



# Installation Manual

RSS-2000 Series Electric Finger Wedge Vehicle Barrier



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## INTRODUCTION

This manual provides Installation Procedures for the RSS-2000 series electric finger wedge vehicle barrier system for Integrators/Contractors. It is **NOT** intended to be all encompassing and is based on "typical" installations. After review of this manual, we recommend a conference call with the RSSI factory to discuss questions regarding procedures that may require further clarification. RSSI is a barrier manufacturer; on questions related to civil issues specific to a particular jobsite, Integrators/Contractors should refer to the Architectural Firm that designed the project or a licensed Civil Engineer familiar with the local site conditions and requirements.

## 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 impact condition designation K12, L3 or ASTM F2656 impact condition designation M50, P1. The barrier is capable of stopping and destroying a 15,000lb 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, downtime or maintenance. The barrier's vault assembly is constructed of hot dip galvanized structural steel requiring a shallow below-grade foundation depth of 24 inches and a rebar reinforced concrete casing around the barrier vault measuring 12 inches on 3 sides and 24 inches on the front. 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, constructed of tubular steel with a "safety yellow" powder coat finish and supported by self-lubricating non-grease type bearings, to an above ground position of 36" without obstructing line-of-sight vision. Removable skid resistant roadway plates provide easy access to service points without the use of heavy equipment or special tools. The barrier ships assembled, tested and ready for installation.

## BEFORE YOU BEGIN

- Read and understand all instructions and procedures before you begin to install components.
- 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.

## 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.

## HOW TO OBTAIN ADDITIONAL FACTORY SUPPORT

If you have any issues or questions, on-site integrator/contractor personnel are highly encouraged to contact RSSI's Service department. **WE CAN HELP YOU!** Normal office hours are 7:00 AM CST - 3:00 PM CST 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>

## 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 installation person must perform all start-up work.
- Do not operate this equipment when you are distracted or under the influence of drugs, alcohol or medication causing diminished control.
- 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.
- 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*

- The Removable Post Assembly Height is 36 inches at deployment. All barriers are shipped fully operational, self-contained for easy installation. The weight of the barrier depends upon the unit purchased.

Description	Dimensions (W x L x H)	Weight
RSS-2000 - 4 Post	6.5' x 10.5' x 2'	6,720 lbs
with heat system		7,620 lbs
RSS-2000V - 5 Post	6.5' x 12.5' x 2'	8,260 lbs
with heat system		9,385 lbs
RSS-2000VI - 6 Post	6.5' x 15' x 2'	9,800 lbs
with heat system		11,150 lbs

*Table 1 – RSS-2000 Series Dimension Chart*

- Before you begin, you will need the following available on site prior to installation:
  - Equipment for excavation, soil compaction, removal and disposal of spoils
  - Concrete placing and finishing tools
  - #5 steel re-bar
  - 3000 PSI (minimum) Mix Concrete
  - Equipment capable of lifting and setting the RSS-2000 series barrier in place

## BARRIER INSTALLATION – A Five Step Process

### Step One – Excavate

- The first step is to excavate the existing roadway to a dimension of the appropriate barrier size.



*Figure 2, Excavation*

<b>Barrier Size</b>	<b>Excavate Area (W x L x H)</b>	<b>Rebar Type #5</b>	<b>Concrete (3000 PSI min.)</b>
RSS-2000 4 Post	9' x 12' x 2'	Approx. 100 feet	Approx. 4 yards
RSS-2000 5 Post	9' x 14.5' x 2'	Approx. 120 feet	Approx. 4.55 yards
RSS-2000 6 Post	9' x 17' x 2'	Approx. 140 feet	Approx. 5.1 yards

*Table 2, Excavation Details***NOTE:**

Ensure barrier placement according to the approved site plan taking in to account the road crown, underground utilities and tie-ins to associated passive knee walls or bollards.

- Attention should be paid toward diverting surface run off and debris around barrier surface as much as possible. This will reduce the amount of cleaning of the barrier vault in the future.



## Step Two – Place the Barrier

- Once the soil is compacted (to local standard), place the RSS-2000 box into the pit leaving 2 feet of the area for concrete on the approach side and a 1 foot area for concrete on the other 3 sides. If the barrier is placed in a new roadway, be sure that the barrier foundation is constructed with the same base and compaction as the roadway design requirements. If installation is in a new roadway, place the barrier and form the foundation perimeter with  $\frac{1}{2}$  inch slope away from the barrier. The barrier is typically installed  $\frac{1}{2}$  inch above grade to allow water to flow around the barrier. Local conditions may dictate installing the barrier flush to the existing roadway.
- Secure Barrier to prevent it from moving or shifting during rebar install, conduit install, and concrete pour.



*Figure 3, Barrier Placement*

### Step Three – Barrier Conduit Connections

- RSSI-2000 barriers are self-contained shipped from the factory ready to install. Connect the appropriate PVC conduit to the power, control and sump pump PVC sleeves in the metal stub outs located on the front (attack) side of the barrier. If the job site requires rigid conduits, the PVC sleeve in the stub outs will have to be replaced.

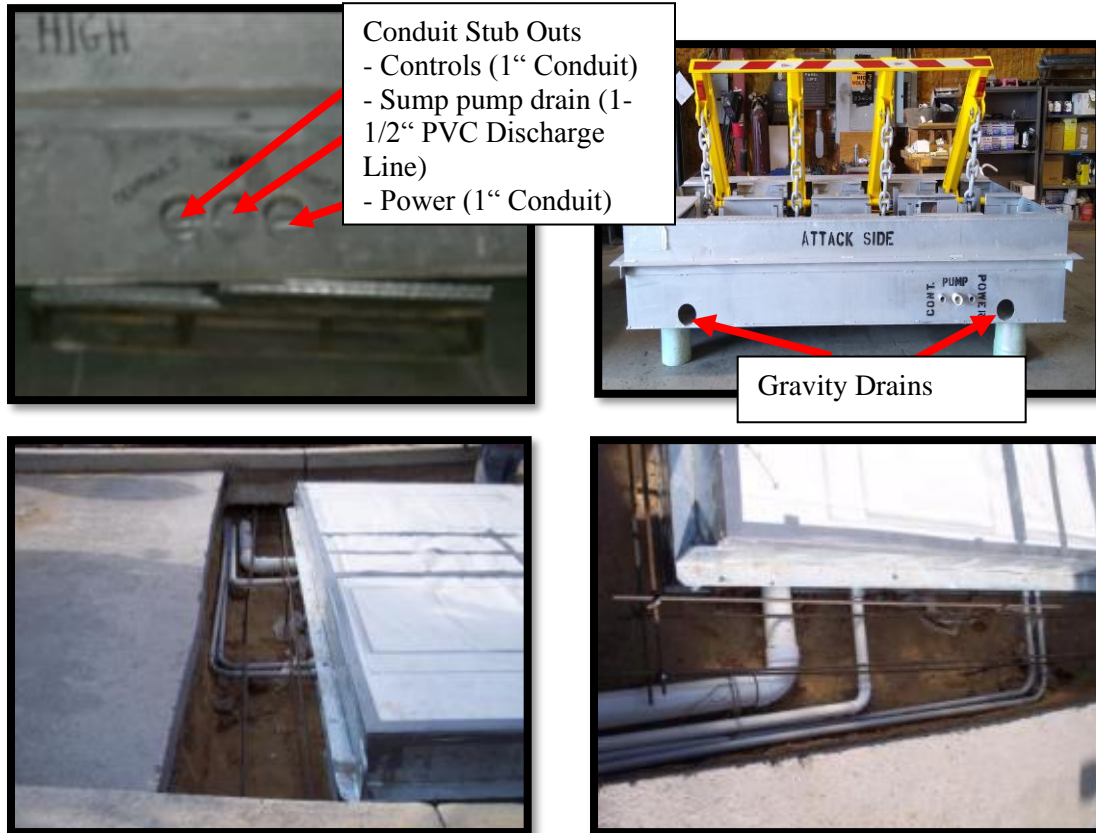


Figure 4, Stub-Out Connections



#### NOTE

RSSI **requires** at least one of the 5" gravity drains be installed (4" PVC) to each barrier. Additionally, the Sump Pump discharge (1-1/2" PVC) should be "**separate**" from and "**not**" tie into the Gravity Drain. This prevents recycling of the discharge water back into the vault. The 4" gravity drains should be on the downhill side of the barrier. 4 Drain holes total are provided. 2 on the Attack and 2 on the Protected side of barrier. Cover unused Drain Holes before pouring concrete. If the site conditions do not allow for gravity drains, contact RSSI regarding a modification at the factory to add a second sump pump or an Air System in the barriers.



#### CAUTION

Failure to add a second sump pump when no gravity drains are connected could void the warranty. Contact the factory for assistance.



## Step Four – Rebar &amp; Concrete

**WARNING**

**ENSURE ALL OPENINGS ARE COVERED BEFORE CONCRETE IS POURED.  
FAILURE TO DO SO WILL RESULT IN EQUIPMENT MALFUNCTION.**

- Place the #5 re-bars and pour the concrete (3,000psi minimum) around the RSS-2000 unit.
- Cover barrier with Plastic before concrete pour.
- Pour Concrete evenly around barrier to prevent it from shifting. Be careful not to damage the electrical or drainage conduit when vibrating concrete. A light broom surface finish is recommended.
- Allow sufficient time for concrete to harden before driving over barrier.



*Figure 5, Rebar & Concrete*

**Step Five – Conduit, Wire, Air Tubing and, Termination Of Controls****Conduit and Wire**

- Rigid Metallic Conduit should be used when penetrating the foundation for the BCP and where exposed to the elements.
- Electrical and Control Conduits will be run from the barrier into and out of Electrical and Control J-box (quazite box) to the BCP. **Use stranded wire.**
- After conduit has been installed, move on to controls. BCP's and BBP's arrive complete from the factory. Ensure all control wire and power wires from the barrier, to the BCP, to the operator controls are labeled to expedite termination to the BCP.
- Fiber. The Fiber may need to be run from the BCP to the Fiber Converter Panel. Ensure a qualified technician that can install, terminate, test, and certify Fiber is used.
- If the system has the submersion air pumps, the air hose will be pulled through Power Conduit from Panel to Barrier Vault.
- Electrical Power Cables should be sized by a Master Electrician or EE per N.E.C. Code based on distance from BCP's and BBP's to barriers.
- If Servo Drive Box is in Barrier vault, RSSI provides a Shielded Ethernet Cable (300 feet) inside the barrier to terminate between the barriers and the BCP.

**WARNING**

**ENSURE A QUALIFIED ELECTRICIAN TERMINATES THE ELECTRICAL CONNECTIONS ACCORDING TO NATIONAL ELECTRIC CODE AND ANY APPLICABLE LOCAL CODES.**

**Terminations**

- All Ethernet terminations should be tested with Ethernet cable tester (TIA/EIA 568A standard).
- All Multi-mode Fiber Optic cable should be terminated (Type ST Connectors) and tested by a qualified fiber optic technician.

**Electrical Terminations**

1. If BBU is provided by RSSI, local commercial power (Typically 120/240 V) 1P 3 wire 30A is wired to Battery Backup Panel (BBP) at MAIN CB-1 (L1 –L2, - Ground). If no BBU commercial power will connect to Top of Main Disconnect Switch in Barrier Control Panel.
2. BBP transfers power to Barrier Control Panel (BCP) MAIN Disconnect Switch.
- 3a. If the Servo Box is inside the barrier, it is powered through the BCP fuses FU1 and terminals 4L1 – 4L2 – Ground and wired to the Barrier Power J-box (splices). Route Cat5 from Servo Drive box in Barrier through Control J-Box and to Control Panel.
- 3b. If Servo Drive is located in BCP. The Motor and Encoder cables will be pulled from barrier vault through appropriate J-Box (Orange=Power/Green=Control) then into BCP. Additionally, debris Sensor cable will be terminated in Controls J-Box (3 wires needed). Note: If distance is over 90 feet from BCP to Actuator contact RSSI for assistance.

4. If supplied, the Barrier Heat Grid is powered through the BCP terminals 1H1 and 1H2 and wired to the Barrier Power J-box (splices). (check conduit legend for wire gauge needed)
5. The 24Vdc Sump Pump is powered through the BCP terminal SP+ and SP- wired to the Barrier Control J-box (splices). 2 wires needed.
6. The 24Vdc Traffic Lights are powered through the BCP PLC outputs and terminal blocks.
7. The 24Vdc Barrier Warning LED Lights are powered through the BCP PLC and wired through the Control J-Box then terminated in J-Box. 2 wires needed
8. The IR Beams(if applicable) are powered through the BCP +24Vdc (Red wire)/-24Vdc (Black wire) power terminal blocks to each IR Beam (splices in stands) Connect the Red wire to Brown and Gray wires of IR pigtail and Black wire to Blue wire of IR pigtail.
9. The Barrier Heat Thermostat (mounted outside Panel) is connected at BCP terminals +24Vdc and PLC input (splices at thermostat); if applicable.

### Control Terminations

1. If the Servo Box is inside the barrier, it communicates with the BCP via shielded twisted pair Ethernet cable (Cat6) from a Ethernet switch to servo box (Tech will be required to terminate and label RJ45 connector on cable end at Ethernet switch in the BCP) Servo Box is pre-terminated at factory. If Servo Drive is in BCP, an in-line breakout board will need to be terminated and plugged into Servo Drive.
2. BCP receives vehicle presence indications from the LOOPS in the roadway to the front of the LOOP DETECTORS in the BCP. (Bottom DIP switch must be set to right position at this point).
3. BCP receives INPUTS from IR Sensor (if applicable) (black wire on sensor pigtails) the black wire is connected to blue wire connected on PLC.
4. BCP controller receives a contact closure from the thermostat (mounted outside) to the BCP PLC inputs. This activates the barrier heat grid system.
5. If BBU is provided, BCP receives INPUT from Battery Backup Panel (BBP) when commercial power is lost and/or when a Low Voltage condition is present. BBP terminations are marked (+24VDC) 13 and 14. The BCP terminations are mark (+24VDC), (I:1/0) for Loss of Power and (I:1/1) for Low Voltage condition.

### Installation of Ethernet Cable (Servo box in Barrier)

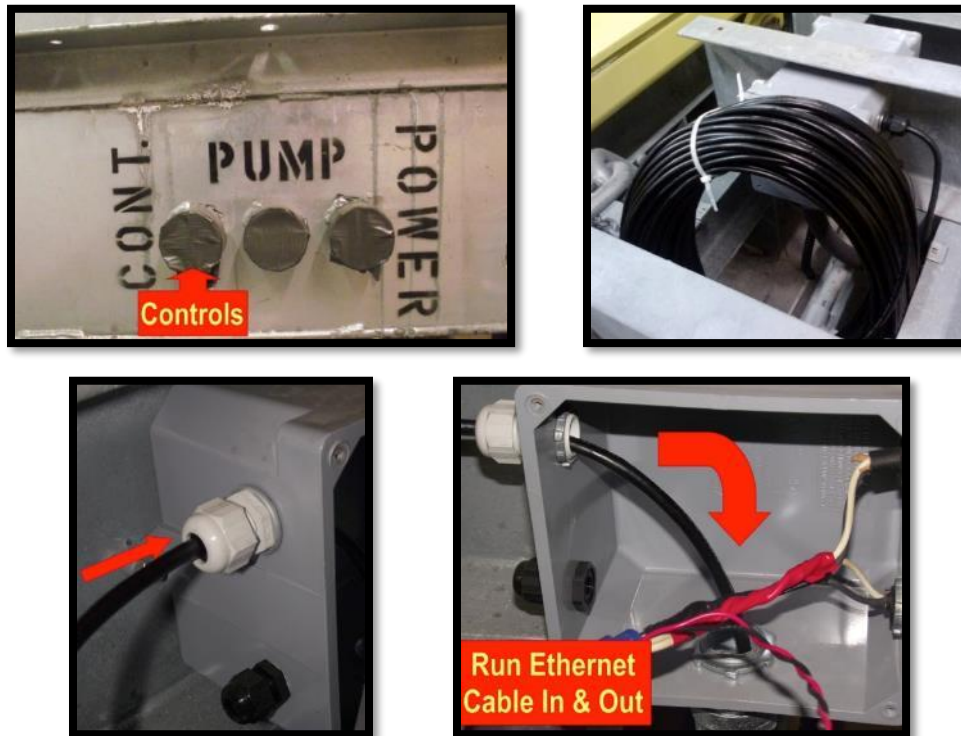


#### CAUTION

The Ethernet cable (if required) is designed to be a straight run with no splices or severe bends or stretching. Splicing this cable will lead to premature failure of the network communication to the Servo Drive

- Unroll the 300 feet of Ethernet cable rolled up inside barrier. (only included in barriers with Servo Drives in the Barrier Vaults)

- Feed Ethernet cable end through Barrier Control J-Box and then down into conduit and pull all the way to the BCP.



*Figure 6, Controls Conduit, Ethernet Run Into J-box.*

- Inside the barrier control panel, terminate Ethernet Cable with RJ-45 connector provided. Use the **TIA/EIA 568A** Wiring diagram in the below Figure.



*Figure 7, Ethernet Wiring Diagram*

- Once termination has been made, plug the cable into the Ethernet Switch.



*Figure 8, Ethernet Connection at BCP*

- Connect Ethernet shield wire to (Earth Ground) on top of switch at pin #4. If metal RJ45 is used, no grounding is required.



*Figure 9, Ethernet Connection and Ground*





## WARNING

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



*Figure 10, Servo Drive Box Inside Barrier*



## NOTE

It is highly recommended to use experienced technicians trained to install shielded twisted pair terminations. After installing, test with a network cable tester.

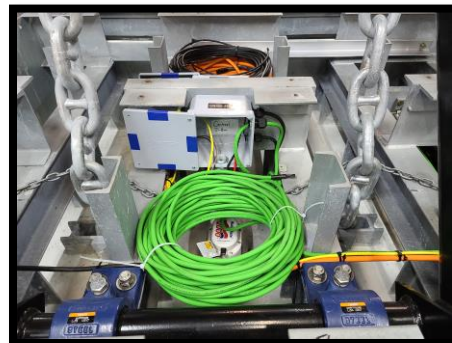
## Installation (Servo box in Control Panel)



## CAUTION

The Servo Drive cables are designed to be a straight run with no splices or severe bends or stretching. Splicing this cable will lead to premature failure of barrier components

- Unroll Orange Power Cable and Green Encoder Cables at barrier. Pull the unterminated end of cable through J-Boxes and to Control Panel. Orange=Power J-Box, Green=Control J-Box.



- Terminate 3 wires from BCP for Debris Sensor, 2 wires from BCP for Warning Lights, and 2 wires from BCP for Sump Pump in Control J-Box.
- Once Servo Cables have been pulled through conduits to BCP, verify correct Drive location for cables and make a service loop then cut off excess.

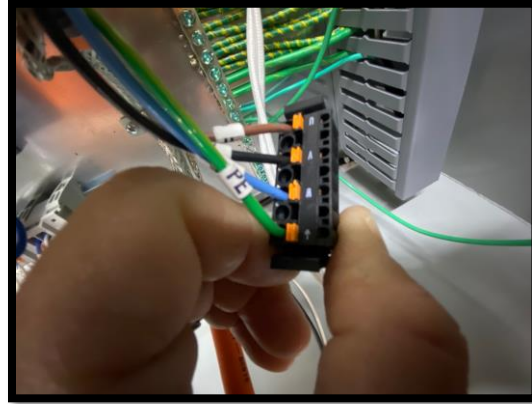
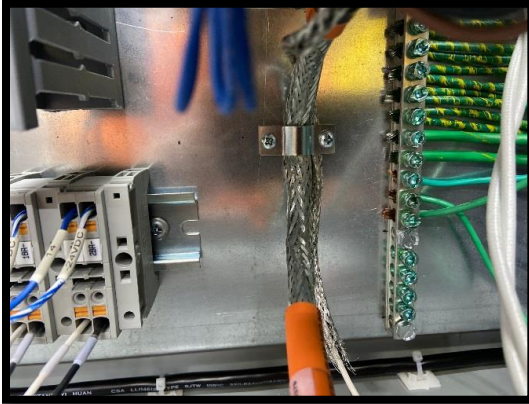


- Terminate Orange Cable to drive by stripping plastic sheathing from section of cable at end. Placing exposed cable shielding under bonding plate then securing. Connect U/V/W wires to harness plug then plug into bottom of Servo Drive.

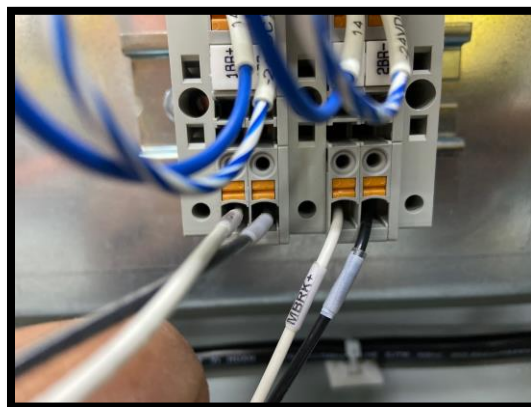


### NOTE

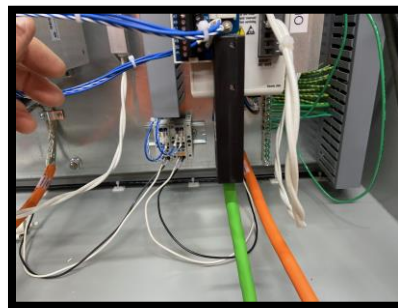
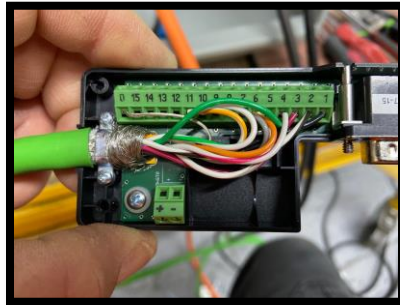
If the Barrier has the Air System option, the Orange and Green cables will need to be sealed with silicone before termination. Please contact RSSI for detailed instructions.



- Terminate MRBK+ and MRBK- wires back to Terminal Block.



- The Green Controls Cable will terminate into a breakout board that will plug into Servo Drive. Remove 6"-8" of rubber sheathing on cable. Place cable on breakout board mark where to cut cable shielding. Leave enough metal shielding to bond to plate at bottom of breakout board. Use small zip tie to secure to bonding plate. Using wiring diagram, terminate each wire. Don't leave much excess, it can be difficult to close breakout board. Plug into front of the Servo Drive then secure with two small screws. (Pics on next page)



Wire Color	Breakout Board Terminal	Wire Color	Breakout Board Terminal
Black	1	White/Gray & Orange	6
White/Black	2	Gray	7
Red	3	White/Green	10
White/Red	4	White/Orange	11
Green	5	Shield wire	0

## Installation, Termination, and Testing of Fiber Cable

- Fiber converters are located in the BCP and in location near Operator Control Console.
- Fiber must be run in locations where the network communication distance exceeds 300 feet.
- A technician terminates the fiber and conducts a BASIC go/no go indication test. Based on the performance of the fiber optic link, if there are any issues, further testing with OTDR and certification may be required.
- Connecting the fiber terminations (ST) to the fiber convertors
  1. Line up pegs with slots, push in and turn clockwise to lock
  2. There is a (TX) transmit and (RX) receive (marked on convertor)
  3. Take each pair of fiber cables (already terminated and tested) and connect to TX and RX
  4. Connect other end of fiber optic cable and termination to RX and TX (opposite)
  5. You should get LINK light indication on fiber convertor, if not, reverse connectors
- Cleaning the fiber terminations before, during and after the termination procedures is a key to success.



### NOTE

It is highly recommended to use experienced technicians trained to install, terminate, test, and certify fiber. After installing, at a minimum test connection with an OTDR tester.



### CAUTION

The Fiber cable is designed to be a straight run with no splices or severe bends or stretching.

## Air Tubing and Pump

The Air Pump system is an optional system that is installed in locations that are prone to flooding or poor drainage has been identified. The tubing is connected to the actuator inside the barrier vault then runs through the Power J-Box and up to BCP Panel, using Power conduit, where it is connected to the Air Pump. The Air Pump can be wired up to be on all the time or after the Debris Sensor has detected presence for 60 seconds.

1. Locate Air Tubing rolled up inside barrier at J-boxes.



**WARNING-** It is imperative that there are no kinks in the line as this will restrict/cut off air flow.

2. Run Air Tubing in the J-box then through Power Conduit back to Barrier Control Panel.



3. Once inside BCP, connect Air Tubing to Pump located at the bottom of the Panel. A splitter will be required if hooking up two barrier air tubes to one pump. See site specific Control Drawings for Pump termination in Panel. Light heat can be applied to the tubing to help with connections.

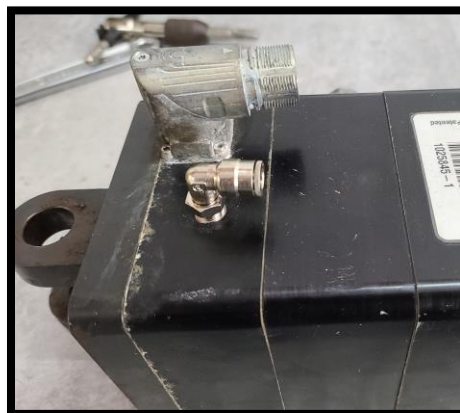


4. **Leave Air Tube removed from actuator and hose plug in place** until the system is ready to be tested. Please see Attachment 6 for instructions on powering up Air Pump system and purging moisture from the lines before connecting. **DO NOT PUMP MOISTURE INTO ACTUATOR!**



### NOTE

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



6 Attachments

- 1- Air Pump System Start-up
- 2- Safety Loop Set-Up
- 3- Initial Barrier Setup and Operation
- 4- Vehicle Detector Loop Installation
- 5- Traffic Light Installation
- 6- Commissioning Checklist

\* \* END OF SECTION \* \*



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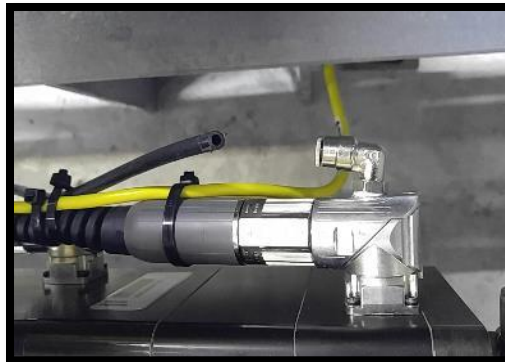


## ATTACHMENT 1 – AIR PUMP SYSTEM START-UP

1. Once the barrier system is powered up you will need to purge moisture from the air tubing. With the tubing removed from the actuator, block the water/debris (pic below) sensor for 60 seconds to activate the pump. The sensor onsite may look different than what is pictured below but will be in same location. Applying tape to water/debris sensor is best option for testing.



2. After 60 secs, verify the Air Pump is on. Place your finger over the tubing to ensure pressure is present. If Pump is on and no air is coming out of the tube, please check the tubing for kinks. Allow the air to flow through the tube for several minutes. Ensure no moisture is coming out.



3. Once all the moisture is out of the line connect the tubing to the actuator and unblock Debris Sensor.



## ATTACHMENT 2 – SAFETY LOOP SET-UP

### Safety Loop Set-up

1. Ensure 24v power supply is on.
2. Install the frequency plug with the wires from the safety loops. Loop detector should flash red/green and then go to solid green indicator light.



#### NOTE

Ensure safety loops are clear before powering safety loop detectors.



Figure 1, Safety Loop Detector

3. Ensure the dipswitches are in the correct position; Factory settings are to the left, reset bottom two dipswitches to the right (train to infinity and normally open).
4. Top two dipswitches are sensitivity settings. Factory settings are to the left (low sensitivity), reset sensitivity to high (top two dipswitches to the right). Test safety loop sensitivity and make adjustments as needed.

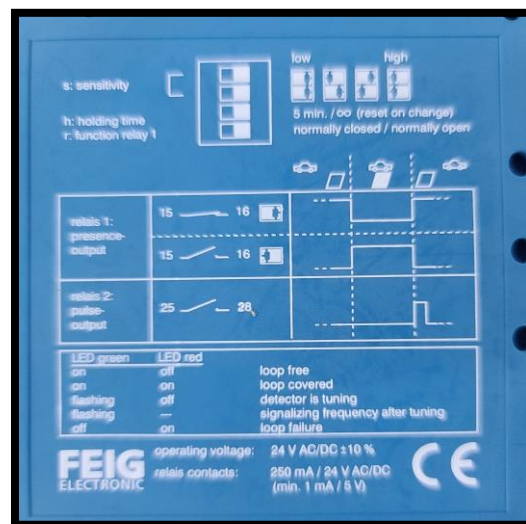


Figure 2, Side of Safety Loop Detector



#### NOTE

Sensitivity settings are Low, Medium Low, Medium High, High

## ATTACHMENT 3 - INITIAL BARRIER SETUP AND OPERATION

### FROM THE MAINTENANCE TOUCH SCREEN IN THE BCP

#### *Homing the Barrier*

1. Turn on Fuse FU1. 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.

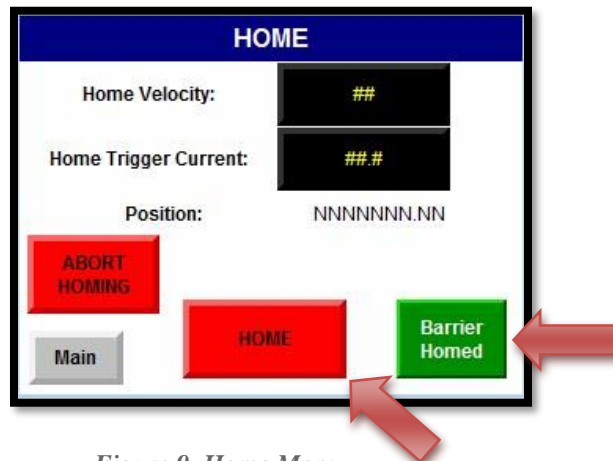


Figure 9, Home Menu

#### *Barrier Control*

1. From the MAIN MENU, press the BARRIER CONTROL button (See Fig 10).



Figure 10, 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 11)

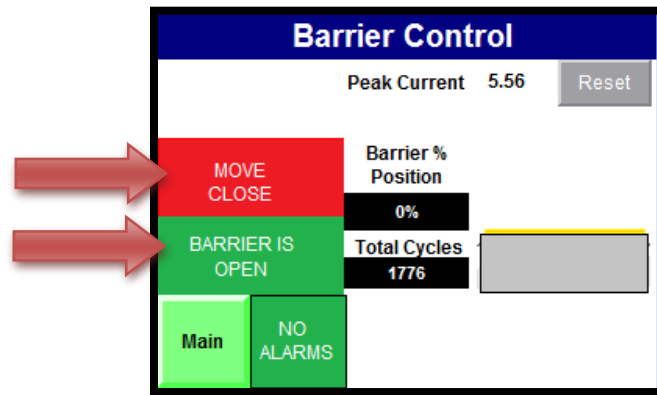


Figure 11, Barrier Control Menu



**NOTE**

If the Peak Current is higher than 20 Amp, it may indicate that the barrier position needs to be adjusted. Refer to position settings in Attachment 2 of the Maintenance Manual.



**NOTE**

If the barrier post assembly is not flush with the roadway (protruding from barrier). Refer to position settings in Attachment 2 of the Maintenance Manual.

## ATTACHMENT 4 - VEHICLE DETECTOR LOOP INSTALLATION GUIDE

### INTRODUCTION

This loop installation guide is intended to illustrate the steps involved in installing a "saw cut type" vehicle detector loop. Loop sizes shown in the figures and illustrations vary according to the detection requirement being accommodated. The photographs are for typical loops used in conjunction with traffic signals.



*Figure 1*



*Figure 2*



*Figure 3*

### INSTALLATION INSTRUCTIONS:

1. Mark the loop outline on the pavement surface using either a string or rigid frame and aerosol spray paint as shown in figures 1 & 2. Note that corners are diagonally cut to prevent damage to wire insulation during placement of the wire in the slot (see figure 3).
2. Place a mark on the concrete saw blade to insure the saw cut depth is 2" deep. The saw blade should be 1/4" wide at the lead cable slot and 1/8 inch wide for the loop slot.
3. Saw loop outline in pavement as shown in figure 2.



*Figure 4*



*Figure 5*

4. Clean debris from saw slot with compressed air, as shown in figure 5, and allow surface and slot to completely dry.
5. After the loop size has been determined, refer to illustration 1 to determine the number of turns of loop wire to be placed in the loop slot. It is important that the proper number of turns

are used.

6. Carefully install a continuous piece of the provided Loop Wire in the saw slot. Use Loop Installation Roller to insure that the wires are in the bottom of the saw slot (see figure 7). Do not use metal objects with pointed or sharp edges for this purpose!



## NOTE

NO WIRE SPLICES ARE PERMITTED IN THE SAW SLOT!



Figure 6



Figure 7

7. Install backer rod in 4 inch segments in the saw slot as needed (see figure 6) to insure that the wires are held tightly in the bottom of the slot.
8. Twist the two wires at least five turns per foot where they exit the saw slot all the way through conduit to BCP and to Loop Detector's wiring harness.

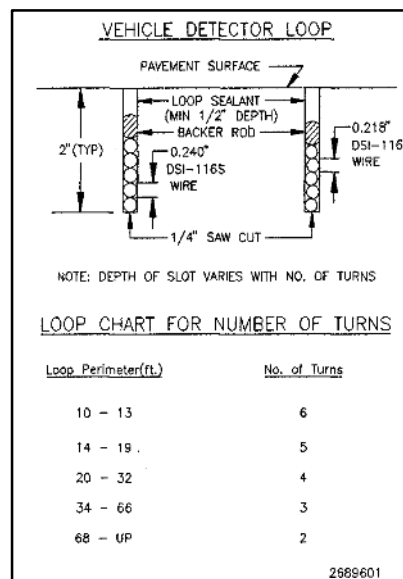


Illustration 1





**NOTE**

If the backer rod is not pressed down firmly on top of the wires and the wires fully encapsulated, the detector loop may false call due to the wires being loose and vibrating under the backer rod. The loop wires should be continuous from the electronic control panel, around the loop and back.



*Figure 8*

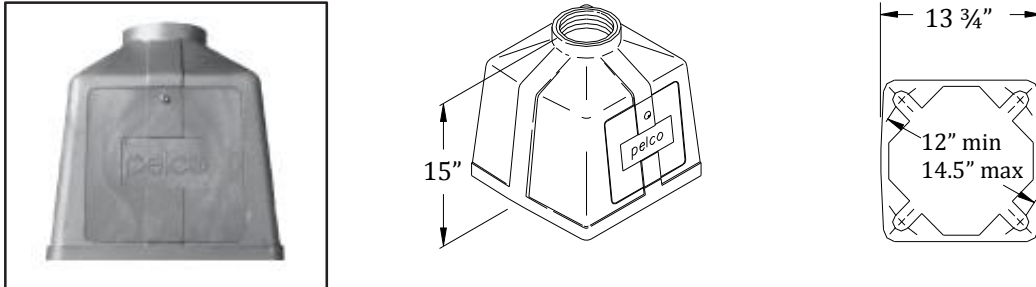


*Figure 9*

9. When installing the loop sealant material, insert the tip of the applicator in the saw cut and confirm the material is being pumped completely around the wires or firmly on top of the backer rod. After pouring the loop sealant in the saw cut as shown in figure 8, level the material using a "v"-shaped piece of cardboard or a special tool (figure 9) to remove any high spots of material in the saw cut. Avoid overfilling the saw cut as it may cause premature failure of the loop sealant.

## ATTACHMENT 5 – TRAFFIC LIGHT INSTALLATION

1. Run Conduit up where Traffic Light will be located.
2. Pour concrete pad 16" W X 16" L X 24" D – Square base is 13 ¾ inches X 13 ¾ inches.
3. You can make a mounting template by tracing the bottom of the square base on cardboard. This provides location where the anchor bolt holes can be drilled.



*Figure 1, Traffic Light Pole Base*

4. Use 1/2 inch X 5 ½ inch minimum length wedge anchor bolts (threaded on one end) to secure Square Base in place.
5. Place square base over the anchor bolts and shim base as necessary to make level. Remove the maintenance door cover on the base to allow access for securing base to anchor bolts. Secure base to bolts with 1/2 inch Nuts and 5/8 inch washers.
6. Pull wires for light through the top of the base
7. Run wires through the Traffic Light Pole and screw pole into the base.
8. Attach the Pedestal Adaptor to the Traffic Light Assembly.
9. Attach the Tunnel Visors to the traffic lights.
10. Run the wires into the traffic Light assembly through the Pedestal adaptor and mount the traffic light to the pole.
11. After securing the pedestal adaptor/traffic light assembly to the pole, terminate wires in the traffic light.



*Figure 2, Traffic Light Configurations – 2 & 3 Lights*

## ATTACHMENT 6 – COMMISSIONING CHECKLIST

### Typical Start-Up/Turn-Over Test Procedures - RSS-2000 Barrier System:

#### A. Visual Check

- ☐ 1. Verify that all field wiring and cables are connected as per System Interconnect Drawings (From barrier junction boxes to BCP).
- ☐ 2. Ensure that all terminal screws and cables are tight.
- ☐ 3. Ensure there are no loose or stripped wires.
- ☐ 4. Ensure that all circuit breakers are turned OFF, and fuse holders are open.
- ☐ 5. Ensure all loop detectors are securely plugged in the proper sockets.

#### B. Voltage and Phase Test: Normal Power (If no BBU skip to Step D)

- ☐ 1. Verify the Customer Supplied Electrical Power to the RSSI automatic transfer switch CB1 (Located in the battery back up panel) should be 240VAC, between L1 and L2.
- ☐ 2. Turn on main power circuit breaker, CB1. Contactor C1 should energize after approximately 8 seconds.
- ☐ 3. Verify the 24 VDC at the DC input terminals on the inverter (should be approximately 24VDC).
- ☐ 4. Turn on Inverter circuit breakers and the on-off switch (located on the top of inverter)
- ☐ 5. Verify 240VAC on terminals at the top of CB2.
- ☐ 6. Turn ON CB3
- ☐ 7. Verify battery charger energizes (Red Power ON light is on) and the battery charging status meter indicates charging between 0 and 15 DC Amps.
- ☐ 8. Verify voltage at top of Main circuit breaker (located in the barrier control panel) should be 240VAC between L1 to L2.

#### C. Battery Backup Power Check

- ☐ 1. Turn off CB1 in BBP.
  - a. Contactor C1 de-energizes and contactor C2 energizes (switches to Inverter power)
- ☐ 2. Verify voltage at input of Main Disconnect (located in the control panel). Should be approximately 240VAC between L1 and L2. Ensure “Loss of Normal Power” alarm is present on Maint. Touch Screen.
- ☐ 3.. Re-check voltages at the bottom of 2L1 and 2L2 terminals in BBP, (245vac) Inverter power.

- ☐ 4. Turn on CB1 in BBP, 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.

### D. Barrier Operational Check: (Normal Power)

- ☐ 1. Verify voltage at top of Main circuit breaker (located in the barrier control panel) should be 240VAC between L1 to L2
- ☐ 2. In the Control Panel, turn all circuit breakers off.
- ☐ 3. Open Servo-Drive Fuse Holders.
- ☐ 4. Turn on Main Disconnect.
- ☐ 5. Close Servo-Drive Fuse Holder
- ☐ 6. Turn-on ALL Circuit Breakers. Verify 24v Power Supply has green LED for Controls.
- ☐ 7. Loop detectors green light should start blinking and blink a series of blinks three times. (Automatic tuning)



Ensure all metal objects are at least 3 feet away from the safety loops. Failure to do this may affect the operation of the safety loops.

- ☐ 8. Verify 24VDC power Supply voltage and status light is GREEN.
- ☐ 9. Use Touch Screen inside Panel to Perform Barrier Setup (See setup guide Attachment 3).
- ☐ 10. Verify Operation of the Barriers.

### E. Battery Backup Operational Check

- ☐ 1. Turn off the Normal Power source, CB1 Main Power (Commercial)
- ☐ 2. Contactor C1 de-energizes and contactor C2 energizes (switches to Inverter power)
- ☐ 3. Verify operation of the barriers
- ☐ 4. When complete, turn on Main Power (CB1).

### F. Safety Loop Check

- ☐ 1. Position a person at the RSSI Control Panel/Box and drive a vehicle slowly over the safety loops and the barriers. The RED LED (detects presence) will light as the vehicle travels over the safety loops and will turn off as the vehicle clears them.
- ☐ 2. With the Barrier in the DOWN position, pull a vehicle forward on the front edge of the front safety loop and stop. The LED indicator on the safety loop detector in the RSSI Control Panel/box should indicate RED (detects presence).

- ☐ 3. Touch the Barrier UP Icon on the Touch screen. Barrier should not operate.
- ☐ 4. Back the vehicle off the safety loop. Touch the Barrier UP Icon and as the barrier starts to raise pull the vehicle onto the front edge of the safety loop. The barrier should stop and lower to the down position.



Ensure to use extreme caution when pulling the vehicle forward as the barrier is raising. Recommend placing wheel chocks to prevent vehicle from traveling onto the barrier.

- ☐ 5. With the Barrier in the DOWN position, pull a vehicle forward to the rear edge of the back safety loop and stop. The LED indicator on the safety loop detector in the RSSI Control Panel/Box should indicate RED (detects presence).
- ☐ 6. Press the Barrier UP Icon, Barrier should not operate.
- ☐ 7. Pull the vehicle off the safety loop. Touch the Barrier UP Icon and as the barrier starts to raise Back up the vehicle onto the back edge of the safety loop. The barrier should stop and lower to the down position.



Ensure to use caution when backing the vehicle as the barrier is rising. Recommend placing wheel chocks to prevent vehicle from traveling onto the barrier

### G. Verify Approved Sequence of Operation

- ☐ 1. Step by Step run through the approved sequence of operation for the appropriate gate

Verify that all of the above tasks have been completed and the barrier system is accepted.

Customer:

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(Printed Name, Signature & Date)

RSSI Technician:

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(Printed Name, Signature & Date)

### Notes

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