

ENGINE CONTROLS & OPERATION

BASIC ENGINE INFORMATION

All Troy-Bilt Roto Tiller-Power Composters use four cycle engines. The engine on your Troy-Bilt Tiller has an oil reservoir to lubricate it by a splash and spray system. It is very important to make sure that your engine gets enough oil for lubrication at all times.

Small air-cooled engines—such as those used in most gardening equipment, including your Tiller—generate a lot of heat during operation. This heat has to be taken away from the engine, otherwise it could seriously damage it.

YOU SHOULD CLEAN DIRT FROM COOLING FINS

A combination of air cooling and oil lubrication systems controls engine heat. Vanes on the engine flywheel blow air through cooling fins on the engine to keep engine parts cooled to safe operating limits as shown in Photo 4/1. Engine covers and shrouds are engineered to aid in control of this air flow. A system of oil passages throughout the engine lubricates engine parts and avoids a buildup of excessive engine heat due to friction.

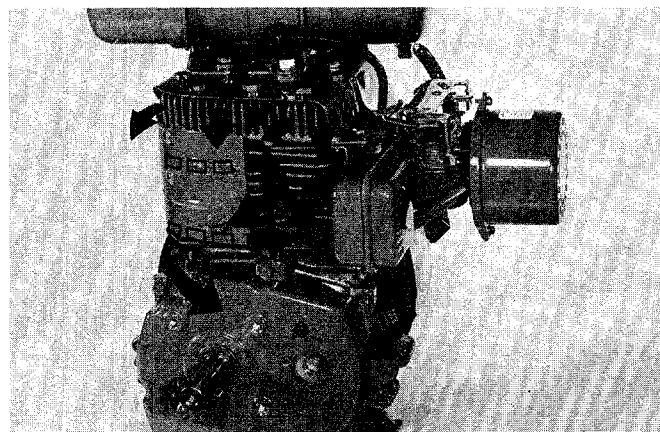
Using the correct type of clean oil and regular cleaning of dirt and debris from the engine's cooling fins will give you better, more efficient engine service and longer engine life. See Photo 4/2.

YOU SHOULD KEEP THE AIR CLEANER DIRT FREE

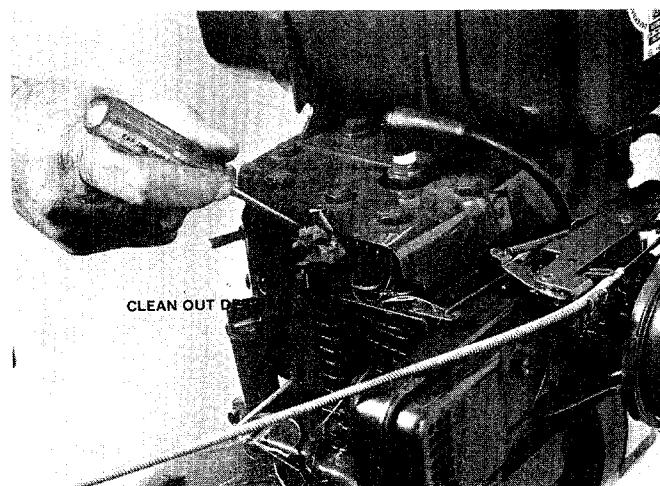
Please remember the importance of your air filter. At normal operating speeds, your engine consumes about 8,000 gallons of air (at normal atmospheric pressure) for every gallon of gasoline it burns.

With a ratio of 8,000 to 1, the need for clean air is obvious. A clean air filter—or a new one when the old one has become too clogged up so that it will no longer remove all of the dirt—and tight fitting, “like-new” air cleaner gaskets are essential. Inspect carefully for signs of a dirty air cleaner and loose gaskets. Even small air leaks can suck in large amounts of dirt,

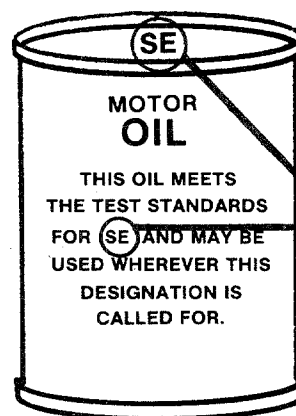
grime or grit in a short time and send these ruinous particles directly into your engine.



(Photo 4/1) Cooling air flows underneath covers (clear arrows) and carries heat away from engine (black arrows).



(Photo 4/2) Clean cooling fins.



(Sketch 4/3)

Look for SE in either place

This is SE classified oil.

CHANGE ENGINE OIL AT THESE INTERVALS

Change the engine oil after the *first two* operating hours (about one tankful of fuel). Then, change oil every ten hours, or sooner if tilling in dusty, dry soil. This is more often than the engine manufacturer recommends—but it will pay good dividends, an engine that will last and last. It's normal for engine oil to get black, but check the oil for grime, dirt and grit—then, change it when needed, no matter how few operating hours you have used that oil.

IMPORTANT: When tilling in extremely dusty conditions, check the oil for level and presence of dirt, and check the air filter for dirt *very frequently*. Every half hour is none too often. Change the oil and clean the air cleaner when they're dirty. If you take both of these actions, your engine will last much, much longer.

For operation of all engines used on Troy-Bilt Tillers, please remember to check the dipstick to see that engine oil is kept up close to the "Full" mark all of the time. Always make sure that you use the proper grade of oil in your engine. SE must be printed on the top of the oil can, or on the label. Please make sure that the air cleaner is clean and tightly fitted before you operate your engine.

HOW TO PRESERVE ENGINE LIFE

When operating your tiller, please don't run your engine at full throttle all of the time. Instead, try to judge when the engine is providing the proper amount of power—not too little, but not too much. Matching engine power to the work is easier on the engine and on the tiller. The sound of your engine operating will be your best guide.

When you are through with the tiller and are ready to put it away for the day, let it run at low or idle speed for two or three minutes without any load on the engine. In fact, let it run at low speed during brief interludes when you're not actually working the tiller—while you're picking up rocks, preparing to start a new row, or just hesitating for a moment. This

practice of giving your engine a "rest" period, will improve fuel economy and will add years to the life of your engine. It will also cool down a hot engine, if its cooling fins are not clogged with dirt.

HELPFUL INFORMATION ABOUT MOTOR OIL

We suggest that you use #30 oil that is rated SE for the greatest engine protection against high temperatures, oxidation, rust, corrosion and dirt buildup. SE oil provides more reliable protection of bearings and bearing surfaces at high temperatures. As we have just explained, small engines generate a lot of heat and the oils we recommend will stand up best to that heat. SE classified oil meets the specifications of all engines used for Troy-Bilt Tillers.

The "S" in "SE" means Service Oil, referring to Automobile Service Stations. The "E" in "SE" is the level of the oil's rating. The higher the letter in the alphabet, the higher the temperature rating for the oil.

ADDING GASOLINE

Use the proper gasoline for your engine. Don't overfill the tank. Don't fill any closer than one half inch from filling neck of tank. Don't smoke while refueling. Clean gasoline spills off engine and tiller before starting engine.

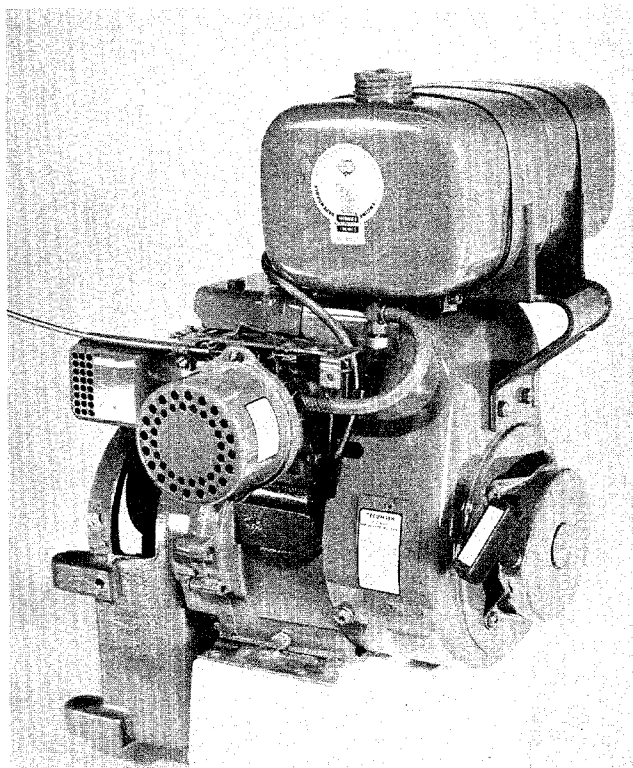
CONTROLS AND OPERATION

Your Troy-Bilt Horse Model Roto Tiller-Power Composter comes equipped with a 6 HP Tecumseh-Lauson engine, or a 7 HP Kohler engine.

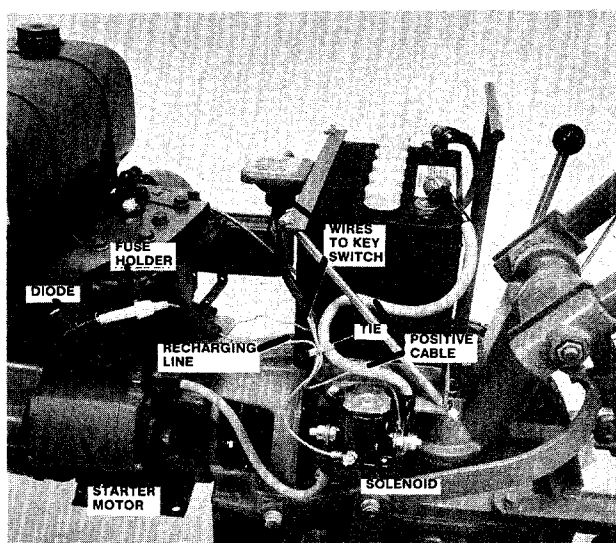
Location and identification of the controls for each engine are shown below in succeeding photographs. In addition to the following information, please consult the engine manufacturer's owner guide which was in the plastic envelope that came with your Troy-Bilt Tiller.

6 HP ENGINES—TECUMSEH-LAUSON

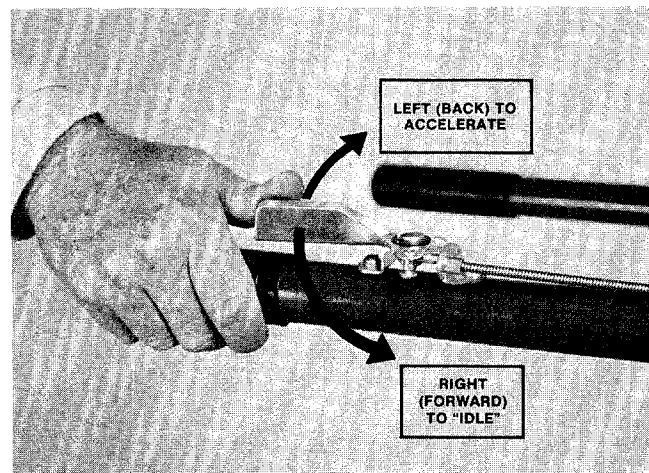
Photos 4/4 and 4/5 below show a 6 HP Standard Start and a 6 HP Electric Starting engine—both manufactured by Tecumseh Products Company (Lauson Division). On both 6 HP engines (standard or electric start), the choke is engaged manually. You obtain high speed by opening the throttle lever on the handlebar all of the way (pulling toward your left). See Photo 4/6 & 4/7.



(Photo 4/4) 6 HP engine

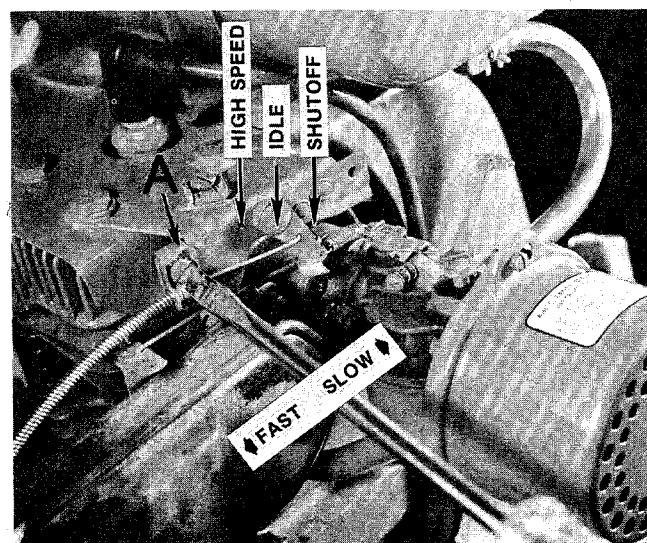


(Photo 4/5) 6 HP electric start



(Photo 4/6) Throttle lever on handlebar

If you close the lever, by moving it all the way to your right, it will engage the engine shutoff switch, automatically shutting off the engine. See Photo 4/6. In between the shutoff switch and high speed is the full range of engine operations from idle (forward) to full power (back toward you). See Photo 4/7 for illustration of the various positions. Please make sure that you don't operate the tiller under a load without seeing to it that the choke is fully open (disengaged). See Photo 4/8B. Failure to do so can quickly build up deposits that are harmful to your engine.

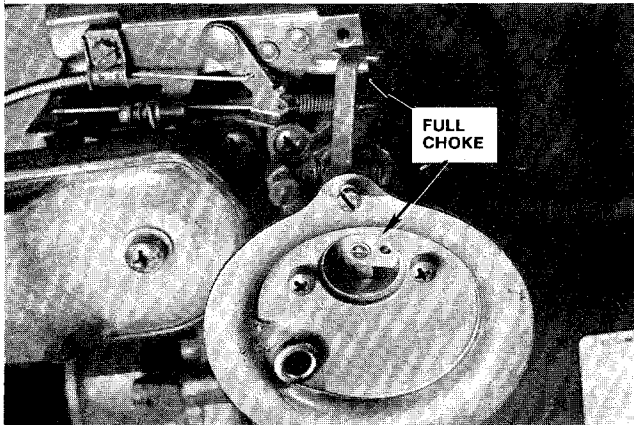


(Photo 4/7) 6 HP, speed control

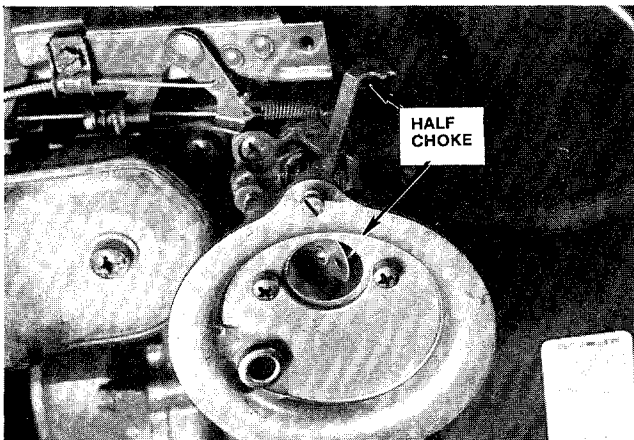
CHOKE

Down on the carburetor, you will note an arrow on top of the choke lever. Push the lever all the way in for **FULL CHOKE**. Half way in is **HALF CHOKE**. Outward (closest to you) is the **CHOKE OFF** position, Photo 4/8B. See Photos 4/8 and 4/8A for full and partial choke positions.

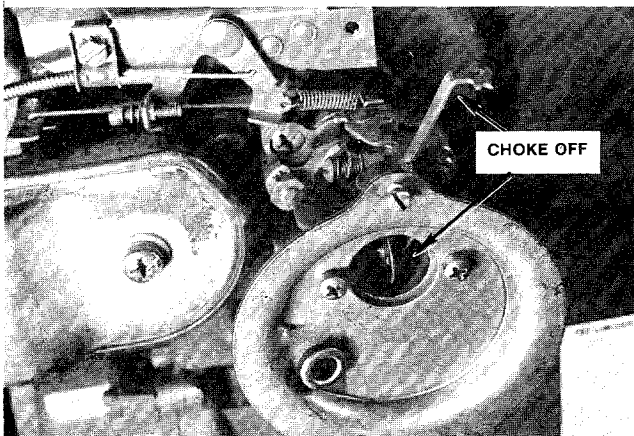
When the choke is engaged fully (closed), the gasoline-to-air mixture is richest. This, of course, helps your engine to start more quickly.



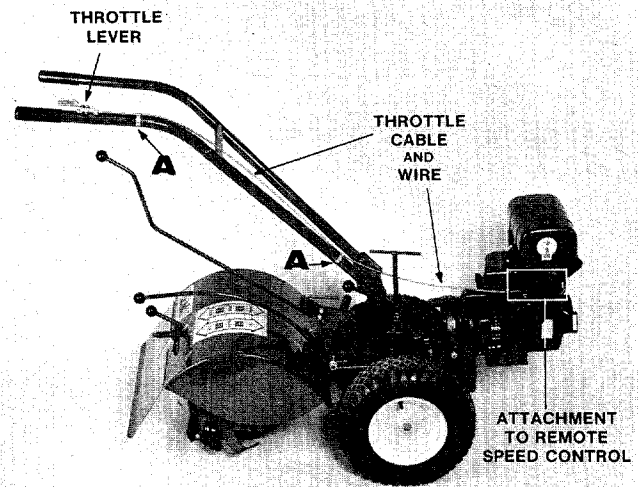
(Photo 4/8) 6 HP engine, full choke.



(Photo 4/8A) Half choke.



(Photo 4/8B) Choke off.



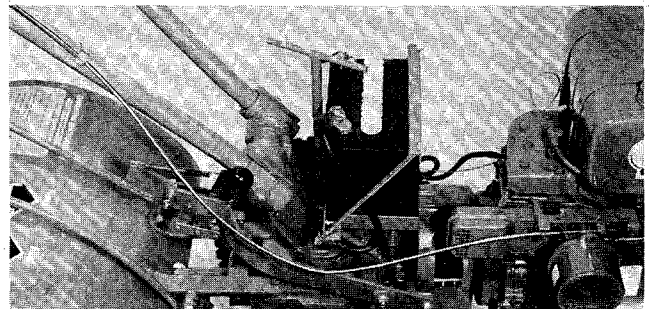
(Photo 4/9) 6 HP engine

Once the engine has started, move the choke to **HALF CHOKE** briefly, then disengage it when the engine is warm enough to start tilling.

THROTTLE CABLE

The throttle lever on the handlebar connects to the throttle wire and a casing. The wire itself runs through the casing. The cable runs down the outside of the handlebar. The cable is held in place with two spring clips that snap over the bar—one just above the crossbar of the right handlebar and one about ten inches above the bottom of the handlebar. Please see Photo 4/9 for placement of the cable and clips.

On all engines, the throttle cable runs down the handlebar and crosses over to the engine (behind the muffler) where it attaches to a bracket. Don't run the throttle cable of an electric start tiller across the top of the battery. It could cause a short circuit with the battery and even make the wire hot enough to melt (see Photo 4/10).



(Photo 4/10) Run throttle cable on electric start tillers down handlebars, as shown. Keep the throttle cable away from battery—6 HP electric start engine.

After the throttle cable crosses over to the engine, the casing is held securely by the bracket clamp (see **A** in Photo 4/7). The copper clad wire itself emerges from the casing and hooks up to a hole in the remote speed control lever above the carburetor. The remote lever is linked back to the governor spring through a series of levers and springs.

GOVERNOR

Your engine has a built-in mechanical governor that limits engine R.P.M. (revolutions per minute) so that its speed does not exceed limits which could be harmful to the engine. The governor is inside the engine where it can't be seen. See governor lever shown in Photo 4/19.

The faster the engine runs, the more force the governor exerts against the throttle, preventing the engine from overspeeding. For more details on governor operation and its linkage, please turn to page 53.

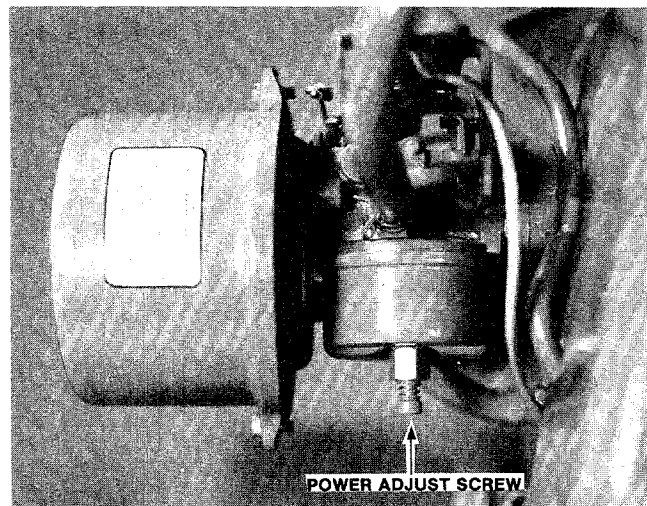
CARBURETOR

The carburetor, shown in Photo 4/11, supplies a mixture of vaporized gasoline and air to the cylinder. The carburetor includes the carburetor body, throttle, choke and fuel bowl.

It is important to keep dirt, gum and water out of your gasoline so that you can keep passages in the carburetor open and unrestricted. Using clean, fresh fuel will avoid these difficulties.

Underneath the carburetor, you can also see the bowl which holds a supply of gasoline that

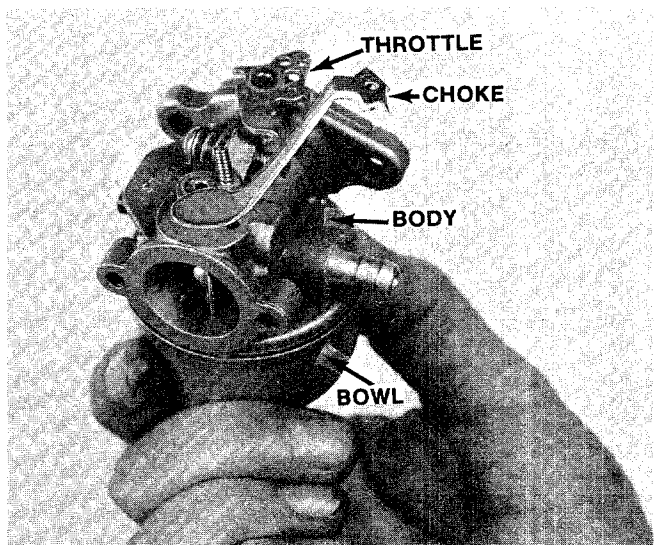
is to be delivered to the engine by a float feed system and gravity. Beneath the bowl, you will see the power adjustment screw (large screw with slotted head)—see Photo 4/12.



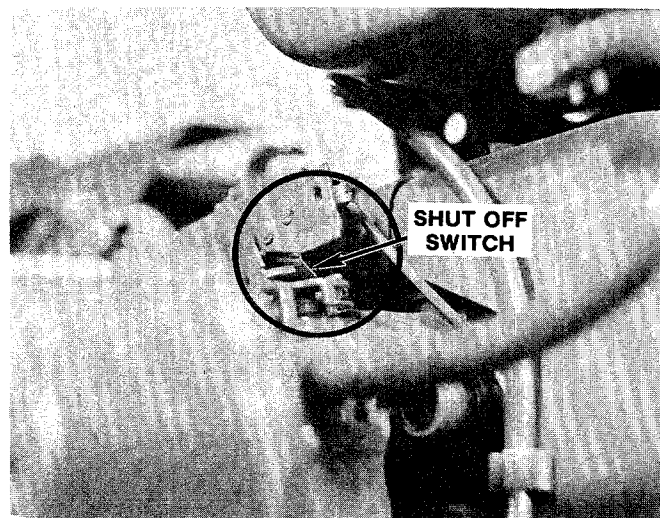
(Photo 4/12) Carburetor—6 HP engine

ENGINE SHUTOFF CLIP

When you close the throttle lever (on the handlebar), it engages a grounding wire at the engine shutoff clip underneath the speed control assembly bracket—see Photo 4/13, which shows the top view. Photo 4/14 shows the view underneath, illustrating how the lever on the assembly completes the gap between the stop switch and the mounting bracket. This stops the engine. Also see Photos 7/42 & 7/44.



(Photo 4/11) Carburetor for 6 HP engine



(Photo 4/13) 6 HP engine

ENGINE OIL LEVEL AND THE DIPSTICK

On your new 6 H.P. tiller, you can measure the oil level with the engine at its normal slope mounted on the tiller. Do this on a level floor by setting your tiller depth regulator at the first (top) notch—so the *tines do not touch* the floor and the engine slopes in its normal position. See Photo 4/15.

Always measure engine oil level with the dipstick screwed securely into the oil filler hole. Please keep a close and regular check on your oil for level and cleanliness. It is normal for your engine oil to turn black, but you should constantly check for dirt and grime in the oil (replace dirty oil.) Keep a good gasket on the dipstick and keep the stick tightly in place always.

4

BRAND NEW ENGINES—6 HP

On brand new engines, fill the sump through the oil filler hole with 24½ ounces of #30 SE classification oil. SE should be stamped on the top of the can or printed on the can's label. Check the oil level with the dipstick. (See Photo 4/16).

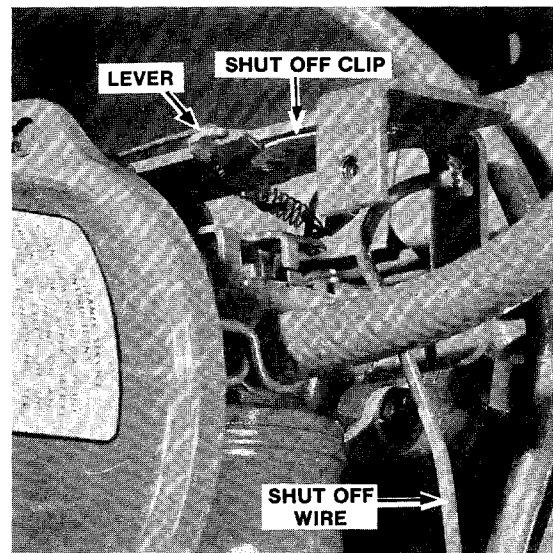
CHANGING OIL

Change oil more often than recommended by engine manufacturer. Change the oil after the *first two hours* (one tankful), then at least every 10 hours of operation thereafter—and sooner in dry and dusty conditions.

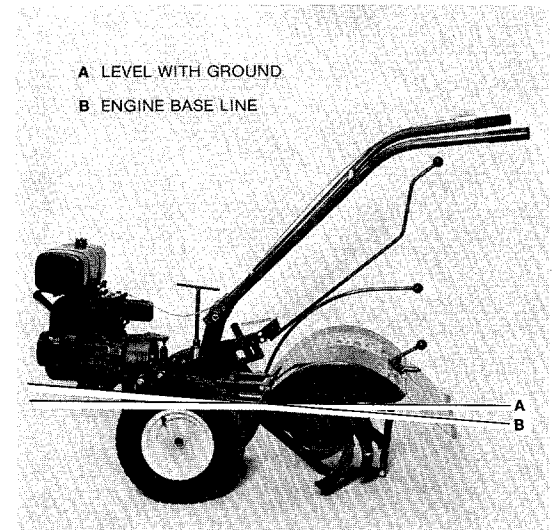
When you are changing engine oil, run the engine for 10 to 15 minutes to heat it up before draining it. This will drain the maximum amount of oil and will also remove the maximum amount of dirt with it. See Photo 4/17 for drain hole locations. You need to remove a drain plug from one side only to drain the oil.

Please remember to tilt the engine base towards the drain hole as the last few ounces drain away. (Put a brick or thick board under one wheel). Often the most dirt is removed in these last few ounces. The extra effort really pays dividends.

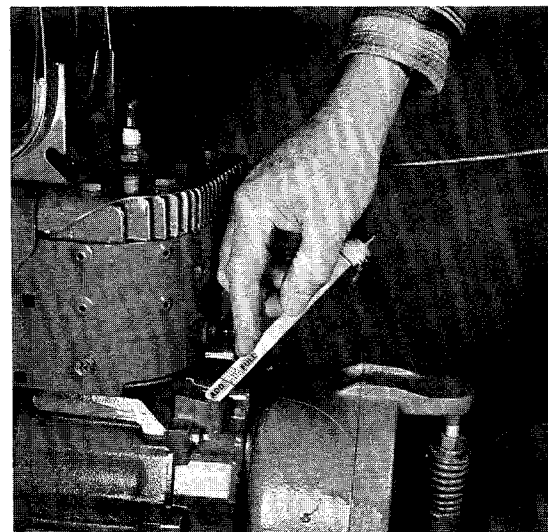
It is not too difficult to tilt your tiller towards the engine drain hole by pulling the gas tank and the nearest handlebar towards you. PLEASE DON'T PUT PRESSURE ON THE AIR CLEANER AND CARBURETOR to move the tiller at any time. You could easily crack your carburetor that way.



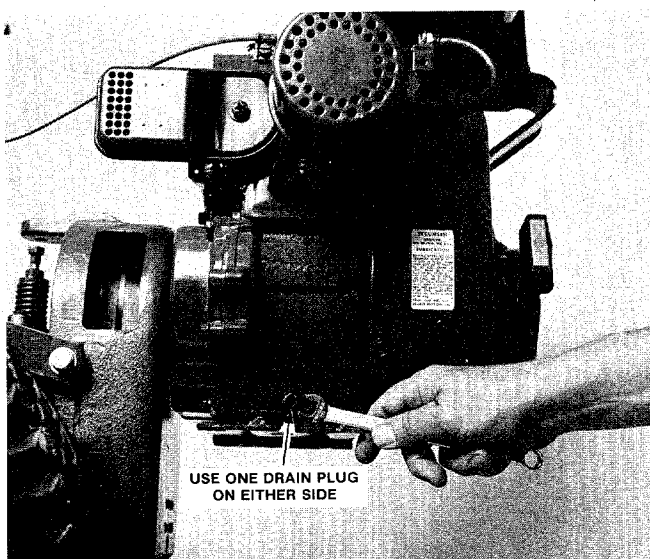
(Photo 4/14) 6 HP engine



(Photo 4/15) 6 HP Tecumseh engine



(Photo 4/16) 6 HP engine's dipstick



(Photo 4/17) 6 HP engine

When the dirty oil is drained from your engine, replace it with 3 or 4 ounces less than 24½ ounces of clean oil and recheck the oil level with the dipstick as you normally do. If additional oil is required, bring the level up to the "Full" mark shown on the dipstick.

Don't overfill your engine crankcase with oil. An excess of oil will very likely show up by being blown out the breather tube into your air cleaner (sponge filter). (Photo 4/18 shows engine breather tube). This will cause oil to drop from the air cleaner after the engine stops. If your engine drips oil in this manner, check the oil level to make sure that it is not too high. Also, see engine breather under Engine Maintenance in this manual, page 116.

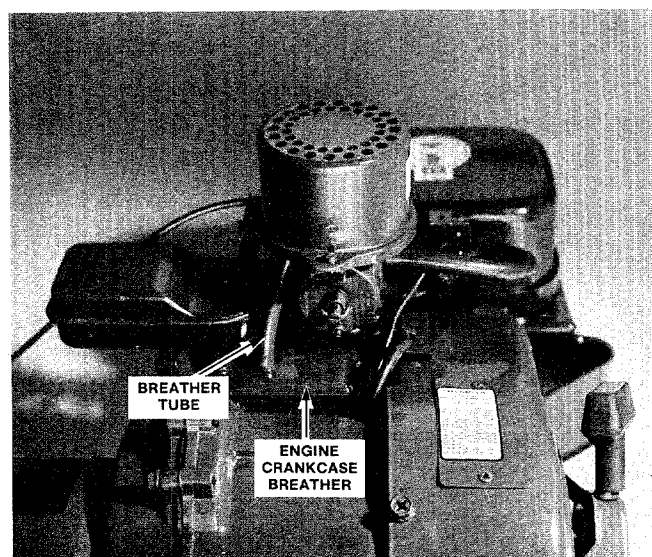
SPARK PLUG

The spark plug, shown in Photo 4/19, of course, provides the spark to the engine to ignite the fuel mixture in the combustion chamber. It is essential to proper engine operation to have a plug with no cracks in the porcelain, or fuel residues or oil deposits on the spark plug electrode itself.

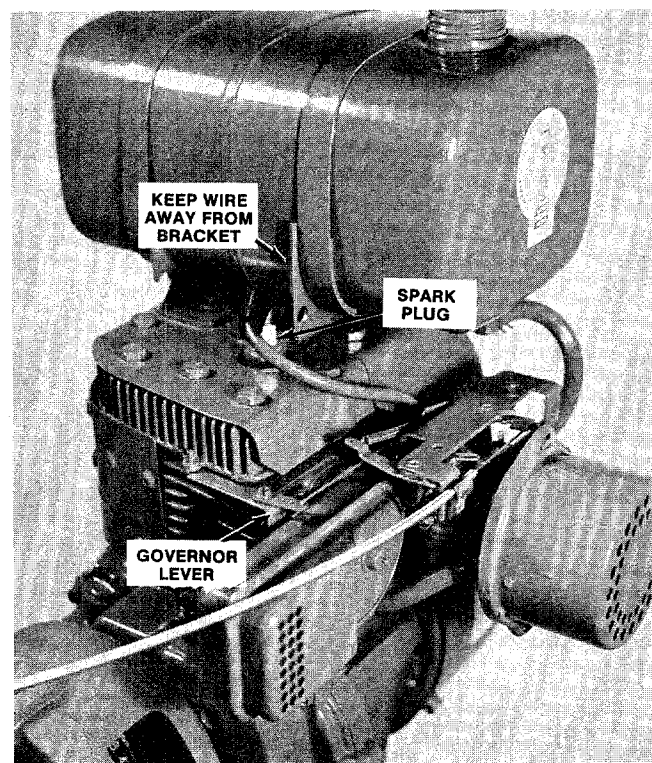
Replace spark plug with a Champion J-8 or equivalent plug. Plug gap should be .030".

AIR CLEANER

The air cleaner of your 6 H.P. engine uses an oil-moistened polyurethane sponge to filter



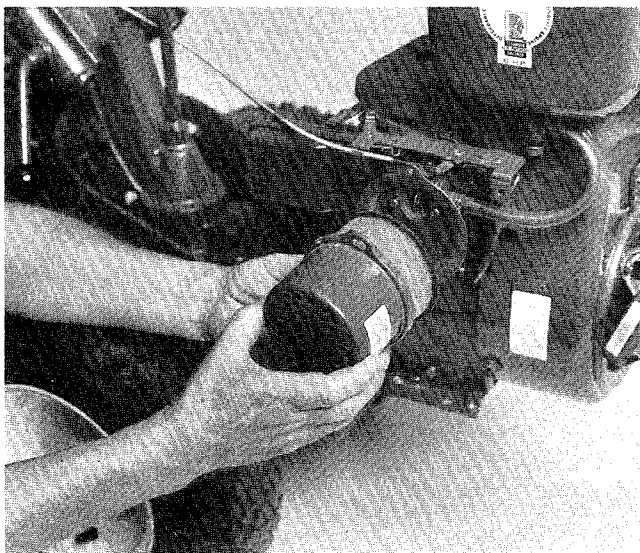
(Photo 4/18) 6 HP engine



(Photo 4/19) 6 HP engine

dirt out of the air delivered to the engine. These small engines use thousands of gallons of air for every gallon of gasoline, so, you can see how important it is that the air your engine gets is clean and free from dirt and grit. See Photo 4/20.

Please keep the air cleaner clean so that it can trap the dirt and grit before they can reach and ruin the engine. See the Tecumseh Owners

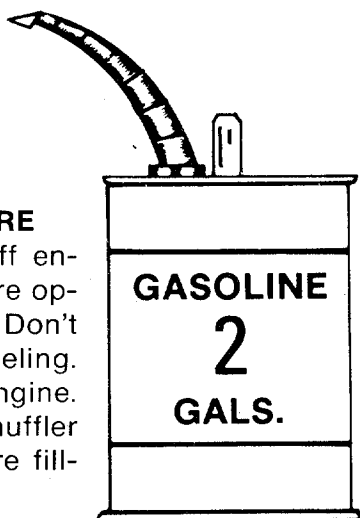


(Photo 4/20) 6 HP engine

REFUEL WITH CARE

Clean fuel spills off engine and tiller before operating engine. Don't smoke while refueling. Don't refuel a hot engine. Allow engine and muffler to cool down before filling tank.

(Sketch 4/21)



guide and the Engine Maintenance section of this manual for information on how to replace or clean your air cleaner's sponge—see page 112.

GASOLINE

Fresh unleaded automotive gasoline is recommended for the Tecumseh 6 HP engine. (Leaded "Regular" grade is an acceptable substitute.) The fuel tank has a screen to keep dirt out of your carburetor and has a 1½ gallon capacity. *Do not mix with oil.*

Stale gasoline—that has been standing for long periods—develops gum that will foul spark plugs, clog fuel lines, carburetors, floats and screens in the fuel system. Stale gasoline



(Photo 4/22) Use Forward/Reverse lever to stop.

does not vaporize properly for efficient engine performance.

With unfavorable weather conditions, gasoline containers being stored in garages, barns, sheds or on concrete floors can develop water condensation on their inner walls. The water eventually finds its way to your engine's fuel supply.

Water in the fuel is a fairly common cause for engines not starting, or running roughly. This condition is often mistaken for carburetor adjustment troubles. Many people avoid getting water into their fuel by buying a gallon or two at a time and constantly replacing it with clean, fresh gasoline. To rid your fuel tank of watery or stale fuel, disconnect the fuel line and drain it into a container—keeping it away from all flames, sparks, cigarettes, or hot engine parts.

To prevent formation of gum and varnish in gasoline that has been standing for long periods (several months), there is an alternative to draining out the fuel. It is to put one ounce of a product called *STABIL*® in your fuel tank and fill the tank up to the top. This will keep harmful gums from forming for up to one year at a very small cost. An 8 ounce can will cost \$3.00 and can likely be obtained from your local Tecumseh Engine Distributor. See page 3 of your Tecumseh engine instructions.

The above is a good method for Winter storage of your tiller, too. You just start your engine right up and consume the *STABIL*, too.

But if your engine won't start in the spring, you can drain the fuel out of the tank and *the carburetor bowl too*. Replace it with clean, fresh gasoline. Then, it won't be hard to start. The real advantage is that your carburetor seals will be kept moist and gums and varnish from stale gasoline will not be formed to gum-up fuel lines and the carburetor passageways.

STARTING THE 6 HP ENGINE

First make sure that the tiller Wheel Speed Shift Lever is in slow speed and the Forward/Reverse Lever is in Neutral before starting the engine.

1. Push the throttle lever to the left, to a slow running position. Then, push the choke lever in to FULL CHOKE (for a cold engine).
2. Pull gently on the starter rope for a few inches until you feel a resistance, then give the starter rope a quick, firm pull. On Electric Start Models, turn the key to "START" and hold it there momentarily. Release the key when the engine starts.
3. As soon as the engine fires and is running, make sure that the throttle lever is at a slow running position and move the choke to HALF CHOKE briefly. Then as the engine warms, move the choke to the OFF position. It's a good practice to let your engine run a good two or three minutes before starting tilling operations. Never till unless the choke is OFF.

After the engine has been operating for ten minutes or more in the garden, it probably won't be necessary to choke the engine at all to restart it.

STOPPING THE ENGINE

1. Push the throttle lever on the handle all the way forward (to the right). This lever will move the throttle wire and the remote speed control lever to the front where the lever contacts the shutoff clip, and stops the engine automatically. If your engine does not shut down under these circumstances, push the choke in to FULL CHOKE to stop the engine, and see the data and Photo 7/63 in this manual for further advice. The lever must contact the shutoff switch (Photo 4/13).

OWNERS PLEASE NOTE:

A properly adjusted Forward/Reverse Lever should make emergency engine shut-offs unnecessary. You should always be able to stop tiller motion with the Forward/Reverse Lever by lifting the lever into the Neutral position. This action will stop all machine motion except the engine, the engine pulley and belts. The belts, however, will not provide power to make the tiller move while the lever is in Neutral. See Photo 4/22.

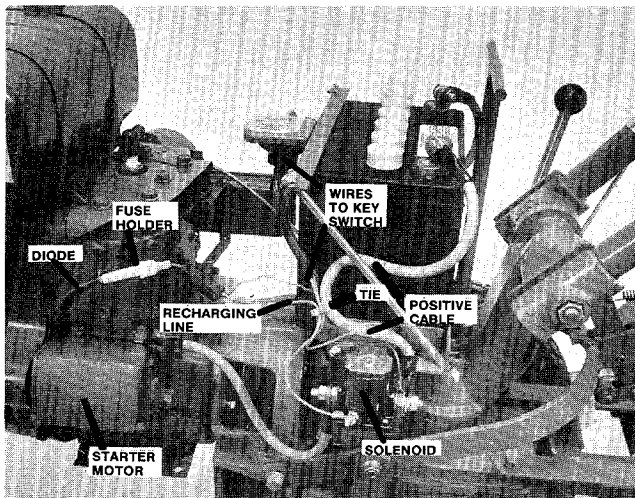
ELECTRIC START SYSTEM ON 6 HP TECUMSEH ENGINE

For hookup and preparation of your 12-volt battery electric start system, please see Section 1, page 24. For service and maintenance and for operation of the engine without a battery or with a dead battery, see note on page 27. For storage of your tiller with electric start remove battery and store in cool, dry place. Temperatures for storage ranging from 10°F to 45°F are best, as long as your battery acid retains its state of charge. You can even store the battery outdoors (in a safe place). If the state of charge is very low when temperatures below freezing occur, you could damage the battery. Never store a battery indoors in a warm place for extended periods.

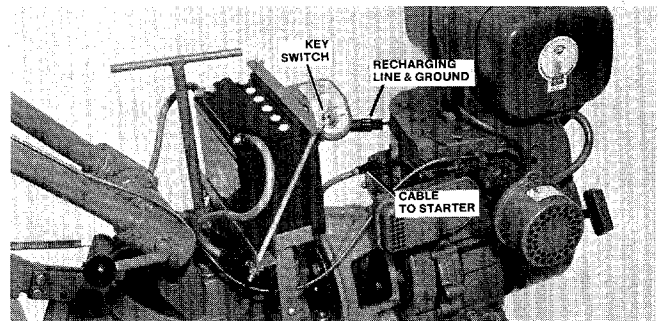
When the tiller is not going to be used for two or three months, or extended periods such as over the winter, remove the battery from its mounting.

If it is convenient for you to check the battery's condition every 3 or 4 weeks, you could hook the battery back up to the tiller's electric start system. Then, you could start the engine on your tiller (outdoors) and run it for 45 to 60 minutes at intermediate speed. If the engine is started easily with the battery, and the battery acid level in each cell is up between the acid level lines, then that's reasonable evidence that everything is O.K.

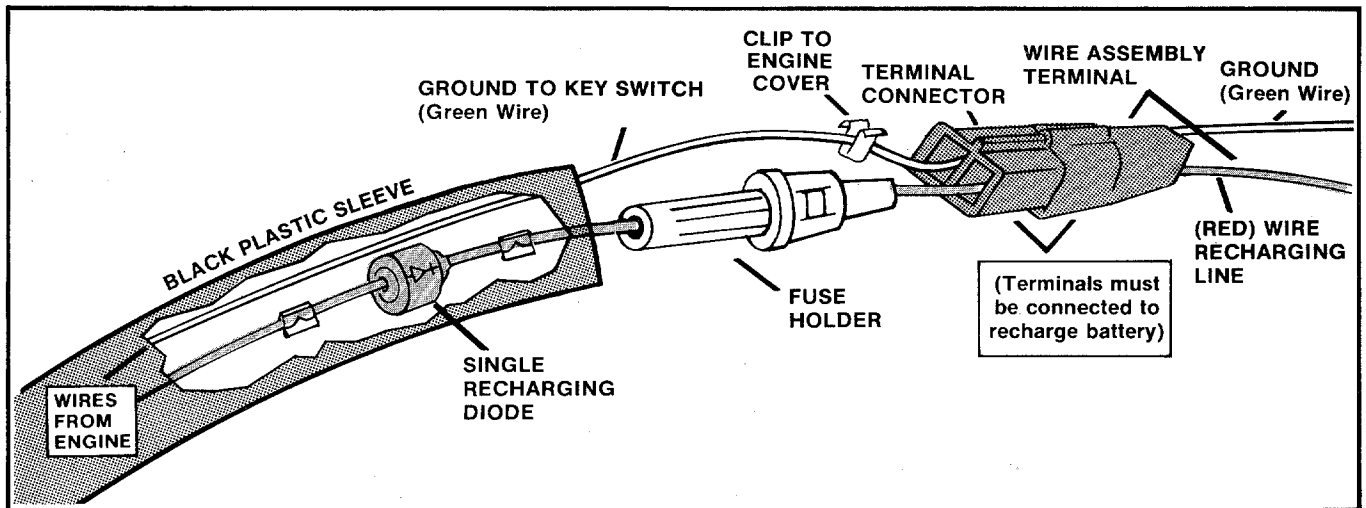
IMPORTANT: Check battery acid level every 10 hours of tiller operation.



Left side of tiller



Right side of tiller

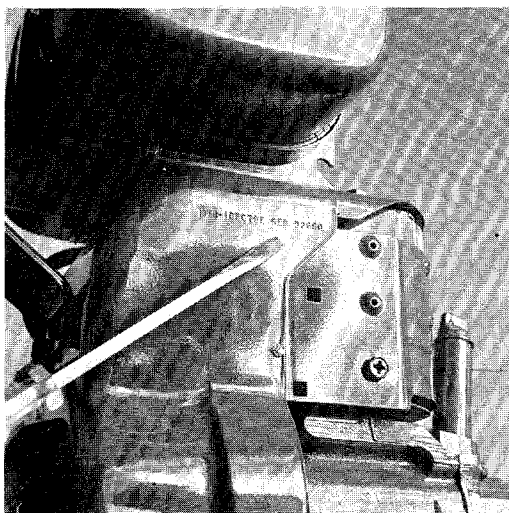


(Sketch 4/24) 6 HP electric start engine battery recharging line and diode details.

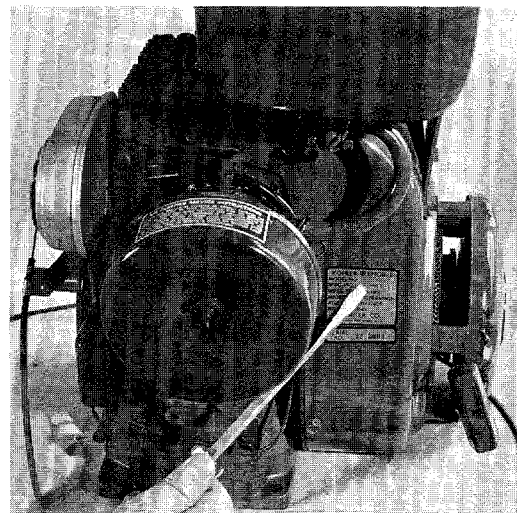
TECUMSEH-LAUSON 6 H.P. ENGINE

LOCATING ENGINE MODEL NUMBERS

KOHLER 7 H.P. ENGINE



LOOK HERE—On the side of the engine blower housing opposite the starter rope.



LOOK HERE—Model and spec. nos. on Kohler name plate.

7 H.P. KOHLER ENGINE

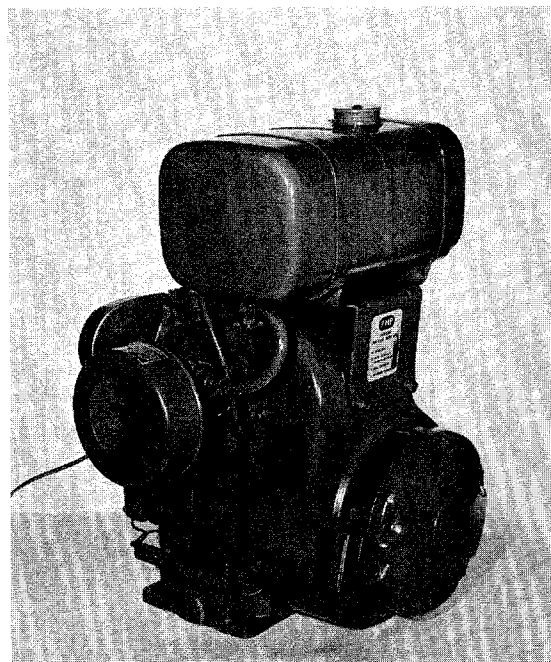
Pictured at the right is the 7 horsepower Kohler engine. It is a powerful and durable engine which should last a long, long time, if given proper and regular maintenance. This engine has a manually operated choke and a stop button, both found at the engine. Details of the operation of the throttle, choke, stop button and other engine components are described below under "Controls And Operation."

Please remember to clean the paper air filter element often, check and replace the engine oil (use SE classified oil) on a regular maintenance schedule. Replace the engine oil at least every ten hours, or sooner when tilling conditions are really dusty and you detect or suspect dirt or grit has infiltrated into the engine. Your fuel tank should keep the engine running for two hours or more, so between four and five fuel tanks should be a reasonable interval to change oil.

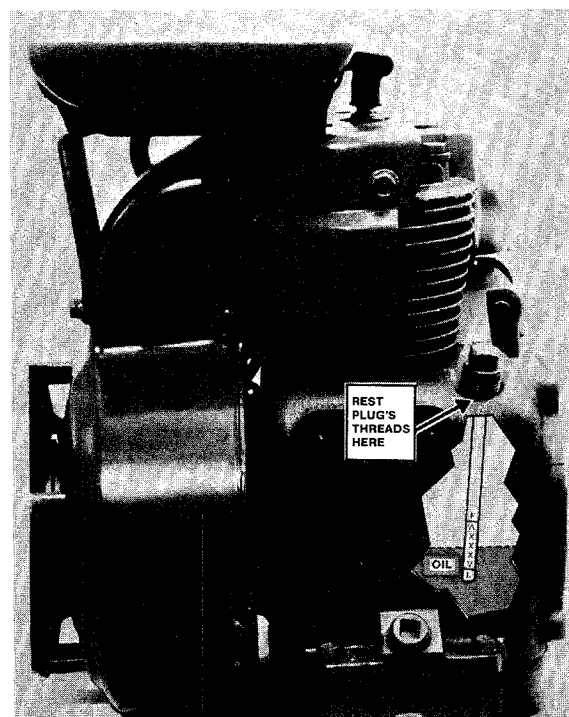
ADDING OIL

With a *new engine* add 2½ pints of SE rated motor oil of #30 weight (viscosity) to the engine's crankcase. Remove the square capped pipe *plug and dipstick* and fill oil through that hole. SE oil has a higher operating heat range than SC oil. SE can be used where SC is recommended.

When measuring oil level with the dipstick, keep the engine base level and **DO NOT THREAD PLUG INWARD TO MEASURE**, instead, rest the threads of THE PLUG on top of hole. Remove the dipstick to measure the oil level—as shown in Photo 4/26.



(Photo 4/25) 7 HP Kohler engine.



(Photo 4/26) 7 HP engine, rest dipstick's threads on top of hole. Don't thread in.

REPLENISHING OIL

You will note that the capacity of your 7 HP engine is about 1/2 pint more than one quart of motor oil when filling a new engine or a short block for an engine repair. It is assumed that some dirty oil will likely cling to the sidewalls of the engine crankcase, especially if the engine is drained while it is cold. It should take about one quart to bring the new oil up to proper level. Please Note: It is recommended that you run the engine for 10 or 15 minutes to heat the oil up before draining it. This will minimize the amount left in the engine.

Large masses of dirt and grime often come out with the last few ounces of oil, so drain the engine completely by tilting the engine towards the drain hole (put a thick board or brick under one wheel).

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THROTTLE CABLE

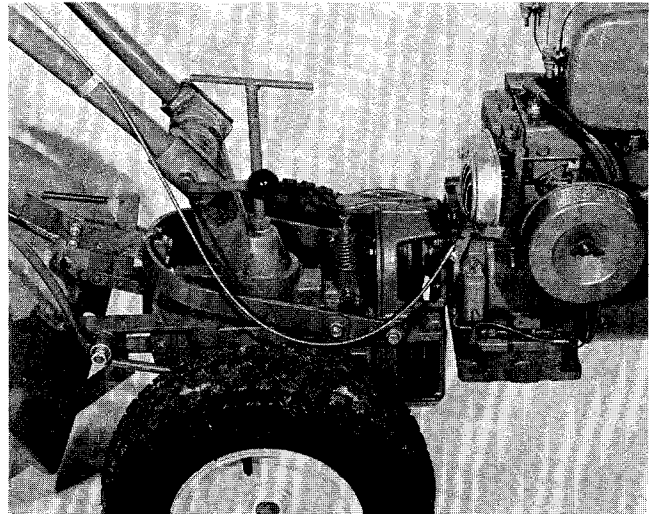
The throttle cable on a 7 HP Troy-Bilt Tiller runs down the right handlebar and dips down outside of the yoke (which raises the engine to tighten the belts) and across to the governor control disc. A small metal clamp and a screw holds the throttle casing in position. See Photo 4/27 for the routing of the cable and the next photo for close up details.

HOOKUP

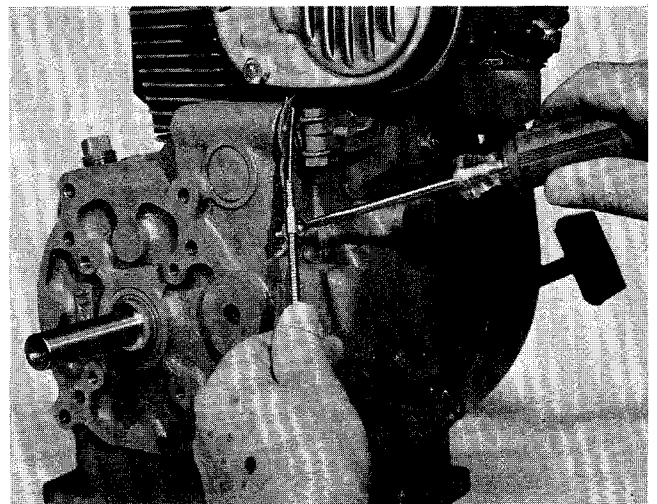
Once the throttle wire is run through the clamp and installed in the closest, most accessible hole in the governor control disc, then you can secure the cable with the screw as shown in Photo 4/28. Leave a little bit of cable projecting beyond the clamp so it will hold properly.

AIR TEMPERATURE	OIL VISCOSITY
Above 30° F.	30
30° F to 0° F.	10W - 30
Below 0° F.	5W - 20

In general you should use #30 motor oil while tilling in warm weather, and be sure to use oil that has a service classification of SE, which we recommend for use on all engines for Troy-Bilt Tillers. Note that in colder weather multi-viscosity oil is recommended in the above table. Use about one quart of oil for a refill, but let your dipstick be your final guide as to when you have reached the FULL mark on the dipstick.



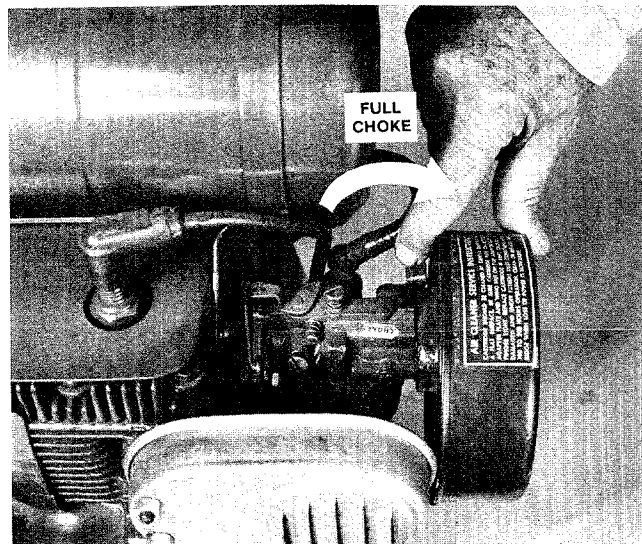
(Photo 4/27) Route cable outside of yoke.



(Photo 4/28) 7HP Kohler engine throttle cable wire goes into first hole of disc. Tighten clamp securely.

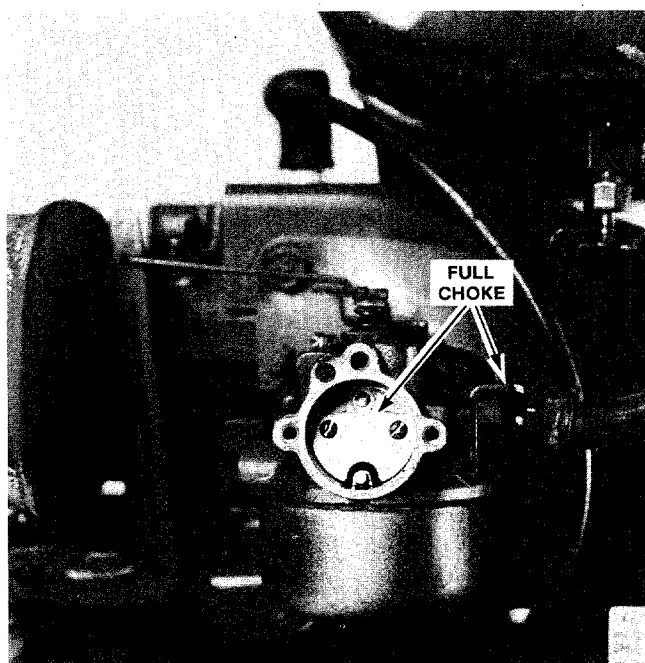
CHOKE

The 7 HP Kohler engine uses a manually operated choke shown in FULL Choke position in Photo 4/29. Photos 4/30 and 4/31 show that when the lever is in FULL Choke position, the butterfly closes the air opening to the carburetor, and the choke in the OFF position leaves air an unrestricted passage into the carburetor. So, in starting a cold engine with FULL choke in use, the fuel mixture going through the carburetor will be very rich. Be very sure to turn your choke off promptly when the engine has started. Running an engine under heavy workloads with the choke on FULL can cause excessive carbon buildup and do harm to the engine.

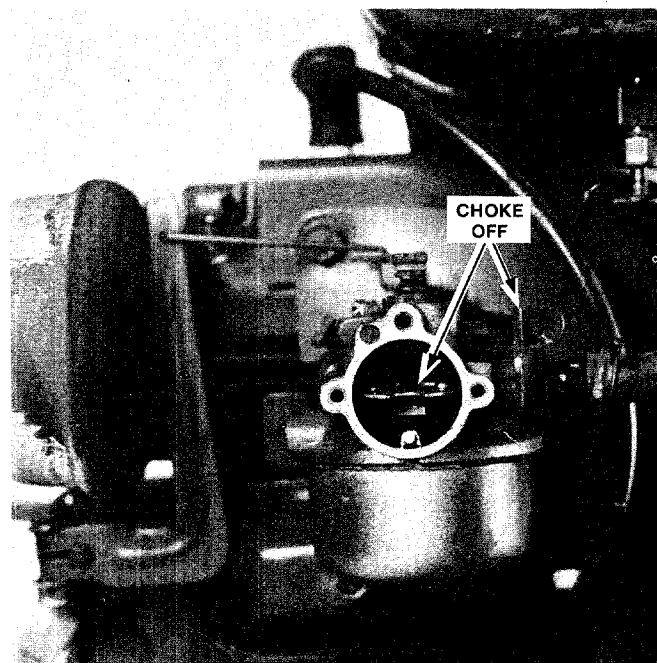


(Photo 4/29) Move choke **toward** you for **FULL Choke**, **away** from you for Choke OFF position.

4



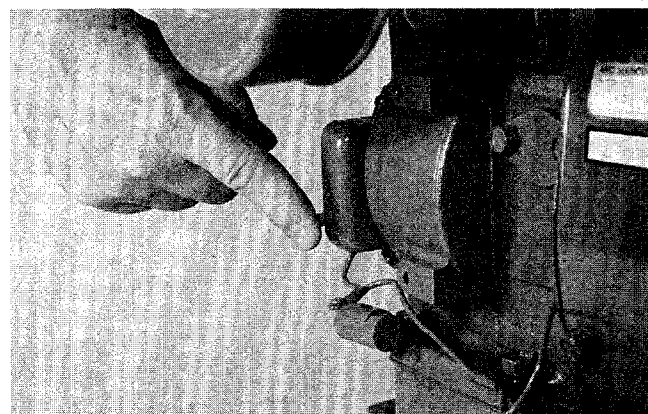
(Photo 4/30) **FULL Choke**, butterfly closes.



(Photo 4/31) **Choke OFF**, butterfly opens.

ENGINE STOP BUTTON

To the left of the air filter, between it and the throttle cable, you'll find the engine stop button. Push it in and hold it in, to stop the engine—see Photo 4/32. Underneath the cover with the stop button are the engine's breaker points.



(Photo 4/32) Push in on stop button and hold it in, to stop engine.

STARTING 7 H.P. ENGINE

Instructions for starting the Kohler engine are as follows: First, make sure that the tiller Forward/Reverse Lever is in the Neutral position and the Wheel Speed Shift Lever is in Low Speed position.

1. Turn on the fuel valve under the gas tank.
2. Move the choke to the FULL choke position shown in Photo 4/29.
3. Just crack open the throttle lever on the handlebar a very small amount. (Avoid flooding the engine with fuel.) Kohler engines have a very fine automatic compression release called ACR which makes starting your 7 HP engine very easy.
4. Pull the rope, recoil starter.
5. After the engine is running, gradually return the choke to the "Open" position.

GASOLINE

Fill fuel tank with clean, fresh **Regular** grade gasoline. You can use leaded or non-leaded fuel but make sure that the octane rating is at least 90. Don't mix oil with gasoline.

GOVERNOR

Your 7 HP engine has a mechanical governor that can be adjusted for varying speeds as indicated in the Kohler engine pamphlet you received with your tiller. See Photo 4/33 for a closeup view of the external governor controls. The external controls are attached to the governor shaft which leads inside the engine.

GENERAL INFORMATION

Your engine has an automatic compression release system which makes it easy to pull the engine through for starting.

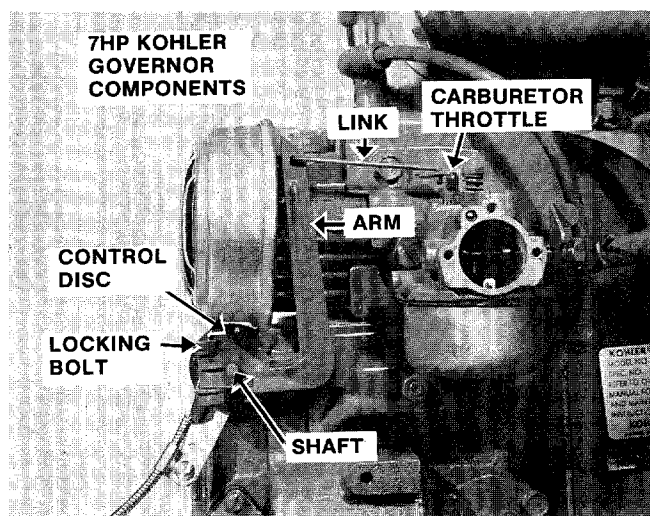
The breaker points for your engine are mounted outside the engine under the same cover used by the stop button. For service of these points, see your Kohler engine pamphlet under Ignition System Service. The breaker points are shown in Photo 4/34. Your engine pamphlet will show you how to adjust the points. The condenser is shown in Photo 4/34 below the breaker points (outside of the cover).

When putting the engine away, after it has cooled down, it is good practice to pull the starter cord slowly until you feel engine compression resisting your pull. This means that both valves in the engine are closed. Leaving the valves closed when the engine is not being used can help prevent the entrance of moisture into your engine.

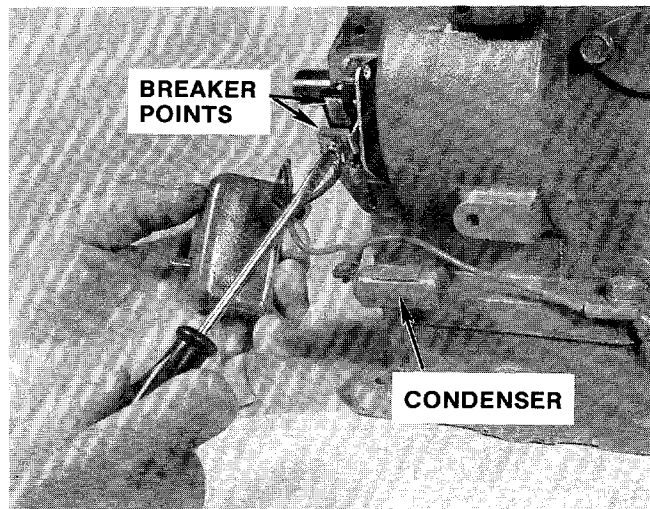
STOPPING THE KOHLER ENGINE

1. Put the tiller Forward/Reverse Lever in Neutral position.
2. Push the stop button and hold the button in until the engine stops. The stop button is shown in Photo 4/32 of this manual.
3. Turn the fuel valve off.

In an emergency, to stop the engine, or if the engine continues to run when the ignition is turned off, apply FULL choke and open the throttle to stall the engine.



(Photo 4/33) External governor linkage for 7 HP Kohler engine.



(Photo 4/34) Breaker points and condenser are externally mounted for easier service.

CARBURETOR

The carburetor shown in Photo 4/35 supplies a mixture of vaporized gasoline and air to the cylinder's combustion chamber. The carburetor includes the carburetor body, throttle, choke and fuel bowl.

**IF YOU HAVE AN ENGINE PROBLEM...
FIRST, READ YOUR ENGINE OWNER'S
MANUAL TO SEE IF THE ANSWER
YOU SEEK IS RIGHT THERE.**

The following information provided in this manual is not meant to be a substitute for an Authorized Serviceman for you. It is intended to give you a little helpful background and understanding of what's going on in your engine. Hopefully, it might help you to solve minor problems and understand the need for effective maintenance.

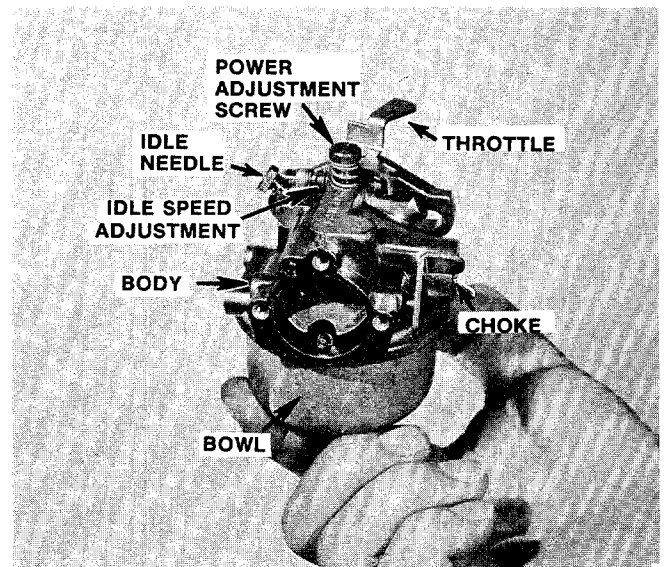
ENGINE COVERS HELP TO COOL ENGINE

Please don't remove any of the engine shroud or covers (see Photo 4/1) in an attempt to "give it more air for cooling." You would be defeating your own purpose. The cooling fins, shroud and covers are carefully designed to direct the greatest volume of air over all points of the engine to avoid uneven heating. Removing a section of these coverings would change the air flow from its designed-in course. This could cause "hot spots" to develop in your engine and could cause damage or even ruin it.

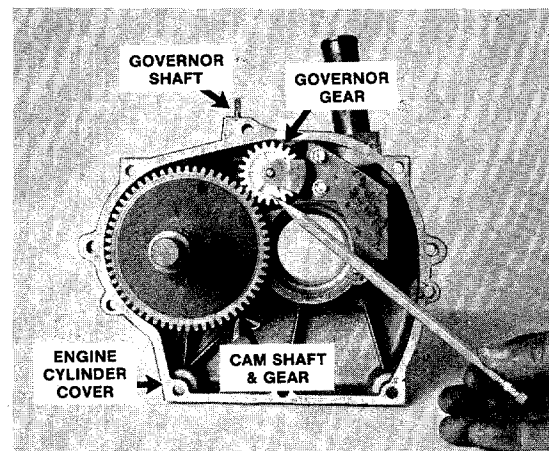
GOVERNOR-6 HP TECUMSEH-LAUSON

Your engine has a mechanical governor which protects the engine by limiting engine speed while it allows the engine to obtain the proper power for varying loads. It very likely won't need any adjustments for years as long as the levers and wires are not bent. So, it's wise not to make unnecessary adjustments to the governor.

Inside the engine mounted on a gear and shaft are a governor spool and two weights that are affected by centrifugal force in relation to engine R.P.M.—see Photo 4/36. The faster the



(Photo 4/35) Carburetor for 7HP Kohler engine.



(Photo 4/36) Governor for 6 H.P. engine.

weights spin, the more force they exert against governor spring tension to close the throttle. While the spring works to open the carburetor throttle, the governor lever and linkage tend to close the throttle. The opposing forces find a balance point and keep the engine virtually at a constant speed. Maximum engine R.P.M. is 3600.

ENGINE COOLING

Don't remove any parts of the engine covers or the engine shroud (see Photo 4/1). These covers are designed to direct cooling air from the flywheel over all parts of the engine. If you removed part of these covers your engine would grow hotter not cooler.

Make sure that dirt, grass, leaves and debris are cleaned from the cooling fins on the top and sides regularly.

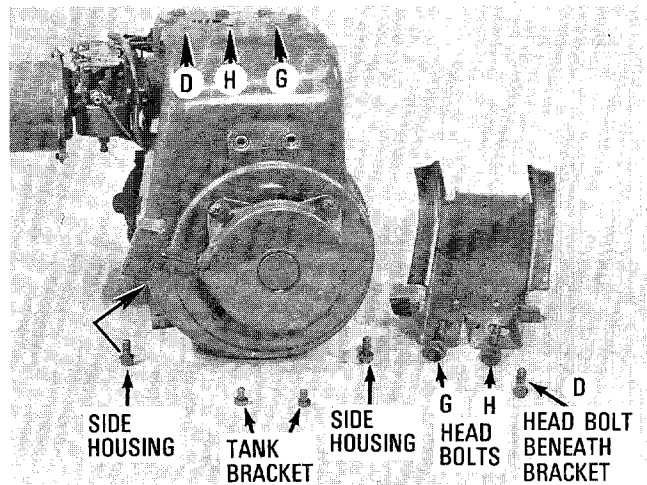
IMPORTANT: Please remember that your engine Warranty stipulates that anyone (including yourself) other than an Authorized Service Dealer or Distributor for the engine manufacturer, who repairs or alters the engine automatically voids the one year Warranty that comes with your engine on your new Troy-Bilt Roto Tiller.

If you have any difficulty in finding an Authorized Service Dealer or in obtaining Warranty service from such a dealer, or in understanding the Warranty, please write to our Service Department, or call if the need is urgent, so that we may help you.

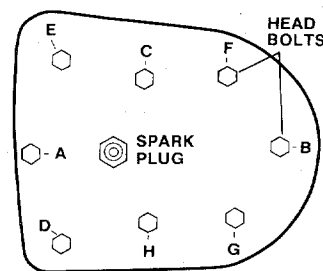
4

ENGINE HEAD BOLT TIGHTENING ORDER

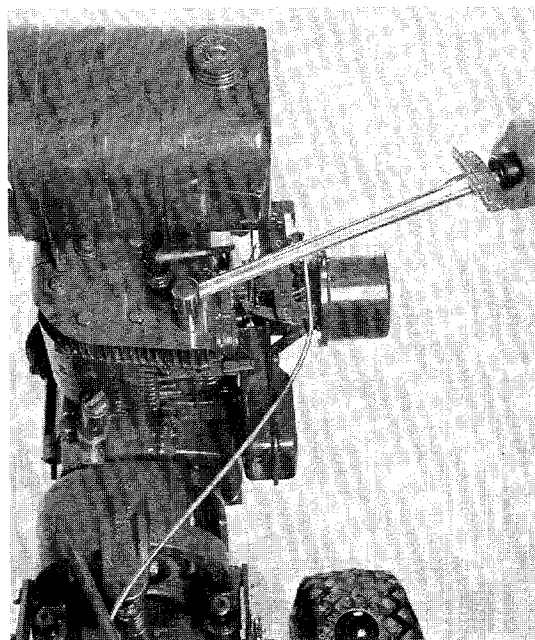
The correct sequence for replacing the head bolts is shown in Sketch 4/38. First, thread in bolts labeled A, B, C, D, E and F. Now tighten and torque them (with a torque wrench) to 140-200 inch-lbs. in the same sequence. Make sure D (also shown in Photo 4/37) is properly tightened down because it's covered 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 4/37, put the two small bolts in the holes on the bottom of the tank bracket. The 6 HP head bolt order is above.



(Photo 4/37) Two head bolts G & H in photo are used to fasten down the fuel tank bracket. Therefore, head bolt D has to be tightened before the bracket is installed. Please follow the bolt tightening sequence as explained under "Head Bolts" and shown in Sketch 4/38.

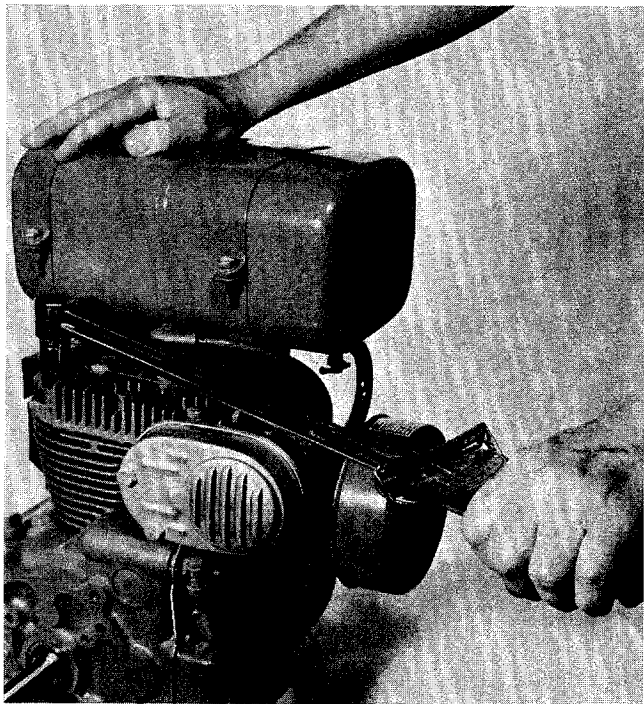


(Sketch 4/38) 6 HP Tecumseh engine head bolt tightening sequence.)



(Photo 4/39) Tightening head bolts on 6 HP engine. See tightening sequence above and in Sketch 4/38.

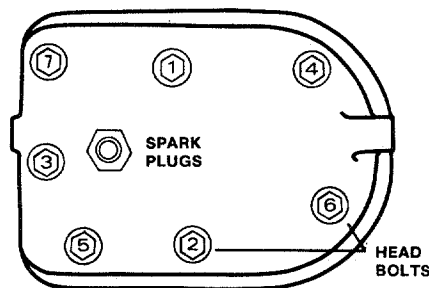
Tighten the head bolts of your 7HP Kohler engine to 180 - 240 inch-lbs. in the sequence shown in Sketch 4/40. Simply partially tighten the bolts as Numbered 1 through 7 and go back over the same sequence for final tightening. Check head bolts for tightness after 8 to 10 hours of operation on new engines and on engines that have had the head removed or a new gasket installed.



(Photo 4/41) Tightening head bolts on 7HP Kohler with a torque wrench.

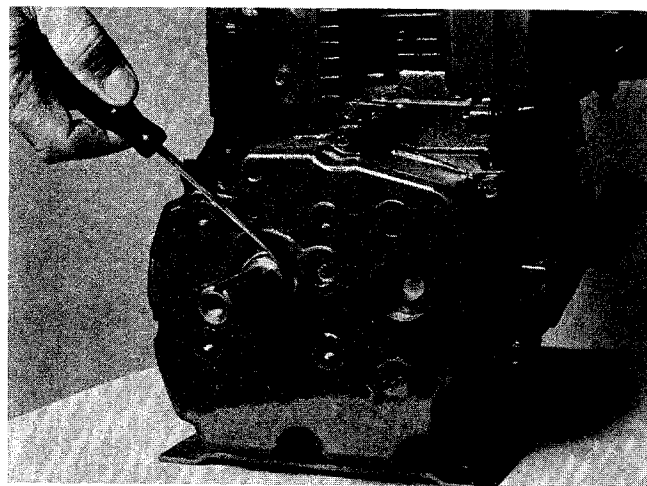
IF OIL LEAKS FROM ENGINE

Engine oil leaks may be evidenced by oil found in the bottom well of the motor mount, part number 1002. A leak could be from a cover gasket, a bottom gasket, or from an engine oil seal shown in Photo 4/42. Of course, the engine has to be removed to correct an oil leak from the cover or the seal.



(Sketch 4/40) Head bolt tightening sequence for 7 HP Kohler engine is in order shown in this sketch.

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(Photo 4/42) Screwdriver points to 6 HP engine oil seal.