● UNTIL LAST YEAR, KAWASAKI DIDN'T SELL A one-twenty-five that could stay on the same racetrack with other motocrossers. In 1978 the KX125-A4 model was introduced and the tables turned . . . somewhat. Although it was capable of winning, the A4 was a bit short on suspension travel and needed a broader engine powerband. But the bike handled well, demonstrating that Kawasaki followed competent guidelines for construction set by works riders.

If more is better in the world of suspension travel, then Kawasaki has pursued the right development trail. The A5 has 9.8 inches of front wheel travel and 8.8 inches at the rear. A Kayaba air/spring, oil-damped fork controls the front wheel's movement. Except for its lighter-gauge springs, it's the same unit found on the 1978 KX250-A4 model. The rear wheel is governed by a pair of 150-millimeter travel, Kayaba nitrogen/spring, oil-damped remote-reservoir shocks. As with all contemporary gas/spring motocross shocks, the Kayabas' reservoir-contained nitrogen simply compresses to provide clearance volume for the shock oil as it's pumped into the reservoir. Each shock body has five circlip grooves cut into it for adjusting the spring-preload.

Despite its advance in suspension travel this year, the A5 is not drawing-board perfect. The distance between the countershaft sprocket and the swing-arm pivot is long enough (89mm) to allow the

drive chain to become tight, then loose during wheel travel. The non-conical magnesium rear hub is heavier than a conical unit in magnesium. Not much more is cast in magnesium other than the brake backing plates and the engine clutch cover.

In other ways Kawasaki has made a real effort to keep the MXer's weight low. Dunlop tires are used for their light weight and good grip. Narrow rims are used for lightness, and the usual on-the-bike sidestand has been left off. It's a good thing because sidestands can be nasty sabers. A sensible prop-up stand is included with every bike.

The Kawasaki's seat has grown longer and the tank shorter. Riders who helped develop the A5 wanted to sit up near the front of the bike for better cornering, and Kawasaki responded by manufacturing a short, high-dome fuel tank to accommodate the longer seat. Molded in high-density plastic, the tank should remain immune to all the Flying Ws you can throw at it. Its decals don't stick well at all, however; one of them rubbed off the first time we sat on the bike. Both fenders, the FIM-approved number plates, the air box and magneto cover are plastic too.

The swing arm and frame have been reinforced in areas under heavy loads. The box-section aluminum swing arm has substantial gussets at its shock mounts, and the A5 frame shows additional bracing at its shock mounts, steering head and at the swing-arm pivots. These pivot points still appear overworked in relationship to the length of the swing arm. The tail-ends of the arm members are cast aluminum, and these tails are welded onto the main swing-arm "body." The chassis itself is similar to the A4, although the A5 has gained an inch-and-a-half in wheelbase, and now stands at 56.6 inches. The frame has a single front downtube and a partial cradle beneath the aluminum-cased engine.

Needle and roller bearings are used almost exclusively in the chassis. There's needle-support in the swing-arm pivot, chain-guide roller and the rear torque-arm pivot. Tapered rollers are used in the steering head. The rear-axle and swing-arm pivot bolts are drilled hollow: a nice, down-to-bare-bones-type finishing touch.

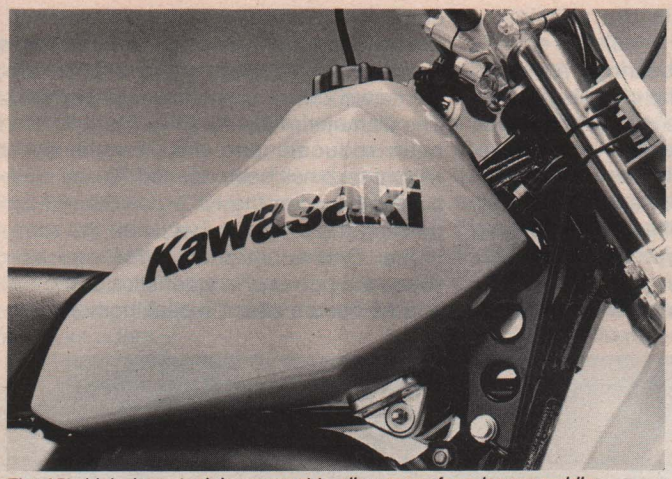
The 125 is a pretty package, with its gold-anodized rims and swing arm. Except for its tank decals the A5 is well finished with no apparent glitches in its construction.


Kawasaki felt the 1978 A4 made enough raw horsepower, but they elected to widen and lower the powerband a little on the A5. The biggest internal change is slightly different crankshaft flywheel dimensions; in order to give the engine more "flywheel" effect without raising the crankshaft's rotating weight, Kawasaki simply made the flywheels taller and narrower. This produces more crankshaft inertia without incurring a weight penalty. The diameter of the A5's header pipe has been reduced, and the 32-millimeter Mikuni carb has been rejetted. These mild tweaks broaden the KX's powerband by pushing the torque curve down the rpm-stairs. One substantial difference between the power characteristics of the A4 and A5 occurs after the peak horsepower point. The A4 horsepower curve dropped away sharply after 10,500 rpm, losing about two-thirds of its maximum horsepower by 11,000 rpm. The A5 holds on to 89 per cent of its maximum power 500 rpm past its peak.

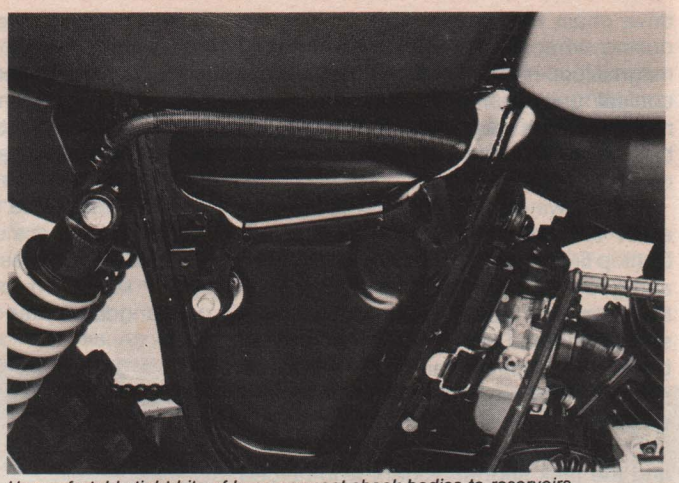
The A5 is not the power king of the 125 class; this distinction is currently held by the Suzuki RM125C, which puts out 22.08 compared to the KX125-A5's 20.09 rear-

# KAWASAKI KX125-A5 CYCLE DIRT TEST

When the Kawasaki's 20 rear-wheel horsepower hooks up, you may find the front end going skyward. The bike's light weight and moderate seat height add to rider advantage. Even with the KX's taller gearing, brave riders will be able to run off the powerband in sixth gear.




*The A5's high-dome tank is compact to allow room for a longer saddle.*



*Uncomfortably tight bits of hose connect shock bodies to reservoirs.*

# KAWASAKI KX125 TEST

wheel horsepower. Both bikes peak at 10,000 rpm. The RM also delivers more torque than the A5 and does so over a wider rpm range. The Suzuki makes 12.24 pounds/feet at 9000 rpm, compared to the A5's 10.55 lbs/ft at 10,000 rpm. On the dyno the A5 test bike makes slightly less horsepower and slightly more torque than the A4 *Cycle* tested in 1978. This lines up with Kawasaki's engineering approach; the factory did move the torque curve down about 500 rpm and slightly raised its roof. But the fiddling hasn't raised the horsepower, leaving the KX125-A5 about seven to nine percent short on the current CR125R and last year's RM125C across rev segements that riders actually use.

The KX engine retains use of the electrofusion cylinder, where fine alloy wires are electrically exploded inside the aluminum cylinder to make the final wall surface thin (for good heat transfer) and scuff-resistant.

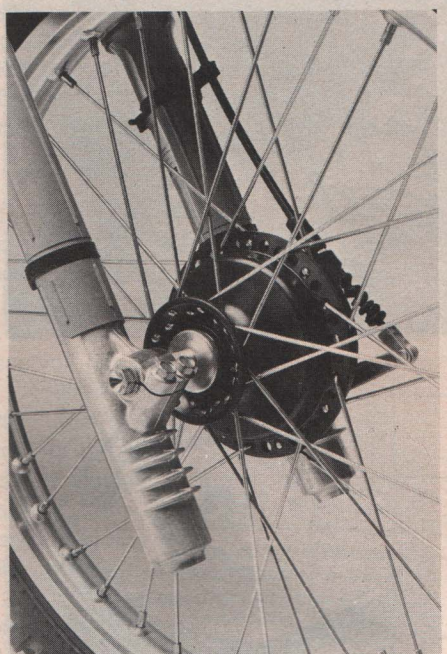
Six plastic reed-valves are housed in a common cage and are situated downstream of the Mikuni carb, just outside the cylinder wall. The reed-valve "chamber" has two booster ports which lead from its top and dump into the combustion chamber just behind the rear transfers. Pre-mix from the carburetor is pulled through the reeds and down into the crankcase area, where it lubricates the KX's ball-bearing mains and roller rod bearings before moving into the combustion chamber.

As with other high-performance piston-port two-strokes, the intake port closes so late that part of the already compiled intake charge is puffed back into the reed-valve area. A hole cut in the piston's intake skirt lines up with the intake port and allows pressure from the crankcase to shoot up into the reed area and chase the stray charge up the booster ports to supplement the main charge which travels through four main transfers. The single-tapered-ring aluminum piston compresses the gas, and once the mixture is exploded the waste leaves the cylinder via one bridged exhaust port.

The KX ignition is a contemporary in-

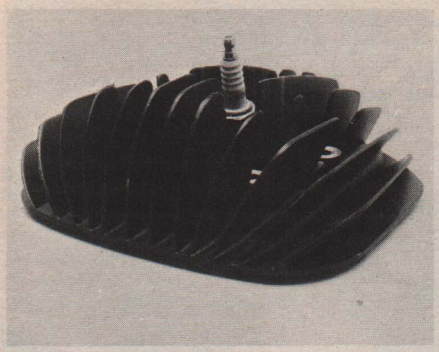
Green Meanie Business Center: subtly changed to spread the powerband. A re-jetted Mikuni, taller flywheels and a slimmed-down exhaust system.


Oh-so-soft primary spring windings, aluminum swingarm (with die-cast ends), full-floating brake stay.

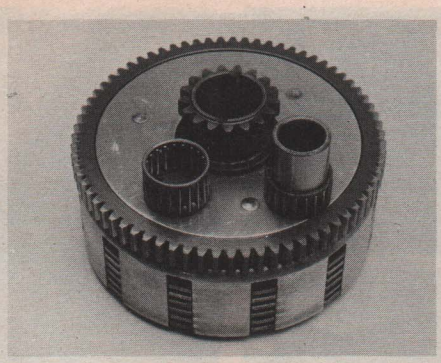


And up front: this slight-looking conical brake allows quick stops—given sufficient lever pressure.

For waterproofing's sake, the air intake has been moved from the right to upper side of the airbox.



Radially splayed cylinder head fins are no larger than necessary—and shaped for best heat transfer.



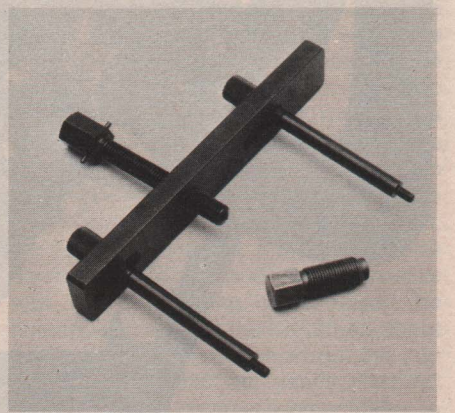
The heavier-than-might-be clutch housing spins on needle bearings. Inner gear is for kick-starter.

# KAWASAKI KX125 TEST

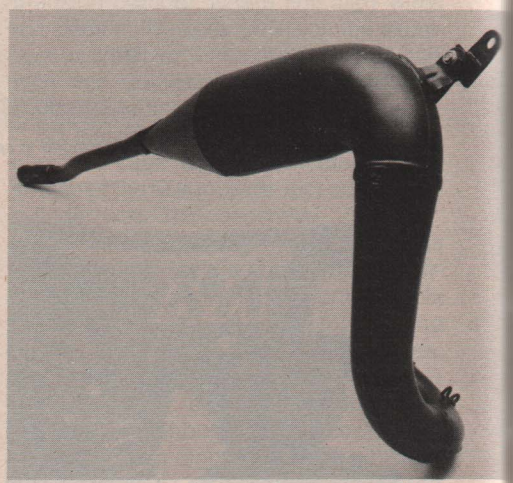
side-rotor capacitor-discharge unit with magnetic trigger pickups. A spark advance curve is built into the electronic ignition circuitry. The timing can be checked with a strobe light, provided you have an accurate light and a tachometer for the engine, which needs to run at 6000 rpm.

Straight-cut gears are used for the primary drive. A 20-tooth crankshaft-mounted gear drives the 71-tooth clutch basket. The clutch has six drive plates and five driven plates, and runs in the same oil bath as the transmission.

The first, second and third gear transmission ratios have been numerically raised, while the final three speeds have the same ratios as last year. But, because the rear sprocket has fewer teeth, the overall ratios for all gears are higher. On

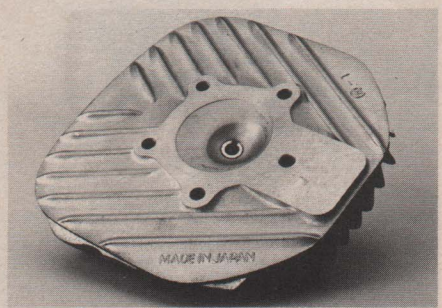


Although not engine parts, they're needed to tear it down: a main-case splitter and flywheel puller.

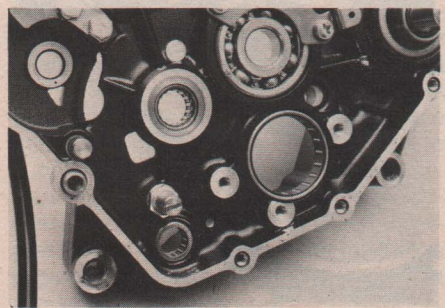


Down, over, up, back, through and around: the 1979 pipe follows the A4 path but has a narrower header.

The 1979 A5 has longer legs, more torque and is better refined than last year's A4. It's been bolstered by a season of Kawasaki factory rider input. The result is a pure race bike with terrific high-speed handling, firmish suspension, but less-than-optimum horsepower output. It's still a front-runner.




Offset squish band aims combustion heat to piston's intake half, keeping exhaust-side temperature down.



Most of the gearbox-related bearings are needles, including those handling the shift shaft and drum.

fast tracks, you can still run the KX out of breath in sixth gear.

Since the introduction of the first KX125 five years ago, Kawasaki has used a 5/16 x 1/2-inch drive chain, although many other 125 manufacturers are using stronger 1/4 x 5/8-inch chains. Kawasaki's development engineers feel the smaller #428 chain is tough enough for the rigors of 125 motocross, and as a bonus it may even be a little lighter than a #520 chain. There was no abnormal chain stretching or wear while we tested the A5.

Dunlop has a couple different rubber compounds available for their rear motocross tires. The KX's 3.00 x 21 front and 4.00 x 18 rear K190 knobs are relatively soft, and they perform well on harder track surfaces.

The KX125-A5 is a realistically sized


Make and model ..... Kawasaki KX125-A5
Price, suggested retail ..... N/A

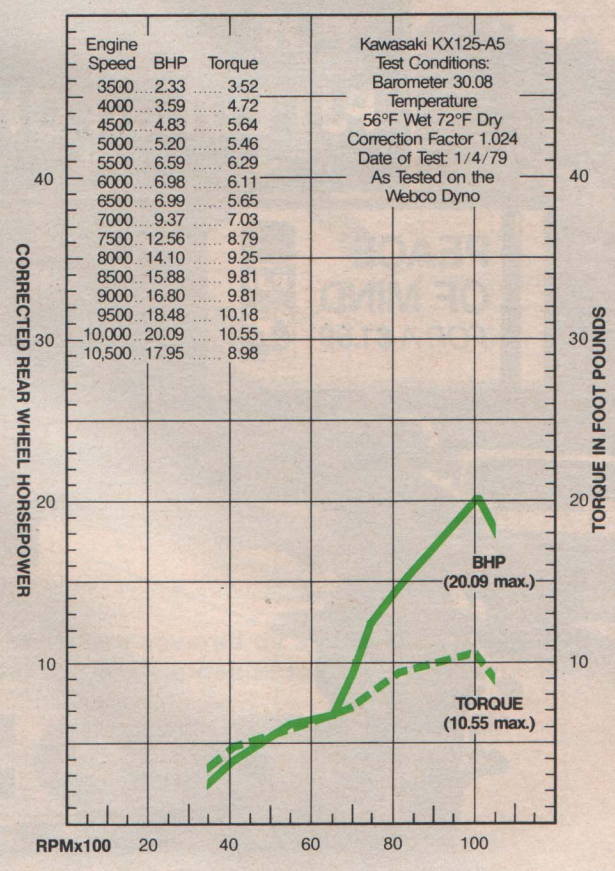
ENGINE
Type ..... Two-stroke single, air-cooled with five-transfer, reed-controlled-intake cylinder
Bore and stroke ..... 56.0 x 50.6mm (2.21 x 1.99 in.)
Piston displacement ..... 125cc (7.6 cu. in.)
Compression ratio ..... 7.5:1 (trapped)
Carburetion ..... (1) 32mm slide-throttle Mikuni
Exhaust system ..... Upswept exhaust with silencer/spark arrestor
Ignition ..... Capacitor discharge, magnetically-triggered magneto
Air filtration ..... Oiled foam
Oil capacity ..... 0.6 liters (0.6 qts.)
Bhp @ rpm ..... 20.09 @ 10,000
Torque @ rpm ..... 10.55 @ 10,000

TRANSMISSION
Type ..... Six-speed, constant-mesh, wet-plate clutch
Primary drive ..... Straight-cut gear, 20/71, 3.55:1
Final drive ..... 1/2 x 5/16 in. chain, 14/60 sprockets, 4.29:1
Gear ratios, (at transmission) ..... (1) 7.10, (2) 5.79, (3) 4.72, (4) 4.08, (5) 3.55, (6) 2.17

CHASSIS
Type ..... Single-downtube, partial cradle, chrome-molybdenum steel
Suspension, front ..... Leading-axle, oil-damped, air/spring fork
rear ..... Aluminum swing arm with (2) remote-reservoir gas shocks
Wheelbase ..... 1438mm (56.6 in.)
Rake/Trail ..... 29°/125mm (4.9 in.)
Brake, front ..... Cable-actuated, 120 x 28mm (4.72 x 1.10 in.) drum, single leading shoe
rear ..... Rod-actuated, 130 x 28mm (5.12 x 1.10 in.) drum, single-leading shoe
Wheel, front ..... Wire, 36-spoke, aluminum alloy, 1.60 x 21 in., one rim lock
rear ..... Wire, 36-spoke, aluminum alloy, 1.85 x 18 in., two rim locks
Tire, front ..... 3.00 x 21 Dunlop Sports K190
rear ..... 4.00 x 18 Dunlop Sports K190
Seat height ..... 914mm (36.0 in.)
Ground clearance ..... 336mm (13.3 in.)
Fuel capacity ..... 8.0 liters (2.1 gal.), no reserve
Curb weight, full tank ..... 94.6 kg (209 lbs.)
Test weight ..... 169.4 kg (374 lbs.)

CUSTOMER SERVICE CONTACT
Kawasaki Motor Corp., USA
3630 Garry Street
Santa Ana, California 92704
Attention: Consumer Services
(714) 540-1600

| Engine Speed | BHP | Torque |
|---|---|---|
| 3500 | 2.33 | 3.52 |
| 4000 | 3.59 | 4.72 |
| 4500 | 4.83 | 5.64 |
| 5000 | 5.20 | 5.46 |
| 5500 | 6.59 | 6.29 |
| 6000 | 6.98 | 6.11 |
| 6500 | 6.99 | 5.65 |
| 7000 | 9.37 | 7.03 |
| 7500 | 12.56 | 8.79 |
| 8000 | 14.10 | 9.25 |
| 8500 | 15.88 | 9.81 |
| 9000 | 16.80 | 9.81 |
| 9500 | 18.48 | 10.18 |
| 10,000 | 20.09 | 10.55 |
| 10,500 | 17.95 | 8.98 |



# KAWASAKI KX125 TEST

motorcycle, one compact riders may appreciate. It has a 36-inch seat height: moderate by today's standards. The handlebear is low and close to the seat's front. Tall riders find little leg room under the handlebar when leaned way over in turns. All riders, short and tall, will discover the seat is thinner than it was last year. To maintain a respectable saddle height while giving the A5 more rear wheel travel, the seat lost some precious foam padding. The result is a painfully thin rear seat section, one that can deliver a good whopping. The seat's front is amply filled.

A small rod on the left side of the carburetor should be pulled up for cold starts. When the engine is cold, it must run on a low-speed, rich-mixture circuit for a minute or so. The engine comes to life with a couple of prods on the easily bent kickstart lever, and is moderately silenced by a non-repackable fiberglass-filled muffler. The KX is not quiet enough to be legally ridden on public domain.

Last year's transmission had some shifting problems; there was an easily found neutral hiding between third and fourth gears. Fortunately, there's no sign of this gremlin in the A5 tranny. Its gearbox shifts consistently and precisely, with or without the clutch. Part of this easy and exact shifting may be explained by all the

needle bearings in the gearbox. All the gearbox shafts, as well as the shift drum, ride on needle bearings. Often, berserko full-throttle, clutchless shifts can be completed. The front end doesn't feel particularly light, but it will come up in the first couple gears or with a mild tug on the handlebar. First or second gear are best for starts depending on available traction. The new, taller first gear is called for most of the time, even though the clutch tolerates repeated slipping. Where the KX starts and stops making good horsepower is readily apparent. It begins and ends with a rush; once it falls off the top or bottom of the pipe, it really stops pulling and you'll swear somebody lassoed the back of the motorcycle. The power switch-off isn't as drastic as the A4's; nevertheless, after 10,500 rpm, the KX is finished and you'd better change-up. Nothing but your right hand prevents the engine from spinning any faster than it should, and overrevving the A5 is really the slow way around the racetrack. Constant shifting is necessary to stay within the engine's powerband, something that's normal in the world of 125 racing.

Our test bike detonated slightly in the midrange; moving the needle up in the carb slide suppressed the sound. There's a possibility that marginal gasoline and a slightly advanced ignition caused the initial rattling; enriching the midrange mixture cooled down the combustion chamber a bit, ending the audible rattling. Otherwise, the A5's carburetion is spot-on. The unmistakably peaky Kawasaki pulls cleanly though not powerfully when the engine is lugged down below its power curve.

The KX engine is thoroughly waterproof, because this year the oiled-foam filter's air intake is directly under the seat base instead of inside the right-hand number plate. Thick mud can pack in around the countershaft sprocket and shift lever, but doesn't derail the drive chain or cause shifting difficulties.

Deep water reduces the A5's stopping ability dramatically. The front brake loses much of its bite when wet, and it takes a

while to dry out. The back brake goes away in the wet too, but it recovers quickly. When dry, both brakes work well and can give short stopping distances. To work properly, the front brake requires a great deal of lever pull. The rear brake provides exceptional feel and is controllable enough to keep from locking the wheel unexpectedly.

When sitting on the KX-A5, the rear suspension feels quite hard. In truth, it feels hard because the first part of it is soft. The rear springs are progressively wound; and because their first windings are so light, the shock springs partially compress by the weight of the bike itself. When you sit down on the seat, the rest of the light windings are practically coil-bound, so you're sitting on just the hard secondary springs. The front fork feels firm even with its relatively light spring rates, thanks to the resistance provided by the air pressure.

Out on the racetrack, the suspension is no-frills, racing *firm*, and it still doesn't offer quite as much travel as some available units. The rear suspension feels stiff because the heavy secondary windings and firm jounce damping handle a lot of the load. Since the primary shock windings are so soft, the KX misses out on the opportunity to shield the rider from *all* unwanted jolts. The stiff main-springs and thin seat combine to create a hard ride. More progressively wound springs should change this tendency. Even with stiff secondary windings, the shocks can be bottomed on hard berm-shots or landings.

But overall control is there. In most instances the rear end of the 125 stays well-behaved, although there are circumstances where it will come around suddenly. Slick mud and loosely topped, hard-packed soil produce this effect. On soil with decent traction, the KX gives excellent yaw control. Steep, loosely packed uphills make the rear end swing slightly from side to side.

The recommended fork air pressure is 12–13 psi. The fork works nicely in all circumstances if the air is kept at or slightly below this level. With much higher pressure the fork becomes unresponsive to small bumps. We rode the KX using 16 psi and found that the front end hopped clumsily towards the outside of bumpy turns. Additionally, the fork's unresponsiveness under compression lengthened normal stopping distances. With "normal" air-fork pressures, the front wheel washes out a little in slow, flat corners but is well-behaved in all other circumstances, especially soft dirt or mud.

The A5's high-speed stability is terrific, indicating that Kawasaki paid strict attention to full-steam-ahead handling traits. You can pitch it into high-speed turns with reckless abandon and come out upright and unperturbed. Overall, the KX is happier going around or bouncing off berms than it is steering around the flat insides of

*(Continued on page 111)*

**Ignition** *Continued from page 202*

geometrically, so at first the rate can be very low for some time. If the spark passes through a region of very lean or very rich mixture, the initial rate of energy release will be low and the delay period long. Peak pressure will be delayed and reduced.

Even when elaborate means are adopted to eliminate mixture strength variations (such as complete evaporation of the fuel into a vapor by passing the mixture through a steam-heated drum on its way to the engine) there are still cycle-to-cycle variations. This redirects suspicion onto exhaust gas residuals, which, in mixing with even a perfectly prepared fuel-air mix, will do so imperfectly.

When research situations are created to eliminate exhaust residuals there are still variations. This inclines researchers to believe that air motion itself causes some variation. There is no way to eliminate turbulent air motion from the combustion chamber, so there will always be air movement at the plug gap. Turbulent air consists of small parcels of molecules in more or less coherent motion. If the spark occurs at the boundary between two small parcels, the shear zone between them may have the effect of spreading the flame faster than if the spark had occurred inside such a cell, in which the flame might be imprisoned for some time.

Elimination of cycle-to-cycle variations is an attractive idea, but it appears that advances in ignition and plugs will only reduce the effects, never eliminate them.

What about the future? Motorcyclists have anxiously watched the proliferation of Federal standards for auto exhaust emissions, wondering when their turn would come. The constant stream of weird and often counter-productive technologies pressed into service as quick-fixes for emissions made us all wonder if our vehicles could even survive such official attention. Most of the clean-air equipment and modifications have made ignition more difficult through use of very lean mixtures, inappropriate ignition timing, or complex pre-combustion and turbulence schemes. Long-burn ignitions and multiple discharge systems firing projected tip plugs seemed to be the trend, with conditions getting ever more stringent.

Now it appears there is hope. The coming of computer-controlled fuel mixture and ignition timing may extend the life of the spark ignition engine in recognizable form into the foreseeable future. The new system has much in common with the racing situation, but instead of a tuner scrutinizing the spark plugs and then correcting the mixture and the timing, there is an oxygen sensor in the exhaust which continuously monitors the engine's fuel-air ratio. Any deviation from the chemically correct ratio of some 14.5:1 is signalled to a small computer which then adjusts the delivery rate of the fuel injection system. The ignition timing is simultaneously adjusted to suit several other variables, being reset as often as every firing event. The minimal exhaust pollutants from this clean-carbureting system will then be conducted to a three-way catalyst pack which oxidizes unburned hydrocarbons and carbon monoxide and reduces oxides of nitrogen.

Ignition of such accurately metered fuel-air mixtures is a simple task compared with the troubles of the earlier schemes.

The real beauty of the oxygen sensor system with three-way catalyst is that we may be able to retain the valuable, proven technology that has given us strong, reliable, understandable piston engines for so many years. We may not have to struggle with Buck Rogers lithium hydride/freon/element 109 engines of mindbreaking complexity and expense. We may just have the possibility of soldiering on much as before, but with clean air and good fuel economy. And good ignition. ◉

**Kawasaki KX** *Continued from page 149*

corners. The KX's occasional tail-happiness on flat corners makes you choose the berms. Otherwise, the A5 behaves superbly: bumps, jumps, acceleration, braking, berms and whoop-de-dos.

In almost every instance the KX has consistent, predictable good handling: the kind that makes a winning bike. The thin seat and rear suspension make the Kawasaki more demanding to ride for long periods of time than other more softly sprung motorcycles. Coupled with this, however, comes precise handling.

Motocross is such a rapidly changing sport that today's competitive bikes and equipment may not be the same in six months. The technology continues to rise in a steep thermal spiral. But right now the Kawasaki KX125-A5 is extremely competitive. Frankly, it needs more horsepower, although it produces greater torque over a wider range than it did last year. Its physical proportions and handling are almost perfect.

Besides shedding its decals and bending its kickstart arm, the Kawasaki stood up very well during the test. None of the wheel spokes broke, and they required only occasional tightening. And the handlebar and levers absorbed some real abuse without bending or breaking.

Kawasaki is not currently quoting a price for the KX125; they plan to leave the retail figure up to individual dealers, while encouraging them to sponsor riders. About 3000 A5s will be produced. Whatever the cost, each will include the sidestand, an air-fork pressure gauge, spark plug and spoke wrenches and a complete manual. If the price is acceptable to the buying public, a force of highly competent A5s should soon be present in 125 motocross. ◉