



NFRP Modified Tiger King 28.5 Engine



Introduction

Tiger King manufactures the S27 Evo engine upon which the NFRP 28.5cc engine is based. The capacity is increased by the use of a Tiger King 29.6mm stroke crankshaft assembly, resulting in an engine of greater power. Many other modifications have been done to increase power and durability.

Oil

We use and recommend Castrol TTS oil mixed 13 parts fuel (by volume) to 1 part oil. (77ml of oil to 1 litre of fuel) The high RPM's of modern racing engines creates high loads on the crankshaft conrod bearing, low oil content fuel is not recommended.

Water Cooling

The water cooling line (typically from the water pickup in the rudder) should be connected to the engine at the fitting near the exhaust port. The outlet is the fitting on the top of the cooling jacket. Large bore water lines should be used for high rates of water flow.

If water cooling on the tuned pipe exhaust system is used, preferably this should be cooled separately by another water pickup and water lines (from a dual pickup rudder for example). If not practical then the engine should be cooled first and the outlet connected to the exhaust cooling system.

The Tiger King cylinder (barrel) casting has pockets within the cooling system (under the cooling jacket) which can retain water after running. The cooling system should always be flushed out after a day's running, but the engine will need to be tipped upside down to get water out of these pockets.



16mm Barrel Carb (WYK Style)

The WYK style carb used has been bored out to 16mm for improved flow at full throttle. Fuel should be connected to the straight brass nipple on the carburettor. The 90 degree bent fitting is an overflow from the priming system, but when the engine is running a small amount of fuel does come out of this fitting. We recommend running a length of line from this fitting to the bottom of the boat so it can drain out.

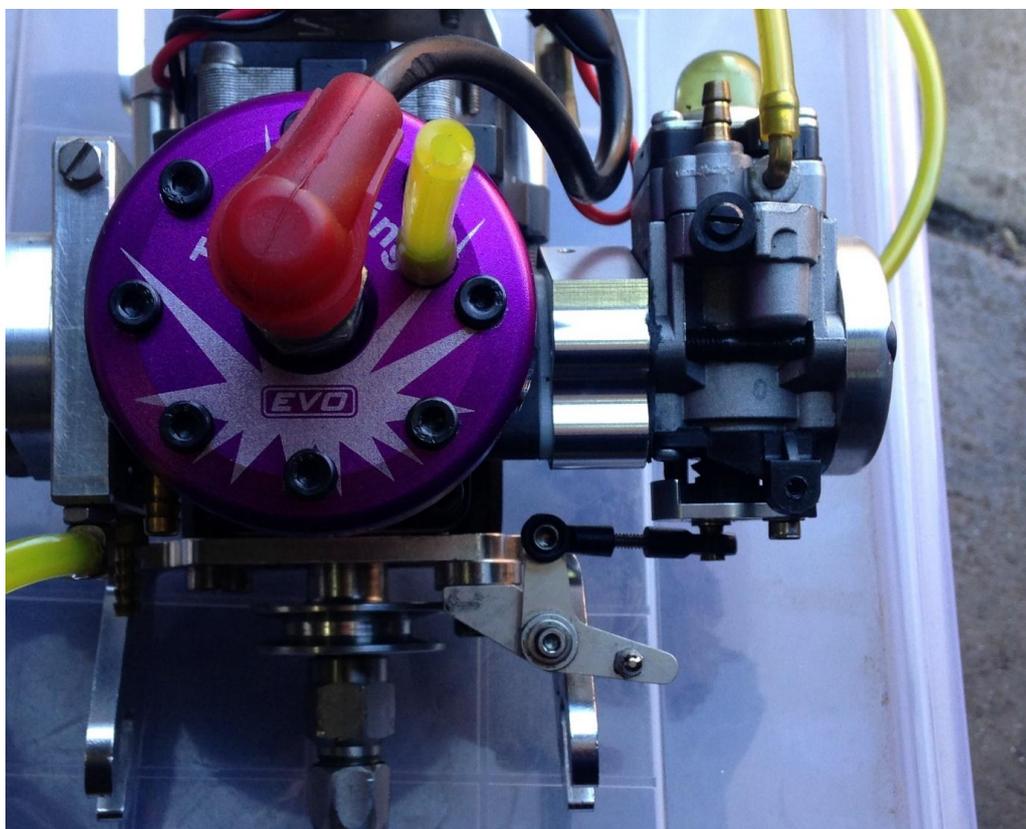
The high speed (main) needle for adjusting the fuel mixture is the one adjacent to the fuel nipples. The low speed (idle) needle is a very small screw driver adjustment in the linkage end of the carb. The needles have been set to 1-3/4 turns out on the high and 4 turns out on the low as a starting point.

The high speed needle should be adjusted by 'reading the plug' once the engine has been run in.

Because the carb has been bored out to 16mm, when the barrel is in the closed position it does not fully close off, it opens at the other side. The adjustment of the low speed needle is crucial to having a good idle and acceleration from idle, as well as being able to shut off the engine from the radio. If the idle mixture is too rich the engine will accelerate poorly from idle on the water, and may even stall when the throttle is opened. If the idle mixture is too lean the engine will not stop when the carb is closed, so it is safer to be rich on the low end than lean, and if leaning the low end mixture then only go small amounts at a time.

The idle position of the barrel is around 1/3 open as a starting point.

If the supplied bell crank and mount is used to connect to the carb, the mount may need to be spaced out from the engine to allow proper range of movement of the linkage.





Exhaust System (Tuned Pipe)

We use and recommend Quick Draw Hotpipes with external stingers. 2-3/8" spacer for higher torque with large props, 2" spacer for higher RPM with smaller props.

Exhaust manifolds designed for Zenoah style engines are rectangular at the engine end, the profile of the exhaust port on the Tiger King cylinder is larger and a different shape. For best performance the manifold shape should be matched to the Tiger King port.

If another type of exhaust system is used (ie not a Hotpipe) we would recommend using a 1" header system.

The included exhaust manifold gasket can be used. For better heat transfer to the cooling system we do not use the gasket.

Bearings

The inner bearing have been replaced with high speed bearing with C3 clearances and polyamide cages. If these need to be replaced at some stage we recommend fitting the same type of bearings.

Base Gasket

All engines have some variation due to production tolerances. To achieve the desired port timings, some of the NFRP 28.5's are assembled without a base gasket between the cases and the barrel. Loctite Aviation Gasket Sealant No. 3 is used instead.

Engines with base gaskets use a certain number of special thin gaskets, the number determined during the buildup. Replacements can be supplied, but these are not the standard gasket used in the S27 Evo engines.

Replacement Parts

Because of the variation between engines and batches, each 28.5 is measured and adjusted to achieve the timings and clearances desired. The head shim used is specially made for each engine. If the sleeve or piston needs to be replaced the engine should be returned to us to ensure the timings and clearances are correct.

Happy Boating!

15-3-15.