

# HOW TO TUNE UP YOUR 6 HP TECUMSEH-LAUSON ENGINE\*

**You  
can do it!**  
No special skills needed.

**DISCONNECT SPARK PLUG WIRE  
TO PREVENT ACCIDENTAL STARTUP**

You'll find it easy to replace your points, condenser, spark plug and head gasket right on the tiller using these step by step instructions. Your reward will be an efficiently operating engine for best tilling performance. Removal of the engine from tiller is not necessary. Of course, these instructions apply only after the one-year engine warranty is up. If your engine needs a tune up before one year, we suggest you contact your local Tecumseh engine service dealer (if you do the tune up yourself, and your work causes subsequent damage to the engine in its operation, it won't likely be covered by the engine manufacturer's one-year warranty).

**TOOLS YOU'LL NEED** — adjustable pliers, 7/16" wrench, 1/2" wrench, large screwdriver, small screwdriver, Phillips screwdriver, small punch, hammer, mallet, flashlight battery, flashlight bulb, three 8-inch lengths of wire, electric, plastic, or masking tape, a 0.020" feeler gage, a spark plug gapping tool and a wirebrush, preferably the kind used on electric drills. You'll also need a 3/4-inch socket wrench, a 13/16" spark plug wrench (the most common size), and a torque wrench.

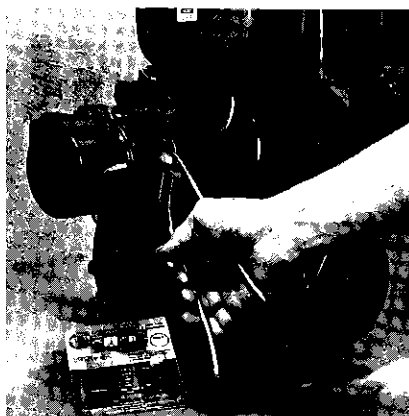


PHOTO 1

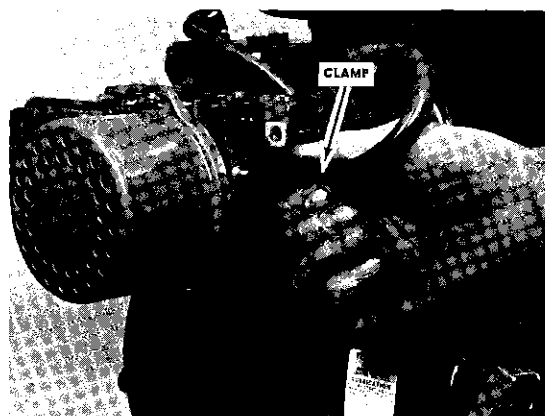


PHOTO 2



PHOTO 3

PHOTOS 1, 2, 3—Use pliers to squeeze the hose clamp at the carburetor fuel line connection (Photo 1). If you have a fuel shutoff valve, turn it to "off" before starting. If you don't have a fuel shutoff, pinch the line after clamp removal, pull the tube off the carburetor, (Photo 2) and then drain gas into a container (Photo 3). Remove it to a safe place (away from flames or sparks etc.) or use it in your lawn mower.

**CAUTION:** Gasoline and its vapors are highly flammable and explosive. Be sure area is well ventilated and keep away from open flame or sparks. Observe No Smoking rules.



PHOTO 4—Loosen two Phillips screws enough to slide straps aside and remove fuel tank.



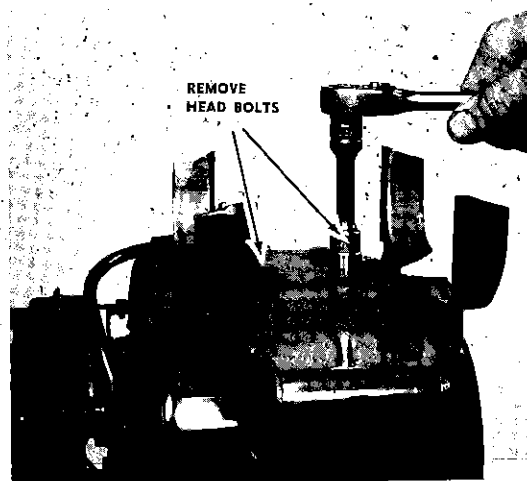
PHOTO 5—Tap fuel tank up with hand and pull it out and away to left.

\* These tuneup instructions cover all Tecumseh—Lauson engines that were supplied with Troy-Bilt Tillers.



PHOTO 6—Remove 7/16" bolts from front of fuel tank bracket.

PHOTO 7—Remove the two head bolts (with 1/2" wrench) that secure the fuel tank bracket.



### NOTE:

At this stage if you do not have a timing dial indicator, the cylinder head must be removed. The remaining head bolts require a 1/2" wrench.

PHOTO 8—Use a 1/2" wrench to remove the single head bolt that was covered by the bracket and then the two bolts from the bottom sides of the blower housing with a 7/16" wrench. One on left is shown (arrow) in Photo 6.

PHOTO 9—Slide blower housing off and clean out all grass, weeds, and dirt that might be in housing or on engine.

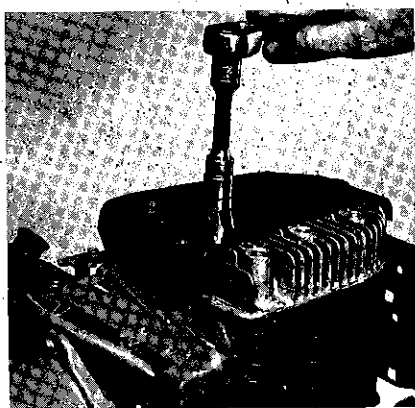


PHOTO 10—Use a 1/2" wrench to remove the 5 remaining bolts.



PHOTO 11—Remove the head and the head gasket underneath. Replace the gasket (Tecumseh #28938B) during re-assembly.



PHOTO 12—Use a screwdriver, or knife to scrape the heavy carbon off of the head. Don't damage head gasket surface. Clean up the head with a medium/fine wire brush on an electric drill (remember safety glasses).

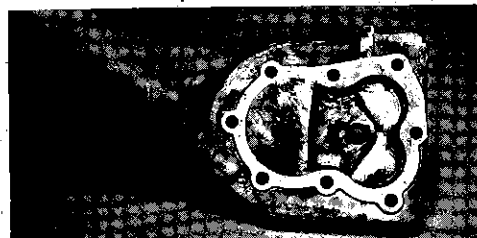


PHOTO 13—Also, remove carbon from top of piston, but be careful not to harm the cylinder wall. Here's how the head should look after cleaning.

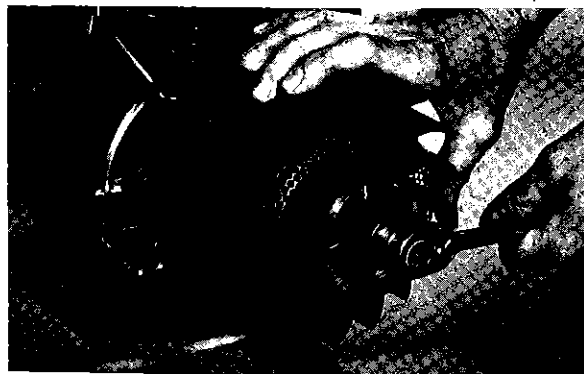


PHOTO 14—Hold the flywheel as shown to prevent it from turning and loosen the flywheel nut with  $\frac{3}{4}$ " socket wrench.

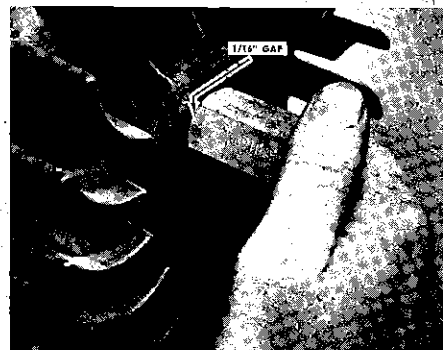


PHOTO 16—Thread the flywheel knock off tool onto the crankshaft and screw it almost all the way in, except for a  $\frac{1}{16}$ " gap at the end.



PHOTO 18—With a hammer strike the flywheel knock off tool (or nut) soundly—don't pound it! If the flywheel doesn't break loose enough for you to remove it, remove the screwdriver and rotate the flywheel  $\frac{1}{2}$  turn (Forward/Neutral/Reverse Lever should be in neutral)\*. Tap the screwdriver in. Then, strike the knock off tool again. That should loosen it.

\* If engine is on tiller.



PHOTO 15—Remove the flywheel nut, washer, starter cup and screen.

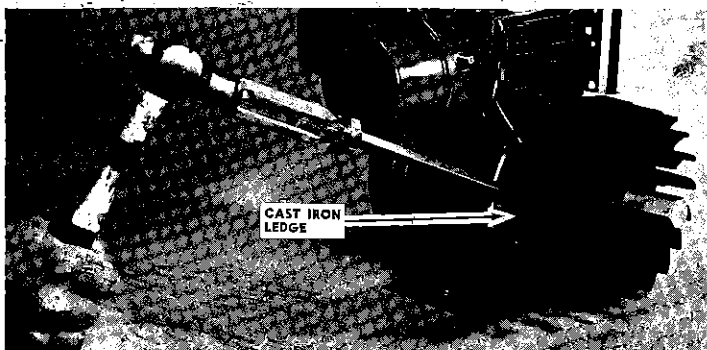


PHOTO 17—Looking between the flywheel and the engine from the left side ( $\frac{1}{2}$  way up from base) you'll find a small ledge of cast iron while all the rest is stamped metal (also see ledge in Photo 21). Tap a large screwdriver between that ledge and the flywheel and leave it wedged in place.

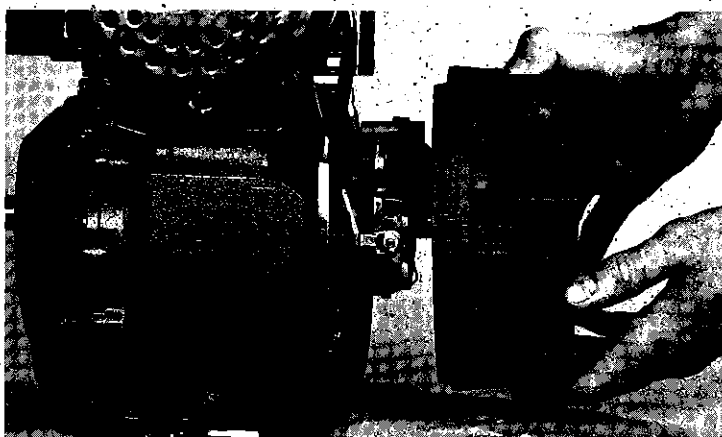


PHOTO 19—Remove the screwdriver and take off the flywheel.

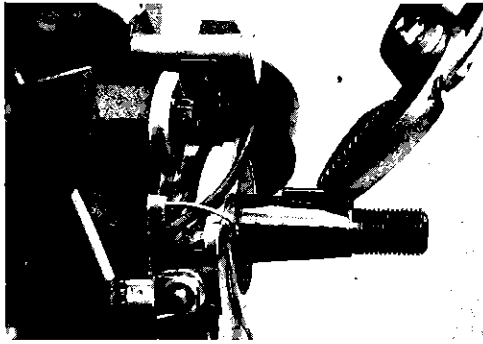


PHOTO 20—Note the position of the fly-wheel key, and remove it with pliers. Don't damage it.

PHOTO 21—Here's what you'll see under the flywheel.

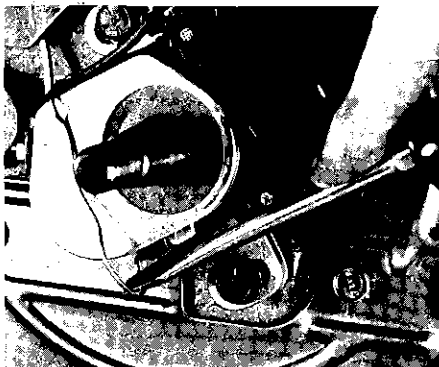
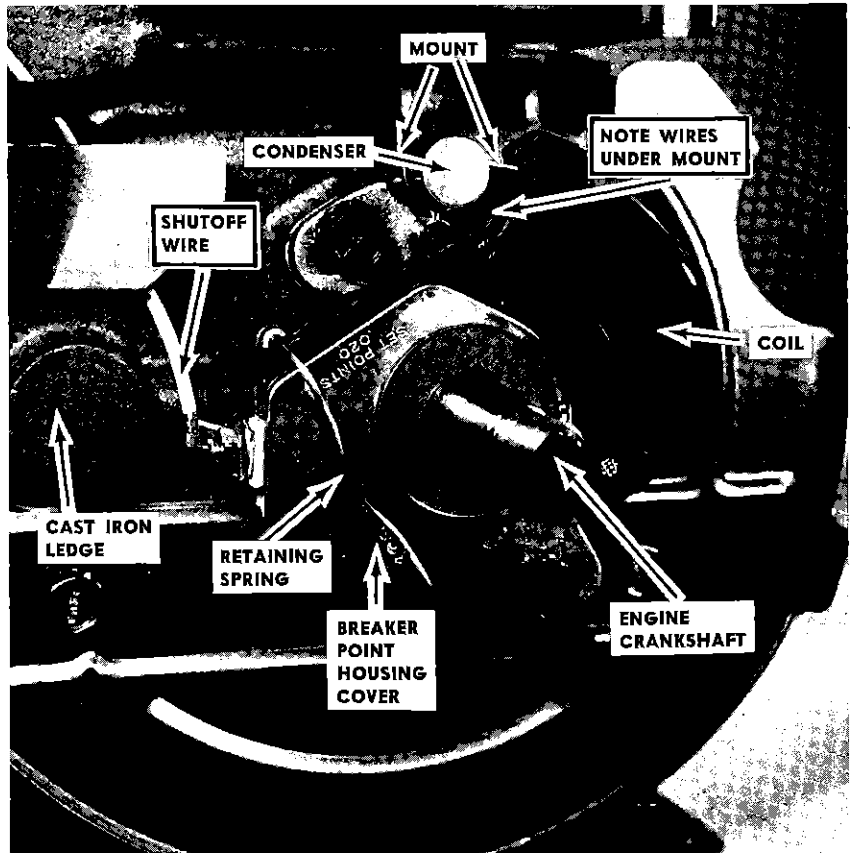


PHOTO 22—Pry the bottom of the retaining spring open with a screwdriver and move the spring (wire) out of the way.

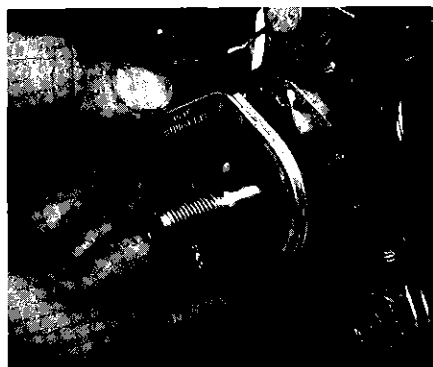


PHOTO 23—Remove the metal and paper dust cover.

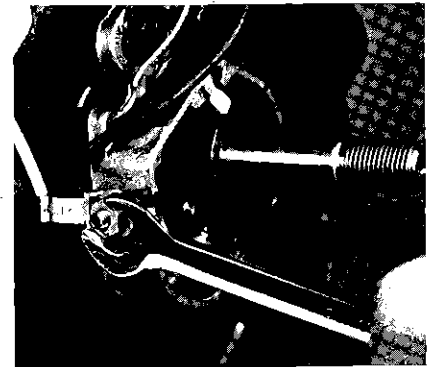


PHOTO 24—Remove the nut on the left side of the breaker point housing and disconnect the three wires on that threaded stud.

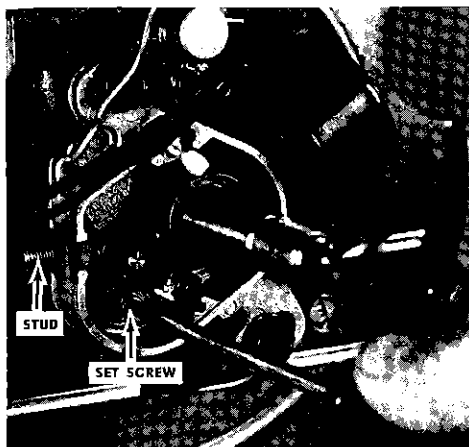
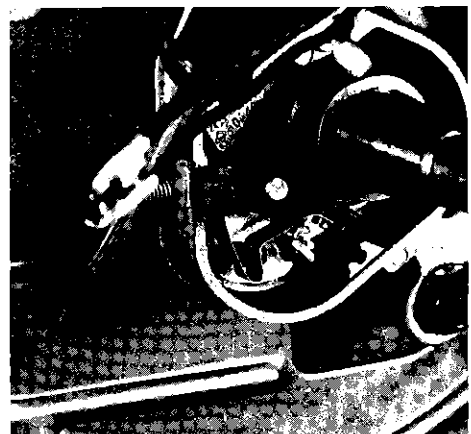


PHOTO 25—Remove the set screw at the left, bottom inside of housing so you can remove the points next.



PHOTO 26—Now, slide the plastic retainer (with the stud in it) out of the groove. It may be necessary to use a screwdriver to wedge it out, as shown.



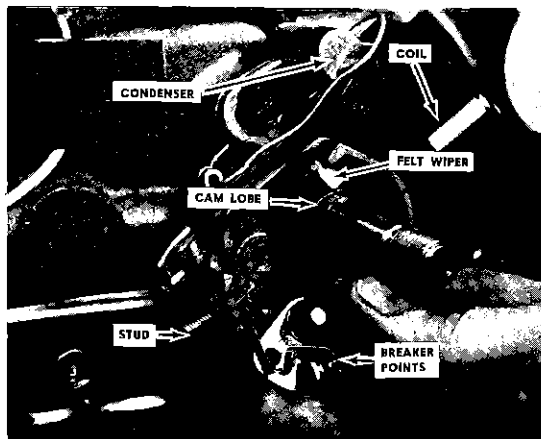


PHOTO 27—Pull the points out, and you're half way home! Note the points—which open and close to create the gap that causes the spark, and also note the cam lobe that opens the points. The felt is a cam wiper. Don't get any oil in the housing or on the new points. Wipe the housing clean, with a clean, dry rag before installing new points.

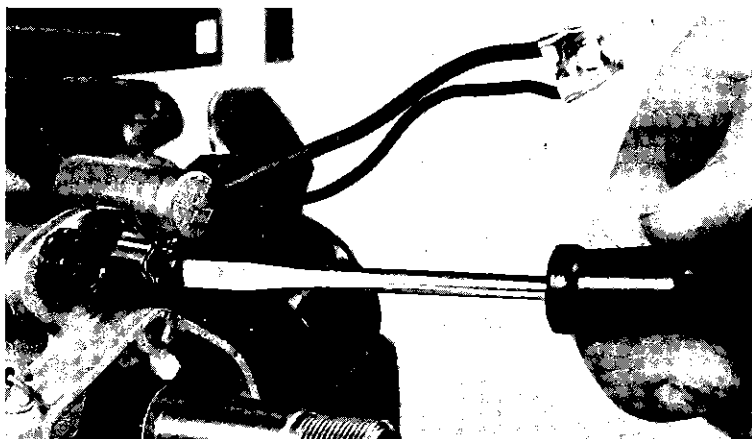


PHOTO 28—Remove condenser as shown in Photo 28. Carefully note how the wires below the condenser mount (shown in Photo 21) are grouped and routed. Later, replace them exactly like that, so they'll fit properly.

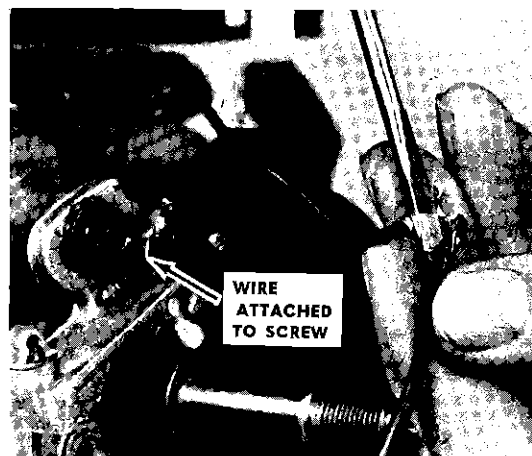


PHOTO 29—The condenser wire will lead you to a soft metal terminal—which also holds another (coil) wire. Your new condenser will have its own terminal. Open the terminal as shown and pull out the old condenser wire; discard it and the old condenser. When you reconnect the coil wire and the condenser wire, simply mate both terminals to attach them.



PHOTO 30—The wire that was originally attached to the black, condenser-mounting screw (see Photo 29) stays on screw as you run the screw through the new condenser's mount.

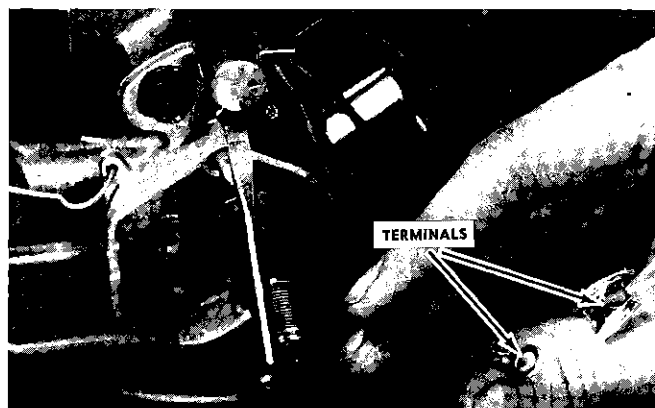


PHOTO 31—Mount the condenser—keeping the two loose wires under the mount as shown. Leave these wires loose for now.

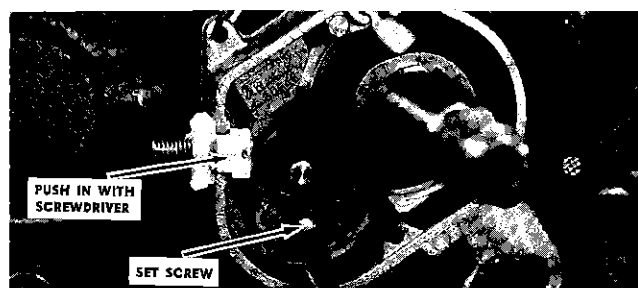
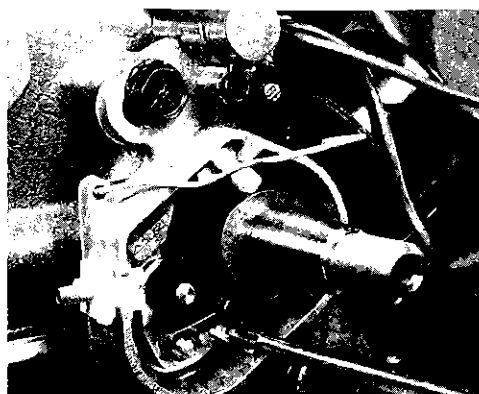
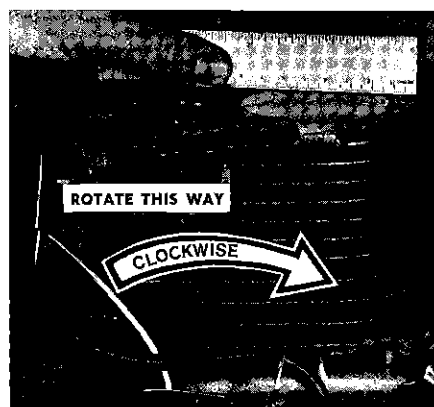


PHOTO 32—INSTALLING POINTS—NOTE: Don't use ANY OIL ON ANY OF THESE PARTS. Oil causes points to pit and burn out. Line up the white plastic retainer for the points with the slot in the housing, and push it in to install new points. Tighten the set screw. However, don't connect any of the wires to the stud for the points yet.

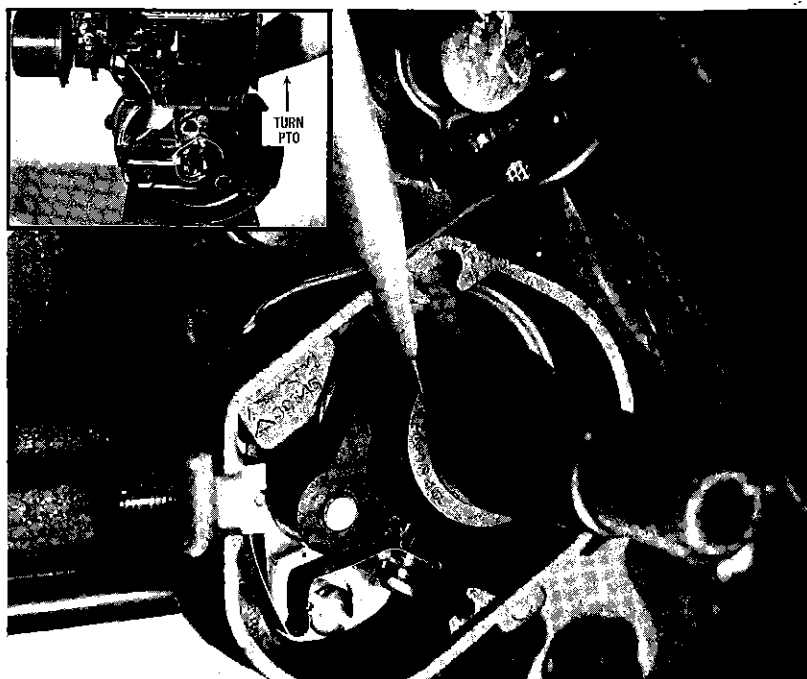
**PHOTO 33—GAPPING THE POINTS**—Reach around to the Reverse Disc, or engine PTO shaft (whichever applies) and rotate the engine shaft (Forward/Neutral/Reverse Lever should be in neutral) until the highest point of the cam (below and to the left of the white felt wiper) opens the points the widest. You'll see that a black or white plastic piece (the cam follower) rides on the cam's surface. The high point on the cam pushes the plastic furthest to its left. This point is marked by a little (\* or  $\Delta$ ) sign right on the cam and is pointed out by the tip of the pencil in the photo.



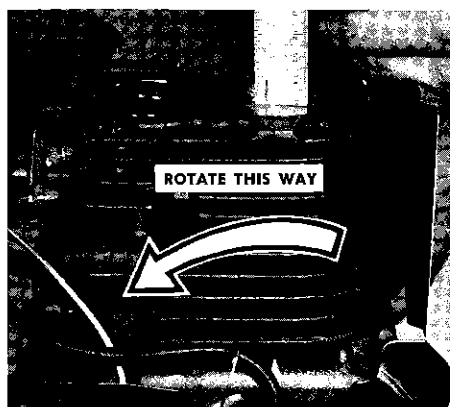
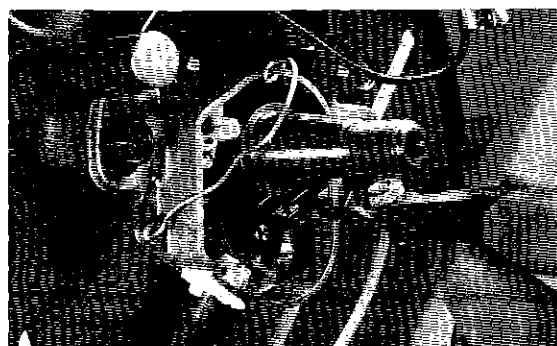
**PHOTO 34—ADJUSTING THE GAP**—With the cam opening the points to their widest gap, loosen the set screw (see Photo 32 for location). Take the screwdriver and insert in the slot (Photo 44) in the housing so you can twist the screwdriver to widen or narrow the gap.



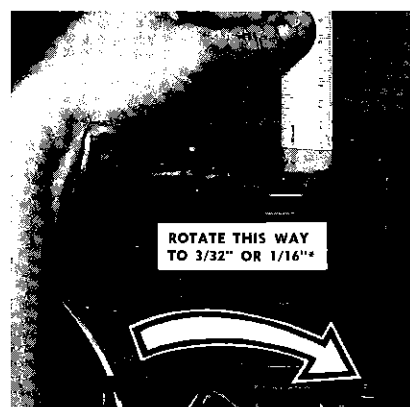
**PHOTO 36—TIMING THE ENGINE**—Reach around to the reverse disc and rotate the engine shaft clockwise (as shown on the photo) until the piston comes up to "top dead center" on the compression stroke with both valves closed. That is the piston's highest point. A straight edge of a ruler will help you see where top dead center is. The ruler must have graduations in 32nds of inches.



**PHOTO 35**—Put a 0.020" feeler gage that's completely free of grease and oil in the gap (or open the gap so feeler gage will fit) and twist the screwdriver to close the points onto the feeler gage. When gage has a slight drag when you pull it out, tighten the set screw. Rotate the crankshaft once more and recheck the gap when the points are wide open. Remember: don't connect any wires to the points yet.



**PHOTO 37**—From your point of view looking at the photo, rotate the crankshaft counterclockwise so the piston goes down more than  $\frac{1}{8}$ ". The photo shows the piston about  $\frac{3}{8}$ " down from the top dead center (TDC).



**PHOTO 38**—Now rotate the engine clockwise back up to  $\frac{3}{32}$ " from the top as shown in the photo. Don't move the crankshaft or piston again during the next few steps.

\*  $\frac{3}{32}$ " for engines built prior to Sept. 1977;  $\frac{1}{16}$ " for engines built after that date.

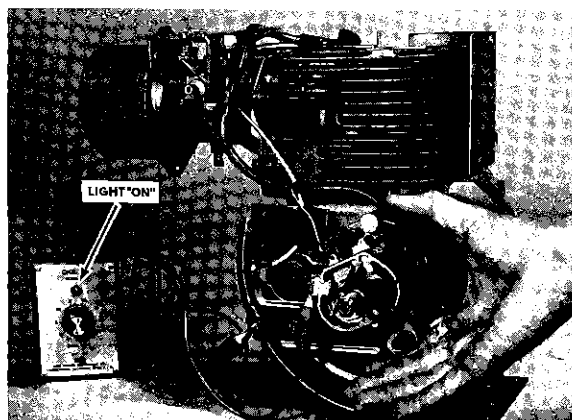
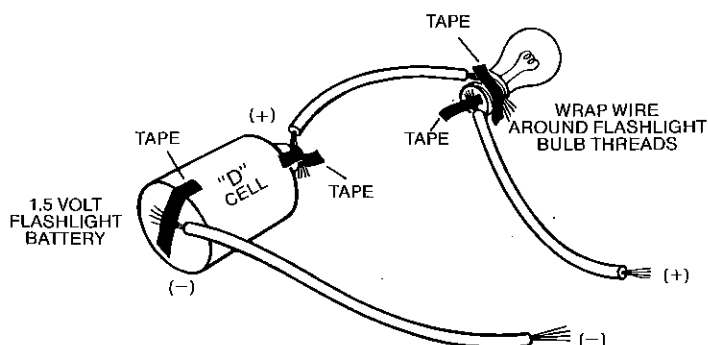


PHOTO 39

PHOTO 39—CONTINUITY CHECK—Use a continuity light as shown in Photos 41 & 42, or use an ohmmeter. You can even use a flashlight battery, bulb and some wire and hook it up, as shown in Sketch 40



SKETCH 40

PHOTO 41—If using a continuity light or an ohmmeter, connect the red wire (+) to the stud on the points (remember no wires from condenser on that stud yet). Simply ground the other (black) wire by attaching it to the nut welded to the plate—see photo. Use a 7/16" socket wrench to loosen the two bolts on the stator plate as shown (one bolt above the points housing and one below it). Refer back to Photo 39. Rotate the entire plate clockwise as far as it will go. When you do so, the light should be ON. Tighten bolts until they are only finger-tight.

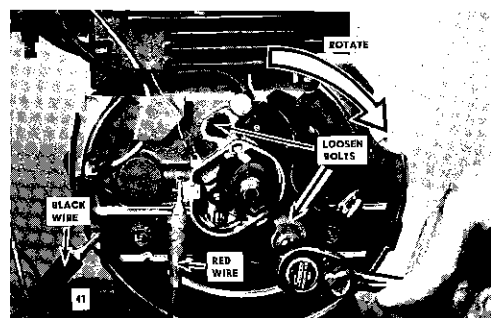


PHOTO 42—Now rotate the stator plate very slowly counter-clockwise until the light goes out. Stop rotating the stator the instant that the light goes out. Then, carefully lock the stator bolts and your engine has been properly timed. Each time you change points, retune the engine.

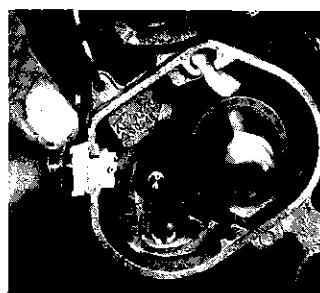
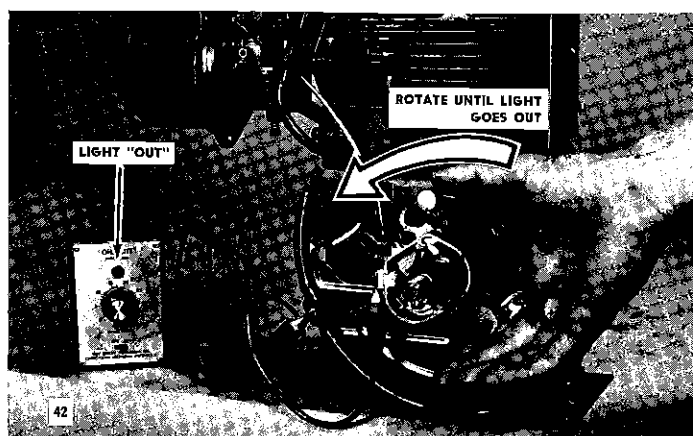


PHOTO 43—Now that the engine is properly timed and the points are gapped to .020", you can finally connect both wires (that are now loose) from the condenser and coil to the stud for the breaker points—see photo.

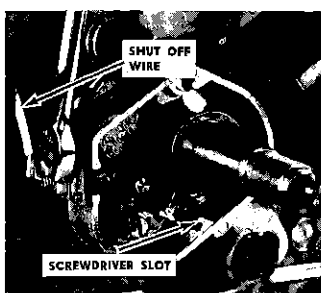


PHOTO 44—Next, add the white engine shutoff ground wire to the stud. Replace the nut and tighten it.



PHOTO 45—Replace the paper and metal dust cover on the breaker point assembly.



PHOTO 46—Put the wire retaining spring back on the dust cover. The two black wires should run under the retaining spring. The white engine shutoff wire should remain outside the spring (see Photo 44).



PHOTO 47—Replace the flywheel on the shaft. Put key into the key-way, cut-out end first.

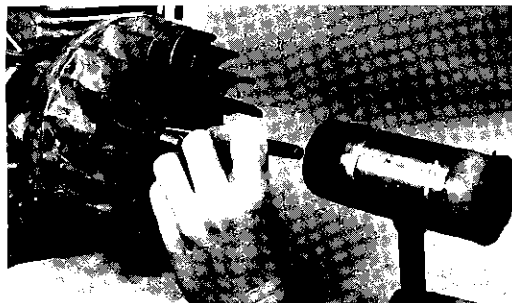


PHOTO 48—Use a punch to drive the key into place.

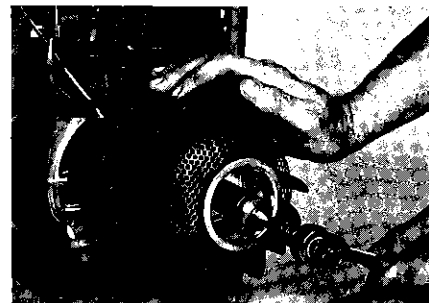


PHOTO 49—Install starter cup and screen (see Photo 15). Rotate cup until tang on the bottom goes in hole shown in Photo 47. Hold the flywheel and tighten nut very securely. Tighten to 360 inch-lbs. If flywheel nut isn't tight enough, the key will shear off when engine starts—and engine won't run.

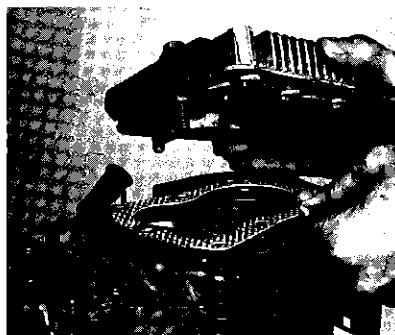
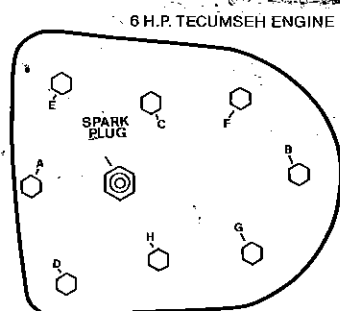


PHOTO 50—Put new head gasket (Tecumseh No. 28938B) in place and install bolts in exactly the procedure discussed in Photo 51 and Sketch 52.



SKETCH 52

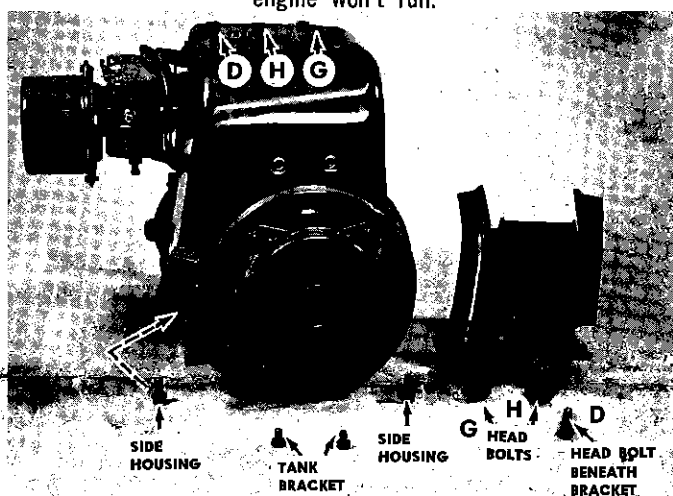


PHOTO 51—Replace the blower housing and fasten it to the engine by threading the two, medium-sized bolts in the two side blower housing locations which are shown in this photo and Photo 6. Note that head bolt locations D, H, and G are shown in this photo.

SKETCH 52—This is the correct sequence for replacing the head bolts. First, thread in bolts labeled A, B, C, D, E and F. Now tighten and torque them (with a torque wrench) to 140-200 inch-lbs. in the same sequence. Make sure D (also shown in Photo 51) is properly tightened down because it's covered after you install fuel tank bracket. Install fuel tank bracket with head bolts G and H to 140-200 inch-lbs. Also recheck torque of bolts A, B, C, H, F, E and G. Finally, as shown in Photo 51, put the two small bolts in the holes on the bottom of the tank bracket.

The reassembly steps in Photo 51 and Sketch 52, plus replacement of the fuel tank and fuel line, are clearly shown in Photos 10, 9, 8, 7, 6, 5, 4, 2 and 1.

To complete your tune up, you'll want to adjust your carburetor. It's even easier than replacing the points and condenser. Just follow the carburetor adjustment instructions in your TROY-BILT Owner's Manual to get exactly the right settings.

©1979 Garden Way Inc.



**GARDEN WAY MANUFACTURING CO., INC.**  
102nd St., & 9th Ave., Troy, N.Y. 12180  
Phone (518) 235-6010