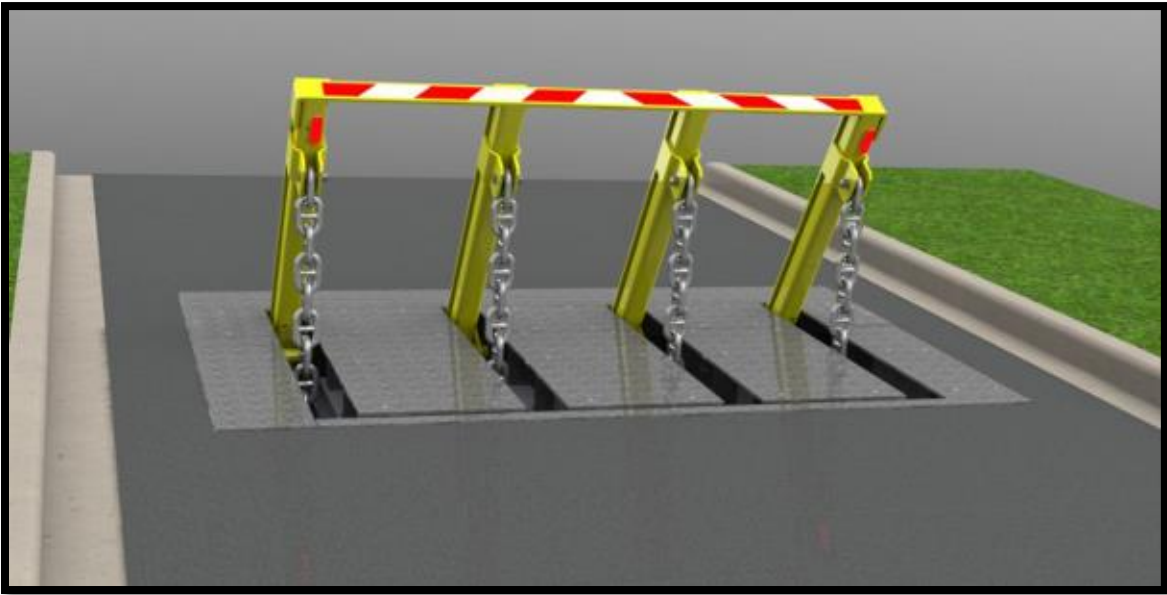




# Maintenance Manual

RSS-2000 Series Electric Finger Wedge Vehicle Barrier



RSSI Barriers, LLC  
6530 East Highway 22  
Panama City, Florida 32404  
850-871-9300/Fax 850-871-4300  
Web Site: [www.rssi.com](http://www.rssi.com)

# Contents

## **Page 3      Introduction**

Page 3	General
Page 3	Before you Begin
Page 3	How to Obtain Factory Support
Page 4	Hazard Alert Message and Symbol
Page 4	General Safety
Page 4	Barrier Description

## **Page 5      Barrier Maintenance**

Page 5	Emergency Manual Operation
Page 10	Troubleshooting Procedures
Page 13	Battery Backup Panel (BBP) Recovery/Restart Procedures
Page 15	Ethernet and Device Testing Procedures
Page 16	Component Repair/Replacement Procedures

## **Attachments**

Page 17	1. Initiate Maintenance Operations (From Secondary Operator Control Touch Screen)
Page 20	2. Initiate Advanced Maintenance Operations (From Maintenance Touch Screen in BCP)
Page 23	3. Preventative Maintenance Checklist
Page 28	4. Replace Actuator
Page 31	5. Replace Sump Pump
Page 34	6. Replace Safety Loop Sensor
Page 36	7. Replace Spring
Page 39	8. Replace Servo Drive Fuse
Page 41	9. Replace LED Traffic Light
Page 43	10. Replace Servo Drive Panel in Barrier
Page 46	11. Replace Servo Drive in Panel
Page 49	12. Replace Post Assembly LED Lights
Page 51	13. Replace Surge Protection Module in BBP
Page 53	14. Replace Low Voltage Monitor Relay in BBP
Page 55	15. Replace Time Delay Relay in BBP (older systems)
Page 57	16. Replace 24 VDC Power Supply in BCP
Page 59	17. Replace and Setup Touchscreens
Page 66	18. Replace Debris Sensor
Page 68	19. Repairing Air System Components

## INTRODUCTION

This manual provides Maintenance Procedures for the RSS-2000 series electric finger wedge vehicle barrier system. It is **NOT** intended to be all encompassing and personnel are highly encouraged to review this manual prior to performing maintenance on RSSI Barriers.

## GENERAL

The RSS-2000 series finger wedge barrier is a modern "best-of-breed" electrically operated, retractable, shallow foundation, anti-ram vehicle barricade that, when properly configured, can operate with a continuous duty cycle in all climates with minimal maintenance and expense. The barrier is DoD approved and certified to meet DOS impact condition designation K12, L3 or ASTM F2656 impact condition designation M50, P1. The barrier is capable of stopping and destroying a 15,000 lb. vehicle traveling at speeds of up to 50 mph. The barrier was independently tested and certified to operate 3,000,000+ cycles with zero failure, minimal downtime and maintenance. When installed correctly the barrier is set 1/2" above the existing roadway with the concrete tapered for a smooth transition. An Allen-Bradley MPAI series IP-67 servo electromechanical actuator with manual override and rapid reverse smoothly and quietly rotates an arresting element to an above ground position of 36" without obstructing line-of-sight vision.

## BEFORE YOU BEGIN

- Read and understand all instructions and procedures before you begin to maintain the barriers.
- Read and observe all Warning hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.
- Follow your company's safety guidelines, to include lockout procedures.
- Use the proper tools when required to help avoid serious personal injury and damage to components.
- After review of this manual, we recommend a conference call with the RSSI factory to discuss any questions regarding procedures we may not have addressed or that require further clarification.

## HOW TO OBTAIN ADDITIONAL FACTORY SUPPORT

If you have any issues or questions, on-site personnel are highly encouraged to contact RSSI's Service department. **WE CAN HELP YOU!** Normal office hours are 7:00 AM Central Standard Time to 3:30 PM Central Standard Time, Monday - Friday. After hour support is available with prior coordination.

Telephone	Email
+1 (850) 871-9300	<a href="mailto:service@rsi.com">service@rsi.com</a>

**HAZARD ALERT MESSAGE AND SYMBOLS****WARNING**

A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

**CAUTION**

A Caution alerts you to an essential installation or maintenance procedure or statement, which, if not strictly observed, could result in damage to the system, equipment or injury.

**NOTE**

A Note alerts you to an essential installation or maintenance procedure, condition, or statement.

**GENERAL SAFETY**

Personnel **MUST** comply with the following important safety instructions **DURING** installation activities for the RSS-2000 series electric finger wedge vehicle barrier system.

- Read and comply with all safety rules in this manual.
- A fully trained maintenance person must perform all work.
- Do not operate this equipment when you are distracted or under the influence of drugs, alcohol or medication causing diminished control.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.
- Prior to start-up of the RSS-2000 series electric finger wedge vehicle barrier system, all electrical connections to the barrier will be isolated (disconnected) IAW local Lock Out Procedures.
- All Ethernet terminations should be tested with Ethernet cable tester (TIA/EIA 568A standard)
- Use special care when removing any inspection plates.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.

**BARRIER DESCRIPTION**

- The RSS-2000 Series Electric Finger Wedge Vehicle Barrier consists of a shallow steel vault assembly that is hot dip galvanized with a skid resistant top plate and removable post assembly.



*Figure 1, RSS-2000*

## BARRIER MAINTENANCE

Maintenance of the RSS-2000 barrier consists of routine Preventative Maintenance Procedures, which RSSI recommends quarterly or semi-annually and non-routine maintenance procedures. Preventative Maintenance Procedures can be found in Attachment 3. Non-routine Maintenance Procedures are addressed in this section.

## EMERGENCY MANUAL OPERATION

Tools needed: Always have these tools readily available

1. Cordless impact wrench or ratchet wrench with TORX 45 bit
2. Cordless drill with adapter for 15/16 socket
3. Flashlight and gloves

## BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel



### WARNING

- **Place traffic cones and block roadway from traffic to ensure worker safety**
- **Use the proper tools when required to help avoid serious personal injury and damage to components.**
- **Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.**

### Lowering Barrier (Open Roadway)

1. Determine which top plate to remove (directly over actuator)
  - 4 and 5 post barrier = standing on attack side – second top plate from left
  - 6 post barrier = Middle top plate



*Figure 3, Actuator Top Plate, RSS-2000*

2. Using cordless impact wrench or ratchet wrench with TORX 45 bit to remove top plate screws



*Figure 4, Remove Top Plate Screws*

3. Remove top plate and relocate in a safe place (plates weigh approx. 75 lbs., use gloves and a buddy)
4. Using flashlight, visually inspect actuator for debris that could interfere with operation.



**WARNING**

**Remove power from barrier (Barrier Control Panel)**

5. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



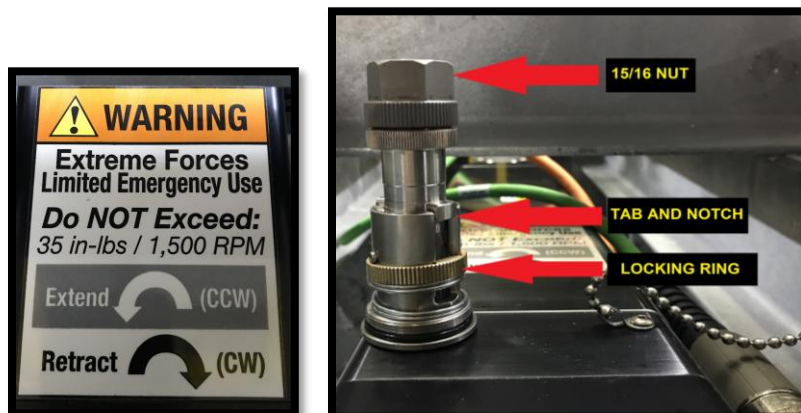
*Figure 5, Main Disconnect*

6. Remove metal cylinder cover from Manual Brake Overdrive (counterclockwise).



*Figure 6, Cylinder Cover*

7. Hand turn the 15/16 nut clockwise while applying light pressure to engage the manual drive downward, tabs inside the notch goes down to Locking Ring. The Brass Ring will lower as you screw down revealing the notch to lock in Manual Drive.



*Figure 7, Manual Drive*



- /
8. Once tab and bottom notch are lined up and Manual Drive is down, turn locking nut (right below 15/16 nut) clockwise to Lock Manual Brake Overdrive in place. Brass ring will pop up into place once locked.



Figure 8, Lock Manual Drive



### WARNING

**NEVER use impact wrench or drill to rotate manual screw (Standard Drill only)**

9. Then switch to a cordless drill and set the drill on the slowest RPM setting. Lower the barrier by using the drill (no pressure) and operating it on reverse setting (counterclockwise) until it reaches the full down position. DO NOT OVERDRIVE.



Figure 9, Warning Label



### NOTE

The Manual Nut is equipped with an internal clutch. It will engage at max physical limits or if the load is too great.



### WARNING

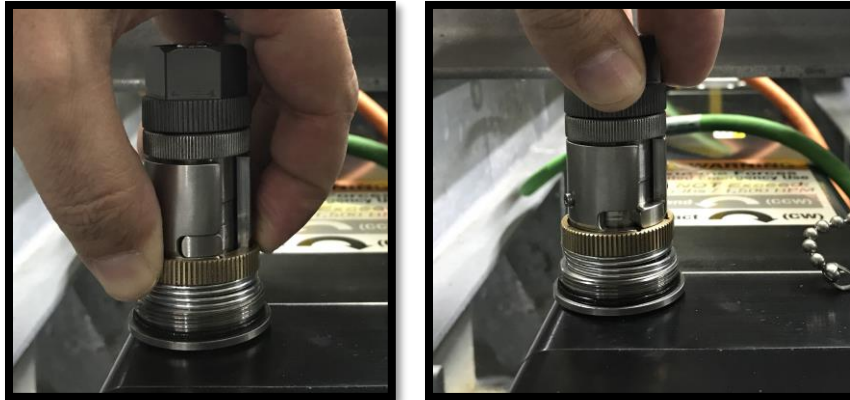
**Improper operation of manual screw will damage actuator**

10. If your barrier is equipped with a safety prop bar, or you have one onsite. After raising barrier into up position, place the safety Prop Bar into position then slowly lower Post Assembly, using drill (on CCW), until resting firmly on the Prop Bar.



*Figure 10, Safety Prop Bar*

11. To release Manual Drive, slide the brass ring down and turn locking nut (counterclockwise) out of notches. Then turn 15/16 nut counterclockwise to disengage Manual Drive. Manual Drive will move upward and pop when fully disengaged. **DO NOT OPERATE BARRIER UNTIL MANUAL BRAKE OVERDRIVE IS FULLY DISENGAGED.** Screw metal cylinder back onto Manual Drive careful not to damage O-Ring or cross-thread.



*Figure 11, Release Manual Drive*



**BEFORE YOU INITIATE MAINTENANCE OPERATIONS**

All Maintenance Operations must be coordinated with site personnel

**WARNING**

- **Place traffic cones and block roadway from traffic to ensure worker safety**
- **Use the proper tools when required to help avoid serious personal injury and damage to components.**
- **Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.**

**Raising Barrier (Close Roadway)**

1. Remove metal cylinder cover from Manual Drive (counterclockwise).
2. Hand turn the 15/16 nut clockwise while applying light pressure to engage the manual drive downward, tabs inside the notch while going down. Brass Ring will lower as you screw down.
3. Once tabs and notches are lined up and Manual Drive is down, turn locking nut (right below 15/16 nut) clockwise to Lock Manual Brake Overdrive in place. Brass ring will pop up into place.
4. Then switch to a cordless drill and set the drill on the slowest RPM setting. Raise the barrier by using the drill (no pressure) and operating it forward (clockwise) on the slowest RPM setting until it reaches the full up position.
5. To release Manual Drive slide the brass ring down and turn locking nut (counterclockwise) out of notches. Then turn 15/16 nut counterclockwise to disengage Manual Drive. Manual Drive will move upward and pop when fully disengaged. **DO NOT OPERATE BARRIER UNTIL MANUAL BRAKE OVERDRIVE IS FULLY DISENGAGED.**



*Figure 12, Warning Label*

6. Place top plate back in place and install screws, start all screws before tightening (anti-seize)
7. After condition requiring Emergency Manual Operation has been corrected (power restored or components repaired, reinstate power to the barrier by turning on the Main Disconnect



*Figure 13, Main Power Disconnect*

8. Push in drive fuse(s) in BCP

## 9. Return barrier to service.

**Troubleshooting Procedures.**

The following Table contains the most common Troubleshooting items for the barrier systems. If you encounter an issue not listed or want to discuss with a technician, please contact the factory.

STEP	Condition (Problem)	Cause (Possible Reason)	Corrective Action	Verify Corrective Action
1	E01 on Active Alarm Screen with Servo Drive fuse pushed in  <b>*Drive in Barrier</b>	Loss of communication to Servo Drive  Note- It is normal to get an E01 with Fuse pulled (drive has no power)	Check Ethernet cable from servo drive inside of barrier to the Ethernet switch inside the BCP with Ethernet cable tester. Re-terminate the RJ45 connections and test cable again. Listen for servo drive to power up, use long screwdriver for stethoscope.	If the Condition still exists, go to step #2.
2	E01 on Active Alarm Screen with Servo Drive fuse pushed in  <b>*Drive in Barrier</b>	Loss of communication to Servo Drive	Use known good spare Ethernet cable above ground and bypass existing cable in ground and test.  (Advanced method) Use windows laptop and DOS command prompt and use PING command to isolate Ethernet network connectivity, Laptop can be plugged directly into servo drive box inside barrier.	If the Condition still exists but Ethernet cables all check good, go to step #3
3	E01 on Active Alarm Screen with Servo Drive fuse pushed in  <b>*Drive in Barrier</b>	Loss of power to Servo Drive	At the BCP, check for Red light at Fuse holder; if red light is lit, replace fuse. Check for 220vac at top and bottom contacts of; find A/C power source issue at CB1 or Main rotary cutoff switch.	If the Condition still exists, go to step #4.
4	E01 on Active Alarm Screen with Servo Drive fuse pushed in  <b>*Drive in Barrier</b>	Loss of power to Servo Drive	Test 220 vac power to Servo Drive inside cabinet with Volt Meter – works with Servo Drive fuses in step 3	If the Condition still exists, and you've checked steps 1-4, replace Servo Drive Panel inside barrier.  Refer to Atch 11, Replace the Servo Drive in Barrier or call RSSI
5	E14 trending in Alarm History with Servo Drive fuse pushed in  <b>*Drive in Barrier</b>	Intermittent Loss of communication to Servo Drive	Check Ethernet cable from Ethernet switch to servo drive in BCP, replace if bad. Replace Waterproof Ethernet connector on Servo Drive. Replace Servo Drive Box	Contact RSSI if conditions still exist.
6	E01 on Active Alarm Screen with Servo Drive fuse pushed in  <b>*Drive in Panel</b>	Loss of power to Servo Drive from	At the BCP, check for Red light at Fuse holder; if red light is lit, replace fuse. Check for 220vac at top contacts of; check A/C power source issue at CB1 or Main rotary cutoff switch. Visually watch servo drive power up	If the Condition still exists, contact RSSI.

## Maintenance Manual

7	General Fault in Active Alarm Screen and Alarm History	Encoder Communications bad to actuator (Green Cable). Internal Encoder in Actuator bad.	Go to drive status and see if the position number is **** (no number) inspect the green encoder cable/wires and then replace actuator- if there is a position number, command the barrier to move and then see detailed alarm in drive status - E31 and E07 = replace actuator.	If the Condition still exists, contact RSSI
8	Loss of Power Alarm on active alarm screen	BBP has experienced Loss of normal power	Test incoming power to BBP at CB1, if good, check battery output at inverter (24-26vdc) then clear active alarm by pressing ALARM RESET on maint touch screen main menu.	Alarm should clear (Green No Alarms) on maint touch screen main menu. If the Condition still exists, call RSSI
9	E09 – Bus under voltage on active alarm page or in alarm history.  Barrier stops in mid Motion	Incoming main power too low for load	Check voltage (208-240v) while running barrier at BBP at CB1. If less than 208v, incoming power is too low.  Contact Electric provider to provide 208-240v	Confirm Electrical voltage  If confirmed and condition still exists, Call RSSI
10	E10 Bus overvoltage	Servo Drive Resistor Bad in BCP or Drive Box in Barrier	Replace Resistor inside BCP or replace Servo Drive Box inside barrier vault.	If the Condition still exists, contact RSSI
11	Sump pump not working	Power problem  If C/B pops, pump could be internally shorted go to step 13	In the BCP check for 24V across terminal blocks in BCP.	Confirm sump pump operation  If the Condition still exists, check item #12
12	Sump pump not working	Debris blocking sump pump discharge	Clean area around sump pump and check sump pump drain lines (PVC)	Confirm sump pump operation  If the Condition still exists, check item #13
13	Sump pump not working	Sump pump bad	Replace sump pump	Refer to Atch 5, Replace Sump Pump  If the Condition still exists after steps #11 & #12 contact RSSI
14	E19 in Active or Alarm History page	Physical stoppage of Motion. Did not reach preset position due to high amps or increase in load.	Check for broken springs or misalignment, debris in vault. Lower front of actuator (rod eye) onto a piece of wood (removing the load) and run barrier from Maint touch screen (barrier control) if the actuator rod extends and retracts normally with very low amps, there is a mechanical issue, if the amps stay very high, then replace actuator.	If the Condition still exists, contact RSSI
15	Barrier has slowed down moving to up position, hesitates, jerky motion	Possible broken spring(s)	Check spring assembly for broken springs; if found replace	Refer to Component Repair Section for Spring Replacement Procedures
16	Vehicles crossing barrier making a clunking noise	Top plates loose	Inspect all top plates screws, tighten or replace	Verify by observing vehicles cross barrier.  If the Condition still exists, check item #17
17	Vehicles crossing barrier making a clunking noise	Down position set wrong	Using “Setting positions procedure” JOG/TEACH Down position Flush with the roadway.	Verify by observing vehicles cross barrier.  Refer to Atch 2, Initiate Advanced Maintenance Operations,  If the Condition still exists, call RSSI.

## Maintenance Manual

18	The barrier safety loops don't detect vehicles	Loop detector tuning	Retune loop detector by removing and inserting front plug with no vehicle on loop. Indicator lights should display solid green when tuned.	Retest loop detector, if the Condition still exists, check item #19.
19	The barrier safety loops don't detect vehicles	Bad loop detector	Replace loop detector.	Retest, if the Condition still exists, check item #20.
20	The barrier safety loops don't detect vehicles	Bad safety loop in roadway	Inspect roadway for cracks through Safety Loop wires. Replace if bad.	Safety Loop Installation can be found in the Installation Manual, Retest safety loop, if the Condition still exists after checking items #18 & #19, call RSSI
21	Touchscreens hard to operate or touchscreen area controls seem out of alignment	Touchscreen mount clips too tight	On back of touchscreen locate 4 black mount clips and loosen excessively tight clips, reposition clips evenly.	Check operation of touchscreen  If condition still exists, check item #22
22	Touchscreens hard to operate or touchscreen area controls seem out of alignment	Bad Touchscreen	Replace touchscreen	Check operation of touchscreen Refer to Atch 16, Replace and Setup Touch Screen If condition still exists, after checking item #21 & #22, Call RSSI
23	Barrier heat grid system doesn't turn on	Thermostat not set properly	Confirm thermostat set to 40 degrees F.	Retest heat, if the Condition still exists, check item # 24.
24	Barrier heat grid system doesn't turn on	Thermostat Location	Ensure thermostat is located in an area near barriers where ambient temperature is used to activate heat grid system.	Retest heat, if the Condition still exists, check item # 25.
25	Barrier heat grid system doesn't turn on	Thermostat Bad	Turn thermostat to lowest setting and confirm contactor H1 does not pull in.  Jump out thermostat input by placing a jumper wire between I 1/15 and +24 vdc. If contactor H1 pulls in, replace Thermostat	Retest heat grid system  If conditions still exist after checking items #23-#25, call RSSI.
26	Barrier heat grid system doesn't seem to produce much heat	Debris in barrier covering heat system	Clean out barrier vault .	Retest heat, if the Condition still exists, call RSSI

*Table 1, Trouble Shooting Procedures*



### NOTE

If you encounter an issue not listed or want to discuss with a technician, please contact the factory. See page 3, HOW TO OBTAIN ADDITIONAL FACTORY SUPPORT.

## ***Battery Backup Panel (BBP) Recovery/Restart Procedures***

The BBP is designed to automatically switch to battery power when normal power is lost and to switch back when normal power is restored. The BBP will also fully charge the batteries after an outage. The system will provide approximately 200 cycles of backup power to operate the barriers during a power outage (2 each 12 volt batteries). Should the power outage last longer than the battery life, the power inverter will shut down when the batteries voltage drops below approximately 20VDC.

### **TO RECOVER WHEN MAIN POWER RETURNS**

1. Perform visual check on panel and pull check all wires to make sure they are secured in screw terminals and pressure terminals.
2. Ensure all breakers are off. (Green)
3. Verify (red rocker) power switch on top of the Inverter is OFF and breaker switch is in the (OFF) left position.
4. Ensure Low Voltage Relay (LVR) settings - HYS is set to 0, Level is set to 40, and Delay is set to 4, dip switches inside relay door set 1 and 5 to "on". (level and delay may be fine-tuned onsite). \*See notes 1-3 below if you have an older system without a LVR.
5. Ensure Battery Cables are secured to power inverter and to both 12V batteries in series (24vdc). The Inverter battery input should be 24-26vdc.
6. Turn ON main 208-240vac power source to CB1 and power on. Verify voltage on top of CB1 (L1 & L2: 208 - 240vac)
7. Turn ON CB1 you will see that the Low Voltage Relay and TBR2 green lights come on, within 5 seconds you will see the red light start flashing on the voltage relay and within 4-6 seconds the amber light on the voltage relay will come on as the relay times in, green light on TBR1 will come on and C1 contactor will energize and pull in.
8. Verify voltage between (L1 & L2: 208- 240vac) on top of CB3 and CB4 and then turn ON CB3 (Battery Charger) and verify unit powers up, you may see the amp meter in the battery charger indicate charging. The battery input to the inverter should now be 26-28vdc.
9. Turn ON red rocker power switch located on top left-hand side of Inverter (beeps) and then turn ON breaker switch on the top right of the inverter (to the right). Turn ON CB2 and verify voltage on the top of C2 (emergency contactor) (EL1 & EL2: 245vac)

**FUNCTIONAL CHECKOUT**

1. Turn OFF CB1 and Contactor C1 should de-energize (pop out) and Contactor C2 should energize (pull in) simultaneously.

Note: if BBU is connected and powering BCP from CB 4, check to see if power stayed on during the switchover and that the PLC generates "Loss of normal power" alarm on maintenance touchscreen. Reset alarms to test again.

2. Re-check voltages at the bottom of CB4 (3L1 & 3L2: 245vac) Inverter power.
3. Turn on CB1, Step 7 above will repeat as the low voltage relay times in again.
4. Re-check voltages at bottom of CB4 (3L1 & 3L2: 208-240vac) Main power source.
5. Battery Charger should be powered up again and showing charging amps to batteries. As the batteries return to fully charged state, charging amps should return to near zero.

NOTE 1: In step 4, For models with TDR (Timer Delay Relay) the DIP switch settings are - top switch is to the right and the last 3 to the left. Rotary dial is factory set to 4 second but can be tuned on site to match power recovery. The TDR times in the same way (C1 and C2 switching) as the LVR but doesn't monitor the incoming voltage.

NOTE 2: For DOS/Overseas models with L1 and Neutral, measure all voltages L1 to N (neutral) factory testing may use L1 and L2 (N). There is no 110vac in the system.

NOTE 3: For models with transformer and 110vac, during voltage checks make sure to measure across L1 - L2 - 3 - to N or ground. 5 power wires must be run to BCP. Incoming power Neutral (N) may not be the same as (2) after the transformer as it terminates to the BCP. Circuit breaker numbers may not be the same - refer to prints when testing.



## Ethernet and Device Testing Procedures

The following table identifies all devices in the RSSI Barrier Network.

IP ADDRESS	DEVICE/LOCATION
192.168.1.10	PLC in BCP
192.168.1.11	Servo Drive Inside Barrier 1
192.168.1.21	Servo Drive Inside Barrier 2
192.168.1.12	Maintenance Touch Screen in BCP

*Table 1, IP Address Listing*

If you receive a loss of communications Alarm or have to change out a device, you may have to conduct Ethernet tests of connectivity to all the nodes/devices (PLC, Touchscreen, Servo Drive ).

1. Using a laptop, connect your Ethernet cable to an empty port on the Ethernet switch in the BCP.
2. Set the static TCP/IP address on your laptop to 192.168.1.200 with subnet mask 255.255.255.0
3. Go to a DOS PROMPT and type PING 192.168.1.10 you should get replies from the PLC.
4. Go to a DOS PROMPT and type PING 192.168.1.11 you should get replies from the Servo Drive in Barrier 1. Barrier 2 IP address listed above.
5. Go to a DOS PROMPT and type PING 192.168.1.12 you should get replies from the Maintenance Touchscreen in the BCP.
6. If you do not get replies from the devices, ensure your laptop is on the correct subnet again and troubleshoot connectivity problems to any device. Test Ethernet cabling end to end with an Ethernet cable tester.

## Component Repair/Replacement Procedures

If there is a component to repair/replace that is not covered in this manual, contact the RSSI Service for assistance (see page 3, HOW TO OBTAIN ADDITIONAL FACTORY SUPPORT).

- Repairs should only be performed by a factory trained technician.
- Most repairs (LED lights, fuses, pins or screws, and sump pump) will be simple remove and replace and traditional skill sets (electrical, plumbing, and mechanical) can easily handle these tasks.
- Critical electrical components, Servo Drive, Actuator, PLC, and Communication Systems require more specialized skill sets. With this manual, and the phone support of a RSSI factory technician, these tasks can be easily performed.

Detailed Component Repair and Replacement Procedures are outlined in Attachments 4-16

### 19 Attachments

1. Barrier Control From Maintenance Touch Screen
2. Initiate Advanced Maintenance Operations (From Maintenance Touch Screen in BCP)
3. Preventative Maintenance Checklist
4. Replace Actuator
5. Replace Sump Pump
6. Replace Safety Loop Sensor
7. Replace Spring
8. Replace Servo Drive Fuse
9. Replace LED Traffic Light
10. Replace Servo Drive Panel in Barrier
11. Replace Servo Drive in Panel
12. Replace Post Assembly LED Lights
13. Replace Surge Protection Module in BBP
14. Replace Low Voltage Monitor in BBP
15. Replace Time Delay Relay in BBP (older systems)
16. Replace 24 VDC Power Supply in BCP
17. Replace and Setup Touchscreens
18. Replacing Debris Sensor
19. Repairing Air System Components

\* \* END OF SECTION \* \*



RSSI Barriers LLC  
6530 E Highway 22  
Panama City, FL 32404  
(850) 871-9300  
[www.rssi.com](http://www.rssi.com)

# ATTACHMENT 1- BARRIER CONTROL FROM MAINTENANCE TOUCH SCREEN

1. From the MAIN MENU, press the BARRIER CONTROL button (See Fig 1).



Figure 1, Main Menu

2. Inside the BARRIER CONTROL menu use the MOVE CLOSED/OPEN buttons to operate the barrier a few cycles, measure the post assembly in the CLOSED (UP) position to ensure it reaches 35-36 inches and ensure the OPEN(DOWN) position is all the way down and out of roadway. (See Fig 2)

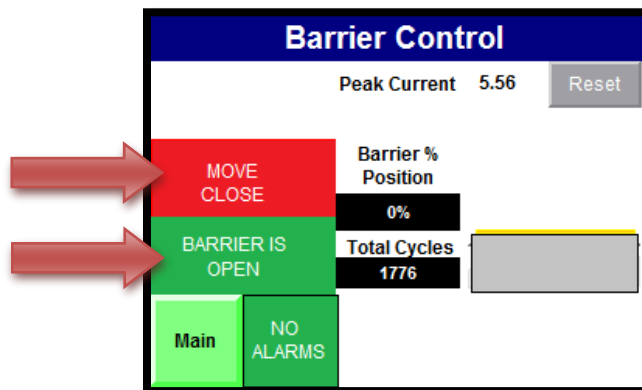


Figure 2, Barrier Control Menu



## NOTE

If the Peak Current is higher than 20 Amps, it may indicate that the barrier position needs to be adjusted. Refer to Step 5 in Attachment 2.



## NOTE

If the barrier post assembly is not flush with the roadway (protruding from barrier), refer to Step 5 in Attachment 2.

## FROM THE MAINTENANCE TOUCH SCREEN IN THE BCP

### *Homing the Barrier*

1. Turn on Servo Drive Fuse(s). On the maintenance touch screen in the BCP, go to the main screen and check for any alarms and reset or clear.
2. At the Main Screen, go to the LOGIN box and login: “RSSI” password: “32404”.
3. Once you have logged in at the Main screen, select the HOME box and then at the HOME menu press the red HOME button. The Home button will flash while homing, once it has completed the process the green BARRIER HOMED button will appear. The barrier is now homed, select Main to return to main screen.



### **WARNING**

If the barrier is in the CLOSED (UP) position, it will start to move down when the Home button is pressed.

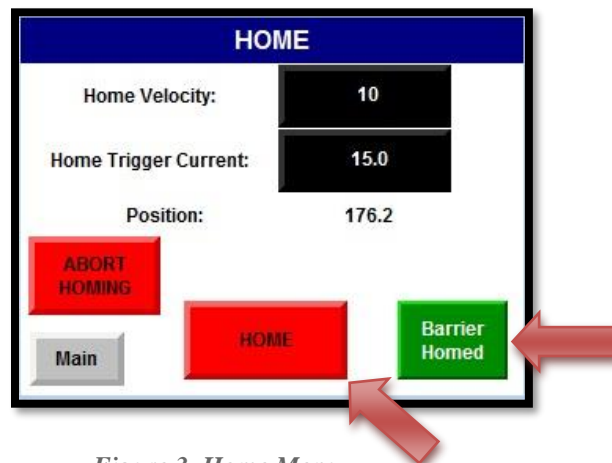


Figure 3, Home Menu

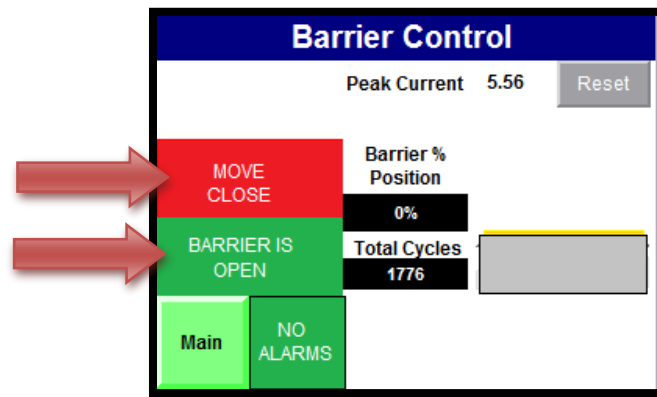
### *Barrier Control*

1. From the MAIN MENU, press the BARRIER CONTROL button (See Fig 4).



Figure 4, Main Menu

2. Inside the BARRIER CONTROL menu use the MOVE CLOSED/OPEN buttons to operate the barrier a few cycles, measure the post assembly in the CLOSED(up) position to ensure it reaches 35-36 inches and ensure the OPEN(down) position is all the way down and out of roadway. (See Fig 5)



*Figure 5, Barrier Control Menu*



**NOTE**

If the Peak Current is higher than 20 Amps, it may indicate that the barrier position needs to be adjusted. Refer to Step 5 in Attachment 2.



**NOTE**

If the barrier post assembly is not flush with the roadway (protruding from barrier), refer to Step 5 in Attachment 2.

## ATTACHMENT 2 - INITIATE ADVANCED MAINTENANCE OPERATIONS (FROM MAINTENANCE TOUCH SCREEN IN BCP)

The Maintenance Touchscreen located in the BCP is located in a mechanical room and many maintenance tasks can be accomplished from the Secondary Operator Controls. However, there are tasks that can only be performed from this touch screen.



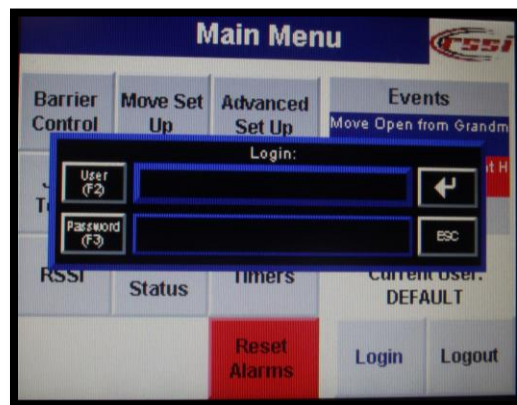
### NOTE

If you're unsure of the impact of changing a setting, please contact RSSI. See page 3, HOW TO OBTAIN ADDITIONAL FACTORY SUPPORT.

1. ALARM Screen: Clear Active alarms before proceeding) Primary/Secondary Touch Screens must be connected before alarms can be cleared.



2. LOGIN Screen User: RSSI, PW=32404





3. DRIVE STATUS screen: Drive Status must be DRIVE OK – if it is not resolve by checking trouble shooting table on page 10.

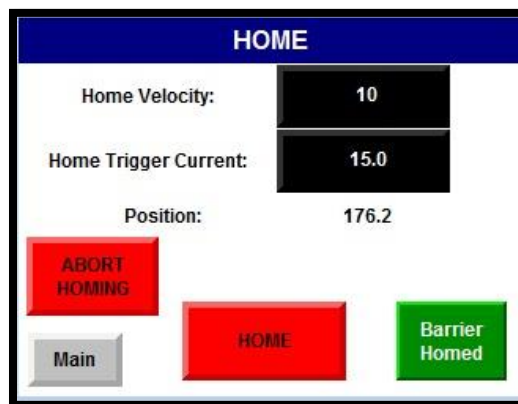


4. HOME Screen: Technician can HOME barrier or abort HOMING. If barrier gets out of HOME again, the touchscreen will show message and direct technician to re-home. If barrier doesn't complete Homing in 30-45 seconds, verify Drive Status in Item 3 above. If Drive is OK, attempt to HOME again. If it doesn't complete Homing a 2<sup>nd</sup> time, pressing the abort homing button will stop HOMING procedure. Contact RSSI for assistance.



### WARNING

If the barrier is in the CLOSED (UP) position, it will start to move down when the Home button is pressed.



5. JOG/TEACH screens: use JOG to position barrier—then TEACH open/closed lane positions. Closed position should read around -180 and open position should read -2 to -5 depending on roadway. Make sure barrier clears all vehicle including snow removal trucks and doesn't bounce when vehicles roll over barrier.



**CAUTION**

DO NOT change any other settings on this screen without FIRST contacting RSSI. Doing so may change the operating characteristics of your barrier.

6. MOVE screen: using accel/decel to select speed of barrier EFO speed (use defaults)

Normal (Slow) Move		
	<b>Close</b>	<b>Open</b>
Velocity (mm/s)	300	300
Accel (mm/s/s)	75	75
Decel (mm/s/s)	100	100
Move Time (Sec):	2.8	2.8
<div>Main</div> <div>Next</div>		

EFO (Fast) Move	
	<b>Close</b>
Velocity (mm/s)	300
Accel (mm/s/s)	300
Decel (mm/s/s)	300
Move Time (Sec):	
<div>Main</div> <div>Prev</div>	

7. Barrier Control Screen: run barrier through a series of open/close movements while monitoring the AMP indicator. Should be less than 15 amps close lane and less than 10 amps open lane. T/shoot high amp movements before proceeding. Recheck Manual Screw, must be Disengaged.

Barrier Control		
Peak Current		5.56
		<div>Reset</div>
MOVE CLOSE	Barrier % Position	0%
BARRIER IS OPEN	Total Cycles	1776
Main	NO ALARMS	

## ATTACHMENT 3 - PREVENTATIVE MAINTENANCE CHECKLIST

Make copies of this checklist for maintenance activity for each barrier and maintain a copy in the maintenance binder for the Warranty/Historical Record. For assistance, please call RSSI's service department at (850) 871-9300 or email [service@rsi.com](mailto:service@rsi.com).

Name of Person Performing Maintenance:	
Barrier Location:	Barrier Model No:
Barrier Serial No:	Voltage:
Barrier Amps UP:	Barrier Amps DOWN:
Barrier Cycle Count:	Date:

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.



#### WARNING

**Place traffic cones and block roadway from traffic to ensure worker safety**

#### Preventative Maintenance Steps

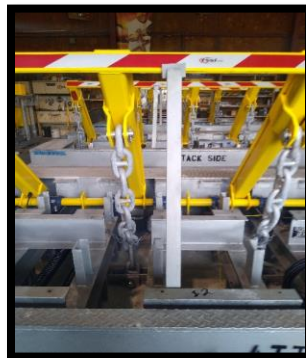
1. Turn power on to unit (if necessary) to check for proper voltage.
2. Place necessary traffic safety cones to ensure worker safety.
3. Check operation of unit by operating the barrier 3 times. Ensure that the post assembly rotates smoothly and reaches full UP and DOWN positions.
4. Check LED warning lights on Post Assembly for proper operation.
5. Make sure the vehicle barrier is in the UP position and disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



6. Remove all access plates using a cordless drill with a TORX 45 bit, remove the screws from all access plates. After all screws are removed move the access plates from the barrier.



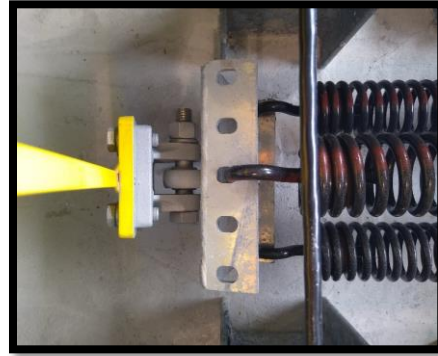
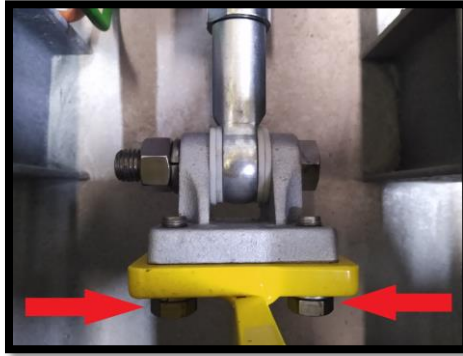
7. Raise Safety Prop Arm (located in vault) and secure under Post Assembly before working in vault.



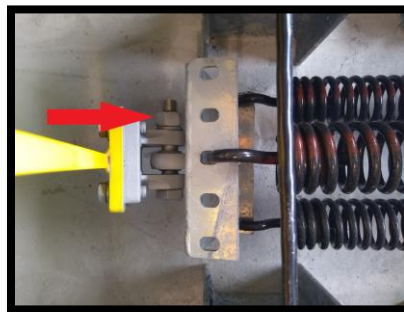
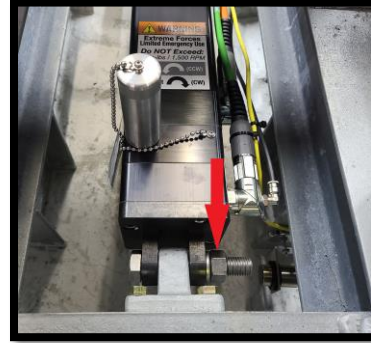
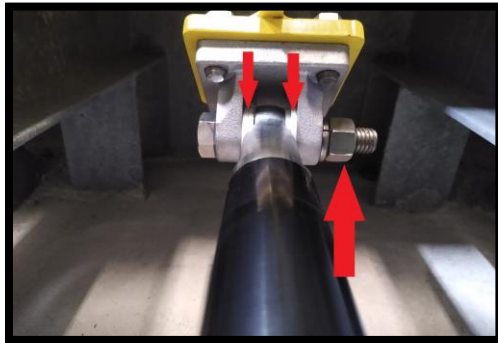
8. Check sump pump and drainage ports (if applicable). Make sure that the drain ports and/or sump pump are clear of debris and the sump pump operates properly.



9. Check actuator and spring assembly pivot arm clevis bracket bolts. If these connections are not kept tight, it might cause loose motion that could result in excessive wear. Spray down pins that hold spring packs in with white lithium grease.

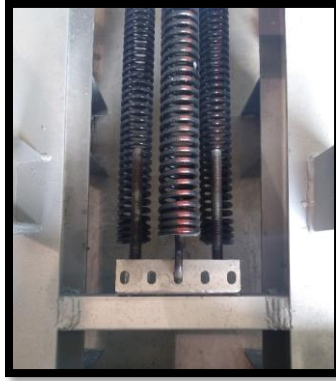


10. Check Actuator and Spring clevis' Bolts and Nuts. Make sure these are tight. A loose fit might cause excessive wear and improper barrier operation. Plastic Spacers in place on Rodeye.

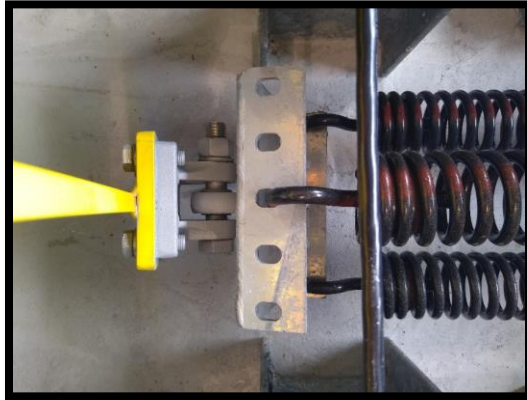


11. Check spring assembly front Bracket. Make sure Springs are intact and tension bolts are tightened until bracket is touching C-Chanel. A loose bracket might cause excessive wear, spring breakage, and improper barrier operation. Spray down Springs and Spring Hooks with white lithium grease.





12. Check spring assembly. Make sure springs are not broken. A loose fit or broken spring might cause excessive wear and improper barrier operation.



13. Check chain pins. Ensure cotter pin is secure and washer in place.



14. Check split journal bearing bolts. Make sure these are tight. A loose fit might cause excessive wear and improper operation.





15. Inspect Servo Drive Panel (if located in barrier).
  - a. Check cables for damage and ensure all connectors are seated properly.
  - b. Check for corrosion on Ethernet Termination at the Servo Drive Panel.
  - c. Check for signs of water intrusion in power connector at Servo Drive Panel.
  - d. Check Mounting Bolts/Nuts for the Servo Drive Panel. Make sure they are tight.
  - e. Check that Servo Drive Panel is not sitting in water (if so, re-check item #7).
16. Check post assembly and touch up paint as needed.
17. Check the barrier interior for dirt and debris. Remove as necessary.
18. Remove Safety Prop Bar.
19. Replace the access cover plates and screws. Apply Permatex anti-seize lubricant or equal to screws.
20. Reinstate power to the barrier by turning on the Main Disconnect



21. Remove traffic safety cones.
22. Return barrier to NORMAL operation.
23. Complete this checklist, report any deficiencies to your supervisor, and maintain a copy in files.

## ATTACHMENT 4 - REPLACE ACTUATOR

Tools needed: Always have these tools readily available

1. Cordless impact wrench or ratchet wrench with TORX 45 bit
2. Cordless drill with adapter for 15/16 socket
3. Flashlight and gloves

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.



#### WARNING

- Place traffic cones and block roadway from traffic to ensure worker safety.
- Use the proper tools to avoid serious personal injury and damage to components.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.



#### CAUTION

Review Emergency Manual Operation Procedures on page 8

1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



2. Disengage Servo Drive fuse(s)



3. Remove top plate screws with TORX 45 bit



4. Disconnect the power (orange) and control (green) cables from actuator, taking care not to contaminate connectors with dirt, debris and water. Protect if necessary.
5. Engage and adjust the manual adjustment screw (review Manual Operating Procedures on Page 8) on top of actuator until you can easily remove the connecting Bolt at the actuator rod end. 5 and 6 Post Barriers will need Spring Tension Bolts loosened to remove Clevis Bolt from Actuator, Refer to Attachment 7, Step 6



### WARNING

**DO NOT hammer out Bolts, this will damage the actuator**

6. Remove actuator Bolts, taking care not to let actuator fall. Remove actuator.
7. Inspect all Bolts and mounting hardware for excessive wear and replace if necessary.
8. Install new actuator in reverse order, adjust manual adjustment screw by hand until rod eye can be slipped back into pivot arm and easily pinned



### WARNING

**(DO NOT FORCE). MANUAL ADJUSTMENT LOCKOUT MUST BE DISENGAGED BEFORE ACTUATOR IS MOVED ELECTRICALLY AGAIN OR DAMAGE WILL OCCUR. (review manual screw lockout adjustment instructions on page 8)**

9. Re-connect power and control connectors, taking great care to line up keyways and hand tightening connectors back onto the actuator. Inspect connector's ends for dirt and water.



### WARNING

**DO NOT OVER-TIGHTEN, DAMAGE TO SEAL MAY OCCUR.**



### WARNING

**MANUAL ADJUSTMENT LOCKOUT SCREW MUST BE DISENGAGED BEFORE ACTUATOR IS MOVED ELECTRICALLY AGAIN OR DAMAGE WILL OCCUR.**

10. Clear barrier of tools and top plates



### Caution

If the actuator has an Air System ensure no moisture gets into Encoder connector with Air Hose Disconnected. Once finished ensure Air Hose is securely connected. See Air System Attachment.



**Caution**

If you have the Orange and Green cables connecting to Actuator ensure all O-rings have been removed from Actuator connector before securing cables to Actuator.



**Caution**

Ensure Plastic Spacers are installed around Rod-Eye on Actuator within the Clevis.

11. Reinstate power to the barrier by turning on the Main Disconnect



12. Push in Servo drive fuse(s)
13. Home the barrier then set positions from the Maintenance Touchscreen (see Attachments 1&2)
14. Reinstall top plate over actuator with TORX 45 screws you removed or replace if corroded or damaged
15. Run the barrier up and down from barrier control menu.
16. Return barrier to service.

## ATTACHMENT 5 – REPLACE SUMP PUMP

### TOOLS NEEDED:

1. Phillips Head Screw Driver
2. Wire cutter and crimper
3. Waterproof Connectors
4. Heat Gun

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.



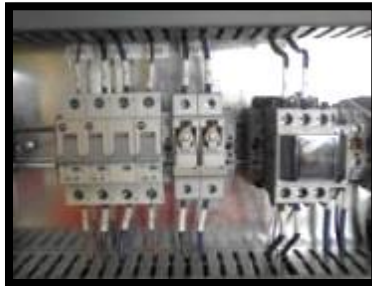
#### WARNING

- **Place traffic cones and block roadway from traffic to ensure worker safety.**
- **Use the proper tools to avoid serious personal injury and damage to components.**

1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



2. Turn off Drive Fuse(s) inside BCP.



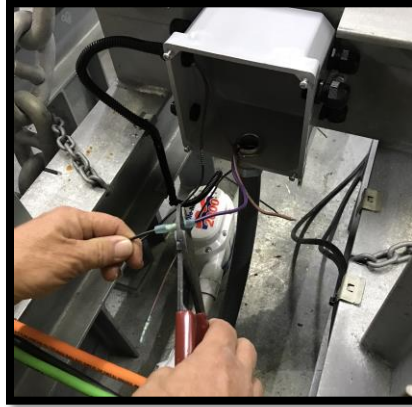
3. Turn off 24V breaker to Sump Pump



4. Remove Top Plate from Barrier and Cover from Control JBox.



5. Cut -24V (black wire) and +24V (Brown wire) terminations to sump pump inside Control JBox.

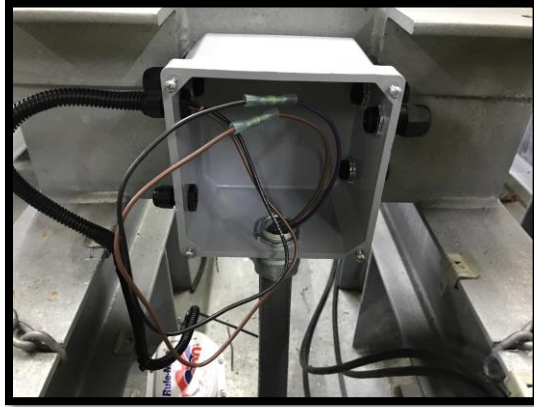


6. Cut zip ties on older sump pump wires. Then disconnect PVC pipe. Then remove sump pump from barrier.

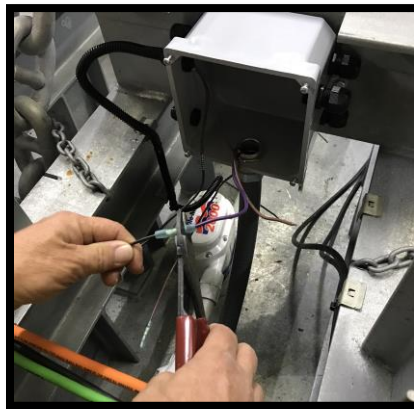




7. Install new pump, then connect 1" PVC. Run new sump pump wires to Control JBox. Only the -24V (black wire) and +24V (solid brown wire).



8. Terminate Black wires -24V (black wire) and +24V (brown wire) inside the Control JBox using crimp and solder water proof connectors.



9. Reinstall power to the barrier by turning on the Main Disconnect
10. Return power to the Sump Pump by turning back on the circuit breaker. The Sump Pump will cycle once power is restored, if no water is present pump will stop.
11. Re-install cover on Control JBox, then re-install steel top plate.
12. Once the top plate is replaced and traffic lane is clear, turn on breaker Servo Drive Fuse(s) inside Panel.
13. Return barrier to normal operation.

## ATTACHMENT 6 – REPLACE SAFETY LOOP SENSOR

### TOOLS NEEDED

1. Small Flat Head Screw Driver

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel

- 1 Turn off the power to the barrier you're working on (24v power supply).
- 2 Remove the Loop Wires from Detector terminations.



- 3 Make note of the sensitivity settings on Safety Loop Sensor.
  - 4 Disconnect the terminations from the defective Safety Loop Sensor.
  - 5 Remove safety loop sensor from Din Rail and replace with new one.
  - 6 Reattach terminations for Safety Loop Sensor and set dip switches for sensitivity.
- Dip switch Settings for loop channels:

Frequency*	Low or High
Hold Time	Infinite
Output 2	Presence
Edge 2	Pulse Entry
Dir Mode	Presence
Dir Logic	Continuous Signal
Inv. Out 1	On (if Loop Wire is connected to Detector)
Inv Out 2	On (if Loop Wire is connected to Detector)

\*If two loops are close in the roadway, alternate them between Low and High frequencies to prevent cross-talk between loops.

- Sensitivity Settings below. Test safety loop sensitivity and make adjustments as needed.

A	B	Sensitivity
Off	Off	Low
On	Off	Med. Low
Off	On	Med. High
On	On	High



- 7 Re-terminate loop wires to the detector and restore 24VDC power. Loop detector should flash Blue LED while tuning.



#### NOTE

Ensure safety loops are clear before powering safety loop detectors.

- 8 Conduct a test of safety loops for functionality.  
Return barrier to operation.

## ATTACHMENT 7 – REPLACE SPRING

### TOOLS NEEDED:

1. One electric or air impact drill
2. 1-1/8<sup>th</sup> inch socket and 1-1/8<sup>th</sup> inch open or boxed end wrench.
3. TORX 45 bit

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

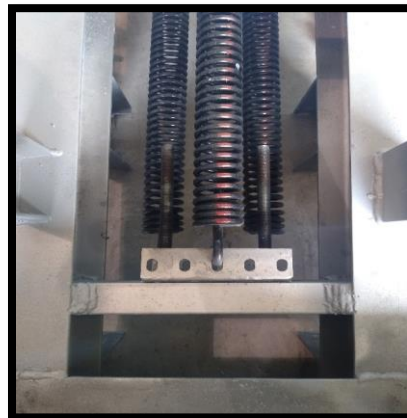
All Maintenance Operations must be coordinated with site personnel



### WARNING

- Place traffic cones and block roadway from traffic to ensure worker safety.
- Use the proper tools to avoid serious personal injury and damage to components.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.

1. Using the Barrier Controls, raise the barrier to the UP position. This will take the tension off the spring assembly.



2. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.

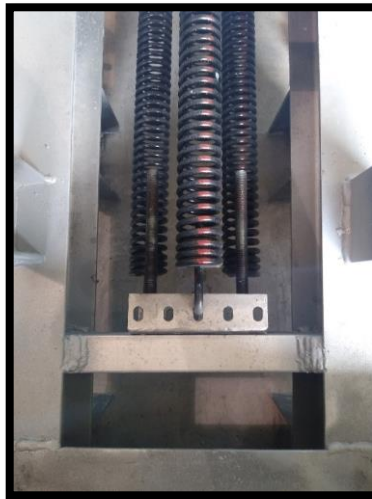


3. Turn off the power to the barrier you're working on (Turn off Servo Drive Fuse(s) in BCP).

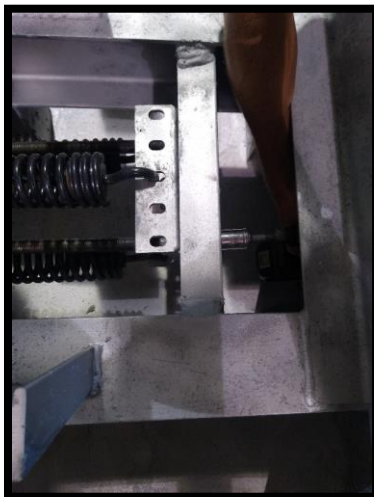
4. Remove the top cover plate over damaged spring.



5. The below picture shows the Tension Bolts and Bracket; the tension bolts and brackets plates will be fully tightened.

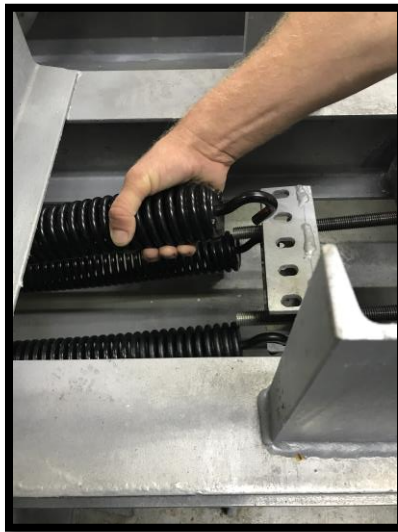


6. Loosen the tension bolts evenly, until spring assembly has some slack in the springs NOTE: Older models that have tension bolts and clevis bracket, Make sure to NOT loosen the tension bolts too far as it will interfere with the removal of the clevis bolt.

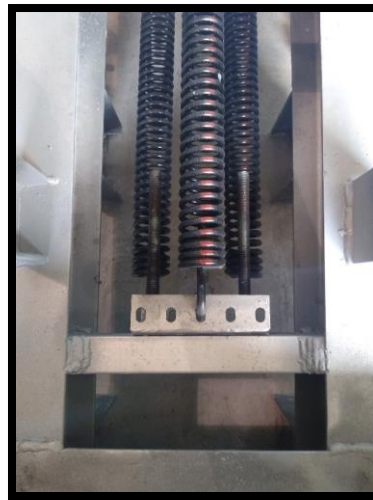
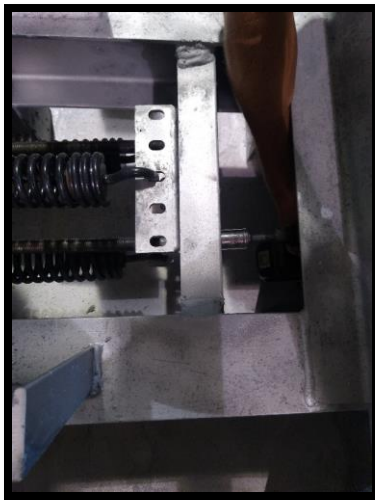




7. Remove and replace damaged Spring on Spring Bracket.



8. Tighten Tension Bolts on Spring Bracket until Bracket is touching the C-Channel.



9. Reinststate power to the barrier by turning on the Main Disconnect
10. Open the Barrier Control Panel and turn ON the Servo Drive of the affected barrier by re-engaging the Servo Drive fuse.
11. Conduct an operational test...exercise barrier 8-10 cycles while observing spring assembly functionality.
12. Replace top plate.
13. Return barrier to service.

## ATTACHMENT 8 - REPLACE SERVO DRIVE FUSE (OLDER SYSTEMS)

TOOLS NEEDED: None

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel

1. Servo Drive Fuse(s) closed



2. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



3. Dis-engage Servo Drive Fuse Holder



4. Remove old Fuse and replace with new one



5. Reinststate power to the barrier by turning on the Main Disconnect



6. Re-engage Servo Drive Fuse Holder(s)
7. Servo Drive should power up
8. Return barrier to service.



## ATTACHMENT 9 – REPLACE LED TRAFFIC LIGHT

### TOOLS NEEDED

1. Phillips Head Screwdriver
2. Pliers

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel. Turn off the power supply to the barrier's traffic lights you're working on.

1. Loosen exterior Traffic Lens Cover wing screws (use pliers if not hand tight)



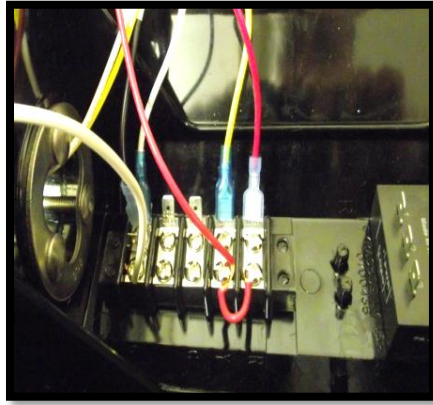
2. Open hinged cover to access LED light and interior terminal connections.



3. Loosen Tabs holding lens in place with a Phillips Head Screw Driver.



4. Remove wires for old LED Light from interior terminal block.



5. Remove old LED light and replace with new LED light.
6. Rewire new LED light to interior terminal block.
7. Tighten Tabs holding lens in place with a Phillips Head Screw Driver.
8. Close hinged cover and tighten cover wing screws.
9. Turn power back on (24v power supply is on CB5) and conduct an operational test to verify Traffic Light functionality.
10. Return barrier to service.

## ATTACHMENT 10 - REPLACE SERVO DRIVE PANEL IN BARRIER

The Servo Drive Panel is a waterproof housing and can be easily removed and replaced as a sealed unit. Do not remove sealed actuator cable connectors from the Servo Drive Panel, remove the connectors at the actuator; remove sealed unit and cables together. The replacement unit will include the cables and can be easily reconnected. The Power and Ethernet connectors are removed at the sealed servo Panel unit and reconnected to the new Servo Drive Panel unit.



### WARNING

**The Servo Drive Panel should ONLY be opened at the RSSI factory. It is considered a “LRU” Line Replacement Unit. Opening this box VOIDS THE WARRANTY.**

### TOOLS NEEDED

- Cordless impact wrench or ratchet wrench with TORX 45 bit
- 3/4 inch wrench
- 7/16 inch wrench
- Flashlight and gloves

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel



### WARNING

- **Place traffic cones and block roadway from traffic to ensure worker safety.**
- **Use the proper tools to avoid serious personal injury and damage to components.**
- **Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.**

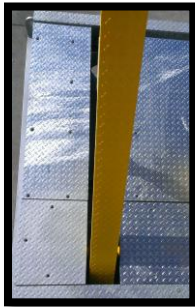
1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



#### NOTE

All top plate screws require a TORX 45 bit.

2. Remove screws from top plate over Servo Drive Panel, screws from the small top plates across the back of the barrier (exposing cable run and zip ties) and screws on top plate directly over actuator.



3. Carefully remove plates, then inspect and if necessary, remove dirt, debris and water from barrier vault.



#### CAUTION

DO NOT FORCE CONNECTORS TOGETHER, they are keyed in and must be aligned correctly, hand tighten only.

4. Disconnect actuator cables taking care not to drop into dirt or debris (protect connectors)
5. Remove plastic ties that hold the actuator cables to barrier beams
6. Disconnect power cable from sealed drive unit taking care not to contaminate with dirt or debris
7. Disconnect Ethernet cable from sealed drive unit taking care not to contaminate with dirt or debris.
8. Remove the 4 nuts that secure the sealed Servo Drive Panel to the side of the barrier (3/4)
9. Disconnect small ground wire from Servo Drive Panel to frame of barrier (7/16)
10. Slide sealed unit up and out, taking care to guide the actuator cables out also.
11. Slide in new Servo Drive Panel taking care to guide the actuator cables in carefully
12. Install the 4 nuts that secure the sealed Servo Drive Panel to the inside of the barrier
13. Reconnect small ground wire from Servo Drive Panel to frame of barrier



**NOTE**

Use dielectric grease to protect connectors.

14. Install Ethernet cable to sealed unit –
15. Install power cable to sealed unit (tighten then push connector in and tighten again) it may take a few times to FULLY SEAT the power connector to seal unit
16. Run the actuator cables back the same way and secure to barrier beams with zip ties
17. Reconnect actuator connectors to actuator.
18. Reinstate power to the barrier by turning on the Main Disconnect
19. Clear barrier of tools and top plates and Push in Servo drive fuse(s)
20. Home the barrier and set positions from the Secondary Operator or Maintenance Touchscreen (see Attachments 1&2)
21. Reinstall top plate over Servo Drive Panel with TORX 45 screws you removed or replace if corroded or damaged



22. Run the barrier up and down from barrier control menu.
23. Return barrier to service.

## ATTACHMENT 11 - REPLACE SERVO DRIVE IN PANEL



### TOOLS NEEDED

- Phillips Head Screw Driver
- Small Electronics (Flathead) Screw Driver

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel



#### WARNING

- **Place traffic cones and block roadway from traffic to ensure worker safety when operating barriers.**
- **Use the proper tools to avoid serious personal injury and damage to components.**
- **Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.**

1. Disconnect power to the Servo Drive by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.

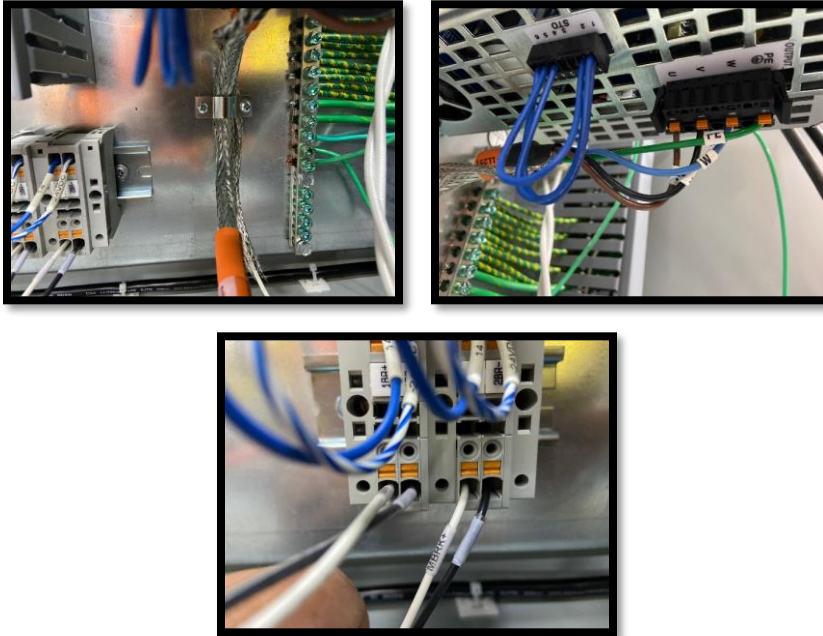


#### NOTE

Ensure not to damage cables or connectors while removing and installing Drive.



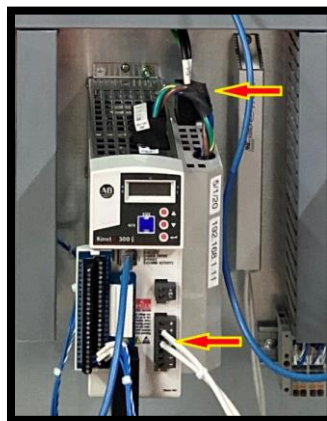
2. Carefully remove Orange (Power) Cable from Drive by first disconnecting bonding plate from cable then pulling U/V/W Wiring Harness. Disconnect Brake wires (MBRK+ and MBRK-) from Terminal Block. Place Cable securely to the side.



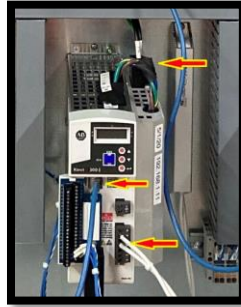
3. Carefully remove Green (Encoder) Cable from Drive by unscrewing 2 small screws on connector then unplugging from Drive. Place Cable securely to the side.



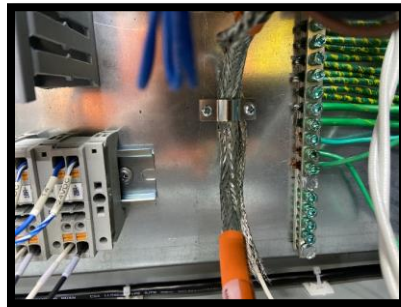
4. Unplug Ethernet Cable from Drive.
5. Remove L1 and L2 harness from top of Servo Drive. Also Remove Shunt wire harness from front of Drive.



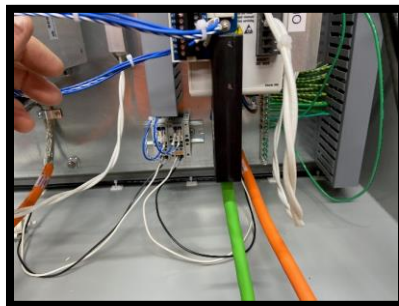
6. Remove 2 screws holding Servo Drive to backplate then take damaged Drive from Panel.
7. Install new Drive in place of old Drive then attach Screws to hold the new Drive to backplate.
8. Connect Shunt harness, L1/L2 wire harnesses, and Ethernet Cable back to new Drive.



9. Install Orange Cable back to drive by placing cable under bonding plate then securing. Then connect U/V/W wiring harness and terminate MRBK + and – wires back to Terminal Block.



10. Connect Green cable back to front of Drive. Be careful not to damage connectors. Secure connection by tightening two screws.



11. Reinststate power to the barrier by turning on the Main Disconnect.
12. Ensure Roadway is clear of Traffic and Tools before moving barriers.
13. Home the barrier and set positions from the Maintenance Touchscreen (see Attachments 1&2)
14. Run the barrier up and down from barrier control menu.
15. Return barrier to service.



## ATTACHMENT 12 - REPLACE POST ASSEMBLY LED LIGHTS

### TOOLS NEEDED:

1. Phillips Head Screw Driver
2. Wire Cutters/Stripper
3. Water proof Butt Splices and Electrical Tape
4. Heat Gun

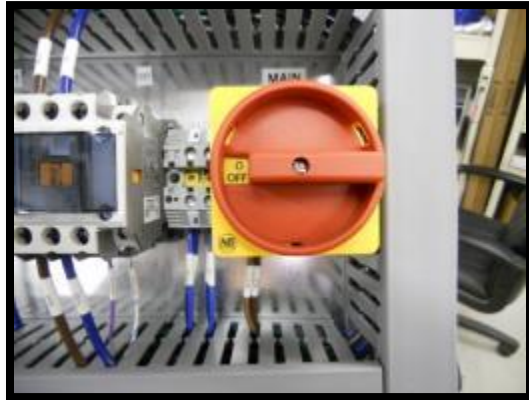
### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel



### WARNING

- Place traffic cones and block roadway from traffic to ensure worker safety.
  - Use the proper tools to avoid serious personal injury and damage to components.
  - Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.
1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



2. Turn off the power to the barrier you're working on (24v power supply).
3. Remove screws holding LED in place.



4. Remove tape and cut wires on the inside of the water proof butt splices at Post Assembly.



5. Cut off ends and strip wires on new LED Lights, then terminate and Post Assembly with a waterproof butt splice and tape connection.



6. Reinstate power to the barrier by turning on the Main Disconnect
7. Conduct a test to verify LED Lights are functioning properly. If not functioning properly, check that the 24v polarity is correct.
8. Return barrier to operation.

## ATTACHMENT 13 - REPLACE SURGE PROTECTION MODULE IN BBP

TOOLS NEEDED: None

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.



#### NOTE

Surge Protection Module is equipped with RED indicators on the front of device to inform you if the device has Failed. Please ensure the Module has Failed before replacing.



1. Turn off ALL Circuit Breakers
2. Locate the Surge Protection Module, then using your thumb and finger pull out pluggable center module from device.



3. Install new pluggable module into Surge Protection Device. Ensure tabs are lined up and module is seated securely.



4. Turn ON CB1, wait 4 seconds for transfer switch, then turn on CB2, & CB3. Then monitor Surge Protection Module to ensure it does not Fail once power is turned on.
5. Return barrier to normal operation.

## ATTACHMENT 14 - REPLACE LOW VOLTAGE MONITOR IN BBP

TOOLS NEEDED: None

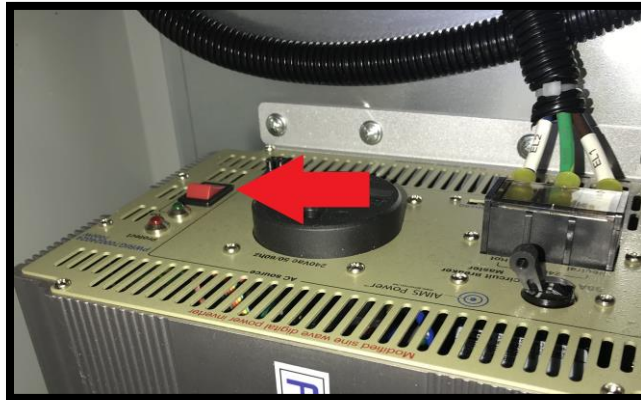
### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.

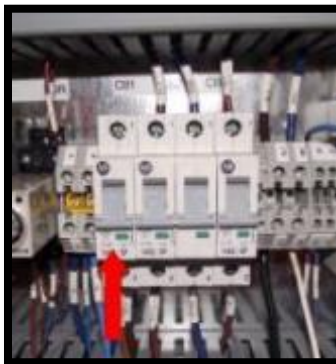
1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



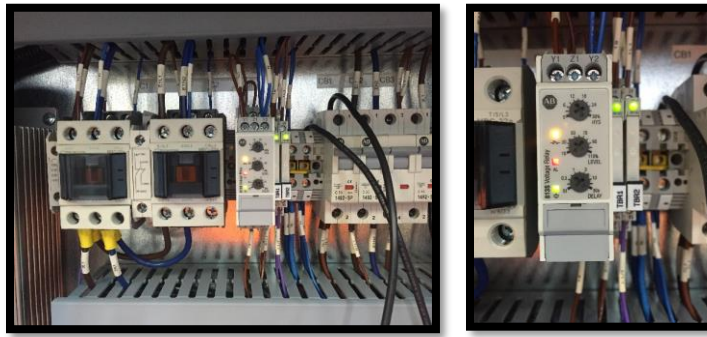
2. Turn off top switch on inverter.



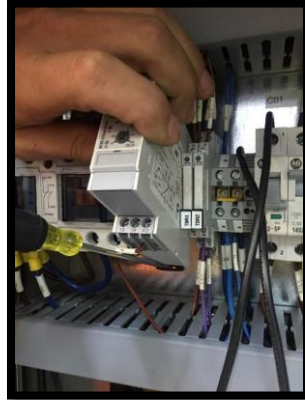
3. Turn off main incoming power to BBP (CB1).



4. Note and Diagram existing wiring for installation of new Relay.



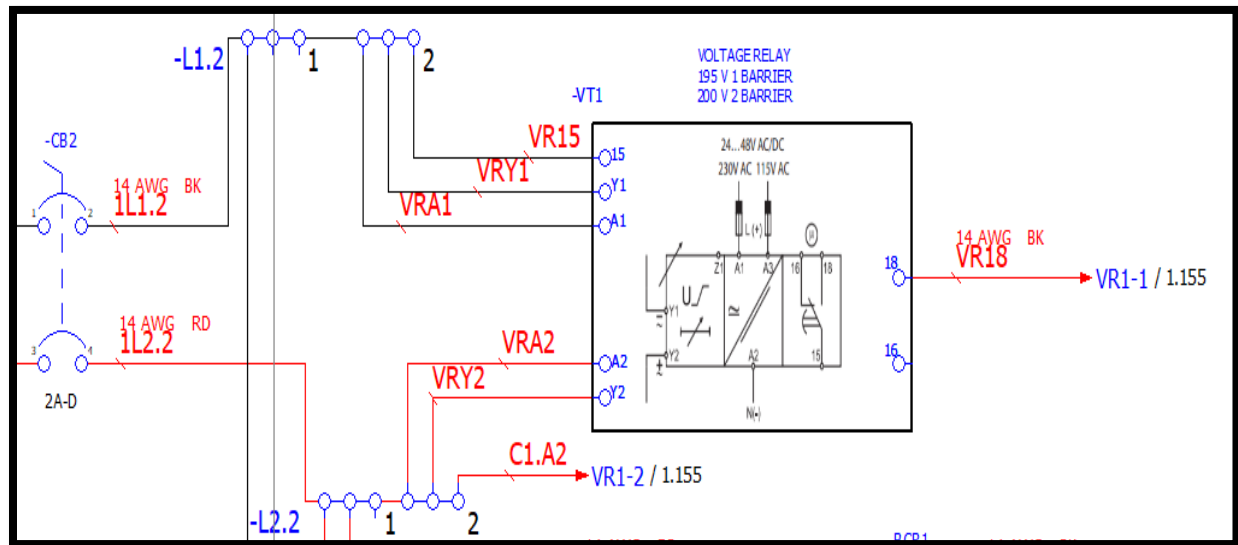
5. Grasp Voltage Monitor Relay while releasing from Dinrail with small screwdriver.



6. Disconnect all wires and discard defective unit.



7. Reconnect existing wires on new unit then attach to Dinrail by reversing procedure in step 5.
8. Return main incoming power to BBS by turning on CB1. Ensure Contactor C1 engages.
9. Turn Inverter switch back to the ON position.
10. Reinststate power to the barrier by turning on the Main Disconnect
11. Return barrier to normal operation.





## ATTACHMENT 15 - REPLACE TIME DELAY RELAY IN BBP

TOOLS NEEDED: None

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with Post 1. The Primary Operator Controls at Post 1 “ENABLE” the Maintenance Function at the Secondary Operator Controls for the safety of Maintenance Personnel. Refer to the Operator Manual for specific procedures.

12. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



13. Turn off top switch on inverter.



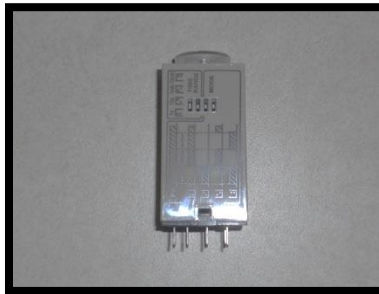
14. Turn off main incoming power to BBP (CB1).



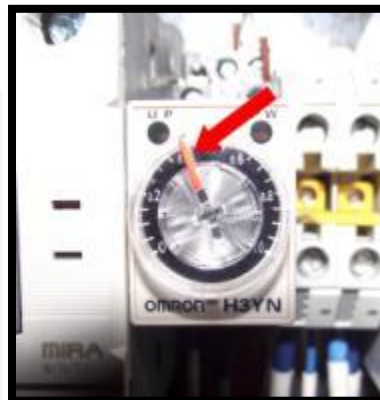
15. Grasp Time Delay Relay with thumb and finger then pull straight out.



16. Ensure Time Delay Relay dip switches are set properly (out of the box, all dip switches are set to the left; adjust the top dip switch to right and leave the remaining three to the left)



17. Install new Time Delay Relay, be cautious as you line up the pins. Ensure dial on the relay is set to 4 seconds.



18. Return main incoming power to BBS by turning on CB1. Ensure Contactor C1 engages.

19. Turn Inverter switch back to the ON position.

20. Reinstate power to the barrier by turning on the Main Disconnect

21. Disengage Maintenance from the Primary Operator Controls and test Open/Close operation from the Secondary, Primary, and Grand Master (if installed) slider controls.

22. Return barrier to normal operation.

## ATTACHMENT 16 - REPLACE 24 VDC POWER SUPPLY IN BCP

### TOOLS NEEDED:

1. Small Phillips Head Screwdriver
2. Small Straight Head Screwdriver
3. Volt Meter

### BEFORE YOU INITIATE MAINTENANCE OPERATIONS

All Maintenance Operations must be coordinated with site personnel.

1. Disconnect power to the barrier by turning off the Main Disconnect and lock out with a wire tie or IAW local lockout procedures.



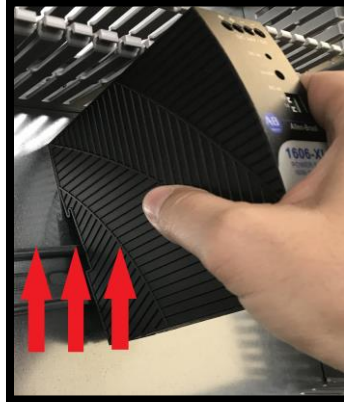
2. Turn the 24V breaker to the OFF position (refer to site control drawings for CB number).



3. Remove the 3 wires on the TOP and BOTTOM of the affected 24VDC Power Supply. (note wire locations for re-termination)



4. Remove Power Supply from the Panel railing by pulling down tab on the bottom of the Power Supply, then pulling out and up from the bottom of the Power Supply.



5. Install the new Power Supply onto Panel railing by reversing step 4 above.
6. Re-terminate the three wires on the TOP and BOTTOM of the new Power Supply.
7. Reinstall power to the barrier by turning on the Main Disconnect



8. Then turn on the affected 24VDC breaker.
9. Ensure 24VDC devices have powered up (check for 24 VDC with Voltmeter).
10. Return barrier to normal operation.

## ATTACHMENT 17 – REPLACE AND SETUP TOUCHSCREENS

### Replace Touchscreens

#### **BEFORE YOU INITIATE MAINTENANCE OPERATIONS**

All Maintenance Operations must be coordinated with site personnel

1. Remove (unplug) 24vdc power and Ethernet patch cable

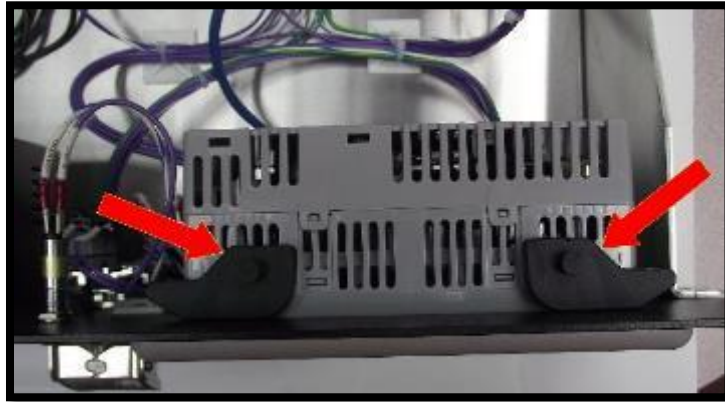


2. Locate 4 black plastic locking clips on rear of screen

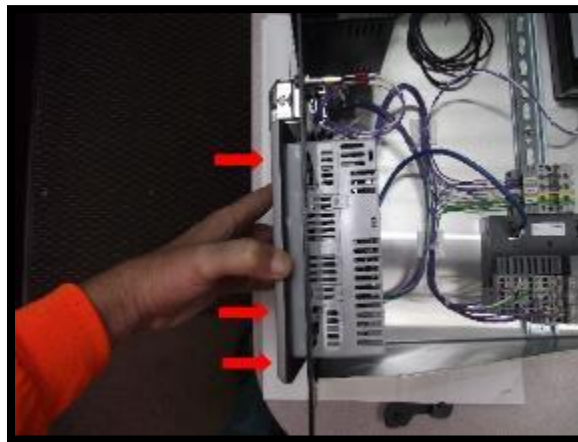




3. Remove by rotating plastic clips until they release



4. Replace with new touchscreen



5. Attach 4 black plastic locking clips by rotating until snug against faceplate



**CAUTION**

Do not over tighten clips, this will cause sensitivity issues on touchscreen

6. Replace (plug in) the 24vdc and Ethernet patch cable

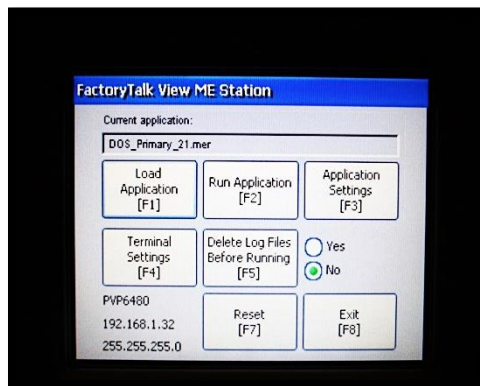


7. Complete steps below “Changing IP address and choose program” section

### Setup Replacement Touchscreen

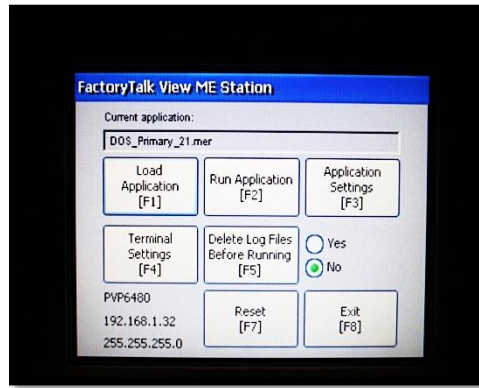
#### Set IP Address

1. Power up replacement touchscreen and it will boot to the menu screen
2. Drill down to this path: terminal settings - networks and communications - network connections - network adaptors and find the option for "USE DHCP" - select NO
3. Go to the IP ADDRESS button and enter 192.168.1.12 for maintenance touchscreen; 192.168.1.22 for primary touchscreen. Simply choose which touchscreen you are replacing. The Subnet mask is 255.255.255.0
4. Use the back button to return to the main menu and select reset touchscreen.
5. You will now be at the menu again and in the lower left corner you should see the new IP address you just set.





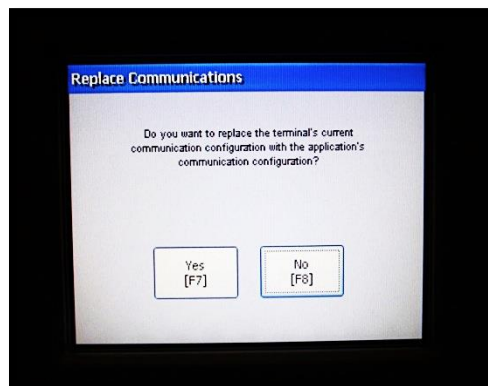
1. Choose Touchscreen Program and From menu, select Load Application [F1].



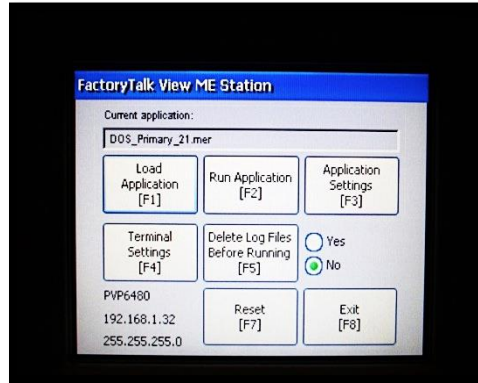
2. Then choose desired program from the list and press Load [F2].



3. If asked “Do you want to replace the terminal’s current communication...configuration?”, select Yes [F7].



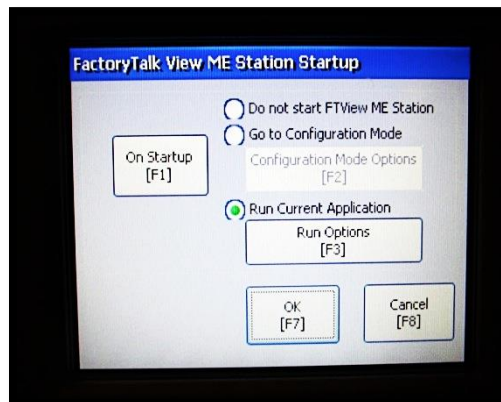
4. After a few moments the run program button and other buttons will light up on Main menu. Select, Terminal Settings [F4]



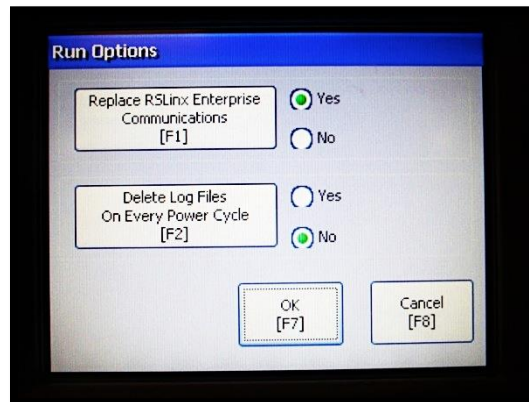
5. Next, select Startup Options



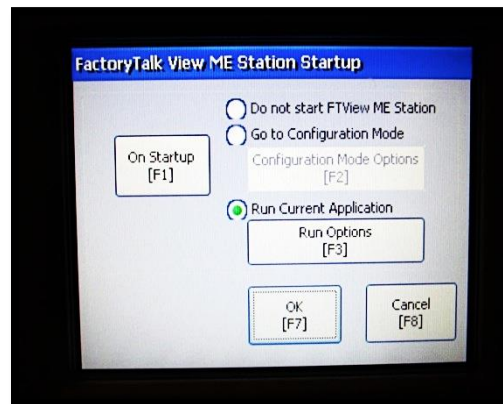
6. Then select Run Current Application and press the Run Options [F3] button.



7. In the Run Options Menu.
  - a. Set Replace RSLinx Enterprise Communications [F1] to Yes.
  - b. Set Delete Log Files on Every Power Cycle [F2] to NO and Press Ok [F7].



8. Press OK [F7]



9. Press Close [F8]



10. Press Reset [F7] to reboot touchscreen.



11. Return barrier to service.

## ATTACHMENT 18 – REPLACE DEBRIS SENSOR

Tools needed:

1. Cordless impact wrench or ratchet wrench with TORX 45 bit



### WARNING

- Place traffic cones and block roadway from traffic to ensure worker safety.
- Use the proper tools to avoid serious personal injury and damage to components.
- Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.

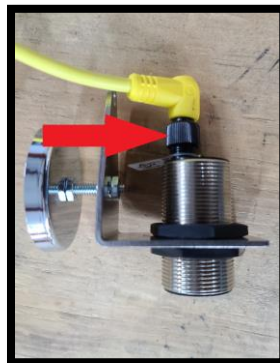
1. Remove top plate screws with TORX 45 bit from plate over Actuator then remove plate.



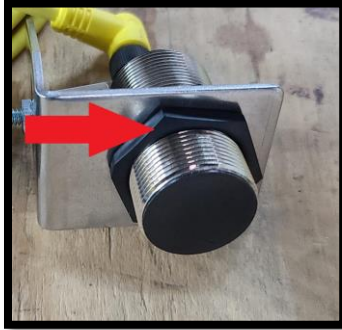
2. Locate Debris Sensor next to Actuator. It is secured with a magnetic mount to steel channel.



3. Remove mount from steel channel for better access. Then disconnect wire lead from sensor by unscrewing connector at back of sensor.



4. Unscrew lock nuts from the front of Debris Sensor then remove Sensor from mount. Install new Sensor to mount then install and hand tighten lock nuts.



5. Screw wire lead back into Debris Sensor then adjust sensitivity using flat head screw on back of Sensor. It should activate just as contact is made with sensor. May have to readjust if guards report a lot of notifications. Once set, place mount and Sensor back onto barrier vault location. Make sure it is the same elevation as Actuator connectors.



6. Test Sensor by clocking for 60 seconds. Check Barrier notification should illuminate on Guard House Controls.
7. Place Top plates back on barrier and secure.
8. Return barrier to operation.



## ATTACHMENT 19 – REPLACE AIR SYSTEM COMPONENTS

The Air System consist of an air line that is ran from the BCP to Barrier Vault through the Power Side J-Box. At the BCP it connects to a small air pump using push in connectors. Inside the vault the line runs though J-box then routes inside vault, though a regulator, then connects at Actuator Encoder connector.

Tools needed:

1. Cordless impact wrench or ratchet wrench with TORX 45 bit
2. Small Screwdriver.



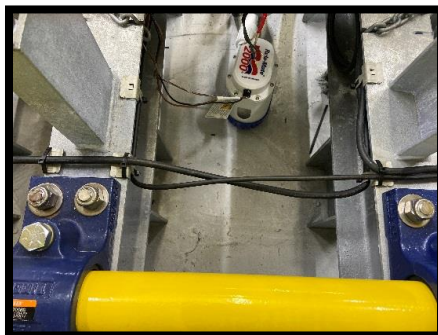
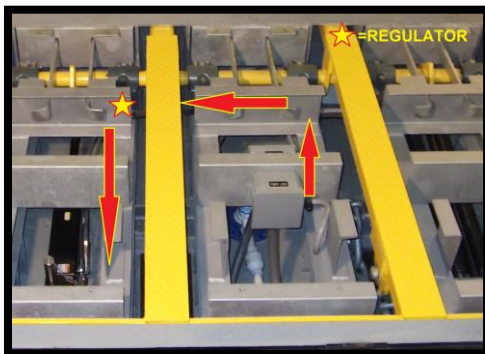
### WARNING

- **Place traffic cones and block roadway from traffic to ensure worker safety.**
- **Use the proper tools to avoid serious personal injury and damage to components.**
- **Never operate this equipment when a vehicle, person or any obstruction is in the way of full operation of the RSS-2000.**

1. Remove top plate screws and plates with TORX 45 bit from over Airline route.



2. Airline Path below. Inspect areas for damage or leaks and replace airline between connections if necessary.

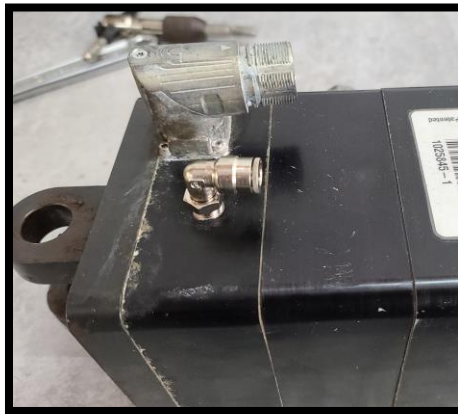


3. The hose can be removed by pushing in lock ring on connector the pulling hose from connector. Barbed fittings may require heat to connect.



**NOTE**

On newer Actuators (Y0005) from RSSI the Air Fitting will be located just under the Encoder Connector.



4. Refer to specific site drawings for wiring of Air Pump to Relay.