AGGRESSOR 6x6 CLUTCHES

ONE DISC CLUTCH
for KART RACING ENGINES

Introduction – The Aggressor 6x6 disc clutch was designed for 200cc four-stroke racing engines with ¾ inch diameter crankshafts. Its acceleration and durability are equal to or better than any other similar clutch. However, an updated design, modern manufacturing methods and a large sales volume allow SMC to produce this “blueprinted” clutch at a very low cost.

The Aggressor 6x6 is comprised of two separate components:

A clutch assembly consisting of friction discs, steel plates and clamping mechanism (figure 1)

A sprocket assembly consisting of a drum, bearing pieces and a sprocket (figure 2)

Preparation of the clutch assembly - The springs and levers of the clamping mechanism can be adjusted to match the torque capacity of the clutch with the torque output of the engine. In most cases, weight must be added to the levers to achieve maximum performance. Use two nuts and bolts per lever for restricted and stock motors. Use one nut and bolt per lever for modified motors.

Install six springs and six T-nuts. Gently turn each nut clockwise with a ½ inch nut driver or similar tool until it stops; then turn each nut counterclockwise exactly one and 3/4 turns. (An alternate method is to set spring height to .525 inch. See figure 3.)

Preparation of the sprocket assembly - Aggressor clutches are shipped without a sprocket installed. Assemble the appropriate sprocket and drum. Spacers, washers, retaining ring and/or a bearing race are also required. See figure 3 for the most common arrangement. Numerous other variations of sprocket types, bearing types and jack shaft applications can be found on the SMC website.

Final Assembly - The majority of racers mount the clutch “inboard” i.e. with the sprocket next to the engine’s crankcase. Install the sprocket assembly first followed by the clutch assembly. For “outboard” mounting when the sprocket is located at the end of the crankshaft go to the SMC website.

If the two assemblies are properly installed, the clutch will extend about .020 to .060 inch beyond the end of the crankshaft. SMC clutches are designed NOT to “float” on the crankshaft.

Lastly, install the key, flat washer, lock washer and bolt. Apply 20 foot-pounds (240 inch-pounds) (27 Newton-meters) of torque. DO NOT USE AN IMPACT WRENCH FOR ASSEMBLY. Excessive torque can crack the bearing race and/or the drive hub. An impact wrench is okay for disassembly only.

Adjustments – With the kart on the ground hold the brake, start the engine and apply full throttle. Read the tachometer. Stop the engine and if necessary turn the nut clockwise to increase engagement rpm. Each nut has six flats. A small adjustment such as two or three flats is recommended**.**

Break-In – The clutch disc will start to wear first at its outer diameter. Heat and pressure will eventually cause the wear pattern to extend radially inward. When the wear is uniform from OD to ID, the clutch is fully ready for racing i.e. the contact patch is at its maximum and acceleration will be faster and more efficient. A very thin (.001 inch) layer of friction material will separate from the discs and bond to the steel
plates. This “transfer layer” will enhance performance.

Break-in will occur naturally over time but the process can be accelerated by several means. Visit the SMC website for specifics.

Maintenance - Break-in will generate dust that will impede performance; clean the discs daily when they are new. After break-in cleaning is necessitated only by track conditions i.e. dusty tracks will require more frequent cleaning.

Mark the plates and discs with an engraving tool or permanent marker before disassembly so that they can be re-assembled in the exact same order and orientation.

SMC clutch discs are made of aircraft brake quality friction materials that are very porous, consequently they trap dirt which cannot be cleaned with chemicals alone. Brake cleaner in combination with
compressed air and a stainless steel “platers brush” (SMC part number 4216) are recommend for
removing contaminations.

Steel plates that are tan, yellow, light blue or dark blue in a few small areas and distorted less than 0.020 inch from flat may be reused. Gray colored plates should be replaced. Do not use sandpaper to clean the plates as it will destroy the transfer layer.

Sprockets with needle bearings or bushings should be cleaned with a solvent such as brake cleaner, dried thoroughly and lubricated with high temperature wheel bearing grease such as Mobile 1 Synthetic Grease. Vaseline is not a suitable lubricant. Sprockets with ball bearings are sealed and do not require re-greasing.

(Continued)

Moisture in the atmosphere, chemicals from the race track, power washing, rain etc. will cause steel parts to rust which in turn will cause performance to diminish. Immediately after the race day is finished it is necessary to protect the clutch from corrosion. Remove the clutch from the kart or apply a rust preventive. Corrosion can also attack clutches stored in damp basements, cold garages or trailers during the winter months.

Overhaul – The rubbing surfaces of the discs and plates do not have to be perfectly flat but they must be parallel. Racers too frequently overhaul perfectly good clutches. All clutches lose some flatness the first time they get hot. SMC clutches do not have minimum thickness specifications for either the disc or steel plates. Overhaul is indicated by a noticeable loss of acceleration, chatter (vibration), overheating, corrosion etc.

If “leopard spots” develop or the transfer layer becomes uneven, the drive plates and pressure plate can be aggressively cleaned with coarse sand paper without affecting their thicknesses. The break-in procedure should be repeated. DO NOT use reground steel plates or pressure plates. Air gap (clearances between discs and plates) will be excessive but more importantly, the stiffness of the plates is severely compromised which can cause chatter and/or shorter disc life.

Unlike the hard steel plates, the clutch discs are soft by design so that they can quickly wear to match the small conical distortion that occurs in hot steel plates. Do not sand the friction material. If the friction material is glazed from excessive heat, the discs should be replaced. Mixing new clutch discs with used drive plates will cause a very lengthy break-in period therefore, if new discs are needed, new steel plates are highly recommended.

Check the levers for free movement and wear. Examine the keyway for cracks.

Racers’ Support – The SMC website www.kartclutches.com has contact information, technical articles, instructional videos and an online store. Telephone support is usually available Monday through Friday between 9:00 am and 5:00pm Eastern Time.

Aggressor clutches are designed and manufactured in the United States of America by Structure Mechanics Corporation (SMC). Established 1985.

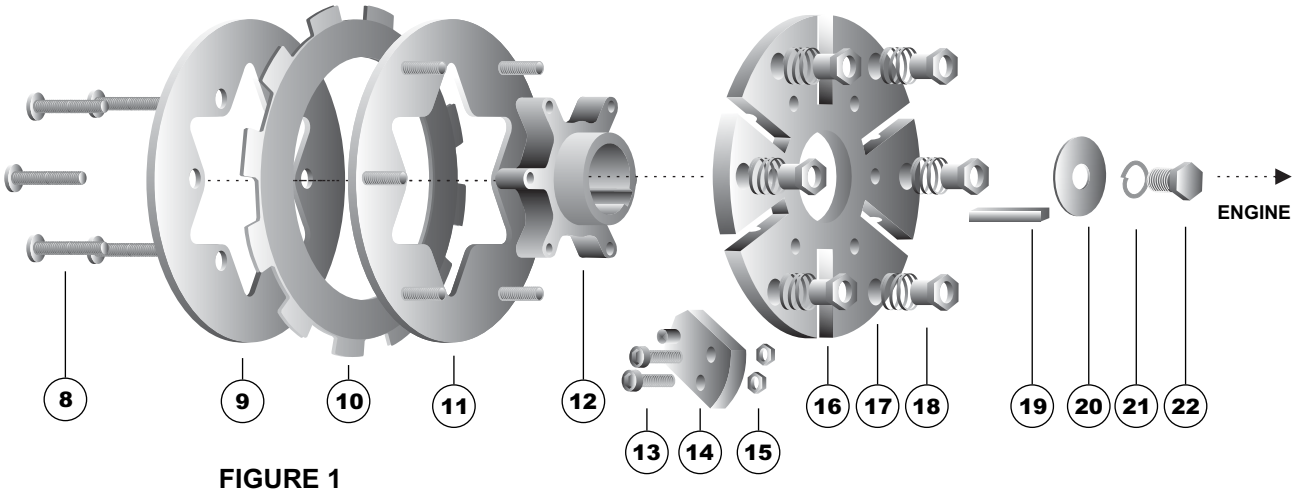


FIGURE 1

AGGRESSOR 6x6 - CLUTCH ASSEMBLY

Ref. No.	Part No.	Description (Number Required)
8	3712	Screw, TorxPlus Button Head (6) (1" length)
9	4003	Back Plate (1)
10	4250	Clutch Disc, Twelve Tabs (1)
11	3621	6x6 Pressure Plate
12	3612	6X6 Drive Hub, Two Disc
13	3708	Machine Screw, lever (12)
14	3624	6X6 Lever,(6)
15	3709	Nut (12)
16	3620	6x6 Front Plate
17	4915	Spring (.090 wire) (6)
18	3707	"T" Nut (6)
19	3705	Key (1-1/8" length)
20	4227	Crankshaft Washer
21	4025	Grade 5 Lock Washer
22	4217	Hex Head Cap Screw

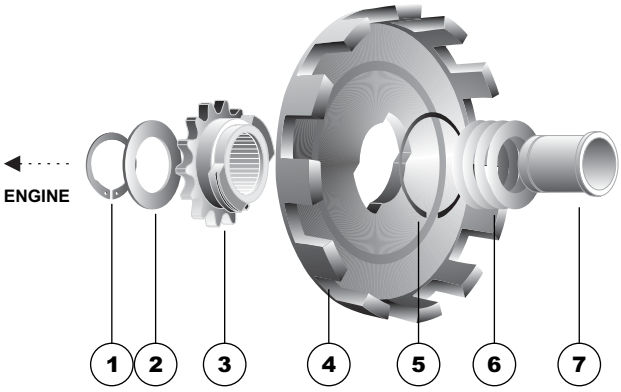


FIGURE 2

AGGRESSOR 6x6 PARTS - SPROCKET ASSEMBLY

Ref. No.	Part No.	Description (Number Required)
	3601-F	AGGRESSOR 6X6, Two Disc Clutch
1	4087	Retaining Ring, Inner Race (0.042 thick)
2	4010	Washer (0.080 thick)
	4023	Outside Washer (1) (#35-13T & #219-16T)
	4049	Outside Washer (1) (#35-12T & #219-15T)
3		Sprocket (Chart - Page 3)
4	4825	Drum, 12-Slots
5	4037	Retaining Ring, High RPM
6	4053	Washer (0.020 thick - 4 required) (Sprockets other than SMC will require one, two or three washers)
7	4088	Bearing Race 1.15" length, 0.09" Shoulder
23	4089	Bronze Bushing, Long
24	4038	Washer

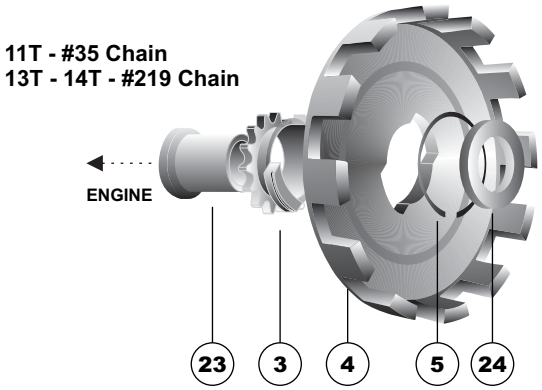


FIGURE 2

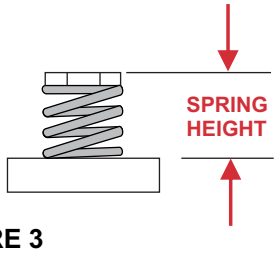
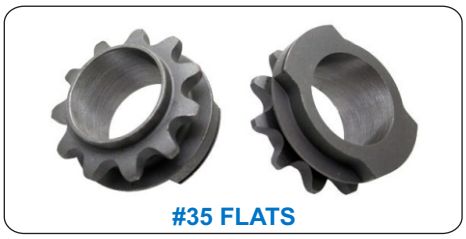


FIGURE 3

*** SPROCKETS SOLD SEPARATELY ***



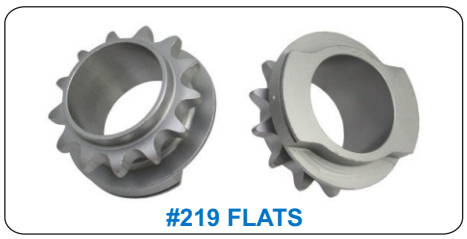
#35 FLATS

#35 FLATS - Bushing

#35 FLATS - Needle Bearing

#35 FLATS - SPROCKET CHART

		Part No.	Description
#35 CHAIN	PTO Assembly	4611	11T Sprocket
		4612	12T Sprocket & Bushing
		4613	13T Sprocket & Bushing
		4614	14T Sprocket & Needle Roller Bearing
		4615	15T Sprocket & Needle Roller Bearing
		4616	16T Sprocket & Needle Roller Bearing
		4617	17T Sprocket & Needle Roller Bearing
		4618	18T Sprocket & Needle Roller Bearing
		4619	19T Sprocket & Needle Roller Bearing
		4620	20T Sprocket & Needle Roller Bearing
		4621	21T Sprocket & Needle Roller Bearing
		4622	22T Sprocket & Needle Roller Bearing
		4623	23T Sprocket & Needle Roller Bearing



#219 FLATS

#219 FLATS - Bushing

#219 FLATS - Needle Bearing

#219 FLATS - SPROCKET CHART

		Part No.	Description
#219 CHAIN	PTO Assembly	4713	13T Sprocket
		4714	14T Sprocket
		4715	15T Sprocket & Bushing
		4716	16T Sprocket & Needle Roller Bearing
		4717	17T Sprocket & Needle Roller Bearing
		4718	18T Sprocket & Needle Roller Bearing
		4719	19T Sprocket & Needle Roller Bearing
		4720	20T Sprocket & Needle Roller Bearing
		4721	21T Sprocket & Needle Roller Bearing
		4722	22T Sprocket & Needle Roller Bearing
		4723	23T Sprocket & Needle Roller Bearing
		4724	24T Sprocket & Needle Roller Bearing
		4725	25T Sprocket & Needle Roller Bearing
		4726	26T Sprocket & Needle Roller Bearing
		4727	27T Sprocket & Needle Roller Bearing
		4728	28T Sprocket & Needle Roller Bearing
		4729	29T Sprocket & Needle Roller Bearing

*** SPROCKETS & PULLEYS SOLD SEPARATELY ***

*** PRICES SUBJECT TO CHANGE***

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