INFERNO

FIRE

INSTALLATION and MAINTENANCE Instructions for the FIRE clutch with a needle bearing.

PATENTED RACING CLUTCH ** PAT. NUMBERS 6,857,515 AND 7,717,250 **

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. If you have any questions, please contact your dealer, visit www.infernoclutch.com or visit us on facebook at www.facebook.com\infernoclutch for more information.

For best results, perform the following weekly maintenance

1. The FIRE clutch is engineered with friction lining to maintain a coefficient of friction that is consistent from a dynamic to static state. For best performance the clutch should be cleaned with **BRAKE CLEANER**. The needle bearing should be lubricated with a small amount of high temperature bearing grease

Following these instructions will give you the best performance. The clutch should be cleaned prior to the first use as some parts have been dipped in oil to prevent rusting.

CLUTCH ASSEMBLY:

Insert Weights:

- **These are optional and can be purchased separately.**
  The snap rings that retain the weight are easily overstressed and damaged. ALWAYS DISCARD SNAP RINGS THAT HAVE BEEN OVER-STRETCHED.

Shoe Installation:

- **Shoes are to be placed on the driving lugs of the hub.**
- **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. 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. Keep balance in mind (see tuning section).**

Sprocket Installation:

- **Insert the sprocket into the drum.**
- **Using external snap ring pliers, place the bowed snap ring into the groove on the sprocket. Because the snap ring is bowed there are two sides. Make sure the side marked "A" in the following picture is away from the drum. Side "B" is toward the drum. The bowed snap ring keeps the sprocket tight in the drum.**

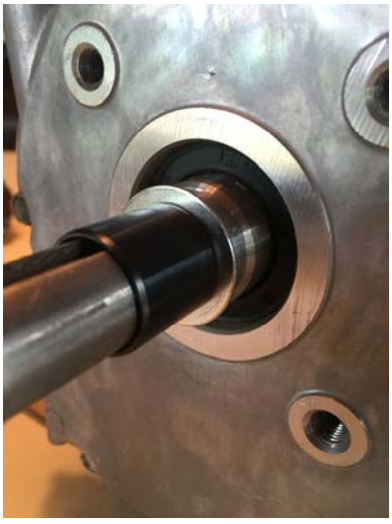
Clutch Installation: (Chain guard removed for clarity)

INBOARD MOUNTING OF THE SPROCKET.

Slide the chamfered crankshaft spacer on the engine. The large chamfer on the inside diameter is designed to give clearance over the radius on the shoulder of the crankshaft.

Install the ¾" x 1 1/16" OD x .04" thick steel washer against the crankshaft spacer.

Install the bearing race.



Lubricate the needle bearing with a high temperature bearing grease and install the needle bearing.

Install the drum/sprocket assembly. The sprocket will slide over the needle bearing easier if you rotate the drum while installing.

Install the grease trap. The sprocket side is stamped with "SPROCKET SIDE". Refer to the picture for correct positioning

Install the spring/shoe retaining washer.

It is recommended to install the clutch in leading orientation. refer to the pictures for correct positioning of the shoes. These illustrations apply only when mounting the sprocket inboard. Tuning information listed in the back of the instructions.

LEADING ORIENTATION

TRAILING ORIENTATION

Install the shoe/hub sub-assembly.

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Properly spaced clutch. The clutch will be clamped tight on the crankshaft to minimize fretting of keyway and potential damage to the integral keys.

Install the bolt, lock washer, and mounting washer. Properly torque to the engine manufacturer specifications.

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

For any additional support visit www.infernoclutch.com or contact your dealer. Frequently check to make sure the clutch retaining bolt does not come loose. Never operate the engine without a properly installed clutch retaining bolt or chain guard.

OUTBOARD MOUNTING OF THE SPROCKET.

Slide the chamfered crankshaft spacer on the engine. The large chamfer on the inside diameter is designed to give clearance over the radius on the shoulder of the crankshaft.

Install the ¾" x 1 1/16" OD x .04" thick steel washer against the crankshaft spacer.

It is recommended to install the clutch in leading orientation. refer to the pictures for correct positioning of the shoes. These illustrations apply only when mounting the sprocket outboard. Tuning information listed in the back of the instructions.

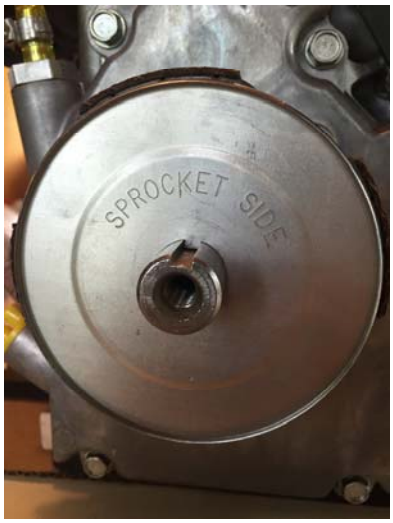
LEADING ORIENTATION

TRAILING ORIENTATION

Install the shoe/hub sub-assembly.

Install the spring/shoe retaining washer.

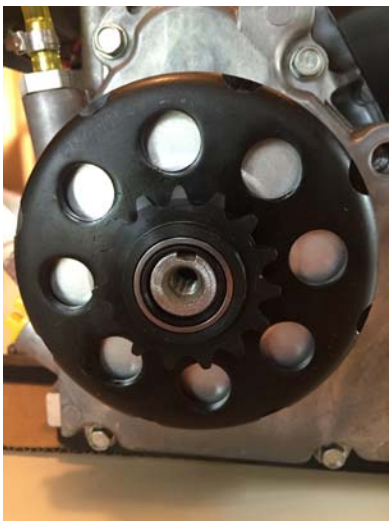
Install the grease trap. The sprocket side is stamped with "SPROCKET SIDE". Refer to the picture for correct positioning.



Install the bearing race.

Install the drum / sprocket assembly.

Lubricate the needle bearing with a high temperature bearing grease and install.



Properly spaced clutch. The clutch will be clamped tight on the crankshaft to minimize fretting of keyway and potential damage to the integral keys.

Install the bolt, lock washer, and mounting washer. Properly torque to the engine manufacturer specifications.

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

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INFERNO FIRE TUNING:

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. Opposing shoes must run the same orientation as well. If you have a leading shoe then the shoe that is opposite it (180 degrees apart) MUST be in a leading shoe orientation as well.

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

****Springs Available from Heaviest to Lightest****
****Speeds are listed as the point at which the shoes touch the drum, NOT LOCK UP RPM****

- **Black – 8443-35-006-A – 3800 RPM**
- **White – 8443-35-005-A – 2800 RPM**
- **Yellow – 8443-35-004-A - 2300 RPM**
- **Orange – 8443-35-003-A – 1900 RPM**
- **Red – 8443-35-002-A – 1400 RPM**
- **Green – 8443-35-009-A – 1200 RPM**

Note: Speeds shown are a FIRE shoe with no added weight.

- **Springs can be alternated. For example, reading around the clutch, white black white black, or any combination of colors. Keep balance in mind. As long as the springs that are opposite one another are of the same color, balance is retained.**
- **Visit www.infernoclutch.com and download the complete engagement speed chart.**

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 A STRETCHED SNAP RINGS.**

Shoe Orientation is also tunable and changes 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 shoe will have the tip of each shoe pointing towards the direction of rotation.**
- **Leading shoes self energize and carry more torque with very little slip. Leading shoes often stay engaged with the engine back very close to the engagement speed 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 will allow more slip and have less aggressive engagement.**
- **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.**
- **The Fire clutch shoe is engineered to make best shoe contact in leading orientation. If you run the shoe in a trailing orientation, you will not see full contact on the shoe until the shoe wears to the drum. This will take a lot of racing time to fully bed. Never machine the outer radius of the shoe. It has a specially designed offset in the surface to ensure the best contact.**

Recommended Initial Setup:

As you can see the FIRE clutch has a wide range of tuning ability. A suggested starting point is to put the shoes in a leading orientation and install (2) white springs with (2) black springs. This setup will be a good starting point for the majority of racers. Each spring color needs to be installed opposite of each other to maintain balance. This setup will start to engage around 3400 rpm. After you test your setup you then can adjust the clutch to your specific needs. Add or remove weight or change the springs. Adding weight to each shoe will adjust your engaging speed down approximately 100-200 rpm per

weight. A full engagement speed chart and a diagram showing leading versus trailing orientation is available to download from our website. www.INFERNOCLUTCH.com