# OPERATION MANUAL

MULTIQUIP®

## Mikasa SERIES

# MODEL MTR-40HS

## TAMPING RAMMER

### (ROBIN EC-08HS ENGINE)

Revision #3 (10/27/20)

To find the latest revision of this publication or associated parts manual, visit our website at:
www.multiquip.com

**THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.**

WARNING
CANCER &
REPRODUCTIVE HARM
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P/N 38707

# MTR-40HS Tamping Rammer

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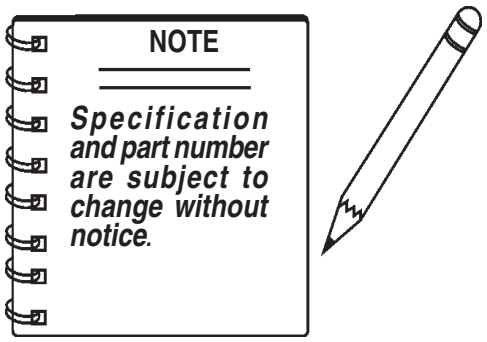
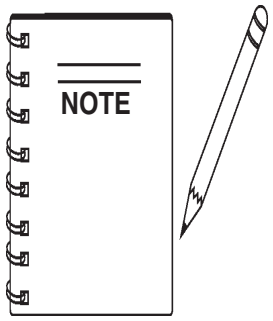


# MTR-40HS — SAFETY MESSAGE ALERT SYMBOLS

## FOR YOUR SAFETY AND THE SAFETY OF OTHERS!

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.




This Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the Multiquip MTR-40HS Tamping Rammer. Refer to the engine manufacturer's instructions for data relative to its safe operation.

**Before using this Rammer, ensure that the operating individual has read and understands all instructions in this manual.**

## SAFETY MESSAGE ALERT SYMBOLS

The three (3) 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 three words: **DANGER**, **WARNING**, or **CAUTION**.

**DANGER:** You **WILL** be **KILLED** or SERIOUSLY injured if you do not follow directions.

**WARNING:** You **CAN** be **KILLED** or SERIOUSLY injured if you do not follow directions.

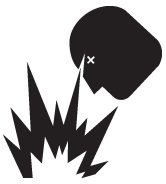
**CAUTION:** You **CAN** be injured if you do not follow directions.

Potential hazards associated with the MTR-40HS Tamping Rammer operation will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

## HAZARD SYMBOLS

Engine exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled. **NEVER** operate this equipment in a confined area or enclosed structure that does not provide ample free flow air.

### Explosive Fuel



**GASOLINE** is extremely flammable, and its vapors can cause an explosion if ignited. **DO NOT** start the engine near spilled fuel or combustible fluids. **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 approved containers, in well-ventilated areas and away from sparks and flames. **NEVER** use fuel as a cleaning agent.

### Burn Hazards

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

### Rotating Parts

**NEVER** operate equipment with covers, or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.

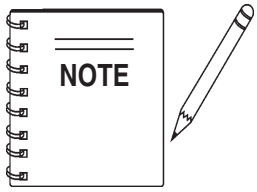
# MTR40-HS — SAFETY MESSAGE ALERT SYMBOLS

## Accidental Starting

**ALWAYS** place the engine ON/OFF switch in the **OFF** position, and remove the ignition key when the machine is not in use.

## Over Speed Conditions

**NEVER** tamper with the factory settings of the engine governor or settings. Personal injury and damage to the engine or equipment can result if operating in speed ranges above maximum allowable.

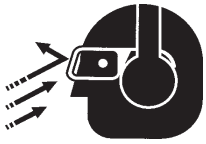



This ***rammer***, other property, or the surrounding environment could be damaged if you do not follow instructions.

## Respiratory Hazard

**ALWAYS** wear approved respiratory protection.

## Sight and Hearing hazard



**ALWAYS** wear approved eye and hearing protection.

## Equipment Damage Messages

Other important messages are provided throughout this manual to help prevent damage to your rammer, other property, or the surrounding environment.

## DANGER:

Failure to follow instructions in this manual may lead to serious injury or even death! This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

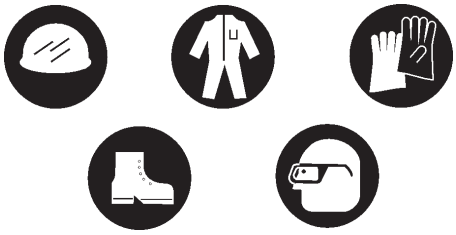
The following safety guidelines should always be used when operating the MTR-40HS Tamping Rammer:

**SAFETY**

■ **DO NOT** operate or service this equipment before reading this entire manual.

■ This equipment should not be operated by persons under 18 years of age.

■ **NEVER** operate the rammer without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.

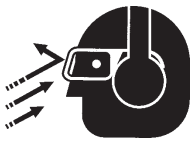


■ **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.

■ **NEVER** operate the rammer under the influence or drugs or alcohol.

■ **ALWAYS** check the rammer for loosened threads or bolts before starting.

■ **ALWAYS** wear proper ***respiratory*** (mask), ***hearing*** and ***eye***

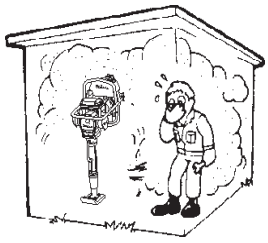


■ Manufacturer does not assume responsibility for any accident due to equipment modifications.

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

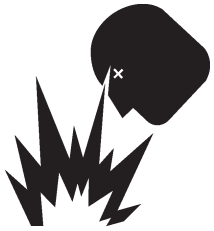
■ **High Temperatures** – Allow the engine to cool before adding fuel or performing service and maintenance functions. Contact with ***hot!*** components can cause serious burns.

■ The engine of this rammer requires an adequate free flow of cooling air. **NEVER** operate the rammer in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause serious damage to the rammer's engine and may cause injury to people. Remember the rammer's engine gives off ***DEADLY*** carbon monoxide gas.



■ **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.

■ **ALWAYS** use extreme caution when working with **flammable** liquids. When refueling, **stop the** engine and allow it to cool.



■ **NEVER** ***smoke*** around or near the machine. Fire or explosion could result from ***fuel vapors***, or if fuel is spilled on a ***hot!*** engine.

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

■ Topping-off to filler port is dangerous, as it tends to spill fuel.

- **NEVER** use accessories or attachments, which are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- **NEVER** Run engine without air filter. Severe engine may occur. Service air filter frequently to prevent carburetor malfunction.
- **AVOID** wearing jewelry or loose fitting clothing that may snag on the controls or moving parts, this can cause a serious injury.
- **ALWAYS** check to make sure that the operating area is clear before starting the engine.
- **NEVER** leave the machine ***unattended*** while running.
- **ALWAYS** be sure the operator is familiar with proper safety precautions and operations techniques before using rammer.
- **ALWAYS** read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.
- **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.
- Refer to the ***ROBIN Engine Owner's Manual*** for engine technical questions or information recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.

**Transporting**

- **ALWAYS** shutdown engine before transporting.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Drain fuel when transporting rammer over long distances or bad roads.
- When placing the rammer inside a truck-bed for transport, always tie-down the rammer.
- **ALWAYS** use proper lifting techniques when moving the rammer.

**Maintenance Safety**

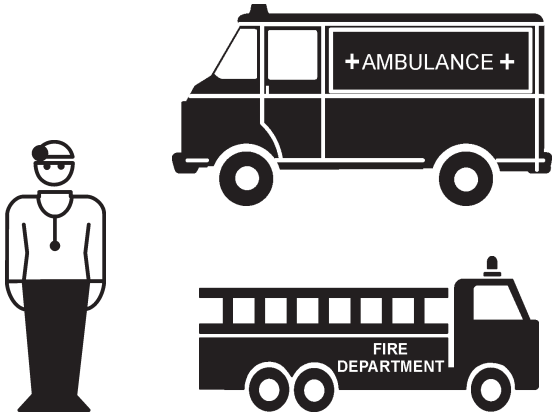
- **NEVER** lubricate components or attempt service on a running rammer.
- **ALWAYS** allow the rammer a proper amount of time to cool before servicing.
- Keep the rammer in proper running condition.
- Fix damage to the rammer immediately and always replace broken parts.
- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters.
- **DO NOT** use food or plastic containers to dispose of hazardous waste.

**Emergencies**

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

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

- In emergencies ***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.



P/N 920100240

P/N 920209100

When you stop the engine, be sure to close the fuel cock

NPA-399 J

P/N 920203990

GREASE

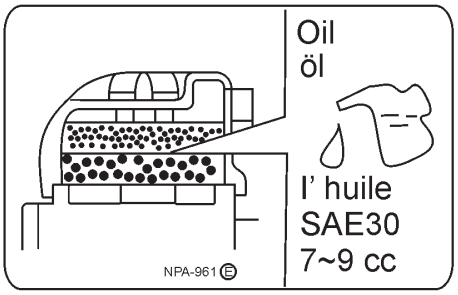
NPA-120 J

P/N 920101200

NPA-963 J

**CLEANING ELEMENT**:
Remove the element from the pre-cleaner
Clean the element with solvent
Apply SAE30 motor oil with 7~9 cc, and squeeze out excess oil before re-installing.

P/N NPA-963

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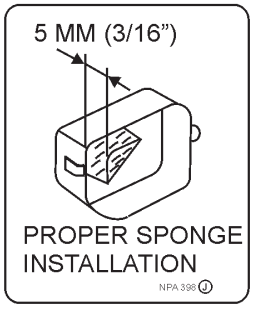



P/N 920203980

DO NOT ALLOW WATER TO ENTER FUEL AND OIL TANKS

NP-599 J

P/N 920205990

To start, switch must be in the "**ON**" position

NPA 293 J

P/N 920202930

**SECONDARY AIRFILTER SERVICE MONTHLY**

NPA 1016 J

P/N NPA1016

- READ OWNER'S SERVICE MANUAL BEFORE OPERATING OR SERVICING THIS MACHINE.
- ALWAYS KEEP UNAUTHORIZED, INEXPERIENCED, UNTRAINED PEOPLE AWAY FROM THIS MACHINE.
- MAKE SURE ALL SAFETY DEVICES ARE OPERATIONAL BEFORE THIS MACHINE IS STARTED. MAKE SURE ENGINE IS TURNED OFF AND SPARK PLUG WIRE DISCONNECTED BEFORE SERVICING THE MACHINE OR COMING IN CONTACT WITH ANY MOVING PART. IF EQUIPMENT IS POWERED BY AN ELECTRIC MOTOR DISCONNECT ELECTRICAL PLUG.
- NEVER LEAVE MACHINE UNATTENDED WHEN OPERATING. ALWAYS STOP ENGINE AND ALLOW ENGINE TO COOL BEFORE ADDING FUEL OR OIL.

NPA-329 J

P/N 920203290

**GASOLINE ONLY**

NPA 1017 J

P/N NPA1017

**PRIMARY AIRFILTER CHECK DAILY** NPA 1018 J

P/N NPA1018

**NAMEPLATE**

_____

_____

_____

CONTACT MULTIQUIP SERVICE DEPT.

4250 ~ 4450 RPM

NPA-982 J

P/N 920107660

**CAUTION**

1. Check that all bolts are tight.
2. Before operation, check oil level at the sight gauge located on the operator's side of the oil tank. Fill the oil tank to the "H" level using only outboard (2-stroke) oil.
3. Fill the fuel tank. Use only regular unleaded gasoline.
4. To start the engine: Turn the ignition switch to the "on" position. Open the fuel-cock located under the fuel tank. Close the choke lever located on the carburetor and pull starter rope. When engine starts, open choke fully.
5. Should the engine become difficult to start, open the drain cock located on the lower side of the crankcase and discharge any excess fuel by cranking the engine 2 or 3 times.
6. Allow the engine to warm up for 4 to 5 minutes before operation.
7. To begin operation, move the throttle lever quickly from the "start" to the "run" or "on" position.
8. Remember to close the engine drain-cock after starting to ensure proper operation.
9. When operation is complete, stop the engine by turning the ignition switch to the "off" position.
10. Note: Transport the machine with the fuel-cock in the "off" position only.

NPA-581 J

P/N 920205810

### Definition of Tamping Rammer

The Mikasa MTR-40HS Tamping Rammer is a powerful compacting tool capable of applying a tremendous force in consecutive impacts to a soil surface. Its applications include soil compacting for backfilling for gas pipelines, water pipelines and cable installation work.

The impact force of the MTR-40HS levels and uniformly compacts voids between soil particles to increase dry density.

Circular motion is converted to create impact force. The MTR-40HS tamping rammer develops a powerful compacting force at the foot of the rammer. To maintain optimum performance, proper operation and service are essential.

### Construction of Tamping Rammer

The Mikasa MTR-40HS is equipped with a Robin air cooled, oil-injected two cycle gasoline engine. Transmission of the power takes place by increasing the engine speed to engage the centrifugal clutch.

### Rammer Gearbox and Spring Cylinder

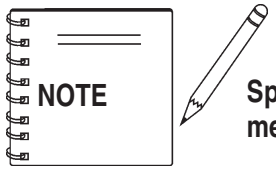
The Mikasa MTR-40HS uses an oil bath lubrication system. Always check the oil level through the oil level sight glass at the rear of the tamper foot.

### Controls

Before starting the MTR-40HS Tamping Rammer identify and understand the function of the controls, see Figure 1 on page 13.

| Table1. MTR-40HS Rammer Specifications | |
|---|---|
| MODEL | MTR-40HS U.S. (metric) |
| Overall Height | 43.7 in. (1,110 mm) |
| Overall Width | 13.8 in. (351 mm) |
| Over Length | 24.5 in. (622 mm) |
| Shoe Size | 5.9 x 10.6 in. (150 x 270 mm) |
| Blows/minute | 600 ~ 690 |
| Tamping Area | 1,445 sq. ft. per hr (134 sq.m per hr) |
| Impact Force | 1,100 - 1,225 lbs./blow ( 500 - 550kg/blow) |
| Clutch | Automatic Centrifugal |
| Operating Weight | 97 lbs. (44 kg) |

| Table 2. ROBIN EC-08HS Engine Specifications | | |
|---|---|---|
| **Engine** | **Model** | **ROBIN EC08HS** |
| | Type | Air-Cooled 2 Stroke Gasoline Engine |
| | Bore x Stroke | 1-31/32 in. x 1-7/32 in. ( 50 mm x 40 mm) |
| | Piston Displacement | 5.12 cu.in. (78.5 cc) |
| | Compression Ratio | 6.5 : 1 |
| | Continuous Rated Output | 1.8 hp/ 4,000 rpm |
| | Max. Output | 3.3 hp/5,500 rpm |
| | Max. Torque | 3.7 ft-lb/3,600 rpm (0.551 Kg-m/3,600 rpm) |
| | Cooling System | Air-Cooled By Fan |
| | Lubrication System | Fuel-Lubrication Oil Spraying System |
| | Fuel Consumption | 0.84 lb/hp/h (2.2hp/4,500 rpm) |
| | Fuel | Gasoline and 2-Stroke Oil |
| | Spark Plug | NGK B-6HS |
| | Starting System | Recoil Starter |
| **Dimension (L x W x H)** | | 11 x 9.75 x 12 in.<br>280 x 248 x 305 (mm.) |
| **Dry Net Weight** | | 17 lbs. (7.7 Kg.) |




**Specifications are general and are subject to change without notice. If exact measurements are required, equipment should be weighed and measured.**

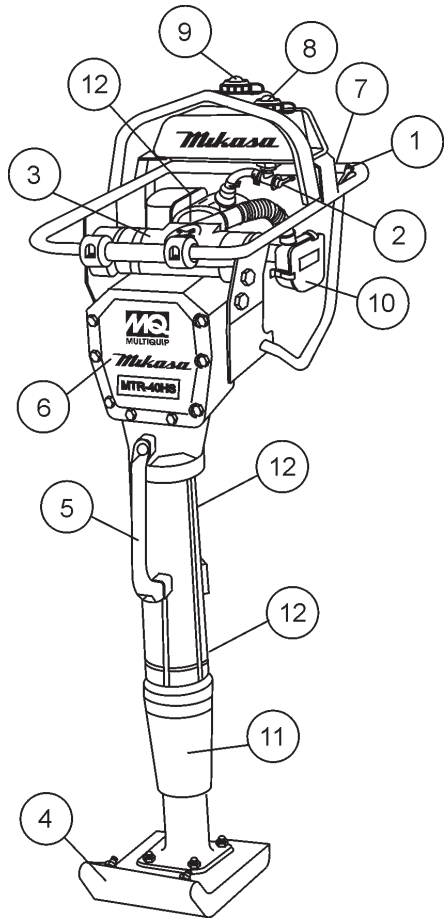



**Figure 1. MTR-40HS Rammer**

Figure 1 shows the location of the controls and components for the MTR-40HS Tamping Rammer. The functions of each control is described below:

1. **Throttle Lever –** Used to adjust engine speed (rpm). Move lever forward ***(SLOW)*** to reduce engine speed, move lever back toward operator ***(FAST)*** to increase speed.
2. **Fuel Shut-Off Valve –** Supplies fuel from the fuel tank to the engine. To begin fuel flow move the fuel shut-off valve downward.
3. **Primary Air Cleaner –** Pre-cleans (first stage) dirt and other debris from entering the engine.
4. **Foot–** Laminated wood with tempered steel plate for superior shock absorption.
5. **Grip –** When transporting the rammer, carry it by griping the handle.
6. **Nameplate –** Displays information regarding the rammer.
7. **Handle –** To operate rammer ***GRIP*** handle assembly firmly on both sides.
8. **Fuel Tank/Cap –** Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tightened securely. **DO NOT** over fill.

**WARNING**

Adding fuel to the tank should be accomplished 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.

9. **Oil Tank/Cap –** Remove this cap to add 2-stroke outboard motor oil to the oil tank. Make sure cap is tightened securely. **DO NOT** over fill.
10. **Engine Air Cleaner –** Prevents dirt (second stage) and other debris from entering the engine.
11. **Dust Sleeve –** Prevents dust and debris from entering into the spring cylinder.

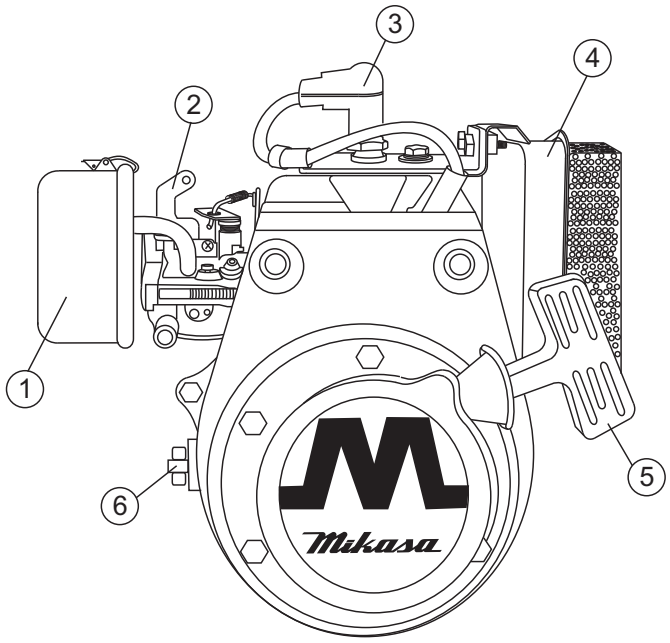



**Figure 2. Engine Controls and Components**

**INITIAL SERVICING**

The engine (Figure 2) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturers Engine manual for instructions & details of operation and servicing.

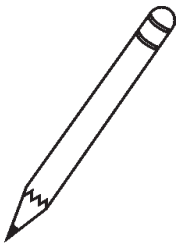
1. **Secondary Air Cleaner –** Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element.
2. **Choke Lever –**Used when starting the engine. Normally used in cold weather conditions. In cold weather turn the choke lever to the fully closed position, in warm weather set choke lever half way or completely open.
3. **Spark Plug –** Provides spark to the ignition system. Set spark plug gap to 0.6 - 0.7 mm (0.024 - 0.028 inch). Clean spark plug once a week.
4. **Engine ON/OFF Switch –** Controls the starting and stopping of the engine. Switch must be in the "ON" position when starting the engine.
5. **Recoil Starter (pull rope) –** Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
6. **Muffler –** Used to reduce noise and emissions.

**WARNING**

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

**NOTE**

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.



This section is intended to assist the operator with the ***pre-inspection*** of the ***MTR-40HS Tamping Rammer***. It is extremely important that this section be ***read carefully*** before attempting to operate the rammer.

**DO NOT** use your rammer until this section is thoroughly understood.

**Inspection**

- Check all nuts, bolts fasteners for tightness. Retighten as necessary.
- Clean any dirt from the recoil starter and engine cooling fins. Wipe the entire rammer clean before operating.
- Replace any missing or damaged Safety Operation decals.

## CAUTION:

Failure to understand the operation of the ***MTR-40HS Tamping Rammer*** could result in severe damage to the rammer or personal injury.

**Prior to Operation**

1. When transporting the machine, carry it by the grip handle located on the body (Figure 3).

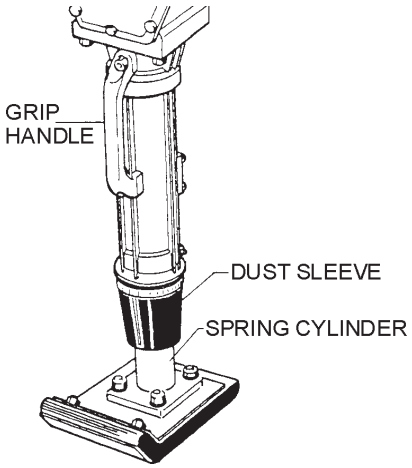



**Figure 3. Grip Handle**

2. The rammer should be greased with three shots of grease after each eight (8) hours of use.
3. Use MQ HIGH TEMPERATURE GREASE, P/N GRS2 or its equivalent.
4. Equivalent greases include Shell Darina or Texaco Thermatex, both of which have a bentone base and EP-2 rating.
5. If an inferior grease is used, it may become too thick or too thin due to changes in temperature, and improper lubrication could result.

**Fuel**

1. This rammer is equipped with a two-cycled gasoline engine. Use only unleaded gasoline. High test ethyl gasoline ***is not recommended.***
2. If fuel is low, remove the fuel filler cap (Figure 4) and fill with only ***unleaded*** gasoline. Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the pump if the engine is ***hot!*** or ***running***.

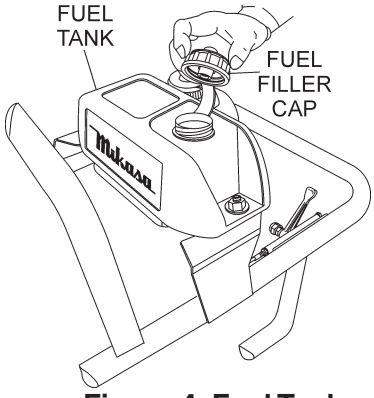



**Figure 4. Fuel Tank**

**Engine Oil Check**

1. Check the engine oil level at the sight gauge located on the operator's side of the ***oil tank*** (Figure 5). Fill the oil tank to the "**H**" level using only outboard (2-stroke) oil. Replenish the oil regularly before the oil level reaches the "**L**" level of the oil tank.
2. Make sure the oil hose is not pinched or squeezed . A sensor detects lack of oil and shuts down the engine automatically.
3. Remember low levels of engine oil may result in engine seizure due to high levels of consumption during operation. Always check oil regularly.

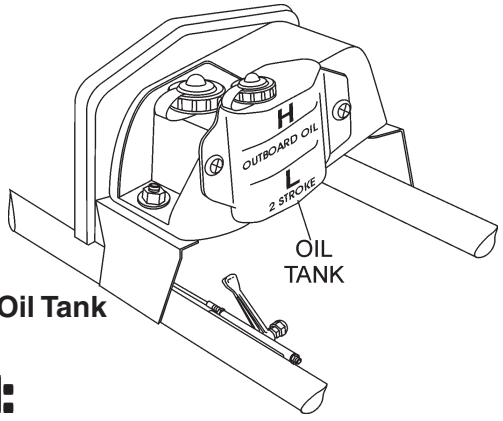



**Figure 5. Oil Tank**

## CAUTION:

***DO NOT USE REGULAR AUTOMOTIVE-TYPE MOTOR OIL.***

This section is intended to assist the operator with the ***initial start-up*** of the ***MTR-40HS*** rammer. It is extremely important that this section be ***read carefully*** before attempting to use the rammer in the field.

**DO NOT** use your rammer until this section is thoroughly understood.

## CAUTION:

Failure to understand the ***initial start-up procedures*** of the MTR-40HS rammer could result in severe damage to the rammer or personal injury.

See Figure 1 (Page 13) for the location of any control referenced in this manual.

### Initial Start-up

The following steps outline the procedure for starting the engine:

1. Open the ***fuel shut- off valve*** by moving the ***fuel cock*** lever to the ***open*** position (Figure 6).

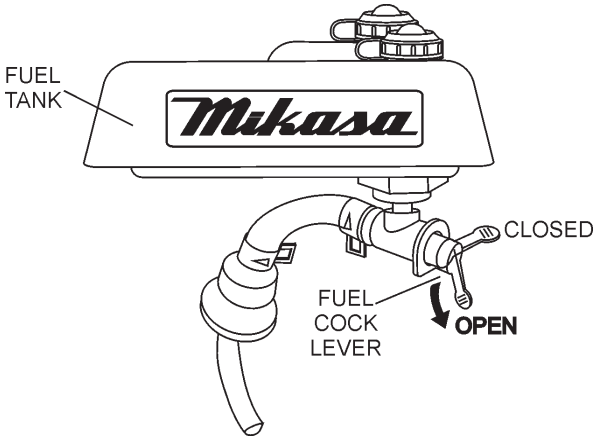



**Figure 6. Fuel Shut-Off Valve (Open)**

2. Set the engine ON/OFF switch (Figure 7) to the "**ON**" position (start).

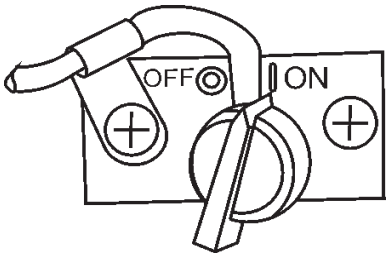



**Figure 7. ON/OFF Switch (ON Position)**

3. Move the throttle lever to the "**IDLE**" position (Figure 8).

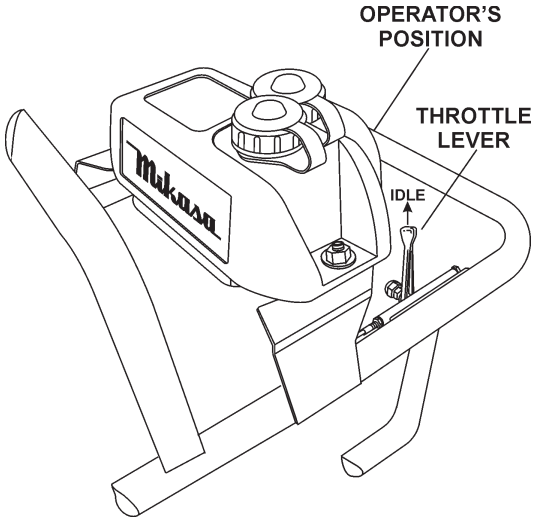



**Figure 8. Throttle Lever (Idle)**

4. In cold weather, start the unit with choke lever "**Fully Closed**" (Figure 9). In warm weather or when the engine is warm, the unit can be started with choke halfway or completely **open**.

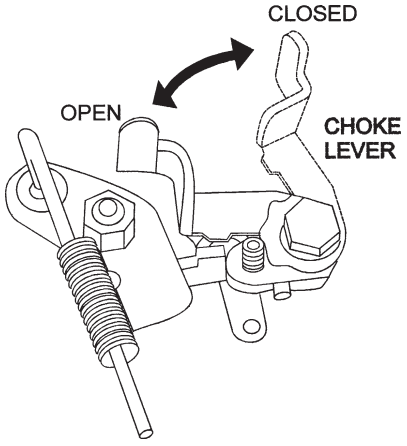



**Figure 9. Choke Lever (Closed)**

5 Grip the recoil starter (Figure 10) handle and pull it until you feel a slight resistance. Then pull sharply and quickly. Return the recoil starter handle to the starter position before releasing.

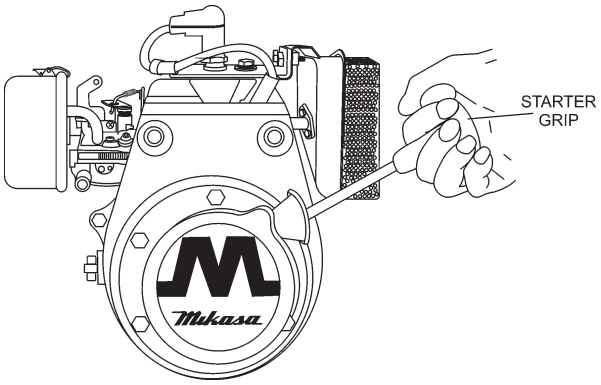



**Figure 10. Recoil Starter**

6. If engine fails to start, move the choke lever (Figure 9) to the half open position to avoid flooding.
7. Repeat steps 1 through 6.
8. If the engine does not start after repeated attempts, check the spark plug for excess fuel. Clean and replace the spark plug as needed.
9. If the carburetor is flooded or the crankcase is loaded with excess fuel, open the drain plug as shown in (Figure 11) and drain out excess fuel, then try and start engine.

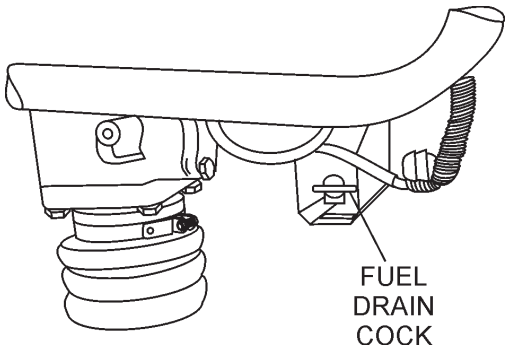



**Figure 11. Fuel Drain Cock**

**Operation**

1. To start the rammer tamping action, move the throttle lever (Figure 12) ***quickly*** from **IDLE** (close) to the **FULL OPEN** position. **DO NOT** move the throttle lever slowly as this may cause damage to the clutch or spring.

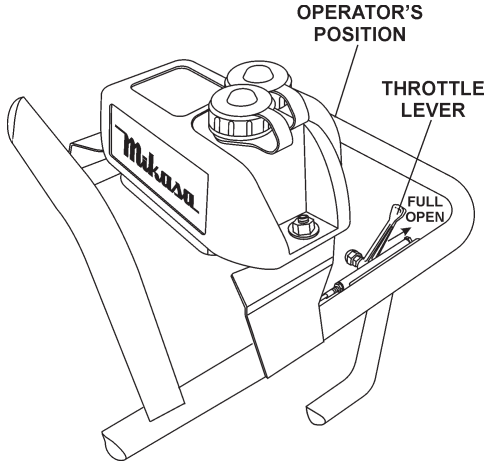



**Figure 12. Throttle Lever (Full Open)**

# CAUTION:

Make sure that the throttle lever is moved to the **FULL OPEN** position. Operating the rammer at less than full speeds can result in damage to the clutch springs or foot

2. The MT-40HS tamping rammer is designed to run at 4,100 **rpm**. At optimum rpm the foot hits at the rate of 600~690 impacts per minute. Increasing throttle speed past factory set rpm does not increase impacts and may damage unit. The MT-40HS is designed to advance while tamping. For faster advance, pull back slightly on the handle so that rear of foot contacts soil first.

**Stopping The Engine**

***Normal Shutdown***

1. Move throttle lever quickly from the **FULL OPEN** to **IDLE** position (Figure 13 ) and run the engine for three minutes at low speed.

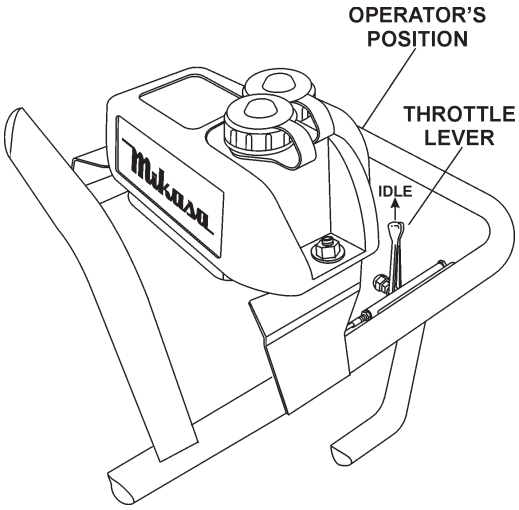



**Figure 13. Throttle Lever (Idle)**

2. After the engine ***cools***, turn the engine ***ON/OFF*** switch to the "**OFF**" position (Figure 14).

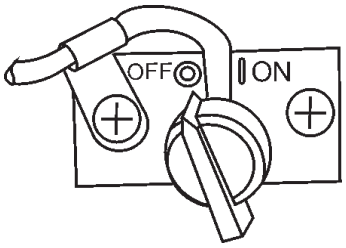



**Figure 14. ON/OFF Switch (Off Position)**

3. Close the ***fuel shut- off valve*** (Figure 15) by moving the fuel cock lever to the **CLOSED** position.

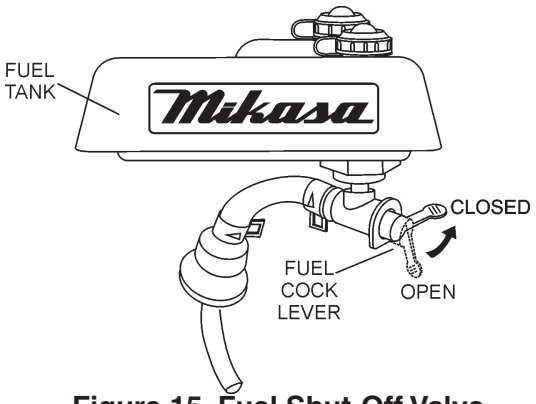



**Figure 15. Fuel Shut-Off Valve (Closed Position)**

***Emergency Showdown***

1. Move the throttle lever quickly to the ***IDLE*** position, and turn the engine ON/OFF switch to the ***OFF*** position. Turn the fuel valve lever to the ***CLOSED*** position.

**MAINTENANCE**

Perform the scheduled maintenance procedures as definded by Table 3 (page 21) and below:

**DAILY**

- Thoroughly remove dirt and oil from the engine compartment and rammer. Clean or replace the air cleaner elements as necessary. Check and retighten all fasteners as necessary. Check the bellows for oil leaks. Repair or replace as needed.

**200 - 300 HOURS (Pre-Cleaner)**

- Remove the element from the pre-cleaner (Figure 16) at the top of the crankcase (body side) and clean it with cleaning oil (kerosene).

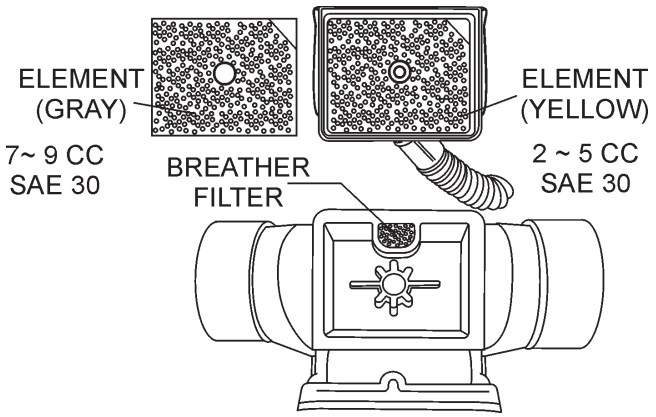



**Figure 16. Primary Air Cleaner**

- Lubricate the top element (yellow) with 2~5 cc of engine oil SAE-30.
- Lubricate bottom element (gray) with 7~9 cc of engine oil SAE-30 and completely squeeze out the excess oil from the element before installing.
- The air cleaner (Figure 17) on the engine side will hardly be contaminated, if it is, clean the outer foam gray element with cleaning solvent. Tightly squeeze outer foam element to remove any excess solvent before reinstalling.

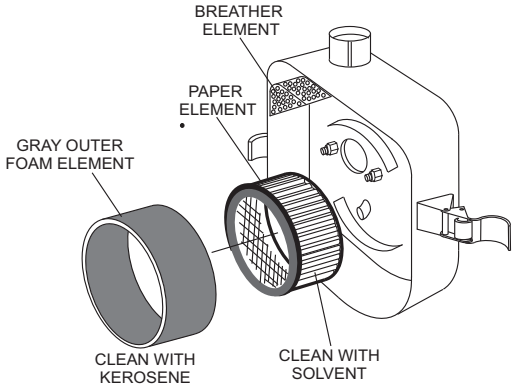



**Figure 17. Engine Air Cleaner**

- Tap the paper filter element (Figure 17) several times on a hard surface to remove dirt, or blow compressed air [not exceeding 30 psi (207 kPa, 2.1 kgf/cm$^2$)] through the filter element from the air cleaner case side. ***NEVER*** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.

## CAUTION:

It is normal for a new 2-stroke engine to emit excess smoke, until moving parts have been seated to their normal operating specifications. This excess smoke normally stops after one full tank of fuel.

**SPARK PLUG**

- Remove and clean the spark plug (Figure 19), then adjust the spark gap to 0.024 ~0.028 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

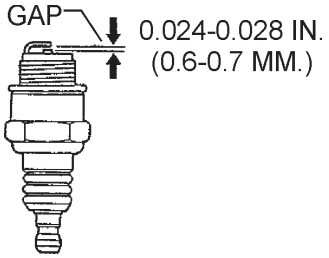



**Figure 19. Spark Plug Gap**

### CLEANING THE OIL TANK

- Clean the inside of the oil tank regularly, preferably 2 or 3 times a year.
- In winter, be sure to clean the inside of oil tank to avoid the freezing of water that may have accumulated inside the tank.

## CAUTION:

If water accidently got inside the oil tank, the oil may appear muddy. If this situation occurs, simply flush the tank, removing all foreign matter including water, and fill oil tank with fresh 2-stroke outboard motor oil.

- When cleaning the oil tank (Figure 18) perform the following procedure:

1. Remove the cock holder cover, oil hose, red and black lead wires from the float sensor.

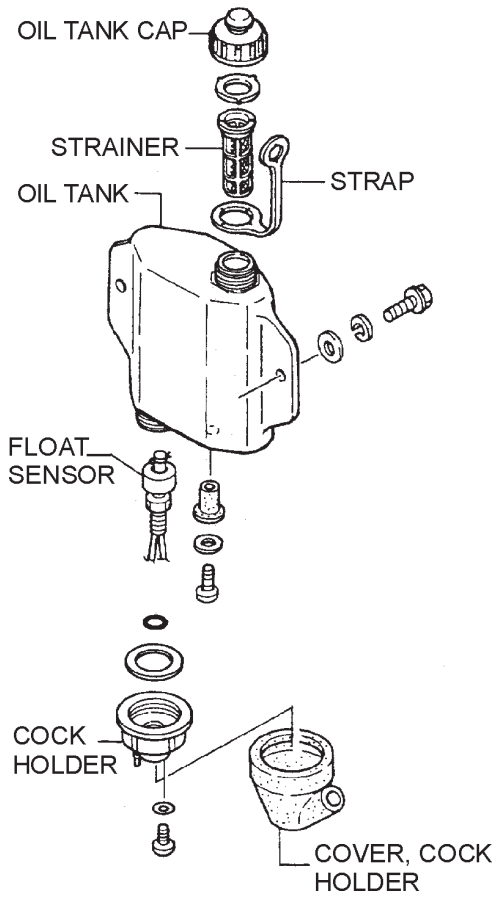



**Figure 18. Oil Tank**

2. Remove the bolts that secure the oil tank to the fuel tank, and drain all oil from the tank.
3. Remove cock holder, then clean strainer and cock holder in a kerosene solution.
4. Make sure every part is clean and dry, then reassemble oil tank. Fill oil tank with 2-stroke outboard motor oil (FB class) to the "H" level.

### FUEL AND OIL LINES

- Check the fuel and oil lines regularly for damage and ensure that there are no leaks.
- Replace fuel and oil lines every 2 years to maintain performance.
- When replacing the oil hose perform the following procedure:

1. Replace oil hose with manufactures suggested type hose or equivalent.
2. If necessary, fill oil tank with 2-stroke outboard motor oil and fuel tank wth unleaded gasoline.
3. Operate rammer until all air is bled from oil injection line.

### CLEANING THE RAMMER

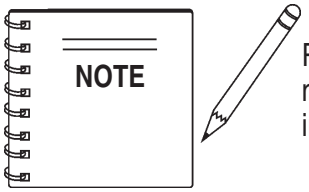
- If using a high pressure spray washer, be careful not to splash water directly on the air cleaner, carburetor, muffler, fuel and oil tank caps. Excessive amounts of water may cause severe engine damage.

**Yearly**

- Check the fuel line and the oil line regularly for damage and to ensure that there are no leaks.
- Replace the oil and fuel lines every two years to maintain the performance and flexibility lines.

**Long Term Storage**

- Drain fuel from fuel tank, fuel line and carburetor.
- Remove spark plug and pour a few drops of motor oil into cylinder. Crank engine 3 to 4 times so that oil reaches all internal parts.
- Clean exterior of rammer with an oil-moistened cloth.
- Store unit covered with plastic sheet in moisture free and dust free location out of direct sunlight




Reference manufacturer engine manual for specific servicing instructions.

Perform the scheduled engine maintenance procedures as definded by Table 3 below:

**Table 3. Engine Maintenance Schedule**

| DESCRIPTION (3) | OPERATION | BEFORE | FIRST MONTH OR 10 HRS. | EVERY 3 MONTHS OR 25 HRS. | EVERY 6 MONTHS OR 50 HRS. | EVERY YEAR OR 100 HRS. | EVERY 2 YEARS OR 200 HRS. |
|---|---|---|---|---|---|---|---|
| Engine Oil | CHECK | X | | | | | |
| | CHANGE | | X | | | | |
| Air Cleaner | CHECK | X | | | | | |
| | CHANGE | | | X (1) | | | |
| All Nuts & Bolts | Re-tighten If Necessary | X | | | | | |
| Spark Plug | CHECK-CLEAN | | | | X | | |
| | REPLACE | | | | | | X |
| Cooling Fins | CHECK | | | | X | | |
| Spark Arrester | CLEAN | | | | | X | |
| Fuel Tank | CLEAN | | | | | X | |
| Fuel Filter | CHECK | | | | | X | |
| Idle Speed | CHECK-ADJUST | | | | | X (2) | |
| Valve Clearance | CHECK-ADJUST | | | | | | X (2) |
| Fuel lines | CHECK | Every 2 years (replace if necessary) (2) | | | | | |

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

(2) These items should be serviced by your servic 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 4. ENGINE TROUBLESHOOTING | | |
|---|---|---|
| **SYMPTOM** | **POSSIBLE PROBLEM** | **SOLUTION** |
| **Difficult to start** | | |
| Fuel is available but spark plug will not ignite. (Power available at high tension cable). | Ignition plug being bridge? | Check ignition system. |
| | Carbon deposit at ignition? | Clean or replace ignition. |
| | Short circuit due to defective insulators? | Replace insulators. |
| | Improper spark gap? | Set spark plug gap to the correct gap. |
| Fuel is available but spark plug will not ignite. (Power **NOT** available at high tension cable). | Short circuit at stop switch? | Check stop switch circuit. Replace stop switch if defective. |
| | Ignition coil defective? | Replace ignition coil. |
| Fuel is available and spark plug ignites (compression **normal)**. | Muffler clogged with carbon deposits? | Clean or replace muffler. |
| | Mixed fuel quality is inadequate? | Check fuel to oil mixture. |
| | Fuel in use inadequate (water, dust)? | Flush fuel sytem and replace with fresh fuel. |
| | Air Cleaner clogged? | Clean or replace air cleaner. |
| Fuel is available and spark plug ignites (compression **low** ). | Defective cylinder head gasket? | Tighten cylinder head bolts or replace head gasket. |
| | Cylinder worn? | Replace cylinder. |
| | Spark plug loose? | Tighen spark plug. |
| **Operation not satisfactory** | | |
| Not enough power available (compression normal, no miss-firing). | Air cleaner clogged? | Clean or replace air cleaner. |
| | Air in fuel line? | Bleed (remove air) from fuel line. |
| | Fuel level in carbureator float chamber improper? | Adjust carbureator float |
| | Carbon deposits in cylinder? | Clean or replace cylinder |
| Not enough power available (compression normal, miss-firing). | Ignition coil defective? | Flush fuel sytem and replace with fresh fuel. |
| | Ignition plug often shorts? | Replace ignition wires, clean ignition. |
| | Fuel in use inadequate (water, dust)? | Flush fuel sytem and replace with fresh fuel. |
| Engine overheats. | Mixed fuel quality is inadequate? | Check fuel to oil mixture. |
| | Excessive carbon depostion in combustion chamber? | Clean or replace crankcase. |
| | Exhaust or muffler clogged with carbon. | Clean or replace muffler. |
| | Spark plug heat value incorrect? | Replace spark plug with correct type spark plug. |

| TABLE 4. ENGINE TROUBLESHOOTING (continued) | | |
|---|---|---|
| **SYMPTOM** | **POSSIBLE PROBLEM** | **SOLUTION** |
| **Operation not satisfactory** | | |
| Rotational speed fluctuates. | Governor adjustment improper? | Adjust governor to correct lever. |
| | Governor spring defective? | Clean or replace ignition. |
| | Fuel flow erratic? | Check fuel line. |
| | Air taken in through suction line? | Check suction line. |
| Recoil starter not working properly. | Dust in rotating part? | Clean recoil starter assembly. |
| | Spring spring failure? | Replace spiral spring. |

| TABLE 5. RAMMER TROUBLESHOOTING | | |
|---|---|---|
| **SYMPTOM** | **POSSIBLE PROBLEM** | **SOLUTION** |
| Engine rotates but amplituide not uniform or does not strike. | Operating speed of throttle lever is incorrectly set? | Set throttle lever to correct position. |
| | Oil in excess? | Drain excess oil. Bring to correct level. |
| | Clutch slips? | Replace or adjust clutch. |
| | Spring Failure? | Replace sprial spring. |
| | Speed of engine improper? | Adjust engine speed to correct operating RPM setting. |

# OPERATION MANUAL

# HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL NUMBER ON-HAND WHEN CALLING


**UNITED STATES**

***Multiquip Inc.***

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
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WEBSITE: www.multiquip.com

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***Multiquip***

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Laval, Quebec, Canada H7L 6V3
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***Multiquip (UK) Limited Head Office***

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