



## DIRT TEST

**W**e often wonder whatever possessed Swedish army officials to utilize an automatic motorcycle in their war games. Could it be that a motorcycle can flat out-run land troops, jeeps and tanks in a footrace? Or dodge machine gun fire and mortar bombardments with the grace of a ballerina? Or simply traverse obstacles and terrain impenetrable by ordinary means? The advantages seem limitless and that's why the Swedish government contracted Husqvarna to develop a motorcycle for army use in 1970. Not just an ordinary machine, but one with an automatic transmission requiring a minimum of riding skill, that could be ridden without the use of both hands (leaves one free for shooting from the saddle) and is easily maintained. Husky jumped at the chance since they didn't have the money needed for that extensive project. Five years in development, there are now an estimated 3000 units circulating on Swedish army land, or about three bikes per every 2000 enlisted men. Most are used as personnel carriers, such as transporting V.I.P.s, and all are 250cc rather than 360s or 390s. They're workhorse models, undoubtedly not equipped (such as with long-travel suspension) as the MX versions are.

With the development work behind and a product obviously well enough engineered to pass stringent army requirements, Husky offered an off-breed of this model to the public last year in the form of a 360 Automatic. Neither Husky nor the public were sure where this new, revolutionary model would fit into motorcycling, so it was termed and tested as more or less, a "playbike," its main selling point being its uniqueness. Our test left us with an overall favorable impression of the bike.

Now, a year later, the 360 has grown to a 390, the chassis and suspension are straight from the MX track, and the question concerning its purpose has obviously been resolved—the new 390AMX is a full-blown GP racer intended to do battle with the big Yamahas, Buels, KTMs and Suzukis. The only item that has remained constant is the automatic transmission buried inside the cases.

It's a simple, ingenious system employing four centrifugal clutches that engage at different times. First-gear clutch is located on the left-hand end of the crankshaft with three more be-

hind it in the transmission portion of the engine which also houses four gearsets like those in a standard shift model. As the rpm increase, the flyweights inside the first gear clutch begin expanding and start to make contact against the outer drum of the clutch, starting the bike in motion. Since the flyweights firmly engage while the engine is at a moderate rpm, the cycle still accelerates until time to shift. Upshifts are dictated by rear wheel speed. As the wheel turns faster another set of clutches begin to take hold and it automatically shifts upward into the next gearset. In fourth gear all four clutches are firmly engaged and downshifting is directly opposite. As the rear wheel slows down, such as braking for a corner, the fourth gear clutch assembly begins to slow down and the flyweights fall away from the drum, allowing the third gear flyweights to take over.

From a racer's point of view the transmission is a blessing, virtually indestructible with no chance of a human foot abusing it—rather like taking away the plastic mallet so you can't break the steel ball bearing. One army requirement was that it would be easily serviceable out in the field, and it is. Under a qualified hand the complete transmission can be removed with a limited number of tools in 15 minutes—with most of this time spent removing the numerous bolts securing the side cases.

There is a master gear-drive lever mounted on the handlebars that completely disengages the engine from the transmission. Used only when starting the engine, it's like a neutral gear and allows the engine to be revved up without the bike taking off. Once started, the engine must be returned to idle before engaging the tranny, or you'll hear loud protests from within the transmission and the drive won't engage until the rpm drop low enough. According to Husky, failure to follow this little rule is one of only two ways the tranny can possibly be hurt; the other is by failure to maintain the correct adjustment between the gear-lever and gear-cable (located on top of the

right side case). There should be one millimeter of play between the two; too much play doesn't allow the master gear to disengage fully, and too little doesn't permit it to engage completely—the result is a badly worn gear after a period of time. The only other necessary service is to simply keep the bike full of transmission fluid, available from your Husky dealer—don't use regular ATF!

The 390 Automatic powerplant is basically a stroked 360, getting its extra 30cc from a one-millimeter bigger bore and a four-millimeter longer stroke. The full-circle flywheel has been changed to a T-forging for balancing and such things as the reed housing (reed assembly remains the same), cylinder, head casting and finning have been enlarged. New to all late '77s is a 38mm Mikuni carb replacing the aging Bing; it supplies a clean running engine and fantastic throttle response in any situation.

Because of the automatic transmission we couldn't get a dyno figure on the engine, but another publication recently dynoed a 390CR which pumped out 34 horsepower; that's down somewhat compared to a Suzuki RM370B which puts out 39 hp. We conducted our own head-to-head drag race with a stock RM370B and, considering the 390 is an automatic with a percentage of slippage and the fact it is down on horsepower, the Suzuki couldn't pull more than a bike-length ahead after five gears. The 390's disadvantage seems to be in the first 10 feet while the flyweights take a split second to firmly engage—from then on it's a dead even race. This led us to believe that the automatic would be much more at home on wide-open GP courses, rather than on tight, twisty tracks where rapid acceleration from corner to corner is essential. This was calculated after we exchanged the stock 13-tooth countershaft sprocket with a 12-tooth; this, plus a 14-tooth sprocket is supplied with the bike. The added acceleration gained from the 12-tooth gear is incredible and a must on short tracks.

Chassis and suspension have changed radically from the 360 mod-

# Husqvarna 390 Automatic

## THIS NEW 390, A FULL-BLOWN GP RACER, IS SLICKER THAN SHIFT!







# Husky's 390 Automatic

el and follow the lines of the 390CR. The chrome-moly frame has been stretched around the steering head which accounts for almost an inch increase in wheelbase. The frame backbone has risen slightly to allow room for the new upswept over-the-engine pipe which also features a built-in repackable fiberglass silencer on the end. The pipe exits along the left side of the seat; if you're constantly doing right-hand berm shots and burying the handlebars, the pipe gets noticeably warm on the left thigh—almost to the point of burning. In most cases it won't affect you, but it does need a heat shield.

The front end has seen some drastic changes, due to Husky's new policy of building machines that appeal to the general public instead of a few salaried riders. Front-end rake has been reduced from 32 degrees to 29 degrees in an effort to make the Husky turn better and the straight-axle forks have been replaced by Husky's new leading-axle forks that supply 9.5 inches of travel as opposed to last year's 8.25 inches.

They're identical to the CR forks, with beefed-up aluminum sliders and hard-chromed stanchion tubes. They are amazingly smooth-working considering each fork utilizes two single-lip oil seals and a heavy-duty nylon scraper to wipe the tubes clean. The forks give a smooth, plush ride, never topping or bottoming even off the most severe jumps. After experimenting on taking different lines around the race track we found the Husky liked to use berms as a turning helper and revolted somewhat by pushing and sliding the front wheel when trying to cut underneath competitors. This reluctance to carve flat corners and head for the berms fits the Automatic's personality though. Because it's slightly slow accelerating from corners, it should be ridden like a 125, keeping the speed up in the corners and utilizing every berm in sight. That's why it's at a slight disadvantage on tight tracks.

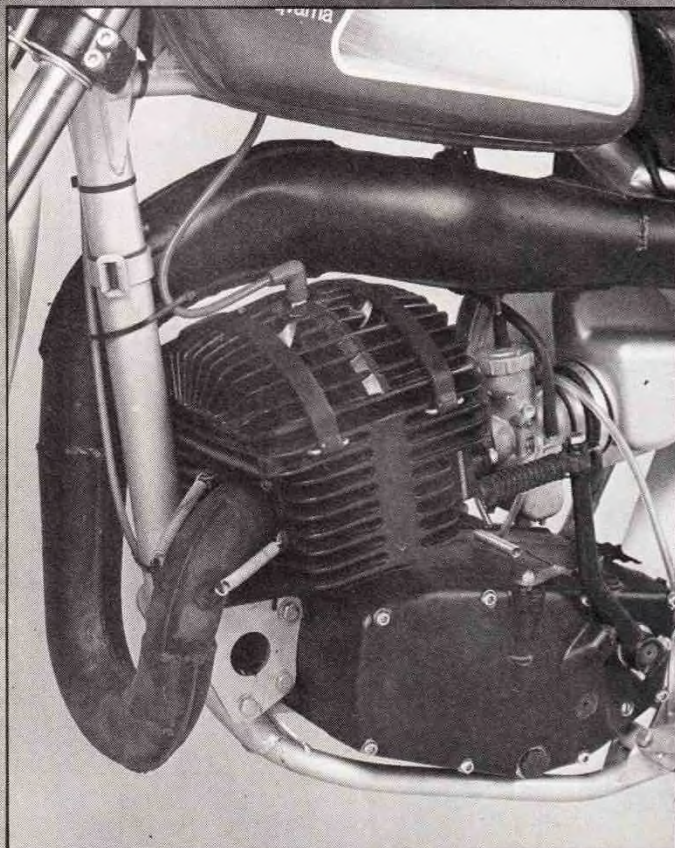
New 15-inch gas Girlings with improved valving and split-rate springs take the place of last year's 13-inch models, giving a whopping 10 inches of rear wheel travel compared to the 360's 7.87 inches of travel. The lengthened shocks required that the upper mounting points be raised an inch, while the rear points remain the same. As a result of all this travel, the 390 is a tall machine with a seat height of 37 inches, equal to Yama-

ha's YZ250D, and two inches taller than last year's 360. The most noticeable effect, aside from handling characteristics, is the fact that the kick start lever is even higher and almost requires that you put your knee to your chest to get at it. Add the extra effort to kick over the larger engine, and you've got yourself some work. Cold starting was mediocre throughout the test—sometimes three kicks, sometimes ten. We really couldn't figure out a system, aside from the fact you must open the throttle at least a quarter-turn while kicking it or it will never fire. Hot starts required only a few kicks.

The gas Girlings work well in smoothing out even the meanest ruts and potholes, but overly stiff (for our taste) springs diminished some of the plushness that you expect to get from 10 inches of travel. Huskies have always been solid-feeling machines that are very predictable and the new 390 follows suit. It has an uncanny way of straightening itself out from near disaster when the throttle is twisted harder. Handling is slow and steady, but very precise, and unless provoked outrageously, it has a natural tendency to remain upright on its two wheels.

No shifting is the easiest of the automatic's peculiarities to master. During our test sessions we let several curious bystanders ride the 390 for a

MIKE LEVASHEFF



MIKE LEVASHEFF

Over-bored and stroked 360 engine still features a pressed-in liner and single chrome ring. New up-pipe now swings around, over top of the engine.

New 9.5-inch travel leading axle forks are bolted up to the newer MX-type conical hub and backing plate; it had the enduro-type full width hub last year.





BRAD ZIMMERMAN

## HUSQVARNA 390 AMX



### TEST BIKE: HUSQVARNA 390 AUTOMATIC

Price, sugg. retail.....\$1995

#### ENGINE

Type.....Reed-valve and piston port two-stroke single  
Bore/stroke.....83 x 71 mm (3.27 x 2.79 in.)  
Piston displacement.....384 cc (23.42 cu. in.)  
Compression ratio.....11.5:1 (uncorrected)  
Carburetion.....Mikuni VM38  
Air filtration.....Oiled foam  
Ignition.....Motoplat transistorized  
BHP @ rpm.....N.A.  
Torque @ rpm.....N.A.

Lubrication.....Oil in fuel  
Electrical power.....None  
Battery.....None

#### DRIVETRAIN

Primary transmission.....Spur gear, 1.70 ratio  
Clutch.....Automatic (centrifugal clutches)  
Secondary transmission..... $\frac{5}{8}$  x  $\frac{1}{4}$  in. (520) chain  
Gear ratios, overall :1.....1st 17.30; 2nd 12.85; 3rd 10.20;  
4th 8.49

#### CHASSIS & SUSPENSION

Suspension, front.....Telescopic fork, 240 mm (9.45 in.)  
travel  
Suspension, rear.....Swing arm, 254 mm (10.0 in.) travel  
Tire, front.....3.00 x 21  
Tire, rear.....4.50 x 18  
Brake, front.....Drum, 160 x 25 mm (6.3 x .98 in.)  
Brake, rear.....Drum, 160 x 25 mm (6.3 x .98 in.)  
Brake swept area.....98.6 cm./sq. (38.8 in./sq.)  
Rake/trail.....29°/n.a.  
Wheelbase.....1435 mm (56.5 in.)  
Seat height.....940 mm (37.0 in.)  
Handlebar width.....838 mm (33.0 in.)  
Ground clearance.....318 mm (12.5 in.)  
Instruments.....None  
Stands.....Side  
Tire retention device(s).....Security bolts; 1 front, 2 rear

#### WEIGHTS & CAPACITIES

Fuel capacity.....7.8 lit. (2.06 U.S. gal.)  
Oil capacity.....1000 cc  
Weight, wet, unladen.....112 kg. (247 lb.)



# Husky's 390 Automatic

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short period, all of whom didn't find automatic shifting annoying or difficult to adjust to. The lack of engine braking is a little unnerving because it simply coasts when the throttle is backed off, which means you'd better have the art of braking (using both front and rear) well mastered. The brakes are good, the rear being a full-floating system, and contrary to what you'd think, it's not at all prone to locking; because it's an automatic and freewheels, you'd think otherwise. One interesting point is the engine is impossible to stall. Lock the rear wheel up, or throw the bike on the ground and the engine continues to idle—pick it up and ride away.

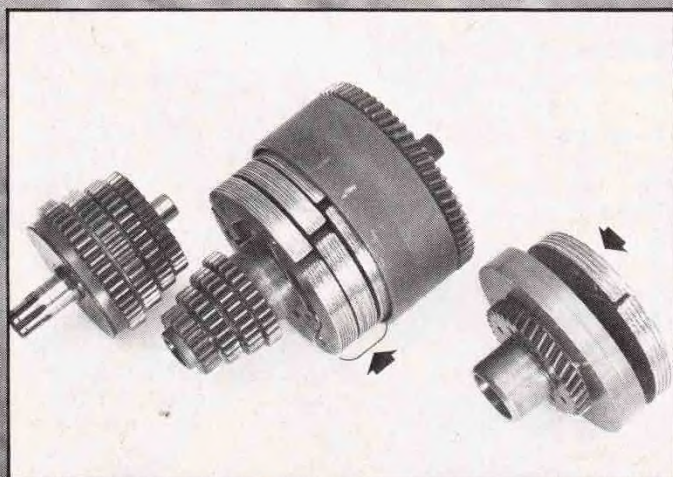
The clutch spring pressure is set so that the flyweights begin to slip outwards and engage when the engine is well into its powerband; that means the engine is never bogged at any time, no matter how fast you're going or what gear the transmission's in. Anytime the throttle is cracked full open the engine is immediately "on the pipe" which is a little nerve-racking and gives the impression that the bike is getting a lot of wheel spin, when it's really not. To a bystander it sounds like you're riding it with just a kill button.

The 390 has no natural tendency to wheelie off the starting line or when powering out of corners, although the front-end will go skyward if provoked, such as when sitting rearward or jerking the handlebars. Doing controlled wheelies is a little

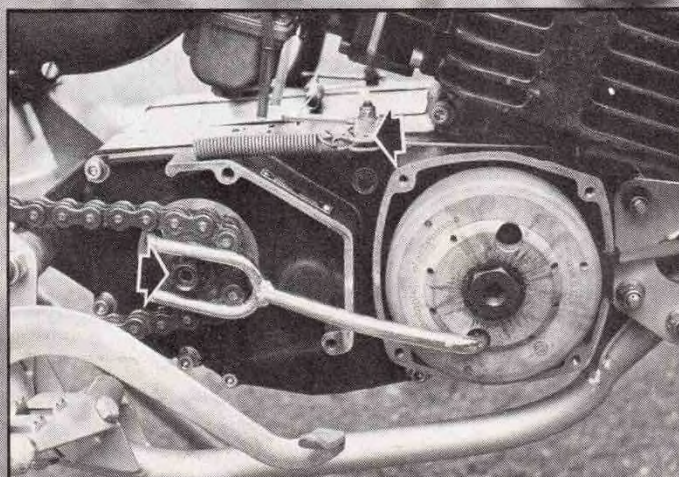
tricky. The automatic shifts are so subtle that it's almost impossible to recognize when one is about to take place—and it doesn't care when either. We lofted the front-end into a beautiful wheelie, holding it steady with power and then the tranny decided to shift to the next higher gear. The result? Yep, we threw it down the road. Well, what the heck—that's what we're paid for.

The 390 engine vibrates more heavily than the 360, some of which is deadened by the rubber-mounted handlebars. The Magura controls fall easily to hand, although the grips are extremely hard and pure torture on the hands. Following the new MX approach, the automatic now comes with the smaller two-gallon aluminum tank instead of the three-gallon enduro-type unit. Husky has spent a lot of time making this model as waterproof as possible. Since the entire transmission is housed tight inside the cases, there's no problem there. You'll find an elaborate air filtering system consisting of numerous rubber baffles riveted to the air box cover, and also one that hangs down from the aluminum based seat, all of which tightly surround the air inlet. The transmission vent is also trick. It vents through the countershaft, and with the help of a small seal, out the sprocket cover and into a vent tube; the tranny won't lose any fluid, even when the bike is on its side.

Overall, we were twice as impressed as we were with the first 360 model. Husky has chosen a niche for the Automatic and it fits in nicely. We think where you ride it, and how well you adapt to its unique features will determine your success with it. Of course it's still a great "playbike" off the track—but now it might play harder than you can handle. **M**

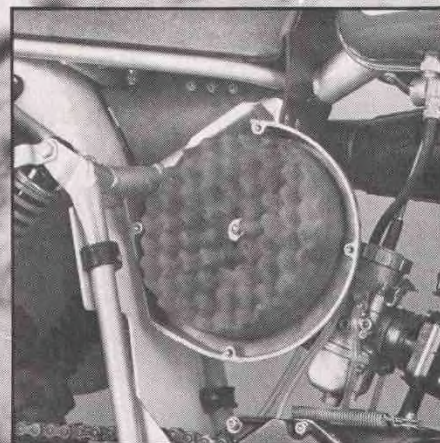
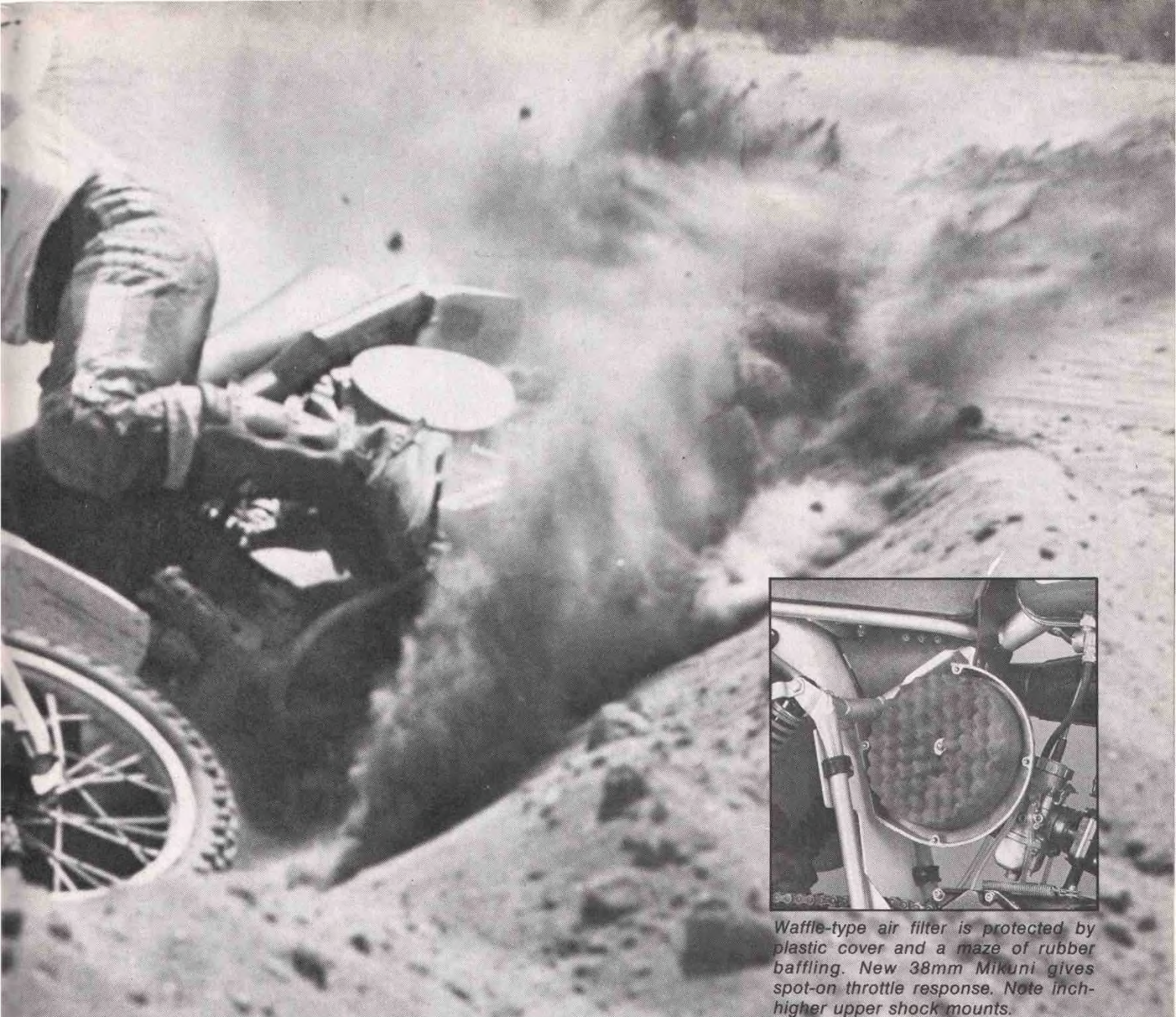


Transmission is simple and virtually unbreakable. It is composed of first gear clutch (right arrow), second through fourth gear clutches (left arrow), and a gearset.

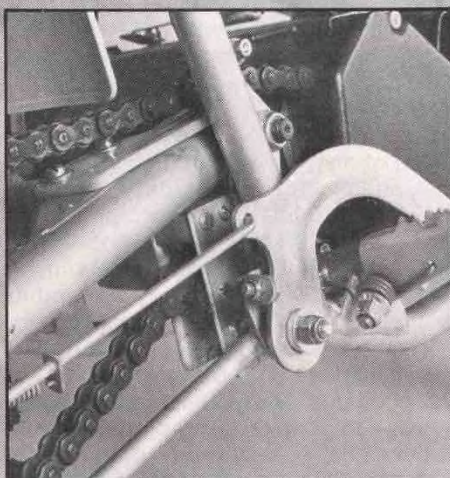


With each Husky you get an assortment of tools such as this flywheel holder for tightening the flywheel. Left arrow shows exposed transmission vent seal, while right arrow shows critical adjustment on master gear lever.

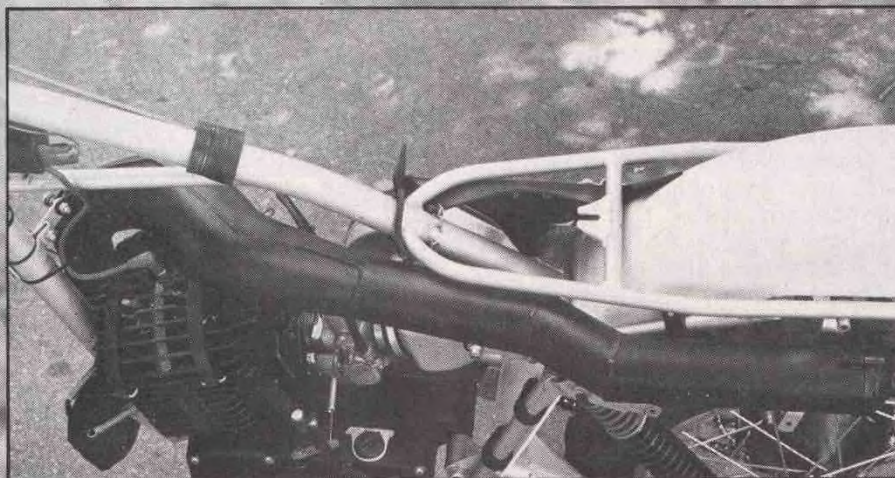




Waffle-type air filter is protected by plastic cover and a maze of rubber baffling. New 38mm Mikuni gives spot-on throttle response. Note inch-higher upper shock mounts.



Swing arm pivots in needle bearings and is protected from a chain sawing by a plastic pad. Husky's added a second chain guard, this one mounted on the frame, directly behind and below swing arm pivot.



With seat and tank removed, the new pipe reveals its many curves. Front part of seat bolts to frame crossbar—nifty, but difficult to get at.