

## V2 Series Mounting Instructions

Chevy Express (Compatible only with CVT47 Liftgate with FA42 platform)  
2003-present

Note: Mounting kits for V2 liftgates are intended for the specified vehicle model only. Use of a mounting kit in a vehicle or manner other than intended is **NOT** recommended by Tommy Gate. Using an incorrect mounting kit will likely result in damage to the van's bumper, door and floor area, as well as to the lifting and folding mechanism of the liftgate.

Note: V2 Series liftgate are not compatible with floor mounted rear heat or rear air conditioning.

### Preparing the Gate

Table 1: Parts list.

QTY.	PART NO.	DESCRIPTION
1	CVT47	Liftgate
1	015656	Drill Template
1	017508	Bracket Kit

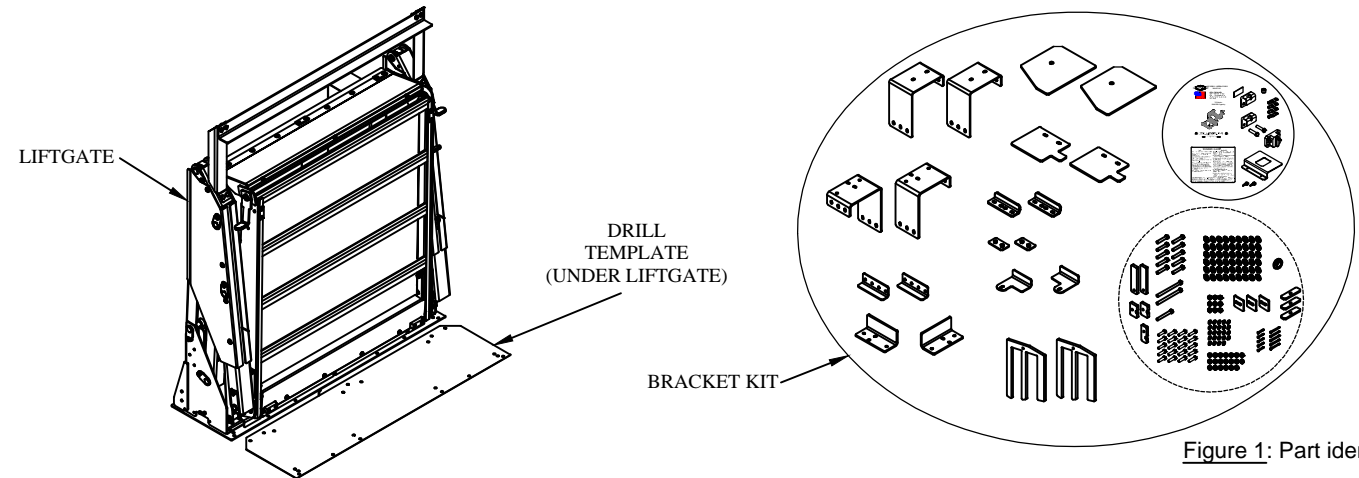


Figure 1: Part identification.

3. Remove the pump box cover by removing five (5) screws (Figure 3).
4. Unscrew the solid plastic plug from the pump reservoir and **Install** the vent plug provided, if not already installed (Figure 2).
5. Replace the pump box cover and screws (Figure 3).
6. Remove and **Save** the six (6) screws fastening the base plate cover to the base plate (Figure 3).
7. Remove and **Save** base plate cover (Figure 3).  
With the screws removed, it can slide out from under the platform.
8. Remove and **Save** the floor transition that is under the base plate cover (Figure 3).

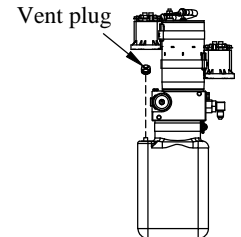


Figure 2: Vent plug.

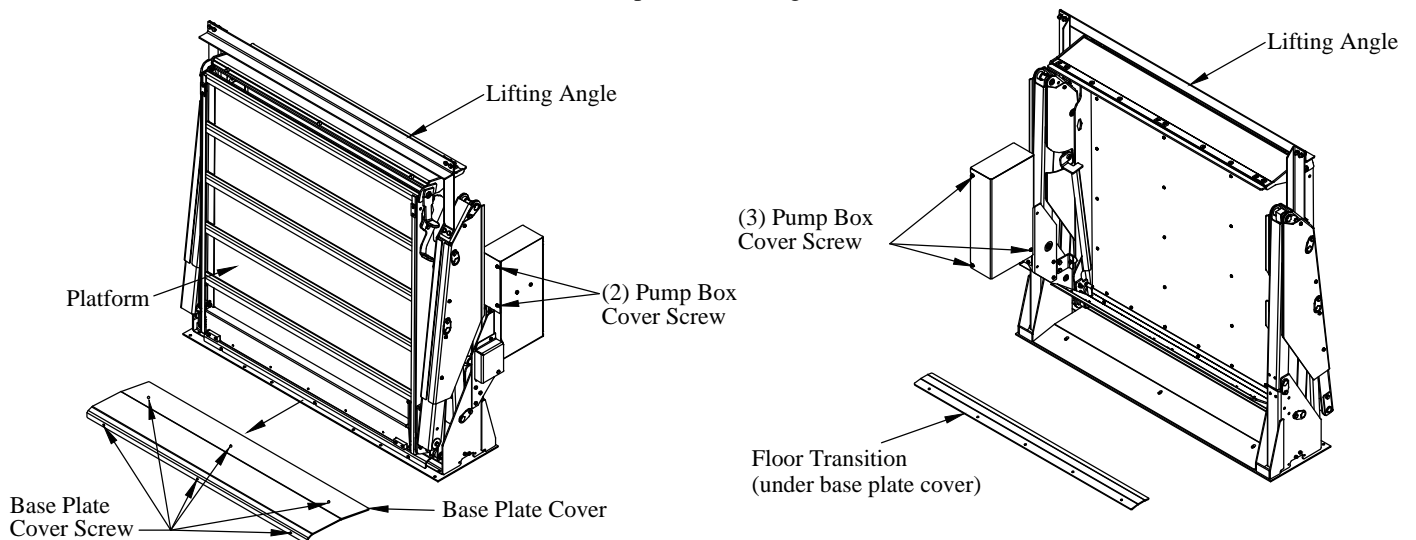


Figure 3: Base plate cover and pump box.

## V2 Series Mounting Instructions

### Preparing the Gate (continued)

**Caution:** Be careful not to tip the liftgate over during the next steps. The liftgate will stand upright, but could be knocked over with a moderate force.

9. **Remove** the screws and bolts fastening the liftgate to the pallet.
10. **Lift** the liftgate by the lifting angle with a fork truck or hoist (Figure 3).
11. **Lower** the liftgate onto the ground.
12. **Remove** the drill template from the pallet (Figure 1).

### Preparing the Van

1. **Remove** the spare tire.
2. **Remove** the plastic threshold at the rear door, if there is one.
3. **Place** the drill template in the rear of the van (Figure 4):
  - Centered side to side.
  - 5-1/4" from the metal part of the closed rear doors at the center.
  - Angled corners toward the front of the van.
  - Holes "J" and "B" toward the front of the van.
  - Holes "K" and "P" toward the rear of the van.
4. **Verify** that the drill template is located within 1/16" of dimensions above.

The drill template needs to be located accurately for the brackets to fit properly.

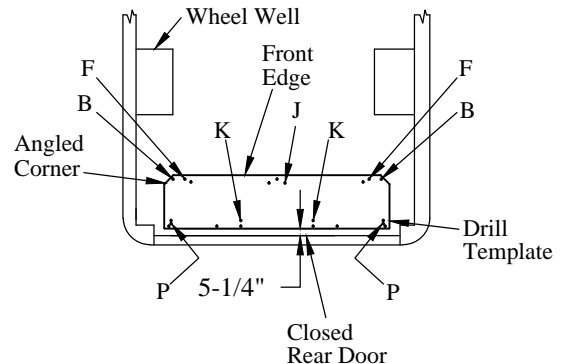


Figure 4: Drill template location (top view).

5. **Skip** steps 6-13 if the van has a bare metal floor.
6. **Mark** the floor covering around the template, leaving clearance as shown (Figure 5).

Use the following for the W dimension:

  - W=1/4" when flooring thickness is 1/2" or less
  - W=1" when flooring thickness is 1/2" to 3/4"
  - W=2" when flooring thickness is 3/4" to 1"

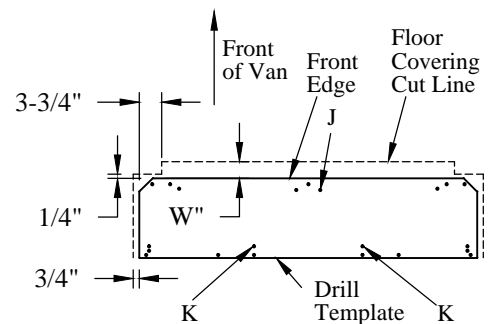


Figure 5: Floor covering cut location (top view).

7. **Remove** the drill template.
8. **Remove** the screws that hold down the rear-most portion of the floor covering, if needed.
9. **Insert** a piece of thin plywood or metal sheet between the flooring and metal van floor.

This will protect the metal van floor from drilling and cutting in the next steps.
10. **Cut** the flooring where previously marked.

Do not cut through the metal van floor for this step.
11. **Remove** the protective plywood or metal sheet that was inserted in a previous step.
12. **Place** the drill template in the rear of the van (Figure 4):
  - Centered side to side.
  - 5-1/4" from the metal part of the closed rear doors at the center.
  - Angled corners toward the front of the van.
  - Holes "J" and "B" toward the front of the van.
  - Holes "K" and "P" toward the rear of the van.
13. **Verify** that the drill template is located within 1/16" of dimensions above.

The drill template needs to be located accurately for the brackets to fit properly.

## V2 Series Mounting Instructions

### Preparing the Van (continued)

**14. Check** for obstructions before drilling in the next steps.

Note: Do not drill all holes in the template, they are not all used for this application. Only drill holes when indicated.  
Any time a hole is drilled in the vehicle, apply rust preventative to the bare metal.

**15. Drill** 3/8" holes in nine (9) locations in the template. Drill "B", "F", "J", "K", and "P" locations only, skip all others (Figure 6).  
Insert a 3/8" bolt into each hole as it is drilled to maintain hole alignment and template position.  
The "P" locations go through multiple layers of the body cross member.  
The "J" location goes through the body and spare tire cross member.

**16. Remove** the drill template.

**17. Replace** the floor covering screws, if previously removed.

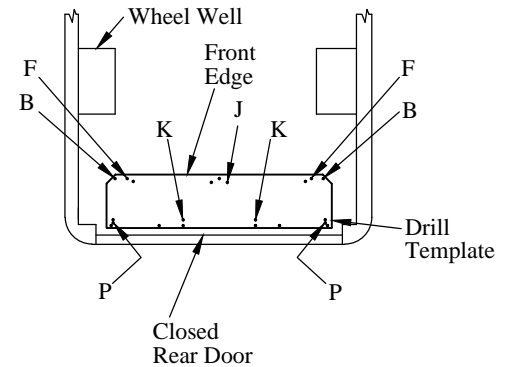


Figure 6: Drilling location (top view).

### Installing the Rib Shims

Note: The rib shims are used to fill the space between the top and bottom of the ribs.

**Important:** Do not omit this section. Without the support of the rib shims, the van floor will be damaged when tightening the bolts.

- 1. Position** a "fork" shim around each "P" location (Figure 7).
- 2. Position** a long shim between the "B" and "F" locations (Figure 7).
- 3. Position** a wide shim near the "J" and passenger side "K" location (Figure 7).
- 4. Position** a narrow shim near the driver side "K" location (Figure 7).
- 5. Verify** that the tops of the shims are even with, or slightly above, the tops of the floor ribs.

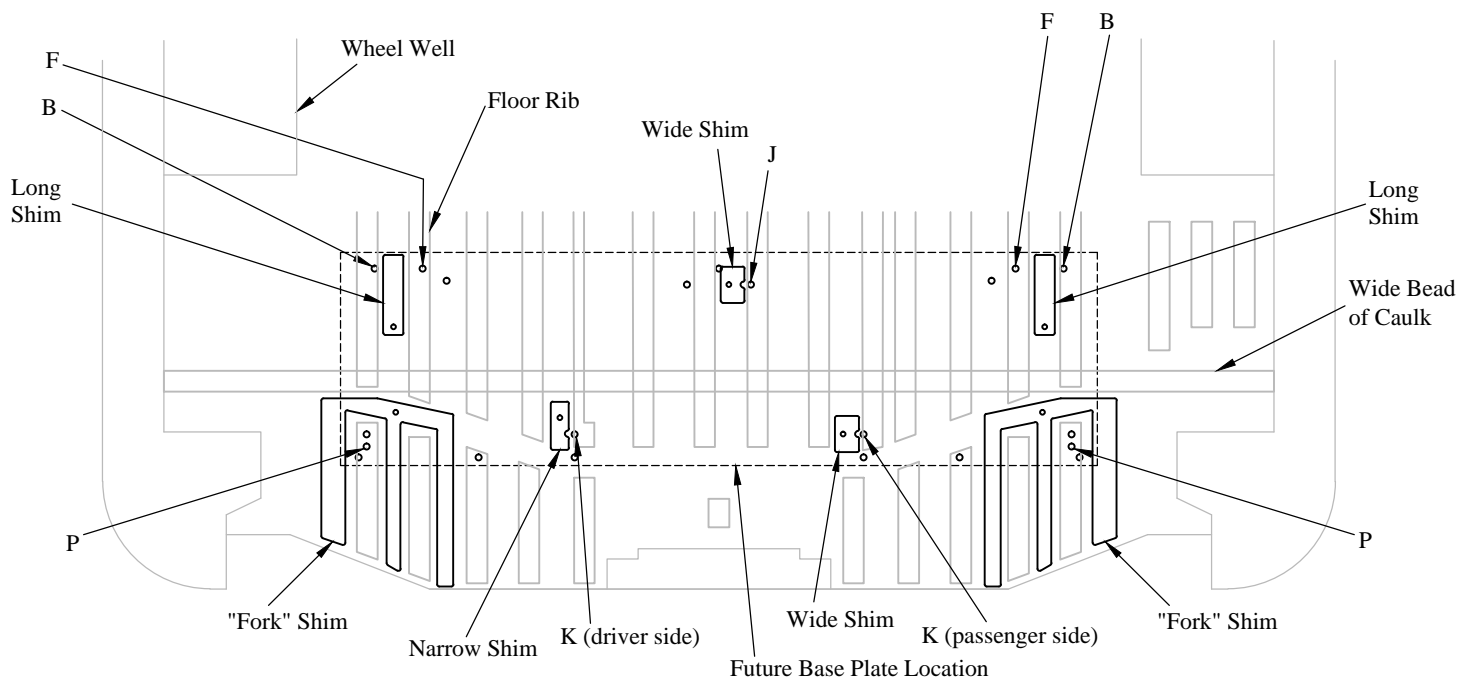
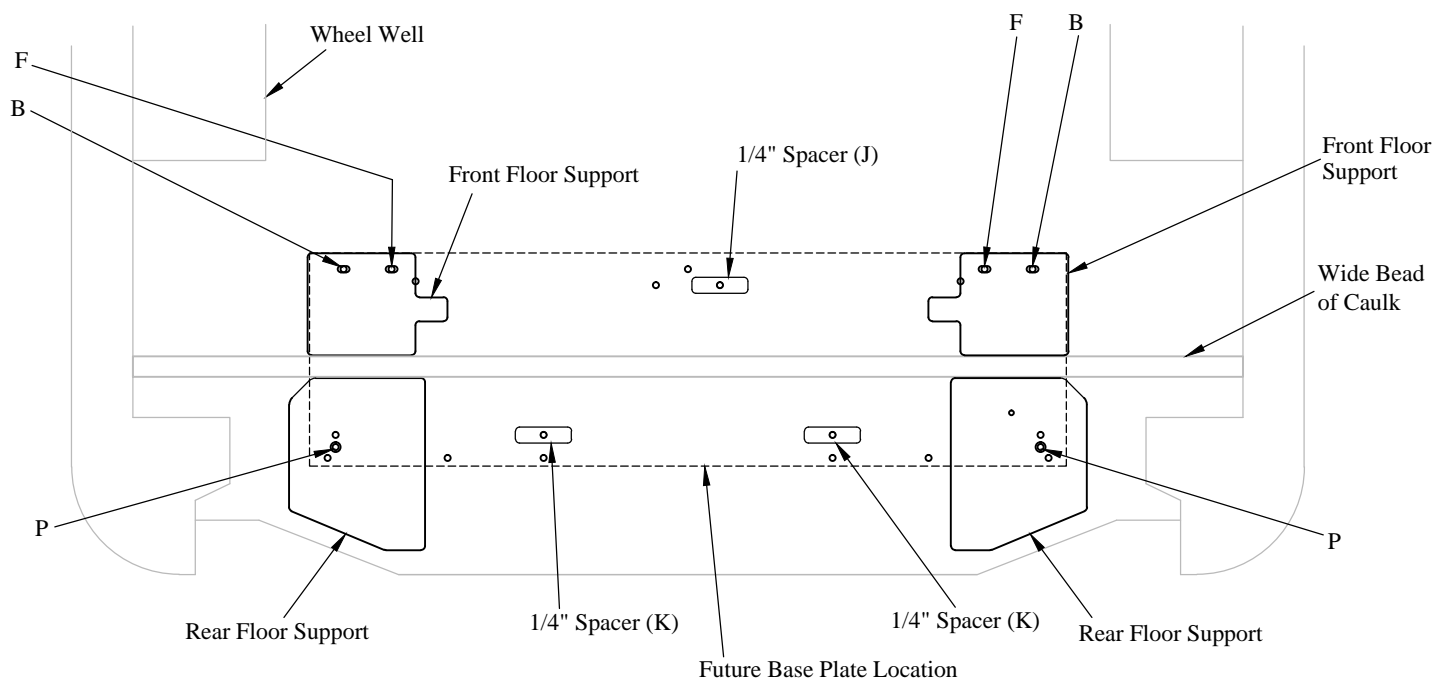


Figure 7: Rib shim locations (top view).

## V2 Series Mounting Instructions

### Installing the Floor Supports

1. **Position** the front and rear floor supports in the van, on top of the ribs and shims (Figure 8).
2. **Position** a 1/4" spacer at each "K" and "J" locations (Figure 8). These spacers are being added to the shims at this location.



Note: Shims from previous section are not shown for clarity.

Figure 8: Floor support locations (top view).

## V2 Series Mounting Instructions

### Installing the Liftgate

**Caution:** Be careful not to tip the liftgate over during the next steps. The liftgate will stand upright in the stored position, but could be knocked over with a moderate force.

1. **Lift** the liftgate by the lifting angle with a fork truck (Figure 10).
2. **Connect** 12 volt battery to the liftgate. Do not use a battery charger.

**Caution:** Do not deploy the liftgate unless it is supported by a fork truck. Deploying an unsupported liftgate will cause it to fall over.

3. **Place** clamps on the fork truck's forks to keep the liftgate from sliding on the forks (Figure 10).
4. **Position** the liftgate so that there is at least 54" between the liftgate and fork truck (Figure 10).  
If this is not possible, an overhead hoist may need to be used to position the liftgate.
5. **Stand Clear** and **Activate** the lowering function of the liftgate until the platform is horizontal.
6. **Place** the liftgate in the rear of the van with the base plate:
  - Centered side to side
  - 5-1/4" from the closed rear doors at the center (Figure 9).
7. **Place** a 3/8" flat washer on each base plate bolt, except the "P" location bolts.
8. **Insert** base plate bolts into holes in base plate, down through van floor (Figure 9).
  - (2) 3/8" x 5" bolts at "P" locations.
  - (1) 3/8" x 3" bolt at "J" location.
  - (6) 3/8" x 2" bolts at "K", "B" and "F" locations.
9. **Maintain** support of the liftgate until it is securely bolted to the van floor.

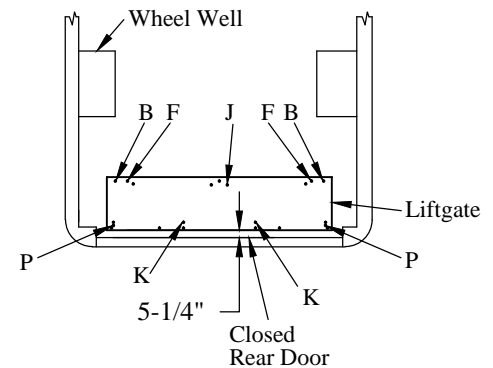


Figure 9: Drilling location (top view).

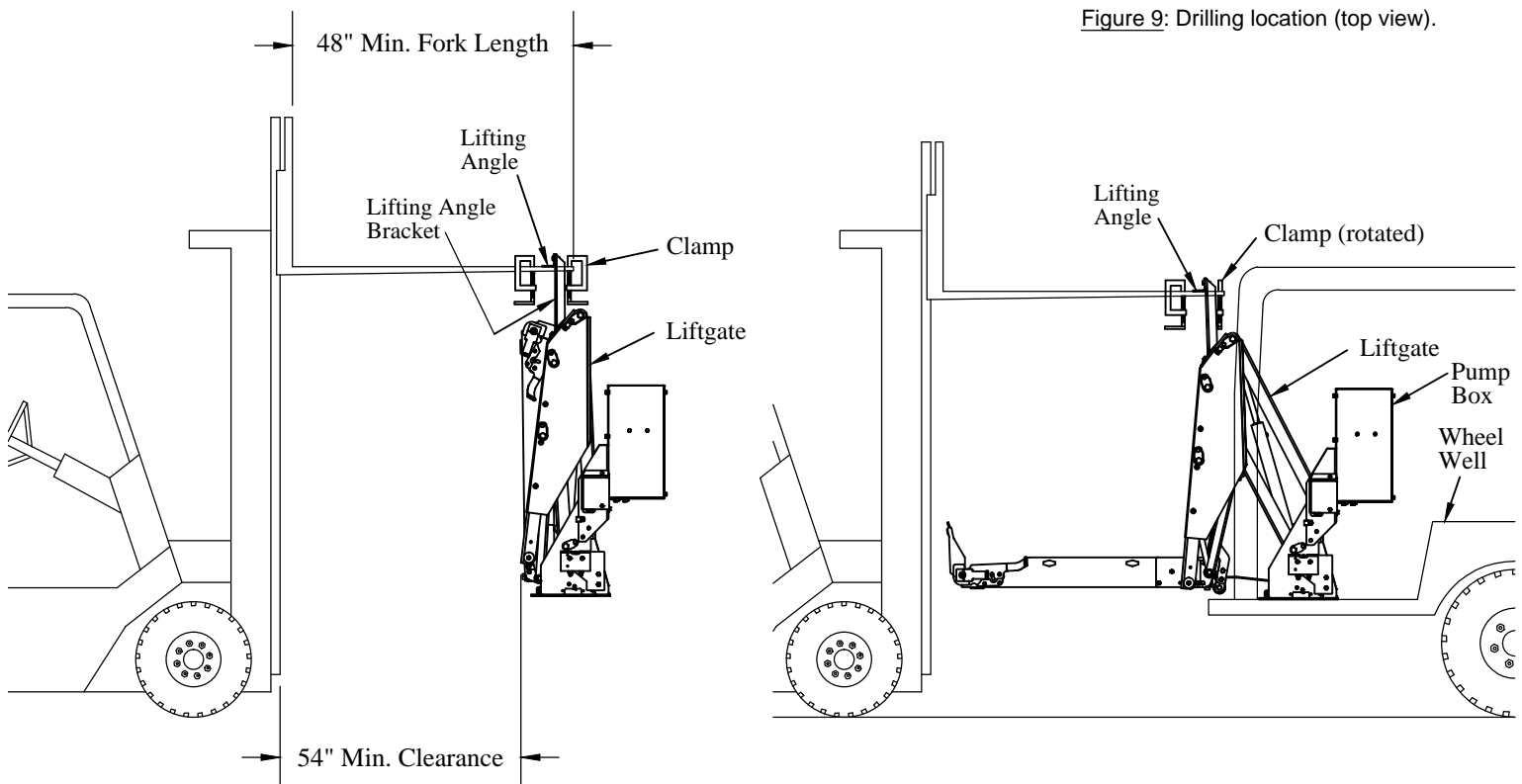


Figure 10: Lifting angle.

## V2 Series Mounting Instructions

### Installing the Liftgate (continued)

10. **Install** a square washer, 3/8" flat washer, and lock nut on the "J" and "K" location bolts (Figure 11).  
Do not tighten at this time.
11. **Install** a rear support angle #1, 3/8" flat washer, and lock nut on each of the "P" location bolts (Figure 11).  
There is a driver side and a passenger side version of the rear support angle #1. Do not tighten at this time.
12. **Install** one (1) rear support angle #2 on the forward flange of each rear body mount (Figure 11). Use supplied 3/8" x 1" bolts, flat washer, lock washer, and hex nut. Hold the rear support angle #2 tight against rear support angle #1 when tightening.

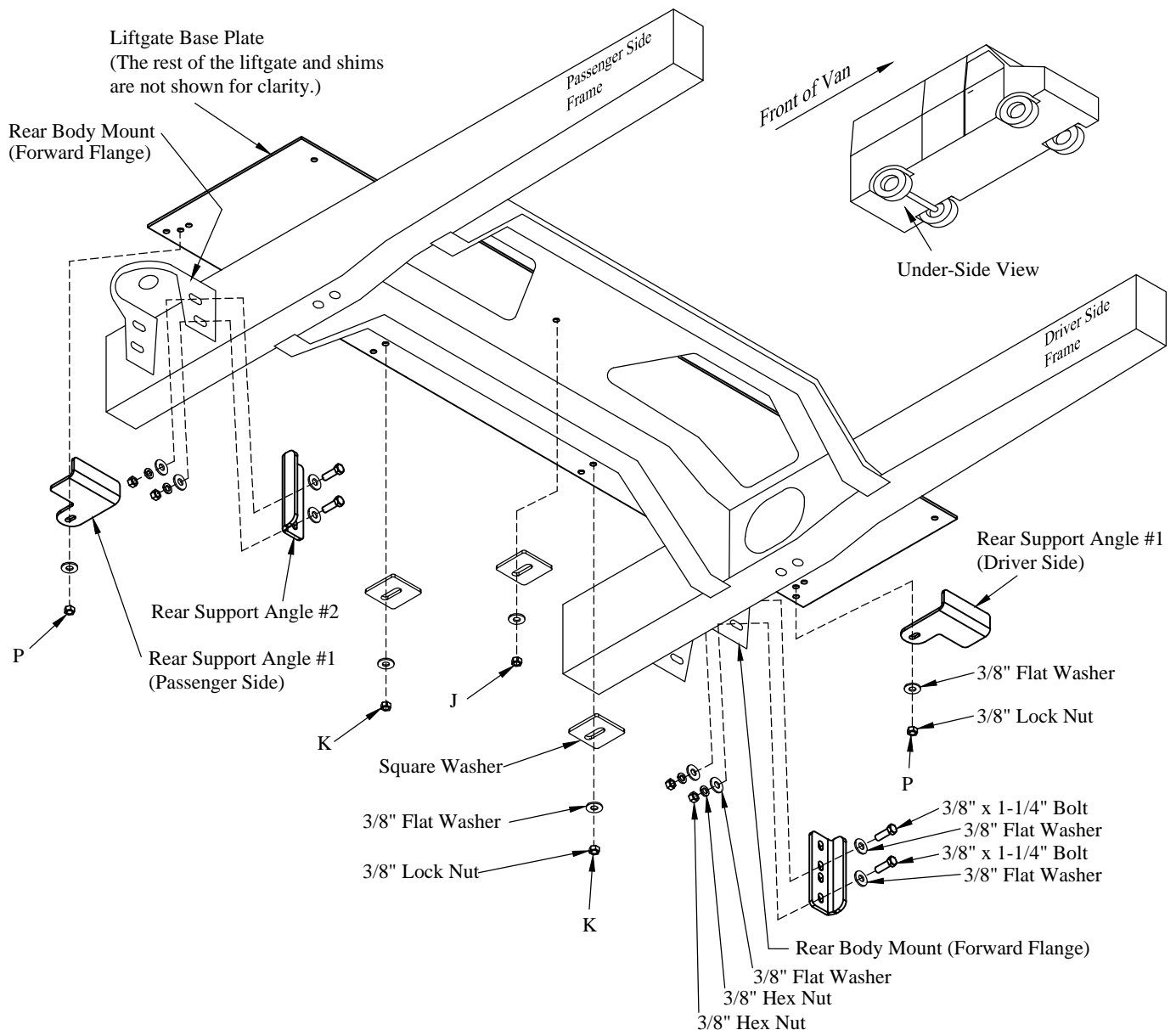


Figure 11: Under-side view of van.

## V2 Series Mounting Instructions

### Installing the Liftgate (continued)

13. **Install** a top bracket and top angle on each "F" and "B" locations (Figure 12). Do not tighten at this time.
14. **Attach** bottom brackets to top brackets using supplied 3/8" bolts, flat washers, lock washers and nuts (Figure 12). Do not tighten at this time.
15. **Install** a bottom angle to the bottom of each bottom bracket. There is a driver side and passenger side version of these parts.
16. **Install** the bottom brackets to the bottom of the van frame (Figure 12). Use backer plate inside the van frame. There is a driver side and passenger side version of these parts. Do not tighten at this time.
17. **Tighten** the base plate bolts in an alternating pattern. Do not over tighten "J" or "P" location bolts and warp the base plate or crush the body cross member.
18. **Tighten** the bolts that go into the bottom of the van frame.
19. **Tighten** all remaining mounting hardware.

Liftgate Base Plate

(The rest of the liftgate and shims are not shown for clarity.)

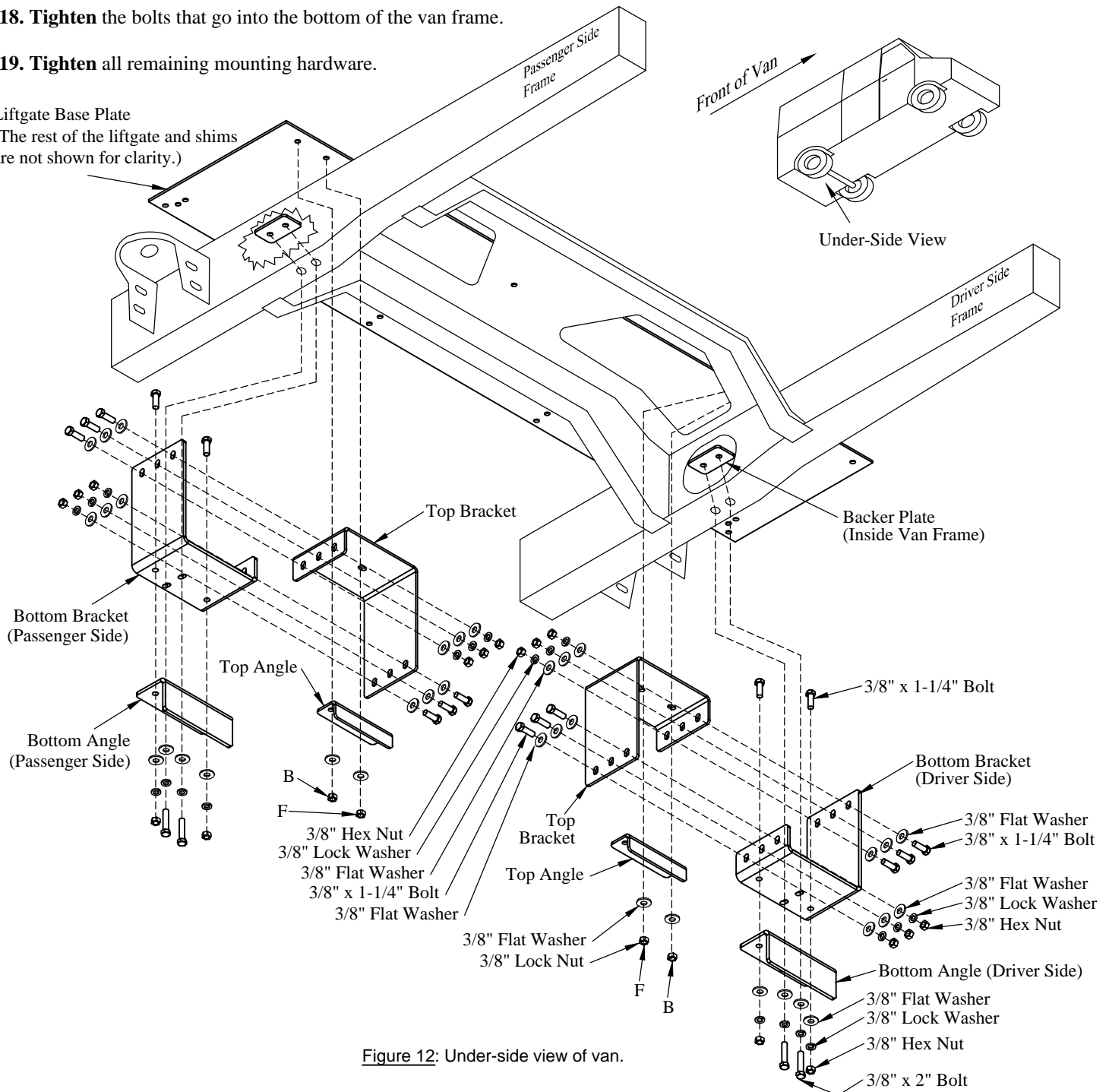


Figure 12: Under-side view of van.

## V2 Series Mounting Instructions

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### Routing the Power Cables

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1. **Install** the circuit breaker on the vehicle fender, firewall, or other location inside the engine compartment away from moving parts. Leave enough room for the power cables to be installed and so that the circuit breaker can easily be reset (Figure 14).

Note: Any time a hole is drilled in the vehicle, apply rust preventative to the bare metal.

2. **Check** for obstructions before drilling in the next steps.

3. **Drill** and **Deburr** a 1-1/4" hole in the van floor, near the power unit, to run the power cables through. Use the supplied rubber grommet to protect the power cables from the sharp sheet metal edge of the drilled hole.

Note: Follow the *Tommy Gate Recommended Electrical Wiring Guidelines* and wiring diagram (Figure 16) in the following steps.

4. **Route** the power cables under the vehicle from the liftgate, along the frame, to a location near the battery (Figure 14).
5. **Pull** the excess cable beyond the battery.
6. **Separate** the positive(+) and negative(-) leads.
7. **Cut** the positive(+) lead to the length required to reach the auxiliary (AUX) terminal of the circuit breaker.
8. **Cut** the remaining positive(+) lead long enough to reach from the circuit breaker battery (BAT) terminal to the positive(+) battery terminal.
9. **Cut** the negative(-) lead to the length required to reach the negative battery terminal.

<p><b>Important:</b> The pump and motor unit for this lift can require significant electrical power at 12 volts D.C. Be sure that the negative(-) ground lead is securely connected to a sufficient vehicle ground point.</p>
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## V2 Series Mounting Instructions

### Routing the Power Cables (continued)

10. **Install** the copper lugs and heat shrink tubing on all required ends.
11. **Connect** the circuit breaker and battery as outlined in the *Tommy Gate Recommended Electrical Wiring Guidelines* and wiring diagram (Figure 16).
12. **Check** for obstructions before using the self-drilling screws in the next step.
13. **Install** the plastic circuit breaker cover over the circuit breaker using the supplied #12 self-drilling screws (Figure 13).

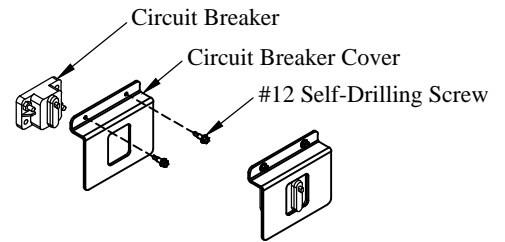


Figure 13: Circuit breaker cover.

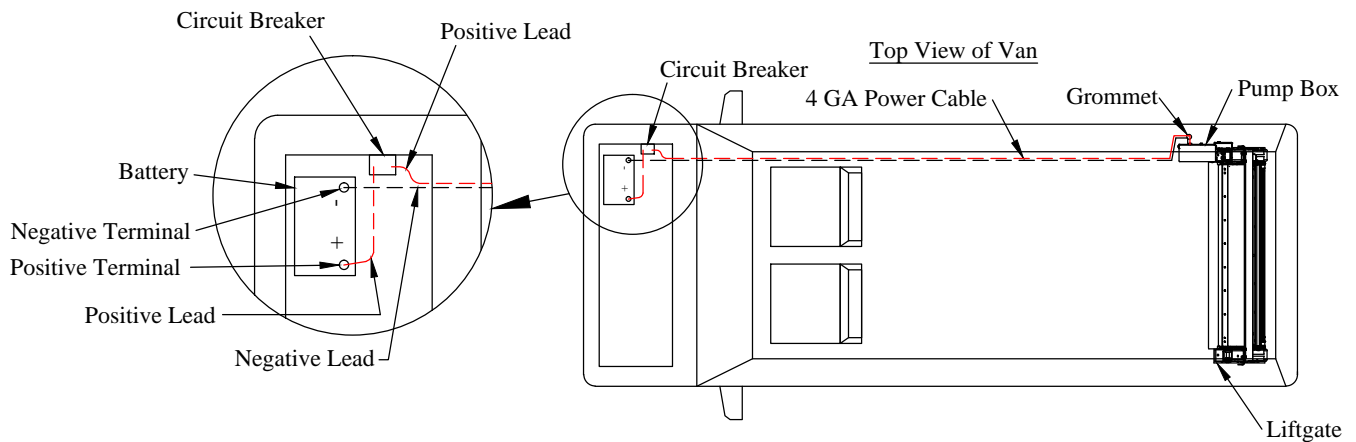


Figure 14: Electrical routing.

### Installing the Floor Transition

1. **Position** the floor transition with one side on the liftgate and the other side on the van floor (Figure 15).
2. **Check** for obstructions before using the self-drilling screws in the next step.
3. **Secure** the floor transition to the van floor with the provided #8 self-drilling screws (1-1/4" or 2" long screws).

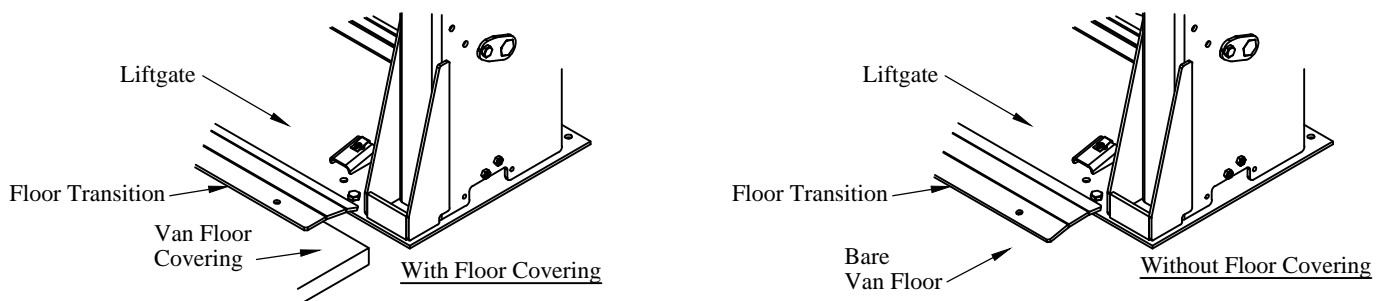


Figure 15: Floor transition.



## ELECTRICAL WIRING DIAGRAM

### Pendant Control

**!!! PLEASE READ AND FOLLOW ALL DIRECTIONS BEFORE PROCEEDING !!!**



**NOTE !!! IF GATES ARE NOT WIRED  
IN ACCORDANCE WITH THIS DIAGRAM  
YOUR WARRANTY WILL BE VOID.**



**WELDING NOTE !!! DISCONNECT ALL BATTERY CABLES. ALWAYS DISCONNECT THE GROUND CABLE FIRST. ATTACH THE WELDING GROUND TO THE TRUCK RATHER THAN THE LIFTGATE.**

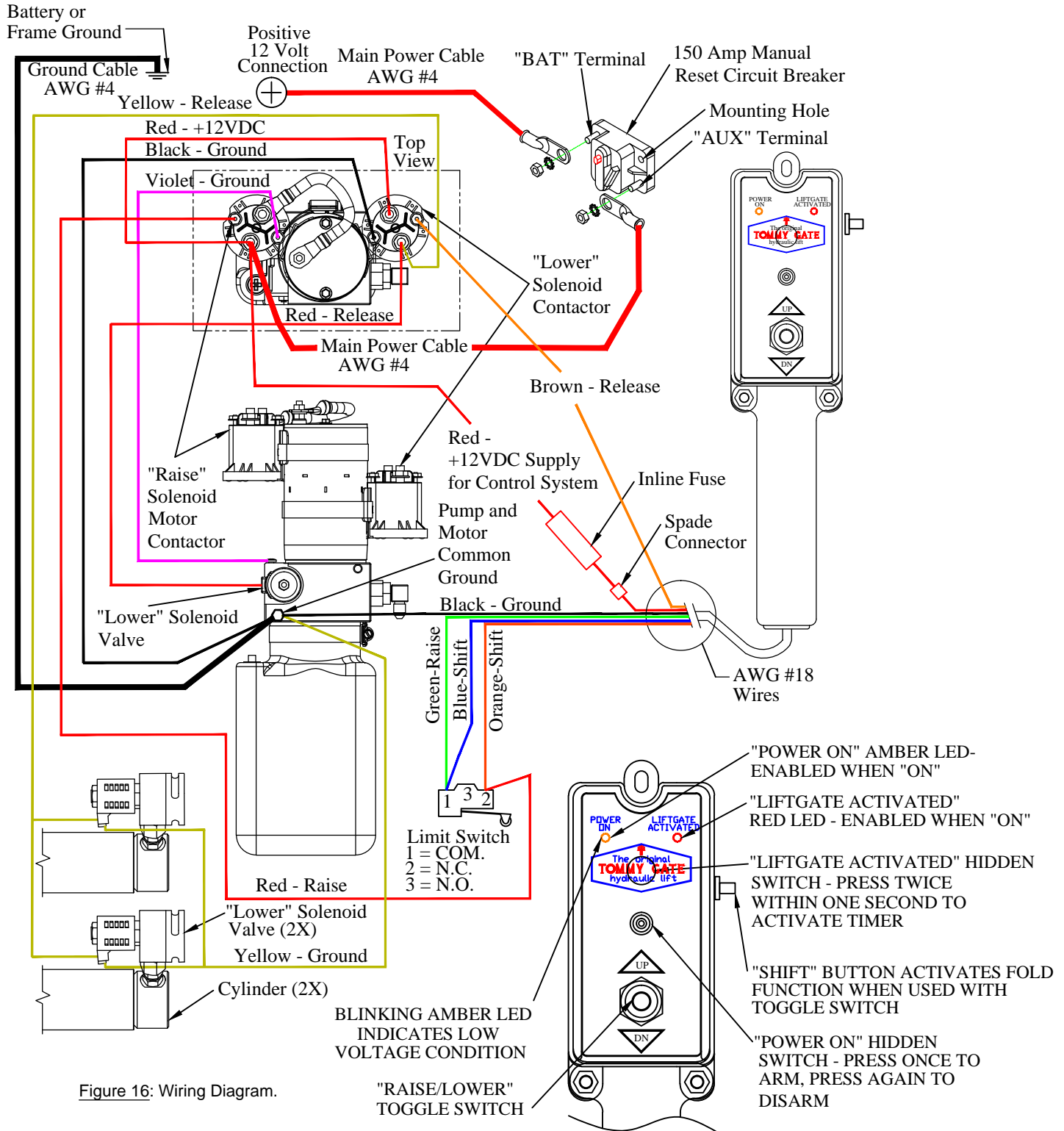


Figure 16: Wiring Diagram.



## Ladder Logic/Wiring Diagram

Legend	
	Circuit Breaker
	Push Button
	Toggle Switch
	Limit Switch
	Contactor - Normally Open Contacts
	Motor
	Solenoid/Contactor - Coil
	Battery Cable
	Wire
	Grounded through motor chassis.
	Quick Disconnect
	Eyelet Terminal
	Splice
	Fuse

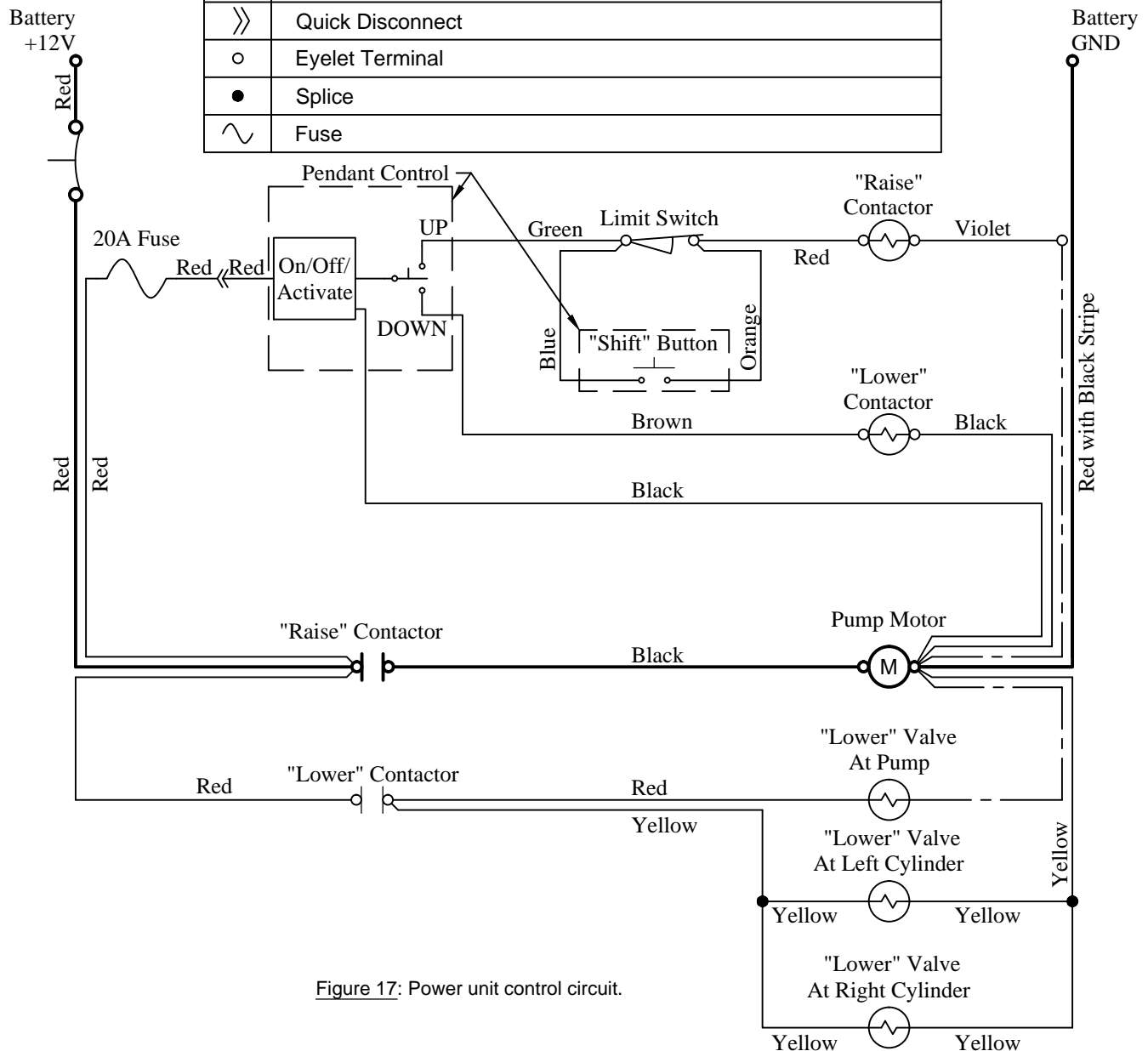


Figure 17: Power unit control circuit.

## V2 Series Mounting Instructions

### Finishing the Liftgate Installation

1. **Install** the "Do's and Do Not's" decal in a highly visible area in the vehicle cab. This decal is with the Owner's / Operator's Manual.
2. **Verify** that all mounting bolts and nuts have been installed and tightened.
3. **Reinstall** base plate cover on base plate with the screws previously removed (Figure 3).
4. **Apply** sealant to holes drilled in the floor for electrical cable routing.

**Caution:** Keep all foreign objects (body parts, tools, load weights, etc) away from the liftgate assembly and away from pinch points at all times when operating the liftgate.

5. **Unbolt** and **Remove** the lifting angle and brackets (Figure 18). There are weld nuts inside the vertical arm.
6. **Reinstall** two 3/8" bolts removed in previous step in driver side vertical arm.
7. **Select** a location to install the control hanging bracket. Use a location on the passenger side rear corner post of the van at a height that allows the entire pendant cord to be completely inside the van when stored (Figure 19).
8. **Lower** the liftgate to the ground.
9. **Clean** the location selected to ensure that it is free from dirt, oil, and grease.
10. **Remove** adhesive backing from control hanging bracket.
11. **Hold** the control hanging bracket with adhesive against the door pillar with firm pressure for one minute.
12. **Install** second control hanging bracket with supplied 3/8" bolts on the passenger side vertical arm where the lifting angle was removed (Figure 18).
13. **Reinstall** the spare tire. Make sure there are not any sharp screws or bolts that will puncture the tire when it is installed.

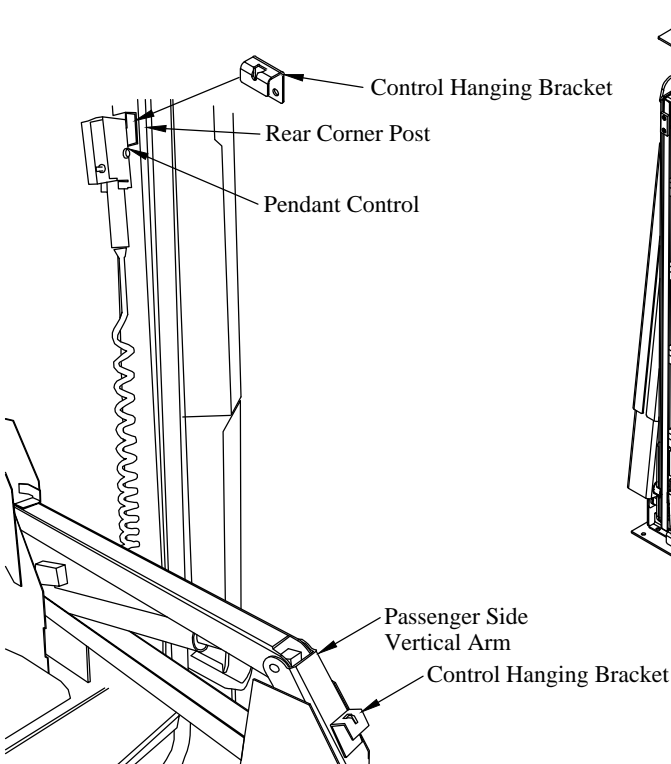


Figure 19: Control Hanging Brackets.

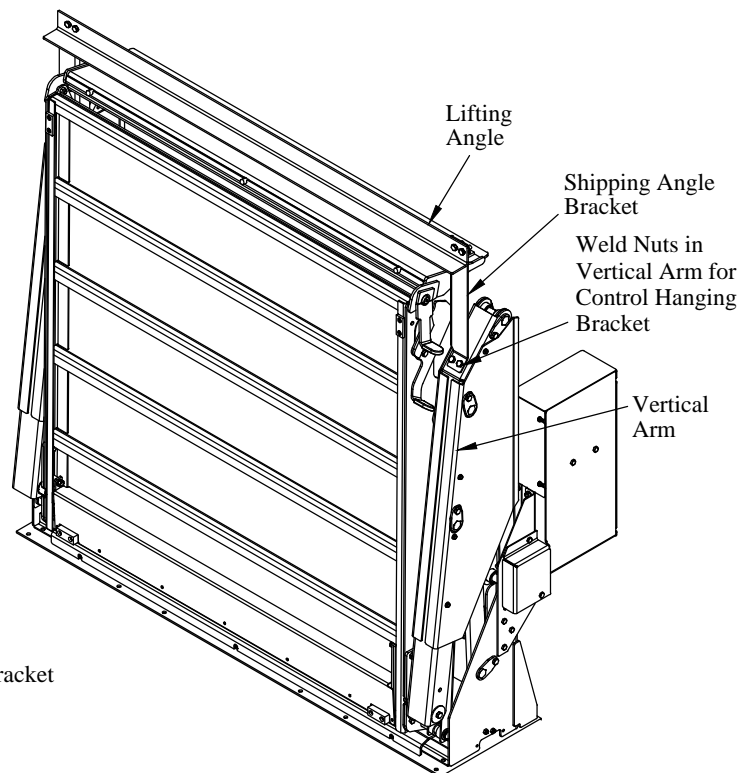


Figure 18: Lifting angle and vertical arm.

### Adjusting the Platform to Stop at Bed Height

1. **Lower** the platform below bed height.
2. **Raise** the platform as high as it will go with just the pendant toggle.
3. **Check** if the platform loading surface is even with base plate cover (Figure 22).  
If it is even, skip to the next section.  
If it is not even, proceed to the next step.
4. **Position** the platform so that it is even with the top of the base plate cover (Figure 22).
5. **Remove** the limit switch cover by removing two (2) 5/16" bolts and nuts (Figure 20).
6. **Loosen** the bolts holding the limit switch (Figure 20).
7. **Move** the limit switch out and then back in until it just clicks.
8. **Tighten** the limit switch bolts with the limit switch in the position described in the previous step.
9. **Install** the limit switch cover with 5/16" bolts and nuts. Be careful not to over tighten the 5/16" bolts (Figure 20).

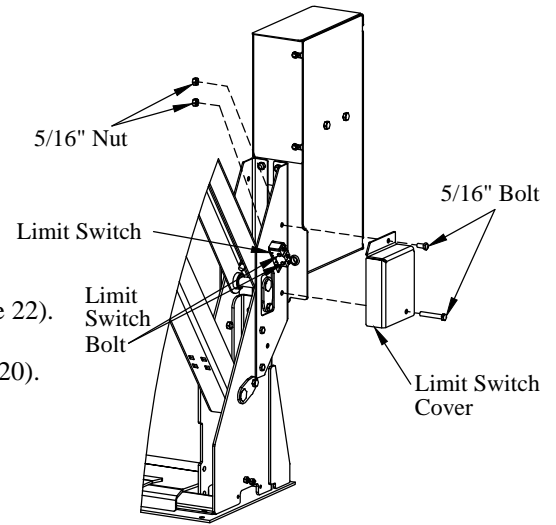


Figure 20: Limit Switch.

### Adjusting the Platform Tilt

1. **Park** the vehicle on level ground.
2. **Lower** the liftgate to the ground. Make sure the liftgate clears the bumper.  
The platform taper end should touch the ground.  
The platform taper end and the hinge end should touch the ground at about the same time.

Note: If the platform tilt is properly adjusted, skip to the next section. Otherwise proceed to the next step.

3. **Adjust** the platform set screws until the platform taper end just rests on the ground (Figure 21).  
Turn the set screws in to raise the taper end, and out to lower the taper end.

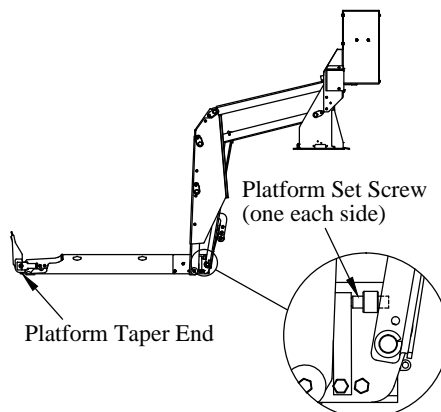


Figure 21: Platform.

### Adjusting the Threshold Bridge

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1. **Raise** the platform as high as it will go with just the pendant toggle (Figure 22).
2. **Lower** the platform 1".
3. **Adjust** each bridge close wheel so that it is tight against the bottom of the threshold bridge (Figure 22).
4. **Verify** that:
  - The bridge and bridge close wheels do not hit the bumper, as the lift is lowered.
  - The bridge comes to rest on the base plate cover, without jamming into the base plate cover, when raised to bed height.
5. **Raise and Close** the platform.
6. **Verify** that the rear doors will close without hitting the platform.
7. **Remove** platform stop shims, if needed on FA34 platform, for more door clearance.  
Make sure to use the same number of shims in each side (Figure 23).

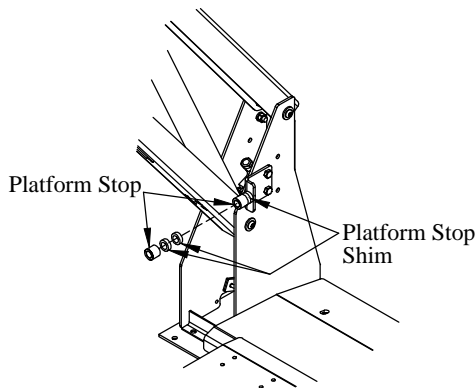


Figure 23: Platform stops.

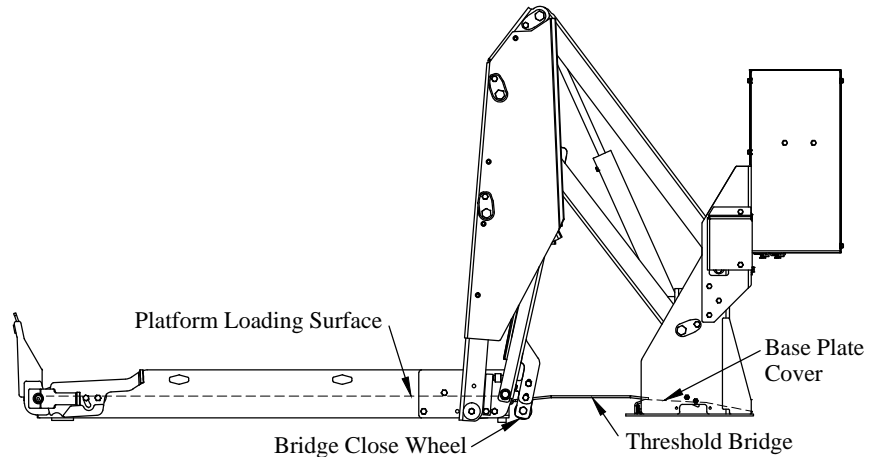


Figure 22: Platform and threshold bridge.

### Testing the Operation of the Liftgate

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**Caution:** Keep all foreign objects (body parts, tools, load weights, etc) away from the liftgate assembly and away from pinch points at all times when operating the liftgate.

1. **Check** operation of the safety control for proper lift operation.  
Be sure the "liftgate activated" light shuts off automatically after 90 seconds of not being used.
2. **Raise** and **Lower** the unloaded platform on a flat surface. The platform should stay even from side to side.  
The liftgate power unit should raise and lower the unloaded platform smoothly and easily.
3. **Load** the platform with the rated capacity as described in the Owner's / Operator's Manual and **Measure** the time necessary to raise the platform. The platform should be fully raised in about 18 seconds.
4. **Examine** the platform for any downward creep.  
With the platform raised and loaded, you should not be able to see the platform creeping down.
5. **Time** the lowering operation with the platform still loaded.  
The platform should reach the ground in about 6 seconds (time may be longer in cold weather).
6. **Remove** the load from the platform and **Examine** the liftgate and vehicle for any problems such as hydraulic oil leaks, loose wiring, etc.
7. **Raise** and **Fold** the platform using the "shift" button on the control.  
Be sure the folding function requires the use of the "shift" button.
8. **Hang** the control on the control hanger on the door pillar.
9. **Place** Owner's / Operator's Manual in the vehicle.

### Painting the Liftgate (if needed)

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Your Tommy Gate has been primed with a gray polyurethane and painted with a black semi-gloss polyurethane topcoat to protect it from the environment. No additional paint is required unless shipping or installation damage or outdoor storage exposure has deteriorated the Tommy Gate paint. **Tommy Gate will not be responsible for shipping or installation damage or outdoor storage exposure that has marred or otherwise deteriorated the Tommy Gate paint.**

If you need to refinish the liftgate you should do the following:

1. **Remove** any dirt, oil, grease, salt, or other contamination by washing with a mild detergent solution.
2. **Rinse** thoroughly with fresh water and allow to dry.
3. Lightly **Scuff Sand** the Tommy Gate topcoat.
4. **Sand** and **Spot Prime** any area of the Tommy Gate paint that shows signs of damage or deterioration.
5. **Mask** off all safety decals, cylinder shafts and vents before painting.

**Warning:** Paint over spray on the cylinder shaft(s) or vent(s) will damage the cylinder seals and void warranty.

6. After proper cleaning and surface preparation, **Apply** desired finish coat per paint manufacturer's recommendations.
7. **Remove** the masking from the safety decals and cylinders.
8. **Check** to ensure that all decals are clean and legible. Additional decals are available from the factory, if needed.

## **WIRE ROUTING**

- (1) When routing wires, avoid heat (above 180°F), abrasion, vibration, metal edges, screws, and trim fasteners. If such routings are not possible, protective devices must be used. If wires must cross a metal edge, the edge should be covered with a protective shield and the wiring fastened within 3 inches on each side of the edge.
- (2) Grommets must be used where wires pass through holes in sheet metal, castings, and / or frame rails. Do not bend wires in a radius smaller than 10 times the wire diameter.
- (3) Routing wires into areas exposed to wheel wash should be avoided. If this cannot be avoided protective shields are required to protect the wires from stones, ice, salt and water damage. Provide a drip loop to prevent moisture from being conducted into switches, relays, circuit breakers, and fuses.
- (4) Wires should be supported every 18 inches with plastic zip ties or rubber-lined clips.
- (5) Wires must be routed to clear moving parts by at least 3 inches unless positively fastened or protected by a conduit. If wiring must be routed between two members where relative motion can occur, the wiring should be secured to each member, with enough wire slack to allow flexing without damage to the wire.
- (6) Maintain at least a 6 inch clearance from exhaust system components. If this is not possible, high temperature insulation and heat shields are required. Existing OEM heat shields, insulation, and wire shielding must be maintained.
- (7) Do not route or attach electrical wires to fuel lines. Route electrical wires at least 1-1/2 inches away from the engine.

## **BATTERY, WIRE, TERMINALS, AND CONNECTORS**

- (1) Wire attachments at the battery must be protected from tension loads so there is no undue strain on the battery terminals. Wires should be routed down rather than horizontally from the terminals with no sharp bends adjacent to the connections.
- (2) Battery power for your Tommy Gate should come directly from the battery or approved connection point through the supplied circuit breaker or fuse. The circuit breaker or fuse should be installed as close to the battery as possible.
- (3) Avoid splicing power cables. If splicing is necessary, the most durable splice joint will be bare metal barrel crimped, flow-soldered and covered with adhesive lined heat shrink tubing. Strip the wire ends making sure that individual conductor strands are not damaged. Use only rosin core solder, proper crimping tools, and wire with a gauge at least equivalent to the circuit being lengthened. Do not use electrical tape.
- (4) Battery cable terminals will be bare metal barrel crimped or flow-soldered and covered with adhesive lined heat shrink tubing.
- (5) Use wire connectors with locking features such as positive locking, inertia locking, bolt together, and soft mold-over with locking external retainers.

## **GENERAL**

- (1) All frame contact areas must be wire brushed to bare metal, free of paint, dirt, and grease. Frame connections must be made using hardened flat washers under the bolt head and lock nuts. Corrosion preventive grease or compound is to be applied to the terminal area of the frame connection.
- (2) Frame cross members are not recommended as part of the ground return.
- (3) All circuit breakers and fuses should be located in one easily serviceable location with a means provided for identification of circuit function and current rating. If possible, avoid putting circuit breakers or fuses in the vehicle cab.
- (4) Before welding to the chassis disconnect the battery. Also disconnect the power train, engine, valve, and transmission control modules.
- (5) Do not alter vehicle ignition, starting, and / or charging systems. Do not reroute engine compartment wiring.
- (6) Full copper circuitry and standardized polarity grounds are recommended.
- (7) Never increase the rating of a factory installed fuse or circuit breaker.
- (8) Disconnect the battery negative (ground) wire prior to any vehicle modification.

Following the above guidelines will provide you with years of trouble free service. Failing to incorporate the above guidelines may result in a voided warranty. Non-compliance with the guidelines above may result in a failure of electrical components, shutdown of engines, loss of backup brake systems, and the possibility of fire.