

Good Sports: The '95 Lakota



by Patrick Kelly
Instructional Designer/
Instructor

With all the hoopla surrounding the introduction of Kawasaki's exciting new watercraft and motorcycles, the KEF300-A1's debut might be easy to miss. But it deserves its own moment in the spotlight.

The Lakota is Kawasaki's first entry into the burgeoning sporting utility class of ATV. The Lakota offers the consumer a single ATV on which to perform work or leisure activities. Its long-travel suspension and excellent power delivery are well suited to sporting use, while its front and rear racks (rack capacity 44lbs. front; 66lbs. rear), optional trailer hitch (towing capacity 650lbs.) and automatic clutches are perfect for those more utilitarian needs.

Chassis

The chassis of the '95 Lakota is based on the popular, sport-oriented Mojave 250. The frame is nearly identical, except for additional bracketry for the racks and a battery box—the Lakota is electric start. The suspension (double wishbone up front and a solid axle with a swingarm and Uni-Trak out back) is identical to the KSF250's, right down to spring and damping rates.

THEORY

What is horsepower?

Nearly every technical article ever written about motorcycles and watercraft mentions horsepower. In fact, horsepower is often the most talked-about item: How much horsepower does it have? How did the engineers get that much horsepower out of the engine? How does its horsepower make the product perform?—those are all familiar questions.

But, just what is "horsepower," and what is its

relationship to another oft-mentioned unit of measure, "torque"?

Before we can define horsepower, we must define torque. Torque is simply "rotational force." It can be measured in many different units, but the one most of us are familiar with is ft/lbs. If we apply 10lbs of force at a distance of 1ft from the axis of rotation, that is 10 ft/lbs of torque. If we apply 1lb of rotational force at a

distance 10ft from the axis of rotation, that is also 10 ft/lbs of torque.

But remember that torque can be applied without actual movement, so torque alone tells us nothing about how much real work is being done. "Work" in this instance is the product of a force and the distance through which it acts. If there is no movement, then there is no work.

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CONTINUED ON PAGE 2

ROUTE LIST: SERVICE PARTS SALES
PLEASE RETURN TO SERVICE LIBRARY

Inside!

■ Service tips & more!

Lakota

CONTINUED FROM PAGE 1

The main chassis difference between the two models is the swingarm: The Lakota's swingarm is longer than the Mojave's to lengthen the wheelbase by 0.6in. The longer wheelbase makes the Lakota's handling characteristics more suited to its role as a sporting utility machine.

The new KEF300's brakes (hydraulic front disc for each front wheel and a single disc on the rear axle) are also the same as the KSF's brakes and provide plenty of stopping power.

The chassis rolls on larger tires than the Mojave's. Although the Lakota's steel wheels are the same diameter as on the KSF model, the front tires are one inch larger in diameter and one inch wider; the rears are the same overall diameter and one inch wider. The larger tires are better suited to the demands of utility usage.

Engine

The Lakota's engine is adapted from the Bayou 300. It is a single cylinder, air-cooled engine with a single overhead camshaft. Its single intake valve and single exhaust valve are

operated by rocker arms with screw and locknut lash adjusters.

Adaptations to the engine include a new camshaft to change the engine's power characteristics. Duration goes up 12° on both the intake and exhaust cam lobes for a total of 272°. Lift for both valves also goes up 0.3mm, to 8.3mm. These changes to the camshaft profile increase the engine's power output and move the power further up the rpm range, making the power delivery more sporting, yet still useful for utility use. Peak horsepower goes from the Bayou's 19.5 hp at

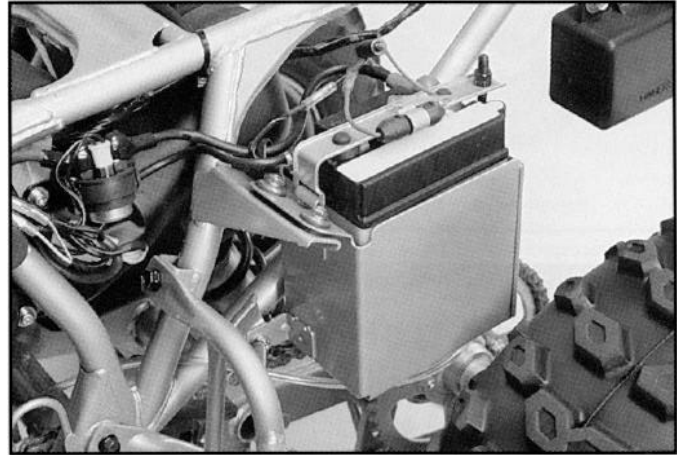
6500 rpm to the Lakota's 21.5 hp at 7000 rpm.

The other major change to the engine is to accommodate the Lakota's chain final drive, used in place of the Bayou's shaft final drive. Chain drive is lighter and works better with the Lakota's long-travel suspension than shaft final drive would. Chain final drive is also more efficient than shaft, so more of the engine's power ends up at the rear wheels.

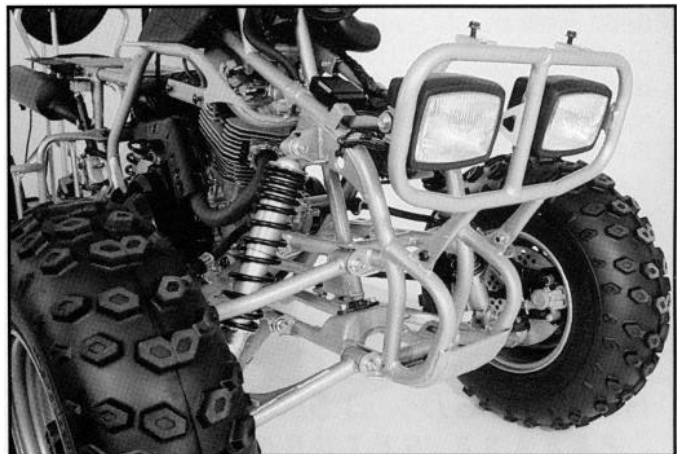
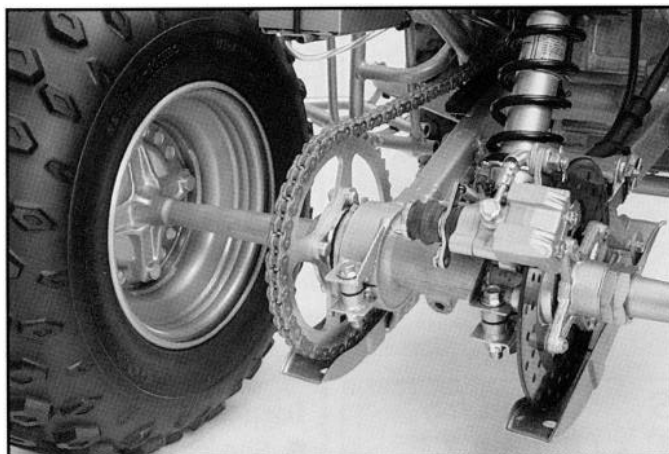
The Lakota: able to work during the week and play on the weekend. It's a versatile and exciting ATV that is sure to generate a little hoopla all its own. □



(ABOVE) Engine is adapted from Bayou 300 but has a different cam. (BELOW) Chain final drive is lighter than shaft and works well with Lakota's long-travel suspension.



(ABOVE) Frame design on the electric-start Lakota is borrowed from the sporting Mojave 250. (BELOW) Double wishbone front suspension is also identical to KSF250.



New phone system for toll-free numbers

We call it "Computer Telephone Integration." If you have called the Hot Line in the last few weeks, you might have noticed a few minor changes in how the phones work.

For instance, if you call from your dealership, the technician who answers

the phone here on the Hot Line already knows where you are calling from. You also have the option to put in a log number at your phone and, when the technician answers, he will have that log report in front of him.

These changes and others are the result of a

new system that routes every Hot Line call through a mainframe computer. This identifies the calling phone number and dealer the same way the computer at the other end of "9-1-1" knows who is calling. (If you are not calling from the phone at your shop, you'll

have to enter your dealer number first to get in.)

This new phone system gives us the ability to analyze many aspects of the Hot Line that, until now, were "invisible." Result? We'll be able to make the Hot Line service faster and more efficient than it is today. □

COVER FEATURE

Horsepower

CONTINUED FROM PAGE 1

Horsepower (hp) is a calculation of the rate at which work is being done.

The unit of measure called horsepower has been around a long time. It was originated by James Watt, an early pioneer in the development of the steam engine. He needed a way to compare an engine's efficiency with the amount of work a horse could do (the former designed to replace the latter in many work situations.)

Watt determined that a horse, working at a steady rate, could perform about 550ft/lbs per second of work. This means the average horse could lift 550lbs to a height of 1ft in one second. That is the equivalent of lifting 33,000 pounds to a height of one foot in one minute. So, one horsepower is equal to 550 ft/lbs per second or 33,000 ft/lbs per minute.

Now we can see that horsepower is a measure of torque applied in a given amount of time. The mathematical formula for horsepower further clarifies this.

By looking at this formula, we can see that an increase in either torque or rpm will increase hp:

$$HP = \frac{\text{Torque} \times \text{rpm}}{5252}$$

The speed, measured in rpm, at which an engine reaches peak hp is always at, or in most cases above, the rpm at which the engine reaches peak torque. Horsepower rises as torque and rpm rise,

to allow hp to continue to rise as rpm increases.

The engine reaches its horsepower peak when the torque output falls fast enough to overcome any further increase in rpm.

If two engines have similar torque outputs, the one that makes its torque at a higher rpm will also make the most horsepower. For example, both the ZX1100-D engine and the new JH900-A engine

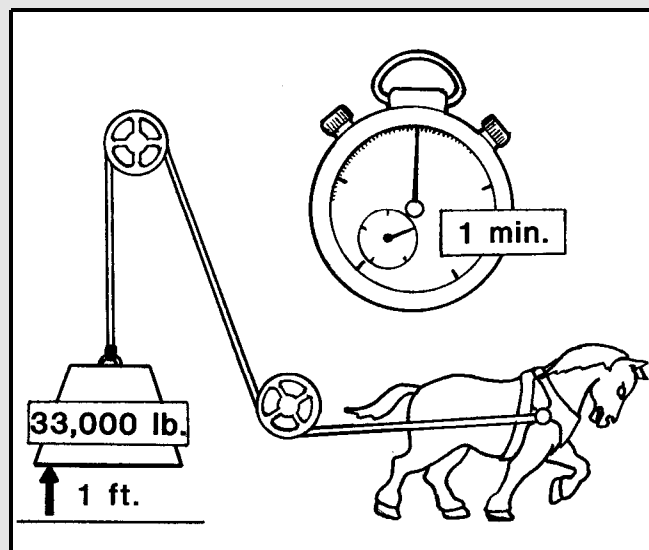
The ZX-11 engine produces a peak hp of 147 at 10,500rpm while the JH900 produces 100hp at 6750rpm.

The more hp an engine produces, the faster it can perform work. For a street bike, that means quicker acceleration and faster quarter-mile times. But, the amount of horsepower is not always the most important thing. For example, on a MULE™ utility vehicle, plenty of low-rpm torque is required for hauling heavy loads from a standing start. MULE engines, therefore, are designed to operate most efficiently and develop peak torque at low rpm, and this results in a smaller amount of peak hp.

Horsepower advantage or no, your average, big-hp motorcycle engine would have a hard time dealing with a fully loaded MULE and trailer!

Remember, work is the product of a force and the distance through which it acts; horsepower is a measure of the rate at which work is done.

—Patrick Kelly



but even after the engine's torque has peaked, hp usually continues to rise. This is because when torque first begins to drop off, it does so gradually enough

produce 81ft/lbs of torque. The ZX-11 engine makes 81ft/lbs of torque at 8500 rpm while the JH900-A engine makes its 81ft/lbs of torque at just 6000rpm.

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Congrats, Service Contest No. 1 Winners!

The results of the first '94-'95 Kawasaki Service Contest are in: A total of 40 technicians passed the test see the list of winners on Page 6) and qualified for the top award, a cordless

butane-powered soldering iron from Snap-On.

In order to maximize the number of people who qualified for the award, the passing level was lowered to 80 percent from the

previously announced 85 percent. The remaining tests in this series will also have passing levels of 80 percent.

Even if you didn't quite "pass" this one, don't give up! The grand prize winner will be determined from the cumulative score from all three tests in the series.

The test in this issue covers the MULE™ and generator product lines. And while the test is open to all of our dealers, if you are a MULE- or generator-only dealer, now is the time to show your stuff.

Good luck! ☐



Service Contest No. 1 prize: a cordless, refillable, butane gas-powered soldering tool from Snap-On Tools.

SERVICE CONTEST

Contest No. 2

Part 2 of the Kawasaki Service contest, found in the middle of this issue of *K-Tech News*, covers MULEs and generators. (Next issue: the third and final quiz, covering JET SKI® watercraft.)

- Deadline for this second part of the contest is February 17.
- The contest is open to any Kawasaki dealership personnel.
- Contestant may use any materials and information available to answer the test questions.
- Send completed tests to: Service Contest No. 2, Kawasaki Motors Corp., U.S.A., 9950 Jeronimo Rd., Irvine, CA 92718. ☐

REGIONAL NEWS/SOUTH & CENTRAL

Growing pains (cont.)

CONTINUED FROM PAGE 12

ATVs. Those sales were good but even better was all the customers who were still coming in weeks later wanting and getting good deals, after hearing about the promotion.

Second growing pain: hiring enough employees. Kawasaki of Henderson opened with just three employees; now there are seven. Bill worked hard to find competent people just to keep up with the increase in business.

Third growing pain: finding ways to satisfy their customers. Customer satisfaction, of course, was not a new concept for either Dannheiser or Hodge.

As an example, they take all their new Jet Ski® watercraft customers to the

lake to familiarize them with the proper operation and controls of their new boat. The customer is assured of getting proper instruction and a good-running machine at the same time.

While they initially wanted to sell only ATVs, both John and Bill are pleasantly surprised by their success with other Kawasaki products: Their sales numbers for motorcycles, watercraft and, yes, ATVs, are near the top in their area.

What may seem like a pain, Hodge turns into a stepping stone of opportunity.

A wise man once said: "A little pain never hurt anybody"; it might even be good. Just ask John Dannheiser and Bill Hodge. ☐

PARTS

In search of ... old parts kits

We get quite a few calls on the Hot Line from dealers who want to order a parts *kit* from an old service bulletin but find that it's no longer available.

If this happens to you, don't panic until you have looked a little further into the bulletin. *Then* panic ...

Just kidding! In most cases, the individual parts for the kit are still available separately. A good example is the steering shaft kit listed on bulletin JS 91-03 for the 1991 X-2 watercraft. On the first page of the bulletin, under "Warranty Information," a single part number is listed for the "steering shaft assy." That

part number is no longer available. But this "assembly" is really a kit which contains the shaft, an o-ring and a washer. These three part numbers are listed separately on Page 3 of the bulletin under "Parts Information" and are still available.

The only catch is that usually the individual parts are more expensive than the kit was. For various reasons, kit prices are often kept artificially low.

In the case of a repair order or a warranty claim, be sure you list and price the parts individually if that's how you had to order them.—*Dave Behlings*

WARRANTY INFORMATION				
Trouble Code	Qty	Part Number	Description	Claim Type: 3
00	01	13310-3701	Shaft Assembly	Job Code: 22037 Time: 0.6 hr. Failure Date: Same as Repair Date

This is the information shown on Page 1 of the old JS 91-03 Service Bulletin ...

Parts Information

Description	Old P/N	New P/N
Shaft Assembly	N/A	13310-3701
Steering Shaft	13107-3722	13107-3728
Washer	92022-3757	92200-3722
O-Ring	670B2016	670B2020

... and this is the still-valid Part Number information listed on Page 3.

READERS NOTE: Service Contest No. 2 answer sheets are due February 17! (See Page 4.)

Micro-K: Index updates

by Dave Pyle
Parts Publications Specialist

In the last few months, you may have noticed a change in the Micro-K Index. We now have so many microfiche that the Index will not fit on a standard piece of paper, so we went up to legal size paper. This gives us room to make the print larger and easier to read, and to include some new information.

At the end of the Index is a handy listing of Micro-K Deck types and current prices, as well as a list of replacement lamps for

microfiche readers.

Have you misplaced your Micro-K Index? The K-FAX System now includes the Micro-K index as one of it's many documents. Just dial (714)-458-5663, follow the instructions, request document no. 2010, and the K-FAX system will send a sharp copy of the Micro-K index direct to your fax machine.

Please remember that if your fax number is new or has changed, you should call your Vehicle Order Desk representative and give him/her the updated information. ☐

K-FAX

Consumer information Sheets

You remember those pesky Consumer Information Sheets: They're the ones with all the braking distances for street-legal motorcycles.

Of course, all this data is also in the Owners Manual for each model, but federal law says you need to have information on all the bikes you sell available for any prospective customer to take out of the store with him or her.

Here are part numbers for the most recent sheets so you can order some (free of charge of course):

- 1995 P/N 99968-0095
- 1994 P/N 99968-0094
- 1993 P/N 99968-0093

(The '95 sheets are not out yet, but will be soon.)

There's an easier way now, however: K-FAX. You can use your telephone to call the K-FAX number and

order these forms for immediate delivery at your store via your friendly fax machine.

What's the procedure?

- 1) Dial (714) 458-5663;
- 2) Follow the easy voice prompts, entering the numbers on your touch-tone phone;

3) Select document number 3801 for the 1993 information or 3802 for the '94 stuff. The '95 info will be available soon as document number 3803;

- 4) Hang up and wait a minute ...

The fax that will soon be emerging from your machine is the Consumer Information Sheet you requested. It's easier than stocking them yourself and they don't get dusty or dog-eared on the shelf.

-Ray St. John

Service Contest No. 1 Winners

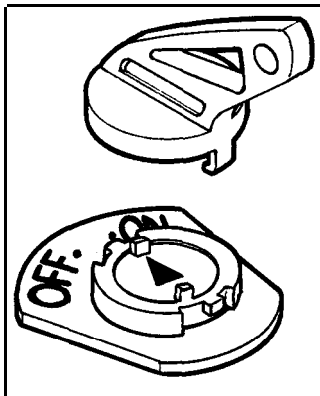
Rick Reed	Beaumont Kawasaki	Beaumont, Calif.
Martin Blais	Mid Cities Kawasaki	Paramount, Calif.
James Brantley Jr.	Regency Kawasaki	Jacksonville, Fla.
Daniel Harrington	Kawasaki of Ocala	Ocala, Fla.
John Donal Jr.	Illinois Kawasaki of Aurora	Aurora, Ill.
Paul Kole	Champion Cycle Center	Chicago, Ill.
Jose Rivera	Champion Cycle Center	Chicago, Ill.
Emmanuel Subida	Champion Cycle Center	Chicago, Ill.
Jose Vallejo	Champion Cycle Center	Chicago, Ill.
Tom Webber	Leer's Kawasaki	Waterloo, Iowa
Ken Gay	Shawnee Kawasaki	Shawnee, Kan.
Curtis Hillman	Shawnee Kawasaki	Shawnee, Kan.
Sean Kent	Shawnee Kawasaki	Shawnee, Kan.
Andy Reeves	Shawnee Kawasaki	Shawnee, Kan.
Jim Stuhr	Shawnee Kawasaki	Shawnee, Kan.
Joseph Stowell	Joe Brooks Kawasaki	Ionia, Mich.
Doug Engie	Northern Kawasaki	Cloquet, Minn.
Colin Hillman	Northern Kawasaki	Cloquet, Minn.
Jason Clymer	Jackson Cycle	Jackson, Minn.
Larry Clymer	Jackson Cycle	Jackson, Minn.
Mike Gregory	Jackson Cyde	Jackson, Minn.
Doug Farnen	Doug's Cycle Shop	Salisbury, Mo.
David Myers	Springfield Kawasaki	Springfield, Mo.
Ron Sainato	Springfield Kawasaki	Springfield, Mo.
Mark Carl	Steven's Motor Sports Inc.	Omaha, Neb.
David Kerschinske	Steven's Motor Sports Inc.	Omaha, Neb.
Damien Toy	Steven's Motor Sports Inc.	Omaha, Neb.
Michael Hansen	Kawasaki of Las Vegas	Las Vegas, Nev.
Panagiotis Vassilatos	Campus Cycle & Marine Kawasaki	Centereach, N.Y.
Rayburn Sumner	Forsyth Kawasaki	Winston-Salem, N.C.
Greg Becker	Big 4 Kawasaki	Marietta, Ohio
James White	Rehmert Cycle Sales	Versailles, Ohio
David Bjork	Capitol Kawasaki	Columbia, S.C.
Jim Tribou	Wayne's Cycle Kawasaki	Waynesboro, Va.
Stacey Cregger	Mark IV Kawasaki	Wytheville, Va.
Greg Deskins	Mark IV Kawasaki	Wytheville, Va.
Travis Jones	Mark IV Kawasaki	Wytheville, Va.
Todd Lytton	Mark IV Kawasaki	Wytheville, Va.
Terry Wolford	Mark IV Kawasaki	Wytheville, Va.
Dennis Burgess	Mac's Cycle	Clarkston, Wash.

Exploring the ZXi's new electrical system

by **Gregg Thompson**
Product Support Supervisor

The new ZXi watercraft (750 and 900) have electrical systems that are significantly different from the systems in our previous watercraft models. We think its worth spending a few minutes familiarizing yourself with the differences before the first time you get to work on one.

Possibly the most obvious difference is that both the new ZXi's have keyed ignition switches.



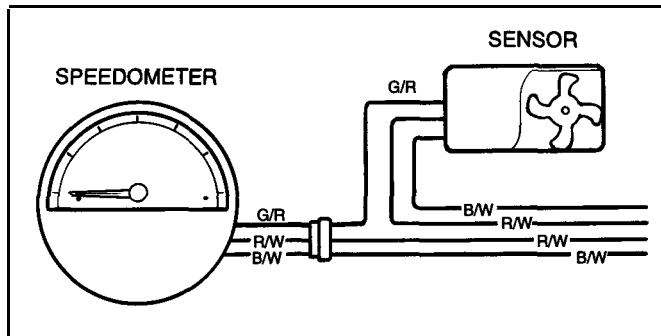
The vehicles won't start and run without the ignition switch being in the ON position. The switch uses a magnetic key that should be turned to the ON position and then removed and stowed while riding to prevent losing it. You need to be aware of this feature and **educate your customers** because if they forget to stow their key while riding, there is a very good chance they *will* lose it.

The lanyard and emergency stop switch function the same as on previous models.

Another obvious difference is that the ZXi's have

electric speedometers (see the "Speedometer" article elsewhere in this issue). This system consists of a sending unit (or sensor) mounted at the bottom rear edge of the hull next to the pump, and a large gauge in the instrument cluster.

On all other models with electric gauges and electric trim, these systems are switched on by an A/C signal from the alternator. Power and ground are connected to them all the time (engine running or not).



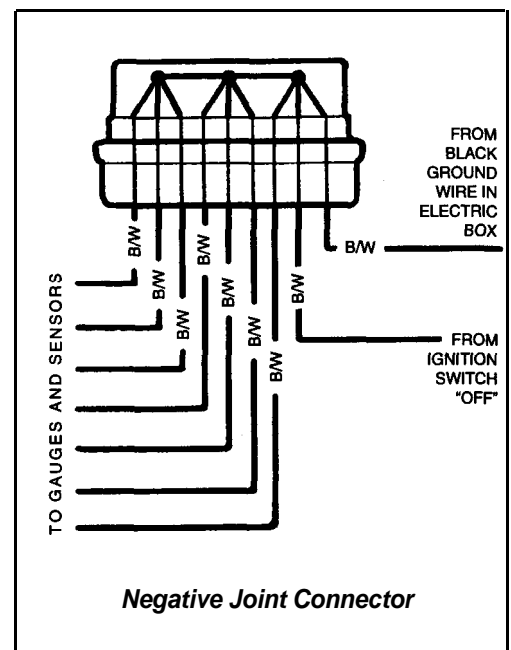
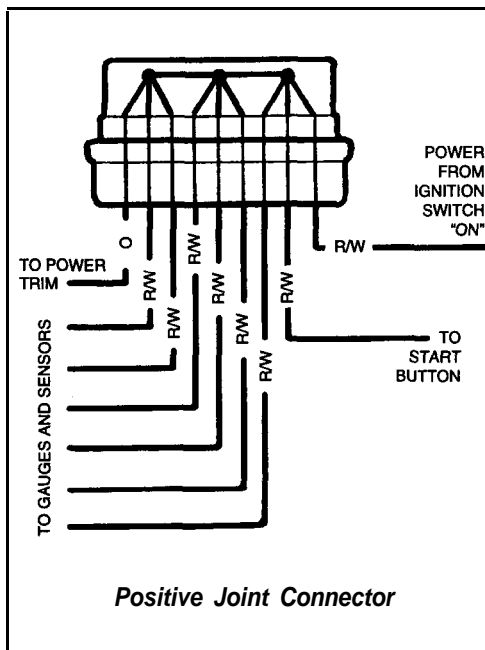
Both the gauge and sending unit receive power from the ignition switch through a joint connector, and are grounded to the electrical case through another joint connector. There is a single, green/red signal wire from the sensor to the gauge.

On the ZXi's, power is switched to all electrical systems by the ignition switch. There is no A/C signal to any of these components or systems. If the engine is turned off using the lanyard or emergency stop switch and the ignition switch is left on, the

gauges will stay on. The gauges draw significant power—almost 250 mA on the 900—which will run the battery down in a day or two. More customer education: "Don't forget to turn your ignition switch OFF."

There are two joint connectors (mentioned before) in the system. One of these large "gang plugs" connects a red/white power lead from the ignition switch to seven switched electrical components plus the engine start button. The other one connects a black/white ground lead (from the electrical case) to mostly the same electrical components.

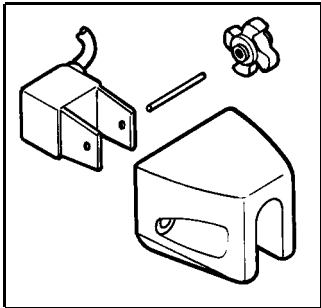
When the ignition switch is turned to the OFF position, it turns the engine off by grounding the igniter through this same joint connector. □



ZXi speedometer tips: Sensor height and fuzz crops

by **Kenny Osberg**
Product Support Specialist

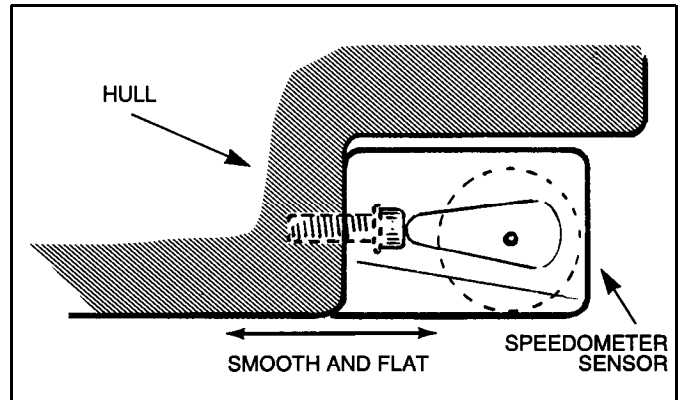
Kawasaki's two new ZXi Jet Ski® watercraft—the JH750-C1 and JH900-A1—are the first Kawasaki watercraft to come equipped with speedometers. I've spent a few weeks preparing and servicing some pre-production units here at KMC and, while working on them, I picked up a few service tips on the new speedometer system that I



can pass on to you.

One of the things we discovered about these speedometers is that they are very sensitive to proper speed sensor alignment. The bottom surface of the sensor body must be even with the bottom surface of the hull. We found that if the bottom of the sensor was lower than (i.e. below) the bottom of the hull, the speedo would not register speed above a certain point, usually around 30mph.

A speedo with this problem would appear to work normally up to about 30mph, and then suddenly drop to zero as the vehicle continued to accelerate to top speed. As the vehicle speed dropped below 30mph, the speedometer



would suddenly come back to life. If you run into this problem, know this: the transition from the hull to the sensor must be very smooth and flat.

We also discovered that the little paddle wheel in the sensor can get fouled with debris and dirt. The wheel should spin freely on its pin when you flick it with your finger. Each of the

paddles in the wheel has a magnet inside it, and they will collect iron particles from the water and the shore. Although this little crop of fuzz probably won't affect the operation of the speedo, it's a good idea to clean it off if you're down there inspecting the sensor. □

SERVICE TIP

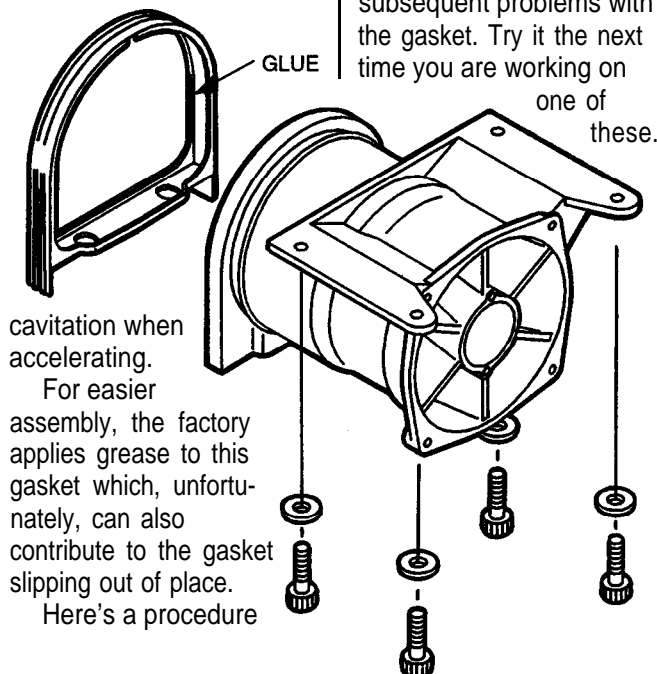
Beating the rubber gasket blues on 750 pump installation

All 750 Jet Ski® watercraft models *except* the new JH750-C1 ZXi have the same basic jet pump design. This features a large rubber gasket between the front of the pump housing and the hull.

The rubber gasket must seal well for the pump to function properly—especially while accelerating at low vehicle speeds. But the mounting bolts hold the pump up against the top of the pump cavity, not at the front, so very little clamping force is applied to the gasket.

Because of this light pressure on the gasket, it can sometimes get sucked

out from between the pump and hull, resulting in massive



cavitation when accelerating.

For easier assembly, the factory applies grease to this gasket which, unfortunately, can also contribute to the gasket slipping out of place.

Here's a procedure

for installing these pumps that should prevent any subsequent problems with the gasket. Try it the next time you are working on

one of these.

First, if you are reusing the old gasket, make sure you clean all the factory grease off it before installing it. Even a new gasket should probably be wiped with lacquer thinner or some other oil-free solvent.

Next, glue the gasket to the pump housing with crazy glue (cyanoacrylate). Now spray some very soapy water on the gasket and in the pump cavity of the hull. The soap will make it slippery for easy assembly but won't affect it later in use.

—Kenny Osberg

ZXi carb tuning x 3

by **Kenny Osberg**
Product Support Specialist

Kawasaki's new flagship, three-cylinder, 900cc water heater—the 900 ZXi—will surely trigger some fond (or maybe not so fond?) memories in some of you older Kawasaki mechanics.

When you pull the 900's flame arrester off for the first time and stare at those three separate carburetors feeding three separate two-stroke cylinders, you'll get what I mean.

Those of you who were around in the Kawasaki Triples' heydays will remember that to achieve a smooth, even idle and good, crisp throttle response, you had to get the carburetors nicely synchronized. This new water-cooled triple is a lot more civilized than those old air-cooled units, but it's still a lot happier when all three throttles are on the same plane.

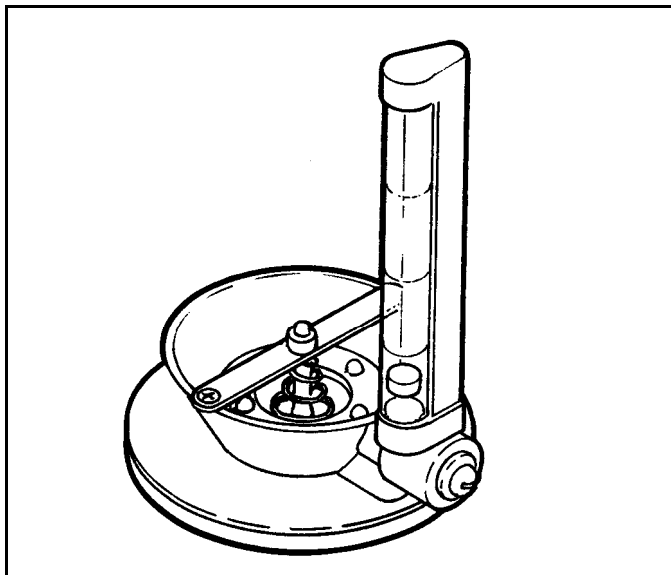
The happier that engine

is, of course, the happier your customers will be.

So how do you synchronize all those carbs? This is when the guy in your shop who's been wrenching on Kawasakis for two decades is going to come in handy. You'll want to rummage through the bottom drawer of his tool box for a handy little tool called a "Uni-Syn." This simple tool measures the air flow through a carburetor. There's no need for any vacuum fittings: Just place the Uni-Syn flat on the bell mouth of each carburetor and compare the readings.

Since this tool measures air flow instead of vacuum, opening the throttle raises the reading on the gauge and closing it lowers the reading. Increasing the idle speed will raise the reading on all the carburetors.

If no one in your shop has a Uni-Syn tool, we have tracked down the manufacturer and ordered a supply. The Kawasaki P/N is W56019-1120. □



HOT LINE KLF300 knocking noise

Twice in past issues we have printed an article entitled "KLF300: Don't knock these solutions" which discussed a couple of hard-to-find causes of engine noises in KLF300-B and -C models. The article was probably a little too long and possibly the title was a little too clever; either way, it seems the article has gone unnoticed by quite a few of you.

So here's the quick and dirty version of the story: KLF300's will sometimes have a *distinct knocking noise* from the engine caused by a defective IC igniter or a defective regulator/rectifier.

That's right: IC igniter or regulator/rectifier!

The knocking noise is heard most clearly on the right-hand side and sounds

like it's a bearing in the bottom end.

Typically, mechanics inspect the clutch and primary drive first and then split the cases looking for a rod or main bearing problem. **Nobody** goes right to the regulator/rectifier the first time they run into one of these (unless they've read one of the *K-Tech News* articles).

Lets face it, this is not a common solution to an engine knock! If you can remember this, though, it can save you a lot of time someday.

—Gregg Thompson



TIP A digital ignition tidbit

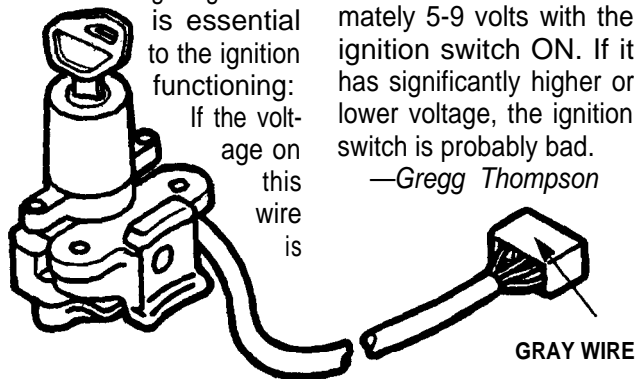
All of Kawasaki's motorcycles with Digital Ignition Systems have a gray wire going from the ignition switch to the igniter. This wire carries reduced voltage to the igniter—a voltage signal that

is essential to the ignition functioning: If the voltage on this wire is

high or too low, the ignition will not fire.

If you run into a "no-spark" situation on one of our digital igniter-equipped motorcycles, check this gray wire. It should have approximately 5-9 volts with the ignition switch ON. If it has significantly higher or lower voltage, the ignition switch is probably bad.

—Gregg Thompson



A transmission oil tip for the new KDX200-H1

by Gregg Thompson
Product Support Supervisor

The Service and Owners manuals for the new KDX200-H1 give a different procedure for changing the transmission oil than the KDX200-E1 manuals did. The procedure is different because the transmission/clutch oil system has been changed, and we think it's worth knowing a little more about it. So read on and we'll tell you about it.

In past KDX200's, the transmission gears have had a tendency to get dry and squeal if the bike was run on a smooth road (or on the bench) for an extended period of time. The transmission shafts didn't actually run in the oil, and without the bouncing and jostling that normally accompanies off-road riding, no oil would get splashed up onto the gears and shafts.

The fix on the run was to

go off the smooth road onto some rougher terrain for a short distance to splash some oil around in the transmission. The fix in the shop was simply to add some more oil (overfill the transmission slightly).

But there were two problems that resulted from overfilling the transmission. The most obvious was that more oil would come out of the crankcase breather when riding at high speeds. The crankcases are vented through the clutch cavity and out behind the kick-starter gear. The higher the oil level in the clutch cavity, the more likely it was to spit some out.

The less obvious problem that resulted from overfilling the transmission was the loss of power. It takes a lot of power to turn the clutch through a pool of oil. The deeper the pool, the more power it robs.

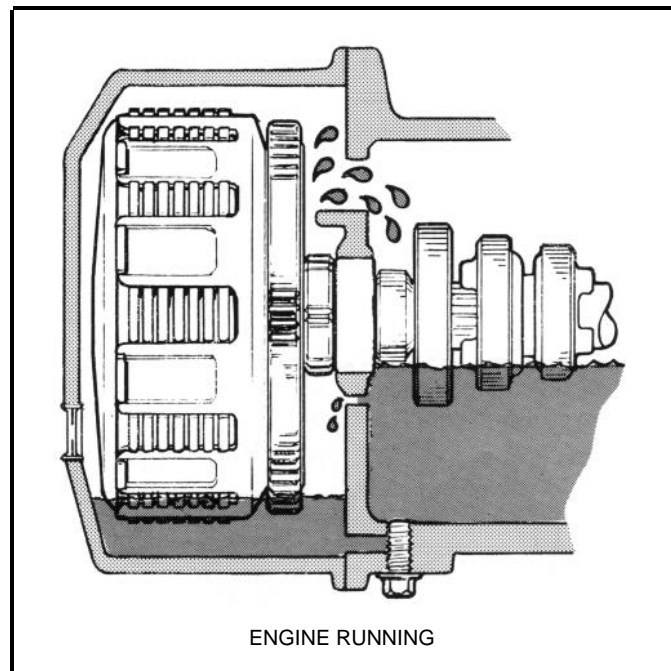
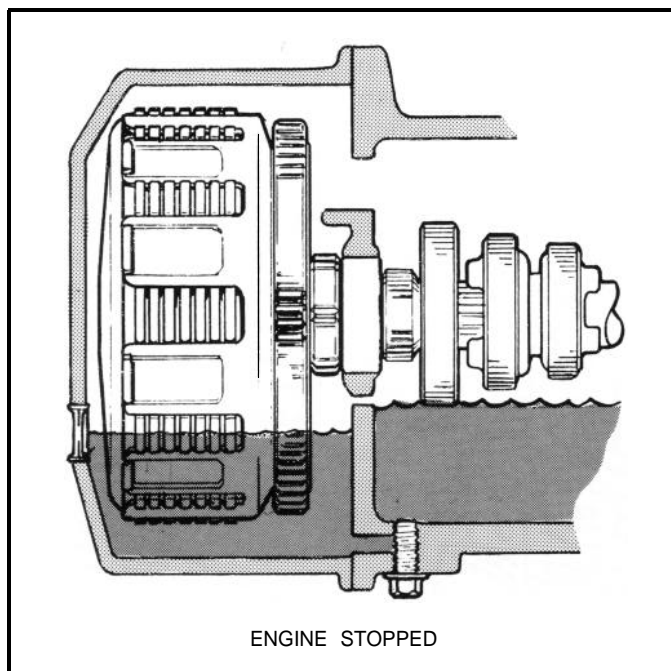
The new KDX200-H1 is

designed to maintain a slightly higher oil level in the transmission and a lower level in the clutch cavity while the engine is running. There is only one small hole in the cases that allows oil to run back from the transmission into the clutch cavity so the oil level can be checked. But there are two large holes up high that catch oil slung up by the clutch and drain it into the transmission. The result is that most of the oil from the clutch cavity gets pumped into the transmission while the engine is running. Just enough trickles back to keep the clutch and primary gears wet.

The transmission drain hole is designed to remove the oil from both chambers with one drain bolt. When changing the oil in a KDX200-H1, always put *the correct, specified amount of oil* back into it. After adding oil, the level

will appear too *high* in the sight glass until the engine has been run for at least a few minutes. This pumps the oil into the transmission chamber. Then, after the engine is shut off, the oil level will be low (in the sight glass) until it is allowed to sit for a minute or two and dribble back into the clutch cavity.

Don't attempt to make adjustments in the oil level if the vehicle hasn't first been run and then set for a while. If you need to lower the oil level, *do not drain it from the drain plug*. Use a syringe and suction it out from the clutch area through the filler hole. This will leave the oil at the correct level in the trans while you make the adjustment. □



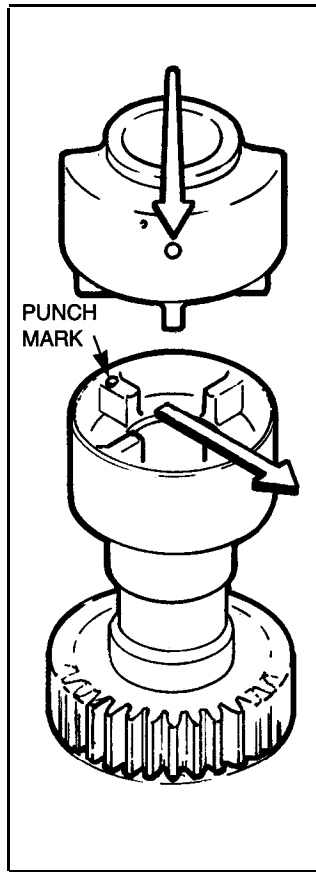
ZX1000, 1100 balancer timing

by **Gregg Thompson**
Product Support Supervisor

We have recently become aware of a little error in the ZX1000 and ZX1100 Service Manuals regarding engine balancer timing. All the manuals for that engine family, from the ZX900-A to the current ZX1100-D, describe assembling the balancer with this note:

"Fit the balancer weight into the gear so that the weight is opposite the mark on the gear."

That worked fine and was necessary for the 900's, which had three drive vanes inside the gear and three driven vanes on the weight. With this design, if the weight was installed in either of the other two possible positions, the balancer



would end up timed to the crankshaft incorrectly by a fraction of a tooth. There would be no way to time it exactly right.

All the ZX1000's and ZX1100's have a balancer with four drive vanes inside the gear and, of course, four driven vanes on the weight. This newer design results in two other differences from the old design: First, it is impossible to install the weight exactly opposite the mark in the gear like the manuals tell you to do. (There is no such position.) And, second, it doesn't matter which way you put it together. The balancer can still be timed to the crankshaft properly (with no difference in procedure) regardless of which way you fit the weight to the gear. □

TIP

customer SERVICE

Keeping yours

by **Mary Sola**
Assistant Manager,
Consumer Services

Consumer gurus say that it takes about nine times as much money and effort to win a new customer as it does to keep a current one. One of the most important ways companies keep customers is by being interested in them.

The winter months, when extra time is a little easier to come by, can be the season to do something about retaining the customers you already have. Send holiday greetings, or plan a simple event at your store which will bring people in and send out notices about it to all our customers.

Mail out flyers or reminder notes suggesting that your customers get service done during the "off-season." And take the time to update your customer files so you can keep in touch easily with those who come in regularly or who have just bought a product recently.

Kawasaki's new warranty registration/inventory system (coming to a K-SHARE terminal near you in 1995) should be a big help in setting up and maintaining customer mailing lists. So take some time to remind folks you're still there for them. □

TECHNICALITIES

New valve springs for the KAF620 MULE™

We've had some cases reported of a valve (usually an intake valve) beginning to stick in the guide of a KAF620 MULE™ cylinder head. The usual symptom is the push rod for that valve falls out of place and the cylinder quits running; the cylinder can't function if one of its valves is not operating.

With the cylinder not working, the technician usually finds the out-of-place push rod easily. But he or she

doesn't always make the connection between the loose push rod and a sticking valve. If the valve isn't removed and cleaned, the failure will repeat almost immediately.

Valves stick because of a very

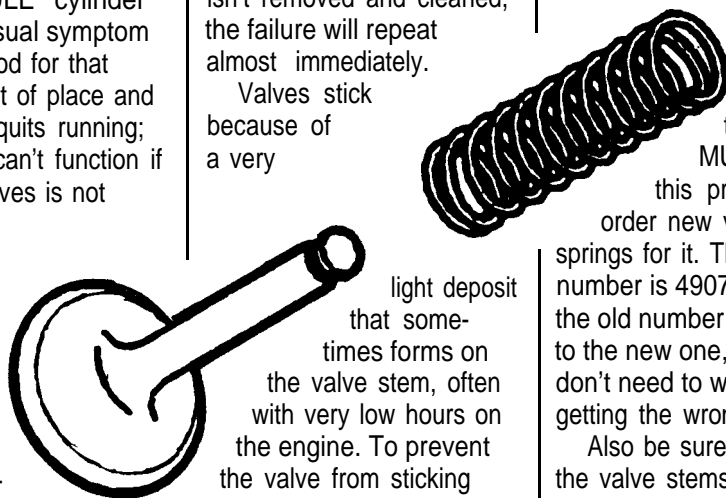
light deposit that sometimes forms on the valve stem, often with very low hours on the engine. To prevent the valve from sticking when this deposit forms, Kawasaki has begun using

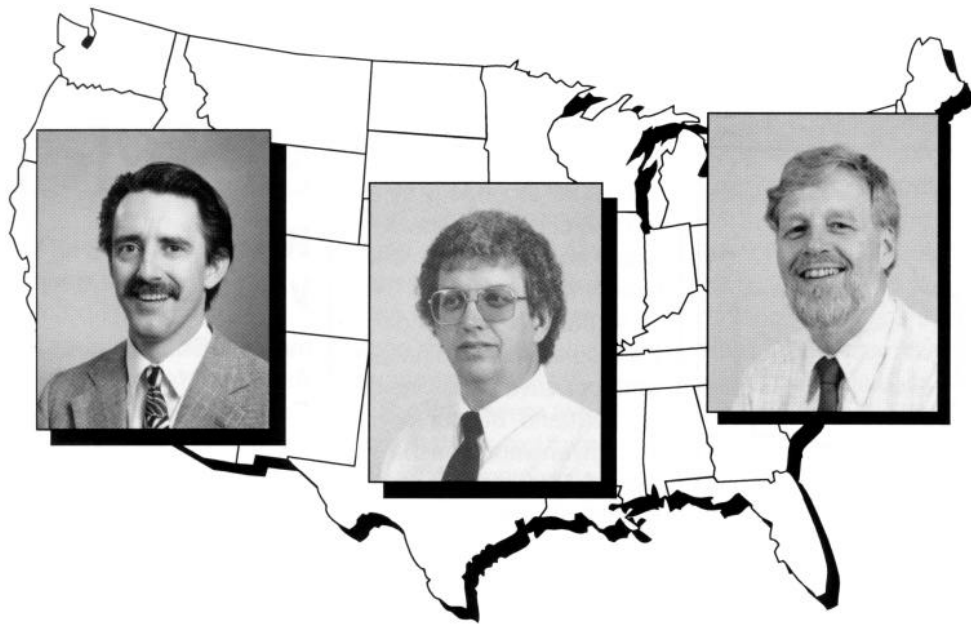
a different valve spring in this engine that is slightly stronger than the original one.

If you run across one of these MULEs with this problem, order new valve springs for it. The new part number is 49078-2071 but the old number substitutes to the new one, so you don't need to worry about getting the wrong part.

Also be sure to clean the valve stems before you reassemble the head.

-Gregg Thompson





WEST

New models, new fun!

by Jerry Heil
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I hope you all had a wonderful holiday. Here at KMC West, we were preparing for the second half of the service training season. New product training materials are done and ready for training action at all training centers.

Our Jet Ski@ watercraft service class has a new JH900 engine for tear-down and inspection, while the Engines class will get new ZX600F and VN800 units. With all the new models out now, it's an exciting time to be in a service training class.

This time of year is also an exciting time for change in your service department. It's a good time to think up projects that would improve the looks and organization of your service area. Happy New Year! ☐

SOUTH & CENTRAL

Overcoming growing pains

by Walter Rainwater
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Owner John Dannheiser and manager Bill Hodge opened Kawasaki of Henderson in 1993 planning to sell only ATVs. But district manager Clay Stuckey assured them they would benefit more as a full line dealer. They were not familiar with other Kawasaki products when they opened: Dannheiser's background included owning a tractor dealership; Hodge's field was advertising.

The first growing pain was establishing a customer base. This was not really a problem given Hodge's background in advertising. They came up with several promotions; one an ATV promo they called 'The 24 Hour Blow-out.' They were open 24 hours straight and sold 20

NORTH & EAST

Team Green classes

by Fred DeHart
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Team Green has scheduled one race preparation class for each region this season. The Team Green class for the East Region will be held on Feb. 9-10. One will also be held in the North Region in March; the date has not yet been finalized.

Be sure to sign up for the Team Green class when you see it scheduled as there will not be another one this season!

MULE™ utility classes will be scheduled in March for both North and East Region facilities. Again, be sure to sign up when you receive the March schedule of classes.

Be sure to enter the Service Contest as you have a great chance to win some new tools and learn at the same time! ☐

CONTINUED ON PAGE 4

Training Schedule

East Region

January
24-26 ...JET SKI® Watercraft

February
7..... Generators
8.....'95 Product Update
9-10Team Green Race Preparation
14-16 ...Troubleshooting Electrical Systems
21-23 ...JET SKI® Watercraft
28..... Service Department Operations

North Region

January
16-18 ...JET SKI® Watercraft
19.....Parts Department Operations
20.....'95 Product Update

Central Region

January
24-25 ...ATV Service
26-27 ...Troubleshooting Electrical Systems
30-Feb 1 JET SKI® Watercraft

February
2..... MULE 500

South Region

January
17-18 ...Troubleshooting Electrical Systems
19-20 ...ATV Service

February
6.....Modern Engine Theory
7-9Engines
13-14 ...MULE Service
15.....Precision Measurement and Diagnostic Tool Usage
16-17 ...Team Green Race Preparation
21-23 ...JET SKI® Watercraft
24.....Service Department Operations
27-26 ...Troubleshooting Electrical Systems

March
1-2ATV Service

West Region

January
30.....Precision Measurement and Diagnostic Tool Usage
31-Feb 1 Team Green Race Preparation

February
2.....ATV Service
7-9JET SKI® Watercraft
10.....'95 Product Update
14.....Service Department Operations
15.....Tune and Service
16.....Precision Measurement and Diagnostic Tool Usage
21.....Generators
22.....Fuel Systems
23-24 ...Engines