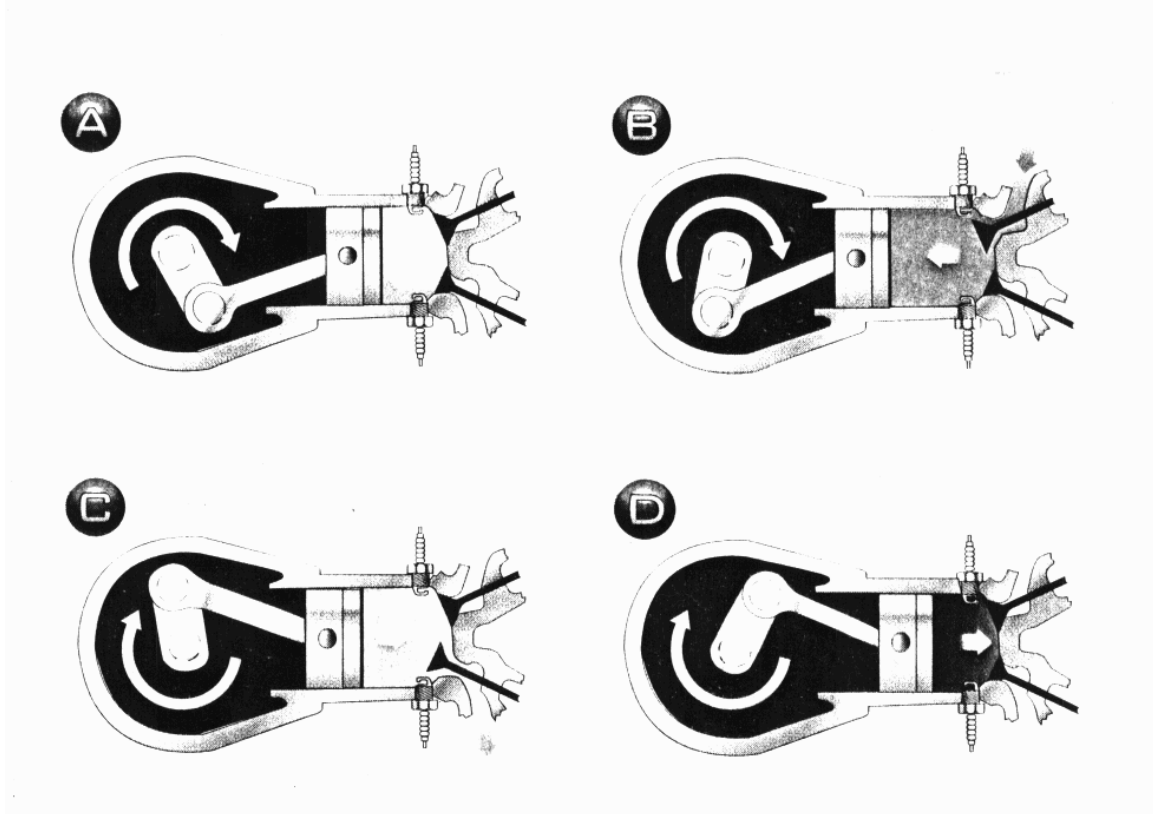


Homework Exercise to prepare for Class #3. Answer these on notebook paper then correct or improve your answers (using another color) by referring to the answer sheet.

1. Identify the four-stroke operating cycle step shown in each of the following illustrations.



2. As an airplane climbs, do you enrich or lean the mixture to maintain an optimum fuel/air ratio?
3. What is your first indication of carburetor ice in an airplane equipped with a fixed pitch propeller?
4. Explain why an engine equipped with a fuel injection system is less susceptible to induction icing than one equipped with a float-type carburetor.
5. The uncontrolled, explosive ignition of the fuel/air mixture within the cylinder's combustion chamber describes which type of abnormal combustion? What actions can you take while airborne to help correct for this problem?
6. If the fuel grade specified for your airplane is not available, can you use a lower grade of fuel? A higher grade?
7. Describe at least two functions performed by the engine's oil system.
8. If a constant-speed propeller is set to a high R.P.M. will the blade pitch (angle of attack) be high or low?
9. True/False. You should maintain a higher propeller R.P.M. with a lower manifold pressure (as opposed to a lower R.P.M. with a higher manifold pressure) to prevent internal engine damage in airplanes equipped with a constant-speed propeller.

10. You are flying an airplane with an ammeter that has its zero reading in the middle of the scale. Immediately after engine start you notice that the ammeter shows a discharge. Is this normal? Why?

Research Problem:

What is the maximum gross weight of the airplane that you use for training?

What are this airplane's V speeds?

Where did you find these data?

**ANSWERS to the Homework Exercise to prepare for Class #3.**  
**Do Not View This until all questions are answered. Use the following to correct or improve your answers. Correct or append your answers using another color pencil or pen. Do not erase incorrect answers – strike them out so the incorrect data are still readable.**

1. a. Power                      c. Exhaust  
b. Intake                      d. Compression
2. Lean the mixture.
3. Your first indication of carburetor icing in an airplane with a fixed-pitch propeller will be a decrease in engine R.P.M.
4. There can be a sharp temperature drop in a float-type carburetor due to fuel vaporization and decreasing air pressure in the venturi. If water vapor in the air condenses when the carburetor temperature is at or below freezing, ice may form. Since engines equipped with a fuel injection system eliminate the carburetor they are relatively free from the formation of induction icing.
5. Detonation. Since detonation can occur when the engine overheats, if you suspect detonation while in flight you should attempt to lower the cylinder temperature. Methods include retarding the throttle, enriching the fuel mixture, and/or lowering the noise to increase airspeed and the cooling airflow around the engine.
6. You should not use a fuel grade lower than specified because it can cause detonation. You may substitute the next higher grade, but only if it is approved by the manufacture.
7. The engine oil system performs many functions including lubricating the engines moving parts, cooling the engine by reducing friction and removing some of the heat from the cylinders, providing a seal between the cylinder walls and pistons, and carrying away contaminants which are removed as the oil passes through a filter.
8. Low.
9. True.
10. No. The starting motor has substantially discharged the battery in order to start the engine. This discharged state will be corrected by a properly operating charging system so the ammeter will initially show a substantial charging rate if the system is working properly. When the battery is fully charged, this ammeter will show zero.