Carburetor: Definition, Parts, Types, Working Principle, Function, PDF

Carburetors are used almost all Si engine for the preparation of combustible air-fuel mixture as a charge.

A carburetor is an important part of an automobile engine, today **you are going to learn definition, parts, types, working, and function of a carburetor in a petrol engine**, also **I give you a PDF downloadable link** of this whole article at the end.

Carburetor Definition:

It is a device (Use in Internal combustion engine) for **mixing air with fuel in a system for the proper burn of fue**l.

The carburetor is only used in a **petrol engin**e, where **spark ignition** happens. Here is the difference between spark ignition and compression ignition in detail.

Parts of a simple carburetor:

So *what are the parts of a* Carburetor? A simple carburetor is constructed of the following parts:

1. Throttle Valve
2. Strainer
3. Venturi
4. Metering system

5. Idling system
6. Float Chamber
7. Mixing Chamber
8. Idle and Transfer port
9. Choke Valve

And also a **modern carburetor** **consist of additional these parts**:

1. Throttle return check
2. Anti-dieseling solenoid
3. Automatic mixture control

Throttle Valve:

Throttle Valve is an important part of a Carburetor. It controls the mixture of charge (air+fuel) supplied to the engine cylinder. The driver opens the throttle valve by pressing the accelerator.

Strainer:

It is a device that is used to filter the fuel before entering the float chamber.

It consists of a fine wire mesh which filters the fuel and removes dust and other suspended particles from it.

If these particles not removed, it can cause blockage of the nozzle.

Venturi:

The venturi is the gradually decreasing cross-sectional hollow tube. It helps to decrease the air pressure of the chamber. For which fuel comes out from the fuel pipe.

Metering system:

The metering system controls the flow of fuel into the nozzle. It is responsible to form a correct mixture of air-fuel.

It consists of two main parts:

1. Metering orifice and
2. Fuel discharge nozzle

When the air passes through venturi, it generates a low-pressure field across the throat. Due to this pressure difference, fuel is discharged into the air stream.

The quantity of fuel is control by the metering orifice and discharge hole at the exit of the fuel discharge nozzle.

Idling system:

The idling system consists of passage directly from the float chamber to the venturi tube.

It provides a rich mixture during idling and at low speed. It works during idling or when the throttle is open below 15%.

Float Chamber:

The float chamber serves as a storage tank of fuel for a continuous supply of fuel. It contains a float valve that maintains the level of fuel in the float chamber.

When the level of fuel decreases in the float chamber the float moves downward, which opens the fuel supply valve and allows the flow of fuel into the float chamber.

As the fuel level increases, the float moves upward which close and stop the fuel supply.

Mixing Chamber:

In the **mixing chamber,** the mixture of air + fuel occurred. And then supplied to the engine cylinder.

Idle and Transfer port:

In addition to the main nozzle in the venturi portion of the carburetor, two other nozzles, or ports, deliver fuel to the engine cylinder.

Choke valve:

Choke Valve is a valve that controls the mixture of air-fuel. The main function of this valve is to control the quantity of the air inside the mixing chamber.

This valve normally is in semi-open condition, but when we need a rich mixture of air-fuel we operate this valve and this valve is close the inlet of the air within the chamber, so we get a rich mixture of air-fuel because the quantity of fuel in the mixture is more because of less air in the chamber.

In the winter season when the engine is not starting we use this valve to get supply rich air-fuel mixture to the engine cylinder.

So these are some important parts of a Carburetor, hopefully, you understand these parts.

Now take a look at the parts with Special features of Modern Carburetors:

Throttle return check:

The total throttle suddenly on an engine running very high speed will cause a very high intake manifold vacuum, which will draw exhaust into the engine intake during v/v overlap.

This will dilute the intake chart to cause misfiring or even stall.

To prevent this a throttle return check v/v is connected to the throttle linkage in some modern carburetors

Anti-dieseling solenoid:

Modern emission control engine usually runs hotter, which may result in some hot spots on the combustion chamber.

These hot spots result in pre-ignition in the combustion chamber.

To avoid this some carburetors are equipped with an anti-dieseling solenoid to turning off the pre-ignition

Automatic mixture control:

A plunger shaped valve is operated by a solenoid and Spring and controls of the separate jet in the float chamber.

when the solenoid is turned on, the v/v is lifted which increases the fuel supply to the jet, and when the solenoid is turned off the spring pushes the valve down to decrease the fuel supply.

The solenoid is operated by a computer, according to the signals received by it on engine speed, coolant temperature.

These types of computer control carburetors are called feedback- controlled calculators.

Working of a Carburetor:

As we already knew, the Simple carburetor mainly consists of

1. Throttle Valve
2. Strainer
3. Venturi
4. Metering system
5. Idling system
6. Float Chamber
7. Mixing Chamber
8. Idle and Transfer port
9. Choke Valve

The Float and needle valve system maintains a constant level of gasoline in the float chamber.

If the amount of the fuel in the float chamber falls below the designed level, the float goes down, thereby opening the fuel supply valve and admitting fuel.

When the designed level has been reached, the float closes the fuel supply valve thus stoping additional fuel flow from the supply system.

The float chamber is vented either to the atmosphere or to the upstream side of the venturi.

During the suction stroke, the air is drawn through the venturi. Venturi is a tube of decreasing cross-section with a minimum area at the throat.

Venturi tube is also known as a choke tube and is so shaped that it offers minimum resistance to the airflow. As the air passes through the venturi the velocity increase reaching a maximum at the venturi throat.

Correspondingly, the pressure decreases reaching a minimum.

From the float chamber, the fuel is fed to a discharge jet, the tip of which is located in the throat of the venturi.

Because of the differential pressure between the float chamber and the throat of the venturi, known as carburetor depression, fuel is discharged into the air stream.

The fuel discharged is affected by the size of the discharge jet and it is chosen to give the required Air fuel ratio.

Types of Carburetor:

What are the types of a carburetor? There are three types of carburetors according to the direction in which the mixture is supplied.

- ***Up-draft carburetor***
- ***Horizontal type carburetor***
- ***Down-draft type carburetor***

If the air is supplied from the bottom of the mixing chamber then it is called an **up-draft type**.

If the air is supplied from one side of the carburetor then it is called **horizontal type carburetor.**

And last if the air is supplied from the above portion of the mixing chamber then it is called **down-draft carburetor.**

In most cases down-draft type carburetor is generally used because of the following advantages:

- The gravity assists the flow of the mixture. so found that the engine pulls better at lower speeds under load.
- The engine can achieve a higher value of volumetric efficiency.
- The carburetor position is rendered more accessible.

And the only disadvantage is:

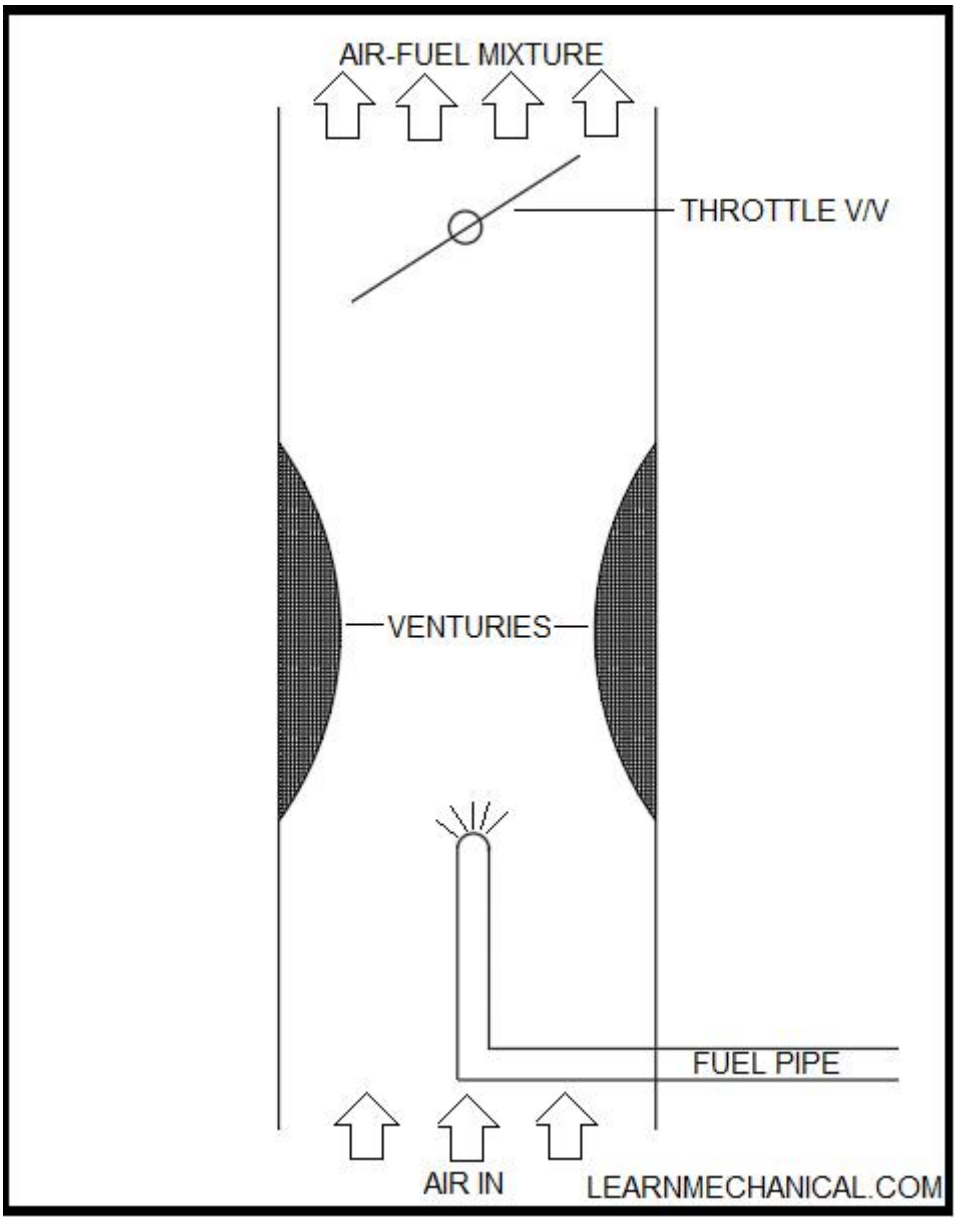
- The possibility of leakage going directly into the inlet manifold if the float is defective and the jet is overflowing.

Also use of a particular carburetor is depends on the fuel supply system too. Here is another article where I mentioned the types of the Fuel supply system, you may check this for a better idea.

Up-draft type carburetor:

In this type of Carburetor, **air goes through the bottom of the carburetor**. And fuel comes from the float chamber and due to the pressure difference within the two-chamber with the help of venturi, fuel comes out from the fuel

pipe and mix with the inlet air and make a mixture of air-fuel, which is passed through the throttle valve which is directly connected with the accelerator. And goes to the engine cylinder where the combustion of charge (air+fuel) takes place.



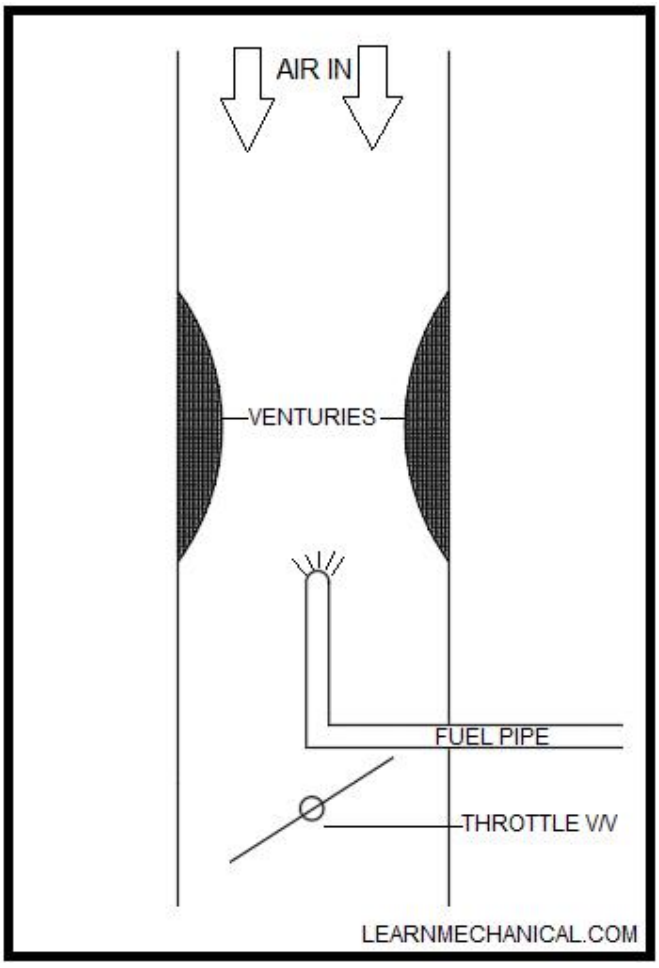
UP-DRAFT CARBURETOR

Down-draft Carburetor:

In this type of carburetor **air comes from the top of mixing chamber**, and the fuel comes from the bottom of the mixing chamber, here also the same principle works, due to low pressure created by the two venturies fuel comes out through the pipe and then the mixing of fuel and air occurred here.

The mixture of fuel and air is controlled by the choke valve, and the quantity of charge supplied to the engine cylinder is controlled by the throttling valve.

In this time most vehicles used down-draft carburetor systems because of the advantages I mentioned above.

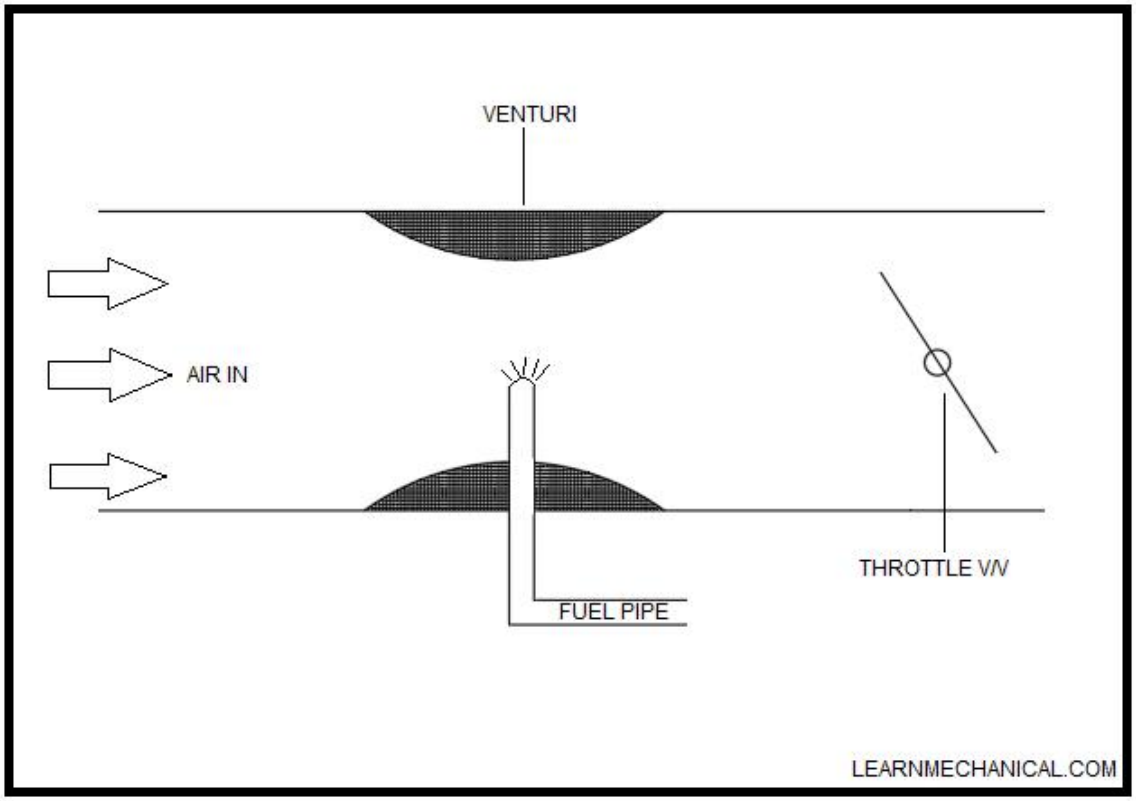


DOWN-DRAFT CARBURETOR

Horizontal Type Carburetor:

When you rotate the down-draft carburetor in the horizontal direction then its become horizontal type carburetor

The working principle of this type of carburetor is very simple. Here the carburetor stays in the horizontal position where the **air is coming in through the one end of the carburetor** shown in the below figure. And mixing with fuel to make the air-fuel mixture and then the air-fuel mixture is going to the engine cylinder for combustion.



HORIZONTAL CARBURETOR

We also have an article on Internal Combustion Engine. If you want to know in details then you can check this article, it will help you.

So these are the types of Carburetor.

Functions of a carburetor:

The main functions of a carburetor are

1. The main function of carburetors to mix air and gasoline and provides a high combustion mixture.
2. It controls the engine speed.
3. It also regulates the air-fuel ratio.
4. Increase or decrease the amount of mixture according to the engine speed and load changing.
5. To keep certain head of fuel in the float chamber all the time.
6. Vaporize the fuel and mix to air to a homogeneous air-fuel mixture.
7. To supply the correct amount of air-fuel mixture at the correct strength under all conditions of load and speed of the engine.

Advantages of the carburetor:

1. Carburetor parts are not as expensive as that of fuel injectors.
2. With the use of a carburetor, you get more air and fuel mixture.
3. In terms of a road test, carburetors have more power and precision.
4. Carburetors are not restricted by the amount of gas pumped from the fuel tank which means that cylinders may pull more fuel through the carburetor that would lead to the denser mixture in the chamber and greater power as well.

Disadvantages of the carburetor:

1. At very low speed, the mixture supplied by a carburetor is so weak that, it will not ignite properly and for its enrichment, at such conditions, some arrangement in the carburetor is required.
2. The working of a carburetor is affected by changes in atmospheric pressure.
3. More fuels are consumed since carburetors are heavier than fuel injectors.
4. More air emissions than fuel injectors.
5. The maintenance costs of a carburetor are higher than the fuel injection system.

Applications of Carburetor:

- Used for Spark-Ignition Engine.
- It used to control the speed of the vehicles.
- It converts the main fuel petrol into fine droplets and mixes with air to burn in smoothly and properly without any problem.

Conclusion:

Hey, now I want to hear from you. I hope you understand the **definition, parts, types, working, and function of the carburetor**. Everything you learned today just remembers the concept doesn't need to copy-paste, remember the concept and thats enough to go.

If you have any queries or doubts about the lathe machine tool, you can ask me in the comment section or we have a dedicated Q&A platform for you where you directly post your question: **Click here to post your question**, and also you can **join our facebook group**. I will love to hear from you and glad to help you. Till then enjoy rest your day. Cheers