

Rocket RimClutch

STRUCTURE MECHANICS CORPORATION, CINCINNATI, OHIO U.S.A.

There are only three steps to preparing the SMC Rocket Rim Clutch for racing. Please read the following carefully. Contact SMC (513-598-1600) or visit its website www.kartclutches.com if you need additional information.

1. Shoe & Spring Assembly

- The shoes are designed to rotate in only one direction. The commonly used four-stroke engines rotate counter clockwise (CCW) when viewed from the end of the crankshaft.
- Each shoe is maked on one side with an arrow to help identify its proper rotational direction.
- **Inboard sprockets** (sprocket next to the engine crankcase) The shoes and springs should be oriented as in **Figure 1**. Arrows are visible.
- **Outboard sprockets** (sprockets near the end of the crankshaft) The shoes and springs should be oriented as in **Figure 2**. Arrows are hidden.
- If it is necessary to change the orientation of the shoes, remove the machine screws, star washers and flat washers. Throw away the star washers. Pry the weights away from the hub. Reverse the springs and shoes. Replace the hardware including three new star washers. Torque the machine screws until the star washers are crushed.



2. Sprocket & Rim Assembly, Flat Sprockets

- Flat sprockets aka "roller bearing", "black" or "SMC" sprockets can rotate in either direction.
- *These sprockets were originally designed by SMC in 1995. Other manufacturers have copied the SMC sprockets without license. If a racer chooses to use a clone sprocket, SMC assumes no responsibility for any problems associated with that sprocket.*
- Insert a sprocket in the drum. A tight fit is highly recommended, therefore a small amount of force might be required. Secure the sprocket with the high speed retaining ring.
- Place one .080 thick washer on the inner race.
- Apply a very small amount of wheel bearing grease to the inner race and insert it into the sprocket from the inside of the rim.
- Place another .080 thick washer on the inner race from the outside of the rim. (#35 pitch 12 and 13 tooth sprockets and #219 pitch 13, 14 and 15 tooth sprockets require washers with a smaller outer diameter to accommodate chain clearance.)
- Gently stretch the retaining ring over the end of the inner race and place it in the groove.



3. Clutch Assembly

- Shoes are usually skewed by the springs and must be slightly rotated and/or compressed to fit inside the drum.
- It is normal for the shoes to drag lightly on the rim when the engine is not running. The shoes will instantly disengage when the engine is started.
- The shoes will re-engage between 2500 and 4500 rpm depending upon the engine's torque output and the racer's choice of springs.

4A. Crankshaft Attachment Sequence, Flat Sprocket, Inboard

- Sprocket & Rim assembly with sprocket toward the engine
- Shoe & Spring assembly, springs side facing the engine*
- Check that the crankshaft is shorter than the above collection of clutch parts**
- Key, flat washer, split washer and **3/4 inch** long machine screw
- Torque to 25 foot-pounds (300 inch-pounds)

4B. Crankshaft Attachment Sequence, Flat Sprocket, Outboard

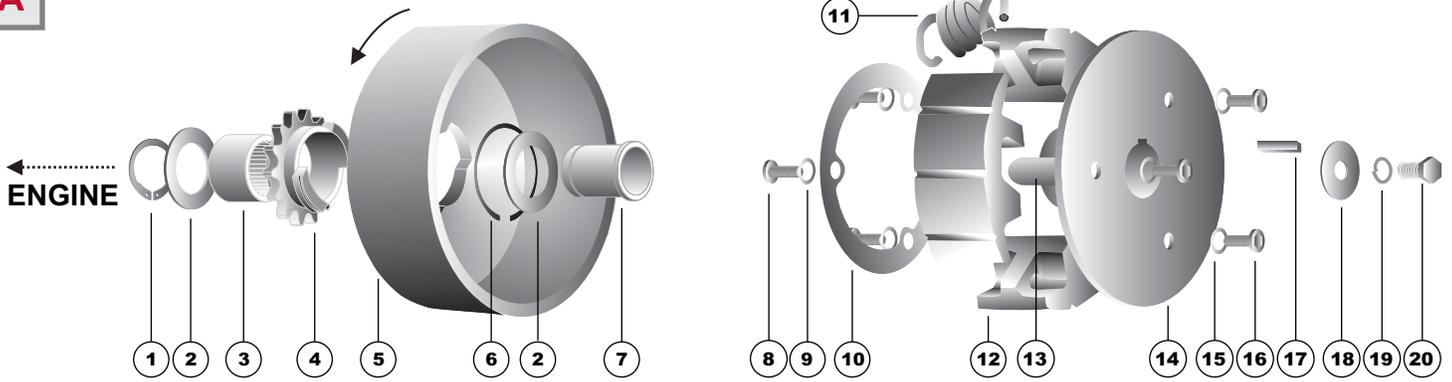
- Narrow (.300 wide) spacer with the beveled edge toward the engine
- Shoe & Spring assembly, springs side facing the mechanic
- Sprocket & Rim assembly*
- Check that the crankshaft is shorter than the above collection of clutch parts**
- Key, **step washer**, split washer and **one inch** long machine screw
- Torque to 25 foot-pounds (300 inch-pounds)



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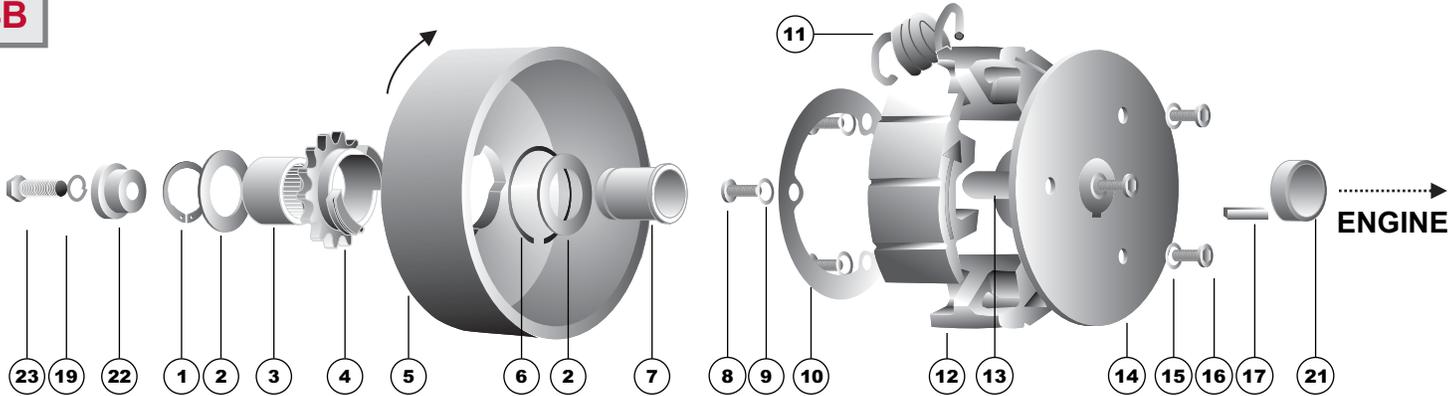
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4A



INBOARD, FLAT SPROCKET

4B



OUTBOARD, FLAT SPROCKET

Rocket PARTS

Ref. No.	Part No.	Price Each	Description (Number Required)
	4404	179.00	ROCKET RIM Clutch, 3/4" shaft, (sprocket not included)
1	4087	0.55	Retaining Ring, Inner Race (0.042 thick)
2	4010	1.25	Washer (0.080 thick)
	4023	1.25	Outside Washer (1) (Used ONLY with: Part 4613 - #35 Chain -13T Sprocket Part 4715 - #219 Chain -15T Sprocket)
	4049	1.25	Outside Washer (1) (Used ONLY with: Part 4612 - #35 Chain -12T Sprocket)
3	4012	7.50	Needle Roller Bearing (Sprockets with bushings must be replaced when bushings wear out)
4	*		Flat - Sprocket (See sprocket chart page 5)
5	4414	95.00	Rim, Flats
	4401	95.00	Rim, Flats, Two Piece, (Check Rules)
6	4037	1.50	Retaining Ring, High RPM
7	4417	9.00	Inner Race (1.275" length); w/ 0.185" Shoulder

Ref. No.	Part No.	Price Each	Description (Number Required)
8	4006	0.25	Button Head Cap Screw (10-32 x 5/8)(3)
9	4425	0.10	Star Washer, 1/4" Internal (3) (Sold in Pack of 10) (Star washer must be replaced when Button Head Cap Screws are unscrewed)
10	4409	3.00	Retainer
11	4418	2.55	Spring, Orange (3) (Additional springs available)
12	4410	8.63	Shoe (3)
13	4413	6.00	Shoe Post (3)
14	4411	68.00	Drive Hub
15	4426	0.10	Star Washer, 1/4" External (3) (Sold in Pack of 10)
16	4419	0.25	Button Head Cap Screw (1/4-28 x 1/2)(3)
17	4036	0.50	Key (0.875" length)
18	4227	2.00	Crankshaft Washer
19	4025	0.06	Grade 8 Lock Washer
20	4217	0.35	Hex Head Cap Screw (5/16-24 X 3/4" length)
21	4212	4.00	Chamfered Spacer (0.300 length)
22	4420	4.00	Stepped Washer (0.375 length)
23	4222	0.35	Hex Head Cap Screw (5/16-24 X 1" length)

TOOLS - FLATS SPROCKET

Part No.	Price Each	Description (Number Required)
4055	9.00	T-Handle, T25 Torx (Tool for #4006)
4060	9.00	T-Handle, T27 Torx (Tool for #4419)

FLATS - SPROCKET CHART

	Part No.	Price Each	Description
#35 CHAIN	PTO Assembly	4611	23.00 11T Sprocket
		4612	23.00 12T Sprocket & Bushing
		4613	23.00 13T Sprocket & Bushing
		4614	23.00 14T Sprocket & Needle Roller Bearing
		4615	23.00 15T Sprocket & Needle Roller Bearing
		4616	23.00 16T Sprocket & Needle Roller Bearing
		4617	23.00 17T Sprocket & Needle Roller Bearing
		4618	23.00 18T Sprocket & Needle Roller Bearing
		4619	23.00 19T Sprocket & Needle Roller Bearing
		4620	25.00 20T Sprocket & Needle Roller Bearing
		4621	25.00 21T Sprocket & Needle Roller Bearing
		4622	25.00 22T Sprocket & Needle Roller Bearing
4623	25.00 23T Sprocket & Needle Roller Bearing		



FLATS - SPROCKET CHART

	Part No.	Price Each	Description
#219 CHAIN	PTO Assembly	4713	22.00 13T Sprocket
		4714	23.00 14T Sprocket
		4715	23.00 15T Sprocket & Bushing
		4716	23.00 16T Sprocket & Needle Roller Bearing
		4717	23.00 17T Sprocket & Needle Roller Bearing
		4718	23.00 18T Sprocket & Needle Roller Bearing
		4719	23.00 19T Sprocket & Needle Roller Bearing
		4720	23.00 20T Sprocket & Needle Roller Bearing
		4721	23.00 21T Sprocket & Needle Roller Bearing
		4722	23.00 22T Sprocket & Needle Roller Bearing
		4723	23.00 23T Sprocket & Needle Roller Bearing
		4724	25.00 24T Sprocket & Needle Roller Bearing
		4725	25.00 25T Sprocket & Needle Roller Bearing
		4726	25.00 26T Sprocket & Needle Roller Bearing
		4727	25.00 27T Sprocket & Needle Roller Bearing
		4729	25.00 29T Sprocket & Needle Roller Bearing



FLATS - SPROCKET CHART

	Part No.	Price Each	Description
#428 CHAIN	PTO Assembly	4631	45.00 11T Sprocket & Needle Roller Bearing
		4632	45.00 12T Sprocket & Needle Roller Bearing
		4633	45.00 13T Sprocket & Needle Roller Bearing
		4634	45.00 14T Sprocket & Needle Roller Bearing

FLATS - SPROCKET CHART

	Part No.	Price Each	Description
#420 CHAIN	PTO Assembly	4641	45.00 18T Sprocket & Needle Roller Bearing
		4642	45.00 19T Sprocket & Needle Roller Bearing
		4643	45.00 20T Sprocket & Needle Roller Bearing
		4644	45.00 21T Sprocket & Needle Roller Bearing



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The **SMC Rocket Rim Clutch** is a very, very old clutch design that has been updated in 2018 with modern steel alloys and precision machining. It has three shoes and three extension springs. Unlike disc clutches which have flat friction surfaces, rim clutches have curved friction surfaces. The shoes cannot apply uniform pressure to the rim which is problematic. Hot spots, asymmetric wear, erratic engagement rpm and chatter are a few of the possible consequences. Proper assembly and maintenance are critical for good performance.

The Rocket Rim Clutch has two distinct and separate assemblies: parts that rotate with the engine (hub, shoes and springs) and parts that rotate with the chain (sprocket and rim).

Operation Notes

- The clutch assembly must not “float” on the crankshaft.
- Normal operating temperature of the rim is 400 F or less. Higher temperatures can be tolerated for a short time but the shoes will wear rapidly and performance can diminish.
- A break-in period is necessary for the clutch to attain its maximum performance. The duration is dependent on load and temperature.
- A moderate amount of dust will be created during break-in. There will be almost no dust after the shoes and rim are completely mated.
- **Dust will cause chatter.** Remove dust that accumulates inside the rim with a clean rag. Remove dust from the shoes with compressed air, brake cleaner or a small wire brush.
- Wear patterns on the shoes should be uniform in the axial direction (parallel with the crankshaft). Wear patterns in the circumferential direction will vary between the leading and trailing edges of the shoe. All three shoes should have similar wear patterns.
- Wear patterns inside the rim should be even in both the axial and circumferential directions.
- The contact surface of the rim should not be sanded except in extreme cases. Shoes can be cleaned with a small (.005 diameter) wire brush but never sanded.
- Lubricate roller bearings with automotive wheel bearing grease.
- Protect the clutch from corrosion. A light coating of WD-40 is helpful.
- The outside of the rim can be decorated with high temperature paint.
- Additional information can be found on the SMC website: www.kartclutches.com



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