

Chapter 1

Introduction

This project consists of a small water tank, pump, microcontroller unit, engine set up and fuel injector. The microcontroller unit is used to setting the water injection period. The pump is used to suction the water in to deliver the fuel injector. The 12 volt fuel injector is used to inject the water in to the cylinder. This 12v fuel injector is controlled by the microcontroller unit.

When water injection is properly used in a gasoline engine the combined fuel behaves like 120 octane. A high octane rating doesn't really provide an increase in power. However, it permits an engine to produce more power. An increase in gas mileage is an indirect result of leaning out the fuel and advancing the ignition timing.

The increase in octane rating from the water injection means that a vehicle that requires 91 or 93 octane can safely run 87 octane and still have a 100+ octane rating. And that difference in cost will easily pay for a gallon of washer fluid.

To help cool a stressed combustion chamber, auto manufacturers typically squirt extra gasoline in the engine. This extra gasoline is not burned; instead it is vaporized when it absorbs heat. It's simple and easy to do from a manufacturing standpoint. However its a poor use of gasoline. When methanol is used in place of the extra gasoline to cool the combustion, the methanol is three times more effective than the gasoline. Water is six time more effective than the gasoline. When properly mixed, the methanol and water cool combustion and raise the octane rating.

Water properties:

Water absorbs six times the heat gasoline does when vaporized in a mixture. The water does not burn. It becomes steam. Only so much can be injected before it starts to quench the combustion. Too much water will put out the fire.