

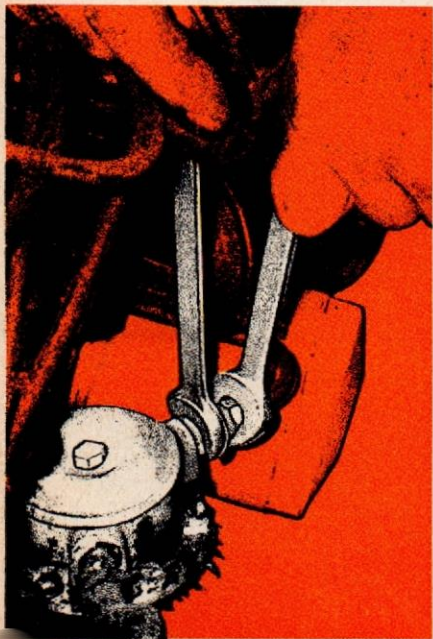
What to Do About a Real Gas Guzzler

GAS GUZZLING may be the nature of some beasts. But when your car's gas mileage takes a nose-dive, that's another case—one you can and should do something about.

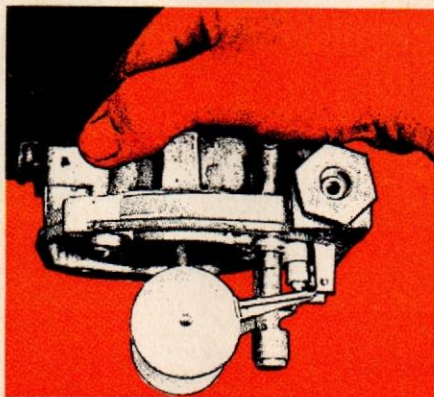
Begin by confirming the problem. Many people become gas-mileage-conscious only after they have overloaded the car with vacation gear plus family and then made good time to a mountain resort. Gas mileage under these conditions may be a lot worse than you—or they—normally get on the highway.

Don't let the mileage results from just one or two fillups throw you. You might have been driving into heavy winds, caught in a fair bit of traffic, running with the A/C on or trapped by any number of things that affect fuel consumption.

Consider the mileage a problem when you have records that cover at least 500 mi.—three or four fillups with no unusual driving. A mileage drop becomes significant if you have kept reasonable records and now



TIGHTEN fuel-line unions with two wrenches. One holds fitting, the other tightens. But do not overtighten the union.



TOP of carb, or fuel-bowl cover, lifts off after removing screws. With float in this position, the valve should be open.

show a 1.5-mpg loss on a full-size car, 2.5 on an intermediate or compact and 3 on a subcompact. Anything much less is likely to be normal deterioration, unless the drop is sudden.

Assuming the car has had regular changes of plugs, points, filters and routine checks of choke, heat riser and emission controls, the most likely causes of gas guzzling are fuel leaks, carburetor flooding and ignition timing or advance errors. Let's look at the details and the checkout procedures.

Fuel leaks. Most fuel leaks show up with the engine idling at the curb. Drip, drip, drip to the asphalt. Others don't. Often, the fan—or air-flow through the engine compartment when driving—carries fuel drips away from the source of the leak.

The simplest way to find a leak is to run your fingers over the most likely sections of the fuel lines. If you feel wetness, sniff to determine whether it's gas. The best time to make a test is with the engine running at cold idle. Prime areas to check:

- At the fuel line fittings—inlet and outlet of the fuel pump, carburetor inlet and gas tank outlet. A tubing connection sometimes loosens from engine vibration. If

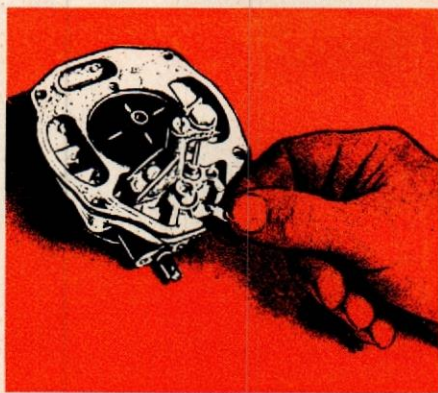
careful tightening with two wrenches doesn't seem to help, undo the connection, wrap Teflon sealing tape or apply a pipe dope like Loctite Pipe Sealant with Teflon around the treads and try again. Don't apply a lot of muscle—fittings are supposed to seal when tightened without unusual force. If they don't, replace.

- Wherever a piece of steel tubing connects to a flexible hose. The cure may be a new hose clamp or, if there's enough slack, cutting off the end of the hose and refitting it.

- Any flexible fuel hose may deteriorate and become porous enough to seep gasoline. If a hose looks wet, do the finger test.

- The crimped fuel pump diaphragm joint is another source of fuel leaks. In the old days, when this joint was held by screws, you could cure a leak by tightening. With today's pumps, the only fix is replace them.

- Carburetor bowl cover gasket. This leak not only wastes gas but is



CHECK needle valve visually for wear or scores on needle tip and dirt on the seat. If you find wear, replace needle and seat.

a primary cause of underhood fires. If the bowl cover screws are loose, tighten them. That may do the job. If they are tight, however, don't overtighten or you'll distort the threads in the carburetor. Remove the cover, replace the gasket and, as insurance against the effects of the usual amount of cover warpage, coat each side of the gasket with a thin film of flexible sealer.

Flooding. Traditional signs of flooding are the odor of gasoline under the hood and the frequent need to start and restart the engine with the gas pedal floored—even if it's cool.

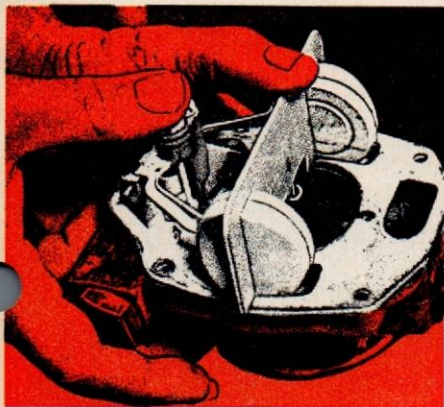
The three most common causes are excessive fuel pump pressure,

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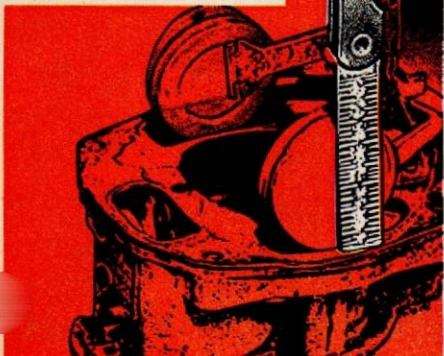
A defective carburetor needle valve seat and improperly-set float level.

Check fuel pump pressure with the engine idling and the pressure gauge teed into the end of the fuel line at the carburetor. For accurate readings, the tee-line to the gauge should be no longer than 6 in. or the weight of fuel in the hose could distort the reading. The pressure should be within manufacturer's specs and remain almost constant even if the throttle is blipped open.

A stiff diaphragm is the usual reason for excessive pressure but, with today's crimped-together pumps, it doesn't matter. The cure is the same as for leakage: throw out the old, pop on the new.

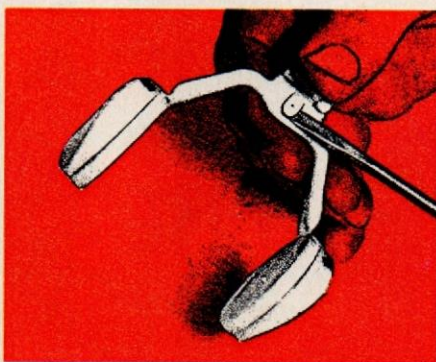


FLOAT-LEVEL measurements can be made with special metal or plastic gauges supplied in some rebuild kits (above) or with a machinist's rule (below). Measure from carb cover to point on float specified in shop manual, making sure to include gasket thickness if the book says to do it that way. Wear or new valve can change level.



Needle valve. Needle-and-seat and fuel level problems are closely related. Up-and-down motion of the float opens and closes the needle valve. If you check one, you include the other and both jobs require partial disassembly of the carburetor.

Fortunately, on the majority of carburetors, the fuel bowl cover can be lifted off without much more than taking off the air cleaner housing, disconnecting the fuel line and removing a few bowl cover screws. When you lift the cover up and out, the float needle and seat come with it on most cars, so servicing it is a bench job. On some carburetors, the needle-and-seat valve and float remain in the carburetor bowl. But service work still is not difficult and it can usually be done without re-



ADJUST float level carefully by bending tab that bears on needle valve until the measurement meets specifications.

moving the carb from the engine.

On either type, remove the pin that pivots the float, lift the float away and take out the needle. Carefully eyeball the needle tip, looking for any signs of gouging or wear. If there are any, the needle-and-seat valve must be replaced. If the needle passes, look inside at the seat and, if you see any dirt, clean it out with an aerosol solvent. It's not likely you'll be able to see any scoring inside the seat, but if you do, replace the valve.

If you must replace the needle and seat, you can choose between a conventional metal-tip needle and one with a synthetic rubber tip. Although a rubber-tip needle lasts almost forever and seals very well, it often takes a set in the first few thousand miles, particularly with some unleaded gasolines, and the float level changes. If you use one, you must take the cover off again



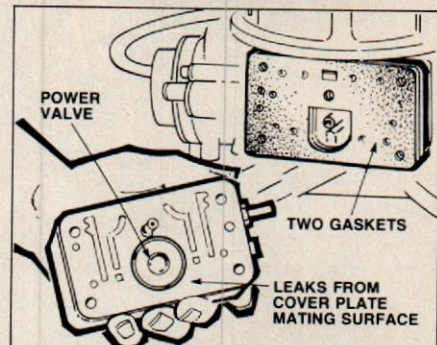
CHECK vacuum advance mechanism in distributor by pushing arm into diaphragm with pressure. Should pop back.

soon and, of course, reset the level.

With a metal-tip needle, a brand-new needle may not mate with its seat and some leakage can result, causing minor flooding. To prevent this, insert the needle into the seat and tap the float end once, gently, with a plastic-tip hammer.

Float level. Refit the float and its
(Continued on page 124)

DOUBLE GASKETS



SIDEPLATES on Holley and some other carbs is actually a body containing power valve and fuel passages. If the plate warps from incorrect tightening, internal fuel leaks can cause flooding. New covers are expensive and hard to get. An often successful cure is to replace the original cover using two new gaskets and a sparing amount of soft-setting sealing compound. Tighten the cover screws evenly.

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field. The National Center for Education Statistics, a division of HEW, publishes a Directory of Postsecondary Schools with Occupational Programs. This, too, is a massive tome, which lists thousands of schools offering programs from accounting to woodworking. Check your library or send \$5.80 to the Superintendent of Documents. The College Book of Occupational Education, available in libraries, also has information on thousands of schools in the U.S.

If you're college-bound, ask your guidance counselor which schools provide strong courses in your specialty. Or you can consult the College Blue Book, which has an alphabetical listing of 2,000 subject areas and the colleges which offer degrees in them.

The Real World is out there and you'd better be prepared with basic job skills. The new way is to pick a college that teaches those skills. If you can get skilled in an area that interests you, great. If not, you've got to put your interests aside for a while, despite what career psychologists say about doing what you like and liking what you do. It's the Real World. ●

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(Continued from page 84)

hinge pin, invert the bowl cover and let the float close the needle valve. The float now is in position for a level measurement. Check the manufacturer's specs carefully to find out exactly what measurement you must make and whether or not the gasket is to be left in place. On the Rochester carburetor we show, the measurement is from the bottom of the circular float at the center to the cover gasket. But it could just as easily have been specified from the top of the float. In making any measurements, don't forget that the float is inverted but references in specifications to top or bottom are based on the normal position, even if float level isn't measured that way.

A float level measurement can be made with a special gauge—in this case one that should just touch the bottoms of the floats—or with a machinist's ruler.

There are special gauges you can use and, in some cases, there is a sight plug in the fuel bowl that, when removed with the engine idling, should dribble fuel if the float level is right. Note: In these

designs—some Holleys—make sure you are setting float level and not fuel level. The specs are different.

Flooding may also be caused by internal carburetor problems such as a leaking power valve. On some two-barrel and most four-barrel Holleys, flooding from an internal leak in the secondary side plate assembly, caused by plate warpage, is fairly common. The cure is a new side plate or—cheaper—a second gasket. Although the Holley problem is one a weekend mechanic can handle, other internal carburetor problems are best left to a specialist.

Ignition timing. Ignition timing has an enormous effect on gas mileage. An error of just a few degrees to the retard side can make a difference of as much as 10 percent in gas mileage. Even if you checked timing as part of the last tuneup, recheck to be sure it is right on. Observe these procedures carefully:

Disconnect and plug one or both vacuum lines at the distributor advance unit. If you set basic timing to specs with the vacuum line on, the spark will be severely retarded.

Make sure you know where the timing marks are and you have them neatly chalked. Among the

one that teaches a *money-earning skill*.

First, *target an occupation for which you're suited*. Many young people know exactly the niche they want to fill. If you don't, the Office of Education has come up with a new way to help you decide. Instead of setting your sights on a particular occupation, select instead a so-called job cluster that interests you most.

It makes sense. There are 20,000 different kinds of jobs but only a couple of dozen clusters, or groups, of occupations. Here are some: business and office occupations, marketing and distribution, communication and media, education, transportation, scientific and technical, administrative, protective, sales, mechanic and repairer, social sciences, health care.

Breaking down occupations into general clusters simplifies choice. Visit places where the work you're interested in is going on. Try your hand at some of the basic skills. If you can get a part-time or summer job doing that work, fine; if not, try volunteer work. At school, seek out extracurricular activities that offer practical experience at such work.

You may find some surprises, too. A young man, born and bred in New York, spent a month on a farm and discovered forestry. "Where's this been all my life?" he asked himself. Answer: Out there all the time. He's enrolling in a Kentucky school which offers a forestry major.

If you're still confused, pick up the thread of what you think is a minor skill or interest. You may find a rich vein of interest and aptitude in what you always looked upon as an unimportant pastime. You can also consult a career counseling firm which, for a fee, will offer expert guidance.

Second, *check the employment opportunities in the field*. Every library has a copy of an important book that will tell you. It's called Occupational Outlook Handbook, published by the U.S. Dept. of Labor's Bureau of Labor Statistics. Thick as a telephone book, it lists all occupations and tells you frankly about prospects in the coming decade. The book is also for sale for \$7 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

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errors often made are setting ignition timing according to a chip in the crank pulley and an identification tag on the engine front cover instead of the proper marks.

Set engine speed to specs for ignition timing. The engine speed specified for checking timing may be measurably different from curb idle and the wrong engine speed can make an enormous difference in the effective timing setting.

Advance systems. For good gas mileage at all speeds, you must be sure the timing is advancing as it should. This is the job of the centrifugal and vacuum advance systems.

The centrifugal advance is controlled by weights on springs in the base of the distributor—or on top of the distributor shaft, just under the rotor, on General Motors V8s. If you can't see the advance mechanism to make sure springs are intact and connected, just twist the rotor in the direction of distributor shaft rotation—it should move a fraction of an inch against spring pressure. Release the rotor and if the mechanism is working, the rotor should spring back.

Testing the vacuum advance is a bit more complex because most late-model cars have devices that limit or eliminate vacuum advance under a variety of conditions for lower exhaust emissions. One universal test method is to connect a piece of vacuum hose at one end to a source of intake manifold vacuum, such as the vacuum tap on the intake manifold for the power brakes. Then disconnect the hose from the distributor vacuum advance, plug its ends and start the engine. While it's idling, connect the other end of your auxiliary vacuum hose to the vacuum advance. When you make the connection, the engine should speed up noticeably which indicates that the vacuum advance is working.

A simple mechanical check of the system is to remove the distributor cap and operate the vacuum advance arm to the distributor breaker plate manually. The arm should move into the advance mechanism, flexing the diaphragm, and then spring back when released. This test isn't as effective as the previous one.

It doesn't take an enormous drop in gas mileage to justify a careful effort to find the cause. A loss of just 2 mpg on a full-size car can cost an average driver more than \$500 in five years of driving at today's gasoline prices. The cost at tomorrow's prices will undoubtedly be even greater. ●