TKM K4S 4 STROKE CLUTCH SERVICE & FITTING GUIDE

K4S CLUTCH

The TKM K4S engine is fitted with a special purpose clutch and the available chain sprockets that can be used are the standard fitment 12 Tooth & the optional 13Tooth together with a 14T, 18T & 20T.

The K4S clutch is designed to permit easy starting with a battery operated hand-held remote starter. When the engine starts, the clutch will be in neutral until the engine reaches approximately 2400rpm. At about 2500rpm the K4S clutch will start to engage and the kart will start to move. Since the clutch engages at a low rpm, driving technique will be the same as a direct drive vehicle.

Due to the extreme demands of racing, it is important to properly maintain your K4S clutch in order to obtain maximum performance and reduce risk of clutch breakage or clutch slip.

K4S CLUTCH REMOVAL

Step 1

First remove the K4S engine from chassis.

Remove clutch guard (K4SCLUTG) by undoing its 2 off M6 bolts (BOM645).

Undo the crank starter nut (17mm A/F) (K4SNUTM10ST or K4SNUTM12ST) using an impact gun.
Note: Right handed thread.

⚠ Warning: Do not hold the ignition rotor side crank nut or use a piston stop when attempting to undo the crank starter nut as this will cause crankshaft to be misaligned & possible engine damage.

Remove the outer shim (K4SCLUTTWEXM10 or K4SCLUTTWEXM12) and slide off sprocket clutch drum assembly.

Remove roller cage bearing (K4SCLUTB151920) & the Inner Shim (K4SCLUTTWIN08).

You can now either remove rest of the K4S clutch assembly from engine as described in ***Step 2*** or move to ***Step 3*** in the Maintenance & Repair section if you are leaving clutch hub assembly on the engine to save time when servicing.

Step 2 ***Removal of K4S Clutch from engine.***

To remove the K4S clutch from engine, undo the large recessed clutch hub nut (27mm A/F) (K4SNUTM20REC) using an impact gun of adequate power.
Note: Right handed thread.

⚠ Warning: Do not hold the ignition rotor side crank nut or use a piston stop when attempting to undo the crank clutch hub nut as this will cause crankshaft to be misaligned & possible engine damage.

Fit the special designed K4S clutch extractor tool (TK4SCEX) by using its 2 off M6 bolts.

Warning: Do not screw in these two bolts too far as they will bottom out on crankcase oil seal area and cause damage.

They only have to screw in the depth of the extracting hole provided in hub. Make sure the large extractor centre bolt is wound out enough to clear crank end when fitting this extracting tool. Again use an impact gun to tighten the large extractor centre bolt onto crank end. This action will snap loose the clutch from the crank taper fit.

Warning: Do not hold the ignition rotor side crank nut or use a piston stop when attempting this clutch removal from the engine as this will cause crankshaft to be misaligned & possible engine damage.

CLUTCH INSTALLATION TO K4S

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Slide K4S clutch drive hub assembly onto taper of crankshaft. The tapers should be clean and dry.

Screw on the large recessed hub nut and tightened to 85ft/lb or 115Nm. Use a small amount of **Loctite 648** only on this thread, not the taper. The recessed side of the large hub nut goes to engine. Use an adequate size impact gun.

Warning: Do not over tighten this nut as this may cause cracking of the drive hub.

Warning: Do not under tighten this nut as this may cause drive hub to come loose from taper.

Clean excess Loctite & then fit the internal shim & roller cage bearing with a quality Grease.

Warning: Any excess grease will likely cause power loosing clutch slip and overheating so be careful with the amount applied. This will also apply to chain lubrication if sprayed in the K4S clutch area.

Now fit the standard 12T Chain Sprocket to Clutch Drum using (36mm A/F) large nut (K4SNUTM28) and tightened to 65ft/lb or 88Nm. Use **Loctite 648** on thread. You may also fit the correct thickness sprocket shims (K4SCLUTDSH075 – 125) if required. These shims are used to give maximum engagement of friction disc lugs in the clutch drum cut outs without the drum rubbing on clutch hub O/D when in neutral low RPM.
Idea clearance 0.5 – 1.00mm

Use the clutch drum holding tool (TK4SCDH) during this operation. Please ensure that this nut is not over tightened as this may cause sprocket bore to distort and cause roller bearing to have insufficient clearance making drum hard to spin on crank. Clean excess Loctite.

Now slide sprocket drum assembly onto crank making sure lugs on friction disc engage with cut outs on drum. Check that sprocket drum assembly spins freely and the outer edge of drum, near cut outs, does not rub on the large hub O/D. If so adjust with the shims mentioned above.

Fit the external shim washer with (17mm A/F) starter crank nut and tighten with impact gun to15ft/lbs or 20Nm.

Warning: Do not over tighten this nut as this may cause crank damage.

Warning: Do not hold the ignition rotor side crank nut or use a piston stop when attempting this clutch removal from the engine as this will cause crankshaft to be misaligned & possible engine damage.

It is important that the sprocket drum assembly has end float clearance to allow the chain sprocket & drum assembly to spin free after the crank starter nut is tightened.

Fit clutch guard using 2 off M6 x 45 Bolts. 11 lbs.ft / 15 Nm.

Fit K4S engine back onto kart.

MAINTENANCE & REPAIR

Step 3 Stripping K4S Clutch

You will now need to undo the 6 off M5 Button Head bolts (BOBUTM510).

⚠ Warning: These bolts should only be nipped tight as they are difficult to undo after the heat cycles produced in normal clutch use.

We advise that you use a new Allen hex key with no rounded edges and possibly use of a sharp centre punch being used on outer diameter of bolt heads, so bolt is being encouraged with Allen hex key and centre punching action in the same direction as bolt undoes which is anticlockwise. As soon as one bolt snaps loose just nip again and move on to the next one repeating this operation until all 6 bolts have snapped loose. You will then be able to undo and remove these bolts in a diagonal sequence.

Then remove both the dished retaining plate (K4SCLUTRETP) & the diaphragm spring taking care that all 18 steel balls (K4SCLUTBALL12) remain located in the ball housing plate. This plate together with the 18 balls can also be removed.

This will now expose the friction disc (K4SCLUTFD) & the 6 off springs (K4SCLUTSPR15S). These can also now be removed.

We advise that the following parts are renewed when servicing the clutch:

Roller cage bearing (K4SCLUTB151920)
6 off M5 Button Head bolts (BOBUTM510).
Friction disc (K4SCLUTFD)
6 off springs (K4SCLUTSPR15S)
Clutch drum (K4SCLUTD)
Chain sprocket (K4SSP12T).

If undue wear is present on plate faces that mate up with friction disc then they must also be changed.

CLUTCH ASSEMBLY

Clean parts with disc brake cleaner. Disc brake cleaner comes in an aerosol can and is available at most automotive parts stores.

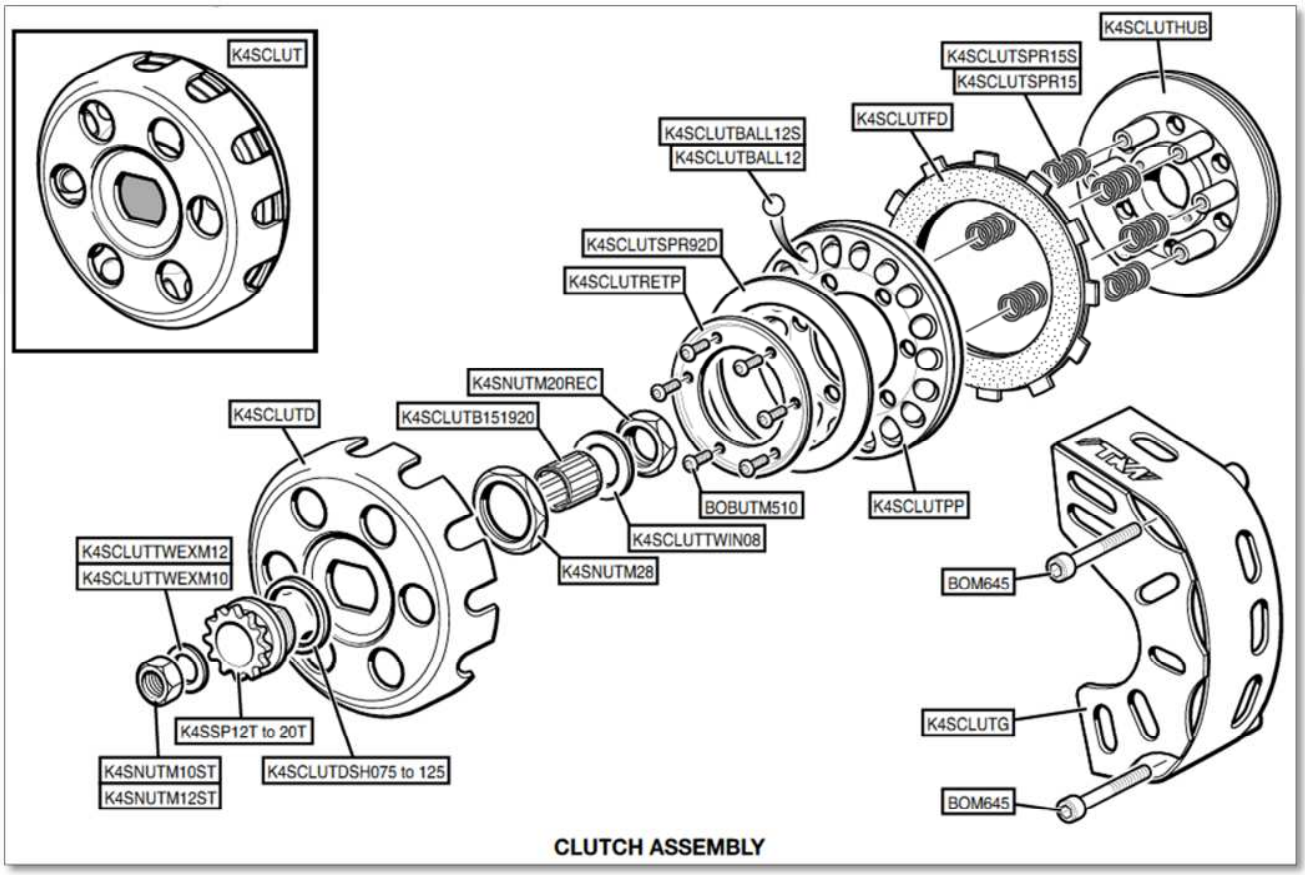
⚠ Warning: Do not use petrol to clean the K4S clutch!

Reassemble K4S clutch with the new parts using a small amount of copper slip grease on outside of spring locating pegs. Do not over tighten the 6 off Button head bolts, just simply nip (1.5ft/lb or 2Nm) with Allen hex key.

Note: Do not use any thread lock on these bolts as there removal next time will be extremely difficult. These bolts should only be tightened in a diagonal sequence a small amount at a time to ensure plates are not distorted from this operation.

Your K4S clutch is now ready for installation on crankshaft. Refer back to clutch installation at start of this guide.

Please see on the next page the K4S Clutch exploded parts drawing with part numbers.



CLUTCH ASSEMBLY