

# OPERATION MANUAL



## **MODEL SP1G CONCRETE SAW (HONDA GX200UT2QXC9 GASOLINE ENGINE)**

Revision #4 (09/13/19)



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

**PN: 38641**

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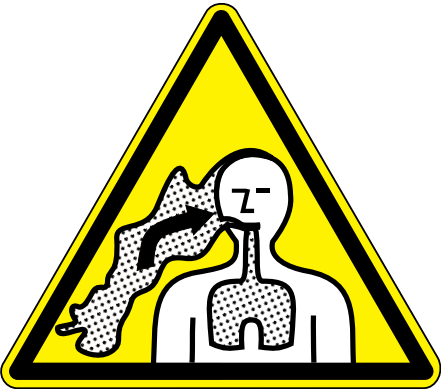
# PROPOSITION 65 WARNING

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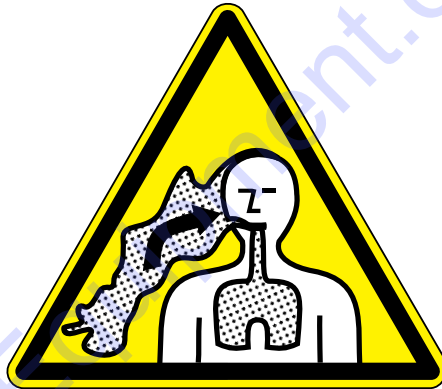
**⚠ WARNING**



**SILICOSIS WARNING**

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica. Silica is a basic component of sand, quartz, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory diseases, including silicosis. In addition, California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

**⚠ WARNING**



**RESPIRATORY HAZARDS**

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm. If you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufacturers or suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH/MSHA for the materials being used.

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### NOTICE

Specifications are subject to change without notice.

# SAFETY INFORMATION



Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.









## SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

## SAFETY SYMBOLS

 <b>DANGER</b>
Indicates a hazardous situation which, if not avoided, <b>WILL</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b> .
 <b>WARNING</b>
Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b> .
 <b>CAUTION</b>
Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>MINOR</b> or <b>MODERATE INJURY</b> .
<b>NOTICE</b>
Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts hazards
	Cutting and crushing hazards
	Hydraulic fluid hazards

# SAFETY INFORMATION

## GENERAL SAFETY

### WARNING

- Adherence to the OSHA 2017 Ruling governing Occupational Exposure to Respirable Crystalline Silica, requires that all sawing operations **MUST BE** conducted with High Efficiency Particulate Air (HEPA) vacuum system connected to the discharge port of the blade guard.

### CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- Avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.
- No one other than the operator is to be in the working area when the equipment is in operation.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

### NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest fire extinguisher.
- **ALWAYS** know the location of the nearest first aid kit.
- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



# SAFETY INFORMATION

## SAW SAFETY

### DANGER

- Engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death.**



### WARNING

- If applicable, **NEVER** use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgeable physician immediately or severe injury or death can occur.
- Accidental starting can cause severe injury or death. **ALWAYS** place the ON/OFF switch in the OFF position.
- **NEVER** disconnect any **emergency or safety devices.** These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.



### CAUTION

- Anytime the saw is lifted onto its nose or tilted fully back, such as for maintenance access, the high end of the saw **MUST** be blocked up to prevent the possibility of crush injury.

### NOTICE

- **ALWAYS** ensure saw is **securely** placed on appropriate blocks or jackstands when performing maintenance that requires elevation of the saw.
- If saw has brakes, ensure brakes are applied when leaving or when using on a slope. Some saws utilize a brake system where the brakes are automatically applied when the engine is stopped.
- If saw has a parking brake, ensure that the parking brake is engaged and holds the saw safely in place when parking on a slope. Turning the saw across the angle of the slope will help prevent accidental downhill movement.
- **ALWAYS** block the saw with appropriate blocks when leaving the saw parked on a slope.
- To prevent unexpected loss of control, **DO NOT** start engine on a sloping surface.
- **DO NOT** use on excessive slopes or on extremely uneven surfaces.
- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- Make sure there is no buildup of concrete, grease, oil or debris on the machine.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.



# SAFETY INFORMATION

## BLADE SAFETY

### ⚠ WARNING

- Rotating blade can cut and crush. **ALWAYS** keep hands and feet clear while operating the saw.



### ⚠ CAUTION

- **NEVER** operate the saw without blade guards and covers in place. Exposure of the diamond blade must not exceed 180 degrees.
- Verify the engine start switch is set to the OFF position before installing a blade.
- **ALWAYS** inspect blade before each use. The blade should exhibit no cracks, dings, or flaws in the steel centered core and/or rim. Center (arbor) hole must be undamaged and true.



### NOTICE

- Use proper diamond blades and follow blade manufacturer's recommendations.
- Ensure the 5/8" blade-mounting bolt is tightened to 45-50 foot lbs. of torque.
- **ALWAYS** examine blade flanges for damage and excessive wear.
- Only cut the material that is specified for the diamond blade. Read the specification of the diamond blade to ensure the proper tool has been matched to the material being cut.
- **DO NOT** drop the diamond blade on ground or surface.
- Ensure that the blade is mounted for proper operating direction (upcut).
- Adhere to the blade manufacturer's recommendations on handling, storage and safe usage of blades.

## ENGINE SAFETY

### ⚠ WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.
- **ALWAYS** shut down the engine before performing service or maintenance.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the saw.



### ⚠ CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.
- Make certain the operator knows how to and is capable of turning the engine OFF in case of an emergency.



### NOTICE

- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.

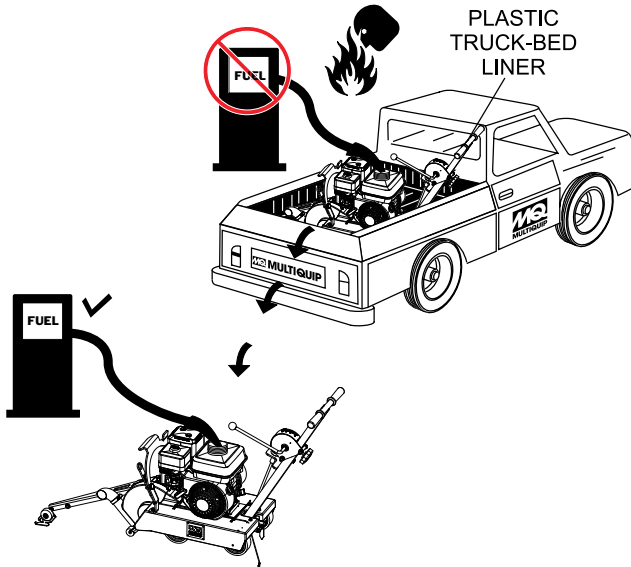


# SAFETY INFORMATION

## FUEL SAFETY

### DANGER

- **DO NOT** add fuel to equipment if it is placed inside truck bed with plastic liner. Possibility exists of explosion or fire due to static electricity



- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with **flammable** liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.



## LIFTING SAFETY

### CAUTION

- **NEVER** allow any person or animal to stand underneath the equipment while lifting.
- Some saws are very heavy and awkward to move around. Use proper heavy lifting procedures.
- **DO NOT** attempt to lift the saw by the guards or front pointers.

### NOTICE

- For lifting the saw, a lifting handle in the front of the unit and grasp points towards the rear of the frame are provided. It is recommended that two persons lift the saw.
- **NEVER** tip the engine to extreme angles during lifting as it may cause oil to gravitate into the cylinder head, making the engine start difficult.
- **DO NOT** lift machine to unnecessary heights.
- **NEVER** lift the equipment while the engine is running.
- **ALWAYS** use ramps capable of supporting the weight of the saw and the operator to load and unload the saw.

## TRANSPORTING SAFETY

### NOTICE

- **ALWAYS** shut down engine before transporting.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.
- Ensure that the diamond blade does not come into contact with the ground or surface during transportation.
- **NEVER** transport the saw to or from the job site with the blade mounted.

# SAFETY INFORMATION

## ENVIRONMENTAL SAFETY/DECOMMISSIONING

### NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below.

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.
- When the life cycle of this equipment is over, remove battery and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the trowel frame and all other metal parts be sent to a recycling center.



Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

## EMISSIONS INFORMATION

### NOTICE

The gasoline engine used in this equipment has been designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in gasoline exhaust emissions.

This engine has been certified to meet US EPA Evaporative emissions requirements in the installed configuration.

Attempting to modify or make adjustments to the engine emission system by unauthorized personnel without proper training could damage the equipment or create an unsafe condition.

Additionally, modifying the fuel system may adversely affect evaporative emissions, resulting in fines or other penalties.

### Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulations.

The label must remain with the engine for its entire life.

If a replacement emission label is needed, please contact Discount-equipment.

## SILICA INFORMATION

### WARNING

- Adherence to the OSHA 2017 Ruling governing Occupational Exposure to Respirable Crystalline Silica, requires that all sawing operations **MUST BE** conducted with High Efficiency Particulate Air (HEPA) vacuum system connected to the discharge port of the blade guard.

# SPECIFICATIONS

**Table 1. Specifications (Saw)**

Arbor Size	5/8 in. (15.87 mm)
Blade Capacity	10 in. (254 mm)
Sawing Orientation	Upcut
Cutting Depth	3.25 in. (82.6 mm)
Front and Rear Wheels	5 x 1.5 in (127 x 38 mm)
Nominal Mass*	105 lb. (47.6 Kg)
Maximum Operating Mass**	113 lb. (51 Kg)

\* Without blade, all fluid tanks empty, any optional parts removed.

\*\* Includes blade, all fluid tanks full, any necessary components installed

**Table 2. Specifications (Engine)**

Model	HONDA GX200UT2QXC9
Type	Air-cooled 4 stroke, Single Cylinder, OHV, Gasoline Engine
Bore X Stroke	2.7 in. X 2.1 in. (68 mm x 54 mm)
Displacement	12.0 cu-in. (196 cc)
Max Output	6.4 H.P./3600 R.P.M. (4.8 kW, 6.5 PS)
Fuel Tank Capacity	Approx. 0.95 U.S. Gallons (3.6 Liters)
Fuel	Unleaded Automobile Gasoline 86 Octane or higher
Lube Oil Capacity	0.63 US qt (0.60 liter)
Speed Control Method	Centrifugal Flyweight Type
Starting Method	Recoil Start
Dimension (L x W x H)	12.3 x 14.8 X 13.2 in. (313 X 376 X 335 mm)
Dry Net Weight	35.3 lbs (16 Kg.)

## SPECIFICATIONS

**Table 3. Noise and Vibration Emissions**

Guaranteed ISO 11201:2010 Based Sound Pressure Level at Operator Station in dB(A)	95
Guaranteed ISO 3744:2010 Based Sound Power Level in dB(A)	126
Hand-Arm Vibration Per ISO 5349-1:2001 in $m/s^2 \Sigma A(8)$ .	0.52

### NOTES:

1. *Sound Pressure and Power Levels are "A" weighted Measures per ISO 3744:2010. They are measured with the operating condition of the machine which generates the most repeatable but highest values of the sound levels. Under normal circumstances, the sound level will vary depending on the condition of the material being worked upon.*
2. *The vibration level indicated is the vector sum of the RMS (Root Mean Square) Values of amplitudes on each axis, standardized to an 8 hour exposure period, and obtained using operating condition of the machine that generates the most repeatable but highest values in accordance with the applicable standards for the machine.*
3. *Per EU Directive 2002/44/EC, the daily exposure action value for hand/arm vibration is  $2.5 m/s^2 \Sigma A(8)$ . The daily exposure limit value is  $5 m/s^2 \Sigma A(8)$ .*

## DIMENSIONS

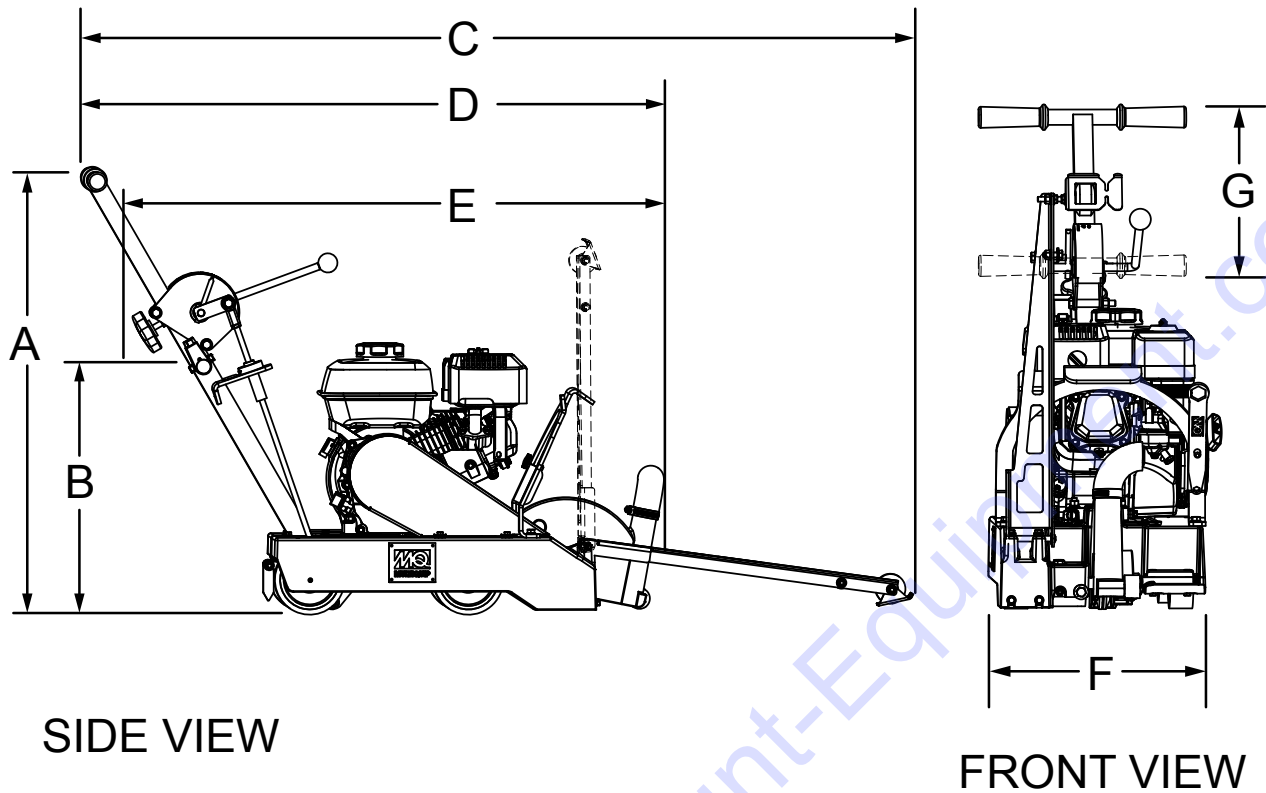


Figure 1. SP1G Dimensions

Table 4. Dimensions		
REFERENCE	DESCRIPTION	DIMENSION
A	Max Height (Handle Bars Fully Raised)	13 in (330 mm)
B	Max Height (Handle Bars Fully Lowered)	26.5 in (673.1 mm)
C	Max Length (Handle Bars Fully Raised & Front Pointer Lowered)	34 in (864 mm)
D	Max Length (Handle Bars Fully Raised & Front Pointer Raised)	46 in (1168.4 mm)
E	Max Length (Handle Bars Fully Lowered & Front Pointer Raised)	43 in (1092.2 mm)
F	Max Overall Width	41 in (1041 mm)
G	Max Handle Bar Deflection	14 in (355.6 mm)

## GENERAL INFORMATION

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### INTENDED USE

Operate the SP1G Saw, tools and components in accordance with the manufacturer's instructions. Use of any other tools for stated operation is considered contrary to designated use. The risk of such use lies entirely with the user. The manufacturer cannot be held liable for damages as a result of misuse.

This saw is not intended for wet cutting (the use of water sprayed onto the blade during sawing operations). The use of a High Efficiency Particulate Air (HEPA) dust collector must be attached to the blade guard discharge port during operations.

### FAMILIARIZATION

This lightweight, compact, and productive saw is designed for dry sawing of concrete slabs utilizing diamond blades. The saw has been engineered for general and industrial flat sawing applications that include: Joint Sawing of Green Concrete, Decorative Sawing in Cured Concrete, Light Demolition Sawing and "V" Groove Beveling. The simple and compact nature of the saw makes it a perfect sawing tool for one person to operate and transport. The saw combines innovative features, top quality components, and a committed attention to state-of-the-art manufacturing.

For peak performance, the saw has been engineered to operate with a powerful 5.5 HP Honda gasoline engine with Cyclone Air Filtration. It includes a 10-inch diameter, green concrete diamond blade. The green concrete blade allows for fast and clean cuts in concrete recently poured (4 to 12 hours) at depths from 1/4 inch to 3 1/4 inches.

The precision-machined, reinforced cast frame and steel chassis assembly are designed to eliminate operational bending and/or flex that would lead to diminished blade performance. Also, the frame's general weight-to-strength ratio and center mounted blade design ensure accurate tracking in the cut.

A robust blade shaft bearing assembly ensures minimal flutter and shaft harmonics providing the most advantageous conditions for a diamond blade at operating speeds.

Heavy-duty front and rear axles, synthetic neoprene wheels with permanently sealed bearings that are greaseable, and solid undercarriage assembly, provide years of reliable use. The SP1G incorporates an innovative posi-lock raise/lower system that provides precise control of blade orientation. This system further allows for infinitely adjusting blade depth control and depth gauge.

The SP1G has a unique front pointer bar that ensures optimum sawing accuracy. For operator comfort and ease of transportation and storage, an adjustable locking handle bar with vibration damping is provided. It also has a lifting handle for ease of transportation.

Operator control of the saws is safely accomplished with adjustable handle bars, and a conveniently oriented raise/lower lever and depth adjustment lever. A shut-off switch is located next to the handle lock allows the operator to safely turn the engine off from the operator's position and away from moving parts.

*For maximum performance and return on investment, use Multiquip Diamond Blades.*

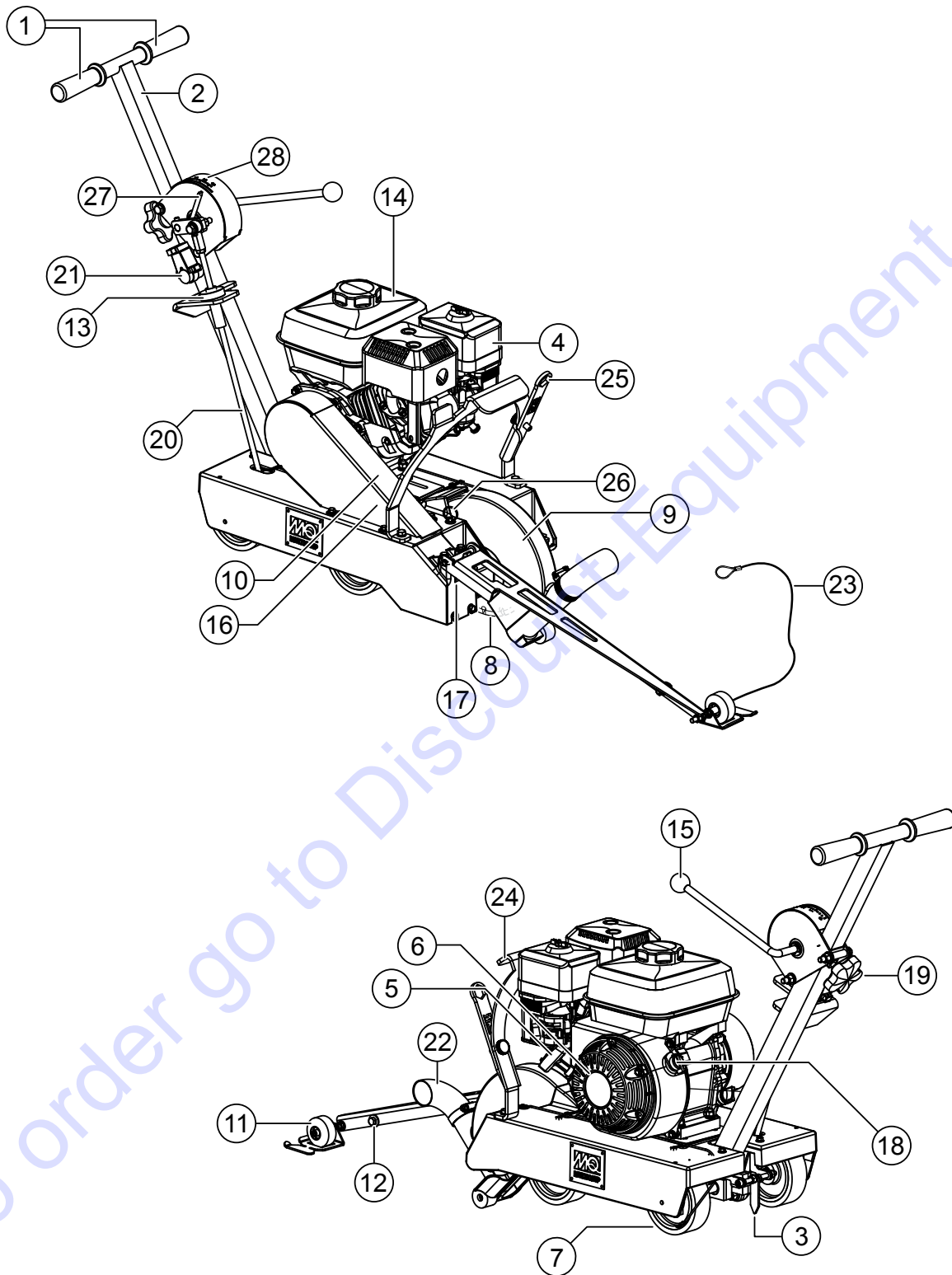


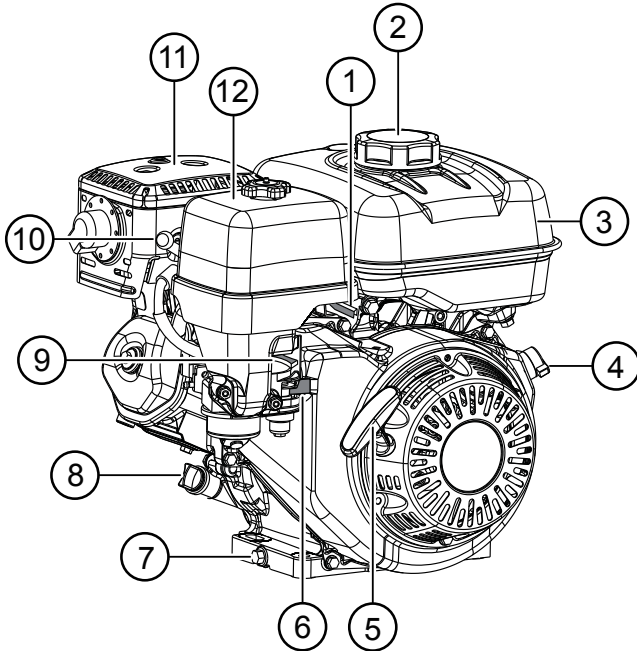
Figure 2. SP1G Components



## COMPONENTS

Figure 2 shows the location of the basic components for the SP1G concrete saw. Listed below is a brief explanation of each component.

1. **Hand Grips/Handlebar** — When operating the saw, place both hands on each grip to maneuver the saw.
2. **Adjustable Handle** — Set to comfortable operating position.
3. **Rear Pointer Guide** — Provides rear start orientation to the snap line.
4. **Air Filter** — Prevents dirt and debris from entering the engine air intake. Keep cleaned and replace when necessary.
5. **Recoil Starter Handle** — Pull to engage and start the engine.
6. **Recoil Starter Assembly** — Engages the engine when the handle is pulled and rewinds the starter rope when the handle is released.
7. **Wheels/Carriage Assembly** — Heavy-duty synthetic neoprene wheels with permanently sealed ball bearings.
8. **Diamond Blade** — 5/8-inch (15.87 mm) arbor diameter and 10-inch blade capacity. The 10-inch diameter provides for 1/4 to 3 1/4-inch depth of cut.
9. **Blade Guard** — Covers saw blade and flips up to allow blade to be changed.
10. **Belt Tension Adjuster** — Adjusts belt tension.
11. **Front Pointer** — Assists in straight tracking.
12. **Front Pointer Arm** — Pivots up for storage and pivots down for use.
13. **Depth Adjust Knob** — Turn knob to establish preferred blade depth.
14. **Fuel Tank** — Uses unleaded gasoline. Do not overfill.
15. **Depth Control Handle** — A single throw raise/lower lever.
16. **V-Belt Cover** — Remove this cover to gain access to the V-belt. **NEVER** operate the saw with this cover removed.
17. **Arbor Shaft Grease Zerk** — Conveniently located for lubrication.
18. **On/Off Switch (Engine)** — Turn to the ON position to allow engine to be started and turn to the OFF position to prevent accidental starting.
19. **Handle Lock** — Locks handle height to a comfortable operating position.
20. **Depth Stop Rod** — Holds blade above working surface or allows blade to cut into working surface at specified depth.
21. **Shut-off Switch** — Located next to the handle lock, serves both as an Emergency Engine Shut-Off and as the primary Shutdown switch. This allows the operator to shutdown the saw safely away from moving parts.
22. **Dust Discharge Port** — Allows dust evacuation and connection point to a vacuum system.
23. **Front Pointer Cable** — Allows for raise/lower of front pointer assembly.
24. **Lifting Handle** — Provides lift point hand hold.
25. **Blade Removal Tool** — Wrench for blade locking and blade guard fasteners.
26. **Blade Shaft Locking Pin** — Locks blade shaft for blade nut removal.
27. **Depth Pointer** — Points to blade depth against the ruler guide.
28. **Ruler Guide** — Shows depth graduation.



**Figure 3. Engine Components**

## INITIAL SERVICING

The engine (Figure 3) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturer's engine manual for detailed operation and service instructions.

1. **Throttle Lever** — Adjusts engine RPM speed.
2. **Fuel Filler Cap** — Remove to add unleaded gasoline to the fuel tank. Make sure cap is tightened securely. **DO NOT** overfill.

### **! DANGER**



**DO NOT** fill the fuel tank while the engine is running or hot. In the event of a fuel spill, **DO NOT** start the engine until all fuel residue has been wiped up and the area surrounding the engine is dry. Fuel is **extremely flammable** and can ignite if it comes into contact with hot engine parts or sparks from the ignition system.

3. **Fuel Tank** — Holds unleaded gasoline. Refer to the manufacturer's engine manual for additional information.
4. **Engine ON/OFF Switch** — **ON** position permits engine starting, **OFF** position stops engine operation.

### **! CAUTION**

**NEVER** disable or disconnect the engine **ON/OFF** switch. It is provided for operator safety. Injury may result if it is disabled, disconnected, or improperly maintained.

5. **Recoil Starter** — Manual starting mechanism. Slowly pull the starter grip until resistance is felt, then pull briskly and smoothly to start the engine.
6. **Fuel Valve Lever** — Open to allow the flow of fuel, and close to prevent the flow of fuel.
7. **Oil Drain Plug** — Remove to drain oil from the engine crankcase.
8. **Dipstick/Oil Filler Cap** — Remove to determine if engine oil is low. Add oil through this port as recommended in Table 6.
9. **Choke Lever** — Aids in starting a cold engine, or starting in cold weather conditions. The choke enriches the fuel mixture.
10. **Spark Plug** — Provides spark to the ignition system. Set the spark plug gap according to the engine manufacturer's instructions, and clean the spark plug once a week.
11. **Muffler** — Reduces noise and emissions. **NEVER** touch the muffler while it is hot.

### **! WARNING**



Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operating. **NEVER** operate the engine with the muffler removed.

12. **Air Cleaner** — Prevents dirt and other debris from entering the fuel system. Remove the wing nut on top of the air cleaner to gain access to the filter elements.

### **NOTICE**

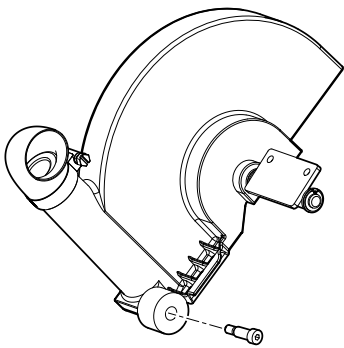
Operating the engine without an air filter, or with a damaged or worn air filter in need of replacement, will allow dirt to enter the engine, causing rapid engine wear.

## BLADE GUARD

### WARNING



**NEVER** operate the saw without blade guards and covers in place. **DO NOT** operate with the front of the blade guard raised. The blade exposure cannot exceed 180 degrees during operation. Adhere to the safety guidelines of the **American National Standards Institute (ANSI) B7.1 and B7.5.**



**Figure 4. Blade Guard**

Check the following on the blade guard (Figure 4):

- Ensure the capacity of the blade guard matches the diameter of your diamond blade.
- Check that the guard is bolted firmly upon the saw frame.

## V-BELT CHECK

A worn or damaged V-belt can adversely affect the performance of the saw. If the V-belt is defective or worn, replace the V-belt as outlined in the maintenance section.

### CAUTION



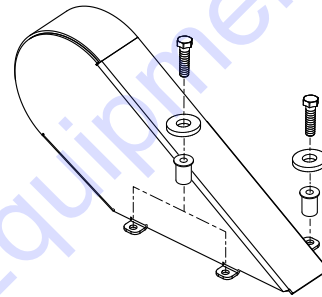
**NEVER** attempt to check the V-belt with the engine running. Severe injury can occur. Keep fingers, hands, hair and clothing away from all moving parts.

## V-belt Alignment and Tensioning

This concrete saw is equipped with a premium V-belt that has been aligned and tensioned by factory personnel. The V-belt must be aligned and tensioned for proper operation of the saw.

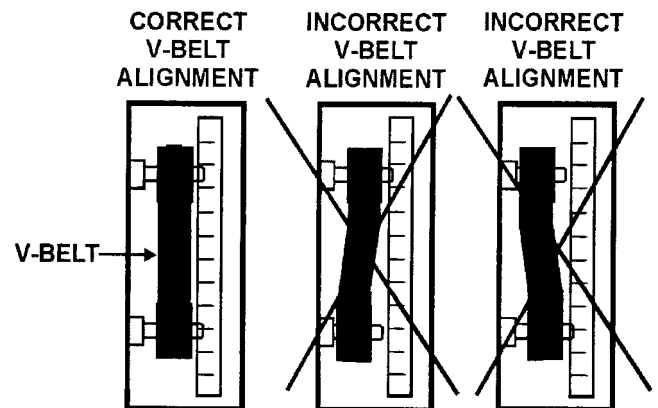
Use the following procedure to check the alignment of V-belt:

1. Remove the bolts that secure the V-belt cover (Figure 5) to the saw frame.



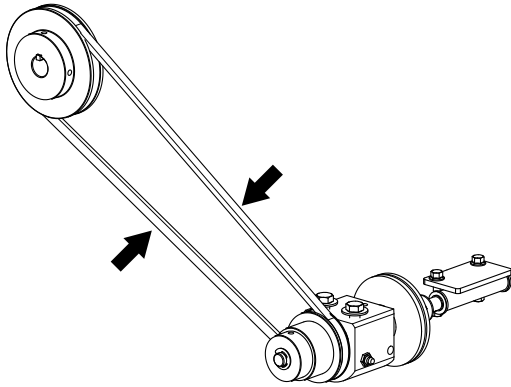
**Figure 5. V-Belt Cover**

2. Check uniform parallelism (Figure 6) of V-belt and pulley (sheaves). Use a straight-edge or machinist's square against both pulleys and adjust both pulleys until equally aligned.



**Figure 6. Pulley Alignment**

3. Check V-belt tension by using a tension meter (6.0 – 9.0 lbs.) against the inside belt at a mid point between the two pulleys, or by deflecting the center belt at a mid point 3/8" (10 mm) to 1/2" (13 mm). See Figure 7.



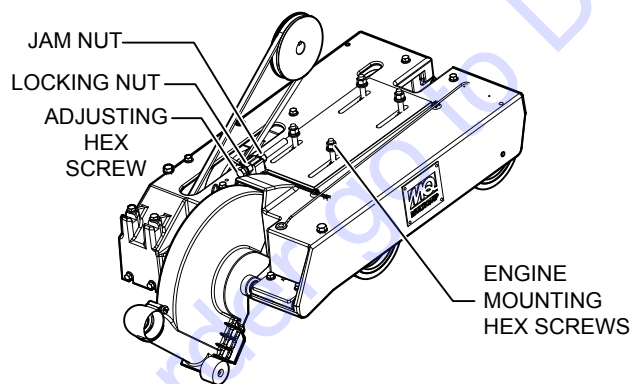
**Figure 7. V-Belt Tension Check**

4. **DO NOT** overtighten or undertighten the V-belt. Severe damage can occur to the saw and engine crankshaft if the belt is over-tensioned. A decrease of power to the blade and poor performance will result if the belt is under-tensioned (loose on pulleys).

### NOTICE

V-belt alignment must be rechecked after adjusting belt tension.

### V-belt Tightening



**Figure 8. V-Belt Tension Adjustment**

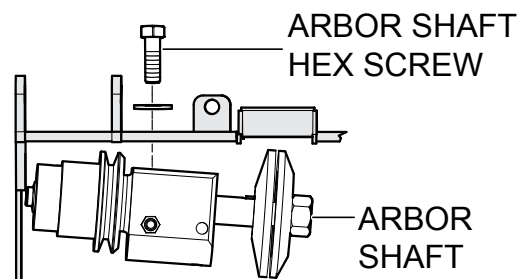
1. With V-belt guard removed, loosen the 4 engine mounting hex screws (Figure 8).
2. Loosen the locking nut and jam nut on the V-belt tension adjuster.

3. Tighten the adjusting hex screw while holding the engine in place to maintain pulley alignment. A screwdriver can be used as a lever at the rear belt guard mounting boss to hold the back of the engine while adjusting V-belt tension.
4. Retighten the locking nut and jam nut.
5. With V-belt held in proper alignment (engine parallel with the frame), retighten the 4 engine mounting hex screws. Verify that all hex screws are properly tightened.

### V-belt Removal and Replacement

If the V-belt becomes worn or damaged, replace it with new one.

1. Remove the 3 hex screws holding the V-belt guard and remove the guard.
2. Loosen the 4 engine mounting hex screws (Figure 8).
3. Loosen locking nut on the V-belt tension adjuster.
4. Loosen the tension on the V-belt by turning the tension adjuster hex screw.
5. Push the engine forward to provide slack in the V-belt.
6. Remove the belt from the main engine pulley.
7. Remove the two arbor shaft hex screws allowing the outside of the shaft to drop (Figure 9).
8. Remove the V-belt.



**Figure 9. V-Belt Removal**

9. Reinstall new V-belt.
10. Reinstall and tighten arbor shaft hex screws.
11. With V-belt held in proper alignment, retighten the 4 engine mounting hex screws. (Follow V-belt Tightening procedure.)
12. Reinstall belt guard with 3 hex screws.

## BLADE


Use the following type of blade:

*Steel Core Segmented or  
Diamond Rim Cutting Wheel.*

Any other type of blade should not to be used. See Table 5 for specific blade usage for material.

Material	Blade
Cured Concrete	Cured Concrete Blade
Green Concrete	Green Concrete Blade
Asphalt	Asphalt Blade
Asphalt over Concrete	Asphalt/Concrete Blade

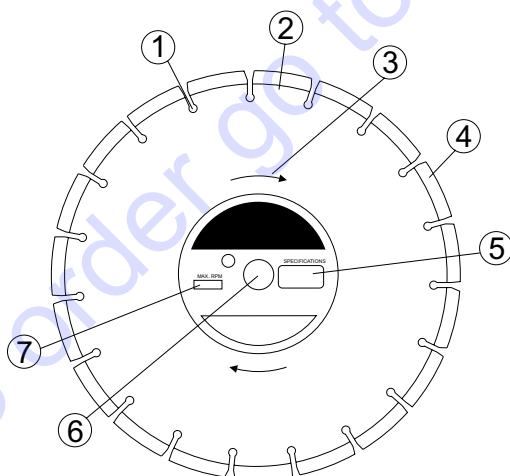
**WARNING**



Failure to thoroughly inspect the diamond blade for operational safety could result in damage to the blade, the saw, and may cause injury to the user or others in the operating area. All damaged blades must be discarded.

**NOTICE**

Adhere to the blade manufacturer's recommendations on handling, storage, and safe usage of blades.



**Figure 10. Diamond Blade**

- Stress Relief Holes (Gullets)** — Check the steel core for cracks that may have propagated from the slots and/or gullets. Cracks indicate extreme fatigue failure and if sawing continues, catastrophic failure will occur.
- Edge Of The Steel Core** — Check the diameter edge for discoloration (blue oxidation) indicating an overheating condition caused by insufficient cooling water/air. Overheating of blades may lead to loss of core tension and/or increase the possibility for blade failure. Check to make sure the steel core's width is uniform about the rim of the blade, and not succumbing to an "under cutting" condition brought about by highly abrasive material or improper under cutting core protection.
- Directional Arrow** — Check to ensure that the blade is oriented properly on the blade shaft for sawing. Reference the directional arrow in the blade and place it so the direction of rotation "downcuts" with the turn of the shaft.
- Diamond Segment or Rim** — Ensure there are no cracks, dings, or missing portions of the diamond segment/rim. **DO NOT** use a blade that is missing a segment or a portion of the rim. Damaged and/or missing segments/rims may cause damage to your saw, and injury to the user or others in the operating area.
- Specifications** — Ensure that the blade specifications, size, and diameter properly match up to the sawing operation. Utilizing a diamond blade not matched properly to the task may result in poor performance and/or blade damage.
- Arbor Hole** — It is essential that the arbor hole diameter properly matches the blade, and that it is free from distortions. Correct blade flanges (collars) must be used. The inside face of the flanges must be clean and free of debris. An out of round arbor condition will cause damage to the blade and the saw.
- MAX RPM** — This RPM reference is the maximum safe operating speed for the blade selected. **DO NOT** use blades rated at a lower rotational speed than the rated RPM of the saw (6000 RPM). Exceeding the MAX RPM is dangerous and may cause poor performance and may damage the blade. All blades must be designed to meet or exceed the maximum spindle RPM.

## Selecting Diamond Blades

Selecting the diamond blade type and grade defines how the blade will perform both in cutting speed and blade life.

Selection of the proper diamond blade consists of:

- Material to be Cut
- Type of Saw Being Used
- Spindle Speed of Saw
- Hardness Characteristics of the Material
- Performance Expectations

Factors for sawing economy:

- Type of Blade
- Depth of Cut
- Sawing Speed
- Characteristics of the Material Being Cut


## Blade Speed

A diamond blade's performance is directly connected to specific peripheral (rim) speeds.

The following shaft rotational speeds have been factory set to ensure optimum blade performance.

Capacity - 6000 RPM.

**WARNING**

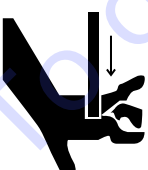


Operating saw blades at rotational speeds greater than those specified by the manufacturer can cause blade damage and may injure the user or others in the operating area.

## Cutting Depth

The SP1G concrete saw has a capacity for a 10-inch blade with a 5/8 in. (15.87 mm) arbor diameter. This allows a cutting range from 0 to 3 1/4 inches.

**WARNING**



Dropping or forcing the blade onto the cutting surface can severely damage the diamond blade and may cause serious damage to the saw and bodily harm.

## Blade Replacement

Refer to Figure 11 for location of components.

1. Place the saw in a secure, level work place.
2. Using the supplied Utility Saw Wrench (9), loosen and remove two Blade Guard Security Bolts (2).
3. Remove the Blade Guard (3).
4. Place the Blade Shaft Locking Pin (4) into the Blade Shaft Locking Hole (5).
5. Spin the Blade Shaft until the Blade Shaft Locking Pin seats into the machined hole of the Blade Shaft.
6. Place the proper Diamond Blade (6) firmly against the Inside Blade Flange.
7. Place the (flat side) Outside Blade Flange (7) against the Diamond Blade.
8. Thread the Blade Retaining Nut (8) onto the Blade Shaft against the Outside Blade Flange and torque to 45-50 ft lbs (standard thread) using the Utility Saw Wrench (9).
9. Remove Blade Shaft Locking Pin and return it to its holding position (4).
10. Place the Blade Guard over the Diamond Blade and into its normal position.
11. Lock Blade Guard in place by replacing the two Blade Guard Security Bolts (2).

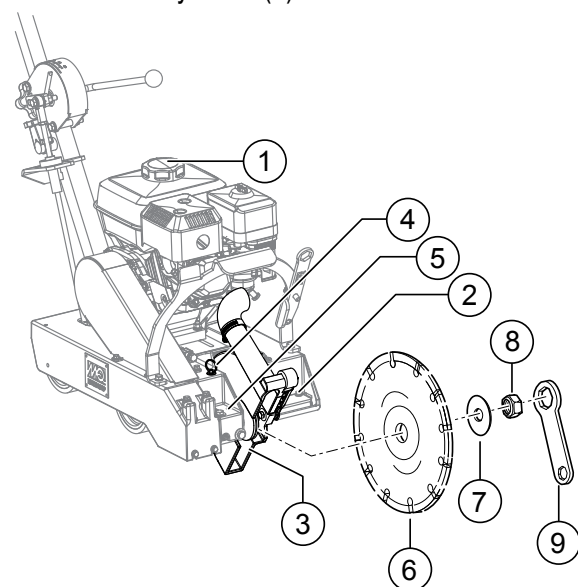


Figure 11. Changing the Blade

## Cutting Depth Adjustment

The SP1G Saw is equipped with a Raise/Lower Assembly that is supported by the following components (Figure 12).

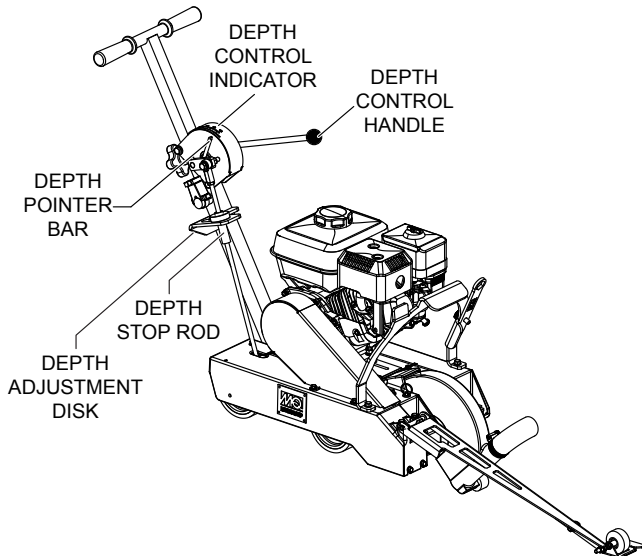


Figure 12. Raise/Lower Assembly

## WARNING

**ALWAYS** make sure that the shutdown switch and the engine **ON/OFF** switch are in the **OFF** position and the blade shaft has **COMPLETELY STOPPED ROTATING** before performing the following operations.

To adjust the diamond blade to the desired cutting depth, perform the following steps: Refer to Figure 13.

1. Pull up on the Depth Control Handle (1) until it locks into place.
2. Mount the desired diamond blade on the blade shaft and secure as instructed in the Blade Removal and Replacement section.
3. Turn the Depth Adjust Knob clockwise until it touches the Depth Stop Bracket (2).
4. Find the set screw on the side of the Depth Adjust Knob. Every 360° turn (counterclockwise) equals approximately 1/4" depth of cut.
5. Turn the Depth Adjust Knob the number of revolutions to coincide with the depth of cut and double check this figure against the Depth Pointer (3) and Ruler Guide. This operation may take several attempts to dial in an exact depth dimension.

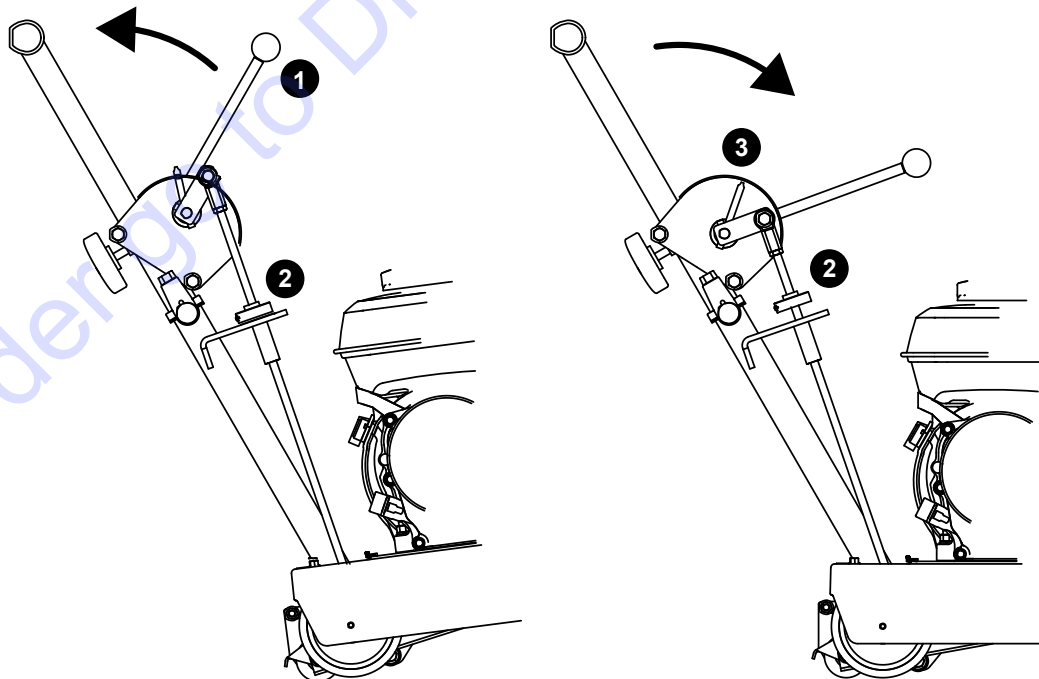


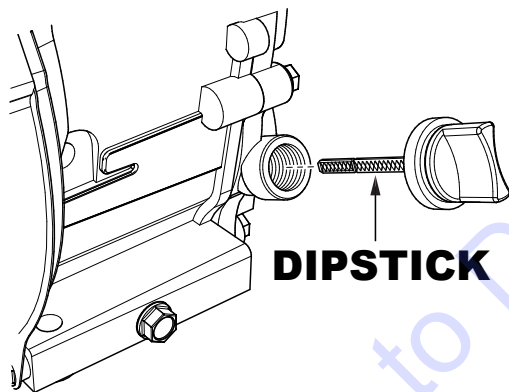
Figure 13. Diamond Blade Adjustment

## BEFORE STARTING

1. Read safety instructions at the beginning of manual.
2. Clean the saw, removing dirt and dust, particularly the engine cooling air inlet, carburetor and air cleaner.
3. Check the air filter for dirt and dust. If air filter is dirty, replace air filter with a new one as required.
4. Check carburetor for external dirt and dust. Clean with dry compressed air.
5. Check fastening nuts and bolts for tightness.

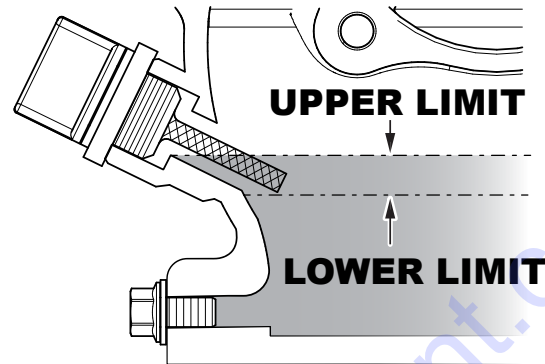
## Engine Oil Check

1. To check the engine oil level, place the saw on secure level ground with the engine stopped. The frame platform must be level to accurately check the engine oil.
2. Remove the filler dipstick from the engine oil filler hole (Figure 15) and wipe it clean.



**Figure 14. Engine Oil Dipstick Removal**

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.
4. If the oil level is low (Figure 16), fill to the edge of the oil filler hole with the recommended oil type (Table 6).



**Figure 15. Checking Engine Oil**

**Table 6. Oil Type**

Season	Temperature	Oil Type
Summer	25°C or Higher	SAE 10W-30
Spring/Fall	25°C~10°C	SAE 10W-30/20
Winter	0°C or Lower	SAE 10W-10

## Fuel Check

### **WARNING**



Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the saw if the engine is hot or running.

1. Remove the gasoline cap located on top of fuel tank.
2. Visually inspect to see if fuel level is low. If fuel is low, replenish with unleaded fuel.
3. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel.

## V-belt Check

A worn or damaged V-belt can adversely affect the performance of the trowel. If a V-belt is defective or worn, replace the V-belt.

## Blade Check

Check for worn or damaged blades. Refer to Blade Placement section.

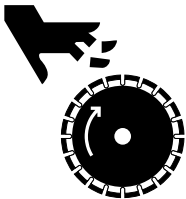


## CAUTION



**DO NOT** attempt to operate the saw until this manual has been read and thoroughly understood. Engine operating steps may vary. See engine manufacturer's operating manual.

## WARNING



When the engine is running the cutting blade is **ALWAYS** rotating. Keep hands and feet clear of rotating blade. Raise the saw to full height when maneuvering the saw within the cutting area.

All displacement of the machine outside the cutting area must be carried out with the tool not in rotation.

## WARNING



**NEVER** place hands or feet inside the belt guard or blade guard while the engine is running. **ALWAYS** shut the engine down before performing any kind of maintenance on the saw.

## CAUTION

Ensure the work area is clear of tools, debris, and unauthorized people.

## NOTICE

The saw is equipped with an outlet that provides a connection to a dust collection bag or vacuum system. It is recommended that a dust collection bag or vacuum system is used while the saw is in operation.

## NOTICE

The Engine Stop Switch serves both as an Emergency Engine Shut-Off and as the primary shutdown switch. This allows the operator to shutdown the saw safely away from moving parts.

1. Ensure that the engine shutdown switch (Figure 16) and the engine ON/OFF switch (Figure 17) on the engine are both in the OFF position to avoid accidental starting.

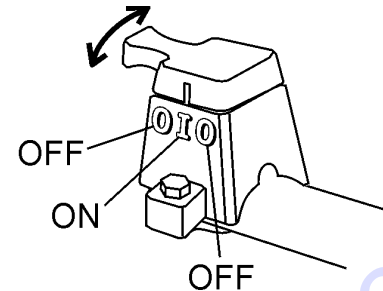


Figure 16. Engine Shutdown Switch

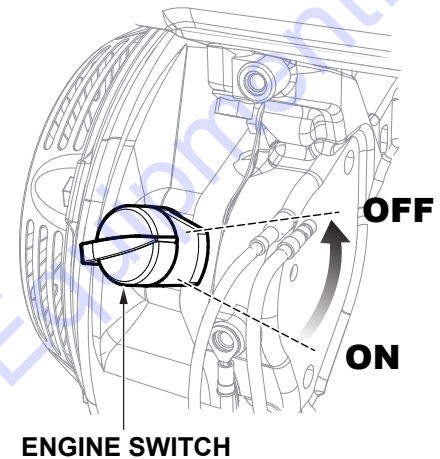


Figure 17. Engine ON/OFF Switch

2. Place the fuel valve lever (Figure 18) to the ON position.

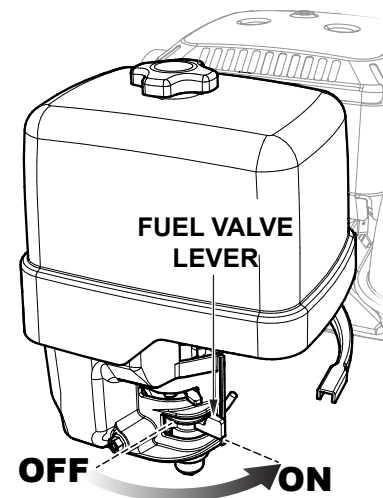


Figure 18. Fuel Valve Lever (ON)

3. Place the engine shutdown switch and the engine ON/OFF switch on the engine to the ON position.

# OPERATION

## NOTICE

**ALWAYS** use the Engine Shutdown Safety Switch located next to the handle lock to shut down the engine. Shutting the engine off using this switch confirms that it is functioning properly.

- Place the choke lever (Figure 19) in the **CLOSED** position.

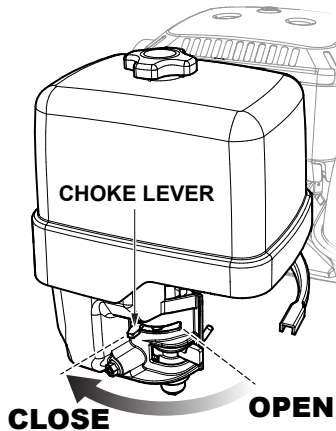


Figure 19. Choke Lever

## CAUTION

The engine speed has been set at the factory. Changing the governor speed could damage the blade and/or the saw.

- Rotate the throttle lever (Figure 20) halfway between fast and slow for starting. All sawing is done at full throttle. The engine governor speed is factory set to ensure optimum blade operating speeds.

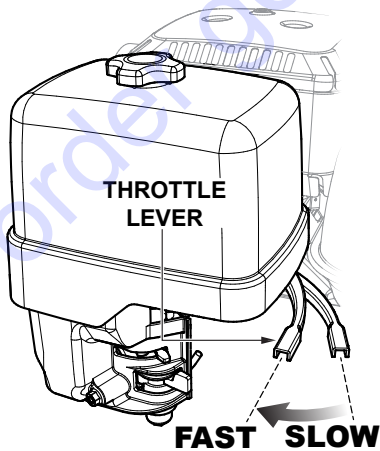


Figure 20. Throttle Lever

- Grasp the starter grip (Figure 21) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding to the compression point. Pull the starter grip briskly and smoothly for starting.

## CAUTION

**DO NOT** pull the starter rope all the way to the end. **DO NOT** release the starter rope after pulling. Allow it to rewind as soon as possible.

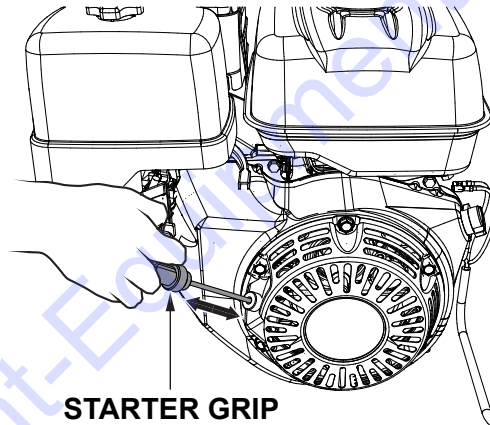


Figure 21. Starter Grip

- If the engine has started, slowly return the choke lever (Figure 19) to the **OPEN** position. If the engine has not started, repeat steps 1 through 5.
- Before the saw is placed into operation, run the engine for several minutes. Check for fuel leaks, and noises associated with loose guards and/or covers.
- Rotate the throttle lever (Figure 20) toward full throttle.

## WARNING

**ALWAYS** cut with the saw at **FULL THROTTLE**. Attempting to cut with the saw at less than full throttle could cause the blade to bind or stop abruptly in the slab resulting in serious injury to the operator or others in the area.

## WARNING

**ALWAYS** keep clear of rotating or moving parts while operating this equipment.

- To begin sawing, lower the rotating blade allowing it to cut to the preset depth.

11. When blade has reached full cutting depth, slowly walk behind the saw at a rate that will allow the engine to operate without losing optimum RPM.

## **CAUTION**

**DO NOT** try to cut faster than the blade will allow. Cutting too fast will cause the blade to rise up out of the cut. Improper cutting rate can decrease the life of the engine and blades.

12. When the end of the cut has been reached, raise the blade out of the cut by pulling back on the handlebars (using a downward pressure) until the raise/lower rod drops into its slot with the blade in the raised position.
13. If cutting is complete, shut the saw down using the following shutdown procedure.

## STOPPING THE ENGINE

### *Stopping the engine under normal conditions:*

1. Place the engine throttle lever (Figure 20) in the slow position, and listen for the engine speed to decrease. Allow engine to run for 2 or 3 minutes for proper cooldown.
2. Turn the engine shutdown switch (Figure 16) to the OFF position. Shutting the engine off using this switch confirms that is functioning properly.
3. Turn the engine ON/OFF switch (Figure 17) to the OFF position.
4. Place the fuel valve lever (Figure 22) to the OFF position.

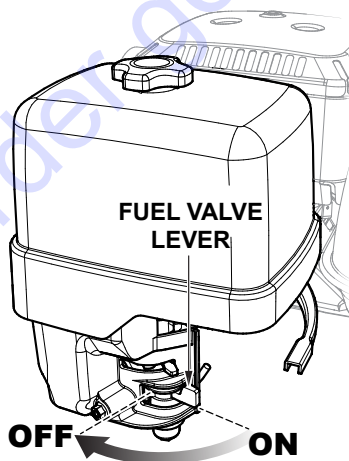


Figure 22. Fuel Valve Lever (OFF)

## RESTARTING AFTER INTERVENTION

*If cutting is interrupted where the engine stops or is turned off while the blade is still in the cut:*

1. Turn engine shutdown switch (next to the handle lock) to the OFF position.
2. Raise the blade out of the cut.
3. Restart the engine as described in the Startup section.

## **CAUTION**

The only acceptable method for freeing a stuck blade is to remove the saw from the stuck or pinched blade. **DO NOT** try to get the blade unstuck using the Raise/Lower system or by lifting the saw by the lifting bale, etc.

*If cutting is interrupted where the blade is stuck in the cut:*

1. Turn engine shutdown switch (next to the handle lock) to the OFF position.
2. Remove the blade guard.
3. Remove blade mounting bolt and outer flange.
4. Maneuver the saw away from the stuck blade.
5. A parallel cut made next to the blade may be necessary to free it.
6. Once the blade is freed inspect the blade for damage. Discard if damaged.
7. Ensure an undamaged, useable blade is installed on the saw before cutting is resumed with the saw.

## NOTICE

See the engine manual supplied with your machine for engine maintenance schedule and troubleshooting guide.

## CAUTION



**ALWAYS** allow the engine to cool before servicing. **NEVER** attempt any maintenance work on a hot engine.

## WARNING



**ALWAYS** ensure that the engine **ON/OFF** switch is in the OFF position and that the arbor shaft has **COMPLETELY STOPPED ROTATING** before performing any of the following operations:

- Removing or installing blades
- Adjusting front or rear pointers
- Lubricating any components
- Removing engine mounting bolts
- Inspecting, adjusting, or replacing drive belt, arbor shaft, arbor shaft bearings or any engine part.

## FRONT POINTER ADJUSTMENT

The front pointer and rear guide have been set at the factory. Perform this procedure only if the pointer or guide is suspected of being out of alignment.

1. Chalk out a straight line on the prepared slab or cutting surface.
2. Use a 4-foot straight-edge or level by placing it flat against the blade.
3. Adjust the front pointer so it just touches the side of the straight-edge or level.
4. Remove the straight-edge or level.
5. Position the front pointer and blade directly over the chalk line.
6. Start the saw and lower the blade onto the chalk line.
7. Begin cutting and make sure the blade follows the chalk line as closely as possible.

8. The pointer should follow the chalk line as well. If it does not, adjust the pointer by loosening then tightening the jam nuts on the pointer until the pointer follows the same path as the blade.

## REAR GUIDE ADJUSTMENT

The rear guide is useful on long runs that allow the operator to follow the line with less effort as well as cutting up to a wall where the front pointer is lifted.

1. Chalk out a straight line on the prepared slab or cutting surface.
2. Cut a straight line about 10 to 12 feet (3 – 4 meters) in length.
3. Adjust the rear guide until it falls into the cut.
4. The rear guide should ride in the cut freely without the feel of it pushing the front pointer or blade off line. If it feels like it is doing so, turn the saw off and after the blade has **COMPLETELY STOPPED ROTATING**, adjust the rear guide by loosening then tightening the jam nuts on the guide until it rides freely in the cut.

## GENERAL ENGINE CARE

### Engine Check:

Check daily for any oil and/or fuel leakage, thread nut and bolt tightness, and overall cleanliness.

### Engine Oil:

Check daily. Inspect with blade removed and saw frame level on a level surface. Keep the oil clean, and at the proper servicing level. **DO NOT OVERFILL.**

### Engine Oil Change:

Change engine oil after the first month or 20 hours of operation, then every 3 months/or 50 hours of operation. See Engine Owner's Manual for detailed information.

### Engine Tank and Strainer:

Clean every year or 300 hours.

### Fuel Line:

Replace every two years or as necessary.

### Spark Plug:

Clean/adjust every 6 months/or 100 hours. Replace every year or 300 hours.

## BLADE SHAFT BEARINGS LUBRICATION

Regular lubrication of various components of the SP1G Saw is critical to ensure a reasonable service life.

Two zerk fittings are located at the lower-front area of the saw. Lubricate before daily use. Use a good quality automotive or general purpose grease. Check and lubricate more often if unit is under heavy use. Do not overfill bearings. Overfilling can damage the grease seals which can result in bearing exposure to dirt and contaminants which can then shorten the life of the bearings. Excess grease can also drip onto the cutting surface.

## ENGINE OIL CHANGE

Drain the used oil while the engine is warm by the following:

Refer to Figure 23.

1. Place an oil pan or suitable container below the engine drain bolt to catch the used oil.
2. Remove the filler cap/dipstick, drain bolt, and sealing washer.
3. Drain the oil completely and reinstall the drain bolt and sealing washer. Make sure the drain bolt is tightened securely.

### NOTICE

Dispose of used oil properly. **DO NOT** pour used oil on the ground, down a drain, or throw in the trash. Used oil can generally be taken to your local recycling center or service station for reclamation.

4. Make sure the engine is in a level position and fill to the outer edge of the oil filler hole with the recommended oil (See Table 6). Engine oil capacity is 0.63 US quart (0.60 liter).

### CAUTION

Running the engine with a low oil level can cause engine damage.

5. Screw in the filler cap/dipstick securely.

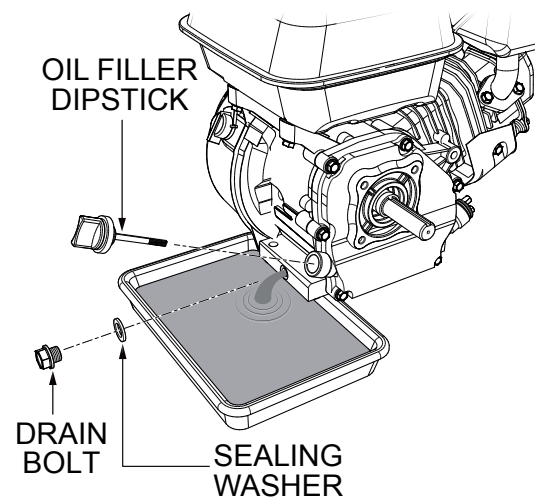


Figure 23. Engine Oil Change

# TROUBLESHOOTING

<b>Troubleshooting (Blades)</b>		
<b>Symptom</b>	<b>Possible Problem</b>	<b>Solution</b>
Blade slows or Stops cutting, still remains on blade.	Blade too hard for the material being cut?	Consult Discount-equipment for correct blade. Try cutting very soft material (sandstone, silica brick, cinder block) to "Redress" the blade.
	Engine Torque diminished because of loose V-Belts?	Tighten and/or replace V-Belts.
	Insufficient Engine power?	Check Throttle setting. Check Engine horsepower.
	Improper direction of rotation?	Check that the blade is oriented and rotational arrow points are in a "Down-Cutting" direction.
	Blade is slipping on the blade shaft?	Check that the blade and flange pin are properly installed on the blade shaft.
Blade does not cut straight and/or true.	Blade being used on misaligned saw?	Check blade shaft bearings and alignment integrity.
	Blade is excessively hard for the material being cut?	Check specifications of the blade with the material being cut. Consult Discount-equipment.
	Blade being used at improper RPM?	Ensure blade surface feet per minute speed (SFPM) is approximately 6,000.
	Blade improperly mounted on arbor shoulders and flanges?	Ensure blade is properly affixed on the blade shaft.
	Excessive force applied to blade while cutting?	Do not force the blade in the cut. Apply a slow, steady pace to sawing.
Blade discoloring, crackling and/or wearing excessively.	Blade too hard for the material being cut?	Consult Discount-equipment for correct blade. Try cutting very soft material (sandstone, silica brick, cinder block) to "Redress" the blade.
	Blade improperly mounted on arbor shoulders and flanges?	Ensure blade is properly affixed on the blade shaft. Ensure the blade flanges are clean and free of debris.
	Arbor hole out of round?	Ensure blade is properly affixed on the blade shaft.
	Incorrect blade chosen for material being cut?	Check specifications of the blade with the material being cut. Consult Discount-equipment.
	Excessive force applied to blade while cutting?	Do not force the blade in the cut. Apply a slow, steady pace to sawing.

# TROUBLESHOOTING

Troubleshooting (Engine)		
Symptom	Possible Problem	Solution
Difficult to start, fuel is available, but no spark at spark plug.	Spark plug bridging?	Check gap, insulation or replace spark plug.
	Carbon deposit on spark plug?	Clean or replace spark plug.
	Short circuit due to deficient spark plug insulation?	Check spark plug insulation, replace if worn.
	Improper spark plug gap?	Set to proper gap.
	Spark plug is red?	Check transistor ignition unit.
	Spark plug is bluish white?	If insufficient compression, repair or replace engine. If injected air leaking, correct leak. If carburetor jets clogged, clean carburetor.
	No spark present at tip of spark plug?	Check if transistor ignition unit is broken, and replace defective unit. Check if voltage cord cracked or broken and replace. Check if spark plug if fouled and replace.
	No oil?	Add oil as required.
	Oil pressure alarm lamp blinks upon starting? (if applicable)	Check automatic shutdown circuit, "oil sensor". (if applicable)
Difficult to start, fuel is available, and spark is present at the spark plug.	ON/OFF switch is shorted?	Check switch wiring, replace switch.
	Ignition coil defective?	Replace ignition coil.
	Improper spark gap, points dirty?	Set correct spark gap and clean points.
	Condenser insulation worn or short circuiting?	Replace condenser.
	Spark plug wire broken or short circuiting?	Replace defective spark plug wiring.
Difficult to start, fuel is available, spark is present and compression is normal.	Wrong fuel type?	Flush fuel system, replace with correct type of fuel.
	Water or dust in fuel system?	Flush fuel system.
	Air cleaner dirty?	Clean or replace air cleaner.
	Choke open?	Close choke.
Difficult to start, fuel is available, spark is present and compression is low.	Suction/exhaust valve stuck or protruded?	Reseat valves.
	Piston ring and/or cylinder worn?	Replace piston rings and/or piston.
	Cylinder head and/or spark plug not tightened properly?	Torque cylinder head bolts and spark plug.
No fuel present at carburetor.	Head gasket and/or spark plug gasket damaged?	Replace head and spark plug gaskets.
	No fuel in fuel tank?	Fill with correct type of fuel.
	Fuel cock does not open properly?	Apply lubricant to loosen fuel cock lever, replace if necessary.
	Fuel filter/lines clogged?	Replace fuel filter.
	Fuel tank cap breather hole clogged?	Clean or replace fuel tank cap.
	Air in fuel line?	Bleed fuel line.

# TROUBLESHOOTING

<b>Troubleshooting (Engine) - continued</b>		
<b>Symptom</b>	<b>Possible Problem</b>	<b>Solution</b>
Weak in power, compression is proper and does not misfire.	Air cleaner dirty?	Clean or replace air cleaner.
	Improper level in carburetor?	Check float adjustment, rebuild carburetor.
	Defective spark plug?	Clean or replace spark plug.
	Improper spark plug?	Set to proper gap.
Weak in power, compression is proper but misfires.	Water in fuel system?	Flush fuel system and replace with correct type of fuel.
	Dirty spark plug?	Clean or replace spark plug.
	Ignition coil defective?	Replace ignition coil.
Engine overheats	Wrong type of fuel?	Replace with correct type of fuel.
	Cooling fins dirty?	Clean cooling fins.
	Intake air restricted?	Clear intake of dirt and debris. Replace air cleaner elements as necessary.
	Oil level too low or too high?	Adjust oil to proper level.
Rotational speed fluctuates.	Governor adjusted incorrectly?	Adjust governor.
	Governor spring defective?	Replace governor spring.
	Fuel flow restricted?	Check entire fuel system for leaks or clogs.
Recoil starter malfunctions. (if applicable)	Recoil mechanism clogged with dust and dirt?	Clean recoil assembly with soap and water.
	Spiral spring loose?	Replace spiral spring.
Starter malfunctions.	Loose, damaged wiring?	Ensure tight, clean connections on battery and starter.
	Battery insufficiently charged?	Recharge or replace battery.
	Starter damaged or internally shorted?	Replace starter.
Burns too much fuel.	Over-accumulation of exhaust products?	Check and clean valves. Check muffler and replace if necessary.
	Wrong spark plug?	Replace spark plug with manufacturer's suggested type.
Exhaust color is continuously "white".	Lubricating oil is wrong viscosity?	Replace lubricating oil with correct viscosity.
	Worn rings?	Replace rings.
Exhaust color is continuously "black".	Air cleaner clogged?	Clean or replace air cleaner.
	Choke valve set to incorrect position?	Adjust choke valve to correct position.
	Carburetor defective, seal on carburetor broken?	Replace carburetor or seal.
	Poor carburetor adjustment, engine runs too rich?	Adjust carburetor.
Will not start, no power with key "ON". (if applicable)	ON/OFF device not activated ON?	Turn on ON/OFF device.
	Battery disconnected or discharged?	Check cable connections. Charge or replace battery
	Ignition switch/wiring defective?	Replace ignition switch. Check wiring.



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