

# RCGF USA 50T

## A SUPER-SMOOTH-RUNNING 50CC TWIN-CYLINDER BOXER

TEXT & PHOTOS BY GERRY YARRISH

Developed and CNC-milled in China, the ever-growing line of RCGF engines is distributed and serviced in the United States by RCGF USA in Sierra Vista, Arizona. Owner/operator Joe Nelson has years of experience working with RC gas engines, and he runs a well-stocked, factory-authorized service center. RCGF USA has all the parts needed for maintenance and repairs and provides fast turnaround for modelers in the continental United States. RCGF USA deals with brand-new engines made with original spec-quality standards.

Several years ago, I reviewed the RCGF 40T, a 40cc twin-cylinder boxer powerplant with exceptional manufacturing quality that was extremely smooth running. When I heard that RCGF had a new 50cc boxer, I just knew it would be an instant winner.

### UNIQUE FEATURES

As I just mentioned, twin-cylinder horizontally opposed gas engines run extremely smoothly because their twin pistons counterbalance each other's travel within the cylinders. The 50cc 50T comes with everything needed for a complete firewall-forward installation. The engine comes with a dual-lead electronic-ignition module that is designed to operate with 6 to 8.4 volts, so you can use a 5-cell Ni-Cd or NiMH pack, an A123 LiFe 6.6V pack, or a 2S 7.4V LiPo pack for power. Also included with the 50T are twin mufflers with exhaust gaskets and mounting hardware, two NGK CM6 spark plugs, four aluminum standoff mounts with attachment hardware, safety clips for the battery/ignition connectors, a four-bolt propeller



The new 50T is a twin-cylinder 50cc gas engine with excellent performance.

hub and prop washer, and an instruction booklet. There are also some extended throttle arms you can use to make the throttle-linkage tasks a bit easier.

### INTERNALS

If you're like me, you appreciate the precisely machined parts of any engine. And when I disassembled the 50T, I was not disappointed. The engine case is beautifully CNC-machined, and it has an excellent surface finish. Although the aluminum looks highly polished, its surfaces are 100 percent machined. The engine case is split in two, with cross bolts holding the halves together. Four flush countersunk bolts securely hold the aft mounting plate in place. Each of the cast-aluminum cylinder housings is held in place with four bolts in the corners of the cylinder skirt. The cylinder housing has an attractive bead-blasted finish, and the castings look very clean.

The cylinder head has a rounded and stepped combustion chamber, but departing from the older 40T design, the new 50T has threaded spark-plug

### SPECIFICATIONS

**Model:** 50T  
**Manufacturer:** RCGF  
**Distributor:** RCGF USA (rcgfusa.com)  
**Type:** Two-stroke twin-cylinder gas engine  
**Displacement:** 50cc  
**Bore:** 1.34 in.  
**Stroke:** 1.10 in.  
**Carburetor:** RCGF (pumper)  
**Ignition:** RCGF dual-lead electronic (w/ auto-advance)  
**Power supply:** 6 to 8.4V  
**Max output:** 4.7hp  
**Speed range:** 1,500-8,600rpm  
**Recommended prop:** 20x10  
**Spark plug:** NGK CM6 (two included)  
**Total weight:** 3.14 lb.  
**Price:** \$419.99

openings set at a downward angle. This does a great job in reducing the engine's overall horizontal width, and the 50T is actually narrower (8.77 in.) than the 40T, so it will fit in narrower engine cowls. The inner walls of the sleeves are nicely honed and have three bypass channels cast into the cylinder housing.



The double-throw crankshaft is all business. It is rugged and has hefty counter weighting.

The engine case is a two-piece design, and it is manufactured using precision CNC machining. The fit and finish is outstanding.

The 50T pistons feature a dual-compression ring design, and the wristpins are supported by caged needle bearings.



The 50T comes equipped with a Walbro carburetor.

The three-piece double-throw crankshaft is sturdy and has healthy sized counterweight webs. The connecting rods are forged, and are supported with caged needle bearings enclosed in the bottom end of each con rod. The ends also have lubrication slits machined into them to provide the needle bearings with plenty of oil for lubrication. Two smaller (rear and front) bearings and a larger middle bearing provide solid support for the crankshaft. All the bearings are of the sealed-NGK type. The forged pistons are also supported with sturdy needle bearings, and the wristpins are secured within the pistons with wire E-clips. Each piston is equipped with two steel compression rings, which fit precisely in the ring slots and are held in position with guide pins.

### INTAKE SETUP

Making the 50T even more compact, the carburetor is positioned at the bottom of the engine case and between the two exhaust ports. The intake assembly is a quad-reed design with a molded plastic housing that supports and isolates the

carburetor from engine heat. Separated from direct contact with the engine case, the carburetor comes equipped with a pressure fitting and a length of fuel line to connect it to the intake housing's pressure fitting. This provides pulse pressure to drive the carburetor's internal diaphragm pump.

Similar in design to a Walbro unit, the RCGF USA carburetor is equipped with a choke and a spring-loaded main throttle valve. The high-end and low-end needle valves and an idle-adjustment screw are all standard issue. The carburetor is mounted at a slight angle, making the throttle linkage a straight run back to the servo.

RCGF USA has a prop-hub drilling guide to drill the four boltholes in the propeller. To make the engine testing a bit easier, I installed a Tru-Turn Bullet spinner so that I could safely use my Sullivan Dynatron starter to fire up the engine. After about four tanks of fuel, I found that the 50T was easy to start by hand flipping the propeller.



The twin mufflers are included with the engine. Notice the offset outlet layout.



The hardware and spark plugs included with the 50T are excellent quality.



The 50T comes with all the hardware needed to install the engine.



The dual-lead electronic ignition module included with the 50T runs on 4.8 to 8.4V power.



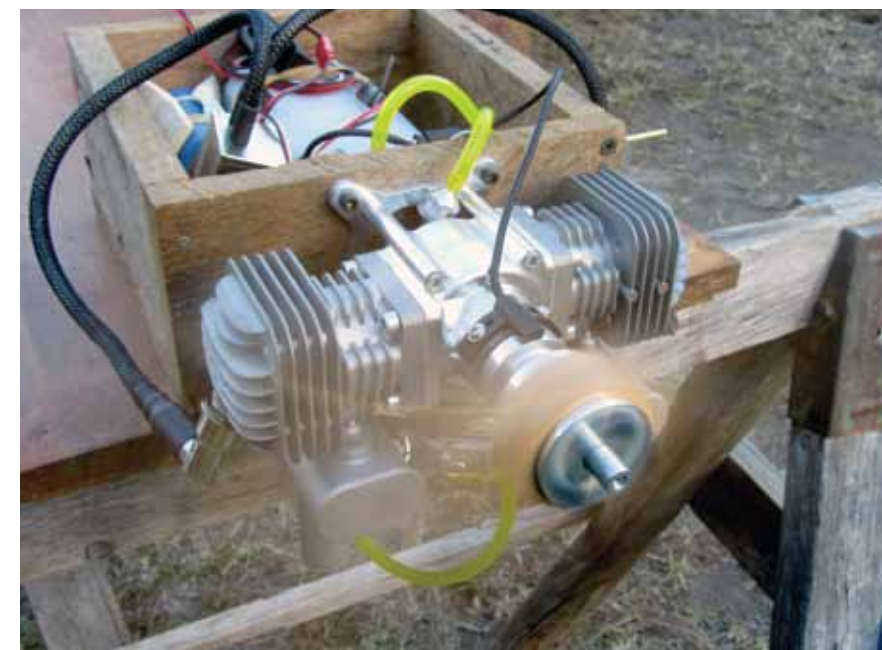
To properly drill the propeller-attachment boltholes, RCGF USA includes a drilling jig that makes the task quick and accurate.

**ENGINE OPERATION**

For the review, I bench-ran the engine and used RCGF- and Evolution-brand propellers. All my test props were balanced using my Du-Bro balancer. I also used a standard decibel (db) meter to test for sound levels taken from the front of the engine. For fuel, I used a 30:1 ratio using regular gasoline and Honda HP2 synthetic two-stroke engine oil.

Starting up the 50T is easy and

uncomplicated. Fully open the throttle and close the choke. Hand-flip the propeller over several times until you see gas flowing through the fuel line and entering the carburetor fuel fitting. Switch on the ignition (I powered it using an A123 6.6V receiver battery pack and switch harness), and continue flipping the prop until you hear the engine rumble, letting you know the cylinders are properly



For the test run, I used a makeshift test stand with all the required accessories secured in a sturdy box.



As you can see, the spark plugs are installed at a downward angle making the engine narrower.

**PROPELLER NUMBERS**

**RCGF USA**

Size	Max rpm	Idle rpm	Max db
20x8	7,250	1,500	82
20x10	6,550	1,450	80

**Master Airscrew (composite)**

Size	Max rpm	Idle rpm	Max db
18x10	7,820	1,500	79.5
20x10	7,550	1,440	78.5

**APC**

Size	Max rpm	Idle rpm	Max db
18x10	7,500	1,550	78.2
20x10	7,400	1,530	79.1

**Evolution**

Size	Max rpm	Idle rpm	Max db
19x8	7,350	1,490	81.3
20x10	6,500	1,550	79.1

primed. Open the choke and bring the throttle to just under quarter power, and flip the prop a few more times.

My test engine fired off after only a few more flips of the prop, and it quickly settled into a smooth idle. For added safety, I installed a servo and a spare receiver in my engine test box, and I controlled the throttle using my transmitter. I allowed the engine to warm up for a couple of minutes before I advanced the throttle. Right from the beginning, the 50T had an excellent transition from idle to full power. Joe Nelson test-runs each engine before it ships out, so I did not tweak the needle valves. Joe takes great pride in supplying engines that don't need any fiddling by the modeler.

**BOTTOM LINE**

This easy-to-start 50cc gas burner is a smooth-running powerplant ideally suited to any sport or scale airplane. Distributed by RCGF USA, the 50T is backed with excellent customer service and is assembled using only approved original spec factory parts. Priced at \$419.99, the 50T is a great value. ✚