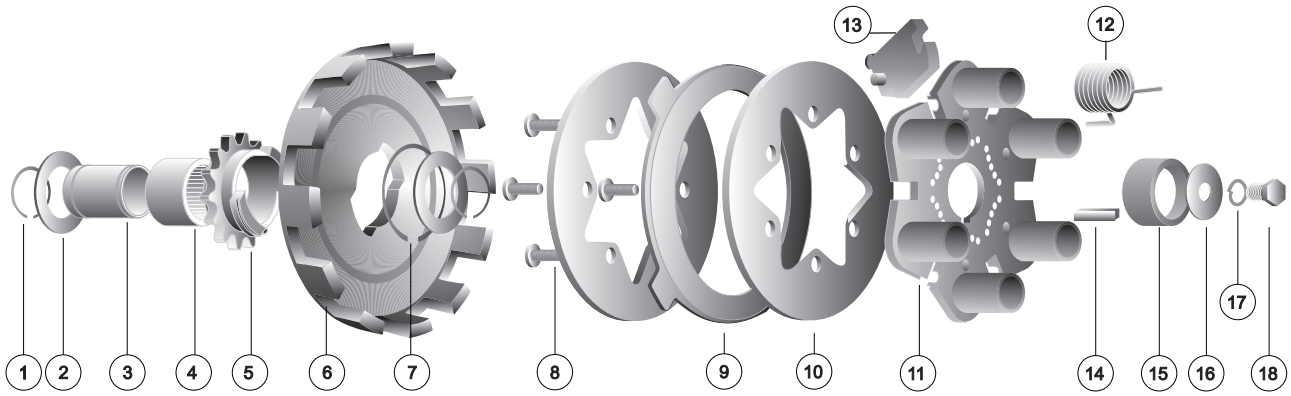
ONE DISC CLUTCH
for KART RACING ENGINES

SMC Roller Levers

Vortex BLACK

PATENTS
6,279,711
6,536,574
Additional Patents Pending



Vortex Parts

Ref. No.	Part No.	Price Each	Description (Number Required)
	4101	**270.00**	**VORTEX Roller Lever,One Disc Clutch**
1	4013	1.00	Retaining Ring, Inner Race (2)
2	4010	1.25	Inside Washer - for all clutches (0.080 thick)
			Outside Washer - for all sprockets with Needle Roller Bearings
	4023	1.25	Outside Washer (1) (#35-13T & #219-15T)
	4049	1.25	Outside Washer (1) (#35-12T & #219-14T)
3	4011	9.00	Inner Race (1.187 length)
4	4012	7.50	Needle Roller Bearing
5	4615		#35-15T Sprocket
6	4825	24.95	Drum, 12-Slots
7	4037	1.50	Retaining Ring, High RPM
8	4006	0.25	Button Head Cap Screw (6)
9	4002	24.50	Clutch Disc, Four Tabs (1)
10	4003	16.00	Drive Plate (2)
11	4001	95.00	Drive Hub
12	4004	3.00	VORTEX Spring - Silver/Bright (6)(Low RPM)
	4059	3.00	VORTEX Spring - Black (High RPM) Optional
13	4120	20.00	SMC Roller Lever (6)
14	4014	0.50	Key, (0.625 length)
15	4015	4.00	Spacer (0.50 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
	4021	55.00	Rebuild Kit, One Disc Clutches (two drive plates, one clutch disc, six cap screws)
	4024	17.00	Inner Race Kit, One 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)
	4043	5.75	Hardware Pack, One Disc Clutches
	4055	9.00	T-Handle, T25 Torx (Tool for #4006)
	4123	120.00	SMC Roller Lever Kit (set of 6)

Sprocket Chart

Part No.	Price Each	Description
		#35* Chain
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
		#219* Chain
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

Spring Chart	Silver	Black	Gold
B&S FLAT HEAD - STOCK	X	X	
B&S OVH - ANIMAL	X	X	
HONDA / CLONE	X	X	
MODIFIED		X	X
OPENS			X

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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.

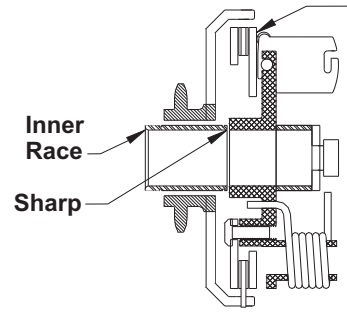
SMC Roller Levers cause disc clutches to engage more effectively. Rollers located at the contact point between the lever and the pressure plate eliminate sliding friction. The lower friction reduces engine bogging. There is now more energy available for acceleration.

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

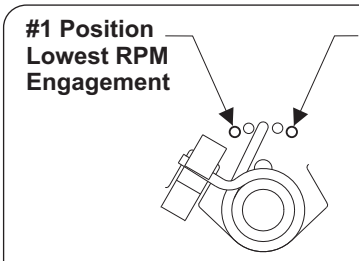
Sprocket Maintenance - Remove the inner race but first note that its inside diameter nearest the engine has a radius and its inside diameter nearest the clutch has a sharp corner. Clean the bearing with brake cleaner, dry it thoroughly and apply a small amount of lubricant. Mobil 1 synthetic grease is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

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

Additional information is available at the SMC web site www.kartclutches.com



Assembly Cross Section



VORTEX Spring Adjustment

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