

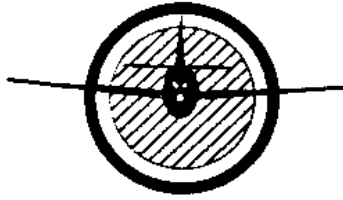
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POWERPLANT COURSE CURRICULUM

VOLUME 4

Revision 1 – June 07, 2019

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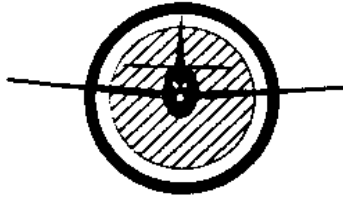


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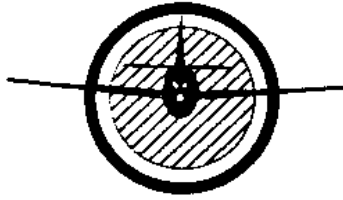
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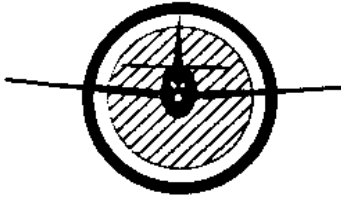
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LIST OF EFFECTIVE PAGES

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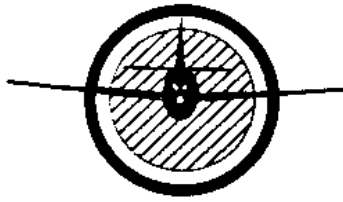
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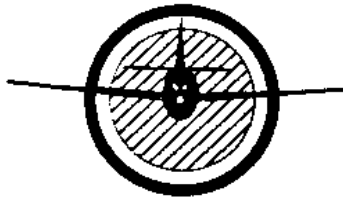
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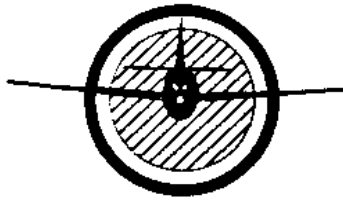
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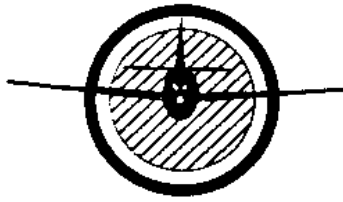
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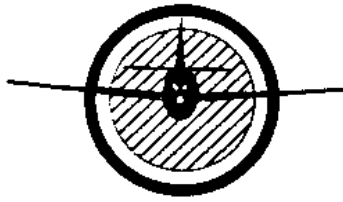
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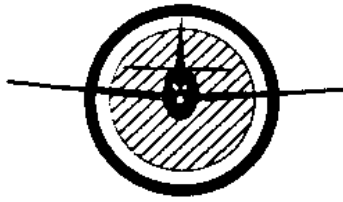
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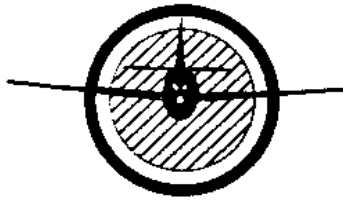
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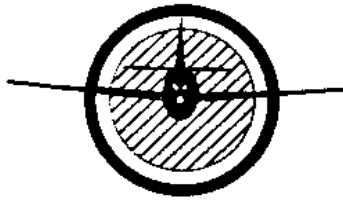
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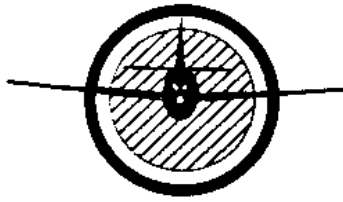
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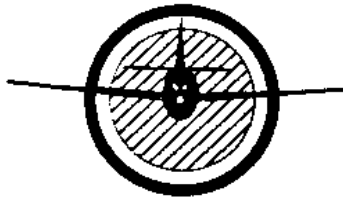
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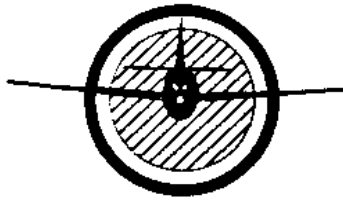
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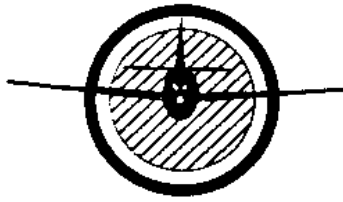
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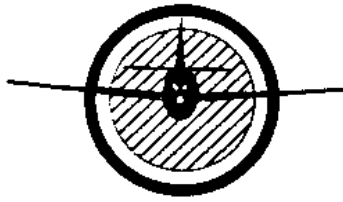
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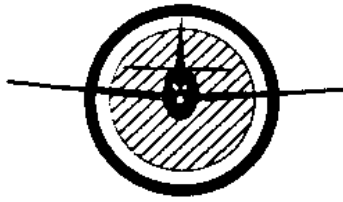
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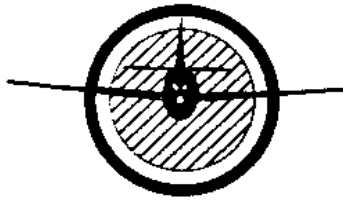
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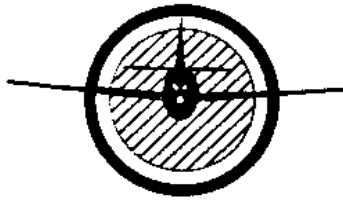
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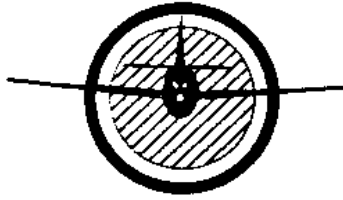
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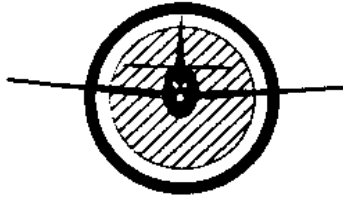
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PUERTO RICO AVIATION MAINTENANCE INSTITUTE
AVIATION MAINTENANCE TECHNICIAN COURSE
FAA Approved # DN9T092R**

POWERPLANT COURSE CURRICULUM MANUAL

LOG OF REVISIONS

The Assistant Secretary of Occupational and Technical Education Program will submit revisions to the POWERPLANT COURSE CURRICULUM MANUAL to the Federal Aviation Administration for approval. The revision will be numbered consecutively. Upon receipt of revisions, the holder will revise the manual as indicated on the revision letter. When the required action is completed, the individual completing the action will write the revision number, sign and record the date the revision was entered, in the space provided below.

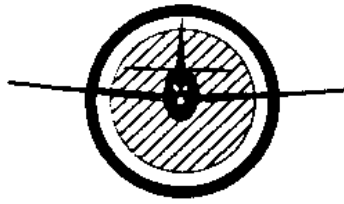
Changes to a page will be identified by using a bold italic font or a black bar alongside the paragraph either on the left or right-side margins.

If any previous revisions are missing, the holder of the Curriculum Manual will contact the General Course Coordinator prior to inserting any new revision or using the Curriculum Manual.

| Rev. No. | Entered by | Date | Rev. No. | Entered by | Date |
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Occupational and Technical Education Program

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Date : June 07,2019



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PUERTO RICO AVIATION MAINTENANCE INSTITUTE
AVIATION MAINTENANCE TECHNICIAN COURSE
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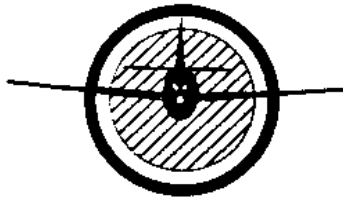
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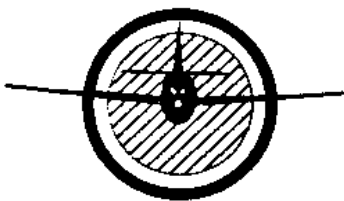


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POWERPLANT COURSE CURRICULUM MANUAL

POWERPLANT SCOPE

| SUBJECTS | THEORY | SHOP LAB | TOTAL HOURS |
|--|------------|------------|-------------|
| I. POWERPLANT THEORY AND MAINTENANCE | | | |
| A. Reciprocating Engines | 75 | 75 | 150 |
| B. Turbine Engines | 60 | 60 | 120 |
| C. Engine Inspection | 15 | 15 | 30 |
| II. POWERPLANT SYSTEMS AND COMPONENTS | | | |
| A. Engine Instrument Systems | 15 | 15 | 30 |
| B. Engine Fire Protection Systems | 9 | 9 | 18 |
| C. Engine Electrical Systems | 25 | 25 | 50 |
| D. Lubrication Systems | 25 | 25 | 50 |
| E. Ignition and Starting Systems | 37 | 37 | 74 |
| F. Fuel Metering Systems | 30 | 30 | 60 |
| G. Engine Fuel Systems | 9 | 9 | 18 |
| H. Induction and Engine Airflow | 9 | 9 | 18 |
| I. Engine Cooling Systems | 9 | 9 | 18 |
| J. Engine Exhaust and Reverser | 15 | 15 | 30 |
| K. Propellers | 33 | 33 | 66 |
| L. Unducted Fans | 4 | 2 | 6 |
| M. Auxiliary Power Unit | 6 | 6 | 12 |
| III Curriculum Final Review | --- | | ---- |
| TOTALS | 376 | 374 | 750 |

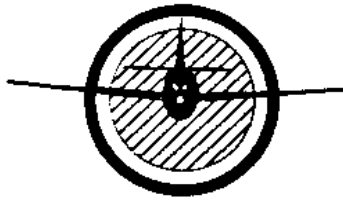


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POWERPLANT COURSE CURRICULUM MANUAL

SCHEDULE OF REQUIRED TEST

| SUBJECTS | No Written Test | Number of Hour |
|--|------------------------|-----------------------|
| I. POWERPLANT THEORY AND MAINTENANCE | | |
| A. Reciprocating Engines | 3 | 6 |
| B. Turbine Engines | 3 | 6 |
| C. Engine Inspection | 1 | 1 |
| II. POWERPLANT SYSTEMS AND COMPONENTS | | |
| A. Engine Instrument Systems | 1 | 1 |
| B. Engine Fire Protection Systems | 1 | 1 |
| C. Engine Electrical Systems | 1 | 2 |
| D. Lubrication Systems | 2 | 3 |
| E. Ignition and Starting Systems | 2 | 3 |
| F. Fuel Metering Systems | 2 | 3 |
| G. Engine Fuel Systems | 1 | 1 |
| H. Induction and Engine Airflow Systems | 1 | 1 |
| I. Engine Cooling Systems | 1 | 1 |
| J. Engine Exhaust and Reverser Systems | 1 | 1 |
| K. Propellers | 2 | 2 |
| L. Unducted Fans | 1 | 1 |
| M. Auxiliary Power Unit | 1 | 1 |
| TOTALS | 24 | 34 |



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POWERPLANT COURSE CURRICULUM MANUAL

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

TOTAL HOURS: 150 THEORY: 75 SHOP/LAB: 75

A. COMPARISON OF AIRCRAFT POWERPLANTS

1. General Requirements
2. Power and Weight
3. Fuel Economy
4. Durability and Reliability
5. Operating Flexibility
6. Compactness
7. Powerplant Selection

B. TYPES OF RECIPROCATING ENGINES

1. Inline Engines
2. Opposed or O-type Engines
3. Radial Engines
 - a. Single Row Radial
 - b. Twin Row Radial
 - c. 4 Row Radial

C. RECIPROCATING ENGINE DESIGN AND CONSTRUCTION

1. Main Engine Section

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- a. Radial Engines
 - 1) Nose Section
 - 2) Power Section
 - 3) Diffuser Section
 - 4) Accessory Section
- 2. Crankshafts
 - a. Crankshaft Balance
 - b. Dynamic Dampers
- 3. Connecting Rods
 - a. Master and Articulated Rod Assembly
 - b. Plain Type Connecting Rods
- 4. Pistons
 - a. Piston Construction
 - b. Piston Pin
 - c. Piston Rings
 - 1) Construction
 - 2) Compression
 - 3) Oil Control Rings
 - 4) Oil Scraper Rings
- 5. Cylinders
 - a. Cylinder Heads
 - b. Cylinder Barrels
- 6. Cylinder Numbering
 - a. Opposed Engines
 - 1) 4 Cylinders

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- 2) 6 Cylinders
- 3) 8 Cylinders
- b. Radial Engines
 - 1) Single Row
 - 2) Double Row
- 7. Firing Order
 - a. Opposed Engines
 - 1) 4 Cylinders
 - 2) 6 Cylinders
 - 3) 8 Cylinders
 - b. Radial Engines
 - 1) Single Row
 - 2) Double Row
- 8. Valve Construction
 - a. Exhaust
 - b. Intake
- 9. Valve Operating Mechanism
 - a. Cam Ring
 - b. Crankshaft
 - c. Tappet Assembly
 - d. Hydraulic Valve Tappets
 - e. Push Rods
 - f. Rocker arms
 - g. Valve Springs
 - h. Hydraulic Valve Lifters

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- 10. Bearings
 - a. Plain
 - b. Ball
 - c. Roller
- 11. Reduction Gearing
 - a. Spur Planetary
 - b. Beveled Planetary
 - c. Spur and Pinion
- 12. Propeller Shafts
 - a. Tapered
 - b. Splined
 - c. Flanged

D. RECIPROCATING ENGINE OPERATING PRINCIPLES

- 1. Operating cycles – Four Stroke
 - a. Intake Stroke
 - b. Compression Stroke
 - c. Power Stroke
 - d. Exhaust Stroke
- 2. Reciprocating Engine Power and Efficiencies
 - a. Work
 - b. Horsepower
 - c. Piston Displacement
 - d. Area of a Circle
 - e. Compression Ratio
 - f. Indicated Horsepower

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- g. Brake Horsepower
 - h. Friction Horsepower
 - i. Friction and Brake Mean Effective Pressure
 - j. Thrust Horsepower
3. Efficiencies
- a. Thermal Efficiency
 - b. Mechanical Efficiency
 - c. Volumetric Efficiency
 - d. Propulsive Efficiency

E. RECIPROCATING ENGINE OVERHAUL

- 1 General Overhaul Procedures
- a. Top Overhaul
 - b. Major overhaul
 - c. Disassembly
 - d. Inspection
 - 1) Visual
 - 2) Magnetic
 - 3) Dimensional
 - e. Cleaning
 - f. Repair and Replacement
2. Cylinder Recondition
- a. Cylinder Head
 - b. Cylinder Barrel
 - 1) Maximum Taper of Cylinder Walls
 - 2) Maximum Out of Roundness

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- 3) Bore Diameter
- 4) Step
- 5) Fit between Piston Skirt and Cylinder
- c. Valves and Valve Springs
- d. Rocker Arms and Shafts
- e. Piston and Piston Pin
- f. Re-facing Valve Seats
 - 1) Steel Seats
 - 2) Bronze Seats
 - 3) Checking Size and Trueness
- g. Valve Reconditioning
 - 1) Standard Angle
 - 2) Interference Fit
 - 3) Narrow Grinding
 - 4) Feather Edge
 - 5) Valve Tip
 - a) Valve Tip Bevel
- h. Valve Lapping and Leak Testing
 - 1) Use of Lapping and Leak Testing
 - 2) Use of Kerosene for Leak Testing
- i. Piston Repairs
 - 1) Areas of Most Damage
 - 2) Removing Piston Scores
 - 3) Balancing of Pistons
- j. Cylinder Grinding and Honing

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- 1) Recognize Defects Requiring Grinding or Honing
- k. Crankshaft Inspection
 - 1) Visual
 - 2) Magnetic Particle
 - 3) X-Ray
 - 4) Use of Dial Indicator
- l. Connecting Rods
 - 1) Visual Inspection
 - a) Use of Magnifying Glass
 - 2) Checking Equipment
 - a) Measure Rod Squareness
 - b) Determine Bushing or Bearing Specs
- m. Engine Run-in
 - 1) Purpose after Engine Overhaul
 - a) Piston Ring Run-in
 - b) Bearing Burnishing
 - c) Engine Performance
 - d) Engine Condition

F. INSPECT, CHECK, SERVICE, AND REPAIR OPPOSED AND RADIAL ENGINES AND RECIPROCATING ENGINE INSTALLATIONS

- 1. Cylinder Inspection
 - a. Techniques of Cylinder Inspection
 - 1) Check for Out –of-Roundness, Taper and Choke
 - 2) Color, Coding of Aircraft Cylinders
 - 3) Check the Areas of Greatest Cylinder Wear

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2. Limits and Tolerances
 - a. Removal of Intake and Exhaust Pipes
 - b. Removal of Rocker Box Covers
 - c. Push Rod Removal
 - 1) Mark for Return to Original Location
 - d. Protection of Master Rod during Cylinder Removal
 - e. Check for Any Broken Piston Rings That May Have Entered the Crankcase
 - f. Removal of Piston
 - g. Support of Connecting Rod
3. Stud Inspection, Removal, and Installation
 - a. Inspection of Studs
 - 1) Cracks
 - 2) Damaged Threads
 - 3) Other Visible Defects
 - b. Stud Removal
 - 1) Removal of Damaged Studs
 - a) Tools Used in Stud Removal
 - b) Procedure Used in Stud Removal
 - 2) Removal of Broken Studs
 - a) Tools Used to Remove Broken Studs
 - b) Procedures for Removal of Broken Studs
 - c. Stud Installation
 - 1) Installing Studs
 - a) Identify Oversized Studs

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- b) Identify Alloy of Studs
 - c) Installation without Special Tools
 - d. Helicoil
 - 1) Description of a Helicoil
 - 2) Usage
 - 3) Installation
 - 4) Removal
- 4. Detection of Cracks and Defects in Crankcase Assemblies
 - a. Cleaning Crankcase Assemblies
 - 1) Materials Generally Used in Crankcase Cleaning
 - 2) Handling and Cleaning of Crankcase Made of Special Alloys
 - b. Inspection of Crankcase Assemblies
 - 1) Types of Specialized Inspections
 - a) Zyglo
 - b) X-Ray
 - c) Dye Penetrant
 - 2) Oil Flow Check Procedure
 - 3) Removal and Installation of Plugs in Crankcase Passageways
 - 4) The Use of Visual Inspection and Dimensional Inspections
- 5. Identification of Serviceable Bearings
 - a. Types of Bearings
 - 1) Plain Bearings
 - 2) Antifriction Bearings
 - 3) Ball Bearings
 - 4) Roller Bearings

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- b. Visual Inspection of Bearings
 - 1) Indication of Acid Etch
 - 2) Source of Acid Etch
 - 3) Effects of Inadequate Lubrication of Bearings
 - 4) Effects of Oil Pressure on Bearing Wear
 - 5) Bearing Wear Caused by Misalignment during Installation
 - c. Dimensional Inspection of Bearings
 - 1) Inside Diameters
 - 2) Outside Diameters
6. Crankcase Inspection
- a. Crankshaft Run-out
 - 1) Flange
 - a) Checking Run-out Before Disassembly
 - b) Procedure for Checking Run-out Before Disassembly
 - 2) Shaft
 - a) Use of V Block or Roller when Checking Shaft Run-out
 - b. Measurements
 - 1) Procedure for Measuring Bearing Journals
 - 2) Determining Out-of-round Journal
 - 3) X-Ray Crankshaft after Dimensional Check
7. Piston and Knuckle Pin Retainers
- a. Piston Pin Retainers
 - 1) Full Floating Piston Pin
 - 2) Types of Piston Pin Retainers
 - 3) Procedure for Removal and Installation

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- b. Knuckle Pin Retainers
 - 1) Determine Serviceability of Knuckle Pin Retainers
 - 2) Pre-positioned Knuckle Pins
- 8. Cams and Cam Followers
 - a. Cam Rings
 - 1) Number of Cam Tracks per Ring or Plate
 - 2) Purpose of a Ramp on a Cam Lobe
 - b. Camshafts
 - 1) Types of Engines that Use Camshafts
 - 2) Number of Lobes Used on a Shaft in Relation to the Number of Valves
 - 3) Procedure for Measuring Cam Lobe Height
- 9. Valve and Valve Seat inspection and Rework
 - a. Valve Types and Material
 - 1) Exhaust Valves
 - 2) Intake Valves
 - 3) Sodium Filled Valves
 - 4) Hazards of Sodium Filled Valves
 - 5) The Use and Advantage of Stellite in Valve Construction
 - b. Valve Seats and Valve Face Angle
 - 1) Purpose of Valve Face Angle
 - 2) Normal Angle of Valves
 - a) Exhaust Valves
 - b) Intake Valves
 - 3) Valve Seat Construction

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- 4) Methods of Retaining Valve Seats in Cylinders
- c. Valve Guides
 - 1) Installation Procedures
 - 2) Relationship of Valve to Seat and Guide
 - 3) Valve Seat Installation Procedures
 - 4) Determining Valve Stretch
 - 5) Gas Tight Seal Obtained between the Valve and the Valve Seat
 - 6) Desired Width of Contact between the Valve and Valve Seat
- 10. Cylinder Assembly, Installation and Construction
 - a. Construction Features
 - 1) Piston
 - a) Cam Ground Piston
 - b) Types of Piston
 - c) Reason for Large Clearances between the Piston and the Cylinder
 - 2) Rings
 - a) Functions of Piston Rings
 - (1) Compression Ring
 - (2) Oil Control Ring
 - (3) Oil Scraper Ring
 - 3) Ring, Piston and Cylinder Fit
 - a) Reason for Chrome Plating Rings
 - b) Precautions in Using Chrome Rings
 - c) Ring Side Clearance
 - d) Ring and Gap

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- e) Procedure for Checking Different Ring Types
- b. Use of Maintenance Manuals
 - 1) Manufacturer's Recommended Procedures
 - a) Cylinder Attaching Methods
 - b) Installing the Master Rod assembly
 - c) Checking Rings before Cylinder Installation
 - d) Checking Crankcase Base Area before Cylinder Installation
 - e) Lubrication of Cylinders, Piston and Ring Assemblies
 - f) Ring Compressors
 - g) Cylinder Hold-down Methods
- c. Special Tools
 - 1) Torque Wrench for Cylinder Hold-down Nuts
 - 2) Torqueing Sequence for Cylinder Hold-down Nuts
 - 3) Other Special Tools as Required by Manufacturers

G. REASONS FOR ENGINE REMOVAL

- 1. Life Span Exceeded
- 2. Sudden Stoppage
- 3. Sudden Reduction in Speed
- 4. Metal Particles in Oil
- 5. Unstable Engine Operation

H. PREPARING FOR ENGINE REMOVAL

- 1. Safety Precautions
- 2. Draining the Engine
- 3. Electrical Disconnects
- 4. Disconnection of Engine Controls

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5. Disconnection of Lines

I. REMOVING THE ENGINE

1. Use of Engine Sling
2. Hoisting the Engine
3. Attachment to Stand

J. NACELLE INSPECTION

1. Engine Mount and Bolts
2. Wiring and Bonding
3. Tubing and Ducting
4. Oil Cooler and Tank
5. Cleaning

K. ENGINE MOUNTS

1. Mount Ring
2. Tangential Suspension
3. Dynafocal Mounts

L. ENGINE INSTALLATION

1. De-preservation
2. Lord Mount Inspection
3. Use of Hoist and Sling
4. Connections and Adjustments
5. Rigging Engine Controls

M. ENGINE TESTING

- 1) Pre-oiling
- 2, Bleeding Fuel System
3. Propeller Checks

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4. Ground Checks

5. Flight Test

N. ENGINE PRESERVATION AND STORAGE

1) Corrosion – Preventive Compounds

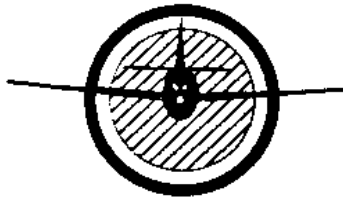
2. Dehydrating Agents

a. Silica Gel Color Changes

3. Treatment Procedures

4. Shipping Containers

5) Inspection of Stored Engines



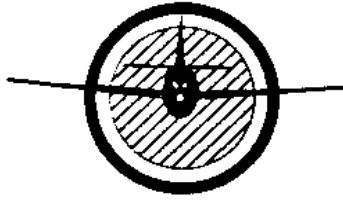
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POWERPLANT COURSE CURRICULUM MANUAL

Performance Goals

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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

LEVEL

P-1 INSPECT AND REPAIR A RADIAL ENGINE

(1)

- A. Given statements concerning the construction, operation, and repair of radial engines; write a brief answer for each question.

P-2 OVERHAUL RECIPROCATING ENGINE

(2)

- A. Given a reciprocating engine, an overhaul manual, appropriate inspection sheets; disassemble, clean, inspect (visual, dimensional and magnetic particle), lap valves to seats and leak test, and reassemble engine. Make a complete list of parts not reusable according to the table of limits, and that are normally replaced at overhaul. Look up all part numbers for the parts and research all AD's pertaining to the engine. Make a return to service entry in a sample logbook.
- B. Using valves supplied by the instructor; grind the valves as directed (by the instructor). All safety precautions shall be observed.

**P -3 INSPECT, CHECK, SERVICE AND REPAIR
RECIPROCATING ENGINES AND ENGINE
INSTALLATIONS**

(3)

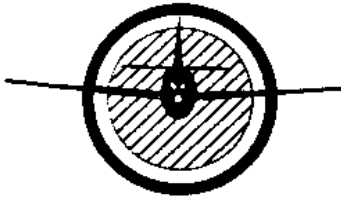
- A. Using an operable aircraft engine, a compression testing device with operating instructions or AC 43.13-2B, as revised; perform a compression check, listing the readings from all cylinders and make the repairs as needed.

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Performance Goals (continued :)

P-4 REMOVE, INSTALL AND TROUBLESHOOT RECIPROCATING ENGINES (3)

- A. Using the necessary lifting or hoisting equipment, an aircraft engine, test stand or airplane, and written instructions and/or procedures; remove and install an aircraft engine.
- B. Given an operable aircraft engine, starting procedures, and safety precautions; operate an engine at various power settings. List all operating discrepancies and their causes.



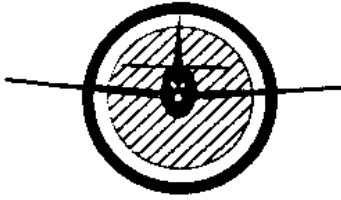
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POWERPLANT COURSE CURRICULUM MANUAL

Practical Projects

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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

1-A: INSPECT AND REPAIR RADIAL ENGINE

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and understanding of the construction, operation and repair of radial engines

REFERENCES:

1. AC 43.13-1B, as revised, Acceptable methods, techniques and practices.
2. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A, Vol. 1 and Vol. 2; as revised)*

EQUIPMENT AND TOOLS REQUIRED:

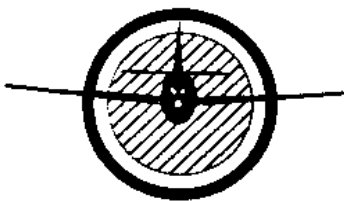
N/A

SUPPLIES AND MATERIALS REQUIRED:

1. List of questions
2. Pencil or Pen
3. Writing paper

PROCEDURE:

The student will answer the list of questions provided by the instructor from information obtained from the reference material.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

2-A: OVERHAUL RECIPROCATING ENGINE

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 42.0 Hrs

PURPOSE:

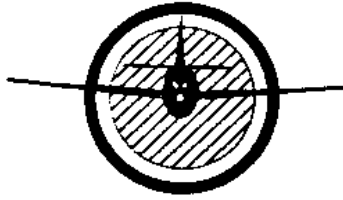
To acquaint the student with the required knowledge and skills in performing a complete engine overhaul, following all FAA and manufacturer's requirements.

REFERENCES:

1. Applicable engine overhaul manuals and service letter information
2. Applicable Engine Parts Catalog
3. Applicable Engine AD Listing
4. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A, Vol. 1 and Vol. 2; as revised)***
5. Powerplant Section Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Complete aircraft reciprocating engine
2. Basic hand tools
3. Required Engine overhaul special tools
4. Precision Measuring Equipment



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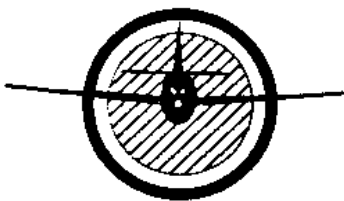
POWERPLANT COURSE CURRICULUM MANUAL

SUPPLIES AND MATERIALS REQUIRED

1. Engine Inspection Sheet
2. Engine AD Listing
3. Sample Engine Logbook Page

PROCEDURE:

A group of students will be furnished an aircraft engine, all the required technical information, equipment and special tools. They will simulate and aircraft engine overhaul on the engine with the instructor's supervision and will present to the instructor a sample of a return to service entry on the sample logbook page.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

2-B: OVERHAUL RECIPROCATING ENGINE

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the correct procedure in the valve grinding process and to observe all safety precautions required.

REFERENCES:

1. Applicable engine overhaul manuals
2. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)*

EQUIPMENT AND TOOLS REQUIRED:

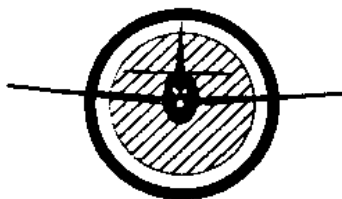
1. Valve Grinding equipment
2. Safety Goggles or Glasses

SUPPLIES AND MATERIALS REQUIRED

1. Aircraft engine intake and exhaust valves.

PROCEDURE:

The student will be furnished with typical aircraft engine valves. The student using the valve grinder equipment will properly grind an engine valve, in accordance with the applicable engine Overhaul Manual instructions while observing all safety precautions required.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

3-A: INSPECT, CHECK, SERVICE AND REPAIR RECIPROCATING ENGINE AND ENGINE INSTALLATIONS.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in performing an engine cylinder compression test and to observe all safety precautions.

REFERENCES:

1. Applicable Engine Overhaul Manual
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Section Textbook and AC 43.13-1B, as revised

EQUIPMENT AND TOOLS REQUIRED:

1. Operable Aircraft Engine
2. Cylinder compression test equipment (pressure differential and direct reading)
3. Air compressor unit and related equipment (hoses, fittings, etc.)
4. Basic hand tools

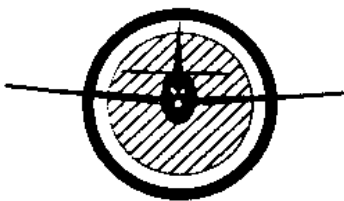
SUPPLIES AND MATERIALS REQUIRED

1. Cylinder compression checks reading form

3-A: INSPECT, CHECK, SERVICE AND REPAIR RECIPROCATING ENGINE AND ENGINE INSTALLATIONS. (continued :)

PROCEDURE:

The student will be furnished with an operable aircraft engine with all the required technical information, tools and equipment. The student will be required to perform an engine run-up and to conduct an engine compression test on all of the cylinders. The student will list all of the cylinder discrepancies and the repairs as needed,



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

4-A: INSTALL, TROUBLESHOOT AND REMOVE RECIPROCATING ENGINES

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 12.0 Hrs

PURPOSE:

To acquaint the student with the correct procedure for performing an engine change on an aircraft.

REFERENCES:

1. Applicable aircraft Service Manual or Mock-up Trainer
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Section Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Complete engine installation assembly
2. Engine hoist and lifting hardware
3. Special tools as required
4. Basic hand tools

SUPPLIES AND MATERIALS REQUIRED

1. Check List form for engine removal and installation.

4-A: INSTALL, TROUBLESHOOT AND REMOVE RECIPROCATING ENGINES (continued :)

PROCEDURE:

The student will be furnished with a complete engine installation assembly; with all the required technical information, equipment and tools. The student will be required to remove and re-install the engine following applicable technical data and safety procedures. A simulated return to service maintenance logbook entry will be presented to the instructor.

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

4-B: REMOVE, INSTALL, AND TROUBLESHOOT RECIPROCATING ENGINES

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in starting and performing an engine run-up procedure; following all safety precautions. To identify any malfunctioning condition on the engine or its components.

REFERENCES:

1. Applicable engine Overhaul Manual
2. Applicable Engine Operator's Manual or Instruction Handbook
3. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
4. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

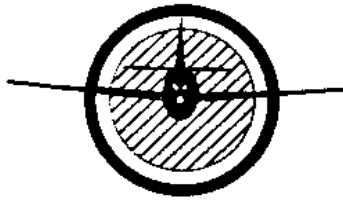
1. Hearing Protection Equipment
2. Fire Extinguishing Equipment.

SUPPLIES AND MATERIALS REQUIRED

1. Applicable engine starting and operation checklist.

PROCEDURE:

The student will be furnished with an operable reciprocating engine with all the required technical information. The student will be required to start, operate and perform a complete engine run-up, while following all safety precautions and procedures. List all the discrepancies and their causes.



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POWERPLANT COURSE CURRICULUM MANUAL

II. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

TOTAL HOURS: 120 THEORY: 60 SHOP/LAB: 60

A. BACKGROUND AND DEVELOPMENT

- 1) Early Examples of the Use of the Reaction Principle
 - a. The Aeolipile
 - b. Leonardo Da Vinci
 - c. Rockets and a Form of Jet Propulsion
 - d. Branca's Application
 - e. Sir Isaac Newton
- 2) The First Gas Turbines
 - a. John Baber
 - b. Sir Frank Whittle
 - c. German Development
 - d. Development in America

B. TURBINE ENGINE CONSTRUCTION

1. Sections
 - a. Air Inlet Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description

- 4) Components
- 5) Operation
- 6) Engine Air
- b. Compressor Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Operation
- c. Combustion (Burner) Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
- d. Turbine Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
- e. Exhaust Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation

- f. Accessory Section
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
- 2. Mayor Sub-Assemblies
 - a. Diffuser
 - 1) Location
 - 2) Types
 - 3) Description
 - 4) Components
 - 5) Operation
 - b. Air Adapters
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
 - c. Engine Rotor
 - 1) Types and Location
 - 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
 - d. Main Bearings
 - 1) Types and Location

- 2) Purpose
 - 3) Description
 - 4) Components
 - 5) Operation
3. Turboprop Exhaust System
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
 4. Thrust Reversers
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
 - e. 5. Engine Noise Suppressors
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
 6. Turboprop
 - a. Types and Locations
 - b. Purpose
 - c. Description
 - d. Components

- e. Operation
- 7. Turboshaft
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
- 8. Turbofan
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation

C. TURBINE ENGINE OPERATION PRINCIPLES

- 1. Thrust
 - a. Types
 - b. Description
 - c. How Thrust is Figured
 - d. Purpose
- 2. Gas Turbine Engine Performance
 - a. Description
 - b. Purpose
 - c. Factors Affecting Performance
 - d. Variables Affecting Performance
 - e. Altitude Effects
- 3. Ram Recovery
 - a. Purpose

- b. Description
- c. Effects
- 4. Jet Fuel Controls
 - a. Types and Location
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
- 5. Jet Fuel Control Maintenance
 - a. Field Repair
 - 1) Types
 - 2) Purpose
 - 3) Description
- 6. Ignition and Electrical Systems
 - a. Brief Description as Related to Turbine Engines
- 7. Lubrication
 - a. Brief Description as Related to Turbine Engines

D. TURBINE ENGINE MAINTENANCE

- 1. Compressor Section
 - a. Foreign Objects
 - 1) Types
 - 2) Description
 - 3) Effects
 - 4) Prevention

- b. Inspection and Cleaning
 - 1) Types
 - 2) Purpose
 - 3) Operation
 - 4) Results
 - c. Causes of Blade Damage
 - 1) Type
 - 2) Reasons
 - 3) Prevention
 - d. Blending and Replacement
 - 1) Types
 - 2) Purpose
 - 3) Description
 - 4) Operation
 - 5) Difference
2. Combustion Section
- a. Inspection of Hot Section
 - 1) Types
 - 2) Purpose
 - 3) Description
 - 4) Marketing
 - 5) Inspection and Repair
 - 6) Acceptable Standards
 - 7) Cracks
 - 8) Burned and Buckled Areas
 - 9) Fuel Nozzle and Support Assembly

3. Turbine Section
 - a. Inspection and Repair of Turbine Disks
 - 1) Turbine Disk Inspection
 - a) Purpose
 - b) Types
 - c) Operation
 - 2) Turbine Blade Inspection
 - a) Purpose
 - b) Types
 - c) Operation
 - 3) Replacement
 - a) Purpose
 - b) Operation
 - 4) Clearances
4. Exhaust Section Inspection
 - a. Purpose
 - b. Types
 - c. Operation
5. Commercial Rating
 - a. Takeoff
 - 1) Wet
 - 2) Dry
 - b. Maximum Continuous
 - c. Normal Rated
 - d. Maximum Cruise
 - e. Idle

6. Engine Instrumentation
 - a. Types
 - b. Purpose
 - c. Description
 - d. Components
 - e. Operation
7. Turbojet Engine Operation
 - a. Operating
 - b. Ground Operation
 - 1) Engine Fire
 - 2) Engine Checks
 - 3) Idle Checks
 - 4) Checking Takeoff Thrust
 - 5) Ambient Conditions
 - c. Engine Shutdown
 - d. Troubleshooting Turbojet Engines
 - 1) Indicated Malfunction
 - 2) Possible Causes
 - 3) Suggested Action
 - e. Turboprop Operation
 - f. Troubleshooting Procedures for Turboprop Engines
 - 1) Indicated Malfunction
 - 2) Possible Causes
 - 3) Suggested Action
 - g. Removal and Installation

- 1) Removal
- 2) Installation
- 3) Variations
- 4) Mounts for Turbojet Engines

E. REASONS FOR ENGINE REMOVAL

1. Life Span Exceeded
2. Sudden Stoppage
3. Metal Particles in Oil
4. Unstable Engine Operation

F. PREPARING FOR ENGINE REMOVAL

1. Safety Precautions
2. Draining the Engine
3. Electrical Disconnects
4. Disconnection of Engine Controls
5. Disconnection of Lines

G. REMOVING THE ENGINE

1. Use of Engine Sling
2. Hoisting the Engine
3. Installation of Dolly

H. NACELLE INSPECTION

1. Engine Mount and Bolts
2. Wiring and Bonding
3. Tubing and Ducting
4. Oil Cooler and Tank
5. Cleaning

I. ENGINE MOUNT

1. Mounts for Turbojet Engines

J. ENGINE INSTALLATION

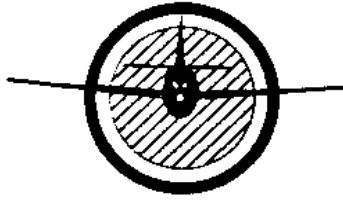
1. De-preservation
2. Use of Hoist and Sling
3. Connections and Adjustments
4. Rigging Engine Controls

K. ENGINE TESTING

1. Pre-oiling
2. Bleeding Fuel System
3. Propeller Checks
4. Ground Checks
5. Flight Test

L. ENGINE PRESERVATION AND STORAGE

1. Corrosion – Preventive Compounds
2. Dehydrating Agents
 - a. Silica Gel Color Changes
3. Treatment Procedures
4. Shipping Containers
5. Inspection of Stored Engines



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POWERPLANT COURSE CURRICULUM MANUAL

Performance Goals

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PERFORMANCE GOALS

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

LEVEL

P-5: OVERHAUL TURBINE ENGINE

(2)

- A. Given a turbine engine, manual, appropriate inspection and cleaning equipment, and overhaul sheets, disassemble, clean; inspect (visual, dimensional, dye penetrant, and magnetic particle).

P-6: INSPECT, CHECK, SERVICE, AND REPAIR TURBINE ENGINES AND TURBINE ENGINE INSTALLATIONS

(3)

- A. Given a turbine engine (during the Overhaul), a manual and needed equipment, remove the combustion case and liner. Inspect the combustion case and liner for hot spots. List all discrepancies and repairs needed.
- B. Given a turbine engine (during the overhaul), a manual, and needed equipment, remove the fuel nozzle, inspect, and list all discrepancies, and repairs as needed. Reinstall the fuel nozzle.
- C. Using a random display of turbine and/or Compressor blades. Inspect and list Repairs as needed.
- D. Given a turbine engine (simulator or mockup), a written information and procedure sheet, Inspect and adjust the fuel control linkage as needed.

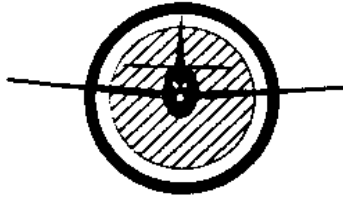
P-7: INSTALL, TROUBLESHOOT, AND REMOVE TURBINE ENGINES

(3)

- A. Using written information, procedural sheets, a turbine engine, and aircraft or simulated Engine cowling and stand install and remove a turbine engine. All safety procedures will be followed.

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- B. Given an operational turbine engine, written Starting procedures, written operating limits, start and operate a turbine engine. List Instrument readings and troubleshoot malfunctions as needed. All safety procedures will be followed.

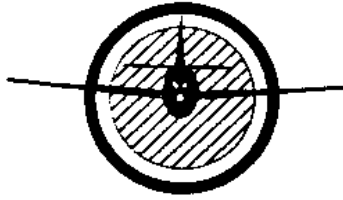


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Practical Projects



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

A. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

5-A Overhaul Turbine Engine

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 24.0 Hrs

PURPOSE:

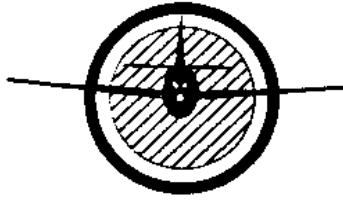
To acquaint the student with the general knowledge, requirements and procedures in the overhaul of turbine engines.

REFERENCES:

1. Applicable Engine Overhaul Instructions Manual
2. Applicable Engine Part Catalog
3. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
4. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Complete aircraft turbine engine.
2. Basic hand tools required.
3. All required engine overhaul special tools and equipment.
4. All required precision measuring equipment and torque wrenches.
5. Required NDI equipment.



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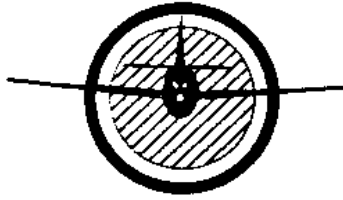
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SUPPLIES AND MATERIALS REQUIRED:

1. Engine overhaul sheets.

PROCEDURE:

The group of students will disassemble and perform basic inspections and repairs to turbine engine modular sections or parts, following all engine manufacturer and FAA requirements.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

6-A Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installation

TEACHING LEVEL 3

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in removing, inspecting, repair and installation of turbine engines combustion case and liners.

REFERENCES:

1. Applicable Engine Overhaul Instructions Manual
2. Applicable Engine Part Catalog
3. ***Aviation Maintenance Technician Handbook-Powerplant
(FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
4. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft turbine engine.
2. Required engine special tools set.
3. Cleaning Equipment.

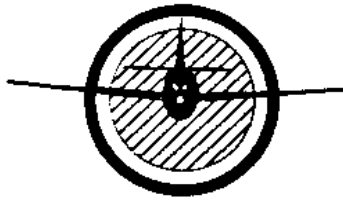
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6-A Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installations

PROCEDURE:

The student will remove and inspect a combustion liner for hot spots and will be required to remove, disassemble, clean, inspect and reinstall all other components during a simulated turbine engine overhaul, following all applicable technical information and using the required special tools to perform this task. The student will list all noted discrepancies found during the inspection.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

6-B Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installation.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills, in removing, inspecting, repair and installation of turbine engines fuel nozzles.

REFERENCES:

1. Applicable Engine Overhaul Manual
2. Applicable Engine Parts Catalog
3. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
4. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Teardown-aircraft turbine engine.
2. Required engine special tools.
3. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Appropriate inspection checklist.

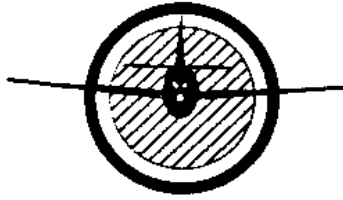
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**6-B Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installation.
(continued :)**

PROCEDURE:

The student will remove, inspect, and reinstall a fuel nozzle during a simulated engine overhaul. The student will follow the engine manufacturer instructions, overhaul manual, and will use any necessary special tool to perform this task. The student will list all noted discrepancies found during this inspection.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

6-C Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installation.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting and repairing turbine and/or compressor blades.

REFERENCES:

1. Sample Engine Overhaul Manual compressor rotor-blade inspections section and turbine blade inspection section.
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

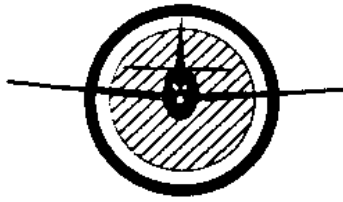
1. Inspection light equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. Random display of turbine and compressor blades.

PROCEDURE:

The student will be furnished with various samples of compressor and/or turbine blades and general inspection instructions. The student should perform an inspection and write down a list of discrepancies on given blades samples.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

6-D Inspect, Check, Service and Repair Turbine Engines and Turbine Engine Installation.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in the procedures of inspecting and rigging turbine engines fuel control unit linkage.

REFERENCES:

1. Applicable Aircraft-engine or Training Mock-up, Maintenance Manual or technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

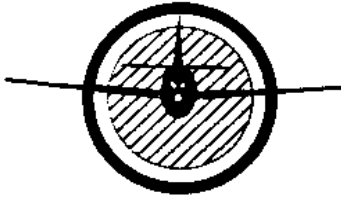
1. Turbine engine mock-up training system.
2. Required engine special tools set.
3. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with a turbine engine mock-up training system and all required technical information. The student will be required to inspect and rig the turbine engine fuel control unit-control linkages in accordance with the appropriate technical instructions.



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POWERPLANT COURSE CURRICULUM MANUAL

PROJECT PRACTICAL

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

7-A Install, Troubleshoot, and Remove Turbine Engines.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the correct procedure in removing and installing a turbine engine.

REFERENCES:

1. Turbine engine training system mock-up, Maintenance Manual or technical instruction.

EQUIPMENT AND TOOLS REQUIRED:

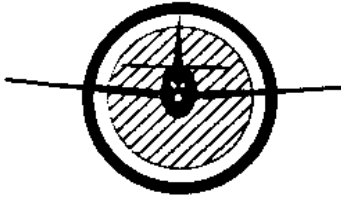
1. Turbine Engine Training system mock-up.
2. Engine hoist and lifting hardware.
3. Special tools set.
4. Basic hand tools required

SUPPLIES AND MATERIALS REQUIRED:

1. Checklist form for engine removal and installation.

PROCEDURE:

The student will be furnished with a complete engine installation assembly, all required technical information, equipment, and tools. The student will be required to remove and install the engine following applicable technical data and safety procedures.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

B. TURBINE ENGINES

7-B Install, Troubleshoot, and Remove Turbine Engines.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in starting, operating, and performing ground run-up checks on turbine engines. The student will follow all safety precautions. And to identify any malfunctioning condition on the engine or its components.

REFERENCES:

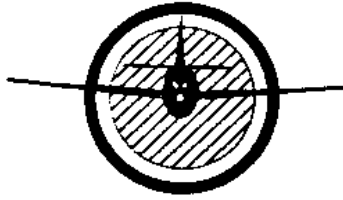
1. Applicable Engine Overhaul Manual and Technical Instructions.
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Operational turbine engine.
2. Hearing protection equipment.
3. Fire extinguishing equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. Applicable engine starting and operation, instruction information guide.

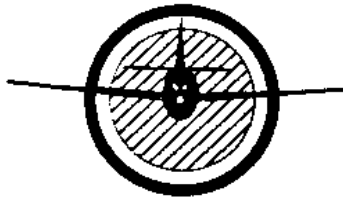


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PROCEDURE:

The student will be furnished with and operable turbine engine and all required technical information. The student will be required to start, operate, and perform a complete engine run-up; following all safety precautions and procedures. The student will list all operating discrepancies and their causes.



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POWERPLANT COURSE CURRICULUM MANUAL

I. POWERPLANT THEORY AND MAINTENANCE

C. ENGINES INSPECTIONS

TOTAL HOURS: 30

THEORY: 15

SHOP/LAB: 15

A. PERIODIC INSPECTION

1. Frequency and Type of Required Inspections
2. Persons Authorized to Conduct Inspections
3. Use of Inspection Checklist
 - a. Manufacturer's
 - b. 14 CFR Part 43, Appendix D
4. Use of Manufacturer's Service information
5. Uses of Airworthiness Directives
6. Use of Type Certificate Data Sheets
7. Inspection of Powerplant Records
8. Inspection Entries and Records

B. POWERPLANT INSPECTION PARTICULARS

1. Sudden Stoppage Inspection
2. Hydraulic Lock
3. Valve blow-by
4. Idle Mixture
5. Induction Manifold
6. Valve Timing and Clearance

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7. Propeller
8. Propeller Governor

C. COMPRESSION TESTING

1. Direct Compression Check
2. Differential Pressure Compression Check
 - a. Principle of Operation
 - b. Procedure
 - c. Interpretation of Results
3. Indications
 - a. Incorrect Valve Clearance
 - b. Worn or Damaged Piston
 - c. Excessive Ring Wear
 - d. Burned or Warped Valves
 - e. Incorrect Valve Timing

D. IGNITION SYSTEM INSPECTION

1. Magneto
 - a. Distributor Block
 - b. Capacitor
 - c. Point Condition
 - d. Point Gap (Internal Timing)
2. Magneto to Engine Timing
3. Ignition Harnesses
4. Spark Plugs
 - a. Heat Range
 - b. Reach
 - c. Installation Procedures

d. Operational Problems

E. ENGINE OPERATIONAL CHECKS

1. Ground Check
2. Propeller Pitch Check
3. Power Check
4. Ignition System Operational Check
5. Idle Speed and Mixture Checks

F. INSTRUMENTATION DURING ENGINE RUN-UP

1. Range Makings
 - a. Red Line
 - b. Red ARC
 - c. Yellow ARC
 - d. Blue ARC
 - e. Green ARC
 - f. White Line
2. Carburetor Air Temperature (C.A.T.)
3. Fuel Pressure
4. Fuel Flowmeter
5. Manifold Pressure (M.P.)
6. Oil Pressure
7. Oil Temperature
8. Tachometer (R.P.M.)
9. Cylinder Head Temperature (C.H.T.)
10. Torquemeter

G. PRINCIPLES OF ENGINE OPERATION

1. Normal Combustion Processes

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2. Detonation
 - a. Causes
 - b. Detection
 - c. Elimination
3. Pre-ignition
 - a. Causes
 - b. Detection
 - c. Elimination
 - d. Backfiring
 - e. After firing

H. GROUND OPERATION OF RECIPROCATING ENGINES

1. Starting Techniques
 - a. Float Carburetor
 - b. Pressure Injection Carburetor
2. Warm Up
 - a. Oil Pressure
 - b. Magneto Safety Check
3. Propeller Pitch Check
4. Power Check
 - a. Propeller Position
 - b. Manifold Pressure
 - c. Engine R.P.M.
5. Magneto Check
 - a. Individual R.P.M. Drops
 - b. Differential Drop
6. Carburetor Checks

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- a. Cruise Mixture
- b. Idle Speed
- c. Idle Mixture
- 7. Supercharger or Turbocharger Check
- 8. Stopping the Engine
 - a. Engine Controls Set
 - b. Float Carburetor
 - c. Idle Cut Off

I. ENGINE TROUBLESHOOTING

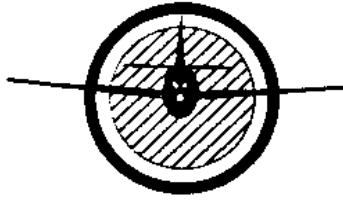
- 1. Detection of Malfunctions by Identification of Symptoms
- 2. Analysis of Symptoms to Reveal Probably Causes
- 3. Engine Fails to Start
 - a. Causes
 - b. Remedies
- 4. Engine Fails to Idle Properly
 - a. Causes
 - b. Remedies
- 5. Low Power With Engine Running Uneven
 - a. Causes
 - b. Remedies
- 6. Engine Fails to Develop Full Power
 - a. Causes
 - b. Remedies
- 7. Engine Runs Rough
 - a. Causes
 - b. Remedies

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- 8. Low Oil Pressure
 - a. Causes
 - b. Remedies

- 9. High Oil Temperature
 - a. Causes
 - b. Remedies

- 10. Excessive Oil Consumption
 - a. Causes
 - b. Remedies



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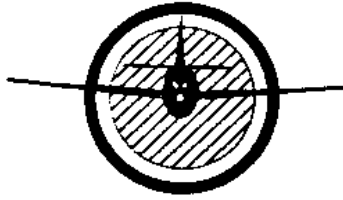
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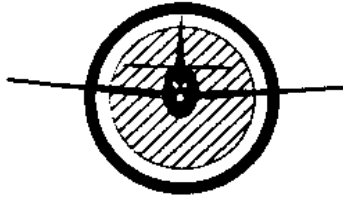


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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

- | | |
|---|---------------------|
| I. POWERPLANT THEORY AND MAINTENANCE | <u>LEVEL</u> |
| C. ENGINE INSPECTION | |
| P-8: PERFORM POWERPLANT CONFORMITY AND AIRWORTHINESS INSPECTIONS | (3) |
| A. Given an aircraft engine, manufacturer's manual, airworthiness directives, types certificate data sheet, the FAA-H-8083-32A book, AC 43. 13-1B, as revised, sample engine logbook, and necessary equipment, perform a 100 hours conformity check. Make a list of all discrepancies and an appropriate logbook entry. | |



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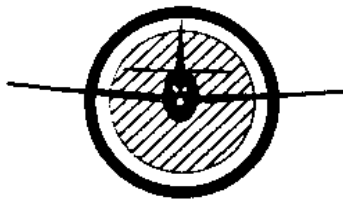
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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

I. POWERPLANT THEORY AND MAINTENANCE

C. ENGINE INSPECTION

8-A Perform Powerplant Conformity and Airworthiness Inspections

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 15.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in performing a complete engine 100 hr. inspection. To locate and use all required technical information. To fill out all required maintenance entries.

REFERENCES:

1. Engine Service Manual
2. Applicable engine Type Certificate Data Sheet
3. Applicable Summary of Airworthiness Directives
4. Aviation Maintenance Technician Handbook - FAA-H-8083-32A
5. AC 43.13-1B, as revised

EQUIPMENT AND TOOLS REQUIRED:

1. Complete engine assembly with all accessories, systems and components
2. Special equipment (compression tester light, etc.)
3. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Engine Inspection Check List.
2. Discrepancies form.

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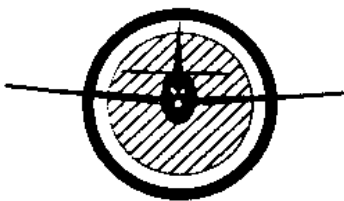
POWERPLANT CURRICULUM MANUAL, VOLUME IV

8-A Perform Powerplant Conformity and Airworthiness Inspections

3. AD Compliance form.
4. Sample logbook page.

PROCEDURE:

The student will be furnished with a complete engine assembly, all required technical information, and necessary equipment. The student will be required to perform a complete 100 hr. inspection on an aircraft engine. The student will fill out all required inspection forms and logbook entry.



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POWERPLANT COURSE CURRICULUM MANUAL

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINES INSTRUMENT SYSTEMS

TOTAL HOURS: 30

THEORY: 15

SHOP/LAB: 15

A. INSTRUMENT INSTALLATION AND MARKING

1. Panel Layout
2. Instrument Mounting
3. Power Requirements
4. Range Marking

B. PRESSURE MEASURING INSTRUMENTS

1. Principles of Pressure Measurement
 - a. Absolute Pressure
 - b. Gauge Pressure
 - c. Differential Pressure
2. Special Pressure Measurements
 - a. Manifold Pressure
 - b. Engine Pressure Ratio
 - c. BMEP and Torque Oil Pressure
 - d. Fuel Pressure
 - e. Oil Pressure
 - f. Pressure Switches

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3. Inspect, Check, Service, and Repair Pressure Measuring Instrument Systems

C. TEMPERATURE MEASURING INSTRUMENTS

1. Types of Temperature Measurement
 - a. Non-electrical
 - 1) Expansion of a Liquid
 - 2) Expansion of a Solid
 - 3) Expansion of a Gas
 - b. Electrical
 - 1) Resistance Change
 - 2) Voltage Generation
2. Special Temperature Measurements
 - a. Cylinder Head Temperature
 - b. Carburetor Air Temperature
 - c. Oil Temperature
3. Inspect, Check, Service, and Repair Temperature Measuring Instrument Systems

D. FLUID RATE OF FLOW MEASURING INSTRUMENTS

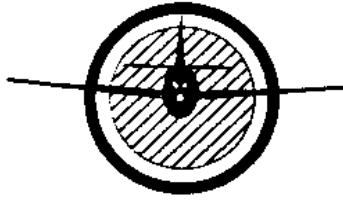
1. Types of Fuel Flow Indicating Systems
2. Purpose of Fuel Flow Indication System
3. Components and Operation of a Fuel Flow Indicating System
4. Relationship Between Fuel Flow and Power Output of an Engine
5. Inspect, Check, Service, and Repair Fluid Side of Flow Measuring Instrument System

E. ENGINE RPM INDICATING INSTRUMENTS

1. Types of Tachometer Systems
 - a. Mechanical
 - b. Electric

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- 1) Three-Phase Tachometer
 - 2) Electronic Tachometer
2. Troubleshooting Tachometer Systems
3. Inspect, Check, Service, and Repair Engine RPM Indicating System

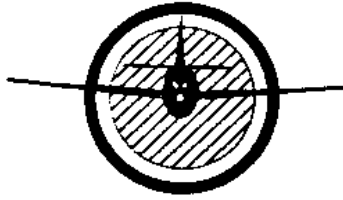


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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

LEVEL

**P-9: TROUBLESHOOT, SERVICE, AND REPAIR
ELECTRICAL AND MECHANICAL FLUID RATE-OF-
FLOW INDICATING SYSTEMS**

(2)

- A. Using written information and diagrams or drawings, draw a diagram of a mechanical fuel flow indication system for a reciprocating engine and an electrical fuel flow indicating system for a turbine engine. Answer questions concerning the difference between fuel flow indicating systems.
- B. Using the AC 43.13-1B, as revised, the FAA-H-8083-32A Handbook, aircraft type certificate data sheets, and an aircraft or mockup, inspect, check all engine related instruments for security, operation, AD's and required markings and Placards. Make a list of all discrepancies.

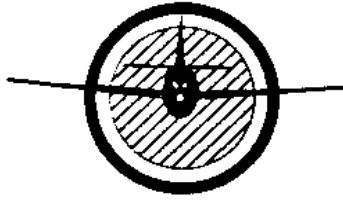
**P-10: INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND
REPAIR ELECTRICAL AND MECHANICAL ENGINE
TEMPERATURE, PRESSURE AND R.P.M. INDICATING
SYSTEMS**

(3)

- A. Given an aircraft engine or mockup and manufacturer's manual or written information remove, inspect, service, reinstall, check operation, troubleshoot and repair as necessary a flexible shaft and electrical tachometer system.

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PERFORMANCE GOALS (continued :)

- B. Using an aircraft engine or mockup with a thermocouple, temperature and pressure indicating system, manufacturer's manual or written reference information, remove, inspect, repair as necessary, reinstall and check operation of the temperature and pressure indicating system.



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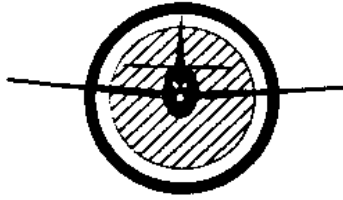
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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

**9-A Troubleshoot, Service and Repair Electrical and Mechanical
Fluid Rate-Of-Flow Indicating Systems**

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in fuel flow indicating systems on reciprocating and turbine engines.

REFERENCES:

- 1. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
- 2. Powerplant Technician Textbook (Jeppesen)**
- 3. Aircraft instruments Systems (EA-A1S)**

EQUIPMENT AND TOOLS REQUIRED:

NONE

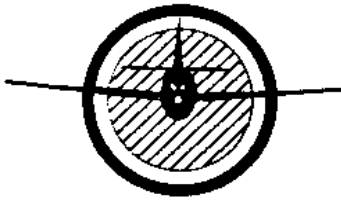
SUPPLIES AND MATERIALS REQUIRED:

- 1. Information sheets.**
- 2. Diagrams or drawings.**

3. List of questions related to fuel flow systems.
4. Paper and pencil.

PROCEDURE:

The student will be furnished with written information, diagrams or drawings and a list of questions on fuel flow indicating systems. The student will be required to draw a diagram and answer questions related to fuel flow indicating systems.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

**9-B Troubleshoot, Service and Repair Electrical and Mechanical Fluid
Rate-Of-Flow Indicating Systems**

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting, checking security, markings, and placards requirements on engine instruments.

REFERENCES:

1. AC 43.13-1B, as revised
2. FAA-H-8083-32A – Aviation Maintenance Technician Handbook
3. Applicable Aircraft Type Certification Data Sheet.

EQUIPMENT AND TOOLS REQUIRED:

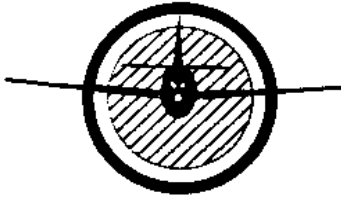
1. Complete aircraft or operable engine on test stand.

SUPPLIES AND MATERIALS REQUIRED:

1. Discrepancies forms

PROCEDURES:

The student will inspect, check security, markings, and placards requirements on engine instruments; using an aircraft or an engine test stand. After the inspection, the student will list all noted discrepancies.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

10-A Inspect, Check, Service, Troubleshoot and Repair Electrical and Mechanical Engine Temperature, Pressure and R.P.M. Indicating System.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in removing, inspecting, servicing, installing, performing, operational check, troubleshoot and repair tachometer indicating systems..

REFERENCES:

1. Applicable Aircraft Maintenance Manual or Technical Instructions

EQUIPMENT AND TOOLS REQUIRED:

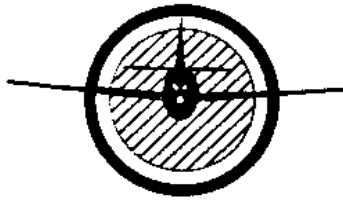
1. Complete aircraft or operable engine on test stand.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURES:

The student will be furnished an aircraft or an engine test stand and all technical information. The student will be required to remove, inspection, service, install, check operation, troubleshoot, and repair mechanical and electrical tachometer indicating systems.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

- 10-B Inspect, Check, Service, Troubleshoot and Repair
Electrical and Mechanical Engine Temperature, Pressure
and R.P.M. Indicating System.**

TEACHING LEVEL: 3

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in removing, inspecting, repair, installation, and checking operation of engine temperature and pressure indicating system.

REFERENCES:

1. Applicable Aircraft Maintenance Manual or Technical Instructions.

EQUIPMENT AND TOOLS REQUIRED:

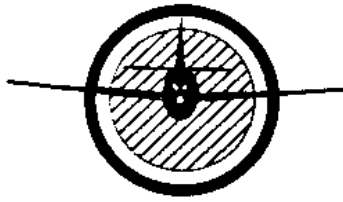
1. Complete aircraft or operable engine on test stand.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURES:

The student will be furnished an aircraft or an engine test stand and all required technical information. The student will be required to remove, inspect, repair, reinstall, and check the operation of temperature and pressure engine indicating systems.



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II. POWERPLANT SYSTEMS AND COMPONENTS

B. ENGINE FIRE PROTECTION SYSTEM:

TOTAL HOURS: 18

THEORY: 9

SHOP/LAB: 9

A. INSPECT, CHECK, TROUBLESHOOT, AND REPAIR FIRE DETECTION SYSTEM

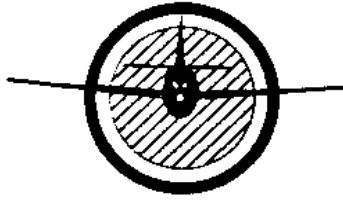
1. Types of Fire Detection Systems
2. Thermocouple Indicating System
3. Thermal Switch Indicating System
4. Range Marking
5. Inspection of Stand Off Insulators
6. Inspection of Kinks, Dents, or Compression of Tubing
7. Care of System During Engine Maintenance or Removal
8. Causes of False Indications
9. Purpose and Requirements for an Extinguishing System
10. Carbon Dioxide System

B. INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR A FIRE EXTINGUISHING SYSTEM

1. Purpose and Requirements for an Extinguishing System.
2. Carbon Dioxide System.
3. Freon and Nitrogen System.
4. Bromochloromethane System (CB)
5. Causes of Malfunctions in Systems

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6. Storage Cylinders – Hydrostatic Test
7. Characteristics of Different Extinguishing Agents
8. Purpose of Nitrogen in Carbon Dioxide and CB System
9. System Discharge Indicator Discs – Yellow, Red
10. Checking System for Proper Servicing



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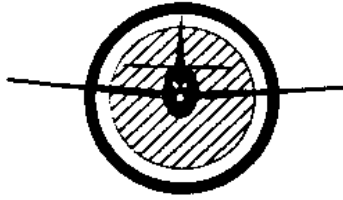
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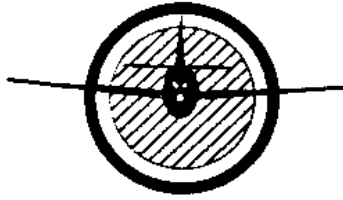
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PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

| B. ENGINE FIRE PROTECTION | <u>LEVEL</u> |
|--|---------------------|
| P-11A: INSPECT, CHECK, AND SERVICE, SMOKE, AND CARBON MONOXIDE DETECTION SYSTEMS | (1) |
| A. Using manufacturer's manuals or appropriate written information and a smoke and carbon monoxide detection system installed in an aircraft or mockup, test the operation of the detection system. | |
| P-11B: INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR ENGINE FIRE DETECTION AND EXTINGUISHING SYSTEM | (3) |
| A. Using manufacturer's manuals or appropriate written information and fire detection and extinguishing system installed in an aircraft or mockup, test the operation of the detection system. Check continuity of the circuit. Check individual fire detectors and locate and correct a malfunction introduced by the instructor. List three possible causes for failure of the extinguishing system. | |



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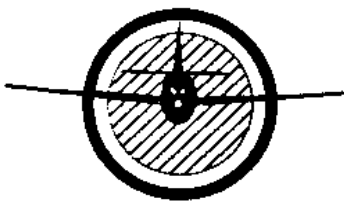
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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

B. ENGINE FIRE PROTECTION SYSTEM

**11-A Inspect, Check, Service, Troubleshoot, and Repair Engine Fire
Detection and Extinguishing Systems**

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in testing and troubleshooting smoke and carbon monoxide detection systems.

REFERENCES:

1. Applicable engine fire protection system mockup trainer technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

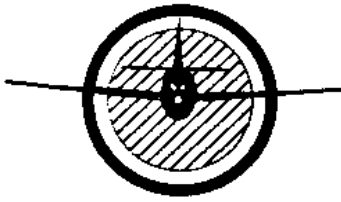
1. Engine fire protection system mockup trainer.
2. Volt-ohm-meter test equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Using manufacturer's manuals or appropriate written information and a smoke and carbon monoxide detection system installed in an aircraft or mockup, test the operation of the detection system.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

B. ENGINE FIRE PROTECTION SYSTEM

11-B Inspect, Check, Service, Troubleshoot, and Repair Engine Fire Detection and Extinguishing Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in testing and troubleshooting engine fire detection and extinguishing systems.

REFERENCES:

1. Applicable engine fire protection system mockup trainer technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

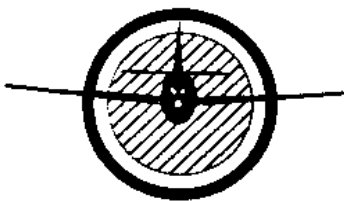
1. Engine fire protection system mockup trainer.
2. VOM test equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Using manufacturer's manuals or appropriate written information and fire detection and extinguishing system installed in an aircraft or mockup, test the operation of the detection system. Check continuity of the circuit. Check individual fire detectors and locate and correct a malfunction introduced by the instructor. List three possible causes for failure of the extinguishing system



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II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

TOTAL HOURS: 50

THEORY: 25

SHOP/LAB: 25

A. WIRING REQUIREMENTS

1. Definition of a Wire
2. Wire Size
3. Factors Affecting Selection of Wire Size
4. Voltage Drop in Aircraft Wire and Cable
5. Conductor Insulation
6. Identifying Wire and Cable

B. ELECTRICAL WIRING INSTALLATION

1. Wire Groups and Bundles
2. Twisting Wires
3. Spliced Connections in Wire bundles
4. Slack in Wiring bundles
5. Bend Radius

C. ROUTING AND INSTALLATION

1. Protection Against Chafing
2. Protection Against High Temperature
3. Protection Against Solvents and Fluids
4. Protection of Wires in Wheel Well Area

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5. Routing Precautions
6. Installation of Cable Clamps

D. LACING AND TYING WIRE BUNDLES

1. Single Cord Lacing
2. Double cord Lacing
3. Lacing Branch Offs
4. Tying

E. CONNECTING WIRES TO TERMINALS

1. Cutting Wire and Cable
2. Stripping Wire and Cable
3. Solderless Terminals and Splices
4. Copper Wire Terminals
5. Aluminum Wire Terminals
6. Crimping Tools

F. EMERGENCY SPLICING REPAIRS

1. Splicing Copper Wires using Pre-insulated Wires
2. Splicing With Solder and Potting Compound

G. CONNECTING TERMINAL LUGS TO TERMINAL BLOCKS

1. Aluminum Terminal Lugs
2. Copper Terminal Lugs

H. BONDING AND GROUNDING

1. General Bonding and Grounding Procedures

I. CONNECTORS

1. Types of Connector
2. Connector Identification
3. Installation of Connectors

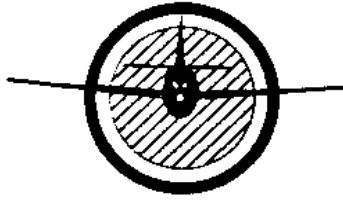
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POWERPLANT CURRICULUM MANUAL, VOLUME IV**

J. CONDUIT

1. Purpose
2. Installation

K. ELECTRICAL EQUIPMENT INSTALLATION

1. Electrical Load Limits
2. Controlling or Monitoring the Electrical Load
3. Circuit Protection Devices
4. Switches
5. Relays



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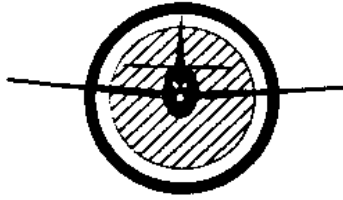
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Performance Goals

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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEM LEVEL

P-12: REPAIR ENGINE ELECTRICAL SYSTEM COMPONENTS (2)

- A. Using appropriate written information, disassemble and inspect a starter, generator and/or alternator. List all discrepancies and repairs as needed, locate part numbers for parts needed.
- B. Given an aircraft or mockup (with a dual generator system), written information, and test equipment as needed, read and record voltage and current output at various RPM's. Check the operation of the reverse current relays. Adjust load equalization as needed.

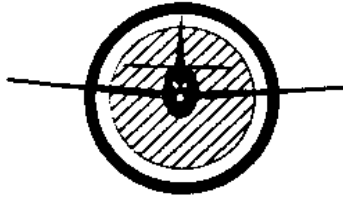
P-13: INSTALL, CHECK AND SERVICE ENGINE ELECTRICAL WIRING, CONTROLS, SWITCHES, INDICATORS, AND PROTECTIVE DEVICES (3)

- A. Using the AC 43.13-1B, as revised, written information, and an aircraft or mockup, determine the current required for a starter, use an AWG or wire chart in the AC 43.13-1B, as revised; to select wire of adequate size for a 1 volt drop. Install a suitable switch and connect it to energize the solenoid switches, of the relay.

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PERFORMANCE GOALS (continued :)

- B. Using the AC 43.13-1B, as revised, terminals, wire, splices, sleeving, switches, protective devices, connectors, electrical components, and an electrical mockup or aircraft, install terminals, splices, switches, protective devices, and connectors (using the proper wire) into an Electrical circuit.

- C. Using the AC 43.13-1B, as revised; an aircraft or mockup, inspect for proper bonding jumpers and write a brief statement of why bonding jumpers are used.



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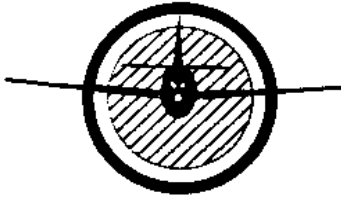
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Practical Projects

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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

12-A Repair, Engine Electrical System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in disassembling, inspecting and reassembly of starters, generators and/or alternators.

REFERENCES:

1. Applicable component technical data.
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

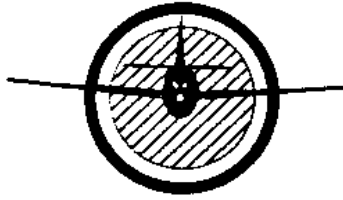
1. Various types of aircraft starters, generators and/or alternators.
2. Special testing equipment:
 - a. Growler
 - b. VOM Tester
3. Basic hand-tools required.
4. Generator or alternator test stand equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. List of discrepancies

PROCEDURE:

The student will be furnished with an aircraft generator or alternator, starter, and all applicable required technical information. After a demonstration by the instructor to the students of aircraft generators, starters, and/or alternators overhaul procedures; the student will simulate a starter, generator, and/or alternator repair or overhaul. The student will list all noted discrepancies and needed repairs.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

12-B Repair, Engine Electrical System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in checking and adjusting dual generator control system.

REFERENCES:

1. Applicable Aircraft Maintenance Manual or Technical Instructions.

EQUIPMENT AND TOOLS REQUIRED:

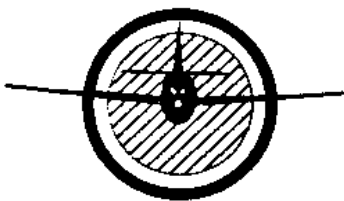
1. An aircraft equipped with dual generator system.
2. VOM Tester or voltmeter

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with an aircraft with dual generator system and the required technical information. The student will be required to test the system, read, record voltage output.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

- 13-A** Install, Check and Service Engine Electrical Wiring, Controls, Switches, Indicators, and Protective Devices

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in determine current load for a starter. To select adequate wire size and suitable switch for starter solenoid installation.

REFERENCES:

1. FAA Advisory Circular – AC 43.13-1B, as revised

EQUIPMENT AND TOOLS REQUIRED:

1. Aircraft or electrical system mockup.

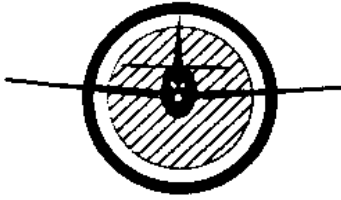
SUPPLIES AND MATERIALS REQUIRED:

1. Written technical information.

PROCEDURE:

The student will be furnished with an aircraft or an electrical system mockup trainer, and required written technical information. The student will be required to:

- a. Determine starter current load.
- b. Select adequate wire size and switch type for starter solenoid installation.



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II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

13-B Install, Check and Service Engine Electrical Wiring, Controls, Switches, Indicators, and Protective Devices

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in the installation of: electrical cables terminals, splices, sleeving, switches, protective devices, connectors, and electrical components.

REFERENCES:

1. FAA Advisory Circular – AC 43.13-1B, as revised
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Aircraft or electrical system mock-up wire
2. Crimping tool set and wire stripper tool.

SUPPLIES AND MATERIALS REQUIRED:

1. Various types and sizes of electrical wire.
2. Various types and sizes of electrical terminals and connectors
3. Various types of electrical components, switches and protective devices.

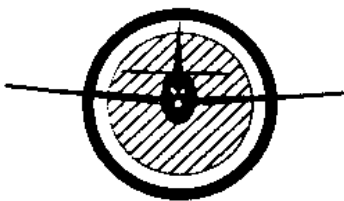
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13-B Install, Check and Service Engine Electrical Wiring, Controls, Switches, Indicators, and Protective Devices (continued :)

PROCEDURE:

The student will be furnished with an aircraft or an electrical system mockup trainer, the required tools, and technical information. The student will be required to install electrical cables terminals, splices, sleeving, switches, protective devices, connectors, and electrical components.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

C. ENGINE ELECTRICAL SYSTEMS

13-C Install, Check and Service Engine Electrical Wiring, Controls, Switches, Indicators, and Protective Devices

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting bonding jumper installation.

REFERENCES:

1. FAA Advisory Circular – AC 43.13-1B/2B, as revised

EQUIPMENT REQUIRED:

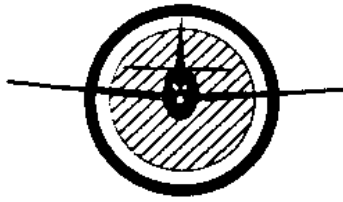
1. An aircraft or electrical system mockup trainer.
2. VOM test equipment.

SUPPLIES AND MATERIALS REQUIRED:

1. Pencil and notebook.

PROCEDURE:

The instructor will furnish the student an aircraft or electrical system mockup trainer and related technical instructions. The student will be required to perform an inspection of all bonding jumper installations. Write a brief statement of why bonding jumpers are used.



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II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

TOTAL HOURS: 50

THEORY: 25

SHOP/LAB: 25

A. PRINCIPLES OF ENGINE LUBRICATION

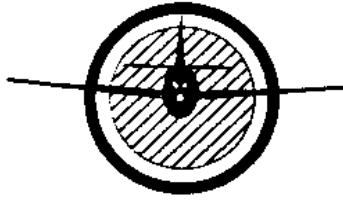
B. REQUIREMENTS AND CHARACTERISTICS OF RECIPROCATING ENGINE LUBRICATING SYSTEMS

C. RECIPROCATING ENGINE LUBRICATION SYSTEMS

1. Dry Sump System
 - a. Oil Tanks
 - b. Indicating Oil Temperature
 - c. Oil Pump
 - d. Oil Filters
 - e. Oil Pressure Relief Valve
 - f. Oil Pressure Gauge
 - g. Oil Temperature Regulator
 - h. Flow Control Valve
 - i. Oil Cooler
 - j. Surge Protective Valves
 - k. Airflow Control
2. Internal Lubrication of Reciprocating Engine
 - a. Pressure

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- b. Splash
- c. Combination
- 3. Lubrication System Maintenance Practice
 - a. Oil Tank
 - b. Oil Cooler
 - c. Oil Temperature Bulbs
 - d. Pressure and Scavenge Oil Screen
 - e. Oil Pressure Relief Valve
 - f. Draining Oil
- 4. Troubleshooting Oil Systems
- 5. Turbojet Dry Sump Lubrication
 - a. Oil Pump
 - b. Filters
 - c. Pressure Relief Valve
 - d. Oil Jets
 - e. System Gauge Connections
 - f. Vents
 - g. Check Valves
 - h. Thermostatic Bypass Valve
 - i. Oil Cooler
 - j. Fuel/Oil Heat Exchanger
- 6. Typical Dry Sump Lubrication System
 - a. Oil Pressure System
 - b. Oil Scavenge System
 - c. Breather Pressurizing system
- 7. Turbine Engine Wet Sump Lubrication System

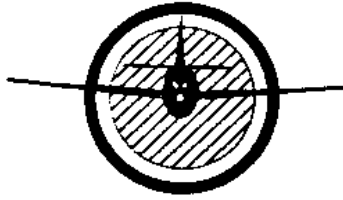


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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS:

LEVEL

P-14: IDENTIFY AND SELECT LUBRICANTS

(2)

- A. Using textbook information, answer question concerning the base type, film strength, viscosity index, and flashpoint of lubricating oils.
- B. Given oil containers (oil cans) for a variety of lubricants, recognize the containers and identify the type of lubricant. Locate appropriate information specifying the type of lubricant Recommended for a specific Engine (as specified by the instructor). List the general precautions to be observed when adding oil or changing oil, and the result or damage which may result when various grades or incorrect types of lubricants are used.

P-15: REPAIR ENGINE LUBRICATION SYSTEM COMPONENTS

(2)

- A. Using textbook information and a list of metals that may be found in the oil screen of an engine, identify the probable part of the engine that has failed, and describe the probable causes for this type of failure.
- B. Using FAR 25.967, Sec. 25.1013 and a fuel tank drawing locate and interpret the FAA regulations, which govern expansion space requirements, the marking of oil tank filler openings, and describe methods commonly employed to maintain a reserve supply of oil or propeller feathering.

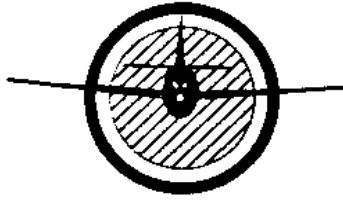
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PERFORMANCE GOALS

- C. Using and aircraft engine or mockup and manufacturer's manual, remove, inspect, clean, and reinstall an oil line.

**P-16: INSPECT, CHECK, SERVICE, TROUBLESHOOT
AND REPAIR ENGINE LUBRICATION SYSTEM**

(3)

- A. Adjust oil pressure on an operable engine
- B. Change oil and inspect oil screens and/or Replace full-flow type oil filter.
- C. Disassemble, inspect and assemble an engine oil pump.



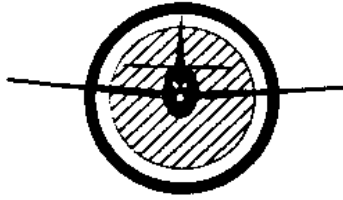
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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

14-A Identify and Select Lubricants

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in lubricating oils characteristics.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant
(FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

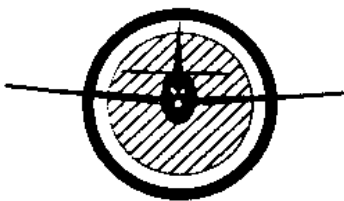
1. None.

SUPPLIES AND MATERIALS REQUIRED:

1. List of questions related to lubricating oils characteristics.

PROCEDURE:

The student will be furnished with a list of questions related to lubricating oil characteristics. The student will be required to answer the given questions correctly.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

14-B Identify and Select Lubricants

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in handling and servicing an aircraft.

REFERENCES:

1. Engine Data Sheets.
2. Engine Overhaul Manuals.
3. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
4. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Oil Containers.

SUPPLIES AND MATERIALS REQUIRED:

1. Variety of lubricants.

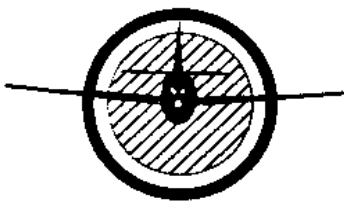
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14-B Identify and Select Lubricants (continued)

PROCEDURE:

The student will be furnished with oil containers, a variety of lubricants, and the required technical information. The student will be required to:

1. Recognize the containers.
2. Identify type of lubricants.
3. Locate information regarding type of lubricant recommended for specific engine.
4. List and follow precautions when adding or changing oil. The student will explain to the instructor the results of using incorrect type of lubricants in an aircraft engine.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

15-A Repair Engine Lubrication System Components.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting oil screens. And to familiarize him with information to identify particles in an oil filter, the probable causes and probable engine problems or failure that may result do to conditions.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

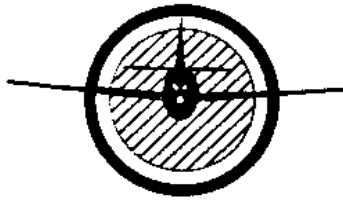
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. List of metals that may be found on oil screens.

PROCEDURE:

The student will be furnished with a list of metals that may be found on oil screens. The student should identify the probable malfunctioning part or component of the engine that has or might failed, and he will list probable causes for the failure.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

15-B Repair Engine Lubrication System Components.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in Federal Aviation Regulations related to the design and construction of oil tanks.

REFERENCES:

1. FAA-H-8083-32A – Aviation Maintenance Technician Handbook.

EQUIPMENT AND TOOLS REQUIRED:

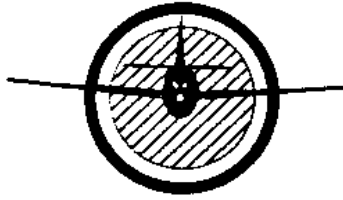
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Oil systems drawings.

PROCEDURE:

The student will be furnished with an oil system drawings and related information. The student will be required to locate and interpret FAA regulations governing oil tanks requirements, markings, and reserve supplies for propeller feathering systems.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

15-C Repair Engine Lubrication System Components.

TEACHING LEVEL 2

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in removing, inspecting, cleaning, and installation of oil lines.

REFERENCES:

1. Aircraft Maintenance Manual of mockup training manual of technical instructions.
2. Powerplant Technician Textbook (Jeppesen)
3. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***

EQUIPMENT AND TOOLS REQUIRED:

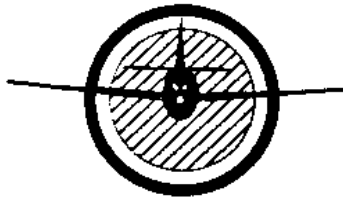
1. An aircraft or mockup trainer.
2. Basic hand tools required

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

The student will be furnished with an aircraft or a mockup trainer and all required technical information. The student will be required to remove, inspect, clean, and install an oil line.



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II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

16-A Inspect, Check, Service, Troubleshoot, and Repair Engine Lubrication Systems.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in adjusting engine oil pressure.

REFERENCES:

1. Applicable engine overhaul manual and related technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

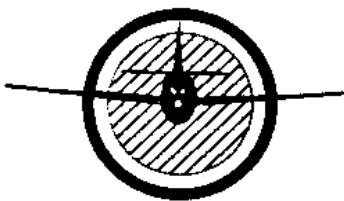
1. Operable reciprocating engine.
2. Required hand tools.

SUPPLIES AND MATERIALS REQUIRED:

1. Information sheets.

PROCEDURE:

The student will be furnished with an operable aircraft engine and the required technical information. The student will be required to operate the engine and adjust engine oil pressure in accordance with manufacturer technical information. The student will observe all necessary safety precautions.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

16-B Inspect, Check, Service, Troubleshoot, and Repair Engine Lubrication Systems.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in performing engine oil change and oil screens inspection and-or replacing full-flow type oil filter.

REFERENCES:

Applicable engine overhaul manual and related technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

1. Operable reciprocating engine.
2. Required hand tools.

SUPPLIES AND MATERIALS REQUIRED:

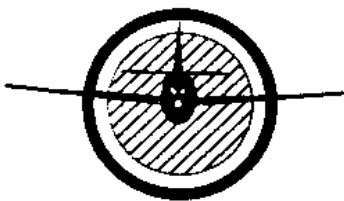
1. Adequate supply of engine oil.
2. Oil containers, funnels and 5 gallons cans.
3. Full-flow type oil filters for particular engine.

PROCEDURE:

The student will be furnished with an aircraft engine, required technical information, adequate oil supply, equipment, and necessary engine parts (oil filter, gaskets, etc.). The student will be required to change the engine oil and inspect or replace oil filter as required.

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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

D. LUBRICATION SYSTEMS

16-C Inspect, Check, Service, Troubleshoot, and Repair Engine Lubrication Systems.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in disassembling, inspecting, and reassembling engine oil pumps.

REFERENCES:

Applicable engine overhaul manual.

EQUIPMENT AND TOOLS REQUIRED:

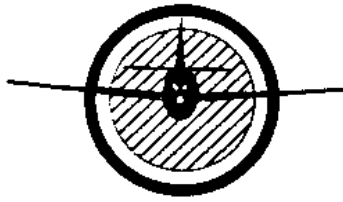
1. Various types of engine oil pumps.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

The student will be furnished with an oil pump and related technical information. The student will be required to disassemble, inspect, and reassemble an engine oil pump in accordance with the engine overhaul manual instructions and procedures.



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POWERPLANT COURSE CURRICULUM MANUAL

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

TOTAL HOURS: 74

THEORY: 37

SHOP/LAB: 37

A. HIGH TENSION MAGNETO SYSTEM

1. Operating Principles
2. Breaker Assembly
3. Coil Assembly
4. Distributor
5. Ignition Harness
6. Ignition Switches

B. LOW TENSION MAGNETO SYSTEM

1. Operating Principles
2. Distributor

C. ACCESSORY IGNITION UNITS

1. Booster Coil
2. Induction Vibrator
3. Impulse Coupling
4. Retard Breaker Vibrator
 - a. High Tension
 - b. Low Tension
5. Engine Analyzer

D. SPARK PLUGS

1. Construction
2. Reach
3. Heat and Range

E. MAGNETO TIMING DEVICES

1. Engine Timing Marks
2. Timing Disks
3. Piston Position Indicators
4. Timing Lights

F. MAGNETO INTERNAL TIMING

1. Significance of “E” Gap
2. Straight Edge and Timing Marks
3. Chamfered Tooth
4. Timing Pin and Index Marks

G. MAGNETO INSPECTION

1. Cam Lubrication
2. Distributor and Dielectric
3. Capacitor
4. Breaker Points
 - a. Normal Condition
 - b. Frosting
 - c. Pitted
 - d. Crowning
 - e. Material Transfer (Buildup)
 - f. Oil Points
5. Dressing Breaker Points

H. IGNITION HARNESS MAINTENANCE

1. Construction
2. Common Faults
3. Harness Testing
 - a. High Tension Testers
 - b. Insulation Testers
4. Replacement or Defective Leads

I. SPARK PLUG INSPECTION

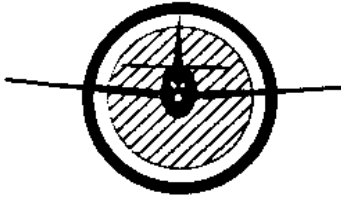
1. Normal Condition
2. Carbon Fouling
3. Lead Fouling
4. Oil Fouling
5. Electrode Erosion
6. Fused Electrodes
7. Connector – Well Flashover

J. SPARK PLUG MAINTENANCE

1. Removal
2. Cleaning
3. Gapping
4. Installation
5. Polarity Protection
6. Ignition Lead Installation

K. TURBINE ENGINE IGNITION SYSTEMS

1. Characteristics
2. Capacitor Type Ignition
3. Igniter Plugs
4. System Inspection and Maintenance

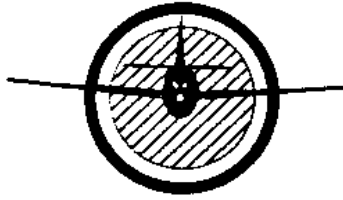


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POWERPLANT COURSE CURRICULUM MANUAL

L. ENGINE STARTING SYSTEMS

1. Reciprocating Engine Starting System
 - a. Direct Cranking electric Starter
 - b. Electric inertia Starting System
 - c. Starting System Maintenance Practices
 - d. Troubleshooting Small Aircraft Starting System
2. Gas Turbine Engine Starter
 - a. Direct Cranking Electrical Starter Systems
 - b. Starter Generator Systems



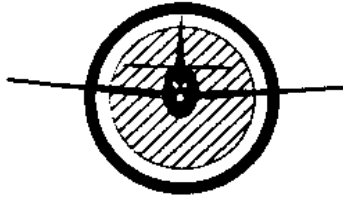
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Performance Goals

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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEM LEVEL

P-17: OVERHAUL MAGNETO AND IGNITION HARNESS (2)

- A. Given a complete magneto (not necessarily capable of operation), written reference information, and equipment as needed, disassemble the magneto, inspect all the parts, list all repairs and parts (with part numbers) as needed. Lubricate the bearings properly and reassemble the magneto.
- B. Using lengths of ignition wire, written service information, and test equipment, inspect the ignition lead and determine the serviceability of the lead.

P-18: INSPECT, SERVICE, TROUBLESHOOT, AND REPAIR RECIPROCATING AND TURBINE ENGINE IGNITION SYSTEMS AND COMPONENTS. (2)

- A. Using an operational magneto, a test bench, and operating instructions, operate the magneto and check for open or shorted ignition leads, replace the leads as necessary. Check the coming in speed of the magneto.
- B. Using schematic diagrams or drawings, and written reference information, complete statements concerning the differences between reciprocating and turbine engine ignition systems and the removal, inspection, and installation of igniter plugs.

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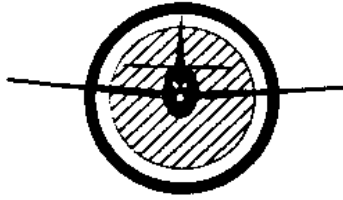
PERFORMANCE GOALS

P-19a: INSPECT, SERVICE, TROUBLESHOOT, AND REPAIR TURBINE ENGINE ELECTRICAL STARTING SYSTEMS. (3)

- A. Given necessary tools, aircraft engine, and written instructions and/or procedures remove, inspect list the condition and install a starter-generator.
- B. Given a list of problems associated with turbine electrical starting system, describe the probable causes and sequence to follow to isolate the problem.

P-19b: INSPECT, SERVICE, TROUBLESHOOT, TURBINE ENGINE PNEUMATIC STARTING SYSTEMS. (1)

- A. Using schematics, diagrams or drawings, and written information, complete statements concerning inspection, service and troubleshoot of turbine engine pneumatic starting system.

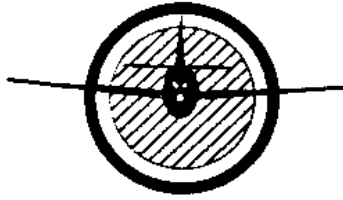


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POWERPLANT COURSE CURRICULUM MANUAL

Practical Projects



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

17-A Overhaul Magneto and Ignition Harness

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 8.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in performing magnetos bearings lubrication.

REFERENCES:

Applicable magneto technical data or overhaul manual.

EQUIPMENT AND TOOLS REQUIRED:

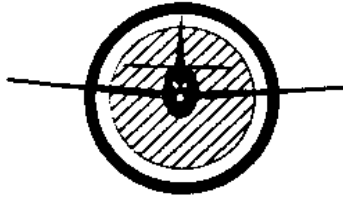
1. Various types model magnetos.
2. Basic hand tools required.
3. Special tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Magneto bearings-grease.

PROCEDURE:

The student will be furnished with an engine magneto and related technical information. The student will be required to disassemble, inspect, lubricate the bearings properly, and reassemble the magneto.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

17-B Overhaul Magneto and Ignition Harness

TEACHING LEVEL; (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in performing and testing ignition leads.

REFERENCES:

1. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)*
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

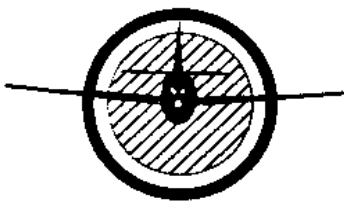
1. Ignition lead tester

SUPPLIES AND MATERIALS NEEDED:

1. Ignition harness.

PROCEDURE:

The student will be furnished with an ignition harness, test equipment, and related technical information. The student will be required to test and inspect ignition leads and determine their serviceability.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

18-A Inspect, Service, Troubleshoot, and Repair Reciprocating and Turbine Engine Ignition Systems and Components.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 8.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in bench testing magnetos.

REFERENCES:

Applicable magneto technical data or overhaul manual.

EQUIPMENT AND TOOLS REQUIRED:

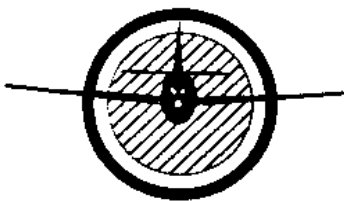
1. Operable magneto
2. High tension-lead tester
3. Magneto test bench equipment

SUPPLIES AND MATERIALS REQUIRED:

None.

PROCEDURE:

The student will be furnished with an operable magneto and related technical information. The student will be required to operate the magneto on test bench equipment, check the ignition leads and the magneto coming in speed.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

18-B Inspect, Service, Troubleshoot, and Repair Reciprocating and Turbine Engine Ignition Systems and Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in the difference between reciprocating and turbine engines ignition systems. Also, how to remove, inspect, and install igniter plugs.

REFERENCES:

- 1. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
- 2. Powerplant Technician Textbook (Jeppesen)**

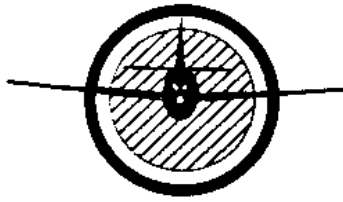
EQUIPMENT AND TOOLS REQUIRED: None.

SUPPLIES AND MATERIALS REQUIRED:

- 1. Schematic diagrams and/or drawings of reciprocating and turbine engines ignition systems.**

PROCEDURE:

The student will be furnished with diagrams or drawings and related reference information on reciprocating and turbine engine ignition systems. The student will prepare complete statements concerning the differences between reciprocating and turbine engines ignition systems. Also stating the differences in the removal, inspection, and installation of igniter plugs.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

- 19-A Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.**

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in removing, inspecting, and installing a starter generator.

REFERENCES:

1. Applicable engine technical instructions

EQUIPMENT AND TOOLS REQUIRED:

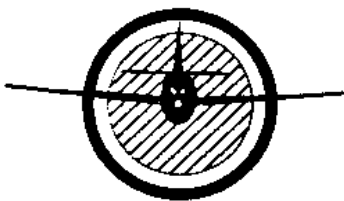
1. Complete Turbine engine assembly.
2. Basic hand-tools required.
3. Special tools required.

SUPPLIES AND MATERIALS REQUIRED:

2. Discrepancies list.

PROCEDURE:

The student will be furnished with a complete turbine engine assembly, and the required technical information and special tools. The student will be required to remove, inspect, list the condition and install a starter generator.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

E. IGNITION AND STARTING SYSTEMS

- 19-B** **Inspect, service, troubleshoot, and repair turbine engine pneumatic starting systems.**

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in troubleshooting the electrical starting system of a turbine engine.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

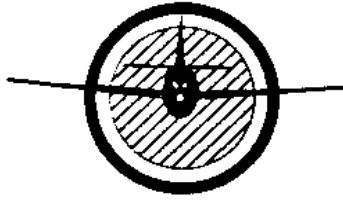
1. None

SUPPLIES AND MATERIALS REQUIRED:

3. List of problems associated with the turbine engine electrical starting system.

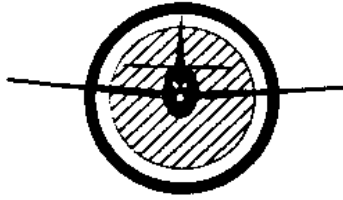
PROCEDURE:

Using schematics, diagrams or drawings and written information; the student shall complete statement concerning the inspection, servicing and troubleshooting of a turbine engine pneumatic starting system



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II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS:

TOTAL HOURS: 60

THEORY: 30

SHOP/LAB: 30

A. PRINCIPLES OF CARBURETION

1. Application of Venturi Principle
2. Metering and Discharge of Fuel
3. Fuel/Air Mixtures
4. Carburetor Ice
5. Types of Carburetors
 - a. Float
 - b. Pressure
6. Carburetor Systems
 - a. Main Metering
 - b. Idle
 - c. Acceleration
 - d. Mixture Control
 - e. Idle Cutoff
 - f. Enrichment
 - g. Economizer

B. FLOAT TYPE CARBURETORS

1. Float Mechanism
2. Main Metering System
3. Idle System
4. Mixture Control
5. Accelerating System
6. Economizer

C. PRESSURE TYPE CARBURETORS

1. Main Metering System
2. Idle System
3. Accelerating System
4. Mixture Control
5. Idle Cutoff
6. Power Enrichment

D. FUEL INJECTION SYSTEMS

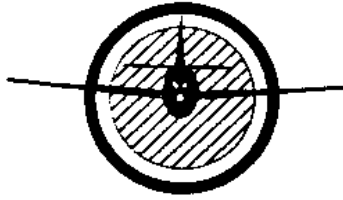
1. Advantages
2. Bendix System
 - a. Injector
 - b. Flow Divider
 - c. Discharge Nozzle
3. Continental System
 - a. Injector Pump
 - b. Control Unit
 - c. Manifold
 - d. Discharge Nozzle

E. CARBURETOR MAINTENANCE

1. Removal
2. Installation
3. Rigging Controls
4. Idle Mixture Adjustment
5. Idle Speed Adjustment

F. FUEL CONTROLS FOR TURBINE ENGINES

1. Functional Requirements
2. Electronic Type
3. Hydromechanical Units
4. Turboprop Coordinator
5. Manifold Drain Valves
6. Limited Field Repairs
7. Trimming Turbojet Engines

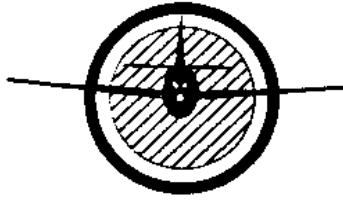


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POWERPLANT COURSE CURRICULUM MANUAL

Performance Goals



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PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

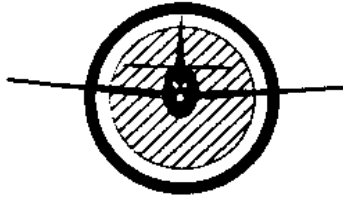
| F. FUEL METERING SYSTEMS | <u>LEVEL</u> |
|---|---------------------|
| P-20: TROUBLESHOOT AND ADJUST TURBINE ENGINE FUEL METERING SYSTEMS AND ELECTRONIC ENGINE FUEL CONTROLS | (1) |
| A. Given diagrams or drawings, written reference information describing turbine engine fuel metering system and electronic engine fuel control answer five questions related to troubleshooting and adjustments of systems. | |
| P-21: OVERHAUL CARBURETOR | (2) |
| A. Given a carburetor, manufacture's Manual, and necessary tools, disassemble the carburetor, make a list of parts normally replace during overhaul, including part Number, check AD's for compliance, and reassemble carburetor. | |
| P-22: REPAIR ENGINE FUEL METERING SYSTEM COMPONENTS | (2) |
| A. Given diagrams or drawings, written reference information describing the fuel-air ratios required by the engine at various operating conditions, interpret and explain fuel and air flow through float carburetors. | |
| B. Using various type fuel metering components or mockup and written reference information, locate, remove, clean, and reinstall a screen in a fuel metering system component. | |

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PERFORMANCE GOALS

P-23: INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR RECIPROCATING AND TURBINE ENGINE FUEL METERING SYSTEMS (3)

- A. Given pictures or diagrams or Schematics, written information pertaining to the continuous flow Fuel injection systems, describe the systems and name the components.
- B. Using an operational engine, appropriate written operating and service instructions, inspect, remove, and install a float type carburetor or a pressure type carburetor or a fuel injector servo. After installation, operate the engine and adjust idle speed and idle mixture.

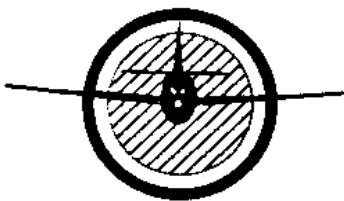


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Practical Projects



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

20-A Troubleshoot and Adjust Turbine Engine Fuel Metering Systems and Electronic Engine Fuel Controls

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required general knowledge and skills relating to the trouble shooting and adjustments of turbine engine mechanical and electronic fuel controls

REFERENCES:

1. Applicable manufacturer's maintenance manuals.

EQUIPMENT AND TOOLS REQUIRED:

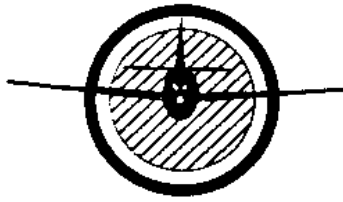
1. Turbine engine fuel mock-up

SUPPLIES AND MATERIALS REQUIRED:

1. Diagrams and/or Drawings.

PROCEDURE:

Given diagrams or drawings, written reference information describing turbine engine fuel metering system and electronic engine fuel control; the student will answer questions related to troubleshooting and adjustments of systems.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

21-A Overhaul Carburetor

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required general knowledge and skills in the overhaul of a carburetor.

REFERENCES:

1. Applicable carburetor overhaul manual and parts catalog.

EQUIPMENT AND TOOLS REQUIRED:

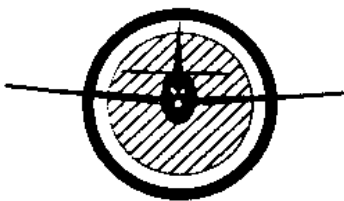
1. Float type carburetor.
2. Basic hand tools required.
3. Special tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. List of parts needed.

PROCEDURE:

The student will be furnished with an aircraft carburetor, required technical information, and special tools. The student will be required to disassemble a carburetor, make a list of parts normally replaced during overhaul, and reassemble the carburetor unit.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

22-A Repair Engine Fuel Metering System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required general knowledge and skills in interpreting fuel/air ratio requirements at various engine operating conditions. And to explain fuel and air flow through float carburetors.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

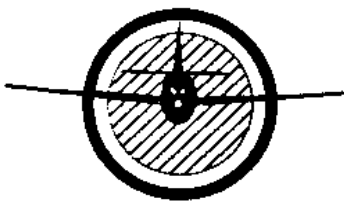
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Diagrams or drawings.

PROCEDURE:

The student will be furnished with diagrams or drawings, related engine fuel/air ratio requirements and reference written information. The student will be required to interpret fuel/air ratio requirements at various engine operating conditions and to explain fuel and air flow through float type carburetors.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

22-B Repair Engine Fuel Metering System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in locating, removing, cleaning, and reinstalling screen filters in fuel metering systems components.

REFERENCES:

Applicable carburetor overhaul manual or technical instructions.

EQUIPMENT AND TOOLS REQUIRED:

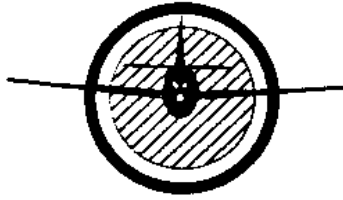
1. Various types fuel metering components.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

The student will be furnished with various types fuel metering components and related technical information. The student will be required to locate, remove, clean, and reinstall a screen filter in a fuel metering system component.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

23-A Inspect, Check, Service, Troubleshoot, and Repair Reciprocating and Turbine Engine Fuel Metering Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in the description and operation of continuous flow / fuel injection systems.

REFERENCES:

1. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)*
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

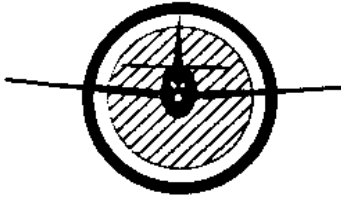
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Pictures or diagrams or schematic of continuous flow / fuel/ injection systems; (Bendix RSA and Teledyne-Continental).

PROCEDURE:

The student will be furnished with pictures, diagrams or schematics of various types of continuous flow / fuel injection systems and related reference information. The student will be required to describe the system and name the components in writing. The student must explain to the instructor, how far is a certified mechanic authorized to work on these systems.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

F. FUEL METERING SYSTEMS

23-B Inspect, Check, Service, Troubleshoot, and Repair Reciprocating and Turbine Engine Fuel Metering Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in the inspection, removal, and installation of float type or pressure type carburetors and fuel injection servos. And familiarized student with the procedure to adjust idle mixture and speed adjustments after installation.

REFERENCES:

Applicable engine technical information.

EQUIPMENT AND TOOLS REQUIRED:

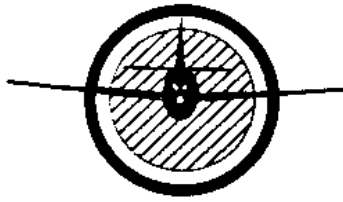
1. Operational aircraft engine.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with an operational engine, required technical information and necessary tools. The student will be required to inspect, remove, and install a float type or pressure type carburetor and a fuel injector servo. After installation, the student will operate the engine and adjust idle mixture and speed adjustment.



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II. POWERPLANT SYSTEMS AND COMPONENTS

G. ENGINE FUEL SYSTEMS:

TOTAL HOURS: 18

THEORY: 9

SHOP/LAB: 9

A. BASIC FUEL SYSTEM

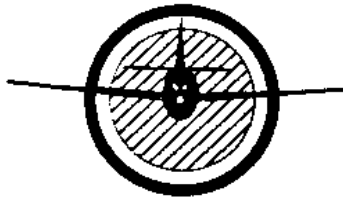
1. Types
 - a. Gravity Feed
 - b. Pressure Feed

B. FUEL SYSTEM COMPONENTS

1. Fuel Tanks
2. Fuel Cell
3. Fuel Line and Fittings
4. Fuel Strainer
5. Auxiliary Fuel Pumps
6. Engine Driven Fuel Pumps
7. Valves

C. FEDERAL AVIATION REGULATIONS GOVERNING FUEL SYSTEMS

1. Basic Requirements
2. Size of Fuel Lines
3. Routing of Fuel Lines
4. Finger Strainers
5. Vents, Expansion Space, and Sumps



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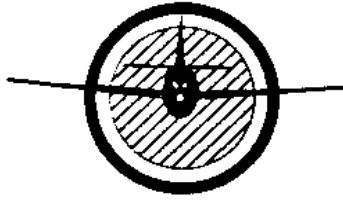
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D. FUEL SYSTEM INDICATORS

1. Fuel Quantity Gauge
2. Fuel Flowmeter Gauge
3. Fuel Pressure Gauge

E. INSPECT, CHECK, SERVICE, AND REPAIR ENGINE FUEL SYSTEM

1. System Operation
2. Inspection of Fuel System
3. Determining Fuel Grade Required
4. Servicing Fuel Systems
5. Troubleshooting and Repairing fuel Systems
 - a. Fuel Filters
 - 1) Micron
 - 2) Wafer Screen
 - 3) Plain Screen Mesh
 - b. Fuel/Oil Cooler
 - c. Pressurization and Dump Valve
 - d. Spray Nozzles



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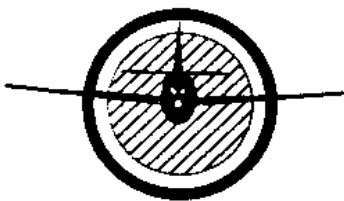
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PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

G. ENGINE FUEL SYSTEMS

LEVEL

P-25: REPAIR ENGINE FUEL SYSTEM COMPONENTS

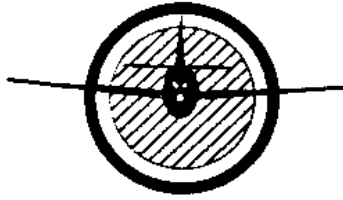
(2)

- A. Using FAR AMT Book “as revised”, specifications for a fuel system (as specified by the instructor), locate, interpret and describe how regulations govern fuel tanks, lines, strainers, pumps, valves, etc.

P-26: INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR ENGINE FUEL SYSTEMS

(3)

- A. Given an operational aircraft and written instructions on the operation and service of the fuel system, inspect, check, service, troubleshoot, and list repairs and needed on the fuel tank outlet strainers, lines, sump drains, and selector valve.

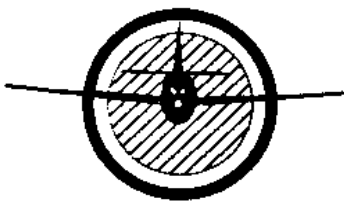


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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

G. ENGINE FUEL SYSTEMS

24-A Repair Engine Fuel System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4.5 Hrs

PURPOSE:

To acquaint the student with the required knowledge in Federal Aviation Regulations requirements related to aircraft fuel systems.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant
(FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***

EQUIPMENT AND TOOLS REQUIRED:

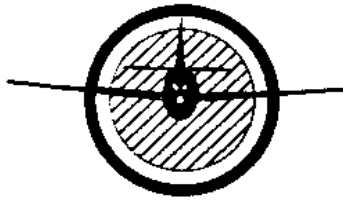
NONE

SUPPLIES AND MATERIALS REQUIRED:

1. FAR AMT Book "as revised"
2. List of specifications for a fuel system.

PROCEDURE:

The student will be furnished with a list of specifications for a fuel system and the FAR AMT Book. The student will be required to locate and interpret how regulations govern fuel system components such as fuel tanks, lines, strainers, pumps, valves, etc.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

G. ENGINE FUEL SYSTEMS

25-A Inspect, Check, Service, Troubleshoot, and Repair Engine Fuel Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4.5 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking operation, servicing, troubleshooting, and repairing fuel systems.

REFERENCES:

1. Applicable Aircraft Maintenance Manual

EQUIPMENT AND TOOLS REQUIRED:

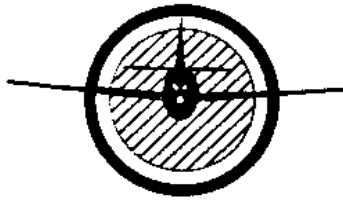
1. Complete aircraft with operable fuel system.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Complete aircraft with operable fuel system.
2. List of discrepancies

PROCEDURE:

The student will be furnished with a complete aircraft and the required technical information. The student will be required to check, inspect, service, troubleshoot, and list repairs (as needed) on the fuel tank outlet strainers, lines, sump drains, and selector valve.



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II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEM

TOTAL HOURS: 18 THEORY: 9 SHOP/LAB: 9

A. NORMALLY ASPIRATED ENGINES

1. Components of Induction System
2. Induction System Icing
3. Induction System Filtering
4. Induction System Inspection and Maintenance
5. Induction System Troubleshooting

B. INTERNAL SUPERCHARGERS

1. Single Stage, Single Speed Systems
2. Single Stage, Two Speed Systems

C. TURBOSUPERCHARGERS

1. For Large Reciprocating Engines
2. Light Aircraft Systems
 - a. Components
 - b. Controllers
 - c. Waste Gate Actuators
3. Sea Level Boosted Systems

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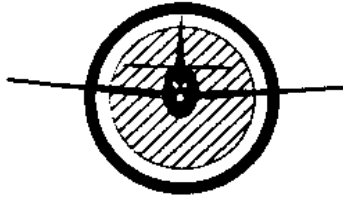
4. Turbocharger Troubleshooting
5. Turbo compound Systems
6. Power Recovery Turbine (PRT)

D. TURBOJET INLET SYSTEMS

1. Importance for Proper Turbine Operation
2. Single Entrance Duct
3. Divided Entrance Duct
4. Variable Geometry Ducting
5. Bellmouth Inlets

E. TURBOPROP COMPRESSOR INLETS

1. Inlet Screens
2. Turbofan Engine Sections



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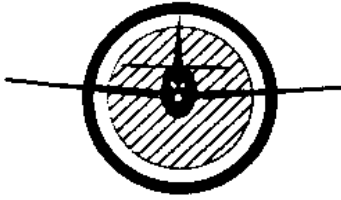
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PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEM

LEVEL

**P-27: INSPECT, CHECK, TROUBLESHOOT, SERVICE,
AND REPAIR ENGINE ICE AND RAIN CONTROL
SYSTEMS**

(2)

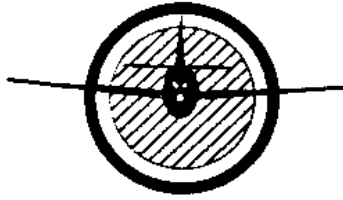
- A. Given an unlabeled drawing of an induction system for reciprocating and turbine engines, appropriate written information, label the drawing to illustrate the most common location for the buildup of ice, and describe how the ice is removed and prevented from forming.

**P-28: INSPECT, CHECK, SERVICE, TROUBLESHOOT
AND REPAIR HEAT EXCHANGERS,
SUPERCHARGERS, AND TURBINE ENGINE AIRFLOW
AND TEMPERATURE CONTROL SYSTEMS.**

(1)

- A. Using a typical aircraft heat exchanger and written reference information, inspect, check, and describe the repairs as needed to the heat exchanger.
- B. Given a typical supercharger (not necessarily capable of being operated), manufacturer's manual or appropriate written information, inspect, check, and make a list for all repairs as needed.

- A. Given an operational aircraft engine and manufacturer's service information, inspect, check, and list repairs, as needed the induction and air intake system of a reciprocating engine.
- B. Using an operational aircraft engine, manufacturer's service information, or appropriate written information, inspect, check, service, and list repairs as needed on a carburetor heat system.
- C. Given an aircraft engine air intake system or mockup incorporating an air screen or filter, and manufacture's service instructions, inspect and service air screens and or air filters in the engine air intake.



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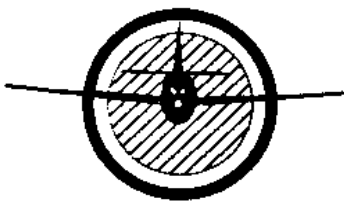
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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

26-A Inspect, Check, Troubleshoot, Service, and Repair Engine Ice and Rain Control System

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 1.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge on reciprocating and turbine engines induction system De-icing systems. And familiarized him with information such as, how ice is buildup, removed and prevented from forming.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

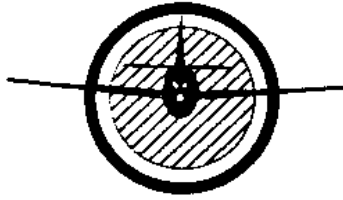
1. None

SUPPLIES AND MATERIALS REQUIRED:

Unlabeled drawings of reciprocating and turbine engines induction systems.

PROCEDURE:

The student will be furnished with unlabeled drawings of reciprocating and turbine engine induction systems. The student will be required to label the drawing to illustrate the most common location for the buildup of ice and describe how the ice is removed and prevented from forming.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

27-A Inspect, Check, Service, Troubleshoot, and Repair Heat Exchangers, Superchargers and Turbine Engine Airflow and Temperature Control Systems

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting, checking and repairing a heat exchanger.

REFERENCES:

1. Aircraft Maintenance Manuals
2. Written Reference Information

EQUIPMENT AND TOOLS REQUIRED:

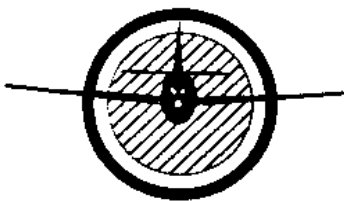
1. Typical Aircraft Heat Exchanger
2. Basic Hand-tools

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

Using a typical aircraft heat exchanger and written reference information; the student will inspect, check and describe the required repairs to the heat exchanger.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

27-B Inspect, Check, Service, Troubleshoot, and Repair Heat Exchangers, Superchargers and Turbine Engine Airflow and Temperature Control Systems

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 1.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge on reciprocating and turbine engines induction system De-icing systems. And familiarized him with information such as, how ice is buildup, removed and prevented from forming.

REFERENCES:

1. Manufacturer's Information
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Typical Supercharger
2. Basic Hand-tools

SUPPLIES AND MATERIALS REQUIRED:

1. None

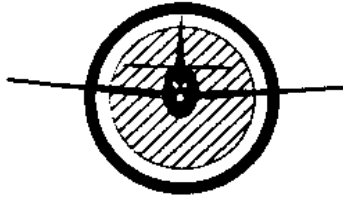
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**27-B Inspect, Check, Service, Troubleshoot, and Repair Heat Exchangers,
Superchargers and Turbine Engine Airflow and Temperature Control Systems
(continued)**

PROCEDURE:

The student will be furnished a typical supercharger (no necessarily capable of being operational), manufacturer's manual or written information. The student will inspect, check and make a list of the repairs that are required.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

28-A Inspect, Check, Service, and Repair Carburetor Air Intake and Induction Manifolds

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 1.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting, checking and repairing reciprocating engines induction systems.

REFERENCES:

1. Applicable engine Overhaul Manual.
2. Applicable Aircraft Maintenance Manual and inspection check list.

EQUIPMENT AND TOOLS REQUIRED:

1. Operational aircraft reciprocating engine.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Inspection checklist guide.
2. List of discrepancies form.

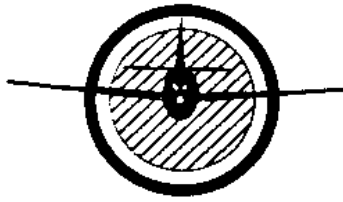
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**28-A Inspect, Check, Service, and Repair Carburetor Air Intake and Induction Manifolds
(continued)**

PROCEDURE:

The student will be furnished with an operation aircraft reciprocating engine and the required technical information. The student will be required to check, inspect, and repair as necessary the engine induction system. The student will also present to the instructor a list of discrepancies and corrective actions for such discrepancies, including a simulated maintenance logbook entry for the work performed.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

28-B Inspect, Check, Service, and Repair Carburetor Air intake and Induction Manifolds

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking and repairing carburetor induction systems.

REFERENCES:

1. Applicable aircraft Maintenance Manual or engine technical data.

EQUIPMENT AND TOOLS REQUIRED:

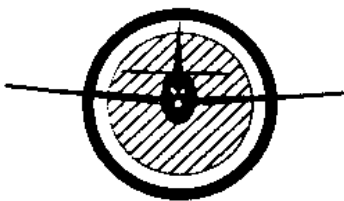
1. Complete operational aircraft engine.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. List of discrepancies form.

PROCEDURE:

The student will be furnished with an operation aircraft reciprocating engine and the required technical information. The student will be required to check, inspect, and repair as needed a carburetor heat system.



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

H. INDUCTION AND ENGINE AIRFLOW SYSTEMS

28-C Inspect, Check, Service, and Repair Carburetor Air Intake and Induction Manifolds

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting and servicing air screens and/or air filters on engine induction systems.

REFERENCES:

1. Applicable aircraft Maintenance Manual or engine technical data.
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Complete operational aircraft engine.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Adequate cleaning equipment and solvent.

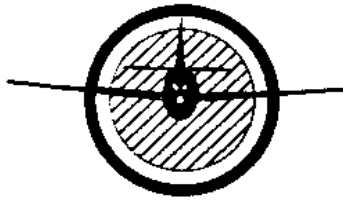
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POWERPLANT CURRICULUM MANUAL, VOLUME IV

**28-C Inspect, Check, Service, and Repair Carburetor Air Intake and Induction Manifolds
(continued)**

PROCEDURE:

The student will be furnished with an aircraft engine with complete engine induction system and related technical information. The student will be required to inspect and service the air screens and/or air filters in the engine air intake. And present to the instructor, a simulated maintenance logbook entry for the work performed.



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POWERPLANT COURSE CURRICULUM MANUAL

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS:

TOTAL HOURS: 18

THEORY: 9

SHOP/LAB: 9

A. ENGINE COOLING SYSTEMS

1. Types
 - a. Liquid Cooled
 - 1) Advantages
 - 2) Disadvantages
 - b. Air Cooled
 - 1) Advantages
 - 2) Disadvantages
2. Purpose of Cooling systems

B. RECIPROCATING ENGINE

1. Cooling Systems
 - a. Removal of Heat
 - b. Undesirable heat
 - c. Cooling
 - d. Cowling and Baffles
 - e. Cowl Flaps for Cooling
 - f. Augmenters
 - g. Baffles

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2. Reciprocating Engine Cooling Systems Maintenance
 - a. Components
 - b. Functions
 - c. Baffles and Cowl Flaps
3. Maintenance of Engine Cowling
 - a. Function
 - b. Description
 - c. Designs
 - d. Operation
4. Inspection of Cowling
 - a. Areas
 - b. Damage
5. Engine Cylinder Cooling Fin Inspection
 - a. Purpose
 - b. Cracks
 - c. Repairs
 - d. Broken Areas
6. Cylinder Baffle and Deflector System Inspection
 - a. Installation
 - b. Purpose
 - c. Design
 - d. Inspection
7. Cowl Flap Installation and Adjustment
 - a. Purpose
 - b. Checks
 - c. Inspection

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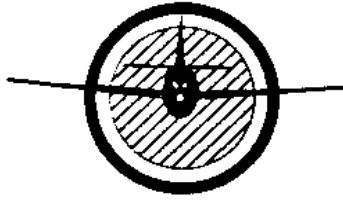
8. Cylinder Temperature Indicating System
 - a. Type
 - b. Purpose
 - c. Installation
 - d. Inspection
9. Valve Adjustments
 - a. Purpose
 - b. Effects
10. Fuel Air Ratio
 - a. Purpose
 - b. Effects
11. Air Cooled Helicopter Engines
 - a. Types
 - b. Operating Principles
 - c. Cooling

C. TURBINE ENGINE COOLING

1. Cooling
 - a. Purpose
 - b. Function
 - c. Critical Effects
 - d. Designs
2. Turbine Engine Insulation Blankets
 - a. Purpose
 - b. Design
 - c. Function
 - d. Contents

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- 3. Turbine Engine Temperature Indicating System
 - a. Exhaust Gas Temperature Indicator
 - 1) Purpose
 - 2) Location



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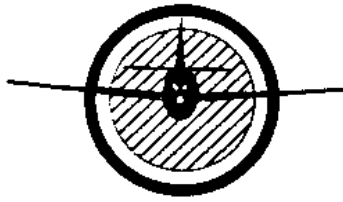
Performance Goals

PERFORMANCE GOALS

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

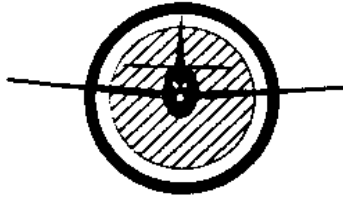
| I. | ENGINE COOLING SYSTEM: | <u>LEVEL</u> |
|--------------|--|---------------------|
| P-30: | REPAIR ENGINE COOLING SYSTEM COMPONENTS | (2) |
| | A. Using an engine equipped with cylinder baffles; inspect, and repair, as needed, baffles and deflectors. | |
| | B. Using textbook information and a list of engine operational problems associated with improperly fitted baffles, explain the Corrective Action that needs to be taken to correct the problem. | |
| | C. Given a cylinder with damaged cooling fins and the manufacturer's service Manual or written information, profile and/or straighten the cylinder cooling Fins as necessary. | |
| P-31: | INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR ENGINE COOLING SYSTEMS | (3) |
| | A. Using an operational engine with cowling, baffles, shrouds, operating instructions, and limits, inspect, check, troubleshoot, service, and repair the cowling, baffles, and shrouds as necessary. | |
| | B. Using an operational engine with a cylinder head temperature indicating system, and written information or manufacturer's manual, inspect, check, troubleshoot, and repair the system as necessary. | |



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POWERPLANT COURSE CURRICULUM MANUAL

Practical Projects



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POWERPLANT COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS

29-A Repair Engine Cooling System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting and repairing engine baffles and deflectors.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

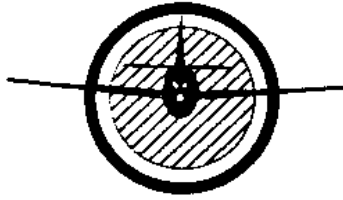
1. An engine equipped with baffles and deflectors.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with an engine equipped with baffles and deflectors and the required technical information. The student will be required to inspect and repair damaged engine baffles and deflectors.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS

29-B Repair Engine Cooling System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 1.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in reciprocating engine cooling system operation and common operational problems associated with improperly fitted baffles.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

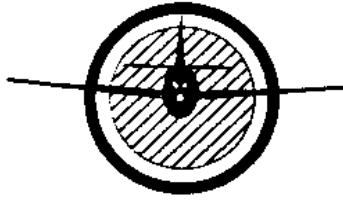
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. List of problems associated with improperly fitted baffles and deflectors.

PROCEDURE:

The student will be furnished with a list of common engine operational problems associated with improperly fitted baffles and deflectors. The student will be required to explain the corrective action that needs to be taken to correct these problems.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS

29-C Repair Engine Cooling System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in the repair of cylinder cooling fins.

REFERENCES:

1. Applicable engine Overhaul Manual.

EQUIPMENT AND TOOLS REQUIRED:

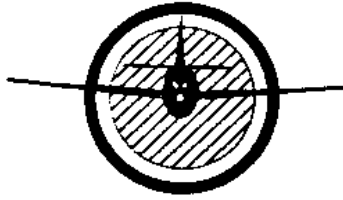
1. Cylinder with damage cooling fins.
2. Set of smooth cut files.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with a cylinder with damage cooling fin(s) and the related technical information. The student will be required to perform the necessary repairs on the damage fin(s) assigned.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS

30-A Inspect, Check, Troubleshoot, Service, and Repair Engine Cooling Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking, troubleshooting, servicing, and repairing: cowlings, baffles, and shrouds.

REFERENCES:

1. Aircraft – Engine Maintenance Manual and related instructions
2. AC 43.13-1B, as revised

EQUIPMENT AND TOOLS REQUIRED:

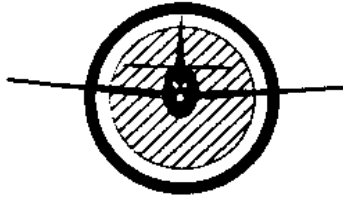
1. Complete operable engine assembly with cowlings

SUPPLIES AND MATERIALS REQUIRED:

1. Applicable inspection check list form.
2. List of discrepancies form.

PROCEDURE:

The student will be furnished with an operable aircraft engine and the related technical instructions. The student will be required to operate, inspect, check, troubleshoot, service, and repair as necessary; cowlings, baffles and shrouds. Simulated maintenance logbook entries will be presented to the instructor.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

I. ENGINE COOLING SYSTEMS

30-B Inspect, Check, Troubleshoot, Service, and Repair Engine Cooling Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking, troubleshooting, servicing, and repairing cylinder head temperature indicating systems.

REFERENCES:

1. Aircraft – Engine Maintenance and related instructions.

EQUIPMENT AND TOOLS REQUIRED:

1. Operable reciprocating aircraft engine equipped with Cylinder Head Temperature indicating system.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with an operable aircraft engine and the related technical information. The student will be required to operate, inspect, check, troubleshoot, and repair the Cylinder Head Temperature indicating system. Simulated maintenance logbook entries will be presented to the instructor.

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEMS

TOTAL HOURS: 30

THEORY: 15

SHOP/LAB: 15

A. RECIPROCATING ENGINE EXHAUST SYSTEM

1. Functions
2. Short Stacks
3. Collector ring System
 - a. Collector Ring
 - b. Manifold
 - c. Augmenter

B. MAINTENANCE PRACTICES

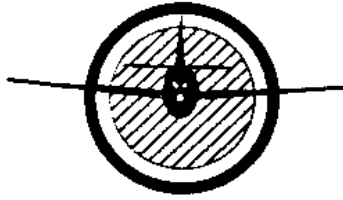
1. Inspection
 - a. Marking Components
 - b. Leak Checking
2. Muffler/Heat Exchanger Failures
3. Manifold and Stack Failures
4. Internal Muffler Failures
5. Turbocharger Systems
6. Coking
7. Repairs
 - a. Limited Welding
 - b. High Temperature Hardware

C. TURBINE ENGINE EXHAUST DUCTS

1. Convergent nozzles
2. Convergent Divergent nozzles
3. Turboprop Exhaust Systems

D. TURBINE EXHAUST COMPONENTS

1. Thrust Reversers
 - a. Mechanical Clamshell Doors
 - b. Aerodynamic Cascade Vanes
2. Noise Suppressors
 - a. Noise Sources
 - b. Corrugated Perimeter Suppressors
 - c. Multi-Tube Suppressors

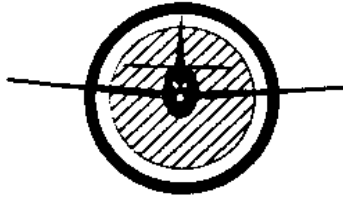


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Performance Goals



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PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEM: LEVEL

P-32: REPAIR ENGINE EXHAUST SYSTEM COMPONENTS (2)

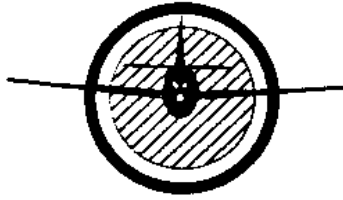
- A. Given an aircraft engine exhaust system, a muffler, and using the AC 43.13-1B inspect the exhaust system and muffler and make a list of all the repairs as necessary. Locate part numbers for replacement parts and check all AD's for compliance.

P-33: INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR ENGINE EXHAUST SYSTEMS (3)

- A. Given an aircraft engine with an exhaust system, Service manual, or written information, inspect, check, Remove, reinstall, and adjust the exhaust system, List all repairs as necessary.
- B. Given an exhaust heater system and using the AC 43.13-1B, as revised and/or manufacturer's service information; Inspect, check, troubleshoot and repair the system as necessary. Simulated logbook entries will be presented to the instructor.

P-34: TROUBLESHOOT AND REPAIR ENGINE THRUST REVERSER SYSTEMS AND RELATED COMPONENTS (1)

- A. Using textbook information, the AC 43.13-1B, as revised and the FAA-H-8083-32A; describe the operation and inspection of jet engine thrust reversers and noise suppressors

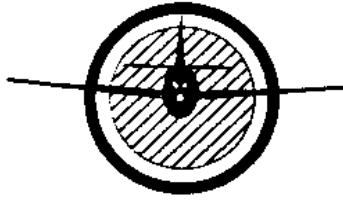


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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEMS

31-A Repair Engine Exhaust System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in inspecting and repairing engine exhaust systems.

REFERENCES:

1. FAA Advisory Circular AC 43.13-1B, as revised
2. Applicable Aircraft-engine Maintenance Manual.
3. Applicable aircraft-engine Parts Catalog.

EQUIPMENT AND TOOLS REQUIRED:

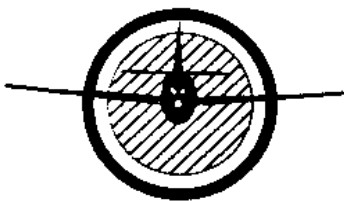
1. Aircraft engine with complete exhaust system
2. Basic hand tools required

SUPPLIES AND MATERIALS REQUIRED:

1. Discrepancies list form.

PROCEDURE:

The student will be furnished with an aircraft engine with a complete exhaust system and the required technical information. The student will be required to perform a complete inspection on the engine exhaust system, including applicable AD notes. The student will list all repairs and part numbers necessary.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEMS

32-A (1) Inspect, Check, Troubleshoot, Service and Repair Engine Exhaust Systems.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking, removing, reinstalling, and adjusting engine exhaust systems.

REFERENCES:

1. Aircraft-engine service manual.

EQUIPMENT AND TOOLS REQUIRED:

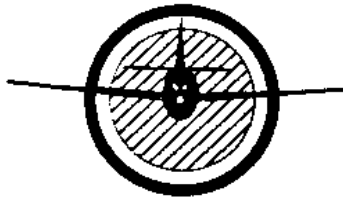
1. Aircraft engine with complete exhaust system.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. Discrepancies list form.

PROCEDURE:

The student will be furnished with an aircraft with a complete exhaust system and the required technical information. The student will be required to check, inspect, remove, reinstall, and adjust the exhaust system. The student will present to the instructor a list of all repairs necessary and simulated maintenance logbook entries required for these repairs.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEMS

32-A (2) Inspect, Check, Troubleshoot, Service and Repair Engine Exhaust Systems.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in inspecting, checking, troubleshooting, and repairing exhaust heater systems.

REFERENCES:

1. FAA Advisory Circular AC 43.13-1B, as revised
2. Applicable Aircraft Engine Service Manual

EQUIPMENT AND TOOLS REQUIRED:

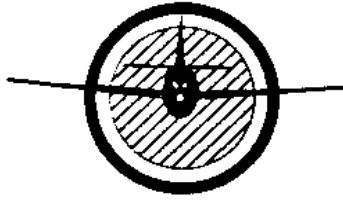
1. Engine exhaust heater system

SUPPLIES AND MATERIALS REQUIRED:

1. Discrepancy list form

PROCEDURE:

The student will be furnished with an exhaust heater system and the related technical information. The student will be required to check, inspect, troubleshoot, and repair the system as necessary. The student will also, present to the instructor a list of discrepancies and the corrective actions necessary, with the simulated maintenance logbook entries for the work performed.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

J. ENGINE EXHAUST AND REVERSER SYSTEMS

32-B Troubleshoot and Repair Engine Thrust Reverser Systems and Related Components

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 2.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in troubleshooting, and repairing engine thrust reverser systems and related components.

REFERENCES:

1. FAA Advisory Circular AC 43.13-1B
2. Applicable Aircraft Engine Service Manual
3. FAA Federal Aviation Regulations (14 CFR Part 147)

EQUIPMENT AND TOOLS REQUIRED:

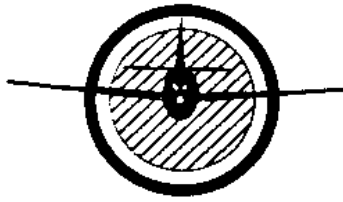
1. Thrust Reverser System Mock-up

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

Using textbook information, the AC 43.13-1B, as revised and the 14 CFR Part 147; the student will describe the operation and inspection of jet engine thrust reversers and noise suppressors.



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II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS:

TOTAL HOURS: 66

THEORY: 33

SHOP/LAB: 33

A. BASIC PROPELLER PRINCIPLES

1. Geometric Pitch
2. Effective Pitch
3. Blade Angle
4. Centrifugal Force
5. Torque Bending Force
6. Thrust Bending Force
7. Aerodynamic Twisting Force
8. Centrifugal Twisting Force

B. MAINTENANCE PRACTICES

1. Fixed – Pitch
2. Ground Adjustable
3. Controllable Pitch
4. Automatic
5. Reverse – Pitch
6. Feathering

C. CONSTANT SPEED AND FEATHERING PROPELLERS

1. Components
2. Principles of Operation
3. Under-speed Conditions
4. Over-speed Conditions
5. Feathering Operations
6. Unfeathering Operations

D. PROPELLER ACCESSORY SYSTEMS

1. Hydraulic Governor
2. Propeller Synchronization
 - a. Master Motor System
 - b. One Engine Master System
3. Ice Control Systems
 - a. Fluid Systems
 - b. Electric Systems
4. Blade Cuffs

E. PROPELLER INSPECTION

1. Wood or Composition Blades
2. Metal Blades
3. Blade Tracking
4. Blade Angle
 - a. Use of Propeller Protractor
5. Balancing
6. Acid Etching Procedure

F. PROPELLER MAINTENANCE

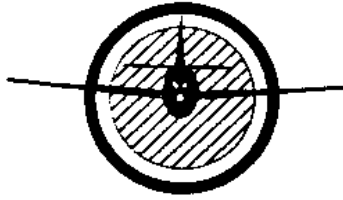
1. Repair of Wood Propellers
2. Repair of Composition Blades

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3. Repair of Metal Propellers
4. Hub and Flange Repair
5. Propeller installation
6. Cleaning
7. Lubrication
8. Blade Tip Identification

G. TURBOPROP SYSTEMS

1. Alpha Range
2. Beta Range
3. Negative Torque Signal (NTS)
4. Thrust Sensitive Signal (TSS)
5. Reduction Gear Assembly

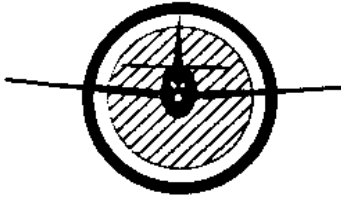


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Performance Goals



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POWERPLANT COURSE CURRICULUM MANUAL

PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

LEVEL

**P-35: INSPECT, CHECK, SERVICE, AND REPAIR
PROPELLER SYNCHRONIZING AND ICE
CONTROL SYSTEMS**

(1)

- A. Given drawings or diagrams, reference information concerning alcohol, chemical and thermal types of propeller anti-icing systems, identify the components and describe the operation of the different types of propeller anti-icing systems.
- B. Using textbook information, write a brief essay on how propeller synchronizing is accomplished.

**P-36: IDENTIFY AND SELECT PROPELLER
LUBRICANTS**

(2)

- A. Given manufacturer's manual or written reference information, locate and interpret information for the lubricant to be used on various types of propellers. List the correct lubricant and any special procedures that need to be considered.

P-37: BALANCE PROPELLERS

(1)

- A. Using manufacturer's manual or written information describes procedures to balance a fixed pitch metal propeller, and/or a wooden fixed pitch propeller, and/or a constant speed propeller.

PERFORMANCE GOALS

P-38: REPAIR PROPELLER CONTROL SYSTEM COMPONENTS (2)

- A. Using a propeller governor (manual or electric), manufacturer's manual, describe the governor action which controls propeller pitch and engine speed. Externally adjust and rig a propeller governor as necessary.

P-39: INSPECT, CHECK SERVICE, AND REPAIR FIXED-PITCH, CONSTANT-SPEED, AND FEATHERING PROPELLERS AND PROPELLER GOVERNING SYSTEMS (3)

- A. Given a fixed-pitch and a variable pitch propeller, a prop protractor, service or written information, check the pitch and length of both propellers as specified by the instructor.
- B. Using copies of aircraft specification sheets, review the specification sheets, and as directed by the instructor, locate a propeller-engine combination that requires a warning or placard on critical range (vibration), and list the warning or what the placard should read, and where the warning or placard should be located.

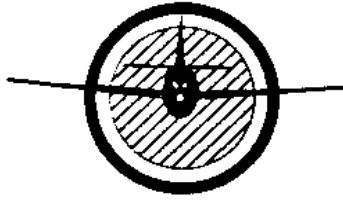
P-40: INSTALL, TROUBLESHOOT, AND REMOVE PROPELLER (3)

- A. Given an engine or mockup, a propeller, written reference information, remove the propeller, inspect the contact between the propeller hub and shaft, and reinstall the propeller using the proper torque values and procedures. Safety as required.
- B. Using a fixed and/or variable pitch propeller mounted on an engine or mockup and written information describing tracking of a propeller check the track of a propeller. Write a brief essay on how a propeller that is out of track is corrected.

PERFORMANCE GOALS

P-41: REPAIR ALUMINUM ALLOY PROPELLER BLADES (3)

- A. Using metal propellers, the AC 43.13-1B, as revised manufacturer's manual or written reference information, inspect, check, and smooth nicks, cuts, and scratches in the leading and trailing edges of metal propeller blades. Using a magnifying glass, inspect the repair under a bright light.
- B. Using the AC 43.13-1B, as revised a sample Form 337, and a sample log book, write a brief essay on the procedure for shortening a propeller; fill out a sample Form 337 on shortening a propeller, and make a log book entry in the sample log book.

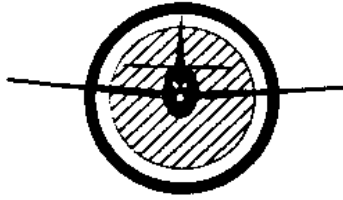


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POWERPLANT COURSE CURRICULUM MANUAL

Practical Projects



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

33-A Inspect, Check, Service, and Repair Propeller Synchronizing and Ice Control Systems

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in identifying the components and the operation of different types of propeller anti-icing systems.

REFERENCES:

Applicable propeller maintenance manual or related technical information.

EQUIPMENT AND TOOLS REQUIRED:

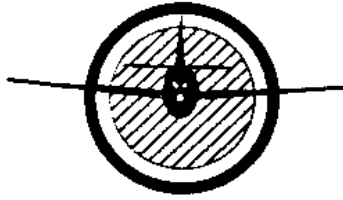
1. Diagrams or drawings

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Given drawings or diagrams and written information concerning alcohol, chemical and thermal types of propeller anti-icing systems; the student will identify the components and describe the operation of the different types of propeller anti-icing systems.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

33-B Inspect, Check, Service, and Repair Propeller Synchronizing and Ice Control Systems

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in identifying the components and the operation of different types of propeller anti-icing systems.

REFERENCES:

1. Powerplant Textbook

EQUIPMENT AND TOOLS REQUIRED:

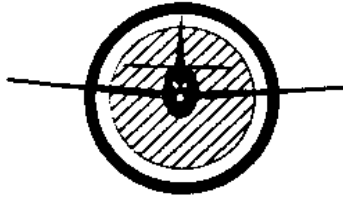
1. Diagrams or drawings

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Using textbook information; the student will write a brief essay on how propeller synchronizing is accomplished.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

34-A Identify and Select Propeller Lubricants

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in locating and interpreting information for propeller lubricants.

REFERENCES:

Applicable propeller maintenance manual or related technical information.

EQUIPMENT AND TOOLS REQUIRED:

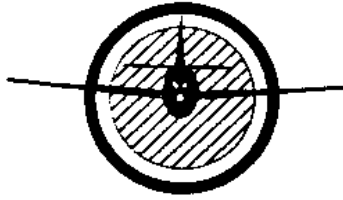
1. Grease gun

SUPPLIES AND MATERIALS REQUIRED:

1. Aircraft propeller grease.

PROCEDURE:

The student will be furnished with various types of aircraft propellers and the required technical information. The student will be required to list the correct type lubricant for each propeller and the proper procedure for lubricating the propeller.



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II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

35-A Balance Propellers

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in the process of balancing propellers.

REFERENCES:

1. Applicable propeller maintenance manual or related technical information.

EQUIPMENT AND TOOLS REQUIRED:

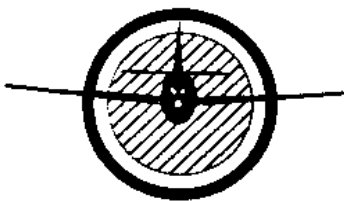
1. Wooden or Metal Propeller

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Using the manufacturer's manual or written information, the student will describe the procedures to balance a fixed pitch metal propeller, and/or a wooden fixed pitch propeller and/or a constant speed propeller.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

36-A Repair Propeller Control System Components

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in propeller governor operation; rigging and adjustment.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

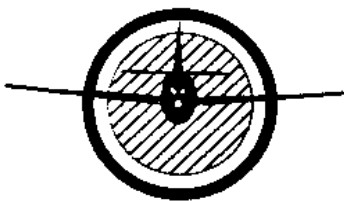
1. Aircraft engine equipped with constant speed prop and governor.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

Drawings of propeller governor operation

PROCEDURE:

The instructor will furnish the student an engine equipped with a propeller governor and the related technical information. The student will be required to rig and adjust a propeller governor, as necessary.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

37-A Inspect, Check, Service and Repair Fixed-Pitch, Constant-Speed and Feathering Propellers and Propeller Governing Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in checking propeller blade pitch and length.

REFERENCES:

1. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Fixed pitch and variable pitch propellers.
2. Universal propeller protector set.
3. Measuring tape ruler.
4. Spirit level.

SUPPLIES AND MATERIALS REQUIRED:

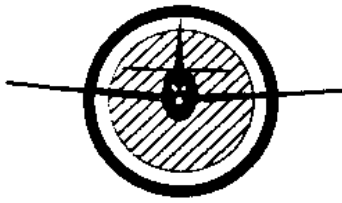
1. Masking tape and wax pencil.

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37-A Inspect, Check, Service and Repair Fixed-Pitch, Constant-Speed and Feathering Propellers and Propeller Governing Systems (continued)

PROCEDURE:

The student will be furnished with a fixed pitch and a variable pitch propeller and the required technical information. The student will be required to check the propeller blade pitch using a Universal Protractor and measure the propeller length, on both propellers.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

37-B Inspect, Check, Service and Repair Fixed-Pitch, Constant-Speed and Feathering Propellers and Propeller Governing Systems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge in interpreting propeller/engine combination, markings, placards, and how to display placards or markings on aircraft instruments and/or instrument panel.

REFERENCES:

1. 14 CFR Part 23.1027
2. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

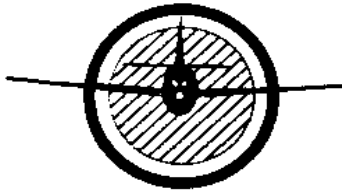
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Copies of Aircraft Spec Data Sheets.

PROCEDURE:

The student will be furnished with copies of an aircraft specifications and Data Sheets. The student will locate information regarding engine/propeller combination, requiring warning or placards related to critical range operations. The student will present to the instructor a list of the warning(s) or placards(s) required and where they must be located.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

38-A Install, Troubleshoot, and Remove Propellers

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the proper procedure for removing and inspecting the hub and shaft contact area before reinstalling aircraft propellers.

REFERENCES:

1. Applicable aircraft engine maintenance manual or reference technical instructor.

EQUIPMENT AND TOOLS REQUIRED:

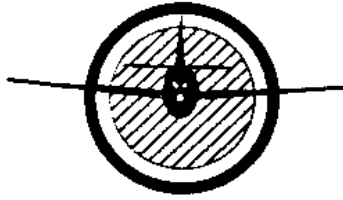
1. Combination engine/propeller assembly.
2. Propeller installation special tools set, hoist and slings
3. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED:

1. None

PROCEDURE:

The student will be furnished with a combination engine/propeller assembly, the required technical information, special tools, and needed equipment. The student will be required to remove, check the contact area between the propeller hub and engine shaft. The student will reinstall the propeller in accordance with manufacturer's procedures and specifications, safetying the propeller as required.



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II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

38-B Install, Troubleshoot and Remove Propellers

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in performing propeller track check and how propeller out of track condition are corrected.

REFERENCES:

1. *Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)*
2. Powerplant Technician Textbook (Jeppesen)
3. Aircraft Propeller and Controls (EA-APC)

EQUIPMENT AND TOOLS REQUIRED:

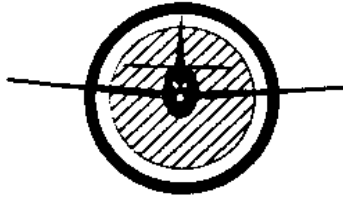
1. Combination engine-propeller assembly.
2. Basic hand tools required.

SUPPLIES AND MATERIALS REQUIRED

None

PROCEDURE:

The student will be furnished with a combination propeller/engine assembly and the related technical information. The student will be required to check the propeller track and write a brief essay on how a propeller that is out of track is corrected.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

39-A Repair Aluminum Alloy Propeller blades

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3.0 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills in checking, inspecting and repairing aluminum alloy propeller blades.

REFERENCES:

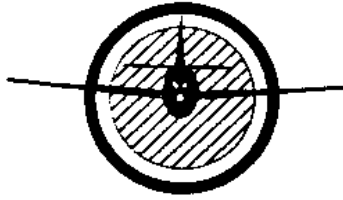
1. FAA advisory circular (AC 43.13-1B)
2. ***Aviation Maintenance Technician Handbook-Powerplant (FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)***
3. Powerplant Technician Textbook (Jeppesen)

EQUIPMENT AND TOOLS REQUIRED:

1. Aluminum alloy propeller
2. Set of smooth cut files
3. Magnifying glass and bright light

SUPPLIES AND MATERIALS REQUIRED:

1. Various grades sandpaper plies and crocus cloth.

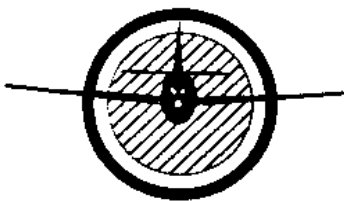


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PROCEDURE:

The student will be furnished with an aluminum alloy metal propeller, the related technical information, tools, and materials. The student will be required to check, inspect, and repair a small damage on the propeller blades. The repair must conform to acceptable methods and standards, prescribed by the FAA and the propeller manufacturer. Using a magnifying glass, the student will inspect the repair under bright light.



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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

K. PROPELLERS

39-B Repair Aluminum Alloy Propeller Blades

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3.0 Hrs.

PURPOSE:

To acquaint the student with the required knowledge on the procedure of shortening propeller blades (reducing propeller diameter).

REFERENCES:

1. FAA Advisory Circular (AC 43.13-1B, as revised)
2. FAR AMT Book "as revised"

EQUIPMENT AND TOOLS REQUIRED:

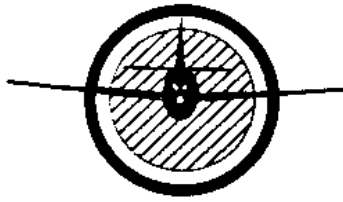
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Sample FAA Form 337
2. Sample log book page

PROCEDURE:

The student will be required to make a log book entry and fill out an FAA form 337 for a propeller repair involving shortening propeller blades. The student will write a brief essay on the procedure for shortening a propeller.



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II. POWERPLANT SYSTEMS AND COMPONENTS

L. UNDUCTED FANS:

TOTAL HOURS: 6 THEORY: 4 SHOP HOURS: 2

A. COMPARISON BETWEEN CONVENTIONAL TURBOFAN AND UNDUCTED FAN ENGINES

B. FAN BLADE DESIGN

1. Dual Counter-Rotating Fans

C. PROPELLER BLADES TIP SPEED

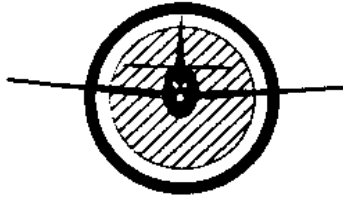
D. UNDUCTED FAN ENGINE NOISE PROBLEMS

E. AFTERWARD FUSELAGE ENGINE PYLON INSTALLATION

F. CABIN COMPARTMENT NOISE PROTECTION

G. STRUCTURAL SONIC FATIGUE

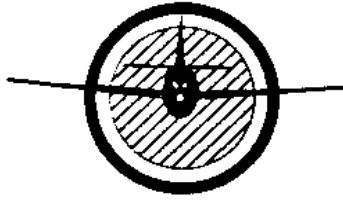
H. TURBO FAN ENGINES FUEL ECONOMY



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Performance Goals



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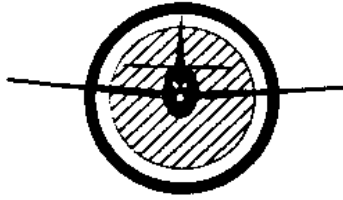
II. POWERPLANT SYSTEMS AND COMPONENTS

L. UNDUCTED FANS

LEVEL

**P-42: INSPECT, AND TROUBLESHOOT UNDUCTED
FAN SYSTEMS AND COMPONENTS**

(1)

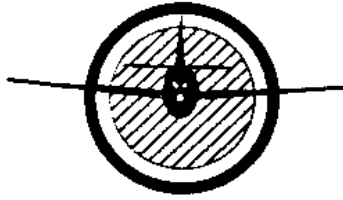


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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

L. UNDUCTED FANS

40-A Inspect and Troubleshoot Unducted Fan Systems and Components

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge in the inspection and troubleshooting of unducted fan systems and components.

REFERENCES:

1. Written Information.

EQUIPMENT AND TOOLS REQUIRED:

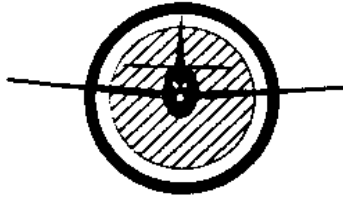
1. None

SUPPLIES AND MATERIALS REQUIRED:

1. None.

PROCEDURE:

Using the written information provided by the instructor, the student will answer questions regarding the operation, inspection and troubleshooting of unducted fan systems and its components.



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II. POWERPLANT SYSTEMS AND COMPONENTS

M. AUXILIARY POWER UNITS

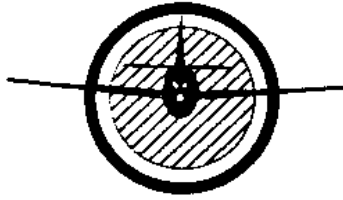
TOTAL HOURS: 12

THEORY: 6

SHOP/LAB: 6

A. AIR TURBINE STARTING UNITS

1. Purpose
2. Advantage
3. Construction & design
4. Components
5. Operation
6. Troubleshooting

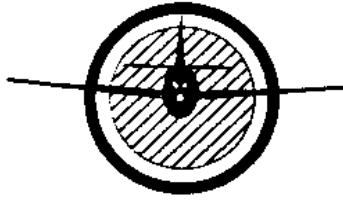


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POWERPLANT COURSE CURRICULUM MANUAL

Performance Goals



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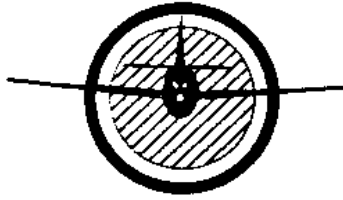
PERFORMANCE GOALS

II. POWERPLANT SYSTEMS AND COMPONENTS

M. AUXILIARY POWER UNITS:

**P-43: INSPECT, CHECK, SERVICE AND TROUBLESHOOT
TURBINE-DRIVEN AUXILIARY POWER UNIT (1)**

- A. Given diagrams and system operation information inspects, services and troubleshoots a typical auxiliary Power unit system (APU).

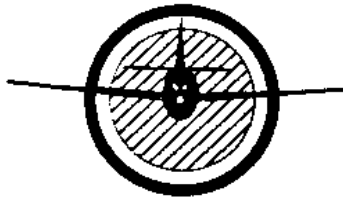


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PRACTICAL PROJECT

II. POWERPLANT SYSTEMS AND COMPONENTS

M. Auxiliary Power Units

41-A Inspect, Check, Service and Troubleshoot Turbine-Driven Auxiliary Power Units

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 6 Hrs.

PURPOSE:

To acquaint the student with the required knowledge in the inspection, checking, servicing and troubleshooting of Turbine-Driven auxiliary power units.

REFERENCES:

1. Manufacturer's Technical Data

EQUIPMENT AND TOOLS REQUIRED:

1. APU Mock-up

SUPPLIES AND MATERIALS REQUIRED:

1. Diagrams and Schematics.

PROCEDURE:

Using the manufacturer's technical data, diagrams and schematics provided by the instructor; the student will answer questions regarding the operation, inspection and troubleshooting of an Auxiliary Power Unit and its components.

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GLOSSARY OF TERMS AND DEFINITIONS

GLOSSARY OF TERMS AND DEFINITIONS

| | | |
|----------------------------------|---|--|
| AMTS | : | Aviation Maintenance Technician School |
| AC 43.13-1B | : | An advisory circular in book form issued by the Federal Aviation Administration which covers acceptable methods, techniques, and practices for aircraft inspection and repair. |
| AD's | : | Airworthiness Directives: A regularity notice set out by the FAA to the registered owner of an aircraft informing him of a condition which must be corrected for the aircraft to maintain its airworthiness status. |
| Airworthiness Certificate | : | A certificate issued by the FAA to all aircraft which have met the minimum standards required for certification. |
| A.P.U. | : | The commonly used abbreviation for auxiliary power unit. This is a self-contained motor-generator carried in the airplane to generate power for ground operation and starting the main engines. |
| A.S.T.M. | : | American Society of Testing Materials: A society which sets up standards in industry; as in specifications of jet fuels. |
| ASTM Specifications | : | Standards developed by the American Society for testing materials. |
| BMEP Indicator | : | An engine instrument which measures output shaft torque and converts it to Brake Mean Effective Pressure (BMEP). |
| Check | : | Means to verify proper operation. |
| Check Flight | : | An operational check and test flight to check the aircraft performance after major re-work or repairs. |
| Check List | : | A systematic list of procedures to be followed when performing any complex operation. |
| CHT | : | Cylinder Head Temperature. |

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GLOSSARY OF TERMS AND DEFINITIONS

| | | |
|----------------------------|---|--|
| Dry Sump Engines | : | An engine in which most of the lubricating oil is carried in an external tank and is fed to the pressure pump by gravity. After it has lubricated the engine, it is pumped back into the tank by an engine driven scavenger pump. |
| E-gap Angle | : | The number of degrees of magnet rotation beyond its neutral position at which the primary breaker points, in a magneto, opens. It is at this point that the primary current-flow is the greatest, and therefore the rate of collapse of the primary field will induce the greatest voltage into the secondary winding. |
| Engine | : | A machine that used heat energy to develop mechanical power. |
| FAA | : | Federal Aviation Administration. A part of the Department of Transportation. The Federal Aviation Administration establishes the rules and regulation as well as enforces those rules. The purpose of the FAA is to set the standards of civil aircraft for the public safety. |
| FAA Acceptable Data | : | Is data that the FAA has approved and is usually identified as such. Approved Data includes: Type Certificate Data and Specification Sheets, Airworthiness Directives, Manufacturer's FAA approved Data (DOA), and other information with the words "Approved Data" stamped on them. You must use approved data for all major repairs and major alterations. |
| FAA Acceptable Data | : | Is found in aircraft documents such as manufacturer's maintenance manuals, service bulletins and letters, advisory circulars, Ac 43.13-I B and 2A, 14 CFT Part 121 and part 135 air carrier maintenance manuals. Acceptable data must be used for all maintenance. |
| FAA-Form 337 | : | Major Repair and Alteration Form. |
| FAA-PMA | : | The identifying letters required on an aircraft part or component that have been approved by the FAA for manufacturing. (Parts Manufacturing Approval) |
| Inspect | : | The determination of the condition of something by sight, feel, measurement, and or other means. |

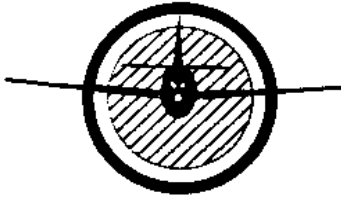
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GLOSSARY OF TERMS AND DEFINITIONS

| | | |
|-----------------------------------|---|---|
| Magnetic Pick-up RPM | : | A newer fan speed indicating system which uses systems a magnetic pick-up in the fan case. Blade motion produces an eddy current powering a cockpit indicator. |
| Mock-up | : | A full-size reproduction of a part or assembly used to determine whether or not all the components will fit as they are designed. It is also used as an expedient for instruction when the real object is impractical to use. |
| Operational Check | : | Checks made to a unit to determine that it is operating properly. |
| Overhaul | : | To disassemble, inspect, repair as necessary, and check. |
| Powerplant | : | The complete installation in the aircraft of the engine, propeller, and all of the accessories and controls needed for its proper operation. |
| Reciprocating Engine | : | An engine which converts the heat energy form burning fuel into the reciprocating movement of the pistons. This movement is converted into rotary motion by the connecting rods and crankshaft. |
| Repair | : | To correct a defective condition and restore to a condition of practical operation or to the original condition. |
| RPM; Revolution per Minute | : | The number of complete revolutions of a body in one minute. |
| Service | : | To perform functions that assure continue operation. |
| Standard | : | The degree of excellence required for a particular purpose. |
| Troubleshooting | : | Systematic analysis of a malfunction in a system or component to determine the cause. |
| Turbine | : | A rotary device actuated by impulse or reaction of a fluid flowing through the vanes, or blades, arranged around a central shaft. |
| Turbine Engine | : | A type of aircraft engine which consist of an air compressor, a combustion section, and a turbine. Thrust is produced by increasing the velocity of the air flowing though the engine. |

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Warm-up Time : The time used by a component for all of its parts to reach operating temperature.

Wet Sump Engine : An engine in which all of the oil supply is carried within the engine itself.



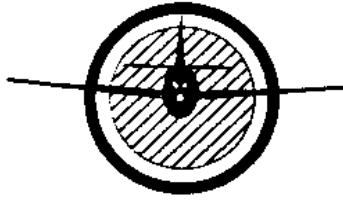
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POWERPLANT COURSE CURRICULUM MANUAL

TEXTBOOKS REQUIRED BY THE STUDENTS

1. Powerplant Textbook:
A&P Technician Powerplant Textbook
Jeppesen
2. Powerplant Technician Test Guide with Oral and Practical Study Guide
Jeppesen
3. Aviation Maintenance Technician Handbook-Powerplant
(FAA-H-8083-32A Vol. 1 and Vol. 2, as revised)



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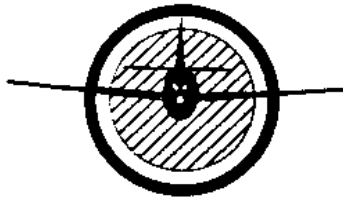
POWERPLANT COURSE CURRICULUM MANUAL

CURRICULUM REQUIREMENTS

This is the description of the levels of proficiency at which items under each subject in the curriculum shall be taught.

TEACHING LEVELS:

- (1) Level 1 requires:
 - (i) Knowledge of general principles, but not practical application.
 - (ii) No development of manipulative skill.
 - (iii) Instruction by lecture, demonstration and discussion.
- (2) Level 2 requires:
 - (i) Knowledge of general principles, and limited practical application.
 - (ii) Development of sufficient manipulative skill to perform basic operations.
 - (iii) Instruction by lecture, demonstration, discussion and limited practical application.
- (3) Level 3 requires:
 - (i) Knowledge of general principles, and performance of high degree of practical application.
 - (ii) Development of sufficient manipulative skill to simulate return to service.
 - (iii) Instruction by lecture, demonstration, discussion and a high degree of practical application.



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POWERPLANT COURSE CURRICULUM MANUAL

POWERPLANT CURRICULUM SUBJECTS

This list is the subjects required in the 750 hours in the Powerplant Curriculum, in addition to 430 hours in the General curriculum Subjects.

The number in parentheses before each item listed under each subject heading indicates the level of proficiency at which that item must be taught.

A. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES

- (1) 1. Inspect and repair a radial engine.
- (2) 2. Overhaul reciprocating engine.
- (3) 3. Inspect, check, service, and repair reciprocating engines and engine installations.
- (3) 4. Install, troubleshoot, and remove reciprocating engines.

B. TURBINE ENGINES

- (2) 5. Overhaul turbine engine.
- (3) 6. Inspect, check, service, and repair turbine engines and turbine engine installations.
- (3) 7. Install, troubleshoot, and remove turbine engine.

C. ENGINE INSPECTION

- (3) 8. Perform powerplant conformity and airworthiness inspections.

II. POWERPLANT SYSTEMS AND COMPONENTS

A. ENGINE INSTRUMENT SYSTEMS

- (2) 9. Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.
- (3) 10. Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and R.P.M. indicating systems.

B. ENGINE FIRE PROTECTION SYSTEMS

- (3) 11. Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.

C. ENGINE ELECTRICAL SYSTEMS

- (2) 12. Repair engine electrical system components
- (3) 13. Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.

D. LUBRICATION SYSTEMS

- (2) 14. Identify and select lubricants.
- (2) 15. Repair engine lubrication systems components
- (3) 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems.

E. IGNITION AND STARTING SYSTEMS

- (2) 17. Overhaul magneto and ignition hardness.
- (2) 18. Inspect, service, troubleshoot, and repair reciprocating and Turbine engine ignition systems and components.
- (3) 19a. Inspect, service, troubleshoot, and repair reciprocating and Turbine engine electrical starting
- (1) 19b. Inspect, service, and troubleshoot turbine, engine pneumatic starting systems.

F. FUEL METERING SYSTEMS

- (1) 20. Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls.
- (2) 21. Overhaul carburetor.
- (2) 22. Repair engine fuel metering system components.
- (2) 23. Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.

G. ENGINE FUEL SYSTEMS

- (2) 24. Repair engine fuel system components.
- (2) 25. Inspect, check service, troubleshoot, and repair engine fuel system.

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H. INDUCTION AND ENGINE AIRFLOW SYSEMS

- (2) 26. Inspect, check, troubleshoot, service, and repair engine ice and rain control systems.
- (1) 27. Inspect, check, service, troubleshoot and repair heat exchanger, superchargers, and turbine engine airflow and temperature control systems.
- (2) 28. Inspect, check, service, and repair carburetor air intake and induction manifolds.

I. ENGINE COOLING SYSTEMS

- (2) 29. Repair engine cooling system components.
- (1) 30. Inspect, check, troubleshoot, service and repair engine cooling systems.

J. ENGINE EXHAUST AND REVERSER SYSTEMS

- (2) 31. Repair engine exhaust system components.
- (3) 32 a. Inspect, check, troubleshoot, service, and repair engine exhaust systems.
- (1) 32 b. Troubleshoot and repair engine thrust reverser systems and related components.

K. PROPELLERS

- (1) 33. Inspect, check, service, and repair propeller synchronizing and ice control systems.
- (2) 34. Identify and select propeller lubricants.
- (1) 35. Balance propellers.
- (2) 36. Repair propeller control system components.
- (3) 37. Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.
- (3) 38. Install, troubleshoot, and remove propellers.
- (3) 39. Repair aluminum alloy propeller blades.

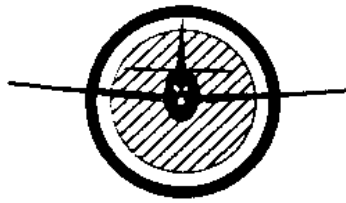
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L. UNDUCTED FANS

- (1) 40. Inspect and troubleshoot inducted fan systems and components.

M. AUXILIARY POWER UNITS

- (1) 41. Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.



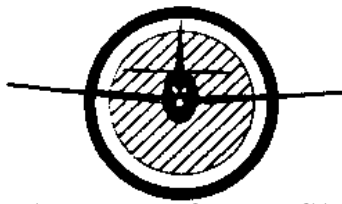
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**STUDENT WORKBOOK
POWERPLANT CURRICULUM**

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POWERPLANT CURRICULUM
PRACTICAL PROJECT RECORD

Student Name: _____ S.S. Num. _____

Instructor: _____ Group: _____

I. POWERPLANT THEORY AND MAINTENANCE

A. RECIPROCATING ENGINES - Total 6

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 1-A | Inspect and repair a radial engine | 1 | | |
| 2-A | Overhaul reciprocating engine | 2 | | |
| 2-B | Overhaul reciprocating engine | 2 | | |
| 3-A | Inspect, check, service and repair reciprocating engine and engine installations. | 3 | | |
| 4-A | Install, troubleshoot and remove reciprocating engine. | 3 | | |
| 4-B | Install, troubleshoot and remove reciprocating Engine. | 3 | | |
| | TOTALS | | | |

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PRACTICAL PROJECT RECORD

B. TURBINE ENGINES – Total 7

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|--|-------|-------|------------------|
| 5-A | Overhaul turbine engine | 2 | | |
| 6-A | Inspect, check, service and repair turbine engines and turbine engine installation. | 3 | | |
| 6-B | Inspect, check, service and repair turbine engines and turbine engine installation. | 3 | | |
| 6-C | Inspect, check, service and repair turbine engines and turbine engines installation. | 3 | | |
| 6-D | Inspect, check, service and repair turbine engines and turbine engines installation. | 3 | | |
| 7-A | Install, troubleshoot, and remove turbine engines. | 3 | | |
| 7-B | Install, troubleshoot, and remove turbine engines. | 3 | | |
| | TOTALS | | | |

C. ENGINE INSPECTION - Totals 1

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 8-A | Perform powerplant conformity and Airworthiness Inspections | 3 | | |
| | TOTALS | | | |

II. POWERPLANT SYSTEMS AND COMPONENTS

A. INSTRUMENT SYSTEMS- Totals 4

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 9-A | Troubleshoot, service, and repair electrical and mechanical fluid rate-of- flow indicating systems. | 2 | | |

PRACTICAL PROJECT RECORD

| | A. INSTRUMENT SYSTEMS (continued :) | | | |
|------|--|---|--|--|
| 9-B | Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems. | 2 | | |
| 10-A | Inspect check, service, troubleshoot, and repair electrical and mechanical engine temperature pressure, and R.P.M. indicating systems. | 3 | | |
| 10-B | Inspect check, service, troubleshoot, and repair electrical and mechanical engine temperature pressure, and R.P.M. indicating systems. | 3 | | |
| | TOTALS | | | |

B. ENGINE FIRE PROTECTION SYSTEMS - Totals 2

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|---|--------------|--------------|-------------------------|
| 11-A | Inspect, Check, Service and Carbon Monoxide Detection Systems | 1 | | |
| 11-B | Inspect, check, service, troubleshoot, and repair engine fire detection and fire extinguishing systems. | 3 | | |
| | TOTALS | | | |

C. ENGINE ELECTRICAL SYSTEMS – Totals 5

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|--|--------------|--------------|-------------------------|
| 12-A | Repair engine electrical system components | 2 | | |
| 12-B | Repair engine electrical system components | 2 | | |
| 13-A | Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices | 2 | | |
| 13-B | Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices | 2 | | |
| | | | | |

PRACTICAL PROJECT RECORD

| C. ENGINE ELECTRICAL SYSTEMS (continued :) | | | | |
|---|--|---|--|--|
| 13-C | Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices | 2 | | |
| | TOTALS | | | |

D. LUBRICATION SYSTEMS – TOTAL 8

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|---|--------------|--------------|-------------------------|
| 14-A | Identify and select lubricants | 2 | | |
| 14-B | Identify and select lubricants | 2 | | |
| 15-A | Repair engine lubrication system components | 2 | | |
| 15-B | Repair engine lubrication system components | 2 | | |
| 15-C | Repair engine lubrication system components | 2 | | |
| 16-A | Inspect, check, service, trouble-shoot, and repair engine lubrication systems | 3 | | |
| 16-B | Inspect, check, service, trouble-shoot, and repair engine lubrication systems | 3 | | |
| 16-C | Inspect, check, service, trouble-shoot, and repair engine lubrication systems | 3 | | |
| | TOTALS | | | |

E. IGNITION AND STARTING SYSTEMS- TOTAL 6

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|---|--------------|--------------|-------------------------|
| 17-A | Overhaul magneto and ignition hardness | 2 | | |
| 17-B | Overhaul magneto and ignition hardness | 2 | | |
| 18-A | Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components | 2 | | |
| 18-B | Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components | 2 | | |
| | | | | |

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PRACTICAL PROJECT RECORD

| E. IGNITION AND STARTING SYSTEMS – (continued): | | | | |
|--|--|---|--|--|
| 19-A | Inspect, service, troubleshoot, and repair turbine engine electrical starting systems. | 3 | | |
| 19-B | Inspect, service, troubleshoot, and repair turbine engine pneumatic starting systems | 3 | | |
| | TOTALS | | | |

F. FUEL METERING SYSTEMS – Totals 6

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|--|--------------|--------------|-------------------------|
| 20-A | Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls | 1 | | |
| 21-A | Overhaul carburetor | 2 | | |
| 22-A | Repair engine fuel metering systems components | 2 | | |
| 22-B | Repair engine fuel metering systems components | 2 | | |
| 23-A | Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems | 3 | | |
| 23-B | Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems | 3 | | |
| | TOTALS | | | |

G. ENGINE FUEL SYSTEMS - Totals 2

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|---|--------------|--------------|-------------------------|
| 24-A | Repair engine fuel system components | 2 | | |
| 25-A | Inspect, check, service, troubleshoot, and repair engine fuel systems | 3 | | |
| | TOTALS | | | |

PRACTICAL PROJECT RECORD

H. INDUCTION AND ENGINE AIRFLOW SYSTEM - Totals 6

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|---|--------------|--------------|-------------------------|
| 26-A | Inspect, check, troubleshoot, service and repair engine ice and rain control systems | 2 | | |
| 27-A | Inspect, check, service, troubleshoot and repair heat exchanges, superchargers, and turbine engine airflow and temperature control systems | 1 | | |
| 27-B | Inspect, Check, Service, Troubleshoot, and Repair Heat Exchangers, Superchargers and Turbine Engine Airflow and Temperature Control Systems | 1 | | |
| 28-A | Inspect, check, service, and repair carburetor air intake and induction manifolds | 3 | | |
| 28-B | Inspect, check, service, and repair carburetor air intake and induction manifolds. | 3 | | |
| 28-C | Inspect, check, service, and repair Carburetor air intake and induction manifolds. | 3 | | |
| | TOTALS | | | |

ENGINE COOLING SYSTEMS - Totals 5

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|---------------|--|--------------|--------------|-------------------------|
| 29-A | Repair engine cooling system components | 3 | | |
| 29-B | Repair engine cooling system components | 3 | | |
| 29-C | Repair engine cooling system components | 3 | | |
| 30-A | Inspect, check, troubleshoot, service and repair engine cooling systems. | 2 | | |
| 30-B | Inspect, check, troubleshoot, service and repair engine cooling systems. | 2 | | |
| | TOTALS | | | |

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PRACTICAL PROJECT RECORD
ENGINE EXHAUST AND REVERSER SYSTEMS - Totals 4

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|----------|--|-------|-------|------------------|
| 31-A | Repair engine exhaust system components. | 2 | | |
| 32-A (1) | Inspect, check, troubleshoot, service, and repair engine exhaust systems. | 3 | | |
| 32-A (2) | Inspect, check, troubleshoot, service, and repair engine exhaust systems. | 3 | | |
| 32-B | Troubleshoot and repair engine thrust reverser systems and related components. | 1 | | |
| | | | | |
| | TOTALS | | | |

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PROPELLERS - Totals 11

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 33-A | Inspect, check, service, and repair propeller synchronizing and ice control systems. | 1 | | |
| 33-B | Inspect, check, service, and repair propeller synchronizing and ice control systems. | 1 | | |
| 34-A | Identify and select propeller lubricants. | 2 | | |
| 35-A | Balance propellers. | 1 | | |
| 36-A | Repair propeller control system components, | 2 | | |
| 37-A | Inspect, check, service, and repair fixed-pitch, constant speed, and feathering propellers, and propeller governing system. | 3 | | |
| 37-B | Inspect, check, service, and repair fixed-pitch, constant speed, and feathering propellers, and propeller governing system. | 3 | | |
| 38-A | Install, troubleshoot, and remove propellers. | 3 | | |
| 38-B | Install, troubleshoot, and remove propellers. | 3 | | |
| 39-A | Repair aluminum alloy propeller blades. | 3 | | |
| 39-B | Repair aluminum alloy propeller blades. | 3 | | |
| | TOTALS | | | |

PRACTICAL PROJECT RECORD

UNDUCTED FANS - Totals 1

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 40-A | Inspect and troubleshoot unducted fan systems and components. | 1 | | |
| | TOTALS | | | |

AUXILIARY POWER UNITS - Totals 1

| Number | Practical Project Title | Level | Hours | Evaluation Grade |
|--------|---|-------|-------|------------------|
| 41-A | Inspect, Check, Service and troubleshoot turbine-driven auxiliary power units (APUs). | 1 | | |
| | TOTALS | | | |

Total Practical Projects: 75

Total Hours: _____

Evaluation Grade: _____