems and All Components thereof	

NOTE: The RII inspector is not permitted to inspect and sign off in the maintenance records any work which he himself had accomplished

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100.5.5
Original
WORK PROGRESS
TURNOVER FORM

WORK PROGRESS TURNOVER FORM

Form Line-by-Line Instructions:

- 1) Outgoing line, enter aircraft tail number, date, time and name of mechanic completing form
- 2) Incoming line is filled out when the follow up maintenance crew arrives to continue with work after crew change, overnight or weekend work pause
- 3) List other maintenance crew assisting with the primary task
- 4) Identify the primary task being performed
- 5) Is the maintenance task being performed on a system or component identified as an RII? Circle Yes or No.
- 6) Describe the portions of the task that have been completed
- 7) With the work in an incomplete state, are there any hazards present that need to be made known
- 8) If current worker(s) were to continue work, what is the next step to take

* If more room is required to complete any of these items, use the back of this form and check the box at the bottom of this page

1) OUTGOING	AIRCRAFT REG	DATE	TIME	MECHANIC COMPLETING FORM
2) INCOMING		DATE	TIME	MECHANIC ACKNOWLEDGING MAINTENANCE STATUS
3) OTHERS PARTICIPATING IN MAINTENANCE ACTIVITY				
+				
4) PRIMARY TASK IN PROGRESS				5) REQUIRED INSPECTION ITEMS (RII)
				YES NO
6) DESCRIPTION / SUMMARY OF WORK ACCOMPLISHED (continue on back if necessary)				
7) SAFETY / HAZARDS PRESENT ON THE AIRCRAFT (continue on back if necessary)				
8) DESCRIBE NEXT STEP(S) FOR CONTINUING THE REMAINING WORK (continue on back if necessary)				

☐ Continued on back of this form



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100.5.6
Original
DISCREPANCY SHEET

Yankee Air Force, Inc.

Discrepancy Sheet

Reg. No _____

Type Check _____

Date _____

Sheet # _____

1.	Insp.		
	Mech.		
	Mech.		
2.	Insp.		
	Mech.		
	Mech.		
3.	Insp.		
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6.	Insp.		
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7.	Insp.		
	Mech.		
	Mech.		
8.	Insp.		
	Mech.		
	Mech.		

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100.5.7
Original
FORM 2408-13

Aircraft Registration Number	Model	Aircraft Type Certificate	Date:	Page:
N240GH	UH-1H	Experimental		72
Part 1 - Fault Information				
Status	Date:	Acft Hrs:	HOBBS:	
Fault/Remarks:				
Signature: _____				
Status	Date:	Acft Hrs:	HOBBS:	
Fault/Remarks:				
Signature: _____				
Status	Date:	Acft Hrs:	HOBBS:	
Fault/Remarks:				
Signature: _____				
Part II - Correction Information				
Part #/Sn #		Off:	On:	
Corrective Action:				
A/P or I/A # Only:		Signature: _____		
Part #/Sn #		Off:	On:	
Corrective Action:				
A/P or I/A # Only:		Signature: _____		
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Corrective Action:				

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100.5.8
Original
FLIGHT LOG SHEET

AIRPLANE AND ENGINE TIME										PAGE NO. _____									
AIRPLANE TOTAL TIME					ENGINE HOURS SINCE OMI					AC NO. _____									
BRT FWD.					1 2 3 4					TOTAL BLOCK									
TODAY					1 2 3 4					TOTAL FLIGHT									
TODAY					1 2 3 4					TOTAL FLIGHT									
STATION					ENGINE OIL					INSTRUMENT APPROACH									
ADDED					OIL ADDED					D N									
TOTAL					NO. OF GAL.					FROM									
DATE					NO. OF GAL.					TO									
BY					NO. OF GAL.					NIGHT									
					NO. OF GAL.					WORK ORDER									
					NO. OF GAL.					TO									
					NO. OF GAL.					FROM									
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YAM AIRCRAFT MAINTENANCE TORQUE WRENCH CALIBRATION LOG

WRENCH MANUFACTURER <u>Richmont</u>		MODEL OR PART NUMBER 2SD150		SERIAL NUMBER TC128	
TORQUE RANGE 10 - 150 in/lb		DRIVE SIZE 1/4"			

TORQUE SETTING	30	90	150	CHECK DATE	CHECKED BY
Tolerance +/- 4%	29 - 31 in/lb	86 - 94 in/lb	144 - 156 in/lb		
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					

WRENCH MANUFACTURER <u>Richmont</u>		MODEL OR PART NUMBER 2SD150		SERIAL NUMBER TC218	
TORQUE RANGE 10 - 150 in/lb		DRIVE SIZE 1/4"			

TORQUE SETTING	30	90	150	CHECK DATE	CHECKED BY
Tolerance +/- 4%	29 - 31 in/lb	86 - 94 in/lb	144 - 156 in/lb		
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					
Torque Reading					

DECEMBER 1, 2021

100.5.11
Original
AIRCRAFT PART TAGS

I

**YELLOW
SERVICEABLE
TAG**

LOCATION ATA <input type="checkbox"/>	INSTALLATION TTAF <input type="checkbox"/>	SERVICEABLE (COMPONENTS)	UNIT NAME _____	MFR NAME / TYPE / MODEL _____
			PART NO. _____ <input type="checkbox"/> New <input type="checkbox"/> Repaired	SERIAL NO. _____ <input type="checkbox"/> Overhauled <input type="checkbox"/> Tested
Inspected By _____ Yankee Air Museum 47884 D Street Belleville, MI 48111			_____ (DATE)	

**GREEN
REPAIRABLE
TAG**

LOCATION ATA <input type="checkbox"/>	REMOVED FROM: TTAF <input type="checkbox"/>	REPAIRABLE (COMPONENTS)	UNIT NAME _____	MFR NAME / TYPE / MODEL _____
			PART NO. _____ COMMENTS: _____ _____ _____	SERIAL NO. _____
Yankee Air Museum 47884 D Street Belleville, MI 48111			_____ (SIGNED) _____ (DATE)	

**RED
REJECTED
TAG**

LOCATION ATA <input type="checkbox"/>	REMOVED FROM: TTAF <input type="checkbox"/>	REJECTED (COMPONENTS)	UNIT NAME _____	MFR NAME / TYPE / MODEL _____
			PART NO. _____ COMMENTS: _____ _____ _____	SERIAL NO. _____
Yankee Air Museum 47884 D Street Belleville, MI 48111			_____ (SIGNED) _____ (DATE)	



100.5.12

Original

PARTS SIGN-OUT SHEET

GENERAL MAINTENANCE MANUAL



DECEMBER 1, 2021

100.5.13
Original
PACKING LIST

TO:

S&T AIRCRAFT ACCESSORIES
310 F.M. 483
NEW BRAUNFELS, TX 78130
830-625-7923

FROM:

YANKEE AIR MUSEUM
47884 D STREET
BELLEVILLE, MI 48111
734-483-4030

ITEM	DESCRIPTION
1	Tail Landing Gear Motor/Gearbox Assembly Eclipse p/n 1227-1-A s/n 6474 -Motor failed, smoked, blew fuse. -Overhaul & set clutch torque as required for B-17G Tail Landing Gear
2	Tach Generator AN5531-1 / Mfr p/n 10732CM5-ACZ Sub 23 s/n AF-43 23968 -Erratic RPM indications -Inspect & repair as necessary -78.9-hrs TSO, S&T WO# 58111 <i>*Please consider warranty repair!</i>
3	Vacuum Pump p/n 3P211J s/n 58849 -Drive shaft sheared. -Repair as necessary.

*Additional information or Questions

Contact Paul Hakala
734-355-0360



DECEMBER 1, 2021

100.5.14
Original
SHIPPING LABEL

Yankee Air Museum
47884 D Street
Belleville, MI 48111

S & T AIRCRAFT ACCESSORIES, INC.
310 FM 483
NEW BRAUNFELS, TX 78130