

# OPERATION MANUAL



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**WHITEMAN**

**MODEL J3036H55  
CONVERTIBLE EDGING  
WALK-BEHIND TROWEL  
(HONDA GX160 GASOLINE ENGINE)**

Revision #2 (04/01/20)



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

**PN: 13412**

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**PROPOSITION 65 WARNING**

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# SILICOSIS/RESPIRATORY WARNINGS

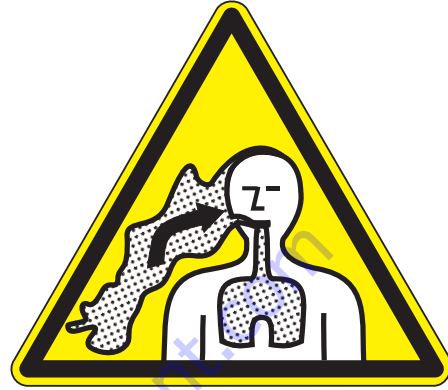
## ⚠️ WARNING



### 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.

**J3036H55  
Convertible Edging  
Walk-Behind Trowel**

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**NOTICE**

Equipment specifications and features are subject to change without notice.

# TRAINING CHECKLIST

Training Checklist			
No.	Description	OK?	Date
1	Read operation manual completely.		
2	Machine layout, location of components, checking of engine oil level.		
3	Fuel system, refueling procedure.		
4	Operation of controls (machine not running).		
5	Safety controls, safety stop switch operation.		
6	Emergency stop procedures.		
7	Startup of machine, engine choke.		
8	Maintaining a hover.		
9	Maneuvering.		
10	Pitching.		
11	Concrete finishing techniques.		
12	Shutdown of machine.		
13	Lifting of machine (lifting bail).		
14	Machine transport and storage.		

## DAILY PRE-OPERATION CHECKLIST

Daily Pre-Operation Checklist		✓	✓	✓	✓	✓	✓
1	Engine oil level						
2	Gearbox oil level						
3	Condition of blades						
4	Blade pitch operation						
5	Safety stop switch operation						

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# 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
	Pressurized fluid hazards



# SAFETY INFORMATION

## SAFETY DECALS

Safety decals associated with the operation of this equipment are defined below:

DECAL	DEFINITION
	<p><b>DANGER</b> Rotating Blade Hazard Keep hands, fingers, and feet clear of engine fan blades and guard rings. Moving parts can cut. <b>DO NOT</b> remove guards. Stop engine before servicing.</p>
	<p><b>DANGER</b> Inhalation Hazard <b>DO NOT</b> use this equipment in an <b>enclosed area</b>. The engine used with this equipment emits harmful levels of carbon monoxide which can cause <b>severe bodily harm — even death!</b></p>
	<p><b>DANGER</b> Training This machine to be operated by qualified personnel only. Ask for training as needed.</p>
	<p><b>DANGER</b> Belt Guard Hazard <b>DO NOT</b> remove belt guards. Keep hands and fingers clear from engine belts. Moving parts can crush.</p>
	<p><b>WARNING</b> Lifting/Crush Hazard <b>NEVER</b> allow any person to stand underneath the trowel while lifting. <b>DO NOT</b> lift trowel with pans attached. <b>ALWAYS</b> make sure handle is securely attached.</p>
	<p><b>NOTICE</b> Read Manual To avoid injury, you must read and understand the operator's manual before using this machine.</p>
	<p><b>NOTICE</b> Protective Clothing <b>ALWAYS</b> wear appropriate clothing when operating the trowel.</p>
	<p><b>NOISE LEVEL</b> Indicates value of the sound power of the equipment measured at operator's seat.</p>

## GENERAL SAFETY

### ⚠ 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 on 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.

# SAFETY INFORMATION

## NOTICE

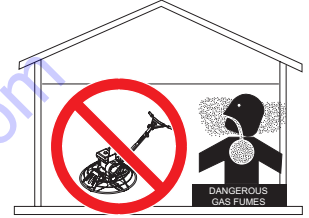
- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized 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 the 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.



## TROWEL 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 the free flow of 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**.
- **DO NOT** install trowel blades that extend beyond the outermost diameter of the guard ring bumper. **ALWAYS** use the appropriate blade size for the installed guard ring configuration. The possibility exists of **severe bodily harm** if the blades extend beyond the guard ring.



### WARNING

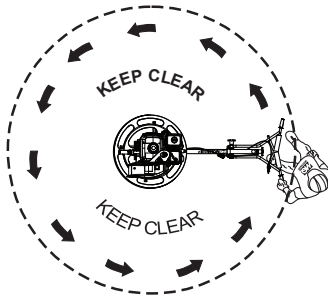
- **ALWAYS** keep clear of rotating or moving parts while operating the trowel.
- **DO NOT** start or operate the trowel if the drive train will not disengage. Centrifugal force between the trowel and surface when starting can cause uncontrolled handle movement that can cause serious injury. The handle must not move while pulling the engine recoil starter.
- **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.



# SAFETY INFORMATION

## CAUTION

- **NEVER** stand on the trowel during operation.
- **NEVER** lubricate components or attempt service on a running machine.
- **NEVER** place your feet or hands inside the guard rings while starting or operating this equipment.



- **ALWAYS** keep the work area clear around the trowel. Make sure it is free of debris and objects.

## NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to the machine and replace any broken parts immediately.
- **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.
- A safety manual for operating and maintenance personnel of concrete power trowels produced by the Association of Equipment Manufacturers (AEM) can be obtained for a fee by ordering through their website at [www.aem.org](http://www.aem.org).

Order Form PT-160

## ENGINE SAFETY

### WARNING

- **DO NOT** place hands or fingers inside the engine compartment while the 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.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Allow the oil to cool before performing maintenance. This will prevent scalding of personnel.



### CAUTION

- **NEVER** touch the hot exhaust manifold, muffler, or cylinder. Allow these parts to cool before servicing the equipment.



### NOTICE

- **NEVER** run the engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service the 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.

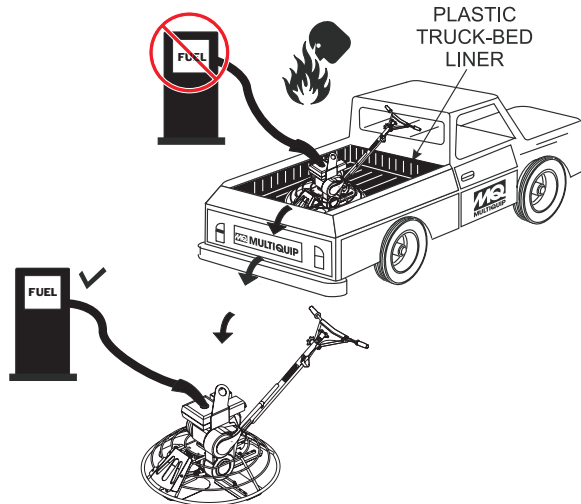


# SAFETY INFORMATION

## FUEL SAFETY

### DANGER

- **DO NOT** add fuel to the equipment if it is placed inside a truck bed with plastic liner. The 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 the 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.



## TRANSPORTING SAFETY

### WARNING

- **NEVER** allow any person or animal to stand underneath the equipment while it is being lifted.



### NOTICE

- Some walk-behind trowels can be lifted or moved by two people utilizing lifting tubes or other special attachments. Generally, however, they must be lifted using lifting bails and cranes, hoists, or forklifts.
- **NEVER** transport the trowel with float pans attached unless safety catches are used and are specifically cleared for such transport by the manufacturer.
- **NEVER** hoist the trowel more than three feet off the ground with float pans attached.
- Before lifting, make sure that the lifting bails are not damaged.
- **ALWAYS** make sure the crane or lifting device has been properly secured to the lifting bails of the equipment.
- **ALWAYS** shut down the engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten the fuel tank cap securely and close the fuel cock to prevent fuel from spilling during transport.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- **DO NOT** lift the machine to unnecessary heights.
- **ALWAYS** tie down the equipment during transport by securing the equipment with rope.

# 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 the 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 the 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 the battery and bring it to an 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.

Attempts 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 regulated.

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

If a replacement emission label is needed, please contact your authorized engine distributor.

# LIFTING AND TRANSPORTING

## LIFTING THE TROWEL

### **⚠ WARNING**

Extra care should be taken when lifting the trowel. **Serious personal injury** or damage to the equipment can be caused by a dropped trowel.

### **⚠ WARNING**

**NEVER** attempt to lift the trowel alone. **NEVER** lift the trowel by the guard ring, as the trowel may rotate and cause injury.

**ALWAYS** make sure the handle is secure, and use only the manufacturer's approved lifting point. The trowel may be lifted by the center lifting bail using a crane or other device with adequate lifting capacity.

### **⚠ WARNING**

**NEVER** lift the trowel to unnecessary heights.

**NEVER** stand underneath the trowel while it is being lifted.

## Lifting Bail

The lifting bail provides an optimal lift point for the trowel. When lifting the trowel onto a concrete slab, attach a chain or rope to the lifting bail. **MAKE SURE** the capacity of the lifting device is sufficient for the weight of the trowel.

Using a crane or forklift to lift the trowel (Figure 1) is **highly recommended**, and is perfectly safe for the trowel. **ALWAYS** use extra care when lifting the trowel off the ground.

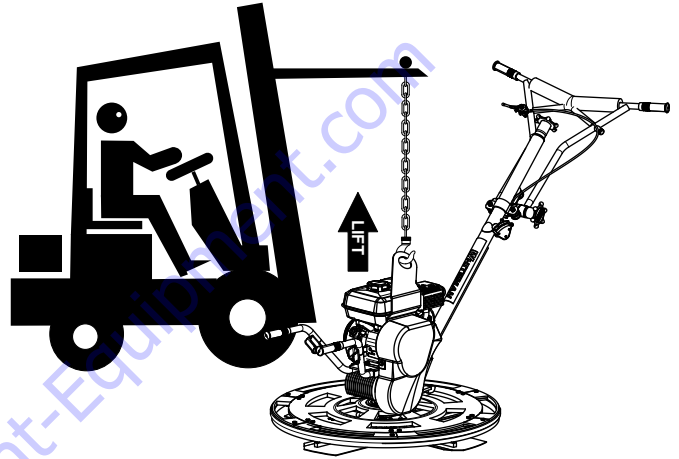


Figure 1. Lifting the Trowel

# SPECIFICATIONS

**Table 1. J3036H55 Trowel Specifications**

Number of Blades	4
Ring Diameter	30 in./36 in. (762 mm/914 mm)
Rotor Speed	60–115 rpm
Path Width	30 in./36 in. (762 mm/914 mm)
Shipping Weight	178 lb. (80 kg)
Operating Weight	180 lb. (81 kg)
Gearbox Oil Capacity	22 oz. (828 ml)
Gearbox Oil Type	Mobil SHC™ 634 industrial synthetic gear oil

**Table 2. Honda Engine Specifications**

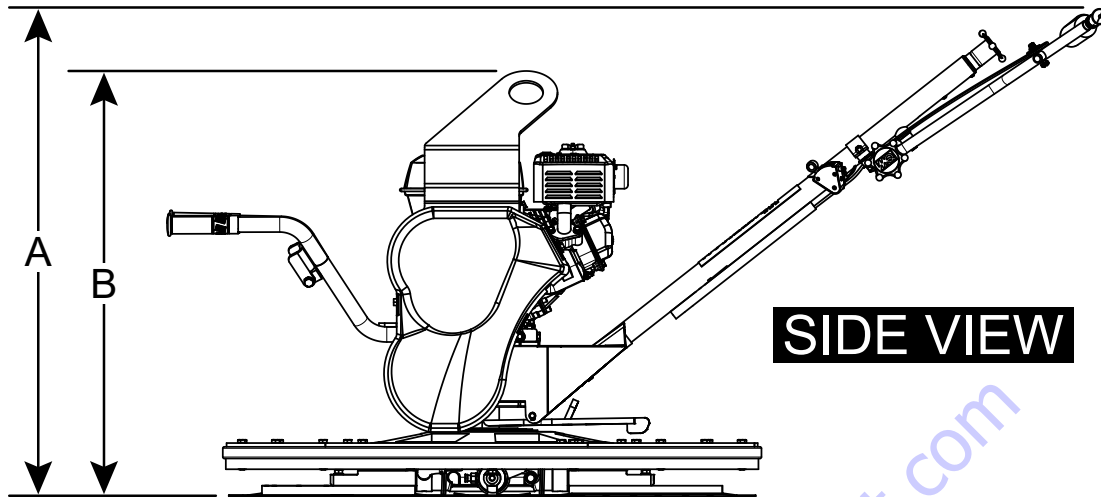
Model	Honda GX160UT2QX2
Type	Air-cooled, 4-stroke, single-cylinder, gasoline engine
Bore x Stroke	2.7 in. x 1.8 in. (68 mm x 45 mm)
Displacement	163 cm <sup>3</sup>
Net Power Output	4.8 hp (3.6 kW) @ 3,600 rpm
Net Torque	7.6 lb-ft. (10.3 N-m) @ 2,500 rpm
PTO Shaft Rotation	Counterclockwise (from PTO shaft side)
Compression Ratio	9:1
Carburetor	Butterfly
Ignition System	Transistorized magneto
Starting Method	Recoil starter
Lubrication System	Splash
Lube Oil Capacity	0.61 qt. (0.58 liters)
Speed Control Method	Centrifugal mechanical type
Air Cleaner	Dual element
Fuel Tank Capacity	3.3 quarts (3.1 liters)
Fuel	Unleaded 86 octane or higher gasoline
Oil Type	4-stroke API, SF or SG SAE 10W-30 general use
Dimensions (L x W x H)	12.2 x 14.3 x 13.6 in. (312 x 362 x 346 mm)
Dry Net Weight	33 lb. (15.1 kg)

**Table 3. J3036H55 Noise and Vibration Emissions**

Guaranteed ISO 11201:2010 Based Sound Pressure Level at Operator Station in dB(A) <sup>a</sup>	87
Guaranteed ISO 3744:2010 Based Sound Power Level in dB(A) <sup>b</sup>	108
Hand-Arm Vibration Per ISO 5349-1:2001 in m/s <sup>2</sup> $\Sigma A(8)$	1.6

## 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 the 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<sup>2</sup>  $\Sigma A(8)$ . The daily exposure limit value is 5 m/s<sup>2</sup>  $\Sigma A(8)$ .



## STANDARD HANDLE SHOWN

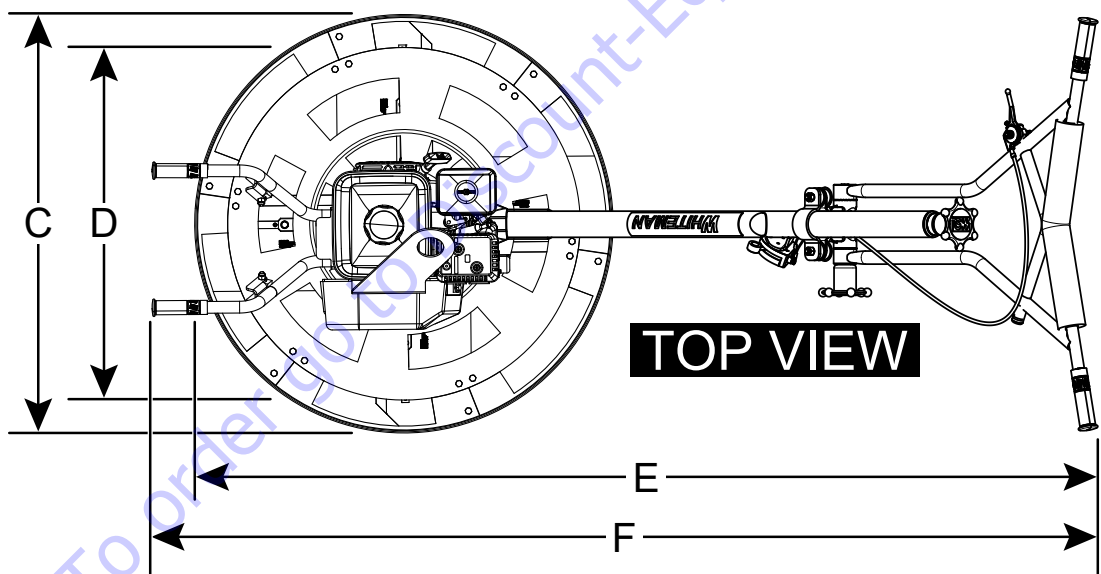


Figure 2. J3036H55 Dimensions

Table 4. J3036H55 Dimensions	
(A) Height (Handle)	41 in. (1,044 mm)
(B) Height (Lifting Bail)	28 in. (714 mm)
(C) Width (Outer Ring Diameter)	36 in. (914 mm)
(D) Width (Inner Ring Diameter)	30 in. (762 mm)
(E) Length (Lift Bracket Disengaged)	70 in. (1,789 mm)
(F) Length (Lift Bracket Engaged)	72 in. (1,829 mm)



# GENERAL INFORMATION

## INTENDED USE

Operate this trowel, its components and tools 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.

## TROWEL FAMILIARIZATION

**Read all safety instructions carefully.** Safety instructions will be found throughout this manual and on the trowel. Keep all safety information in good, readable condition. Operators should be well trained on the operation and maintenance of the trowel.

This walk-behind trowel is designed for the floating and finishing of concrete slabs.

Walk around the trowel and take notice of all the major components (Figure 3)—the engine, blades, steering handle, gearbox, etc. Make sure there is always oil in the engine.

Before using your trowel, test it on a flat, watered-down section of finished concrete that is free of debris and other objects.

This trial test run will increase your confidence in using the trowel and will familiarize you with the trowel's controls. You will learn how the trowel handles under actual conditions.

## Engine

This trowel is equipped with a Honda 4.8 hp (3.6 kW) gasoline engine (Figure 4). Refer to the engine owner's manual for instructions regarding the operation and maintenance of your engine. If the original manual is lost or damaged, please contact your nearest Multiquip dealer for a replacement.

## Drive System

Power is transferred from the engine to the gearbox input shaft via a V-belt pulley drive system. The pulley engages a centrifugal clutch.

## Gearbox

The gearbox is located beneath the engine and transfers power to the spider assembly. The gearbox controls the rotational speed of the trowel and is equipped with two shafts (input and output).

## Spider

The vertical output shaft of the gearbox connects to a cast hub called the spider. The spider has four arms that extend outward, to which blades or float pans are attached. As the gearbox output shaft rotates, so does the spider assembly.

## Adjustable Guard Ring

A safety guard ring prevents objects from coming into contact with the rotating blades, which facilitates the finishing of surface edges without damage to adjacent walls or risers. The patented ABS plastic rotating guard ring resists concrete buildup and is easily converted between 36" and 30" in diameter.

## Blades

The blades of the trowel finish concrete as they are rotated around the surface. This trowel comes equipped with four 8" x 14" combination blades, equally spaced in a radial pattern, attached to the vertical rotating shaft by means of the spider assembly. Additional 8" x 10.5" combo blades are provided for use with the 30" guard ring configuration.

### DANGER

**DO NOT** install trowel blades that extend beyond the outermost diameter of the guard ring bumper. **ALWAYS** use the appropriate blade size for the installed guard ring configuration. The possibility exists of **severe bodily harm** if the blades extend beyond the guard ring.

## Centrifugal Safety Stop Switch

In the event of a trowel runaway condition (the operator releases the handlebar during operation), the centrifugal safety stop switch will stop the engine and bring the trowel to a halt.

## TRAINING

For proper training, please use the **Training Checklist** form located in the front of this manual. This checklist will provide an outline for an experienced operator to provide training to a new operator.



# COMPONENTS (TROWEL)

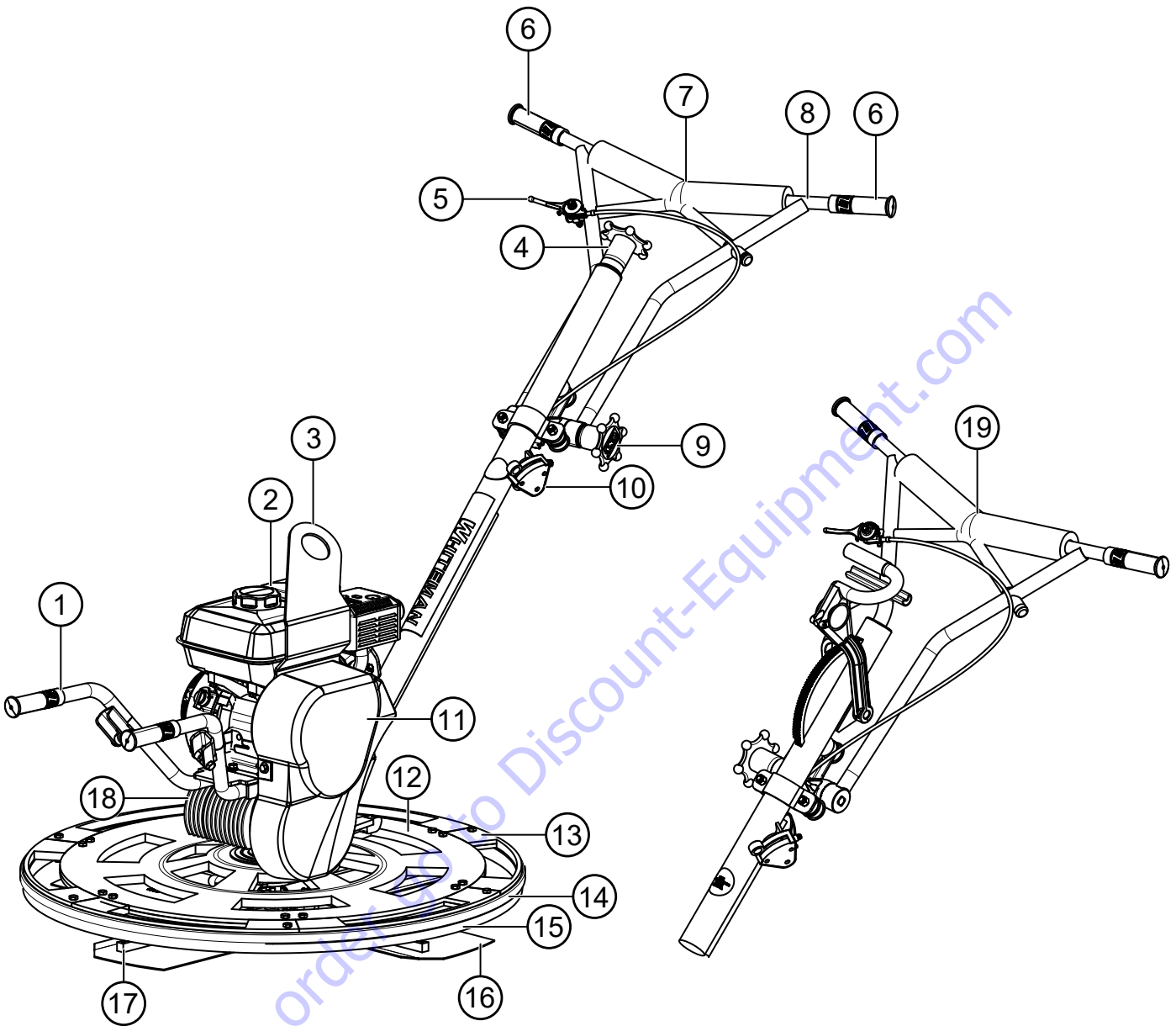


Figure 3. Trowel Components

## COMPONENTS (TROWEL)

Figure 3 shows the location of the basic trowel components. A brief explanation of each component is listed below.

1. **Lift Handles** — Grasp the lift handles to lift the trowel with two people.
2. **Engine** — Honda 4.8-horsepower (3.6 kW) gasoline engine. Refer to Table 2 for engine specifications.
3. **Lifting Bail** — Attach a suitable lifting device to the lifting bail whenever lifting of the trowel is required.
4. **Pitch Control Star Wheel** — Adjusts blade pitch. Rotate the star wheel clockwise to pitch the blades upward. Rotate the star wheel counterclockwise to pitch the blades flat (no pitch).
5. **Throttle Lever** — Controls engine speed.
6. **Hand Grip** — **ALWAYS** place hands on **both** hand grips when maneuvering the trowel. Replace hand grips when they become worn or damaged.
7. **Handlebar Pad** — Foam rubber pad protects the body when coming into contact with the vibratory handlebar.
8. **Vibratory Handlebar** — Rubber shock mounts/isolators reduce trowel vibration.
9. **Handlebar Adjuster** — Change the angle or height of the handlebar by loosening the star wheel. Adjust the handlebar to the desired position, then tighten the star wheel firmly to secure the handlebar in place.
10. **Centrifugal Safety Stop Switch** — Will stop the engine and bring the trowel to a halt in the event of a trowel runaway condition (i.e. the operator releases the handlebar during operation).
11. **V-Belt Cover** — Remove this cover to gain access to the V-belt. **NEVER** operate the trowel with this cover removed.
12. **30" Guard Ring Assembly** — Consists of a 30" guard ring, bumper ring, and bumper. Prevents blade contact with boundaries (i.e. walls) when finishing surface edges in the 30" configuration. **NEVER** place hands or feet inside the guard ring while the engine is running.
13. **36" Guard Ring** — Consists of six fastened guard ring segments that cover the trowel blades and support the 36" bumper and bumper ring. Can be removed and reinstalled without being fully disassembled. **NEVER** place hands or feet inside the guard ring while the engine is running.
14. **36" Bumper** — Prevents blade contact with boundaries (i.e. walls) when finishing surface edges.
15. **36" Bumper Ring** — Supports the 36" bumper.
16. **Blades (4)** — Versatile 8" x 14" combination blades will satisfy most troweling needs. Additional 8" x 10.5" blades are included for use with the 30" guard ring configuration.
17. **Trowel Arms (4)** — Blades or float discs are attached to the trowel arms. **NEVER** operate the trowel with a bent, broken, or out-of-adjustment trowel arm.
18. **Gearbox** — Helical worm gear drive gearbox rotates the trowel blades via engine interface. **ALWAYS** check the gearbox oil level (sight glass) prior to each use. Fill with Mobil SHC™ 634 gearbox oil as needed.
19. **Quick Pitch™ Control Handle (Optional)** — To adjust the pitch of the blades upward using the Quick Pitch™ handle, simply pull the T-handle backward while squeezing the trigger. Push the T-handle forward to pitch the blades flat (no pitch). **Contact Multiquip unit sales to purchase this option.**

### DANGER

**DO NOT** install trowel blades that extend beyond the outermost diameter of the guard ring bumper. **ALWAYS** use the appropriate blade size for the installed guard ring configuration. The possibility exists of **severe bodily harm** if the blades extend beyond the guard ring.

## COMPONENTS (ENGINE)

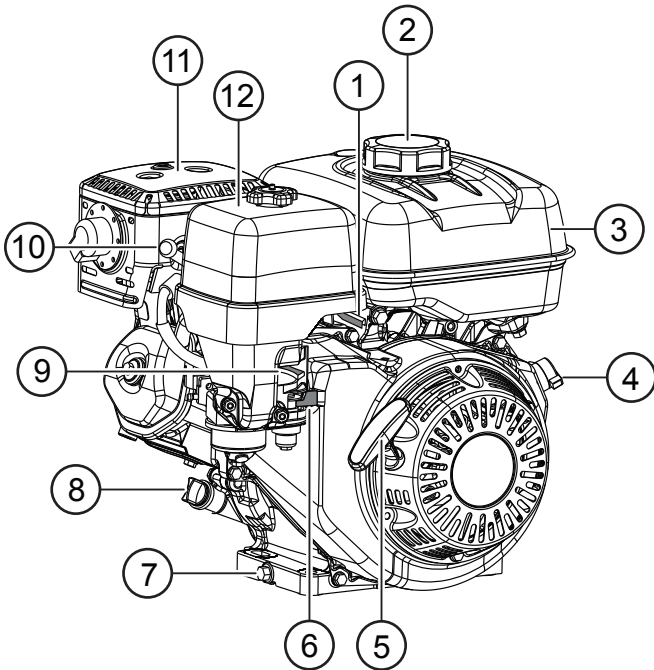


Figure 4. Basic Engine Components

### INITIAL SERVICING

The engine (Figure 4) 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 speed (RPM).
2. **Fuel Filler Cap** — Remove to add unleaded gasoline to the fuel tank. Make sure the cap is tightened securely. **DO NOT** overfill.

#### DANGER



**NEVER** 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 up to 3.3 quarts (3.6 liters) of 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

**DO NOT** 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. Pull the starter grip slowly 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 Bolt** — 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 5.
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, **NEVER** 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.

## UNPACKING THE HANDLE

The handle (Figure 5) is shipped in the folded, or stowed, position.

1. To place the folding upper handle in the operational position, turn the star wheel **counterclockwise** to release it from its folded/stowed position.
2. Pull back on the upper handle to place the handle in the operational position. Turn the star wheel **clockwise** to secure the handle firmly in place.

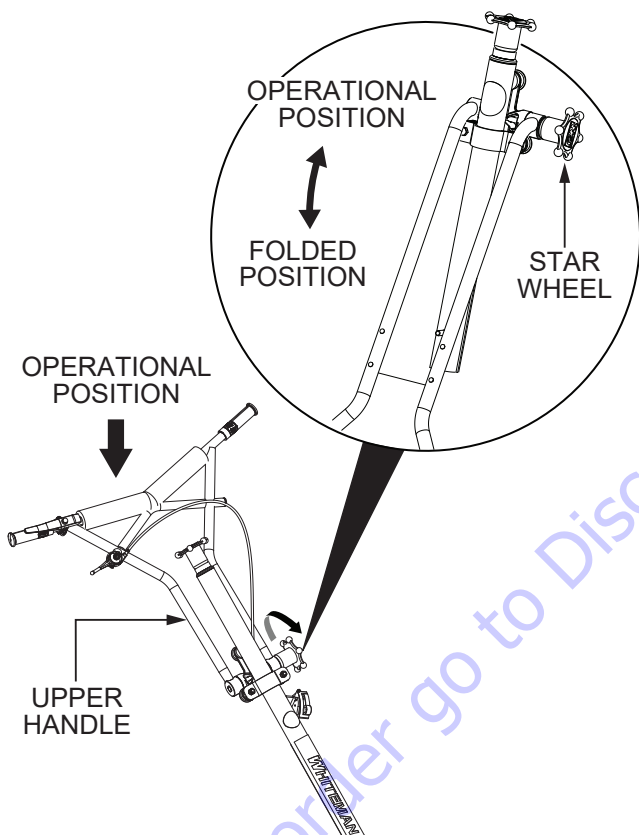


Figure 5. Unpacking the Handle

## ASSEMBLY AND INSTALLATION

Some components must be installed before the trowel can be operated. This section provides general instructions on how to install these components. **For detailed handle assembly instructions, contact Multiquip and request Instruction Sheet P/N 20485.**

### Handle Tube Installation

Attach the main handle (tube) to the gearbox using the supplied hardware as shown in Figure 6.

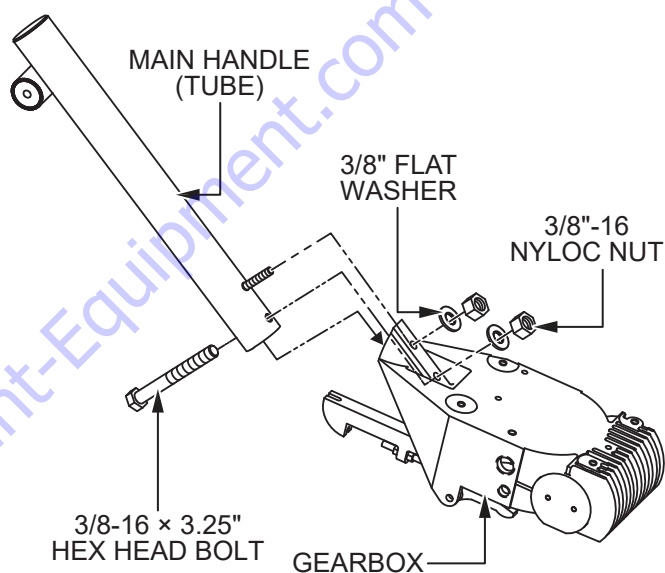


Figure 6. Handle Tube Installation

### Vibratory Handlebar Adjustment

The vibratory handlebar is already attached to the main handle tube.

To adjust the height of the handlebar, loosen the star wheel (Figure 7) and move the handlebar to the desired position. Tighten the star wheel firmly to secure.

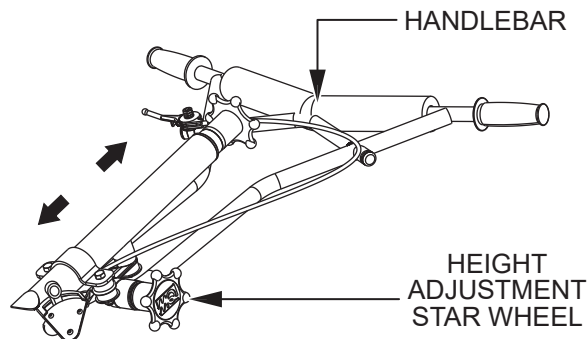


Figure 7. Handlebar Adjustment

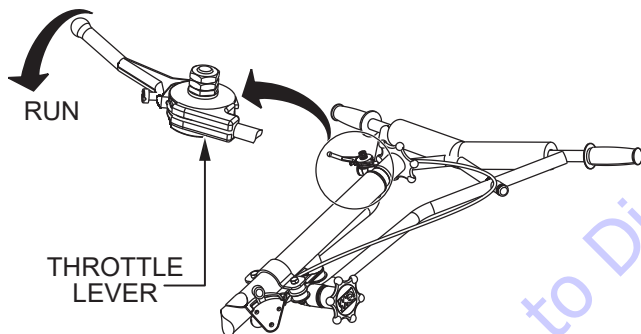
## NOTICE

If additional handlebar adjustment is desired, a trowel handle wedge kit (P/N 2576) can be purchased from your Multiquip dealer.

The wedges are placed between the handle and the gearbox, which will move your handle operating position approximately 3 inches (76 mm) up or down. The kit comes complete with wedges, new bolts, and installation instructions.

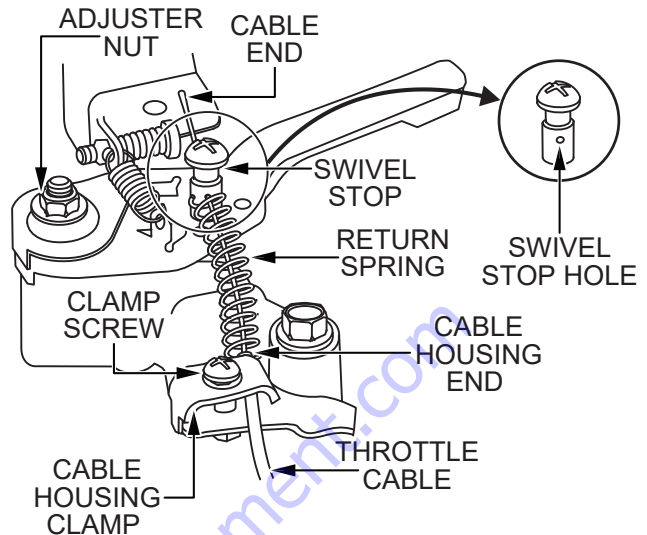
## Throttle Cable Installation

1. Uncoil the throttle cable and housing.
2. Make sure the throttle cable is fed through the tube on the underside of the handle and secured to the upper handle and main tube with zip ties.
3. Place the throttle lever (Figure 8) in the **RUN** position.



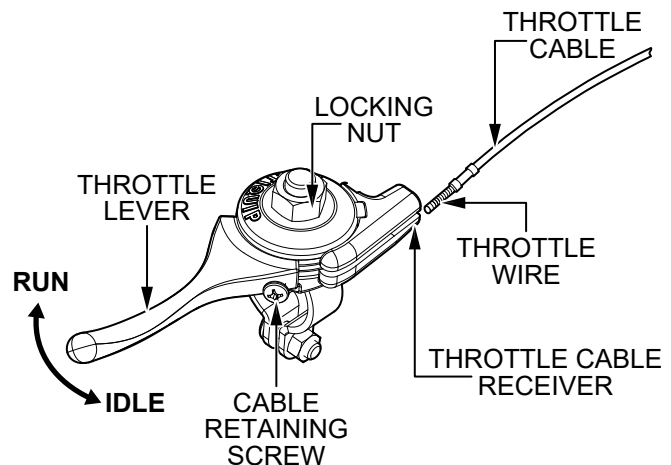
**Figure 8. Throttle Lever (Run)**

4. Loosen the cable housing clamp screw and the swivel stop screw (Figure 9).



**Figure 9. Throttle Cable Installation**

5. Place the primary throttle return spring between the cable housing clamp and the swivel stop screw (Figure 9).
6. Feed the cable assembly through the cable housing clamp, return spring, and swivel stop hole, until the cable housing extends under the housing clamp to its far edge (Figure 9).
7. On the throttle lever, slightly loosen the locking nut and cable retaining screw (Figure 10).



**Figure 10. Adjusting Cable Tension**

8. Make sure the throttle cable is seated in the throttle cable receiver (Figure 10).

9. Route the throttle wire approximately 1/2 inch past the cable retaining screw (Figure 10). Tighten the cable retaining screw to secure the throttle wire.
10. Adjust cable tension as needed by loosening or tightening the locking nut and cable retaining screw on the throttle lever (Figure 10).

## NOTICE

If the throttle lever does not return to the neutral position with the throttle backed off, loosen the adjusting nut 1/2 turn at a time, tighten, and recheck. Readjust throttle tension as necessary.

## Centrifugal Safety Stop Switch Connection

Connect the black tail wire from the engine to the black safety stop wire from the centrifugal stop switch as shown in Figure 11.

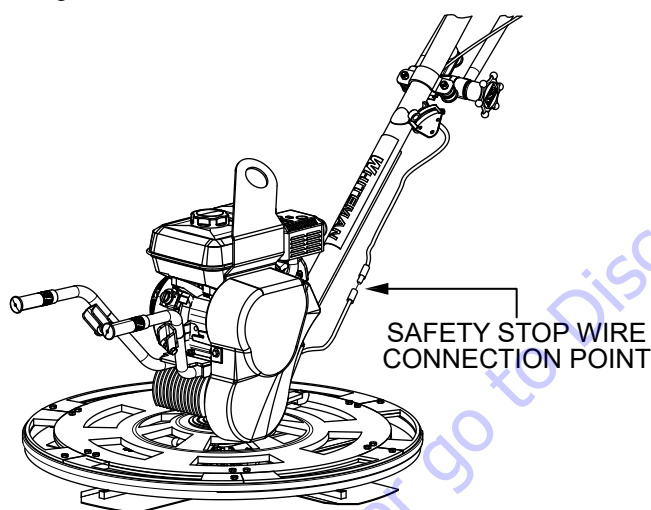


Figure 11. Centrifugal Safety Stop Switch Connection

## Blade Pitch Cable Installation

1. For trowels equipped with a **standard** handle, turn the star wheel **counterclockwise** to release tension on the blade pitch cable. See Figure 12.

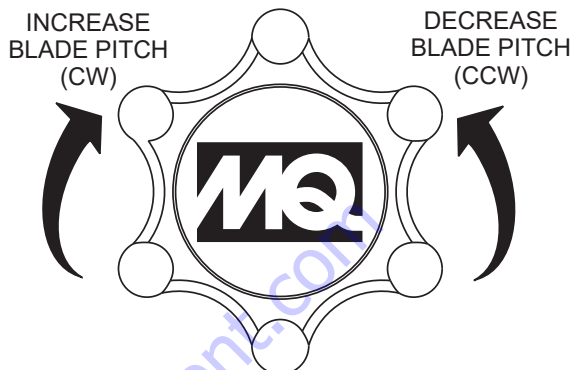


Figure 12. Blade Pitch Cable Adjustment (Standard Handle)

2. For trowels equipped with a **Quick Pitch™** handle, squeeze the trigger lock and push the T-handle towards the engine to release tension on the blade pitch cable. See Figure 13.

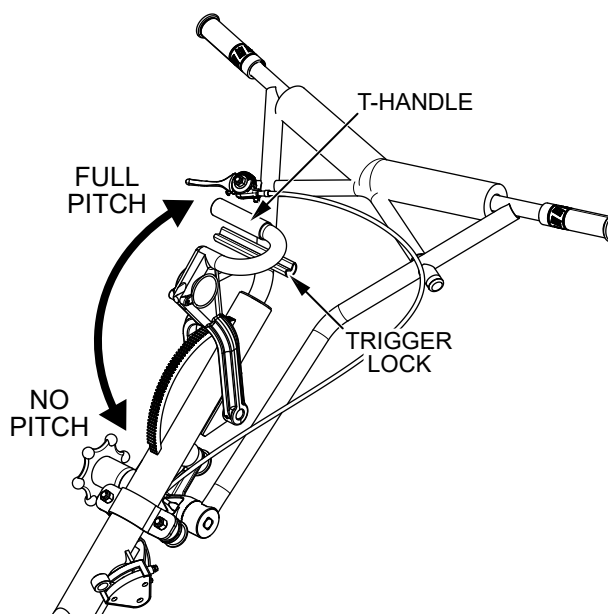


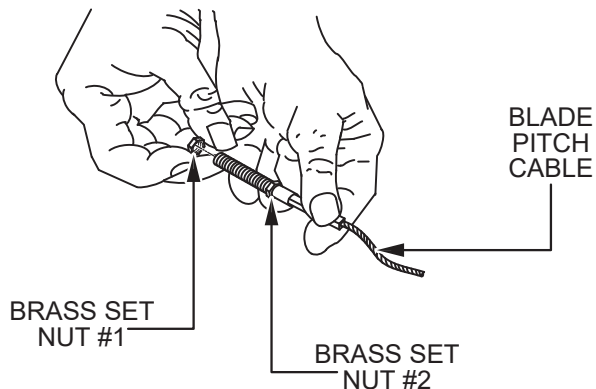
Figure 13. Blade Pitch Cable Adjustment (Quick Pitch™ Handle)

## CAUTION

The Quick Pitch™ T-handle is under spring tension and can snap in the direction of force (toward the user) if not firmly grasped, which may cause bodily injury.

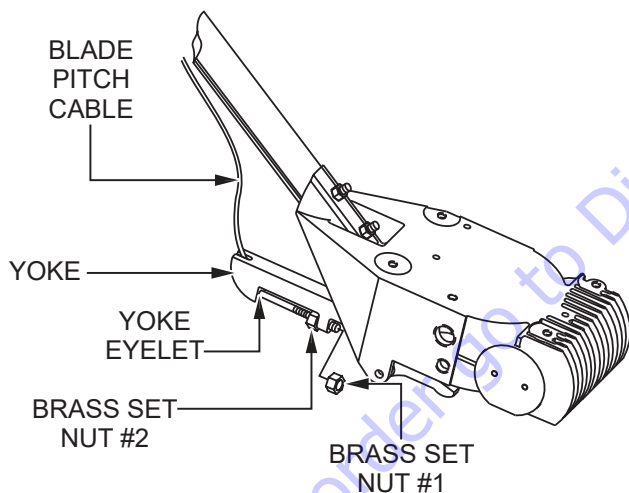


- Remove brass set nut #1 from the end of the blade pitch cable (Figure 14).



**Figure 14. Blade Pitch Cable**

- Thread brass set nut #2 as far as possible towards the blade pitch cable (Figure 14).
- Insert the blade pitch cable end through the yoke eyelet (Figure 15). Tighten brass set nut #1 by hand to remove all slack from the cable.



**Figure 15. Cable Yoke Attachment**

- Tighten brass set nut #2 against the yoke boss to secure the cable in place.
- Tighten brass set nut #1 against the yoke boss.

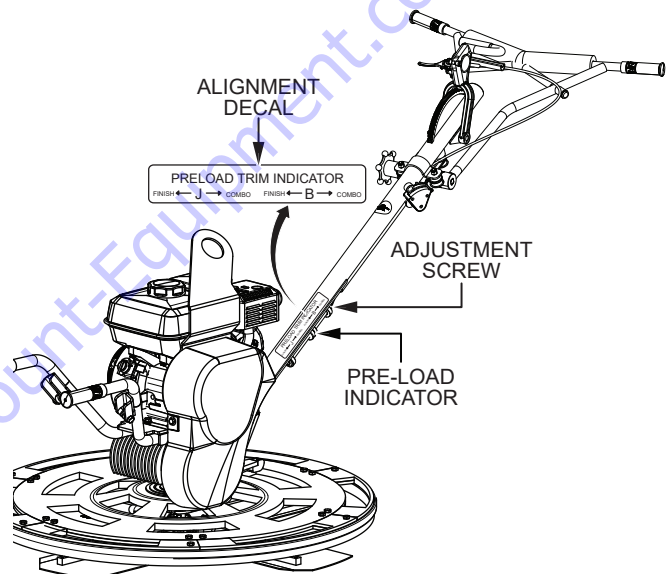
## Pre-Load Adjustment (Quick Pitch™ Handle Only)

### ⚠ CAUTION

The Quick Pitch™ handle is spring-loaded. Personal injury or damage can result from improper handling, installation, or adjustment. **Use extreme caution** when handling this component.

After the Quick Pitch™ handle has been installed, spring pre-load adjustment is required.

- Locate the spring pre-load adjustment screw (Figure 16) on the underside of the handle tube.



**Figure 16. Spring Pre-Load Adjustment**

- An alignment decal (Figure 16) has been placed on the side of the handle tube to assist the user with adjustment of the Quick Pitch™ handle spring. Turn the adjustment screw until the sliding pre-load indicator aligns with the letter 'J' on the decal.

## 36-Inch to 30-Inch Guard Ring Conversion

1. Remove and retain the four 5/16-18 × 1-1/4" HHFS screws and four 5/16-18 × 1-1/2" HHFS screws securing the 8" × 14" trowel blades to the spider assembly (Figure 17).

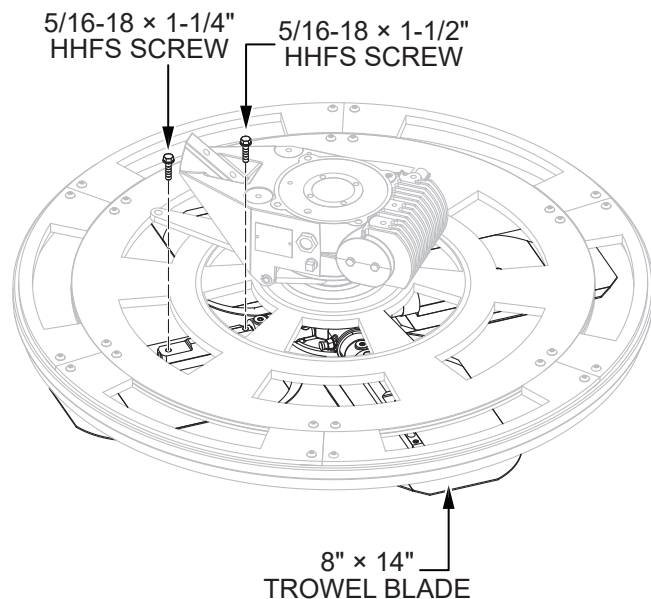


Figure 17. 14-Inch Trowel Blade Removal

2. Remove the twelve M8-1.25 × 25 mm HHC screws and M8-1.25 nyloc nuts securing the 36" guard-bumper ring assembly to the 30" guard ring (Figure 18). Retain all twelve nyloc nuts and six of the M8-1.25 × 25 mm screws for installation of the 30" guard-bumper ring assembly.

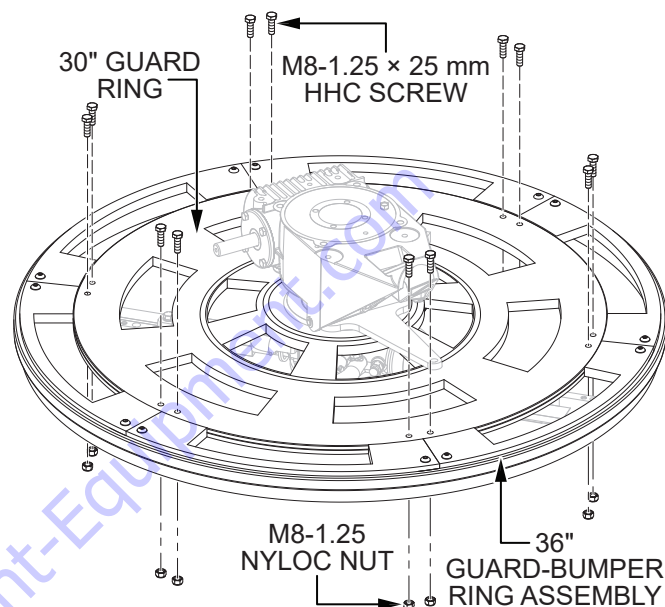


Figure 18. 36-Inch Guard-Bumper Ring Assembly Removal

### NOTICE

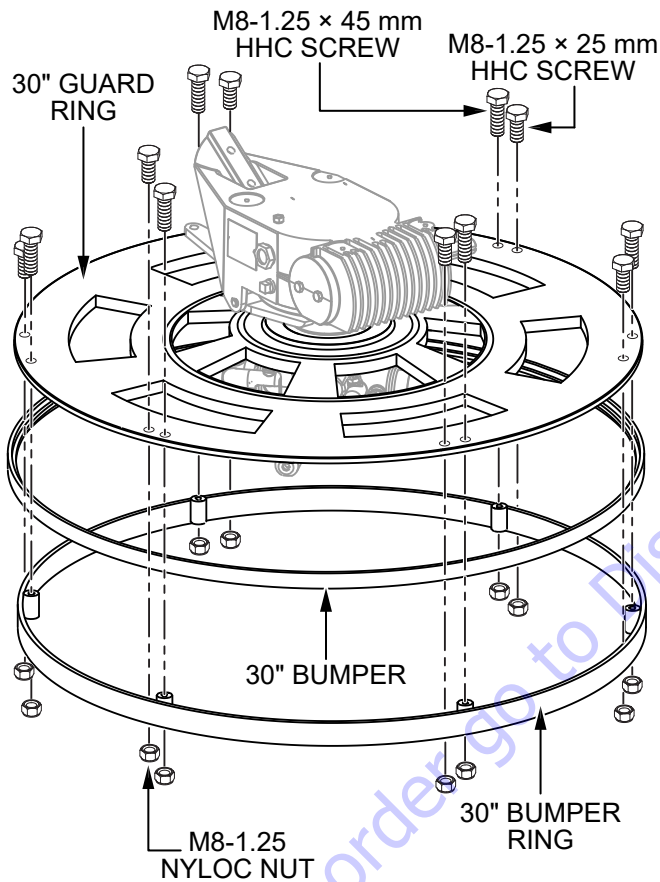
**DO NOT** discard the six remaining M8-1.25 × 25 mm screws! Retain them in a safe location, as they will be needed when converting the trowel back to the 36" guard ring configuration.

### NOTICE

The 36" guard-bumper ring assembly is designed to be removed and reinstalled without being fully disassembled. The 36" guard-bumper ring assembly consists of six guard ring segments, a bumper ring, and a bumper. For ease of installation, leave these components assembled.

3. Locate the bag containing six M8-1.25 × 45 mm HHC screws provided for installation of the 30" guard-bumper ring assembly. Remove the screws from the packaging.

- The inner surface of the 30" bumper is marked with the letter 'T'. Orient the 30" bumper with the 'T' upward. Orient the 30" bumper ring with the welded bushings at the top of the ring.
- Place the 30" bumper in between the 30" guard ring and the 30" bumper ring as shown in Figure 19. Secure the 30" bumper ring to the 30" guard ring with the six provided M8-1.25 × 45 mm HHC screws and six retained M8-1.25 nyloc nuts.



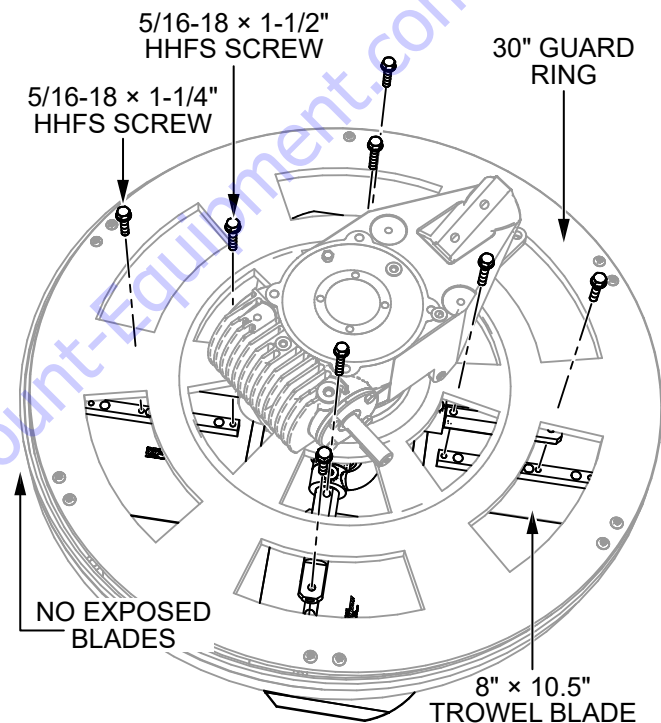
**Figure 19. 30-Inch Bumper Ring Installation**

- Install the six retained M8-1.25 × 25 mm HHC screws and six remaining M8-1.25 nyloc nuts into the available 30" guard ring holes (Figure 19) and tighten securely.

- Secure four 8" × 10.5" trowel blades to the spider assembly (Figure 20) with the four 5/16-18 × 1-1/4" HHFS screws and four 5/16-18 × 1-1/2" HHFS screws that were removed in step #1.

**! DANGER**

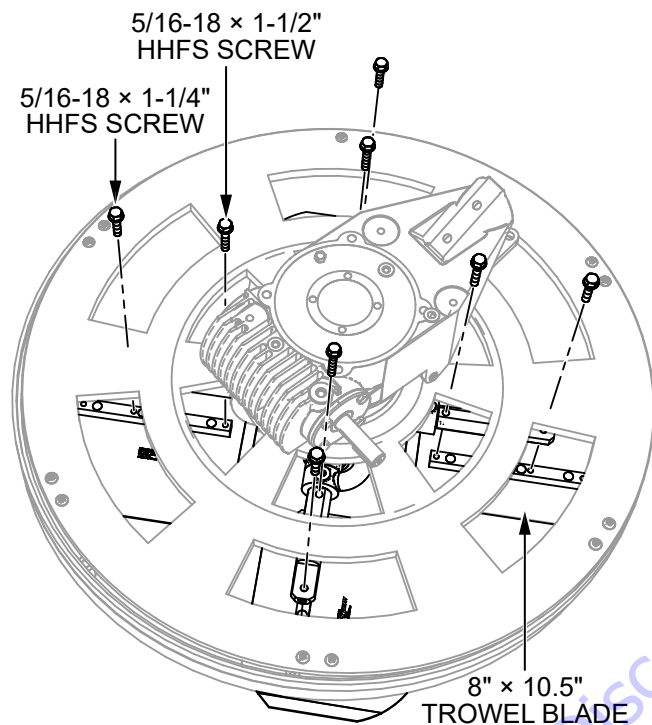
**DO NOT** install trowel blades that extend beyond the outermost diameter of the guard ring bumper. **ALWAYS** use the appropriate blade size for the installed guard ring configuration. The possibility exists of **severe bodily harm** if the blades extend beyond the guard ring.



**Figure 20. 10.5-Inch Trowel Blade Installation**

## 30-Inch to 36-Inch Guard Ring Conversion

1. Remove and retain the four 5/16-18 × 1-1/4" HHFS screws and four 5/16-18 × 1-1/2" HHFS screws securing the 8" × 10.5" trowel blades to the spider assembly (Figure 21).

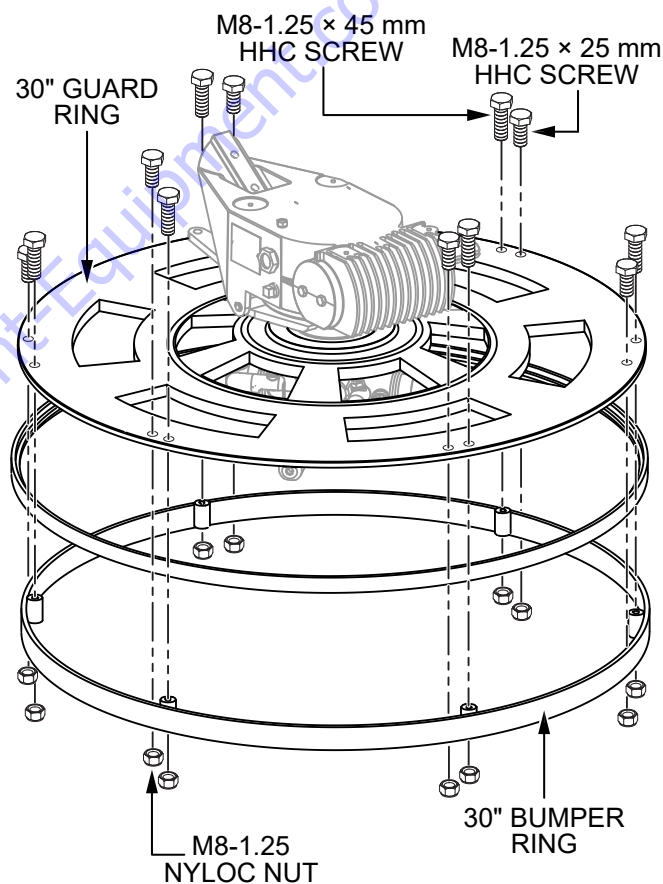


**Figure 21. 10.5-Inch Trowel Blade Removal**

2. Remove the six M8-1.25 × 25 mm HHC screws, six M8-1.25 × 45 mm HHC screws, and twelve M8-1.25 nyloc nuts securing the 30" bumper ring to the 30" guard ring (Figure 22). Retain the twelve nyloc nuts and six M8-1.25 × 25 mm screws for installation of the 36" guard-bumper ring assembly.

### NOTICE

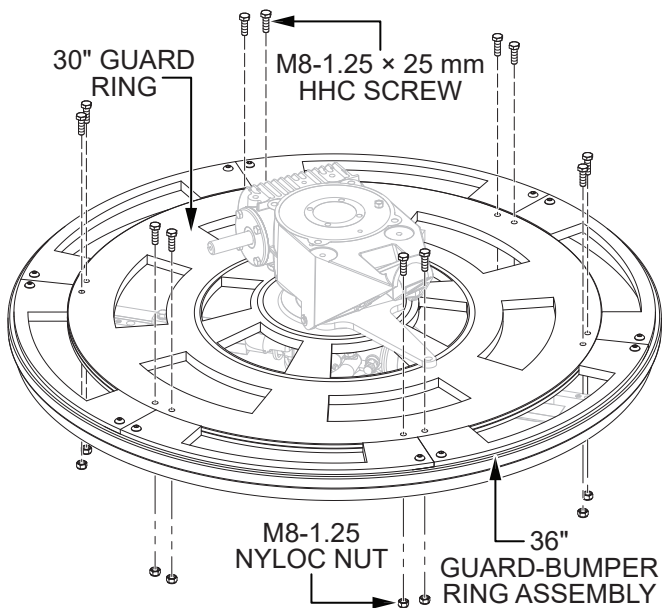
**DO NOT** discard the six removed M8-1.25 × 45 mm screws! Retain them in a safe location, as they will be needed when converting the trowel back to the 30" edger configuration.



**Figure 22. 30-Inch Bumper Ring Removal**

3. Locate the six additional M8-1.25 × 25 mm HHC screws retained from the 36-inch to 30-inch guard ring conversion.

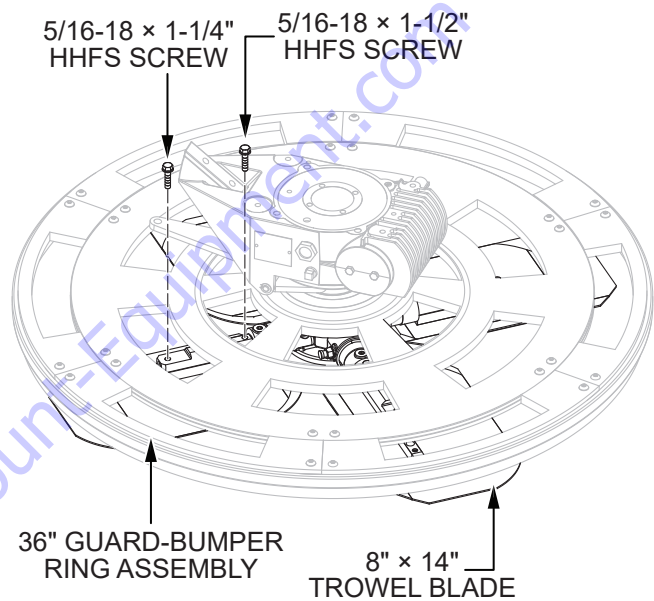
4. Secure the 36-inch guard-bumper ring assembly to the 30-inch guard ring with the twelve M8-1.25 x 25 mm HHC screws and M8-1.25 nyloc nuts (Figure 23).



**Figure 23. 36-Inch Guard-Bumper Ring Assembly Installation**

5. Secure four 8" x 14" trowel blades to the spider assembly with four 5/16-18 x 1-1/4" HHFS screws and 5/16-18 x 1-1/2" HHFS screws (Figure 24).

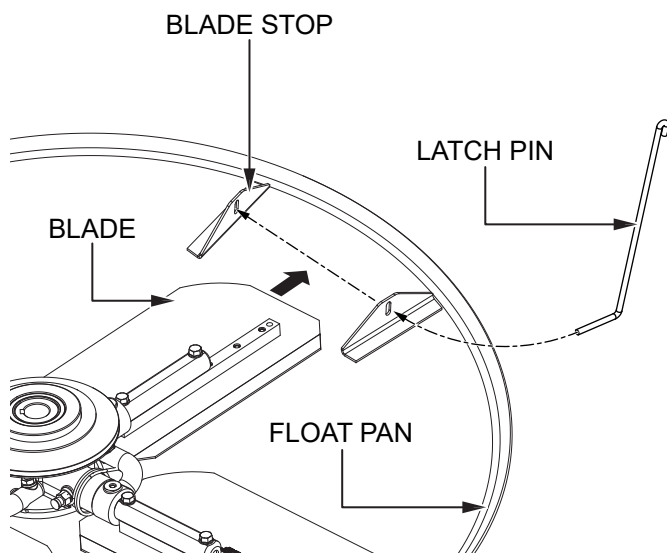
**⚠ DANGER**  
**DO NOT** install trowel blades that extend beyond the outermost diameter of the guard ring bumper. **ALWAYS** use the appropriate blade size for the installed guard ring configuration. The possibility exists of **severe bodily harm** if the blades extend beyond the guard ring.



**Figure 24. 14-Inch Trowel Blade Installation**

## Float Pan Installation (Optional)

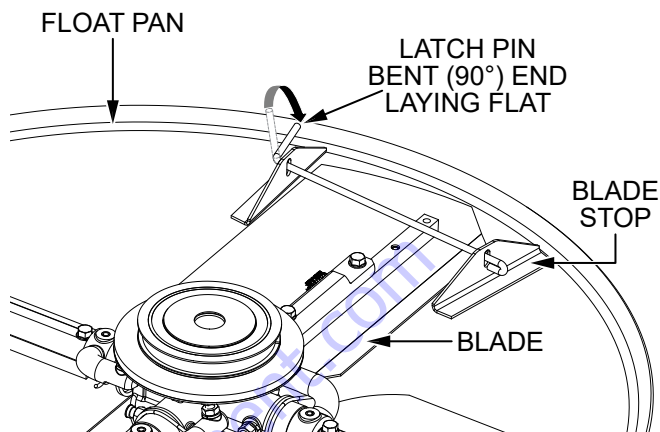
Float pans attach to the trowel blades and allow the trowel to 'float' on wet concrete. The disc design facilitates early floating and easy movement from wet to dry areas. Float pans are also very effective at embedding large aggregates and surface hardeners.



**Figure 25. Float Disc Installation**

1. Lift the trowel just enough to slide the float pan under the blades. Lower the trowel onto the pan with the blades between the blade stops (Figure 25).
2. Fit the blades between the blade stops. Be sure to rotate the blades in the same direction as when the machine is in operation, or use the engine to rotate the blades into position.
3. Route the latch pins through the blade stop holes as shown in Figure 25.

4. After it has been routed through the blade stop holes, rotate each latch pin so the end that is bent approximately 90 degrees lays flat on the surface of the float pan. See Figure 26.



**Figure 26. Latch Pin Placement**

5. Make sure the blade edges are secured between the blade stops, and the latch pins are secured completely over the blades, locking them in place.
6. Periodically check the latch pins during normal operation to ensure they are still in the correct position.

## ENGINE OIL

1. Place the trowel on secure, level ground with the engine **OFF**.
2. Remove the dipstick (Figure 27) from the engine oil filler hole and wipe it clean.

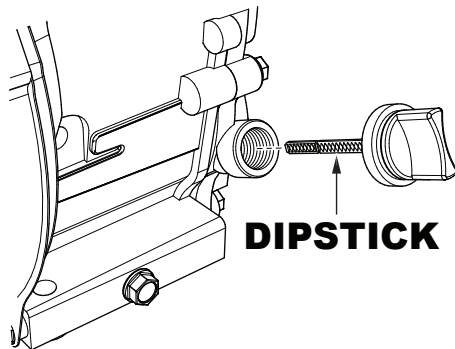


Figure 27. Engine Oil Dipstick

3. Reinsert the dipstick, then remove it again without screwing it into the filler neck. Check the oil level shown on the dipstick.
4. If the oil level is low (Figure 28), fill to the edge of the oil filler hole with the recommended oil type listed in Table 5. Refer to Table 2 for maximum engine oil capacity.

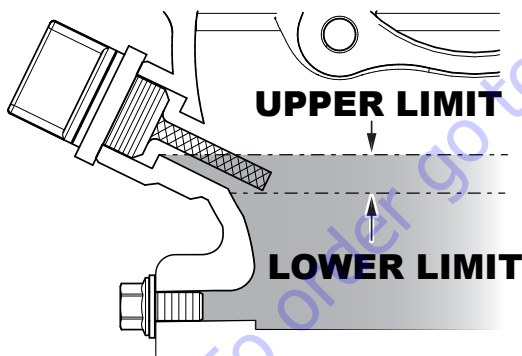


Figure 28. Engine Oil Level

Table 5. Engine 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

Remove the fuel filler cap and inspect the fuel level in the tank. If fuel is low, replenish with 86 octane or higher unleaded gasoline.

### **!** DANGER



Motor fuels are **highly flammable** and can be dangerous if mishandled. **NEVER** smoke while refueling. **NEVER** attempt to refuel while the engine is **running** or **hot!**

### **!** WARNING

**ALWAYS** use a strainer for filtration while refueling. **NEVER** top off fuel. **ALWAYS** wipe up any spilled fuel immediately.

## GEARBOX OIL

1. Look at the sight glass on the side of the gearbox (Figure 29) to determine if gearbox oil is low. The correct oil level is to the halfway point on the sight glass.

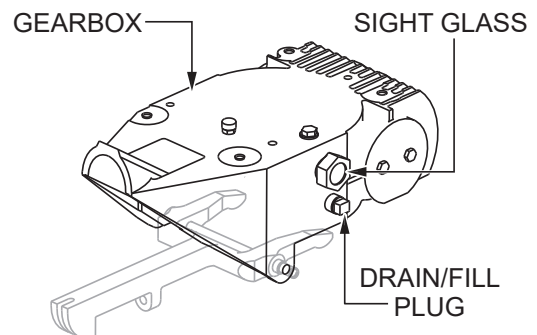
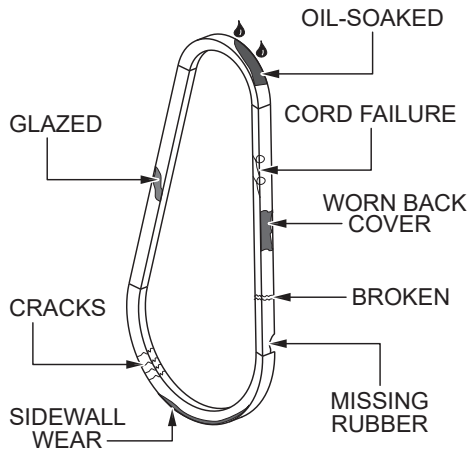


Figure 29. Gearbox Oil

2. If gearbox oil is low, remove the drain/fill plug (Figure 29) and fill with Mobil SHC™ 634 industrial synthetic gear oil until the correct oil level is reached. Replace the drain/fill plug when finished.
3. If there is too much oil in the gearbox, remove the drain/fill plug and allow the oil to seep out. Replace the plug once the correct oil level is reached.

## V-BELT

1. Inspect the V-belt (Figure 30) to determine if it is frayed, peeling, full of tiny cracks, has pieces of rubber missing, or is otherwise damaged.

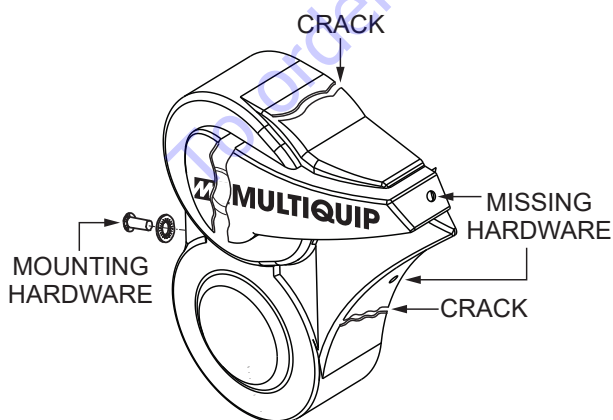


**Figure 30. V-Belt Inspection**

2. Inspect the V-belt (Figure 30) to determine if it is oil-soaked or *glazed* (a hard, shiny appearance on the sides of the belt). Either of these conditions can cause overheating of the belt, which may weaken the belt and increase the possibility of it breaking.
3. Replace the V-belt immediately if any of the aforementioned wear conditions are observed.

## BELT GUARD

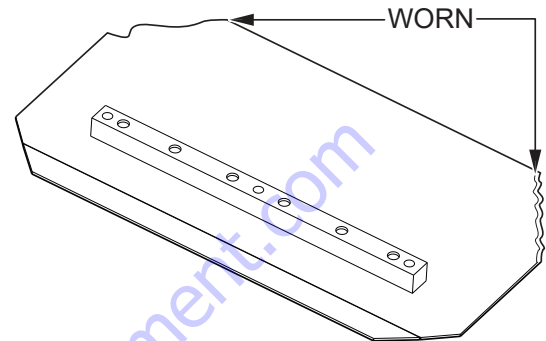
Inspect the belt guard (Figure 31) for damage and loose or missing hardware.



**Figure 31. Belt Guard Inspection**

## BLADES

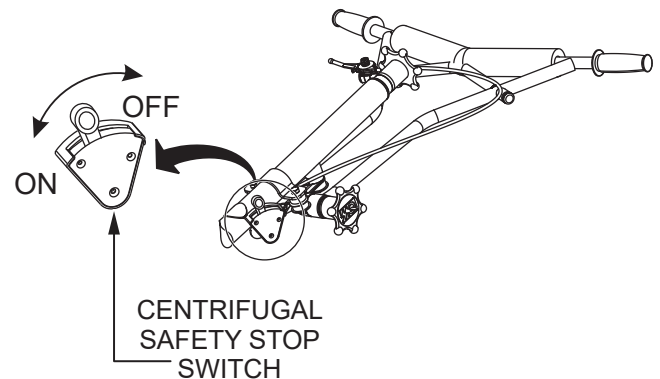
Inspect the trowel blades for wear or damage (Figure 32). If one blade is worn out while the others look new, there could be a blade pitch problem. Refer to the **Maintenance** section of this manual for the blade pitch adjustment procedure. Replace any worn or damaged blades immediately.



**Figure 32. Blade Inspection**

## CENTRIFUGAL SAFETY STOP SWITCH

Your trowel is equipped with a centrifugal safety stop switch (Figure 33). **This switch should be tested every time the engine is started.** Refer to the **Operation** section for more information.



**Figure 33. Centrifugal Safety Stop Switch**

The switching mechanism should operate freely, and should always be kept in this condition. With the switch in the **OFF** position, the engine should not start or run. The purpose of this switch is to stop the engine during a runaway situation (i.e. the operator releases the handle during operation).



# OPERATION

This section is intended to assist the operator with the initial startup of the walk-behind trowel. It is extremely important that this section be read carefully before attempting to use the trowel in the field. **DO NOT** use your trowel until this section is thoroughly understood.

## BEFORE STARTING

### NOTICE

**DO NOT** attempt to operate the trowel until the **Safety**, **Inspection**, and **Operation** sections of this manual have been read and thoroughly understood.

1. Clean the trowel, particularly the engine cooling air inlet. Remove all dirt and dust.
2. Inspect the engine air cleaner for dirt and dust. Replace the air cleaner if it is dirty.
3. Inspect the carburetor for external dirt and dust. Clean with dry compressed air as needed.
4. Inspect all fastening nuts and bolts for tightness.

## STARTING THE ENGINE

1. Place the engine fuel valve lever in the **OPEN** position (Figure 34).

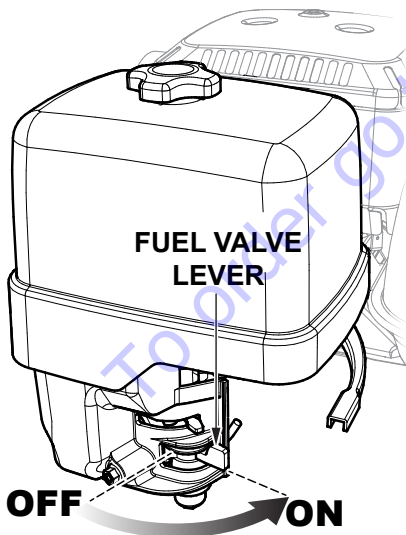


Figure 34. Engine Fuel Valve Lever (Open)

2. Place the engine ON/OFF switch in the **ON** position (Figure 35).

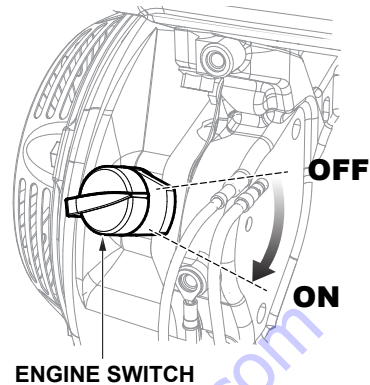


Figure 35. Engine ON/OFF Switch (ON)

3. Place the throttle lever in the **IDLE** position (Figure 36).

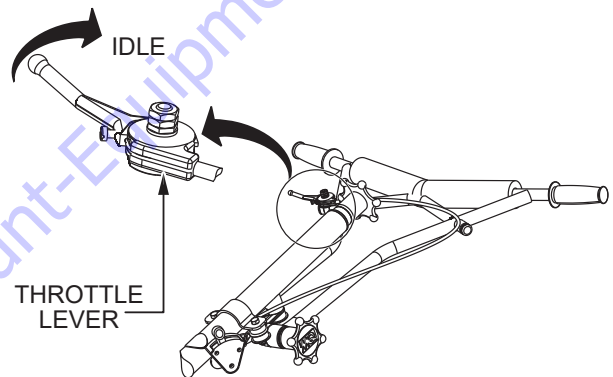


Figure 36. Throttle Lever (Idle)

4. If starting a cold engine, place the choke lever in the **CLOSED** position (Figure 37).

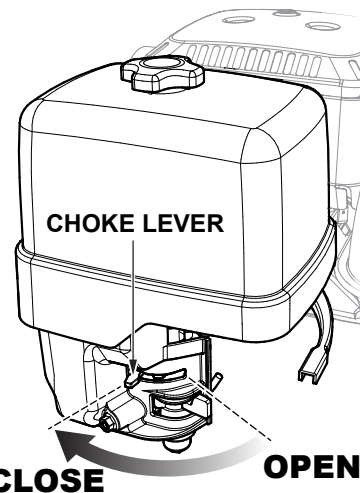


Figure 37. Choke Lever (Closed)

5. If starting a warm engine, place the choke lever in the **OPEN** position (Figure 38).

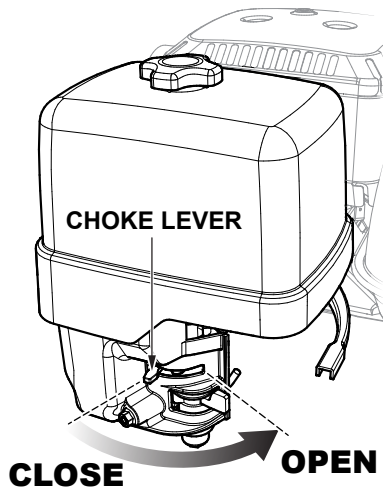


Figure 38. Choke Lever (Open)

6. Slowly pull the starter grip (Figure 39) until resistance is felt, then pull briskly and smoothly to start the engine. Gently return the starter grip to its original position.

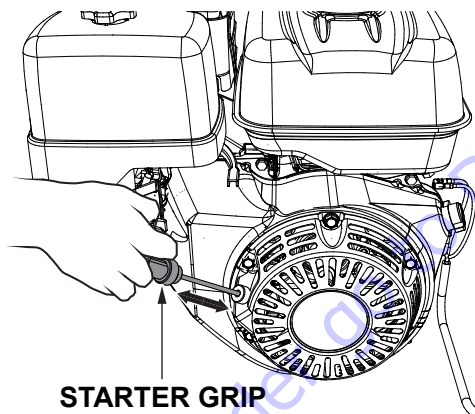


Figure 39. Starter Grip

7. If the engine has started, slowly return the choke lever to the **CLOSED** position (Figure 37). If the engine has not started, repeat steps 1–6.
8. Before operating the trowel, run the engine for several minutes and check for fuel leaks and loose components.

## CENTRIFUGAL SAFETY STOP SWITCH TEST

### **CAUTION**

Test the centrifugal safety stop switch **every time the engine is started**.

**NEVER** operate the trowel without making sure the switch is operational.

1. Clear the area around the trowel. Make sure it is free of debris and objects.
2. With the engine running at idle, place the safety stop switch lever in the **OFF** position (Figure 40). Verify that the engine shuts off. If the engine continues to run, replace the centrifugal safety stop switch.

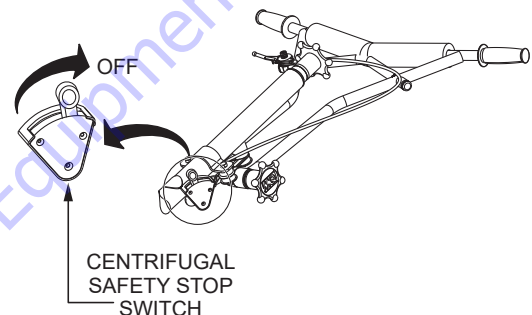


Figure 40. Centrifugal Safety Stop Switch (OFF)

3. Place the safety stop switch lever in the **ON** position. Restart the engine and let it idle.
4. Stand behind the handle in the operator's position (Figure 41) and spin the handle to the right, simulating a runaway condition. Centrifugal force should throw the safety switch outward to the **OFF** position, thus shutting off the engine.

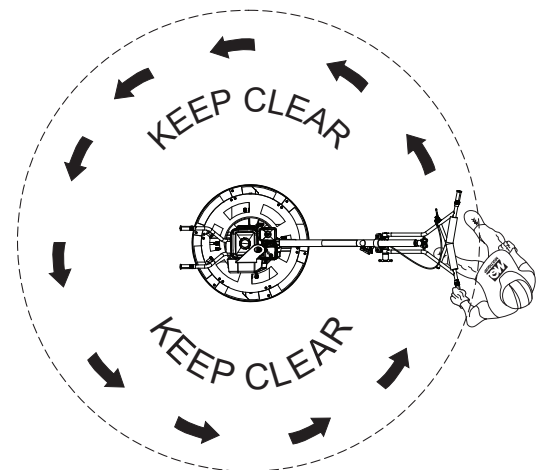


Figure 41. Centrifugal Safety Stop Switch Test

## TO BEGIN TROWELING

Place the throttle lever (Figure 42) in the **RUN** position.

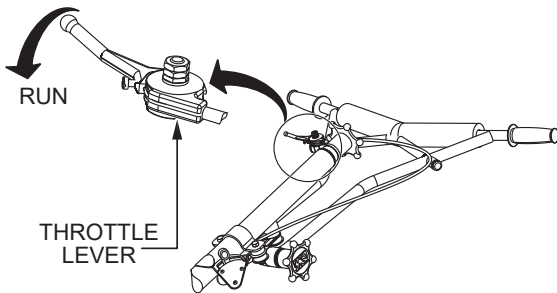


Figure 42. Throttle Lever (Run)

## PITCHING THE BLADES

### Standard Handle

To pitch the blades upward with the standard handle (Figure 43), turn the star wheel clockwise. Turn the star wheel counterclockwise to pitch the blades flat (no pitch).

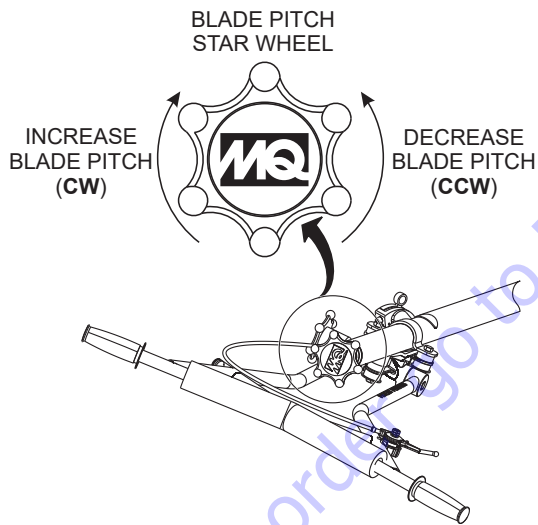


Figure 43. Pitching the Blades (Standard Handle)

### Quick Pitch™ Handle

To pitch the blades upward with the Quick Pitch™ handle (Figure 44), pull the T-handle backward while squeezing the trigger lock. Push the T-handle forward to pitch the blades flat (no pitch).

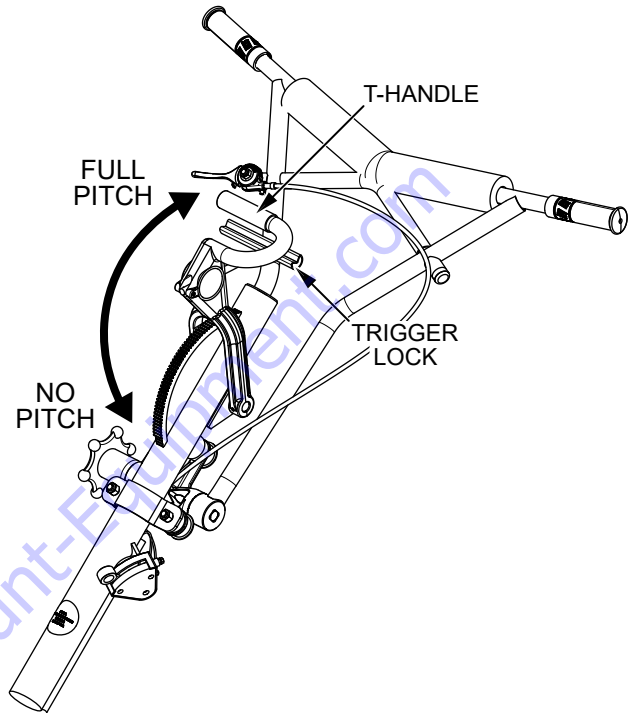


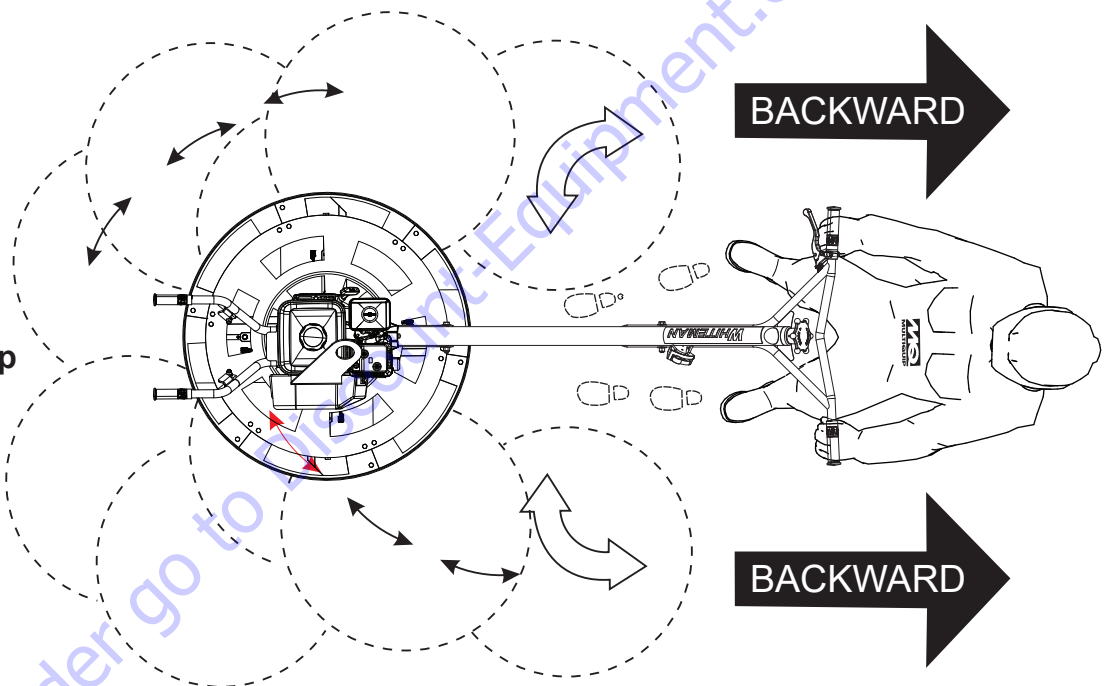
Figure 44. Pitching the Blades (Quick Pitch™ Handle)

## MANEUVERING THE TROWEL

1. Stand in the operator's position behind the handle. With secure footing and a firm grasp on the handle, slowly increase the engine speed until the desired blade speed is obtained.
2. Figure 45 illustrates a typical walk-behind trowel application. Practice maneuvering the trowel. The trick is to let the trowel do the work.
3. Continue to practice maneuvering the trowel as if finishing a slab of concrete. Practice edging and covering a large area.
4. An effective finishing technique is to work **backward**. **Be careful when moving backward** so that hazards can be avoided. The best way to get accustomed to the trowel is repeated use.

To move the trowel to the operator's **left**, **lift up** on the handle. To move the trowel to the **right**, **push down** on the handle.

**REMEMBER!** If you let go of the trowel, simply **step away** and let the trowel come to a complete **STOP** before trying to recover it.



The best method for finishing concrete is to slowly walk **backward** with the trowel, guiding it from side to side. This will cover any footprints in the wet concrete.

**Figure 45. Maneuvering the Trowel**

**CAUTION**

**NEVER** place your **hands** or **feet** inside the guard rings while starting or operating this equipment.

**CAUTION**

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

## STOPPING THE TROWEL

1. Return the throttle lever to the **IDLE** position (Figure 46) and let the engine run for three minutes at low speed.

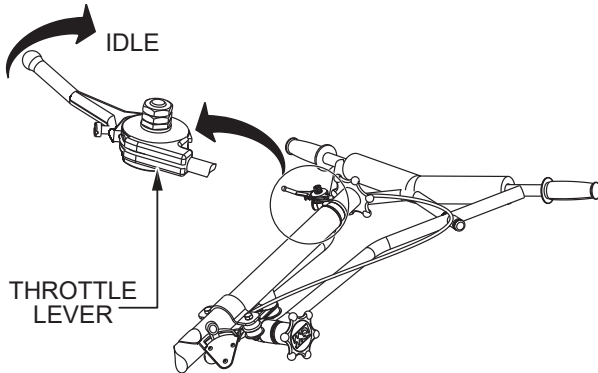


Figure 46. Throttle Lever (Idle)

2. Release the handle and place the engine ON/OFF switch in the **OFF** position (Figure 47).

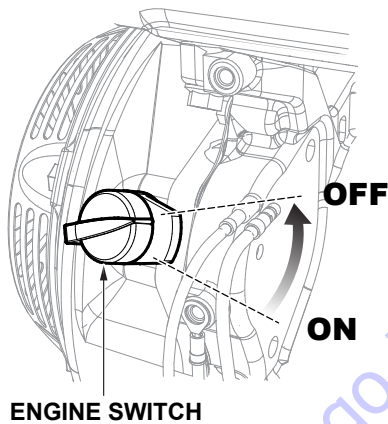


Figure 47. Engine ON/OFF Switch (OFF)

3. Place the centrifugal safety stop switch (Figure 48) in the **OFF** position.

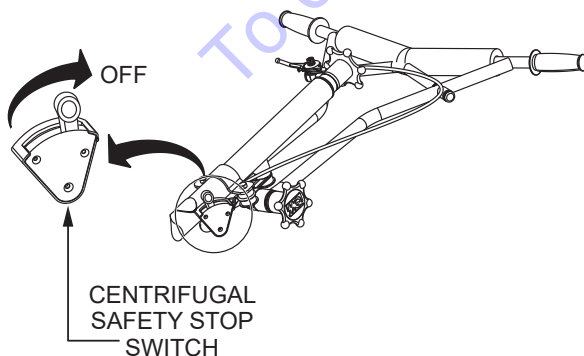


Figure 48. Centrifugal Safety Stop Switch (OFF)

4. Place the fuel valve lever in the **CLOSED** position (Figure 49).

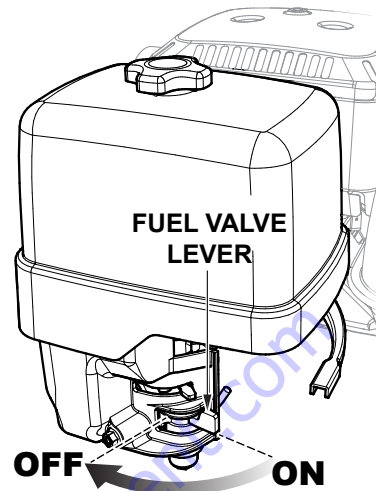


Figure 49. Fuel Valve Lever (Closed)

## CONCRETE FINISHING TECHNIQUES

The instructions in this manual are provided as a basic guide to trowel operation, **not** a complete guide to concrete finishing. We suggest that all operators (experienced and novice) read *Slabs on Ground* published by the American Concrete Institute.

## HANDLES

### Standard Handle

The standard walk-behind trowel handle (Figure 50) is equipped with a star wheel for blade pitch adjustment. Refer to the **Operation** section of this manual for more information.

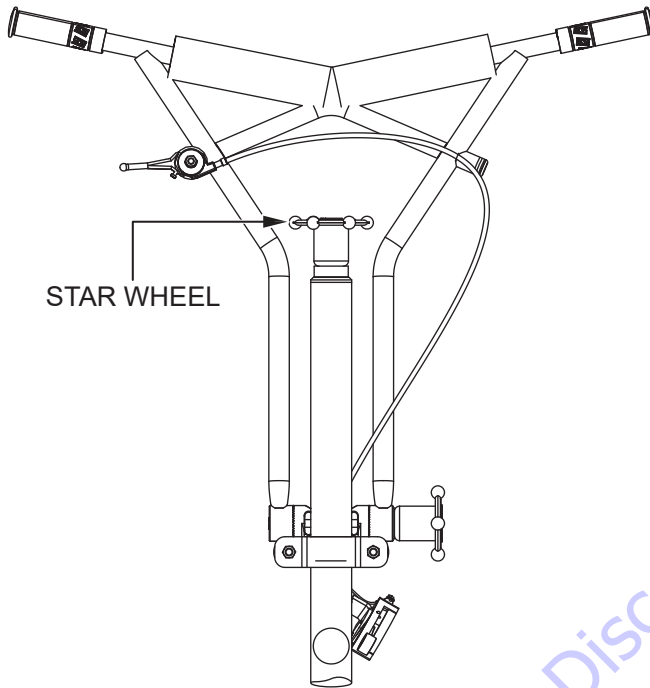


Figure 50. Standard Handle

### Quick Pitch™ Handle (Optional)

The optional Quick Pitch™ handle (Figure 51) allows the operator to quickly and easily adjust blade pitch using a spring-loaded T-handle. Refer to the **Operation** section of this manual for more information. Please contact Multiquip unit sales to order this option.

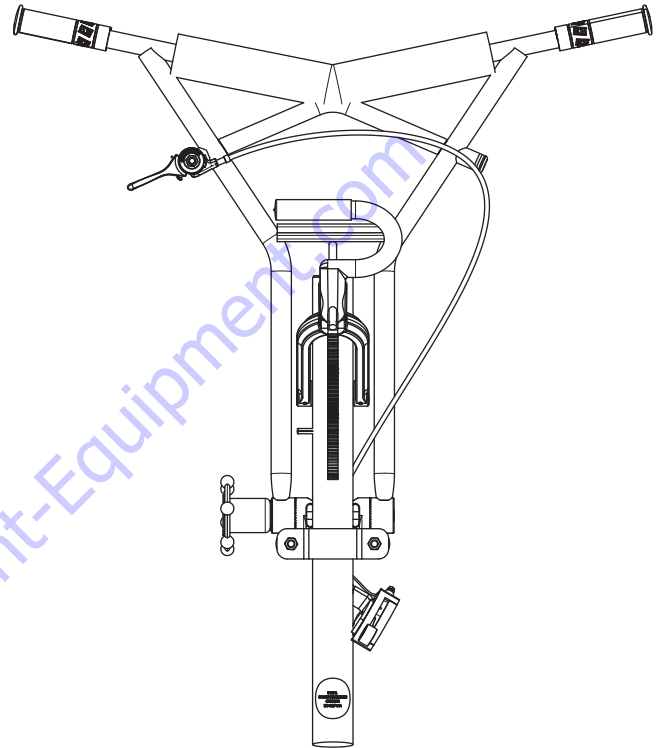


Figure 51. Quick Pitch™ Handle

## BLADES AND PANS

Trowel blades are essential for finishing concrete. The blades of this trowel were built to stringent quality standards from the finest steel. Trowel blades should be replaced when they fail to finish concrete in a satisfactory manner.

If replacement blades are needed, refer to the parts manual provided with your trowel for part numbers, and order from your Multiquip parts dealer or importer.

### Combination Blades (Standard)

This trowel is equipped with combination blades (Figure 52) which provide optimal performance for both floating and finishing operations. These blades are versatile and should satisfy most troweling needs.

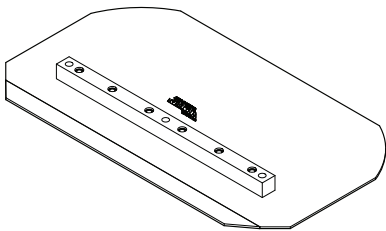


Figure 52. Combination Blade

### Finish Blades (Optional)

Finish blades (Figure 53) are specifically designed for trowel finishing operations, and provide premium surface finishing capability. Finish blades should **only** be used after the concrete has partially dried enough to prevent the trowel from sinking into the concrete when placed on it.

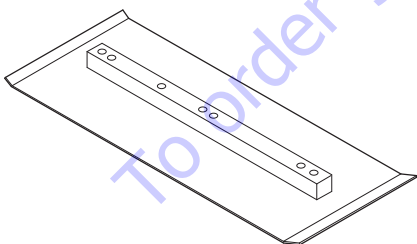


Figure 53. Finish Blade

### Clip-On Float Blades (Optional)

Clip-on float blades (Figure 54) are easily installed onto existing finish blades for floating purposes. They are easily removed once floating is complete so that finishing can proceed immediately.

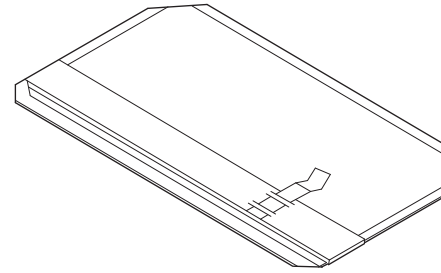


Figure 54. Clip-On Float Blade

### Float Discs (Optional)

Float discs, or *pans* (Figure 55), attach to the spider assembly and allow the trowel to float on wet concrete. The disc design allows early floating and easy movement from wet to dry areas. Float discs are also very effective at embedding large aggregates and surface hardeners.

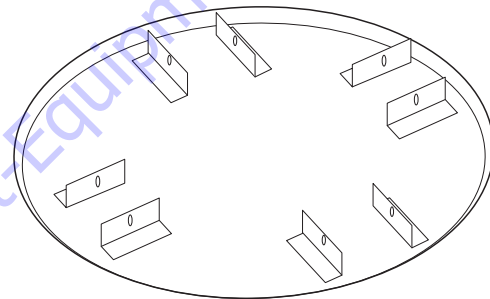


Figure 55. Float Disc/Pan

#### NOTICE

For optimal pan performance, blade speed must be lowered using the Low Speed Kit (P/N LOWSPEEDKITJB). Refer to the **Engine and Clutch Assembly** section of the trowel parts manual for more information.

### TROWEL ARM ADJUSTMENT TOOL

If the trowel blades show uneven wear patterns, or some blades wear out faster than others, the trowel arms may need to be adjusted. A trowel arm adjustment tool (P/N 1817) is available for consistent adjustment of all trowel arms. See Figure 56.

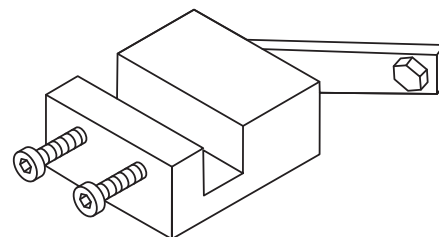


Figure 56. Trowel Arm Adjustment Tool

Table 6. Engine Maintenance Schedule						
Description (3)	Operation	Before Each Use	First Month or 20 Hrs.	Every 6 Months or 100 Hrs.	Every Year or 300 Hrs.	Every 2 Years or 500 Hrs.
Engine Oil	Check	X				
	Change		X	X		
Air Cleaner	Check	X				
	Clean			X (1)		
	Change					X (*)
Spark Plugs	Check/Adjust			X		
	Replace				X	
Spark Arrester	Clean			X		
Fuel Filter	Replace				X (2)	
Fuel Tube	Check	Every 2 years (replace if necessary) (2)				

\* Replace the paper filter element only.

(1) Service more frequently when used in **dusty** areas.

(2) These components should be serviced by your service dealer unless you have the proper tools and are mechanically proficient. Refer to your engine shop manual for service procedures.

(3) For commercial use, log hours of operation to determine proper maintenance intervals.

Table 7. Trowel Maintenance Schedule					
Item	Operation	Periodic Maintenance Interval			
		Daily	Every 50–60 Hrs.	Every 200–300 Hrs.	Every 2000–2500 Hrs.
V-Belt	Check/Replace		X		
Trowel Arms	Grease	X			
Blades	Check/Replace		X		
Trowel Arms	Remove/Clean			X	
Thrust Collar/Bushing	Remove/Clean			X	
Blade Arms	Adjust			X	
Arm Bushing	Remove/Replace				X
Wear Ring	Remove/Replace				X
Thrust Collar Bearing	Remove/Replace				X
Pitch Control Cable	Check				X
Clutch	Remove/Clean			X	



General maintenance practices are crucial to the performance and longevity of your trowel. This equipment requires routine cleaning, lubrication, and inspection of components for wear or damage.


Refer to Table 6 and Table 7 to schedule engine and trowel maintenance. The following maintenance procedures can prevent serious trowel malfunction or damage.

**! DANGER**




**NEVER** use gasoline or low flash point solvents to clean the engine or any of its components. The possibility exists of **fire** or **explosion** which can damage the equipment and cause **severe bodily harm** or even **DEATH**.

**! WARNING**



Some maintenance operations may require a running engine. **ALWAYS** make sure the maintenance area is well ventilated. Gasoline engine exhaust contains **poisonous carbon monoxide gas** that can result in **unconsciousness** and/or **DEATH** when inhaled.

**! CAUTION**



**ALWAYS** allow the engine to cool before servicing. **NEVER** attempt to service a hot engine.

**! CAUTION**


**ALWAYS** disconnect the spark plug wire from the spark plug and secure it **away** from the engine before performing trowel maintenance or adjustments.

## ENGINE MAINTENANCE

Inspect the engine daily for cleanliness, oil or fuel leakage, and loose fasteners.

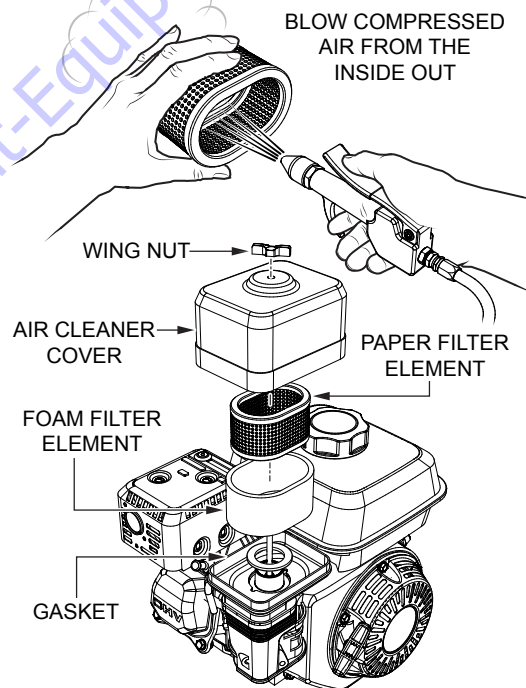
### Air Cleaner

**! CAUTION**



**ALWAYS** wear personal protective equipment such as approved safety glasses, face shields, dust masks, or respirators when cleaning air filters with compressed air.

The engine air cleaner is equipped with a replaceable, high-density, paper element. Refer to Figure 57 for air cleaner maintenance.



**Figure 57. Air Cleaner Maintenance**

1. Remove the air cleaner cover and foam filter element.
2. To remove dirt, tap the paper filter element several times on a hard surface or blow compressed air, not exceeding 30 psi (207 kPa, 2.1 kgf/cm<sup>2</sup>), through the filter element from the inside out. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.

- Clean the foam element in warm, soapy water or a **nonflammable** solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before reinstalling.

## NOTICE

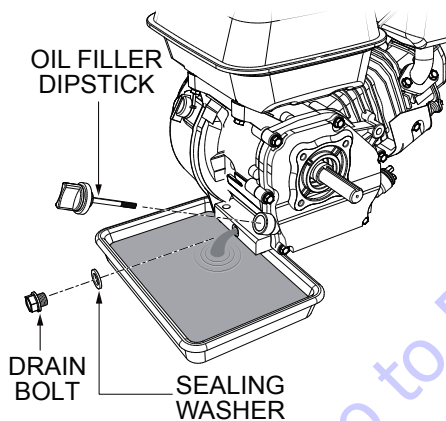
Operating the engine with loose or damaged air cleaner components can allow unfiltered air into the engine, causing premature wear and failure.

## Engine Oil

### NOTICE

**ALWAYS** drain the engine oil while the oil is **warm**.

- Remove the drain bolt and sealing washer, and allow the oil to drain into a suitable container (Figure 58).

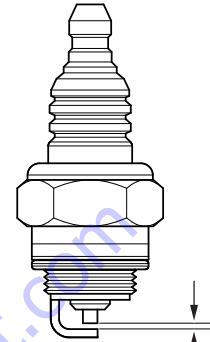


**Figure 58. Draining Engine Oil**

- Replace the engine oil with the recommended oil type listed in Table 5. For engine oil capacity, see Table 2. **DO NOT** overfill.
- Reinstall the drain bolt with sealing washer and tighten securely.

## Spark Plug

- Remove the spark plug (Figure 59) and clean it with a wire brush if it is to be reused. Replace the spark plug if the insulator is cracked or chipped.



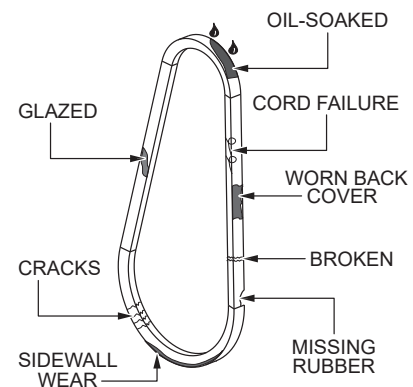
**GAP:** 0.028 – 0.031 in.  
(0.7 – 0.8 mm)

**Figure 59. Spark Plug**

- Using a feeler gauge, adjust the spark plug gap (Figure 59). The gap should measure 0.028–0.031 inch (0.7–0.8 mm).
- To prevent cross-threading, thread the spark plug into the cylinder hole by hand, then tighten securely.

## V-Belt

- Inspect the V-belt (Figure 60) to determine if it is frayed, peeling, full of tiny cracks, has pieces of rubber missing, or is otherwise damaged.



**Figure 60. V-Belt Inspection**

- Inspect the V-belt (Figure 60) to determine if it is oil-soaked or *glazed* (a hard, shiny appearance on the sides of the belt). Either of these conditions can cause overheating of the belt, which can weaken the belt and increase the possibility of it breaking.

# MAINTENANCE

3. Replace the V-belt immediately if any of the above wear conditions are observed.

## Fuel Strainer

1. Thoroughly clean the area around the fuel tank cap.
2. Remove the fuel tank cap from the fuel tank.
3. Remove, inspect, and clean the fuel strainer (Figure 61) with solvent.

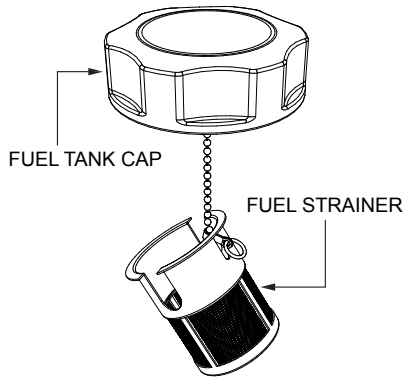


Figure 61. Fuel Strainer

## Spark Arrester

1. Remove and retain the four 5 mm screws securing the muffler protector to the muffler (Figure 62). Remove the muffler protector and set it aside.

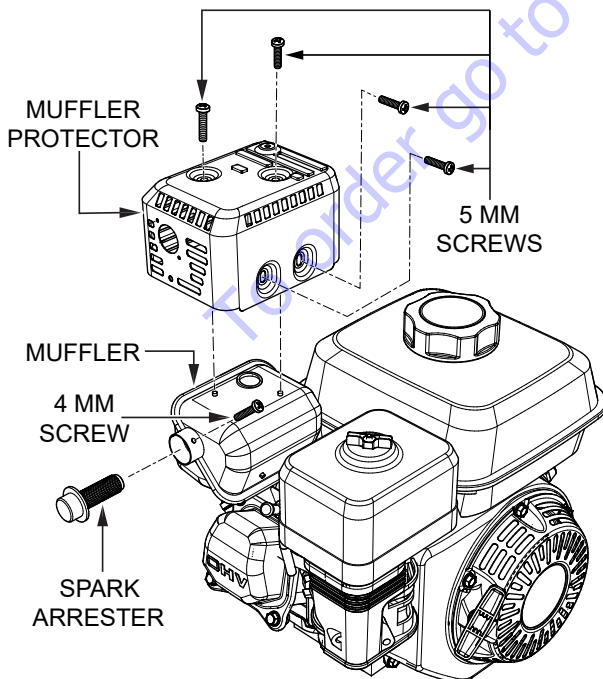


Figure 62. Spark Arrester Removal

2. Remove and retain the 4 mm screw securing the spark arrester to the muffler, and remove the spark arrester (Figure 62).
3. Carefully remove carbon deposits from the spark arrester screen (Figure 63) with a wire brush.

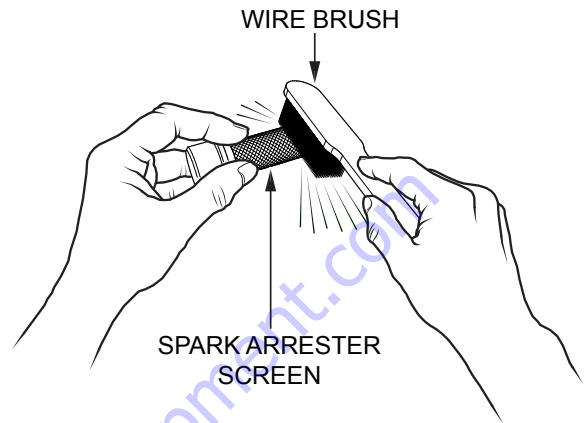


Figure 63. Cleaning the Spark Arrester

4. Replace the spark arrester if it is damaged (has breaks or holes).
5. Reinstall the spark arrester, muffler protector, and exhaust deflector in reverse order of disassembly.

### NOTICE

Refer to the manufacturer's engine manual supplied with your trowel for more detailed information about engine maintenance and troubleshooting.

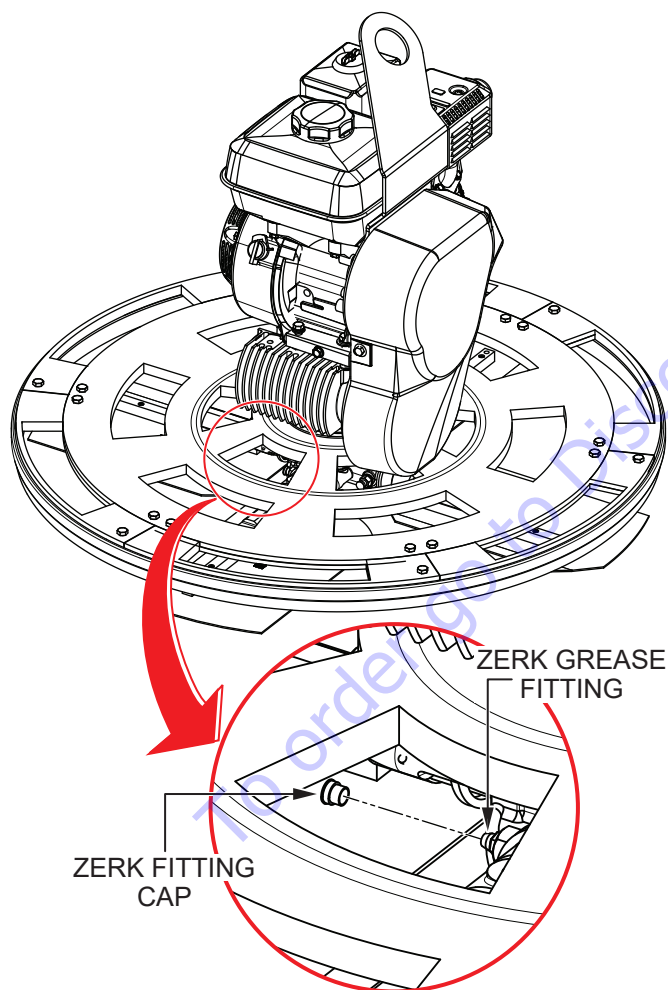
## TROWEL MAINTENANCE

Clean the trowel daily. Remove all dust and slurry buildup. Make sure lubrication is performed after any steam-cleaning.

### Trowel Lubrication (Every 8 Hours)

Regular lubrication is required to maintain your trowel in optimal working condition. Perform the following lubrication procedure after **every 8 hours of use**.

1. Locate one of the Zerk grease fittings on the spider assembly (Figure 64). Remove the Zerk fitting cap and set it aside.



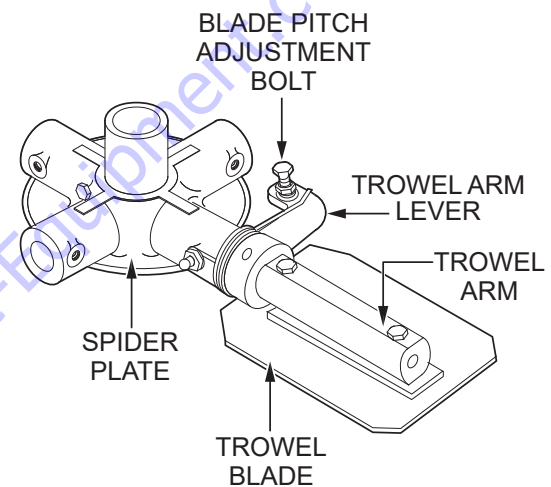
**Figure 64. Spider Lubrication**

2. Wipe the Zerk grease fitting clean to prevent abrasive material from entering the fitting during lubrication.

3. Lubricate the Zerk grease fitting with 1 to 1½ shots of multipurpose grade grease. **DO NOT** overgrease. Replace the Zerk fitting cap when finished.
4. Repeat steps 1–3 for the remaining grease fittings on the spider assembly.

### Blade Pitch Adjustment

Perform maintenance adjustment of blade pitch using a bolt on the trowel arm lever (Figure 65). This bolt is the contact point of the trowel arm with the lower wear plate on the thrust collar. The goal of adjustment is consistent blade pitch and finishing quality.



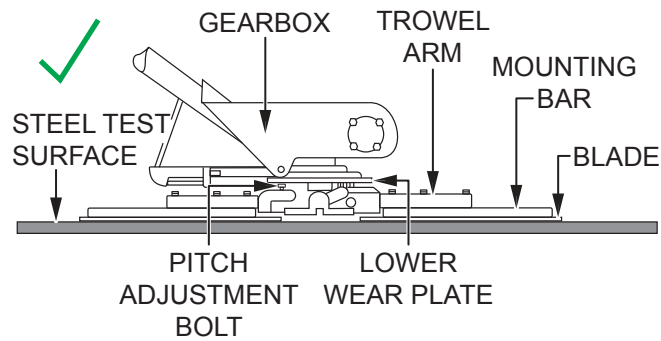
**Figure 65. Blade Pitch Adjustment Bolt**

Look for the following indications when determining if blade pitch adjustment is necessary:

- Are the blades wearing out unevenly (e.g. one blade is completely worn out while the others look new)?
- Does the machine have a perceptible rolling or bouncing motion while in use?
- Does the guard ring rock up and down while the machine is in use?

Once it has been determined that blade pitch adjustment is required, do the following:

1. Place the trowel on a flat, level surface, with blocks under the main guard ring for support. Any uneven spots in the floor or debris under the trowel blades will cause an incorrect perception of adjustment. Ideally, a 5 ft. x 5 ft. (1.5 m x 1.5 m), 3/4 inch-thick, **flat** steel plate should be used.
2. Pitch the blades as flat as possible (Figure 66). The pitch adjustment bolts should barely contact (0.10 inch maximum clearance) the lower wear plate. All adjustment bolts should be spaced the same distance from the lower wear plate. If any one of the bolts does not make contact, adjustment is necessary.



**Figure 66. Blades Pitched Flat (Correct)**

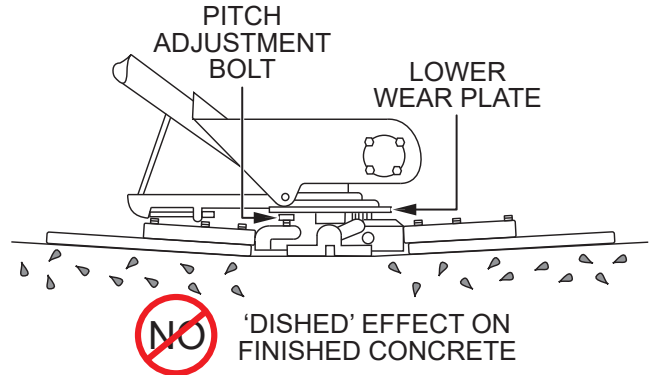
3. Adjust the 'high' bolts down to the level of the bolt that is not touching, or adjust the 'low' bolt up to the level of the higher ones. Whenever possible, adjust the 'low' bolt up to the level of the rest of the bolts. This is the fastest method, but it may not always work. After adjustment, verify that the blades pitch correctly.

## NOTICE

Incorrectly adjusted blades will often be unable to pitch flat. This can occur if the adjustment bolts are raised too high. Conversely, adjustment bolts that are too low will prevent the blades from being pitched high enough for finishing operations.

If the trowel still finishes poorly after blade pitch adjustment, the blades, trowel arms, and trowel arm bushings should be inspected for improper adjustment, wear, or damage.

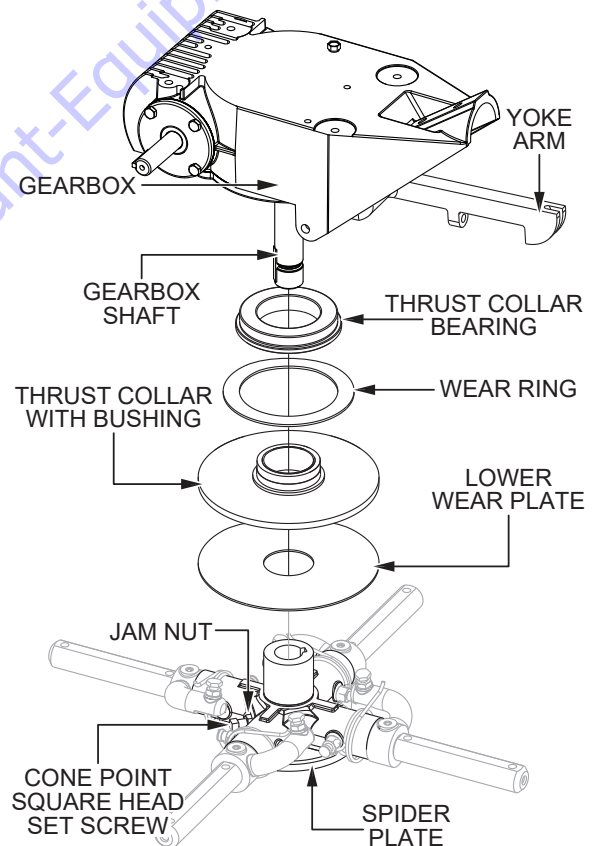
Figure 67 illustrates incorrect spider plate alignment due to improper adjustment, worn spider bushings, or bent trowel arms.



**Figure 67. Blades Pitched Flat (Incorrect)**

## Spider Removal

1. Locate and loosen the cone point square head set screw and attached jam nut on the side of the spider assembly (Figure 68).



**Figure 68. Spider Removal**

2. Carefully lift the upper trowel/gearbox assembly off of the spider assembly. A light tap with a rubber mallet may be necessary to dislodge the spider from the main shaft of the gearbox.

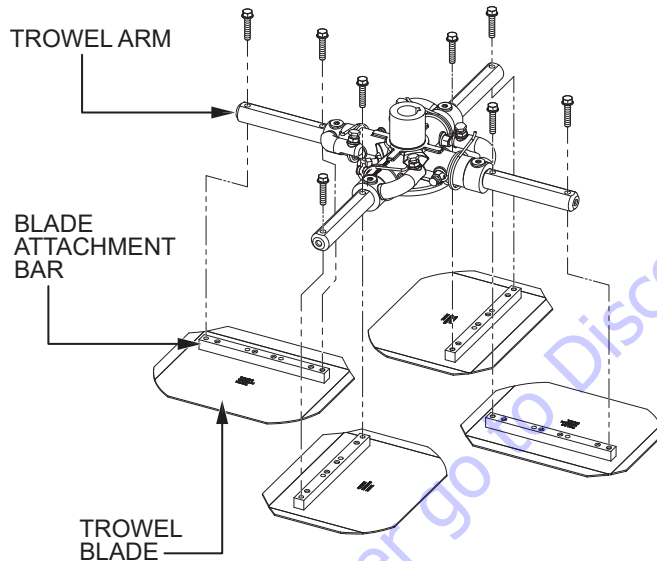
## Blade Replacement

It is recommended to replace **all** of the trowel blades at the same time. If only one or some of the blades are changed, the machine may wobble or bounce and will not finish concrete consistently.

### NOTICE

Please note the orientation of each blade on the trowel arm before removal.

1. Place the trowel on a flat, level surface, with blocks under the main guard ring for support.
2. Remove the bolts and lock washers from each of the trowel arms, then remove the blades as shown in Figure 69.

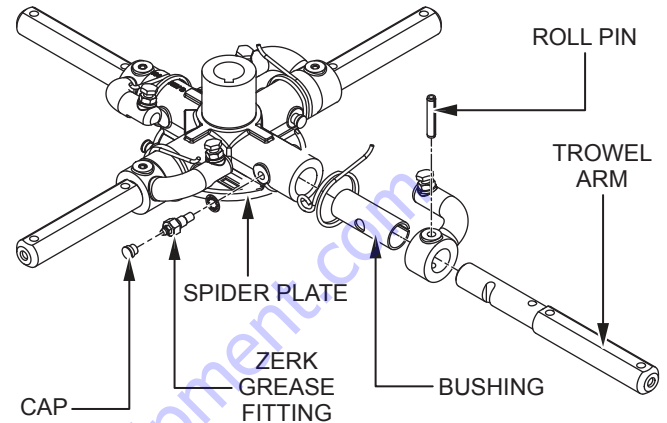


**Figure 69. Blade Removal**

3. Wire brush and remove all concrete and debris from all six sides of each of the four trowel arms. This is important to properly seat the new blades.
4. Install the new blades, maintaining the proper blade orientation as noted during removal. Secure with the bolts and washers that were removed earlier.

## Trowel Arm Removal

1. Each trowel arm is held in place at the spider plate by a Zerk grease fitting (hex head bolt) and a roll pin. Remove the Zerk grease fitting and the roll pin from the spider plate (Figure 70).

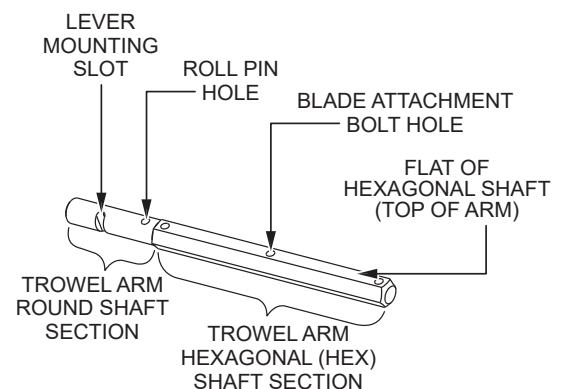


**Figure 70. Trowel Arm Removal**

2. Remove the trowel arm from the spider plate (Figure 70).
3. Carefully remove the trowel arm bushing (Figure 70).
4. Examine the trowel arm bushing, and clean it if necessary. Replace the bushing if it is worn or out-of-round.

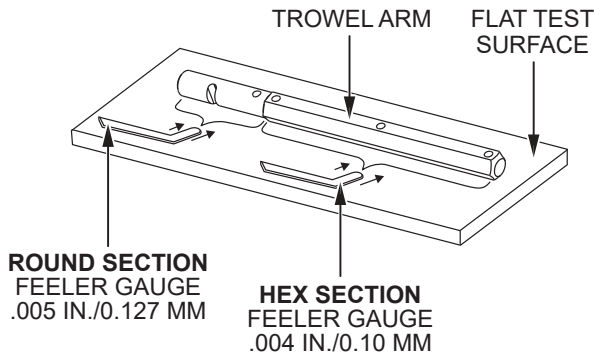
## Trowel Arm Inspection

Trowel arms (Figure 71) can be damaged by rough handling such as dropping the trowel, or by striking exposed plumbing, rebar, or other objects while in operation. A bent trowel arm will prevent smooth, fluid rotation of the blades. If bent trowel arms are suspected, examine them for straightness as shown below.



**Figure 71. Trowel Arm**

1. Place the trowel arm on a thick steel plate, granite slab, or any other surface which is **true** and **flat** (Figure 72).



**Figure 72. Trowel Arm Inspection**

2. Check each of the six sides of the trowel arm hex section (Figure 72). A feeler gauge of .004 inch (0.10 mm) should not pass between the flat of the trowel arm and the test surface along its length on the test surface.
3. As the flat hex section rests on the test surface, use a feeler gauge of .005 inch (0.127 mm) to check the clearance between the round shaft section and the test surface. Rotate the arm to each of the flat hex sections and check the clearance between the round shaft and the test surface. The clearance between the round shaft and the test surface should be identical for each hex section. See Figure 72.
4. Replace any bent or uneven trowel arms.

## Trowel Arm Adjustment

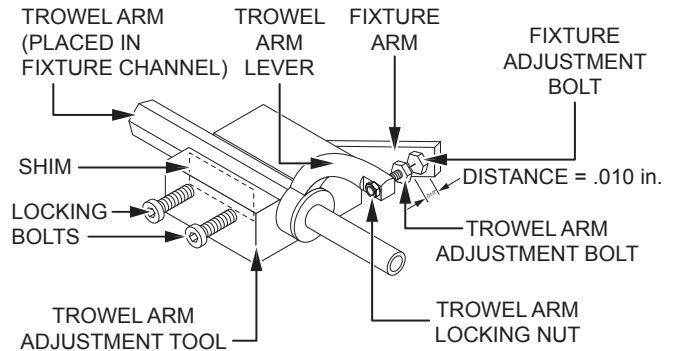
The easiest and most consistent way to adjust a trowel arm is with the trowel arm adjustment tool (P/N 1817).

Once locked into the adjustment tool, each trowel arm bolt is adjusted until it contacts a stop on the fixture. This will consistently adjust all of the trowel arms, keeping the finisher as flat and evenly pitched as possible.

The trowel arm adjustment tool comes with usage instructions and all the hardware necessary to correctly perform this adjustment.

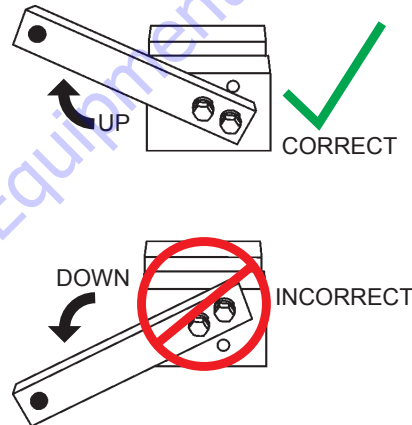
Perform the following procedure to adjust trowel arms using the trowel arm adjustment tool:

1. Unscrew the locking bolts on the adjustment tool and place a trowel arm (with lever attached) into the fixture channel as shown in Figure 73.



**Figure 73. Trowel Arm Adjustment**

2. Make sure the fixture arm is in the **UP** position (Figure 74).



**Figure 74. Fixture Arm Position (UP)**

3. A thin shim (Figure 73) may be required to cover the blade holes on the trowel arm. Be sure to align the trowel arm adjustment bolt with the fixture adjustment bolt.
4. Tighten the locking bolts (Figure 73) to secure the trowel arm in place.
5. Adjust the bolt distance shown in Figure 73 to match one of the arms. The other arms will be adjusted to match this distance.
6. Loosen the locking nut on the trowel arm lever, then turn the trowel arm adjusting bolt until it barely touches (.010") the fixture adjustment bolt. See Figure 73.
7. Once the correct adjustment has been made, tighten the locking nut on the trowel arm to lock it in place.
8. Loosen the locking bolts on the adjustment tool, and remove the trowel arm.
9. Repeat steps 1–8 for the remaining trowel arms.

## REASSEMBLY

1. Clean the wear plates and thrust collar, and examine the entire spider assembly. Use a wire brush to remove any concrete or rust buildup. Replace any spider components that are damaged or out-of-round.
2. Inspect the bronze trowel arm bushing, and clean it if necessary. If the bushing is damaged, worn, or out-of-round, replace it.
3. Reinstall the trowel arm bushing onto the trowel arm.
4. Repeat steps 2–3 for each trowel arm.
5. Make sure the spring tensioner is in the correct position to exert tension on the trowel arm.
6. Insert all trowel arms with levers (and bronze bushings already installed) into the spider plate. Align the grease holes on the bushings with the grease hole fittings on the spider plate.
7. Lock the trowel arms in place by tightening the Zerk grease fitting hex head bolts and jam nuts.
8. Reinstall the blades onto the trowel arms.
9. Install the stabilizer ring onto the spider assembly.
10. Reinstall the lower wear plate, thrust collar, and wear ring onto the spider shaft in the reverse order of disassembly. **Make sure there is little or no lateral movement** between the thrust collar and the spider shaft.
11. Carefully lift the upper trowel/gearbox assembly, align it with the keyway on the spider shaft, and insert it into the spider assembly.
12. Reinstall the cone point square head set screw and jam nut, and tighten securely. Make sure the point of the set screw engages the groove in the gearbox main shaft.
13. Lubricate all grease points (Zerk fittings) with premium lithium 12-based grease, conforming to NLG1 grade #2 consistency.

## LONG-TERM STORAGE

Perform the following procedure when storing the trowel for more than 30 days.

- Drain the fuel tank completely, or add STA-BIL® to the fuel.
- Run the engine until all gasoline in the carburetor is completely consumed.
- Completely drain the oil from the crankcase and refill with fresh oil.
- Remove the spark plug. Pour 5–10 cc of SAE 30 oil into the cylinder. Turn the engine ON/OFF switch to the **ON** position for a few seconds to distribute the oil. Return the engine ON/OFF switch to the **OFF** position, and reinstall the spark plug.
- Clean off all external trowel components with a cloth.
- Cover the trowel and store it away from direct sunlight in a clean, dry location.



# TROUBLESHOOTING (ENGINE)

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.
	Head gasket and/or spark plug gasket damaged?	Replace head and spark plug gaskets.
No fuel present at carburetor.	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 (ENGINE)

Troubleshooting (Engine) - continued		
Symptom	Possible Problem	Solution
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.

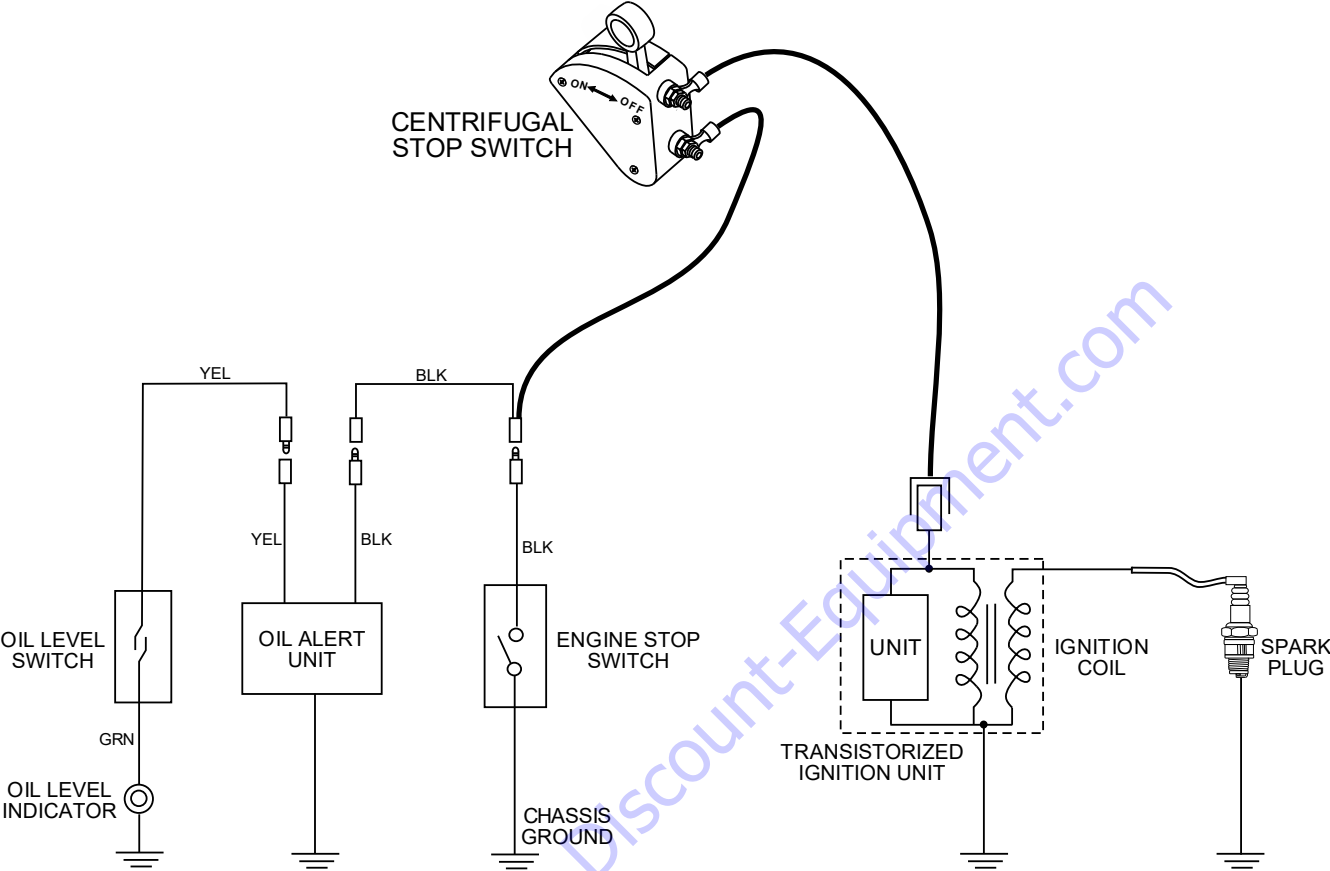
# TROUBLESHOOTING (TROWEL)

Troubleshooting (Walk-Behind Trowel)		
Symptom	Possible Problem	Solution
Engine running rough or not at all.	Engine ON/OFF Switch in "OFF" position or malfunctioning?	Make sure that the Engine ON/OFF Switch is ON or replace switch if necessary.
	Centrifugal ON/OFF Switch in "OFF" position or malfunctioning?	Place centrifugal stop switch in "ON" position. Check wiring. Replace switch if necessary.
	Fuel?	Look at the fuel system. Make sure there is fuel being supplied to the engine. Check to ensure that the fuel filter is not clogged.
	Ignition?	Check to ensure that the ignition switch has power and is functioning correctly.
	Loose wire connections	Check wiring. Replace or repair as necessary.
	Bad contacts in ON/OFF switch?	Replace ON/OFF switch.
Trowel bounces, rolls concrete, or makes uneven swirls in concrete.	Blades?	Make certain blades are in good condition, not excessively worn. Finish blades should measure no less than 2" (50mm) from the blade bar to the trailing edge, combo blades should measure no less than 3.5" (89mm). Trailing edge of blade should be straight and parallel to the blade bar.
	Pitch adjustment?	Check that all blades are set at the same pitch angle as measured at the spider. A field adjustment tool is available for height adjustment of the trowel arms. (Contact Parts Dept.)
	Bent trowel arms?	Check the spider assembly for bent trowel arms. If one of the arms is even slightly bent, replace it immediately.
	Spider?	Check fit of arms in spider. This can be done by moving the trowel arms up and down. If there is more than 1/8 inch (3.2 mm) of travel at the tip of the arm, the spider and arms should be replaced.
	Thrust collar?	Check the flatness of the thrust collar by rotating it on the spider. If it varies by more than 0.02 inch (0.5 mm) replace the thrust collar.
	Thrust collar bushing?	Check the thrust collar by rocking it on the spider. If it can tilt more than 3/32 inch (2.4 mm) - as measured at the thrust collar O.D., replace the thrust collar.
	Thrust bearing worn?	Check the thrust bearing to see that it is spinning freely. Replace if necessary.

# TROUBLESHOOTING (TROWEL)

Troubleshooting (Walk-Behind Trowel) - continued		
Symptom	Possible Problem	Solution
Machine has a perceptible rolling motion while running.	Main shaft?	The main output shaft of the gearbox assembly should be checked for straightness. The main shaft must run straight and cannot be more than 0.003" (0.08 mm) out of round at the spider attachment point.
	Yoke?	Check to make sure that both fingers of the yoke press evenly on the wear cap. Replace yoke as necessary.
	Blade Pitch?	Check to ensure that each blade is adjusted to have the same pitch as all other blades. Adjust per maintenance section in manual.
Clutch slipping or sluggish response to engine speed change.	Worn V-belts?	Replace V-belt.
	Hand clutch out of adjustment?	Adjust per instructions in maintenance section of this manual.
	Worn or defective hand clutch parts?	Replace parts as necessary.
	Worn bearings in gearbox?	Rotate input shaft by hand. If shaft rotates with difficulty, check the input and output shaft bearings. Replace as necessary.
	Worn or broken gears in gearbox?	Verify that the gearbox shaft rotates when the input shaft is rotated. Replace both the worm and worm gear as a set.
Trowel blades do not rotate.	Defective clutch?	Replace clutch.
	Broken V-belt?	Replace V-belt.
	Defective ON/OFF switch?	Check and replace ON/OFF switch if necessary.
	Defective centrifugal ON/OFF switch?	Check and replace centrifugal ON/OFF switch if necessary.

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# OPERATION MANUAL

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