UNION SWITCH & SIGNAL

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Model 95 Highway Crossing Exit Gate Mechanism

for Quad Gate Application

- ♦ Installation
- ♦ Adjustment
- ♦ Operation

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Revision History

Rev.	Date	Nature of Revision
	November 1998	Original Issue
*	April 2001	Conversion Kit components updated, counterweight table changed to reflect 36 lb. weights, wiring diagram changes, and addition of wiring diagram for Model 95 with Maintenance Switch.
*	June 2001	Added Model 95 Gate Mechanism with Power Down Relay and parts list.
3	October 2003	Incorporated ECO EM-2006; added torque settings in in-lbs for torque testing and adjustment. Incorporated ECO EM-2035; identified a new power up (down) module for the gate mechanism and referenced Service Manual 6495 for the installation procedures. Incorporated ECO 139712-191A; modified the settings for the cam adjustments. Miscellaneous editorial changes and format updates.
4	July 2005	Incorporated ECO EM-2063; added new counterweight information. Incorporated ECO EM-2178; revised the wiring diagrams to reflect the new snub diode. Incorporated ECO EM-2215; removed the stiffener from the electrical drawings. Incorporated ECO EM-2259: updated wiring diagrams.
5	May 2006	Incorporated ECO EM-2276; replaced part number J726131 with part number N46716401. Incorporated ECO EM-2308; replaced part number N46709102 with N46709104. Incorporated ECO-EM-2369; updated wiring diagrams, added Item 340 to Tables 4-5 and 4-46, added drawing references, and corrected text in Section 4-4.

* Revisions were not numbered, they were only identified by date.

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1 Introduction

1.1 Description and General Operation

The Model 95 Exit Gate Mechanism represents a leap into the use of modern techniques and materials. Its modular design yields an uncluttered mechanism with fewer parts to stock and a simpler unit to service and maintain. Each unit can be removed and replaced with minimal effort. The exit gate mechanism is a conventional Model 95 Gate Mechanism with the motor wiring reversed and cams readjusted to clear in the up position when there is a loss of power.

WARNING

The Model 95 Exit Gate Mechanism is to be used only for the exit gate in a quad gate application and should not be used as an entrance gate mechanism, otherwise the entrance gate may not descend when required, which could result in severe personal injury or death.

Refer to Service Manual 6495 Model 95 Highway Crossing Gate Mechanism for detailed information regarding general gate mechanism applications. This manual deals only with the specific exit gate application.

Refer to Service Manual 6495A, Model 95 Gate Mechanism Pedestrian Arm Upgrade Option (X46780501), for detailed information regarding the installation of a pedestrian gate arm onto an existing Model 95 Gate Mechanism.

Service Manual 6495C, Model 95 Maintenance Switch Retrofit Kit Installation and Operation (N46709202), contains detailed information on the maintenance switch retrofit kit.

The unit can be mounted on 4-inch or 5-inch diameter masts with standard hardware. Each piece of the subassembly is designed to be replaced in the field, should the need arise. The electrical assembly is plate-mounted so that all of the electrical components can be easily removed and replaced. The unique snap-action motor contact extends contact life while helping to operate the mechanism more smoothly.

All highway crossing gate mechanisms are inspected prior to shipment to ensure that all parts and modules are present, undamaged and appropriately packaged. If any equipment is missing or damaged, contact Union Switch and Signal for replacement items:

Union Switch and Signal
645 Russell Street
Batesburg, SC 29006
Attn.: Customer Service
1-800-652-7276

1.2 Ordering References

The Exit Gate Mechanism is composed of a conventional Model 95 Gate Mechanism with motor leads reversed and cams readjusted. The ordering information for the Exit Gate Mechanism is presented in Table 1-1. The individual major installation parts are shown in Figure 1-1. For details on the counterweights, please refer to Figure 2-2.

Table 1-1 - Exit Gate Mechanism Ordering Information

Part Number	Description	Wiring Diagram
X46700013	Exit Gate Conversion Kit for modifying an existing conventional Highway Crossing Gate Mechanism to operate as an exit gate: (See Sections 3 and 4.)	Figure 2-3
N46710401	Exit Gate, w/ Non-Vital Relay	Figure 2-3
N46710402	Exit Gate, w/ Vital Relay	Figure 2-3
N46710406	Exit Gate w/ Non-Vital Relay, Heater, and Timer	Figure 2-4

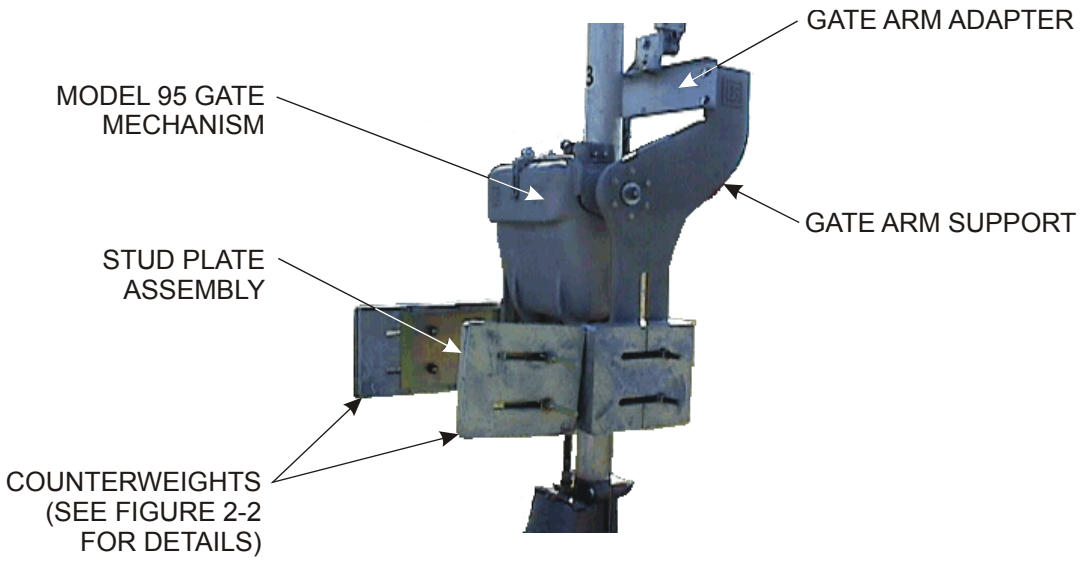


Figure 1-1 - Major Installation Parts

2 Installation

2.1 Introduction

When installing the Model 95 Exit Gate Mechanism, follow your railroad's standard operating procedures.

2.1.1 Required Tools

The Model 95 Exit Gate Mechanism is designed to be installed with standard tools. All gate mechanisms are shipped with a tool kit (N46707001). This kit includes Allen wrenches for buffer and cam adjustments, other various wrenches, and a hold-down pin.

A torque wrench, a spring scale, or both will be needed to set the counterweights. Union Switch and Signal offers an optional torque wrench kit (X46700003), which includes a torque wrench and a socket.

2.1.2 Foundations

Standard pre-cast or poured concrete may be used as a foundation for the Model 95 Exit Gate Mechanism. Examples are given in the AREMA Manual, Part 14. Bolt spacing is a standard four-bolt pattern, spaced 11-11/16" on center for a 5" junction box.

WARNING

To avoid possible injury to personnel or local traffic, ensure that Railroad Standard Operating Procedures are followed during installation of the gate mechanism and the gate arm.

2.2 Mast Mounting

To mount the mast, follow the steps below.

1. Erect mast with junction box facing away (opposite) from the tracks.

2. Mount support clamp (X46705402). Position top of clamp 42-3/4" above top of the foundation. (The exact height may need to be adjusted slightly to meet the required height of the gate arm above the roadway.)

3. Install T-bolts (X46703701, included with mechanism) in back of gate mechanism with threaded portion toward the mast. Set gate mechanism on top of support clamp. Fasten to mast with clamps and supplied hardware, but do not tighten at this time.

4. Thread 1-1/2" flexible conduit and 90° elbow coupling (X46700002) to gate mechanism and junction box.

5. Install cable grip conduit for gate arm lights cable, included with gate mechanism.

6. Apply a light coating of grease to the main shaft ends. Install gate arm supports (hubs pre-mounted) to keyed main output shaft. Place washers and nut on the end of shaft and tighten.

7. Install gate arm adapter (J705191-5806) to gate arm supports.

8. Install gate arm (rotate gate mechanism so that gate arm will extend parallel to roadway, so traffic is not blocked during installation).

9. Install counterweights as follows (See Figure 1-1):

    a. Install stud plate assemblies (M46705101, M46705002, J4751200120, J4751210119, and J4802120116) on support arms.

    b. Slide on the proper number and type of counterweights. Refer to the Counterweight Table (Table 2-1).

    c. Secure with the proper hardware. The number of counterweights required depends on the type and length of the gate arm. The fiberglass and aluminum arms are equal in weight, so they require the same counterweight arrangements.

10. Rotate the mechanism on the mast so the gate arm is positioned over the roadway and tighten the mechanism clamp to the mast before raising the arm.

11. For Model 95 Gate Mechanisms converted to exit gate application, affix the “EXIT GATE” label (M46707901), as shown in Figure 2-1. Affix the wiring diagram label (M46708101) to the inside of the cover. Verify that motor lead terminations are per the wiring diagram (Figure 2-3).

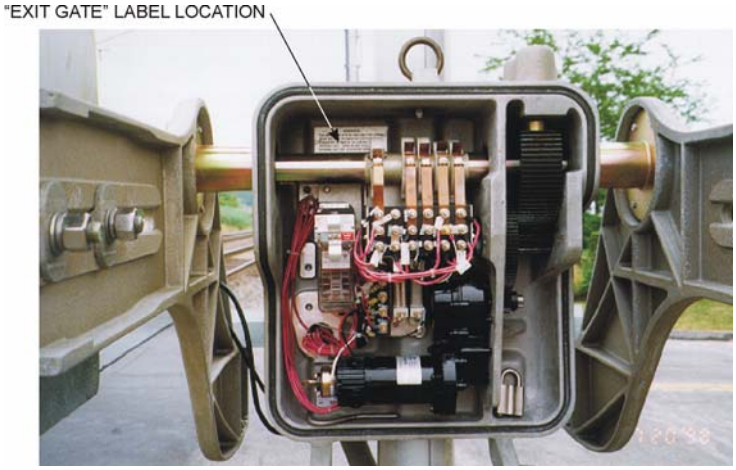


Figure 2-1 - Location of “EXIT GATE” Label

Table 2-1 - Model 95 Exit Gate Mechanism Counterweight Table

Gate Arm Length (Center of Mast to Tip of Arm)	Clear Position Torque			Horizontal Position Torque			Horizontal Position Scale Reading		Counterweight Information*			
	At Main Shaft (ft-lbs)	At Motor Shaft		At Main Shaft (ft-lbs)	At Motor Shaft		Distance "X"(ft)	Scale Reading (lbs)	Square Weights6 (36 lbs Each)		Oblong Weights (47 lbs Each)	
		(in-oz)	(in-lbs)		(in-oz)	(in-bs)			Quantity (M4514843116)	Kit Number	Quantity (M46712301)	Kit Number
12-15	90-130	**17 - 24**	**1.1 - 1.5**	228	**42**	**2.7**	5	45	3	X46740801	5	X46740808
16-18	90-130	**17 – 24**	**1.1 - 1.5**	254	**47**	**3**	6	42	5	X46740802	5	X46740808
19-21	90-130	**17 – 24**	**1.1 - 1.5**	339	**63**	**3.9**	7	48	10	X46740803	8	X46740809
22-23	90-130	**17 – 24**	**1.1 - 1.5**	347	**64**	**4**	7	50	11	X46740804	8	X46740809
24-26	90-130	**17 – 24**	**1.1 - 1.5**	370	**69**	**4.3**	8	46	12	X46740805	9	X46740810
27-29	90-130	**17 – 24**	**1.1 - 1.5**	381	**71**	**4.4**	8	47	14	X46740806	10	X46740811
30-32	90-130	**17 – 24**	**1.1 - 1.5**	395	**74**	**4.6**	8	49	16	X46740807	11	X46740812
33-40	90-130	**17 – 24**	**1.1 - 1.5**	400	**85**	**5.3**	40	10	NA	NA	13	X46740813

* With Extension Arms (Part Number N451484-2403

Bold columns indicate inch-ounce or inch-pound torque wrench (X46700003) settings

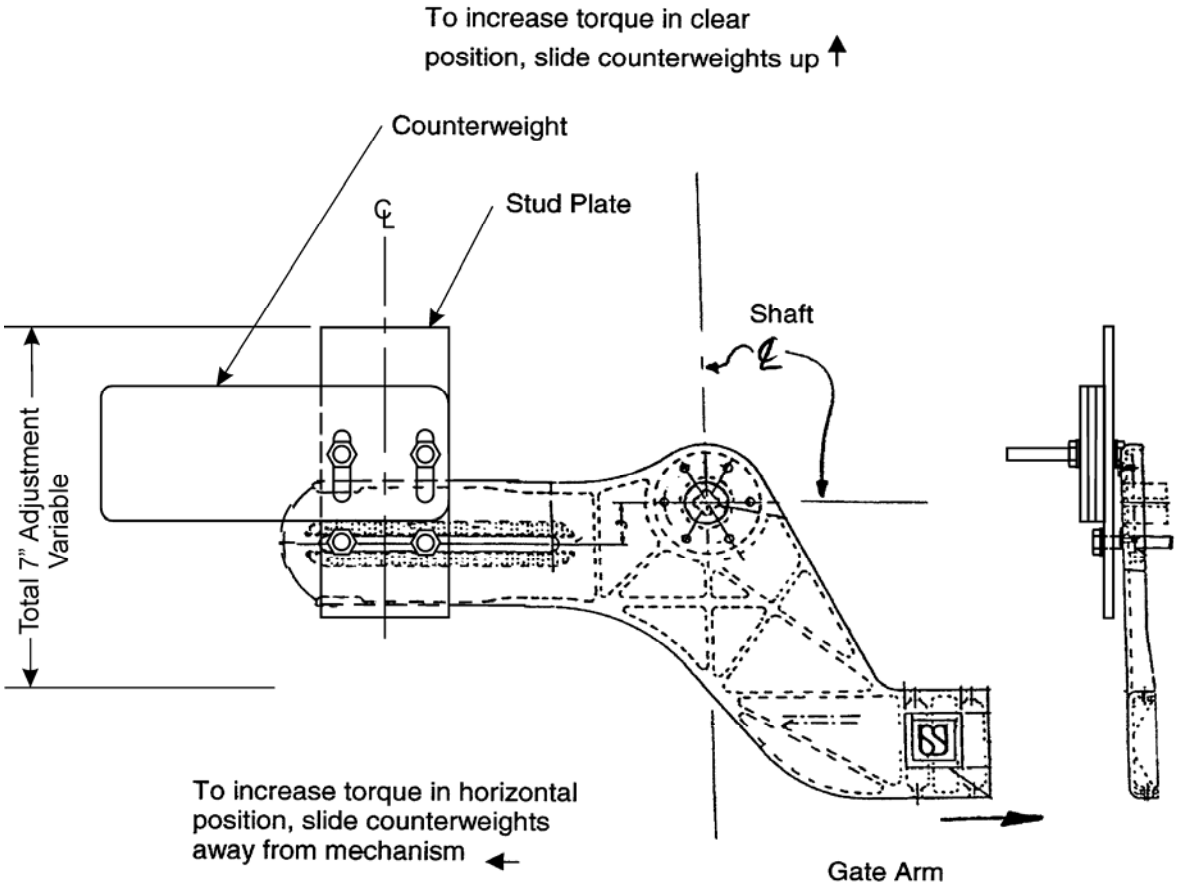


Figure 2-2 - Counterweights and Gate Arm

2.3 Power and Control Wiring

A maximum of 0.1 ohm resistance is allowed between the battery and the mechanism terminals. The wiring requirements are presented in Table 2-2.

Table 2-2 - Battery and Wire Requirements

Distance from Battery to Mechanism	Cable Conductor Size
Up to 60 feet	No. 9 AWG
60 to 120 feet	No. 6 AWG
120 to 250 feet	No. 4 AWG (or 2 No. 6 AWG)

Number of Cells (12-Volt System)			
Gate Arm Length	**Lead**	**Nickel-Iron**	**Nickel-Cadmium**
Up to 24 feet	6	9	9
25 to 42 feet	7	11	11

CAUTION

The specified operating voltage for the Model 95 Gate Mechanism is 11 to 16 volts direct current. This applies to both the motor supply (B12) and the Up Control. Generally, this power will be supplied from batteries, however, it is possible to use a power supply without batteries (this can be done only if battery backup is not required in the event of a power failure). If used, this power supply must be properly filtered and regulated or equipment damage may occur.

2.4 Power Supply Filtering and Regulation Test for Non-Battery Operation

1. Set a voltmeter on the VDC scale.
2. Place the voltmeter negative (black) lead on terminal 6B of the gate mechanism.
3. Place the voltmeter positive (red) lead on terminal 2C of the gate mechanism.
4. The voltage should read no more than 16 VDC.
5. Move the positive (red) lead of the voltmeter to terminal 1C.
6. The voltage should read no more than 16 VDC.
7. With the crossing operating and the gate arm going up, make certain that the voltage does not fall below 11 VDC on 12 VDC system.
8. Place the voltmeter on the AC scale. The voltmeter must block the DC voltage. For some voltmeters, such as most analogs, it may be necessary to place a 0.1μF to 1μF capacitor in series with the meter. An oscilloscope can be used as an alternative.

9. Again, with the crossing operating and the gate arm going up, check that the voltmeter does not read more than 3 VAC (this is checking the AC).

2.5 Wiring Diagrams

Connect the wires to the Mounting Board as shown in the correct figure as referenced in Table 2-3.

Table 2-3 - Wiring Diagrams

Figure	Wiring Diagram
Figure 2-3	Model 95 Exit Gate without Maintenance Switch
Figure 2-3	Model 95 Exit Gate without Maintenance Switch
Figure 2-4	Model 95 Non-Vital Exit Gate Mechanism with Heater and Timer

2.6 Spring Buffer Adjustment

The Model 95 Exit Gate mechanism is equipped with adjustable spring buffers to control the horizontal and vertical rest positions of the gate. The torque should be set prior to setting buffers.

To adjust the horizontal (down) buffer, follow these steps.

1. Remove the aluminum buffer cap located on the top of the mechanism with the Allen wrench supplied in the Model 95 tool kit.

2. Loosen the lock nut of the buffer nearest the mechanism door (furthest from the road) and turn the threaded sleeve.

CAUTION

If the spring buffer is adjusted down too far, it can hit the segment gear and cause damage to the buffer.

3. Adjust until arm is properly leveled.

4. Tighten the lock nut and replace gasket and cap.

To adjust the vertical (up) buffer, follow these steps.

1. Remove the aluminum buffer cap located on the top of the mechanism.

2. Loosen the lock nut of the buffer furthest away from the mechanism door (nearest the road) and turn the threaded sleeve.

3. Screw the buffer to just touch the segment gear.

4. Tighten the lock nut and replace gasket and cap.

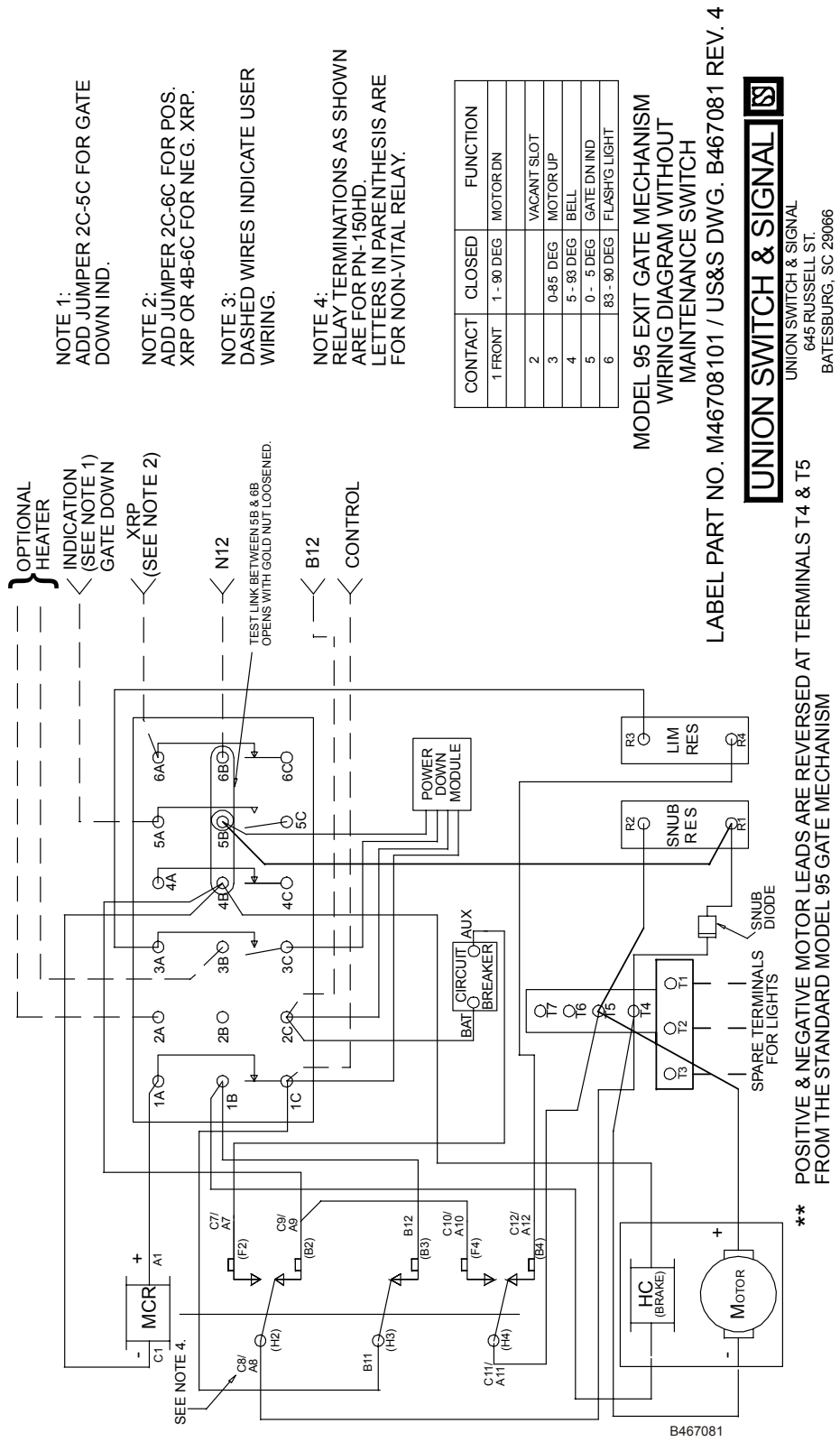


Figure 2-3 - Wiring Diagram for the Model 95 Exit Gate Mechanism without the Maintenance Switch

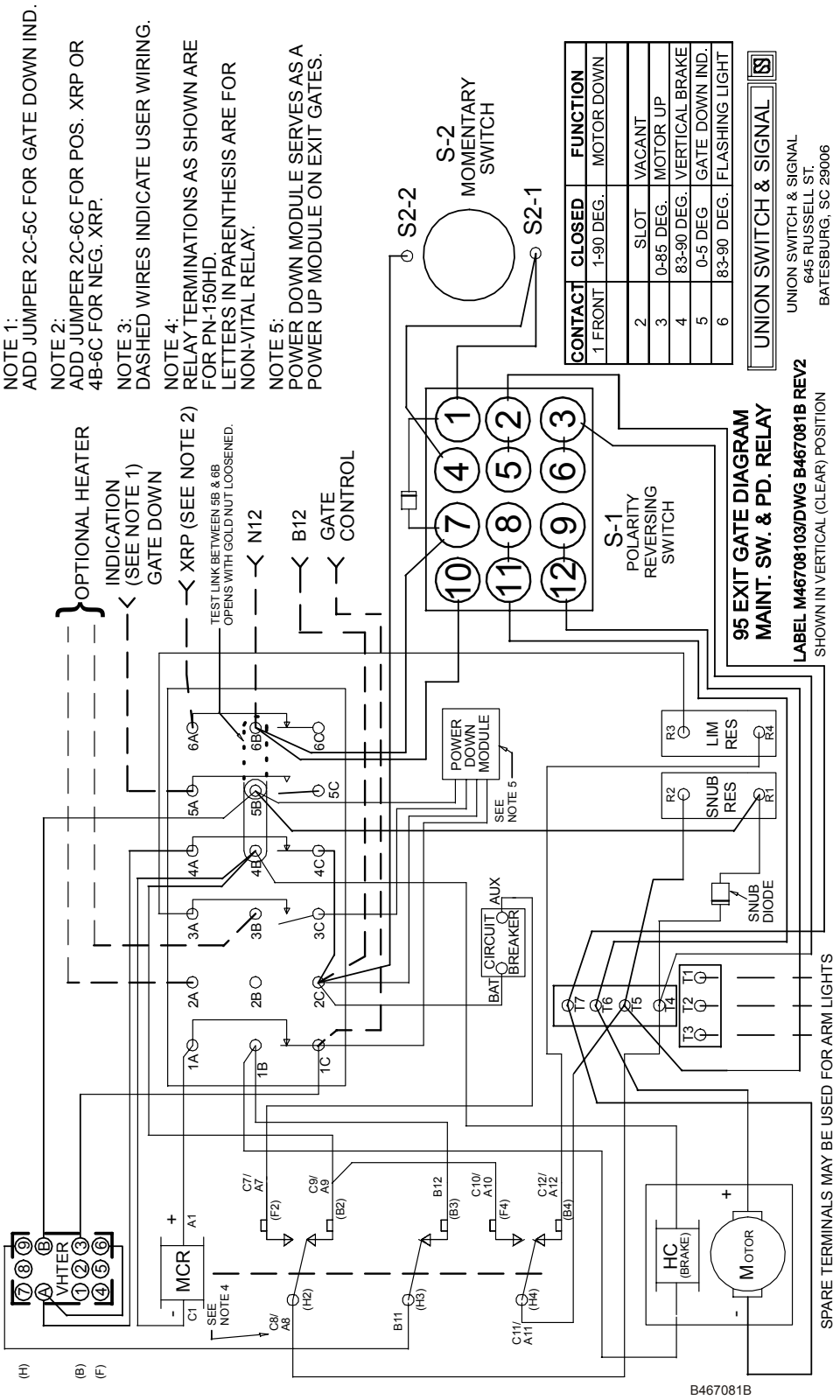


Figure 2-4 - Wiring Diagram for the Model 95 Non-Vital Exit Gate Mechanism with Heater and Timer

2.7 Torque Testing and Adjustments

2.7.1 Torque Testing

For the Gate Mechanism to operate properly, you must test the torque values of the gate arm. The torque must be calibrated properly to reduce mechanical stress that could reduce the effective lifetime of the mechanism. Follow the torque values as shown in Table 2-4. Refer to Section 2.7.2 and 2.7.3 for details on vertical and horizontal torque testing.

Table 2-4 - Gate Angle Position Torque Values

Gate Angle (degrees)	Gate Torque (ft-lb)
0 (check at 5°)	400
90	80

2.7.2 Vertical

2.7.2.1 Using Spring Scale

Raise arm to the vertical position. At 10 feet from the mechanism output shaft, a spring scale should read 9-13 pounds when the gate arm is near the 85°. To adjust, loosen hardware and slide counterweights in or out.

2.7.2.2 Using Torque Wrench

With the arm positioned at approximately 85°, apply an appropriate torque wrench (X467000-03) supplied in optional torque wrench kit to the motor shaft located in the lower-left corner of the inside housing. The torque should read between 17 to 24 in-oz (for the torque wrench with the 0-80 scale) or 1.1 to 1.5 in-lbs (for the torque wrench with the 0-6 scale). If the proper torque wrench is not available, use the spring scale method above. To adjust, loosen hardware and slide counterweights in or out.

2.7.3 Horizontal

2.7.3.1 Using Spring Scales

Lower the gate to the horizontal position. Attach the spring scale at the specified distance (x) according to Table 2-1.

This distance is measured from the mechanical output shaft and up the arm to where the spring scale is to be attached. Once scale is in place, release arm by loosening the gold nut on the terminal board. To adjust, loosen hardware and slide counterweights back and forth (this would be up and down if the arm were down).

2.7.3.2 Using Torque Wrench

Apply an appropriate torque wrench (X467000-03) supplied in the optional torque wrench kit to the motor shaft located in the lower-left corner of inside housing. Release arm by loosening the gold nut

on the terminal board. To adjust, loosen hardware and slide counterweights back and forth (this would be up and down if the arm were down). Refer to Table 2-1 for appropriate measurements.

2.8 Cam Adjustment

The cams should be rotated so that the appropriate contacts are closed as indicated in Table 2-5. Use a 3/16" T-handle Allen wrench provided with the gate mechanism to loosen one of the two cam screws to be adjusted.

Table 2-5 - Cam Adjustment

Contact No.	Closed (Degrees)	Function
1	1-90	Motor Down
2	Vacant	Vacant
3	0-84	Motor Up
4	80-90	Bell
5	0-5	Gate Down Indication
6	83-90	Flashing Lights

Can be adjusted to make and break 0-90 degrees per application.

In a typical installation, the #1 cam will have to be rotated to determine precisely where the arm rests in the vertical position. Ensure that the side-to-side cam adjustment is centered with the contact assembly so that the contact assembly sidewalls do not touch the cams. Refer Figure 2-5.

After the cams are properly positioned, begin tightening the clamping screws until each cam begins to fit securely to the shaft. Turn the screw approximately 1-1/2 more turns to obtain torque.

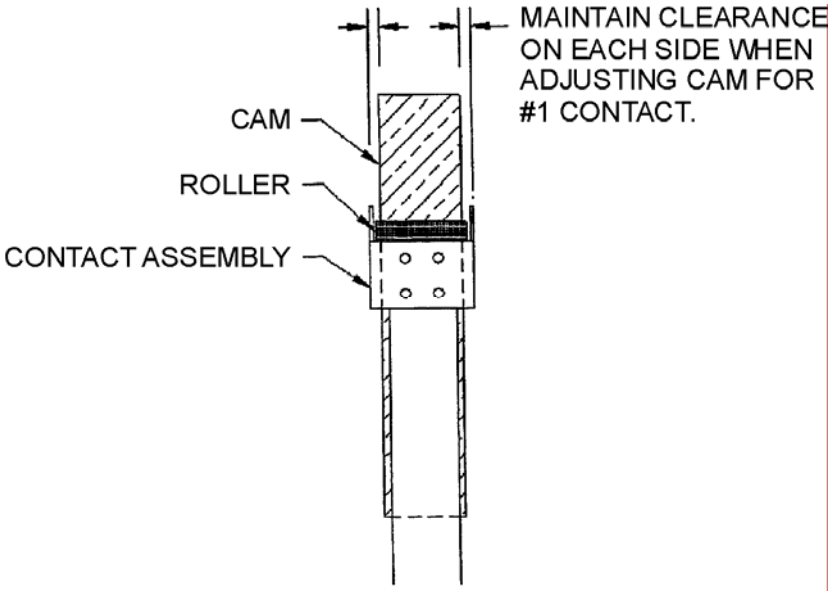


Figure 2-5 - Number 1 Contact

2.9 Gate Arm Ascent and Descent Time Test

Part numbers, N46710401, N46710402 and converted mechanisms are equipped with a power-up/power down module. For the exit gate mechanism this module is used in the power up portion of operation (0° to 85°). For the basic Model 95 Gate Mechanism (Service Manual 6495), this module operates as a power down module. The modules are identical but are identified differently because of function.

> **Note**
>
> Model 95 Exit Gate Mechanisms manufactured on September 1, 2003, and later are equipped with a redesigned power up module. Gate mechanisms manufactured before this date that need a replacement module will require the new Power Down Module Upgrade Kit, X46700031. The old and new modules are functionally identical; modules that are operating properly do not need to be replaced.
>
> The replacement procedure for this module is presented in Service Manual 6495.

1. Apply 12 VDC to the control line of the gate mechanism. This will lower the arm automatically to the horizontal position.
2. Measure the descent time required to lower the arm from 90 to 0 degrees (vertical to horizontal position). The descent time must be less than 15 seconds.
3. With the arm in the horizontal position, check that the shock just touches segment gear.
4. Verify that the brake holds the arm in the down position.
5. Remove the control voltage (set DC voltage to 0). Removing the voltage will force the brake to disengage and allow the arm to ascend.
6. Measure the ascent time (maximum time: 12 seconds). If necessary, adjust the snub resistor slide (refer to Figures 5-10 through 5-13, Item 40 in Service Manual 6495) and retest the ascent time. The fixed limit resistor (refer to Figures 5-10 through 5-13, Item 42 in Service Manual 6495) on the right side of electrical assembly limits the current to the motor during the first 85° of the power up cycle.

2.10 Circuit Breaker

The Model 95 Exit Gate Mechanism is equipped with a self-restoring circuit breaker for the protection of the mechanism, batteries, etc., in the case of excessive current draw during ascent (or descent when set up as an exit gate) of the gate arm due to an obstruction. The circuit breaker is mounted on the electrical assembly (Figures 5-10 through 5-13, Item 35 in Service Manual 6495).

The unit normally resets itself within a minute, and in most field applications, the unit opens within a few minutes.

3 Conversion Kit Installation

3.1 Exit Gate Conversion Kit Procedure (X46700013)

3.1.1 Wiring for Converting Model 95 Entrance Gate Mechanism to Exit Gate Without Maintenance Switch.

1. Reverse motor leads from the motor to T4 and T5. The red lead for the exit mechanism terminates on T5 and the black lead on T4. Refer to Wiring Diagram Figure 2-3.

2. Replace wiring label (M46708101) on door.

3.1.2 Wiring For Converting Model 95 Entrance Gate Mechanisms to Exit Gate With Maintenance Switch.

1. Locate and reverse the two wires from the maintenance switch to T4 and T5. (Refer to Figure 2-3).

   a. Move the wire currently on T4 to T5.

   b. Move the wire formerly on T5 to T4.

   c. Reverse the labels on the wires.

2. Replace wiring label on door as shown in Figure 2-3.

3.1.3 Adjust Cam Settings

1. Using the T-handle Allen wrench from tool pack that is included with the existing mechanism, adjust the cam settings as follows:

   a. Reset number 1 cam to open at 0 degrees (horizontal). This cam may need to be readjusted during installation.

   b. Reset number 3 cam (number 2 is vacant) to make from 0 to 85 degrees. This can be readjusted to vary the ascent time along with the snub resistor.

   c. Affix “Exit” label (M46707901) as shown in Figure 2-1.

4 Parts List

4.1 Model 95 Exit Gate Mechanism Configurations

Table 4-1 lists the various available configurations of the Model 95 Exit Gate Mechanism. Table 4-2identifies the parts associated with the Exit Gate Mechanism and Figure 4-1 show the parts and their location in the mechanism.

Table 4-1 - Configurations for the Model 95 Exit Gate Mechanism

Part Number	Configuration
N46710401	Non-Vital Exit Gate Mechanism with Heater
N46710402	Vital Exit Gate Mechanism with PN-150 Relay and Heater
X46710403	Non-Vital Exit Gate Mechanism Kit with Heater Kit
X46710404	Vital Exit Gate Mechanism with PN-150 Relay and Heater
N46710406	Non-Vital Exit Gate Mechanism with Heater and Timer

Table 4-2 - Exit Gate Mechanism – General Configuration (N467104XX)

Item No.	Part Number	Description
1	N46780106	Non-Vital Mechanism with Maintenance Switch and Heater
	N46780206	Vital Mechanism with Maintenance Switch
2	M46707901	Exit Gate Label
3	M46704921	Nameplate Label
	M46704922	Nameplate Label
	M46704933	Nameplate Label
4	M46708101	Wiring Diagram Label
	M46708103	Wiring Diagram Label
5	Not Used	
6	N46714501	Time Delay Relay

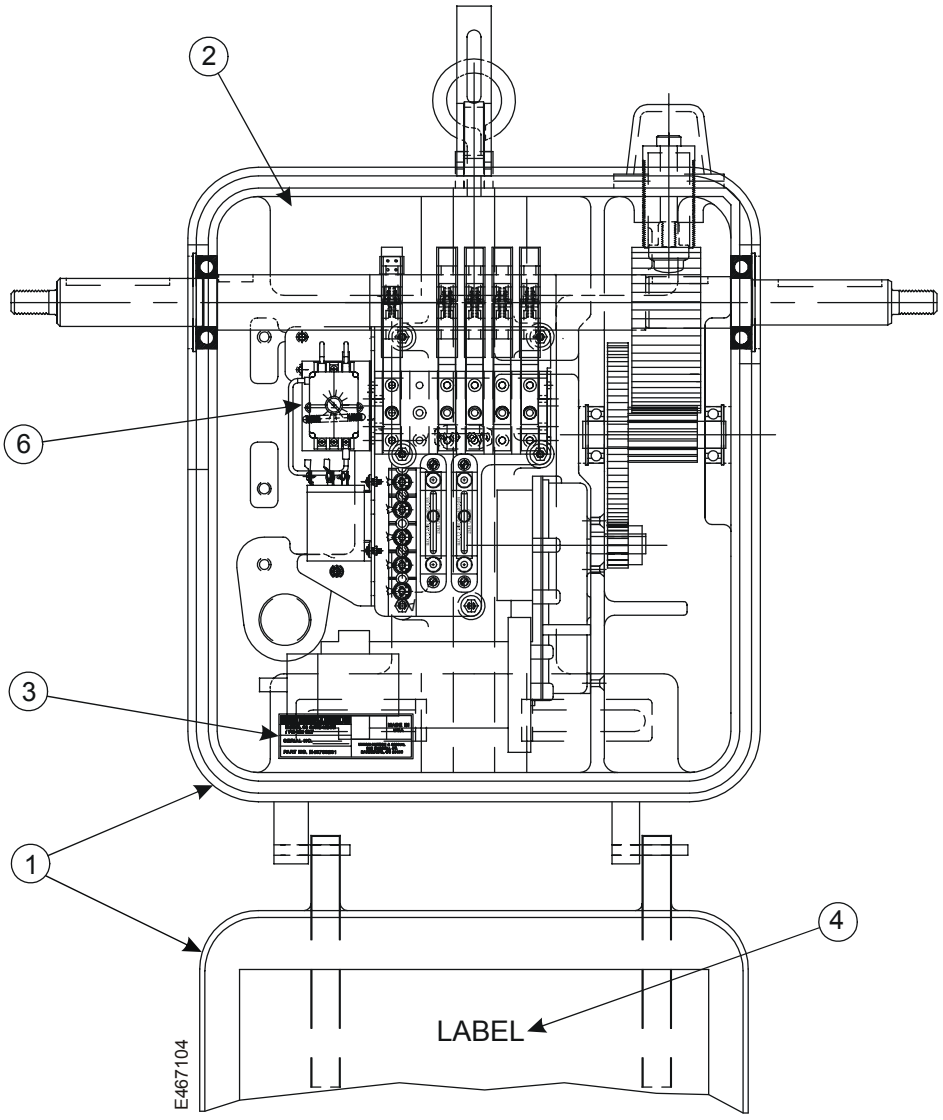


Figure 4-1 - Model 95 Exit Gate Mechanism General Configuration

Table 4-3 - Exit Gate Mechanism with Maintenance Switch and Heater (N46780106 and N46780206)

Item No.	Part Number	Description
5	N46781001	Gate Mechanism Mechanical Assembly
10	N46782001*	PB Electrical Assembly
	N46782101**	PN-150 Electrical Assembly
15	J507218	Screw, 1/4 - 20 x 5/8” SS
20	J4751210111	Washer, Lock No. 1/4, SS
25	M46704917*	Nameplate Label
	M46704923**	Nameplate Label
30	X46703701	“T”-Bolt Kit
35	M46709001	Wiring Label
40	J5001360114**	Screw, 1/4 - 20 x 7/8” /Round
45	J5001390116	Screw, 1/4 - 20 x 1” SS
50	J047521	Washer, High Collar, Lock, 1/4”
120	J0773730023	Tape, 3M F-9465PC
125	J055609004	Vinyl Envelope 9” x 12”
130	PN46707001	Tool Kit
135	J032924	Protector, 3/4 Internal Thread
140	J032950	Protector, 1-1/2”
145	PN46704801	Heater Kit, 120V
150	PN46709201**	Maintenance Bracket Assembly
	A774186*	Maintenance Bracket Assembly
160	N322505702**	PN-150HD Relay

* For N46780106 Mechanism Only

** For N46780206 Mechanism Only

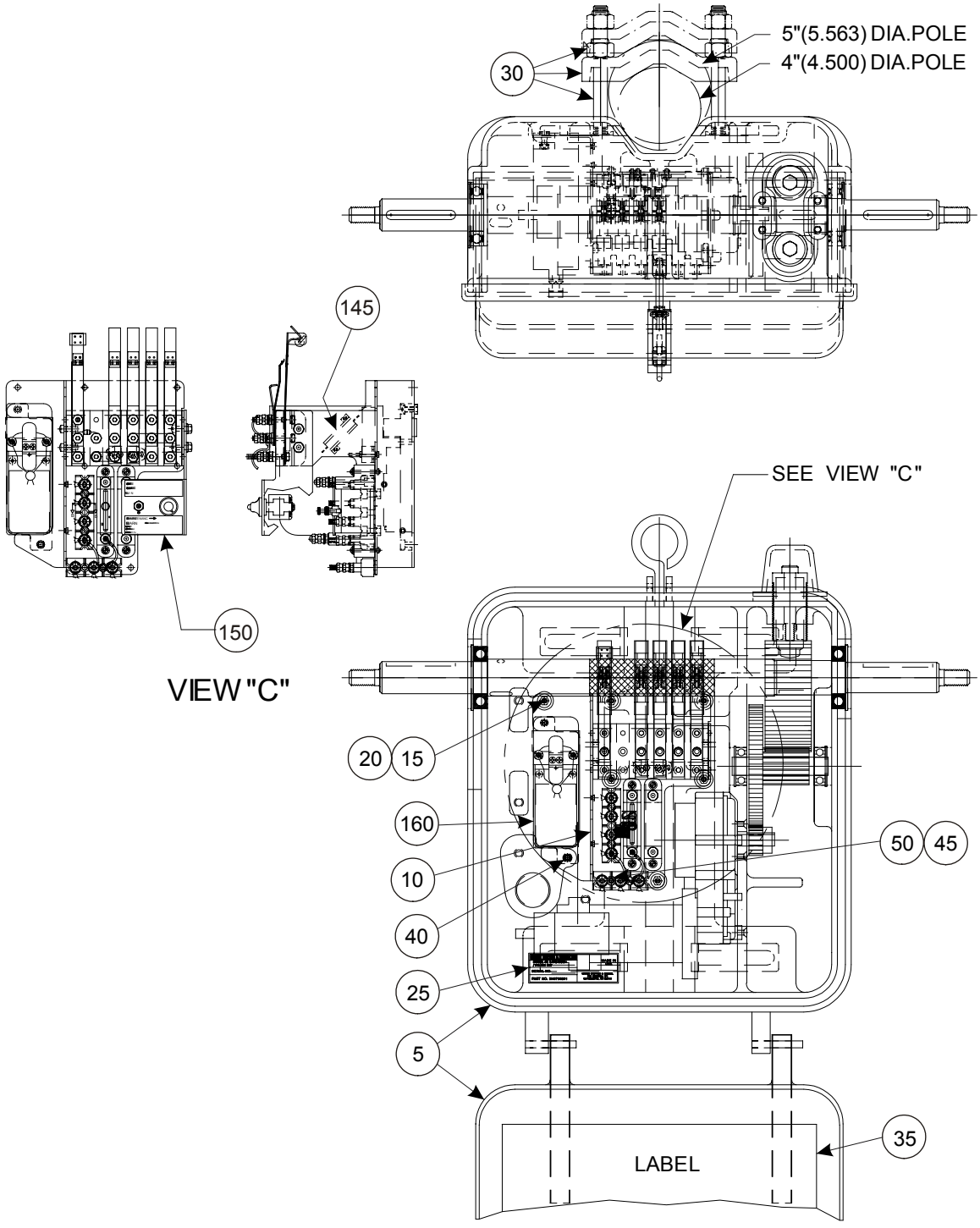


Figure 4-2 - Exit Gate Mechanism

4.2 Model 95 Exit Gate Mech. Mechanical Assembly (N46781001)

Table 4-4 is the parts list for the Model 95 Exit Gate Mechanism mechanical assembly; Figure 4-3 shows the location of the parts.

Table 4-4 - Parts List for the Exit Gate Mechanism Mechanical Assembly

Item No.	Part Number	Description
3	N46708301	Gearbox and Cover Assembly
5	M46700101	Gearbox
*10	N46700402	Cover With Hasp
15	Q46702101	Cover Latch Casting
20	PN46710203	Cover Latch Assembly
25	J0680140006	Spring-Pin 1/4 Dia SS
35	M46700601	Shaft, Mod 95 Main
40	PN467036-02	Gear Motor-Assembly
45	M46700701	Gear, Motor Drive
50	M46700801	Gear, Large Idler
55	M46700802	Gear, Small Idler
60	M46700901	Gear, Segment Drive
65	J7256450012	Bearing-Roller 209pp
70	J7120580006	Ring-#209 Int Snap
75	M46700803	Shaft, Idler Gear
80	M46700804	Key, Idler Gear Shaft
85	J7256450011	Bearing-Roller 205pp
90	J7120580004	Ring-#205 Ext Snap
95	PN46701401	Gear Shock Assembly
100	M46701101	Cover, Gear Shock
105	J6909510007	Gasket-Model 95 Shock
110	J0523620003	Screw, 3/8 - 16 x 1-1/4” Hex Socket
115	M46700805	Key, Segment Gear
120	J7120580005	Ring-#205 Int Snap
125	J7762830001	Cam - Model 95 Circuit Controller
130	J5001010105	Screw, 1/4 - 20 x 5/8” Hex Cap SS
135	J4751210113	Washer, SS Lock 3/8”
140	J5000970116	Screw,1/4 - 20 x 1” Hex SS
*145	J041245	Threadlocker-242
150	J6909510008	Gasket, EPDM Sponge, Black
155	J0504980002	Screw, Set 1/4 - 20 x 5/16”
157	J4750780002	Washer, 15/16” ID, 3" OD
160	J0504980003	Screw, 1/2 - 13 x 1/2”, Set

Item No.	Part Number	Description
162	J0480750004	Nut, 7/8" – 9 heavy Hex Nylon Lock
165	J048417	Nut, 1-1/2” Cndt Lock
185	J0680140008	Spring-Pin, 2-1/4” L, 1/4” Dia
195	J4751200112	Washer, SS Plate No. 1/4
200	J4751210111	Washer, SS Lock No. 1/4
205	J056448003	Eye Bolt, 1/2 - 13 SS
210	J4803170110	Nut, 1/2 - 13 Heavy JM, SS
220	J480217	Nut, 1/2 - 13 Elastic Stop
305	M46710204	Hold, Threaded
310	O0205112	Hex Nut, 18 - 8 3/8 - 24
315	J4751200114	Washer, SS Plate 3/8”
320	M46703901	Clamp, Cam Model 95
*505	X46703701	T-Bolt Kit
*510	M46708101	Wiring Label (N46710401, N46710402)
	M46708103	Wiring Label (N46710406)
*515	M46707901	“Exit” Gate Label
*	N45710301	Cover Latch Assembly Complete

* Part not shown in Figure 4-3.

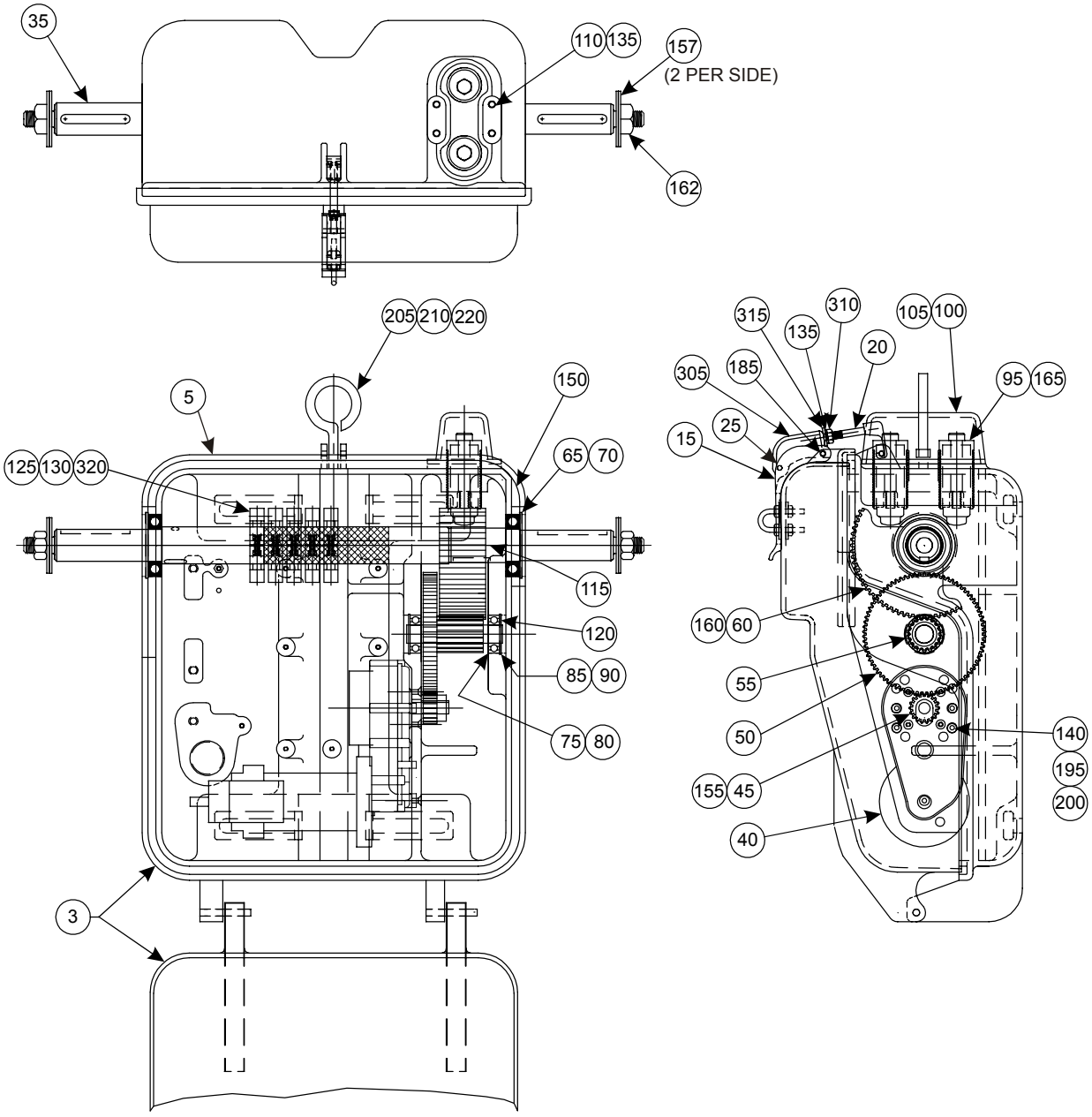


Figure 4-3 - Model 95 Exit Gate Mech. - Mechanical Assembly (N46781001)

4.3 Non-Vital Relay Electrical Assembly for 12-Volt Systems

Table 4-5 presents the parts list for the non-vital electrical assembly (N467820-01) for the exit gate mechanism and Figure 4-4 shows the location of the parts.

Table 4-5 - Parts List for Non-Vital Exit Gate Mechanism Electrical Assembly (N46782001)

Item No.	Part Number	Description
05	N46708702	Bracket, Relay Mounting
10	N46716401	MCR Non-Vital Relay w/ Ties and Label
15	J726132	Cover, Plastic
30	J725715-0018	Block -Terminal Board Black
35	J725694-0169	Circuit Breaker, 12V 20A Reset
40	N156682	Resistor, Comp
42	N156682-001	Resistor, Comp
45	M107471	Terminal Board
55	J500124-0242	Screw, 8 - 32 x 1/2", with Lock Washer
60	J475120-0109	Washer, Plate No 8, SS
65	J475121-0108	Washer, Lock No 8, SS
70	J500139-0114	Screw, 1/4 - 20 x 7/8", SS
75	J500132-0128	Screw, 8 - 32 x 1-3/4", SS
*80	N46704205	#1 Contact Assembly
*85	N46704302	Heel Contact Assembly
*90	N46704403	Front Contact Assembly
*110	M130200	Terminal Post, AAR
*112	M118271	Term Post, AAR
*115	M451011-3501	Lock Washer
120	J047818	Washer, 17/64" x 9/16" COP, AAR
125	J480300	Nut, 14 - 24 Hex Brass NP, AAR
130	J480301	Nut, 14 - 24 Hex Brass, AAR
*135	M451011-3402	Washer, Insulating
*140	J071626	Link, Test
*145	M047290	Connector, #18 x 1/2"
*150	PN467066-02	PB Harness Assembly
155	J047521	Washer, High Collar, Lock 1/4"
165	J480211-0108	Nut, 1/4 - 20, Hex, SS
170	J048145	Nut, 10 - 32 Hex, Steel
175	O0305047	Washer, No. 10 Flat
190	J703310	Cable Tie, Self Locking
191	J5000970112	Screw, 1/4 - 20 x ¾", Hex HD SS

Item No.	Part Number	Description
200	PN46705601	Diode Assembly, Snub Mod. 95
205	J475182-0013	Washer, No. 8 Flat Nylon
265	J791597-0003	Screw, 8 - 32 x 3/4", Nylon RH
275	N46712401	Power Down Module (N467104-01) (Optional)
**280	J507218	Screw, 1/4 - 20 x 5/8" SS
**285	J475121-0111	Washer, 1/4" SST Lock
**290	J500139-0116	Screw-SST 1/4 - 20 x 1" FIL
325	M109154	Terminal Block
330	J500097-0114	Screw, 1/4 - 20 x 7/8", Hex Head, SS
*335	J475121-0124	Washer, Lock, 1/4", SS
340	N46716501	Snub Support Lead

*Part not shown in Figure 4-4.
** For mounting electrical assembly to housing. Not referenced in Figure 4-4.

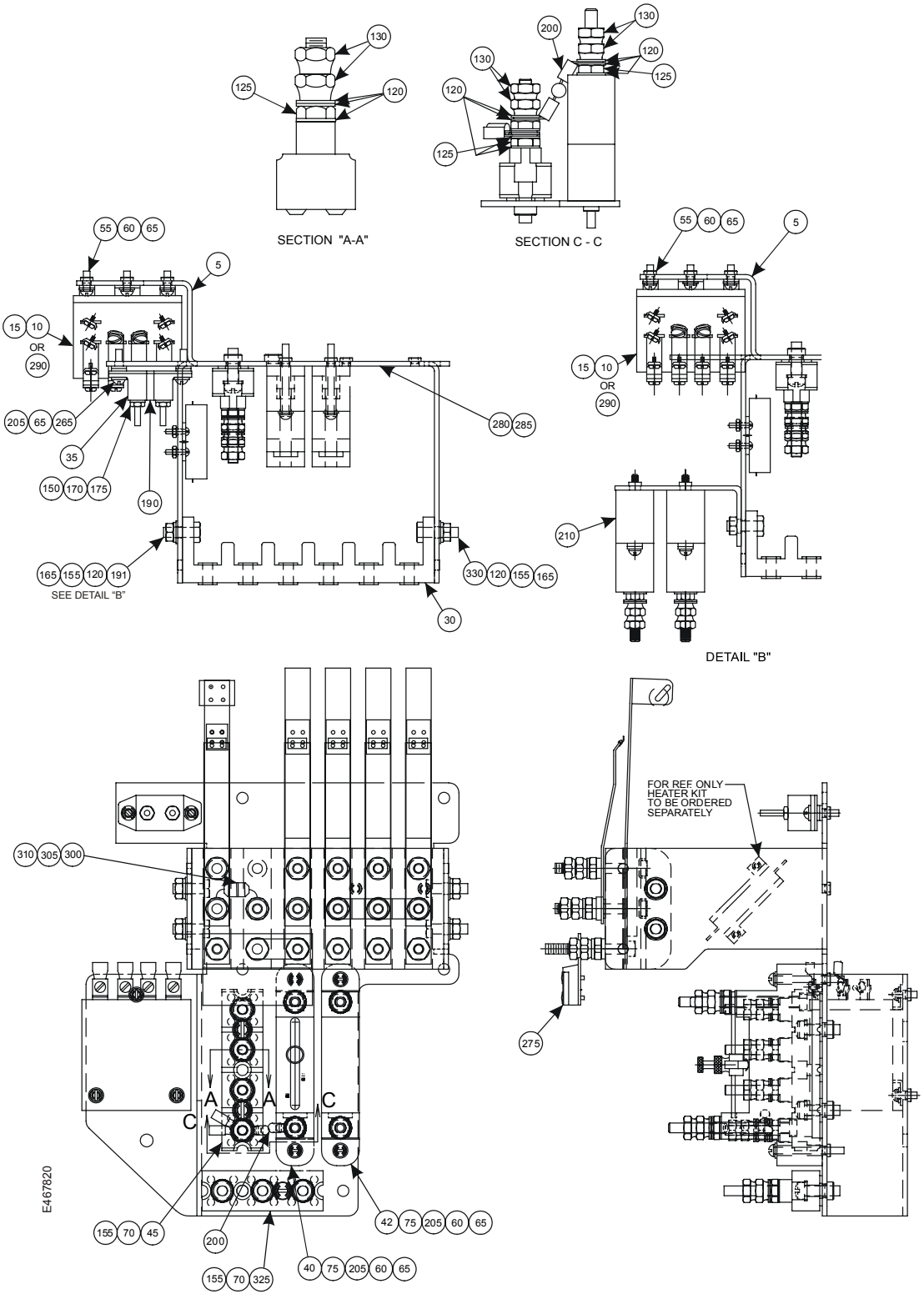


Figure 4-4 - Model 95 Exit Gate Mechanism - Electrical Assembly with Non-Vital Relay for 12-Volt Systems (Refer to Drawing E467820.)

4.4 PN-150 Electrical Assembly for 12-Volt Systems (N46782101)

Table 4-6 presents the parts list for the vital electrical assembly (N46782101) for the exit gate mechanism and Figure 4-5 shows the location of the parts.

Table 4-6 - Parts List for Vital Exit Gate Mechanism Electrical Assembly (N46782101)

Item No.	Part Number	Description
05	N46701801	Bracket, Relay Mounting
10	N451376-0301	Base, PN-150 Mounting
15	J500136-0114	Screw, 1/4 - 20 x 7/8” RD, SS
20	J475121-0111	Washer, Lock No. 1/4”, SS
25	M038448	Washer
30	J725715-0018	Block, Terminal Board Black
35	J725694-0169	Circuit Breaker, 12V 20A Reset
40	N156682	Resistor, Comp
42	N156682-001	Resistor, Comp
45	M107471	Terminal Board
50	N330681-0502	Part Bag
60	M015577	Washer
65	J475121-0108	Washer-SS Lock No 8
70	J500139-0114	Screw, 1/4 - 20 x 7/8”, SS
75	J500132-0128	Screw, 8 - 32 x 1-3/4”, SS
*80	N467042-05	#1 Contact Assembly
*85	N467043-02	Heel Contact Assembly
*90	N467044-03	Front Contact Assembly
*110	M130200	Terminal Post, AAR
*112	M118271	Terminal Post, AAR
*115	M451011-3501	Lock Washer
120	J047818	Washer, 17/64” x 9/16” COP, AAR
125	J480300	Nut, 14 - 24 Hex Brass NP, AAR
130	J480301	Nut, 14 - 24 Hex Brass, AAR
*135	M451011-3402	Washer, Insul
*140	J071626	Link, Test
*145	M047290	Connector, No. 18 x 1/2”
150	N467067-02	Harness Assembly, PN-150
155	J047521	Washer, High Collar, Lock, 1/4”
*160	J075483	Grommet, Rbr Atl. 1919
165	J480211-0108	Nut, 1/4 - 20, Hex, SS
170	J048145	Nut, 10 - 32 Hex, Steel
175	O0305047	Washer, No. 10 Flat

Item No.	Part Number	Description
190	J703310	Cable Tie, Self Locking
191	J500097-0112	Screw, 1/4 – 20 x 3/4” Hex HD SS
200	PN46705601	Diode Assembly, Snub Mod. 95
205	J475182-0013	Washer, No. 8, Flat Nylon
265	J791597-0003	Screw, 8 - 32 x 3/4”, Nylon RH
270	M437500	Spacer
275	N46712401	Power Down Module
**280	J507218	Screw, 1/4 - 20 x 5/8” SS
**285	J475121-0111	Washer, 1/4” SST Lock
**290	J500139-0116	Screw-SST 1/4 - 20 x 1” FIL
**295	J047521	Washer, 1/4 Lock
325	M109154	Terminal Block
330	J500097-0114	Screw, 1/4 - 20 x 7/8”, Hex Head, SS
*335	J475121-0124	Washer, 1/4” Lock, SS
340	N46716501	Snub Support Lead

* Part not shown in Figure 4-5.
** For mounting electrical assembly to housing. Not shown in Figure 4-5.

4.5 Conversion Kit Components (X46700013)

Table 4-7 lists all of the parts in the conversion kit required to convert a standard Model 95 Crossing Gate Mechanism to an Exit Gate Mechanism.

Table 4-7 - Parts List for the Exit Gate Conversion Kit

Part Number	Description	Quantity/Assembly
J4751200120	Washer, 3/4 Plate, SS	16
J4751210119	Washer, 3/4 Lock, SS	16
J4802120116	Nut, 3/4 - 10, Hex, SS	16
M46705002	Stud, Mech, Center Weight	8
M46705101	Plate, Exit Gate Stud	2
M46707901	Label, "EXIT GATE"	1
M46708101	Label, Wiring Diagram	1
Q4514842402	Washer, Serrated	4

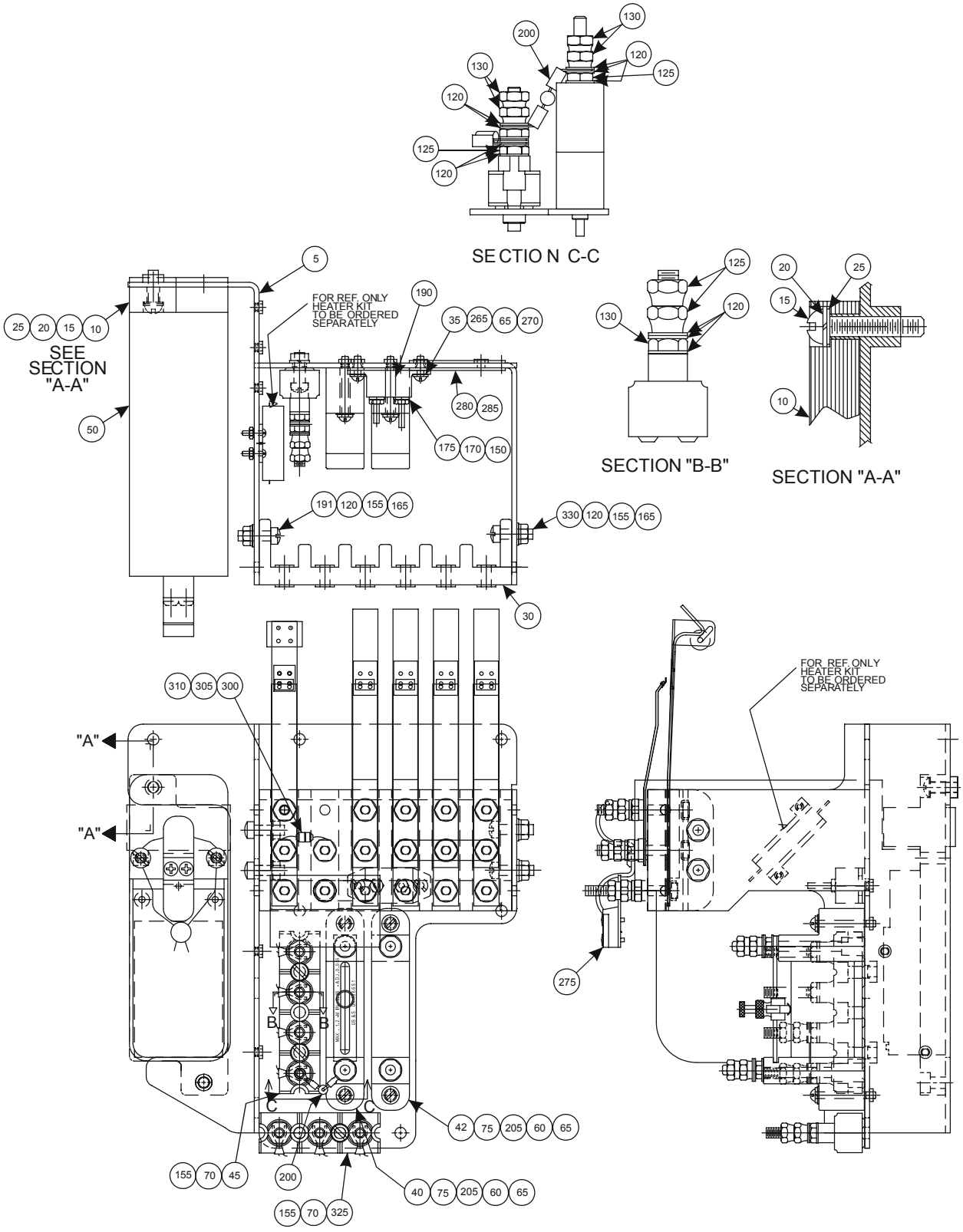


Figure 4-5 - Model 95 Exit Gate Mechanism - Electrical Assembly with PN-150 Relay for 12-Volt Systems. (Refer to Drawing F467821.)

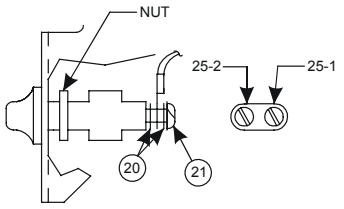
4.6 Maintenance Bracket Assembly

Table 4-8 lists the parts in the maintenance bracket assembly and Figure 4-6 shows their location.

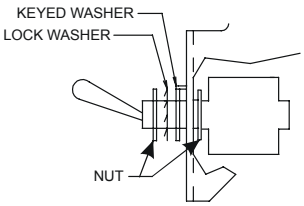
Table 4-8 - Parts List for the Maintenance Bracket Assembly (N46709202)

Item No.	Part Number	Description
1	M46708801	Maintenance Label
2	N46709104	Toggle Switch Assembly Wires
3	M46708901	Bracket, Maintenance
4	J7257070650	Switch, Momentary PB
5	J5000970114	Screw, 1/4 - 20 x 7/8", Hex Head, SS
6	J4751200112	Washer, Plate No. 1/4, SS
7	J047521	Washer, High Collar, Lock, 1/4"
8	J4802110108	Nut, 1/4 – 20, Hex, SS
9*	J055643	Bag, 5" x 7"
10	M109154	Terminal Block
11	J480300	Nut, 1/4 – 24 Brass Hex, NP
12	J480301	Nut, 14 – 24 Brass Hex
13	J047818	Washer, 17/64" x 9/16", COP
14	J507277-0010	Screw, 1/4 - 20 x 1" Fil Head
15*	M467090-01	Wiring Label
17*	J703302	Cable Tie, Self-Locking
18*	A043013	Wire Seal, No. 23 2 Ply
19*	J055639	Ziplock Bag 8" x 10"
20	J047709	Washer, Int., No. 8 Lock
21	J5072950106	Screw, 8 - 32 x 3/8" Pan, SS

* Not shown in Figure 4-6



SWITCH, MOMENTARY
(MOUNTING AND WIRE TERMINATION)
VIEW "B"



SWITCH, TOGGLE
(MOUNTING OF PRE-WIRED SWITCH.
HARDWARE PROVIDED WITH SWITCH.)
VIEW "A"

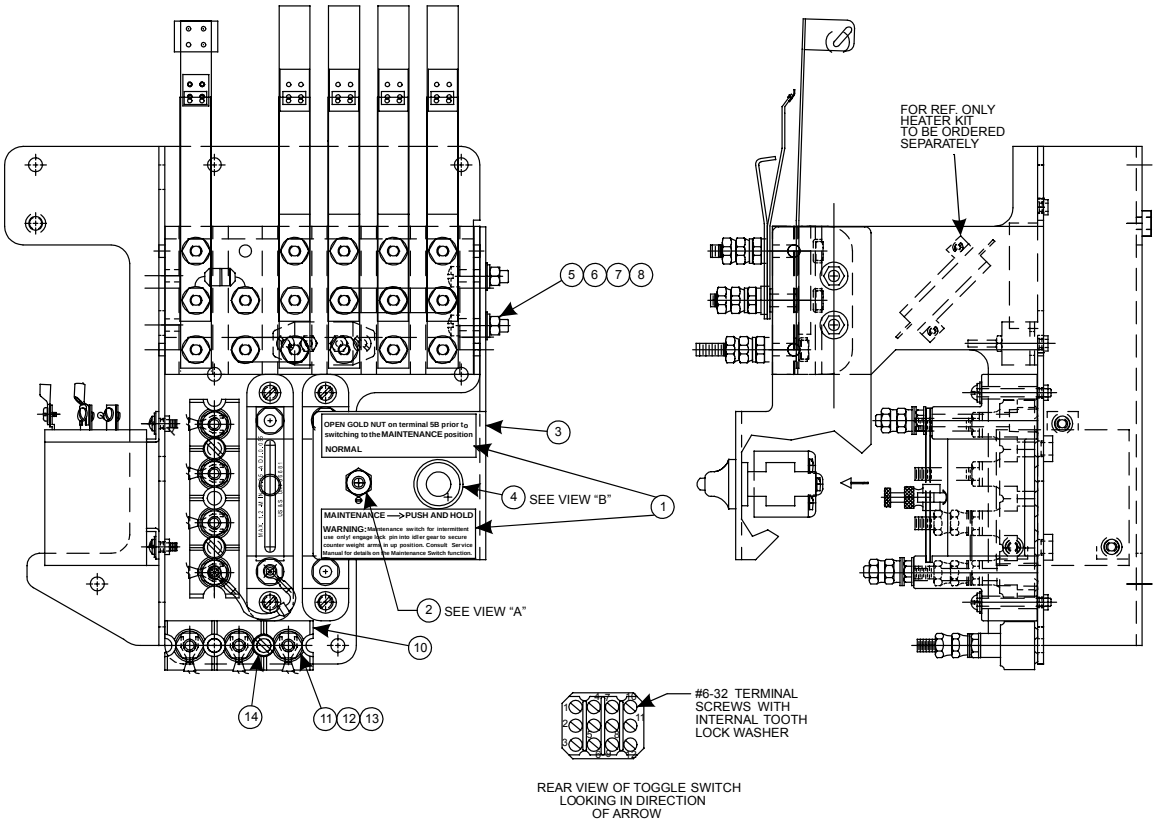


Figure 4-6 - Maintenance Bracket Assembly (N46709202)

4.7 Tool Kit (N46707001)

Table 4-9 is a list of the items in the exit gate mechanism tool kit and Figure 4-7 shows all of the pieces in the kit.

Table 4-9 - Parts List for the Exit Gate Mechanism Tool Kit

Item No.	Part Number	Description
10	J0390000119	Tool Bag - #166 Zip Vinyl
20	M46706901	Pin, Hold Down
30	J0390000116	Hex Key, 3/16" Ball Point
40	J0529800014	Hex Key, 5/64" Short Series
50	J0529800015	Hex Key, 1/8" Short Series
60	J0529800016	Hex Key, 9/64" Short Series
70	J0529800017	Hex Key, 5/16" Short Series
80	A7737150001	Tape, Fastener, 3/4” Loop
90	A7737150002	Tape, Fastener, 3/4” Hook
95*	J0773730023	Tape, 3M, F-9465PC

***** Not shown in Figure 4-7

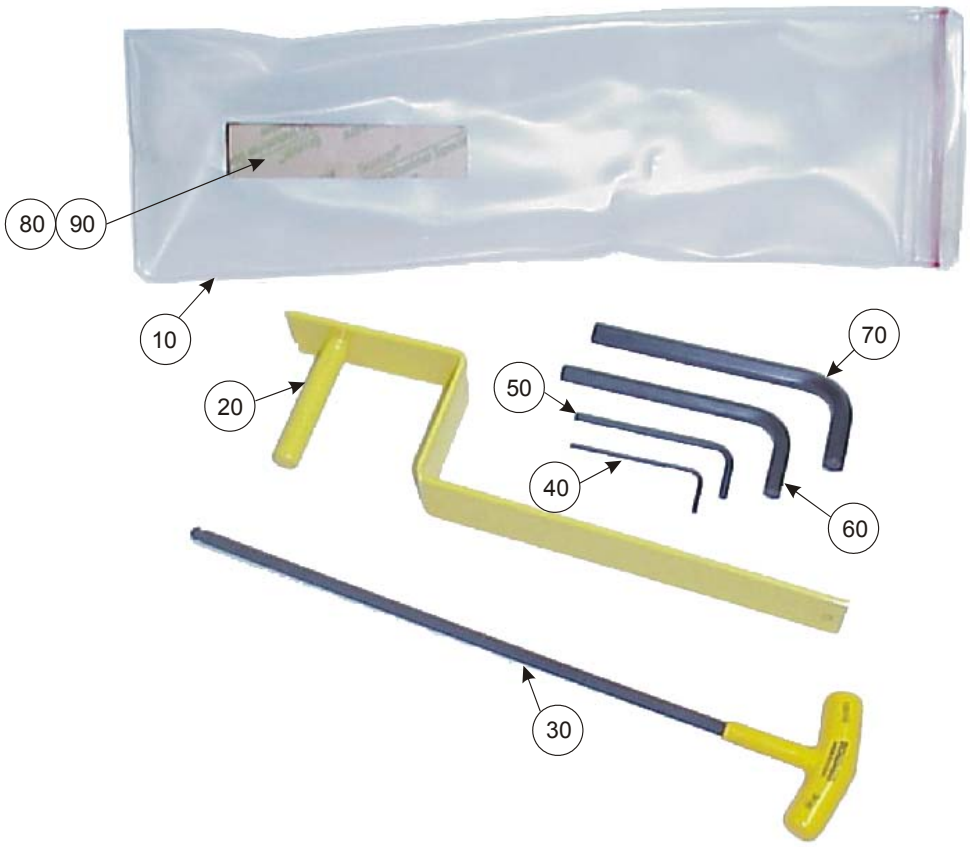


Figure 4-7 - Tool Kit (N46707001)

4.8 Recommended Model 95 Non-Vital Gate Mech. Spare Parts Kit

Table 4-10 is a list of the recommended spare parts for the exit gate mechanism.

Table 4-10 - Recommended Spare Parts for the Non-Vital Exit Gate Mechanism (X46700016)

Part Number	Description	Qty/Assembly
N46703602	Gearmotor Assembly	1
N46716401	MCR Non-Vital Relay w/ Ties and Label	1
N46704205	# 1 Contactor Assembly	1
N46704302	Heel Contact Assembly	1
N46704403	Front Contact Assembly	1
J7256940169	Circuit Breaker, 12V, 20A, Reset	1
N46705601	Snub Diode Assembly	1
X46700031	Power Down Module	1
N156682001	Resistor	1
N156682	Resistor	1
J0702050438	Electric Brake Assembly (Hold Clear Device)	1
J726132	Plastic Cover Relay	1

4.8.1 Recommended Spare Parts Not Contained in the Spare Parts Kit

Table 4-11 presents additional recommended spare parts not contained in the Spare Parts Kit.

Table 4-11 - Additional Recommended Spare Parts

Part Number	Description
J0702050635	Replacement Motor Brushes (2 per motor required)

4.9 Model 95 Gate Mech Torque Wrench Kit

Table 4-12 lists the items in the torque wrench kit (X46700003).

Table 4-12 - Torque Wrench Kit (X46700003)

Part Number	Description
J0390000115	Torque Wrench
J0390000117	Socket, 7/16”, 12 point, 1/4” Square Drive

5 Technical Support

The Rapid Action Information Link Team (RAIL Team) is a group of experienced product and application engineers ready to assist you to resolve any technical issues concerning this product. Contact the RAIL Team at 1-800-652-7276 or by e-mail at railteam@switch.com.