

OPERATION AND PARTS MANUAL



MODEL JS60C **WALK-BEHIND TROWEL** **(SUBARU EX170DM2230 GASOLINE ENGINE)**

Revision #0 (9/4/15)

Original Version



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

P/N 30224

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FUEL AND CHEMICAL EXPOSURE WARNINGS



WARNING

Gasoline engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: **ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

SILICOSIS/RESPIRATORY WARNINGS

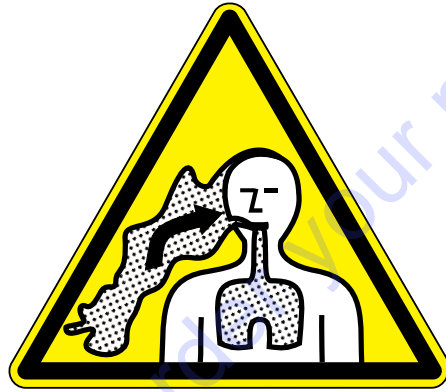
WARNING



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.

TABLE OF CONTENTS

JS60C WALK-BEHIND TROWEL

Fuel And Chemical Exposure Warnings	2
Silicosis/Respiratory Warnings	3
Table Of Contents	4
Parts Ordering Procedures	5
Training Checklist	6
Daily Pre-Operation Checklist	7
Safety Information	8-12
Trowel Specifications/Dimensions	13
Engine Specifications	14
General Information	15
Trowel Components	16-17
Engine Components	18
Assembly And Installation	19-23
Inspection	23-24
Operation	25-29
Options	30-31
Maintenance	32-40
Troubleshooting	41-44
Wiring Diagram	45
Explanation Of Code In Remarks Column	46
Suggested Spare Parts	47

Component Drawings

Nameplates And Decals	48-49
Standard Handle Assembly	50-53
Quick Pitch Handle Assembly	54-57
Guard Ring And Engine Mounting Assembly ...	58-59
Stabilizer Ring Assembly	60-61
Gearbox Assembly	62-63
Engine And Clutch Assembly	64-65
Spider Assembly	66-67
Blades And Pan Assembly	68-69

Honda GX270UT2QA2 Gasoline Engine

Crankcase Assembly	70-71
Crankshaft Assembly	72-73
Muffler Assembly	74-75
Air Cleaner Assembly	76-77
Governor Assembly	78-79
Blower Assembly	80-81
Recoil Starter Assembly	82-83
Fuel Tank Assembly	84-85
Carburetor Assembly	86-87
Ignition Coil Assembly	88-89
Oil Sensor Assembly	90-91
Terms And Conditions Of Sale — Parts	92

NOTICE

Specifications and part numbers 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 bale).		
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						

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

! DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

! WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.

! CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

NOTICE

Addresses practices not related to personal injury.

Potential hazard 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
	WARNING Lethal Exhaust Gas Hazard <ul style="list-style-type: none"> Inhaling exhaust fumes can result in severe injury or death. Only operate equipment in well ventilated areas. DO NOT inhale exhaust gases/fumes.
	WARNING Explosive Fuel Hazard <ul style="list-style-type: none"> Gasoline fuel can cause fire or explosion. Stop engine before refueling. Keep cigarettes, sparks and flames away from hot surfaces.
	CAUTION Burn Hazard <ul style="list-style-type: none"> HOT PARTS can burn skin. DO NOT touch hot parts. Allow machine a sufficient amount of time to cool before performing maintenance.

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

DECAL	SAFETY HAZARD
	WARNING Rotating Blade Hazard <ul style="list-style-type: none"> Keep hands and feet clear of guard rings. Stop engine before servicing.
	WARNING Read Manual To avoid injury you must read and understand operator's manual before using this machine.
	WARNING Lifting Crush Hazard <ul style="list-style-type: none"> NEVER allow any person to stand underneath the trowel while lifting. DO NOT lift trowel with pans attached. ALWAYS make sure handle is securely attached. On Quick Pitch™ models make sure T-Handle latch is locked (engaged).
	ALWAYS wear protective clothing when operating this equipment
	WARNING Training This machine to be operated by qualified personnel. Ask for training as needed.
	WARNING Guard Hazard NEVER operate this equipment with guards removed. Keep hands clear.

SAFETY INFORMATION

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 under medication.



- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

- No one other than the operator is to be in the working area when the equipment is in operation.

- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.

- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.

- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.

- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.

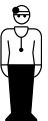
- **ALWAYS** know the location of the nearest fire extinguisher.



- **ALWAYS** know the location of the nearest first aid kit.



- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance**, **doctor** and **fire department**. This information will be invaluable in the case of an emergency.



SAFETY INFORMATION

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 free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



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



WARNING

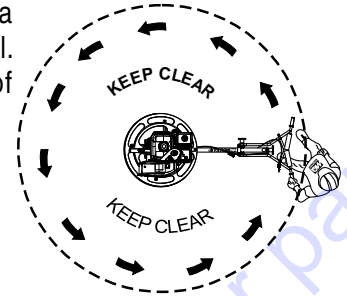
- **ALWAYS** keep clear of rotating or moving parts while operating the trowel.
- **DO NOT** start or operate the trowel if the drive train will not disengage. Centrifugal force between the trowel and surface when starting can cause uncontrolled handle movement that can cause serious injury. The handle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



CAUTION

- **NEVER** stand on 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 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 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.

Order FORM PT-160

ENGINE SAFETY

WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.
- **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 equipment.



SAFETY INFORMATION

NOTICE

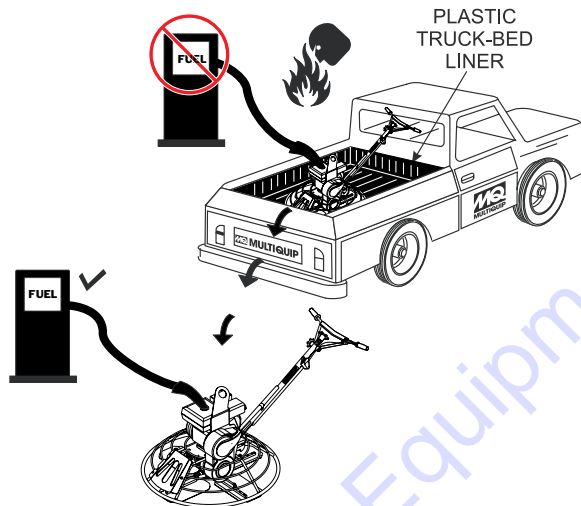
- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating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



FUEL SAFETY

DANGER

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



- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with flammable liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.

- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.



TRANSPORTING SAFETY

CAUTION

- **NEVER** allow any person or animal to stand underneath the equipment while lifting.



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 bales and cranes, hoists, or forklifts.
- **NEVER** transport 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 bales are not damaged.
- Always make sure crane or lifting device has been properly secured to the lifting bales of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down 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 rules below.

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



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

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

EMISSIONS INFORMATION

NOTICE

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

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

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

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

Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulation(s).

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

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

TROWEL SPECIFICATIONS/DIMENSIONS

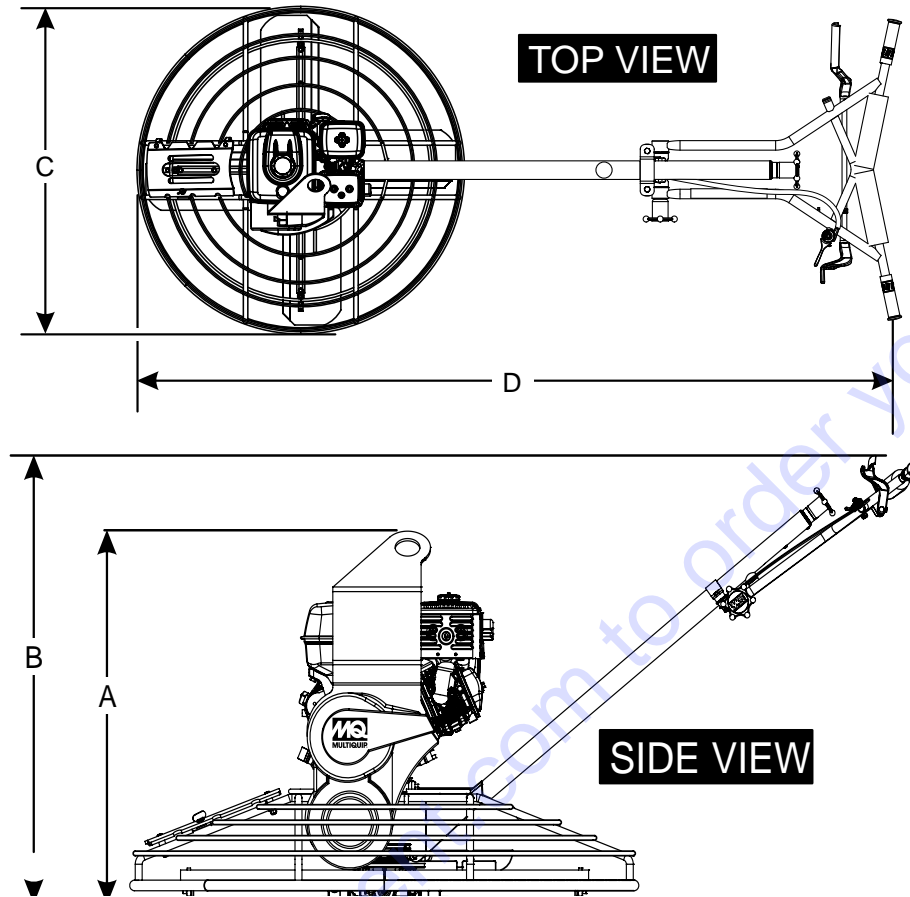


Table 1. Trowel Specifications

A-Height (Lifting Bale) – in (mm.)	34.5 (876.2)	Path Width – in (mm.)	48 (233)
B-Height (Handle) – in (mm.) Standard	41.1 (1,044.2)	Rotor – RPM (Dry Concrete)	60-130
Quick Pitch™	41.1 (1,044.2)	Gear Box Oil Capacity – oz (ml.)	28 (828)
C-Width (Ring Diameter) – in (mm.)	46.0 (1,168.4)	Shipping Weight – lbs. (kg)	Standard 218 (98.8)
D-Width – in (mm.)	75.2 (1,910.1)	Quick Pitch™	218(98.8)
Number of Blades	4		

ENGINE SPECIFICATIONS

Table 2. JS60C Noise and Vibration Emissions

Model		BH90C
Guaranteed ISO 11201:2010 Based Sound Pressure Level at Operator Station in dB(A)		127
Guaranteed ISO 3744:2010 Based Sound Power Level in dB(A)		97
Hand-Arm Vibration Per ISO 5349-1: 2001 in $m/s^2 \Sigma A(8)$	Standard Handle (SXHC)	2.03
	Quick Pitch™ Handle (QXHC)	2.03

NOTES:

1. Sound Pressure and Power Levels are "A" weighted Measures per ISO 226:2003 (ANSI S1.4-1981). They are measured with the operating condition of the machine which generates the most repeatable but highest values of the sound levels. Under normal circumstances, the sound level will vary depending on the condition of the material being worked upon.
2. The vibration level indicated is the vector sum of the RMS (Root Mean Square) Values of amplitudes on each axis, standardized to an 8 hour exposure period, and obtained using operating condition of the machine that generates the most repeatable but highest values in accordance with the applicable standards for the machine.
3. Per EU Directive 2002/44/EC, the daily exposure action value for whole body vibration is $0.5 m/s^2 \Sigma A(8)$. The daily exposure limit value is $1.15 m/s^2 \Sigma A(8)$.

Table 3. Engine Specifications/Dimensions

Model	Subaru EX170DM2230 Engine
Type	Air-cooled 4 stroke, Slant Single Cylinder, OHC, Horizontal PTO Shaft Gasoline Engine
Bore X Stroke	2.64 in. X 1.89 in. (67 mm x 48 mm)
Displacement	10.31 cu-in. (169 cc)
Max. Output	5.7 H.P. @ 4000 RPM
Fuel Tank Capacity	Approx. 0.95 U.S. Gallons (3.6 Liters)
Fuel	Unleaded Gasoline
Lube Oil Capacity	0.63 qt. (0.6 liters)
Oil Type	4-Stroke API, SF or SG SAE 10W-30 General Use
Speed Control Method	Centrifugal Fly-weight Type
Cooling System	Forced Air
Starting Method	Recoil Start
Spark Plug Type	NKG BR6HS
Spark Plug Gap	0.028-0.031 in. (0.70 - 0.80 mm)
Dimensions (L x W x H)	11.97 x 13.94 X 13.19 in. (304 X 354 X 335 mm)
Dry Net Weight	33.08 lbs (15 Kg.)

INTENDED USE

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

TROWEL FAMILIARIZATION

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

Take a walk around the trowel. Take notice of all the major components (Figure 2 and Figure 3) like the engine, blades, steering handle, kill switch, gearbox, etc. Check that there is always oil in the engine.

Read all the 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.

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

This trial test run will increase your confidence in using the trowel and at the same time it will familiarize you with the trowel's controls. In addition you will understand how the trowel handles under actual conditions.

ENGINE

This trowel is equipped with a SUBARU 6.0 HP gasoline engine. Refer to the engine owner's manual for instructions regarding the operation and maintenance of your engine. Please contact your nearest Multiquip Dealer for a replacement should the original manual disappear or otherwise become unusable.

DRIVE SYSTEM

Power is transferred from the engine to the gearbox input shaft via a V-belt pulley drive system. The pulley engages using a centrifugal clutch. See parts section of this manual for a breakdown of the drive system.

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 4 arms that extend outward that are used for attachment of blades or other accessories. Remember as the gearbox output shaft rotates so does the spider assembly.

GUARD RING

This unit is equipped with a safety guard ring. It is designed to help protect items from coming into contact with the rotating blades while the trowel is in operation.

BLADES

The blades of the trowel finish the concrete as they are rotated around the surface. This trowel comes equipped with four **combination blades** (8 in./203 mm wide) per rotor equally spaced in a radial pattern and attached to a vertical rotating shaft by means of a spider assembly.

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.

TROWEL COMPONENTS

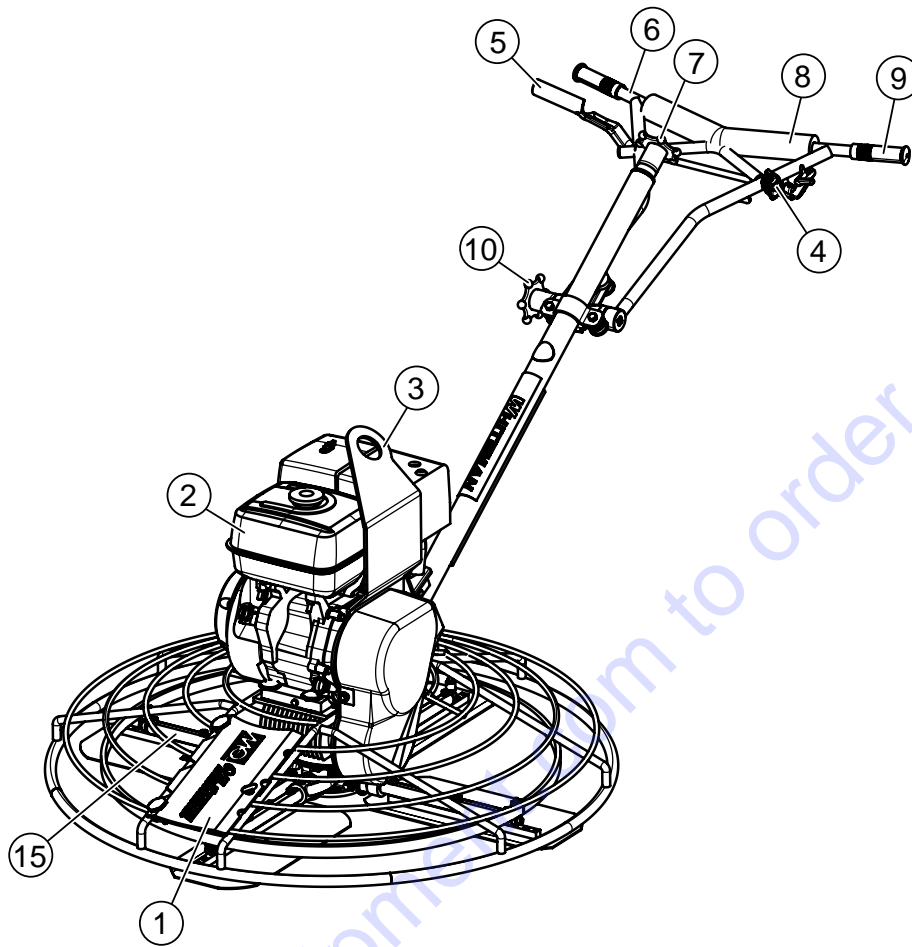


Figure 2. Trowel Control and Components

Figure 2 and Figure 3 shows the location of the basic controls or components, for the trowel. Listed below is a brief explanation of each control or component.

1. **Access Panel** — Allows access to the blade area. **NEVER** run the trowel with this access panel removed.
2. **Engine** — Subaru 5.7 HP gasoline engine.
3. **Lifting Bale** — Attach a suitable lifting device to lifting bale whenever lifting of the trowel is required.
4. **Throttle Lever** — Controls engine speed. Returns engine to idle when released.
5. **Clutch Levers** — Left and right clutch engagement levers begin blade rotation when engaged.
6. **Vibratory Handle Bar** — Installed rubber shock mounts/isolators reduces vibration when the trowel is operating.
7. **Star Wheel Pitch Knob (4-Blade)** — To adjust the pitch of the blades, rotate the star wheel clockwise to pitch blades upwards. Rotate star wheel counterclockwise to pitch blades flat (no pitch).
8. **Handle Bar Pad** — Foam rubber pad that protects the body when coming in contact with handle bar.
9. **Hand Grips** — When maneuvering of the trowel is required **ALWAYS** place both hands on each grip to operate the trowel. Replace hand grips when they become worn or damaged.
10. **Star Wheel Knob (Handlebar Adjuster)** — Changes the angle/height of the handlebar. Loosen the star wheel (turn counterclockwise) to place the handlebar in the desired position. Tighten the star wheel (turn clockwise) to lock handlebar.

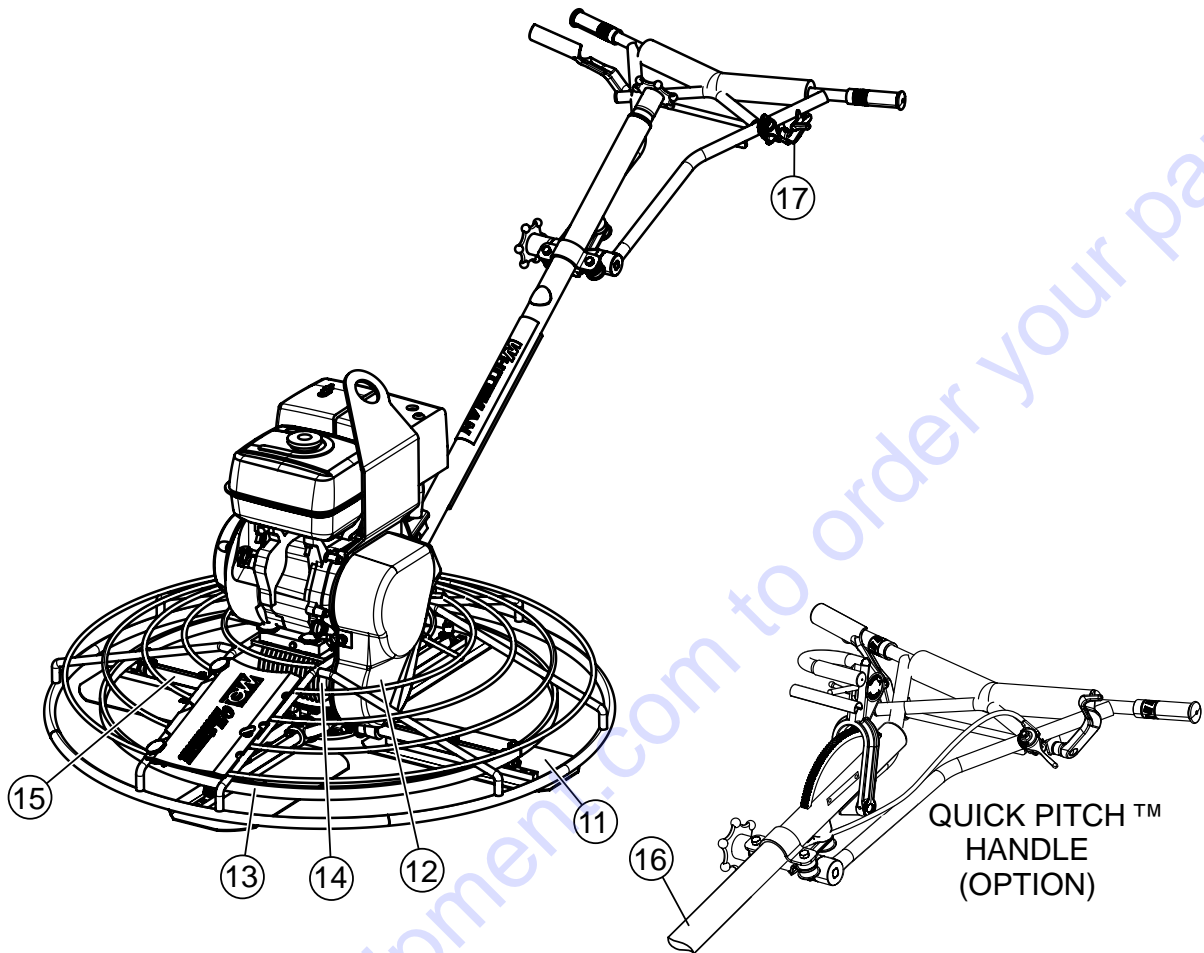


Figure 3. Trowel Control and Components (Cont.)

- 11. **Blades** — This trowel is equipped with combination blades. These blades are versatile and should take care of most troweling needs. In addition float discs can be attached to the trowel arms that will allow the trowel to float on "wet" concrete.
- 12. **V-Belt Cover** — Remove this cover to gain access to the V-belt. **NEVER** operate the trowel with this cover removed.
- 13. **Guard Ring** — **NEVER** put hands or feet inside guard ring while the machine is running.
- 14. **Gearbox** — Helical worm gear drive gearbox. Provides rotation of blades via engine interface. **ALWAYS** check gearbox oil level (sight glass) prior to each use. Fill with recommended type gearbox oil.
- 15. **Trowel Arm** — **NEVER** operate the trowel with a bent, broken or out of adjustment trowel arm. If the blades show uneven wear patterns or some blades wear out faster than others, the trowel arm may need to be adjusted. Use the trowel arm adjustment tool P/N 1817 to adjust the trowel arms.
- 16. **Quick Pitch™ Control Handle** — Contact Discount-Equipment for this option.
- 17. **Right Clutch Lever** — Pull up to engage the clutch. 4-blade rotation will start. This is the secondary control lever.

ENGINE COMPONENTS

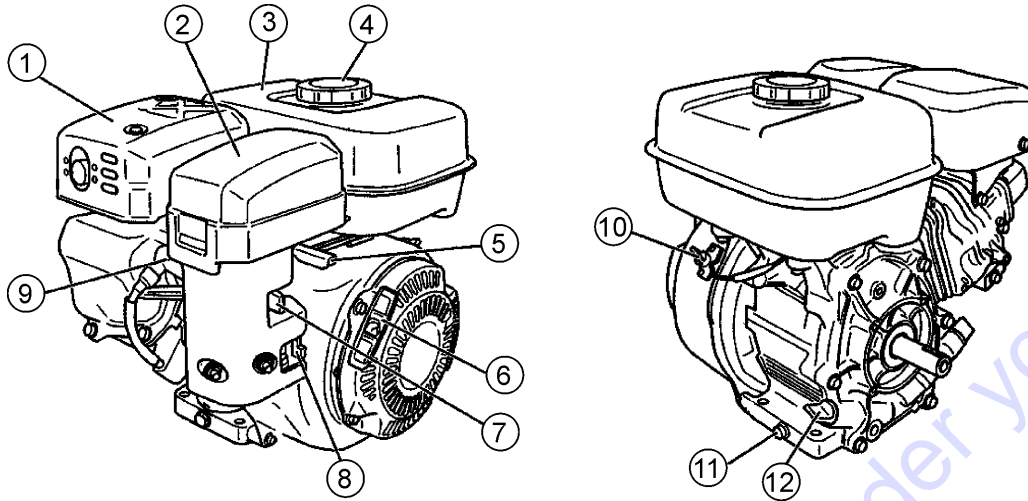


Figure 4. Engine Controls and Components

INITIAL SERVICING

1. **Muffler** – Used to reduce noise and emissions. **NEVER** touch when **hot!**
2. **Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter canister to gain access to filter element.

NOTICE

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

3. **Fuel Tank** – Fill with unleaded gasoline. Reference Table 3 for fuel tank capacity. For additional information refer to Honda engine owner's manual.

DANGER



Add fuel to the tank only when the engine is stopped and has had an opportunity to cool down. In the event of a fuel spill, **DO NOT** attempt to start the engine until the fuel residue has been completely wiped up and the area surrounding the engine is dry.

4. **Fuel Filler Cap** – Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tightened securely. **DO NOT** over fill.

5. **Throttle Lever** – Used to adjust engine RPM speed. This lever is connect to the throttle lever cable located on the handle bars. Reference throttle cable installation procedure in this manual.
6. **Recoil Starter (pull rope)** – Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
7. **Choke Lever** – Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
8. **Fuel Valve Lever** – **OPEN** to let fuel flow, **CLOSE** to stop the flow of fuel.
9. **Spark Plug** – Provides spark to the ignition system. Set spark plug gap according to engine manufacturer's instructions. Clean spark plug once a week.
10. **Engine ON/OFF Switch** – **ON** position permits engine starting, **OFF** position stops engine operation.
11. **Oil Drain Plug** – Remove this plug to remove oil from the engine's crankcase.
12. **Dipstick/Oil Filler Cap** – Remove this cap to determine if the engine oil is low. Add oil through this filler port as recommended in Table 4.

ASSEMBLY AND INSTALLATION

UNPACKING THE TROWEL

This trowel is equipped with a folding upper handle (Figure 5).

1. To place the handlebar in the operational position, simply turn the star wheel counterclockwise to release it from its locked/stowed position.
2. Next, pull back on the handlebar and place the handlebar in the desired position. Turn star wheel clockwise to lock handlebar firmly in place so that it will not move or slip.

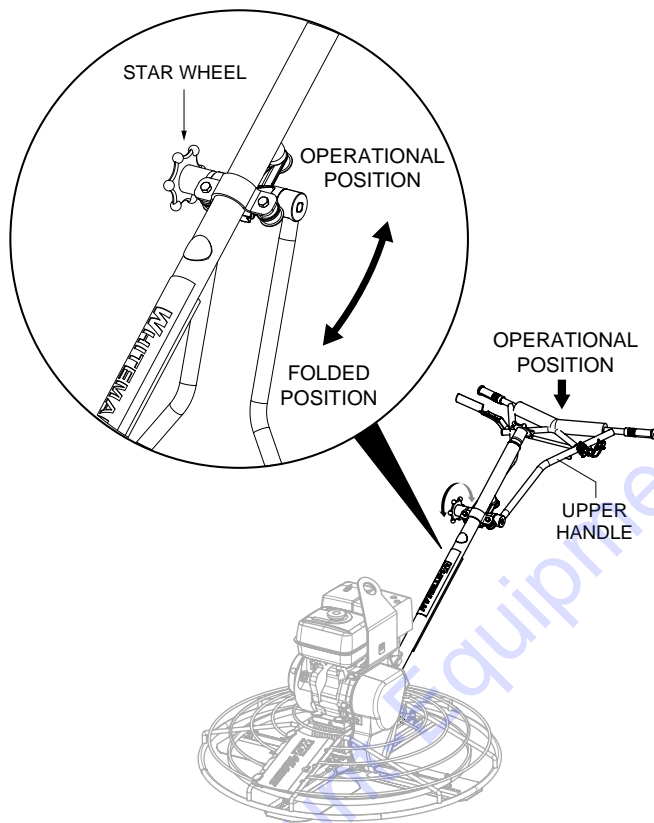


Figure 5. Trowel Folded and Operational Positions

ASSEMBLY AND INSTALLATION

Before the trowel can be put into operation there are some components that must be installed. This section provides general instructions on how to install those components.

MAIN HANDLE TUBE INSTALLATION

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

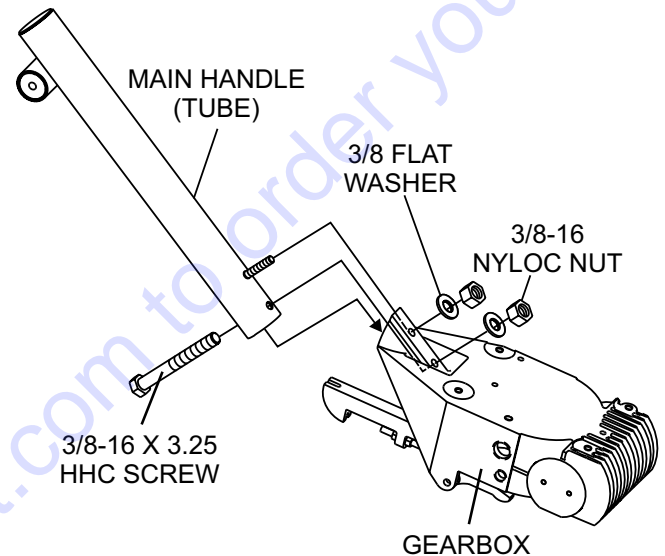


Figure 6. Handle Installation

2. The handlebar is already attached to the main handle tube.
3. If readjustment is necessary, loosen the star wheel as shown in Figure 7 and move the handlebar to the desired position.

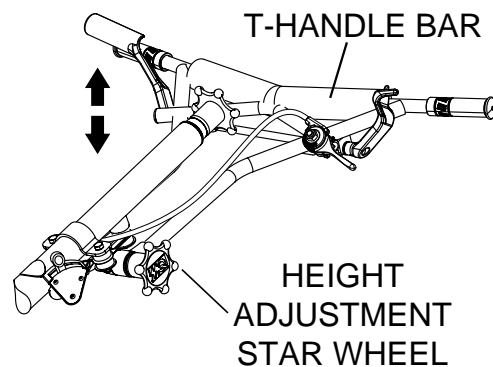


Figure 7. Upper Handle Adjustment

ASSEMBLY AND INSTALLATION

BLADE PITCH CABLE INSTALLATION

1. For trowels equipped with a **Standard** handle (SXHC), simply turn the **star wheel** counterclockwise to pitch the blades flat. This will release the tension on the blade pitch cable (Figure 8).

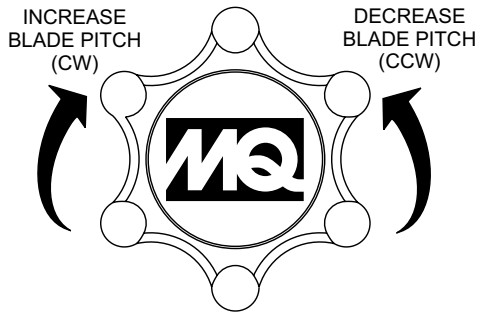


Figure 8. Adjusting Cable Blade Pitch (Standard Handle)

2. For trowels equipped with a **Quick Pitch™ T-handle** (QXHC), simply squeeze the trigger lock and push the **T-handle** towards the engine to pitch the blades downward. Pushing the **T-handle** towards the engine will cause the blades to lay flat (Figure 9). This will release the tension on the blade pitch cable.

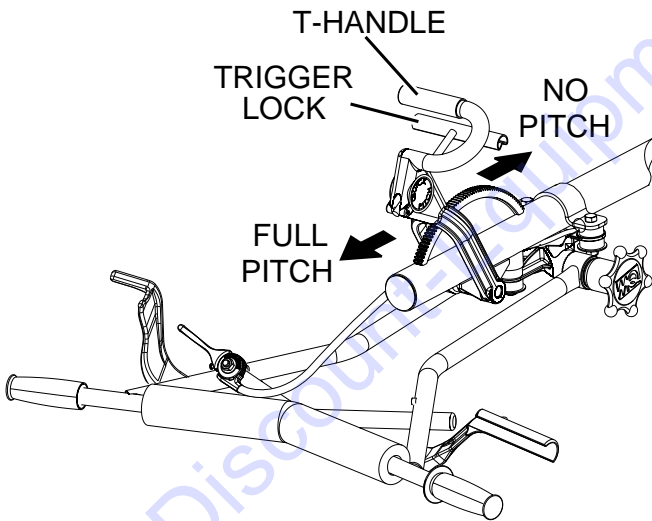


Figure 9. Adjusting Cable Blade Pitch (Quick-Pitch™ Handle)

WARNING

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

3. Remove brass set nut #1 from the blade pitch cable end. See Figure 10.

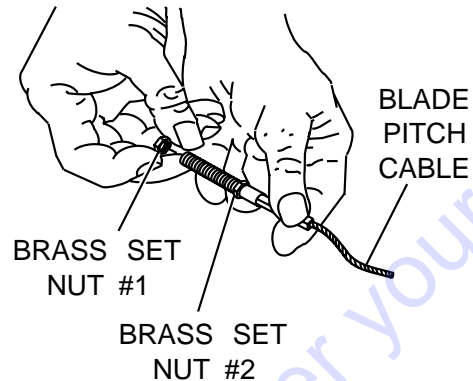


Figure 10. Blade Pitch Cable

4. Thread the brass set nut #2 towards the cable as far as possible. See Figure 10.
5. Insert the cable end through the yoke eyelet (Figure 11). Tighten brass set nut #1 by hand to remove all the slack from the cable.

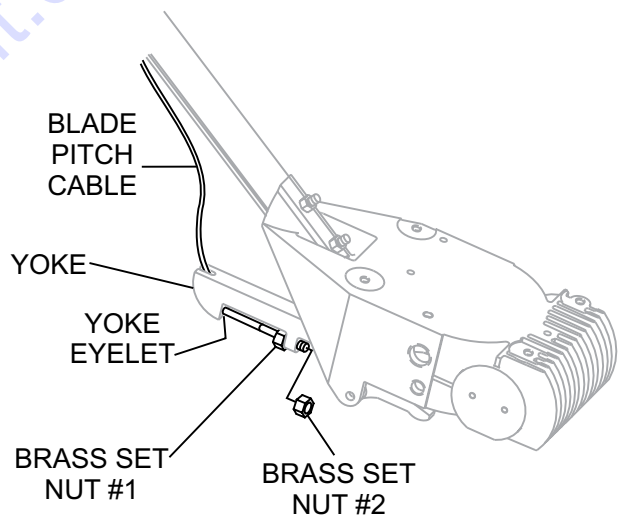


Figure 11. Cable Yoke Attachment

6. Using a wrench, tighten the brass set nut #2 up against the yoke boss. This will lock the cable in place.
7. Using a wrench, tighten the brass set nut #1 against the yoke boss.

ASSEMBLY AND INSTALLATION

THROTTLE CABLE INSTALLATION

Refer to Figure 12 for the location of components.

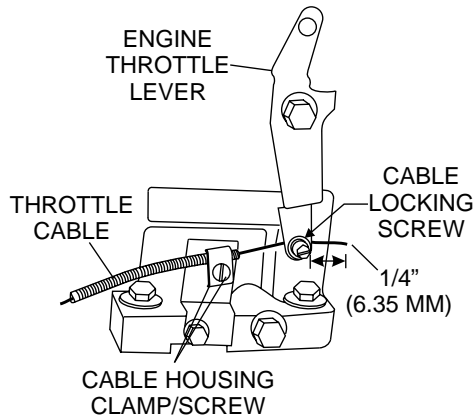


Figure 12. Throttle Cable Installation

1. Uncoil the throttle cable and housing.
2. Feed the throttle cable through the cable housing.
3. Connect the **trowel throttle cable** to the engine throttle linkage (Figure 13). There should be a piece of wire installed on the trowel to show where to route the throttle cable.
4. Route **cable end** through the **cable locking screw**. When connecting the **cable housing**, make sure that no more than 1/4" (6.4 mm) of the **cable housing** protrudes past the **housing clamp** on the engine.
5. Tighten **cable clamp** screw.
6. After the trowel throttle cable has been connected to the engine throttle linkage, adjust and tighten operator position of the T-bar handle to lock the throttle cable at the proper length.

7. Adjust cable tension by loosening or tightening the locking nut and cable retaining screw on the throttle lever (see Figure 13).

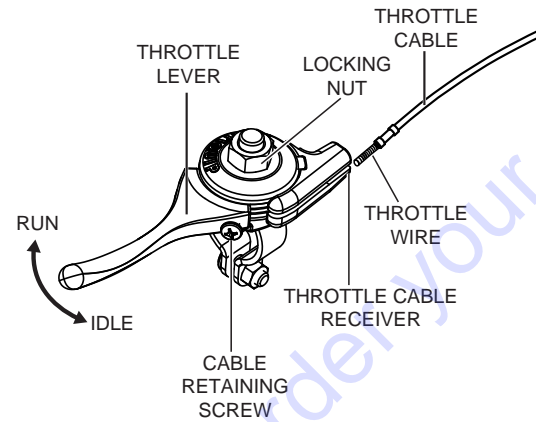


Figure 13. Adjusting Cable Tension

NOTICE

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

INSTACLUTCH CABLE INSTALLATION

1. Uncoil the free end of the clutch cable.
2. Check that the clutch cable (Figure 14) is attached to the handlebar cable anchor.

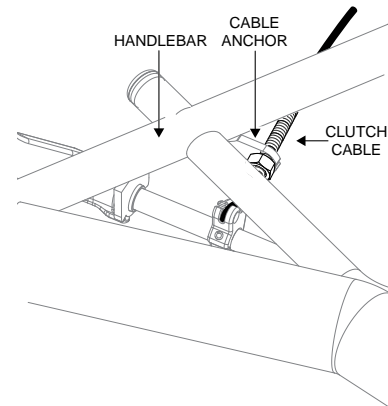


Figure 14. Handlebar Clutch Cable

3. Check that the clutch cable is fed along the tube and secured with zip ties.

ASSEMBLY AND INSTALLATION

- Using a 7/16" wrench remove the three 1/4" retaining bolts (Figure 15) that secure the clutch cover to the frame.

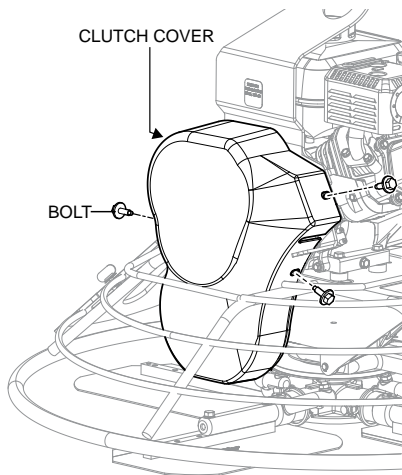


Figure 15. Clutch Cover Removal

- Route the clutch cable (Figure 16) underneath the top most rung of the guard ring.

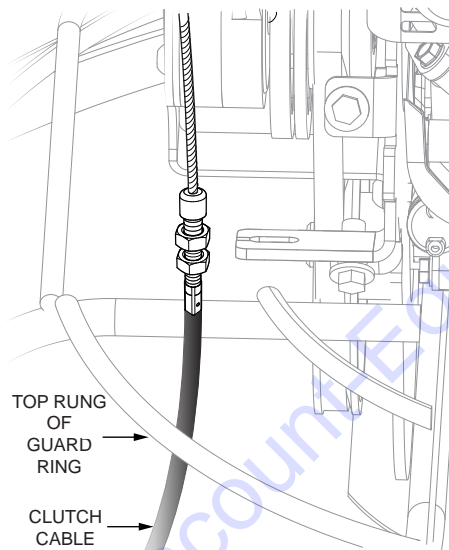


Figure 16. Clutch Cable Routing

- Remove the 5/16" outer nut (Figure 17) and rubber cap from the threaded end on the clutch cable.

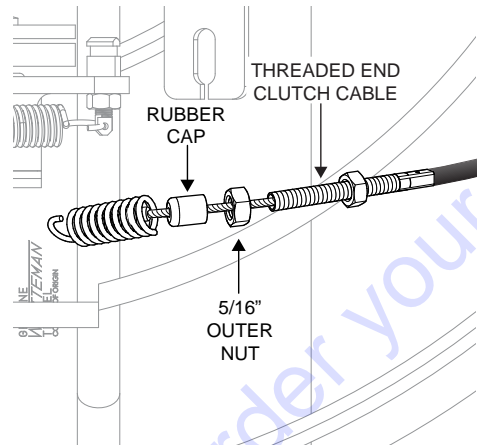


Figure 17. Outer Nut And Rubber Cap Removal

- Adjust the 5/16" inner nut (Figure 18) for a 7/8" distance from the threaded end on the clutch cable to the inner nut.

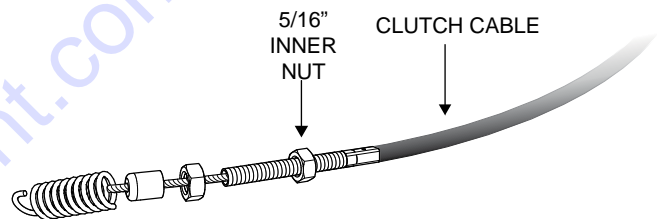


Figure 18. Inner Nut Adjustment

- Insert the exposed cable (Figure 19) into the cable slot on the cable anchor.

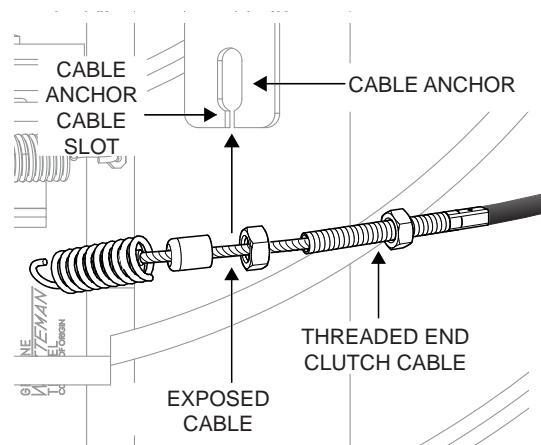


Figure 19. Inserting Clutch Cable Into Cable Anchor

ASSEMBLY AND INSTALLATION/INSPECTION

9. Connect the clutch cable to the clutch anchor by placing the spring loop over the clutch anchor flats as shown in Figure 20. Use needle nose pliers to slide the spring loop fully into the groove.

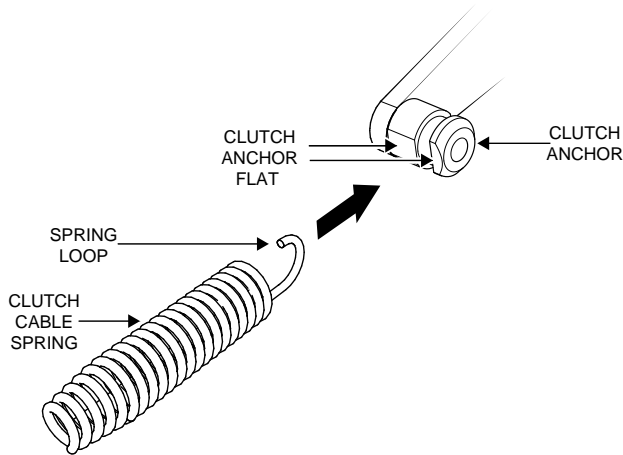


Figure 20. Spring Loop Attachment.

10. Tighten the inner nut (Figure 21) against the clutch cable support bracket until there is no longer any slack in the cable between the threaded cable end and the clutch cable spring.

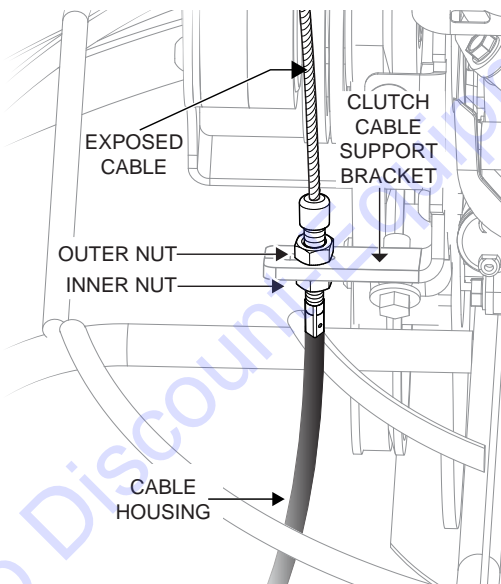


Figure 21. Attaching Clutch Cable To Cable Support Bracket

11. Using two 1/2" wrenches tighten the inner and outer nut against the clutch cable support bracket.

Before Starting

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

Engine Oil Check

1. To check the engine oil level, place the trowel on secure level ground with the engine stopped.
2. Remove the dipstick from the engine oil filler hole (Figure 22) and wipe clean.

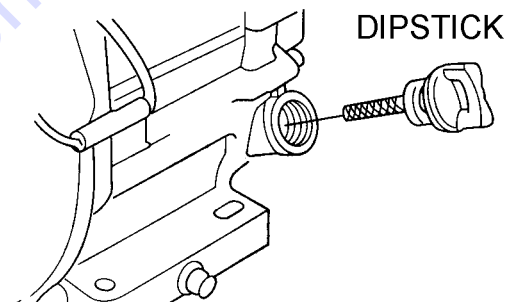


Figure 22. Engine Oil Dipstick Removal

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.

- If the oil level is low (Figure 23), fill to the edge of the oil filler hole with the recommended oil type as listed in Table 4. Reference Table 3 for maximum engine oil capacity.

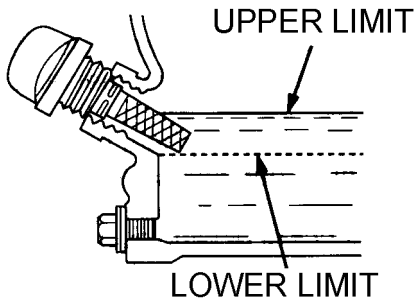


Figure 23. Engine Oil Dipstick (Oil Level)

Table 4. 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

! DANGER

EXPLOSIVE FUEL!

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

Fuel Check

- Visually inspect to see if fuel level is low. If fuel is low, replenish with unleaded fuel.
- When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel immediately.

Gearbox Oil

- Determine if the gearbox oil is low by removing the oil plug located on the side of the gearbox. (Figure 24) This plug will be marked by the "check" decal. The correct level of the lubrication oil should be to the bottom of the fill plug.

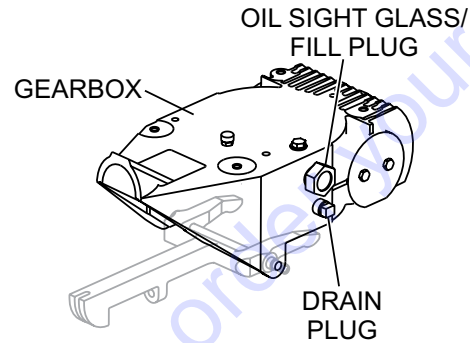


Figure 24. Gearbox

- If lubrication oil begins to seep out as the drain plug is being removed, then it can be assumed that the gearbox has a sufficient amount of oil.
- If lubrication oil does not seep out as the drain plug is being removed, fill with type ISO 680 (P/N 10139) gearbox lubricant oil until the oil filler hole overflows.

V-Belt Check

A worn or damaged V-belt can adversely affect the performance of the trowel. If a V-belt is defective or worn simply replace the V-belt as outlined in the maintenance section of this manual.

Belt Guard Check

Check for damage, loose or missing hardware.

Blade Check

Check for worn or damaged blades. Check to see if one blade is worn out while the others look new. If this is the case there could be a blade pitch problem. Refer to the maintenance section of this manual for blade pitch adjustment procedure. Replace any worn blades.

Operation

This section is intended to assist the operator with the initial start-up 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.

Lifting the Trowel Onto a Slab

Extra care should be taken when lifting the trowel off the ground. Serious damage to the machine or personal injury could be caused by dropping a trowel.

WARNING

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

ALWAYS make certain the handle is secure and use only the manufacturer's approved lifting point. The trowel may be lifted at the center lifting bale by crane or other lifting device of adequate capacity.

NOTICE

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

NOTICE

The trowel is heavy and awkward to move around. Use proper heavy lifting procedures and **DO NOT** lift the trowel by the guard rings.

Lifting Bale

The lift bale provides an optimal lift point for lifting the trowel. When lifting the trowel onto a concrete slab, attach a chain or rope to the lifting bale. Make sure the lifting device has adequate lifting capacity to lift the trowel.

Using a crane or forklift (Figure 25) to lift the trowel is highly recommended, and is perfectly safe for the trowel. **ALWAYS** use extra care when lifting the trowel off the ground.

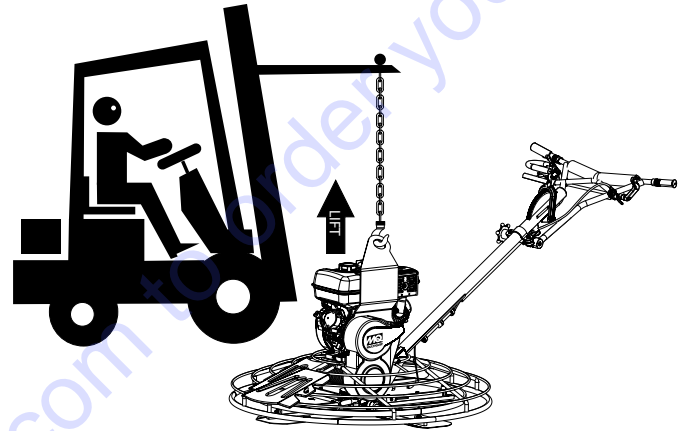


Figure 25. Lifting the Trowel

NEVER lift the trowel to unnecessary heights. **DO NOT** stand underneath the trowel while it is being lifted. Serious damage to the machine or personal injury could be caused by dropping a trowel.

Starting the Engine

1. Turn the engine start/stop switch to the "ON" position (Figure 26).

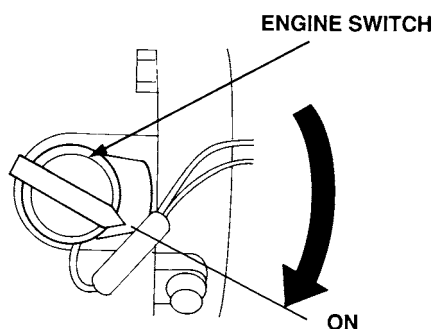


Figure 26. Engine ON/OFF Switch (ON Position)

2. Place the engine fuel valve lever (Figure 27) in the "ON" position.

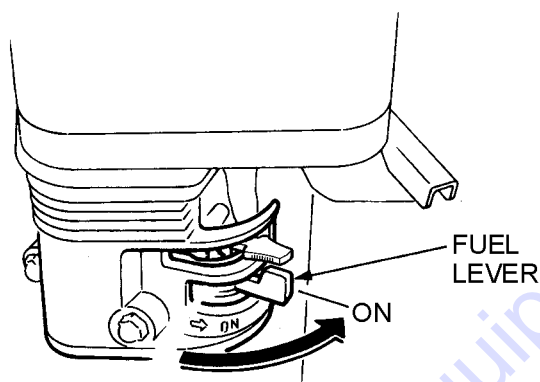


Figure 27. Engine Fuel Valve Lever (ON)

3. Push the **throttle lever** (Figure 28) in the "idle" position.

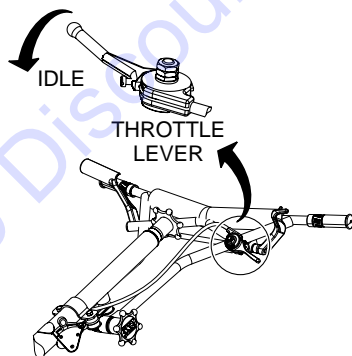


Figure 28. Throttle (Idle Position)

4. Place the **choke lever** (Figure 29) in the "OPEN" position.

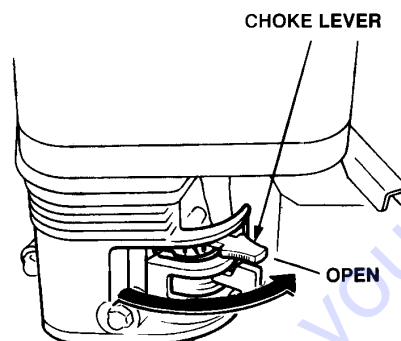


Figure 29. Choke Lever Open

5. Grasp the starter grip (Figure 30) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding to the compression point. Pull the starter grip briskly and smoothly for starting.

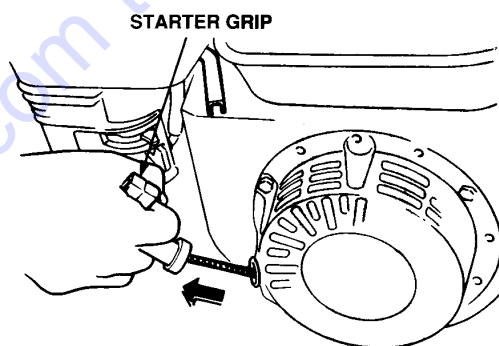


Figure 30. Starter Grip

6. If the engine has started, slowly return the choke lever (Figure 31) to the **CLOSED** position. If the engine has not started repeat steps 1 through 5.

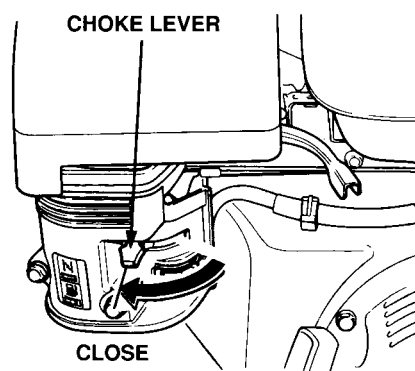


Figure 31. Choke Lever Closed

- Before the trowel is placed into operation, run the engine for several minutes. Check for fuel leaks, and noises that would associate with a loose guard ring and/or covers.

To Begin Troweling

- To begin troweling, place the throttle lever (Figure 32) in the "RUN" position.

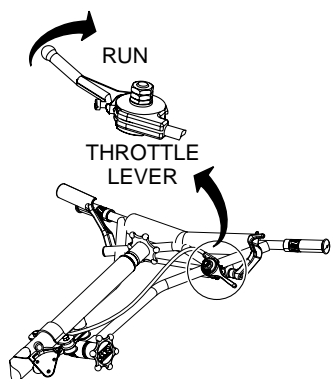


Figure 32. Throttle Lever (Run)

- Squeeze the pull the clutch lever (Figure 33) to begin 4-blade rotation. Verify that the blades are rotating.

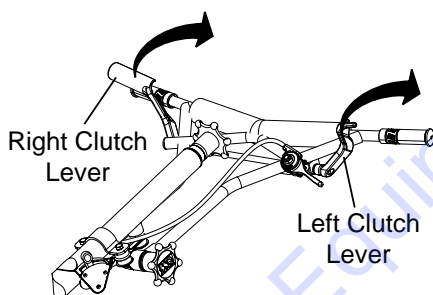


Figure 33. Clutch Levers (Blade Activation)

Concrete Finishing Techniques

The following steps are intended as a basic guide to machine operation, and are not to be considered a complete guide to concrete finishing. We suggest that all operators (experienced and novice) read "**Slabs on Grade**" published by the **American Concrete Institute, Detroit, Michigan**. Read the "Training" section of this manual for more information.

Pitching the Blades (Standard Handle)

To pitch the blades upwards using the "**Standard**" handle, (Figure 34) simply turn the **star-wheel** clockwise. Turning the star wheel counter clockwise will cause the blades to lay flat.

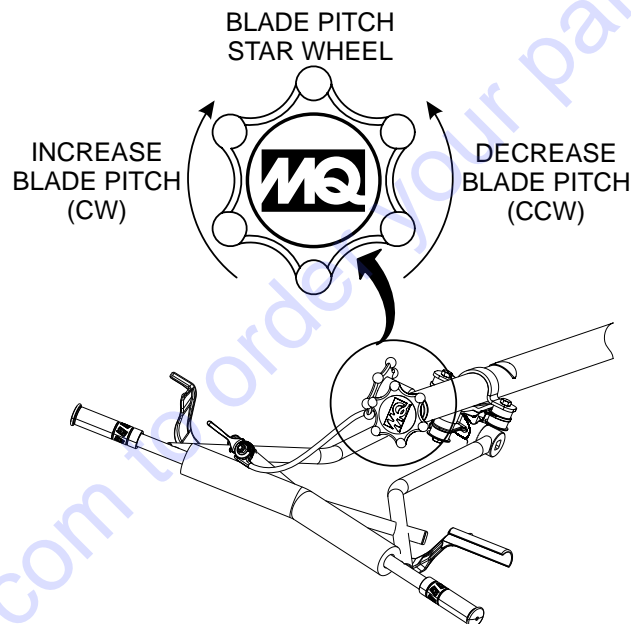


Figure 34. Blade Pitch Star Wheel

Pitching the Blades (Quick Pitch™ Handle)

To pitch the blades upwards using the "**Quick Pitch™**" handle, (Figure 35) simply **pull** the T-handle backwards while squeezing the trigger. Pushing the T-handle forward will cause the blades to lay flat.

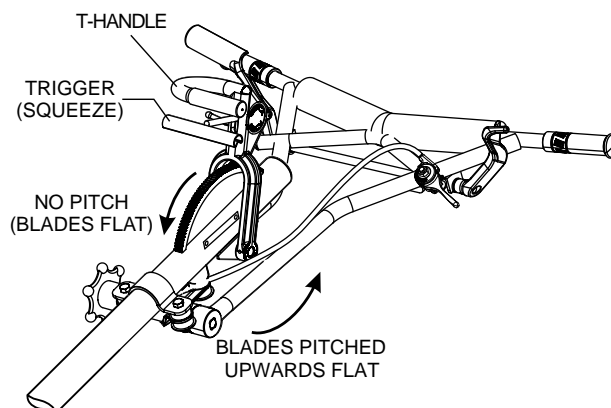


Figure 35. Blade Pitch T-Handle

Maneuvering the Trowel

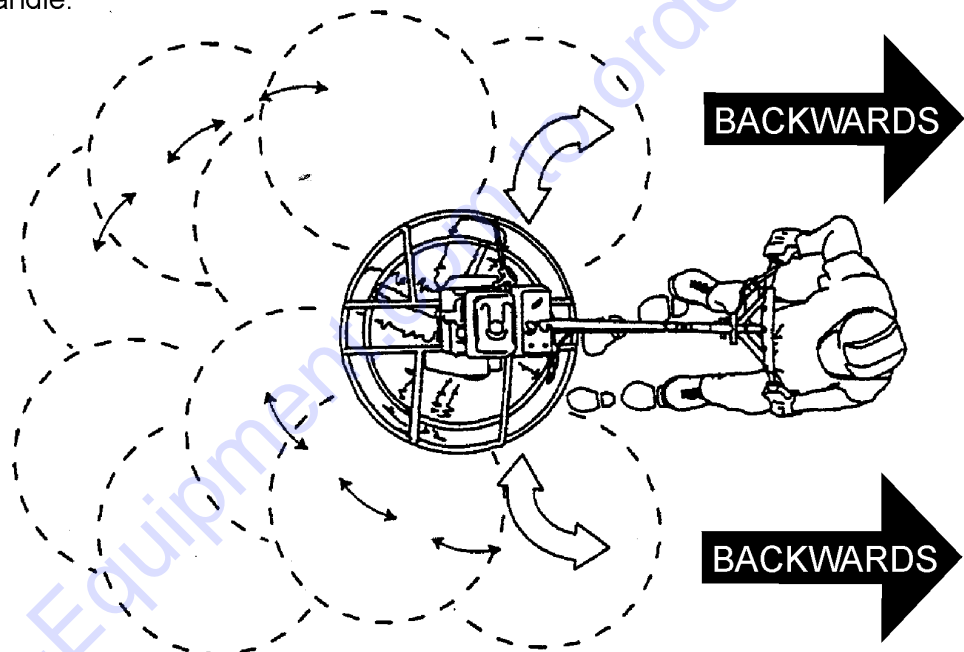
1. Get into the operator's position behind the handle. With a secure foothold and a firm grasp on the handle, slowly increase the engine speed until the desired blade speed is obtained.
2. Figure 36 below illustrates a typical walk-behind trowel application. Practice maneuvering the trowel. The trick is to let the trowel do the work.

3. Continue to practice maneuvering the trowel. Try to practice as if you were finishing a slab of concrete. Practice edging and covering a large area.

Remember a good finishing technique is to work backwards. Be careful when moving backwards 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! that if you let go of the trowel, just **step away** and let the trowel come to a complete **STOP** before trying to recover the trowel.



The best method for finishing concrete is to slowly walk **backwards** with the trowel, guiding the trowel from side to side. This will cover all footprints on wet concrete.

Figure 36. Maneuvering the Trowel

CAUTION

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

CAUTION

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

Stopping The Engine

1. Move the throttle lever to the (Figure 37) "IDLE" position and run the engine for three minutes at low speed.

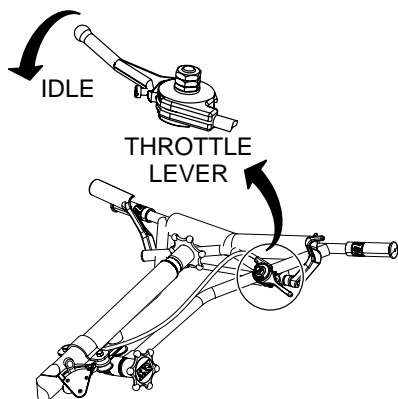


Figure 37. Throttle Lever (Idle)

2. After the engine cools, turn the engine start/stop switch to the "OFF" position (Figure 38).

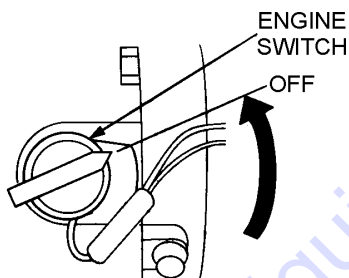


Figure 38. Engine ON/OFF Switch (OFF Position)

3. Close the fuel shut-off valve (Figure 39) by moving the fuel valve lever to the **OFF** position.

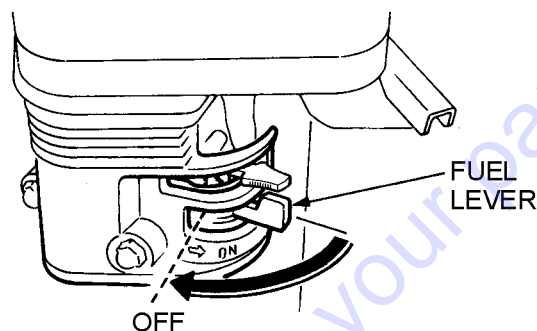


Figure 39. Fuel Valve Lever (OFF)

NOTICE

Trowel blades should be changed when they fail to finish concrete in a satisfactory manner.

Blades are a vital part of finishing concrete. This trowel, or finisher, has been designed to finish concrete and the blades are built to stringent quality standards out of the finest steel.

If you need replacement blades, consult the parts list in this manual for part numbers and order them from your Multiquip parts dealer or importer.

Combo Blades

This trowel is equipped with combination float/finish (Figure 40) blades as original equipment. These blades have been designed for optimum performance in both the floating and finishing operations. These blades are versatile and should take care of most troweling needs.

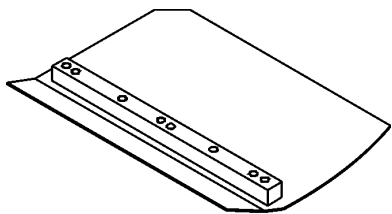


Figure 40. Combination Blade

Finish Blades (Optional)

These blades (Figure 41) have been specifically designed for finish operations with this trowel. They will provide a premium surface finishing capability from your trowel. They should only be used after the concrete has set to the point where the trowel does not sink into the concrete when placed on it.

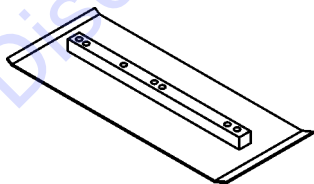


Figure 41. Finish Blade

Clip-On Float Blades (Optional)

These blades will clip (Figure 42) onto an existing installed blade, allowing your finisher to float on “wet” concrete so that the troweling operation can begin as early as possible. These blades are easily removable, so that after the floating operation, when the concrete is sufficiently cured, they can be removed to expose the finish blades for continued troweling.

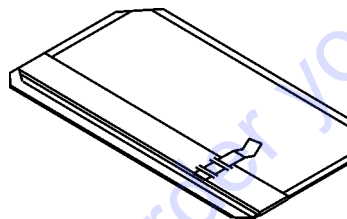


Figure 42. Clip-On Float Blade

Float Discs (Optional)

These round discs (Figure 43) attach to the spiders and allow the machine to “float” on “wet” concrete. The disc design allows early floating and easy movement from wet to dry areas. They are also very effective in embedding large aggregates and surface hardeners.

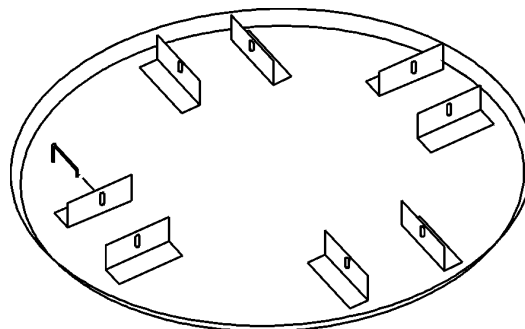


Figure 43. Float Disc/Pan

NOTICE

For optimum panning performance blade speed must be changed. Use Low Speed Kit. Reference Engine and Clutch Assembly in parts section of this manual.

Trowel Arm Adjustment Tool (Optional)

If blades show uneven wear patterns or some tend to wear out faster than others, the trowel arms may need to be adjusted. A special tool is available (Figure 44) that will adjust all of the trowel arms consistently. The Trowel Arm Fixture P/N is 1817.

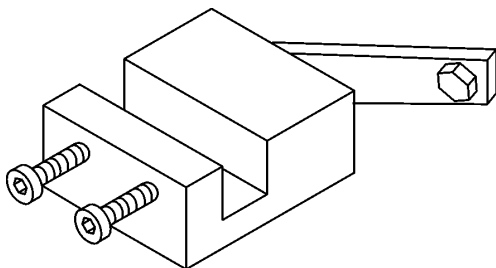


Figure 44. Trowel Arm Adjustment Fixture

Quick Pitch™ Handle (Optional)

This feature (Figure 45) is not standard equipment on this model walk-behind trowel. To order this feature please contact Discount-Equipment.

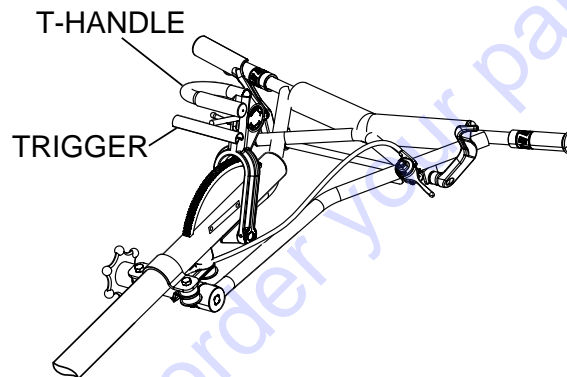


Figure 45. Quick Pitch™ Handle (Option)

The Quick Pitch™ Handle feature allows the operator to adjust the pitch of the blades by grasping the handle, then squeezing the trigger lever and then moving the handle either forward or backwards to achieve the desired blade pitch.

MAINTENANCE

Table 5. 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		
Engine Oil Filter	Replace	Every 200 Hrs.				
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 items should be serviced by your service dealer, unless you have the proper tools and are mechanically proficient. Refer to the HONDA Shop Manual for service procedures.

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

Table 6. Trowel Maintenance Schedule

ITEM	OPERATION	DAILY	Periodic Maintenance Interval		
			Every 50-60 Hrs	Every 200-300 Hrs	Every 2000-2500 Hrs
V-Belt	Check/Replace	X			
Relube 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, blade and trowel arm inspection, lubrication and V-belt inspection for wear and damage. Reference Table 5 and Table 6 for scheduled engine and trowel maintenance.

The following procedures, devoted to maintenance, can prevent serious trowel damage or malfunctioning.

NOTICE

Reference **HONDA** engine manual supplied with your trowel for more detailed engine maintenance and troubleshooting.

CAUTION

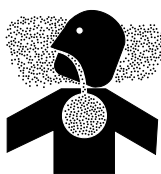


ALWAYS allow the engine to cool before servicing. **NEVER** attempt any maintenance work on a hot engine.

CAUTION

ALWAYS disconnect the spark plug wire from the spark plug and secure away from the engine before performing maintenance or adjustments on the machine.

WARNING



Some maintenance operations may require the engine to be run. Ensure that the maintenance area is well ventilated. Gasoline engine exhaust contains poisonous carbon monoxide gas that can cause unconsciousness and may result in **DEATH**.

GENERAL CLEANLINESS

Clean the trowel daily. Remove all dust and slurry buildup. If the trowel is steam-cleaned, ensure that lubrication is accomplished **AFTER** steam cleaning.

ENGINE CHECK

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

Engine Air Cleaner

! DANGER



DO NOT use gasoline or low flash point solvents for cleaning the air cleaner, the possibility exists of fire or explosion which can cause damage to the equipment and severe bodily harm or even **DEATH**!

! CAUTION



Wear protective equipment such as approved safety glasses or face shields and dust masks or respirators when cleaning air filters with compressed air.

This engine is equipped with a replaceable, high-density paper air cleaner element. See Figure 46 for air cleaner components.

1. Remove the air cleaner cover and foam filter element.
2. Tap the paper filter element several times on a hard surface to remove dirt, or blow compressed air not exceeding 30 psi (207 kPa, 2.1 kgf/cm²) 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.
3. Clean foam element in warm, soapy water or nonflammable solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.

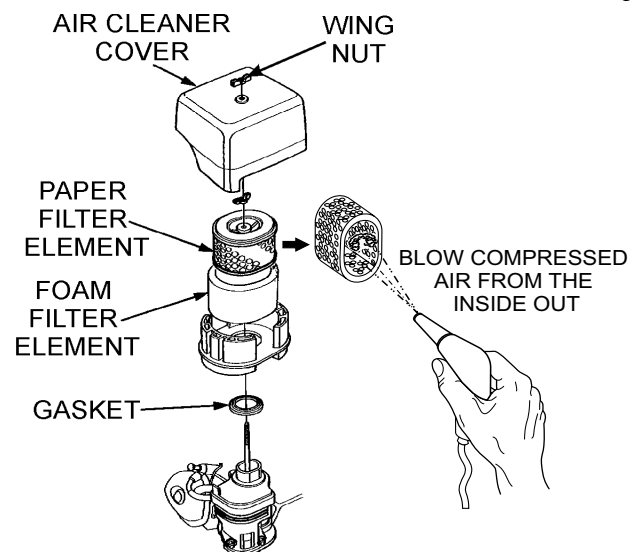


Figure 46. Engine Air Cleaner

NOTICE

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

ENGINE OIL

1. Drain the engine oil when the oil is warm as shown in Figure 47.
2. Remove the oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
3. Replace engine oil with recommended type oil as listed in Table 4. For engine oil capacity, see Table 3 (engine specifications). **DO NOT** overfill.
4. Reinstall drain bolt with sealing washer and tighten securely.

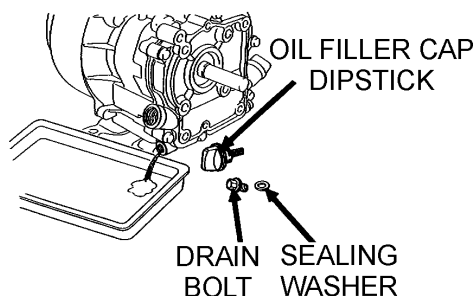


Figure 47. Draining Engine Oil

SPARK PLUG

NOTICE

NEVER use a spark plug of incorrect heat range.

1. Remove and clean spark plug (Figure 48) with a wire brush if it is to be reused. Discard spark plug if the insulator is cracked or chipped.
2. Using a feeler gauge adjust spark plug gap to 0.028 ~0.031 inch (0.7~0.8 mm).
3. Thread spark plug into cylinder hole by hand to prevent cross-threading, then tighten securely.

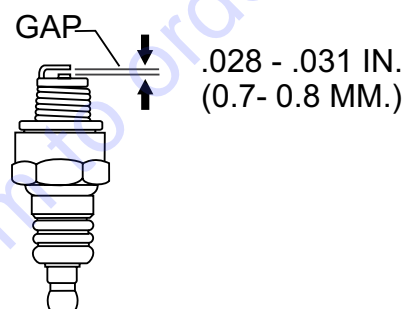


Figure 48. Spark Plug Gap

V-BELT

Visually examine the V-belt (Figure 49) and determine if it is full of tiny cracks, frayed, has pieces of rubber missing, is peeling or otherwise damaged.

Also, examine the belt and determine if it is **oil soaked** or **"glazed"** (hard shiny appearance on the sides of the belt). Either of these two conditions can cause the belt to run hot, which can weaken it and increase the danger of it breaking.

If the V-belt exhibits any of the above wear conditions replace the V-belt immediately.

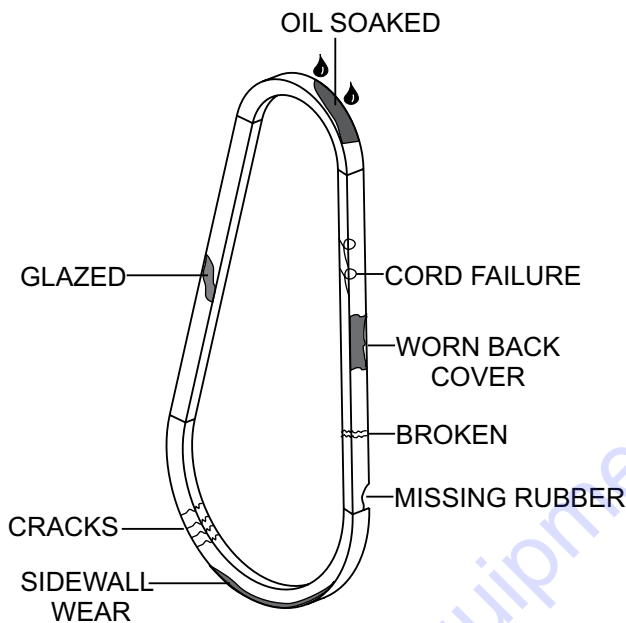


Figure 49. V-Belt Inspection

SPARK ARRESTER CLEANING

Clean the spark arrester every 6 months or 100 hours.

1. Remove the 4 mm screw (3) from the exhaust deflector, then remove the deflector. See Figure 50
2. Remove the 5 mm screw (4) from the muffler protector, then remove the muffler protector.
3. Remove the 4 mm screw from the spark arrester, then remove the spark arrester.

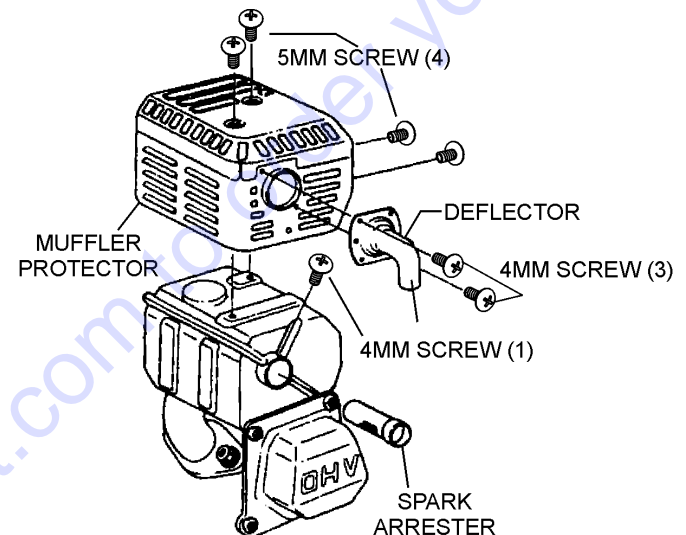


Figure 50. Spark Arrester Removal

4. Carefully remove carbon deposits from the spark arrester screen (Figure 51) with a wire brush.

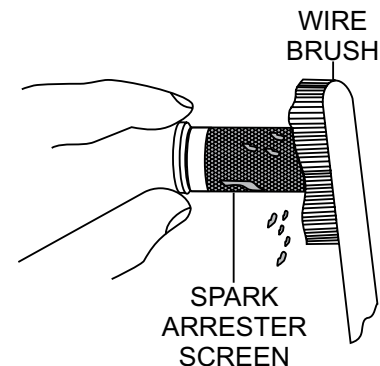


Figure 51. Cleaning The Spark Arrester

5. If the spark arrester is damaged and has breaks or holes, replace with a new one.
6. Reinstall the spark arrester and muffler protector in reverse order of disassembly.

BLADE PITCH ADJUSTMENT PROCEDURE

The maintenance adjustment of blade pitch is an adjustment that is made by a bolt (Figure 52) on the arm of the trowel arm lever. This bolt is the contact point of the trowel arm lever to the lower wear plate on the thrust collar. The goal of the adjustment is to promote consistent blade pitch and finishing quality. Adjustments are made by tightening or loosening the blade pitch adjustment bolt.

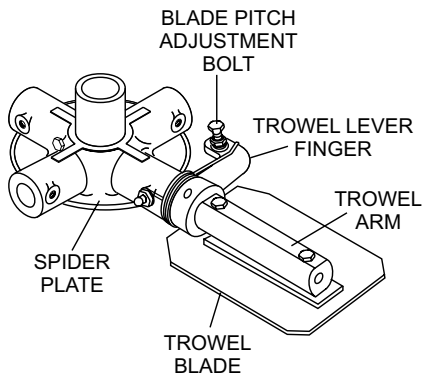


Figure 52. Blade Pitch Adjustment Bolt

Watch for the following indications when determining if blade pitch adjustments are necessary:

- Is the machine wearing out blades unevenly, (i.e. one blade is completely worn out while the others look new)?
- Does the machine have a perceptible rolling or bouncing motion when in use?
- Look at the machine while it is running, do the guard rings "rock up and down" relative to the ground?

If it is determined that blade pitch adjustments are required do the following:

NOTICE

Before any blade pitch adjustments can be made it is essential to have a clean level area free of dirt and debris to test the trowel. Any unlevel spots in the floor or debris under the trowel blades will give an incorrect perception of adjustment. Ideally, a 5 x 5 ft. (1.5 x 1.5 meter), three-quarter inch (19 mm) thick **FLAT** steel plate should be used for testing.

1. Place the trowel on a flat, level area free of dirt and debris.

2. Pitch the blades as flat as possible. The pitch adjustment bolts (Figure 53) should all barely make contact (0.10 inch max. clearance) with the **lower wear plate** on the spider. All pitch alignment bolts should be spaced the same distance from the lower wear plate. If one is not making contact, adjustment will be necessary.

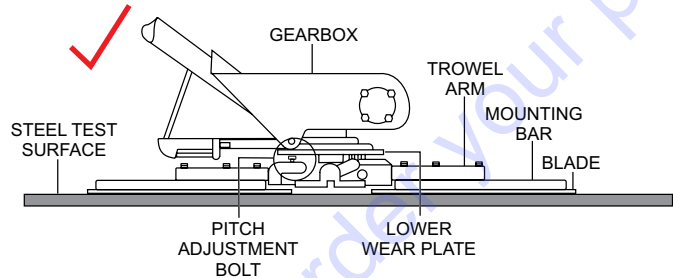


Figure 53. Correct Blade Pitch (Flat)

3. Adjust the "high" bolts down to the level of the one that is not touching, or adjust the "low" bolt up to the level of the higher ones. If possible, adjust the low bolt up to the level of the rest of the bolts. This is the fastest way, but may not always work. Verify after adjustment the blades pitch correctly.
4. Blades that are incorrectly adjusted often will not be able to pitch flat. This can occur if the adjusting bolts are raised too high. Conversely, adjusting bolts that are too low will not allow the blades to be pitched high enough for finishing operations.
5. If, after making blade pitch adjustments the machine is still finishing poorly, blades, trowel arms, and trowel arm bushings may be suspect and should be looked at for adjustment, wear, or damage.
6. Figure 54 illustrates, "incorrect alignment", worn spider bushings or bent trowel arms.

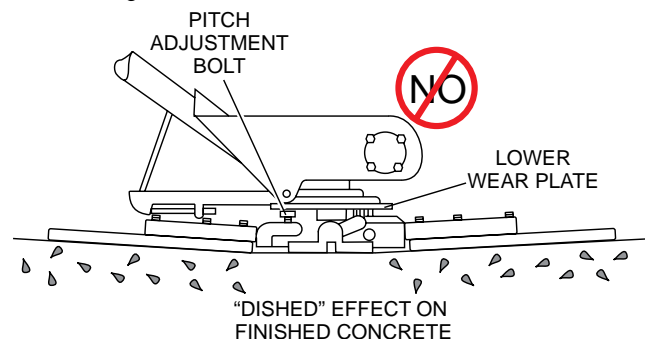


Figure 54. Incorrect Spider Plate Alignment

SPIDER REMOVAL

Remove the spider assembly from the gearbox shaft as follows:

1. Locate the cone point square head set screw (Figure 55) and attached jam nut found on the side of the spider assembly.
2. Loosen the jam nut and cone point square head set screw.
3. Carefully lift the upper trowel/gearbox assembly off of the spider assembly. A slight tap with a rubber mallet may be necessary to dislodge the spider from the main shaft of the gearbox.

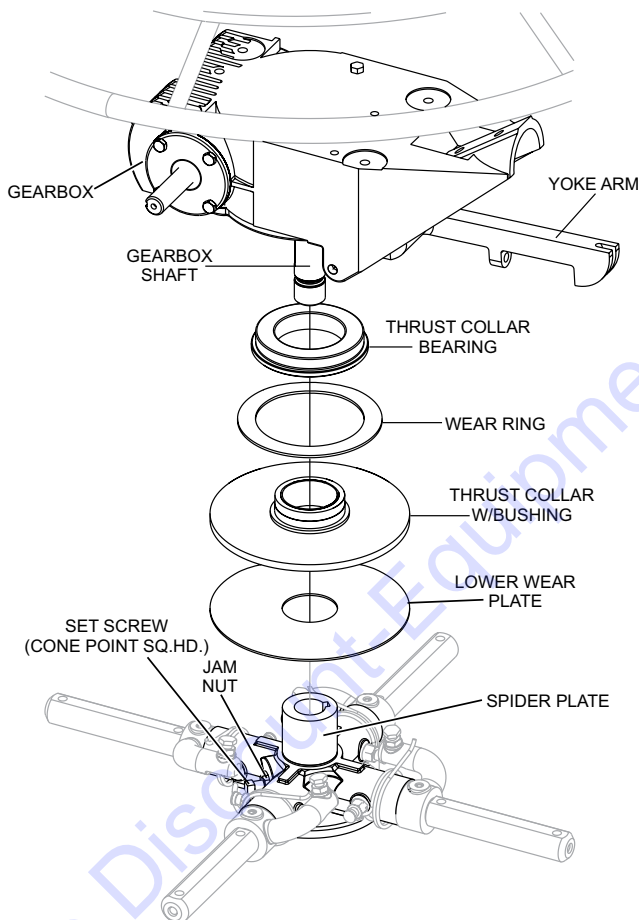


Figure 55. Spider Removal

CHANGING BLADES

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

Perform the following procedure when changing blades: Please note the blade orientation on the trowel arm before removing.

1. Lift the trowel up, placing blocks under the main guard ring to support it.
2. Remove the bolts and lock washers from all the trowel arms, and then remove the blades as shown in Figure 56.

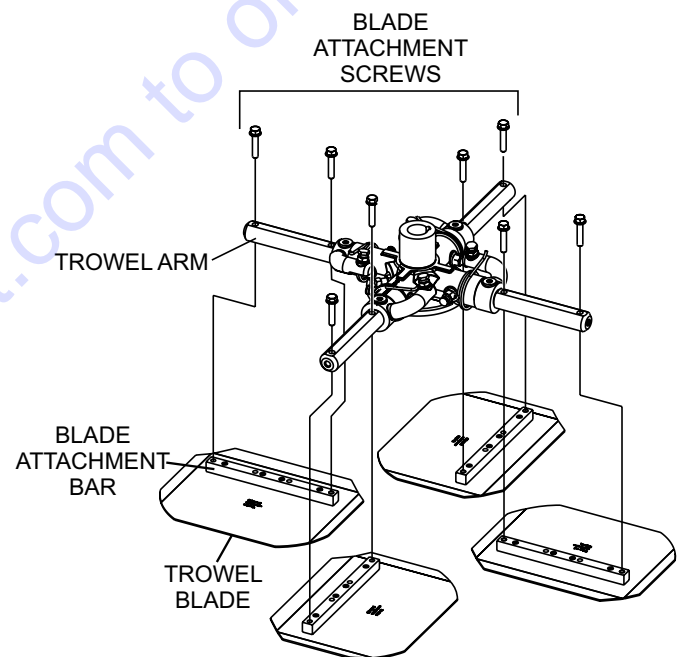


Figure 56. Blade Removal

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 for direction of rotation.
5. Reinstall the bolts and lock washers.

TROWEL ARM REMOVAL

1. Each trowel arm is held in place at the spider plate by a hex head bolt (zerk grease fitting) and a roll pin. Remove both the hex head bolt and the roll pin (Figure 57) from the spider plate.
2. Remove the trowel arm from the spider plate.
3. Should the trowel arm inserts (bushing) come out with the trowel arm, remove the bushing from the trowel arm and set aside in a safe place. If the bushing is retained inside the spider plate, carefully remove the bushing
4. Examine the trowel arm bushing insert (Figure 57), clean if necessary. Replace bushing if out of round or worn.

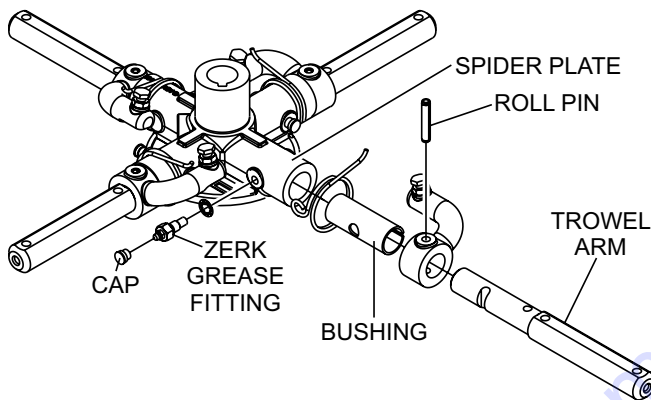


Figure 57. Trowel Arm Removal

CHECKING TROWEL ARM STRAIGHTNESS

Trowel arms (Figure 58) can be damaged by rough handling, such as dropping the trowel on the pad, or by striking exposed plumbing, forms, or rebar while in operation. A bent trowel arm will not allow the trowel to operate in a smooth fluid rotation. If bent trowel arms are suspect, check for flatness as follows:

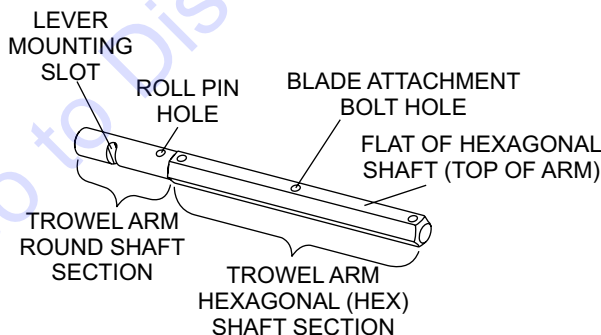


Figure 58. Trowel Arm

1. Use a thick steel plate, granite slab or any surface which is true and flat, to check all six sides of each trowel arm for flatness (Figure 59).
2. Check each of the six sides of the trowel arm (hex section). 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.

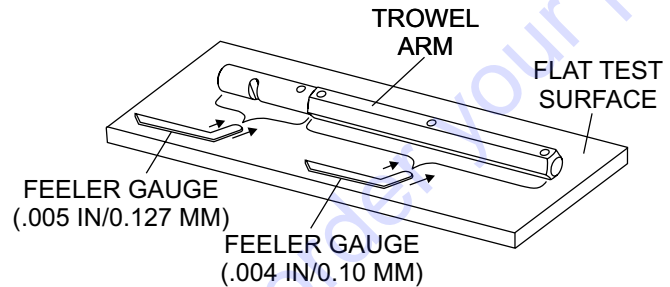


Figure 59. Checking Trowel Arm Flatness

3. Next, check the clearance between the round shaft and the test surface as one of the flat hex sections of the arm rests on the test surface. Rotate the arm to each of the flat hex sections and check the clearance of the round shaft. Use a feeler gauge (Figure 60) of .005 inch (0.127 mm). Each section should have the same clearance between the round of the trowel arm shaft and the test surface.
4. If the trowel arm is found to be uneven or bent, replace the trowel arm.

TROWEL ARM LEVER ADJUSTMENT

The easiest and most consistent way to adjust the trowel arm lever is to use the Trowel Arm Adjustment Fixture (P.N. 1817).

As each trowel arm is locked into the fixture, the arm bolt is adjusted to where 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.

This fixture will allow consistent adjustment of the trowel arm lever. It comes with all the hardware necessary to properly accomplish this maintenance and instructions on how to properly utilize this tool. Adjusting the trowel arm lever without a fixture requires a special talent.

Perform the following procedure when adjusting the trowel arm lever:

1. Unscrew the locking bolts on the adjustment fixture and place the trowel arm (lever attached) into the fixture channel as shown in Figure 60.
2. Ensure the fixture arm is in the up position.
3. A thin shim may be required to cover the blade holes on the trowel arm. Make sure to align the trowel adjustment bolt with the fixture adjustment bolt.

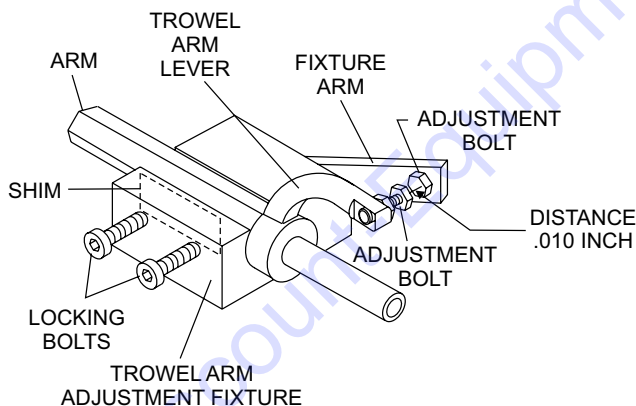


Figure 60. Trowel Arm Adjustment Fixture

4. Use an allen wrench to tighten the locking bolts securing the trowel arm in place.
5. Adjust the bolt distance shown in Figure 60 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 adjusting bolt.
7. Once the correct adjustment is made, tighten the lock nut on the trowel arm to lock in place.
8. Loosen locking nuts on the adjustment fixture, and remove trowel arm.
9. Repeat steps for the remaining trowel arms.

REASSEMBLY

1. Clean and examine the upper/lower wear plates and thrust collar. Examine the entire spider assembly. Wire brush any concrete or rust buildup. If any of the spider components are found to be damaged or out of round, replace them.
2. Make sure that the bronze trowel arm bushing is not damage or out of round. Clean the bushing if necessary. If the bronze bushing is damaged or worn, replace it.
3. Reinstall bronze bushing onto trowel arm.
4. Repeat steps 2 -3 for each trowel arm.
5. Make sure that the spring tensioner is in the correct position to exert tension on the trowel arm.
6. Insert all trowel arms with levers into spider plate (with bronze bushing already installed) using care to align grease hole on bronze bushing with grease hole fitting on spider plate.
7. Lock trowel arms in place by tightening the hex head bolt with zerk grease fitting and jam nut.
8. Reinstall the blades onto the trowel arms.
9. Install stabilizer ring onto spider assembly.
10. Reinstall lower wear plate, thrust collar and upper wear ring in the reverse order that they were disassembled onto the spider shaft. Make sure that there is little or no lateral movement between the thrust collar and the spider shaft.
11. Carefully lift the upper trowel assembly, line up the keyway on gear box main shaft and insert into spider assembly.

12. Reinstall square head cone point into spider plate and tighten in place. Tighten jam nut. Use care in making sure point of set screw engages groove in gear box main shaft.
13. Lubricate all grease points (zerk fittings) with premium "Lithum 12" based grease, conforming to NLGI Grade #2 consistency.

INSTALLING PANS ONTO FINISHER BLADES

These round discs, sometimes referred to as "pans", attach to the spiders arms and allow early floating on wet concrete and easy movement from wet to dry areas. They are also very effective in embedding large aggregates and surface hardeners.

Refer to Figure 61 when installing pans onto finisher blades.

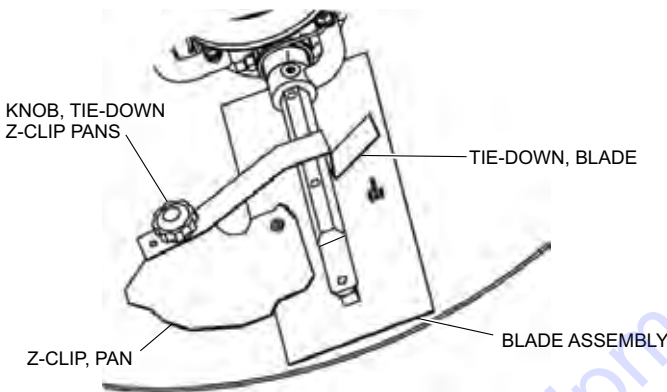


Figure 61. Z-Clip Finisher Pan Installation

1. Lift trowel just enough to slide pan under blades. Lower finisher onto pan with blades adjacent to Z-Clips.
2. Rotate blades into position under Z-Clips. Ensure that the blades are rotated in the direction of travel when the machine is in operation or use the engine to rotate the blades into position.
3. Attach the blade tie-downs to the far side of the Z-Clip brackets with tie-down knobs as shown in Figure 61.
4. Check to make certain that the blade edges are secured under the Z-Clips and the tie-downs are secured completely over the edges of the blade bar before the machine is put back into operation.

LONG-TERM STORAGE

For storage of the trowel for over 30 days, the following is required:

- Drain the fuel tank completely, or add STA-BIL to the fuel.
- Run the engine until the 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 to 10 cc of SAE 30 oil into the cylinder. Turn the engine switch to the **START** position for a few seconds to distribute the oil. Reinstall the spark plug.
- Clean all external parts of the trowel with a cloth.
- Cover the trowel and store in a clean, dry place.

TROUBLESHOOTING

Troubleshooting (Engine)		
Symptom	Possible Problem	Solution
Difficult to start, fuel is available, but no spark at spark plug.	Spark plug bridging?	Check gap, insulation or replace spark plug.
	Carbon deposit on spark plug?	Clean or replace spark plug.
	Short circuit due to deficient spark plug insulation?	Check spark plug insulation, replace if worn.
	Improper spark plug gap?	Set to proper gap.
	Fuel reaching carburetor?	Check fuel line.
	Water in fuel tank?	Flush or replace fuel tank.
	Fuel filter clogged?	Replace fuel filter.
	Stuck carburetor?	Check float mechanism.
	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 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.
Difficult to start, fuel is available, and spark is present at the spark plug.	Oil pressure alarm lamp blinks upon starting? (if applicable)	Check automatic shutdown circuit, "oil sensor". (if applicable)
	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.
Difficult to start, fuel is available, spark is present and compression is normal.	Spark plug wire broken or short circuiting?	Replace defective spark plug wiring.
	Wrong fuel type?	Flush fuel system, and replace with correct type of fuel.
	Water or dust in fuel system?	Flush fuel system.
	Air cleaner dirty?	Clean or replace air cleaner.
Difficult to start, fuel is available, spark is present and compression is low.	Choke open?	Close choke.
	Suction/exhaust valve stuck or protruded?	Reseat valves.
	Piston ring and/or cylinder worn?	Replace piston rings and/or piston.
	Cylinder head and/or spark plug not tightened properly?	Torque cylinder head bolts and spark plug.
No fuel present at carburetor.	Head gasket and/or spark plug gasket damaged?	Replace head and spark plug gaskets.
	No fuel in fuel tank?	Fill with correct type of fuel.
	Fuel cock does not open properly?	Apply lubricant to loosen fuel cock lever, replace if necessary.
	Fuel filter/lines clogged?	Replace fuel filter.
	Fuel tank cap breather hole clogged?	Clean or replace fuel tank cap.
	Air in fuel line?	Bleed fuel line.

TROUBLESHOOTING

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.	Spark plug heat value incorrect?	Replace with correct type of spark plug.
	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 ON/OFF switch in "ON" position.	ON/OFF switch not activated ON?	Turn on ON/OFF Switch.
	ON/OFF switch/wiring defective?	Replace ON/OFF switch. Check wiring.
	Centrifugal stop switch not activated ON?	Turn on centrifugal stop switch.
	Centrifugal stop switch/wiring defective?	Replace centrifugal stop switch. Check wiring.

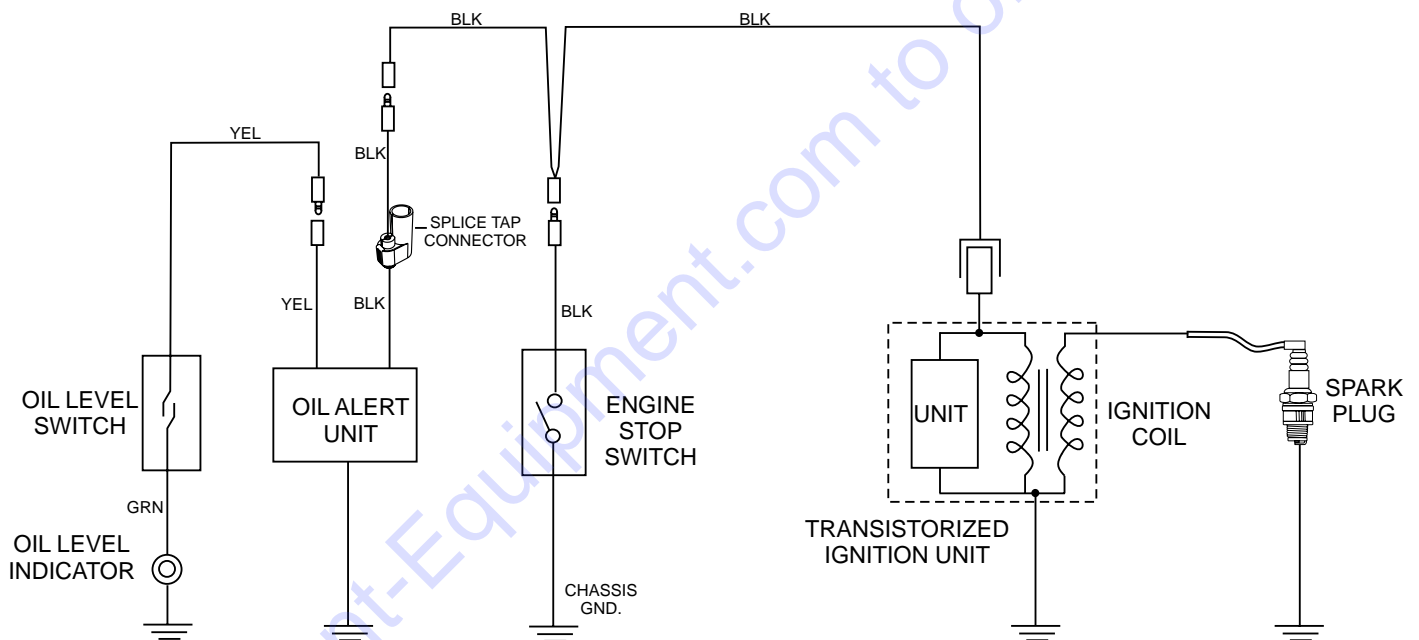
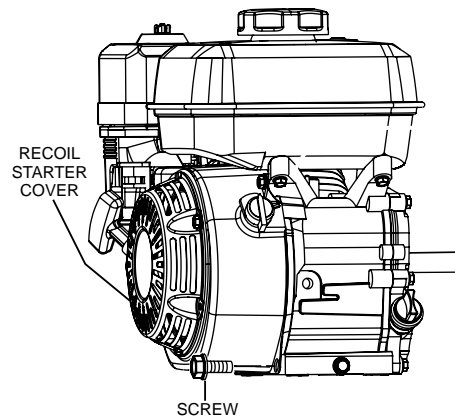
TROUBLESHOOTING

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

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.

WIRING DIAGRAM



EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN. ...	1	MQ-45T ONLY
3	12348	HOSE	A/R	MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol (@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

SUGGESTED SPARE PARTS

BS90C WALK-BEHIND TROWELS

1 to 3 Units

Qty.	P/N	Description
1.....	21172.....	CABLE, THROTTLE
1.....	20285.....	CABLE, CONTROL, (STD)
1.....	20297.....	CABLE, CONTROL (Q.P.)
1.....	30230.....	CABLE, INSTACLUTCH
2.....	0152 3.....	V-BELT, A28
4.....	1157 A.....	BUSHING, TROWEL ARM
4.....	2827-1.....	ARM, TROWEL, EXTENDED, SILVER
1.....	10968.....	THRUST BEARING KIT
2.....	20111.....	OIL, MOBIL SYNTHETIC 220Z.

SUBARU EX170DM2230

Qty.	P/N	Description
3.....	20A0670100.....	SPARK PLUG
1.....	X430440142.....	TANK CAP
3.....	20A3263603.....	AIR CLEANER ELEMENT
1.....	2825011118.....	ROPE, RECOIL

NOTICE

Part numbers on this Suggested Spare Parts list may supersede/replace the part numbers shown in the following parts lists.

NAMEPLATES AND DECALS

NO.	PART NO.	PART NAME	QTY.	REMARKS
1#	23698	ISO DECAL: ROTATING BLADE HAZARD, 2.00" DIA.	1	
2#	23810	ISO DECAL: INHALATION HAZARD, 2.00" DIA	1	
3#	23699	ISO DECAL: READ MANUAL, 2.00" DIA.	1	
4#	23700	ISO DECAL: LIFTING/CRUSH, 2.4" X 2.0"	1	
5#	36099	ISO DECAL: PROTECTIVE CLOTHING, 3.50" X 1.13"	1	
6#	23701	ISO DECAL: ASK FOR TRAINING, 2.00" DIA.	1	
7	2942	DECAL: MQ WHITEMAN 13" WHITE	1	
8	1492	DECAL: FINISHER HANDLE	1	
9	23803-111	ISO DECAL: GUARANTEED SOUND 111 dbA	1	
10#	20816	DECAL: MQ LOGO 6.78" X .80"	2	
11	23824	DECAL: SERIAL PLATE	1	CONTACT DISCOUNT-EQUIPMENT
12	4014	SCREW, 2-3/16 P-K TYPE U-DRIVE	2	
13	30319	DECAL KIT	1	INCLUDES ITEMS W/#
14	12405	DECAL: WHITEMAN QUICK PITCH	1	
15#	22070	DECAL: MQ MULTIQUIP ROUND 3.78" DIA.	1	
16#	23704	ISO DECAL: GUARD WARNING 2.00" DIA.	1	
17	1735	DECAL: PRELOAD TRIM INDICATOR	1	

[illegible]

PARTS FINDER

**Search Website
by Part Number**



**Search Manual
Library For Parts
Manual & Lookup Part
Numbers – Purchase
or Request Quote**

Search Manuals

Enter the serial number or part number to search for parts.

* Part #
Serial Number

* Model
Model Number

Serial
Serial Number

Part Number
Part Number

Quantity
Quantity

Submit

**Can't Find Part or
Manual? Request Help
by Manufacturer,
Model & Description**

Parts Order Form

Please fill in the following information:

Manufacturer

Model

Description

Quantity

Part Number

Serial Number

Part Name

Part Description

Part Location

Part Condition

Part Status

Part Notes

Submit

Discount-Equipment.com is your online resource for quality parts & equipment.

Florida: **561-964-4949** Outside Florida TOLL FREE: **877-690-3101**

Need parts?

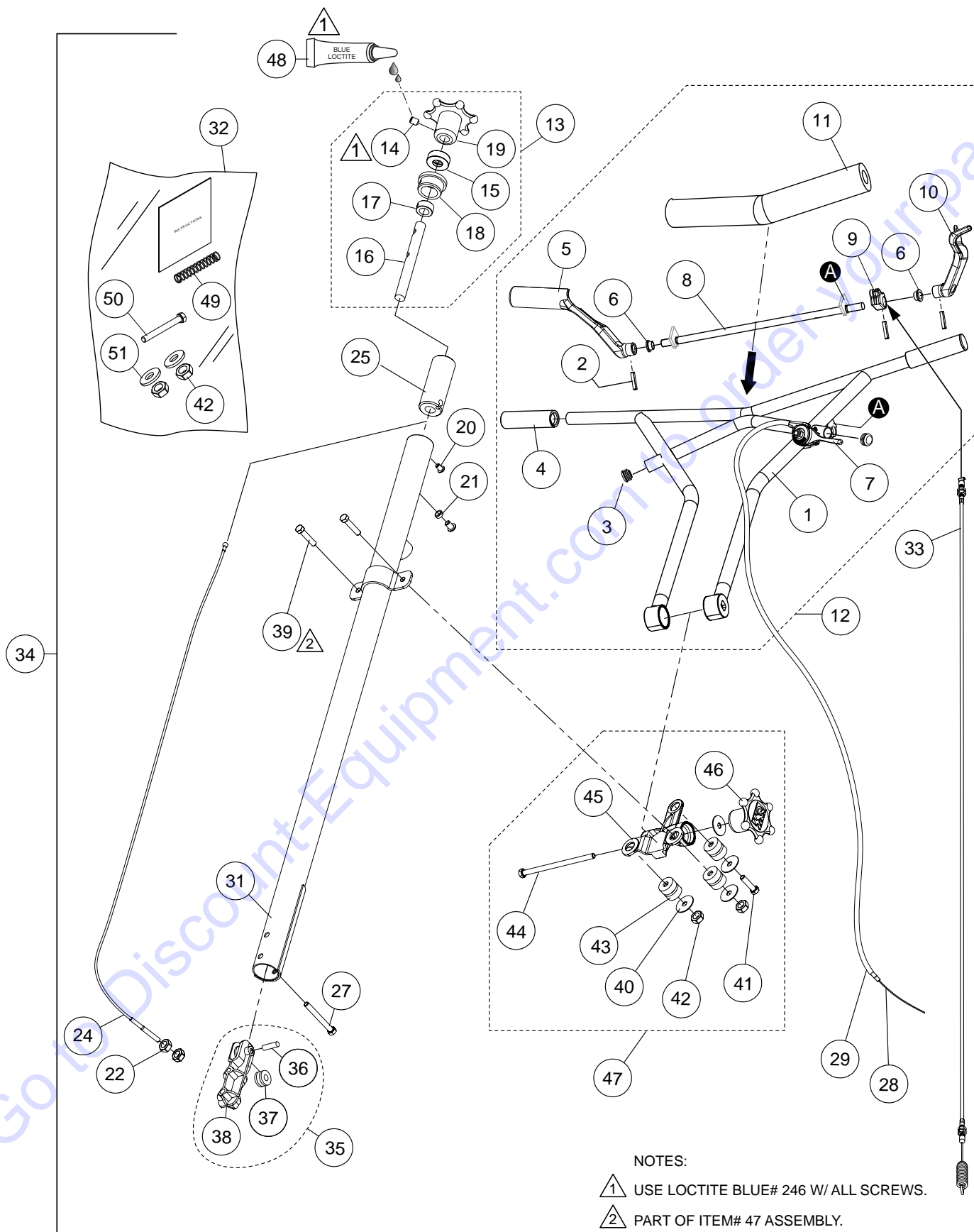
Click on this link: <http://www.discount-equipment.com/category/5443-parts/> and choose one of the options to help get the right parts and equipment you are looking for. Please have the machine model and serial number available in order to help us get you the correct parts. If you don't find the part on the website or on one of the online manuals, please fill out the request form and one of our experienced staff members will get back to you with a quote for the right part that your machine needs.

We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, Stow, Wacker, Sakai, Mi-T-M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment, Amida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, APT, Wylie, Ingersoll Rand / Doosan, Innovatech, Con X, Ammann, Mecalac, Makinex, Smith Surface Prep, Small Line, Wanco, Yanmar

STANDARD HANDLE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1#%	30155	HANDLE	1	
2#%	30203	PIN, ROLL, 3/16" X 7/8"	3	
3#%	22208	PLUG, THROTTLE LEVER	2	
4#%	30174	GRIP	2	
5#%	30169	CASTING, RIGHT PADDLE	1	
6#%	30173	BUSHING, FLANGED, BRONZE, .51" ID X .625" OD	2	
7#%	22732	THROTTLE LEVER ASSY.	1	
8#%	30172	ROD, TORSION BAR	1	
9#%	30171	CASTING, CABLE PULL	1	
10#%	30170	CASTING, LEFT PADDLE	1	
11#%	22166	COVER, VIBE CONTROL HANDLE PAD	1	
12#	30156	UPPER HANDLE ASSY.....	1	INCLUDES ITEMS W/%
13#	20819	HAND WHEEL ASSY., PITCH CONTROL.....	1	INCLUDES ITEMS W/\$
14#\$	0122 C	SCREW, SHS 3/8-16 X 1/2"	1	
15#\$	0281	BEARING, THRUST	1	
16#\$	1478	SHAFT, TROWEL CONTROL	1	
17#\$	3615	COLLAR, SET 3/4" ID	1	
18#\$	20282	BEARING, TROWEL CONTROL	1	
19#\$	20817	WHEEL, HANDLE	1	
20#	0786	SCREW, BHC 1/4-20 X 3/8" NYL PATCH, NP	2	
21#	0786A	SPACER, SLIDE BLOCK GUIDE, .360" X 17/64" X 1/8" L	1	
22#	1116	NUT, BRASS JAM 5/16-18	2	
24#	20285	CABLE, CONTROL	1	
25#	20287	SLIDE BLOCK, TROWEL CONTROL	1	
27#	21017	SCREW, HHC 3/8-16 x 3-1/4" FULL THRD GRD5	1	
28#	21172	CABLE, THROTTLE	1	
29#	21173	HOUSING, THROTTLE CABLE	1	
31#	22095-P	HANDLE, W/ FIN VIBE CONTROL	1	
32#	30220	KIT, HANDLE INSTALLATION	1	INCLUDES ITEMS W/◆
33#	30230	CABLE, CLUTCH	1	
34	SXHC	MAIN HANDLE ASSY.	1	INCLUDES ITEMS W/# CONTACT UNIT SALES

STANDARD HANDLE ASSY.



STANDARD HANDLE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
35#	20280	BLOCK, PITCH CONTROL	1.....	INCLUDES ITEMS W/@
36#@	20279	PIN, SUPPORT BLOCK	1	
37#@	1118	PULLEY, PITCH CABLE ASSY.	1	
38#@	20275	BLOCK, SUPPORT	1	
39#❖	1665	SCREW, HHC 3/8-16 X 2"	2	
40#❖	3233	WASHER, FENDER, 1.5"OD X 3/8"ID	4	
41#❖	9154	SCREW, HHC 3/8-16 X 1-3/4"	1	
42#❖◆	10133	NUT, NYLOC 3/8-16"	4	
43#❖	22059	ISOLATOR, VIBRATION	3	
44#❖	22167	SCREW, HHC 3/8-16 X 6.5" GRD 5	1	
45#❖	22206	CHASSIS, CAST VIBRATION ISOLATOR	1	
46#❖	20439	WHEEL ASSY. , HAND	1	
47#	30206	VIBE CHASSIS ASSY.....	1.....	INCLUDES ITEMS W/❖
48#	60097	LOCTITE, BLUE #246	1	
49#◆	21746	SPRING, PRIMARY THROTTLE RETURN	1	
50#◆	1493	SCREW, HHC 3/8-16 X 3-1/4"	1	
51#◆	10136	WASHER, 3/8" FLAT	2	

This diagram is an exploded view of a mechanical assembly, likely a hydraulic cylinder or actuator. It shows the following components and their assembly sequence:

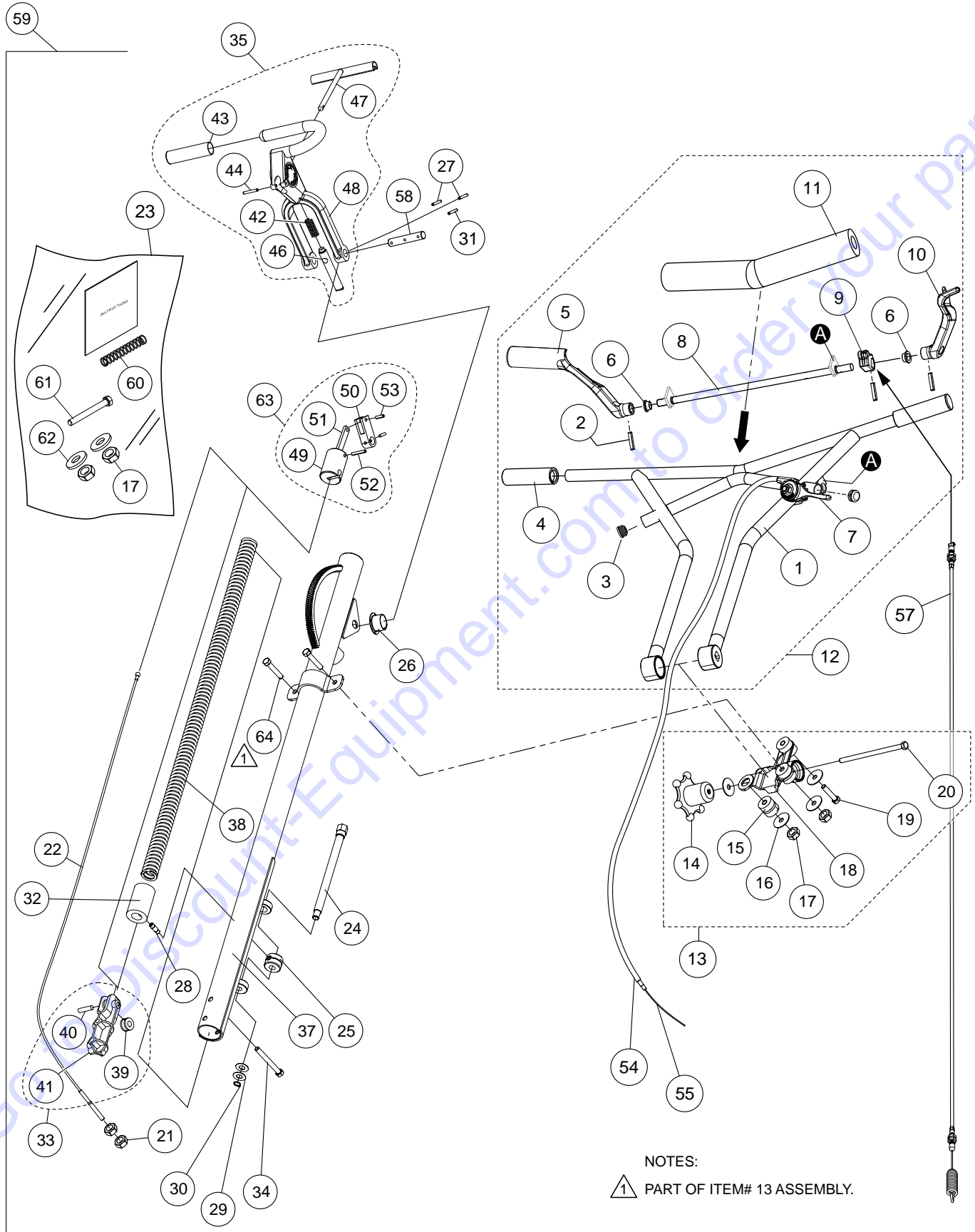
- Top Section (Callout A):** Shows the assembly of the upper rod end. Part 11 (cylinder head) is joined to part 10 (rod) using part 9 (nut) and part 6 (washer). Part 8 (rod) is then inserted through part 5 (seal) and part 2 (pin) into part 4 (rod).
- Bottom Section (Callout B):** Shows the assembly of the lower rod end. Part 20 (rod) is joined to part 19 (nut) and part 18 (washer) using part 15 (pin) and part 14 (pin). Part 16 (rod) is then inserted through part 17 (seal) and part 13 (pin) into part 12 (rod).
- Main Assembly:** The two rod ends are joined to the main body (part 1) using part 7 (nut) and part 3 (pin). The main body is then joined to the base (part 22) using part 26 (pin) and part 24 (pin). The base is secured with part 32 (pin) and part 33 (pin). The main body is also secured with part 37 (pin) and part 38 (pin). The main body is joined to the base using part 39 (pin) and part 40 (pin). The main body is joined to the base using part 41 (pin) and part 42 (pin). The main body is joined to the base using part 43 (pin) and part 44 (pin). The main body is joined to the base using part 45 (pin) and part 46 (pin). The main body is joined to the base using part 47 (pin) and part 48 (pin). The main body is joined to the base using part 49 (pin) and part 50 (pin). The main body is joined to the base using part 51 (pin) and part 52 (pin). The main body is joined to the base using part 53 (pin) and part 54 (pin). The main body is joined to the base using part 55 (pin) and part 56 (pin). The main body is joined to the base using part 57 (pin) and part 58 (pin). The main body is joined to the base using part 59 (pin) and part 60 (pin). The main body is joined to the base using part 61 (pin) and part 62 (pin). The main body is joined to the base using part 63 (pin) and part 64 (pin).

1 PART OF ITEM# 13 ASSEMBLY.

QUICK PITCH HANDLE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1#%	30155	HANDLE	1	
2#%	30203	PIN, ROLL, 3/16" X 7/8"	3	
3#%	22208	PLUG, THROTTLE LEVER	2	
4#%	30174	GRIP	2	
5#%	30169	CASTING, RIGHT PADDLE	1	
6#%	30173	BUSHING, FLANGED, BRONZE, .51" ID X .625" OD	2	
7#%	22732	THROTTLE LEVER ASSY.	1	
8#%	30172	ROD, TORSION BAR	1	
9#%	30171	CASTING, CABLE PULL	1	
10#%	30170	CASTING, LEFT PADDLE	1	
11#%	22166	COVER, VIBE CONTROL HANDLE PAD	1	
12#	30156	UPPER HANDLE ASSY.....	1	INCLUDES ITEMS W/%
13#	30206	VIBE CHASSIS ASSY.....	1	INCLUDES ITEMS W/@
14#@	20439	WHEEL ASSY. , HAND	1	
15#@	22059	ISOLATOR, VIBRATION	3	
16#@	3233	WASHER, FENDER, 1.5"OD X 3/8"ID	4	
17#@◆	10133	NUT, NYLOC 3/8-16	4	
18#@	22206	CHASSIS, CAST VIBRATION ISOLATOR	1	REPLACES P/N 22056
19#@	9154	SCREW, HHC 3/8-16 X 1-3/4"	1	
20#@	22167	SCREW, HHC 3/8-16 X 6-1/2" GRD 5	1	
21#	1116	NUT, BRASS JAM 5/16-18	2	
22#	20297	CABLE, CONTROL	1	
23#	30220	KIT, INSTACLUTCH HANDLE INSTALLATION..	1	INCLUDES ITEMS W/◆
24#	1717	SCREW, Q.P. TRIM ADJUSTMENT	1	
25#	1718	NUT , Q.P. TRIM CONTROL ADJUSTMENT	1	
26#	1719	BUSHING, PIVOT PLATE	2	
27#	1729	PIN, ROLL 3/16" X 1-1/4"	2	
28#	1732	Q.P. ADJUSTMENT PIN	1	
29#	1733	WASHER, 1/2" X 1/32"	2	
30#	1737	RING, SNAP	1	
31#	4568	PIN, ROLL 3/16" X 1"	1	
32#	20270	Q.P. ADJUSTMENT BLOCK	1	
33#	20280	BLOCK, PITCH CONTROL	1	INCLUDES ITEMS W/◇
34#	21017	SCREW, HHC 3/8-16 X 3-1/4" FULL THRD GRD5	1	
35#	20390	TRIGGER, QP ASSY.....	1	INCLUDES ITEMS W/\$
37#	22060-P	MAIN HANDLE, Q.P. VIBE CONTROL	1	
38#	1715	Q.P. SPRING CENTER BALANCE	1	
39#◇	1118	PULLEY, PITCH CABLE HANDLE	1	
40#◇	20279	PIN, SUPPORT BLOCK 3/8" X 1.59"	1	
41#◇	20275	BLOCK, SUPPORT	1	
42#◇	1706	SPRING, COMPRESSION	1	
43#◇	1724	GRIP, HANDLE	1	
44#◇	1729	PIN, ROLL 3/16 X 1-1/4"	1	
46#◇	20437	PIN, Q.P. LATCH	1	
47#◇	1746	TRIGGER, Q.P.	1	

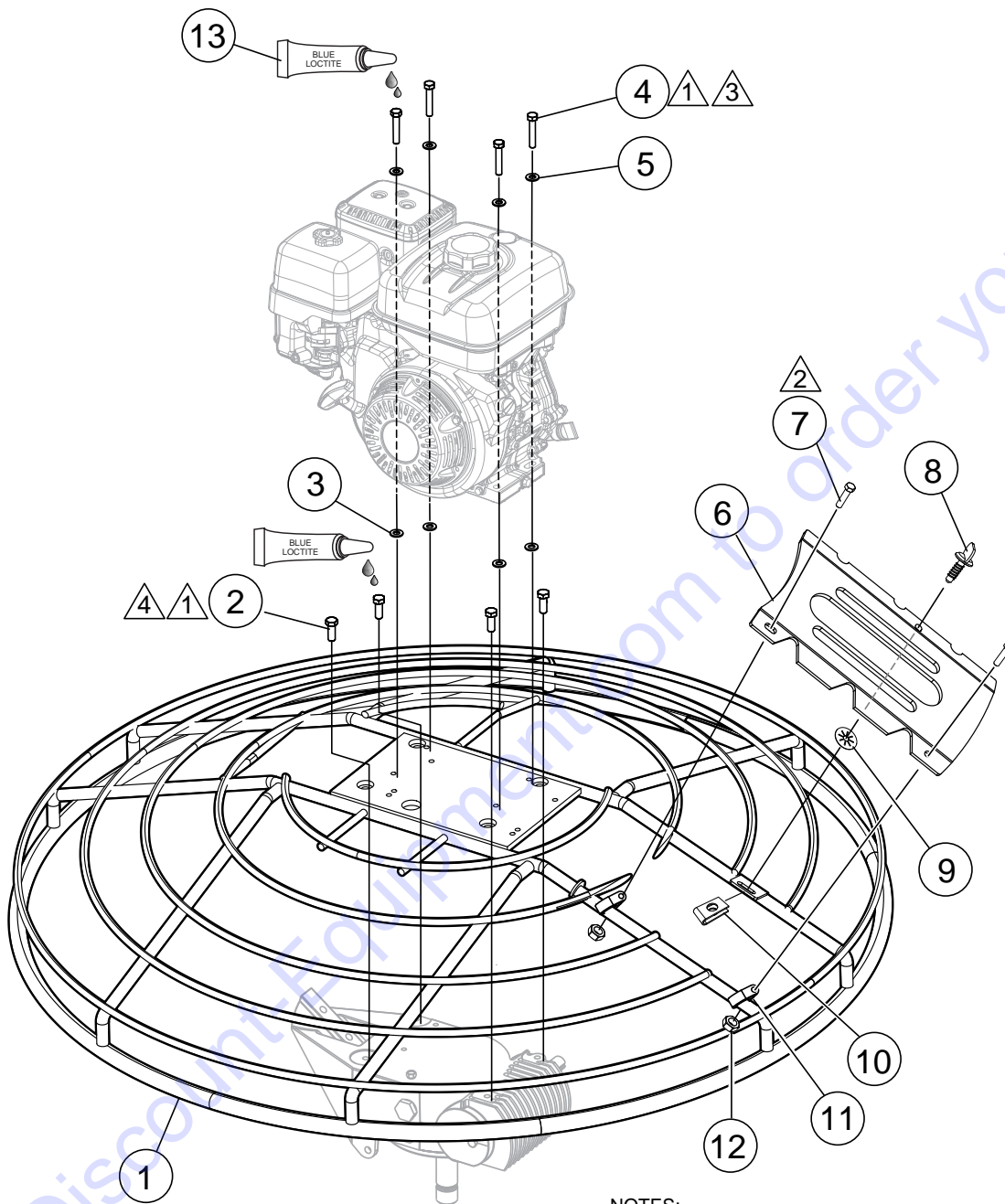
QUICK PITCH HANDLE ASSY.



QUICK PITCH HANDLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
48#\$	20389	TRIGGER, Q.P.	1	
49#❖	20269	BLOCK, CABLE SLIDE	1	
50#❖	20443	ARM, SLIDE CONTROL	1	
51#❖	1709	Q.P. DOGBONE	1	
52#◆	20276	PIN, ROLL, 1/4" X 1-3/4	1	
53#◆	1731	PIN, ROLL, 1/4" X 3/4"	1	
54#	21173	HOUSING, THROTTLE CABLES	1	
55#	21172	CABLE, THROTTLE 68"L	1	
57#	30230	CABLE, INSTACLUTCH	1	
58#	1711	SHAFT, CONTROL Q.P.	1	
59	QXHC	MAIN HANDLE ASSY.	1	INCLUDES ITEMS W/#
60#◆	21746	SPRING, PRIMARY THROTTLE RETURN	1	
61#◆	1493	SCREW, HHC 3/8-16 X 3-1/4"	1	
62#◆	10136	WASHER, 3/8" FLAT	2	
63	20293	LINKAGE, Q.P. CONTROL.....	1	INCLUDES ITEMS W/❖
64	1665	SCREW, HHC 3/8-16 X 2"	2	

GUARD RING AND ENGINE MOUNTING ASSY.



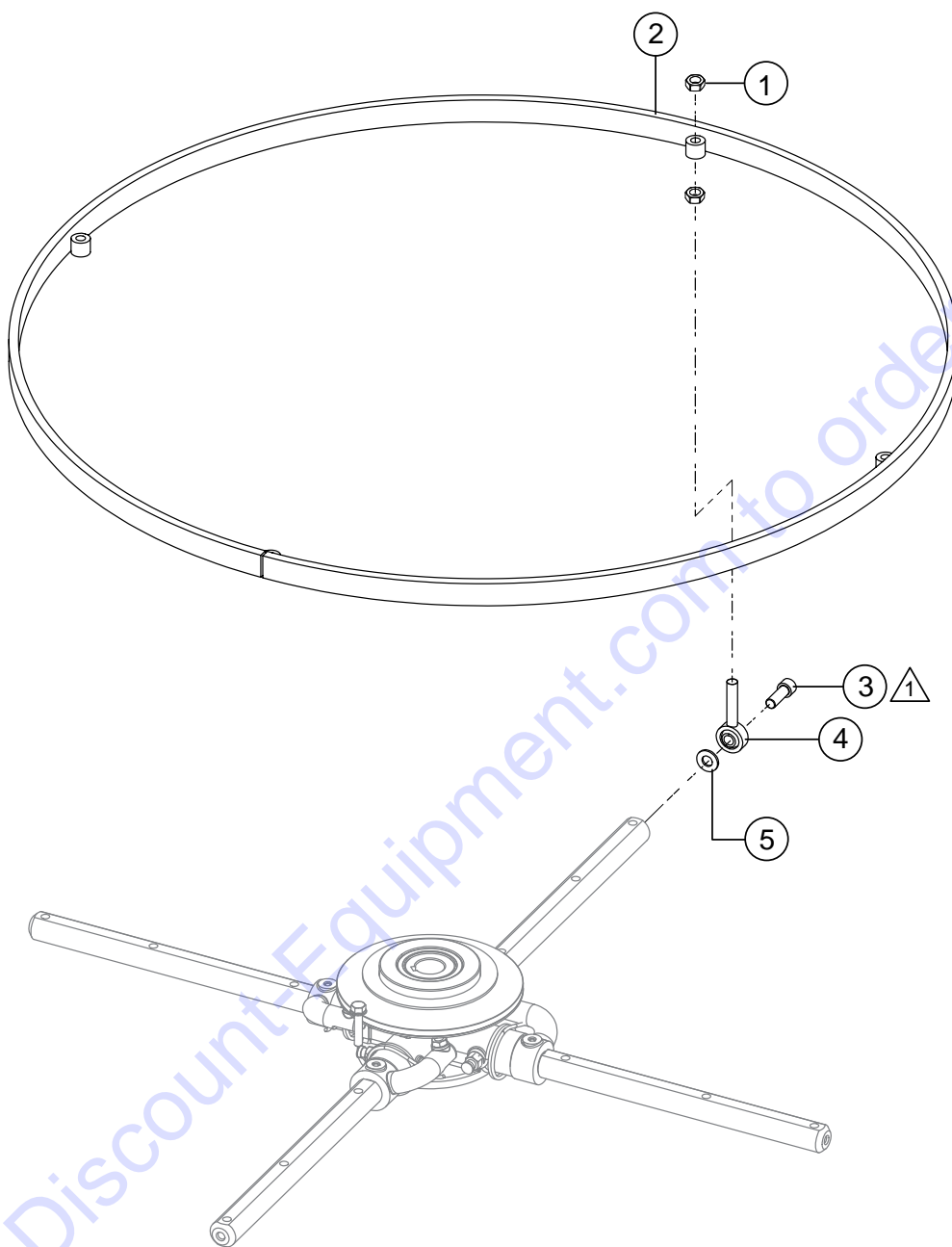
NOTES:

- △1 USE LOCTITE BLUE# 246 W/ ALL SCREWS.
- △2 TORQUE TO 8 FT.-LBS. (10.8 N·m)
- △3 TORQUE TO 14.5 FT.-LBS. (20 N·m)
- △4 TORQUE TO 23 FT.-LBS. (31 N·m)

GUARD RING AND ENGINE MOUNTING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	21973	GUARD RING	1	
2	0205	SCREW, HHC 3/8-16 X 1"	4	
3	13351	WASHER, FLAT 3/8 EXT THICK HIGH STRGTH	4	
4	1391	SCREW, HHC 5/16-24 X 1-1/2 ZINC	4	
5	933241	WASHER, FLAT SAE 5/16 GRD 9 YZ	4	
6	21979	ACCESS PANEL	1	
7	26250	SCREW, HHC 1/4-20 X 1-3/4"	2	
8	21893	SCREW, FAST LEAD	1	
9	21986	WASHER, FAST LEAD-STAINLESS	1	
10	21894	CLIP, FAST LEAD	1	
11	21922	CLAMP, 0.625"ID PIPE	2	
12	10024	NUT, NYLOC 1/4-20	2	
13	60097	BLUE LOCTITE, #246	AR	

STABILIZER RING ASSY.



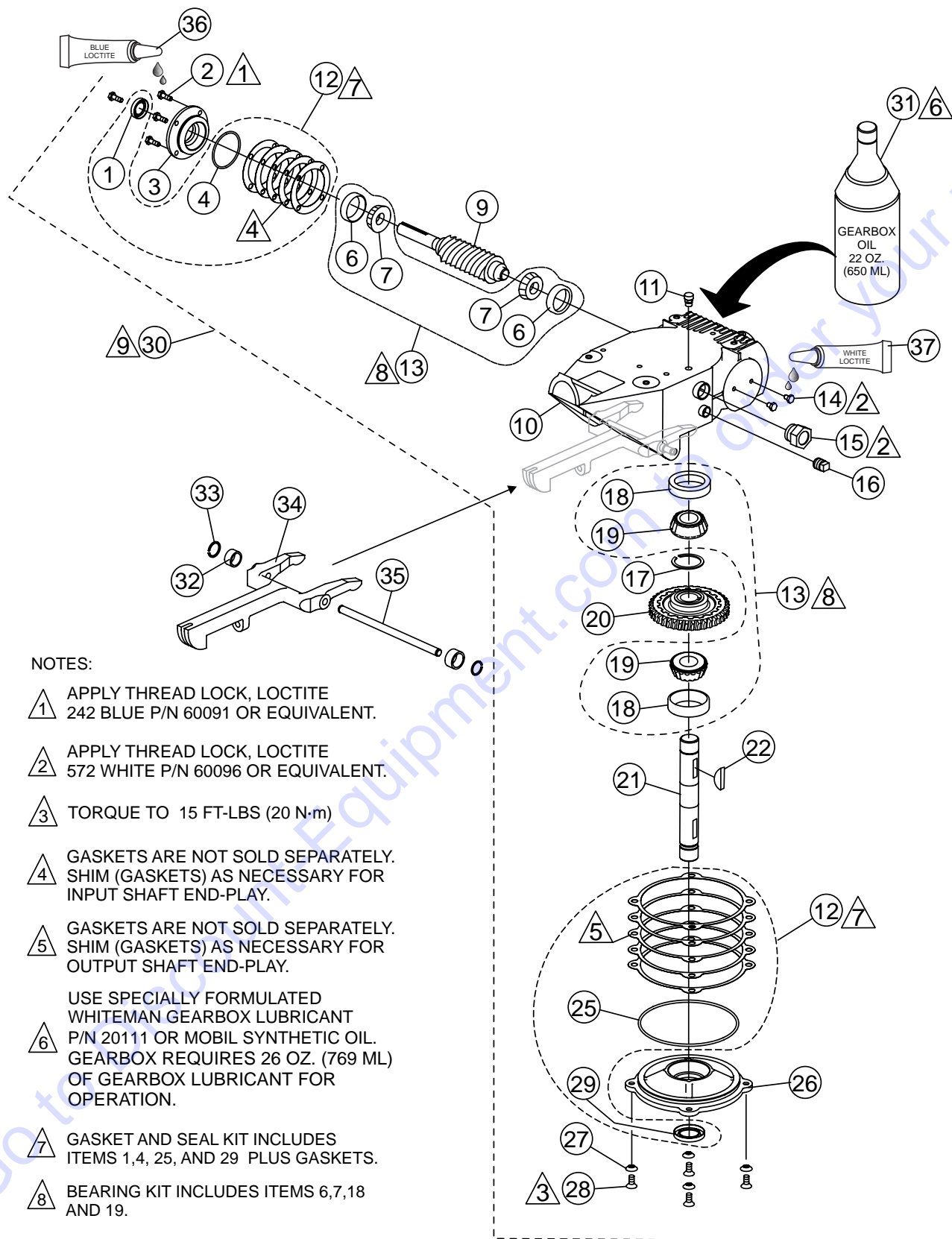
NOTES:

△ 1 TORQUE TO 17 FT.-LBS. (23 N·m)

STABILIZER RING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	6014 C	NUT, HEX FINISH 5/16-24	8	
2	1483	RING, STABILIZER	1	
3	1237	SCREW, SHC 5/16-18 X 7/8, NYL PATCH, NP	4	
4	1723	ROD END, 5/16 DIA X 5/16-24 MALE END RH	4	
5	0300 B	WASHER, FLAT SAE 5/16	4	

GEARBOX ASSY.



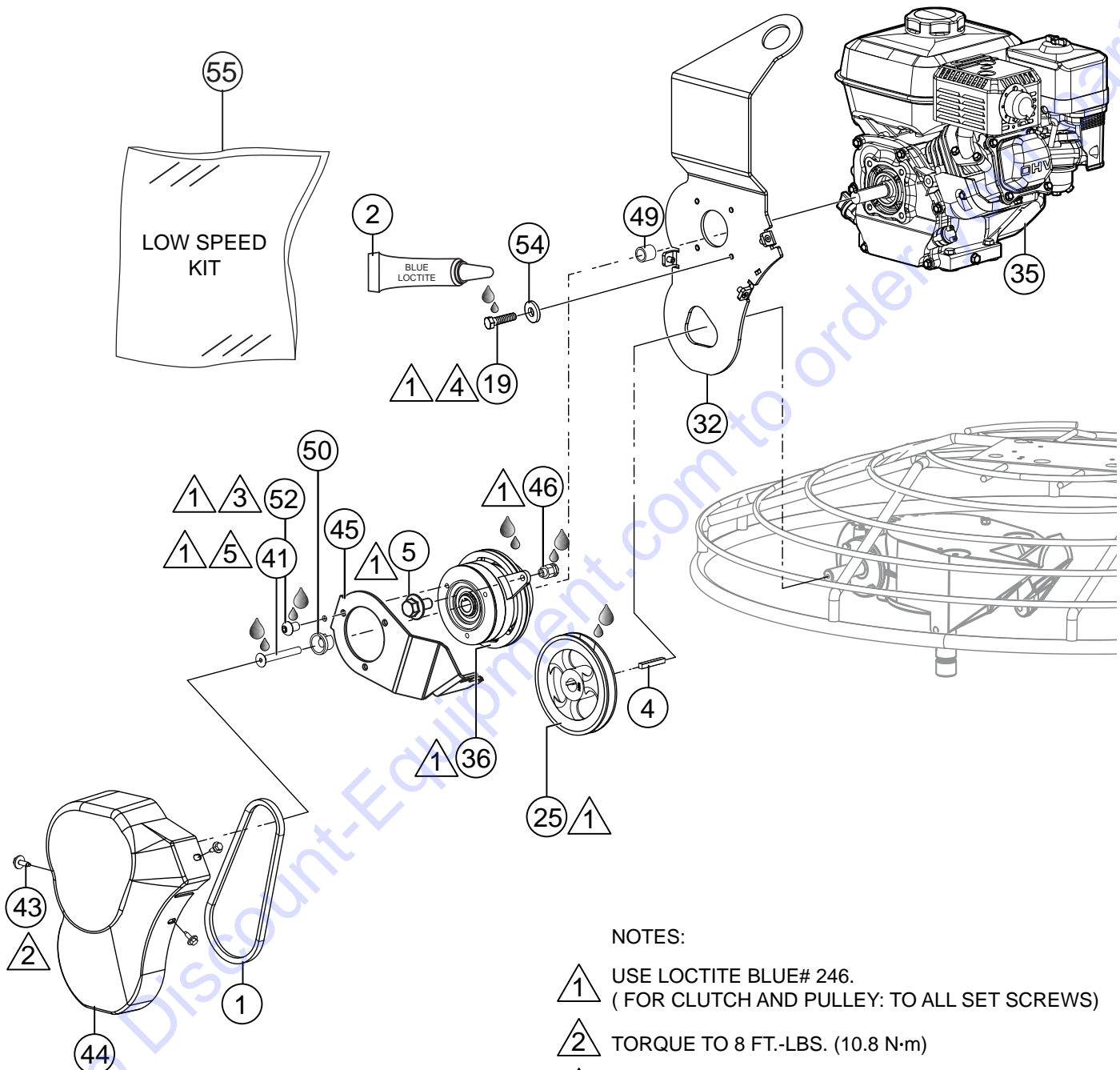
NOTES:

- ① APPLY THREAD LOCK, LOCTITE 242 BLUE P/N 60091 OR EQUIVALENT.
- ② APPLY THREAD LOCK, LOCTITE 572 WHITE P/N 60096 OR EQUIVALENT.
- ③ TORQUE TO 15 FT-LBS (20 N·m)
- ④ GASKETS ARE NOT SOLD SEPARATELY. SHIM (GASKETS) AS NECESSARY FOR INPUT SHAFT END-PLAY.
- ⑤ GASKETS ARE NOT SOLD SEPARATELY. SHIM (GASKETS) AS NECESSARY FOR OUTPUT SHAFT END-PLAY.
- ⑥ USE SPECIALLY FORMULATED WHITEMAN GEARBOX LUBRICANT P/N 20111 OR MOBIL SYNTHETIC OIL. GEARBOX REQUIRES 26 OZ. (769 ML) OF GEARBOX LUBRICANT FOR OPERATION.
- ⑦ GASKET AND SEAL KIT INCLUDES ITEMS 1,4, 25, AND 29 PLUS GASKETS.
- ⑧ BEARING KIT INCLUDES ITEMS 6,7,18 AND 19.
- ⑨ GEARBOX ASSEMBLY ITEM 30, INCLUDES ITEMS WITHIN DASHED LINE EXCEPT ITEMS 12,13 AND 31.

GEARBOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1%\$	0753	SEAL, OIL	1	
2%	0131A	SCREW, HHC 1/4-20 X 3/4"	4	
3%	12876	FLANGE, INPUT SHAFT	1	
4%\$	20395	O-RING, 2"	1	
6%#	20466	BEARING, CUP, TIMKEN #M11910	2	
7%#	20465	BEARING, CONE, TIMKEN #LM11949	2	
9%	1851	GEAR, WORM "B" INPUT SHAFT	1	
10%	12874	CASE, WORM GEAR	1	
11%	21218	VENT, AIR	1	
12	21046	GASKET/SEAL KIT.....	1	INCLUDES ITEMS W/\$
13	21047	BEARING KIT	1	INCLUDES ITEMS W/#
14%	20476	SCREW, HHC 1/4-28 X 3/8"	2	
15%	21033	SIGHT GLASS, 3/4 M PIPE STEEL	1	
16%	0121 A	FITTING, PLUG 3/8 MP SQ HEAD	1	
17%	1138	RING, SNAP	1	
18%#	20475	BEARING, CUP TIMKEN #M86610	2	
19%#	20474	BEARING, CONE TIMKEN #M86647	2	
20%	1140	GEAR, WORM, COMPOSITE	1	
21%	20470	SHAFT, OUTPUT	1	
22%	1139	KEY, WOODRUFF #810	1	
25%\$	20396	O-RING	1	
26%	12875	COVER, GEARBOX	1	
27%	10235	WASHER, C/S EXT. SHKP	4	
28%	20875	SCREW, FHSC 5/16-18 X 3/4"	4	
29%\$	0254	SEAL, OIL	1	
30	20407	GEARBOX ASSY.	1	INCLUDES ITEMS W/%
31	20111	OIL, MOBIL SYNTHETIC SHC634, 22 OZ. (650 ML)	2	
32	22292	SPACER, 0.5" X 0.402" X .25"L UNTREATED	2	
33	20802	RING, SNAP	2	
34	1150	YOKE ARM	1	
35	20801	PIN, YOKE	1	
36	60091	LOCTITE, BLUE #242	AR	
37	60096	LOCTITE, WHITE #572	AR	

ENGINE AND CLUTCH ASSY.

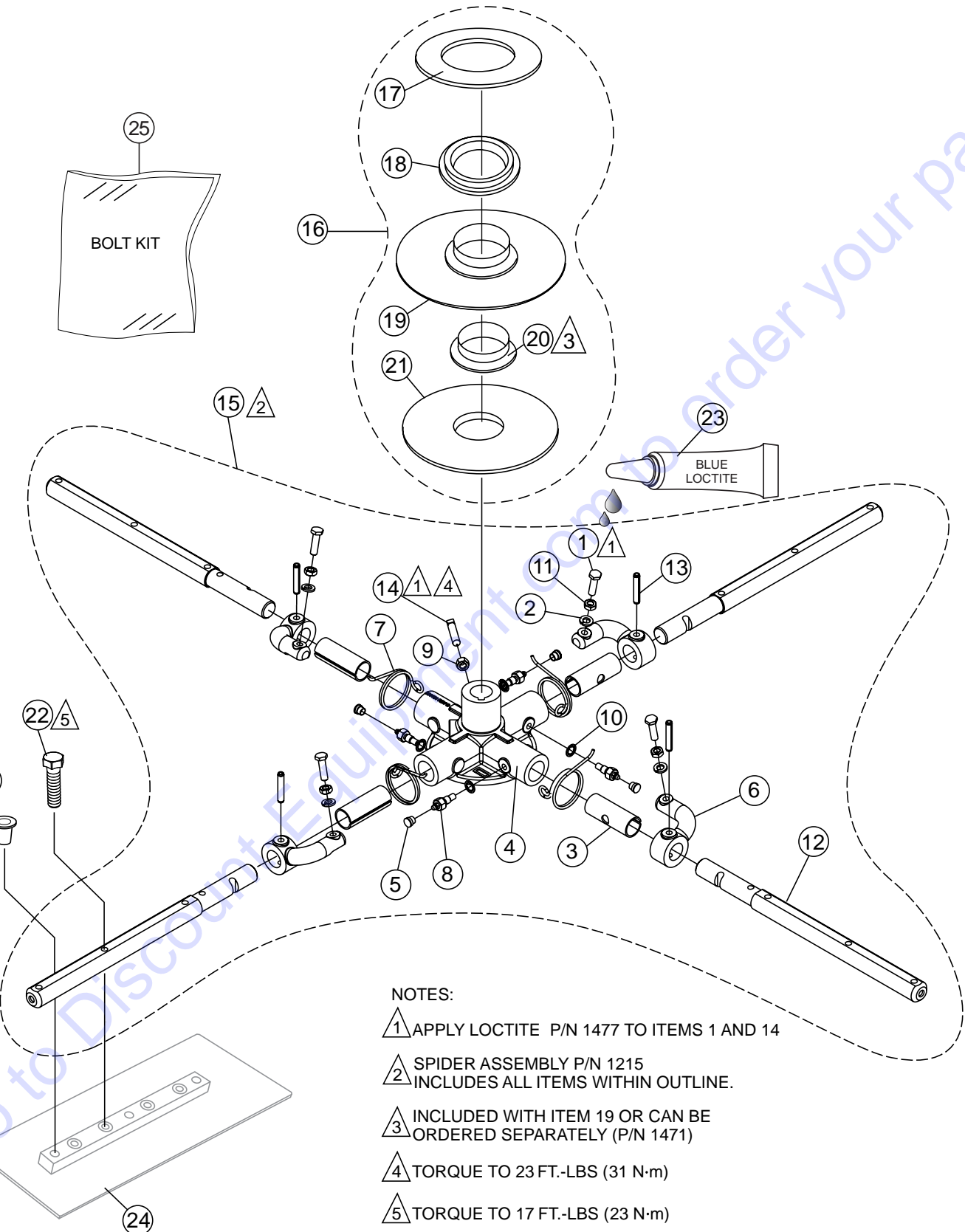


NOTES:

- 1 USE LOCTITE BLUE# 246.
(FOR CLUTCH AND PULLEY: TO ALL SET SCREWS)
- 2 TORQUE TO 8 FT.-LBS. (10.8 N·m)
- 3 TORQUE TO 13 FT.-LBS. (18 N·m)
- 4 TORQUE TO 14.5 FT.-LBS. (19.6 N·m)
- 5 TORQUE TO 26 FT.-LBS. (35 N·m)

ENGINE AND CLUTCH ASSY.

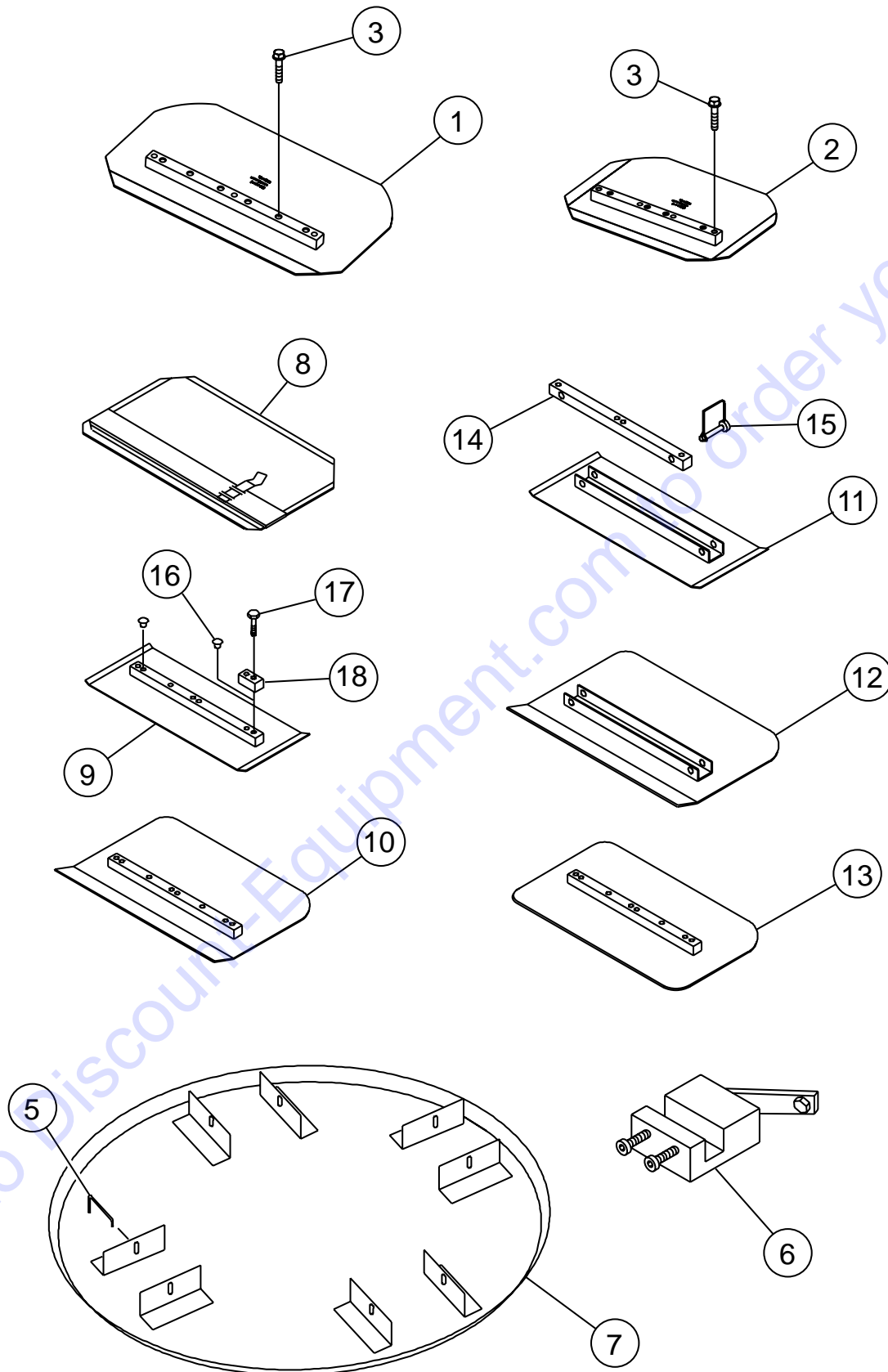
<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0152 3	BELT, A28	1	
2	60097	BLUE LOCTITE, #246	AR	
4	0627	KEY, 3/16" X 1-1/4"	1	
5	22538-001	SCREW, HEX FLANGE, 1/4-20 X 0.5"	1	
19	10229	SCREW, HHC 5/16-24 X 1"	4	
25	21140	PULLEY AK54 X 3/4"	1	
32	21984	LIFTING BALE ASSY.	1	
35	22623	ENGINE, HONDA GX27OUT2QAP2 (8.5 HP)	1	
36	22891	CLUTCH, FRICTION DRIVE, 1.0" SHAFT	1	
41	23965	SCREW, FHSC, 7/16-20 X 1.00	1	
43	30119	SCREW, 1/4-20X7/8 IND HEX, DOG PT	3	
44	30344	BELT GUARD	1	
45	30200	BRACKET, 1" SHAFT	1	
46	30202	ANCHOR, SPRING	1	
49	30236	SPACER, 1" SHAFT	1	
50	30240	END CAP, 1" SHAFT	1	
52	32448	SCREW, BHC, 5/16-18 x 1/2"	4	
54	933241	WASHER, FLAT SAE 5/16 GRD 9 YZ	8	
55	22587	LOW SPEED KIT	1	INCLUDES ITEMS W/\$



SPIDER ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1%	0164 B	SCREW, HHC ROUNDED 3/8-16, FULL THREAD	4	
2%	0166 A	LOCK WASHER 3/8" MED	4	
3%	1157 A	BUSHING, TROWEL ARM	4	
4%	1161-1	SPIDER PLATE, 1-1/8" SHAFT 4BLD, SILVER	1	
5%	1162 A	CAP, GREASE ZERK #2 YELLOW	4	
6%	1163-1	LEVER, TROWEL ARM, RIGHT HAND, SILVER	4	
7%	1316	SPRING, LS ARM RETURN	4	
8%	1322	RETAINING SCREW ASSY.	4	
9%	1456	NUT, HEX FINISH 3/8-16	1	
10%	1875	WASHER, INT. SHKP. 3/8"	4	
11%	1876	NUT, HEX JAM 3/8-16 CLASS 2B	4	
12%	2827-1	ARM, TROWEL, B EXTENDED, SILVER	4	
13%	4164	ROLL PIN 5/16" X 1-3/4"	4	
14%	12097	SCREW, SQHS 3/8-16 X 1-3/4" CONE GRD 8 PLTD	1	
15	1490	SPIDER PLATE ASSY.,	1	INCLUDES ITEMS W/%
16	10968	THRUST COLLAR ASSY.	1	INCLUDES ITEMS W/\$
17\$	12208	WEAR RING	1	
18\$	12778	FLANGE BEARING	1	
19\$	10793	THRUST COLLAR	1	INCLUDES ITEMS W/#
20\$#	1471	THRUST COLLAR BUSHING	1	
21\$	1154 A	WEAR PLATE	1	
22@	21906	SCREW, HHCS 5/16-18 X 1-1/2" GRD 5	12	
23	1477	BLUE LOCTITE, #242	AR	
24		BLADE ASSY.....	4	CONTACT DISCOUNT-EQUIPMENT
25	23648	KIT, BOLT SAE.....	1	INCLUDES ITEMS W/@
26@	1434	PLUG, BLADE	4	

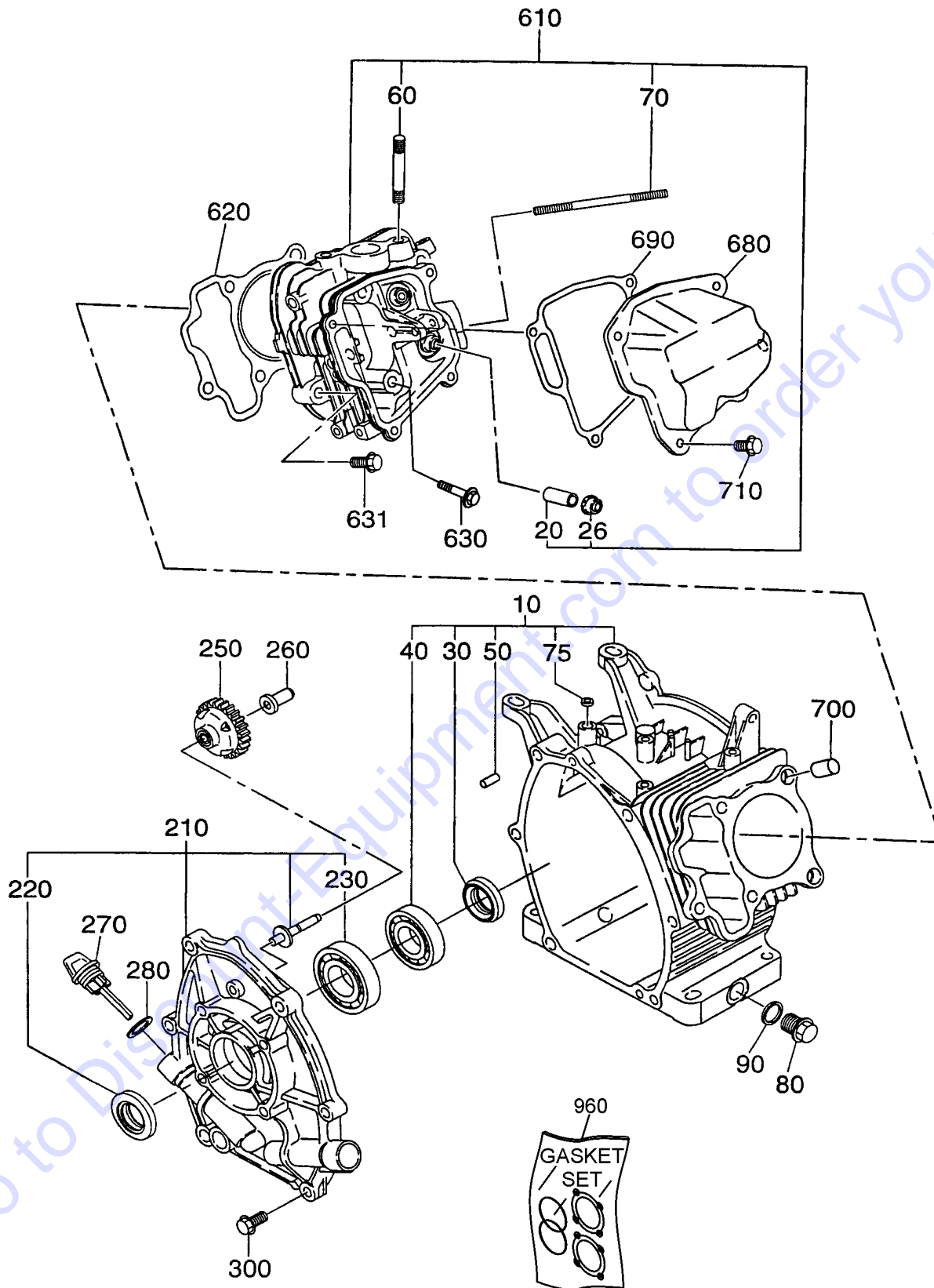
BLADES AND PAN ASSY.



BLADES AND PAN ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1		BLADE, COMBO 8" X 14"	4	(ALL EXCEPT 30")
2		BLADE, COMBO 8 X 10-1/2"	4	(30" TROWEL ONLY)
3	21906	SCREW, HHFS 5/16-18 X 1-1/2" GR5.....	8	ALL
5	20646	LATCH PIN FOR FLOAT PANS	4	CONTACT UNIT SALES DEPT./ACC.ITEM
6	1817	TRWL ARM ADJ. FIXTURE 36" TO 46" MODELS..	1	CONTACT UNIT SALES DEPT./ACC.ITEM
7		FLOAT DISC	1	CONTACT UNIT SALES DEPT./ACC.ITEM
8		FLOAT BLADE	4	CONTACT UNIT SALES DEPT./ACC.ITEM
9		FINISH BLADE	4	CONTACT UNIT SALES DEPT./ACC.ITEM
10		COMBO FLOAT & FINISH BLADE	4	CONTACT UNIT SALES DEPT./ACC.ITEM
11		ENDURO UNIVERSAL FINISH BLADE	4	CONTACT UNIT SALES DEPT./ACC.ITEM
12		ENDURO UNIVERSAL COMBO BLADE.....	4	CONTACT UNIT SALES DEPT./ACC.ITEM
13		REVERSIBLE COMBO BLADE	4	CONTACT UNIT SALES DEPT./ACC.ITEM
14		UNIVERSAL MOUNTING BAR.....	4	CONTACT UNIT SALES DEPT./ACC.ITEM
15	QS1869	SNAP PIN FOR QC BLADES	8	CONTACT UNIT SALES DEPT./ACC.ITEM
16	1434	PLUG, BLADE (FINISH BLADE ONLY)	4	
17	0202	SCREW, HHC 5/16-18 X 1" ZINC	4	
18	0201	LUG, GUARD RING	4	

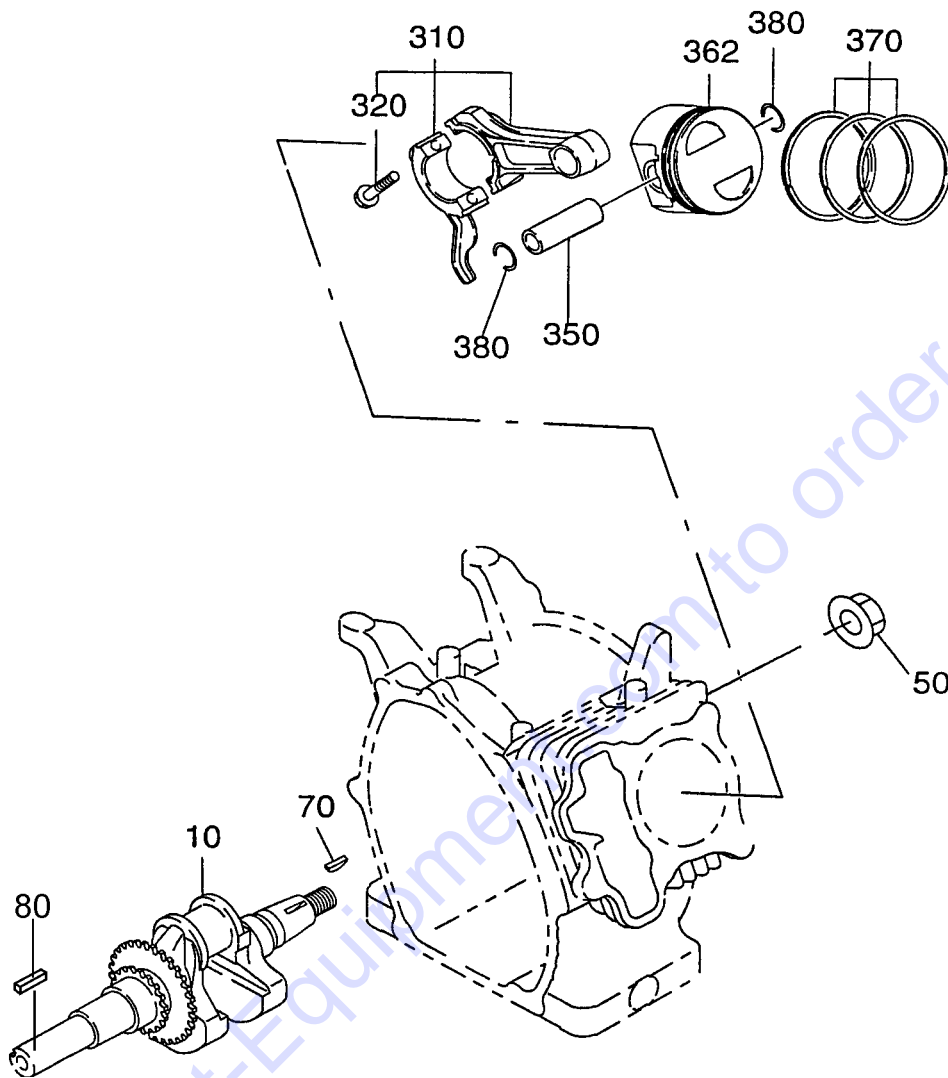
EX17 — CRANKCASE ASSY.



EX17 — CRANKCASE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
10	20A1010601	CRANK CASE CP	1	INCLUDES ITEMS W/\$
20#	20A1420103	VALVE GUIDE	2	
26#	20A1601001	STEM SEAL	1	
30\$	20A0480100	OIL SEAL	1	
40\$	20A0610100	BALL BEARING	1	
50\$	20A1501103	PIPE KNOCK	2	
60#	20A0161100	STUD	1	
70#	20A0160100	STUD	2	
75\$	20A0480200	OIL SEAL	1	
80	20A0410100	PLUG	1	
90@	20A0220100	GASKET	2	
210	20A1100201	MAIN BEARING COVER C	1	INCLUDES ITEMS W/%
220%	20A0480300	OIL SEAL	1	
230%	20A0610200	BALL BEARING	1	
250	20A4500401	GOVERNOR GEAR CP	1	
260	20A4190103	GOVERNOR SLEEVE	1	
270	20A6360103	OIL GAUGE	2	
280@	20A0230100	GASKET	2	
300	20A0110100	FLANGE BOLT	6	
610	20A1300101	CYLINDER HEAD CP	1	INCLUDES ITEMS W/#
620@	20A1500103	GASKET (HEAD)	1	
630	20A0110200	FLANGE BOLT	4	
631	20A0110300	FLANGE BOLT	1	
680	20A1550501	ROCKER COVER CP	1	
690@	20A1600113	GASKET (ROCKER COVER)	1	
700	20A1501103	PIPE KNOCK	2	
710	20A0111100	FLANGE BOLT	4	
960	2779900127	GASKET SET	1	INCLUDES ITEMS W/@ AND ITEM 340 MUFFLER ASSY.

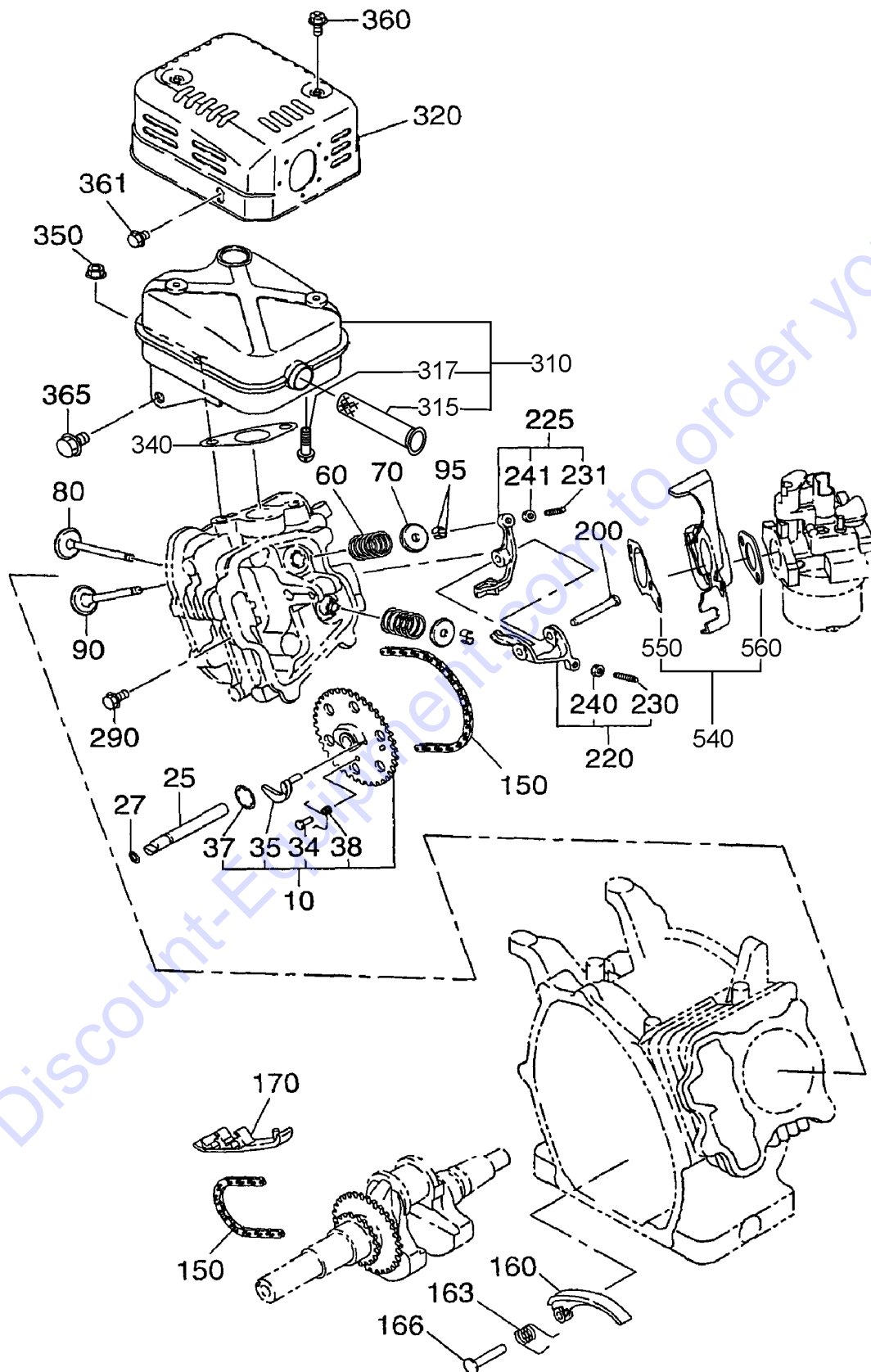
EX17 — CRANKSHAFT ASSY.



EX17 — CRANKSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	20A2090201	CRANKSHAFT CP	1	
50	20A0185300	FLANGE NUT	1	
70	20A0360100	WOODRUFF KEY	1	
80	20A0361200	KEY	1	
310	20A2250110	CONNECTING ROD ASSY.....	1	INCLUDES ITEMS W/#
320#	20A2300103	CONNECTING ROD BOLT	2	
350	20A2330103	PISTON PIN	1	
362	20A2340103	PISTON	1	
370		PISTON RING SET	1	
380	20A0320100	CLIP	2	

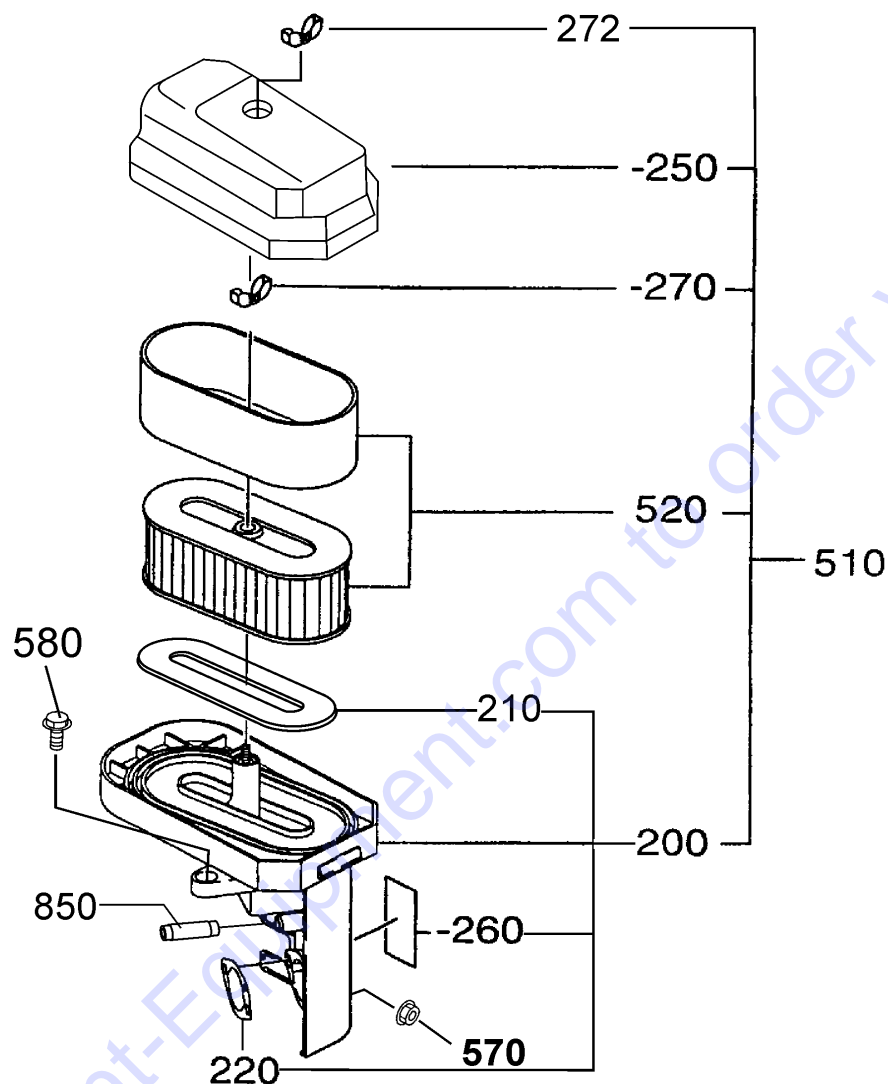
EX17 — MUFFLER ASSY.



EX17 — MUFFLER ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
10	20A3160101	CAM SHAFT CP	1	INCLUDES ITEMS W/%
25	20A3510103	PIN (CAM SHAFT)	1	
27	20A0280100	O-RING	1	
34%	20A3860103	PIN (SPRING)	1	
35%	20A3640103	RELEASE LEVER	1	
37%	20A3650103	CLIP	1	
38%	20A3870203	RETURN SPRING	1	
60	20A3360103	VALVE SPRING	2	
70	20A3370103	SPRING RETAINER	2	
80	20A3340103	INTAKE VALVE	1	
90	20A3360103	EXHAUST VALVE	1	
95	20A3380103	COLLET-VALVE	4	
150	20A3560101	TIMING CHAIN CP	1	
160	20A3691103	TENTIONER	1	
163	20A3710103	SPRING (TENTIONER)	1	
166	20A3690203	PIN (TENTIONER)	1	
170	20A3691303	CHAIN GUIDE	1	
200	20A3500201	PIN (ROCKER) CP	1	
202	20A0321100	CLIP	1	
220	20A3620100	ROCKER ARM (IN) ASSY.....	1	INCLUDES ITEMS W/#
225	20A3620200	ROCKER ARM (EX) ASSY.....	1	INCLUDES ITEMS W/@
230#	20A0140100	ADJUST SCREW	1	
231 @	20A140100	ADJUST SCREW	1	
240#	20A0180100	NUT	1	
241 @	20A0180100	NUT	1	
290	20A0111100	FLANGE BOLT	1	
310	20A3011101	MUFFLER CP	1	INCLUDES ITEMS W/+
315+	20A3760101	SPARK ARRESTER CP	1	
317+	20A0140200	TAPPING SCREW	1	
320	20A3420101	MUFFLER COVER CP	1	
340	20A3520103	GASKET (MUFFLER)	1	
350	20A0185100	FLANGE NUT	2	
360	20A0120100	TAPPING BOLT	2	
361	20A0111200	FLANGE BOLT	1	
365	20A0110400	FLANGE BOLT	1	
387	20A0140200	TAPPING SCREW	2	
440	20A3700101	DEFLECTOR CP	1	
540	20A3290203	INSULATOR CP	1	INCLUDES ITEMS W/\$
550\$	20A3590303	GASKET 2 (INSULATOR)	1	
560\$	20A3590203	GASKET 1 (INSULATOR)	1	

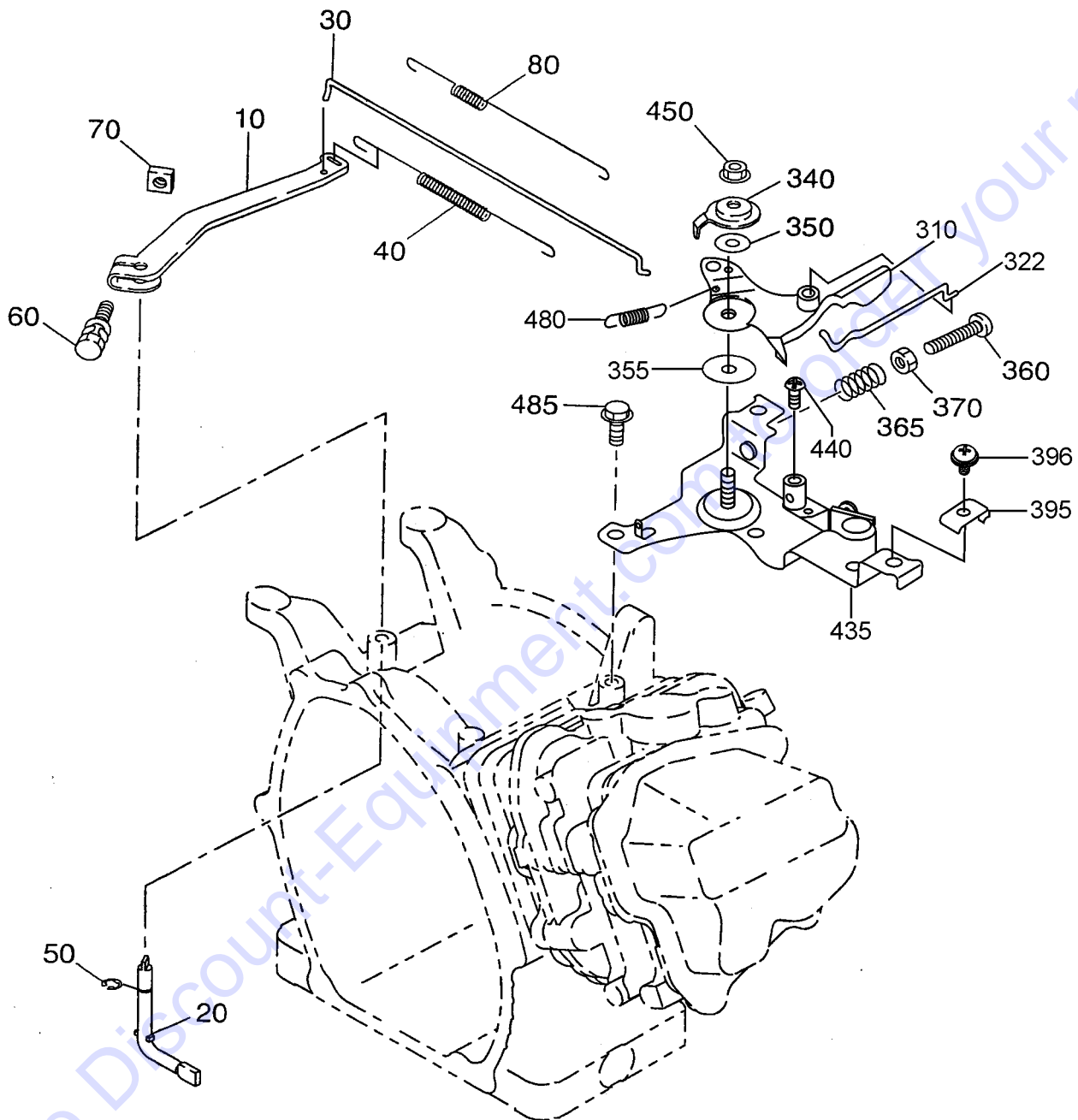
EX17 — AIR CLEANER ASSY.



EX17 — AIR CLEANER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
510#	20A3273100	AIR CLEANER ASSY.	1.....	INCLUDES ITEMS W/#
510-200#	20A3280202	BASE CP	1.....	INCLUDES ITEMS W/%
510-210#%	2773261008	PACKING	1	
510-220#%	2773260408	PACKING	1	
510-250#	20A3280103	COVER CP	1	
510-260#%	20A3261503	LABEL	1	
510-270#	2773274118	WING NUT	1	
510-272#	2773260708	WING NUT	1	
510-520#	20A3263603	ELEMENT SET	1	
570	20A0185200	FLANGE NUT	2	
580	20A0111300	FLANGE BOLT	1	
850	20A0811100	BREATHER PIPE	1	

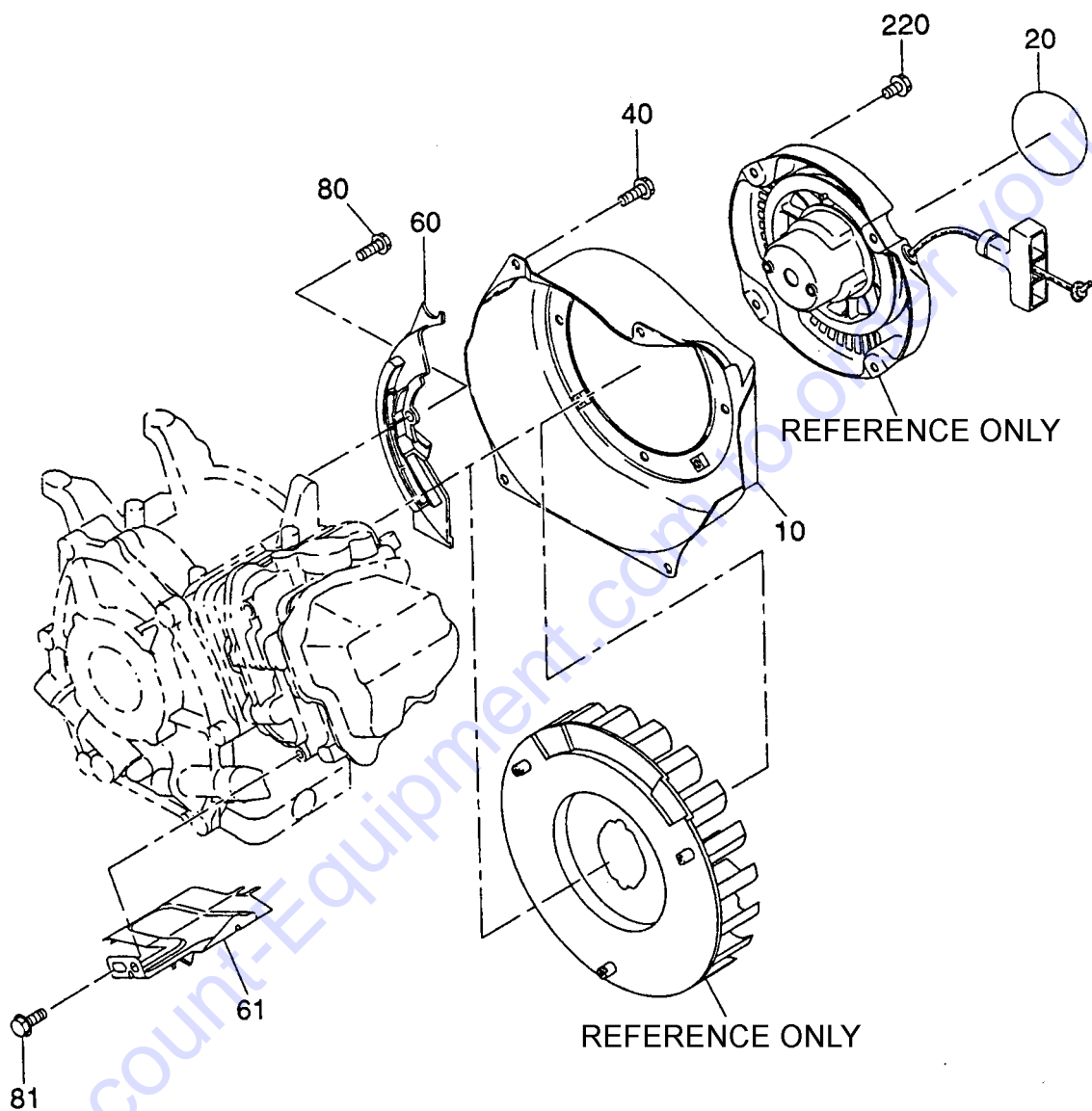
EX17 — GOVERNOR ASSY.



EX17 — GOVERNOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
10	20A4230103	GOVERNOR LEVER	1	
20	20A4220103	GOVERNOR SHAFT	1	
30	20A4270101	GOVERNOR ROD CP	1	
40	20A4280103	ROD SPRING	1	
50	20A0321100	CLIP	1	
60	20A0130110	BOLT AND WASHER AY	1	
70	20A0190100	NUT	1	
80	20A4251003	GOVERNOR SPRING	1	
310	20A4330301	SPEED CONT. LEVER CP	1	
322	20A4370101	LINK ROD CP	1	
340	20A4350203	STOP PLATE	1	
350	20A4680103	WASHER	1	
355	20A0230600	FRICTION WASHER	1	
360	20A0140400	SCREW	1	
365	20A4501103	SPRING (ADJUST)	1	
395	20A4390203	CLAMP	1	
396	20A0151100	SCREW AND WASHER AY	1	
435	20A4600301	SPEED CONT. BRKT CP	1	
440	20A0141100	SCREW	1	
450	20A0191100	SELF LOCK NUT	1	
480	20A4510301	RETURN SPRING	1	
485	20A0111100	FLANGE BOLT	2	

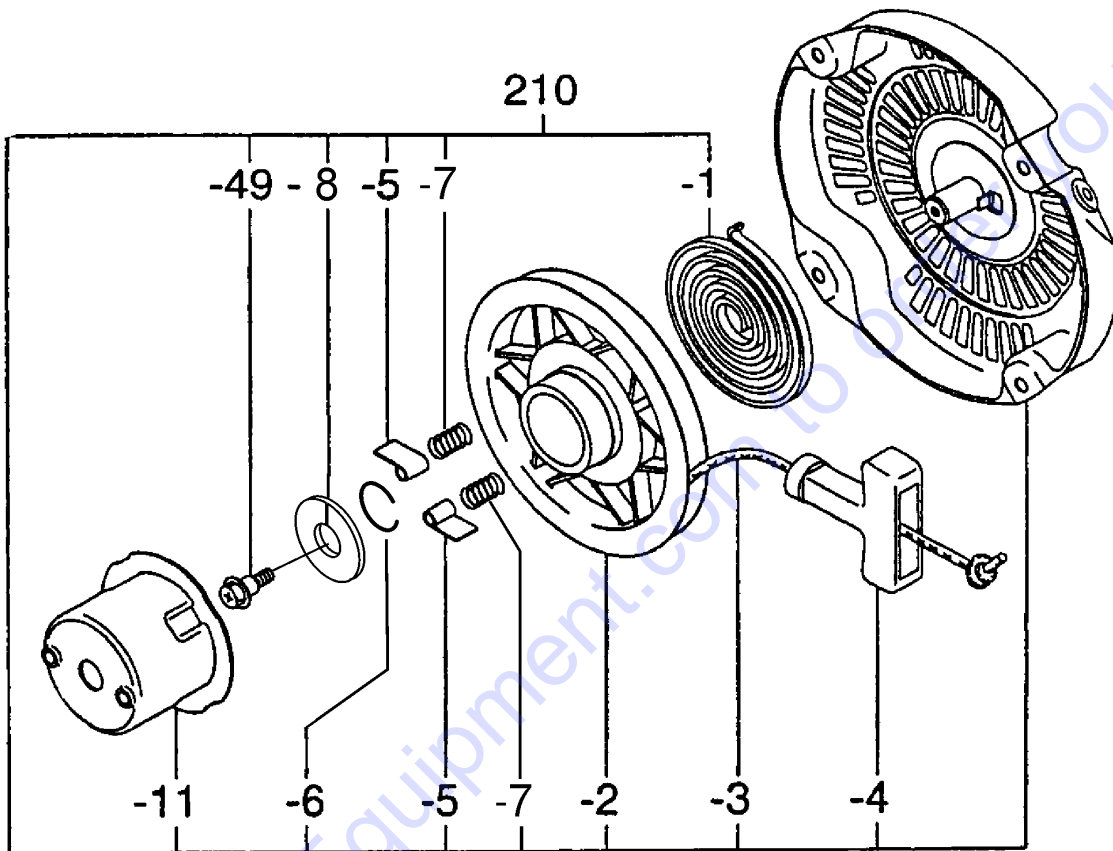
EX17 — BLOWER ASSY.



EX17 — BLOWER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	20A5120101	BLOWER HOUSING CP	1	
20	0732005820	LABEL (TRADE MARK)	1	
40	20A0111400	FLANGE BOLT	4	
60	20A5271101	BAFFLE 1 (CASE) CP	1	
61	20A5270203	BAFFLE 2 (HEAD)	1	
80	20A0111500	FLANGE BOLT	1	
81	20A0111100	FLANGE BOLT	1	
220	20A0111400	FLANGE BOLT	4	

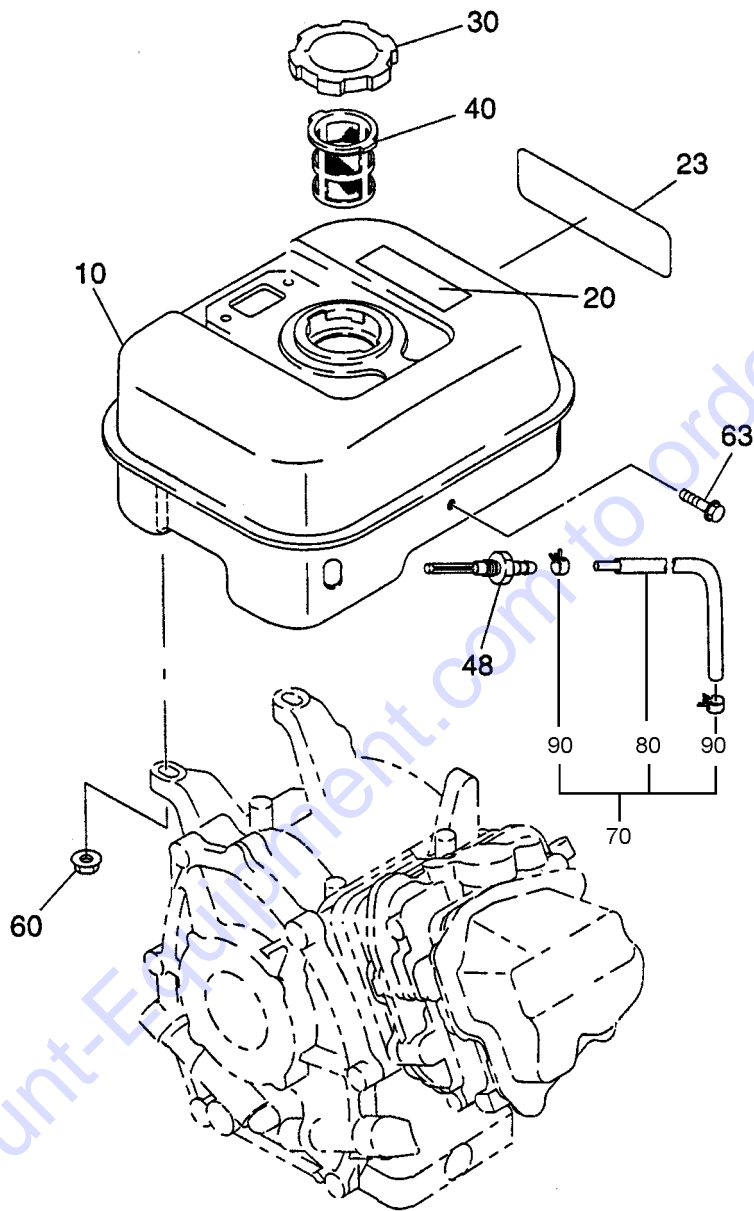
EX17 — RECOIL STARTER ASSY.



EX17 — RECOIL STARTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
210	20A5020130	RECOIL STARTER ASSY.	1.....	INCLUDES ITEMS W/#
210-1#	2705011508	SPIRAL SPRING	1	
210-2#	2695012008	REEL	1	
210-3#	2825011118	STARTER ROPE	1	
210-4#	2615010008	STARTER KNOB	1	
210-5#	2705012508	RATCHET	2	
210-6#	2275013108	FRICTION SPRING	1	
210-7#	2275013508	RETURN SPRING	2	
210-8#	2705026108	RATCHET GUIDE	1	
210-11#	20A5021133	STARTER PULLEY	1	
210-49#	2275015208	SET SCREW	1	

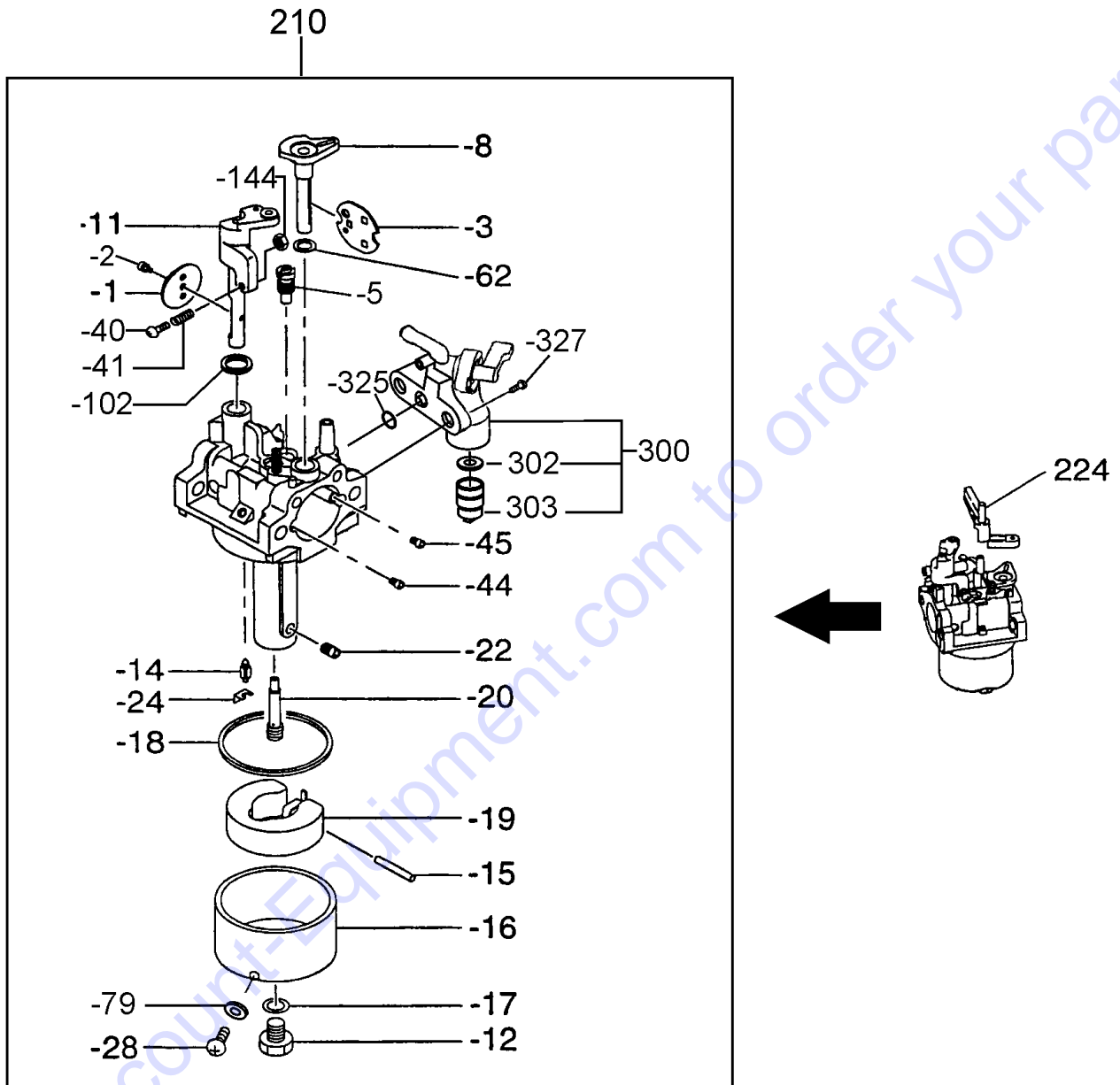
EX17 — FUEL TANK ASSY.



EX17 — FUEL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	20A6110201	FUEL TANK CP	1	
20	0732005760	LABEL (WARNING)	1	
23	2779511203	LABEL (MODEL)	1	
30	X430440142	FUEL TANK CAP CP	1	
40	20A0640100	FUEL FILTER	1	
48	20A0640200	UNION	1	
60	20A0185200	FLANGE NUT	2	
63	20A0111600	FLANGE BOLT	1	
70	20A6260501	FUEL PIPE CP	1	INCLUDES ITEMS W/\$
80\$	20A0810100	RUBBER PIPE	1	
90\$	20A0580100	HOSE CLAMP	2	

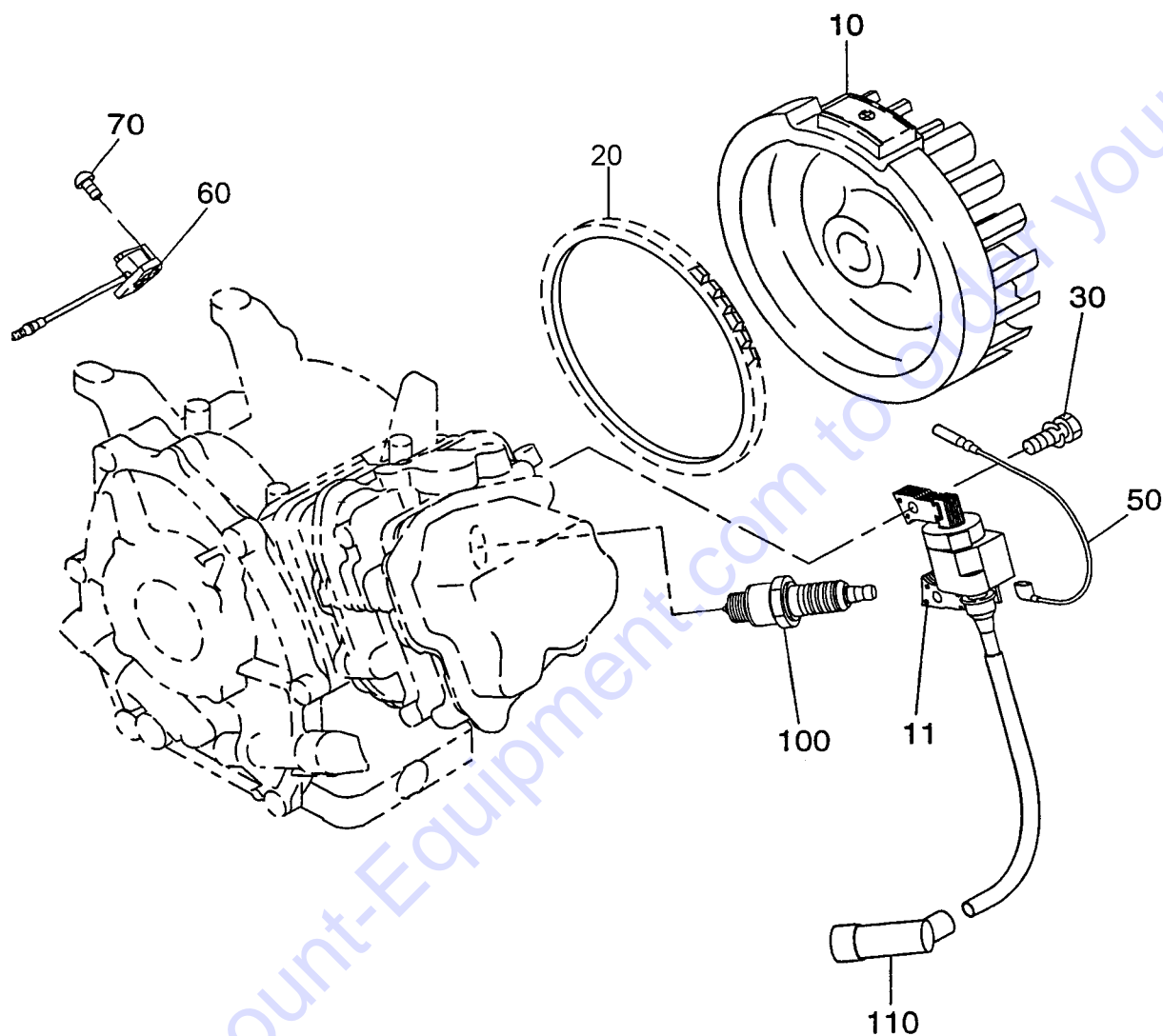
EX17 — CARBURETOR ASSY.



EX17 — CARBURETOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
210	20A6230240	CARBURETOR ASSY.	1	INCLUDES ITEMS W/#
210-1#	2776253508	THROTTLE VALVE	1	
210-2#	2096235108	SCREW	1	
210-3#	2776252508	CHOKE VALVE	1	
210-5#	2466242008	PILOT JET	1	
210-8#	2776252008	CHOKE LEVER	1	
210-11#	2776253118	THROTTLE SHAFT-A	1	
210-12#	2276245108	BOLT	1	
210-14#	2776250008	NEEDLE	1	
210-15#	2776251508	PIN	1	
210-16#	2776250608	FLOAT BODY AY	1	
210-17#	2146245008	PACKING	1	
210-18#	2146254008	CHAMBER PACKING	1	
210-19#	2266250608	FLOAT	1	
210-20#	2776244008	MAIN NOZZLE	1	
210-22#	2266241208	MAIN JET	1	
210-24#	2266270118	CLIP	1	
210-28#	2776236008	BOLT	1	
210-40#	1066255608	SCREW	1	
210-41#	2836235708	SPRING	1	
210-44#	2486241008	AIR JET	1	
210-45#	1066241008	AIR JET (PILOT)	1	
210-62#	2366268008	SEAL	1	
210-79#	2366254108	PACKING	1	
210-102#	2466239008	SEAL	1	
210-144#	2776255308	NUT	1	
210-300#	20A6210200	FUEL STRAINER ASSY.....	1	INCLUDES ITEMS W/\$
210-302#\$	2776211018	PACKING	1	
210-303#\$	2776210018	CUP	1	
210-325#	2776255208	O-RING	1	
210-327#	1656237708	SCREW	2	
224	20A4380101	CHOKE LEVER CP	1	

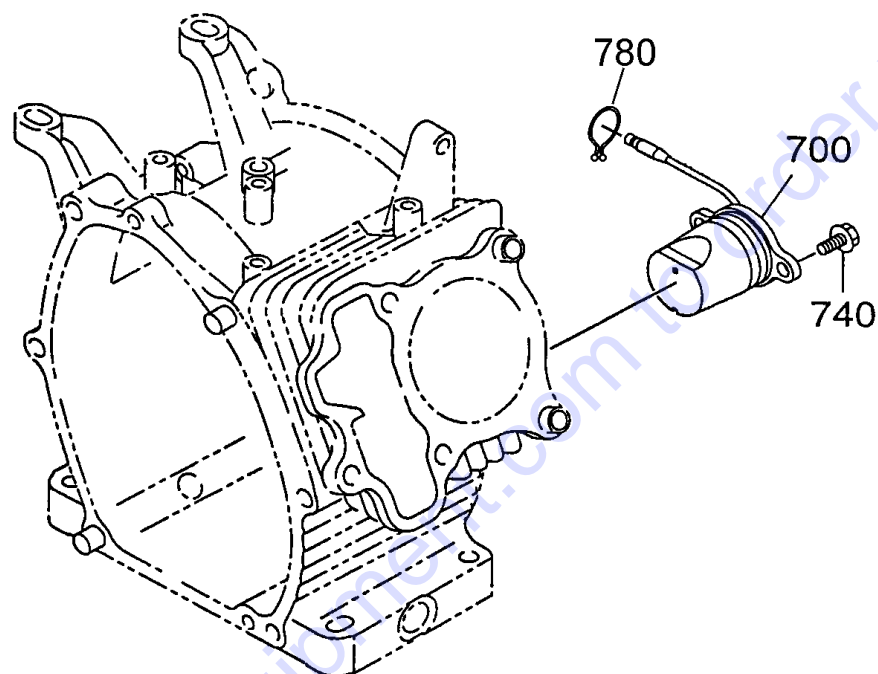
EX17 — IGNITION COIL ASSY.



EX17 — IGNITION COIL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
10	20A7923101	FLYWHEEL CP	1	
11	20A7943101	IGNITION COIL CP	1	
20	20A5410113	COOLING BLOWER	1	
30	20A0130200	BOLT AND WASHER AY	1	
50	20A7310101	WIRE 1 CP	1	
60	KU31107101	SWITCH ASSY.	1	
70	20A0140300	TAPPING SCREW	2	
100	20A0670100	SPARK PLUG	1	
110	0655000110	SPARK PLUG CAP	1	

EX17 — OIL SENSOR ASSY.



EX17 — OIL SENSOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
700	2777630121	OIL SENSOR CP	1	
740	20A0130400	BOLT AND WASHER AY	2	
780	20A0590100	PURSE LOCK	1	

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