

# INSTRUCTIONS



**TWO DISC CLUTCH  
FOR  
KART RACING ENGINES**  
APRIL 2012

**PATENTED**

**Adjustments** - Set the engagement speed to the engine's peak torque RPM (typically 4000 RPM). The engagement speed is adjusted by removing the Vortex springs and repositioning the lower leg of each spring in another hole. (The optional Vortex Spring Wrench, Part Number 4018 simplifies spring removal and replacement.) The #2 position causes engagement at approximately 4000 RPM. The difference between adjacent holes is approximately 180 RPM.

**Clutch Maintenance** - **SMC** highly recommends cleaning clutch discs mechanically NOT chemically. We have found that brake cleaner and other chemicals are inadequate for removing dirt and other fine particles packed into the tiny voids. A stainless steel utility brush aka plater's brush with a wire diameter of .006 is ideal for removing the hard-to-get-at dirt. Try this yourself and see the difference with a magnifying glass. Better yet, put a piece of white paper under the disc while brushing it. Check out the dirt! The friction material is very porous and consequently works very well as a dirt collector. Once the voids are filled and packed, the dirt starts to act as a lubricant (think tiny ball bearings) and causes the clutch to slip for a greater distance. Clutches like tires get dirty quickly. It is important to clean clutch discs every race weekend if not every heat if you want maximum acceleration. Upon disassembly use an appropriate marker to identify the top side of the drive plates and clutch disc if they will be reused. It will be very important to replace discs and drive plates in the original position and orientation. Heat and pressure cause these parts to wear and change shape. The top and bottom surfaces of drive plates and clutch disc all wear differently. An upside down clutch disc or drive plate can cause poor performance.

**IMPORTANT** - The clutch discs and drive plates should be considered a matched set. If only one of these five parts is worn, glazed or warped, it is usually necessary to replace all five parts.

The Vortex clutch is not very sensitive to air gap. Small changes in clutch disc or drive plate thicknesses due to wear do not affect performance. Drive plates that are light blue or distorted less than 0.020" from flat may be reused.

Heat and pressure cause friction material to separate from the clutch disc and bond to the drive plates. This friction material should be removed from the drive plates with sandpaper. Do not use sandpaper on discs.

Protect the clutch from moisture. Although most of the Vortex parts have an anticorrosion coating, there are a few areas where rust can occur and affect performance. Remove any rust with fine sandpaper, wire brush or Scotch-Brite.™

Use a Torx® T25 wrench with 60 inch-pounds (five foot-pounds) of torque to tighten the six button head cap screws.

**SMC Roller Levers** cause disc clutches to engage more effectively. Rollers located at the contact point between the lever and the pressure plate eliminate sliding friction. The lower friction reduces engine bogging. There is now more energy available for acceleration.

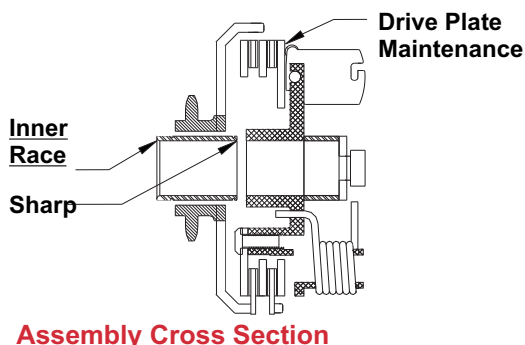
**DO NOT USE BULLY SPROCKETS ON SMC CLUTCHES - Bully sprocket do not meet SMC requirements for accuracy or quality.**

**Sprocket Maintenance** - Remove the inner race but first note that its inside diameter nearest the engine has a radius and its inside diameter nearest the clutch has a sharp corner. Clean the bearing with brake cleaner, dry it thoroughly and apply a small amount of lubricant. Mobil 1 synthetic grease is recommended.

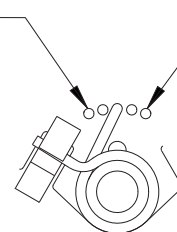
**Performance Notes** - The Vortex clutch engages very smoothly. It does not diminish or "bog" engine RPMs during engagement and consequently accelerates faster.

See our web site [www.kartclutches.com](http://www.kartclutches.com) for additional information.

**PATENT No's. 6,279,711 and 6,536,574**



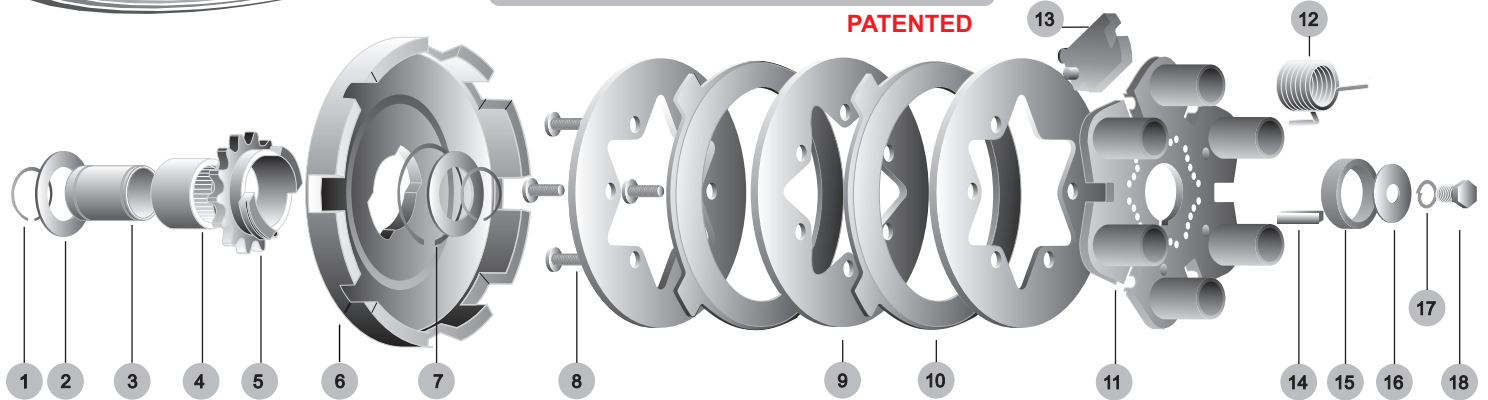
#1 Position  
Lowest RPM  
Engagement



#5 Position  
Highest RPM  
Engagement

**VORTEX Spring Adjustment**

# PARTS & PRICES



## Vortex Parts

## Additional Sprockets

| Ref. No. | Part No.    | Price Each    | Description (Number Required)   |
|----------|-------------|---------------|---|
|          | 4101        | 270.00        | VORTEX Roller Lever, One Disc Clutch  |
|          | <b>4102</b> | <b>295.00</b> | <b>VORTEX Roller Lever, Two Disc Clutch</b>   |
|          | 4103        | 340.00        | VORTEX Roller Lever, Three Disc Clutch  |
| 1        | 4013        | 1.00          | Retaining Ring, Inner Race (2)  |
| 2        | 4010        | 1.25          | Inside Washer - for all clutches ( 0.080 thick)<br>Outside Washer - for all sprockets with Needle Roller Bearings |
|          | 4023        | 1.25          | Outside Washer (1) (#35-13T & #219-16T)   |
|          | 4049        | 1.25          | Outside Washer (1) (#35-12T & #219-15T)   |
| 3        | 4011        | 9.00          | Inner Race (1.187 length)   |
| 4        | 4012        | 7.50          | Needle Roller Bearing   |
| 5        |             |               | Sprocket (select from additional sprocket table)  |
| 6        | 4812        | 24.95         | Drum, Eight Slots   |
| 7        | 4037        | 1.50          | Retaining Ring, High RPM  |
| 8        | 4006        | 0.25          | Button Head Cap Screw (6)   |
| 9        | 4003        | 16.00         | Drive Plate (3)   |
| 10       | 4002        | 24.50         | Clutch Disc, Four Tabs (2)  |
| 11       | 4031        | 98.00         | Drive Hub   |
| 12       | 4059        | 3.00          | VORTEX Spring - Black   |
|          | 4004        | 3.00          | VORTEX Spring - Silver (6) (Low RPM) (Optional)   |
|          | 4068        | 3.00          | VORTEX Spring - Gold (6) (High RPM) (Optional)  |
| 13       | 4120        | 20.00         | SMC Roller Lever (6)  |
| 14       | 4036        | 0.50          | Key (0.875" length)   |
| 15       | 4032        | 4.00          | Spacer (0.250 length)   |
| 16       | 4016        | 0.50          | Crankshaft Washer   |
| 17       | 4025        | 0.25          | Grade 8 Lock Washer   |
| 18       | 4017        | 0.50          | Hex Head Cap Screw  |
|          | 4018        | 15.00         | VORTEX Spring Wrench  |
|          | 4034        | 95.00         | Rebuild Kit, Two Disc Clutches (three drive plates, two clutch disc, six cap screws)                              |
|          | 4035        | 17.00         | Inner Race Kit, Two Disc Clutches (inner race, two washers, two retaining rings, spacer)                          |
|          | 4038        | 5.00          | Bushing, Short (#35-11, #219-13, #219-14)   |
|          | 4039        | 7.00          | Bushing, Long (#35-11, #219-13, #219-14)  |
|          | 4045        | 5.75          | Hardware Pack, Two Disc Clutches  |
|          | 4055        | 9.00          | T-Handle, T25 Torx (Tool for #4006)   |
|          | 4123        | 120.00        | SMC Roller Lever Kit (set of 6)   |

Denotes parts specific to Vortex two-disc clutches.

| Part No.           | Price Each | Description                               |
|--------------------|------------|---|
| <b>#35* Chain</b>  |            |   |
| 4610               | 21.00      | 10T Sprocket & Needle Roller Bearing      |
| 4611               | 21.00      | 11T Sprocket                              |
| 4612               | 21.00      | 12T Sprocket & Bushing                    |
| 4613               | 21.00      | 13T Sprocket & Bushing                    |
| 4614               | 21.00      | 14T Sprocket & Needle Roller Bearing      |
| 4615               | 21.00      | 15T Sprocket & Needle Roller Bearing      |
| 4616               | 21.00      | 16T Sprocket & Needle Roller Bearing      |
| 4617               | 21.00      | 17T Sprocket & Needle Roller Bearing      |
| 4618               | 21.00      | 18T Sprocket & Needle Roller Bearing      |
| 4619               | 21.00      | 19T Sprocket & Needle Roller Bearing      |
| 4620               | 21.00      | 20T Sprocket & Needle Roller Bearing      |
| 4621               | 21.00      | 21T Sprocket & Needle Roller Bearing      |
| 4622               | 21.00      | 22T Sprocket & Needle Roller Bearing      |
| 4623               | 21.00      | 23T Sprocket & Needle Roller Bearing      |
| <b>#219* Chain</b> |            |   |
| 4713               | 21.00      | 13T Sprocket                              |
| 4714               | 21.00      | 14T Sprocket                              |
| 4715               | 21.00      | 15T Sprocket & Bushing                    |
| 4716               | 21.00      | 16T Sprocket & Needle Roller Bearing      |
| 4717               | 21.00      | 17T Sprocket & Needle Roller Bearing      |
| 4718               | 21.00      | 18T Sprocket & Needle Roller Bearing      |
| 4719               | 21.00      | 19T Sprocket & Needle Roller Bearing      |
| 4720               | 21.00      | 20T Sprocket & Needle Roller Bearing      |
| 4721               | 21.00      | 21T Sprocket & Needle Roller Bearing      |
| 4722               | 21.00      | 22T Sprocket & Needle Roller Bearing      |
| 4723               | 21.00      | 23T Sprocket & Needle Roller Bearing      |
| 4724               | 21.00      | 24T Sprocket & Needle Roller Bearing      |
| 4725               | 21.00      | 25T Sprocket & Needle Roller Bearing      |
| 4726               | 21.00      | 26T Sprocket & Needle Roller Bearing      |
| 4040               | 31.00      | #35-11T Sprocket & Bushing Assembly       |
| 4041               | 31.00      | #219-13T Sprocket & Bushing Assembly      |
| 4042               | 31.00      | #219-14T Sprocket & Bushing Assembly      |
| 4056               | 13.95      | Extension Kit, #35-10T, One Disc Clutch   |
| 4057               | 13.95      | Extension Kit, #35-10T, Two Disc Clutch   |
| 4058               | 13.95      | Extension Kit, #35-10T, Three Disc Clutch |

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