

Can a 4-Stroke Engine be Converted to make a Steam Engine

Modify a four-stroke engine to make a steam engine  [vote for,
(+1, -2) against]

With a few simple parts and tools, you could change a regular gasoline car engine into a steam engine. Or, you could design an engine to change itself on the fly.

You would first replace the camshaft(s) to eliminate the combustion and compression strokes. Then take out the whole cooling system and replace it with insulation for the engine block. Finally, replace the intake manifold with a more robust and insulated model with tubes and valves leading to a boiler, and route the exhaust up into the smokestack.

I'm not sure why someone would change their car into a steam locomotive, but this is how you would do it.

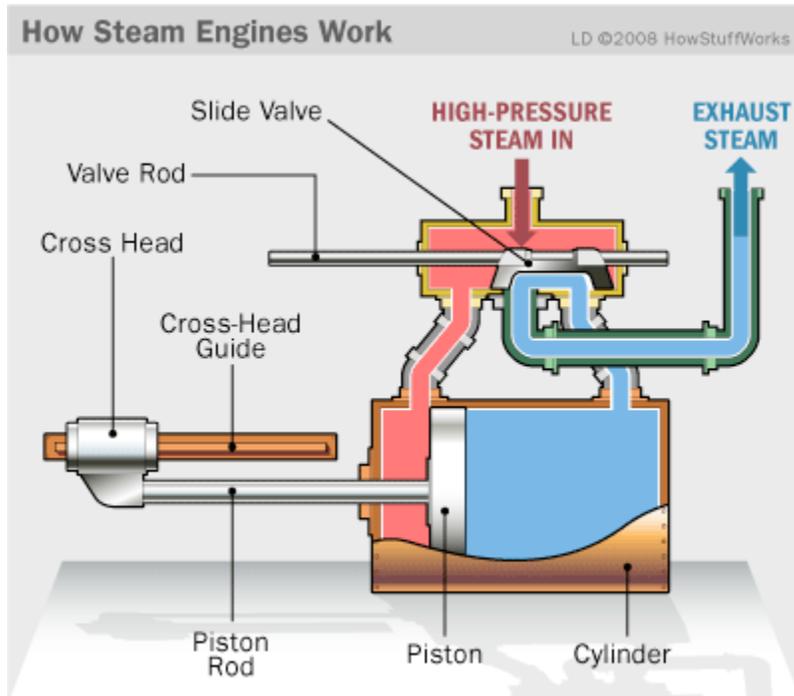
How would you do it, [Idischler]? I was trying to find a way to turn a regular 4-stroke engine into a 2-stroke steam engine. Did you mean that it would be easiest to adapt a 2-stroke gasoline engine?

I know that there are currently some small commuter cars being developed that can run on either compressed air or gasoline, so it wouldn't be that hard to do something similar with steam.

Steam Engine Operation

The following diagram shows the major components of a **piston steam engine**. This sort of engine would be typical in a steam locomotive.

The engine shown is a **double-acting** steam engine because the valve allows high-pressure steam to act alternately on both faces of the piston. The following animation shows the engine in action.



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You can see that the **slide valve** is in charge of letting the high-pressure steam into either side of the cylinder. The **control rod** for the valve is usually hooked into a linkage attached to the **cross-head**, so that the motion of the cross-head slides the valve as well. (On a steam locomotive, this linkage also allows the engineer to put the train into reverse.)

You can see in this diagram that the **exhaust steam** simply vents out into the air. This fact explains two things about steam locomotives:

It explains why they have to take on water at the station -- the water is constantly being lost through the steam exhaust.

It explains where the "choo-choo" sound comes from. When the valve opens the cylinder to release its steam exhaust, the steam escapes under a great deal of pressure and makes a "choo!" sound as it exits. When the train is first starting, the piston is moving very slowly, but then as the train starts rolling the piston gains speed. The effect of this is the "Choo..... choo.... choo... choo choo-choo-choo" that we hear when it starts moving.

On a steam locomotive, the cross-head normally links to a **drive rod**, and from there to **coupling rods** that drive the locomotive's wheels. The arrangement often looks something like this

<http://science.howstuffworks.com/steam1.htm>

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