

## Cape Cod Community College AMTS

### Curriculum Subject Guide for AMT 263 Powerplant Curriculum, Subject Item 14-16

#### Part 147, Appendix D, Part 2 - Subject D. Lubrication Systems

#### Subject: Lubrication Systems

Item 15. Repair engine lubrication system components. (Level 2)

Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

### **Project 1A & 1B & 1C**

Purpose: To acquaint the student with engine lubrication systems.

#### References:

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Colt (PA-22) Flight and Parts Manual
3. Piper Comanche 250 (PA-24) Service Manual
4. Piper Comanche 250 (PA-24) Parts Catalog
5. Cessna 402C Service Manual and Parts Manual
6. Lycoming O-540 Engine Service Manual
7. Continental T S I O-520 Engine Service Manual
8. Lycoming Direct Drive Overhaul Manual

#### Equipment and Tools Needed:

1. Piper Colt (PA-22)
2. Piper Comanche 250 (PA 24)
3. Cessna 402C
4. AMT Roll-Around Toolbox
5. Computer workstation with internet access.

#### Supplies and Materials Needed:

(1) None

#### Procedure:

#### **Complete following procedure on the assigned project 1A & 1B & 1C**

1. For each engine, on a separate sheet of paper, draw an oil system schematic using the accepted symbology and label all parts and the oil flow. Tracing, photographing, photocopying, scanning, or computer drawings are NOT acceptable.

**Project 1A** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Colt (PA-22)
3. Piper Colt (PA-22) Flight and Parts Manuals
4. Lycoming Direct Drive Overhaul Manual

**Project 1B** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Comanche 250 (PA-24)
3. Piper Comanche 250 (PA-24) Service & Parts Manuals
4. Lycoming O-540 Engine Service Manual

**Project 1C** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Cessna 402C
3. Cessna 402C Service Manual and Parts Manual
4. Continental T S I O-520 Engine Service Manual

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Part 147, Appendix D, Part 2 - Subject D. Lubrication Systems

Subject: Lubrication Systems

Item 14. **Identify and select lubricants.** (Level 2)

Item 15. **Repair engine lubrication system components.** (Level 2)

Item 16. **Inspect, check, service, troubleshoot, and repair engine lubrication systems.** (Level 3)

**Project 2A & 2B & 2C**

Purpose: To acquaint the student with engine lubrication systems and components inspection, checking, servicing, and repairing.

References:

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Colt (PA-22) Flight and Parts Manual
3. Piper Comanche 250 (PA-24) Service Manual
4. Piper Comanche 250 (PA-24) Parts Catalog
5. Cessna 402C Service Manual and Parts Manual
6. Lycoming O-540 Engine Service Manual
7. Continental T S I O-520 Engine Service Manual
8. Lycoming Direct Drive Overhaul Manual

Equipment and Tools Needed:

1. Piper Colt (PA-22)
2. Piper Comanche 250 (PA 24)
3. Cessna 402C
4. AMT Roll-Around Toolbox
5. Computer workstation with internet access.

Supplies and Materials Needed:

1. Engine Oil
2. Appropriate Oil Filter
3. Clean Drain Bucket
4. .032” Safety Wire

Procedure:

**Complete following procedure on the assigned project 2A or 2B or 2C**

1. On a separate sheet of paper, prepare a checklist for a 100-Hour inspection of the assigned engine's lubrication system. The checklist must include at least the scope and detail of 14 CFR Part 43 Appendix D pertinent items and must include system servicing instructions. Have the Instructor check your checklist and initial below BEFORE proceeding to Step #2. Checklist OK blank \_\_\_\_\_
2. Perform a 100-hour inspection as per your checklist. To include (but not be limited to): identifying and selecting the proper oil to use in the system, draining and servicing the oil quantity reservoir, and removing, inspecting, and reinstalling the main oil screen/filter. Correct Oil blank \_\_\_\_\_ NOTE: Drain the oil into a CLEAN bucket so as to be able to reuse it in the engine at the discretion of the Instructor.
3. List all discrepancies noted in Step 2 above and repair them as authorized by the Instructor.
4. Conduct an operational run-up of the engine and check for lubrication system leaks. Run up OK blank \_\_\_\_\_

**Project 2A** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Colt (PA-22)
3. Piper Colt (PA-22) Flight and Parts Manuals
4. Lycoming Direct Drive Overhaul Manual

**Project 2B** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Comanche 250 (PA-24)
3. Piper Comanche 250 (PA-24) Service Manual
4. Piper Comanche 250 (PA-24) Parts Catalog
5. Lycoming O-540 Engine Service Manual

**Project 2C** Item 15. Repair engine lubrication system components. (Level 2) and Item 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems. (Level 3)

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Cessna 402C
3. Cessna 402C Service Manual and Parts Manual
4. Continental T S I O-520 Engine Service Manual

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Practical Project Guide for AMT 263 Powerplant Curriculum, Subject Item 14-16

Part 147, Appendix D, Part 2 - Subject D. Lubrication Systems

Subject: Lubrication Systems

Item 16. Inspect, check, service, **troubleshoot**, and repair engine lubrication systems. (Level 3)

### Project 3

Purpose: To acquaint the student with engine lubrication systems and components troubleshooting of common problems.

References:

1. 14 CFR, Federal Aviation Regulations for Aviation Maintenance Technicians (Current Edition), Aviation Maintenance Technician Handbook – Powerplant, Volume 2 (FAA-H-8083-32) Chapter 6
2. Piper Colt (PA-22) Flight and Parts Manual
3. Piper Comanche 250 (PA-24) Service Manual
4. Piper Comanche 250 (PA-24) Parts Catalog
5. Cessna 402C Service Manual and Parts Manual
6. Lycoming O-540 Engine Service Manual
7. Continental T S I O-520 Engine Service Manual
8. Lycoming Direct Drive Overhaul Manual

Equipment and Tools Needed:

(1) None

Supplies and Materials Needed:

(1) None

Procedure:

**Complete following procedure on the assigned project 2A or 2B or 2C**

- (1) Starting on page 2, fill in the Probable Cause and Remedy for each Trouble noted. Within each Trouble, each line represents a possible Probable Cause and Remedy. Be sure to fill in all of them. NOTE: these are not related to any specific engine.

<b>Trouble</b>	<b>Probable Cause</b>	<b>Remedy</b>
1. Excessive Oil Consumption		
2. High Oil Pressure		
3. Low Oil Pressure		

4. High Oil Temperature		
5. Oil Foaming		

Trouble	Isolation Procedure	Remedy
<b>1 Excessive oil consumption</b>		
Oil line leakage	Check external lines for evidence of oil leakage.	Replace or repair defective lines.
Accessory seal leakage	Check for leak at accessories immediately after engine operation.	Replace accessory and/or defective accessory oil seal.
Low grade of oil		Fill tank with proper grade oil.
Failing or failed bearing	Check sump and oil pressure pump screen for material particles.	Replace engine if metal particles are found.
<b>2 High or low indicated oil pressure</b>		
Defective pressure gauge	Check indicator.	Replace indicator if defective.
Improper operation of oil pressure	Erratic pressure indications either excessively high or low.	Remove, clean, and inspect relief valve accessory oil seal.
Inadequate oil supply	Check oil quantity.	Fill oil tank.
Diluted or contaminated oil		Drain engine and tank; refill tank.
Clogged oil screen		Remove and clean oil screen.
Oil viscosity incorrect	Make sure correct oil is being used.	Drain engine and tank; refill tank.
Oil pump pressure relief valve adjustment incorrect	Check pressure relief valve adjustment.	Make correct adjustment on oil pump pressure relief valve.
<b>3 High or low indicated oil temperature</b>		
Defective temperature gauge	Check indicator.	Replace indicator if defective.
Inadequate oil supply	Check oil quantity.	Fill oil tank.
Diluted or contaminated oil		Drain engine and tank; refill tank.
Obstruction in oil tank	Check tank.	Drain oil and remove obstruction.
Clogged oil screen		Remove and clean oil screens.
Obstruction in oil cooler passages	Check cooler for blocked or deformed passages.	Replace oil cooler if defective.
<b>4 Oil foaming</b>		
Diluted or contaminated oil		Drain engine and tank; refill tank.
Oil level in tank too high	Check oil quantity.	Drain excess oil from tank.

Figure 6-30. Oil system troubleshooting procedures.

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