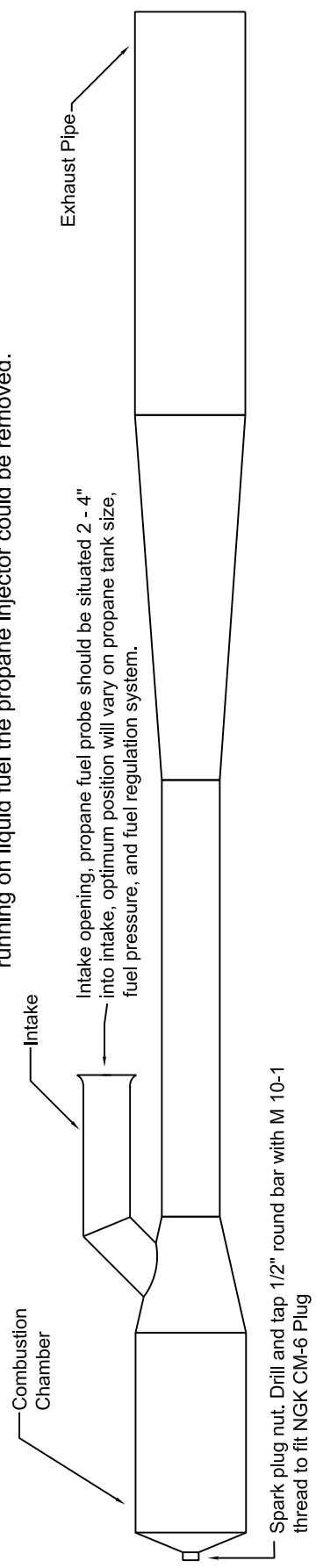
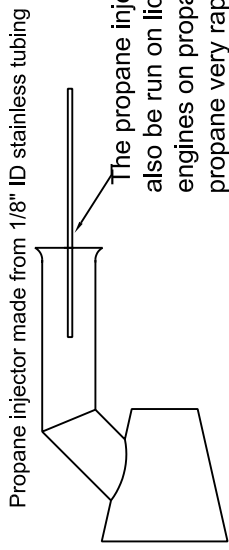


The propane injector should be situated parallel to the midline of the intake, if the engine will also be run on liquid fuel the propane injector should be slightly offset or removable. Starting engines on propane is much easier than with liquid fuel, the engine can be started on propane very rapidly and then be switched over to run on liquid fuel. Once the engine is running on liquid fuel the propane injector could be removed.



All dimensions in inches.

**Not for commercial use**

# ThermalPulse 12: Giant Chinese Valveless

By using these plans you acknowledge that building and operating jet engines is inherently dangerous, and that running a jet engine could cause severe bodily harm, fire, property destruction, and even death; the author is not responsible for anything that may result from the use of these plans.

This engine is designed after the popular "Chinese valveless" pulsejet. This engine is much larger than the original hobby airplane size jet, and will produce approximately 12 pounds thrust on propane. The engine should be made of stainless steel, the thickness should be **at least** 25 gauge; but it is recommended that thicker metal be used if the engine will be run primarily on the ground or at low speed due to heat build up.

The propane fuel injector should be adjustable so that it can be inserted into the engine at different depths. The optimum depth the propane injector should be situated into the engine will vary depending on fuel tank size, fuel pressure, and what kind of regulation system is used. This engine will consume a large amount of fuel and may require more than most propane regulators can provide. With an adjustable propane injector the engine can be easily tuned for best performance. The engine can be run on propane, liquid fuel, or both.

The liquid fuel injector should be at a 90 degree angle relative to the intake, in order for the engine to draw fuel up from the fuel tank without use of a liquid fuel pump. The fuel tank should be approximately at the same height as the engine so that it draws fuel properly. If the engine continuously sprays fuel vapor out of the intake, the engine should be shut off immediately and the fuel injector should be adjusted. If this happens the fuel injector can be bent back into the intake at a very slight angle so that it is pointing into the combustion chamber. This should prevent any fuel vapor from being drawn out of the engine by escaping exhaust gas. If it is bent too far however, it will push fuel back into the fuel tank instead of the engine.

If the engine is to be used only with liquid fuel, an air compressor should be used for starting. The air compressor gun should have a long nozzle attachment that can be inserted near the tip of the liquid fuel injector. A permanent starting air tube can be made, or an adjustable propane injector could be used for starting air as well when not hooked to a propane line.

The easiest way to start the engine is to use propane to get the engine running. After a fraction of a second liquid fuel will then be drawn up from the fuel tank and the engine should gain substantial power. Once the engine is running on liquid fuel the propane can be shut off and the propane injector can be removed if it is easy to remove. The engine should only be run on low when starting with propane, if the engine is running on lots of propane the additional fuel may cause it to quit because of overfueling.

An adjustable fuel valve should be used to regulate liquid fuel flow. This will make starting on liquid fuel much easier, as well as being able to throttle the engine. Depending on fuel tank height, and how long the fuel line is, having a needle valve may be the only way to reduce the fuel flow to the necessary level. Valveless pulsejets can throttle very well, usually from about 1/4 to full power on liquid fuel. A needle valve could be used, or something as simple as a pair of vice grips to squeeze the fuel line and constrict fuel flow.

Anything that can catch on fire or melt should be kept away from the engine; the injectors should have substantial length leading away from the engine and always be made from metal like stainless steel. If you are having problems starting your engine, try adjusting the spark gap on the spark plug. Pulsejets do not need a hot spark like cars, so a very wide spark gap will make starting much easier.

