



CREATING
VALUE

50 SERIES MECHANICAL - PINS & BUSHINGS

JOYGLOBAL

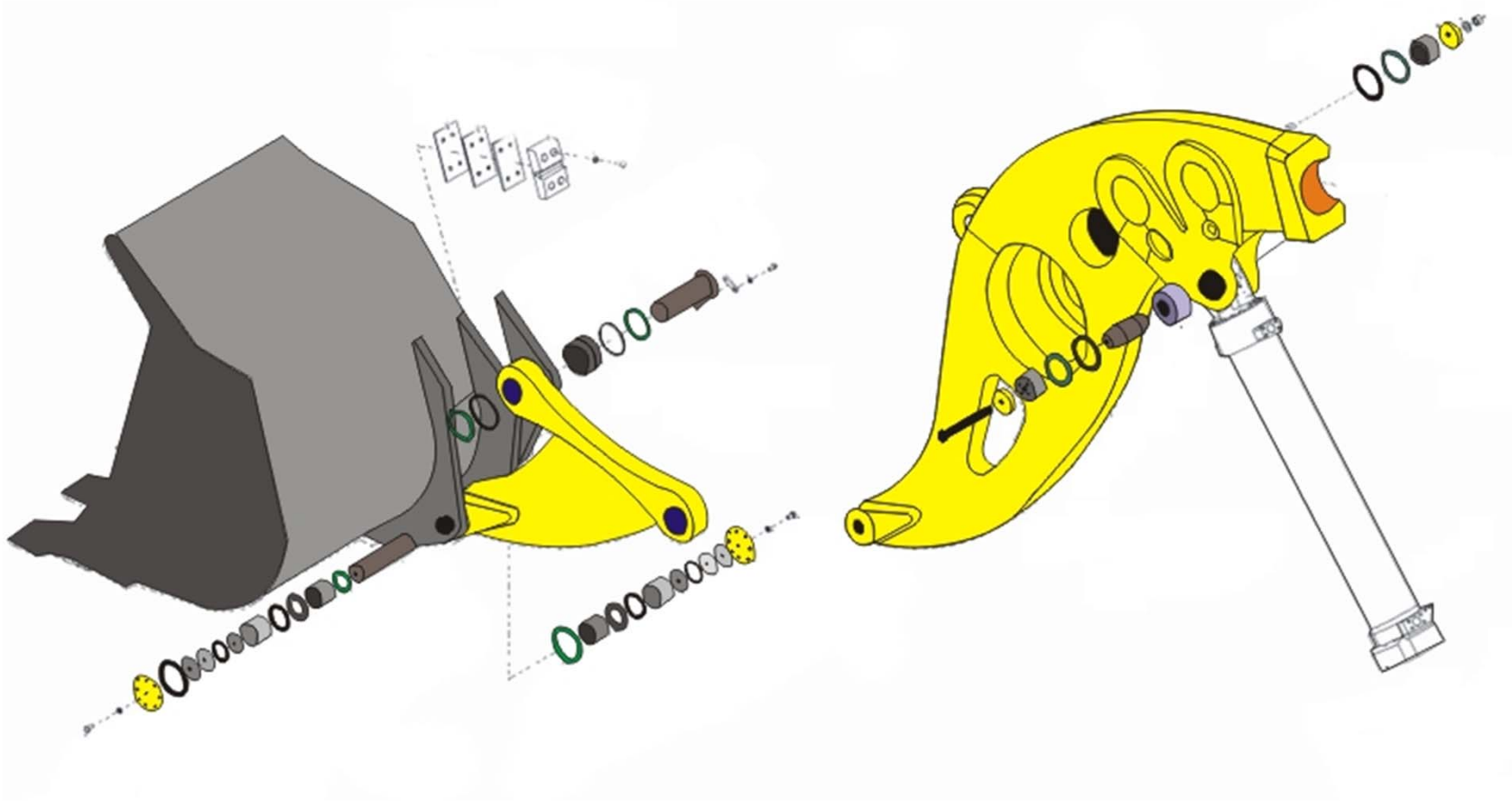
50 SERIES MECHANICAL

PINS & BUSHINGS

- Theory of Operation
- Component Description
- Circuit Description
- Setting and Adjustment
- Trouble Shooting

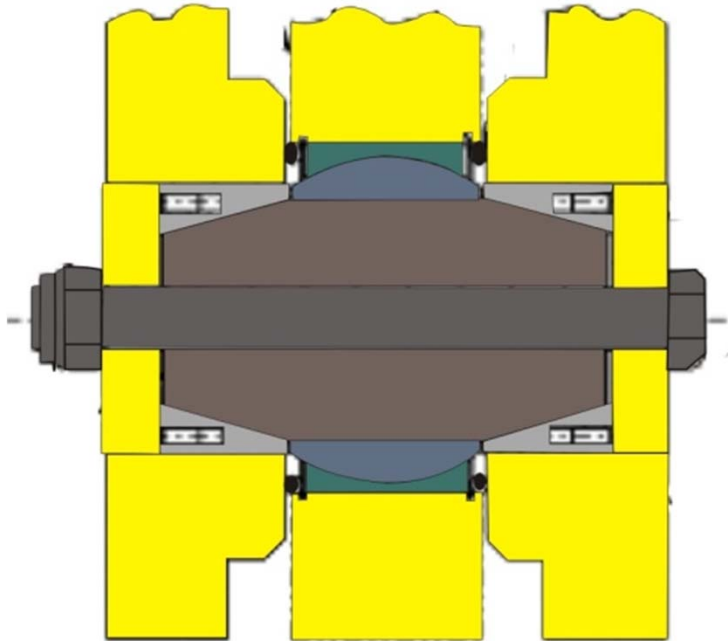


SAW-CUT PINS AND BUSHINGS



Theory of Operation

SAW-CUT PINS AND BUSHINGS



BUCKET CYLINDER

The bolt torque maintains the clamping force that locks the sawcut bushing to the pin and bore.

Why is a re-torque needed?

- To maintain bushing conformation to:
 - Bore
 - Tapers
- Cylinder forces
 - Cylinder
 - Bushing
 - Pin
 - Saw-cut
 - Bore (liftarm, bellcrank, level link, bucket)

Theory of Operation

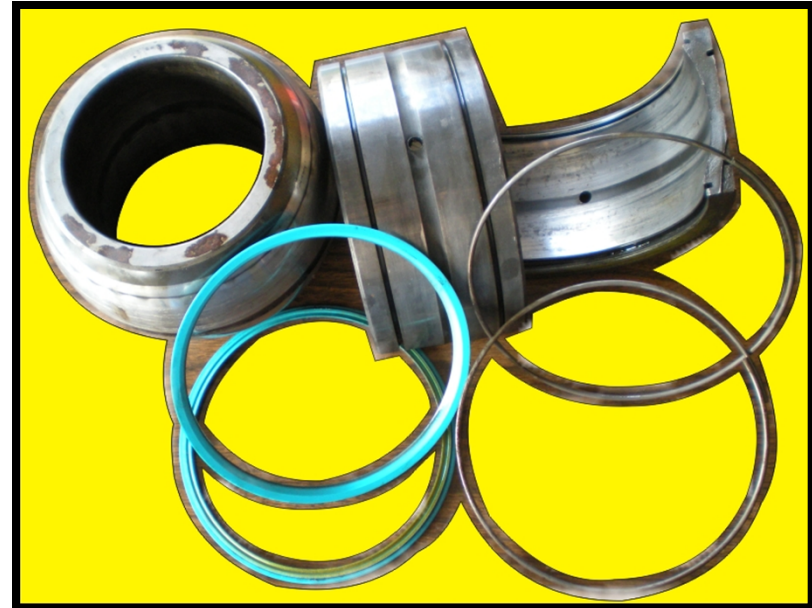
SAW-CUT PINS AND BUSHINGS

SPHERICAL BEARING BUSHING



Product improvement to a spiral groove for grease to flow.

- Split outer race
- Spherical inner race
- Outer seal
- Retaining rings



Component Description

SAW-CUT PINS AND BUSHINGS

TAPER PIN

Center area is carburized to 58-64 HRC.

Remainder of surfaces are to be at a minimum 36 HRC.

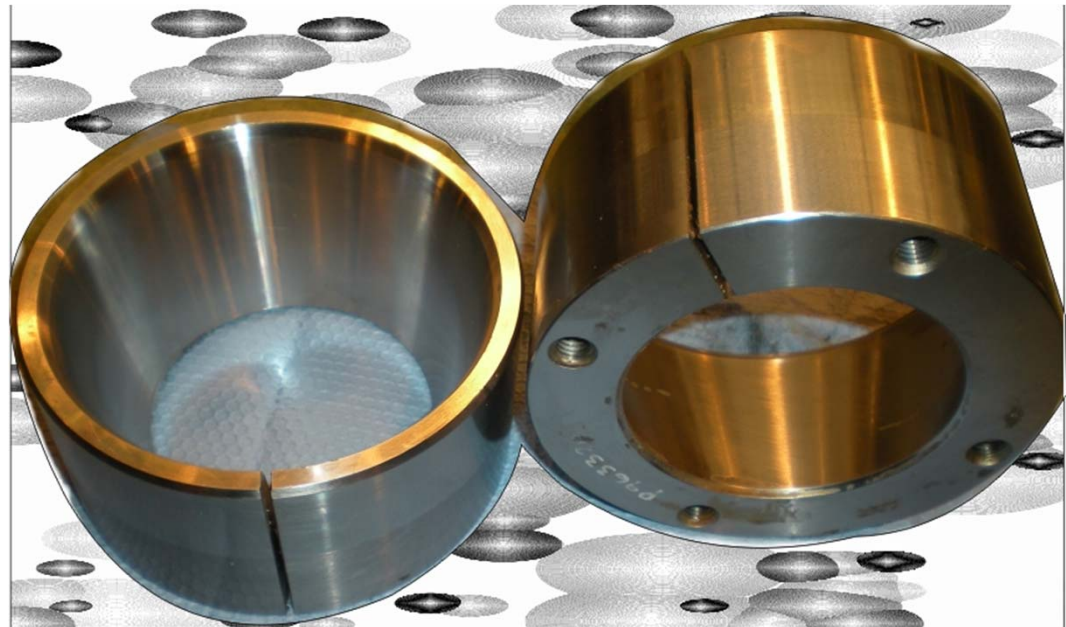


Component Description

SAW-CUT PINS AND BUSHINGS

SAW-CUT BUSHING

- Inside taper matches the taper on the end of the pin.
- Locks the pin to the bore.
- Accommodates removal of the pin.
- The split should be .118" wide.



Component Description

SAW-CUT PINS AND BUSHINGS

RETAINING WASHER

- Captures the sawcut bushings.
- Applies the clamping force.



Component Description

SAW-CUT PINS AND BUSHINGS

BOLT

1 ¼ - 7 torque to 1363 ft lbs

1 ½ - 6 torque to 2371 ft lbs

**Follow Re-torque Intervals and Check at every
PM!**

Component Description

SAW-CUT PINS AND BUSHINGS

BOLT STEERING CYLINDER

1 - 8 torque to 450 ft lbs

1 ¼ - 7 torque to 850 ft lbs

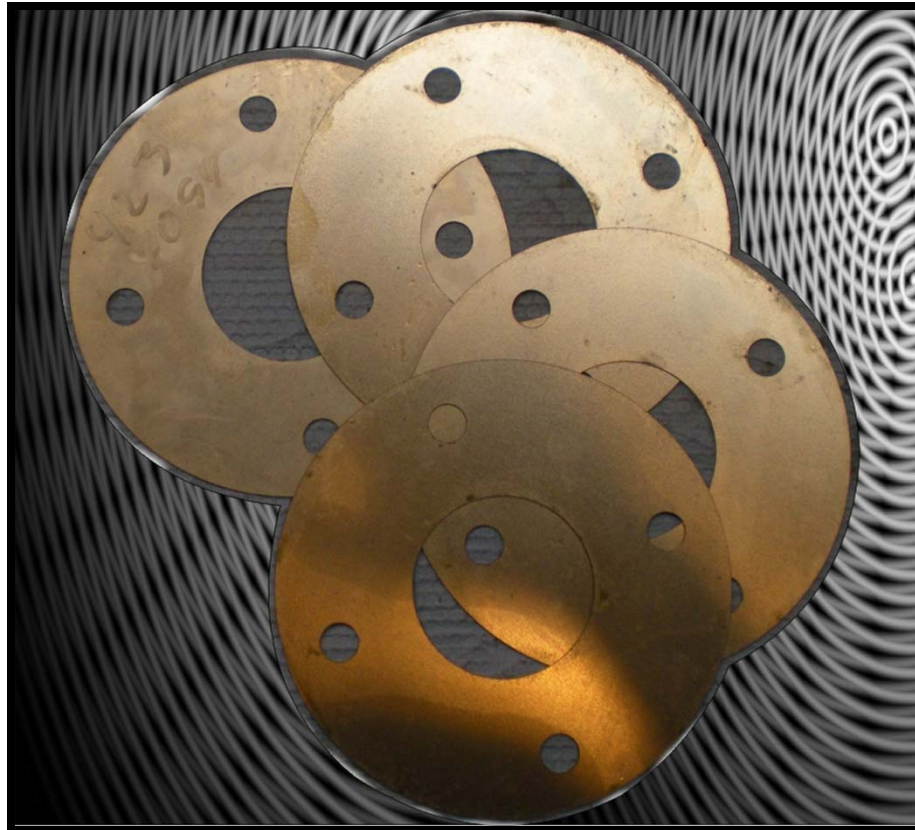
**Follow Re-torque Intervals and Check at every
PM!**

Component Description

SAW-CUT PINS AND BUSHINGS

SHIM

- Used under the outer (retainer) washer.



Component Description

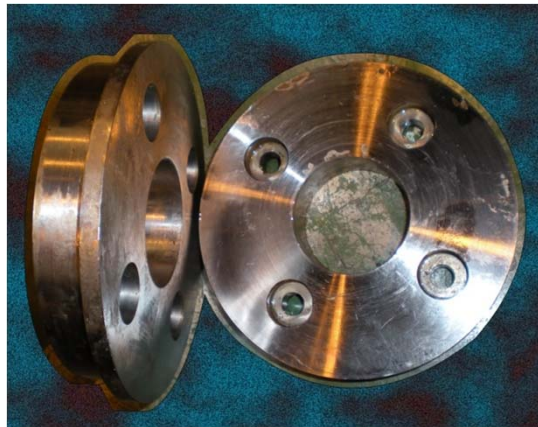
SAW-CUT PINS AND BUSHINGS

OUTER WASHER CAPTURE PLATES

Used on L-1850 and L-2350 machines.

Three different configurations used.

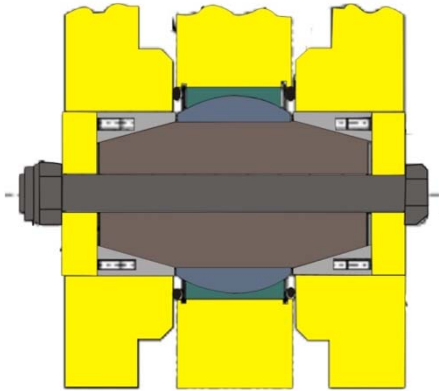
1. Cups the retainer washers.
2. Covers the retainer washer flush.
3. Insets to cover the retainer washer.
4. Examples 2 and 3 are same part.



Component Description

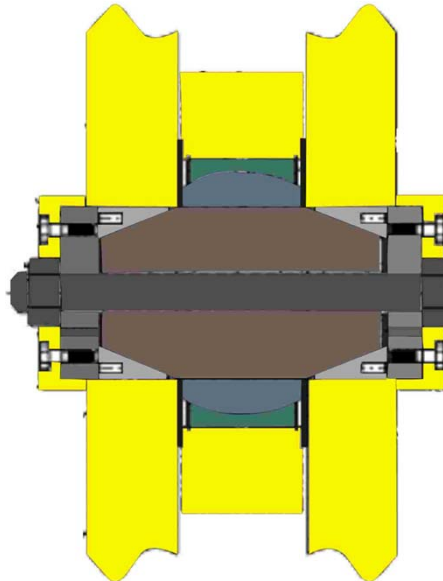
SAW-CUT PINS AND BUSHINGS

L-2350 CONFIGURATIONS



BUCKET CYLINDER

Pin – 6" X 11" with 15° taper
Sawcut – 6" O. D.
Bolt – 1 ½-6 X 16"



HOIST CYLINDER TO LIFARM

Pin – 8 ½" X 12 5/8" with
21° taper
Sawcut – 8 ½" O. D.
Bolt – 1 ½-6 X 18"

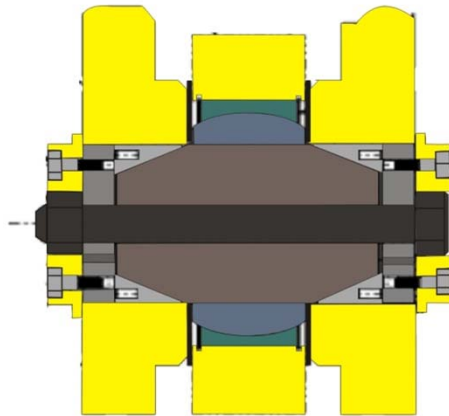
Uses an outside (retaining)
washer that covers the
washer (retainer plate)

Component Description

SAW-CUT PINS AND BUSHINGS

L-2350 CONFIGURATIONS

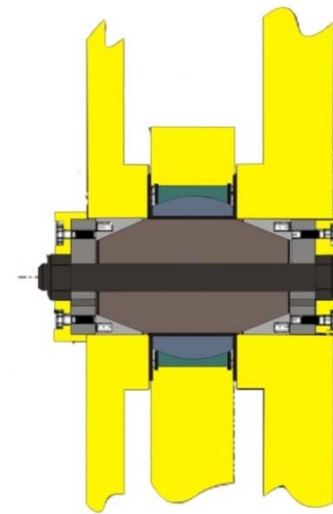
Pin – 6 $\frac{3}{4}$ " X 11" with 21°
Sawcut – 6 $\frac{3}{4}$ " O. D.
Bolt - 1 $\frac{1}{2}$ -6 X 16"



LEVEL LINK TO BELLCRANK

Uses a flush mount outside (retainer) washer over the washer (retainer plate).

Pin – 6 $\frac{3}{4}$ " X 11" with 21° taper
Sawcut – 6 $\frac{3}{4}$ " O. D.
Bolt – 1 $\frac{1}{2}$ -6 X 16"



LEVEL LINK TO BUCKET

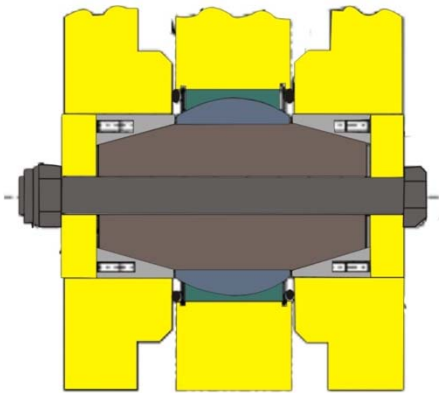
Uses one cover outside (retainer) washer and one inset outer (retainer) washer over the washers (retainer plates).

Component Description

SAW-CUT PINS AND BUSHINGS

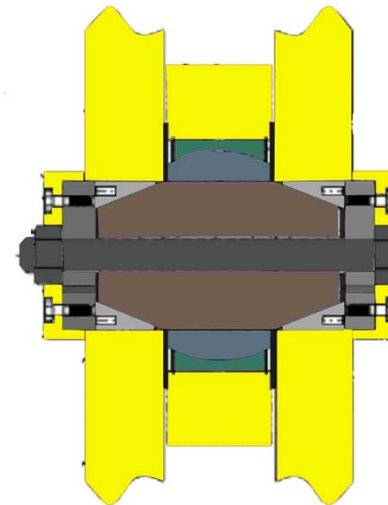
L-1850 AND L-2350 CONFIGURATIONS

Pin – 6" X 11" with 15° taper
Sawcut – 6 ¾" O. D.
Bolt – 1 ½-6 X 16"



BUCKET CYLINDER

Pin – 6 ¾" X 11" with 21° taper
Sawcut – 6 ¾" O. D.
Bolt – 1 ½-6 X 16"



HOIST CYLINDER TO LIFARM

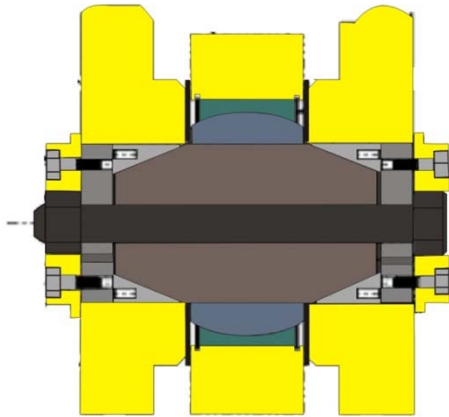
Uses an outside (retaining) washer that covers the washer (retainer plate)

Component Description

SAW-CUT PINS AND BUSHINGS

L-1850 AND L-2350 CONFIGURATIONS

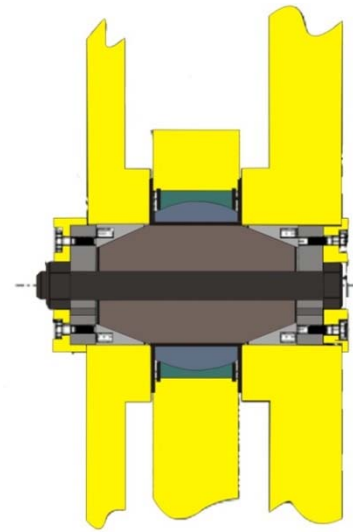
Pin – 6 ¾” X 11” with 21°
Sawcut – 6 ¾” O. D.
Bolt - 1 ½-6 X 16”



LEVEL LINK TO BELLCRANK

Uses a flush mount outside (retainer) washer over the washer (retainer plate).

Pin – 6 ¾” X 11” with 21° taper
Sawcut – 6 ¾” O. D.
Bolt – 1 ½-6 X 16”



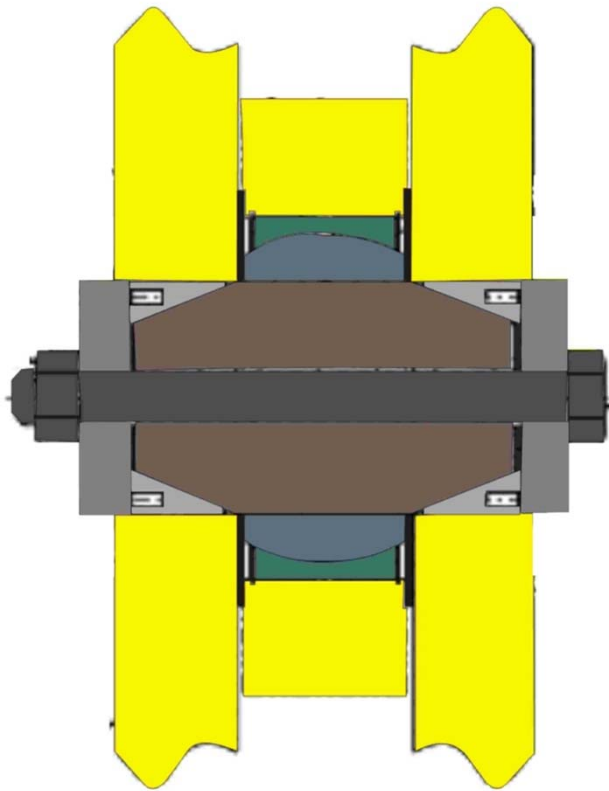
LEVEL LINK TO BUCKET

Uses one cover outside (retainer) washer and one inset outer (retainer) washer over the washers (retainer plates).

Component Description

SAW-CUT PINS AND BUSHINGS

L-1350



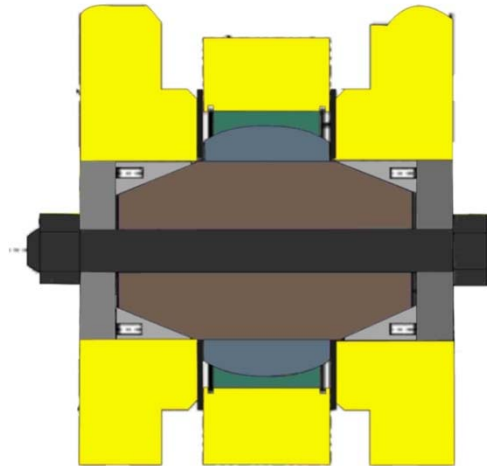
Pin – 6 $\frac{3}{4}$ " X 11" with a 15° taper
Sawcut – 8 $\frac{1}{4}$ " O. D.
Bolt – 1 $\frac{1}{2}$ -6 X 16"

HOIST CYLINDER TO LIFARM

Component Description

SAW-CUT PINS AND BUSHINGS

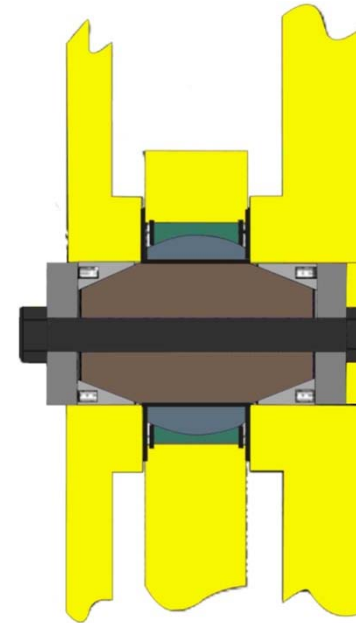
L-1350



BUCKET CYLINDER

Pin – 6" X 11" with a 15° taper
Sawcut – 6" O. D.
Bolt – 1 ½-6 X 16"

Pin – 6 ¾" X 11" with a 15° taper.
Sawcut – 8 ¼" O. D.
Bolt – 1 ½-6 X 16"

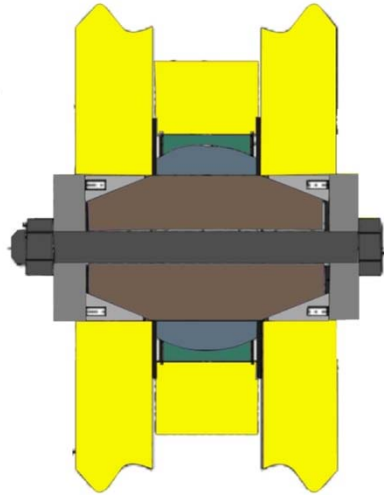


LEVEL LINK TO BUCKET

Component Description

SAW-CUT PINS AND BUSHINGS

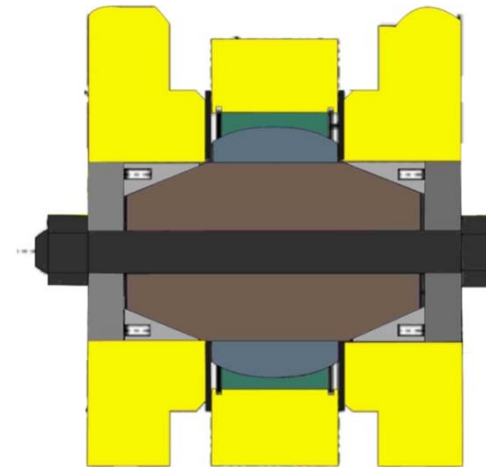
L-1150



HOIST CYLINDER TO LIFARM

Pin – 6" X 11" with a 15° taper.
Sawcut – 6 3/4 " O. D.
Bolt – 1 1/2-6 X 16"

Pin – 4 1/2" X 11" with a 15° taper.
Sawcut – 5 1/2" O. D.
Bolt – 1 1/4-7 X 15"

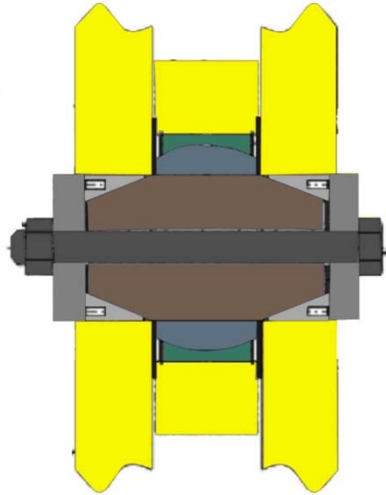


BUCKET CYLINDER

Component Description

SAW-CUT PINS AND BUSHINGS

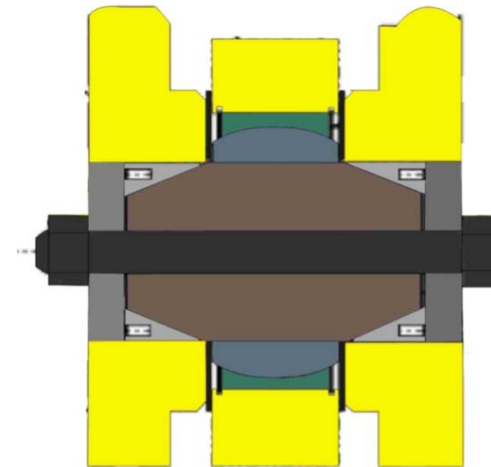
L-950



HOIST CYLINDER TO LIFARM

Pin – 4 ½" X 11" with a 15° taper.
Sawcut – 5 ½" O. D.
Bolt – 1 ¼-7 X 15"

Pin – 4 ½" X 11" with a 15° taper.
Sawcut – 5 ½" O. D.
Bolt – 1 ¼-7 X 15"



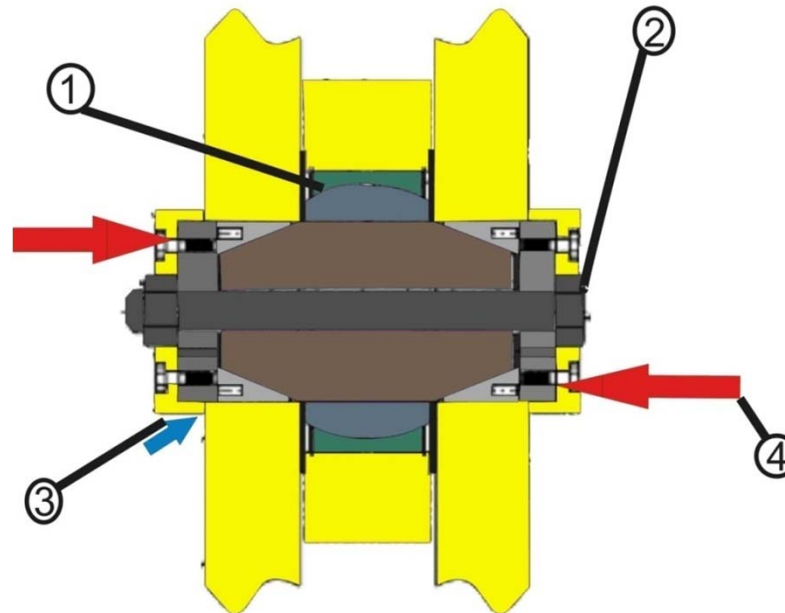
BUCKET CYLINDER

Component Description

SAW-CUT PINS AND BUSHINGS

CUTAWAY OF JOINT

1. Make sure the pin is centered in spherical bearing bushing.
3. Shims installed to provide cap clearance.



2. Retaining bolt. **Makes sure re-torque is done.**

4. Retaining washers applies clamping force to the sawcut bushing that locks it to the bore ID and the pin, when proper torque is maintained on the bolt.

Circuit Description

SAW-CUT PINS AND BUSHINGS

SAFETY

When installing any pin or bushing, make sure that all local safety regulations and rules are followed.

Wear any and all PPE required to accomplish the task.

Use the appropriate lifting practices to maneuver heavy parts into position during installation.

SAW-CUT PINS AND BUSHINGS

INSTALLING BUSHING

When installing bushing into the bore and onto the pin, make sure that the split is positioned 90° to the centerline of the component.

Recheck bolt torque at every PM.

SAW-CUT PINS AND BUSHINGS

SEATING THE BUSHING AND PIN



When seating the bushing, do not strike the bolt or retaining washer with a metal sledge hammer. Use an appropriate sized mallet on the bore ear to advance the bushing onto the pin and into the bore.

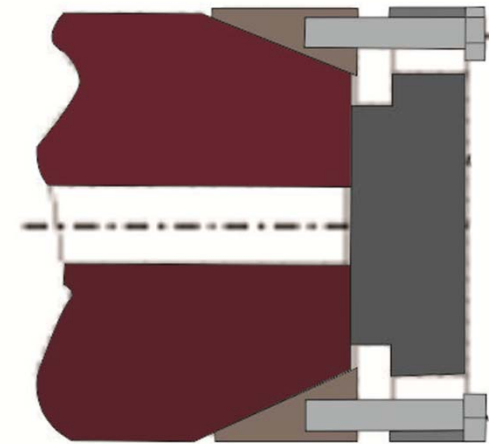
Repeat until the bolt doesn't advance when torque is set.

Recheck torque at every PM.

SAW-CUT PINS AND BUSHINGS

REMOVAL TOOL

1. Remove clamping bolt and capture plate washers.
2. Install bushing removal tool using four bolts and the tapped holes in the sawcut.
3. Tighten the four bolts evenly.
4. Bushing should press off the pin and out of the bore.
5. If bushing does not come out, strike the center of the tool with a hammer.



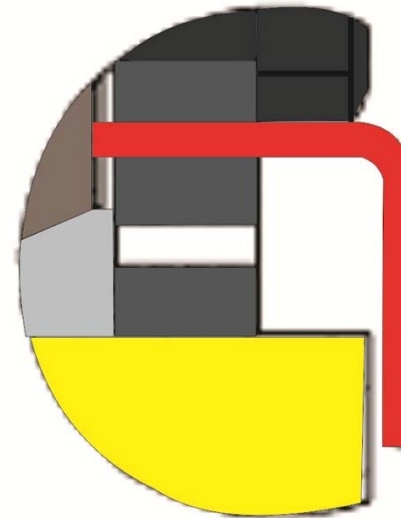
Removal & Installation

SAW-CUT PINS AND BUSHINGS

SHIM CAP

The measurement you get here is the amount of shim you place under the outer washer capture plate.

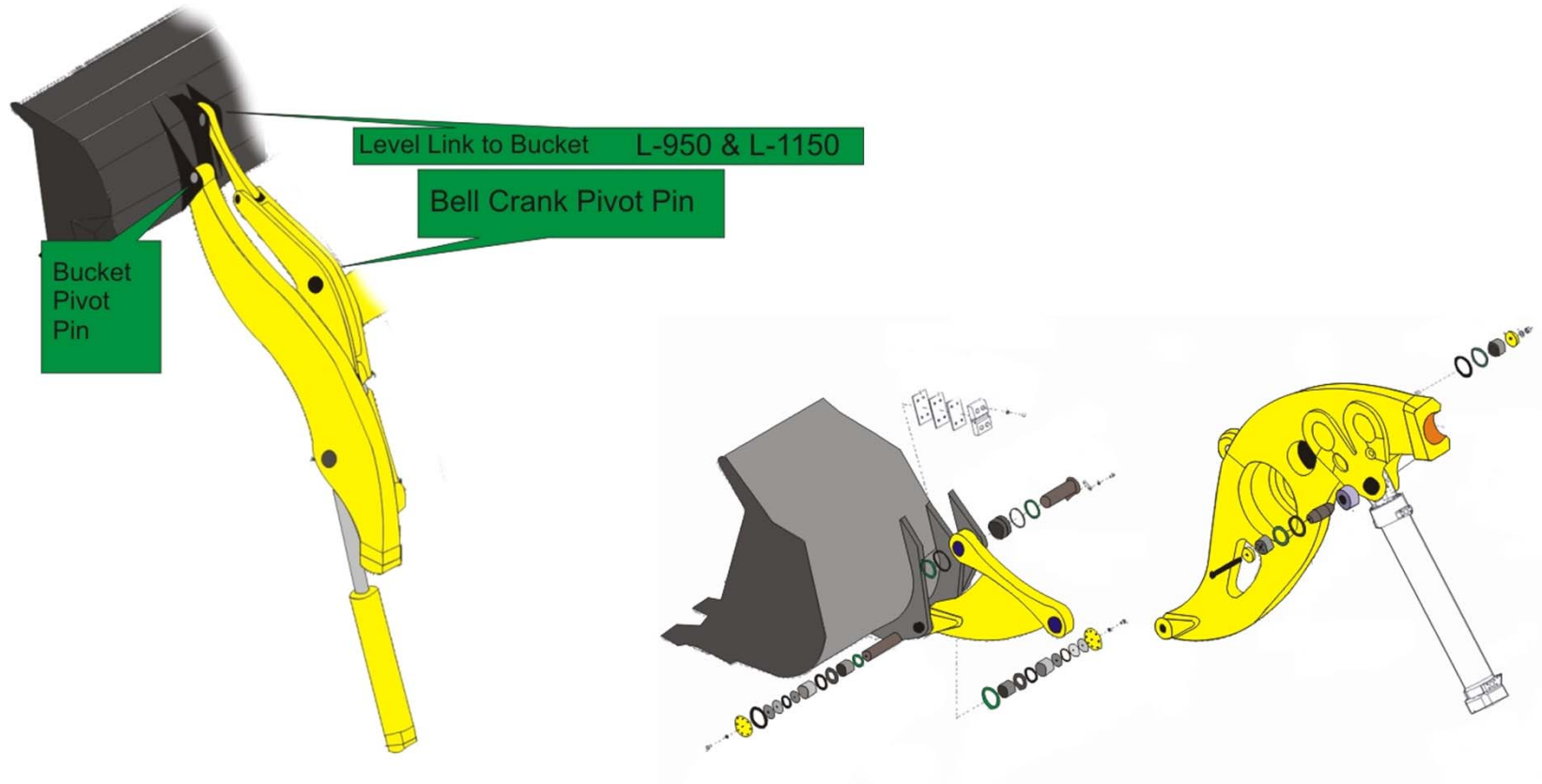
Need to be complete on L-1850 and L-2350.



Settings & Adjustment

SAW-CUT PINS AND BUSHINGS

LOCATIONS



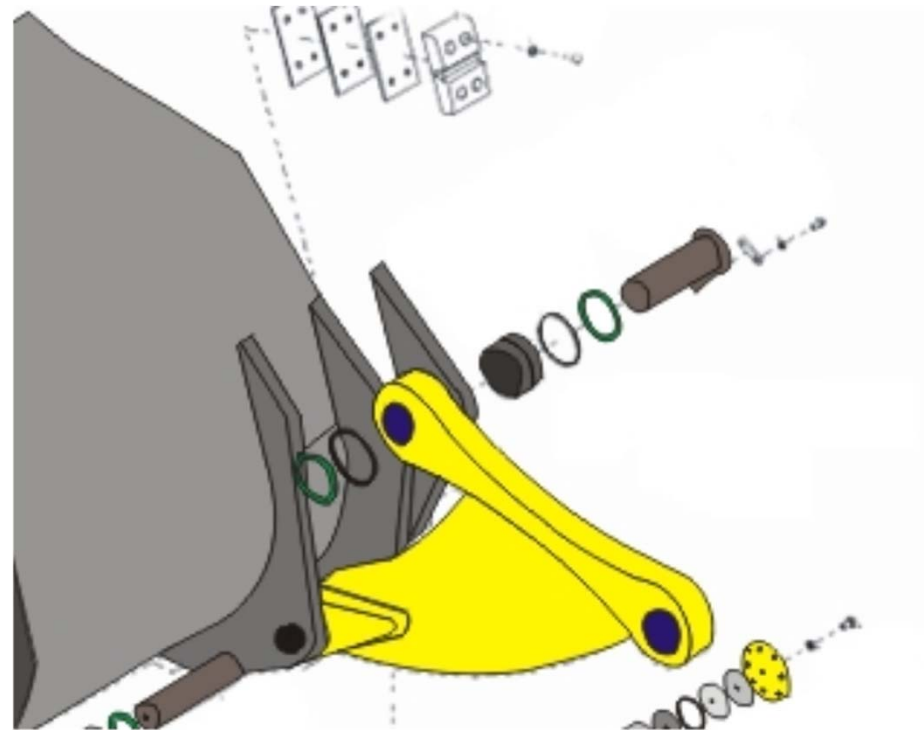
Component Description

STRAIGHT PINS AND BUSHINGS

LEVEL LINK TO BUCKET PIN (L-950 & L-1150)

The level link to bucket pivot joint is made up of

- The Pin
- Pin Cap Lug
- Bolts
- Lock washers



Component Description

STRAIGHT PINS AND BUSHINGS

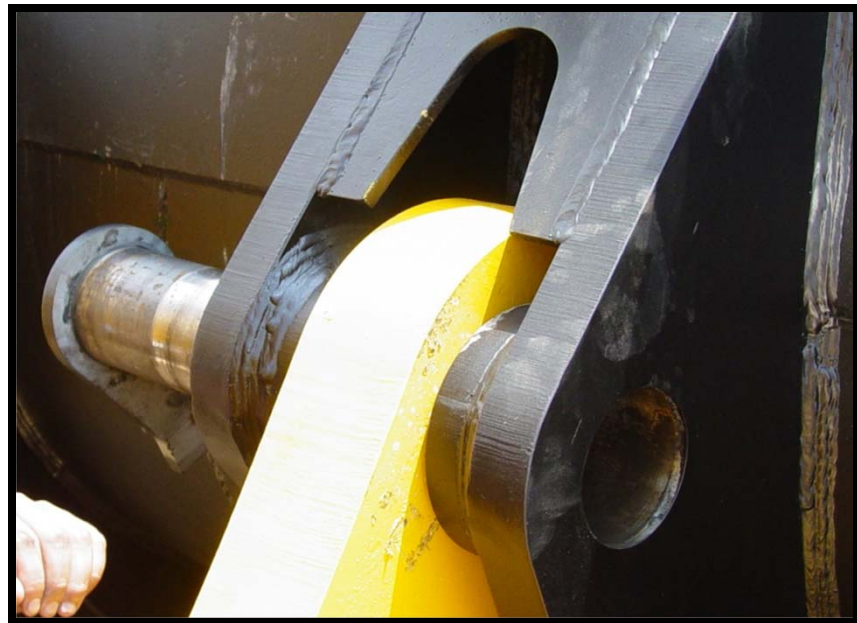
LEVEL LINK TO BUCKET PIN (L-950 & L-1150)



The pin is 4 ½ inch diameter.

One assembly made up of:

- Pin Section
- Pin Lug



Component Description

STRAIGHT PINS AND BUSHINGS

LEVEL LINK TO BUCKET PIN (L-950 & L-1150)

The pin lug secures the pin in place,

And

Prevents rotation of the pin independent of the bucket movement.

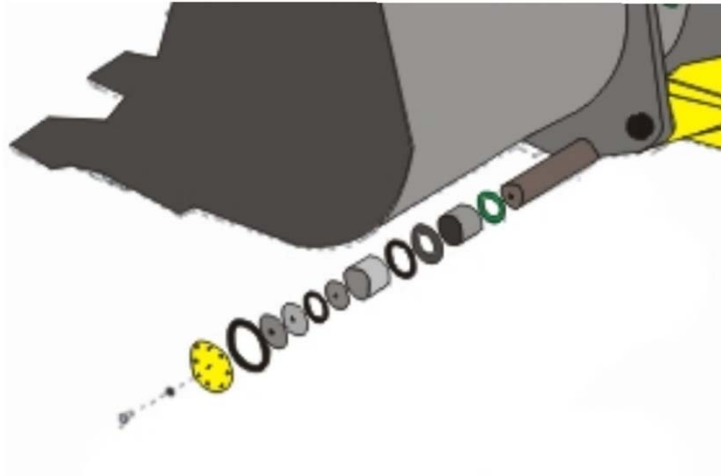
The bolts and locking tab secures the pin assembly in place.



Component Description

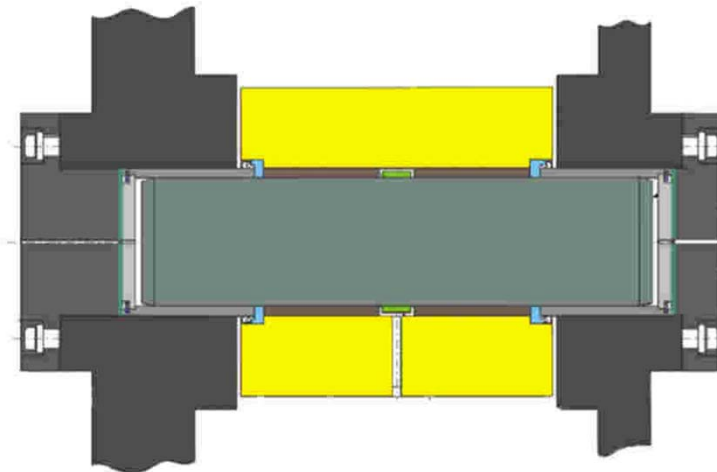
STRAIGHT PINS AND BUSHINGS

BUCKET TO LIFTARM PIN



The joint is made up of:

- Pin
- Pin Retainer Caps
- Bushings
- Bushing washer
- Seal
- Sleeves
- Pin Puller Caps
- Shims
- Spacer
- Bolts



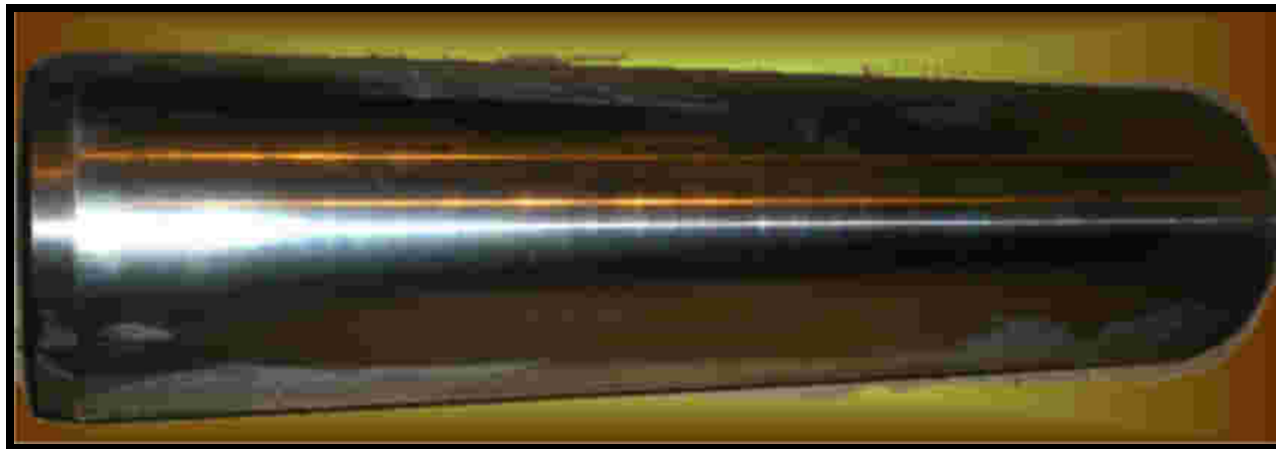
Component Description

STRAIGHT PINS AND BUSHINGS

BUCKET TO LIFTARM PIN

Machined to size

Cased harden to a min of 55 Rc



Component Description

STRAIGHT PINS AND BUSHINGS

LIFTARM BUSHING

Provides a bearing surface for the joint.

Made of an “nickel-aluminum-bronze alloy.



Component Description

STRAIGHT PINS AND BUSHINGS

SPACER

Separates the two bushings and allows for flow of grease into the joint.



Component Description

STRAIGHT PINS AND BUSHINGS

SEAL

Keep dirt and water out to the joint.



Component Description

STRAIGHT PINS AND BUSHINGS

PIN SLEEVE AND PULLER CAP ASSEMBLY

Cap is installed in boss and held in place by snap ring.



Component Description

STRAIGHT PINS AND BUSHINGS

THRUST BUSHING WASHER

Takes the thrust loads applied to the joint during operation.



Component Description

STRAIGHT PINS AND BUSHINGS

SHIM



Component Description

STRAIGHT PINS AND BUSHINGS

RETAINER CAP

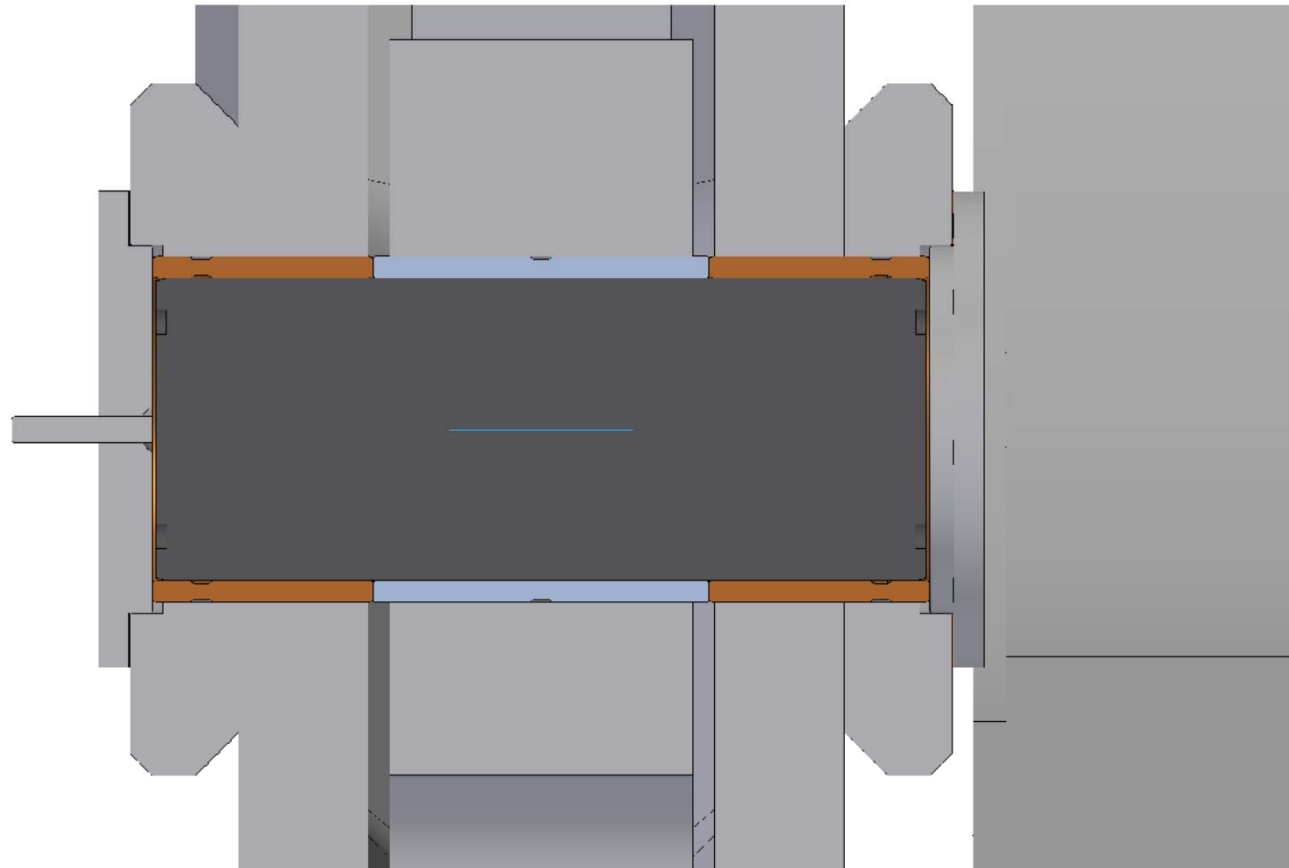


Component Description

STRAIGHT PINS AND BUSHINGS

BELL CRANK PIN

- Pin
- Sleeve
- Bushings
- Capture plates
- Shims



Component Description

STRAIGHT PINS AND BUSHINGS

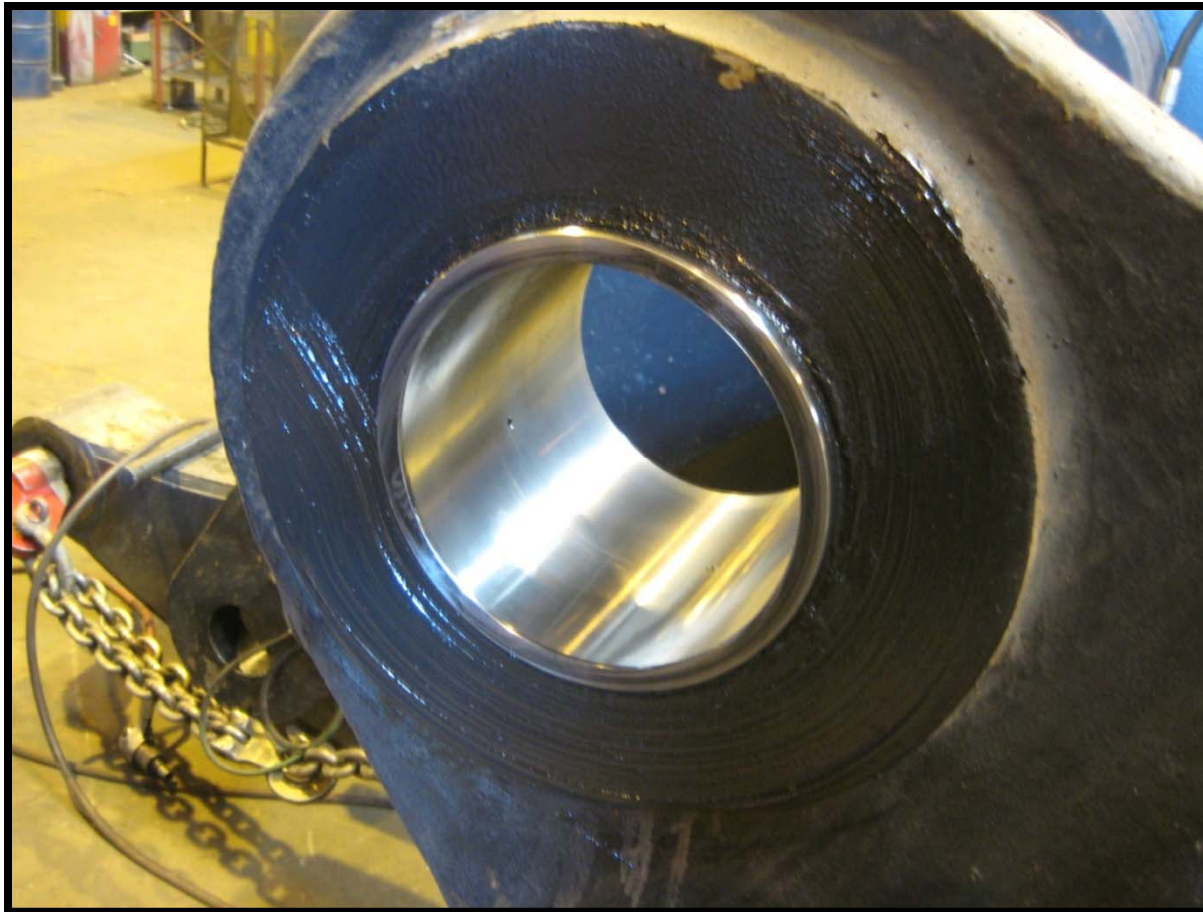
PIN



Component Description

STRAIGHT PINS AND BUSHINGS

SLEEVE



Component Description

STRAIGHT PINS AND BUSHINGS

BUSHINGS



Component

Training
Description

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GEN 1

JOYGLOBAL

STRAIGHT PINS AND BUSHINGS

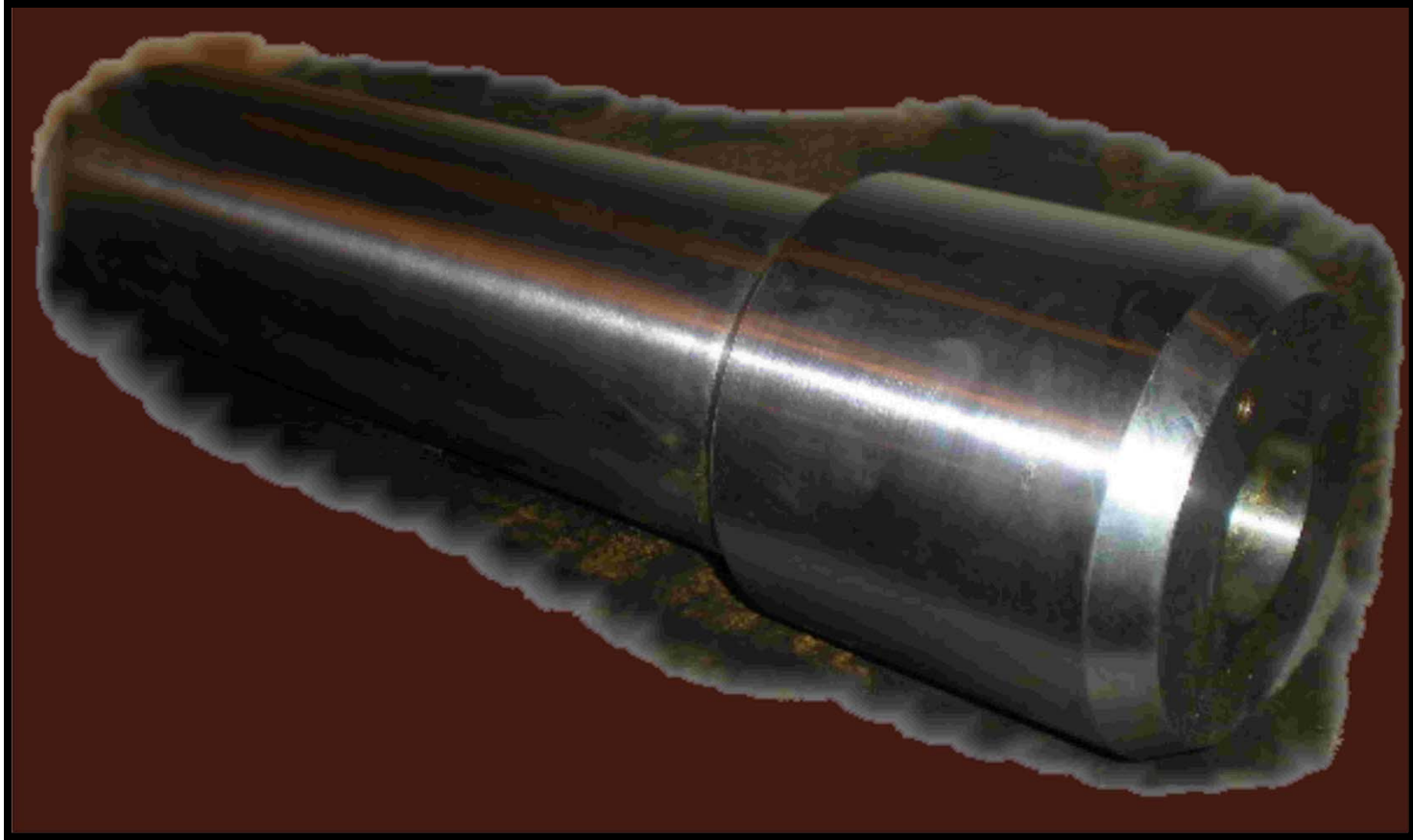
SHIMS RETAINER PLATES



Component Description

STRAIGHT PINS AND BUSHINGS

PIN



Component Description

STRAIGHT PINS AND BUSHINGS

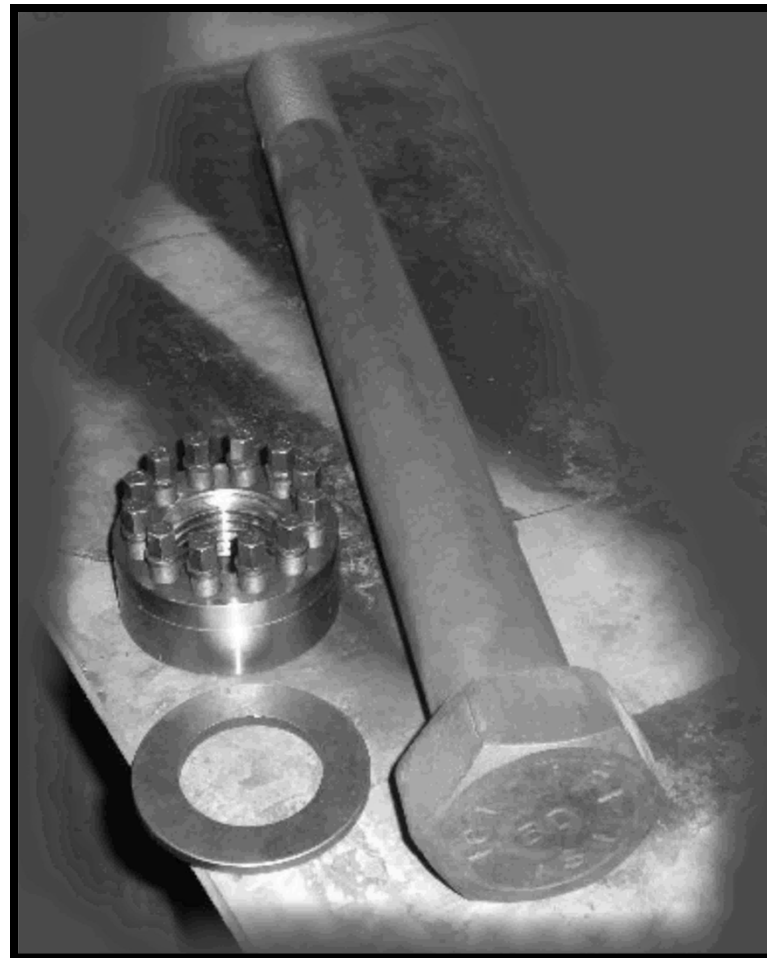
CAPTURE SLEEVE



Component Description

STRAIGHT PINS AND BUSHINGS

BOLT AND SUPER NUT



Component

Training
Description

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GEN 1

JOYGLOBAL

STRAIGHT PINS AND BUSHINGS

SUPER NUT AND WASHER



Component

Training
Description

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GEN 1

JOYGLOBAL

BUSHINGS AND PINS

Possible problems.

Loose movement

Causes.

Loss of clamping force of capture washers.
Loss of bolt torque.

Noisy movement

Cause.

Lack of grease

Troubleshooting

LUBRICATION



Make sure that there is fresh grease present at the joint.



Check injector settings.



Make sure there is grease in the grease reservoir



Check for broken or loose grease lines.

Troubleshooting

JOYGLOBAL



P&H Brand LeTourneau-Series
wheel loader