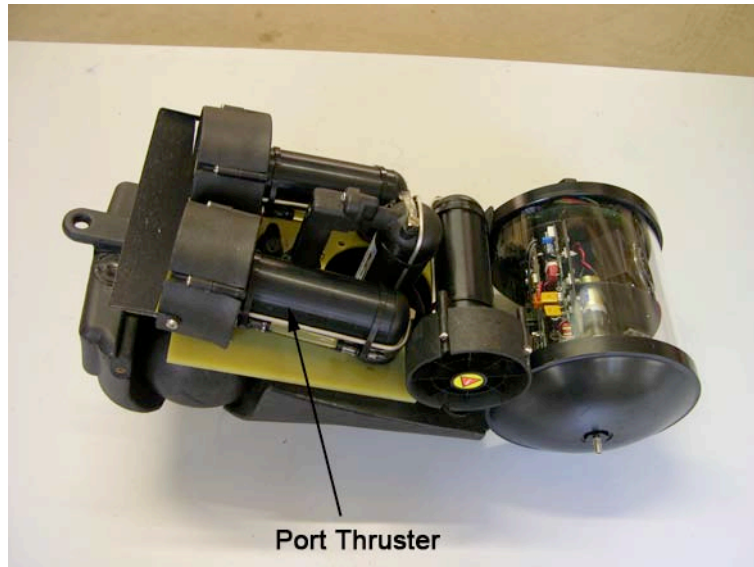


Port Forward Thruster

Introduction

The LBV² is fitted with four (4) identical thrusters. They can be interchanged to any position. Each thruster is isolated from the main housing and other thrusters. They have a four (4) pin connector for power and data. There is an o-ring seal around the connector.



Work Environment

Prior to beginning ensure you have a clean and dry workspace. Locate the required tools and parts and have paper towels available. It is a good idea to have a container to keep fasteners in as they are removed. Read through the instructions fully prior to beginning and make sure you understand what they are asking you to do.

Reading Manual



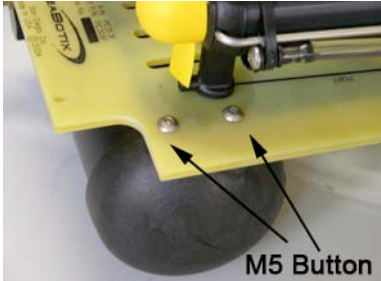

Below is a list of the required tools, estimated time to complete and level of difficulty. Next to each step where a tool is required the tool is listed. Some of the steps have special notes that must be observed.


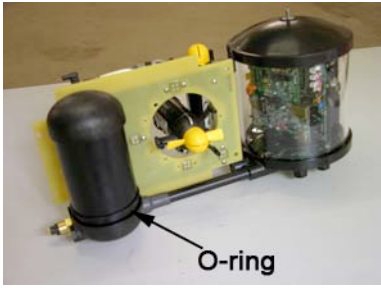
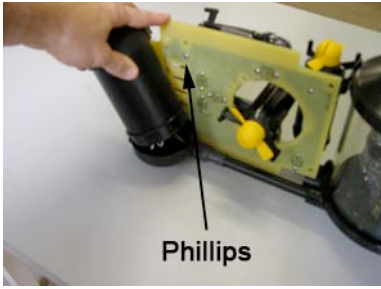
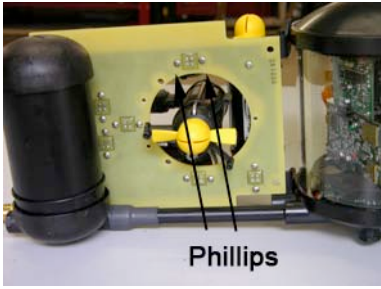

Tools Required	Time to complete	Level of Difficulty
<ul style="list-style-type: none"> • #2 Phillips Screwdriver • 3mm Hex Ball Driver • Power can o-ring tool • O-ring lube 	<ul style="list-style-type: none"> • 10 minutes removal • 15 minutes install • 35 minutes including other procedures 	<ul style="list-style-type: none"> • Moderate • Care required



Prior to working on the LBV make sure the power is off and the umbilical is DISCONNECTED.



Removal

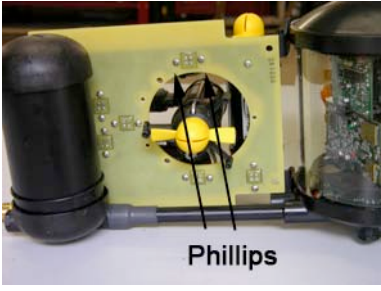
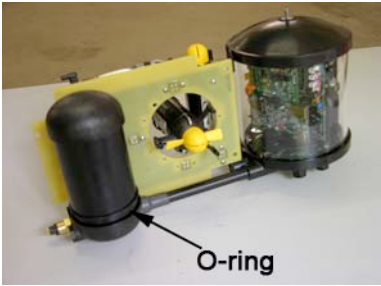
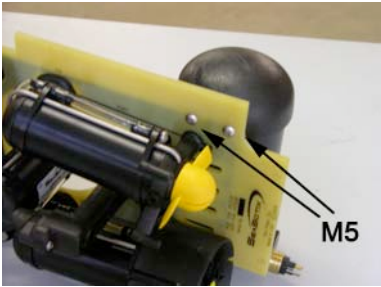

	<p>Prior to performing this procedure you must first follow these procedures:</p> <ul style="list-style-type: none"> • Flotation module removal • Shell/Bumper frame removal
	<p><u>Step 1</u></p> <p>Place LBV upside down.</p>
 <p>Phillips</p>	<p><u>Step 2 - #2 Phillips Screwdriver</u></p> <p>Remove the 3 Phillips pan head screws holding the port thruster Kort nozzle in place and remove Kort nozzle.</p>
 <p>M5 Button</p>	<p><u>Step 3 – 3mm Hex Ball Driver</u></p> <p>Remove the 2 M5 button head cap screws securing the port power can end cap to the back plane.</p>
	<p><u>Step 4</u></p> <p>Turn LBV on to its starboard side.</p>





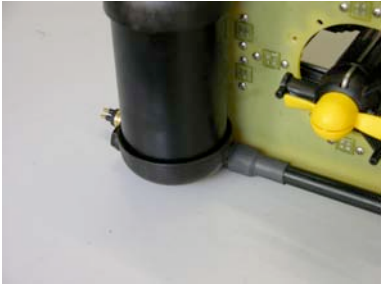
	<p><u>Step 5</u></p> <p>Holding the power can with your fingers and using your thumb to leverage against the back plane carefully pry open the power can.</p> <p>Note: you will release the vacuum so do this process slowly and ensure there is no water that will enter the power can.</p>
 <p>O-ring</p>	<p><u>Step 6</u></p> <p>The o-ring will slip into the power can so locate the o-ring and wrap around the power can tube.</p>
 <p>Phillips</p>	<p><u>Step 7 - #2 Phillips Screwdriver</u></p> <p>Carefully pull the power can aft to gain access to the forward Phillips screw holding the port thruster and remove.</p>
 <p>Phillips</p>	<p><u>Step 8 - #2 Phillips Screwdriver</u></p> <p>Allow power can to rest it the starboard end cap and remove the 2 Phillips pan head screws holding the connector for the port thruster.</p>
	<p><u>Step 9</u></p> <p>Remove the port thruster pulling straight off the connectors.</p>

	<p><u>Step 10</u></p> <p>Check to see if the o-ring has stuck to the back plane and remove if it has.</p>
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Installation

	<p><u>Step 1 – O-ring Lube</u></p> <p>Lubricate the o-ring and place in groove on the thruster connector.</p>
	<p><u>Step 2</u></p> <p>Push the port thruster onto the 4 pins.</p> <p>Note: make sure you push on straight so as not to damage the pins.</p>
	<p><u>Step 3 - #2 Phillips Screwdriver</u></p> <p>Pull the power can back to gain access to the forward prop end cap Phillips pan head screw on the front of the thruster. Insert and tighten the forward Phillips pan head screw.</p>

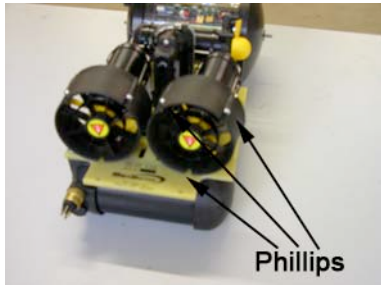
 <p style="text-align: center;">Phillips</p>	<p><u>Step 4 - #2 Phillips Screwdriver</u></p> <p>Insert and tighten the 2 Phillips pan head screws on the thruster connector at the rear of the thruster.</p>
 <p style="text-align: center;">O-ring</p>	<p><u>Step 5</u></p> <p>Making sure not to pinch any wires push the power can tube into the groove on the starboard power can end cap.</p>
 <p style="text-align: center;">M5</p>	<p><u>Step 6 – 3mm Hex Ball Driver</u></p> <p>Holding the power can down insert and tighten the 2 M5 button head cap screws through the back plane.</p> <p>Note: if they do not go in easily the power can tube is not seated properly.</p>
	<p><u>Step 7 – O-ring Lube</u></p> <p>Put grease on the o-ring liberally and push down against the starboard power can end cap.</p>
	<p><u>Step 8 – O-ring Insertion Tool</u></p> <p>Using the power can o-ring insertion tool and starting from the back plane side of the power can push the o-ring in-between the power can end cap and power can tube.</p>

	<p><u>Step 9 – O-ring Insertion Tool</u></p> <p>Repeat this process pushing the o-ring into place for a full 90° around the power can.</p> <p>Tip: push straight down so you don't stretch the o-ring. If excess occurs stop and start over.</p>
	<p><u>Step 10 – O-ring Insertion Tool</u></p> <p>Repeat the process on the opposite side for 90°</p>
	<p><u>Step 11 – O-ring Insertion Tool</u></p> <p>Repeat the process pushing the o-ring in to the front of the power can (another 90°).</p>
	<p><u>Step 12 – O-ring Insertion Tool</u></p> <p>Repeat the process for the final 90°.</p>
	<p><u>Step 13 – O-ring Insertion Tool</u></p> <p>Smooth out the o-ring seated in-between the power can end cap and power can tube.</p>



Step 14

Place the LBV upside down.



Step 15 - # Phillips Screwdriver

Push on the Kort nozzle and insert and tighten the 3 Phillips pan head screws.

Note: do not over tighten and strip out the threads.

Once complete follow the procedures to:

- **Install flotation module**
- **Install Shell/Bumper Frame**