4SKANSW 2020 Endurance Series - Clutch Setting Requirements

This document outlines the requirements for the regulated clutch for the 2020 4SKANSW Endurance series.

The clutch must be a standard Hilliard Inferno Flame, Hilliard part number: LD4S-FLAME

The clutch must be fitted with four (4) White Hilliard Inferno Flame springs, Hilliard part number 8443-35-005-A

The maximum number of springs permitted is four (4) (no doubling up of springs)

Springs can and will be tested to ensure they are genuine white Hilliard Inferno Flame springs, part number 8443-35-005-A

The original white paint is to remain on the springs and must be visible at a post race inspection. If the paint is damaged or missing, the springs must be replaced before the event

Clutch shoe weights are not permitted in any form this includes standard Hilliard weights or any other form of added material that adds weight to the clutch shoe(s)

The clutch can be installed with the sprocket positioned either inboard or outboard.
Inboard is considered to be when the drive sprocket is located between the clutch and the engine, refer to image 1
Outboard is considered to be when the sprocket is located between the clutch and the retention bolt and washer, refer to image 2

The clutch shoes can be installed in either a “Leading” configuration or “Trailing” configuration.
Leading shoes self energize and carry more torque with very little slip.
Trailing shoes will allow more slip and have less aggressive engagement.
Trailing shoes need to be bed in until you can see that the entire surface of the shoe is contacting the drum, this will take many hours.
Hilliard recommends using a leading shoe configuration as a starting point

Image 4 shows a leading shoe configuration for an inboard sprocket setup
Image 5 shows a leading shoe configuration for an outboard sprocket setup
Image 6 shows a trailing shoe configuration for an outboard sprocket setup
Image 7 shows a trailing shoe configuration for an inboard sprocket setup

Permissible sprocket sizes are 16, 17, 18, 19, 20, 21 & 22

Sprockets and chain must be #219 pitch

INBOARD MOUNTED SPROCKET

OUTBOARD MOUNTED SPROCKET

LEADING SHOE INBOARD MOUNTED SPROCKET

LEADING SHOE OUTBOARD MOUNTED SPROCKET

TRAILING SHOE OUTBOARD MOUNTED SPROCKET

TRAILING SHOE INBOARD MOUNTED SPROCKET

Approved Clutch Parts

Complete Clutch -	Hilliard part number: LD4S-FLAME
Springs (white) -	Hilliard part number 8443-35-005-A
Shoe -	Hilliard part number 8443-31-017
Sprocket 16T -	Hilliard part number 8443-47-049
Sprocket 17T -	Hilliard part number 8443-47-050
Sprocket 18T -	Hilliard part number 8443-47-051
Sprocket 19T -	Hilliard part number 8443-47-052
Sprocket 20T -	Hilliard part number 8443-47-053
Sprocket 21T -	Hilliard part number 8443-47-054
Sprocket 22T -	Hilliard part number 8443-47-055
Bearing -	Hilliard part number 8444-9U-034
Snap Ring -	Hilliard part number 1279-01-136-T
Mounting kit -	Hilliard part number 8444-9U-030
Crankshaft spacer -	Hilliard part number 8444-9U-035
Hub Spacer -	Hilliard part number 8444-9U-019
Drive Hub -	Hilliard part number 8444-23-089
Drum -	Hilliard part number 8444-13-099
Bushing -	Hilliard part number 844-15-002-B

Hilliard's Maintenance recommendation for the Hilliard Inferno Flame Clutch

1. **Drum & Sprocket:**

The Flame clutch is engineered to minimize clutch chatter when cleaned with solvent based cleaners. Even though the clutch design minimizes chatter, the preferred method of cleaning is to spray some WD-40 on a rag and wipe the inside of the drum. Wipe out as much dirt and debris as possible. The area where the drum and the shoes make contact is the heart of the clutch. A nice, clean, smooth surface provides the best consistency from race to race. An alternate method of cleaning is to clean the drum with acetone, starting fluid, or carburettor cleaner. These cleaning fluids will remove all of the oil and can cause the clutch to become aggressive during engagement. A small amount of oil residue will give a more consistent coefficient of friction and longer clutch life. If the drum is galled and not smooth then you can sand the inside of the drum with fine sandpaper. Clean the drum I.D. with WD-40 after sanding.

2. **Shoes:** The preferred method to clean the shoes is to spray some WD-40 on a rag and clean the outside of the shoe. An alternate method is to clean the mechanism with acetone, starting fluid, or carburettor cleaner. These cleaning fluids will remove all of the oil and will cause the clutch to become more aggressive during engagement. A small amount of oil residue will give a more consistent coefficient of friction and longer clutch life so WD-40 is recommended for cleaning. The Flame shoe has cleaning grooves so scrape any debris out of each groove when performing the weekly maintenance.

3. **Bearing:** Clean the bearing with WD-40 or a solvent based cleaner finishing off with brake cleaner or carburettor cleaner to remove the solvent. Lubricate the needle bearing with High Temperature Bearing Grease. DO NOT OVER GREASE BEARING

4. **Bushing (some older style flame clutches have a bush):** Spray some WD-40 on a rag and clean the outside of the bushing. Apply one small drop of oil to the outside of the bushing. We recommend light-weight oil. Do NOT use grease, never-seize, or lubricants containing Teflon. Do NOT excessively lubricate the bushing. Excessive lubricant will end up inside the drum. Only a small drop is needed. Centrifugal force and heat will cause some oil to come out of the pores of the bushing and it automatically lubricates the bushing during operation. Do NOT clean the bushing with acetone, starting fluid, or carburettor cleaner. The bushing is oil impregnated at the factory and these cleaning fluids will dissolve all of the oil out of the pores of the bushing. Do NOT put the bushing on a rag, paper, cardboard, or other porous surface because the oil will wick out of the bushing. The bushing must be wrapped in plastic or placed in a plastic bag for storage.

The clutch should be cleaned prior to the first use as some parts have been dipped in oil to prevent rusting.