

SERVICE DEPT.

IS YOUR BIKE AN ALCOHOLIC?

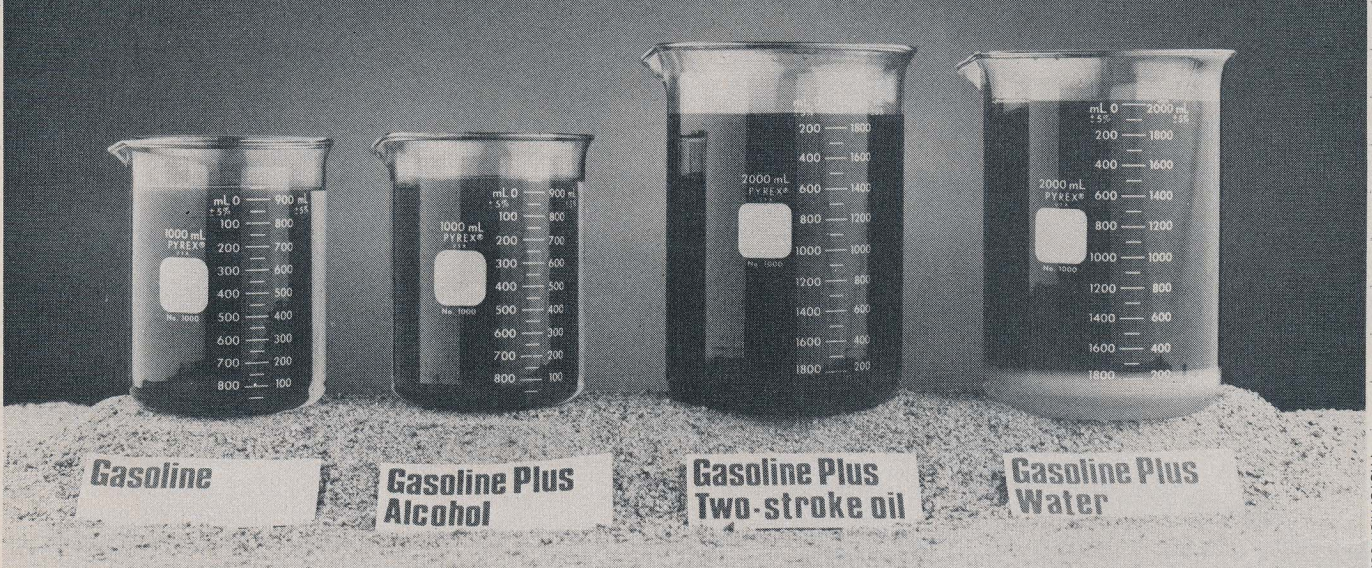


PHOTO: RICH COX

Gasoline and alcohol do mix—unlike gasoline and water—but either combination in your bike's fuel tank can cause big trouble!

By Karel Kramer

Did you notice our coverline: "Buy the wrong gas, seize your bike?" Rather frightening, eh? We wish we could say that it's some sort of scare tactic, but there seems to be a lot of truth in that statement, especially in parts of the country where methanol is readily available.

You probably know that for various reasons, gasohol—the legal 10 percent ethanol/90 percent gasoline mix available from the local gas pump in parts of the country—isn't really the hot setup for your two-stroke's racing engine. No problem, you say; you can stay away from gasohol, right? It's plainly marked at the pumps.

The problem is mixtures of gasoline and between five- and seven-percent methanol have been finding their way onto the market—unmarked. Most of the major oil manufacturers deny their fuels contain any alcohol unless they are labeled gasohol, according to Bob Wehman, president of Spectro Oils of America. Wehman researched the situation before starting a series of seminars Spectro

conducted at their own expense to warn the motorcycling public of the problem. And after talking to some other sources in the petroleum-refining industry, we found most people believe the root of the problem is not generally at the refinery or the corporate level.

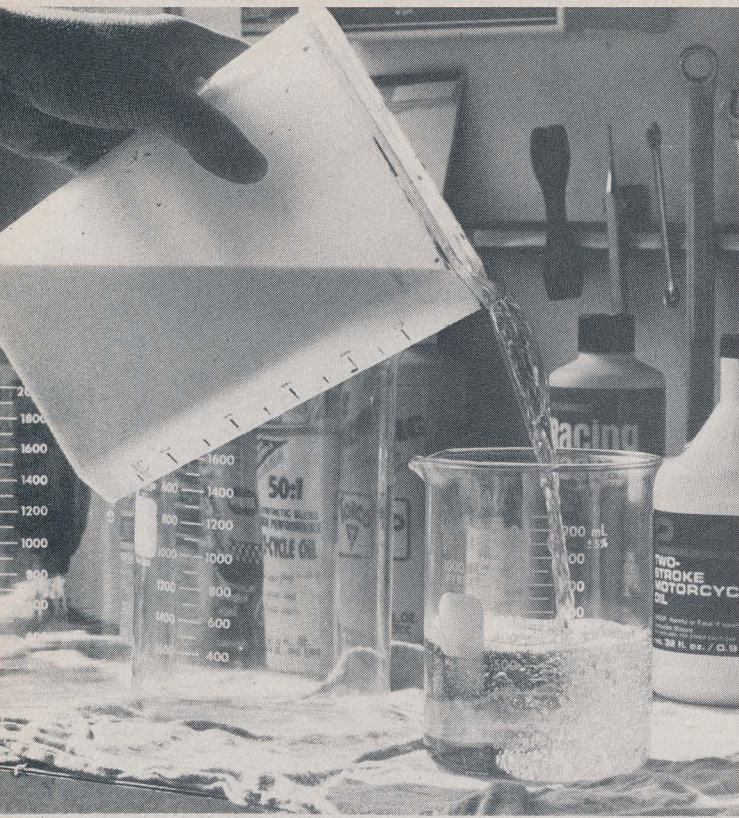
Methanol is refined from petroleum in a relatively expensive process, but in some areas of the country methanol is available for as little as 50 cents a gallon due to a glut. A gasoline supplier can pump his gasoline into a storage tank, then pump in a percentage of cheaper methanol. He can then sell the gasoline at the same price as pure gasoline. If his profit margin is normally 10 percent, he just increased it a little over three percent—that's \$250 on every 10,000 gallons of fuel! Obviously, this is just conjecture, but there are documented cases of this kind of alcohol contamination around the country.

Folks in the government know about these practices, but there doesn't seem to be anybody doing anything about it. Why? If you don't pause to think about

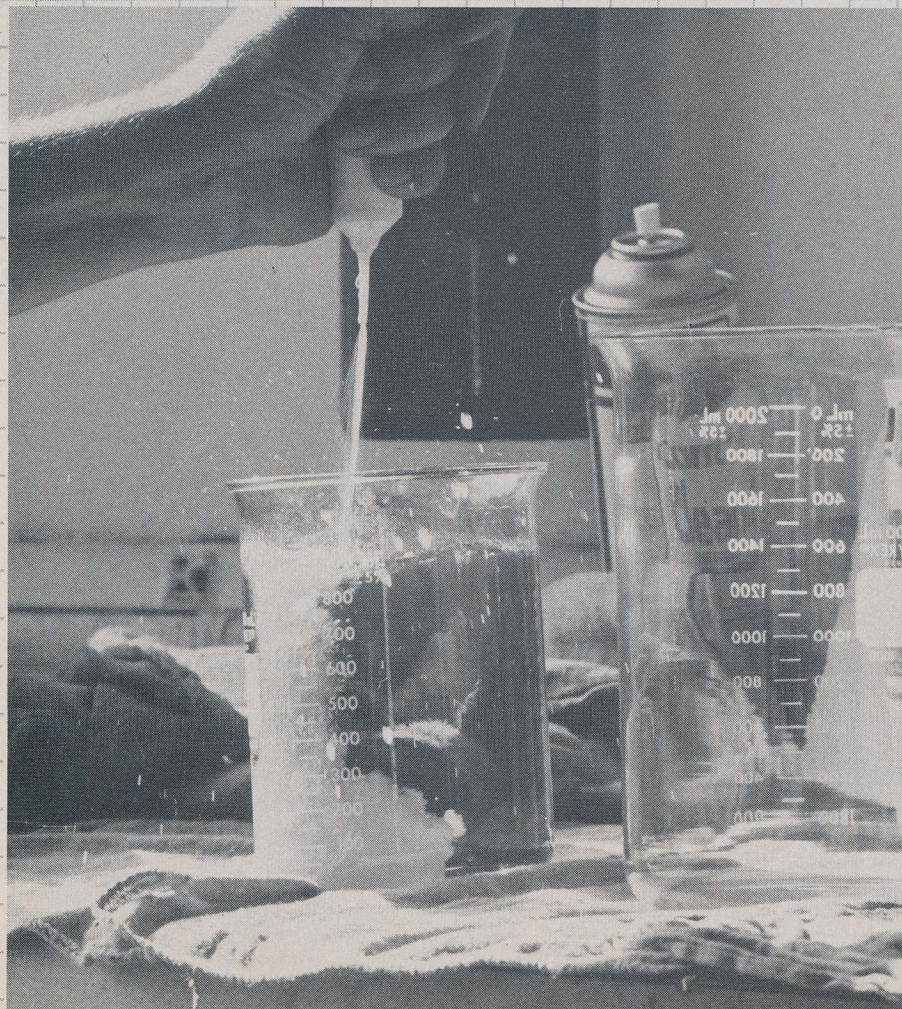
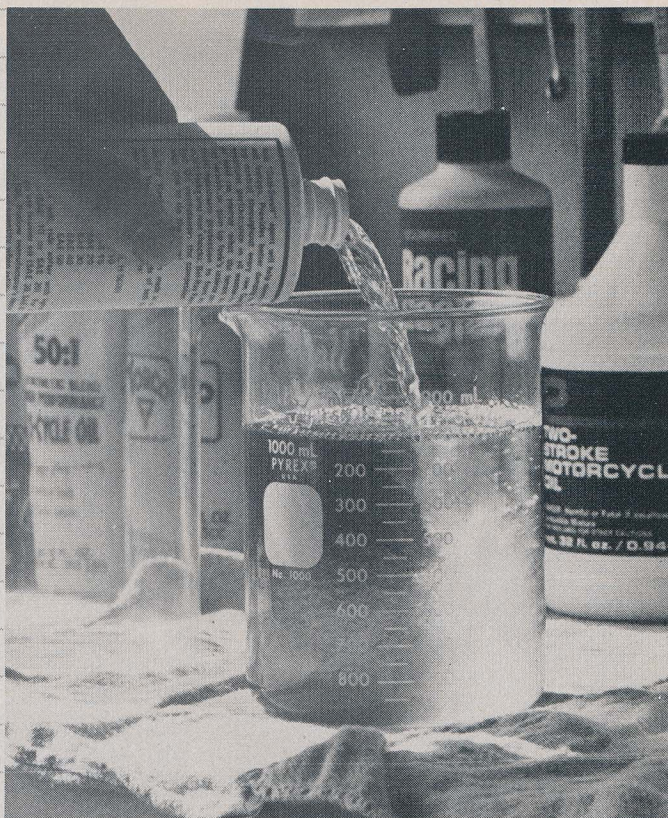
what it could do to your two-stroke, the mixture doesn't sound half bad. Whatever percentage of alcohol is burned, there's a larger percentage decrease in the exhaust chemicals that cause acid rain. We don't know the specific numbers, but seven percent alcohol in the fuel mix apparently produces 15 percent less pollution. Also, methanol has a higher octane rating, so a poorer quality of gasoline can be used without detonation or pinging.

So, what's the problem? You probably already know some of the consequences. If you ran the contaminated mix at an event with a fuel check, the mix would read illegal and you would be disqualified. Also, alcohol burns at a ratio of roughly seven parts air to one part fuel, while gasoline is roughly 15 to 1. If there is an alcohol mix, your jetting is instantly leaned out, maybe dangerously so. Alcohol is a solvent, thus it may compromise the ability of the oil in your fuel to lubricate, and engine wear can be accelerated. This is true in the case of four-stroke engines as well.

We tested a 50/50 mix of Mobil unleaded and regular.



Fuel methanol was added; the mix looked identical to straight gas.

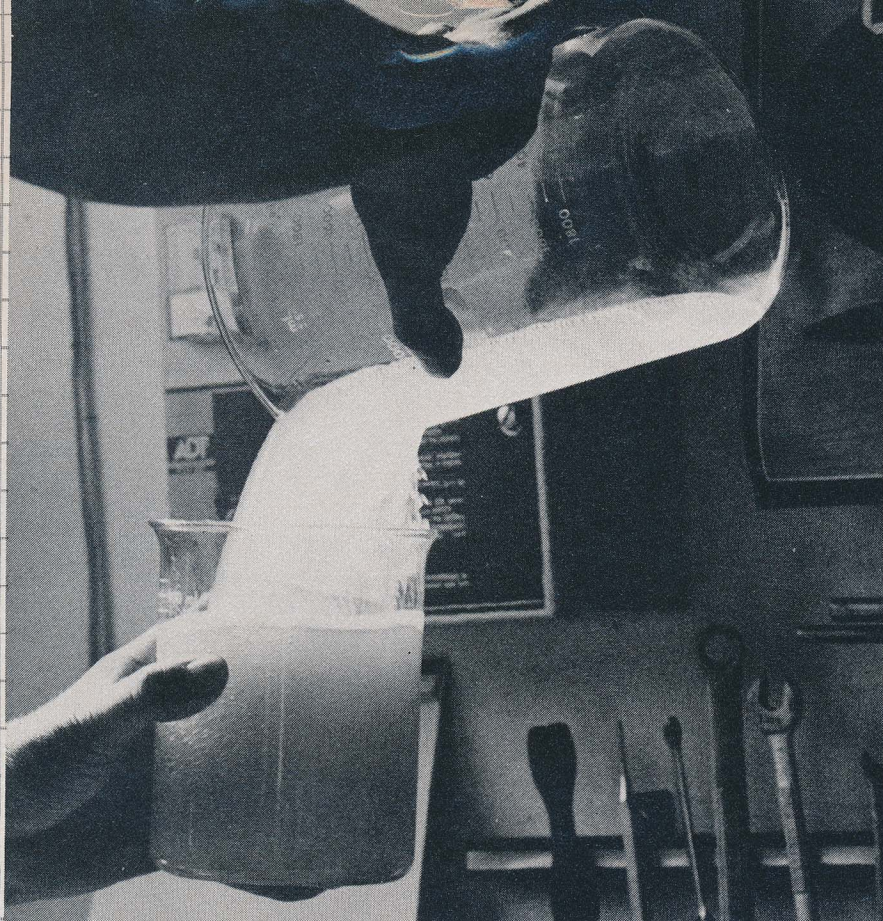


One to two percent water was added. We tried just a couple drops with a similar effect.

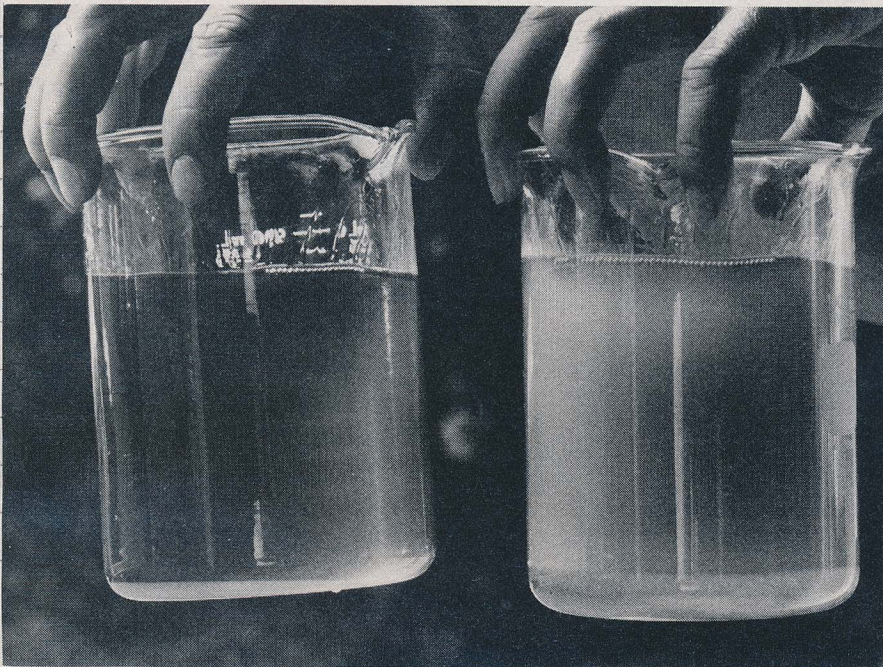
In spite of this bad news, the worst news involves a matter of chemistry. If you don't have other problems, just running a mixture of oil, alcohol and gasoline probably won't do much damage in one or two tankfuls, especially if you buy good gas the next time you fill up. However, as compatible as these three liquids are, they completely fall apart in the presence of water. If you have a gas/alcohol/oil mixture, as little as one half of one percent water added to the mixture will break it apart. The water and alcohol mix fall to the bottom, while the good, clean, usable gas/oil mixture rises to the top. Unfortunately the fuel petcock on your bike is at the bottom of your tank! If you encounter that kind of separation, your engine will run on the straight alcohol/water mixture—hardly the last word in lubrication. You can expect to seize your bike's crank bearings, rod and rod bearing and the piston all at the same instant. That's not fun.

While alcohol will mix with gasoline, it mixes better with water. Both water and alcohol have polar molecules, while gasoline has a non-polar makeup. No need for fancy explanations here, just remember that polar molecules attract each other more than polar/non-polar. Alcohol is strongly polar and will even pull water molecules right out of the air! If not stored correctly, the alcohol can have enough water in it from the start to cause the adverse reaction.

If you haven't heard of a single grand seizure in your part of the country, the gasoline in your area is probably fine. If



Vigorous agitation is needed for full separation to occur. Then the separation is readily seen.



A marked difference was seen when water was added to two fuel mixes, one of which (right) had alcohol; the other (left) had only pre-mix.

you have heard of some, then there is a way to test the gas you use. Mix up your normal pre-mix before a ride, pour about a quart into a clear container, then add about an eyedropper full of water. Shake the mixture vigorously, then let it sit. You'll see a separation almost immediately if the mixture is contaminated. Naturally, if there are more than a few drops of clear liquid at the bottom, there is alco-

hol present. If the gas is good, the water will quickly settle to the bottom and the mixture will return to its normal color. You can then pour the bad gas into the family car, or pour more water in the can and shake it up. Let it sit for an hour or so; the top 80 percent can be poured off and used.

This lazy man's check will work every time you ride. Use the same gas and two-

DOES OIL MAKE A DIFFERENCE?



Testing showed that none of the oils were able to prevent alcohol separation.

Once the gasoline seminars by Spectro Oils of America were over, we started hearing claims from manufacturers that mixes of gasoline, alcohol and their brand of oil would be stable—even in the event of water contamination. We wanted to substantiate these claims, but we didn't want to "pick on" specific companies. We wanted to give our readers the best chance of having safe fuel.

First, we purchased every brand of two-stroke oil we could find. Then, we mixed gasoline with slightly less than 10 percent methanol. (We used fuel methanol; since it might have chemicals added to make it compatible with fuels, it would be less prone, if anything, to separation than what a person might find at the pumps.)

We added the two-stroke oils to the mix in their makers' suggested ratios, then added 10cc of water. After the mixture was agitated, we waited to see a separation. Naturally, if there was more than 10cc of clear liquid in the bottom, the alcohol had fallen out. Every oil we tested suffered separation with the introduction of water.

Since we used castor- and petroleum-based oils, as well as those called synthetics, we have to say that no oil can prevent this breakup. The culprit is molecular attraction, which is greater between water and methanol than between methanol and gasoline. The specific oils we tested are listed below.

CASTOR-BASED OILS

Maxima Racing
Castor
Blendzall

Klotz
Golden Spectro
Yamalube R
Hondaline
Maxima Super M
Kal-Gard 2
Duralube
HPS

MINERAL-BASED OILS

Torco T2
Torco GP-7

Penzoi Two-stroke
Bardahl
PJ1 Goldfire
Kawasaki K2

stroke oil whenever possible, and use an oil with a strong dye or color to it. Then get to know what your brand of pre-mix looks like. Any time you've fueled, and the bike has had a chance to sit for a few minutes before riding, pull the fuel line and drain a sample of the fuel into some clear container. If the liquid is clear, the fuel is contaminated; if not, get your gear on and gas it!

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