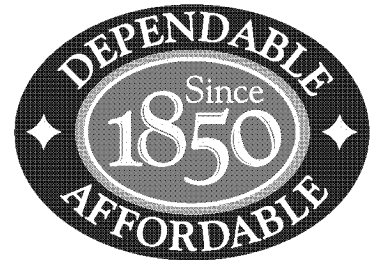


Bolens®

Operator's Manual



Since it began making garden tools in 1850, Bolens has been known for long-lasting, dependable products. Bolens eventually carried that hard-working heritage into the outdoor power equipment industry, when it designed and built the first-ever power-driven garden tractor.

Today, homeowners around the country rely on Bolens for durable, reliable power equipment at an affordable price.

**2-Cycle Garden Cultivator
Model BL410**

INTRODUCTION

THANK YOU

Thank you for buying this quality product. This modern outdoor power tool will provide many hours of useful service. You will find it to be a great labor-saving device. This operator's manual provides you with easy-to-understand operating instructions. Read the whole manual and follow all the instructions to keep your new outdoor power tool in top operating condition.

PRODUCT REFERENCES, ILLUSTRATIONS AND SPECIFICATIONS

All information, illustrations, and specifications in this manual are based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice.

Copyright ©2002 MTD SOUTHWEST INC, All Rights Reserved.

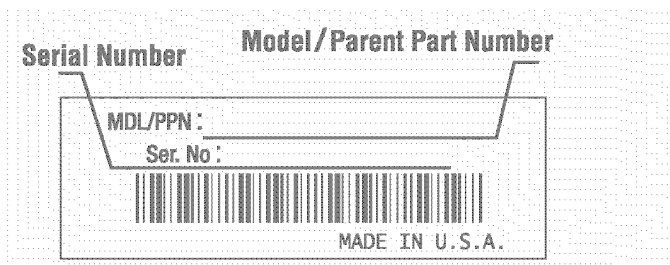
SERVICE INFORMATION

Service on this unit both within and after the warranty period should be performed only by an authorized and approved service dealer.

For service call **1-330-558-7220** or **1-866-840-6483** to obtain a list of authorized service dealers near you.

DO NOT RETURN THE UNIT TO THE RETAILER. PROOF OF PURCHASE WILL BE REQUIRED FOR WARRANTY SERVICE.

Before beginning, locate the unit's model plate. It lists the model and serial numbers of your unit. Refer to the sample plate below and copy the information for future reference.



Copy the model / parent part number here: _____

Copy the serial number here: _____

Make sure you carefully read and understand this manual before starting or operating this equipment.

THIS PRODUCT IS COVERED BY ONE OR MORE U.S. PATENTS. OTHER PATENTS PENDING.

TABLE OF CONTENTS

Service Information	2
Rules for Safe Operation	3
Know Your Unit	6
Assembly Instructions	7
Oil and Fuel Information	8
Starting/Stopping Instructions	9
Operating Instructions	10
Maintenance and Repair Instructions	11
Cleaning and Storage	14
Accessories and Replacement Parts	14
Troubleshooting Chart	15
Specifications	16
Warranty Information	18
Parts List	Inside Back Cover

CONTENTS OF CARTON

- Model BL410 Garden Cultivator with Handlebars and Wheel Bracket Assembly
- Bottle of 2-Cycle Oil
- Operator's Manual
- Product Registration Card

Examine all parts to make certain that nothing is missing and no breakage has occurred during shipping. Any damaged or missing part must be replaced before using this product.

CALIFORNIA PROPOSITION 65 WARNING

	WARNING	
THE ENGINE EXHAUST FROM THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM.		

RULES FOR SAFE OPERATION

NOTE: For users on U.S. Forest Land and in the states of California, Maine, Oregon, and Washington. All U.S. Forest Land and the state of California (Public Resources Codes 4442 and 4443), Oregon, and Washington require by law that certain internal combustion engines operated on forest brush and/or grass-covered areas be equipped with a spark arrestor, maintained in effective working order, or the engine be constructed, equipped, and maintained for the prevention of fire. Check with your state or local authorities for regulations pertaining to these requirements. Failure to follow these requirements could subject you to liability or a fine. **This unit is factory equipped with a spark arrestor.** If it requires replacement, ask your LOCAL SERVICE DEALER to install the **Accessory Part #182747 Spark Arrestor.**

Read the Operator's Manual(s) and follow all warnings and safety instructions.

Failure to do so can result in serious injury to the operator and/or bystanders.

FOR QUESTIONS, CALL 1-330-558-7720 or 1-866-840-6483

• SAFETY SYMBOLS •

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and their explanations, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

SYMBOL

MEANING



SAFETY ALERT SYMBOL: Indicates danger, warning or caution. Attention is required in order to avoid serious personal injury. May be used in conjunction with other symbols or pictographs.



DANGER: Failure to obey a safety warning will result in serious injury to yourself or to others. Always follow the safety precautions to reduce the risk of fire, electric shock and personal injury.

SYMBOL

MEANING



WARNING: Failure to obey a safety warning can result in injury to yourself and others. Always follow the safety precautions to reduce the risk of fire, electric shock, and personal injury.



CAUTION: Failure to obey a safety warning may result in property damage or personal injury to yourself or to others. Always follow the safety precautions to reduce the risk of fire, electric shock, and personal injury.

NOTE: Advises you of information or instructions vital to the operation or maintenance of the equipment.

• IMPORTANT SAFETY INFORMATION • READ ALL INSTRUCTIONS



WARNING: When using the unit, you must follow the safety rules. Please read these instructions before operating the unit in order to ensure the safety of the operator and any bystanders. Please keep these instructions for later use.

BEFORE OPERATING

- Read the instructions carefully. Become familiar with the controls and proper use of the unit.
- Do not operate this unit when tired, ill or under the influence of alcohol, drugs or medication.
- Children under the age of 15 must not use the unit; teens may operate the unit with adult guidance.
- Inspect the unit before use. Replace damaged parts. Check for fuel leaks. Make sure all fasteners are in place and secure. Replace parts that are cracked, chipped or damaged in any way. Do not operate with loose or damaged parts.
- Be aware of the potential risk of injury to your head, hands and feet.

- Clear the area to be cultivated before each use. Remove rocks, broken glass, nails, wire, string and other objects which may be thrown by the unit. Clear the area of children, bystanders and pets; keep them outside a 50-foot (15 m.) radius, at a minimum. Even then, they are still at risk from thrown objects. Encourage bystanders to wear eye protection. If you are approached, stop the unit immediately.
- Squeeze the throttle control and make sure that it automatically returns to the idle position. Make all adjustments or repairs before using the unit.

SAFETY WARNINGS FOR GAS UNITS

- Store fuel only in containers specifically designed and approved for the storage of such materials.
- Avoid creating a source of ignition for spilled fuel. Do not start the engine until fuel vapors dissipate.



WARNING: Gasoline is highly flammable and its vapors can explode if ignited. Follow the ensuing precautions.

RULES FOR SAFE OPERATION

• IMPORTANT SAFETY INFORMATION •

- Always stop the engine and allow it to cool before filling the fuel tank. Never remove the cap of the fuel tank, or add fuel, when the engine is hot. Never operate the unit without the fuel cap securely in place. Loosen the fuel tank cap slowly to relieve any pressure in the tank.
- Add fuel in a clean, well-ventilated outdoor area where there are no sparks or flames. Slowly remove the fuel cap only after stopping engine. Do not smoke while fueling. Wipe up any spilled fuel from the unit immediately.
- Move the unit at least 30 feet (9.1 m) from the fueling source and site before starting the engine. Do not smoke. Keep sparks and open flames from the area while adding fuel or operating the unit.

WHILE OPERATING

- Never start or run the unit inside a closed room or building. Breathing exhaust fumes can be lethal. Operate this unit only in a well ventilated area outdoors.
- Wear safety glasses or goggles that are marked as meeting ANSI Z87.1 standards, and ear/hearing protection when operating this unit. Wear a face or dust mask if the operation is dusty.
- Wear heavy, long pants, boots, gloves and a long sleeve shirt. Do not wear, short pants, sandals or go barefoot.
- To reduce the risk of injury associated with objects pulled into rotating parts, do not wear loose clothing, jewelry, scarves, etc. Secure hair above shoulder level.
- Use the unit only in daylight or good artificial light.
- Keep outside surfaces free from oil and fuel.
- This unit has a clutch. The tines remain stationary when the engine is idling. If they do not, have the unit adjusted by an authorized service technician.
- Be sure the tines are not in contact with anything before starting the unit.
- Avoid accidental starting. Be in the starting position whenever pulling the starter rope. The operator and unit must be in a stable position while starting. Refer to the *Starting/Stopping Instructions*.
- Use the right tool. Only use this tool for the purpose intended.
- Do not force the unit. It will do the job more effectively, with a smaller chance of injury, if you use the unit for the task it was designed.
- Use extreme caution when reversing or pulling the unit towards you.
- Do not overreach. Take extra care when working on steep slopes or inclines. Always keep proper footing and balance.
- Always hold the unit with both hands when operating. Keep a firm grip on the handlebar grips.

- Keep hands, face and feet at a distance from all moving parts. Do not touch or try to stop the tines when they are rotating. Do not operate without guards in place.
- Do not touch the engine, muffler or gearbox. These parts get extremely hot from operation. When turned off they remain hot for a short time.
- Do not operate the engine faster than the speed needed to do the job. Do not run the engine at high speed when not in use.
- Always stop the engine during suspended or delayed operation, or when you walk from one location to another.
- Stop the engine for maintenance, repair or to install or remove the tines. To avoid injury, stop the unit and make sure the tines no longer turn.
- The tines become very sharp from use. Always wear heavy gloves when handling, removing, installing or cleaning the tines.
- Use only genuine factory replacement parts and accessories for this unit. These are available from your authorized service dealer. Use of any non original factory parts or accessories could lead to serious injury to the user, or damage to the unit, and void your warranty.
- Keep the unit clean of vegetation and other materials. They may become lodged between the tines and gearbox or guard.
- To reduce the risk of fire, replace a faulty muffler and spark arrestor. Keep the engine and muffler free from grass, leaves, excessive grease or carbon build up.

OTHER SAFETY WARNINGS

- Never store the unit, with fuel in the tank, inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing or transporting. Be sure to secure the unit while transporting.
- Store the unit in a dry place, either locked up or up high to prevent unauthorized use or damage. Keep out of the reach of children.
- Clean the tines with a hose and water. Wipe the tines with a light machine oil to prevent rust.
- Never douse or squirt the engine with water or any other liquid. Keep handles dry, clean and free from debris. Clean after each use, as described in the *Cleaning and Storage* section.
- Keep these instructions. Refer to them often and use them to instruct other users. If you loan someone this unit, also loan them these instructions.

SAVE THESE INSTRUCTIONS

RULES FOR SAFE OPERATION

SAFETY AND INTERNATIONAL SYMBOLS

This operator's manual describes safety and international symbols and pictographs that may appear on this product. Read the operator's manual for complete safety, assembly, operating and maintenance and repair information.

SYMBOL

MEANING



- **SAFETY ALERT SYMBOL**
Indicates danger, warning or caution. May be used in conjunction with other symbols or pictographs.



- **WARNING - READ OPERATOR'S MANUAL**
Read the operator's manual(s) and follow all warnings and safety instructions. Failure to do so can result in serious injury to the operator and/or bystanders.



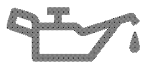
- **WEAR EYE AND HEARING PROTECTION**
WARNING: Thrown objects and loud noise can cause severe eye injury and hearing loss. Wear eye protection meeting ANSI Z87.1 standards and ear protection when operating this unit. Use a full face shield when needed.



- **KEEP BYSTANDERS AWAY**
WARNING: Keep all bystanders, especially children and pets, at least 50 feet (15 m) from the operating area.



- **UNLEADED FUEL**
Always use clean, fresh unleaded fuel.



- **OIL**
Refer to operator's manual for the proper type of oil.



- **THROWN OBJECTS AND ROTATING CUTTER CAN CAUSE SEVERE INJURY**
WARNING: Do not operate without the proper attachments and guards in place. Keep away from the rotating tines.

SYMBOL

MEANING



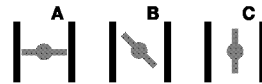
- **ON/OFF STOP CONTROL**
ON / START / RUN



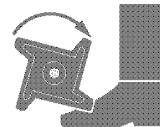
- **ON/OFF STOP CONTROL**
OFF or STOP



- **HOT SURFACE WARNING**
Do not touch a hot muffler, gear housing or cylinder. You may get burned. These parts get extremely hot from operation. They remain hot for a short time after the unit is turned off.



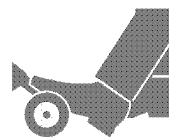
- **CHOKER CONTROL**
A • **FULL** choke position.
B • **PARTIAL** choke position.
C • **RUN** position.



- **GARDEN CULTIVATORS - ROTATING TINES CAN CAUSE SEVERE INJURY**
WARNING: Stop the engine and allow the tines to stop before installing or removing tines, or before cleaning or performing any maintenance. Keep hands and feet away from rotating tines.



- **NO STEP**
Always keep proper footing and balance. Do not overreach, take extra care when working on steep slopes or inclines.



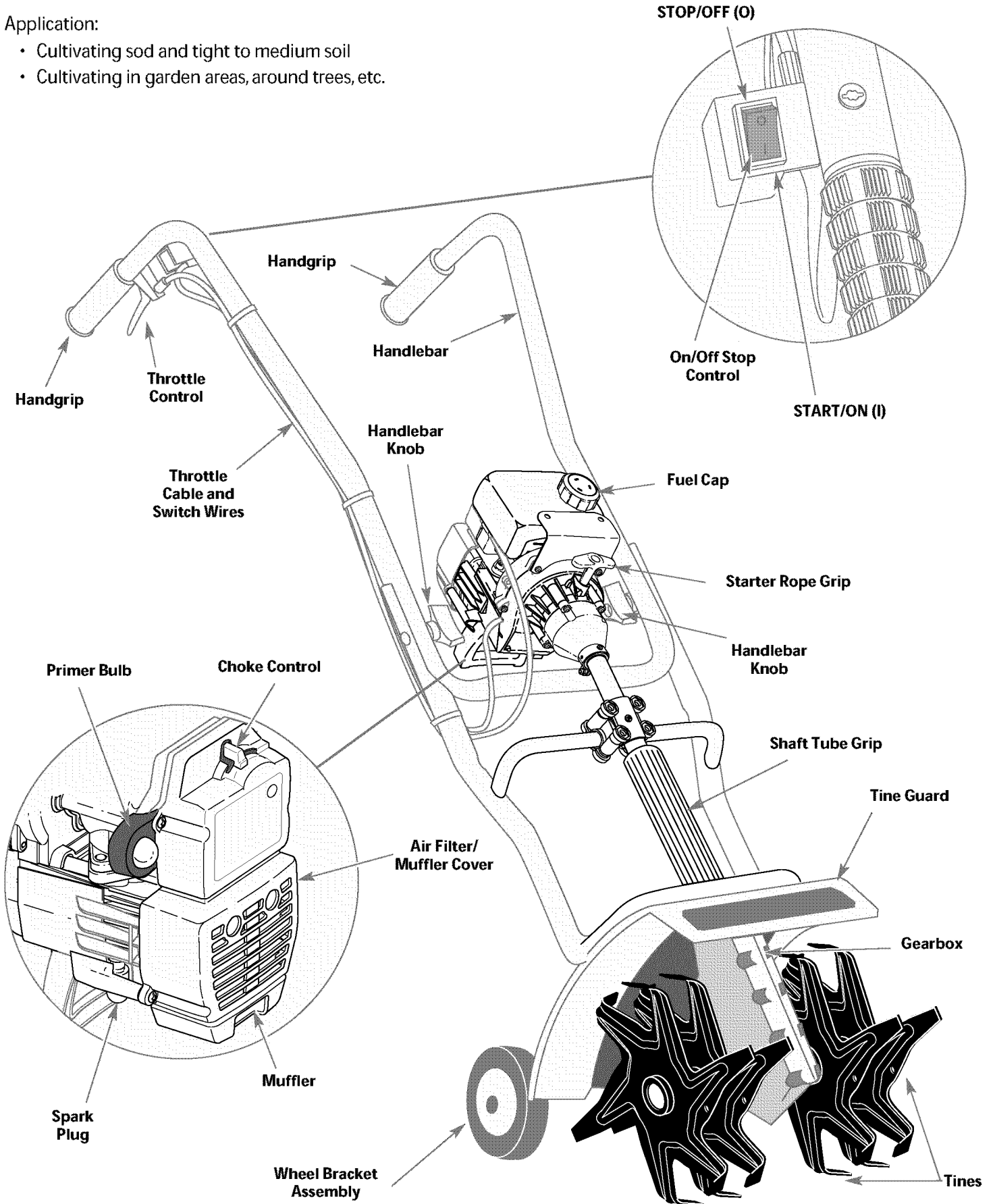
- **PLACE LEFT FOOT HERE**
Avoid accidental starting. Stand in the starting position whenever pulling the starter rope. The operator and unit must be in a stable position while starting.

RULES FOR SAFE OPERATION

KNOW YOUR UNIT

Application:

- Cultivating sod and tight to medium soil
- Cultivating in garden areas, around trees, etc.



ASSEMBLY INSTRUCTIONS

ASSEMBLING THE UNIT

Before operating, position the unit's handlebars.

NOTE: You may also need to reposition the wheel height before using the cultivator. Refer to the *Adjusting Tine Depth* section.

Begin by carefully unpacking the contents and making sure that nothing is damaged.

POSITIONING THE HANDLEBARS

1. Loosen the two knobs on the inside of the handlebars (Fig. 1).
2. With the unit upright, swing the handlebars up into the operating position (Fig. 1).

NOTE: Take care not to pinch the throttle cable or switch wires when positioning the handlebar.

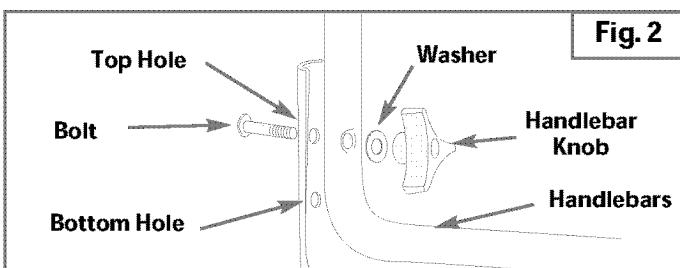
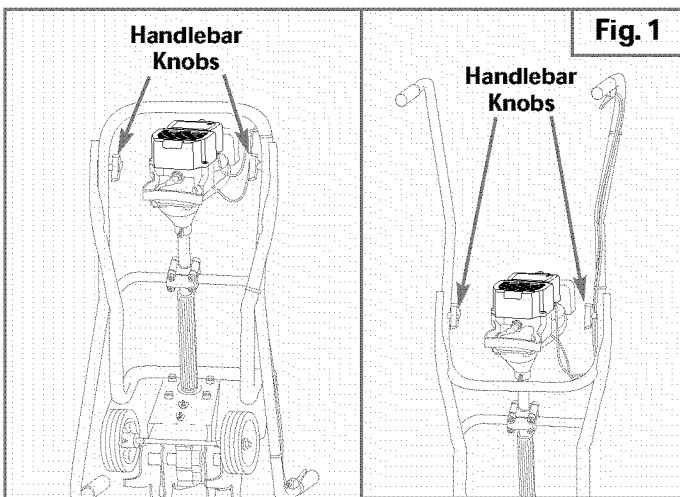
3. Tighten the knobs to secure the handlebars in place.

NOTE: Do not over-tighten the knobs.

4. Readjust the throttle cable and switch the wires so they are smooth and tight against the handlebar assembly. This will help prevent them from catching or snagging during normal operation.

ADJUSTING THE HANDLEBAR HEIGHT

1. Remove the knobs and mounting bolts and reinstall them through either the top or bottom holes in the handlebar assembly (Fig. 2) in order to adjust the height of the handlebars.
2. Be sure to tighten the knobs to secure the handlebars in place.



INSTALLING THE WHEEL BRACKET ASSEMBLY

If the wheel bracket assembly is not installed, or if you ever need to remove or reinstall it, follow the ensuing instructions.



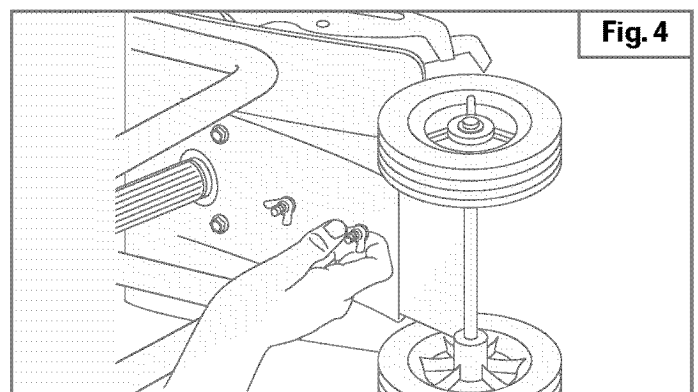
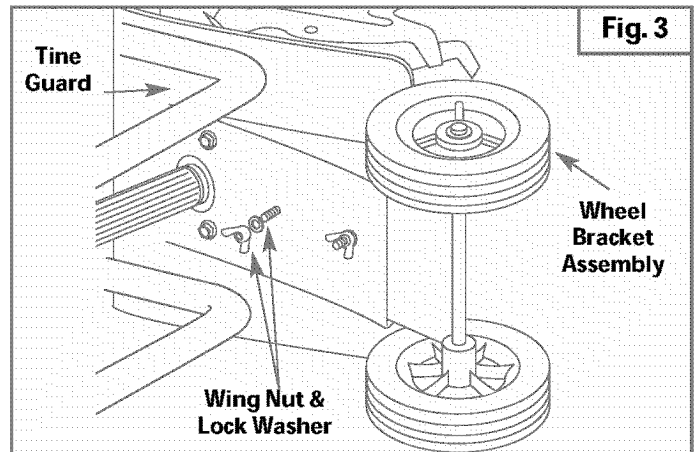
WARNING: To avoid injury from the tines, wear heavy gloves and a long sleeve shirt when installing the wheel bracket assembly.



WARNING: To prevent serious personal injury, the wheel bracket assembly must be installed when operating the unit.

1. With the unit on its side, place the wheel bracket assembly on the underside of the tine guard (Fig. 3).
2. Install a carriage bolt through each of the slotted holes in the wheel bracket and into the tine guard.
3. On the **TOP** side of the tine guard, install a lock washer and a wing nut onto each of the bolts (Fig. 3).
4. Make sure the square shoulder of the bolts is pushed through the slotted holes in the wheel bracket. Tighten the wing nuts (Fig. 4).

NOTE: Do not over-tighten the wing nuts. Loosen the wing nuts to adjust wheel height.



OIL & FUEL INFORMATION

OIL AND FUEL MIXING INSTRUCTIONS

Old and/or improperly mixed fuel are the main reasons for the unit not running properly. Be sure to use fresh, clean unleaded fuel. Follow the instructions carefully for the proper fuel/oil mixture.

Definition of Blended Fuels

Today's fuels are often a blend of gasoline and oxygenates such as ethanol, methanol, or MTBE (ether). Alcohol-blended fuel absorbs water. As little as 1% water in the fuel can make fuel and oil separate. It forms acids when stored. When using alcohol-blended fuel, use fresh fuel (less than 60 days old).

Using Blended Fuels


If you choose to use a blended fuel, or its use is unavoidable, follow recommended precautions:

- Always use fresh fuel mix per your operator's manual
- Always agitate the fuel mix before fueling the unit
- Drain the tank and run the engine dry before storing the unit

Using Fuel Additives

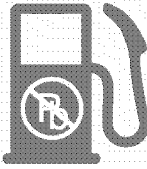

The bottle of 2-cycle oil that came with your unit contains a fuel additive which will help inhibit corrosion and minimize the formation of gum deposits. It is recommended that you use our 2-cycle oil with this unit.

If unavailable, use a good 2-cycle oil designed for air-cooled engines along with a fuel additive, such as STA-BIL® Gas Stabilizer or an equivalent. Add 0.8 oz. (23 ml.) of fuel additive per gallon of fuel according to the instructions on the container. NEVER add fuel additives directly to the unit's fuel tank.


	CAUTION: For proper engine operation and maximum reliability, pay strict attention to the oil and fuel mixing instructions on the 2-cycle oil container. Using improperly mixed fuel can severely damage the engine.
--	---


Thoroughly mix the proper ratio of 2-cycle engine oil with unleaded gasoline in a separate fuel can. Use a 32:1 fuel/oil ratio. Do not mix them directly in the engine fuel tank. See the following table for specific gas and oil mixing ratios.


NOTE: One gallon (3.8 liters) of unleaded gasoline mixed with one 4 fl.oz. (118 ml.) bottle of 2-Cycle Oil makes a 32:1 fuel/oil ratio.

	+	
UNLEADED GAS		2 CYCLE OIL
1 US. GALLON (3.8 LITERS)		4 FL OZs. (118 ml)
1 LITER		31 ml

MIXING RATIO = 32 : 1

	WARNING: Gasoline is extremely flammable. Ignited vapors may explode. Always stop the engine and allow it to cool before filling the fuel tank. Do not smoke while filling the tank. Keep sparks and open flames at a distance from the area.
---	--

	WARNING: Remove fuel cap slowly to avoid injury from fuel spray. Never operate the unit without the fuel cap securely in place.
---	--

	WARNING: Add fuel in a clean, well ventilated area outdoors. Wipe up any spilled fuel immediately. Avoid creating a source of ignition for spilled fuel. Do not start the engine until fuel vapors dissipate
---	---

NOTE: Dispose of the old fuel/oil mix in accordance to Federal, state, and local regulations.

FILLING THE FUEL TANK

Make sure the cultivator is in a horizontal position when filling or adding fuel to the tank.

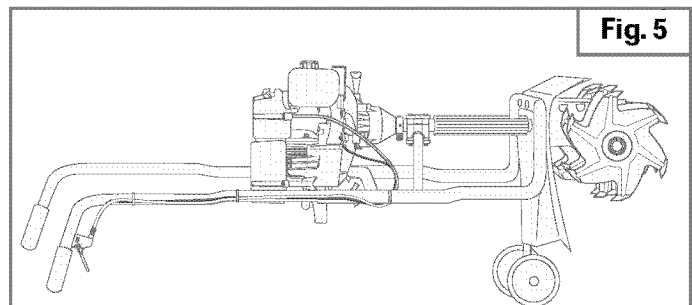


Fig. 5

STARTING/STOPPING INSTRUCTIONS

STARTING INSTRUCTIONS



WARNING: Operate this unit only in a well-ventilated outdoor area. Carbon monoxide exhaust fumes can be lethal in a confined area.



WARNING: Avoid accidental starting. Make sure you are in the starting position when pulling the starter rope (Fig. 8). To avoid serious injury, the operator and unit must be in a stable position while starting.

1. Mix gas with oil. Fill fuel tank with fuel/oil mixture. Refer to *Oil and Fuel Mixing Instructions*.
2. Put the Start/Stop Control in the **START (I)** position (Fig. 6).
3. Fully press and release the primer bulb 5 to 7 times, slowly, until **FUEL IS VISIBLE IN THE PRIMER BULB** (Fig. 7). If you can't see fuel in the bulb, press and release the bulb three (3) additional times, or as many times as it takes before you can see fuel in it.
4. Place the choke lever in the **FULL** choke position (A |←|) (Fig. 7).
5. Stand between the handlebars and support the unit by placing your left foot on the wheel bracket assembly and gripping the handlebar grip with your right hand (Fig. 8).

NOTE: Tilt the unit back slightly to bring the tines off the ground when starting.

6. While squeezing the throttle control to the wide open (full throttle) position, grasp the starter rope grip with your left hand and pull the starter rope briskly 5 times. If the engine attempts to run before the fifth pull, proceed to step 7.

NOTE: The unit will not run in the **FULL** choke position (A |←|).

7. Place the choke lever in the **PARTIAL** choke position (B |↖|) (Fig. 7).
8. Pull starter rope briskly 1 to 3 times to start the engine (Fig. 8).

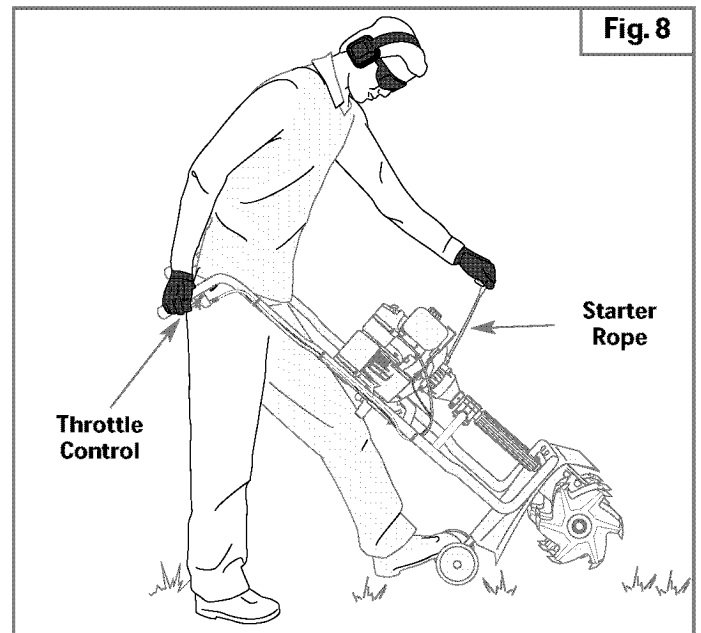
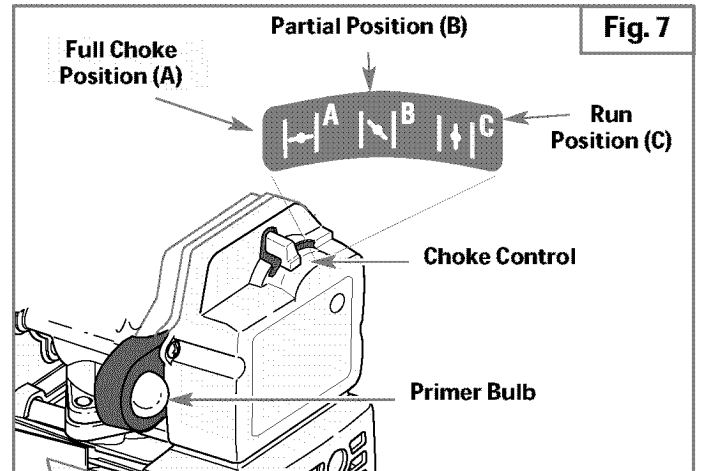
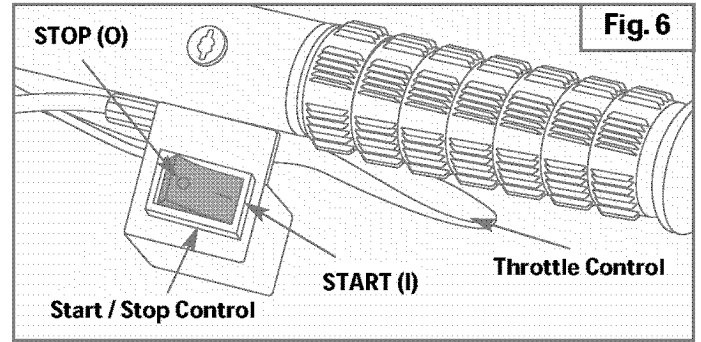
NOTE: Squeeze the throttle control until the engine has started and warmed up.

9. If the engine does not start, repeat steps 4 through 8.

NOTE: If the engine floods while trying to start, place the choke lever in the **RUN** position (C |→|) (Fig. 7). Squeeze the throttle control. Pull the starter rope briskly. The engine should start within three (3) to eight (8) pulls.

10. Squeeze the throttle control to warm up engine for 5 to 10 seconds. Place the choke lever in the **RUN** position (C |→|) (Fig. 7).

NOTE: Choking is unnecessary when starting a warm engine. Put the On/Off Stop Control in the **START (I)** position (Fig. 6), and start in **PARTIAL** choke position (B |↖|) (Fig. 7).



STOPPING INSTRUCTIONS

1. Release your hand from the throttle control (Fig. 8). Allow the engine to cool down by idling.
2. Put the On/Off Stop Control in the **STOP (O)** position (Fig. 6).

OPERATING INSTRUCTIONS

OPERATING TIPS



WARNING: Always wear eye, hearing, foot and body protection to reduce the risk of injury when operating this unit.

1. Move the cultivator to the work area prior to starting the engine. Transport the cultivator by pushing it on its wheels.



WARNING: To prevent serious personal injury, never pick-up or carry the unit while the engine is running.

2. Start the unit as described in the *Starting Instructions*.
3. With the engine running and the tines off the ground, depress the throttle control to increase the engine speed.
4. Holding both of the handlebar grips firmly, slowly lower the cultivator until the tines make contact with the ground (Fig. 9).
5. As cultivating action begins, pull back on the cultivator so that the tines can penetrate the ground.
6. Once the ground has been broken, continue at a moderate pace until you are familiar with the controls and the handling of the cultivator.
7. Pull the cultivator backwards to improve the depth of cultivation and reduce your effort.



WARNING: To prevent serious personal injury, use extreme caution when reversing or pulling the unit towards you.

8. If the tines are digging too deep or not deep enough, adjust them according to *Adjusting Tine Depth*.

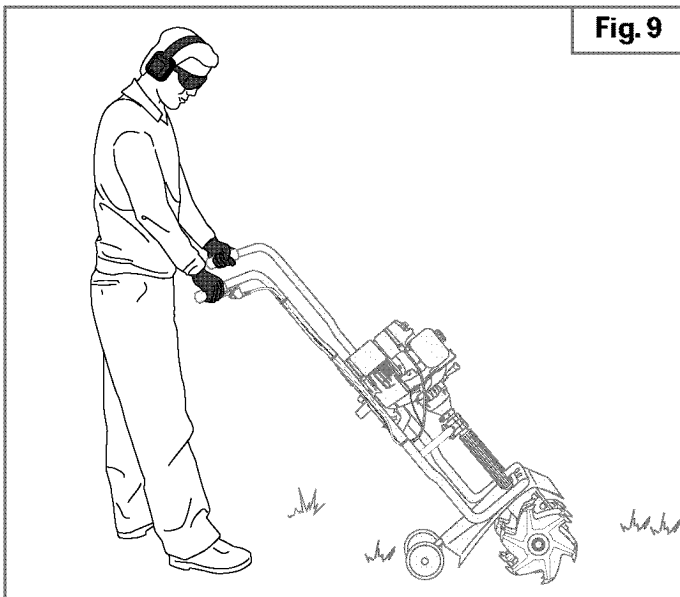


Fig. 9

ADJUSTING TINE DEPTH

Tine adjustment will vary depending on the type of soil being cultivated and how it will be used. Generally, adjusting the tines to break the soil 4 to 6 inches is recommended for most gardens. Adjust the tines as follows:

1. Stop the engine and disconnect the spark plug wire.
2. Loosen (do not remove) the two wing nuts on the tine guard (Fig. 10).
3. Slide the wheel bracket assembly down for shallower penetration, and up for deeper tine penetration.
4. Once the tines are in the desired position, tighten the wing nuts, making sure that the carriage bolts are seated properly through the bracket.
5. If the tine depth is incorrect, repeat steps 2 to 4.
6. Reconnect the spark plug wire and continue use.

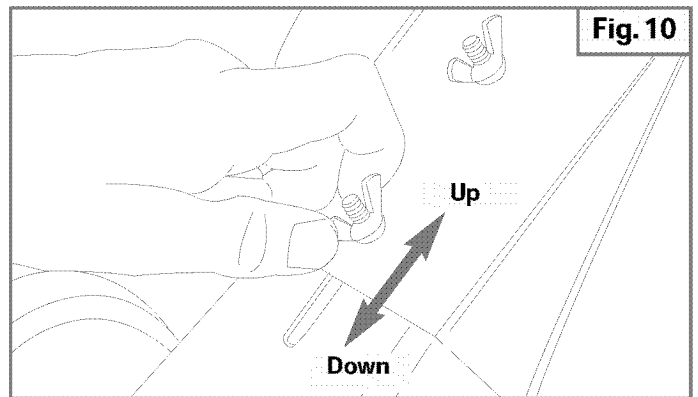


Fig. 10

Transporting the Unit



WARNING: To prevent serious personal injury, always stop the engine when operation is delayed or when transporting the unit from one location to another.


1. Stop the engine.
2. Slide the wheel bracket assembly all the way down.
3. Tilt the unit back until the tines clear the ground.
4. Push or pull the unit to the next location.

MAINTENANCE & REPAIR INSTRUCTIONS

MAINTENANCE SCHEDULE

Perform these required maintenance procedures at the frequency stated in the table. These procedures should also be a part of any seasonal tune-up.

NOTE: Some maintenance procedures may require special tools or skills. If you are unsure about these procedures take your unit to any non-road engine repair establishment, individual or authorized service dealer.



WARNING: To prevent serious injury, never perform maintenance or repairs with unit running. Always service and repair a cool unit. Disconnect the spark plug wire to ensure that the unit cannot start.


NOTE: Maintenance, replacement, or repair of the emission control devices and system may be performed by any non-road engine repair establishment, individual or authorized service dealer.

In order to assure peak performance of your engine, inspection of the engine exhaust port may be necessary after 50 hours of operation. If you notice lost RPM, poor performance or general lack of acceleration, this service may be required. If you feel your engine is in need of this inspection, refer service to any non-road engine repair establishment, individual or authorized service dealer for repair. **DO NOT** attempt to perform this process yourself as engine damage may result from contaminants involved in the cleaning process for the port.

FREQUENCY	MAINTENANCE REQUIRED	REFER TO
Before starting engine	Fill fuel tank with fresh fuel mix	Page 8
Every 10 hours	Clean and re-oil air filter	Page 12
Every 25 hours	Check and clean spark arrestor Check spark plug condition and gap	Page 12 Page 13
Every 50 hours	Inspect exhaust port and spark arrestor screen for clogging or obstruction to assure maximum performance levels	Page 12

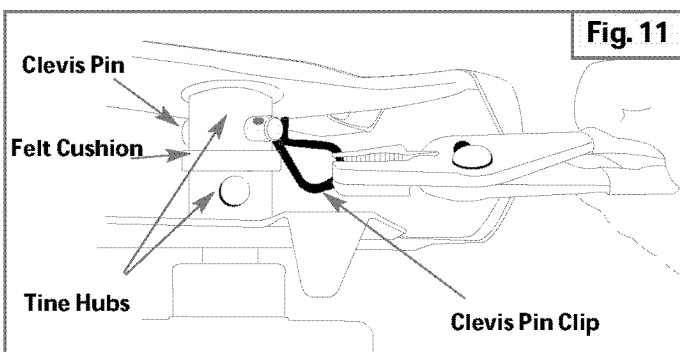
TINE REMOVAL AND REPLACEMENT

Replace all four (4) tines at the same time, because they will wear evenly through normal use. Work on one side at a time.



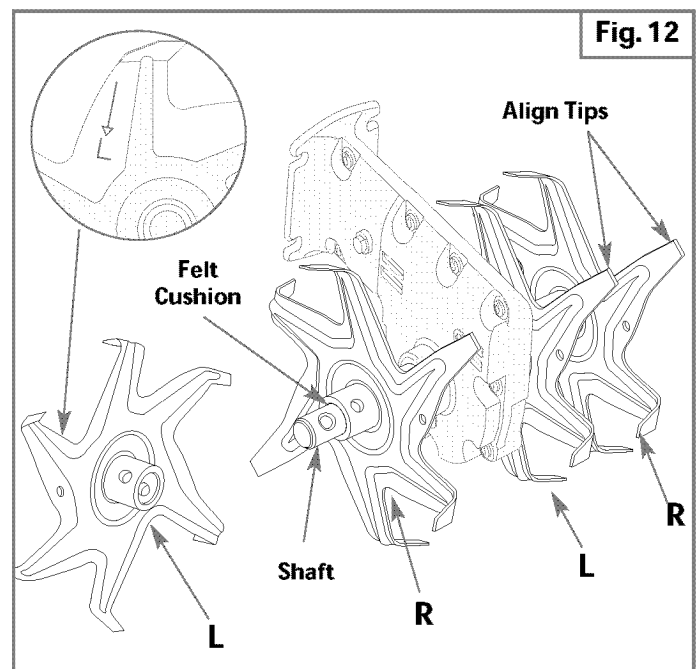
WARNING: To prevent serious personal injury, always wear heavy gloves when handling the tines.

- Put the On/Off Stop Control in the **STOP (O)** position and disconnect the spark plug wire.
- Remove the clevis pin clips and clevis pins (Fig. 11).
- Remove the tines and felt cushions from the shaft.
- Clean and oil the shaft.
- The tines are stamped with the letter "R" or "L" to identify their position on each side of the gearbox when facing the front of the unit.
- Replace the tines and felt cushions onto the shaft with the hubs on the tines facing each other.



- Ensure the tips on tines are aligned in the same direction with each other before reinstalling the clevis pins and pin clips (Fig. 12).
- Repeat this procedure on the opposite side.

NOTE: When installed correctly, there will be an "R" and "L" tine on both the gearbox and the tips of the tines. These letters will line up in the same direction for each side. It is important that the tines are installed correctly.



MAINTENANCE & REPAIR INSTRUCTIONS

AIR FILTER MAINTENANCE

Removing the Air Filter/Muffler Cover

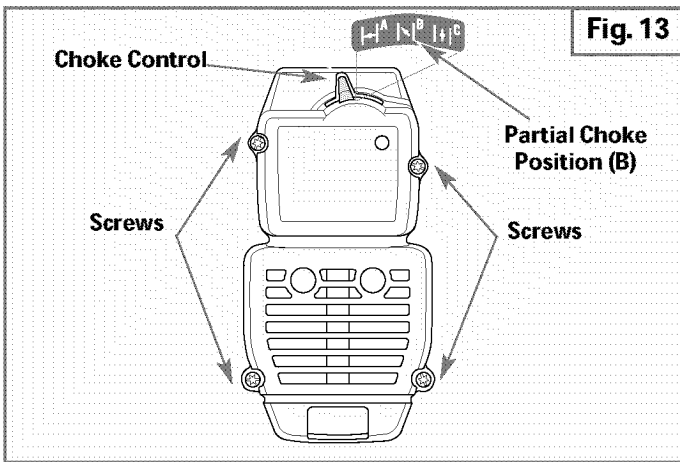


WARNING: To avoid serious personal injury, always turn your unit off and allow it to cool before you clean or service it.

1. Place the choke control in the **PARTIAL** choke position (B).

NOTE: The choke control must be in the **PARTIAL** choke position (B) (Fig. 13) to remove the air filter/muffler cover.

2. Remove the four (4) screws securing the air filter/muffler cover (Fig. 13). Use a flat blade or # T20 Torx bit screwdriver.
3. Pull the cover from the engine. Do not force.



Cleaning the Air Filter

Clean and re-oil the air filter every 10 hours of operation. It is an important item to maintain. Failure to maintain the air filter will **VOID** the warranty.

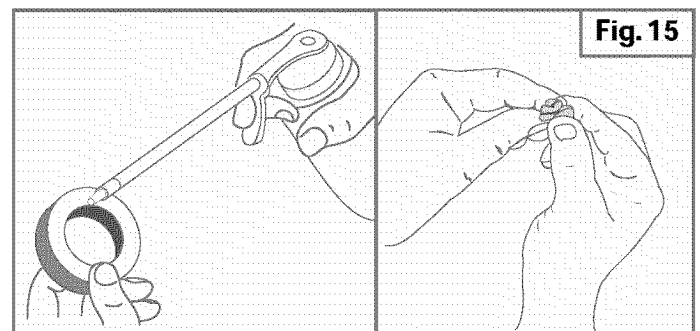
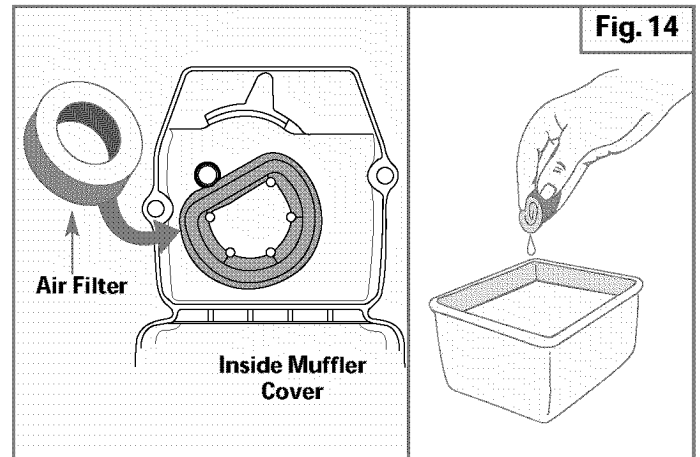
1. Remove the air filter/muffler cover. Refer to the *Removing the Air filter/Muffler Cover* section.
2. Remove the air filter from inside the air filter/muffler cover (Fig. 14).
3. Wash the filter in detergent and water (Fig. 14). Rinse the filter thoroughly. Squeeze out excess water. Allow it to dry completely.
4. Apply enough SAE 30 oil to lightly coat the filter (Fig. 15).
5. Squeeze the filter to spread and remove extra oil (Fig. 15).
6. Replace the air filter inside the muffler cover (Fig. 14).

NOTE: Operating the unit without the air filter and cover assembly will **VOID** the warranty.

Reinstalling the Air filter/Muffler Cover

1. Place the air filter/muffler cover over the back of the carburetor and muffler.

NOTE: The choke control must be in the **PARTIAL** choke position (B) (Fig. 13) to remove the air filter/muffler cover.



2. Insert the four (4) screws into the holes in the air filter/muffler cover (Fig. 13) and tighten. Use a flat blade or # T20 Torx bit screwdriver. Do not over tighten. Do not force.

SPARK ARRESTOR MAINTENANCE

1. Remove the air filter/muffler cover. Refer to *Removing the Air Filter/Muffler Cover*.
2. Locate the muffler front and the two (2) bolts securing it to the engine (Fig. 16). Remove the two (2) bolts using a flatblade screwdriver or 5/16-inch socket or nut driver. Pull the muffler off of the engine.
3. Turn the muffler over to the back side and locate the exhaust gasket. Remove the muffler gasket from the muffler (Fig. 16).

NOTE: If the exhaust gasket is torn or damaged, replace it with a new gasket before you reassemble the muffler.

4. Using a small flatblade screwdriver, carefully pry up the spark arrestor from the recessed hole (Fig. 17). Remove the spark arrestor from the muffler.
5. Clean the spark arrestor with a wire brush. Replace it if it is damaged or if it can't be cleaned thoroughly (Fig. 17).
6. Reinstall the spark arrestor by pressing it into the recessed hole on the muffler's back side. Make sure it fits tightly against the muffler and is not raised up.
7. Place the exhaust gasket against muffler's back side. Align the gasket bolt holes with the bolt holes in the muffler. While holding exhaust gasket in place, insert the bolts into the muffler's front side (Fig. 16).

MAINTENANCE & REPAIR INSTRUCTIONS

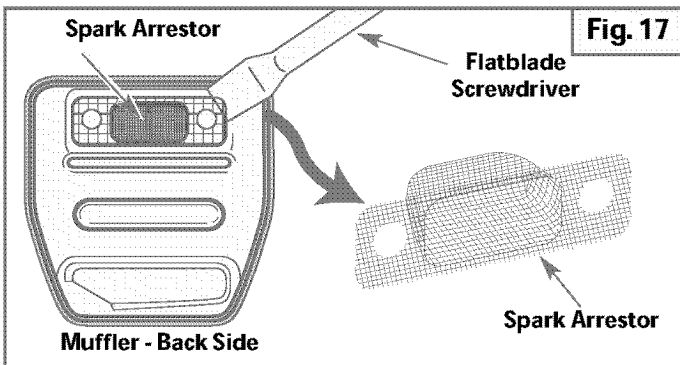
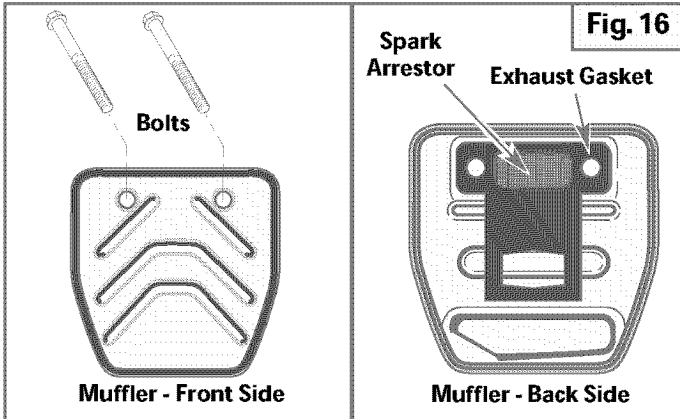
- Place the muffler (with the exhaust gasket in place and bolts inserted), against the engine, aligning the bolt holes. Tighten the bolts to secure the muffler to the engine. If using a torque wrench, torque to:

80-90 in.·lb. (9-10.2 N·m)

- Reinstall the air filter/muffler cover.



WARNING: If the muffler is not tightened securely, it could fall off causing damage to the unit and possible serious personal injury.



CARBURETOR ADJUSTMENTS

The engine's idle speed adjuster is adjustable through the air filter/muffler cover (Fig 18).

NOTE: Careless adjustments can seriously damage your unit. An authorized service dealer should make carburetor adjustments.

Check Fuel Mixture

Old and/or improperly mixed fuel is usually the reason for the unit not running properly. Drain and refill the tank with fresh, properly mixed fuel prior to making any adjustments. Refer to *Oil and Fuel Information*.

Clean Air Filter

The condition of the air filter is important to the operation of the unit. A dirty air filter will restrict air flow and change the air/fuel mixture. This is often mistaken for an out of adjustment carburetor. Check the condition of the air filter before adjusting the idle speed adjuster. Refer to *Air Filter Maintenance*.

Adjust Idle Speed Adjuster



WARNING: The unit may still run during idle speed adjustments. Wear protective clothing and observe all safety instructions to prevent serious personal injury.

If after checking the fuel mixture and cleaning the air filter the engine still will not idle, adjust the idle speed screw as follows:

- Start the engine and let it run for about 2-3 minutes at a high speed (full throttle) to warm up. Refer to the *Starting/Stopping Instructions*.

NOTE: Ensure the tines are not in contact with the ground when adjusting the idle.

- Release the throttle control and let the engine idle. If the engine stops, insert a small phillips or flat blade screwdriver into the hole in the muffler cover (Fig. 18). Turn the idle speed screw **clockwise** 1/8 of a turn at a time (as needed) until the engine idles smoothly.

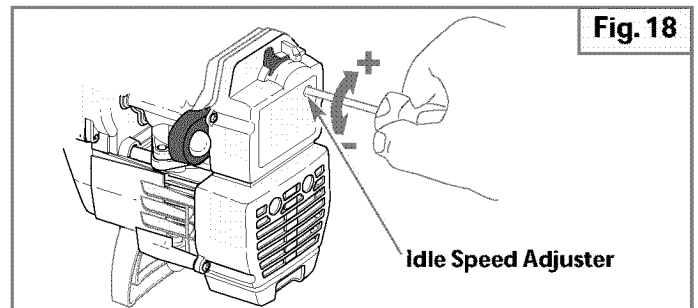
NOTE: The tines should not rotate during engine idle.

- If the tines rotate when the engine idles, turn the idle speed screw **counterclockwise** 1/8 of a turn at a time (as needed), to reduce idle speed.

Checking the fuel mixture, cleaning the air filter, and adjusting the idle speed screw should solve most engine problems. If not and all the following are true:

- The engine will not idle
- The engine hesitates or stalls on acceleration
- There is a loss of engine power

Have the carburetor adjusted by an authorized service dealer.



REPLACING THE SPARK PLUG

Use a Champion RDJ7Y spark plug (or equivalent). The correct air gap is 0.020 in. (0.5 mm). Remove the plug after every 25 hours of operation to check its condition.

- Stop the engine and allow it to cool. Grasp the plug wire firmly and pull the cap from the spark plug.
- Clean dirt from around the spark plug. Remove the spark plug from the cylinder head by turning a 5/8 in. socket counterclockwise.

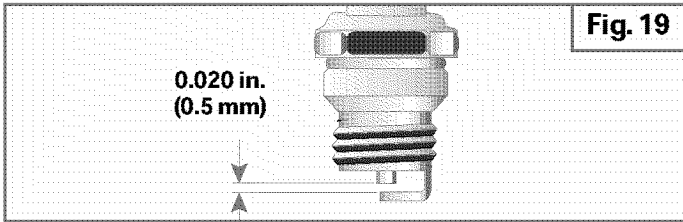
NOTE: Replace a cracked, fouled or dirty spark plug.

- Set the air gap at 0.020 in. (0.5 mm) using a feeler gauge (Fig. 19).



CAUTION: Do not sand blast, scrape or clean electrodes. Grit in the engine could damage the cylinder.

MAINTENANCE & REPAIR INSTRUCTIONS



4. Install a correctly gapped spark plug in the cylinder head. Tighten by turning the 5/8 in. socket clockwise until snug.

If using a torque wrench torque to:

110-120 in.·lb. (12.3-13.5 N·m)

Do not over tighten.

CLEANING THE UNIT



WARNING: To avoid serious personal injury, always turn the off and allow it to cool before you clean or service it.

- Use a small brush to clean off the outside of the unit and to keep the air vents free of obstructions.
- Do not use strong detergents or petroleum based cleaners, like kerosene. Some household cleaners contain aromatic oils such as pine and lemon that can damage the plastic housings or handles. Wipe off any moisture with a soft cloth.

STORAGE

- Never store a fueled unit where fumes may reach an open flame or spark.
- Allow the engine to cool before storing.
- Store the unit in a locked up area to prevent unauthorized use or damage.
- Store the unit in a dry, well-ventilated area.
- Store the unit out of the reach of children.

LONG TERM STORAGE

If you plan to store the unit for an extended time:

1. Drain all fuel from the fuel tank into a container. Do not use fuel that has been stored for more than 60 days. Dispose of the old fuel in accordance to local regulations.
2. Start the engine and allow it to run until it stalls. This ensures that all fuel has been drained from the carburetor.
3. Allow the engine to cool. Remove the spark plug and put 1 oz. (30 ml) of high quality motor oil into the cylinder. Pull the starter rope slowly to distribute the oil. Reinstall the spark plug.

NOTE: Remove the spark plug and drain all of the oil from the cylinder before attempting to start the unit after storage.

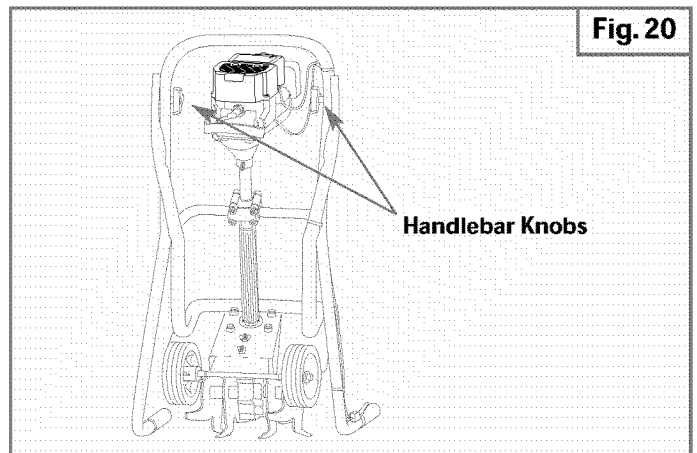
4. Thoroughly clean the unit and inspect for any loose or damaged parts. Repair or replace damaged parts and tighten loose screws, nuts or bolts. The unit is ready for storage.

TRANSPORTING

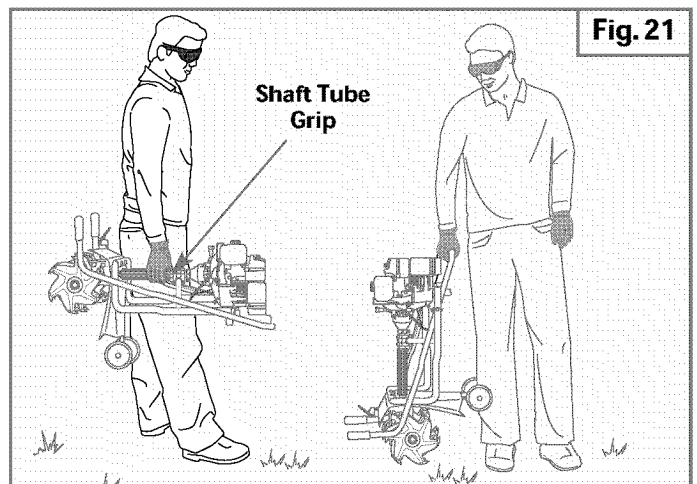
- Allow the engine to cool before transporting.
- Secure the unit while transporting.
- Drain the fuel tank before transporting.
- Tighten fuel cap before transporting.

MOVING THE UNIT

1. Allow the unit to cool before moving.
2. Loosen the knobs on the handlebar.
3. Fold the handlebars down as shown (Fig. 20).



4. Either carry the unit by the shaft tube grip or grasp the center of the handlebar to use it as a carrying handle (Fig. 21).
5. After the unit has been moved, reposition the handlebars and continue operation.



ACCESSORIES/REPLACEMENT PARTS

2-Cycle Oil	147543
Spark Plug	610311
Fuel Cap	180000
Tine (L) (Left Side Outer or Right Side Inner)	182729
Tine (R) (Right Side Outer or Left Side Inner)	182730
Clevis Pin with Clip	147473

TROUBLESHOOTING

ENGINE WILL NOT START

CAUSE

On/Off Stop Control in the STOP position
Empty fuel tank
Primer bulb wasn't pressed enough
Engine flooded
Old or improperly mixed fuel
Fouled spark plug
Plugged spark arrestor

ACTION

Turn the On/Off Stop Control to START
Fill fuel tank
Press primer bulb fully and slowly 5-7 times
Use starting procedure with choke control in RUN
Drain fuel tank / Add fresh fuel mixture
Replace or clean the spark plug
Clean or replace spark arrestor

ENGINE WILL NOT IDLE

CAUSE

Air Filter is Plugged
Old or improperly mixed fuel
Improper carburetor adjustment

ACTION

Replace or clean the air filter
Drain fuel tank / Add fresh fuel mixture
Adjust according to the *Carburetor Adjustments* section

ENGINE WILL NOT ACCELERATE

CAUSE

Old or improperly mixed fuel
Improper carburetor adjustment
Cultivator tines bound with dirt or grass

Dirty air filter
Plugged spark arrestor

ACTION

Drain fuel tank / Add fresh fuel mixture
Take to an authorized service dealer for a carburetor adjustment
Stop the unit, switch the On/Off Stop Control to STOP, clean and remove any debris binding the tine
Clean or replace the air filter
Clean or replace spark arrestor

ENGINE LACKS POWER OR STALLS WHEN UNDER LOAD

CAUSE

Old or improperly mixed fuel
Improper carburetor adjustment
Fouled spark plug
Plugged spark arrestor

ACTION

Drain fuel tank / Add fresh fuel mixture
Take to an authorized service dealer for a carburetor adjustment
Replace or clean the spark plug
Clean or replace spark arrestor

SPECIFICATIONS

ENGINE

Engine Type.....	Air-Cooled, 2-Cycle
Displacement.....	31 cc
Idle Speed RPM.....	2,800-3,600 rpm
Operating RPM.....	7,700+ rpm
Clutch Type.....	Centrifugal
Ignition Type.....	Electronic
On/Off Stop Control.....	Rocker Switch
Spark Plug Gap.....	0.020 inch (0.5 mm)
Lubrication.....	Fuel/Oil Mixture
Fuel/Oil Ratio.....	32:1
Carburetor.....	Diaphragm, All-Position
Starter.....	Auto Rewind
Muffler.....	Baffled with Guard
Throttle.....	Spring Return
Fuel Tank Capacity.....	14 ounces (415 ml)

DRIVE SHAFT AND CULTIVATOR

Drive Shaft Tube.....	Steel Tube
Throttle Control.....	Finger-Tip Trigger
Cultivating Path Width (Maximum).....	9 inches (22.86 cm)
Cultivating Depth (Maximum).....	6 inches (15.24 cm)
Weight (no fuel).....	25.8 lb. (11.7 kg)

EPA Emission Control Warranty Statement

Your Warranty Rights and Obligations

The Environmental Protection Agency and MTD SOUTHWEST INC (MTD) are pleased to explain the emission control system warranty on your 2002 and later small off-road engine. New small off-road engines must be designed, built and equipped to meet stringent anti-smog standards. MTD must warrant the emission control system on your small off-road engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road engine.

Your emission control system may include parts such as the carburetor or fuel-injected system, the ignition system, and catalytic converter. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, MTD will repair your small off-road engine at no cost to you including diagnosis, parts and labor.

The 2002 and later small off-road engines are warranted for two years. If any emission-related part on your engine is defective, the part will be repaired or replaced by MTD.

Owners Warranty Responsibilities

- As the small off-road engine owner, you are responsible for the performance of the required maintenance listed in your operator's manual. MTD recommends that you retain all receipts covering maintenance on your small off-road engine, but MTD cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the small off-road engine owner, you however should be aware that MTD may deny you warranty coverage if your small off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.
- You are responsible for presenting your small off-road engine to a MTD Authorized Service Center as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

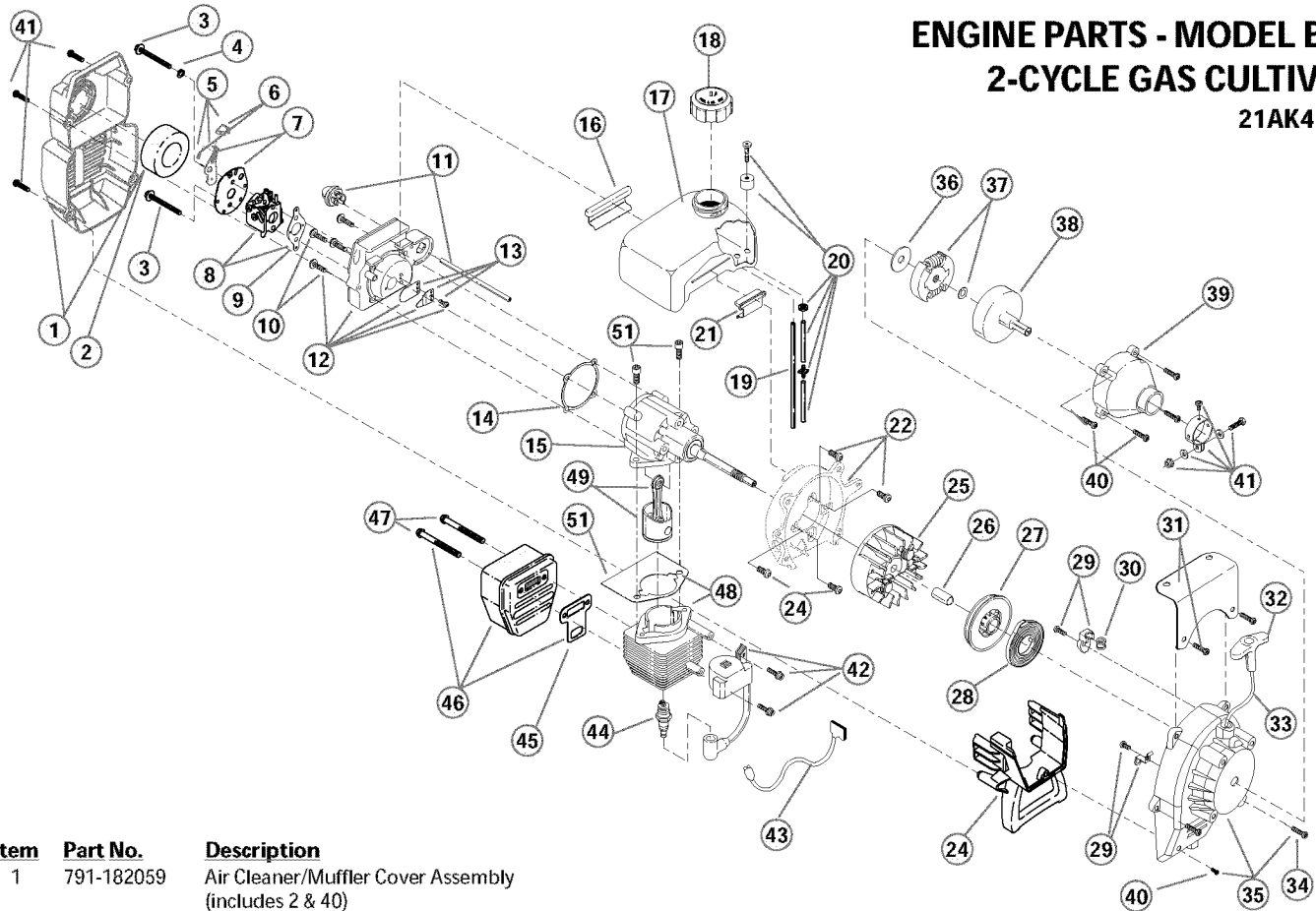
If you have any questions regarding your warranty rights and responsibilities, you should call 1-800-345-8746.

Manufacturer's Warranty Coverage

- The warranty period begins on the date the engine or equipment is delivered to the retail purchaser.
- The manufacturer warrants to the initial owner and each subsequent purchaser, that the engine is free from defects in material and workmanship which cause the failure of a warranted part for a period of two years.
- Repair or replacement of warranted part will be performed at no charge to the owner at an Authorized MTD Service Center. For the nearest location please contact MTD at: 1-800-345-8746.
- Any warranted part which is not scheduled for replacement, as required maintenance or which is scheduled for only for regular inspection to the effect of "Repair or Replace as Necessary" is warranted for the warranty period. Any warranted part which is scheduled for replacement as required maintenance will be warranted for the period of time up to the first scheduled replacement point for that part.
- The owner will not be charged for diagnostic labor which leads to the determination that a warranted part is defective, if the diagnostic work is performed at an Authorized MTD Service Center.
- The manufacturer is liable for damages to other engine components caused by the failure of a warranted part still under warranty.
- Failures caused by abuse, neglect or improper maintenance are not covered under warranty.
- The use of add-on or modified parts can be grounds for disallowing a warranty claim. The manufacturer is not liable to cover failures of warranted parts caused by the use of add-on or modified parts.
- In order to file a claim, go to your nearest Authorized MTD Service Center. Warranty services or repairs will be provided at all Authorized MTD Service Centers.
- Any manufacturer approved replacement part may be used in the performance of any warranty maintenance or repair of emission related parts and will be provided without charge to the owner. Any replacement part that is equivalent in performance or durability may be used in non-warranty maintenance or repair and will not reduce the warranty obligations of the manufacturer
- The following components are included in the emission related warranty of the engine, air filter, carburetor, primer, fuel lines, fuel pick up/ fuel filter, ignition module, spark plug and muffler.

PARTS LIST

ENGINE PARTS - MODEL BL410 2-CYCLE GAS CULTIVATOR 21AK410G163

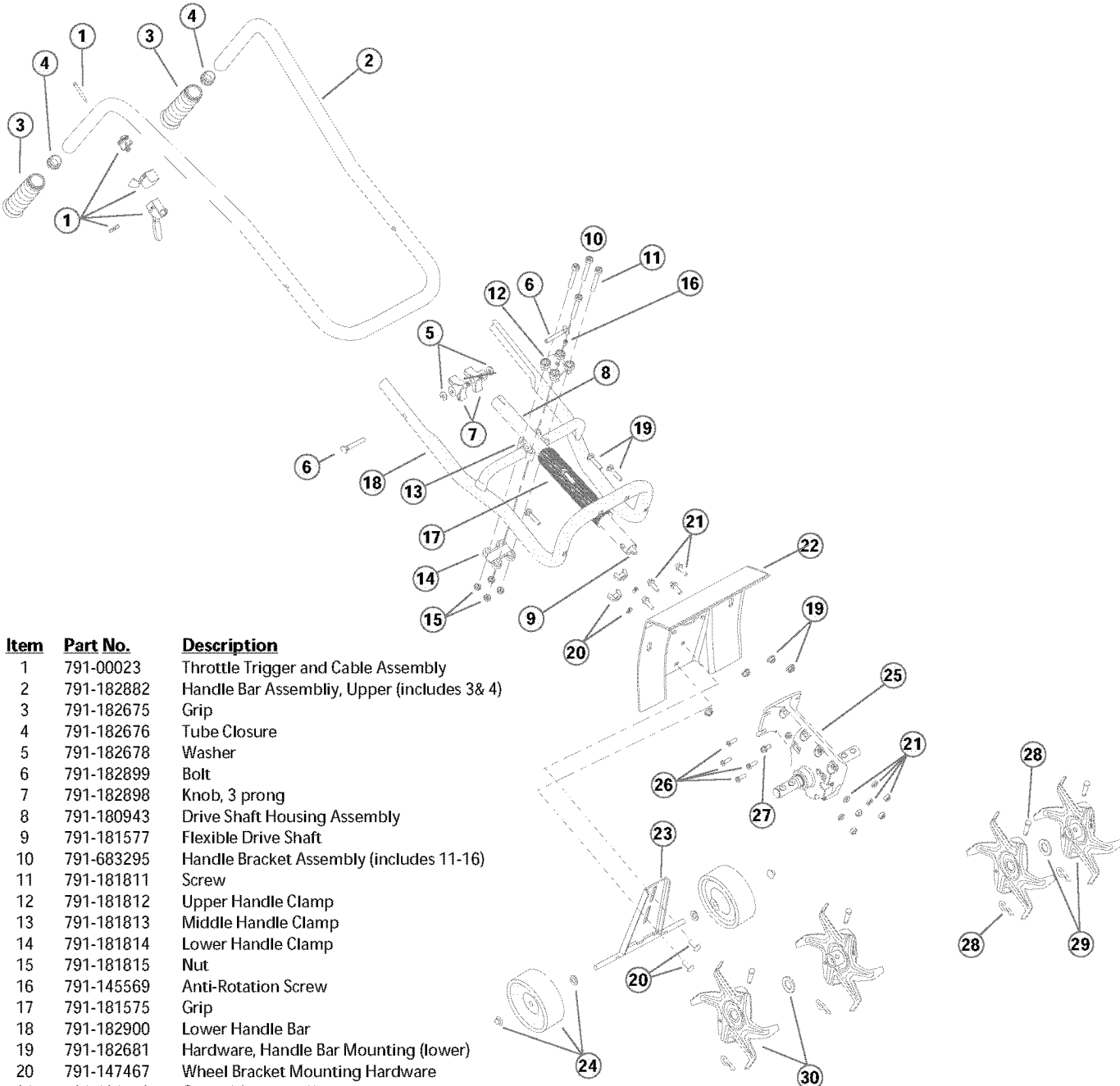


Item	Part No.	Description
1	791-182059	Air Cleaner/Muffler Cover Assembly (includes 2 & 40)
2	791-180350	Air Cleaner Filter
3	791-180351	Carburetor Mounting Screw Assembly
4	791-180226	Wavy Washer
5	791-182160	Choke Lever Assembly (includes 6)
6	791-182161	Choke Knob and Screw
7	791-182162	Choke Lever and Plate (includes 5)
8	753-04106	Carburetor Assembly W/Limiter Caps (includes 9 & 21)
9	791-610675	Carburetor Gasket
10	791-181860	Carb Mount Screw
11	791-181558	Primer and Hose Assembly
12	753-1196	Carb Mount Assembly (includes 10)
13	791-684451	Reed Assembly
14	753-1208	Carburetor Mount Gasket
15	791-180026	Crank Case Service Assembly (includes 10, 14 & 24)
16	791-612134	Rear Mounting Pad
17	753-04237	Fuel Tank Assembly (includes 19-21)
18	791-182612	Fuel Cap Assembly
19	791-181168	Fuel Return Line
20	791-682039	Fuel Line Assembly
21	791-145308	Front Mounting Pad
22	791-683065	Shroud Assembly
23	791-181861	Shroud Screw
24	791-182064	Shroud Extension and Stand
25	791-181867	Flywheel Assembly
26	791-181065	Spacer
27	791-181597	Recoil Pulley Assembly
28	791-613102	Recoil Spring
29	791-180930	Pulley Retainer Assembly
30	791-611061	Rope Guide
31	791-180317	Fuel Tank Guard Assembly
32	791-181079	Pull Handle
33	791-613103	Rope
34	791-181912	Housing Screw

Item	Part No.	Description
35	753-04238	Starter Housing Assembly (includes items 27-30, 32-34)
36	791-182368	Clutch Washer
37	791-182369	Clutch Rotor Assembly
38	791-153592	Clutch Drum Assembly
39	791-180098	Clutch Cover Assembly (includes item 40)
40	791-181345	Clutch Cover Screw
41	791-153597	Upper Clamp Assembly
42	791-181937	Module Assembly
43	791-182880	Wire Lead
44	791-610311	Spark Plug
45	753-04159	Exhaust Gasket
46	791-182174	Muffler Assembly (includes item 45 & 47)
47	791-182464	Muffler Mounting Bolt Assembly
48	791-181622	Cylinder Assembly (includes items 51 & 52)
49	753-1207	Piston and Rod Assembly
50	753-1197	Cylinder Gasket
51	791-182723	Cylinder Bolt
*	753-04134	Engine Gasket Kit
*	791-180602	O.E.M. Carburetor Repair Kit (Walbro)
*	791-180090	O.E.M. Carburetor Repair Kit (Zama)
*	791-181069	Gasket-Diaphragm Repair Kit (Walbro)
*	791-180091	Gasket-Diaphragm Repair Kit (Zama)
*	753-1209	Piston Ring
*	753-1210	Short Block Assembly (items 14, 44, 48-51)
*	791-181501	Starter Housing Screw Set
*	791-181873	Carburetor Limiter Cap Set (Walbro)
*	791-181562	Carburetor Limiter Cap Set (Zama)
*	791-610309	Crankcase Seal
*	791-181599	Clutch Springs (Qty. 2)
*		not shown

PARTS LIST

BOOM AND CULTIVATOR PARTS - MODEL BL410 2-CYCLE GAS CULTIVATOR 21AK410G163



Item	Part No.	Description
1	791-00023	Throttle Trigger and Cable Assembly
2	791-182882	Handle Bar Assembly, Upper (includes 3 & 4)
3	791-182675	Grip
4	791-182676	Tube Closure
5	791-182678	Washer
6	791-182899	Bolt
7	791-182898	Knob, 3 prong
8	791-180943	Drive Shaft Housing Assembly
9	791-181577	Flexible Drive Shaft
10	791-683295	Handle Bracket Assembly (includes 11-16)
11	791-181811	Screw
12	791-181812	Upper Handle Clamp
13	791-181813	Middle Handle Clamp
14	791-181814	Lower Handle Clamp
15	791-181815	Nut
16	791-145569	Anti-Rotation Screw
17	791-181575	Grip
18	791-182900	Lower Handle Bar
19	791-182681	Hardware, Handle Bar Mounting (lower)
20	791-147467	Wheel Bracket Mounting Hardware
21	791-181579	Guard Mounting Hardware
22	753-04240	Guard
23	791-180320	Wheel Bracket Assembly
24	791-180944	Wheel Assembly
25	791-147474	Gear Box Assembly
26	791-182195	Screw
27	791-180288	Sleeve Retainer Bolt
28	791-147473	Tine Fastener Assembly
29	791-182729	Tine Assembly (Left Outer or Right Inner)
30	791-182730	Tine Assembly (Left Inner or Right Outer)

Optional Accessories

- * 147543 Ryobi 2-Cycle Oil

*not shown

MANUFACTURER'S LIMITED WARRANTY FOR:

Bolens

SINCE-1850

The limited warranty set forth below is given by Troy-Bilt LLC with respect with new merchandise purchased and used in the United States, its possessions and territories.

Troy-Bilt warrants this product against defects in material and workmanship for a period of two (2) years commencing on the date of original purchase and will, at its option, repair or replace, free of charge, any part found to be defective in material or workmanship. This limited warranty shall only apply if this product has been operated and maintained in accordance with the Operator's Manual furnished with the product, and has not been subject to misuse, abuse, commercial use, neglect, accident, improper maintenance, alteration, vandalism, theft, fire, water or damage because of other peril or natural disaster. Damage resulting from the installation or use of any accessory or attachment not approved by Troy-Bilt for use with the product(s) covered by this manual will void your warranty as to any resulting damage.

This warranty is limited to ninety (90) days from the date of original retail purchase for any Bolens product that is used for rental or commercial purposes, or any other income-producing purpose.

HOW TO OBTAIN SERVICE: Warranty service is available, WITH PROOF OF PURCHASE THROUGH YOUR LOCAL AUTHORIZED SERVICE DEALER. To locate the dealer in your area, please check for a listing in the Yellow Pages or contact the Customer Service Department of Troy-Bilt LLC by calling 1-866-840-6483 or writing to PO Box 361131, Cleveland, Ohio 44136-0019. No product returned directly to the factory will be accepted unless prior written permission has been extended by the Customer Service Department of Troy-Bilt LLC.

This limited warranty does not provide coverage in the following cases:

- A. Tune-ups - Spark Plugs, Carburetor Adjustments, Filters
- B. Wear items - Bump Knobs, Outer Spools, Cutting Line, Inner Reels, Starter Pulley, Starter Ropes, Drive Belts
- C. Troy-Bilt does not extend any warranty for products sold or exported outside of the United States of America, its possessions and territories, except those sold through Troy-Bilt's authorized channels of export distribution.

Troy-Bilt reserves the right to change or improve the design of any Bolens Product without assuming any obligation to modify any product previously manufactured.

No implied warranty, including any implied warranty of merchantability or fitness for a particular purpose, applies after the applicable period of express written warranty above as to the parts as identified. No other express warranty or guaranty, whether written or oral, except as mentioned above, given by any person or entity, including a dealer or retailer, with respect to any product shall bind Troy-Bilt LLC. During the period of the Warranty, the exclusive remedy is repair or replacement of the product as set forth above. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

The provisions as set forth in this Warranty provide the sole and exclusive remedy arising from the sales. Troy-Bilt LLC shall not be liable for incidental or consequential loss or damages including, without limitation, expenses incurred for substitute or replacement lawn care services, for transportation or for related expenses, or for rental expenses to temporarily replace a warranted product. (Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.)

In no event shall recovery of any kind be greater than the amount of the purchase price of the product sold. Alteration of the safety features of the product shall void this Warranty. You assume the risk and liability for loss, damage, or injury to you and your property and/or to others and their property arising out of the use or misuse or inability to use the product.

This limited warranty shall not extend to anyone other than the original purchaser, original lessee or the person for whom it was purchased as a gift.

How State Law Relates to this Warranty: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

To locate your nearest service dealer dial 1-866-840-6483.

TROY-BILT LLC

PO Box 361131

Cleveland, OH 44136-0019 U.S.A.

**SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE
FOR QUESTIONS CALL 1-866-840-6483**