Types of Carburetors

- How they work

This presentation is from Virginia Tech and has not been edited by the Georgia Curriculum Office.

Performance Objectives

- Students will be able to list and describe the common types of small engine carburetors and their applications.

Enabling Objectives

- Given the instruction in class the student will correctly identify and describe the principles of operation of the three common types of small engine carburetors.
- Natural or side draft
- Updraft
- Downdraft

Interest Approach

- How many of you know where the carburetor is located on your lawn mower?
- Is it above or below the gas tank?
- Does it really matter where it is located in relation to how it works?

Types of Carburetors

- In this unit we will discuss three common types of carburetors. They are the:

- Natural or side draft
- Updraft
- Downdraft

Natural Draft Carburetor

- This carburetor is used where there is little space on top of the engine. The air horizontally into the manifold.

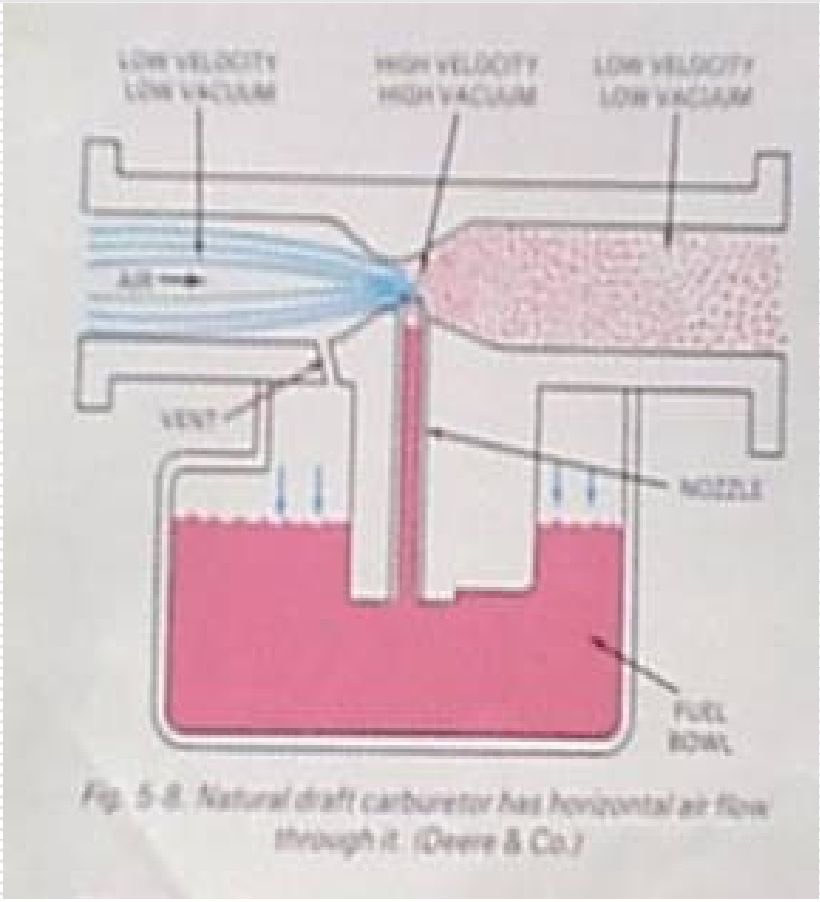


Fig. 5-8. Natural draft carburetor has horizontal air flow through it. (Deere & Co.)

Updraft Carburetors

- This type is placed low on the engine and use a gravity fed-fuel supply. In other words, the tank is above the carburetor and the fuel falls to it.

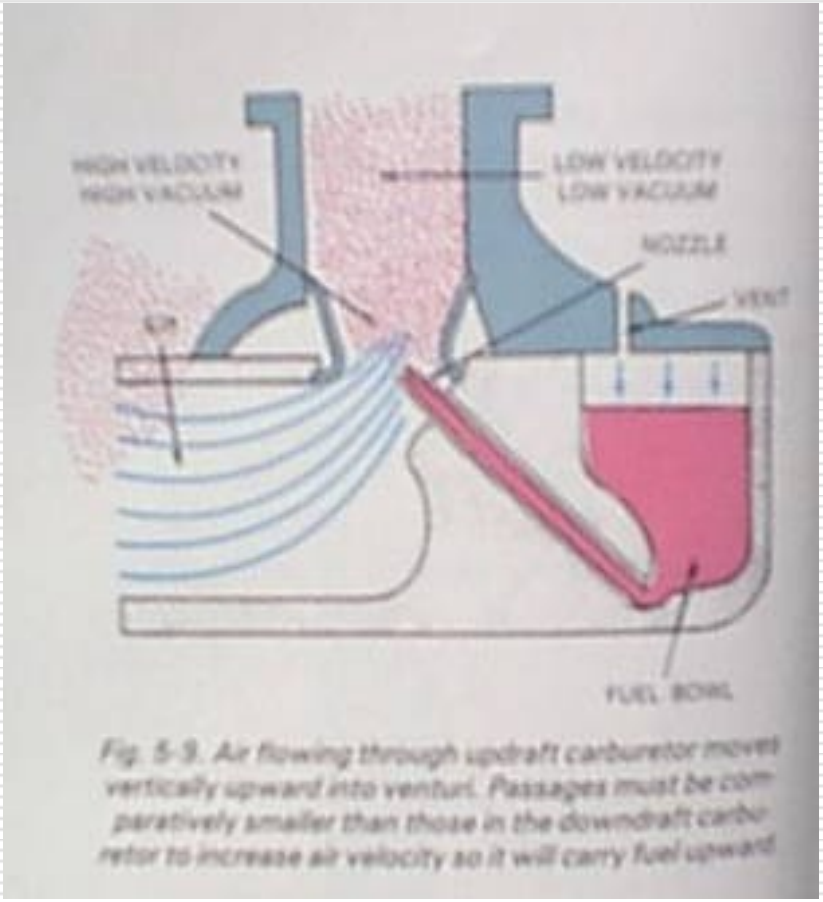


Fig. 5-9. Air flowing through updraft carburetor moves vertically upward into venturi. Passages must be comparatively smaller than those in the downdraft carburetor to increase air velocity so it will carry fuel upward.

Updraft Carburetors

- Even this carburetor uses gravity to receive the fuel from the tank, the air-fuel mixture must be forced upward into the engine.

Downdraft Carburetors

- This carburetor operates with lower air velocities and larger passages. This is because gravity assists the air-fuel mixture flow to the cylinder.

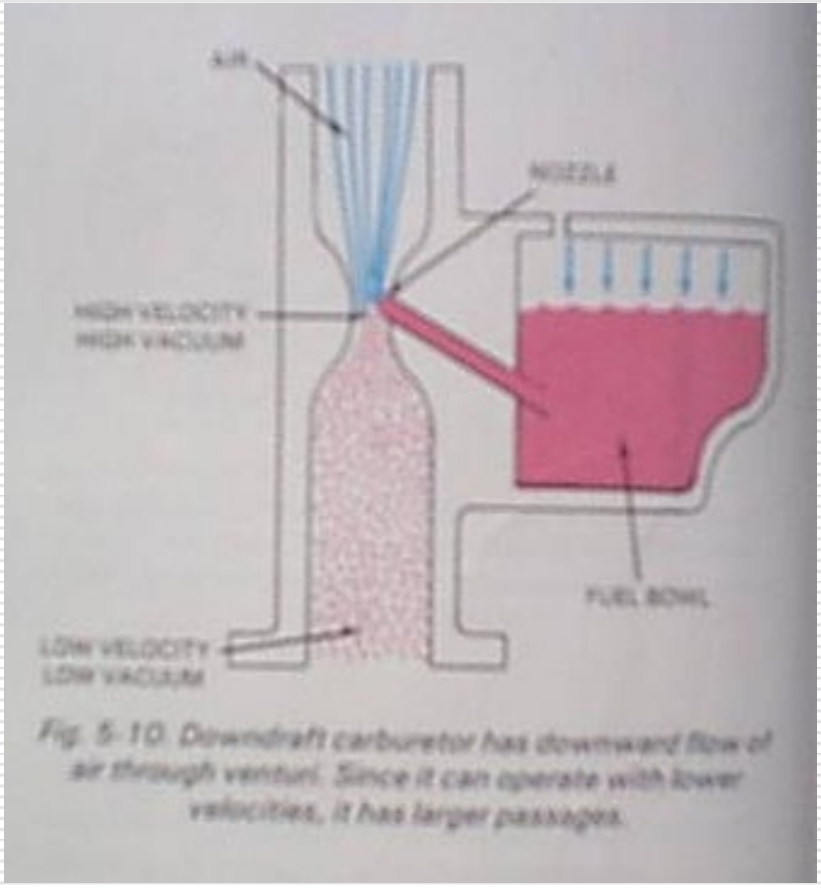


Fig. 5-10. Downdraft carburetor has downward flow of air through venturi. Since it can operate with lower velocities, it has larger passages.

Down-draft Carburetors

- The downdraft carburetor can provide large volumes of fuel when needed for high speed and high power output.

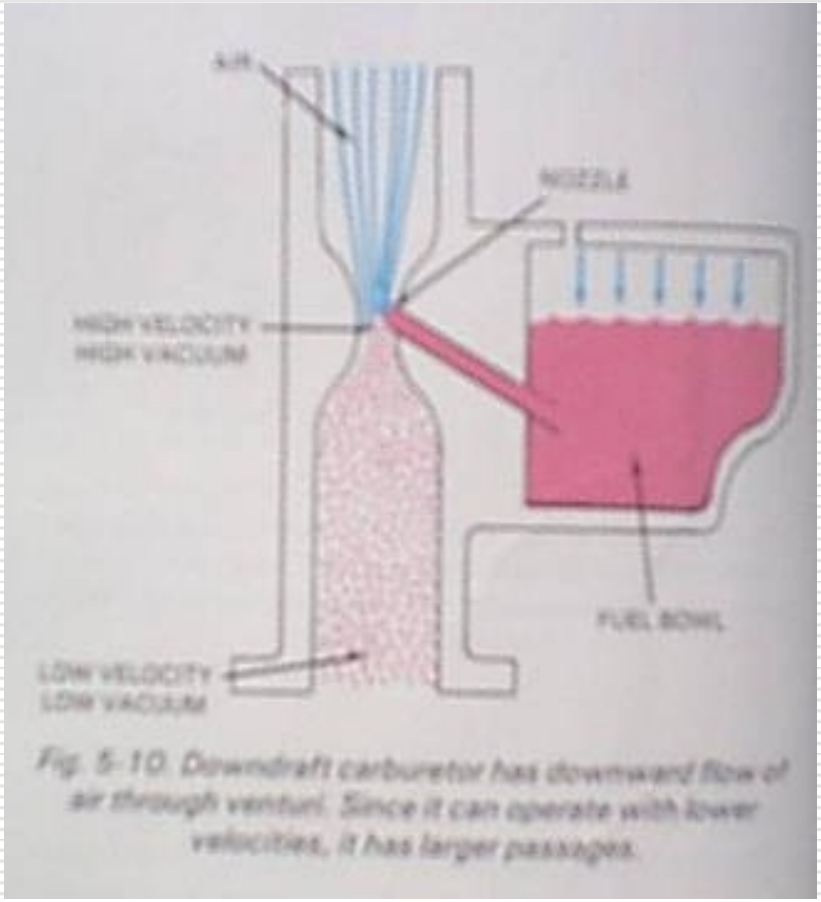


Fig. 5-10. Downdraft carburetor has downward flow of air through venturi. Since it can operate with lower velocities, it has larger passages.

Float-Type Carburetor

- A Float is a small sealed vessel made of brass or plastic. It maintains a constant level of fuel in the float bowl.

Float-Type Carburetors

- The float works much like one in a watering system, opening and closing a needle valve as the float lowers or raises.

The Choke

- The choke is a round disc mounted on a shaft located at the intake end of the carburetor.

The Choke

- Since cold fuel is hard to vaporize, the choke is used during cold engine starts to provide a rich mixture to the carburetor in order to get the engine started.

The Throttle

- The throttle is a round disc mounted on a shaft beyond the main fuel nozzle in the carburetor.

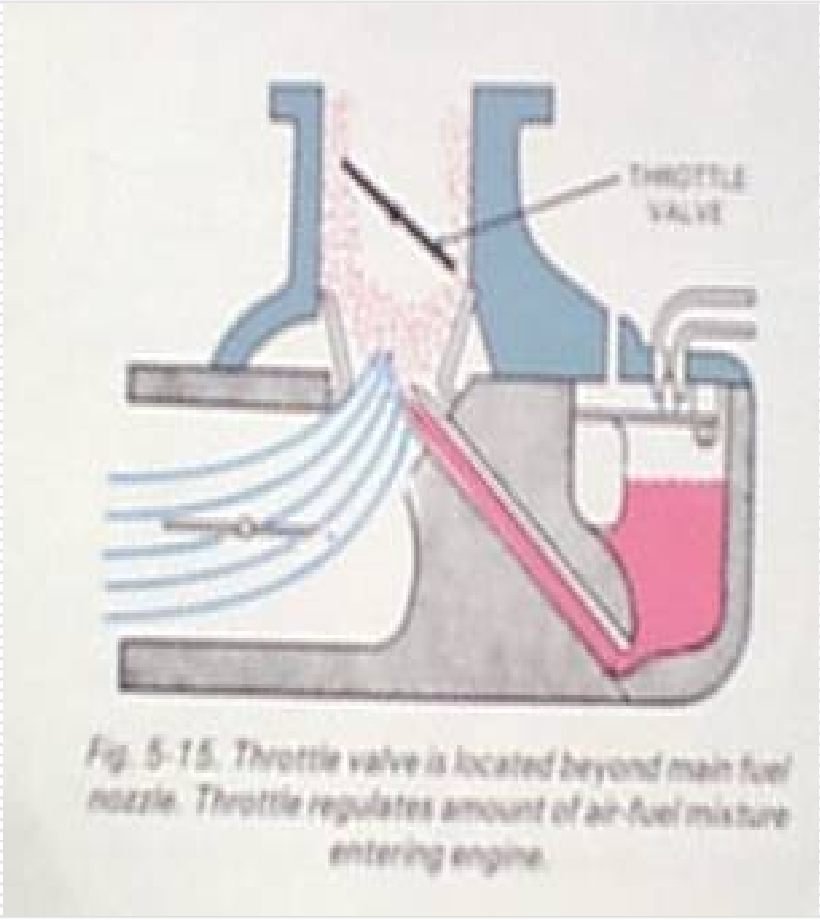


Fig. 5-15. Throttle valve is located beyond main fuel nozzle. Throttle regulates amount of air-fuel mixture entering engine.

The Throttle

- It regulates the amount of air-fuel mixture entering the cylinder.

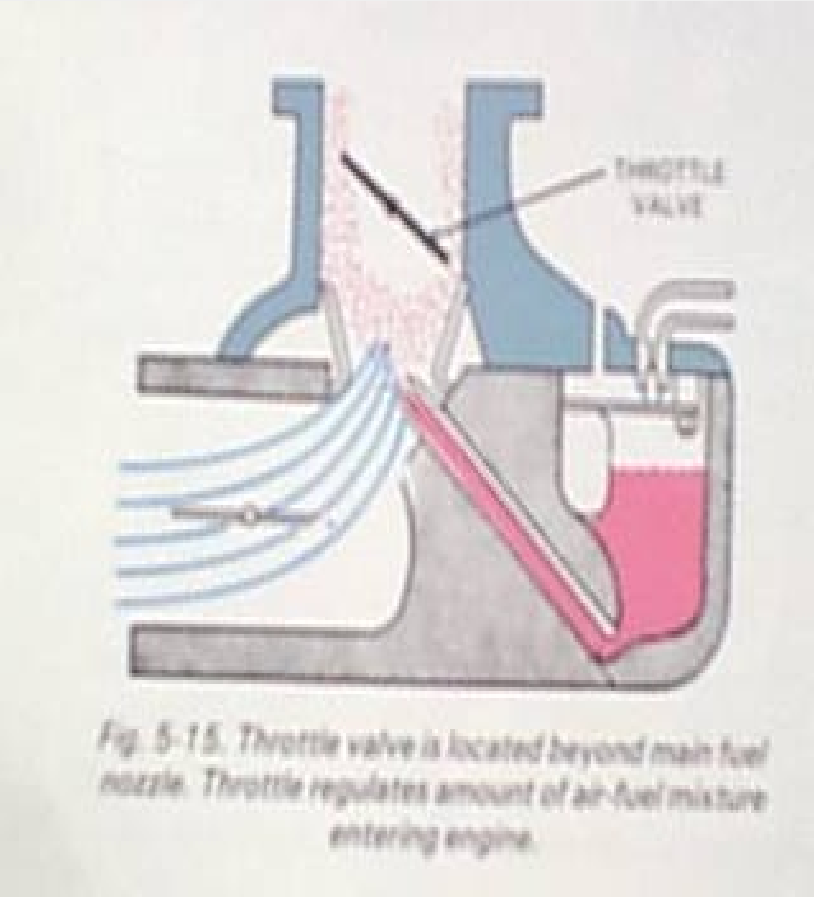


Fig. 5-15. Throttle valve is located beyond main fuel nozzle. Throttle regulates amount of air-fuel mixture entering engine.

Load Adjustment

- The amount of fuel entering the main discharge nozzle is sometimes regulated by a load adjusting needle.

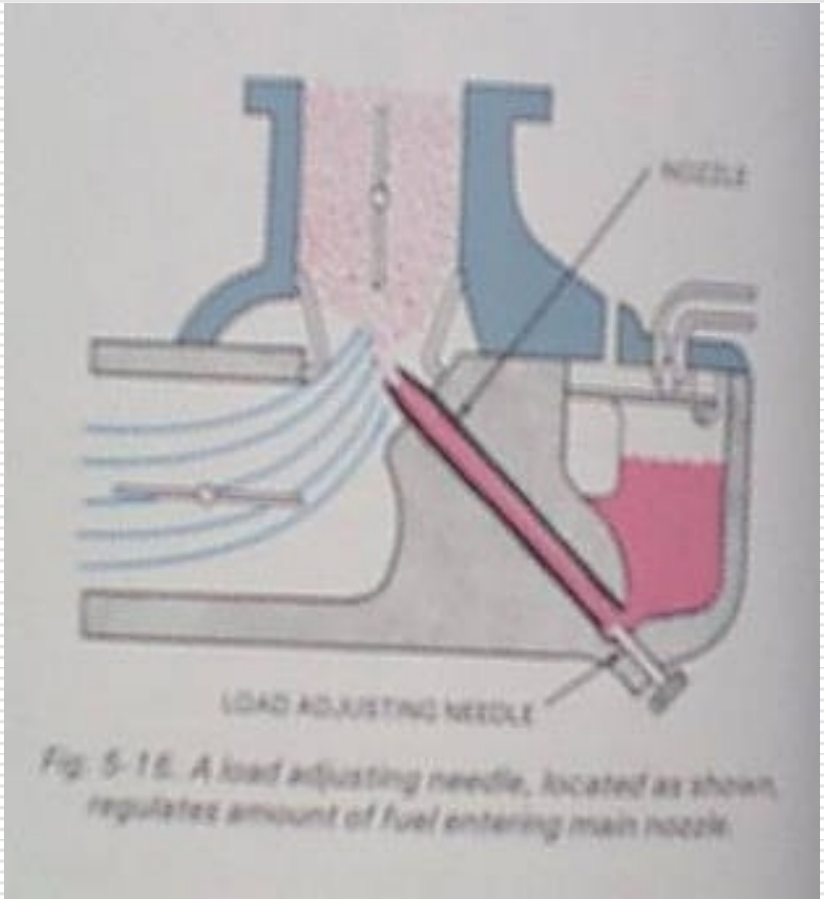


Fig. 5-16. A load adjusting needle, located as shown, regulates amount of fuel entering main nozzle.

Load Adjustment

- Many carburetors today have a fixed jet or orifice which is preset to allow the proper amount of flow. These carburetors are non-adjustable.

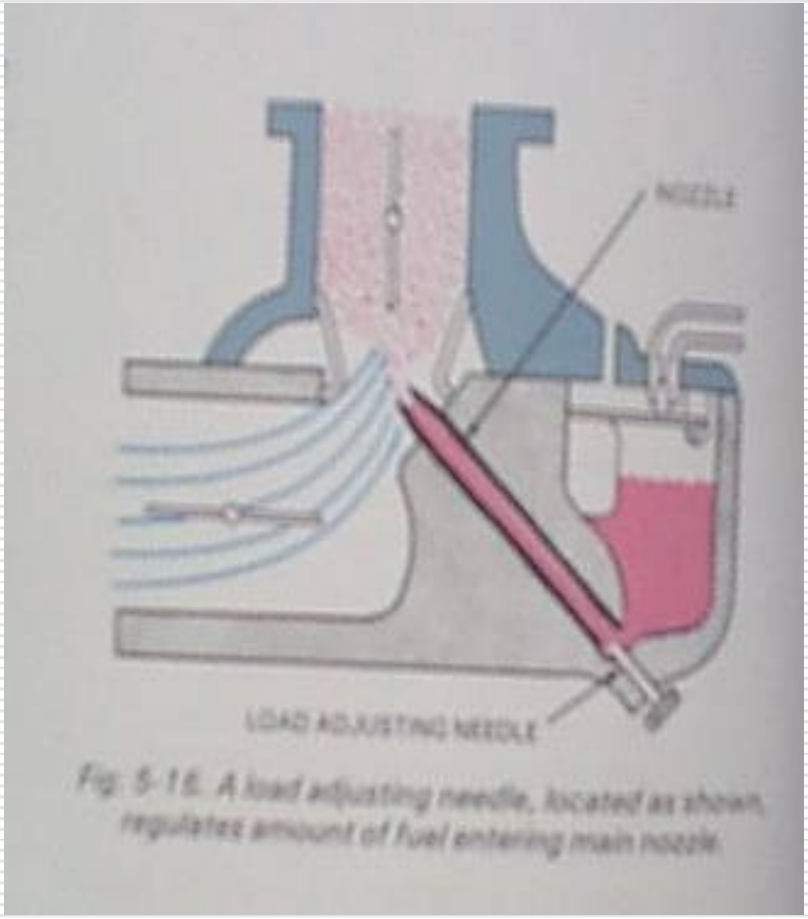


Fig. 5-16. A load adjusting needle, located as shown, regulates amount of fuel entering main nozzle.

The Primer

- Many small engines have hand operated plunger called a primer. When depressed it forces additional fuel through the main nozzle prior to starting a cold engine.

Diaphragm Carburetors

- This type does not have a float, rather the difference between atmospheric pressure and the vacuum created in the engine pulsates a flexible diaphragm.

Diaphragm Carburetors

- The pulsation of the diaphragm takes place on every intake and compression stroke.

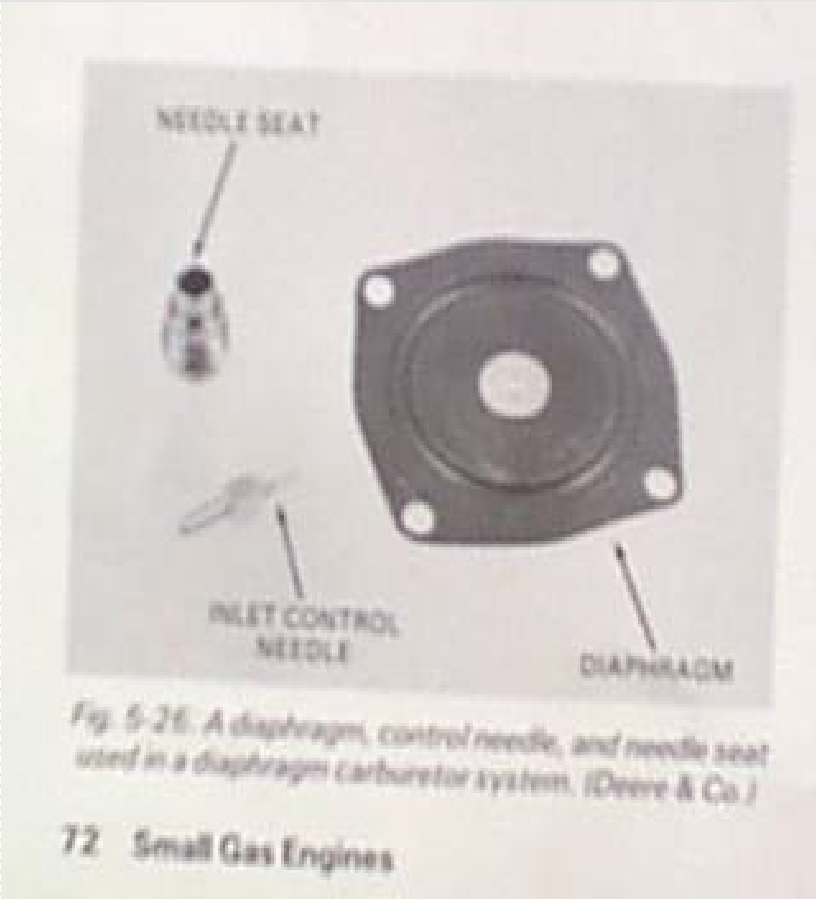


Fig. 5-26. A diaphragm, control needle, and needle seat used in a diaphragm carburetor system. (Deere & Co.)

72 Small Gas Engines

Throttle Controls

- A basic manual throttle control consists of either mechanical linkage or flexible cable.

Throttle Controls

- This linkage manually opens and closes the throttle valve to obtain the desired engine speed.

Summary

- Small engines have one of the following types of carburetors:
- Natural or side draft
- Updraft
- Downdraft

Summary

- The natural or side draft carburetor is used when there is little space on top of the engine. The air flows horizontally into the manifold.

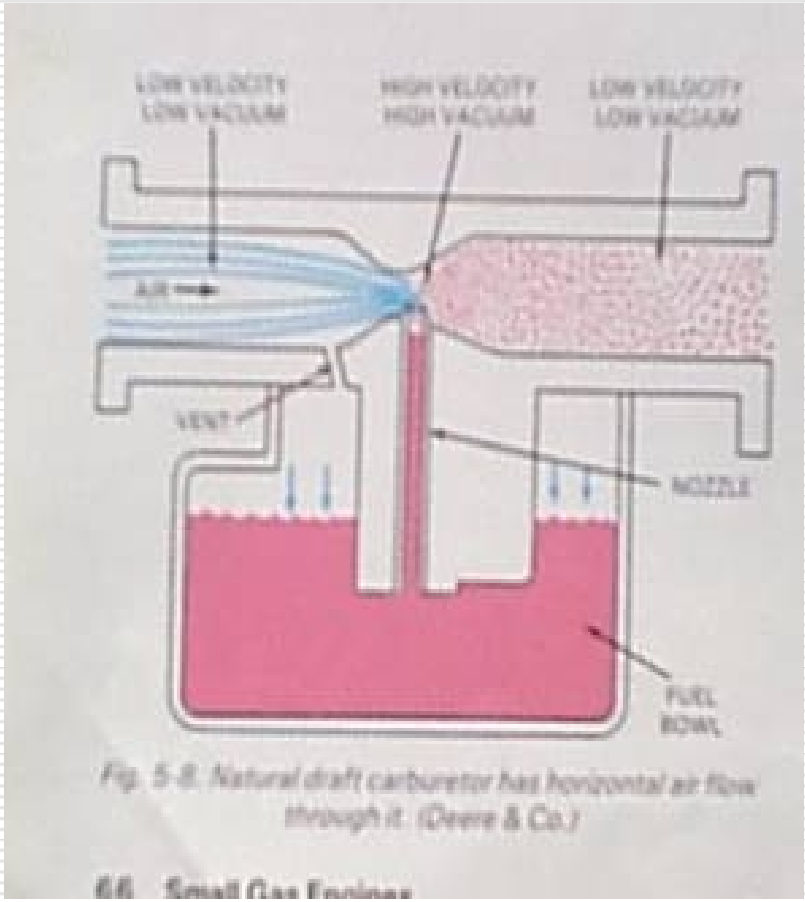
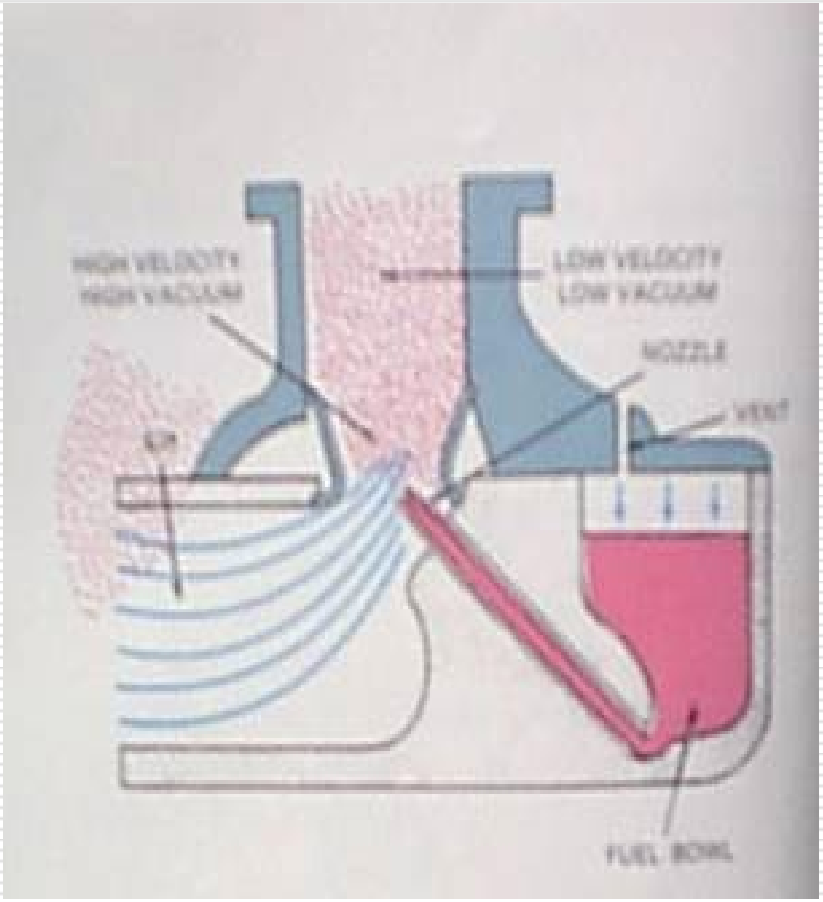


Fig. 5-8. Natural draft carburetor has horizontal air flow through it. (Deere & Co.)

66 Small Gas Engines

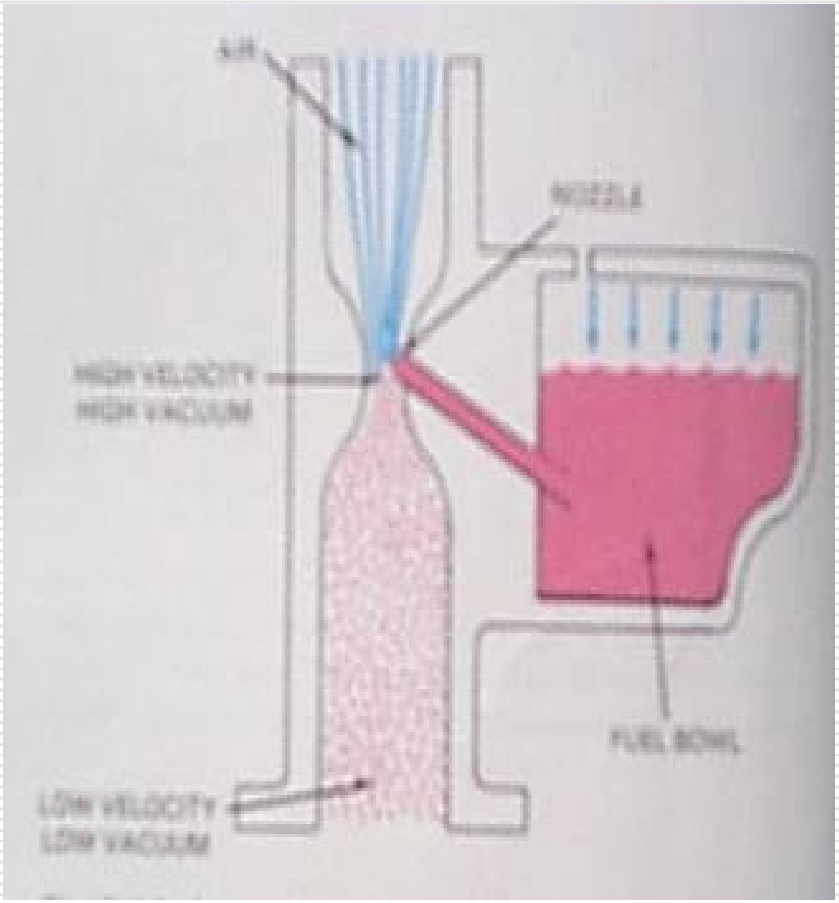
Summary

- The updraft carburetor is place low on the engine and uses a gravity fed fuel supply.
- The air-fuel mixture is forced upward into the engine.



Summary

- The downdraft carburetor operates with lower air velocities and larger passages.
- It provides larger volumes of fuel when needed.



Summary

- Some carburetors are either float type or diaphragm carburetors.
- The float type uses a float to maintain a constant level of fuel in the fuel bowl
- The diaphragm carburetor uses differences in atmospheric pressure and vacuum pressure to pulsate a diaphragm to pump fuel.