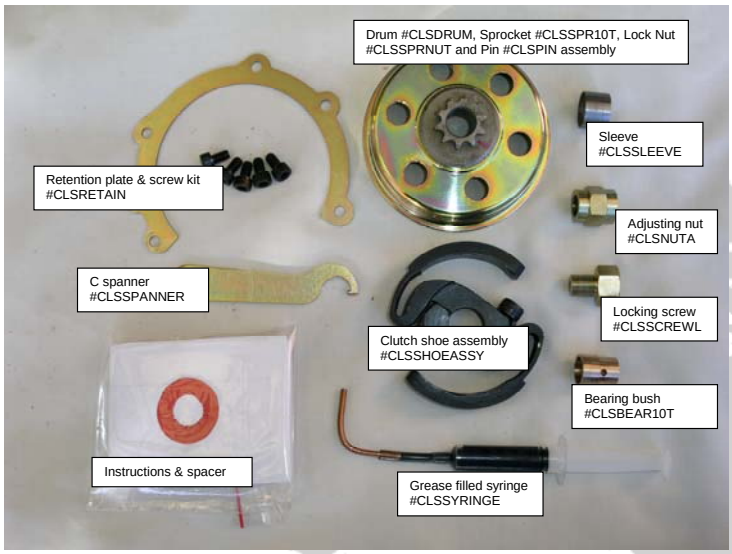
SSS CLUTCH by STRIKE

INSTRUCTIONS FOR FITTING A 10 TOOTH "SSS CLUTCH" TO A KT100S SHORT SHAFT KART ENGINE & ITS OPERATION (Rev 0270907)

Updates to this revision are shown in *italics*

INTRODUCTION:

1. These instructions only apply to fitting a 10 teeth SSS clutch to a KT100S engine with a short shaft crankshaft (with an M12 thread). This 10 teeth clutch does **NOT** fit to a long shaft crank (with an M10 thread).
2. While the instructions below might look a little complex initially, they are quite logical and easy to perform.
3. The clutch features a lubrication system for the clutch bearing. This requires the operator to inject grease into the clutch each time the kart is raced.



4. The clutch kit includes a crank/clutch retention plate to retain the clutch should the crankshaft break. It is essential that this be fitted to the engine at all times.
5. The clutch is designed for AKA Clubman applications **only.**
6. Fully read and understand this method before proceeding. Do not deviate until you have a full understanding of the design principles. This applies to both the person installing the clutch and the final user.
7. Ensure all parts have been supplied as per the accompanying picture.

METHOD OF ASSEMBLY:

1. Fit the sleeve over the crankshaft (with large chamfered end inwards) and push up to the Ø20 mm shoulder. *If the sleeve is loose on the shaft, lightly squeeze it with pliers or in a vice so that it will need to be tapped onto the crankshaft. The sleeve is to be fitted to the crankshaft using the maximum strength retaining grade of Loctite, Grade 638 or 680. After cleaning both crank and sleeve, coat the shaft and inside of the sleeve shaft to ensure an even spread of Loctite. Wipe off any excess. Do not allow Loctite to get onto the crank thread.* Note that pushing a small screwdriver into the slot will slightly expand the sleeve, making fitting and removal easier.

2. Fit the clutch shoe assembly over the sleeve ensuring that:

   - the 2 mm relief on the side of the clutch shoe is facing outwards.
   - the face of the relief overhangs the end of the sleeve by approximately 3 mm.

- the slot in the sleeve aligns with one of the two gaps between the two shoe halves. Use a small screwdriver to rotate the sleeve inside the clutch shoe assembly to achieve this alignment.
- lightly tighten the two M8 clamp screws.

3. Screw the bearing bush (tapered end facing inwards) onto the crank and tighten using the small C spanner provided, ensuring that the small ∅3 pin fully enters the small hole in the side of the bearing bush. Prior to this, check and remove any imperfections on the crank taper that might prevent the bearing bush from fully seating on the taper. Tighten the bearing bush with **light** finger pressure only.

4. Now screw on the adjusting nut, with the small diameter end (with the slotted thread) inwards towards the bearing bush. With a 19 mm spanner, lightly tighten the nut up against the bearing bush. To prevent the crankshaft rotating, it will be necessary to either hold the ignition rotor retaining nut (22 mm AF) or use a piston stop.

5. Fit the locking screw and lightly tighten with two 19 mm spanners. Then with the prefilled syringe, fitted with the plastic tube and copper tube extension, insert the copper tube into the hole of the lock screw by about 10 mm. Inject grease into the screw. Grease must come out the hole in the bearing bush and, very importantly, not leak out between the adjusting nut and bearing bush. Assuming that all is ok, remove the locking screw and adjusting nut. If not ok, then loosen off the lock screw and then tighten and loosen the adjusting nut against the bearing 2 or 3 times times. Unscrew the nut and look for evidence of continuous contact between the outer edge of the bearing bush and the adjusting nut. If not continuous, repeat until this is achieved. This continuous contact is necessary to effect a seal so that grease will not leak out at this junction. Recheck for grease flow out the hole in the bearing bush.

6. Fit the 0.25 mm paper spacer up to the clutch shoe assembly.

7. Slide the clutch drum over the bearing bush and then screw on the adjusting nut with the shorter length circular end (with the slotted thread) towards the clutch shoes.

8. Lightly tighten up the adjusting nut by hand until it bottoms out on the bush. (This process will push back the clutch shoe assembly to provide the 0.25 mm end float). You will need to hold the crankshaft to prevent rotation.

9. Remove the adjusting nut, clutch drum and paper spacer.

10. Clamp the clutch shoe assembly to the sleeve by tightening the two M8 screws to a torque of 22 - 24 Nm (16 - 18 ft lb)...this is very tight. You will need a long series Allen key to achieve this or a short series key with an extension tube. Take note of the gap between the two halves on either side of the crankshaft. **GET** this as equal as possible by tightening more on the side where the gap is larger. An uneven gap will bend the screw leading to breakage. Both screws must be tightened. You will again need to hold the crankshaft to prevent rotation.
11. Lubricate the inside of the sprocket in the clutch drum with a light application of the molybdenum based grease (from the syringe). Do not grease the bearing bush as any such grease would be pushed towards the clutch

shoes and subsequentially inside the drum, causing slippage. Reassemble the clutch drum onto the bush and screw on the adjusting nut to a light torque level of about 10 Nm (7 ft lb). You will again need to prevent crankshaft rotation by holding the ignition rotor retaining nut.

12. Check for end float of the clutch drum. This should be equal to the 0.25 mm thickness of the paper spacer. If not, review the sequence you used and repeat.

13. Fit the locking screw into the back of the adjusting nut and then, with two 19 mm spanners, tighten the locking screw to the adjusting nut with a torque of 25 Nm (18 ft lb). Ensure that the adjusting nut is not unscrewed as this will alter the end float clearance and cause grease leakage.

14. Fit the drum retention plate using the 5 off M6 screws supplied. It is essential to fit this plate. The plate will prevent the clutch and crank escaping from the engine should the crankshaft break. **This is an essential safety item.**

15. With the syringe, inject grease into the center of the locking screw so that the cavity in the screw is completely filled.

16. **Using the syringe, lubricate the clutch** every time before the kart goes out to the track. For each of these applications, dispense about 0. 2 ml of grease (this represents one graduation on the side of the syringe). Give small frequent applications rather than large infrequent applications

OPERATION:

1. **Minimize slipping**. The SSS clutch had been designed to allow the engine to be started with the kart stationary, idled for a reasonably short period of time and then driven away smartly to prevent prolonged slippage. Extended high load slipping will cause the clutch to overheat and create significant premature wear of the shoe lining material. Slipping generates heat. Once engaged, the clutch generates no heat (as evidenced by the fact that the clutch is cool after finishing a track session).

2. **Lubrication.** The SSS clutch has a bearing bush that requires frequent lubrication,. This is every time the kart goes onto the track. Apart from initial assembly, it is necessary to dispense *about 0.1 ml* at each application.

3. **Starting**. The engine must be started by external means, which usually means using an electric starter with an extended shaft that passes through a hole in the side pod. Irrespective of the type of starter used, it is imperative that it has a one-way clutch (sprag) to allow the engine to run faster than the starter motor. If this is not used, the locking screw will repeatedly come loose and/or the starter motor may be damaged through over speeding. A 19 mm socket drive is required on the starter. ***THE STARTER MUST RUN IN LINE WITH THE CRANKSHAFT CENTRELINE AND THE WEIGHTOFTHE STARTER MUST NOT BE ALLOWED TO "HANG" OFF THE CRANKSHAFT IE THE STARTER MUST BE SUPPORTED AT ALL TIMES WHEN ENGAGED WITH THE CRANKSHAFT***

4. **Drum retention plate**. The supplied plate **MUST** be fitted. This is an essential safety item.

5. **Idle speed.** The idle speed is to be set as low as possible, in the range of 2500 rpm. On some engines it appears that leaning off the low speed jet by about a half turn will improve idle quality and starting. Obviously this will need to be wound out by the same amount just before or once the kart is underway.

6. **Stopping the engine.** Because the engine cannot be stalled as with a direct drive, there are two ways to stop the engine. The first is to have a switch that earths the spare female connector on the ignition wiring loom. The other is to simply stop the airflow to the engine by blocking the air inlet tubes on the airbox.

7. **Chain tension**. Excessive tension will cause premature wear on both the engine crankshaft and bearings and also the clutch bearing. Ensure that there are NO tight points in the chain over a couple of wheel rotations.

LUBRICATION SYSTEM:
To keep the bearing bush lubricated, a lubrication system has been incorporated into the design of the clutch. The locking screw has a small hole at the outside opening up to a Ø6 hole along its inner length. At the end of the screw there are two slots that connect to a chamfer at the end of the thread. The adjusting nut has a groove along half of the thread at the end that faces inwards, meeting up with a chamfer. The bearing bush also has a groove along the thread that connects to the hole in the side. The above creates a path for the grease to exit via the small hole, directly lubricating the bearing. The grease flows from the inside of the lock screw through the system under centrifugal force. The injection of grease into the screw each time the kart is used ensures that the bearing is well lubricated. Too much grease is likely to cause slippage. Should this occur, reduce the amount of grease injected or the frequency.

The grease supplied in the kit is “Penrite Moly Grease EP 3%”. Use this or an equivalent. To refill, ensure the plunger is fully pushed into the syringe, pump the grease from a grease gun into the outlet tube of the syringe, thereby forcing the plunger outwards.

DISASSEMBLY TIP:

After un-tightening the locking screw using the two spanners, it is most likely that the adjusting nut will be tight. To loosen it, fit a ring spanner over the nut and give it a sharp hit with a hammer. It will then easily unscrew as will the bearing bush. If the bush is too tight for removal with the C spanner, use a center punch in the hole and give a light tap with a small hammer.

SPROCKET REPLACEMENT:

When replacing the sprocket, do not use a chain style sprocket clamp. This could cause the thin section of the sprocket body to break. Not important on removing an old sprocket, but not so good when fitting a new sprocket. A rattle gun is ok to undo the nut, but not for tightening as the applied torque will be unknown. The only way to tighten the retaining nut is to use a device that grips the drum with two (or more) of the six holes in the face of the drum. *It is recommended that STRIKE tool # ST0001 is used for this application.* Do not even consider clamping the drum in a vice as this will cause the drum to become non circular, leading to clutch malfunction.

Check that the pin is below the face of the drum before the nut is fitted. The correct tightening torque is 120 Nm (89 lb ft). To ensure the nut remains tight, use a thread locking compound. Wipe off any excess when finished. *Spin the assembly on the crankshaft with the bearing bush fitted to ensure that it runs evenly with a maximum run-out of 0.5 mm at the outer edge.*

WARNINGS:

- DO **NOT** RUN THE CLUTCH WITHOUT THE CLUTCH DRUM IN PLACE! If it is run without the drum in place, the shoes will fling outwards unconstrained and terminally destroy the engine and, most likely, any person in the vicinity. Note that this warning applies to any engine mounted, shoe type, centrifugal clutch, including Rotax MAX, ARC, Fireball, Leopard and Comer.
- Do **NOT** run the engine without the clutch retention plate fitted.
- **DO** lubricate the bronze bushes every time the kart goes out. If there is more than 0.15 mm total clearance over the shaft in the bearing bush then it must be replaced
- Do **NOT** spray chain lube through the holes in the clutch drum, as this will most likely cause the clutch to slip.

For any future revisions, go to www.strikeproducts.com.au