

PO 432

1. **Performance:** Describe Aero Engine Systems
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet will describe aero engine systems, to include:
 - a. fuel systems,
 - b. propeller systems, and
 - c. engine instruments.
4. **Remarks:** Nil.
5. **Complementary Material:** Complementary material associated with PO 432 is designed to enhance the cadet's knowledge of aero engines, specifically:
 - a. EO C432.01 (Describe Ignition and Electrical Systems),
 - b. EO C432.02 (Describe Turbocharging and Supercharging Systems), and
 - c. EO C432.03 (Describe Gas Turbine Engines).

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EO M432.01

1. **Performance:** Describe Fuel Systems
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe fuel systems, to include:
 - a. carburetors, and
 - b. fuel injection.
4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe fuel systems.	Interactive Lecture	10 min	C3-116 (pp. 59–61)
TP2	Describe carburetors.	Interactive Lecture	10 min	C3-116 (pp. 61–68)
TP3	Describe fuel injection.	Interactive Lecture	5 min	C3-116 (pp. 68–69)

5. **Time:**
 - a. Introduction / Conclusion: 5 min
 - b. Interactive Lecture: 25 min
 - c. Total: 30 min
6. **Substantiation:** An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize fuel systems.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.
8. **Training Aids:** Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.
9. **Learning Aids:** Nil.
10. **Test Details:** This EO is assessed IAW Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.
11. **Remarks:** Cadets who are qualified Advanced Aviation may assist with this instruction.

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EO M432.02

1. **Performance:** Describe Propeller Systems
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe propeller systems, to include:
 - a. propeller types,
 - b. feathering, and
 - c. propeller reversing.

4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe propeller systems.	Interactive Lecture	10 min	C3-116 (pp. 72–73)
TP2	Describe types of propellers, to include: <ol style="list-style-type: none"> a. fixed pitch, and b. variable pitch. 	Interactive Lecture	10 min	C3-116 (pp. 73–75)
TP3	Describe feathering and propeller reversing.	Interactive Lecture	5 min	C3-116 (p. 75)

5. **Time:**

- a. Introduction / Conclusion: 5 min
- b. Interactive Lecture: 25 min
- c. Total: 30 min

6. **Substantiation:** An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize propeller systems.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.
8. **Training Aids:** Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.
9. **Learning Aids:** Nil.

10. **Test Details:** This EO is assessed IAW Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.
11. **Remarks:** Nil.

EO M432.03

1. **Performance:** Describe Engine Instruments
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe engine instruments, to include:
 - a. oil pressure gauge,
 - b. oil temperature gauge,
 - c. cylinder head temperature gauge,
 - d. tachometer, and
 - e. manifold pressure gauge.

4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe the oil pressure and oil temperature gauges.	Interactive Lecture	5 min	C3-116 (pp. 75–76)
TP2	Describe the cylinder head temperature gauge.	Interactive Lecture	5 min	C3-116 (p. 76)
TP3	Describe the tachometer.	Interactive Lecture	5 min	C3-116 (pp. 76–77)
TP4	Describe the manifold pressure gauge.	Interactive Lecture	5 min	C3-116 (pp. 77–79)
TP5	Conduct an in-class activity to review aero engines.	In-Class Activity	5 min	

5. **Time:**

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|-------------------------------|--------|
| a. Introduction / Conclusion: | 5 min |
| b. Interactive Lecture: | 20 min |
| c. In-Class Activity: | 5 min |
| d. Total: | 30 min |

6. **Substantiation:**
 - a. An interactive lecture was chosen for TPs 1–4 to clarify, emphasize, and summarize engine instruments.
 - b. An in-class activity was chosen for TP 5 as it is an interactive way to reinforce the topic and confirm the cadets' comprehension of aero engine systems.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.
8. **Training Aids:** Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.
9. **Learning Aids:**
 - a. Pen / pencil, and
 - b. Aero Engine Review worksheet.
10. **Test Details:** This EO is assessed IAW Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.
11. **Remarks:** Nil.

EO C432.01

1. **Performance:** Describe Ignition and Electrical Systems
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe ignition and electrical systems.
4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe the ignition system.	Interactive Lecture	15 min	C3-116 (pp. 69–71)
TP2	Describe the electrical system.	Interactive Lecture	10 min	C3-116 (pp. 71–72)

5. **Time:**
 - a. Introduction / Conclusion: 5 min
 - b. Interactive Lecture: 25 min
 - c. Total: 30 min
6. **Substantiation:** An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize the ignition and electrical systems.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.
8. **Training Aids:** Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.
9. **Learning Aids:** Nil.
10. **Test Details:** Nil.
11. **Remarks:** Cadets who are qualified Advanced Aviation may assist with this instruction.

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EO C432.02

1. **Performance:** Describe Turbocharging and Supercharging Systems
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe turbocharging and supercharging systems.
4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe turbocharging.	Interactive Lecture	10 min	C3-116 (pp. 54–55)
TP2	Describe supercharging.	Interactive Lecture	5 min	C3-116 (pp. 55–56)
TP3	Conduct an in-class activity to confirm the cadets' comprehension of turbocharging and supercharging.	In-Class Activity	10 min	

5. **Time:**
 - a. Introduction / Conclusion: 5 min
 - b. Interactive Lecture: 15 min
 - c. In-Class Activity 10 min
 - d. Total: 30 min
6. **Substantiation:**
 - a. An interactive lecture was chosen for TPs 1 and 2 to clarify, emphasize, and summarize turbocharging and supercharging systems.
 - b. An in-class activity was chosen for TP 3 to confirm the cadets' comprehension of turbocharging and supercharging.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

8. **Training Aids:**

- a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area,
- b. Turbocharging and Supercharging Worksheet, and
- c. Turbocharging and Supercharging Worksheet Answer Key.

9. **Learning Aids:**

- a. Pen / pencil, and
- b. Turbocharging and Supercharging Worksheet.

10. **Test Details:** Nil.

11. **Remarks:** Cadets who are qualified Advanced Aviation may assist with this instruction.

EO C432.03

1. **Performance:** Describe Gas Turbine Engines
2. **Conditions:**
 - a. Given:
 - (1) Supervision, and
 - (2) Assistance as required.
 - b. Denied: Nil.
 - c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard:** The cadet shall describe gas turbine engines, to include:
 - a. turbojets,
 - b. turbofans,
 - c. turboprops, and
 - d. turboshafts.

4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Describe turbojets.	Interactive Lecture	10 min	C3-116 (pp. 86–87)
TP2	Describe turbofans.	Interactive Lecture	10 min	C3-116 (pp. 87–88)
TP3	Describe turboprops and turboshafts.	Interactive Lecture	5 min	C3-116 (p. 87)

5. **Time:**

- a. Introduction / Conclusion: 5 min
- b. Interactive Lecture: 25 min
- c. Total: 30 min

6. **Substantiation:** An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize gas turbine engines.
7. **References:** C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Pepler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.
8. **Training Aids:** Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.
9. **Learning Aids:** Nil.

10. **Test Details:** Nil.
11. **Remarks:** Nil.