



7R Switch Circuit Controller installed at customer location

Switch Products

SWITCH POSITION MONITORING

WITH RAIL-MOUNTED SWITCH CIRCUIT CONTROLLER

CSX Transportation, with nearly 2,000 mainline hand-throw switch locations throughout its network, has selected Alstom technology to closely track the position of their switches in dark territory. CSX will install Alstom's Model 7R Rail-Mounted Switch Circuit Controller as part of their comprehensive PTC strategy. CSX is also exploring opportunities to install these units in other parts of its network, including yards.

The 7R unit uses an actuated push-pull mechanism that can be used to integrate the positions of various devices with suitable control circuits. For railway controllers, this means the ability to electronically detect a full range of equipment conditions including:

- > Switch Point Locking
- > Derail Operation
- > Bridge Locking
- > Bridge Position
- > Tunnel Door Position
- > Slide Detector Actuation

Alstom's 7R registers the 'normal' or 'reverse' position of railway switches and it can also be used to shunt track circuits or control relay circuits.

When paired with Alstom's microWIU wayside interface unit, becomes a significant component of a total Dark Territory PTC system.

The Model 7R SSC is also offered in a customized kitted PTC-in-a-Box solution that helps railroads meet their PTC deployment goals as quickly and efficiently as possible.

Note: Opportunity awarded through a LTPA

In This Section:

- GM4000A™
- Model 6 Yard Switch Machine
- Model 5 Letter Series
- Junction Terminal Box
- Switch Circuit Controllers
- Switch Position Indicator
- Model 9B Lock

> GM4000A™ Wayside Switch Machine



GM4000A™ Switch Machine installed at customer location

The **GM4000A™** Switch Machine incorporates all of the features required to meet today's rigorous interlocking demands. The machine is easy to install, operate and maintain. One model does it all! It is truly universal. There is no need to purchase different machines for different locations because this unit is a drop-in replacement for most industry machines.

Large inventories of spare parts are reduced due to the GM4000A™'s Modularity Design Concept. The machine uses 50% fewer parts than traditional switch machines and it is adaptable to nearly all site-specific requirements without having to make application or electrical changes.

BENEFITS

- > **Split-Link Cam Bar** - prevents opening/shaving of lock rod slot
- > **Trackside Electrical Operation** - faster monthly/quarterly testing
- > **Electronic Overload Protection (Internal)** - no overload relays needed
- > **Brushless Motor** - eliminates motor maintenance (brushes / dust)
- > **Solid-State Electronic Controller** - allows flexibility to design & integrate the machine to any existing wiring, without field wiring changes
- > **Limit Switches (Positive-Break Type)** - no contact finger adjustments, no burned contacts (milli-amp current draw), no frost on contacts (IP-67 enclosed design)
- > **New Point Detector Design** - easier installation, testing, & maintenance
- > **Machine "Footprint" matches all industry standard layouts** - direct replacement for Model 5 letter switch machine and most competitor machines

Easy to Specify, Operate, Install and Maintain

FEATURES

Advanced Drive Train

- > Maintenance free gearbox, no lubrication required

Main Drive Module

- > Single and dual control versions
- > Hand throw and hand crank permits track switching without electrical power
- > Low 8.75 inch profile

Lock Rod Module

- > Wide or narrow notch designs
- > 3.5 to 6.5 inch adjustable throw
- > Left or right-hand field configurable

Accurate Point Detection System

- > Indicates normal or reverse switch position with latchout
- > Breaks indication if point moves away from stockrail
- > Configurable for restorable and non-restorable latchout modes

Split Link Cam Bar

- > Prevents Lock Rod shaving
- > Allows flagging over a fouled switch without damaging hand throw arm
- > Permits throw bar to complete full stroke when lock rod is fouled

Optional Heaters

- > 24V or 110V
- > Available for terminal and/or gearbox

Maintenance-Free Motor and Controller

- > No clutch
- > Internal current overload protection
- > On-board selectable speeds
- > No dynamic snubbing wire
- > No magnetic detent
- > Brushless DC motor and solid-state controller
- > LED fault indicators
- > Controller uses LED reference indicators and local control switches which eliminate the need for hand cranking during monthly testing
- > Accepts both 24VDC and 110VAC or 110VDC; (Universal Power)

Integral Latch Stands

- > Bolted directly to machine (No adjustment needed for tie shifting)
- > Left or right-hand field configurable
- > Available with or without latch stands (GM4000 latch stands are compatible with the GM4000A machine)

Optional Maintainer Tool Kit

- > Factory Grease
- > Hex Head wrenches
- > Spoon gauge

> GM4000A™ Wayside Switch Machine



GM4000A™ Switch Machine being tested at the Rochester, NY facility

Specifications

↻ Data	↻ Value
Applications	Single Switch, Single-slip Switch, Double-slip Switch, Derail, Frog
Layout	Field-configurable for left or right-hand throw
Control	Single or dual control
Mounting Requirements	Universal footprint. Matches all industry standard bolt patterns
Thrust	Maximum rated thrust 4,000 lbf (Maximum thrust requires 85V minimum, 4-second speed setting and high current setting)
Throw Bar Stroke	6.5 Inches (16.5 cm)
Overload Protection	No Overload Relays Needed
Dynamic Snubbing	Not required
Magnetic Detent	Inherent in machine
Hand Crank	Available for maintenance and emergency use
Machine Access	Rapid cover release and closure hasp
Control Scheme	2, 3, 4 or 5-wire
Control Voltage	8-36VDC
Weight	1,000 lbs.
Motor Type	Maintenance-free brushless
Operating Voltage	85 - 160VAC/DC, 13 - 160VDC, machine will operate at 50Hz, 60Hz or 100Hz AC
Operating Time	4 seconds at 110V AC, 15 seconds at 110V AC/DC, 15 seconds at 24VDC
Clutch Setting	Not required
Dimensions	Length: 67" x Width: 41" x Height: 8.75"

> GM4000A™ Wayside Switch Machine

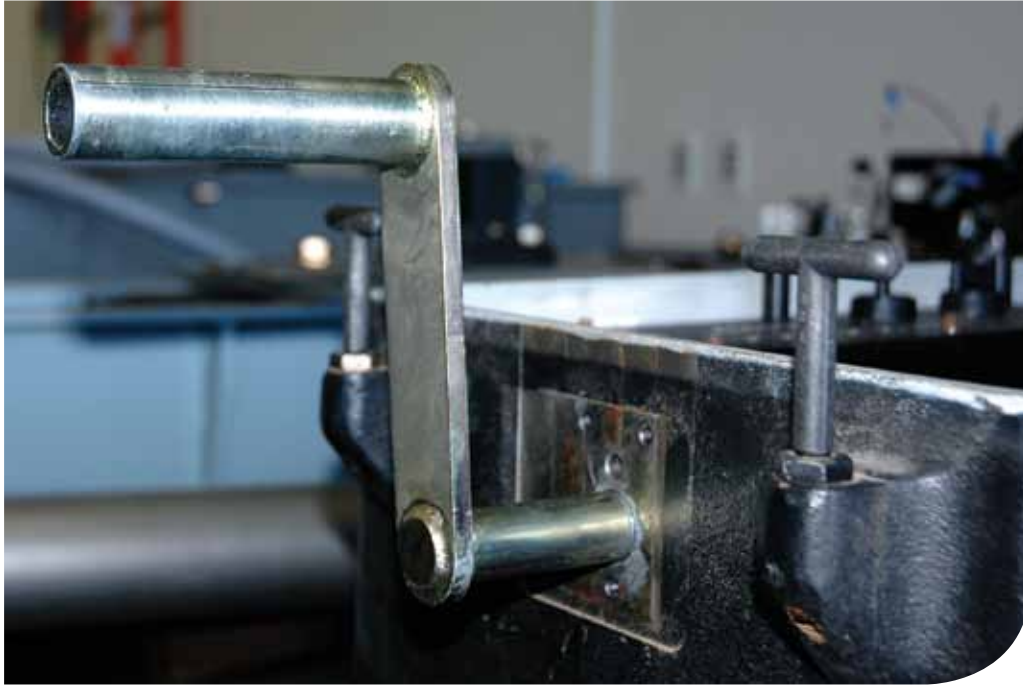
GM4000A Current Draw	High Speed		Low Speed	
Nominal Voltage	Average Current	Peak Current	Average Current	Peak Current
110 VDC	2 A	14 A	0.3 A	4.4 A
24 VDC	1.5 A	17 A	1.5 A	17 A

GM4000A™ Configuration Key for Model Number Configuration

Code	MODEL NUMBER	WM
CONTROL CONFIGURATION		
A	GMV00-000-01	Dual Control (Hand Throw, With Hand Crank Capability)
B	GMV00-000-02	Dual Control (Hand Throw, W/O Hand Crank Capability)
C	GMV00-000-03	Single Control (No Hand Throw, With Hand Crank Capability)
D	GMV00-000-04	Single Control (No Hand Throw, With Hand Crank Capability, No Latch Out)
MACHINE ORIENTATION		
L	Left Hand	
R	Right Hand	
LOCK RODS		
N	GM050-300-01	Narrow Notch Threaded End 3.5 – 6.5 Inch Adjustment
W	GM050-300-02	Wide Notch Threaded End 3.5 – 6.5 Inch Adjustment
S	GM050-300-03	Narrow Notch Spade End 3.5 – 6.5 Inch Adjustment
B	GM050-300-04	Wide Notch Spade End 3.5 – 6.5 Inch Adjustment
C	GM050-300-05	Wide Notch Spade End 4.5 – 6.0 Inch Adjustment
E	GM050-300-07	Narrow Notch Threaded End 3.0 – 6.5 Inch Adjustment
For Lock Rods -01 Thru -07 Add: (4) GMV00-012-00, (2) GMV00-013-00 AND (2) GMV00-014-00		
X	No Lock Rod Add: Only (2) Covers GMV00-011-00	
POINT DETECTOR ROD		
T	GMV00-500-01	Swivel Threaded End With Rivets
S	GMV00-500-02	Solid Spade End
P	GMV00-500-03	Swivel Threaded End With Grease Pin
C	GMV00-500-04	Swivel Threaded End With Grease Pin 4.5-6 Inch
D	GMV00-500-05	Threaded End Non Swivel
CONTROLLER CONFIGURATION		
S	GMV00-043-00	Standard Controller
E	GMV00-044-00	Enhanced Controller
GEAR BOX HEATER		
B	55290-040-00	(24VDC & 110VAC/DC) Gear Box Heater
N	NO Gear Box Heaters	
CONDENSATION HEATERS		
A	55290-041-00	24 Volt Heater
B	55290-042-00	110 Volt Heater
C	Both Heaters	
N	NO Condensation Heater	
LATCH STANDS		
L	GMV00-400-01	(2) Required Per Machine
N	No Latch Stands	
TOOLS (Optional Accessory)		
B	Hand Crank & Spoon Gauge (.38/.25) & Tool Kit (GMA50-012-00, GMA50-002-00, GMK50-000-01)	
S	GMA50-002-00 Spoon Gauge (.38/.25)	
H	GMA50-012-00 Hand Crank	
E	GMA50-013-00 Hand Crank, Hex End And: 50570-018-00 Ratcheting Crank	
C	GMA50-014-00 Spoon Gauge (6.0/4.5mm)	
K	GMK50-000-01 Maintainer Tool Kit	
N	NO Tools	
HAND THROW LETTER KIT (Optional Accessory)		
K	GMK50-004-01 Letters "N" & "R"	
N	NO Hand Throw Letter Kit	
HARNESS ADAPTER OPTION		
A	GMK50-013-01 Kit, Polarized Switch Repeater Harness	
H	GMK50-010-01 Wire Harness Adapter for Motor End Wire Entrance	
N	NO Harness Adapter	
LATCH OUT		
A	No Latch Out	
B	Restorable Latch Out	
C	Restorable Latch Out	
D	Non-Restorable Latch Out (GMA50-107-01)	
ADDITIONAL ACCESSORY TO BE ORDERED SEPARATELY		
GMA50-100-01	Puller Complete, Bushing	
GMA50-105-01	Cam Bar Detection Switch Kit (For machines manufactured prior to July 2006 AND Configured with non-restorable latch out)	

Each GM4000A is configured to meet your needs. Please refer to the configuration worksheet above, note the options you need and contact Customer Service at 1-800-717-4477 for further ordering information, pricing and delivery.

> GM4000A™ Wayside Switch Machine



GM4000A™ Switch Machine Hand Crank

Ordering Information - Accessories

Product Name	Description	Price
GMA50-012-00	Hand Crank	\$ 99.00
GMA50-002-00	Spoon Gauge (Point Detector Adjustments)	\$ 145.00
GMV00-012-00	Wear Plate, Side Lock Rod, four required	\$ 30.00
GMV00-013-00	Wear Plate, Top Lock Rod, two required	\$ 30.00
GMV00-014-00	Wear Plate, Bottom Lock Rod, two required	\$ 40.00
GMV00-016-00	Wear Plate, Side Throw Bar, four required	\$ 30.00
GMV00-017-00	Wear Plate, Top and Bottom Throw Bar, four required	\$ 30.00
GMA50-003-00	Point Detector Rod Drop Lug	\$ 115.00
GMA50-008-01	Adjustable Lock Rod Drop Lug (Threaded Lock Rod)	\$ 715.00
GMA50-006-00	Throw Bar Coupler, straight	\$ 177.00
GMA50-007-00	Throw Bar Coupler, downward set, 3.4"	\$ 469.00
GMK50-000-01	Maintainer Tool Kit	\$ 397.00
GMK50-003-01	Gear Box Heater Kit	\$ 846.00
GMK50-012-02	Condensation Heater Kit, 110V	\$ 150.00
55494-017-00	Thermal Mat, Short Cover	\$ 20.00
55494-018-00	Thermal Mat, Long Cover	\$ 29.00

> GM4000A™ Enhanced Controller

Maintainer Friendly



GM4000A™ Enhanced Controller

FEATURES

> 5 Seconds Electronic Overload Protection (Internal)

No overload relays needed. Internal overload protection electronics are included.

> Trackside Electrical Operation

The controller allows maintainers the ability to operate the machine electrically while performing maintenance or testing, rather than having to use the Hand-Crank.

> Universal 2, 3, 4, & 5 Wire Mode Compatible

Allows flexibility to design & integrate the GM4000A to any existing wiring, without field wiring changes.

> 5-Second Obstruction Cut-Off = NO Clutch

The controller is designed to electrically cut power to the motor if an obstruction is encountered between the points. The machine does not have a mechanical clutch, which means less maintenance.

> Reference LED's for Troubleshooting

The top surface of the Controller is clustered with LED's to help diagnose any potential fault.

> Speed, Current, & Selection

The controller allows the maintainer to select a 4 second or 15 second throw time. The controller allows for a Low or High Current draw.

> Universal Power AC / DC

The controller will operate with either AC or DC Power.

> Voltage Frequency

The controller will operate at 50Hz, 60Hz, or 100Hz AC. This allows designers more flexibility for new-work construction.

> Control Voltage

The controller accepts Control Voltages in the range of 9-35 VDC.

Ordering Information

Description	Ordering #	Price
Solid-State Controller, Enhanced	GMV000-044-00	\$ 2,595.00

> Model 6 Yard Switch Machine



Model 6 Yard Switch Machine

FEATURES

- > **High Speed Version (.6 sec) fastest available**
- > **Exclusive trailing mechanism eliminates damage to machine, switch points, and fittings**
- > **Versatile; for use in all yard applications, car classification, rapid transit, and industrial spurs**
- > **Two speeds available**
- > **Operates using 110V DC**
- > **All machines are supplied with heaters**
- > **Available with or without transformers**

Alstom's **Model 6** Switch Machine has evolved to become the Industry Standard for Yard Machines. The Model 6 has over 80 years of proven performance and is truly a trusted, versatile machine. The Model 6 Electric Switch Machine is designed for flat or gravity-type classification yards and industrial sidings.

The unit has ample power for throwing switches of large rail. The machine's mechanism is constructed so that it may be trailed without damaging the machine, switch points or fittings. The Model 6 is designed for power operation with a hand crank being provided for manual operation.

TRANSFORMER GROUP

- > **One Type K1/2, 110 volt, 60 Hz, 0.010 KVA transformer for supplying energy for clearance track circuits. The primary has taps at 6 and 98 volts. There are two secondaries, each 3 volts, with a tap at 2 volts.**
- > **Two Type S2, 1 volt, 60Hz, step-up transformers, one for each clearance track circuit. They have one 20 volt secondary**
- > **Two adjustable resistors for regulating the voltage of indication lights.**
- > **Sixteen terminal posts.**

> Model 6 Yard Switch Machine



Model 6 Yard Switch Machine installed at customer location

Specifications

Data	Value
Dimensions	Length = 4'11.25" x Width = 18.875" x Height = 11.75"
Weight	~700 lbs.
Stroke Length	5.5"
Electrical Requirements	110V DC

Ordering Information - with or without Transformer Group

Ordering #	Description	Speed	Gear Ratio	Control	Price
52500-004-08	High Speed DC	0.6	31.8:1	Single, 3-wire	\$ 21,995
52500-004-18	Regular Speed DC	1.50	79.5:1	Single, 3-wire	\$ 21,995
A85-0706	High Speed with Transformer Group (Note 1) With Hand Crank	0.6	31.8:1	Single, 3-wire	\$ 22,995
A85-0701	Regular Speed with Transformer Group (Note 1) With Hand Crank	1.50	79.5:1	Single, 3-wire	\$ 21,995

Note 1: Transformer Group is Ordering Number 52506-003-01.

For complete information on Model 6 Switch Machines or for ordering parts for a Model 6 switch machine, see Product Manual P1383 on the Alstom Web Site.

Note 2: Call Alstom Customer Service Center at 1-800-717-4477 for control options.

> Model 5 Letter Switch Machine Series



Model 5H Switch Machine installed at customer location

The 5 Letter Series of switch machines are designed for use in mainline, interlocking, and rapid transit applications. As one of the first machines on the market, the Model 5 series has the largest installed base of any switch machine in North America.

The Best Value in the Long Run

The 5 Letter series switch machines are rugged and reliable. Their time tested mechanical controllers provide maximum safety and durability over an average life of 20 years. Alstom switch machines are rugged and reliable. Their time-tested mechanical construction and field-proven circuit controller are designed to provide maximum safety and dependable operation during the machine's long service life, while requiring only minimal maintenance. They are versatile, with options for an internal controller and dual control operation (for power and hand throw). Their low profile makes them suitable for nearly any location.

> Model 5F

Dual Control - configured for RH or LH mainline applications.

> Model 5E

Single Control - configured for RH or LH mainline applications.

> Model 5H

Dual Control - with interval biased - neutral controller - configured for RH or LH mainline applications.

> Model 5G

Single Control - with interval biased - neutral controller - configured for RH or LH mainline applications.

> Model 5T

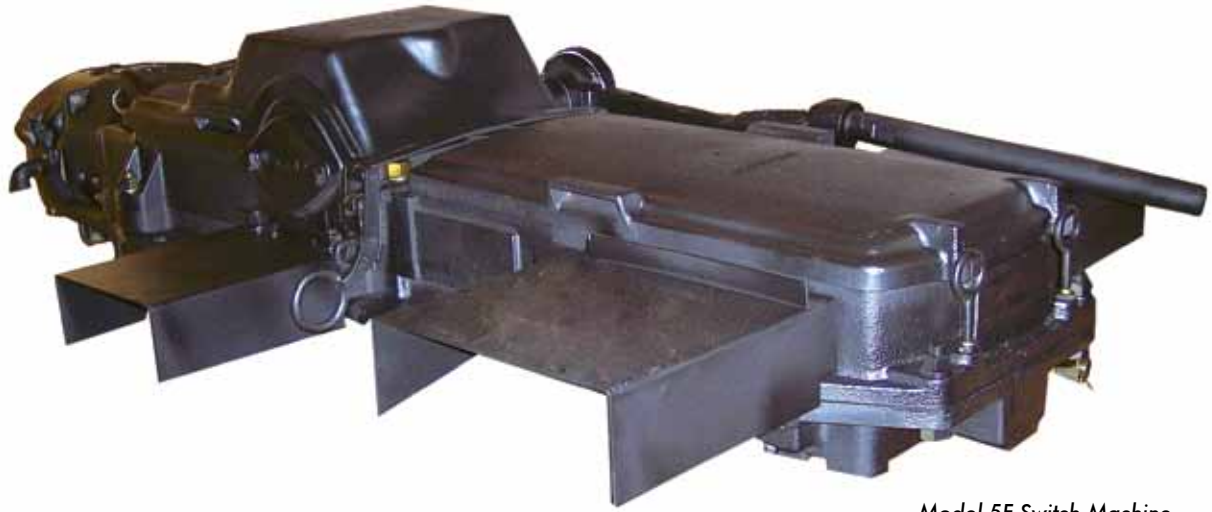
Single Control - used for all transit applications.

FEATURES

- > **Versatile Design**
- > **Single switch**
- > **Single-slip and double switch**
- > **Power and hand throw**
- > **Low profile accommodates most locations**



> Model 5 Letter Switch Machine Series



Model 5F Switch Machine

Specifications

Data	Model 5T	Model 5E	Model 5F	Model 5G	Model 5H
Application	Transit	Mainline	Mainline	Mainline	Mainline
Length (in – approx.)	64	68	68	80	80
Width (in – approx.)	33	35	35	35	35
Height (in – approx.)	8	9.5	12.75	9.5	12.75
Weight (lbs – uncrated)	600	780	980	1065	1065
Throw Bar Stroke (in)	6	6	6	6	6
Hand Throw	No	No	Yes	No	Yes
Hand Crank	Yes	Yes	Yes	Yes	Yes
Operating Voltage	110 VDC	110/24 VDC	110/24 VDC	110/24 VDC	110/24 VDC
Operating Time (approx.)	2 sec	3 sec	3 sec	3 sec	3 sec
Internal Control Scheme	No 3 wire	No 3 wire	No 3 wire	Yes 4 wire	Yes 4 wire
Control Voltage	--	--	--	10/24 VDC	10/24 VDC
Point Detector (separate)	No	Yes	Yes	Yes	Yes
Magnetic Detent	No	Yes	Yes	Yes	Yes
Dynamic Snubbing	Yes	Yes	Yes	Yes	Yes
Overload Clutch	Yes	Yes	Yes	Yes	Yes
Clutch Setting (amps)	12-14 (110V)	12-14 (110V) 17-20(24V)	12-14 (110V) 17-20(24V)	12-14 (110V) 17-20(24V)	12-14 (110V) 17-20(24V)
Frost Protection Lubrication Thrust (lbs – max rated)	No Grease/Oil 600	Optional Grease/Oil 2500	Optional Grease/Oil 2500	Optional Grease/Oil 2500	Optional Grease/Oil 2500

> Model 5F Dual Control Switch Machine

FEATURES

> Point Detector

An over-and-locked type circuit controller with two normal, two reverse, two shunt and two motor-control contacts. The normal and reverse contacts check and indicate when the switch points are within the proper distance of the stock rail and are locked. The motor control contacts control the motor operating circuit.

> Overload Friction Clutch

Absorbs shocks encountered in switch operation. It is factory-adjusted to slip when the motor operating current is from 12–14 ampere for 110 Volt machines and 18–20 ampere for 24 Volt machines.

> Removable Hand Crank

Available for maintenance and emergency use. An automatic cutout contact with a latch-out feature and manual reset protects the operator.

> Dual Control Mechanism

Permits either power or hand-throw operation.

> Heaters

Provided in the motor and point detector compartments.

> Rugged Motor

Provides long, reliable service. It has series, split connected, epoxy-coated, insulated field coils and an epoxy-coated armature. Dynamic snubbing limits motor overrun at the end of the stroke and a simple magnetic detent holding device then locks the motor armature. Magnetic holding is frictionless and virtually maintenance-free.



Model 5 Switch Machine being assembled at the Rochester, NY facility

Specifications

Data	Value
Applications	Single Switch, Single-Slip Switch, Double-Slip Switch, Derail, Movable Point Frog
Mounting Requirements	Requires only two ties for mounting, meets requirements of AAR Load Curve 1457.
Thrust	Maximum rated thrust (pounds) 2,500 lbs., Maximum rated thrust (kilograms) 1,136.7 kg.
Weight	Uncrated (pounds) 980 lbs., Uncrated(kilograms) 445.5 kg.
Motor Type	DC Motor, field-wound, with permanent magnet. Magnetic detent holds motor against vibration; and stray electrical currents at end of stroke
Motor Voltage	110Vdc $\pm 20\%$, 24Vdc $\pm 20\%$
Operating Time	110 Volt machines – 3 seconds, 24 Volt machines – 8 to 10 seconds
Clutch Setting	110 Volt machine – 12-14 Amps, 24 Volt machine – 18-20 Amps
Contacts	Provided for lock rod, point detector rod, and "over and locked" in normal and reverse positions
Dynamic Snubbing Circuit	Through contacts in the point detector. Point detector contacts: 2 normal, 2 reverse, 2 motor control and 2 shunt contacts. Motor control contacts carry and break motor current directly
Control Scheme	3-wire control, 10 or 24Vdc control voltage
Throw Bar Stroke	6" (15.2 cm)
Hand Crank	Option for maintenance and emergency use, with automatic cutout contact and latch-out feature; to protect operator.
Frost Protection	110 Volt heaters in motor and contact compartments.

> Model 5F Dual Control Switch Machine

Ordering Information - Model 5F - Right Hand Layouts

Lock Rod	Det. Rod	Motor	Clutch	Control	Ordering #	Price
RH Wide-Notch Threaded End	Single Switch	24 Volt 110V Heater	24 Volt	Dual, 3-wire 10 or 24VDC	54529-011-21	\$ 21,995.00
RH Narrow-Notch Threaded End	Single Switch	24 Volt 110V Heater	24 Volt	Dual, 3-wire 10 or 24VDC	54529-011-25	\$ 21,995.00
RH Wide-Notch Threaded End	Single Switch	24 Volt 24V Heater	24 Volt	Dual, 3wire 10 or 24VDC	54529-011-29	\$ 21,995.00
RH Wide-Notch Threaded End	Single Switch	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-16	\$ 21,995.00
R/LH Nar.-Notch Spade End	Single Switch	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-20	\$ 22,995.00
RH Wide-Notch Threaded End	Movable Point Frog	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-22	\$ 22,995.00

Ordering Information - Model 5F - Left Hand Layouts

Lock Rod	Det. Rod	Motor	Clutch	Control	Ordering #	Price
LH Wide-Notch Threaded End	Single Switch	24 Volt 110V Heater	24 Volt	Dual, 3-wire 10 or 24VDC	54529-011-22	\$ 21,995.00
LH Narrow-Notch Threaded End	Single Switch	24 Volt 110V Heater	24 Volt	Dual, 3-wire 10 or 24VDC	54529-011-26	\$ 21,995.00
LH Wide-Notch Threaded End	Single Switch	24 Volt 24V Heater	24 Volt	Dual, 3-wire 10 or 24VDC	54529-011-30	\$ 21,995.00
LH Wide-Notch Threaded End	Single Switch	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-17	\$ 21,995.00
L/RH Nar.-Notch Spade End	Single Switch	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-21	\$ 22,995.00
LH Wide-Notch Threaded End	Movable Pt. Frog	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-23	\$ 22,995.00
LH Narrow-Notch Threaded End	Single Switch	110 Volt High Speed	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-25	\$ 21,995.00
L/RH Wide-Notch Spade End	Single Switch	110 Volt 110V Heater	110 Volt High Speed	Dual, 3-wire 10 or 24VDC	54529-015-32	\$ 21,995.00

Hand Crank sold separately, please contact the Alstom Customer Service Center 1-800-717-4477.

> Model 5E Single Control Switch Machine

The **Model 5E** Electric Switch Machine is the same as the Model 5F except that it is used for power operation only.



Ordering Information - Model 5E - Right and Left Hand Layouts

Lock Rod	Det. Rod	Motor	Clutch	Control	Ordering #	Price
RH Wide-Notch Threaded End	Movable PointFrog	110 Volt High Speed w/110 Volt Heater	110 Volt High Speed	Single, 3-wire 110 or 24VDC	54519-015-06	\$ 19,900.00
LH Wide-Notch Threaded End	Movable Point Frog	110 Volt High Speed w/110 Volt Heater	110 Volt High Speed	Single, 3-wire 110 or 24VDC	54519-015-07	\$ 19,900.00
RH Wide-Notch Threaded End	Single Switch	110 Volt High Speed w/110 Volt Heater	110 Volt High Speed	Single, 3-wire 110 or 24VDC	54519-015-12	\$ 18,900.00
RH Wide-Notch Spade End	Single Switch	110 Volt High Speed w/110 Volt Heater	110 Volt High Speed	Single, 3-wire 110 or 24VDC	54519-015-24	\$ 18,900.00
LH Wide-Notch Spade End	Single Switch	110 Volt High Speed w/110 Volt Heater	110 Volt High Speed	Single, 3-wire 110 or 24VDC	54519-015-25	\$ 19,900.00

Hand Crank sold separately, please contact the Alstom Customer Service Center 1-800-717-4477.

> Model 5H Dual Control Switch Machine with Biased-Neutral Controller



Model 5H Switch Machine installed at customer location

FEATURES

> Point Detector

An over-and-locked type circuit controller with two normal, two reverse, two shunt and two motor-control contacts. The normal and reverse contacts check and indicate when the switch points are within the proper distance of the stock rail and are locked. The motor control contacts control the motor operating circuit in conjunction with the biased-neutral controller.

> Biased-Neutral Controller

The machine has two biased neutral, mechanically interlocked contactors, a blocking rectifier and an overload relay. Each contactor has one dependent, front-back contact with a permanent magnet blowout (arc suppression). A snubbing contact provides dynamic motor braking at the end of the stroke. The magnetic structure prohibits armature operation until voltage of the proper polarity is applied across the coils.

> Heaters

Provided in the motor, controller and point detector compartments.

> Removable Hand Crank

Available for maintenance and emergency use. An automatic cut-out contact, with a latch-out feature and manual reset, protects the operator.

> Overload Friction Clutch

Absorbs shocks encountered in switch operation. It is factory adjusted to slip when the motor operating current is from 12–14 Ampere for 110 Volt machines, and 18–20 Ampere for 24 Volt machines.

> Rugged Motor

Provides long, reliable service. It has series, split connected, epoxy-coated, insulated field coils and an epoxy-coated armature. Dynamic snubbing limits motor overrun at the end of the stroke, and a simple magnetic detent holding device then locks the motor armature. Magnetic holding is frictionless and virtually maintenance-free.

> Dual Control Mechanism

Permits either power or hand-throw operation.

> Model 5H Dual Control Switch Machine with Biased-Neutral Controller

Specifications

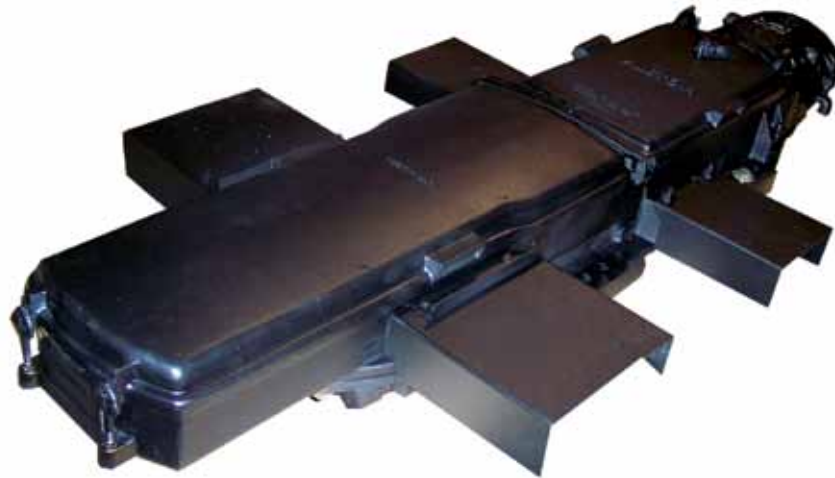
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Applications	Single Switch, Single-slip Switch, Double-slip Switch, Derail, Movable Point Frog
Mounting Requirements	Requires only two ties for mounting; Meets requirements of AAR Load Curve 1457
Thrust	Maximum rated thrust 2,500 lbs. (1,136.7 kg)
Weight	Uncrated 1065 lbs. (484.1 kg)
Motor Type	Series-wound DC motor; Magnetic detent holds motor against vibration and stray electrical currents at end of stroke
Motor Voltage	110Vdc at ± 20%, 24Vdc at ± 20%
Operating Time	3 seconds for 110 Volt machines, 8-10 seconds for 24 Volt machines
Clutch Setting	12-14 Amps for 110 Volt machines, 18-20 Amps for 24 Volt machines
Contacts	Provided for lock rod, point detector rod, and over-and-locked in normal and reverse positions
Dynamic Snubbing Circuit	Through contacts in the point detector. Point detector contacts: 2 normal, 2 reverse, 2 motor control, 2 shunt contacts. Motor control contacts carry and break motor current directly
Control Scheme	4-wire control, 10 or 24Vdc control voltage
Throw Bar Stroke	6.0 Inches (15.2 cm)
Hand Crank	Option for maintenance and emergency use; with automatic cutout contact and latch-out feature to protect operator
Frost Protection	Optional 110 Volt heaters for motor, controller and contact compartments; If heaters are not used, a frost shield and felt commutator cover should be installed in motor; The point detector contacts feature a long wipe to help prevent frost buildup on the contacts

Ordering Information - Model 5H - Right and Left Hand Layouts

↻ Lock Rod	↻ Det. Rod	↻ Motor	↻ Clutch	↻ Control	↻ Ordering #	↻ Price
RH Wide-Notch Threaded End	Single Switch	24 Volt	24 Volt	Dual, 4-wire 110 or 24VDC	54505-011-33	\$27,995.00
R/LH Wide-Notch Threaded End	Single Switch	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-20	\$27,995.00
R/LH Nar.-Notch Threaded End	Single Switch	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-30	\$27,995.00
R/LH Wide-Notch Threaded End	Single Switch	24 Volt	24 Volt	Dual, 4-wire 110 or 24VDC	54505-011-34	\$27,995.00
LH Narrow-Notch Threaded End	Single Switch	24 Volt	24 Volt	Dual, 4-wire 110 or 24VDC	54505-011-42	\$27,995.00
R/LH Wide-Notch Threaded End	Single Switch	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-21	\$27,995.00
R/LH Nar.-Notch Threaded End	Single Switch	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-31	\$27,995.00
LH Wide-Notch Threaded End	Movable Point Frog	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-23	\$27,995.00
LH Narrow-Notch Spade End	Single Switch	110 Volt	110 Volt	Dual, 4-wire 110 or 24VDC	54505-015-48	\$27,995.00

Hand Crank sold separately, please contact the Alstom Customer Service Center 1-800-717-4477.

> Model 5G Single Control Switch Machine with Biased-Neutral Controller



The **Model 5G** Electric Switch Machine is the same as the Model 5H except that it is used for power operation only.

Ordering Information - Model 5G - Right and Left Hand Layouts

Lock Rod	Det. Rod	Motor	Control	Ordering #	Price
RH Wide-Notch Threaded End	Single Switch	110 Volt w/110 Volt Heater	Single	54504-015-26	\$ 25,995.00
R/LH Wide-Notch Threaded End, RH Wide-Notch Threaded End	Movable Point Frog	110 Volt w/110 Volt Heater	Single	54504-015-35	\$ 22,995.00
LH Narrow-Notch Spade End, R/LH Wide-Notch Spade End	Movable Point Frog	110 Volt w/110 Volt Heater	Single	54504-015-40	\$ 25,995.00
R/LH Narrow-Notch Spade End	Single Switch	110 Volt w/110 Volt Heater	Single	54504-015-31	\$ 25,995.00
LH Narrow-Notch Spade End, R/LH Narrow-Notch Spade End	Movable Point Frog	110 Volt w/110 Volt Heater	Single	54504-015-41	\$ 25,995.00

Hand Crank sold separately, please contact the Alstom Customer Service Center 1-800-717-4477.

> Model 5T Switch Machine for Transit



Model 5T's ready for shipment at the Rochester, NY facility

FEATURES

- > **Maximum Safety**
- > **Low 8 inch profile**
- > **Point Detector**
- > **Hand Crank**
- > **Dynamic Snubbing**
- > **Fast Operation - 3 second throw time**
- > **Ideal for subway or rapid transit properties**

The **Model 5T Electric Switch Machine** is ideal for subway or rapid transit properties and incorporates all the features required to meet interlocking practices. The Model 5T Switch Machine has a compact design measuring 64" long, 8" high and 33" wide.

The incredibly low 8 inch profile makes this machine particularly desirable by many Transit properties. Additionally, the machine has a throw time of 3 seconds which is one of the fastest throw times in the industry.

Specifications

↻ Data	↻ Value
Application	Transit
Thrust	Maximum rated thrust 500 lbs. (227 kg)
Weight	Uncrated 600 lbs. (272.7 kg.)
Dimensions	Length 64 inches (162.56 cm), Width 33 inches (83.82 cm), Height 8 inches (20.32 cm)
Motor Type	DC Motor with permanent magnet and field-wound; magnetic detent holds motor against vibration and stray electrical currents at end of stroke
Motor Voltage	110VDC
Operating Time	Under 3 seconds for 110 Volt machines
Clutch Setting	12-14 Amps for 110 Volt machines
Control Scheme	3-wire control, 10 or 24VDC control voltage
Throw Bar Stroke	6.0 inches (15.2 cm)
Hand Crank	Optional for maintenance and emergency use; with automatic cutout contact to protect operator
Frost Protection	Not available

Ordering Information

↻ Layout	↻ Motor	↻ Speed	↻ Description	↻ Ordering #	↻ Price
Left-hand	110	Under 3	Without Guards	45506-011-01	\$ 35,300.00
Right-hand	110	Under 3	Without Guards	45506-011-02	\$ 35,300.00
Right-hand	110	Under 3	With Guards	45506-011-04	\$ 35,300.00

Hand Crank sold separately, please contact the Alstom Customer Service Center 1-800-717-4477.

> Junction Terminal Box



Junction Terminal Box installed at customer location

Ordering Information

Description	Ordering #	Price
Junction Terminal Box Complete, with pedestal, has 36 terminal posts, hole for 2" conduit	A91-0230	\$ 995.00
Junction Terminal Box Only, has 36 terminal posts, hole for 2" conduit	52918-009-01	\$ 789.00
Cover Complete	45520-013-01	\$ 149.00
Pedestal, 3.50" pipe, with base	18006-001-00	\$ 299.00
Terminal Block, 2 terminals with connector	46048-022-04	\$ 100.00
Terminal Block, 3 terminals with connector	05971-044-00	\$ 67.00
Terminal Block, 2-way (1c - 1d)	P62-0339	\$ 150.00
Terminal Block, 12-way	A03-0129	\$ 73.00
Terminal Block, 6-way, may be separated into 3-way blocks	A03-0127	\$ 64.00
Terminal Block, 6-way, may be separated into 3-way blocks	A03-0130	\$ 152.00
Hook Bolt, for cover	35446-007-00	\$ 40.00

> 7R Switch Circuit Controller



7R Switch Circuit Controller in service at customer location

As part of a comprehensive PTC Solution, Alstom introduces the first **Rail-Mounted Switch Circuit Controller**. The electro-mechanical unit is derived from the original 7K design, but now includes improved features such as IP-67 frost-protected Limit Switches, Vibration Isolation mounts, and a robust design profile that allows it to clamp to the rail base.

This new design can be used on Mainline, Yard, or Dark Territory applications, as needed for PTC or independent detection requirements. Its value is evident in the reduced Man-Hours needed to install the unit (compared to a conventional tie-mounted unit) and the reduction of department coordination involved in doing so (no track crew needed).

Positive, dual-point detection independently verifies both normal and reverse positions - reducing derailments and improving velocity. The unit can be quickly clamped to the rail and is an ideal product for concrete-tie locations, rotted wood-tie track, and new construction needs. It is also designed in such a way that it can be mounted directly to wood ties if needed.



7R Switch Circuit Controller being inspected at customer location

When coupled with Alstom's microWIU, you have an ideal PTC solution for wayside equipment.

The 7R Switch Circuit Controller is proof positive that Alstom leads the industry with innovative designs and ground-breaking PTC technology.

FEATURES



Rail-Mounted

- > One unit for normal and reverse detection
- > Eliminates extended ties used for conventional circuit controller mounting
- > Unit sits minimum of 1" below Head of Rail
- > Will mount to all rails 115# and Higher

Perfect for Dark Territory Environment

- > Rail Mounted "Between the Tie" design minimizes impact of Rail-Creep on poor track beds

New Limit Switches

- > No springs or contact fingers
- > Field replaceable, compact design
- > Environmentally Sealed: IP67

Easy Adjustment

- > Same, proven adjustable cam & rocker design as the 7K
- > Updated Centering Attachment
- > New Cover-Gasket Tension Bolt

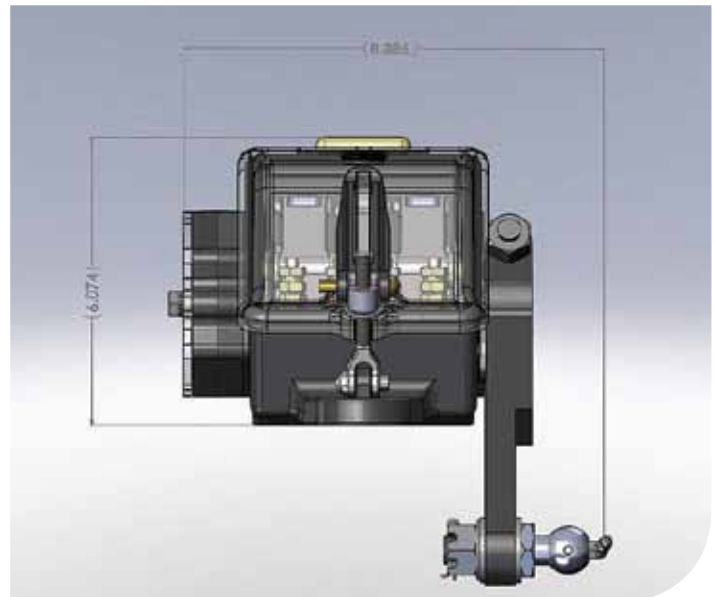
Environmental

- > - 40 to 70 Celsius temperature range
- > AREMA Class G vibration (10G)



Dimensions

- > Length: 15" (Back, from Base-Edge of Rail)
- > Width: 8.9" (Arm & Centering device incl.)
- > Depth: 2" (From Bottom of Stock Rail)
- > Height: 7.6" (From bottom of mntg. Bracket)
- > Weight: 47 Pounds



> Models 7J and 7K Switch Circuit Controllers



Model 7 Switch Circuit Controllers being painted at the Rochester, NY facility

APPLICATIONS

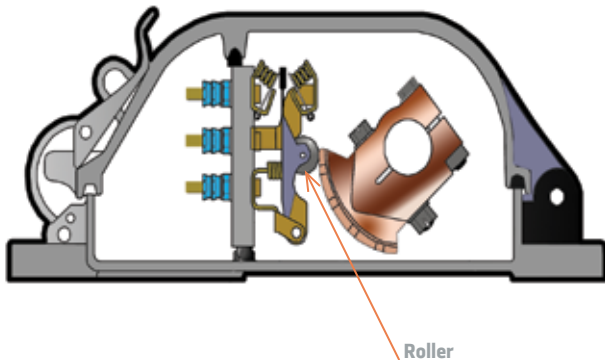
- > **Switch Point Position (normal or reverse)**
- > **Switch Point Locking**
- > **Bridge Locking and Bridge Position**
- > **Rail-Joint Sealing**
- > **Tunnel Door Position**
- > **Slide Detector Actuation**



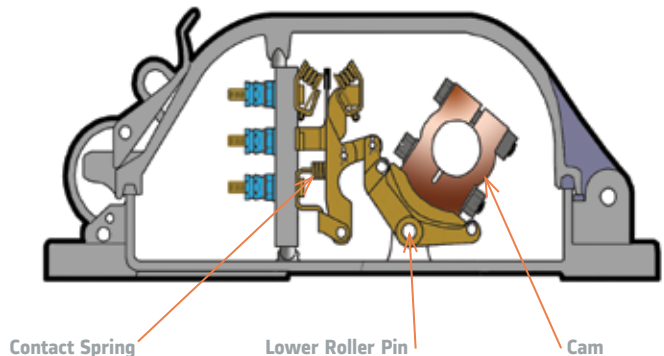
Call our Customer Service Center at 1-800-717-4477 to order

The Model 7 line of switch circuit controllers meets the rigorous demands of the rail industry – high sensitivity, reliability, and rugged strength to withstand great mechanical stress under a wide range of environmental conditions. The controller may be used to integrate the positions of various devices with suitable control circuits.

Commonly used with switch machines to detect switch positions, Model 7 controllers can also detect the positions of derails, bridge locks, slide detectors, etc. They can shunt track circuits as well as control relay circuits. The arched cast-iron case provides great mechanical strength, eliminates projecting corners, and offers full access to all internal parts.



Model 7J Switch Circuit Controller



Model 7K Switch Circuit Controller

> Models 7J and 7K Switch Circuit Controllers

FEATURES

- > **Rugged**
Heavily reinforced case, 1.5 inch cold-drawn steel shaft, corrosion and wear resistant cams, spring steel cam surfaces
- > **Sensitive**
A 5-degree movement of the crank transfers the contacts (vibration doesn't affect contacts)
- > **Reliable**
Positive action contact mechanism, spring contact pressure, withstands vibration
- > **Easy Internal Access**
- > **Ventilators Minimize Condensation**
- > **Versatile**
Cams adjustable to operate contacts simultaneously or progressively, left or right-hand operation, wide choice of fittings and accessories
- > **Large Camshaft**
Camshaft 1.5" (3.81 cm) in diameter



Switch Circuit Controller installed at customer location

- > **Field Adjustable**
Cams may be adjusted to operate the contacts at any desired position of the actuating device
- > **Terminal Compartment Sealed Off From Grease and Oil Contamination**

Ordering Information

Description	Ordering #	Price
7J CONTROLLER COMPLETE	53530-030-01	\$ 2,150.00
7K CONTROLLER COMPLETE	53530-031-01	\$ 2,150.00
CAP, for wire outlet, with 1.50" (3.81 cm) std. pipe tapped hole	35491-004-00	\$ 49.00
CAP, for wire outlet, with 1.25" (3.18 cm) std. pipe tapped hole	35491-024-00	\$ 185.00
COUPLING, 45 degree, for 1.50" (3.81 cm) flexible conduit	45688-092-02	\$ 400.00
CRANK, with insulated ball pin, 1.0" (2.54 cm) offset, 5.375" (13.65 cm) centers	38660-015-01	\$ 189.00
CRANK, with insulated ball pin, 1.0" (2.54 cm) offset, 4.50" (11.43 cm) centers	38660-020-02	\$ 300.00
CENTERING ATTACHMENT, for broken switch rod protection, includes gasket	53231-002-01	\$ 385.00

> Model 10A Electric Switch Lock



Model 10A Electric Switch Lock

FEATURES

- > **No need to DAP the ties**
- > **Indication lamp protected by shock-absorbing mounting**
- > **Large, sturdy, silver-to-silver contacts**
- > **Vital parts held under constant tension to minimize vibration wear**
- > **Convenient pedal built to withstand rough operation**
- > **Self-lubricated bearings**
- > **Observation window protects indication lamp**

The **Model 10A** Electric Switch Lock is used to securely lock the hand-throw lever of a hand-operated switch machine or ground-throw switch stand in the normal position. It provides a means of interlocking a manually-operated switch with the signal circuits so that the switch may not be operated unless traffic conditions permit, or unless the normally-sealed emergency release is operated. This switch lock does not require dapping the ties and may be applied to either a right- or left-hand layout.

The cast-construction of the Model 10A Switch Lock makes it very durable. It is designed for 8 to 12VDC operation. If AC operation is required, a transformer and rectifier are required in a separate housing. The contact arrangements available with the Model 10A Switch Lock are shown with the switch lock in the normal position (fronts open, backs closed). Contacts 1 and 5 are actuated by the energization of the lock-magnet coils. Contacts 2, 3, and 4 are actuated whenever the padlock is removed.

Specifications

↻ Data	↻ Value	↻ Value	↻ Value
Dimensions	Width = 9" (22.86 cm)	Height = 11½" (29.21 cm)	Depth = 15-7/16" (39.21 cm)

> Model 9B Electric Switch Lock

FEATURES

- > Available in two heights – high and dwarf
- > Door cannot be closed unless the switch is locked
- > Banner type indicator displays LOCKED or UNLOCKED
- > Four adjustable contacts, actuated by the operating handle
- > Emergency release provided
- > Door-operated circuit controller optional
- > Sturdy, weatherproof construction
- > Easy maintenance



Model 9B Dwarf Electric Lock installed at customer location

The Industry Standard, **Model 9B** Electric Switch Lock has a proven track record in the field and has a longevity in the industry second to none. The Model 9B Electric Switch Lock prevents unauthorized operation of switch stands, hand-throw switch machines, derails and other devices. The unit may be electrically interlocked with the signaling system or remotely locked by the dispatcher, preventing switch operation unless traffic conditions permit. The Model 9B Switch Lock operates by means of a plunger which is lowered into

a hole in the lock rod connected to switch points, derails, or other devices. The Model 9B is available in two heights: high and dwarf. The unit's cast-iron base is bolted to the pedestal of a high lock, or in the case of a dwarf configuration, directly to the mechanism's case. The base has two compartments for the wires and locking plunger. A wire entrance plate or a junction box may be bolted to the wire compartment. A pressure grease fitting is provided for lubricating the locking plunger.

Ordering Information

Description	Ordering #	Price
MODEL 9B LOCK, high, with door-operated circuit controller and emergency release	21150-201-20	\$ 9,995.00
MODEL 9B LOCK, high, without circuit controller and emergency release	21150-201-05	\$ 7,995.00
MODEL 9B LOCK, high, with door operated circuit breaker and without emergency release	21150-201-06	\$ 8,995.00
MODEL 9B LOCK, high, without door operated circuit breaker and with emergency release	21150-201-18	\$ 8,995.00
MODEL 9B LOCK, dwarf, with door-operated circuit controller and emergency release	21150-201-43	\$ 9,995.00
MODEL 9B LOCK, dwarf, without circuit controller and with emergency release	21150-201-10	\$ 8,995.00
MODEL 9B LOCK, dwarf, with door operated circuit breaker and without emergency release	21150-201-12	\$ 8,995.00
MODEL 9B LOCK, dwarf, without door operated circuit controller and emergency release	21150-201-55	\$ 8,995.00