

# WARNING:

Before putting tool in service, take to your immediate supervisor.



# RENFROE



Model R



Model RO

Model R/RO Clamp  
Application, Operation and Maintenance Manual

OM 480-R RO



# Operators 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. Direct Requests to J.C. Renfroe & Sons, Inc., Jacksonville, Florida 32201.

**J.C. RENFROE & SONS,  
INCORPORATED**

of Jacksonville, Florida, has been an international leader in the manufacture and marketing of Lifting Clamps for over fifty years. **RENFROE** products are manufactured in Jacksonville, Florida. A worldwide network of stocking distributors provides a readily available source of supply and service.

**J.C. RENFROE & SONS,  
INCORPORATED**

Jacksonville, Florida 32201  
Telephone: 904/356-4181  
Toll Free: 1-800-874-8454  
Fax: 904/354-7865  
[www.jcrenfroe.com](http://www.jcrenfroe.com)

---

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.

---

## **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.

---

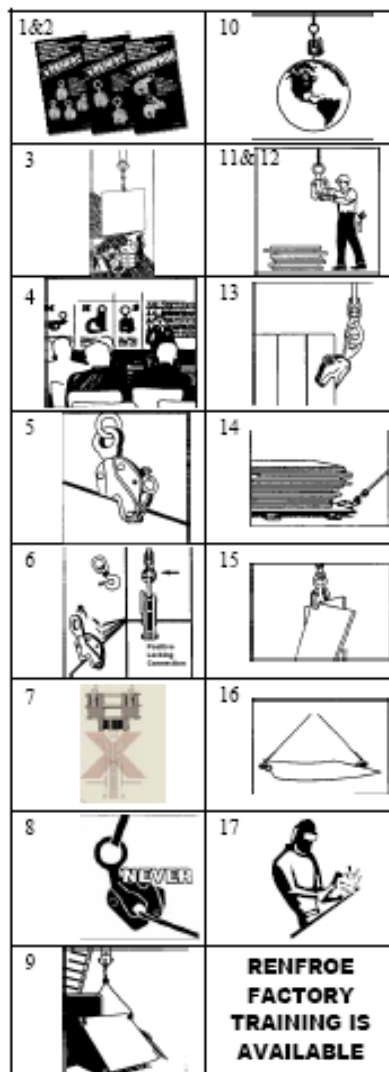
### **NOTICE OF EXCLUSION OF WARRANTY**

**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 J.C. RENFROE & SONS, INC.**

# OPERATING AIDS

## (DO'S AND DON'TS)

1. DO read and understand the operator's manual before using clamp.
2. DO consult Operators Manual or RENFROE when in doubt.
3. DON'T lift over workmen. DON'T lift over safety areas or personnel.
4. DO attend a factory training class for establishing proper use of Renfro Products.
5. DO Lock clamp closed when clamps are fitted with a lock. DON'T lift with lock in open or "lock open" position.
6. DON'T use a connection that may release the clamp.
7. DON'T attach clamp directly to crane hook. DO use a flexible connection between crane hook and clamp shackle. DON'T use heavy flexible connection.
8. DO use correct clamp for job. DON'T use large capacity clamps to lift light loads.
9. DO use an adequate number of clamps to balance load. DON'T lift loads that are not balanced.
10. DO use clamps within their rated capacity. DON'T overload clamps.
11. Do inspect clamp before each lift, follow inspection and maintenance instructions outlined in the manual and use RENFROE replacement parts to assure proper operation of the clamp.
12. DON'T use clamp that has been overloaded. DO refer to pre-lift inspection in Operator's Manual.
13. DON'T side load with a straight shackle clamp.
14. DON'T misuse. DON'T lift plate from bottom of plate stack.
15. DON'T rush. DON'T lift more than one plate at a time with a vertical clamp.
16. DON'T improvise. Always use correct clamp for the job. DON'T lift plate horizontally with a vertical lift only clamp.
17. DON'T alter clamp. DON'T grind, weld or modify the clamp in any manner.



**J.C. RENFROE & SONS, INC.**

P.O. BOX 4279 / 1926 SPEARING STREET / JACKSONVILLE, FL 32201

Phone: 904-356-4181  
 Facsimile: 904-354-7965  
 Internet: [www.jorenfro.com](http://www.jorenfro.com)  
 E-Mail: [sales@jorenfro.com](mailto:sales@jorenfro.com)

---

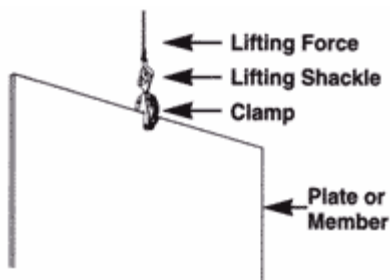
# OPERATING AIDS (DO'S AND DON'TS)

---

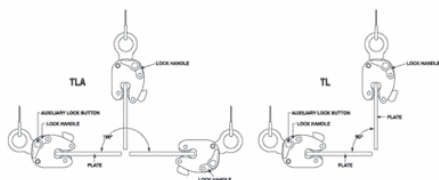
1. **DO** Consult Operator's Manual or RENFROE when in doubt. RENFROE factory representatives are available upon request at no charge to train and assist in establishing the proper use of RENFROE products.
2. **DO** Lock clamp closed before lifting load. **NEVER** lift with lock in open or "Lock Open" position.
3. **DO** Use safety hooks. **NEVER** use a hook that may release clamp.
4. **DO** Use correct clamp for job. **NEVER** use large capacity clamps to lift light loads.
5. **DO** Use an adequate number of clamps to balance load. **NEVER** lift loads that are not balanced.
6. **DO** Use clamps within their rated capacity. **NEVER** overload clamps.
7. **DO** Inspect clamp before each lift, follow inspection and maintenance instructions outlined in this manual and use RENFROE replacement parts to assure proper operation of the clamp.
8. **DON'T** Side load. **NEVER** lift from side with vertical clamp.
9. **DON'T** Lift over workmen. **NEVER** lift over Safety Areas or personnel.
10. **DON'T** Misuse. **NEVER** lift plate from bottom of plate stack.
11. **DON'T** Rush. Never lift more than one plate at a time with a vertical clamp.
12. **DON'T** Improvise. Always use correct clamp for job. **NEVER** lift horizontally with a vertical clamp.
13. **DON'T** Use clamp that has been overloaded.
14. **DON'T** Alter clamp. **NEVER** grind, weld or modify the clamp in any manner.
15. **DON'T** attach clamp directly to crane hook, always use sling between crane hook and clamp.
16. **DON'T** improvise. Always use correct clamp for the job. **DON'T** lift plate horizontally with a vertical lift only clamp.
17. **DON'T** alter clamp. **DON'T** weld, grind or modify the clamp in any manner.

# DEFINITIONS

**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 below.



**VERTICAL TURN/LIFT:** A vertical turn/lift clamp is a vertical lifting clamp specifically intended to turn a single plate or member thru a ninety degree (90°) arc and back to vertical thru the same ninety degree (90°) arc or from horizontal to vertical to horizontal thru 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 below.



**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 below.

**WARNING:** The capacity of all horizontal clamps is based on a sling angle of sixty degrees (60°). See illustration below. 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.

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

**FINISHED AND POLISHED PLATES:** Steel plates in this category have other than hot-rolled surfaces such as stainless steel, etc., are generally handled using non-marring clamps incorporating smooth gripping surfaces.

**WARNING:** For applications using clamps with serrated gripping sur-

---

faces on finished or polished plates, secure written recommendations from 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 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 thickness a clamp specified for handling plates is capable of lifting. **WARNING: Never use a clamp for lifting a plate where the plate thickness is less than or greater than the minimum and maximum stenciled on the clamp.**

**JAW OPENING:** The minimum and maximum thickness of a member of clamp specified as having a JAW OPENING is capable of handling. **WARNING: Never use a clamp on a member whose thickness is less than or greater than the range of jaw**

**opening 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 zero degrees Fahrenheit (-18 Celsius) to a maximum of 200 degrees Fahrenheit (+93 degrees Celsius). The minimum and maximum temperatures apply to both ambient and the material being handled by the clamp. **WARNING: Secure written authorization from 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 degrees Fahrenheit (+93 degrees Celsius). Depending on conditions a lift may exceed 1000 degrees Fahrenheit (538 degrees Celsius). The exact application and temperatures of the plates to be handled are critical in selecting the proper model. **WARNING: Secure written instructions from 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 are 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. Typical "Lock Open Only" clamp is the Model RO.

"LOCK OPEN-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 the "Lock Open" 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 and the J-Series.

"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, HR, HDR 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 he should be but may not be aware and to enable the operator to protect himself 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 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.

---

## MODEL R

### VERTICAL LIFTING LOCKING



## MODEL RO

### VERTICAL LIFTING LOCK OPEN ONLY



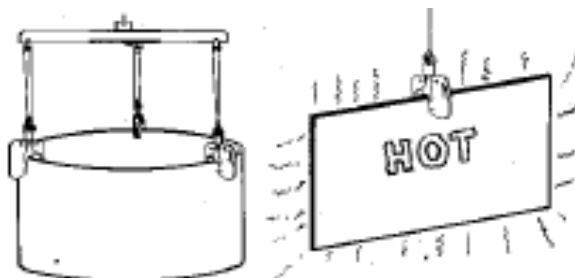
### Application R/RO

The Model "R" is a vertical lifting clamp primarily used in the handling of heavy steel plates in a wide range of plate thicknesses. Specific models are available for handling "hot" plates, temperatures in excess of 200 Degrees F (+93 Degrees C). Refer to Illustrations on next page. For all applications involving the handling of "hot plates" refer to factory for written instructions.

The Model "R" incorporates a "Lock Open", "Lock Closed" feature which facilitates attaching and removing the clamp from the plate. The Model "RO" is available with a "Lock Open Only" feature allowing the clamp to be "Locked Open", lifted onto a "Hot" plate and the lock released by use of a "Tag Line" attached to the locking pin allowing the operator to be further away from the "Hot" plate. Refer to Definitions, Page 2, for explanation of "Lock Open", "Lock Closed" and "Lock Open Only" clamps.

For identification of component parts, refer to exploded view of clamps located at the end of the Maintenance Section.

**WARNING: Refer to the section on operation and maintenance for the approved procedures in the operation and maintenance of this product.**



---

## Operation R/RO

### 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 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 material whose thickness is not within the range of jaw opening stenciled on 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.

### Step 3.

Inspect clamp before each lift.

**WARNING: Do not use if in need of repair.**

If in doubt, refer to 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 sharp and free of foreign matter.
- D. Some models of the "R" incorporate swivel jaws, while others incorporate die blocks.
  1. Swivel Jaws: Swivel jaws should turn freely. Inspect swivel jaw mounting hole in body for elongation indicating overload or excessive wear.
  2. Die Blocks: The retaining bolts must be tight and free of damage.
- C. Inspection condition of body for wear, damage and distortion, particularly in the area of the jaw opening.
- D. Inspect lifting shackle and all pins for wear and damage.
- E. Inspect locking mechanism and lock spring. The locking mechanism on the model "R" is designed to select a spring tension for various ranges of plate thicknesses. The spring must have a definite tension when the spring is set in the position of maximum tension without material on the clamp. Check spring for distortion and damage. Spring coils should be in contact with the adjacent coils when there is no tension applied to the spring. Lock handle and spring mechanism should operate smoothly without binding.
- F. Remove any clamp from service in need of repair.

**WARNING: Replace shackles that are bent, show excessive wear at eye, and have elongated eye and shackle pin hole.**

Step 4.

The clamp is a component of the rigging used in lifting or transporting a plate. It is important to use safe and adequate rigging. The lock is used to hold the clamp in place until the gripping mechanism is actuated by a force applied to the lifting shackle.

**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 sling between crane hook and clamp.

Step 5.

Model with “Lock Open-Lock Closed” feature: Move lock handle to “Lock Open” position. Gripping cam is maintained in a retracted position. Refer to Illustration A.

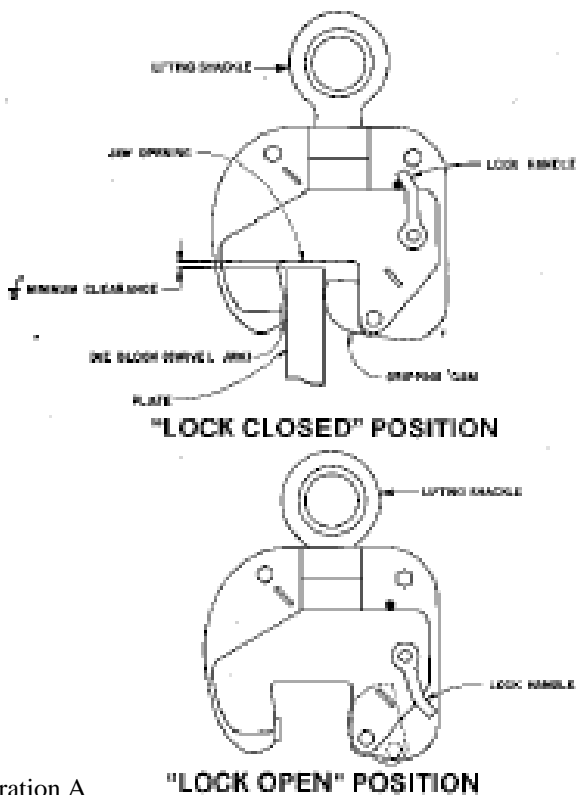


Illustration A

Model with “Lock Open Only” feature: Move gripping cam to the fully open position and insert locking pin, maintaining gripping cam in retracted position. Refer to Illustration B.

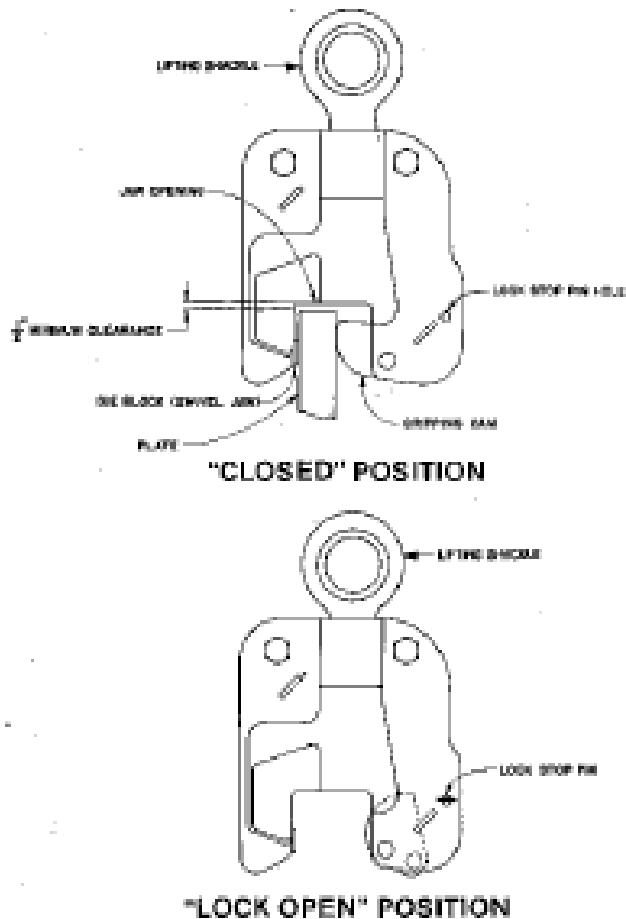


Illustration B

**Step 6.**

Position clamp on plate to be lifted. Always position clamp on plate so die block (swivel jaw) is in contact with plate before locking mechanism is actuated. Do not allow inside of jaw opening to rest on edge of plate. Maintain 1/2" clearance. Refer to Illustrations A and B, Step 5.

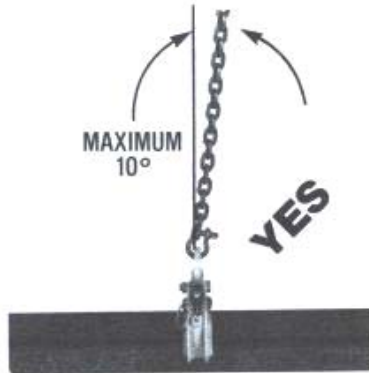
Position clamp so direction of force applied by the crane is in line with the lifting shackle.

**WARNING: Never exceed ten degree side-loading.**

Refer to Photographs C, D, E, F and G.



Photograph C Sling directly above and in line with lifting shackle.



Photograph D Maximum allowable side-loading



Photograph E. (Typical) Excessive side loading.



Photograph F. Clamps in line with sling.



Photograph G.

Step 7.

Make certain the swivel jaw or die block and gripping cam are fully in contact with the plate and not partially on and off the edge of the plate.

Step 8.

Model with “Lock Open-Lock Closed” feature: Place lock lever in “Lock Closed” position. Refer to Illustration A, Step 5.

The Model “R” locks have multiple spring tensions for various capacities.

**WARNING: Use proper spring tension for plate thickness being lifted.**

Refer to Illustration H.

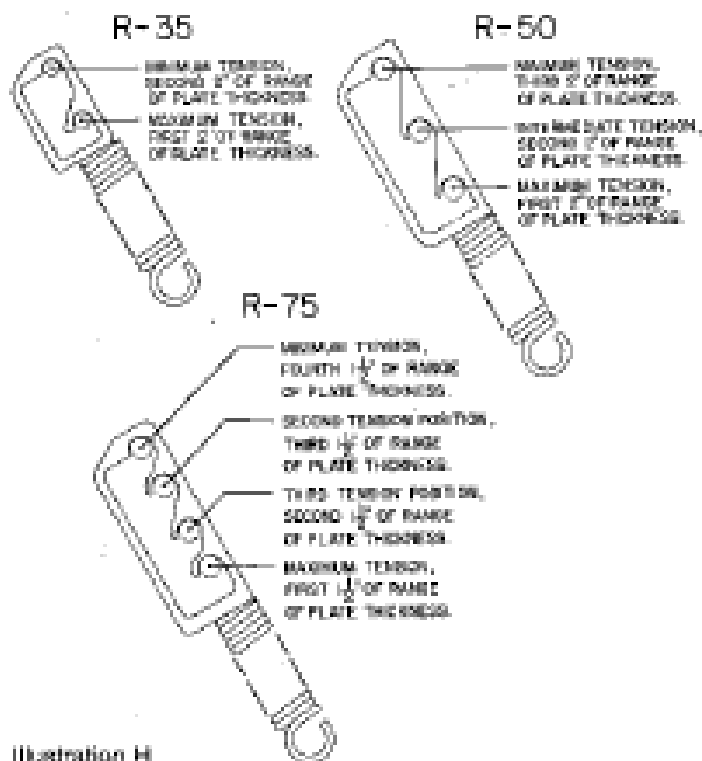


Illustration H

R 35 Ton—4" plate variation—two tension positions. First two inches of plate thickness use maximum tension position. Second two inches of plate thickness use minimum tension position.

Example: Clamp rated 1/4—4 1/4" plate thickness. Use maximum tension on plate up to 2 1/4" thick. Use minimum tension of plate above 2 1/4" - 4 1/4" thick.

---

R 50 Ton—6" plate variation—three tension positions. First two inches of plate thickness use maximum tension position. Second two inches of plate thickness use intermediate tension position. Third two inches of plate thickness use minimum tension position.

Example: Clamp rated 6" to 12" plate thickness use maximum tension on plates 6" to 8" thick. Use intermediate tension on plates above 8" to 10" thick. Use minimum tension on plates above 10" to 12" thick.

R 75 Ton and R 100 Ton—6" plate variation—four tension positions. First one and one-half inches of plate thickness use maximum tension position. Second one and one-half inches use next to maximum tension position. Third one and one-half inches of plate thickness use next to minimum tension position. Fourth one and one-half inches of plate thickness use minimum tension position.

Example: Clamp rated 8" to 14" plate thickness use maximum tension on plate 8" to 9 1/2" thick. Next to maximum tension position on plates above 9 1/2" to 11" thick. Next to minimum tension position on plates above 11" to 12 1/2" thick and minimum tension position on plate above 12 1/2" to 14" thick.

Spring now exerts force on gripping cam.

**WARNING: Lift only when clamp is in "Lock Closed" position.**

Models with "Lock Open Only" feature: Remove lock stop pin, permitting gripping mechanism to engage plate. Refer to Illustration B, Step 5.

Apply a lifting force to the lifting shackle until gripping surfaces of the clamp are in full contact and exerting a force on the plate.

**WARNING: A constant force must be maintained on the lifting shackle throughout the entire operation.**

Step 9.

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.**



### Step 10.

To remove clamp:

Model with “Lock Open-Lock Closed” feature: After plate is fully supported and in a stable position, relax lifting force, keeping hands clear, move lock handle to “Lock Open” position—lift clamp from plate. Refer to Illustration A, Step 5.

Model with “Lock Open Only” feature: After plate is fully supported and at rest in a stable position, relax lifting force, move gripping cam to retracted position by manually operating shackle—insert lock stop pin—lift clamp from plate. Refer to Illustration B, Step 5.

### Step 11.

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.

## Maintenance R/O

Inspection Kits are available at no charge upon request from the distributor or RENFROE.

Kit contains:



---

## **Maintenance Program for Renfro Clamps Manufactured from Steel**

The severity of service to which the clamp is subjected in the work place determines the frequency and type of inspection procedure required for the clamp. The frequency and type of inspection is determined by the clamp owner. Renfro acknowledges the ASME B30.20 safety standard which sets forth minimum inspection requirements for "Below-the-Hook" lifting devices and the Renfro 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 master link and link chain legs for wear and damage.
- Inspect circular body of clamp for wear, distortion and damage.
- Inspect lock handle mechanism for wear, distortion or damage.

Remove any clamp from service in need of repair.

**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 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.

**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-One 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.

**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)**

---

## Inspection Procedures

### 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 Renfro factory for instructions on returning the clamp for recertification.

### Step 2.

Completely disassemble clamp.

### Step 3.

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

### Step 4.

#### BODY

- A. Inspect welds for fractures. RENFROE recommends a dye penetrant 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 shackle pin guide slots located inside of body. Guide slots must be smooth and free of indentions to prevent shackle slide from hanging.
- C. Inspect all pin holes for wear and elongation.
- D. Inspect inside jaw opening for displaced metal and distortion.
- E. Inspect clearance of lock handle assembly mounting hole for wear. Clearance with shaft of lock handle assembly should be minor.
- F. Some models of the "R" incorporate swivel jaws, while others incorporate die blocks.

1. Swivel Jaw (round): Inspect swivel jaw mounting holes for elongation and wear. Swivel jaw must turn freely. Remove clamp body from service when Swivel Jaw Mounting Hole dimensions equal or exceed those listed below.

Rated Capacity Tons	Mounting Hole Dia. Inches	Mounting Hole Depth Inches
35	3.545	.900

2. Die Block (Rectangular): Inspect die block mounting holes and retaining bolts for distortion and damage. Die blocks must fit snugly in body recess.

**WARNING:** Replace clamps containing fractures, elongated swivel jaw or die block mounting recesses, distorted jaw openings and clamps with worn and rough shackle pin guide slots and jaw opening with displaced metal. Refer to exploded view.

---

Step 4.

LOCK ASSEMBLY, CAM FOLLOWER and BEARING

R-1, R-11 and R-12

- A. Inspect lock pawls and lock handle for damage and wear. Refer to exploded view.
- B. Inspect lock assembly pivot shaft mounted on right lock pawl for wear. Bearing, R-12 must fit snugly over shaft.
- C. Inspect cam follower, R-11 for wear and damage. Make certain that cam follower nut is tight during assembly.
- D. Inspect bearing, R-12 for damage and wear. Bearing must turn freely.

**WARNING:** Replace all parts that are damaged or worn.

Step 5.

LOCK SPRING ASSEMBLY R-2

- A. Inspect body for wear and distortion, particularly in the area where the body contains the stops for the various spring tension positions. Refer to exploded view.
- B. Inspect spring for damage and distortion. Spring coils must be in contact with the adjacent coil when spring is relaxed.

The spring must have a definite tension when the spring is set in the position of maximum tension without material in the clamp. To put the clamp in the maximum position with clamp fully assembled, adjust lock spring assembly until adjusting slot nearest to spring engages the shaft on the lock assembly, and the lock handle is moved to the "Lock Closed" position. Refer to exploded view .

**WARNING:** Replace lock spring assembly that is damaged or if the spring is distorted or lacking improper tension.

Step 6.

GRIPPNG CAM R-3 and RH-3

- A. Inspect cams for chipped or worn teeth. Teeth must be sharp and free of foreign matter. Inspect the cams for fractures, particularly at the cam pin hole.
- B. RH-3 cams are intended to handle hot lifts only. This cam is identified by having two 3/16" holes drilled on the outside of the edge of the cam (when assembled in clamp) between the cam assembly pin and the cam pin. These holes are approximately 1/2" deep. Hot lift cams are painted red at time of shipment. Refer to exploded view.

**WARNING:** Replace cams with worn or damaged teeth, containing fractures or which have elongated pin holes.

---

Step 7.

CAMSTRAP ASSEMBLY R-4

- A. Inspect welds, internal and external surfaces for fractures, wear and distortion.
- B. Inspect all pin holes for wear and elongation.

**WARNING: Replace cam strap assemblies that are distorted, contain fractures and have worn or elongated pin holes.**

Step 8.

CAM ASSEMBLY PIN, SHACKLE PIN and CAM PIN

R-5, R-7 and R-9

- A. Inspect all pins for:
  - 1. Distortion
  - 2. Surface blemishes
  - 3. Wear
  - 4/ Fractures

**WARNING: Replace pins that are distorted, have surface scars, are worn or contain fractures.**

Step 9.

LIFTING SHACKLE R-6

- A. Inspect welds and body for fractures, wear and distortion.
- B. Inspect lifting shackle eye for elongation and wear at point where eye engages sling attachment.
- C. Inspect shackle pin hole for wear and elongation.

An elongated shackle eye indicates overloading. Elongated shackle pin holes indicate wear and possible overloading.

**WARNING: Replace shackle that have elongated shackle eye, are worn or distorted and have elongated shackle pin holes.**

Step 10.

DIE BLOCK R-8 and RH-8 (SWIVEL JAW)

- A. Inspect die block (swivel jaw) for fractures, damage and wear. Serrations must be sharp and free of imperfections and foreign matter.
- B. Die block s must fit snugly in body recess and swivel jaws must turn freely in swivel jaw mounting hole. During assembly—insert lubricant in body recess before installing swivel jaw. Recommended lubricant is powdered graphite or Molybdenum Disulfide grease. Tighten screw and lock nut, then reverse nut one turn to allow free rotation of swivel jaw. When installing die block, make certain the die block retaining bolts are free of damage and tight.

- 
- C. Die blocks (swivel jaws) are also available for “Hot Lifts”. These are identified by two holes 3/16” diameter and 1/2” deep in the gripping surface. “Hot Lift” die blocks (swivel jaws) are painted red at the time of shipment. Refer to exploded view.

**WARNING: Replace worn, dull or damaged die blocks (swivel jaws).**

Step 11.

BODY BOLT and SPACER SLEEVE SET R-10

- A. Inspect body bolts and spacer sleeves for wear at position where sleeve contacts shackle.
- B. Inspect body bolt. Replace if damaged.
- C. Make certain the body bolt nuts are tight.

When replacing body bolts, tighten bolt and nut, center-punch bolt and nut at thread joint to lock nut in place.

**WARNING: Replace body bolt, nut and sleeve if worn or damaged.**

Step 12.

LOCK STOP BOLT R-13

- A. The lock stop bolt is not supplied on all capacities. Some models have stops welded in place.
- B. Inspect lock stop bolt. Make certain the bolt is in place and tight.

**WARNING: Replace damaged or missing lock stop bolts.**

Step 13.

SHACKLE PIN SLIDE R-14

- A. Inspect slide for damage and wear.
- B. Inspect shackle pin hole in slide for wear and elongation. Sliding surfaces should be smooth.

The slide may be operated dry or lubricated. Recommended lubricant is powdered graphite or Molybdenum Disulfide grease.

**WARNING: Replace shackle slides that are damaged, have worn or elongated holes or sliding surfaces that are not smooth.**

Step 14.

COVER PLATE R-15

- A. Inspect cover plate for damage.
- B. Make certain all cover plate assembly bolts are in place.

**WARNING: Do not operate clamp unless cover plate is in place,**

---

Step 15.

LOCK STOP PIN R-16

- A. Inspect lock stop pin for damage and distortion.
- B. The lock stop Pin is used on “Lock Open” clamps. The lock stop pin is attached to the clamp body with a small link chain.

**WARNING: Replace lock stop pins that are damaged or distorted.**

Step 16.

ASSEMBLY

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 and fasteners must be in place.**

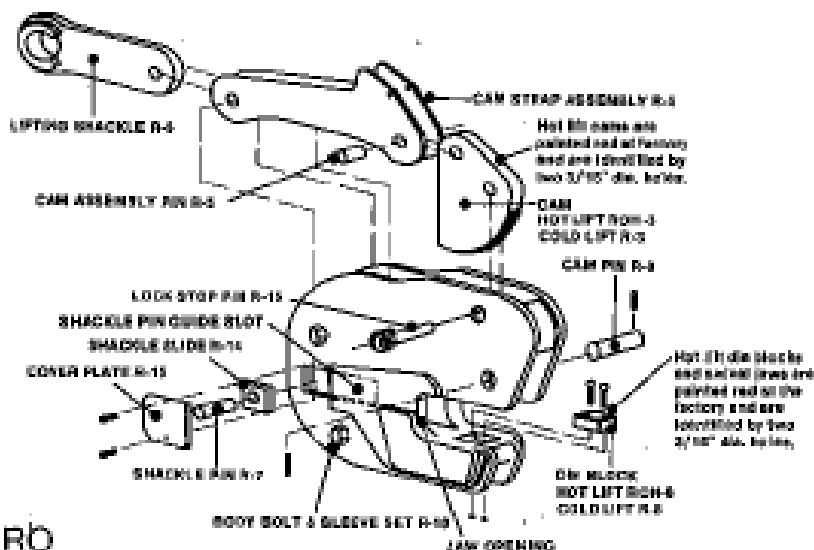
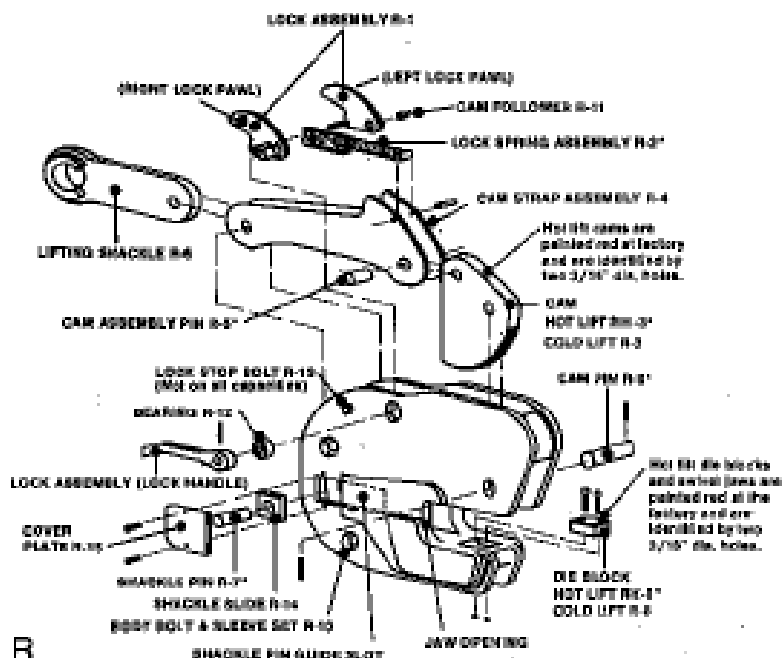
GENERAL

RENFROE products may be returned to the factory for inspection and repair 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 RENFROE catalog for instruction 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.**





## Exploded View

\*These parts are included in Rentroe Repair Kit.

**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.**



**J.C. RENFROE & SONS, INC.**

P.O. Box 4279 • 1926 Spearing Street • Jacksonville, Florida 32206  
Phone: U.S.A. Toll Free (800) 874-8454 - 904/356-4181  
Facsimile: 904/354-7865 • Internet: [www.jcrenfroe.com](http://www.jcrenfroe.com)