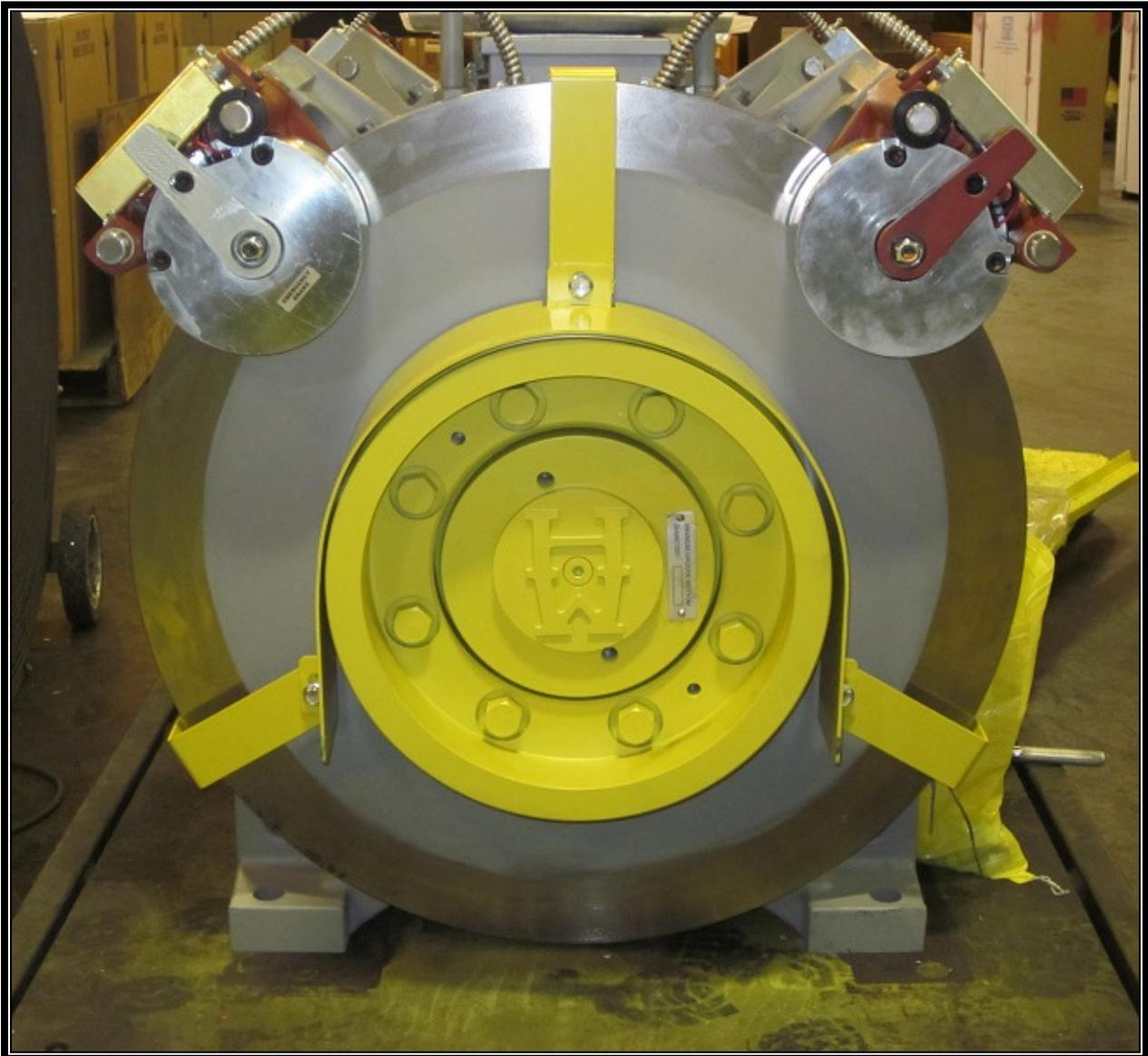


Hollister-Whitney Elevator Corporation

Replacement Manual - Main Shaft Bearing GL100, GL115, GL130 and GL170 Gearless Machines





Hollister-Whitney Elevator Corporation

#1 Hollister-Whitney Parkway
Quincy, IL 62305
Phone: 217-222-0466

Fax: 217-222-0493
e-mail: info@hollisterwhitney.com
www.hollisterwhitney.com

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BEFORE PERFORMING ANY MAINTENANCE ON THE MACHINE BEARINGS, TAKE ALL THE NECESSARY SAFETY PRECAUTIONS TO IMMOBILIZE THE CAR AND COUNTERWEIGHT TO PREVENT ANY UNINTENDED MOVEMENT DURING THE MAINTENANCE PERIOD THAT MAY RESULT IN INJURY OR DEATH!



BEFORE PERFORMING ANY MAINTENANCE ON THE MACHINE BEARINGS, REMOVE ALL ELECTRICITY FROM THE MACHINE AND BRAKES TO PREVENT ANY UNINTENDED MOVEMENT THAT MAY RESULT IN INJURY OR DEATH DURING THE MAINTENANCE PERIOD!



READ THE ENTIRE TRACTION SHEAVE REPLACEMENT PROCEDURE BEFORE BEGINNING ANY OF THE STEPS OUTLINED BELOW. CONTACT HOLLISTER-WHITNEY WITH ANY QUESTIONS PRIOR TO BEGINNING THE TRACTION SHEAVE REPLACEMENT.



DO NOT USE ANY OTHER MACHINE COMPONENT TO LIFT THE MACHINE! USE ONLY THE HOISTING EYEBOLTS WHEN LIFTING AND MOVING THE MACHINE! HOISTING THE MACHINE BY ANY OTHER COMPONENT WILL RESULT IN DAMAGE TO THE MACHINE AND POSSIBLE FAILURE RESULTING IN THE MACHINE FALLING FROM THE HOISTING SYSTEM!

READ THE ENTIRE SHAFT AND BEARING REPLACEMENT PROCEDURE BEFORE BEGINNING ANY OF THE STEPS OUTLINED BELOW. CONTACT HOLLISTER-WHITNEY WITH ANY QUESTIONS PRIOR TO BEGINNING THE SHAFT AND BEARING REPLACEMENT.



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I. Main Shaft Bearing Replacement

- Tools required - 3mm hex key, 9/64" hex key, 5/16" hex key, (2) - 9/16" wrenches (or adjustable wrenches), 3/4" wrench (or adjustable wrench), 1-1/8" socket, 1-1/4" wrench (or adjustable wrench), flat-blade screwdriver, 3 rear cap jack bolts 1/2"-13 with 3" of usable thread, 3 rotor lock bolts 3/4"-10 with at least 2" of useable thread. 2 pieces of 5/8" threaded rod at 18" long, 2 pieces of 3/4" threaded rod at 18" long, 2 heavy duty nuts for the 5/8" rod, 4 heavy duty nuts for the 3/4" rod, 20 ton hydraulic jack with 6" of stroke and the necessary tools to remove the machine from the mounting structure (if necessary.)
- **PARTS FABRICATED BY SERVICE PROVIDER:** front jack support plate (figure 5), rotor support bracket (figure 12), rotor support bar (figure 13), and rear jack support plate (figure 16). Pictures in manual for **reference only**. Fabricated parts to be made and designed to handle work being required of job. Use good judgment and common fabrication practices on all fabricated parts. Read manual and take measurements on machine to determine specifics on fabricated parts.
- Before beginning the main shaft bearing replacement, the counterweight will need to be landed and immobilized in the pit, and the car will need to be hung by a suitable hoisting system within the hoist way. ***IF HOLLISTER-WHITNEY HAS SUPPLIED RAIL LOCK DEVICES FOR THE CAR, THE RAIL LOCKS ARE NOT SUITABLE TO HOLD THE CAR IN PLACE ONCE THE ROPES HAVE BEEN REMOVED FROM THE TRACTION SHEAVE!*** Another method of suspending the car will need to be utilized.
- Once the car has been suspended, and the tension has been removed from the hoist ropes, remove the traction sheave guard by removing bolts "A" and their corresponding lock nuts. Figure 1.
- After the guard has been removed, remove the guard brackets "B", by removing the bolts and washers that attach the brackets to the body of the machine. (Note: bolts behind rotor) Figure 1.

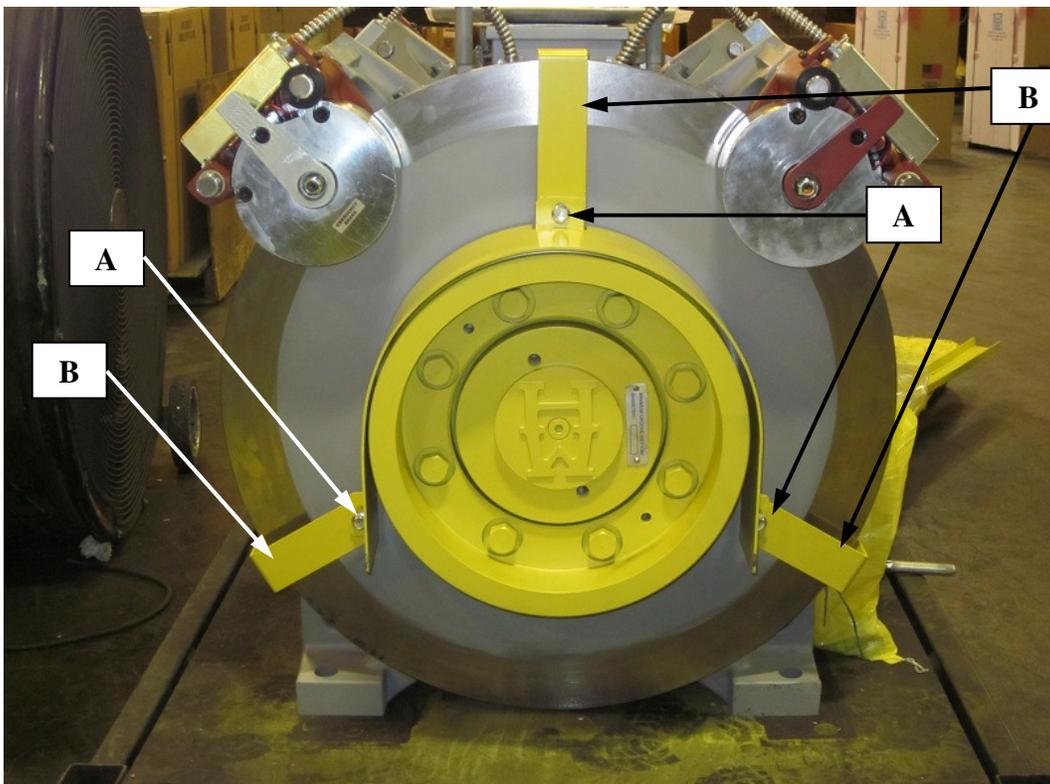


Figure 1



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- Once the traction sheave guard has been removed, remove the hoist ropes from the traction sheave to eliminate any load on the machine during the shaft and bearing replacement.
- After the machine is free of all hanging load, it will need to have the mounting bolts loosened and/or removed in order to move the machine around for adequate clearance to the front and rear of the machine. If the machine is installed in a machine-room-less application, and adequate clearance around the machine cannot be achieved by moving it around on the overhead steel, it may be necessary to remove the machine from the hoist way and place it in an open area for the shaft and bearing replacement.
- If machine must be moved refer to Section II for handling specs. **Note:** Disconnect all appropriate power and controller wiring prior to moving machine. Reconnect after repair.
- To begin the shaft and bearing replacement, first, install the rotor lock bolts. Install 3 bolts into the body of the machine using the holes where the traction sheave guard brackets were mounted. Tighten all 3 bolts firmly against the rotor to help prevent the rotor from moving during the maintenance period. Refer to Figure 2 for the general bolt hole locations and Figure 3 for a general picture of a rotor lock bolt in place.

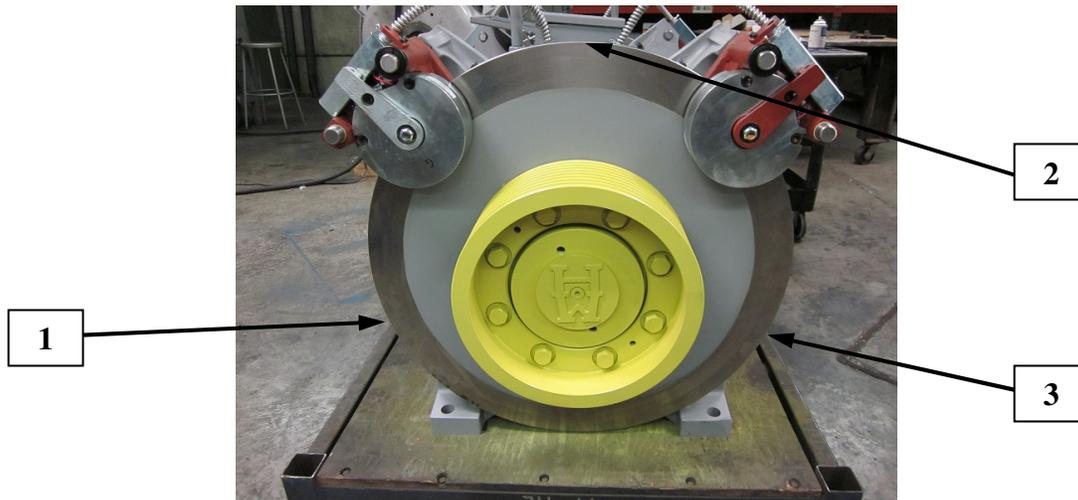


Figure 2

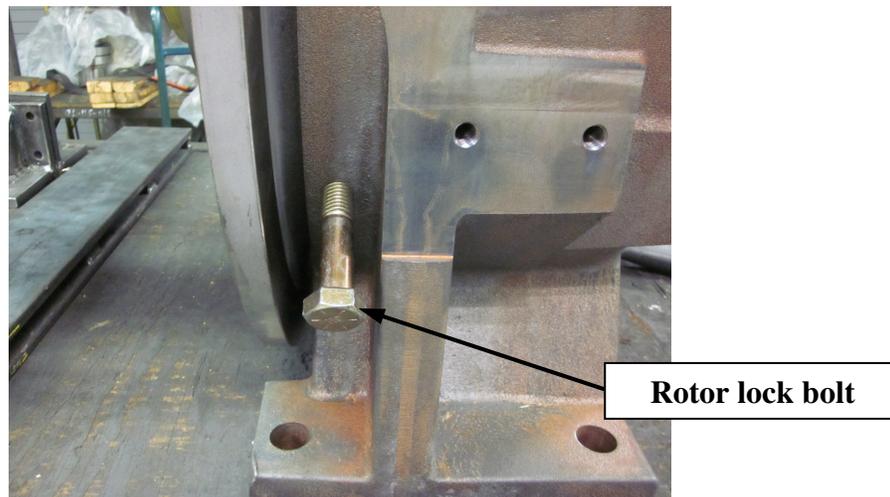


Figure 3



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- After the rotor lock bolts are in place, remove the bolt "A" holding on the "HW" logo plate "B", and remove the logo plate. Next remove 2 of the traction sheave body bolts, "C." It will not matter which 2 bolts are removed, as long as the 2 bolts are on opposite sides of the centerline of the shaft. Refer to Figure 4. (The entire traction sheave may be removed if so desired, but it is not necessary. Follow Bulletin 1156 - "Traction Sheave Replacement" if the traction sheave is to be completely removed.)

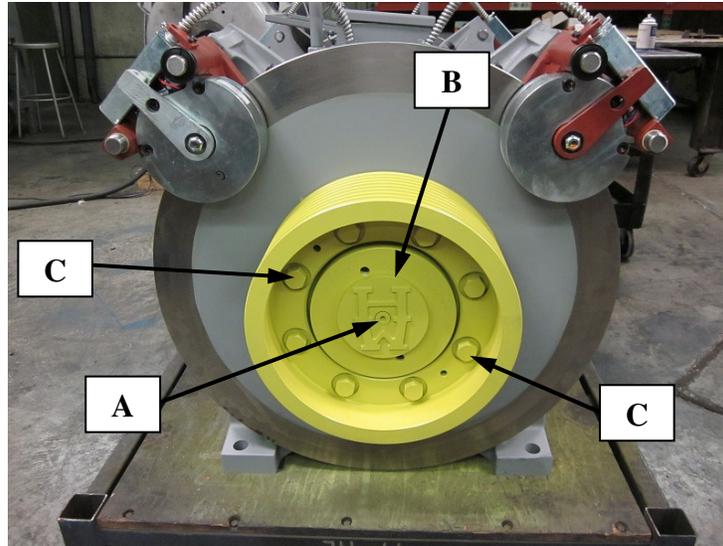


Figure 4

- Next install the 2 pieces of 5/8" threaded rod, "A", into the 2 traction sheave mounting holes in the rotor. With the threaded rod in place, slide the front jack support plate, "B", over the threaded rods, followed by heavy duty nuts, "C." After the basic assembly is ready, hold the hydraulic jack, "D", centered on the machine shaft, and tighten the heavy duty nuts, "C", to hold the jack in place. **DO NOT BEGIN PRESSING THE SHAFT AT THIS TIME!** See Figure 5.

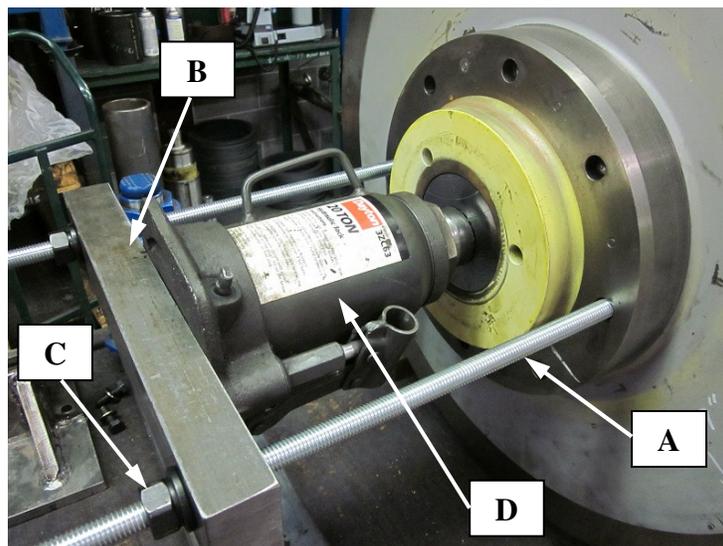


Figure 5



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- With the jack in place at the front of the machine, move to the rear of the machine. Remove the encoder, and then remove the screws "A" from the back cap "B." Refer to Figure 6.

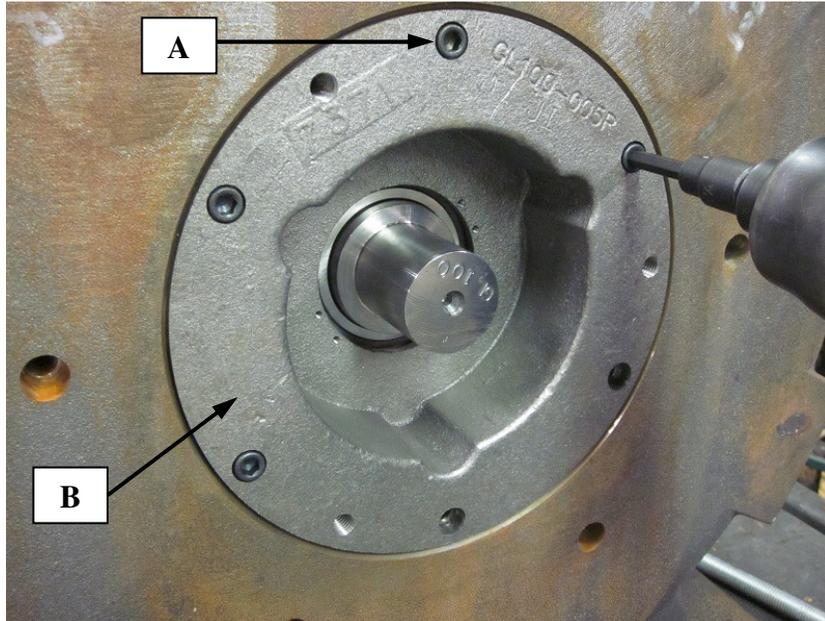


Figure 6 (encoder already removed)

- Once the back cap screws have been removed, install the jack bolts, "A", to remove the back cap, "B", from the machine. The jack bolts are 1/2"-13, with a minimum of 3" of usable thread. Refer to Figure 7.

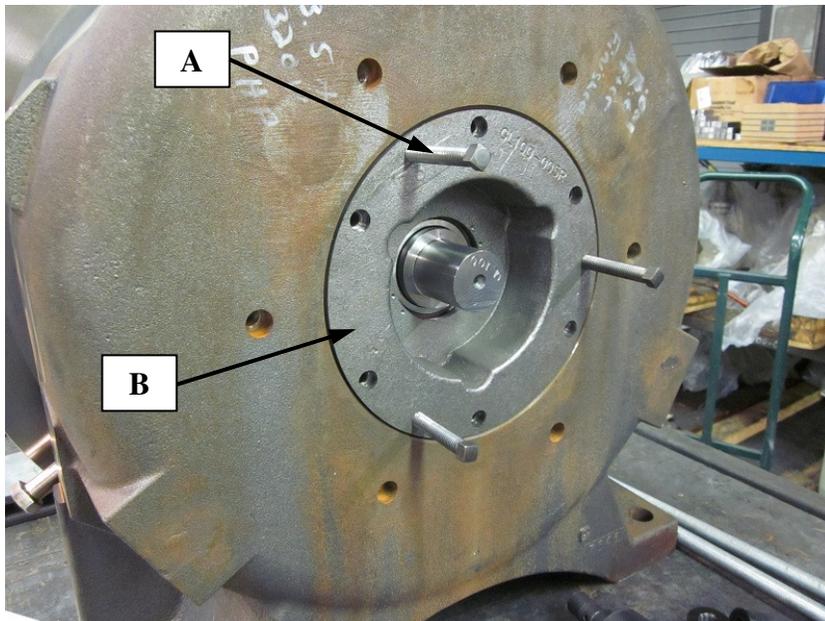


Figure 7



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- After the jack bolts, "A", are installed, begin by turning each jack bolt a couple turns at a time. If one jack bolt is turned to far before the others, it will cause the back cap, "B", to bind within the machine housing making removal difficult. Continue rotating each jack bolt until the rear cap is free from the machine housing. Refer to Figure 8.



BE SURE TO SUPPORT THE REAR CAP AS IT IS REMOVED FROM THE MACHINE HOUSING. ONCE FREE OF THE HOUSING, THE CAP WILL WANT TO FALL AWAY FROM THE MACHINE, CREATING A POTENTIALLY HAZARDOUS SITUATION SHOULD THE FALLING CAP STRIKE OTHER MAINTENANCE PERSONNEL!

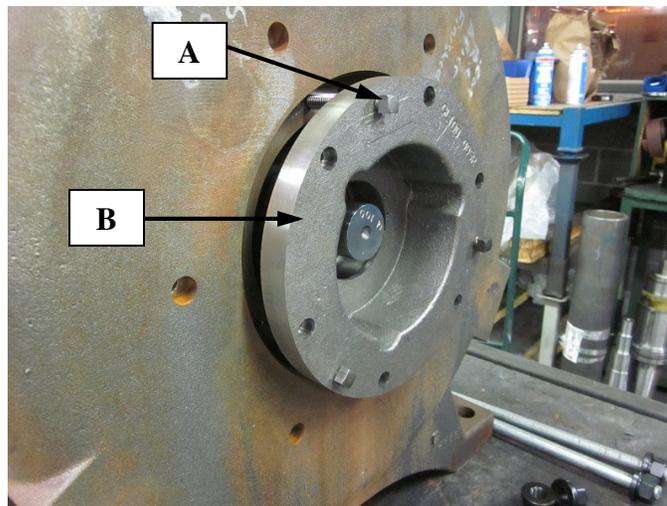


Figure 8

- Next, remove the retaining ring, "A", that is near the front bearing. A large screwdriver, or other suitable tool, can be used to pry the end of the retaining ring to allow it to be removed from the groove in the machine housing. Figure 9 shows the retaining ring, "A", already removed from the groove at the front of the housing.



Figure 9



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Fax: 217-222-0493
e-mail: info@hollisterwhitney.com
www.hollisterwhitney.com

- With the retaining ring removed, the shaft can now be pressed out. Begin actuating the hydraulic jack that was placed at the front of the machine, and slowly press the shaft out through the rear of the machine with the jack. It will require 3"-4" of travel before the shaft and bearing are free of the rotor and machine housing. As the travel approaches 3", begin supporting the rear of the shaft to prevent it from falling from the machine housing once it is completely freed from the rotor and machine housing. Also support the hydraulic jack to prevent it from falling. Once the shaft is free of the rotor and machine housing, the pressure holding the jack in place will be released, allowing the jack to fall if not supported properly. Figure 10 shows the rear of the machine with the shaft laying loosely in the machine housing, and Figure 11 shows the shaft and bearing assembly completely removed from the machine.



FAILURE TO SUPPORT THE MACHINE SHAFT WILL RESULT IN THE SHAFT FALLING FROM THE MACHINE, WHICH MAY RESULT IN DAMAGE TO THE MACHINE SHAFT AND THE MACHINE, AND A POTENTIAL SAFETY HAZARD IF THE SHAFT FALLS AND STRIKES ANY MAINTENANCE PERSONNEL!



FAILURE TO SUPPORT THE HYDRAULIC JACK MAY RESULT IN THE JACK FALLING FROM THE MACHINE, WHICH MAY RESULT IN DAMAGE TO THE JACK, AND A POTENTIAL SAFETY HAZARD IF THE JACK FALLS AND STRIKES ANY MAINTENANCE PERSONNEL!



Figure 10



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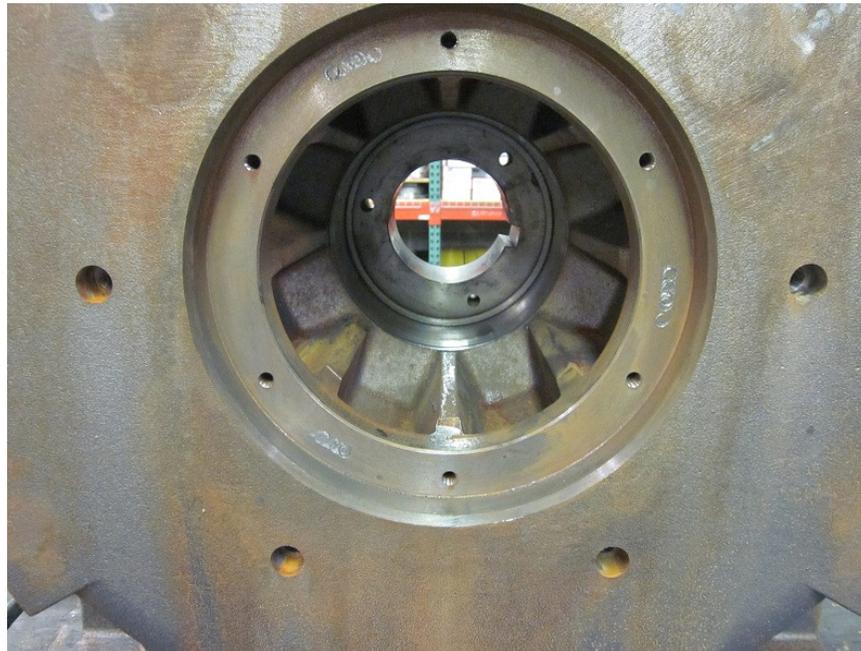


Figure 11

- Once the shaft and bearing assembly have been removed from the machine, remove the hydraulic jack support and threaded rod from the front of the machine.
- After the shaft removal hardware has been removed, fabricate and install two rotor support brackets, "A", in the lowest brake locations on the machine body (Optional Mounting Location #1 and #2 from Figure 1.) If there are brakes located at those mounting pads, follow Bulletin 1159 for Warner Brakes, and Bulletin 1158 for Mayr Brakes, to remove the brakes so the support plates can be mounted. Refer to Figure 12.

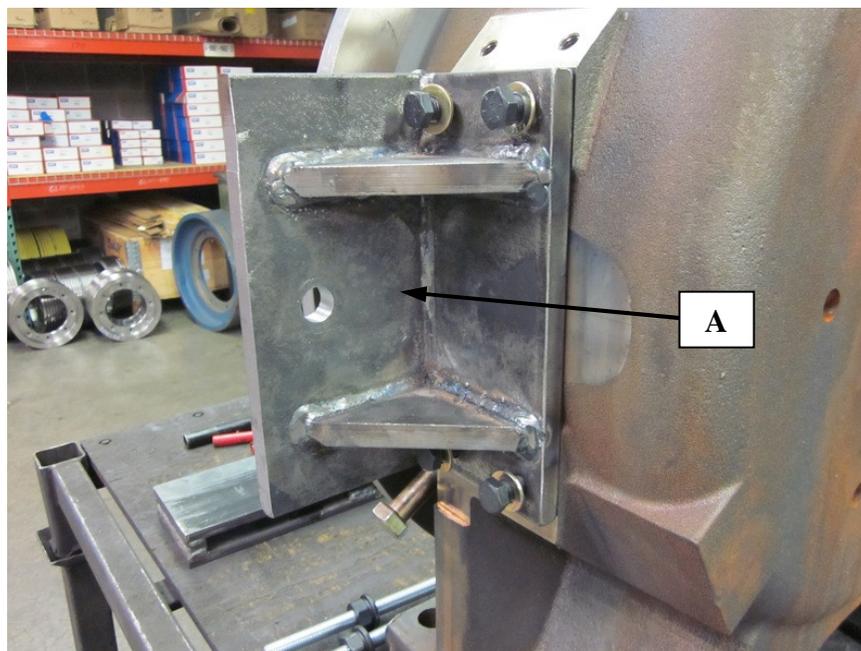


Figure 12



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- After both support brackets, "A", are mounted, install the 3/4" threaded rod, "B", through the brackets and secure the end of the rod towards the rear of the machine with a heavy duty nut. Next, install the rotor support bar, "C", over the threaded rod and across the face of the rotor (or traction sheave, if the traction sheave is still in place on the machine.) Secure the rotor support bar to the threaded rod with heavy duty nuts, "D." Once all the equipment is in place, hold the rotor support bar across the center of the rotor, and tighten all the nuts on the threaded rod firmly to prevent the rotor from pushing forward as the new shaft and bearing assembly is pressed in. Refer to Figure 13.

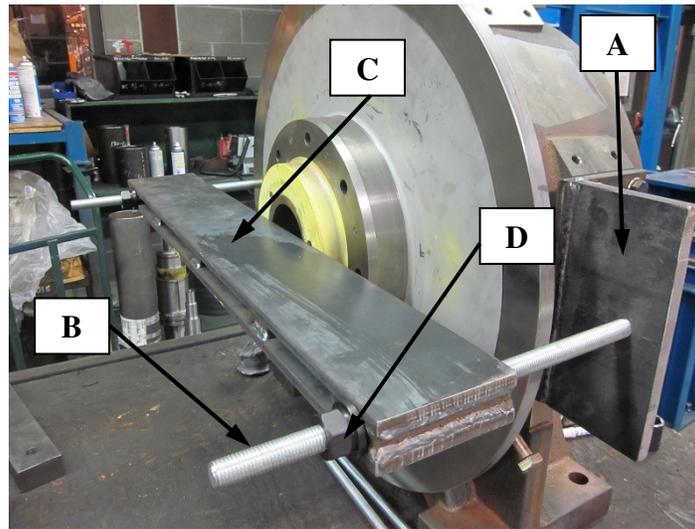


Figure 13

- The new shaft and bearing assembly will be shipped with only 2 items. The first item will be a new shaft with the proper bearing assemblies pre-assembled from the factory, "A." The second item will be a new retainer ring that will be installed behind the front bearing in a groove in the machine housing, "B." Refer to Figure 14.

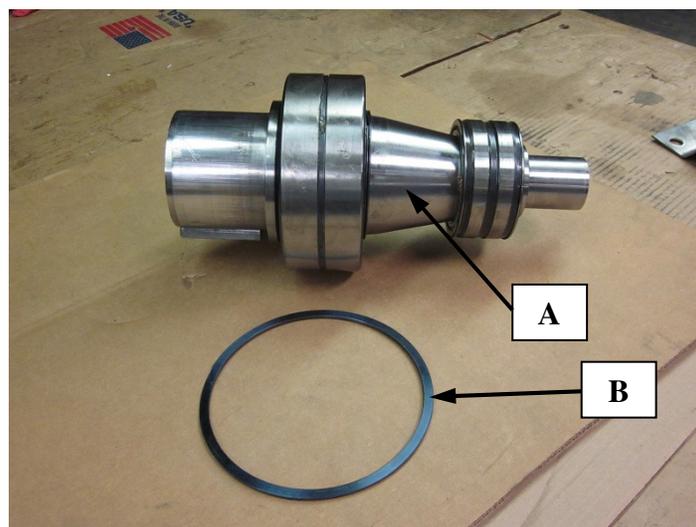


Figure 14



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- Once the rotor support equipment is installed, place the new shaft assembly, "A", into the rear of the machine. Push the assembly into position so that the front of the shaft and the bearing hold the shaft in place while the shaft installation equipment is assembled. Refer to Figure 15.

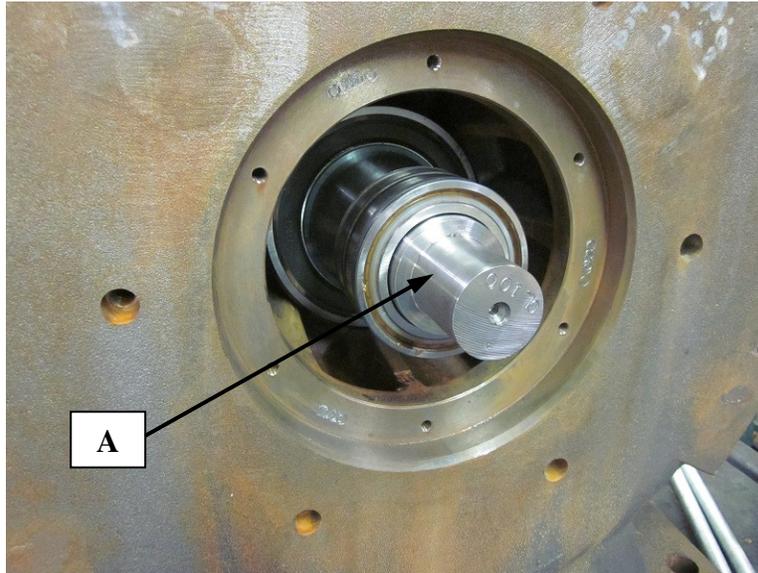


Figure 15

- With the shaft assembly in place, assemble the shaft installation equipment on the rear of the machine. First, place the 5/8" threaded rod, "A", into the holes supplied on the back of the machine. Next, place the rear jack support plate, "B", over the threaded rod and secure with heavy duty nuts, "C." Then, hold the hydraulic jack, "D", centered on the shaft assembly and secure the jack support plate against the jack with the heavy duty nuts. Refer to Figure 16.

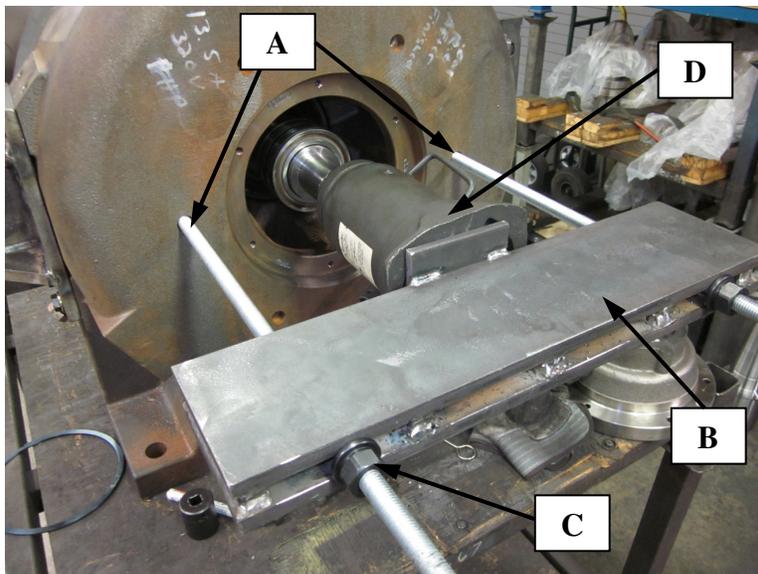


Figure 16



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Quincy, IL 62305
Phone: 217-222-0466

Fax: 217-222-0493
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- Before actuating the hydraulic jack, double check all the connections on the rotor support assembly, the rotor lock bolts and the shaft installation assembly. Ensure everything is tight, secure and centered to ensure the shaft assembly is pressed in straight. Refer to Figure 17 for a side view of the entire assembly.



Figure 17

- After everything has been verified, begin actuating the hydraulic jack to slowly press the new shaft assembly into the machine. The shaft assembly is fully seated when the shoulder on the front of the shaft is pressed up against the rotor, and the bearings are seated against the front of the machine housing. There will be no visible clue that those surfaces have reached each other. The best indicator will be the pressure on the hydraulic jack. If force is increased to actuate the jack, but the jack will no longer press forward, the shaft is likely seated all the way into the machine.
- After the shaft is fully seated, remove the jack. Before the rest of the installation equipment is removed, install the new bearing retainer ring behind the front bearing and in the groove in the machine housing. If the ring snaps into place in the groove, all of the installation equipment can be removed from the machine. If the groove is still covered by the bearing, and will not allow the ring to snap into place, the shaft will need to be pressed further into the machine.
- To press the shaft deeper into the machine, **SLIGHTLY** loosen the heavy duty nuts, "A", on the rotor support bar, "B." This will allow the rotor to move forward slightly to allow room for the shaft to be pressed into the machine past the retainer ring groove. Ensure the rotor support bar remains centered on the rotor. Refer to Figure 18.

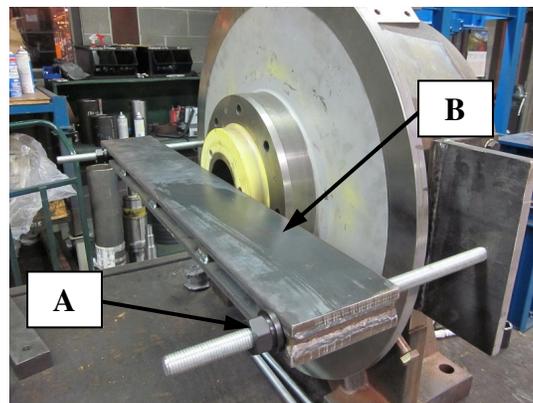


Figure 18

- After the rotor support bar has been loosened, re-install the hydraulic jack at the rear of the machine and press the shaft further into the machine housing.



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- Once the shaft has been pressed far enough, remove the hydraulic jack and install the new bearing retainer ring. After the retainer ring has been installed, remove all the shaft assembly installation equipment and the rotor lock bolts from the machine.
- With the installation equipment removed, re-install the rear cap and the encoder on the back of the machine.
- Next, if any brakes were removed during the process, follow Bulletin 1159 for Warner Brakes, and Bulletin 1158 for Mayr Brakes, to re-install the brakes
- Then, if the traction sheave was removed during the process, follow Bulletin 1156 Section I - "Traction sheave replacement" to re-install the traction sheave.
- If the sheave remained in place during the process, but 2 of the sheave body bolts were removed, replace the body bolts at this time.
- Finally, replace the "HW" logo plate.
- Once the encoder, brakes and traction sheave are in place, re-install the machine following Section III - "Installation."
- Ship the old machine shaft and bearing assembly back to Hollister-Whitney, with the supplied RMA number clearly written on the packaging.

II. Handling

- Machine must be moved by using the hoisting eyebolts provided at the top of the machine.

Machine Weight		
Model	Weight (in lbs.)	Weight (in kg)
GL100	1340	608
GL115	1380	626
GL130	1450	658
GL170	1600	726

Table 1

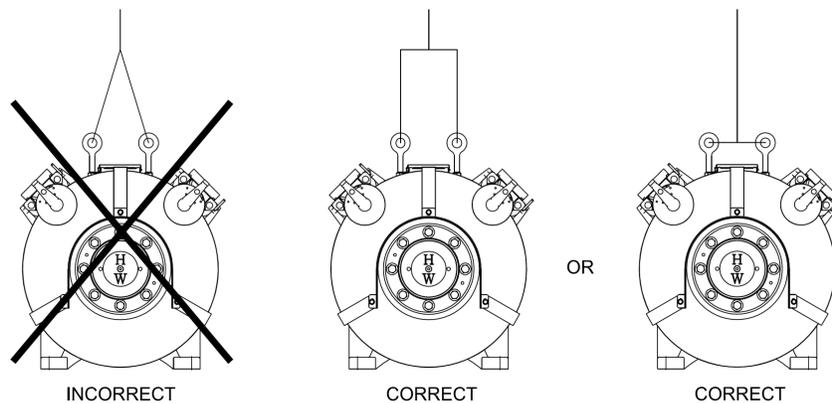


Figure 19

- When hoisting the machine, pull straight up on the hoisting eyebolts using a spreader beam or other suitable rigging apparatus to prevent damage to the eyebolts and possible failure which could result in dropping the machine. Refer to Figure 19 for the proper hoisting methods and Table 1 for the machine weights.



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- Follow all the necessary safety precautions to avoid damage to the machine or risk to personnel when moving the machine.

III. Installation

a. Machine Install & Electrical Connections

- Before hoisting the machine into place, verify all the hoisting equipment is rated for the weight of the machine. Refer to Table 1 & Figure 19.
- Reconnect machine to overhead steel.
- Reconnect all machine wiring that was removed.

b. Startup

- Verify machine data tag matches all the motor related settings and brake parameters. Figure 20.
- Remove any dirt, grease or rust that may have accumulated on the brake rotor. Use fine sandpaper or emery cloth with light pressure to remove rust from the rotor, taking care to keep the rust and metal dust out of the machine.
- Follow the controller manufacturer's procedure for alignment of the magnets.
- Briefly run the machine to verify the machine functionality and brake operation.
- Verify the traction sheave is plumb and aligned with the rope drop locations.
- Install the hoist ropes, adjust the rope shackles and check the ropes for equal tension. The rope tension must be uniform or it may cause vibration and premature wear on the traction sheave and hoist ropes.
- Re-verify the traction sheave is plumb once the machine is fully loaded.

PM-AC GEARLESS ELEVATOR MACHINE			
MODEL:	GL100-15H	SER. NO:	304934
HP:	3.0	HZ:	60
VOLTS:	180	AMPS:	11.6
RPM:	36.2	POLES:	28
DUTY:	60 MIN	INSUL. CLASS:	F
AMB:	40C / 104F	MACH. WT.:	1340
SPEED:	100 FPM	CAPACITY:	2000
TORQUE:	536 FT/LB	SUSPENSION:	2-1
BRAKE PICK:	103.5 VDC	BRAKE PICK:	1.7 A
BRAKE HOLD:	52 VDC	BRAKE HOLD:	0.86 A
 HOLLISTER-WHITNEY ELEVATOR CORP. MADE IN USA			

Figure 20 – Sample Machine Data Tag