ROKON RT 340 AUTOMATIC TCR

Cycle World Road Test

■ Mention the name Rokon to a random group of people and you're likely to find someone who has heard of Rokon's first attempt at building a motorcycle: the Trail Breaker. This first attempt was unusual–unusual to the point of being ungainly. After all, it had huge low pressure (5 psi) tires, about two feet of ground clearance, and a complicated drive system using an automatic clutch, chains, bevel gears, and U-joints to drive both wheels.

Obviously, the Trail Breaker wasn't designed for any type of off-road competition, or even serious riding in the normal sense of the term. But Rokon has changed all that. Its new RT340 Automatic TCR is designed for the serious enduro rider and this one is definitely not ungainly. Its well thought out automatic transmission, disc brakes and magnesium alloy wheels make it the most revolutionary motorcycle in years!

Heading the list of the TCR's (Tom Clark Replica) revolutionary components is a torque converter manufactured originally for snowmobiles by the Salsbury firm of Los Angeles. This system consists of two pulleys which expand and contract, according to engine rpm and loading, changing the gear ratio automatically. At an engine speed of approximately 2700 rpm, three weights on the engine-mounted pulley fly outward and cause the pulley to contract and press against the V-belt, taking up the drive smoothly. As engine speed increases the front pulley contracts more, becomes larger, and raises (lowers numerically) the gear ratio as road speed increases. The rear pulley has a large spring/cam arrangement which allows it to become smaller in proportion to the front pulley's increase in size.

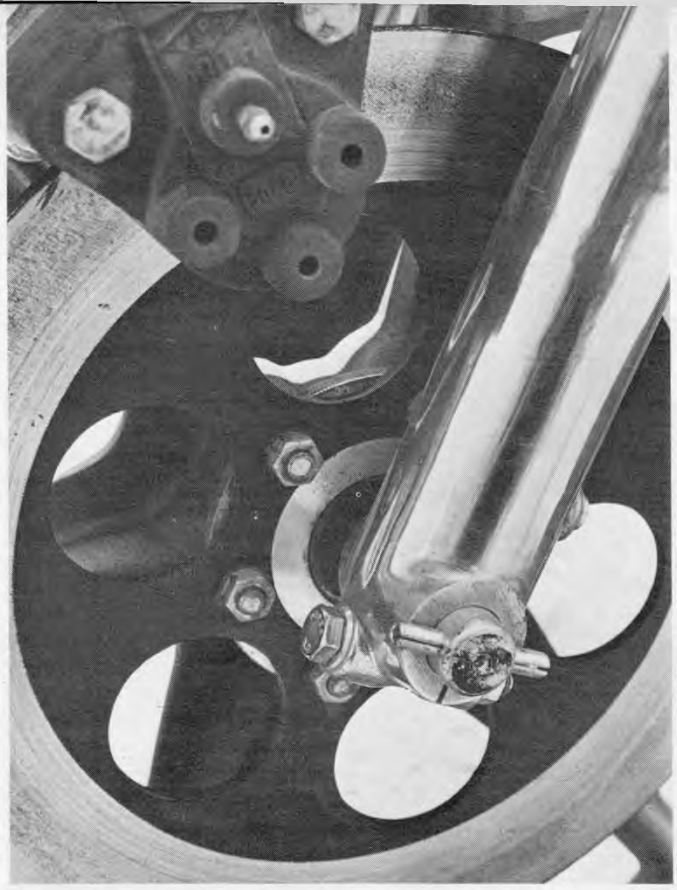
The beauty of this drive system is that it allows the engine to be kept near its torque peak with large throttle openings at practically any road speed. Termed an "infinitely variable" system, the torque converter has reduction ratios from 3.76:1 to 0.87:1.

The rear pulley is connected to a transfer box which features a three-row chain and provides an intermediate reduction ratio of 1.73:1. A 13-tooth countershaft sprocket and a 54-tooth rear sprocket provide a final reduction of 4.15:1. Total reduction ratios vary from 27.0:1 to 6.25:1, providing a real "stump puller" low range and a top speed of 83 mph at the 6500 rpm at which the engine produces maximum power.

The primary drive, or torque converter mechanism, is covered on the outside by a sheet metal guard which looks like the primary chaincase on a conventional motorcycle. A portion of the rear of this guard is left open to permit the circulation of air to dissipate the considerable amount of heat the torque converter generates. Of course, with the rear of the primary drive cover left open, water and dirt may enter and find their way to the V-belt and pulleys.

Water is not harmful to the system, but completely submerging the unit during a stream crossing in an enduro will cause the belt to slip and a tractive power loss of approximately 20 percent will result. The unit quickly dries, however, with the only possible damage to it arising from any dirt or sand which may have come in contact with the pulleys' sliding shafts, and the abrasive action which will speed the wear of the V-belt.

A "hillclimb racer" is an adequate description of the Rokon's performance in mountainous terrain. Merely opening the throttle wide at the bottom of a hill sends machine and rider upward at an alarming rate of speed. The torque converter keeps the engine rpm up near the torque peak and upward motion continues until wheelgrip is lost. It's interesting to note that stopping mid-way up a hill doesn't necessarily >



ROKON RT 340

mean having to turn back and remake the climb as with so many conventional motorcycles. Opening the throttle gently starts forward motion again which is proportional to the amount of throttle being used. No need to worry about trying to synchronize the throttle and clutch to prevent wheelspin: the torque converter does it for you.

Going downhill is a different story altogether, and takes a bit of getting used to. When the throttle is closed the torque converter begins to lose its driving force and the net effect is like putting a conventional motorcycle into neutral. Blipping the throttle will re-establish some engagement (and hence engine compression braking) momentarily, but the same blip that sped up the engine also speeds up the motorcycle's downhill progress. Steep, soft downhills which would normally call for the rider to stop his engine, put the machine into gear, and walk the machine down are extremely difficult to negotiate with the Rokon because there is no way to lock the machine in gear...any gear! And it's impossible to apply both brakes while standing beside the machine.

Although the Rokon would appear to be in neutral without the engine running (and it is for all practical purposes) there is a slight but constant drag caused by the rear torque converter pully spinning against the stationary V-belt when the rear wheel is moving. It's rather like trying to push a machine with the brakes dragging badly. What is needed is some sort of device to solidly engage the drive mechanism for bad downhill sections, and completely disengage it in the event the machine must be pushed.

Pushing the Rokon, however, is likely to be a rare necessity as far as the engine is concerned. Manufactured by Sachs, the 335cc Single was originally designed to power racing snowmobiles, and is very reliable. Because it is a racing engine, original units received by Rokon were mechanically noisy because of a large amount of piston clearance, but such large clearances are not necessary and subsequent units have less piston clearance and less noise. However, the cylinder head fins (cast in the popular "sunburst" radial pattern) and the cylinder fins are all free standing, which makes them vibrate and amplify noises generated by the engine's internals.

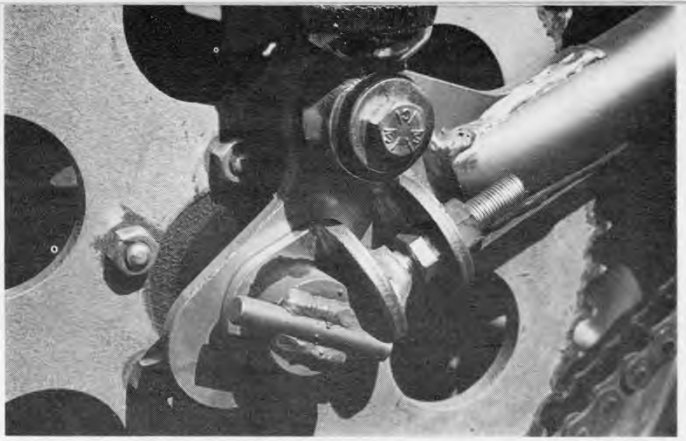
Being a racing engine, the Sachs has a beefy crankshaft assembly riding on ball bearings. The connecting rod is fitted with roller bearings at the big end while the piston pin rides in a bushing. A two-ring piston controls the opening and closing of the inlet, two transfer, and exhaust port, and fairly mild port timing accounts for the broad torque range necessary in snowmobile racing.

Original RT340s were fitted with a Tillotson diaphragm carburetor similar to the ones used by Harley-Davidson on its big Twins recently. This carburetor allows the engine to run quite happily even with the machine lying on its side, but problems with premature fuel vaporization due to high temperatures found directly behind the engine on hot days led to the substitution of a 38mm Mikuni. This unit performs excellently under all conditions: even with the machine lying on its side momentarily after a spill. A rubber inlet manifold acts as an insulator and shock mount for the instrument.

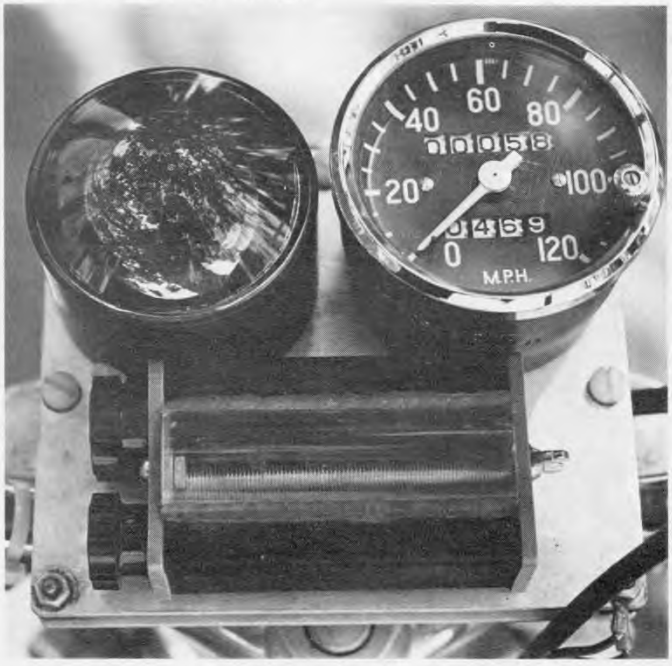
The carburetor throat is connected to a large, fiberglass airbox under the seat by a semi-pleated plastic hose. Air is admitted to the Filtron element through the open top of the airbox and any water which finds its way inside may be drained by squeezing a rubber duck bill valve on the bottom of the airbox.

Another of the innovations Rokon is using are disc brakes and cast magnesium wheels. The discs are 11 in. in diameter and the brake pucks are 1.5 in. wide, giving an effective brake swept area of 180 sq. in. Many road racing machines don't have this much brake area, and since disc brakes are impervious to water, you always have plenty of stopping power. Kelsey-Hayes single-acting caliper units and rear master cylinder are used while the front brake master cylinder is borrowed directly from the Japanese machines using front disc brakes.

Rear axle is fitted with a t-handle to aid in removing it to change a tire. Note the beefy chain adjustment components with a 9/16-in. nut on either side of the steadying plate.



The instrument panel consists of a VDO speedometer with forward/backward adjustable trip odometer, a watch holder (left) and an enduro route sheet holder at the bottom.



The Rokon's front brake is mounted on the left hand fork tube exactly like the one found on a Honda CB750 and floats in the horizontal plane to allow the brake pads to be pressed evenly against both sides of the disc. The rear caliper unit is mounted at the top of the disc and just behind the rear suspension unit on the left hand side. This serves to protect the caliper, but makes it necessary to put the anchor arm in compression. Rokon has mounted the anchor arm to the frame instead of the swinging arm for a full-floating action which works extremely well both theory and in practice. Rear brake action is excellent, combining good "feel" with moderate pedal pressure.

The front brake is also very smooth and progressive in operation, although it's easy to forget just how much stopping power is available and locking the front wheel by overzealous application is fairly easy to do. But, then, the Rokon isn't an ordinary motorcycle, and takes some getting used to. Experiments with cero-metallic brake pucks, which provide superior stopping action in wet, muddy going are showing that disc and brake pad wear is high and replacement intervals are close together. Ordinary organic pucks seem to be the best all around choice and will probably be standard equipment on later production models.

Another unusual feature of the Rokon is the pull-rope starting device, much like the one found on an outboard motor. The idea of a kick starter has been tossed around at the factory, but riders who have used and become familiar with the pull-rope are enthusiastic with it and once we mastered the technique of pulling the rope with one hand (being careful not to bang our hands on the sharp edge of the fuel tank), and controlling the throttle opening with the other, we like the system just fine.

Kim-Tab magnesium alloy wheels with heavy tire bead areas have proven well suited to their use on the Rokon. There are no spokes to loosen up and minor dings in the wheel rim may be straightened by using a wooden block and a hammer. These wheels are immensely strong and the rim area doesn't have lips to catch mud and debris, which adds to the weight of the wheel.

One big complaint we had about the Rokon was the noise level, both from the engine and from the exhaust system. The muffler is made in a rectangular section shape whose flat sides act as a sounding board and create a peculiar "ringing" sound. The exhaust exits the muffler through two small pipes at the rear, but it isn't certified as a spark arrester yet and adding two bolt-on units is costly and difficult, considering the bracing that would be necessary to hold them on securely.

A silencer of round shape was tried but it interfered with the rider's leg. Later RT340s will come with a rectangular section silencer with "dimples" in the metal to reduce the ringing and they will be spark arrester equipped.

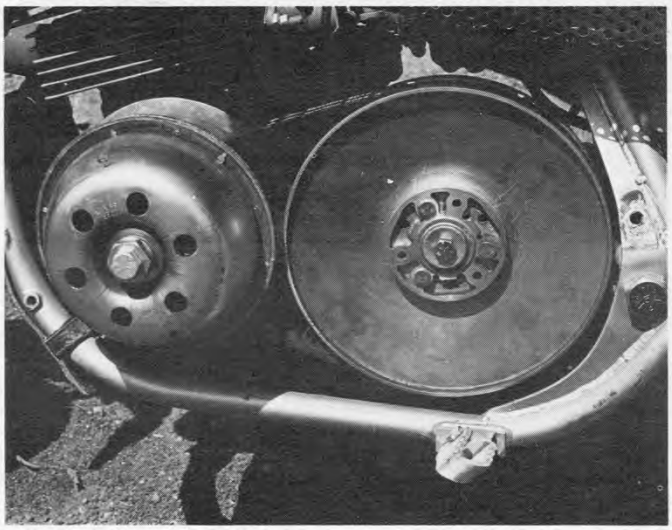
In spite of its considerable weight of approximately 280 lb., ready to run, the RT340 handles superbly. Both front and rear suspension is by Betor with the front forks offering nearly 7 in. of perfectly damped travel. The rear suspension units feature the same excellent action and have five-way adjustable springs for riders of varying weights and riding preferances.

A front fork angle of 30 deg. combined with 4 in. of trail give the Rokon essentially neutral steering characteristics with none of the understeering tendencies often found on heavy motorcycles. In fact, fire road sliding is a strong point as the machine is easy to break into a slide and just as easy to stop sliding without the fear of being "high-sided" if the throttle is closed too quickly. With steering geometry like this, it's hard to imagine that the machine would be so agile while picking one's way through tight, twisty trails.

The frame looks, and is, fairly conventional in design and construction. Twin downtubes run from the steering head under the engine and intermediate gearbox, curving upward to terminate at the rear suspension units' top mounting point. A huge, 2.5 in. diameter toptube runs rearward from the steering head to a point just in front of the seat, and smaller tubes are >

Right hand view of the engine clearly shows the pull-cord starter and the rear brake pedal which pivots from the front and is connected to the Kelsey Hayes master cylinder by an adjustable rod.

Torque converter components are shown clearly when the outer cover is removed. The engine mounted pulley (left) contains three weights which fly outward as engine rpm increases, squeezing the sides of the pulley against the V-belt to begin forward motion of the machine.



welded to it and extend rearward to serve as supports for the seat, took kit and rear fender.

Fabricated from DOM 1020 mild steel, the frame tubes and supporting gussets are MIG-welded, a process which feeds the welding rod down through the center of the welding arc by a motor. The process is very quick, preventing high heat from reaching the surrounding material. Hence, the frames don't have to be heat-treated to relieve stresses caused by the welding after assembly.

Since the Sachs engine mounts to its support by four bolts on the bottom of the crankcase, a platform fabricated from 3/16 in. sheet steel serves as a mounting point for the engine and secondary reduction (transfer) box. Sloping downward toward the front of the machine, the platform gives the engine a forward slant and the cylinder head and cylinder may be removed without taking the engine out of the frame. In fact, the entire machine, not counting the flywheel assembly, may be disassembled using ordinary hand tools. The magneto unit and crankshaft-mounted torque converter assembly require special pullers to remove them, however.

Care taken in design and execution of the RT340 is evident at first glance and more apparent when the machine is inspected closely. An aluminum panel mounted above the center of the handlebars is equipped with a VDO speedometer with a trip odometer which may be reset either forward or backward. An enduro route card holder with a magnifying lens and a watch holder with a similar lens complete the instrument panel. At the other end of the machine is a genuine leather tool pouch, mounted just behind the seat. This contains a good assortment of high quality tools.

Look closely and you'll see that G.E. Silicone Seal is used extensively around the magneto case and at points where wiring exits the case, preventing the entry of water into the electrical system which includes a 40 watt alternator to supply power to the sealed beam headlight and the taillight. No battery or stop light is fitted at present, making the machine illegal for road use in some states, but as soon as a suitable 12V battery is found, the Rokon will be equipped for road use anywhere.

Also commendable is the extensive use of Heli-coil inserts in aluminum parts, but the machine isn't fitted with lock washers: Loctite is used instead, and although it is a good product, we feel that lock washers would do just as well, and would obviate the necessity of carrying a tube of Loctite everywhere you go.

Both axles have t-bars welded to one end, and removal of the rear wheel is possible without taking the chain apart. Both fenders are made of flexible plastic which may be bent almost double without cracking, and the high-impact fiberglass used for the air cleaner box and gasoline tank will take an incredible amount of abuse without cracking or breaking.

Without doubt, the TCR is a tough machine built for the accomplished off-roader, but that's not all it's suited for. During our test session, a member of CW's art department came along to take pictures and practice his limited knowledge of motorcycle riding. He rode a conventional motorcycle on a journey from the entrance of the park to the other side, but was going so slowly we had to stop and wait for him to catch up several times. On the return trip, he rode the Rokon and arrived back at the park's entrance a much improved rider. Not having to worry about synchronizing clutch and gearshift motions gave him more time to concentrate on riding, and the regular staff members had a hard time making him give back the machine!

The Rokon RT340 Automatic TCR is a motorcycle designed for the expert enduro and trail enthusiast, but its simplicity of operation will appeal to the novice rider as well. Although its $1495 price will not appeal to a great number of enthusiasts, especially beginners, those willing to shell out the cash will have spent their money well.

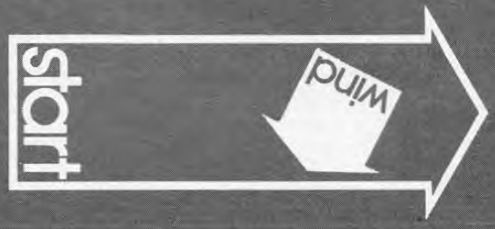
ROKON RT 340 AUTOMATIC TCR

SPECIFICATIONS

List price	$1495
Suspension, front	telescopic fork
Suspension, rear	swinging arm
Tire, front	3.50-19
Tire, rear	4.00-18
Brake, front, eff. dia. x width, in.	(2) 11.0 x 1.5
Brake, rear, eff. dia. x width, in.	(2) 11.0 x 1.5
Total brake swept area, sq. in.	180
Brake loading, lb./sq. in. (160-lb. rider)	2.45
Engine, type	two-stroke Single
Bore x stroke, in., mm	3.07 x 2.76, 78 x 70
Piston displacement, cu. in., cc	20.45, 335
Compression ratio	11.8:1 (uncorrected)
Claimed bhp @ rpm	37 @ 6500 (SAE)
Claimed torque @ rpm, lb.-ft.	28 @ 6000
Carburetion	38mm Mikuni
Ignition	flywheel magneto
Oil system	oil mist
Oil capacity, pt.	oil in fuel
Fuel capacity, U.S. gal.	3.5
Recommended fuel	premium
Starting system	pull-cord
Lighting system	12V, 40 watts
Air filtration	oil-wetted foam
Clutch	centrifugal
Primary drive	Salsbury variable ratio
Final drive	single-row chain
Gear ratios, overall:1	
5th	27.0 to 6.25, variable
Wheelbase, in.	55.8
Seat height, in.	32.5
Seat width, in.	10.5
Handlebar width, in.	34.0
Footpeg height, in.	11.7
Ground clearance, in.	10.3
Curb weight (w/half-tank fuel), lb.	281
Weight bias, front/rear, percent	42/58
Test weight (fuel and rider), lb.	421
Mileage at completion of test	263

TEST CONDITIONS

Air temperature, degrees F	83
Humidity, percent	60
Barometric pressure, in. hg.	29.95
Altitude above mean sea level, ft.	363
Wind velocity, mph	2-4
Strip alignment, relative wind:	



PERFORMANCE

Top speed (actual @6500 rpm), mph	83
Computed top speed in gears (@6500 rpm), mph	83
Mph/10000 rpm, top gear	variable
Engine revolutions/mile, top gear	variable
Piston speed (@6500 rpm), ft./min.	2990
Lb./hp (160-lb. rider)	11.4
Speedometer error:	
50 mph indicated, actually	46
60 mph indicated, actually	56
70 mph indicated, actually	67
Acceleration, zero to:	
30 mph, sec.	2.9
40 mph, sec.	3.9
50 mph, sec.	5.0
60 mph, sec.	7.0
70 mph, sec.	10.2
80 mph, sec.	18.5
Standing one-eighth mile, sec.	9.07
terminal speed, mph	67.46
Standing one-quarter mile, sec.	15.56
terminal speed, mph	77.72