

CONVERTING A HOME HEATING OIL FURNACE TO BURN WASTE MOTOR OIL/ WASTE VEGETABLE OIL/ BIODIESEL: PARTS/ TOOLS NEEDED WITH A FULL EXPLANATION/ DEMONSTRATION FOR A DIY PROJECT

Jesse Parris, Alternative Energy Education from the Yahoo Altfuelfurnace Forum:
<http://groups.yahoo.com/group/altfuelfurnace>

Jesse Parris runs the Altfuelfurnace forum on Yahoo. The forum has over a thousand members from all over the globe and describes itself this way:

DESCRIPTION

Alternative fuels, like SVO, (straight veg oil, waste veg oil) waste motor oil and biodiesel are being successfully burned in adapted residential oil-fired furnace burners such as Arco, R.W. Beckett, Carlin, Ducane, Esso, International, Riello, Slant Finn and Wayne.

PURPOSE OF THIS FORUM

The forum is a meeting place to exchange information and ideas in adapting residential oil burners that use HHO(home heating oil)to these alternative fuels. This would also include info on other devices like pre-heaters, heat-exchangers, heat-retention units, thermocouples, filters, thermocouple temperature controllers, relay devices, etc.

Features and resources at the forum include photo galleries and movies of working converted burners as well as files and links for purchasing parts and services.

While Richard Wiswall transforms his vegetable oil into biodiesel to burn in standard oil furnaces and diesel engines, Jesse has adapted his gun-style oil burner on his forced hot-air furnace to burn straight vegetable oil, waste motor oil and/or biodiesel.

Like Richard, Jesse collects, on a year-round basis, used vegetable oil in plastic jugs at a local restaurant. However, for his residential furnace, the demand for the used veggie oil is much less than a farm would require. He encourages the idea of co-ops for collecting used vegetable oil. If many small oil users group together, they present a larger demand and can negotiate and offer a more reliable oil removal service to restaurants. Cooperatives also might develop the capacity to filter waste vegetable oil quicker and cleaner as well as meet the demand that greenhouses might require.

After collecting the waste vegetable oil, Jesse starts the process by filtering it through several stages of 1-5 micron, felt filters. Once filtered, the oil is stored in 55 gallon plastic barrels and transferred into the garage, as the season demands it. A gun-style oil burner, a Beckett AF in this case, has been adapted to preheat the oil to 120 degrees (using an aluminum cover with cartridge heaters embedded into it) at the oil pump on the burner. From there, the oil pump brings the oil up to 150 psi as it passes through a long collar using temperature controlled band heaters that bring the temperature up to 275-300 degrees. When the hotter oil reaches the end of the nozzle tube, it get sprayed out using a standard Hago oil burner nozzle. The mixture of hot, atomized waste veg-oil spray is combined with fanned air and ignited where it is swirled through a special retention head that's used to control the flame cone to work within the specifications of a residential furnace setup.

The waste vegetable gun-style oil burner experimentation has evolved over the last three year into a newer and more efficient design which now features a siphon nozzle setup that has proven to work as well, or better, with less overall maintenance. The advantage of the siphon nozzle is that it lasts 6-8 weeks or longer before needing attention instead of the 2 to 3 weeks for the standard nozzle setup. Other modifications that might bear more experimentation have included the use of firebrick in the combustion chamber of the forced hot air furnace or boiler instead of the standard Koawool setup to modify and control the flame cone.

The parts for converting an oil burner to run an alternative fuel cost anywhere between \$200-\$400, depending on whether or not the setup is standard nozzle or siphon nozzle. While a preheater is required for both, a compressor is required for a siphon nozzle setup, which brings up the initial investment.

If you already have a shop compressor then you are ahead of the game.

As a side note, filtering and pre-heating waste vegetable oil is what allows it to run in an unmodified diesel motor without any damage, though the preheating demands are less: between 160 to 190 degrees being the ideal temperature of the vegetable oil right before reaching the injection pump.

Important Safety Notes:

Heated oil is volatile and can explode under the right circumstances. Always have a controlled safety plan (fire extinguisher, water hose nearby, protective eyewear, gloves, and a telephone with emergency numbers on hand) close by while experimenting, just to cover all the bases.

Related Yahoo Groups:

Altfuelbabington

Vegoilburners

Wastewatts

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