E030068-A-E HEPI Actuator Assembly Procedure

LIGO Actuator Assembly Procedure
KineOptics

NOTE: Use production machine shop prints and assembly prints for assembly.

1: Inspect all parts for compliance with prints, cleanliness, and general condition.

2: Resistor Stack Assembly
- 1a: Drop in Diaphragm and screw in Diaphragm Restraint (use anti-sieze)
- 1b: Position diaphragm towards bleed holes, shim if necessary.
- 1c: Carefully screw in Diaphragm Restraint and torque to 200 Ft. Lbs.
- 1d: Assemble Resistor Stack using 18 each .004" thick shims, torque to 72 in. lbs.

3: Tack weld both bellows to actuator plate and weld three access holes on Actuator Plate.

4: Weld both bellows to actuator plate alternating top & bottom in 1.5" lengths in two steps with a pause for cooling.

Note: Use height gauge to check length and squareness of bellows. Stretch if necessary to provide a positive contact with the Top and Bottom plates. 75A 20% Start 3/32 TG

5: Weld Slug Caps to Slugs, one Long Slug and one Short Slug.

6: Weld Long Slug Assy. to Upper Plate (plate with 4ea. 6-32 tapped holes)
Note: Register Groove for Bellows is on the same side as Slug.

7: Weld Short Slug Assy. to Lower Plate (Plate with 3ea. .750" diameter holes)
Note: Register Groove for Bellows is on the same side as Slug.

8: Assemble Front, Back & Side plates. Rotationally align Actuator plate with Flexure Shim Tools, (1.100")

9: Tack weld bellows to Top and Bottom Plates

10: Disassemble Plates and Weld Bellows in 1" sections.

11: Assemble Front, Back & Side Plates and install Flexure Shim Tools.

12: Weld Flexures to Flexure Caps, install into Assembly and tack to Actuator plate.

13. Disassemble Plates and weld Flexures using back purge of shielding gas. (40A, .040" TG)

14. Manifold Preparation:
- 14a: Install Manifold, shape Purge Tube and tack in place on the Manifold.
- 14b: Remover manifold and weld Purge Tube to manifold.
- 14c: Cut .375" tubing. One each, 1.25" long & 2.0" Long. Weld on SwageLoc fittings, the ones without O-rings. Use test Plugs to hold on SwageLoc Caps.
- 14d: Weld tubing with SwageLoc fittings on to manifold, Long one goes on side without Pin Valves, short one on Pin Valve side. DON"T FORGET the CAPS!!!

15: Assemble Plates and install Manifold. Use clamps and check squareness with with height gauge.

16: Weld Plugs into manifold Passages, (14-20 Cap Head)

17: Remove side plate and Weld Purge Tube to Actuator plate. (45a, 3/32 TG)

18: Weld Manifold to Top and Bottom Plate.

19: Weld Large Manifold Caps and Small Manifold Caps to Manifold Passages.

20: After leak check, tighten all plates, install spacers, weld flexure plates and side plates.
21: Inspect for general condition and plug all holes.

22: Install Actuator rods to Actuator plate with cap screws.

23: Using Tripod spacers, tack weld all three Tripod in six pla ces. Vacuum braze and heat treat to H900.

24: Install Tripod to Actuator Rods using Cap Screws.

25: Locktite Linear Bearing into Sensor Post.

26: Locktite Shart into Sensor Holster.

27: Assemble Sensor Unit with spring, snap ring, and Micrometer Head.

28: Install Sensor Unit to Tripod.

29: Install Sensor Flag.