PALADIN®
JRB

OPERATOR'S MANUAL

POWERLATCH® HYDRAULIC COUPLER
PATENTED

FOR EXCAVATORS

SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM93C
Date: August 2019
Rev. 9

TABLE OF CONTENTS

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new 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 to obtain further assistance. 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 machine 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

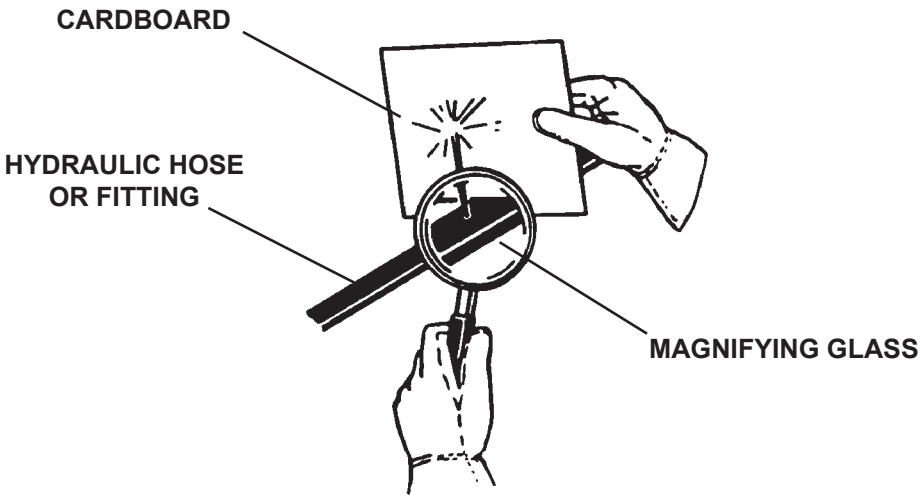
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground 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.

WARNING!

CALIFORNIA PROPOSITION 65 WARNING

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. www.P65Warnings.ca.gov

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

- Never use your attachment for a work platform or personnel carrier
- Do not exceed the lifting capacity of your 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.
- 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.
- Never lift, move, or swing a load or attachment over anyone.
- 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

WARNING!

KEEP ATTACHMENT CLOSE TO THE GROUND DURING LOCK AND UNLOCK OPERATIONS.

Attachment can drop without warning if not properly secured. Visually check the coupler is securely locked on attachment. Follow procedures described in this manual for checking fit between coupler and attachment. Failure to do so could result in serious injury or death.

EQUIPMENT SAFETY PRECAUTIONS

WARNING!

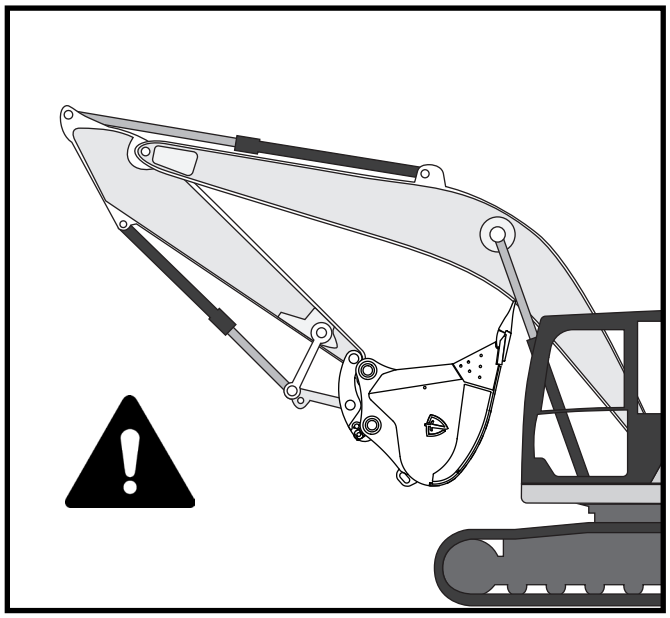
CLEAR COUPLER OF DEBRIS BEFORE OPERATING

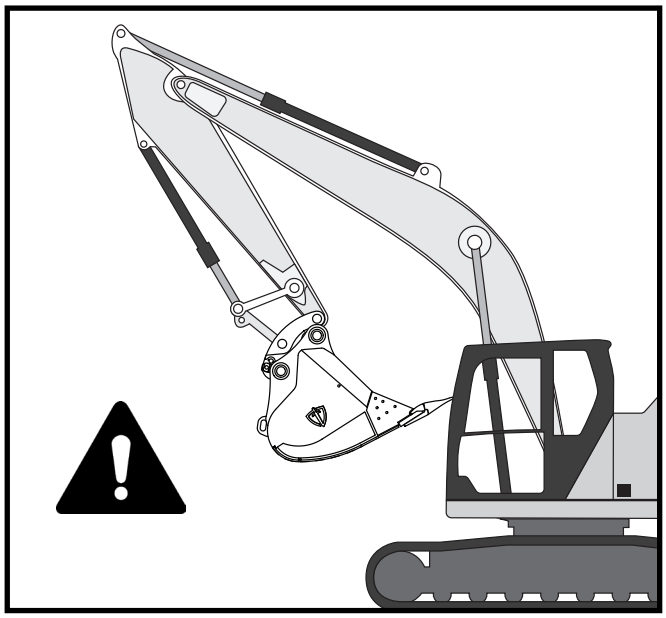
Make sure coupler is free of debris prior to operation. Debris can interfere with the locking mechanism not allowing it to function properly.

UNDERSTAND EFFECTIVE REACH OF ATTACHMENTS

The coupler increases the distance between the dipper arm and the attachment. The effective “reach” of the attachment will be increased.

Depending on the specific coupler and attachment combination, it may be possible for the attachment to come in contact with the upper structure of the excavator (cab, boom, cylinders,etc.). The operator should familiarize himself with any potential interference locations prior to use.





WARNING!

ONLY USE PALADIN PROVIDED HYDRAULIC KIT TO OPERATE THE COUPLER

The PowerLatch Coupler has been extensively studied and tested, for both efficiency and safety, using the provided hydraulic kit.

The PowerLatch Coupler has not been studied or tested using any other hydraulic system. Since hydraulic systems vary in many aspects, Paladin cannot know whether the coupler may be operated safely with a hydraulic system that is not its own. Because of the unknown characteristics of any other hydraulic system, Paladin takes no responsibility for the safety of a PowerLatch coupler if it is operated with a hydraulic system other than the one provided by Paladin.

EQUIPMENT SAFETY PRECAUTIONS

WARNING!

LIFT EYE USAGE

The coupler is designed with a lift eye for lifting and placing material. It is designed for the convenience of the operator. Consult your prime mover manufacturers specifications for lifting procedures and capacities. Incorrect applications and uses and failure to follow these instructions may result in severe injury or death.

In order to use the lift eye correctly and safely the attachment must first be removed from the coupler. Not only is this the safe method, it also increases the lifting capacity of the prime mover. When an attachment is in use with the coupler, the chain, cable or other lifting device can contact it and may cause interference, damage or potential for unexpected release.

The lifting device must always be removed when changing attachments. If the device is in the area of the coupler or attachment during coupling, it may cause an incomplete locking of the coupler to the attachment or damage to the coupler and/or the attachment.

TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on 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., 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.

MEASURE TRAVEL HEIGHT AND LENGTH PRIOR TO TRANSPORTING

The overall travel height and/or length of the prime mover will be increased if the coupler and attachment are installed. Do not rely on original prime mover specifications to determine overall dimensions. Actual dimensions will be affected by specific coupler and attachment combination.

EQUIPMENT SAFETY PRECAUTIONS

MAINTAINING THE ATTACHMENT

- Before performing maintenance lower the attachment to the ground, apply the brakes, turn off the engine and remove the 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.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Do not smoke while working on the hydraulic system.
- Never work under a raised attachment.
- Take care when manually handling coupler & components, bucket and installation pins. Refer to weight table in the Specification section of this manual.
- Do not allow pacemakers or similar medical aid or magnetic media, such as computer hard drives, credit cards, magnetic credit cards, cassette audio and videos, within 200mm (7”) of the magnet in the coupler.

NOTICE! Remove the attachment from the coupler at the end of each shift. *Failure to do so could cause increasing tightness of the locking mechanism, causing it to be come difficult to uncouple.*

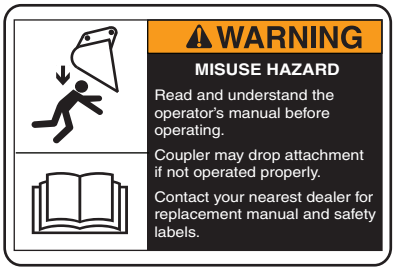
DECALS

DECAL PLACEMENT

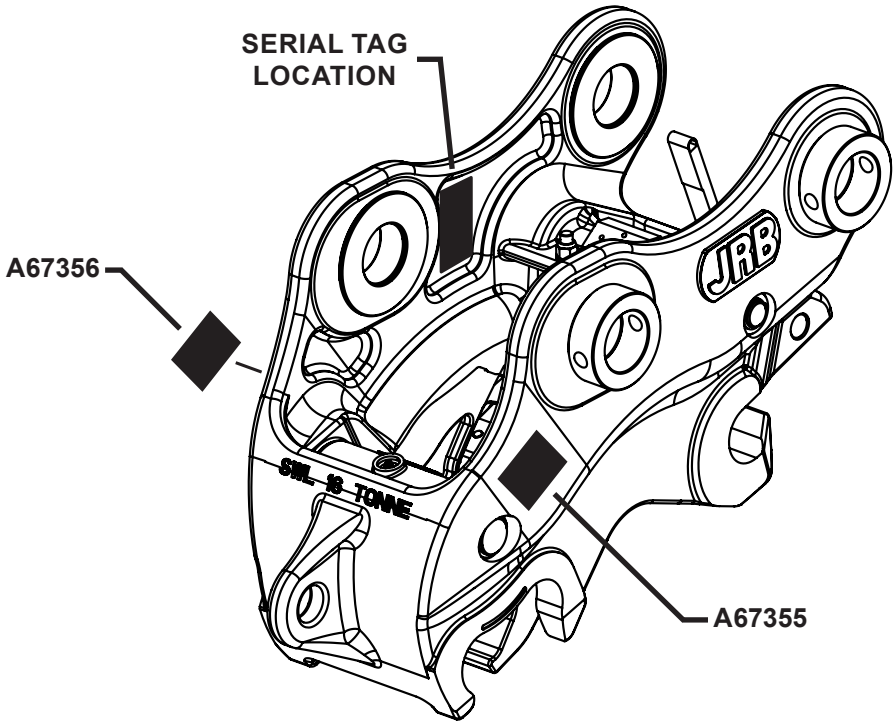
GENERAL INFORMATION

The following diagram(s) show the location of the decals used on your attachment. The decals are identified by their part numbers, with reductions of the actual decals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all the decals before operating coupler. They contain information you need to know for both safety and product longevity.

ITEM# A67355
WARNING! HIGH PRESSURE FLUID



ITEM# A67356
WARNING! MISUSE HAZARD

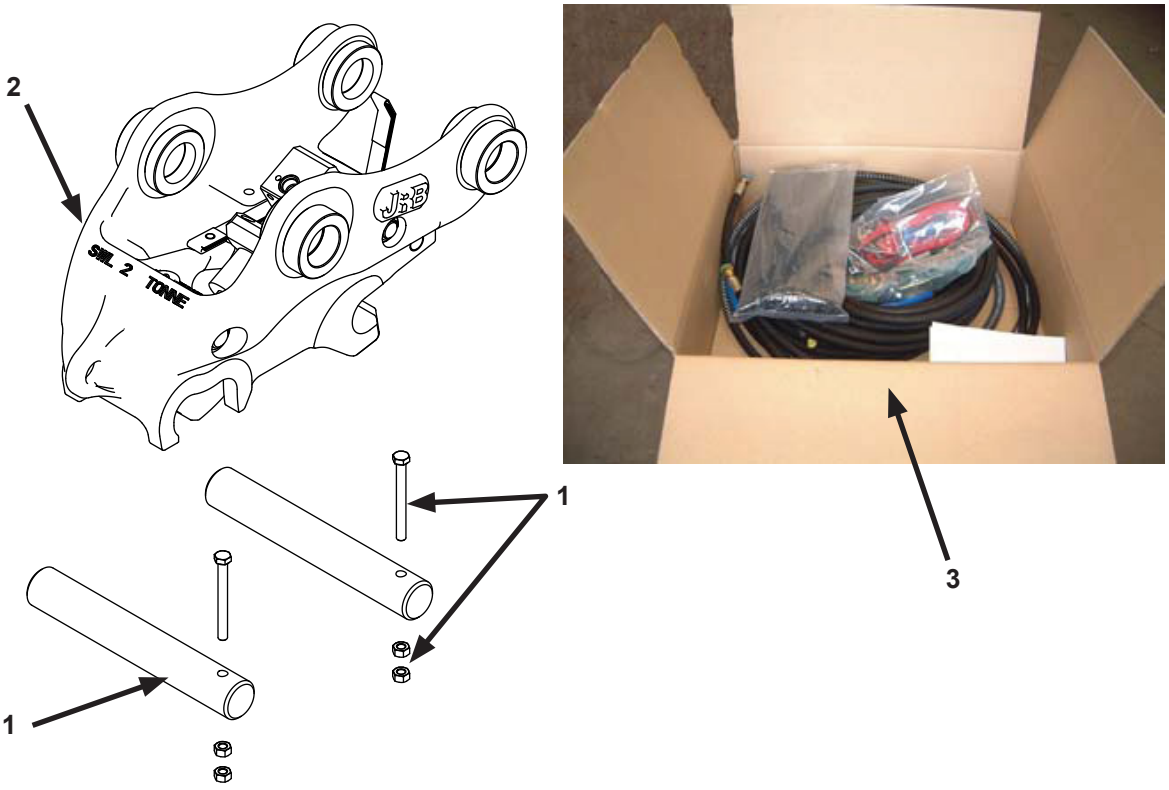


IMPORTANT: Keep all safety decals clean and legible. Replace all missing, illegible or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced.

REPLACING SAFETY DECALS: Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow surface to fully dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the positon shown in the diagram above and smooth out any bubbles.

INSTALLATION

WARNING! **DO NOT USE SUPPLIED PINS TO INSTALL COUPLER TO MACHINE. The dummy pins are non-hardened and only intended to be used in the attachment. Use the original OEM specification hardened pins to install the coupler to the machine. Failure to comply could cause equipment damage or failure.**



The following items are required to install the coupler:

Item	Req'd	Description
1	1	Attachment Pin Kit (Includes 2 pins, bolts & nuts)
2	1	Hydraulic Coupler
3	1	Hydraulic Kit

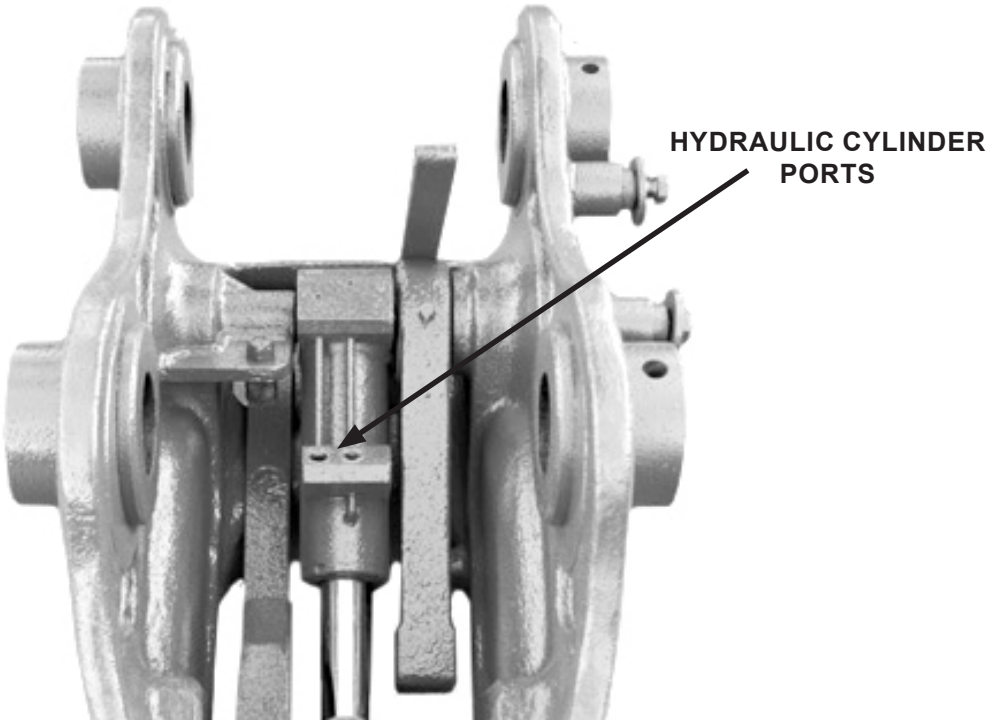
- Installation Instructions (this manual)
- All required paperwork, certificates & decals
- Grease gun (not supplied)
- Wrench (not supplied)

INSTALLATION

ATTACHING COUPLER TO PRIME MOVER

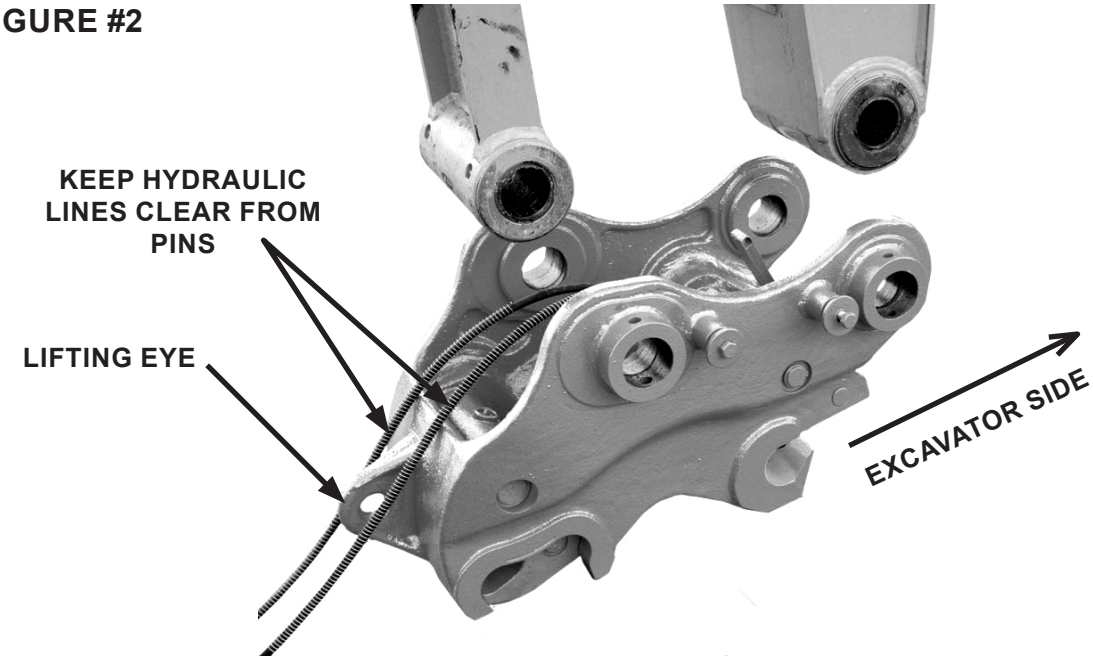
1. Remove plugs from cylinder ports. See Figure #1

FIGURE #1



2. Install cylinder jump hose into port "B" (.43" UNC port).
3. Install cylinder jump hose into port "A" (.56" UNC port).
4. Position coupler with lifting eye pointing away from excavator. See Figure #2

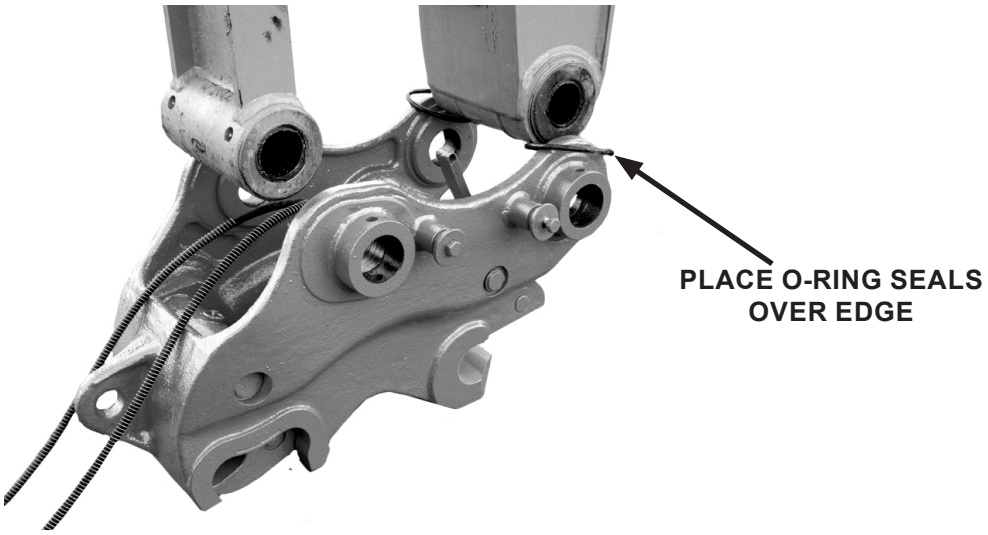
FIGURE #2



INSTALLATION

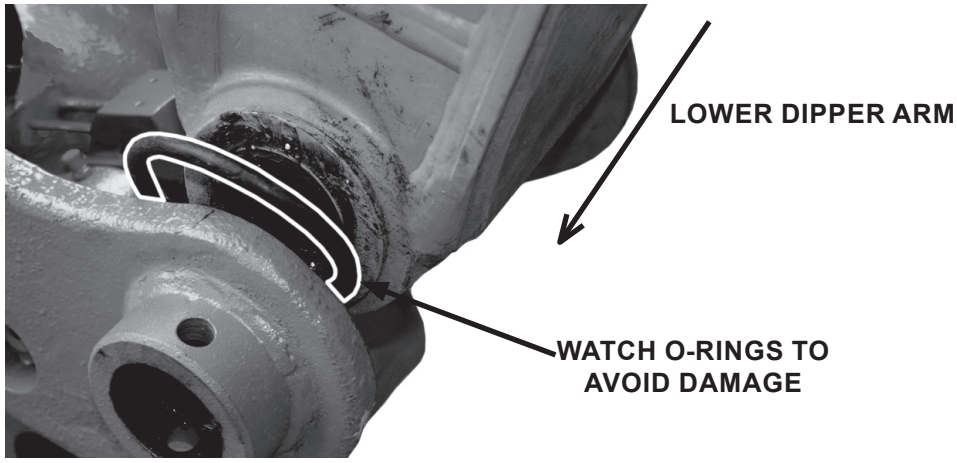
5. Align the coupler with the end of the dipper arm and install seals and shims where required. Lightly grease the O-ring seals and place over the edge of the coupler as shown. See Figure #3

FIGURE #3



6. Slowly lower the dipper arm into place while making sure the O-ring seals do not enter the pin hole or get damaged. Align the holes in the coupler with the holes in the dipper arm. See Figure #4

FIGURE #4



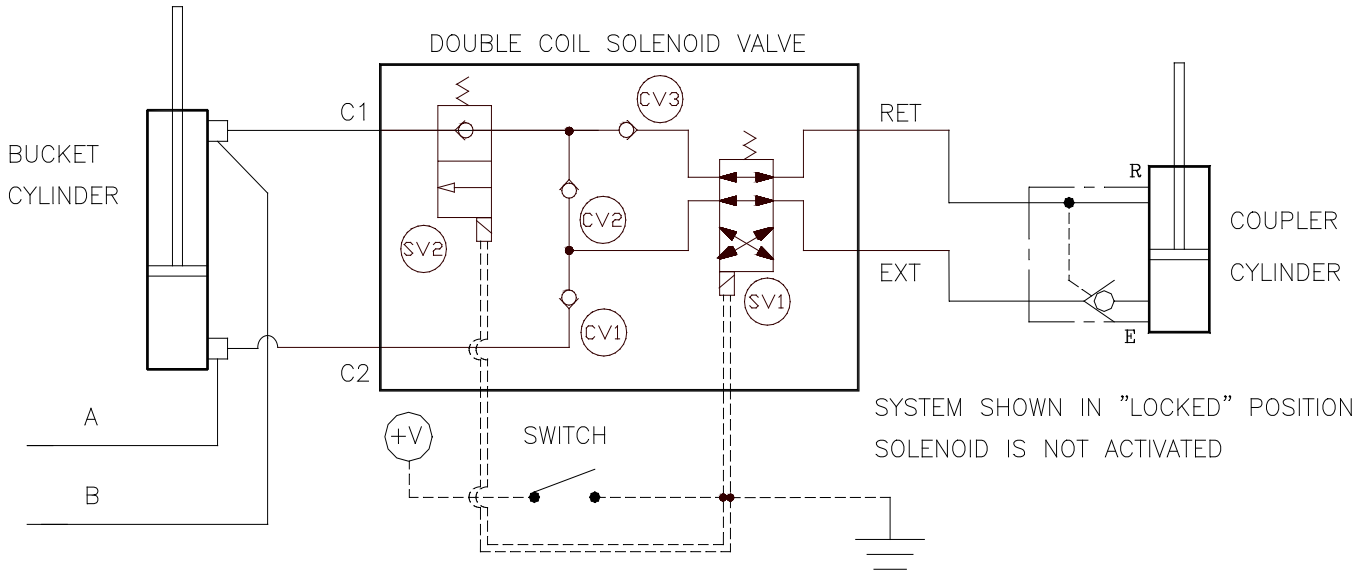
7. Install the original OEM bucket pin through the coupler and dipper arm holes and install the locking bolt and nuts.

WARNING! Use original OEM spec hardened pins to connect coupler to dipper/link. Use the supplied attachment pins for the bucket or attachment only. Do not use attachment pins to install the coupler to the prime mover.

INSTALLATION

8. Slowly lower the link arm into place while making sure the O-ring seals do not enter the pin hole or get damaged. Align the holes in the coupler with the holes in the link arm.
9. Install the original OEM bucket pin through the coupler and link arm holes and install the locking bolt and nuts.
10. With coupler on the ground, straighten the hydraulic hoses, removing any twist before continuing installation.
11. Refer to the installation instructions provided with the hydraulic kit for your specific prime mover for detailed installation procedure for the hydraulic/electrical components needed to operate the coupler.

HYDRAULIC / ELECTRICAL DIAGRAM



The schematic above is in the LOCKED position (no electrical power to solenoid). System pressure applied to bucket cylinder line “A” or “B” is transferred through valve port C2 or C1 respectively. Pressure is then sent through CV1 or SV2/CV2, through solenoid valve SV1 and charges the head end of coupler cylinder. The system maintains a positive force on the locking plate at all times while the bucket cylinder is pressurized.

With switch in the UNLOCK position (electrical power applied to both solenoids SV1 and SV2) and line A pressurized; pressure is transferred through CV1 and SV1 and energizes the rod-end of the coupler cylinder to retract the coupler locking plate. Hydraulic fluid from the head end of the coupler cylinder moves through the “EXT” port back through SV1, CV3, and SV2 and drains into line B. When line B is energized, the locking plate can not be retracted.

Note: The Paladin excavator coupler is designed to be locked when there is no electrical power. In other words, the coupler is locked by default. Electrical power is required to unlock the coupler.

NOTICE! Do not connect a 12V solenoid to a 24V supply, or a 24V solenoid to a 12V supply as damage to the solenoid will result.

INSTALLATION

POST INSTALLATION TESTING

Test the pressure of the prime mover before it enters into the coupler system. Each OEM has a predetermined operating pressure that Paladin has used to make the coupler function. If the prime mover pressure is not within the range given by the OEM then the coupler could potentially not work or malfunction. Always run the prime mover at the OEM suggested pressure.

Test the pressure in the extend (supply) line of the lock cylinder, with switch in lock position and the bucket cylinder fully extended to over-relief condition. The operating pressure of the coupler circuit should match full operating pressure of the prime mover.

NOTICE! DO NOT use low/servo pressure. The coupler needs full working pressure for satisfactory operation.

COUPLER & HYDRAULIC SYSTEM TESTING

Power up prime mover engine to approximately quarter throttle and rotate the coupler to full curl position and hold over relief to put hydraulics under pressure. Operate the coupler switch to ensure the coupler cylinder is working correctly. The locking jaw or wedge should extend when the switch is in the lock position and retract when the switch is in the unlock position. This will give pressurized flow to the coupler cylinder and help in bleeding air from the system. Repeat this procedure several times.

After testing, check for any leaks and fix if necessary. If the system is free from leaks, the coupler should now be ready to use.

COUPLER REMOVAL

1. Position coupler on the ground.
2. Turn off the prime mover and work controls to vent residual pressure in the hydraulic system.
3. Disconnect cylinder hoses from manifold block on the dipper arm. Plug hoses to keep contaminents out.
4. Remove the coupler from the prime mover by following the installation procedure in reverse starting with step 9.

OPERATION
CONTROLS

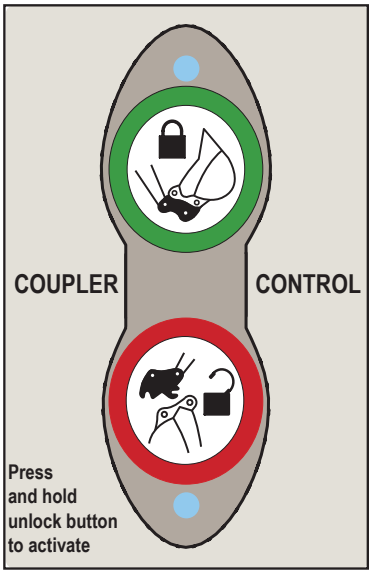
NOTE: Some prime movers will require a different style control switch for operating the coupler. Refer to the instructions included with your hydraulic kit for details.

COUPLER CONTROL BOX

Unlocking Procedure

With prime mover stick at approximately 90° to the ground, rotate coupler to full curl position and hold over relief. Activate the unlock sequence by pressing and holding the UNLOCK button on the control box (approx. two to three seconds). This is to prevent accidental unlocking of the coupler if the switch is inadvertently hit.

The UNLOCK button will light up and stay on. An internal buzzer will sound and remain on as long as the control box is in the UNLOCK mode.



Locking Procedure

To activate the lock sequence, press the LOCK button. The LOCK button will light up and blink for five seconds followed by an audible beep. The green LED will then remain on.

NOTE: The LOCK button can be pressed at any time to trigger the lock sequence.

Troubleshooting Control Box

If an error occurs in the control box circuit, a continuous audible alarm will sound and signal lights will either flash or remain on. To determine the cause of the error, perform the following steps

1. Check the control box for damage. If any part of the control box is cracked or broken, it will need replaced.
2. Check wire harness for damage. Damage to the wire harness may cause a shorted or open circuit. Repair or replace if necessary.
3. If the problem was able to be repaired, the box will need reset to remove the error condition.
4. If the alarm continues after resetting the control box, call Paladin Customer Service.

Resetting Control Box

To reset the control box do the following:

1. Turn the machine ignition to OFF.
2. Make sure control box is completely powered down (no buzzer and no lights).
3. While pressing both the LOCK and UNLOCK buttons, turn the machine ignition ON.

NOTICE! DO NOT try to override the control box and connect the valve coils directly to voltage. Doing so may cause damage to the control box.

OPERATION

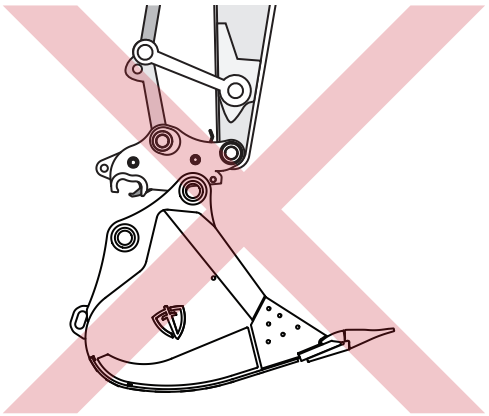
INTENDED USE

The PowerLatch coupler is designed as a tool to provide a safe and efficient way for the operator to attach, detach and interchange between different attachments with ease. It can accommodate a variety of attachments, including demolition attachments, rippers and hammers. Use in any other way is considered contrary to the intended use.

The coupler must ONLY be used in accordance with the instructions in this manual. Paladin will not be liable for any accidents or damage which result from bad working practices. The guidelines below are applicable to all PowerLatch Couplers.

Some examples of misuse include, but are not limited to, the following:

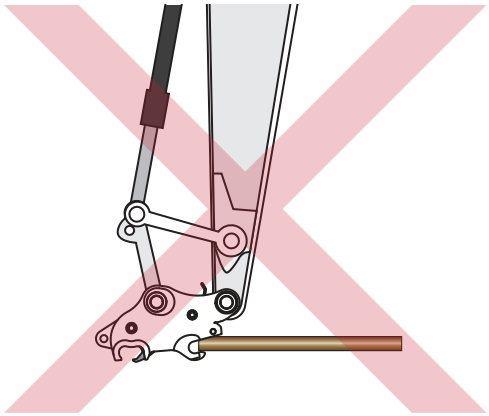
FIGURE #1



AVOID Incorrect use of coupler to pick up and move attachments, for example:

- Moving attachments by front pin only. See Figure #1
- Using hook only to lift attachments.
- Picking up items before the hook is retracted.
- Jamming the rear pin with the hook.

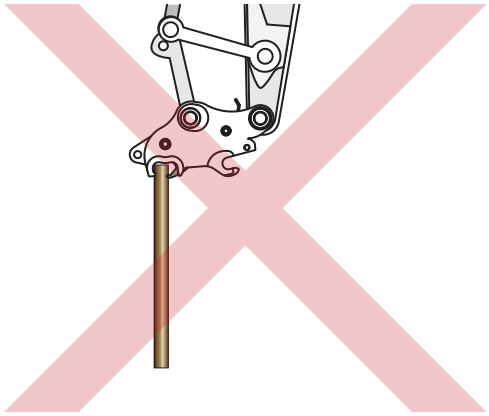
FIGURE #2



AVOID using the jaw as a lifting tool or hammer, for example:

- Moving items held in the jaw. See Figure #2
- Using jaw or hook to hammer products into the ground.

FIGURE #3



AVOID using the hook to lift and move items, for example:

- Moving items using the hook.
- Positioning items gripped with hook.See Figure #3

OPERATION

AVOID incorrect use of coupler to pick up items using chains or slings, for example:

- Using the jaw to pick up items with chains.
- Using the corner of the jaw to pick up items with chains.
- Using the hook to pick up items with chains. See Figure #4
- Using the coupler body to pick up items with chains. See Figure #5
- Using the machine dipper arm to pick up items with chains.
- Using the cylinder to pick up items with chains.

FIGURE #4

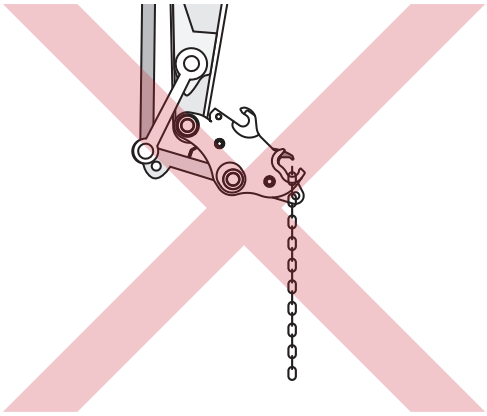


FIGURE #5

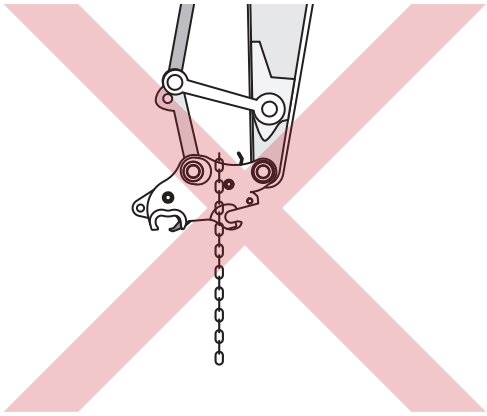
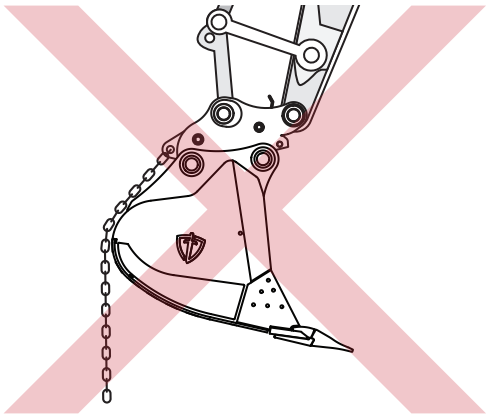


FIGURE #6



AVOID incorrect use of the lift eye, for example:

- When the bucket is attached, the shackle and chain are not visible. See Figure #6

OPERATION

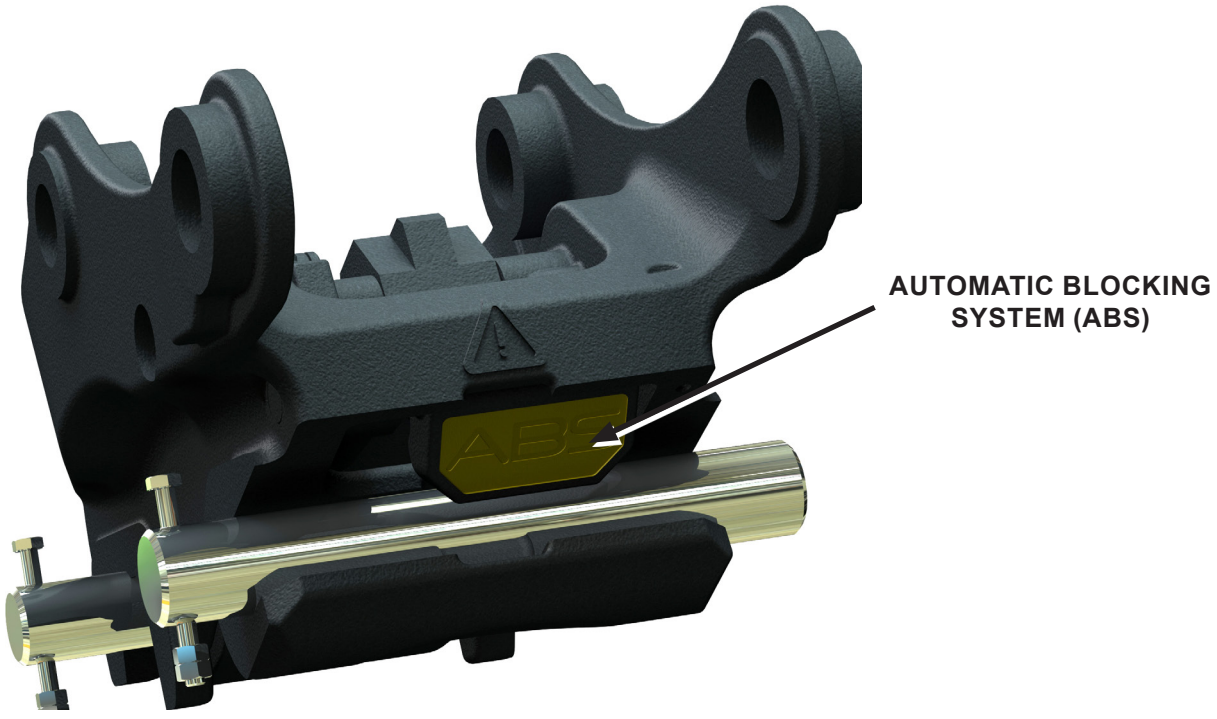
WARNING! KEEP ATTACHMENT CLOSE TO THE GROUND DURING LOCK AND UNLOCK OPERATIONS.
Attachment can drop without warning if not properly secured. Visually check the coupler is securely locked on attachment. Follow procedures described in this manual for checking fit between coupler and attachment. Failure to do so could result in serious injury or death.
Read all safety precautions before operating equipment.

AUTOMATIC BLOCKING SYSTEM (ABS)

The PowerLatch Coupler has a patented Automatic Blocking System (ABS). This mechanism eliminates the need to manually insert a safety pin, allowing the coupler to be operated solely from the prime mover's cab. See Figure #1

The twin-locking feature of the PowerLatch Coupler means that there are independent locks on the front and rear attachment pins. Therefore, the attachment remains securely attached to the coupler in the event of loss of engagement, such as accidentally switching off the hydraulics. This is because the secondary mechanical backup system is completely independent of the hydraulic circuit. Also, if the rear attachment pin is not correctly engaged during the attaching process, the ABS will secure the front attachment pin.

FIGURE #1

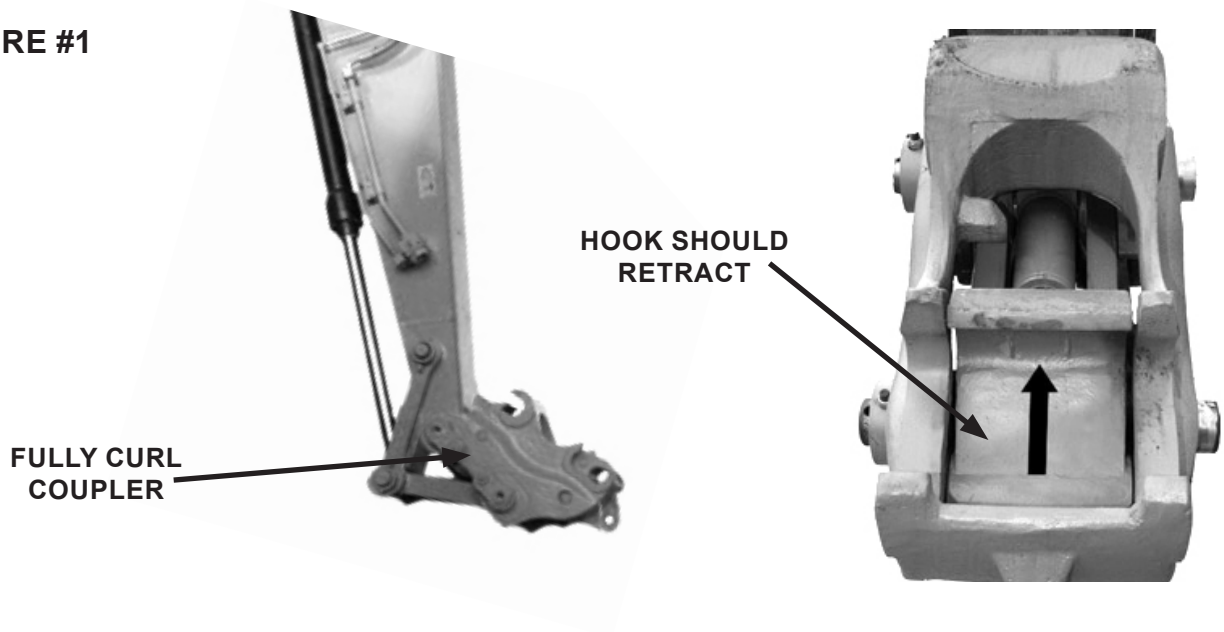


OPERATION

LOCKING ATTACHMENT

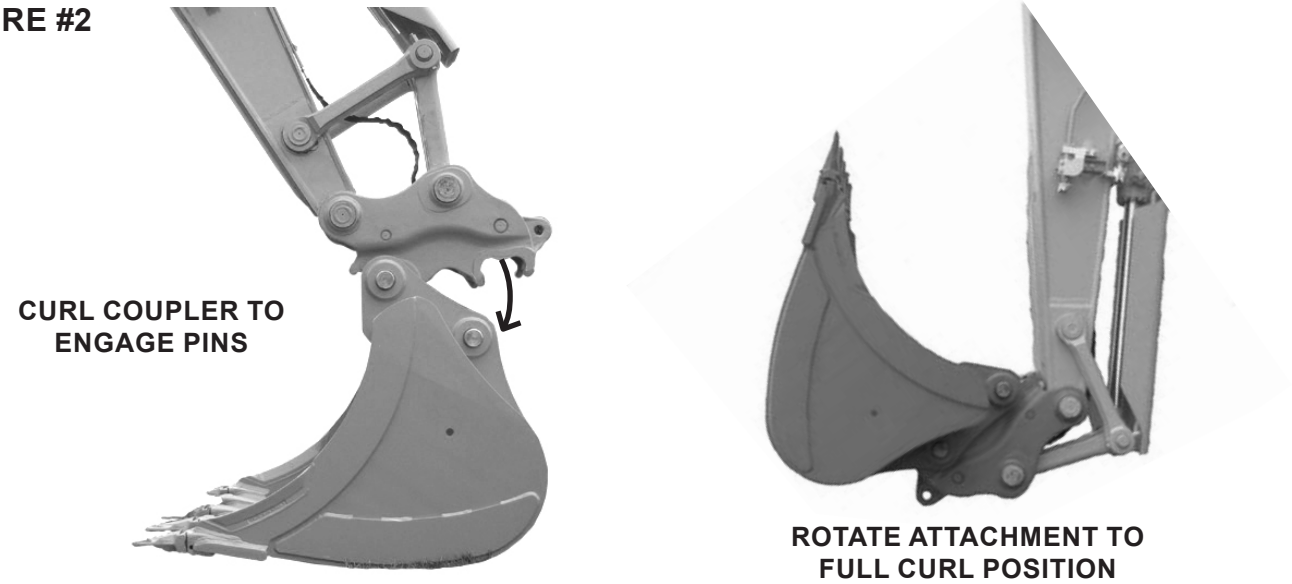
1. With prime mover dipper arm at approximately 90° to the ground, rotate coupler to full curl position and hold over relief. This will allow the blocking bar to swing free of the hook. See Figure #1. Press and hold UNLOCK button of control box (the buzzer will sound) and hold the bucket curl lever for approx. 5-10 seconds to allow the hook to fully retract. Visually verify the hook is fully retracted.

FIGURE #1



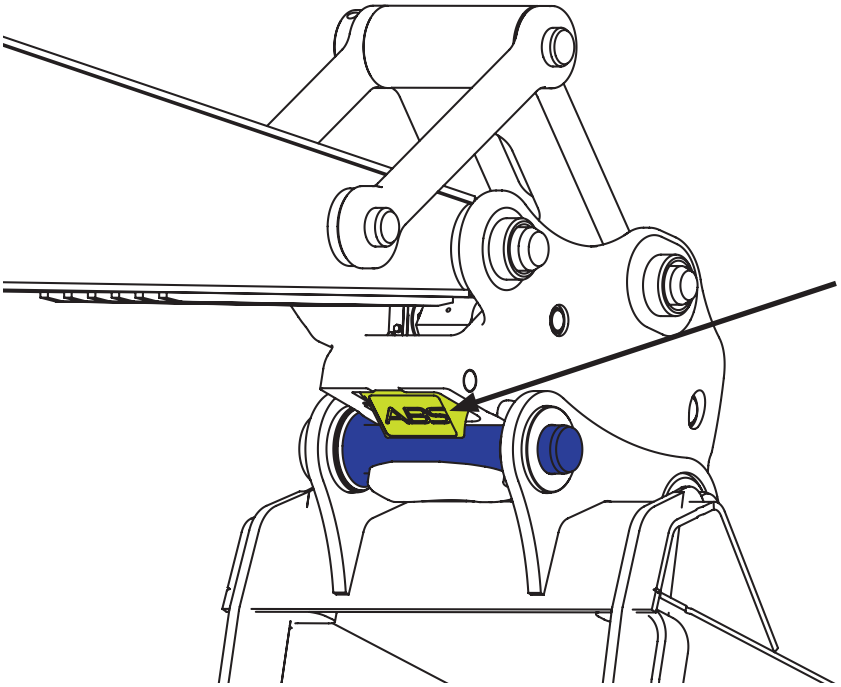
2. Ensure the hook and ABS are fully retracted before attempting to engage the attachment. Place the coupler above the attachment.
3. Curl the coupler to engage the attachment pins.
4. With prime mover dipper arm at approximately 90° to the ground, slowly rotate attachment to the full curl position and hold over relief. See Figure #2. Press LOCK button (the buzzer will stop). Hold the bucket curl lever for approx. 5-10 seconds to allow the hook to fully engage and clamp the attachment pin.

FIGURE #2



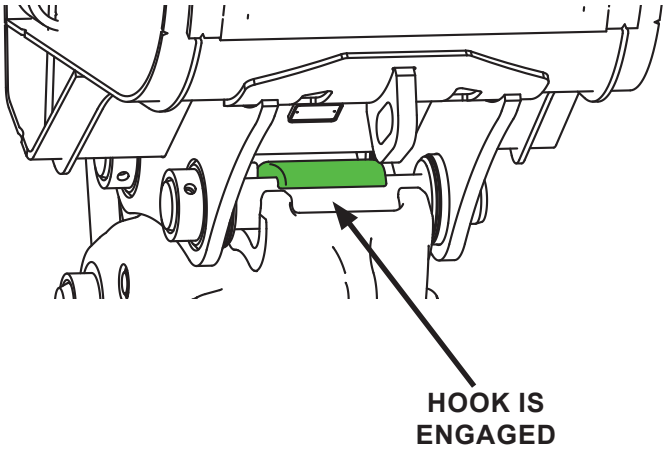
5. Slowly uncurl attachment and check the ABS is visible. See Figure #3

FIGURE #3



6. To ensure attachment pins are securely held by coupler, apply pressure to the attachment by rotating it against the ground and away from the prime mover before operating. This is referred to as a “Ground Test”.
7. Visually inspect and check that the hook is engaged. See Figure #4

FIGURE #4



DANGER! **If attachment pin has not been correctly engaged, the hook MUST NOT be retracted. This could cause the unintended release of the attachment and could cause damage to the prime mover or personal injury.**
If the hook is not correctly engaged, place the attachment on the ground and release the attachment. Repeat steps 1-7.

8. If the hook is correctly engaged, then the coupler is ready for operation.

OPERATION

UNLOCKING ATTACHMENT

1. Rotate attachment/coupler and prime mover dipper arm to the full curl position and hold over relief. Press UNLOCK (release) button (the buzzer will sound) and hold the bucket curl lever for approx. 5-10 seconds to allow the hook to fully retract. Visually verify the hook is fully retracted. The ABS should be free from hook notches and the attachment can now be released. See Figures #1 & #2

FIGURE #1

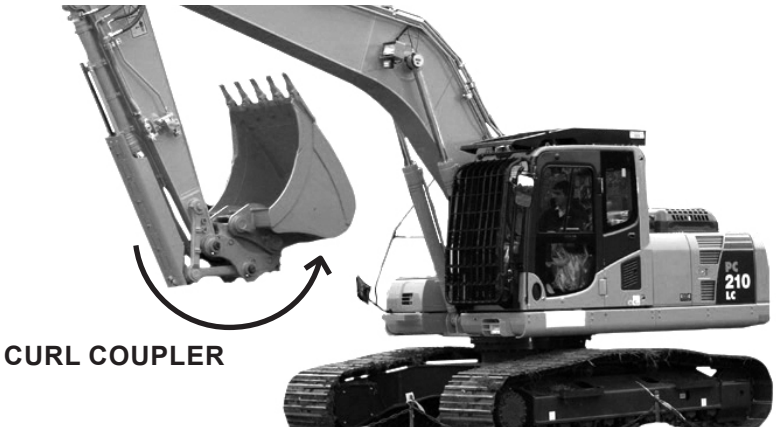
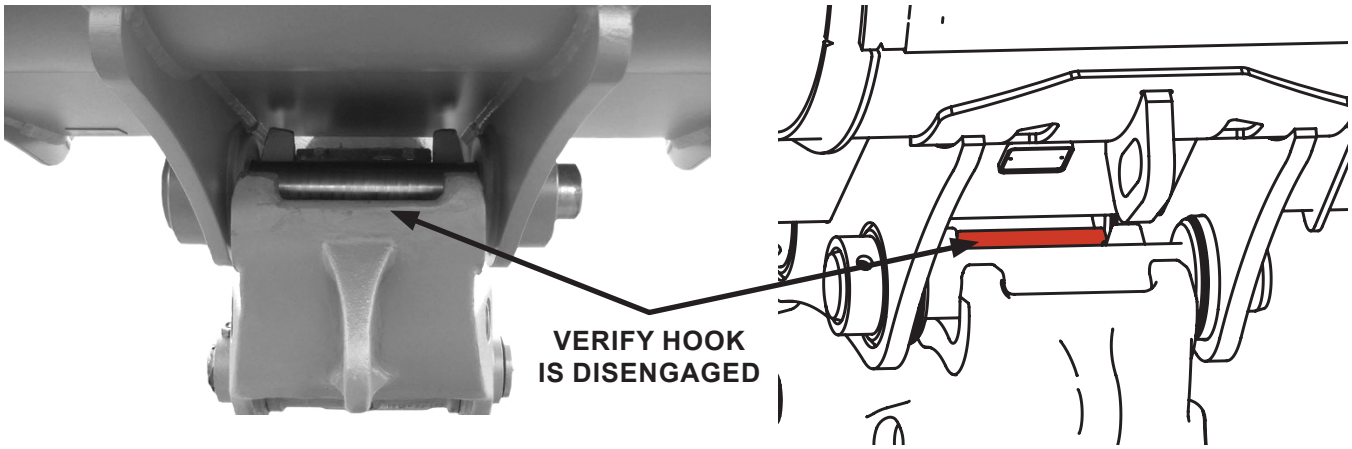


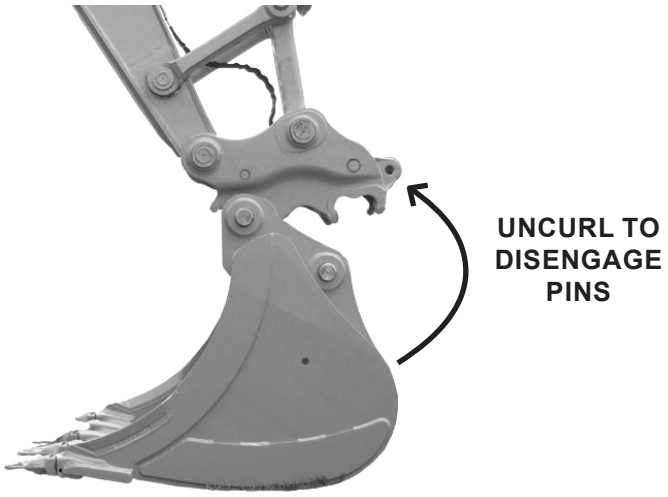
FIGURE #2



WARNING! Do not try to release or change attachment near any persons or in any areas that may result in an accident or injury occurring. The switch should be in the LOCK position at all times, except while changing attachments.

2. Slowly roll out attachment until attachment base is horizontal. Lower the boom until the attachment is on the ground.
3. Once attachment is on the ground, continue to uncurl the coupler. See Figure #3
4. Lift the coupler clear of the attachment. The coupler is now safely disengaged.

FIGURE #3



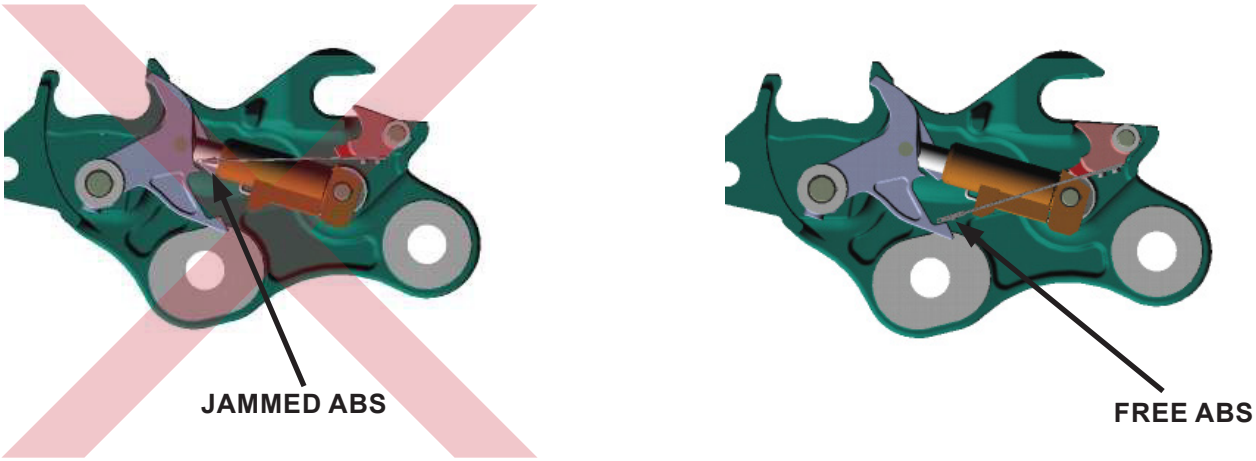
JAMMED ABS

If the coupler will not release the attachment, the ABS may be jammed so the hook will not retract. This happens because the attachment was not fully curled in step 1 of the unlock procedure. See Figure #1

To fix, press the LOCK button. Hold the bucket curl lever for approx. 5-10 seconds to allow the hook to engage. Ensure the ABS is free from debris or any other obstruction that may cause it to jam then repeat steps 1-4 of the unlock procedure, ensuring the prime mover dipper arm is pulled in close to the prime mover and the attachment fully curled.

NOTICE! DO NOT try to force attachment from the coupler if the ABS will not release. Doing so may cause damage to the coupler and/or attachment.

FIGURE #1



OPERATION

LIFTING WITH COUPLER

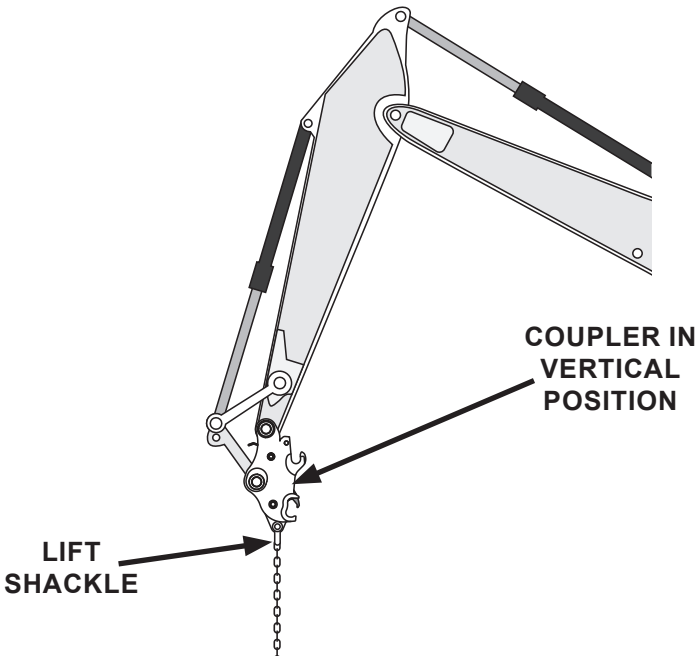
WARNING! Always use correctly rated shackle and lifting devices. Refer to Specifications section of this manual for product weight table. Never use worn, damaged or undersized lifting equipment.

This coupler is designed with a certified Lift Eye for lifting and placing material. Consult your prime mover specifications for lifting procedures and capabilities. In order to use the lift eye, correctly and safely, the attachment must be removed. With an attachment installed the chain, cable or other lifting device can contact the attachment and cause interference, damage or unexpected release.

Any lifting device must be removed when changing attachments.

The Safe Working Load (SWL) can be found stamped into the coupler frame (near the lifting eye). Check the lifting capacity of the coupler and the prime mover before lifting and do not exceed. Lift with the coupler in a vertical position. See Figure #1.

FIGURE #1



OPERATION

WORK TOOLS

The PowerLatch Coupler is designed to allow the easy changeover of standard buckets and work tools. The coupler can work with a range of buckets from a variety of prime mover manufacturers within the same size range.

No modifications are required to the buckets or the prime mover. The coupler can use buckets in the shovel mode position, operate hydraulic breakers and be used as a lifting tool.

The coupler can also work in a range of applications and with a wide variety of work tools.

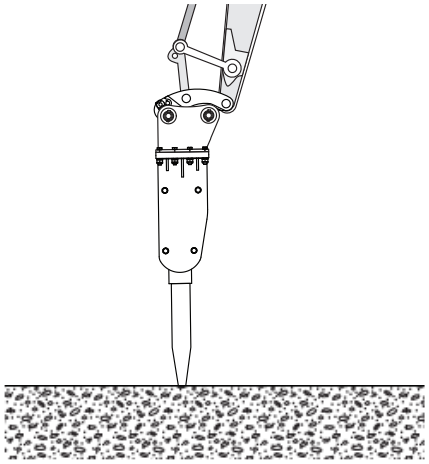
CAUTION! **Do not use any tool that is not in the correct weight class specified by the prime mover manufacturer.**

DEMOLITION ATTACHMENTS & WORK TOOLS

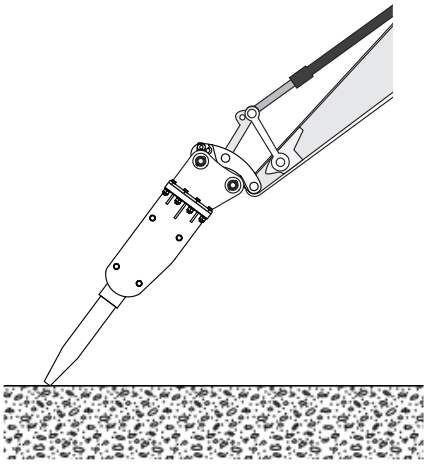
The PowerLatch Coupler can be used with hydraulic breakers and work tools of appropriate pin spread and weight. DO NOT use a tool which is beyond the tonnage class specified.

Always use breakers in the vertical position whenever possible. NEVER use the breaker as a lever. When used with a breaker the coupler should be inspected frequently.

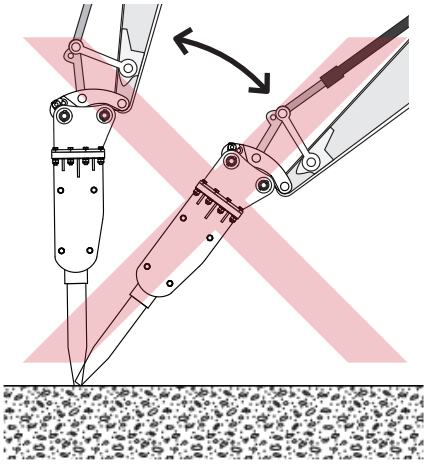
WARNING! **Do not use the coupler with a hydraulic breaker for long periods without a periodic inspection of all working parts. If the breaker needs to be used continuously for a long period, it is recommended that it be mounted directly to the machine. The coupler has not been designed to work with prolonged excessive vibration.**



OPERATE BREAKER IN THE VERTICAL POSITION.



USE CAUTION WHEN OPERATING A BREAKER NOT IN THE VERTICAL POSITION.



NEVER USE THE BREAKER AS A LEVER.

NOTICE! Do not use coupler with a mechanical style pulverizer. Damage to the coupler may result which will void warranty. Mount pulverizer directly to the prime mover.

OPERATION

STORAGE

The following storage procedure will help you to keep your product in top condition. It will also help you get off to a good start the next time your attachment is needed. We therefore strongly recommend that you take the extra time to follow these procedures whenever your unit will not be used for an extended period of time.

- 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, capscrews and hydraulic connections.
- Coat exposed portions of the cylinder rods with grease.
- Lubricate grease fittings.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Replace decals that are damaged or in unreadable condition.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

Additional Precautions for Long Term Storage:

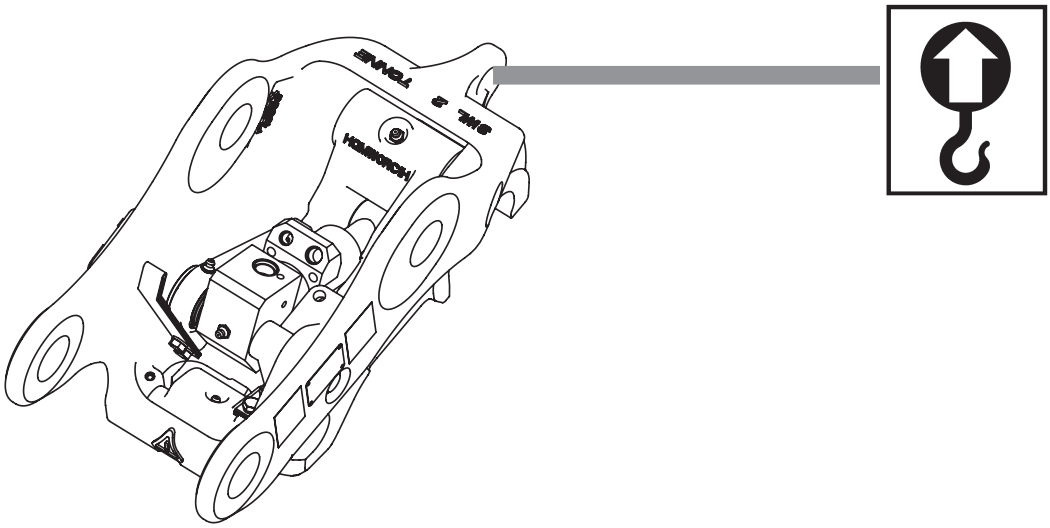
- Touch up all unpainted surfaces with paint to prevent rust.

REMOVAL FROM STORAGE

- Wash unit and replace any damaged and/or missing parts.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points 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 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

Tie down points are identified by tie down decals where required. Securing to trailer at other points 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 as recommended.
- 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.

WARNING! The overall travel height and/or length of the prime mover will be increased if the coupler and attachment are installed. Do not rely on original prime mover specifications to determine overall dimensions. Actual dimensions will be affected by specific coupler and attachment combination.

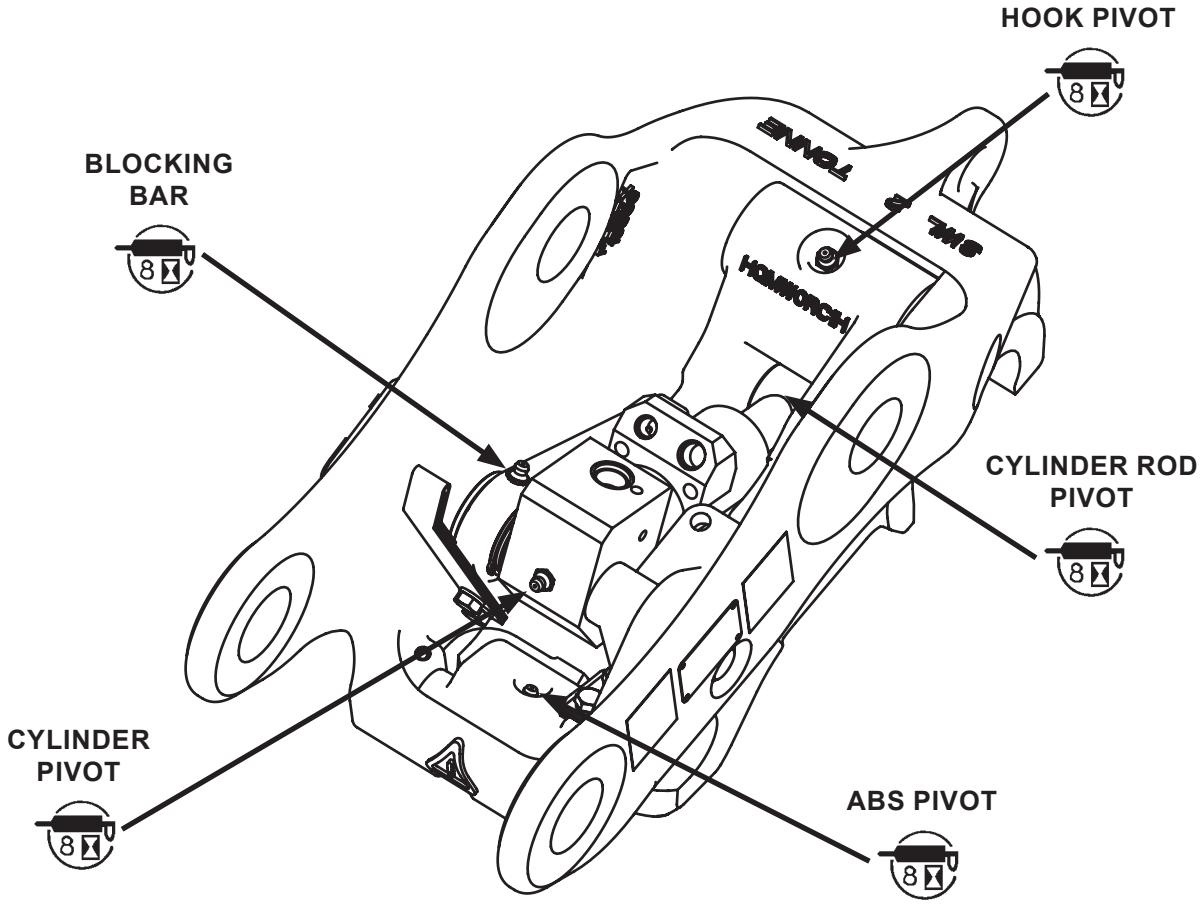
MAINTENANCE & SERVICE

LUBRICATION

All parts provided with grease fittings should be lubricated as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

NOTICE! Cylinders and pin kits that are supplied without grease zerks DO NOT need to be greased.

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



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

MAINTENANCE & 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	Every 8 Hours (Daily)	Every 40 Hours (Weekly)
Check prime mover hydraulic system to ensure an adequate level and cleanliness of hydraulic oil.	✔	
Check for missing or loose hardware. Replace or tighten as necessary. See Bolt Torque Specifications	✔	
Check hydraulic system for leaks and tighten as necessary. Check for damage and replace as needed.	✔	
Check for missing or damaged safety decals and replace as necessary.	✔	
Check coupler for worn parts or cracks. (If cracks exist in coupler frame or welds, remove coupler from prime mover and contact Paladin Customer Service.)	✔	
Lubricate grease fittings.	✔	
Lubricate & retract cylinder rod.	✔	
Check that ABS and blocking bar swing freely and that area around locking mechanism is free from dirt or debris.	✔	
Cycle the cylinder ram to check that it is working correctly.	✔	
Check that the switch/buzzer are working.	✔	
Check that mounting pins and pin locking hardware are secure.	✔	
Check condition of the internal spring. (Spring must be replaced if the outer cover is worn through.)	✔	
Check coupler frame for signs of wear. See "Inspecting the Coupler Frame" in the Maintenance Section.		✔

WARNING! **Escaping hydraulic fluid under pressure can penetrate the skin causing serious injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.**

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.

Stop the engine and relieve pressure before connecting or disconnecting lines. Tighten all connections before starting engine or pressurizing lines.

MAINTENANCE & SERVICE

HYDRAULIC CHECK

WARNING! Remove the ignition key and disconnect battery before performing maintenance on the hydraulic system.

The most common cause of coupler failure is contaminates in the hydraulic system. If this occurs, the coupler may work slowly or improperly. In this situation, perform the following checks.

1. Check the solenoid valve block assembly for contamination as follows:
   - Switch off the prime mover and operate controls to vent residual pressure in the hydraulic system.
   - Vent pressure from the hydraulic tank by releasing the tank filler cap.
   - Remove solenoid valve and dismantle. Inspect for blockages or damaged seals.
   - Clean and replace all seals if necessary.
   - Clean or change filter fittings.
   - Re-assemble solenoid unit and install to prime mover. If in doubt, replace solenoid valve.
2. Re-connect all hydraulic hoses to correct ports as detailed in the installation instructions provided with your coupler hydraulic kit. Make sure the pressure feed hose connects to valve port "P" and the tank return hose connects to valve port "T".
3. Check that the coupler cylinder has not become locked due to contamination as follows:
   - Switch the coupler to the unlock position and disengage the prime mover hydraulics.
   - When the cylinder is fully retracted, switch off the prime mover and operate the controls to vent residual pressure in the hydraulic system.

WARNING! There may be some residual pressure in the hydraulic cylinder. Unscrew the check valve slowly to allow any trapped pressure to escape.

- Slowly unscrew the check valve in the hydraulic cylinder.
- Inspect the check valve and clean or replace the O-ring seals.
- Clean all cavities including the cylinder.
- Re-assemble the check valve into the cylinder.
- If there is any damage to the cylinder, replace the entire cylinder.

MAINTENANCE & SERVICE

OPERATION CHECK

If the coupler is locked on the attachment but the attachment can still be released from the coupler, the cylinder or the cylinder check valve is losing hydraulic pressure and may need re-sealed or replaced. To check for loss of pressure, place the attachment on the ground and attempt to move the coupler on the attachment. If the coupler does not hold firmly, the coupler is losing hydraulic pressure.

WARNING! Do not operate coupler in this condition. Have coupler repaired immediately.

COUPLER ABS UNIT AND SPRING REMOVAL AND REPLACEMENT

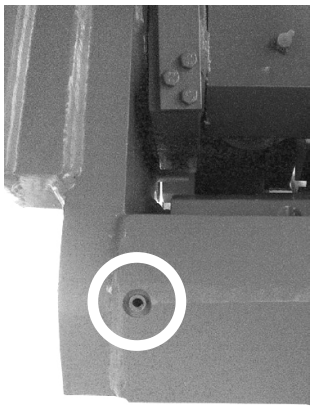
WARNING! Take care when handling coupler and components, attachment and installation pins. Refer to Specifications Section for product weight table.

Removal

1. Uncouple attachment/work tool from the coupler (Refer to Operation Section of this manual).
2. Retract the hook by moving coupler switch to the UNLOCK position.
3. Remove the coupler from the machine.
4. Remove the roll pin securing the ABS unit. See Figure #1

FIGURE #1

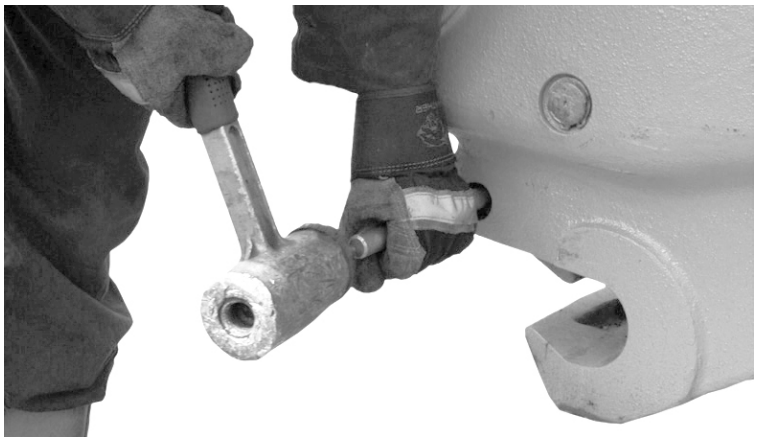
CAST COUPLER



FABRICATED COUPLER

5. Remove the ABS pivot pin. See Figure #2

FIGURE #2

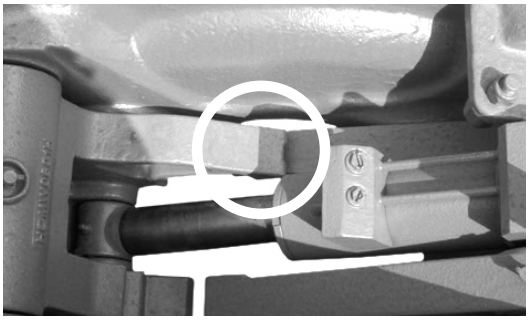


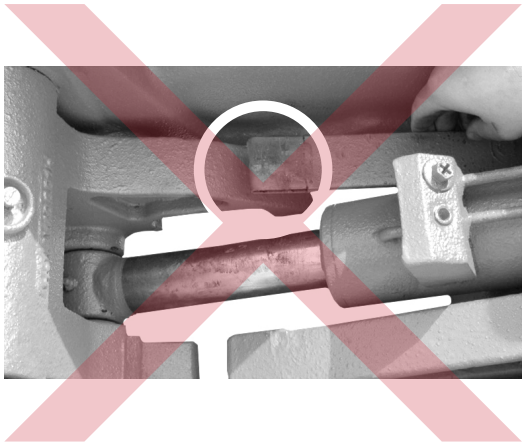
6. Remove the ABS unit.
7. Unbolt the ABS spring from the ABS unit.

Replacement

Replacement is the reverse of the removal procedure.
When replacing the ABS unit, the spring must be BELOW the thumb on the back of the hook. See Figure #1. See Coupler Torque Specifications for torque value of ABS spring bolts.

FIGURE #1





HYDRAULIC CYLINDER REMOVAL AND REPLACEMENT

NOTICE! Make sure you do not contaminate any hydraulic components during the replacement procedure.

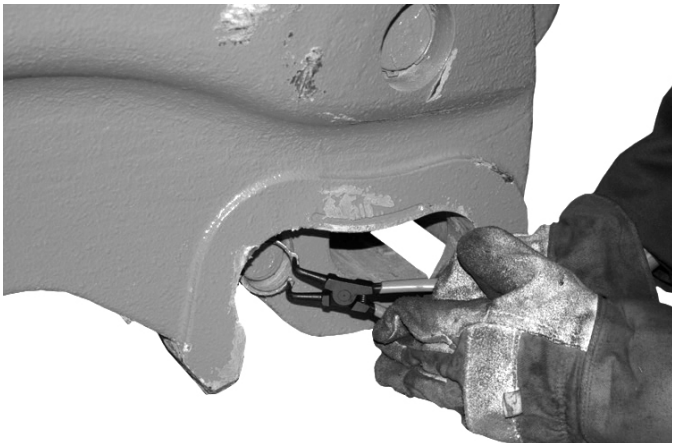
WARNING! Take care when handling coupler & components, attachment and installation pins. Refer to Specifications section for product weight table.

Removal

1. Uncouple attachment/work tool from the coupler (Refer to Operation Section of this manual).
2. Lock the hook by moving the coupler switch to the LOCK position.

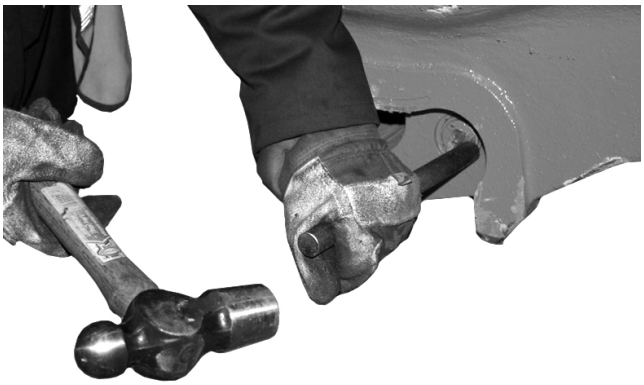
3. Remove the coupler from the prime mover.
4. Remove the snap rings/roll pin from the hook. See Figure #1

FIGURE #1



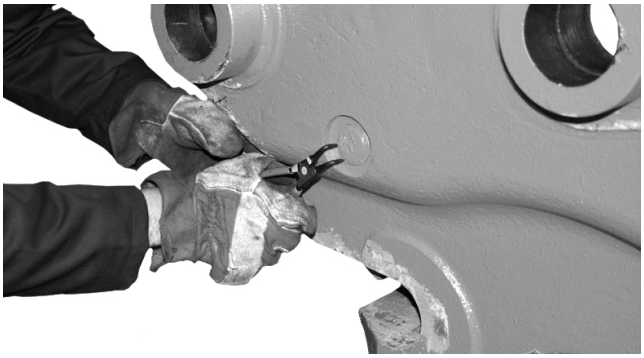
5. Remove the cylinder hook pin. See Figure #2

FIGURE #2



6. Remove the snap ring securing the cylinder pin. See Figure #3

FIGURE #3



7. Remove the cylinder pin. See Figure #4

FIGURE #4

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 movers operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

8. Remove the hydraulic cylinder.

Hook & Cylinder Removal

On some couplers, the small cylinder pin is inaccessible because of the coupler frame. If this is the case, remove the long hook pin and lift out the hook and cylinder as one unit then remove the small cylinder pin.

Replacement

Replacement is the reverse of the removal procedure.

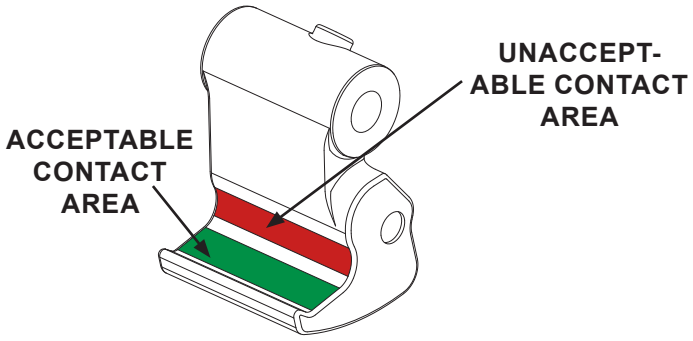
INSPECTING THE COUPLER FRAME

It is possible that over time the coupler could become worn or damaged in the horseshoe area of the frame. To determine if the horseshoe area of the coupler is worn to an unacceptable level, it is recommended that you check the contact area on the coupler hook.

Inspect coupler hook to see where the bucket pin is coming into contact with the hook. Use Figure #1 to establish if the contact point on your hook is in the acceptable area. If the bucket pin comes into contact with the protruding wear indicators, this is unacceptable contact.

If bucket pin is secured by the hook in the unacceptable contact area, this is an indication that the horseshoe area of the coupler frame is worn and will need repairing.

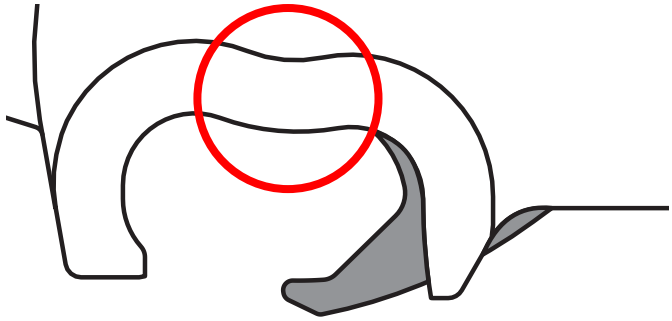
FIGURE #1



REPAIRING THE COUPLER FRAME

If the coupler frame becomes worn or damaged in area shown in Figure #2, then the following procedure must be performed for repair.

FIGURE #2



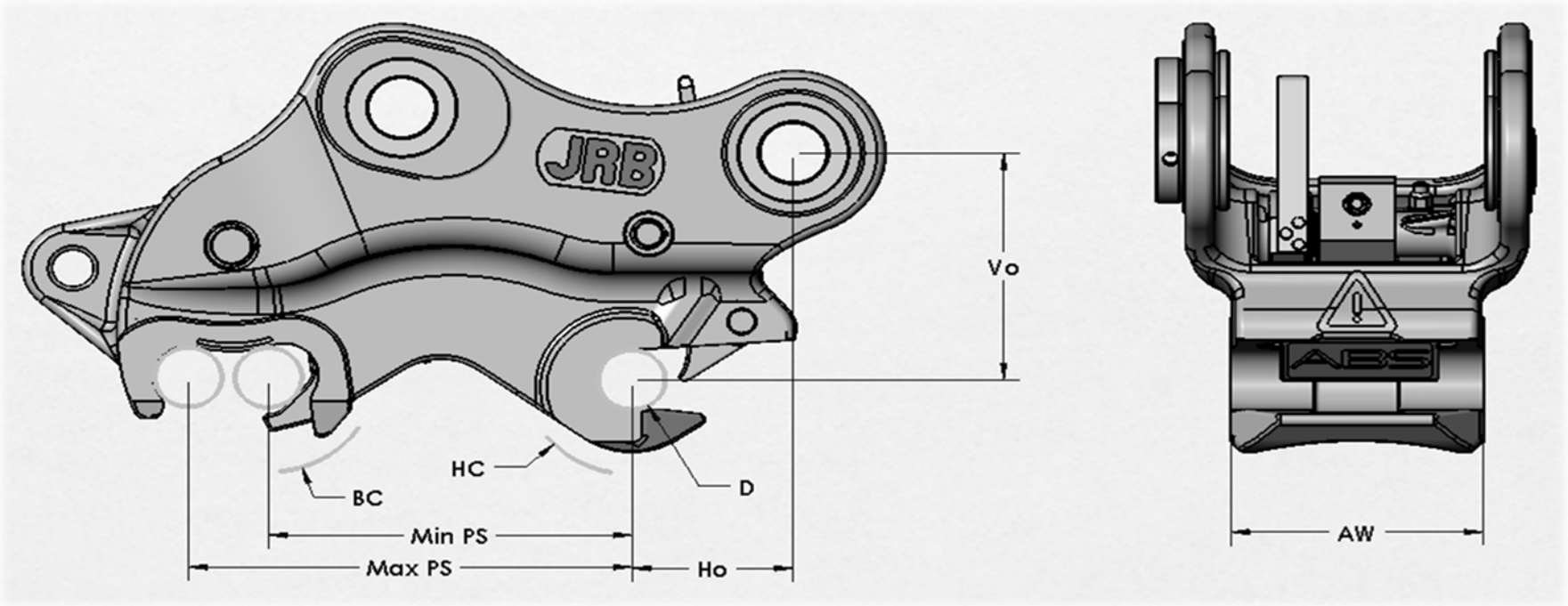
The maximum wear allowed around this area is 5mm (0.19 inches) If the wear is more than this the area will need repaired.

1. Contact manufacturer for a template for the coupler using serial number and coupler type.
2. The worn area should be prepared with use of a grinder before being built up with weld to match the appropriate shape. Mig welding is recommended for these repairs. Alternatively, welding with low hydrogen electrodes (E7018 or equivalent) can be used. All welds should be blended in and smooth to avoid stress areas.
3. Once fully welded, the repaired area must be allowed to cool slowly in controlled conditions.
4. Fully dress the welded areas by grinding and check that there is no interference with the movement of the hook or other parts of the coupler. Check that the dressed areas match the template provided.
5. Remove all sharp edges and repaint area. Perform a maintenance check before re-installing the coupler to the prime mover.

Contact manufacturer for more detailed information about the above process.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
COUPLER FAILS TO LOCK/UNLOCK	Snapped, bent or lost pins.	Replace if necessary.
	Damaged cylinder.	Replace if necessary.
	Loose or damaged hardware.	Tighten or replace.
	Solenoid valve coil is loose or burnt out.	Tighten or replace.
	Worn, damaged, insufficient or inadequate hydraulic pump.	Refer to prime mover's owners manual.
	Hydraulic oil level too low	Refer to prime mover's owners manual.
	Air in hydraulic lines.	Cycle hydraulic flow to coupler several times to remove air from lines.
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	ABS jammed.	See Jammed ABS in the Operation section.
LEAKING OIL	Worn or damaged seal.	Replace if necessary.
	Loose or damaged hoses.	Tighten or replace.
	Loose or damaged connections.	Tighten or replace.
ELECTRICAL FAILURE	Damaged electrical wiring	Repair or replace if necessary.
	In-line fuse to control switch has blown.	Replace if necessary.
	Controls and/or buzzer is broken.	Repair or replace if necessary.
	Incorrect voltage to magnetic coil.	Ensure solenoid is getting correct voltage.
	Prime mover electrical failure.	Refer to prime mover's owners manual.



	Legend	Range 3 (20 Class)		Range 4 (25 Class)		Range 5 (35 Class)		Range 6 (45 Class)	Range 7 (55 Class)		Range 8 (70 Class)		Range 9 (100 Class) Fabricated*	
Coupler Weight	**Kg. (lbs)**	93 (205)		180 (397)		263 (580)		310 (683)	470 (1036)		560 (1235)		930 (2050)	
Minimum Attachment Width	**AW**	6.66" (169mm)		8.70" (221mm)		10.91" (277mm)		12.08" (307mm)	12.84" (326mm)		13.59" (345mm)		14.45" (367mm)	
Pin Diameter	**D**	50mm	60mm	60mm	65mm	70mm	80mm	80mm	80mm	90mm	90mm	100mm	100mm	110mm
Pin Spread Min.	**Min PS**	11.03" (280mm)	11.42" (290mm)	13.59" (345mm)	13.98" (355mm)	14.81" (376mm)	15.40" (391mm)	16.93" (430mm)	17.44" (443mm)	18.04" (458mm)	18.97" 482mm)	19.69" (500mm)	21.06" (535mm)	21.85" (555mm)
Pin Spread Max.	**Max PS**	12.48" (317mm)	12.59" (320mm)	16.33" (415mm)	16.53" (420mm)	18.58" (472mm)	18.77" (477mm)	20.47" (520mm)	20.47" (520mm)	20.66" (525mm)	23.70" (602mm)	23.90" (607mm)	24.60" (625mm)	25.00" (635mm)
Coupler Vertical Offset	**Vo**	8.66" (220mm)		10.82" (275mm)		12.01" (305mm)		12.01" (305mm)	13.90" (353mm)		14.33" (364mm)		17.01" (432mm)	
Coupler Horizontal Offset	**Ho**	5.28" (134mm)		7.48" (190mm)		7.68" (195mm)		7.60" (193mm)	9.29" (236mm)		9.57" (243mm)		11.57" (294mm)	
Hook (Shell) Clearance ** Radius from pin center	**HC**	3.13" (178mm)		3.80" (193mm)		3.90" (198mm)		4.19" (213mm)	4.51" (229mm)		4.69" (238mm)		5.43" (276mm)	
Box Section Clearance ** Radius from pin center	**BC**	3.51" (178mm)		3.59" (182mm)		3.62" (184mm)		4.27" (217mm)	4.55" (231mm)		4.61" (234mm)		4.94" (251mm)	
Lift Eye Rating	**lbs (Tonne)**	11,023 (5)		28,660 (13)		28,660 (13)		35,273 (16)	44,092 (20)		55,115 (25)		66,138 (30)	

*Range 9 coupler is fabricated body (not cast)

SPECIFICATIONS

BUCKET PIN AND HYDRAULIC CYLINDER WEIGHT CHART

MACHINE TONNAGE RANGE	COUPLER RANGE	BUCKET PIN WEIGHT KG. (LBS)	CYLINDER WEIGHT KG. (LBS)
6 - 9	3	8.5 (19)	7 (16)
10 - 13	4	20 (44)	11 (24)
14 - 18	5	30 (66)	13 (29)
19 - 21	6	44 (97)	13 (29)
22 - 27	7	52 (115)	29 (64)
28 - 35	8	68 (150)	30 (66)
36 - 45	9	-----	-----

All weights are approximate.

COUPLER TORQUE SPECIFICATIONS

Blocking Bar Leaf Spring Bolts (Range 3 - 9*) ..... 30 ft. lbs. (41 Nm)

ABS Leaf Spring Bolts
Range 3 - 6..... 30 ft. lbs. (41 Nm)
Range 7 - 8* ..... 60 ft. lbs. (82 Nm)
Range 9*..... 102 ft. lbs. (138 Nm)

Cylinder Check Valve ..... 30 ft. lbs. (41 Nm)

* Use grade 12 bolts and apply Loctite 262 on Range 7 - 9 couplers.

BOLT TORQUE SPECIFICATION

GENERAL TORQUE SPECIFICATION TABLES

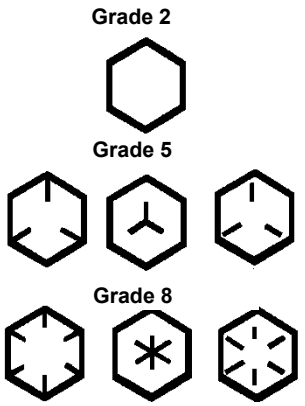
Use the following charts when determining bolt torque specifications, when special torques are not given. Always use grade 5 or better when replacing bolts.

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			
		Ft-lbs		Newton-Meter		Ft-lbs		Newton-Meter	
Inches	mm	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

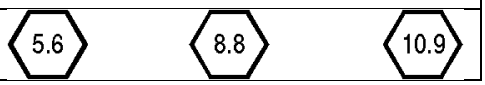
Bolt head identification marks as per grade.
NOTE: Manufacturing Marks Will Vary



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.



Bolt Size	Grade No.	Pitch (mm)	Ft-lbs	Newton-Meter	Pitch (mm)	Ft-lbs	Newton-Meter
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

PARTS

In order to provide you with the most UP-TO-DATE part information, parts for this attachment are being 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 12:00 P.M. (Eastern Standard Time) will be shipped the same day.

SERVICE DEPARTMENT
(330) 734-3000
(800) 428-2538

For Fax and E-mail Orders
PHASales@paladinattachments.com
(330) 734-3018

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***.