
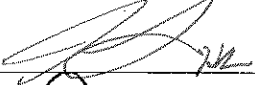
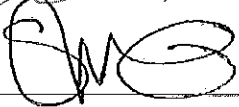


Field Service Spares Replacement Procedure – Pol Motor Kit, 3011

Approval:

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Revision History

Rev.	ECO	Description of Change	Date
A	9629	Initial release	03-15-2012

Field Service Procedure – Replacement Pol Motor Kit, 3011

1. Brief Summary:

Troubleshooting document for diagnosing a fault with and replacing the pol motor on the 3011 antenna.

2. Checklist:

- Verify Range of Motion
- Verify Pot Range
- Measure Motor Voltage
- Verify Harness

3. Theory of Operation:

To ensure the receive and transmit paths of the system are correctly aligned to the linear satellite signal the antennas feed assembly can be driven through a 180 degree range of motion by the 24VDC pol motor. Based on the vessels GPS position and the look angle to the desired satellite the DAC will calculate the numerical value for the position of the pol assembly. The PCU will then issue voltage to drive the pol motor until the pol pot outputs the correct value, at which point the feed will be aligned to the incoming satellite signal (provided it has been calibrated and is functioning correctly). Then as the vessel sails and the GPS position changes the look angle to the satellite will also change and adjustments will be made to maintain good cross pol isolation (alignment to the satellites linear signal).

One indication that there is a fault with the feed alignment of the system is that the target light will be permanently illuminated on the DAC and the antenna won't target correctly. If this is the case it will sit 8 degrees above or 8 degrees below of the elevation look angle of the satellite. This is because part of the antennas targeting procedure is to target the system above or below the satellite, to calculate the auto threshold setting based on the noise floor level, then it will align the feed for the correct reception position based on the vessels GPS location and the lookup table in the DAC, before targeting the satellite.

If the system is unable to drive the pol motor or the pol pot has failed and the correct feedback from the pot is not obtained, the system can't complete the targeting process and the antenna will stay in this position. Setting the pol type to "0009" will put the system into manual pol mode will allow the antenna to target the satellite, however misalignment of the feed will cause bad cross pol isolation.

4. Verify Range of Motion:

First verify the settings in the DAC are correct, the pol scale should be set to "0090" to give the feed 180 degrees of motion. The default pol offset setting for a 3011 antenna is "0040". You may find these have been modified slightly to "trim" the pol angle.

In the setup menu of the DAC set the pol type to "0009". This changes the operation mode of the pol assembly from automatic (pol type "0072") to manual there by removing the automatic calculation based on the vessels GPS position and allows the feed assembly to be manually driven for diagnostic purposes. Now enter the pol window and drive the pol assembly down into its lower end stop, observe the position of the feed. Now drive the pol assembly up, the feed should move 180 degrees under normal operation.

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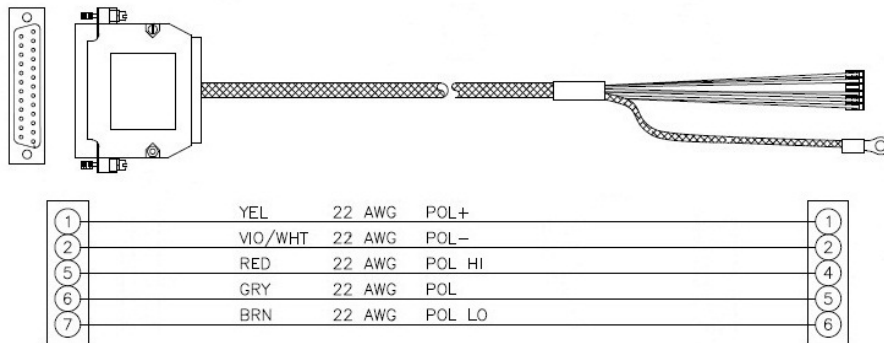
5. Verify Pot Range:

If no feed drive is present verify the pol reading on the DAC isn't out of range (i.e. displaying a value of either 0 or 255). If one of these values are displayed it's possible the pot isn't aligned correctly and that adjusting it may bring it back within the scale the DAC recognizes. Disengage the pot from the main gear sprocket and rotate its pulley to verify the feedback changes on the DAC. If feedback changes proceed with calibrating the pol pot and verifying its operation as described in section 8 of this document. If the pol count on the DAC doesn't change when the pot is adjusted the pot has failed and is outputting a default value, no drive will be issued to the pol motor as the value is out of the range which the system operates in. Then the pol pot is defective and must be replaced.

6. Measure Motor Voltage:

Leaving the pol type in manual mode (pol type "0009"), apply drive to the feed assembly and measure the voltage to the motor on the IDC connector, 24VDC should be present. If voltage is present but the motor isn't driving the motor is defective and needs to be replaced.

If no voltage is present verify the connections of the reflector harness by measuring continuity from pins 1 to 1 and 2 to 2 as per the below diagram.



If the harness connections are good then the PCU motherboard isn't outputting the voltage to drive the motor and needs replacing.

As long as the pol range is within the pot limits the DAC will issue the pol drive command to the PCU motherboard, based on the antenna targeting, a change in the vessels GPS position or operator inputs. The PCU motherboard will issue the voltage to the motor directly. The motor will then drive the feed until the correct output from the pot has been received, at which point the feed will be in the correct reception position (providing the system is functioning and calibrated correctly). Therefore there is also the possibility for a pol drive fault to be caused by the PCU motherboard.

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7. Replacing the Pol Motor:

7.1. Tools.

- Snips/Cutters
- 3mm Allen Wrench/Key
- 3/32" Allen Wrench/Key
- Cable Ties/Tie Wraps
- Loctite 222, 242 and 638

7.2. Procedure.

Procedure for replacing the pol motor, Sea Tel kit part number: 136815 (pol motor assembly part number: 132981-1).

<p>*Caution: Power down the pedestal before following this procedure.</p> <p>1. Snip the cable ties securing the pol motor harness using a pair of cutters.</p>	
<p>2. Disconnect the pol motors IDC connector from the termination block on the feed assembly.</p>	
<p>3. Using a 3mm Allen wrench remove the 2 screws securing the pol motor assembly to the feed and remove the defective motor assembly. Save the hardware for future use.</p>	

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4. Install the pulley to the replacement motor assembly in the same orientation as on the defective motor. Apply Loctite 638 to the shaft and Loctite 222 to the set screw. Tighten the set screw using a 3/32" Allen wrench ensuring, it's installed against the flat edge of the motor shaft.

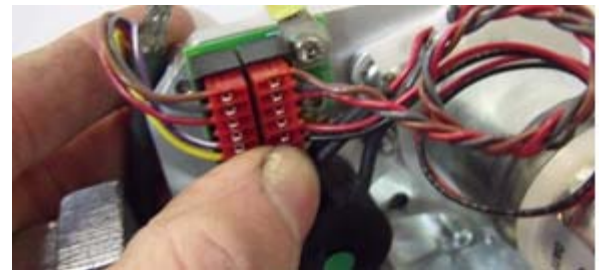
***Note:** For further information refer to the Loctite Procedure 121730 provided with this kit.



5. Using the hardware removed in step 3 install the replacement motor assembly to the feed, applying Loctite 242 to the threads. Loosely install the two screws using a 3mm Allen wrench then tension the motor to engage the pulley to the main sprocket and tighten both screws to secure it in place.



6. Connect the pol motor IDC connector to the termination block.



7. Secure the pol motor harness to the body of the motor using a cable tie, secure the excess harness using cable ties.

***Note:** No calibration of the pot is required as it has remained engaged with the main drive sprocket.



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8. Pol Pot Alignment and Verification:

1. Drive the reflector to 00.0 degrees of elevation to view the orientation of the LNB:

Press the **TRACK** button to turn the tracking function off (if applicable) to prevent the antenna from going into a search. Push the **NEXT** button until the "Antenna" window is displayed (the screen will show the AZ, EL and REL values). Press the **ENTER** button twice to isolate the "EL" window and then press the **▲** arrow to activate it (a cursor will be displayed). Now use the **▲** and **▼** arrow keys to scroll the cursor along and use the **▲** and **▼** arrow keys to change the elevation value to "00.0" and press the **ENTER** button.

2. Set the Pol Type to manual mode:

Enter the "Setup Menu" mode by pressing and holding the **▲** **▼** arrow keys together until the "EL Trim" or "Auto Trim" window is displayed. Push the **▼** arrow key until the "Polang Type" window is displayed. Press the **▲** arrow key to activate the window. Now use the **▲** and **▼** arrow keys to scroll the cursor along and use the **▲** and **▼** arrow keys to change the characters. Set the "Polang Type" to "000g" (which is manual mode) and press the **ENTER** button.

3. Press the **ENTER** button to go to the "Pol Offset" window and verify the default setting of "0040" (if necessary use the arrow keys to select the appropriate digits and change accordingly).

4. Now press the **ENTER** button again to display the "Pol Scale" window. Verify the pol scale is set to "0090", if not press the **▲** arrow key to activate the window. Now use the **▲** and **▼** arrow keys to scroll the cursor along and use the **▲** and **▼** arrow keys to change the characters to "0090" and press the **ENTER** button.

***Note:** If the pol scale was set to another value other than "0090" the feed won't have the full 180 degrees of rotation which would have caused alignment issues. If this was the case set the pol scale to '0090' and repeat the "verify the range of motion" test at the beginning of this procedure.

5. Press the **NEXT** button until the "Antenna" window is displayed (the screen will show the AZ, EL and REL values).

6. Press the **ENTER** button 4 times until "Pol xxx" is displayed and then press the **▲** arrow key to activate the window.

7. Now hold either the **▲** or **▼** arrow key to drive the pol until a count of "130" is displayed.

***Note:** It's advisable to have someone watching the feed while it's being driven as if the pot isn't correctly calibrated there is the possibility to damage the reflector harness if it is coiled around the feed assembly.

8. Observe the physical alignment of the LNB:





The LNB should be horizontal underneath the feed assembly with the coax pointing towards the left (as shown below). If not continue on to step 9, otherwise skip ahead to step 13.

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(Steps 9-12 require assistance to observe and operate antenna simultaneously)

9. Using the DAC-2202 drive the feed assembly to horizontal:

Press the  arrow key to activate the cursor on the pol window. Now hold either the  or  arrow key to drive the pol motor until the LNB is aligned horizontally (as shown above). Now press the  button to de-activate the window.

10. Locate the polang potentiometer (pol pot) on the feed and loosen the screw that secures the slotted mounting plate (fig. 1.1) with a 3/32" Allen wrench and then carefully move the pol pot gear out of alignment with the main sprocket (Fig. 1.2).




(Fig. 1.1)

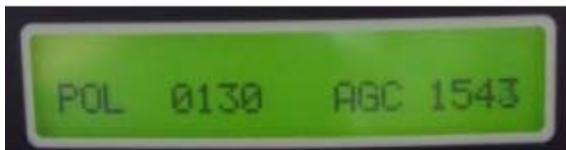


(Fig. 1.2)

11. Align the potentiometer:

On the DAC verify the cursor is not displayed on the pol window, if it is press the  button (Fig 1.3) (failure to do this will result in display not changing). Now rotate the pot manually until a count of "130" is achieved. Now reinstall the pot on the main drive sprocket.

***Note:** When re-installing the pot onto the main sprocket its common for the reading to change as the teeth of the sprockets are engaged. Because of this the tolerance is +/- 2 degrees so from "128"-"132". If the alignment is outside of the range adjust and reinstall the pot until the reading is within tolerance..





(Fig 1.3)




(Fig 1.4)

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12. Drive the pol motor to its upper and lower electrical limits and verify the assembly drives in the correct direction and that the feed assembly has the complete 180 degrees of rotation:

On the DAC press the  arrow key to display the cursor underneath the pol value and then press and hold the  arrow key to drive the feed to its upper end stop. Verify the LNB is vertical, to the left of the OMT with the coax cable pointing upwards.

Now press and hold the  arrow key to drive the feed to its lower end stop and verify the LNB is vertical, to the right of the OMT with the coax cable pointing downwards.

***Note:** XX09 MK2 PCU software version 2.03j and higher support the option to enable the feed to rotate 270 degrees, if your feed rotates more than 180 degrees this can be turned off by entering "nC001" into the remote command window of the DAC to verify the 180 degrees of rotation and re enabled by entering "nC000" into the remote command screen.





13. Set the Pol Type to automatic (auto pol):

Press and hold the   arrow keys together until the "EL Trim" or "Auto Trim" window is displayed. Push the  arrow key to scroll through the settings until the "Polang Type" window is displayed and press the  arrow key to activate the window. Now use the  and  arrow keys to scroll the cursor along and use the  and  arrow keys to change the value from "0009" to "0072" and then press the  button to put the system back into automatic polang (auto pol) mode.

Watch the LNB and verify it returns to the correct reception position (while the pol motor is driving the target light will be illuminated on the DAC).

***Note:** If making adjustments to the polarization alignment of a VSAT antenna contacting the NOC afterwards to run through a cross-pol isolation test and calibrating the antennas pol offset setting will be necessary.

14. Save the settings in the DAC-2202:

Press and hold the   arrow keys together briefly, "Save New Parameters" will be displayed. Press the  arrow key to activate the window and then press the  button, "Parameters Saved" will be displayed and the pol type and pol offset will be stored in the DAC.