SIEMENS

INSTRUCTION & MAINTENANCE

S-40 RAILROAD HIGHWAY CROSSING GATE

JUNE 2008 (REVISED MAY 2018)

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VERSION E.2

Siemens Mobility
700 Waterfront Drive
Munhall, Pennsylvania 15120
1-800-793-SAFE

Instruction & Maintenance - Railroad Highway Crossing Gate Model S-40

Contents

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DOCUMENT HISTORY

Version	Release Date	Details of Change
A-E	6/16/2008	N/A
E.1	8/12/2016	All
E.2	5/21/2016	Updated relay panel graphics and added clarifying notes on relay panel compatibility.

Introduction

Siemens's Model S-40 Railroad Highway Crossing Gate is a refinement of the Models S & S-20 that have served the railroad industries for nearly sixty years. The newly designed four pole compound series/permanent magnet motor and control circuitry (patent no. 5, 834, 914) provides enhanced torque and speed control for the longest and heaviest gate arms with minimum current. It also pro- vides precedent setting improvements in speed control during various failure conditions.

Present gate circuits provide snubbing through dynamic braking motor control that will lower the gate arm smoothly from 45 degrees to horizontal in normal gate arm down operation and from 90 degrees to horizontal in the event of a loss of power. Power down circuits alone must resist the falling counterweights when a gate arm is knocked off as present gate circuits do not provide snubbing in an up drive or falling counterweights condition.

The S-40 Gate Mechanism provides snubbing in both up and down directions to smoothly lower falling counterweights when a gate arm is knocked off during a loss of power or the failure of a power down circuit contact. Additionally, a backup Overspeed Control Snubbing Circuit is in place that will recognize an over speed condition and snub in either direction if the regular snub circuit is open.

Features	
Snubbing of counterweights if arm is knocked off during loss of power.	Maintenance switch option. Good up to 6-7 counterweights
Snubbing of counterweights if arm is knocked off during power-up operation (relay up and regular snub circuit open).	Rollers for horizontal counterweight adjustment.
Snubbing of arm down or of falling counterweights when arm off in the event of a failed-open snubbing resistor or contact.	Test nut located on relay panel test link assembly.
Enhanced arm down control allowing fast yet smooth lowering of the longest and heaviest gate arms.	Power down contact now molded vs. sandwich construction.
Snubbing prevents over-drive into buffer when up control is restored after an arm knockdown.	

The S-40 Gate motor provides time-proven series wound coils, in addition to a permanent magnet field, providing the best characteristics of both a series and shunt type motor. The permanent magnet fields are used in power and gravity down operation to provide a high level of control for both the normal and failure condition snubbing. The motor can withstand indefinite periods of stall.

Operation

With standard wiring, as shown on page 3, positive and negative battery to terminal locations 4 & 5 is always present and serves to supply power to the motor. An additional positive battery "up control" connection serves to energize the relay and the hold clear coils for gate operation. External switching by the user is required which will raise and hold the gate arm at vertical when the up control is energized and will allow the gate to lower when de-energized. A test link connection is provided that allows lowering and raising of the gate arm at the mechanism.

Gate up control picks up the hold clear armature which in turn opens the power down contact located at the hold clear and latches the hold clear pawl into the ratchet wheel. In addition it picks up the relay to energize the motor in power up drive. An over-running clutch in the ratchet wheel allows the motor shaft to turn freely in up drive while locking when the direction reverses. At 45 degrees the power down contact #6 on the terminal board closes but with no effect being in series with the open power down contact at the hold clear. At 90 degrees contact #7 opens to de-energized the relay and remove power from the motor. The pick-up coil is de-energized but the hold coil remains energized to hold the arm at vertical with a minimum of current. With the gate at vertical and the relay de-energized, the snubbing circuit is completed. Also the relay is in position for power down when lowering the arm.

Removing up control allows the hold clear armature to drop away. This releases the ratchet wheel and closes the power down contact at the hold clear. The arm is power driven to 45 degrees at which time the power down contact #6 opens and the snubbing circuit controls the remaining gravity descent. At 5 degrees the partial snubbing through resistor ED is bypassed when contact #10 closes to obtain a maximum horizontal snub. The snubbing circuit remains even if all power to the mechanism were removed and will control arm descent if the arm were lifted by hand and released, and also will control the up motion from descending counterweights if the gate arm is knocked down. The S-40 gate mechanism is equipped with backup over-speed module snubbing in the event of an arm knockdown during power up in which case the regular snub circuit is open.

Specifications

	Standard 12 VDC Mechanism	Optional 24 VDC Mechanism
Housing & Cover	Permanent mold aluminum	Permanent mold aluminum
Gear Train	240 to 1 gear ratio	240 to 1 gear ratio
Bearings	Maintenance free sealed	Maintenance free sealed
Motor	12 VDC compound series/pm	24 VDC compound series/pm
Hold Clear	Gravity drop with over-running clutch ratchet wheel	Gravity drop with over-running clutch ratchet wheel
Hold coil current	35 mA@ 12 VDC	35 mA@ 12 VDC
Operating voltage	11 -16 VDC	22-26 VDC
Operating current power up or down	6-15 A @ 12 VDC	4-10 A @ 24 VDC

Standard Features

Standard S-40 Gate Mechanism - Internal:

Relay panel assembly complete with down rate resistors and over-speed control. Test link assembly with special test nut (gate up control).
Standard Gate Control Relay.
Adjustable heavy duty power down contact with heat resistant actuating cam (position 6). Adjustable snap action power up contact and actuating cam (position 7).
Adjustable contact and cam for flashing light control (position 8). Adjustable contact and cam for bell control (position 9).
Adjustable horizontal snub contact and cam (position 10).

Note: Contact cams are factory set as shown on wiring diagram, page 3.

Adjustable snub resistor to set down time (1.0 ohm max).
115 VAC Defroster located under motor end and wired to terminal board position 12 with insulated nuts.
Mechanism serial number located on motor housing label.

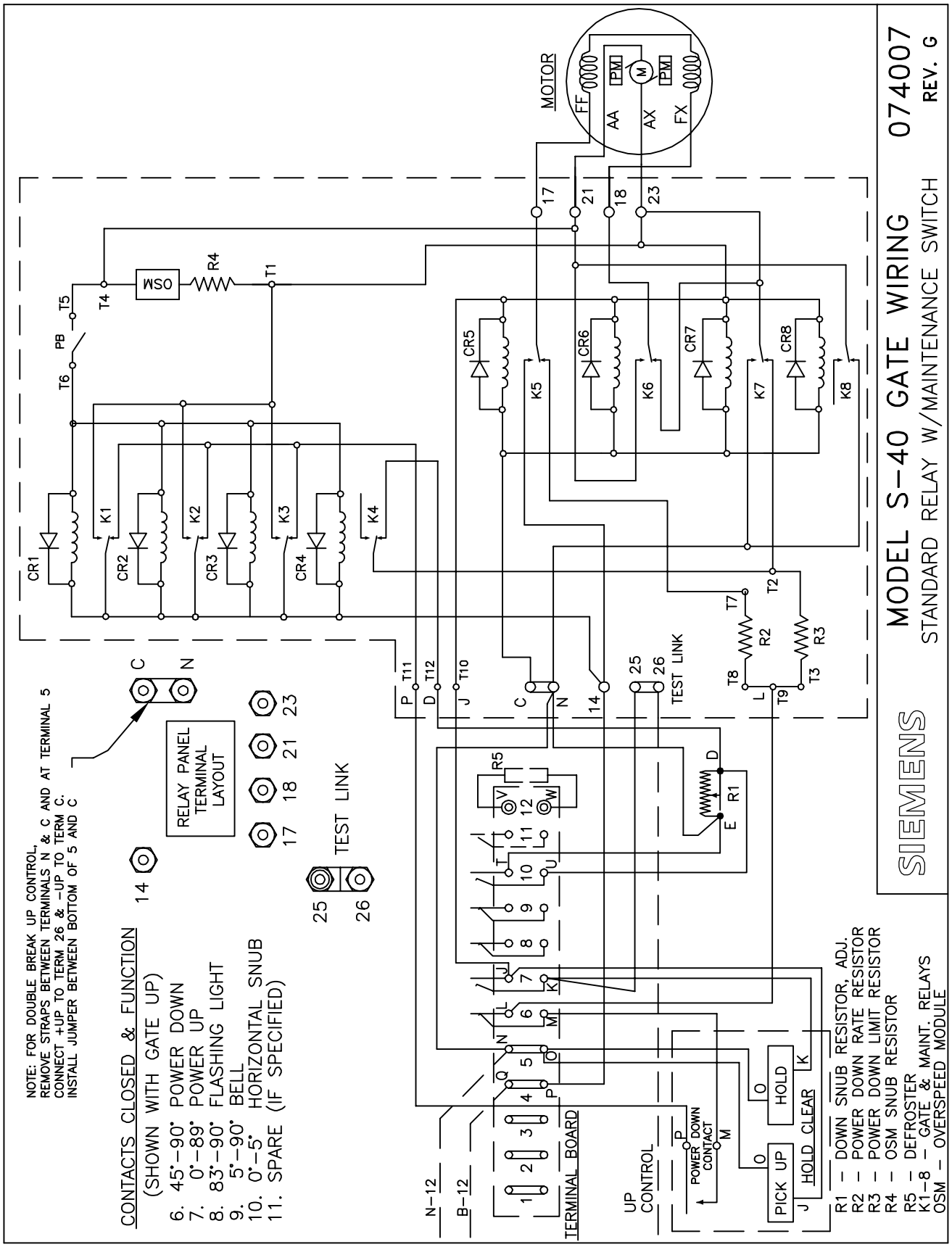
Standard S-40 Gate Mechanism - External:

Lifting eyebolt.
Shaft ends with 1"- 8 UNC nuts, lock washers and hub keys. Mounting bolts and saddles for 5" pipe mounting.
Mechanism support clamp for 5" pipe mounting.
2" x 42" long liquid tight conduit with one straight and one 45 degree connector. Mechanism serial number stamped on top outside of cabinet.

Additional contacts and cams. Special contact cam settings. OptionsSpecial defroster - 230 VAC, 12 or 24 VDC.
Auxiliary shaft for application of sidewalk arm (factory installed only, cannot be added to gate in service).
Maintenance switch assembly with stop bracket - see page 13
Galvanized steel cover part no. 070901-8X.
Motor cut out assembly, 12 VDC, no. 074046-12X. Motor cut out assembly, 24 VDC, no. 074046-24X. Wire harness, base to mechanism #074000-WX.

Exit Gate Mechanism is available for four-quadrant applications. Contact you Siemens Systems Sales Rep. for details.

The below drawing is current. Earlier panels used two relays, but all versions of the maintenance panel are functionally equivalent and can be exchanged without impacting the operation and specifications of the mechanism.



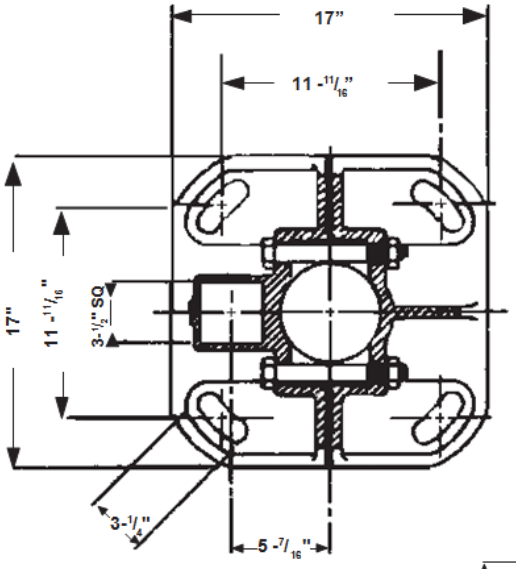
Foundations

Prefabricated galvanized steel or poured concrete may be used for the foundation.

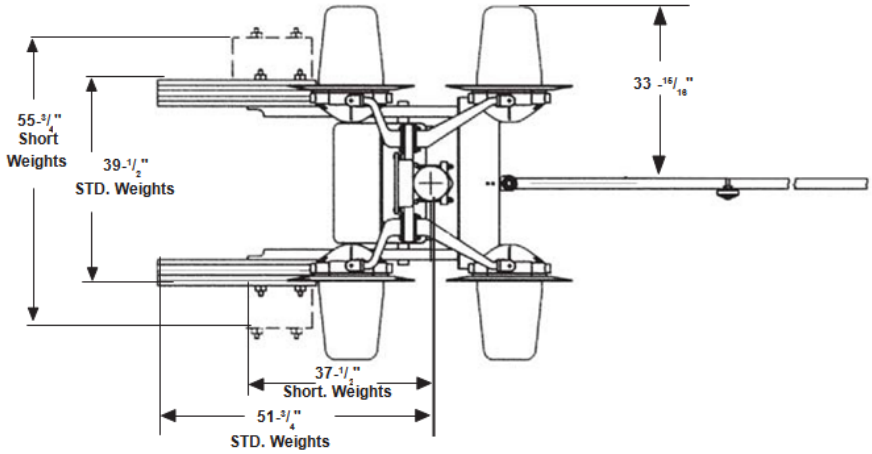
When using Siemens' galvanized steel foundation, part number 035903-911-1X, be sure bottom of excavation is flat and level to insure full support to the base plate. Backfill should be compacted, with height of exposure above ground as shown for concrete below.

Place foundation as dictated by local conditions, remembering that gate arm lengths are measured from center of foundation to end of arm.

For field poured concrete foundation, 4 anchor bolts, part number 131702-26X, are required.



CROSS SECTION OF JUNCTION BOX BASE
PART NO. 041931-2X



Recommended Battery and Wire Requirements

Sizes of wire used for the motor circuit should be calculated so that there will be not more than 0.1 ohm resistance between the battery and mechanism terminals.

Wire sizes as follows are recommended:

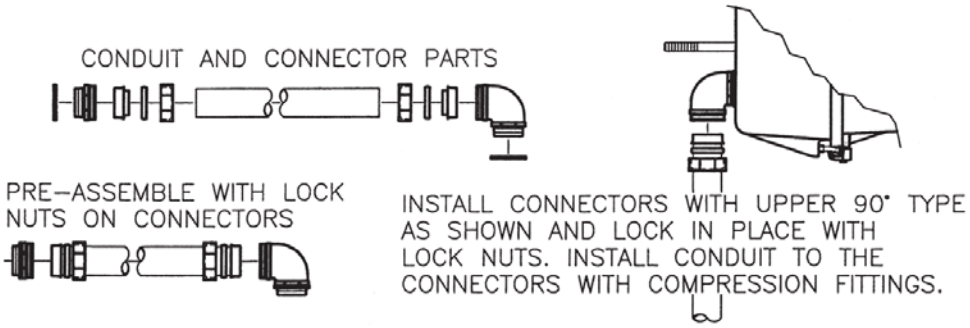
Distance from Battery Terminals to Mechanism Terminals	Size of Soft Drawn Copper Wire to Use
Up to 60 feet (120 feet of wire)	No. 9 AWG
From 60 to 120 feet (240 feet of wire)	No. 6 AWG

The following battery is recommended with above wire sizes for gates of various lengths:

Gate Arm Length In Feet	Number of Cells		
	Lead	Nickel Iron	Nickel Cadmium
Up to 24	6	9	9
25 to 42	7	11	11

Installation

1. **Erect mast and base.** Erect five inch mast, with junction box base facing traffic. Mounting hole for front and back flashing lights will be on the field side of mast. Place a level on the mast and plumb to vertical using large shim washers or leveling nuts on the foundation bolts.
2. **Mount support clamp on mast.** Support clamp 070786-5X mounts on the mast with casting facing 45 degrees from the field side toward track. The top of casting should be 51" above the top of foundation (page 20, item 5).
3. **Prepare mechanism.** Thread 90 degree flex conduit coupling into the back of the gate cabinet and insert the 4 square head machine bolts into the slots on the back of cabinet (page 21, items 14 & 19).
4. **Clamp mechanism in place.** Lift mechanism (see page 7) and set on top of the support clamp. Clamp to mast with clamps, nuts and washers provided (page 21, items 13, 15, 16 & 17).
5. **Install arm supports.** Mount gate arm supports with bolted on hubs over the keys on the main shaft ends. Install main shaft nuts and washers (page 21, items 55 & 56) but **do not fully tighten** until after installing the conversion bracket.
6. **Install arm coupling or conversion bracket.** Bolt to the arm support castings and **fully tighten** main shaft nuts.
7. **Install flexible conduit.** Thread coupling into base and install conduit to base and rear of cabinet.



8. **Mount flashing lights, bell and signs.** The flashing light units have been factory wired but control wires from the light's junction box to the junction box base must be field installed. **Align the flashing light units before placing the crossing in service.** Bell, when used, is mounted on top of the mast with the gong facing the roadway. A spare contact is provided on the gate controller to cut off bell when the gate arm is down (see wiring page 3). Mount the required signs.
9. **Connect power to mechanism.** See page 4 for recommended battery and wire requirements and connect per wiring diagram page 3. A test link with gold nut is provided on the relay panel, connect the up control directly to this terminal number 26. Seal conduit opening per AREMA Signal Manual Part 2.4.25.
10. **Install counterweight stud plates.** Be sure the roller spacers are over the studs and in the arm support slot before mounting clamp bar and locking piece. See page 27, items 8, 4, 11, 12 & 13.
11. **Install counterweights and gate arm as follows:** If required, the back clamps can be loosened and the mechanism rotated parallel to the roadway for arm installation.

    a. **Install counterweights.** Install with the gate arm supports and counterweights with the gate arm in the up position (see page 26). Number required per table on page 10. Weights are based on new Siemens arms and may vary when other or repaired arms are used.

    b. **Raise counterweights.** Raise to horizontal using the maintenance switch per pages 13 and 14 on gates so equipped. Hand cranking can be utilized per page 12 or the use of a come-along if user specifications require.

    c. **Install gate arm.** On breakaway pivot type assemblies, install number and type of shear bolts per arm manufacturer's instructions.
12. **Set horizontal torque and arm height.** Set horizontal torque to 100 ± 20 foot-pounds per instructions on page

    11. Set arm height with horizontal buffer (upper position) per instructions on page 9.
13. **Raise and check vertical position of arm.** Adjust the vertical position by rotating contact cam #7 on the main shaft (see page 8).
14. **Adjust the vertical buffer (lower position).** Set to 1/32 clearance from segment gear per instructions on page 9.

Installation Steps (continued)

15. **Set vertical torque.** Determine vertical torque limits per table on page 10 and set per instructions on page 11.

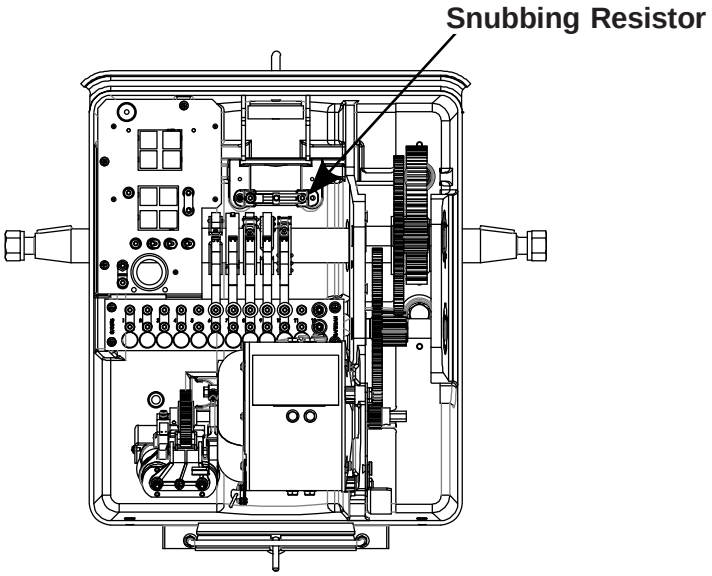
16. **Adjust descending time.** Total descent time is a sum of the adjustable snubbing circuit (90 degrees - 5 degrees) and the horizontal snub control through contact #10 (5 degrees - 0 degrees).

    0-5 degree Horizontal snub. Heavy arms of 28' - 40' length require the full 5 degree of horizontal snub to prevent excessive sag or damage under ice loading conditions.

    0-2.5 degree Horizontal snub. Shorter arms can be adjusted to half horizontal snub to obtain desired descent time. Adjustment is made by rotating contact cam #10 on the main shaft (see page 8).

    Snubbing resistor. Adjust snubbing resistor (page 22, item 67) for 10-15 seconds descent time.

Note: In some applications with long gate arms and high wind conditions, Siemens recommends the use of an extended mast with multiple wind guards spaced no more than 10' apart.



FRONT VIEW ASSEMBLED

Final Checks

A. **Voltage at terminal P & N.** Should be no less than 11 or more than 16 volts.

B. **Check for possible grounds.**

C. **Check voltage and current during operation.**

   Voltage should not drop below 11 volts during gate up cycle.

   Gate up current should be 6-15 amps (longer arms require more current). Power down current should be 6-15 amps.

D. **Check clearing and descending times.**

   Clearing time varies with length of arm but should be between 6 and 10 seconds. Descending time with power down (as set -per-step 16) of 10-15 seconds.

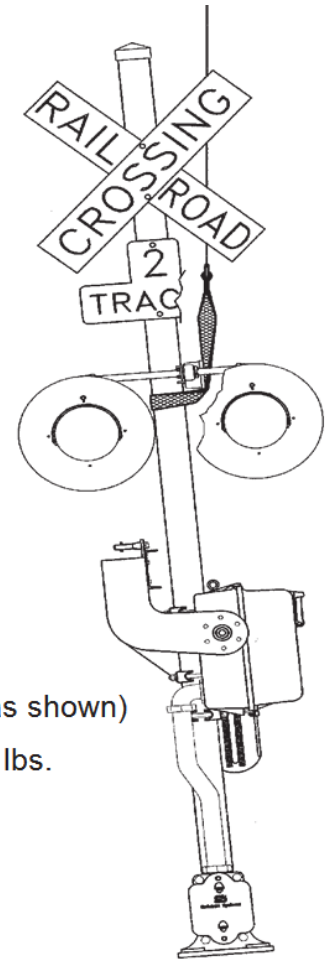
   Descending time without power down. Disable the power down circuit by blocking contact #6 with a plastic card. The descent time should not be less than 8 or more than 15 seconds.

E. **Check terminal board contacts.** Check clearance, square contact and wiping action per page 8.

F. **Check power down contact of hold clear.** Check clearance and wiping action per page 18.

Note: When using gold test nut to operate gate mechanism, take care to make quick positive contact. Arcing can result in false triggering of the over speed module causing temporary high gate up current and clearing time.

Lifting Recommendations

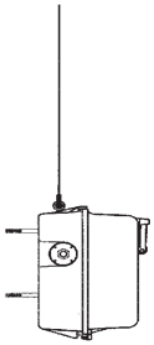


Weight (as shown)

700 lbs.

RECOMMENDATIONS FOR LIFTING PRE-ASSEMBLED SIGNALS WITH GATE MECHANISM.

1. SIGNAL ASSEMBLY MUST BE WITHOUT ARM AND COUNTERWEIGHTS
2. LIFT POINT SHOULD BE A MINIMUM OF 15" ABOVE GATE MECHANISM.
3. LIFTING SLING CAN BE USED AROUND MAST AND UNDER THE JUNCTION BOX CROSSARM FOR LIGHTS AS SHOWN.



Weight (as shown)

350 lbs.

Mechanism only can be lifted into place using the lifting eye provided

Description	Part Number	Dimensions	Weight
Adapter Cast	076203-510X		28 lbs.
Adapter Fab	076203-501X		20 lbs.
Conversion Bracket (Cast Adapter)	076227-X		75 lbs.
Conversion Bracket (fab Adapter)	076227-22X		55 lbs.
J. B. Base Assy.	041931-X		85 lbs.
Mast & J. B. Base (5" Alum.)	070519-27AX	14 feet - 0 inches	140 lbs.
Mast & J. B. Base (5" Alum.)	070519-40AX	16 feet - 0 inches	160 lbs.
Mast & J. B. Bast Stub (5" Alum.)	070519-3AX	7 feet - 0 inches	100 lbs.
Sidelight Cantilever	041442-26X		38 lbs.
Counterweight Std.	070755-4	15 x 30 x 1/2 inches	63 lbs.
Counterweight Short	070755-34	15 x 15 x 5/8 inches	38 lbs.
Counterweight Stud Plate	070757-26X		15 lbs.
Arm Supports (1 each)	070920-LX-or-070920-RX		72 lbs. ea.
Arm Supports (1 each)	070921-LX-or-070921-RX		30 lbs. ea.
R. R. Crossing Sign w/mtg. Hardware	035200-17X		40 lbs.
#2 Track Sign w/mt. Hardware	035236-2X		25 lbs.
J. B. Crossarm 2-Way w/FLX-12 Heads Complete	042003-000616		110 lbs.
S-40 Gate Mechanism	073000-W00001		350 lbs.
Galvanized Steel Foundation	035903-911-1X		200 lbs.

Circuit Controller Adjustment

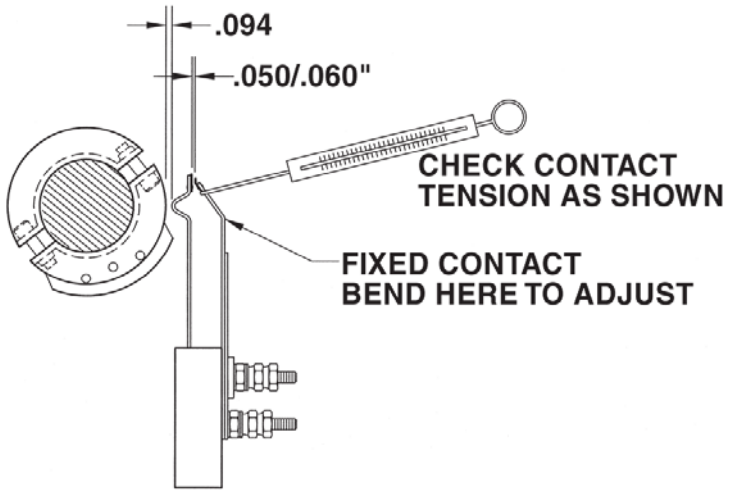
Five spring contacts are provided on a standard mechanism assembly. Additional contacts can be furnished if required. Three contacts are required for gate operation (position 6, 7 & 10) and two contacts (position 8 & 9) are factory adjusted and may be used as indicated in the table below.

Contacts are factory set as shown below. The rear or moveable contact rarely requires adjustment unless being replaced. The contact opening can increase with use and should be checked periodically and adjusted if required. The openings should not exceed 1/16". Contact adjustment can be made by adjusting the bend angle of the front or fixed contact with a contact forming tool. Set contact opening to where there is a light drag on a 1/16" gauge. Always check contact operation after adjustment to be sure there is square contact and a good wiping action when the contact closes. Tension pressure of closed contact to be between 28 and 48 oz.

Contact tools and gages are available, see page 15 for ordering information.

CAUTION: Repeated or over bending of a contact may cause damage and not allow proper tension when closed or gap when opened.

Contact cams are factory set for contact function as shown in the table below, or as specified by customer. Adjustment may be required at installation. Use the allen wrench provided to loosen the cam locking screw, then using the allen wrench as a lever, shift the cam positon and retighten the screw.

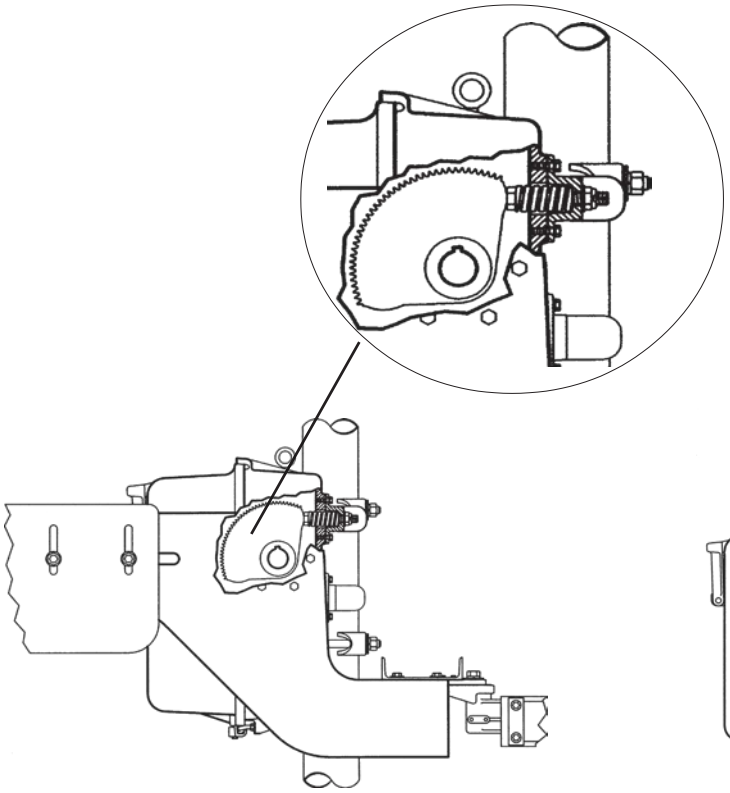


Term. Board Position Number	Wire Designation	Contact Closed with Gate Arm at	Function of Contact
6	L-M	45 degrees - 90 degrees	Power Down Control
7	J-K	0 degrees - 89 degrees	Power Up Control
8	R-S	83 degrees - 90 degrees	Spare (Suggest Flashing Light Control)
9	H-I	5 degrees - 90 degrees	Spare (Bell Control)
10	T-U	0 degrees - 5 degrees	Horizontal Snub Control

Spring Buffer Adjustment

The Model S-40 gate mechanism is equipped with an adjustable spring buffer for horizontal and vertical gate arm positioning. Field adjustment is necessary, follow instructions below.

Note: These adjustments should always be checked before placing gate in service.

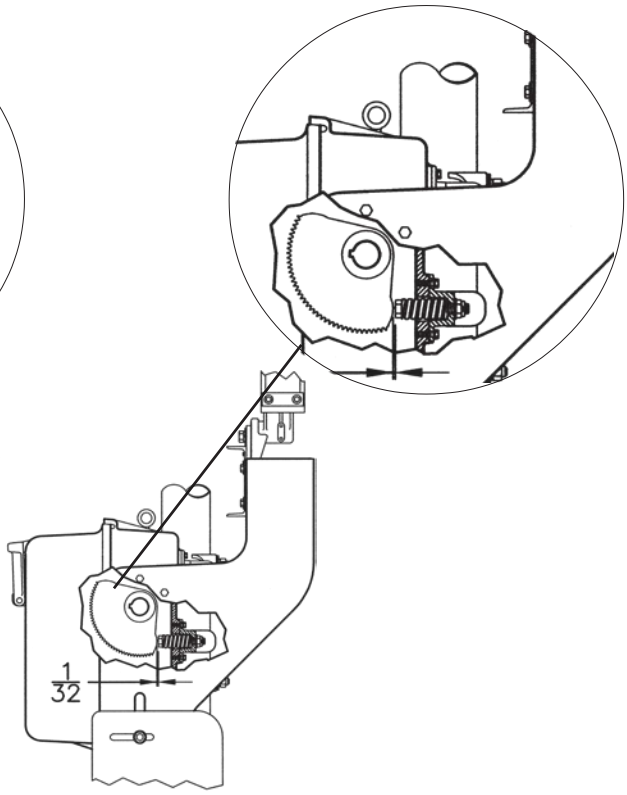


Horizontal Position

The horizontal buffer controls the height of the gate arm above the roadway.

To adjust horizontal arm position - With arm horizontal, remove cap from rear of the top buffer housing, remove the 3/16 x 1 1/2 cotter pin and turn the castle nut on the buffer stud as required to raise or lower the gate arm.

After adjusting, replace the cotter pin and cap.



Vertical Position

The vertical buffer supports the weight of counter-weights at installation and if the gate arm is knocked off, however there should be no contact with the segment gear during normal operation.

To adjust vertical buffer - With arm vertical, remove cap and 3/16 cotter pin at lower buffer and turn castle nut clockwise until buffer pad is clear of segment gear. Cycle gate down and back to vertical, then adjust buffer pad to 1/32" clearance (use plastic card as gauge).

After adjusting, replace the cotter pin and cap.

Additional Instructions and Adjustments Necessary When Auxiliary Arms are Installed

The adjustment is a two person operation and takes place as follows:

1. Position roadway arm in the horizontal position.
2. Person No. 1 to loosen set screws (item 4, page 28) and slide the driven gear (item 2) from the train. Note person No. 2 may have to raise the arm slightly to relieve the gear tooth pressure from the driven gear.
3. Person No. 2 should raise the auxiliary arm (item 14, page 28) to the horizontal or near horizontal position to allow person No. 1 to reenter the driven gear to the gear train.
4. Retighten set screw and run test operation.

Counterweight requirements depend on the weight and length of the gate arm, and on the weight and position of the arm coupling or conversion bracket. The counterweights listed in the tables below are based on new Siemens arms and conversion brackets and may vary when other or repaired arms are used.

Counterweights can be mounted on a single counterweight support arm for fiberglass or combination aluminum/ fiberglass arms up to 32' and wood arms up to 24'. Longer arms require counterweight supports on both sides of the mechanism.

Horizontal torque. Set horizontal torque to between 80 and 120 foot-pounds per instructions on page 11 for all arm lengths with standard applications. Use of a gate retraction device may require a higher setting, see note on page 11.

Vertical torque. Set vertical torque to torque range listed in tables below and instructions on page 11 for all applications.

Table 1 – Fiberglass and Fiberglass/Aluminum Gate Arm Counterweights and Vertical Torque

	Gate Arm Length in feet	Counterweights Required		Stud Plate 070757		Distance "X" in feet	Scale Reading Range (lbs.)		Torque Range (ft. – lbs.)	
		Std	Short	Std	Short		Min	Max	Min	Max
Counter-weights mounted on one Support Arm	12' – 15'	1	3	-26X	-30X	5'	30	35	175	205
	16' – 20'	2	5	-26X	-30X	5'	35	37	175	210
	21' – 22'	3	7	-26X	-30X	5'	35	38	175	210
	23' – 27'	4	10	-26X	-30X	5'	38	46	190	230
	28' – 32'	5	10	-26X	-30X	6'	39	44	235	260
Counter-weights mounted on two Support Arms	33' – 36'	6	13	-26X (2)	-30X(2)	7'	41	48	260	300
	37' – 40'	7	17	-26X (2)	-30X(2)	10'	34	38	300	350

Table 2 – Wood Gate Arm Counterweights and Vertical Torque
Note: Wood arms 31 feet and longer are shipped with a truss assembly

	Gate Arm Length in feet	Counterweights Required		Stud Plate 070757		Distance "X" in feet	Scale Reading Range (lbs.)		Torque Range (ft. - lbs.)	
		Std	Short	Std	Short		Min	Max	Min	Max
Counter-weights mounted on one Support Arm	13' – 18'	2	5	-26X	-30X	5'	35	37	175	185
	19' – 24'	4	9	-26X	-30X	5'	35	38	175	190
Counter-weights mounted on two Support Arms	25' – 28'	7	15	-26X(2)	-30X(2)	5'	38	46	190	230
	29' – 30'	7	15	-26X(2)	-30X(2)	6'	39	44	235	260
	31' – 32'	10	22	-26X(2)	-30X(2)	7'	37	41	260	285
	33' – 36'	10	22	-26X(2)	-30X(2)	7'	41	48	285	335
	37' – 40'	16	34	-24X(2)	-31X(2)	10'	34	38	340	380
	41' – 42'	16	34	-24X(2)	-31X(2)	10'	38	40	380	400
	43' – 46'	20	42	-24X(2)	-31X(2)	10'	40	44	400	440

Standard Galvanized Counterweight #070755-4G 15" x 30" x 1/2" 58 pounds.
Short Galvanized Counterweight #070755-34G 15" x 15" x 5/8" 38 pounds. (Furnished only when specified)

Torque Adjustments
(Using Siemens' Torque Wrench Kit)

Siemens's Torque Wrench Kit permits measurements to be taken from the 1/2 inch hexagon end of the motor shaft. It provides a simpler method than the conventional manner with a spring scale for both measurements.

The torque wrench is calibrated to allow for both inch-pound and foot-pound readings to be taken through the 240 to 1 gear reduction from the 1/2 inch hexagon end of the motor shaft.

Note: Other torque wrenches should not be used.

The Siemens Torque Wrench Kit, part number 070981-X, consists of:

- Torque Wrench (calibrated for both inch-pound and foot-pound readings through the 240 to 1 gear reduction)
- Ratchet Wrench (3/8 inch drive)
- Ratcheting Box End Wrench (1/2 and 9/16 inch openings)
- Socket (1/2 inch, 3/8 inch drive)
- Hex Key Wrench (3/16 inch)
- Tool Box
- I & M Sheet

Horizontal Torque

1. To obtain horizontal torque, lower the arm to the horizontal position.
2. Block contact #10 (horizontal snub) with a plastic card and lift the gate arm approximately 5 degrees from the horizontal position.
3. Attach the torque wrench to the hexagon end of the motor shaft and allow wrench to rotate until blocked by the housing or edge of the open cover.
4. The value read should be between 80 and 120 foot-pounds. If reading does not fall in this range, counterweights should be moved in either direction, as shown on page 12 until proper reading is obtained. Remove torque wrench before adjusting counterweights.
5. When proper reading is obtained, remove torque wrench, remove card from contact #10 and reapply power.

Note: The use of a gate retraction device may require a higher horizontal torque setting to keep the arm at horizontal when it is rotated. If done, add final checks of:

- Horizontal torque must not exceed 250 ft. lbs.
- Gate up current must be 6-15 amps.
- Horizontal snub contact #10 to be a full 5 degrees for all length arms.
- Vertical torque must remain within specified limits.
- Increased gear maintenance will be required. Clean gears and reapply grease when signs of gear wear evident.

Vertical Torque

1. To obtain vertical torque, operate the gate mechanism to place the arm in the vertical position. Make certain that the segment gear is not touching the lower buffer pad.
2. Place the torque wrench over the 1/2 inch hexagon end of the motor shaft.
3. Disable the power down and power up contacts (position 6 & 7) by blocking with a plastic card. Holding the torque wrench firmly, disconnect power-up circuit. Slowly allow wrench to rotate until blocked by the housing or edge of the open cover.
4. The value read should be in accordance with the torque range specifications as listed in tables on page 10.
5. If reading does not fall within specifications, counterweights should be moved horizontally in either direction, as shown on page 12 until proper reading is obtained. Always reapply power-up, engage hold clear and remove torque wrench before adjusting counterweights. When proper reading is obtained, remove wrench, remove card from contacts 6 & 7 and reapply power.

Hand Cranking of Gate Mechanism

Warning: Disconnect power to gate mechanism before inserting tools for hand cranking.

The gate mechanism hand crank feature may be used either to crank the gate arm up, or in the case where the arm has been sheared off, to crank the counterweights to the horizontal position. The tools required are a ratchet wrench with 3/8 inch square drive, a 1/2 inch socket for 3/8 inch drive, and a ratcheting box end wrench for 1/2 inch hex shaft; all of which are included in the Siemens Torque Wrench Kit.

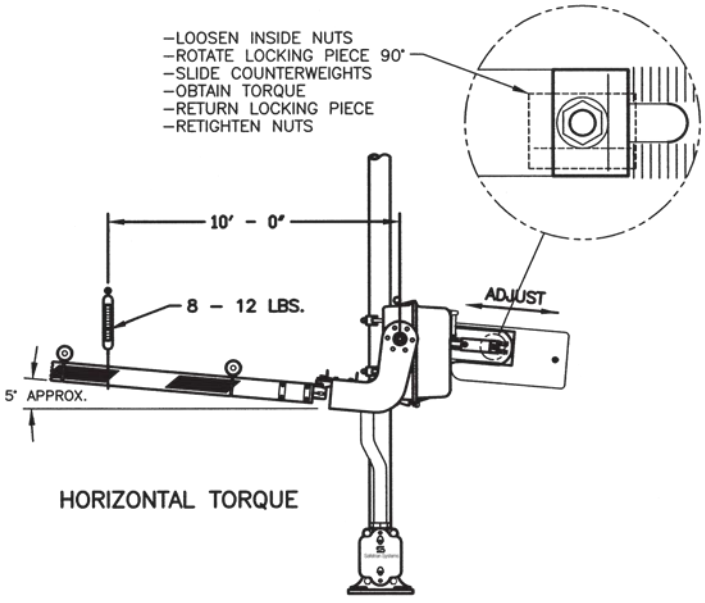
1. Place ratcheting box end wrench over the hexagon shaft and slide towards motor. The ratchet should be set in the direction to prevent its rotation backward (-**ON**- to raise arm, -**OFF**- to raise counterweights).
2. Place the socket ratchet wrench over the end of the hexagon shaft and crank in the desired direction.
3. At the desired height, align the hole in the lower gear with the hole in the gear frame and insert a 3/8" pin or bolt. The gear train should be locked in this manner whenever working with the unbalanced condition of removing or replacing an arm or counterweights.

Torque Adjustments (Using Spring Scale)

Horizontal Torque

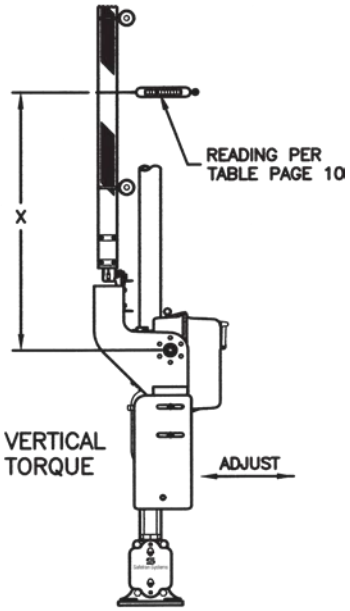
Follow steps listed on page 11 using a spring scale in place of the torque wrench.

To adjust counterweights:



Vertical Torque

Follow steps listed on page 11 using a spring scale in place of the torque wrench. Spring scale readings and locations are listed in the torque tables on page 10.



Maintenance Switch Operation

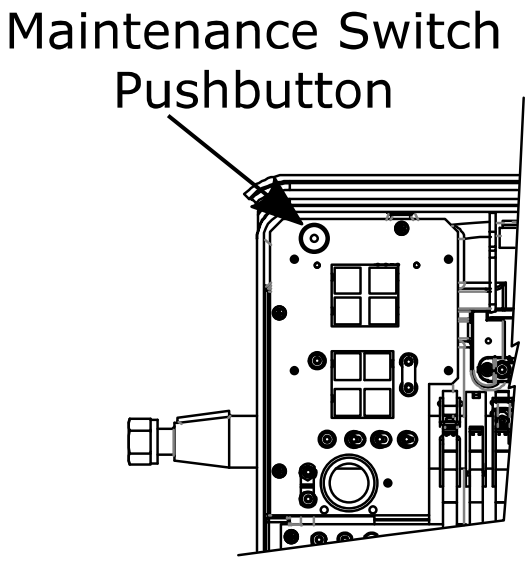
Note: The Maintenance Switch (patent no. 5, 852, 350) is an optional feature and must be specified when ordering an S-40 Gate Mechanism.

The Maintenance Switch option consists of a push button switch and operating relay as part of the relay panel located in the upper left area of the gate cabinet, and a stop bar assembly located at the motor end of the gear train. See diagram below and on next page.

The Maintenance Switch is applicable to fiberglass/aluminum gate arms up to 40 feet long. Activating the normally open, momentary contact, push button switch will raise up to seven standard size counterweight plates* to a horizontal position when the gate arm is removed. Once raised the stop bar is used to hold the counterweights at horizontal until the arm is in place.

Operating Steps

1. Position the Stop Bar with key-slot over the pivot lug in a ready position as shown on page 14.
2. Apply gate control of Down by removing up control (back off gold nut at test link assembly).
3. Depress and hold the Push Button until counterweights are fully raised with the segment gear stopped against the horizontal buffer.
4. Rotate the Stop Bar end against the motor pinion teeth and release the Push Button.
5. Install gate arm.
6. Return the Stop Bar to the storage position as shown on page 14.



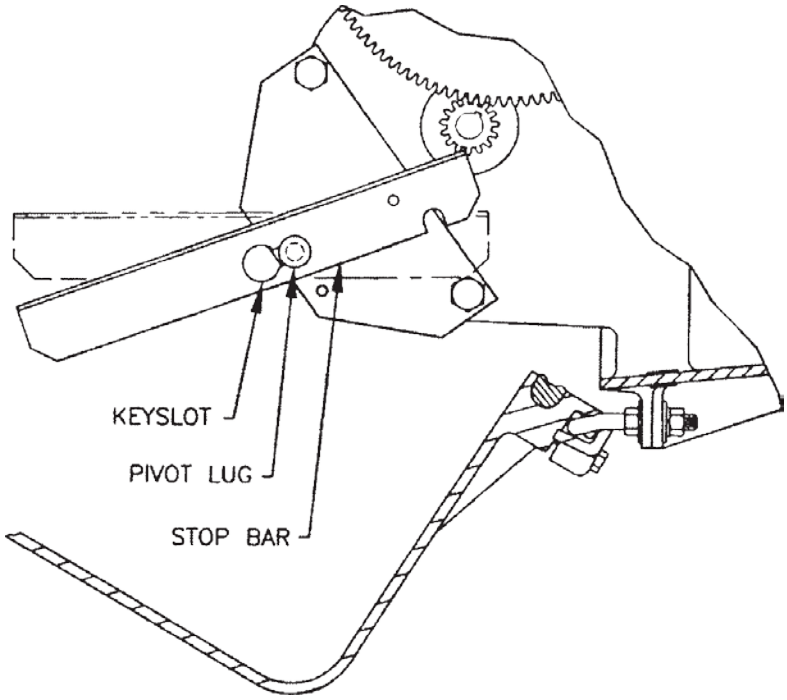
*Tests show that 7 of the standard size 63# counterweights in a centered position with 13 VDC at gate terminals can be raised to a full horizontal position. Six counterweights in a maximum extended position can be raised to full horizontal with the minimum 11 VDC at gate terminals.

Gates with 8 or more counterweights will require hand cranking per page 12 or the use of a come-along to move the counterweights to the horizontal position.

Maintenance Stop Bar Application

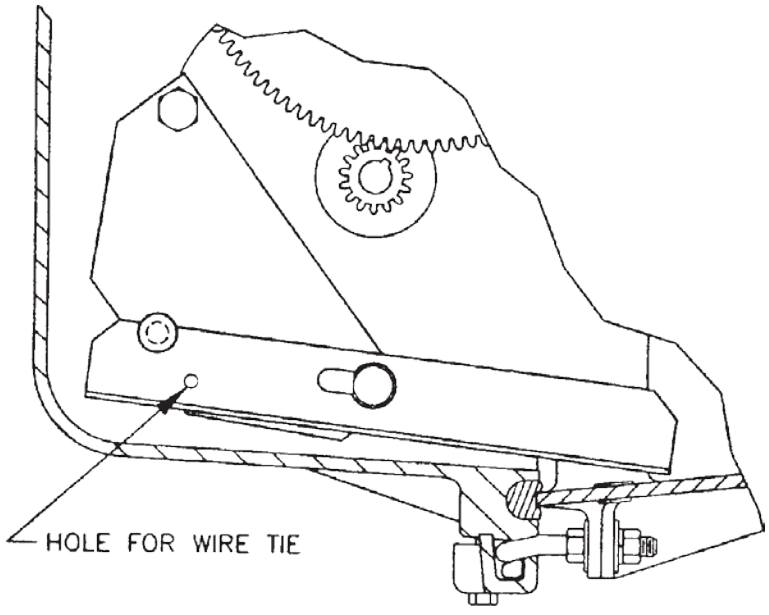
Maintenance Hold Position (Door Open)

Position Stop Bar with key-slot over pivot lug. When counterweights are fully raised, rotate Stop Bar up against motor pinion teeth as shown and release the maintenance switch push button.



Storage Position

Remove Stop Bar, rotate it and place the key-slot over the lower motor mount bolt head, then rotate up with the notch under the pivot lug as shown.



General Maintenance

Model S-40 gate mechanisms have self-lubricating bearings on the main shaft, gear shafts and on the auxiliary sidewalk arm shaft, when so equipped. No lubrication is required.

Ensure that air vents are kept unobstructed and flexible conduit between the gate mechanism and the junction box base is kept sealed.

Recommended Maintenance Schedule

Every Six Months or 50,000 Operations, whichever comes first

- Apply a thin coat of all-temperature grease (such as Aeroshell 7) to all gears

Annually or 100,000 Operations, (whichever comes first)

Note: can only be completed on first two generations of relay panels.

- Remove all grease from gears and reapply all temperature grease
- Clean all contact tips with an contact burnishing tool (180 grit or finer)
- Inspect motor brushes & commutator; service as stated below
- Visually Inspect relay panel relay contacts for excessive burning and pitting.
  A slight discoloration of the contact tips is normal
- Perform Hold Clear Maintenance steps listed on page 16.

Motor

Motor Shaft bearings are sealed with all temperature grease and no lubrication is required. The brush pressure should be between 10 and 16 ounces. Normally the brush pressure, as adjusted at the factory, will be retained within proper limits throughout the long life of the brushes.

Required maintenance is to inspect the brushes and commutator annually and following a broken or fouled gate arm condition that may have held the motor in stall. Clean a darkened commutator by holding a commutator cleaning stone or non-metallic abrasive cloth to it while rotating the motor shaft. After cleaning, cycle the gate 2-3 times to clear brushes, then wipe commutator with a lint free cloth. Brushes worn to less than 3/4" length should be replaced.

Maintenance Tools

Torque Wrench Kit (contents listed on page 11) - 070981-X

Maintenance Kit Complete - 073112-3X (includes following items which can be ordered separately):

- Contact Forming Tool - 073112
- Contact Setting Gage - 073112-1
- Commutator Cleaning Tool - 073112-2
- Contact Cleaning Strips (box of 12) - 073000-15
- Tension Gage for Motor Brush Springs and Controller Contacts - 073000-16
- Torque Card - 070982-2

Motor and Snub Relay

The motor and snub relay has four individual front back and heel contacts as shown on the wiring diagram page 3. The relay is energized by up control closing the front contacts to complete the motor up circuit. The relay is de-energized closing the back contacts when controller contact #7 on the terminal board opens at 90-degrees. This completes the snub circuit and is positioned for power down when up control is removed.

Relay Specifications			
Relay	**Coil Resistance**	**Pick Up**	**Drop Away**
12 VDC Std	33 Ohm	9.0 V max.	2.5 V min.
24 VDC Std	132 Ohm	18.0 V max.	1.0 V nominal

Hold Clear Maintenance & Installation

Introduction

The hold clear function is to hold the arm in a vertical position with power applied, but allowing the arm to descend when power is removed. This is achieved with an overrunning clutch type ratchet wheel which is latched by an electro-magnetically operated lever and pawl.

Adjustment

The hold clear itself as factory installed and adjusted normally needs no readjusting, however if any parts are changed or if disassembled for cleaning, all adjustments should be carefully checked and readjustments made if necessary. Adjustment details are found under the installation instructions and the diagrams on pages 18 & 19.

The power down contact assembly mounted on the hold clear top plate should be inspected periodically and may at some point need to be readjusted. See diagrams and instructions on page 18 for adjustment specifications.

Maintenance

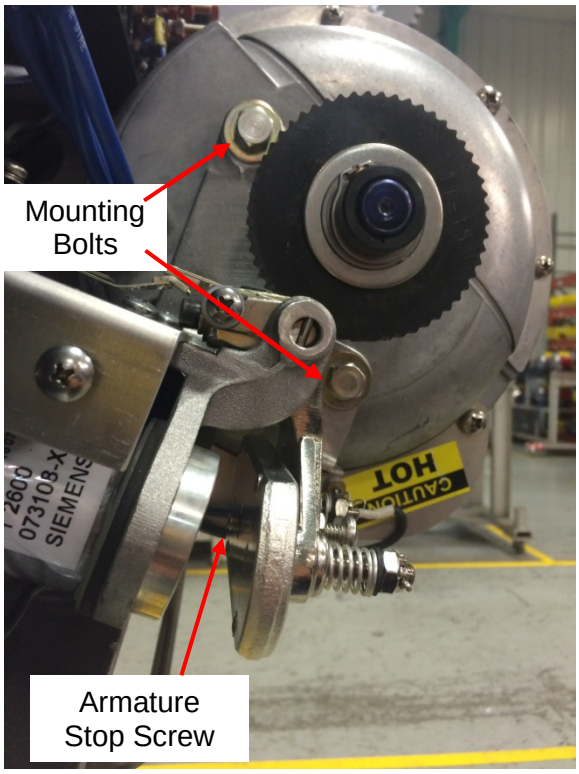
Periodically inspect to the maintenance check points listed below. No lubrication is required.

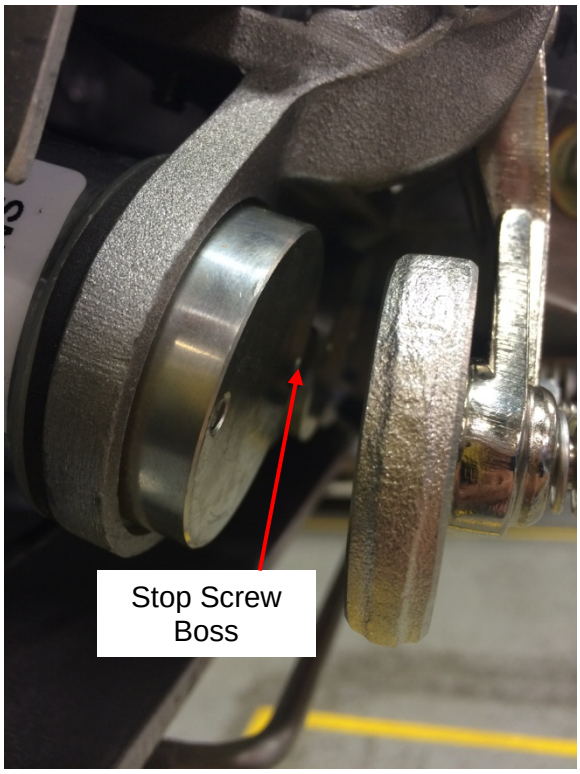
1. Power Down Contact Assembly
   - Condition of contacts, is cleaning required?
   - Contact clearance and wiping action when closed.

2. Ratchet Wheel
   - Spins freely on hub clockwise.
   - Locks to hub counter-clockwise.
   - Aligned with pawl. Set screws are tight.

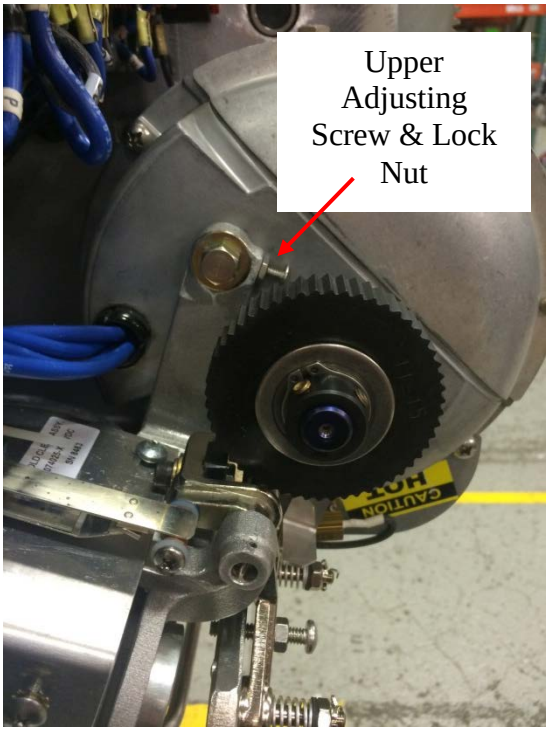
3. When attaching the Hold Clear Assembly (HCA) to the Motor it is imperative that the HCA is rotated so the Armature Stop Screw contacts the Stop Screw Boss between the two coils when the armature is closed by hand (but not energized). Improper orientation of the HCA is possible where the Stop Screw does not contact the Boss because the rotation of the armature is stopped by the interaction of the pawl to the ratchet wheel instead of properly resting on the Stop Screw.

4. To do this, have the two HCA mounting bolts hand tight. Rotate the HCA against the motor so that the stop screw is properly interacting with the boss. If the stop screw was adjusted properly during the assembly of the HCA, the armature bracket and pole pieces should be parallel when you close the Armature Bracket manually. Tighten the lower bolt and now check for the 0.015” MAXIMUM (Closed) gap between the pawl and ratchet wheel by manually holding the armature closed. Adjust the Upper Adjusting Screw to obtain the 0.015” max gap and also ensure there is 0.050” MINIMUM clearance between the pawl and the ratchet wheel (Open) when the HCA is de-energized.





5. Tighten the top mounting bolt. Secure the lock nut on the Upper Adjusting Screw by applying Loctite 242 to the threads and hold the adjusting screw still (with a Phillips screwdriver) while the Lock Nut is being secured.



Step 1. Prepare to Gauge Clearance

Remove the cover of the Hold Clear Assembly. Lower the gate to full horizontal position by opening the Gate Control Test Strap. Insert an insulating material (shear pin card \ credit card) in contact number 7 to insulate the contact from closing. Apply an approved jumper between the number 4 terminal (+ Battery / “Q”) and the bottom of number 7 contact (K).

Step 2. Position Armature

During normal release of the Armature from the Magnet Poles, the lower portion of the Armature moves away from the Magnet Poles before the top portion moves away. Therefore, it is important that the Armature be in the same position when checking the clearance. To position the Armature correctly, gently lift upward on the Spring Studs while moving the Armature toward the Magnet Poles. The upper edge of the Armature will be slightly closer to the Magnet Poles than the lower edge when in the proper position.

Step 3. Check Clearance

While continuing to hold a slight upward and inward pressure on the Spring Studs, insert the .010" gauge (“U” side up and straddling Adjustment Screw A) between the Armature and Magnet Poles from the underside until it protrudes beyond the top of the Armature. Move gauge from left to right to assure clearance.
Remove .010" gauge and repeat with the .005" gauge.

Step 4. Determine Results

If the .010" gauge moved freely in STEP 3 then there is still life in the Stop Pins.
If the .010" gauge did not move freely in STEP 3 and the .005" gauge did move freely, there is still adequate clearance but the Stop Pins are nearing the end of their life cycle and the clearance should be monitored frequently.
The failure of both the .010" and the .005" gauges to move freely in STEP 3 indicates the Stop Pins have reached the end of their useful life and the Armature Assembly needs to be replaced promptly.

Step E. Return to Service

Assure all gauges are removed from the Hold Clear assembly and remove the jumper applied in STEP 1. Remove insulating material from contact 7 and close the Test Strap opened in STEP 1 to return the gate to the vertical position. Replace the Hold Clear protective cover and perform an operational check of the mechanism.

Note: The gauges required to perform this procedure are available from Siemens Systems Corp., Customer Service Group at 800-626-2710.

Description	Part Number
.005" Hold Clear Checking Shim	073105-10
.010" Hold Clear Checking Shim	073105-11

Note: Adjustment or reassembly of pawl, contact actuator or adjustment screws requires application of Loctite Removable Threadlocker 242 or equal into joint threads before tightening.

Installation Instructions

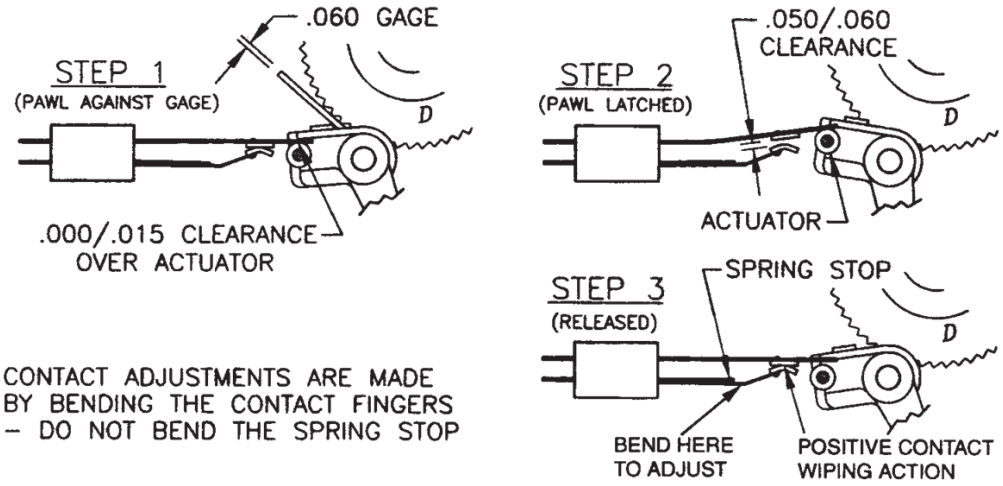
Instructions for installing a complete new hold clear assembly #074025-X (w/o ratchet wheel) or #074025-2X (complete with ratchet wheel and mounting hardware). The Model S-40 Hold Clear can be used directly on the Model S-20 and on the older Model S Gates. The complete assembly with ratchet wheel is required when replacing a Model S Hold Clear.

1. Install the Ratchet Wheel Assembly first to the motor shaft with key and set screws. The long end of hub should be facing out and be even with the end of the motor shaft.

2. Install the complete Hold Clear assembly and the Stop to the motor end with the two shoulder type mounting bolts and washers, but do not fully tighten. The stop is located under the lower bolt head and washer as shown on the next page. **The following adjustments are pre-set on new Hold Clear assemblies.**
   - The armature plate stud springs are set to 17/32 dim. and locked with cotter pins as shown on next page.
   - The armature plate stop pins are set to parallel with the pole faces using adjustment screw "A" and lock nut as shown on the next page.
3. Set the Pawl to Ratchet tooth clearance to .015" max. but without binding or dragging on tooth root.
   - With the mounting bolts slightly loosened, hold the armature bracket up against adjustment screw "A" engaging the pawl to the ratchet wheel. Turn adjustment screw "B" until the pawl is tight into a ratchet tooth root and then back off 3/4 turn.
   - Tighten the mounting bolts and check the clearance as it can change slightly when tightening. When properly set, apply Loctite and tighten the lock nut.
4. Release the armature plate and check the .050" minimum clearance between the pawl and ratchet wheel.
   - The .060" contact setting gage #073112-1 can be used to check clearance.
   - Loosen the lower mounting bolt and reposition the stop if needed.
5. Power Down Contact must be checked for proper clearance and a positive wiping action when the contact points close. Contacts can be set using contact forming tool #073112 as follows:
   Step 1. Holding the armature up with the pawl against a .060" gage, the upper contact finger is set for .015" maximum clearance over the actuator.
   Step 2. Remove the gage and hold armature up with pawl fully engaged. Set contact gap to .050/.060". Step 3. Check for a positive wiping action of contacts when armature is released.
6. Connect wires, install cover guard and check pick up and drop away voltages.
   - Maximum pick-up is 7.0 volts.
   - Minimum drop away is 2.5 volts with load from raised gate arm (approx. 1.0 volts without load).

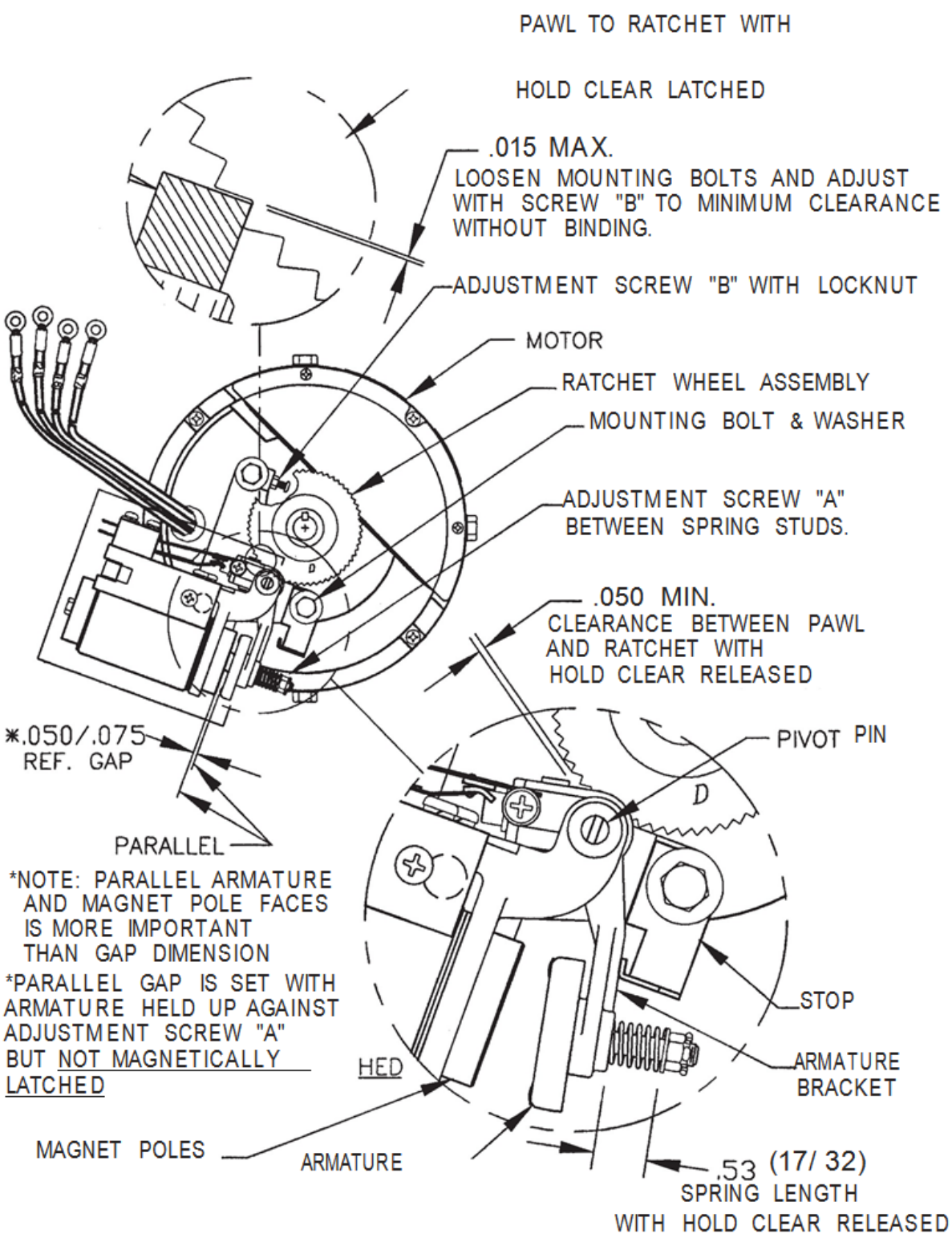
Note: Adjustment or re-assembly of pawl, contact actuator or adjustment screws requires application of Loctite Removable Threadlocker 242 or equal into joint threads before tightening.

POWER DOWN CONTACT ASSEMBLY

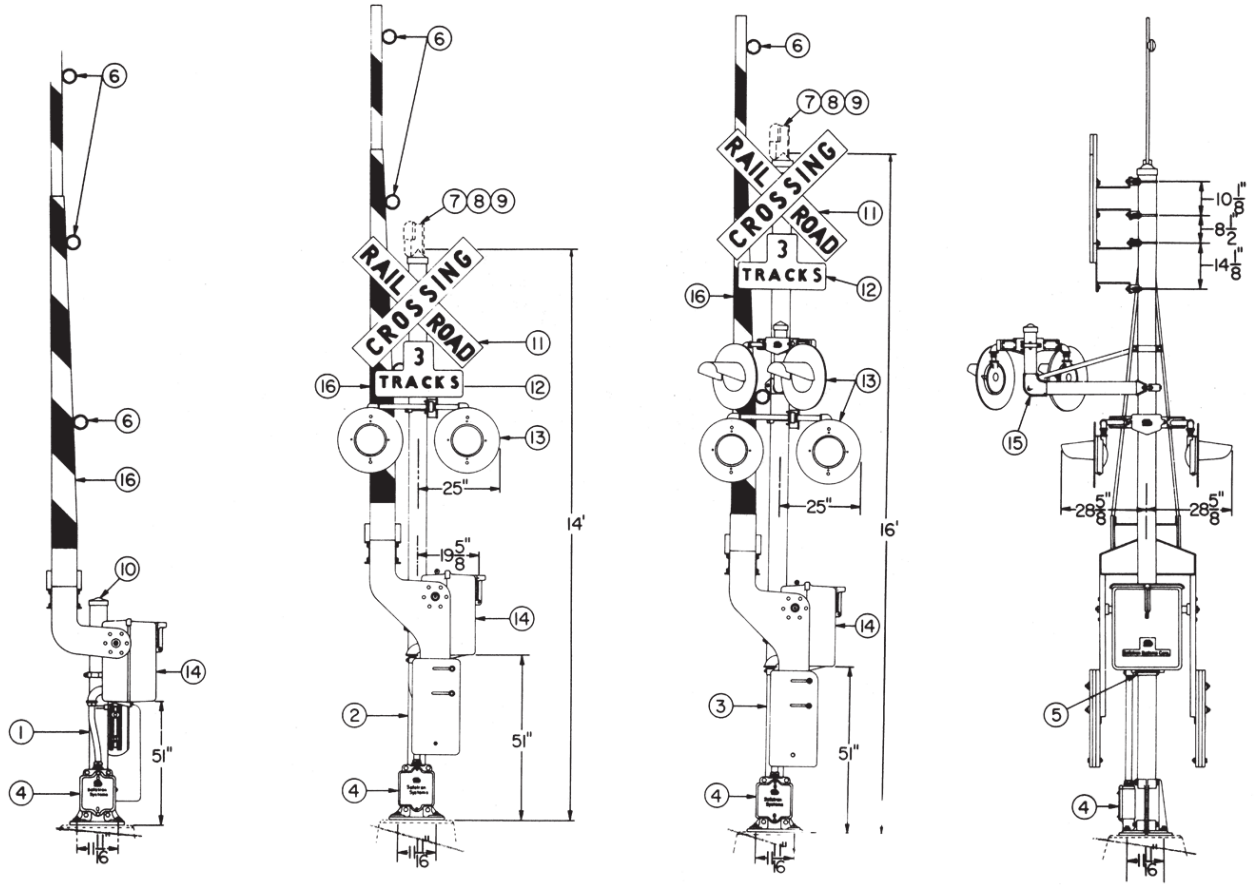


CAUTION: Repeated or over bending of a contact may cause damage and not allow proper tension when closed or gap when opened.

Model S-40 Hold Clear Assembly



Model S-40 Gate Types 50, 51, and 52 Replacement Parts



Type 50
S-40 Gate mounted on stub mast

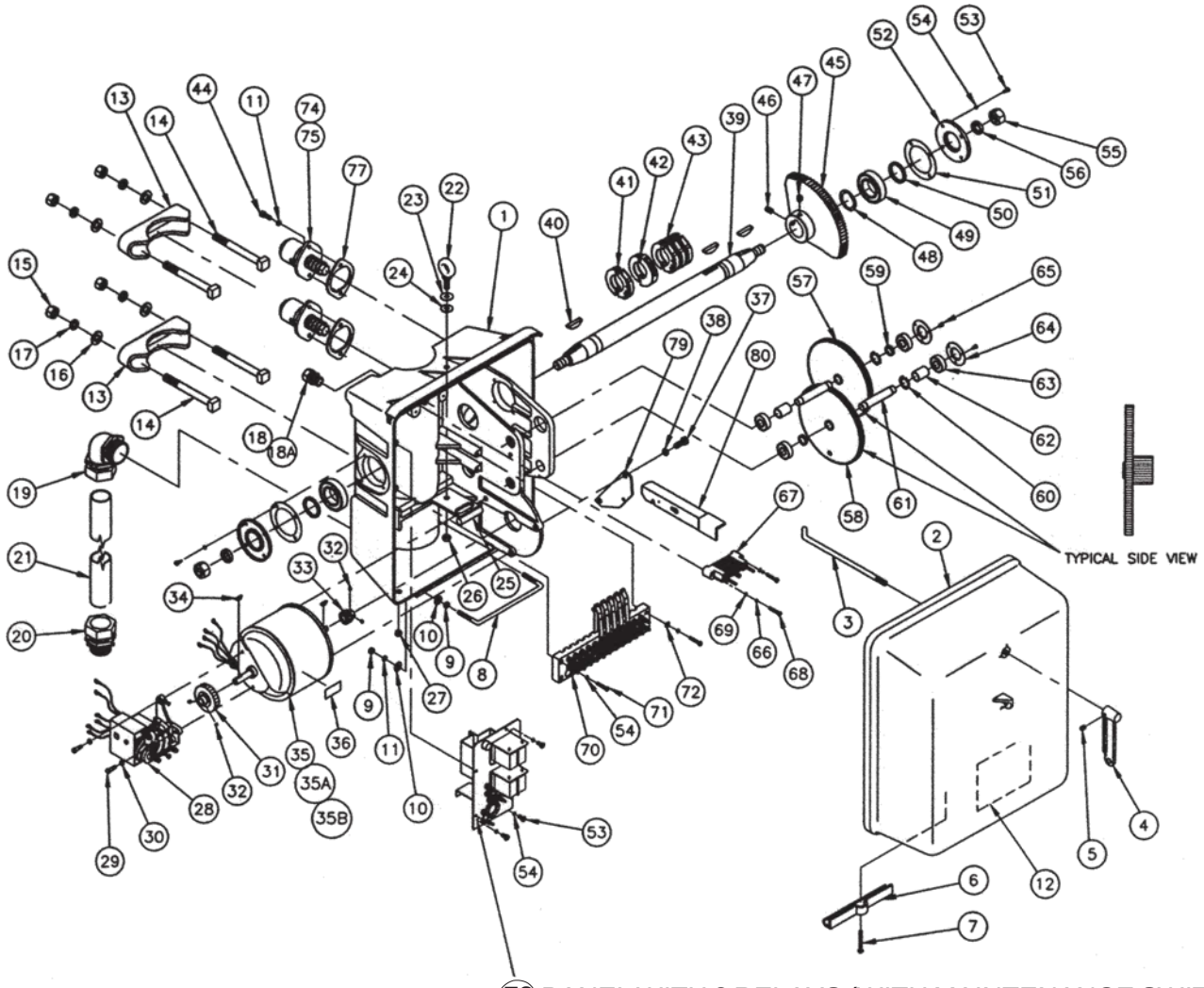
Type 51
S-40 Gate with front and/or back flashing lights

Type 52
S-40 Gate with front and/or back flashing lights and cantilever mounted sidelights

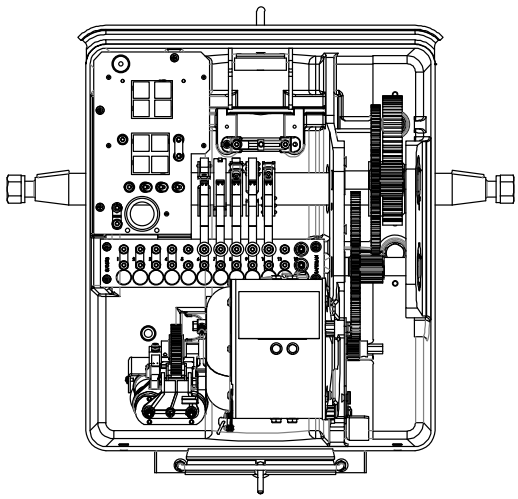
To order, specify description and part number

Item No.	Description		Part number
1	Mast, 5" Stub		070519-3A
2	Mast, 5" Standard		070519-27A
3	Mast, 5" for Front, Back , and 45 degree Left Lights		070519-43A
4	Base, Junction Box, 11-11/16" Bolt Spacing for 5" Pipe		041931-2X
5	Clamp, Mechanism Support		070786-5X
6	Lamp, Gate Arm		075970-AX
7	Bell, 5" Mounting	8-12 VDC	040200-4X
		24 VDC	040200-110X
8	Bell, 120 VAC Operation, for 5" Mounting		040200-8X
9	Bell, 12-16 VAC/10-12 VDC Operation, for 5" Mounting		040200-10X
10	Pinnacle, 5"		035045-503X
11	Sign, Railroad Crossing , for 5" Mounting		035200-17X
12	Sign, Track, for 5" Mounting, (specify # of tracks)		035236-(#)X
13	Lamp, Flashing -- See flashing lamp section of catalog		Specified
14	Gate Mechanism		Specified
15	Cantilever, Sidelight (required for left-hand sidelights)		041442-26X
16	Gate Arm & Conversion Bracket --See gate arm section of catalog		Specified
17	Machine Bolt, Square 3/4" – 10 x 7.00"		008085-SC
18	Casting, Aluminum Saddle		070950
19	Washer, Flat 3/4"		001737-SC
20	Washer Lock 3/4"		001815-MSC
21	Nut, Hex 3/4" – 10		002114-SC

S-40 Gate Complete Assembly



78 PANEL WITH 2 RELAYS (WITH MAINTENANCE SWITCH)
**Relay configuration may differ from the illustration above*



FRONT VIEW ASSEMBLED

ITEMS NOT SHOWN

81 COVER GASKET

82 DEFROSTER, 115VA

83 INSULATED NUT

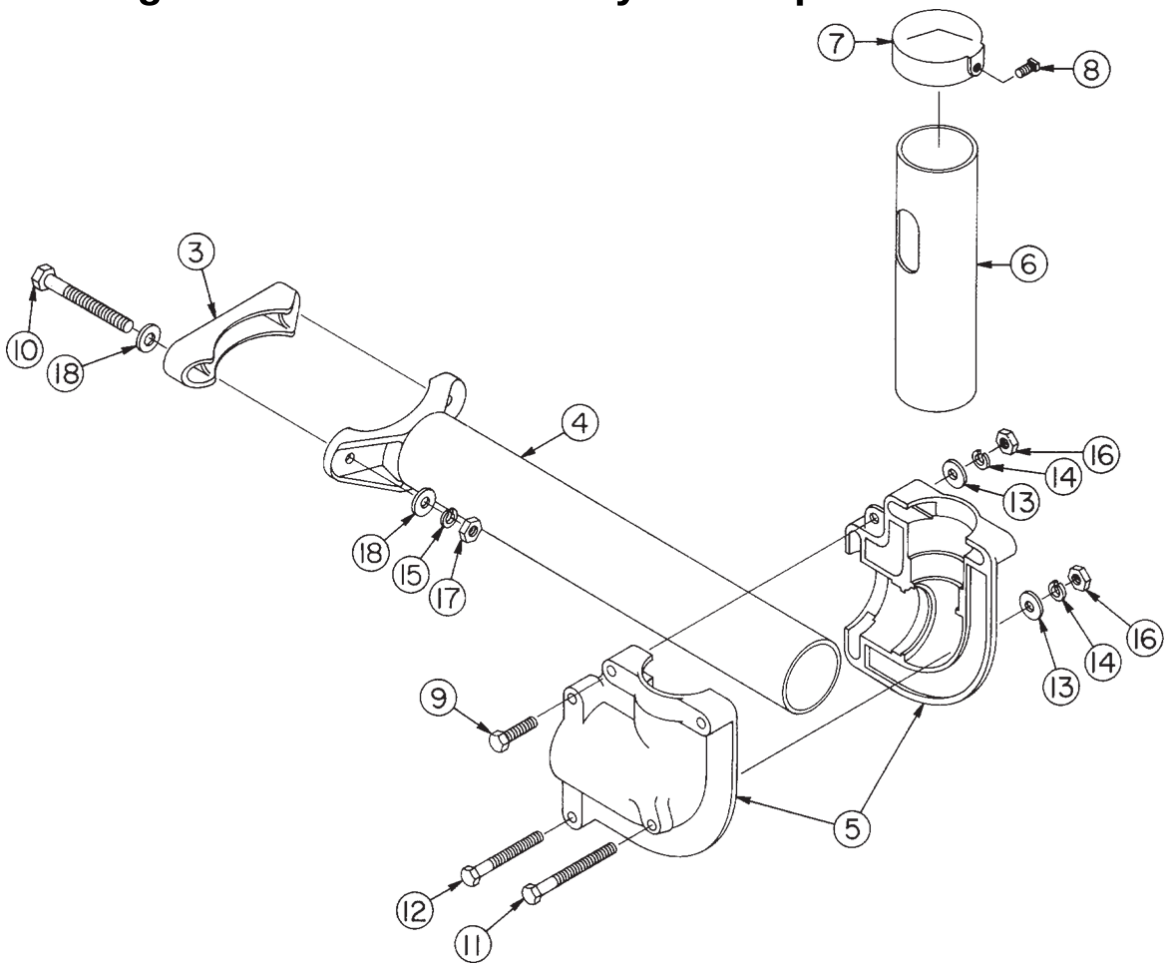
S-40 Gate Replacement Parts

To order, specify description and part number.

Item No.	Description	Qty. Req'd.	Part Number
1	Cabinet, Gate	1	073001-1
2	Cover, Gate	1	073002-X
3	Latch Rod	1	070919-2
4	Handle, Latch	1	070909-4
5	Screw Set Socket Head 3/8" – 16 x 1/2"	1	4658-E
6	Hinge Retainer	1	070968-4
7	Screw, Hex 5/16" – 18 x 2-1/2"	1	2692-HE
8	Hinge Bolt	1	070968-2
9	Nut, Hex 3/8" – 16	4	2104-E
10	Washer, Flat 3/8" x 1 O.D.	4	1726-E
11	Washer, Lock 3/8"	6	1810-ME
12	Decal, Wiring w/o Maintenance Switch	1	074006
	w/ Maintenance Switch	1	074007
13	Casting, Aluminum Saddle	2	070950
14	Machine Bolt, Square 3/4" – 10 x 7.00"	4	8085-SC
15	Nut, Hex 3/4" – 10	4	2114-SC
16	Washer, Flat 3/4"	4	1737-SC
17	Washer Lock 3/4"	4	1815-MSC
18	3/4" Connector 3/8" – 1/2" wire	1	7304-2
18A	3/4" Connector 5/8" – 3/4" wire	1	7354
19	Connector, Elbow	1	070232
20	Connector, Straight	1	070233
21	Conduit, Flexible	1	070692
22	Eye Bolt 1/2" – 13 x 1.50"	1	7099
23	Washer, Flat 1/2"	1	1755-E
24	Washer, Neoprene	1	070980-4
25	Latch Plate	1	070919-3X
26	Nut, Flexlock 1/2" – 13	1	2327-FLSC
27	Vent Bushing	4	041913-X
28	Hold Clear Assembly 12VDC	1	074025-X
	Hold Clear Assembly 24VDC	1	074025-1X
29	Mounting Bolt	2	075084
30	Washer, Flat 5/16"	2	1752-C
31	Ratchet Wheel w/screws	1	073111-XR
32	Set Screw, Socket 1/4" – 28 x 1/4"	4	4615-SC
33	Pinion	1	070554-A
34	Woodruff Key #10	2	7101
35	Motor Assembly, 12 VDC	1	074018-X
	Motor Assembly, 24 VDC	1	074018-1X
35A	Brush Holder Bracket	1	075111-X
35B	Motor Brush	4	075116
36	Label, Caution (hold clear)	1	070980-8
37	Cap Screw, Hex 1/2" – 13 x 1-1/2"	3	4168-HSC
38	Washer, Lock 1/2"	3	1812-MSC
39	Shaft, Main	1	074028
40	Woodruff Key #UX	3	7149
41	Cam, Assembly, Power Down	1	070633-502X

Item No.	Description	Qty. Req'd.	Part Number
42	Snap Switch Assembly	1	073014-1X
43	Cam, Assembly	3	070633-AX
44	Screw, Hex Cap 3/8"-16 x 1-1/4"	4	4089-HE
45	Gear Segment	1	073003
46	Set Screw, Socket 1/2" – 13 x 3/4"	1	4708-SC
47	Set Screw, Socket 1/2" – 13 x 1/2" (Over Key)	1	4706-SC
48	Retaining Ring	1	070584
49	Bearing	2	075284
50	O-Ring 2"	2	070585
51	Gasket, Seal Plate	2	070747-3
52	Seal Plate, Bearing	2	073008
53	Machine Screw Phil Pan Head 1/4" – 20 x 5/8"	12	2659-PEX
54	Washer, Lock 1/4"	16	1808-ME
55	Nut, Hex 1"- 8	2	2118-SC
56	Washer, Lock 1"	2	1817-MSC
57	Gear & Pinion Upper	1	073004
58	Gear & Pinion Lower	1	073005
59	Spacer 1/4"	2	073009-3
60	Washer, Spring	2	070695-500
61	Shaft, Gear	2	073007-1
62	Spacer 1-1/2"	2	073009-2
63	Ball Bearing	4	070588
64	Cover, Bearing	2	073007-2
65	Machine Screw Phil Truss Head #10 – 32 x 3/8"	6	2614-TEX
66	Washer, Lock #10	2	1806-ME
67	Resistor, Adjustable 1 Ohm 12V	1	029602-3BX
	Resistor, Adjustable 4 Ohm 24 V	1	029603-1X1
68	Machine Screw Phil Pan Head #10 – 32 x 1.75"	2	2625-PEX
69	Washer, Flat #10	2	1712-E
70	Terminal Board Assembly	1	074030-XR
71	Machine Screw Phil Pan Head 1/4" – 20 x 1-1/2"	4	2665-PEX
72	Washer, Flat 1/4" x 5/8" O.D.	2	1717-E
74	Buffer Assembly Upper	1	074045-X
75	Buffer Assembly Lower	1	074045-X
77	Gasket, Buffer Cap	2	070926-1
78	Panel Assy. w/Maint. Switch 12VDC	1	074010-6X
	Panel Assy. w/Maint. Switch 24VDC	1	044010-10X
79	Mounting Plate	1	074034-X
80	Stop Bar	1	074035
81	Cover Gasket	1	070559-A
82	Defroster 110 VAC	1	070698-X
	Defroster 24 VDC	1	070698-9X
83	Insulated Nut	2	023408-1X

Sidelight Cantilever Assembly and Replacement Parts

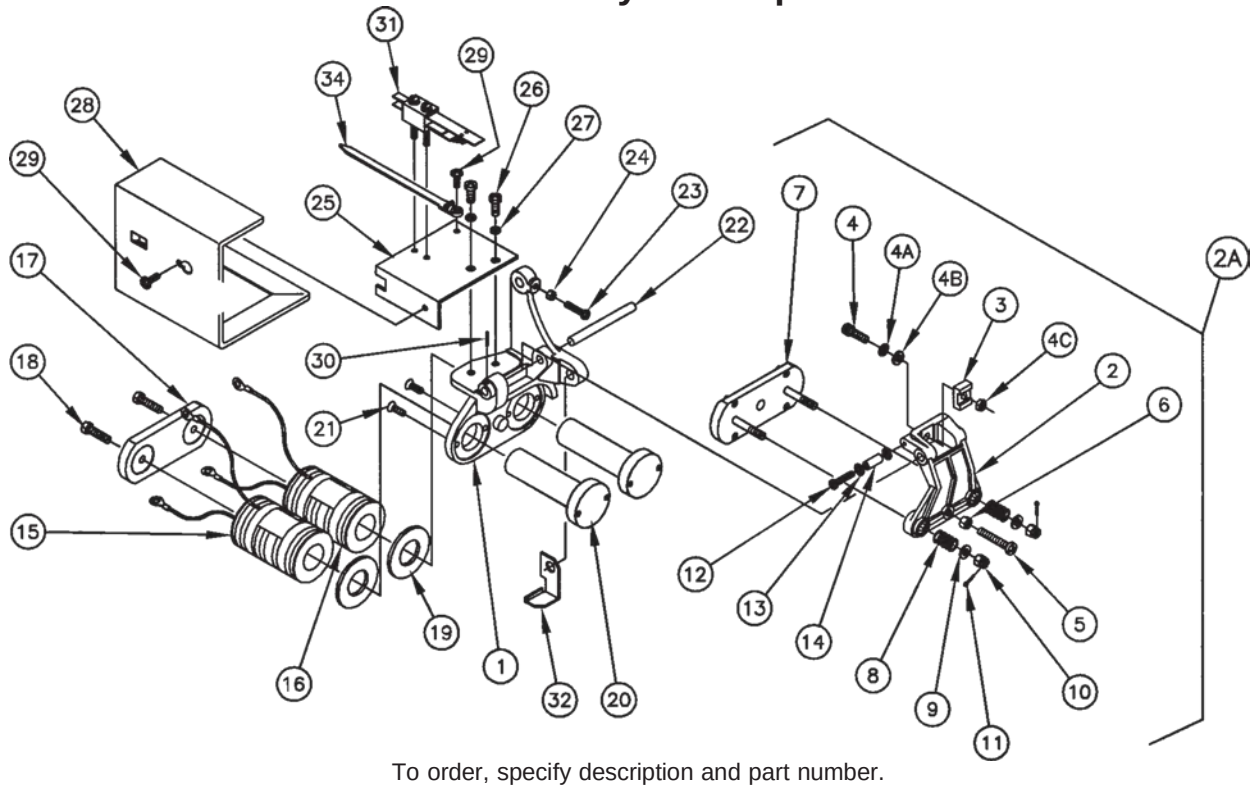


For Complete Assembly, Order Number 041442-26X

To order, specify description and part number.

Item No.	Description	Qty. Req'd.	Part Number
3	Casting, Aluminum Clamp	1	070950
4	Pipe, Lower	1	041442-25X
5	Casting, Aluminum Elbow	2	041442-515
6	Pipe, Upper	1	041442-29
7	Pinnacle, 4" – 5"	1	035045-502
8	Set Screw, Square Head, 3/8" – 16 x 1"	1	4932-SC
9	Cap Screw, Hex Head, 1/2" – 13 x 2"	2	4170-HSC
10	Cap Screw, Hex Head, 3/4" – 10 x 6"	2	4286-HSC
11	Cap Screw, Hex Head, 1/2" – 13 x 6"	1	4182-HSC
12	Cap Screw, Hex Head, 1/2" – 13 x 5"	4	4180-HSC
13	Washer, Wrought, 1/2"	7	1755-C
14	Washer, Spring Lock, M, 1/2"	7	1812-MSC
15	Washer, Spring Lock, M, 3/4"	7	1815-MSC
16	Nut, Hex, 1/2 " – 13	7	2108-SC
17	Nut, Hex, 3/4" – 10	2	2114-SC
18	Washer, Flat, 3/4"	4	1737-SC

Hold Clear Assembly and Replacement Parts

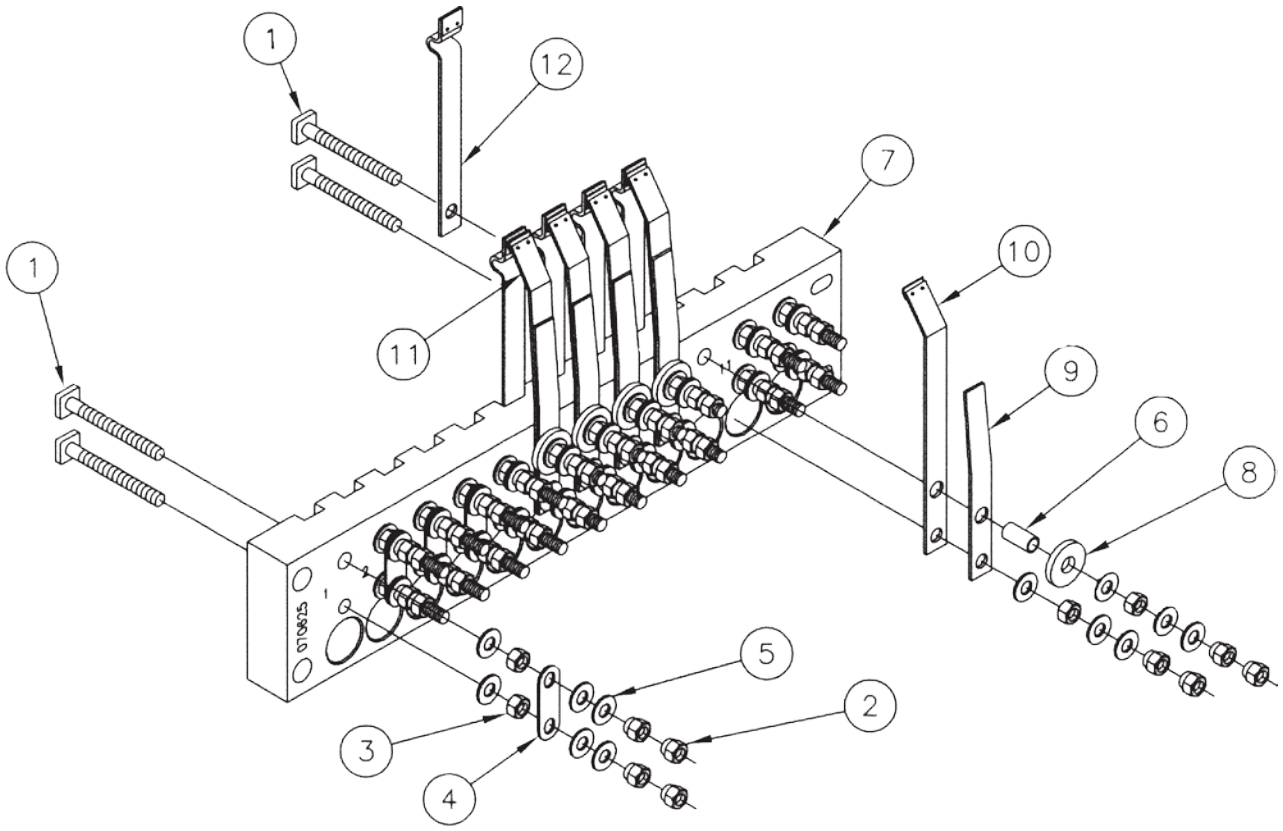


To order, specify description and part number.

Item No.	Description	Qty Req'd.	Part No.	Item No	Description	Qty. Req'd.	Part Number
1	Hold Clear Frame	1	073100-1	17	Yoke	2	073104-1
2	Armature Bracket	1	073102	18	Cap Screw, Hex Head, 1/4-20 x 3/4"	2	4002-HE
2A	Armature Bracket Assy.,	1	074026-1X				
3	Pawl, Hold Clear	1	073102-2S	19	Cushion Spacer	2	073100-2
4	Cap Screw, Socket Head 1/4-28 x 7/8"	1	004024-SSJ	20	Core	4	073103-1
				21	Cap Screw, Flat Socket Head 10-32 x 5/8"	1	7747-YE
4A	Washer, Lock 1/4	1	001808-MSC				
4B	Washer, Lock 1/4	1	001717-SC	22	Pivot Pin	1	073100-3
4C	Nut, Lock 1/4-28	1	002320-SZLK	23	Machine Screw, Phil Pan Head, 10-32 x 3/4"	1	2619-PEX
5	Machine Screw, Phil Pan Head, 1/4-20 x 1-1/2"	1	2665-PEX				
				24	Nut, Hex 10 - 32	1	2015-E
6	Nut, Hex 1/4-20	1	2100-E	25	Contact Shelf	2	074025
7	Armature, Assembly	1	073105-X	26	Machine Screw, Phil Pan Head, 1/4-20 x 5/8"	2	2659-PEX
8	Spring, Compression	2	070651				
9	Washer, Shoulder	2	1978-F	27	Lock Washer 1/4"	1	1808-ME
10	Nut Hex Castle, 1/4-28	2	2494-SN	28	Contact Guard	2	074025-1
11	Cotter Pin, 1/16" x 1/2"	2	1000-SC	29	Machine Screw, Truss Head 10 - 32 x 3/8"	1	2614-TEX
12	Machine Screw, Phil Pan Head, 10-32 x 1-1/4"	1	2623-PSCX				
				30	Roll Pin	1	1537-E
13	Washer, Nylon	2	1712-1	31	Power Down Cont. Assy.	1	074025-10X
14	Actuator, Hold Clear	1	073102-3	32	Stop	1	074025-2
15	Coil Assy., Pickup 32 ohm, 12V	1	073108-X	33	Loctite, Small Tube	1	104798
	Coil Assy., Pickup 340 ohm, 24V	1	073108-2X	34	Wire Tie	1	070644-2
16	Coil Assy., Hold 64 ohm, 12V	1	073108-1X				
	Coil Assy., Hold 680 ohm, 24V	1	073108-3X				

For Complete Assembly, 12 VDC Order Number 074025-X For Complete Assembly, 24 VDC Order Number 074025-1X
For Complete Assembly with Ratchet Wheel and Mounting Hardware, 12 VDC Order Number 074025-2X For Complete Assembly with Ratchet Wheel and Mounting Hardware, 24 VDC Order Number 074025-6X

Terminal Board Assembly and Replacement Parts

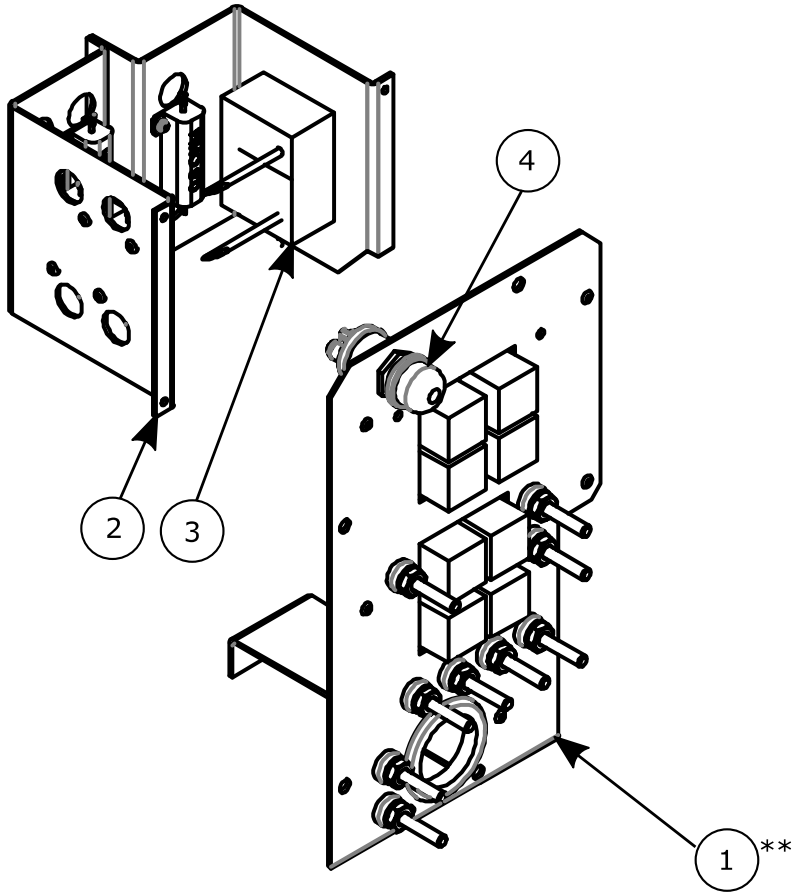


Terminal Board Assy. Complete (Std.) 074030-XR
Terminal Board Assy. Complete (6 contacts) 074030-1XR

To order, specify description and part number.

Item No.	Description	Std. Qty. Req'd.	Part Number
1	Terminal Post	24	010427-6
2	Nut, Binding	48	023831
3	Nut, Clamp	24	023832
4	Connector	5	023839-2
5	Washer, Beveled	72	023834
6	Bushing, Insulating	5	041414
7	Terminal Board	1	070625
8	Washer, Insulating	5	070627
9	Spring, Reinforcing	5	073012-2
10	Contact, Fixed - Std.	4	073012-X
11	Contact, Fixed - Hvy. Duty (Power Down - Position #6)	1	074031-X
12	Contact, Movable	5	073011-X

Relay Panel Assembly

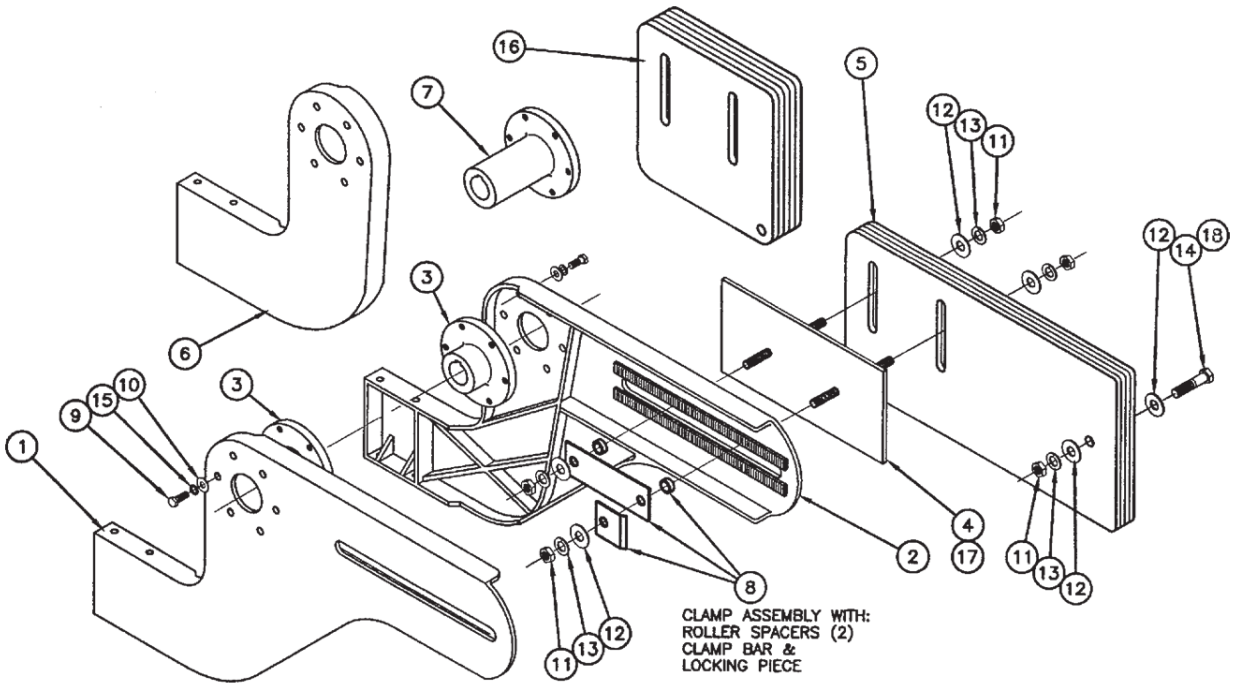


**Relay configuration may differ from the illustration shown above. Three variants of the relay panel assembly exist and are fully compatible. The specifications, mounting, and connection of each panel remain the same and any variant can be replaced by a later variant without further setup or adjustment.

To order, specify description and part number.

Item No.	Description		Part Number
1	Panel Assy. Complete, 8 Relays (w/Maint. Switch)	12 VDC	074010-6X
		24 VDC	074010-10X
2	Back Panel Assembly	12 VDC	074012-4X
		24 VDC	074012-X9
3	Overspeed Module (OSM)	12 VDC	074015-1X
		24 VDC	074015-2X
4	Pushbutton		092431-81

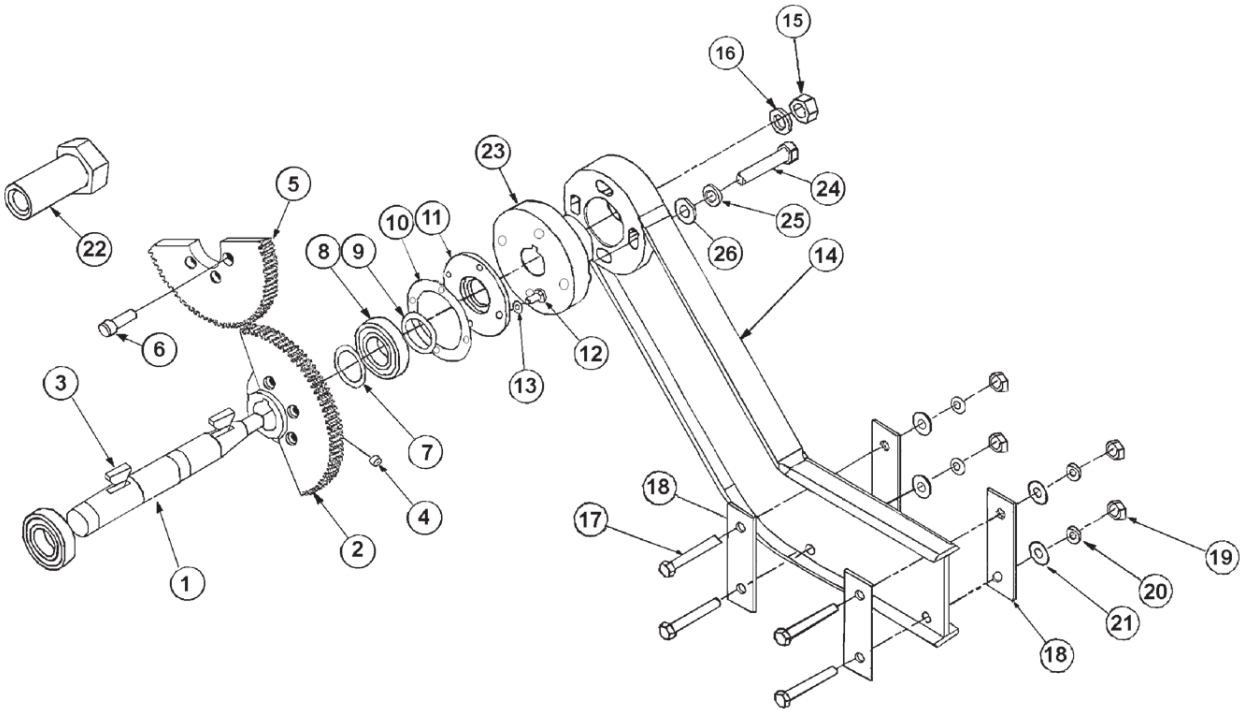
Gate Arm Supports/Counterweights Replacement Parts



To order, specify description and part number.

Item No.	Description	Part Number
1	Support, Left Hand	070920-L
	Support, Left Hand with Hub and Mounting Bolts	070920-LX
2	Support, Right Hand	070920-R
	Support, Right Hand with Hub and Mounting Bolts	070920-RX
3	Hub, Gate Arm Support	070923-3
4	Plate, Stud for wood arms 13' – 36' and all fiberglass arms (standard) w/hardware	070757-26X
	Plate, Stud for wood arms 37' – 42' (standard) w/hardware	070757-24X
5	Counterweight, Galvanized Steel, 1/2" x 15" x 30", 58 lbs. (standard)	070755-4G
6	Support, Left Hand for use without counterweights	070921-L
	Support, LH w/o counterweights with Hub and Mounting Bolts	070921-LX
6A	Support, Right Hand (not shown) w/o counterweights	070921-R
	Support, RH w/o counterweights with Hub and Mounting Bolts	070921-RX
7	Hub, Extended (for sidewalk arms)	070575-1X
8	Clamp Assembly for Stud Plate	070925-X
9	Cap Screw, Hex Head, 1/2" – 13 x 1.50"	4168-HSC
10	Washer, Wrought, 1/2"	1755-C
11	Nut, Hex, 3/4" – 10	2114-SC
12	Washer, Wrought, 3/4"	1737-SC
13	Washer, Spring Lock, M, 3/4"	1815-MSC
14	Cap Screw, Hex Head, 3/4" – 10 x 2" for 1 – 2 standard counterweights	4274-HSC
	Cap Screw, Hex Head, 3/4" – 10 x 3" for 3 – 4 standard counterweights	4278-HSC
	Cap Screw, Hex Head, 3/4" – 10 x 4" for 5 – 6 standard counterweights	4282-HSC
	Machine Bolt, Hex Head, 3/4" – 10 x 6.5" for 7 – 10 standard counterweights	3177-SC
15	Washer, Spring Lock, M, 1/2"	1812-MSC
16	Counterweight, Galvanized Steel, 5/8" x 15" x 15", 38 lbs. (short)	070755-34G
17	Plate, Stud for wood arms to 36' and all fiberglass arms (short) w/hardware	070757-30X
	Plate, Stud for wood arms 37' – 46' (short) w/hardware	070757-31X
18	Cap Screw, Hex Head, 3/4" – 10 x 2.5" for 1 – 3 short counterweights	4276-HSC
	Cap Screw, Hex Head, 3/4" – 10 x 5" for 4 – 6 short counterweights	4284-HSC
	Machine Bolt, Hex Head, 3/4" – 10 x 8" for 7 – 11 short counterweights	3180-SC
	Machine Bolt, Hex Head, 3/4" – 10 x 14" for 12 – 21 short counterweights	3190-SC

Auxiliary Shaft and Support for Sidewalk Arms Replacement Parts



To order, specify description and part number.

Item No	Description	Qty Req'd	Part Number
1	Shaft, Sidewalk Arm	1	073020
2	Gear Assembly, Sidewalk Arm	1	070569-AX
3	Woodruff Key #D	2	007102
4	Set Screw, 3/8" – 16 x .31"	2	004655-SC
5	Gear, Bottom	1	070569-1A
6	Cap Screw, Socket Head 3/8" – 16 x 1.25" Locking	3	004089-2
7	Retaining Ring	1	073021
8	Bearing	2	073022
9	O-Ring 1-3/16" I.D.	1	073023
10	Gasket, Seal Plate	1	073025
11	Seal Plate	1	073024
12	Machine Screw, Phil PanHead 1/4" – 20 x 5/8"	4	002659-PEX
13	Washer, Lock 1/4"	4	001808-ME
14	Sidewalk support arm, adjustable	1	070759-54
15	Nut, Hex 5/8" – 18	1	002113-E
16	Washer, Lock 5/8"	1	001814-ME
17	Cap Screw, Hex Head 3/8" – 16 x 2.75"	4	004095-HSC
18	Plate, Washer	4	070763-1
19	Nut, Hex 3/8" – 16"	4	002104-SC
20	Washer, Lock	4	001810-MSC
21	Washer, Flat 3/8"	4	001753-C
22	Nut, Extended 1" - 8	1	07403823
23	Hub, Shaft, Sidewalk Support arm	1	070759-51
24	Cap Screw, Hex Head, 1/2" - 13 x 2.5"	4	004172-HSC
25	Washer, Lock, 1/2"	4	001812-MSC
26	Washer, Flat, 1/2"	4	001730-SC

Hardware Torque Guidelines

Thread Size	Hex Nut Size	Torque - Ft. Lb.
1/4 - 20	7/16	6
5/16 - 18	1/2	15
3/8 - 16	9/16	25
1/2 - 13	3/4	55
5/8 - 11	15/16	90
3/4 - 10	1 1/8	105
1" - 8	1 1/2	140

NOTES

NOTES

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2400 Nelson Miller Parkway
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(502) 618-8800

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