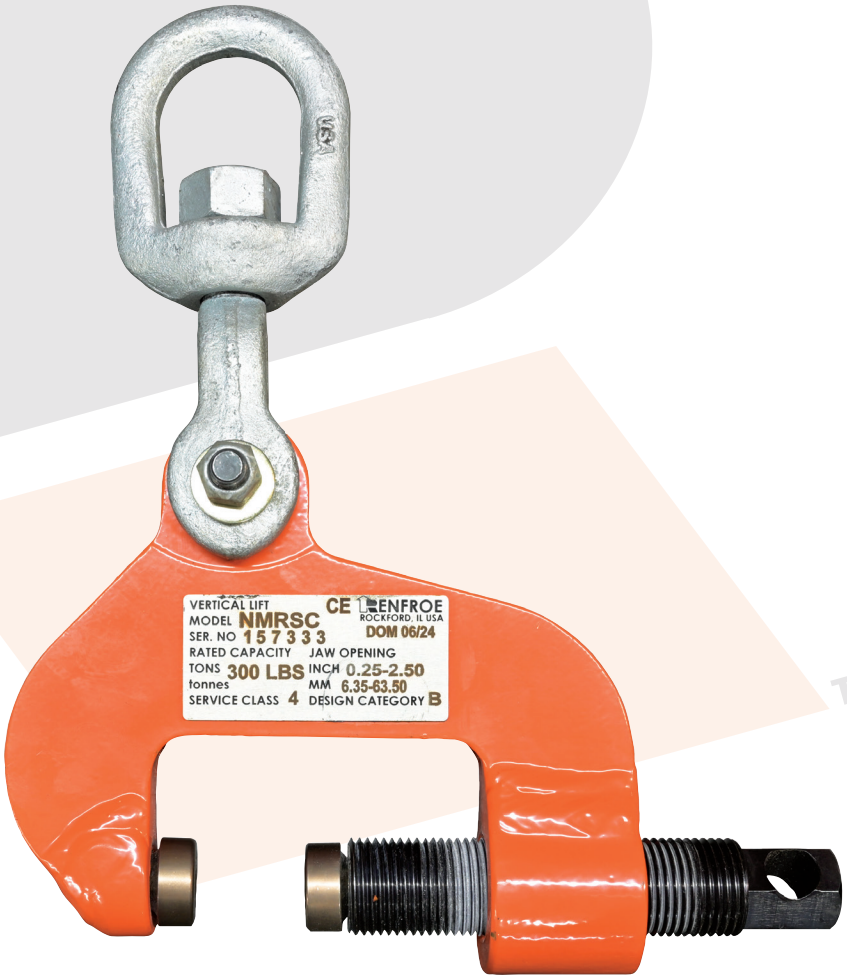
⚠WARNING Before putting tool in service, take the manual to your supervisor.

LIMITED LIFETIME WARRANTY

RENFROE™

MODEL NMRSC CLAMP

APPLICATION, OPERATION, AND MAINTENANCE MANUAL



Model NMRSC Clamp Operator's Manual

This Operator's Manual covers the application, operation, and maintenance of this RENFROE™ product. Operator's Manuals for other current RENFROE products are available upon request.

RENFROE

The RENFROE brand has been trusted and preferred by international lifting clamp users for more than 50 years. They are manufactured by The Caldwell Group, Inc. in Rockford, IL, and sold via a worldwide network of stocking distributors who exemplify the same high-quality performance and service standards RENFROE brand stands for.

The Caldwell Group, Inc.
200 State Street
Beloit, WI 53511
800.628.4263
815.229.5667
caldwellinc.com

Table of Contents

⚠WARNING

Prior to selection, operation, and/or maintenance of RENFROE products, read and understand the information provided in this manual.

The understanding and use of the definitions are important in determining the limitations and proper application of RENFROE products.

Failure to review and utilize recommended applications, operation, and maintenance instructions may result in serious injury to operator and others.

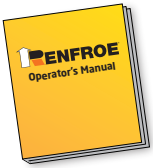
Notice of Exclusion of Warranty

RENFROE has herein set forth in conspicuous language an exclusion of any warranty either expressed or implied, which is not specifically and particularly contained herein. Please refer to that statement for representations and warranties of products manufactured by RENFROE.

This publication supersedes all previously published and/or distributed information by manufacturer and/or its distributors with respect to applicable RENFROE products and subject matter described or contained herein.

RENFROE™ Clamp Oper

1

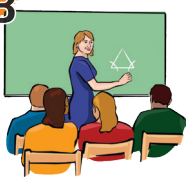


DO read and understand the Operator's Manual before using clamp.

2

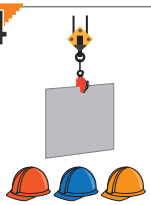
DO consult the Operators Manual or RENFROE when in doubt.

3



DO attend a RENFROE factory training class to establish proper clamp use.

4



DON'T lift over workers, safety areas, or personnel.

5

DO lock clamp closed with lock; **DON'T** lift with lock in open position.

6

DON'T use a connection that may release the clamp.

7

DON'T attach clamp directly to crane hook or use a heavy flexible connection.

8

DO use a flexible connection between crane hook and clamp shackle.

9

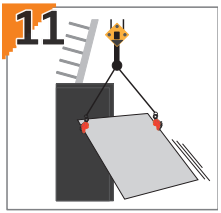
DO use correct clamp for job; **DON'T** use large capacity clamps to lift light loads.

10

DO use clamps within their rated capacity; **DON'T** overload clamps.

ration Do's and Don'ts

11



DO use enough clamps to balance load; **DON'T** lift loads that are not balanced.

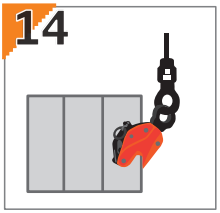
12

DO always refer to pre-lift inspection in Operator's Manual.

13

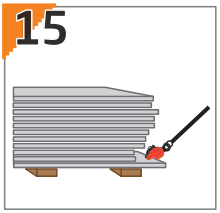
DO inspect clamp before each lift and follow inspection & maintenance instructions.

14



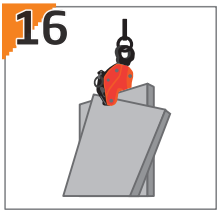
DON'T side load with a straight shackle clamp.

15



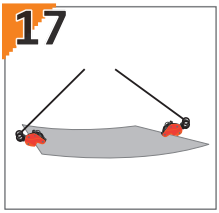
DON'T misuse (i.e. **DON'T** lift plate from bottom of plate stack).

16



DON'T rush—and **DON'T** lift more than one plate at a time with a vertical clamp.

17



DON'T lift plate horizontally with a vertical lift only clamp.

18

DON'T alter the clamp; **DON'T** grind, weld or modify the clamp in any manner.

19

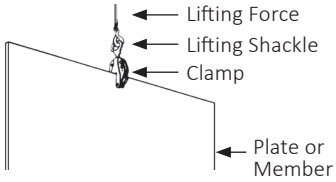
DO secure load before attaching clamp.

20

DO use only RENFROE replacement parts to assure proper operation of the clamp.

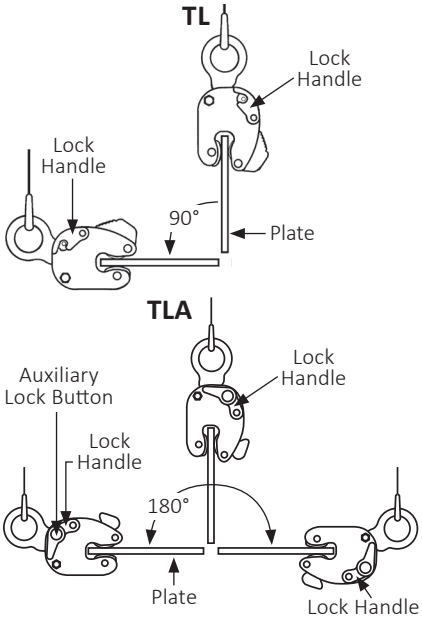
Vertical Lift

The lifting of a single plate or member in which the lifting force exerted by the rigging is directly above and in line with the lifting shackle as shown in the illustration on the right.



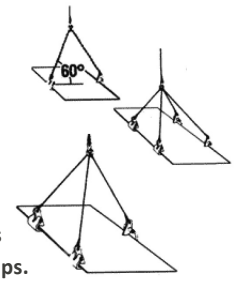
Vertical Turn/Lift

A vertical turn/lift clamp is a vertical lifting clamp specifically intended to turn a single plate or member through a ninety degree (90°) arc and back to vertical through the same ninety degree (90°) arc or from horizontal to vertical to horizontal through a one hundred and eighty degree (180°) arc. Refer to Application Section of specific Turn/Lift clamps for further detail. During the turning operation, the edge of the plate opposite the edge to which the clamp is attached should always be in contact with a supporting surface such as a factory floor and the load on the clamp not exceed one half rated capacity of clamp—refer to illustrations shown on the right.



Horizontal Lift

Clamps (used in pairs or multiples) are attached to the side edges of a plate or bundle of plates positioned horizontally to the floor level. The rigging attached to clamps is generally multi-legged slings with the connecting point of the slings being approximately centered between the distance separating the clamps. Refer to illustrations shown on the right. **WARNING: The capacity of all horizontal clamps is based on a sling angle of sixty degrees (60°). Sling angles less than sixty degrees (60°) increase the load exerted on the clamps. Never exceed the rated capacity of a single clamp.**



Steel Plates

Unless otherwise specified, lifting clamps are manufactured to handle hot-rolled steel plates whose Brinell Hardness does not exceed 300. **WARNING: Do not lift plates with coatings or mill scale that prevent the gripping surfaces of the clamp from making positive contact with the base metal.**

Finished and Polished Plates

Steel plates in this category have other than hot-rolled surfaces such as stainless steel, etc., and are generally handled using non-marring clamp that incorporate smooth-gripping surfaces. **WARNING: For applications using clamps with serrated gripping surfaces on finished or polished plates, secure written recommendations from CALDWELL/RENFROE.**

Structural Members Fabricated Sections

Unless otherwise specified, clamps described as capable of handling structural members and fabricated sections are limited to hot-rolled steel whose Brinell Hardness does not exceed 300. **WARNING: For applications not covered by the above information, secure written recommendations from CALDWELL/RENFROE.**

Rated Capacity

The rated capacity of a RENFROE product is based on the product being in “new or as new” condition and represents the maximum load the product is to be subjected to when utilized in the manner described in this manual. Wear, misuse, abuse, and other factors relating to usage may reduce the rated capacity. Shock loading and the factors listed must be taken into consideration when selecting a RENFROE product for a given application.

Plate Thickness

The minimum and maximum plate/wall thickness a clamp specified for handling plates is capable of lifting. **WARNING: Never use a clamp for lifting a plate where the plate/wall thickness is less than or greater than the minimum and maximum stenciled on the clamp.**

> For applications not covered by the above information, secure written recommendations from CALDWELL/RENFROE.

Jaw Opening

The minimum and maximum plate/wall thickness a clamp specified for handling plates is capable of lifting. **WARNING: Never use a clamp for lifting a plate where the plate/wall thickness is less than or greater than the minimum and maximum stenciled on the clamp.**

Operating Temperatures

Unless specified under the Application Section of the individual model, the approved operating temperature of RENFROE clamps is from 0°F (-18°C) to a maximum of 200°F (93°C). The minimum and maximum temperatures apply to both ambient and the material being handled by the clamp. **WARNING: Secure written authorization from CALDWELL/ RENFROE before using clamps in temperatures other than shown.**

Hot Lifts

The Model R and S clamps are available in modifications that are capable of making lifts where the temperatures of the member being lifted exceeds 200°F (93°C). Depending on conditions, a lift may exceed 1000°F (538°C). The exact application and temperatures of the plates to be handled are critical in selecting the proper mode. **WARNING: Secure written instructions from CALDWELL/RENFROE for all hot lift applications.**

Locking Clamps

Locking clamps are divided into the categories listed below. With the exception of the “Locking Wedge” and “Locking Screw” type, the purpose of the locks is to facilitate the attaching and removing of the clamp from the member being handled.

Lock Closed

An over-center, spring-loaded mechanism in which the spring exerts a force on the gripping cam when the lock handle is moved to the “Lock Closed” position. When the handle is moved to unlocked position, the force exerted by the spring is relaxed and the gripping cam may be retracted by pushing the lifting shackle into body of clamp. Refer to the Operation Section of specific models of “Lock Closed” clamps for additional details. Typical “Lock Closed” clamps are Models DG, FR, and M.

Lock Open Only

Normally used on “Hot Lift” clamps and consists of a manually operated “Lock Stop Pin” that is inserted when gripping cam of clamp is retracted and removed when clamp is positioned on the plate. Tag line may be used to permit operator to remove pin from a greater distance from clamp. Refer to the Operation Section of specific model of “Lock Open Only” clamps for additional details. A typical “Lock Open Only” clamp is the Model RO.

Lock Closed-Lock Open

An over-center, spring-loaded mechanism in which the spring exerts a force on the gripping cam when the lock handle is moved to the “Lock Closed” position. When the handle is moved to the “Lock Open” position, the gripping cam is maintained in the retracted position for ease in installing the clamp on a plate or member. The Model FRD contains individual “Lock Open” and “Lock Closed” mechanisms that must be operated separately. Refer to the Operation Section of specific models of the “Lock Open-Lock Closed” clamps for additional details. Typical “Lock Open-Lock Closed” clamps are Models FRD, R, S, SD, SEA, SX, TL, TLA, TLC, and the J Series.

Locking Wedge

Locking wedge is a fluted steel wedge that is driven in place with a hammer. The body of the wedge is positioned in a slot in the clamp body with the fluted edges contacting the member to which the clamp is being attached. Refer to Operation Section of specific models of the “Locking Wedge” clamps for additional details. Typical “Locking Wedge” clamps are Model A1, B1, B2, and PB.

Locking Screw

“Lock Screw” clamps depend on manually adjusting a screw to hold the gripping surface in place for lifting and removing the clamp from member being lifted. Refer to Operation Section of a specific model of “Locking Screw” clamps for additional details. Typical “Locking Screw” clamps are Models AC, ACP, NM, PC, SCP, and SCPA.

Non-Locking

"Non-Locking" clamps have no mechanisms to aid in attaching or removing clamp from member being lifted. It is necessary to have position of clamp maintained on the member being lifted until a properly applied force is exerted to the lifting shackle. Refer to Operation Section of specific models of the "Non-Locking" clamps for additional details. Typical "Non-Locking" clamps are Model AST, ASTL, BD, LHC, LHD, and WHSR.

Warning

A pointing out and notice of danger. The purpose of a "WARNING" is to apprise the operator and all other affected persons of the existence of danger of which they should be but may not be aware and to enable the operator to protect themself and others where applicable against such danger. An attempt is made herein to warn against reasonable and reasonably foreseeable danger in the proper use and possible reasonable misuse of CALDWELL/ RENFROE products described in this manual.

Designated Person

A person selected by the employer or the employer's representative as being competent to perform those specific duties.

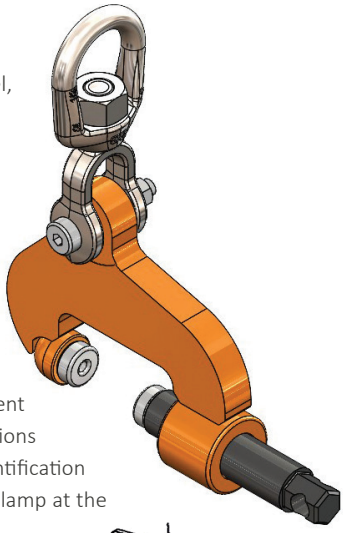
Qualified Person

A person who, by possession of a recognized degree in an applicable field or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve problems relating to the subject matter at hand.

Download a RENFROE Catalog

Download a copy of the most current RENFROE catalog to see the full-line selection here:
caldwellinc.com/caldwell-catalog-library

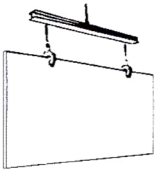
Model NMRSC Rotating Screw Clamp Series



The Model NMRSC Clamp (Non-Marring Rotating Screw Clamp) is manufactured with smooth gripping surfaces to prevent marring when gripping stainless steel, copper, aluminum, and other polished plates.

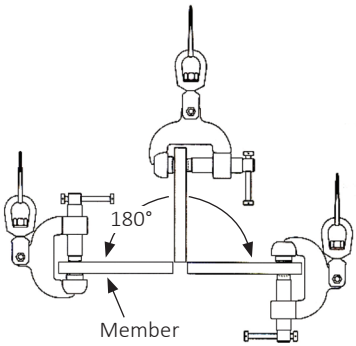
The clamp is a vertical lift clamp capable of lift and turn operations from the horizontal through 180° arc. The suspended load may also be rotated 360° about the vertical axis. Refer to illustration below. Side loading is limited to 10° from the vertical axis.

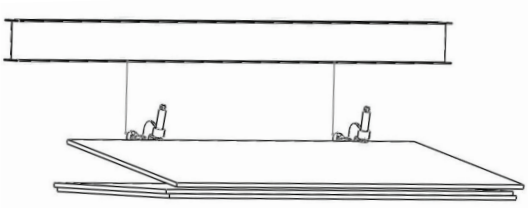
Refer to additional instructions in the Operations Section. The adjusting screw is used to accommodate various thicknesses of material and to facilitate attachment of the clamp to the member to be lifted. Refer to Definitions Pages for explanation of "Locking Screw" clamp. For identification of component parts, refer to the detail drawings of the clamp at the end of the Maintenance Section.



Due to the variety of conditions that may exist in the handling of plates, it is recommended that the clamps be used in pairs and attached to a chain or wire rope sling, supported by a spreader beam.

The Model NMRSC is not intended for use in transportation of plates using mobile equipment where shocking of the load may occur. For an exploded view of the clamp parts, turn to page 21.
WARNING: Refer to the sections on Operation and Maintenance for the approved procedures in the operation and maintenance of this product.





Recommended for use in pairs.

Model NMRSC Rotating Screw Clamp Series

STEP 1

Before using any RENFROE clamp, refer to the Application section to confirm the operation to be undertaken is an appropriate application for this product.

STEP 2

Select a clamp with appropriate capacity, and plate thickness. The model designation, capacity, and plate thickness are stenciled on each clamp. **WARNING: Never exceed rated capacity or use on plates that are not within the range of plate thickness stenciled on the clamp. Lift only one plate on each lift.**

Always use a clamp with maximum plate thickness and rated capacity near equal to the thickness and weight of the plate being lifted. **WARNING: Make certain the beam the clamp is attached to is capable of supporting the rated capacity of the clamp.**

STEP 3

Inspect clamp before each lift. **WARNING: Do not use if in need of repair.**

If in doubt, refer to the Maintenance section for detailed maintenance instructions and exploded view of the clamp for part identification.

A. Check the clamp to be certain the identification and warning tags are present and legible.

B. Do not use the clamp if the tags are missing or illegible.

C. Inspect gripping surfaces for wear and defects. Gripping surfaces must be smooth and free of foreign matter. The screw cup and swivel jaw should turn freely. Set screw must not protrude from either the screw cup pad or the swivel jaw pad.

D. Screw should turn freely. Inspect for wear and damage. Internal springs must hold swivel jaw and screw cup in “Centered” position with the gripping surfaces at 90° to the length of the screw. **WARNING: Do not use clamp unless springs are in place and are holding the swivel jaw pad and screw cup pad at 90° to the length of the screw.**

E. Inspect condition of the body for wear and damage, particularly on the inside of the jaw opening.

F. Inspect condition of the lifting shackle and shackle screw for wear and damage. Shackle yoke must pivot freely about the shackle screw. Shackle eye must rotate freely about the shackle yoke.

G. Remove any clamp from service in need of repair.

STEP 4

The clamp is a component of the rigging used in the lifting and transporting of members. It is important to use safe and adequate rigging. **WARNING: Improper or excessively heavy rigging may interfere with the operation of the clamp and its ability to maintain a proper position on the plate. Never attach crane hook directly to the clamp—always use a flexible sling between crane hook and clamp.**

STEP 5

Position clamp on the member to be lifted. Do not allow inside of the jaw opening to rest on the member to be lifted. Maintain 1/4" clearance. Refer to Illustration A. Position clamp such that the direction of force applied by the crane is in line with the lifting shackle. **WARNING: On Model NMRSC never exceed 10° side loading. Refer to Illustration B.**

Illustration A

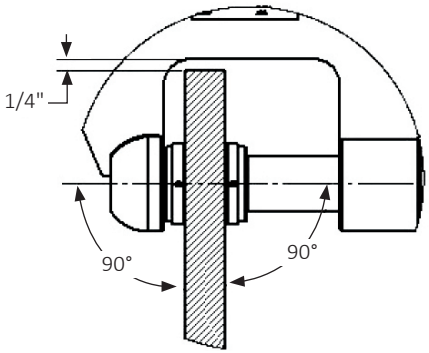
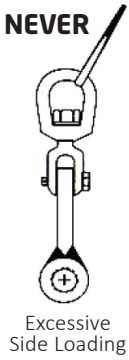
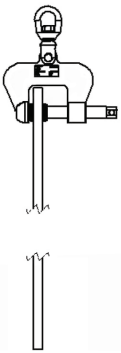


Illustration B



Excessive Side Loading

Illustration C



STEP 6

Tighten screw making certain that both gripping surfaces are parallel to the surface of the member being lifted and are not partially on and off the ledge member. Refer to Illustration C. **WARNING: Apply required torque on screw. The torque value for this Model NMRSC clamp fitted with 1" diameter steel pads is 21 ft-lbs. for lifting 300 lbs. of dry and oil-free steel plate.**

STEP 7

Commence lift. **WARNING: The operator should position himself away from and fully clear of the member to be lifted. Do not commence lift until all personnel are clear of the area of the lift. Never stand under or near a member being lifted. Do not permit the member being lifted to contact adjacent structures or equipment.**

STEP 8

To remove clamp after plate is fully supported and at rest in a stable position, relax the lifting force. Loosen adjusting screw, and remove clamp from plate.

STEP 9

Inspect clamp. Remove from service if in need of repair. **WARNING: In the event the stenciling is worn and not legible or the tag containing the model, capacity or other pertinent information is missing—do not use clamp until it has been properly labeled.**

Inspection kits are available from the distributor or RENFROE. Kit contains:

RENFROE clamps are constructed so the wearing parts may be replaced by using the RENFROE Repair Kits. Kits contain all parts generally replaced due to normal wear. To order a repair kit, talk to your distributor or call us at 800.628.4263 or 815.229.5667.

Model NMRSC Rotating Screw Clamp Series

The severity of service to which the clamp is subjected in the workplace determines the frequency and type of inspection procedure required for the clamp. The frequency and type of inspection is determined by the clamp owner. RENFROE acknowledges the ASME B30.20 safety standard which sets forth minimum inspection requirements for "Below-the-Hook" lifting devices and the RENFROE Recommended Inspection Schedule meets and/or exceeds the ASME inspection recommendations.

Before using a clamp, operators should be trained by a qualified person to visually inspect a lifting clamp that will include, but not be limited to, the following:

Every-Lift Inspection:
A visual inspection by the operator before and after each lift made by the clamp.

- Check the clamp to be certain the identification and warning tags are present and legible.
- Do not use the clamp if the tags are missing or illegible.
- Inspect gripping surfaces for wear and defects. Gripping surfaces must be smooth and free of foreign matter. The screw cup and swivel jaw should turn freely. Set screw must not protrude from either the screw cup pad or the swivel jaw pad.
- Screw should turn freely. Inspect for wear and damage. Internal springs must hold swivel jaw and screw cup in "Centered" position with the gripping surfaces at 90° to the length of the screw.
- Inspect the condition of the body for wear, damage, and distortion, particularly in the area of the jaw opening.
- Inspect condition of the lifting shackle and shackle screw for wear and damage. Shackle yoke must pivot freely about the shackle screw. Shackle eye must rotate freely about the shackle yoke.
- Remove any clamp from service in need of repair.

Choose Factory Refurbish & Recertification

Do you currently offer clamp refurbishing and recertifications? Count on CALDWELL/RENFROE to handle refurbishments in total for you or to supplement your in-house capabilities. To begin the quote process or learn more about the program, call our customer service department. We'll explain how things work and get you started right away. If requested, we can also provide a certificate of proof test. **Call us at 800.628.4263.**

WARNING: Do not use the clamp if in need of repair. If, during the Every-Lift Inspection, the operator believes the clamp exhibits excessively worn parts or is damaged, the clamp should be inspected by a qualified person who will make a determination as to its fitness to make a lift. At this time, the condition of the clamp should be noted and recorded. After inspection by the qualified person, it may be decided that a periodic inspection procedure is necessary.

Frequent Inspection:
A visual inspection (see Every-Lift Inspection) by an operator or other designated person timed according to the clamps service class.

Normal Service	Monthly
Heavy Service	Weekly to Monthly
Severe Service	Daily to Weekly

If, during the frequent inspection, the operator believes the clamp exhibits excessively worn parts or is damaged, the clamp should be inspected by a qualified person who will make a determination as to its fitness to make a lift. At this time, the condition of the clamp should be noted and recorded. After inspection by the qualified person, it may be decided that a periodic inspection procedure is necessary.

Periodic Inspection:
A recorded inspection by a qualified person as described in the Periodic Inspection Procedure below timed according to the clamps service class.

Normal Service	Annual
Heavy Service	Semi-Annual
Severe Service	Quarterly

If during any inspection a condition is found which leads to a periodic inspection, then the next periodic inspection is due from the time the clamp is returned to service. See the table below.

Normal Service	1 Year
Heavy Service	6 Months
Severe Service	3 Months

WARNING: If any hazardous condition is found that may cause injury to the operator or other personnel, then the clamp should be subjected to a Periodic Inspection by a qualified person.

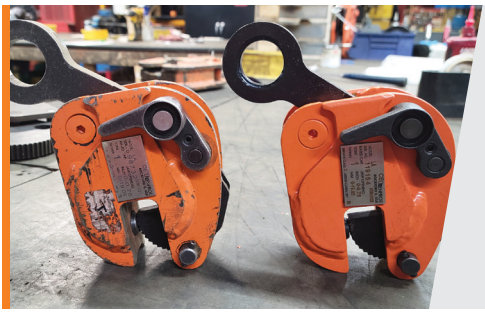
Repair (Replacement of Worn Parts):
During regular maintenance, when replacing parts that are worn, a record should be made of the parts replaced. After the replacement of worn parts, clamps need not be load tested if using RENFROE parts. Non-RENFROE parts are not approved and shall not be used.

Repair (Replacement of Damaged Parts):
During a repair in which parts are replaced due to damage, a record should be made of the repair. At this time, the clamp should be marked with the following information as per the ASME B30.20 requirements:

- **Name and address of the repairer**
- **Repairer's unit identification**
- **Clamp weight (if altered)**
- **Rated load (if altered)**
- **ASME BTH-1 Design Category (if altered)**
- **ASME BTH-1 Service Class (if altered)**

RFID
Some RENFROE clamps are fitted with an RFID chip and can be clearly identified by means of an ID number. This can be captured using the RUD ID EASY-CHECK® (reading device) and transferred to the EYE-D.NET system, for example. The latter application assists you in managing and documenting your components.

Further information can be found online or from your RENFROE contact.



RENFROE Clamps 101: Repair, Rebuild, or Replace?

Know your options when you find a lifting clamp that's showing wear on the CALDWELL blog here: **caldwellinc.com/blog**

Model NMRSC Rotating Screw Clamp Series

STEP 1

Verify the identity of the clamp by checking the identification plate on the clamp body. If the identification plate is missing or not legible, an RFID chip (Radio Frequency Identification Device) is embedded in the clamp body or a clamp component. If the identification plate is missing and the RFID chip is unavailable, call the factory for instructions on returning the clamp for recertification.

STEP 2

Completely disassemble clamp.

STEP 3

Remove all dirt, grease, and other matter that may inhibit proper inspection of the clamp body or clamp components.

STEP 4

Body:

A. Inspect welds, internal and external surfaces for fractures, and distortions. RENFROE recommends a dye penetrate or similar method of detecting indications on the clamp. If an indication is found, it may be necessary to use a magnetic particle, ultrasonic, or similar methods for determining damage to the clamp or components.

B. Inspect surfaces of the body plate that come into contact with the shackle yoke for wear, damage, or distortion.

C. Inspect shackle screw hole for wear and elongation.

D. Inspect inside of swivel jaw block for displaced metal, fractures, or distortion. Inspect condition of wave spring retaining groove. Groove must be free of displaced metal, foreign matter, or worn edges.

E. Inspect inside of screw block for worn threads, fractures, and displaced metal. **WARNING: Replace clamps containing fractures, elongated holes, distorted jaw openings, distorted and worn threads, jaw openings with displaced metal, or damaged spring retaining grooves.**

Show Us Your Renfroe!

Do you have a “vintage” RENFROE clamp that’s still in good working order? Do you have a brand new clamp that’s lifting something cool? We’d love to see YOUR RENFROE clamp in action. **Snap a photo and send it to: marketing@caldwellinc.com.** You never know ... we might make you famous on our blog or social media pages!

STEP 5

Screw (NMRSC-3 in parts diagrams on page 21):

A. Inspect for distortion, damaged threads, and wear.

B. Inspect for fractures, particularly in the area where the screw cup mounts and on the opposite end where the hole is provided for the handle.

C. Inspect the wave spring retaining groove. Groove must be free of displaced metal, worn edges, and foreign matter. **WARNING: Replace screws that are bent, have distorted and worn threads, contain fractures, or have worn retaining spring grooves.**

STEP 6

Screw Cup (NMRSC-4 in parts diagrams on page 21):

A. To remove screw cup, tighten the internal set screw until the screw cup lifts free of the screw. Removal of the screw cup destroys the internal wave spring. The used spring must be discarded and replaced with a new unit. **WARNING: Discard used wave spring. Do not attempt to reassemble clamp with old spring. Always install new wave spring after disassembly of screw cup.**

B. Inspect screw cup pads for fractures, damage, and wear and any imperfections and foreign matter. Retaining spring groove must be free of displaced metal, worn edges, or foreign matter. **WARNING: Replace worn, dull, or damaged screw cup pads.**

C. To install screw cup pad, insert lubricant into the recess of the screw. The recommended lubricant is Molybdenum Disulfide grease. Install new wave spring into retaining groove of the screw cup. The spring must be fully retained in the groove width and centered about its axis. Lightly lubricate set screw threads with Molybdenum Disulfide grease. Install set screw. Set screw must be fully contained within the body of the screw cup and must not protrude from either side. Press screw cup pad into the screw recess until the wave spring locks into the screws retaining groove.

D. Attempt to remove screw cup pad from the screw by hand. Screw cup pad should move approximately 1/16" as the spring compresses. If the screw cup pad can be removed by hand, either the spring is not properly sealed or the screw cup or screw retaining groove is worn beyond acceptable limits.

E. Check screw cup pad for proper operation. Screw cup must rotate freely in the screw and swivel 3° in all directions. Spring must return screw to “centered” position when deflected. **WARNING: If screw cup pad can be removed by hand or if the spring does not center the screw cup, remove clamp from service until the unit is repaired.**

STEP 7

Swivel Jaw (NMRSC-5 in parts diagrams on page 21):

A. To remove swivel jaw pad, tighten internal set screw until the swivel jaw pad lifts free of the swivel block. Removal of the swivel jaw pad destroys the internal wave spring. The used wave spring must be discarded and replaced by a new unit. **WARNING: Discard used wave spring. Do not attempt to reassemble clamp with old spring. Always install new wave spring after disassembly of swivel jaw pad.**

B. Inspect swivel jaw pad for fractures, damage, and wear imperfections and foreign matter. Retaining spring groove must be free of displaced metal, worn edges, and foreign matter. **WARNING: Replace worn, dull, or damaged swivel jaw pads.**

C. To install swivel jaw pad, insert lubricant into the recess of the swivel block. The recommended lubricant is Molybdenum Disulfide grease. Install new wave spring into retaining groove of the swivel jaw pad. The spring must be fully retained in the groove width and centered about its axis. Lightly lubricate set screw threads with Molybdenum Disulfide grease. Install set screw. Set screw must be fully contained within the body of the swivel jaw pad and not protrude from either side. Press the swivel jaw pad into the swivel blocks spring retaining groove. **WARNING: Replace bent screws, those with distorted or worn heads, and distorted threads.**

D. Attempt to remove swivel jaw pad from swivel block by hand. Swivel jaw should move approximately 1/16" as the spring compresses. If the swivel jaw pad can be removed by hand, either the spring is not properly seated or the swivel jaw pad and/or swivel block retaining groove is worn beyond acceptable limits.

E. Check swivel jaw pad for proper operation. Swivel jaw pad must rotate freely in the swivel block and swivel 5° in all directions. Spring must return swivel jaw pad to the "centered" position when it is deflected. **WARNING: If swivel jaw pad can be removed from the swivel block by hand or if the spring does not center the swivel jaw pad, remove clamp from service until the unit is properly repaired.**

STEP 8

Shackle Screw (NMRSC-1 in parts diagrams on page 21):

A. Inspect shackle screw for distortion, surface blemishes, wear, and fractures. **WARNING: Replace shackle screw that is distorted, bent, has surface scars, is worn, or contains fractures.**

STEP 9

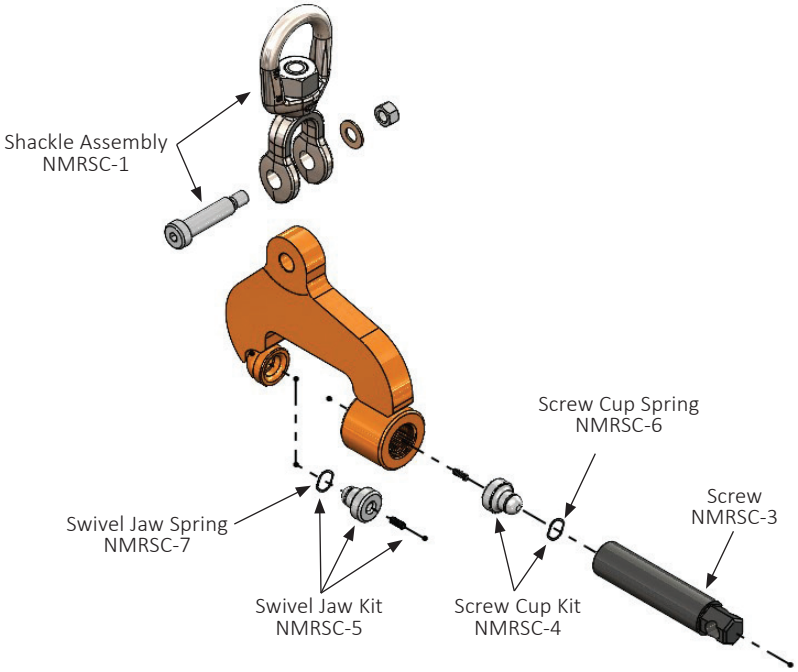
After reassembly, check operation of clamp. All parts should move freely without binding. Refer to exploded view for proper location of component parts. **WARNING: All retaining pins, screw, and springs must be in place before returning clamp to service.**

GENERAL

RENFROE products may be returned to the factory for inspection and refurbishment in accordance with an established fee schedule.

Use only RENFROE replacement parts to insure maximum efficiency and safety factor originally built into the product. Refer to CALDWELL Customer Service for instructions on ordering replacement parts.

WARNING: Do not weld, grind, or modify the clamp body or component parts in any manner. In the event the stenciling is worn and not legible or the tag containing the model, capacity, or other pertinent information is missing, do not use clamp until it has been properly labeled. RENFROE will replace tag upon request.



Exclusion of Warranty

There exists no warranties neither expressed nor implied which extend beyond the descriptions or statements contained in the face or any part hereof.

5 WAYS TO PROTECT YOUR CLAMP INVESTMENT

1. **Inspect clamps per ASME B30.20 standards.** A visual ***Every Lift Inspection*** is required each time the clamp is used. A more in-depth ***Frequent Inspection*** can be required daily, weekly or monthly, depending on the clamp's service class. And, recorded ***Periodic Inspections*** can be required quarterly, semi-annually or yearly, depending on service class.

2. **Establish a good maintenance protocol.** Ensure all employees know how inspections work. Provide them with adequate time and training to perform those inspections. Clearly identify requirements and get your safety team involved with ongoing monitoring of the program to make sure it continues as designed.

3. **Know when to repair, rebuild or replace.** Know your options when you find a lifting clamp that's showing wear.
Go to the Caldwell Blog here: caldwellinc.com/blog

4. **Use RENFROE Rebuild Kits to replace wear parts.** Factory-built replacement parts offer you the best outcome when a replacement of a wear part is needed.

5. **Refurbish and recertify clamps at the RENFROE Service Center.** To begin the quote process or learn more about the program, call our customer service department. We'll explain how things work and get you started. If requested, we can also provide a certificate of proof test. **Call us at 800.628.4263.**

FOR OVER 70 YEARS, J.C. RENFROE HAS PRODUCED THE MOST RELIABLE, DURABLE CLAMPS IN THE INDUSTRY

In an independent test against two other manufacturers with comparable clamps, J.C. RENFROE proved to be the most durable in horizontal and vertical cycle/fatigue testing.

- The test was conducted by Rexnord Innovation Center (RIC), a completely independent accredited laboratory
- Fatigue testing was performed on the three manufacturers' comparable clamps in both vertical and horizontal orientations
- RENFROE'S LPA model completed 10 times more cycles in the horizontal configuration than its nearest competitor
- RENFROE load tests every one of its clamps ensuring that the company maintains its reputation for having the most durable clamps in the market

TESTS RESULTS FROM REXNORD INNOVATION CENTER

Horizontal Fatigue Test

RENFROE	1,664,928 Cycles
Supplier #1	Only 159,672 Cycles
Supplier #2	Only 79,352 Cycles

Vertical Fatigue Test

RENFROE	2,000,000 Cycles
Supplier #1	2,000,000 Cycles
Supplier #2	Only 817,310 Cycles

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LIFTING SOLUTIONS

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IN STOCK

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Large selection, ready to ship.

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