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## INSTALLATION INSTRUCTIONS

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Original Issue Date: 7/96

Model: **ATS**

Market: **Industrial**

Subject: **Exercise Timer Kits PA-346650 to PA-346669, PA-346650-SD to PA-346669-SD, PA-346674 to PA-346678, PA-346674-SD to PA-346674-SD, PA-346685**

Use these instructions to install and program the exercise timer, a digital weekly time switch with segmented program display. Set up to four different start/shutdown programs per day. The timer digitally displays the time of day and weekday number. The timer has a minimum switching time of one minute and approximately 20 hours of program memory reserve power. See Figure 1 to cross reference field installed PA- kit numbers with factory installed kit numbers and specifications. Observe the following safety precautions while installing the exercise timer.

### **DANGER**



**Hazardous voltage.**  
**Will cause severe injury or death.**

Disconnect all power sources before opening enclosure.

*(600 Volt and above)*

### **WARNING**



**Hazardous voltage.**  
**Can cause severe injury or death.**

Disconnect all power sources before opening enclosure.

*(under 600 Volt)*

**Short circuits. Hazardous voltage can cause severe injury or death.** Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while adjustments are made. Remove wristwatch, rings, and jewelry before servicing equipment.

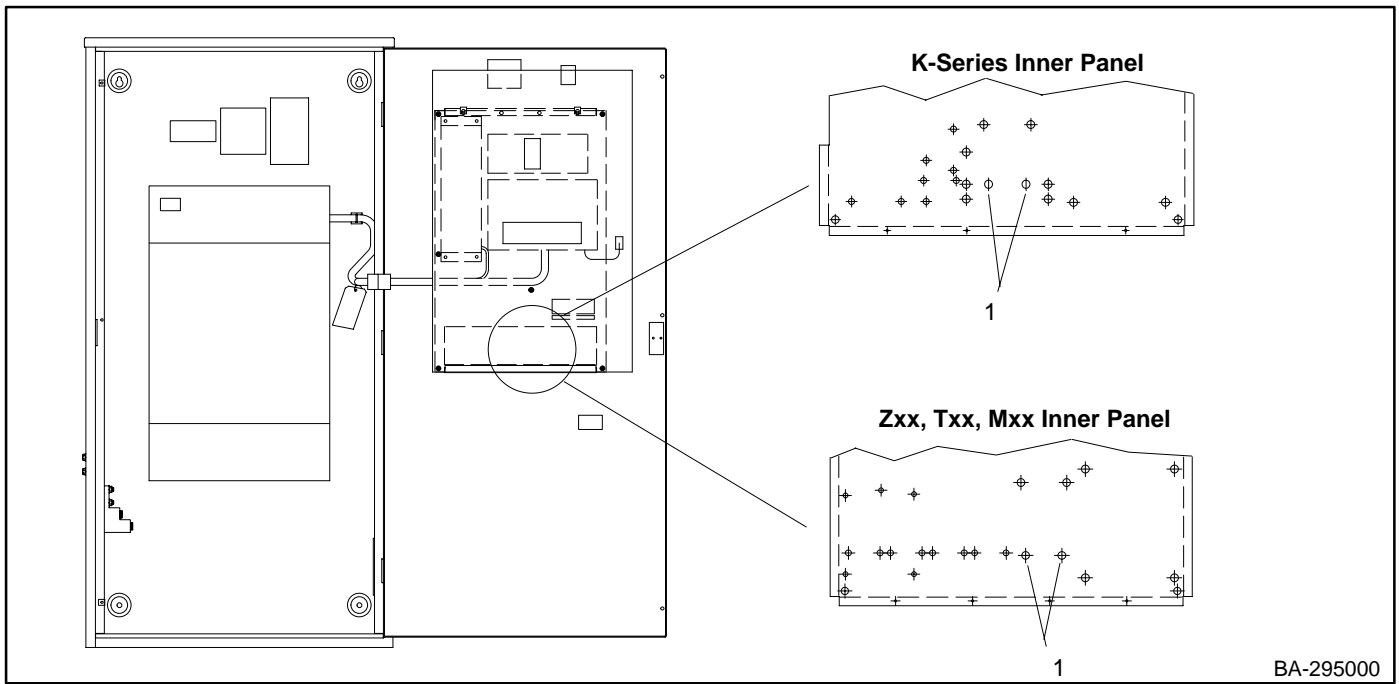
**Servicing transfer inner panel. Hazardous voltage can cause severe injury or death.** Disconnect inner panel harness at inline connector. This will de-energize circuit board and logic circuitry but allow transfer switch to continue to supply utility power to necessary lighting and equipment. Hazardous voltage exists for any accessories mounted to inner panel which are NOT wired through the inner panel harness and de-energized by inline connector separation. Such accessories are at line voltage.

Factory Installed Kits	Field Installed Kits	Voltage	Function	NEMA Rating
KA-23-WA	PA-346650	110-120	No load	1
DA-23-WA	PA-346650	110-120	No load	1
KA-23-WB	PA-346651	190-240	No load	1
DA-23-WB	PA-346651	190-240	No load	1
KA-23-WC	PA-346652	380-416	No load	1
DA-23-WC	PA-346652	380-416	No load	1
KA-23-WD	PA-346653	440-480	No load	1
DA-23-WD	PA-346653	440-480	No load	1
KA-23-WE	PA-346654	550-600	No load	1
DA-23-WE	PA-346654	550-600	No load	1
KA-23-XA	PA-346655	110-120	Load	1
DA-23-XA	PA-346655	110-120	Load	1
KA-23-XB	PA-346656	190-240	Load	1
DA-23-XB	PA-346656	190-240	Load	1
KA-23-XC	PA-346657	380-416	Load	1
DA-23-XC	PA-346657	380-416	Load	1
KA-23-XD	PA-346658	440-480	Load	1
DA-23-XD	PA-346658	440-480	Load	1
KA-23-XE	PA-346659	550-600	Load	1
DA-23-XE	PA-346659	550-600	Load	1
KA-23-YA	PA-346660	110-120	Load/No load	1
DA-23-YA	PA-346660	110-120	Load/No load	1
KA-23-YA3	PA-346661	110-120	Load/No load	3R,12,4,4X
DA-23-YA3	PA-346661	110-120	Load/No load	3R,12,4,4X
KA-23-YB	PA-346662	190-240	Load/No load	1
DA-23-YB	PA-346662	190-240	Load/No load	1
KA-23-YB3	PA-346663	190-240	Load/No load	3R,12,4,4X
DA-23-YB3	PA-346663	190-240	Load/No load	3R,12,4,4X
KA-23-YC	PA-346664	380-416	Load/No load	1
DA-23-YC	PA-346664	380-416	Load/No load	1
KA-23-YC3	PA-346665	380-416	Load/No load	3R,12,4,4X
DA-23-YC3	PA-346665	380-416	Load/No load	3R,12,4,4X
KA-23-YD	PA-346666	440-480	Load/No load	1
DA-23-YD	PA-346666	440-480	Load/No load	1
KA-23-YD3	PA-346667	440-480	Load/No load	3R,12,4,4X
DA-23-YD3	PA-346667	440-480	Load/No load	3R,12,4,4X
KA-23-YE	PA-346668	550-600	Load/No load	1
KA-23-YE3	PA-346669	550-600	Load/No load	3R,12,4,4X
DA-23-YE3	PA-346669	550-600	Load/No load	3R,12,4,4X
DA-23-ZA	PA-346674	110-120	Load/No load	1
DA-23-ZB	PA-346675	190-240	No load	1
DA-23-ZC	PA-346676	380-416	No load	1
DA-23-ZD	PA-346677	440-480	No load	1
DA-23-ZE	PA-346685	550-600	No load	1
HKA-23-W	PA-346685	240	No load	1

**Figure 1. Specifications**

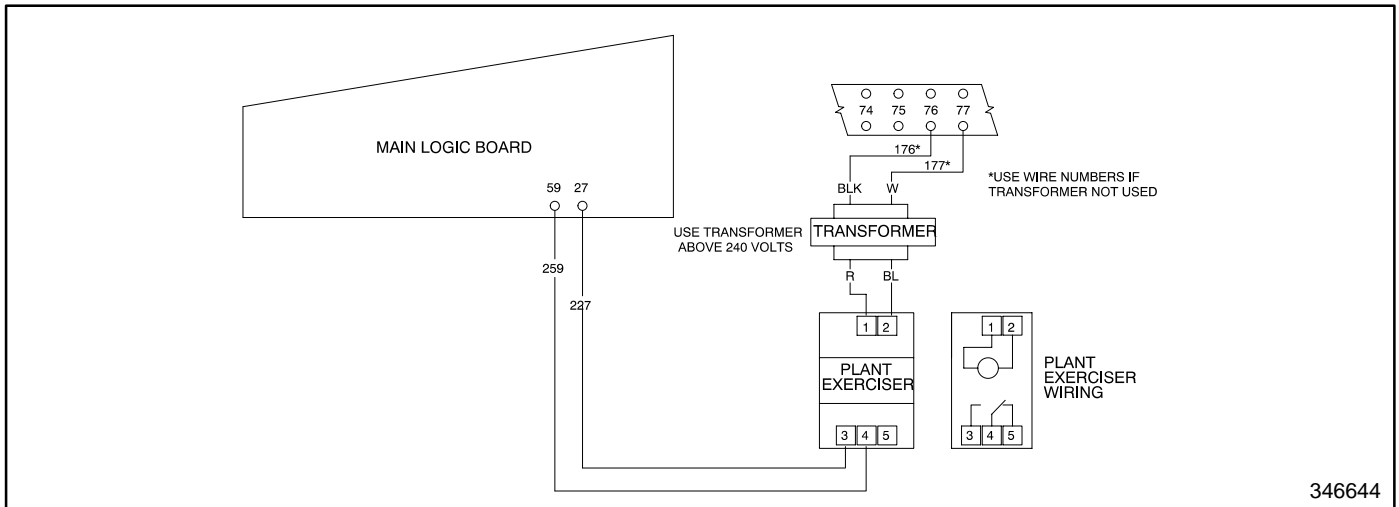
# Installation

1. Disconnect power to transfer switch.
2. Find the exercise timer mounting location on the inner panel if the switch is not already equipped with one. Some factory-installed accessories may interfere with mounting location of the exercise timer. If mounting location is obstructed by factory-installed accessories mount exercise timer on the inner panel in an accessible location that the mounting rail fits. See Figure 2.
3. Secure mounting rail to inner panel using screws (X-51-9), washers (X-25-48), and nuts (298811).
4. Mount exercise timer to mounting rail.
5. Wire the exercise timer according to the wiring diagram which corresponds to the part number of the exercise timer kit. See Figure 3 through Figure 8.
6. Reconnect power to transfer switch.

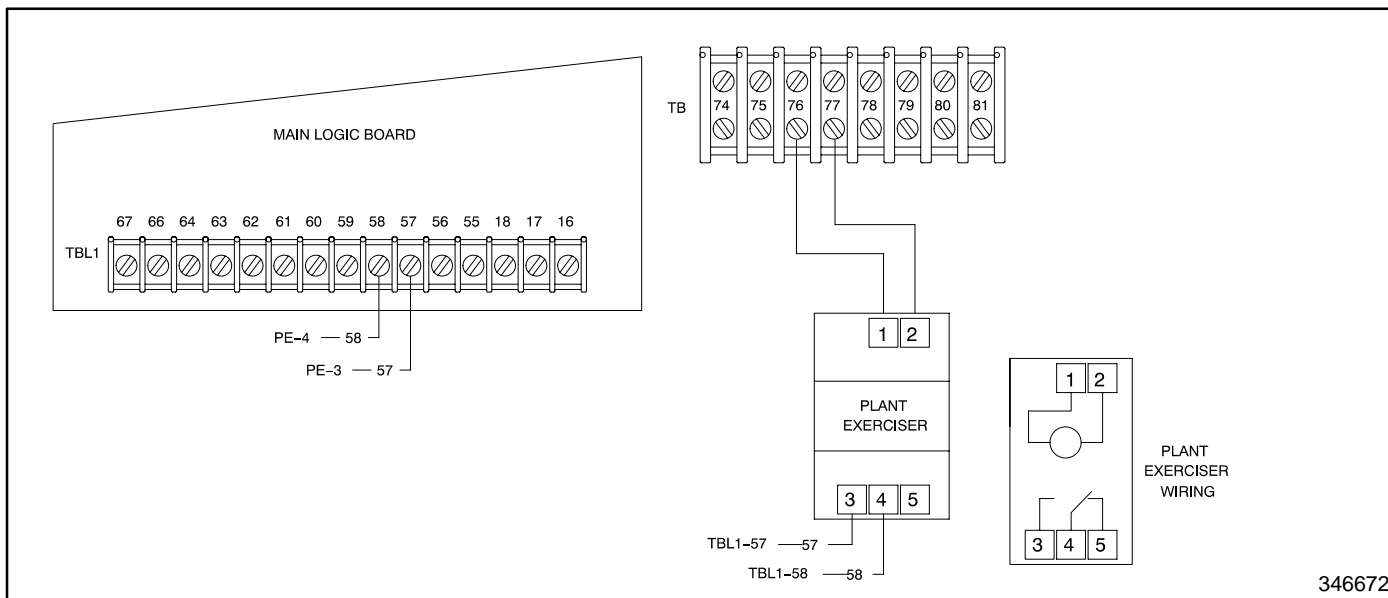


1. Mounting holes

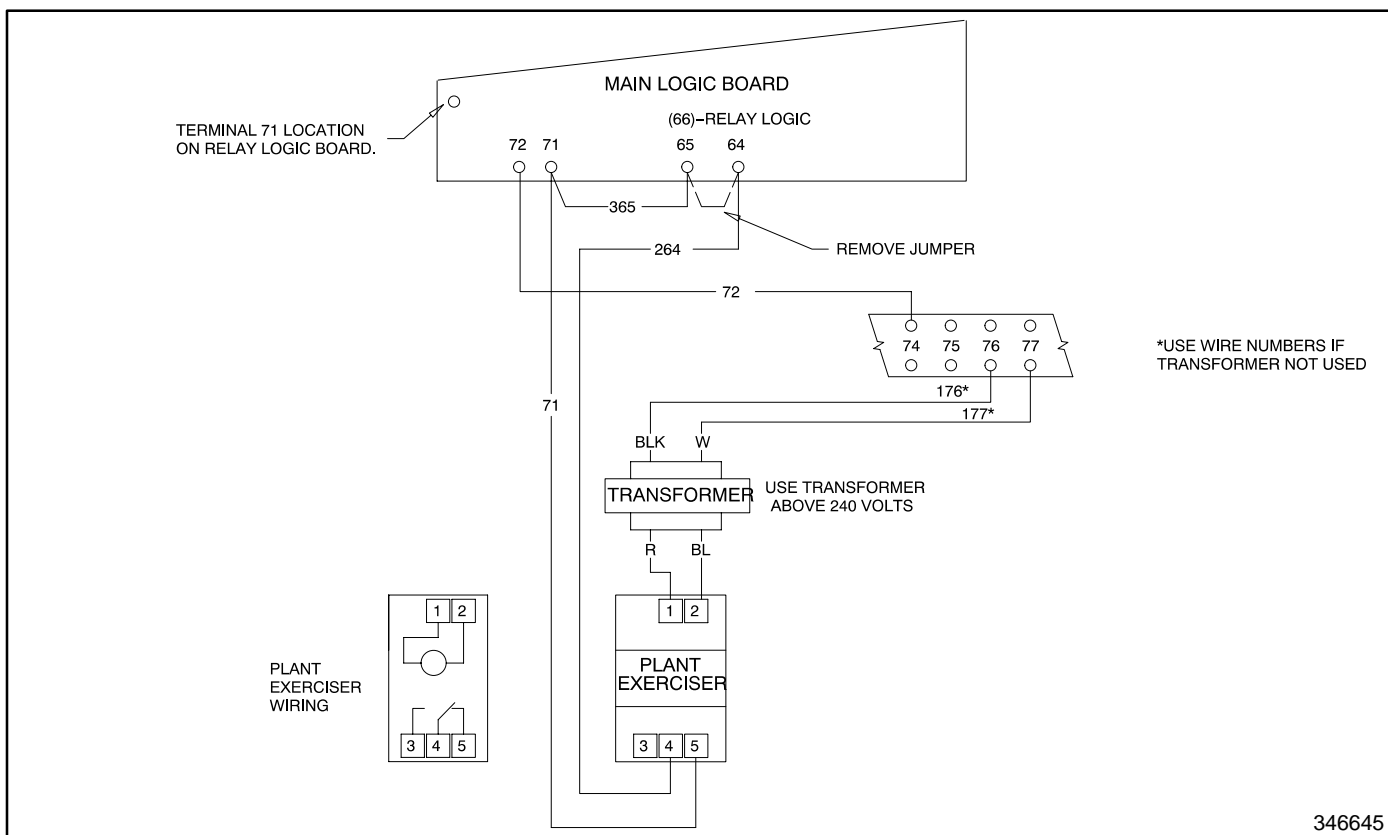
**Figure 2. Exercise Timer Mounting**



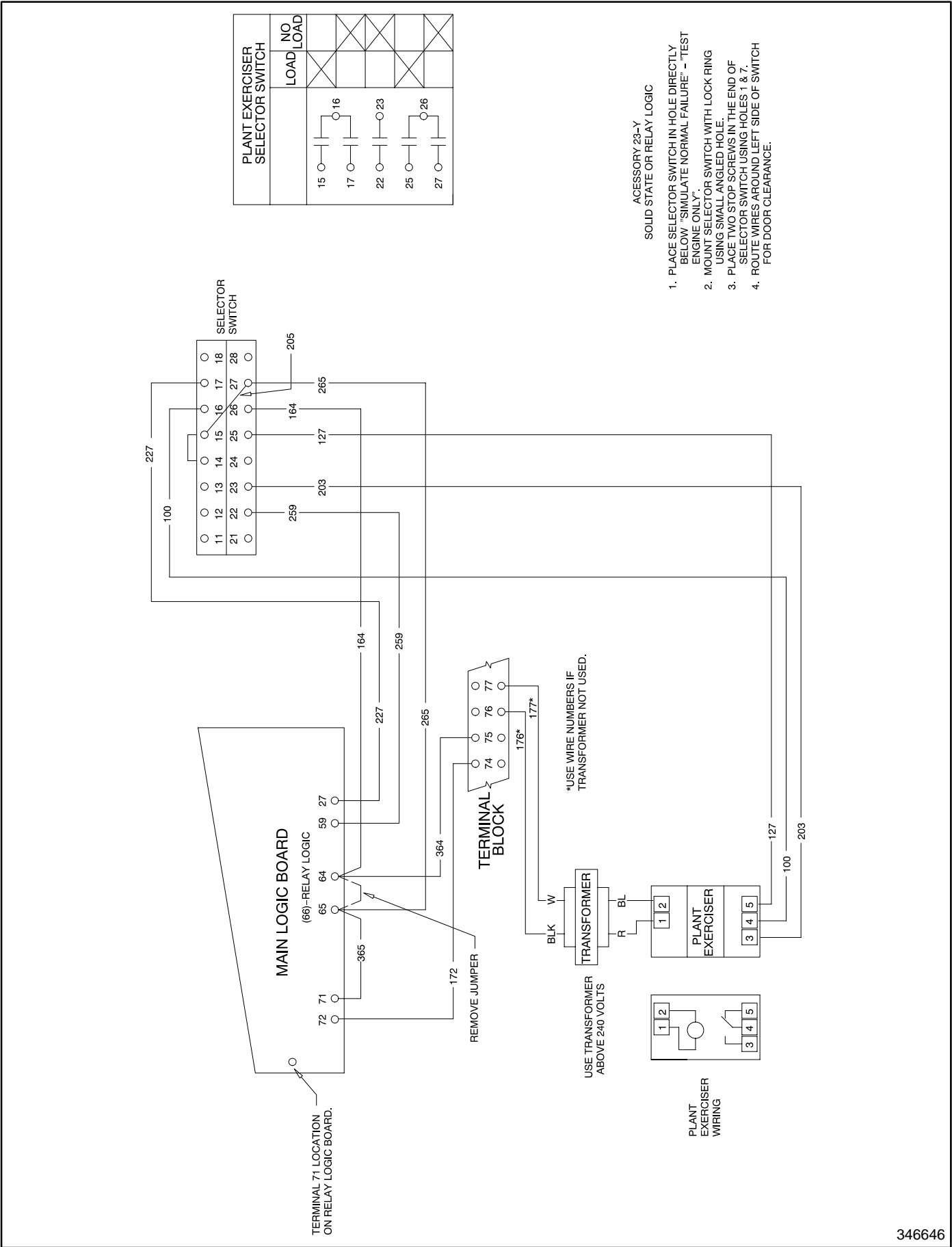
**Figure 3. Wiring Diagram for kits PA-346650 to PA-346654 and PA-346650-SD to PA-346654-SD**



**Figure 4. Wiring Diagrams for kits PA-346685 and PA-346685-SD**

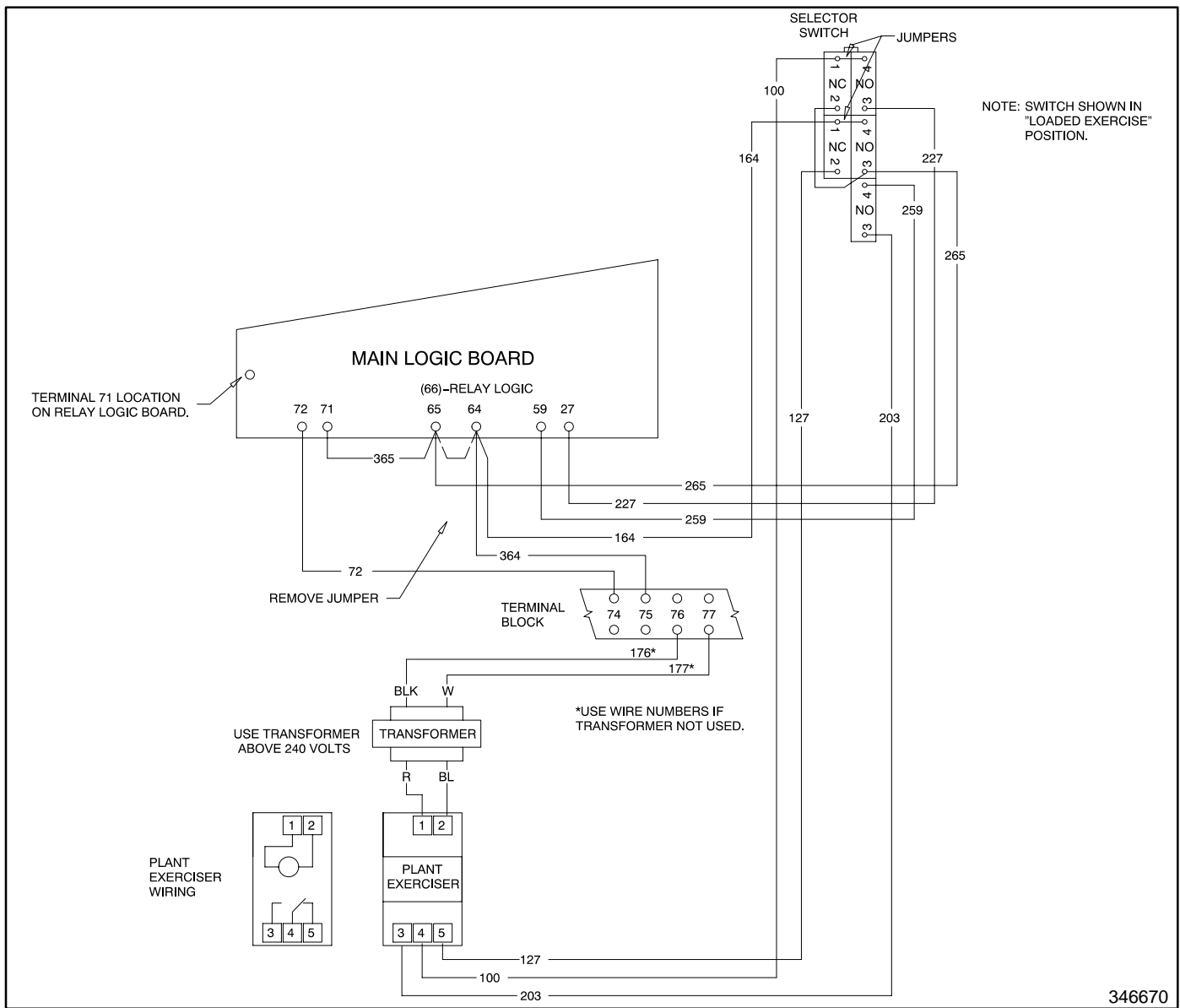


**Figure 5. Wiring Diagram for kits PA-346655 to PA-346659 and PA-346655-SD to PA-346659-SD**

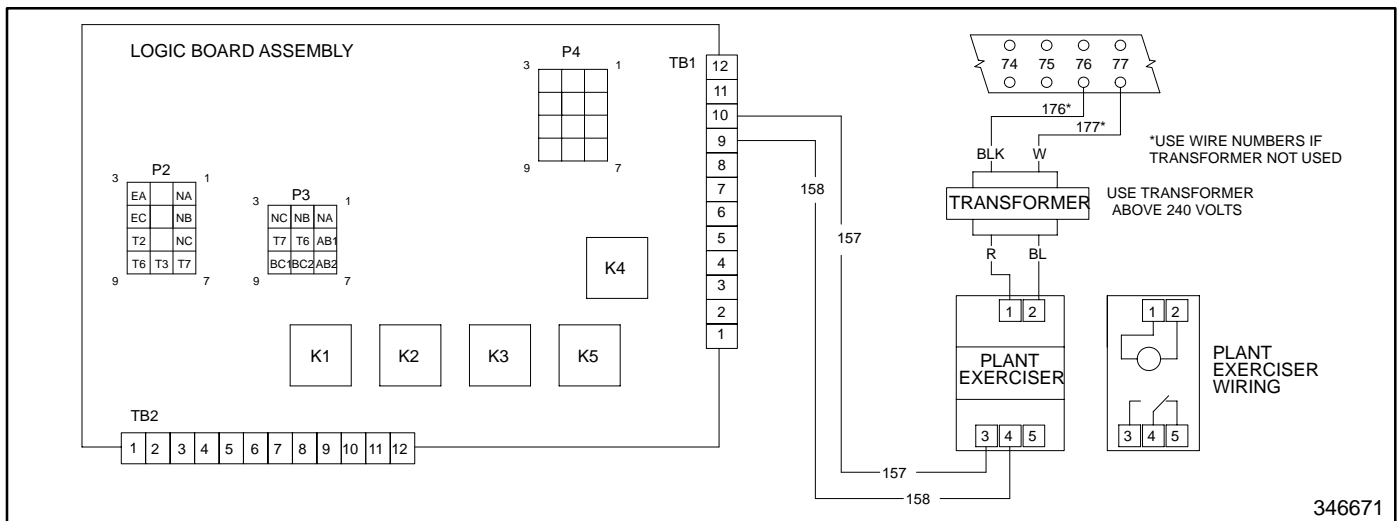


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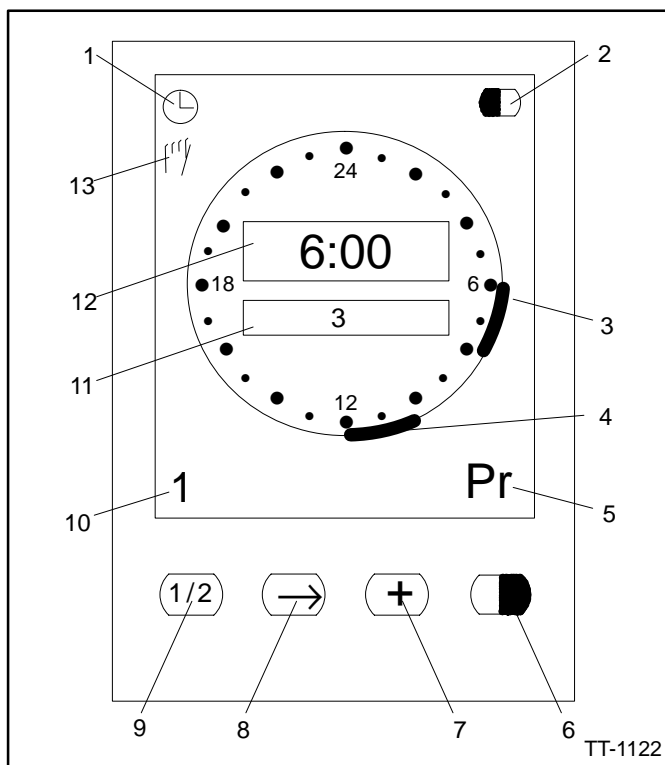
Figure 6. Wiring Diagram for kits PA-346660 to PA-346668, and PA-346660-SD to PA-346668-SD



**Figure 7. Wiring Diagram for kits PA-346661 to PA-346669 and PA-346661-SD to PA-346669-SD**



**Figure 8. Wiring Diagram for kits PA-346674 to PA-346678 and PA-346674-SD to PA-346678-SD**



1. Blinking clock symbol = set time of day  
Constant clock symbol = time switch running
2. State of output contact, half shaded = on, no shading = off
3. Segment display of first program, 1 segment = 15 min.
4. Segment display of second program, 4 programs per day max
5. Symbol of program input or interrogation
6. Set button stores the programs to memory. Also used to override program
7. Plus button increments time for programming
8. Arrow button changes from day to hour:minute. Copy start and shutdown times from one day to the next
9. Week button alternates between week one and week two
10. Displays week one or week two
11. Actual day of the week or program day
12. Real time, set start time or set shutdown time
13. Hand symbol—blinking = continuous manual operating  
constant = manual override

**Figure 9. Exercise Timer**

## Operation

### Resetting the Clock

1. Lift bottom flap of timer front cover to open.
2. Simultaneously press and hold the ARROW (→), PLUS (+), and SET (◐) buttons for 10 seconds.
3. Continue to depress the ARROW (→) button and simultaneously release the PLUS (+) and SET (◐) buttons.
4. Release the ARROW (→) button when all segments of the LCD display appear. See Figure 9.


### Initial Setup (Time and Date)

Use the following procedure to set the current date and time.

1. Press the ARROW (→) button once. The clock symbol and the program day flash.
2. Press and release the PLUS (+) button until the current day of the week displays. Monday is day 1, Sunday is day 7.
3. Press the ARROW (→) button once when the current day displays.
4. To increase the hour, press and release the PLUS (+) button. Press the ARROW (→) button once to enter the hour. Timer runs from 1 to 24 hours, not am/pm.
5. To set the minute press and release the PLUS (+) button to increase the display until the correct minute displays. Hold the PLUS (+) button to increase the minutes by 5.
6. To enter the minute press the ARROW (→) button once. After the minute has been entered PR (program) flashes on the exerciser's display, and the number 1 in the display's lower left corner indicates the week.

### Programming the Plant Exercise and Shutdown Times

7. To advance to the desired exercise day press and release the ARROW (→) button. If the exercise day is in week 2 proceed to step 7a.
  - a. Press and release the ARROW (→) button to advance to day 7.
  - b. Press the ARROW (→) button once.
  - c. Press the WEEK (1/2) button once. The number 2 in the display's lower left corner indicates the week.
  - d. Press and release the ARROW (→) button four times to advance to the desired exercise day.
8. Press or hold the PLUS (+) button to set the exercise start time.
9. Press the SET (◐) button to save the exercise start time.
10. To set the exercise shutdown time, press or hold the PLUS (+) button. Bar segments fill the display to identify the start time.
11. To save the exercise shutdown time press the SET (◐) button.
12. To advance to the next exercise day press the ARROW (→) key.
13. The timer copies the start and shutdown time from the previous day to the following day. To clear the setting if the exercise start and shutdown times are

different or do not apply to the current day press the PLUS (+) and SET (  ) buttons simultaneously.

14. To continue filling the desired schedule for succeeding days as described in steps 8-11 press the ARROW (→) key.
15. When day 7 of week 1 or week 2 displays, the timer is ready to run the program. Press the ARROW (→) button once.
16. The program is complete and ready to run when the clock icon is in the upper left corner of the exerciser's display.

## Resetting the Time

Use the following procedure to reset the time.


1. Perform Initial Setup steps 1 to 5.
2. Press and release the ARROW (→) button eight times until the clock icon appears.

## Reviewing the Program

Continue to press and release the ARROW (→) button to review the programmed start and shutdown times.



## Modifying an Existing Program

Use one of the following procedures to reprogram a previously entered program.

1. Reprogramming procedure 1.
  - a. Press the WEEK (1/2) button to choose week 1 or week 2.
  - b. Press the ARROW (→) key four times.
  - c. Perform the procedure listed under Programming the Plant Exercise and Shutdown Times.
  - d. Cancel the entered program for every day by pressing the PLUS (+) and SET (  ) buttons simultaneously.
  - e. Enter the new program for every day.
2. Reprogramming procedure 2.
  - a. Reset the clock as described under Resetting the Clock.
  - b. Perform the steps listed under Initial Setup.






## Manual Override

Use the following procedure to manually override the exercise timer.


1. For manual override, press the SET (  ) button and release once. Relay contacts change state.
2. To end manual override, press and release the SET (  ) button again and relay contacts change state. If manual override is not ended, the timer automatically continues with the program at the next preset on or off time.

## Continuous Manual Operation

Use the following steps for continuous manual operation.

1. Press the SET (  ) button for two seconds until the hand icon (  ) flashes.  
  
If the display set symbol (  ) is on, the segmented display shows. If the display set symbol (  ) is off, the segmented display does not show.
2. Press the SET (  ) button once if the display set symbol is off.

## Ending Continuous Manual Operation

Press the SET (  ) button for two seconds until the clock icon appears in the display.



### Plant Exerciser Kits

Parts List				
Kits: PA-346650, PA-346650-SD, PA-346651, PA-346651-SD			Unique Parts	
Qty.	Description	Common Parts	PA-346650 PA-346650-SD	PA-346651 PA-346651-SD
2	Washer, plain	X-25-48	346647	346648
2	Screw, r.h.m. 8-32 x .518	X-51-9		
1	Track	294622		
1	Plate, mounting	294627		
2	Nut, captive	298811		
1	Clock, timer			
1	Lead	T227-1811-505		
1	Lead	T259-1811-505		

### Plant Exerciser Kits

Parts List				
Kits: PA-346655, PA-346655-SD, PA-346656, PA-346656-SD			Unique Parts	
Qty.	Description	Common Parts	PA-346655 PA-346655-SD	PA-346656 PA-346656-SD
2	Washer, plain	X-25-48	346647	346648
2	Screw, r.h.m. 8-32 x .518	X-51-9		
1	Track	294622		
1	Plate, mounting	294627		
2	Nut, captive	298811		
1	Clock, timer			
1	Lead	TO65-1804-505		
1	Lead	TO71-1815-505		
1	Lead	TO72-1809-505		
1	Lead	T176-1811-505		
1	Lead	T177-1811-505		
1	Lead	T264-1813-505		

### Plant Exerciser Kits

Parts List				
Kits: PA-346660, PA-346660-SD, PA-346662, PA-346662-SD			Unique Parts	
Qty.	Description	Common Parts	PA-346660 PA-346660-SD	PA-346662 PA-346662-SD
2	Washer, plain	X-25-48	346647	346648
2	Screw, r.h.m. 8-32 x .518	X-51-9		
1	Track	294622		
1	Plate, mounting	294627		
1	Switch, selector	295322		
2	Nut, captive	298811		
1	Clock, timer			
1	Lead	T100-1828-2205		
1	Lead	T127-1828-2205		
1	Lead	T164-1821-2205		
1	Lead	T172-1809-505		
1	Lead	T176-1811-505		
1	Lead	T177-1811-505		
1	Lead	T203-1828-2205		
1	Lead	T205-1804-2222		
1	Lead	T227-1819-2205		
1	Lead	T259-1819-2205		
1	Lead	T265-1821-2205		
1	Lead	T364-1808-505		
1	Lead	T365-1808-505		

## Plant Exerciser Kits

Parts List				
Kits: PA-346661, PA-346661-SD, PA-346663, PA-346663-SD			Unique Parts	
Qty.	Description	Common Parts	PA-346661 PA-346661-SD	PA-346663 PA-346663-SD
2	Washer, plain	X-25-48		
2	Screw, r.h.m. 8-32 x .518	X-51-9		
1	Track	294622		
1	Plate, mounting	294627		
1	Switch, operator	298039		
2	Block, contact	298051		
1	Block, contact	298052		
1	Contact, assembly	298054		
2	Nut, captive	298811		
1	Clock, timer		346647	346648
1	Lead	T100-1828-505		
1	Lead	T127-1828-505		
1	Lead	T164-1821-505		
1	Lead	T172-1809-505		
1	Lead	T176-1811-505		
1	Lead	T177-1811-505		
1	Lead	T203-1828-505		
1	Lead	T205-1804-505		
1	Lead	T227-1819-505		
1	Lead	T259-1819-505		
1	Lead	T265-1821-505		
1	Lead	T364-1808-505		
1	Lead	T365-1808-505		

## Plant Exerciser Kits

Parts List					
Kits: PA-346657, PA-346657-SD, PA-346658, PA-346658-SD, PA-346659, PA-346659-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346657 PA-346657-SD	PA-346658 PA-346658-SD	PA-346659 PA-346659-SD
2	Washer, lock #8		X-22-7	X-22-7	X-22-7
2	Washer, plain	X-25-48			
	Screw, r.h.m. 8-32 x .518		X-51-9 (4)	X-51-9 (4)	X-51-9 (4)
1	Track	294622			
1	Plate, mounting	294627			
	Nut, captive		298811 (4)	298811 (4)	298811 (4)
1	Clock, timer	346647			
1	Transformer		295301	295302	295302
1	Lead	TO65-1804-505			
1	Lead	TO71-1815-505			
1	Lead	TO72-1809-505			
1	Lead	T264-1813-505			

## Plant Exerciser Kits

Parts List					
Kits: PA-346652, PA-346652-SD, PA-346653, PA-346653-SD, PA-346654, PA-346654-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346652 PA-346652-SD	PA-346653 PA-346653-SD	PA-346654 PA-346654-SD
2	Washer, lock #8		X-22-7	X-22-7	X-22-7
2	Washer, plain	X-25-48			
	Screw, r.h.m. 8-32 x .518		X-51-9 (4)	X-51-9 (4)	X-51-9 (4)
1	Track	294622			
1	Plate, mounting	294627			
	Nut, captive		298811 (4)	298811 (4)	298811 (4)
1	Clock, timer	346647			
1	Transformer		295301	295302	295302
1	Lead	T227-1811-505			
1	Lead	T259-1811-505			

## Plant Exerciser Kits

Parts List					
Kits: PA-346664, PA-346664-SD, PA-346666, PA-346666-SD, PA-346668, PA-346668-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346664 PA-346664-SD	PA-346666 PA-346666-SD	PA-346668 PA-346668-SD
2	Washer, lock #8		X-22-7	X-22-7	X-22-7
2	Washer, plain	X-25-48			
	Screw, r.h.m. 8-32 x .518		X-51-9 (4)	X-51-9 (4)	X-51-9 (4)
1	Track	294622			
1	Plate, mounting	294627			
1	Switch, selector	295322			
4	Nut, captive	298811			
1	Clock, timer	346647			
1	Transformer		295301	295302	295299
1	Lead	T100-1828-2205			
1	Lead	T127-1828-2205			
1	Lead	T164-1821-2205			
1	Lead	T172-1809-505			
1	Lead	T203-1828-2205			
1	Lead	T205-1804-2222			
1	Lead	T227-1819-2205			
1	Lead	T259-1819-2205			
1	Lead	T265-1821-2205			
1	Lead	T364-1808-505			
1	Lead	T365-1808-505			

## Plant Exerciser Kits

Parts List					
Kits: PA-346665, PA-346665-SD, PA-346667 PA-346667-SD, PA-346669, PA-346669-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346665 PA-346665-SD	PA-346667 PA-346667-SD	PA-346669 PA-346669-SD
2	Washer, lock #8	X-22-7	X-22-7	X-22-7	X-22-7
2	Washer, plain	X-25-48			
	Screw, r.h.m. 8-32 x .518	X-51-9			
1	Track	294622			
1	Plate, mounting	294627			
1	Switch, operator	298039			
2	Block, contact	298051			
1	Block, contact	298052			
1	Contact, assembly	298054			
4	Nut, captive	298811			
1	Clock, timer	346647			
1	Transformer		295301	295302	295299
1	Lead	T100-1828-505			
1	Lead	T127-1828-505			
1	Lead	T164-1821-505			
1	Lead	T172-1809-505			
1	Lead	T203-1828-505			
1	Lead	T205-1804-505			
1	Lead	T227-1819-505			
1	Lead	T259-1819-505			
1	Lead	T265-1821-505			
1	Lead	T364-1808-505			
1	Lead	T365-1808-505			

## Plant Exerciser Kits

Parts List					
Kits: PA-346674, PA-346674-SD, PA-346675, PA-346675-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346674 PA-346674-SD	PA-346675 PA-346675-SD	PA-346685 PA-346685-SD
2	Washer, plain	X-25-48			
2	Screw, r.h.m. 8-32 x .518	X-51-9			
1	Track	294622			
2	Nut, captive	298811			
1	Clock, timer		346647	346648	346648
1	Lead	T157-1815-505			
1	Lead	T158-1815-505			

## Plant Exerciser Kits

Parts List					
Kits: PA-346676, PA-346676-SD, PA-346677, PA-346677-SD, PA-346678, PA-346678-SD			Unique Parts		
Qty.	Description	Common Parts	PA-346676 PA-346676-SD	PA-346677 PA-346677-SD	PA-346678 PA-346678-SD
2	Washer, lock #8	X-22-7			
2	Washer, plain	X-25-48			
4	Screw, r.h.m. 8-32 x .518	X-51-9			
1	Track	294622			
1	Transformer		295301	295302	295299
4	Nut, captive	298811			
1	Clock, timer	346647			
1	Lead	T157-1815-505			
1	Lead	T158-1815-505			