

Oil: Part 1

Oil is a very small word but a very important thing when it comes to your engine. Without it the engine will not run for more than a few minutes without seizing. So what does oil actually do inside of the engine? Basically it does four very important things. First, and what you are most familiar with, it lubricates the moving parts of the engine that touch each other. Second, it cools the engine. Third, it protects the metal parts within the engine. And fourth, it cleans the internal parts of the engine. We'll cover these actions in order.

Lubricates: The oil is composed of molecules that, by their nature roll past each other with very little drag or friction. This oil must allow the metal parts of the engine that roll or slide past each other to do so with as little friction as possible to allow the engine to run smoothly without wearing the parts down against each other. Even with the oil between the moving parts of the engine a certain amount of heat is generated and must be removed to keep the oil from overheating and breaking down or evaporating. So oil must be constantly pumped or splashed throughout the engine to wash away the hot oil and replace it with cooler oil.

Cools: This brings us to cooling the engine. Yes air, in a Corvair, or water is pumped through the engine when it is running to cool the engine, but that cools only the upper part, or heads, of the engine and then only in part. The oil, exclusively, cools the bottom end where you find the crankshaft, rods, and camshaft. The oil being pumped through the engine absorbs the heat generated, primarily, by friction and also as a result of combustion in the heads and cylinders. Some of the oil is also pumped up into the heads to lubricate the valve train. As this oil flows through the heads it absorbs a great deal of the heat generated in the heads and carries it to the oil pan. As the oil cycles through the oil pan it transfers much of its gained heat to the pan surface, which then radiates or passes out into the air which is forced to pass under the engine. In the Corvair we also have an oil cooler through which all of the oil going to the engine is pumped which allows it to pass much of its heat to the air which is being forced through the out side of the cooler. This is a very efficient way to cool oil which is why a greater part of the cooling of the Corvair engine is accomplished by the oil than by the air being forced through the rest of the engine.

Protects: We will discuss later the composition of engine oil but for now we will only state that modern oil contains additives that make it stick to all of the internal parts preventing moisture from oxidizing the surface of those parts. It also sticks to the friction generating parts of the engine preventing them from becoming dry when standing still, not running, which would do much damage to these surfaces on engine start up.

Cleans: The oil also contains additives that act like the detergent in your washing machine to break down contaminants, dirt, picked up by the oil and to remove them to the oil filter.

In the next article we will discuss the composition of and types of oils.