

INFERNO

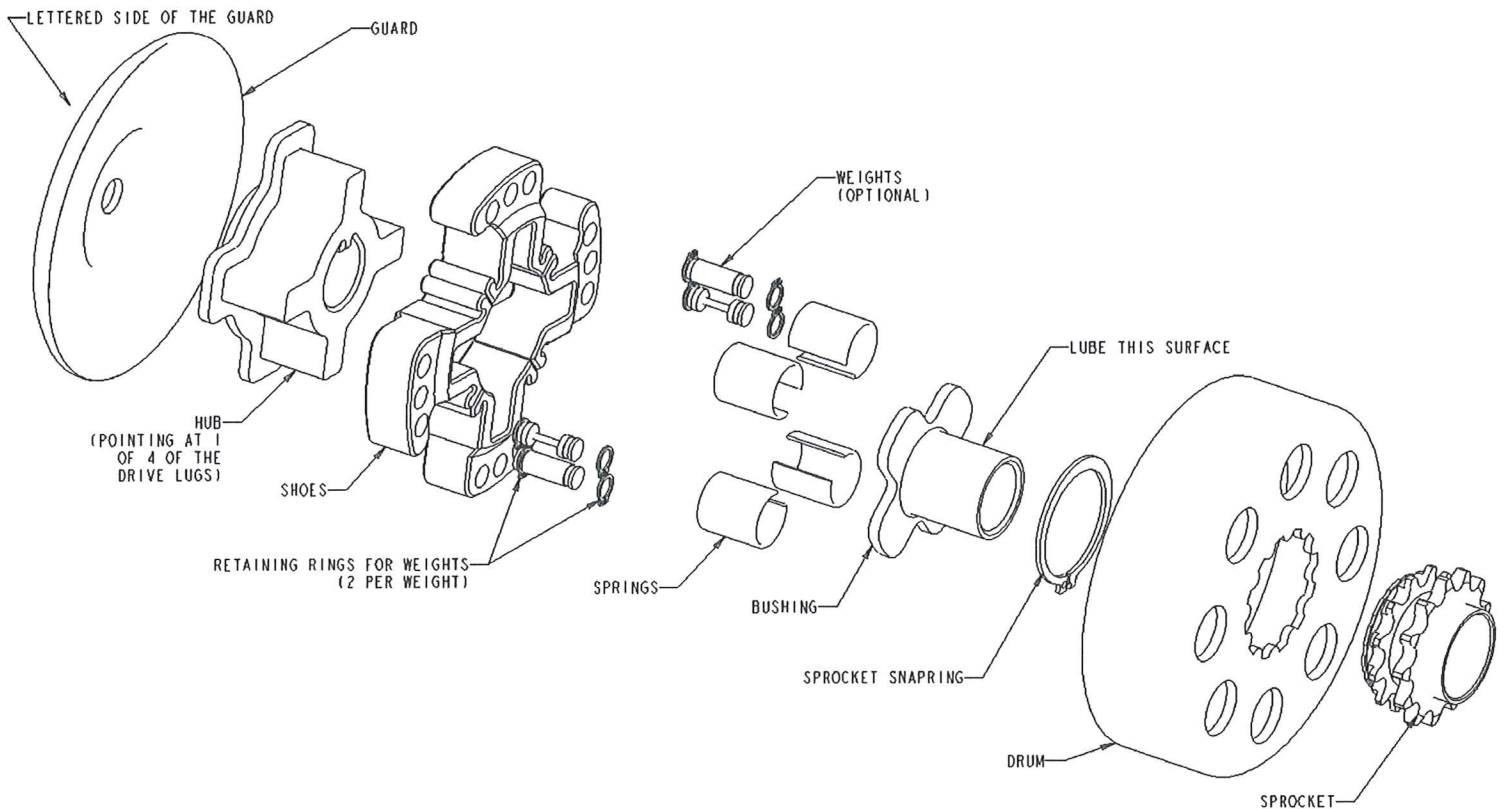
BLAZE

INSTALLATION and MAINTENANCE Instructions

The Inferno racing clutch is a highly tunable centrifugal drum clutch. The clutch can be built in several different configurations giving the racer the ultimate control possible over their unique racing situation. Adjustability comes from the ability to change the engagement speed by changing the springs, and changing the weights in the shoes, as well as the ability to change the torque output of the clutch by changing the weight of the shoes, and the configuration in which they are run. With 4 shoes, racers are able to mix and match shoes, shoe configuration, springs, and weight configurations, giving thousands of possibilities, keeping in mind that clutch balance is important. For example you can't get one shoe, set it up heavy, and have a shoe opposite it being light. This would not be balanced, and would cause serious vibration. **BALANCE IS KEY!**

This clutch is a two (2) piece mechanism. There is a potential that if the clutch is not assembled or installed properly that serious injury can occur. It is **VERY** important that you follow all the directions for proper clutch installation. Visit <http://www.hilliardextremeduty.com/install.htm> if you are unfamiliar with the clutch and how it should be assembled together.

See the tuning guide prior to assembly. Different configurations are available, and will drastically change clutch characteristics. Get an idea from the tuning guide on what configuration you might want to start with.



Shoe Installation:

- Shoes are to be placed on the driving lugs of the hub. See Illustration for clarification. Also see the tuning guide to determine the best configuration.
- Shoes should fit loosely on these lugs, and be able to slide freely on them.

Spring Installation:

- Use External Snap Ring Pliers to spread the springs apart for easy installation. See the tuning guide to determine the best set of springs.
- **DO NOT** stretch the springs any further than necessary for installation.
- If mismatching springs make sure similar springs are opposite one another in the assembly. Keeping balance in mind.

Insert Weights:

- These are optional, and not required for the clutch operation.
- The snap rings that retain the weight must be replaced after each time they are removed.

Bushing:

- For best performance oil the bushing before every run.
- Wipe off excess oil before installing into the sprocket.

Clutch Installation: (Sprocket closest to the engine, or inboard mounted. Reverse the order of the part installation for sprocket out, or outboard mounted.)

- Some engines have a small shoulder or large radius on the shoulder that is not large enough to retain the sprocket. If the sprocket is not retained by the shoulder you need to add a thin washer (min. .030) with a 3/4" I.D. and a 1-1/16" O.D. It needs to be thin so the clutch is not longer than the crankshaft.
- Slide sprocket and drum onto the engine shaft, so that the sprocket faces the engine. Note: (The drum and sprocket will be loose on the shaft.
- Slide the bushing that was properly lubricated on the engine shaft. You will have to line up the key in the bushing with the keyway on the engine. The bushing should slide through the sprocket.
- Slide on the hub/shoe/spring assembly from the previous steps. Make sure that the letters on the hub are out away from the engine. The part of the hub that protrudes from the back, should be outside of the drum. (Reference picture). The key in the hub will need to be lined up with the keyway on the crankshaft to get the clutch to slide on completely. The shoes should be fully enclosed under the drum.
- Measure the distance from the end of the clutch to the end of the crankshaft. The clutch should be shorter than the crankshaft (If it is not special instructions need to be followed). The distance from the end of the crankshaft, to the end of the hub should be between .020, and .030. If it is not, then remove the clutch, and place appropriate spacers (washers) on the engine shaft, and re-install the clutch following the same instructions.
- Recheck your measurement for end play. You do not want to have the clutch longer than the shaft, nor do you want too much room for it to move. This step is critical, and needs to be confirmed.
- Install the guard so that the letters on the guard remain out toward the user, and must be readable after installation.
- The guard is to tighten against the end of the crankshaft, not clamping on the clutch hub. There should be .020-.030 clearance from the inside of the guard to the hub of the clutch. **DO NOT CLAMP THE GUARD TIGHT TO THE HUB.**
- If the clutch is to be installed with the sprocket away from the motor, or outboard mounted, then the guard is not needed.
- **DO NOT OPERATE WITH THE SPROCKET INBOARD WITHOUT THIS GUARD.**
- Retain the clutch using a bolt and washer. The washer should tighten to the guard, and the guard to the shaft, **NOT THE CLUTCH! DO NOT USE setscrews** to retain this clutch onto the shaft.
- Verify there is a .020-.030" movement by sliding the clutch drum tight to the guard, and measuring the gap from the front edge of the bushing to the shoulder on the crankshaft.

****IMPROPER INSTALLATION/ASSEMBLY CAN RESULT IN SERIOUS INJURY****

For any additional support visit www.hilliardextremeduty.com

INFERNO TUNING GUIDE

**** The most important tuning tip is to keep the clutch BALANCED****

Balancing is the most important feature to keep in mind. If you change the weight of one shoe, then the shoe that is opposite it (180 degrees apart) **MUST** also be the same weight, and running in the same formation.

Outside of keeping the clutch balanced, the choices are endless, and all up to the racer. Below are listed some baselines, and some concepts to help you fine tune the clutch to your specific application.

Heavier Springs = higher engagement speed - Weaker Springs = lower engagement.

****Springs Available from Heaviest to Lightest****

- **Black – 8443-35-006-A – 4200 RPM**
- **White – 8443-35-005-A – 3300 RPM**
- **Yellow – 8443-35-004-A - 2850 RPM*Sold Separately**
- **Orange – 8443-35-003-A – 2400 RPM *Sold Separately**
- **Red – 8443-35-002-A – 2000 RPM *Sold Separately**
- **Green – 8443-35-009-A – 1250 RPM*Sold Separately**

****Engagement speeds vary with configuration****

****Speeds are listed as the point at which the shoes touch the drum, NOT LOCK UP RPM****

- **Springs can be alternated. For example, reading around the clutch, white black white black, or any combination of colors. Keeping balance in mind, as long as the springs that are opposite one another are of the same color, balance is retained.**

Insert Weights for tuning torque, engagement, and configuration.

- **These are optional, and not required for the clutch operation.**
- **The more weight that is added to the shoe, the lower the engagement.**
- **The more weight that is added to the shoe, the higher the torque capacity.**
- **The placement of the weights allows engagement properties to change. Moving the weights from one end to the other will affect the configuration, making it more leading or more trailing, or making it more center balanced.**
- **NEVER REUSE THE SNAP RINGS. Once removed, discard, and replace with new.**

Shoe Configurations are also tunable and change the engagement characteristics of the clutch.

- **Shoes with a mass in front of the driving lug (the 4 lugs on the hub that drives the shoes), with respect to the direction of rotation are called leading shoes.**
- **Leading shoes self energize, and carry more torque, with very little slip, often bringing the engine back very close to the engagement before releasing. (More on and off, with little slip.)**
- **Shoes with a mass behind the driving lug (the 4 lugs on the hub that drives the shoes), with respect to the direction of rotation are called trailing shoes.**
- **Trailing shoes offer a more predictable and controllable slip, allowing the engine to stay at a higher RPM range. However they carry less torque.**
- **Leading and trailing shoes can be mixed. You can run 2 leading shoes, with 2 trailing shoes as long as they are opposite each other. This is called the "X" pattern. This configuration is a great starting place as it offers a middle of the road approach, from which the rider can determine more or less "grab" and then finish tuning with weights and springs.**

Combinations of tuning characteristics allow for a wide range of tunability.

- **Combining alternating springs along with varying weights, and shoe configurations, can offer a large range of clutch characteristics.**
- **Tuning is vital to get the clutch dialed into your application. The clutch can slip, or almost stall out your motor depending on the configuration.**

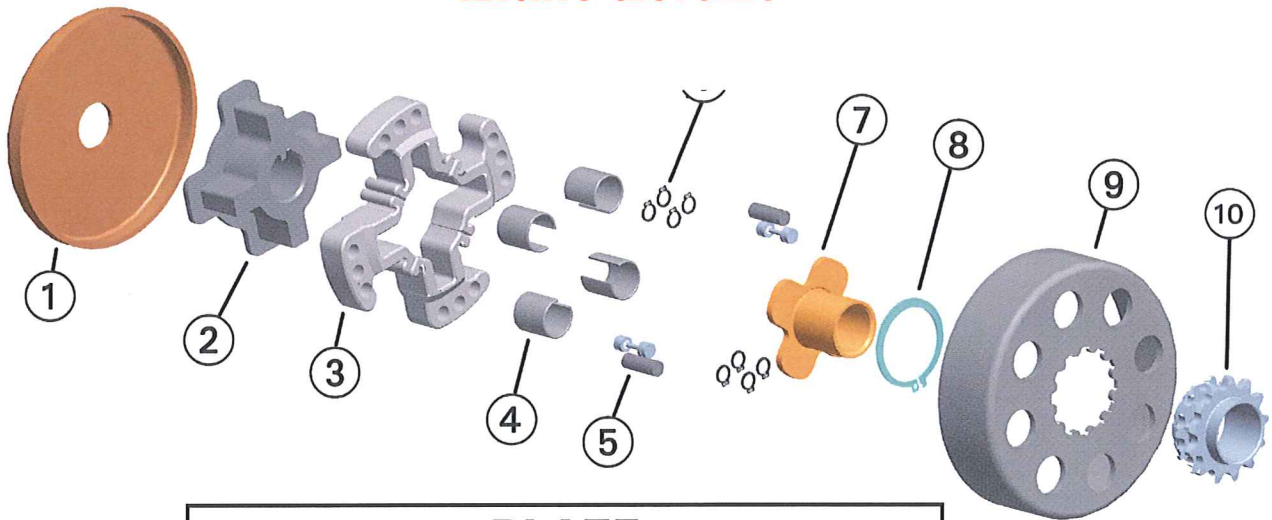


Hilliard

EXTREME DUTY

INFERNO

RACING CLUTCHES



BLAZE		
Ref #	PART No.	DESCRIPTION
1	8444-12-003	GUARD
2	8444-23-089	3/4" SPROCKET HUB
3	8444-31-009	TUNABLE RACING SHOE
4	8443-35-002-A	RED SPRING (1950 RPM)
	8443-35-003-A	ORANGE SPRING (2300 RPM)
	8443-35-004-A	YELLOW SPRING (2800 RPM)
	8443-35-005-A	WHITE SPRING (3275 RPM)
	8443-35-006-A	BLACK SPRING (4325 RPM)
	8443-35-009-A	GREEN SPRING (1225 RPM)
5	8444-22-005	HEAVY WEIGHT
	8444-22-006	LIGHT WEIGHT
6	1279-01-033-T	WEIGHT SNAP RING
7	8444-15-002-B	BUSHING 3/4 (SHORT)
8	1279-01-136-T	BOWED SNAP RING
9	8444-13-099	STAMPED RACING DRUM
10	8444-47-038	13 TOOTH #35 CHAIN SPROCKET
	8444-47-039	14 TOOTH #35 CHAIN SPROCKET
	8444-47-040	15 TOOTH #35 CHAIN SPROCKET
	8444-47-041	16 TOOTH #35 CHAIN SPROCKET
	8444-47-042	17 TOOTH #35 CHAIN SPROCKET
	8444-47-043	18 TOOTH #35 CHAIN SPROCKET
	8444-47-044	19 TOOTH #35 CHAIN SPROCKET
	8444-47-045	12 TOOTH #35 CHAIN SPROCKET