



## Workhorse Re-assembly

Date: August 20, 1999

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### Abstract

The technical manual did not detail how to tighten the end-cap and transducer hardware.

### Instrument/Program Affected

All Workhorse and Rio Grande ADCPs

### Description

Replace sections 4-3.1 and 4-3.2 with the following text and graphics.

#### 4-3.1 End-cap Replacement

- a. Stand the Workhorse on its transducer face on a soft pad.
- b. Connect the internal I/O connector to the plug on the common mode choke.
- c. Place the end-cap on the pressure case, aligning the mating holes and the beam 3 number embossed on the end-cap with the beam 3 number embossed on the transducer head. When mating the end-cap with the pressure case flange, try to apply equal pressure to all parts of the O-rings. Make sure the face O-ring remains in its retaining groove.



**NOTE.** We recommend you use new 2-260 O-rings if you are preparing for a deployment.

- d. Examine the end-cap assembly nuts, bolts, and washers (6 mm) for corrosion; replace if necessary. [Figure 1](#) shows the assembly order of the end-cap mounting hardware. *All* the hardware items are needed to seal the Workhorse properly.
- e. Install all four sets of hardware until “finger-tight.”
- f. Tighten the bolts in small increments in a “criss-cross” pattern until the split washer flattens out, and then tighten each bolt ¼ turn more to compress the face seal O-ring evenly. Tighten the bolts to the recommended torque value of 5.6 Newton-meters (50 pound-inches).



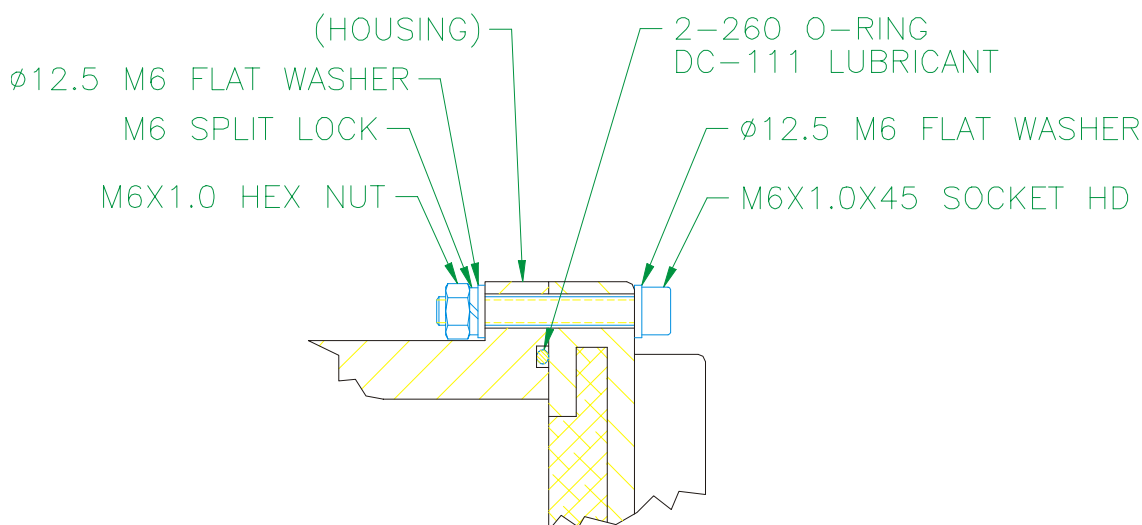
**CAUTION.** Apply equal pressure to the O-rings as you tighten the bolts. If one bolt is tightened more than the others, the O-rings can become pinched or torn. **Damaged O-rings will cause the system to flood.**



**CAUTION.** Do not over tighten the bolts that hold the transducer, housing and end cap together. If you tighten too far, you can crack or break the plastic bushing. On the other hand, **leaving the bolts too loose can cause the system to flood.** Tighten the hardware to the recommended torque value.



**NOTE.** The recommended torque value for the end-cap 6mm bolts is 5.6 Newton-meters (50 pound-inches).



**Figure 1. End-Cap Mounting Hardware**

### 4-3.2 Transducer Head Assembly Replacement

- Stand the Workhorse pressure case on its end-cap.
- Connect the internal I/O connector to the plug on the common mode choke.
- Gently lower the transducer head/electronics assembly into the pressure case, aligning the mating holes and the beam 3 number embossed on the transducer head with the beam 3 number embossed on the end-cap. When mating the pressure case with the transducer head flange try to apply equal pressure to all parts of the O-ring. Make sure the face O-ring remains in the retaining groove.



**NOTE.** We recommend you use new 2-260 O-rings if you are preparing for a deployment.

- Examine the transducer assembly nuts, bolts, and washers (8 mm) for corrosion; replace if necessary. [Figure 2](#) shows the assembly order of the transducer mounting hardware. *All* hardware items are needed to seal the Workhorse properly.
- Install all four sets of hardware until “finger tight.”



- f. Tighten the bolts in small increments in a “criss-cross” pattern until the split washer flattens out, and then tighten each bolt  $\frac{1}{4}$  turn more to compress the face seal O-ring evenly. Tighten the bolts to the recommended torque value of 9.6 Newton-meters (85 pound-inches). Do not deform the plastic bushings.



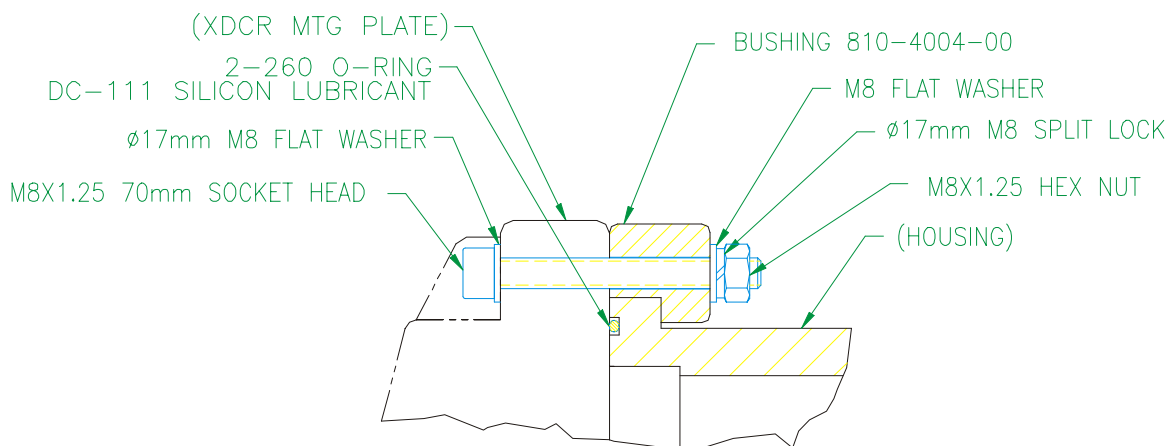
**CAUTION.** Apply equal pressure to the O-rings as you tighten the bolts. If one bolt is tightened more than the others, the O-rings can become pinched or torn. **Damaged O-rings will cause the system to flood.**



**CAUTION.** Do not over tighten the bolts that hold the transducer, housing and end cap together. If you tighten too far, you can crack or break the plastic bushing. On the other hand, **leaving the bolts too loose can cause the system to flood.** Tighten the hardware to the recommended torque value.



**NOTE.** The recommended torque value for the transducer head 8mm bolts is 9.6 Newton-meters (85 pound-inches).



**Figure 2. Transducer Mounting Hardware**

## **Solution/Action**

### **Short-Term Solution**

Add this FSB to your technical manual. Please use the new text whenever you reassemble your ADCP.

### **Long-Term Solution**

The technical manual will be revised by December 1999.