VALID DC SLIDE SYSTEM

Service Manual

Integrated End Wall Slide Drive

PART# VSS90M-002-SM

Valid MANUFACTURING Ltd.
Advanced technology... Simple solutions.

Rev J 30 July 2021 MW

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FOR YOUR SAFETY

Caution

- READ AND UNDERSTAND THE ENTIRE SERVICE MANUAL BEFORE SERVICING YOUR SLIDES.
- ENSURE THAT THE AREA AROUND THE VEHICLE IS CLEAR OF OBSTRUCTIONS BEFORE OPERATING THE SLIDES.
- ENSURE THAT THE AREA WITHIN THE COACH IS CLEAR OF OBSTRUCTIONS BEFORE OPERATING THE SLIDES.
- THE SLIDE SYSTEM SHOULD BE SERVICED ONLY BY QUALIFIED PERSONNEL.

INTRODUCTION

The Valid DC Slide System uses 12V DC power, a compressed air supply and an industry standard CANbus network to provide an integrated solution for up to four slide rooms and multiple touch screens.

A state-of-the-art synchronized motor control system moves the slide using multiple motor drive assemblies.

This service manual is intended to be used in conjunction with the operation guide (Part# VSS90M-xxx-OM), since it assumes that you already know how to operate the slide system.

For those of you who are not familiar with **PSI**, **PSIa**, **PSIg**, **In Hg** and manual pressure gauges, you may benefit from referring to Addendum 1, Air Pressure Guide, on page 223.

USING THE TOUCH SCREEN

All the slide controllers and touch screens are powered when the ignition is turned on. When first powered up, the touch screens are in sleep mode and have to be woken up by pressing the touch screen. They will return to sleep mode after 10 minutes of inactivity.

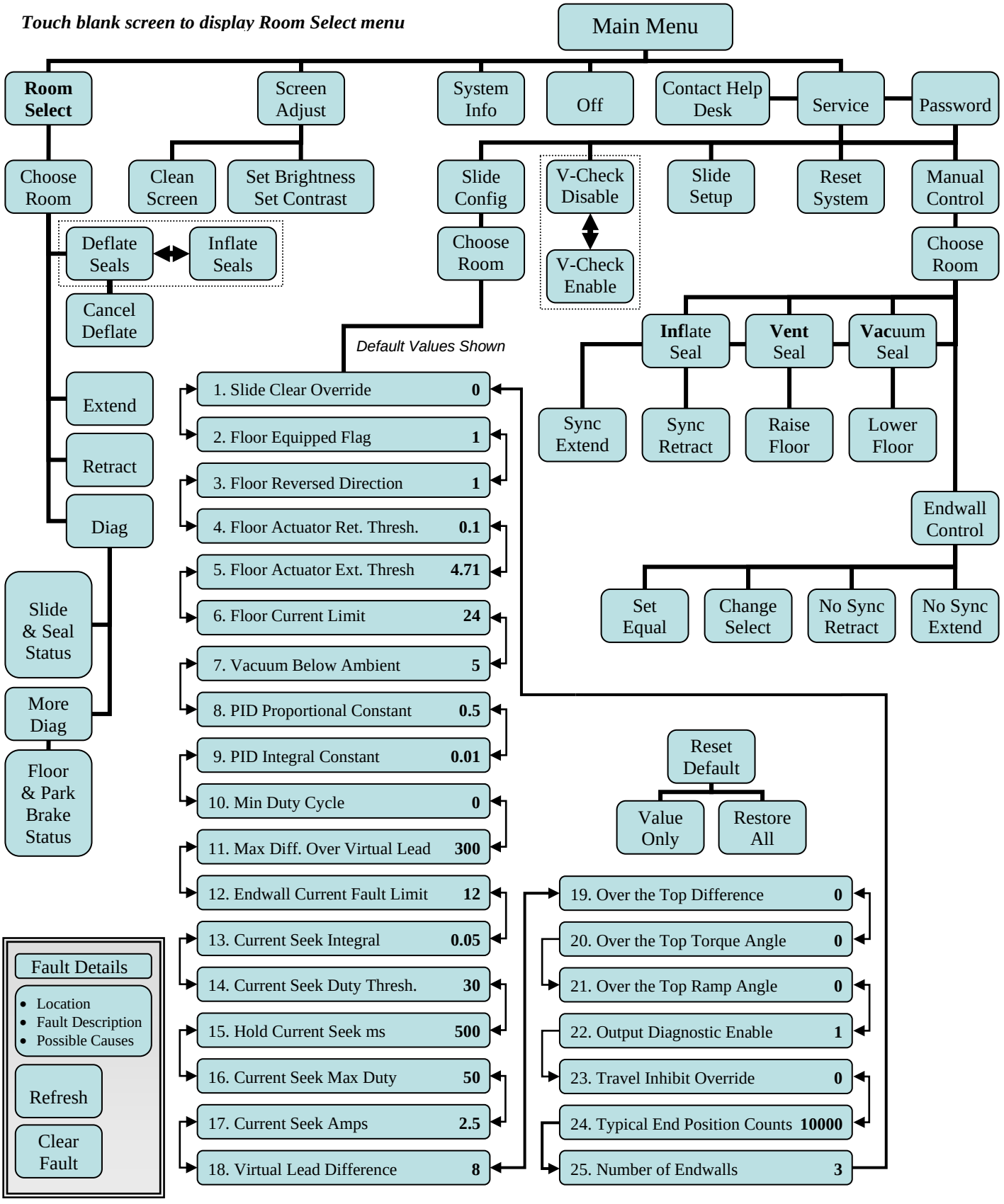
There can be as many as five touch screens on the network, though typically there is just one or two.

Each touch screen can be configured to control any of the four slides, which provides the flexibility to have the touch screen at the front of the coach controlling the front slides and the touch screen at the rear of the coach controlling the rear slides.

Only one slide at a time can be moved. If one touch screen is extending or retracting a slide and an attempt is made to access the room motion menus from any other touch screen, the following message is displayed: “Another interface is currently in use.” As soon as the Extend or Retract button is released, another touch screen can obtain control.

When controlling a slide in <Service> <Manual Control>, be aware that only one touch screen should ever use this function at any one time. Otherwise, multiple touch screens will conflict as they compete to control the slide.

Touch Screen Menu Map



Cleaning the Touch Screen

Thorough cleaning of the screen should be performed regularly.

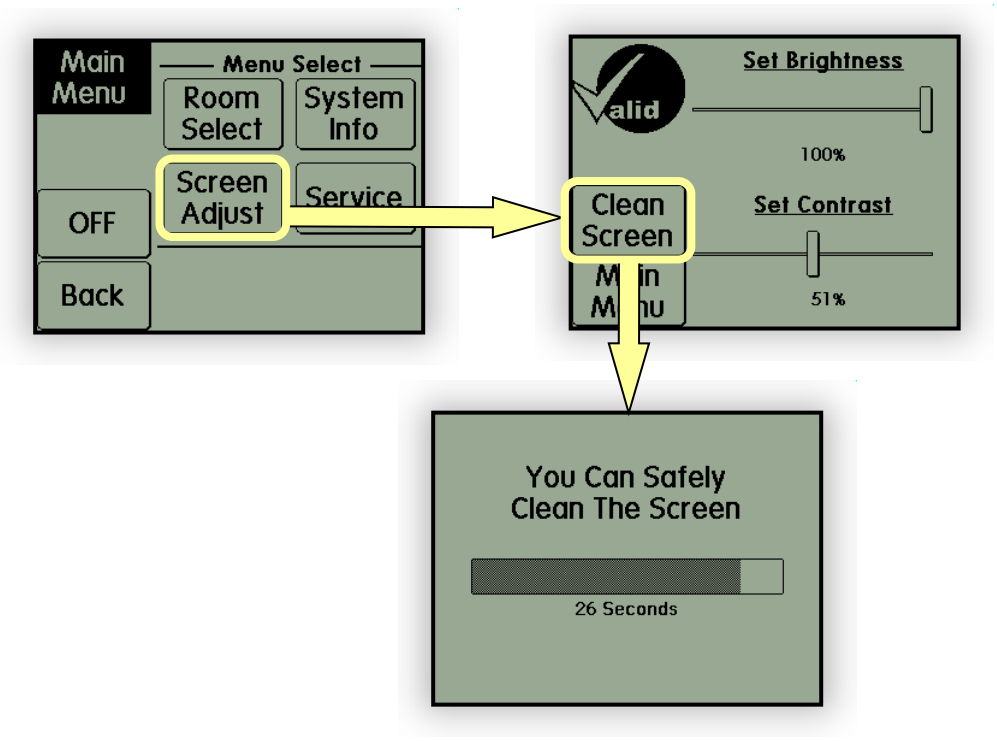
Always use a soft cotton cloth. Some materials, such as paper towels or old rags, could cause scratches and damage the screen.

For best results, use a clean, damp, non-abrasive cloth with any domestic glass cleaner. The cleaner should be applied to the cloth, rather than the screen itself. Glass cleaner sprayed directly on the screen could leak inside and cause damage.

> Do not use any industrial cleaners that contain Acetone, Ethyl Alcohol, Ethyl acid, Methyl Chloride or Petroleum Benzene.

From the Main Menu, select <Screen Adjust> and then <Clean Screen.>

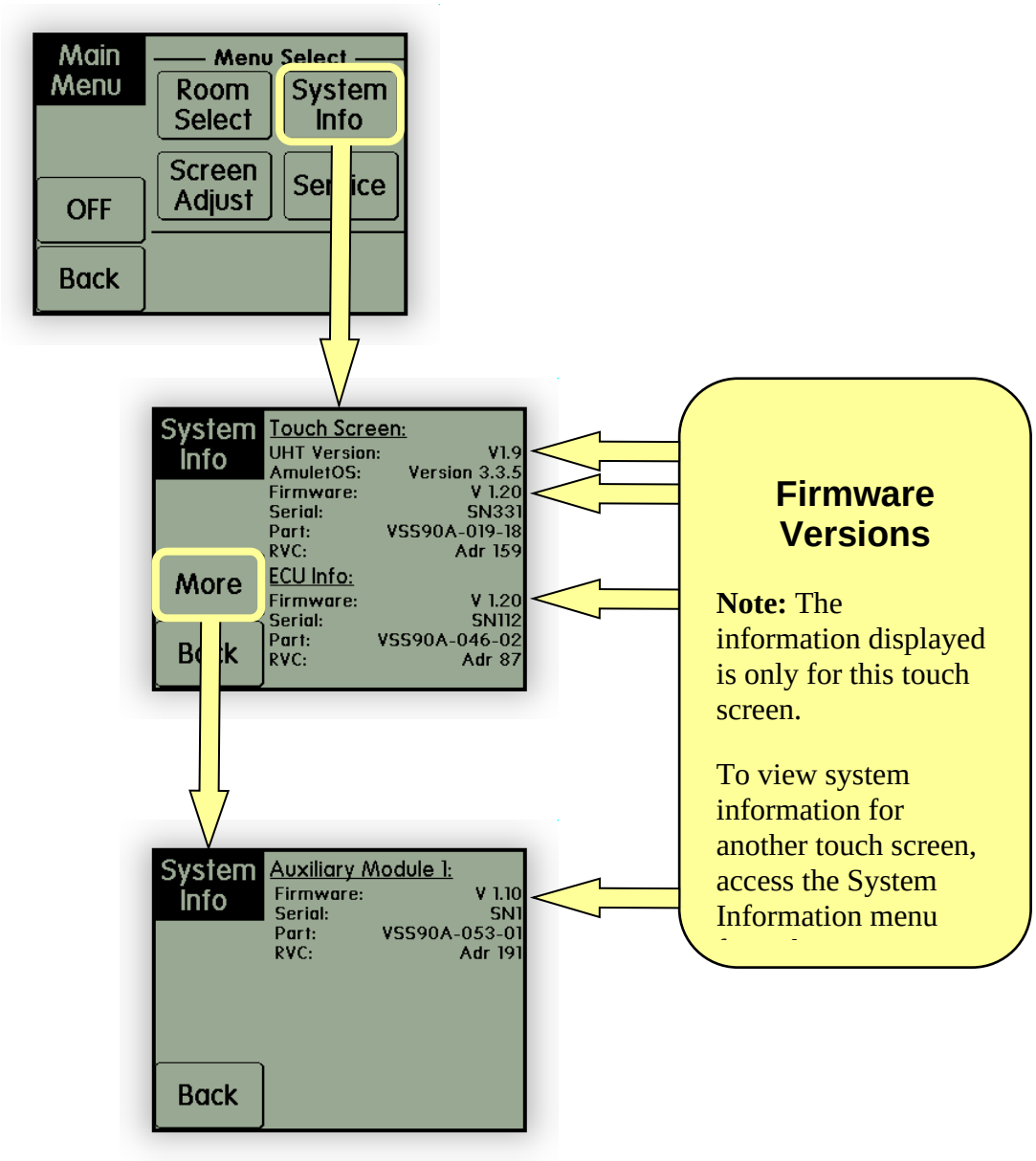
You have 30 seconds to clean the screen:



Firmware Version

The software programs inside the slide controller and touch screens are called firmware.

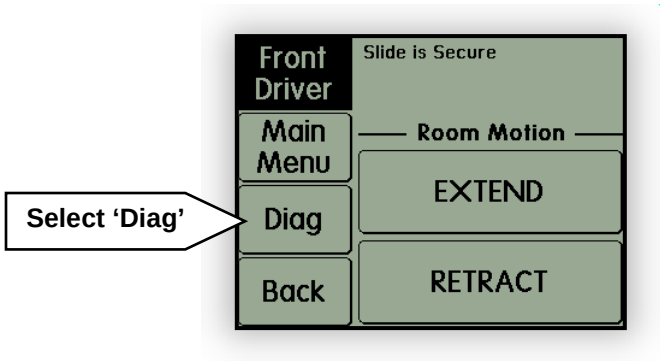
Select <System Info> in the Main Menu to view the firmware revision number.



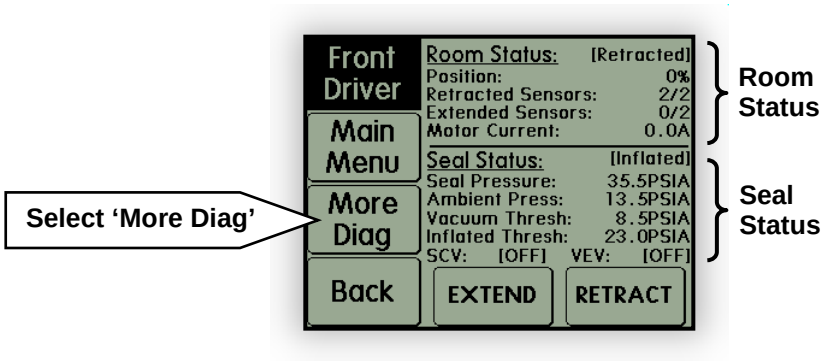
Diagnostics

Diagnostics for each slide can be accessed from the <**Room Motion**> menu.

Since the slide can be extended or retracted from within the diagnostics screens, this provides a very useful troubleshooting tool.

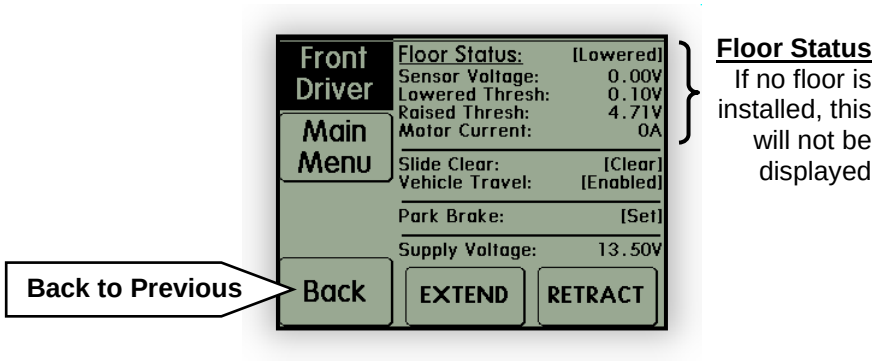


Refer to the following pages for detailed descriptions of **Diag** and **More Diag.**



ITEM	DESCRIPTION
Room Status:	[Retracted], [Mid Position] or [Extended].
Position:	A percentage indicating slide extension: 0% = Fully retracted. 100% = Fully extended.
Retracted Sensors: **and** **Extended Sensors:**	Each endwall motor assembly contains a **retract** and **extend** limit switch. The first digit shows the activated count, and the second digit shows the number of endwalls for the selected slide. Refer to the following examples: **0/3** = No limit switches are activated; the slide has three (3) endwalls. **2/2** = Both limit switches are activated; the slide has two (2) endwalls. **3/3** = All three (3) limit switches are activated; the slide has three (3) endwalls.
Motor Current:	During slide movement the room motor current is displayed in amps. This is the combined current for both motors. During floor movement, the floor motor current is displayed in amps.

Seal Status:	[Inflated], [Vented] or [Vacuumed].
Seal Pressure:	Absolute Pressure (PSIA) of seal. If it reads 0, it is likely that the pressure transducer is disconnected.
Ambient Pressure:	Calculated automatically during the vent cycle. The default at power-on is 13.5 PSIA.
Vacuum Threshold:	This is always a fixed level below the Ambient Pressure. This is the initial vacuum threshold that must be reached before a slide is allowed to move.
Inflated Threshold:	This is the required pressure for a seal to be considered inflated. If this pressure is not met, the slide is not secure, and so vehicle travel is disabled.
SCV and VEV:	'Seal Control Valve' and 'Vacuum Ejector Valve' ON or OFF **Inflated or inflating:** • SCV & VEV are both OFF **Venting:** • SCV is ON and VEV is OFF **Vacuuming:** • SCV & VEV are both ON



TITLE	DESCRIPTION
Floor Status:	[Lowered], [Mid Position] or [Raised] Refer to thresholds, below
Sensor Voltage:	The position feedback from the actuator is in the range 0 to 5V DC. 0V indicates a retracted actuator. Depending on the mounting method, an actuator is either retracted or extended when the floor is lowered. Refer to page 19 for the Floor Reversed Configuration. A constant reading of 2.5V (approx) indicates that the actuator feedback is not connected.
Lowered Threshold:	This is the configured voltage that must be met before a floor is considered lowered.
Raised Threshold:	This is the configured voltage that must be met before a floor is considered raised.
Motor Current:	During floor movement the floor motor current is displayed in amps. During slide movement the room motor current is displayed in amps. This is the combined current for both motors.

Slide Clear:	[Clear], [Blocked] or [Overridden]. If blocked, slide operation is disabled from the touch screen unless it is 'overridden' in the slide configuration (refer to page 18). The manual slide control switch can be used to operate the slide since it ignores slide clear. This is the status for this room only.
Vehicle Travel:	[Enabled], [Disabled] or [Overridden]. If disabled, coach travel is not allowed (by preventing it from being put in gear) unless it is overridden in the slide configuration (refer to page 26). This is the status for this room only.

Park Brake:	[Set] or [Not Set]. Normal Slide operation is not allowed unless the park brake is set. *Note: There is no override configuration for the park brake.*

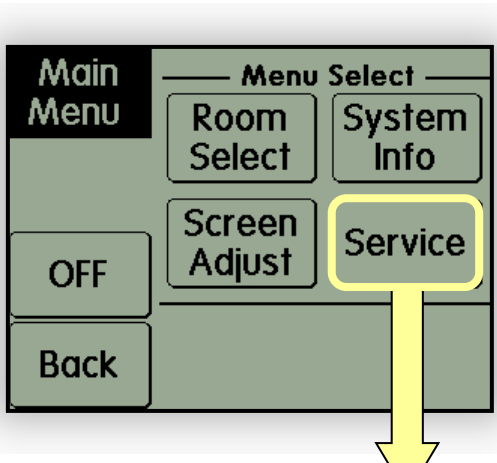
Supply Voltage:	The DC supply voltage measured by this room controller. For slide operation, the voltage must be in the range of 10V to 16.5V.

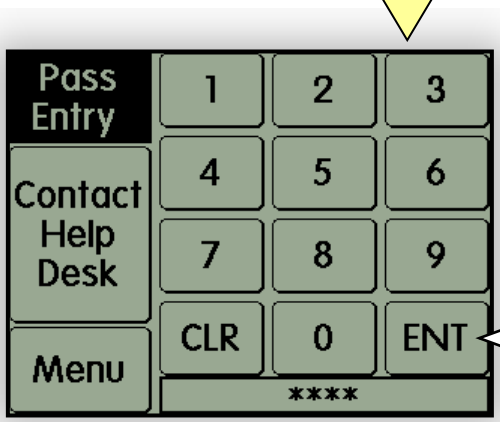
Accessing the Service Menus

CAUTION

The Service area is for troubleshooting and adjusting configuration values in the slide controllers. It is a password-protected area and should only be entered under the guidance of a technician.

The service area is accessed from the Main Menu:

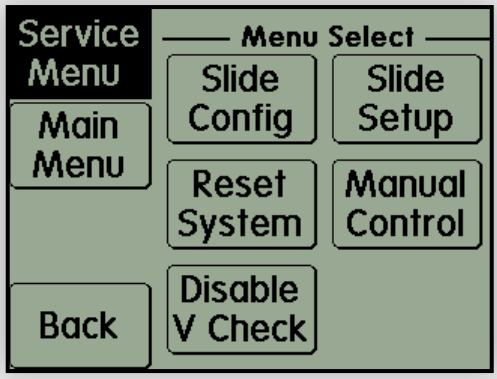




Type the password:
6477

Press **ENT**

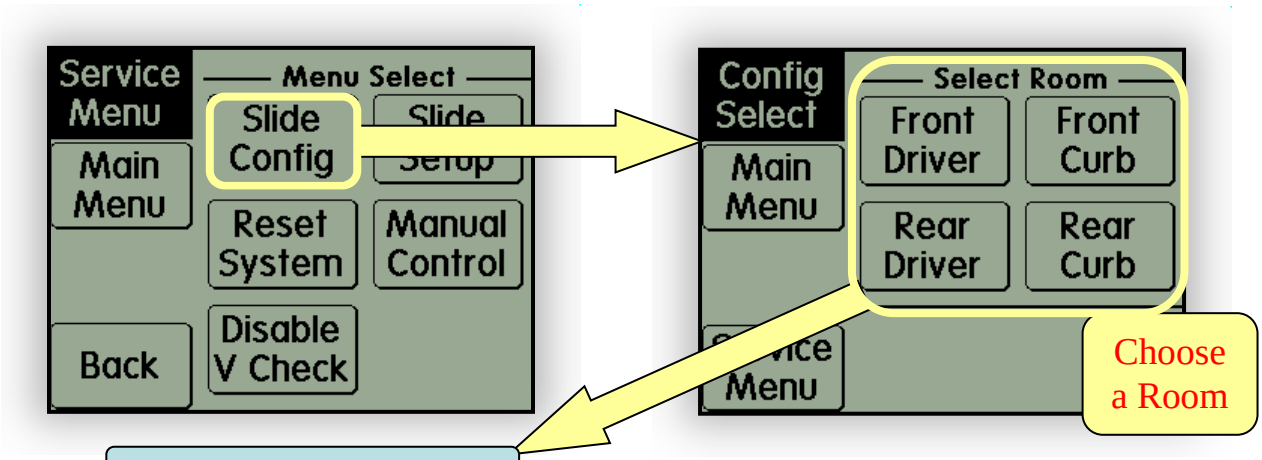
The password needs be entered only once for each session.
A session ceases if the ignition is turned off or if the touch screen goes to sleep after 10 minutes of inactivity.

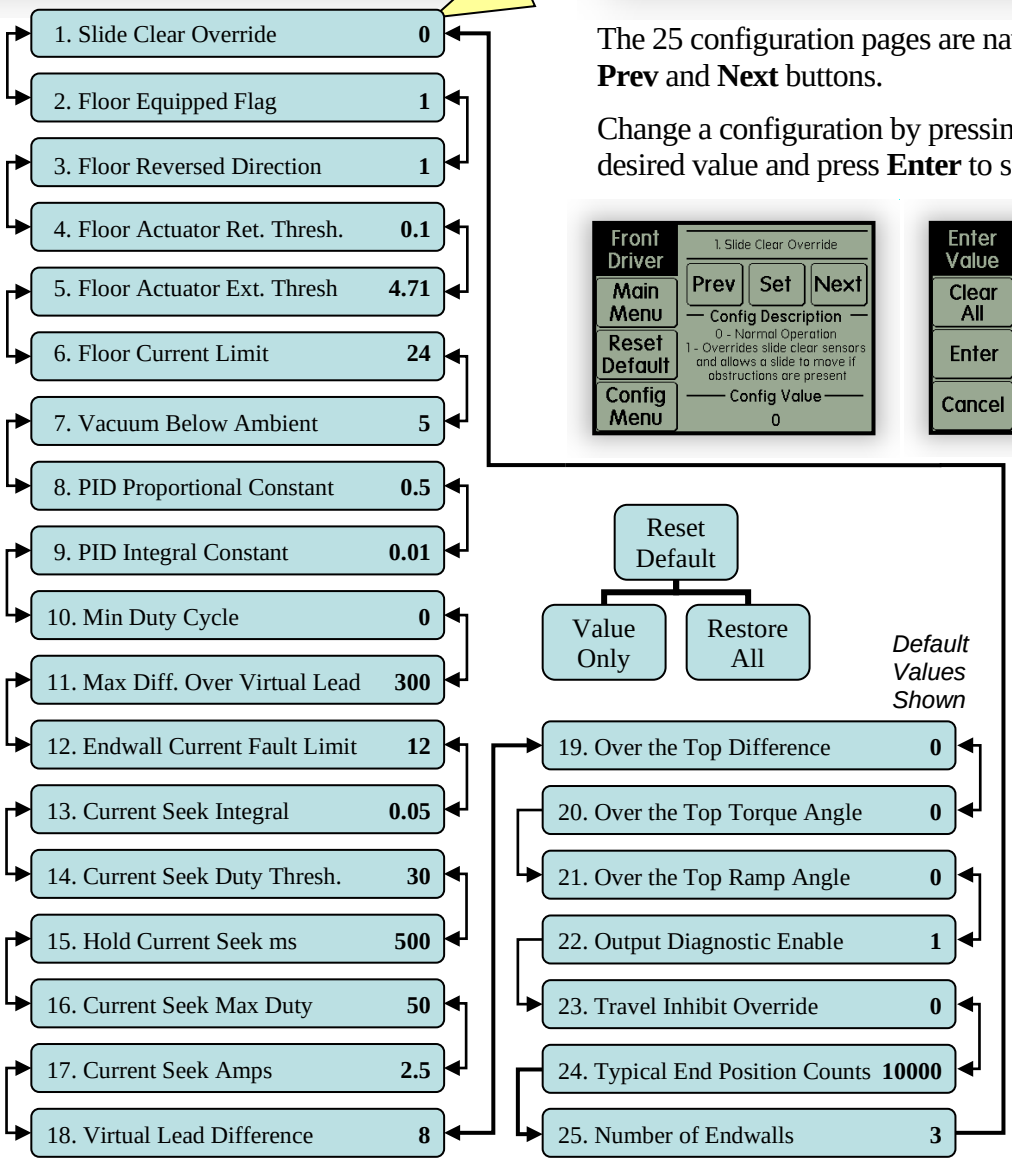


The features of the service menu are explained later in this document.

Slide Configuration

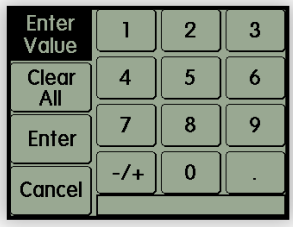
Slide Config is password-protected. Instructions for entering the password can be found in the section "Accessing the service menus" on page 16.



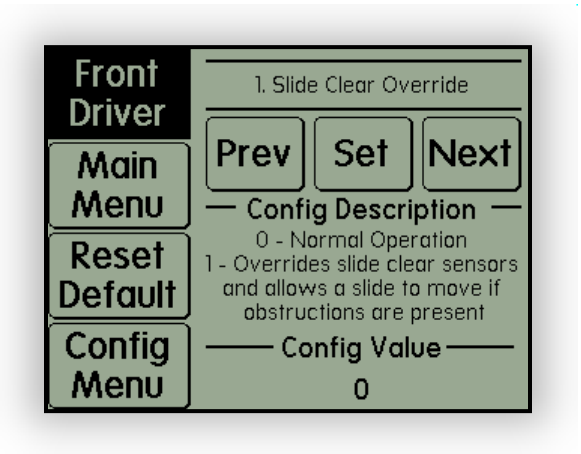


The 25 configuration pages are navigated with the **Prev** and **Next** buttons.

Change a configuration by pressing **Set**, then type the desired value and press **Enter** to save the changes.



1. Slide Clear Override



Each slide has a wire input called “Slide Clear”. If this wire is grounded (0 Volts DC), the slide is considered ‘Clear’. The slide is “Not Clear” if this wire is not connected, or is connected to +12Volts DC.

This allows the coach builder or converter to provide feedback to the slide control system to ensure that the slide is clear of any interference, such as a chair, table top, baggage bay door, etc, before the slide can either be extended or retracted.

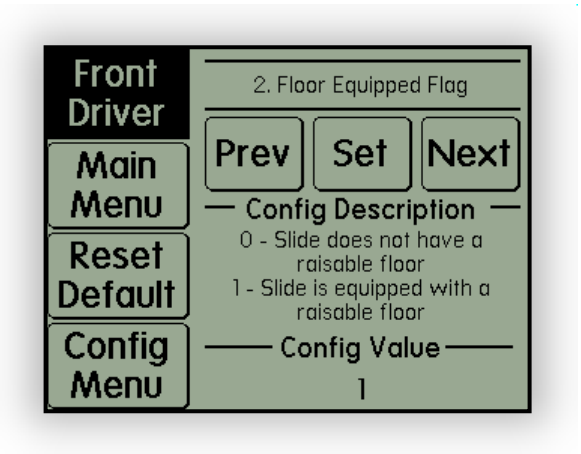
Multiple mercury/micro switches in series may be used to feed this signal.

If a slide is “Not Clear” it may not be moved. A fault screen will be displayed every time the Extend or Retract button is pressed.

In cases where there is a problem with this signal, e.g. bad mercury/micro switch, it may be necessary to override this input in order to allow the slide to be moved. In that case, enter 1; otherwise leave it as 0 for normal operation.

Default Flag: **0** (false)

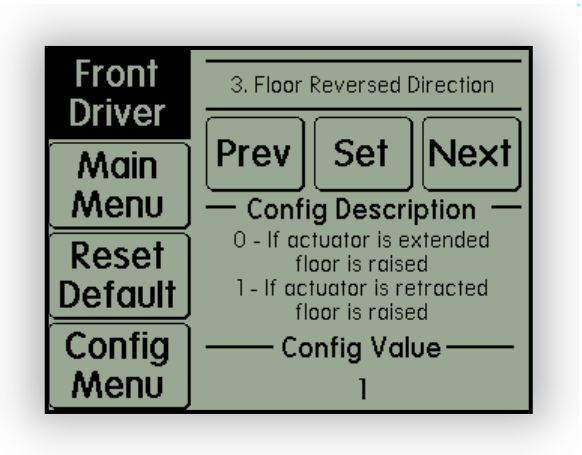
2. Floor Equipped Flag



If a flat floor exists for the selected room, enter 1; otherwise enter 0.

Default Flag: **1** (true)

3. Floor Reversed Direction



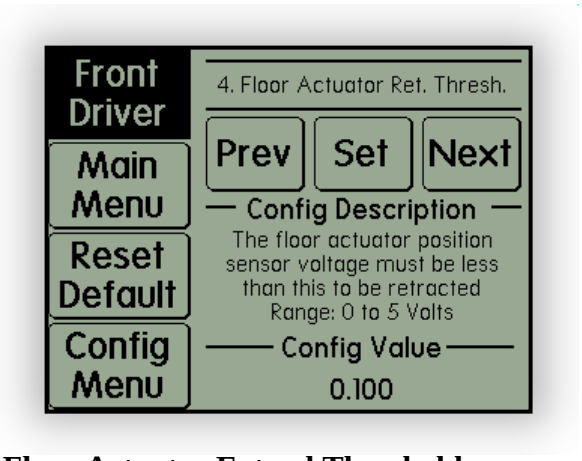
This configuration is determined by design of the flat floor lifting mechanism.

If the actuator is **extended** when the flat floor is raised, enter 0.

If the actuator is **retracted** when the flat floor is raised, enter 1.

Default Flag: **1** (true)

4. Floor Actuator Retract Threshold

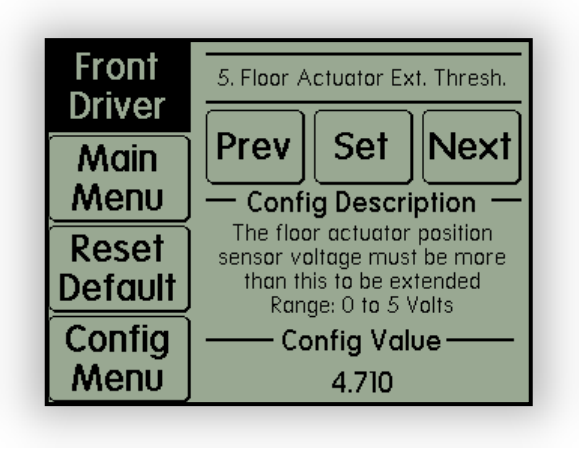


If the flat floor actuator position feedback is **less** than this configuration value, then the actuator is considered fully retracted.

Depending on the configuration for item 3 above, the flat floor may be raised or lowered.

Default Value: **0.100** Volts

5. Floor Actuator Extend Threshold

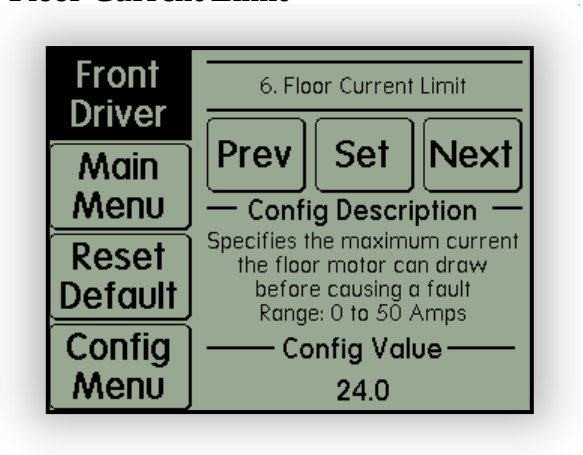


If the flat floor actuator position feedback is **greater** than this configuration value, then the actuator is considered fully extended.

Depending on the configuration for item 3 above, the flat floor may be raised or lowered.

Default Value: **4.710** Volts

6. Floor Current Limit

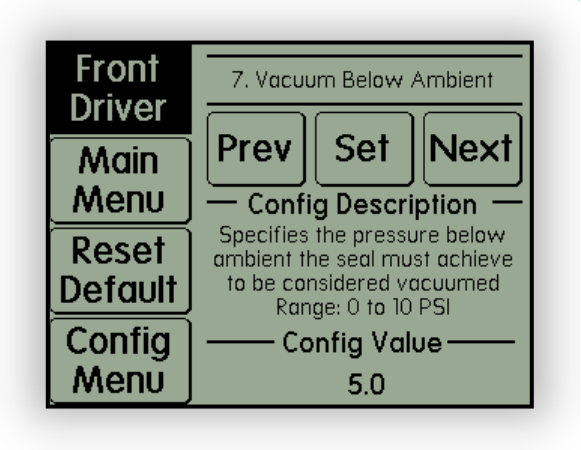


The slide controller has a high-speed continuous current monitoring system that will turn off the flat floor motor drive if the current exceeds this trip limit.

The monitoring system will respond quicker than a standard fuse, thus reducing the possibility of blowing the coach fuse as well as protecting the internal circuitry of the controller.

Default Value: **24.0** Amps

7. Vacuum Below Ambient



This configuration sets the **initial** vacuum threshold. The PSI number is the amount below ambient pressure.

For example: If the ambient pressure is 13.5 PSIA (default) then the initial vacuum threshold is 13.5 – 5 = 8.5 PSIA.

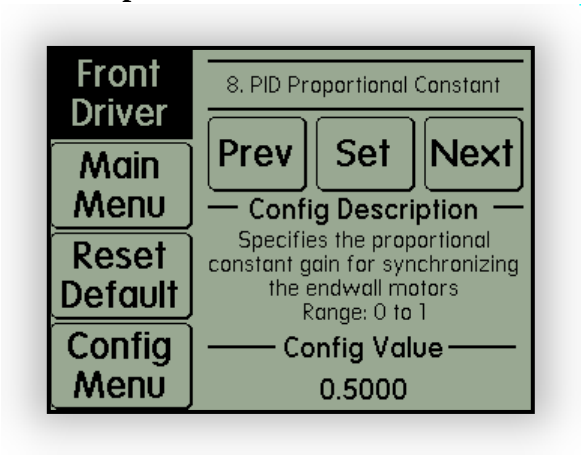
It should be noted that the atmospheric ambient air pressure is only used if there is at least an 8 PSI drop in the seal pressure during the vent cycle. This guarantees that the seal has vented from an inflated state to the current ambient air pressure. The default ambient of 13.5 PSIA will be used if there is less than an 8 PSI drop.

> **Tip:** If you release your finger off the button before it starts to vacuum during an extend or retract cycle, there will *not* be an 8 PSI drop the next time you press the button, since the seal pressure is already close to ambient: and so it will use the default ambient of 13.5 PSIA.

It should be noted that the system also uses a fixed 1.0 PSI and 2.5 PSI below ambient for the stop-slide and re-vacuum thresholds, respectively.

Default Value: **5** PSI

8. PID Proportional Constant

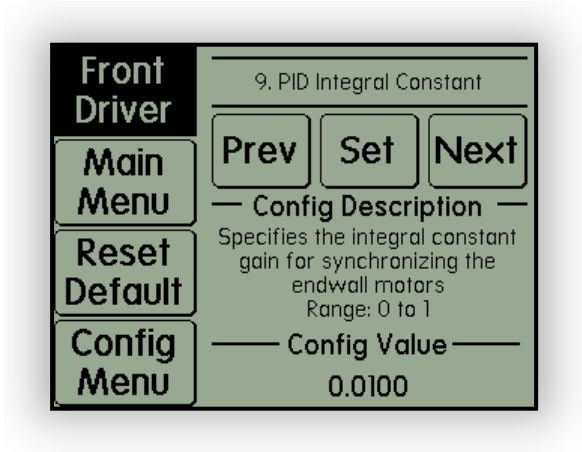


This configuration is part of the closed loop slide room motor control system.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0.5**

9. PID Integral Constant

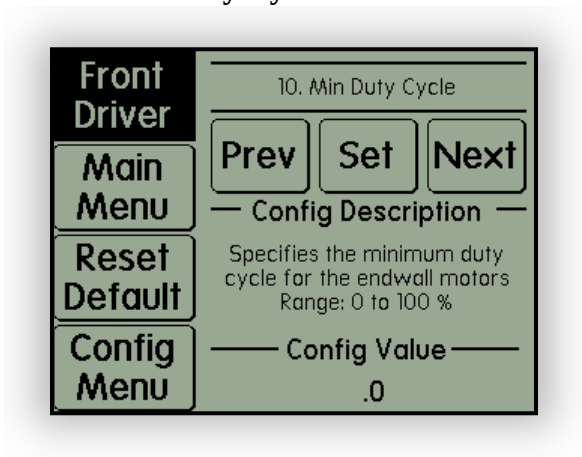


This configuration is part of the closed loop slide room motor control system.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0.01**

10. Minimum Duty Cycle

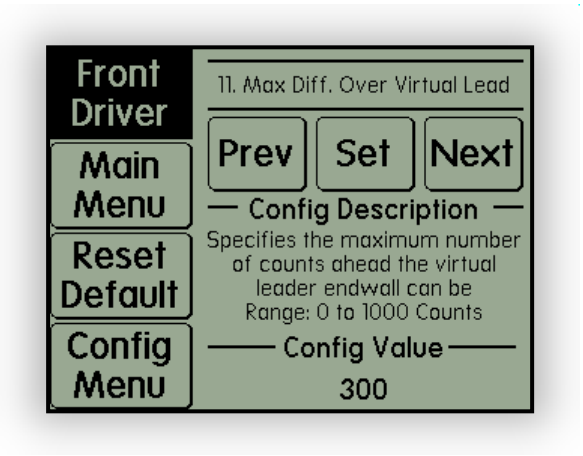


This configuration is part of the closed loop slide room motor control system.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0**

11. Maximum Difference Over Virtual Lead



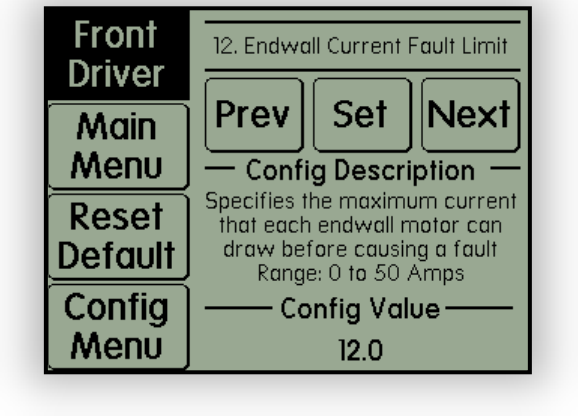
Multiple synchronized motors are used to extend and retract the slide room.

If the encoder count of any of these motors differs by an amount greater than this configured value, the fault "Encoder Maximum Difference Exceeded" will occur and the room will stop moving.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **300**

12. Endwall Current Fault Limit



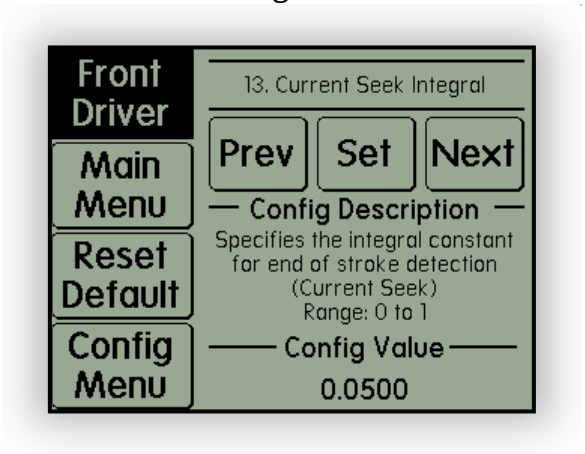
The slide controller has a high-speed continuous current monitoring system that will turn off the room motor drive if any **one** motor exceeds this trip limit.

The monitoring system will respond quicker than a standard fuse, thus reducing the possibility of blowing the coach fuse as well as protecting motor and the internal circuitry of the controller.

Default Value: **12.0** Amps (Per Motor)

***** VERY IMPORTANT *****
Under no circumstances should this value be greater than 14 Amps, otherwise permanent damage to the motors may occur.

13. Current Seek Integral



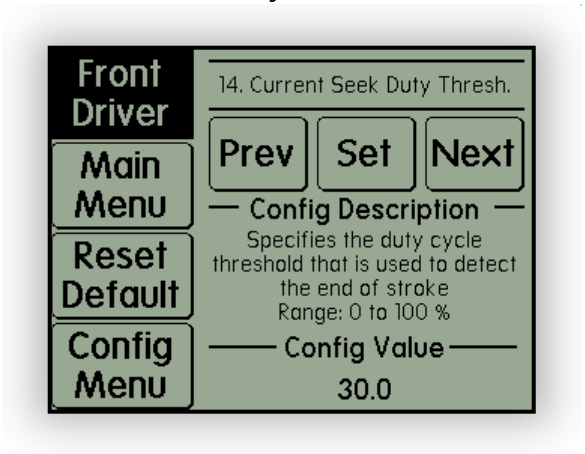
This configuration is part of the closed loop slide room motor control system.

Current Seek mode is activated when a limit switch is made, indicating the drive arm is close to the end of its stroke.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0.05**

14. Current Seek Duty Threshold



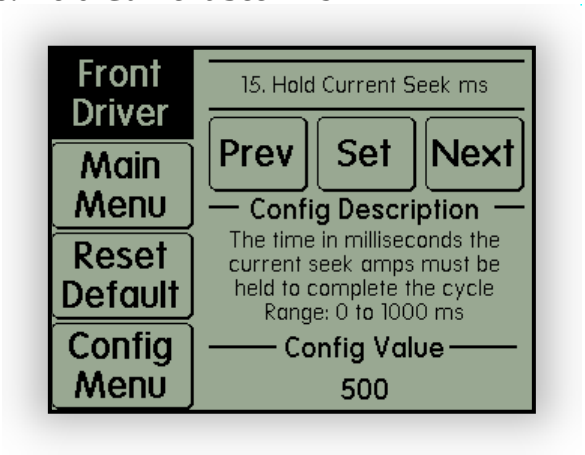
This configuration is part of the closed loop slide room motor control system.

Current Seek mode is activated when a limit switch is made, indicating the drive arm is close to the end of its stroke.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **30** %

15. Hold Current Seek ms



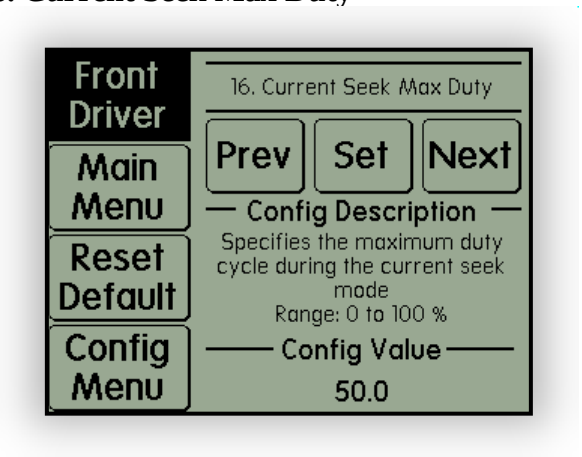
This configuration is part of the closed loop slide room motor control system.

Current Seek mode is activated when a limit switch is made, indicating the drive arm is close to the end of its stroke.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **500** milliseconds

16. Current Seek Max Duty



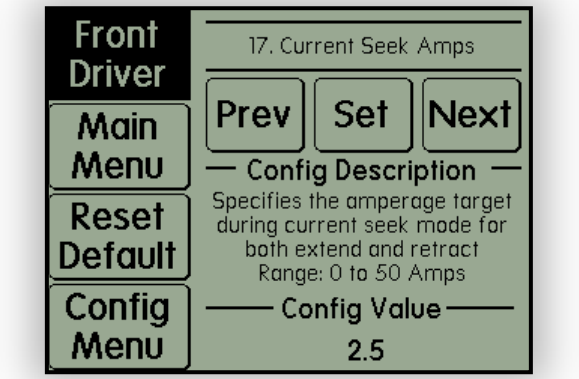
This configuration is part of the closed loop slide room motor control system.

Current Seek mode is activated when a limit switch is made, indicating the drive arm is close to the end of its stroke.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **50**%

17. Current Seek Amps



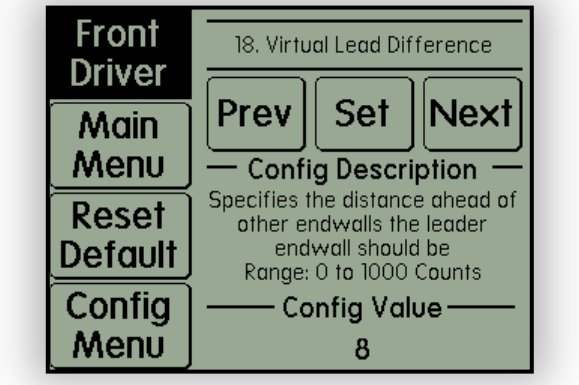
This configuration is part of the closed loop slide room motor control system.

Current Seek mode is activated when a limit switch is made, indicating the drive arm is close to the end of its stroke.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **2.5** Amps

18. Virtual Lead Difference



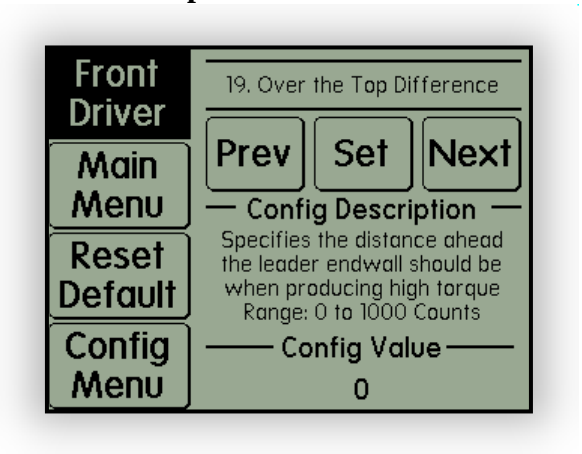
This configuration is part of the closed loop slide room motor control system.

One motor is dynamically chosen as the "lead." This configuration determines the leader's target position.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **8** Encoder Counts

19. Over the Top Difference



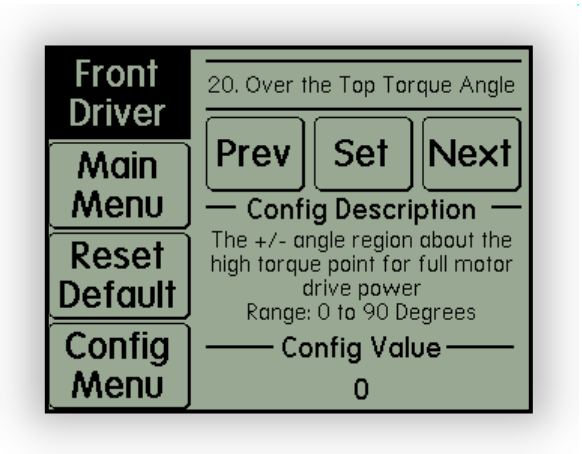
This configuration is part of the closed loop slide room motor control system.

"Over the Top" refers to the region where the drive arm passes through a vertical position. This is when maximum motor torque is required.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0** Encoder Counts

20. Over the Top Torque Angle



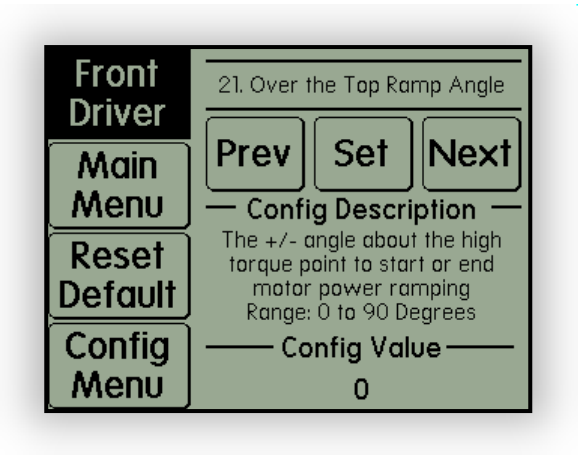
This configuration is part of the closed loop slide room motor control system.

"Over the Top" refers to the region where the drive arm passes through a vertical position. This is when maximum motor torque is required.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0** Degrees

21. Over the Top Ramp Angle



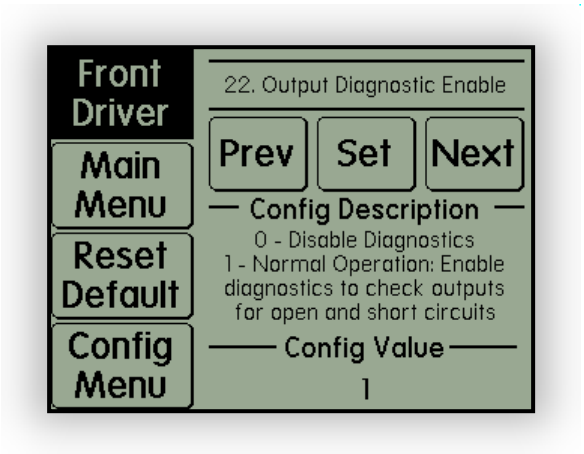
This configuration is part of the closed loop slide room motor control system.

"Over the Top" refers to the region where the drive arm passes through a vertical position. This is when maximum motor torque is required.

Do not alter this value unless specifically directed by Valid Manufacturing Ltd.

Default Value: **0** Degrees

22. Output Diagnostic Enable



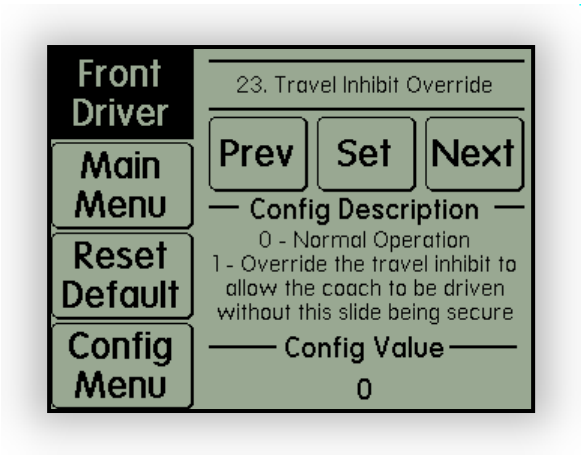
This configuration should normally be enabled. This allows the detection of short and open circuit faults for the Seal Control Valve, Vacuum Ejector valve, short circuit detection of the Vehicle Travel output and motor undercurrent.

If disabled, detection of the above faults will be disabled.

Default Flag: **1** (Enabled)

Note: Motor over-current detection is always enabled regardless of this configuration.

23. Travel Inhibit Override



This configuration refers to overriding the Vehicle Travel Disable status for that slide.

A slide is considered ‘Secure’ when the slide is retracted and the seal is inflated. Any condition other than this is considered “Not Secure” and results in a Vehicle Travel Disabled signal, preventing coach travel.

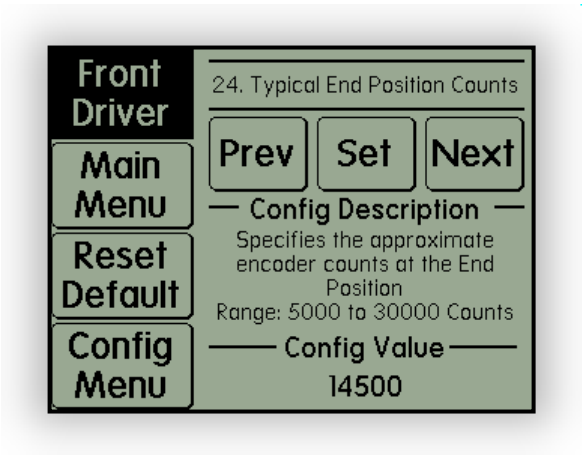
If there is a problem with a slide, e.g. a bad seal, it may be necessary to enable the ‘Inhibit Override’ to allow coach travel.

Default Flag: **0** (Not Overridden)

CAUTION

If the ‘Inhibit Override’ is enabled, visually ensure that all slides are fully retracted before driving the coach.

24. Typical End Position Counts



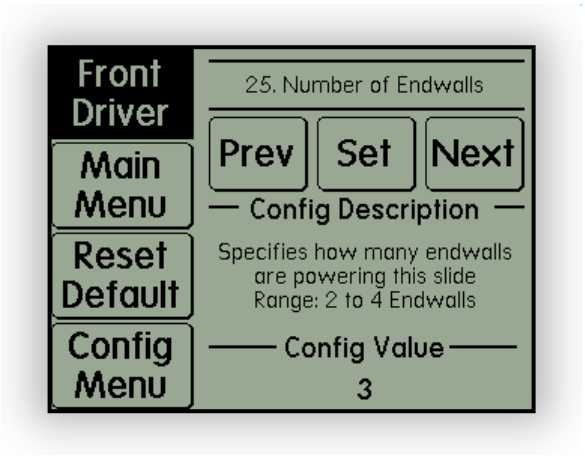
Each slide drive motor has an associated encoder count. A fully retracted and homed slide will have an encoder count of 1000. As the slide extends, this encoder count increases. However, it must never exceed this configured value or the fault **"Endwall Encoder Overrun"** will occur.

This is also the same number used when **Set Equal** is pressed in the manual control menu (refer to page 30).

Default Value: **10000** Encoder Counts

Note*:* For the original motor assemblies, the gearbox requires a configuration of **10000**. Newer motor assemblies require a configuration of **14500**.

25. Number of Endwalls



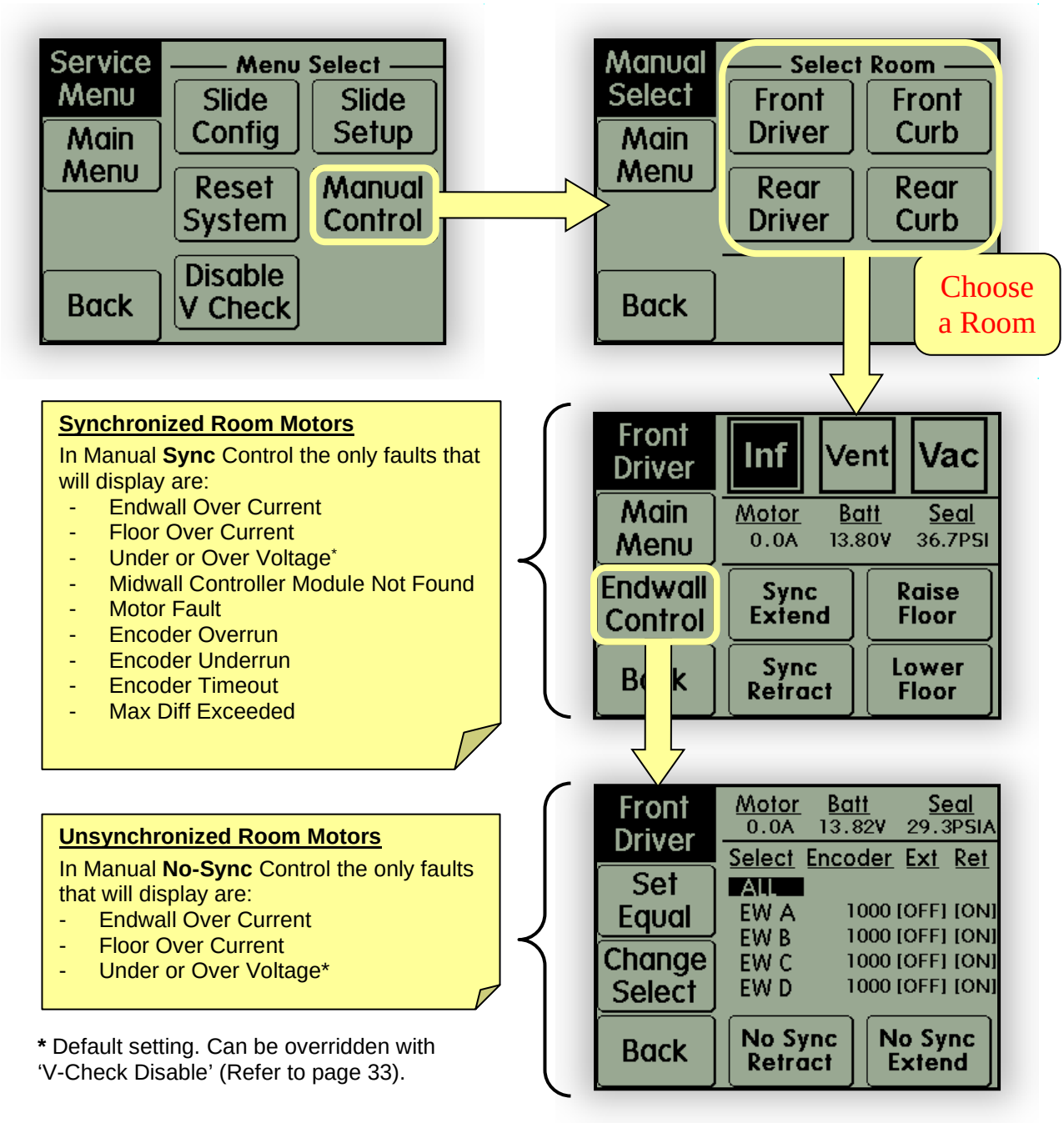
Each slide room can have up to four drive motors. A and B are at each end of the slide with drives C and D in the middle.

Configure each room for the number of drive motors being used to move the slide.

Default Value: **3** Endwalls

Manual Control and Endwall Control

Manual Control is password-protected. Instructions for entering the password can be found in the section "Accessing the service menus" on page 16.



Synchronized Room Motors

In Manual **Sync** Control the only faults that will display are:

- Endwall Over Current
- Floor Over Current
- Under or Over Voltage*
- Midwall Controller Module Not Found
- Motor Fault
- Encoder Overrun
- Encoder Underrun
- Encoder Timeout
- Max Diff Exceeded

Unsynchronized Room Motors

In Manual **No-Sync** Control the only faults that will display are:

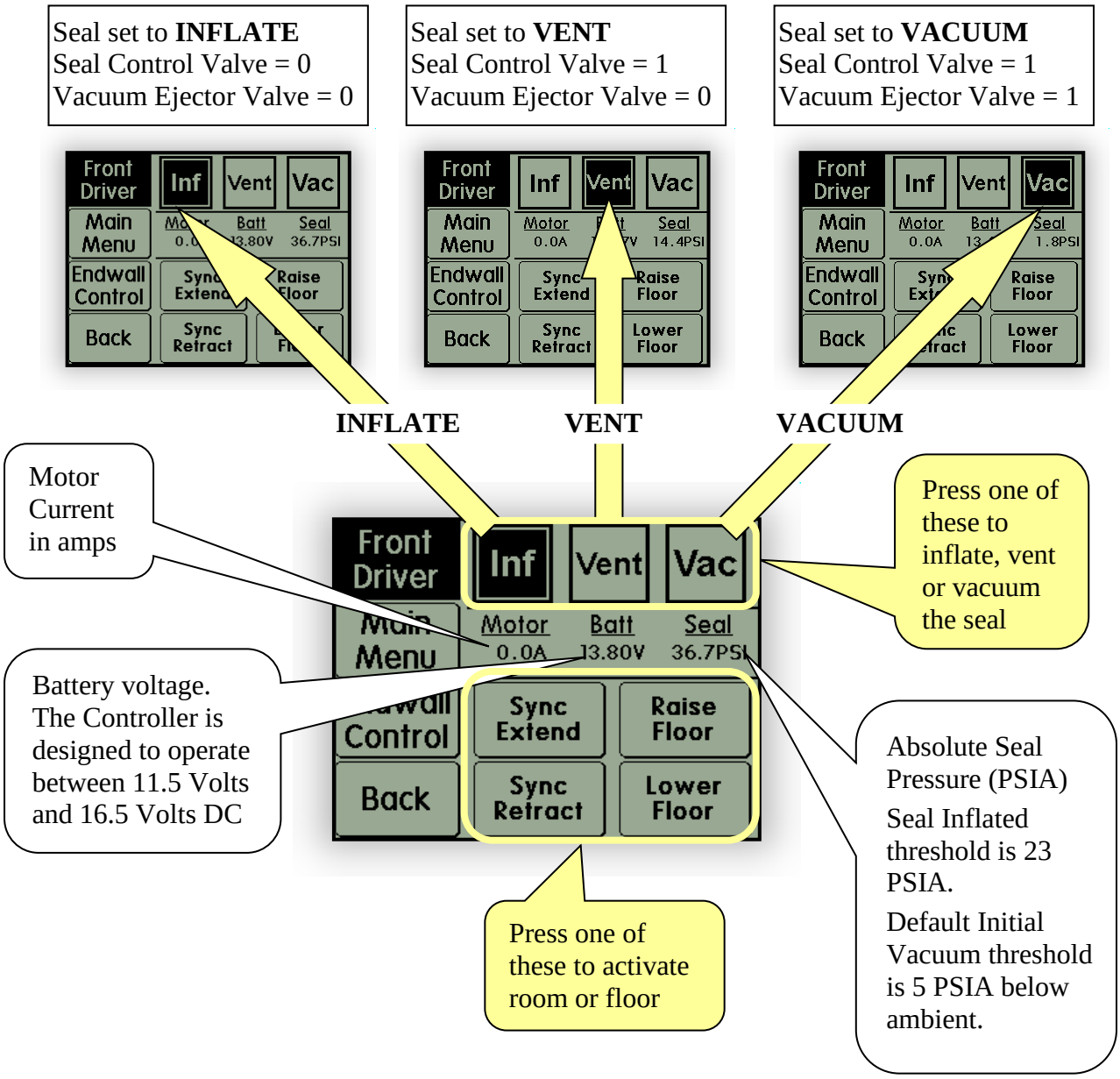
- Endwall Over Current
- Floor Over Current
- Under or Over Voltage*

***** Default setting. Can be overridden with 'V-Check Disable' (Refer to page 33).

CAUTION

*All interlocks are removed in Manual control, allowing the slide room to be **completely** under manual operation. For example, if you try to lift the floor, before the slide is extended, or try to extend the slide with the seal inflated, the motors **will** be activated. To prevent damage to the slide room, do not operate in manual control unless you know what you are doing or have received explicit direction from qualified service personnel.*

Manual Control – Synchronized Room Motors

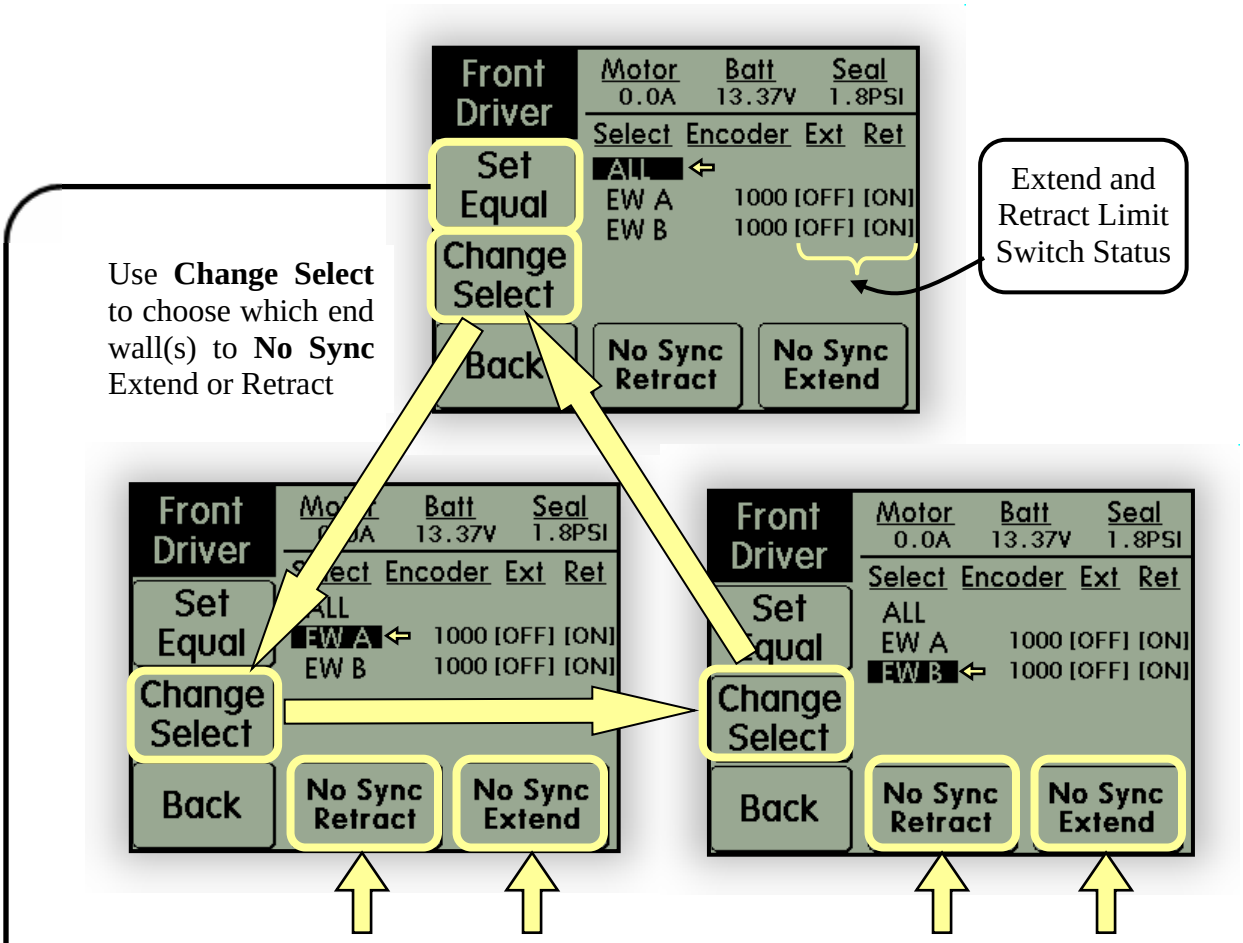


Notes:

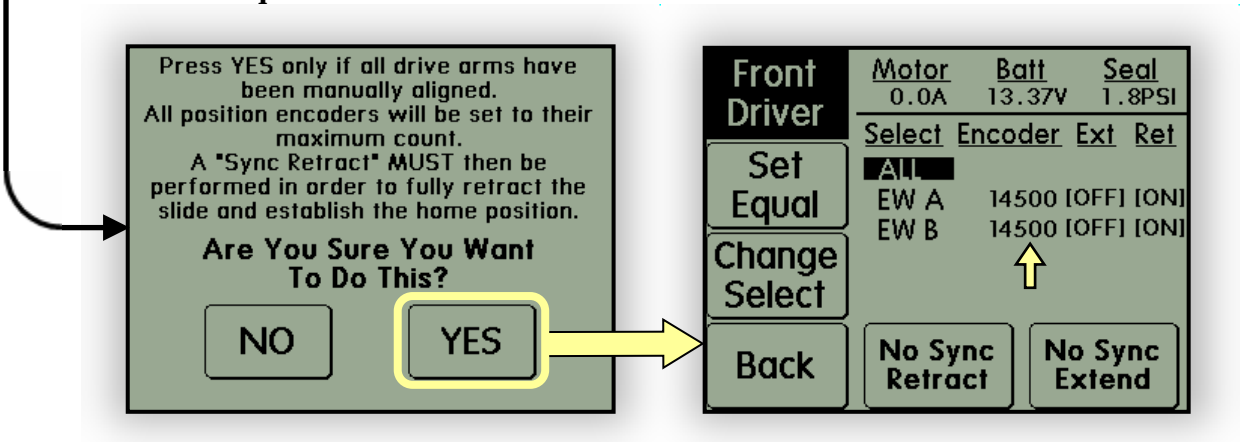
1. The red fault status LED on the Electronic Control unit does not update when accessing the manual control screen.

2. The forward or reverse actuator configuration must be properly set for the floor motor direction to be correct. Do **not** reverse the motor leads until you have first confirmed the **Floor Reversed Direction** configuration setting (refer to page 19).

Endwall Control – Un-Synchronized Room Motors and Set Equal

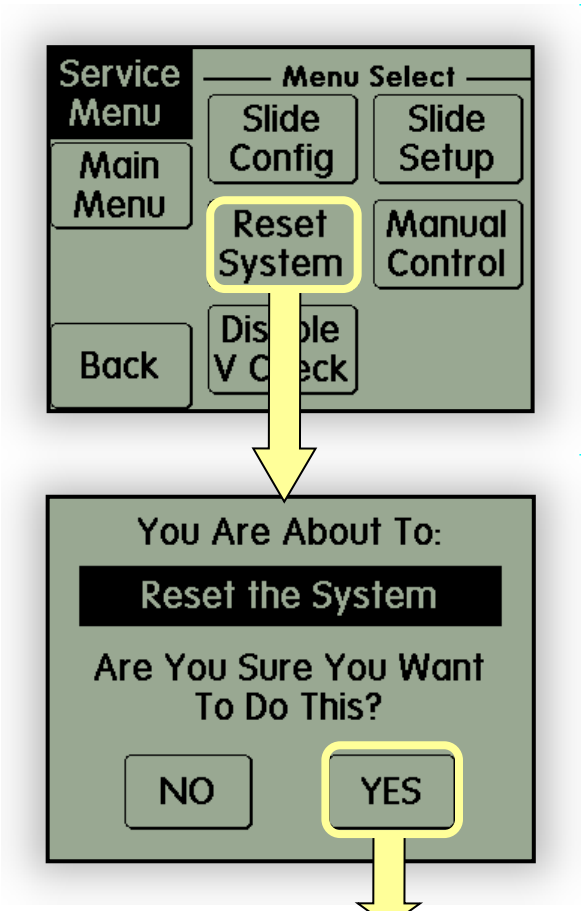


Use **Set Equal** to set both encoder counts to their maximum count:



Reset System

Reset System is password-protected. Instructions for entering the password can be found in the section “Accessing the service menus” on page 16.



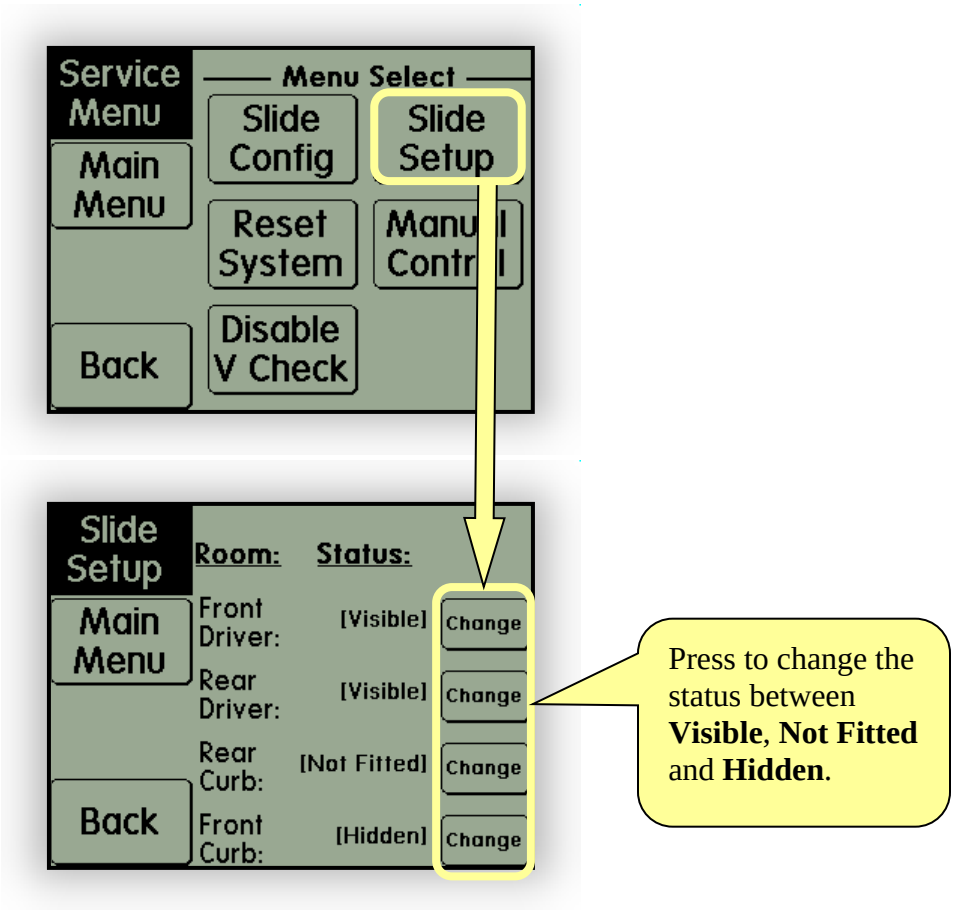
This will issue a processor reset to the slide controller and all touch screens.

The touch screen will go blank during the reset. Press the screen to wake it up after a second or two.

Reset system requests all devices to re-boot. Configuration values are unaffected. It is the same as cycling the power i.e. turning the ignition off then on again.

Slide Setup

Slide Setup is password protected. Instructions for entering the password can be found in the section "Accessing the service menus" on page 16.



This item is used when the coach is first configured and then should not need to be changed.

The Slide Setup configuration affects the following:

- Which rooms show on Room Select menu for that touch screen.
- Which rooms are installed in the coach.

All four service menu room selections are always displayed regardless of how slide setup is configured.

**** Important ****

*If a slide location is not physically installed in the coach, Slide Setup **must** be configured as **Not Fitted**, otherwise the control system will prevent coach travel.*

'V Check' Disable/Enable

The 'V Check' button allows the system voltage checking to be disabled.

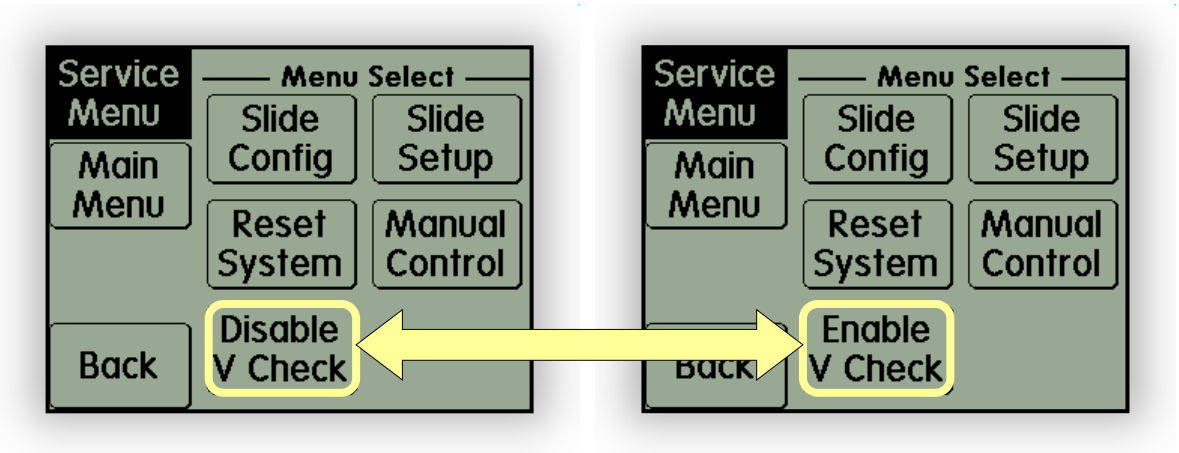
To prevent electrical or mechanical damage, do not disable V Check unless you know what you are doing or have received explicit direction from qualified service personnel.

If enabled, a fault screen will display if the voltage is either Under Voltage or Over Voltage (refer to page 36). If **disabled**, the system will attempt to operate, regardless of the supply voltage.

The menu button toggles between **Disable V Check** and **Enable V Check**.

The text indicates the action that will occur if the button is pressed:

Button Text	Current Status	Action if button pressed
Disable V Check	Voltage checking is enabled. **Note:** This is the default status when the system is powered up by turning on the ignition.	Voltage checking will be disabled.
Enable V Check	Voltage checking is disabled.	Voltage checking will be enabled.



Note: Any time a touch screen is turned on by pressing it, 'V Check' will be automatically disabled.

CAUTION

If voltage checking is disabled and the supply voltage is greater than 16.5V DC, electrical damage is likely to occur. If the supply voltage is less than 11.5V DC, the endwalls may not remain synchronized.

*A slide should **never** be operated if the supply voltage is less than 10V DC.*

Faults

The slide controller has a sophisticated fault detection system, which is designed to not only indicate any unusual condition, but also protect the entire slide system from possible damage.

The controller independently monitors and reports its own fault. The touch screen(s) display the fault status of the controller. A fault can always be detected, regardless of what screen is being accessed. However, fault messages are only displayed in the following screens:

- Room Motion
- Diag
- More Diag

A fault on one slide room will not prevent you from operating any other slide.

A red LED (refer to page 218) on the controller indicates a fault condition. Most faults will "auto-clear" (see below) after 10 seconds. However, the fault messages will remain on the touch screen until you press either **Main Menu** or **Clear Fault**.

The **Refresh** button will always display the last fault, even if the fault condition no longer exists.

The **Clear Fault** button will clear the fault both in the controller and from the touch screen. However, if the fault condition still exists, the fault will re-occur either immediately or the next time you press **Extend** or **Retract**.

Auto-clear
Auto-clear' is the term used to describe when the slide controller automatically clears its fault 10 seconds after the fault occurrence, upon which the red fault LED on the controller will automatically turn off.
However, if the fault is related to the 12 VDC system voltage or a pressure transducer and the fault condition remains, the fault will not auto-clear until 10 seconds after the fault condition is removed.

Fault list

Priority / Fault Code	Description	Refer to Page #
01	System Under Voltage	36
02	System Over Voltage	36
03	Slide Not Installed Cannot Operate	37
04	Park Brake Off Cannot Move Slide	37
05	Slide Not Clear Cannot Move Slide	38
06	Pressure Transducer Volts Out of Range	39
07	Power Loss During Slide Movement	40
08	Endwall Encoder Overrun	40
09	Endwall Encoder Underrun	41
10	Endwall Encoder Timeout	41
11	Encoder Maximum Difference Exceeded	42
12	Vacuum Ejector Output Short Circuit	43
13	Vacuum Ejector Output Open Circuit	44
14	Seal Control Output Short Circuit	45
15	Seal Control Output Open Circuit	46
16	Room Motor Over Current	47
18	Floor Motor Over Current	48
19	Floor Motor Under Current	49
20	Lost Vacuum While Moving Slide	50
21	Floor Position Setpoint Not Reached	51
22	Room Motion Timed Out	52
23	Extended Limit Switch Not Triggered	53
24	Retracted Limit Switch Not Triggered	53
25	Insufficient Vacuum	54
26	Seal Inflation Timed Out	55
27	Floor Not Lowered Cannot Extend Room	56
28	Endwall Motor Fault	56
29	Travel Inhibit Output Short Circuit	57
30	Midwall Controller Module Not Found	58
99	ECU Internal Circuit Error	58

Fault Priority
In the case of more than one fault, only the highest priority will be displayed.
“01” is the highest priority.

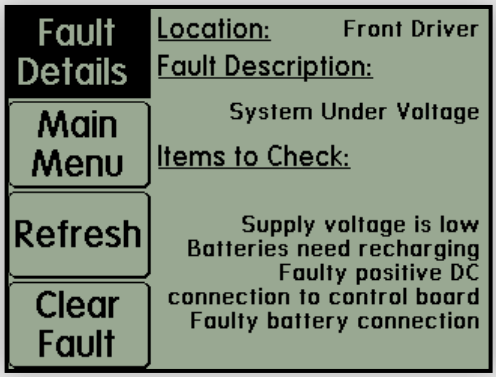
1. System Under Voltage

Description: The slide controller has an on-board voltmeter. The measured value is displayed in the 'More Diag' screen.

If the measured voltage is less than 11.5 V DC, a 'System Under Voltage' fault occurs.

Fault re-activation after 'Clear Fault':

- If the extend or retract buttons are pressed and the measured voltage is still under 11.5V.
- If the ignition is turned on and the measured voltage is less than 11.5V.



Auto-clear: This fault will only auto-clear if the voltage goes back above 12V DC

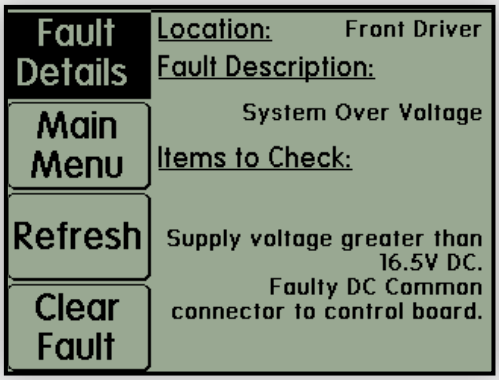
2. System Over Voltage

Description: The slide controller has an on-board voltmeter. The measured value is displayed in the 'More Diag' screen.

If the measured voltage is more than 16.5V DC, a 'System Over Voltage' fault occurs.

Fault re-activation after 'Clear Fault':

- If the extend or retract buttons are pressed and the measured voltage is still greater than 16.5V.
- If the ignition is turned on and the measured voltage is more than 16.5V.



Auto-clear: This fault will only auto-clear if the voltage goes back below 16V DC

Emergency Retract Procedure

- If the voltage is too high, no slide movement is allowed.
- If the voltage is too low, try operating the slides in Manual Control (page 28) or rotary switch positions 2 through 6 (page 61)

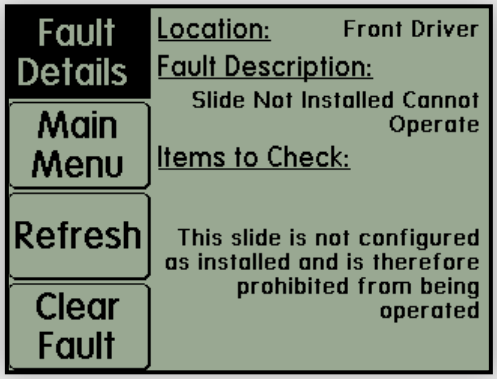
If the supply voltage is below 8.5V DC, the controller may not even operate in manual modes. It is designed to operate from 10.0V to 16.5V.

3. Slide Not Installed Cannot Operate

Description: This fault only occurs if the controller slide setup (page 32) does not match the coach physical configuration and an extend or retract button has been pressed.

Fault re-activation after 'Clear Fault':

If the extend or retract buttons are pressed again.



Auto-clear: 10-seconds after fault occurrence.

Tech Tip: If room is already extended and you press the extend button, it will not fault. **Or** if room is already fully retracted and you press retract, it will not fault.

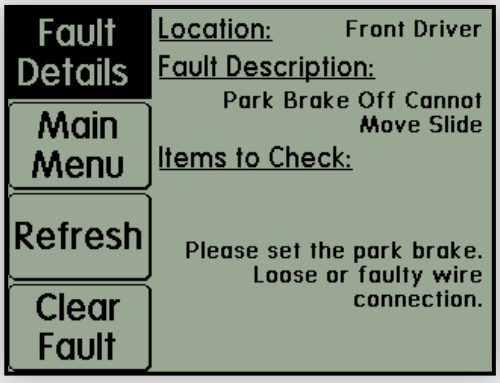
Emergency Retract Procedure
Enter the password-protected service menus and configure slide setup (page 32).

4. Park Brake Off Cannot Move Slide

Description: The Touch Screen does not allow a slide to be extended or retracted unless the park brake is set.

Fault re-activation after 'Clear Fault':

If the extend or retract buttons are pressed again, with the park brake off.



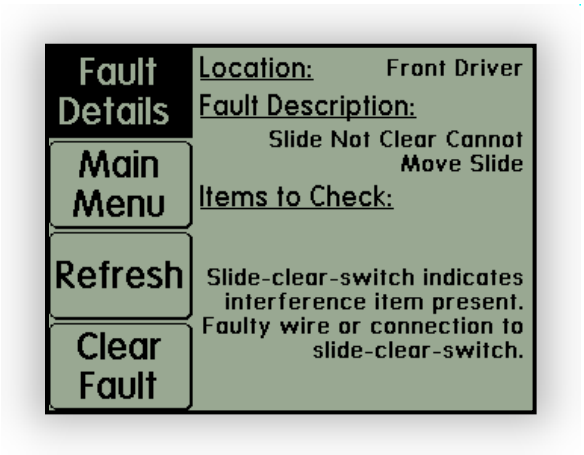
Auto-clear: 10 seconds after fault occurrence

Emergency Retract Procedure
Retract the slide from either the password protected Manual Control Screen (page 28) or use rotary switch position 1 (page 61). Both these methods ignore park brake and slide clear status.

5. Slide Not Clear Cannot Move Slide

Description: The Touch Screen does not allow a slide to be extended or retracted unless its slide clear input is “clear.”

The controller has a slide clear wire input for each room. Its purpose is to indicate that the slide is clear of any interference item, for example, a baggage bay door, or chair or table, etc. The slide clear input must be tied to ground (chassis) for the slide to operate. There may be multiple mercury/micro switches in series.



Fault re-activation after ‘Clear Fault’:

If the extend or retract buttons are pressed again.

Note: The park brake must be set.

Auto-clear: 10 seconds after fault occurrence

Emergency Retract Procedure
Retract the slide from either the password protected Manual Control Screen (page 28) or use rotary switch position 1 (page 61). Both these methods ignore park brake and slide clear status.

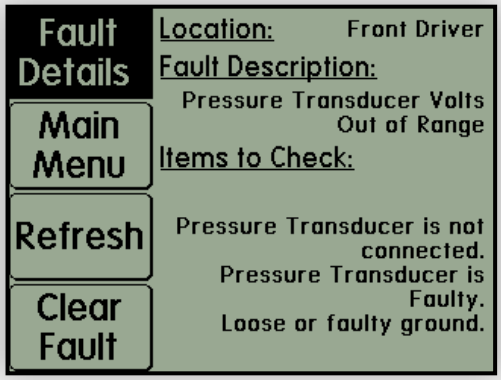
6. Pressure Transducer Volts Out of Range

Description: Each slide room has an air manifold which contains an absolute pressure transducer which measures from 0PSIA (perfect vacuum) to 150PSIA. The voltage out corresponds to the range from 0.5V to 4.5V DC. If the voltage falls outside these limits a fault condition will occur.

If the pressure transducer is not connected, the controller input circuitry will default to 0V DC, which will be detected as a fault.

Fault re-activation after 'Clear Fault':

This fault will immediately re-activate if the voltage is still outside the allowable range.



Auto-clear: The controller continuously monitors this fault. The fault condition must be removed for this fault to be cleared.

Vehicle Travel Disable:
Since a secure slide has to be fully retracted with an inflated seal, this fault indicates that the seal inflation status is unknown. Therefore, the vehicle travel disabled signal will be activated.
*Note: This is the only **fault** that activates the vehicle travel disable signal.*

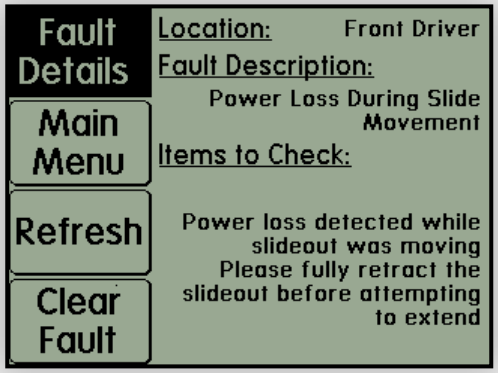
Emergency Retract Procedure
Retract the slide from either the password protected Manual Control Screen (page 28) or use rotary switch positions 2 thru 6 (page 61).

7. Power Loss During Slide Movement

Description: The controller remembers whenever there is a power loss while moving a slide. Whenever this happens, it is necessary to re-establish 'Home' position by fully retracting the slide.

Fault re-activation after 'Clear Fault':

This fault will occur each time power is applied to the controller (ignition turned on) until the slide has been fully retracted to establish 'Home' position.



Auto-clear: This fault does not auto-clear. Press **Clear Fault**. Retract the slide to 'Home' it.

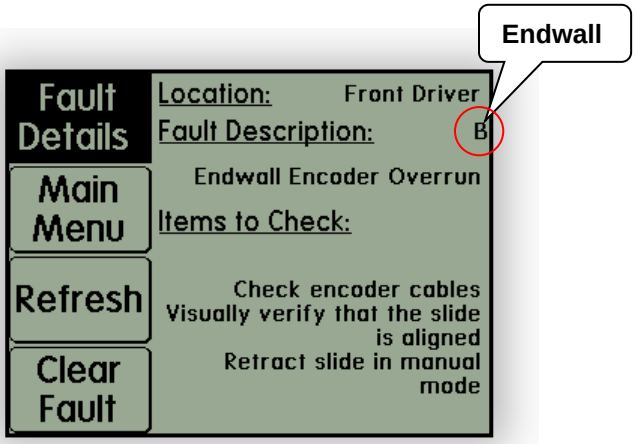
Emergency Retract Procedure
Retract the slide as normal; hold **Retract** until the message "Please Release Button" displays.

8. Endwall Encoder Overrun

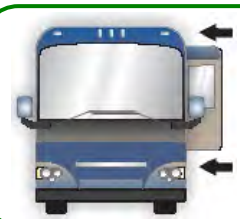
Description: The encoder count in the indicated endwall (A, B, C or D) has exceeded its normal operating limit, as defined by configuration item: **Typical End Position Counts** (refer to page 27).

Fault re-activation after 'Clear Fault':

Any time the condition is detected while moving the slide room.



Auto-clear: 10 seconds after fault occurrence.



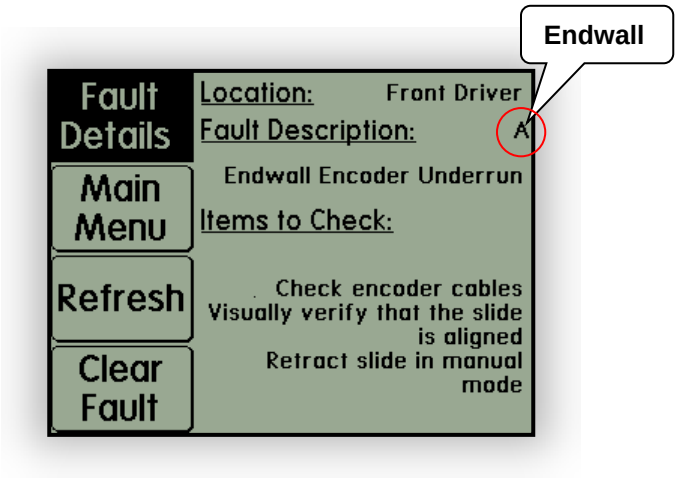
Emergency Retract Procedure
Retract the slide as normal; hold **Retract** until the message "Please Release Button" displays.

9. Endwall Encoder Underrun

Description: The encoder count in the indicated endwall (A, B, C or D) has decremented below zero (0). When retracting a slide, its encoder count should always decrement. On a 'homed' slide, the encoder count should never go below 1000 when fully retracted.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while moving the slide room.



Auto-clear: 10 seconds after fault occurrence

Emergency Retract Procedure
Access the password protected Manual and Endwall Control screens (page 28) and select **Set Equal**, vacuum the seal, and then do a **Sync Retract** to 'home' the slide.

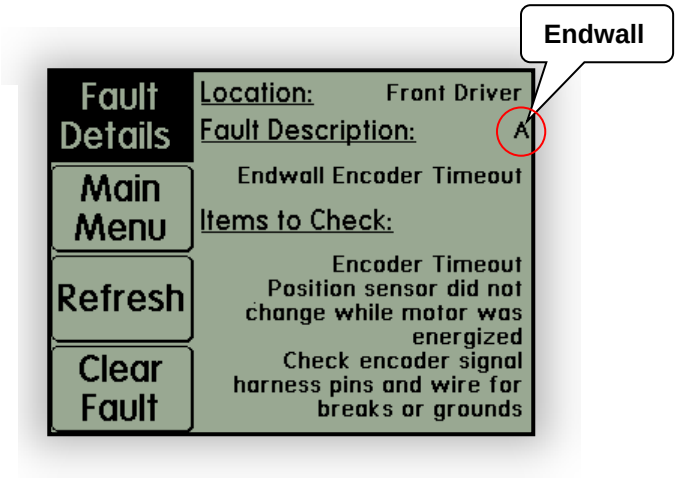
10. Endwall Encoder Timeout

Description: While the motor was energized, no encoder signal was detected for the indicated endwall (A, B, C or D).

Fault re-activation after 'Clear Fault':

Any time the condition is detected while moving the slide room.

Auto-clear: 10 seconds after fault occurrence.



Emergency Retract Procedure
Access the password protected Manual and Endwall Control screens (page 28), vacuum the seal, and then do a **No-Sync Retract.** Release the button when the slide is fully retracted.
Note: It is expected that a **Room Motor Over Current** fault will occur at the end of stroke.
If the vehicle will not go into gear after initiating this procedure, enable Travel Inhibit Override (see item #23 on page 26).

11. Encoder Maximum Difference Exceeded

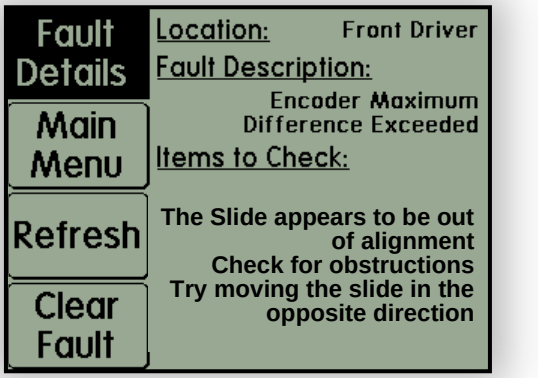
Description: The encoder count for a drive motor is not within the allowable tolerance to maintain synchronized motor drive as determined by the configuration **Max. Diff Over Virtual Lead** (refer to page 22).

After checking for obstructions, try moving the slide in the OPPOSITE direction to see if normal operation resumes.

If the issue persists, following the Emergency Retract Procedure, described below.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while moving the slide room.



Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure

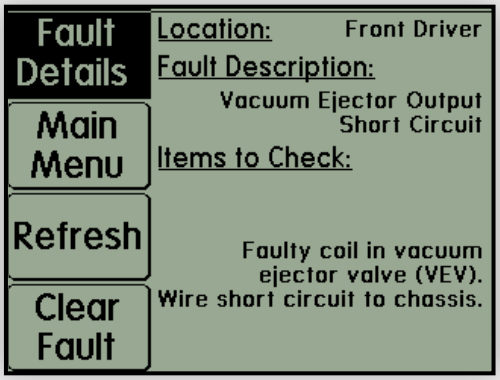
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- If the slide is **not** physically skewed, access the password-protected Manual and Endwall Control screens (page 28) and select **Set Equal**, vacuum the seal and then do a **Sync Retract** to 'Home' the slide.
- If the slide is skewed, it may be necessary to first straighten it up by using **No-Sync Retract** or **No-Sync Extend** (refer to page 30), then follow the previous procedure.

12. Vacuum Ejector Output Short Circuit

Description: The vacuum ejector valve (VEV) is mounted on the air manifold. When activated, this valve vacuums the pneumatic weather seal.
The controller has detected a short circuit on its output.

Fault re-activation after 'Clear Fault':

Any time the condition is detected during extending or retracting the slide room.



Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure

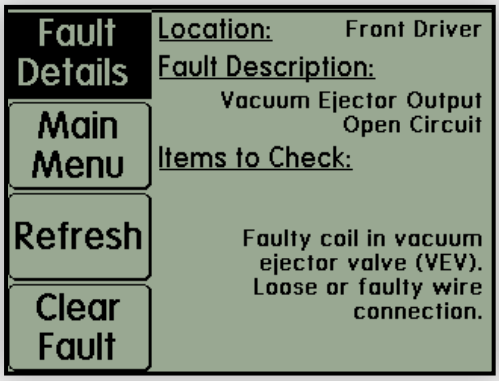
- Access the password-protected service menus to operate manual control. Refer to page 28.
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- Refer to the manual slide control switch section on page 61.

13. Vacuum Ejector Output Open Circuit

Description: The vacuum ejector valve (VEV) is mounted on the air manifold. When activated, this valve vacuums the pneumatic weather seal.
The controller has detected an open circuit on its output.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting the slide room.



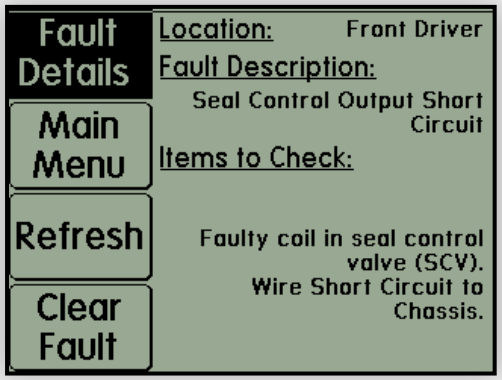
Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure

- Access the password protected service menus to operate manual control. Refer to page 28.
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- Refer to the manual slide control switch section on page 61.

14. Seal Control Output Short Circuit

Description: The seal control valve (SCV) is mounted on the air manifold. When activated, this valve vents the pneumatic weather seal. The controller has detected a short circuit on its output to the seal control valve.



Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting the slide room.

Auto-clear: 10 seconds after fault occurrence.

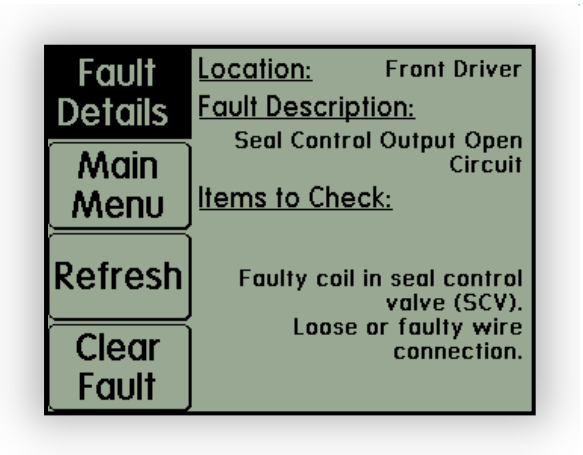
Emergency Retract Procedure

- Access the password-protected service menus to operate the manual control. Refer to page 28.
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- If the seal cannot be deflated, it may be necessary to disconnect the seal from the air manifold to allow it to freely vent (refer to page 213).

15. Seal Control Output Open Circuit

Description: The controller has detected an open short circuit on its output to the seal control valve.

The seal control valve (SCV) is mounted on the air manifold. When activated, this valve vents the pneumatic weather seal.



Fault re-activation after 'Clear Fault':

Any time the condition is detected during extending or retracting the slide room.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure

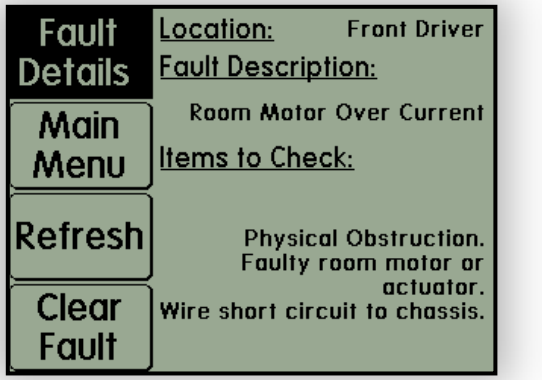
- Access the password-protected service menus to operate the manual control. Refer to page 28.
- Refer to the manual control section in this manual
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- If the seal cannot be deflated, it may be necessary to disconnect the seal from the air manifold to allow it to freely vent (refer to page 213).

16. Room Motor Over Current

Description: The controller has detected excess current on one of the room motors. Visually inspect the slide to ensure that it is clear from any obstruction. This condition may result from the following issues:

1. An object is wedged between the slide and the inside of the coach.
2. The air seal or wiper are damaged and have become wedged between the slide and the coach
3. The air seal does not actually deflate; for example, if the air line to the seal is pinched.

Fault re-activation after 'Clear Fault':
Any time the condition is detected while extending or retracting the slide room.



Auto-clear: 10 seconds after fault occurrence.

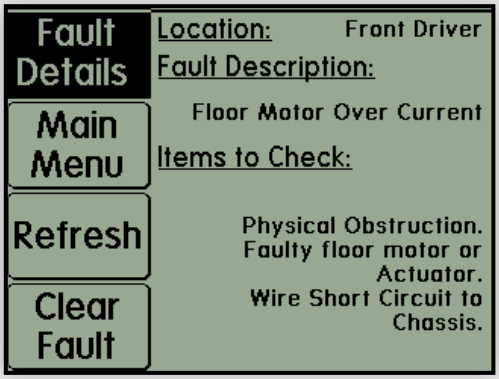
Emergency Retract Procedure

- If, after inspection, no obstruction is visible, increase the current limit in the password-protected configuration **Endwall Current Fault Limit** (refer to page 22) to a maximum of **14** Amps.
- If the fault persists, try pushing/pulling the slide in while pressing retract on the touch screen. If this still does not move the slide, contact Valid Manufacturing Ltd.

***Tech Tip**: The over-current detection on the slide controller is much faster than a regular fuse. For example, a 25Amp fuse is rated at 50 Amp for 1 second. The controller will respond to an over-current situation about 10 times faster than a fuse.*

18. Floor Motor Over Current

Description: The controller has detected excess current on the floor motor. Visually inspect the flat floor to ensure that it is clear of any obstructions; confirm that the flat floor does not hit the bottom edge of the slide room as it rises.



Fault re-activation after 'Clear Fault':

Any time the condition is detected during raising or lowering of the floor.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure

- If, after inspection, no obstruction is visible, increase the current limit in the password protected configuration **Floor Current Limit** (refer to page 20) to a maximum of **35** Amps.
- If the fault persists, there are two options available to lower the floor:

  1. Remove just the motor and use a flat screwdriver bit manually or with a cordless drill to lower the floor.

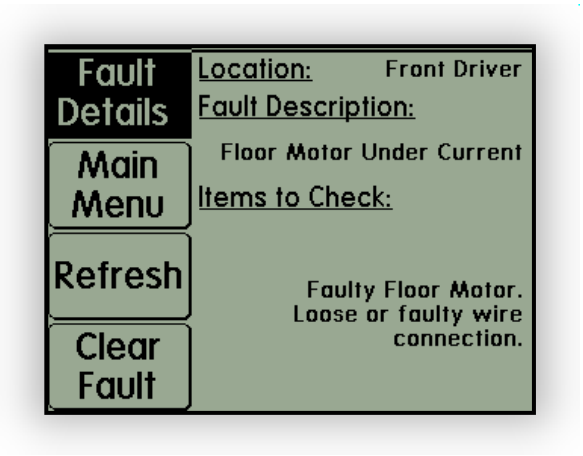
     OR

  2. Disconnect the rod-eye end of the floor actuator (refer to page 156).
     CAUTION: it will be necessary to use a jack to support the floor because as soon as you disconnect the actuator the floor will drop down to its lowered level.

Tech Tip: *The over-current detection on the slide controller is much faster than a regular fuse. For example, a 25Amp fuse is rated at 50 Amp for 1 second. The controller will respond to an over-current situation about 10 times faster than a fuse.*

19. Floor Motor Under Current

Description: The controller has detected no current draw by the floor motor.



Fault Re-activation after 'Clear Fault':

Any time the condition is detected during raising or lowering of the floor.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure:

- Visually inspect the controller and motor connections, looking for a loose or faulty wire. Use a multi-meter to measure the resistance of the motor. It should be less than 3 Ohms.
- If the motor resistance is good, it may be the controller. Connect a 12V DC battery to the motor to lower the floor.
- If the fault persists, there are two options available to lower the floor:

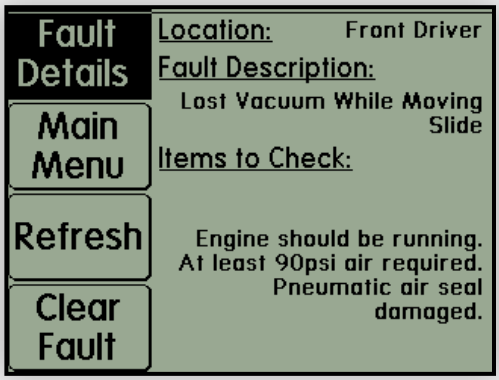
  1. Remove just the motor and use a flat screwdriver bit manually or with a cordless drill to lower the floor.

  OR

  2. Disconnect the rod-eye end of the floor actuator (refer to page 156).
  CAUTION*:* it will be necessary to use a jack to support the floor, because as soon as you disconnect the actuator the floor will drop down to its lowered level.

20. Lost Vacuum While Moving Slide

Description: The pneumatic weather seal has suddenly lost its vacuum during slide movement.
Slide operation requires a vacuumed seal prior to being moved.



Fault Re-activation after 'Clear Fault':

- Any time the condition is detected during extending or retracting the slide room.

Auto-clear: 10-seconds after fault occurrence

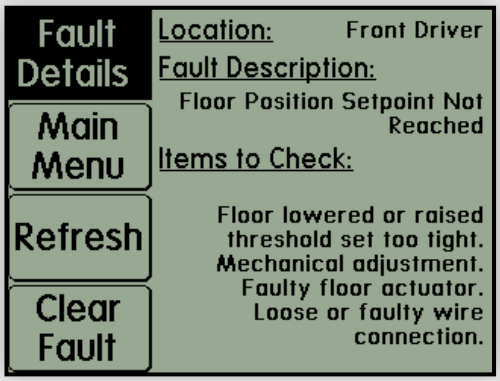
Emergency Retract Procedure:

- Access the password-protected service menus to operate manual control. Refer to page 28.
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- An alternative is to refer to the manual slide control switch section on page 61 to use rotary switch positions 2 through 4.

This fault will only show up if a seal had a large vacuum loss AFTER the slide started moving. The fact that it started moving indicates that it did achieve an initial vacuum that satisfied the threshold of 5 PSIA below ambient, as shown in the Diag screen.
If the seal is damaged, any future attempts to extend or retract the slide will result in a "Vacuum Timeout" fault.

21. Floor Position Setpoint Not Reached

Description: The floor actuator position signal has not yet reached its required raised or lowered threshold.
The controller allows a floor 45 seconds to raise or lower.
Visually inspect the floor to ensure that no obstruction is preventing it from reaching the raised or lowered position.



Fault re-activation after 'Clear Fault':

Any time the condition is detected during raising or lowering of the floor.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure:

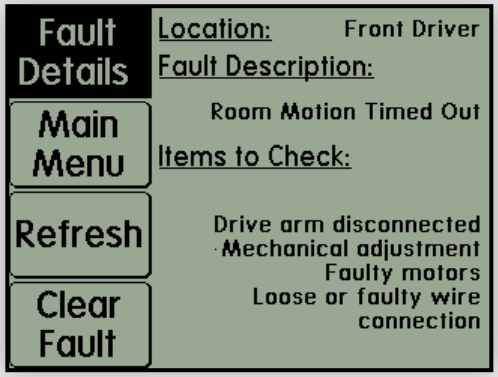
- Access the password-protected service menus to operate manual control (refer to page 28).
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- An alternative is to refer to the manual slide control switch section on page 61 to use rotary switch positions 2 through 4.

CAUTION*:* Visually confirm that the floor in its lowered position completely below the slide, to ensure that the slide room is able to retract. Otherwise, damage may occur.

22. Room Motion Timed Out

Description: The slide room motor drive was not able to fully retract or fully extend the slide room within 100 seconds (1 min. 40 secs.) of continuous operation.

Visually inspect the slide room to ensure there is no obstruction preventing it from reaching its extended or retracted position.



Fault re-activation after 'Clear Fault':

Any time the condition is detected during extending or retracting the slide room.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure:

- Access the password-protected service menus to operate manual control (refer to page 28).
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- An alternative is to refer to the manual slide control switch section on page 61 to use rotary switch positions 2 through 4.
- ***CAUTION:*** Visually confirm that the floor in its lowered position completely below the slide, to ensure that the slide room is able to retract.

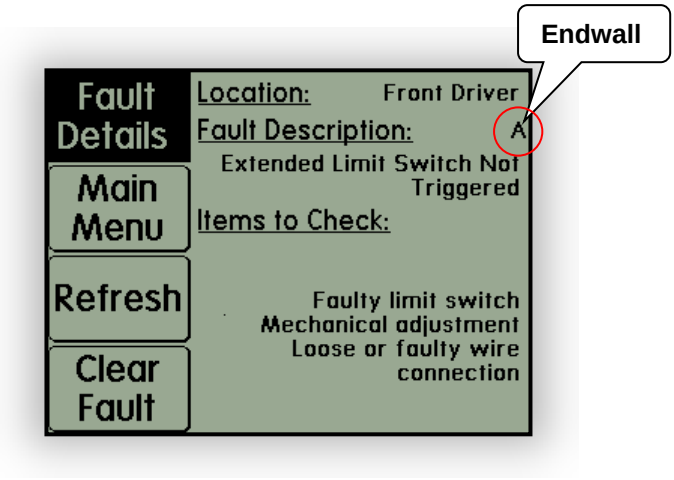
23. Extended Limit Switch Not Triggered

Description: The **extend** limit switch on the indicated endwall (A, B, C or D) failed to activate as the slide extended.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while the slide is extended.

Auto-clear: 10 seconds after fault occurrence.



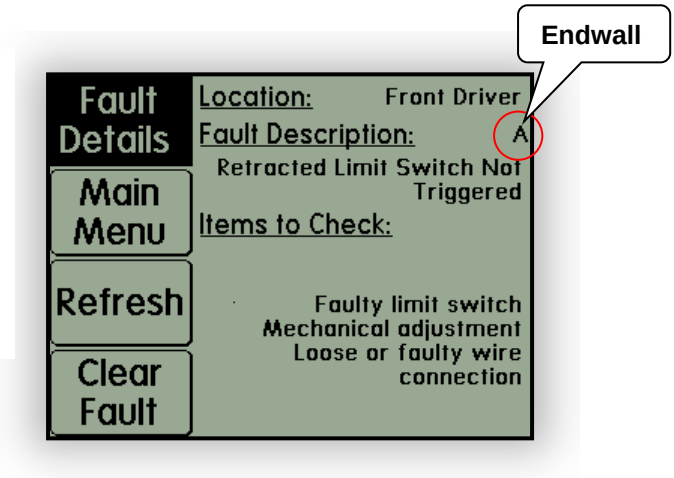
24. Retracted Limit Switch Not Triggered

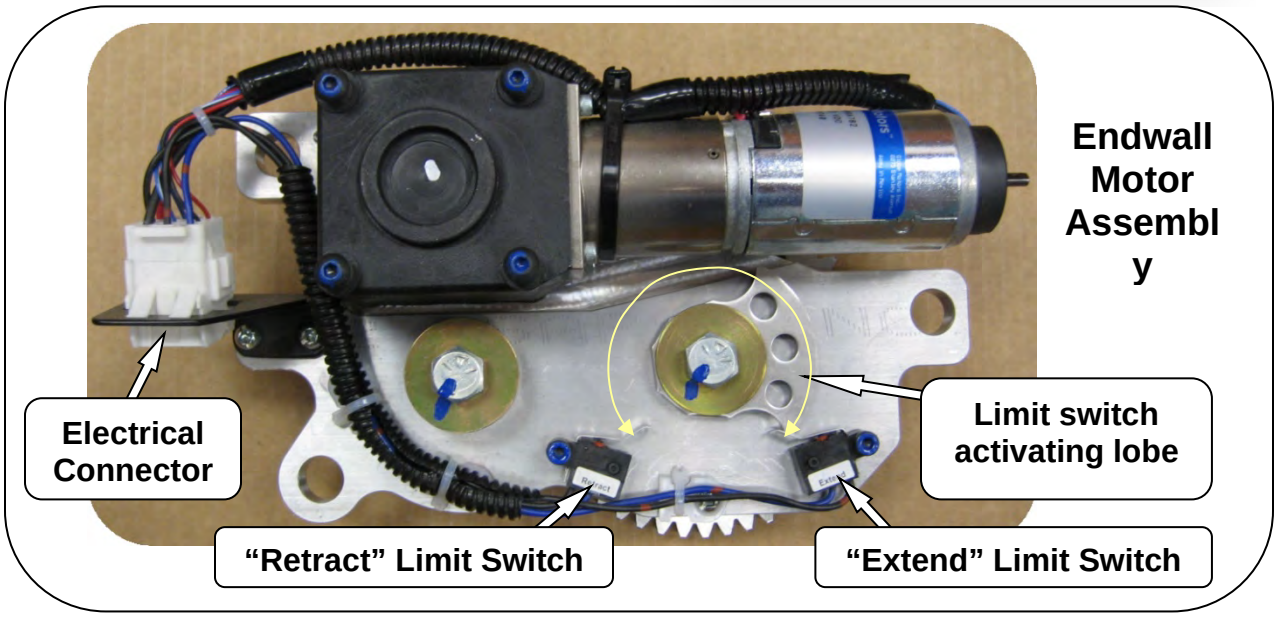
Description: The **retract** limit switch on the indicated endwall (A, B, C or D) failed to activate as the slide retracted.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while the slide is retracted.

Auto-clear: 10 seconds after fault occurrence.

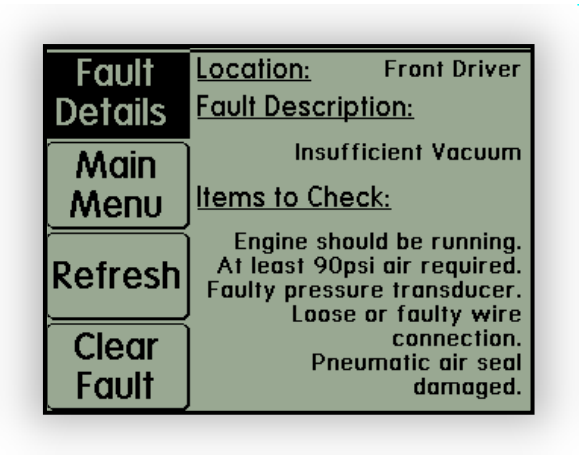




Refer to page 186 for the electrical connector harness pin assignments.

25. Insufficient Vacuum

Description: Slide operation requires a vacuumed seal prior to being moved.
The vacuum level of the pneumatic weather seal did not reach the initial vacuum threshold of 5 PSIA below ambient air pressure: Observe the display in <Diag> screen.
5 PSIA corresponds to -10 In hg (inches of mercury) as viewed on the air manifold pressure gauge.
From when it starts vacuuming, a controller allows a seal 45 seconds to reach 5 PSIA below ambient.



Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting the slide room.

Auto-clear: 10 seconds after fault occurrence.

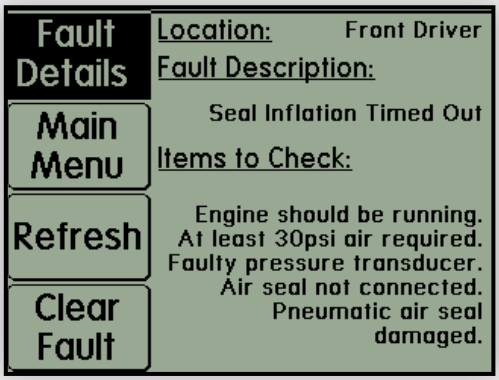
Emergency Retract Procedure:

- Access the password protected service menus to operate manual control (refer to page 28).
- ***CAUTION:*** Do not attempt to retract the slide with an inflated seal, otherwise seal damage may occur. At the very least, it should be vented to release the air pressure.
- An alternative is to refer to the manual slide control switch section on page 61 to use rotary switch positions 2 through 4.

CAUTION*:* visually inspect the floor in its lowered position to ensure that the slide room is able to retract, otherwise damage may occur.

26. Seal Inflation Timeout

Description: The inflation of the pneumatic weather seal did not reach the required pressure of +23 PSIA: Observe the display in the <Diag> screen.
+23 PSIA corresponds to about +10 psi on the air manifold pressure gauge.
From when it starts inflating, a controller allows 60 seconds for the seal pressure to reach +23 PSIA.



Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting the slide room.

Auto-clear: 10 seconds after fault occurrence.

Emergency Retract Procedure:

1. Use the touch screen to retract the slide room as normal.
2. Visually inspect the slide room to ensure that it is fully retracted.
3. Access the password-restricted configuration menus and change item 23 "Travel Inhibit Override" to Overridden (refer to page 26). This will override the Vehicle Travel Disabled signal from that room, allowing the coach to be driven. ***CAUTION***: if the seal is ripped it will not provide a weatherproof seal.

Tech Tip: *If the seal is ripped, it may drain the coach air supply and prevent the other slides from being supplied with adequate air pressure. In this case, it will be necessary to turn down the air manifold pressure regulator completely, or isolate the air seal using seal isolation valve (refer to page 75).*

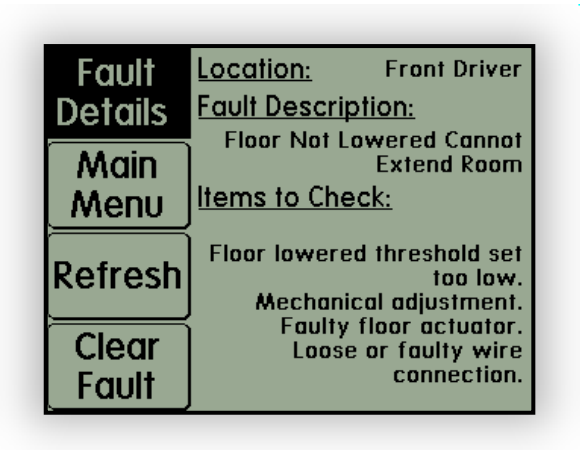
27. Floor Not Lowered Cannot Extend Room

Description: A floor must be fully lowered before a room may be extended.
The floor position signal does not indicate that it is fully lowered.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while **EXTEND** is pressed.

Tech Tip: This fault will occur if the Floor Reversed Configuration is set incorrectly (refer to page 19).



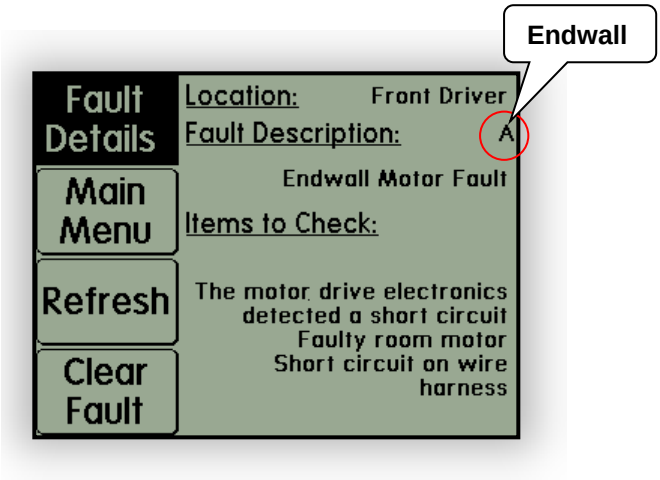
Auto-clear: 10 seconds after fault occurrence.

28. Endwall Motor Fault

Description: In addition to the current monitoring device on the controller, which is used to initiate room and floor motor over current faults, the motor drive electronics also monitor for short circuits.
This fault indicates there is a short circuit at the controller.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting the slide room



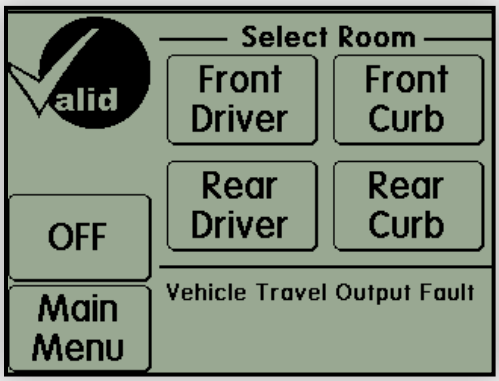
Auto-clear: 10 seconds after fault occurrence.

29. Travel Inhibit Output Short Circuit

Description: A message is displayed in the "Main" or "Select Room" menu if the Vehicle Travel output is unable to provide a coach travel disable signal.

This is caused by a short circuit of this signal

Slide operation is still permitted.



Fault activation:

- If the condition exists when the ignition is turned on and Travel Inhibit Override is enabled (refer to page 26).
- Any time the condition is detected while extending or retracting a slide room.

Auto-clear: The only way to clear this fault is to turn the ignition off, then on again. If the short circuit condition no longer exists, the fault will not re-occur.

The Vehicle Travel Signal has three possible display messages:

- **Inhibit Travel Overriden**
- **Vehicle Travel Output Fault**
- **Vehicle Travel Disabled**

Only one of these messages will be displayed at any one time. They are listed in display priority.

Emergency Retract Procedure:

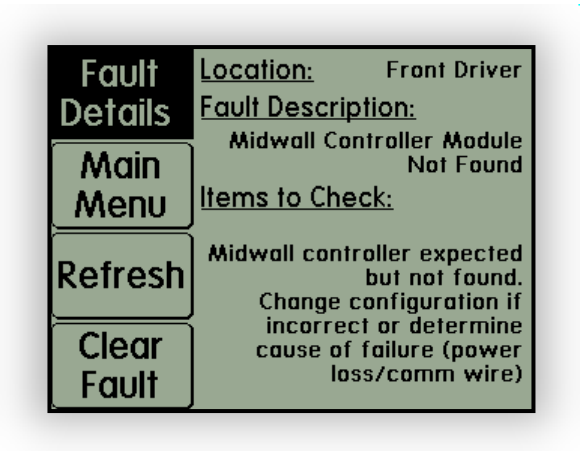
- ***CAUTION***: The message **Vehicle Travel Output Fault** indicates the slides may **not** be able to disable coach travel when extended. Before driving the coach, ensure that all slides are secure both visually and from the **Slide is Secure** message for each room on the touch screen.

30. Midwall Controller Module Not Found

Description: The midwall auxiliary controller module was not found. It is required to operate any room with more than two motor driven end walls. Check the power cable and the communication cable to the main controller.

Fault re-activation after 'Clear Fault':

Any time the condition is detected while extending or retracting a slide room configured with more than two end walls.



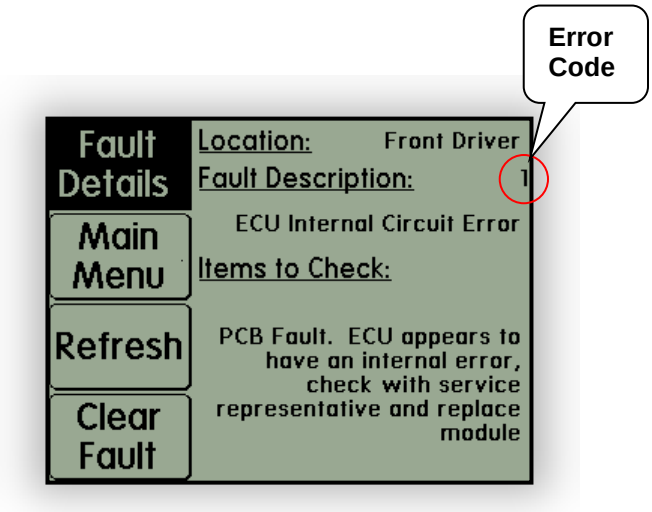
Auto-clear: 10 seconds after fault occurrence.

99. ECU Internal Circuit Error

Description: The controller has detected a component failure on its circuit board as indicated by the error code (1 through 16).

Fault activation:

Any time the condition is detected while extending or retracting a slide room.



There are no user serviceable parts on the controller – it should be replaced.

Auto-clear: The only way to clear this fault is to turn the ignition off, then on again.

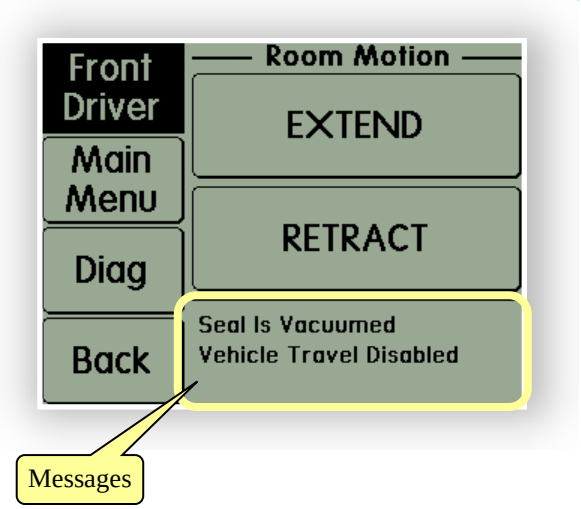
Messages

There is a three-line message area in the following screens:

- Main Menu
- Room Select
- Room Motion

They are broken down into two groupings:

1. Main Menu and Room Select are used for coach messages.
2. Room Motion is used for individual room messages.



The vehicle travel message has three (3) states. Only **one** of them will be displayed at any one time:

- Vehicle Travel Output Fault
- Vehicle Travel Disabled
- Inhibit Travel Overridden

Message	Main Menu and Room Select	Room Motion
Seal is Inflated	Never displayed	The seal pressure is above the inflated threshold, which is a fixed value of 23 PSIA.
Seal is Inflating	Never displayed	The seal is pressurized but has not yet reached the inflated threshold.
Seal is Venting	Never displayed	The seal control valve (SCV) is energized, to deflate the seal, but the pressure is above ambient.
Seal is Vented	Never displayed	The seal control valve (SCV) is energized, to deflate the seal, and the pressure is at ambient.
Seal is Vacuuming	Never displayed	The seal control valve (SCV) and vacuum ejector valve (VEV) are energized to vacuum the seal.
Seal is Vacuumed	Never displayed	The seal control valve is energized and the seal pressure is lower than 1PSI below ambient.
Park Brake Not Set	The park brake input is not set high (12VDC).	The park brake input is not set high (12VDC).

Message	Main Menu and Room Select	Room Motion
Slide Clear is Overridden	Never displayed	Display if that slide is 'Slide Clear Overridden.' Refer to page 18.
Slide is Secure	Never displayed	It will only display when that slide is fully retracted and the seal is inflated.
Inhibit Travel Overridden	If all other slides are secure, this message will be displayed, otherwise it will display '*Vehicle Travel Disabled.*'	Displayed if that slide is 'Inhibit Travel Overridden.' Refer to page 26.
Vehicle Travel Disabled	One or more slides are not secure	
Vehicle Travel Output Fault	There is a short circuit on the vehicle travel disabled output to the coach.	Never displayed
ECU in Local Control Mode	The rotary switch on the controller is not in position 0 Refer to page 61.	Never displayed
Manual Btn Temp Override	When the controller rotary switch is in position 7, at least one of the three items (0, 1 or 2) has been set to temporary override. Refer to page 64.	Never displayed
Manual Btn Inhibit Override	When the controller rotary switch is in position 7, item 3 has been set to persistent override. Refer to page 64.	Never displayed
	Never displayed	If one screen is being used to extend or retract a slide while any other screen is in either 'Room Motion,' 'Diag' or 'More Diag,' those other screens will see the message "**Another Interface is Currently in Use**" Just press OK to return to the Room Select menu.

MANUAL SLIDE CONTROL SWITCHES

The manual slide control switches are under a removable plastic cover on the controller, normally located in a baggage bay.

The rotary switch has eight modes (0-7) of operation. For normal touch screen operation it should be in position zero (0). In any other position, the message "**ECU in local Control Mode**" will be displayed in the Main Menu or Room Select Menu on the touch screen.

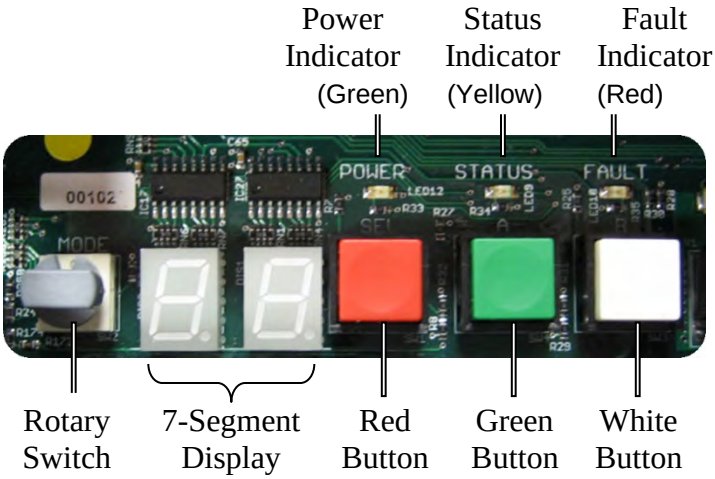
These switches should be used only if there are no operational touchscreens. It is not possible to configure a controller without a touch screen; the only exceptions are the four overrides in mode 7.

Slide rooms can be controlled through the touch screen(s) or using the red, green, and white buttons on the controller depending on the rotary switch selection.

The 7-segment display will indicate either the room number or fault code.

The yellow status indicator flashes once every time a room or floor achieves or leaves its end of stroke position.

Onboard control and indicators



Rotary Switch	Mode	Description	SEL (red)	A (green)	B (white)
0	Normal Operation	Touch screen operation only. The 7-segment display should be blank unless accessing a fault code	Show Fault Room	Show Current Room	Show fault code (see below)
1	Local Operation	Same as Extend or Retract on the touch screen except it ignores the park brake and slide clear inputs	Room 1-4	Retract	Extend
2	Air Seal Manual Toggle	Toggles seal inflate, vent and vacuum for the selected room. Maintains the seal state until switch is moved to position 0 or 1.	Seal 1-4	Vent / Inflate Toggle	Vent / Vacuum Toggle

Rotary Switch	Mode	Description	SEL (red)	A (green)	B (white)
3	Flat Floor Manual Operation	Lowers or raises the flat floor for the selected room regardless of slide position. As soon as the floor position threshold is met at the end of stroke, the yellow status indicator will flash once. The lower or raise direction depends on the **Floor Reversed Direction** configuration.	Floor 1-4	Lower	Raise
4	Slide Room Manual Operation	**Synchronized** Extend or Retract for the selected room regardless of the state of the air seal or flat floor.	Room 1-4	Retract	Extend
5a	Slide Endwall 'No Sync' Retract	**Unsynchronized** (open loop) **Retract** for the selected room regardless of the state of the air seal or flat floor. By default, all endwalls are selected. Press the green button to cycle through **all, a, b, c** or **d**. If <u>all</u> endwalls are selected, the display will just display the selected room number (1, 2, 3, or 4). If a <u>single</u> endwall is selected, the display will toggle between the selected room number (1, 2, 3 or 4) and selected endwall letter (a, b, c, or d). This mode does "seek" at the end of stroke; a motor over current fault will occur if held on.	Room 1-4. Flashes single endwall selection	Select Endwalls: **all, a, b, c** or **d**	Retract All or selected endwall
5b	Parallel Slide Endwall 'No Sync Retract'	This mode must be enabled through the rotary switch position 7, item 4. **Unsynchronized** (open loop) **Retract** for any endwalls plugged into 1A, 1B, 2A and 2B on the **main** controller. This feature should only be used in case of a failure of the intermediate wall controller.	Displays 'P' for parallel	Press A and B simultaneously to **retract** endwalls connected to 1A, 1B, 2A and 2B on the main controller.	

Rotary Switch	Mode	Description	SEL (red)	A (grn)	B (wht)
6a	Slide Endwall 'No Sync' Extend	**Unsynchronized** (open loop) **Extend** for the selected room regardless of the state of the air seal or flat floor. By default, all endwalls are selected. Press the green button to cycle through **all, a, b, c** or **d**. If all endwalls are selected, the display will display just the selected room number (1, 2, 3, or 4). If a single end wall is selected, the display will toggle between the selected room number (1, 2, 3 or 4) and selected endwall letter (a, b, c, or d). This mode does "seek" at the end of stroke; a motor over current fault will occur if held on.	Room 1-4. Flashes single endwall selection	Select Endwalls: **all, a, b, c** or **d**	Extend All or selected endwall
6b	Parallel Slide Endwall 'No Sync Extend'	This mode must be enabled through the rotary switch position 7, item 4. **Unsynchronized** (open loop) **Extend** for any endwalls plugged into 1A, 1B, 2A and 2B on the **main** controller. This feature should only be used in case of a failure of the intermediate wall controller.	Displays 'P' for parallel	Press A and B simultaneously to **Extend** endwalls connected to 1A, 1B, 2A and 2B on the main controller.	
7	Override	Provides three temporary and one persistent override. Temporary overrides will be reset when power is removed from the controller. In this mode only, the yellow status indicator illuminates if the selected item is overridden. **0 – Disable all motor current limits (temporary)** The Main Menu and Room Select Menu display this text: Manual Btn Temp Override	Item 0-4	Override ON Yellow Status LED 'ON'	Override OFF Yellow Status LED 'OFF'

Rotary Switch	Mode	Description	SEL (red)	A (grn)	B (wht)
7	Override	**1 – Disable output diagnostics (temporary)** The disable output diagnostics is global and will not show up in the configuration item 22 for a slide. The Main Menu and Room Select Menu display this text: Manual Btn Temp Override **2 – Disable over voltage detection (temporary)** The Main Menu and Room Select Menu display this text: Manual Btn Temp Override **3 – Disable Travel Inhibit (persistent)** The disable override is global and will not show up in the touchscreen configuration item 23 for any slide. The Main Menu and Room Select Menu display this text: Manual Btn Inhibit Override **4 – Enable Parallel Motor Output Modes (temporary)** This mode requires harness re-allocations to move a slide with more than two endwalls in the case of a failure of an intermediate wall control module. Refer to rotary switch position 5b and 6b described above.	Item 0-4	Override ON Yellow Status LED 'ON'	Override OFF Yellow Status LED 'OFF'

7-Segment Display Fault Codes

In rotary switch mode 0 (Normal Touch Screen Operation), the 7-segment display is available to indicate the fault room and fault code by pressing either the red or white buttons, respectively.

This may be useful when operating the slide from the baggage bay. If you see the red fault indicator illuminate, quickly move the rotary switch to position zero (0), press the red and white buttons, and make a note of the 7-segment display indicators.

Unlike the touch screen, the controller only displays the fault room and code while the red fault indicator is illuminated. Typically, the majority of faults automatically clear after 10 seconds, which means you have to move quickly to retrieve the information.

CODE	DESCRIPTION
01	System Under Voltage
02	System Over Voltage
03	Slide Not Installed Cannot Operate
04	Park Brake Off Cannot Move Slide
05	Slide Not Clear Cannot Move Slide
06	Pressure Transducer Volts Out of Range
07	Power Loss During Slide Movement
08	Endwall Encoder Overrun
09	Endwall Encoder Underrun
10	Endwall Encoder Timeout
11	Encoder Maximum Difference Exceeded
12	Vacuum Ejector Output Short Circuit
13	Vacuum Ejector Output Open Circuit
14	Seal Control Output Short Circuit
15	Seal Control Output Open Circuit

CODE	DESCRIPTION
16	Room Motor Over Current
18	Floor Motor Over Current
19	Floor Motor Under Current
20	Lost Vacuum While Moving Slide
21	Floor Position Setpoint Not Reached
22	Room Motion Timed Out
23	Extended Limit Switch Not Triggered
24	Retracted Limit Switch Not Triggered
25	Insufficient Vacuum
26	Seal Inflation Timed Out
27	Floor Not Lowered Cannot Extend Room
28	Endwall Motor Fault
29	Travel Inhibit Output Short Circuit
30	Midwall Controller Module Not Found
99	ECU Internal Circuit Error

SLIDE CONTROLLER SETUP PROCEDURE

Introduction

This section describes the setup procedures required to configure a slide controller. These procedures would be used in the following situations:

- A new or replacement controller – All six items below.
- Service performed on a slide which required the removal of one or more slide drive arms – Just the slide homing procedure for that slide.

Checklist

1. Access Service Menus
2. Slide Setup
3. Flat Floor configuration for each slide
4. Confirm 'Typical End Position Counts'
5. Confirm 'Endwall Current Fault Limit'
6. 'Home' the slides

Step 1 – Access the Service Menus

Refer to page 16.

Step 2 – Slide Setup

Refer to page 32 to let the controller know how many slides exist in the coach and configure each touch screen for which rooms are visible.

Step 3 – Flat Floor Configuration

The following two configurations must be set for each slide room:

- Does any room have a flat floor? Refer to configuration item **Floor Equipped** described on page 18.
- If there is a flat floor, does the actuator operate in reverse direction? Refer to configuration item **Floor Reversed Direction** described on page 19.

Step 4 – Confirm 'Typical End Position Counts'

Depending on the motor drive assembly, the configuration **Typical End Position Counts** have to be set accordingly. Refer to page 27:

'Typical End Counts'	**Notes**
10,000	**Original Design.** An Extended slide encoder count of around 9850 as viewed in the **Endwall Control** screen (refer to page 30).
14,500	**New Design Jan 2008** An Extended slide encoder count of around 14300 as viewed in the **Endwall Control** screen (refer to page 30).

**** IMPORTANT ****

Never *mix original and new motor drive assemblies in the same slide room because each encoder counts at a different rate of slide motion.*

Step 5 – Confirm 'Endwall Current Fault Limit'

Refer to page 22 to confirm that the Endwall Current Fault Limit is set to 12 Amps.

Step 6 – 'Home' the Slides

Each slide room must be 'homed' to establish 'slide secure' when fully retracted, to allow the coach to travel. Refer to page 68 for the Slide Homing Procedure.

Slide Homing Procedure

Introduction

The Integrated End Wall (IEW) slide drive system has a motor and encoder for each endwall.

The encoders provide relative position information which is used to synchronize the motors as a slide extends or retracts.

During installation of the control system it is necessary to establish the fully retracted HOME position for each slide.

There is a region at each end of the slide travel which is indicated by the activation of a limit switch on each motor drive assembly. As soon as a limit switch is activated, the control system enters 'Seek Mode' which prepares to turn off the motors when the drive arms reach their end of stroke.

Except for **NoSync Retract** in service mode, the HOME position is established every time a slide is fully retracted and allowed to complete its 'Seek' cycle. This is indicated by the message "Please Release Button" or observing the motor current go to zero in manual control **Sync Retract**.

The encoder count for each slide is set to 1000 any time a retract 'Seek' cycle finishes. In practice there is often a small mechanical spring effect which back-drives the encoder about 50 counts when the motor is turned off.

Encoder counts are incremented while extending and decremented during a retract. If the encoder count falls below zero (0) the fault "Endwall Encoder Underrun" will occur. To prevent this while initially retracting a slide to establish HOME position, select <Set Equal> to set the encoder count to maximum.

CheckList

1. ❑ Access Service Menus.
2. ❑ Manually Align the Drive Arms (if slide not square).
3. ❑ Press 'Set Equal'.
4. ❑ Retract the Slide.

Step 1 – Access the Service Menus

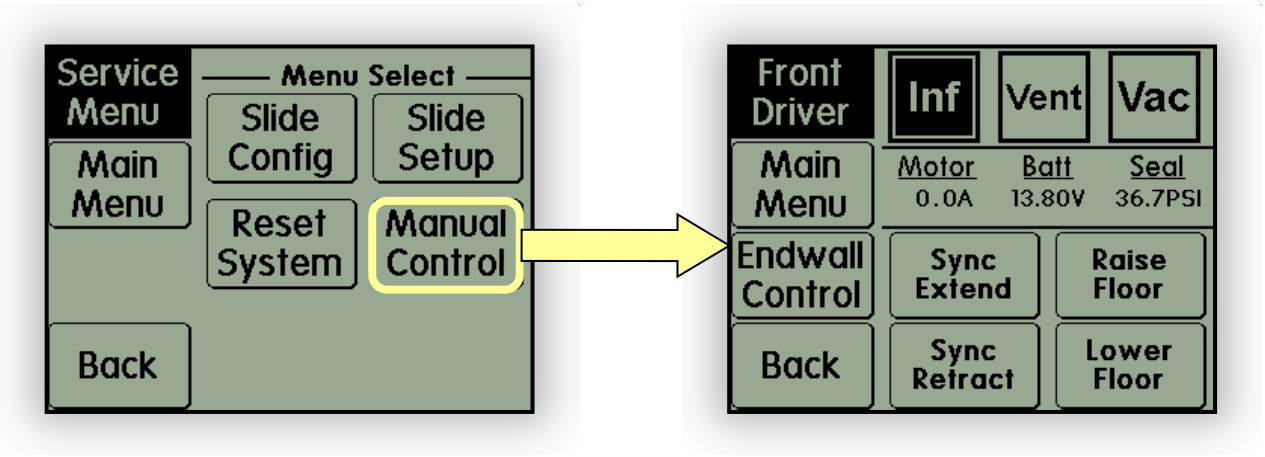
Refer to page 16.

Step 2 – Manually Align the Drive Arms

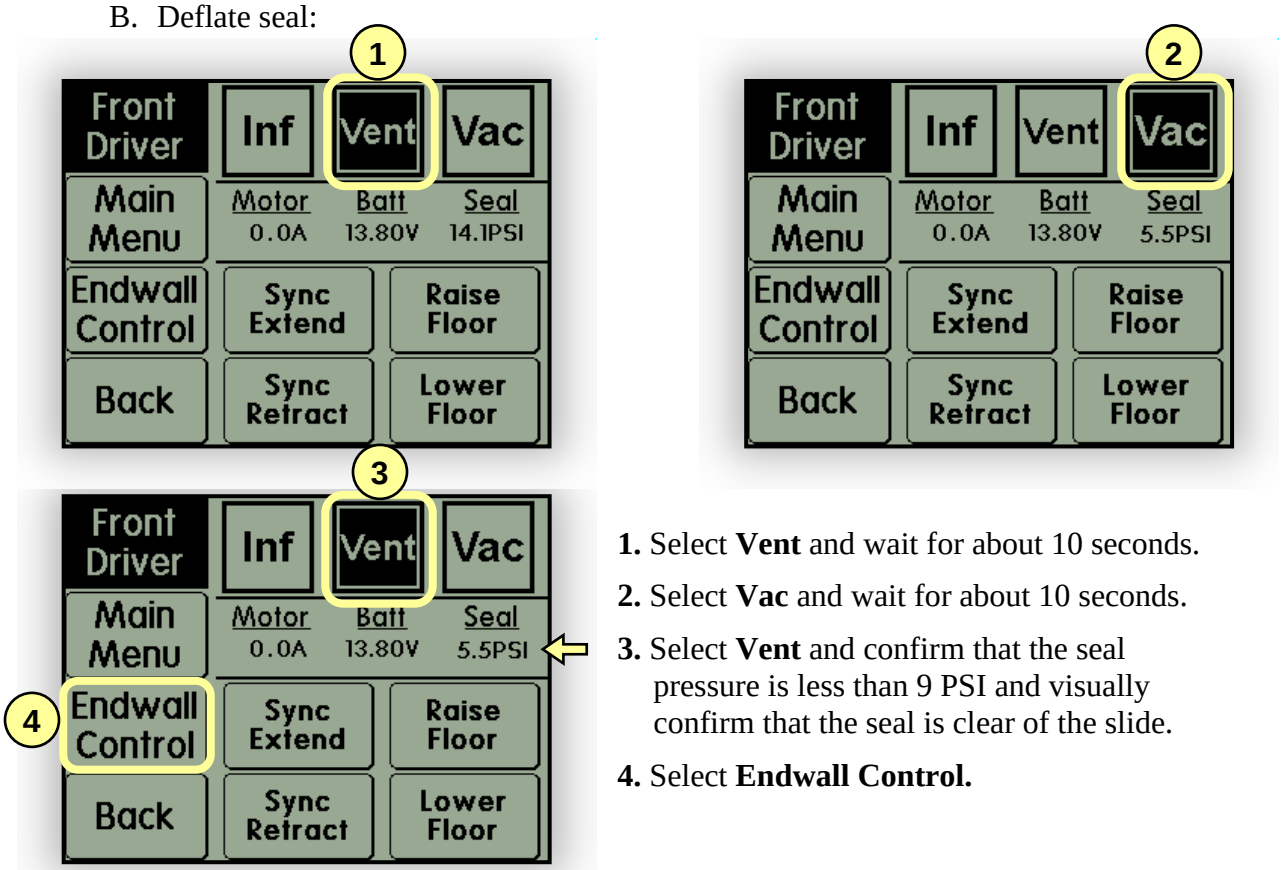
Both drive arms must be installed and manually aligned to ensure that the slide is square to the coach. Measure from the outside of the coach to each end of the slide; both measurements should be within 1/4 inch of each other.

> ***** IMPORTANT *****
> *This step is **NOT** required if both drive arms are connected **AND** the slide is already square to the coach.*

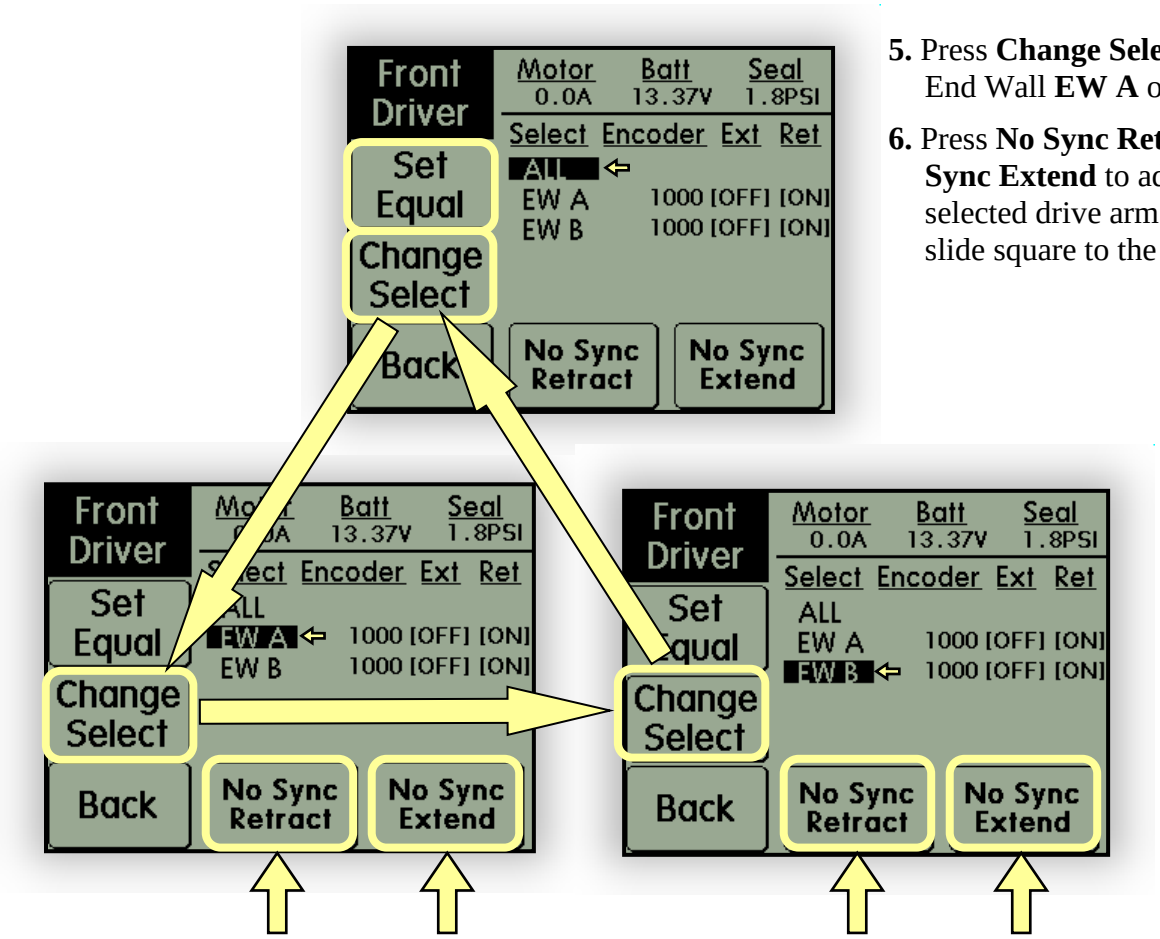
A. Enter manual control. Press <Manual Control>.



B. Deflate seal:

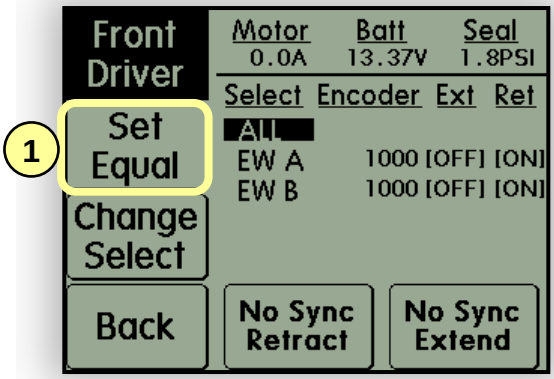


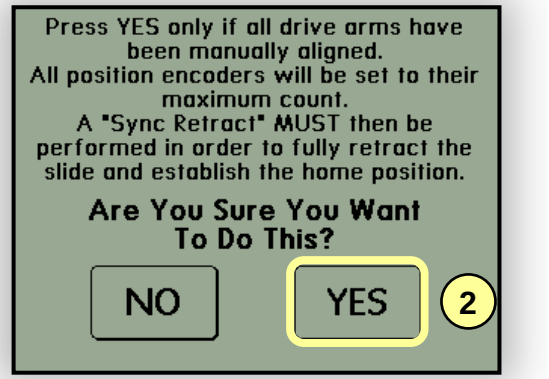
1. Select **Vent** and wait for about 10 seconds.
2. Select **Vac** and wait for about 10 seconds.
3. Select **Vent** and confirm that the seal pressure is less than 9 PSI and visually confirm that the seal is clear of the slide.
4. Select **Endwall Control.**

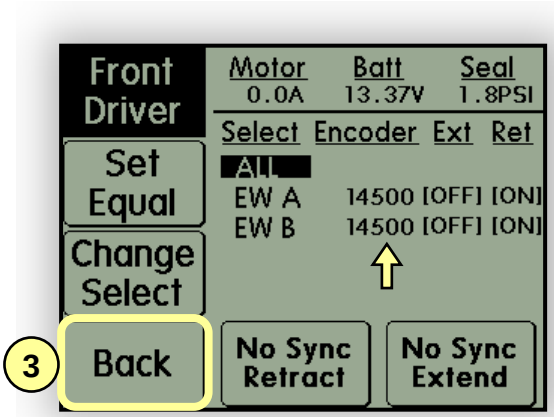


5. Press **Change Select** to choose End Wall **EW A** or **EW B.**
6. Press **No Sync Retract** or **No Sync Extend** to adjust the selected drive arm to align the slide square to the coach.

Step 3 – Press Set Equal





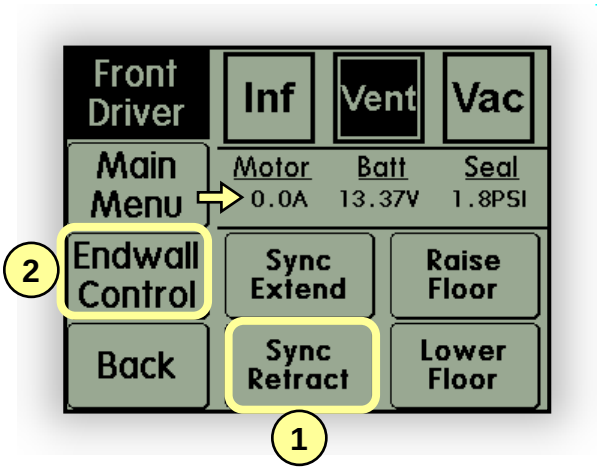


1. Press **Set Equal**
2. Press **YES** and confirm that both encoders now show 14,500*

   ***Note:** Early model slides will show 10,000. Refer to page 27 for further information.

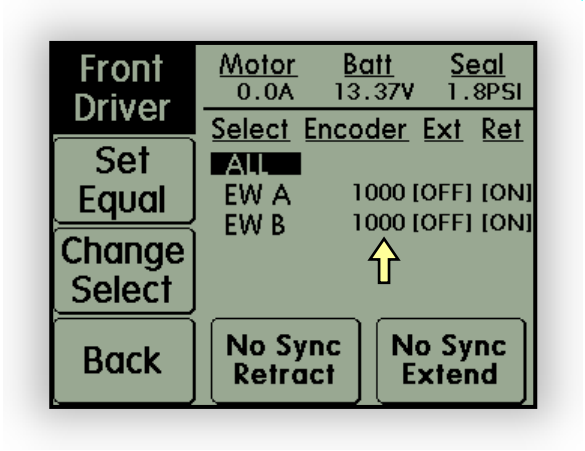
3. Press **Back**

Step 4 – Retract the Slide



1. Confirm that the seal pressure is still below 9 PSI.
2. Press and hold **Sync Retract** until the motor current goes to zero (0).
3. Press Endwall Control and confirm that both encoders now in the range 1000 to 1050.

The normal Room Select Retract also 'homes' the slide provided the **Retract** button is held until the message "**Please Release button**" displays.

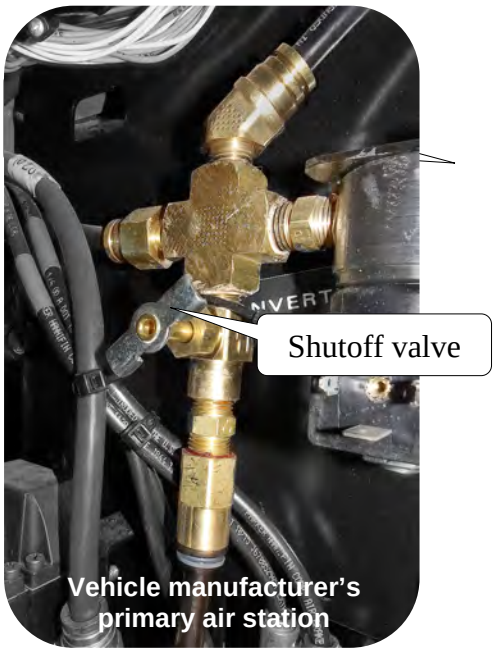


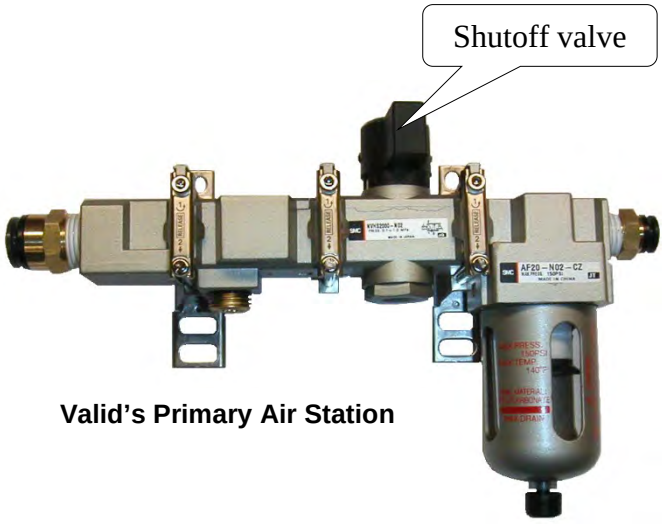
*****VERY IMPORTANT *****

***NEVER** use "**No Sync Retract**" to home a slide because it does not perform an end-of-stroke Seek Cycle.*

SLIDE SEAL AIR SUPPLY

Coach primary air





Valid's Primary Air Station

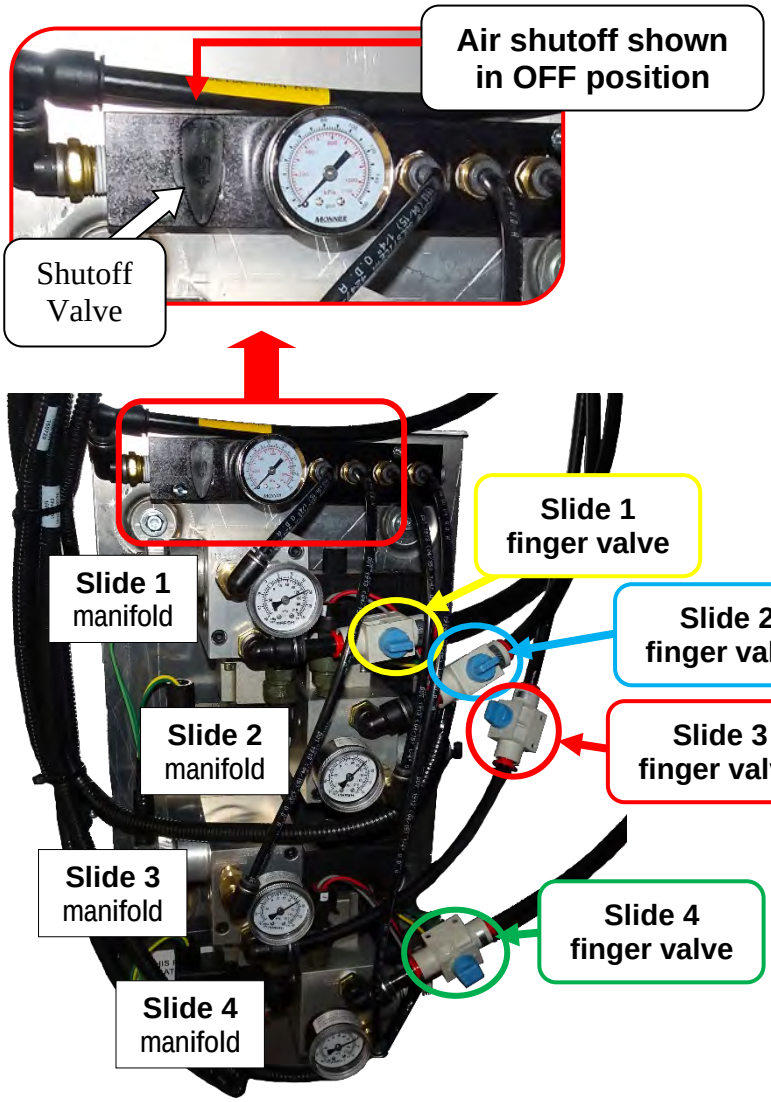
The coach's air supply system feeds air into either Valid's or the vehicle manufacturer's primary air station, which then supplies the pneumatic back panel.

Turning air on or off at the pneumatic back panel

The slide manifold shutoff valve is located on the pneumatic back panel, which is generally found in one of the baggage bays. Air for the pneumatic back panel comes from the coach's primary air station.

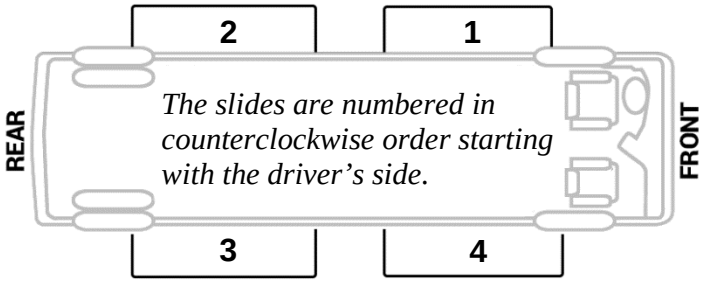
Use the slide manifold shutoff valve to turn off the air to all slide seals in the coach. This prevents any seal from inflating while the slide is being serviced.

Use the shutoff finger valves to turn off air to a single slide.



Ensure that you shut off the air to the correct slide you wish to work on. The air manifolds are numbered starting with the first one at the top, and correspond to the slides as shown in the diagram below.

When you have finished servicing the slide(s), restore air supply by turning on the air using the individual finger valve, or the manifold shutoff valve on the pneumatic panel.



The slides are numbered in counterclockwise order starting with the driver's side.

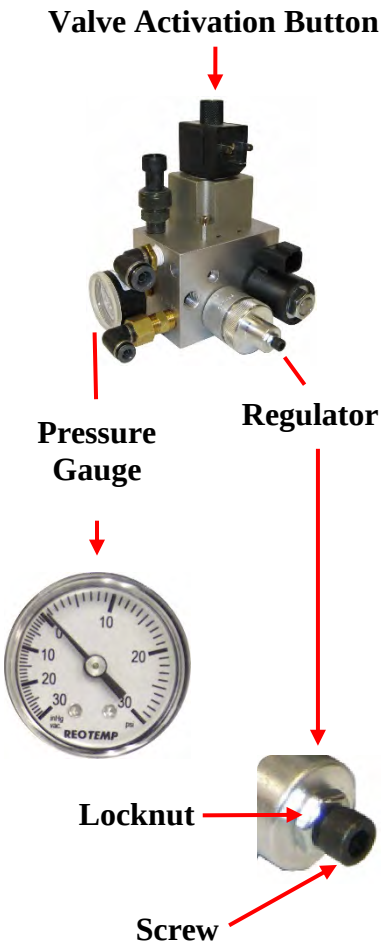
SETTING THE PRESSURE REGULATOR

*****IMPORTANT *****

All regulators are factory set. Make sure that the air supply to the regulator is verified before making any adjustments

Seal pressure varies among coach manufacturers. If you are unsure of the original air seal pressure and need to perform an adjustment, you should set the pressure value to approximately 20 PSIg.

There are as many pressure regulators as slides in your coach. If you have more than one slide, ensure that all regulators are properly set and adjust as necessary.



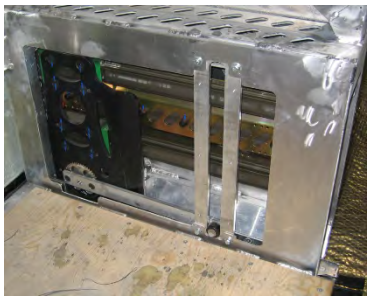
To adjust the regulator pressure:

1. Ensure air seal is inflated and coach air is at **full** pressure. The pressure gauge should read a positive pressure (clockwise).
2. Use a wrench to loosen the locknut.
3. Use a 5/32” Allen wrench to turn the screw counter-clockwise, to cut off air flow.
4. Vent the seal by pressing the valve activation button on the seal control valve.
5. Slowly turn the screw clockwise to increase the pressure until the gauge reads 20 PSIg.
6. Re-check the pressure setting by pressing the valve activation button, and then release to observe the gauge reading. Adjust the screw as necessary.
7. Tighten the locknut when pressure is correct.
8. Re-check pressure after the slide(s) is cycled (i.e. ON-retract / ON-extend).

Note: Air responds slowly; allow for adjustment time when turning the screw and do not overshoot your goal.

SERVICE ACCESS POINTS

Each slide has service access points which **must** be readily accessible. It is expected that the coach converter will have engineered the finished coach design to provide ready access to these following points:

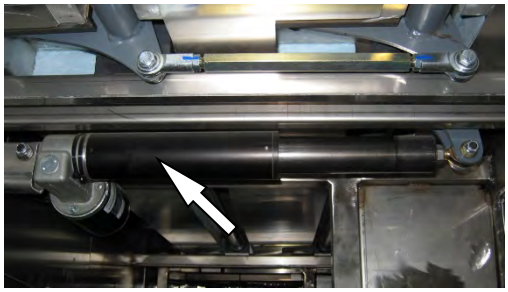


Interior end-wall access

Exterior access panel

Interior roof hooks

Baggage bay access to the flat-floor components



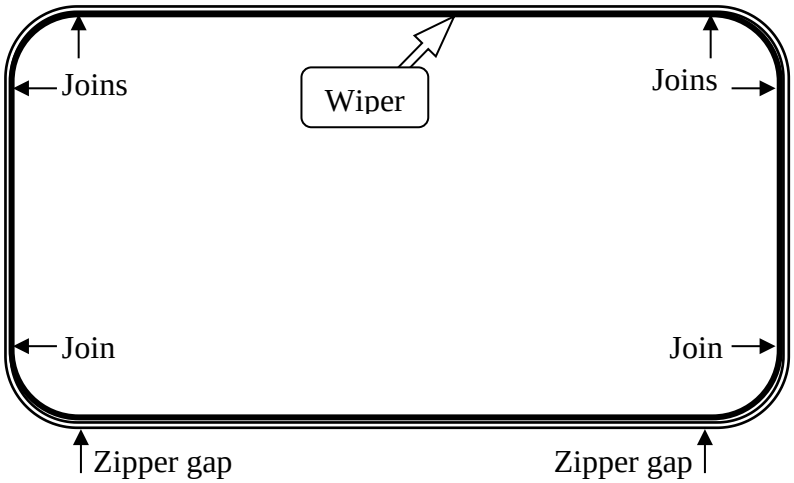
Flat-floor actuator

Flat-floor support and lifting mechanism

REPAIRING THE WIPER

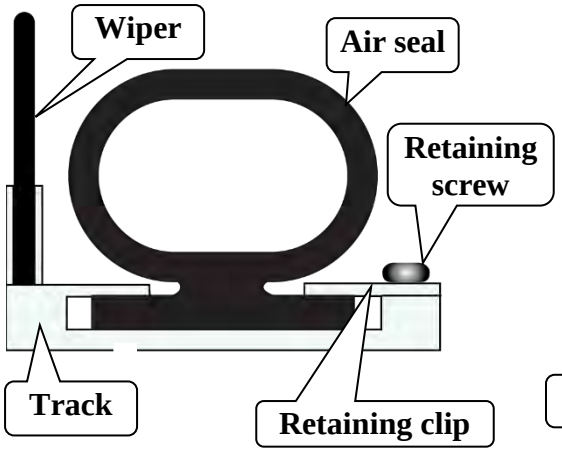
Introduction

The wiper is located on the outside edge of the seal track. Its primary purpose is to “wipe” off water, especially on the top of the slide, as the slide retracts into the coach.
The wiper is generally comprised of four (4) corner pieces and four (4) straight pieces, as shown below. However, note that not all coach converters use a wiper around the entire perimeter of the slide.

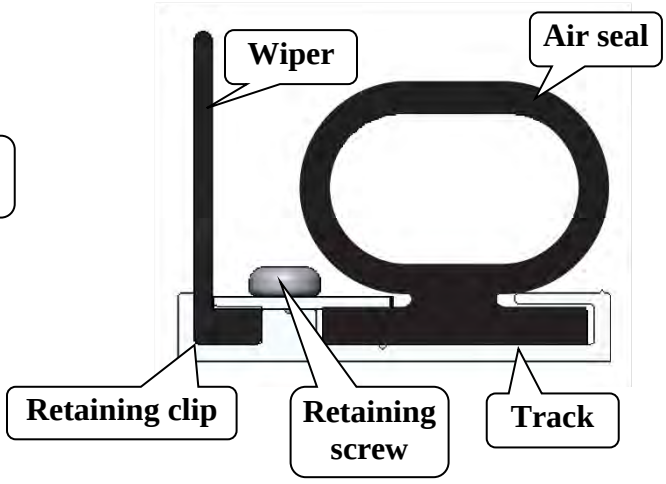


Determine the wiper style installed on the slide. Note the profile, and the way in which it is held in place.
Follow the instructions beginning on this page to replace the crimped-on wiper (straight profile, retainer on opposite side of air seal).
Follow the instructions beginning on page 80 to replace the extruded wiper (L-shaped profile, retainer on same side and holding in place).

Crimped-on wiper:



Extruded wiper:



Replacing Crimped-On Wipers

Tools and Consumables Required

- EPDM rubber, 1/16” x 1-1/8”
- Seal wiper, 4 inch corner
- Tape measure
- Sandpaper, 120 grit
- Vise-Grips
- Socket set / wrenches
- Loctite 495 Instant Adhesive
- Steel plate 1/16” thick 3”x 3
- Knife
- M8 Allen key
- Imperial Allen key set
- Glass suction cup

Checklist – Repairing the Crimped-on Wiper

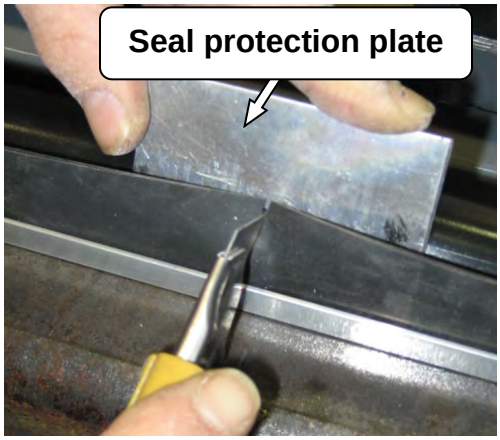
1. ❑ Put slide in seal change position.
2. ❑ Remove the wiper.
3. ❑ Pry open the wiper retaining track.
4. ❑ Insert the wiper.
5. ❑ Put the slide back to its operating travel position.

Step 1 – Put Slide in Seal Change Position

Refer to steps 1 through 8, starting on page 83, for instructions on how to put the slide in seal change position.

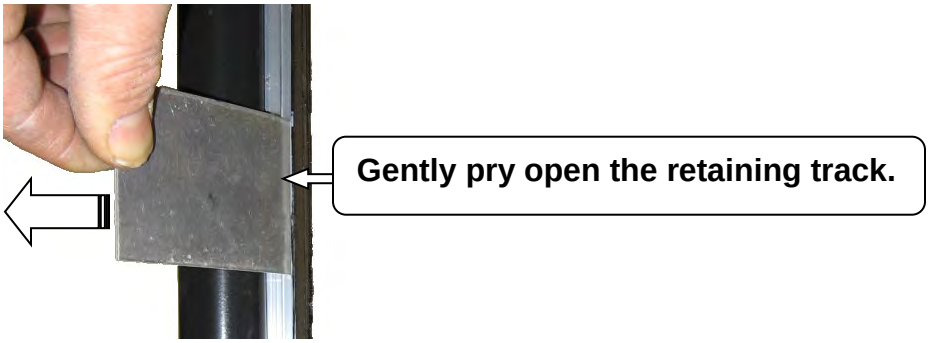
Step 2 – Remove the Wiper

If the entire wiper is to be replaced, use Vise-Grips to pull the wiper from its track. If a short section is to be replaced, use a knife along with a seal protection plate to prevent damage to the air seal, and cut the wiper and remove using Vise-Grips.

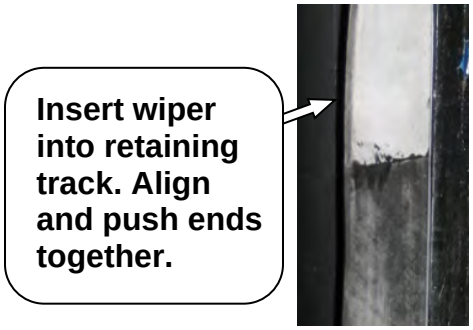


Step 3 – Pry Open Wiper Retaining Track

Using the lever plate, gently pry open the wiper retaining track.



Step 4 – Insert Wiper



As you insert the wiper along the track, reinstall the retaining clips as you go, taking care to replace them in the order that they were removed.

Step 5 – Put Slide Back Into Operation

Refer to steps 14 through 21, starting on page 83, for instructions on how to put the slide back to into operation.

REPLACING EXTRUDED WIPERS

The extruded wiper is found in newer slides. Follow these steps to replace it.

Tools and Consumables Required

- Wiper Extrusion, straight
- Wiper Extrusion, 4-inch corner
- Tape measure
- Sandpaper, 120 grit, or Scotch pad
- Steel plate 1/16” thick 3”x 3”
- Knife
- M8 Allen key
- Imperial Allen key set
- Glass suction cup

Checklist – Repairing the Extruded Wiper

1. ❑ Put slide in seal change position.
2. ❑ Remove retaining clips to access screws.
3. ❑ Remove the old wiper.
4. ❑ Insert the new wiper and reinstall retaining clips.
5. ❑ Put the slide back to its operating travel position.

Step 1 – Put Slide in Seal Change Position

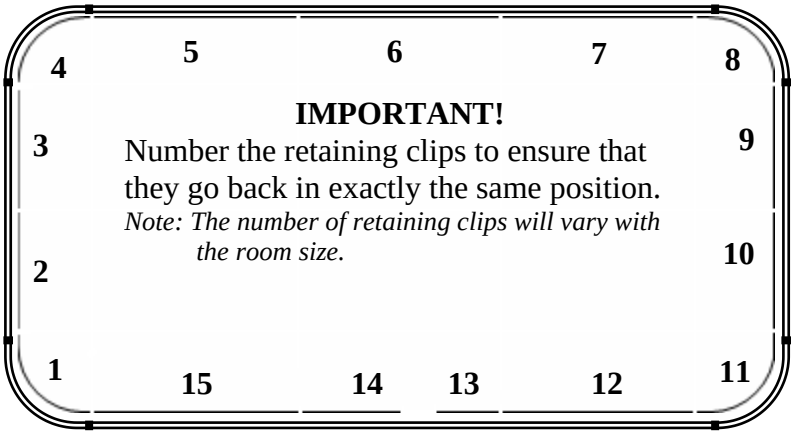
Refer to steps 1 through 9, starting on page 83, for instructions on how to put the slide in seal change position.

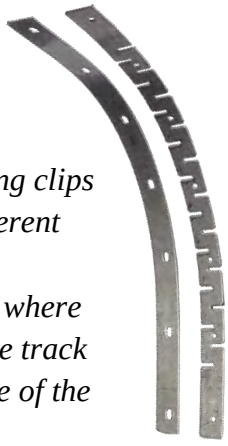
Step 2 – Remove the Retainer to Access Screws

Inflate the air seal before removing the retaining clips to allow access to the screws.

Start at one corner. Using your fingers to push aside the seal, unscrew the screws holding down the retaining clip and remove.

Important: Number the retaining clips so that you may replace them in exactly the same location (see below).





Note: Retaining clips may have different appearances depending on where they are on the track and the profile of the slide.

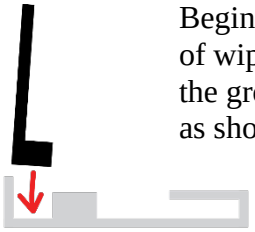
Corner retaining clips

Step 3 – Remove Old Wiper

If the entire wiper is to be replaced, pull the wiper from its track.

If a short section is to be replaced, cut the wiper and remove damaged section.

Step 4 – Insert New Wiper



Push wiper into groove

Beginning at a corner, insert a corner piece of wiper into the track, pushing it down into the groove as shown at left, until it sits flat as shown at right.

Next, install a straight piece. Push the end of the straight wiper piece so it is flush with the end of the corner piece. No adhesive is necessary.

Wiper correctly inserted into track

As you go, screw the retaining clips back into place. Ensure they are oriented correctly so that the holes line up.

Step 5 – Put Slide Back Into Operation

Refer to steps 16 through 23, starting on page 83, for instructions on how to put the slide back to into operation.

REPLACING THE AIR SEAL

Read This First

The roof hooks define the normal slide extended position. Whenever the "roof hooks" are removed, as is the case for air seal replacement, there are two rules that MUST be followed **prior** to extending a slide to service or seal change position.

1. To prevent zipper damage both "Zipper Arms" must be unbolted and the zippers unzipped.
2. **NEVER** remove the W-rail **red** final limit stops.

Tools and Consumables Required

- New air seal *<< Phone for a part #*
- Seal flange cutting Jig *<< Part# VJF50P-002-01*
- Sika Cleaner 205 or 226 or 99% Isopropanol *<< For cleaning metal*
- Sika Aktivator *<< Acid to prepare metal*
- Sika Primer 206 G+P *<< Black primer*
- Sikaflex-252 *<< Black Adhesive*
- Sika Remover 208 *<< For use with **uncured** Sika*
- Sika Hand Cleaner *<< Disposable hand wipes*
- Angle Die Grinder with Speed-Lok attachment
- R821 Norzon Speed-Lok 3" 80-Y Grit Sanding discs
- Scuff pads
- Chisel
- Knife
- Robertson screwdriver
- Imperial and metric Allen key sets *<< For stops and seal joint plate*
- Socket set
- Disposable nitrile gloves
- Cloth replacement towel
- Glass suction cup *<< To remove exterior panels*

IMPORTANT: Because the lower portion of the air seal is held in place with sealant, it is not possible to remove the air seal without damaging it. Make sure that you have the replacement air seal BEFORE you start.

Checklist – Seal Replacement

1. ❑ Extend slide
2. ❑ Shut off air supply
3. ❑ Remove exterior panels
4. ❑ Remove white service stops
5. ❑ Move red stops to outer holes (slide travel of 24” or less)
6. ❑ Remove drive arms
7. ❑ Unbolt zipper arm and unzip zipper
8. ❑ Remove slide roof hooks
9. ❑ Push slide out to seal change position
10. ❑ Remove air seal
11. ❑ Prepare for air seal installation
12. ❑ Pre-fit air seal
13. ❑ Install air seal
14. ❑ Pull slide in from seal change position
15. ❑ Install slide roof hooks
16. ❑ Zip up zipper and attach zipper arm
17. ❑ Install drive arms
18. ❑ Move red stops to inner holes (slide travel of 24” or less)
19. ❑ Install white service stops
20. ❑ Install exterior access panels
21. ❑ Turn on air supply

Step 1 – Extend Slide

Extend the slide as normal and then access the touch screen service menus to vent and vacuum the air seal (Refer to manual control, page 28).

Step 2 – Shut Off Air Supply

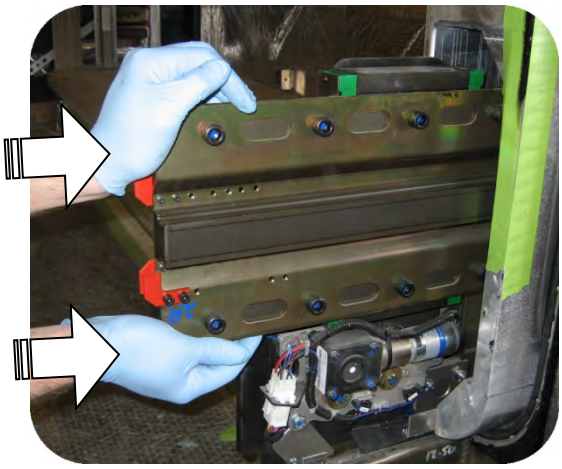
Refer to page 74 for information on how to shut off the air supply to the particular slide you are working on, or to all slides.

Step 3 – Remove Exterior Access Panels

Refer to page 204 for instructions on how to remove the exterior access panels.

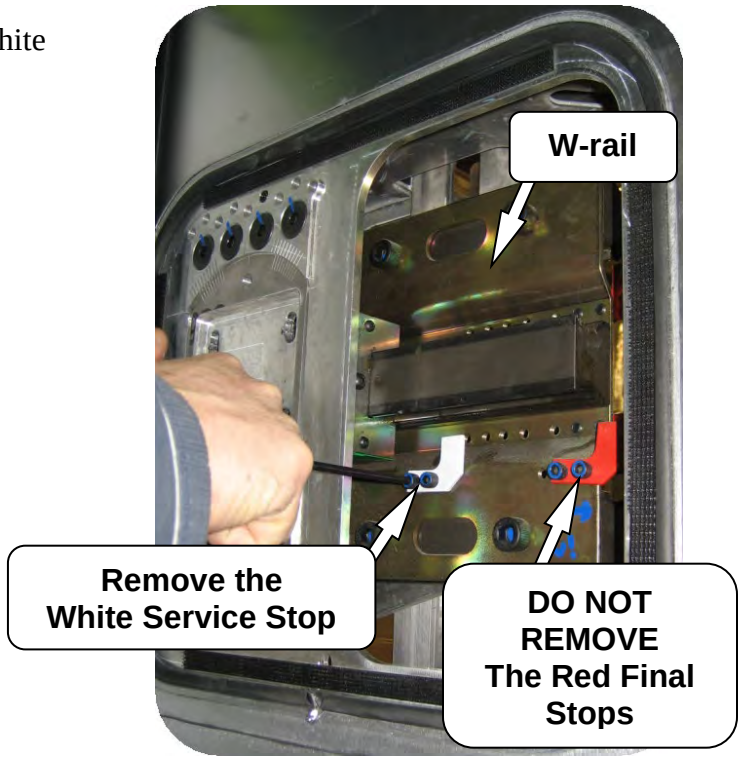
Step 4 – Remove White Service Stops

Retract the slide a couple of inches from its extended position and push the W-rails out until they hit their red inside stops.



Use a 3/16” Allen key to remove the white service stop from each end of the slide; make a note of their position and their orientation.

Tech Tip: The stops always point toward the bearing rails on the same side of the W-rail.



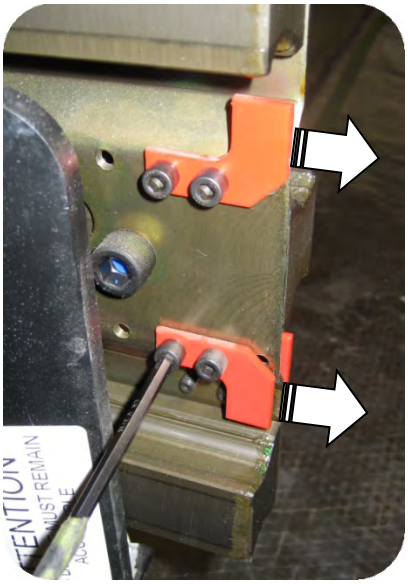
Caution: Do NOT remove any RED final-limit stops, otherwise the slide could fall out of the coach.

Step 5 – Move Red Stops to Outer Holes

(for slide travel of 24 inches or less)

If the slide travel is 24 inches or less, three of the six red final-limit stops can be **moved** (not removed) to the outside holes on the W-rail using a 3/16” Allen key.

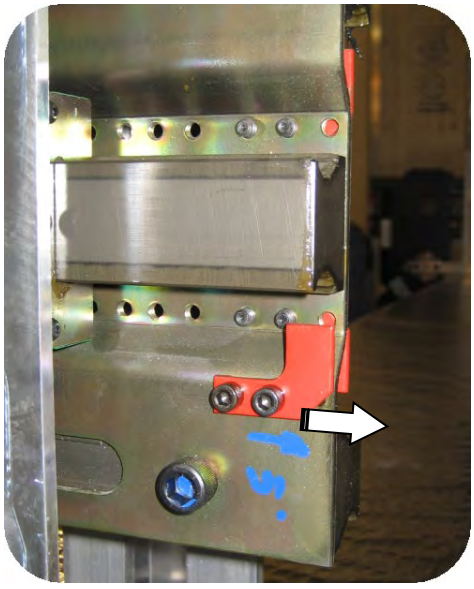
INSIDE THE COACH:



Normal operating position

Service position

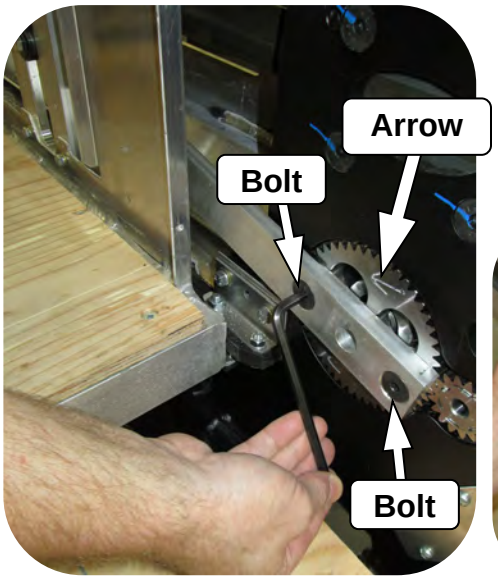
EXTERIOR ACCESS PANEL:



Normal operating position

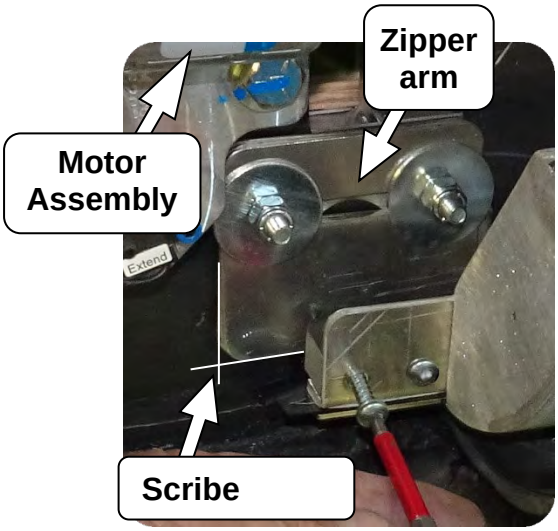
Service position

Step 6 – Remove Drive Arms



Use a 7/32” Allen key to remove the two bolts and remove the drive arm from each end of the slide. Observe the arrows on the gear which point in the direction of the slide room.

Step 7 – Unbolt Zipper Arm and Unzip the Zipper



Before you begin

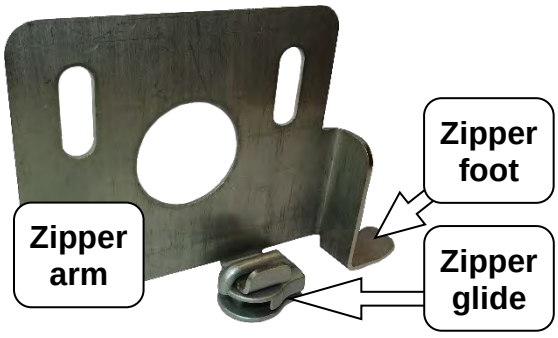
Make scribe marks around the bottom corner of the zipper arm to provide an alignment mark for reattachment.

The position of the zipper arm is very important. Alignment marks allow for correct re-attachment.

Step 1. Unscrew guide block

Unscrew the guide block from the zipper arm. Lift out and set aside.

The parts of a zipper arm



Step 2. Remove nuts from zipper arm bolts

Remove the nuts from the bolts securing the zipper arm and shims.

Step 3. Remove shims

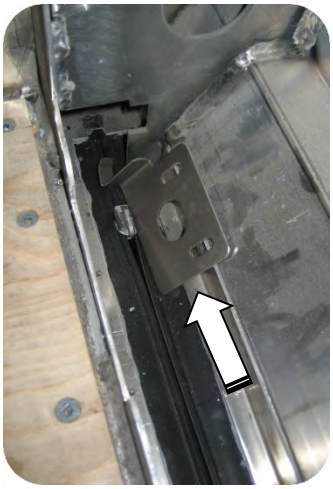
Remove the shims from the outside of the zipper arm. Move the zipper arm out, and then remove the shims from the inside of the zipper arm.

Important: Take note of how many shims there are on each side – they will have to be put back in the same configuration.

Step 4. Remove zipper arm

Lift the zipper arm off the stub plate bolts and slide it as far as possible to the outside of the coach. This prevents side pressure from damaging the zipper when the slide is extended out to its service position, as well as ensuring the zipper glide does not run off its track.

Do not unhook the zipper arm from the zipper glide.



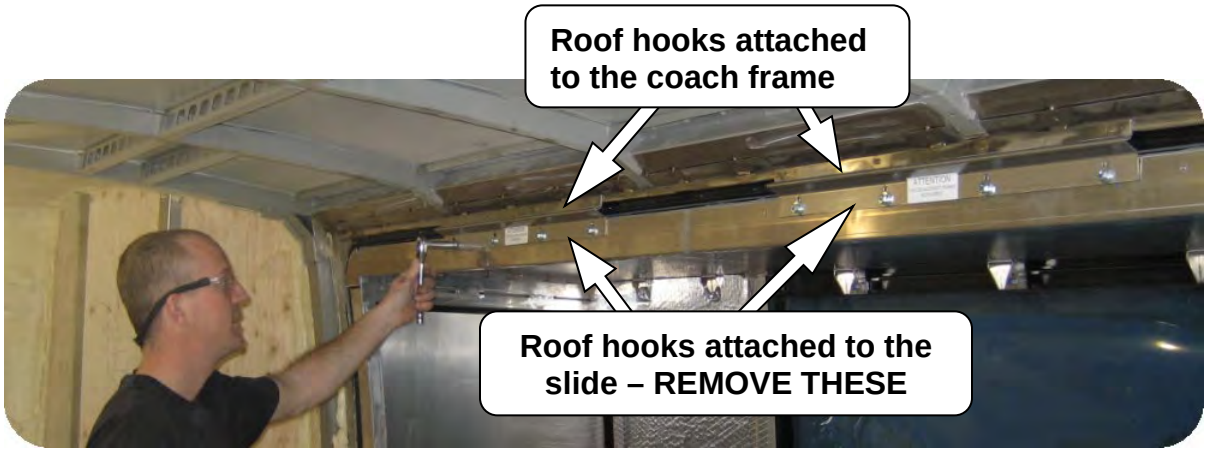
Slide the zipper arm as far as possible to the *outside* of the coach.

CAUTION

Do not slide the zipper arm toward the center of the coach, otherwise the zipper glide will run off the zipper track, requiring removal of the zipper track (refer to page 109).

Step 8 – Remove Slide Roof Hooks

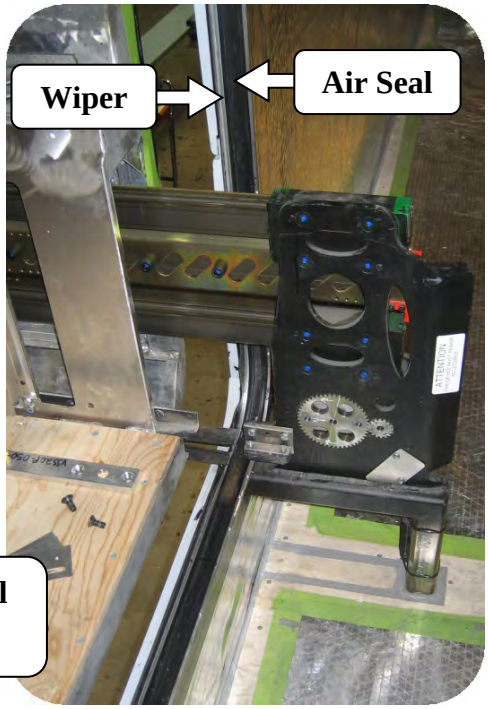
Remove the roof hooks from the top of the slide. Make sure to mark the vertical position of the roof hooks on the slide prior to removal to aid in re-assembly. Only remove the portion of roof hook that is attached to the slide. The rail attached to the coach frame should not be removed.



Step 9 – Push the Slide Out to Seal Change Position

First ensure that the red final-limit stops are installed, then push the slide out to its maximum travel.

This will give about 3 1/4 inches of inside clearance on the sides and top of the slide and about 2 inches between the slide floor and the wiper.



Slide shown in Seal Change Position

Step 10 – Remove Air Seal

> ***IMPORTANT**: Because the lower portion of the air seal is held in place with sealant, it is not possible to remove the air seal without damaging it. Make sure that you have the replacement air seal available before you start.*

1. Disconnect the air inlet tube from its air fitting. Attach a pull string to assist with new seal installation
2. Number the air seal retaining clips to allow the clips to be replaced in EXACTLY the same location. ** VERY IMPORTANT **.

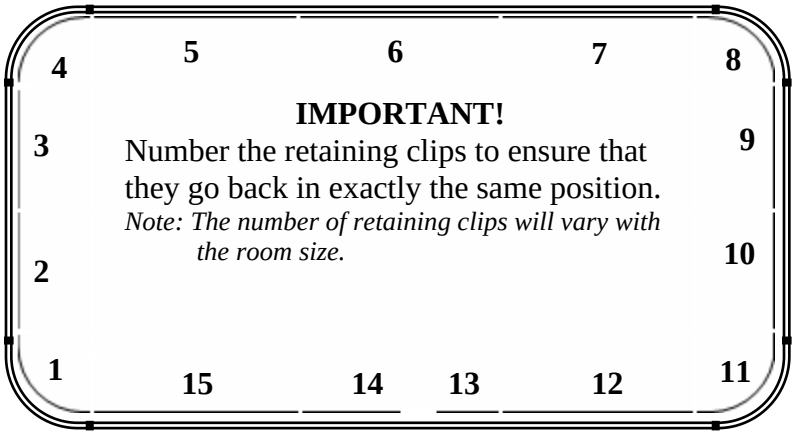
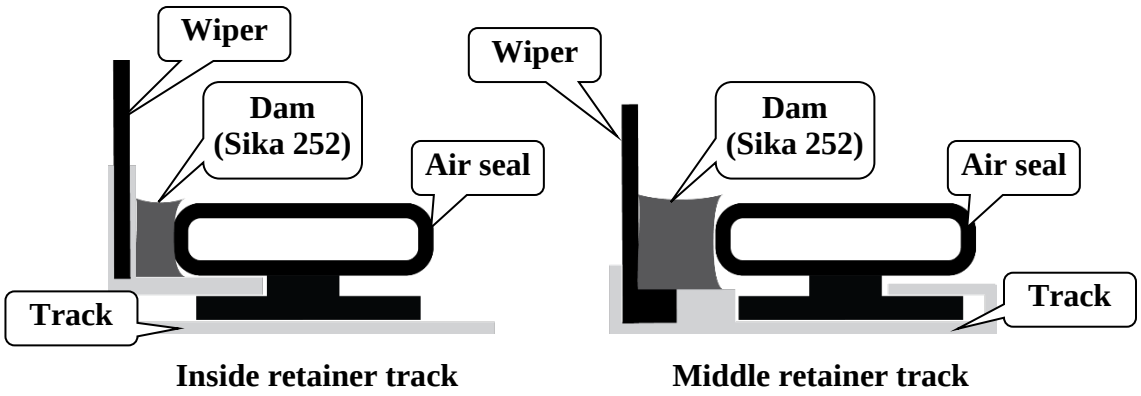


Figure 1

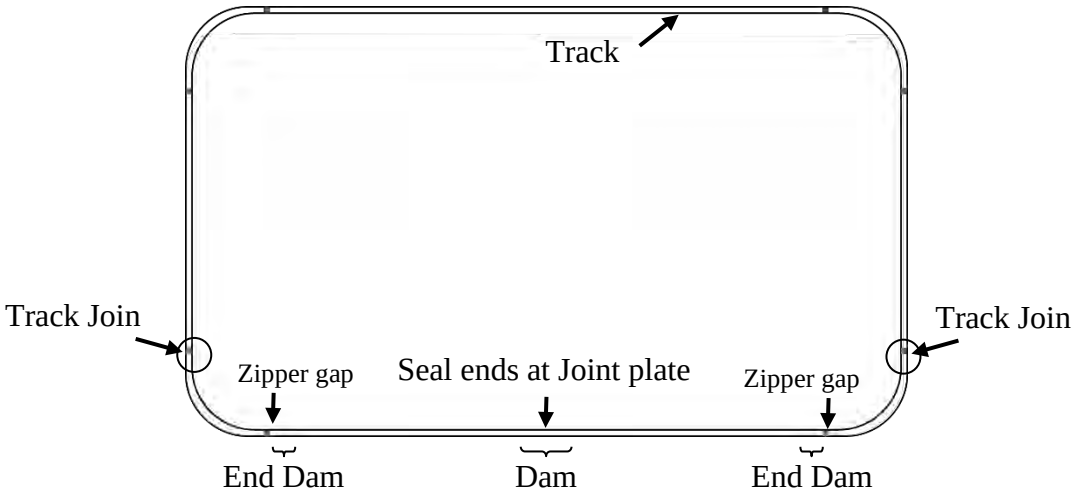
3. Remove all the screws around the perimeter that hold the air seal retaining clips.
4. Remove the seal joint plate.
5. Remove the air seal by first pulling up the inside edge and then pulling the seal towards you (you are inside the coach). The lower portion of the air seal is held in place with a sealant. It is likely that the air seal will be damaged during this process.

6. There are three Sika 252 sealant “dams” (refer to Figure 2) which are likely to remain intact, since the seal should pull away from them. These dams are part of the water management system and are required for maximum weather sealing. If they are damaged and have to be removed, the slide should NOT be moved within 24 hours after re-creating them (refer to page 98).



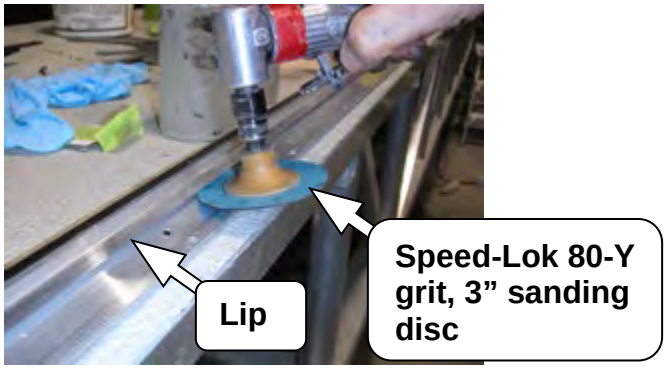
The three (3) dams are SHORT sections of Sika 252 sealant, applied in specific locations on the lower track.

Figure 2



Step 11 – Prepare for Air Seal Installation

1. Clean up the adhesive, down to bare metal, in the lower portion of air seal retaining track. Cut or chisel and use a die grinder and scuff pad. It is important to clean out under the lip of the track.



Unfortunately, there is no solvent for cured Sika primer or adhesive – it has to be cut, scraped, or sanded off.

2. Do a final clean of the entire track with the Sika Cleaner 205 or 226.
3. First apply the Sika Aktivator and then Sika Primer 206 G+P to the cleaned lower track using cloth replacement towels. (If replacing dams (page 98), those locations also need cleaning, Aktivator and Primer). Make sure that you get under the track lip. On the sides, ensure that the track joins are covered; go several inches beyond.

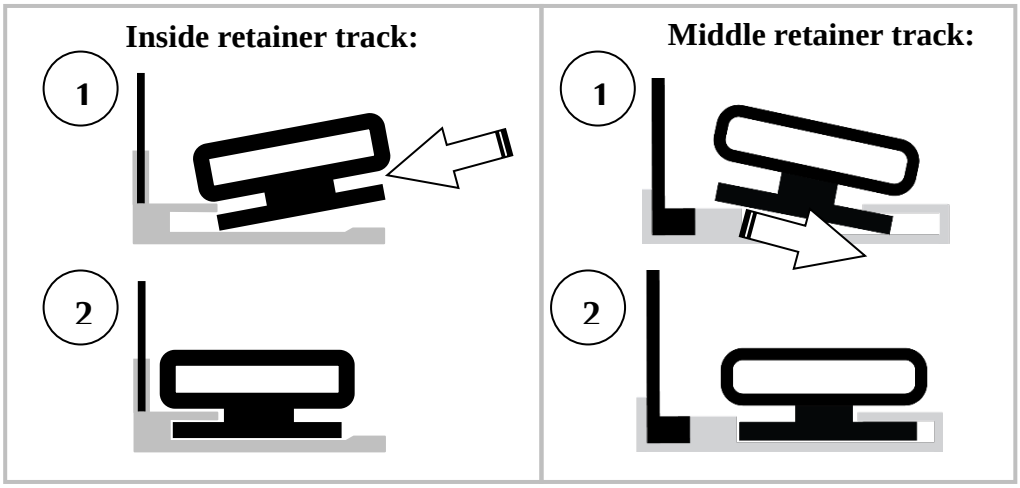
Sika Product order:
1. **Clean**
2. **Aktivate**
3. **Prime**
4. **Sealant**

Notes:
- It is only the lower portion of the track that needs sealing. The sealing is for weather-proofing to prevent water from leaking in under the seal. The clips and track lip keep the seal in place.
- Only Sika Remover 208 can be used to clean up un-cured Sika.

Step 12 – Dry-fit Air Seal

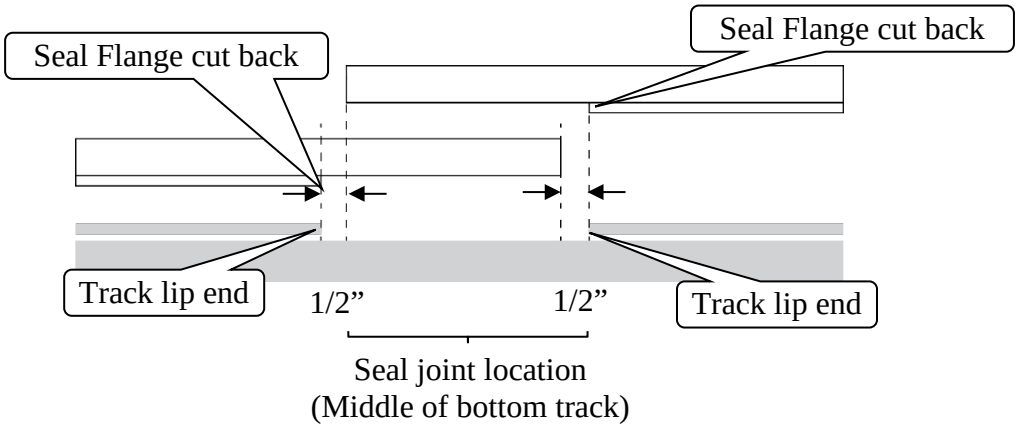
The new air seal must be pre-fit for length before it is glued in. The seal flange is inserted by pressing it under the track lip.

> **Tip:**
> **It may be necessary to gently pry open the track lip a small amount, if seal flange does not go in.**

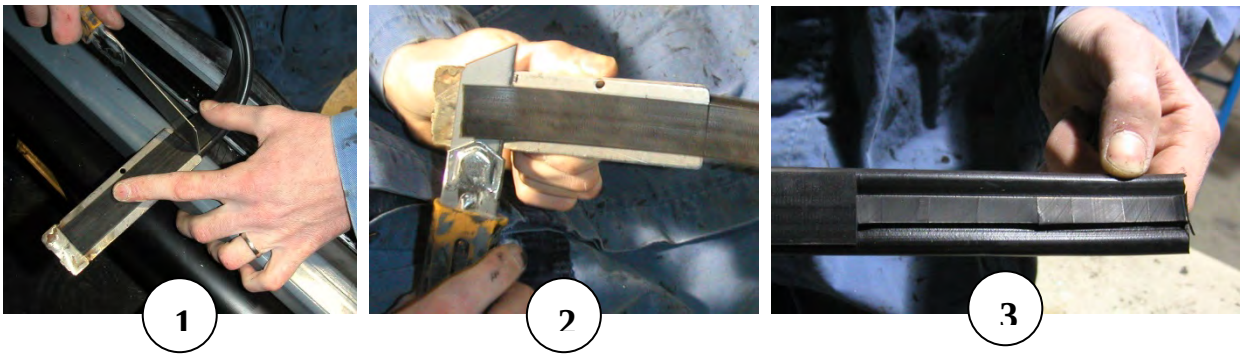


1. Start by inserting the rubber air inlet tube and work around the entire track, with the ends of the seal meeting at the seal joint location in the middle of the bottom track.

2. Use a sharp knife to cut each end of the seal at the seal joint location, about 1/2" from the other track lip end. The ends **MUST** overlap, as shown below.



Use the special cutting jig (Part# VJF50P-002-01) to remove several inches of seal flange from each seal end Cut back enough to align with its track lip end.



3. Re-install the **top** retaining clips. In the example in Figure 1, this would be clips 5 to 7.

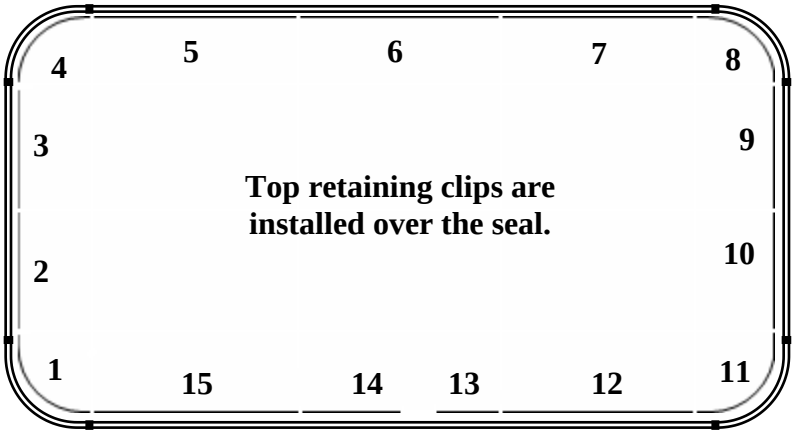


Figure 1

Step 13 – Install Air Seal

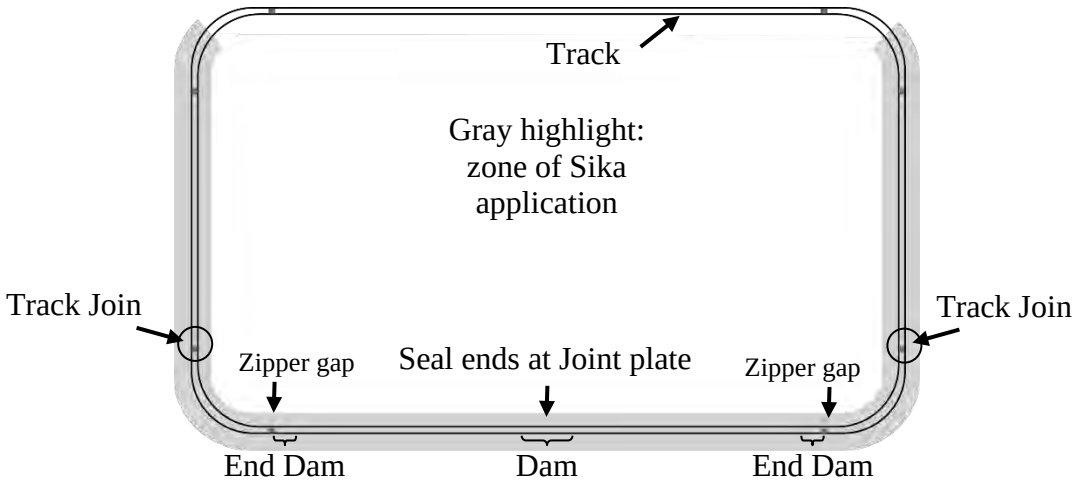
Pull back the seal ends, from the lower track and up the sides to the corners, and secure so that it is out of the way. Apply Sikaflex 252 adhesive on top of the track primer. Then, apply Sikaflex 252 as described:

1. First, apply Sikaflex in the following locations:
   - On track holes
   - On track rivets
   - On track saw-cut notches

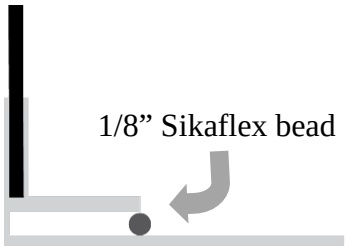
   In these locations, smooth the Sika with your fingertip so that it is flush with the level of the track.

   The zone of Sikaflex application is indicated by the gray highlight in Figure 2.

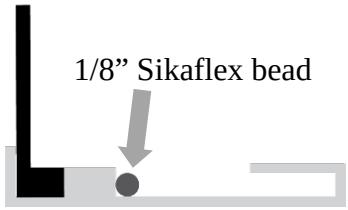
Figure 2



2. Next, apply a continuous 1/8” bead of Sikaflex along the track in the location as indicated below, depending on the track style (inner retainer or middle retainer). Remember that you are waterproofing the seal, so make sure that you apply a continuous bead, with no gaps.



Inside retainer track



Middle retainer track

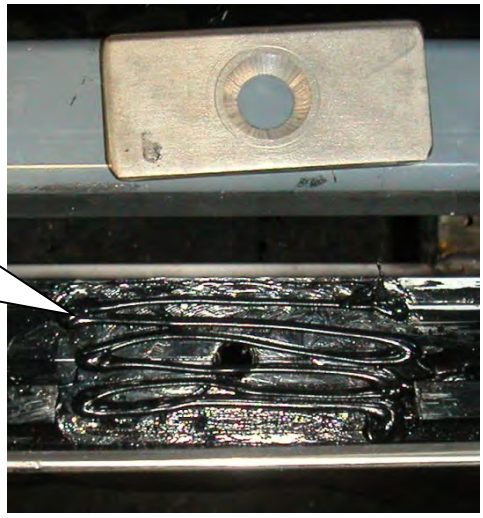
3. Apply several beads to the seal joint location.

   Use remover to clean up excess Sikaflex 252 from seal during installation.

   Note: Apply Sikaflex on one side of the track, and then install the seal on that side, reinstalling the retaining clips in the correct order once the seal is in place. Then, do the other side.

Sikaflex begins to dry/harden after about an hour, so aim to complete the process in this time frame.

Go back and forth, applying several beads of Sikaflex 252 at the seal joint location



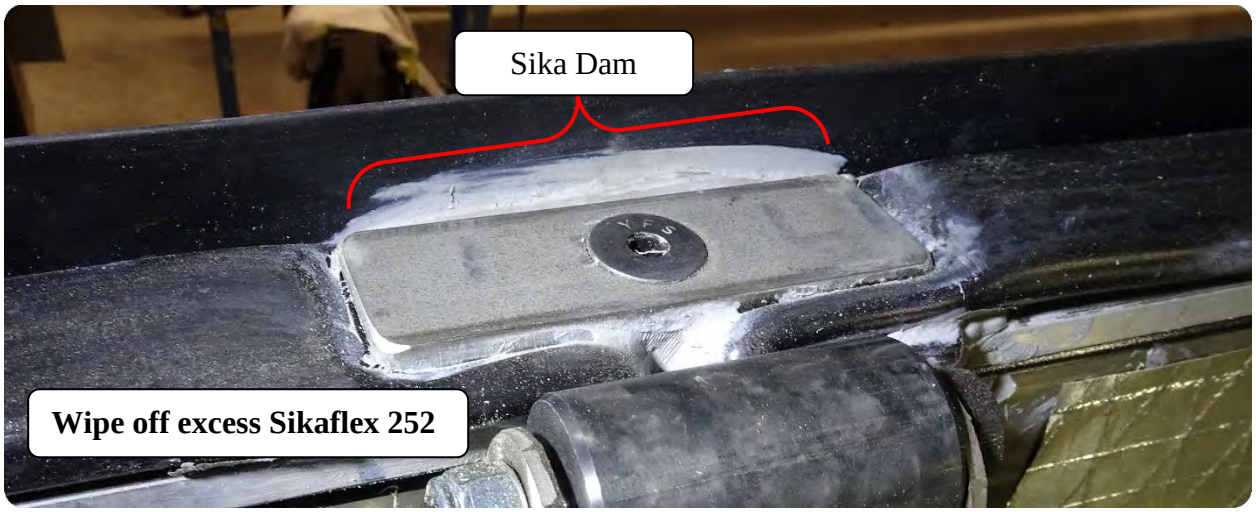
4. Install the seal on the lower section of the track. Attach the pull string to the air inlet rubber tube of the air seal and use to pull tube through coach frame. Just before seating the seal at the inlet tube, apply a liberal amount of Sikaflex 252 around the tube and hole to ensure a good weatherproof seal.

IMPORTANT: Do not pinch the air inlet rubber tube by stretching the air seal. Recheck position before installing retaining clips.

5. Re-install the lower retaining clips **except** the two adjacent to the seal joint location (Clips 13 and 14 in Figure 1, page 94).
6. Fill the ends of the seal with Sikaflex 252 and then fold under and install the clamp plate. Making sure that the folds are symmetrical and take up the length of the plate for maximum seal effectiveness. It should be a nice fit. **If required, cut a little more off of the seal flange if it bulges because of excess seal.** It will be necessary to use a screwdriver to keep the plate straight during tightening with the 5.5mm Allen key.

7. Install the remaining seal retaining clips and use Sika Remover 208 to wipe off any excess Sikaflex 252.

Retaining clip that fits underneath the clamp plate.



8. Re-connect the air inlet tube to its air fitting.

IF DAMS HAVE NOT BEEN REPLACED:

9. Inflate the air seal and check for leaks using warm soapy water. Even though the Sikaflex 252 takes 24 hours to cure, the slide is ready for immediate use. However, it is beneficial to keep the seal inflated for the first 24 hours to squeeze out any excess Sikaflex 252.

IF DAMS REQUIRE REPLACEMENT:

10. Inflate the air seal and check for leaks using warm soapy water. If you have the benefit of 48-hours, it is beneficial to leave the seal inflated for 24 hours to squeeze out any excess Sikaflex 252.
11. Deflate the air seal. Use Sikaflex 252 to run a bead the height of the seal (in its relaxed and vented state) between the wiper and the seal in the areas shown in Figure 1. Finish by wiping a finger with soapy water to get a nice smooth surface. Do **not** inflate the seal or move the slide for at least 24 hours to let the dams cure.

Figure 3

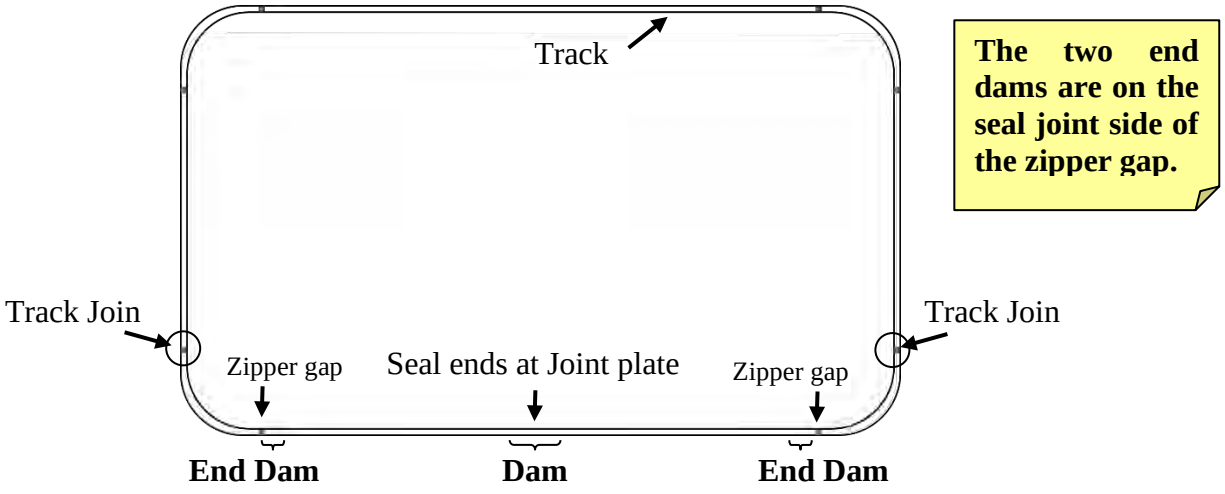
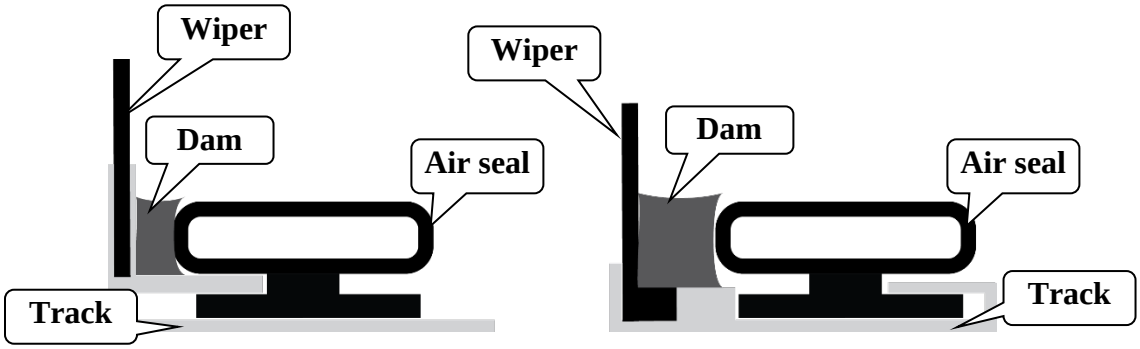
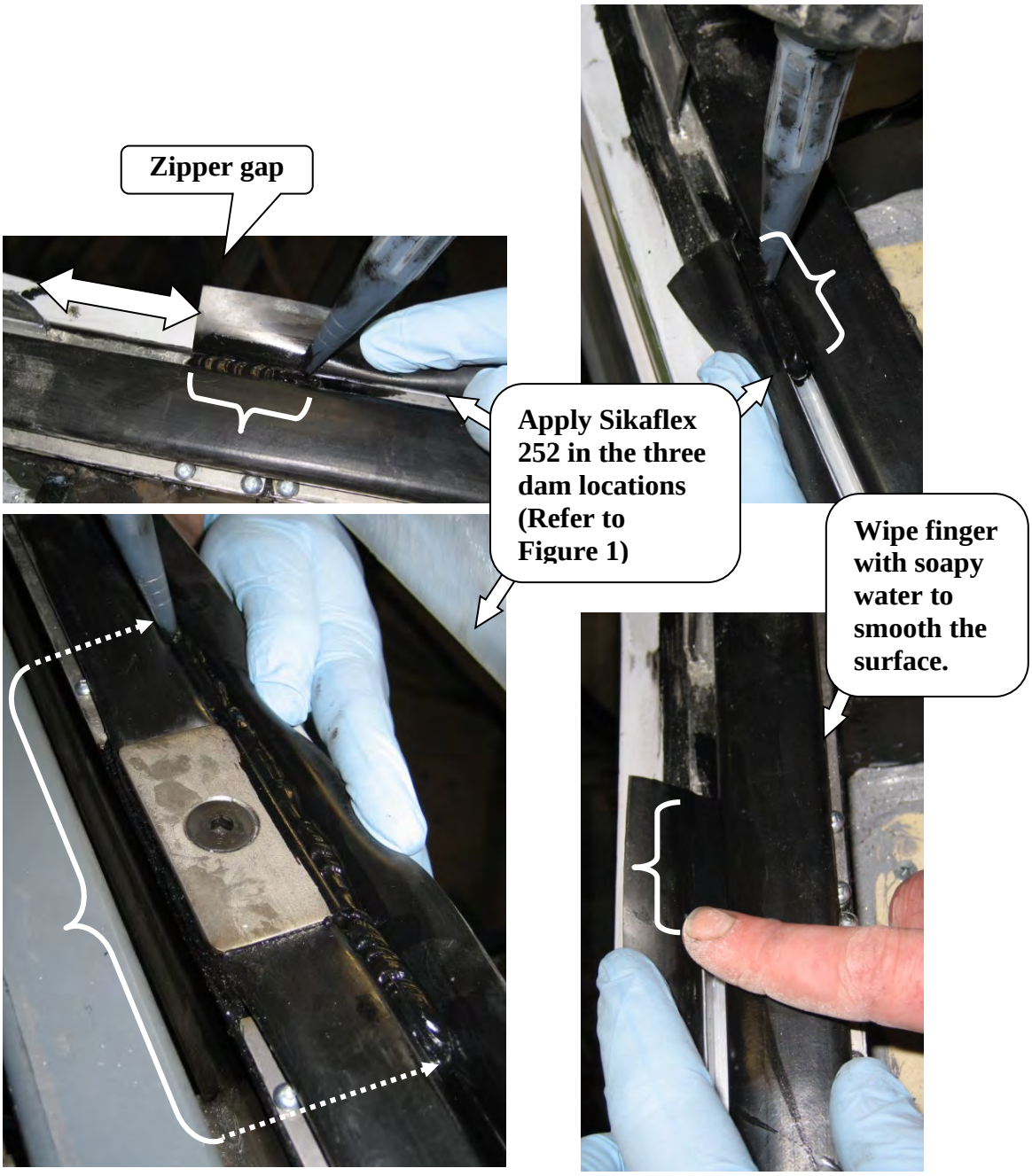
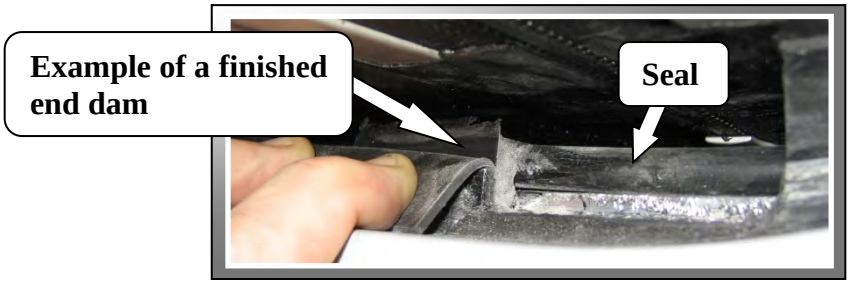


Figure 4



Inside retainer track **Middle retainer track**


Zipper gap
Apply Sikaflex 252 in the three dam locations (Refer to Figure 1)
Wipe finger with soapy water to smooth the surface.


Example of a finished end dam
Seal

Step 14 – Move the slide in from Seal Change Position

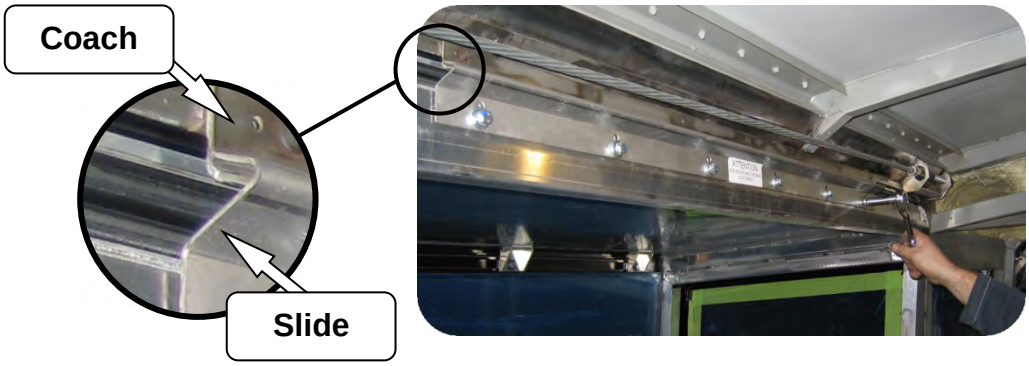
Grab the slide and pull it back in from seal change position to its normal extended position.

It may be necessary to also have someone push from the outside.

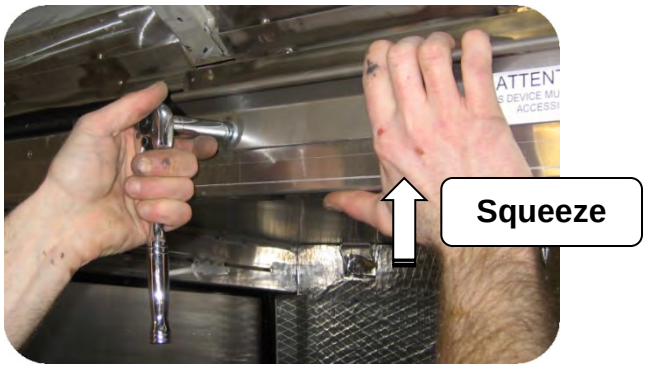
Step 15 – Install Slide Roof Hooks

The roof hooks must be installed with the drive arms installed, the slide extended and the seal deflated.

Use the alignment marks made prior to removal as a guide for initial positioning of the slide roof hooks.

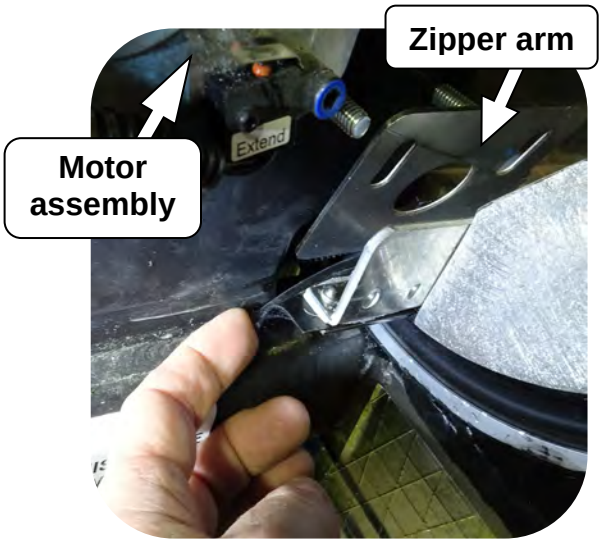


Squeeze between the coach roof hook and the top of the slide and then firmly tighten the bolts using a ½ inch socket. The bolts screw into metal inserts. Tighten to 25ft/lbs.



Step 16 – Zip up the Zipper and Attach Zipper Arm

The zipper is reattached before the drive arms are installed. Ensure that the seal is **not** inflated, otherwise it will push against the zipper arm and not allow correct placement.



Before you begin

Ensure zipper halves are folded downwards. This will prevent zipper from bunching up and catching on the zipper arm.

Grab the zipper arm and slide it back to the stub wall mounting bolts.

CAUTION

*Do not slide the zipper arm **past** its stub wall mounting bolts, otherwise the zipper glide will run off the zipper track, requiring removal of the zipper*

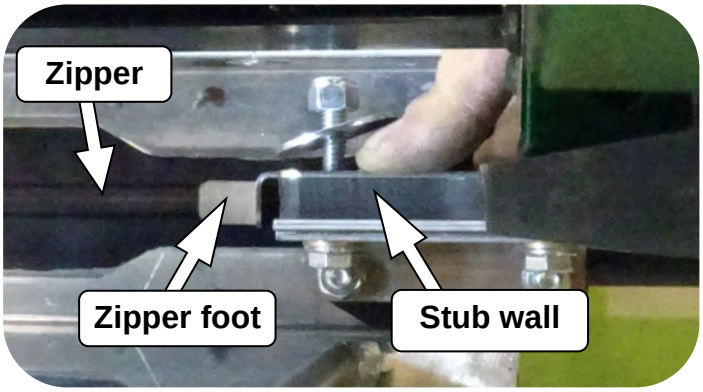
Step 1. Insert inside shims

Put the zipper arm on the bolts, followed by the washers and nuts (do not tighten).

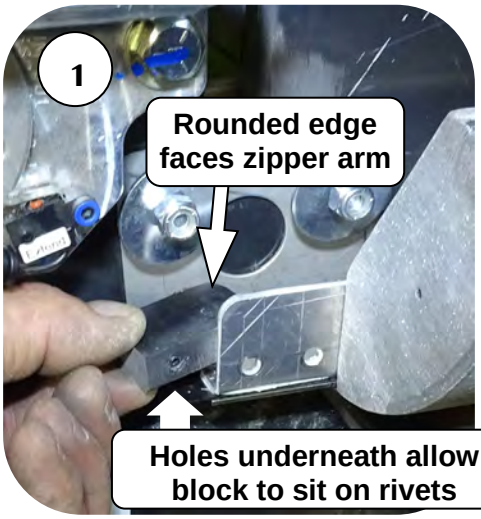
Insert the shims that go between the stub wall and the zipper arm.

Ensure that the foot is centered directly over the zipper.

Read more about shims on page 104.



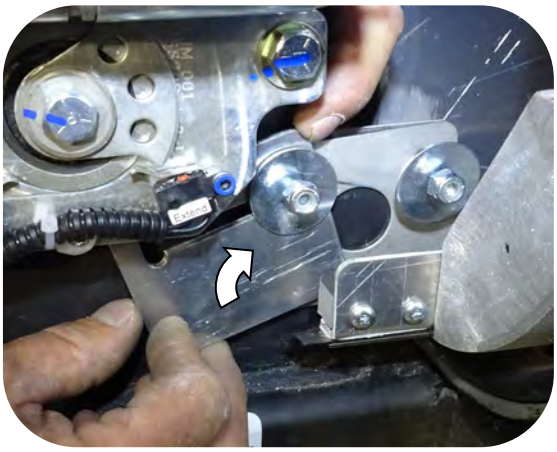
The centering of the zipper arm is very important. A misaligned arm will exert tension on the zipper.



Step 2. Insert guide block

Place the guide block back into position (1) and screw on (2) with the #10 x ¾" zinc-plated tapping screws.

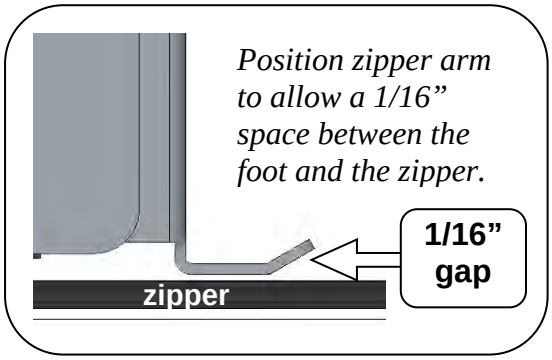
Important: Ensure that the guide block is seated correctly, with the holes in the bottom aligning with the rivets on the guide block bracket.



Step 3. Insert outside shims

Insert the shims that go between the zipper arm and the guide block.

The number that you removed should be the same number that you can easily fit back in; however, if this is not the case, fit in as many as will slide in comfortably. ***Never*** force in a shim.



Step 4. Tighten nuts

With the zipper arm and all shims in place, prepare to tighten the nuts.

Before you do, position the zipper arm so the zipper foot is about 1/16" above the zipper itself.

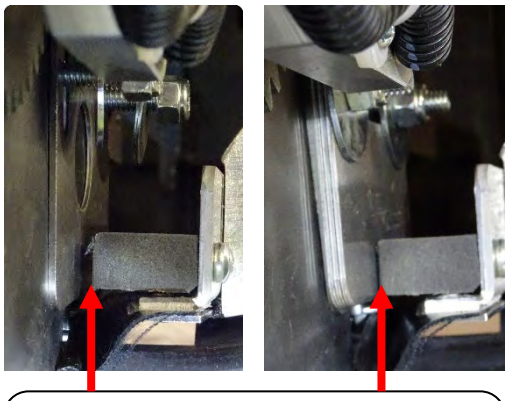
This allows just enough space to prevent the foot from rubbing on the zipper during slide movement, while still functioning to provide a good seal when the air seal is inflated.

The importance of shims

Shims on both sides of the zipper arm can serve very important roles.

On the inside (between the zipper arm and the stub wall), they allow for the correct placement of the zipper arm to allow the zipper to function without tension.

On the outside (between the zipper arm and the washers/nuts) they allow for smooth motion of the slide, and they exert just enough pressure on the wall of the slide to allow the seal to make a watertight fit in the zipper area.

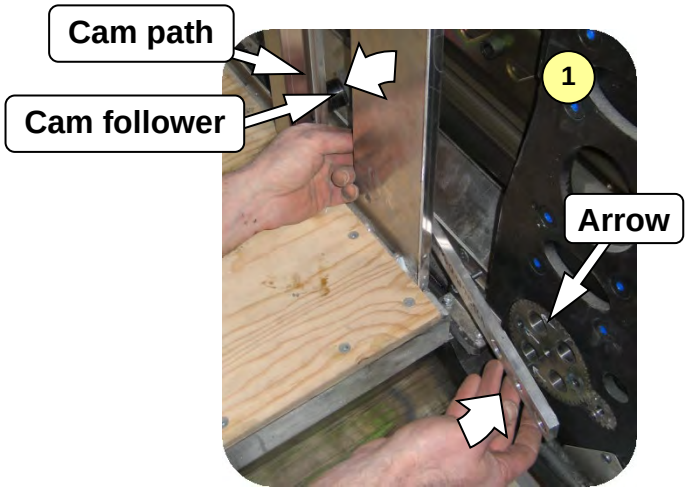


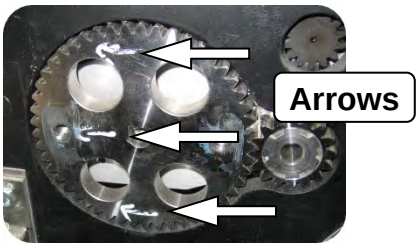
Outside shims fill the space between the guide block and the zipper arm.

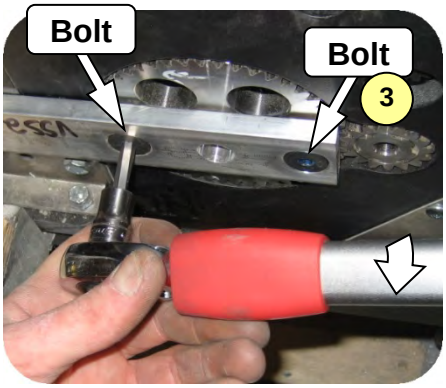
Shims may not be required on both sides of the zipper arm, however there is likely to be at least one on one side of the zipper arm.

Step 17 – Install Drive Arms

Confirm the arrows on the gear point toward the cam path. Fit the drive arm so its cam follower slots into the cam path. Apply Loctite 243 to the bolts and torque to 35ft/lbs.







Step 18 – Move Red Stops to Inner Holes
(for slide travel of 24 inches or less)

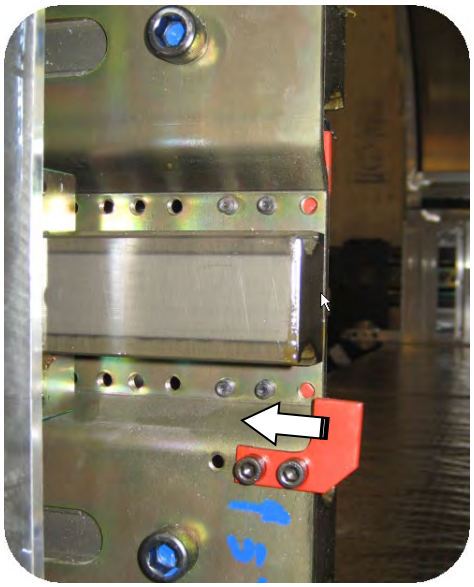
If the slide travel is 24 inch or less, all six red final-limit stops must be located on their inner position for normal operation. If they were moved out, in Step 5 above, use a 3/16” Allen key to move them back.

INSIDE THE COACH:

Service position

Normal operating position

EXTERIOR ACCESS PANEL:



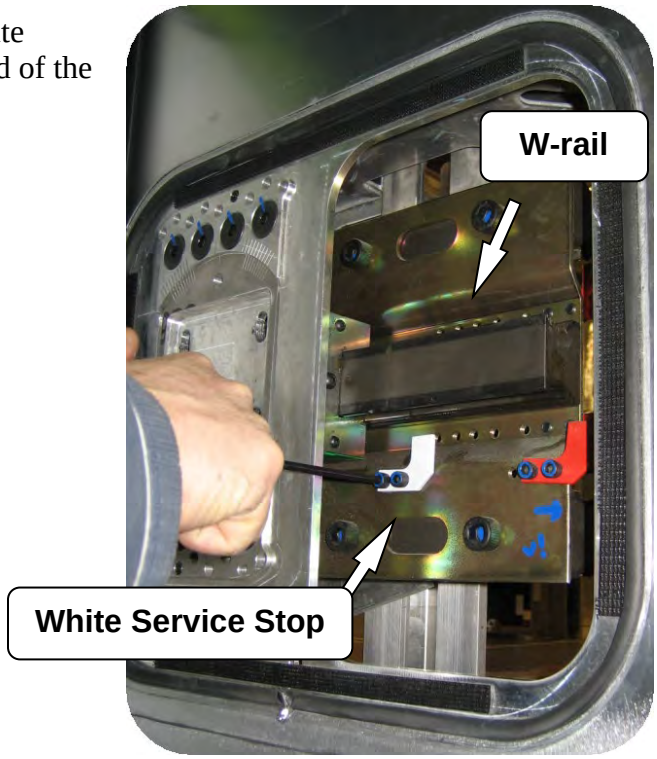
Service position

Normal operating position

Step 19 – Reinstall White Service Stops

Use a 3/16” Allen key to reinstall the white service stops onto the W-rails on each end of the slide.

Tech Tip: The stops always point toward the bearing rails on the same side of the W-rail.



Step 20 – Reinstall Exterior Access Panels

Refer to page 205 for instructions on how to install the exterior access panels.

CAUTION

It is very important to do a thorough check of the panel after installation. If this is not done, the panel may leak and cause damage to interior coach components.

Step 21 – Turn On Air Supply

The air supply was turned off in Step 1. Turn it back on.

ZIPPER REPLACEMENT

Introduction

To completely replace a zipper, the slide must be in the seal change position, in which case first complete steps 1 through 12, of the seal change procedure on page 83, and then refer to **re-attaching the zipper glide** on page 109, which includes the key steps to removing and replacing the zipper.

RE-ATTACHING A ZIPPER GLIDE

Introduction

The zipper glide may need reattaching to the zipper track for the following reasons:

- It is not closing up the zipper, in which case it is removed to tighten the two flanges, or replace it with a new one.
- Accidentally pulled of the zipper track during servicing.

Tools and Consumables Required

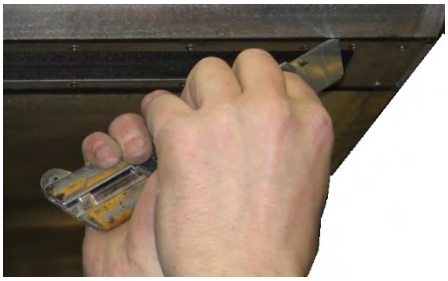
- Drill
- 1/8” drill bit
- 3/8” drill bit
- 1/8” aluminum rivets
- Riveting tool
- Knife
- Drifting punch
- Hammer
- Sikaflex-252 (as required)

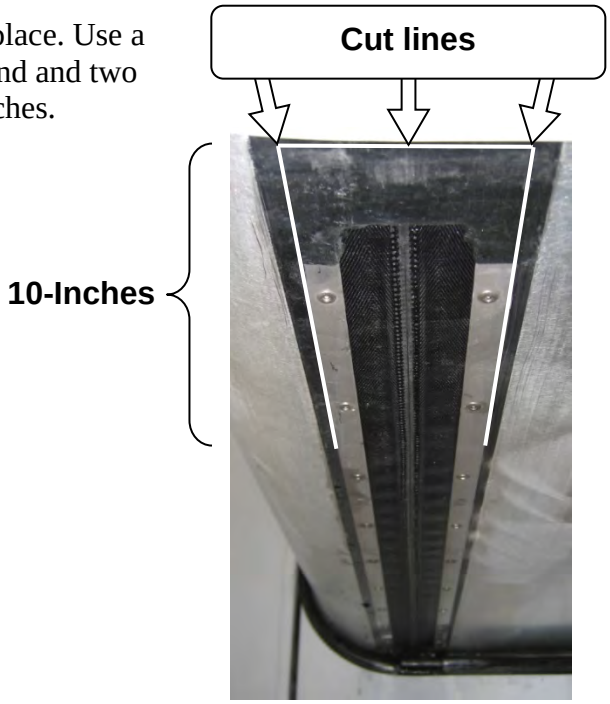
Checklist – Re-attaching a Zipper Glide

1. ❑ Cut retaining plate sealant
2. ❑ Remove rivets
3. ❑ Access the zipper track
4. ❑ Install the zipper glide
5. ❑ Rivet zipper retaining plate
6. ❑ Reattach zipper arm
7. ❑ Apply Sikaflex-252 (as required)

Step 1 – Cut Retaining Plate Sealant

The zipper retaining plate is sealed in place. Use a sharp knife to cut the seal around the end and two sides of the plate, for a length of 10-inches.

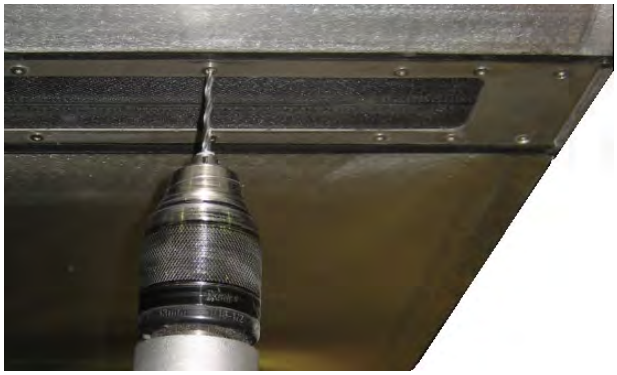




Step 2 – Remove Rivets

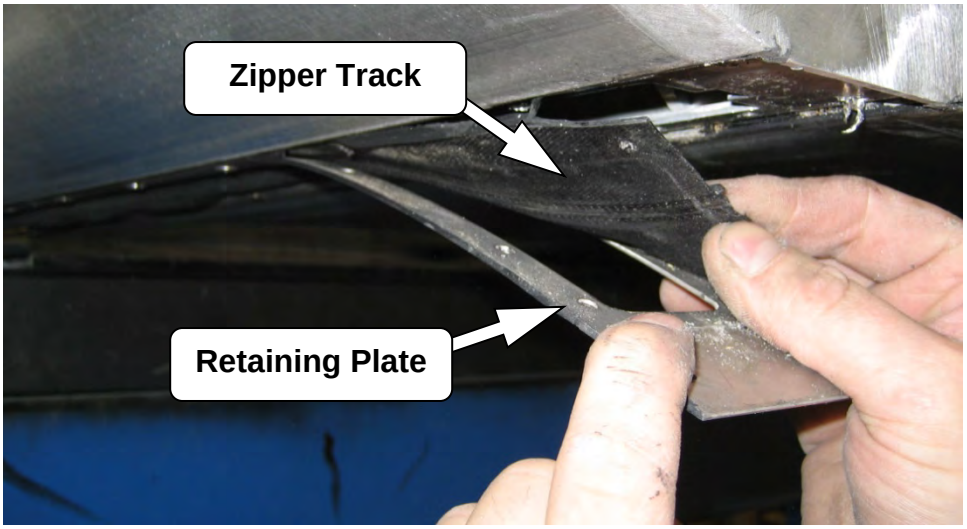
Using a 1/8” drill bit, drill out all rivets within the 10-inch section. If the rivet spins, use the larger 3/8” drill bit to remove the head

Be careful not to drill any deeper than is required to break the rivet head free.



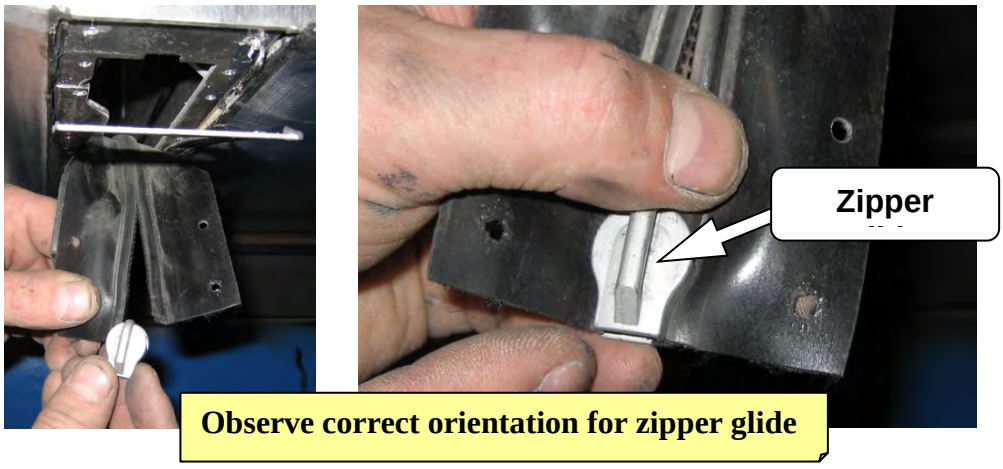
Step 3 – Access the Zipper Track

Use the knife to pry out the retaining plate. Gently peel back the plate just enough to access the zipper track.

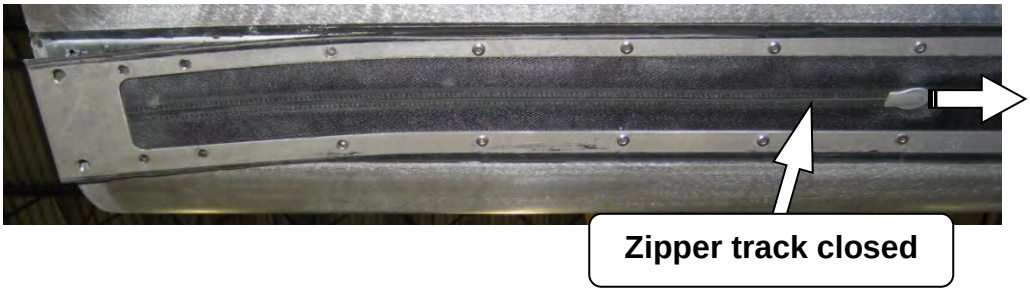


Step 4 – Install Zipper Glide

Pull apart the zipper track and install the zipper glide: Push the slide onto one track and then insert the other side of track into slide. Make sure that the left and right track mate evenly.



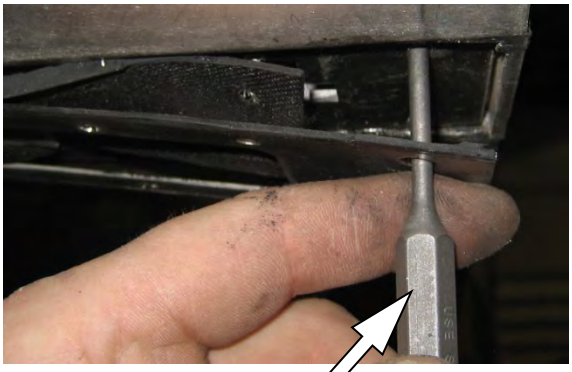
Move the zipper glide in towards the coach. As it moves in it should **close** up the zipper **behind** it.



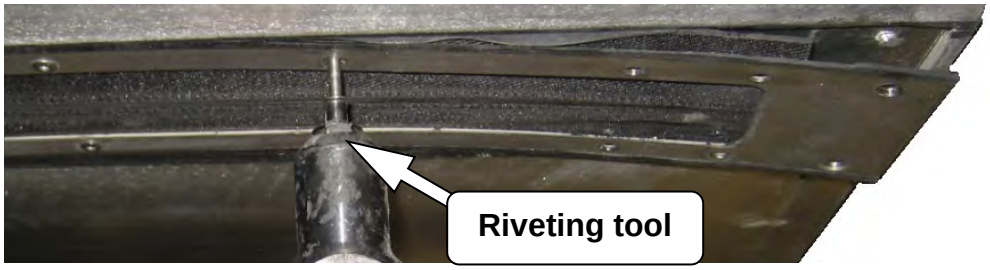
Step 5 – Rivet zipper retaining plate

Gently tap the drifting punch to knock out any remaining rivet shanks. Remove any rivets or debris to prevent them getting jammed in the zipper.

Warning: excessive force with the punch will deform the internal mounting flange.

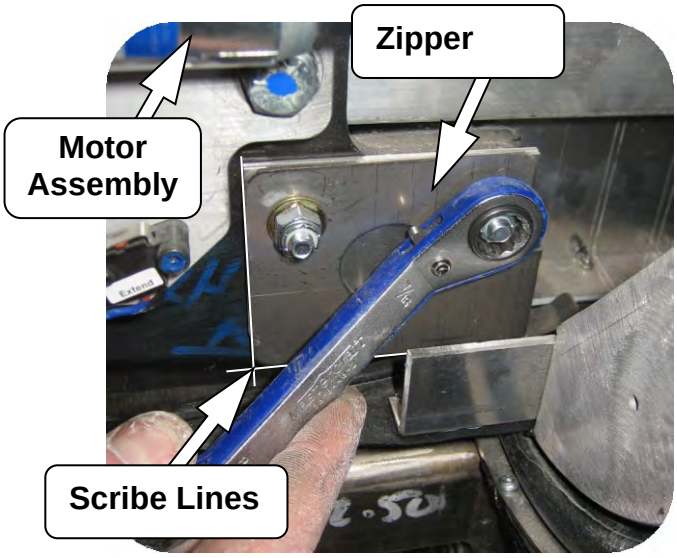


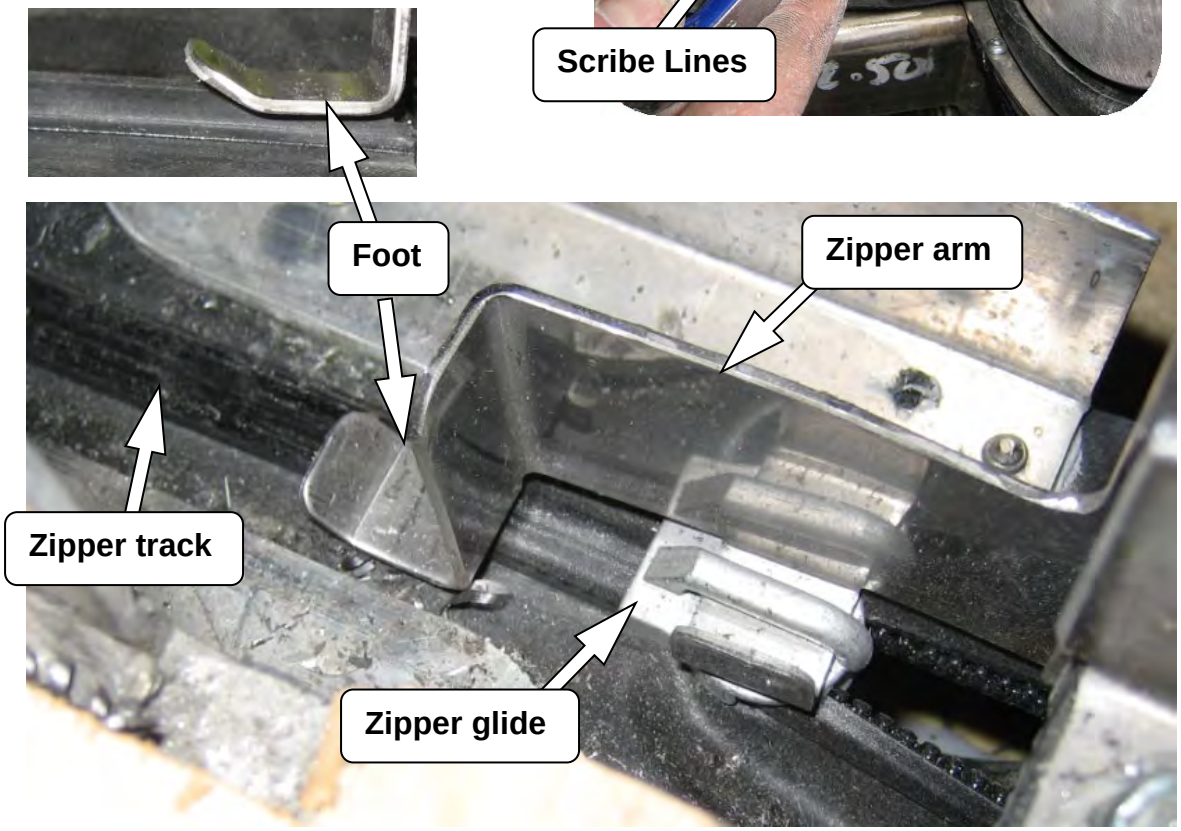
Use 1/8” aluminum rivets to re-attach the zipper retaining plate.



Step 6 – Reattach zipper arm

Fit the zipper arm back onto the zipper glide and reattach zipper arm to stub wall using scribe lines for alignment. The slide **must** be in the normal extended position.
If no scribe lines exist, adjust the zipper arm so that its foot just touches the top of the zipper track with the seal **not** inflated.





Step 7 – Apply Sikaflex-252 (as required)

If the zipper has been replaced it will be necessary to apply Sikaflex-252 around the zipper retaining plate to create a smooth water-tight surface. Use another slide zipper retaining plate as a visual reference.
If only a zipper glide was installed, inspect the retaining plate to determine if it is necessary to apply Sikaflex-252.

ADJUST SLIDE GUIDE BLOCKS

Introduction

Each slide has two guide blocks; one attached to each stub wall plate. Their purpose is to prevent the slide from side movement during slide travel.

The guide blocks are installed with the slide fully extended. Each guide block should have about 1/32” clearance from the side of the slide.

The guide blocks are factory installed and should not normally require adjustment. Please consult with Valid Manufacturing Ltd. (refer to page 222) if you determine that an adjustment should be made.

Tools and Consumables Required

- 7/16” wrench
- 0.050 spacers

Checklist – Adjust Slide Guide Blocks

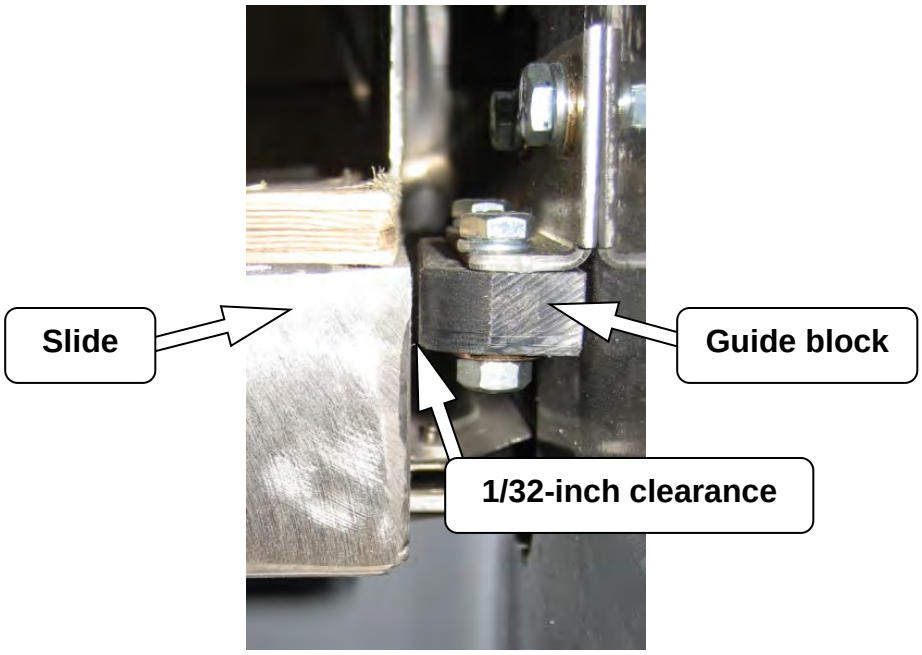
1. ❑ Gain access to the two interior stub walls
2. ❑ Add or remove shims

Step 1 – Gain Access to the Two Interior Stub Walls

Gain access to the two interior stub wall plates by removing interior furnishings. Each coach will require different access methods. If in doubt, contact the coach converter for advice.

Step 2 – Add or Remove Shims

Loosen the two bolts using the 7/16-inch wrench and add or remove shims to achieve a clearance about 1/32-inch between the guide block and the edge of the slide.



The 1/32-inch clearance is not critical. The goal is to get the guide block as close to, but not touching, the slide without impeding the slide as it extends or retracts. The gap should be never be more than 1/16-inch.

ADJUST SLIDE TILT

Introduction

Slide tilt is used to make angular adjustments between the outside surface of the slide-out room and the exterior surface of the coach. Slide tilt is **not** required to address a situation where the slide does not retract far enough or retracts too far. However, after adjusting the slide tilt it may be necessary to adjust the slide retract position.

Finish the tilt adjustment on one end of the slide, **before** moving to the other end.

If an endwall bearing or slide height adjustment is also required, **do those first** since a slide tilt will probably be required anyway after those procedures.

Tools and Consumables Required

- Slide Hammer *<< Part# VJF20A-010*
- Drill Jig *<< Part# VSS10T-04*
- Hammer (Ball peen or claw)
- 8mm Allen socket
- Ratchet
- Flashlight *<< Inspect dowel holes*
- Hydraulic lift table with support stand *<< Support slide*
- Short length of 2x6 *<< Straddle zipper*

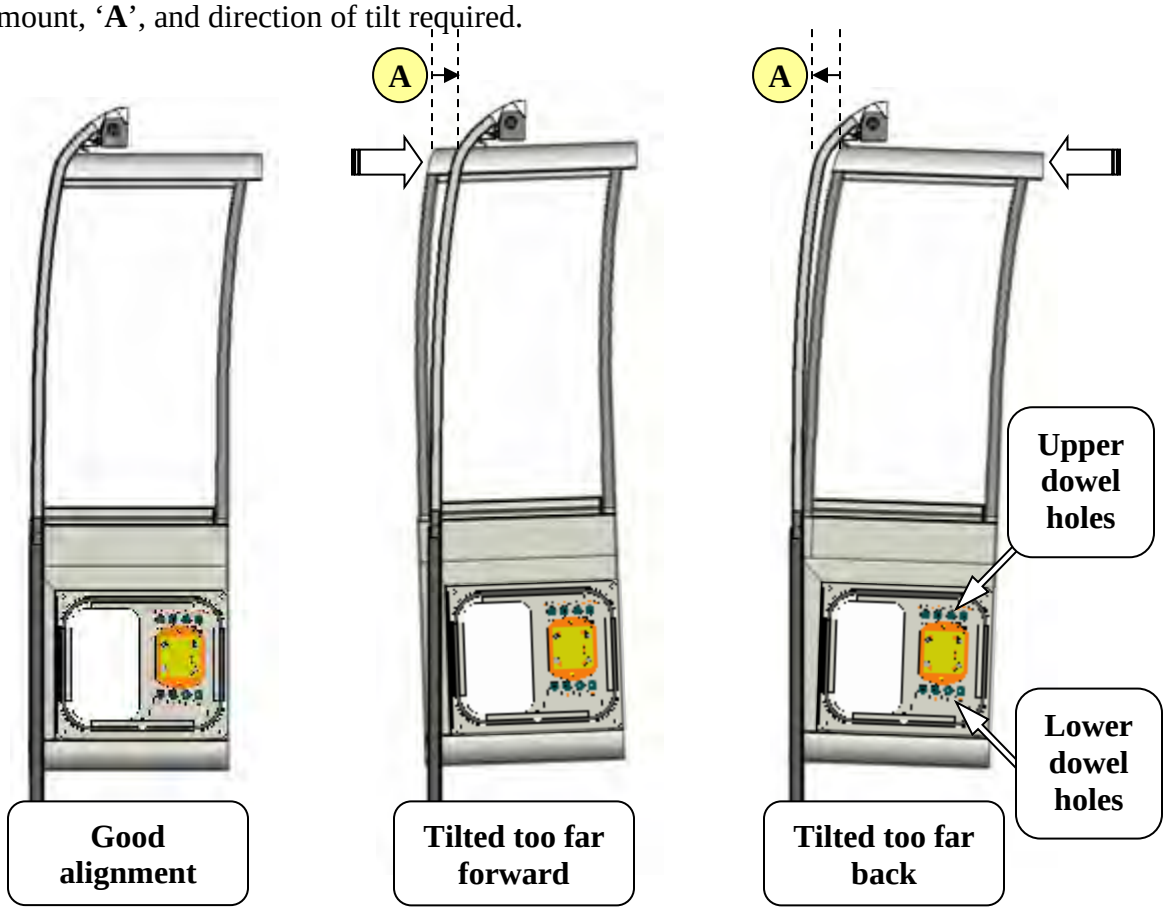
Note: The dowel pin is 5/16-inch diameter, ¾-inch long, with a 10-32 internal thread

Checklist – Adjust Slide Tilt

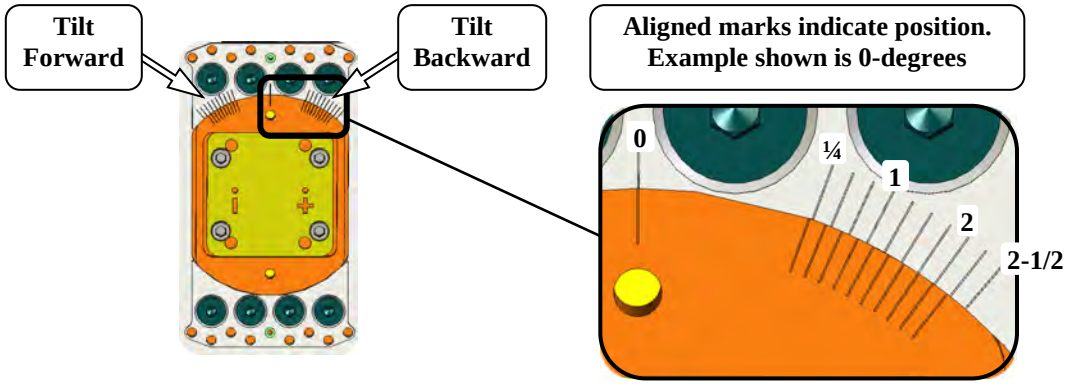
1. ❑ Determine Amount of Tilt Required
2. ❑ Remove the Exterior Access Panels
3. ❑ Mark the Vernier Gauge
4. ❑ Support the Front of the Slide
5. ❑ Remove the Dowel Pins
6. ❑ Adjust Slide Tilt
7. ❑ Repeat for the Other End of the Slide
8. ❑ Drill Holes and Insert the Dowel Pins
9. ❑ Secure Tilt Clamp Bolts
10. ❑ Inspect Other Clearances
11. ❑ Re-install the Exterior Access Panels

Step 1 – Determine Amount of Tilt Required

Determine the amount of tilt required with the slide **fully retracted and the air seal inflated.** On the outside of the coach, inspect how well the slide is flush to the coach. Determine the amount, '**A**', and direction of tilt required.



A vernier gauge is marked in ¼-degree intervals. There is a center (vertical) mark along with a grouping for forward tilt and backward tilt. The height of the slide will determine exactly how much movement in dimension '**A'** will occur. However, typically each ¼-degree mark equates to about 1/16th inch of movement at the top of the slide.

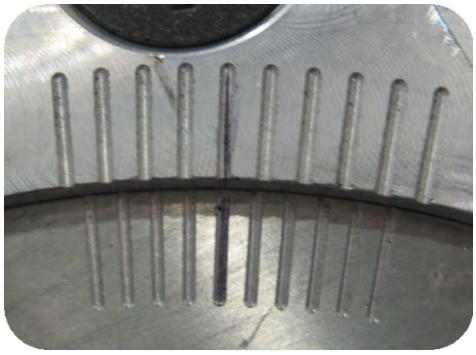


Step 2 – Remove the Exterior Access Panels

Extend the slide as normal. Refer to page-204 for instructions on how to remove the exterior access panels.

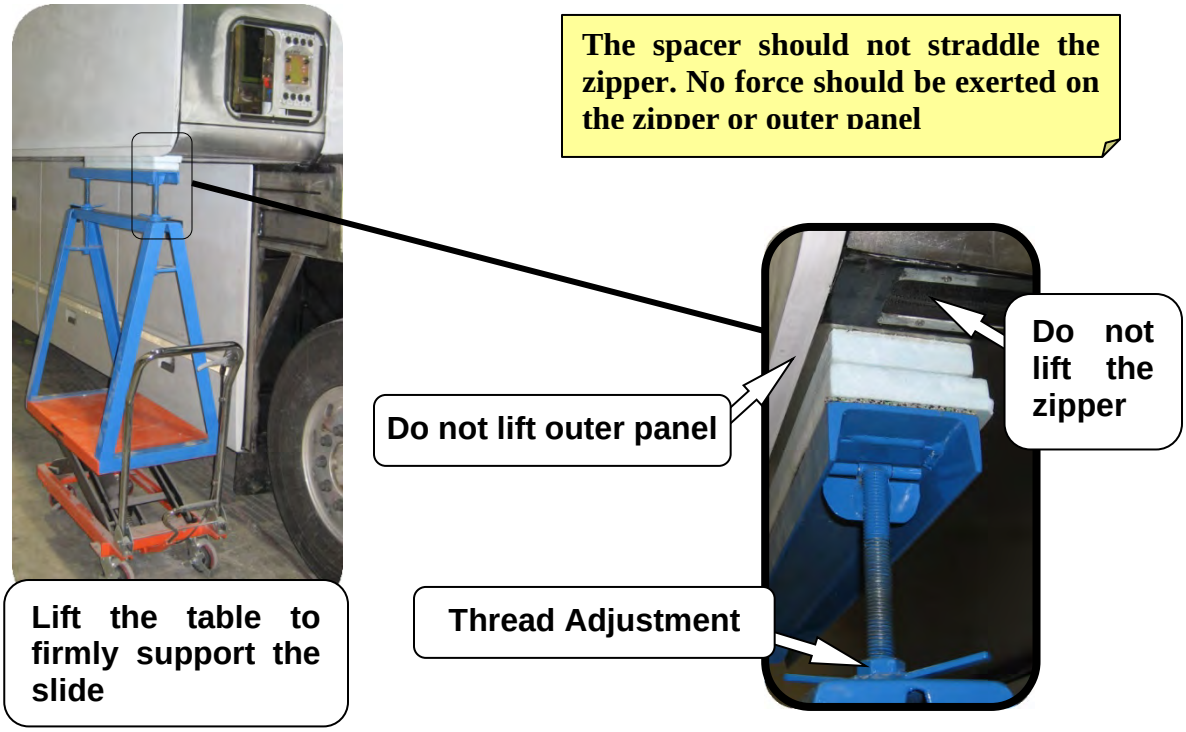
Step 3 – Mark the Vernier Gauge

Inspect the vernier gauge to find the closest matching lines. Use a pen to mark these lines as a starting reference.



Step 4 – Support the Front of the Slide

Use a hydraulic lift table with a support stand, and at least a 1-1/2-inch spacer to firmly support the front of the slide. Use a soft layer between the lift table and the slide to protect the paintwork.



CAUTION

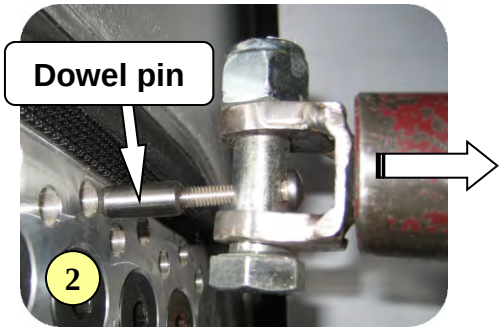
The lift table must be rated to support the full weight of the slideout room.

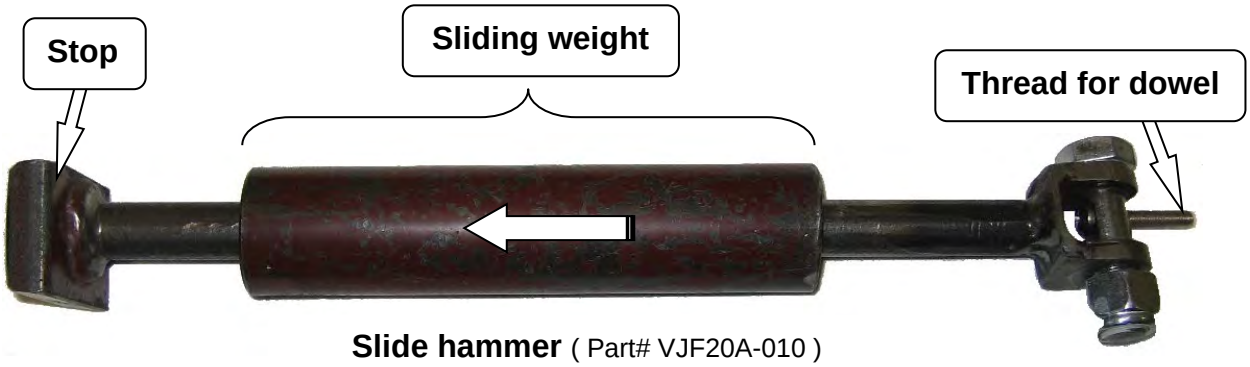
A fully furnished slideout room may weigh up to 2500lbs.

Step 5 – Remove the Dowel Pins

Make a note of the current position of the upper and lower dowel pins, since these holes will **not** be used again.

Screw the slide hammer into the dowel pin and extract it by repeatedly moving the sliding weight back against the stop.





Slide hammer (Part# VJF20A-010)

IMPORTANT: Always remove the dowel pin BEFORE loosening the tilt adjustment bolts; otherwise it can bind, making extraction difficult.

Step 6 – Adjust Slide Tilt

Using an 8mm Allen key, loosen all 8 tilt clamp bolts and **raise** the hydraulic lift table or **lower** using the adjustment thread to adjust the tilt amount.

Re-tighten all 8 clamp bolts, remove the lift tables, retract the slide, make sure the seal is inflated, and inspect how flush the slide is to the coach.

Re-extend the slide and re-support the slide to repeat the adjustment as necessary.

Tech Tip: The hydraulic lift table is not suited to making fine lower adjustments. Instead, use the thread adjustment to lower the slide.
Final adjustments can be so small that ½-turn of the adjustment thread may be all that is required.

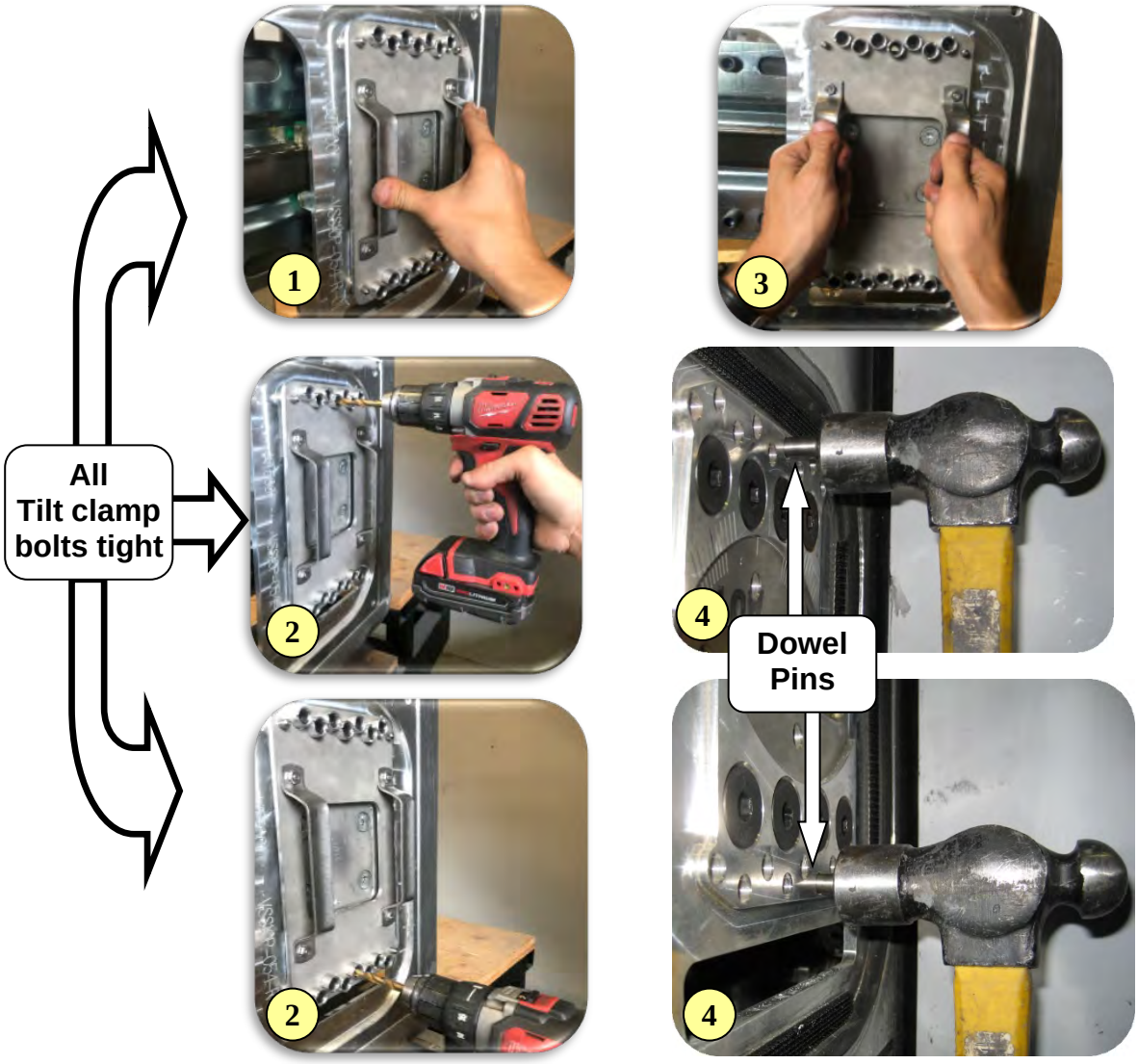
Step 7 – Repeat for the Other End of Slide

Repeat steps 2 thru 6 for the other end of the slide and then re-check the original end because one end may affect the other.

Step 8 – Drill Holes and Insert the Dowel Pins

Two (2) **new** dowel holes, one upper, one lower will have to be drilled using the drill jig (Part #VSS10T-04):

1. Start by pushing the drill jig into place. The locating pins should be a snug fit in the four most outward holes and it needs to sit flat against the end plate.
2. With a 5/16-inch drill use a **very quick** stroke of the drill, to ensure that the 5/16-inch dowel pin will not be loose.
3. Remove drill jig using handles and rocking back and forth to release if necessary.
4. Insert the dowel pin and **lightly** tap in with a hammer to prevent damage to the dowel pin threads.



**** IMPORTANT ****

Do not force dowel pins – they should easily tap in.

Excess force will damage the thread of the pin and prevent future removal.

Step 9 – Secure Tilt Clamp Bolts

One at a time, remove each tilt clamp bolt and apply Loctite 243 (Blue) to the threads and "Never-Seize" to the taper of the countersunk head. Tighten with a torque wrench to 50ft/lbs

Step 10 – Inspect Other Clearances

After adjusting the slide tilt, it may be necessary to adjust the slide retract position (refer to page 131) as well as the slide height (refer to page 123) for air seal clearance and the flat floor height (refer to page 160).

Step 11 – Re-install Exterior Access Panels

Refer to page 205 for instructions on how to install the exterior access panels.

ADJUST SLIDE HEIGHT

Introduction

The slide is installed at the correct height during manufacture and so should not normally require further adjustment.

IMPORTANT: The following procedure should ONLY be performed after first fully understanding the reason why slide height adjustment should be required AND prior consultation with Valid Manufacturing Ltd.

There are two reasons why the height of the slide may require adjustment:

1. The bottom of the slide is rubbing on a **vacuumed** seal.
2. The coach paint pattern on the slide does not line up with pattern on the coach.

The air seal must **not** be inflated when measuring or adjusting the slide height.

This procedure is most effective with two (2) people; one to work on the end wall and the other to make fine adjustments in slide height or tilt using the hydraulic lifting tables.

Tools and Consumables Required

- Height Adjustment Plates:
  - Vertical Adjustment Plate, 0, IEW
  - Vertical Adjustment Plate, 0.0625, IEW
  - Vertical Adjustment Plate, 1/8, IEW
  - Vertical Adjustment Plate, 3/16, IEW
  - Vertical Adjustment Plate, 1/4, IEW
  - Vertical Adjustment Plate, 5/16, IEW
- 243 blue Loctite
- Anti-Seize
- 1/8” flat blade screwdriver << *Remove adjustment plate*
- Ratchet
- 6 mm Allen Key for ratchet
- Torque wrench (50ft/lb)
- Suction Cup << *To remove exterior panels*
- Qty-2 Hydraulic lift table with support stand << *Support slide*
- Short length of 2x6 or other 1-1/2” thick spacer << *Support Slide*
- Foam padding << *Protect slide paint*
- ½ ” Socket << *Roof Hook Bolts*
- Step ladder << *Access exterior endwall*

Checklist – Adjust Slide Height

1. ❑ Determine Height Adjustment
2. ❑ Remove the Exterior access panels
3. ❑ Select Height Adjustment Plate
4. ❑ Loosen the Slide Roof Hooks
5. ❑ Support the Slide
6. ❑ Remove Height Adjustment Plate
7. ❑ Fit Oriented Height Adjustment Plate
8. ❑ Repeat for Other End of Slide
9. ❑ Re-install the exterior access panels
10. ❑ Adjust and Tighten the Roof Hooks

Step 1 – Determine Height Adjustment

The height can be adjusted at each end of the slide in 1/16-inch intervals, determined by the selection and orientation of the height adjustment plate.

Extend the slide as normal and then access the touch screen service menus to vent and vacuum the air seal (Refer to manual control, page 28).

Turn off the air supply to the slide. This will prevent the air seal from inflating.
Refer to page 74 for instructions on how to do this.

From outside the coach, measure the distance between the slide outer skin and the **vacuumed** seal. The factory setup distance is ¼". However, as long as the slide-out does not touch the seal as it extends or retracts, there is **no** need to adjust the height. If faced with a decision to lift the slide, never close up the gap on the top of the slide to less than 1/8".

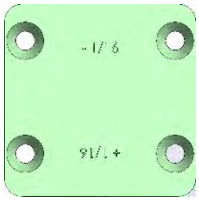
Step 2 – Remove Exterior Access Panels

Refer to page 204 for instructions on how to remove the exterior access panels.

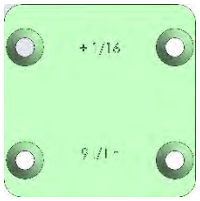
Step 3 – Select Height Adjustment Plate

There are seven (7) height adjustment plates available, each providing a different height adjustment increment. The plates have been engraved to indicate the amount of adjustment available with that specific plate. Each plate has two potential adjustment increments. The desired adjustment should be aligned with the text in the upright position.

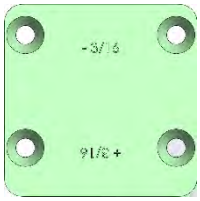
Examples:



- 1/16" Adjustment



+ 1/16"



- 3/16" Adjustment

Available adjustment plates: 0", ±1/16", ±1/8", ±3/16", ±1/4", ±5/16", ±3/8"

Choose a mounting plate which contains the desired adjustment amount difference. For example, if the installed plate is +1/16" and you wish to lift it +1/8", then select the plate and orientation for +3/16".

Step 4 – Loosen Slide Roof Hooks

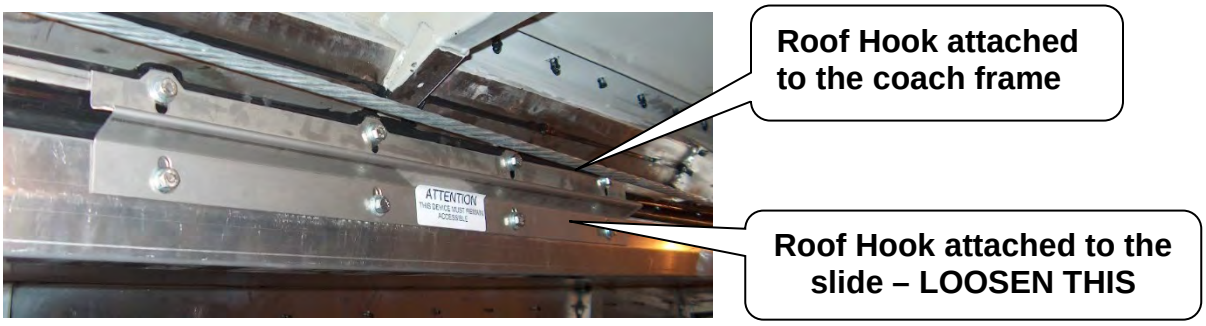
Access the roof hooks at the top of the slide from the inside the coach. A fascia trim or other panel will have to be removed. Contact the coach converter for further clarification.

Use manual control (refer to page-28) and do a **Sync Retract** to move the slide **1-inch** back from its full extended position.

Tech Tip: Retracting the slide 1-inch achieves the following:

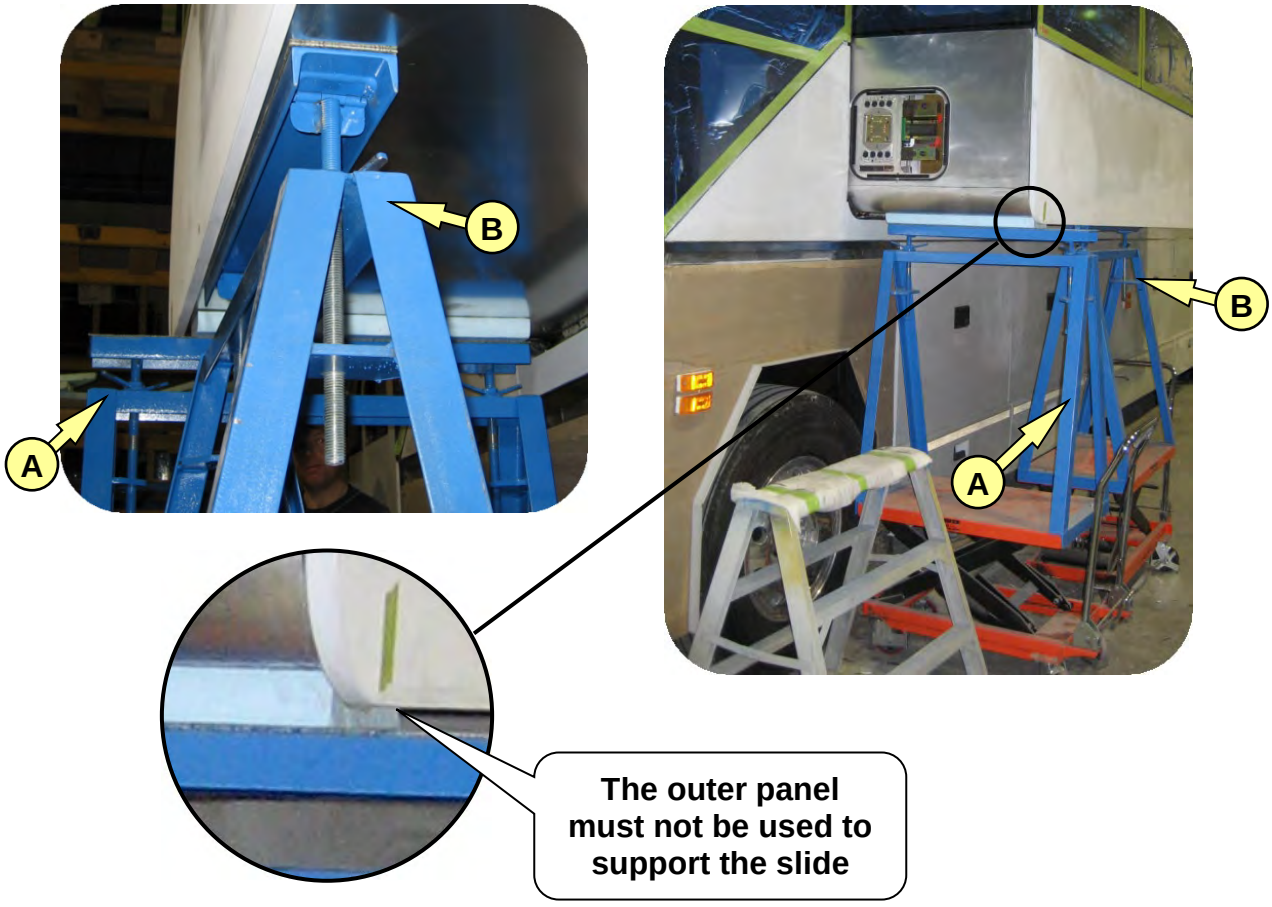
- The roof hooks are disengaged so they do not interfere with the height adjustment.
- The bearing rail outboard white service stop becomes more accessible in case it is necessary to remove the endwall bearing.

Loosen the roof hooks from the top of the slide. Ensure to mark the vertical position of the roof hooks on the slide prior to removal to aid in re-assembly. Only loosen the portion of roof hook that is attached to the slide. The portion attached to the coach frame may be welded.



Step 5 – Support the Slide

Use two hydraulic lift tables with support stands. Lift ‘A’ provides height adjustment and ‘B’ tilts the slide to assist with re-installing the height adjustment plate.



Support stand ‘A’ has a 1-1/2” spacer to prevent the outer panel from supporting the slide. The spacer is positioned on the outer edge of the zipper retaining plate. Support stand ‘B’

must be placed just behind the outer panel. Both stand positions support the slide under its structural members. Use a soft layer between the lift tables and slide to protect the paintwork.

**** IMPORTANT ****
Do lift the slide directly under the zipper otherwise it may be damaged

CAUTION

The lift table must be rated to support the full weight of the slideout room. A fully furnished slideout room may weigh up to 2500lbs.

Step 6 – Remove Height Adjustment Plate

Support the slide by elevating lifting table '**A**' about ½-inch above its point of contact; the coach will tilt slightly to confirm support.

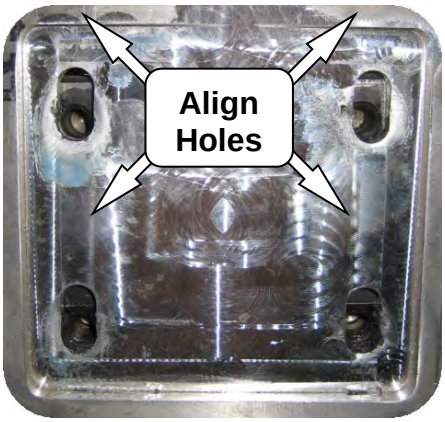
Use a 6mm Allen wrench to remove the four (4) height adjustment plate retaining bolts and then lever off the plate with a small flat-blade screwdriver.

Step 7 – Fit Oriented Height Adjustment Plate

Inspect the hole alignment between the slide and bearing. Use the lift tables to elevate and tilt the slide to line up **three** of the **four** bolt holes.

Rotate the height adjustment plate to position the desired adjustment at the top.

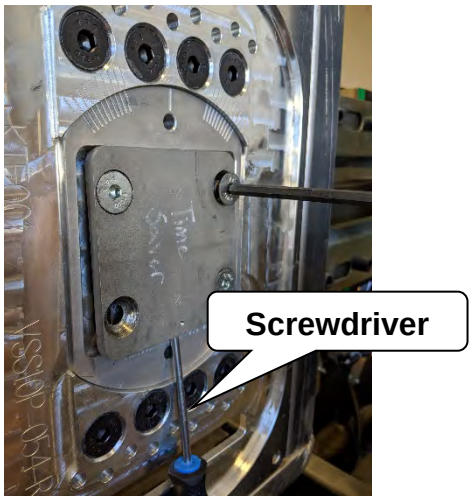
Insert **three** bolts and screw them in as much as possible while using a small screwdriver to keep the plate against the bolt heads. The plate must **not** be allowed to go into the endwall recess.



Adjust the tilt and/or height of the lift tables until the fourth bolt hole is aligned.

Insert the **fourth** bolt in to the same depth as the other three. Again, the plate must **not** be allowed to go into its endwall recess.

Adjust the tilt and height of the lift tables until the height adjustment plate can be **lightly tapped** into its recess. It may take a few tries. Having one person adjusting the lift tables and another pushing on the plate is the best way to do this.



***** VERY IMPORTANT *****

Under no circumstances should the height adjustment plate be forced into position by tightening its retaining bolts; damage WILL occur!
With the lift tables properly adjusted for slide height and tilt, the plate will freely move into position with a light tap.

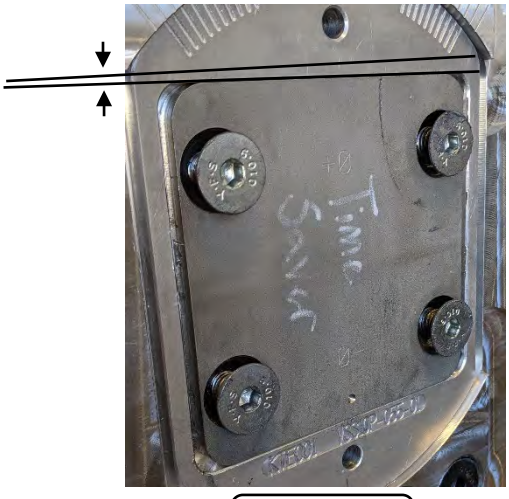


Figure 1

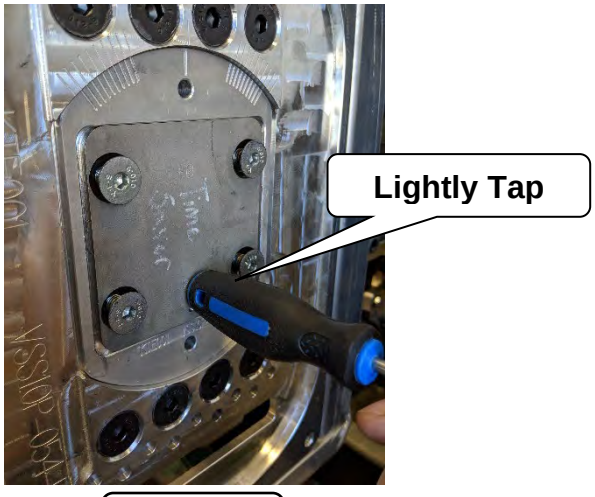
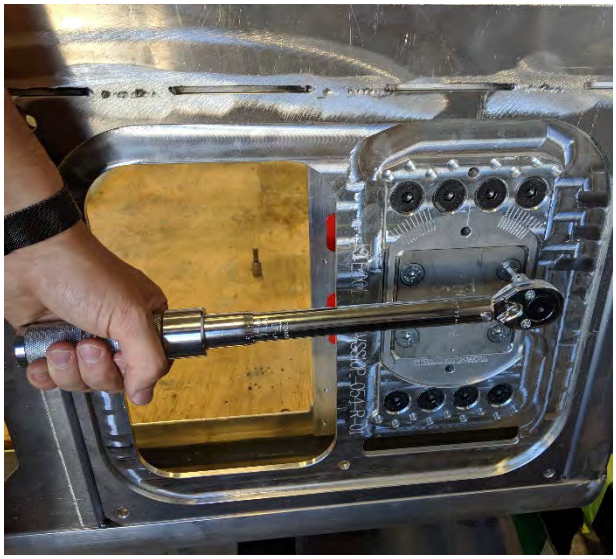


Figure 2

Figure-1 shows the height adjustment plate partially screwed into then endwall bearing but not inside the endwall recess; the slide has yet to be aligned with it.

Figure-2 shows the plate being lightly tapped into its recess after the lift tables had tilted and lifted the slide.

Tighten the bolts exactly as described:



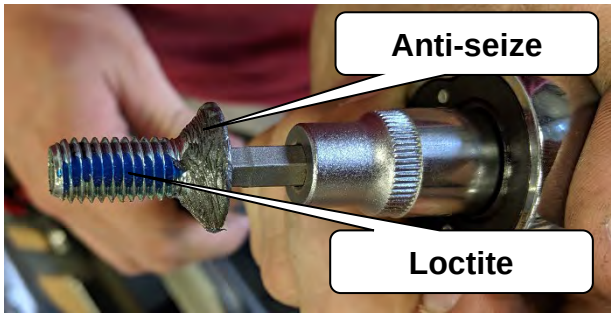
A. With the height adjustment plate in place, tighten the four bolts until they are fully threaded while the slide is still supported.

B. Unscrew each bolt ½-turn to remove any clamp load from the plate.

C. Lower both lifting tables out of the way to allow the coach bearing rail to take the full weight of the s+lide. You may see the slide room rotate forward slightly.

D. **Firmly** re-tighten all four bolts

E. Unscrew **one bolt at a time**, apply Loctite 243 to threads and Anti-seize to head of bolt, then tighten with a torque wrench to 50ft-lbs.



Note: Make sure to use SHFCM10x1.25-25mm Grade 10.9 zinc plated bolt.

***** VERY IMPORTANT *****

Each of the steps described above need to be done every time a height adjustment is completed. These steps take the 'play' out of the height adjustment assembly and ensures a consistent installation. If the slide is not flush after the height adjustment is completed, a rotational adjustment needs to be completed as well. Do NOT use the height adjustment to do a rotational adjustment. This will cause problems once the coach is in service.

Step 8 – Repeat for Other End of Slide

Repeat steps 5 thru 7 for the other end of the slide.

Step 9 – Re-install Exterior Access Panels

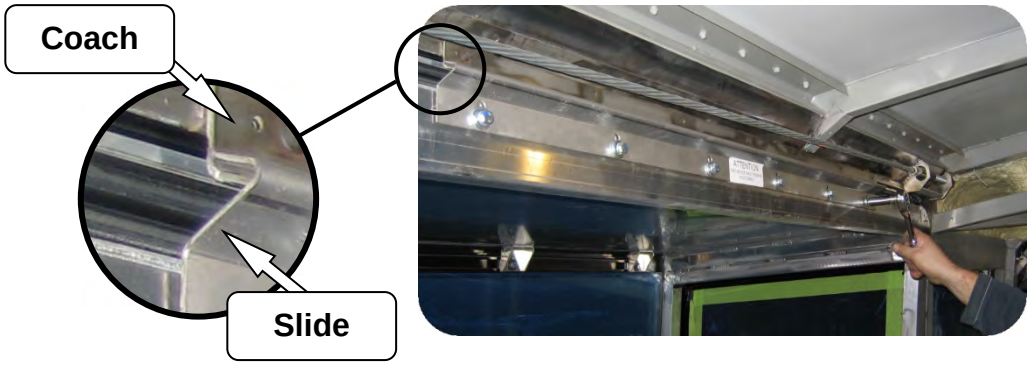
Refer to page-205 for instructions on how to install the exterior access panels.

Step 10 – Adjust and Tighten Roof Hooks

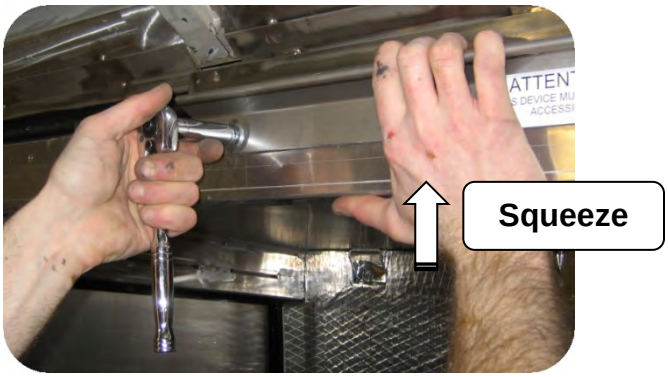
The roof hooks are adjusted with the air seal deflated and the slide extended:

- The seal should still be deflated because the air was shut off in step-1
- Use manual control (refer to page-28) and do a **Sync Extend** to move the slide to its normal-use fully extended position.

The roof hooks overlap as shown below. With the roof hook bolts loose, the roof hook on the slide hangs on the one on the coach.



Squeeze between the coach roof hook and the top of the slide and then firmly tighten the bolts using a ½ inch socket. The bolts screw into metal inserts. Tighten to 25ft/lbs.



Correctly adjusted roof hooks will come together uniformly and smoothly as the slide fully extends. The roof of the slide will have minimal downward deflection under the pressure of an inflated air seal.

Step 11 – Finish

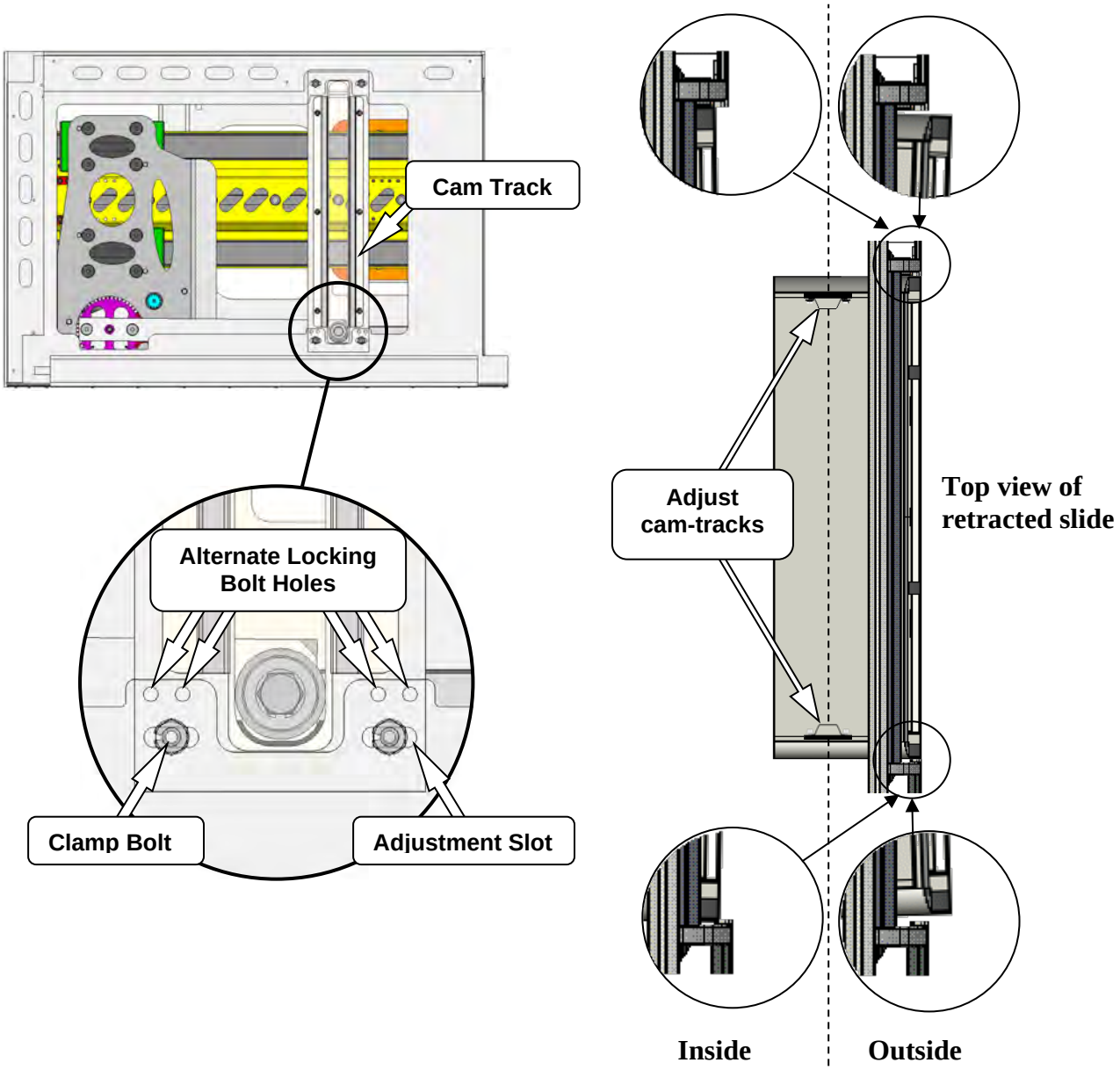
The slide air was shut-off in step 1. Turn it back on.

Retract the slide and confirm the height adjustment with the seal inflated.

ADJUST SLIDE RETRACT POSITION

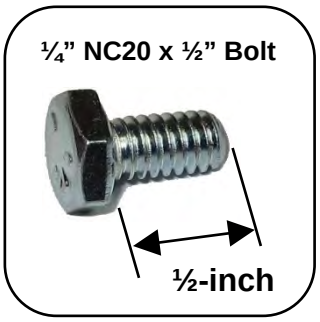
Introduction

The retracted position of the slide is adjusted with the cam tracks. This allows each end of the slide to be adjusted in or out to line up with the exterior skin of the coach.
Each cam track is attached with four (4) clamp bolts which are loosened to allow the cam track to slide back and forth within its adjustment slot. When the adjustment is complete, the four (4) bolts are re-tightened and a locking bolt is installed to secure its position.



Tools and Consumables Required

- Qty-2 1/4 NC20 x 1/2” Bolt
- 13/64-inch Drill Bit
- Small Electric or Air Drill
- 1/4 NC 20 Tap
- Ratchet tap wrench
- 7/16” socket and ratchet



Checklist – Adjust Slide Retract Position

1. ❑ Determine amount of adjustment
2. ❑ Access Cam Tracks
3. ❑ Adjust Cam Tracks
4. ❑ Install Locking Bolts

Step 1 – Determine Amount and Method of Adjustment

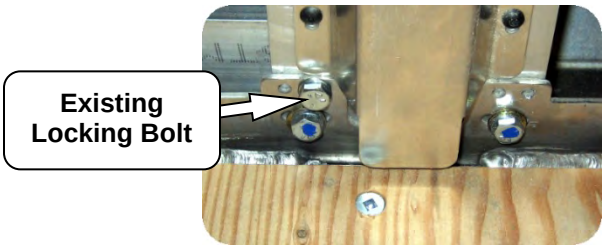
Fully retract the slide as normal and inspect the outside ends of the slide to see how much adjustment is required and in which direction.

Step 2 – Access Cam Tracks

Access the cam tracks from the inside of the coach. The design of interior fittings will typically include panels which can be removed to gain access to the slide end-walls. Contact the coach converter if you require clarification.

Step 3 – Adjust Cam Tracks

With the slide fully retracted, use a 7/16” socket to remove the cam track locking bolt – make a note of which of the four (4) holes the bolt was removed, because that hole will **not** be used again.



Loosen the four (4) mounting bolts.

On the touch screen access service mode and in **Manual Control** vacuum the air seal and then leave it in “Vent”. Refer Page-29

Manually push the slide in or out to align the exterior face of the slide with that of the coach. The adjustment slots provide a range of +/- ¼-inch.

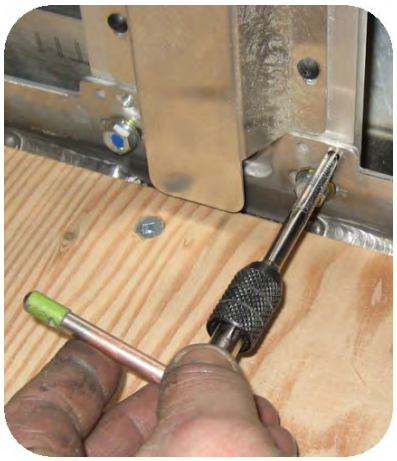
Tighten the four (4) mounting bolts

Repeat the adjustment for the other end wall, as required.

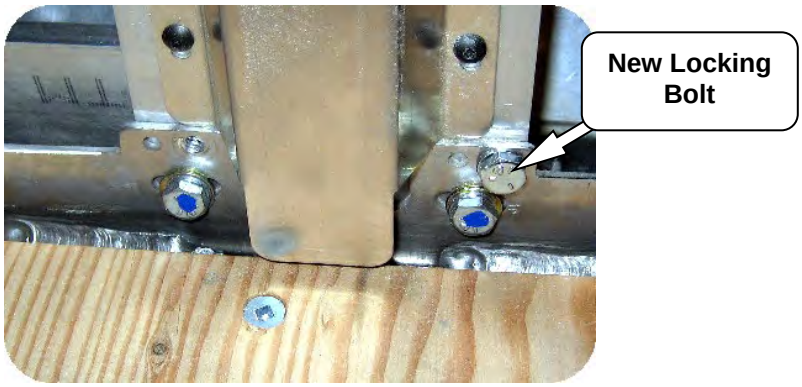
Step 4 – Install Locking Bolts

The four (4) clamp bolts **must** be tight before installing the locking bolt.

Choose **one** of the remaining **unused** pre-drilled holes in the inner plate as a guide and drill a 13/64 hole through it and the 3/8”cam track plate.



Tap a ¼” NC thread through the 13/64” hole and install a ¼” NC20 x ½” long locking bolt



Repeat the procedure for the other end wall, as required.

SLIDE BEARING REPLACEMENT

Introduction

There are three 45mm bearings on each end of the slide. All three travel on bearing rails mounted on the 'W-rail'. Two of the bearings are rigidly mounted on the stub wall with the third on the slide end wall.

These instructions are for the replacement of the outboard **slide** bearing. This procedure shares many of the same steps as when adjusting the slide height.

To replace the inboard stub wall bearings, refer to page-143.

Tools and Consumables Required

- Ratchet
- 6 mm Allen Key for ratchet
- Torque wrench (50ft/lb)
- 3/16" Allen key *<< For Red/White Stops*
- Suction Cup *<< To remove exterior panels*
- Two Hydraulic lift table with support stand *<< Support slide*
- 1-1/2" Slide Support Spacers *<< Support Slide*
- Foam padding *<< Protect slide paint*
- Plastic bearing rail insert *<< Bearing Retainer*

Checklist – Slide Bearing Replacement

1. ❑ Remove Exterior Access Panels.
2. ❑ Retract Slide 1-inch.
3. ❑ Support Slide.
4. ❑ Remove Height Adjustment Plate.
5. ❑ Remove Red and White Stops.
6. ❑ Remove Endwall Bearing.
7. ❑ Inspect Bearing Rail.
8. ❑ Re-install bearing.
9. ❑ Fit Oriented Height Adjustment Plate.
10. ❑ Re-install Red and White Stops.
11. ❑ Re-fit Exterior Access Panel.
12. ❑ Finish.

Step 1 – Remove Exterior Access Panels

Extend the slide as normal.

Refer to page 204 for instructions on how to remove the exterior access panels.

Step 2 – Retract Slide 1 inch

Use manual control (refer to page 28) to vent and vacuum the air seal and **Sync Retract** to move the slide **1 inch** back from its full extended position.

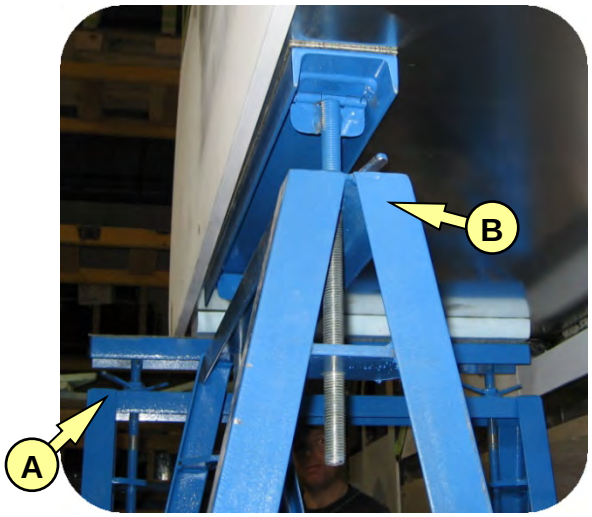
Turn off the air supply to the slide. This will prevent the air seal from inflating. Refer to page 74 for instructions on how to do this.

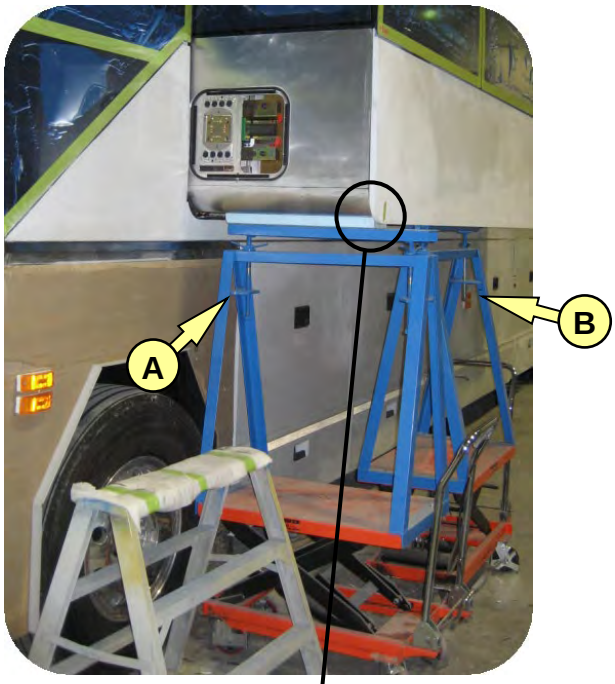
Tech Tip: Retracting the slide 1-inch achieves the following:

- The roof hooks are disengaged so they do not interfere with the bearing replacement.
- The bearing rail outboard white service stop becomes more accessible.

Step 3 – Support the Slide

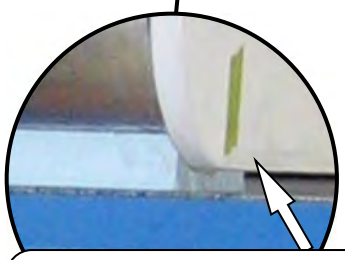
Use two hydraulic lift tables with support stands. Lift '**A**' provides height adjustment and '**B**' tilts the slide to assist with re-installing the height adjustment plate.





Support stand '**A**' has a 1-1/2" spacer to prevent the outer panel from supporting the slide. The spacer is positioned on the outer edge of the zipper retaining plate. Support stand '**B**' must be placed just behind the outer panel. Both stand positions support the slide under its structural members.

Use a soft layer between the lift tables and slide to protect the paintwork.



The outer panel must not be used to support the slide

**** IMPORTANT ****
Do lift the slide directly under the zipper otherwise it may be damaged

CAUTION

The lift table must be rated to support the full weight of the slideout room.

A fully furnished slideout room may weigh up to 2500lbs.

Step 4 – Remove Height Adjustment Plate

Support the slide by elevating lifting table '**A**' about ½-inch above its point of contact; the coach will tilt slightly to confirm support.

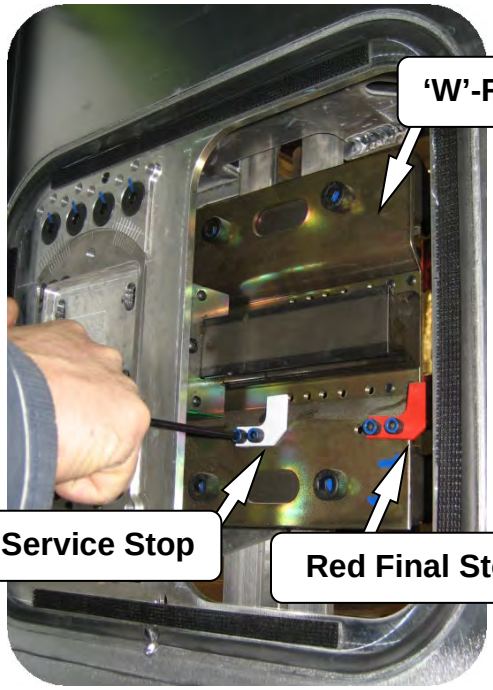
Use an 6mm Allen wrench to remove the four (4) height adjustment plate retaining bolts and then lever off the plate with a small flat-blade screwdriver.

***** IMPORTANT *****
Make a note of the orientation of the height adjustment plate to ensure it is re-installed exactly the same.

Step 5 – Remove Red and White Stops

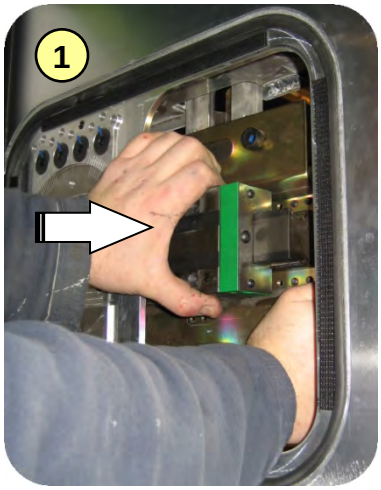
Use a 3/16" Allen key to remove both the white service stop and red final stop; make a note of their position and their orientation.

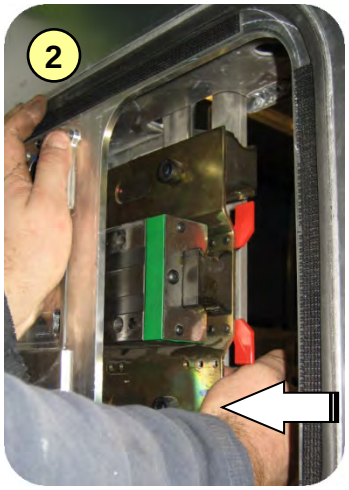
Tech Tip: Grab the 'W' Rail and pull it out to make the stops more accessible

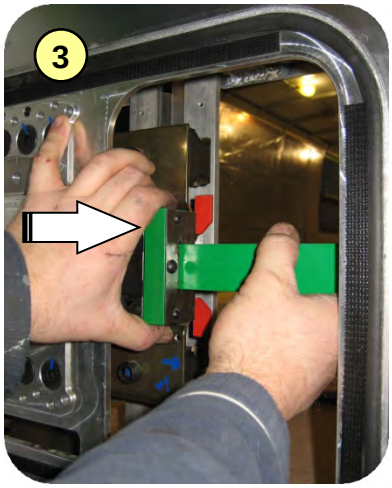


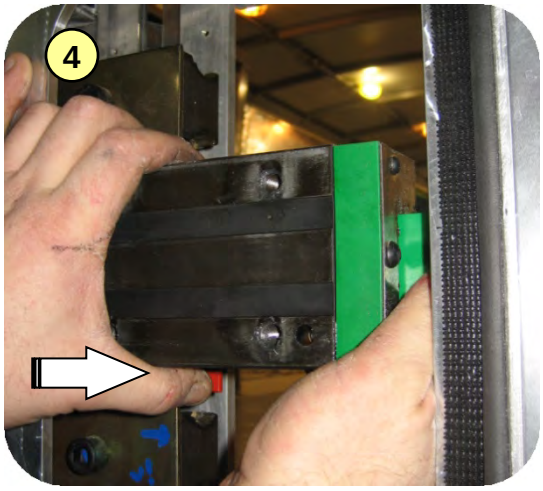
Step 6 – Remove Endwall Bearing

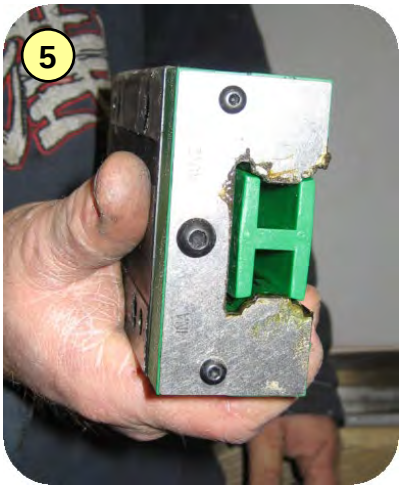
Slide the bearing to the outer end of its bearing rail, push the W-Rail in towards the center of the coach and slide the bearing off the main rail onto a plastic retaining rail.









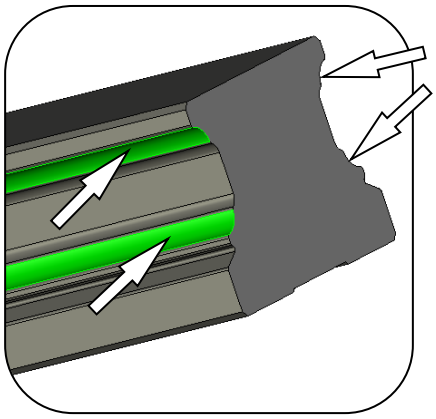


Step 7 – Inspect Bearing Rail

The bearing rail has four surfaces on which the ball bearings travel.

Wipe off and inspect these surfaces to ensure that there is no pitting or other imperfections which could prevent smooth operation.

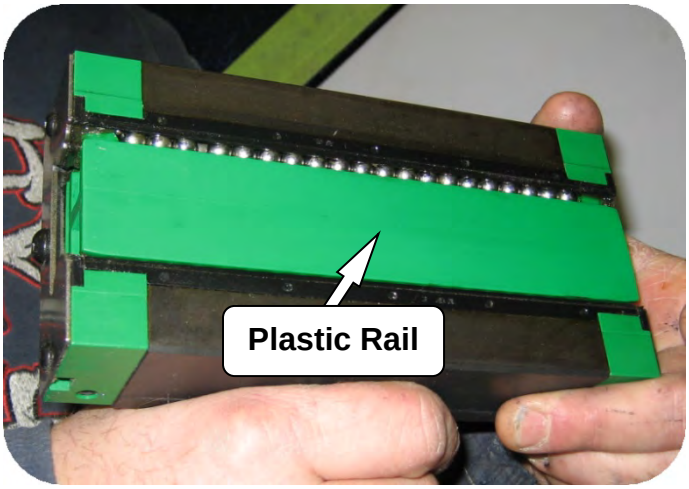
Replace the bearing rail as required; it is bolted to the W-Rail.

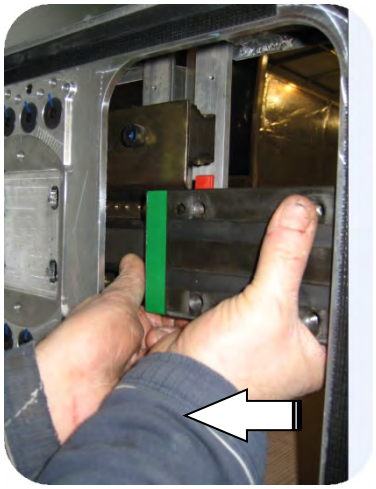


Tech Tip: The bearing is self-lubricated; there is no requirement to lubricate the bearing or rail.

Step 8 – Re-install Bearing

Confirm that the new bearing is fitted with a plastic rail
Slide the new bearing onto the main rail; the plastic rail will be pushed out.
Line up the bearing behind the four end wall mounting holes.





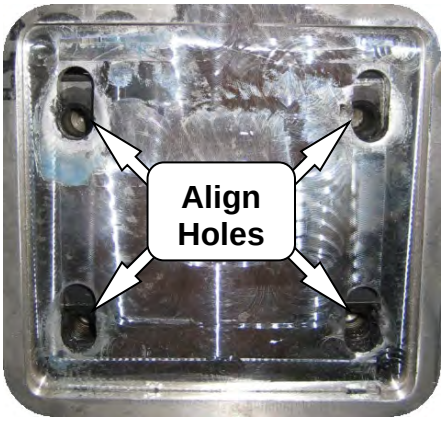
CAUTION – The bearing should EASILY slide onto the rail. DO NOT FORCE IT; otherwise damage to the bearing may occur in addition to ball bearings falling out.

Step 9 – Fit Oriented Height Adjustment Plate

***** VERY IMPORTANT *****

Under no circumstances should the height adjustment plate be forced into position by tightening its retaining bolts; damage WILL occur!
With the lift tables properly adjusted for slide height and tilt, the plate will easily move into position with a light tap.

Inspect the hole alignment between the slide and bearing. Use the lift tables to elevate and tilt the slide to line up **three** of the **four** bolt holes.

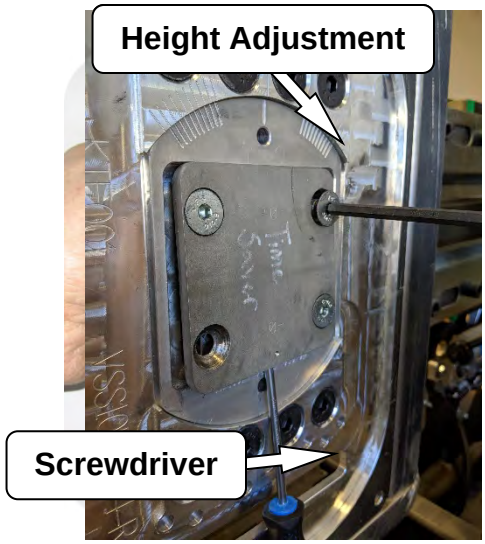


Rotate the height adjustment plate to position the desired adjustment at the top.

Insert **three** bolts and screw them in much as possible while using a small screwdriver to keep the plate against the bolt heads. The plate must **not** be allowed to go into its endwall recess.

Adjust the tilt and/or height of the lift tables until the fourth bolt hole is aligned.

Insert the **fourth** bolt in to the same depth as the other three. Again, the plate must **not** be allowed to go into its endwall recess.



Adjust the tilt and height of the lift tables until the height adjustment plate can be **lightly tapped** into its recess. It may take a few tries. Having one person adjusting the lift tables and another pushing on the plate is the best way to do this.

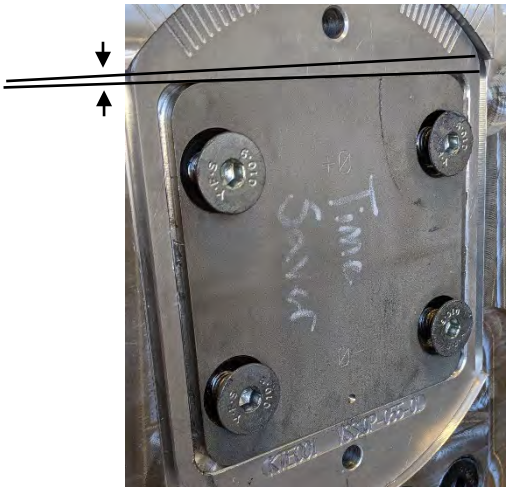


Figure 1

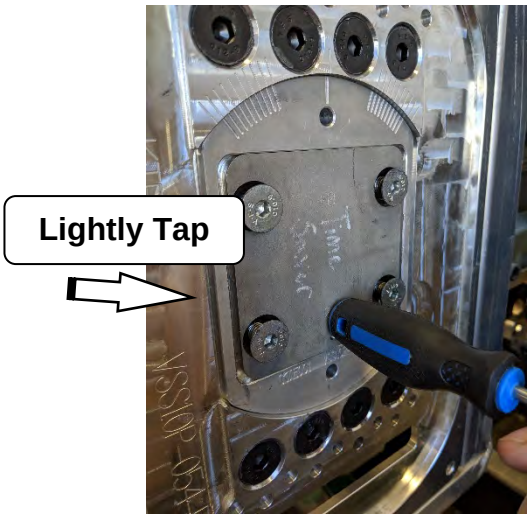


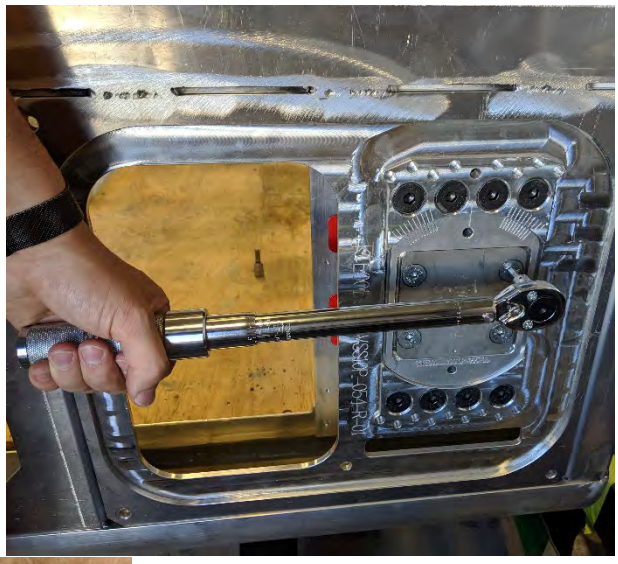
Figure 2

Figure 1 shows the height adjustment plate partially screwed into then endwall bearing but not inside the endwall recess; the slide has yet to be aligned with it.

Figure 2 shows the plate being lightly tapped into its recess after the lift tables had tilted and lifted the slide.

Tighten the bolts exactly as described:

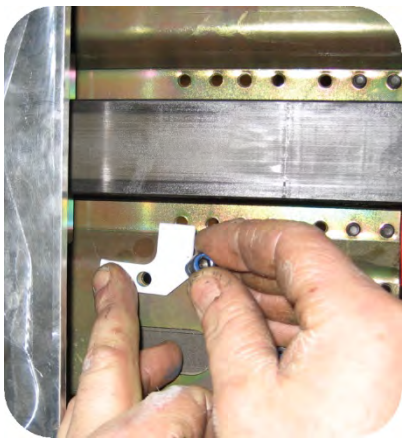
1. Tighten the four bolts until they are fully threaded and then unscrew them ½-turn. Make sure to use SHFCM10x1.25-25mm Grade 10.9 zinc plated bolt.



2. Lower both lifting tables out of the way to allow the coach bearing rail to take the full weight of the slide
3. **Firmly** re-tighten all four bolts and then unscrew **one bolt at a time**, apply Loctite 243 to threads and Anti-seize to head of bolt, then tighten with a torque wrench to 50ft-lbs.

Step 10 – Re-install Red and White Stops

Re-install the red and white stops in the same position and orientation as when removed in step-5.



Step 11 – Re-install the Exterior Access panels

Refer to page-205 for instructions on how to install the exterior access panels.

Step 12 – Finish

The slide air supply was shut off in step 2. Turn it back on.

Retract and extend the slide to confirm operation

STUB WALL BEARING REPLACEMENT

Introduction

There are three 45mm bearings on each end of the slide. All three travel on bearing rails mounted on the 'W-rail'. Two of the bearings are rigidly mounted on the stub wall with the third on the slide end wall.

These instructions are for the replacement of the two inboard **stub wall** bearings.

To replace the outboard slide bearings, refer to page-134.

Tools and Consumables Required

- Ratchet
- 6 mm Allen key for ratchet
- Torque wrench (50ft/lb)
- 3/16" Allen key *<< For Red/White Stops*
- Suction Cup *<< To remove exterior panels*
- Two Hydraulic lift table with support stand *<< Support slide*
- 1-1/2" Slide Support Spacers *<< Support Slide*
- Foam padding *<< Protect slide paint*
- Two plastic bearing rail inserts *<< Bearing Retainer*

Checklist

1. ❑ Deflate Air Seal
2. ❑ Access the Interior Stub Wall
3. ❑ Support the Slide
4. ❑ Remove Red Final Stops
5. ❑ Insert Plastic Rails
6. ❑ Remove Stub Wall Bearing
7. ❑ Install Stub Wall Bearing
8. ❑ Re-insert Bearing Rails
9. ❑ Re-install Red Final Stops
10. ❑ Finish

Step 1 – Deflate Air Seal

Fully extend the slide and then use manual control (refer to page 28) to vent and vacuum the air seal.

Turn off the air supply to the slide. This will prevent the air seal from inflating. Refer to page 74 for instructions on how to do this.

Step 2 – Access the Interior Stub Wall

In a finished coach, the stub wall is hidden beneath the interior fittings. Contact the coach converter if unsure how to access the stub wall.

Step 3 – Support the Slide

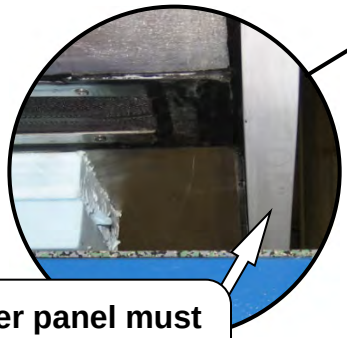
Use a hydraulic lift table with a support stand.

The support stand has a spacer of at least 1-1/2” to prevent the outer panel from supporting the slide. The spacer is positioned on the outer edge of the zipper retaining plate.

Use a soft layer between the lift tables and slide to protect the paintwork.

**** IMPORTANT ****

Do lift the slide directly under the zipper otherwise it may be damaged



The outer panel must not be used to support the slide

CAUTION

The lift table must be rated to support the full weight of the slideout room.

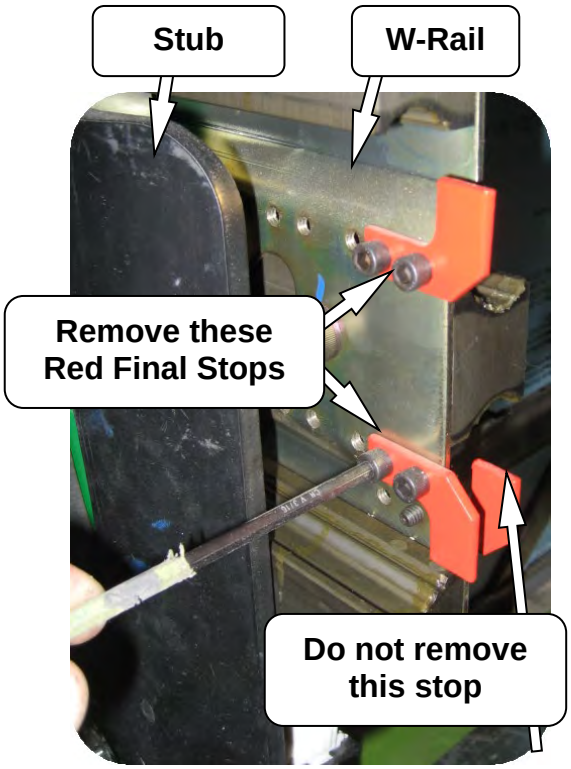
A fully furnished slideout room may weigh up to 2500lbs

Step 4 – Remove Red Final Stops

Use a 3/16” Allen key to remove both the inside red final stops; make a note of their positions and their orientation.

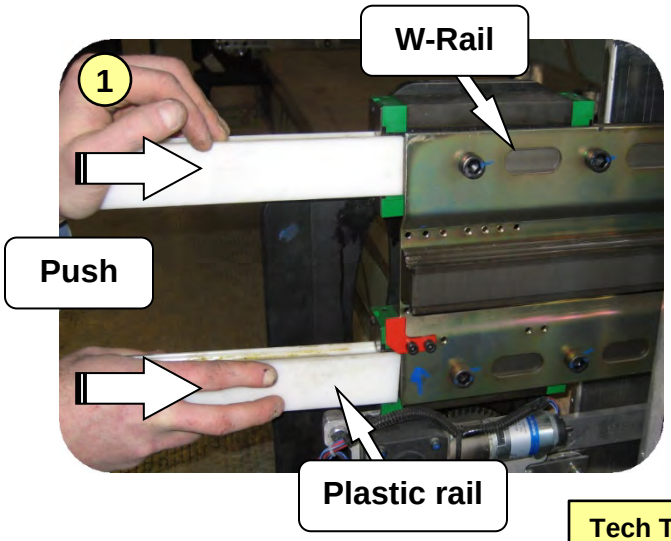
The outside red stop is for the slide bearing and does not need to be removed

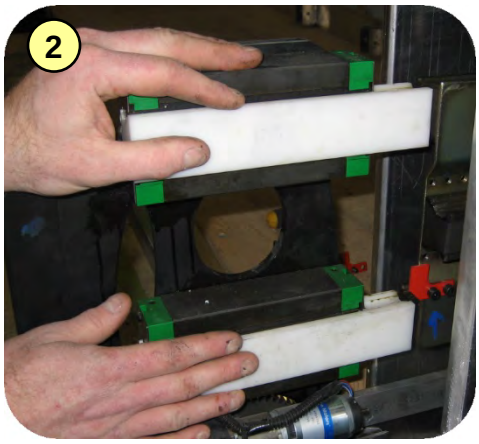
Tech Tip: Grab the W-rail and pull it out to make the stops more accessible.



Step 5 – Insert Plastic Rails

Place both plastic bearing rail inserts against the end of the main bearing rails and push to insert them into the stub wall bearings; this will push the W-Rail out.

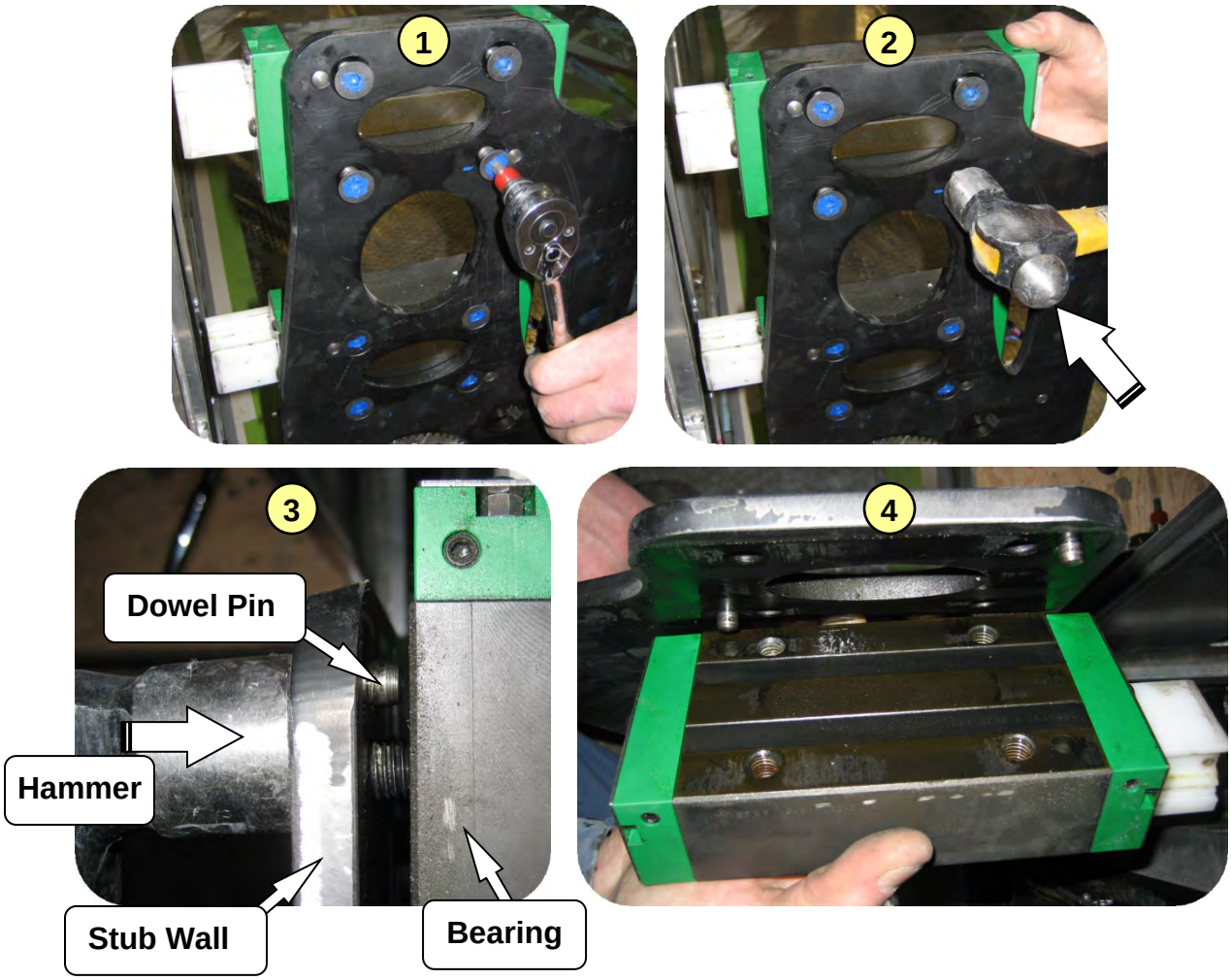




Tech Tip: If no spare plastic rail is available, lay the **new** bearings on a flat surface and withdraw their plastic rails.

Step 6 – Remove Stub Wall Bearing

Use a 6mm Allen wrench to unscrew, but not remove, the four bearing bolts.
Tap each bolt in turn to incrementally push the bearing off the two stub wall dowel pins.

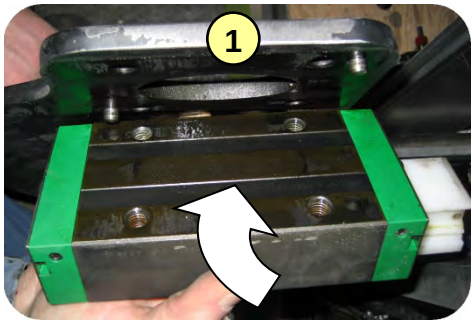


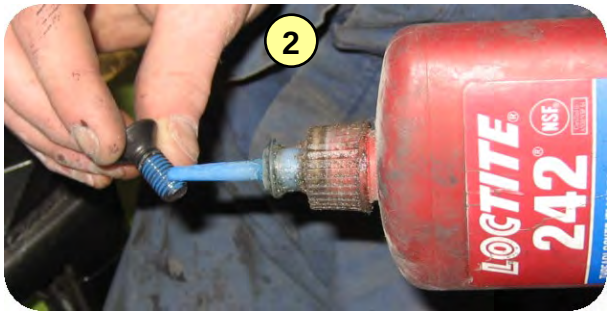
Step 7 – Install Stub Wall Bearing

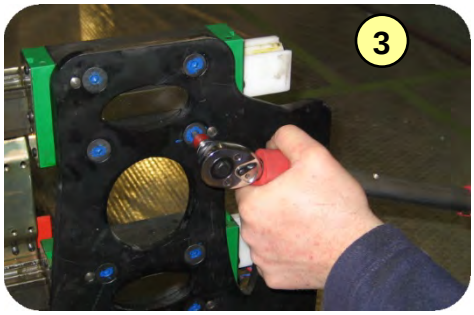
The bearing **must** have its plastic rail installed; this prevents ball bearings from falling out of their raceways.

Fit the bearing onto the two stub wall dowels.

Apply Loctite 242 (blue) to the four bearing bolts and tighten to a torque of 50ft/lbs







Step 8 – Re-insert Bearing Rails

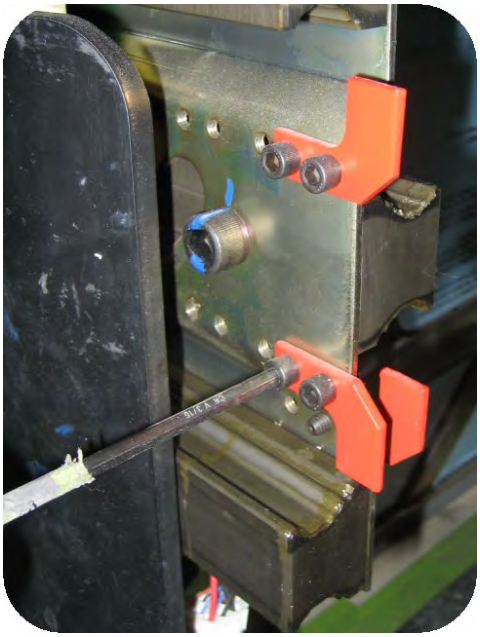
It is recommended that two people re-insert the bearing rails; one person to operate the hydraulic lifting table and the other inside the coach inserting the rails.

Slide the W-rail up to the bearings and inspect their alignment. Adjust the height of the slide with the lift table to align the bearing rails to the bearings.

Grab the W-rail and pull it back to insert the bearing rail. **Do not force it;** re-adjust the slide height until it smoothly slides in. The plastic rails will be pushed out by the main bearing rails.

Step 9 – Re-install Red Final Stops

Re-install the red and white stops in the same position and orientation as when removed in step-3.



Step 10 – Finish

Remove the exterior slide support (hydraulic lifting table).

The slide air supply was shut off in step 1. Turn it back on.

Retract and extend the slide to confirm operation.

DRIVE MOTOR REPLACEMENT

Introduction

The slide room drive system consists of multiple synchronized motor assemblies mounted to stub walls at each end of the slide. On longer slides, center stub walls may also be equipped with motor assemblies.

As viewed when standing outside the coach, facing the slide, there are left and right hand motor assemblies.

The slide configuration item **Typical End Position Counts** (refer to page-27) must be set to match the installed motor assembly:

Motor Assembly	Typical End Position Counts
Original Design	10,000
New Design 2008	14,500

***** IMPORTANT *****

Never mix motor assemblies with different end position counts.

An original design motor assembly can be directly replaced by a new design provided that BOTH left and right motor assemblies are changed-out to the new design.

Tools and Consumables Required

- 7/32” Allen Key / Socket
- Ratchet
- 9/16” socket
- Torque Wrench 30ft/lbs
- Loctite 243 (blue)

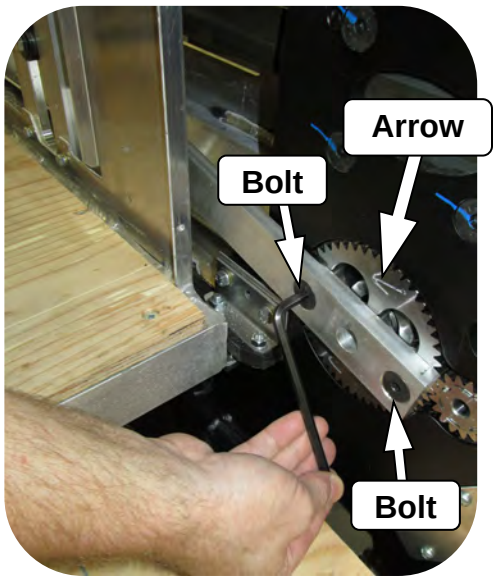
Checklist – Drive Motor replacement

1. ❑ Access Stub Wall
2. ❑ Remove Drive Arm
3. ❑ Remove Motor Assembly
4. ❑ Install Motor Assembly
5. ❑ Attach Drive Arms

Step 1 – Access Stub Wall

Access the slide stub walls from inside the coach. Furnishings will have to be removed; contact the coach converter if you require clarification.

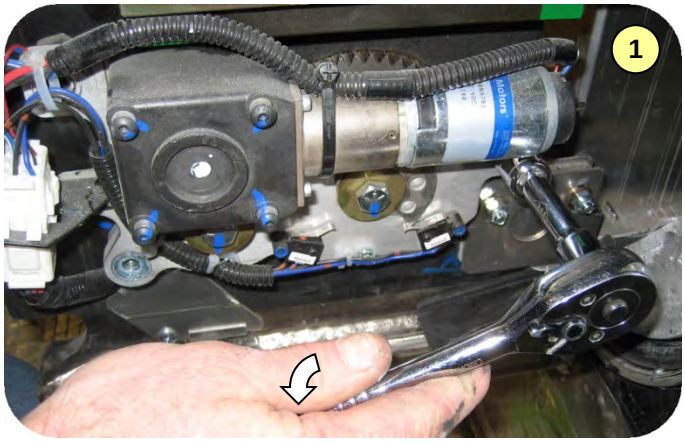
Step 2 – Remove Drive Arms

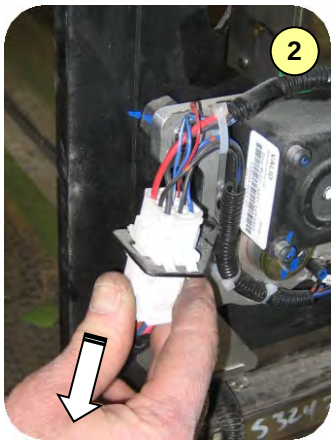


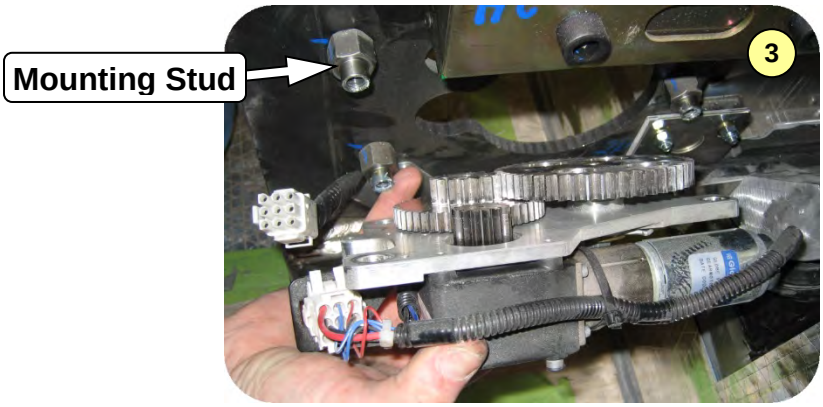
With the slide extended, use a 7/32” Allen key to undo the two bolts and remove the drive arm. Observe the arrows on the gear which point in the direction of the cam path.

Step 3 – Remove Drive Assembly

Use a 9/16” socket to remove the three motor assembly securing bolts, unplug the electrical connection and remove the motor assembly from the mounting studs..



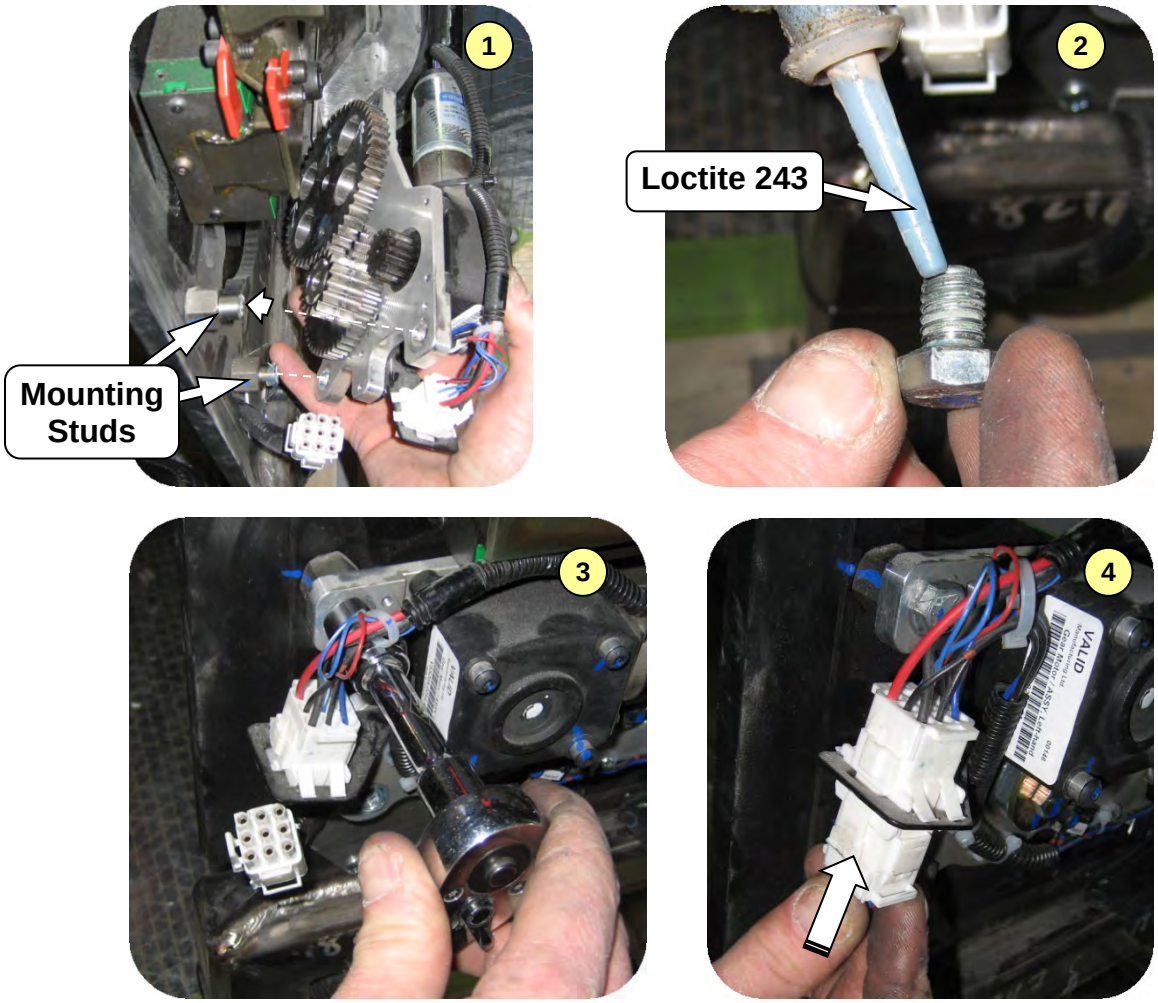




Step 4 – Install Drive Assembly

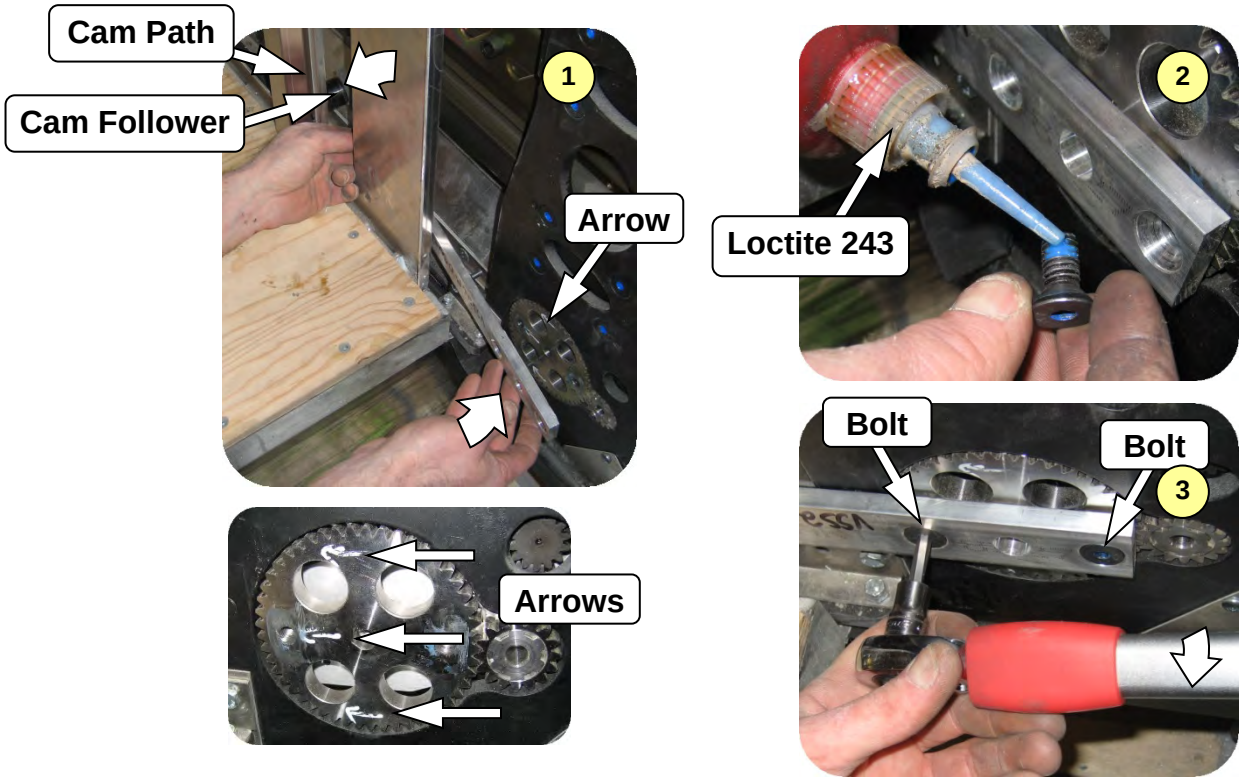
Fit the motor drive assembly onto its mounting studs and apply Loctite 243 (blue) to the bolts and firmly tighten with a 9/16” socket and torque wrench to 30ft/lbs.

Plug in the electrical connector.



Step 5 – Install Drive Arms

Confirm the arrows on the gear point toward the cam path. Fit the drive arm so its cam follower slots into the cam path. Apply Loctite 242 (blue) to the bolts and torque to 35ft/lbs.



***** WARNING: CRITICAL DIMENSION *****

The length of the 3/8-16 capscrew socket flat head bolts which secure the drive arm MUST be 7/8 inch in length.
If a longer bolt is used, damage WILL occur to the gears.

FLAT FLOOR ACTUATOR REPLACEMENT

Introduction

A 5-inch 12V DC actuator is used to raise and lower the floor.
The body of the actuator is attached to the coach; the moving rod is attached to the floor linkage.

Tools and Consumables Required

- 9/16 inch wrench
- ¼ inch Allen Key
- ¾ inch wrench
- Groove lock (Channellock) pliers
- Qty-3 Spacer Blocks (2x4 4-7/8” long)

Checklist – Floor Actuator Replacement

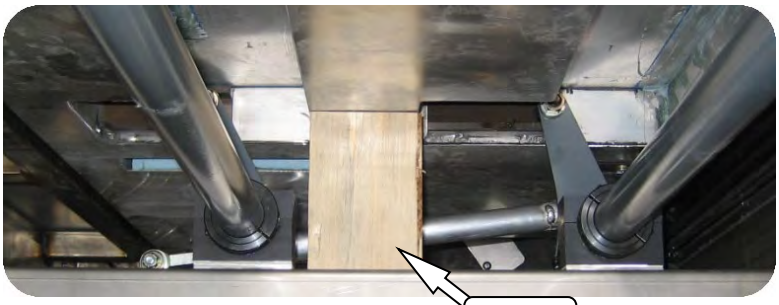
1. ❑ Access floor actuator
2. ❑ Raise and block the floor
3. ❑ Disconnect electrical connections
4. ❑ Remove the floor actuator
5. ❑ Prepare new floor actuator
6. ❑ Install new floor actuator

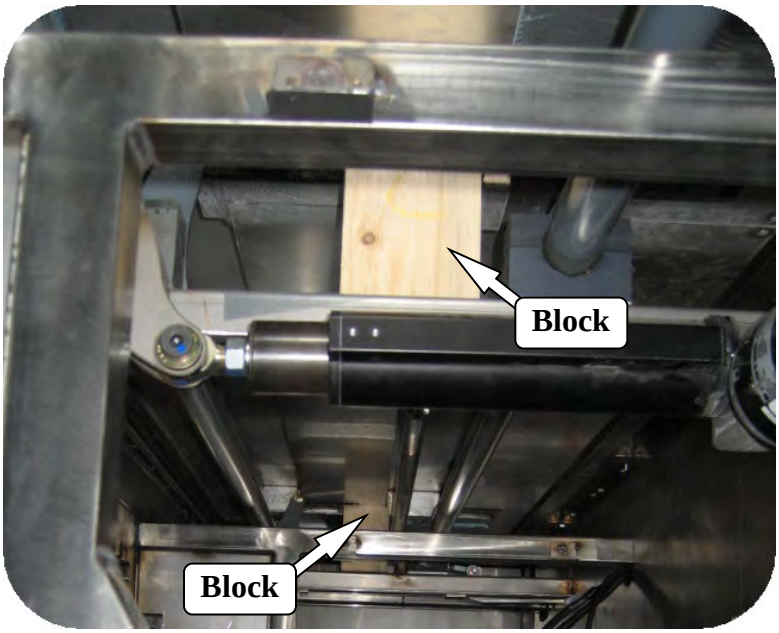
Step 1 – Access Floor Actuator

Access to the floor actuator is from underneath the slide, in the coach baggage bay. Typically there are access panels that have to be unbolted. However, contact the coach converter if you require clarification.

Step 2 – Raise and Block the Floor

Fully extend the slide. With the flat floor fully raised place three safety support blocks underneath the flat floor; one at each end and one in the middle.



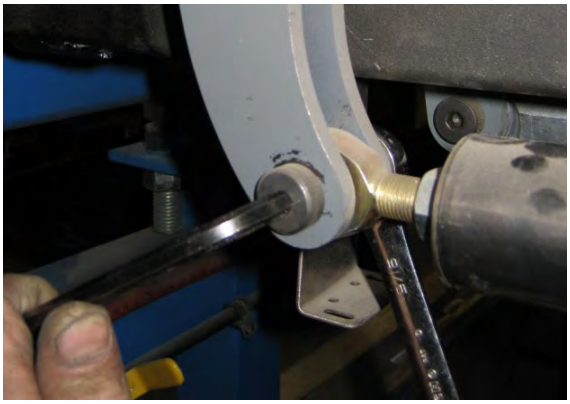


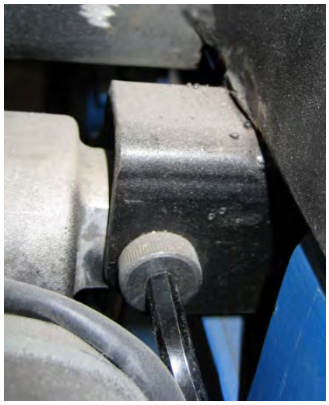
Step 3 – Disconnect Electrical Connections

At the actuator, unplug the electrical connector.

Step 4 – Remove the Floor Actuator

Using a 9/16” wrench and a 1/4-inch Allen key, remove the two mounting bolts.



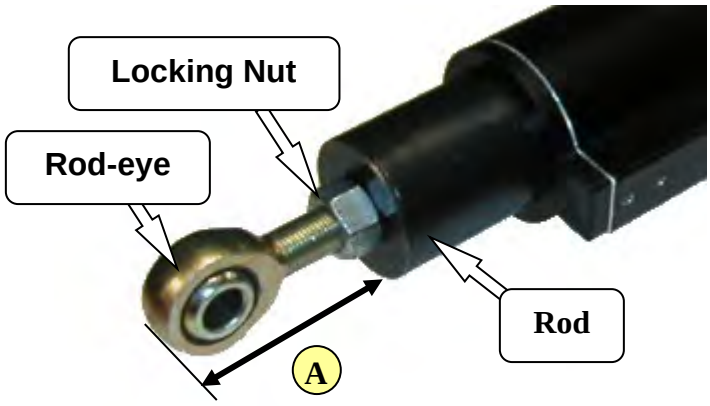


CAUTION

The floor MUST be supported with blocks BEFORE disconnecting the actuator, otherwise it may fall down

Step 5 – Prepare New Floor Actuator

Use the groove lock pliers and the 3/4” wrench to remove the rod-eye from the **new** actuator and apply blue Loctite 242 to its threads. Screw it back into the rod until dimension ‘**A**’ is the same as original actuator.
Rotate the rod, to move it in or out, so the mounting distance is the same



Step 6 – Install New Floor Actuator

- Install the new actuator. Use blue Loctite 243 on the threads of the two mounting bolts and rod-eye locking nut prior to tightening.
- Plug in the actuator electrical connector.
- Remove the three safety blocks.

FLAT FLOOR ROD-EYE ADJUSTMENT

Introduction

The floor actuator supports the **entire** weight of the floor. When the actuator is fully extended, the flat floor should be level with the slide floor. When the floor is lowered, it will clear the underside of the slide allowing it to retract.
The floor rod-eye adjustment is done with the floor actuator **fully extended.**

This procedure is only to adjust the elevation of the flat floor, NOT its level.

Tools and Consumables Required

- Straight edge
- ¾ inch wrench
- Battery and jog box << Allows local motor control

Checklist – Floor Rod-Eye Adjustment

1. ❑ Access floor actuator
2. ❑ Determine the direction of adjustment
3. ❑ Adjust the floor elevation

Step 1 – Access Floor Actuator

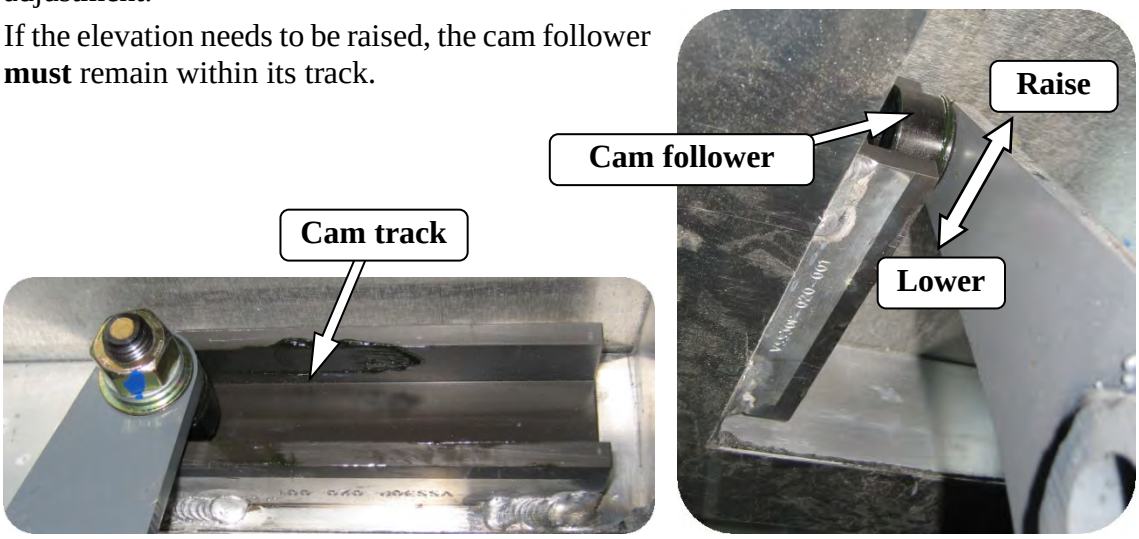
Access to the floor actuator is from underneath the slide, in the coach baggage bay. Typically there are access panels that have to be unbolted. However, contact the coach converter if you require clarification.

Step 2 – Determine Direction of Adjustment

Fully extend the slide and raise the floor as normal.

From inside the coach, on the top side of the flat floor, determine the elevation adjustment.

If the elevation needs to be raised, the cam follower **must** remain within its track.



The photographs above, from within the baggage bay beneath the flat floor, show a cam follower in its “fully raised” position. If the flat floor actuator rod eye is adjusted to raise the floor any further, the cam follower will exit the cam track and fail to support the flat floor. In this case it will be necessary to elevate the floor by adding shims under all six (6) pillow bearing blocks; refer Page-162

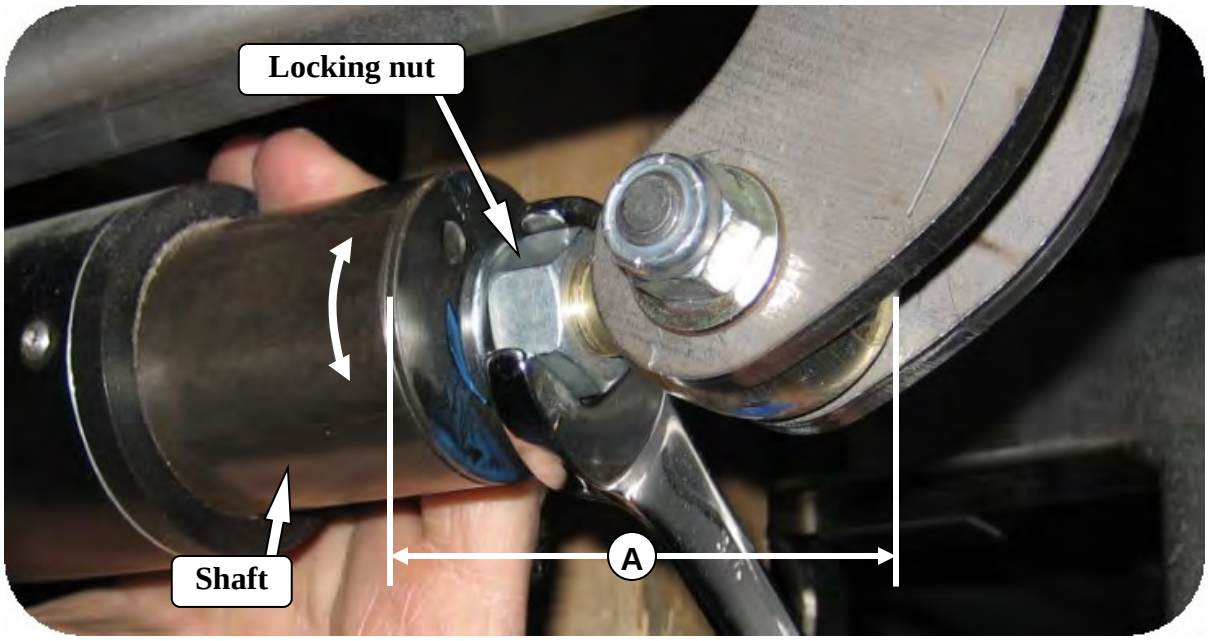
CAUTION

Do not adjust the actuator rod-eye too much and cause cam followers to exit their cam tracks: This may result in injury and damage to the floor.

Step 3 – Adjust Floor Elevation

With the floor fully raised, use the ¾-inch wrench to loosen off the rod-eye locking nut; depending on the mechanical configuration, the actuator could be extended or retracted.

Increase dimension 'A'	Reduce dimension 'A'
Increase dimension '**A**' by rotating the shaft to **undo** the rod-eye thread. If the actuator is extended, tighten the locking nut and re-extend the actuator to its full extension. Repeat as necessary.	Reduce dimension '**A**' by rotating the shaft to **thread-in** the rod-eye. If the actuator is retracted, tighten the locking nut and fully retract the actuator again. Repeat as necessary.
Blue Loctite 243 should be applied to the rod-eye threads before tightening the locking nut.	



CAUTION

Do not exceed 2-1/2-inches for dimension 'A'. The total length of the rod-eye is 3-inches. At least ½-inch of thread is required, otherwise the rod-eye could come out and the floor will fall down. Refer to page 160 for shim adjustment.

FLAT FLOOR SHIM ADJUSTMENT

Introduction

The level of the flat floor is factory set using a three step process:

1. The torque shaft tie-rods are all set the same length
2. Floor actuator rod-eye is set to mid-thread position
3. Shims are used to elevate and level the flat floor

Once the coach is complete, small flat floor elevation adjustments can be made with the floor actuator rod-eye (page 157). However, if larger adjustments have to be made, then shims will have to be added or removed from under the torque shaft bearings

Refer to page 163 for an illustration of the flat floor mechanism.

Tools and Consumables Required

- 7/16” low profile socket
- 7/16” Deep socket
- Pry Bar
- 0.050-inch Shim, Part# FF30-007-01
- 0.025-inch Shim (white), Part# FF30-007

Checklist – Flat Floor Shim Adjustment

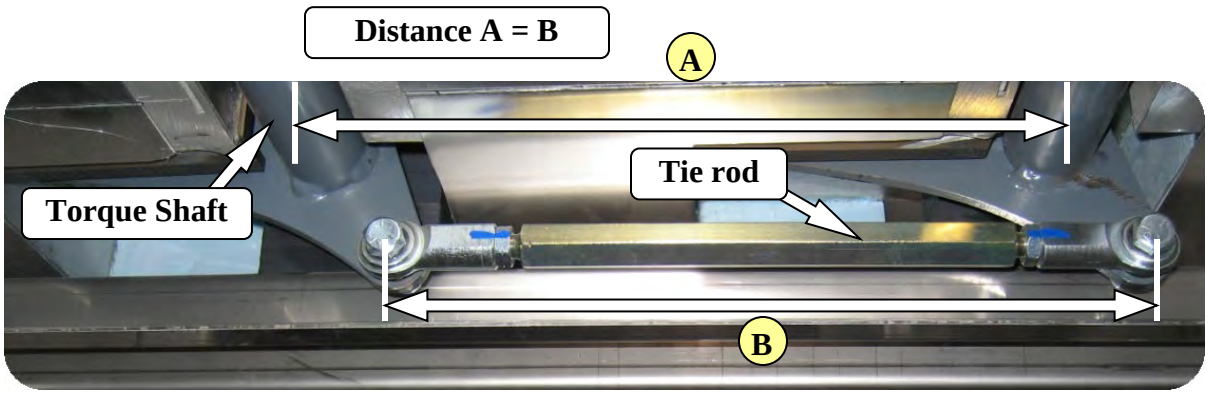
1. ❑ Access the floor actuator
2. ❑ Ensure the tie-rods are the correct length
3. ❑ Set floor actuator rod-eye to mid-thread
4. ❑ Add or remove shims

Step 1 – Access Floor Actuator

Access to the floor actuator is from underneath the slide, in the coach baggage bay. Typically there are access panels that have to be unbolted. However, contact the coach converter if you require clarification.

Step 2 – Ensure Tie-rods are Correct Length

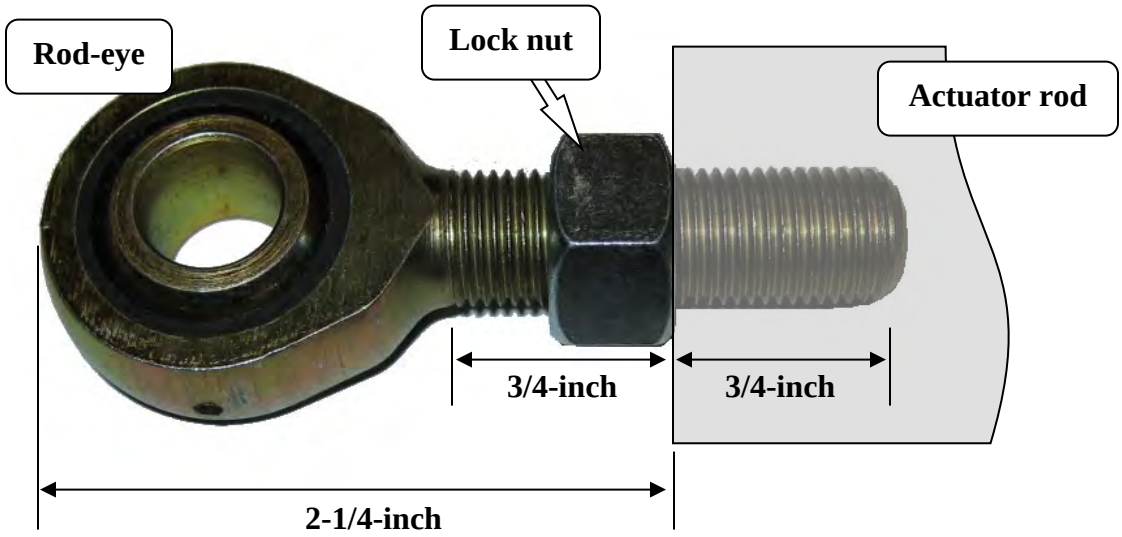
The center-to-center distance of the tie-rod bolts should always be **exactly** the same as the center-to-center distance of the torque shafts. This ensures that both cam followers are always at the same elevation. Adjust as required.



IMPORTANT: Do not attempt to adjust the level of the flat floor by adjusting the tie rods; see below for adding or removing bearing shims.

Step 3 – Set Floor Actuator Rod-eye to Mid-thread

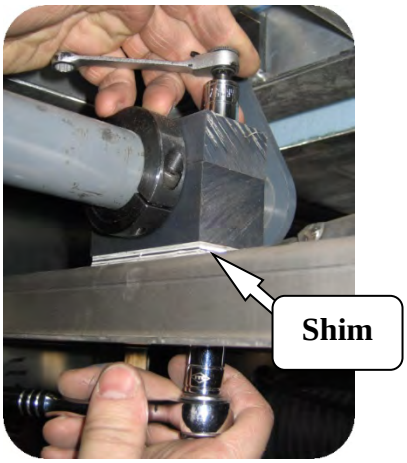
Using a ¾-inch wrench loosen the rod-eye lock nut and rotate the actuator rod to adjust the rod-eye thread to its mid-position.



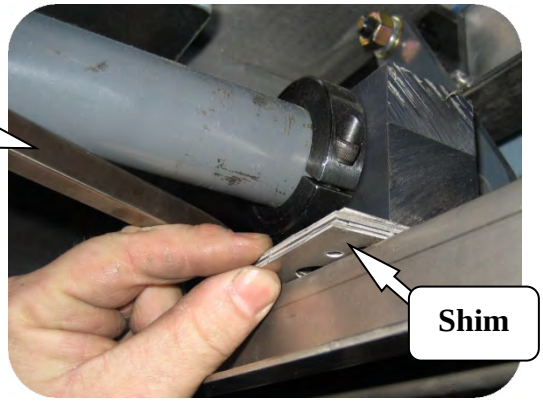
Step 4 – Add or Remove Shims

Extend the slide as normal to fully raise the flat floor.

Loosen the torque shaft bearing bolts and add or remove shims to adjust the flat floor elevation; use a pry bar to slightly lift the torque shaft to make it easier to remove or insert the shims. It may be necessary to loosen off other bearings on the same torque shaft if it is difficult to access the shims.



Shims: 0.025” (white)
0.050”

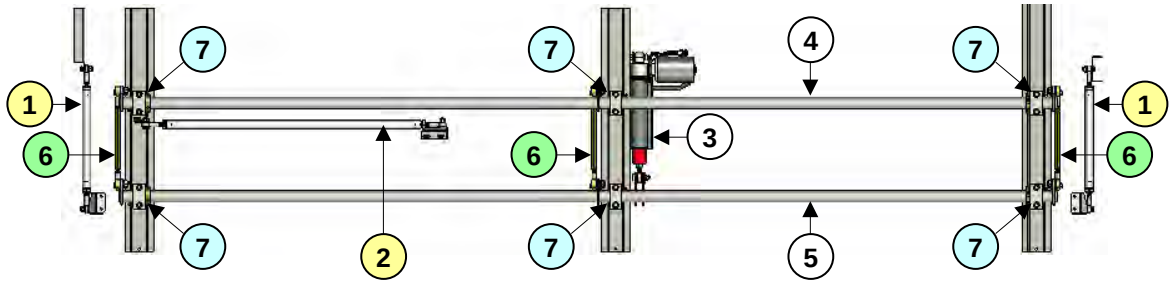


**** IMPORTANT ****
Always re-tighten the bearing bolts before re-checking the elevation.

FLAT FLOOR SWAY CONTROL ARM ADJUSTMENT

Introduction

The horizontal position of a flat floor is adjusted with three (3) sway control arms; two (2) lateral and one (1) longitudinal. This allows adjustment of the clearance from the edge of a flat floor in the raised position, to the floor of the coach.



Flat Floor Mechanism (Top View)

ITEM	DESCRIPTION
1	Lateral Sway Control Arm
2	Longitudinal Sway Control Arm
3	12V DC Actuator
4	Inner Torque Shaft
5	Outer Torque Shaft
6	Tie Rod
7	Torque Shaft Bearings

Tools and Consumables Required

- Qty-2 9/16” Wrench
- 1” or Adjustable Wrench
- Measuring Tape

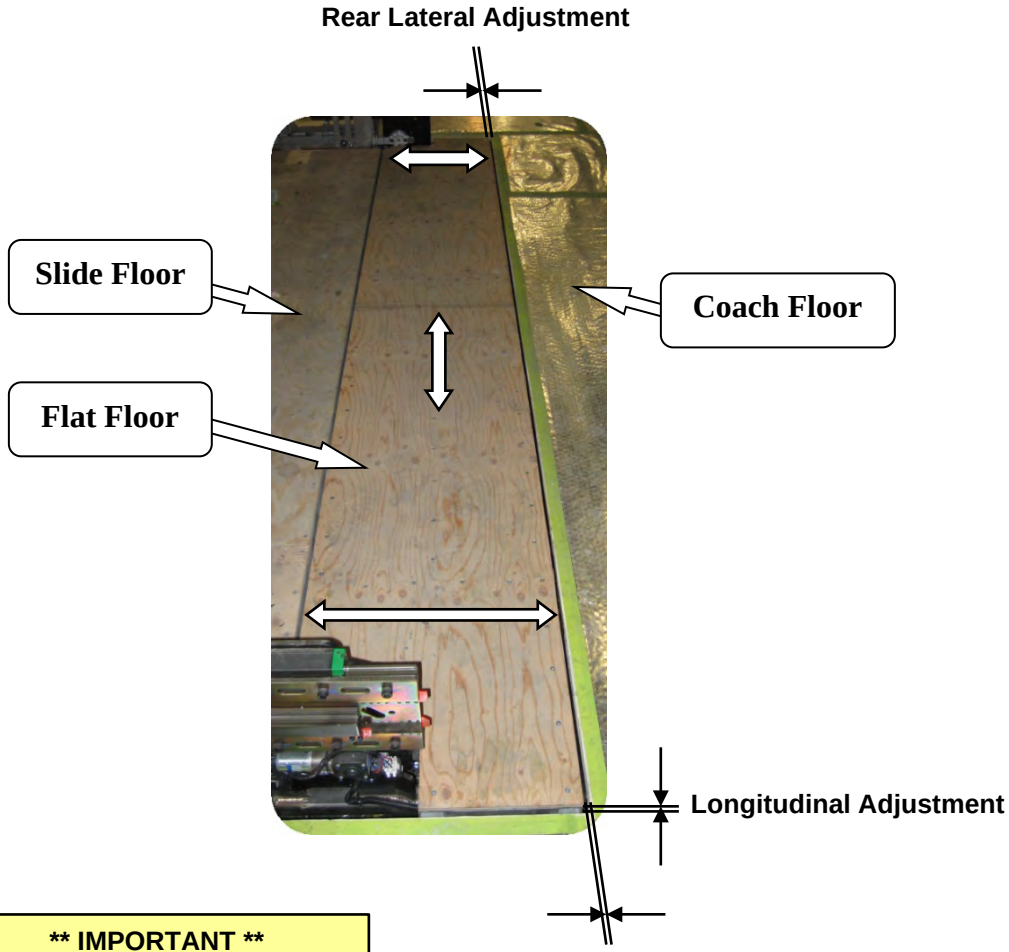
Checklist – Flat Floor Sway Control Arm Adjustment

1. ❑ Determine the Amount of Adjustment
2. ❑ Adjust Sway Control Arms

Step 1 – Determine the Amount of Adjustment

The slide must be fully extended with the flat floor fully raised to determine the amount of adjustment required.

If a longitudinal adjustment is required, then only adjust the single longitudinal sway control arm. If a front or rear lateral adjustment is required, it is likely that both lateral sway control arms should be adjusted to maintain a parallel edge clearance to the coach floor.



**** IMPORTANT ****
If you increase a gap on one edge it will reduce on the other. Make sure you have enough clearance on the other edge.

Step 2 – Adjust Sway Control Arms

Each sway control arm has two (2) lock nuts; one at each end.
Use 9/16” wrenches to loosen both lock nuts.

Rotate the sway control arm shaft clockwise or counter-clockwise as required to extend or retract its length.

TORQUE SHAFT BEARING REPLACEMENT

Introduction

Refer to instructions for adding and removing torque shaft bearing shims on page 162. Undo the bolts, pre-grease (refer to page 210) and replace the bearing, using the same shims.

AIR MANIFOLD ASSEMBLY

Introduction

The air manifold is connected to the coach air supply and controls the inflation, venting and vacuuming of the slide air seal. It also contains an absolute pressure transducer allowing the control system to monitor the seal status.
The following pages show how to assemble all parts for an air manifold. In addition, page 177 also shows some common errors and solutions

Tools and Consumables Required

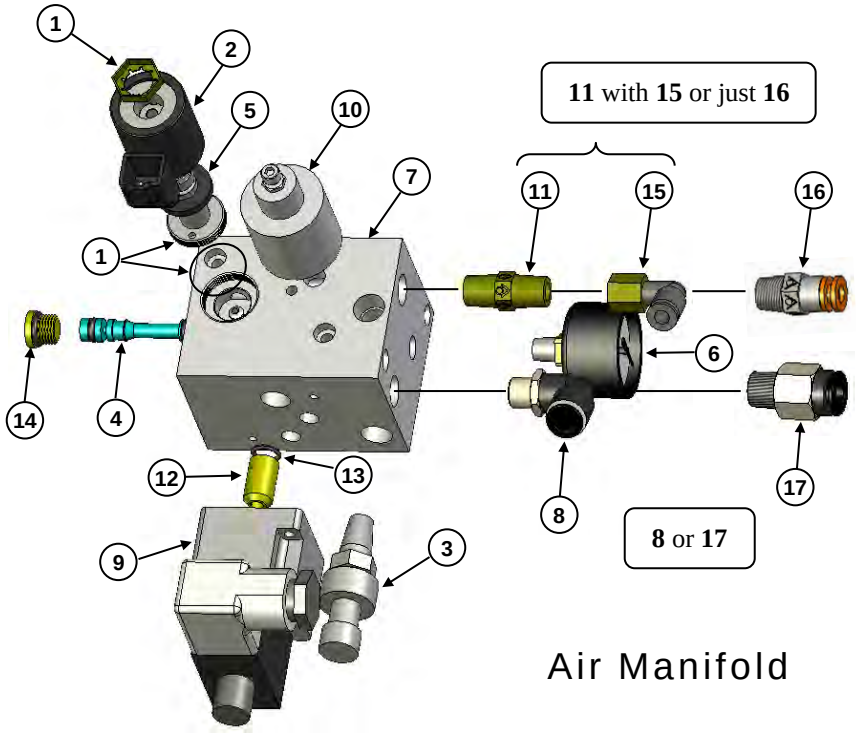
- 7/16” wrench
- 9/16 inch wrench
- 11/16-inch wrench
- 7/32-inch Allen key
- 4mm Allen key
- ¾ inch wrench
- #1 Phillips screwdriver
- ¼-inch nut driver
- Loctite 222 Thread Locker *<< When 0-rings are present*
- Loctite 545 Thread sealant *<< Firmly secures threads*
- Torque wrench (50 inch/lbs)
- Valve tool, part# VTL01T001
- Premium silicone grease

Checklist – Air Manifold Assembly

1. ❑ Identify required parts
2. ❑ Vacuum cartridge
3. ❑ Regulator
4. ❑ Vacuum ejector valve (VEV)
5. ❑ Cartridge check valve
6. ❑ Seal control valve (SCV)
7. ❑ Pressure transducer
8. ❑ Air fittings for supply and seal
9. ❑ Pressure gauge
10. ❑ Fully assembled air manifold

Step 1 – Identify Required Parts

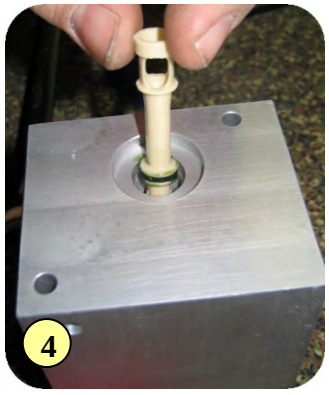
ITEM	DESCRIPTION
1	VALVE, KIT (Valve, 0-Ring and Nut)
2	COIL, HYDRAFORCE, 12VDC
3	PRESSURE TRANSDUCER, 0-150PSIA, 1/4NPT, 5/8 HEX, .5-4.5v OUTPUT, 5V INPUT
4	CARTRIDGE, VACUUM, HIGH PRESS
5	SPACER, HYDRAFORCE
6	GAUGE, PRESSURE, 30inHG - 0 - 30PSI, 1.5IN DIA, 1/8NPT CENTER BACK
7	SECONDARY MANIFOLD BLOCK, W/ VACUUM, ORB PORT, SLIDEOUTS
8	AIR FITTING ELBOW, MALE 1/4 NPT, 3/8 TUBE
9	VALVE, DIRECT OP POPPET SOL, 12VDC DIN, MAN MNT, NON-VACUUM RATED
10	REGULATOR, PNEUMATIC, 0-30PSI, MANIFOLD MOUNT
11	VALVE, AIR CHECK ¼ NPT SEMPRESS
12	VALVE, CARTRIDGE, CHECK
13	O RING, 012, 3/8 ID, 1/2in OD
14	PLUG, ORB, SOCKET HEAD, -05S
15	AIR FITTING, SMC FEMALE ELBOW
16	AIR VALVE, ¼ TUBE TO ¼ NPT CHECK VALVE
17	AIR FITTING, MALE 1/4 NPT, 3/8 TUBE

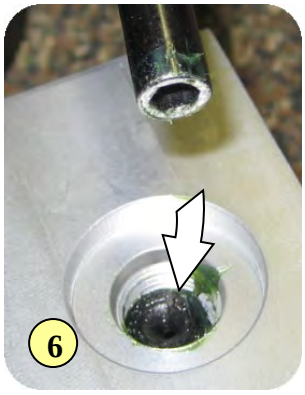


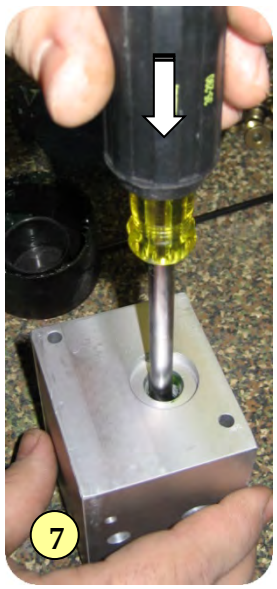
Air Manifold

Step 2 – Vacuum Cartridge

Apply premium silicone grease to both O-rings of the vacuum cartridge.
Tip: Disassemble the two parts of the cartridge to make it easier to grease.
Insert the cartridge into the manifold block. Using a ¼" nut driver, firmly push the cartridge in; you can feel when it suddenly "clicks" into place.
Apply Loctite 222 to the orb plug and firmly hand tighten in place with a 7/32-inch Allen key.

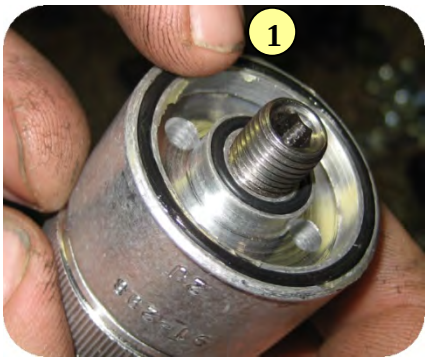


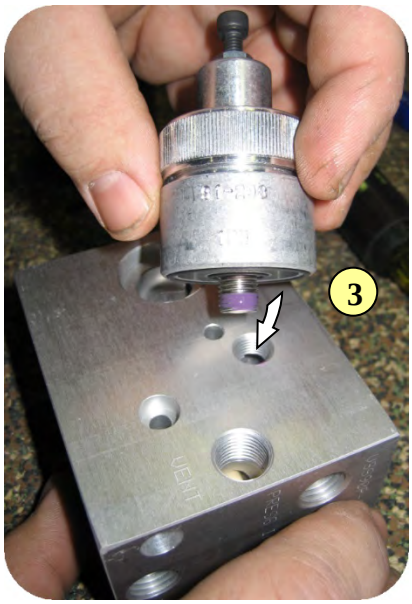




Step 3 – Regulator

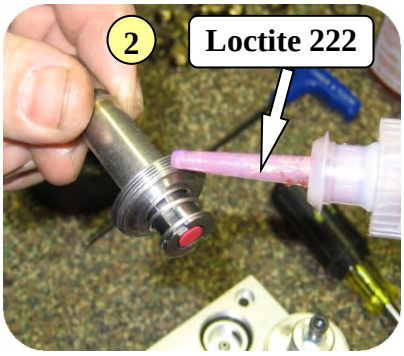
Apply premium silicone grease to the O-Ring. Apply Loctite 222 to the regulator, screw into the manifold block and firmly hand tighten.





Step 4 – Vacuum Ejector Valve (VEV)

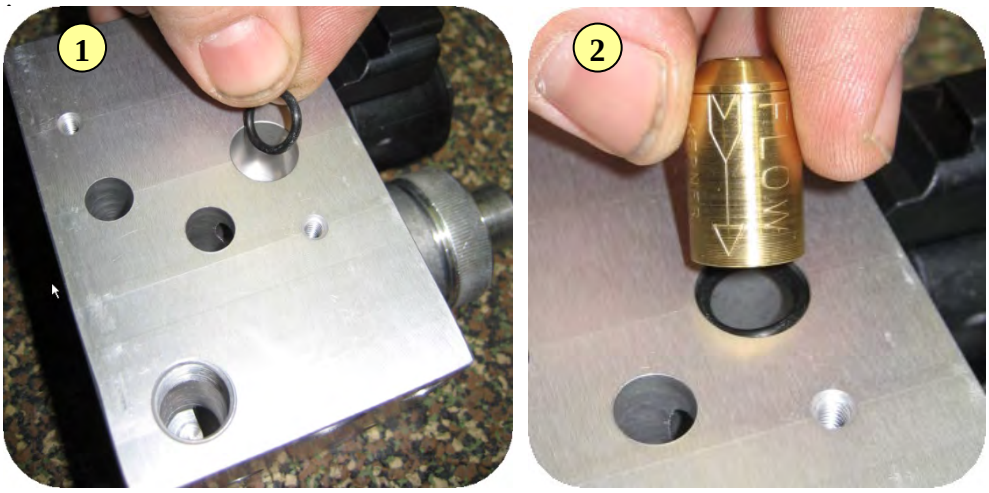
Fit the O-Ring into the manifold block. Apply Loctite 222 to the valve and screw into the manifold block. Using the valve tool (part# VTL01T001) torque the valve to 120 inch/lbs. Fit the Hydraforce spacer and Coil. Apply Loctite 545 to the threads and tighten the nut to 50 inch/lbs



Valve Tool
Part# VTL01T001

Step 5 – Cartridge Check valve

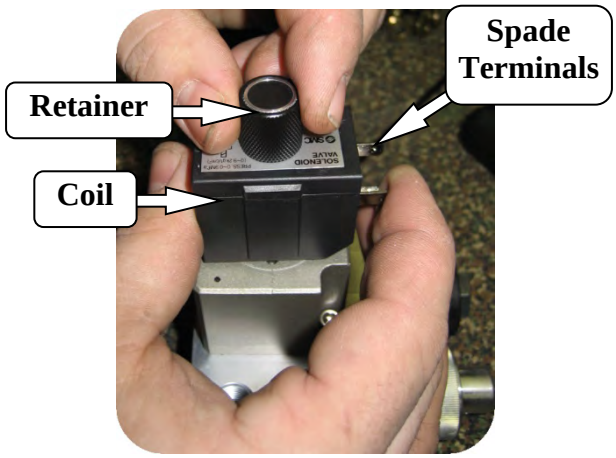
First insert the O-ring and then the cartridge check valve; observe orientation of the flow marking.



Step 6 – Seal Control Valve (SCV)

Fit the four O-rings onto the bottom of the Seal Control Valve and place it on the manifold block; observe the orientation – there is only one correct position. Firmly hand tighten the two bolts using a 4mm Allen Key.

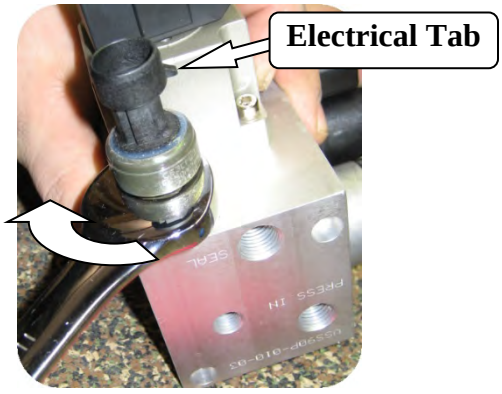
The coil should be oriented so that its spade terminals face the regulator; unscrew the retainer, lift and rotate the coil so that its alignment pin moves to the new position and then tighten the retainer.



The orientation of the coil can be changed by unscrewing the retainer, then LIFT and rotate the coil so that its alignment pin moves to a new position.

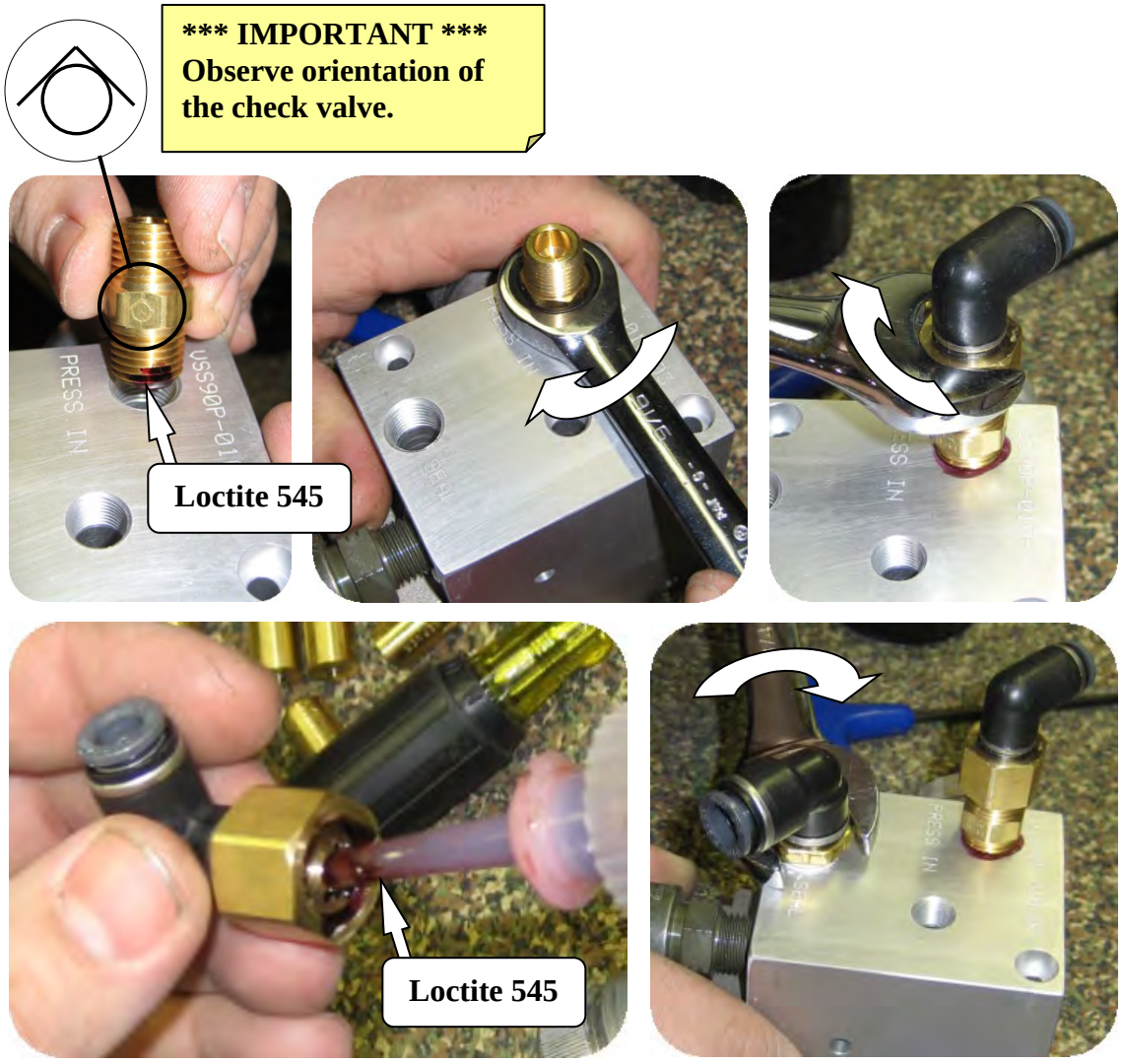
Step 7 – Pressure Transducer

Apply Loctite 545 to the threads and screw the pressure transducer into the manifold block and firmly hand tighten using an 11/16-inch wrench. Make sure that the electrical connection retaining tab faces in the direction shown below, otherwise will be difficult to disconnect the electrical connection when installed in the coach.



Step 8 – Air Fittings for Supply and Seal

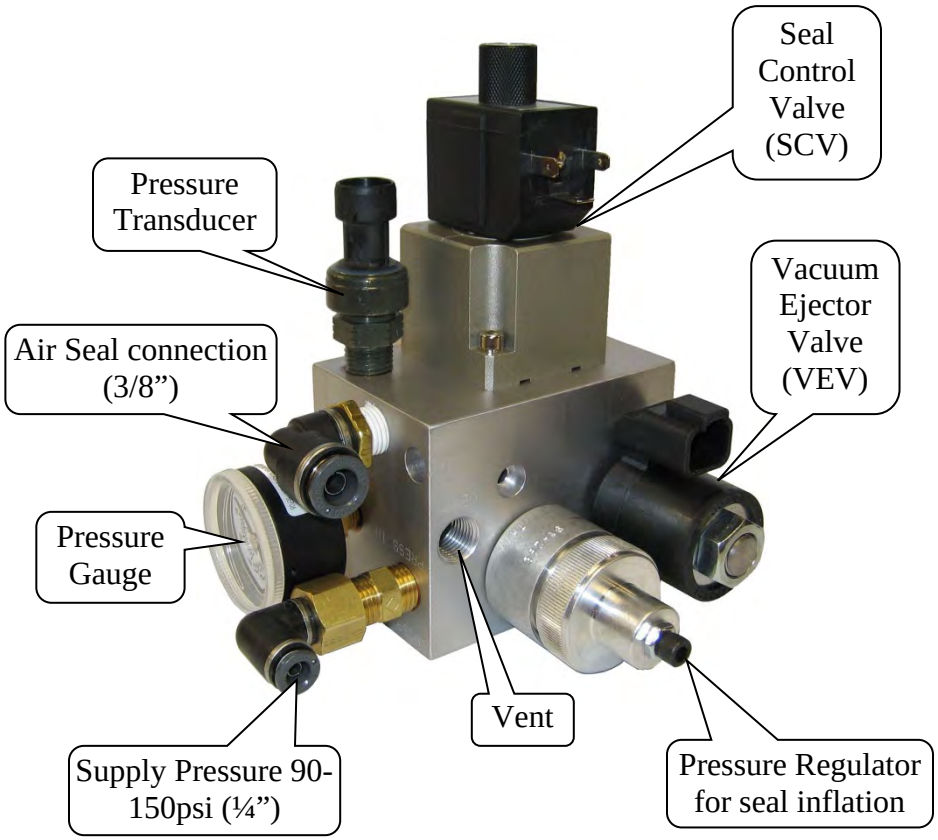
Depending on the version of air manifold, different air fittings are used for connection to the coach air supply and air seal. Refer to page 168 for parts identification.
The air supply will either be a single ¼-inch NPT, ¼-inch tube, fitting with an **integral** check valve or it may be a separate check valve along with a 90-degree fitting.
The air seal connection will either be a straight or 90-degree male ¼-inch NPT, 3/8" tube Unless they come prepared with Teflon, apply Loctite 545 to the threads. Use a wrench and firmly hand tighten.



Step 9 – Pressure Gauge

Apply Loctite 545 to the threads and screw into manifold. Firmly hand tighten with a 7/16-inch wrench.

Step 10 – Fully Assembled Air Manifold



Common Air Manifold Assembly Errors and Solutions

For instructions on how to adjust the air manifold regulator to set the seal pressure, refer to page 75.

	Description	Problem	Solution
1	Regulator can't be set to correct pressure, either overshoots or undershoots target	Adjusting regulator in too large of increments &/or not cycling system air	When setting the regulator, turn the screw very slowly as a small rotation equals a large change in pressure. Also make sure that the seal control valve is cycled frequently when the pressure is being adjusted. This ensures that the regulator is set to the actual pressure and will not change when the seal control valve is cycled.
2	Air seal doesn't pressurize when pressure is connected to pressure port (both valves de-energized.	Regulator turned down all the way	Slowly turn regulator up.
		Seal control valve reversed	Disconnect air supply and rotate seal control valve 180 degrees.
3	Sufficient vacuum level can't be obtained	Vacuum cartridge O-rings damaged during installation (Required to grease O-rings)	Disconnect air supply, connect air supply to vent port and carefully (use a soft pad to catch cartridge) blow vacuum cartridge out of port. Inspect and replace O-rings if necessary.
4	Vacuum level is not maintained when vacuum ejector valve is de-energized	Vacuum portion of manifold is not sealing	Remove seal control valve and ensure that the check valve and O-rings for the check valve are installed properly. If they were installed properly check vacuum cartridge for improper assembly or damage.

TROUBLESHOOTING

Here we have provided a number of common troubles and their solutions. If you do not see your particular concern addressed here, please contact Valid Manufacturing Ltd. (See page 222 for contact information.)

Common air manifold errors are listed on page 177.

The touch screen and controller cable connections are shown on page 180.

For DC voltage checks, refer to page 193. For resistance checks refer to page 195.

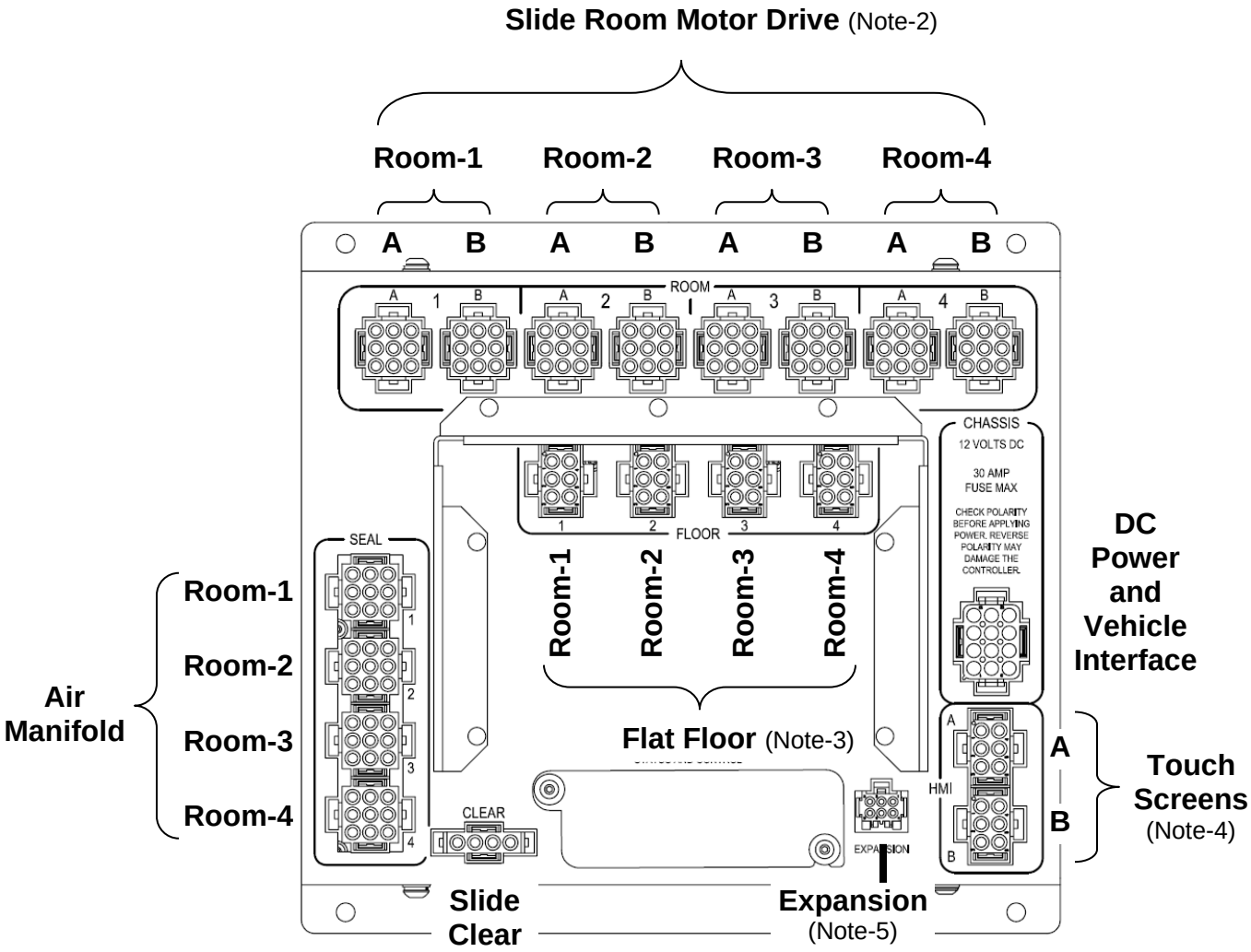
Frequently Asked Questions (FAQ)

	QUESTION	ANSWER
2	What is the password for service mode?	6477
3	How do you logout of service mode?	Turn off the ignition or select “OFF” from the <Main Menu>.
4	How do I configure the front touch screen to only show the front slide(s) and the rear touch screen to only show the rear slide(s)?	Each touch screen can be independently configured to show certain slides. Refer to Slide Setup on page 32.
5	Why does the service menu display a slide that is not installed in the coach?	The service menu always shows four slides, regardless of whether they exist in that coach.
6	Why is the seal not being vacuumed?	Possible reasons: • Engine not running – coach air less than 90psi • Rupture in the air seal
7	What does slide “not clear” mean?	Refer to page 38.
8	What faults will the system report?	Refer to page 35.
9	Can I override the sensors and just get the room to slide in?	Use Timed Retract. See page 61.
10	What does PSIA mean in the Touch Screen diagnostics display?	**P**ounds per **S**quare **I**nch **A**bsolute The electronic pressure transducer on the air manifold reads PSIA. Refer to Addendum 1 on page 223.
11	How do I read the dial pressure gauge on the air manifold?	Above zero (0), the dial gauge measures PSI pressure relative to the current air pressure. Below zero (0), the dial gauge measures inches of mercury. Refer to Addendum 1 on page 223.
12	I want to park the coach, what do I need to consider about the slides?	Refer to page 211.

	QUESTION	ANSWER
13	Where are the firmware or serial numbers of the controller and touch screen?	The firmware and serial numbers are displayed in the info screen. Refer to page 12. The serial number of the ECU is on the circuit board as viewed through the clear plastic switch cover. The serial number for the touch screen is the number printed on the circuit board just under the rear metal cover.

ELECTRICAL CABLE CONNECTORS

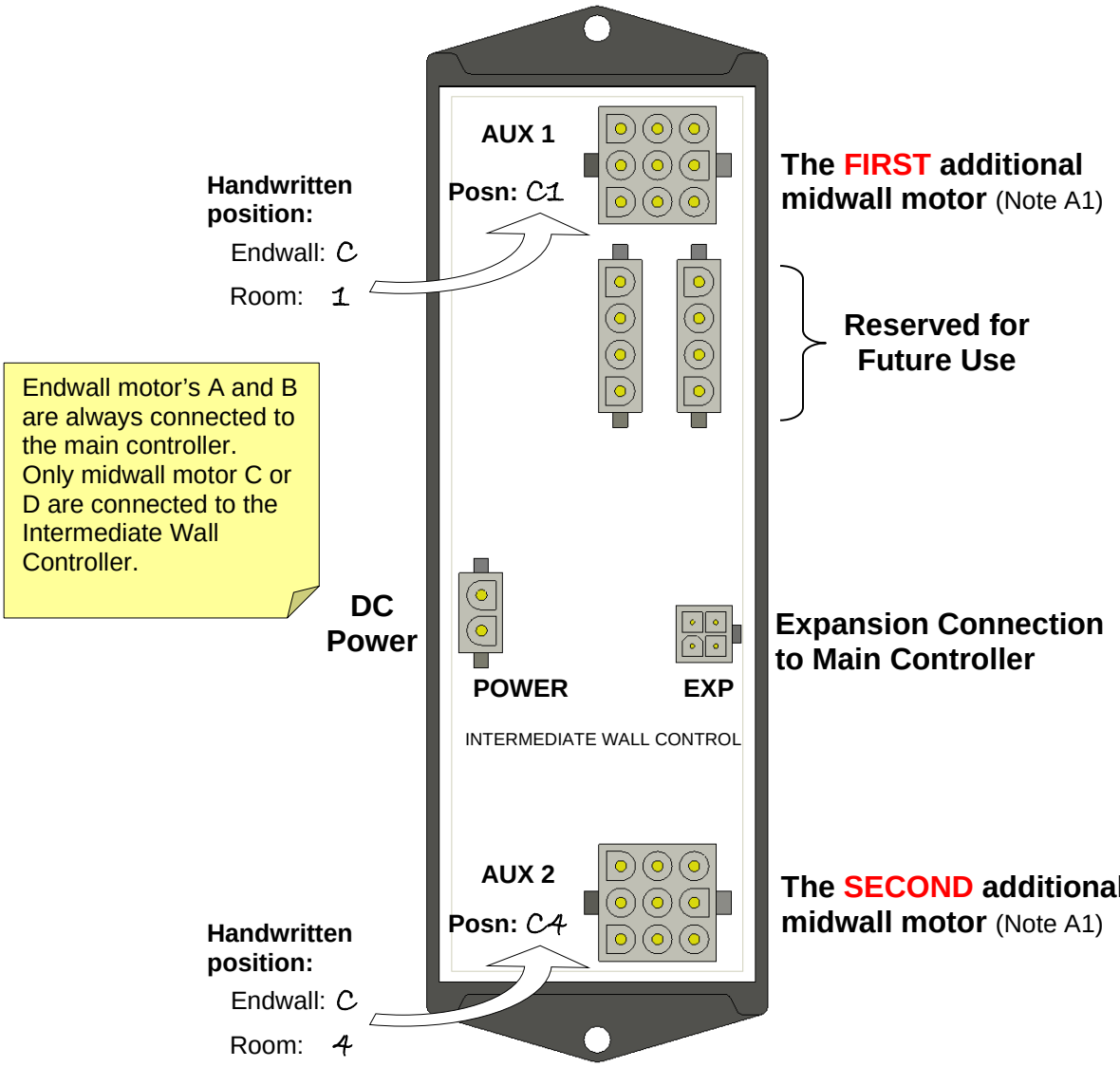
Main Controller Connections



Notes:

1. Slide Setup should be configured for each coach to inform the controller which slides are installed.
2. Refer to page-182 for the endwall harness assignments.
3. The Flat Floor configurations **Floor Equipped Flag** and **Floor Reversed Direction** must be configured for each coach; refer to pages 18 and 19.
4. Both **A** and **B** touch screen connectors must be connected to either a touch screen harness or a terminator plug.
5. The Expansion Port allows connection to Intermediate Wall Controllers for slide rooms with **more** than 2 motor-driven endwalls.

Intermediate Wall Controller Connections



Notes:

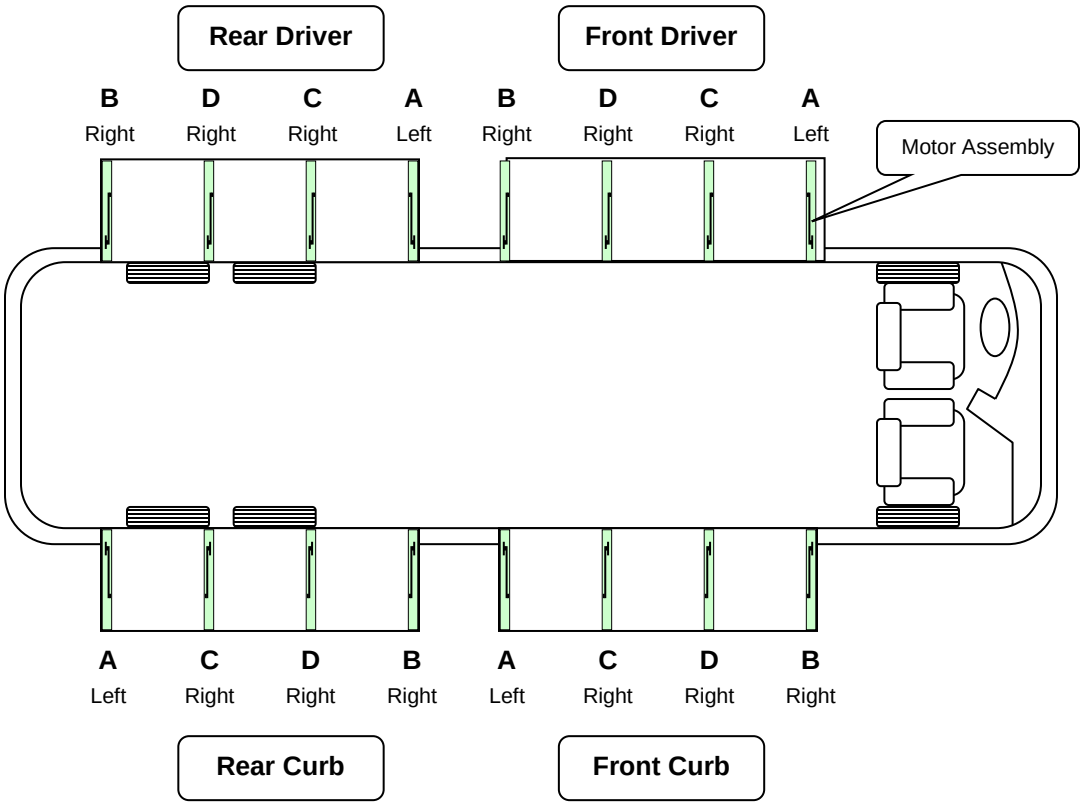
A1. The **AUX 1** and **AUX 2** endwall motor connections are automatically allocated based upon the slide configuration 'Number of Endwalls'. Refer to page 27. The allocation is made in the following order:

1. Front Driver
2. Rear Driver
3. Rear Curb
4. Front Curb

For example, if the front driver and front curb both had 3 endwalls while the remainder had 2 endwalls, **AUX 1** would be allocated to the 'C' midwall for the front driver and **AUX 2** to the 'C' midwall for front curb.

Endwall Harness Assignments

A slide room may have 2, 3 or 4 motor-driven endwalls. The alphabetical wiring harness assignments are shown below. The ‘left’ and ‘right’ refer to the motor assemblies (refer to page 219).

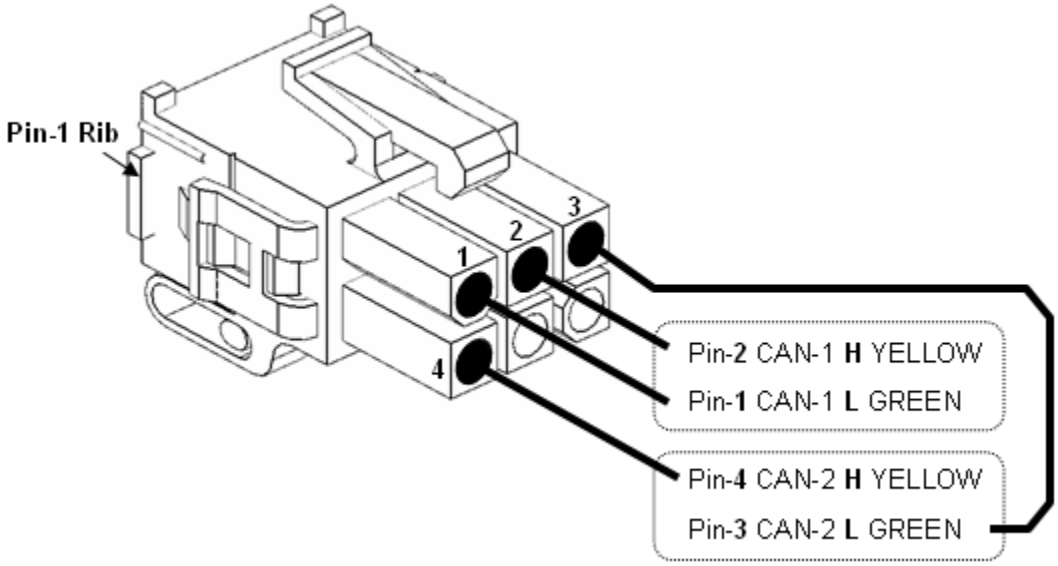


Endwall motors A and B are connected to the main controller. Midwall motors C and D are connected to the Intermediate Wall Controller.

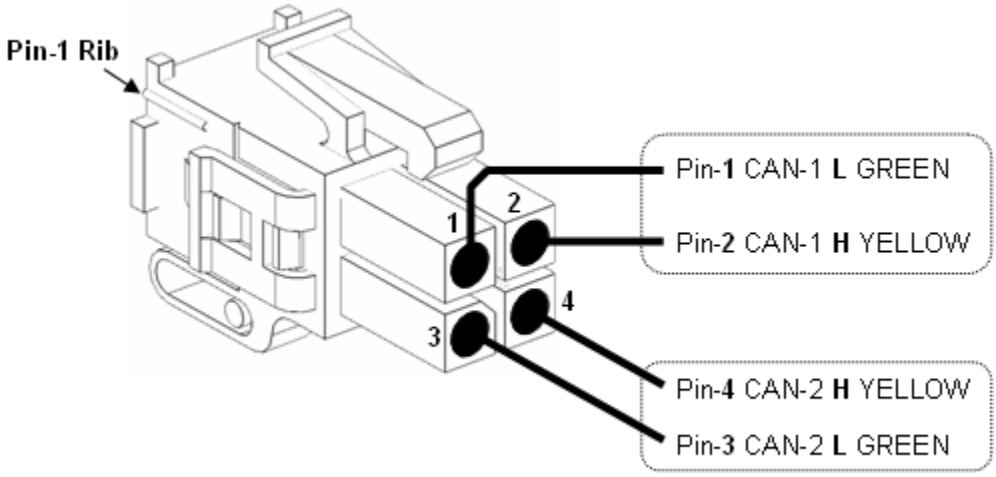
Intermediate Wall Controller to Main Controller CANbus

This short 8-inch harness connects the Intermediate Wall controller (Expansion Module) to the Main Controller.

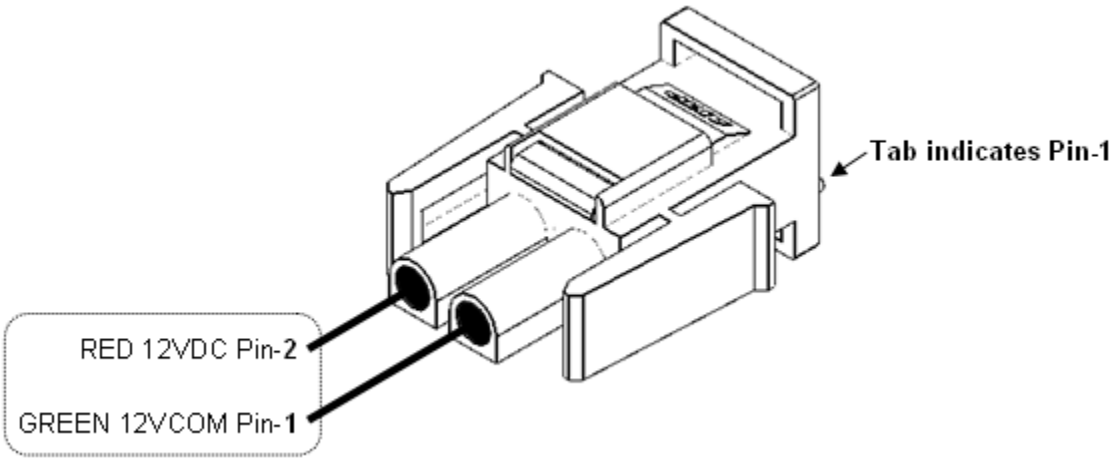
This Connector plugs into the Main Controller:



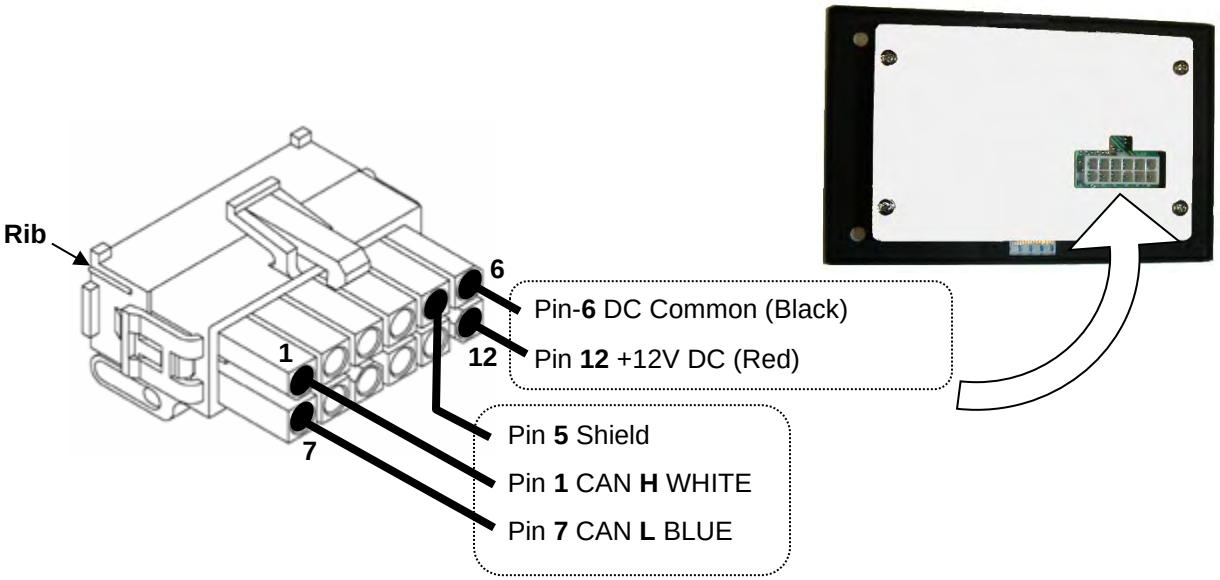
This connector plugs into the Intermediate Wall Controller (Expansion Module):



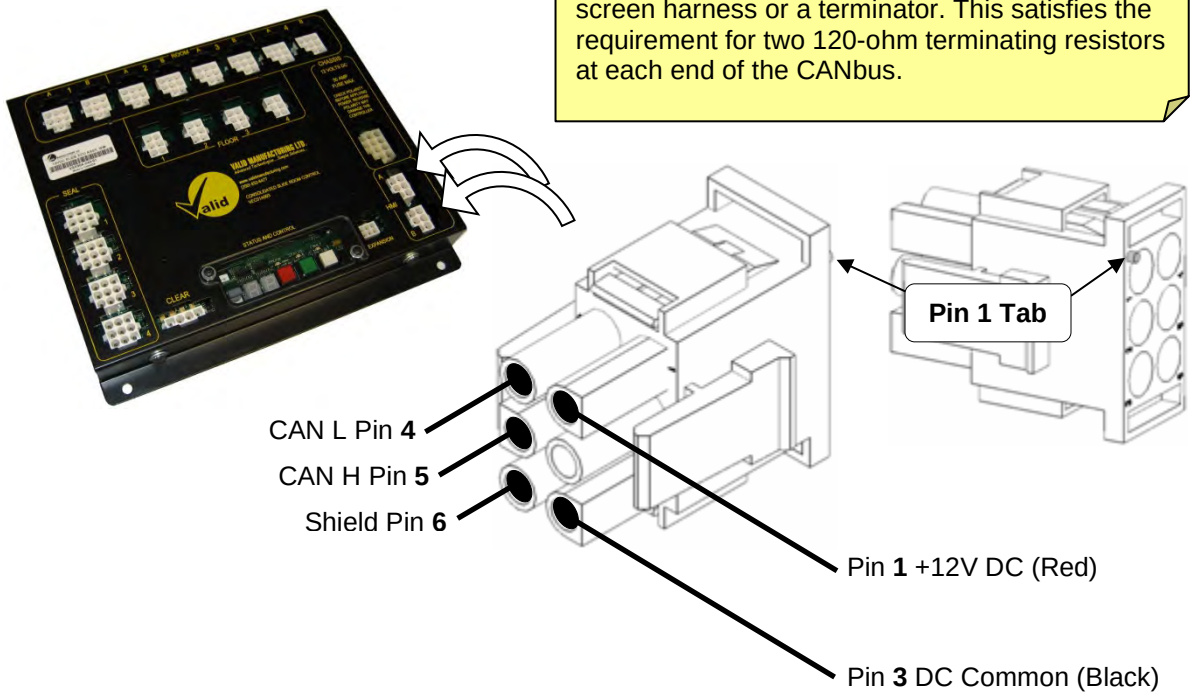
Intermediate Wall Controller DC Power Connector



Touch Screen Cable Connector

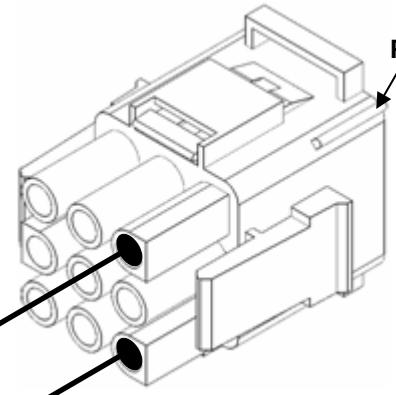


Tech Tip: Both touch screen connections on the controller must be connected to either a touch screen harness or a terminator. This satisfies the requirement for two 120-ohm terminating resistors at each end of the CANbus.



End Wall Cable Connector

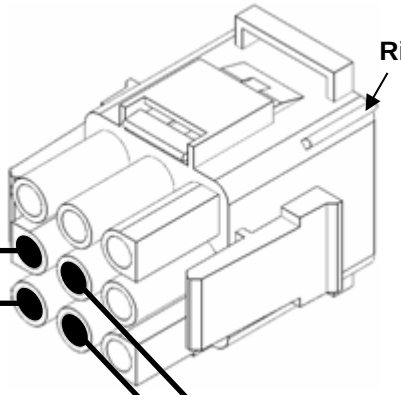
MOTOR



Motor A (Orange). Pin **1**

Motor B (Black). Pin **3**

ENCODER



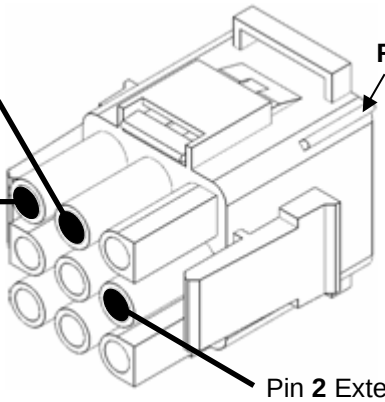
DC Common (Black). Pin **8**

+5 VDC Encoder (Red). Pin **9**

Pin **5** Encoder B (Brown)

Pin **6** Encoder A (Gray)

LIMIT SWITCHES

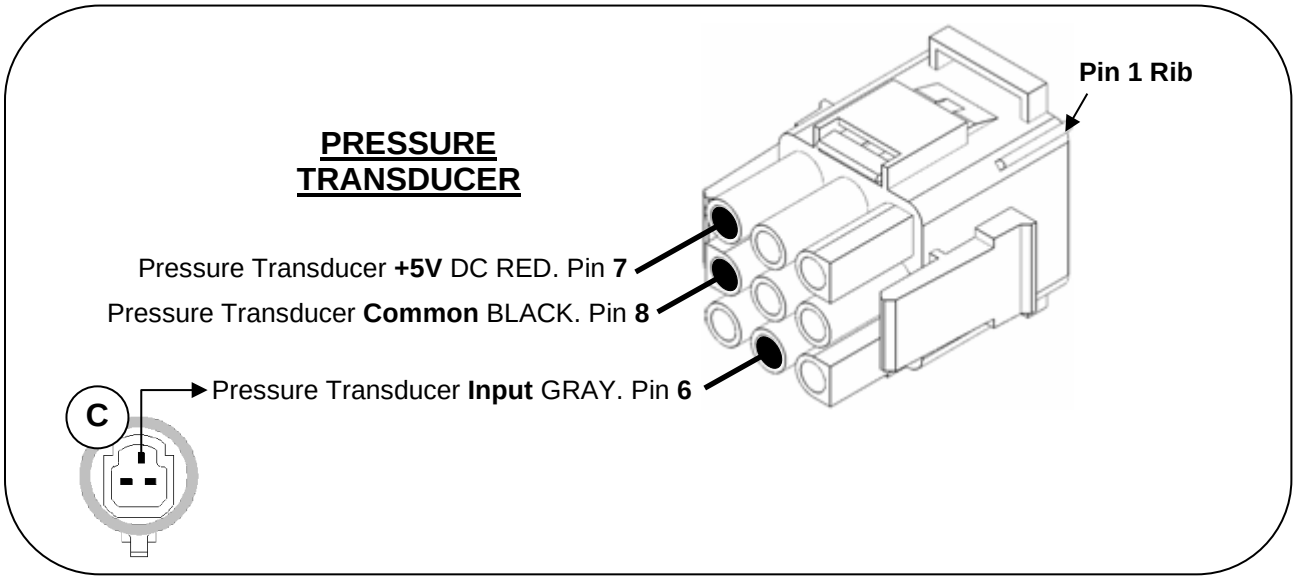


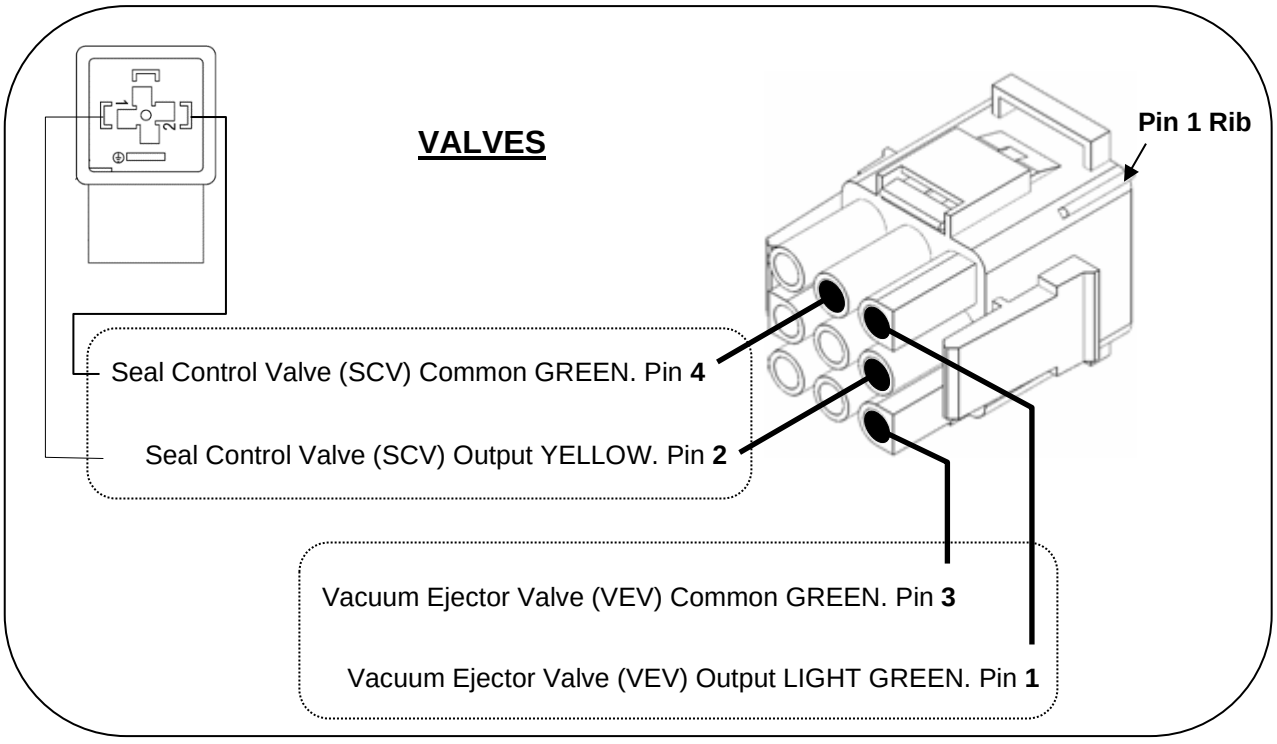
Retracted Input (Blue). Pin **4**

+5 VDC Switches (Pink). Pin **7**

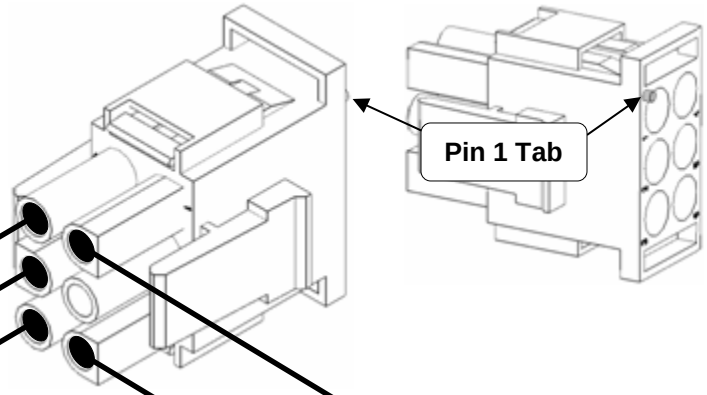
Pin **2** Extended Input (Yellow)

Air Manifold Cable Connector





Flat Floor Motor and Position Feedback



Floor Position **Input** WHITE. Pin **4**

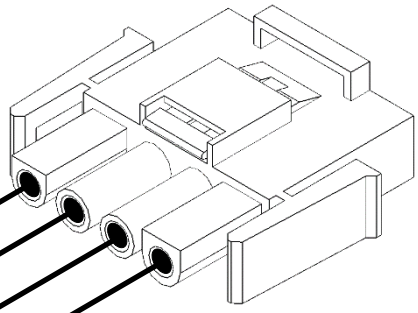
Floor Position **Common** BLACK. Pin **5**

Floor Position **+5V** DC RED. Pin **6**

Pin **1** Motor B (Black)

Pin **3** Motor A (Orange)

Slide Clear Inputs

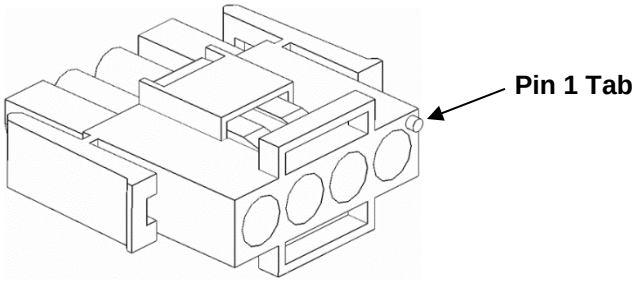


Slide Clear Input Room-1 (Tan) Pin **1**

Slide Clear Input Room-2 (Tan) Pin **2**

Slide Clear Input Room-3 (Tan) Pin **3**

Slide Clear Input Room-4 (Tan) Pin **4**

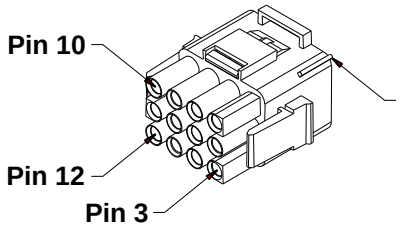


Coach Interface

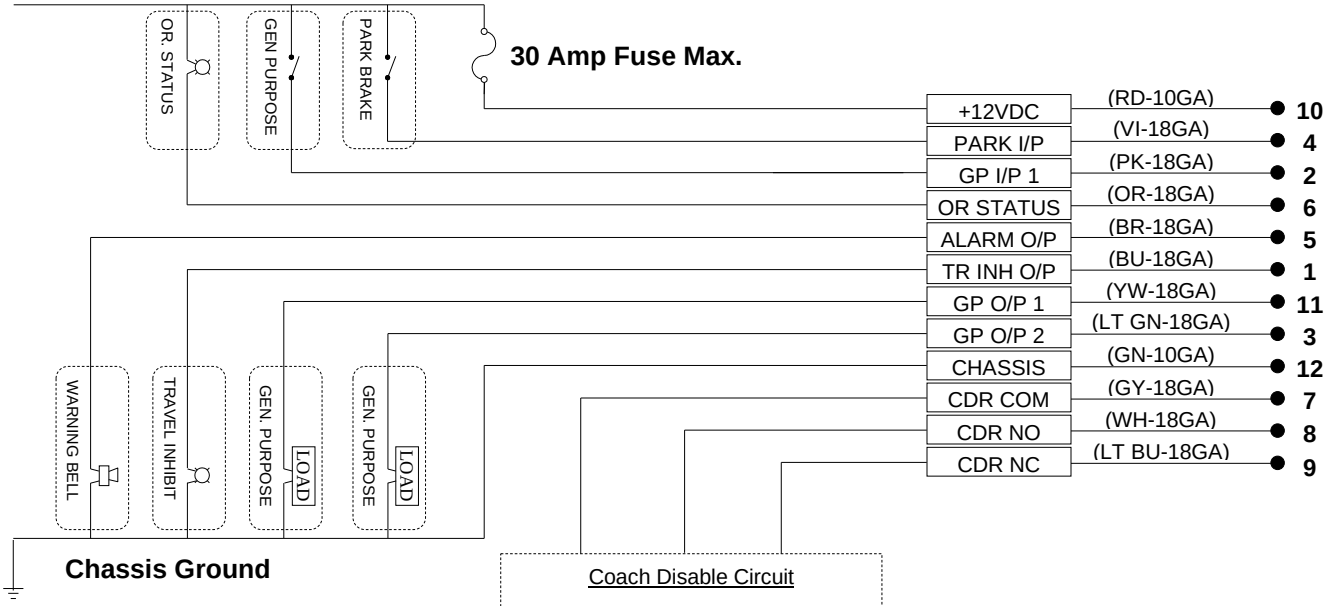
A 12-pin connector plugs into the controller to provide DC power and the coach interface.

Pin#	Description	Details
1	Travel Inhibit Output	Sourcing output. Active High only +12V DC , 1-Amp Maximum Active High when any slide is not secure Normally used to prevent coach from going into gear.
2	GP Input 1	Reserved for future
3	GP Output 2	Reserved for future
4	Park brake input	Sourcing input required. +12V DC indicates that the park brake is set so that slides can be moved.
5	Alarm Output	Sourcing Output. Active High only +12V DC , 1-Amp Maximum Energizes output whenever a room or flat floor is moving.
6	Override Status Output	Sinking Output. 1-Amp maximum. Intended to operate a lamp to indicate that Travel Inhibit has been manually overridden.
7	Coach Disable Relay (CDR) Common	This relay is mounted on the controller board and is energized when vehicle travel is disabled.
8	Coach Disable Relay (CDR) Normally Open (NO) Contact	
9	Coach Disable Relay (CDR) Common Normally Closed (NC) Contact	
10	+12 VDC	DC power to the slide control system. Typically provided from a 25 Amp fuse
11	GP Output 2	Reserved for future
12	Chassis	DC Common. Must be bonded to coach chassis.

COACH INTERFACE



+12 VDC Switched Ignition



Coach Disable Circuit

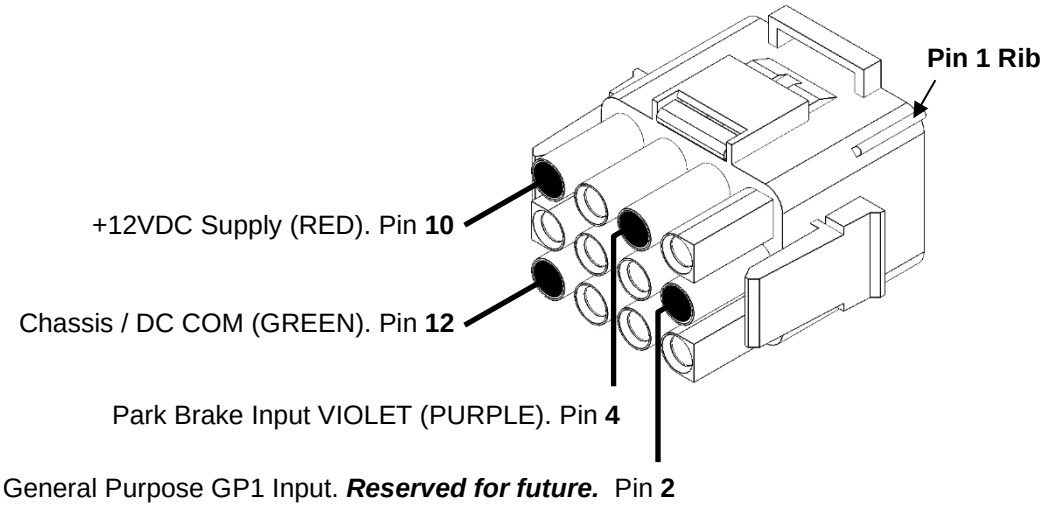
Coach disable is dependant on the type of transmission present.

Relay CDR is energized when travel is to be inhibited

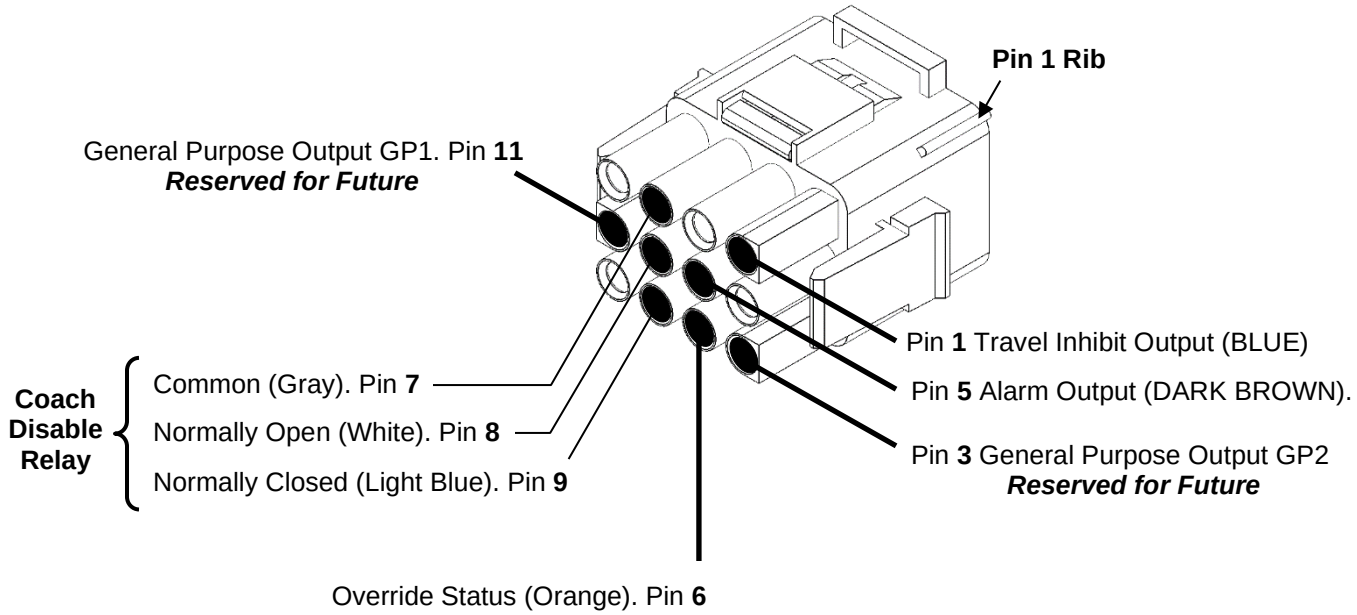
NOTES

- All 12 VDC Ouputs rated 1 Amp Max.
- All 12 VDC Inputs draw 2.5 mAmp Max.

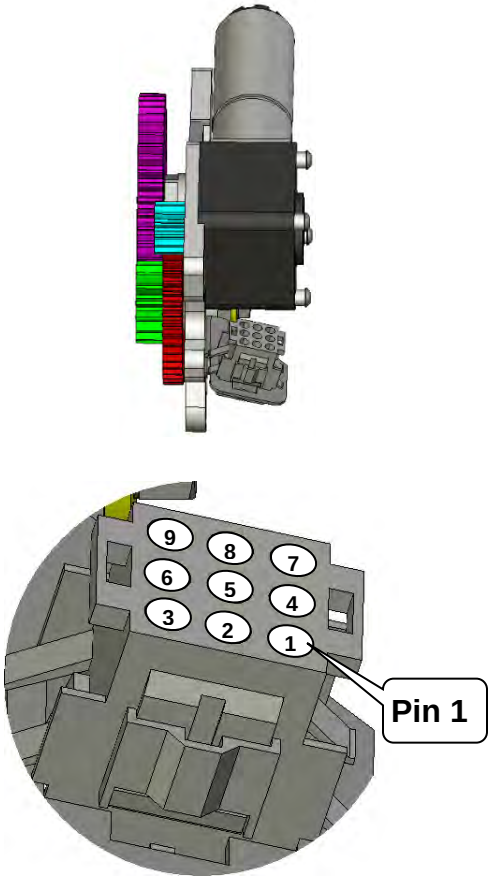
Coach interface – Inputs to Controller

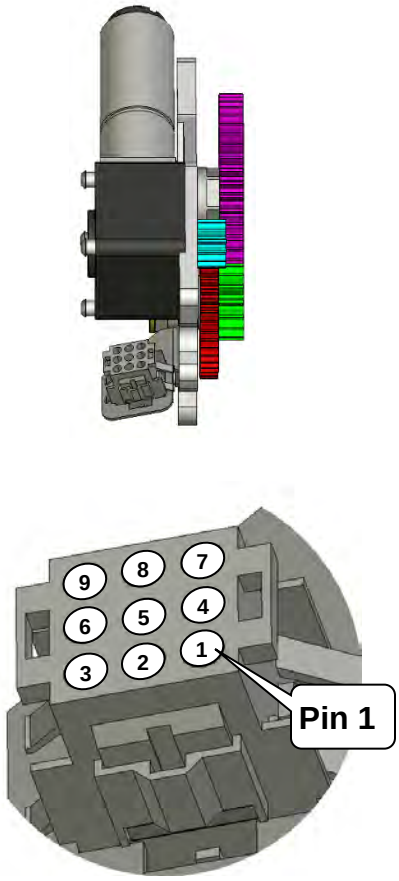


Coach interface – Outputs from Controller



Slide Gear Motor Assembly



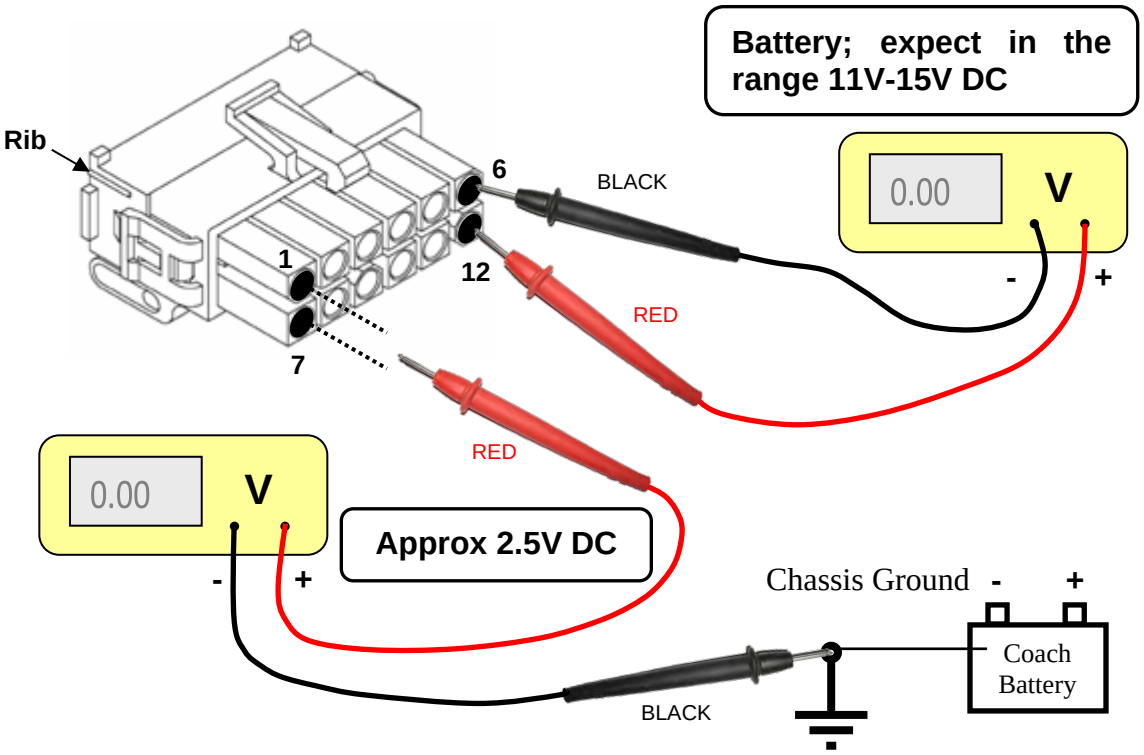


LEFT MOTOR ASSEMBLY			**RIGHT MOTOR ASSEMBLY**	
Wire	**Description**	**Pin**	**Description**	**Wire**
BK-18GA	Motor **B**	**1**	Motor **A**	RD-18GA
BK/RD-18GA	Extended Input	**2**	Extended Input	BK/RD-18GA
RD-18GA	Motor **A**	**3**	Motor **B**	BK-18GA
BK/RD-18GA	Retracted Input	**4**	Retracted Input	BK/RD-18GA
BU/WH-22GA	Encoder **A**	**5**	Encoder **B**	BU-22GA
BU-22GA	Encoder **B**	**6**	Encoder **A**	BU/WH-22GA
BU-18GA	Switch +5VDC	**7**	Switch +5VDC	BU-18GA
BK-22GA	Ground (DC Common)	**8**	Ground (DC Common)	BK-22GA
RD-22GA	Encoder +5V	**9**	Encoder +5V	RD-22GA

DC VOLTAGE CHECKS

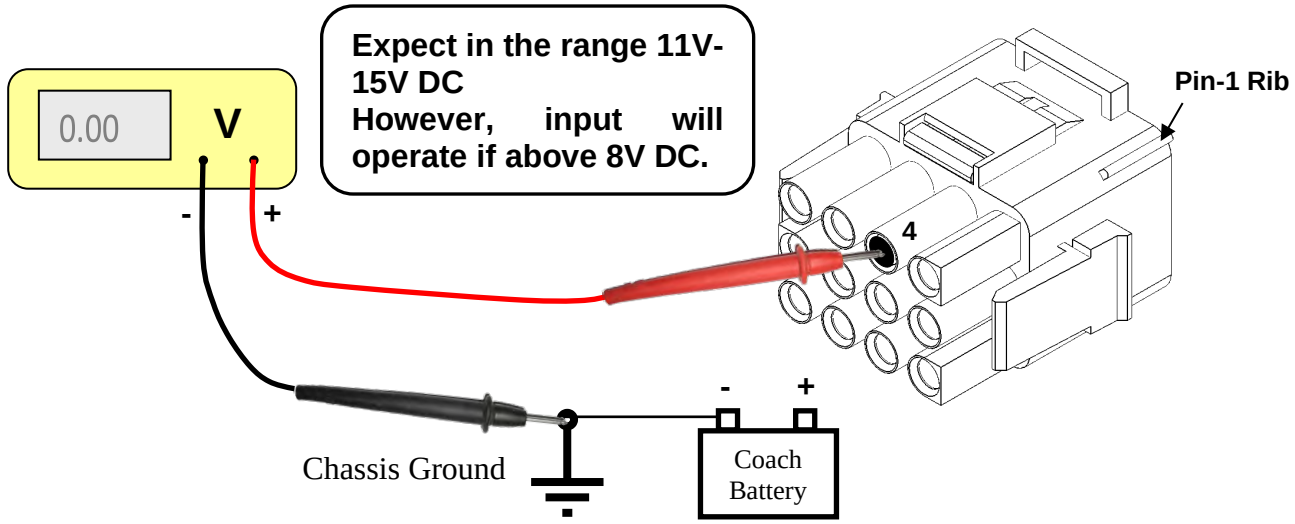
TV01 – Touch Screen Cable Connector

IGNITION MUST BE ON AND ALL OTHER DEVICES CONNECTED



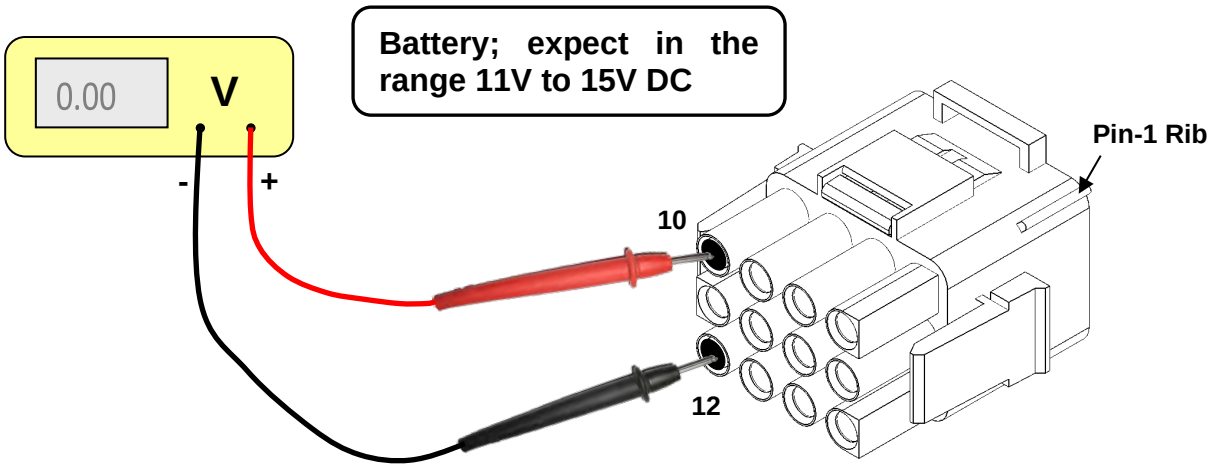
TV02 – Controller 12-pin Vehicle Interface Connector: Park Brake Input

IGNITION MUST BE ON WITH ALL OTHER DEVICES CONNECTED AND PARK BRAKE SET



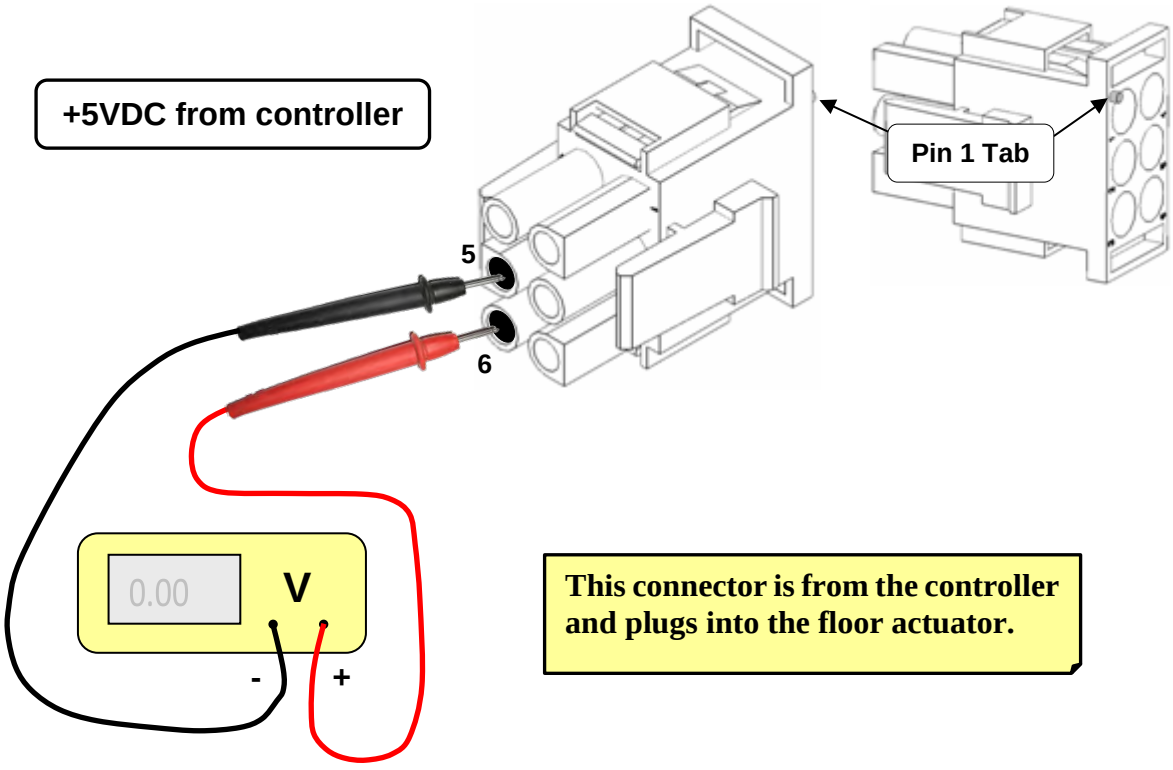
TV03 – Controller 12-Pin Vehicle Interface Connector: DC Power from Coach

IGNITION MUST BE ON



TV04 – Floor Actuator 6-pin Cable Connector: DC Power from controller

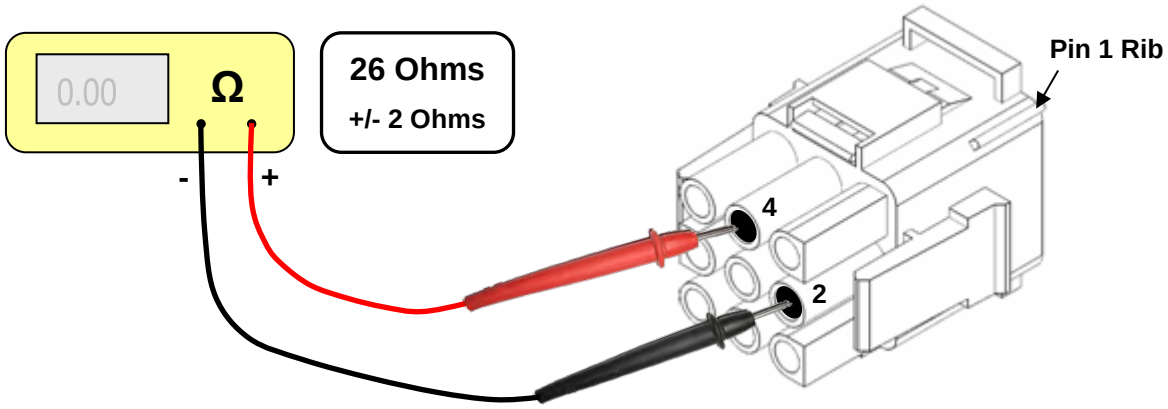
IGNITION MUST BE ON WITH ALL OTHER DEVICES CONNECTED



RESISTANCE CHECKS

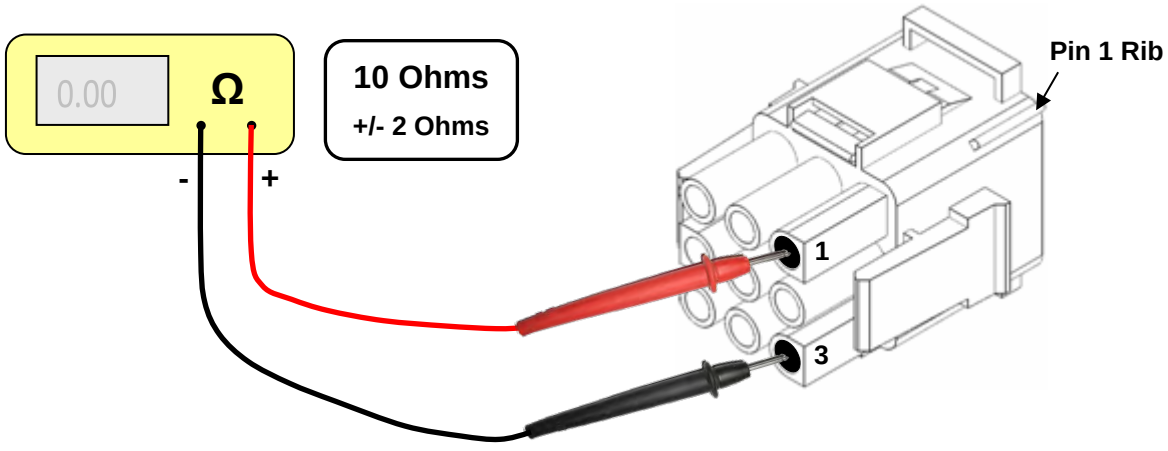
TR01 – Air Manifold 9-pin cable connector: Seal Control Valve

IGNITION MUST BE OFF AND ALL OTHER DEVICES CONNECTED



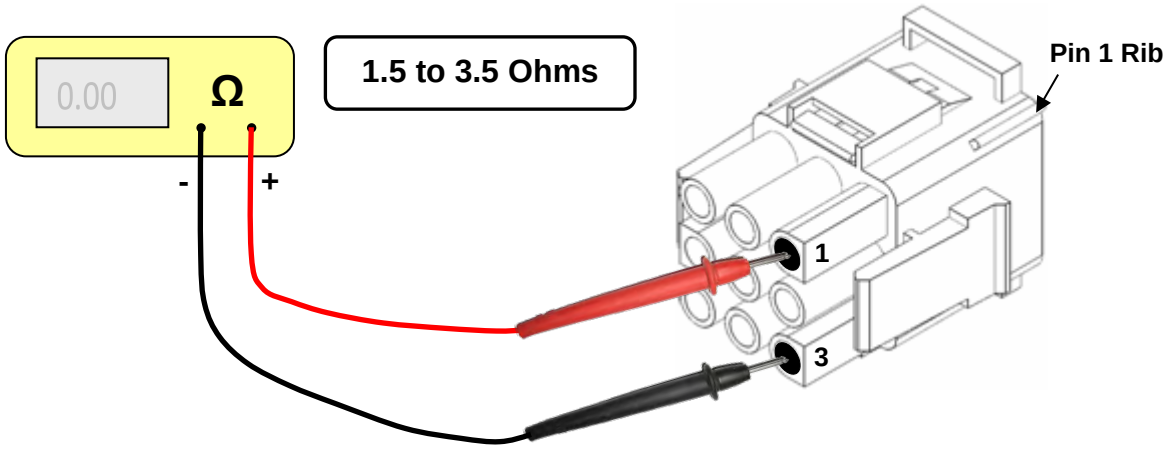
TR02 – Air Manifold 9-pin cable connector: Vacuum Ejector Valve

IGNITION MUST BE OFF AND ALL OTHER DEVICES CONNECTED



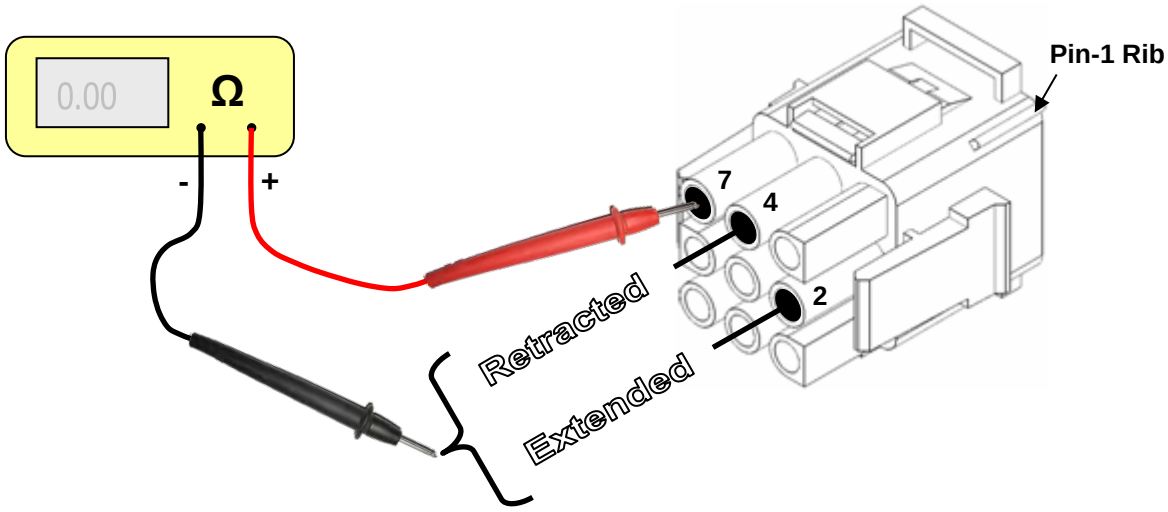
TR03 – Endwall Motor 9-pin cable connector: Motor Windings

IGNITION MUST BE OFF AND ALL OTHER DEVICES CONNECTED



TR04 – Endwall Motor 9-pin cable connector: Limit Switches

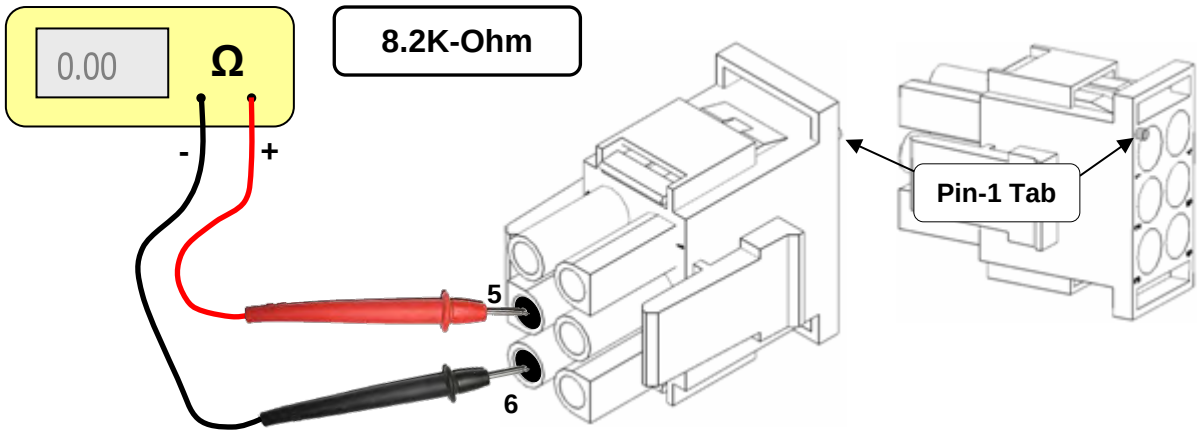
IGNITION MUST BE OFF AND ALL OTHER DEVICES CONNECTED

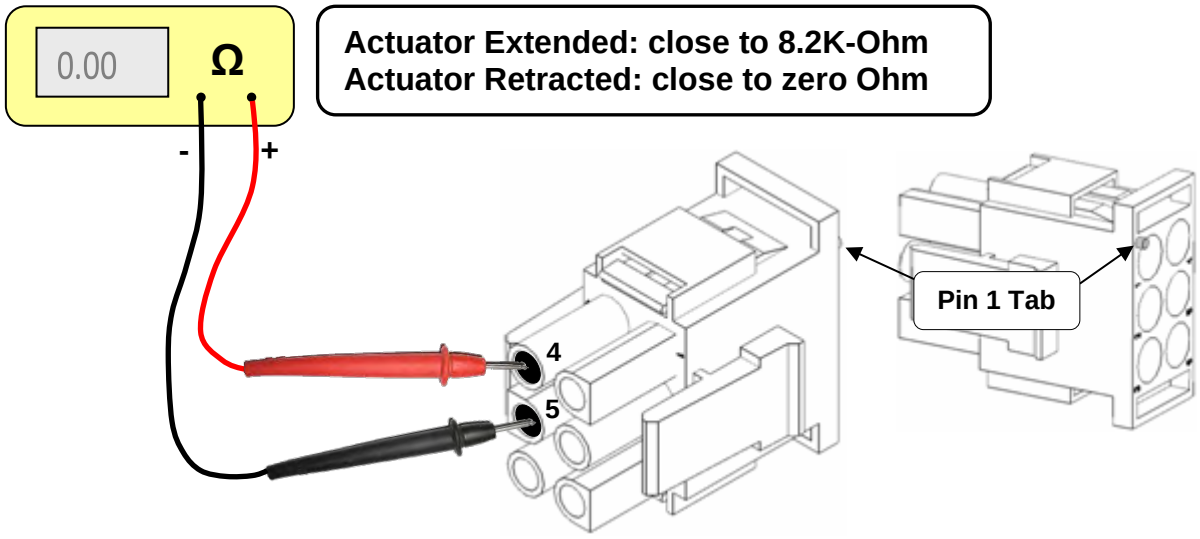


Continuity (Zero Ohms) when limit switch is activated to indicate the slide is fully retracted or extended

TR05 – Controller 6-pin Cable Connector: Flat Floor Actuator Position

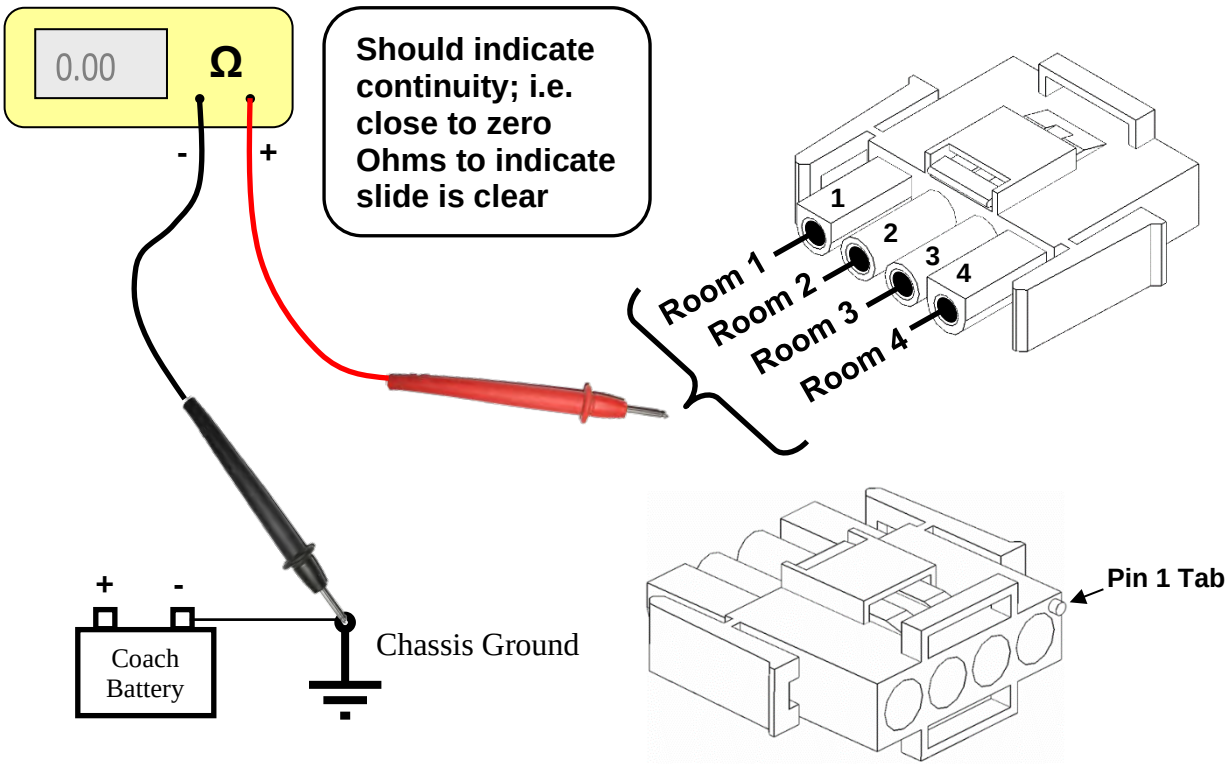
IGNITION MUST BE OFF AND ALL OTHER DEVICES CONNECTED





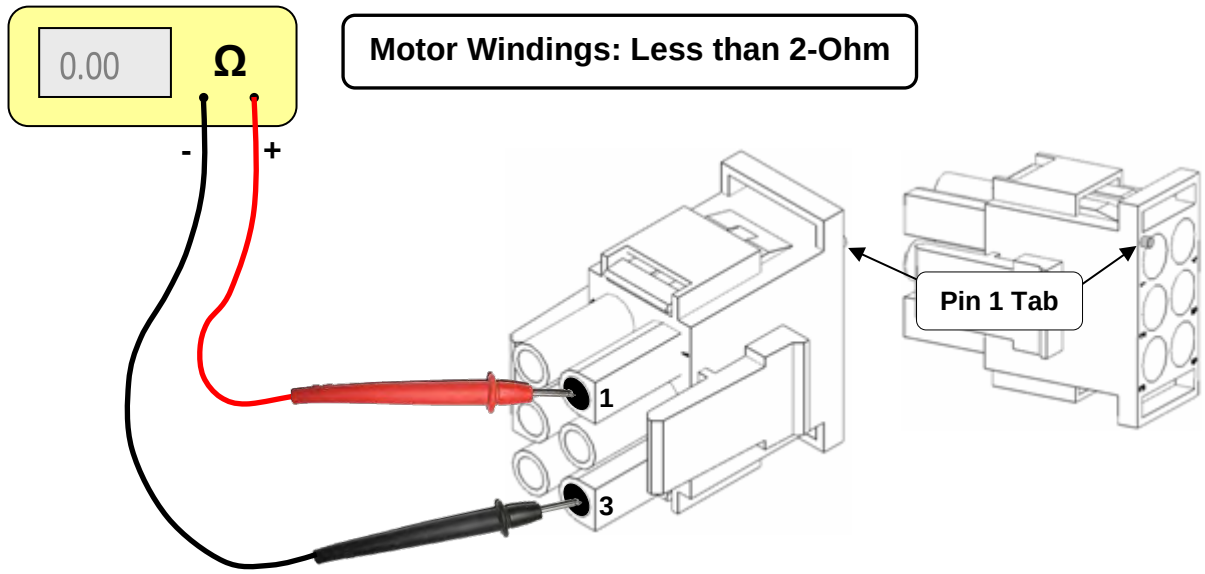
TR06 – Controller 4-pin Cable Connector: Slide Clear

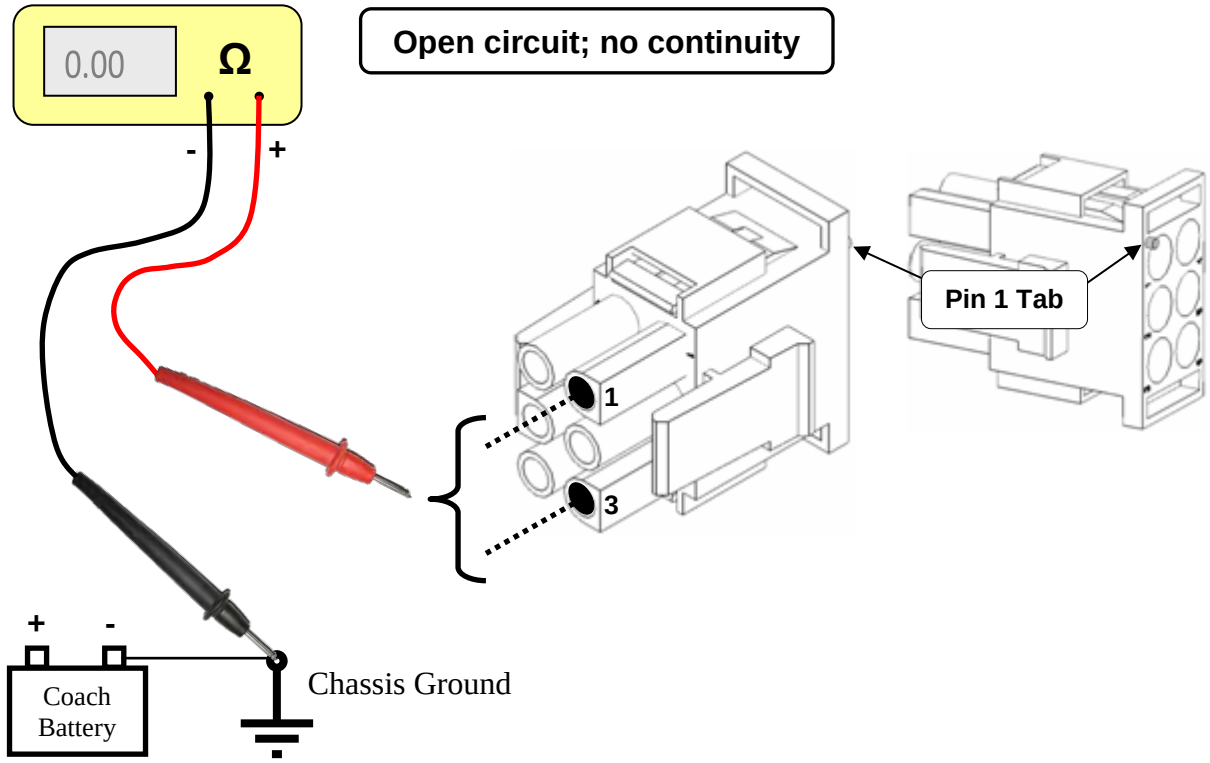
IGNITION MUST BE <u>OFF</u> WITH ALL OTHER DEVICES CONNECTED AND THE SLIDE CLEAR INTERLOCKS ENABLED



TR07 – Controller 6-Pin Flat Floor Cable Connector : Motor Windings

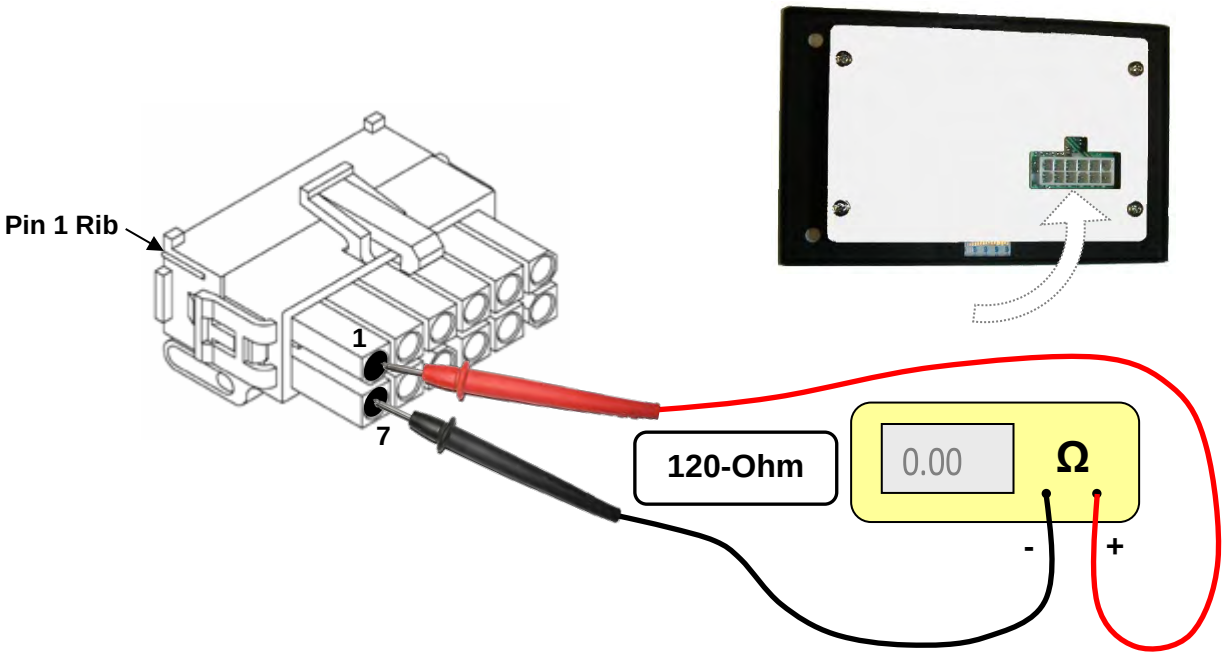
IGNITION MUST BE OFF WITH ALL OTHER DEVICES CONNECTED



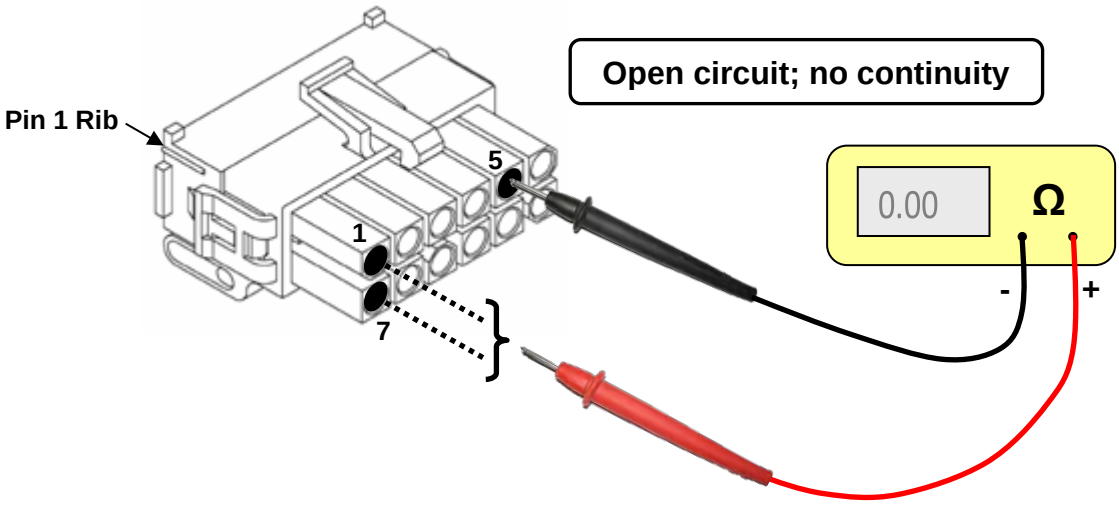


TR8a – Touch Screen Harness - Terminator and Isolation

BOTH ENDS OF THE TOUCH SCREEN HARNESS MUST BE UNPLUGGED

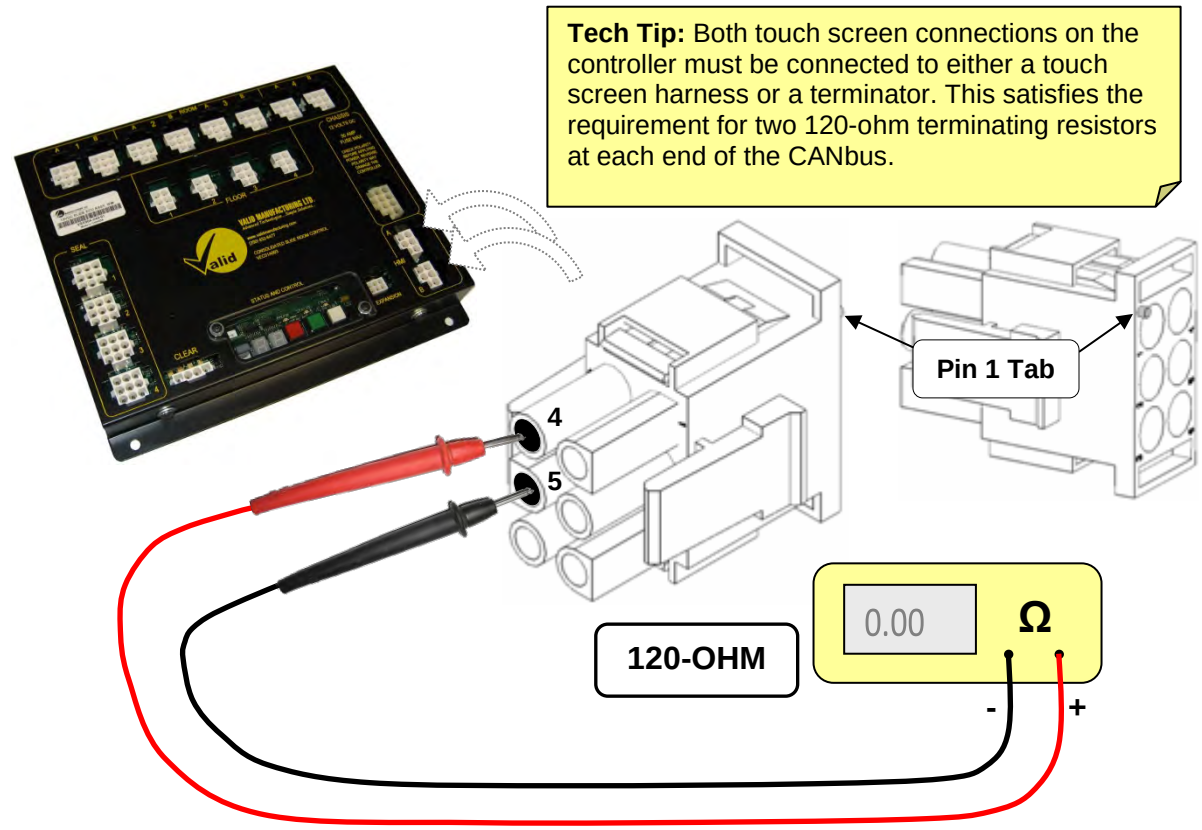


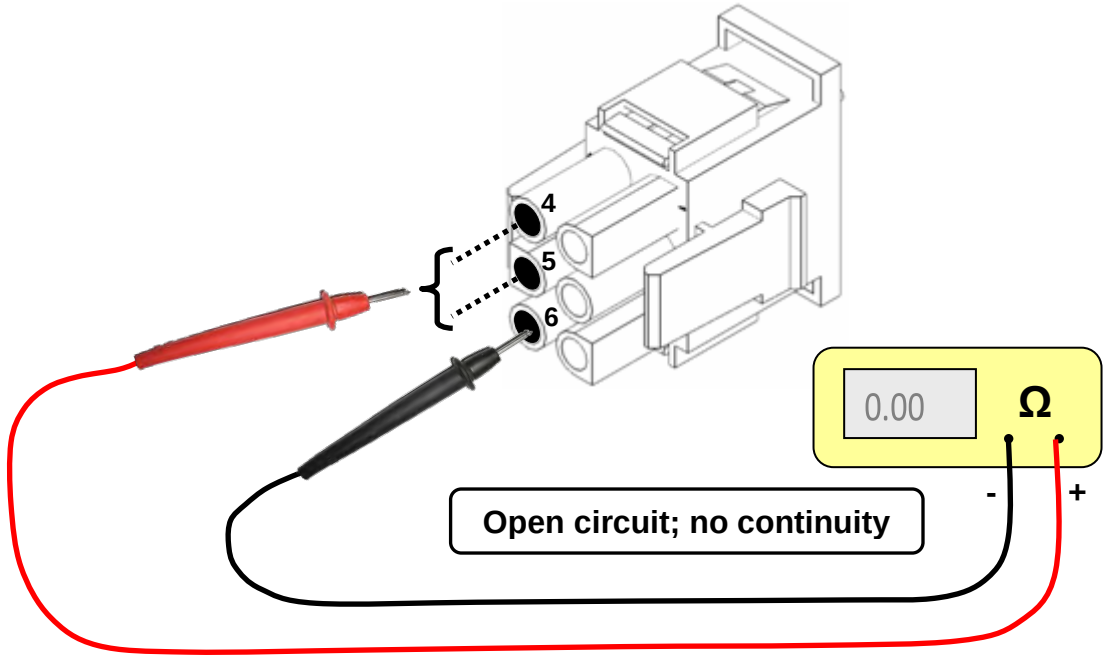
IMPORTANT: The network will **NOT** function unless there is at least **one** terminator



TR8b – Touch Screen Harness - Terminator and Isolation

BOTH ENDS OF THE TOUCH SCREEN HARNESS MUST BE UNPLUGGED



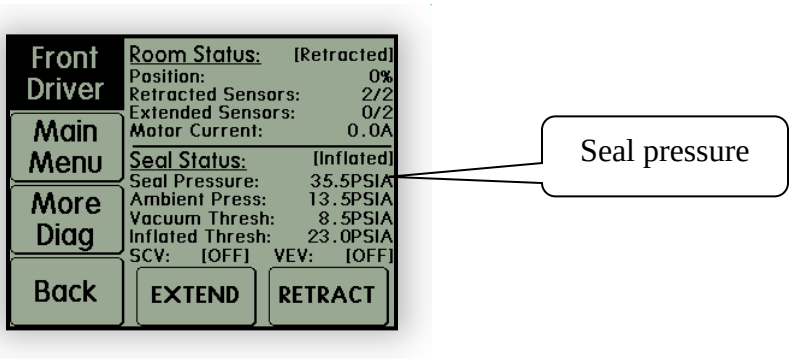


MAINTENANCE

Air Leak Test

Perform an air leak test to verify that the air seal, air manifold and connecting tubes are not leaking air, which will result in the seal slowly deflating over a period of time.

1. On the touch screen, in the diagnostics page, record the pressure reading for each fully inflated seal, which should be around 34 to 36 psia.



2. In the slide controller baggage bay, turn **off** the shut off valve; this will also vent the tubes to the air manifolds. Refer to page 74 for instructions on how to do this.
3. Leave for 24 hours.
4. On the touch screen, in the diagnostics page, again record the pressure reading for each seal.
5. The pressure drop should be less than 4 psi.
   Note: Locate any leak by using soapy water on the joints to look for air bubbles.
6. Finally, turn **on** the shutoff valve for normal operation.

Tip: If a quick connect air fitting is leaking, it is recommended to cut ½-inch off the tube and refit. Repeated extraction and insertion of a tube will result in an air leak because the tube outer surface is scraped by the fitting.

Air Seal Deflate Test

A 3/8” plastic air tube runs from each air manifold to an adaptor adjacent to the air seal which makes connection to the air seal’s rubber feed tube.

If for some reason, one of these tubes became pinched, it may partially or completely restrict the air flow in and out of the air seal. The slide control system uses a pressure transducer on each air manifold to measure seal pressure. If partially restricted, the air seal will take longer to deflate. If completely restricted, it will **appear** to deflate very quickly because there is such a small volume of air in the tubes between the air manifold and the air seal.

To verify that the tubes are not pinched, perform the following procedure from within the touch screen manual control screen (refer to page 28):

1. Inflate the air seal to full pressure (about 35 PSIA on the touch screen or 20 PSIG on the mechanical gauge). Observe and feel the air seal to determine if it inflated as expected.
2. Vent the air seal and watch the seal pressure readout on the touch screen. It should take between 10 and 15 seconds for the air pressure to reduce to ambient (14 PSIA on the touch screen or 0-PSIG on the mechanical gauge). If it takes **less** than this, there is a complete blockage in the air tube between the air manifold and the air seal, whereas a partial restriction will take **more** time. Observe and feel the air seal to determine if it deflated as expected or remained inflated.
3. If a restriction in air flow is apparent, the next step is to disconnect the air seal at the rubber tube (access will have to be determined based upon each coach design) and listen to the air sound as it vents from the seal; which should take between 10-15 seconds. This will isolate the problem to the air seal or the plastic tube between the air seal and the air manifold.
4. Should the air seal rubber tube be pinched as a result of an air seal replacement, where the rubber tube was not properly aligned in the track, it may be necessary to re-do the air seal (refer to page 83).

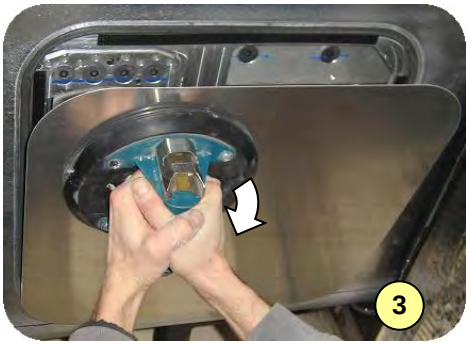
Exterior Endwall Cover Panel Removal Procedure

Step 1 – Obtain and inspect suction cup

- Obtain a heavy duty suction cup used for handling large windows. Inspect and clean the bottom surface if necessary.

Step 2 – Attach suction cup

- The slide should be fully extended.
- Place the suction cup near the corner of the panel.



****IMPORTANT****

Do not place the suction cup in the middle of the panel, otherwise the panel may deform during its removal.

Step 3 – Remove Panel

- Using a strong jerking action, pull the panel from the endwall.

CAUTION

The Velcro will rapidly release with the sudden pull. Do not stand on the top step of a ladder or other support, but brace yourself for the release, otherwise you may fall.

Exterior Endwall Cover Panel Installation Procedure

Step 1 – Inspect Dual Lock (Velcro)

- Inspect the Dual Lock on both the panel and the endwall to ensure all pieces have good adhesion to the surfaces they are attached to.
- If loose pieces are found, refer to page 207 for the dual lock replacement procedure.

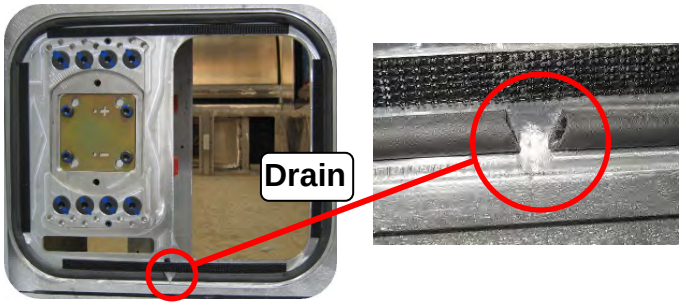
Step 2 – Inspect Seal and Mating Surfaces

- Inspect "D" seal for nicks or cuts.
- Inspect panel and endwall recess for foreign objects, remove as required.

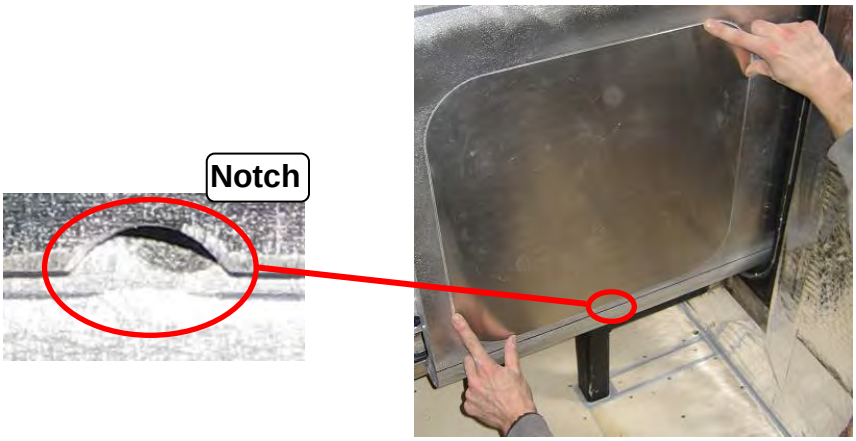
Step 3 – Align Panel

- Rotate the panel so that the notch in the bottom lines up with notch in the endwall recess as shown below.

****IMPORTANT****
The panel has a notch which MUST be aligned with the drain on the tub.



- Using two opposing corners as reference, carefully align the panel into its recess. Ensure panel does not overlap endwall sheeting.



Step 4 – Install Panel

- While holding the panel with one hand, use the other to firmly “pound” around the perimeter in a circular direction.
- Multiple hits will likely be required to ensure all Dual Lock has been engaged. Continue until Dual Lock no longer “snaps” when the panel is struck.

****IMPORTANT****
Do not hit panel in the middle otherwise the panel will be dented

Step 5 – Check Panel

- Feel around the perimeter to ensure that the panel is fully recessed, with no proud areas.

CAUTION

It is very important to do a thorough check of the panel after installation. If this is not done, the panel may leak and cause damage to interior coach components.

Exterior Endwall Cover Panel Dual Lock (Velcro) Installation Procedure

Step 1 – Inspect Dual Lock (Velcro)

- Inspect Dual Lock on both the panel and the endwall to ensure all pieces have good adhesion to the surfaces they are attached to. For any loose pieces follow the steps below.

Step 2 – Remove Loose Dual Lock

- Remove loose Dual Lock. Ensure to not scratch the mating surface too deeply or adhesion of the new piece might be affected.

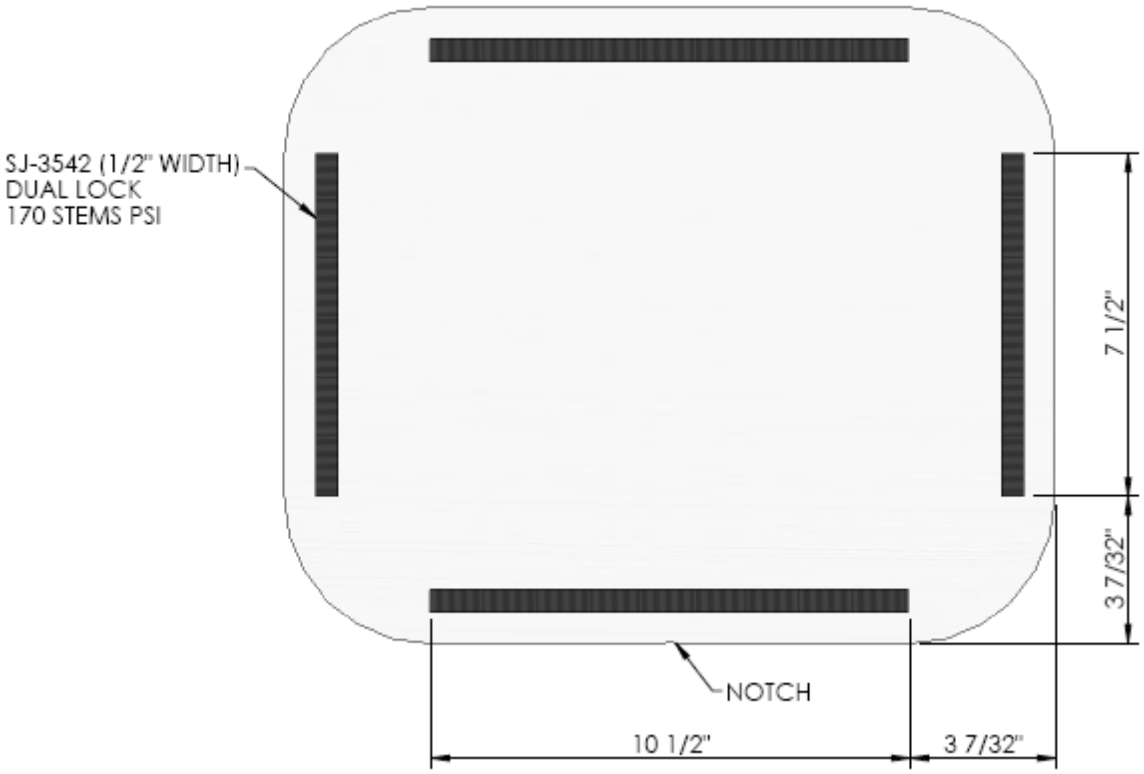
Step 3 – Clean Dual Lock Mating Surface

- Clean all surfaces which the Dual Lock attaches to with the chemical acetone. Ensure no glue or other material is left behind from old Dual Lock. Surface should be cleaned to bare aluminum.

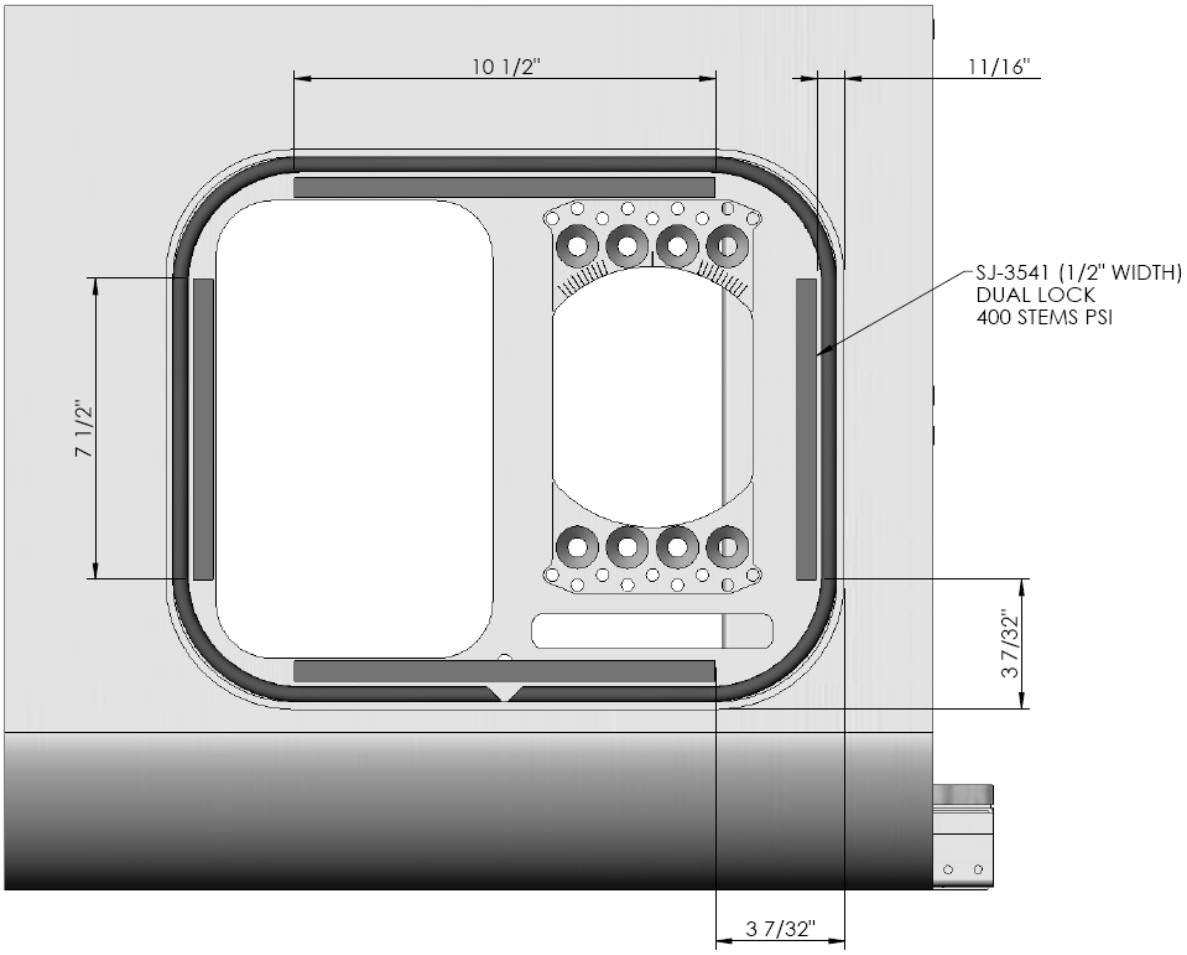
****IMPORTANT****
Acetone is a dangerous chemical. Avoid inhalation and contact with skin. It is also very flammable. Refer to its MSDS sheet for proper use.

Step 4 – Prepare Dual Lock

- Prepare Dual Lock according to which piece is loose. Refer to the drawings below for Dual Lock type, size and location.
- Panel Dual Lock layout:



- Endwall Dual Lock Layout:



****IMPORTANT****

Please note the endwall and the panel use different strengths of Dual Lock. Ensure the correct strength is used in the corresponding location.

Step 5 – Layout Dual Lock Location

- Mark location for Dual Lock. Ensure locations are the same as the above layout drawings, otherwise panel will not secure properly.

Step 6 – Install Dual Lock

- Using layout marks carefully install Dual Lock in correct location. Wrap a sacrificial piece (use old piece if possible) around roller and using medium pressure roll back and forth to activate Dual Lock adhesive.
- If mating piece is not available use a roller to very carefully apply Dual Lock so as to not crush it.

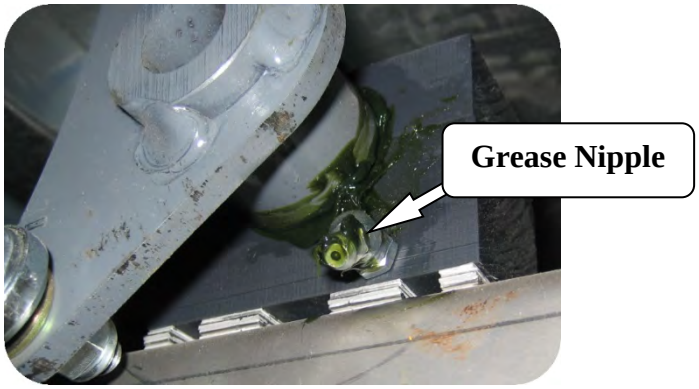
Lubrication

Flat floor torque shaft bearings

Use a grease gun with general purpose premium grease and apply via grease nipples on each flat floor torque shaft bearing.

The design of the coach determines bearing access. For side mounted grease nipples, access may be from the baggage bay or from above in the main living area. For bottom mounted grease nipples, access is from the baggage bay.

Bottom Grease Nipple



Side Grease Nipple

Parking the Coach

- It is recommended that the room slides be moved out and in at least once every 3 months. This allows the pneumatic air seal to be cycled through its vacuum and inflate cycle.
- Air pressure keeps the pneumatic seals inflated. If the air supply is turned off, the seal will eventually deflate. As a result, the seal will not provide a weather barrier. If the coach is stored inside, this should not be an issue.

PARTS

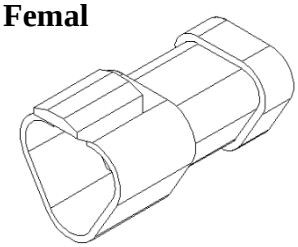
The purpose of this section is to provide a generic part listing for the 12VDC slide control system.

Network Terminators

On a slide control system with two touch screens, two Y000070 120-Ohm network terminators are used; each one is installed on the touch screen harnesses close to the touch screens.

On systems with only one touch screen, there will be one Y00070 120-Ohm network terminator installed on the touch screen harness close to the touch screen. There will also be a 120-Ohm resistor attached to a connector which plugs into the second touch screen position on the main controller.

Femal

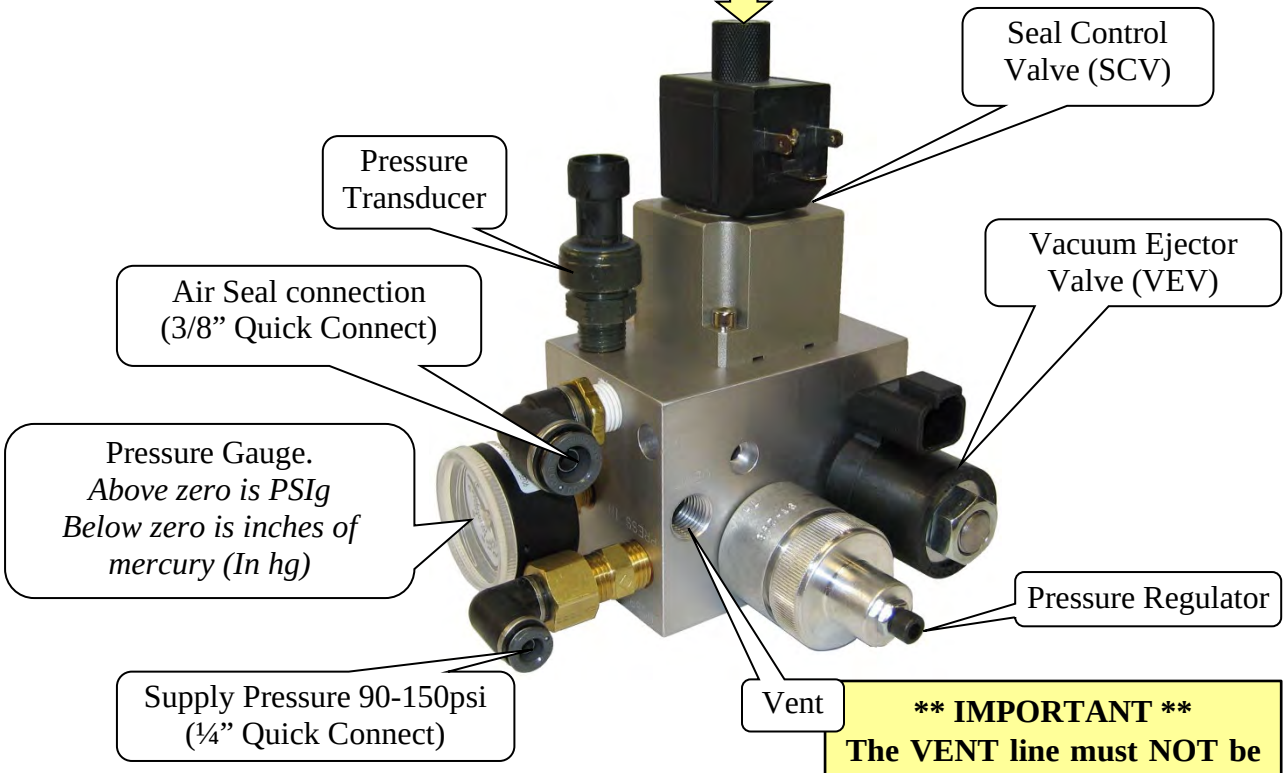


Part# Y000070

Air Manifold

Refer to page 168 for detailed parts list and assembly instructions

To vent the air seal, use a finger to press the valve actuator.
Also press this several times, after adjusting the regulator, to confirm the setting.

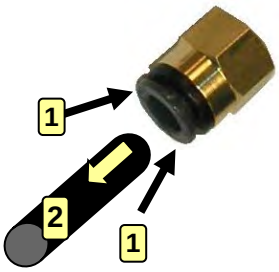


Air Manifold

**** IMPORTANT ****
The VENT line must NOT be obstructed in any way. Do not connect any fittings or lines to this port without approval from Valid Manufacturing Ltd

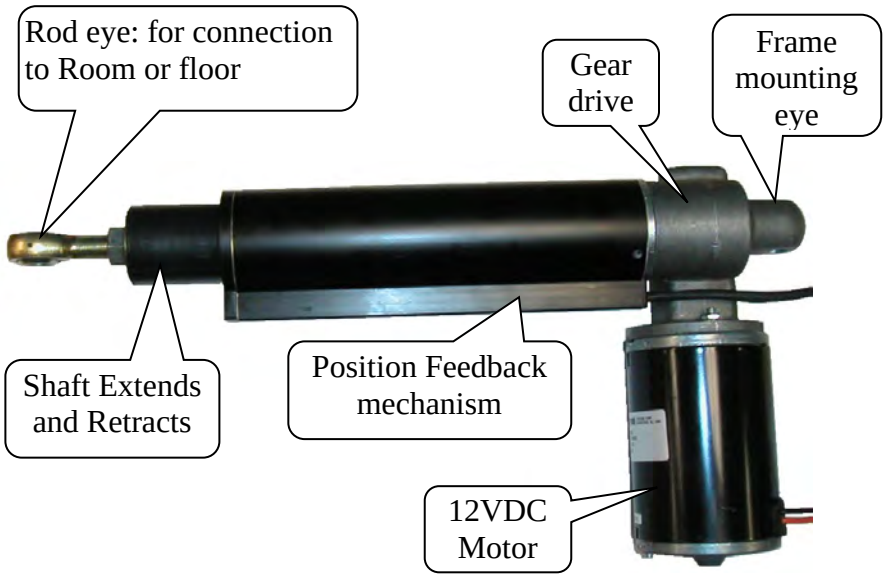
How to Remove an Air Tube:

Depress and hold the outer ring then withdraw tube.



Tip: If a quick connect air fitting is leaking. It is recommended to cut ½-inch off the tube and refit. Repeated extraction and insertion of a tube will result in an air leak because the tube outer surface is scraped by the fitting.

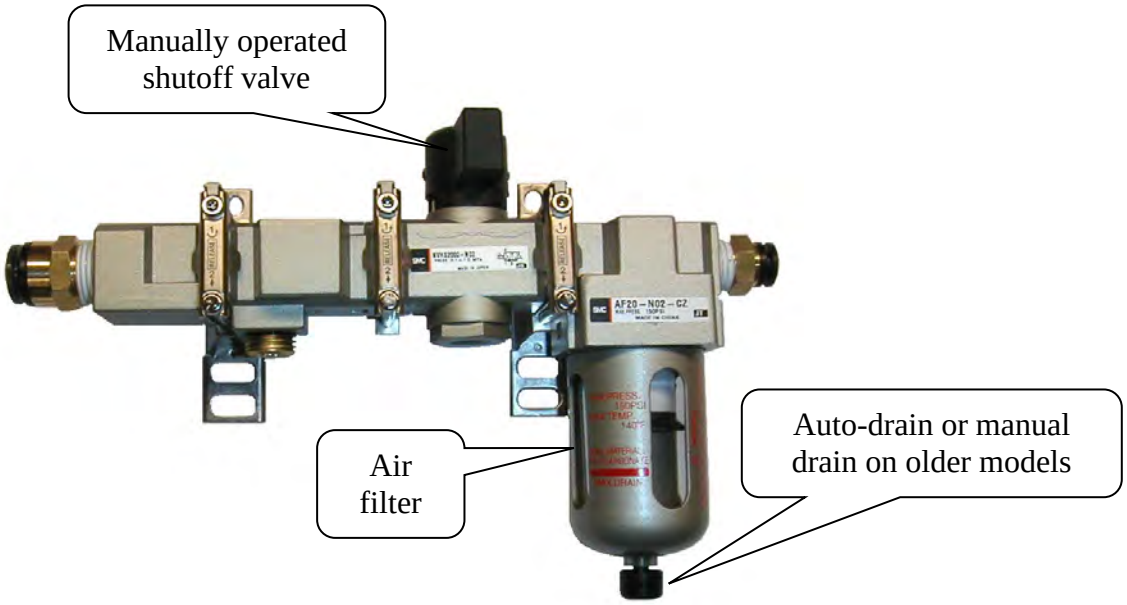
Floor Actuator



FLOOR actuators have 5 inches of travel.

ACTUATOR, 12VDC, 5in, C/W CONNECTORS

Primary Air Station

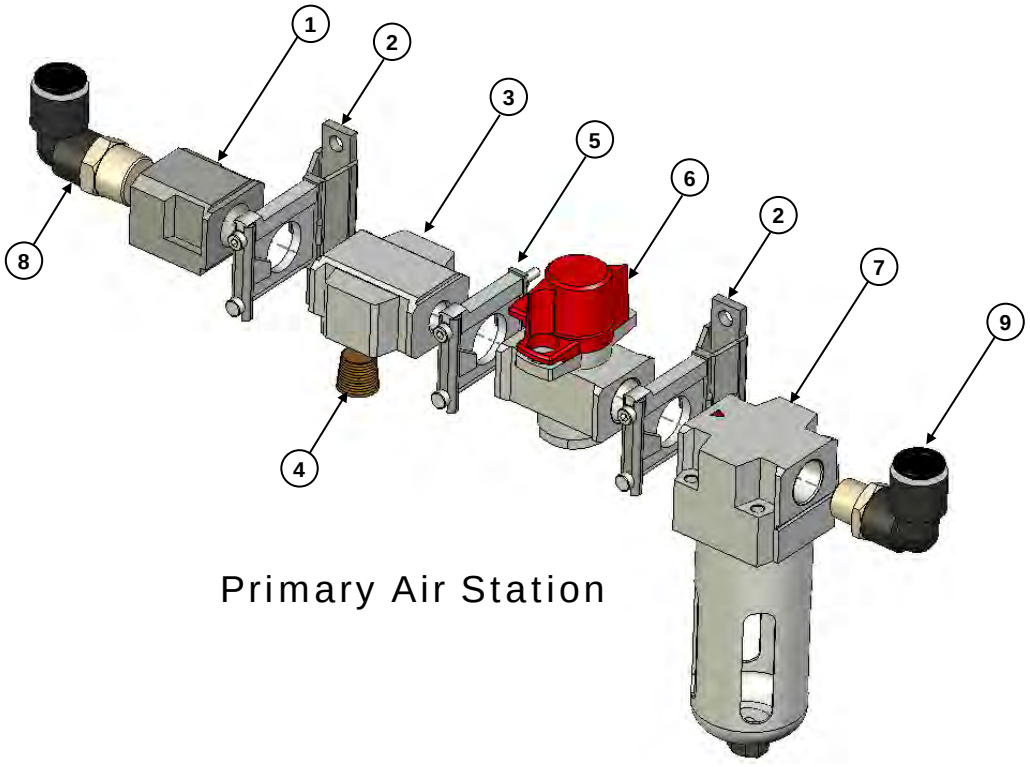


PRIMARY AIR STATION, SLIDEOUT PNEUMATIC SYSTEM

The air filter should never need replacing. However, if the air compressor introduces oil into the air, the filter will eventually require replacement. The symptom would be a degradation of performance during seal vacuuming. For example, instead of coach air having to be 90psi, it may now require 100psi to achieve sufficient air seal vacuum.
Refer to page 213 for instructions on how to remove an air tube from a quick-release fitting.

How to replace the air filter:

1. Turn off the shut-off valve.
2. Attempt to extend or retract a slide, at which point the seal vacuuming will bleed the air off.
3. Untwist the outer casing and **replace** the air filter (The air filter is not designed to be cleaned).
4. Turn on the shut-off valve.



Primary Air Station

ITEM	DESCRIPTION
1	ADAPTER, END BLOCK, 3/8 NPT, 20 SERIES, SMC
2	BRACKET, W/ SPACER, AC20 SERIES, SMC
3	VALVE, CHECK, PNEUMATIC, 1/4 NPT, 20 SERIES, SMC
4	PLUG, BRASS C SUNK PIPE 1/4 NPT
5	SPACER, JOINER, AC20 SERIES, SMC
6	VALVE, SHUT-OFF, 1/4NPT, 20 SERIES, SMC
7	AIR FILTER, SMC ¼ NPT, NC AUTO DRAIN

ELBOW FITTINGS:

ITEM	DESCRIPTION
8	AIR FITTING, ELBOW, MALE 3/8 NPT, 3/8 TUBE
9	AIR FITTING, ELBOW, MALE 1/4 NPT, 3/8 TUBE

STRAIGHT FITTINGS:

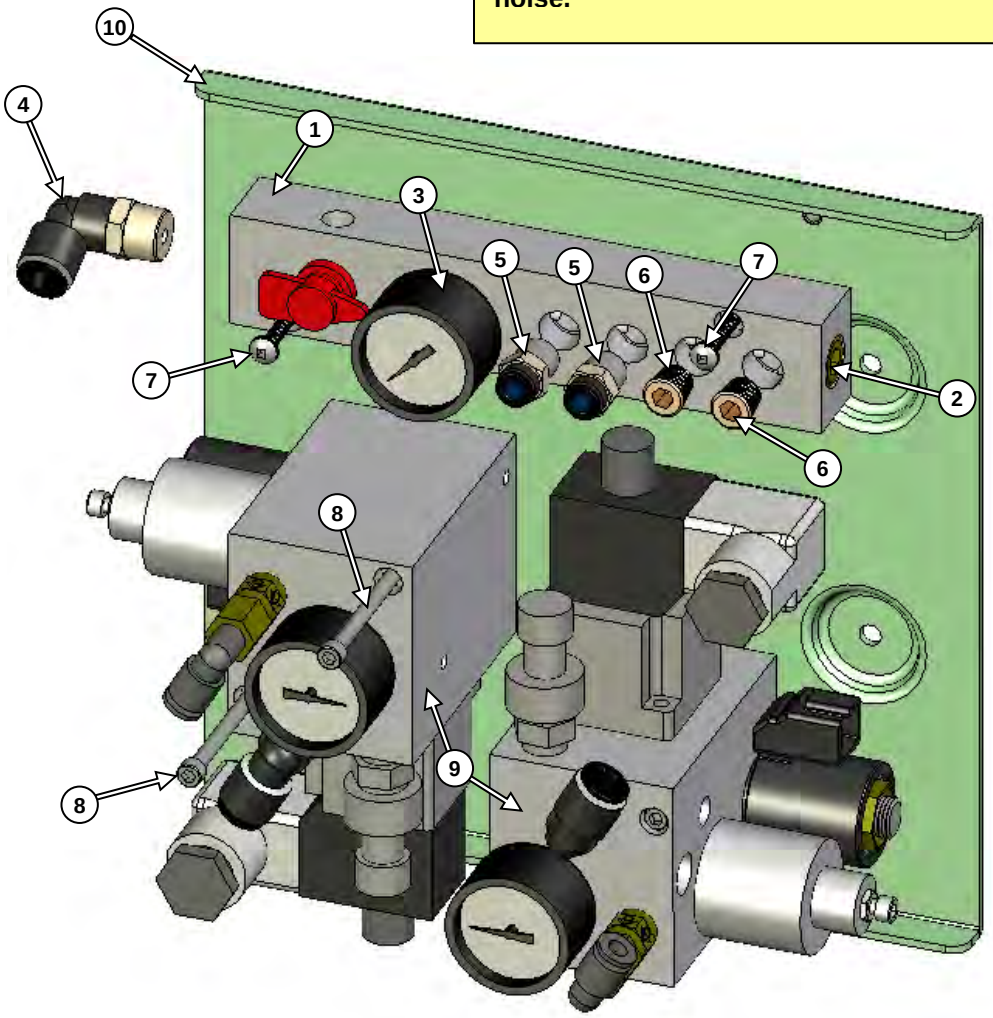
ITEM	DESCRIPTION
8	AIR FITTING, MALE 3/8 NPT, 3/8 TUBE
9	AIR FITTING, MALE 1/4 NPT, 3/8 TUBE

Pneumatic Back Panel

The illustration below shows a two slide panel. A three slide coach would have three air manifolds; a four slide would have four air manifolds.

***** VERY IMPORTANT *****

The pneumatic panel MUST be mounted so that it is electrically isolated from the coach chassis to minimize electrical noise.



ITEM	DESCRIPTION
1	MANIFOLD ASSEMBLY
2	PLUG, BRASS C SUNK PIPE 1/8 NPT
3	GAUGE, AIR BACK MOUNT 0-160PSI
4	AIR FITTING, ELBOW, MALE 3/8 NPT, 3/8 TUBE
5	AIR FITTING, MALE 1/4 NPT, 1/4 TUBE
6	PLUG, BRASS C SUNK PIPE 1/4 NPT
7	SCREW, PHROB 10-32 x 1in
8	CAPSCREW, SKTHD 10-32 x 3-1/2in
9	SLIDEOUT MANIFOLD, PNEUMATIC SYSTEM, COACH SLIDEOUTS, 12VDC
10	PLATE, MOUNTING, AIR MANIFOLDS

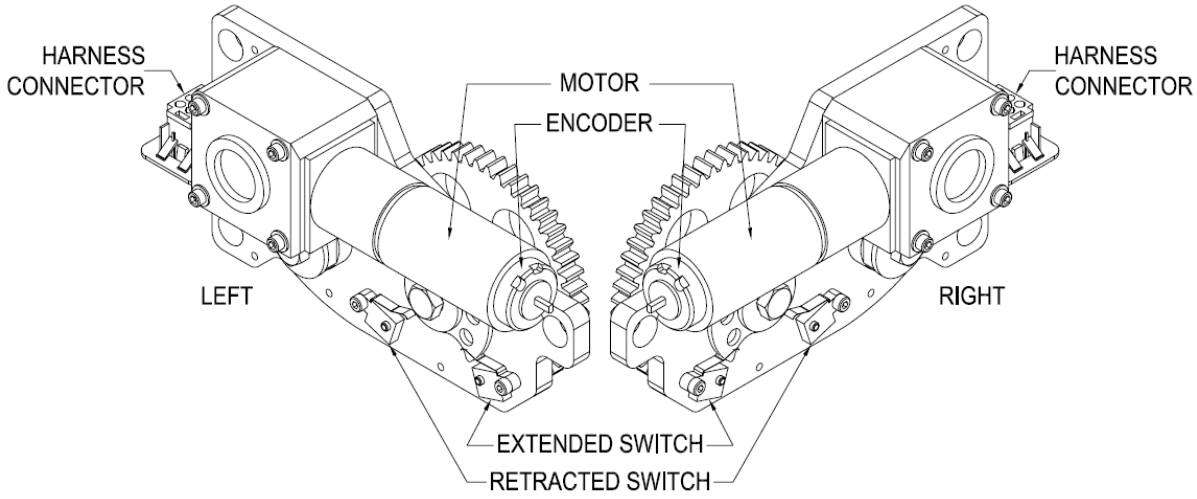
Touch Screen

Slide controllers (ECU)

MAIN CONTROLLER
ASSY, CONTROLS, IEW

INTERMEDIATE CONTROLLER
ASSY, INTERMEDIATE WALL CONTROL

Slide Gear Motor Assembly



There are left and right versions for each motor assembly.

NEVER mix motor assemblies with different last two digits part numbers in the same slide, because each encoder counts at a different rate of slide motion.

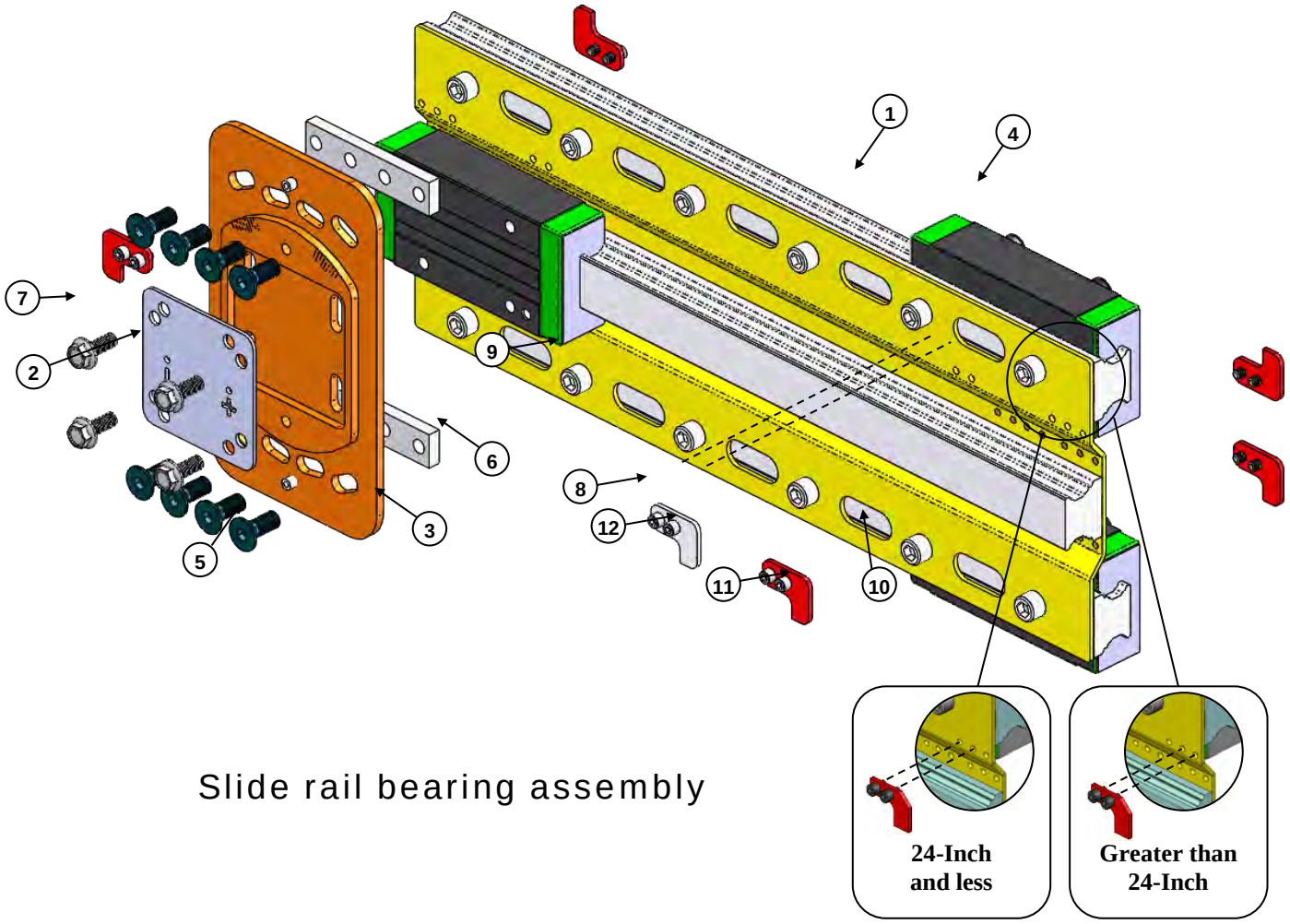
Refer to page 27 and page 67 for setting the configuration “Typical End Position Counts”.

Refer to page 182 for endwall harness assignments.

The pin-outs for the connector on the motor assembly are detailed on page 192.

It should be noted that the cable harnesses between these motors and the controller all have identical wiring connections. Refer to page 186.

Slide Rail Bearing Assembly



Slide rail bearing assembly

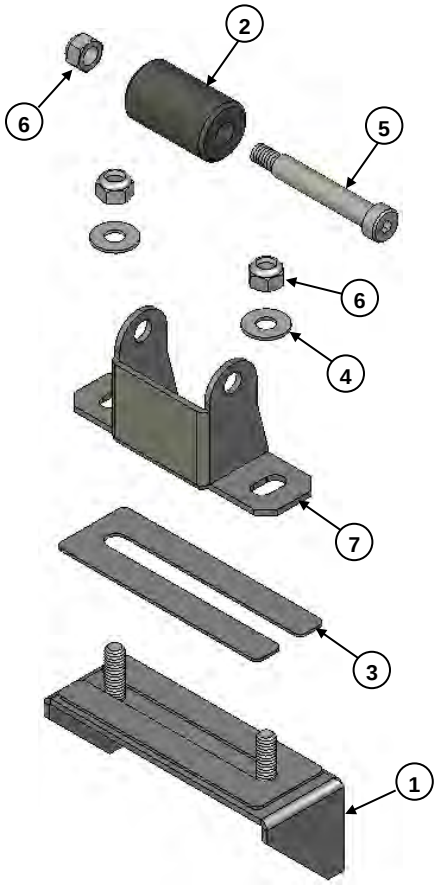
ITEM	DESCRIPTION
1	LINEAR RAIL, INA MNG. PHOS
2	VERTICAL ADJUSTMENT PLATE, 0,0.0625, IEW
	VERTICAL ADJUSTMENT PLATE, 1/8, 3/16, IEW
	VERTICAL ADJUSTMENT PLATE, 1/4, IEW
	VERTICAL ADJUSTMENT PLATE, 5/16, IEW
3	PLATE, ROTATING BEARING MOUNT, IEW
4	BEARING, LINEAR INA 45mm, SNL, MANG PHOS, PL
5	CAPSCREW, SKTHDFLT, M12-1.75 x 30
6	ROTATIONAL TAPPED CLAMP RETAINER PLATE, IEW
7	CAPSCREW, HEXHD, FLANGED, M10 x 1.25 x 25mm GR 10.9, ZP
8	CAPSCREW, SKTHD 1/4-20 x 3/8in
9	CAPSCREW, SKTHD M12 x 20mm
10	BEARING RAIL MOUNT PLATE, IEW
11	BEARING STOP - END, RED, IEW
12	BEARING STOP - SEAL CHANGE, WHITE, IEW

Support Roller

Some slides are fitted with a support roller in the middle of the span to support the slide.

The nylon roller does not require any lubrication. However, over a period of time, there may be a build-up of dirt on the face of the roller which has the potential of scratching the paint on the underside of the tub.

The roller can be accessed from the baggage bay. For best results, use a clean, damp, non-abrasive cloth with any domestic glass cleaner (same as used to clean the touch screen, refer to page 11).



ROLLER ASSY, SLIDEOUT FLOOR

ITEM	DESCRIPTION
1	WELDMENT, ROLLER BRACKET, LOWER
2	ROLLER, NYLON GS, 1 in OD
3	SHIM, ROLLER ASSEMBLY, SLIDE SUPPORT
4	WASHER, FLAT 5/16in PLATED
5	CAPSCREW, SKTSHOULDER 3/8 x 2in
6	NUT, HEX 5/16-18 NYLOC PLATED
7	FORMING, ROLLER BRACKET, UPPER, CRS(SS)

WARRANTY & SERVICE

Warranty

Your Valid Slide Control is warranted for a period of one year against defects of workmanship.

If you acquired your Valid Slide Control as a factory-installed option on a new or used coach, then your warranty extends for a one year period commencing from the date the coach was purchased.

If you purchased your Valid Slide Control and had it installed yourself, then your warranty extends for a one year period commencing from the date the slide control was purchased.

If, during the warranty period, any component of the slide control system fails to operate as indicated in this manual, simply return the part to the point of purchase for a no-questions replacement of the component.

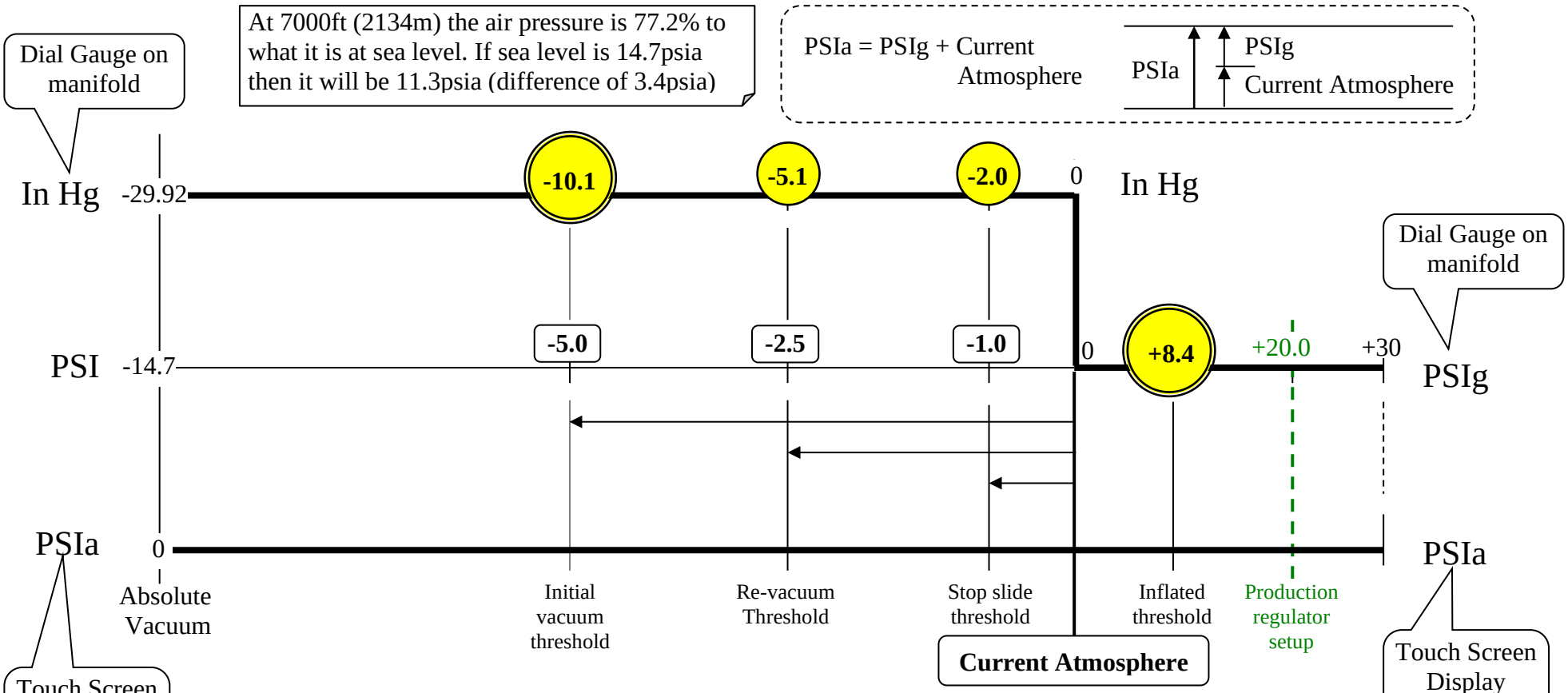
Valid Manufacturing Ltd. is not responsible for the cost of labor required to move or modify furnishings, fittings and appliances etc. that cover service access points (refer to page 76).

Service

For information or service on your Valid Slide Control, contact your coach manufacturer or Valid Manufacturing Ltd.

Valid Manufacturing Ltd.
5320 48 Ave. SE
Salmon Arm, B.C.
Canada
V1E 1X2

Phone: 250-832-6477
Fax: 250-832-7746
Email: *sales@validmanufacturing.com*



In Hg - Inches of mercury, as shown on mechanical dial gauge, on manifold, when BELOW current atmosphere
PSIg - Gauge PSI, as shown on mechanical dial gauge, on manifold, when ABOVE current atmosphere
PSIa - PSI Absolute, measured by pressure transducer on manifold, and shown on Touch Screen Display.

Note-1*: The vacuum thresholds -1.0,-2.5 and -5.0 psi, are relative to current atmosphere*

Note-2: *A mechanical dial gauge will always read the current atmospheric ambient pressure as zero*

Note-3: *The default controller ambient is +13.5PSIa; This is used in certain conditions.*

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Part# VSS90M-002-SM