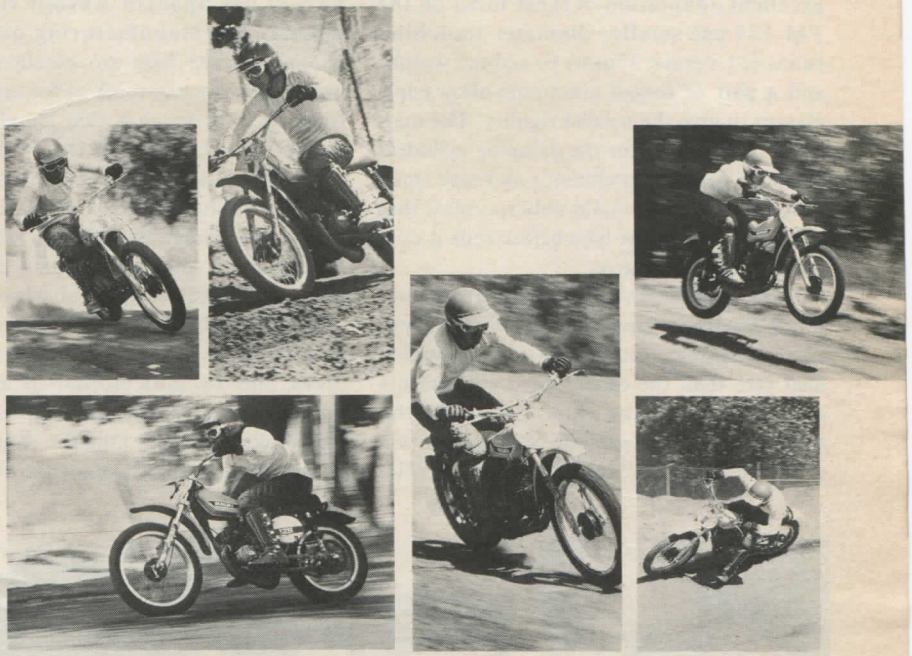
CYCLE ROAD TEST

SUZUKI TM-125K CHALLENGER



• Suzuki's TM-125K Challenger is a completely new machine for 1973. All it inherits from the TS-125 trail bike are the basic crankcase halves and general engine design. The gearbox and entire cylinder layout as well as the complete chassis are all newly created by translating into metal Suzuki's World Championship Motocross experience. While it is impossible for outsiders, even snoopy ones like ourselves, to know how long human nature and manufacturing economics can prevent new knowledge from having its effect at the production line, it is exquisitely interesting to see freshness surface in unexpected places. Like in the character of the TM-125K.

It seems that experience is applicable over a broader range than one might suspect. Suzuki has won the 250cc World Championship for the last three years in a row and the corresponding 500cc crown for the last two years. Casual logic would predict proportionate improvements in the production counterparts of those winning machines. But we found the TM-250 to be only a mediocre racer in our test (*Cycle*, November '72). We understand that the '73 TM-400 is much improved over the lackluster model we tested two years ago. And now we get this absolutely brilliant 125cc production racer for which Suzuki has no grand prix counterpart. Chances are the same design team in charge of the grand prix bikes created the TM-125K and applied what it learned during GP development.

For our first day's ride, we selected the short Shadow Glenn course at Indian Dunes Motorcycle Park. It was miserably hot on that day and there is a lot of shade in that particular section in which to recuperate between testing sessions.

The bike starts easily and settles into a muted two-stroke mutter as it warms. A very effective and bulbous secondary muffler takes the irritating audible sting out of the expansion chamber's power-augmenting pulse and makes the bike deceptively quiet. But the picture really begins to form as you pull the clutch lever, ease down into low gear, and pull tentatively out onto the track.

With a lot of 125s, we have found that there is a certain amount of conscious waiting for the engine's power to overcome the load as the throttle is opened after a turn. With the TS-125K, there is always enough throttle-controllable torque available at the rear wheel to keep the wheel just barely spinning and produce the best acceleration. Only the best 125cc production motocrossers have the power curve sufficiently well developed and matched to the gearbox ratios to allow the rider a satisfactory degree of throttle control. A power curve that is too steep for its gearbox ratios will waste a great deal of power in wheelspin and a bland engine mated to a close-ratio gearbox will result in a bike with insufficient speed range.

Our Challenger was fitted with a 3.00 x 21 Bridgestone up front and a 3.50 x 18 Inoue at the rear. Both tires are motocross knobs but the Inoue provides nothing near the traction of the more recently designed Bridgestone counterpart. The knobs on the Bridgestone go much farther around the sidewall of the tire for better cornering grip. Had our bike been fitted with the new Bridgestones on both ends, the acceleration and cornering power would have been even more spectacular. The TM-125s come with either tire as standard equipment and happenstance gave us the mismatch. As a result, the rear wheel on our bike would slide fairly bad in smooth turns which had no bank or berm, but we were still able to put it on a lot of good 250s at Indian Dunes. And anywhere there was a soft spot or berm, the little bike would accelerate off the turn like a rocket.

Hitting the jumps at maximum acceleration and shoving down hard on the bars just as the front wheel reached the crest gave flat, beautifully controlled leaps. Touchdown produced no wobbles, even if the wheels were a little off track, and when the throttle was opened just before the rear wheel hit, the front would stay barely lofted until the next shift.

Upon approaching the overpass at the Dunes, there is a series of ripples and pot holes that develop between grading sessions which are caused by repeated heavy braking and down-shifting. During early testing the Challenger would pound our shoulders viciously and it was hard to keep the handlebars under control. Examination of the fork oil showed the sliders to contain a thick mess which looked like a mixture of axle grease and motor honey. The Suzuki Service Manual called for SAE 10 motor oil or automatic transmis-

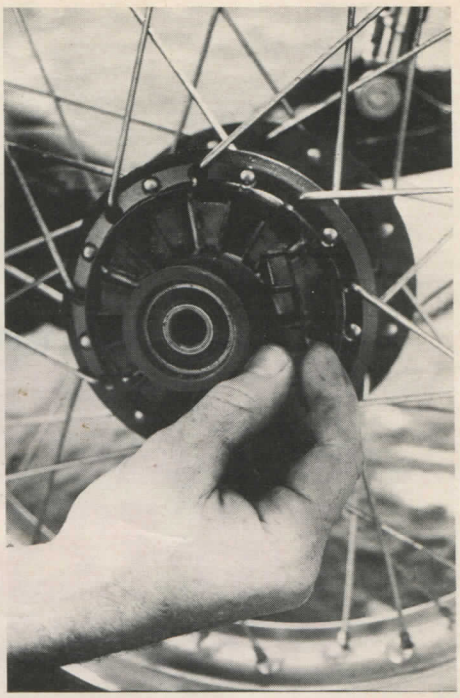
sion fluid. An on-the-spot experiment with ATF (140cc in each leg) was successful, allowing the forks to float the front wheel over the holes.

The forks are of the same design as those on the TM-250 and new TM-400, which are also duplicates of Ceriani hydraulics. The excellent adaptation of these forks on the TM-125 use smaller diameter stanchion tubes (31 versus 35mm) to reduce weight and a pair of forged aluminum-alloy triple clamps to give the needed rigidity. The matter of oil viscosity for the damping cylinders is one of personal preference and race track characteristics. We could only speculate that those who tested the bike before rode it on a much smoother course.

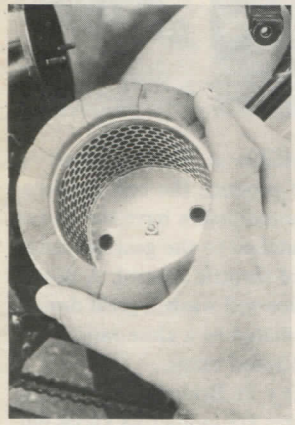
Rear suspension action is controlled by shock absorbers having the currently popular dual springs (one having a much higher load rate than the other). Five adjustments are provided so the rider can select the amount of spring preload which suits his weight and the nature of the course. The third position lets the shocks almost bottom on the roughest part of the Indian Dunes course for our 160-pound test rider. We felt no oscillation due to loss of shock absorber damping, but then our rider can only ride hard for about 15 minutes at a time.

We can't begin to imagine why, but the Suzuki has Spanish Akront rims on its wheels. The manufacturing quality and strength of the rims are excellent, but the only reason we can think of for sending rims from Spain to Japan is that Honda and Kawasaki have bought out the entire production of the Japanese D.I.D. factory. Our sole complaint about the Akronts is that they have a deep flange on each side which makes them very strong but collects and holds about 10 pounds of mud per wheel.

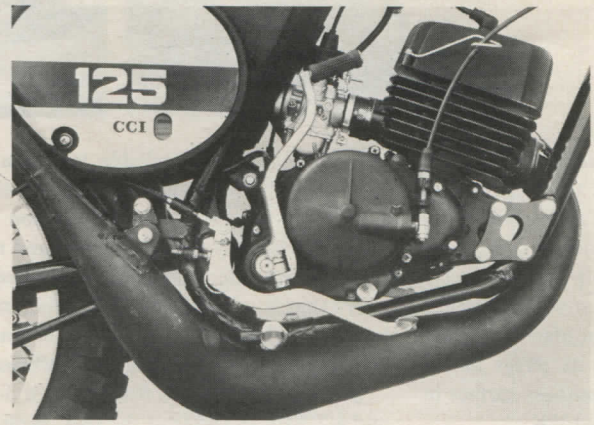
Both brakes are powerful and can be accurately controlled on rough ground. Many bikes, and Yamaha motocross models are the worst, are far too easily stalled when the rear brake locks and kills the engine. If you have to be unnaturally tender with the brake pedal in the heat of racing, you're losing distance to your competitors.



The cush hub assembly has a lot of slop in it; the fix is a clean-up and a dose of silicone seal.



Two spring clips unfasten the urethane foam element.



The primary case contains the pinion unit of the clutch withdrawing system. The clutch gives a very precise feel at lever.

The TM-125 behaves itself when airborne; landings produce no gollywobbles.

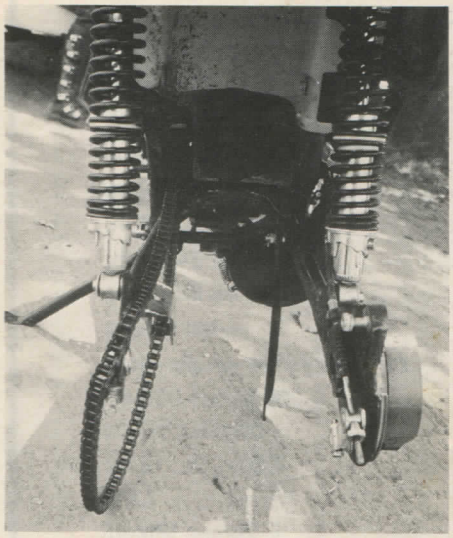
Material for both fenders is the super-flexible variety which can be twisted double without harm. The only mud on our shield came from bikes we were chasing. We found, on this merely damp course, no difficulty with mud clogging in either wheel or in the chain run.

The seat is thickly padded and extremely shock absorbent but the cover gets butter-slick when it is wet. Challenger owners will have to cover the seat with a much rougher material for wet courses simply because it is extremely tiring to compensate for the lack of secondary traction. The seat and tank shapes coordinate perfectly to prevent unnecessary rider punishment.

Large triangular super-flexible plastic side panels serve double duty as number plates and walls for the air-filter chamber. Removing three Phillips screws from each cover allow them to be taken away to reveal the oil injection reservoir, the air filter, and the electronic control box for the ignition. Flipping off two spring clips from the stamped steel air filter housing allows the element to be removed for cleaning. Squeezing the urethane foam in solvent cleans it for re-oiling. A screw cap on the top of the tough plastic oil tank permits filling with the recommended Castrol R-30 Racing Oil. This oil has a castor bean oil base which Suzuki says gives lots longer bearing and piston life than mineral-based racing oils. A little peek-hole in the right number plate allows a quick visual check of the oil supply. Both the oil tank and electronic box are protected from shock and vibration with rubber live mounts.

PHOTOGRAPHY: BILL DELANEY

The rear brake stay falls down neatly, and along with sidestand, the stay holds up the machine.



Several features of the rear chain run drew our attention. A hard rubber pad fastened to the swingarm pivot tube prevents wear there when the chain is loose and the rear suspension is fully extended, as would be the case over a jump. Very tough box-sectioned steel plates form the sides of the chain guide. The guide's adjustable roller keeps the chain from wearing through the bottom of the guide. Chain size is relatively small at $\frac{1}{2}$ x $\frac{5}{16}$-inch, but the same chain is used on most other 125 motocrossers without an undue rate of failure. The rear sprocket, which is big at 61 teeth, is made of steel and is quite heavy. Most Challenger owners will want to replace it with an alloy counterpart in order to reduce critical unsprung weight.

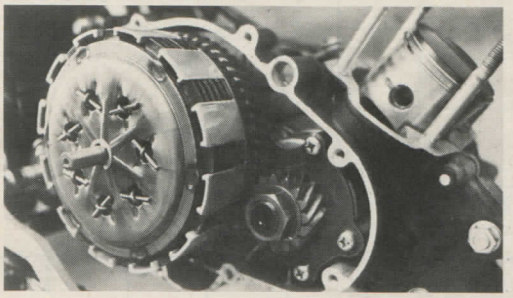
As mentioned previously, the engine has its origin in the TS-125 trail bike, but little remains of the original components. The crankcases have steel rings cast into the aluminum to support the crankshaft and gearbox ball bearings, and these very sturdy cases were retained and modified for the motocrosser. Unfortunately one of the modifications will not be good news for TS-125 owners who might have wanted to fit a TM-125 cylinder to their trail bikes. Increased fin area and a change in the exhaust port position required that an extra boss be cast into the cylinder support flange of the left case half. That extra boss holds a short stud to take the place of one of the through-studs. As a result of this factory modification, the TS cases won't accept the TM cylinder without a lot of welding and machining.

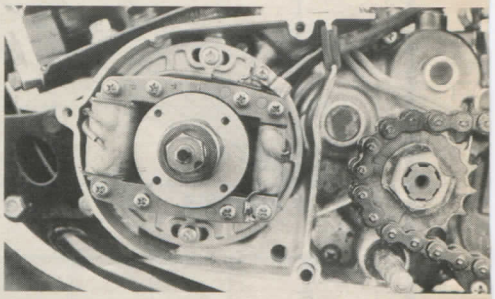
Internally, the Suzuki cylinder has a 56mm bore and a 50mm stroke, exactly the same as the Honda and Yamaha counterparts. And the porting design and layout is almost identical to that of the Honda: both bikes having very conventional four-port cylinders. Even the exhaust port designs are

(Text cont'd. on p. 74; charts overleaf)

Suzuki 125 has controllable power at rear wheel: you can spin the wheel at the rate you wish.

The rack of the clutch rack-and-pinion setup can be seen protruding from the clutch center. At right is Suzuki's version of the pointless set-it-and-forget-it electronic ignition.





Both fenders on the TM-125 are constructed from super-flexible material.

The muffler rearranges the power curve slightly; it doesn't subtract horsepower.

TM-125K *Continued from page 53*

the same, with the top portions of both being flared out above the transfer port line to increase the area of the port without excessively increasing its height. The Suzuki's iron liner is cast in place with a chemical-bond process that assures good heat transfer between the iron liner and aluminum cylinder body. Four increments of oversize pistons are available.

Fuel/air mixture is supplied by a 26mm Mikuni carburetor that differs from most other Mikunis only in the fact that it has a longer chromium-plated brass throttle slide. The extra length is to decrease slide wear and minimize the resulting inaccuracy in mixture control at intermediate throttle openings. The long-slide carbs are externally distinguished by their higher top-hat slide caps.

As with all of Suzuki's dirt racers, the expansion chamber is tucked up under the frame, beneath the engine. This arrangement functions fairly well on a motocross course where big rocks are few and the hazards are at least known. But when the TM-125 is used as a play bike, the chamber gets badly dented very quickly. Indeed the center of gravity could be beneficially lowered an inch by running the chamber over the engine and lowering the engine in the frame. The chamber and its secondary muffler are quickly detachable via three spring hooks and a couple of bolts.

Pointless Electronic Ignition is Suzuki's trade name for the magnetically triggered capacitive discharge ignition system fitted to the TM-125. Since the system uses a couple of magnets (one stationary and one rotating) to trigger the spark, there are no breaker points to adjust and replace periodically. Once the timing is set, an operation which requires a strobe light and a tachometer available from Suzuki as service tools, it requires no maintenance between engine crankshaft overhauls. The Suzuki service manual gives complete testing procedures for checking the PEI system with an ohmmeter.

Another novel nicety for the Challenger is the rack and pinion clutch withdrawing mechanism. A new primary case casting for the TM-125 holds the new components in place. The primary advantage of the rack and pinion arrangement is that the travel of your hand on the handlebar lever is transferred to the clutch pressure plate in a very linear and low-friction fashion. That means you get a very accurate feel of the power engagement. We noticed the difference mainly when getting away from the starting gate. The fastest starts with the little bike could be gotten by slipping the clutch away from the line until the tire was rotating quite a bit. With many dirt racers, clutch engagement is either on or off—like a switch. We liked the feel of the Suzuki action a lot.

By the end of the second day's ride, we were getting accustomed to the Challenger. Steering response on very fast, smooth

turns is almost neutral with a slight tendency toward understeer caused by the Inoue tire. Both wheels would slide in an entirely predictable manner, but we were having to start the turn quite a bit earlier than would have produced the fastest line.

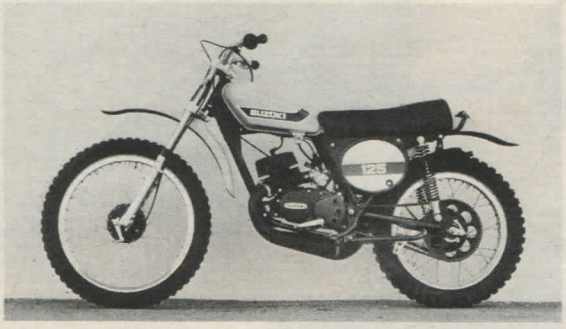
Riding position was perfect for us: just the right compromise between standing and seated body geometry. All controls fit thick booted feet and gloved hands without hindrance and the only awkward motion involved came from us having to adjust the shift lever quite high so that our boot wouldn't accidently shift on extremely rough parts of the track.

The Challenger is very reassuring to ride whether you're racing or joy-riding in the boonies. Its power curve has no abrupt spurts which would keep it from being tractable on the trail—at which task, for example, the Honda CR-125M is miserable. By comparing the power curves of the Suzuki and the Honda (see August '73), you can see that the Suzuki has more power at the bottom, then the Honda has a lot fatter mid curve, then the Suzuki keeps going to develop slightly more maximum power at higher revs. By matching the power curves to the gearbox charts and assuming that both bikes are using the top 2,000 rpm of their curves on a motocross circuit, there isn't much difference between the two machines. We would postulate that the Honda would have the advantage on a faster course and the Suzuki would edge ahead on a very rough stretch or on a long uphill climb. The Suzuki weighs nine pounds more than the Honda and has one less gearbox speed ratio.

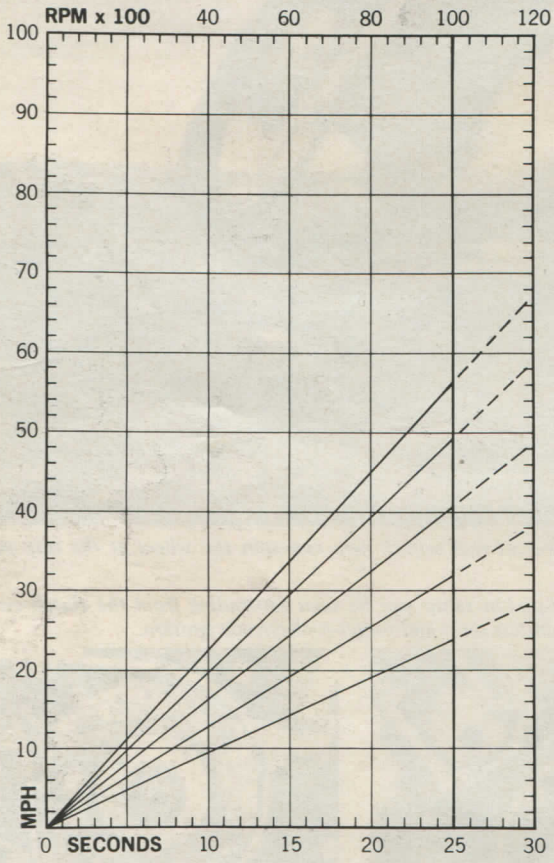
Challengers are going out the door (that's dealer talk for taxes and etc. tacked on to the price) for $680 in our part of the country. When you are lucky enough to find one in stock, that is.

It used to be that the Japanese 125cc dirt racers were only part racers. The only ones which won races were those extensively modified by the addition of several hundred dollars worth of extra parts. No longer. This little Suzuki is the cheapest and one of the best racers in the class. ◉

SUZUKI TM-125K CHALLENGER



Price, suggested retail	West Coast, POE $636
Tire, front	3.00 in. x 21 in. Bridgestone
rear	3.50 in. x 18 in. Inoue
Brake, front	4.330 in. x 1.192 in.
rear	5.125 in. x 1.120 in.
Brake swept area	34.24 sq. in.
Specific brake loading	10.48 lb/sq. in., at test weight
Engine type	Piston port two-stroke single
Bore and stroke	2.205 in. x 1.968 in., 56mm x 50mm
Piston displacement	7.5 cu. in., 123cc
Compression ratio (actual)	7.5:1
Carburetion	1; 26mm; Mikuni
Air filtration	Oiled polyurethane foam
Ignition	Magnetically controlled C.D. (P.E.I.)
Bhp @ rpm (actual)	17.41 @ 10,000 rpm
Torque @ rpm (actual)	9.81 @ 8,500 rpm
Mph/1000 rpm, top gear	5.62
Fuel capacity	1.3 gal.
Oil capacity	1.2 pints
Gear ratios, overall	(1)31.04 (2)23.04 (3)18.11 (4)15.15 (5)13.23
Wheelbase	53 in.
Seat height	30.5 in., with rider
Ground clearance	7.5 in., with rider
Curb weight	199 lbs., with full tank of gas
Test weight	359 lbs. with rider
Instruments	None
Top speed	60 mph with standard gearing



Engine Speed	BHP	Torque
2500	1.25	1.32
3000	2.17	3.81
3500	2.77	4.17
4000	3.41	4.47
4500	4.29	5.00
5000	5.02	5.28
5500	6.75	5.96
6000	6.89	6.02
6500	8.35	6.74
7000	10.34	7.71
7500	13.00	9.10
8000	14.54	9.54
8500	15.87	9.81
9000	16.12	9.40
9500	16.66	9.20
10,000	17.41	9.14
10,500	10.42	5.21

Date of Test: June 25, 1973

Test Conditions: Barometer 29.50; Temperature 74F Dry, 66F Wet; Correction Factor 1.056