

FORMULA TKM 2-STROKE

TAG Installation Guide

Introduction

This installation guide is provided for owners who are fitting a TKM TAG 2-stroke engine to their own kart and should be read carefully before installation begins. The engine package is provided to you in a form which is easy to fit to your kart and should take less than an hour with minimal needs. Please follow this guide carefully.

Step 1

Engine comes complete with:- DENSO Spark plug, Carburettor, induction noise box, Exhaust system complete, Ignition system complete, Clutch with chain sprocket, TAG Starter assembly, PVL KF style electronic ignition system complete with all leads and wire harness, Standard Battery and Battery mount assembly complete with cover.

A more powerful superior high tech lightweight battery option is available from Tal-Ko.

Step 2

The engine mount top plate required has a drill pattern of 80 X 102mm which is different to the normal BT82 one which is 80 X 123mm. These are centre line dimensions. The TAG mounts can be supplied by Tal-Ko as an optional extra. Fix top plate mount to engine using 4 off M8 cap head bolts ensuring they are the correct length and neither too long so that they bottom or too short so that there is insufficient thread holding.

Step 3

Place the engine onto the chassis and ensure that the engine mount fits chassis correctly. Make sure that the engine is clear of seat and side bar brackets and can slide along the chassis rails a small distance to allow for chain adjustment.

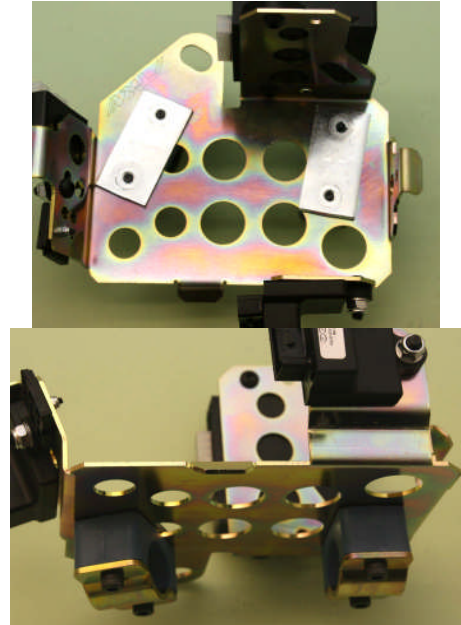
Step 4

Take the battery with its battery mounting bracket assembly with all the PVL relays and CDI box already attached and remove the retaining large O Ring, battery and battery rubber sponge pad.

Then locate the mounting bracket on the brake side main chassis tube next to the seat. You are provided with a set of tube mounting clamps which slot into the base of the battery mounting bracket which allow for multiple positions so all chassis can be catered for. Ensure the position you choose with the plastic cover installed is good for the wire harness connection and clears the seat and seat mounting stays. If required you may modify both mounting bracket and the plastic cover to ease fitment.

Once positioned and tightened, place the special adhesive backed rubber sponge pad in the base so the battery is cushioned from vibrations. Then

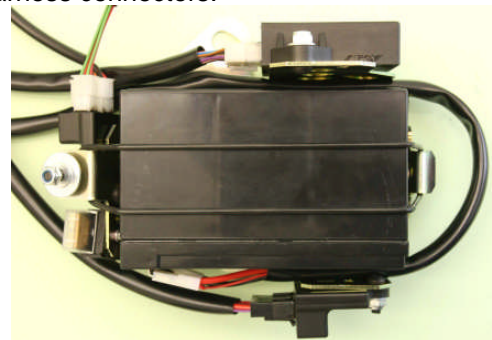
replace the retaining large O ring over battery to keep it in place.



Pictures of battery mount with tube connectors

Step 5

Position the main wiring harness provided as in the picture below making sure the correct connectors are firmly pushed and clipped into their associated PVL components. The fused unit mount backing is already bolted at a slight angle to front of battery mount. This slight angle aids clearance to the plastic cover and connection for battery lead. You will just need to clip in position carefully the fused front part already connected to main wiring harness. Please note that at this stage do not connect the battery to wire harness connectors.



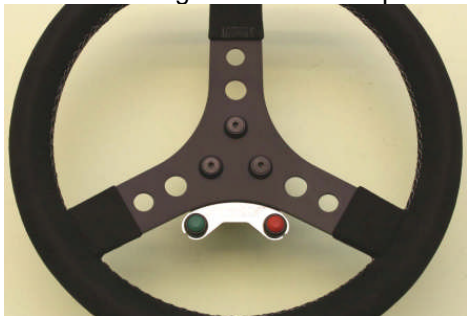
Picture with standard battery

The wire harness is positioned so that each side of the battery has a harness main wire in between it and the battery bracket uprights. This acts as an additional hold for the wire harness and a cushion for the battery.

Step 6

Fit the push button controls to the TKM steering wheel mounting bracket provided with the green start

button on the brake side. Then fit this bracket with push buttons in between the steering wheel column boss and the steering wheel as in the picture below.



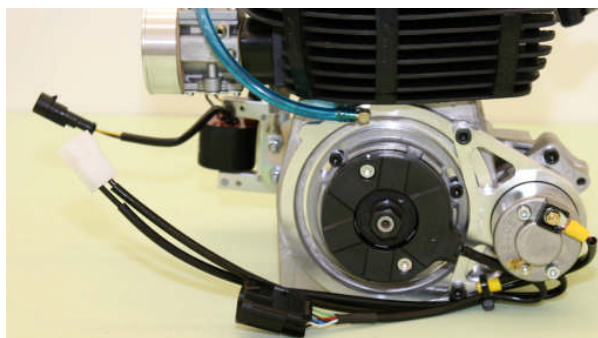
Picture of push buttons fitted to steering wheel

Ensure that the wiring from the push buttons are then cable tied to allow full movement of the steering wheel without causing the wires to chafe.

Then connect to the PVL driver control unit via the PVL extension cable provided located at front of battery mounting bracket. Cable tie as required.

Step 8

Route the main wiring harness along the top of the main chassis tubes under the front of the seat and the along to top of the inside engine mount chassis tube so connection can be made to the PVL HT coil, PVL stator and the PVL starter motor lead provided already attached to the starter motor fitted to your engine. Cable tie wiring as required. You may notice at rear of starter motor a small spade terminal which can be used as an extra earth if required. Both starter leads have yellow terminals and the one connected to the solid black wire is the main earth lead already bolted to support bracket bolt and the other with the red line on the black lead is the live already bolted to the live terminal on starter motor. Do not mix these up as damage may occur!



Picture of starter motor lead

Please note that at this stage do not connect the battery to wire harness connectors or put spark plug in engine.

Step 9

Connect the fuel system piping. But first remember that if you have previously been using the fuel tank with old fuel you **MUST** empty the tank and flush with clean fuel in a safe environment. An inline tank filter is highly recommended and should be fitted in the fuel supply pipe from tank to carb with the direction of flow arrow on filter fitted the correct way. The fuel supply pipe is fitted direct to the brass union on side of carb. Cable tie as required ensuring that pipe cannot chafe and is not pinched tight at each cable

tie. An overflow fuel catch tank should be fitted to your kart as per MSA regulations.

Note that the blue pulse pipe from the engine pulse union located on the side of the engine goes to the union on top of the carb.

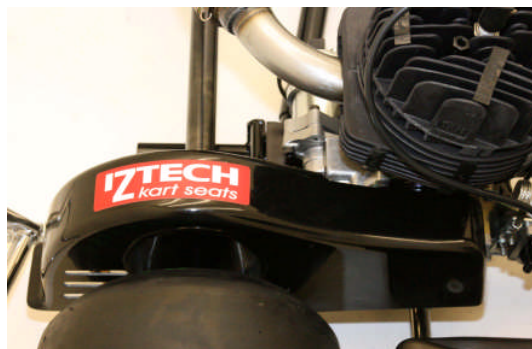
Step 9

Check the alignment of the axle sprocket with the clutch chain sprocket using a straight edge or laser, adjusting the axle sprocket carrier as necessary ensuring that you have sufficient axle key located in the sprocket carrier. If the sprocket carrier does not have sufficient location on the key then it can always be turned around so its offset can cover the key. Remember to tighten sprocket carrier clinch bolt. Your TAG engine is fitted with a 10 tooth chain sprocket so fit a rear axle sprocket to suit your required track and a starting point suggested maximum RPM of around 15,000.

Fit chain and adjust (10mm of total up & down movement) ready for use, remembering to fully tighten the mount clamp bolts and then lubricate chain with chain spray, but avoiding getting any on the clutch internals.

Step 10

You will need to fit a fully enclosed chain and clutch guard made by Iztech, Tillett and others. Tal-Ko can supply this guard if required.



Picture of fully enclosed guard covering clutch

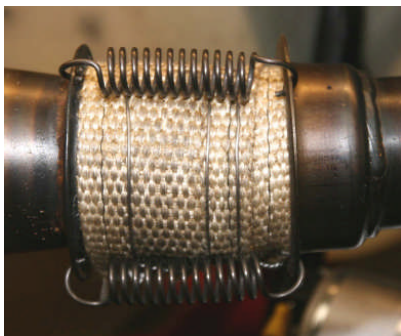
Step 11

Fit the exhaust manifold onto the engine first placing the gasket on the 2 studs, then the manifold and finally the spring washers and special extended 13mm A/F nuts. A deep cranked ring spanner will be required to tighten these nuts.

Then fit the chrome exhaust end can provided to the exhaust pipe by first removing the 3 self tapping screws holding on the chrome pipe end with tail pipe. The exhaust end can then slides over the still in place chrome end with tail pipe. Ensure that it is fitted with the 3 large holes at 180 degrees from the tail pipe. Then replace all 3 screws to locate both chrome ends.

Slide the exhaust flex supplied (80mm long) into manifold and then slide exhaust onto other end of flex with its flex ring. At this point wrap the heat proof webbing provided around flex and lock wire around its O/D in 3 places. Then use the flex securing springs provided and also locate with springs onto rear cradle. The position of this rear cradle **MUST** be

adjusted to ensure a natural line of the exhaust so no tension is put on the flex. Note the TAG engine uses a different manifold and exhaust to the direct drive engine.



Picture of exhaust flex with wired wrap

Step 12

The carb noise box mounting flange and its gasket is already fitted to front of carb. Fit the noise box filter in the noise box by carefully folding rubber and filter so it fits in noise box and then fit noise box in the rubber groove on filter. Fit noise box to carb mounting flange with the twin air inlet filters facing approximately upwards and carefully tighten with clip provided. Note you will need to drill a hole on the small tab sticking down from bottom of noise box so you can cable tie noise box to kart frame.

Step 13

The carburettor throttle cable will need fitting to the cable swivel assembly on cross shaft of the carb. Use a correct size inner and out cable to suit fitments which Tal-Ko can supply as an option. Place special end of the cable into the cable slot then thread through outer cable and connect to the pedal. It is important to ensure that the pedal locates against a bolt at full throttle to prevent damage to the carb. It is also advisable to drill a small hole 2-3mm dia in the cylinder head fin in line with the connection of the throttle cable to carb and use a light additional throttle return spring.

Step 14

At this stage you will need to adjust your jets accordingly to the TKM class you are running in taking into account engine type (Junior 100cc or Senior *Extreme* 115cc) and if a Junior engine what colour/size carb restrictor you are using/fitted. See Page 1 of the running guide provide to select from the list and set your carb jets to suit. You may have to turn the low jet in again and high jet out same amount to get you engine to tick over correctly. The jets are located on the side of the carb and marked with an L for the Low jet and an H for the High jet. The high jet is adjusted by fingers and the low jet with a small screwdriver.

To fully close the jets, screw them in until they gently stop and are seated on the taper of the jet in the jet holes. Never use force to seat these jets as you will damage the carb. Once you have closed/seated the jets you can then turn out the jets to correct amount to suit. We would advise you start on 1 ¾ - 2 turns out on low jet & ¼ - ½ turn out on high jet. Adjust as required.



Picture of carb jets

Step 15

Next fill your fuel tank to at least half way with correctly mixed fuel and oil.

Premium unleaded fuel should be mixed at 16:1 using Shell Advance Racing M oil which we can supply if required.

Mix 5 litres of fuel with 310ml of oil for 16:1

You must then ensure that your carb is primed with fuel without flooding it!

The best way to do this is by removing the air induction box at the carb flange and the fuel supply pipe to carb. Prime the fuel supply pipe and then reconnect pipe back to the carb. At this stage you can connect your battery terminals to the main wiring harness. Remember RED is + positive & BLACK is - negative.

With the spark plug removed turn engine over using the starter button. Whilst doing this, fully cover the front induction flange of the carb with palm of your hand until fuel is just present in the carb bore induction. Warning! Do not over choke carb as possible flooding of engine will occur. Then refit the induction box back to the carb.

Step 16

Next carefully screw in the DENSO spark plug provided and tighten. Place plug cap already fitted to your coil's HT lead.

Step 17

Place the special TKM battery mounting plastic cover on its locating bolt and just gently tighten. The large diameter washer provided goes below plastic and the smaller diameter washer with its lock nut goes on top. Over tightening of this nut could damage the plastic cover.

Step 18

You are now ready to start your engine! Please note that because engine is new the starter may not engage every time due to tightness of the new un-run engine. This will ease once the engine has been run. You may have to hand choke by covering both induction trumpets until it fires. As soon as it fires remove hand immediately otherwise it will cause possible flooding of the engine.

Please refer to the Running Guide to ensure all other steps are carried out, before starting the engine.