



## HOW-TO BOOKLET #3094 MOWER TUNE-UPS



### TOOL & MATERIAL CHECKLIST

- Screwdriver
- Spark Plug
- Fresh Fuel
- Wrench Set
- New Fuel Cap
- Pliers
- Ignition Wire

***Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.***

Dirt is the Number 1 problem with both 2- and 4-cycle lawn mower engines. This is because the engine works almost at ground level where spinning blades generate a whirlwind of dust that chokes engine air filters, fuel filters and lines, spark plugs, controls and other parts.

This How-To Booklet deals with lawn mowers that won't start. Even after following the directions here, you may not be able to get the mower going. This is because some symptoms are so obscure in engines that it takes a professional with professional equipment to spot the problem. But, in general, malfunctioning engines show symptoms that are easy to identify. Check the problem in an orderly fashion, as detailed below, and you usually will be able to find the solution and save a trip to the repair shop some hot, muggy Saturday morning.

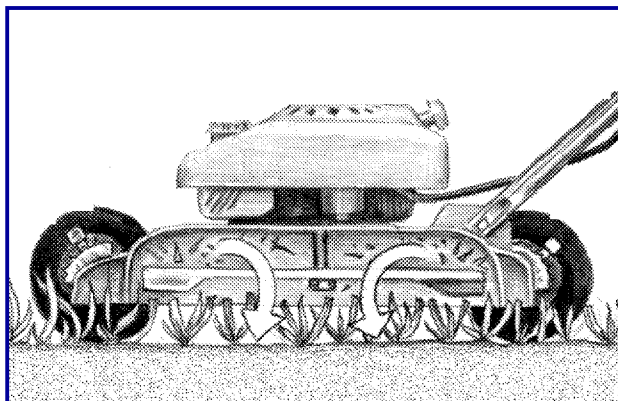
### PROBLEM: ENGINE WON'T START

The procedures:

- 🏠 Are the engine controls properly set on “start”?
- 🏠 Does the engine have fresh fuel in the fuel tank?
- 🏠 Is the tank more than half full of fuel?
- 🏠 Is the spark plug wire attached tightly to the plug?

Going down this checklist:

- 1 Trace the sheathed control cable from the handle of the equipment to the throttle on the engine. The throttle should be fully opened with the control handle setting on “start”. As you move the control lever from “start” to “fast” to “stop”, the cable should be clamped so that it operates the throttle. The cable can be slipping in the clamp just enough to cause the throttle to malfunction. Move the throttle control to its open, or “start” position with you fingers. Or, push the throttle



forward, toward the front of the engine. You may have to move the control lever with your other hand to ease the throttle open. If the throttle cable is slipping in the clamp, tighten the clamp screw with a screwdriver after you push the cable forward toward the engine until the throttle stops. The throttle is now in a fully open position. Set the handle control lever on “fast” or “start” and tighten the clamp.

If the engine now starts, let it run several minutes. Then pull the control lever to “stop”. If the engine slows but does not stop, loosen the cable clamp and pull the cable just a tad toward the control lever until the engine stops. Then tighten the clamp. Go through this sequence until the mower stops and starts on command of the control lever.

- 2** No gas or dirty gas, mower manufacturers and professional lawn mower repair persons report, are two big troublemakers for engines that won't start.

Dump out the gas in the tank in a safe spot and refill the tank—even though you think the fuel is perfectly good. If you are just starting the mowing season, start with new gasoline; last year's gas can be weak.

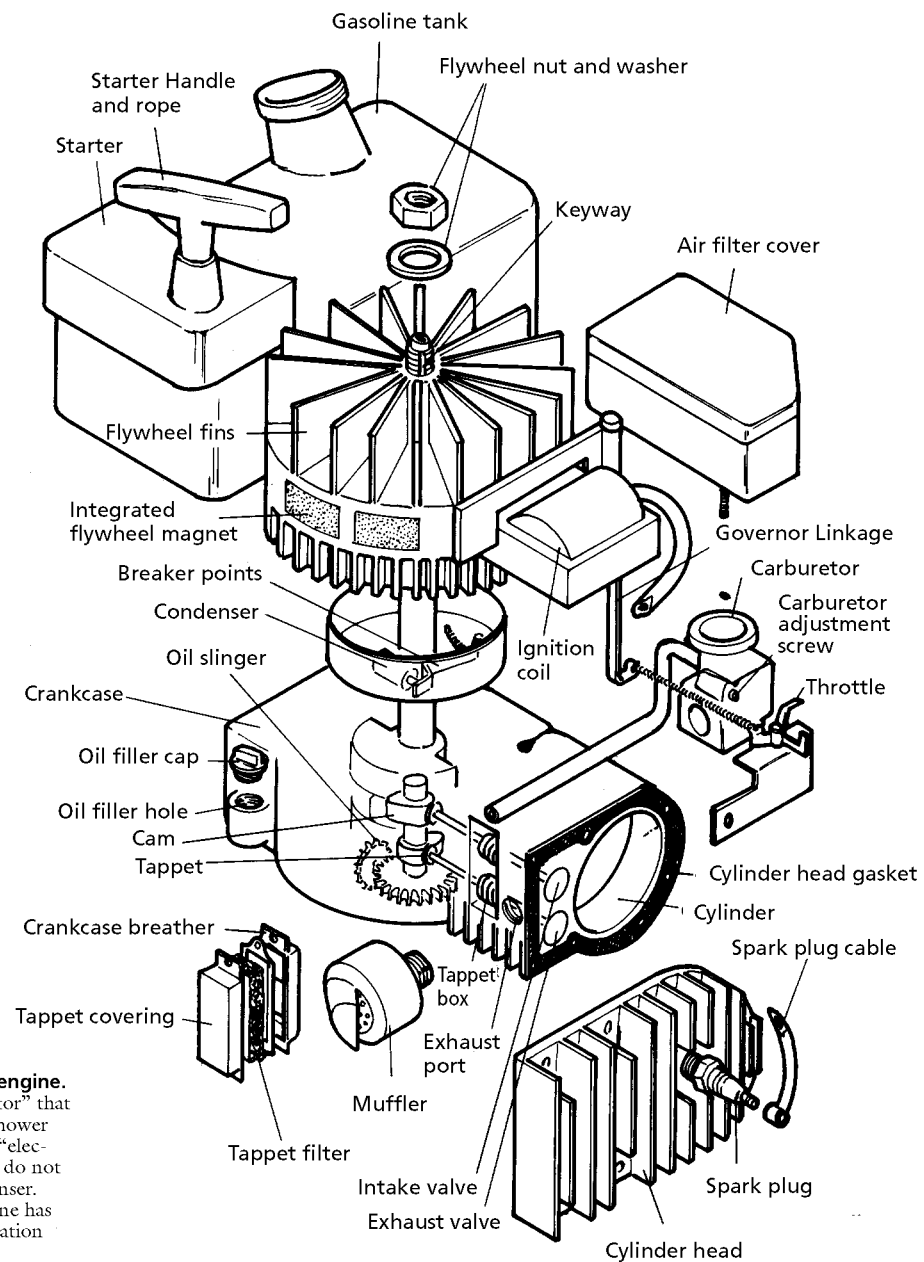
- 3** Fill the tank with fresh fuel. Low fuel in a tank sometimes can prevent starts. This sounds strange, but it is true.

- 4** Spark plug wires, through engine vibration, can become loose. The engine doesn't get any spark so the fuel can't be ignited.

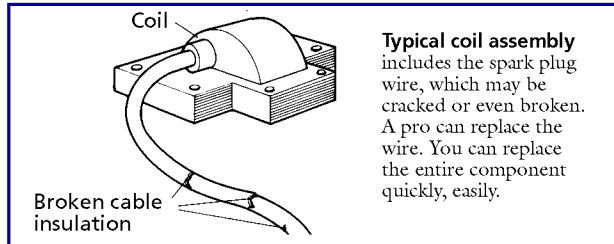
Pull the wire off the plug. You'll notice a thin metal “socket” which goes over the plug terminal. With pliers, carefully crimp the metal socket. Now replace the socket on the plug terminal.

## AND IT STILL WON'T GO?

If you've gone through the checklist above and the engine still won't start, here are several other tricks



**Anatomy of a 4-cycle engine.**  
At right is a “part’s locator” that you can use when lawnmower troubles arise. The new “electronic ignition” mowers do not have points and a condenser. But, otherwise, the engine has about the same configuration and components.



**Typical coil assembly** includes the spark plug wire, which may be cracked or even broken. A pro can replace the wire. You can replace the entire component quickly, easily.

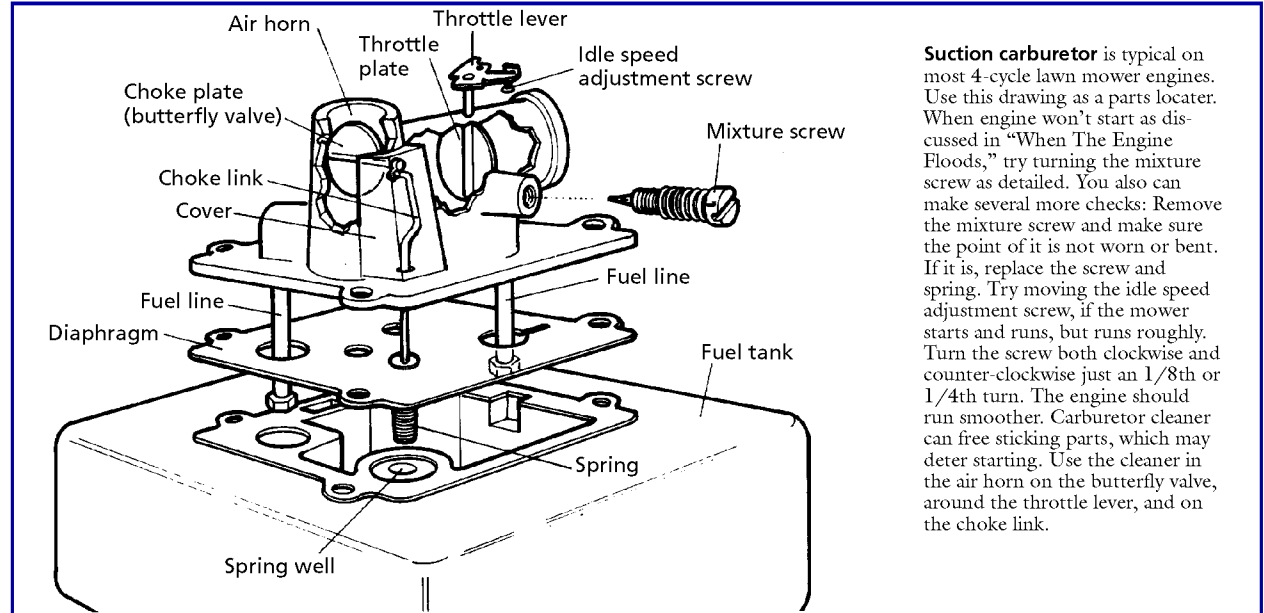
you can try before heading for the repair shop:

- Remove the cap on the fuel tank. Check the little pinhole in the cap to make sure that it is open. If not, use a paperclip or piece of wire to open this port. Try starting the engine. Still won't start? Leave the cap off the tank and try cranking the engine. If the engine starts, the cap is faulty—probably too tight so air is blocked from entering the tank. This sometimes happens on brand new engines. Replace the cap. Do not run the engine without the cap on the fuel tank or substitute the cap with a plug such as a corn-cob or piece of cloth wadded into the opening.
- Is the spark plug grounding device off? Some engines have a little metal flap that is pressed down over the end of the spark plug to stop the engine. Is the device off the plug?
- Did you forget to prime the engine or not prime it enough? Some engines have a soft rubber primer that you push several times to inject fuel in the carburetor. The primer must be pushed firmly four or five times when the engine is cold to fill the carburetor. However, if the engine is hot, do not press the primer, which may flood the carburetor.

Instead, pull the starter cord several times with the control lever in the “stop” position. This will help clear excess fuel from the fuel system. Then put the control lever on “start” and crank the engine normally.

### MORE ROUTINE CHECKS TO MAKE

The checks below are more detailed than the ones previously. We suggest that you put the lawn mower on a



**Suction carburetor** is typical on most 4-cycle lawn mower engines. Use this drawing as a parts locator. When engine won't start as discussed in “When The Engine Floods,” try turning the mixture screw as detailed. You also can make several more checks: Remove the mixture screw and make sure the point of it is not worn or bent. If it is, replace the screw and spring. Try moving the idle speed adjustment screw, if the mower starts and runs, but runs roughly. Turn the screw both clockwise and counter-clockwise just an 1/8th or 1/4th turn. The engine should run smoother. Carburetor cleaner can free sticking parts, which may deter starting. Use the cleaner in the air horn on the butterfly valve, around the throttle lever, and on the choke link.

work table and look more closely for no-start troubles.

- Is the engine getting electricity? You need a helper to determine this.
- **1** First, remove the spark plug wire from the plug terminal. Now have the helper pull the starter cord while you hold the metal plug wire socket about 1/4-inch from the plug terminal. You should see a tiny spark between the plug terminal and the plug wire socket. If you don't:
- **2** Remove the spark plug and check the base. If the base is dirty with carbon soot, throw the plug in the trash and replace it with a new plug. We recommend that you start each new mowing season with a new spark plug. And, this plug should be replaced about half-way through the mowing season, even though it seems to be functioning properly. Since the plugs are not expensive, replacement is a sure way to know that any malfunction probably is not the fault of the spark plug.
- **3** Very carefully look at the spark plug wire from

the metal socket end to its terminal at the coil. Bend wire in your fingers and look for broken and cracked insulation. These cracks are sometimes difficult to see, so look closely as you twist the wire back-and-forth.

If the wire is broken, it must be replaced. You can do it two ways: have a professional replace the wire, or replace the coil in which the wire is secured. Coils are not expensive; in fact, you may pay less for a new coil than to have a repair shop replace the wire. Check it.

- Is the cutting blade loose? Tip the mower over, after you empty the fuel tank. Also, remove the spark plug wire on the plug terminal, and turn the mower so the hole where you add oil to the engine faces upward.
- **1** Try to wobble the blade. If the blade is loose, tighten the blade bolts with a wrench. If the blade is loose, but the bolts can't be tightened, have a pro make the necessary repair. Some lawn mowers can't be started if the cutting blade is wobbly or there is no cutting blade attached to

the mower engine. Do not, under any circumstances, operate the mower until the blade is properly tightened and secure on its mounting.

- 2 Is the air filter clean? Remove the cap holding the air filter on top of the carburetor with a screwdriver. Then remove the filter. If the filter is paper, replace it. If the filter is foam—like a kitchen sponge—wash the filter in dishwasher detergent and water. When it is clean, rinse out all detergent and dry the filter. Then add a few drops of household oil on the filter's surface and replace it in its housing and on top of the carburetor.

### WHEN THE ENGINE FLOODS

Flooding is a very common problem, and, of course, you can practically pull your arm off trying to crank the engine into action. Next time, try this:

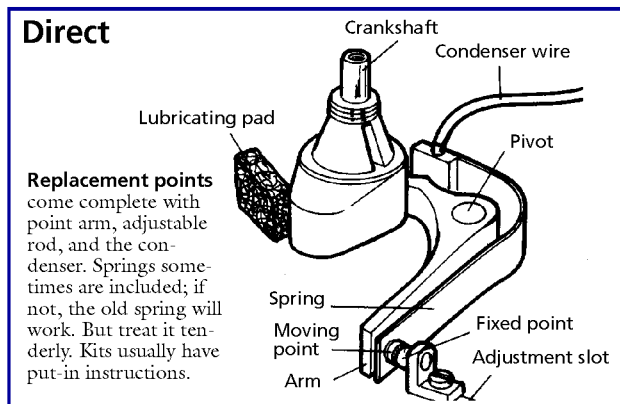
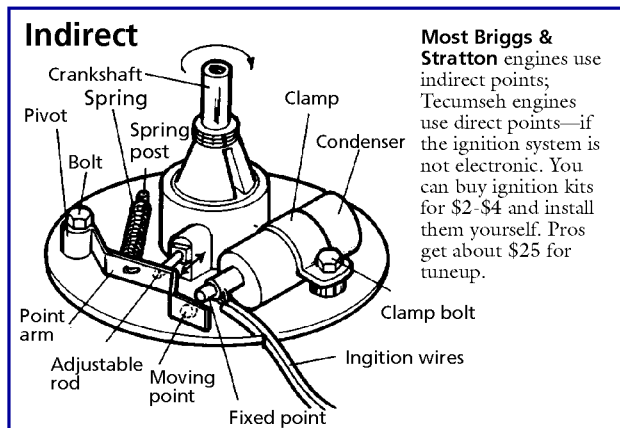
- 1 Put the throttle control in the “stop” position.
- 2 Pull the starter rope (or crank the engine) at least 6 times. The closed throttle produces a high vacuum and opens the choke. In turn, the vacuum cleans excess fuel from the engine.

Still won't start?

Turn the needle valve or mixing screw 1/4-turn counterclockwise, and crank the engine. If no luck, turn this screw another quarter turn. Try cranking. If it won't start, turn the screw clockwise 1 full turn, and try cranking the engine. (See illustration).

**The last resort**, but be extremely careful and keep your face and hands away from the carburetor:

- 1 Remove the air filter from the carburetor with a screwdriver.
- 2 Push the screwdriver blade into the carburetor barrel past the butterfly valve. The screwdriver keeps this valve open.
- 3 Keeping your hands and face away from the carburetor, crank the engine. Repeat the cranking operation several times. The engine should start. When it starts, remove the screwdriver and replace the filter.



### THE CONDENSER AND POINTS

The information above could be classed as “quick-fixes” to a lawn mower starting problems. We hope the combination works. If it doesn't and you own a mower with a condenser and points (electronic ignitions do not have these parts), chances are very good that the condenser and/or points need replacement. You can buy the replacement parts in many home center and garden outlets. Be sure you match the replacement parts kit with the model engine of your lawn mower. The packages will be clearly marked—some with instructions on how the parts are installed. Below are the basics:

Tools you'll need include a box wrench set; hammer; pipewrench; nut driver; screwdriver; flywheel puller; match book; the replacement parts.

- 1 Remove the engine cover and flywheel.
- 2 Remove the screen that covers the flywheel.
- 3 Remove the clutch assembly and the flywheel.
- 4 With the clutch off (if unit has one) you will see the flywheel key in the crankshaft. If the key is bent, you can just replace the key; the points/condenser may be okay. If not, continue on:
- 5 Remove the flywheel. You can buy a “puller” for this. It is a block of metal that is inserted over the top of the crankshaft. You tap the “puller” with a hammer, which pops the flywheel off the crankshaft. Do not pry up on the flywheel; it is pot metal and will break.
- 6 Lift off the flywheel. Under it you will see a small metal covering. Unscrew the covering to expose the points and the condenser.
- 7 Remove the condenser clamp and condenser. Install the new condenser and lightly clamp it in place. Two tiny wires are slipped into a hole in the condenser; a spring holds the wires under tension. There is a plastic tool in the kit to hold back the spring tension while the wires are threaded into the hole.
- 8 Remove the moving point. As the slotless screw is removed the spring and point will lift off.
- 9 Install the new moving point. Fasten the spring to the arm of the point and the spring post. Then move the condenser forward so it touches the tip of the moving point. Turn the crankshaft via the blade until the moving point opens to its widest gap. You'll have to try this a couple of times.
- 10 With the moving point set at the widest point, insert the flat of a matchbook cover between the condenser and moving point. Both the condenser and point should just touch the sides of the matchbook cover. Now, tighten the clamp on the condenser. Reassemble the engine. The matchbook is about .025 ins. thick. This is the right point setting. If you have feeler gauges, use the .025 gauge.