

RACE TESTING HONDA'S 125

POPULAR

34120 OCTOBER 1976 \$1.00

CYCLING IND

**RIDING THE
PRO RACE
CIRCUIT
ON \$300**

**WORLD MX
COVERAGE!**

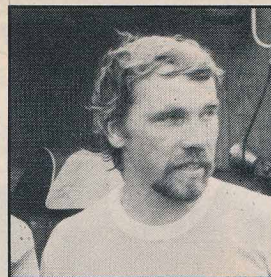
**DO IT
YOURSELF
WHEEL
CHANGING!**

**4 MINUTE
TIRE CHANGES!**



C0677 1206 4206 51 0180
J TIMM
RR 1
BRODHEAD WI 53520

VOLUME 9, NUMBER 10
OCTOBER 1976



Cover:
Action from the U.S. Grand
Prix at Carlsbad, with Adolf
Weil and Tommy Croft.
Shot by Steve Reyes and
Ektachrome, loaded in a
6x7 Pentax.

Centerspread:
More race action from
Carlsbad—this time at the
start of the second moto.
Steve Reyes again doing
the honors.

POPULAR CYCLING

FEATURES

- 16 **THE MID-OHIO 125 U.S. GRAND PRIX**
Marty smokes 'em, Gaston wins crown.
- 28 **U.S. TWO-DAY QUALIFIER SERIES WRAP-UP**
Special tests, tire changes and lots of Pentons.
- 40 **1976 WOMEN'S NATIONALS**
The female half goes fast, too.
- 44 **PRIVATEERING THE NATIONALS**
Kenny Zahrt shows how it's done on \$300.
- 54 **UNITED STATES GRAND PRIX**
Dr. Wolsink does it again.
- 64 **YAMAHA IT 400 UPDATE**
A progress report after months of abuse.

ROAD TESTS

- 22 **THE 1976 HONDA 125 ELSINORE**
Running a low third in class.

TECHNICAL

- 34 **WHEEL LACING**
Cross-4, inside, 8-gauge . . .
- 48 **ON-THE-TRAIL TIRE REPAIR**
Fixing flats in the boonies.
- 51 **YAMAHA YZ 100 NOGUCHI REED AND CARB KIT**
Getting 125 power from your 100.
- 60 **YAMAHA'S WATER-COOLED OW FACTORY MOTOCROSSERS**
Liquid cooling for lightning speed.

DEPARTMENTS

- 6 **EXPRESSION CHAMBER**
Mailed messages, printed answers.
- 8 **ZIMMERMAN**
The death of fun motocross racing.
- 12 **INSIDE EUROPE**
World's best trials machines.
- 70 **BUYER'S GUIDE**
Where to spend your bucks.

STAFF

Editorial Director
George Elliott

Editor
Brad Zimmerman

Graphic Director
Gary Wallace

Photographic Director
Steve Reyes

Copy Editor
Julie Ryan

CORONADO BOOK
CORPORATION

President
Gordon Behn

Art Director
James P. McGowan

Advertising Director
Tom Culp

Advertising/Production
Administrator
Michael F. Grout

Advertising Coordinator
Gail A. Litt



POPULAR CYCLING is published monthly by CORONADO BOOK CORPORATION. Second class postage paid at Los Angeles, California, and at additional mailing offices. Executive, Editorial, Advertising and Circulation offices, 12301 Wilshire Blvd., Los Angeles, California 90025. Telephone (213) 820-3601. Single copy price \$1.00. Subscription rate in U.S.A. and possessions, 12 issues \$9.00, 24 issues \$17.00, 36 issues \$24.00. Canada and all other countries, 12 issues \$11.00, 24 issues \$21.00, 36 issues \$30.00. All editorial contributions should be accompanied by return postage. No responsibility is assumed for loss or damage to unsolicited contributions. This publication is purchased with the understanding that the information presented is from many sources from which there can be no warranty or responsibility by the Publisher as to accuracy or originality or completeness. Printed in U.S.A. Copyright 1976 by Coronado Book Corporation. Change of address: At least six weeks notice is required for a change of address. Please send both old and new addresses, together with an address label from a recent issue to POPULAR CYCLING, P.O. Box 49659, Los Angeles, California 90049. POSTMASTER: Please send Form 3579 to POPULAR CYCLING, P.O. Box 49659, Los Angeles, California 90049.

*From a distance,
the trickery
doesn't stand out.
Towards the
middle of a moto,
you'll visibly
notice the
difference in
engine
performance.*

Presently an
experiment,
possibly a
stock item in
the future.



YAMAHA'S WATER- COOLED OW FACTORY MOTO- CROSSERS

Will Prestone soon be
a major MX sponsor?

Since the Hoptown race at the beginning of this year's season, there have been as many different versions of how the water-cooled Yamahas work as there are magazines. Everybody has gone and written down what he or she thinks goes on inside the cases and cylinder. Unfortunately, most of the versions have been wrong.

Realizing that it's the biggest change for 125cc motocross machines this year, we decided to sit down with Bill Buchka. Bob Hannah's mechanic, and find out what really goes on inside the motorcycle, while also taking an overall look at the total bike.

First of all, the reason for the water cooling is obvious. As we mentioned in our Shinobi head article, water cooling is the best way to fight the problem of horsepower loss due to heat build-up in a two stroke. When the engine gets hot, it begins to slow down. Liquid cooling seems to be the answer.

The idea of water cooling the OW-27 (Yamaha's designated part number for the factory machines) has been used before by the factory on their TZ-type road racing machines. The methods and functions have simply been adapted to motocross usage.

In the OW model there is a mechanical pump, driven by a series of reduction gears, that is actuated off of the crank. When the engine turns over, the water pump does its thing.

To follow the water pattern, we'll begin at the radiator. When the bike is first started, the water is sitting in the radiator, cylinder, head and hoses. As the engine turns over, the water is circulated through the radiator. This is due to the pull of gravity, the fact that hot water rises and cold water sinks, and the mechanical workings of the pump. In the radiator it flows over a series of zig-zag channels where the air flowing over the fins as the bike goes forward, cools the water. From the top of the radiator on down, the water is fed through these tiny, little channels. The air blows over the outside of the channels, cooling the water. Just like in your family station wagon.

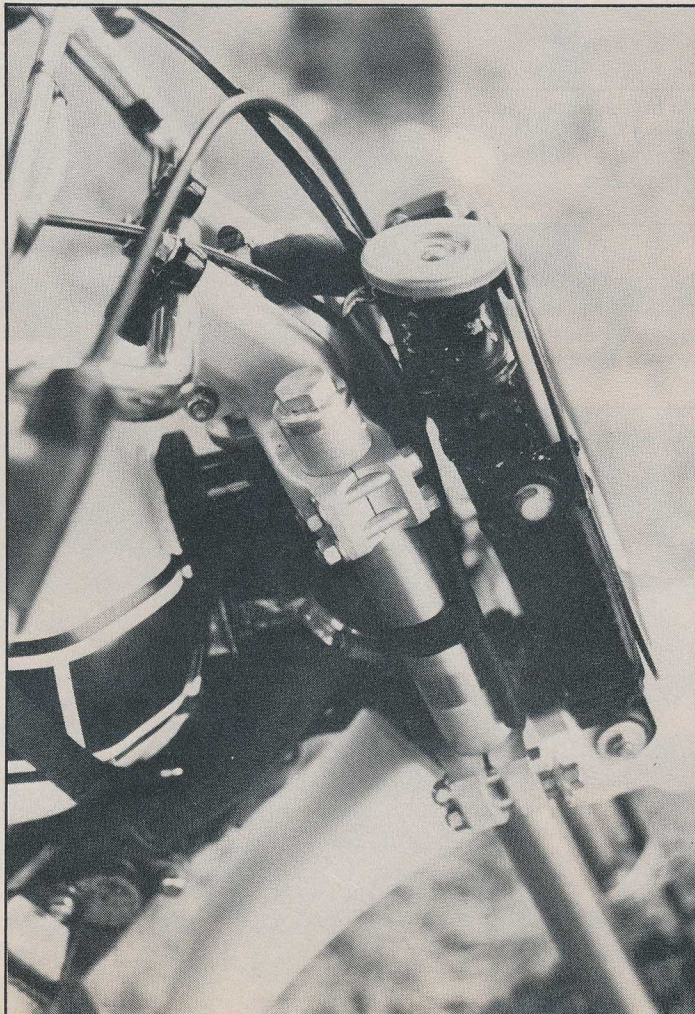
From the bottom of the radiator, the cooled water enters a hose that goes briefly into the steering head area. This is to avoid problems encountered while turning the machine. If the tubes only went from the radiator to the cylinder, when you turned the forks to the click stops, you might run the possibility of crimping a hose, thereby defeating your purpose. With the hoses routed briefly through the steering head, that problem disappears. The forks can't get to the hose and stop the liquid flow.

Once it clears the forks, the water exits out of the steering head via a hose that runs down the right side of the machine and into the right side case. Inside this case area is a water pump,



By Brad Zimmerman

Looking a little closer, you can see the radiator and accompanying hoses. Bill Buchka shows off his muscles lifting Bob Hannah's machine.



The radiator is less than 2 inches deep and about 8 inches long. You can also see the Pro Fab handlebar clamps and knurled fork legs.

driven by a series of reduction gears that are excited by the crank turning over. The water is then forced out of the case by the pump and makes its first entry into the cylinder by way of a spigot at the rear of the cylinder head.

Inside the cylinder head, the water first swirls around the top of the top end, cooling the rear of the engine block. Then, through a series of channels, it drops into the cylinder itself, working its way around the sleeve which houses the piston. Inside the cylinder area, the water eventually works its way towards the front, routes itself back into the cylinder head and exits the engine by way of a water

jacket found at the front of the cylinder head.

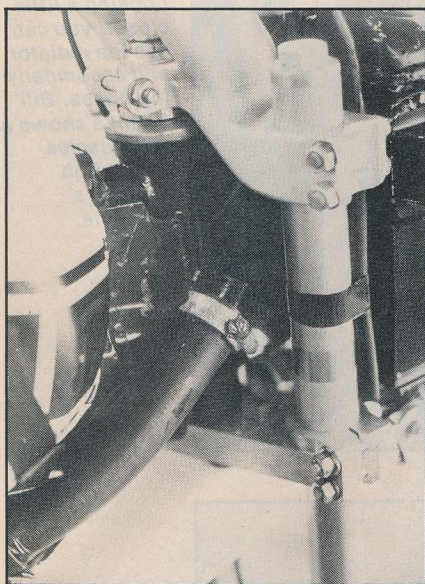
From there, it's back up the left side of the frame structure, through the steering head area again and back to the radiator again. The entire process doesn't take long. If you were to follow one small amount of water on its journey, you'd find that it's only about a 10 to 15 second trip at the very most. As the engine gets hotter, the rpms are turning faster. The water temperature rises, and its traveling speed is gradually increased.

The advantages of the water cooling system are obvious. First of all, the bike will run stronger and longer with this

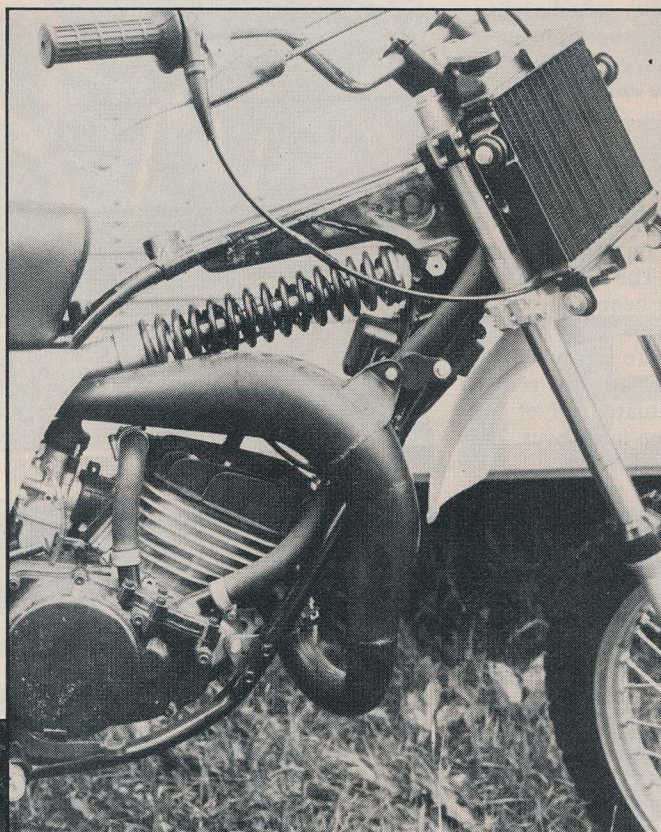
system. Although its performance is almost identical to an air-cooled engine in the first stages of warm-up, the real difference begins to show up when the machine is warmed to normal operating temperatures.

An air-cooled engine loses about 20 percent of its potential horsepower due to the heat build-up. The water-cooled engine, although it does suffer slightly from the heat, only loses about 3 percent of its horsepower abilities. When you're looking at a machine that puts out somewhere between 25 and 30 hp on a motocross track, a 3 percent loss is almost insignificant.

There are other little goodies you can
Continued on page 72

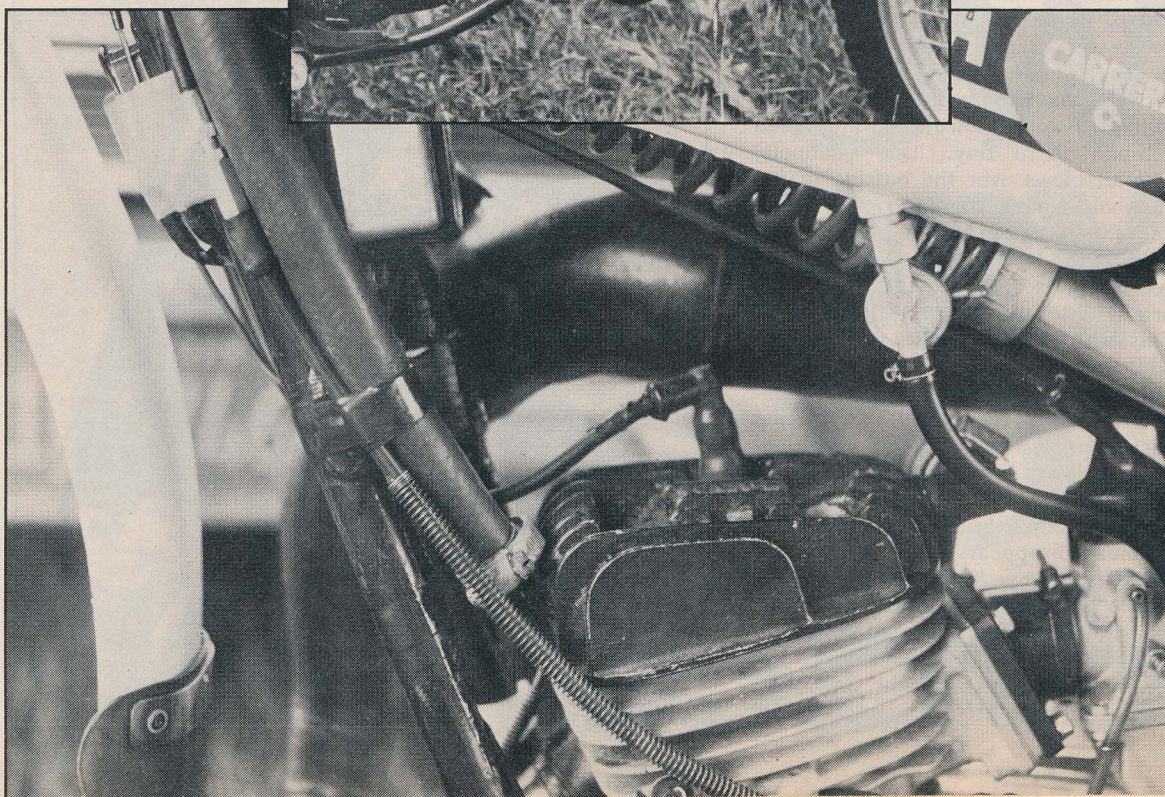


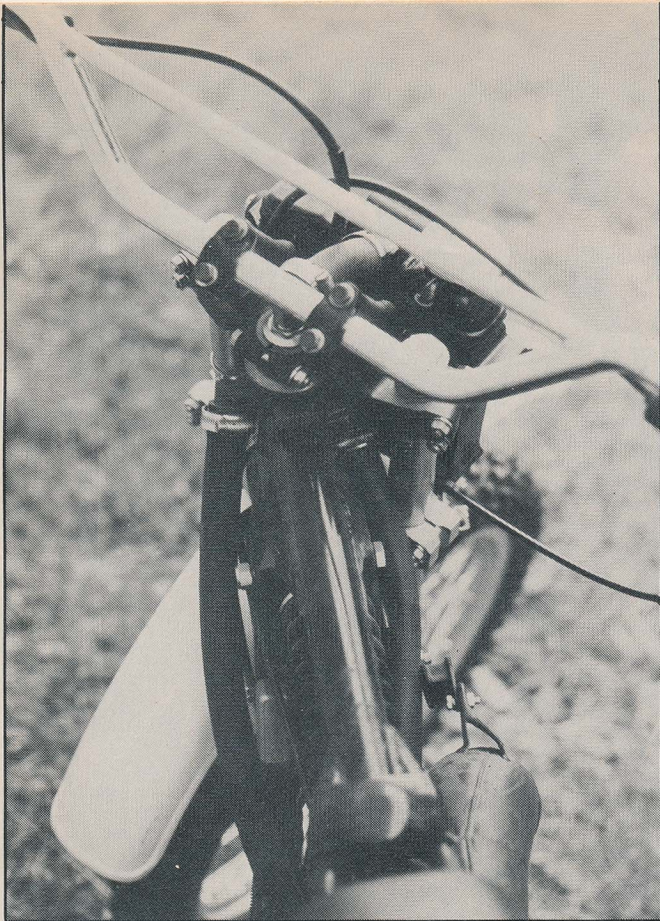
After being cooled in the radiator, the water enters the steering head for fork clearance, then exits out the right and heads down toward the pump.



Run by a set of gears connected to the crank, the pump, located behind the right side case, forces the water up and into the rear of the cylinder head.

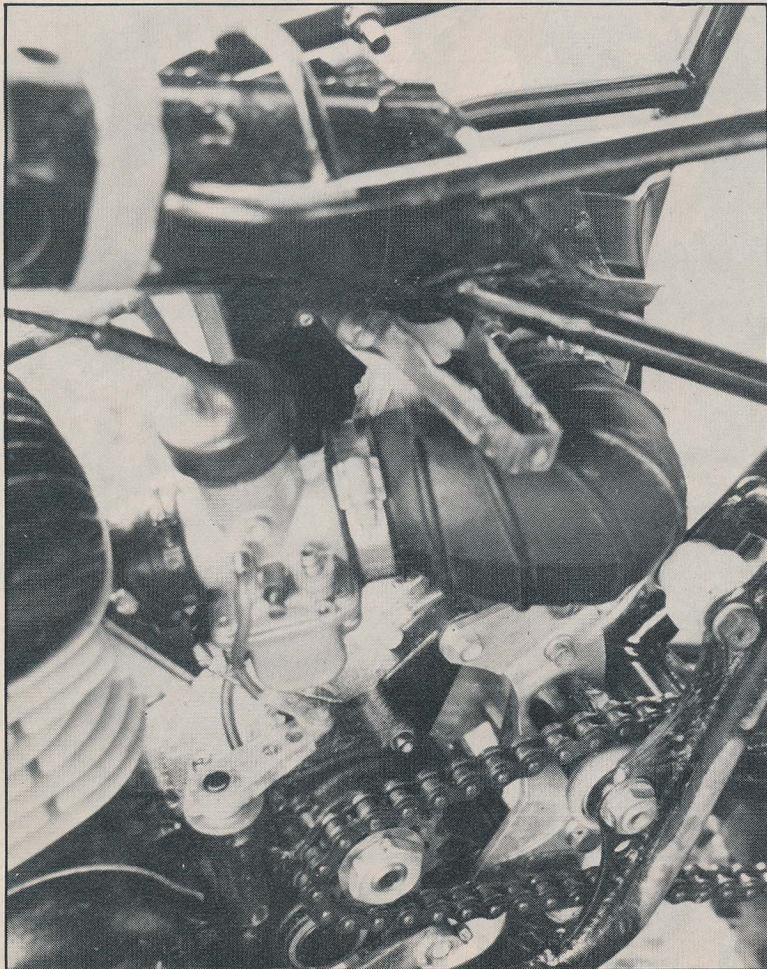
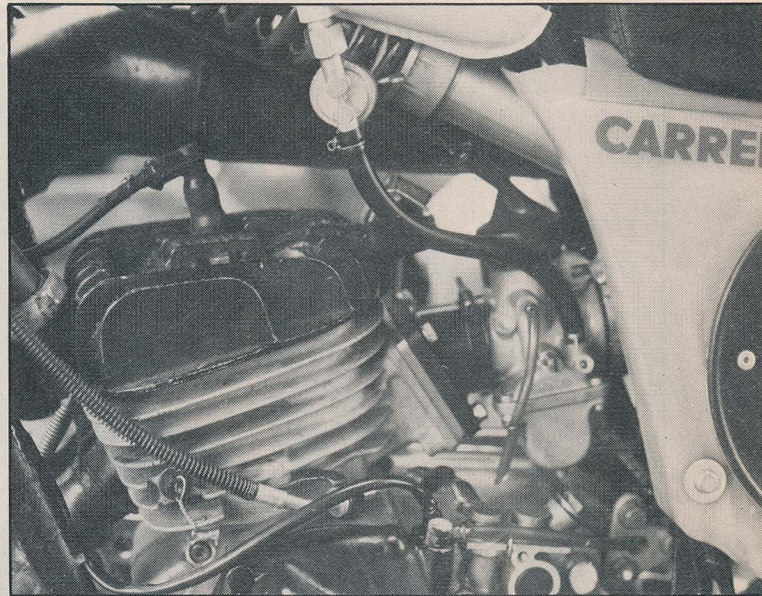
After going through both the head and the cylinder, the water exits out the front of the head toward the left and gets routed back to the steering head and into the radiator to be re-cooled.



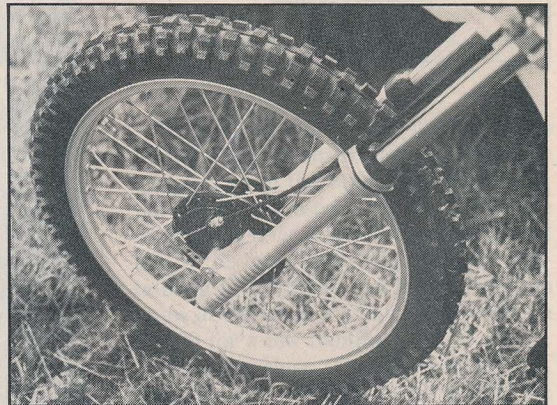


Looking down from above, you can see the water's pathways and how the steering head comes into play. The hose going from the radiator to the top of the steering head is outgoing; the hose on the left is returning water.

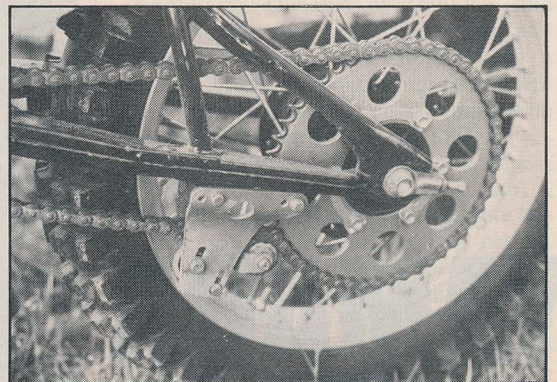
Even though there is a lot going on inside, the cylinder doesn't look any larger than stock. Unfortunately, the stud pattern is different, so you can't plonk one of these down on your stocker.



The new airbox design, now being tested on the 250 and open class machines, is slated to appear on the 125 in the near future.



These forks, manufactured one at a time out of solid stock, probably cost more than your total motorcycle.



Another little goody is this combination chain guide and chain tensioner. So far it hasn't failed all season and would be a welcomed addition to production machinery. Note, also, the thinner than normal tubing that comprises the frame.

MOTO-X FOX TRIX FOR 1976



"All the trix for '76"

Mail coupon and \$1.00 to:



MOTO-X FOX

520 McGLINCY LANE CAMPBELL
CALIFORNIA 95008 (408) 371-1221

Please send your '76 catalog to:

Name _____
Address _____
City _____
State _____ Zip _____

Custom designed
EMBLEMS-DECALS-JACKETS
Inexpensive. No minimum quantity on embroidered emblems. Write today for FREE CATALOG. Complete details, design help included.
SOUTHERN EMBLEM
P.O. Box 8 P C Toast, N.C. 27049

**BSA Parts
Kawasaki Parts**
SHIPPED SAME DAY
Box 81 Rte 1A
NORFOLK Norfolk, MA 02056
MOTORCYCLES Call (617) 384-7555

5 SKINNY FAT TANK SYSTEMS TO FIT MOST DIRT BIKES! SEND \$0. FOR STICKER AND CATALOG OF PLASTIC TANKS USED BY WINNING RIDERS.
DON VESCO PRODUCTS, INC.
7565 NORTH AVENUE
LEMON GROVE, CA. 92045

VANS CAR CHOPPERS
Learn at Home! CUSTOMIZING INSIDE and OUT!
SAVE BY DOING YOUR OWN — make money customizing for others. Learn how professionals create wild designs... flames, murals, portholes, scoops, carpeting, upholstery, etc. Tools included. Learn all at home for only a few dollars a month. Rush name, address, zip, state, age. No salesman will call.
FREE CUSTOMIZING COLOR BROCHURE
"Careers Through Home Study"
CUSTOMIZING CENTER 4401 Birch St., Dept. EDO96 Newport Beach, CA 92663

WATER-COOLED

get away with in a water-cooled situation. The carburetion is the first to be fiddled with. The OW Yamaha machines have had their main jets lowered at least four sizes, and the slide, needle and needle jet are all changed. The nice thing about the water-cooled engine is that carburetion is basically stabilized into a controlled situation.

Also, the compression ratio of the machine can be pumped up much higher than usual. You're also running less of a risk of engine seizure, rings sticking and bearing failures. Basically, the powerplant, although it isn't bullet-proof, will last longer than an air-cooled unit with the same horsepower ratings.

You'd think that the water-cooled system would weigh a lot more than a similar machine that is air-cooled. It does, but at the same time you've got to remember that Yamaha has the resources to compensate for this additional weight by lightening other components on the machine. When put through weigh-in, their bikes have been right down there at the minimum weight in the past. With the water-cooled system added, it's simply a matter of taking off weight in other areas to compensate for the additional taxation.

There are a few disadvantages of the water cooling system. If, for example, the water pump itself were to give up the ghost, the bike could get to the point of overheating. But due to the fact that the water itself (because it's being constantly cooled and heated) is traveling normally up and down both sides of the radiator, the bike could continue its cooling cycle without the aid of the mechanical pump.

Also, the engine still has the cooling fins in existence. Even though the carburetion is very lean compared to an air-cooled system, the bike could still probably get by through the combination of water and air finned cooling and continue to run.

The only mishap so far happened to Bill Buchka during a tuning run on a Friday before the race when one hose came loose from a spigot and poured very warm water on him. Other than that, the water-cooled system has worked satisfactorily.

Looking at the rest of the machine, you'll find that it still has those exotic parts that normal competitors can't afford or can't find. For instance, the offset forks on the Yamaha machines are made out of solid block aluminum and would run about \$1,500 to make yourself. Then, you'd have to go to the expense of finding the internal parts to match. Not really what you'd call a feasible proposition.

The framework has been modified to accept the water cooling system, es-

pecially in the steering head area, where the problem of running warm and hot water around greased bearings without getting the bearings wet had to be conquered. Besides that, it's still the same OW frame we've all come to know and love.

The tubing is stronger than what you've got and lighter than you can find. The structure design is different, and the monoshock in the rear works better. Suspension travel out back works out to about 10½ inches, and the front forks are probably giving something in the same neighborhood of available travel.

A new airbox design is being tried out in the 250cc machines and will probably show up on the 125 racers in the near future. Instead of the usual split airbox, which snakes around the monoshock system and is prone to varying degrees of dust penetration, the 250 works machines are using an airbox system similar to that found on the Husky machines. The hose comes out of the carburetor and goes toward the right side of the machine where a single airbox unit houses a single dual element filter.

Supposedly, the monoshock system in the rear end is also very trick. There is some type of thermostatically controlled valving that controls the dampening characteristics of the machine. When the monoshock unit gets hot (thus, in theory, thinning down the oil viscosity), the valving apparatus narrows down or almost shrinks. This compensates for the oil's thinning out tendencies and keeps the dampening characteristics at a constantly identical rate.

Up front, the triple clamps are similar to those available to the public through Pro-Fab. They move the handlebars back closer toward the rider, compensating for each individual's style and the physical demands. You'll also find magnesium hubs and a different set of gears inside the box (still six-speed, but varying ratios according to each track). A better shifting mechanism allows the rider to shift the machine up a gear while leaving the throttle in the wide open position.

The most important thing about these OW models is the fact that Yamaha is experimenting with their motocross team on a new concept for motocross racing. For all of you asphalt racers, you already know that the Yamaha factory experimented with a water-cooled engine on their TZ road racers and then made the machines available to the public soon afterwards. It's commendable to see a factory experimenting with a new idea for the motocross field. It wouldn't be very surprising if we were offered the same thing soon in the new line of motocross machines. You don't do this much experimentation just for the fun of it.