

CVT TIPS

Ten tips for a
happy CVT clutch

By the Staff of Dirt Wheels

Jeff Supinski of EPI Performance has CVT parts dancing in his head 24 hours a day. If you call him, he can infect you with some of that knowledge.



□ The continuously variable transmission ranks right up there with the wheel, sliced bread and caffeine as one of man's greatest achievements. This design consists simply of two clutches and a belt, yet it enables the sport utility quad to do amazing things. You push the throttle, you go. The CVT does the rest, dishing out the right amount of power for rocks, mud, sand or whatever else you have on the agenda.

Be mindful, though: As simple and reliable as the CVT appears, it's still not indestructible. The belt usually is the fall guy. It gets all the blame when things go wrong. But nine times out of 10, the problem didn't start with the belt. Failures are most often the result of modifications and applications made by an unknowing ATV owner. On a daily basis, EPI Performance deals with all the ugly things that can

go wrong inside that big case. We talked with Jeff Supinski of EPI to learn ways to keep your continuously variable transmission happy.

1. Know who you are. The manufacturers all have done an amazing job of guessing who you are. They make quads for the farm/mud/sand rider who goes and spends his weekends hunting, racing and mud diving. In other words, all CV transmissions are set up in a state of compromise. If your riding is specialized, you probably have to set up your quad with your application in mind. For example, riding in sand creates different demands compared to riding in mud.

2. Listen to your clutch. You know when you're doing bad things to your clutch. Any time you gas it and don't go forward, all that power is going into the clutch and not coming

out. Einstein or Newton or someone smart like that taught us that energy can neither be created nor destroyed, right? It's being transformed from kinetic energy into heat, and heat is notoriously bad for your CVT. Abuse causes the belt to fail first, but that's actually a good thing. The belt is kind of a canary in a coal mine. If the canary dies, that means something more expensive will die next. Use your nose and use common sense.

3. Use the throttle wisely. You can extend the life of your stock clutch with simple techniques. Never hold a steady load on the motor if you're stuck and the wheels aren't turning. Use low range if you have it. And a sudden burst of power is less likely to heat things up than a slow, gradual increase in throttle. Remember Newton.



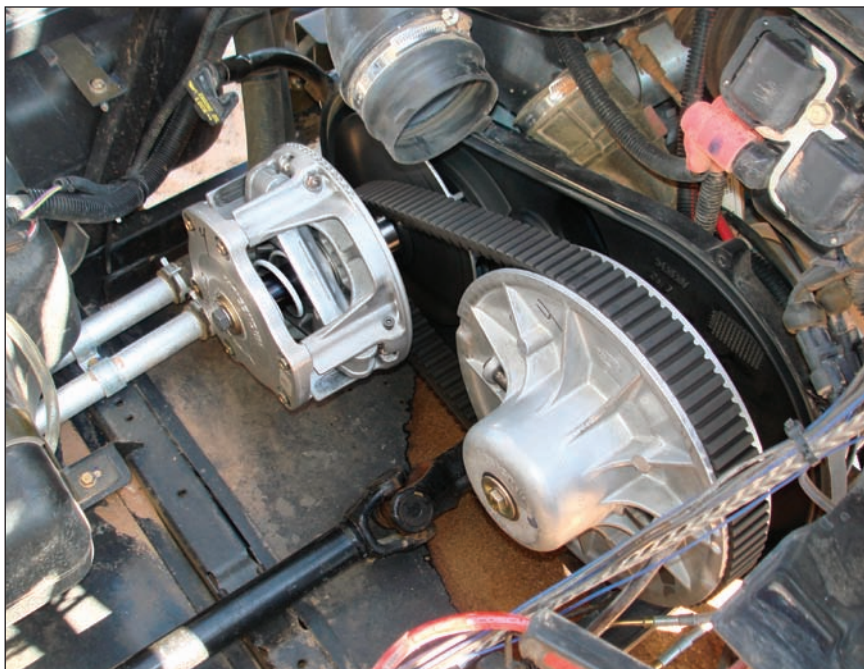
A typical clutch kit is simple, usually consisting of springs and flyweights. The cost is generally under \$200, making it a very cost-effective modification.

◀ *ATV makers do a good job of guessing who you are. If you find yourself in extreme conditions like deep mud or sand, you need to match your CVT clutch to your type of riding.*

4. Know your rpm. If your quad has a tachometer, pay attention to it. From the factory, your transmission is designed to run within a certain rpm range. If that rpm range changes over time, then something is up and your clutch probably needs attention. Slippage will cause higher rpm than normal. Clutch spring or flyweight damage can cause lower rpm and a perceived loss of power. If you don't have a tach, use your ears and the seat of your pants.

5. Understand the world in which you live. Climate and environment play a very big role in clutch life. The CVT was originally designed for snowmobiles. That was a much happier place for this design. The clutch was out in the open; it was cooler and there was less dust. The ATV clutch is typically in a closed case that captures heat. It's typically operated in hotter weather, and dust can get in and cause premature wear. The bottom line is that if you live in a hot, dusty place, your clutch will suffer.

6. Remember your clutch when you buy wheels. The number one modification for most quads is an upgrade in tires. Larger wheels do two things. First, they increase traction. Second, they change the overall ratio between rpm and speed. The traction issue creates obvious hardship on the clutch. The ratio difference is more complicated. More often than not, it changes the rpm level, and your quad will suddenly seem less powerful. If you get wheels that are about 1 inch larger, you might get away with the stock clutch under mild use. If you go bigger, you will have to invest in a clutch kit.

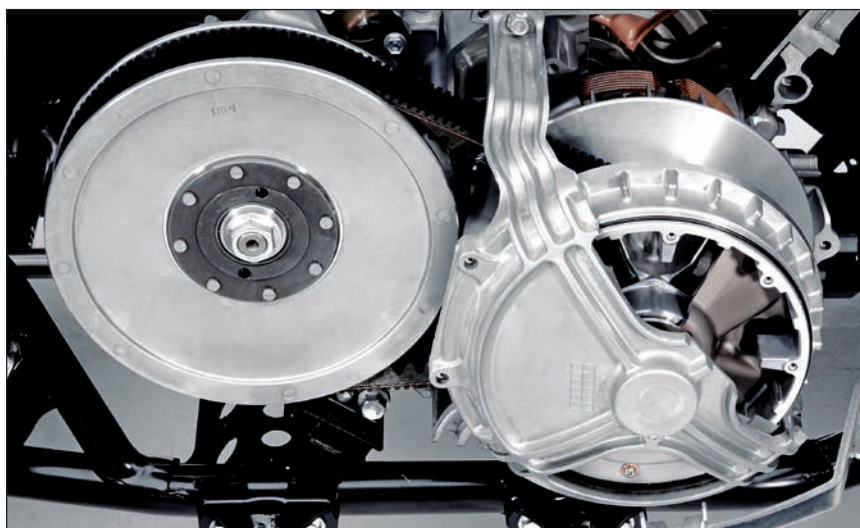


Side-by-sides often have CV transmissions that are similar to those in ATVs, yet they often deal with more weight and power.

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Mud competition takes an ugly toll on clutches. The belt is generally the scapegoat for problems in the centrifugal clutch.



"You can't wax a clutch," says Jeff. In other words, clutches aren't pretty, but still need to be a vital part of your overall plan for building a better ATV.



Riders are all too willing to install oversize wheels and other high-bling parts without making much more essential investments in the clutch.

7. Remember your clutch when you increase horsepower. It's entirely possible and even likely that you can increase horsepower with a pipe or a big-bore kit and make your quad slower. Horsepower is achieved by an increase in rpm, an increase in torque or both. An increase in the rpm capability of your motor will never be realized in the real world if the clutch isn't altered. By the same token, a change in the engagement point can make a quad feel much faster with no motor alteration. A higher engagement rpm results in harder acceleration and quicker throttle response.

8. Understand the backshift. Backshift is what happens when you take your thumb off the throttle. Most ATVs are slow to change ratio when you decelerate. That means when you get back on the throttle suddenly, you will find that the motor feels sluggish, as if it's in too tall a gear. A good transmission expert can change the backshift characteristics of an ATV very easily, and it can result in much better performance.

9. Clutches aren't sexy. But they should be. When a rider builds a sand quad, he goes straight for the high-bling wheels. Then he's all over the motor kits and the polished aluminum goods, all of which cost small fortunes. You can't wax a clutch, but it's the weak link, and it's cheap to upgrade. A good clutch kit costs less than \$200, or about the price of one tire.

10. Match the clutch kit to the application. EPI Performance has quite a few clutch kits that do different things. If you just installed larger tires and want to restore your quad's performance, the Sport Utility kits for oversized tires are the ticket. These kits will get your motor back in its peak powerband on the tach. If you have more extreme use in mind, then you should look at the Sand Dune or Mudder kits. They're designed for those specific types of riding. The Sand Dune kits are designed to deal with steady loads without a loss in rpm, like when you're climbing a long hill. The Mudder kits are designed to turn those big, heavy, mud-eating tires through the thick stuff. There also are Utility kits that are calibrated for those hardworking machines that live on a farm or ranch or are used by contractors. For more information, give EPI a call at (218) 829-6036, or visit www.epiperformance.com. □