



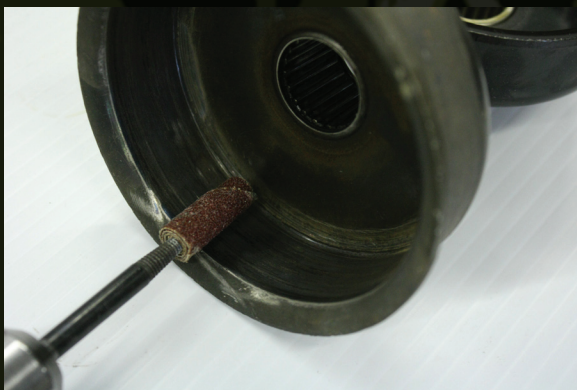
If The Shoe Fits...

Over the last couple of months in the "Grassroots Tech Barn," I have used our time together to shed a bit of light onto a few topics that are near and dear to my heart. This



month however, I am back at the bench to dive into a new subject; the shoe clutch. We will discuss the basic operation, maintenance, and installing it onto the engine properly.

Prior to the introduction of the Box Stock Engine, the shoe clutch spent most of its time tucked away on a



dark shelf, or in the back of a toolbox drawer wondering if it would ever see the light of day again. The requirement of a shoe type clutch in this division has brought the shoe clutch back to life.

Regardless of the brand, the operation of the shoe clutch is pretty straight forward. Two or more shoes rest upon a locating post, held onto each other or a center hub with a two or more springs. The tension of these springs determine how quickly, or how delayed, engagement occurs. Consult the owner's manual for the clutch to determine the spring setup that achieves the proper rpm.

Maintenance is a very overlooked area for clutches in general, especially shoe clutches. Racers sometimes tend to forget about certain items until they are a problem. Avoiding that trouble, as well as optimizing performance is this month's intent.

First and foremost, never ever should the clutch be exposed to water. Even on the most simple style of clutch, there are moving parts that will not function properly be-



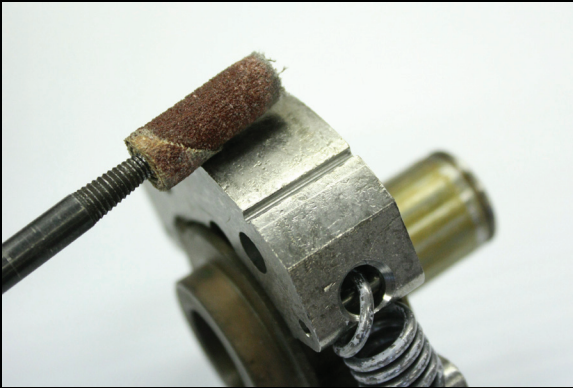
cause of rust or grit. The clutch does need to be cleaned, just not in that manner. Taking the time to remove the clutch



before washing the kart is time well spent toward the performance of the clutch. Plus, weekly maintenance is necessary to insure peak performance, and that maintenance cannot be performed if it is still on the engine.

The important thing to remember here is that the better we utilize the area of the shoe and drum surfaces, the better the clutch will lock up. Better lockup equals less slip, less slip equals better performance.

Separate the drum from the drive hub by removing the outer snap ring. Upon inspection of the shoes and the inside of the drum you will see blue areas, showing obvious heat and contact. These are the high spots we want to bring



down. We want to work down the high spots and make the shoes and the inside of the drum more accurate. Take a dremel tool, or another small grinder, with a sanding drum, and gently massage the high spots, leaving the low areas alone. Over time, the high spots will come down to the low spots, increasing the surface area.

Take the coarsest grit paper you can and rough up



the shoes and the i.d. of the drum. Forty grit is my flavor of choice. Two coarse, rough surfaces will lock to one another, reducing slip. Consequently, two slick or smooth surfaces promote slipping.

Wash everything clean with brake cleaner to re-



move all the grit and dirt, and blow dry with compressed air. Add a single drop of oil to the bearing and rub it in, and you are ready to re assemble. Excessive amounts of oil will find its way onto the shoes, making the clutch slip. Replace the drum onto the center hub and add your snap ring. Voila!

Your clutch should easily slide onto your crankshaft, and the key should enter freely as well. Forcing either will only create much more work later, or as I have experienced, the need for removal with little time to spare. If it does not



move freely, a bit of emery cloth or a small file will usually fix the problem. Some clutch keys have burrs that need to be filed down before the key can be used. Most crankshaft burrs are on the top of the keyway in the crank. A flat file across the top of both sides of the keyway will usually eliminate the problem

It is suggested that your clutch bolt and washer tighten to the crankshaft and not the clutch. This is accomplished by using a small diameter washer below the flat clutch washer. This washer should be small enough to fall inside the clutch bore and it will allow the clutch to float on the crankshaft. I personally like about .035-.060 float in my



clutch. This helps the clutch sprocket and the rear sprocket to maintain alignment as the frame flexes.

Different brands of clutches may slightly alter the procedures listed above, however the principles and theories are the same. Paying attention to the smallest of details is usually the difference between a successful day at the track and just another day. See you next month!

