AIRFRAME & POWERPLANT MECHANICS

POWERPLANT TEST GUIDE

Written, Oral, and Practical

ALIGNS WITH

FAA-H-8083-32B & FAA-H-8083-32B-ATB

Airframe & Powerplant Mechanics Powerplant Handbook

2026 EDITION

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www.actechbooks.com

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INDUCTION AND EXHAUST SYSTEMS

CHAPTER 3

Carburetor Induction Systems, Turbine Engine Inlet Systems, Reciprocating Engine Exhaust Systems, and Exhaust Vectoring

QUESTIONS

3-1 AM.III.D.K4
Where on a reciprocating engine is manifold pressure measured?
A. As the air/fuel mixture flows past the throttle plate.
B. As the airflow mixture enters one or more cylinders.
C. At a pre-calibrated point within a manifold tube.

3-2 AM.III.J.K7
One source commonly used for carburetor air heat is _____
A. turbocharger heated air.
B. alternate air heat.
C. warm ducted air from around the exhaust system.

3-3 AM.III.J.K7
On an airplane equipped with an alternate air door in the carburetor air box, when the main air duct air filter becomes blocked or clogged, the _____
A. system will automatically allow warm, unfiltered air to be drawn into the engine through a spring loaded alternate air valve.
B. the carburetor heat door will automatically open to supply the engine.
C. alternate air must be selected in the cockpit to continue induction into the engine.

3-4 AM.III.J.K1
The action of a carburetor air scoop is to supply air to the carburetor, but it may also _____
A. cool the engine.
B. keep fuel lines cool and prevent vapor lock.
C. increase the pressure of the incoming air by ram effect.

3-5 AM.III.J.K7
During engine operation, if carburetor heat is applied, it will _____
A. increase air to fuel ratio.
B. increase engine RPM.
C. decrease air density to the carburetor.

3-6 AM.III.E.K1
In the event of an engine fire during start-up, what type of fire extinguisher is most effective to put out the fire?
A. Dry Powder
B. Carbon Dioxide
C. Water

ANSWERS

3-1 Answer A
Filtered air enters the fuel metering device (carburetor or fuel injector) where the throttle plate controls the amount of air flowing into the engine. The air coming out of the throttle is referred to as manifold pressure which is the primary control of engine output power.
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Page 1

3-2 Answer C
The carburetor heat valve admits air from the outside air scoop for normal operation and it admits warm air from the engine compartment for operation during icing conditions. The carburetor heat is operated by a push-pull control in the cockpit. When selected, warm ducted air from around the exhaust system is directed into the carburetor. This raises the intake air temperature.
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Page 1

3-3 Answer A
On a basic carburetor induction system found on a light aircraft with reciprocating engine, an induction air box allows air to be drawn from a scoop mounted in the nose cowling or, when selected, from inside the cowling for the purpose of warming the carburetor by ducting air past the exhaust system. However, an alternate air door can be opened by engine suction if the normal route of airflow should be blocked by something. The valve is spring loaded closed and is sucked open by the engine if needed.
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Page 2

3-4 Answer C
The carburetor air filter is installed in the air scoop in front of the carburetor air duct. The air duct provides passage for outside air to the carburetor. Air enters the duct through the scoop. The intake opening is located in the slipstream so air is forced into the induction system giving ram air effect to the incoming airflow (raises pressure).
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Pages 1, 3-4

3-5 Answer C
Improper or careless use of carburetor heat can be just as dangerous as the most advanced stage of induction system ice. Increasing the temperature of the air causes it to expand and decrease in density. This action reduces the weight of the charge delivered to the cylinder and causes a noticeable loss in power because of decreased volumetric efficiency.
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Page 3

3-6 Answer B
Carbon Dioxide (CO_2) is the most effective agent against fires involving liquids, such as gasoline. Because burning liquids will float on top of water, water extinguishers should not be used with fuel based fires. Dry powder may also be effective, but causes corrosion and so is not often used with aircraft. Halon extinguishers may also be effective.
Ref: Powerplant Handbook H-8083-32B-ATB Chapter 3 Page 5