

TOMAHAWK

TPC170H
REVERSE HYDRAULIC PLATE COMPACTOR

Operation Manual



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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 that are not recommended by Tomahawk Power. Damage to equipment and injury to the user may result.

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 approved safety goggles or safety glasses with side shields, or when needed, a face shield. Use a dust mask in dusty work conditions. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate. This applies to all persons in the work area.


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

1.2.8 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.

1.2.9 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.

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

1.3 Safety While Using Combustion Engines

 Internal combustion engines present special hazards during operation and fueling! **DANGER** 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 trenches unless there is adequate ventilation, through such items as exhaust fans or hoses are provided. Gasoline exhaust 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

 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.

1.4.9 ALWAYS check for damaged parts before each use. Carefully check that the equipment will operate properly and perform its intended function. Replace damaged or worn parts immediately. Never operate the screed with a damaged part.

1.4.10 ALWAYS inspect the machine prior to placing in storage and before re-use. Store the machine in a dry, secure place out of the reach of children when not in use.

1.4.11 ALWAYS use only accessories that are recommended by the manufacturer for use with the machine. Accessories that may be suitable for one machine may create a risk of injury when used with the machine.

2. PRODUCT DETAILS

2.1 Compactor Description

Powered by a 5.5HP Honda Engine, the TPC170H reverse plate compactor is perfect for retaining walls, asphalt, and more. Designed with a 28 in. x 24 in. plate. Operating at 5,400 Blows per Minute (BPM), the TPC170H compacts cohesive and granular soils up to 20 inches!

2.2 Specifications

Model	TPC170H
Engine	Honda GX200
Horsepower	6.5 HP
Compaction Force	7,000 lbs./ft.
Blows Per Minute	5,400
Centrifugal Force	30 Kn
Vibration Frequency	90 hz
Travel Speed	66 ft/min
Plate Size (LxW)	28 x 24 in
Weight	374 lbs

3. OPERATION

3.1 Recommended Fuel

The engine requires regular grade unleaded gasoline, 87 octane or higher. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage fuel system. Consult engine owner's manual for complete fuel specifications.

3.2 Before Starting

Read and understand safety and operating instructions at beginning of this manual.

- 3.2.2 Check:**
- Oil level and fuel levels
 - Tightness of external fasteners
 - V-Belt tension (FIG 1)
 - Condition of fuel lines
 - Handles (FIG 2)
 - Condition of air filter

3.3 Starting the Engine

3.3.1 Open fuel valve by moving lever to the "ON" position. (a1)

NOTE: If engine is cold, move choke lever to close position.

If engine is hot, set choke to open position (b2).

3.3.2 Move the throttle lever to the idle position.

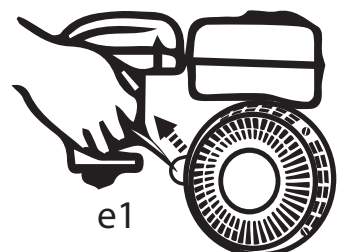
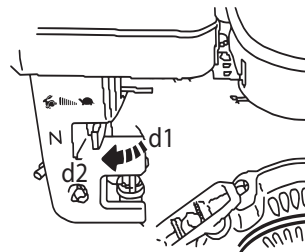
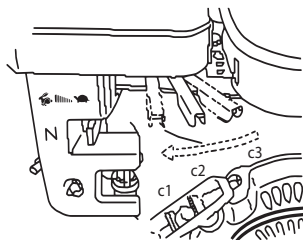
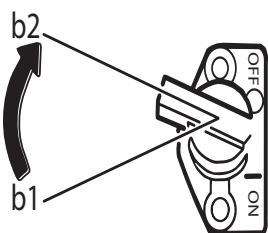
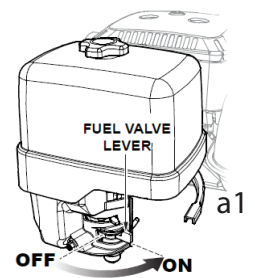
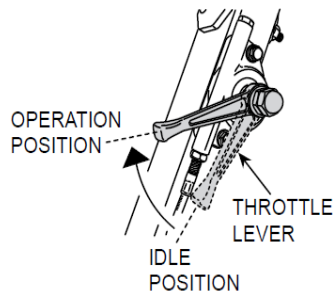
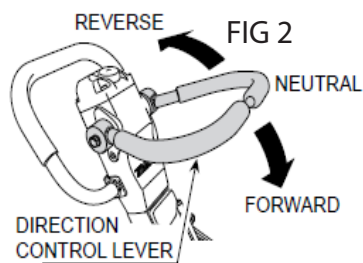
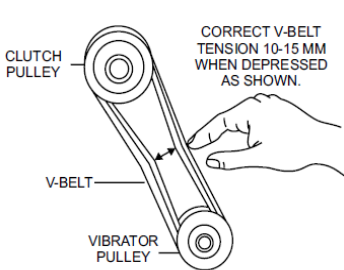
3.3.3 Pull starter rope (c).

NOTE: If the oil level in the engine is low, the engine will not start. If this happens, add oil to engine. Some engines are equipped with an oil alert light that will come on while pulling the starter rope.

3.3.4 Open choke as engine warms (b2).

3.3.5 Open throttle fully to operate.

FIG 1



3.4 Stopping the Engine

3.4.1 Reduce engine RPM to idle by moving throttle completely to right (d2).

3.4.2 Turn engine switch to "OFF".

3.4.3 Close fuel valve by moving lever to the left (a2).

3.5 Application

This plate is designed for compacting patchwork on asphalt, cohesive soils, granular soils, sticky soils (clay or slit), gravel, sand, or mixed soils. It is designed to specifically maneuver narrow, cramped spaces, the TPC170H compacts cohesive and granular soils up to 20 inches, while its self-cleaning, open base plate minimizes rock and dirt build up.

3.6 Operation

Run engine at full throttle and allow plate to pull itself along at its normal speed. When operating on an incline it may be necessary to assist plate by pushing it forward slightly. Depending on the material being compacted, three or four passes are recommended to achieve the best compaction.

While a certain amount of moisture in the soil is necessary, excessive moisture may cause soil particles to stick together and prevent good compaction. If soil is extremely wet, allow it to dry somewhat before compacting.

If soil is so dry as to create dust clouds while operating plate, some moisture should be added to the ground material to improve compaction. This will also reduce service to the air filter.

When using the plate on paving stones, attach a pad to the bottom of the plate to prevent chipping or grinding surface of the stones. A special polyurethane pad designed for this purpose is available as an optional accessory.



DO NOT operate plate on concrete or on extremely hard, dry, compacted surfaces. The plate will jump rather than vibrate and could damage both plate and engine.

4. MAINTENANCE

4.1 Periodic Maintenance

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 20 hours	Every 2 weeks or 50 hours	Every month or 100 hours	Every year or 300 hours
Check fuel level.	●				
Check engine oil level.	●				
Inspect fuel lines.	●				
Inspect air filter. Replace as needed.	●				
Check and tighten external hardware.	●				
Check and adjust drive belt.		●	●		
Clean air cleaner elements.			●		
Inspect shockmounts for damage.			●		
Change engine oil.		●		●	
Clean engine cooling fins.				●	
Clean sediment cup / fuel filter.				●	
Check and clean spark plug.				●	
Check and adjust valve clearance.					●
Change exciter oil.					●

4.2 Cleaning the Plate

Clean the plate after use to remove dirt, stones, and mud caught under the engine console. If plate is being used in a dusty area, check engine cylinder cooling fins for heavy dirt accumulation. Keep engine cylinder fins clean to prevent engine from overheating.

4.5 Spark Plug (Fig. 5)

Clean or replace the spark plug as needed to ensure proper operation. Refer to the engine owner's manual.

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Do not touch the muffler while it is hot.

NOTE: Refer to the Technical Data for the recommended spark plug type and the electrode gap setting (page 6).

- 4.5.1 Remove spark plug and inspect it.
- 4.5.2 Replace plug if the insulator is cracked or chipped.
- 4.5.3 Clean spark plug electrodes with a wire brush.
- 4.5.4 Set the electrode gap (a).
- 4.5.5 Tighten spark plug securely.



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

4.6 Engine Oil (Fig. 6)

- 4.6.1 Drain oil while the engine is still warm.
- 4.6.2 Remove the oil fill plug (a) and drain plug (b) to drain oil.
- 4.6.3 Install drain plug.
- 4.6.3 Fill the engine crankcase through the oil opening (b), to the upper mark on the dipstick (c). Do not thread in the dipstick to check the level. See Technical Data for oil quantity and type (page 6).
- 4.6.4 When the crankcase is full, reinstall the dipstick.

NOTE: In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.

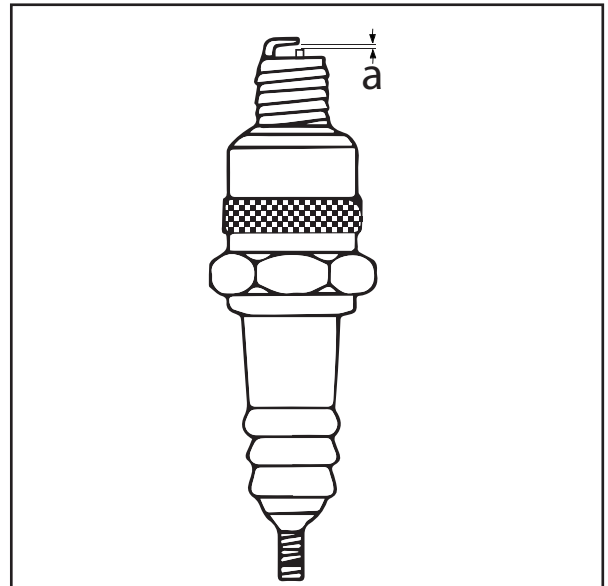


Fig. 5

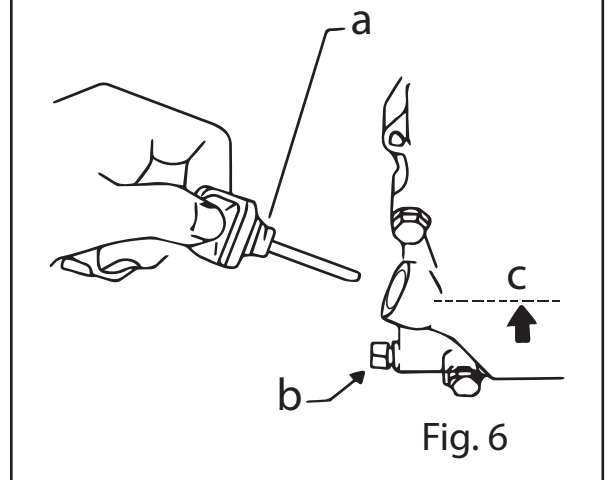


Fig. 6

4.7 Air Filter (Fig. 7)



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



NEVER run engine without air filter: Severe engine damage will occur and a fire or explosion could result.

The engine is equipped with a dual element air cleaner. Under normal operating conditions, elements should be cleaned once every week. Under severe, dry and dusty conditions, the elements should be maintained daily. Replace an element when saturated with dirt that cannot be removed.

4.7.1 Remove the air cleaner cover (a). Remove both elements and inspect them for holes or tears. Replace damaged elements.

4.7.2 Wash the foam element (b) in a solution of mild detergent and warm water. Rinse it thoroughly in clean water. Allow the element to dry thoroughly.

4.7.3 Tap the paper element (c) lightly to remove excess dirt or blow compressed air through the filter from the inside out. Replace the paper element if it appears heavily soiled.

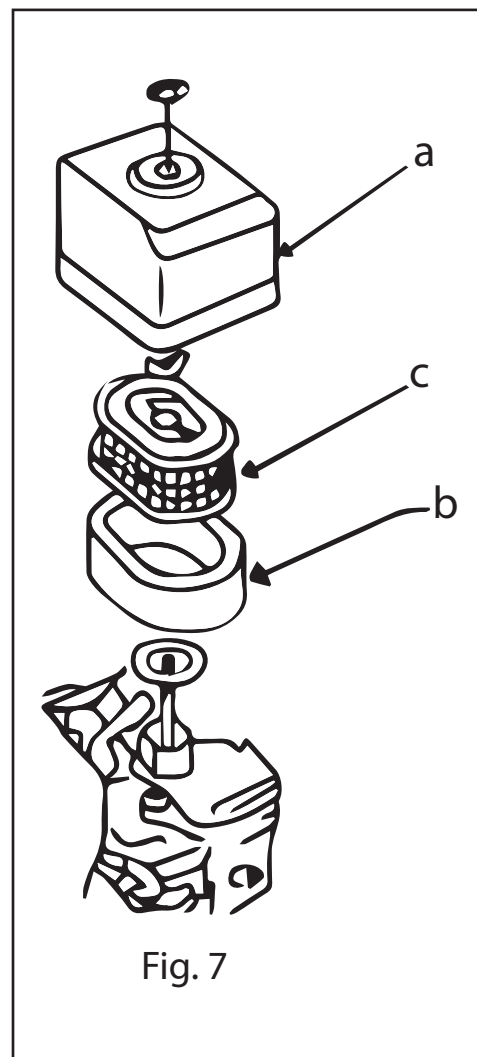
4.8 Cleaning Sediment Cup (Fig. 8)

4.8.1 Turn fuel valve off.

4.8.2 Remove sediment cup (a) and O-ring (b).

4.8.3 Wash both thoroughly in a nonflammable solvent. Dry and reinstall them.

4.8.4 Turn fuel valve on and check for leaks.



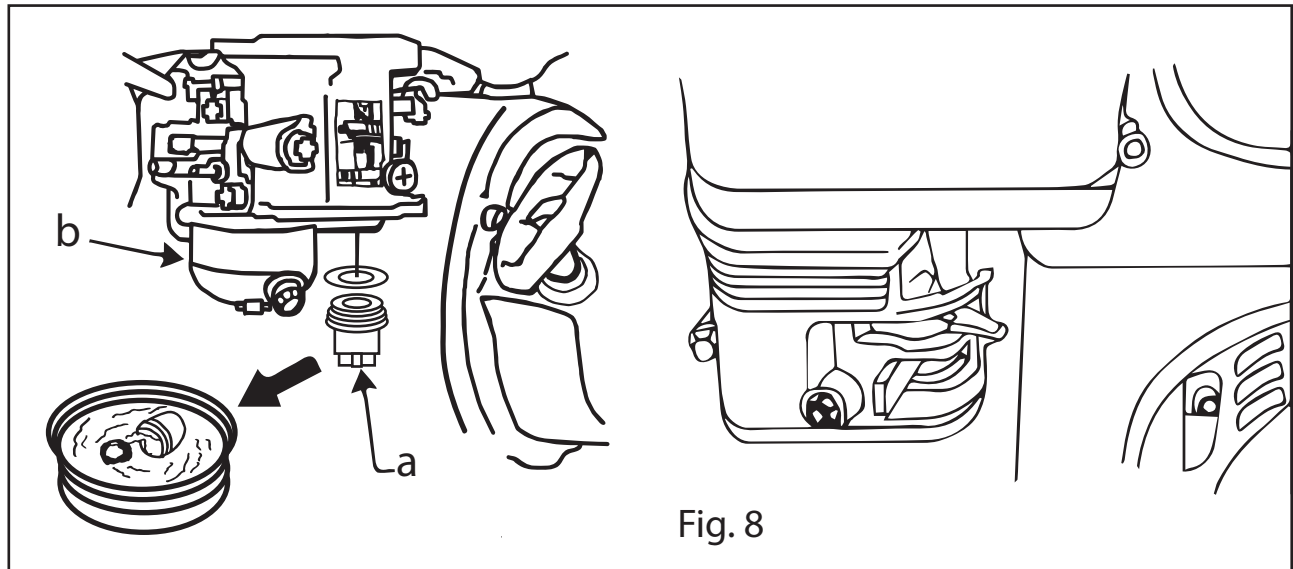


Fig. 8

4.9 Carburetor Adjustment (Fig. 9)

4.9.1 Start the engine and allow it to warm up to operating temperature.

4.9.2 Set the pilot screw (a) 2 turns out. See Note.

4.9.3 With the engine idling, turn the pilot screw (a) in or out to the setting that produces the highest rpm.

4.9.4 After the pilot screw is adjusted, turn the throttle stop screw (b) to obtain the standard idle speed. See Technical Data.

NOTE: On some engines the pilot screw is fitted with a limiter cap (c) to prevent excessive enrichment of the air-fuel mixture in order to comply with emission regulations. The mixture is set at the factory and no adjustment should be necessary. Do not attempt to remove the limiter cap. The limiter cap cannot be removed without breaking the pilot screw.

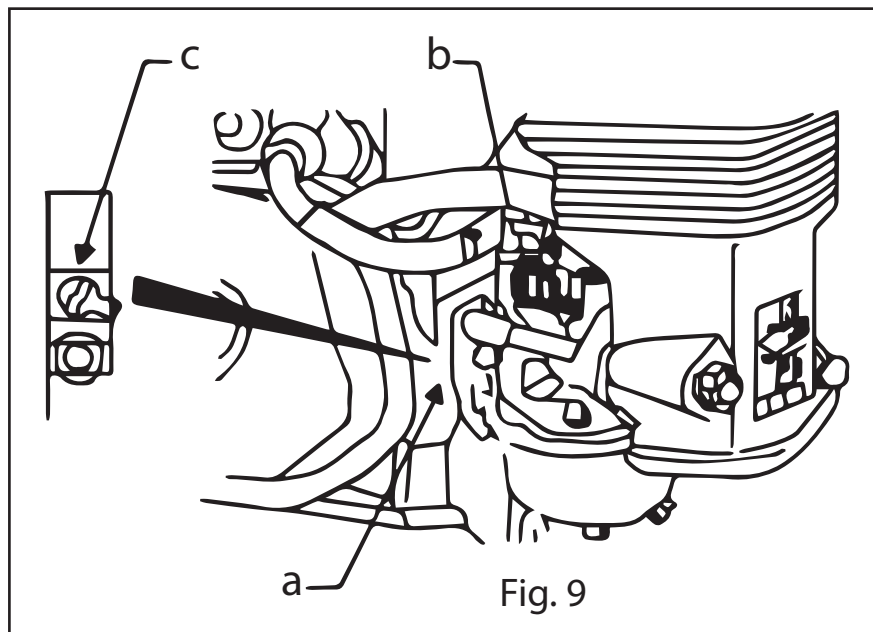


Fig. 9

5. TROUBLESHOOTING

Troubleshooting (Compactor)		
Symptom	Possible Problem	Solution
Travel speed low and vibration weak.	Clutch slips?	Adjust or replace clutch.
	V-belt slips?	Adjust or replace V-belt.
	Excessive oil in vibrator?	Fill to correct level.
	Trouble in vibrator internals?	Check vibrator assembly for any worn or defective parts, replace any defective parts.
	Aeration in hydraulic oil for for travel reversing system?	Purge air in hydraulic oil. (Bleed plug)
	Engine speed incorrect?	Set engine speed to correct RPM.
Travels forward or backward but unable to switch direction.	Hydraulic pump problems?	Check hydraulic pump.
	Direction Control Lever installation wrong?	Correct installation of IDirection Control Lever.
	Broken or defective oil hose?	Replace oil hose.
	Aeration in hydraulic oil?	Purge air in hydraulic oil. (Bleed plug)
	Excessive oil in reversing system?	Fill to correct level.
	Hydraulic pump clogged with trash?	Clean valve inside hydraulic pump.
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage.
Does not travel in forward or reverse	V-belt disengaged or slips?	Engage V-belt, adjust or replace.
	Clutch slips?	Adjust clutch, replace if necessary.
	Vibrator locks?	Check vibrator and correct problem.
	Cylinder piston bearing failure?	Check piston bearing in cylinder for leakage at USH packing.

6. STORAGE

If the plate compactor is being stored for more than 30 days:

6.1 Storage Tips

6.1.1 Remove loose stones and dirt from plate.

6.1.2 Clean engine cylinder cooling fins.

6.1.3 Clean or replace air filter.

6.1.4 Change exciter oil.

6.1.5 Change engine oil and follow stroage procedures described in the engine manual.

6.2 Lifting the Machine

See Technical Data for the weight of the machine.



To avoid serious injury, burns, or fire hazards, let the engine cool before transporting the machine



To reduce risk of back injury while lifting, keep your feet flat on ground an shoulder width apart. Keep your head up and back straight.



DO NOT lift the plate compactor by its guide handle. The plate compactor can shift, causing it to fall.

To lift machine manually:

6.2.1 Stop the engine.

6.2.2 Obtain help from a partner and plan the lift.

6.2.3 Grasp the machine by its cage and lifting slot.

6.2.4 Lift the machine.

To lift machine mechanically:

Attach hook, harness, or cable to the machine as shown and lift as desired.

6.3 Transporting the Machine

6.3.1 Turn the fuel valve to the off position and keep the engine level to prevent fuel from spilling.

6.3.2 Tie down the machine on vehicle to prevent the machine from sliding or tipping over.

7. COMPACTION TIPS

7.1 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.

7.2 Soil 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.

7.3 Test Strips: 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

7.4 Compaction Terms

7.4.1 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.



7.4.2 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.



7.4.3 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.



7.4.4 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.

7.4.5 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.

7.4.6 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.



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