
FALL HOME IMPROVEMENT AND ENERGY GUIDE



Better driving means better automobile efficiency

With uncertain fuel prices, owning and operating an automobile is an expensive proposition. It is important to keep fuel efficiency in mind when buying a new car, but it isn't too late to save money on the car you already own, with the help of a few tips for efficient fuel use.

The easiest way to save is by driving only when it is necessary. Use other available options like walking, biking, and public transportation systems. Or make a telephone call instead. Ride-sharing on trips to work is also a good way to save energy and money.

When you do use your car, try to combine a number of short errands or chores into one trip. It is estimated that we use 30 per cent of our gasoline on trips of less than 8 km. These short ventures consume less fuel because the car's engine is not

warm for much of the trip.

Avoid jumpy starts, because more fuel is used and the tires wear out more quickly. Sharp jabs on the gas pedal activate the accelerator pump, which supplies extra fuel to the engine.

Never rest your foot on the brake pedal while driving, however lightly; this could put needless resistance on the wheels. If you are waiting for someone, or are caught in a traffic jam, turn off the motor. Idling gives you zero fuel economy.

Remove roof racks when they are not needed because they increase wind resistance significantly. Also, close your windows on the highway; open windows add to aerodynamic drag and raise fuel consumption.

Fill your gas tank only to the first 'click', when the pump shuts

itself off. Never top up the tank because the fuel might expand in warm weather and overflow the tank.

Try to decrease your speed on the highway - tests show that most cars use 20 per cent less fuel when driven at 90 km-h than they do at 110 km-h.

Allow plenty of time to reach your destination. Driving to beat the clock forces you to speed, brake sharply, accelerate too rapidly and generally waste fuel and put strain on the car.

In the winter, drivers have to be even more careful if they want to improve the fuel efficiency of their vehicles. For example, at -12 degrees C the average engine needs at least 15 km of driving to warm up fully, so it is even more important to eliminate short trips from your driving pattern.

It is not necessary to let your engine idle for a long period when starting in the winter - 30 seconds is all the car generally needs. It will warm best as it is driven, but be careful to accelerate smoothly.

Watching the traffic well ahead of you and driving defen-

sively, whether in winter or summer, is one of the best ways to save fuel. This allows you to travel at a consistent speed and avoid braking too often. If you are travelling on a hilly road, allow the vehicle to slow down as you climb the hill, and speed up to the legal limit when descending. In other words, maintain even accelerator pressure. Professional truckers call this 'road management'.

Regular engine tuning is vital if you want to get the most for your energy dollar. Tuning should be done every four months, but a fall and spring tuneup are most important to get your engine ready for drastic temperature changes. This can cut fuel consumption by 10 per cent.

Tire pressure should be checked every week in the winter because temperature changes affect the pressure, and underinflated tires adversely affect fuel consumption. If your tire pressures are 20 kPa or 3 psi softer than the manufacturer recommends, you are using about 1.5 per cent more fuel than neces-

sary. And remember to check the tires when they are cold.

Snow tires running on dry pavement cause your car to consume 4 per cent more fuel than when you are using summer tires. So snow tires should be removed as early in the spring as possible.

Radial tires have a well-documented potential for a 5 per cent or better improvement in fuel economy over bias ply tires. P-Metric tires represent the state of the art in tires engineered for fuel economy. These tires are lighter, operate at higher pressures for the same load and offer less resistance when rolling.

An air conditioner adds weight to your car and can reduce fuel economy by as much as 6 per cent in a small car. When in use, it can increase by as much as 20 per cent in hot weather stop-and-go driving.

Car costs can be cut dramatically. Organize yourself to take advantage of alternatives like walking or biking, and try to allow for those minutes of extra car care that will save you money.

Service furnace at least once a year

Just like a car, or any other major mechanical device, your oil furnace needs to be checked regularly. A knowledgeable heating professional should clean and service your furnace at least once a year to ensure safety, reliability and efficiency.

A thorough cleaning and tuning operation will take one to two hours and involve the partial disassembly of your furnace and oil burner. The internal heat exchanger, flue pipe and lower chimney surfaces should be brushed and vacuumed to remove soot and debris. Corroded or damaged flue pipes should be replaced immediately.

Moving parts such as dampers need to be lubricated and belts should be tightened. All safety controls must be cleaned and tested. The entire system, from the fuel tank oil filter to the nozzle should be inspected, cleaned, adjusted and, where necessary, parts should be replaced.

Your serviceman should use

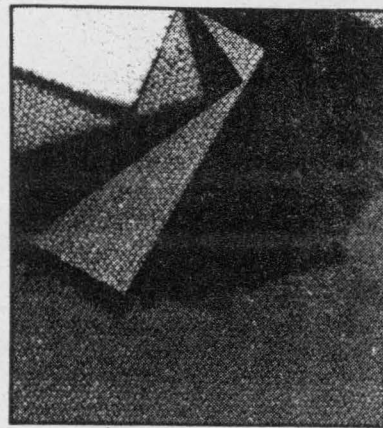
replacement nozzles certified by the Canadian Standards Association (CSA). Make sure that the oil spray pattern and oil flow, measured in gallons per hour, are compatible with the rating described on the name plate of the furnace.

The condition of the ductwork can affect furnace efficiency. Recirculating air needs a clear path for its return to the furnace for reheating. The duct system should allow for adequate circulation, and registers should never be obstructed. An open or loose panel on the furnace casing will draw cool basement air into the system, and may even be a safety hazard. Warm air ducts should be insulated, especially where they pass through unheated spaces or into exterior walls. The joints in the ductwork can be taped with special duct tape to reduce the loss of warm air, but remember to wash them first, otherwise the tape won't stick.

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Oil bills burning you up?

Tuning up a solution to warm up to

If you're buying more oil than you think your furnace deserves, a few dollars spent on tuning or retrofitting may give you peace of mind and help to limit those fuel bills. Another option is to replace your oil furnace or oil burner with a new, more efficient model. But before you make any changes, you should have the efficiency of your present furnace tested.

With modern instruments, an oil furnace efficiency rating can be produced in minutes. In fact, testing for efficiency both before and after tuning is the only way to get a precise measure of improvement. Beware of any 'expert' who scorns the use of test equipment or tries to convince you that efficiency can be measured by looking at the color of the flame in the combustion chamber.

There are a number of measures that may improve the efficiency of your system. Downsizing the oil spray nozzle may allow a closer match of your furnace's heat production to your home's needs. It allows less oil into the combustion chamber, reducing the heat output of the furnace. If your furnace switches on for short periods of time, even in cold weather, downsizing should be considered in order to save fuel. If you have added insulation or lowered the thermostat setting to conserve energy, your furnace is more likely to be too large for the heating needs of your home.

The circulating fan in your furnace delivers heated air into your house. It is usually easy to reset this fan to run longer on each heating cycle, extracting more heat from the furnace and circulating it into the living space.

A delayed solenoid valve fitted between the oil supply pump and burner nozzle delays oil flow to the nozzle until the pump reaches full operating pressure and the combustion air fan reaches full speed. On both startup and shutdown the solenoid valve reduces the release or unburned

oil into the combustion chamber. This reduces soot buildup and keeps the nozzle clean, both of which help maintain the furnace's efficiency.

'Retention head' burners produce a turbulent flow of combustion air, mixing the oil and air more completely for better combustion. This is more expensive than the other options described but may provide better fuel savings. An older or unreliable burner should be replaced by the highest efficiency burner available. This will often be a retention head or similar unit. If the efficiency of your furnace is 77 per cent or higher, it is not worth spending any money on a new burner because 87 per cent is the highest level of efficiency that you could expect to get with oil. If the efficiency is lower, and you decide to retrofit rather than

replace the furnace, be sure that the entire furnace assembly still has a few years of useful life, so that the savings will cover the cost.

The newest retrofitting option is an add-on condensing heat exchanger. It contains two water sprayers that absorb heat from combustion gases. The warm water is then pumped into a coil that transfers the heat to the circulating house air. This device is only certified to be installed with some furnaces, so check with a dealer to see if it is compatible with your system. This is the most expensive option, but it produces very high seasonal efficiency ratings. The condensing heat exchanger is also available as an add-on to many new oil furnaces. The seasonal efficiency of this option is expected to be 90 to 95 per cent.

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Chimneys require maintenance

Every householder knows that regular service and maintenance of heating equipment is the key to economy and safety. What is easy to forget is that the chimney is a critical component, whether you heat with oil, natural gas or wood.

Take a look at the following checklist. If your chimney or your maintenance practices do not match this profile, seek advice from a qualified professional.

- All chimneys must be installed with safe clearances to combustible building components and materials.

- For safety and long life the chimney should be properly sized. Ideally it should be the same size as the flue pipe that connects it to the heating appliance.

- Multiple connections to the same chimney can be dangerous. Never connect two or more heating appliances to a single chimney without an inspection by the appropriate authority in your area.

- A chimney located inside a house will perform better and require less maintenance than one located outside.



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Control humidity to control condensation

Humidity and condensation are common problems in many homes - but the causes and available solutions are often complicated and confusing.

Infiltration is the cause of cold, dry outdoor air into your home through cracks and gaps. Cold air cannot hold as much moisture as warm air, so when infiltrating air mixes with warm indoor air, humidity levels in the home tend to drop. So, except in humid regions, infiltration shouldn't cause condensation problems.

Exfiltration is another matter. This is the flow of warm, moist room air outwards through gaps and cracks in a building. As this warm air comes into contact with cold surfaces it cools, can hold less moisture and gives up the excess in the form of water or frost. It is probably that in most homes some exfiltration does occur.

During the winter months, condensation is usually a visible problem only when water or ice forms on the inside of windows, but it can cause more serious problems that cannot be seen. When house air, leaking into exterior walls or the roof, condenses as water or ice on cold surfaces, the result can be water-sodden insulation or even structural deterioration.

If you are having problems

with condensation in your home. Repair any leaks in basement walls, keep eavestroughing in good repair and make sure the grade slopes away from the basement walls. If the problem persists, try controlling the production of moisture inside.

Keep lids on your pots when cooking, reduce the number of plants you keep indoors, keep firewood outside instead of in the basement, and try to take shorter showers. Curbing activities that produce moisture may be the only change you need to make.

But if surface condensation persists - moisture on walls or ice on windows - it probably means that you need insulation or additional glazing on the windows. If these steps fail, the only solution is to ventilate the house. Sometimes this just means opening the appropriate window or windows, but bathroom exhaust fans, a range hood fan or a central mechanical ventilation system may be necessary.

The most complicated problems are a result of hidden condensation - when humidity gets into a building cavity, such as the attic. This is when structural damage, staining and ruined insulation are likely to occur. The easiest way to prevent this situation is to control humidity inside the house.

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Important information for those who believe a new house should be a quality home.

■ Every new house generates a wonderful feeling of warmth on the day it's purchased. And there are some fast and easy ways to help ensure your home continues to give you that feeling of warmth, from basement to attic, for years to come. How? By maintaining the highest degree of energy efficiency possible.

ENERGY EFFICIENCY BUILT RIGHT IN.

The first step in making your new home more energy efficient is to check with your builder. Ask that the following features be included in your new home. Plenty of insulation in the attic and walls; caulking and weatherstripping around doors and windows; proper ventilation to ensure dust free air, and energy efficient doors and windows.

Installing a 200 amp service is easy and inexpensive if it's done when your house is being built. It gives you the extra capacity to safely

add new appliances, finish the basement, or even add luxury items like a whirlpool or sauna.

All these things not only help keep your home comfortable and safe all year round, they also increase your home's fuel efficiency and decrease your annual heating bill. What's more, a well insulated home is a much quieter place to live. Important factors when you look to the future and consider the possibility of resale.

TAKE COMFORT.

A heat pump can further minimize heating costs and maximize comfort. The heat pump operates by drawing heat from the outside air and pumping it through your house. Believe it or not, there's enough heat in the outside air for a heat pump to work quite effectively until the temperature drops to below the freezing mark. Then your conventional furnace takes over, with no disruption to your comfort.

Since the heat pump actually delivers more energy than it takes to run it, it's the most energy efficient method of home heating possible.

An added bonus is that, in summer, the heat pump serves as an air conditioner too, by pumping heat out of the house, giving you year-round comfort.

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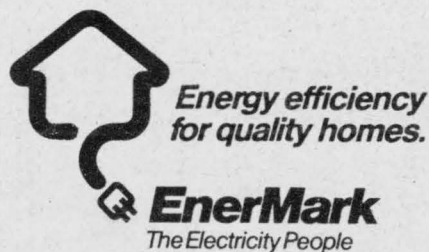
Electric water heaters are not only highly energy efficient, they store up to 40% more hot water. So your morning shower will never be a rude awakening.

ENERGY EFFICIENCY: DOLLARS AND SENSE.

No matter how you heat your home, energy efficiency makes sense. It can make your home more comfortable to live in. Less costly to heat. And more valuable when it's time to consider selling.

Talk with your contractor to make sure your new home will be as energy efficient as possible. So you know that home will always give you a nice, warm feeling all over.

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Reduce energy costs with insulated doors

Are you losing valuable energy through your doorways? If you are, and you're thinking of replacing them, be sure that the new ones will be energy savers. The things you should look for in a new door are stability, thermal resistance, cost, appearance and security.

Stability and thermal resistance go hand in hand. Look at the weatherstripping - it should be strong, secure, resilient and easily replaceable since it will be under a lot of stress from movement and traffic. Because all doors can warp or change shape, try to find weatherstripping that can be adjusted to the surface of the door. Make sure there is weatherstripping on the hinged side of the door as this is often overlooked.

Insulated doors are the most energy efficient. They are filled with a high RSI material and are

a substantial improvement over regular uninsulated doors. But because RSI values depend on type of material and thickness, check the door's actual insulating value with the manufacturer or distributor.

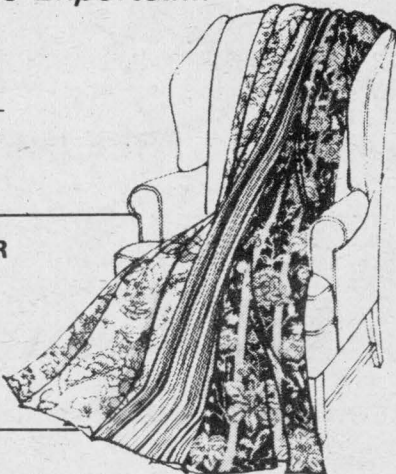
Boyd Hodgins of Ottawa Door Consultants says that doors vary substantially in price. The average cost of an uninsulated wooden door is about \$200 to \$300 to \$500. A wooden door with double glazing would be even more expensive, the bottom of the line ranging from \$300 to \$500.

Hodgins says the most cost-efficient and popular door installation today is a steel insulated door, because it is energy efficient and comes with its own frame and weatherstripping. With a wooden door, you often have to purchase the frame and weatherstripping separately.

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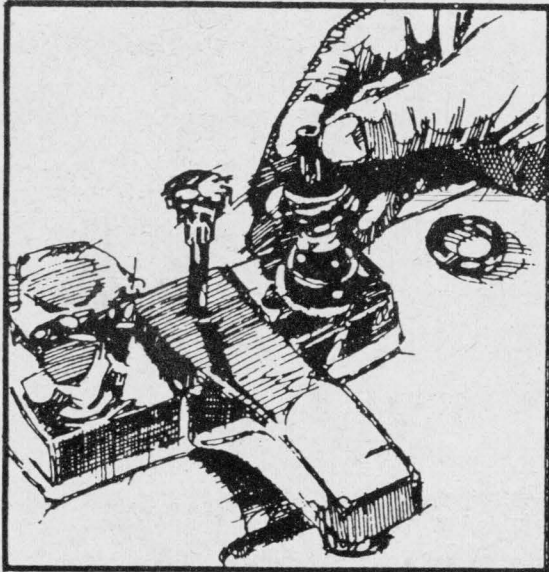
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Diesel conversion has quick payback

More and more owners of vehicle fleets are opting for natural gas as an alternative fuel because it offers energy savings, increased engine life, reduced pollution, less maintenance and safety.

The cost of converting an automobile or light truck to natural gas is between \$1600 and \$2000, but savings, relative to the annual distance driven and the energy efficiency of the vehicle, will be made over the long term. The payback period for a \$2000 investment can be as little as one year for high-mileage vehicles. Since the cost of a given amount of natural gas can be as little as half the cost of the equivalent amount of gasoline, yearly savings can amount to as much as \$1400.

Another reason people are converting their vehicles to natural gas is that its use extends engine life. Unlike gasoline, natural gas reaches the engine in vapour form. Thus, the lubricant on the cylinder walls is not diluted, as with nonvapourized fuels, and the engine oil retains its lubricating properties. Consequently, oil changes need not be as frequent and there is less wear on the cylinders, pistons and piston rings.

Reduced atmospheric pollution is another advantage of using natural gas as a fuel. Vehicles powered by natural gas emit far less nitrogen oxide, carbon monoxide and hydrocar-

bons than gasoline-powered vehicles. Considering that natural gas is in a gaseous state, its combustion is more complete and, consequently, cleaner than that of gasoline.

The equipment for converting to natural gas (tanks and fuel lines) is made of a steel resistant to the high pressure created by combustion gases. To ensure safety, the tanks and fuel lines must meet national and provincial standards.

The National Standard of Canada, set by the Canadian Standards Association (CSA), serves as the criterion for the adaptation of vehicles to natural gas. High-pressure tanks must also meet Transport Canada requirements and the dangerous goods regulation of the Department of Labour.

Natural gas is as safe as many other fuels:

- It is lighter than air. Once released, it disperses rapidly.
- To ignite in the atmosphere, it must be present in far higher concentrations than gasoline.
- Natural gas tanks are stronger than any other part of a vehicle.
- Unlike gasoline, refueling is by means of an hermetically sealed connection; this prevents any mixing of the fuel with air, which could cause an explosion.

Lower costs, increased engine life, reduced pollution, less frequent maintenance, and safety are all factors to be considered.

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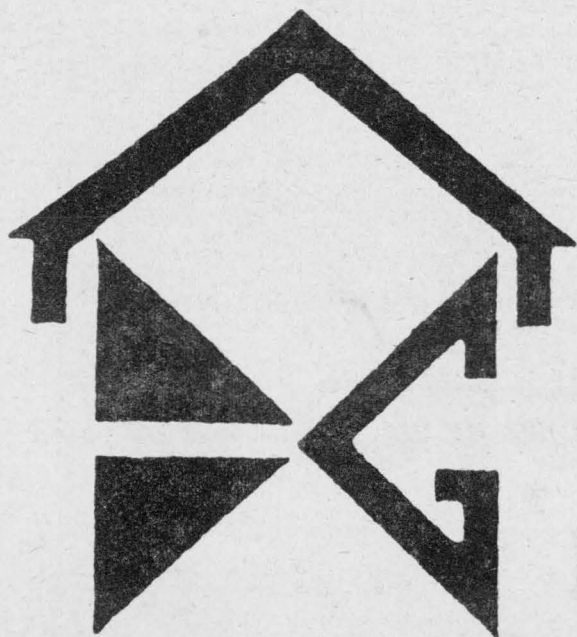
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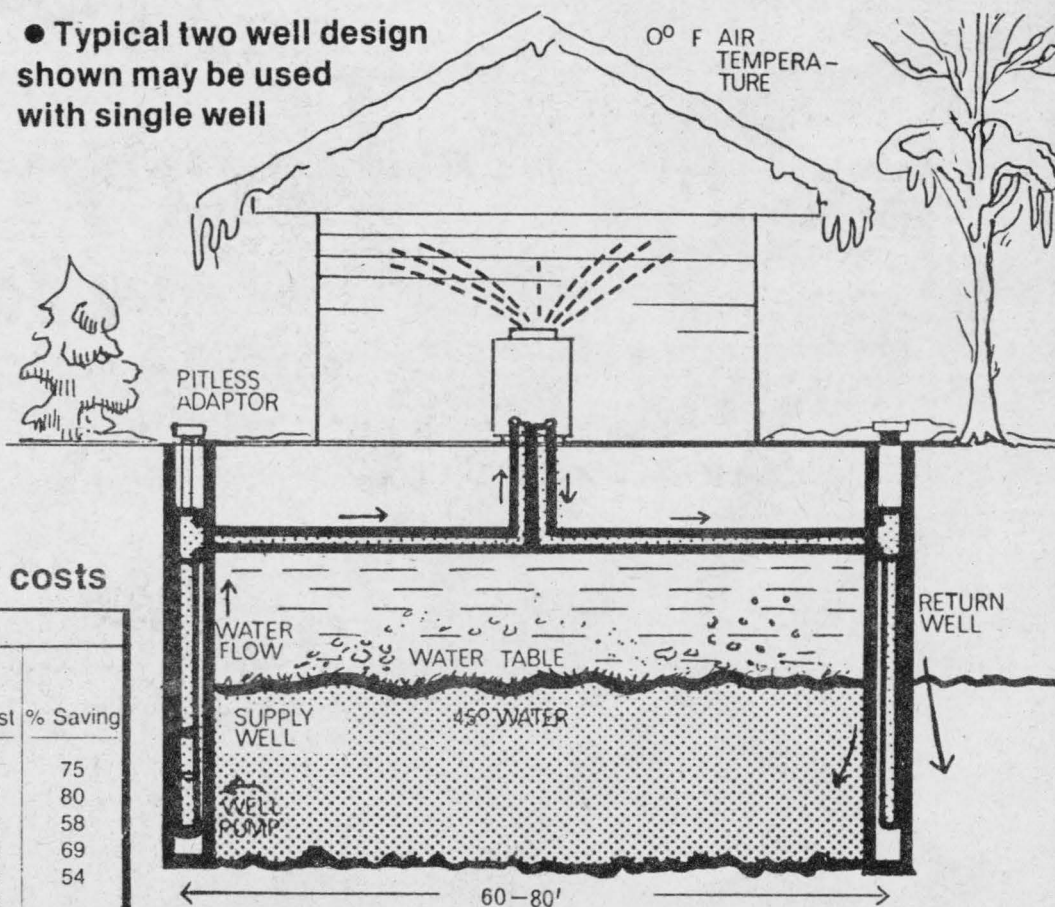
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• Typical two well design shown may be used with single well



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