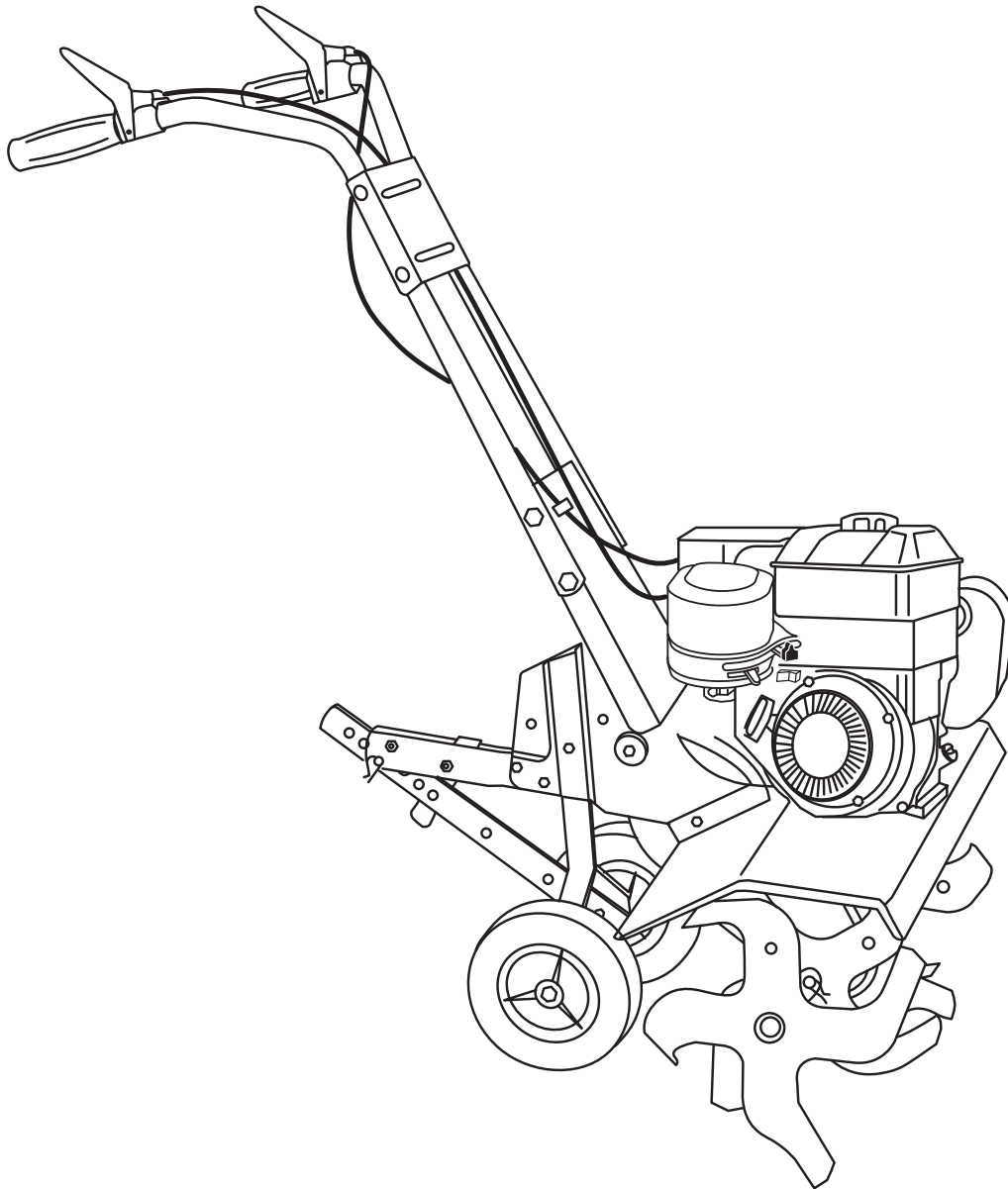


# Jonsered®



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## Operator's Manual

# J208F24

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**⚠WARNING:** Please read this manual carefully and make sure you understand the instructions before using machine.

Gasoline containing up to 10% ethanol (E10) is acceptable for use in this machine.  
The use of any gasoline exceeding 10% ethanol (E10) will void the product warranty.

# SAFETY RULES



## Safe Operation Practices for Walk-Behind Powered Rotary Tillers



### TRAINING

- Read this Manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
- Never allow children to operate the equipment. Never allow adults to operate the equipment without proper instruction.
- Keep the area of operation clear of all persons, particularly small children, and pets.

### PREPARATION

- Thoroughly inspect the area where the equipment is to be used and remove all foreign objects.
- Disengage all clutches and shift into neutral before starting the engine (motor).
- Do not operate the equipment without wearing adequate outer garments. Wear footwear that will improve footing on slippery surfaces.
- Handle fuel with care; it is highly flammable.
- Use an approved fuel container.
- Never add fuel to a running engine or hot engine.
- Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors.
- Replace gasoline cap securely and clean up spilled fuel before restarting.
- Use extension cords and receptacles as specified by the manufacturer for all units with electric drive motors or electric starting motors.
- Never attempt to make any adjustments while the engine (motor) is running (except where specifically recommended by manufacturer).

### OPERATION

- Do not put hands or feet near or under rotating parts.
- Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic. Do not carry passengers.
- After striking a foreign object, stop the engine (motor), remove the wire from the spark plug, thoroughly inspect the tiller for any damage, and repair the damage before restarting and operating the tiller.
- Exercise caution to avoid slipping or falling.
- If the unit should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning of trouble.
- Stop the engine (motor) when leaving the operating position.
- Take all possible precautions when leaving the machine unattended. Disengage the tines, shift into neutral, and stop the engine.
- Before cleaning, repairing, or inspecting, shut off the engine and make certain all moving parts have stopped. Disconnect the spark plug wire, and keep the wire away from the plug to prevent accidental starting. Disconnect the cord on electric motors.
- Do not run the engine indoors; exhaust fumes are dangerous.

- Never operate the tiller without proper guards, plates, or other safety protective devices in place.
- Keep children and pets away.
- Do not overload the machine capacity by attempting to till too deep at too fast a rate.
- Never operate the machine at high speeds on slippery surfaces. Look behind and use care when backing.
- Never allow bystanders near the unit.
- Use only attachments and accessories approved by the manufacturer of the tiller.
- Never operate the tiller without good visibility or light.
- Be careful when tilling in hard ground. The tines may catch in the ground and propel the tiller forward. If this occurs, let go of the handlebars and do not restrain the machine.

### MAINTENANCE AND STORAGE

- Keep machine, attachments, and accessories in safe working condition.
- Check shear pins, engine mounting bolts, and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.
- Never store the machine with fuel in the fuel tank inside a building where ignition sources are present, such as hot water and space heaters, clothes dryers, and the like. Allow the engine to cool before storing in any enclosure.
- Always refer to the operator's guide instructions for important details if the tiller is to be stored for an extended period.

### - IMPORTANT -

CAUTIONS, IMPORTANTS, AND NOTES ARE A MEANS OF ATTRACTING ATTENTION TO IMPORTANT OR CRITICAL INFORMATION IN THIS MANUAL.

**IMPORTANT:** USED TO ALERT YOU THAT THERE IS A POSSIBILITY OF DAMAGING THIS EQUIPMENT.

**NOTE:** Gives essential information that will aid you to better understand, incorporate, or execute a particular set of instructions.



**Look for this symbol to point out important safety precautions. It means CAUTION!!! BECOME ALERT!!! YOUR SAFETY IS INVOLVED.**



**CAUTION: Always disconnect spark plug wire and place wire where it cannot contact spark plug in order to prevent accidental starting when setting up, transporting, adjusting or making repairs.**

## PRODUCT SPECIFICATIONS

Gasoline Capacity:	3.2 Quarts (3.6 Liters) Unleaded Regular
Oil (API:SG-SL): (Capacity: 20 oz./0.6 L)	SAE 30 (Above 32°F / 0°C) SAE 5W30 (Below 32°F / 0°C)
Spark Plug :	Champion RC12YC (Gap: .030" / 0.76 mm)

**CONGRATULATIONS** on your purchase of a new tiller. It has been designed, engineered and manufactured to give you the best possible dependability and performance.

Should you experience any problems you cannot easily remedy, please contact your nearest authorized service center. We have competent, well-trained technicians and the proper tools to service or repair this unit.

Please read and retain this manual. The instructions will enable you to assemble and maintain your tiller properly. Always observe the "SAFETY RULES".

## CUSTOMER RESPONSIBILITIES

- Read and observe the safety rules.
- Follow a regular schedule in maintaining, caring for and using your tiller.
- Follow instructions under "Maintenance" and "Storage" sections of this Manual.

**IMPORTANT:** THIS UNIT IS EQUIPPED WITH AN INTERNAL COMBUSTION ENGINE AND SHOULD NOT BE USED ON OR NEAR ANY UNIMPROVED FOREST-COVERED, BRUSH-COVERED OR GRASS COVERED LAND UNLESS THE ENGINE'S EXHAUST SYSTEM IS EQUIPPED WITH A SPARK ARRESTER MEETING APPLICABLE LOCAL LAWS (IF ANY). IF A SPARK ARRESTER IS USED, IT SHOULD BE MAINTAINED IN EFFECTIVE WORKING ORDER BY THE OPERATOR.

IN THE STATE OF CALIFORNIA, A SPARK ARRESTER IS REQUIRED BY LAW (SECTION 4442 OF THE CALIFORNIA PUBLIC RESOURCES CODE). OTHER STATES MAY HAVE SIMILAR LAWS. FEDERAL LAWS APPLY ON FEDERAL LANDS. SEE YOUR AUTHORIZED SERVICE CENTER/DEPARTMENT FOR SPARK ARRESTER.

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# ASSEMBLY

Your new tiller has been assembled at the factory with exception of those parts left unassembled for shipping purposes. To ensure safe and proper operation of your tiller all parts and hardware you assemble must be tightened securely. Use the correct tools as necessary to insure proper tightness.

## TOOLS REQUIRED FOR ASSEMBLY

A socket wrench set will make assembly easier. Standard wrench sizes are listed.

- (1) Utility knife
- (1) Screwdriver
- (1) Pair of pliers
- (2) 1/2" wrenches

## OPERATOR'S POSITION (See Fig. 1)

When right or left hand is mentioned in this manual, it means when you are in the operating position (standing behind tiller handles).

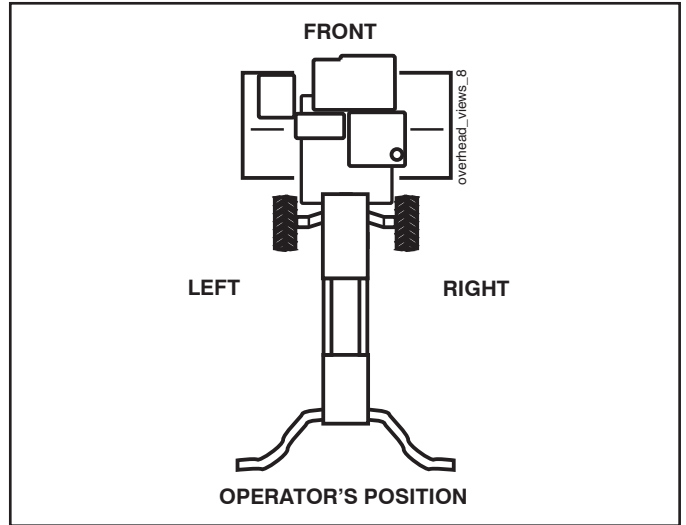
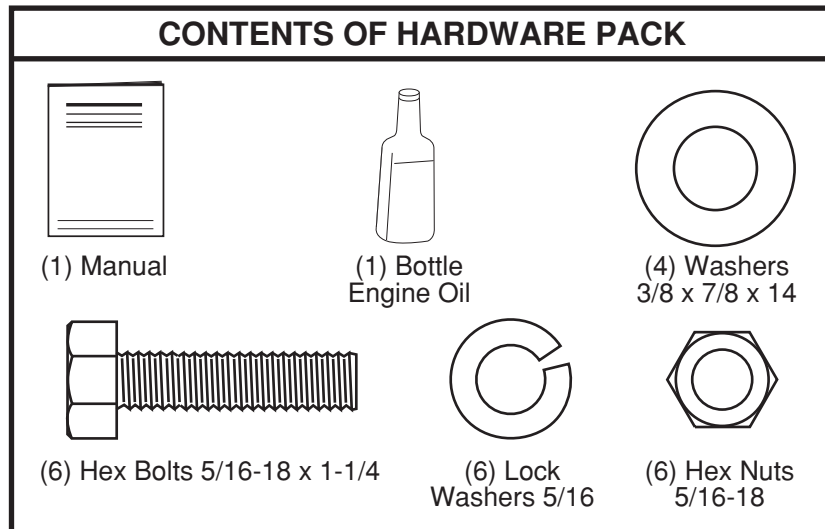


Fig. 1



# ASSEMBLY

## UNPACK CARTON & INSTALL HANDLE (See Fig. 2)



**CAUTION:** Be careful of exposed staples when handling or disposing of cartoning material.

**IMPORTANT:** WHEN UNPACKING AND ASSEMBLING TILLER, BE CAREFUL NOT TO STRETCH OR KINK CABLE(S).

- Cut cable ties securing handles.
- Slowly lift handle assembly up, route cable(s) as shown and align handle holes with handle panel hole and slot.
- Loosely assemble hardware as shown. Repeat for opposite side. Tighten all hardware securely.
- Cut cable ties securing tiller to skid and remove tiller from skid.
- Remove screws securing depth stake to skid and discard the screws.

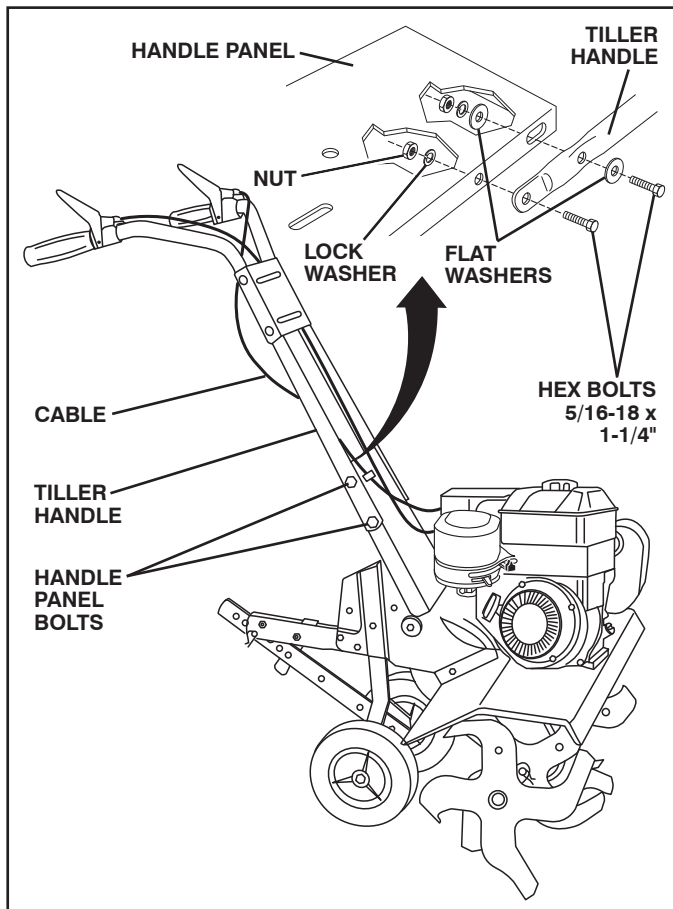


Fig. 2

## INSTALL DEPTH STAKE ASSEMBLY (See Fig. 3)

- Loosen nut "A".
- Insert stake support between engine bracket halves with stake spring down.
- Bolt stake support to engine brackets with bolts, lock washers and nuts. Tighten securely. Tighten nut "A".
- Depth stake must move freely. If it does not, loosen support bolt.

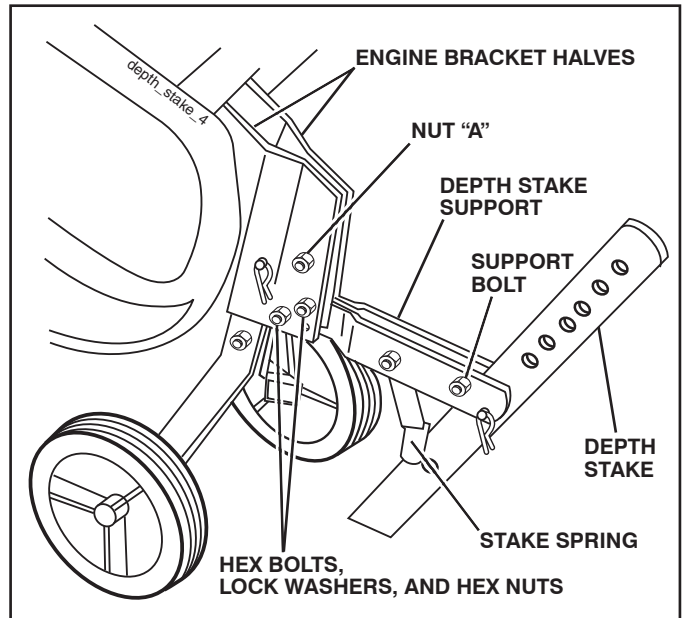


Fig. 3

## HANDLE HEIGHT

- Handle height may be adjusted to better suit operator. (See "HANDLE HEIGHT" in the Service and Adjustments section of this manual).

## TILLING WIDTH

- Tilling width may be adjusted to better handle your tilling conditions (See "TINE ARRANGEMENT" in the Service and Adjustments section of this manual).

## TINE OPERATION

- Check tine operation before first use. (See "TINE OPERATION CHECK" in the Service and Adjustments section of this manual).

# OPERATION

## KNOW YOUR TILLER

### READ THIS MANUAL AND SAFETY RULES BEFORE OPERATING YOUR TILLER.

Compare the illustrations with your tiller to familiarize yourself with the location of various controls and adjustments. Save this manual for future reference.

These symbols may appear on your Tiller or in literature supplied with the product. Learn and understand their meaning.

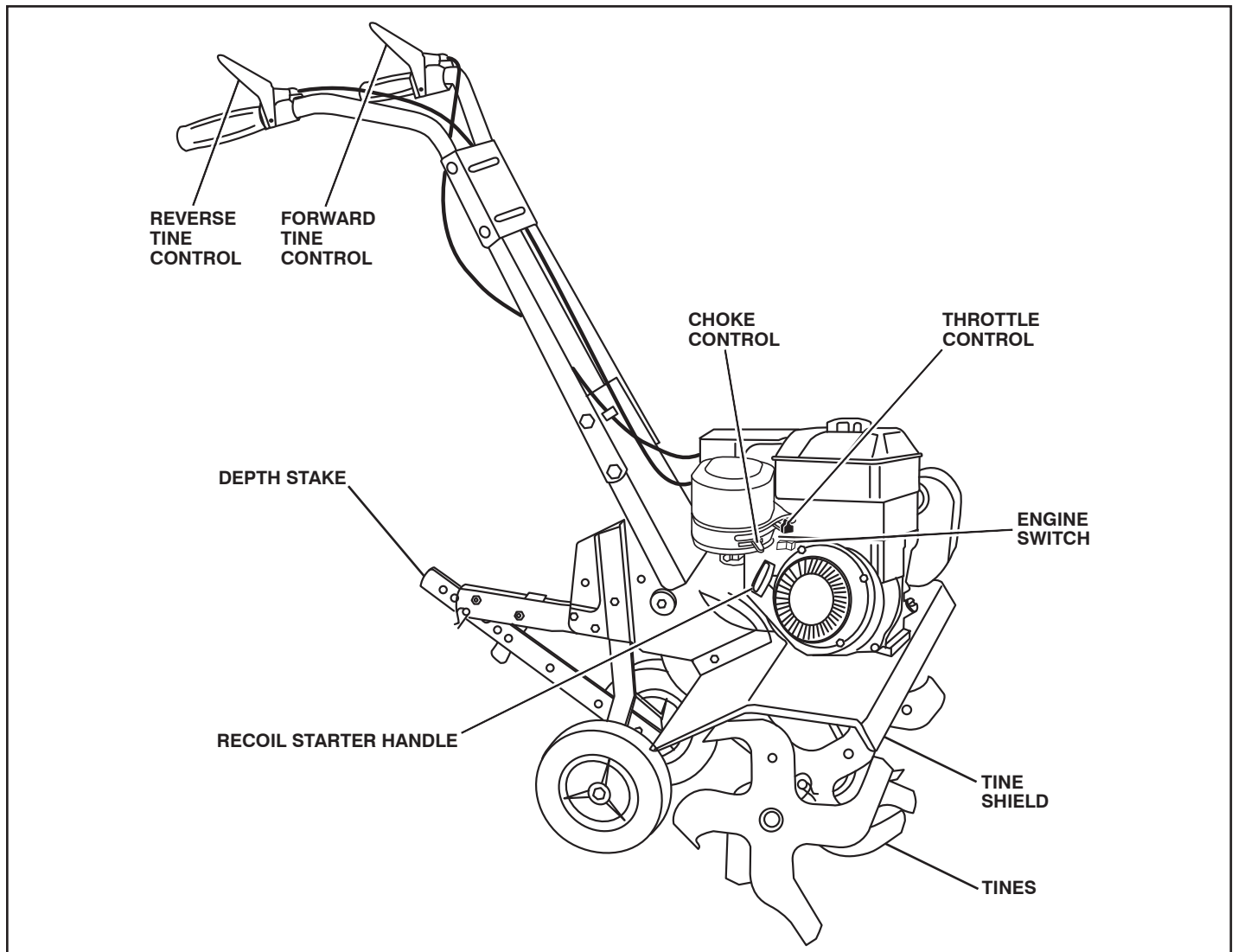
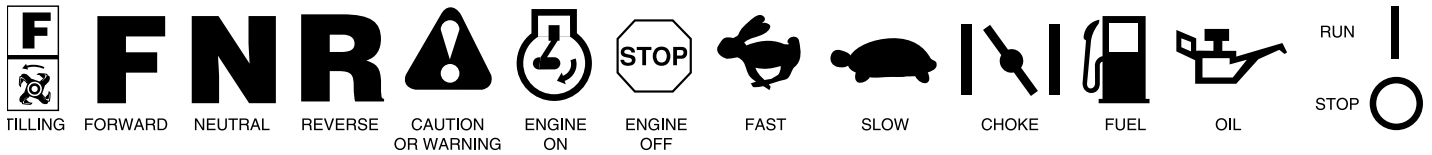


Fig. 4

## MEETS ANSI SAFETY REQUIREMENTS

Our tillers conform to the safety standards of the American National Standards Institute.

**CHOKE CONTROL** - Used when starting a cold engine.

**ENGINE SWITCH** - Used to stop engine. Must be in "ON" position when starting.

**DEPTH STAKE** - Controls forward speed and the depth at which the tiller will dig.

**FORWARD TINE CONTROL** - Engages tines in forward direction.

**REVERSE TINE CONTROL** - Engages tines in reverse.

**RECOIL STARTER HANDLE** - Used to start the engine in forward direction.

**6 THROTTLE CONTROL** - Controls engine speed.

# OPERATION



The operation of any tiller can result in foreign objects thrown into the eyes, which can result in severe eye damage. Always wear safety glasses or eye shields before starting your tiller and while tilling. We recommend a wide vision safety mask over spectacles or standard safety glasses.



Use ear protectors to avoid damage to hearing.

## HOW TO USE YOUR TILLER

Know how to operate all controls before adding fuel and oil or attempting to start engine.

### STOPPING (See Fig. 5)

#### TINES

- Release forward tine control to stop forward movement.
- Release reverse tine control to stop reverse movement.

#### ENGINE

- Move throttle control to "SLOW" position.
- Turn engine switch to "OFF" Position.
- Never use choke to stop engine.

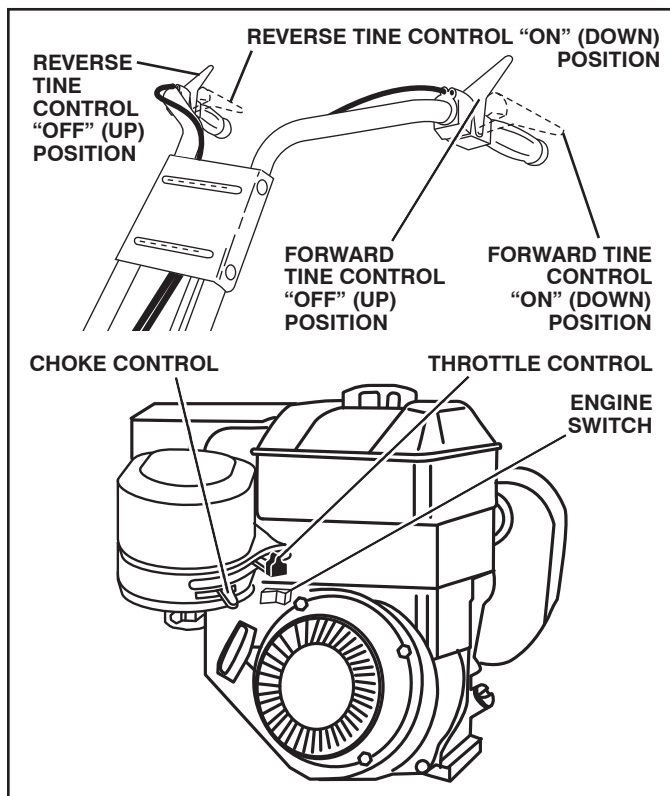


Fig. 5

### TINE OPERATION (See Fig. 5)

#### FORWARD

- With reverse tine control in the "OFF" (up) position, Squeeze forward tine control to handle.

#### REVERSE

- With forward tine control in the "OFF" (up) position, Squeeze reverse tine control to handle.

## TILLING

The speed and depth of tilling is regulated by the position of the depth stake and wheel height.

The depth stake should always be below the wheels for digging. It serves as a brake to slow the tiller's forward motion to enable the tines to penetrate the ground. Also, the more the depth stake is lowered into the ground the deeper the tines will dig.

### DEPTH STAKE (See Fig. 6)

Adjust depth stake by removing the hairpin clip and clevis pin. Change depth stake to desired position. Replace the clevis pin and hairpin clip.

- For normal tilling, set depth stake at the second or third hole from the top.

### WHEELS (See Fig. 6)

Adjust wheels by removing the hairpin clip and clevis pin. Change wheel position. Replace the hairpin clip and clevis pin.

- For normal tilling, set wheels at the second or third hole from the top.

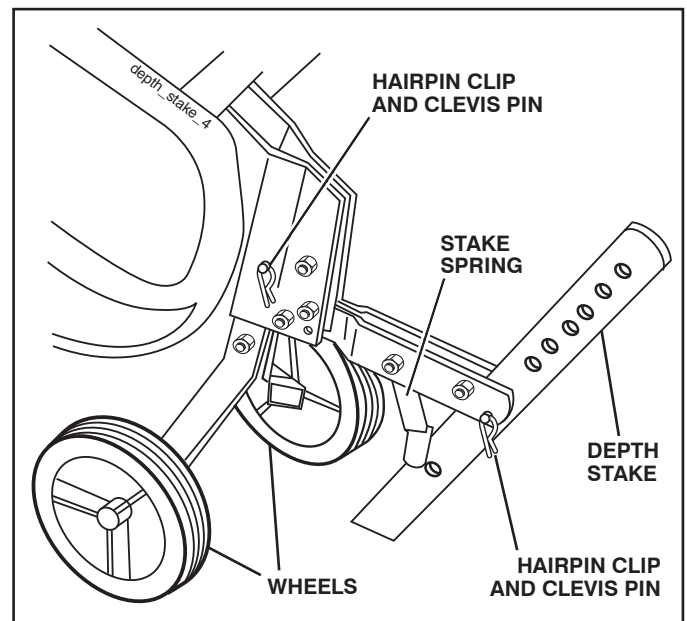


Fig. 6



# OPERATION

## TO TRANSPORT



**CAUTION:** Before lifting or transporting, allow tiller engine and muffler to cool. Disconnect spark plug wire. Drain gasoline from fuel tank.

## AROUND THE YARD

- Tip depth stake forward until it is held by the stake spring.
- Push tiller handles down, raising tines off the ground.
- Push or pull tiller to desired location.

## AROUND TOWN

- Disconnect spark plug wire.
- Drain fuel tank.
- Transport in upright position to prevent oil leakage.

## BEFORE STARTING ENGINE

**IMPORTANT:** BE VERY CAREFUL NOT TO ALLOW DIRT TO ENTER THE ENGINE WHEN CHECKING OR ADDING OIL OR FUEL. USE CLEAN OIL AND FUEL AND STORE IN APPROVED, CLEAN, COVERED CONTAINERS. USE CLEAN FILL FUNNELS.

## FILL ENGINE WITH OIL (See Fig. 7)

- With engine level, remove engine oil filler plug.
- Fill engine with oil to point of overflowing. For approximate capacity see “PRODUCT SPECIFICATIONS” on page 3 of this manual.
- Tilt tiller back on its wheels and then re-level.
- With engine level, refill to point of overflowing if necessary. Replace oil filler plug.
- For cold weather operation you should change oil for easier starting (See “OIL VISCOSITY CHART” in the Maintenance section of this manual).
- To change engine oil, see the Maintenance section of this manual.

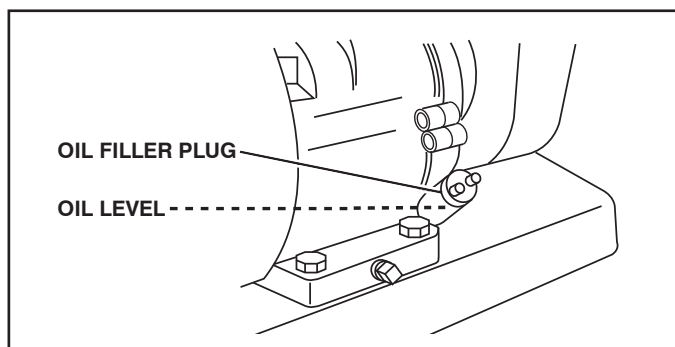


Fig. 7

## ADD GASOLINE

- Fill to within 1/2 inch of top of fuel tank to prevent spills and to allow for fuel expansion. Do not overfill. Use fresh, clean, regular unleaded gasoline with a minimum of 87 octane. Do not mix oil with gasoline. Purchase fuel in quantities that can be used within 30 days to assure fuel freshness.



**CAUTION:** Fill to within 1/2" of top of fuel tank to prevent spills and to allow for fuel expansion. If gasoline is accidentally spilled, move machine away from area of spill. Avoid creating any source of ignition until gasoline vapors have disappeared.

**Wipe off any spilled oil or fuel. Do not store, spill or use gasoline near an open flame.**

**IMPORTANT:** WHEN OPERATING IN TEMPERATURES BELOW 32°F (0°C), USE FRESH, CLEAN WINTER GRADE GASOLINE TO HELP INSURE GOOD COLD WEATHER STARTING.

**CAUTION:** Alcohol blended fuels (called gasohol or using ethanol or methanol) can attract moisture which leads to separation and formation of acids during storage. Acidic gas can damage the fuel system of an engine while in storage. To avoid engine problems, the fuel system should be emptied before storage of 30 days or longer. Drain the gas tank, start the engine and let it run until the fuel lines and carburetor are empty. Use fresh fuel next season. See Storage Instructions for additional information. Never use engine or carburetor cleaner products in the fuel tank or permanent damage may occur.

## TO START ENGINE (See Fig. 8)



**CAUTION:** Keep tine control in “OFF” position when starting engine.

When starting engine for the first time or if engine has run out of fuel, it will take extra pulls of the recoil starter to move fuel from the tank to the engine.

- Make sure spark plug wire is properly connected.
- Turn engine switch to “ON” Position.
- Place throttle control in “FAST” position.
- Move choke control to full “CHOKE” position. Grasp recoil starter handle with one hand and grasp tiller handle with other hand. Pull rope out slowly until engine reaches start of compression cycle (rope will pull slightly harder at this point).
- Pull recoil starter handle quickly. Do not let starter handle snap back against starter. Repeat if necessary.
- If engine fires but does not start, move choke control to half choke position. Pull recoil starter handle until engine starts.
- When engine starts, slowly move choke control to “RUN” position as engine warms up.

**NOTE:** A warm engine requires less choking to start.

- Move throttle control to desired running position.
- Allow engine to warm up for a few minutes before engaging tines.

**NOTE:** If at a high altitude (3000 feet) or in cold temperatures (below 40°F), the carburetor fuel mixture may need to be adjusted for best engine performance. If you think the fuel mixture needs adjusting, contact your nearest authorized service center/department, which has the proper equipment and experience to make any necessary adjustments.

**8 NOTE:** If engine does not start, see troubleshooting points.



# OPERATION

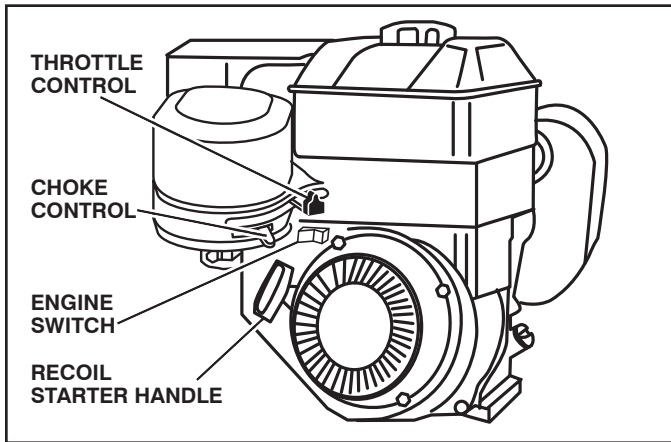


Fig. 8

## BREAKING IN YOUR TILLER

Break-in your belt(s), pulleys and tine control before you actually begin tilling.

- Start engine, tip tines off ground by pressing handles down and engage tine control to start tine rotation. Allow tines to rotate for five minutes.
- Check tine operation and adjust if necessary. See “TINE OPERATION CHECK” in the Service and Adjustments section of this manual.

## TILLING HINTS



**CAUTION:** Until you are accustomed to handling your tiller, start actual field use with throttle in slow position.

To help tiller move forward, lift up the handles slightly (thus lifting depth stake out of ground). To slow down the tiller, press down on handles.

If you are straining or tiller is shaking, the wheels and depth stake are not set properly in the soil being tilled. The proper setting of the wheels and depth stake is through trial and error and depends upon the soil condition. (The harder or wetter the ground, the slower the engine and tine speed needed. Under these poor conditions, at fast speed the tiller will run and jump over the ground).

A properly adjusted tiller will dig with little effort from the operator.

- Tilling is digging into, turning over, and breaking up packed soil before planting. Loose, unpacked soil helps root growth. Best tilling depth is 4"-6". A tiller will also clear the soil of unwanted vegetation. The decomposition of this vegetable matter enriches the soil. Depending on the climate (rainfall and wind), it may be advisable to till the soil at the end of the growing season to further condition the soil.
- Soil conditions are important for proper tilling. Tines will not readily penetrate dry, hard soil which may contribute to excessive bounce and difficult handling of your tiller. Hard soil should be moistened before tilling; however, extremely wet soil will “ball-up” or clump during tilling. Wait until the soil is less wet in order to achieve the best results. When tilling in the fall, remove vines and long grass to prevent them from wrapping around the tine shaft and slowing your tilling operation.

- You will find tilling much easier if you leave a row un-tilled between passes. Then go back between tilled rows. (See Fig. 9) There are two reasons for doing this. First, wide turns are much easier to negotiate than about-faces. Second, the tiller won't be pulling itself, and you, toward the row next to it.
- Set depth stake and wheel height for shallow tilling when working extremely hard soil or sod. Then work across the first cuts at normal depth.

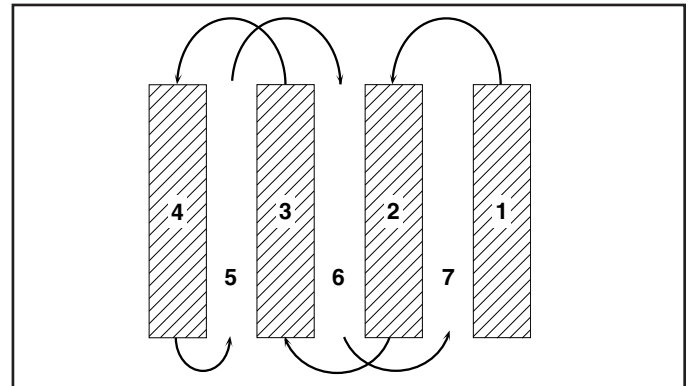


Fig. 9

## CULTIVATING

Cultivating is destroying the weeds between rows to prevent them from robbing nourishment and moisture from the plants. At the same time, breaking up the upper layer of soil crust will help retain moisture in the soil. Best digging depth is 1"-3".

- You will probably not need to use the depth stake. Begin by tipping the depth stake forward until it is held by the stake spring.
- Cultivate up and down the rows at a speed which will allow tines to uproot weeds and leave the ground in rough condition, promoting no further growth of weeds and grass (See Fig. 10).

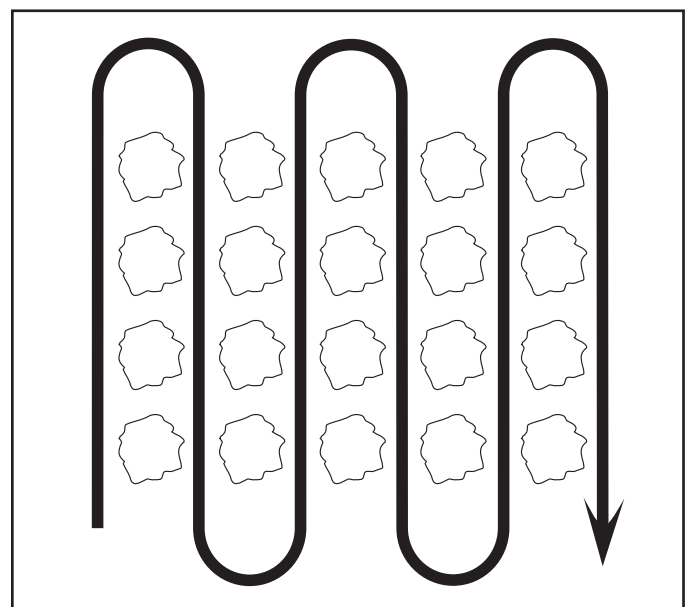


Fig. 10

# MAINTENANCE

MAINTENANCE SCHEDULE	SERVICE DATES											
	BEFORE EACH USE	EVERY 5 HOURS	EVERY 25 HOURS	EVERY 50 HOURS								
FILL IN DATES AS YOU COMPLETE REGULAR SERVICE												
Check Engine Oil Level	✓	✓										
Change Engine Oil				✓ <sub>1,2</sub>								
Oil Pivot Points		✓										
Inspect Spark Arrester / Muffler				✓								
Inspect Air Screen	✓											
Clean or Replace Air Cleaner Cartridge				✓ <sub>2</sub>								
Clean Engine Cylinder Fins				✓								
Replace Spark Plug				✓								

1 - Change more often when operating under a heavy load or in high ambient temperatures.

2 - Service more often when operating in dirty or dusty conditions.

## GENERAL RECOMMENDATIONS

The warranty on this tiller does not cover items that have been subjected to operator abuse or negligence. To receive full value from the warranty, operator must maintain tiller as instructed in this manual.

Some adjustments will need to be made periodically to properly maintain your tiller.

All adjustments in the Service and Adjustments section of this manual should be checked at least once each season.

- Once a year you should replace the spark plug, clean or replace air filter, and check tines and belt for wear. A new spark plug and clean air filter assure proper air-fuel mixture and help your engine run better and last longer.

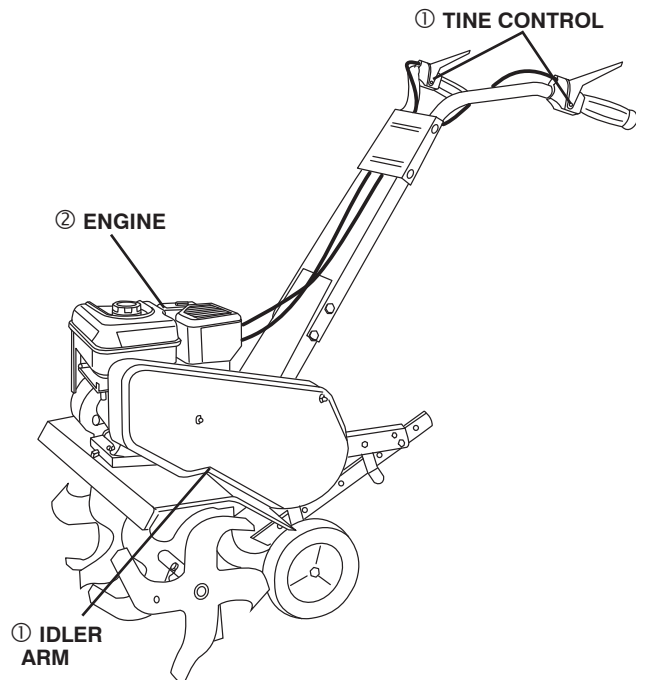
## BEFORE EACH USE

- Check engine oil level.
- Check tine operation.
- Check for loose fasteners.

## LUBRICATION

Keep unit well lubricated (See "LUBRICATION CHART").

## LUBRICATION CHART



- ① SAE 30 OR 10W-30 MOTOR OIL
- ② REFER TO MAINTENANCE "ENGINE" SECTION



# MAINTENANCE

## COOLING SYSTEM (See Fig. 14)

Your engine is air cooled. For proper engine performance and long life keep your engine clean.

- Clean air screen frequently using a stiff-bristled brush.
- Remove blower housing and clean as necessary.
- Keep cylinder fins free of dirt and chaff.

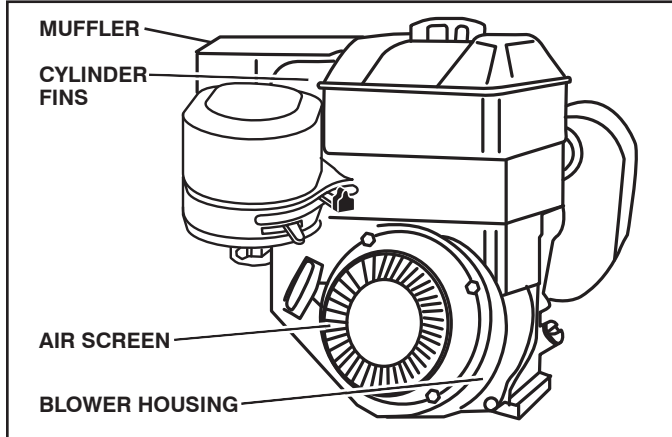


Fig. 14

## MUFFLER

Do not operate tiller without muffler. Do not tamper with exhaust system. Damaged mufflers or spark arresters could create a fire hazard. Inspect periodically and replace if necessary. If your engine is equipped with a spark arrester screen assembly, remove every 50 hours for cleaning and inspection. Replace if damaged.

## SPARK PLUG

Replace spark plugs at the beginning of each tilling season or after every 50 hours of use, whichever comes first. Spark plug type and gap setting is shown in "PRODUCT SPECIFICATIONS" on page 3 of this manual.

## TRANSMISSION

Your transmission is sealed and will only require lubrication if it is serviced.

## CLEANING

Do not clean your tiller when the engine and transmission are hot. We do not recommend using pressurized water (garden hose, etc.) to clean your unit unless the gasket area around the transmission and the engine muffler, air filter and carburetor are covered to keep water out. Water in engine will shorten the useful life of your tiller.

- Clean engine, wheels, finish, etc. of all foreign matter.
- Keep finished surfaces and wheels free of all gasoline, oil, etc.
- Protect painted surfaces with automotive type wax.

# SERVICE AND ADJUSTMENTS



**CAUTION:** Disconnect spark plug wire from spark plug and place wire where it cannot come into contact with plug.

## TILLER

### TO ADJUST HANDLE HEIGHT (See Fig. 15)

Factory assembly has provided lowest handle height. Select handle height best suited for your tilling conditions. Handle height will be different when tiller digs into soil.

- If a higher handle height is desired, loosen the four nuts securing handle panel to engine brackets.
- Slide handle panel to desired location.
- Tighten the four nuts securely.

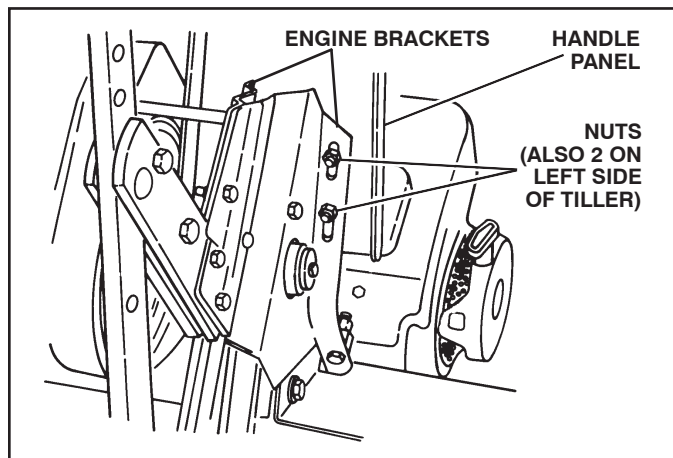


Fig. 15

### TINE ARRANGEMENT

Your outer tines can be assembled in several different ways to suit your tilling or cultivating needs.



**CAUTION:** Tines are sharp. Wear gloves or other protection when handling tines.

#### NORMAL TILLING - 26 INCH PATH (See Fig. 16)

- Assemble holes "A" in tine hubs to holes "B" in tine shaft.

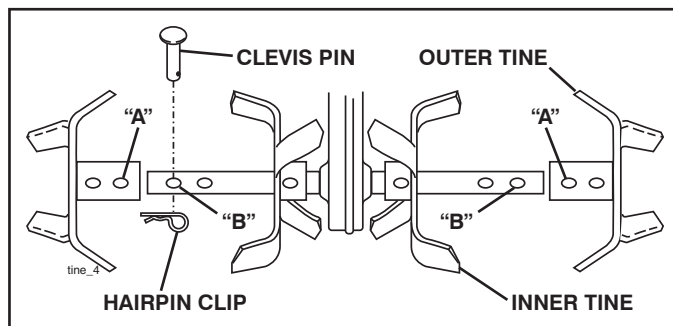


Fig. 16

#### MID-WIDTH TILLING - 24 INCH PATH (See Fig. 17)

- Assemble holes "A" in tine hubs to holes "C" in tine shaft.

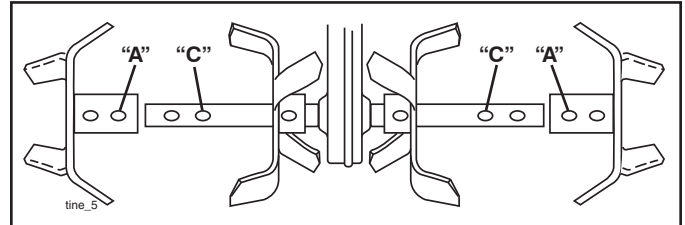


Fig. 17

#### NARROW TILLING/CULTIVATING - 12-3/4 INCH PATH (See Fig. 18)

- Remove outer tines.

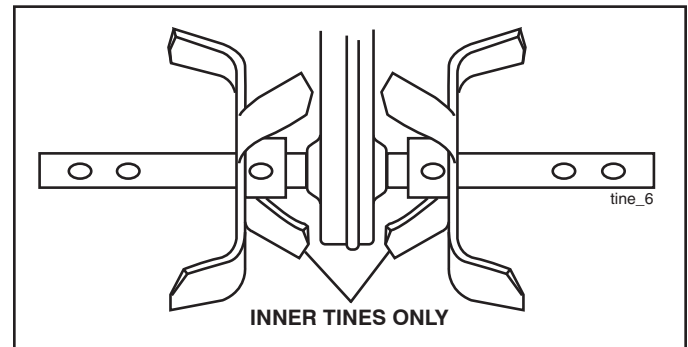


Fig. 18

**NOTE:** When reassembling outer tines, be sure right tine assembly (marked "R") and left tine assembly (marked "L") are mounted to correct side of tine shaft.

#### TO REMOVE BELT GUARD (See Fig. 19)

- Remove two (2) cap nuts and washers from side of belt guard.
- Loosen (do not remove) tine shield nut on underside of tine shield.
- Pull belt guard out and away from unit.
- Replace belt guard by reversing above procedure. Be sure slot in bottom of belt guard is under head of tine shield bolt and all nuts are tightened securely.

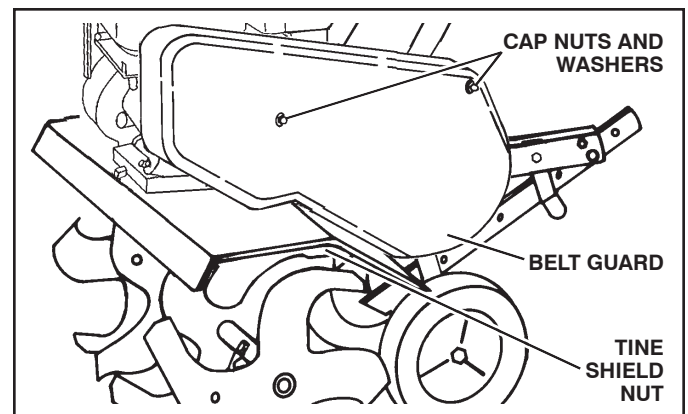


Fig. 19



# SERVICE AND ADJUSTMENTS

## TINE OPERATION CHECK (See Fig. 20)



**WARNING: Disconnect spark plug wire from spark plug to prevent starting while checking tine operation.**

For proper tine operation, forward tine control lever must be against control body and all slack removed from inner wire of control cable when control is in the "OFF" (up) position.

If lever and cable are loose, loosen cable clip at lower end of cable. Pull up on cable to remove slack, without extending spring on end of cable, and retighten cable clip.

### FINAL CHECK "OFF" POSITION

- With tine control "OFF" (up), push down on handle to raise tines off the ground.
- Slowly pull recoil starter handle while observing tines. Tines should not rotate.
- If tines rotate, inner wire of control cable is too tight which is extending lower spring and engaging tines. Loosen cable clip and push down on cable only enough to relieve spring tension. Tighten cable clip.
- Recheck in "OFF" position and adjust if necessary.

### FINAL CHECK "ON" POSITION

- With tine control "ON" (held down to handle) push down on handle to raise tines off the ground.
- Slowly pull recoil starter handle while observing tines. Tines should rotate forward.
- If tines do not rotate, inner wire of control cable is too loose. Loosen cable clip and pull cable up to remove slack and retighten clip.
- Recheck in "ON" position and adjust if necessary.

**NOTE:** If "ON" position check required adjustment, recheck "OFF" position adjustment to insure tines do not rotate when control is "OFF" (up).

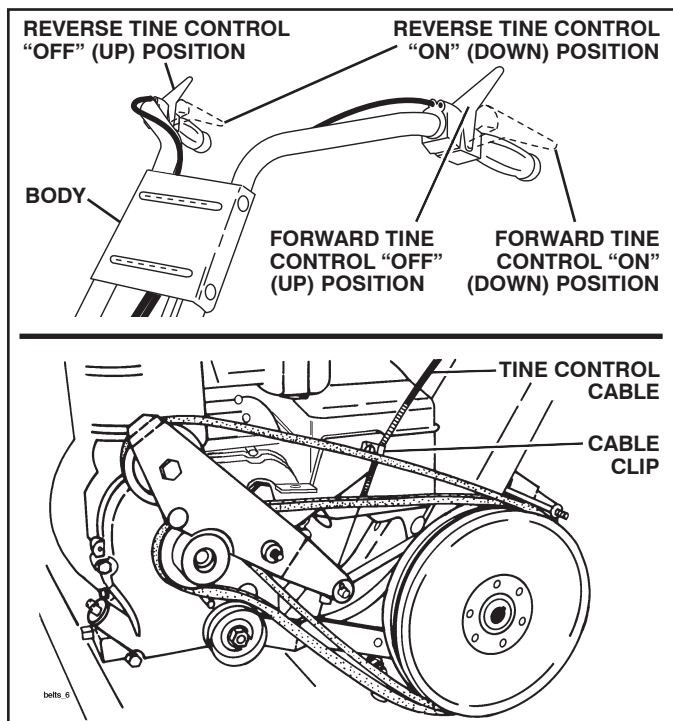


Fig. 20

## TO REPLACE V-BELTS (See Figs. 21 and 22)

Replace V-belts if they have stretched considerably or if they show cracks or frayed edges. There are two (2) V-belts - forward (inside) and reverse (outside).

Belt guard must be removed to service belts. See "TO REMOVE BELT GUARD" in this section of manual.

**NOTE:** Observe carefully routing of both belts and location of all belt guides before removing belts.

### BELT REMOVAL

- Remove reverse idler pulley from idler arm.
- Remove reverse (outside) V-belt.
- Remove forward (inside) V-belt from transmission pulley first and then from engine pulley.

### BELT REPLACEMENT

- Install new forward (inside) V-belt to engine pulley first then to transmission pulley. Be sure belt is positioned on inside groove of both pulleys, inside all belt guides and rests on idler pulley.
- Before installing reverse (outside) V-belt, turn belt "inside out". Twist so wide, flat surface of belt is to inside.

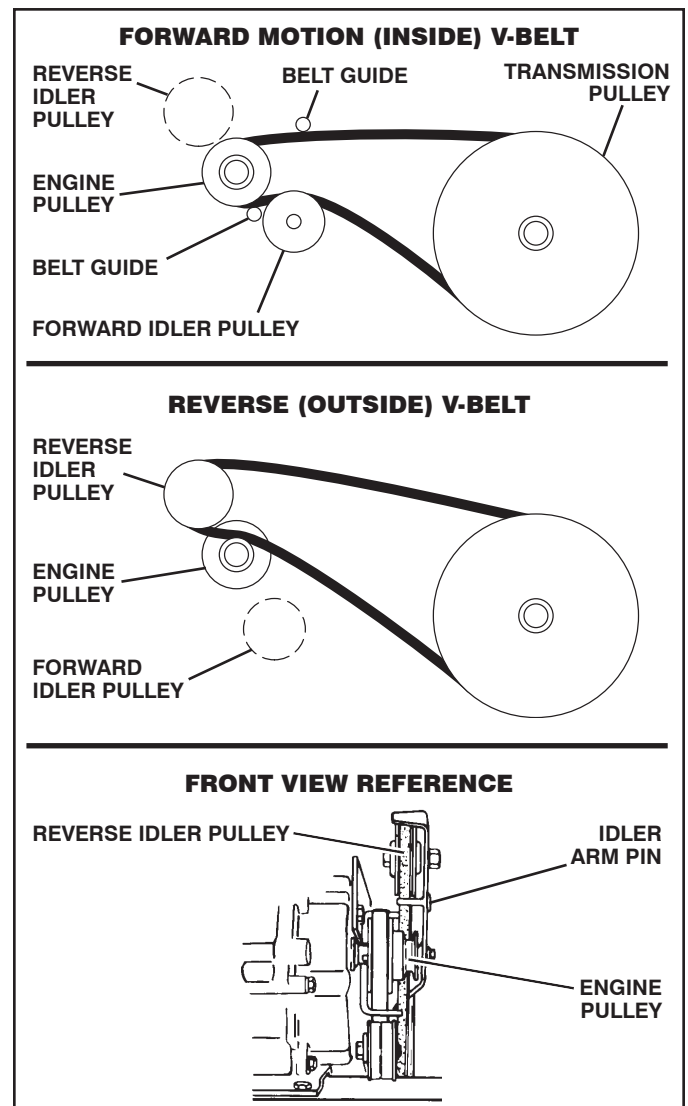


Fig. X



# SERVICE AND ADJUSTMENTS

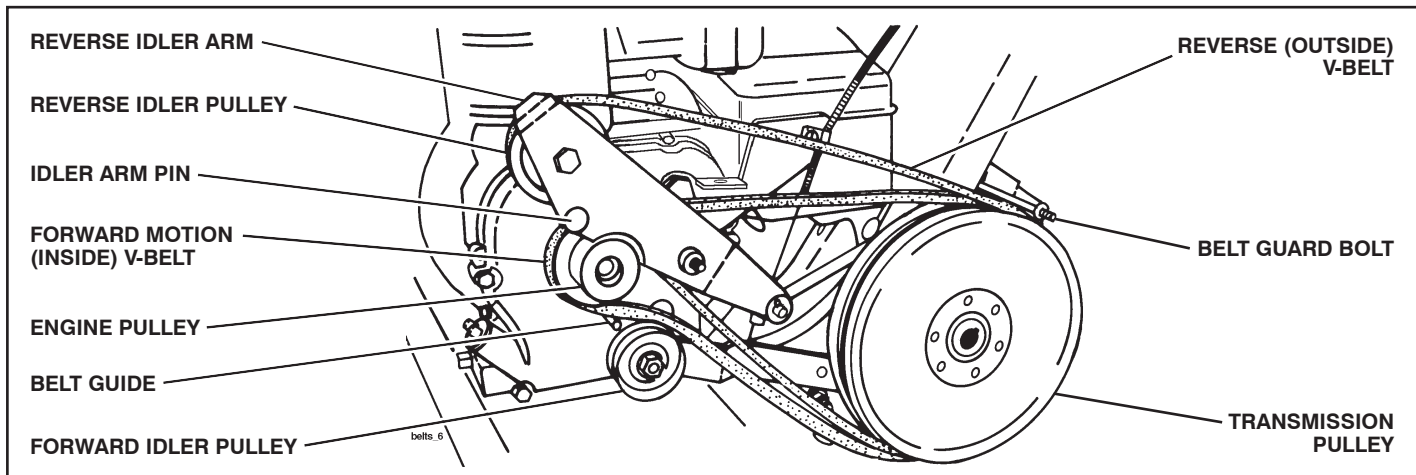


Fig. 22

- Wrap V-belt around reverse idler pulley and reassemble idler to idler arm. Tighten securely. Be sure belt is between reverse idler pulley and idler arm pin.
- Install belt to outside groove of transmission pulley. Be sure belt is inside all belt guides and rests on outside groove of engine pulley.

## CHECK TINE OPERATION

- See "TINE OPERATION CHECK" in this section of manual.

## REPLACE BELT GUARD

## ENGINE

### TO ADJUST CARBURETOR

The carburetor has been preset at the factory and cannot be adjusted.

**IMPORTANT:** NEVER TAMPER WITH THE ENGINE GOVERNOR, WHICH IS FACTORY SET FOR PROPER ENGINE SPEED. OVERSPEEDING THE ENGINE ABOVE THE FACTORY HIGH SPEED SETTING CAN BE DANGEROUS. IF YOU THINK THE ENGINE-GOVERNED HIGH SPEED NEEDS ADJUSTING, CONTACT YOUR NEAREST AUTHORIZED SERVICE CENTER/DEPARTMENT, WHICH HAS THE PROPER EQUIPMENT AND EXPERIENCE TO MAKE ANY NECESSARY ADJUSTMENTS.

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# STORAGE

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Immediately prepare your tiller for storage at the end of the season or if the unit will not be used for 30 days or more.



**WARNING: Never store the tiller with gasoline in the tank inside a building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.**

## TILLER

- Clean entire tiller (See “CLEANING” in the Maintenance section of this manual).
- Inspect and replace belts, if necessary (See belt replacement instructions in the Service and Adjustments section of this manual).
- Lubricate as shown in the Maintenance section of this manual.
- Be sure that all nuts, bolts and screws are securely fastened. Inspect moving parts for damage, breakage and wear. Replace if necessary.
- Touch up all rusted or chipped paint surfaces; sand lightly before painting.

## ENGINE

### FUEL SYSTEM

**IMPORTANT:** IT IS IMPORTANT TO PREVENT GUM DEPOSITS FROM FORMING IN ESSENTIAL FUEL SYSTEM PARTS SUCH AS THE CARBURETOR, FUEL FILTER, FUEL HOSE, OR TANK DURING STORAGE. ALSO, EXPERIENCE INDICATES THAT ALCOHOL BLENDED FUELS (CALLED GASOHOL OR USING ETHANOL OR METHANOL) CAN ATTRACT MOISTURE WHICH LEADS TO SEPARATION AND FORMATION OF ACIDS DURING STORAGE. ACIDIC GAS CAN DAMAGE THE FUEL SYSTEM OF AN ENGINE WHILE IN STORAGE.

- Drain the fuel tank.
- Start the engine and let it run until the fuel lines and carburetor are empty.
- Never use engine or carburetor cleaner products in the fuel tank or permanent damage may occur.

**NOTE:** Fuel stabilizer is an acceptable alternative in minimizing the formation of fuel gum deposits during storage. Add stabilizer to gasoline in fuel tank or storage container. Always follow the mix ratio found on stabilizer container. Run engine at least 10 minutes after adding stabilizer to allow the stabilizer to reach the carburetor. Do not drain the gas tank and carburetor if using fuel stabilizer.

### ENGINE OIL

Drain oil (with engine warm) and replace with clean oil. (See “ENGINE” in the Maintenance section of this manual).

### CYLINDER(S)

- Remove spark plug.
- Pour 1 ounce (29 ml) of oil through spark plug hole into cylinder.
- Pull starter handle slowly several times to distribute oil.
- Replace with new spark plug.

### OTHER

- Do not store gasoline from one season to another.
- Replace your gasoline can if your can starts to rust. Rust and/or dirt in your gasoline will cause problems.
- If possible, store your unit indoors and cover it to give protection from dust and dirt.
- Cover your unit with a suitable protective cover that does not retain moisture. Do not use plastic. Plastic cannot breathe which allows condensation to form and will cause your unit to rust.

**IMPORTANT:** NEVER COVER TILLER WHILE ENGINE AND EXHAUST ARE STILL WARM.

# TROUBLESHOOTING POINTS

PROBLEM	CAUSE	CORRECTION
<b>Will not start</b>	<ol style="list-style-type: none"> <li>1. Out of fuel.</li> <li>2. Engine not "CHOKED" properly.</li> <li>3. Engine flooded.</li> <li>4. Dirty air cleaner.</li> <li>5. Water in fuel.</li>   <li>6. Clogged fuel tank.</li> <li>7. Loose spark plug wire.</li>   <li>8. Bad spark plug or improper gap.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill fuel tank.</li> <li>2. See "TO START ENGINE" in the Operation section.</li> <li>3. Wait several minutes before attempting to start.</li> <li>4. Clean or replace air cleaner cartridge.</li> <li>5. Empty fuel tank and carburetor, and refill tank with fresh gasoline.</li> <li>6. Remove fuel tank and clean.</li> <li>7. Make sure spark plug wire is seated properly on plug.</li> <li>8. Replace spark plug or adjust gap.</li> </ol>
<b>Hard to start</b>	<ol style="list-style-type: none"> <li>1. Throttle control not set properly.</li> <li>2. Dirty air cleaner.</li> <li>3. Bad spark plug or improper gap.</li> <li>4. Stale or dirty fuel.</li> <li>5. Loose spark plug wire.</li> </ol>	<ol style="list-style-type: none"> <li>1. Place throttle control in "FAST" position.</li> <li>2. Clean or replace air cleaner cartridge.</li> <li>3. Replace spark plug or adjust gap.</li> <li>4. Empty fuel tank and refill with fresh gasoline.</li> <li>5. Make sure spark plug wire is seated properly on plug.</li> </ol>
<b>Loss of power</b>	<ol style="list-style-type: none"> <li>1. Engine is overloaded.</li> <li>2. Dirty air cleaner.</li> <li>3. Low oil level/dirty oil.</li> <li>4. Faulty spark plug.</li> <li>5. Oil in fuel.</li>   <li>6. Stale or dirty fuel.</li> <li>7. Water in fuel.</li>   <li>8. Clogged fuel tank.</li> <li>9. Spark plug wire loose.</li> <li>10. Dirty engine air screen.</li> <li>11. Dirty/clogged muffler.</li> <li>12. Poor compression.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set depth stake and wheels for shallower tilling.</li> <li>2. Clean or replace air cleaner cartridge.</li> <li>3. Check oil level/change oil.</li> <li>4. Clean and regap or change spark plug.</li> <li>5. Empty and clean fuel tank and refill, and clean carburetor.</li> <li>6. Empty fuel tank and refill with fresh gasoline.</li> <li>7. Empty fuel tank and carburetor, and refill tank with fresh gasoline.</li> <li>8. Remove fuel tank and clean.</li> <li>9. Connect and tighten spark plug wire.</li> <li>10. Clean engine air screen.</li> <li>11. Clean/replace muffler.</li> <li>12. Contact an authorized service center/department.</li> </ol>
<b>Engine overheats</b>	<ol style="list-style-type: none"> <li>1. Low oil level/dirty oil.</li> <li>2. Dirty engine air screen.</li> <li>3. Dirty engine.</li> <li>4. Partially plugged muffler.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check oil level/change oil.</li> <li>2. Clean engine air screen.</li> <li>3. Clean cylinder fins, air screen, muffler area.</li> <li>4. Remove and clean muffler.</li> </ol>
<b>Excessive bounce/ difficult handling</b>	<ol style="list-style-type: none"> <li>1. Ground too dry and hard.</li> <li>2. Wheels &amp; depth stake incorrectly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Moisten ground or wait for more favorable soil conditions.</li> <li>2. Adjust wheels and depth stake.</li> </ol>
<b>Soil balls up or clumps</b>	<ol style="list-style-type: none"> <li>1. Ground too wet.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wait for more favorable soil conditions.</li> </ol>
<b>Engine runs but tiller won't move</b>	<ol style="list-style-type: none"> <li>1. Tine control is not engaged.</li> <li>2. V-belt not correctly adjusted.</li> <li>3. V-belt is off pulley(s).</li> </ol>	<ol style="list-style-type: none"> <li>1. Engage tine control.</li> <li>2. Inspect/adjust V-belt.</li> <li>3. Inspect V-belt.</li> </ol>
<b>Engine runs but labors when tilling</b>	<ol style="list-style-type: none"> <li>1. Tilling too deep.</li> <li>2. Throttle control not properly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set depth stake for shallower tilling.</li> <li>2. Check throttle control setting.</li> </ol>

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# LIMITED WARRANTY

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**What is covered.** We warrant that this product is **free from defects in material or workmanship** under normal use and maintenance. Certain components, such as normal wear parts, engines, and transmissions are excluded from this warranty. We will, at our option, repair or replace any defective product or part covered by the Limited Warranty, free of charge at any authorized Servicing Dealer/Center using OEM replacement parts, subject to the limitations and exclusions described below.

**Limited Warranty period.** We will warrant the product to the original retail purchaser from the date of retail purchase for the applicable period of time shown on the chart below.

**What is NOT covered.** This Limited Warranty does not cover:

- (a) Engines and transmissions, except as noted on the chart below; a separate warranty provided with your product might apply.
- (b) Normal wear parts (parts and items that normally wear out with use), including without limitation spark plugs, bulbs, filters, lubricants, starter cords, belts, blades, and blade adapters are not covered, nor is damage due to normal wear, such as abrasion to mower decks, tires punctured by an external source, natural discoloration of materials, or dulling or damage to blades due to contact with abrasives, rocks, rods, or other foreign objects.
- (c) Emissions control equipment and components to the extent regulated by the U.S. Environmental Protection Agency or similar government agencies. These are covered by a separate emission control warranty contained in the operator's manual.
- (d) Depending on the product, there is either NO WARRANTY or a reduced warranty if the product is used for commercial, non-residential, or rental purposes and, in such circumstances, this Limited Warranty is offered instead of and replaces any warranty regime provided by law. Please refer to the chart below.
- (e) Damage related to abuse, misuse, neglect, modifications, alterations, use of unauthorized attachments, improper storage, or lack of lubrication or engine failure due to the use of oils that do not meet engine manufacturer's specifications, pressure cleaning or steam cleaning the product, excessive dirt, abrasives, salt water, moisture, corrosion, rust, or varnish. Failure to perform required maintenance as described in the operator's manual will void this warranty.
- (f) Damage or failures due to improper set up, pre-delivery service or repair service by anyone other than an authorized servicing dealer during the warranty period.
- (g) Damage caused by use of gasoline containing more than 10% (E10) ethanol content (e.g. E15, E25, E30, E50, E85), use of ether or similar starting fluids, or stale fuel.
- (h) Damage to sprayers from using caustic or flammable materials in the sprayer, or lack of or broken strainers.

**Your Responsibilities.** To preserve your rights under this Limited Warranty, you must exercise reasonable care and use of the product, including following the preventive maintenance, storage, and fuel and oil usages as prescribed in the operator's manual. Any adjustment (e.g. to the throttle cable or belt guides) after the first thirty days of purchase and any preventive maintenance as outlined in the operator's manual are NOT covered. In addition, you must cease using the product immediately upon any failure or damage, and take the product to an authorized servicing dealer prior to any further use.

**WARRANTY EXCLUSIONS, DISCLAIMERS, AND LIMITED RIGHTS.** WE WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. YOUR REMEDY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT OR PART, AT OUR DISCRETION. THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH HEREIN. ANY WARRANTY IMPLIED BY STATE LAW (WHETHER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR OTHERWISE) IS HEREBY DISCLAIMED; WHERE SUCH A DISCLAIMER IS NOT PERMITTED BY LAW, THEN SUCH IMPLIED WARRANTY IS LIMITED FOR THE DURATION OF THE APPLICABLE LIMITED WARRANTY PERIOD LISTED IN THE CHART BELOW. SOME LOCALITIES, INCLUDING THE PROVINCE OF QUEBEC, DO NOT ALLOW EXCLUSIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSIONS AND LIMITATIONS MAY NOT APPLY TO YOU.

THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS BASED ON YOUR LOCALITY.

**How to obtain service.** To obtain warranty service, you must take your product to an authorized Servicing Dealer/Center. To find your nearest authorized Servicing Dealer/Center, visit our website and use the Dealer Locator feature, or call 1-800-487-5951 (US) or 1-800-805-5523 (Canada) from 8:00 AM to 7:00 PM EST. Any costs to transport or ship the product are your responsibility. You must present proof of purchase (including date, product model and serial number) to an authorized Servicing Dealer/Center for warranty service. Proof of purchase rests solely with you. You may register your product using our online product registration site to help ensure that you are notified of important product information. However, registering your product is not a condition of warranty service.

# Jonsered®

[www.jonsered.com/us](http://www.jonsered.com/us) or [www.jonsered.com/ca](http://www.jonsered.com/ca)

Jonsered® Warranty Chart 2015 586 47 08-01	Consumer (personal, household use only)	Commercial (any commercial, professional, agricultural, institutional or income producing use, other than rental use)	Rental (any rental usage)
<b>HANDHELD PRODUCTS</b>			
Chain Saws, including engines (*)	2 Years	90 days	90 days
Forestry Clearing Saws, including engines <sup>(1)</sup>	2 Years	2 Years	90 days
All Other Handheld Products, including engines <sup>(1)</sup>	2 Years	90 days	90 days
Attachments (Split boom models) <sup>(1)</sup>	2 Years	90 Days	90 days
<b>WHEELED PRODUCTS</b>			
Landowner Zero Turn Mowers ZXF	3 Years	1 Year	No Warranty
Residential Zero Turn Mowers ZR, ZF <sup>(2)(3)</sup>	3 Years	No Warranty	No Warranty
Lawn Tractors <sup>(2)(3)</sup>	3 Years	No Warranty	No Warranty
Frame, Chassis, Front Axle	5 Years	No Warranty	No Warranty
Walk Behind Mowers, High Wheel Trimmer	3 Years	No Warranty	No Warranty
Snow Throwers, Tillers <sup>(1)(2)(3)</sup>	3 Years	90 days	90 days
Lead-Acid Batteries (for all wheeled products) <sup>(4)</sup>	180 days	180 days	180 days
Engines			
Rato, LCT, Locin	2 years	90 days	No Warranty
All Others	See Note 2	See Note 2	See Note 2
Transmission / Drive Systems			
Tuff Torq, General Transmission	2 Years	No Warranty	No Warranty
Peerless	3 Years	No Warranty	No Warranty
Hydro-Gear	See note 3	See note 3	See note 3
All Others	See note 3	See note 3	See note 3
Decks			
Zero-Turn Mowers and Riding Tractors with steel reinforced stamped deck shell have the Limited Warranty	10 Years	No Warranty	No Warranty
Zero-Turn Mowers and Riding Tractors fabricated deck shell	See Note 1	No Warranty	No Warranty
<b>PARTS AND ACCESSORIES</b>			
Parts and Accessories (if purchased) <sup>(5)</sup>			
Collection Systems and Baggers	1 Year	90 days	No Warranty
All other accessories (e.g., bars, chains, carrying cases, trimmer heads, trimmer guards, personnel protective equipment, etc.)	90 days	30 days	No Warranty
Parts (e.g., belts, blades, starter covers, starter springs, etc.)	30 days	30 days	No Warranty
Reconditioned or Refurbished Products	30 days	No Warranty	No Warranty
Sprayers	1 Year	1 Year	1 Year

- 1 Ignition modules, tiller tines, fabricated decks, and trimmer shafts all have a "Limited Lifetime Warranty," and are warranted for the life of the product or 7 (seven) years after the product's final production run, whichever comes first. Parts and labor are included in the initial warranty period; labor is excluded after the initial warranty period expires. Pole Saws and Pole Hedge Trimmers are excluded from the "Limited Lifetime Warranty." Deck Shell replacement will be limited to a maximum of two (2) deck shells within the Limited Lifetime Warranty.
- 2 Your engine is warranted separately by the engine manufacturer; please refer to the separate engine warranty provided with your product.
- 3 ZX Landowner - (ZT3100 transmission):  
Hydro-Gear warrants transmission for one (1) year commercial warranty, parts and labor.  
ZX Landowner - (ZT3100 transmission):  
Hydro-Gear warrants transmission for two (2) years consumer warranty, parts and labor.  
Snow Throwers and Lawn Tractors: two (2) years consumer warranty, parts and labor.  
For all others, your transmission is warranted separately by the transmission manufacturer; please refer to the separate transmission warranty provided with your product.
- 4 Battery warranty does not include discharged or uncharged batteries.
- 5 Replacement parts and accessories provided under this Limited Warranty are warranted only for the BALANCE of the warranty period applicable to the part or accessory that was replaced.

### Product Registration

Please register your product at [www.jonsered.com](http://www.jonsered.com).

Go to "Support" then "Product Registration"

You may call 1-800-487-5951 (US) or 1-800-805-5523 (Canada) to have your product registered.

Please have all product information ready prior to calling Consumer Support.

Thank you for choosing Jonsered.

**.Jonsered®**