



Horstman Redhawk Clutch



4 Disc Automatic Style

Horstman's newest addition to their centrifugal clutch line is the Redhawk. The clutch is designed to fit outboard on a 1" diameter crankshaft. The clutch engages automatically as the engine revs reach 2800 rpm. The engagement speed can be changed with spring tension adjustment. Four friction discs in fact provide eight gripping surfaces that insure positive lock up to transmit full engine power.

Installation Instructions

The crankshaft pto is 1" diameter non tapered. The clutch must be installed with a rectangular key and must slide easily over the pto. If necessary remove any burrs or nicks that could prevent easy mounting of the clutch. A strip of fine emery or sandpaper can be used to remove burrs or polish the crank pto. Do not force the clutch onto the crank as removal would be very difficult. Apply a light coat of anti-seize grease onto the crank before installing the clutch. If crank is "shortened" it may be necessary to install a spacer(item 28) inside the clutch hub(item 9) to move the clutch outward from the engine to keep levers(item 20)from touching the side cover.

Race tip

The Redhawk clutch has very aggressive lockup and chatter can occur during slow take off. To reduce chatter and reduce corrosion in the clutch we advise spraying WD-40 on the clutch before each track session. Aim the spray at the friction discs.

Stall Speed

Stall speed is the rpm that the clutch locks up solid. In racing it is important to adjust the clutch stall speed to match the engine torque peak. If the clutch locks up before peak torque performance may be sluggish. If the clutch locks up after peak torque power will be wasted in the form of heat into the clutch. It is wise to have your engine tested on a dyno to determine hp and torque. For track testing a tach is important. **WARNING DO NOT ALLOW CLUTCH TO EXCEED 3000 RPM STALL SPEED**

Adjusting Stall Speed

Adjustment is accomplished by turning each of the six adjustment screws (item 14). To raise Stall Speed turn the screws clockwise ¼ turn each. The range of adjustment is about 1 ¾ turns total per screw. To lower stall speed install weaker springs per chart below.

Spring P/N	Color	Stall Speed Range
464900	Red	2800-3000
465000	Black	2600-2800
514200	Blue	2400-2600

The clutch comes stock with black springs.

Compression Spring Installation

When installing springs always make the initial setting at .410". This insures that the springs will not coil bind. (see figure 1.)

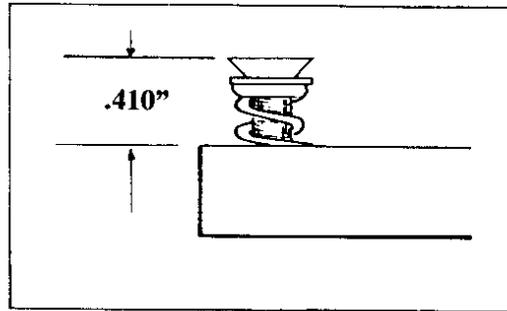


Fig. 1 — Compression spring installation setting

Adjustment Limits

The springs are designed to work within strict limits. **Never adjust below the .360" minimum** as the springs will coil bind and the clutch cannot lock up solid. The result will be excessive slip and heat build up until the clutch melts down. (see figure 2)

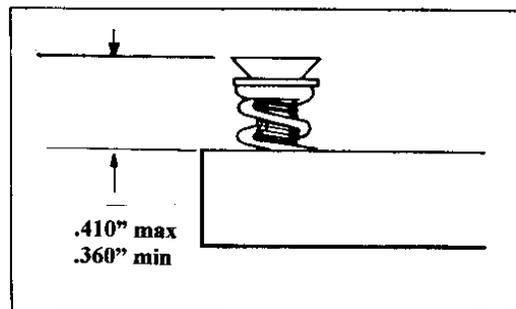


Fig. 2 — Compression spring adjustment limits

Air Gap

Air gap allows the discs to separate for easy starting of the engine and a neutral condition. The factory air gap is .030"-.040". The air gap will increase when the friction discs wear. The maximum recommended air gap is .055". Check the air gap with a feeler gauge after each race event and when the .055" limit has been reached it is time to install one or more new friction discs. Another way to reduce the air gap is to replace one or more standard floater(s) with one or more optional wider floater(s) p/n 560090. Excessive air gap causes the clutch to engage very hard which makes the car difficult to control. (see figure 3)

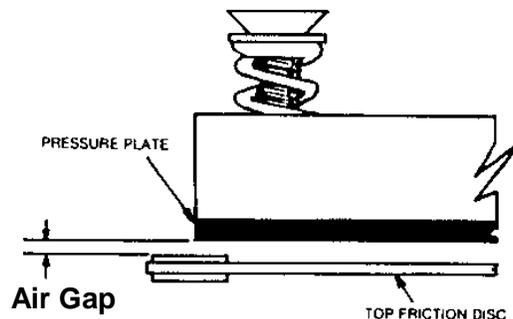


Fig 3

Maintenance and repair

The clutch is subject to extreme heat and abuse caused by high slip racing conditions. The clutch must be inspected and maintained to insure maximum performance.

Drum and sprocket

Oiling the chain with a good racing chain lube will increase sprocket life. Check the teeth on the sprocket and if they are worn to a point or chipped replace the sprocket. Check the channels in the drum on the sides where the friction disc lugs make contact. If the channels are worn or grooved more than .015" they can be polished with a Dremel™ hand grinding tool and fine grinding stone. If the drum has excessive wear or grooves replacement is necessary. Also check for cracks in the square section where the sprocket attaches to the drum. Replace drum if cracks appear. **Apply grease to bearing in sprocket before every race event!!!**

Friction disc(s)

The friction disc has a tough steel core with special friction material bonded to the surface. Replace when the overall thickness is below .115" or when the three lugs are worn past .595".

Floater(s)

Check for warp or glazed surface. Replace or resurface by lapping with 120 grit sandpaper.

Pressure Plate

A true pressure plate is critical for top performance and heat dissipation. The pressure plate is precision ground on the surface that engages the friction disc. This surface should be checked about every five races for glaze (shined) look. If glazed then lap with the 120 grit sandpaper to remove glaze.

Levers

The pivot hole in the lever is subject to high stress. Inspect every ten races for wear or elongation and replace if necessary.

Dowel pins

Replace after every ten races. Keep a light coat of anti-seize or grease on the pins at all times.

Lever Support

Check for wear in the slots where the levers reside. Inspect for any sign of warp or cracks. Replace if necessary.

Springs

Remove and check free length and replace when below .475".

Clutch Disassembly

Caution! Wear gloves and eye protection.!

Remove clutch from engine

Remove snap ring (item 1)

Remove external thrust washer (item 2)

Remove drum/sprocket (item 5A) **Use T25 Torx Wrench or socket when removing sprocket**

Slide internal thrust washer (item 7) off drive hub

Remove Spring adjusters, retainers, and springs (item 16,15,14)

Remove Cap Screws (item 18) and washers (item 17)

Slide lever support (item 13) from drive hub (item 9).

Remove levers (item 20) and dowel pins (item 19)

Horstman Redhawk Clutch Parts List			Nov 2004
Item No	Part Number	Description	Units Required
1	560050	Snap Ring	1
2	560051	Thrust washer, external, fits 12T sprocket	1
	560052	Thrust washer, external, fits 13T-20T sprocket	1
3	560053	Bushing, fits 12T sprocket	1
	560054	Bearing, fits 13T-20T sprocket	1
4	560055	Sprocket, 12T #35 w/bushing	Optional
	560056	Sprocket, 13T #35 w/bearing	Optional
	560058	Sprocket, 15T #35 w/bearing	1
	560059	Sprocket, 16T #35 w/bearing	Optional
	560060	Sprocket, 17T #35 w/bearing	Optional
	560061	Sprocket, 18T #35 w/bearing	Optional
	560062	Sprocket, 19T #35 w/bearing	Optional
	560063	Sprocket, 20T #35 w/bearing	Optional
	560065	Sprocket, 22T #35 w/bearing	Optional
5	560068	Drum, less sprocket	1
6	560084	Button head screw, 10-32 x 1/4	2
7	560052	Thrust washer, 1 1/4 od x .825" id	1
8	560080	Front plate	1
9	560081	Drive hub, 1" bore	1
10	560082	Friction disc	4
11	560083	Floater, standard size .085" thick	3
	560090	Floater, heavy duty .095" thick	Optional
12	560085	Pressure plate	1
13	560086	Lever support	1
14	465000	Spring, color black, medium tension	6
	464900	Spring, color red, high tension	Optional
	514200	Spring, color blue, low tension	Optional
15	334800	Stall speed adjusting screw	6
16	334700	Spring retainer	6
17	560094	Flat washer 1/4" An	6
18	560087	Cap Screw 1/4-28 x 1 5/8"	6
19	480086	Dowel pin	6
20	480085	Lever	6
21	560095	Lock nut 10-32	6
22	560093	Brass weight (set of 12)	1
23	482264	Cap screw, 10-32 x 5/8"	6
24	560091	Clutch key	1
25	560089	Washer, flat 3/8"	1
26	560092	Washer, lock 3/8"	1
27	560088	Bolt, 3/8-24 x 2" hex head grade 5	1
28	560096	Spacer, 1.00" x .410" x .100" thick	Optional
	560002	Redhawk Clutch, complete 12T#35 fits 1" crankshaft	
	560003	Redhawk Clutch, complete 13T #35 " "	
	560005	Redhawk Clutch, complete 15T #35 " "	
	560007	Redhawk Clutch, complete 17T #35 " "	
	560008	Redhawk Clutch, complete 18T #35 " "	
	560009	Redhawk Clutch, complete 19T #35 " "	
	560010	Redhawk Clutch, complete 20T #35 " "	

