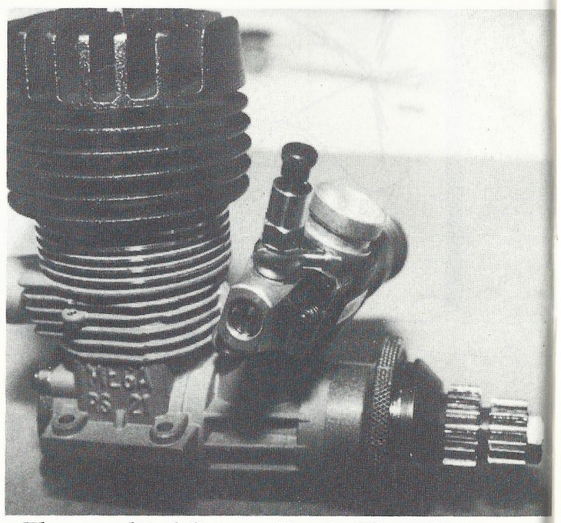
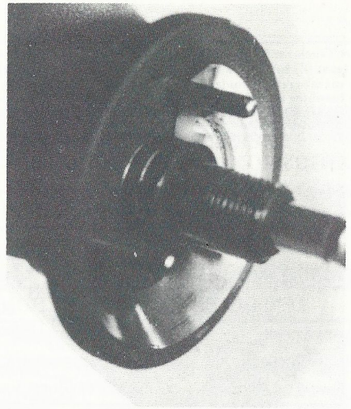
SERPENT'S CENTAX CLUTCH



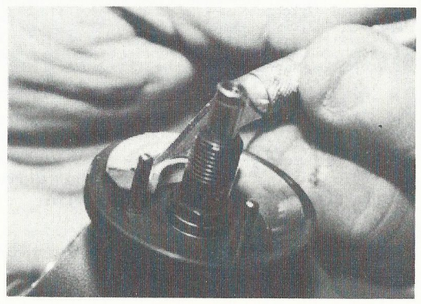
The completed Centax Clutch (Photo #5).

By Mike Myers
(From the *Starting Grid* based on information from Art Carbonell)

The Serpent Centax Cutch is designed to give the best possible performance on the race track for 1/10 scale and 1/8 scale on-road gas cars. It requires periodic maintenance for best performance and long life. When set-up and maintained properly it's fantastic. Your car will idle better and accelerate better. The Centax clutch can be adjusted to your driving style and/or the condition of the race track for quicker or smoother acceleration.



Top: Photo #1 Bottom: Photo #2



How the Centax Clutch Operates:

As the engine spins up to speed, centrifugal force causes the three white flyweights to move out, away from the centerline of the crankshaft. Photo #1 shows them "at rest", and photo #2 shows how they move out as engine rev's get higher. As they move out against the tapered flywheel surface, they put pressure on the metal clutch backing plate which in turn puts pressure on the carbon clutch shoe, pushing it out against the pinion/end-bell assembly. The harder the fly-weights try to move outward, the more pressure they put against the clutch-shoe.

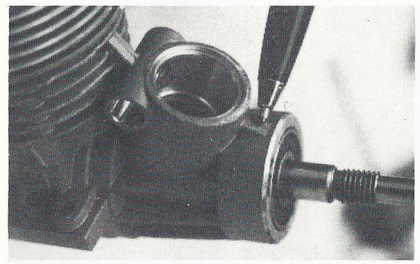
If there's too little end-play, there isn't enough pressure holding the clutch-shoe against the bell housing, (the fly-weights don't come out far enough to provide the required force to lock and fully engage the clutch) and the clutch will slip. This is similar to what would happen in a full-size car, if you drove your car with the clutch only partially engaged - the clutch would slip, generate a lot of heat, and burn up.

If there's too much end-play, the white flyweights can come out too far, get "stuck" in the outer position and not retract when the engine slows down. This will prevent the clutch from disengaging - you'll know this right away, as when the car stops, so will the engine.

Between these two extremes, the Centax clutch can be set to provide the desired performance, from smooth, gentle engagement (for slippery tracks) to wild engagement for maximum punch. It's also possible to set the clutch to engage at a higher or lower engine RPM.

Flywheel Installation:

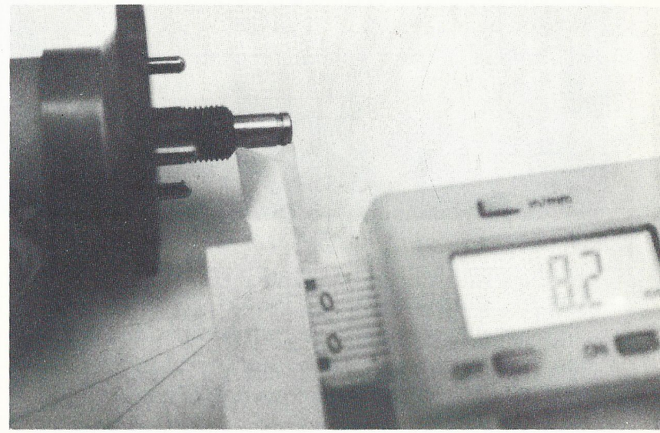
When you first install the Centax clutch on an engine, the first thing to check is that the flywheel can go all the way onto the crankshaft without binding against part of the motor casing. Photograph #3 shows a Serpent engine with a "casting brace" that interferes with the flywheel. Photograph #4 shows the removing of excess material with a grinding wheel mounted in a Dremel tool.



Top: Photo #3 Bottom: Photo #4

Assemble the flywheel onto the engine using a couple of the flywheel spacing washers behind the flywheel. If you're installing the Centax clutch on a Serpent or Picco engine, make sure you use the brass collet that comes with the flywheel, and not the one that comes with the engine. If you're installing the Centax clutch on a non-Serpent engine (such as NovaRossi or Rex), you will need a special length collet, to accommodate the different crankshaft length. A set of three 7mm short collets (Serpent part No. 6504) is available from your Serpent dealer or from RC Motorsports of Miami for these engines (photo #5).

Photo #6



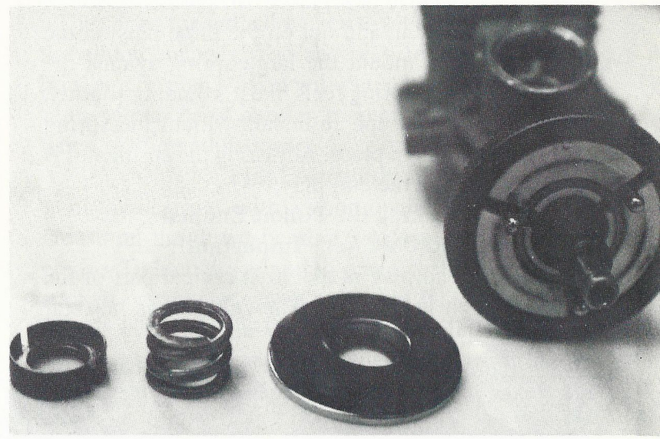


Photo #7

Tighten the flywheel lock nut fairly tight (as tight as you can get it using only your hands to hold the flywheel, not a pair of channel-locks). This is just for the initial adjustments - later on, when you tighten the lock-nut fully, it will be a little tighter, which will change the adjustments slightly.

Measure the distance from the end of the flywheel lock-nut to the end of the crankshaft. As shown in photo #6, it should be about 8.1mm (this isn't critical). Place the three white fly weights onto the flywheel. The clutch kit will include either an o-ring or a small circular spring which retains the fly weights in the flywheel (shown in photo #7).

Mount the metal plate over the fly weights. Make

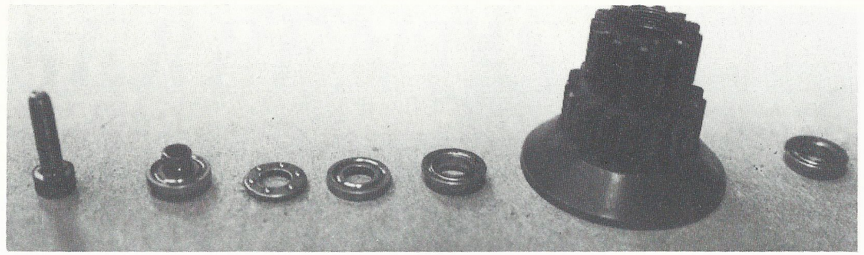
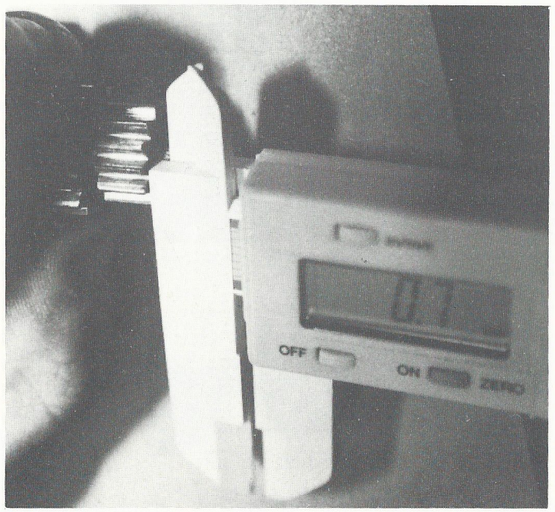


Photo #10

sure there isn't any grease on the metal plate that will get on the carbon clutch shoe - if there is, clean it off with electric motor spray cleaner). If you're re-installing a used carbon clutch shoe, check it over carefully. If there are buffs or dark ridges on the engagement surface, this may indicate the clutch-shoe was slipping and may need to be replaced. Make sure the clutch shoe slides freely in and out on the three pins on the flywheel. Next, mount the large spring against the clutch shoe. If the spring feels like it's binding slightly, turn it end-for-end and re-install. Mount the spring nut to hold things in place. Adjusting the spring nut is done after setting the end play.

Checking the Pinion/Endbell End Play. Very Important!:

Setting the end-play is the most critical part of the Centax Clutch installation. The end-play is how far



Top: Photo #13 Bottom: Photo #14

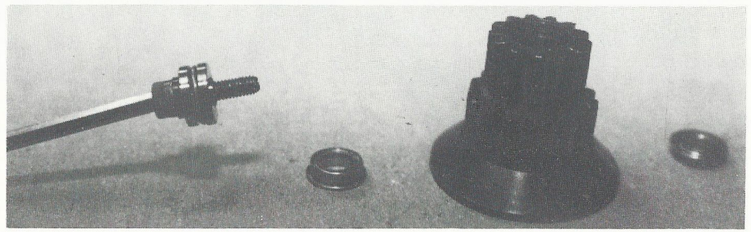
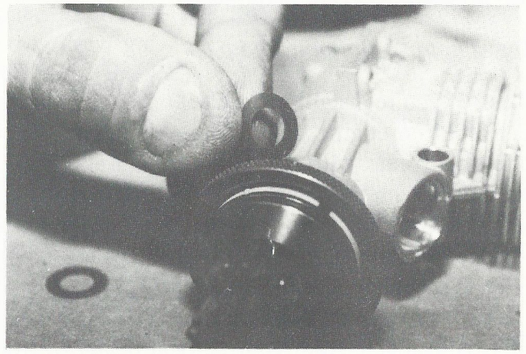


Photo #11

the pinion/end-bell assembly slides in and out towards and away from the engine. If you have too much or too little end-play, the clutch will either slip and burn up or not release properly and burn up. It is extremely important to set the end-play properly.

Mount the thrust bearing assembly on the retaining screw as shown in photo #11. Push one bearing into the front of the pinion (the end of the pinion that points away from the engine). Do not install the other bearing into the other side of the pinion yet - that comes later. Tighten the retaining screw. With the digital caliper, set the reading to "zero" with the pinion moved "in" all the way, then move the pinion "out" and the caliper will give you the exact read-out of how far the pinion moved. (see photo #13). DTC Tool Corporation sells an inexpensive plastic digital caliper for about $35, which works great for this and the other measurements you need to take.

Take this measurement several times. It should be between 0.5mm and 0.9mm. Art feels the ideal setting



is 0.6mm. If the measurement is more than 0.9mm, you need to reduce the end-play by adding additional shims behind the flywheel (see photo #14). Remove the flywheel, install the additional shim(s), re-assemble the flywheel and again measure the end-play. The Centax Clutch kit includes several shims of different thickness. If the measurement was less than 0.5mm, you have installed too many shims. Remove the flywheel, remove one or more shim(s), re-assemble the flywheel, and again measure the end-play.

When you have the correct amount of end-play, remove the pinion assembly and install the other bearing into the pinion/end-bell assembly.

Setting the Clutch/Engagement RPM:

The large coil spring determines the RPM at which the clutch will engage. Measure the distance from the end of the crankshaft retaining nut to the end of the spring nut (as shown in photo #15). The accept-

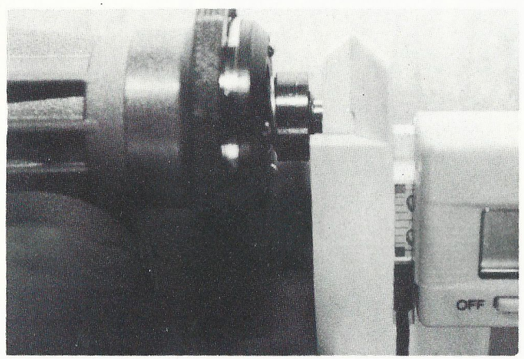


Photo #15

able range used to be from 0.2mm to 0.7mm; Art set his engines at 0.5mm. Recently, a longer nut has been introduced, which changes this dimension.

The dimension isn't critical, as once the engine is assembled and in the car, you can easily make adjustments to fine-tune the shift point, inserting a 1.5mm pin or a 0.050 Allen key through the small hole in the clutch housing. The spring tension can be increased by turning the adjusting nut further on to the clutch nut, causing the clutch to engage later. Find the slot in the adjusting nut and then turn it clockwise, while holding the flywheel.

If you use a setting less than 0.5mm, the clutch will engage sooner (at a lower engine RPM). This is useful on a dusty, low-traction track, or for breaking in an engine. If you use a setting more than 0.5mm, the clutch will engage later (at a higher engine RPM, which gives you more " punch". Don't go too far - if you tighten the retaining nut too much, the clutch may not engage properly.

The spring-nut is externally adjustable. The best way to set the shift point is out on the track, checking where on the straightaway your car is shifting, and if it's too early or too late, making the required adjustment. Remember that as your tires wear, they get smaller, and the shift point will occur earlier. Similarly, when you put on new (larger) tires, the shift point will occur further down the straightaway.

If you're using the Centax for the first time, start out at 0.5mm, see how you like it, then if the clutch engages sooner or later than you'd like, you can adjust the clutch accordingly.

The spring nut will allow you to set the RPM at which the clutch engages. The end-play setting determines how much "punch" you will get. Although the effects of these may seem similar, remember which is which when making adjustments.

Final Assembly:

Oil the bearings with a good quality light oil. Use grease on the thrust bearing. Art uses RCM Teflon grease. Tighten the retaining screw securely. Spin the endbell, and make sure it spins freely. When you're satisfied that everything is correct, install the dust cap. Art suggests that you get Serpent's optional aluminum dust cap. It's a small part, but it can make a big difference in the life of the clutch.

Maintenance:

Re-grease the clutch thrust bearing (preferably with RCM Teflon grease or an equivalent) when you first get to the race track, and before your Main. Check the end-play periodically, to make sure that it isn't beyond the acceptable limit due to clutch shoe wear.

Notes:

A good tool for taking clutch measurements, is a plastic digital caliper, model 700-103Y, PC-6" Y. It's available for about $35 from DTC Tool Corp., P.O. Box 4685, Hialeah (Miami), Florida 33014.

The toll free number to call them is (800) 432-4044.

RCM Teflon grease is available from your Serpent dealer, or from:

RC Motorsports of Miami
4715 N.W. 147th Street
Miami, Fl 33014
(305) 620-0005