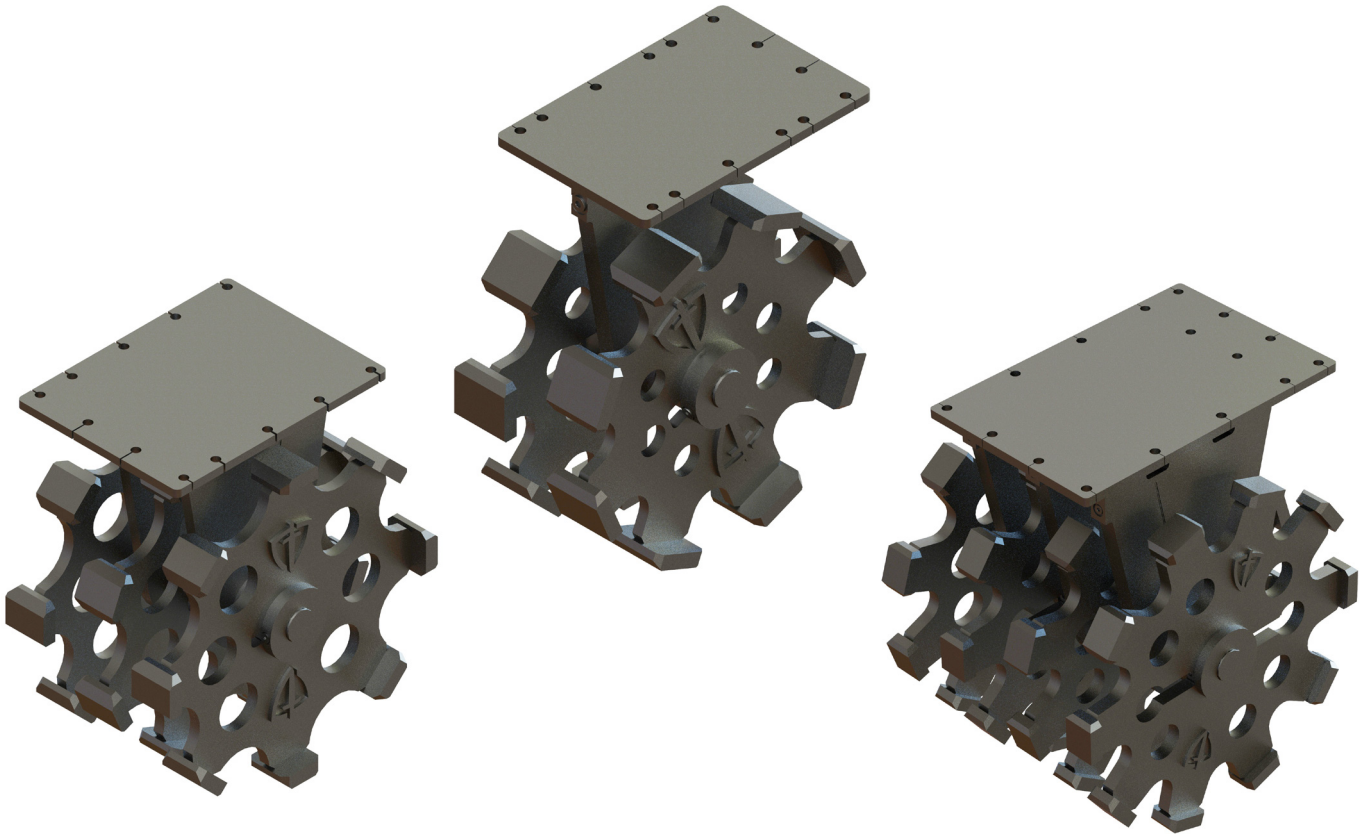
PALADIN™
POWERFUL ATTACHMENT TOOLS

# OPERATOR'S MANUAL

## STRIKEFORCE™ WHEEL COMPACTORS
## TWC500, TWC1000 & TWC4K SERIES

**FOR**
**TLB & EXCAVATORS**



**SERIAL NUMBER: _____**

**MODEL NUMBER: _____**

**Manual Number: 51-4766**
**Release Date: July 11, 2018**
**Rev. 1**

# TABLE OF CONTENTS

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# PREFACE

## GENERAL COMMENTS

Congratulations on the purchase of your new PALADIN product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

**WARNING! Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.**
**Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.**

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

**NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.**

## BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer. Keep this manual available for reference. Provide this manual to any new owners and/or operators.

## SAFETY ALERT SYMBOL

This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

## SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

## SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters; some items are listed below (not inclusive):

- prime mover type, age condition, with or without cab enclosure and configuration
- operator training, behavior and stress level
- job site organization, working material condition and environment

Based on the uncertainty of the prime mover, operator and job site it is not possible to get precise prime mover and operator sound pressure levels or vibration levels for this attachment.

**NOTE: A list of all Paladin Patents can be found at http://www.paladinattachments.com/patents.asp.**

# SAFETY STATEMENTS

**THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.**

**DANGER** — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.**

**WARNING** — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.**

**CAUTION** — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.**

**NOTICE** — **NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.**

# GENERAL SAFETY PRECAUTIONS

**WARNING!**

## READ MANUAL PRIOR TO INSTALLATION

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**

## READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.

## KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

# GENERAL SAFETY PRECAUTIONS

**WARNING!**

## PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

**WARNING!**

## LOWER OR SUPPORT RAISED EQUIPMENT

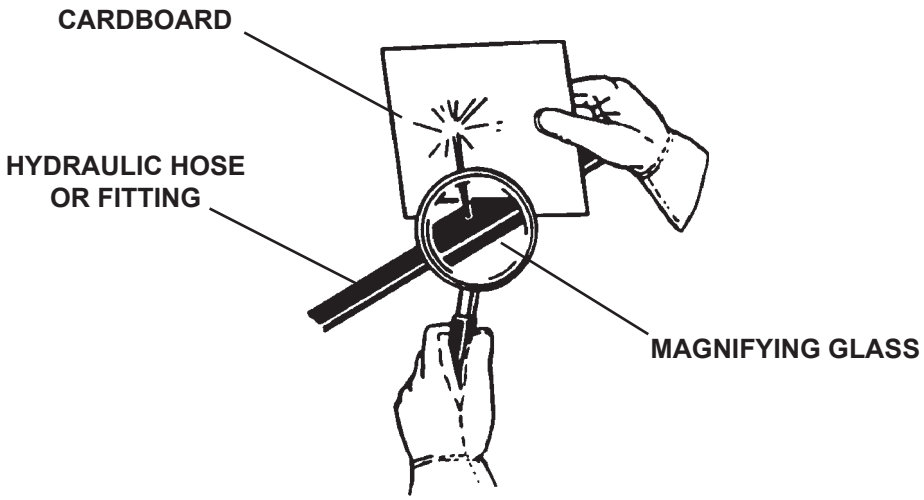
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

**WARNING!**

## USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION.**



# GENERAL SAFETY PRECAUTIONS

**WARNING!**

## DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protective Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

**WARNING!**

## SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.

## SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

# EQUIPMENT SAFETY PRECAUTIONS

**WARNING!** **KNOW WHERE UTILITIES ARE**

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

**WARNING!** **EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.**

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

**WARNING!** **REMOVE PAINT BEFORE WELDING OR HEATING**

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area, and dispose of paint and solvent properly. Remove paint before welding or heating.
When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

**WARNING!** **END OF LIFE DISPOSAL**

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.

## OPERATING THE ATTACHMENT

- Block off work area from bystanders, livestock, etc.
- Never allow anyone to approach the compactor when in operation.
- Do not exceed rated operating capacity of prime mover.
- Operate only from the operator’s station.
- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the prime mover to overturn.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- Never lift, move, or swing a load or attachment over anyone.
- Do not lift loads in excess of the capacity of the prime mover. Lifting capacity decreases as the load is moved further away from the unit.
- When operating in trenches and excavations, properly shore the excavation to avoid a cave in.
- The compactor should not be used as a parking brake to immobilize your prime mover or used in any way to assist in moving your prime mover. Follow the instructions in your prime mover operator’s manual before leaving the operator’s station

# EQUIPMENT SAFETY PRECAUTIONS

## OPERATING THE ATTACHMENT (Continued)

- When using compactor with a quick coupler, operator should check total working weight, including weight of the coupler. Always make sure coupler is securely locked on attachment before use.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine and remove the key.

## TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough terrain and slopes.
- When transporting on a trailer secure attachment at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., as a cave-in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

## MAINTAINING THE ATTACHMENT

- Before performing maintenance (unless otherwise specified), lower the attachment to the ground, apply the brakes, turn off the engine and remove key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manuals before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Never work under a raised attachment.

# INSTALLATION

## GENERAL INFORMATION

The following instructions will help you to mount your wheel compactor onto your prime mover. The wheel compactor uses the attaching system for your prime mover. Therefore, if you know how to install an attachment onto the front of your prime mover, installing the wheel compactor should prove no problem.

Remember to read all safety warnings, decals and operating instructions in your prime mover manual and this manual before operating the attachment. If there is any portion of this manual that you do not understand, contact your dealer.

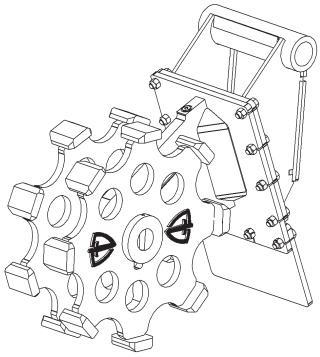
## INSTALLATION

1. Remove any attachment from the front of the prime mover.
2. Following all standard safety practices and the instructions for installing an attachment in your prime mover operator's manual, install the attachment onto your prime mover.

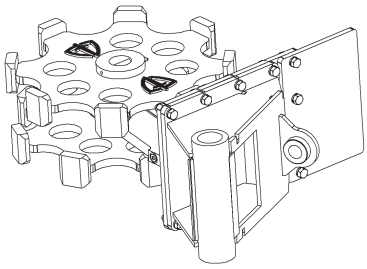
**WARNING! To Avoid Serious Personal Injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the unit.**

## DETACHING FROM PRIME MOVER

**CAUTION! When detaching: Position your wheel compactor for the best stability. Due to the weight of the compactors, personal injury could occur if it tips over.**



**UPRIGHT WITH MOUNTING PLATE IN CONTACT WITH GROUND**



**LAYING DOWN WITH MOUNTING PLATE IN CONTACT WITH GROUND**

1. Lower the attachment to the ground and rotate until the mounting plate is contacting the ground.
2. Follow your prime mover operator's manual for detaching (removing) an attachment.
3. Position the compacter for the best stability.

# OPERATION

## INTENDED USE

The Paladin TWC Wheel Compactors are designed for consolidating and condensing clay or fine mechanically stable (separates with difficulty) soils using the force of the prime mover to compress columns of soil to achieve an overall compaction. Use in any other way is considered contrary to the intended use.

## GENERAL INFORMATION

The compactor attaches to the attachment mounting mechanism of your prime mover. Due to this arrangement, thorough knowledge of your prime mover is necessary for machine operation. Read and understand your prime mover's operator's manual before attempting to use the compactor.

Before operating the compactor, check the Specifications section of this manual for compatibility of prime mover and compactor.

***NOTICE! Operating the compactor on a prime mover that exceeds the specifications listed for that model will void warranty.***

The following instructions are very important to the proper performance of the compactor and obtaining your required compaction density for your job at hand.

## SOIL TESTING

Compaction density is based on soil samples of a set moisture content and soil composition. Changing weather conditions can alter moisture content and may make meeting specifications impossible.

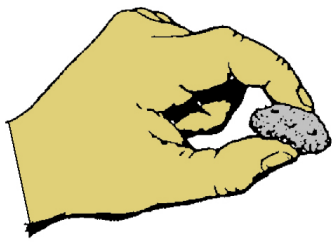
The wheel compactor works best in clay or fine mechanically stable soils using the down force applied by the prime mover on lifts (depth of the loose fill being compacted) of 2 to 4 feet. (Loose lifts of over 2 feet of clay or 3 feet of sand can be challenging.) Soil compacts from the bottom of the lift to the surface. It is imperative that frequent and reliable tests be conducted during compacting to determine the maximum lift that can be used and still provide the required density. Lifts in excess of the established test results should not be used if the required density is to be achieved and maintained.

While there are various laboratory and field tests for determining soil composition and moisture, it may not always be possible to have accurate test data before starting a job. In this instance it is beneficial to recognize the soil type and moisture content by the following visual tests.

**Moisture Content**

1. Pack a soil sample by hand into the shape/size of a golf ball.
2. Place the sample between the index finger and thumb. Squeeze gently. See Figure #1

**FIGURE #1**

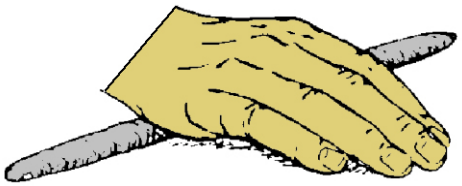


3. If the material shatters into fairly uniform pieces, the soil is close to the optimum moisture.
4. If the material “weeps” in your hand or does not break but flattens out, the soil contains more moisture. (Wheel compactors are effective even in high moisture soil conditions.)
5. If you cannot form into a ball or it is difficult to obtain a ball it is probably too dry and moisture may need to be added. (Plate Compactors work better in this soil.)

**Soil Type**

1. Roll a sample by hand into a thick roll about 1/8” in diameter. See Figure #2

**FIGURE #2**



2. If there is no problem rolling the material into this shape the soil is usually clay which is more desirable for wheel compactors.
3. If the material cannot be rolled into a 1/8” diameter roll, it usually indicates less clay and extra care may be required when attempting to compact.

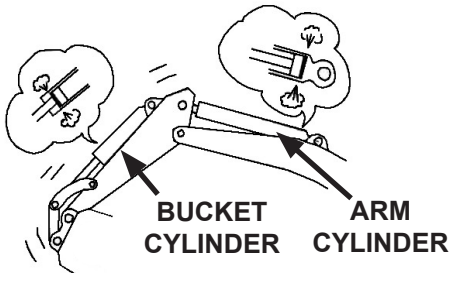
## COMPACTING

The wheel compactor uses force to drive water and air out of the material being compacted. How compacted the material can get depends on the following characteristics:

- **Water Saturation** The amount of water within the material.
- **Material Size and Shape** The more uniform the material shape and size the less compacted it can be.
- **Compaction Depth** The further down from the recommended compaction action the less compaction occurs.

***NOTICE! Do not operate the compactor with the arm and bucket cylinders in the fully extended or fully retracted position. Doing so may cause damage to the cylinders.***

***NOTICE! Remove any accumulated dirt and debris on the compactor before operating.***



# OPERATION

## OPERATION

It is recommended to try the compactor on a short test distance to determine the suitable layer depth and to find out how long the compactor has to work on an area to achieve the compaction required.

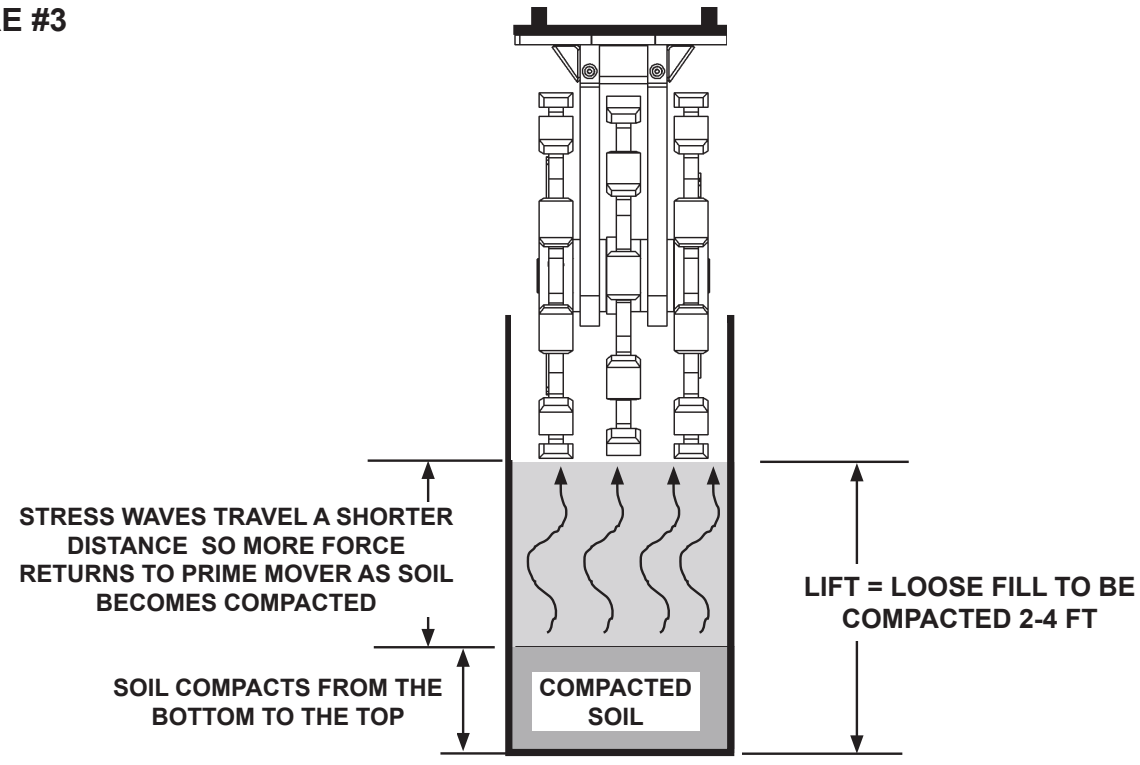
1. Place the compactor in the trench or excavation area to be compacted.
2. Exert down pressure and move the wheel back and forth in a straight line. (8-12 passes should be sufficient in most soil conditions.)

**NOTE: It will take an operator a couple days to get the feel of the wheel compactor and to achieve the best compaction with the least amount of passes. An experienced operator will be able to tell when he has reached adequate soil compaction by the feel of the wheel compactor through the hydraulic controls in the prime mover. (The transfer of vibrations to the operator is greater on compacted soil.)**

**NOTE: Additional time or pressure in one area may loosen soil previously compacted.**

**IMPORTANT: When the maximum compaction has been reached, a slight increase in vibration will be felt by the operator. This increase in vibration is an indication that the soil will not compress any further. Soil compacts from the bottom of the lift to the surface, therefore as the soil becomes compacted, these stress waves have a shorter distance to travel and more force returns to the prime mover which increases the vibration to the control handles. (Operating the wheel compactor on a hard surface will transfer more of a vibration to the control levers then operating on soft "unpacked" ground.) See Figure #3**

**FIGURE #3**



# OPERATION

**WARNING! Do not move or lift objects with the compactor. Equipment damage or severe personal injury or death could occur.**

## COMPACTING TRENCHES

The closer the width of the trench is to the width of the compactor, the higher the delivered compaction. **NOTE: It will take the same or even more time to compact a trench as it took to dig it.**

**WARNING! Ground vibrations may collapse trench walls resulting in severe personal injury or death from falls into open excavations. Erect barriers around open excavations to maintain control of work zone.**

## COMPACTING ON SLOPES

When working on a slope, place the fill material at one end and allow it to seek its own angle of repose. Compaction should begin on this angle near the top of the slope. All fill material is backfilled to this angle and the compactor is worked up and down the slope.

## STORAGE:

- Clean the unit thoroughly, removing all mud, dirt, and grease.
- Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts and capscrews.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

**Additional Precautions for Long Term Storage :**

- Touch up all unpainted surfaces with paint to prevent rust.

## REMOVAL FROM STORAGE:

- Wash unit and replace any damage and/or missing parts.
- Perform regular maintenance.

## LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points than specified is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach lifting accessories to unit at any recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

# OPERATION

**WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.**

## TIE DOWN POINTS

Securing to trailer at other points than specified is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach tie down accessories to unit at any recommended tie down points.
- Check unit stability before transporting.

**WARNING! Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.**

## TRANSPORTING

Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this handbook when transporting your attachment.

# LUBRICATION

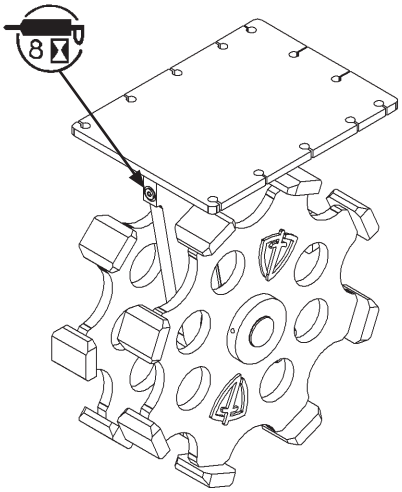
## LUBRICATION POINTS

Economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Neglect leads to reduced efficiency, heavy draft, wear, breakdown and needless replacement of parts. All parts provided with grease fittings should be lubricated every 8 hours. If any grease fitting are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

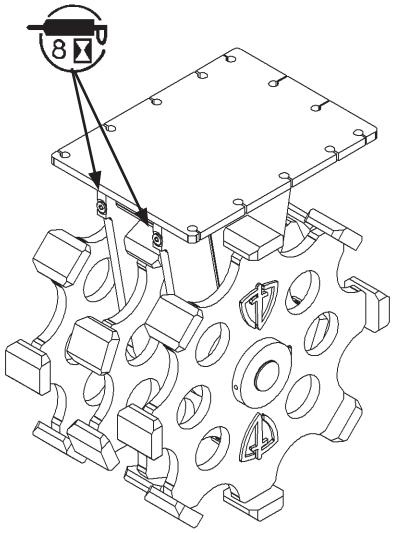
**IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and greatly increases the wear. After greasing, wipe off excess grease from fittings.**


Lubricate daily or every 8 hours, whichever comes first, with SAE Mulit-Purpose Lubricant or an equivalent SAE Multi-Purpose type grease.

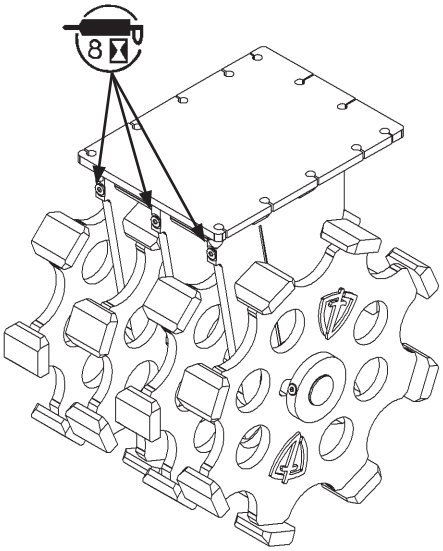
**MODELS**
**TWC500-12**
**TWC1000-12**




**MODELS**
**TWC500-18**
**TWC1000-18**
**TWC4K-18**
**TWC4K-24**




**MODELS**
**TWC1000-24**
**TWC4K-32**



# MAINTENANCE AND SERVICE

## GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

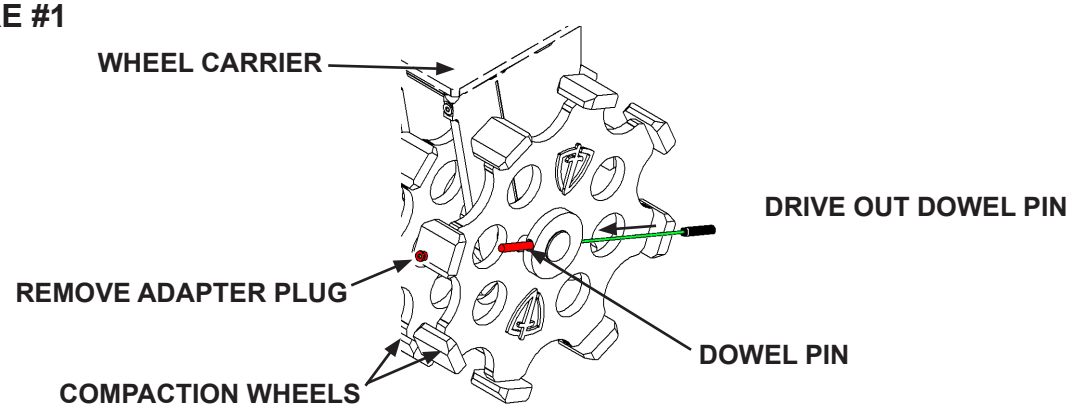
| PROCEDURE | DAILY |
|---|---|
| Replace any missing hardware with approved replacement parts. | ✔ |
| Check for missing or loose plug adapters. Replace or tighten if necessary. See Bolt Torque Specifications. | ✔ |
| Lubricate all grease fittings. | ✔ |
| Check compaction wheels for excessive wear or damage and repair or replace as necessary. | ✔ |
| Visually inspect the machine for worn parts or cracked welds, and repair or replace as necessary. | ✔ |

## REPLACING BUSHINGS AND SEALS

When replacing a bushing we recommend replacing all the bushings and lip seals at the same time.

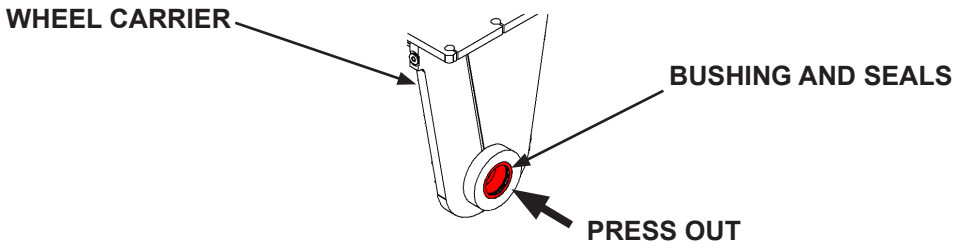
1. Remove the adapter plugs on the center boss on the compaction wheels and drive the dowel pins out from the opposite side of the wheel boss using an awl or other adequate tool. See Figure #1

**FIGURE #1**



2. Remove the wheel(s).
3. Press out the double lip seals and bushing(s) from the wheel carrier. See Figure #2

**FIGURE #2**

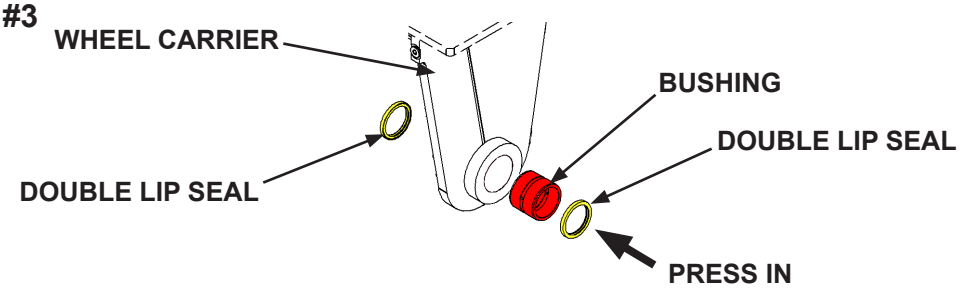



**NOTE: On assemblies with four compaction wheels, remove the two outside bushings first and then reposition and press out the middle bushing and seals.**

***NOTICE: Do not apply heat to the housing. This will result in the bushings becoming loose and may damage seals.***

4. Press the bushings into the carrier. See Figure #3
5. Install a double lip seal on each side of the bushing with the lip out. Press into place. (This will keep the dirt out and the grease in.) See Figure #3

**FIGURE #3**




6. Repeat steps 4 and 5 until all bushings and seals have been replaced.
7. Install an outside wheel onto the wheel pin using the existing dowel and adapter plug. (The Paladin shield should be towards the outside.) See Figure #4
8. **Two Compaction wheels:** Install the pin in the carrier and install the remaining outside wheel (with the shield to the outside) onto the wheel pin using the remaining dowel and adapter plug.
   **Three/Four Compaction Wheel:** Positioned the inner compaction wheels in the carrier aligning the center hole. Install the wheel pin. Take care to assemble with the outside compaction wheels (with shield emblem) located on the outside of the carrier. The wheels may need to be rotated to install the dowel pin through the wheel and wheel pin.

See Figure #4

9. Install the adapter plug(s) to secure the wheels in place. See Figure #4

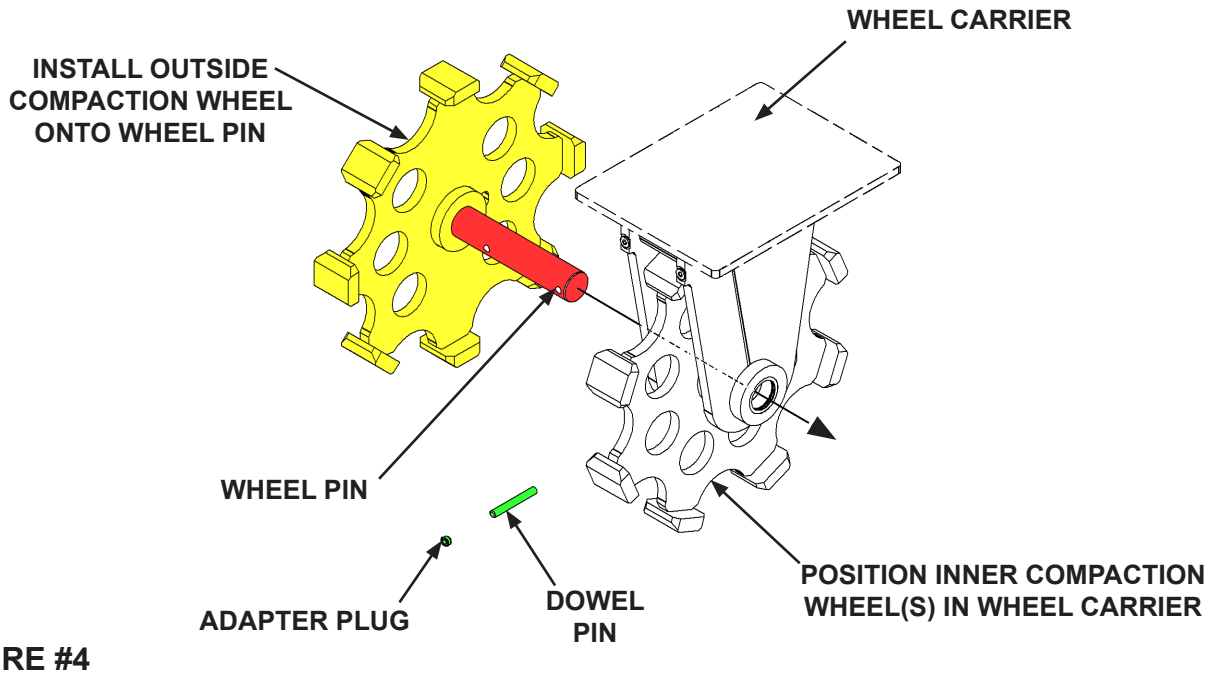



**FIGURE #4**

10. Apply grease to the grease fittings located on the wheel carrier. See Lubrication Section

Bushing replacement in now complete.

# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| Unable to achieve desired compaction. | Soil too wet or too dry. | Check soil moisture content and type. |
| | Not making enough passes. | Make 10-12 passes in one area. |
| | Not enough down force. | Full down force may be required for maximum compaction |
| | Lifts too deep for soil type. | See Operation Section |

# BOLT TORQUE SPECIFICATIONS

## GENERAL TORQUE SPECIFICATION TABLES

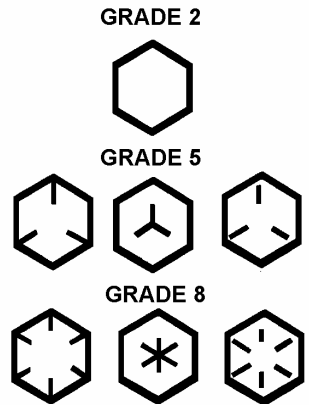
Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

## SAE BOLT TORQUE SPECIFICATIONS

**NOTE: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.**

| Bolt Size | | SAE GRADE 5 TORQUE | | | | SAE GRADE 8 TORQUE | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pounds Feet | | Newton-Meters | | Pounds Feet | | Newton-Meters | |
| Inches | Millimeters | UNC | UNF | UNC | UNF | UNC | UNF | UNC | UNF |
| 1/4 | 6.35 | 8 | 9 | 11 | 12 | 10 | 13 | 14 | 18 |
| 5/16 | 7.94 | 14 | 17 | 19 | 23 | 20 | 25 | 27 | 34 |
| 3/8 | 9.53 | 30 | 36 | 41 | 49 | 38 | 46 | 52 | 62 |
| 7/16 | 11.11 | 46 | 54 | 62 | 73 | 60 | 71 | 81 | 96 |
| 1/2 | 12.70 | 68 | 82 | 92 | 111 | 94 | 112 | 127 | 152 |
| 9/16 | 14.29 | 94 | 112 | 127 | 152 | 136 | 163 | 184 | 221 |
| 5/8 | 15.88 | 128 | 153 | 174 | 207 | 187 | 224 | 254 | 304 |
| 3/4 | 19.05 | 230 | 275 | 312 | 373 | 323 | 395 | 438 | 536 |
| 7/8 | 22.23 | 340 | 408 | 461 | 553 | 510 | 612 | 691 | 830 |
| 1 | 25.40 | 493 | 592 | 668 | 803 | 765 | 918 | 1037 | 1245 |
| 1-1/8 | 25.58 | 680 | 748 | 922 | 1014 | 1088 | 1224 | 1475 | 1660 |
| 1-1/4 | 31.75 | 952 | 1054 | 1291 | 1429 | 1547 | 1700 | 2097 | 2305 |
| 1-3/8 | 34.93 | 1241 | 1428 | 1683 | 1936 | 2023 | 2312 | 2743 | 3135 |
| 1-1/2 | 38.10 | 1649 | 1870 | 2236 | 2535 | 2686 | 3026 | 3642 | 4103 |

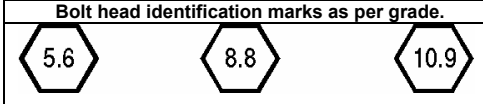
Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary




## METRIC BOLT TORQUE SPECIFICATIONS

**NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.**

Bolt head identification marks as per grade.




| Size of Bolt | Grade No. | Pitch (mm) | Pounds Feet | Newton-Meters | Pitch (mm) | Pounds Feet | Newton-Meters |
|---|---|---|---|---|---|---|---|
| M6 | 5.6 | 1.0 | 3.6-5.8 | 4.9-7.9 | - | - | - |
| | 8.8 | | 5.8-.4 | 7.9-12.7 | | - | - |
| | 10.9 | | 7.2-10 | 9.8-13.6 | | - | - |
| M8 | 5.6 | 1.25 | 7.2-14 | 9.8-19 | 1.0 | 12-17 | 16.3-23 |
| | 8.8 | | 17-22 | 23-29.8 | | 19-27 | 25.7-36.6 |
| | 10.9 | | 20-26 | 27.1-35.2 | | 22-31 | 29.8-42 |
| M10 | 5.6 | 1.5 | 20-25 | 27.1-33.9 | 1.25 | 20-29 | 27.1-39.3 |
| | 8.8 | | 34-40 | 46.1-54.2 | | 35-47 | 47.4-63.7 |
| | 10.9 | | 38-46 | 51.5-62.3 | | 40-52 | 54.2-70.5 |
| M12 | 5.6 | 1.75 | 28-34 | 37.9-46.1 | 1.25 | 31-41 | 42-55.6 |
| | 8.8 | | 51-59 | 69.1-79.9 | | 56-68 | 75.9-92.1 |
| | 10.9 | | 57-66 | 77.2-89.4 | | 62-75 | 84-101.6 |
| M14 | 5.6 | 2.0 | 49-56 | 66.4-75.9 | 1.5 | 52-64 | 70.5-86.7 |
| | 8.8 | | 81-93 | 109.8-126 | | 90-106 | 122-143.6 |
| | 10.9 | | 96-109 | 130.1-147.7 | | 107-124 | 145-168 |
| M16 | 5.6 | 2.0 | 67-77 | 90.8-104.3 | 1.5 | 69-83 | 93.5-112.5 |
| | 8.8 | | 116-130 | 157.2-176.2 | | 120-138 | 162.6-187 |
| | 10.9 | | 129-145 | 174.8-196.5 | | 140-158 | 189.7-214.1 |
| M18 | 5.6 | 2.0 | 88-100 | 119.2-136 | 1.5 | 100-117 | 136-158.5 |
| | 8.8 | | 150-168 | 203.3-227.6 | | 177-199 | 239.8-269.6 |
| | 10.9 | | 175-194 | 237.1-262.9 | | 202-231 | 273.7-313 |
| M20 | 5.6 | 2.5 | 108-130 | 146.3-176.2 | 1.5 | 132-150 | 178.9-203.3 |
| | 8.8 | | 186-205 | 252-277.8 | | 206-242 | 279.1-327.9 |
| | 10.9 | | 213-249 | 288.6-337.4 | | 246-289 | 333.3-391.6 |

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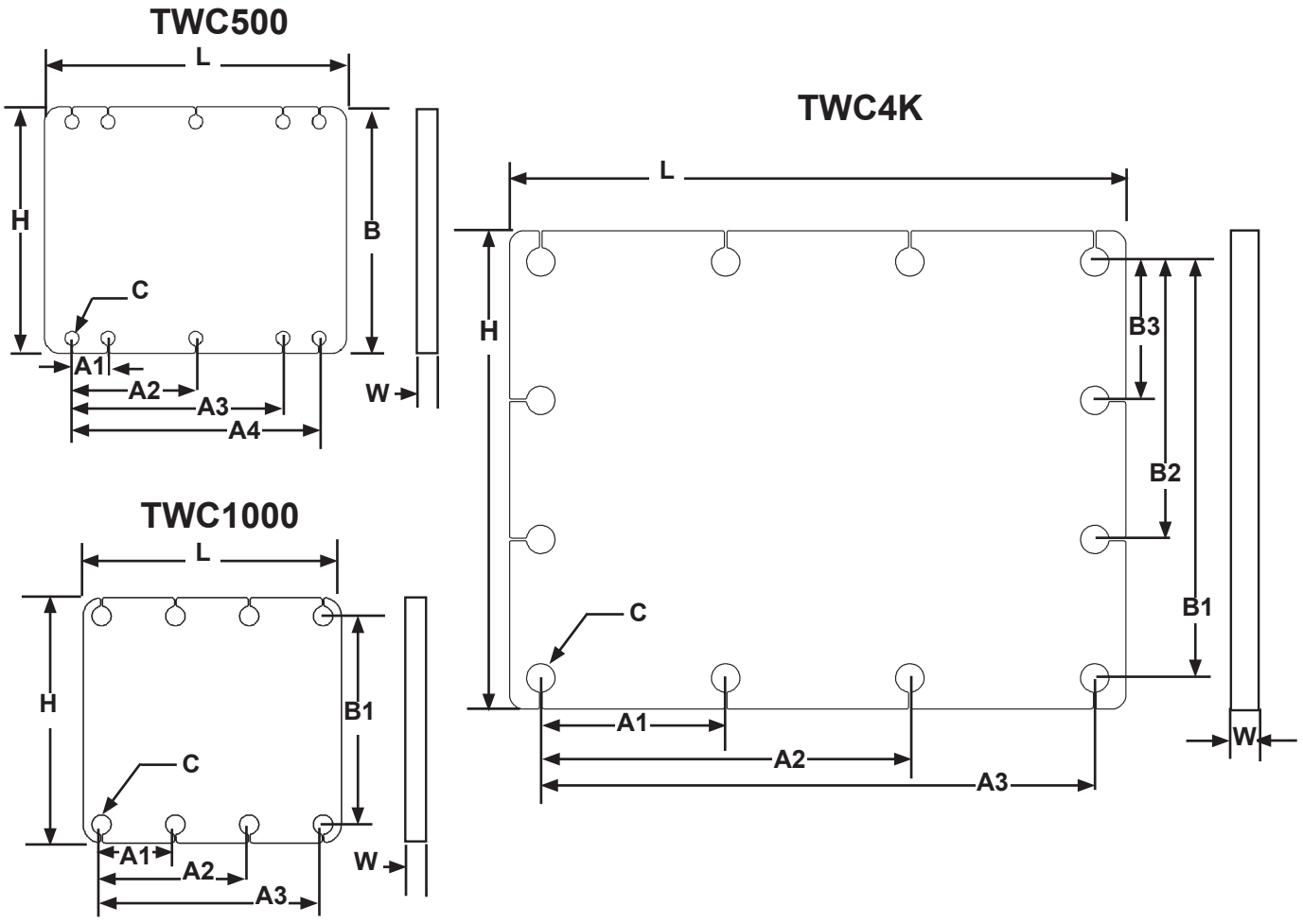
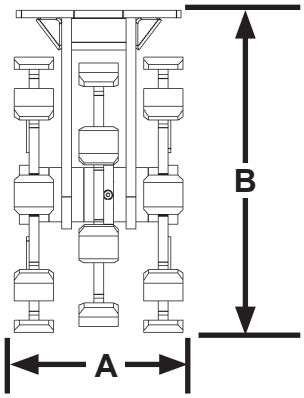
# SPECIFICATIONS

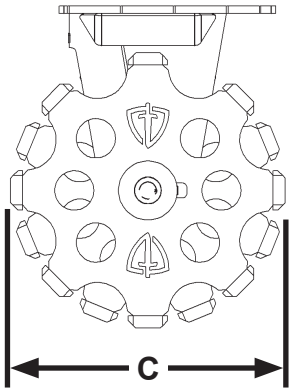
## MOUNTING PLATE BOLT PATTERNS




| | TWC500 | TWC1000 | TWC4K |
|---|---|---|---|
| **H x W x L** | 12.01 X .75 X 14.69<br>(305.0 X 19.1 X 373.0) | 16.78 X .75 X 18.13<br>(426.2 X 19.1 X 460.4) | 22.44 X 1.25 X 29.53<br>(570.0 X 31.8 X 750.0) |
| **A1** | 1.75 (44.5) | 5.43 (138.0) | 8.98 (228.0) |
| **A2** | 6.00 (152.5) | 10.87 (276.0) | 17.95 (456.0) |
| **A3** | 10.26 (260.5) | 16.30 (414.0) | 26.93 (684.0) |
| **A4** | 12.01 (305.0) | NA | NA |
| **B1** | 10.51 (267.0) | 14.96 (380.0) | 6.61 (168.0) |
| **B2** | NA | NA | 13.23 (336.0) |
| **B3** | NA | NA | 19.84 (504.0) |
| **C** | .67 (17.0) 10X | .83 (21.0) 8X | 1.06 (27.0) 12X |

# SPECIFICATIONS




*TWC1000-18 SHOWN*

**SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFOR.**

| | | Mini-Excavators | | Backhoe and Small Excavator | | |
|---|---|---|---|---|---|---|
| **DESCRIPTION** | **UNIT** | **TWC500-12** | **TWC500-18** | **TWC1000-12** | **TWC1000-18** | **TWC1000-24** |
| **A. Trench Width** | inch (cm) | 12.00 (30.48) | 18.00 (45.72) | 12.00 (30.48) | 18.00 (45.72) | 24.00 (60.96) |
| **B. Overall Height** (without mount) | inch (cm) | 26.62 (67.61) | | 32.75 (83.19) | | |
| **C. Compaction Wheel Diameter** | inch (cm) | 22.00 (55.88) | | 28.00 (71.12) | | |
| **Shipping Weight** (without mount) **need to add pallet wt.** | lbs (kg) | 302 () | 460 () | 525 (404) | 737 (457) | 971 (704) |
| **Number of Compaction Wheels** | | 2 | 3 | 2 | 3 | 4 |
| **Carrier Weight - Minimum** | lbs (kg) | 2700 (1225) | | 13000 (5897) | | |
| **Carrier Weight - Maximum** | lbs (kg) | 14000 (6350) | | 38000 (17237) | | |
| **Machine Class (mT)** | | 3T-6T | | 8T-12T | | |

| | | Medium Excavators | | |
|---|---|---|---|---|
| **DESCRIPTION** | **UNIT** | **TWC4K-18** | **TWC4K-24** | **TWC4K-32** |
| **A. Trench Width** | inch (cm) | 18.00 (45.72) | 24.00 (60.96) | 32.00 (81.28) |
| **B. Overall Height** (without mount) | inch (cm) | 44.00 (111.76) | | |
| **C. Compaction Wheel Diameter** | inch (cm) | 38.00 (96.52) | | |
| **Shipping Weight** (without mount) **need to add pallet wt.** | lbs (kg) | 1965 () | 2044 () | 2706 () |
| **Number of Compaction Wheels** | | 3 | 3 | 4 |
| **Carrier Weight - Minimum** | lbs (kg) | 37000 (16783) | | |
| **Carrier Weight - Maximum** | lbs (kg) | 64000 (29030) | | |
| **Machine Class (mT)** | | 16T-25T | | |

# PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at ***www.paladinattachments.com/Manuals***. Please use these diagrams and parts lists to locate replacement parts.

When servicing your attachment, remember to use only original manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering when contacting the factory, please have the product control number (PCN or C/N) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number, model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

**NOTE: Most daily and emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)**

**SERVICE DEPARTMENT**
(734) 996-9116
(800) 456-7100

**For Fax and E-mail Orders**
PLC_Sales@paladinattachments.com
(734) 996-9014

# WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, Paladin Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at ***www.paladinattachments.com***.