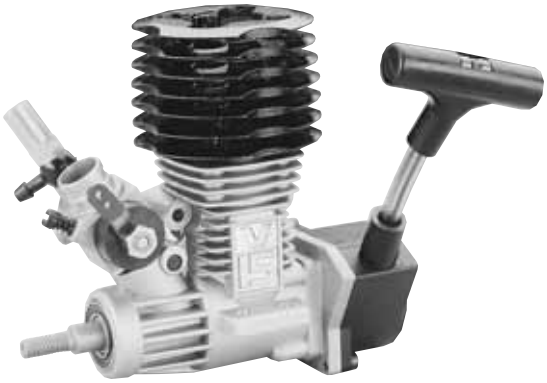
DURATRAX®



VELOCITY 15

ENGINE INSTRUCTIONS

Warranty

- DuraTrax® will warranty this engine for 90 days after the purchase date from defects in materials or workmanship. DuraTrax will either repair or replace, at no charge, the incorrectly made part.
- Make sure you **save the receipt or invoice** you were given when you bought your engine! It is your proof of purchase and we must see it before we can honor the warranty.
- To return your Velocity 15 for repairs covered under warranty you should send your engine to:

Hobby Services
1610 Interstate Drive
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*

Repair service is available anytime.

- After the 90 day warranty, you can still have your Velocity 15 repaired for a small charge by the experts at DuraTrax's authorized repair facility, Hobby Services, listed above.

To speed up the repair process, please follow these instructions:
Send written instructions which include: a list of all items returned, a **THOROUGH** explanation of the problem, the service needed and your phone number during the day. If you expect the repair to be covered under warranty, be sure to include a proof of date of purchase (your store receipt or purchase invoice). Also be sure to include your full return address.

INTRODUCTION

You are the proud owner of a DuraTrax engine – designed to provide easy starts and all the power you'll need for thrilling R/C action.

The following instructions contain information you'll need to break-in, operate and maintain your new engine like a pro. Read and follow them carefully, and your engine will provide a long life of strong, dependable performance.

FOR YOUR SAFETY

• Model engine fuel is poisonous and must be kept in a clearly marked container, stored away from the reach of children. Avoid getting fuel into your eyes or mouth.

• Because model engine fuel is highly flammable, it should also be kept away from anything that might cause it to ignite (including open flames, excessive heat, or any objects and materials which could produce a spark). Smoking must not be permitted near the fuel.

• R/C model engine exhaust, like that of automobile engines, contains deadly carbon monoxide. Do not run the engine in enclosed spaces – operate it only in open, well-ventilated areas.

• Your engine will become very hot as it runs. Touching any part – particularly the muffler (silencer), cylinder head or exhaust header pipe – could result in a serious burn. Avoid contact with the engine until it has cooled.

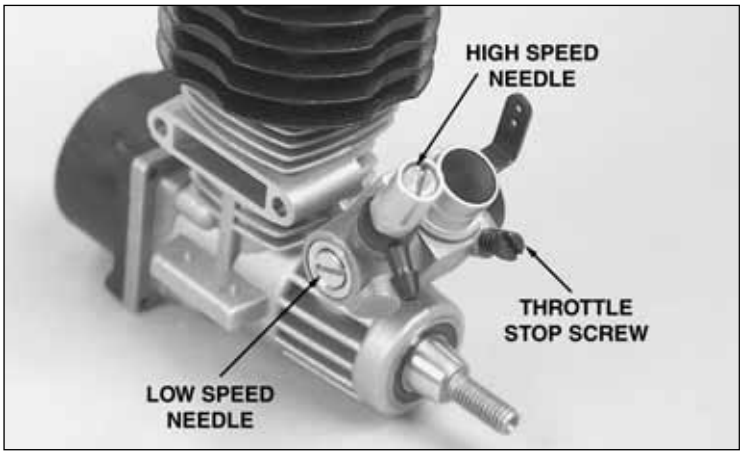
• Protect onlookers – especially small children – by making sure that they remain at least 20 feet (60 meters) away while you start the engine.

ADDITIONAL PRECAUTIONS

• This engine was designed only to power R/C model vehicles and should not be used for any other purpose.

• Never pull the starter cord out more than 10 inches (25cm). To rewind the cord, continue holding the handle and let the recoil action pull it smoothly back into the starter unit. Do not abruptly release the handle.

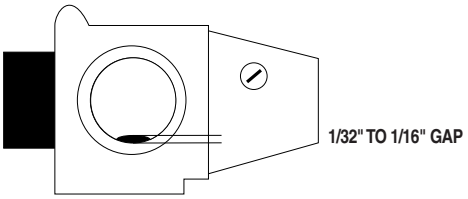
CARBURETOR SETTINGS



The High-Speed Needle
The "high-speed" needle is sticking up from the side of the carb. 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 2-1/2 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 carb body, opposite the throttle arm (see picture on previous page). 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 RPM, 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 (see picture on previous page). This is called the throttle stop screw. This increases or decreases the idle RPM without changing the fuel-to air-mixture. You should see an openning of approximately 1.5mm (between 1/32" and 1/16") between the carb body and the carb barrel when the throttle is pushed closed.

RUNNING THE ENGINE

Before running, please, read this manual thoroughly to familiarize yourself with this engine.

There are several simple steps to starting the engine:
1. Install a glow plug if one is not in your engine. This threads 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 by turning the flywheel on the engine. Watch the fuel go through the line and when it gets to the carburetor, turn the flywheel one more full revolution.
4. Open the high speed needle valve exactly 2-1/2 turns out **(counterclockwise)** from fully closed. Be careful not to overtighten the high speed needle. When you feel some resistance, stop turning the needle. **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 vehicle, 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 inches of pull to start the engine.

If the engine does not start after several pulls, 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.

Fuels
Use fuels that are specially formulated for car and truck engines. DuraTrax Red Alert fuel is specially formulated for R/C engines like the Velocity .15.

How To Stop Your Engine
You may have been wondering how to stop the engine. All you have to do is 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. You can also touch the flywheel with the tip of your shoe through the hole in the bottom of the chassis.

BREAKING-IN THE ENGINE

To insure long life and good performance from your Velocity .15 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.

The First Tank
Your first tank of fuel should be running the engine 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 2-1/2 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 vehicle away from you and back, then adjusting the needle. The engine will perform sluggishly and stall from time to time - that is normal.
4. Run the vehicle back and forth at medium speeds, slowly accelerating and decelerating the vehicle, 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.
5. Stop the engine and allow the engine to cool before the second tank. This normally takes around 10 minutes (See **How To Stop Your Engine**).

Tanks 2-6
Turn in the needle valve (clockwise) around 1/12 turn from the previous setting. Run the vehicle back and forth. You should notice that the engine will perform better during each run. Stop the vehicle periodically to check for overheating. If it is too hot, stop the engine. Wait for it to cool, then open up the needle valve 1/4 turn and restart. After the 6th tank, you should be near to the peak performance of the engine.

ENGINE MAINTENANCE

Ten 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. Do not use a fuel with a low oil content. Make sure you use a fuel from a reputable manufacturer, such as DuraTrax Red Alert.
6. 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.
7. Do not use a fuel with a nitromethane (often called nitro) content over 20%.
8. 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 (not included), which is installed in the glow plug hole.
9. Do not use silicone sealer on the engine joints. Silicone sealer contains acetic acid, which is corrosive if it gets inside your engine.
10. 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.

If you are having problems with your engine consult the engine troubleshooting on the back page. The following are some potential problems.

Glow Plug

The glow plug is an item that will wear out and need replacement from time to time. It is a good idea to remove the glow plug before your first run, heat it and see how well it glows. You should see a bright orange glow from the filament. If a coil or two will not glow or the plug will not glow at all, replace the plug. If the engine quits when you remove the glow starter, the plug might need to be changed, although this may be because you are running too rich and need to screw in your high-speed needle some. Look at the glow plug when you are running the engine. If you see some bubbles coming from around the plug, replace the glow plug (copper) gasket, or both the plug and gasket. The only real way to test a glow plug is to replace it. Make sure you have a spare plug or two on hand when you run the engine.

Fuel

Fuel can go bad. The main ingredient in model fuel is methanol, which is basically an alcohol. Alcohols can absorb water out of the air, so keep your fuel jug capped at all times. Store your fuel out of the sunlight and 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 an engine that is not running correctly, try using some fresh fuel.

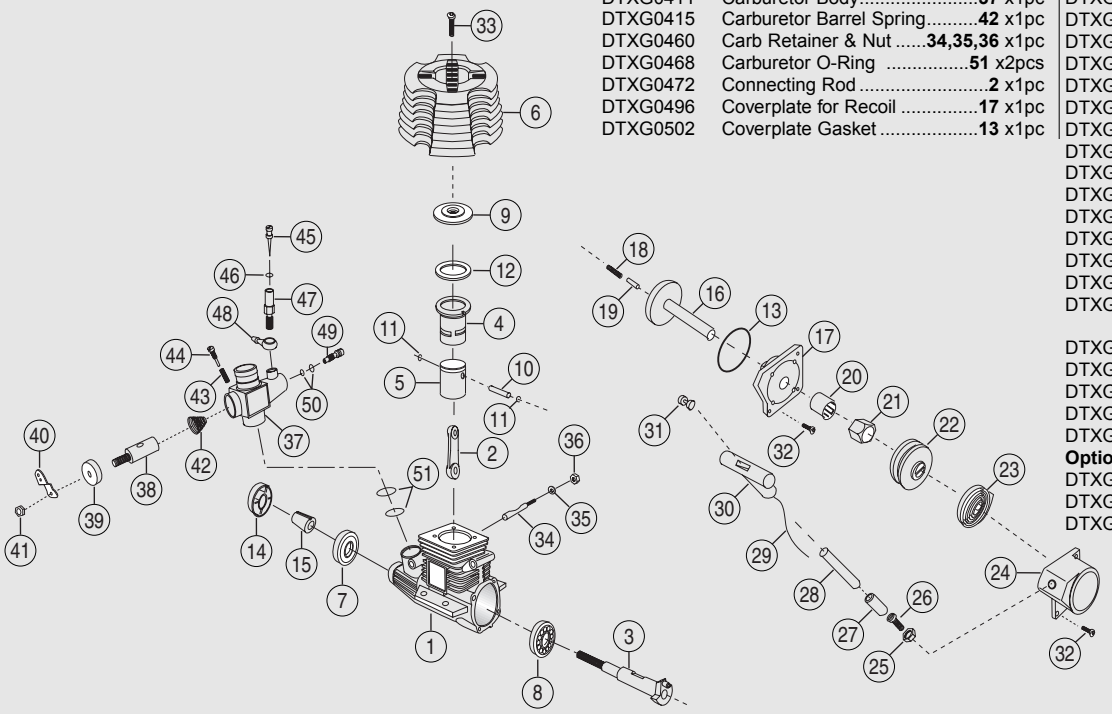
Fuel line is susceptible to pinhole leaks. You cannot see the hole in the fuel line, but if you see air bubbles in the line going to the carburetor, replace the fuel line. Another symptom of a leak in the fuel line is a surging engine. The properly tuned engine will surge when the air bubbles hit the carb. It is basically leaning out the mixture.

To keep dirt out of the engine, use an inline fuel filter on the fuel line running from the fuel tank to the carburetor. Dirt can get caught in the needle seat and cause an inconsistent running engine. 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 can help to use compressed air to blow out the fuel passages as well. Dirt can get into your carburetor and engine through the air filter. Ensure that your air cleaner has a good seal to the top of the carb. Periodically wash the air cleaner foam element and re-oil the filter. Any air cleaner that has a torn element or a bad seal should be replaced immediately.

Overheating

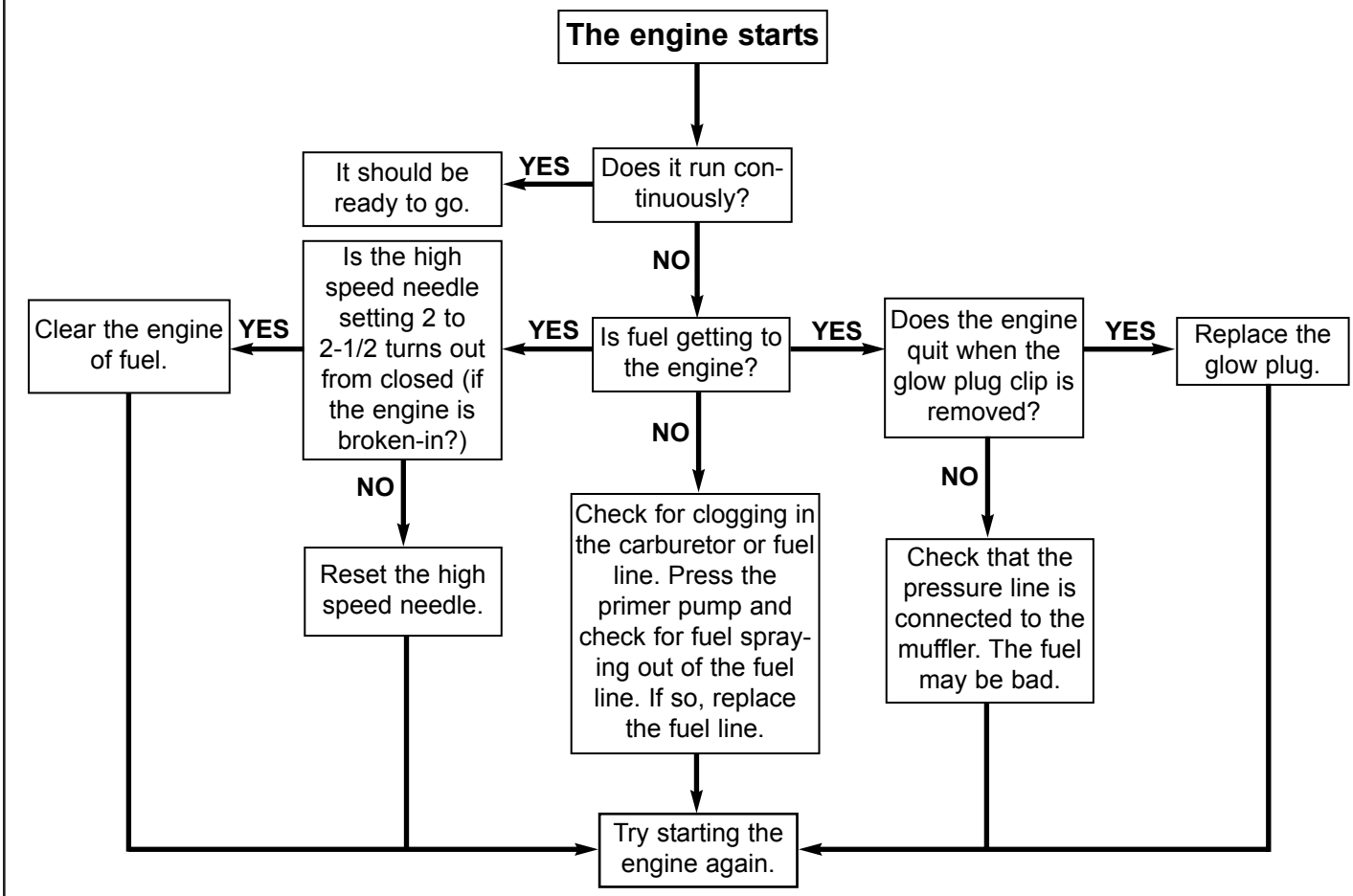
One of the worst things you can do to your engine is overheat it. The oils that lubricate the engine are carried in the fuel. If your engine is set too lean, there will not be enough oil in the engine to lubricate the internal parts. This will cause premature wear in the engine and cause damage.

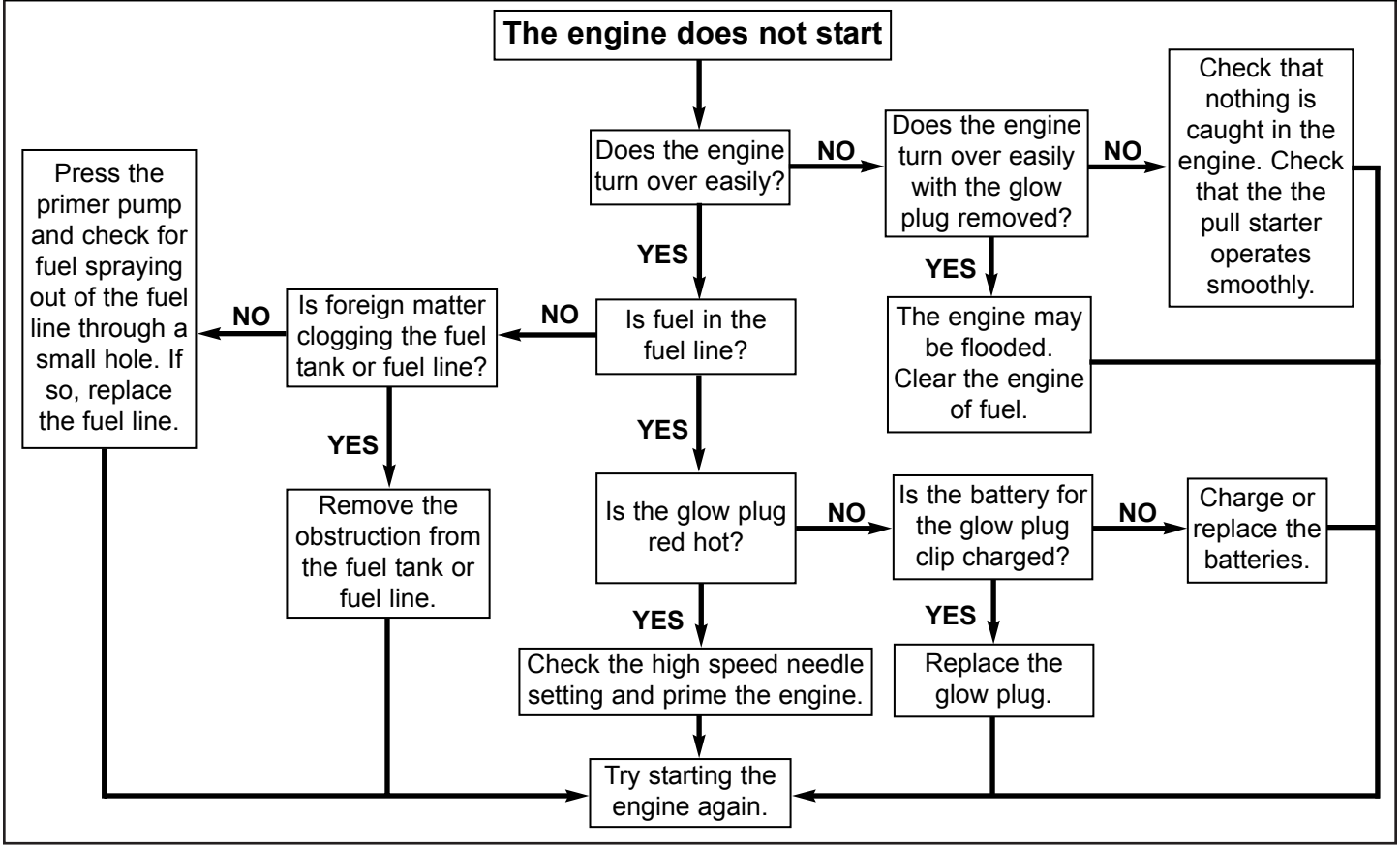
Exploded View and Parts List



Stock #	Description	Includes
DTXG0352	Bearing Front	**7** x1pc
DTXG0362	Bearing Rear	**8** x1pc
DTXG0380	Carburetor Barrel	**38** x1pc
DTXG0401	Carburetor Boot / Dust Cover	**39** x1pc
DTXG0411	Carburetor Body	**37** x1pc
DTXG0415	Carburetor Barrel Spring	**42** x1pc
DTXG0460	Carb Retainer & Nut	**34,35,36** x1pc
DTXG0468	Carburetor O-Ring	**51** x2pcs
DTXG0472	Connecting Rod	**2** x1pc
DTXG0496	Coverplate for Recoil	**17** x1pc
DTXG0502	Coverplate Gasket	**13** x1pc
DTXG0511	Coverplate Screws	**32** x4pcs
DTXG0522	Crankcase	**1** x1pc
DTXG0535	Crankshaft	**3** x1pc
DTXG0553	Cylinder Piston Set	**4,5** x1pc
DTXG0557	Fuel Inlet Nozzle	**48** x1pc
DTXG0562	Drive Washer	**14** x1pc
DTXG0566	Drive Washer Collet	**15** x1pc
DTXG0572	Head Button	**9** x1pc
DTXG0586	Heatsink Head Black	**6** x1pc
DTXG0592	Heatsink Head Gasket	**12** x1pc
DTXG0602	Head Screws	**33** x4pcs
DTXG0604	Idle Needle	**49** x1pc
DTXG0607	Idle Needle O-Ring	**50** x2pcs
DTXG0617	Needle Socket	**47** x1pc
DTXG0622	Needle Valve	**45** x1pc
DTXG0630	Needle O-Ring	**46** x1pc
DTXG0635	One-Way Bearing	**20,21** x1pc
DTXG0642	Piston Pin	**10** x1pc
DTXG0655	Piston Pin Retainers	**11** x2pcs
DTXG0752	Recoil Starter	**22,23,24,25,26,27,28 29,30,31** x1pc, **32** x3pcs
DTXG0762	Start Shaft	**16** x1pc
DTXG0776	Start Shaft Pin	**19** x1pc
DTXG0782	Start Shaft Spring	**18** x1pc
DTXG0802	Throttle Arm	**40,41** x1pc
DTXG0811	Throttle Stop Screw	**43,44** x1pc
Optional:		
DTXG0442	Carburetor Slide Valve	Not Shown
DTXG0497	Coverplate Standard	Not Shown
DTXG0587	Heatsink Head Purple	Not Shown

ENGINE TROUBLE SHOOTING





Printed in USA
DTXZ2603 for DTXG0260