

**Procedure: VALIDATING GYRO INSTALLATION WITHOUT FRONT BRACE**

**Description: Checking lateral alignment of cylinder rod ends**

**Application:** Model 7000 gyro installed without using front brace to control foundation alignment.

**Other Items:**

Required: millimeter ruler/ measuring device or instrument

Required: Doc # 90020, Rev 5, Model 7000 Gyro Installation Manual

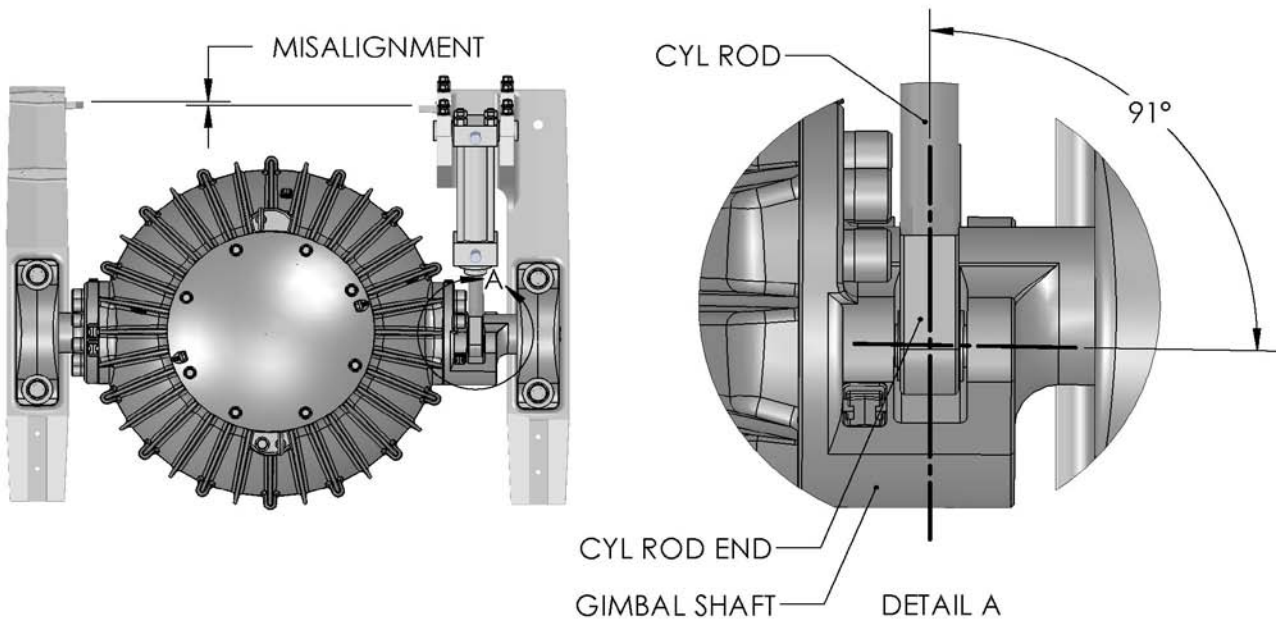
Required: Dwg # 90002, Rev 3, Model 7000 Gyro Installation Details

Required: Dial indicator with base

**Background**

If the gyro has been installed without the use of the forward brace in place; the port and starboard aluminum saddle beams may have moved relative to each other during handling (Fwd/Aft alignment) or during gluing without the forward brace installed. This has the potential to misalign the gyro gimbal axis which in turn will misalign the gimbal bearings and cause binding and premature wear of the brake mechanism. In short, a misalignment during gluing could reduce the performance and life of the gyro.

Figure 1 below shows the misalignment that could occur if the saddle beams are not in proper alignment with each other. If the cylinder rod is not perpendicular to the gimbal shaft, a bending load will be induced on the cylinder rod which could lead to premature failure of the cylinders, rods or seals.



**Figure 1** Potential Misalignment of cylinder rod end at gimbal shaft

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**Procedure:**

1. Turn off power to Drive. Turn toggle switch on Drive enclosure to Off; leave both ship's breaker and toggle switch off.
2. Turn on 24VDC. Scroll to hour meter page on display and record both Run and Sea hours. \_\_\_\_\_ Hours locked      \_\_\_\_\_ Hours Sea
3. Open brake valves via Service Brake display (reference Service Bulletin 90025). 24V power to controller must be on.



4. Manually manipulate the gyro fwd and aft during the brake alignment checks.



5. Confirm that the gyro travels approximately +60 to -60 degrees. Refer to Service Bulletin 90025 for instructions on how to reach the appropriate page on the display. List range below:

\_\_\_\_\_ Degrees forward

\_\_\_\_\_ Degrees aft

6. If the gyro can be precessed fully 60 degrees in both directions, does the force required to precess it remain constant during the stroke, or does it increase near the end of stroke? Higher force needed near the ends of the stroke may indicate binding due to misalignment.

\_\_\_\_\_ Constant force throughout range

\_\_\_\_\_ Higher force at ends of range

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7. Place a dial indicator with magnetic base on the top cylinder end-cap shown below. Ensure that the dial indicator is as close to 90 degrees to the cylinder as possible. The goal is to measure the total side-to-side distance that the cylinder rod experiences during its stroke. With gyro at 0 degrees, set the indicator to zero and precess the gyro forward while recording the largest measurement and direction (port or starboard) from the indicator. Repeat measurement while precessing gyro aft. List the total distances below. The measurements you will experience will be very small; example (.001 or .01mm)

\_\_\_\_\_ Total distance travelled toward port; Move Gyro fwd

\_\_\_\_\_ Total distance travelled toward starboard; Move Gyro aft



8. Inspect the rod ends as the gyro is manually manipulated fwd/aft. Visually inspect to see that the spacing on both sides of the cylinder rod end does not dramatically change. Perform this function on all installed gyros.
9. In addition to checking alignment, we want you to check some dimensions on Drawing 90002 Rev 3 Model 7000 Gyro Installation Details
- As shown on sheet 4, the gyro needs at least 64 mm clearance (centered in front of the gyro sphere) from the front of the saddle beam to ensure the motor power cable does not hit anything when the gyro is manually precessed to the positive limit (+60 degrees). List clearance below. Please send clear pictures indicating the measurement.

\_\_\_\_\_ Motor power cable clearance

- As shown on the Top Left View of Sheet 2, the gyros needs 199 mm clearance aft of the gyro saddle beam for tool clearance in the event the hydraulic lines have

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to be replaced. List clearance below. Please send clear pictures indicating the measurement.

\_\_\_\_\_ Tool clearance

10. Send all data for each gyro to Seakeeper for verification

#### REVISION HISTORY

REVISION	DESCRIPTION OF CHANGES	DATE	APPROVED
1	INITIAL RELEASE	09OCT09	JA
2	CORRECTED ERROR IN "OTHER ITEMS" SECTION	15OCT09	BRD

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