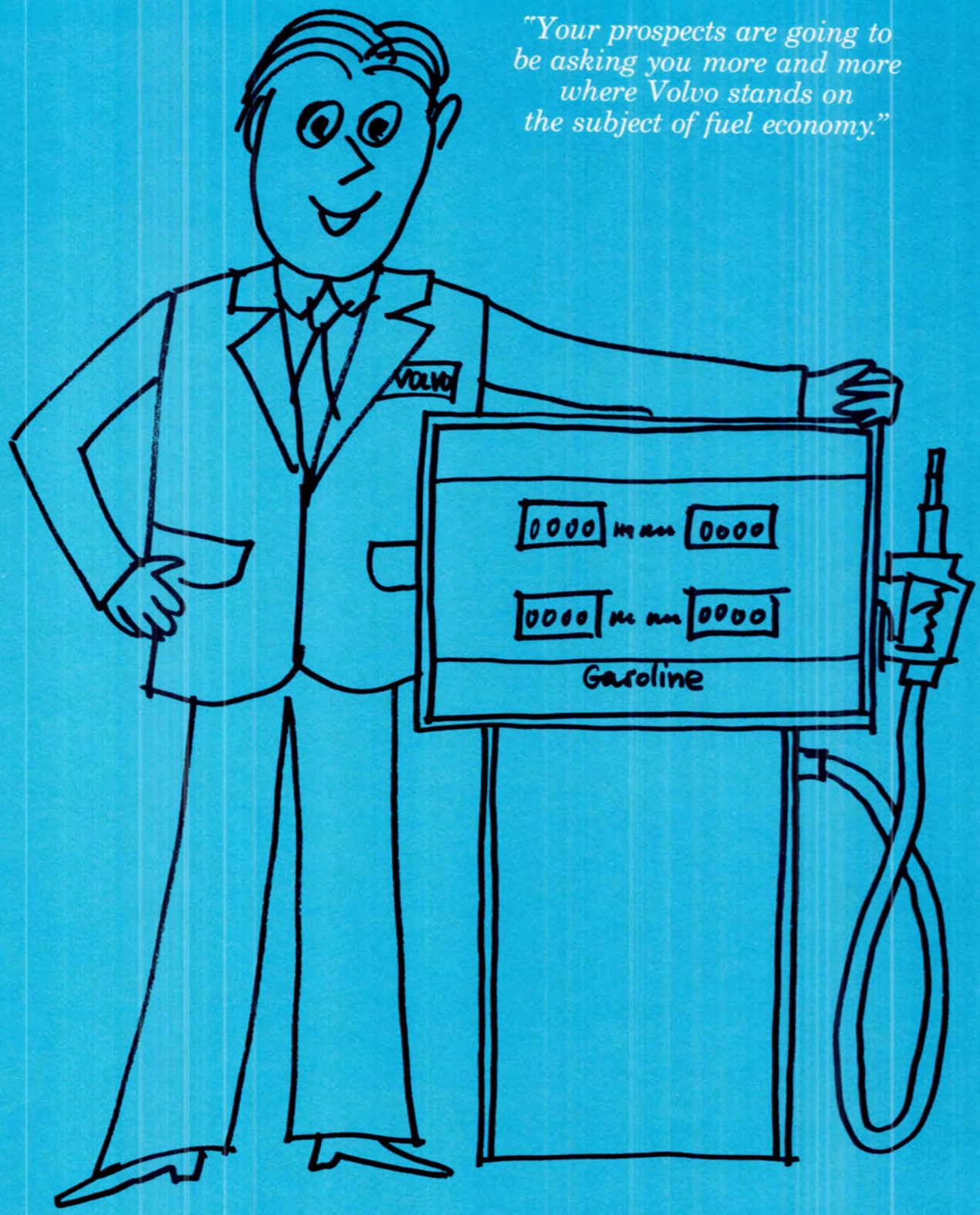
showroom

'30

MPG

"Your prospects are going to be asking you more and more where Volvo stands on the subject of fuel economy."



30 MPG

Americans are an automobile-centered society. Our lifestyle reflects it. Great numbers of Americans have moved from the city to the suburbs in the past two decades, making dependence on the automobile fairly total. We commonly drive 30 minutes or more to work, shop at distant shopping complexes, and don't think twice about driving the Little League Team to a baseball game ten miles away. If a trip to the beach or a ski resort is planned, there isn't a rush for train schedules. There's: "Which car should we take?"

Oil is being consumed at an incredible rate. At a recent energy conference this was said about petroleum use: "Since World War II, we have had a phenomenal rate of mal-usage so that in each decade—the '50s and the '60s—the world consumed more than had been used up in all previous human history." It's been determined that nearly a third of the petroleum used in the United States goes to power automobiles. As a result, government restrictions have been proposed touching upon many areas of energy use, particularly automobile gasoline consumption. Although gasoline hasn't reached $2 a gallon as it already has in some parts of Europe, we can expect higher gasoline prices at the pumps, increased gasoline taxes, penalties for "gas guzzling" cars, and other restrictions to limit gasoline consumption.

On an encouraging note, the U.S. Secretary of Transportation recently said, "Ten years from now I expect the average automobile to be smaller, lighter, safer and more fuel efficient." Sound familiar? It should. It describes the Volvo as it is now.

The Volvo is more than a foot shorter than the average domestic car, over 500 lbs. lighter, is felt by many to be the safest car on the road (the U.S. government bought and crash-tested 24 Volvos to help set safety standards for cars of the future) and has already surpassed the U.S. government requirement of 18 miles per gallon required for 1978 automobiles. This even includes the combined average m.p.g. for Volvos marketed in California where the most stringent emission regulations in the U.S. commonly result in automobiles getting poorer fuel economy.

Depend on it. Your prospects are going to be asking you more and more where Volvo stands on the subject of fuel economy. Miles per gallon won't be the only reason a person buys an automobile, but it will take on increasing importance as the cost of gasoline rises.

What does Uncle Sam require?

The low point in passenger vehicle gasoline consumption occurred in the 1974 model year when the average automobile sold in America achieved 13.9 miles per gallon. The following year the Energy Policy and Conservation Act was passed. It required that all cars sold in America achieve 18.0 m.p.g. by 1978, 20.0 m.p.g. by 1980, and 27.5 m.p.g. by 1985. This doesn't mean that every single automobile manufactured in those years must attain these standards. It applies to an *average* of the models of each manufacturer.

What is MPG?

MPG or miles per gallon is simply a method of determining fuel economy. It's calculated by measuring the amount of fuel used in a given number of miles. Mileage ratings as we commonly know them are determined by U.S. government agencies, the Federal Energy Administration (FEA) and the Environmental Protection Agency (EPA), which each year test new model automobiles for fuel economy.

The EPA tests are done in a laboratory on a dynamometer, which simulates driving conditions. This method has the advantage of testing every automobile under the same conditions. While an outdoor road test might give a truer driving picture, slight variations in weather, driver or road surfaces could affect the final ratings.

Two tests are done by the EPA: one for city driving, the other for highway. The city test is a 7½ mile run with an average speed of 20 MPH and with 18 stops. The highway test is a 10 mile nonstop trip with an average speed of 50 MPH. The EPA says in its 1977 Gas Mileage Guide, "If your highway driving speed averages faster than the test's average of 50 MPH, you should expect to achieve poorer fuel economy than the highway fuel economy estimate in this Guide—about 10 to 15 percent less for every 10 MPH above 50 MPH." It's no wonder people are disappointed with their car's m.p.g. after studying the EPA ratings. Even in these days of lowered highway speed limits, few motorists consistently drive as slow as 50 MPH on the highway.

The EPA tests, though, were never meant to be the final word on what kind of miles per gallon a driver will get on his car. There are too many variables in personal driving habits that affect fuel economy. The EPA itself notes, "Even though you may not get the listed fuel economy because of where you drive—city versus country, mountains versus flat terrain, cold versus mild climate—and your personal driving habits, these estimates allow you to compare the relative fuel efficiency of different vehicles." *Compare* is the keyword.

Type of vehicle, driving habits and other factors can affect fuel economy greatly. Volvo has been at an advantage in the area of fuel economy, partly due to lighter weight. A lighter weight, though, isn't the only thing that adds to improved fuel economy. Advancements in engine design and optimum axle ratios are among some things also contributing.

HERE'S HOW TO DETERMINE M.P.G.

1. **Fill your gas tank on level ground and record the odometer mileage**
2. **Drive as you normally would**
3. **Refill the gas tank at the same gasoline station, noting the amount of fuel used and the miles travelled**
4. **Divide the miles travelled by the amount of fuel used. Fuel used/Miles travelled = m.p.g. As an example, if you drove 300 miles and used 15 gallons of gasoline, your m.p.g. would be 20. To get a more meaningful m.p.g. figure, compute mileage for four or five tankfuls.**

Factors affecting Fuel Economy.

The EPA says: "A standard size car can get over 20 miles per gallon under favorable conditions; it can also get less than 2 miles per gallon under poor conditions." Many factors contribute to fluctuations in fuel economy, the principal ones being driving habits, vehicle weight and engine size. The major ones are described here.

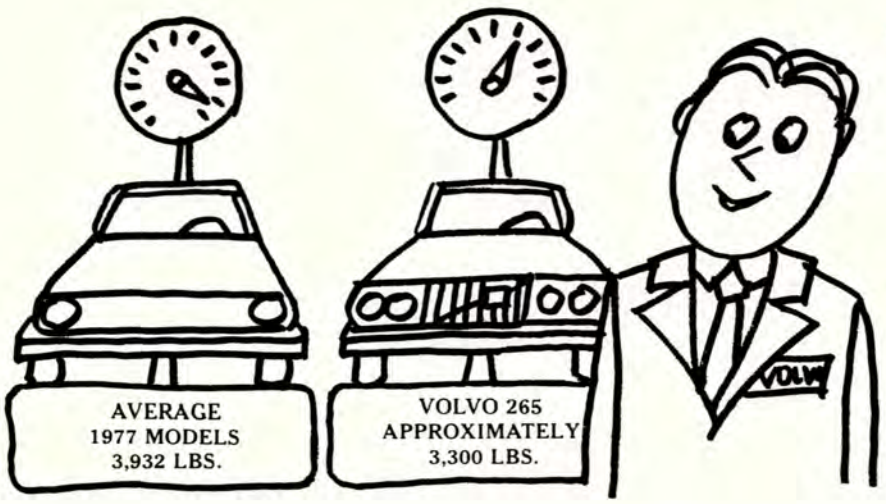
Weight. The average 1977 automobile has a projected curb weight of 3,923 lbs. Even though this is a four percent drop from 1975, it still represents over a quarter ton more than the weight of the 265 wagon, the heaviest Volvo sold in the U.S.

Volvo's use of aluminum and lightweight alloys has decreased the weight while maintaining the strength and durability for which they are known. Occasionally prospects will say they prefer a heavier automobile—that they feel safer with "all that steel around them." You couldn't be in a better bargaining position. Volvo's reputation for safety is unsurpassed. Heavier doesn't necessarily mean stronger or safer.

Size and shape. The shape of the vehicle has a great influence on speed, and in turn, economy of operation. A streamlined vehicle has lower drag coefficient than a rectangularly shaped vehicle. All vehicles aren't shaped like rockets of course, because automobile designers have to balance speed and economy of operation against other factors such as safety and roominess.

Engine. Volvo advancements in engine design have resulted not only in improved performance but also in fuel economy. In many markets, including the American market, carburetion systems have been replaced with a more precise method of gasoline induction by continuous flow mechanical injection. This injection of controlled amounts of gasoline into the engine results in less fuel waste.

The heavier an automobile is, the more powerful the engine needs to be to give satisfactory performance. It then goes without saying that a lighter weight automobile can get excellent performance with a smaller engine. It might require an 8-cylinder engine to give adequate performance on a very heavy car, but for a 3,000 lb. automobile like the Volvo, a 4-cylinder more than meets the power and acceleration needs of most people. If a prospect's driving needs require a more powerful engine, the 6-cylinder Volvo would be the choice. It's projected that in ten years, the 8-cylinder engine will be a thing of the past.



"The average 1977 automobile sold in the U.S. still represents over a quarter ton more than the weight of the 265 wagon."

Transmission. Automatic transmission on a Volvo is adjusted to shift at optimum speed and load conditions. This results in efficient operation, and in turn, fuel savings. Under most conditions, a manual transmission is more economical to use than an automatic transmission due to smaller power losses in the shifting process. As a result, you'll find more and more prospects requesting it. Five years ago these same prospects would probably have chosen automatic.

Volvo's fully synchronized four-speed manual transmission is also available with electrically-activated overdrive. The overdrive operates on fourth gear to reduce engine speed by 20 percent, thus improving fuel economy on the highway.

Cruise control will be available as an accessory for most 1976 and 1977 Volvos. This device allows a driver to accelerate to a desired speed, press a "set speed" button, remove his foot from the gas pedal and maintain a constant speed. If set at the recommended highway cruising speed of 55 m.p.h., it lessens the chance of a driver becoming "heavy footed."

Accessories. While accessories can lower fuel economy both in added weight and in consumption of power, people have grown used to the conveniences accessories offer and don't try to economize by eliminating them completely. Few people suffering through a hot, humid summer will want to give up air conditioning for higher m.p.g. Instead, people will effect fuel savings through judicious use.

Axle ratios. The number of times the engine rotates for each wheel revolution affects fuel economy. A low numerical axle ratio means less acceleration but improved gas mileage. On the other hand, a high numerical axle ratio means better acceleration at the cost of gas economy. A 1977 Volvo with manual transmission has a rear axle ratio of 3.91/1 for quick acceleration. In fourth gear with overdrive, the transmission gear reduction ratio drops to a low 0.80, resulting in improved gas economy during highway driving.

Tuneups. An engine in peak operating condition gets between 3 to 9 percent better fuel economy than one that hasn't been maintained. The importance of having an automobile tuned at regular intervals should be impressed upon the customer. After the preliminary 600-mile inspection service, Volvo's minimum maintenance recommendation is every 7500 miles.

"The importance of having an automobile tuned at regular intervals should be impressed upon the customer."

"Volvo has an enviable record in both fuel economy and emission control."

Emission control. It's commonly felt that strict emission regulations result in lowered fuel economy. The EPA challenges this by stating in a government pamphlet: "especially misleading is the contention that fuel economy always becomes poorer as emission standards are made more stringent." Whoever is right, one thing is clear. Volvo has an enviable record in both fuel economy and emission control. We have already surpassed the government's dictum of 18 m.p.g. for all cars sold in America in 1978, and as far as emission controls are concerned, Volvo is becoming known by the press and public as a "clean car." The Volvo 240 Series marketed in California with the Lambda Sond System has been called by the California Air Resources Board "virtually pollution free...the most significant step ever made in the battle to develop clean automobiles."

Tires. Radial tires, standard on all Volvos, run truer than conventional tires, resulting in energy savings. The design of radials allows the sidewalls to flex while the tread runs straight and smooth. Fuel dollars can also be saved by keeping tires inflated to the proper pressure. Underinflated tires result in a loss of fuel economy.

Still more factors. There are many variables in car design and operation that can affect gas mileage, such as exhaust systems, drive train loss, excessively high idle speed, and so on. Their impact on fuel economy in most cases is overshadowed by the factors already mentioned.

In some areas affecting fuel economy, the driver has no control; namely, temperature, wind, precipitation and road conditions. For instance, warm temperatures allow for better fuel economy than cold temperatures. At 20° F there will be an approximate 8 percent loss in fuel economy (compared to the combined m.p.g. rating shown in the EPA 1977 Gas Mileage Guide.) A tailwind will increase your m.p.g.; a headwind decrease it. M.P.G. dwindles in snow or rain or on rough or loose road surfaces. Mountain driving further reduces m.p.g.; fuel losses from driving up a steep hill are not made up on the downhill side.

Driving habits and MPG.

A common cry heard by all automobile manufacturers is that EPA ratings are not accurate. Drivers complain that the gas mileage they're getting from their car is nowhere near the gas mileage they expected after reading the EPA ratings. They forget two things. First, the EPA tests are done under simulated conditions in a laboratory. The cars don't go over steep hills, drive against 20 mile an hour headwinds or face many conditions an ordinary driver will experience.

For the average driver, it's a rare time when a road is straight and smooth and weather conditions perfect. The people running the EPA tests know this. They have knowingly sacrificed this true driving picture to insure that all automobiles tested go through identical tests. Small variations in temperature or weather could affect the EPA ratings. The EPA suggests that their fuel economy figures be used as a point of comparison and not as a guarantee of what a driver should expect from his car.

The second thing that drivers forget is that great savings in fuel can be made on HOW or WHERE or even WHEN (s)he drives a car. According to an EPA pamphlet, *Factors Affecting Fuel Economy,* "Driving habits and trip characteristics can have more effect on fuel economy than any vehicle design feature."(!) The following simple suggestions will help your prospects increase their m.p.g. Try them yourself. You'll find a difference.

Plan trips. Combine several short trips into one. Trips of five miles or less account for only 15 percent of the trips made, but use more than 30 percent of all automotive fuel. When possible, plan trips during light traffic periods to avoid stop and go traffic. Remember, if you're caught in a traffic jam, you're getting zero miles to the gallon.

Drive smoothly. Avoid rapid starts and stops. Uneven speeds eat up fuel. Accelerate smoothly and gradually, trying to anticipate stop lights and traffic. The few minutes gained in jockeying for position isn't worth the loss in gasoline, money and nerves. For optimum fuel economy drive between 35 and 55 MPH. Keep in mind that for every 5 MPH over 55 you drive, you will lose 1 m.p.g. If you're getting 20 m.p.g. at 55 MPH, at 70 MPH you'll get only 17. Similarly, driving slower than 35 MPH burns more fuel, mainly because of the lower gears used. Driving in first gear can use over 30 percent more gasoline than driving in fourth gear.

No need to warm up. In cold weather simply start your car and drive away. It's not necessary to warm the car for several minutes. Running the car on fast idle wastes fuel, especially when combined with cold temperatures. (Remember never to race the engine immediately after starting when the weather is cold.)

Stay out of bad weather. In poor weather conditions, don't drive unless you have to. A severe snowstorm, icy roads and strong headwinds will take a huge toll in fuel economy.

Avoid rough roads. Loose gravel, sand, mud or other poor road surfaces can lower fuel economy between 10 and 30 percent.

Don't store items in car. Leave those golf clubs, tire chains, etc., at home, not in the trunk. Objects stored on the top of the car not only add weight, they're an air drag.

Use accessories sparingly. Energy and money can be saved by using accessories wisely. An air conditioner can lower m.p.g. as much as 10 percent, so after your car is cooled down, try the ventilation system.

Keep your car in peak condition. Regular tuneups improve fuel economy by around 8 percent. It's a fallacy that tampering with emission controls will benefit fuel economy, and doing such is illegal in most states. A recent study shows that in most cases tampering with emission control systems actually worsened fuel economy.

Don't idle your engine. If you're stopped for more than a few minutes, switch off the engine to conserve fuel.

Shift into high gear. M.P.G. can be improved by shifting into high gear as soon as driving conditions allow.

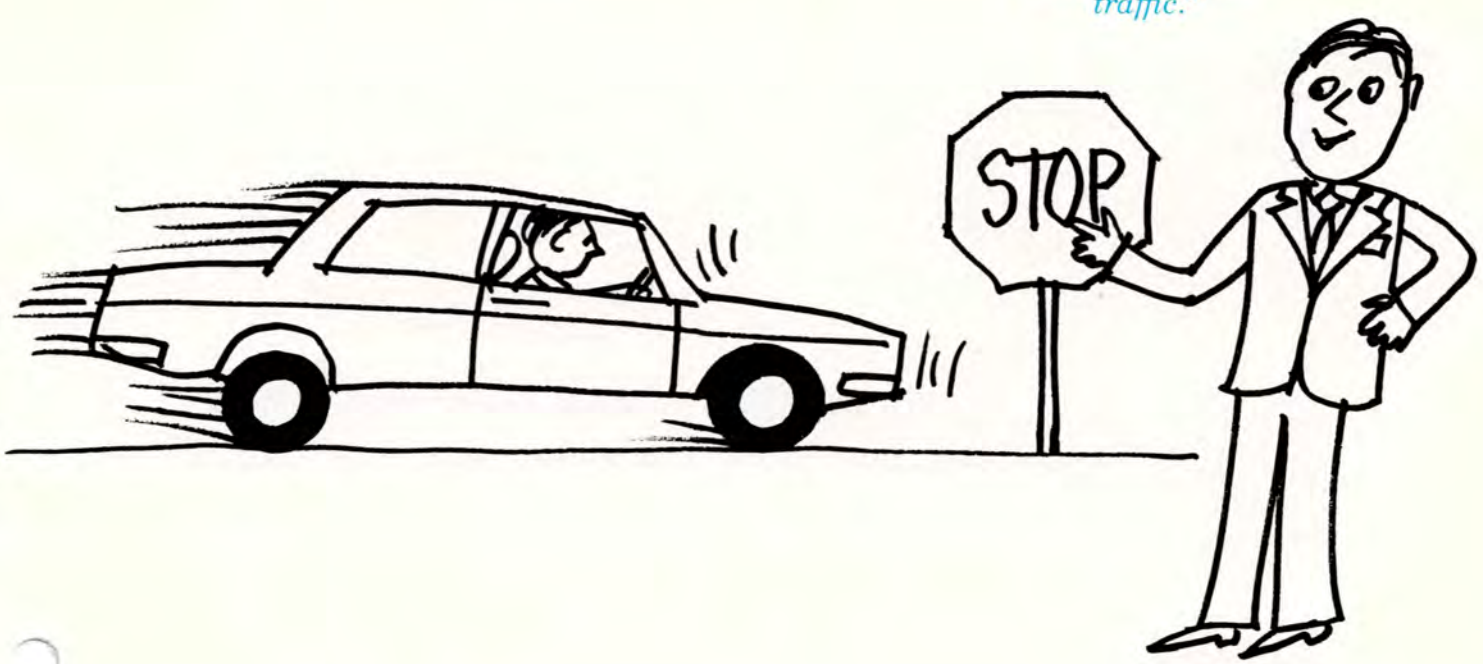
Turn on right. If you live in a state or city where right turns are permitted after coming to a full stop at a red light, be sure to take advantage of it. In any event, don't block the lane and prevent other people from making the turn and saving gasoline.

Use your brakes. Don't use your accelerator/clutch when stopping for a red light on a hill.

Car pool. If your destination is only a few blocks away, it's inefficient to drive your car. Instead, walk or ride your bicycle. The exercise will do you good!

These tips will help conserve gasoline. A driver will soon begin to see improved fuel economy with just slight modifications in driving habits. Personal driving habits are the one area where a driver has complete control.

"Try to anticipate stop lights and traffic."



Volvo and the competition.

Volvo sedans are classified as compacts (cars having 110 cubic feet inside) in the EPA/FEA ratings. In the "49 States" fuel economy listing, Volvo is in the top half in terms of combined m.p.g. compared to the other 81 models listed in this classification.

The 245 and 265 are in the top quarter in their classification as "mid-size station wagons." The Volvo 245 with manual transmission is the highest gasoline powered automobile in highway m.p.g. Volvo's comparative ratings become even more favorable in the California Gas Mileage Guide with most Volvos rated near the top or in the top quarter of their classification.

Volvo ranks very well in its EPA classification, but it should be noted that comparing automobiles within the same EPA classification can be misleading because of the wide disparity of models included.

In the "compact" classification, for instance, are listed automobiles ranging from the AMC Hornet (retail approx. $3,500) to Rolls Royce ($43,200 and up). So it might be well to compare Volvo's fuel economy with the automobiles most competitive to us. Diesel automobiles are omitted from this comparison as Volvo currently markets no diesels in the American market.

VEHICLE FUEL ECONOMY*

Vehicle	Eng. Size	Cyl	Fuel Sys.**	Trans.	49 STATES City	49 STATES Hwy.	49 STATES Comb.	CALIF.* City	CALIF.* Hwy.	CALIF.* Comb.
260 SERIES										
Audi 100 LS	114	4	FI	M	18	27	21	18	29	22
	114	4	FI	A	17	23	19	18	26	21
BMW 530i	182	6	FI	M	14	23	17	14	20	16
	182	6	FI	A	14	20	17	13	18	15
Lincoln Cont. Mark V	400	8	2	A	13	18	15	10	16	12
Mercedes 230	141	4	1	A	17	21	19	17	21	19
280E	168	6	FI	A	14	19	16	15	18	16
280SE	168	6	FI	A	14	19	16	15	18	16
Seville	350	8	FI	A	14	19	16	12	17	14
Volvo 260	163	6	FI	M	15	28	19	14	26	18
	163	6	FI	A	17	21	18	14	21	16
240 SERIES										
Aspen/Volare	225	6	1	M	20	29	23	16	23	18
	225	6	1	A	18	24	20	16	19	17
	225	6	2	M	17	24	20	—	—	—
	225	6	2	A	16	21	18	—	—	—
Cordoba	318	8	2	A	13	18	15	11	16	13
	360	8	2	A	14	20	16	—	—	—
Monarch/Granada	200	6	1	M	21	28	24	—	—	—
	250	6	1	M	21	28	24	—	—	—
	250	6	1	A	18	23	20	16	20	18
Volvo 240	130	4	FI	M	18	28	22	18	28	22
	130	4	FI	A	18	24	20	19	26	21
245/265 SERIES										
Century	350	8	4	A	14	19	16	13	18	15
Aspen/Volare	225	6	2	M	17	24	20	—	—	—
	225	6	2	A	16	21	18	—	—	—
Volvo 245	130	4	FI	M	18	30	22	18	29	22
	130	4	FI	A	17	24	20	19	26	21
Volvo 265	163	6	FI	M	15	28	19	14	26	18
	163	6	FI	A	17	21	18	14	21	16

*Taken from 1977 Gas Mileage Guide, Second Edition Jan. 1977, Environmental Protection Agency. Copies available by writing to Fuel Economy, Pueblo, Col. 81009. **Fuel System designations: FI-Fuel Injection. Numerals indicate number of barrels in carburetor.

When a prospect asks about gas mileage.

Tell them about Volvo's Healthy Position in the EPA Ratings. Volvo ranks higher than half of the automobiles in its EPA classification, and in some categories Volvo ranks in the top quarter. The 245 with manual transmission has the highest highway rating for any gasoline powered automobile in the mid-size station wagon category.

Explain EPA's Method of Testing. EPA tests are done indoors on a machine that doesn't take into account weather, road conditions or personal driving habits. All can lower m.p.g. substantially. Another thing to consider: EPA highway tests are done with an average speed of 50 MPH. Most people drive faster than this, reducing the m.p.g. figure. The EPA emphasizes its fuel economy ratings are estimates and should be looked upon as a method of comparison and not as a guarantee of what a driver can expect.

Note Volvo's Philosophy of Quality and Safety. Many automobiles can offer exceptional mileage figures, but at the expense of other factors such as safety, power or roominess. Volvo is not willing to make this sacrifice in quality, especially in the area of safety.

Offer Driving Tips. Explain how improved gas mileage can be realized by modification of driving habits (see page 8).

Remind Them MPG is only One of Many Reasons to Buy a Car. Fuel economy has to be balanced against other factors, such as comfort, performance, longevity, safety, quality of workmanship, etc.

Show Them Actual Dollar Savings. Fuel savings for a year may not be as great as a prospect may think. (See chart below.) A 5 m.p.g. difference between cars may mean only the savings of a few dollars a month. This small saving may not be worth it to your customer if it means sacrificing other factors.

"Remind them MPG is only one of many reasons to buy a car."

DOLLAR COST PER 10,000 MILES

COMBINED MPG	CENTS PER GALLON						
	75	70	65	60	55	50	45
50	$150	$140	$130	$120	$110	$100	$ 90
48	156	146	135	125	115	104	94
46	163	152	141	130	120	109	98
44	170	159	148	136	125	114	102
42	178	167	155	143	131	119	107
40	188	175	162	150	138	125	112
38	197	184	171	158	145	132	118
36	208	194	181	167	153	139	125
34	221	206	191	176	162	147	132
32	234	219	203	188	172	156	141
30	250	233	217	200	183	167	150
28	268	250	232	214	196	179	161
26	288	269	250	231	212	192	173
24	312	292	271	250	229	208	188
22	341	318	295	273	250	227	205
20	375	350	325	300	275	250	225
18	417	389	361	333	306	278	250
16	469	438	406	375	344	313	281
14	536	500	464	429	393	357	321
12	625	583	542	500	458	417	375
10	750	700	650	600	550	500	450

How many fuel dollars are actually saved surprises most people. They expect the figure to be much higher. For example, if a car with a combined EPA rating of 30 m.p.g. is chosen over one with a combined EPA rating of 24, the monthly savings (at 60¢ a gallon) amount to only a little over $5 a month. This small amount is seldom worth it to a prospect if it means giving up roominess or other conveniences.

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