

## HEPI HAM Lifting Procedure

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DCC RELEASE							

### 1. SCOPE

The purpose of this document is to provide step-by-step instructions in preparing and lifting the payload off the HAM crossbeam.

### 2. APPLICABLE DOCUMENTS

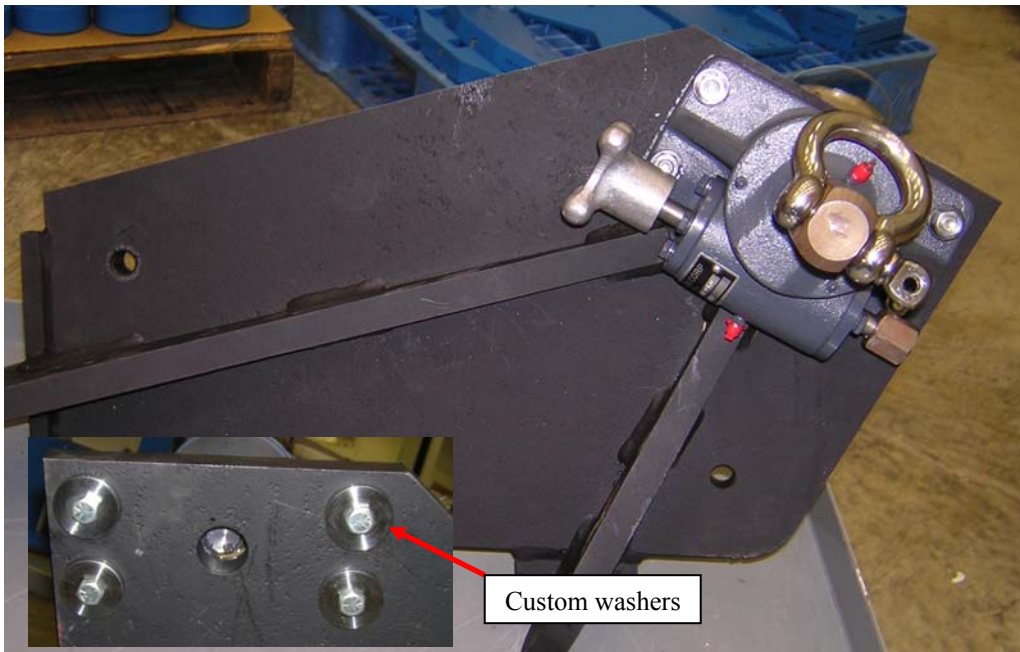
Listed below are all of the applicable and referenced documents for this task procedure:

- E040011 HEPI Assembly and Installation Procedure, Section 9 - Preparation for Installation
- D040124 HAM Lifting Plate

### 3. PREPARING THE LIFT

1. Check and test the gearbox, hardware and load cell for any flaws or damage before proceeding. Check the condition of the tapped holes of the crossbeam corner prior to lifting. Remove any dirt, rust, etc. from holes.
2. Attach the gearbox to either lifting plates (D040124-2 Right) or (D040124-3 Left). Use (4) 3/8-16 x 2.00 Grade 5 or higher Hex Head bolts with (4) custom washers against the bottom surface of the lifting plate. Use (4) 3/8-16 nuts and (4) 3/8 washers against the top surface of the gearbox. Torque evenly to 40 ft-lbs (480 in-lbs).

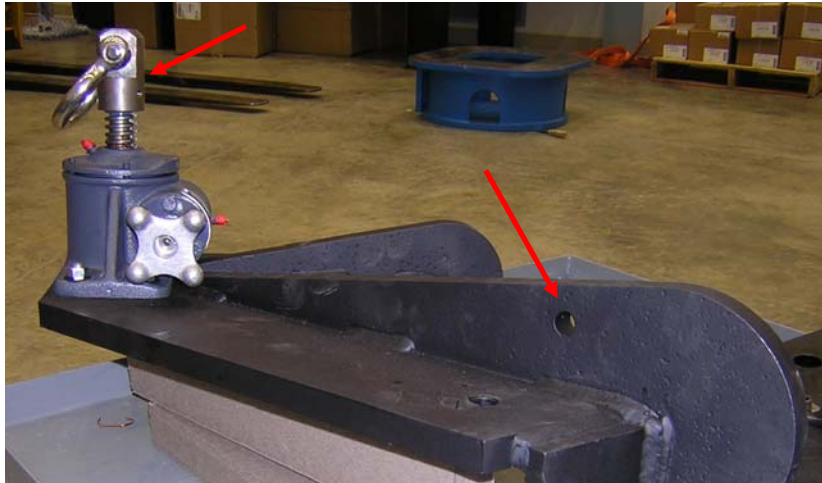
**Note:** *The gearbox must be oriented on the lifting plate(s) as shown below. The custom washers must be used on the bottom of the lifting plate.*



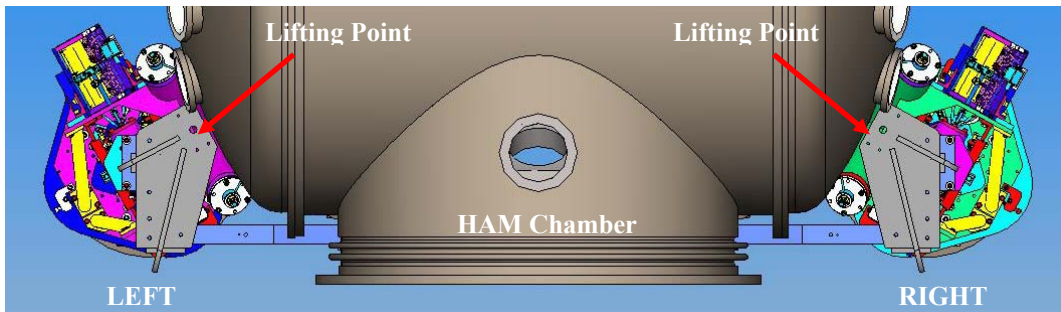


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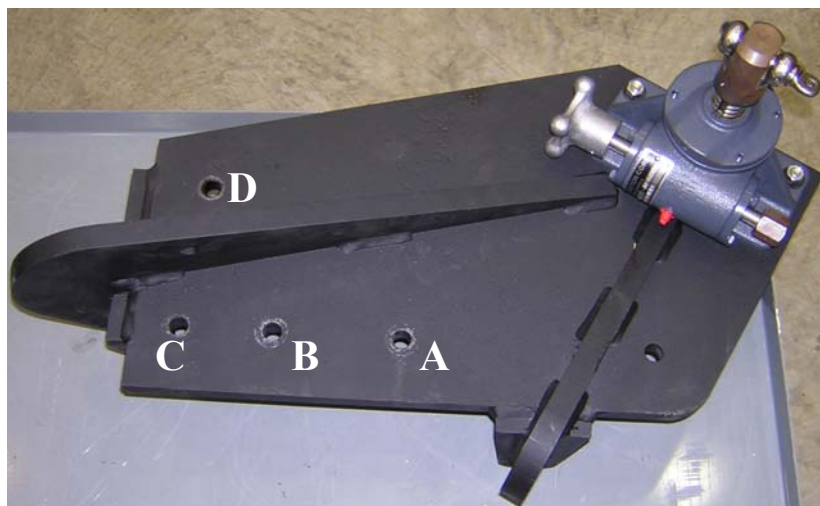
3. Attach a 5/8 shackle on to the head of the gear box and an eyebolt to the lifting plate. Securely fasten. Pick up the plate by the eyebolt and shackle.



4. Carefully lift the plate 2" directly above of the corner of the HAM crossbeam in the position(s) shown below.



5. Place a custom made steel washer 1.5" OD and .1875 T on top of the HAM crossbeam surface over the tapped 1/2-13 holes at positions A, C and D.



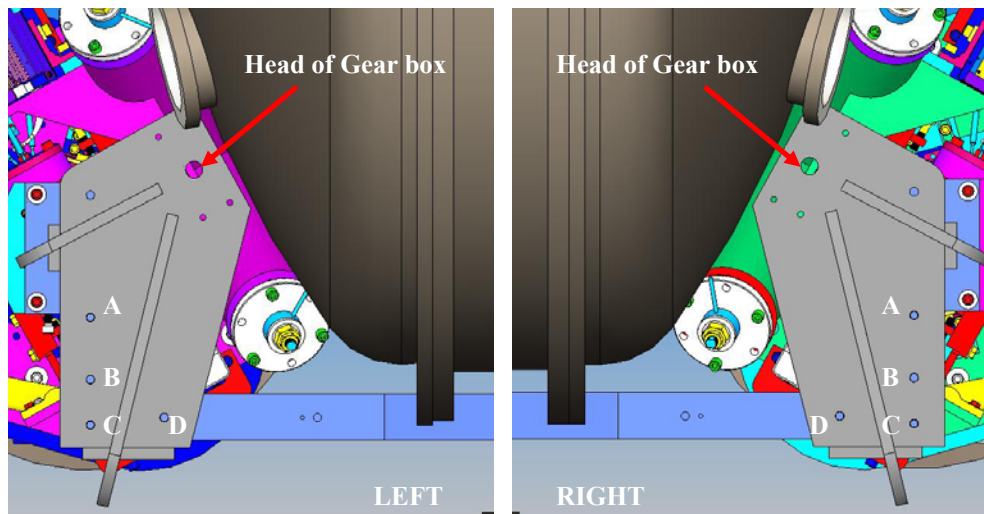


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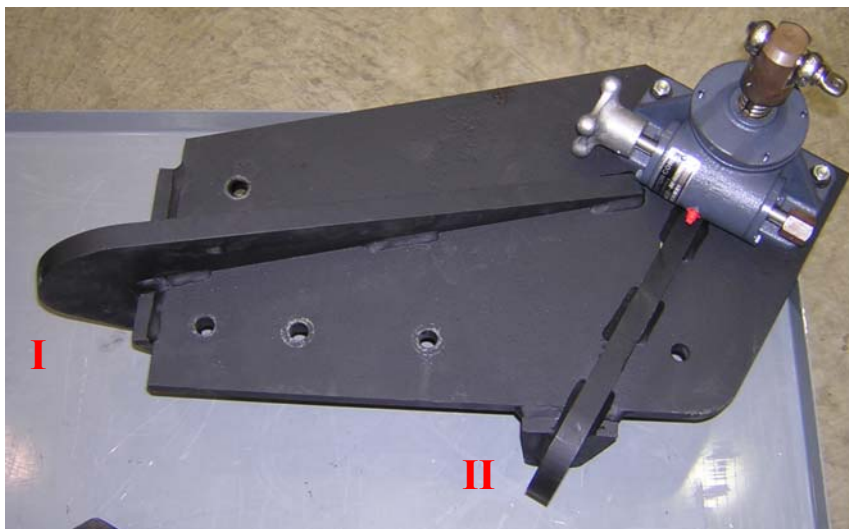
- Carefully lower the lifting plate down onto the HAM crossbeam, aligning it correctly above the four tapped holes.

**Caution:** Show extra care when positioning the lifting plate on top of the crossbeam to avoiding shocking the payload.

- Use (4) 1/2-13 x 1.50 Grade 8 or higher steel Hex Head bolts and attach the lifting plate to the crossbeam. Use (4) 1/2" steel washers on the top surface of the lifting plate. Lubricate threads with a small amount of Krytox and torque evenly to 41 ft-lbs (492 in-lbs).



- Insert 1/2-20 x 2.00 Socket Head Screws through the threaded holes of the side supports. Slide shims between the support plates and the crossbeam if necessary. Torque I to 12.5 ft-lbs (150 in-lbs) and II to 5 ft-lbs (60 in-lbs).



- Detach the gear box shackle and eyebolt from the crane.
- Carefully bring the crane directly over the head of the gear box. Use a plumb bob to ensure this location.



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### 4. LIFTING THE HAM CROSSBEAM

1. Connect the shackle to the crane and lift to remove excess length. Stop if you see any load being transferred to the load cell.

**Caution:** *The lift point will be very close to the HAM chamber. Extra caution must be taken while lifting.*

2. Remove the (4) 1/2-13 Socket Head Cap Screws connecting the crossbeam to the air-bearing adapter.
3. By using the gear box, apply load to the crane hook. As you lift, watch the vertical dial indicator at the support tube closest to the pier you are lifting. As you raise the crossbeam you will notice the dial indicator could start out reading lower then begin to rise. This is particularly true with the HAM installation. Continue to lift the crossbeam until the dial indicator reaches +0.010.

Record load cell \_\_\_\_\_ lb

Record all dial indicator positions:

Pier ID: \_\_\_\_\_ X: \_\_\_\_\_ Y: \_\_\_\_\_ Z: \_\_\_\_\_

Pier ID: \_\_\_\_\_ X: \_\_\_\_\_ Y: \_\_\_\_\_ Z: \_\_\_\_\_

Pier ID: \_\_\_\_\_ X: \_\_\_\_\_ Y: \_\_\_\_\_ Z: \_\_\_\_\_

Pier ID: \_\_\_\_\_ X: \_\_\_\_\_ Y: \_\_\_\_\_ Z: \_\_\_\_\_

4. Remove air bearing assembly, the course stage assembly, the scissor table, the pier plate adapter and HAM pier.
5. Clean the grout plate top surface of any dirt particles.
6. Position the new EPI HAM pier (D030329 Left / Right) onto the pier grout plate (D972126).
7. Check the pier level with a surveyor's level, scale, and stand. If it is out of level by more than .01 over the width of the pier, remove the pier and check again for any obstructions that are preventing the pier from sitting level.
8. Set yaw of pier by laying a flat edge across the flat on the pier to the flat on an adjacent pier.
9. Replace the 3/4" flange nuts and torque to 100 ft-lbs .

**Caution:** *Take great care to not apply force or torque to the Crossbeams or anything rigidly attached to them. Do not push them, lean on or stand on them (or anything connected to them)! It is very important that the current optical alignment is not disturbed.*

10. Proceed with E040011 HEPI Assembly and Installation Procedures, Section 10 – Installation of EPI Housing Assembly to the Pier.