OPERATION MANUAL

MULTIQUIP®

Mikasa SERIES

MODEL MT-65HA

TAMPING RAMMER

(HONDA GASOLINE ENGINE)

Revision #2 (10/19/20)

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
www.P65Warnings.ca.gov
P/N 38707

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MT-65HA

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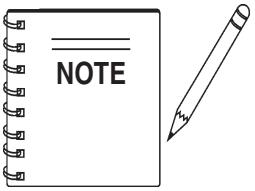
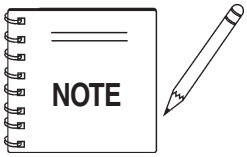


Specification and part number are subject to change without notice.

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 **MQ Mikasa, Model MT-65HATamping Rammer**. Refer to the engine manufacturers 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**,

DANGER

You **WILL** be ***KILLED*** or ***SERIOUSLY INJURED*** if you **DO NOT** follow these directions.

WARNING

You **CAN** be **KILLED** or ***SERIOUSLY INJURED*** if you **DO NOT** follow these directions.

CAUTION

You **CAN** be ***INJURED*** if you **DO NOT** follow these directions.

HAZARD SYMBOLS

Potential hazards associated with the operation of a ***MT-74F Tamping Rammer*** will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

WARNING — **Lethal Exhaust Gas Hazards**

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.

WARNING — **Explosive Fuel Hazards**

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.

WARNING — **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.

WARNING — **Respiratory Hazards**

ALWAYS wear approved ***respiratory*** protection when required.

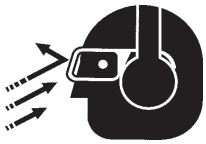
CAUTION — Rotating Parts Hazards

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

CAUTION — Accidental Starting Hazards

ALWAYS place the **ON/OFF** switch in the **OFF** position when the rammer is not in use.

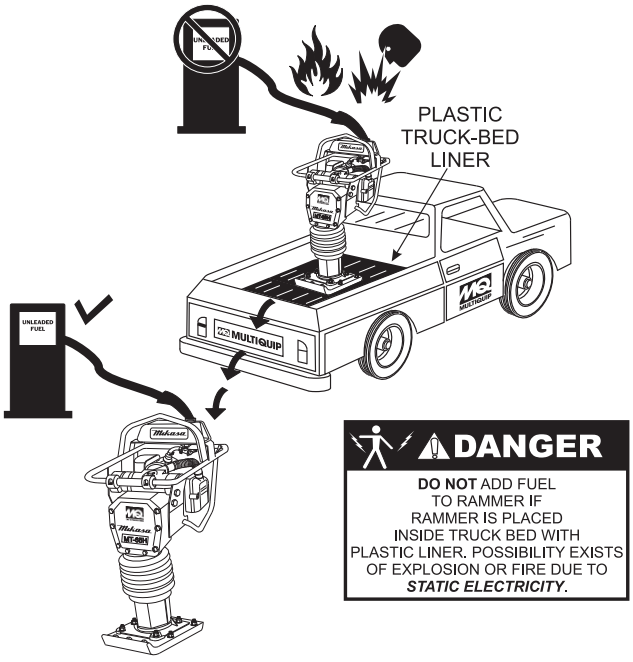
CAUTION — Eye and Hearing Hazards



ALWAYS wear approved eye and hearing protection.

DANGER — Refueling Hazard

NEVER refuel rammer when placed in truck bed with plastic liner. The possibility exists of explosion due to static electricity. When adding fuel, remove rammer from truck bed and place on ground.



CAUTION — Equipment Damage Hazards

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

CAUTION — Lifting Handle

Before starting operation, check the lifting handle to make sure there is no damage on the bolts, no cracks or breakage on the handle, and no fissure on the surface.

This handle is for ***manual lifting only***. Use handle to lift the shoe part of the rammer with the body laid down on the ground or truck bed. Use proper lifting techniques to avoid back injury.

Do not use this rammer as a rammer lift point. Use the lifting point on top of the rammer.

Do not move the rammer with the lifting handle and the front rollers more than 5 meters.

CAUTION — Read Manual

Before attempting to operate the pump, and to avoid serious injury to personnel, always read and understand operation manual. Failure to read and understand operation manual could result in serious harm or even death!

DANGER **Read this manual!**

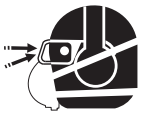
Failure to follow instructions in this manual may lead to serious injury or even death! This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

The following safety guidelines should always be used when operating the MT-65HA Tamping Rammer:

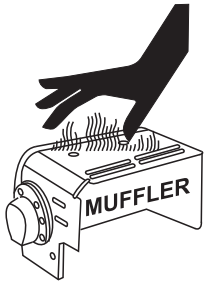
GENERAL SAFETY

- **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 this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.

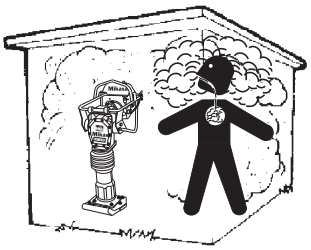
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.
- **NEVER** operate this equipment under the influence of ***drugs*** or ***alcohol***.



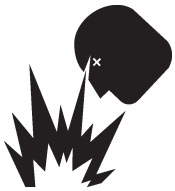
- **ALWAYS** wear proper respiratory (mask), hearing and eye protection equipment when operating the rammer.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications.
- **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.



- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or 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 section 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 or 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. **DO NOT *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***.

- **DO NOT *smoke*** around or near the machine. Fire or explosion could result from fuel vapors, or if fuel is spilled on a hot engine.
- Topping-off to filler port is dangerous, as it tends to spill fuel.
- Stop the engine when leaving the rammer unattended.
- Maintain this equipment in a safe operating condition at all times.

- **ALWAYS** stop the engine before servicing, adding fuel and oil.
- **NEVER** run engine without air filter. Severe engine may occur.
- **ALWAYS** service air cleaner frequently to prevent carburetor malfunction.
- **ALWAYS** check the machine for loosened threads or bolts before starting.
- **ALWAYS** be sure the operator is familiar with proper safety precautions and operations techniques before using rammer.
- **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.
- **DO NOT** operate this equipment unless all guards and safety devices are attached and in place.
- **CAUTION** must be exercised while servicing this equipment. Rotating and moving parts can cause injury if contacted.
- Keep all ***inexperienced*** and ***unauthorized*** people away from the equipment at all times.
- Unauthorized equipment modifications will void all warranties.
- **NEVER** pour or spray water over the engine.
- Test the engine ON***/OFF*** switch before operating. The purpose of this switch is to shut down the engine of the rammer.
- Refer to the ***HONDA Engine Owner's Manual*** for engine technical questions or information recommended by Multiquip for this equipment.

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

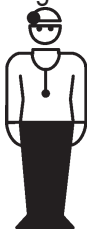
MAINTENANCE

- **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

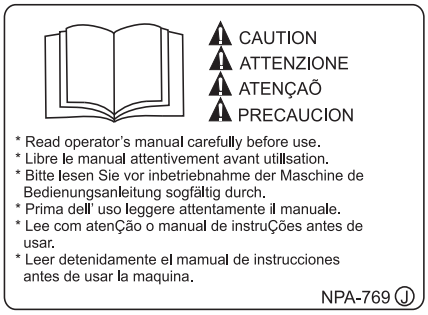
- **ALWAYS** know the location of the nearest ***fire extinguisher*** and **first aid kit.**

- 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.



Mikasa

P/N 920106460



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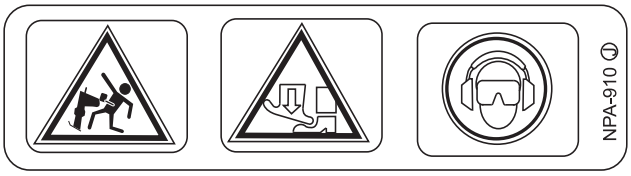

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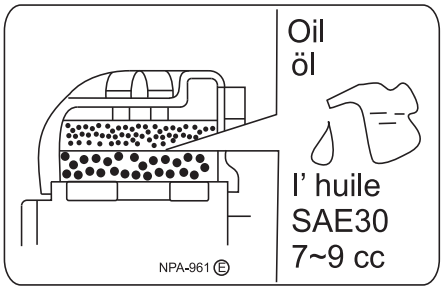


P/N 920209610

CLEANING ELEMENT: NPA-963 J
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 920209630

SECONDARY AIRFILTER SERVICE MONTHLY NPA-1016

P/N 920210160

PRIMARY AIRFILTER CHECK DAILY NPA-1018

P/N 920210180

GASOLINE ONLY NPA-1017

P/N 920210170

To start, switch must be in the "**ON**" position
NPA 293

P/N 920202930

- 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

3800 ~ 4100 RPM
NPA-957 J

P/N 920209570

When you stop the engine, be sure to close the fuel cock
NPA-399 J

P/N 920203990

NAMEPLATE

_____

_____

_____

CONTACT MULTIQUIP PARTS DEPT.

P/N 920209750

CAUTION

Prior to each operation check

Check all nuts and bolts for tightness.
Check oil levels in both the engine and the lower unit.
Keep machine at the upright operating position to check.
1. Lower unit assembly-Check sight glass for proper level.
2. Engine-Fill to the lower outer rim.

NPA-975 J

OPERATION

To START engine:

Open fuel filter valve and close choke lever on carburetor.
Place starter switch to "ON" and pull start rope.
When engine starts, open the choke lever and warm up the engine for 4-5 minutes before operation.

To STOP engine:

Move the throttle lever quickly from "ON" to "OFF" position.
Then move starter switch to "OFF" and close the fuel filtervalve.

Definition of Tamping Rammer

The Mikasa MT-65HA 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 road, embankments and reservoirs as well as backfilling for gas pipelines, water pipelines and cable installation work.

The impact force of the MT-65HA levels and uniformly compacts voids between soil particles to increase dry density.

Circular motion is converted to create impact force. The MT-65HA 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 MT-65HA is equipped with an air cooled, four-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 MT-65HA 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 MT-65HA Tamping Rammer identify and understand the function of the controls, see Figure 1 on page 13.

CAUTION

Handle Operation

Before starting operation check the lifting handle to:

1. Make sure that there is no damage on the bolts.
2. Make sure that there is no crack or breakage on handle.
3. Make sure that there is no fissure on the surface. If there is any abnormality or damage, replace with new one.

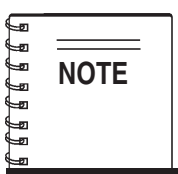
For operation:

This handle is to be used to lift up the shoe part of the machine with the body laid down on the ground or truck bed.

1. Use proper lifting techniques to avoid back injury. This handle is for manual lifting only.
2. Do not use this handle as a rammer lift point. Use the lifting point on the top of the machine.
3. Do not move the rammer with the lifting handle and the front rollers more than 16 feet (5 meters).

Table 1. MT-65HA Rammer Specifications	
MODEL	**MT-65HA**
Overall Height	40.2 in. (1,020 mm)
Overall Width	14.8 in (375 mm)
Over Length	28.7 in (730 mm)
Shoe Size	13.4 x 11.2. (340 x 285 mm)
Blows/minute	645 - 695
Stroke (Jump Height)	3.15 in. (80 mm)
Travel Speed	29.5 - 39.4 ft./min (9 - 12 meters/min)
Impact Force	2,900 lb (1,300 kg)
Clutch	Automatic Centrifugal
Fuel Tank Capacity	2.1 qt. (2 liters)
Max Area of Compaction	2,145 sq. ft./hr.
Operating Weight	152 lbs. (69 kg)

Table 2. Engine Specifications	
Model	**Honda GX100KRBM Engine**
Type	Air-Cooled 4 Stroke, Overhead camshaft, single cylinder gasoline engine.
Piston Displacement	6.0 cu.in. (98 cc)
Max. Output	3.0 hp/4,200 rpm (2.2 KW)
Max. Governed Speed, No Load	3,800 - 4,100 rpm
Cooling System	Air-Cooled
Engine Oil Capacity	0.32 qt. (0.3 liters)
Fuel	Unleaded gasoline
Lubricant for Engine	Automobile Oil; Class SE or higher
Starting System	Recoil Starter
Spark Plug Type	DENSO: U16FSR-UB
Carburetor System	Diaphragm



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

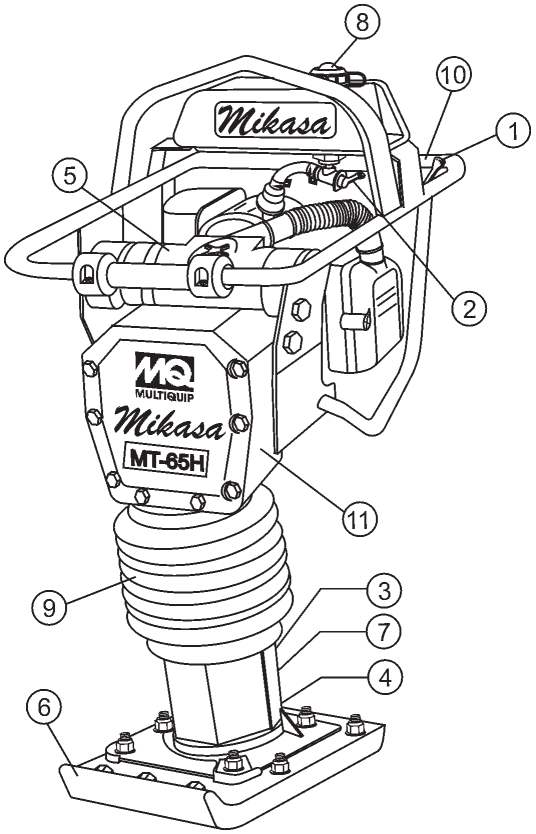


Figure 1. MT-65HA Rammer

Figure 1 shows the location of the controls and components for the MT-65HA 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. **Oil Bath Fill Plug –** Open this plug to add oil to the oil bath reservoir.
4. **Drain Valve –** Open this valve to remove oil from the bellows.
5. **Primary Air Cleaner –** Pre-cleans (first stage) dirt and other debris from entering the engine.
6. **Foot–** Laminated wood with tempered steel plate for superior shock absorption.
7. **Oil Level Sight Glass –** Indicates the level of oil in the oil bath reservoir.
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. **Bellows –** Reservoir for oil bath.
10. **Handle –** To operate rammer ***GRIP*** handle assembly firmly on both sides.
11. **Nameplate –** Displays information regarding the rammer.

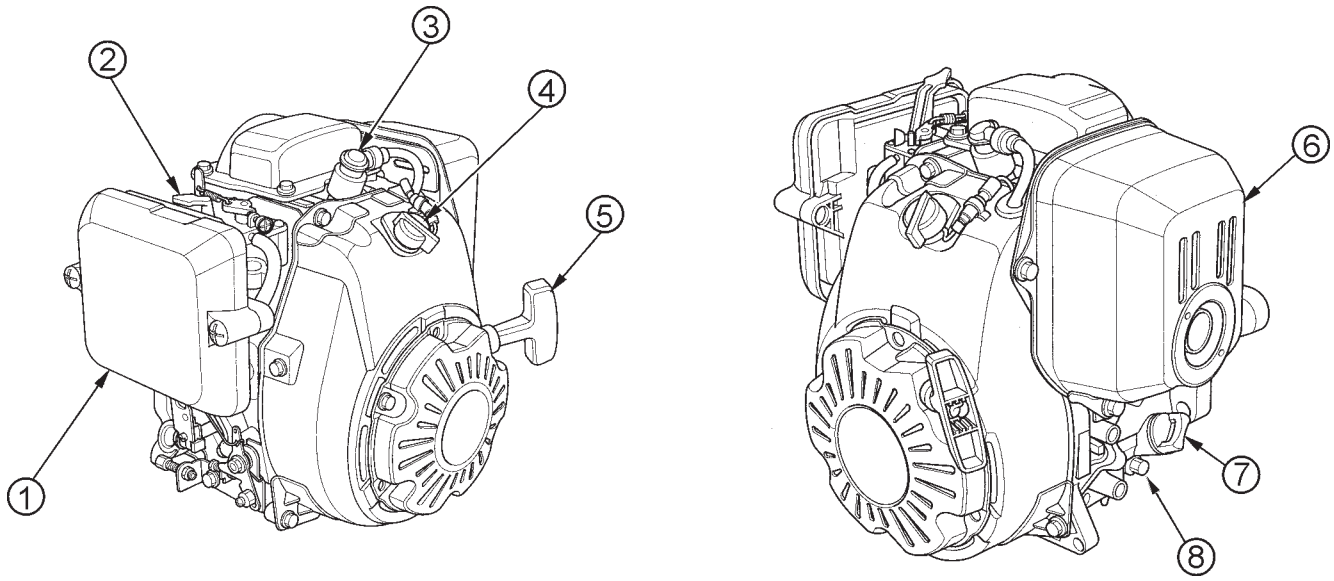
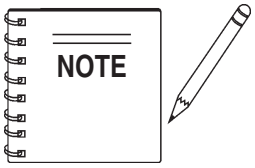


Figure 6. Engine Controls and Components

INITIAL SERVICING

The engine (Figure 6) 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.



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.

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.

7. **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 3.
8. **Oil Drain Plug –** Remove this plug to remove oil from the engine's crankcase.

This section is intended to assist the operator with the initial start-up of the MT-65HA Tamping Rammer. It 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.

⚠ CAUTION

Failure to understand the operation of the MT-65HA Tamping Rammer could result in severe damage to the trowel or personal injury.

Rammer Gearbox and Spring Cylinder Oil Bath

This unit uses an oil bath lubrication system. Perform the following:

1. Check the oil level through the oil level sight glass (Figure 2) at the rear of the tamper foot.

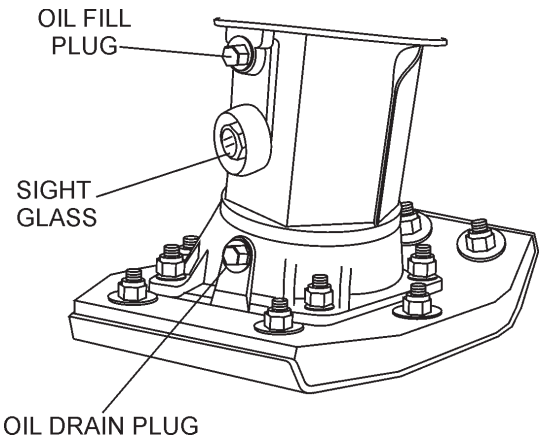


Figure 2. Foot Housing Sight Glass

2. If oil is not visible, add 10W-30 SE, SF or higher grade motor oil into the oil fill plug opening (Figure 2). The bath contains approximately 1.7 pints (800 cc.)

NOTE

The oil level should be kept at the half way point of the sight glass.

Engine

1. Fill the fuel tank (Figure 3) with unleaded gasoline. At the same time, check the engine oil and make it a habit to replenish it often.

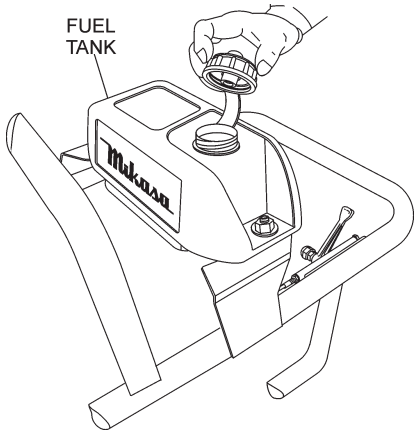


Figure 3. Fuel Tank

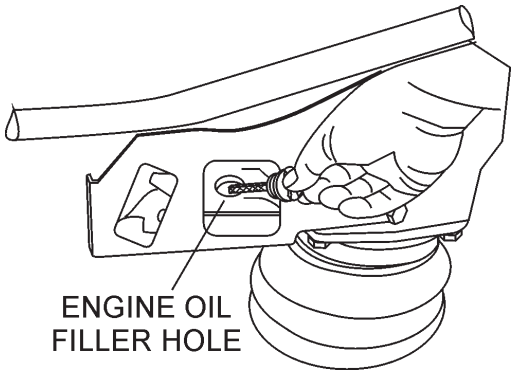


Figure 4. Engine Oil Dipstick

2. Low levels of oil may result in engine seizure due to high levels of consumption during operations.
3. Check the engine oil level and if the engine oil level is low, it should be refilled. Use the proper motor oil as suggested in the Table 3 below.

Table 3 Motor Oil Grade

Season or Temperature	Grade of motor oil (higher than MS class)
Spring, Summer or Autumn +120° F to +15° F	SAE 30
Winter +40° F to +15° F	SAE 30
Below +15° F	SAE 10W-30

Inspection

1. Check all nuts, bolts fasteners for tightness. Retighten as necessary.
2. Clean any dirt from the recoil starter and foot pedestal. Wipe the entire unit clean before operating.
3. Replace any missing or damaged Safety Operation decals.
4. Adjust height of handle. Adjust handle by loosening nuts and moving handle to suit operation. Retighten nuts.

Initial Start-up

When starting the MT-65HA Tamping Rammer perform the following:

1. Open the ***fuel shut- off valve*** by moving the ***fuel cock*** lever to the ***open*** position (Figure 5).

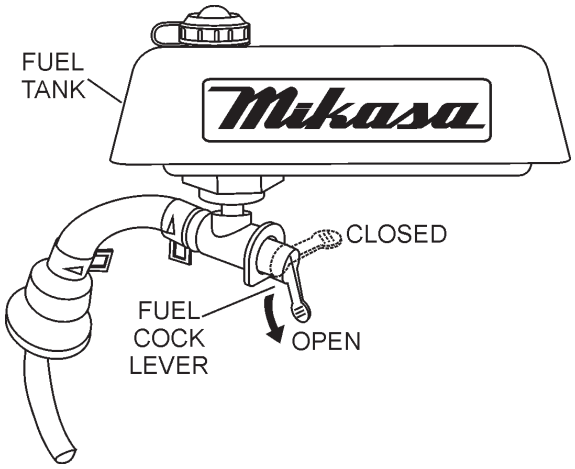


Figure 5. Fuel Shut-Off Valve (ON)

2. Set the engine ON/OFF switch (Figure 6) to the "**ON**" position (start).

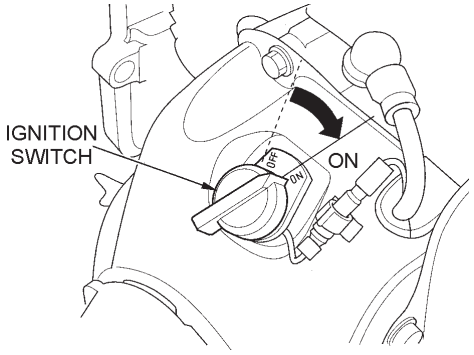


Figure 6. On Off Switch

3. Close the choke lever Figure 7 and move the throttle lever to the "**Full Open**" position. Turning the choke lever 90 degrees clockwise closes the choke. In cold weather, start the unit with choke fully closed. In warm weather or when the engine is warm, the unit can be started with choke halfway or completely open.

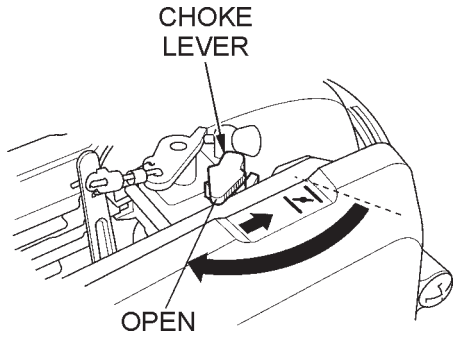


Figure 7. Choke Lever

4. Grip the recoil starter (Figure 8) handle and pull it until you feel a slight resistance. Then pull sharply and quickly. Return the recoil starter handle to the starter case before releasing.

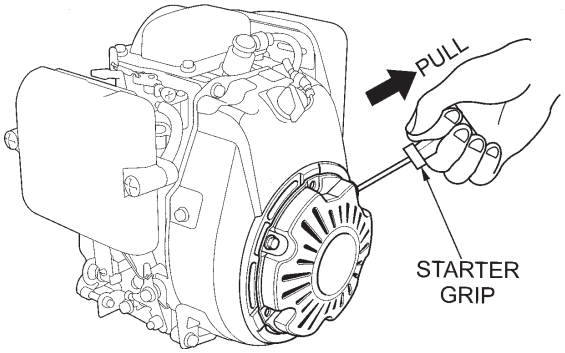


Figure 8. Recoil Starter

5. If engine fails to start, move the choke lever (Figure 7) to the half open position to avoid flooding.
6. Repeat steps 1 thru 4.
7. If the engine does not start after repeated attempts, check the spark plug for excess fuel. Clean and replace the spark plug as needed.

Operation

1. To start the rammer tamping action, move the throttle lever (Figure 9) ***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.

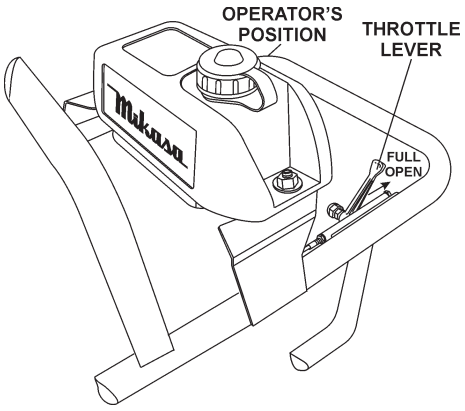


Figure 9. Throttle Lever (Full Open)

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-65HA Tamping rammer is designed to run at 3,600 rpm. At optimum rpm the foot hits at the rate between 590 ~ 695 impacts per minute. Increasing throttle speed past factory set rpm does not increase impacts and may damage unit. The MT-65HA is designed to advance while tamping. For faster advance, pull back slightly on the handle so that rear of foot contacts soil first.
3. To stop the tamping action, move throttle lever quickly from the **FULL OPEN** to **IDLE** position.

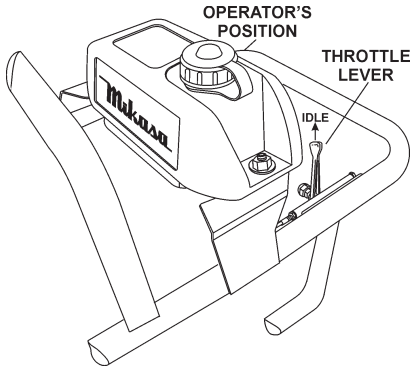


Figure 10. Throttle Lever (Idle)

Stopping The Engine

Normal Shutdown

1. Move throttle lever quickly from the **FULL OPEN** to **IDLE** position (Figure 10) and run the engine for three minutes at low speed. After the engine ***cools***, turn the engine start/stop switch to the "**STOP**" position (Figure 11).

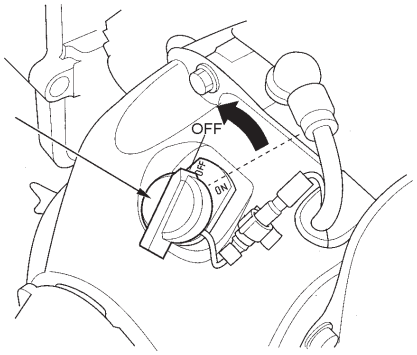


Figure 11. ON/OFF Switch (Off Position)

2. Close the ***fuel shut-off valve*** (Figure 12) by moving the fuel cock lever to the **CLOSED** position.

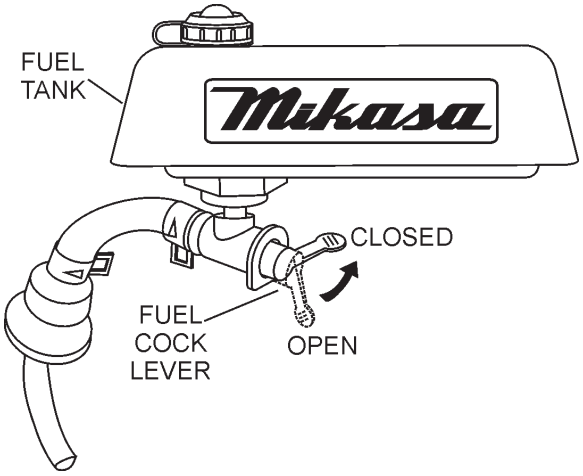


Figure 12. Fuel Shut-OFF Valve (Off Position)

Emergency Showdown

1. Move the throttle lever quickly to the ***IDLE*** position, and turn the engine start/stop switch to the ***STOP*** position.

Maintenance

Perform the scheduled maintenance procedures as indicated:

DAILY

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

WEEKLY

- Remove the fuel filter cap and clean the inside of the fuel tank.
- Remove or clean the filter at the bottom of the tank.
- Remove and clean the spark plug, then adjust the spark gap to 0.02~0.03 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.
- Clean air cleaner cover.

150 HOURS (Pre-Cleaner)

- Remove the element from the pre-cleaner (Figure 11) at the top of the crankcase (body side) and clean it with cleaning oil (kerosene). Check daily if rammer is used in a dusty area.

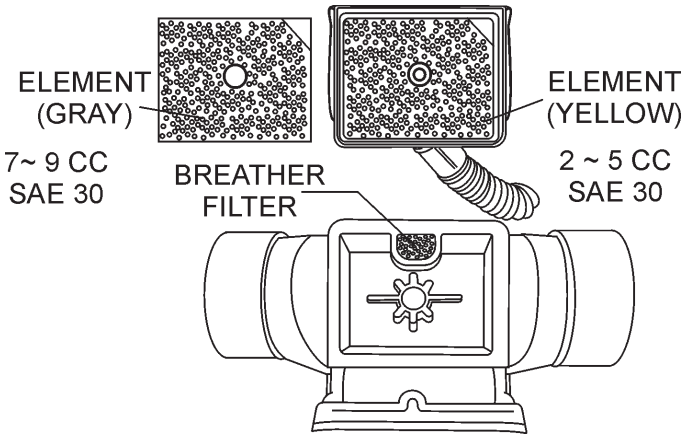


Figure 11. Primary Air Filter

- Lubricate the top element (yellow) with 2~5 cc of engine oil SAE-30.
- Lubricate bottom element (gray) with 13~15 cc of engine oil SAE-30 and completely squeeze out the excess oil from the element before installing.
- Tap the paper filter element (Figure 12) 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.

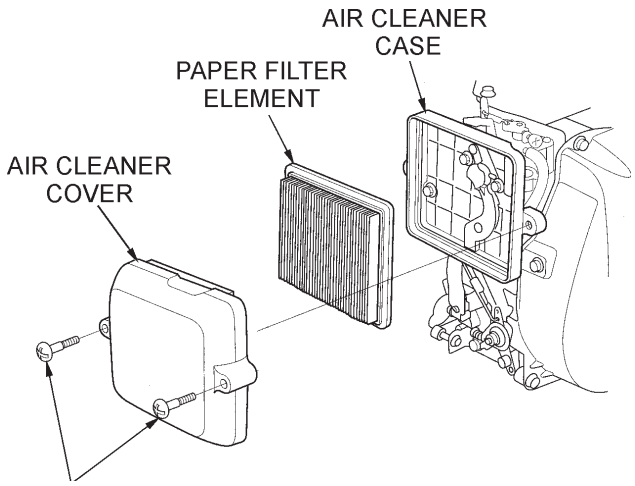


Figure 12. Engine Air Cleaner

150 HOURS (Oil Bath)

- Drain oil reservoir on foot housing (Figure 13). Refill with approximately 1.7 pt. (800 cc.) of 10W-30 SE, SF or higher grade motor oil. Oil should be midway in sight glass. Break in oil should be changed after first 50 hours.

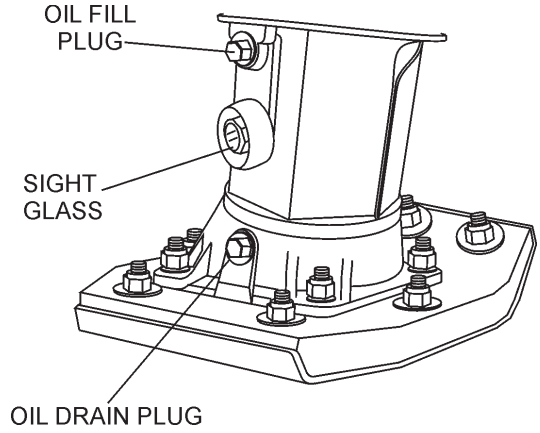


Figure 13. Foot Housing Drain Plug

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 with a cloth soaked in clean oil.
- Store unit covered with plastic sheet in moisture free and dust free location out of direct sunlight

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?	
	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 sprial spring.

TABLE 5. RAMMER TROUBLESHOOTING		
SYMPTOM	**POSSIBLE PROBLEM**	**SOLUTION**
Engine runs but rammer jumps erratically or not at all..	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.
	Soil over-compacted?	Shut-down machine and test soil.

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
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

CANADA

Multiquip

(450) 625-2244
4110 Industriel Boul.
Laval, Quebec, Canada H7L 6V3
E-MAIL: infocanada@multiquip.com

UNITED KINGDOM

Multiquip (UK) Limited Head Office

0161 339 2223
Unit 2, Northpoint Industrial Estate,
Globe Lane,
Dukinfield, Cheshire SK16 4UJ
E-MAIL: sales@multiquip.co.uk

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