

# **DOR-O-MATIC<sup>®</sup>**



INSTRUCTIONS FOR INSTALLING AND USING THE

81540-900 MICRO COMPUTER CONTROL BOX

WITH THE

A) 81001 MOTOR GEAR BOX OPERATOR

WITH MICROSWITCHES

OR

B) 81002 MOTOR GEAR BOX OPERATOR.

WITH HALL EFFECT COUNTER -

AND

INSTRUCTIONS FOR INSTALLING AND USING THE

#84540-9XX MICROCOMPUTER CONTROL BOX

WITH THE

#81002 MOTOR GEAR BOX OPERATOR

FOR ASTRO-SWING

## **DOR-O-MATIC<sup>™</sup>**

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## A. INTRODUCTION

The 81540 control box is a microprocessor control box which will eliminate the 81650 series of control boxes. We will begin shipping the new 81540 control boxes with operators which use microswitches and then we will bring out the new operator which uses a Hall Effect Counter which must be used with this control box. We still have a large number of 81650 series control boxes in stock so from time to time you will still be receiving the 81650 series control boxes instead of the new control box with your orders. Eventually we will not be making any more new 81650 series control boxes. Also eventually we will not be making any more new 81001 Astro-Swing operators with microswitches.

The significant features of the new 81540 control box are as follows:

1. Eliminates the need for the 82050-900 Easy Manual Open and Perfect Synchronization Control Box for Simultaneous Pair of Astro-Swing whether being used with the Astro-Swing operator with microswitches or with the Hall Effect Counter. The new control box has an adjustment in it which allows the installer to synchronize the operation of the doors upon installation. The new control box also supplies the "Easy Open" feature at all times unless the Power Boost Close and Power Boost Hold switch is "on".
2. Provides improved reliability due to state-of-the-art electronics and the latest design and manufacturing processes. Because of a new layout the new control box has less wire and solder connections; it also uses a microprocessor unit for logic instead of a series of integrated circuits, all of which results in a more reliable control box than was previously available.
3. A universal control box to meet all the field needs and conditions currently in use as well as those intended for use such as Nova. The new control box can be used with:

- Carpet actuation, carpet safety
- Motion detector actuation, carpet safety
- Motion detector actuation, sensor rail safety
- Sensor rail actuation, sensor rail safety
- Push plates
- Card readers
- Nova
- etc.

A drawing of the new 81540 control box illustrating the switches and functions appears in Fig. 1 at the right.

# 81540 MICRO PROCESSOR  
CONTROL BOX

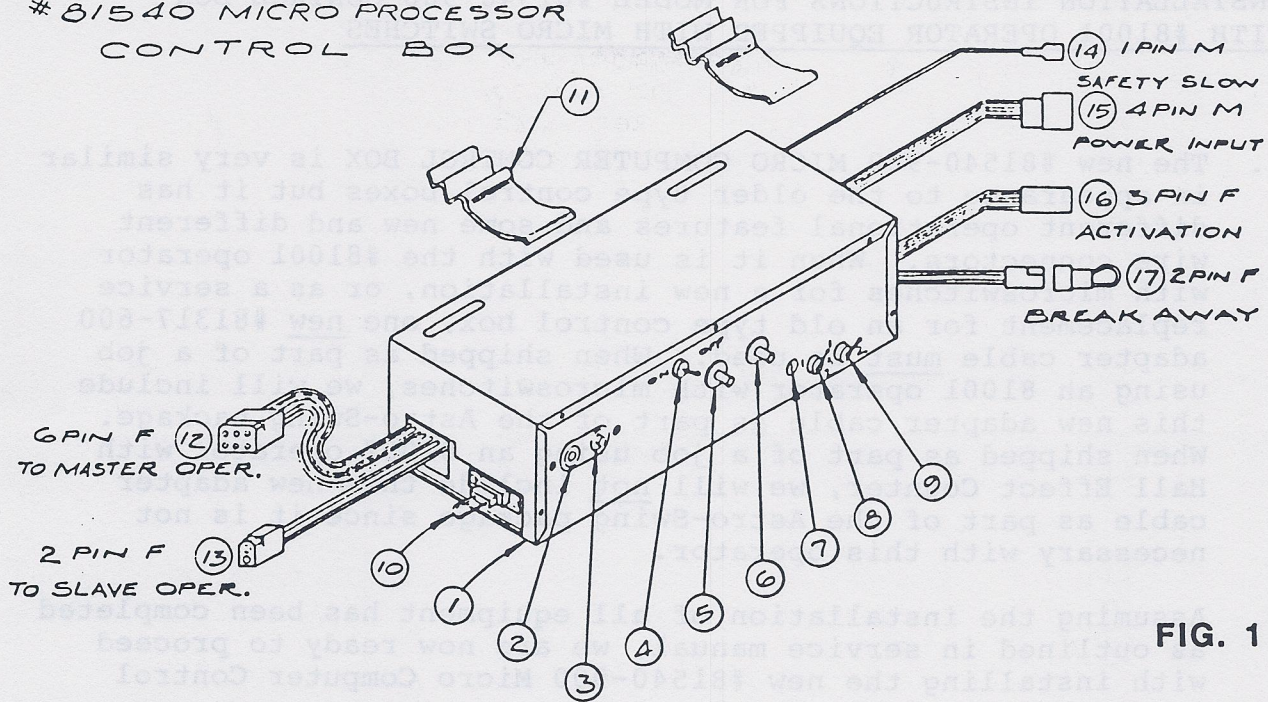


FIG. 1

- ① CONTROL BOX # 81540-900 - 115V  
CONTROL BOX # 81540-991 - 230V
- ② FUSE 6A I. B. FOR 115V  
FUSE 3A I. B. FOR 230V
- ③ CIRCUIT BREAKER 2 AMP
- ④ POWER BOOST CLOSE & POWER BOOST HOLD SWITCH
- ⑤ CLOSING SPEED ADJUSTMENT-FOR MASTER OPERATOR
- ⑥ CLOSING SPEED ADJUSTMENT-FOR SLAVE OPERATOR
- ⑦ TIME DELAY ADJUSTMENT - 1/2 SEC. TO 30 SEC.
- ⑧ OPENING SPEED ADJUSTMENT #1 FAST, #2 MED, #3 SLOW
- ⑨ BACK CHECK SPEED ADJUSTMENT #1-ONE DOOR, #2-TWO DOORS
- ⑩ LOGIC PLUG:
  - 1. PLUG MUST BE INSTALLED WHEN CONTROL BOX IS USED WITH # 81001 OPERATOR WITH MICRO SWITCHES
  - 2. REMOVE PLUG IF BOX IS USED WITH # 81002 OPERATOR WITHOUT MICRO SWITCHES
- ⑪ CONTROL BOX MOUNTING CLIPS 4 REQ'D.
- ⑫-⑰ SEE NOTATION ON ILLUSTRATION ABOVE

B. INSTALLATION INSTRUCTIONS FOR MODEL #81540-900 CONTROL BOX WITH #81001 OPERATOR EQUIPPED WITH MICRO SWITCHES

1. The new #81540-900 MICRO COMPUTER CONTROL BOX is very similar in appearance to the older type control boxes but it has different operational features and some new and different wire connectors. When it is used with the #81001 operator with microswitches for a new installation, or as a service replacement for an old type control box, one new #81317-600 adapter cable must be used. When shipped as part of a job using an 81001 operator with microswitches, we will include this new adapter cable as part of the Astro-Swing package. When shipped as part of a job using an 81002 operator with Hall Effect Counter, we will not include this new adapter cable as part of the Astro-Swing package since it is not necessary with this operator.
2. Assuming the installation of all equipment has been completed as outlined in service manual, we are now ready to proceed with installing the new #81540-900 Micro Computer Control Box.
3. Before installing the control box in the header make certain the #81327-600 Logic Plug is installed and secured with the (2) #5-40 screws provided. (See Fig. 2)

NOTE:

The Logic Plug must be installed when the control box is used with #81001 operator with micro switches.

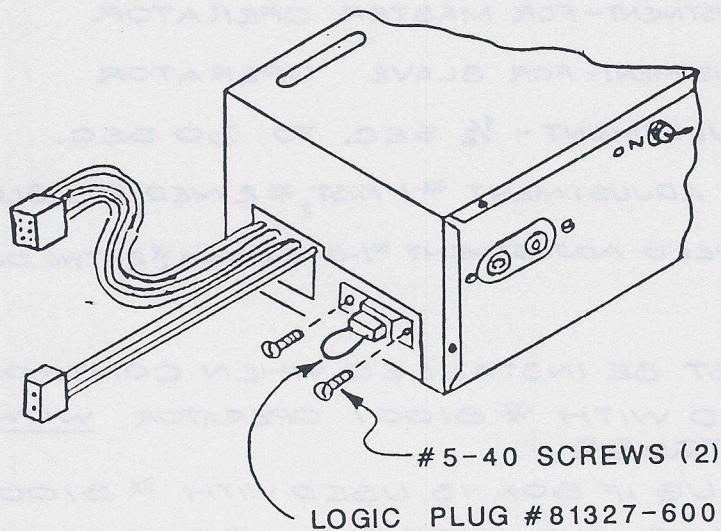


Fig. 2

4. The #81540-900 Box still uses a snap-in type mounting exactly the same as the original. The four spring clips in the header retain the control box in place and no screws are required. (See Fig. 3)

5. The control box should be positioned with the switches pointing down toward the floor and the end with the 6 pin wire connector pointing toward the motor.
6. Visually line up the slots in the side of the control box with the spring clips in the header and push straight up until spring clips snap into place.
7. Gently pull down to assure that all clips are properly seated. Box may be removed by just pulling down harder.

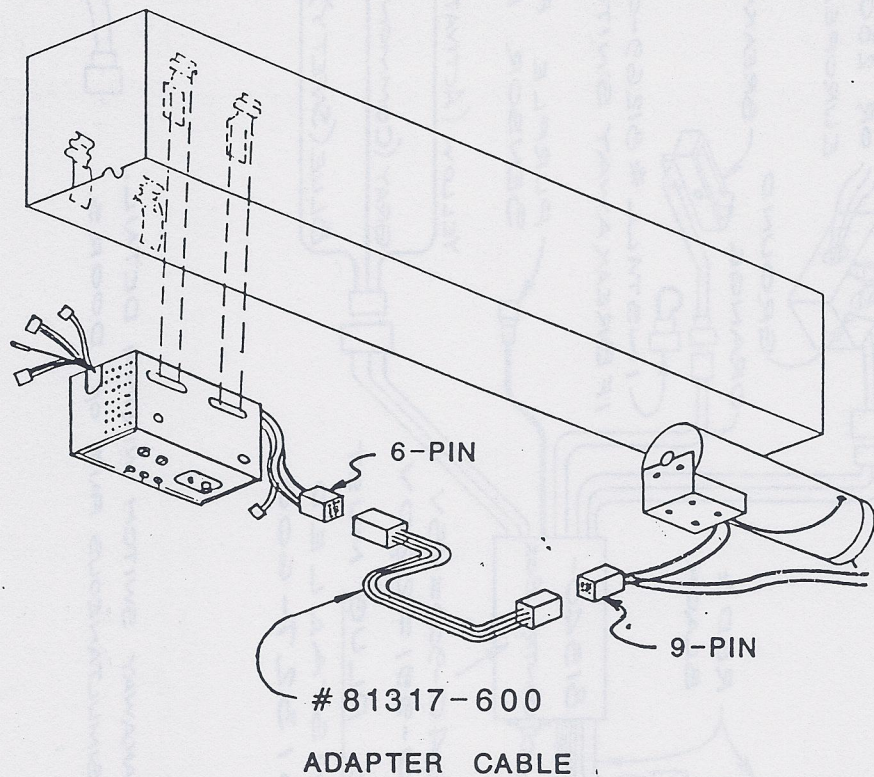
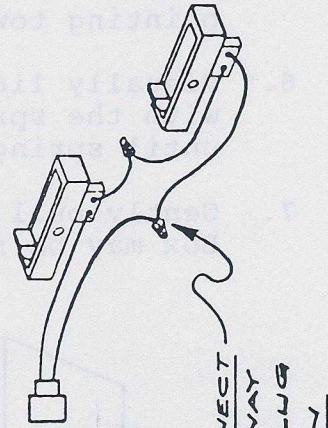
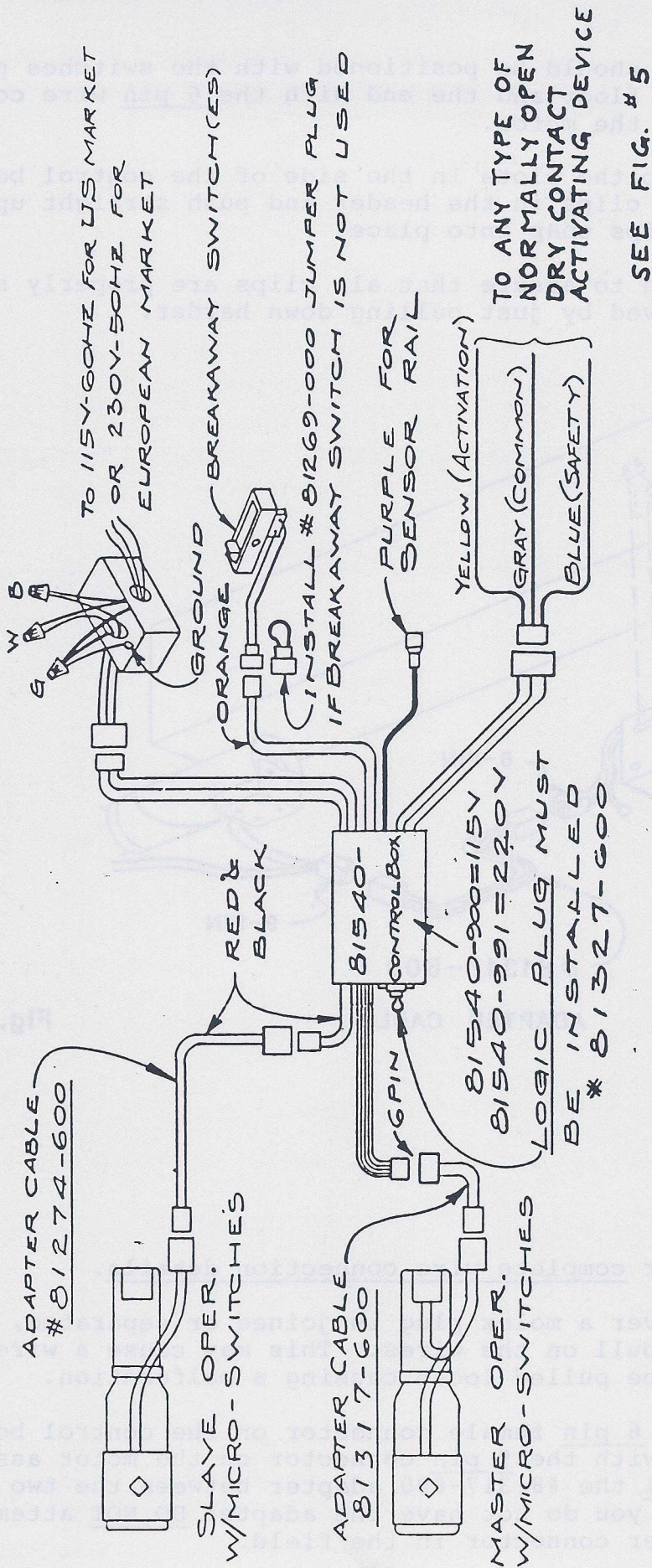


Fig. 3

WIRE CONNECTIONS:

1. (See Fig. 4) for complete wire connection details.
2. Caution: Whenever a molex plug is joined or separated, DO NOT push or pull on the wires. This may cause a wire or terminal to be pulled loose causing a malfunction.
3. Notice that the 6 pin female connector on the control box will not match with the 9 pin connector on the motor assembly. You must install the #81317-600 adapter between the two connectors. If you do not have the adapter DO NOT attempt to re-wire either connector in the field.

WIRE CONNECTION DETAIL



DOUBLE BREAKAWAY SWITCH WIRING DETAIL,  
FOR USE ON SIMULTANEOUS PAIR OF DOORS.

INSTALLER MUST CUT & RECONNECT  
ORANGE WIRES FROM BOTH BREAKAWAY  
SWITCHES TO ONE MOLEX PLUG  
EXACTLY AS SHOWN

Fig. 4

**A. GENERAL**

The #84540-9XX is a continuation of Dor-O-Matic's policy to continually upgrade and improve our products for service and dependability using the latest computer technology.

The #84540 looks and operates very similar to the old #81540 but has the following improvements:

1. Have added a safety sensing circuit to prevent the door from ever becoming completely dead. System no longer requires the main power to be turned off and back on to restart automatic door function after automatic shut down. With new system door can always be restarted by manually pushing the door open 10" to 12" or by reactivating door in normal manner.
2. The breakaway switch circuit has been changed so power is never cut off to the microchip and preventing it from losing its memory. Door no longer has to reset every time it is broken out.
3. Increased the current rating of the relay drive transistor for added reliability.
4. Wind stack relay changed to a different type with a higher contact current rating to prevent contact sticking.
5. Rating of bridge rectifier increased to 10 amp for added surge protection.
6. Added a crystal controlled oscillator to control frequency of the timer. We are no longer dependent on line frequency.
7. Housing length increased by 1".

**B.** The #84540 is now considered our standard model control box and is used with the following activation and safety devices:

Sensor rail activation, sensor rail safety.  
Motion detector activation, carpet safety.  
Motion detector activation, sensor rail safety.  
Carpet activation, carpet safety.  
Push plates.  
Card readers.  
NOVA.  
etc.

A drawing illustrating the control box switches and functions appears in FIG. #1.

\* 84540 MICRO PROCESSOR  
CONTROL BOX

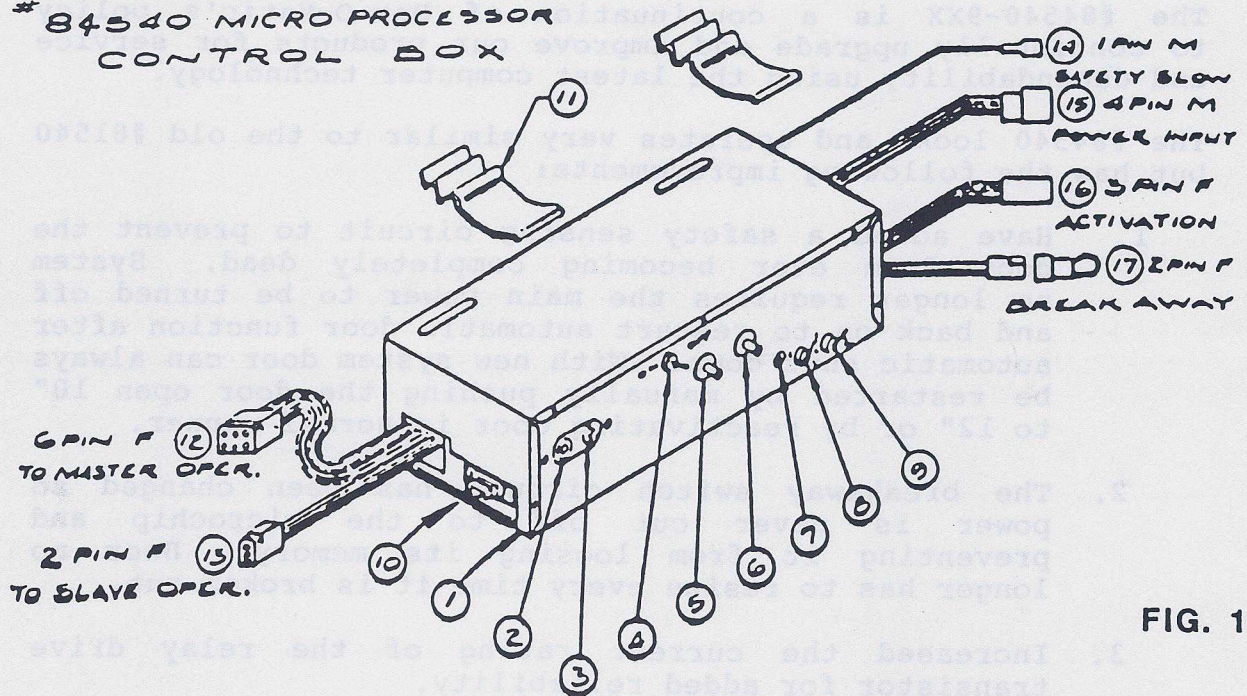


FIG. 1

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- ⑦ TIME DELAY ADJUSTMENT - 1/2 SEC. TO 30 SEC.
- ⑧ OPENING SPEED ADJUSTMENT #1 FAST, #2 MED, #3 SLOW
- ⑨ BACK CHECK SPEED ADJUSTMENT #1-ONE DOOR, #2-TWO DOORS
- ⑩ LOGIC TERMINAL-USED FOR "NOVA"
- ⑪ CONTROL BOX MOUNTING CLIPS 4 REQ'D.
- ⑫-⑰ SEE NOTATION ON ILLUSTRATION ABOVE



C. NOTE

1. The #84540 control box can not be used as a replacement on old type Astro-Swing operators equipped with microswitches.
2. For units with microswitches you must order the #81540-400 and the #81317-600 adapter cable.

D. INSTALLATION INSTRUCTIONS

1. Make sure all power is turned off to operator.
2. Assuming the installation of all other equipment in header has been completed as outlined in the service manual, we are ready to install the #84540 control box.
3. The #84540 control box still uses the snap in spring clip type mounting, but because the new control box is 1" longer, on replacement units, be certain the spring clips line up properly with the slots in the side of the control box. Reposition clips in header if necessary. See FIG. #3.

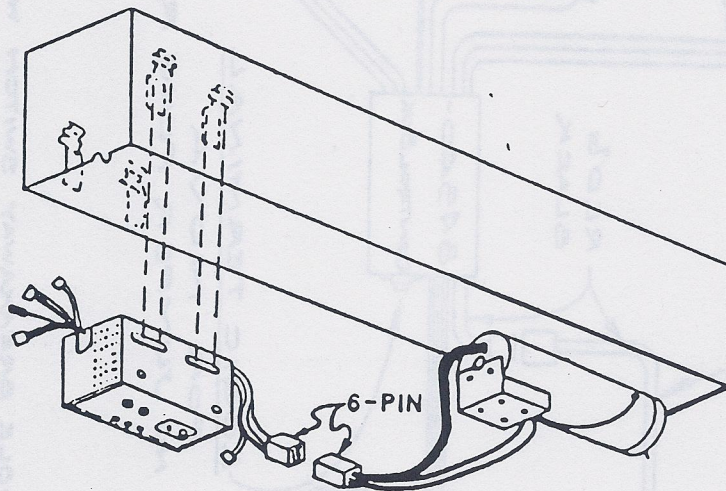
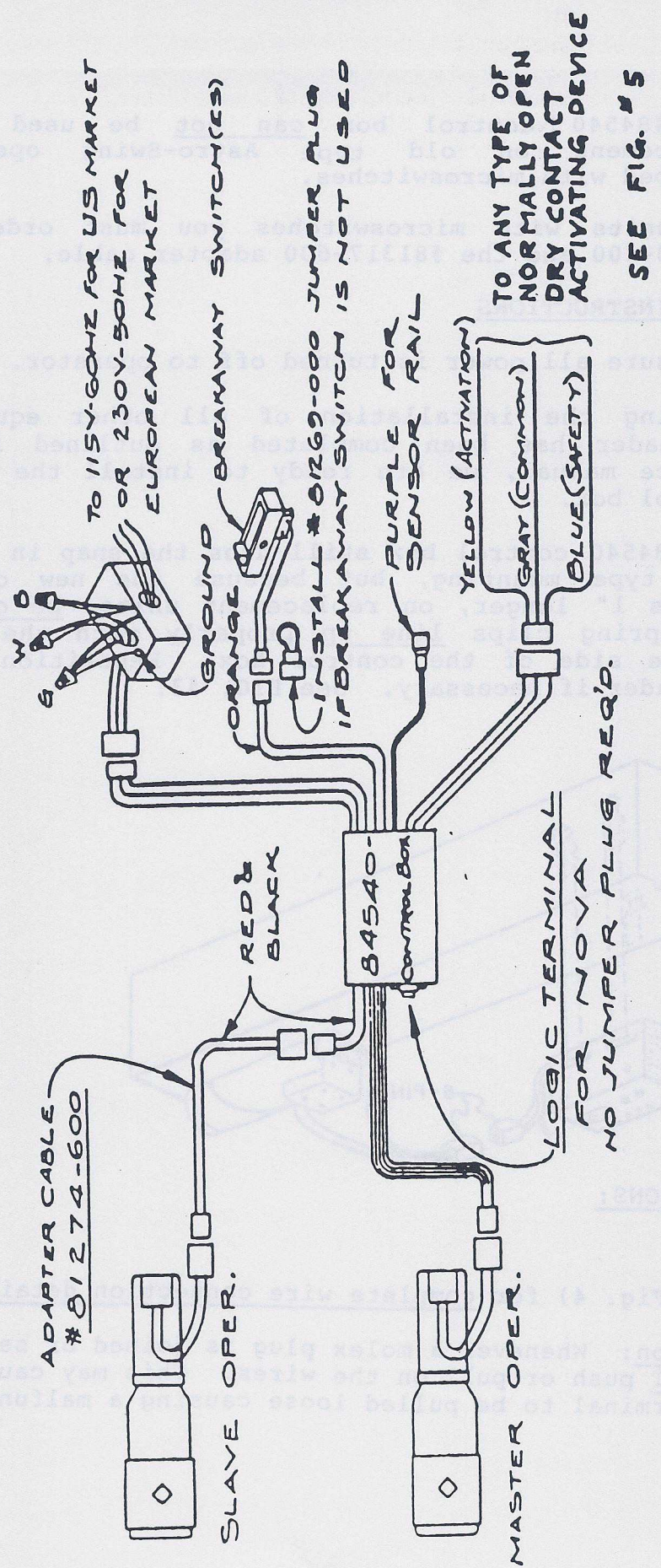


Fig. 3

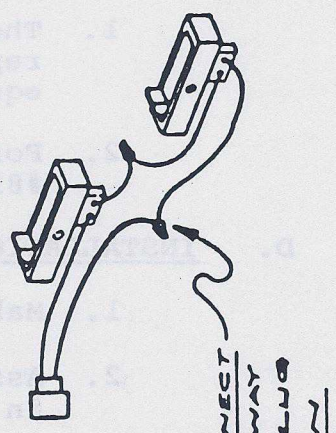
E. WIRE CONNECTIONS:

1. (See Fig. 4) for complete wire connection details.
2. Caution: Whenever a molex plug is joined or separated, DO NOT push or pull on the wires. This may cause a wire or terminal to be pulled loose causing a malfunction.

WIRE CONNECTION DETAIL



DOUBLE BREAKAWAY SWITCH WIRING DETAIL,  
FOR USE ON SIMULTANEOUS PAIR OF DOORS.



INSTALLER MUST CUT & RECONNECT ORANGE WIRES FROM BOTH BREAKAWAY SWITCHES TO ONE MOLEX PLUG EXACTLY AS SHOWN

Fig. 4

3. If installing simultaneous pairs of doors, connect the 2 conductors (red & black) wires to the Slave operator using the #81274-900 adapter cable (automatically shipped with simultaneous pair of doors). If installing a single door the (red & black) wires from the control box are not used.
4. Connect orange wires to breakaway switch for in-swinging center pivoted doors or install orange jumper plug if breakaway switch(es) is (are) not used.
5. The single purple wire is used only with a sensor rail type activation system.
6. Connect all activation and safety devices to the (yellow, blue & gray) wires only. (See Fig. 5)

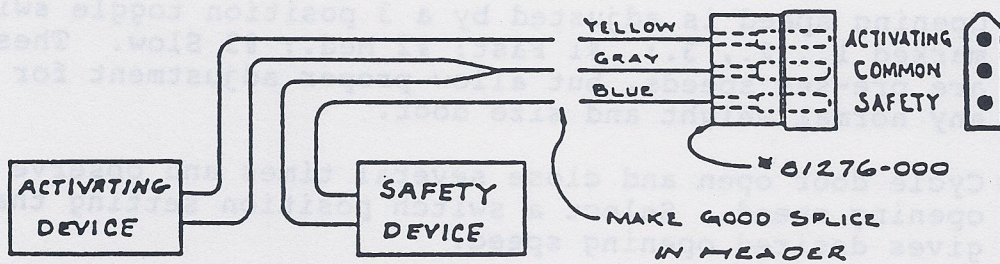


Fig. 5

7. Connect the black, white & green wires to the main power input 115V or 230V. (See Fig. 6)

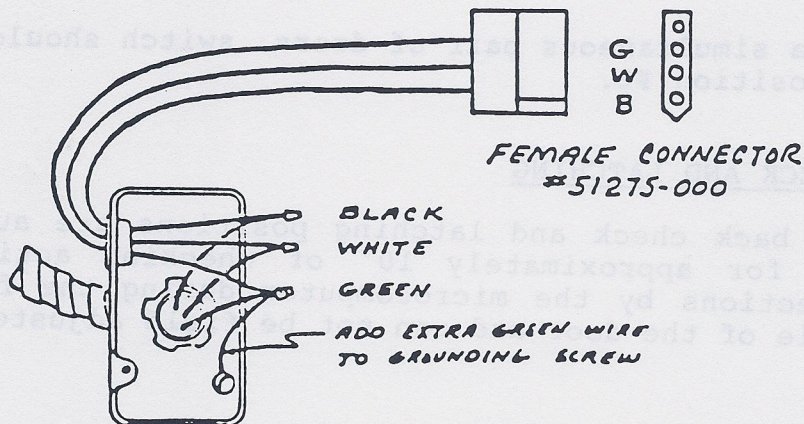


Fig. 6

F. OPERATIONAL CHECKS AND ADJUSTMENTS:

1. Set opening speed switch to position #3 (Slow)
2. Set back check speed switch to position #1 (One Door)
3. Adjust time delay potentiometer approximately 1/8 turn up from minimum.
4. Turn on power to operator.
  - a. Door should cycle open and close one time, then is ready for normal operation.

5. OPENING SPEED ADJUSTMENT:

- a. Opening speed is adjusted by a 3 position toggle switch marked 1., 2., 3.: #1 Fast; #2 Med.; #3 Slow. These are pre-set speeds, but allow proper adjustment for any normal weight and size door.
- b. Cycle door open and close several times and observe opening speed. Select a switch position setting that gives desired opening speed.

NOTE:

It is recommended that door be operated as slow as practical for the traffic conditions.

6. BACK CHECK SPEED ADJUSTMENT

- a. The back check speed is controlled by a 2 position toggle switch marked #1-One Door and #2-Two Doors.
- b. For any size single door, switch should be set in position #1.
- c. For a simultaneous pair of doors, switch should be set in position #2.

7. BACK CHECK AND LATCHING

- a. The back check and latching positions are automatically set for approximately 10° of checking action in both directions by the microcomputer during the first sizing cycle of the door and can not be field adjusted.

8. CLOSING SPEED ADJUSTMENT:

- a. Continue to cycle door open and close while making adjustments.
- b. You will notice there are two closing speed adjustment potentiometers, one marked "Master" and one marked "Slave". This is so that on simultaneous pairs of doors each leaf can be adjusted separately allowing both doors to close fully at the same time.
- c. On a single door, only the Master potentiometer is used to adjust closing speed. The Slave control has no effect.

9. LATCHING SPEED:

- a. Latching speed is factory set and has no adjustment.

10. TIME DELAY ADJUSTMENT:

- a. TO MEET ANSI AND U.L. STANDARDS THE TOTAL TIME DELAY, INCLUDING ANY DELAY IN THE ACTIVATION AND SAFETY DEVICES, MUST BE ADJUSTED TO HOLD THE DOOR OPEN FOR A MINIMUM OF 1½ SECONDS AFTER BOTH ACTIVATION AND SAFETY ZONES ARE CLEAR.
- b. Adjustment is made with a small screwdriver inserted through the hole in the control box housing marked "TIME DELAY". Clockwise rotation of potentiometer increases the time delay period. The total adjustment range on the control box itself is ¼ to 30 seconds of time delay.

11. POWER BOOST CLOSE AND POWER BOOST HOLD FEATURES:

- a. This is a built in feature that can be turned on or off with a 2 position toggle switch.
- b. It is used to electronically increase the closing force of the door from 9 lbs. to 18 lbs. in order to close and hold the door closed against high winds or high stack pressure.
- c. When the power boost close feature is turned on, the automatic increase in power occurs approximately 7 seconds after the door has closed to the latch position which is approximately 10° before the door is fully closed. The power boost feature will not turn on during the normal closing portion of the door cycle which is approximately the first 80° of the closing door travel.

12. OPERATIONAL WALK-THROUGH TEST.

NOTE: It is assumed that during the installation process any problems would have been found and corrected before this point. However, it is recommended that a complete walk-through test now be performed.

- a. Opening and holding function: Normally walk up to door and step in activating area. Door should open smoothly and silently to the back check point where it should slow down rapidly and drift into full 90° open without slamming.
- b. Remain standing in activating area for awhile making sure that door will not time out and close while being activated.
- c. Step on through door opening and into safety area. Again remain in safety area making sure that door will not close while safety area is activated.
- d. Step out of safety area. After both activating and safety area are clear the door should time out at the pre-set time delay period. Door should close quietly and smoothly to the latch point, where it rapidly slows down and slowly drifts into the fully closed position without slamming.
- e. Safety function with door closed. Step back in safety area, have someone else then step in activating area, door must not open.
- f. Have other person step out of activating area. Door should stand open until end of time delay cycle and then close as before.

13. RELEASE OF ASTRO-SWING SYSTEM FOR SERVICE:

- a. Remove all tools and installation equipment and clean any debris from vicinity of door.
- b. Install all safety, traffic control, and instruction decals to door as required.

This is very important! Failure to do this leaves the installer LIABLE for any accident that might occur.  
THIS MUST BE DONE.

- c. Verbally explain the proper operation of the door system to the owner or person in charge.
- d. Install the dress plates in the header.

- END -