

Cycle

MARCH 1977 • 75 CENTS

**KAWASAKI Z1 24-HR.
ENDURANCE RACER**

**INSIDE LOOK:
ISDT YAMAHA IT400**

**CAN-AM
175 & 250
QUALIFIERS**

**1977 HONDA
GL1000
GOLD WING**

**YAMAHA'S
MUSTY, TRUSTY
XS650C**



480504 ECH 9740M090 441C JUL77
MARTY EICHORN
19740 MC CORNICK
DETROIT MI 48224



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This Month's Cover: What you see here is the classic one-time-only cover shot. Lying flat on his back, and with full understanding of what he was doing and the price he would pay, Dale Boller had his model ride off a ledge and right across Dale's supine body. Judge for yourself if it was worth it.

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● THERE IS A BUILDING NEAR CLEVELAND, OHIO that has a lot of interesting things in it. On one side, cast alloy motorcycle wheels are being made. In the middle is a workshop for the restoration of antique cars. Nestling up to the other wall, almost in the shadow of a magnificent Lincoln V-12, is unmistakably a motorcycle race shop. There are all the familiar features—the lifts with well-used machines in assembly, the metal racks full of racing paraphernalia, and many feet of bench space, cluttered with heads, boxes, and tools. There are people at work.

What is this strange amalgam? It is the Lester Tire & Wheel Company, with owner Tom Lester's auto shop, and the base of operations of the most successful endurance team on this side of the Atlantic.

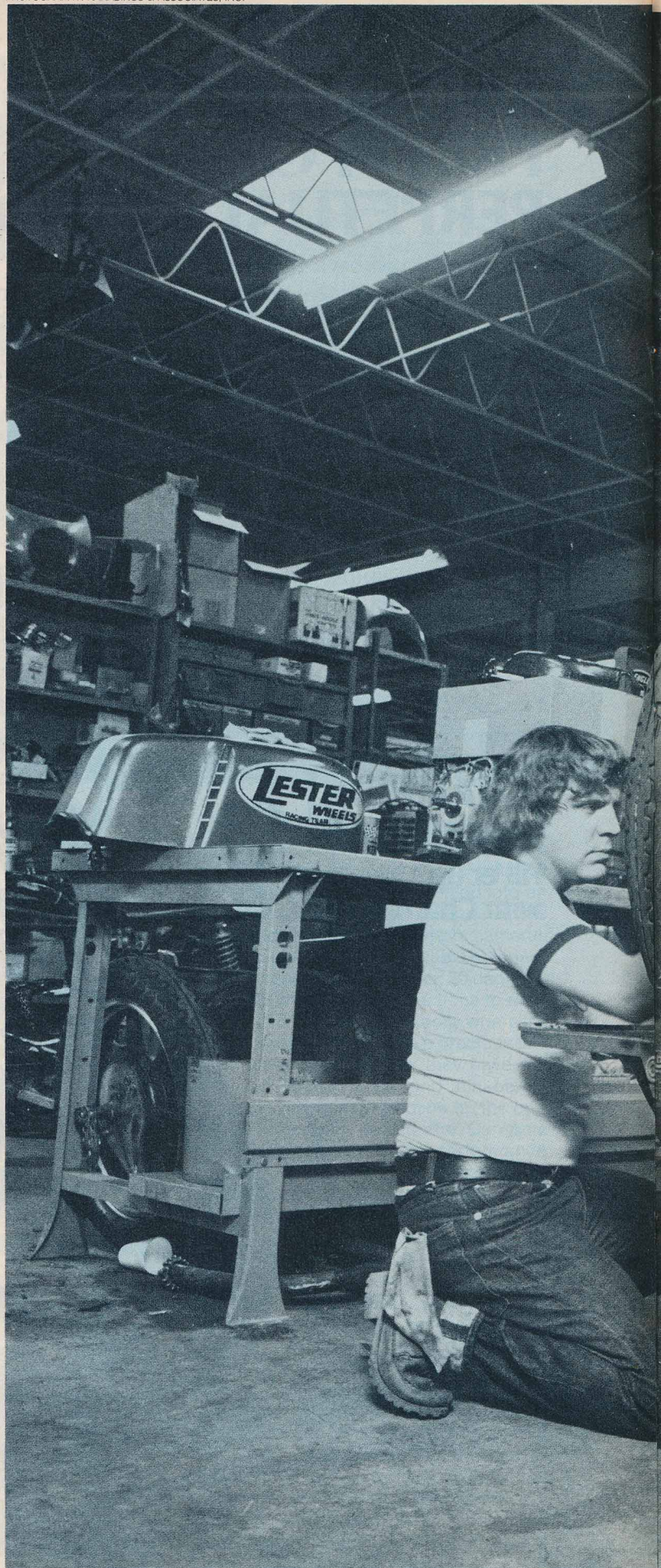
READY & WILLING

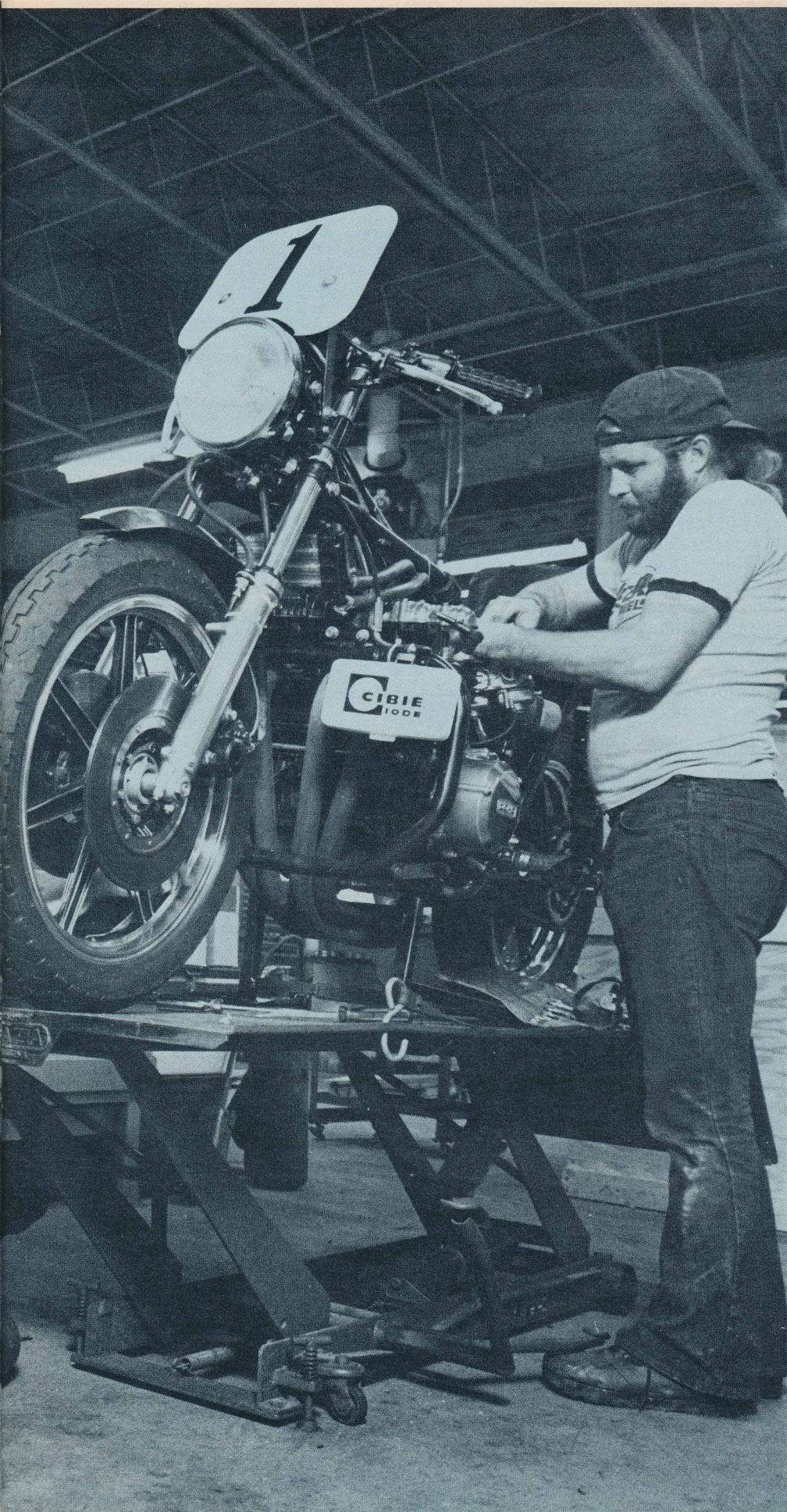
The Lester Tire and Wheel Co. 24-Hour Endurance Racing Team has made this country's first serious commitment to long-distance road racing; as a result they have won everything, and now look to Europe for their next challenge.
By Kevin Cameron

Europe hosts many 24 hour races for motorcycles, and the importers and manufacturers pour in money and technology to make it a great popular spectacle. In the US, endurance racing has always been a splinter sport, taking place on low-rental tracks before audiences of fifty or a hundred die-hard well-wishers, wives and friends. Here there are no big pay-offs, no TV cameras, no factory contracts. A mile down the road from the track, no one knows it's happening. That doesn't make it easy.

The European teams are sophisticated. They use aircraft refueling equipment. They have specialized tools for rapid maintenance, modular frames, quick-change wheels and brakes, blinding lighting systems. This Cleveland team uses near-standard Kawasaki Z1s. They refuel with a dumpcan, adjust their chains with old-fashioned wrenches. They have no gadgets, no modular concepts.

Am I making a sneering comparison between aerospace engineering and back-yard ingenuity, between professional and amateur? Certainly not. Here is the remarkable fact: until the advent of Honda's made-for-the-job sixteen valve 941cc endurance racer in 1976, the Cleveland group had gone farther in 24





hours with their near-stock machines than any of the professional European teams. And they had done it through rain, over the short, bumpy 2.1 mile Nelson Ledges, Ohio, track.

The Ledges is a dismal sort of place by comparison with any of the great racing plants of this world. Judged on the basis of races run and experience delivered to the competitor, it ranks much higher. Somewhere in its yearly schedule is the annual 24 hour endurance race. When it rains, a sticky mud forms that adheres to your shoes so you get taller the farther you walk. Not only does this mud trap unwary vans, but it also flows out over the track here and there to cover the bumpy surface with a greasy invitation to crash.

There are people who like to race for 24 hours here. When I think of 24 hour racers, I am reminded of the famous animal learning experiments in which it was found that intermittent reward was a greater stimulus to behavior than a reward every time.

In this kind of racing, the rewards are certainly intermittent. The experimental animals appear here, armed with their shiny and perfectly good motorcycles, and twenty-four hours later, they are very likely picking up the pieces of those motorcycles which are no longer any good at all. Some of the experimental animals go home and never come back. Others feel rewarded somehow, and plan to come back and do it again.

Racing success and Lester sponsorship have only recently come to this group. It has taken them five years to learn the skills that have lifted them from the ranks of week-end warriors and also-rans to their present dominance.

Their first attempt on the long distance was a succession of crashes. "Send in another Christian!", they used to say as yet another wreck left the rider in worse shape than the machine. The long hours of riding were an invitation to boredom and fatigue, so they had to learn how best to pace the laps, how to conserve the riders' energies. Certain other riders on the course had to be avoided as moving calamities, and there were some times of day more likely than others to bring crashes. The primitive appeal of sunrise seems to excite even the tiredest rider, so they learned to put out the slowdown signal at these times and make it stick.

Their first bike was a Kawasaki H1, fast for a short distance, but liable to vibration problems.

"Everything metal fell off that bike," says mechanic Ken Mallison. "We drenched it in Loctite but nothing worked."

They learned to consider every part, to keep records of what worked and what had not. Reliability improved, and crashes became fewer.

The group was welded together by common experiences, by enduring together the tension and the hard work. In the early hours of a race everyone strains

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to hear the engine's note, every face drawn with the effort, as though mental energy could be beamed to the machine on the course, keeping it from harm. They learned, too, that if this mental tension were released, the strain broken, they were less able to deal with the unexpected.

"If you walk away," says Mallison, "something will happen. Never walk away."

The four riders alternate in fifty-five minute shifts now, happily synchronized with the refuelling. Since the rider change takes longer than refuelling, they don't need fancy aircraft fuelers. A dumpcan is fast enough, and it can go to a machine that has overshot the pit.

They took account of the riders' differing strengths. Lang Hindle is their finishing rider, called in to make up distance when competition is close. His aggressive style is more nearly that of the GP rider. Derek Mitchell is a ten-year endurance racing veteran who is the night specialist and a good rain rider. Frank Mrazek excels in rain. He can keep to the scheduled pace in the wet, perhaps because of his European experience, riding on surfaces of slick cobblestone or brick. Denny Laidig is the disaster rider, who can make do with bent bars, missing pegs, or an inoperative clutch. He loves to ride, but makes it clear that he looks no further than that.

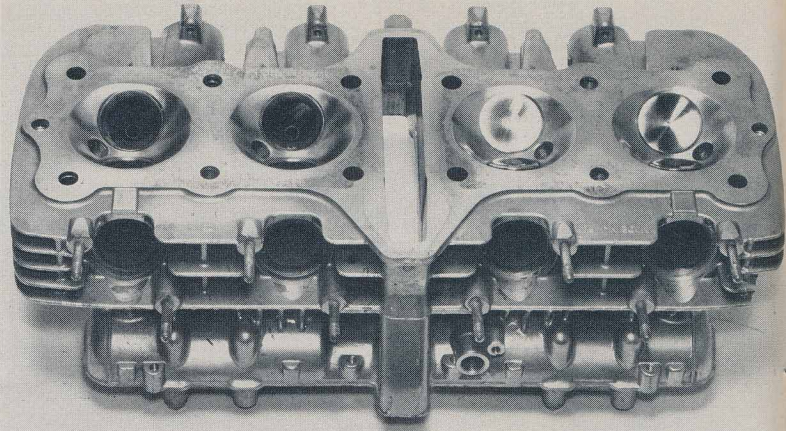
"Put him on the bike, set the lap time, and forget it," says Mallison of Laidig's consistency.

The group took a great step in 1974 when they chose the Z1 as their new race bike. For financial reasons, the new Z1 went to the track stock save for careful assembly, improved lighting, and a header. With this more reliable machine, they developed effective lap scoring and race information techniques.

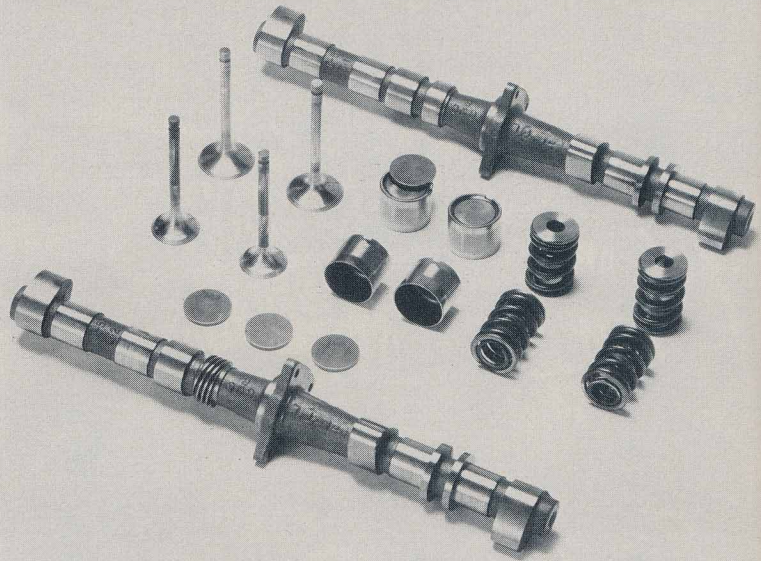
In GP racing, where distances are short, engines and riders are used to the limit. The "strategy" is to gas it. You go your maximum and hope to keep it up until the finish. Endurance racing is different. Your engine red-line may be 10,500, but you know it will only last a short time at that pace. You must plan to keep engine stress down while maintaining the quickest safe lap time. The upshift point may be only 7500 RPM.

The rider may be able to lap at 1:19 on a given course, but only by great concentration and full use of the machine. No one can keep this up for hours. The race is therefore planned for the fastest pace that is possible, with some cushion provided for fuel stops and maintenance. Strategy has a real meaning and is tied to machine and rider capabilities.

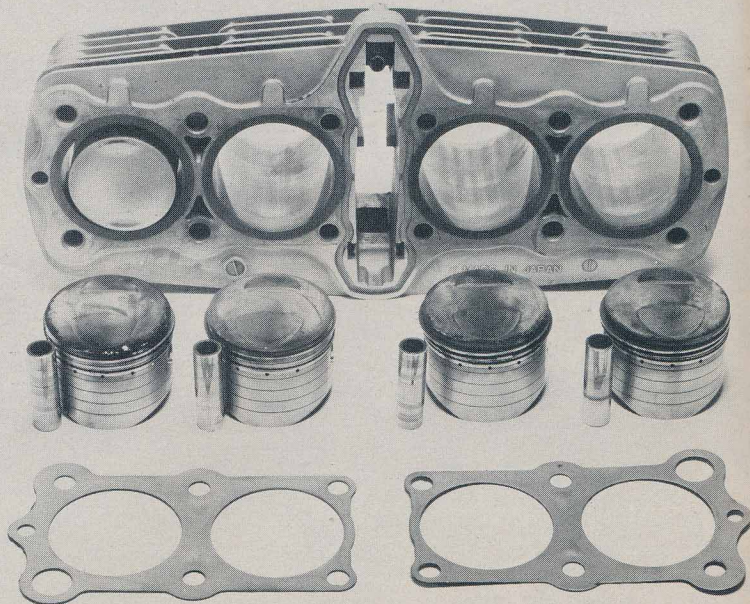
It is of paramount importance to have accurate, up-to-the moment information about your own machine, its position, its lap time, and its schedule of stops. The same information must be available for each of the opposing machines, either



What little head work there is was done by Otie's Automotive in Akron, Ohio. It amounts to a mild clean-up, careful valve seating and a bit of polishing.



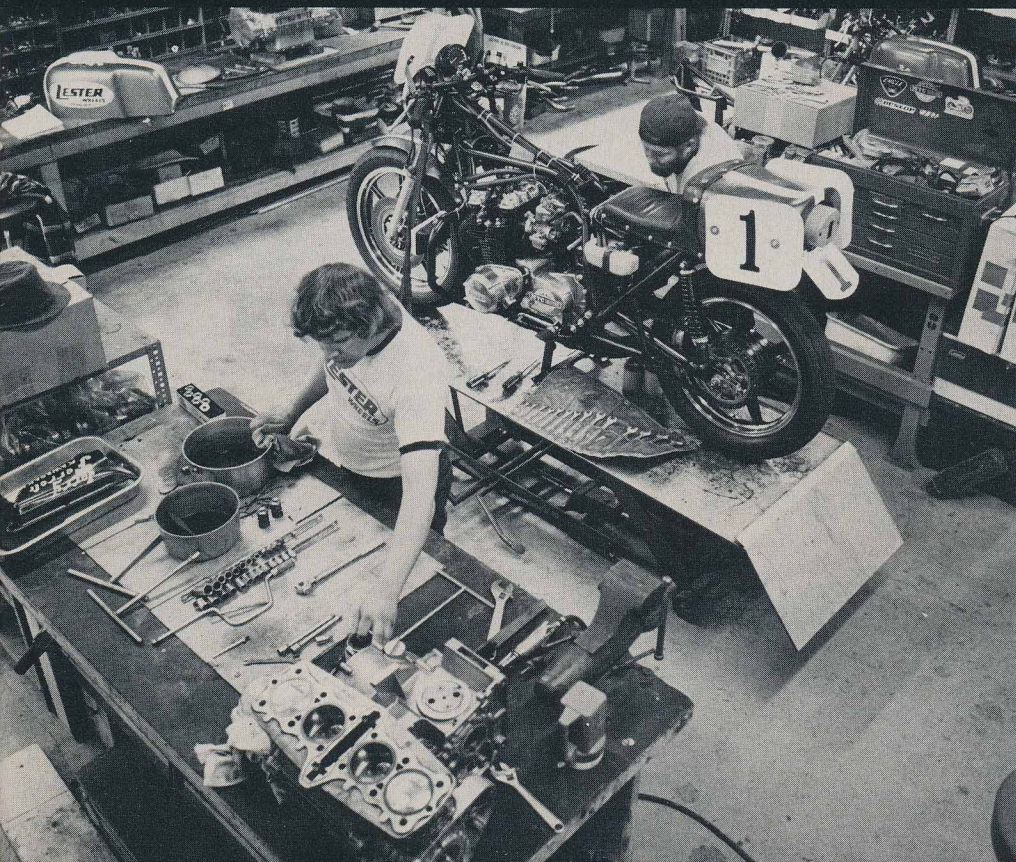
Camshafts are either from Kenny Harmon or Engle and tend to be on the mild side. Double springs are Engles with flat-wire dampers. Retainers are titanium.



Engine's displacement, now 1170cc, comes from MTC Engineering and Alcoa forged 10.5-1 pistons. The motor generally turns 7500 rpm—but can go to 10,500 rpm.



Running gear consists of Dunlop tires, S&W rear shocks, a 1976-model front fork, fiberglass tank and seat, a collector exhaust—oh, and Lester alloy wheels.



The Lester motorcycle race shop is next-door to the Lester antique car restoration bay. What happens here is just as important as what happens on the track.

ahead or within striking distance. If the leading bike is ahead of you by twelve laps, lapping at 1:27, while you are lapping three seconds faster, you will lap him every twenty-nine laps. At that rate, you will lead in eight hours and twenty-four minutes.

The chief timer and human computer for the team is Mickey Park, who has the unusual ability to compile and dispense the required information in whatever form is most useful. What will the positions be in ten laps? He can tell you. What if failing lights slow your bike two seconds a lap, while the opposition picks up the pace a second? He has that too.

For the 1975 season they decided to extend their conservative equipment philosophy to include a carefully modified engine. At the low RPM usual in endurance racing, the only sensible change was increased displacement. They installed a 1000cc cylinder and piston kit from MTC Engineering. To make the engine safer under emergency conditions, they strengthened the valve gear with stronger springs and light-metal retainers, working with a moderate increase in valve lift. Now they had more power at the design speed, plus the capability to produce a safe power surplus if the situation demanded it.

In the 1975 Ledges event, they paced themselves well, allowing the leading Honda, which had won the two previous years, to draw away. The machine improvements had stretched the group's bankroll to the point that the machine would have to be sold if it did not win. They held their pace. Then, despite all precautions and planning, there was a crash. Rather than tackle the massive repair job at once, they hit on the idea of making minimal repairs and getting the machine back on the track immediately, even turning very slow laps. With the machine running, they were able to organize the work area and labor force to do the particular jobs required. When everything was laid out, and each worker knew his task, they called in the bike and did the whole job efficiently and in minimum time.

Now they had a running machine, as fast as ever, but they were many laps out of first place. What to do? A comfortably increased pace would give them second, but they decided it would be all or nothing. The order went up on the board: RACE.

Howling along several seconds per lap faster than the apparently secure leading Honda, they were gambling on the strength of the engine they had built and the smooth functioning of their teamwork. The Honda held to its scheduled pace, apparently indifferent to the steady advance of the Z1, which was lapping them twice per hour. At this rate, it would come down to a last-laps GP in which both machines might be wiped out. The great tension and alertness of the crew enabled them to deal successively with a pit fire

(Continued on page 104)

and a generator failure without mishap. Inexorably, the hours passed, and the scent of success became ever-stronger.

Then the Honda didn't come by. Had the scorer missed? No, another lap passed and still no opposition. A wave of relief was brushed away by new tensions focused on the bike, now leading. Did it sound right? Is the gearbox acting up? Is it smoking more? Just go easy, please don't let anything break now!

Finally it was over, and they had won overall for the first time. Not only had they endured through these twenty-four hours, but also through the years of trying, creating a team that could do what no individual ever could.

The team's efforts came to the attention of Mr. Tom Lester, who is the complete automotive enthusiast, and an energetic man who has done well in life through hard work. He has had a hand in a variety of racing schemes from time to time.

Direct sponsorship of the endurance team by Lester resulted from a happy coincidence of his enthusiasm for racing, the team's obvious unstoppable drive to success, and the ideal test environment provided for wheels by 24 hour racing.

The team is pleased with its success, and Mr. Lester wouldn't have it any other way. Their last win was the 24 hour Las Vegas event, against minimal opposition. (Except for 50 mph winds, sand, and freezing temperatures.) There is a feeling of having outgrown their modest beginnings. It's nice to lead, start to finish, but when they look at the people they have beaten, they can see themselves only a few years before, eager, hard-working, and ignorant. Now they are eyeing Europe, hopeful that Mr. Lester will want to match swords with the big teams there, on the classic tracks. They now have the credentials.

For the moment, their successful 1976 machine is still a monument to what can be done by organization and conservative construction. The frame starts life as a stock Z1 unit, and has the open bays ahead of and behind the engine reinforced by diagonals. There are tie-bars joining the long tubes that run back from the steering head. Geometry is unchanged. The swing-arm is stock save for doublers.

Front fork is the 1976 unit, with its deeper engagement of sliders on the tubes. This tightened up the fork and made braking more certain. Fork dampers and springs are S&W's over-the-counter units for the Z1, as are the rear shocks, wrapped with 120 pound springs.

The Lester front wheel is shod with a Dunlop K-81 and braked by dual stainless Kawasaki discs, unthinned and undrilled. Calipers are the 1976 big-bore type, running stock friction material. All these parts go 24 hours without service.

The rear wheel retains the drum brake, a unique feature of the Lester system, and

wears Dunlop's 24 hour endurance tire, which has gone the distance everywhere but in the sand at Las Vegas. If the rear wheel must be changed, it is removed as a unit—wheel, backing plate, axle, and adjusters—and replaced with another assembly. This takes a little over one minute.

Drive chains were a source of trouble until the advent of Kawasaki's sealed O-ring chain, and this now goes the distance with one adjustment.

The stock seat and tank are replaced with fiberglass parts, and six gallons of fuel are carried. There is no fairing because it is more valuable to have direct access to the engine during stops.

Lighting is all-important. The headlight shell carries a round 4.5 amp quartz lamp, and below, mounted on a heavy crashbar, are two rectangular units of similar capacity. The stock alternator powers two of these units at a time, with one in reserve.

None of the original wiring remains. In a crash, wires leading to the stock connectors in the headlight are neatly sheared off by the hole in the headlight shell. The new system places these parts under the tank, among the frame tubes. Switches are unreliable, so this function is performed by leading all the wires to a multi-pin female tube socket. Depending upon which pins are wired together in the male plug, various circuits are established. Because the plugs are hand-wired, there is little chance of failure. The versatility of the system extends beyond the two obvious functions, the DAY and NIGHT plugs. There are other plugs, called PANIC plugs, which allow damaged parts of the system to be bypassed so that the machine can continue to run. PANIC 3, for example, connects the battery directly to the ignition. The system is the brainchild of the team's electrical specialist, Mike Allaman.

The engine uses the MTC Engineering 1170 cc cylinder kit with Alcoa-MTC forged 10.5:1 pistons. This compression ratio is moderate, but it goes the distance when higher ratios don't. Hot cranking compression is about 130 pounds, and when this falls to 90 psi it's time for service. Pistons that have run 50 hours or more look perfect—better than street parts.

The cylinder head has had a mild clean-up only—they have repeatedly beaten bikes with the \$600 airflow jobs. Valve seating and other machine work is performed by the famous Otie's Automotive in Akron. Stock valves, seats, and guides are used because they have given the best results. Remember that most speed equipment is designed for drag racing, where RPM is high and the finish line is only 1320 feet away. Most of it just won't work when the dimensions are in miles, not feet.

Camshafts are either Kenny Harmon's 30/70 degree, .408" lift, or the Engle 42/80 with .411 lift. There are cams with more lift and duration, but this means nothing at a steady 7500 RPM. The double Engle

springs, with flat-wire dampers and titanium retainers, are held to the valves with stock steel collets. Installed at 95 pounds seat pressure, the springs are good for three 24 hour races. If a part is working properly, there is no reason to replace it, and good reason not to. The cams are degreed in, lobe for lobe, and accurate records are kept of valve clearances, spring heights, and compression. Sprint red-line is 10,500, but bigger numbers have come up occasionally. The valves are under good control. There is nothing marginal here.

An MTC-supplied heavy duty DID cam chain, the 219H, has never failed them.

Stock clutch and springs take the torque to a five-speed set of close ratio CR gears from the Kawasaki LTD catalog. These and other standard parts were supplied by Jerry Ferrell Kawasaki in Medina.

Carburetion is by the early-type 28 mm stock Z1 carbs with stock settings save for a 5L1 needle in the richest position, a richer slide, and (except for sandy conditions) airhorns. They have a set of the trick 31 mm CR carbs, but the performance gain at the usual RPM was minimal, and the cost of standardizing on the new carbs was very high. The trick carbs stay on the shelf.

Preferred exhaust system is the old-style Yoshimura header, which has the best ground clearance. Its four 32-inch pipes join into a baffled collector that passes current sound tests easily.

Ignition current is sent to heavy Harley double-bodied coils by late-style points with higher spring pressure. Champion N60Y plugs are fired at 40 degrees, and there is no advance.

Oil has to be good to lubricate this very hot-running and underfinned engine. Kendall Racing GT-1 50-weight is used, and only a quart and a half must be added during the 24 hour span. A stock Kawasaki oil cooler is fitted, and the stock oil filter is retained.

Ready-use items kept in the pits include lamp assemblies, timed and gapped points plates, an alternator, a carburetor set, and the engine cover that surrounds the front sprocket, together with the clutch pushrod.

Everyone connected with the project believes that any competent mechanic could easily duplicate this machine. I was handed an itemized list of parts used totalling a modest \$1600, and I was able to examine each item on the race machine. I am sure they are right about the machine, but it will be difficult indeed for anyone to match their teamwork.

They know that the racing has to get harder in order for the team to survive. The challenge ahead is the glue that holds them together. Will they get to Europe to face the Hondas? Will there be more opposition here in the US, as racing turns back to the four-stroke because of government pressure on the makers? In any case, the Lester Endurance Team is ready and willing.