

# FORMULA TKM 4-STROKE

## *Installation Guide*

### **Introduction**

This installation guide is provided for owners who are fitting a TKM 4-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:- Radiator, Carburettor, Noise box, Exhaust, Engine Mount (less clamps), 1 Litre of Oil and the Oil Breather Condenser Pot together with the Petrol Pulse Pump mounted on the seat bracket with pipes.

The standard mounts are available in either 90 x 32 or 92 x 32. They are stamped with 90 or 92 on the bottom face in a recess for identification. Other sizes of mounts are available to special order.

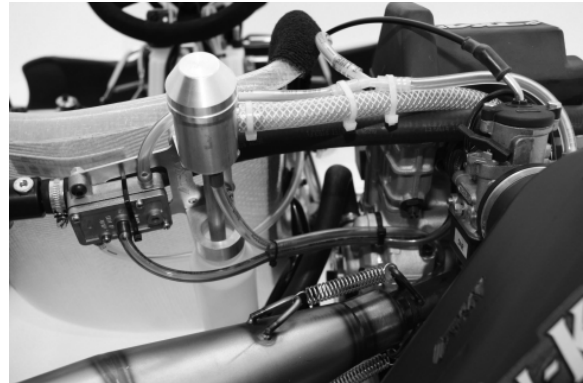
### **Step 2**

Place the engine onto the chassis and ensure that the engine mounts fit correctly. Make sure that the engine is clear of seat brackets and can slide along the chassis rails a small distance to allow for chain adjustment. We can supply you with a set of 2 rising blocks with 4 longer bolts to raise engine by 9mm to give extra clearance on side bar mounting if required. Fit mount clamps and secure lightly with mounting bolts. Ensure that the mounting bolts are the correct length and neither too long so that they bottom or too short so that there is insufficient thread holding.

### **Step 3**

Take the bracket with condenser pot and pulse pump mounted and locate on the rear of the seat. This should be mounted as high as possible on the seat so that the top of the condenser unit is at least 30mm above the seat lip. The pot must also be as close as possible to vertical. It should be fitted to the rear of the seat but to the right hand side of the centre point so that it is close to the engine. Drill the seat and mount using the bolts and spacers provided.

When bolting up note that there is 10 degrees of rotational adjustment available in the M5 slotted holes of the condenser pot mount on the bracket. This makes it easy to gain the best position for the main large breather pipe from the engine.



### **Step 4**

**Connecting the oil breathing pipes.** The small clear oil return pipe should be connected from the engine to the small union at the bottom of the pot ensuring that there is a nice smooth steady fall on the pipe from condenser to engine. Trim if required and cable tie. Without this steady fall oil will collect in pipe and restrict oil returning to engine.

The larger pipe should run straight up from the engine and then naturally over the top of the carb inlet manifold and across to the condenser pot union with a steady rise if possible. Again trim if required. Secure with a cable tie – though note this is the pipe you will have to remove to insert oil into the engine.

### **Step 5**

**Connect the fuel system piping.** But first remember that if you have previously been using the fuel tank with a two-stroke engine you MUST empty the tank and flush with clean unmixed fuel in a safe environment. Also note that this engine requires an extra outlet/inlet on the tank (three in total) so this should be fitted in the top of the tank at this stage. Make sure the tank is clean and flushed after drilling and fitting of extra union. An inline tank filter is highly recommended.

Pipe 1(Fuel Supply) is connected from the tank pick-up connector to the **in** arrow union on the pulse pump.

Pipe 2 (Fuel Supply) goes from the pulse pump **out** arrow union to one end of the Y connector (not fitted with the 70 fuel return jet).

Pipe 3 (Fuel Supply) goes from the long end of the Y connector to the carburettor **in** union.

Pipe 4 (Fuel Return) goes from the remaining short end of the Y connector (with 70 jet) to the new fuel tank union. This is the fuel return pipe.

Pipe 5 (Breather Pipe) goes from the tank to act as a breather – ideally located into a high mounted catch tank. The Y connector should be located as high as possible on the kart just between the engine and the condenser pot bracket. The Y connector arm with return jet inserted should be highest of all. This helps to remove trapped air from the pipes. When all of the pipes are connected and trimmed to length, cable tie neatly in position ensuring no chafes.

Note that the blue pulse pipe from the engine brass pulse union located under the inlet manifold goes to the rearward facing brass pulse union on the pulse pump.

### **Step 6**

Check the alignment of the axle sprocket with the clutch teeth, adjusting as necessary ensuring that you have sufficient axle key located in the sprocket carrier. Remember that you will need less teeth on the rear sprocket than with a two-stroke. Try 12T : 68T as a good starting point. 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.

Once complete, fit chain and adjust (12mm of total up & down movement) ready for use, remembering to fully tighten the clamp bolts. Finally adjust fitment of the fully enclosed plastic chain guard to ensure it does not rub against the exhaust and it is spaced out from axle bearing to suit the chain alignment.

### **Step 7**

Fit the exhaust onto the manifold with securing springs and also locate with springs onto rear cradle. The position of this rear cradle **MUST** be adjusted to ensure a natural fit with no tension on the exhaust manifold. **IMPORTANT** If this is not done then the exhaust manifold pipe may touch plastic float bowl on carb during running which will cause dangerous fuel leaks. Please note a special Exhaust Manifold and Cranked Exhaust is available for **Pro-Karts** with brake discs located in the centre of the axle.

### **Step 8**

Fit noise box to carb inlet with the twin air inlet filters facing approximately downwards. Note you will need a bracket to secure the noise box from its mounting bush to a suitable location such as a securing bolt on the rear axle bearing. Tal-Ko offer a bracket set for its own karts, though every make of kart will require

something different. It is vital to use such a support bracket and the noise box must always be supported firmly in a natural position with no pull on carb as this will cause the carb rubber inlet connector to engine to fracture.

### **Step 9**

The carburettor throttle cable will need fitting to the slide of the carb. Simply remove the carb top (2 Bolts) remove slide assembly and push cable through cable swan neck, large spring and outer small hole in needle retaining plate. Place end of cable into the slide cable slot and reassemble carb top. 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 or pull on the rubber inlet connecting manifold.

### **Step 10**

Next connect the ignition on/off switch. This can be fitted anywhere suitable, though we provide with the engine a bracket that allows you to fit switch on the M8 bolt holding the upper plastic steering column bush to chassis just above the tank. It may well require a new longer length bolt when this bracket is fitted to allow the bolt to fully enter the Nyloc part of its securing nut.

Connect a red wire from the switch to the spare red short lead coming off the coil unit. Secure neatly. Another lead must be earthed from the switch to either the chassis or engine. If on the engine we recommend to the earth lead. If this earth is not good then the switch will not operate. Ensure both wires are neatly secured with cable ties or PVC tape. Remember to mark the On/Off positions.

### **Step 11**

A radiator catch tank must be used. It can be fitted in between bottom of radiator and engine near clutch guard using a cable tie on bottom radiator bracket.

### **Step 12**

You will need to drill/cut holes in both the outside and inside faces of the sidepod to allow access for the starter shaft.

**Refer to the Running Guide to ensure all other steps are carried out, such as filling with oil and water before starting the engine.**

**Please note** that if you wish to install a temperature gauge then the sensor **MUST** be located in the special location hole provided at the top of the engine. This will have an M10 x 1 taper plug in place which should be removed and the sensor fitted with PTFE tape to prevent leakage.