

**MASS ENERGY**  
CONSUMERS ALLIANCE  
*A Non-Profit Organization*



**Maintain your  
heating system  
and SAVE**

**[www.massenergy.org](http://www.massenergy.org)**

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## GET AN ANNUAL TUNE-UP

Call your Mass Energy oil dealer to schedule an annual tune-up or cleaning. The objective of your oil system technician during a tune-up is to maximize your heating system's efficiency and ensure the safety of your system. Here are the steps that should be taken annually:

1. Perform a combustion efficiency and carbon monoxide test.
2. Check for unusual noises and vibrations.
3. Check the flame ignition. Flame ignition should be instantaneous. Delayed ignition is indicative of a combustion problem.
4. Check for flame impingement. Flame should fill the combustion chamber without hitting the sides or back of the chamber.
5. Check the flame cut-off time. The flame should cut off in less than three seconds after the burner shuts off.
6. Check for soot deposits in the flue, combustion chamber, and on the heat exchanger.
7. Check the chimney for problems and the accumulation of soot.
8. Check for oil leaks.
9. Check the draft regulator for any improper adjustments or defects.
10. Check the distribution system.
11. Check for the presence of a Hartford Loop (*New Steam Systems only*).

Important: After your heating system has been cleaned and tuned up, the technician should perform an efficiency test. Make sure your technician puts the measured efficiency of your heating system in writing for you.

## WHAT TO LOOK FOR IN TUNE-UP RESULTS

The following combustion efficiency test results are considered acceptable for oil-fired heating systems after a tune-up has been performed:

· Smoke	0 to Trace
· Net Stack Temperature	300 to 600
· Net Stack Temperature with Flame Retention Burner	300 to 400
· CO <sub>2</sub> (Carbon Dioxide)	8 to 12%
· O <sub>2</sub> (Oxygen)	4-8%
· CO (Carbon monoxide) in flue (Goal = 0)	less than 100 ppm
· Draft at Breach	-.02 to -.04
· Draft over Fire	-.01 to -.02

The ambient air in the area around the appliance shall have no greater than 9 parts per million (ppm) of CO. *Note: The use of "soot sticks" is not an acceptable alternative to brushing and vacuuming the heat exchanger surface.*

## TUNE-UP RESULTS

If you know how efficient your existing heating system is, it's pretty easy to calculate the savings you will get by replacing it. The chart below will help you determine potential savings resulting from replacement of your existing system. Your heating service technician or energy auditor may be able to help determine the **AFUE** (*Annual Fuel Utilization Efficiency*) of your present system. If you were only provided with the "combustion efficiency", you can estimate the AFUE by multiplying the combustion efficiency by 0.85. The numbers in the chart assume that both the old and new systems are sized properly; savings will be greater than indicated if the old system is too large.

		SAVINGS PER \$100 OF ANNUAL FUEL COST								
		Annual Fuel Utilization Efficiency (AFUE) - New System								
		55%	60%	65%	70%	75%	80%	85%	90%	95%
AFUE Of Existing System	50%	\$9	\$16	\$23	\$38	\$33	\$37	\$41	\$44	\$47
	55%	-	8	15	21	26	31	35	38	42
	60%	-	-	7	14	20	25	29	33	37
	65%	-	-	-	7	13	18	23	27	32
	70%	-	-	-	-	6	12	14	22	26
	75%	-	-	-	-	-	6	11	16	21
	80%	-	-	-	-	-	-	5	11	16
	85%	-	-	-	-	-	-	-	5	11
	85%	-	-	-	-	-	-	-	5	11

To determine savings, find the horizontal row corresponding to the old system's AFUE, then choose the number from that row that is in the vertical column corresponding to the new system's AFUE. That number is the projected dollar savings per hundred dollars of existing fuel bills. For example, if your present AFUE is 65% and you plan to install a high-efficiency system with an AFUE of 90%, then the projected saving is \$27 per \$100. If, say, your annual fuel bill is \$2,000, then the total yearly savings should be about  $\$27 \times 20 = \$540$ .

That's a lot of money to save each year, especially when you consider the expected lifetime of a heating system, but it still doesn't answer the question of whether replacing the system is a good investment. To answer that, you can calculate the first year return on investment (ROI). The equation is as follows:

$$\text{Return On Investment (ROI)} = \frac{\text{First Year Savings}}{\text{Installed Cost}}$$

$$\text{ROI} = \$540/\text{year} \div \$5,000 = 0.11 \text{ (11\%)}$$

Unlike most other investments, energy conservation investments are tax free. If fuel prices go up, the annual savings and return on investment also go up. For example, if fuel prices increase 30%, the annual savings in this example increases to \$702, and the return on investment increases to 14%.

Sources: American Council for an Energy Efficient Economy ([www.aceee.org](http://www.aceee.org)), US Environmental Protection Agency's Energy Star program ([www.energystar.gov](http://www.energystar.gov)), Massachusetts Department of Housing and Community Development's Bureau of Energy Programs.



# MASS ENERGY

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## **MASS ENERGY'S RECOMMENDATION ON REPLACING YOUR HEATING SYSTEM**

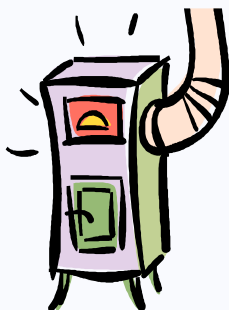
If after your tune-up, the measured combustion efficiency is 80% or less, or the AFUE is 70% or less, you should ask the technician if there is some way to improve your system's efficiency or whether it makes sense to replace the heating system.

Ask the technician to be specific and to put recommendations in writing. If the system needs to be replaced, we recommend that you get three bids and that each bid be required to have an ENERGY STAR® efficiency rating.

**Call your Mass Energy oil dealer today to schedule a tune-up.**

### **QUESTIONS?**

Dont's hesitate  
to contact us.



**More information at  
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