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Effective Date: Immediately
Supercedes: N/A
Completion Date: N/A

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SERVICE BULLETIN

Ride Manufacturer: Larson International Inc. Affected Production Dates: All
Ride Name: Ring of Fire & Fire Ball Affected Serial Nos.: All units

Ride Manufacturer: Hi Roller Company Affected Production Dates: All
Ride Name: Ring of Fire Affected Serial Nos.: All units

Ride Manufacturer: LMC, Inc. Affected Production Dates: All
Ride Name: Super Loops Affected Serial Nos.: All units

Abstract Of Issue:

Mandatory inspection requirements for actuator brass gear and actuator operating pressures. Some manuals refer to this assembly as "jactuator".

Reason for Release:

Larson International Inc. has learned that some operators are not following the service requirements supplied in the manual for the ride. As a result, they are failing to properly conduct annual inspections of the actuator brass gear threads. Failure to properly inspect and maintain the actuator brass gear threads, both internal and external, can cause failure of the actuator. Failure of the actuator poses a risk of serious injury or death and damage to the ride. When the threads in the brass gear fail this allows the top section of the ride to fall during erection or disassembly causing severe damage to the main section as well as the top section. Abnormal wear and load is created by allowing dirt and foreign objects to accumulate on the screw shaft or from lack of lubrication.

Caution: Actuator assembly should never be run without proper lubrication.

Action To Be Taken:

ANNUAL ACTUATOR INSPECTION:

1. Remove actuator brass gear from actuator assembly and degrease.
2. Visually inspect threads of actuator brass gear to verify that there is no uneven wear, chipping, or cracks.

Larson International Inc. issues notifications for the benefit of owners of amusement rides manufactured by Larson International, Inc. As a service to the industry, and in the interest of employee and public safety, Larson International, Inc. also issues notifications for the benefit of owners of amusement ride equipment for which the manufacturer no longer exists such as LMC, Inc. and Hi-Roller Company. In doing so, Larson International, Inc. does not assume liability for losses associated with amusement ride equipment built by manufacturers other than Larson International, Inc.

3. Measure the face of the internal threads of the actuator brass gear in order to verify that the threads measure not less than 3/16". (See Step 9 of Detail Of Issue)
4. Should the components fail to meet the inspection criteria, the actuator brass gear must be replaced.
5. Reassemble and pack actuator assembly with Texaco EP #1 or equivalent. Apply a thick uniform coating of multiple-purpose grease to lubricate the actuator screw.

ERECTION OF RIDE:

1. The actuator screw should be cleaned and re-greased each time after moving the ride and prior to erection. This reduces wear on the actuator assembly.
 2. **Caution:** Never run actuator pressures above 2100 psi. The actuator should operate smoothly at pressures below 1900 psi. If at any time during use of the actuator there is jerkiness or uneven movement do not attempt to complete erection of the ride. Carefully bring the top section back down to the stowed position and inspect both the actuator screw and brass gear.
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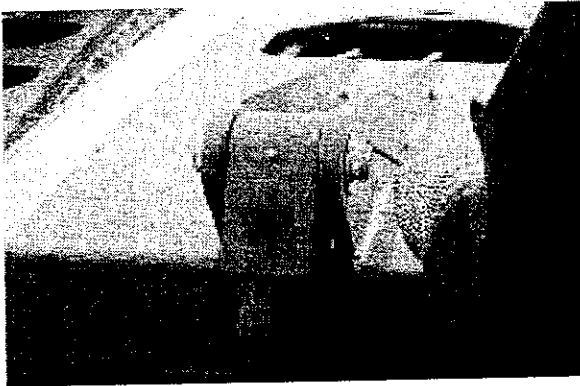
Detail Of Issue:

(Text/Drawings/Schematics)

The following procedure is to be done while the ride is in transport position.

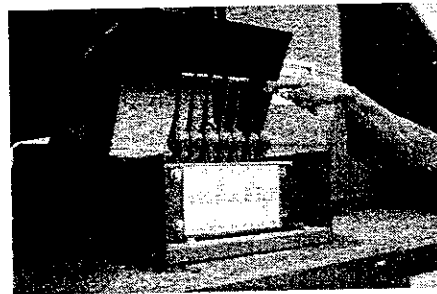
STEP ONE

Remove cotter keys from actuator screw.



STEP TWO

Relieve pressure from pin by moving hydraulic levers.



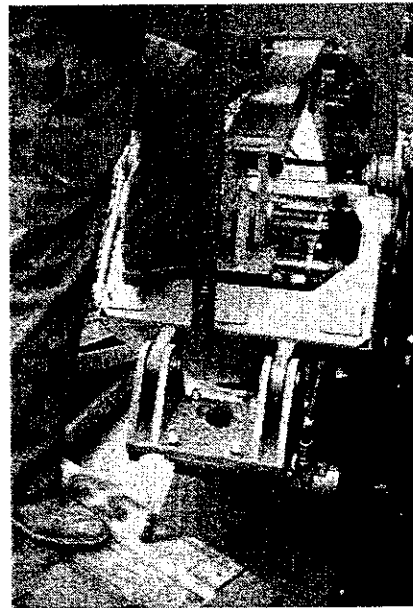
STEP THREE

Remove pin.



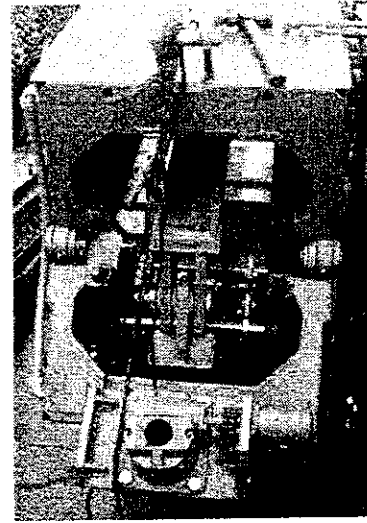
STEP FOUR

Remove actuator screw.



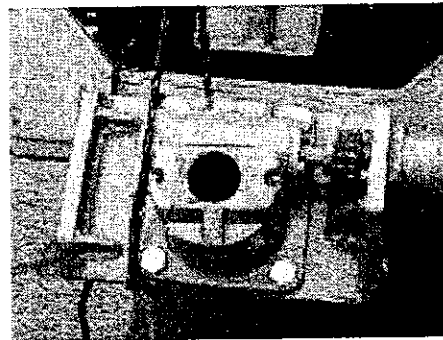
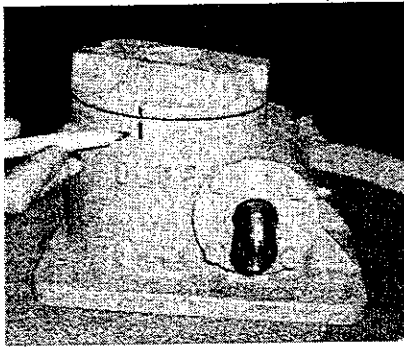
STEP FIVE

Tie up actuator mounting assembly for ease of work



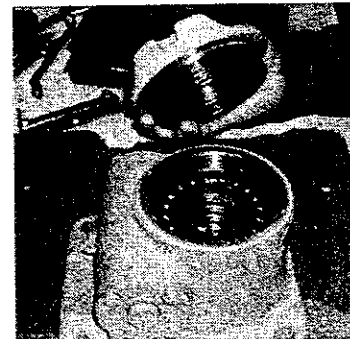
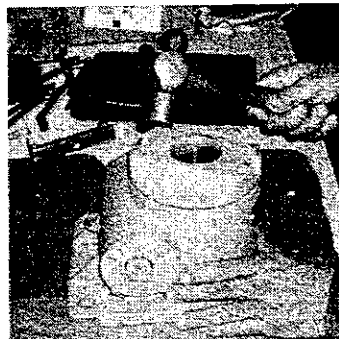
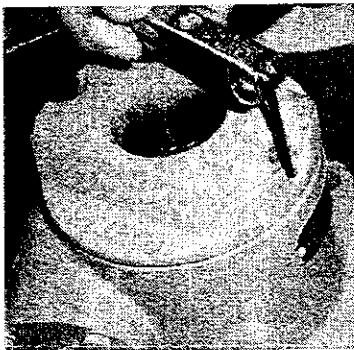
STEP SIX

Mark actuator gearbox assembly and cap before removing. (Work can be performed without removing gearbox actuator assembly from ride.)



STEP SEVEN

Remove cap on actuator gearbox by removing screws, tapping with hammer, and unscrewing cap.

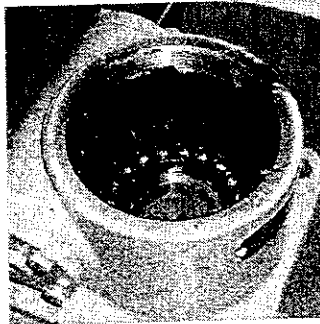
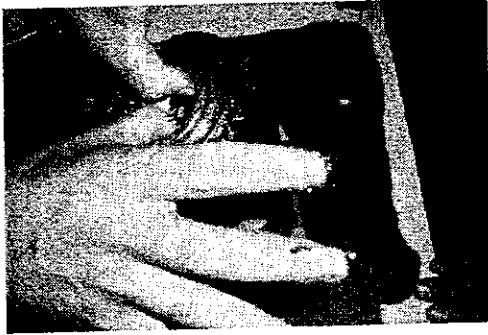


STEP EIGHT

Remove bearing and actuator brass gear and inspect threads on gear. Degrease and inspect brass gear and bearing.

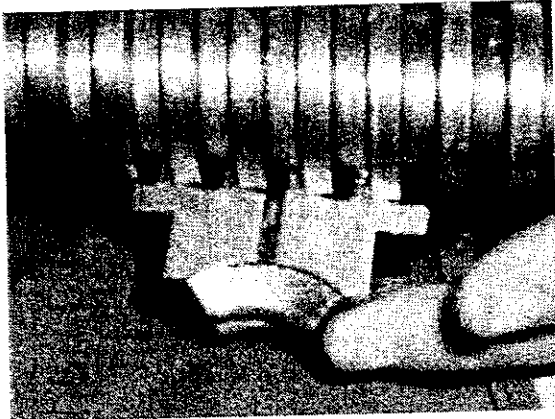


WARNING: Replace brass gear if threads are less than 3/16".

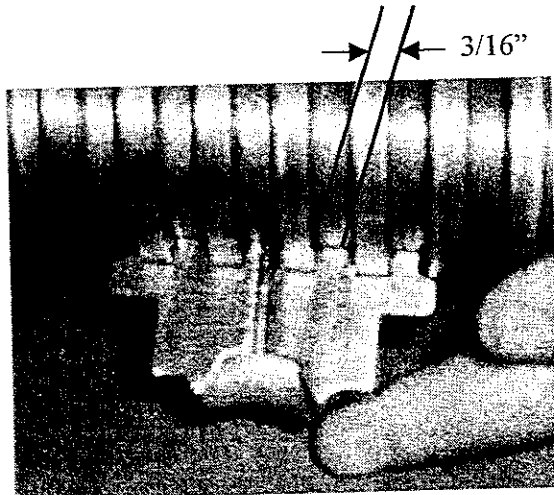


STEP NINE

If brass gear threads are less than 3/16", install new brass gear. If threads are acceptable, reinstall.



UNACCEPTABLE



ACCEPTABLE

STEP TEN

Reassemble the entire actuator gearbox assembly.



ATTENTION: Ensure bearings are in proper position and pack with Texaco EP #1 or equivalent lubricant.

Align marks on cap and gearbox by tapping with hammer.



ATTENTION: The bearings have moved out of position if, after hand screwing and tapping, the marks do not align.



WARNING: Do not over tighten and get actuator gearbox in a bind.

STEP ELEVEN

Reassemble unit on ride utilizing new cotter pins. Grease screw and zerk fittings.