EFFICIENCY PRODUCTION, INC.

AMERICA'S TRENCH BOX BUILDER™

Ground Quick-Release™ Shackle

Operation & Parts Manual / Tabulated Data

U.S.A. Patents Pending

Serial Number(s):

Last Update: 06/06/2013

Introduction

Efficiency Production's new **Ground Quick-Release Shackle** is designed and engineered for the quick and easy handling and lifting of Slide Rail System components.

The use of these Ground Quick-Release Shackles compliments "Feet on the Ground" approach to Slide Rail System Components installation. When used in conjunction with other shackles and tools provided in **"Job Box" by Efficiency Production, Inc.** there is no need for jobsite personnel to go above the safety of top frame level for releasing the lifting shackles.

The Ground Quick-Release Shackles are suitable for lifting all Efficiency Production Slide Rail System Components, with combined weight up to 12,000 lbs. (5,450 kg.) of load. Also, it is capable of lifting any loads (up to 12,000 lbs.) which lifting lugs can fit in to the 2 in. wide fork gap.

FOR *INSTALLATION* OF EQUIPMENT ONLY

Design complies with ASME BTH-1-2005 (Design of Below-the-Hook Lifting Devices, An American National Standard of the The American Society of Mechanical Engineers) Code, **Design Category A Service Class: 1**; ASME B30.20-2006; AISC-9the Edition (1991) and Design of Welded Structures by Omer W. Blodgett – The James F. Lincoln Arc Welding Foundation (2002); and RR-C-27D from Sep. 1990 and RR-C-27C from July 1986.

The ASME Code Service class and Design Category and maximum load capacity are clearly engraved on the front of Ground Release Shackle. Special wide throat shackles is designed to accommodate Slide Rail System Components lifting devices.

The Ground Quick-Release Shackle is designed to withstand a measure of unavoidable misuse. Slide Rail System Components, when stacked together, tend to jam together occasionally. The shackle is stiffened to resist spreading of the forks under such overload conditions at ninety degrees to the axis of the element. (See "Safety Check List"). However, using shackle fork as a crow bar shall be avoided.

When lifting Slide Rail Panels in pairs of individual posts weighing more than the safe working load of the shackle, it is necessary to use a pair of shackles. Pairs of shackles are mounted on a two-legged steel wire rope sling. The ring at the top of the sling can be hooked directly onto a standard crane hook block, "D" shackle, or fork anchor.

Features

NOTE: **FOR *INSTALLATION* OF EQUIPMENT** ONLY

A. Capacity of 12,000 pounds (5,450 kg.) of static vertical load.
B. High-strength steel body;
C. Corrosion coating on alloy steel pin;
D. High-strength alloy steel pin and accidental releasing pin protection;
E. Highly visible color;
F. Heavy web stiffening to withstand side loading imposed when lifting elements from a stack (See "Safety Check List" for proper working practice);
G. Lifting ring at the top of the shackle enables lifting from a variety of angles;
H. Indicator bar at the back of lifting pin giving a clear visual indication that plunger has engaged element-lifting hole completely;
I. Shackle throat depth designed for Efficiency Production, Inc. Slide Rail System;
J. Quick coupling and release of shackle from any elements ensuring maximum productivity;
K. Pin rotation ability allows change in pin release angle as per user preference;
L. "Safety Ring" to protect against accidental pin release cause by poor working practices;
M. Pin release mechanism – via hitting the pin at the back with small hammer;
N. Pin release mechanism is also designed to prevent the pin from being damaged if two Ground Release Shackle with pins in "open position" hit each other accidentally.
O. Easy replacement of the top holding pin;
P. Clear indication of possible hand pinch points;
Q. Pre-selected Tag-Line (Release Rope) 50' long;
R. Pictorial instructions for proper use attached to the shackle

Method of Operation

1. Tie a length of rope (provided by EPI) to the pull ring on the pull-wire assembly. In any case the rope should be about 3 feet longer than the lifting length. Do not use a continuous loop as this will become snagged. For you convenience EPI rope standard length is 50 ft.

2. Set desired angle of release by rotating the pin via provided square opening in the front of the pin.

3. Before positioning the Ground Release Shackle, it is necessary to retract the shackle pin. Pull the release wire until the trip mechanism holds the pin in the open position.

4. Separate the Slide Rail System Element to enable the main body of the Ground Release Shackle to be slid over the lifting lug. With the plunger tube assembly up, slide the fork of the Ground Release Shackle over the lifting lug with the throat of the shackle.

5. With the pin over the slide rail element-lifting hole, firmly tap the indicator bar end extending from the plunger tube assembly. If the plunger does not locate directly through the hole, move the main shackle body until the plunder goes through the lift lug hole and into the shackle body on the underside. **The indicator bar should be flush with the plunger tube assembly.**

6. Repeat this for both lift lugs when lifting slide rail elements (panels);

7. Install the safety ring over the plunger tube assembly as shown on the photos.

8. With the plunger properly located, the safety ring engaged, the element can then be lifted into position, for installation. It is advisable to tie the shackle ropes in suitable manner in order to prevent them from being trapped, snagged, or blowing out of reach in strong winds.

9. To release the shackles after threading is complete, the safety ring must first be unhitched by flicking the release rope, then simply pulling on the release rope. If there is a tendency to jam, have the crane give the shackle some slack and try to release again.

10. Unauthorized alterations invalidate the tabulated data of this document.

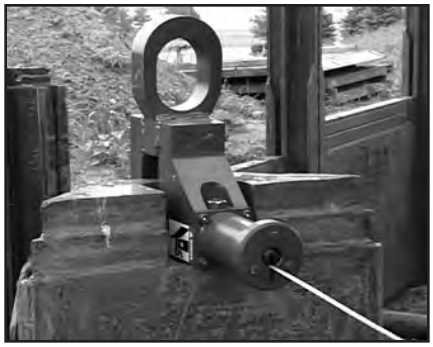
Warning:

"Jerking" of the Ground Release Shackle under full load or forcing the Shackle Pin in to the lifting lug with a lot of force may lead to bending or cracking of the pin, and/or bending of the fork. It will prevent the pin from fully closing and will make the Ground Release Shackle unusable. It also will void this Operation and Parts Manual /Tabulated Data and the Engineering Certification. FOR *INSTALLATION* OF EQUIPMENT ONLY**.**

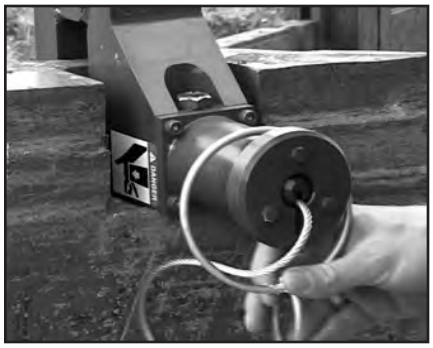
D. Installation Instructions

1. Position the Shackle with pin in open position, over hole of the lift lug.

2. Engage the pin by striking with small hammer.



3. When the pin is flush with the housing, the Shackle is fully engaged.



4. Place the safety ring over the housing.

5. Repeat all steps above for additonal lift lugs, or other components.

6. Component is ready for lifting and positioning.

7. After positioning and securing the component, release the safety ring by pulling the release rope/line.

8. Then pull on the release cable to free the Shackle from Component lifting lug.

9. Fully released shackle ready to be removed from component.

Safety Check List

NOTE: **FOR *INSTALLATION* OF EQUIPMENT** ONLY

1. **SAFETY FIRST!**

2. Pre-Installation Checks:

   a. Establish the weight of the lift involved and ensure a shackle with appropriate safe working load is being utilized. The shackle capacity is 12,000 lbs. (5,450 kg).

   b. Ensure the lifting hole is at the correct distance relative to the top of the lifting lug. If Ground Release Shackle is used with Efficiency Production, Inc. Slide Rail System Sliderail panels or posts – the fit shall be no problem. In case of lifting parallel beams, the additional shackle may be used – it is provided in EPI "Job Box" or can be purchased directly from EPI.

   c. The lifting hole should be neatly drilled or punched and of a suitable size for the lift taking place.

3. **Do not use the lifting Ground Release Shackle for hammering or extracting.**

4. Set desired angle of release by rotating the pin via provided square opening in the front of the pin.

5. Ensure that the main pin has gone through both sides of the shackle body - check that the indicator bar is flush with the end of the main plunger housing.

6. Do not modify the lifting shackles of any part of the lifting apparatus. Keep the oxygen/acetylene and all other torches well clear of the Ground Release Shackle.

7. Care should be taken to avoid the release rope from getting snagged.

8. The angle between the two legs of the lifting bridal (when using twin shackles) should never exceed 60 degrees.

9. Always use the safety ring to prevent accidental release - it only takes an extra second or two.

Maintenance/Trouble-Shooting *on Next Page*

Training

Before using the Shackle, all personnel should have received basic training in lifting and control of heavy loads. It is strongly recommended that the following areas be covered.

1. Basic safety in lifting operations.
2. Supervision during lifting operations.
3. Detailed instruction on how the Ground Release Shackle operates.
4. Safety features of the Ground Release Shackle.
5. Dangers and malpractices.
6. Correct choice of Ground Release Shackle for the job.

Maintenance & Trouble-Shooting

The Shackle is manufactured from high quality material and assembled in a manner designed to offer long service with a minimum of maintenance. However, verify working condition of shackle before each use. Disassemble ,clean and inspect shackle as required.

In order to preserve the product in this state, it is necessary to ensure that it is not misused or used for purposes outside its recommended use and to carry out regular inspections and servicing. The shackle is designed only for the installation of slide rail components, not the removal of components from the ground.

Regularly checking that the product has not been distorted due to overload and that the pin functions smoothly throughout its travel, are all that is necessary apart from a regular light application of oil to all moving parts.

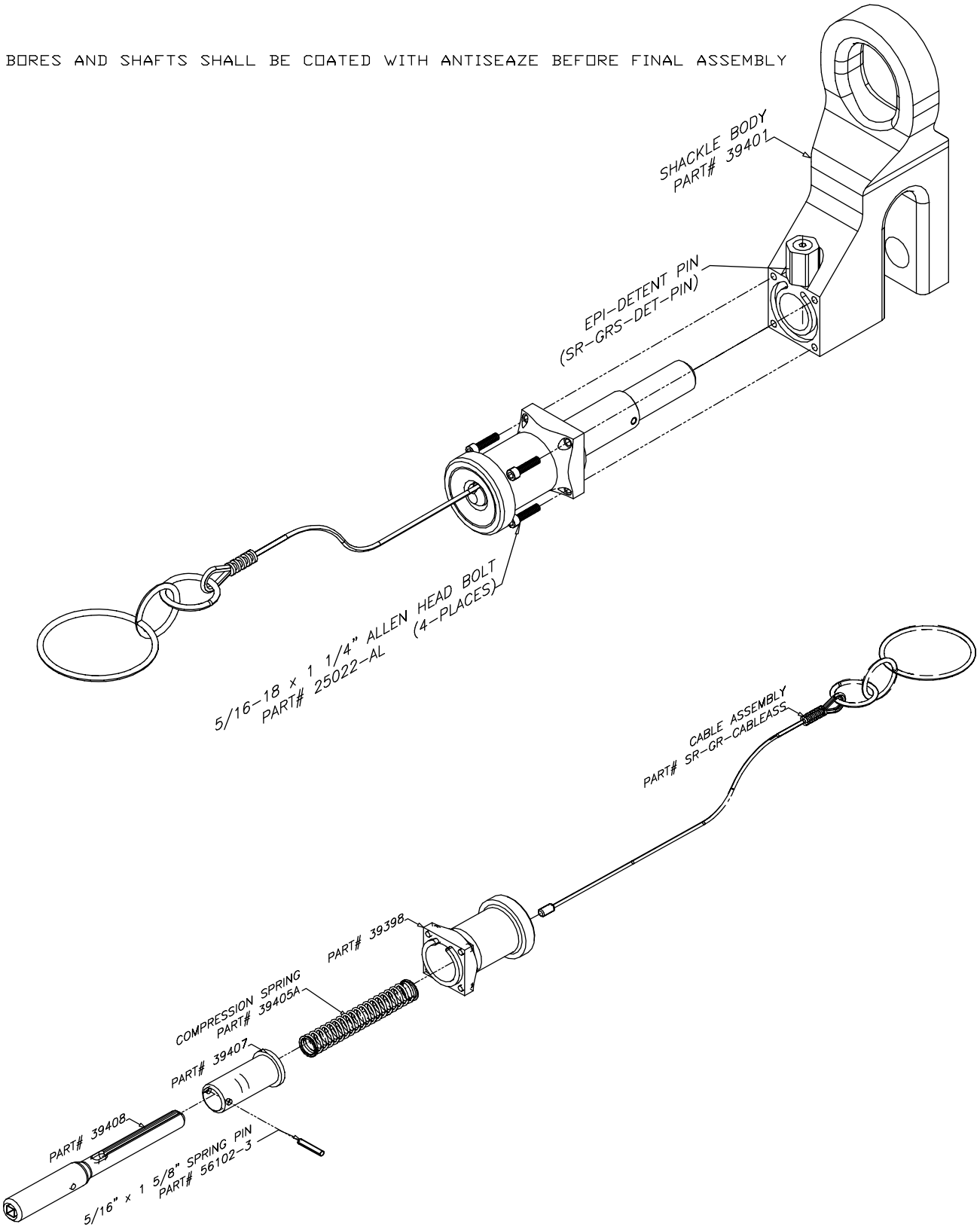
If the loading pin (Part # GRS-F) is stuck in closed or open position, gently turn the loading pin using a wrench or screw driver. DO NOT use a sledge hammer to strike loading pin back to open position.

If the product does not operate perfectly, contact your distributor for advice, or return for immediate attention. If at any time your shackle needs parts or service, please contact your distributor or Efficiency Production Inc. for expert attention.

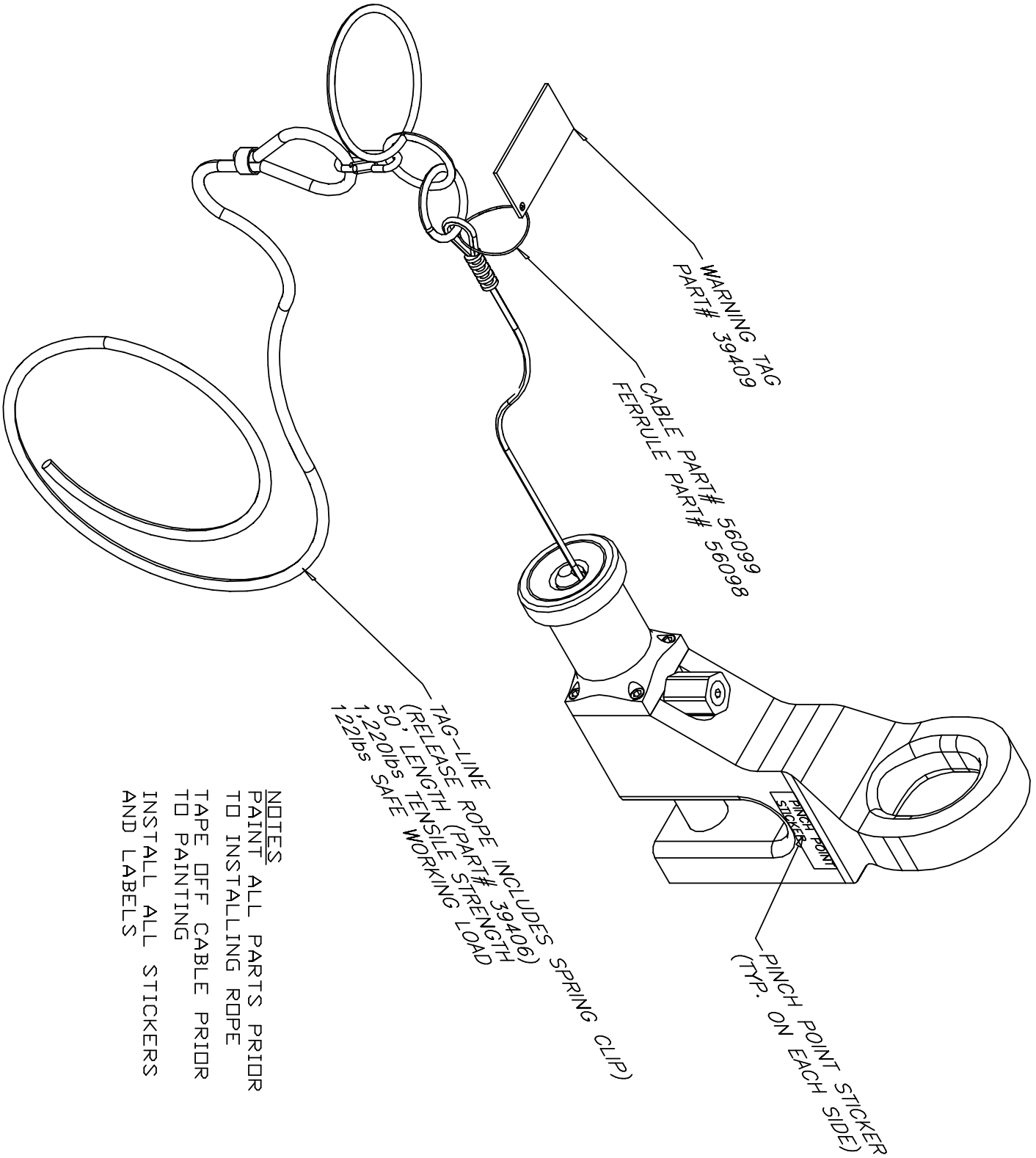
Keep the plunger mechanism clean and well lubricated. A shot of WD-40 once a day on the pin and the sleeve. If the pin gets stuck, use a graphite spray and gently work the pin in and out.

Efficiency Production will provide training to a designated client personnel upon request. Unauthorized disassembly an reassembly of the unit by unauthorized personnel will void this tabulated data and any liability on behalf of Efficiency Production, Inc.

Parts List


BORES AND SHAFTS SHALL BE COATED WITH ANTISEAZE BEFORE FINAL ASSEMBLY
SHACKLE BODY
PART# 39401
EPI-DETENT PIN
(SR-GRS-DET-PIN)
5/16-18 x 1 1/4" ALLEN HEAD BOLT
PART# 25022-AL
(4-PLACES)
CABLE ASSEMBLY
PART# SR-GR-CABLEASS
PART# 39398
COMPRESSION SPRING
PART# 39405A
PART# 39407
PART# 39408
5/16" x 1 5/8" SPRING PIN
PART# 56102-3

Assembled

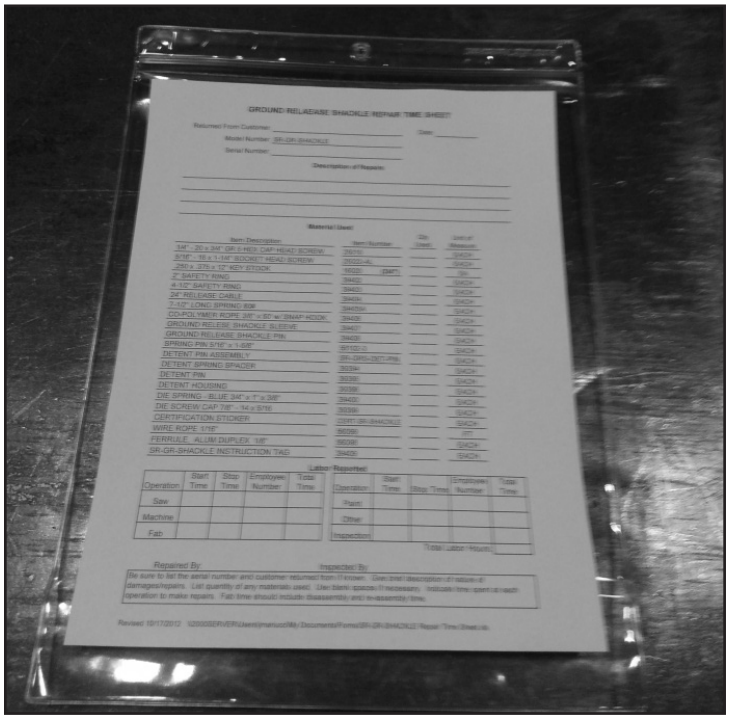

WARNING TAG
PART# 39409
CABLE PART# 56099
FERRULE PART# 56098
TAG-LINE
(RELEASE ROPE INCLUDES SPRING CLIP)
50' LENGTH (PART# 39406)
1,220lbs TENSILE STRENGTH
122lbs SAFE WORKING LOAD
PINCH POINT STICKER
PINCH POINT STICKER (TYP. ON EACH SIDE)
NOTES
PAINT ALL PARTS PRIOR TO INSTALLING ROPE
TAPE OFF CABLE PRIOR TO PAINTING
INSTALL ALL STICKERS AND LABELS

Required Tools & Supplies

- Electric hand drill
- Large engine hone
- Small brake hone
- .314" diameter reamer
- Tap handle
- 5/16"-18 tap
- 5/8"-11 tap
- 90 degree grinder
- Dremmel tool
- Carbide burr
- Hammer
- 5/16" pin punch
- Allen wrench set
- 1 ¼" wrench or socket
- ½" square drive ratchet
- Emory paper
- Anti-Seize
- JB Weld

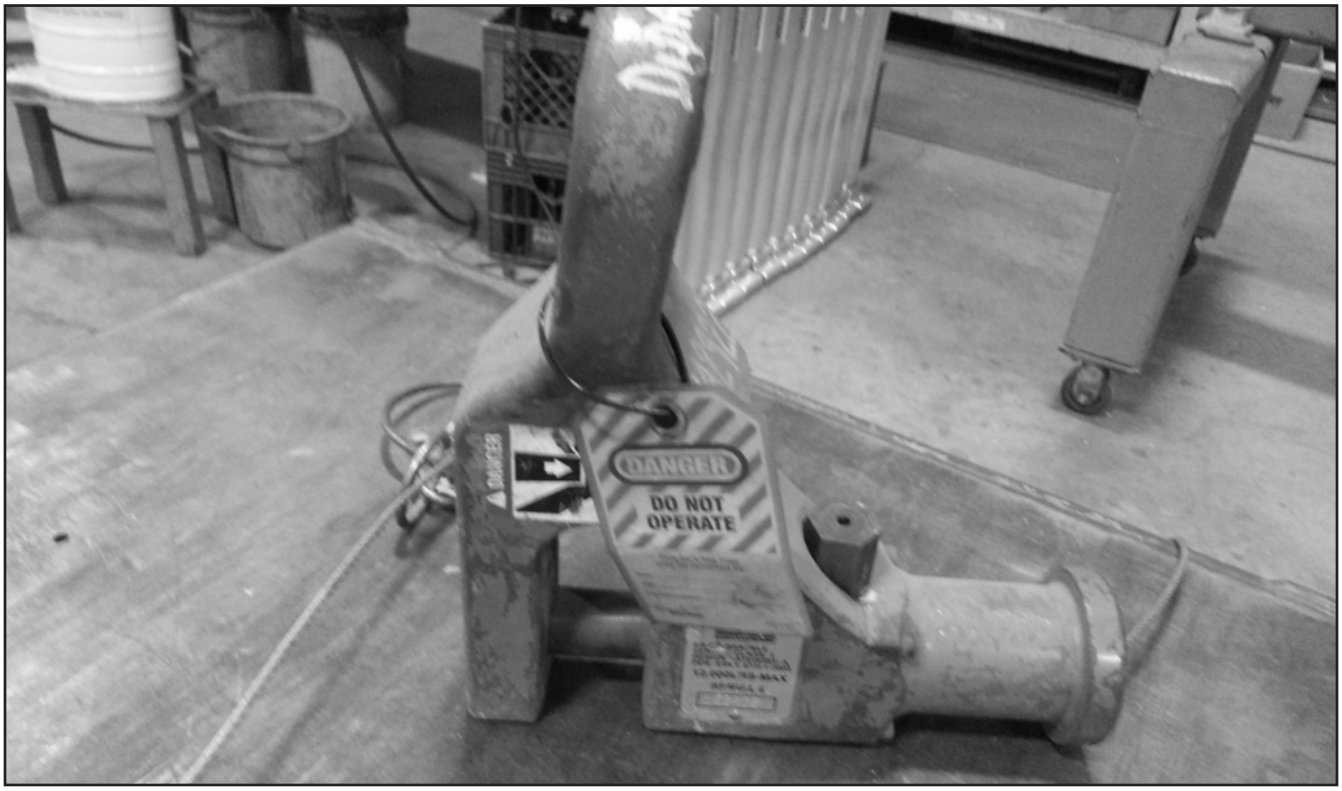
Step 1

Tag returned ground release shackle with "Ground Release Shackle Repair Time Sheet". Remove and fill out only when the repairs are started.



Step 2

Visually inspect ground release shackle for any obvious damages. Do not use if the cast housing itself is damaged.

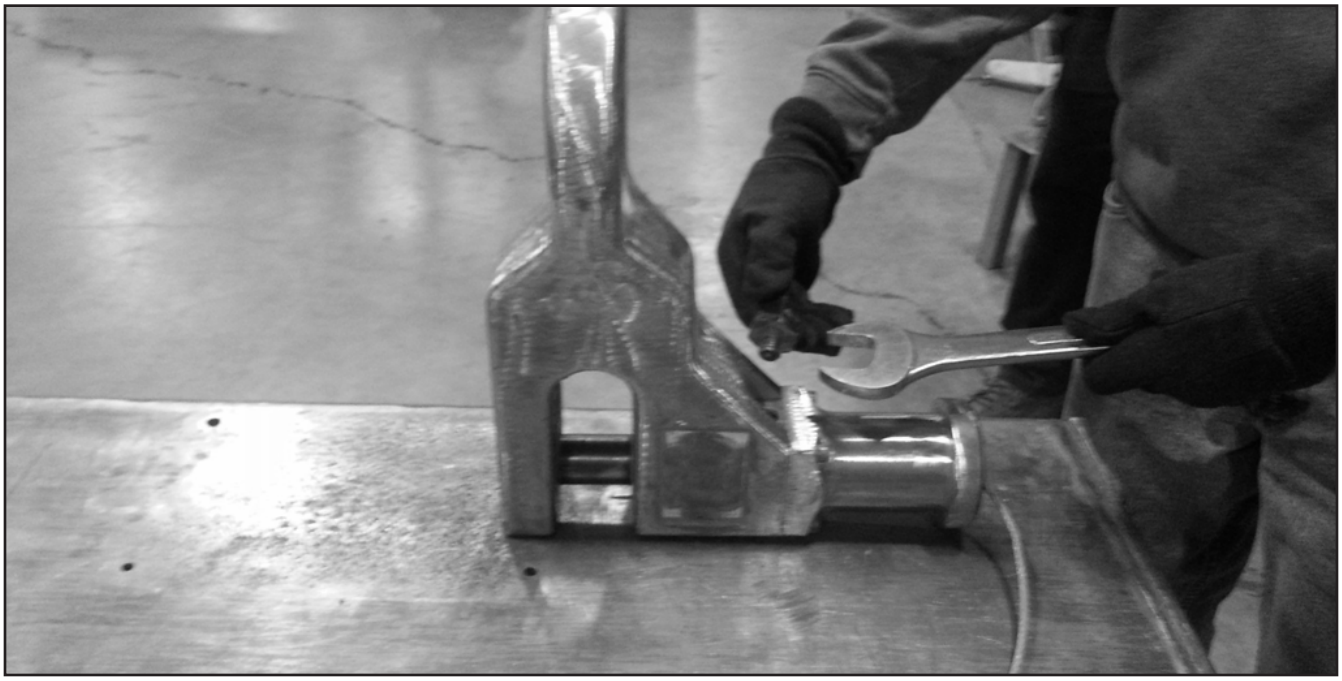


Step 3

Remove 7/8"-14 die screw cap.

Step 4

Remove detent housing.

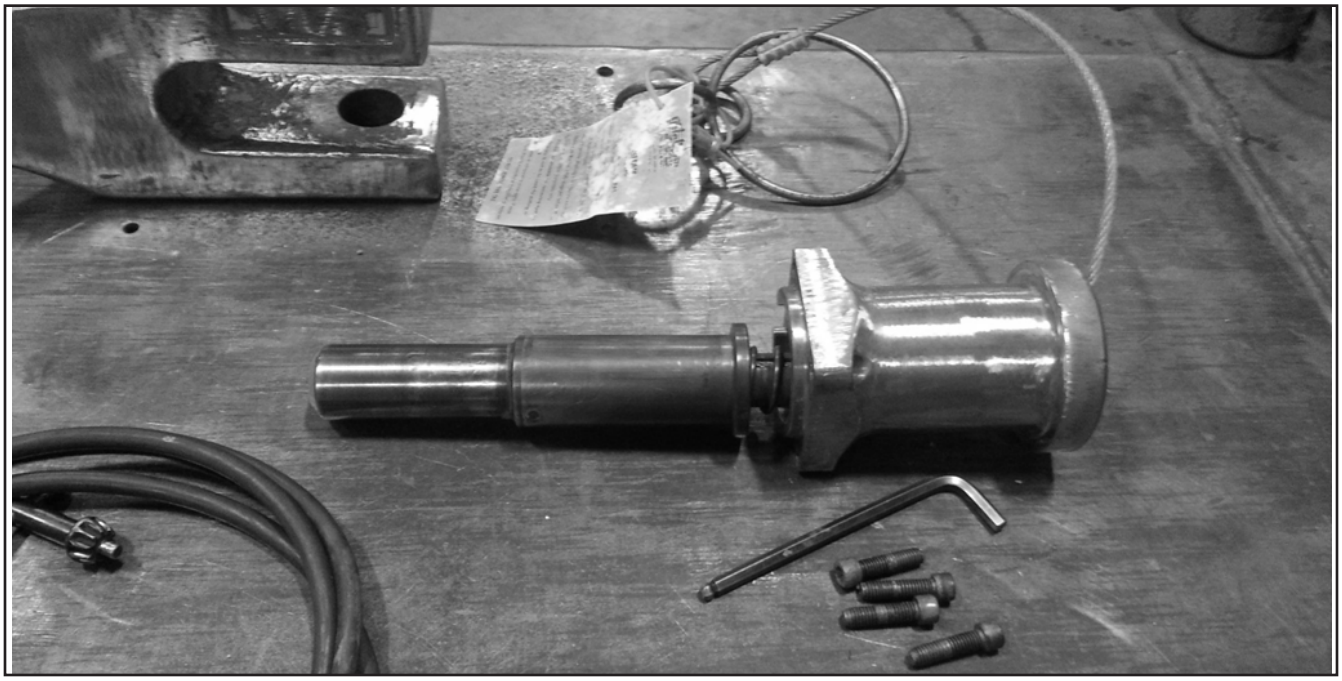


Step 5

Remove the four 5/16"-18 x 1 ¼" allen head bolts from spring housing.

Step 6

Remove spring housing and pin-sleeve assembly from cast body.

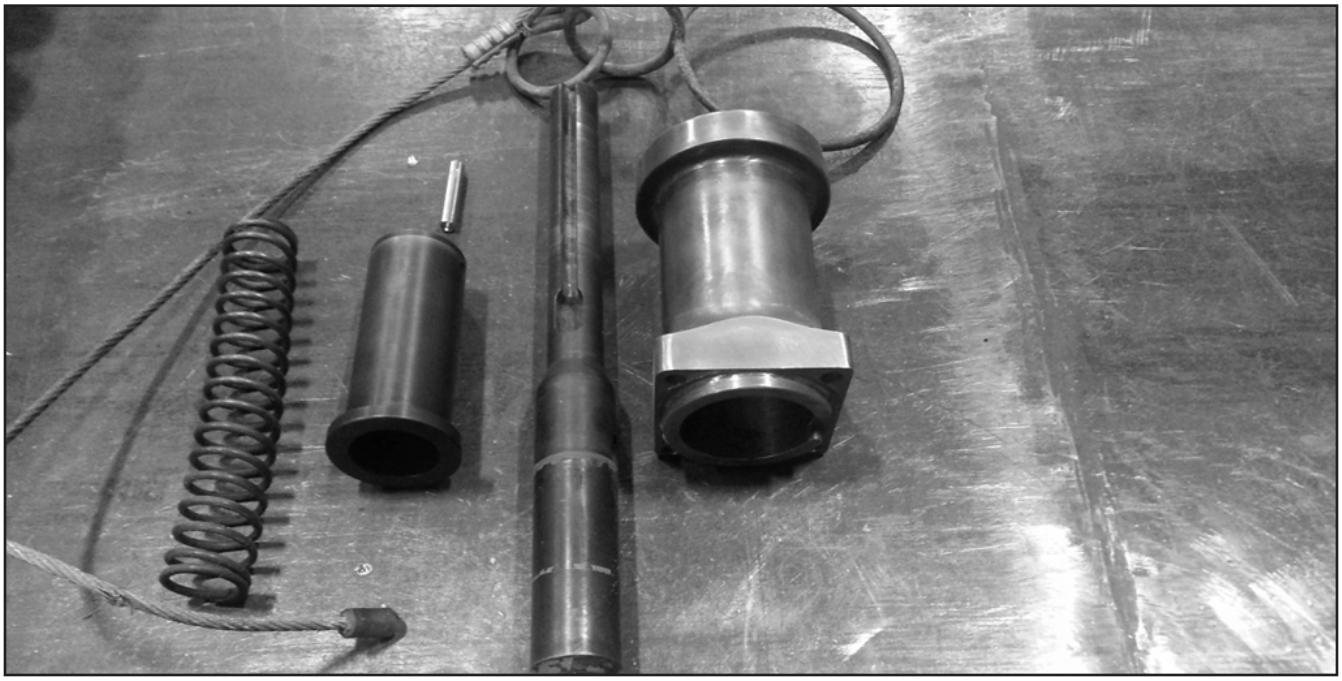


Step 7

Remove split pin from pin-sleeve assembly using 5/16" pin punch and hammer if necessary. If not, go to Step 26.

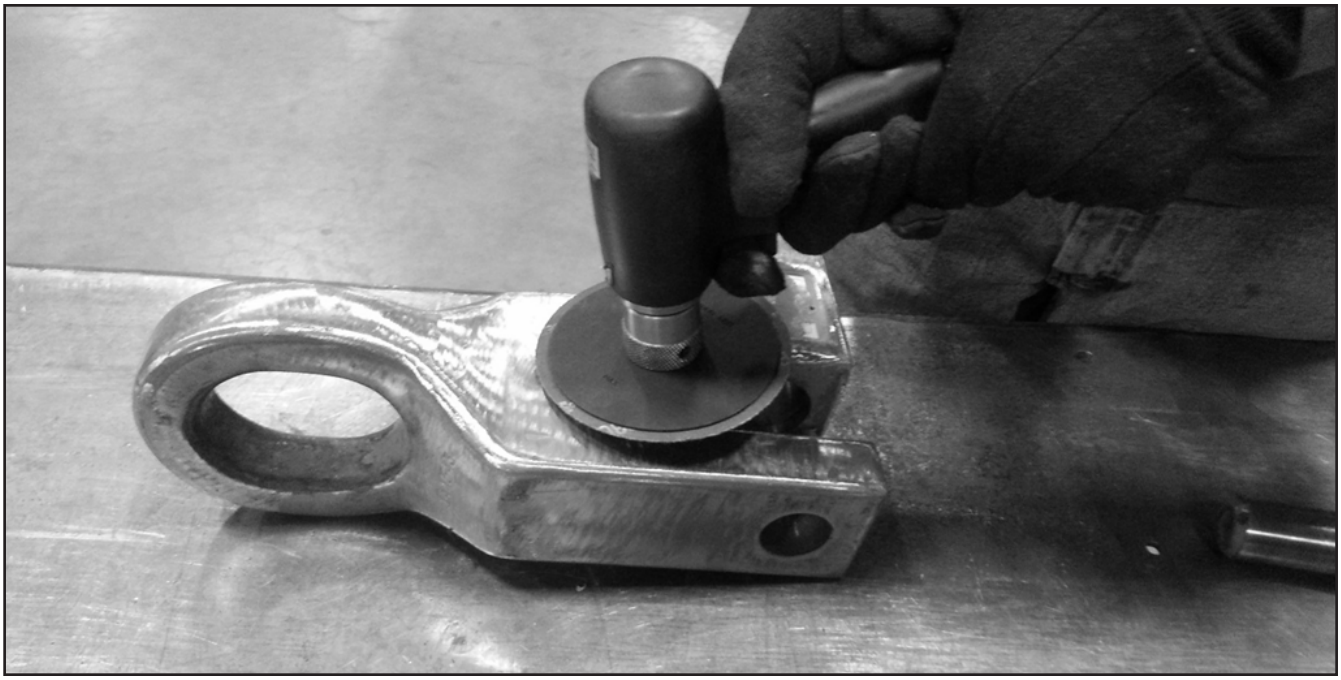
Step 8

Set components aside. Clean and inspect for cracks or signs of fatigue or other damages.



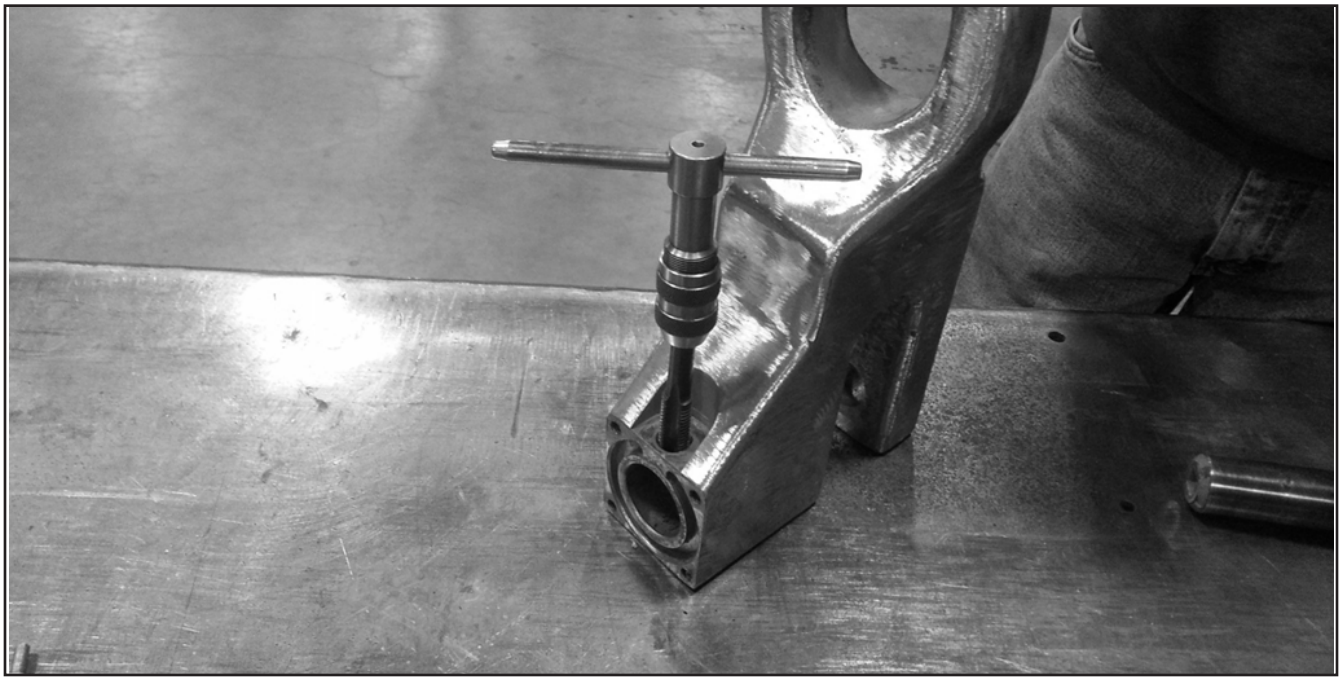
Step 9

Clean housing removing any sharp edges or damages to cast body with grinder.



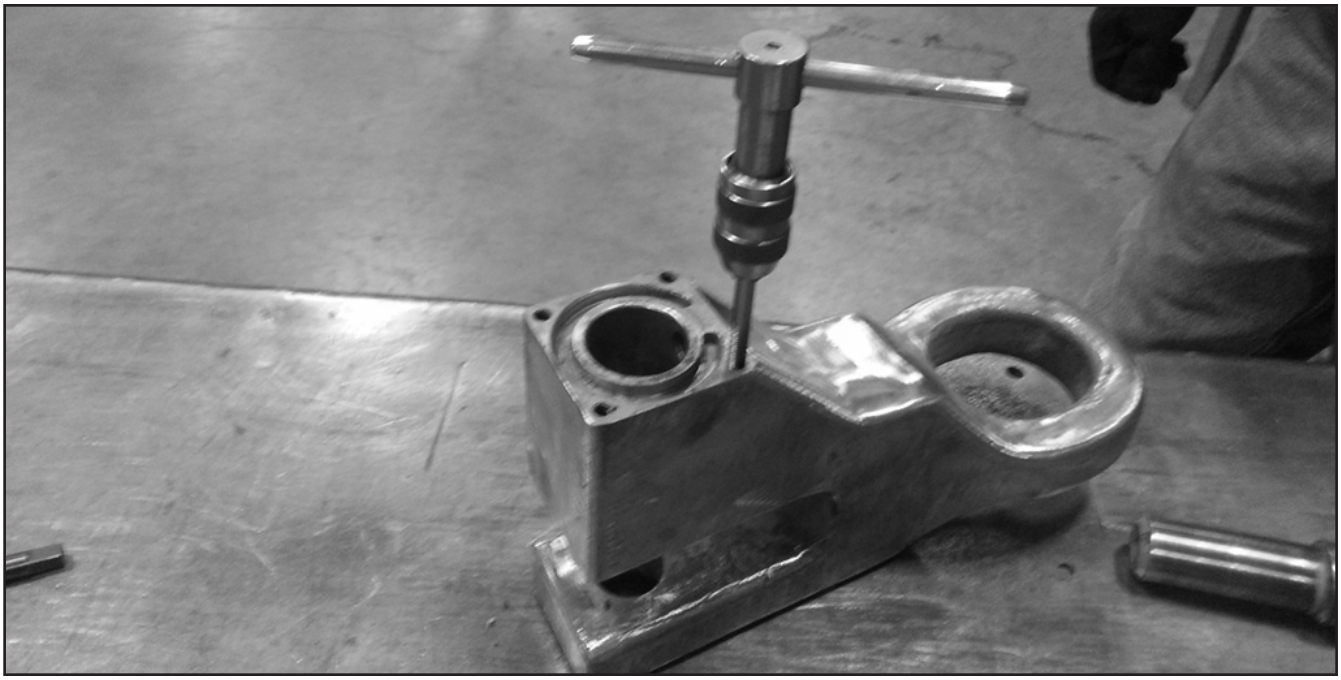
Step 10

Chase detent housing threads with 5/8"-11 tap.



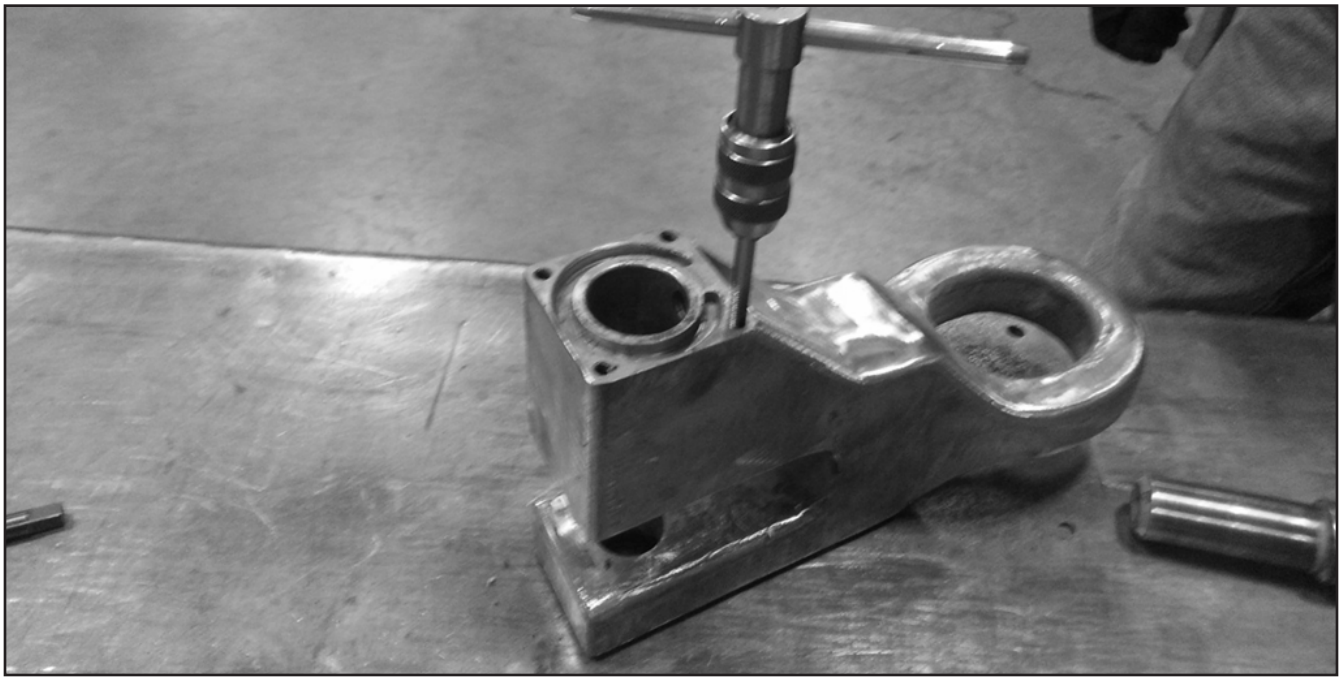
Step 11

Chase four spring housing threads with 5/16"-18 tap.



Step 12

Clean cast housing pin holes with die grinder and carbide burr if necessary.



Step 13

Repeat on other cast housing hole.

Step 14

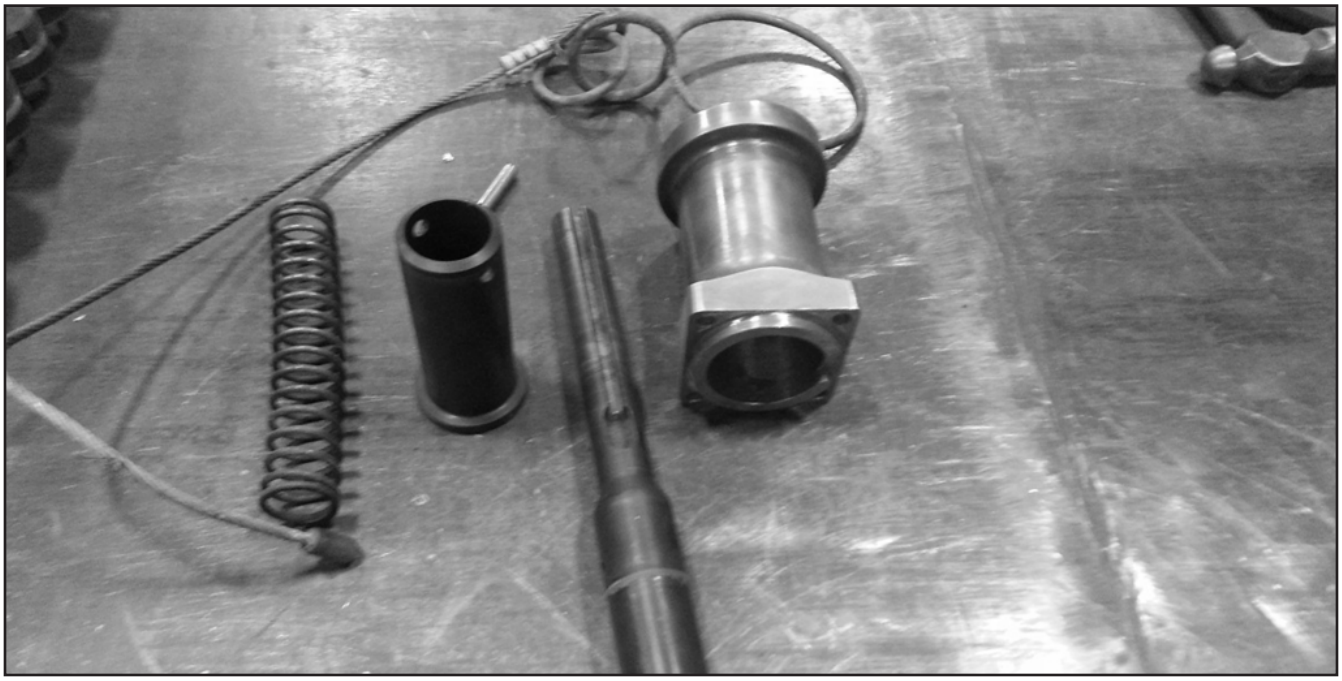
Clean cast housing sleeve side hole using large engine hone and electric hand drill.

Step 15

Clean cast housing fork side hole using small brake hone and electric drill.

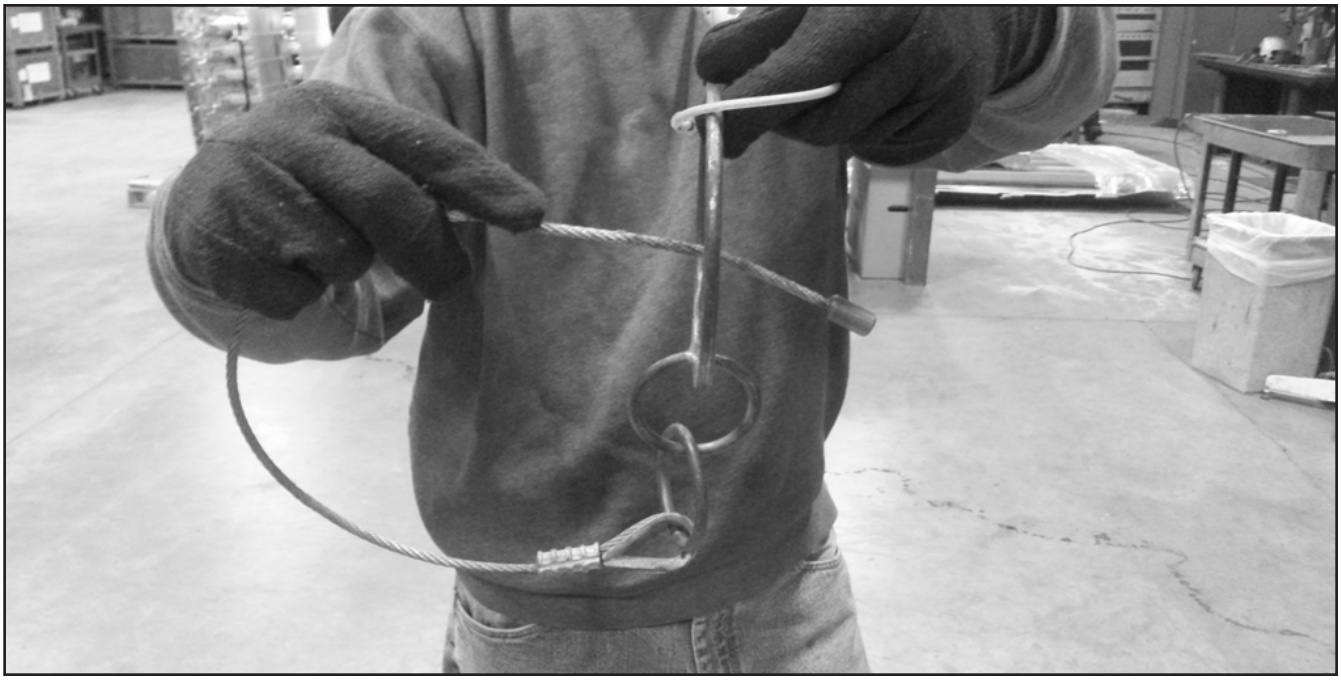
Step 16

If spring housing and pin-sleeve assembly was disassembled in Step 7, reinspect for damages.



Step 17

Push end of cable through 4" diameter ring.

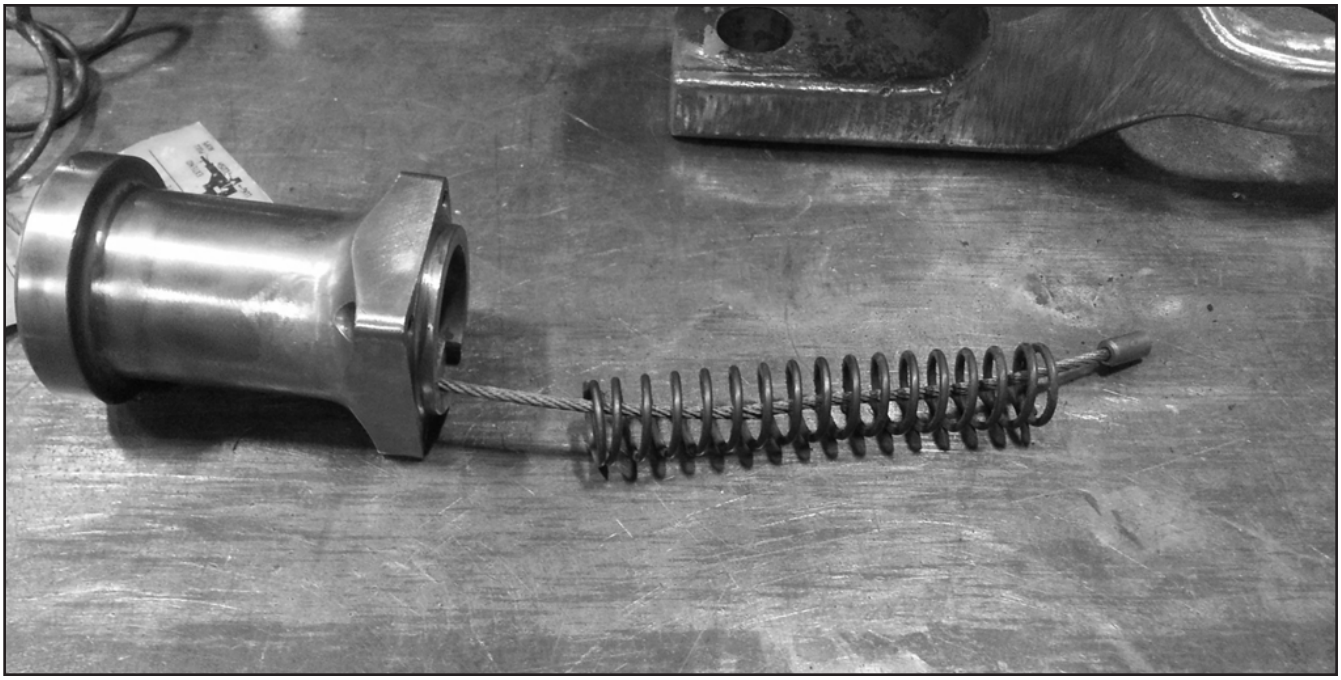


Step 18

Push cable through small hole side of spring housing.

Step 19

Push spring over cable toward end of spring housing.



Step 20

Slide sleeve over cable.

Step 21

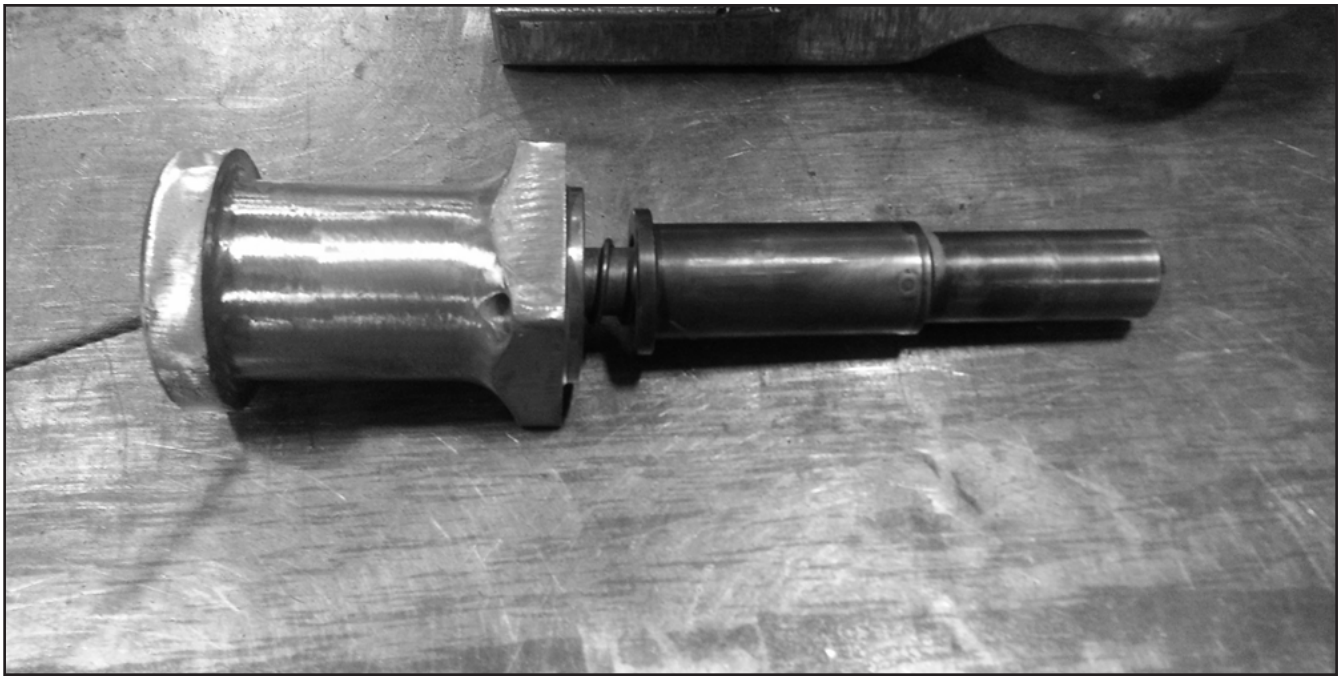
Install cable into slot in pin.

Step 22

Align hole in sleeve with pin. Install NEW split pin.

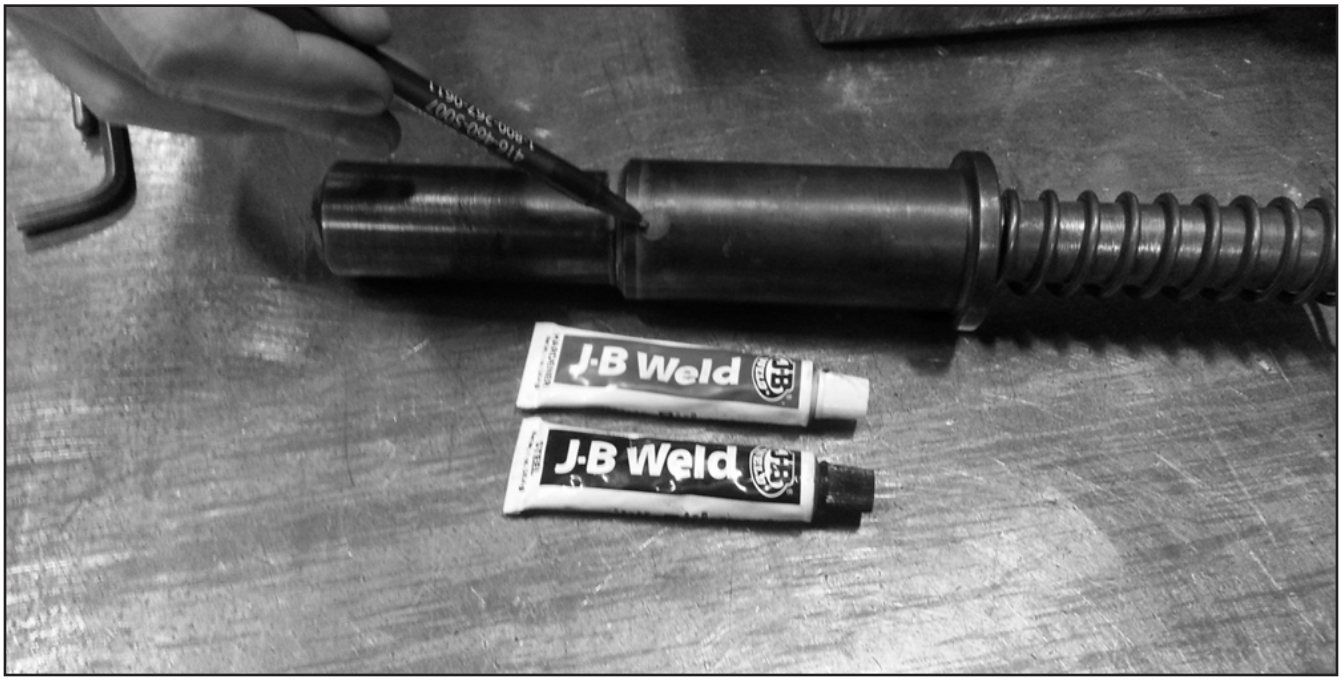
Step 23

Push pin-sleeve assembly/spring assembly into spring housing.



Step 24

Apply JB Weld to end of split pin. Use emery cloth to smooth out.



Step 25

Ensure that pin-spring assembly turns freely in cast housing.

Step 26

Install pin-spring assembly into cast housing. Make sure cut-out on spring housing is aligned with matching side of cast housing.

Step 27

Inspect the four 5/16"-18 x 1 ¼" bolts for signs of stretching or other damage. Replace as necessary.

Step 28

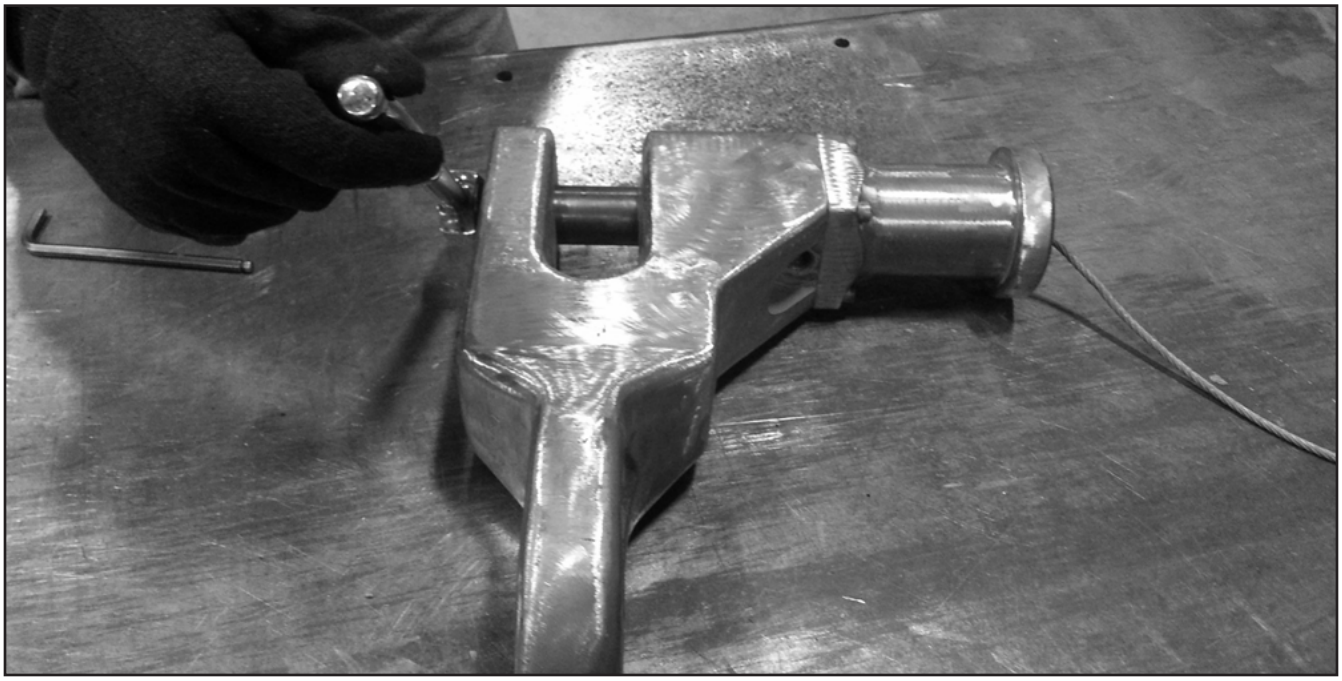
Push pin housing assembly into place to absorb load from spring. Install and tighten all four bolts evenly. Go around the assembly alternating tightening.

Step 29

Pull and release pin-spring assembly several times to ensure proper working of mechanism.

Step 30

Turn pin-spring assembly several times using ratchet.



Step 31

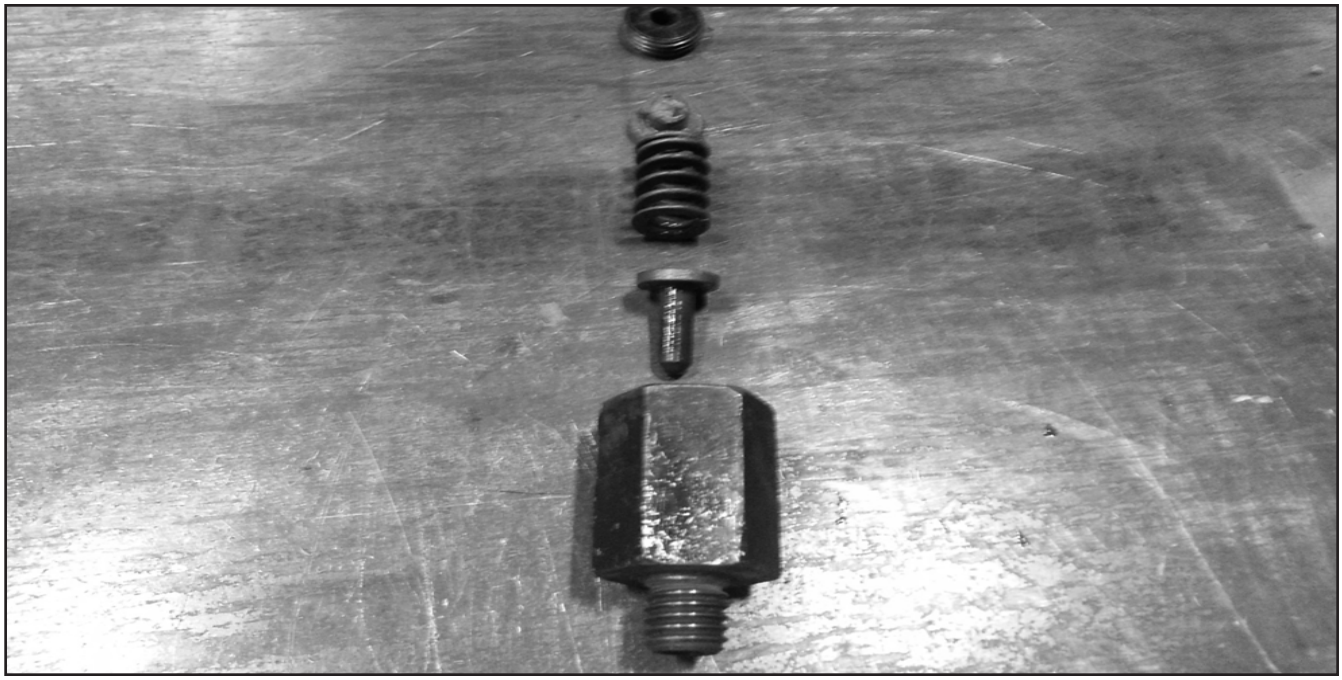
Repeat Step 29.

Step 32

Run reamer through detent housing.

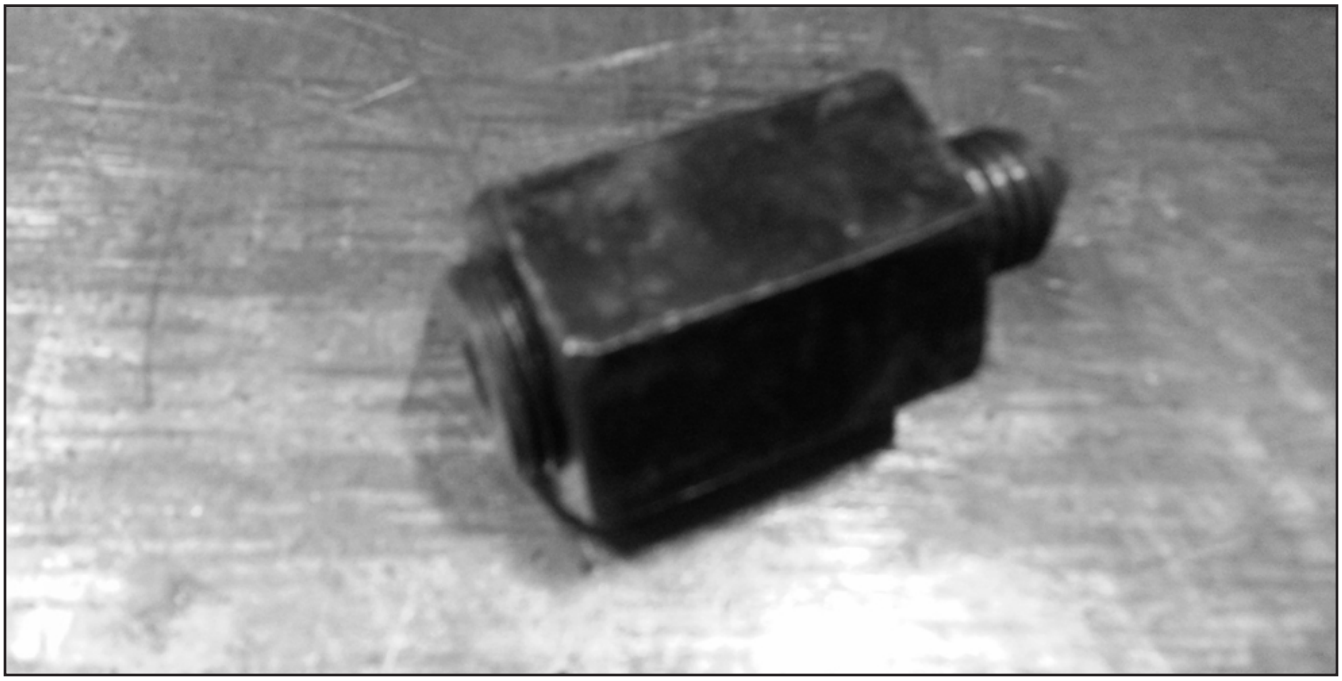
Step 33

Preassemble detent assembly...



Step 34

...Leaving cap loose. Ensure that pin moves freely.



Step 35

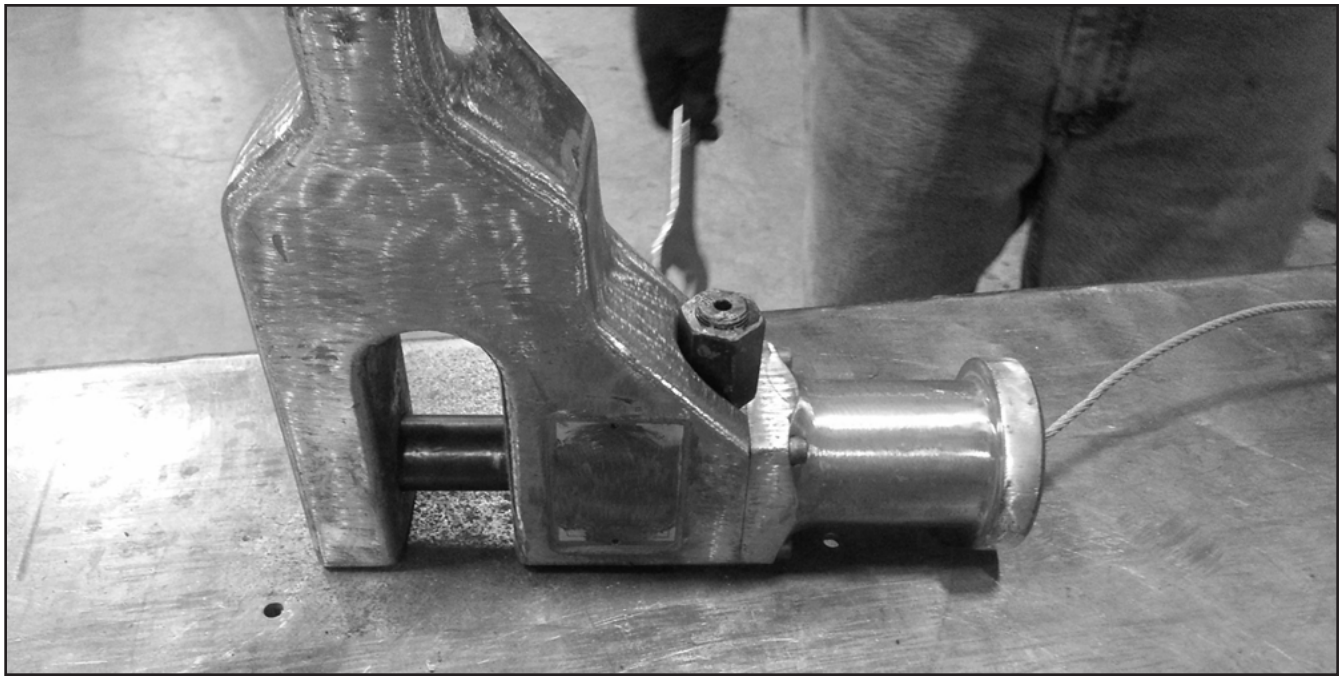
Add Anti-Seize to both threads.

Step 36

Repaint ground release shackle.

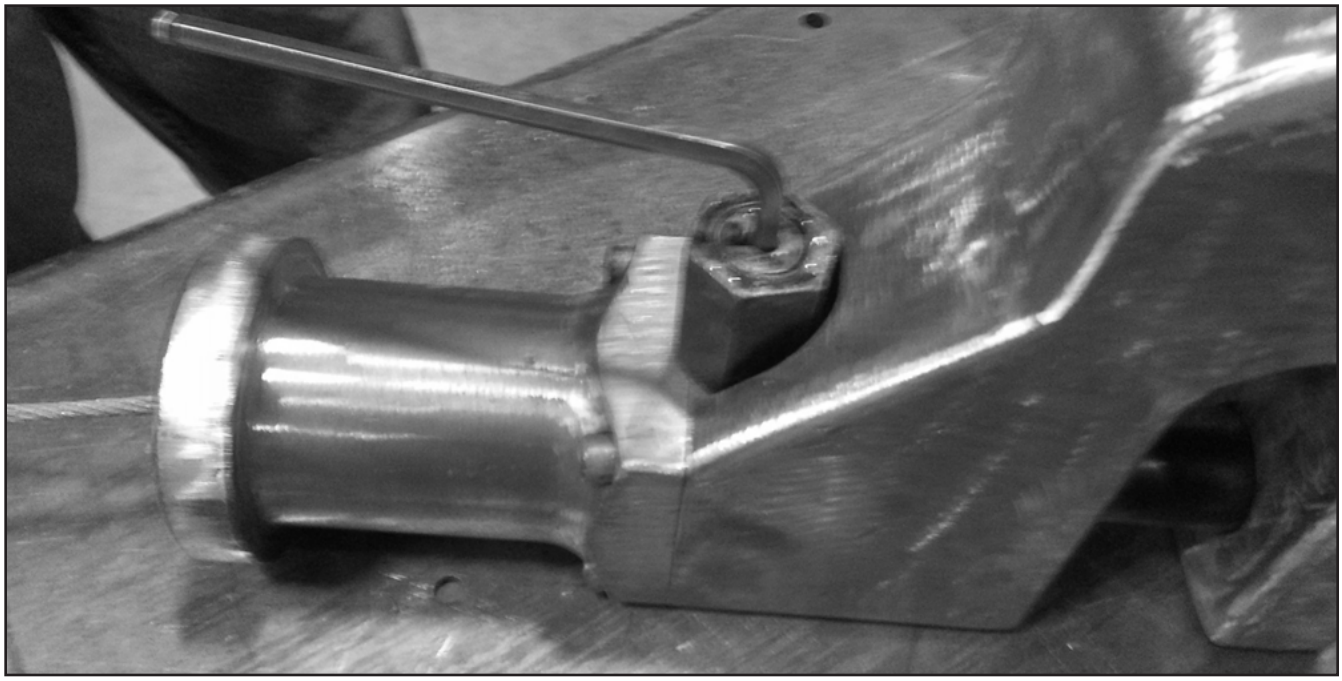
Step 37

Install detent housing into cast housing using 1 ¼" wrench.



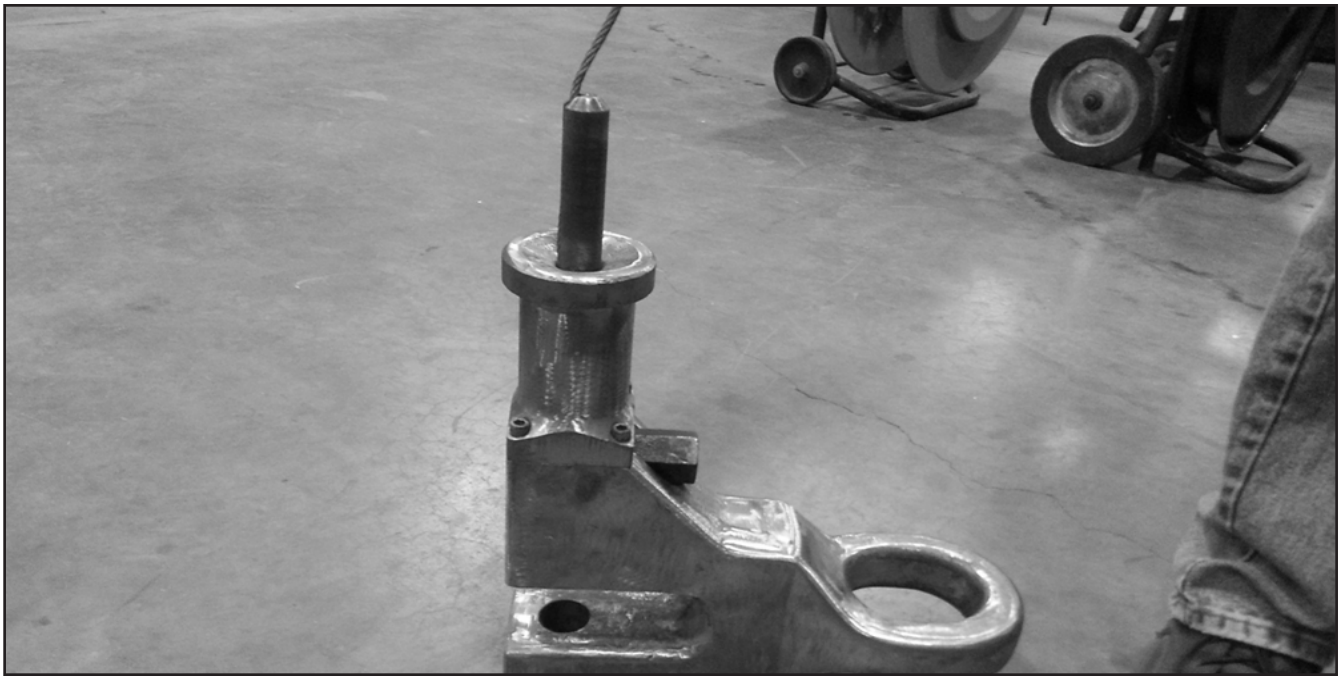
Step 38

Tighten 7/8"-14 die screw cap.



Step 39

Pull cable. Pin should lock in out position.

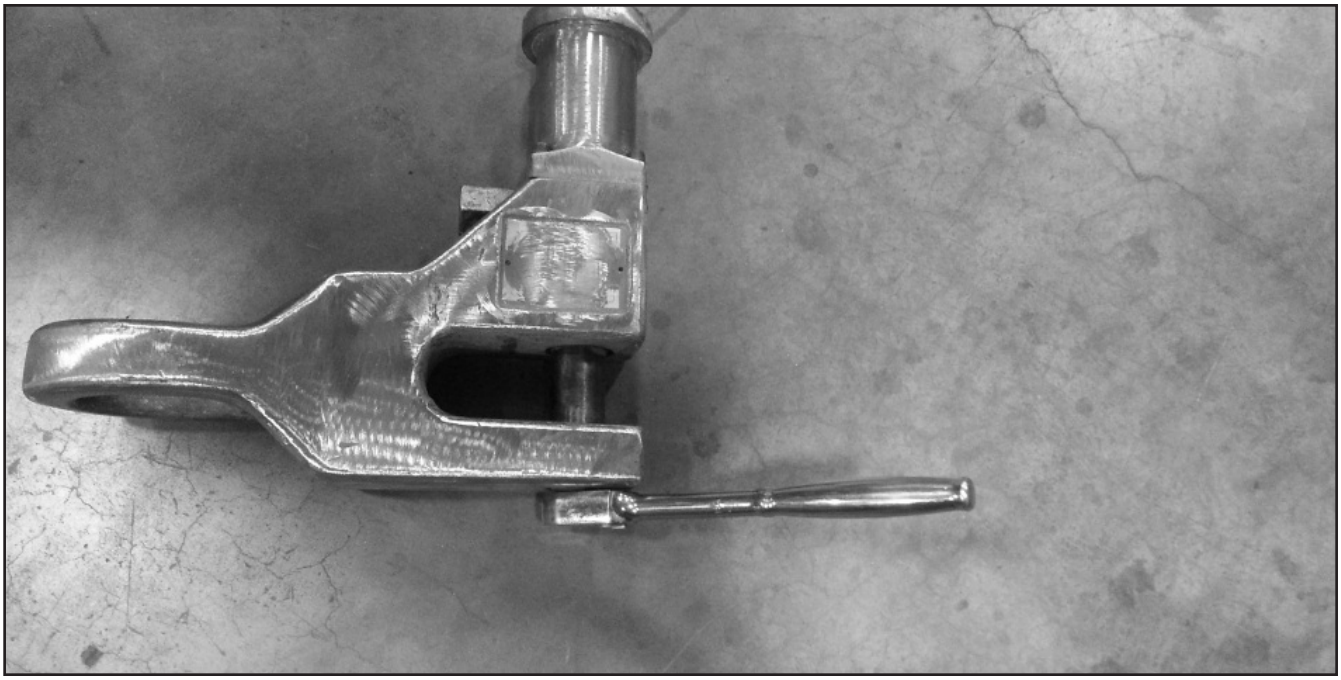


Step 40

Drop on concrete three times on each side. Pin should stay locked. If pin does not stay locked, repair per applicable repair steps as listed above.

Step 41

Rotate pin.



Step 42

Repeat Steps 39 and 40.

Step 43

Add all labels and tags.