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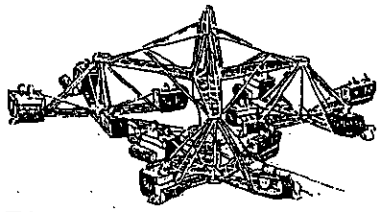
FERRIS WHEELS



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BIG ELI

Wheel Bulletin No. 950317-1

Applies to Eagle and Double Eagle Serial Nos. 4-90 through 27-95
Applies to HY-5 II Serial Nos. 81-91 through 89-94

Date: March 17, 1995
Subject: Rim Cable Turnbuckle Pins

1. In the course of testing an Eagle at Eli Bridge Company a very serious problem developed with the turnbuckle pin used in the pair of rim cables which make the final connection when the Wheel is unfolded.

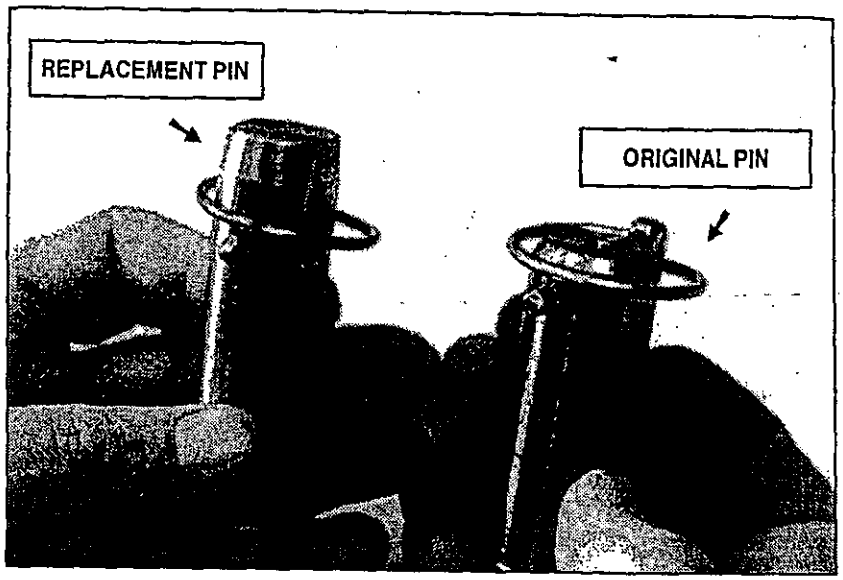
2. One end of the turnbuckle is permanently connected to the spoke with a bolt and self-locking nut. The other end of the turnbuckle must be disconnected every time the Wheel is folded, so that end has been fitted with a pin secured with a Klik-pin. The pin which has been used up to the present time is the pin which was supplied to us by the cable manufacturers. The hole in the pin is close to the end of the pin, and we have found that it is possible for the Klik-pin to be shoved off the pin without unlocking the Klik-pin.

3. In our testing procedure, the Eagle had been running for approximately 9.5 hours when for some reason not explainable the Klik-pin apparently worked out of the pin, the pin fell out, and the rim cable came loose.

4. This has been spelled out to you specifically so that you will understand the seriousness of this problem.

Engineering Bulletin # 950317-1
Date: March 17, 1995
Subject: Rim Cable Turnbuckle Pins

5. We are convinced the problem was with the pin. Therefore, we have prepared a new design pin with a longer tapered end. The Klik-pin cannot be removed unless it is first unlocked by pulling open the ring.



6. Each Wheel requires two pins of this new design. We are furnishing them to you at no charge. It is imperative that you get rid of the old pins and immediately install the new ones we are sending you.

7. We consider this modification to be mandatory, immediately on receipt of the pins. The pins are in production at the present time and will be shipped to you as soon as they are available.

Lee A. Sullivan

Chairman of the Board
ELI BRIDGE COMPANY

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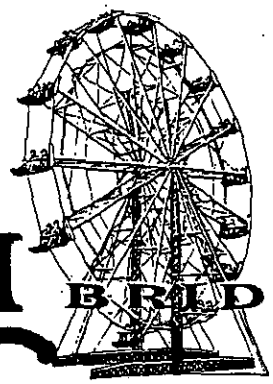

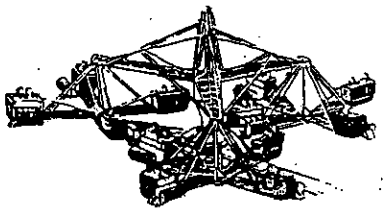

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BIG ELI

Bulletin No. 950427-1

Applies to All Eagle and Double Eagle Wheels
Applies to All HY-5 and HY-5 II Wheels

Date: April 27, 1995
Subject: Winch Cable

It has come to our attention that a winch cable on an Eagle 16 broke during dismantling of the Wheel. We have been using such a cable since about 1968 on every HY-5, HY-5 II, Eagle 16, and Double Eagle Big Eli Wheel, and until now we have never had a report of the failure of one of these cables.

This bulletin is being directed most specifically to owners of Eagle 16 and Double Eagle Wheels since there is a higher load on the winch cable on these Wheels than on HY-5 or HY-5 II Wheels. Therefore, there is more reason to be concerned about the soundness of the winch cable. Even so, the same care should be used on the winch cable for the HY-5 and HY-5 II Wheels.

The static maximum load on the winch cable was calculated to be 5329 pounds. Measuring an actual load, the maximum cable tension was found to be 4771 pounds, with the average between the calculated load and the actual load being 5050 pounds. The calculated and measured loads deviated less than 6% from the average.

From 1968 to 1989 the winch cable we supplied was 1/2" 6x37 IWRC extra improved plow steel, which, according to the manufacturer, had a breaking strength of 12.6 tons, or 25,200 pounds. Beginning in 1989 we began supplying a winch cable that was 1/2" 6x26 WS RRL Flex-S IWRC, with a breaking strength of 15.3 tons or 30,600 pounds.

The lesser strength cable even so has a breaking strength that is five times the 5050-pound average.

Engineering Bulletin # 950427-1
ate: April 27, 1995
Subject: Winch Cable

The strength of a cable involves many factors, each of which can affect the life of the cable. The following guidelines will allow an economical and reasonable service life, while maintaining a high degree of safety as far as preventing damage to the ride or possible injury to the passengers is concerned.

Replace a winch cable if any of the following conditions exist:

A. Kinking, as shown in Picture No. 1. Sometimes this has occurred when the winch cable has been pulled too tightly around the ends of the A-frames when folded for traveling.

B. Crushing or flattening of the cable because it has not been wound evenly on the winch drum. See Picture No. 2.

C. Bird caging, as shown in Picture No. 3, where the cable strands have expanded, leaving a "bird cage" in the middle.

D. Severe stretching occurring in a short section of cable, indicated by a marked reduction in the diameter of the cable.

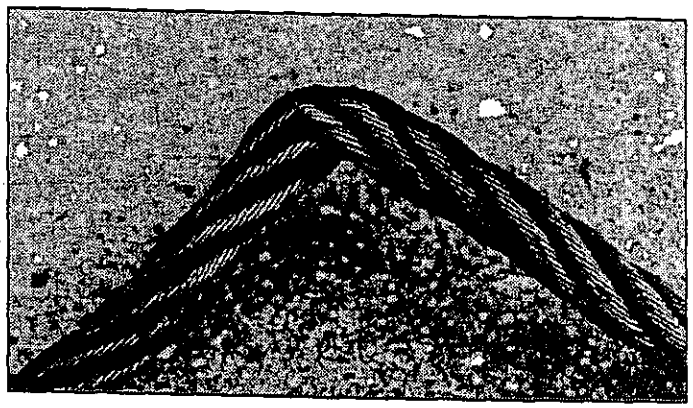
E. One strand in which 75% of the wires are broken.

F. General evidence of severe corrosion:

1. Rust appearing to stem from the interior of the cable.

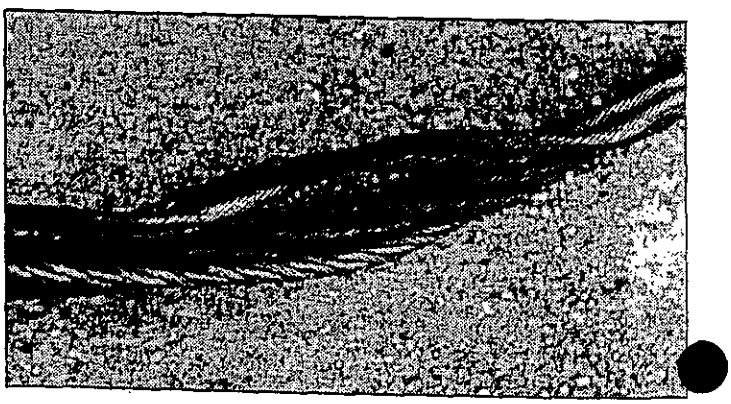
2. Cable appears clean at present, but previous corrosion is evident from pitted condition of the wires.

G. A number of wires, equal to the number of wires in a strand, being broken in the length of one rope lay, where "lay" is the length along the cable for a single strand to make a complete turn around the cable.



Picture No. 1

Picture No. 2



Picture No. 3

Engineering Bulletin # 950427-1
Date: April 27, 1995
Subject: Winch Cable

Snagging of the cable can cause broken strands. Dirt on a cable can act as an abrasive element, which will accelerate wear. Flexing of the cable around a drum causes the individual wires to wear against each other. The smaller the drum, the more wear will occur. Whenever there is gradual breaking of individual wires, this increases the loading on the remaining wires, which will shorten their life. Sudden jolts caused by a heavy load suddenly applied can greatly increase the loading on the cable.

Some of these factors will occur regardless of how well the cable is maintained. Even though we have had only a single report of a broken cable, we feel that it is extremely important that the winch cable be carefully examined to see if any damage found would fall within the guidelines above for determining when a cable should be replaced.

A winch cable should be replaced any time obvious damage is found, but because of the importance of the winch cable in the safe operation of the ride it should be replaced every five years. We consider this to be a mandatory requirement.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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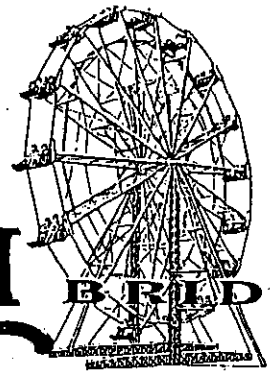

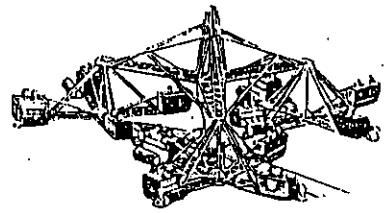

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BIG ELI®

Bulletin No. 950427-4

Applies to HY-5 & HY-5 II Wheels Serial Nos. 1-68 to 81-90
Applies to Eagle & Double Eagle Wheels Serial Nos. 1-89 to 8-90

Date: April 27, 1995
Subject: Star Light Roller Panel Channels

It has come to our attention that on a 19-year-old HY-5 one of the roller channels on a star light panel came loose when all four of the sheet metal screws holding it were lost. In 19 years it may be that the screws or the holes in the panels simply rusted away. All we know for certain is the four screws were missing.

It is potentially dangerous for any part of the rotating structure to become loose on any Big Eli® Wheel. In addition to normal vibrations when the ride is operating, trailer-mounted rides are subjected to heavy vibration because of traveling on the highway, and so it is a particular concern that all parts be checked regularly to be certain they are securely fastened.

On December 28, 1990, Eagle 16 Wheel serial number 9-91 was the first to be equipped with stainless steel star light panels and the roller channels were riveted to the star light panels with stainless steel Pop rivets. The first HY-5 II so equipped was serial number 82-91, which was shipped on September 4, 1991. All later serial numbers of Eagle 16 and HY-5 II Wheels have had the stainless steel star light panels with riveted roller channels.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950427-4
Date: April 27, 1995
Subject: Star Light Roller Panel Channels

We believe this use of stainless steel Pop rivets will ensure much longer and more positive fastening of the roller channels to the star light panels. We consider it mandatory that all existing star light panels, on trailer-mounted Big Eli Wheels delivered before December 28, 1990, have the original sheet metal screws holding the roller channels to the star light panels be replaced with stainless steel Pop rivets.

On new star light panels the 3/16" diameter stainless steel rivets we are using are identified as follows:

Pop SSD 66 SSBS

The original hole size was made with a No. 25 drill size (.1495" diameter), and for 3/16" diameter stainless steel rivets the hole side should be increased to a No.11 drill size (.1910" diameter). If you find the rivets are loose in the holes because of rusting or wear, it will be necessary to go to the next larger size of rivet, because the rivet will not develop full strength if it is not a good fit in the hole. This might also require drilling the holes in the roller channel and star light panel to fit the next larger stainless steel rivet.

On HY-5 and HY-5 II Wheels, 96 rivets will be required, four per roller track. On Eagle 16 and Double Eagle Wheels 128 rivets will be required, four per roller track. These rivets are available from Eli Bridge Company.

To repeat, we consider this modification mandatory on all HY-5 and HY-5 II trailer-mounted Wheels delivered before September 4, 1991, and all Eagle 16 and Double Eagle trailer-mounted Wheels delivered before December 28, 1990.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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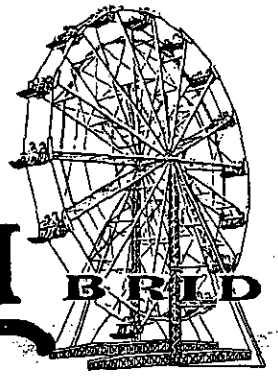

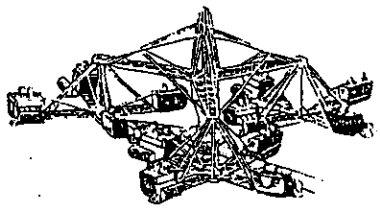

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BIG ELI

Bulletin No. 950501-1

Applies to All Eagle, Double Eagle and HY-5 II Wheels

Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

The axle end of the spoke stack on all Eagle 16, Double Eagle 16, and HY-5 II Wheels is held together with spoke tenon chain links, spoke tenons, and assembly pins. During normal setup, take-down, and transportation over the road, the assembly pins will wear. Experience has shown that the pins wear the most where the spoke tenon bears against the pin. This is between the two spoke tenon chain links at each pin connection. Also, the pins nearer the top of the spoke stack (when the Wheel is folded for transport as in Figure 1) wear the most, with wear decreasing as you go from spoke to spoke down through the spoke stack, so that the pins with the least wear are at the bottom of the spoke stack. The more a Wheel is set up, taken down, and transported over the road, the more pin wear will occur.

Figure 1

INSPECTION:

Initially inspecting for wear can be done easily with the Wheel folded for transport. The distance between the master spoke tenon and the next spoke tenon must be measured to the nearest 1/32" on each side.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950501-1
Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

The drawing shown in Figure 2 shows where to take the measurement.

On an Eagle 16 or a Double Eagle 16, that dimension should be 5.0625" (5-1/16") to 5.125" (5-1/8"). On a HY-5 II, that dimension should be 5.15625" (5-5/32") to 5.21875" (5-7/32"). A measurement that is larger than the larger of the above dimensions indicates that the assembly pins are probably worn and require further inspection.

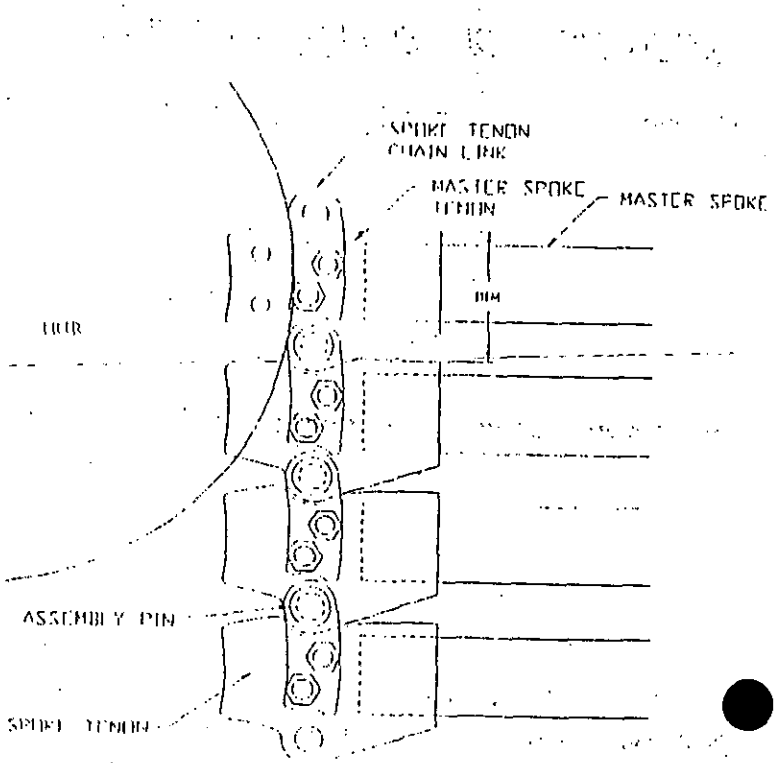

Figure 2

Further inspecting the assembly pins can be accomplished with the Wheel folded for transport without removing the assembly pins which would cause the spoke stack to fall. All of the assembly pins should be inspected one at a time by looking at the pin where the tenon bears against it between the two spoke tenon chain links. This can be done by loosening the nuts on the two bolts which attach the spoke tenon chain links and the spoke tenon.

CAUTION: DO NOT TAKE THE NUTS COMPLETELY OFF THE BOLT.

With the nuts loosened, pry the spoke tenon chain link on the inside of the Wheel back away from the spoke tenon enough so that the assembly pin can be seen where the spoke tenon bears against it. A worn pin will have a smaller diameter where the spoke tenon makes contact with it. The original equipment pin is one inch in diameter. If you can see that any part of the pin is worn by .0625" (1/16") as shown in Figure 3, the pin must be replaced. Be sure to retighten the nuts on each spoke tenon chain link before loosening the nuts on the next one to be inspected.

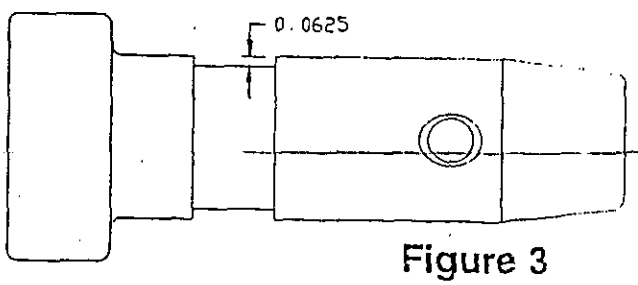

Figure 3

If the pin holes in the spoke tenon chain link or the spoke tenon have elongated .0625" (1/16") to a total length of 1.0625" (1-1/16"), then the spoke tenon chain links and the spoke tenon should be aligned as closely as possible and then reamed out to a diameter of 1.0625" (1-1/16"). Then an oversize pin should be installed.

Engineering Bulletin # 950501-1
Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

HOW TO REPLACE THE ASSEMBLY PINS:

Replacing worn pins must be done one pin at a time because each assembly pin is holding the weight of the spokes hanging below it.

CAUTION: THE SPOKE STACK MUST BE SUPPORTED SO IT DOES NOT FALL WHEN A PIN IS REMOVED FOR REPLACEMENT.

This can be done by pulling up from the top spoke or by blocking up under the bottom of the spoke stack. Be sure that whatever is used is capable of supporting a minimum of 3400 lbs. for an Eagle 16, 4150 lbs. for a Double Eagle 16, or 2500 lbs. for a HY-5 II on the side of the spoke stack where the pin is to be removed.

A worn pin will usually be difficult to remove because the spoke tenon will rest on the worn smaller diameter of the pin so that the pin hole in the spoke tenon is not in line with the pin holes of the spoke tenon chain links. The spoke stack must be moved up or down until the holes are lined up enough to remove the worn pin and replace it with a new pin. The replacement pins should be lubricated to help in assembly and to reduce pin wear. Once the new pin has been installed and the washer and cotter pins replaced, the procedure can be repeated on other pins that need replacement.

Approved replacement pins are available through Eli Bridge Company.

Name	Eli Part #
Assembly Pin - 1" (standard)	283 110
Assembly Pin - 1-1/16" diameter (oversize)	283 110A
Assembly Pin - 1-1/8" diameter (oversize)	283 110B

INSPECTION SCHEDULE:

The mandatory inspection must be performed every twelve months. If you find that you are developing enough wear to require pin replacement in twelve months time, then the time between inspections must be reduced.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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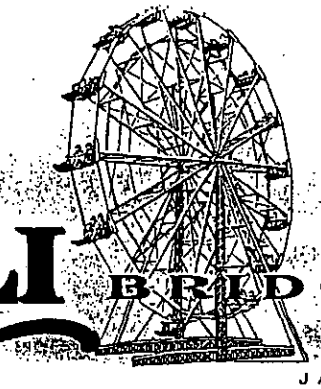

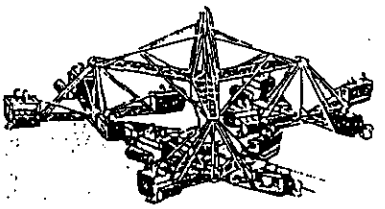

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BIG ELI

Bulletin No. 970129

Applies to all servo-controlled, two-directional HY-5 II, Eagle 16, Double Eagle, No. 5 and No. 16 Wheels

We have been informed that there have been occurrences of servo-controlled Wheels going "out of control", at which time they started running backwards unexpectedly while in the neutral (stop) position. Our position is that if the risk exists, the safest action to take is to shut the Wheel down until the problem is eliminated.

This condition is very dangerous, especially if the ride operator or passengers are on the loading platform or in the path of the Wheel when it starts moving.

There have been several causes suggested for this condition including a) the neutral leg going out on the power source, b) the controller board being bumped loose while traveling or c) burned out, d) water in the joystick device or e) a cracked gasket under the amphenol plug, (which allows hydraulic fluid to leak into the plug which breaks contact and the ride takes off).

The problem is tied in each case to the electronics and computer components. We have, therefore, designed a retrofit kit for the control wherein the servo, the joystick, and the control board are all removed and a mechanical control device is installed. Retrofit kits for the Sundstrand hydraulic transmission are available from us right now for $1,500 F.O.B. our factory, and kits for the OilGear hydraulic transmission will be available the middle of February (which will probably run about $2,000 or less). **We consider this modification to be mandatory.**

We have an alternative available as an immediate solution for OilGear customers. It is to purchase a new Sundstrand hydraulic unit with the retrofit kit (already partially attached). If you have an older OilGear unit this may make the most sense as we have obtained a special pricing on the Sundstrand transmission from our dealer. The transmission and retrofit kit together are $4,000.00 F.O.B. our factory. These prices are in effect until May 1, 1997.
There will be complete installation instructions provided with the kit.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Additionally, our customer service tech is available by phone 5 days a week from 7:00 a.m. to noon and 1:00 to 4:00 p.m. (CST) Monday through Friday.

If you prefer to have our technician perform your installation at your expense, please contact us as soon as possible so trips to a particular area of the country can be combined and the travel expense to you reduced.

We have researched this problem and find no better or less expensive way to assure that the "out of control" condition cannot occur. Nor have any of our customers shared with us if they have found a solution. Safety must remain the foremost consideration. The "up side" is that replacement costs for the components on the retrofit system are considerably less than the electronic components and they are much less sensitive to the environment.

I know that every day your Eli Wheel is down is a problem and I apologize for the inconvenience. Please call if you have any questions of me or our customer service staff. Thank you for your cooperation.

Best regards,

Patty S. Rainey
President/CEO

UPDATE OF INFORMATION CONCERNING PREVIOUS BULLETIN #970129

To: All owners of servo-controlled, two-directional HY-5 II, Eagle 16 and Double Eagle, No. 5 and No. 16 Wheels:

DATE: April 17, 1997

We have finally completed a satisfactory retrofit for both the OilGear and Sundstrand transmissions. We apologize for the inconvenience in not completing this sooner. We went through a number of trials that worked well on the test bench but were not satisfactory on the Wheel.

We also need to clear up some confusion. If you have the brake-ratchet control on your Wheel now, you DO NOT NEED this retrofit. Your Wheel is not servo-controlled. The change was made in 1988 and 1989 on the HY-5 II's, when both were available for a period of time.

The servo-controlled Wheels are equipped with a joystick. Our original plan was to discontinue the joystick and servo-control which was met with opposition from some customers because they liked the ease of operation of the joystick.

The manual control kit for the Sundstrand (as installed on the Eagle in Gibsonton) is working well, but the manual control unit for the OilGear was unsatisfactory. Certain features in the joystick and servo systems differ from the OilGear to the Sundstrand. Consequently, the retrofit kits are different.

The OilGear retrofit retains the joystick, adding a valve and footswitch kit for $1,500.

There are two options for Sundstrand transmissions: either the manual control kit with a pintle replacement for the servo for $1,500, or a footswitch kit for $300. All prices are f.o.b. Jacksonville. If you wish to have our Customer Service Technician do the installation, there will be additional travel expense and daily time charges.

We are slowly getting the parts in from our suppliers and will ship kits to those of you who have ordered them as soon as all the parts come in and they can be kitted up with the appropriate hoses, fittings and wire. If you ordered but have not received your kit, please call us with your location on the road so we can ship to the correct address.

Thanks for your cooperation and have a good season.

ELI BRIDGE COMPANY
800 Case Avenue
Jacksonville, IL 62650 USA
Phone: (217)245-7145
FAX: (217) 479-0103

Bulletin No. 970417

Release Date: 4/17/97
Effective Date:4/17/97

SERVICE BULLETIN

Ride Manufacturer: ELI BRIDGE COMPANY
Ride Name: HY-5, HY-5 II, Eagle 16 and Double Eagle Wheels
Model Number: All ELI trailer-mounted Wheels

Affected Production Dates: All
Affected Serial Nos.: ALL

Abstract of Issue: WHEN THE WHEELS ARE DISMANTLED, IT IS IMPERATIVE THAT THE WINCH CABLE IS PROPERLY SEATED IN THE A-FRAMES OR THE WHEEL WILL DROP CAUSING SERIOUS (and EXPENSIVE) DAMAGE AND POSSIBLE INJURY. If the cable looks like it is not directed into the A-frames, the Wheel can be trued by tightening or loosening the corner guy cables to twist the Wheel around until it is lined up with the A-frame. DO assure that the Wheel is properly trued BEFORE the cable misses the A-frame. Once the cable slides down the outside of the A-frame, it is too late and the Wheel will drop.

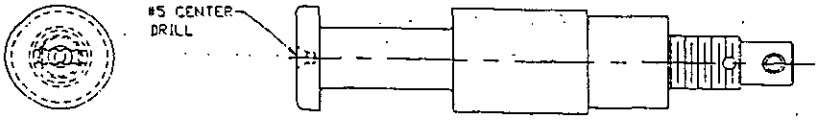
Reason For Release: As the responsibility for moving the Wheel may no longer involve individuals who were factory trained, we see more incidences of Wheels being dropped. We feel it is prudent to remind everyone **(1) to watch the cable, especially while the Wheel is being dismantled, to be sure the cable goes into the A-frames, (2) keep all personnel away from the Wheel where they would be in its path if it fell, and (3) on Eagle 16's and Double Eagles, the seat pin (journal bolt) for the master spoke is different from the others, it has been upgraded to a higher stress material.**

There is a great deal of stress put on the seat pins (journal bolts) on the master spokes. This is where the singletree is attached which is pulled around by the winch cable. The pins are designed to withstand this load. To the best of our knowledge, when the cable is properly seated in the A-frames (derrick) while the Wheel is being lowered by the winch, the pins have not experienced any failure.

However, there have been cases when the seat pins (journal bolts) on the Eagle master spoke were broken from the sudden impact of the drop when the cable missed the A-frames. Since March 1994, we started using a stronger material for the master spoke seat pins to better withstand the multiplied stresses generated by the impact of the drop, if it should occur. The pins are marked on the head by a #5 center drilled hole.

Action to Be Taken: (1) Inform all individuals involved in setting up or dismantling Wheels to ALWAYS watch the cable to see that it seats properly in the A-frame. Failure to do so can cause $30,000 or more in damage to the Wheel. (2) Stay off the spokes and out of the path of the Wheel. Failure to do so can cause death or injury to personnel. (3) When ordering replacement pins for master spokes on Eagles, order the master spoke pins (journal bolts) and be sure they are installed on the proper spokes. **THE MOST IMPORTANT THING IS TO NEVER MISS THE A-FRAME.**

Detail of Issue: Drawing: master spoke seat pin is distinguished by the #5 center drill in the head of the pin.



FROM: Eli Bridge Company
TO: All HY-5 II, Eagle and Double Eagle Customers
DATE: June 8, 1999

BRAKE: WEEKLY CHECKING PROCEDURE

It is absolutely essential that the brakes on an Eagle, Double Eagle, or HY-5 II be checked at least once a week. Brakes that are out of adjustment can be very dangerous because if they are not operating properly they may not be able to provide you with proper stopping and holding when you need it.

1. After the ride is set up and operating, stop the Wheel from turning and lock the brakes by touching the Brake button on the operator's control panel. Then cut off ALL power going to the ride. ALL electrical connections between the ride and the generator must be cut off. There is a built-in small out-of-balance load on the Wheel, so that if the brakes do not hold, the Wheel will begin to drift. Do not add extra weight to the Wheel for this first step, because if the brakes are not operating properly the Wheel might begin to turn rapidly. If the Wheel moves at all with the brakes set and with all power off, then the brake controls are out of adjustment. If the Wheel does not move, then go to step 2. If the Wheel does move, then go to step 3.

2. Turn the power back on, and put two people in each of two seats next to each other. Our testing procedure uses a 600 pound weight in one seat, but by using four large people you should be able to come close to our test weight. Turn on the Wheel and rotate it until the loaded seats are half way up at the 9 o'clock position. Stop the Wheel and set the brakes by pressing the Brake button on the operator's control panel. Then cut off ALL power going to the ride. The brakes should remain locked and not allow the loaded seats to drift downward. If the Wheel remains properly locked, then the brakes are functioning as they should. If the Wheel drifts at all, then go to the next step.

3. The holding valve may need some adjustment. These valves will be part of the power loss equipment. On some Wheels this power loss equipment, which includes a hand pump, is located on the under side of the loading platform, and on others, where a DC power unit is used, it is located on the left side of the trailer, opposite from where the operator stands. On that power loss equipment the holding valve for the brakes is the one closest to the tower.

On the power loss panel under the loading platform there are two holding valves. One is painted red and the other green. The red holding valve is the one which controls the brake operation, and the green one is for the loading platform. Using the red one, first of all be sure that the needle valve next to it is shut off completely, because any leakage through the needle valve will not allow the holding valve to hold properly. Release the jam nut on the holding valve adjusting screw, and back out the adjusting screw all the way. Then turn in the adjusting screw three complete turns. Turn on the Wheel and raise the loaded seats to the 9 o'clock position. Press the Brake button on the operator's control stand, and then cut off ALL power going to the

ride. If the brake holding valve is properly adjusted, the Wheel will not drift downward. If the Wheel moves at all, go to the next step.

4. Turn on the power and lower the loaded seats to the bottom of the Wheel. Turn in the adjusting screw on the holding valve one more complete turn. The raise the loaded seats to the 9 o'clock position, press the Brake button, and then cut off ALL power going to the ride. If the Wheel does not drift, then the holding valve is properly holding as it is supposed to do. Turn in the adjusting one more quarter turn, and then lock the jam nut to hold the adjusted position.

5. If the holding valves will not hold with four complete turns of the adjusting screw, try one more complete turn. If after five complete turns the Wheel will still continue to drift, then most likely the cartridge in the holding valve will need to be replaced. Sometimes a cartridge that has been adjusted many times will not hold the adjustment. A new cartridge when received will be properly adjusted already, so additional adjusting will not be necessary.

6. If you have gone through the adjustment procedure, including replacing the cartridge in the holding valve, and the brakes still do not hold, then call an Eli Bridge Company customer service representative.

7. As with any piece of machinery, All Big Eli Wheels need to be properly maintained at all times in order to function properly. This is certainly true for the brakes and all of the components involved in the brake operation. Watch for loose or abraded wiring and electrical shorts. Be sure that the hydraulic system is able to maintain a pressure of 1,000 pounds per square inch in the braking circuit, and check all fittings for leakage. Air in the hydraulic lines will make the braking spongy. Bleed the air out of the lines by unscrewing the fittings at the brake cylinders to let the air out. There are Belleville washers in the brake linkage, and sometimes they get broken and fall out. If this happens, call the factory for recommendations. The brake shoes will wear in a taper, and it is advisable to reverse the brake pads at the beginning of each season. When the brake pad has worn down so that the metal holder is only ¼ inch from the drive rims, then the brake pad should be replaced. If the drive rims are not lined up properly, they will break out the leading edge of the brake pad.

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Bulletin No. 990609

Release Date: 6/9/99

Effective Date: 6/9/99

SAFETY ALERT

Ride Manufacturer: Eli Bridge Company Affected Production Dates: 1989 to Present
Ride Name: HY-5 II Wheels, Affected Serial Numbers: 74-89 through 89-94
Ride Names: Eagle and Double Eagle Wheels, Affected Serial Numbers: 1-89 through 32-98
Ride Names: Rim Drive Ground Model Wheels with 30 h.p. power units and hydraulic loading platforms

The mandatory items in this Bulletin do NOT apply to cable drive Wheels, ground model rim drive Wheels with brake ratchet control handles, rim drive systems with two-15h.p. power units.

Abstract of Issue #1: A customer just called to advise us of a recent incident on a Double Eagle Wheel. During normal operation, the operator pressed the brake release button, which lowers the loading platform and releases the brakes. This occurred split second before the generator lost power. The loss of power prevented the loading platform from lowering completely, but brakes had just released. Because the load was unbalanced and therefore moved in the direction of gravitational equilibrium, a footbottom hit the loading platform as the Wheel turned and a passenger's ankle was injured. There is only a split second when this can happen, but we now know that it can. A change is being made in the system to install a limit switch that will not allow the brake to release until the platform is down below the footbottom space.

Abstract of Issue #2: In the same conversation about the above, we also learned that our customer's brakes were not holding the load when power was lost. The customer was not aware that occasionally the brakes need to be adjusted. The brakes on HY-5 II, Eagle and Double Eagle Wheels are designed to hold a load in place, even if there is a power loss to the Wheel. The primary component provided for this safety system is the holding valve. If the valve is not adjusted at a high enough pressure level, it will fail to hold an unbalanced Wheel in place in a power loss situation. This safety system should be tested regularly to prevent the brakes from failing.

Reason for Release #1: Because the loss of power at the wrong moment can cause an incident and Eli Bridge Company has no control over the power source for its Wheels, a change in the system needs to be made to prevent a repeat occurrence of the above incident. A limit switch has been selected and tested to keep the brake from releasing until the platform is down and out of the way of the footbottom space.
Reason for Release #2. It became obvious after talking with several other customers subsequent to the above incident, they, also, were not aware of the safety feature built into the brake system, nor how to perform the brake adjustment. The unexpected release of the brake when power is lost is preventable when the system is working properly. A simple testing procedure can determine if the brake system is working properly. This procedure will show how an adjustment can be made to put the system back into compliance if it has gone out of adjustment.

Actions to be taken #1: It is necessary for a mandatory change to the ride. A limit switch needs to be ordered from Eli Bridge Company and installed on the loading platform. This will prevent the brakes from releasing until the loading platform is clear of footbottom space when the Wheel turns. The limit switch kit will be provided free of charge if ordered within 45 days of the of this bulletin.

Actions to be taken #2: Mandatory testing is necessary each time the Wheel is set up and once each week thereafter until the Wheel is moved again. The testing procedure is relatively simple and the instructions for adjusting the valve, when necessary, are included along with this Bulletin. If this procedure does not result in a properly working brake system, call the factory. A testing log for proper documentation is also included. Customers are urged to fill this out and keep it on file.

Serial Number _____

Weekly Testing Certification for Hydraulic Braking on HY-5 II, Eagle and Double Eagle Wheels

The Brake Valve Test should be performed EVERY time the Wheel is set up and at least once every week of operation thereafter. Do NOT run the Wheel if the brakes fail to hold the Wheel when the power is cut.

Date	Signature of person performing the test	Was the Wheel warmed up to operating temperature prior to testing?	Did the Valve perform successfully the first time?	If not, what adjustments were made? What parts were installed?

TO: ALL BIG ELI HY-5 II, Eagle 16 and Double Eagle Wheel Owners

There was an incident on a Double Load BIG ELI Eagle #16 where a drive-rim removable bolt broke during operation. With the cooperation of the owner, the Ohio State Inspection Department, and the other Wheel owners in Ohio, there has been an investigation as to the cause of the break.

The crack started at the end of the threads closest to the shank of the removable bolt and proceeded to break into the shank. By design, there should be no bending load on the threads of the removable drive-rim bolt. But, if the nut and bolt are not sufficiently tightened, the aluminum drive rim and the steel spoke tab which are being held together by the nut and bolt will be allowed to move against each other and eventually wear the holes onto ovals. This looseness lets the pin move and the result is that a load is put on the nut by the tab. This load is transferred to the threads as a bending load, thus eventually cracking the thread until ultimate failure occurs as a break.

Eli Bridge Company feels it has determined the cause and believes it is prudent to recommend to all of the above owners that:

1) Both the drive-rim removable bolts and pivot bolts should be NDT'd using ultrasound or X-ray testing. Any bolts found to have cracks should be replaced immediately.
3) After testing or replacement, all pivot bolts must be lubricated with never-seize on the large shoulder and this should be added to the annual maintenance list/log.
4) The next time the Wheel is folded, the "hub bolts" (the bolts holding the spoke tenons to the bananas which wind around the hub for operation) and the holes in the bananas need to be measured for wear. If there is 1/16" or more total wear in any one connection, then any wear 1/32" or more requires replacement of the piece, by the following tear-down. For instance, if there is 3/64" wear in the bolt and 1/64" wear in the banana, then the bolt must be replaced.
5) The replaceable drive-rim bolt must be torqued to 100 foot/pounds each time the drive rim is installed in the operating position. If the nut is bottoming out on the threads before it reaches proper torque, add a flat washer with enough thickness to allow proper torquing. Do not use a split or lock washer.

If any HY-5 II owner has experienced a removable bolt breaking, please contact Eli Bridge Company immediately.

More information will be forthcoming, but this addresses the main issues of safety in the meantime. Thank you for your help and continued support in the Safety Improvement of the Industry.

PLEASE forward this to anyone you know who can help get it to the Wheel owners. Thank You!

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Supercedes: None
Completion Date: March 1, 2006

SAFETY ALERT

Ride Manufacturer: Eli Bridge Company **Affected Production Dates**: All **Affected Serial Nos**: All
Ride Names: Eagle 16 Wheels, Double Eagle 16 Wheels, HY-5II Wheels

Abstract of Issues: 1) A Double Eagle had a removable drive-rim bolt failure due to the bolt having been in operation beyond its useful life. The threads on the nut and bolt had lost their elasticity and were backing off and being retightened several times a week. During the time the bolt was loose, it wore the hole in the spoke tab into an oval, to the point where a load was applied to the nut, which was not intended by the design. The nut and bolt should always be tight so that the only loads on the bolt are a compression load from the tightening of the nut and bolt and a sheer load on the shank where the aluminum drive rim and the steel spoke tab meet.
2) Both the removable nut and bolt and the pivot nut and bolt should be kept lubricated to avoid rust and corrosion, especially where the steel is in contact with the aluminum drive rim

Reason For Release: 1) There was an incident on a Double Load BIG ELI Eagle #16 where a drive-rim removable bolt broke during operation. With the cooperation of the owner and his staff, the Ohio State Inspection Department, and the other Wheel owners in Ohio, there has been an investigation as to the cause of the break. The crack started at the end of the threads closest to the shank of the removable bolt and proceeded to break into the shank. By design, there should be no bending load on the threads of the removable drive-rim bolt. If the nut and bolt do not remain tightened, the aluminum drive rim and the steel spoke tab which are being held together by the nut and bolt will be allowed to move up and down against each other and eventually wear the holes into ovals. This looseness lets the pin move and the result is that a load is put on the nut by the tab. This load is transferred to the threads as a bending load, thus eventually cracking the thread until ultimate failure occurs as a break.
2) During the investigation we found that occasionally when Eagles & HY-5II's are assembled or disassembled the pivot pin is broken by the torque applied when the drive rim is folded or unfolded if the pivot pin had corroded against the aluminum rim.

Actions to be taken:

1) All Drive-Rim Removable Bolts (and nuts) and Pivot Bolts (and nuts) over five (5) years old must be replaced with new ones before opening the season or by March 15, 2006 if the Wheel is already operating.
2) Any bolt and nut, no matter the age, should be replaced if the nut starts repeatedly backing off the threads after being properly torqued.
3) Drive Rim Bolts (both removable and pivot bolts) need to be torqued to between 75- and 100-foot-pounds each time they are installed.
4) If the nut is bottoming out on the threads before the proper torque is reached, then a flat washer of adequate thickness (not a lock or split washer) should be inserted between the nut and spoke tab to rectify this problem.
5) All existing Drive-Rim Removable Bolts (and nuts) and Pivot Bolts (and nuts) must be replaced with new ones every five years.
6) Both bolts should be kept lubricated and "Never-Seize" (or equivalent) must be applied on the large shoulder of the Pivot Bolts before beginning each season, more often if it operates in climates that cause it to disintegrate in less than a year.
7) The Spoke Tenon Bolt (often called "hub bolt) connections should be checked for wear at least once per year: preferably before the season starts in the Spring, more if the wear is close to the tolerances. Excessive wear on these causes faster wear of drive rim bolts.
   a) If either the bolt or banana is worn 1/32" or more on one side of the spoke stack, it should be replaced with a new one. AND the bolt and/or banana in the same position on the other side of the spoke stack should be replaced at the same time. Failure to replace them both could allow the stack to pull to one side or the other when raising the tower and setting the Wheel up.
   b) If the spoke tenon hole is worn more than 1/32" call Eli Bridge.
8) If your spoke tab holes are wearing into ovals, the tabs should be replaced or they should be reamed out and bushed to bring the hole back to original size. This will help deter the bending stress on the threads. Parts/reamers for both of these options are available from Eli Bridge Company.

NOTE: In February 2006 there will be some minor modifications (for instance, slightly larger radii in the pivot and removable drive-rim bolts for the Eagle and Double Eagle to provide an even more robust design of these bolts.