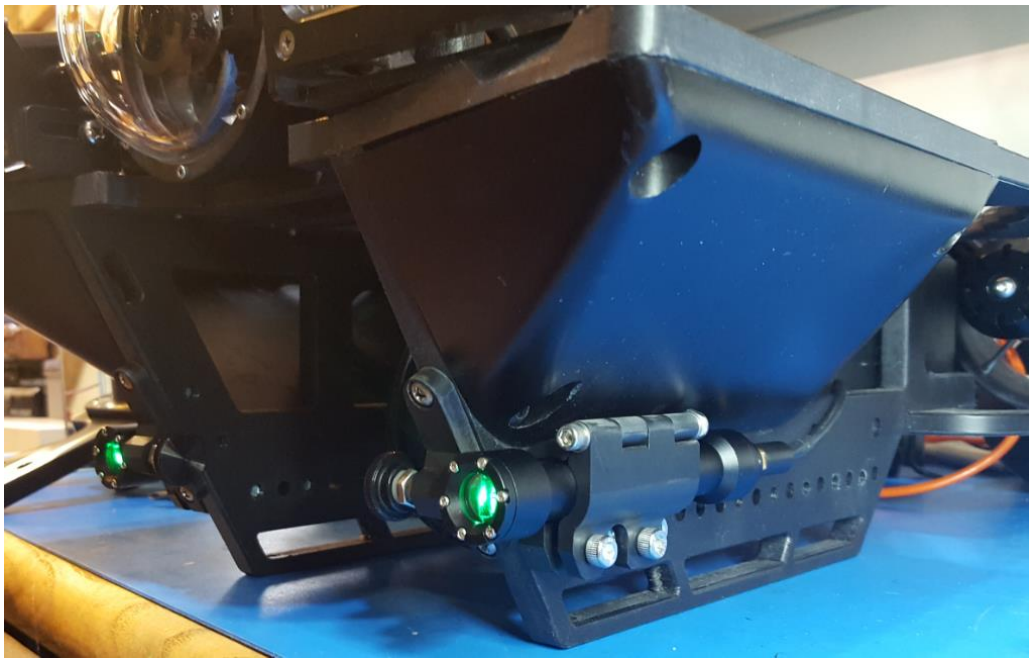





The Global Leader in MicroROV Technology



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Document Number	Rev.	Date	Originator	Checked	Approved
WI-72833-LASER SCALAR	A	07/26/2022	M. Willis	A. Goldstein	A. Goldstein

	PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS Pottstown, PA					
	Doc. No.:	WI-72833-LASER SCALAR	Rev.:	A	Date:	07/26/2022 2

Revision History

Rev.	Date	Description	Originator	Checked	Eng. Approved
R	5/4/2020	Initial	M. Willis	A. Goldstein	A. Goldstein
A	7/26/2022	Updated 72794 to 72833	M. Willis	A. Goldstein	A. Goldstein

Abbreviations

Abbr.	Definition
ATM	Atmosphere (pressure unit)
ENG	Engineering
FHMS	Flat Head Machine Screw
HD	High Definition
ICB	Interface Control Box
IMU	Inertial Measurement Unit
IN / "	Inch
LED	Light Emitting Diode
M	Meter
MM	Millimeter
MSS	Mission Specialist Series
PHCS	Pan Head Cap Screw
P/N	Part Number
QTY	Quantity
SHCS	Socket Head Cap Screw
SS	Stainless Steel
V	Volt
VR	Videoray LLC

References

Document Number	Description
72833	PARALLEL LINE LASER ASSEMBLY – PRO 5
72832	PARALLEL LINE LASER ALIGNMENT ASSEMBLY
72831	STARBOARD LINE LASER SUBSEA HINGE ASSEMBLY
72826	PORTSIDE LINE LASER SUBSEA HINGE ASSEMBLY
72820	LINE LASER SUBSEA ASSEMBLY



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR

Rev:

A


Date:

07/26/2022

Page 3 of 18

TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Safety Requirements	4
1.2	Tools Needed	4
1.3	Information about Instructions.....	4
2.0	LASER INSTALLATION INSTRUCTIONS	5
3.0	LASER ALIGNMENT	14

	PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS Pottstown, PA					
	Doc. No.:	WI-72833-LASER SCALAR	Rev:	A	Date:	07/26/2022 2

1.0 INTRODUCTION

The purpose of this procedure is to define the steps required to assemble and align the laser assemblies onto a Pro 5 vehicle.

1.1 Safety Requirements

Approved safety glasses are required to be worn when installing the Laser Scalar onto the Pro 5 ROV. The covers should be kept on the lasers at all times except when aligning and right before diving. There is no on/off switch for the lasers. If they are connected to the vehicle and the vehicle has 12V power, the lasers will be on.

DO NOT LOOK INTO THE LASERS OR ALLOW THE LASERS TO BE POINTED AT ANYONE'S EYES. DAMAGE TO YOUR EYES CAN OCCUR.



1.2 Tools Needed

- Phillips Head Screwdriver (#2 preferable)
- 4mm Hex Wrench
- 5mm Hex Wrench
- Adjustable Wrench
- Molykote 111 Compound
- Zip Ties
- Clippers

1.3 Information about Instructions

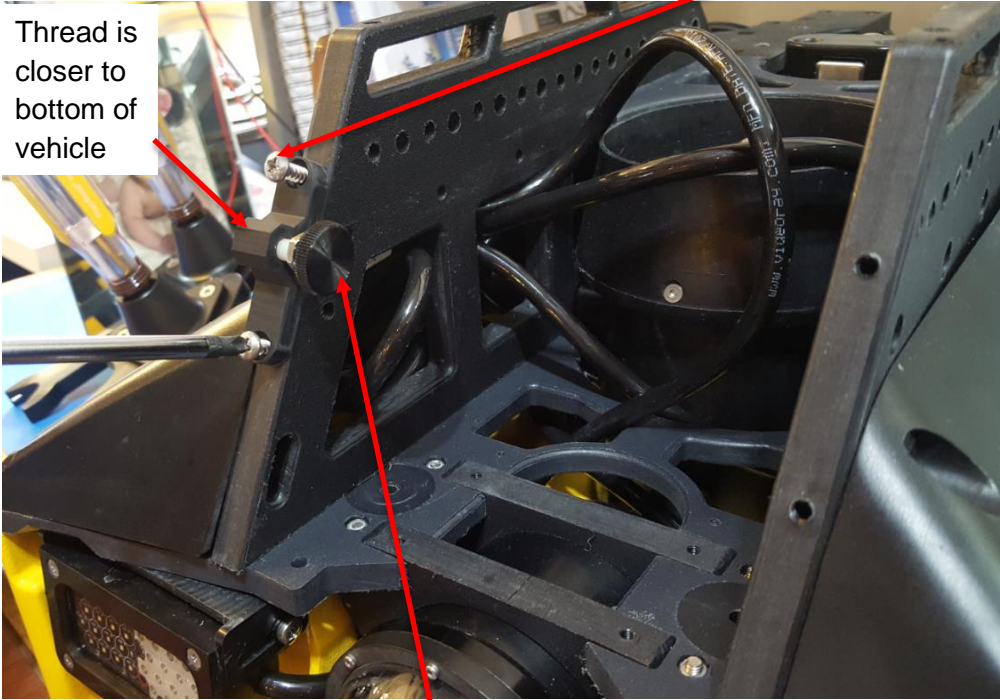
The instructions need to be followed in numerical order to complete assembly properly. If there is any questions please contact support@videoray.com before proceeding.

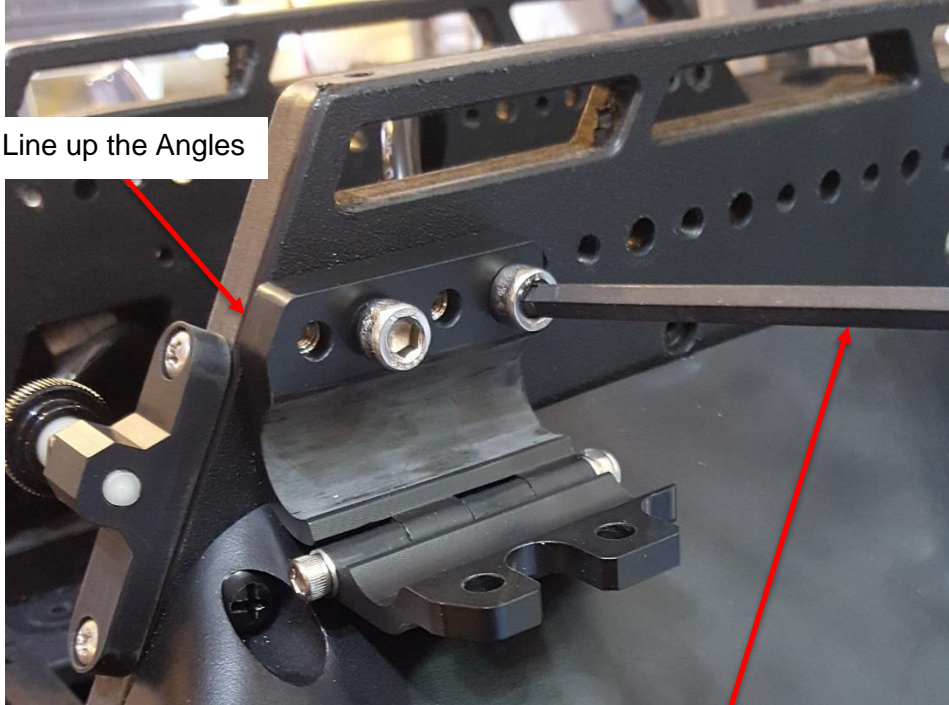
NOTE 1: All electrical connections are to be made **after** application of Molykote 111 compound onto the male pins whether specifically stated in the instructions or not.

NOTE 2: Do not overtorque screws, many times metal screws are going into plastic threads and overtorqueing will cause damage. As a general rule of thumb when first meeting resistance go another ¼ turn and that should be sufficient.



2.0 LASER INSTALLATION INSTRUCTIONS

Step	Description	Initial
1.	<p>The laser subsea and hinge assemblies are already assembled from Videoray.</p> <p>Install the Parallel Line Laser Alignment Assemblies as shown below. Make sure the threaded hole is closer to the bottom of the vehicle than the top. Use #8 X 3/4" Plastite screws to secure them to the Pro 5. Repeat both sides.</p>  <p>Thread is closer to bottom of vehicle</p> <p>Knob on the inside (both sides)</p>	

Step	Description	Initial
2.	<p>Install two SHCS M6 X 20MM into the first two threaded holes on the Pro 5 using a M5 Hex Wrench. The Hinge will be closer to the top of the vehicle. Note that the angle cut into the inside part of the hinge assembly will line up with the front angle of the Pro 5. Repeat for other side.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR

Rev:

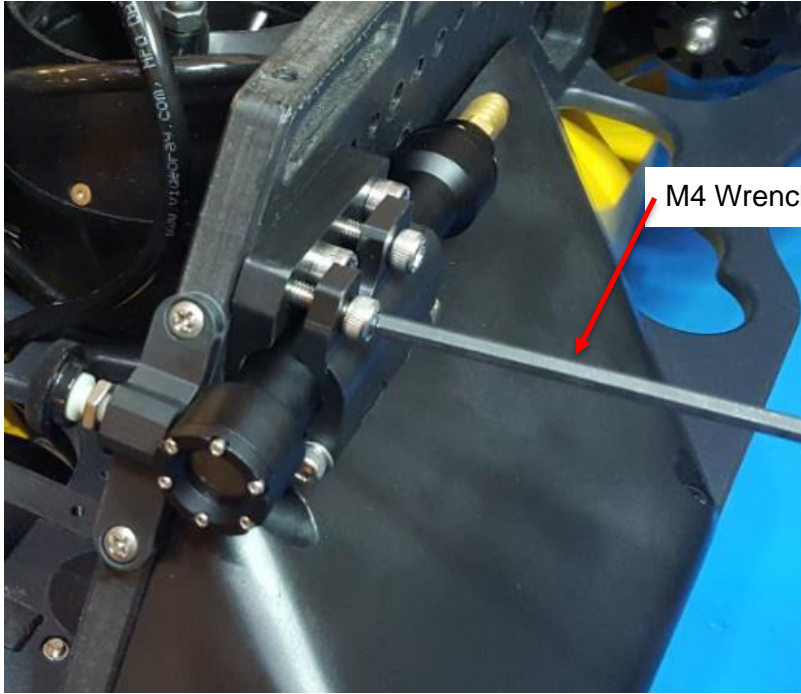
A

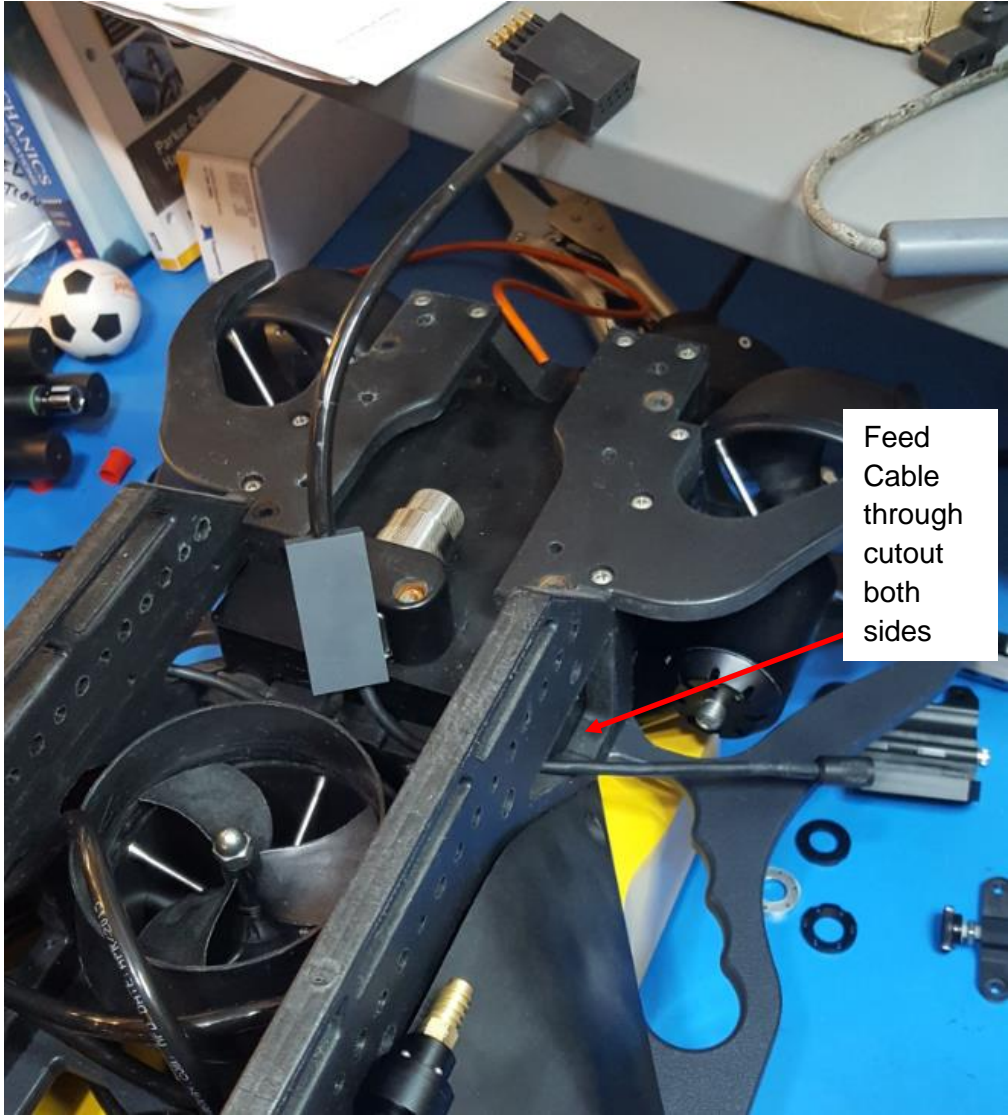
Date:


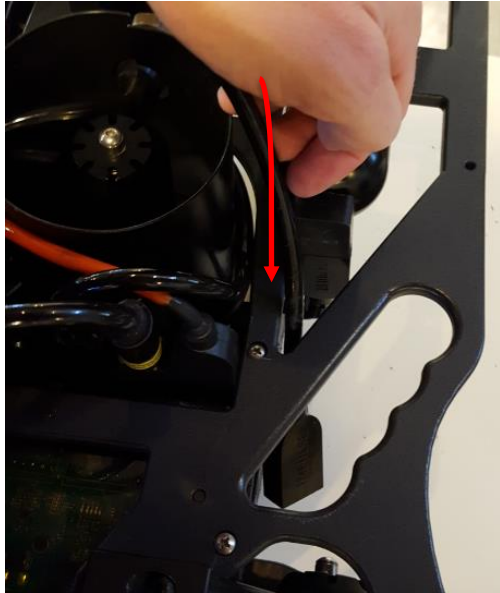
07/26/2022

Page 7 of 18

Step	Description	Initial
3.	<p>Insert the Subsea Laser Assembly into the Hinge Assembly as show. Note to line up the front of Laser so that the nylon screw will hit in the middle of the front part. Repeat for both sides.</p> <div data-bbox="381 445 1214 1188"><p data-bbox="341 583 657 699">Line up laser so that nylon screw hits the middle of the front part</p></div>	

Step	Description	Initial
4.	<p>Install SHCS M5 X 18MM into the Hinge Assembly. Use a M4 Hex Wrench. Tighten until snug. There is a M5 nylock nut The lasers will need to be rotated to align, so do not tighten too much. Repeat for both sides.</p> 	

Step	Description	Initial
<p>5.</p>	<p>Feed the Y cable through the side cutouts of the Pro 5 as shown. This may be easier if the rear lower plate of the Pro 5 is removed like shown in the picture. Connect the end of the cables to the lasers (both sides).</p> 	
<p>6.</p>	<p>Feed the 9 pin end of the cable into the starboard side shroud.</p>	
<p>7.</p>	<p>If the rear lower plate was removed, re-install it.</p>	

Step	Description	Initial
8.	<p>Insert a 9 pin extension into Port 6 of the combo box. Make sure to use 111 on the pins.</p>  <p>Port 6</p>	
9.	<p>Feed the other end of the extension cable through the starboard side hole in the top plate like shown below.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR

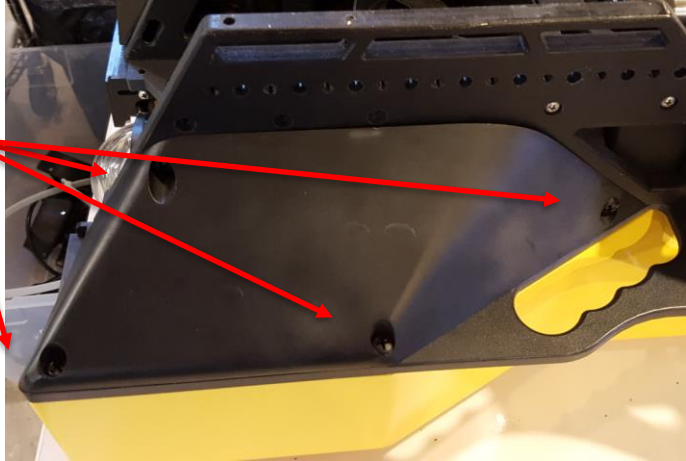
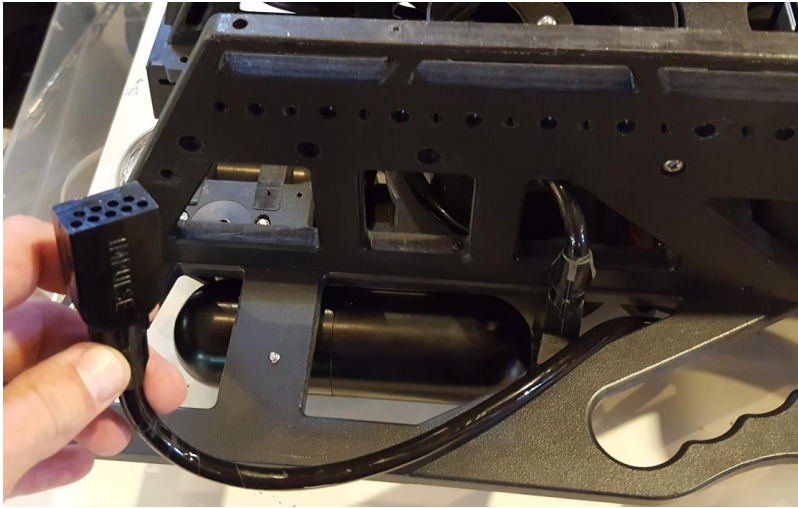

Rev:



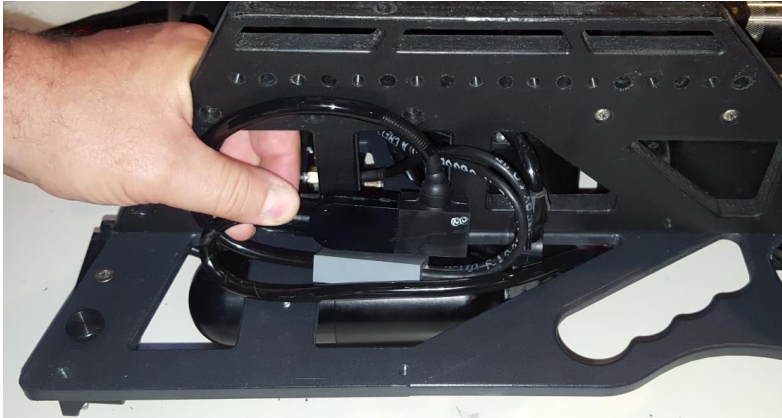
A

Date:

07/26/2022

Page 11 of 18

Step	Description	Initial
10.	<p>Take off the starboard side shroud using a Phillips head screwdriver.</p> <p>Unscrew the 4 nylon screws</p> 	
11.	<p>Pull the extension cable through the hole fully.</p> 	
12.	<p>Coat the male pins of the 9 pin M/F connector with MolyKote 111.</p> 	

Step	Description	Initial
13.	<p>Plug the 9 pin male to the 9 pin female of the extension cable.</p> 	
14.	<p>Plug the 9 pin male dummy into the back of the 9 pin m/f cable. Use 111 on the pins.</p> 	
15.	<p>Orient the cable by whatever means necessary to fit inside where the shroud is going to go; see below for example. Use zip ties if necessary.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR

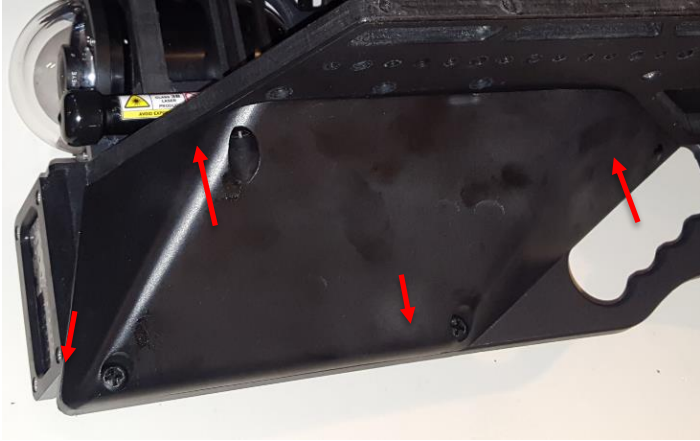
Rev:

A

Date:

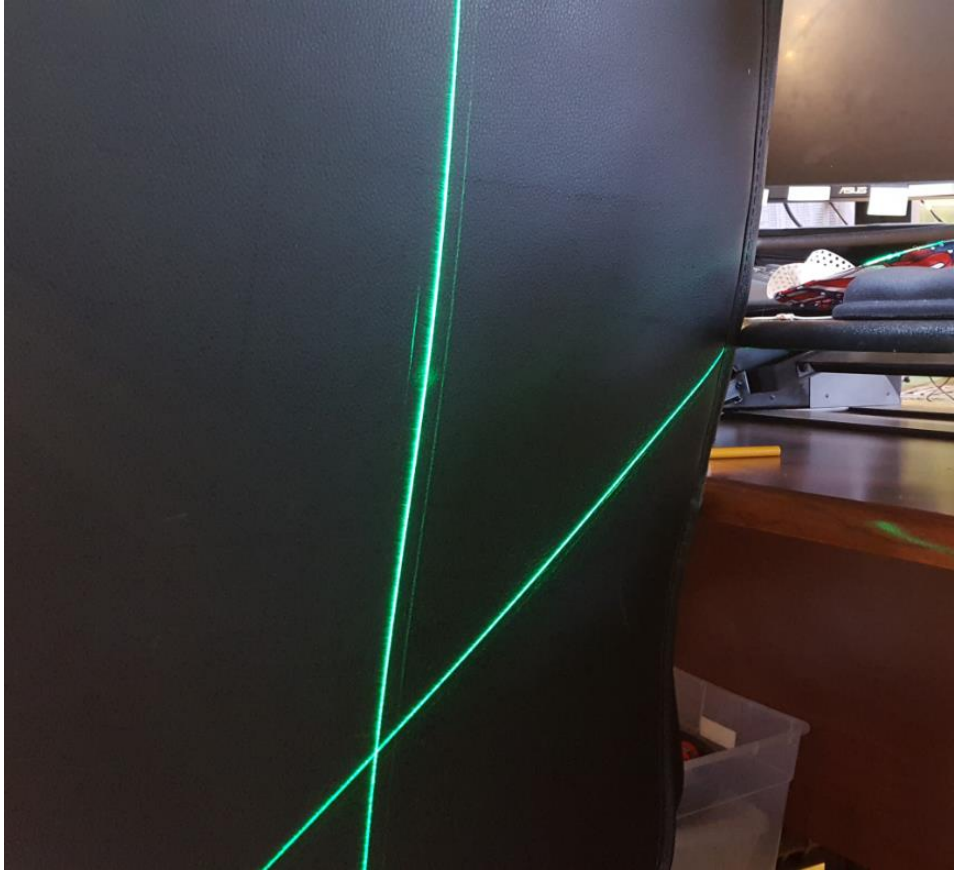
07/26/2022

Page 13 of 18

Step	Description	Initial
16.	Re-install the starboard side shroud using the Phillips head screwdriver. 	



3.0 LASER ALIGNMENT

Step	Description	Initial
1.	<p>Make sure the lasers are pointing away from anyone or anything reflective. Point lasers towards a wall.</p> <p>Turn on power to the vehicle and take off the laser covers. Most likely they are going to not be parallel on fit up. They'll likely look something like below.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR


Rev:

A

Date:

07/26/2022

Page 15 of 18

Step	Description	Initial
2.	<p>Turn the laser housings until the lasers are a parallel to each other vertically. See below. Tighten the M5 screws on the Hinge Assemblies another turn after this is completed.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR

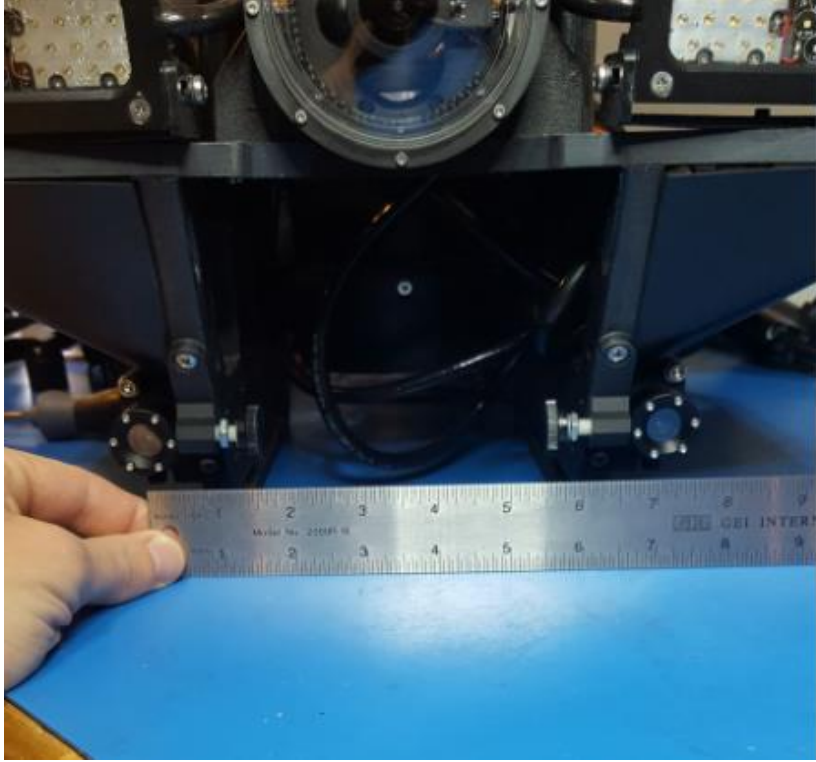
Rev:


A

Date:

07/26/2022

Page 16 of 18

Step	Description	Initial
3.	<p>Turn the power to the vehicle off.</p> <p>Measure from center to center of the lasers. This should be somewhere between 7" to 7-1/4". Write down or remember the number.</p> 	

Step	Description	Initial
4.	<p>Turn the power to the vehicle back on and make sure everyone is out of the way.</p> <p>Turn the nylon screws to push the lasers outwards until the same measurement from above is reached. See below.</p> <p>Note: Lasers are biased inwards, so they'll need to be pushed outwards to become parallel with each other.</p> 	



PRO 5 LASER SCALAR ASSEMBLY INSTRUCTIONS

Pottstown, PA

Doc. No.:

WI-72833-LASER SCALAR


Rev:

A

Date:

07/26/2022

Page 18 of 18

Step	Description	Initial
5.	<p>Adjust until laser lines are the same distance apart as the laser housings on the vehicle.</p> <p>NOTE: Since the lasers will have been pushed apart by the Nylon screws, a new measurement will need to be taken at the vehicle. Then come back to this step and adjust until the new measurement is achieved. This iteration step might need to be done a couple of times depending on how much accuracy is desired.</p> 	
6.	Tighten the lock nuts on they nylon screws with a wrench to set the distance.	
7.	Turn the M5 screws on the Hinge Assembly tight with a M5 Hex Wrench. Make sure to not tighten too much or you might break the hinge assembly. The laser housings should not be able to move forward or backward or be rotated.	
8.	Once finished. Power down the vehicle and attach caps back onto the laser housings.	