

Owner's Manual GC2100R Front Tine Tiller



MODEL NUMBER: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

Register your Generac product at:
WWW.GENERAC.COM
888-545-6576

Original Instructions

SAVE THIS MANUAL FOR FUTURE REFERENCE

 **WARNING**

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov

(000393a)

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Section 1: Safety Rules & General Information

Introduction

Thank you for purchasing this Generac front tine tiller. This unit has been designed to provide high performance, efficient operation, and years of use when maintained correctly.

The unit is designed and built for consistent, reliable use for tilling projects. It is built to withstand frequent handling under these conditions.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly



Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-545-6576, or visit www.generac.com for starting, operating, and servicing procedures. The owner is responsible for correct maintenance and safe use of the unit.

This manual must be used in conjunction with all other supporting product documentation supplied with the product.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION, and NOTE blocks are used to alert personnel to special

instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Alert definitions are as follows:



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

(000001)



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

(000002)



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

(000003)

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety alerts cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

How to Obtain Service

When the unit requires servicing or repairs, contact Generac Customer Service at 1-888-545-6576 or visit www.generac.com for assistance.

When contacting Generac Customer Service about parts and service, always supply the complete model and serial number of the unit as given on its data decal located on the unit. Record the model and serial numbers in the spaces provided on the front cover of this manual.

General Hazards

⚠️ WARNING

Personal injury. Never remove, alter, or tamper with safety devices. Do not operate unit without safety equipment in place. Doing so could result in death, serious injury, property damage, or equipment damage.

(000403)

⚠️ WARNING

Personal injury. Keep out of reach of children. Failure to do so could result in death or serious injury.

(000128a)



⚠️ WARNING

Vision loss. Eye protection is required when servicing unit. Failure to do so could result in vision loss or serious injury.

(000377)

⚠️ WARNING

Personal injury and equipment damage. Do not tamper with engine governed speed. Operating engine too fast or slow increases the risk of injury or permanent engine damage.

(000254)



⚠️ WARNING

Moving Parts. Do not wear jewelry when starting or operating this product. Wearing jewelry while starting or operating this product could result in death or serious injury.

(000115)



⚠️ WARNING

Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury.

(000111)



⚠️ WARNING

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

(000108)



⚠️ WARNING

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury.

(000110)

⚠️ WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to operate or service this equipment and could result in death or serious injury.

(000215a)



⚠️ WARNING

Hearing Loss. Hearing protection is recommended when using this machine. Failure to wear hearing protection could result in permanent hearing loss.

(000107)

⚠️ WARNING

Personal injury. Wear sturdy shoes with no-slip tread, long pants, and gloves when operating this unit. Failure to do so could result in death or serious injury.

(000492)

⚠️ WARNING

Personal injury. Operate only in daylight or in area lit by artificial light. Failure to do so could result in death, serious injury, property or equipment damage.

(000620)

Exhaust and Fuel Hazards



⚠️ DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.

(000179b)



⚠️ DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

(000103)



⚠️ DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Store fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

(000143)

**⚠ DANGER**

Explosion and Fire. Do not overfill fuel tank. Fill to 1/2 inch from top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury. (000166b)

**⚠ DANGER**

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury.

(000174)

**⚠ WARNING**

Fire risk. Fuel and vapors are extremely flammable. Do not operate indoors. Doing so could result in death, serious injury, or property or equipment damage. (000281)

**⚠ WARNING**

Explosion and fire risk. Do not smoke near unit. Keep fire and spark away. Failure to do so could result in death, serious injury, or property or equipment damage.

(000282)

**⚠ WARNING**

Explosion and Fire. Do not smoke while refueling unit. Failure to do so could result in death, serious injury, or property or equipment damage. (000284a)

Fire Hazards

**⚠ DANGER**

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury.

(000174)

**⚠ WARNING**

Risk of Fire. Verify machine has properly cooled before installing cover and storing machine. Hot surfaces could result in fire.

(000109)

**⚠ WARNING**

Risk of fire. Never operate engine without the air cleaner installed. Operating engine without the air cleaner could result in death or serious injury.

(000249)

Explosion Hazards

**⚠ DANGER**

Explosion and fire. Fuel and vapors are extremely flammable and explosive. No leakage of fuel is permitted. Keep fire and spark away. Failure to do so will result in death or serious injury. (000192)

**⚠ WARNING**

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury.

(000110)

Safety and Operating Decals

See **Figure 1-1**. This unit features numerous safety and operating decals. These decals provide important operating instructions and warn of dangers and hazards. Replace damaged or missing safety and operating decals immediately.

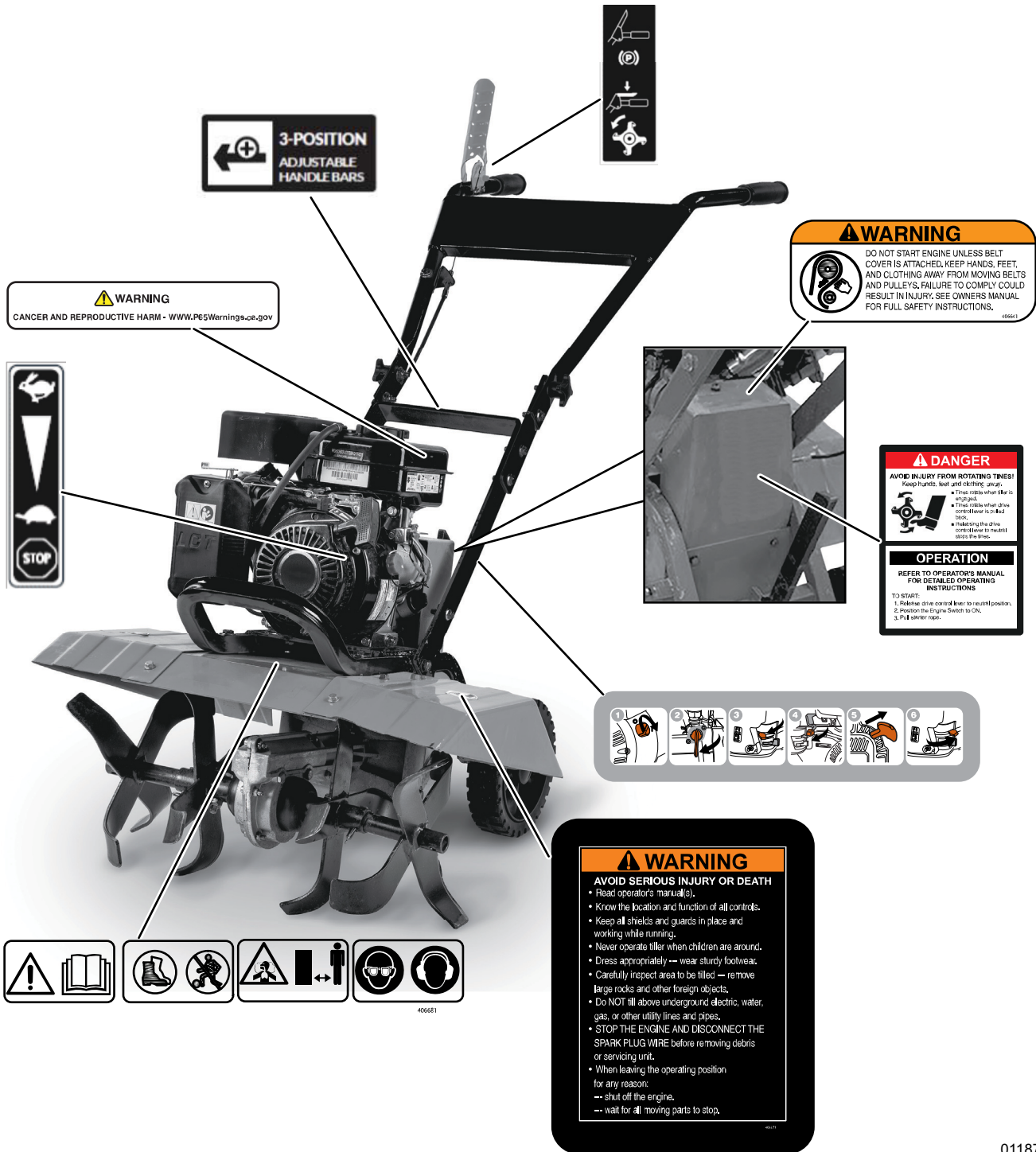


Figure 1-1. Safety Decals

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Section 2: General Information and Setup

Components and Locations

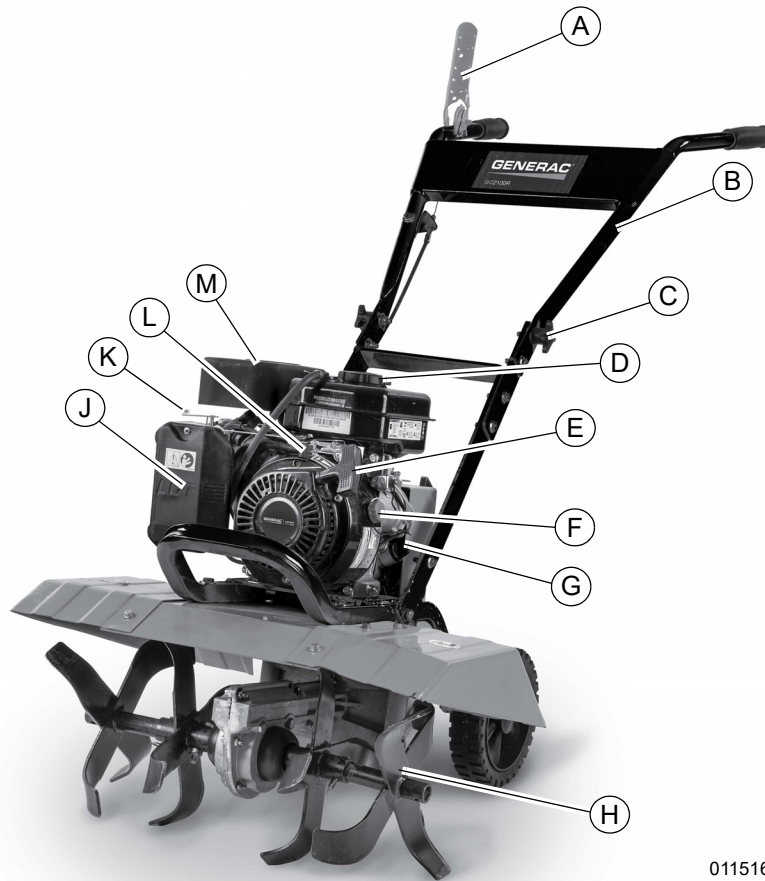


Figure 2-1. Features and Controls

A	Drive control lever	G	Oil fill cap/dipstick
B	Handlebar	H	Tines
C	Handlebar adjustment knob	J	Air filter
D	Fuel fill cap	K	Choke lever
E	Recoil starter handle	L	Throttle lever
F	ON/OFF switch	M	Muffler

Specifications

Engine	4-stroke OHV
Engine speed	3,600 rpm
Displacement	98 cc
Torque (ft-lbs / Nm)	3.33 / 4.5
Fuel capacity (qt / L)	1.69 / 1.6
Oil capacity (oz / mL)	12 / 350
Fuel type	Unleaded gasoline
Spark plug type	Torch E6TC / E6RTC, Champion RN9YC, NGK BPR6ES, Bosch WR6DC
Tine rpm	180
Tilling width (in / cm)	11–21 / 28–53
Tilling depth (in / cm)	7–11 / 18–28
Wheel size (in / cm)	8 / 20.3
Handlebars	Powder coated steel
Frame	Powder coated steel
Transmission	Worm gear and belt
Machine dimensions (L x W x H) (in / cm)	48 x 24 x 40 / 122 x 61 x 102
Machine weight (lbs / kg)	95 / 43.1

Emissions

The United States Environmental Protection Agency (US EPA) (and California Air Resources Board (CARB), for engines/equipment certified to California standards) requires this engine/equipment to comply with exhaust and evaporative emissions standards. Locate the emissions compliance decal on the engine to determine applicable standards. See the included emissions warranty for emissions warranty information. Follow the maintenance specifications in this manual to ensure the engine complies with applicable emissions standards for the duration of the product's life.

Remove Contents from Carton

1. Remove and verify carton contents prior to assembly. Carton contents should contain the following:

Description	QTY
Upper handlebar assembly	1
Outer right tine	1
Inner right tine	1
Outer left tine	1
Inner left tine	1
Lower handlebar	1
Right tine shield	1
Left tine shield	1
Handlebar adjustment plates	2
Drag stake	1

Description	QTY
M10 x 50 bolt	2
M10 nut	2
M8 x 45 bolt	2
M8 lock washer	2
M8 flat washer, small	2
M8 x 25 bolt	8
M8 flat washer, large	8
M8 nut	8
M6 x 16 bolt	6
M6 flat washer	6
M6 nut	6
8 x 45 pin	2
8 x 32 pin	1
Hairpin	3

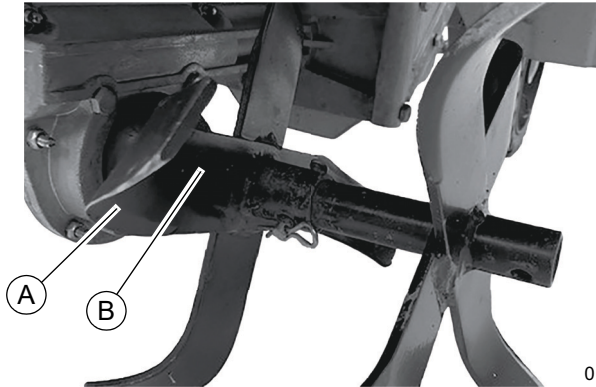
2. Contact Customer Service with unit model and serial number for any missing carton contents.
3. Record model, serial number, and date of purchase on front cover of this manual.

Assembling the Unit

NOTE: Right and left sides of unit are determined from the operating position, facing forward travel.

Installing Inner Tines

See [Figure 2-2](#). Assemble two inner tines (A) with gear-box shafts (B) using two M10x50 bolts and M10 nuts.



011861

Figure 2-2. Installing Inner Tines

Installing Lower Handlebar

Proceed as follows to install lower handlebar:

1. See [Figure 2-3](#). Align lower handlebar holes with support bracket holes.



011862

Figure 2-3. Lower Handlebar Assembly

2. Insert M8 x 45 bolts, spring washers, and flat washers into lower holes.
3. Insert M8 x 25 bolts and screw in big washers and M8 nuts from other side.
4. Tighten M8 x 45 bolts and M8 nuts.

Installing Handlebar Adjustment Plates

Proceed as follows to install handlebar adjustment plates:

1. See [Figure 2-4](#). Align lower holes of each handlebar adjusting plate (C) with lower handlebar holes.



011863

Figure 2-4. Handlebar Adjustment Plates

2. Insert M8 x 25 bolts and tighten big washer and M8 nuts.

Installing Upper Handlebar

Proceed as follows to install upper handlebar:

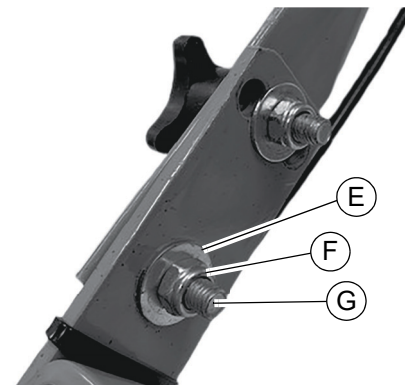
1. See [Figure 2-5](#). Remove two handlebar adjusting hand knobs (D), flat washers, and nuts from handlebar adjusting plates.



011864

Figure 2-5. Handlebar Adjusting Hand Knobs

2. See [Figure 2-6](#). Align upper handlebar holes with handlebar adjustment plate holes.



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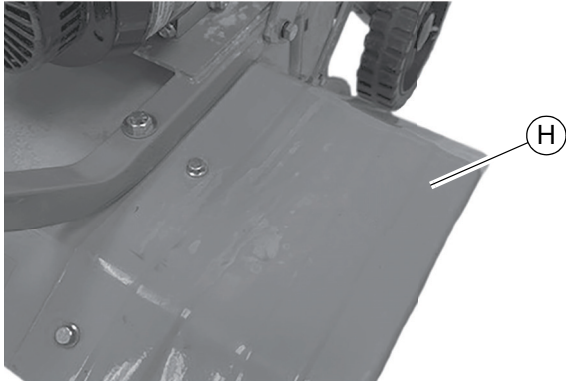
Figure 2-6. Handlebar Adjustment Plate Holes

3. Insert M8 x 25 bolts (G) in lower holes and screw on big washer (E) and M8 nuts (F).

4. Insert adjusting hand knobs into desired upper holes and screw on big washer and M8 nuts.
5. Tighten all four M8 nuts.

Installing Tine Shields

See **Figure 2-7**. Install tine shields (H) using six M6 x 16 bolts, flat washers, and M6 lock nuts.

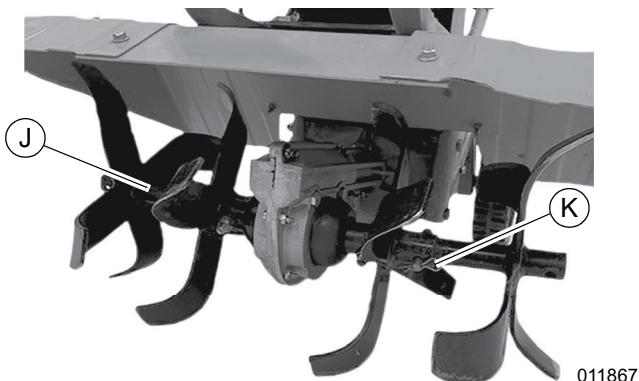


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Figure 2-7. Installing Tine Shields

Installing Outer Tines

See **Figure 2-8**. Install two outer tines (J) to inner tines using the axis pins. Lock axis pins with clevis pins (K).



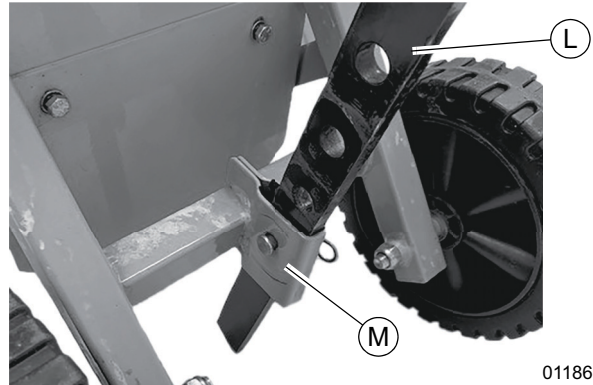
011867

Figure 2-8. Installing Outer Tines

Installing Drag Stake

Proceed as follows to install the drag stake:

1. See **Figure 2-9**. Insert drag stake (L) into drag stake holder tube (M).



011868

Figure 2-9. Drag Stake Holder Tube

2. Adjust drag stake to desired tilling depth.
3. Lock drag stake with 8x32 pin and clevis pin.

Adding Engine Oil and Fuel

Engine Fluid Requirements

Engine Oil	<ul style="list-style-type: none"> • 0–100 °F (-17–38 °C): SAE 10W-30 • 50–100 °F (10–38 °C): SAE 30 • For Service SF, SG, SH, SJ" or higher.
Fuel	<ul style="list-style-type: none"> • Unleaded gasoline • Minimum 87 octane rating • Up to 10% ethanol (gasohol) is acceptable • Non-ethanol premium fuel recommended • DO NOT use E85 • DO NOT use a gas oil mixture • DO NOT modify engine to run on alternate fuels • Stabilize fuel prior to storage

Adding Engine Oil



WARNING

Fire and explosion risk. Keep spark and flame away from liquid and vapor. Do not smoke while using. Doing so could result in death, serious injury, or equipment damage. (000341)

WARNING

Skin irritation. Avoid prolonged or repeated contact with used motor oil. Used motor oil has been shown to cause skin cancer in laboratory animals. Thoroughly wash exposed areas with soap and water. (000210)

CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

(000135)

IMPORTANT NOTE: Unit is shipped without oil in engine. Traces of oil may be in reservoir from factory testing. Oil must be added prior to initial operation. Use only the recommended high detergent engine oil. See *Engine Fluid Requirements*. Do not mix engine oil and gasoline.

Proceed as follows to add engine oil:

1. Place unit on a level surface.
2. Verify oil fill area is clean.
3. See *Figure 2-1*. Remove oil fill cap/dipstick (G) and wipe oil dipstick clean.
4. Add recommended oil slowly. Use a funnel to avoid spillage.

IMPORTANT NOTE: Do not overfill. Check oil level frequently while filling.

5. Insert oil dipstick into oil filler neck. Do not screw in. Remove oil dipstick and verify oil level is within safe operating range on oil dipstick.
6. Install oil fill cap/dipstick and hand-tighten when oil level is correct.

Adding Fuel

**DANGER**

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

(000105)

**DANGER**

Explosion and Fire. Do not fill fuel tank past full line. Allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury.

(000214)

**WARNING**

Explosion and Fire. Do not smoke while refueling unit. Failure to do so could result in death, serious injury, or property or equipment damage.

(000284a)

NOTE: Never use contaminated gasoline or mixed gasoline with oil. Do not allow dust, foreign matter or water to enter into the fuel tank.

1. Place unit on a level surface in a well ventilated outdoor area.
2. Verify unit is OFF and cooled for a minimum of two minutes.
3. Clean area around fuel cap and remove cap slowly.
4. Fill tank with fresh, unleaded gas with a minimum 87 octane rating to marked line on fuel screen. **Do not overfill.**
5. Install fuel fill cap.
6. Clean up any spilled fuel.

NOTE: Allow spilled fuel to evaporate before starting unit.

Spark Arrestor

WARNING

Personal injury. Before performing any maintenance procedure or inspection, stop the engine, and allow all parts to cool. Disconnect spark plug wire and keep spark plug wire away from spark plug. Failure to do so could result in serious injury.

(000688)

This unit is equipped with a spark arrestor. Under California law, and the laws of some other states, operating an internal combustion engine using hydrocarbon fuels without an engine spark arrestor is not permitted. This also applies to operation on US Forest Lands. All units shipped to California, New Mexico, and Washington State are provided with spark arresters. Failure of the owner or operator to maintain this equipment in compliance with state regulations is a misdemeanor under California law and may be in violation of other state and/or federal regulations. Contact the State Park Association or the appropriate state organization for specific information in your area.

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Section 3: Operation

Operation Tips

WARNING

Accidental startup. Shut engine OFF, allow to cool, and remove plug wire before clearing debris from trimmer guard. Failure to do so could result in death or serious injury. (000579)

WARNING

Projectile risk. Remove all debris from work area before operating unit. Failure to do so could result in death, serious injury, or property or equipment damage. (000410)

WARNING

Risk of flying objects. Shut engine OFF when traveling over loose items such as gravel or mulch. Failure to do so could result in serious injury or property damage. (000486)

- Immediately release drive control lever if tines jam or strike a foreign object. Push throttle control to STOP to stop engine. Remove spark plug wire. Remove foreign objects when tines have stopped, and inspect for damage.

Tilling Tips

- Tilling depth varies with ground condition.
- Set detent pin in highest hole of drag stake when beginning to till in unbroken ground or extremely hard soil. Make several light passes over area to be tilled. Set drag stake for deeper tilling with successive passes.
- Lower drag stake if tiller jumps or skids uncontrollably. This allows for shallower tilling. Firmly hold handlebars in event of sudden lurches.
- Do not till overly dry areas. Water desired area a few days before tilling. Tilling overly dry ground produces dust that does not absorb water.
- Do not till after a heavy rain. Allow area to dry for 1–2 days before tilling.

Cultivating Tips

- Plant rows on 20–22 in (50.8–55.9 cm) centers for ease of turning.
- Set drag stake lever to a higher hole. This allows for shallow cultivation necessary to turn over weeds, and break up and aerate soil.

Before Starting Engine

WARNING

Personal injury. Never remove, alter, or tamper with safety devices. Do not operate unit without safety equipment in place. Doing so could result in death, serious injury, property damage, or equipment damage. (000403)

CAUTION

Equipment damage. Clear the engine of grass and debris before each use. Failure to do so could result in engine damage. (000490)

IMPORTANT NOTE: Unit is shipped without oil. Add engine oil before starting. See [Adding Engine Oil](#) for instructions.

- Check engine oil level.
- Check fuel level.
- Inspect unit for damage.
- Remove any debris buildup from the top of the engine, the underside of the machine, and the muffler.
- Verify all fasteners are correctly tightened.
- Verify position of wheels and wheel lockouts. Wheels should be in tilling position prior to startup.
- Verify drag stake position and depth.

Starting the Engine

CAUTION

Equipment damage. Do not leave unit operating unattended at any time. Shut down engine prior to leaving. Failure to do so could result in property or equipment damage. (000734)

IMPORTANT NOTE: It is normal for engine to smoke after first startup. The protective coating on internal engine parts is burning off.

Proceed as follows to start engine:

1. Verify unit is level.
2. See [Before Starting Engine](#).
3. Set engine ON/OFF switch to ON.
4. Set choke lever to full CLOSED.

NOTE: Closing the choke is not necessary on a hot engine.

- See [Figure 3-1](#). Set throttle control lever (A) to approximately one-quarter towards FAST (rabbit) (B).

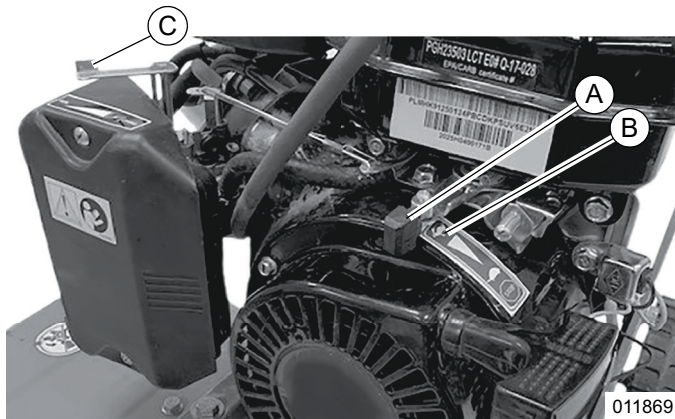


Figure 3-1. Throttle Control Lever

- Firmly grasp recoil starter handle and pull recoil starter handle slowly until resistance is felt. Then rapidly pull recoil starter handle up and away to start engine. **Do not** allow starter rope to snap back. Slowly rewind starter rope while holding recoil starter handle.

NOTE: The engine should start within one to two pulls.

- Gradually move choke lever (C) to NO CHOKE and increase throttle speed once engine starts.
- See [Troubleshooting](#) if unit fails to start after 5 attempts.

Operating the Engine

Engine Speeds

- Idle speed:** Use LOW setting on throttle lever to reduce stress on engine when tilling is not being performed. Lowering engine speed to LOW extends motor life, conserves fuel, and reduces noise.
- Operating speed:** Set throttle lever to FAST for normal tilling.

NOTE: Downward pressure on the handles reduces tilling depth and increases forward speed. Upward pressure on the handles increases tilling depth and reduces forward speed. Release the tine control lever to neutral position to stop the tiller.

Shutting Down

Emergency Stopping

Turn engine ON/OFF switch to OFF to stop the engine at any time. Release drive control lever to neutral position to stop wheels and tines at any time.

Normal Shutdown

IMPORTANT NOTE: Do not set choke lever to CLOSE to stop engine. Engine damage may occur.

Proceed as follows to shutdown the engine under normal conditions:

- Set throttle lever to SLOW (turtle).
- Idle engine for 1–2 minutes.
- Set engine ON/OFF switch to OFF.
- Set fuel valve lever to OFF.

Tilling

Proceed as follows to operate tiller:

- Adjust drag stake to desired tilling depth.

NOTE: Raise drag stake up one hole at a time, testing tiller operation after each raise. Raising drag stake lever too high can result in loss of control.

- Set throttle control to FAST.
- Pulling down on control lever engages tines. Tine rotation helps unit crawl forward through working area.

Adjustments

WARNING

Accidental startup. Engine must be off before adjusting any controls or attachments. Failure to do so could result in death, serious injury, or property or equipment damage. (000735)

Handlebar Height Adjustment

NOTE: Ideal handlebar height varies with operator height and tilling depth.

Proceed as follows to adjust handlebar height:

- Loosen M8 x 25 lower bolts on upper handlebar.
- Remove two handlebar adjustment knobs, flat washers, and nuts from handlebar adjustment plates.
- Align holes in upper handlebar with holes in handlebar adjustment plates at the desired position.
- Insert handlebar adjustment knobs and tighten.
- Tighten M8 x 25 lower bolts on upper handlebar.

Drag Stake Lever Adjustment

Proceed as follows to adjust the drag stake tilling depth:

1. Remove hairpin and 8 mm pin from drag stake bracket.
2. Raise drag stake lever to position tines at desired tilling depth.
 - Place 8 mm pin in top hole of drag stake lever for the shallowest tilling.
 - Place 8 mm pin in bottom hole of drag stake lever for the deepest tilling.
3. Align hole in drag stake lever with hole in drag stake bracket, insert 8 mm pin, and insert hairpin.

Slopes



Personal injury. Use caution when operating unit over uneven terrain or slopes. Failure to do so could result in death, serious injury, equipment or property damage.

(000460)

- This unit can be used on slopes up to 15°. Continuous use on slopes steeper than 15° could result in engine damage.
- Operate tiller across the face of slopes, never up or down the slope.
- Avoid sudden turns or maneuvers.

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Section 4: Maintenance and Troubleshooting

Maintenance

Regular maintenance will improve performance and extend engine/equipment life. The manufacturer recommends that all maintenance work be performed by an Independent Authorized Service Dealer (IASD). Regular maintenance, replacement, or repair of the emissions control devices and systems may be performed by any repair shop or person of the owner's choosing. However, to obtain emissions control warranty service free of charge, the work must be performed by an IASD. See the emissions warranty.



Accidental Start-up. Disconnect spark plug wire when working on unit. Failure to do so could result in death or serious injury.

(000102)



Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

(000108)

Maintenance Schedule



Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to operate or service this equipment and could result in death or serious injury.

(000215a)

Procedure	Before Each Use	Every 20 Hours	Every 50 Hours	Every 100 Hours
Check engine oil level	●			
Clean engine exterior, cooling fins, and remove collected tilled material*	●			
Inspect general equipment condition	●			
Inspect drive belt tension (replace if necessary)	●			
Clean tine shaft	●			
Inspect fasteners	●			
Inspect air filter	●			
Inspect tiller transmission grease	●			
Change engine oil		1 st time 20 hours		●
Lubricate cables with SAE 30 oil		●		
Remove trimmer guard and clean out any collected debris		●		
Clean air filter**		●		
Lubricate wheel axle shaft			●	
Replace tiller transmission grease			●	
Inspect and or replace spark plug				●
Replace air filter				●

* Cleaning the top of the engine during use is critical for sufficient air flow.

** Change more frequently if used in extremely dusty or dirty conditions.

Replacing the Drive Belt

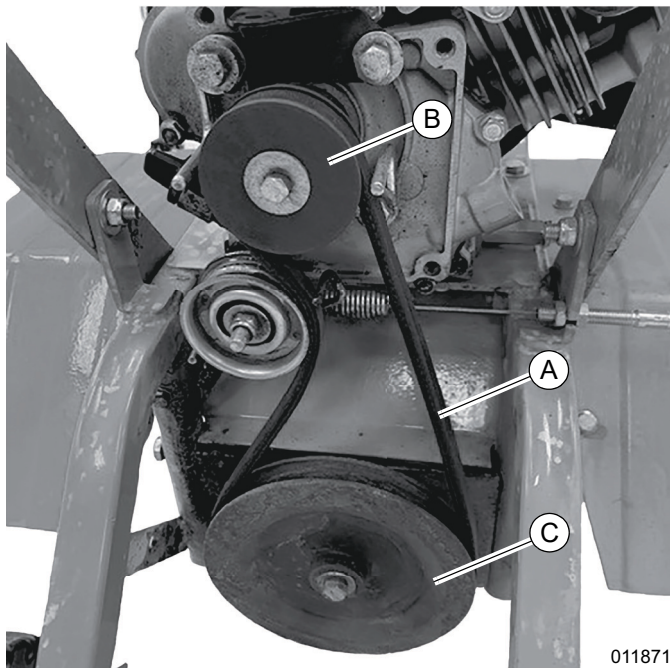
⚠ WARNING

Accidental Start-up. Disconnect spark plug wire when working on unit. Failure to do so could result in death or serious injury.

(000102)

Proceed as follows to replace drive belt:

1. Shut down engine if running. Allow several minutes for unit to cool.
2. Disconnect spark plug wire and place it where it will not contact spark plug.
3. Remove upper and lower belt guards.
4. See [Figure 4-1](#). Remove drive belt (A) from engine pulley (B) and transmission pulley (C).



011871

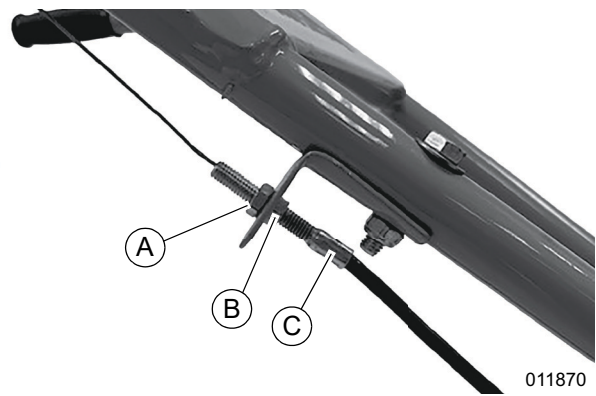
Figure 4-1. Remove Drive Belt

5. Install new belt on engine pulley and transmission pulley.
6. Install upper and lower belt guards.
7. Attach spark plug wire.

Adjusting the Cable

Proceed as follows to increase cable tension:

1. See [Figure 4-2](#). Loosen upper jam nut (A) and lower jam nut (B) at the same time using two 12 mm wrenches.



011870

Figure 4-2. Jam Nut Adjustment

2. Loosen upper jam nut enough to rotate lower jam nut (C). Screw lower jam nut upwards until reaching desired cable tightness.
3. Tighten upper jam nut down to lock lower jam nut.

Changing Engine Oil

⚠ WARNING

Skin irritation. Avoid prolonged or repeated contact with used motor oil. Used motor oil has been shown to cause skin cancer in laboratory animals. Thoroughly wash exposed areas with soap and water.

(000210)

⚠ CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

(000135)

NOTE: Drain oil when engine is warm. Warm oil drains more completely.

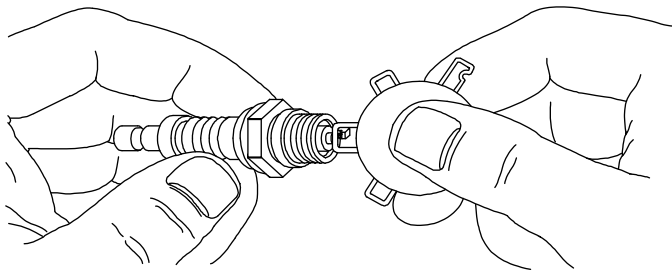
Proceed as follows to change engine oil:

1. Shut off engine and allow unit to cool.
2. Disconnect spark plug wire from spark plug.
3. Remove the oil fill cap/dipstick and position a suitable oil receptacle beside the oil fill tube.
4. Drain oil. Dispose of used oil according to local, national, or state laws.
5. Fill crankcase with oil. **Do not overfill.** See [Adding Engine Oil](#).
6. Install oil fill cap/dipstick and hand-tighten.
7. Connect spark plug wire to spark plug.

Servicing Spark Plug

Spark plug gap must be correct for efficient operation. Proceed as follows to service the spark plug:

1. Clean area around spark plug.
2. Remove spark plug.
3. Clean the electrodes with a metal brush and remove any build up.
4. See [Figure 4-3](#). Measure spark plug clearance with a feeler gauge. The clearance should be 0.019–0.027 in (0.5–0.7 mm). If adjustment is necessary, bend the side electrode carefully.



000211

Figure 4-3. Spark Plug

5. Replace spark plug if electrodes are pitted, burned or porcelain is cracked. Use Torch E6TC, Torch E6RTC, Champion RN9YC, NGK BPR6ES, Bosch WR6DC, or equivalent.
6. Install spark plug finger-tight, and tighten an additional 3/8 to one-half turn using spark plug wrench.

Lubrication

Tine shafts should be lubricated at least once every season. Proceed as follows to lubricate tine shaft:

1. Remove right side tines and allow transmission to cool. Verify unit is on stable, level ground.
2. See [Figure 4-4](#). Remove grease fitting screw (A) and air vent screw (B) to fill the worm gear housing through the lower grease fitting hole until grease begins to come out from the upper air vent hole.

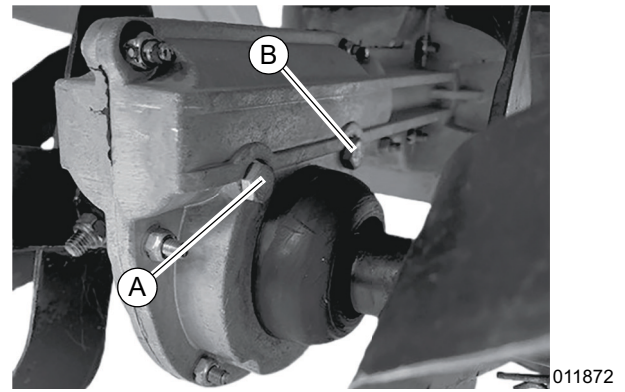


Figure 4-4. Grease Fitting and Air Vent Screws

3. Install grease fitting screw and air vent screw.

Testing Fuel Lines

Proceed as follows to test and clean fuel lines:

1. Set fuel valve to OFF.
2. Remove end of fuel line running from fuel tank to carburetor.
3. Hold end of fuel line above an open fuel can, and set fuel valve to ON. If fuel runs out of fuel line, there is no clog and fuel line can be installed.
4. If fuel does not run out of fuel line, there may be a clog. Set fuel valve to OFF.
5. Remove fuel line completely and use compressed air to unclog fuel line.
6. Install fuel line correctly, and verify fittings are secure.

Replacing Wheels

Proceed as follows to replace wheels:

1. Remove wheel cap using flat head screwdriver.
2. Loosen locknut with wheel on ground using a 5/8 in wrench.
3. Use a suitable lifting device and raise the machine to allow for wheel removal.
4. Remove the locknut and slide the wheel off.
5. Replace the wheel and finger-tighten the locknut before lowering machine.
6. Tight locknut with wheel on the ground.
7. Push wheel cap on until it clips into place.

Cleaning Tine Axle Shaft

Proceed as follows to clean the tine axle shaft:

1. Verify engine is cool.
2. Disconnect spark plug wire and place it where it will not contact spark plug.
3. Tip tiller backwards and rest handlebars on ground to expose the tines.
4. Remove all vegetation, string, wire, or other materials which may have accumulated on the tine axle between the inside set of tines and the transmission housing seal.
5. Tip tiller back to level position.
6. Install spark plug wire.

Storage



⚠ DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Store fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

(000143)



⚠ DANGER

Explosion and Fire. Drain fuel in a well ventilated area, into an approved container only after engine has cooled. Failure to do so will result in death or serious injury.

(000180)



⚠ WARNING

Risk of Fire. Verify machine has properly cooled before installing cover and storing machine. Hot surfaces could result in fire.

(000109)

NOTE: A yearly checkup or tune-up by an IASD is recommended for optimal performance.

IMPORTANT NOTE: Prevent gum deposits from forming in fuel system parts such as the carburetor, fuel filter, fuel hose, and fuel tank during storage. Using alcohol-blended fuels (gasohol 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.

Proceed as follows to put unit in storage for thirty days or more:

1. Protect wheels and axles from rust:
 - a. Remove wheel. See [Replacing Wheels](#).
 - b. Coat axles lightly with axle grease.
 - c. Install wheel. See [Replacing Wheels](#).
2. Drain fuel tank completely.

3. Run engine until it stops. This prevents gum deposits from forming inside carburetor.
4. Drain oil from engine while engine is still warm. Fill with fresh recommended oil. See [Adding Engine Oil](#).
5. Clean external surfaces, engine, and cooling fan.
6. Disconnect spark plug wire and remove spark plug. Pour 1 oz (29.6 mL) of SAE 30 engine oil into spark plug hole.
7. Plug spark plug hole and pull starter cord slowly to distribute oil evenly in cylinder head.
8. Install spark plug and connect spark plug wire.
9. Inspect for loose or damaged parts or hardware. Repair or replace any damaged parts, and tighten loose hardware.
10. Place unit in a suitable storage location. If using fuel stabilizer, store unit in a well ventilated area away from flame or spark (such as a pilot light, heater, grill, etc.).
11. If there is any possibility of unauthorized use or tampering, remove spark plug from unit and store in a safe place before storing the unit. Plug the spark plug hole to prevent foreign material from entering.

Troubleshooting

Problem	Cause	Correction
Recoil cord will not pull out or is difficult to pull	Seized engine.	Check engine oil level.
	Oil compression lock.	Remove the spark plug, hold a rag over the spark plug hole, and pull recoil cord several times to blow out any oil in the cylinder. Wipe off the spark plug and reinstall it.
	Broken or jammed recoil cord.	Turn engine pulley by hand and with the spark plug removed. If the engine pulley turns the recoil is broken or jammed. Contact an IASD.
Engine will not start	No or insufficient fuel.	Fill fuel reservoir.
	Spark plug wire not attached.	Verify spark plug wire is attached correctly.
	Insufficient or dirty engine oil.	Verify the engine has the right amount of clean oil. If oil is dirty, change it. See Changing Engine Oil .
	Choke lever incorrectly positioned.	Choke lever must be set to CHOKE for a cold engine start.
	Dirty or degraded fuel.	Fuel must be fresh, clean, and unleaded with no more than 10% ethanol. If the fuel is old, change it. Use a fuel stabilizer if fuel will be kept longer than one month.
	Engine or fuel valve not set to ON.	Engine and fuel valve must be set to ON.
	Clogged fuel line.	Verify fuel line is clear. Clean fuel line if clogged. See Testing Fuel Lines .
	Broken or faulty spark plug.	Verify spark plug is clean. Replace spark plug if dirty or cracked. If spark plug is oily, leave it out, hold a rag over spark plug hole and crank engine several times to blow out any oil in the cylinders. Wipe off spark plug and install.
	Flooded engine.	Do not prime engine. Wait a few minutes before restarting.
	Drive belt tension lever engaged.	Disengage drive belt tension lever.
Engine hard to start	Old or degraded fuel.	Drain fuel and replace with fresh fuel.
	Spark plug wire not attached.	Verify spark plug wire is attached correctly.
	Drive safety control lever activated.	Drive safety control lever must be in neutral to start engine.

Problem	Cause	Correction
Engine runs rough	Dirty or clogged air cleaner.	Clean or replace air cleaner.
	Loose spark plug wire.	Connect and tighten spark plug wire.
	Choke lever incorrectly positioned.	Set choke lever to OPEN.
	Clogged fuel line or stale fuel.	Clean fuel line and fill tank with clean, fresh fuel.
	Clogged vent.	Clear vent.
	Contaminants in fuel system.	Drain fuel tank and fill with clean, fresh fuel.
	Incorrect carburetor adjustment.	Contact an IASD.
Engine overheats	Insufficient engine oil.	Check engine oil level and adjust as needed.
	Incorrect carburetor adjustment.	Contact an IASD.
	Dirty or clogged air cleaner	Verify the cleaner is clean. If air cleaner is dirty, change it according to the engine owner's manual.
	Incorrect engine oil.	Verify correct oil weight is being used. Engine may smoke if oil is too light for ambient temperature.
Engine does not stop when throttle control is at STOP	Incorrect throttle linkage adjustment.	See engine manual. Contact an IASD.
	Debris interfering with throttle linkage.	Clean throttle linkage.
Tiller moves forward during starting	Tine clutch control not in neutral.	Release tine clutch control to neutral to start engine.
Tiller difficult to control when tilling (machine jumps or lurches forward)	Excessive engine speed for conditions.	Set throttle control lever to lower speed.
	Tines set too deep.	Raise tines for shallow tilling by lowering drag stake lever.
Tines do not engage	Debris in tines.	Stop tiller completely, inspect and remove debris in tines.
	Tine clevis pin(s) missing.	Replace tine clevis pin(s).
	Drive belt worn or stretched.	Replace belt.
	Incorrectly adjusted pulley and idler.	Contact an IASD.

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Generac Power Systems, Inc.
S45 W29290 Hwy. 59
Waukesha, WI 53189
1-888-GENERAC (1-888-436-3722)
www.generac.com