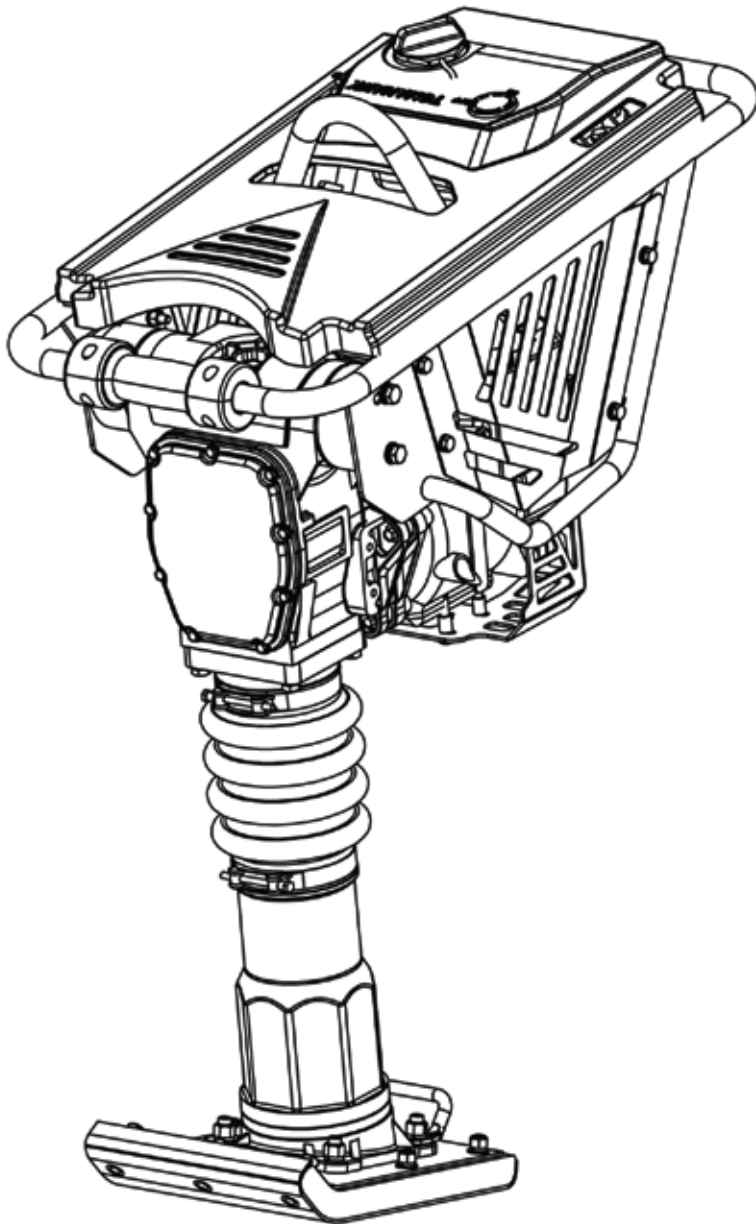


# TOMAHAWK

**JX60H  
VIBRATORY RAMMER**

**Operations Manual**



FIND THE HOW TO GUIDE ON

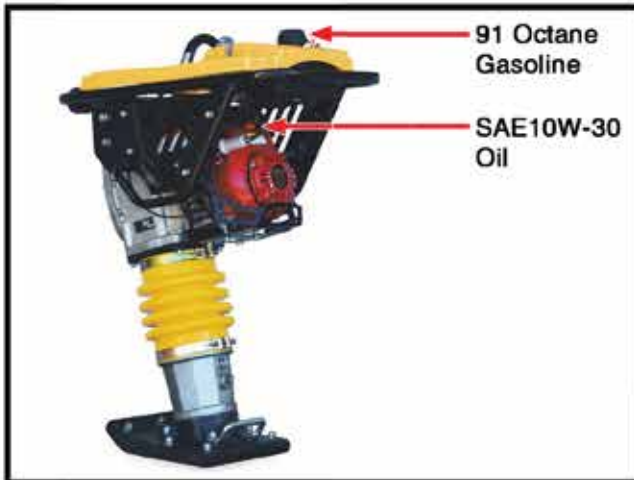


**HONDA  
ENGINES**



# QUICK START INSTRUCTIONS

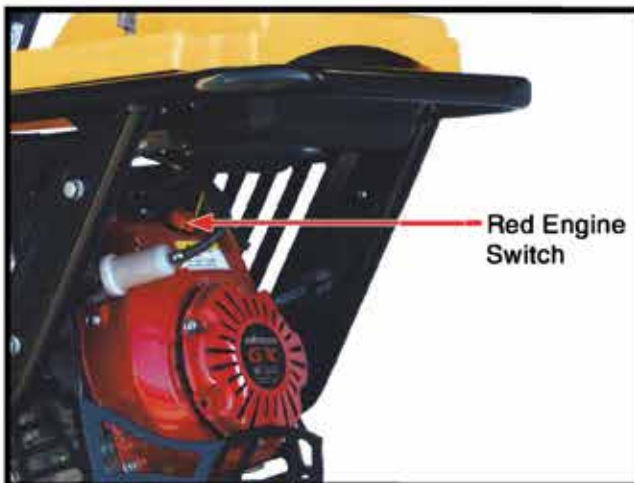
## JX60H TAMPING RAMMER



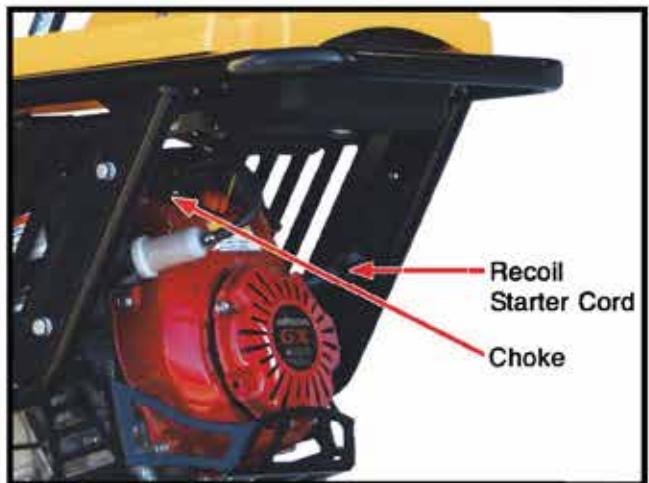
1. Add oil and gas to the rammer's engine.



2. Under the rammer's cover, open the fuel valve and close the choke.



3. Next, turn the red engine switch to "ON."



4. Pull the recoil starter cord until the engine fires, then adjust the choke.



5. Let the engine idle at 1/4 throttle for 1 minute. To run the machine, move the throttle forward.



6. To stop the machine, turn the red engine switch to "OFF" and close the fuel valve.

### STARTING TIPS

1. Make sure gasoline has not gone bad
2. Make sure engine has adequate oil
3. Make sure the engine is in the "ON" position
4. Set the Choke to the "ON" position when starting cold
5. Move the choke to the "OFF" position when starting warm
6. Make sure the red Honda Engine switch is in the "ON" position

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This manual provides information and procedures to safely operate and maintain this model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact Tomahawk Power LLC or visit [www.tomahawk-power.com](http://www.tomahawk-power.com) This machine is built with user safety in mind; however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully. If you have questions about operating or servicing this equipment, please contact Tomahawk Power.

The information contained in this manual is based on machines in production at the time of publication. Tomahawk Power reserves the right to change any portion of this information without notice.

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## 1. Safety Information

This manual contains DANGER, WARNING, CAUTION, and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**CAUTION:** Used without the safety alert symbol, **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in property damage.

## 1.1 Laws Pertaining to Spark Arresters

Notice: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose.

In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

## 1.2 Operating Safety



Familiarity and proper training are required for the safe operation of equipment! Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine.

**1.2.1 NEVER** allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.

**1.2.2 NEVER** touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.

**1.2.3 NEVER** use accessories or attachments for the rammer, which are not recommended by TOMAHAWK POWER. Damage to the rammer and/or injury to user may occur.

**1.2.4 NEVER** leave machine running unattended.

**1.2.5 ALWAYS** be sure operator is familiar with proper safety precautions and operation techniques before using machine.

**1.2.6 ALWAYS** wear hearing protection when operating equipment.

**1.2.7 ALWAYS** wear protective clothing appropriate to the job site when operating equipment.

**1.2.8 ALWAYS** wear hearing protection when operating equipment.

**1.2.9 ALWAYS** close fuel valve on engines equipped with one when machine is not being operated.

**1.2.10 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.

**1.2.11 ALWAYS** operate machine with all safety devices and guards in place and in working order. DO NOT modify or remove safety devices. DO NOT operate machine if any safety devices or guards are missing or inoperative.

**1.2.12 ALWAYS** read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.

### 1.3 Operator Safety while using Gasoline Engines



**DANGER** Internal combustion engines present special hazards during operation and fueling! Read and follow warning instructions in engine owner's manual and safety guidelines below. Failure to follow warnings and DANGER safety guidelines could result in severe injury or death.

**1.3.1 DO NOT** run machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.

**1.3.2 DO NOT** smoke while operating machine.

**1.3.3 DO NOT** smoke when refueling engine.

**1.3.4 DO NOT** refuel hot or running engine.

**1.3.5 DO NOT** refuel engine near open flame.

**1.3.6 DO NOT** spill fuel when refueling engine.

**1.3.7 DO NOT** run engine near open flames.

**1.3.8 ALWAYS** refill fuel tank in well-ventilated area.

**1.3.9 ALWAYS** replace fuel tank cap after refueling.

**1.3.10 ALWAYS** check fuel lines and fuel tank for leaks and cracks before starting engine.

**1.3.11 DO NOT** run machine if fuel leaks are present or fuel lines are loose.

### 1.4 Service Safety



**WARNING** Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

**1.4.1 DO NOT** attempt to clean or service machine while it is running. Rotating parts can cause severe injury.

**1.4.2 DO NOT** crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.

**1.4.3 DO NOT** test for spark on gasoline-powered engines, if engine is flooded or the smell of gasoline is present. A stray spark could ignite fumes.

**1.4.4 DO NOT** use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.

**1.4.5 ALWAYS** keep area around muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite them, starting a fire.

**1.4.6 ALWAYS** replace worn or damaged components with spare parts designed and recommended by Tomahawk Power.

**1.4.7 ALWAYS** disconnect spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.

**1.4.8 ALWAYS** keep machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.

## 2. Technical Data

### 2.1 Engine Data

<b>Model</b>	JX60H
<b>Engine</b>	Honda GX100
<b>Engine Speed (RPM)</b>	3800±100
<b>Power (HP)</b>	3.0
<b>Weight (lbs)</b>	150
<b>Impact Force (kN)</b>	12.8
<b>Jumping Stroke (in)</b>	1.6 - 3.4
<b>Fuel Tank Capacity (L)</b>	0.81 US qt
<b>Shoe Size (in)</b>	13 x 11
<b>Ramming System Lubrication</b>	0.8 L, CD10W-30

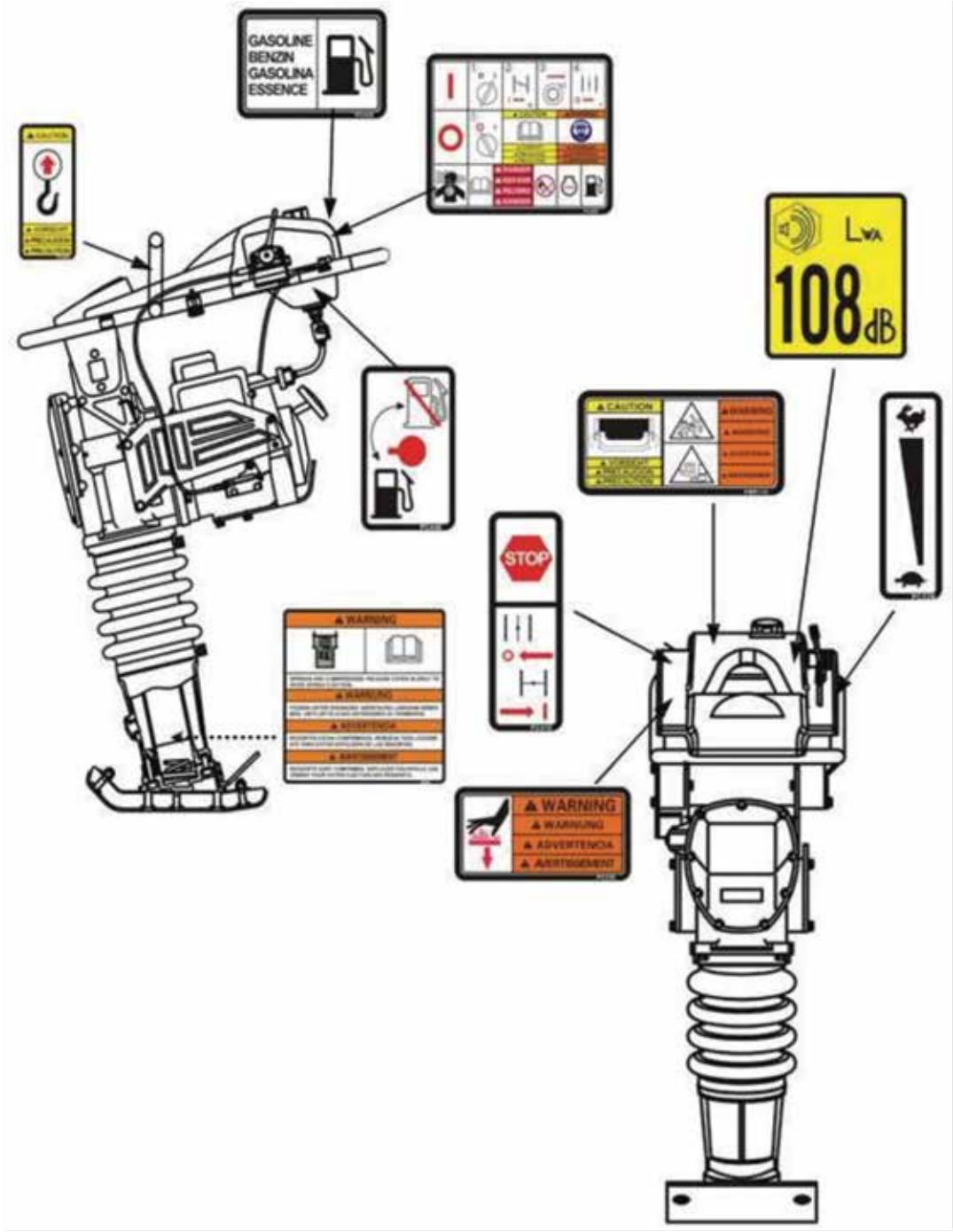
## 2.2 Machine Data

<b>Engine Type</b>	Air-cooled 4-stroke OHC
<b>Bore x Stroke</b>	56 X 40 mm
<b>Displacement</b>	98 cm <sup>3</sup>
<b>Net Power Output*</b>	3 HP (2.1 kW) @ 3,600 rpm
<b>Net Torque</b>	4.2 lb-ft (5.7 Nm) @ 3,600 rpm
<b>PTO Shaft Rotation</b>	Counterclockwise
<b>Compression Ratio</b>	8.5:1
<b>Carburetor</b>	Float Type
<b>Starting System</b>	Recoil
<b>Oil Capacity</b>	0.42 US qt (0.40l)
<b>Fuel Tank Capacity</b>	0.81 U.S. qt (0.77 liter)









### 3. Labeling

#### 3.1 Label Locations



### 3.2 Safety Labels

Tomahawk & Jumping JX machines use international pictorial labels where needed. These labels are described below:

	<p>This label contains important safety and operating information. If it becomes illegible, the cover must be replaced. Refer to the Parts Manual for ordering information.</p>
	<p>DANGER! Engines emit carbon monoxide; operate only in well-ventilated areas. Read the Operation Manual for machine information. No sparks, flames, or burning objects should be near the machine. Shut off the engine before refueling. Use only clean, filtered unleaded gasoline.</p>
	<p>CAUTION! Use only clean, filtered gasoline fuel.</p>
	<p>CAUTION ! Lifting point.</p>
	<p>WARNING! Hot surface!</p>
	<p>CAUTION! For optimal control, performance, and minimal hand/arm vibration, grasp handle as shown.</p>



**WARNING!**  
Serious injury if struck by compressed spring or cover. If the spring system cover is removed improperly, the springs can eject.



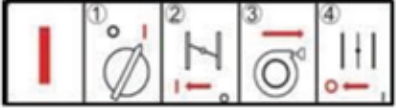
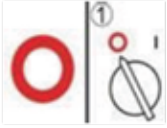



Guaranteed sound power level in dB(A).



A nameplate listing the model number and serial number is attached to each unit. Please record the information found on this plate so it will be available if the nameplate lost or damaged.

### 3.3 Operating Labels

Tomahawk & Jumping JX machines use international pictorial labels where needed. These labels are described below:

	<p>START THE ENGINE</p> <ol style="list-style-type: none"> <li>1. Turn the engine switch to the ON position</li> <li>2. Close the choke</li> <li>3. Pull the recoil starter</li> <li>4. Open the choke.</li> </ol>
	<p>Stop the engine: Turn the engine switch to OFF position.</p>
	<p>FUEL VALVE Closed Open</p>
	<p>Engine stop button: Press to stop engine. Choke: O: Open I: Closed</p>
	<p>NOTICE! Throttle control lever: Turtle = Idle or Slow Rabbit = Full or Fast</p>



## 4. Operation

### 4.1 Application

Rammers are designed to compact loose soils and gravel to prevent settling and to provide a firm, solid base for the placement of footings, concrete slabs, foundations, gas piping works, water pipe works, and cable backfill works, etc.



Please do not use in the following cases as it may cause damage because machine is unbalanced.

- Pile foundation
- Hard soil excessively compacted over normal condition
- Steep bank and slopes

The Tamping Rammer is to be used for compacting cohesive clay, gravels, and patching work on asphalt, etc.

### 4.2 Structure

The top end is made up of the engine, Clutch, Connecting Rod, Operating Handle, and Fuel Tank that connects via Shock Absorbing Rubber to the body. The bottom end is made up of Spring Cylinder (Sliding part), Foot Plate that ramps body, Foot and Bellows.

### 4.3 Before Starting

- This machine is of oil bath lubrication system.
- Check the oil level through a window at rear end of the foot. Replenish oil if oil is not visible at the window. For lubrication, use automobile engine oil of SAE 10W-30.
- Fill the fuel tank with regular gasoline (unleaded). Simultaneously, check engine oil and make it a habit to replenish on the earlier side. Low lubrication oil level may result in engine seizure due to consumption during operation. Nevertheless, oil level should be checked prior to start up without fail. For lubrication, use automobile engine oil of 10W-30 SE, SF or better grade. See Engine Operating Manual for further detail.
- Check every bolt, nut or screwed area for tightness. These may have become loosened due to vibrations from previous use.
- Remove dirt and dust. Particularly clean the vicinity of recoil starter and foot.

## 4.4 To Start

1. Open the fuel shut-off valve by moving the fuel cock level to the open position.
2. Set the engine ON/OFF switch to the “ON” position.
3. Push the choke to the closed position.
3. Grip the recoil starter handle and pull it until you feel slight resistance. Then pull quickly. Return the recoil starter handle to the starter case before releasing.
4. If the engine has started, return the choke lever slowly to the full-open position.
5. Be sure to warm-up the engine for a period 3 to 5 minutes at low speed.

NOTE: If it is difficult to start the engine by repeatedly pulling the starter rope, remove ignition plug and check the sparking performance. If the plug is wet due to excessive fuel intake or soiled, replace the coil or clean sufficiently. With the ignition plug removed, pull the recoil starter handle 2-3 times to discharge excessive gas.

## 4.5 Operation

1. Turn the choke lever to open the choke. Run the engine for 5 minutes at low speed to warm the engine.
2. Move the throttle lever quickly to the “FULL OPEN” position. DO NOT move the throttle lever slowly as this may cause damage to the clutch or spring.



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.

3. After starting the tamping action, adjust the jumping motion to suit the particular soil condition by lightly controlling the throttle lever. When the engine speed falls between the set values shown on the engine, your work can be carried out at the best efficiency. Increasing the engine speed unnecessarily does not cause the compaction force to increase. On the contrary, a resultant resonance causes the compaction force to decrease, damaging the machine.
4. Under cold weather, the oil in the machine may become viscous, causing the tamping rammer to perform somewhat irregular movement. It is recommended to perform a warm-up run while moving the throttle lever repeatedly between ON and OFF positions, before beginning to work.

5. Soil contacting surface of the foot is lined with heat-treated metal sheet for extra strength. However, for compacting cobblestone, use the filling-up soil for example so that the foot hits the soil uniformly.
6. The tamping rammer has been designed to advance while jumping. For quicker advance, erect the machine by pushing its handle down slightly so that flat surface of the foot at its rear-end contacts the ground.
7. To stop the tamping action, move throttle lever quickly from the FULL OPEN to IDLE position.

## **4.6 To Stop**

### **4.6.1 Normal Shutdown**

1. With the throttle lever closed from ON to OFF, run the engine for 3-5 minutes at low speed, and after the temperature is lowered, turn the switch to the position.
2. Close the fuel shut-off valve by moving the fuel cock lever to the CLOSED position.

### **4.6.2 Emergency Shutdown**

Move the throttle lever quickly to the IDLE position, and turn the engine's ON/OFF Switch to the OFF position.



## 5. Maintenance

### 5.1 Periodic Maintenance Schedule

The chart below lists basic engine maintenance. Refer to engine manufacturer's Operation Manual for additional information on engine maintenance.

	Daily before starting	After first 5 hours	Every 2 weeks or 25 hours	Every month or 100 hours	Every year or 300 hours
Check fuel level.	●				
Check engine oil level	●				
Inspect fuel lines & fittings	●				
Tighten rammer's shoe		●	●		
Check & tighten engine's cylinder screws		●	●		
Tighten external hardware		●	●		
Clean engine's cooling fins			●		
Clean and check spark plug			●		
Replace Spark Plug				●	
Change engine oil.					●
Clean recoil starter					●
Change ramming system oil					●
Clean muffler & exhaust					●

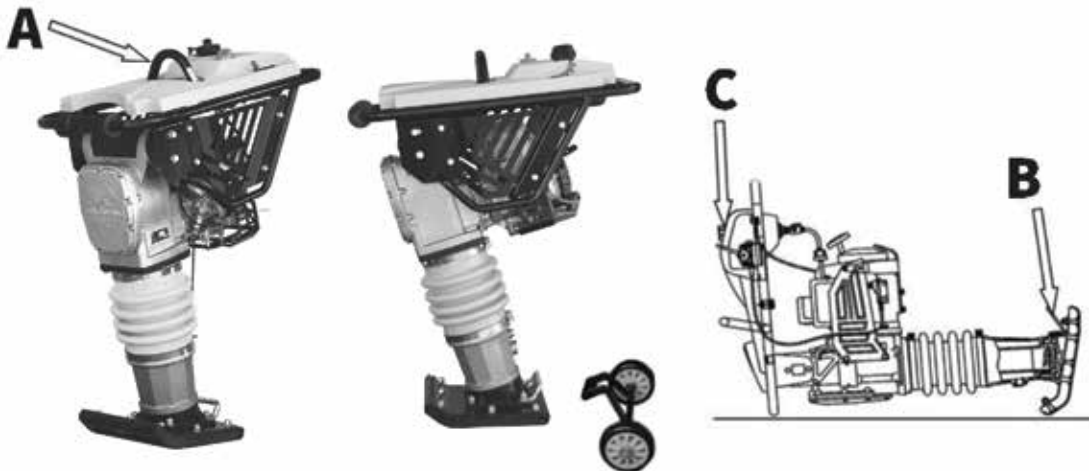
\* Change ramming system oil after first 50 hours of operation.

Note: If engine performance is poor, check, clean, and replace air filter elements as needed.

## 5.2 Transportation

1. Shutdown engine for transportation
2. For transportation, tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
3. Drain fuel for transportation over long distances or poor roads.
4. Secure machine firmly to prevent it from moving or tipping.
5. The rammer should be transported in the same position as if it is placed on level ground. In case the rammer must be laid down for transportation, drain the fuel tank as well as the carburetor and make sure that the oil plug is tightened securely, then tie the rammer to the vehicle at points (a) and (b).
6. The rammer must be laid down so that the air filter faces up. After laying the rammer down, make sure that there is no leak from the fuel from cap (c).
7. Make sure lifting device has enough capacity to hold machine (see identification plate on machine for weight). Use central lifting point (a) when lifting machine.
8. Use trolley kit (not included) for short distance transportation.

Visit [www.tomahawk-power.com](http://www.tomahawk-power.com) for wheel kit accessories and more.



## 5.3 Spark Plug

Check and clean spark plugs regularly. A fouled, dirty spark plug may cause hard starting and poor engine performance. Set spark plug gap to recommended clearance. Refer to engine manual.



The muffler and engine cylinder become very hot during operation and remain hot for a while after stopping the engine. Allow engine to cool before removing spark plug.

**NOTICE:** A loose spark plug can become very hot and may cause engine damage.

## 5.4 Air Filter

A clean engine will extend engine life. Keep the air filter clean at all times. Clean the rammer's air filter using the recommended solvent daily. See engine manual for proper cleaning procedure. Let the filter dry before reinstalling.



NEVER use gasoline or other types of low flash point solvents for cleaning the air cleaner. A fire or explosion could result.

## 5.5 Storage

The rammer should be stored on level ground, after the engine and machine have cooled down. Be sure to secure the rammer as necessary to avoid it from falling down. If the rammer has to be laid down, tighten fuel tank cap and engine oil plug securely and wait until the engine and machine are cooled down. After laying it down, make sure that there is no fuel or oil leak (if fuel leaks, drain the tank).

### 5.5.1 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.

## 6. Troubleshooting

### 6.1 Rammer Troubleshooting

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Engine rotates but amplitude 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 spiral spring
	Improper engine speed	Adjust engine speed to correct operating RPM setting

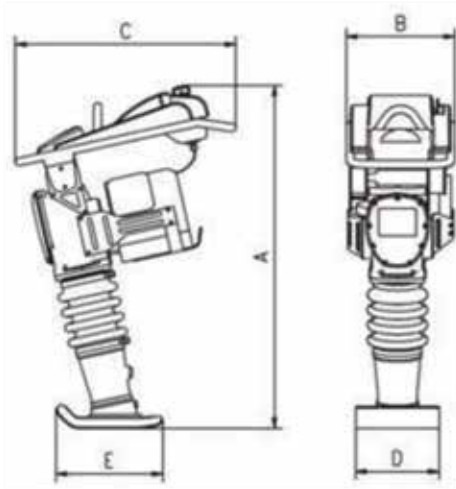
## 6.2 Engine Troubleshooting

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Difficult to start, fuel is available, but spark plug will not ignite	Ignition plug not properly connected	Check ignition system
	Carbon deposit at ignition	Clean or replace ignition
	Short circuit due to deficient insulator	Replace insulators
	Improper spark plug gap	Set spark plug gap to the correct gap
Difficult to start, fuel is available but spark plug will not ignite	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 is inadequate (water, dust)	Flush fuel system and replace with fresh fuel
	Air filter clogged	Clean or replace air filter
Fuel is available and spark plug ignites (Compression normal)	Defective cylinder head gasket	Tighten cylinder head bolts or replace head gasket
	Cylinder worn	Replace cylinder
	Spark plug loose	Tighten spark plug
Operation not satisfactory Not enough power available (Compression normal, no misfiring)	Air cleaner clogged	Clean or replace air cleaner
	Air in fuel line	Bleed (remove air) from fuel line
	Fuel level in carburetor float chamber improper	Adjust carburetor float
	Carbon deposit in cylinder	Clean or replace cylinder

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>SOLUTION</b>
Not enough power available (Compression normal, no misfiring)	Ignition coil defective	Flush fuel system and replace fuel
	Ignition plug shorts	Replace ignition wires, clean ignition
	Fuel is inadequate (water, dust)	Flush fuel system and replace fuel
Engine overheats	Mixed fuel quality is inadequate	Check fuel to oil mixture
	Excessive carbon deposition 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
Rotational speed fluctuates	Governor adjustment improper	Adjust governor to correct lever
	Governor spring defective	Clean or replace ignition
	Fuel flow restricted	Check entire fuel system for leaks or clogs
	Air taken in through suction line	Check suction line
Recoil starter malfunction	Debris in recoil starter track	Clean recoil starter assembly
	Spiral spring loose	Replace spiral spring

## 7. Equipment Size

Working Size (in):



Model	A	B	C	D	E
JX60H	27''	x	14''	x	40''

Sound Specification (According to 2000/14/EC)

Measured sound power level	105 dB(A)
Guaranteed sound power level	106 dB(A)
Sound power level limit	108 dB(A)

Hand-Arm Vibration Specification (According to ISO 5394, EN 1033 and EN500-4):  
6.8 m/s<sup>2</sup>

## 8. Warranty

Tomahawk products are covered by a Warranty for a period of twelve (12) months from the date of purchase against defects in material or workmanship provided that:

- The product concerned has been operated and maintained in accordance with the operating instructions.
- Has not been damaged by accident, misuse or abuse.
- Has not been tampered with or repaired by any unauthorized person.

The owner is responsible for the cost of transportation to and from the authorized repairer and the unit is at the risk while in transit to and from the repairer.

Impact damage is not covered under warranty. Clutches are not covered under any warranty.

Engines are officially guaranteed by Honda. See Honda's GX100 Operation Manual for more information.



## 8. Maintenance Record

### PREVENTATIVE MAINTENANCE AND ROUTINE SERVICE PLAN

The Tomahawk JX60H Rammer has been assembled with care and will provide years of service. Preventative maintenance and routine service are essential to the long life of your tamping rammer. Adhere reading through this manual thoroughly, you will find that you can do some of the regular maintenance yourself. However, when in need of parts or major service, be sure to see your dealer. For your convenience we have provided this space to record relevant data about your tamping rammer.

<b>Invoice Number:</b>		<b>Type of Machine:</b>	
<b>Date Purchased:</b>		<b>Dealer Name:</b>	
<b>Serial Number:</b>		<b>Dealer Phone:</b>	

REPLACEMENT PARTS USED					MAINTENANCE LOG	
PART NO.	DESCRIPTION	QTY	COST	DATE	DATE	OPERATION

## 5. Compaction Tips

**5.1 Soil Drop Test:** Soil preparedness refers to the “wetness” of the dirt or soil. Soil needs to be 50% dry and 50% wet, before starting compaction. A simple “hand test” can determine this. Pick up a handful of soil with your hand and squeeze the dirt. Observe whether the soil is powdery or if it breaks apart when dropped. If the soil does break apart, it means that it is too dry. If the soil keeps together in one piece when dropped, it is ready for compaction.

**5.2 Soil Testing:** Testing: The function of this step is to measure the density of an aggregate material to ensure the increase of density when driving out air. At a low moisture content level, there are more soil particles assembling together. In order to determine if the soil is compacted properly, there are several methods.

**5.2.1 Soil Testing:** Test strips are useful to determine the method of compaction and understand how many passes of your plate compactor are needed to achieve the optimum compaction. Every layer of compacted soil meets a specific percentage on the proctor curve. Through soil testing, it is possible to identify optimum moisture. Soil testing measures the soil density compared to the degree of compaction specifications, as well as the effect of the moisture.

A common laboratory method called the Proctor Compaction Test can be used to determine the optimal moisture content for a given soil type. The goal of this method is to understand the soil’s maximum dry density. A second method of soil testing is known as the California Test 216 and is used to find the relative compaction of untreated and treated soils.

Four factors account for optimum compaction including lift thickness, pressure, and soil moisture content. During the compaction process, the soil's moisture adds density and lubricates soil particles, until there is a maximum dry unit weight without voids in the soil. The table below explains the different outcomes and properties of fill materials.

Properties of Different Fill Materials			
	Foundation Support	Permeability	Compaction Difficulty
Gravel	Excellent	Very High	Very Easy
Sand	Good	Medium	Easy
Silt	Poor	Medium Low	Somewhat Difficult
Clay	Moderate	None	Very Difficult

## 5.3 Compaction Terms

**5.3.1 Cohesive soils:** Clays and mixes have a particular particle size of less than .003” or .002” and are typically classified as cohesive soils. This type of soil is primarily used for retaining pond beds and mound fills. These soils are dense due to the strongly bound molecular attraction. Cohesive soils and water will not mix easily, but only once the soils are moist it will feel sticky.



**5.3.2 Granular soils:** These soils have particle sizes of .003” or greater, like sand. Water drains easily through the soils particles of granular soils. The larger the particles, the larger the equipment needed to achieve lower frequencies and higher compaction force. Plate compactors are typically the best option for compacting granular soils - however, depending on the vibration frequency and particle size, reversible plate compactors and double drum rollers may be more appropriate for this type of work.



**5.3.3 Mixed soils:** Sometimes soils can be a mixture of both types, cohesive and granular. Thus choosing the appropriate compaction equipment is more difficult. We recommend testing your equipment to match the best machine to the desired job.



**5.3.4 Static force:** Found in the deadweight of machines, static force applies pressure downward on soil surfaces. As a result, soil particles compress in the topsoil layer.

**5.3.5 Vibratory force:** This force is engine-driven, creating a downward force, in addition to the machine's static weight. Vibrations compress the soil material closer together to increase density.

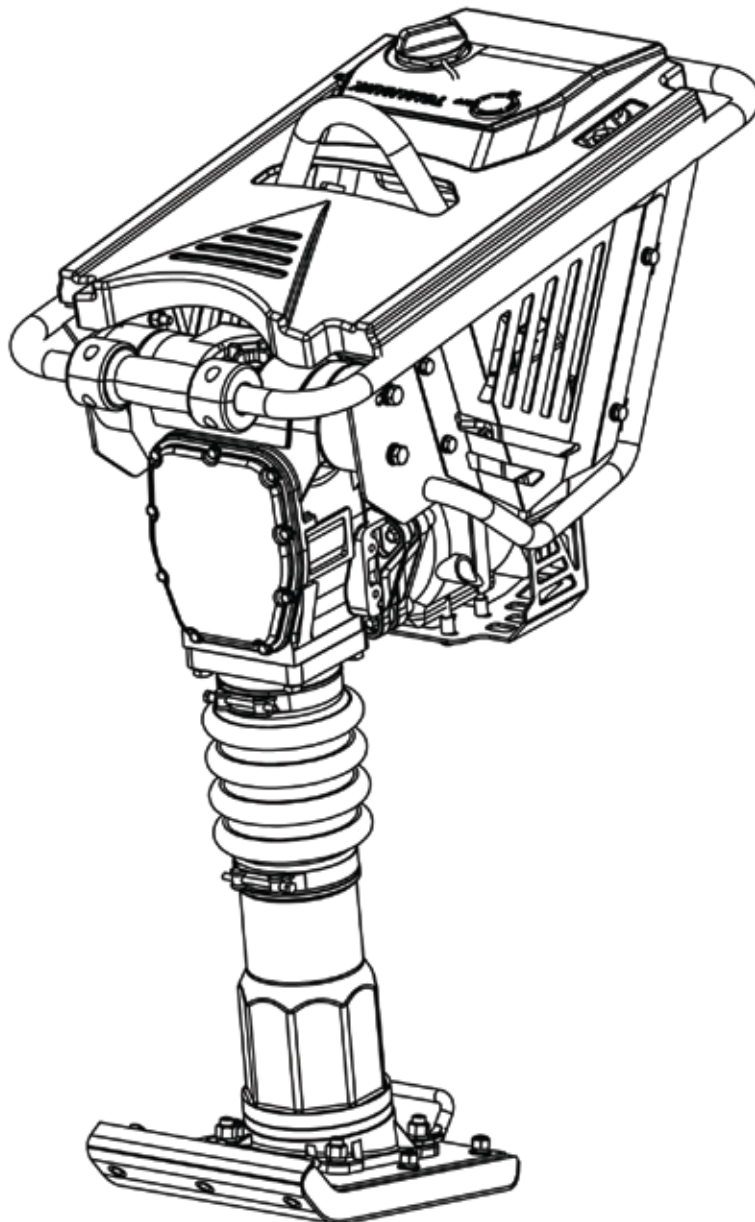
**5.3.6 Types of compaction:** There are four types of compaction that can be applied to soils or asphalt. Each one takes place using one of the two types of the forces explained above (static or vibratory).

1. Vibration: Periodic motion of particles with rotating weight in opposite directions from a position of equilibrium.
2. Impact: An action of one object coming into contact with another.
3. Kneading: Force is applied by alternating movement in adjacent positions.
4. Pressure: The process of continuous physical force against solid materials.

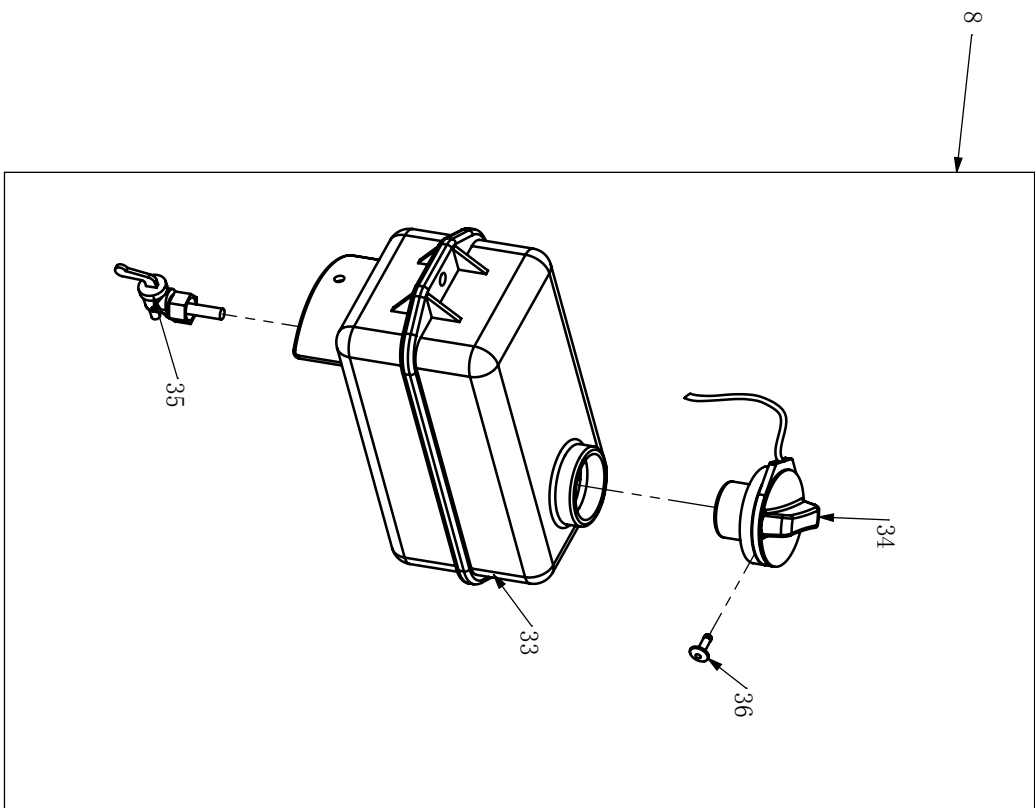
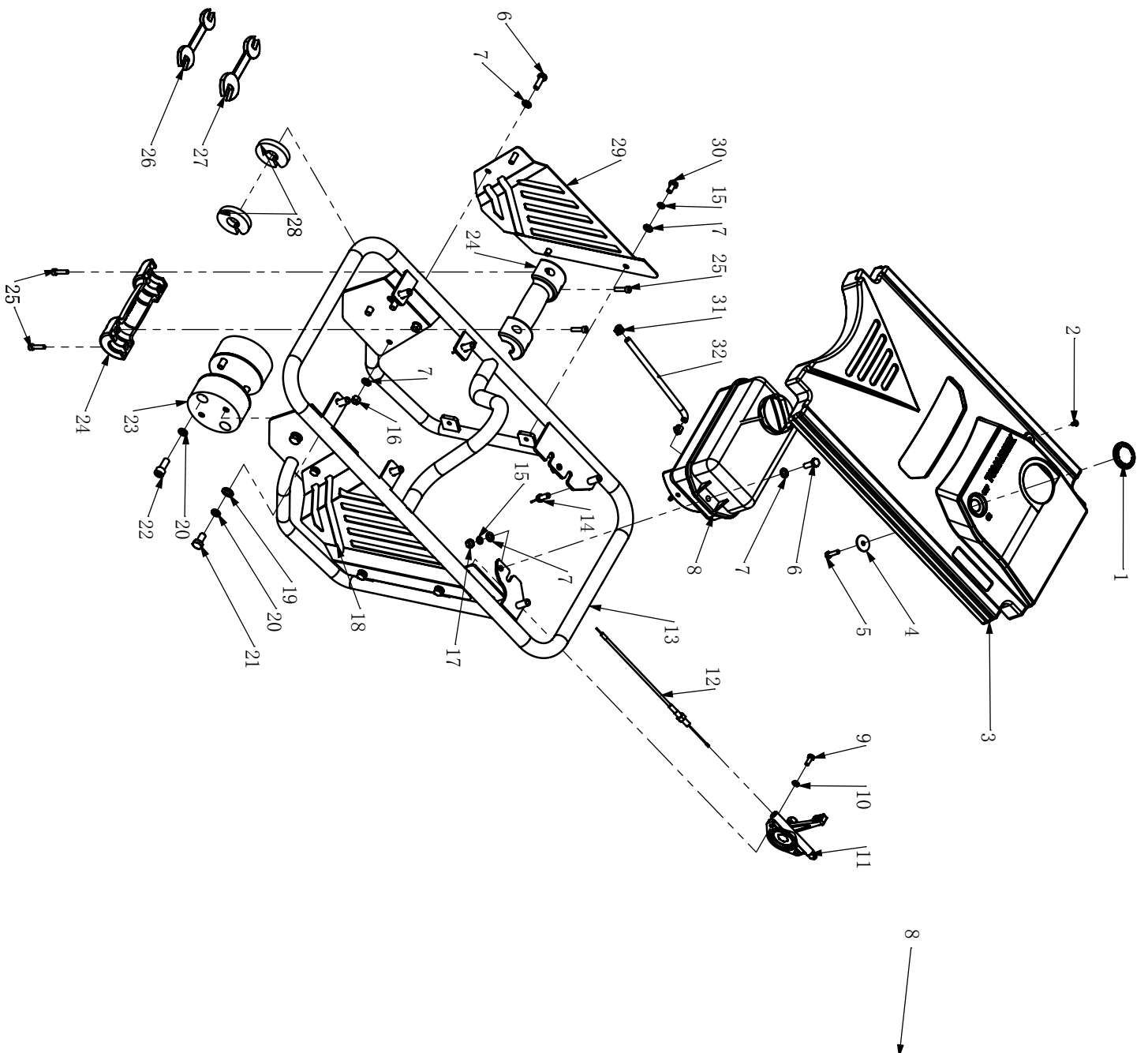
# TOMAHAWK

**JX60H  
VIBRATORY RAMMER**

**Operations Manual**



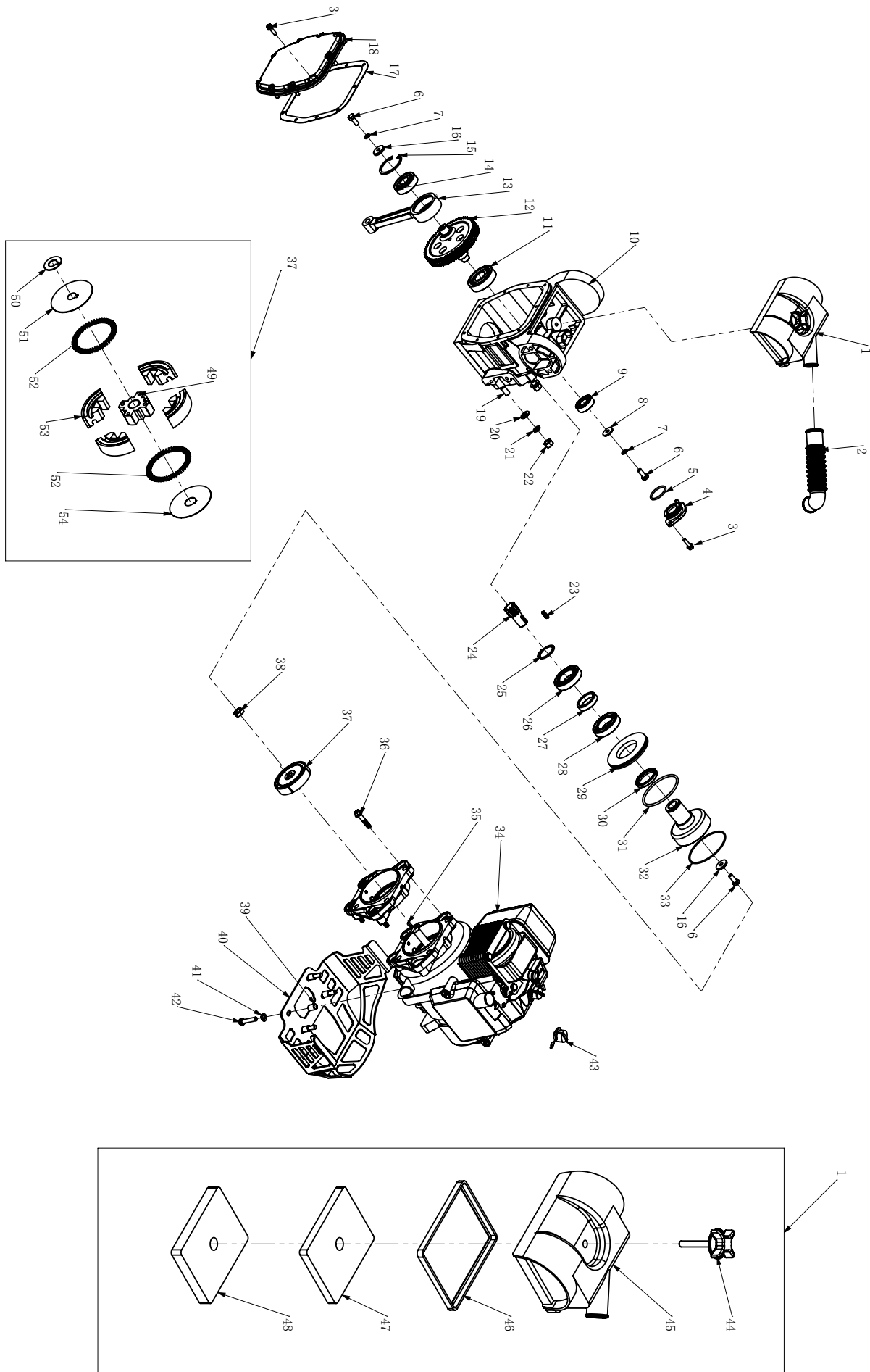
# TANK AND HANDLE



## TANK AND HANDLE

No.	Description	Drawing No.	Qty
1	Plug	1102-00058-4	1
2	Screw ST4.8x12	16481209	1
3	Handle Cover	1102-00057-4	1
4	Washer M6x25x1.5	11062502	1
5	Bolt M6x35	15060350	1
6	Bolt M8x25	15080250	6
7	Washer M8	11080000	16
8	Fuel Tank Assy.	1101-21000-4	1
9	Bolt M6x16	15060160	2
10	Washer M6	11060000	2
11	Trottel Lever Assy.	1102-06000-3	1
12	Throttle Wire	1101-06000-4	1
13	Handle Assy.	1101-22000-3	1
14	Wing Bolt M8x20	16082024	6
15	Spring Washer M8	12080000	6
16	Nut M8	13080000	4
17	Lock Nut M8	13080001	2
18	Engine Shield, Right	1102-00068-2	1
19	Washer M10	11100000	4
20	Spring Washer M10	12100000	8
21	Bolt M10x20	15100200	4
22	Allen Screw M10x25	16100253	4
23	Shock Absorber Assy.	1101-03000-4	2
24	Roller Assy.	1101-26000-1	1
25			4
28			2
26	Wrench 12x14	70000038	1
27	Wrench 13x16	70000039	1
29	Engine Shield, Left	1102-00067-2	1
30	Bolt M8x16	15080160	4
31	Clamp Φ10	70000023	2
32	Fuel Hose	1101-00038-4	1
33	Fuel Tank	1101-21001-4	1
34	Gap, Fuel Tank	1101-21002-4	1
35	Fuel Switch	1101-21003-4	1
36	Pin	1101-16004-4	1

# CRANK CASE ASSEMBLY

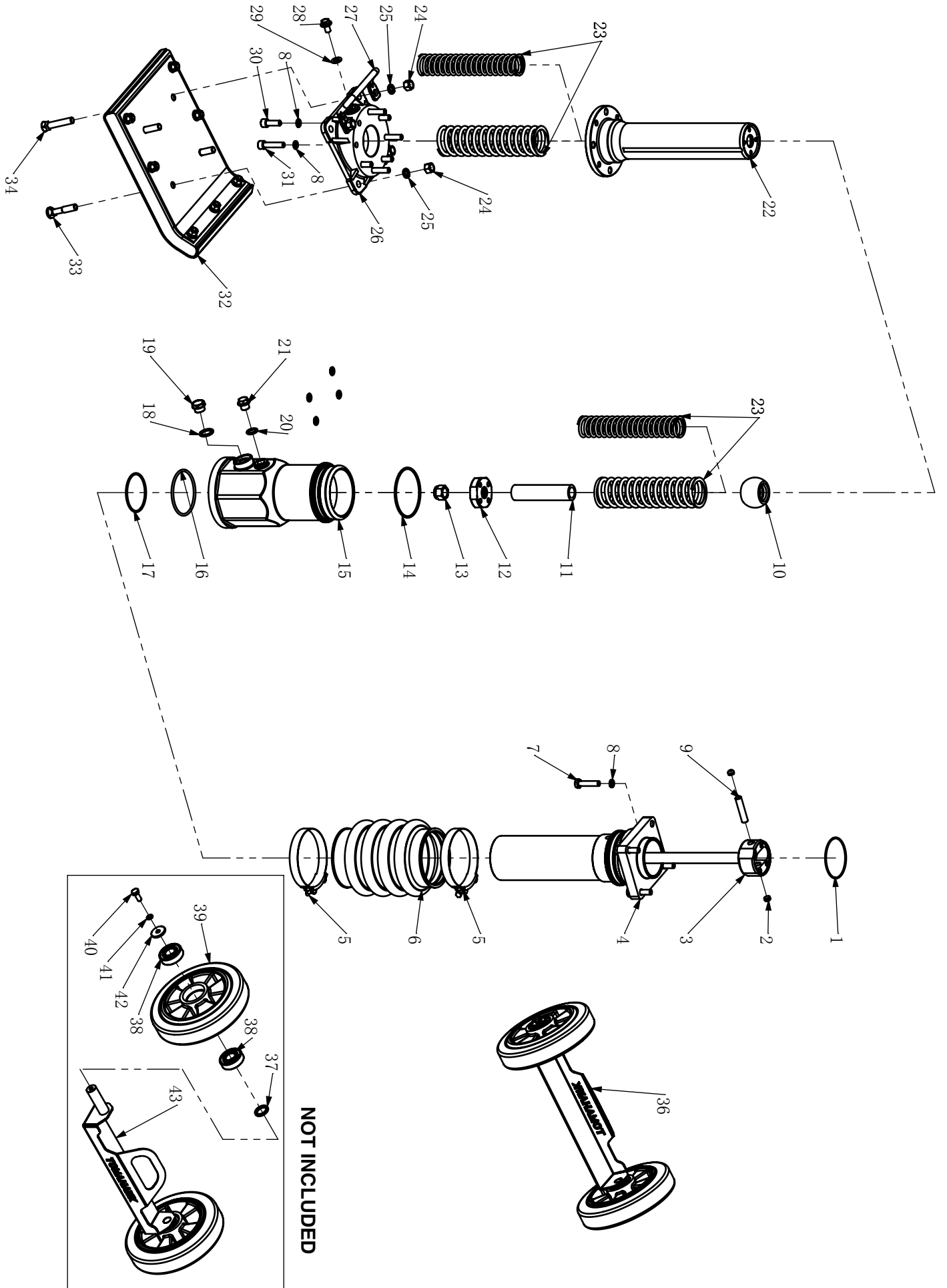




## CRANK CASE ASSEMBLY

No.	Description	Drawing No.	Qty
1	Air Cleaner Assy.	1101-07000-1	1
2	Intake Hose	1101-00027-4	1
3	Bolt M6x20	15060202	11
4	Bearing Cover	1101-00019-1	1
5	O-Ring $\Phi$ 40x3.1	260403.1	1
6	Bolt M8x20 (12.9)	15080208	3
7	Spring Washer M8	12080000	2
8	Washer M8x24x3	11082403	1
9	Bearing 6203	216203	1
10	Crank Case	1101-00012-1	1
11	Bearing 6305	216305	1
12	Crank Gear	1101-00017-4	1
13	Connecting Rod	1101-00018-4	1
14	Bearing 6304	216304	1
15	Circlip $\Phi$ 52	18520002	1
16	Washer M8x26x4.5	1101-00061-4	2
17	Packing, Front Cover	1101-00020-4	1
18	Front Cover	1101-00050-1	1
19	Bolt M10x50	15100509	4
20	Washer M10	11100000	4
21	Spring Washer M10	12100000	4
22	Nut M10	13101410	4
23	Key 5x19	20050519A	1
24	Pinion	1101-00016-4	1
25	Circlip $\Phi$ 35	18350001	1
26	Bearing 6007	216007	1
27	Spacer	1101-00015-1	1
28	Bearing 6007	216007-Z	1
29	Spacer	1101-00014-1	1
30	Oil Sealing TC $\Phi$ 52x $\Phi$ 40x4	2540520702	1
31	O-Ring $\Phi$ 92x4	2609204	1
32	Clutch Drum	1101-00013-4	1
33	O-Ring $\Phi$ 95x2.4	260952.4	1
34	Engine	25100002	1
35	Key 4x13	20040013D	1
36	Bolt M8x40	150804002	4
37	Clutch Assy.	1101-02000-1	1
38	Bolt M12	1101-00030-1	1
39	Spacer, Engine Shield	1101-00031-1	4
40	Engine Shield, Lower	1102-07000-3	1
41	Washer M8	11080000	4
42	Bolt M8x40	15080400	4
43	Engine Switch	35120-Z0D-V81C	1
44	Grip Bolt CP Assy., Air Cleaner	1101-00026-4	1
45	Cover, Air Cleaner	1101-00024-4	1
46	Packing, Air Cleaner	1101-00025-4	1
47	Air Filter (Gray)	1101-00023-4	1
48	Air Filter (Yellow)	1101-00022-4	1

# CYLINDER AND FOOT ASSEMBLY



## CYLINDER AND FOOT ASSEMBLY

No.	Description	Drawing No.	Qty
1	O-Ring $\Phi$ 82x2.4	260822.4	1
2	Plug	1101-00011-4	2
3	Piston Rod	1101-00046-4	1
4	Guide Cylinder	1101-00006-4	1
5	Clamp, Bellow	1101-00005-4	2
6	Bellow	1101-00049-4	1
7	Bolt M10x45	15100450	4
8	Spring Washer M10	12100000	12
9	Piston Pin	1101-00010-4	1
10	Stopper, Upper	1101-00044-4	1
11	Stopper, Lower	1101-00042-4	1
12	Piston End	1101-00040-4	1
13	Lock Nut M18x1.5	13180007	1
14	O-Ring $\Phi$ 100x3.5	261003.5	2
15	Protection Sleeve	1101-00002-1	1
16	O-Ring $\Phi$ 92x4	2609204	1
17	O-Ring $\Phi$ 78x3.1	260783.1	1
18	Sealing M20	14200002	1
19	Oil Level Gauge	1101-00004-4	1
20	Sealing M16	14160002	1
21	Plug M16x1.5x12	70161512	1
22	Spring Cylinder	1101-00003-4	1
23	Main Spring	1101-20000-4	2
24	Lock Nut M12	13120001	4
25	Spring Washer M12	12120000	4
26	Foot Plate	1101-00001-4	1
27	Handle Bar	1101-00007-4	1
28	Plug M10x1x16	70101016	1
29	Washer M10x1	70000004	1
30	Allen Screw M10x30	16103015	4
31	Allen Screw M10x45	16104515	4
32	Foot Assy.	1101-01000-4	1
33	Bolt M12x65	15120655	2
34	Bolt M12x70	15120705	2
35	Wheel Kits	1101-19000-1	1
36	Spacer	70000048	2
37	Bearing 6204	216204-2R	4
38	Wheel	2420050601	2
39	Bolt M8x20	15080200	2
40	Spring Washer M8	12080000	2
41	Washer M8x30x3	11083003	2
42	Frame, Wheel Kits	1101-18000-3	1

# 4" IRON RAMMER SHOE KIT

## 4" x 10" Shoe

Great for trench compaction for conduit and more, this steel rammer shoe is preferred by utility contractors and landscapers for its ability to work in confined spaces and economically priced to replace your JX60H vibratory rammer's shoe!

Fits Tomahawk JX60H model rammers.



MODEL# JX60H-4SHOE

**AVAILABLE AT TOMAHAWK-POWER.COM**

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## LIFT RIGHT

### Save your back

The Tomahawk Power Rammer Transport Wheel Kit is great for job sites large and small. This is the best tool for headache free rammer transport!

Perfectly balanced, simply line up the wheels to the rammer shoe, hook the wheels into the lifting handle, and roll away!

Fits Tomahawk TR68H and JX60H model rammers.



MODEL# TR68H-WHEEL

**AVAILABLE AT TOMAHAWK-POWER.COM**

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**COMPACTION**



**3,550 lbs/ft Vibratory Rammer**  
Part#: TR68H

3.6 HP Honda GXR120 Engine  
Easily achieve a 100% compaction rating  
3-in-One Fuel System with carburetor protection  
13" x 11" plate for narrow trenches and corners  
3 Year Engine Warranty & 1 Year Product Warranty



**3,400 lbs/ft Plate Compactor**  
Part#: TPC90H

5.5 HP Honda GX160 Engine  
Easily achieve a 100% compaction rating  
22" x 20" cold, rolled steel beveled base plate  
Includes 3.5 gallon water tank for asphalt compaction  
3 Year Engine Warranty & 1 Year Product Warranty



**3,000 lbs/ft Plate Compactor**  
Part#: TPC80

6 HP Kohler Command PRO Engine  
Easily achieve a 100% compaction rating  
16.5" x 21.5" plate for narrow trenches and corners  
Optional Honda Engine model: TPC80H  
3 Year Engine Warranty & 1 Year Product Warranty

**FINISHING**



**6.5 Gal Backpack Concrete Sprayer**  
Part#: TCS6.5

Maintain constant, adjustable pressure up to 435 PSI  
Achieve superior concrete finishes with even spraying  
Spray 15,000 sq ft in less than 10 minutes  
Compatible with major manufacturer wands  
1 Year Product Warranty



**1.6 HP Vibratory Concrete Screed**  
Part#: TVSA-H

1.6 HP Honda GX35 Engine  
Aluminum Magnesium blades available from 8ft - 14ft  
Finish concrete 4X faster than other screed methods  
360° adjustable handle placement  
3 Year Engine Warranty & 1 Year Product Warranty



**6" Early Entry Green Concrete Saw**  
Part#: TFS6H

5.5 HP Honda GX160 Engine  
Maximum cutting depth of 1 3/16 inches  
OSHA compliant vacuum port for dust collection  
Includes 6" early entry concrete blade  
3 Year Engine Warranty & 1 Year Product Warranty

**GENERATORS**



INVERTER SERIES

**2000 Watt Inverter Generator**  
Part#: TG2000i

2000 Max Watts, 1600 Rated Watts  
Run Time of 8 hours on 1 gallon of gas  
OSHA and GFCI Compliant  
Parallel technology capable for double the power  
2 Year Product Warranty



INVERTER SERIES

**3500 Watt Inverter Generator**  
Part#: TG3500i

3500 Max Watts, 3000 Rated Watts  
Run Time of 20 hours on 3.5 gallon of gas  
OSHA and GFCI Compliant  
Parallel technology capable for double the power  
2 Year Product Warranty



**4000 & 7000 Watt Generators**  
Part#: TG4000 & TG7000

4000 / 7000 Max Watts, 2500 / 5500 Rated Watts  
Run Time of 8 hours at 50% Load  
OSHA and GFCI Compliant  
Wheel kits available for more jobsite portability  
2 Year Product Warranty

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**WELDING / POWER**

INVERTER SERIES



**120 Amp Portable Welder Generator**  
Part#: TWG120A

Steady 120 Amp DC welding output  
60% Duty Cycle for extended use  
Suitable for welding rods from 6010 to 6013  
Includes wheel kit for job site portability  
2 Year Product Warranty

INVERTER SERIES



**210 Amp Portable Welder Generator**  
Part#: TWG210A

Steady 50 - 210 Amp DC welding output  
60% Duty Cycle for extended use  
Suitable for welding rods from 6010 to 7024  
Electric Key Start with battery included  
2 Year Product Warranty



**7500 & 9000 Watt Generators**  
Part#: TG7500 & TG9000

7500 / 9000 Max Watts, 6500 / 8500 Rated Watts  
Run Time of 10 hours at 50% Load  
7 gallon fuel tank for extended use  
Electric Key Start with battery included on TG9000  
2 Year Product Warranty

**PEST CONTROL**



**3.7 Gallon 3HP Backpack Fogger**  
Part#: TMD14

Turbo Boosted Pump with 40ft + Horizontal Reach  
Sprays 1 acre in 30 minutes  
10X Faster than Manual Pump Sprayers  
Converts to Leaf Blower with 200 MPH Air Velocity  
1 Year Engine Warranty & 1 Year Product Warranty



**5 Gallon 1.8HP Backpack Sprayer**  
Part#: TPS25

Reach Up to 30ft Horizontal Reach  
Sprays 1 acre in 15 minutes  
10X Faster than Manual Pump Sprayers  
Commercial Grade Pump  
1 Year Engine Warranty & 1 Year Product Warranty



**4 Gallon 3HP Backpack Spreader**  
Part#: TGS30

Reach Up to 30ft Horizontal Reach  
Covers 1 acre in less than 30 minutes  
20X Faster than Manual Broadcast Spreaders  
Converts to Fogger with Liquid Tank Accessory  
1 Year Engine Warranty & 1 Year Product Warranty

**AND MORE**



**8" Gas Powered Concrete Scarifier**  
Part#: TSCAR8H

5.5 HP Honda GX160 Engine  
Remove traffic lines at 800 - 1,000 linear ft/hr  
Tungsten Carbide Blade Kit Available  
OSHA approved dust port for silica vacuum removal  
3 Year Engine Warranty & 1 Year Product Warranty



**36" & 46" Concrete Power Trowel**  
Part#: TPT36K & TPT46K

6 HP Kohler CH260 & 9.5 HP Kohler CH395 Engines  
Adjust trowel blade pitch from 0-28°  
60-115 RPM rotor speed for superior concrete finishes  
Includes float pan and trowel blades  
3 Year Engine Warranty & 1 Year Product Warranty



**2" and 3" Trash Water Pumps**  
Part#: TW2 & TW3

Moves liquids at a rate up to 9,240 gallons/hour  
Handle solids up to 0.6"  
Cast iron impeller for smooth performance  
6.5 HP engine protected by rugged all purpose frame  
1 Year Product Warranty

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