



## Contents

### I. Controls

1-1 System components	1
1-1A versions C1 & C2	2
1-2 Motor wiring harness connections	3
1-3 Extend and retract switch connections	3
1-4 Power to board	4
1-5 Board overview	4
1-6 Manual mode -jog	5
1-7 Manual mode -stall force calibration	5
1-8 Error codes	5
1-9 Motor direction switches	7
1-10 System schematic	7

### II. Motors

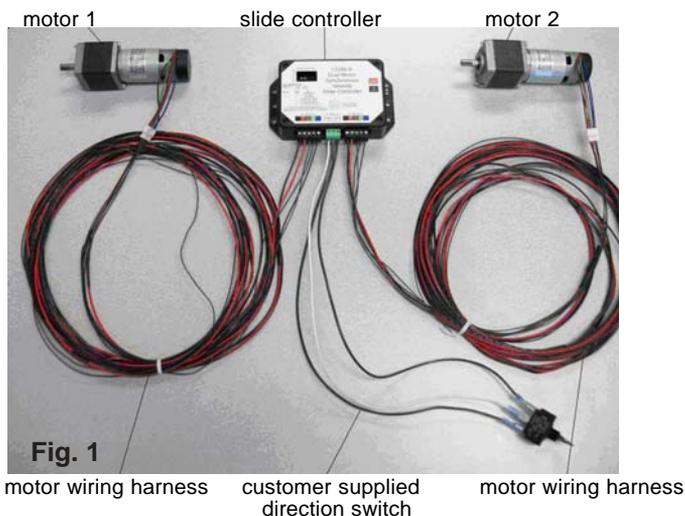
2-1 Manual override	8
2-2 Motor disengagement	8
2-3 Motor replacement	10
2-4 Slide mechanism replacement	13

### III. Troubleshooting

3-1 Trouble shooting flow chart	15
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## I. CONTROLS - VERSIONS B & C

### 1-1 System components



**REV-C Motor**



**REV-C Controller**

Rev-C motor and Controller components install exactly as Rev-B. However, Rev-B components are not to be used with Rev-C components. Rev-B components are shown in Fig. 1.

## I. CONTROLS - VERSIONS C1 & C2



Version C1 maintains the same motor harness connector to the controller as in version C. However, the connector at the motor has been insulated with a new molded shield to protect against external damage.



Version C2 motor harnesses have molex connectors at the controller and the molded connector at the motor end.

### 1-1A CONTROLLER VERSIONS C1 & C2

New control configurations for version C1 & C2, see below:

#### 1-1A.1 CONFIGURATION

1. Press button 2x and hold 3rd for 5 seconds to enter manual mode.
2. Press button 4x and hold 5<sup>th</sup> for 5 seconds to enter stall threshold calibration mode.
3. Press button 6x and hold 7<sup>th</sup> for 5 seconds to Override mode.

#### 1-1A.2 MANUAL MODE

1. Green Led blinks once, wall switch controls motor 1.
2. Press button, Green Led blinks twice, wall switch controls motor 2.
3. Press button, Green Led solid, wall switch controls motor 1 and 2.
4. Press and hold button to exit.

#### 1-1A.3 STALL THRESHOLD CALIBRATION MODE

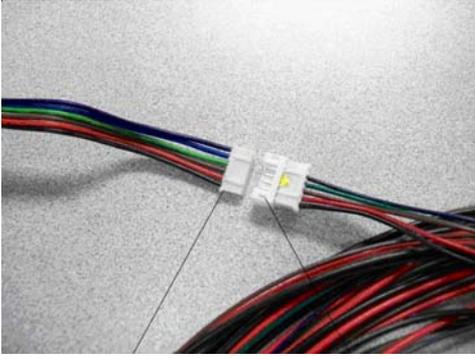
1. Use Pot to turn stall threshold up/down.
2. Press button to save and exit.

#### 1-1A.4 OVERRIDE MODE

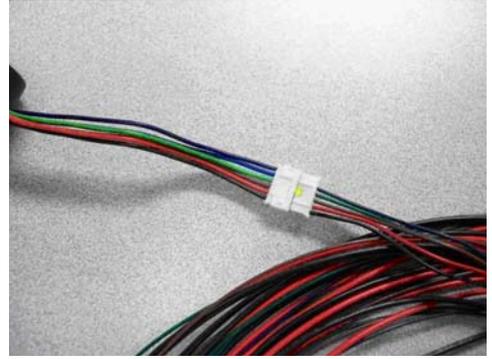
1. Use the extend/retract switch to move both motors in/out all pulse counting, and stall are disabled in this mode.
2. Over-current and short circuit detection are still active to help prevent damage to the board.
3. To exit the mode, push and hold the push button switch until the LEDs begin to blink simultaneously.

Exiting the override mode resets the motor positions.

## 1-2 Motor wiring harness connections



motor wires      motor connector-wiring harness



Correctly connected motor

**NOTE:** Ribs on motor connector line up with notch in side of male connector on wiring harness.  
Color codes on wires also match (black to black, red to red, etc.).



Motor connection at board

Wire colors match with color codes on control board.

Note: It doesn't matter which motor is 1 or 2.

## 1-3 Extend and retract switch connections **NOTE:** Direction control switch (customer supplied)

Common connection on control board goes to common connection on extend and retract switch. (The board supplies +12vdc to this terminal for switching) The ext and ret connections on the control board go to the extend and retract terminals on the switch.



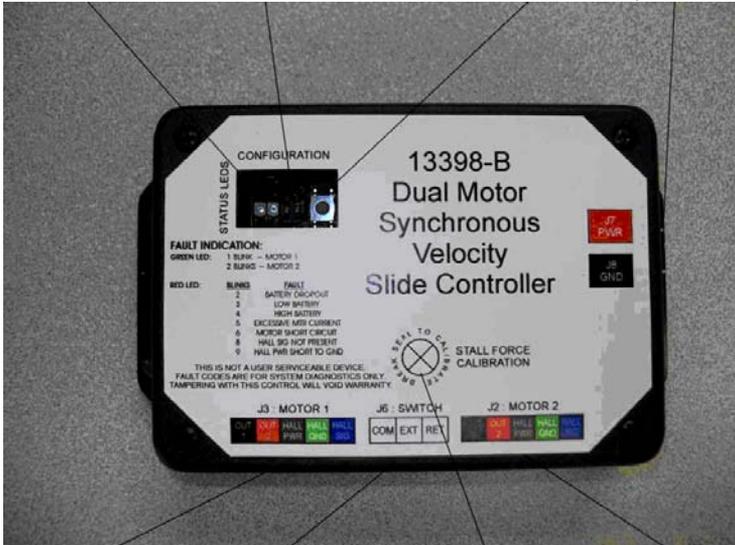
## 1-4 Power to board



¼ spade terminals are provided for power into the board. (Voltage range 8vdc to 18vdc). 12 vdc is recommended. Lower voltages reduce available power to room slide. 10ga wire is the minimum size recommended.

## 1-5 Board overview

status led's      motor direction      switches mode button      power connection



motor 1 connector      direction switch      stall calibration      motor 2 connector

- Status led's** - 2 led's, 1 green and 1 red, are provided to indicate current controller status and faults.
- Motor direction switches** - Used to change direction of motors, 2 are provided, 1 for each motor.
- Mode button** - Places controller in manual mode, for jogging individual motors. Places controller in calibration mode, where stall current can be increased or decreased or returns controller to auto mode.
- Power source** - 12 volt dc input. Unit will operate from 8 volts dc to 18 volts dc.
- Motor 1 connector** - Power and encoder input for motor 1.
- Direction switch connector** - Provides input from customer supplied extend and retract switch.
- Stall calibration** - Allows for adjustment of stall force.
- Motor 2 connector** - Power and encoder input for motor 2.

## 1-6 Manual mode -Jog

Press mode button 2 times quickly, press a 3<sup>rd</sup> time and hold for approximately 5 seconds. The green led will flash on and off. Manual mode now active for motor #1. Using the extend and retract switch, motor 1 can be jogged manually.

Press the mode button 1 more time and the green led will flash on and off. Manual mode is now switched to motor #2. The extend and retract switch will now jog motor #2.

When both motors have been jogged to the desired position, exit manual mode by pressing and holding the mode button until both red and green led's start to flash. The control is now back in auto mode.

### 1-6.2 Units with the C1 board "electronic" manual override.

In the event of *any fault code*, the unit can be manually overridden electronically using these steps:

1. Locate the circuit board
2. Press the "mode button" six times quickly, press a 7th time and hold for approximately 5 seconds.
3. The red and green LED lights will begin to flash indicating you are in override mode
4. Using the wall switch, press and hold the "in" button until the unit comes completely in.

#### **Caution!**

**During this override procedure the motors are not synchronized. Visually watch the room, if one side is moving significantly slower than the other (or not at all) then immediately stop and use the "motor disengagement" override method.**

## 1-7 Stall force calibration

If the system stalls out before reaching end of stroke, or if the room doesn't seal as tightly as desired, then stall force may be increased.

#### **\*\*\*CAUTION\*\*\***

IF ROOM STALLS MID STROKE, MAKE SURE THAT THERE ARE NO OBJECTS IN THE WAY, OR THAT SOMETHING HAS BEEN PULLED INTO THE SYSTEM, CAUSING RESTRICTED MOVEMENT. ALSO CHECK SYSTEM VOLTAGE. EVEN THOUGH THE SYSTEM CAN RUN ON AS LITTLE AS 8VDC, THE FORCE AVAILABLE TO MOVE THE ROOM IS REDUCED ON LOWER VOLTAGE. IF THE ROOM IS FREE OF OBSTRUCTIONS AND VOLTAGE IS SUFFICIENT (12VDC) AND THE SYSTEM STILL STALLS MID STROKE, ONLY THEN SHOULD STALL FORCE BE INCREASED.

Press mode button 4 times quickly, then press a 5<sup>th</sup> time and hold for approximately 5 seconds. The red led will start to flash, flash, flash, ... Break the seal on the cover over the stall force calibration hole. Directly below the sealed hole is a potentiometer. Using a small screwdriver increase the stall force by turning clockwise, turning counter-clockwise will reduce stall force. Once the desired setting has been reached press the mode button and both led's will light up. The board is now back in auto mode.

It is desirable to increase the stall force only enough to insure proper functioning of the room. Increasing the setting beyond the amount needed only shortens system life.

## 1-8 Error codes

During operation when an error occurs the board will use the led's to indicate where the problem exists.

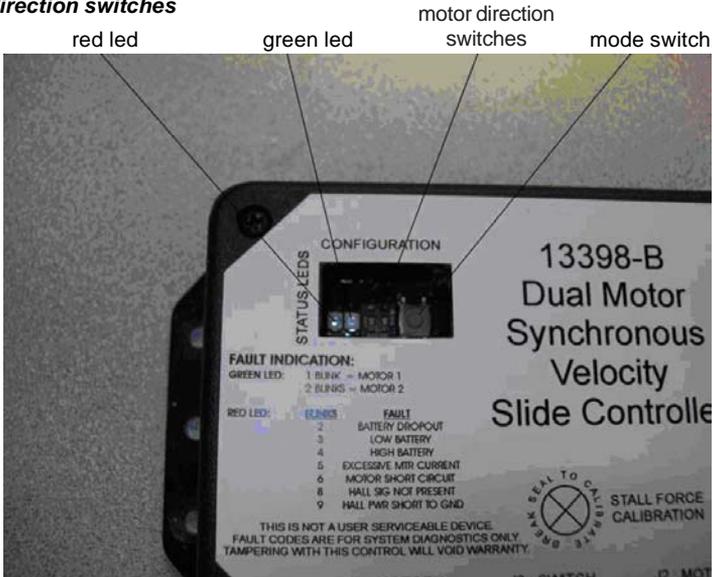
For motor specific faults the green led will blink 1 time for motor 1, and 2 times for motor 2. The red led will blink from 2 to 9 times depending on the error code.

The error codes are as follows:

- 2 Battery drop out: Battery capacity low enough to drop below 6 volts while running
- 3 Low battery: Voltage below 8 volts at start of cycle
- 4 High battery: Voltage greater than 18 volts
- 5 Excessive motor current: High amperage, also indicated by 1 side of slide continually stalling.
- 6 Motor short circuit: Motor or wiring to motor has shorted out.
- 8 Hall signal not present: Encoder is not providing a signal. Usually a wiring problem.
- 9 Hall power short to ground: Power to encoder has been shorted to ground. Usually a wiring problem.

When an error code is present, the board needs to be re-set. Energizing the extend/retract switch resets the board. Energize the extend/retract switch again for normal operation.

## 1-9 Motor direction switches



Motor direction switches are used to change the direction of individual motors. If when trying to extend or retract the room, one side goes in and the other side goes out, then there is a problem in the wiring. The motor direction switches can be used to correct this problem. The left switch controls motor 2 and the right switch controls motor 1. If motor 1 is going in the wrong direction then change switch 1's position. If motor 2 is going in the wrong direction then change switch 2's position.

The motor direction switches can also be used to change the direction of the extend/retract switch. If the room extends when the extend/retract switch is moved to the retract position, it's direction can be reversed by moving both switch 1 and switch 2 to their opposite positions. This feature can be used if it is more convenient to change the motor direction switches than to rewire the extend/retract switch.



## II. Motors

### 2-1 *Manual override*

In the event that the Inwall Slide Unit fails to operate and manual operation is necessary, proceed as follows:

1. Locate the control board.
2. Un-plug both motors.



3. The room may now be pushed in or out as desired. Larger rooms may need several people to push. Try to keep both sides of the room even. When the room is completely in, plug both motors back in to the controller, this applies a brake to the motors and keeps the room locked in position.

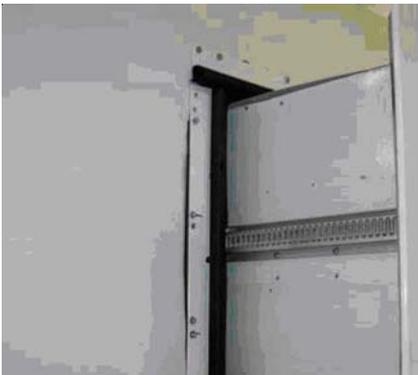
\*\*\*\*\***Do not move the rv unless the motors are plugged in.**\*\*\*\*\*

If you are unable to move the room after following the above procedure, then both motors will need to be disengaged. See 2-2 for details.

### 2-2 *Motor disengagement*

If motors need to be disengaged, follow these steps:

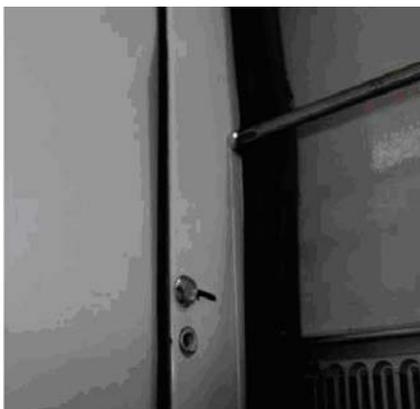
1. On the outside of the room, approximately 2 inches above the top guide rack there is a motor retention screw. Remove this screw.



2. Directly above the rack, pull back the weather stripping to expose the bottom of motor. Insert a screwdriver between the motor and it's mount and pry the motor up.



3. Lift the motor approximately 1 inch, tighten the motor retention screw to hold the motor in it's raised position.



4. The motor is now disengaged. Repeat these steps on the other side of the room. The room should freely move, and can be pushed in or out as desired.

**\*\*\*\*\*Do not move the rv with the motors disengaged.\*\*\*\*\***

5. If the rv needs to be moved, a travel lock will need to be made as follows: With the room closed, cut a board 1 inch longer in length than the distance between the interior stop and the wall. Wedge this board tightly between the wall and stop to lock 1 side of the room. Cut another board to fit the other side of the room and wedge into place. This should lock the room in the retracted position, allowing the rv to be moved.

Alternately several ratchet straps may be used, wrapping completely around the rv, and room, then pulled tight. Depending on the size of the room, straps with a 500 to 1000 pound capacity will be required.

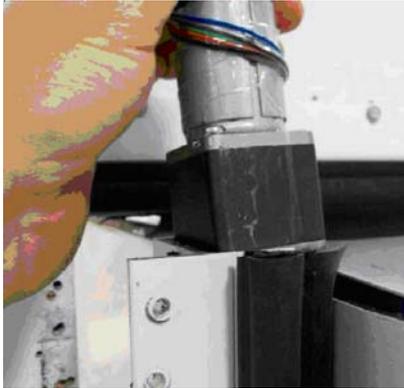


### 2-3 Motor replacement

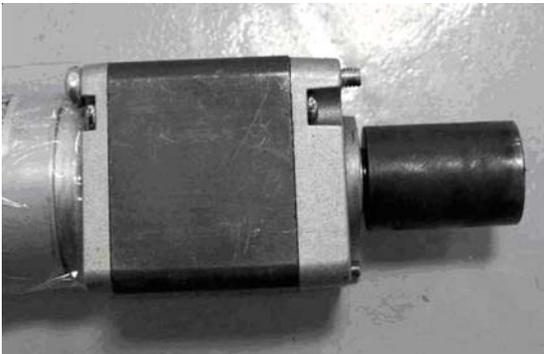
1. If a motor needs replacement follow steps 1 through 4 for motordisengagement.
2. With the motor disengaged place support under the room. Wedges, a jack, or forklift may be used.
3. Once the room is supported, remove the screws retaining the side column to the outside face of the rv.
4. Slightly raise the room to remove any weight from the side column. It is now possible to slide the side column out of the wall, it may be necessary to use a pry bar to start the column moving. Slide the column out until it is past the outside face of the wall.



5. Remove the motor retention screw and lift the motor out the top of the side column.



6. There is a coupler, which connects the motor to the drive mechanism. If the coupler is still attached to the motor, it may be removed with pliers.



If it is still inside the column, proceed as follows:

- a. On the bottom, inside of the column is the opposite end of the drive shaft. Using a piece of wood or brass push the shaft up approximately 1-inch.

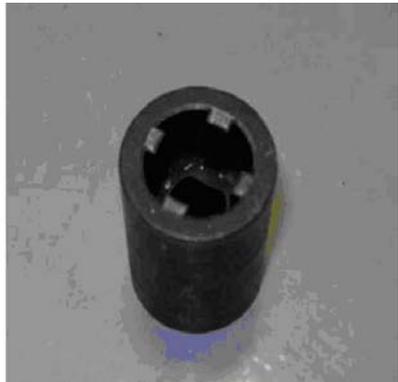
\*\*\*\*\*Do not push shaft up further than 1 ½ inches.\*\*\*\*\*



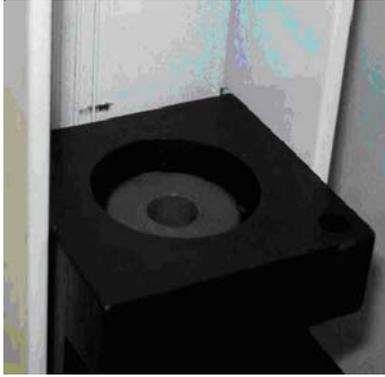
- b. The coupler will be lifted above the motor mount and can be removed with a pair of needle nose pliers or hemostats.



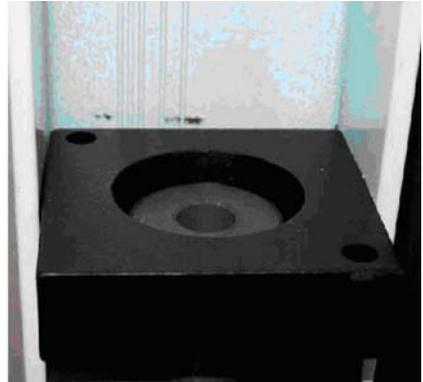
7. The coupler needs to be placed onto the end of the drive shaft, inside the motor mount, at the top end of the column. Note the splines on the drive shaft and motor coupler.



The coupler can be rotated while pushing down, or the side column can be pushed back and forth while pushing down, to engage the splines. The coupler should be pushed down below the top of the motor mount..



8. The motor can now be installed. Insert the motor through the top of the side column. Note the screws protruding from the shaft end of the motor. They enter into the 2 holes in the corners of the motor mount. Pay attention to the orientation of the screws and mating holes.



9. Align the motor shaft with the hole in the coupler, the motor should drop part of the way into the coupler. While pushing down on the motor, slide the side column back and forth on the racks to rotate the coupler and align the coupler flat with the flat on the motor shaft. When the flats line up, the motor will drop down onto the motor mount.



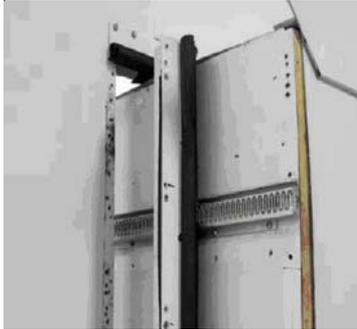
10. Replace the motor retention screw.



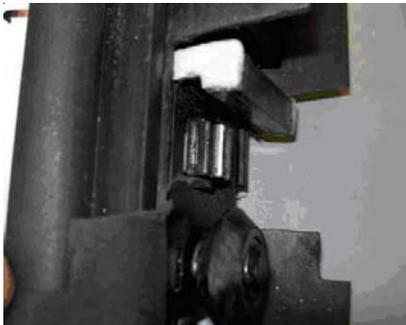
11. Tuck the motor wires inside the side column. The column can be slid back along the racks, and into the opening in the wall. There will be some resistance from the motor.
12. With the side column mounting flange pushed against the outside of the wall, the mounting screws can be replaced.
13. Plug the motor back in.

#### **2-4 Slide mechanism replacement**

1. Follow steps 1 through 4 for motor replacement.
2. With the motor disengaged, and the side column detached from the side wall, remove the exterior T-molding. Slide the side column along the racks towards the outside, until the column separates from the racks.



3. The new side column assembly can now be installed. Remove the motor and re install the coupler. (see 2-3 Motor replacement) This is easier to do before the column assembly is installed.
4. On the side of the column facing towards the room, there is a v-roller, a gear above the roller and a hook, with a plastic shoe, above the gear.



The hook slides into a hook shaped slot on the top edge of the racks. The v-roller fits into a v shaped groove on the bottom edge of the rack. The gear meshes with the rack teeth on the outside face of the rack.



Start the top hook on the side column into the hooked slot on the top gear rack on the side of the room. Start the bottom hook on the side column into the hooked slot on the bottom gear rack on the side of the room. Slide both top and bottom in until the 1 gear tooth is just touching the 1 tooth on the end of both the top and bottom racks. The v-rollers should be close to touching the v shaped slot in the bottom of both racks.



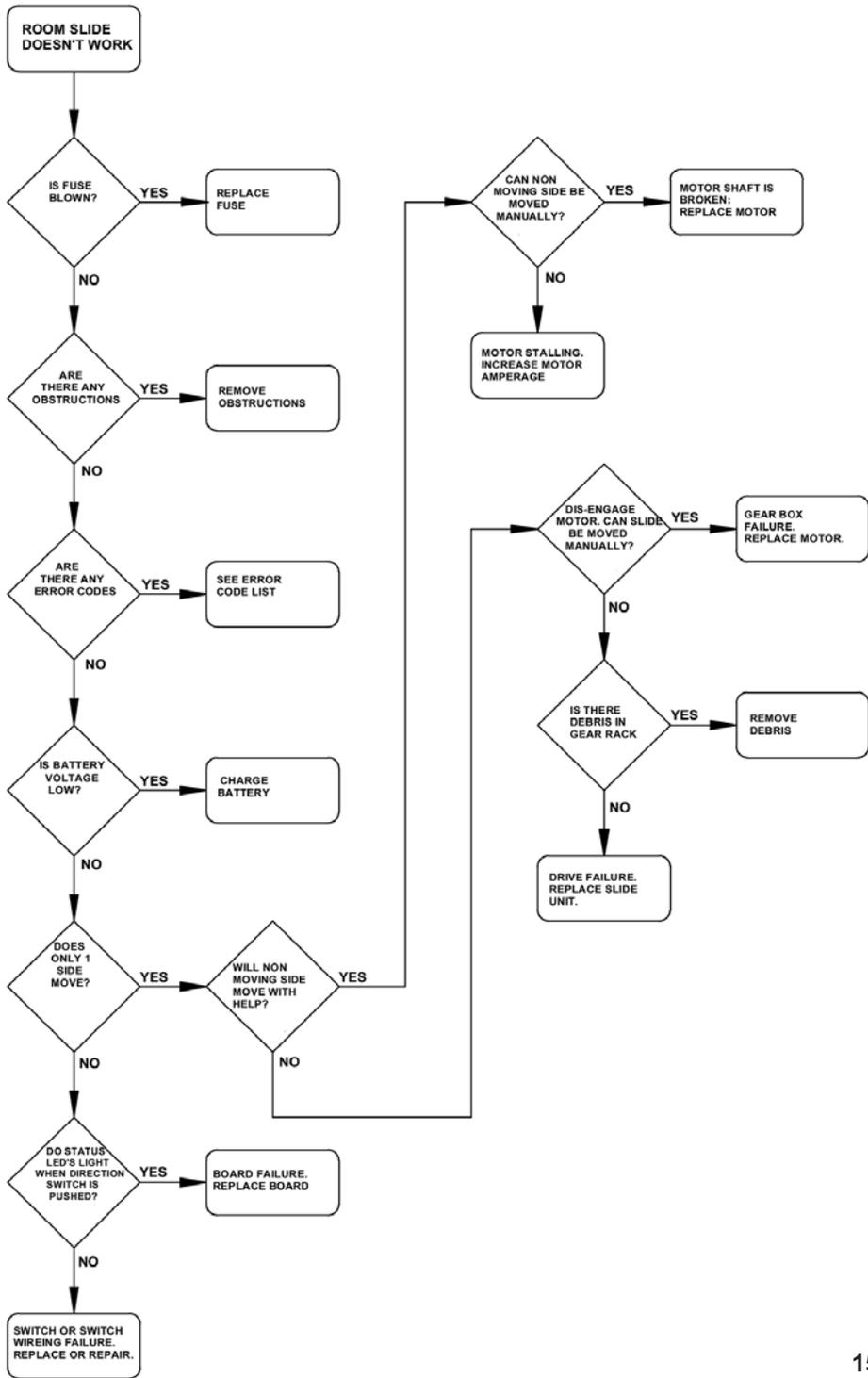
5. Push evenly on both the top and bottom of the side column, engaging the gear teeth into the rack teeth of both top and bottom racks at the same time. Continue to slide the side column onto the racks until the weatherstrip on the front face of the side column is flush with the end of the racks. Both top and bottom racks should come flush at the same time. If the racks are 1 tooth out of time with each other there will be a 3/16 difference in the end position of the racks. If both top and bottom are flush, continue. If both top and bottom are not flush, then pull the side column out to disengage the gears and repeat until both top and bottom gear racks are flush at the same time.



1. Push the side column along the racks until it is close to the outside face of the wall.
2. Follow steps 8 through 13 for motor replacement (Motor replacement 2-3).

### III. Troubleshooting

3-1 Trouble shooting flow chart



### **3-2 Checking Fuses**

The Total Control 1Slide requires a minimum of 30 amp fuse. Check the 12 volt fuse box for blown fuses, and replace any if necessary. Consult the rv manufacturers documentation for the location of the 12 volt fuse box, and the location of the Room Slide Controller's fuse. If the fuse blows immediately upon replacement, there is a problem with the wiring to the Inwall Slide control box. Have qualified service personnel check and repair.

### **3-3 Obstructions**

Check outside the rv for possible obstructions: tree, post, car, ect... Check inside the rv for any obstructions: luggage, furniture, open cabinets, ect... Also check for smaller objects that may be wedged under the floor or in the sides of unit. Remove obstructions before proceeding.

### **3-4 Error Codes**

Consult rv manufacturer's documentation for the location of the Total Control 1 Slide Controller. See page 1-8 for a description of the error codes, and possible problems.

### **3-5 Low Voltage**

The Total Control 1 Slide Controller is capable of operating the room with as little as 8 volts. But at these lower voltages the amperage requirement is greater. Check voltage at the controller, see page C-5 for the location of power connections. If voltage is lower than 11 volts, it is recommended that the battery be placed on a charger until it is fully charged. It may be possible to 'jump' the rv's battery temporarily to extend or retract the room. Consult the rv manufacturer's owners manual on the procedure for 'jumping' or charging the battery.

**\*\*\*\*\*Never 'jump' or charge the battery from the power connections on the Inwall Controller. Always do this at the battery.\*\*\*\*\***

### **3-6 Only 1 side moving**

The Total Control 1 Room Slide has a separate motor to operate each side of the room. Does only 1 side of the room move a short distance (2 to 4 inches) and stop.

### **3-7 Will non moving side move with help**

If only 1 side of the room is moving as in 3-6 above, then with someone's assistance press the switch to extend or retract the room while pushing the non moving side in the appropriate direction. On larger rooms it may be necessary to have 2 or more people pushing the room.

### **3-8 Non moving side moved manually**

Try to push the non moving side in and out. If a motor shaft has broken then it will be possible to move that side of the room several inches by hand. Larger rooms may require several people to push.

### **3-9 With motor dis-engaged can room be moved?**

Dis-engage motor, see 2-2 to disengage motor. After dis-engaging the motor is it possible to move the room by hand? On larger rooms more than 1 person may be required to move the room.

### **3-10 Debris in the rack**

Check all 4 gear racks on the side of the room for debris.

### **3-11 Do status led's light**

Consult the rv manufacturers documentation for the location of the Total Control 1 Controller. When the room slide direction switch is actuated, do the status led's light up. Check this in both the extend and retract modes. See page 3 for the location of the status led's. If the led's do not light up, or only light in 1 direction, then un-plug and re-plug the direction switch connection on the board. This connection is shown on page 4. If the problem persists, the led's still do not light up in both directions, then the switch or the wiring between the switch and the room is defective.

### **3-12 Increase motor amperage**

See page 4 for stall force calibration. Only increase stall force enough to cycle room effectively.