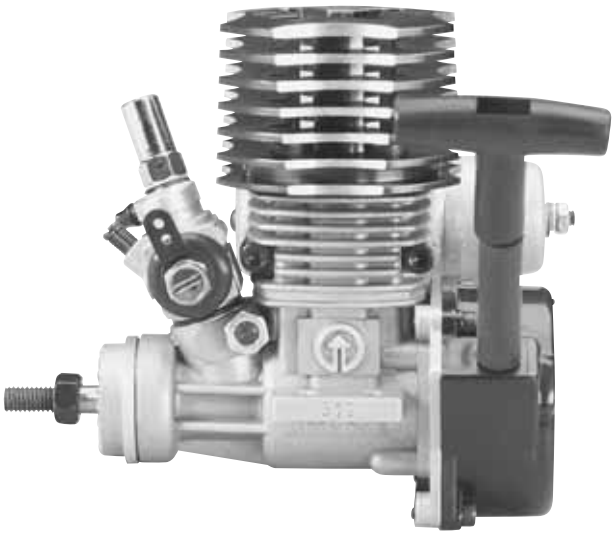
TOWER HOBBIES



.15 Ball Bearing Engine with Recoil Starter

WARRANTY

- Tower Hobbies® will warranty this engine for 2 years after the purchase date from defects in materials or workmanship. Tower Hobbies will either repair or replace, at no charge, the incorrectly made part.
- Make sure you save the invoice you were given when you bought your model! It is your proof of purchase and we must see it before we can honor the warranty.
- To return your Tower Hobbies .15 BB engine for repairs covered under warranty you should send your engine to:

Hobby Services
3002 N. Apollo Drive Suite 1
Champaign, Illinois 61822
Attn: Service Department
Phone: (217) 398-0007 9:00 am-5:00 pm Central Time M-F
E-mail: hobbyservices@hobbico.com
www.hobbyservices.com

REPAIR SERVICE IS AVAILABLE ANYTIME.

After the 2 year warranty, you can send your Tower Hobbies engine in for repair for a small charge by expert technicians at our authorized repair facility, Hobby Services, at the address listed above.

To help speed up the repair process, please follow these instructions: Send written instructions which list all of the items returned, a thorough explanation of the problem, the service needed, and your phone number during the day. Also be sure to include your full return address.

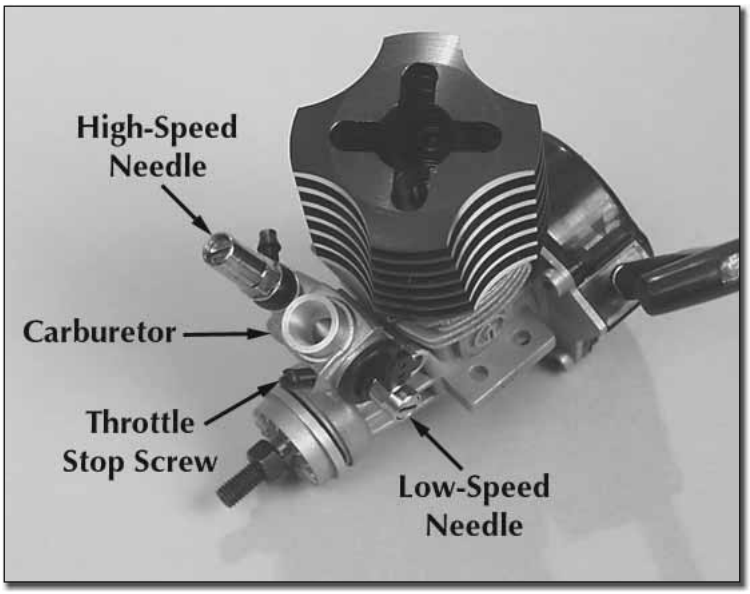
RECOMMENDED ITEMS FOR YOUR TOWER HOBBIES .15 BALL BEARING ENGINE

TOWER POWER™
20% Car Fuel (Quart)
TOWP1620

DURATRAX®
Silver Sport Plug
DTXG3001

If your car kit does not come with an air filter, we recommend that you purchase the **TOWC6030** Air Filter Set.

CARBURETOR SETTINGS

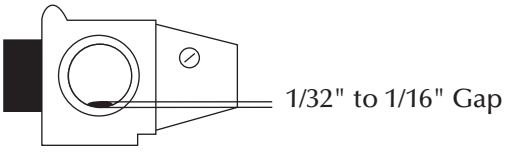


THE HIGH-SPEED NEEDLE

The "high-speed" needle is located on the side of the carburetor. It is located in the brass housing, just above the fuel inlet. It controls the fuel to air mixture of the carb. The needle is pre-set for break-in from the factory at 2-3/4 turns out from the fully closed position of the carb. Once the engine is broken-in, the high-speed needle would typically run from 2 to 2-1/2 turns out from closed, depending on the weather, humidity and altitude above sea level. To richen turn the needle counterclockwise, to lean turn the needle clockwise.

THE LOW-SPEED NEEDLE

The "low-speed" needle is the screw in the middle of the throttle arm. It controls the fuel to air mixture at low throttle settings. There is a simple way of adjusting the low-speed needle correctly called the "pinch test." With the engine at idle, pinch the fuel line and listen to how the engine speeds up or slows down. If the engine increases its speed for about 2 or 3 seconds and then loses speed, the needle is set correctly. If the engine loses RPM quickly, it is set too lean and the low-speed needle needs to be opened (**counterclockwise**) to richen the mixture. Pinch again to check the mixture. If the engine takes longer than 4 seconds to slow down, lean (**clockwise**) the low-speed needle and then pinch again to check the mixture.



THE THROTTLE STOP SCREW

On the front of the carburetor, there is a black screw. This is called the idle stop screw. This increases or decreases the idle RPM without changing the fuel to air mixture. The barrel should be approximately 1.5mm (between 1/32" and 1/16") from fully closed.

BREAKING IN THE ENGINE

To insure long life and good performance from your Tower engine, you **MUST** break in the engine. The break-in period is critical for long life of the internal parts of the engine. This should be done over the first 5 or 6 tanks of fuel.

SOME THINGS TO REMEMBER DURING BREAK-IN

1. Run with the body off. This will keep the engine cooler.
2. Keep the air cleaner on at ALL times
3. Run on a smooth, hard surface. An empty parking lot is perfect.
4. Use the same fuel that you will use for normal running.
5. Resist the urge to accelerate and decelerate the vehicle quickly.
6. Break-in puts stress on the glow plug and you can burn it out during break-in. Make sure you have an extra plug or two on hand.
7. Do NOT overheat the engine. You can check the head temperature by using one of the temperature gauges that are available or by putting a drop of water on the top of the cylinder head. If the water boils away immediately, shut off the engine and allow it to cool. If it takes more than 5 seconds to boil away, the engine is at proper running temperature for break-in.

RUNNING THE ENGINE

THERE ARE SEVERAL SIMPLE STEPS TO STARTING THE ENGINE:

1. Install a glow plug into the top of the cylinder head.
2. Fill the tank almost to the top. Leave a little air at the top of the tank.
3. Prime the engine using the primer button on the fuel tank to force the fuel through the fuel line. Watch the fuel go through the line and when it gets to the carburetor, press the primer button once more to get fuel into the engine.
4. Open the high speed needle valve exactly 2-3/4 turns out (**counterclockwise**) from fully closed. **The high-speed needle is sticking up from the carburetor inside the brass housing.** All of the carburetor settings are adjusted with a flat bladed screwdriver. If you have previously run the truck, keep the same needle valve setting that you used on your last run.
5. Start the engine by pulling the recoil - Use short, quick pulls. **DO NOT** pull the recoil starter's string to the end. You only need 10 to 12 inches of pull to start the engine.
6. Your truck is equipped with a throttle return spring. It is installed between the cylinder head and the throttle arm on the carburetor. This will return the throttle to idle if there is a loss in power for the on-board radio equipment.

Sometimes it is helpful to start the engine at around half throttle. Have a friend pull back on the throttle some while you start the engine. This may be an indicator that the low speed needle setting needs to be adjusted. When the engine starts, immediately return the throttle to idle. If this is not done the engine can over-rev and cause engine damage. **If the engine is difficult to turn over with the recoil starter, especially if it is brand new, loosen the glow plug a half turn before starting the engine. This allows some compression to escape, but the engine will still start.** ***Make sure you tighten the glow plug after***

the engine starts. If the recoil starter is still difficult to pull, the engine is flooded – there is too much fuel inside the engine. Remove the glow plug and air cleaner, then turn the engine upside down and pull the recoil 5 or 6 times. This will clear the engine of fuel, and you will notice the recoil pulls easier. Replace the glow plug and repeat the starting procedure.

HOW TO STOP YOUR ENGINE

To stop the engine, pinch the fuel line that runs to the carburetor and from the bottom of the fuel tank. Pinching this will restrict the fuel flow and the engine will quit within a few seconds.

THE FIRST TANK

Your first tank of fuel should be running the truck at a very rich high-speed needle valve setting. This allows the fuel to carry as much oil as possible into the engine to lubricate the internal parts during the break-in.

1. Open the needle valve 2-3/4 turns from fully closed (counterclockwise). This is factory set already, but check it to make sure. When closing the high-speed needle, close the needle until you feel some resistance. **DO NOT** overtighten or you will damage the engine.
2. Start the engine.
3. Once the engine is started, open the high-speed needle valve around 1/8 turn at a time, finding the setting where the engine just barely runs. This may take a few times adjusting the needle, running the truck away from you and back, then adjusting the needle. The truck will perform sluggishly and stall from time to time - that is normal.
4. Run the truck back and forth at medium speeds, slowly accelerating and decelerating the truck.
5. After a minute or two of running, make sure the engine is not overheating by putting a drop of water on the cylinder head and watching it boil away. If it boils away immediately, stop the engine and allow it to cool. Open the high-speed needle around a 1/4 turn before starting again. This is a good habit to get into every time you run to ensure that the engine does not overheat during any run. Looking at the smoke that comes out the exhaust is also an indicator of how rich or lean the engine is running. If there is a good amount of smoke coming out of the exhaust, then chances are good that you are running rich.
6. Run the truck back and forth at a medium speed until the tank is almost out of fuel. Do not allow the tank to run out of fuel. This leans out the engine and can cause overheating (See How To Stop Your Engine).
7. Stop the engine and allow the engine to cool before the second tank. This normally takes around 10 minutes.

TANKS 2-6

Turn in the needle valve (clockwise) around 1/12 turn from the previous setting. Run the truck back and forth. You should notice that the truck will perform better during each run. Stop the truck periodically to check for overheating. If it is too hot, stop the engine. Wait for it to cool, then open up the needle valve and restart. After the 5th tank, you should be near to the peak performance of the engine.

ENGINE MAINTENANCE

9 WAYS TO ENSURE A LONG LIFE FROM YOUR ENGINE:

1. Keep your engine clean. Dirt will act as insulation on an engine. It will not be able to shed heat as easily. Use a good air filter to keep dirt out of your engine and clean it often.
2. Do not over-lean your engine.
3. Do not run your engine with little or no load. Don't throttle up the engine to full throttle when the wheels are not in contact with the ground.
4. Do not overheat the engine. This goes along with keeping it clean and not over-leaning the engine.
5. Avoid using old fuels in the engine. Always run all of the fuel out of the engine. After running for the day, use an after-run oil and work it into the engine by turning the flywheel or pulling the engine recoil slowly.
6. Do not use a fuel with a nitromethane (often called nitro) content over 20%.
7. Do not scratch the piston or cylinder sleeve. Avoid jamming something into the exhaust port when removing or re-installing the clutch or flywheel. Use a special tool called a crankshaft locking tool, which is installed in the glow plug hole.
8. Do not use silicone sealer on the engine joints. Silicone sealer contains acetic acid, which is corrosive if it gets inside your engine.
9. Do not allow any water inside the engine. This sounds easy, but temperature changes can cause condensation inside the engine. This is a good reason to use an after-run oil. Store your engine inside the house, not in a garage or shed where there will be temperature extremes.

FUEL

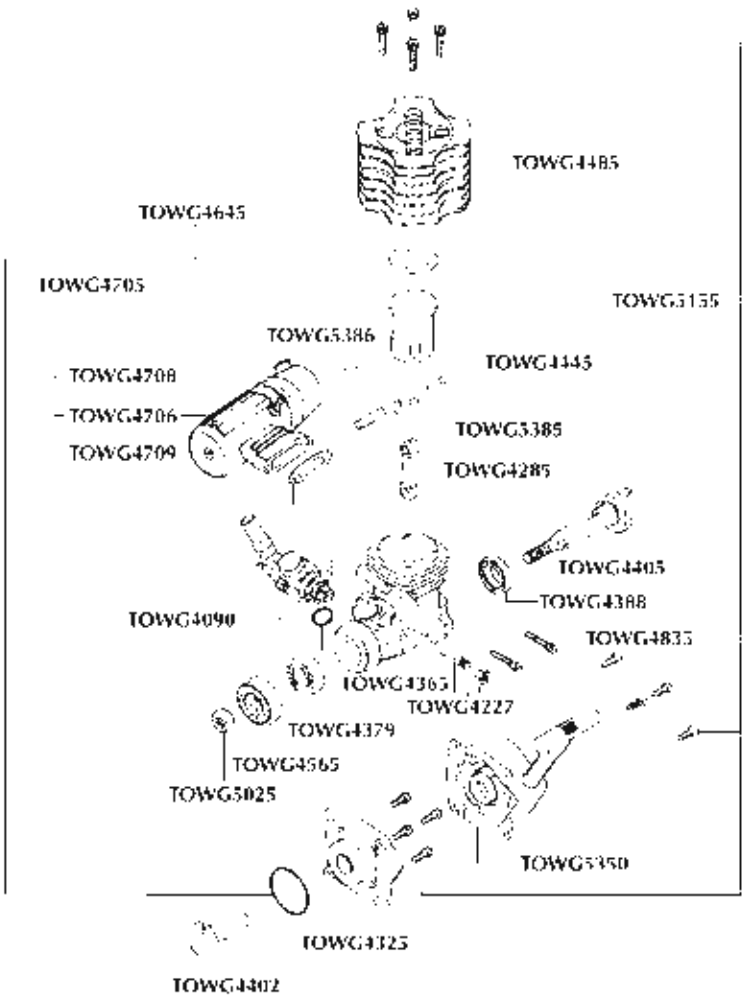
Keep your fuel jug capped at all times and store out of the sunlight, in a cool place. Bad fuel is one of the most difficult problems to diagnose in engines. If you have tried everything you can think of to remedy a poorly running engine, try using some fresh fuel.

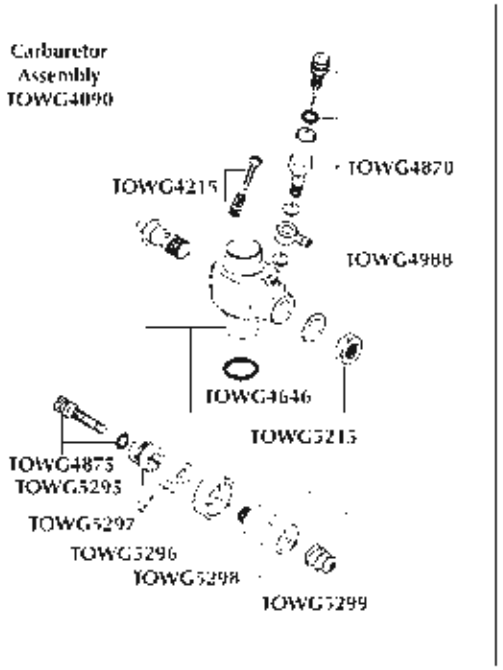
Fuel line is susceptible to pinhole leaks. If you see air bubbles in the line going to the carburetor or the engine is surging, replace the fuel line.

To keep dirt out of the engine, we recommend that you use an inline fuel filter and an air filter. If you suspect that some dirt has lodged itself in the carb, remove the needles and clean the carb with denatured alcohol or fuel. It helps to use compressed air to blow out the fuel passages as well. Ensure that your air cleaner has a good seal to the top of the carb. Periodically wash or replace the air cleaner foam element and re-oil the filter.

OVERHEATING

One of the worst things you can do to your engine is overheat it. The oils that lubricate the engine are carried in the fuel. If your engine is set too lean, there will not be enough oil in the engine to lubricate the internal parts. This will cause premature wear in the engine and cause damage. We have talked about overheating in other parts of this manual, but we want to stress the proper techniques to check for overheating. The easiest way of checking the temperature of the cylinder head is using one of the available temperature gauges. This will give you a direct reading of the cylinder head temperature. Do not let the head temperature exceed 220° Fahrenheit (104° Celsius).





Stock #	Description
TOWG4227	Carburetor Retainer with Nut
TOWG4285	Connecting Rod
TOWG4325	Cover Plate / Adapter
TOWG4365	Crankcase
TOWG4379	Front Bearing
TOWG4388	Rear Bearing
TOWG4402	Starting Shaft
TOWG4405	Crankshaft
TOWG4445	Cylinder Liner & Piston
TOWG4485	Cylinder Head
TOWG4565	Drive Washer
TOWG4645	Gasket Set
TOWG4705	Muffler Assembly
TOWG4706	Muffler (Front)
TOWG4708	Muffler (Rear)
TOWG4709	Muffler Assembly Screw with Nut
TOWG4835	Muffler Mount Screws

Stock #	Description
TOWG5025	Nut
TOWG5155	Screw Set
TOWG5350	Recoil Starter Assembly
TOWG5385	Piston Pin
TOWG5386	Piston Pin Retainer
TOWG4090	Carburetor Assembly
TOWG4215	Throttle Stop Screw with Spring
TOWG4646	Rubber O-Ring
TOWG4870	Needle Valve Assembly with Nipple
TOWG4875	Idle Needle
TOWG4988	Fuel Nipple with Gasket
TOWG5215	Carburetor Body with Spray Bar & Nut
TOWG5295	Throttle Arm Fixing Nut
TOWG5296	Dust Cover
TOWG5297	Throttle Arm
TOWG5298	Carburetor Rotor
TOWG5299	Carburetor Spring