

“TIGER SHARK”

GENERAL INFO ON TIGER SHARK ENGINES

TIGER SHARK engines come in two basic configurations, RINGED and NONRINGED. Both of these use state of the art ABC {aluminum, brass, and chrome} construction. Both engines have Schnuerle porting to boost performance while delivering exceptional fuel economy. The balanced crankshaft is supported at both ends by ball bearings for smooth friction free performance. Carburetors have high and low speed mixture adjustments and are designed to operate on muffler pressure.

Power output, expected life span, handling and fuel consumption are basically the same. The decision to use one version over the other is only a matter of personal preference.

FUEL TANK SIZE

The tank chart listed here will deliver approximately 8-12 minutes of run time in the average airplane.

40 – 52	8 oz.
61 – 75	12oz.
91 – 120	16oz.

PROPELLER SIZE

Some experimentation will be necessary to determine the best propeller for your application. Even propellers with the same size manufactured by different companies will have different performance characteristics. Use the chart as a starting point for flight and to break in the engine. TS recommends the use of wood propellers for engines with displacements of .61 and larger. If a spinner is used be sure the openings for the blades do not make contact with the blade itself as this

can lead to propeller failure. The propeller and spinner should be properly balanced.

ENGINE	START	RANGE
TS40	10-6	9-8 – 11-5
TS46	10-7	10-6 – 12-4
TS52	11-6	10-8 – 12-5
TS61	11-7	10-8 – 12-6
TS75	13-6	11-7 – 14-4
TS91	14-6	13-8 – 16-5
TS108	16-6	15-8 – 18-5
TS120	16-8	15-10 – 18-6

Engine and carburetor instructions

Caution!

Model engines are not toys; even small displacement engines produce enough power to cause severe injury. Very high temperatures are produced during running; never touch any part unless sufficient time for cooling has passed. The rotating mass of the propeller combined with the power output can easily slice skin and muscle. If you have no experience with model engines we strongly recommend you seek help from an experienced modeler.

Never allow spectators to stand in front of, or in line with the propeller. A separated propeller blade has tremendous velocity and can penetrate like a knife.

Always use a good quality test stand or the model itself to test run the engine. Never test run an engine by clamping it in a vice, the pressure from the vise will distort the engine case and possibly cause damage and the vibration will pull is loose.

Use only the correct size propeller. Be sure it is properly balanced and installed. Discard any

propeller with visible defects or damage. Never alter a propeller in any way.

Always tune from behind the propeller. Never reach over or remain in the propeller path.

To start the engine use a “chicken stick” or electric starter, never use your fingers.

Shut down the motor by cutting the fuel or air supply; never throw anything into a rotating propeller.

Exhaust contains high levels of carbon monoxide, run only outside or in very well ventilated areas.

Never run an engine over loose sand or gravel, the propeller will turn such objects into projectiles or draw them through the carburetor causing damage.

Model fuel is very flammable, Store it carefully in a cool location and keep it away from sparks, heat, flame or any other possible source of ignition.

BEFORE STARTING

All TS engines are pre-lubed and spun at the factory. If however the engine has sat a long time it is recommended to replenish the lubricant. Any good quality after- run oil will do, simply place two drops in the glow plug hole, two drops in the carburetor opening and flip the prop through several times with the glow plug out to circulate the oil through the engine.

Because of tight tolerances it is normal for all engines of this type to have a “tight spot” as the piston reaches the top of its stroke, this will lessen as the engine breaks-in.

Be sure the engine is mounted securely, the propeller is correctly installed, and the fuel lines are connected correctly. The propeller should be

installed in such a way as to allow compression to start to build when the blade gets to the 2:00 position, this allows for a quick flip over the top of compression when using a “chicken-stick”.

Be sure the glow plug is the correct type and heat range {medium heat range works well for break-in as well as most aircraft applications}. If the engine is enclosed in a cowl, leave the cowl off during break-in to ease adjustments and give access to the fuel line for the idle mixture adjustment that will be covered later.

Incorrect break-in of the engine may cause internal damage, reduced power and shorten life span. Please follow the instructions!

SUPPORT EQUIPMENT

The following items will be needed to run the engine:

Fuel, any good quality fuel may be used. TS recommend the nitro-methane content be 10% or less during the break-in and at least 18% oil with a synthetic/castor blend. This fuel will also work well for normal use, however if more power is required up to 15% nitro-methane may be used. Never use less than 15% oil.

Glow plug, use a medium heat range long reach plug for the engine.

Glow plug driver, this consists of a glow plug connector and battery. They come, as 1-piece units as well as in separate components, if using a component system be sure to keep the wires clear of the propeller.

Starter, using an electric starter is recommended for both safety and convenience, a chicken stick may be used if preferred.

Fuel transfer, some means of getting the fuel from the bottle to the fuel tank will be necessary, bottles, pumps and squeeze ball are all available.

BREAK-IN PROCEDURE

STEP 1

With the engine mounted, fuel tank filled, and the glow plug removed, Screw the high-speed needle valve in till it bottoms {Do not tighten}. Open the valve 1 $\frac{3}{4}$ turns. Open the throttle, place a finger over the carburetor opening and flip the prop through several times by hand. You will see fuel pass through the line to the carburetor. Close the throttle and install the glow plug {do not hook up the glow driver} and flip the prop a few more times.

Look in the carburetor, open the throttle until about a 1/16-inch gap is visible between the barrel hole and the carburetor body.

STEP 2

Attach the glow plug driver. Spin the engine or flip the prop until it starts. Once the engine is running open the throttle slowly to its maximum. Now open the needle valve until the engine begins to “babble” this is also known as “4 stroking”. Now close the needle slowly until the “babble” just clears, run till the tank is empty in this very rich condition. DO NOT LEAN THE ENGINE FOR MAXIMUM RPM. Allow the engine to cool.

STEP 3

Reset the needle valve at 1-3/4 turns. Reset the carburetor to the start position. Fill the fuel tank. Attach the glow driver and restart the engine. Open the throttle to maximum, Slowly turn in the needle valve until maximum rpm is reached. Let the engine run at maximum for 10 – 15 seconds then open the valve till it once again “babbles”. Wait 10 – 15 seconds and repeat the process alternating between lean and rich until the fuel is

exhausted. Do not lean the mixture past peak RPM.

STEP 4

Reset the needle valve and carburetor to the start position. Refill the fuel tank, attach the glow driver and start the engine. Adjust the needle valve to maximum rpm, and then richen it by 3-4 “clicks”. Remove the glow plug driver.

Slowly run the engine through its RPM range from full to about $\frac{1}{4}$ throttle then back to full, using the throttle not the needle valve. Continue this for about 2 minutes.

STEP 5

The low speed needle is set from the factory and will only require fine-tuning. If the original setting is lost, Close the throttle all the way, Gently screw the low speed needle in until it bottoms {DO NOT TIGHTEN} then open the needle 1 $\frac{1}{2}$ turns.

Reinstall the glow plug driver and lower the RPM with the throttle as far as it will go and continue to run. Pinch the fuel line near the carburetor shutting off the fuel supply, listen carefully to the engine. Just before the engine starts to die a small increase in RPM {50–100} should be noticed. If the engine dies with no increase turn the IDLE MIXTURE CONTROL NEEDLE counter-clockwise 10-15 degrees and try again. If more than 100 RPM turn the needle clockwise the same amount. Repeat this process until the desired increase is found. Remove the glow driver and repeat the process.

Break-in is now complete and the engine is ready for flight.

STEP 6

It is very important that the engine is not run lean. As the airplane moves forward, the propellers load changes allowing for more RPM. To compensate for this increase the high speed needle must be set on the rich side of maximum RPM. Start the engine using the same procedure as the break-in. Allow 20-30 seconds for the engine to reach operating temperature. Slowly turn in the needle till maximum RPM is reached, then open the needle at least 4 “clicks”. Pick up the airplane and at full throttle; hold it in a nose high attitude of about 60- degrees to insure sufficient fuel flow during climb. Tests fly the airplane; make fine adjustments to the needle one “click” at a time. Through trial and error you will be able to establish a setting where maximum RPM can be reached during flight. If at any time you suspect the engine is to lean, throttle back, land and adjust the needle. **DO NOT CONTINUE TO FLY IN A LEAN CONDITION**, The engine will overheat and be damaged.

STEP 7

Some end of the day maintenance will protect your engine allowing many seasons of trouble free performance.

Drain all fuel from the tank after each day of flying.

Place two drops of after-run oil in the carburetor and flip the propeller several times to distribute it through the engine.

Wipe the oil residue from the airframe and engine.

A small piece of paper towel may be stuck in the exhaust outlet and the carburetor inlet; this will prevent dirt and dust from entering during storage.

ENJOY YOUR “TIGER SHARK” ENGINE.