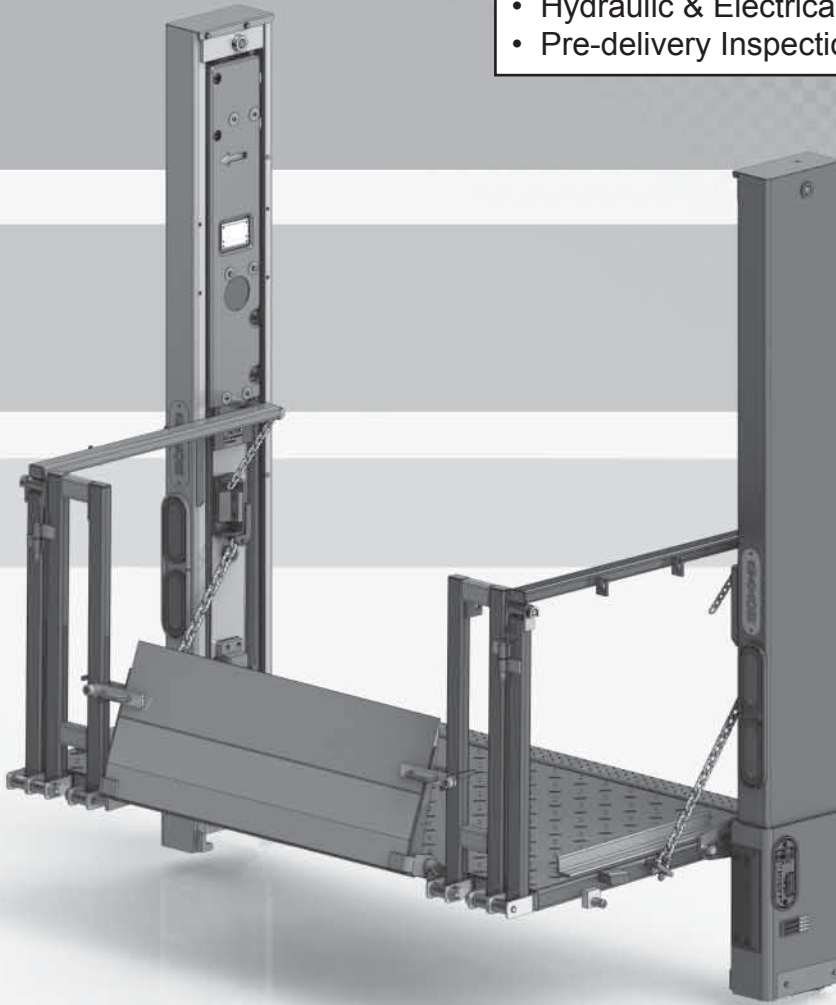


**M-16-13  
REV. G  
APRIL 2021**

### **Installation Manual Contains:**

- Warnings & Safety Instructions
- Requirements - Body Strength & Installed Liftgate
- Liftgate Installation Components
- Liftgate Component Installation Instructions
- Hydraulic Fluid Filling Instructions
- Decals
- Hydraulic & Electrical System Diagrams
- Pre-delivery Inspection Form



**MAXON<sup>®</sup>**  
**LIFT CORP.**

To find maintenance & parts information for your **BMR-CS Liftgate**, go to **www.maxonlift.com**. Click the **PRODUCTS**, **COLUMNLIFT** & **BMR-CS** buttons. Open the **Maintenance Manual** in the **PRODUCT DOCUMENTATION** window. For parts, click on the **PARTS PORTAL**, **COLUMNLIFT** & **BMR-CS** buttons.

# **BMR-CS**

## **INSTALLATION MANUAL**

# TABLE OF CONTENTS

<b>SUMMARY OF CHANGES: M-16-13, REVISION G.....</b>	<b>5</b>
<b>WARNINGS.....</b>	<b>6</b>
<b>SAFETY INSTRUCTIONS .....</b>	<b>7</b>
<b>VEHICLE REQUIREMENTS .....</b>	<b>8</b>
BODY STRENGTH.....	8
INSTALLED LIFTGATE .....	12
<b>LIFTGATE INSTALLATION COMPONENTS.....</b>	<b>13</b>
<b>COMPONENTS.....</b>	<b>14</b>
STEP 1 - PREPARE VEHICLE IF REQUIRED .....	19
STEP 2 - CHOOSE METHOD OF INSTALLATION.....	21
STEP 3 - POSITION LIFTGATE .....	22
METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE .....	22
METHOD 2 - WELD BOLT-ON LIFTGATE TO BODY .....	27
METHOD 3 - WELD LIFTGATE TO BODY.....	30
STEP 4 - BOLT LIFTGATE TO VEHICLE.....	33
STEP 5 - REMOVE LOWER SUPPORT FIXTURES .....	38
STEP 6 - POSITION PUMP BOX FRAME .....	39
STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE .....	41
STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES.....	47
RUN GRAVITY DOWN HYDRAULIC LINES .....	48
TORQUE VALUES FOR HYDRAULIC CONNECTORS.....	50
RUN POWER DOWN HYDRAULIC LINES .....	51
RUN ELECTRIC CABLES .....	53
STEP 9 - GROUND PUMP TO VEHICLE FRAME.....	58

## TABLE OF CONTENTS - Continued

STEP 10 - RUN CHARGE LINES .....	59
RECOMMENDED POWER CONFIGURATIONS .....	59
RUNNING CABLE FROM VEHICLE BATTERY .....	61
STEP 11 - CONNECT CHARGE LINES & BATTERIES.....	62
STEP 12 - PRESSURIZE HYDRAULIC SYSTEM .....	66
STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL.....	67
STEP 14 - REMOVE UPPER SUPPORT FIXTURES.....	72
STEP 15 - SECURING COLUMNS .....	73
METHOD 1 & METHOD 2 .....	73
METHOD 1 ONLY.....	74
STEP 16 - FINISH WELDING LIFTGATE TO VEHICLE .....	77
METHOD 2 & METHOD 3 - WELD LIFTGATE TO BODY .....	77
STEP 17 - CHECK CLEARANCE OF CONNECTOR BAR SIDE BRACKETS & STOP BLOCKS .....	81
STEP 18 - CHECK CLEARANCE OF RUNNER PADS .....	83
STEP 19 - PLATFORM CHAIN ADJUSTMENT .....	88
STEP 20 - PLACE "ALIGN ARROWS" DECAL .....	89
DECALS & PLATES .....	90
<b>TOUCH UP GALVANIZED FINISH .....</b>	<b>92</b>
<b>HYDRAULIC SYSTEM DIAGRAMS .....</b>	<b>93</b>
PUMP & MOTOR SOLENOID OPERATION - GRAVITY DOWN.....	93
PUMP & MOTOR SOLENOID OPERATION - POWER DOWN.....	94
GRAVITY DOWN HYDRAULIC SCHEMATIC.....	95
POWER DOWN HYDRAULIC SCHEMATIC.....	96
<b>ELECTRICAL SYSTEM DIAGRAMS .....</b>	<b>97</b>
INTERCONNECTING ELECTRICAL SCHEMATIC - GRAVITY DOWN .....	97

**TABLE OF CONTENTS - Continued**

GRAVITY DOWN SINGLE & DUAL PUMP ELECTRICAL SCHEMATIC ..... 98

INTERCONNECTING ELECTRICAL SCHEMATIC - POWER DOWN ..... 99

POWER DOWN SINGLE & DUAL PUMP ELECTRICAL SCHEMATIC ..... 100

BMR-CS ELECTRICAL & HYDRAULIC VALVES TORQUE VALUES ..... 101

**PRE-DELIVERY INSPECTION FORM..... 102**

## SUMMARY OF CHANGES: M-16-13, REVISION G

PAGE	DESCRIPTION OF CHANGE
COVER	Updated REV. and date of release.
24	Deleted dimensions between inside surfaces of mounting plates and NOTE.

Comply with the following **WARNINGS** and **SAFETY INSTRUCTIONS** while installing Liftgates. See Operation Manual for operating safety requirements.

## **WARNING**

Installing and maintaining a liftgate can expose you to chemicals, including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, install and maintain liftgate in a well-ventilated area and wear **proper Personal protective equipment (PPE)**. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## **WARNING**

- Do not stand, or allow obstructions, under the platform when lowering the Liftgate. **Be sure your feet are clear of the Liftgate.**
- **Keep fingers, hands, arms, legs, and feet clear of moving Liftgate parts (and platform edges) when operating the Liftgate.**
- **Correctly stow platform when not in use. Extended platforms could create a hazard for people and vehicles passing by.**
- **Make sure vehicle battery power is disconnected** while installing Liftgate. Connect vehicle battery power to the Liftgate only when installation is complete or as required in the installation instructions.
- **Remove all rings, watches and jewelry before doing any electrical work.**
- If it is necessary to stand on the platform while operating the Liftgate, keep your feet and any objects clear of the inboard edge of the platform. Your feet or objects on the platform can become trapped between the platform and the Liftgate extension plate.
- Never perform unauthorized modifications on the Liftgate. Modifications may result in early failure of the Liftgate and may create hazards for Liftgate operators and maintainers.
- Recommended practices for welding on steel parts are contained in the current **AWS (American Welding Society) D1.1 Structural Welding Code - Steel**. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.
- Recommended practices for welding galvanized steel are contained in the current **AWS (American Welding Society) D19.0 Welding Zinc-Coated Steel**. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.

## SAFETY INSTRUCTIONS

- Read and understand the instructions in this **Installation Manual** before installing Liftgate.
- Before operating the Liftgate, read and understand the operating instructions in **Operation Manual**.
- Comply with all **WARNING** and instruction decals attached to the Liftgate.
- Keep decals clean and legible. If decals are illegible or missing, replace them. Free replacement decals are available from **Maxon Customer Service**.
- Consider the safety and location of bystanders and location of nearby objects when operating the Liftgate. Stand to one side of the platform while operating the Liftgate.
- Do not allow untrained persons or children to operate the Liftgate.
- Wear appropriate safety equipment such as protective eyeglasses, faceshield and clothing while performing maintenance on the Liftgate and handling the battery. Debris from drilling and contact with battery acid may injure unprotected eyes and skin.
- Be careful working by an automotive type battery. Make sure the work area is well ventilated and there are no flames or sparks near the battery. Never lay objects on the battery that can short the terminals together. If battery acid gets in your eyes, immediately seek first aid. If acid gets on your skin, immediately wash it off with soap and water.
- If an emergency situation arises (vehicle or Liftgate) while operating the Liftgate, release the control switch to stop the Liftgate.
- A correctly installed Liftgate operates smoothly and reasonably quiet. The only noticeable noise during operation comes from the power unit while the platform is raised and lowered. Listen for scraping, grating and binding noises and correct the problem before continuing to operate Liftgate.

# VEHICLE REQUIREMENTS

**NOTE:** Installer is responsible for ensuring vehicle meets Federal, State, and Local standards and regulations.

## BODY STRENGTH

### ! WARNING

**Consult vehicle body manufacturer for vehicle body strength data. Make sure the forces created by the Liftgate are within the limits prescribed by the vehicle body manufacturer.**

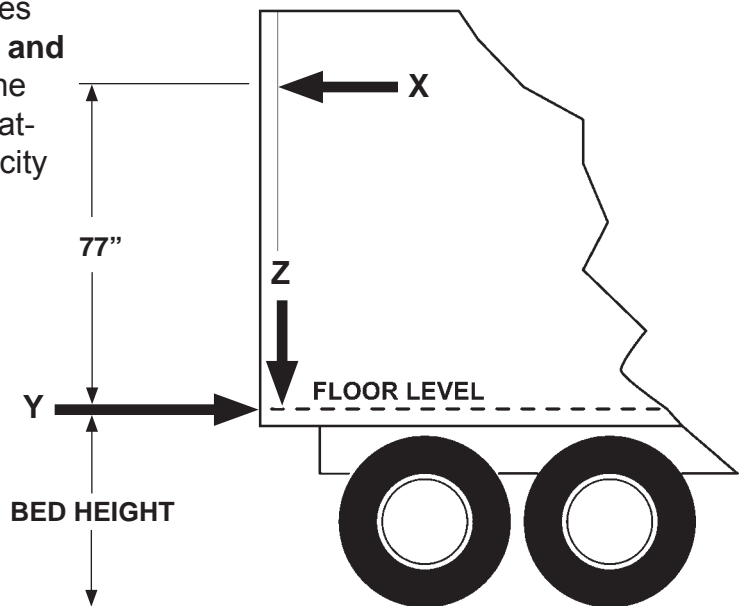
**NOTE:** Maximum operating bed height for body is **56" (Unloaded)**. Minimum bed height is **platform depth plus 5" (Loaded)**. Do not install this Liftgate on vehicle bodies equipped with swing open doors.

The BMR-CS is a body-mounted Liftgate that puts forces on the side walls of truck and trailer bodies (**FIG. 8-1**). For correct installation, truck and trailer bodies must be strong enough to withstand the tension, compression and shear forces shown in **FIG. 8-1**. Use **TABLES 9-1** and **9-2** on the following page to determine the forces that apply to the type of platform, size of platform, and load capacity of your Liftgate.

**X= Tension on each sidewall**

**Y= Compression on each sidewall**

**Z= Shear on each sidewall**



**FIG. 8-1**

## VEHICLE REQUIREMENTS - Continued

### BODY STRENGTH - Continued

MODEL CAPACITY	P/F SIZE	(X)(Y) LBS.	(Z) LBS.
BMR-CS35 3500 LBS. (GALVANIZED PLATFORM)	36" & 42"	1043	3786
BMR-CS44 4400 LBS. (GLAVANIZED PLATFORM)	36" & 42"	1262	4461

**TABLE 9-1**

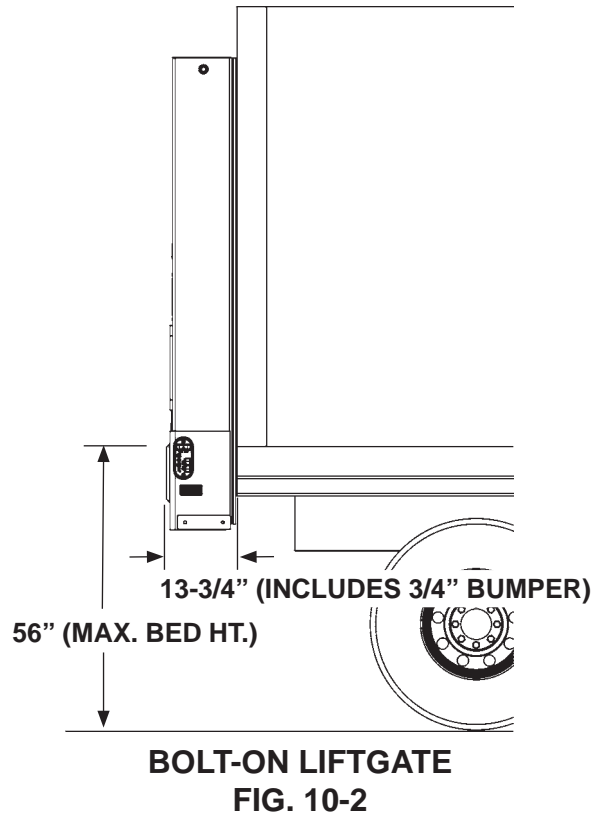
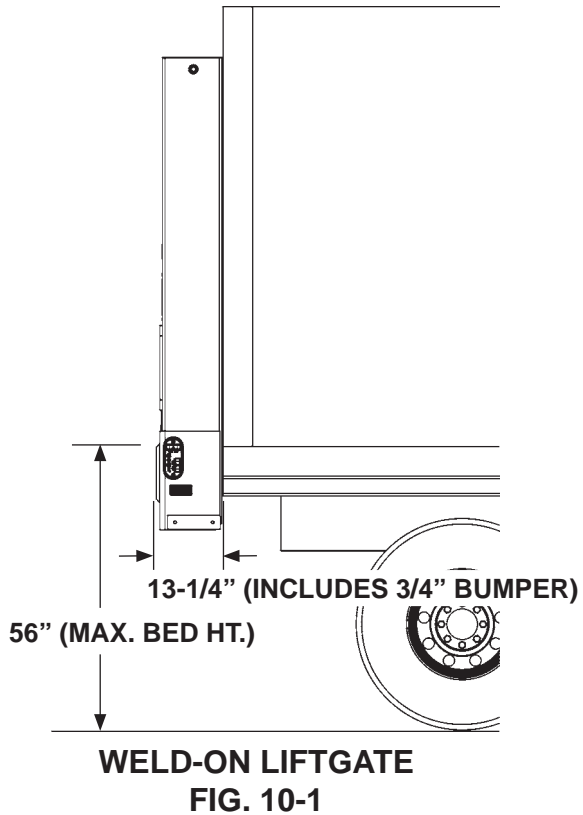
MODEL CAPACITY	P/F SIZE	(X)(Y) LBS.	(Z) LBS.
BMR-CS35 3500 LBS. (ALUMINUM STD & KNURLED PLATFORM)	36" & 42"	964	3510
BMR-CS44 4400 LBS. (ALUMINUM STD & KNURLED PLATFORM)	36" & 42"	1183	4185

**TABLE 9-2**

## VEHICLE REQUIREMENTS - Continued

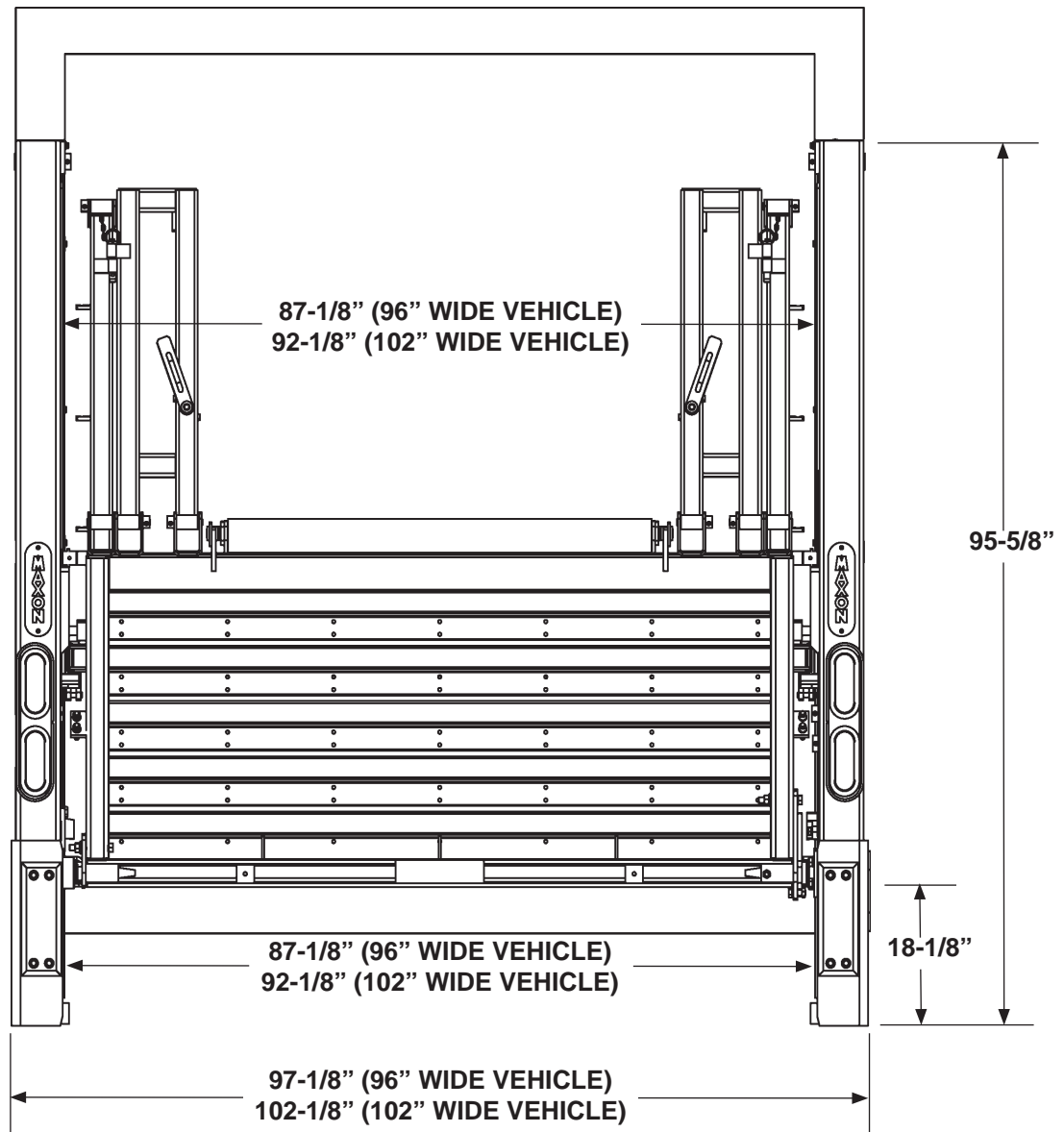
### CLEARANCE DIMENSIONS

**NOTE:** Maximum bed height is 56" (unloaded).  
Minimum bed height (loaded) varies with type and size of platform.  
Refer to **FIGS. 10-1 & 10-2**.



# VEHICLE REQUIREMENTS - Continued

## CLEARANCE DIMENSIONS - Continued



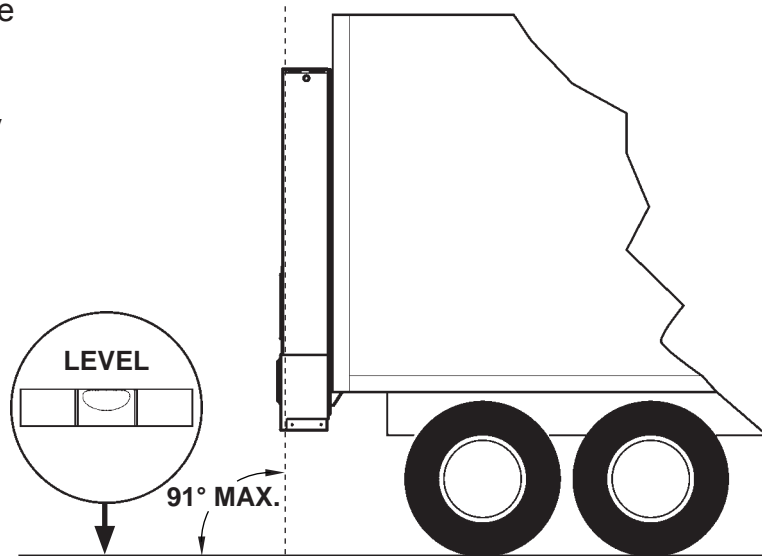
**CLEARANCE DIMENSIONS**  
**FIG. 11-1**

## VEHICLE REQUIREMENTS - Continued

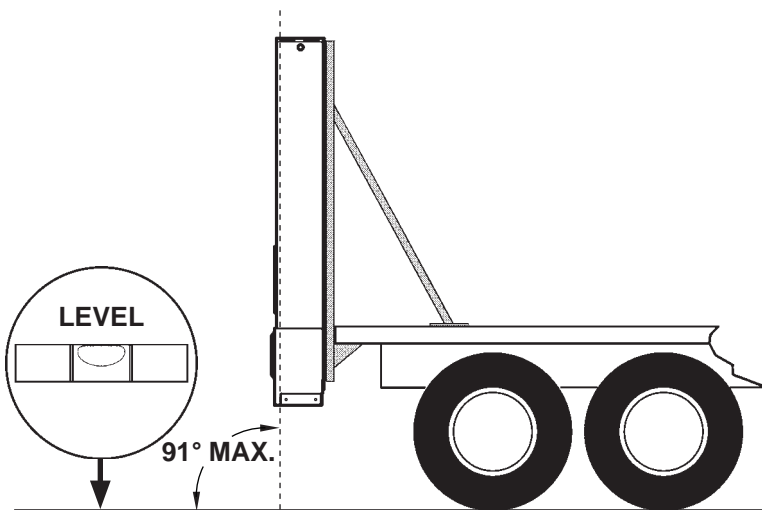
### INSTALLED LIFTGATE

**NOTE:** If Liftgate columns exceed a 91 degree angle from level ground when installed on body, or if columns cannot be mounted flush against rear of vehicle, a steel filler may be used to bridge gap between vehicle body and Liftgate columns. Make sure the added materials and welds meet the **BODY STRENGTH** requirements shown on the previous pages.

With the vehicle parked on level ground, the columns of the BMR-CS must be perpendicular to the ground (vertical) for the Liftgate to operate correctly (**FIGS. 12-1 and 12-2**).



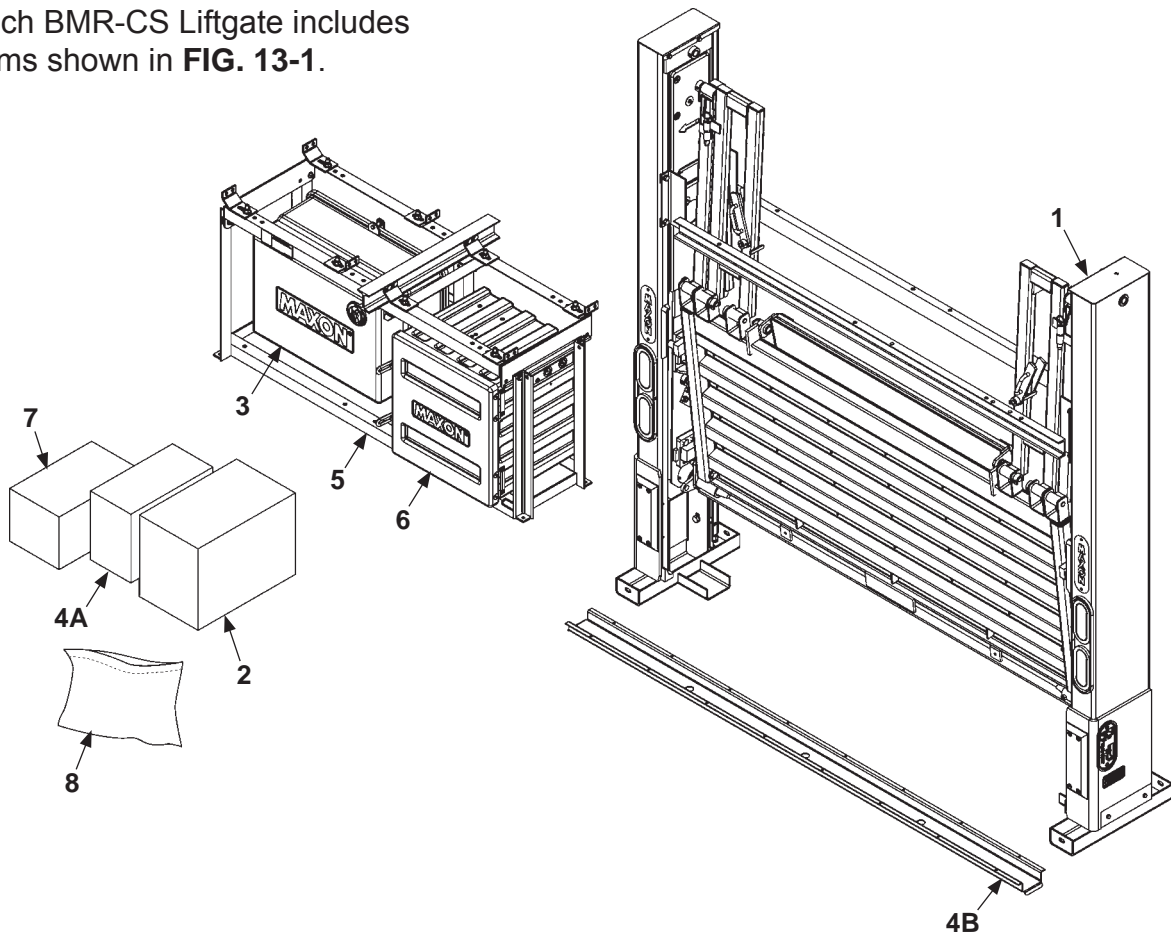
**LIFTGATE INSTALLED ON VAN BODY (COLUMNS SHOWN PERPENDICULAR TO LEVEL GROUND)**  
**FIG. 12-1**



**LIFTGATE INSTALLED ON FLAT BED (COLUMNS & SUPPORTS SHOWN PERPENDICULAR TO LEVEL GROUND)**  
**FIG. 12-2**

# LIFTGATE INSTALLATION COMPONENTS

Each BMR-CS Liftgate includes items shown in **FIG. 13-1**.



**FIG. 13-1**

DESCRIPTION	
1	BMR-CS Liftgate.
2	Hardware parts bag, mounting bracket parts bag, hydraulic lines & fittings, wiring harness, power cable, molded switch control box.
3	Pump box assembly.
4A	Pump installation kit (3', 10', 15', 20' or 28').
4B	Channel guard (for 10', 15', 20' or 28' installation kits only)
5	Frame for pump box with optional battery box is shown. A shorter frame is also available for mounting single pump box or an optional battery box.
6	Battery box (optional)
7	Optional equipment
8	Installation and operation manuals.

**TABLE 13-1**

# COMPONENTS

**NOTE:** Make sure you have components and parts before you start installing Liftgate. Compare parts in the part box and each kit box with packing list enclosed in each box. If parts and components are missing or incorrect, call:

**Maxon Customer Service**  
**Call (800) 227-4116 or**  
**Send e-mail to [cservice@maxonlift.com](mailto:cservice@maxonlift.com)**

BMR-CS MODEL	KIT, MANUALS	BOLT-ON INSTALLATION KIT, STAINLESS STEEL	BOLT-ON INSTALLATION KIT, STEEL	BOLT-ON INSTALLATION KIT, STEEL (BLACK)
ALL	296909-01	288875-111 (96" WIDE VEHICLE)		288875-131 (96" WIDE VEHICLE)
		288875-112 (102" WIDE VEHICLE)	288875-101 (96" WIDE VEHICLE)	288875-132 (102" WIDE VEHICLE)
		288875-111-150 (96" WIDE VEHICLE)	288875-102 (102" WIDE VEHICLE)	288875-131-150 (96" WIDE VEHICLE)
		288875-112-150 (102" WIDE VEHICLE)		288875-132-150 (102" WIDE VEHICLE)

**TABLE 14-1**

BMR-CS MODEL	PART BOX	3 FT PUMP BOX INSTALL KIT	10 FT PUMP BOX INSTALL KIT	15 FT PUMP BOX INSTALL KIT	20 FT PUMP BOX INSTALL KIT	28 FT PUMP BOX INSTALL KIT
BMR-CS35 PD BMR-CS44 PD	296805-02 (WELD-ON)					
	296805-12 (BOLT-ON)	297060-11	297060-12	297060-13	297060-14	297060-15
	296805-12-150 (BOLT-ON)					
BMR-CS35 GD BMR-CS44 GD	296805-01 (WELD-ON)					
	296805-11 (BOLT-ON)	297060-01	297060-02	297060-03	297060-04	297060-05
	296805-11-150 (BOLT-ON)					

**TABLE 14-2**

## COMPONENTS - Continued

BMR-CS MODEL	OPTIONS					
	SINGLE PUMP ASSY	SECOND PUMP KIT	HYDRAULIC OIL UNIVIS HVI-13	FRAME, PUMP OR BATTERY BOXES	HEADER KIT (ADJUST- ABLE)	HEADER KIT (RECESSED DOME LAMP)
BMR-CS35 GD BMR-CS44 GD	296190-12	296445-12	284098-01	288180-11G SINGLE FRAME (GALVANIZED)	289190-02 (GALVA- NIZED)	289188-11 (GALVA- NIZED, 96" WIDE VEHICLE)  289188-12 (GALVA- NIZED, 102" WIDE VEHICLE)
BMR-CS35 PD BMR-CS44 PD	296180-12			287980-11G DUAL FRAME 2 BATT BOX (GALVANIZED)  288810-11G DUAL FRAME 3 BATT BOX (GALVANIZED)		

**TABLE 15-1**

BMR-CS MODEL	OPTIONS				
	DOME LAMP RECESSED MOUNT	DOME TIMER SWITCH	AUXILIARY CONTROL	HAND HELD CONTROL	CYCLE COUNTER
BMR-CS35 GD BMR-CS44 GD	906589-01-100 (ONLY FOR HEADER KITS WITH RECESSED MOUNTS FOR DOME LAMPS)	295880-01 3' REACH	297080-11	296169-01	289537-01
BMR-CS35 PD BMR-CS44 PD		295880-02 20' REACH	297080-12		

**TABLE 15-2**

## COMPONENTS - Continued

BMR-CS MODEL	OPTIONS				
	POWER & GROUND CABLES	CONSPICUITY (REFLECTIVE) TAPE	PUMP PRESSURE GAUGE	STREET SIDE CONTROL KIT	CAB CUTOFF SWITCH (TRUCK ONLY)
BMR-CS35 GD BMR-CS44 GD	<b>295263-01</b> BASIC INSTALLATION	<b>295261-01</b>	<b>295895-01</b>	<b>297080-01</b>	<b>297077-01</b>
BMR-CS35 PD BMR-CS44 PD	<b>295263-11</b> EXTENDED INSTALLATION			<b>297080-02</b>	

**TABLE 16-1**

BMR-CS MODEL	BATTERY BOX & CHARGING OPTIONS			
	BATTERY BOX (BATTERIES NOT INCLUDED)	BATTERY 12V, 1150 CCA, BCI GROUP 31	BATTERY BOX MOUNTING FRAME	TRUCK CHARGE LINE
BMR-CS35 BMR-CS44	<b>269560-01</b> 2 BATTERIES	<b>907086</b>	<b>287990-01G</b> SINGLE GALVANIZED FRAME FOR 2 BATTERIES  <b>287929-01G</b> SINGLE GALVANIZED FRAME FOR 3 BATTERIES	<b>280290</b>
	<b>289988-01</b> 2 BATTERIES (INCLUDES DC-DC CON- VERTER)			
	<b>269950-01</b> 3 BATTERIES			
	<b>289988-02</b> BATTERIES (INCLUDES DC-DC CON- VERTER)			

**TABLE 16-2**

## COMPONENTS - Continued

BMR-CS MODEL	BATTERY BOX & CHARGING OPTIONS		
	2/0 AWG CABLE TRUCK CHARGE LINE	TRAILER CHARGE LINE FOR USE WITHOUT TRAIL CHARGER	TRACTOR CHARGE LINE FOR USE WITH OR WITHOUT TRAIL CHARGER
BMR-CS35 BMR-CS44	<b>285860-01</b>	<b>280275-01</b> SINGLE POLE  <b>280275-02</b> DUAL POLE  <b>280275-06</b> SINGLE/DUAL POLE FOR NOSE BOX  <b>280275-08</b> 1/0 AWG DUAL POLE WITH SINGLE NOSE BOX	<b>280275-03</b> SINGLE POLE  <b>280275-04</b> DUAL POLE  <b>280275-05</b> SINGLE & DUAL POLE

**TABLE 17-1**

BMR-CS MODEL	DIRECT TRAIL CHARGER OPTIONS			
	DIRECT WITH DUAL POLE CON- NECTIONS	DIRECT, DUAL COMBINATION CON- NECTIONS	DIRECT, 7-WAY CONNEC- TIONS	DIRECT, REFRIGERATED OR STRAIGHT TRUCK CONNECTIONS
BMR-CS35 BMR-CS44	<b>295219-01</b> (DIRECT-01)	<b>295220-01</b> (DIRECT-02)	<b>295211-01</b> (DIRECT-03)	<b>295972-01</b> (DIRECT-04)

**TABLE 17-2**

BMR-CS MODEL	SELECT TRAIL CHARGER OPTIONS			
	SELECT WITH REFRIGERATED & DUAL POLE CONNECTIONS	SELECT WITH DUAL POLE & 7-WAY CONNEC- TIONS	SELECT WITH DUAL COMBINATION & 7-WAY CONNECTIONS	SELECT WITH DUAL COMBINATION, REFRIGER- ATED & 7-WAY CONNECTIONS
BMR-CS35 BMR-CS44	<b>295210-01</b> (SELECT-21)	<b>295217-01</b> (SELECT-24)	<b>295218-01</b> (SELECT-25)	<b>296170-01</b> (SELECT-32)

**TABLE 17-3**

## COMPONENTS - Continued

BMR-CS MODEL	MISCELLANEOUS OPTIONS			
	200 AMP CIRCUIT BREAKER KIT	150 AMP CIRCUIT BREAKER KIT	BATTERY BOX LOCK KIT (SINGLE FRAME)	BATTERY BOX LOCK KIT (DUAL FRAME)
BMR-CS35 BMR-CS44	<b>296504-200</b> (WITHOUT BATTERY BOX)	<b>296504-150</b> (FOR TRUCK AP- PLICATION & AUX- ILIARY BATTERY)	<b>295245-02G</b> (BATTERY BOX IN- STALLED IN SINGLE FRAME)	<b>295245-01G</b> (BATTERY BOX IN- STALLED IN DUAL FRAME WITH PUMP BOX)

**TABLE 18-1**

BMR-CS MODEL	MISCELLANEOUS OPTIONS		
	DIRECT / SELECT BYPASS	MANUAL HOLDER	BATTERY STATE OF CHARGE INDICATOR
BMR-CS35 BMR-CS44	<b>295221-01</b> (BYPASSES TRAIL CHARGER OR DISCONNECTS BATTERIES FROM CHARGING SYSTEM)	<b>286328-01</b> (INSTALLS IN BAT- TERY BOX)	<b>908171-01-100</b> (INSTALLS ON BATTERY BOX)

**TABLE 18-2**

## STEP 1 - PREPARE VEHICLE IF REQUIRED

**NOTE:** Perform the following step for flatbed vehicle body only. If vehicle body is not a flatbed, skip this step.

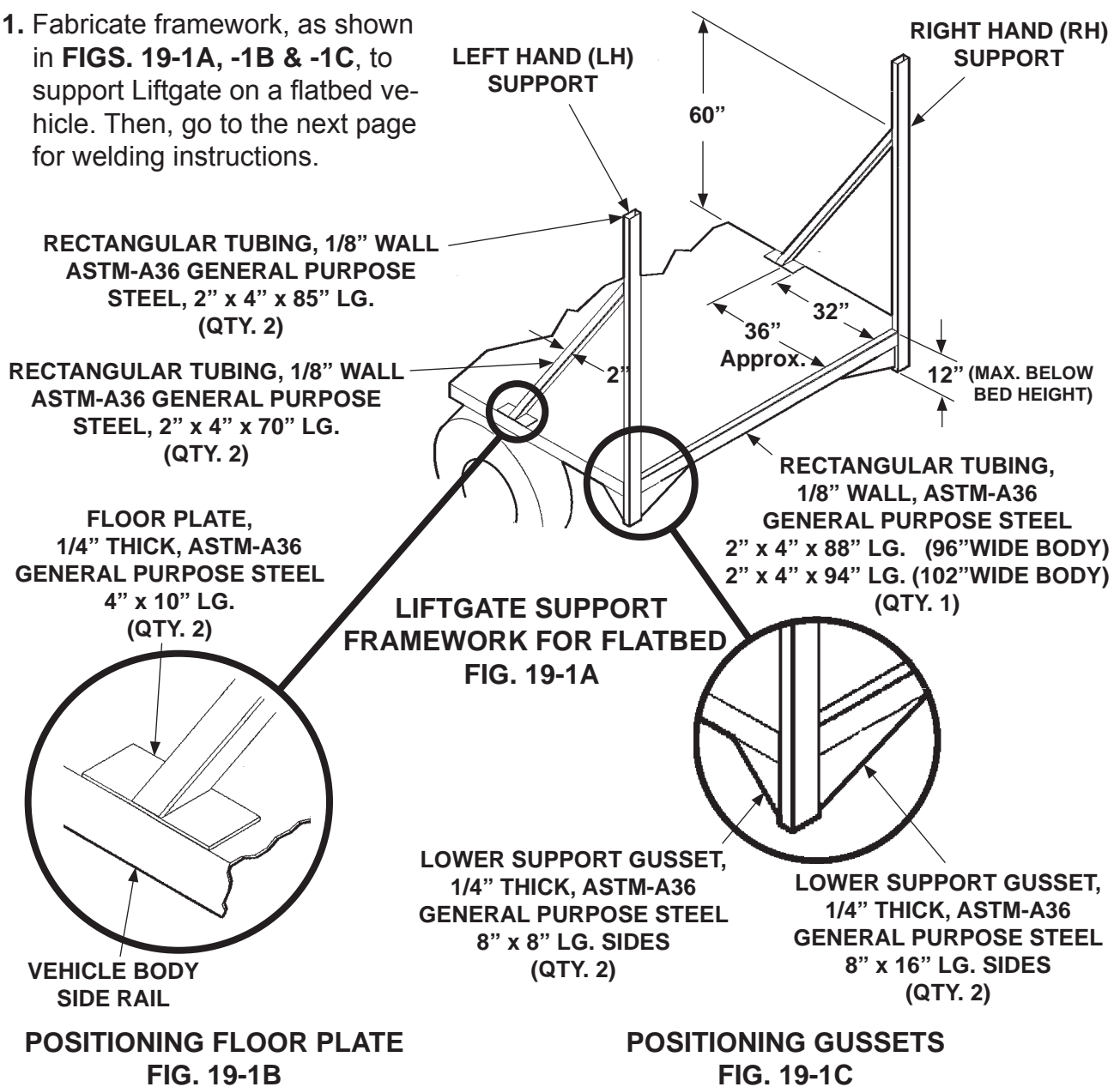
**NOTE:** LH and RH supports must be perpendicular to level ground. See **VEHICLE REQUIREMENTS, INSTALLED LIFTGATE.**

**NOTE:** Materials for support framework are not provided with Liftgate.

### ⚠ WARNING

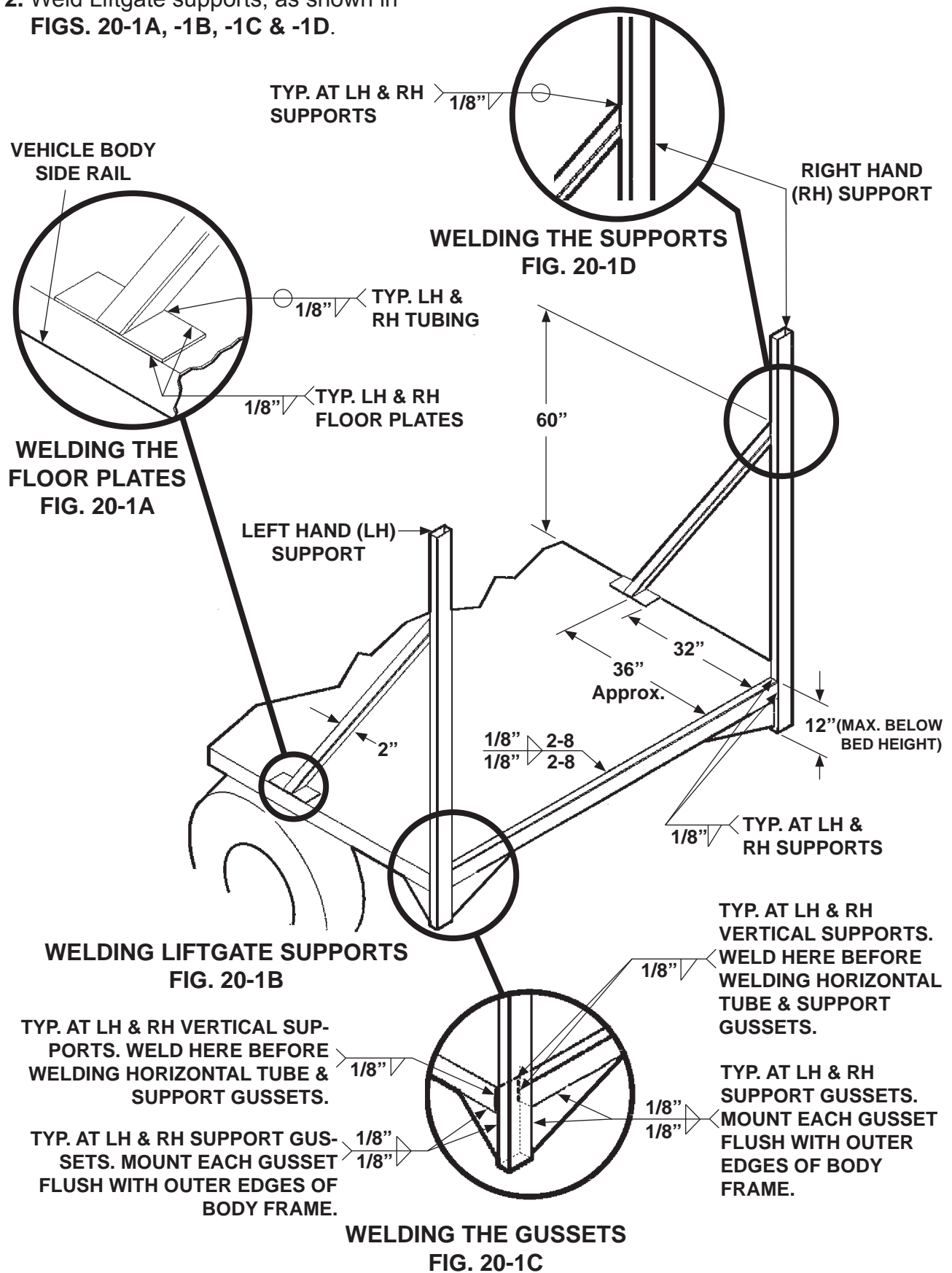
Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.

1. Fabricate framework, as shown in **FIGS. 19-1A, -1B & -1C**, to support Liftgate on a flatbed vehicle. Then, go to the next page for welding instructions.



# STEP 1 - PREPARE VEHICLE IF REQUIRED - Continued

2. Weld Liftgate supports, as shown in FIGS. 20-1A, -1B, -1C & -1D.



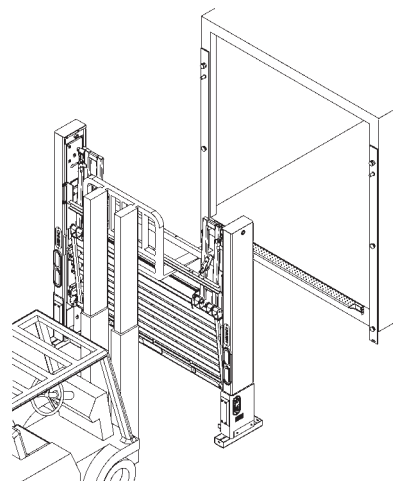
## STEP 2 - CHOOSE METHOD OF INSTALLATION

**NOTE:** MAXON recommends pre-installing the extension plate and mounting plates on the vehicle body before installing the Liftgate.

**NOTE:** In METHOD 1, the extension plate and mounting plates come separate as part of the bolt-on installation kit.

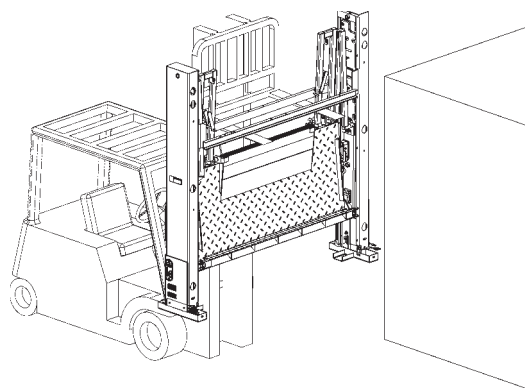
Three methods for mounting a BMR-CS Liftgate on a vehicle body are covered in this manual.

**METHOD 1** - Column mounting plates and extension plate can be welded to vehicle body before bolting on the Liftgate (**FIG. 21-1**). Refer to the **PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE** instructions in **STEP 3**.



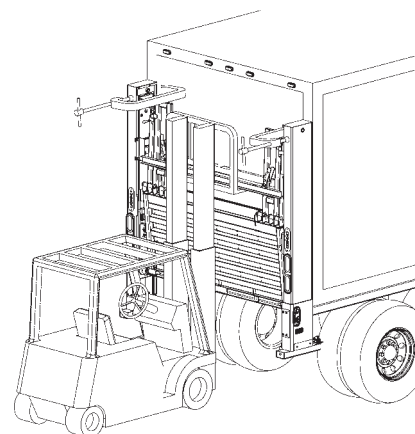
**FIG. 21-1**

**METHOD 2** - Column mounting plates and extension plate are assembled to Liftgate at factory (**FIG. 21-2**). Refer to the **WELD BOLT-ON LIFTGATE TO BODY** instructions in **STEP 3**.



**FIG. 21-2**

**METHOD 3** - Liftgate equipped with extension plate can be welded to vehicle body (**FIG. 21-3**). Refer to the **WELD LIFTGATE TO BODY** instructions in **STEP 3**.



**FIG. 21-3**

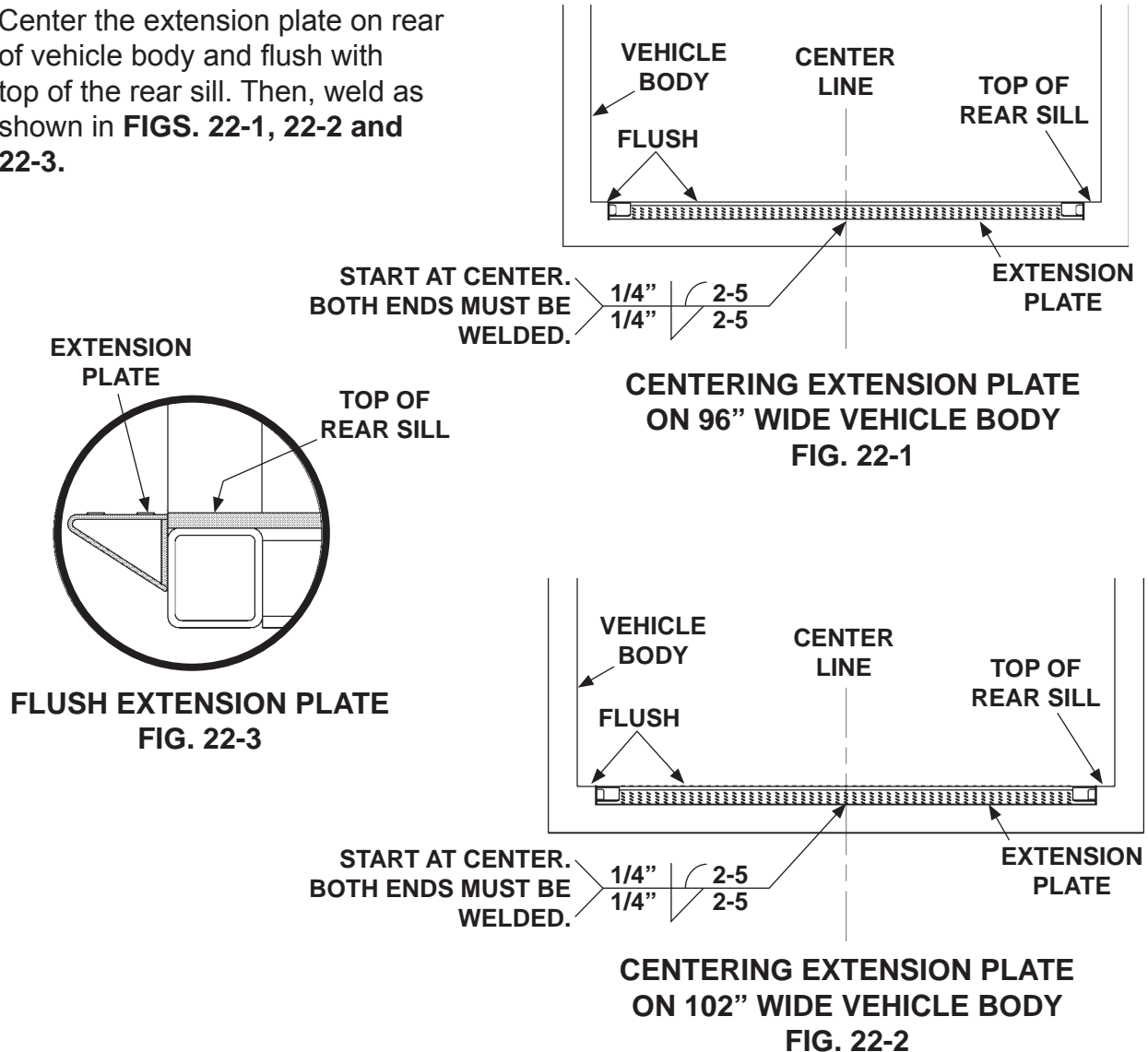
# STEP 3 - POSITION LIFTGATE

## METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE

### ⚠ WARNING

Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.

1. Center the extension plate on rear of vehicle body and flush with top of the rear sill. Then, weld as shown in **FIGS. 22-1, 22-2 and 22-3**.

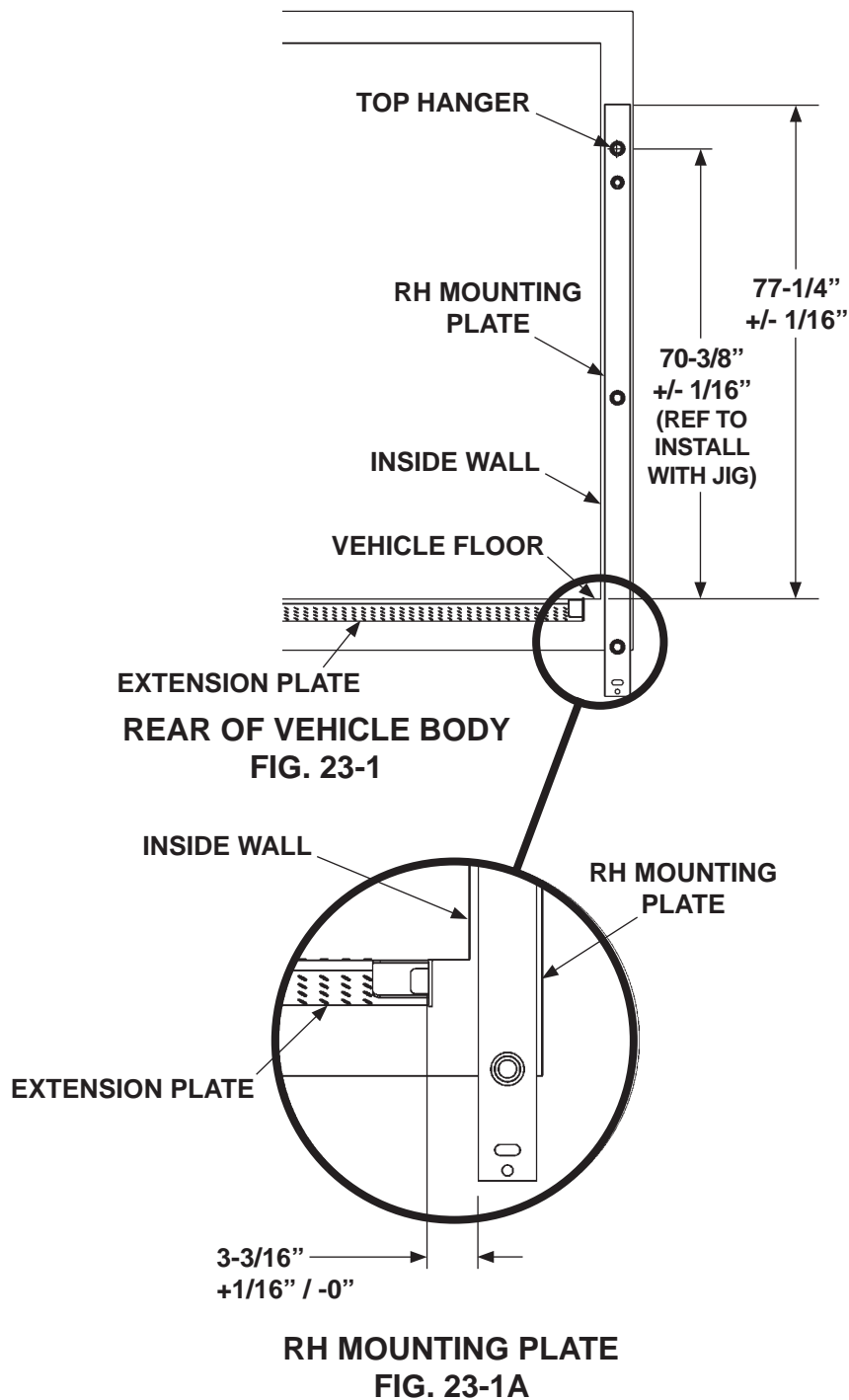


## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

**NOTE:** Distance between extension plate and RH mounting plate is measured from the inside edge of mounting plate as shown in illustration.

2. Position RH mounting plate as shown in **FIGS. 23-1 and 23-1A**.



## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

3. Position LH mounting plate on vehicle body as shown in FIGS. 24-1, 24-1A, and 24-1B.

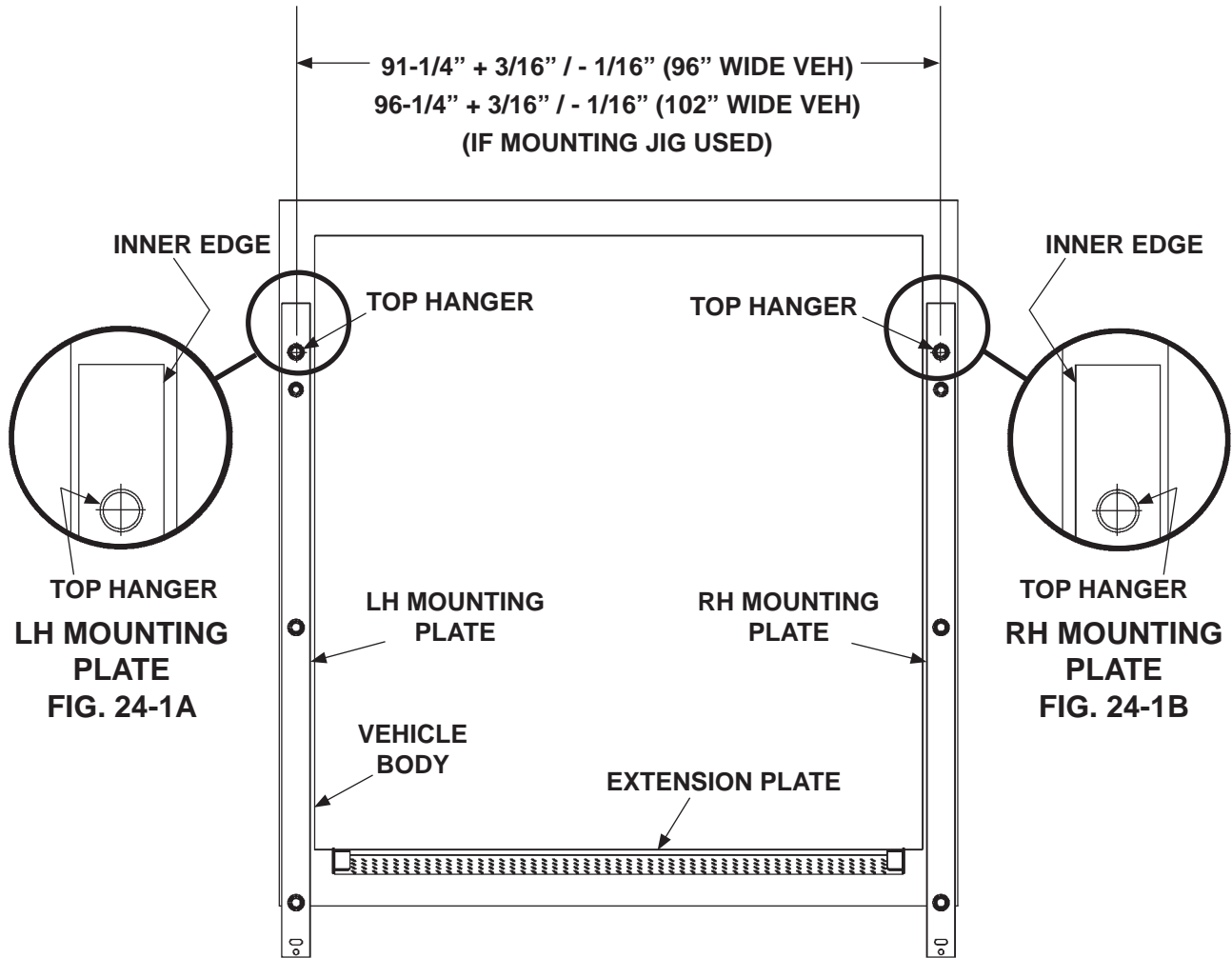


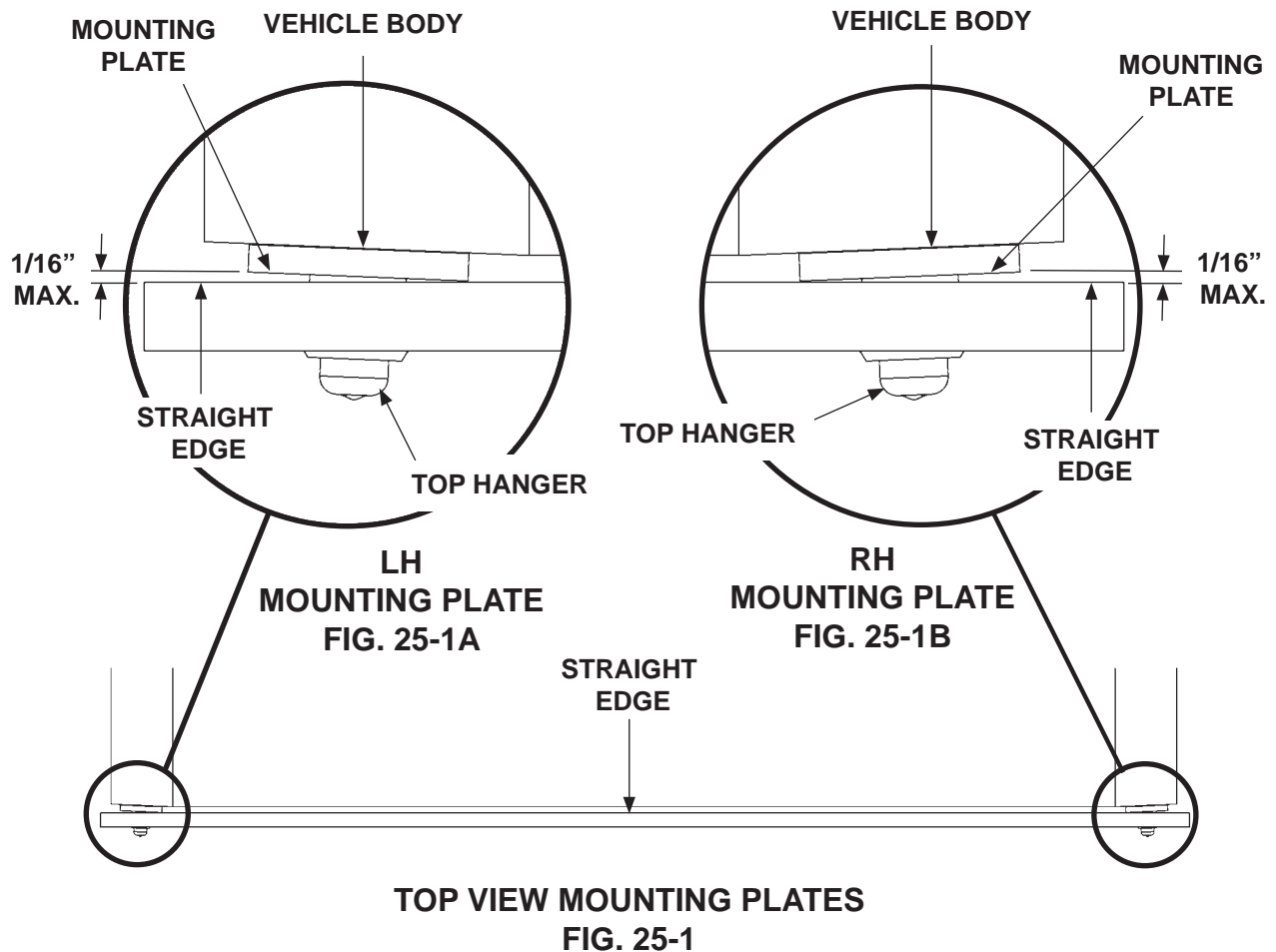
FIG. 24-1

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

**NOTE:** Before welding mounting plates to vertical posts on vehicle body, check to make sure LH and RH mounting plates are positioned within dimensions shown in **FIGS. 25-1A** and **25-1B**.

4. Place a straight edge across LH and RH mounting plates (**FIG. 25-1**). Ensure that any gap between the mounting plates and straight edge (**FIGS. 25-1A** and **25-1B**) are less than 1/16" maximum.

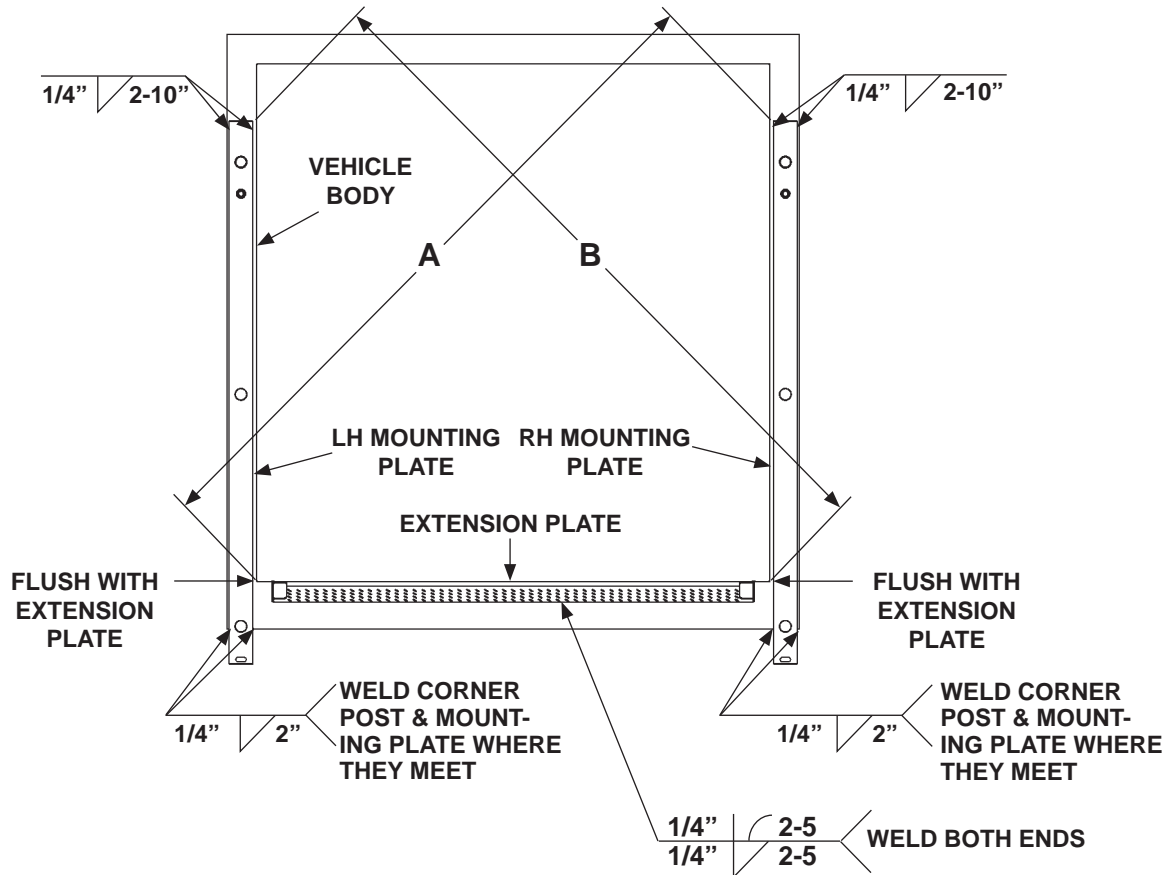


## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

**NOTE:** Before welding mounting plates to vehicle frame, check squareness to make sure mounting plates are perpendicular to extension plate.

5. Check to make sure mounting plates are square and perpendicular to the extension plate by measuring dimensions **A** and **B** as shown in **FIG. 26-1**. Squareness is acceptable when dimensions **A** and **B** are within 1/8" of each other.
6. Weld RH mounting plate onto vehicle body (**FIG. 26-1**), then weld LH mounting plate onto vehicle body.



REAR OF VEHICLE BODY  
FIG. 26-1

**GO TO STEP 4: BOLT LIFTGATE TO VEHICLE**

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 2 - WELD BOLT-ON LIFTGATE TO BODY

#### ⚠ WARNING

Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury, can result from welds that are done incorrectly.

#### CAUTION

Comply with welding CAUTION decal on the LH column.

1. Weld 2 pieces of 10" X 2" angle stock to the top surface of the extension plate near the RH column as shown in **FIG. 27-1**. Repeat for LH column. The angle stock helps keep extension plate flush with top of vehicle bed while installing Liftgate.

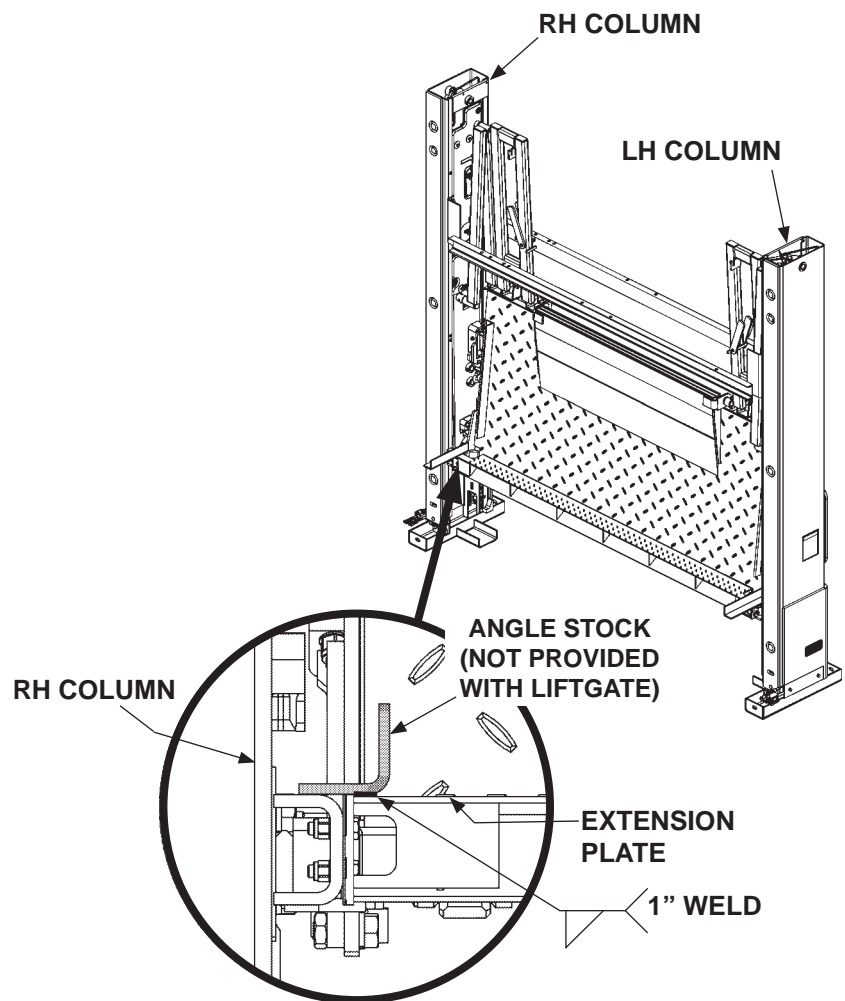


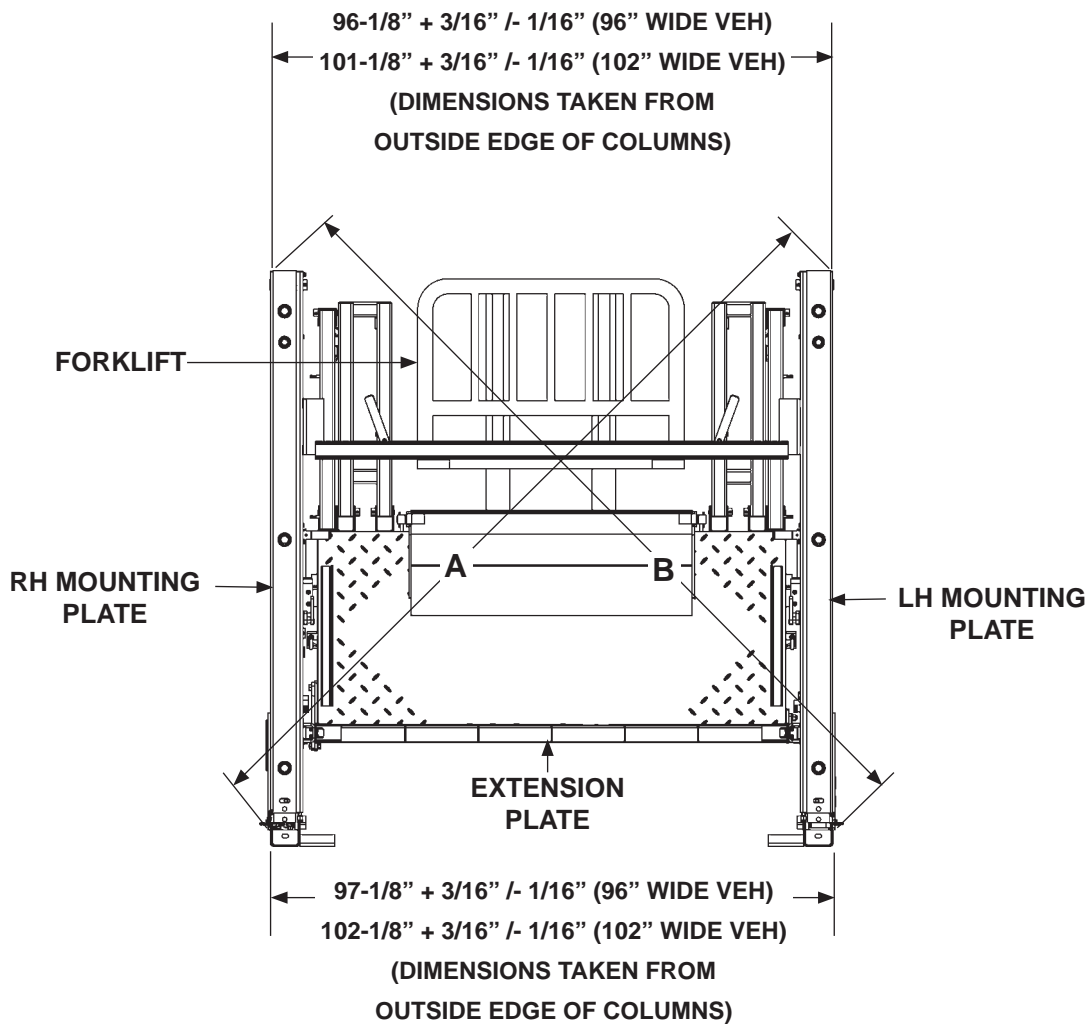
FIG. 27-1

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 2 - WELD BOLT-ON LIFTGATE TO BODY - Continued

**NOTE:** Before welding Liftgate to vehicle frame, check squareness to make sure columns are perpendicular to extension plate.

2. Check to make sure RH and LH columns are square and perpendicular to the extension plate by measuring dimensions at the top and bottom of the columns, and dimensions **A** and **B**, as shown in **FIG. 28-1**. Squareness is acceptable when dimensions **A** and **B** are within 1/4" of each other, and top and bottom column dimensions are as shown in **FIG. 28-1**.

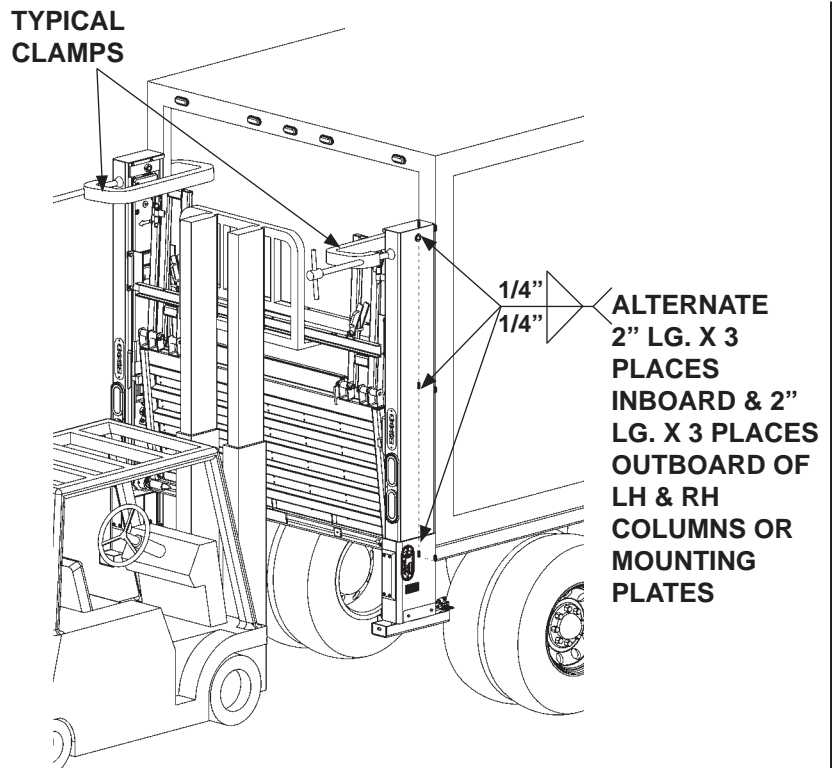


**CHECKING IF COLUMNS ARE SQUARE  
(REAR OF LIFTGATE SHOWN)  
FIG. 28-1**

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 2 - WELD BOLT-ON LIFTGATE TO BODY - Continued

3. Use overhead hoist or fork lift to center Liftgate against the vehicle (**FIG. 29-1**). Let angle stock, welded to extension plate, rest on the top surface of the vehicle bed.
4. Clamp top of each column to vehicle body to prevent gap (**FIG. 29-1**).



WELDING LIFTGATE TO VEHICLE  
FIG. 29-1

### CAUTION

To prevent damage to Liftgate:

- Connect welder ground to vehicle body.
- Protect hydraulic hoses and electrical cables with flame-resistant cover.

5. Weld the RH and LH columns to vehicle body as shown in **FIG. 29-1**.
6. Remove clamp from each of the columns. Then, move fork-lift away from work area.
7. Check to make sure RH and LH columns are square and perpendicular to the extension plate (**FIG. 28-1**).

**GO TO STEP 5: REMOVE LOWER SUPPORT FIXTURES**

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 3 - WELD LIFTGATE TO BODY

#### ⚠ WARNING

Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury, can result from welds that are done incorrectly.

**NOTE:** Before welding extension plate to vehicle body, make sure:

- Inboard edge of extension plate is flush with the top of sill on vehicle body.
- Top surface of extension plate is level with the ground.

#### CAUTION

Comply with welding CAUTION decal on the LH column.

1. Weld 2 pieces of 10" X 2" angle stock to the top surface of the extension plate near the RH column as shown in **FIG. 30-1**. Repeat for LH column. The angle stock helps keep extension plate flush with top of vehicle bed while installing Liftgate.

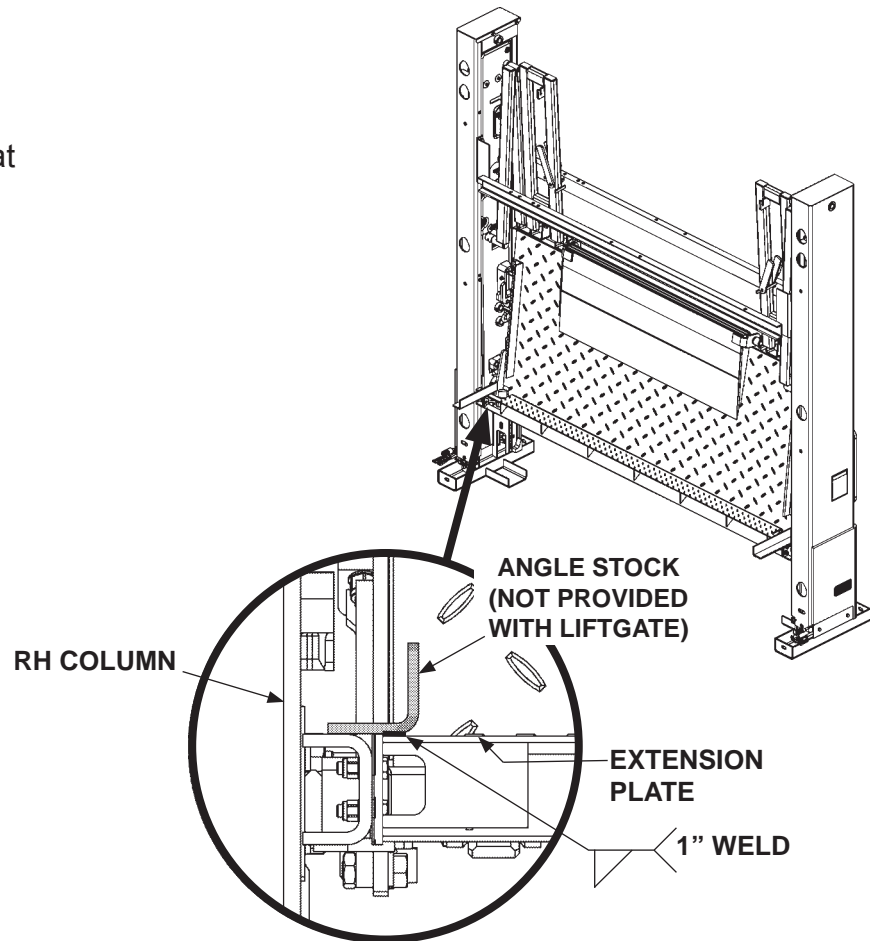


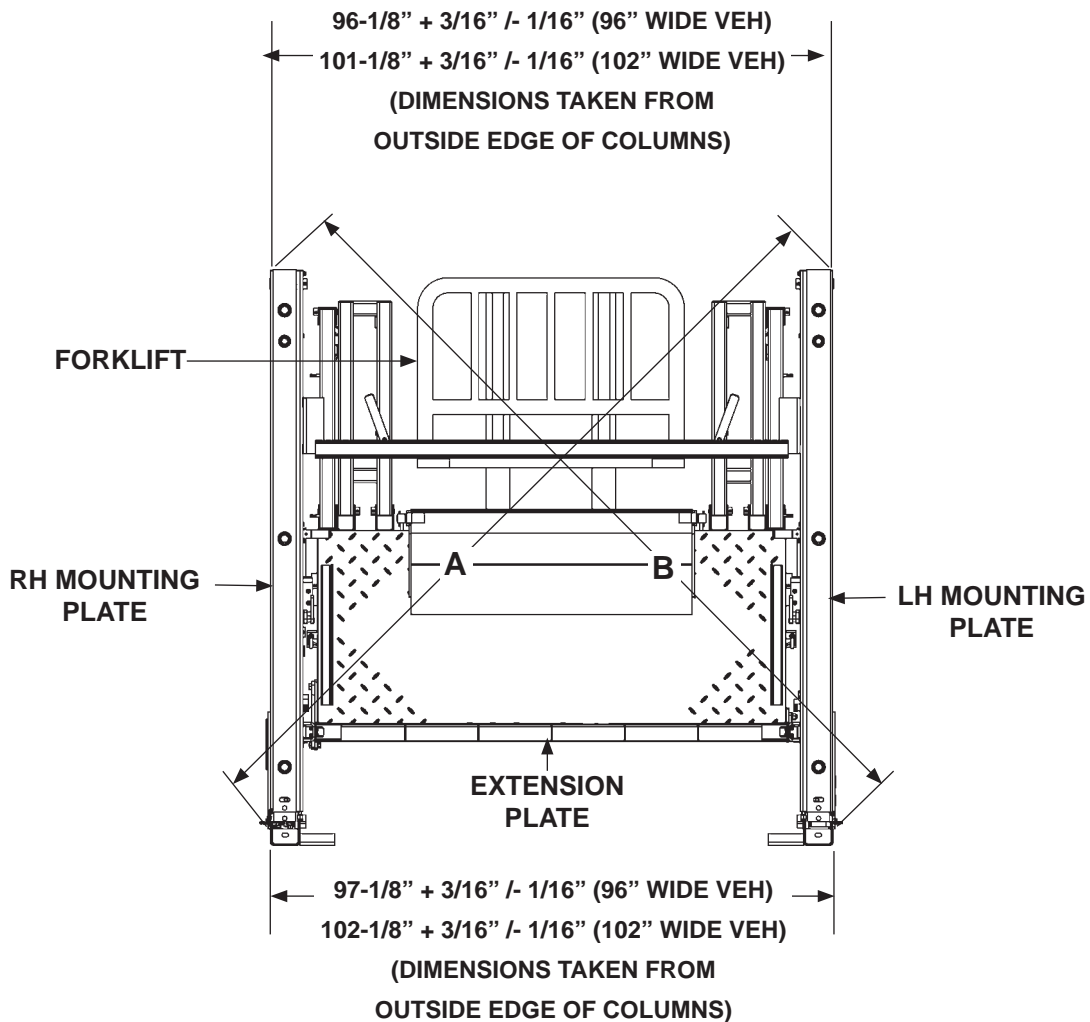
FIG. 30-1

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 3 - WELD LIFTGATE TO BODY - Continued

**NOTE:** Before welding Liftgate to vehicle frame, check squareness to make sure columns are perpendicular to extension plate.

2. Check to make sure RH and LH columns are square and perpendicular to the extension plate by measuring dimensions at the top and bottom of the columns, and dimensions **A** and **B**, as shown in **FIG. 31-1**. Squareness is acceptable when dimensions **A** and **B** are within 1/4" of each other, and top and bottom column dimensions are as shown in **FIG. 31-1**.

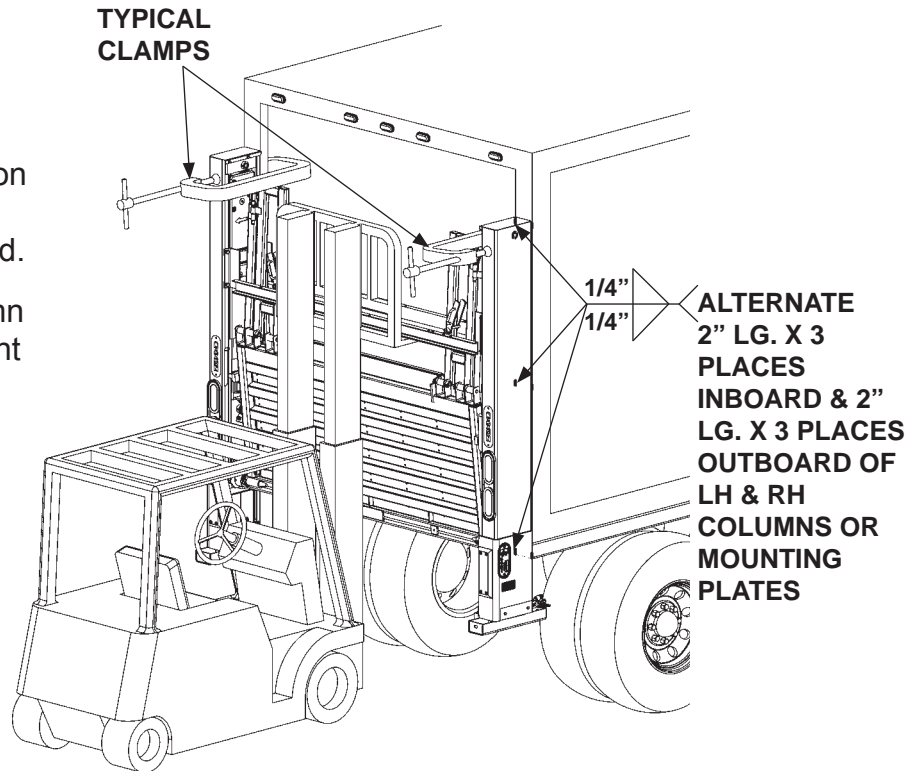


**CHECKING IF COLUMNS ARE SQUARE  
(REAR OF LIFTGATE SHOWN)  
FIG. 31-1**

## STEP 3 - POSITION LIFTGATE - Continued

### METHOD 3 - WELD LIFTGATE TO BODY - Continued

3. Use overhead hoist or forklift to center Liftgate against the vehicle (**FIG. 32-1**). Let angle stock, welded to extension plate, rest on the top surface of the vehicle bed.
4. Clamp top of each column to vehicle body to prevent gap (**FIG. 32-1**).



WELDING LIFTGATE TO VEHICLE  
FIG. 32-1

### CAUTION

To prevent damage to Liftgate:

- Connect welder ground to vehicle body.
- Protect hydraulic hoses and electrical cables with flame-resistant cover.

5. Weld the RH and LH columns to vehicle body as shown in **FIG. 32-1**.
6. Remove clamp from each of the columns. Then, move forklift away from work area.
7. Check to make sure RH and LH columns are square and perpendicular to the extension plate (**FIG. 30-1**).

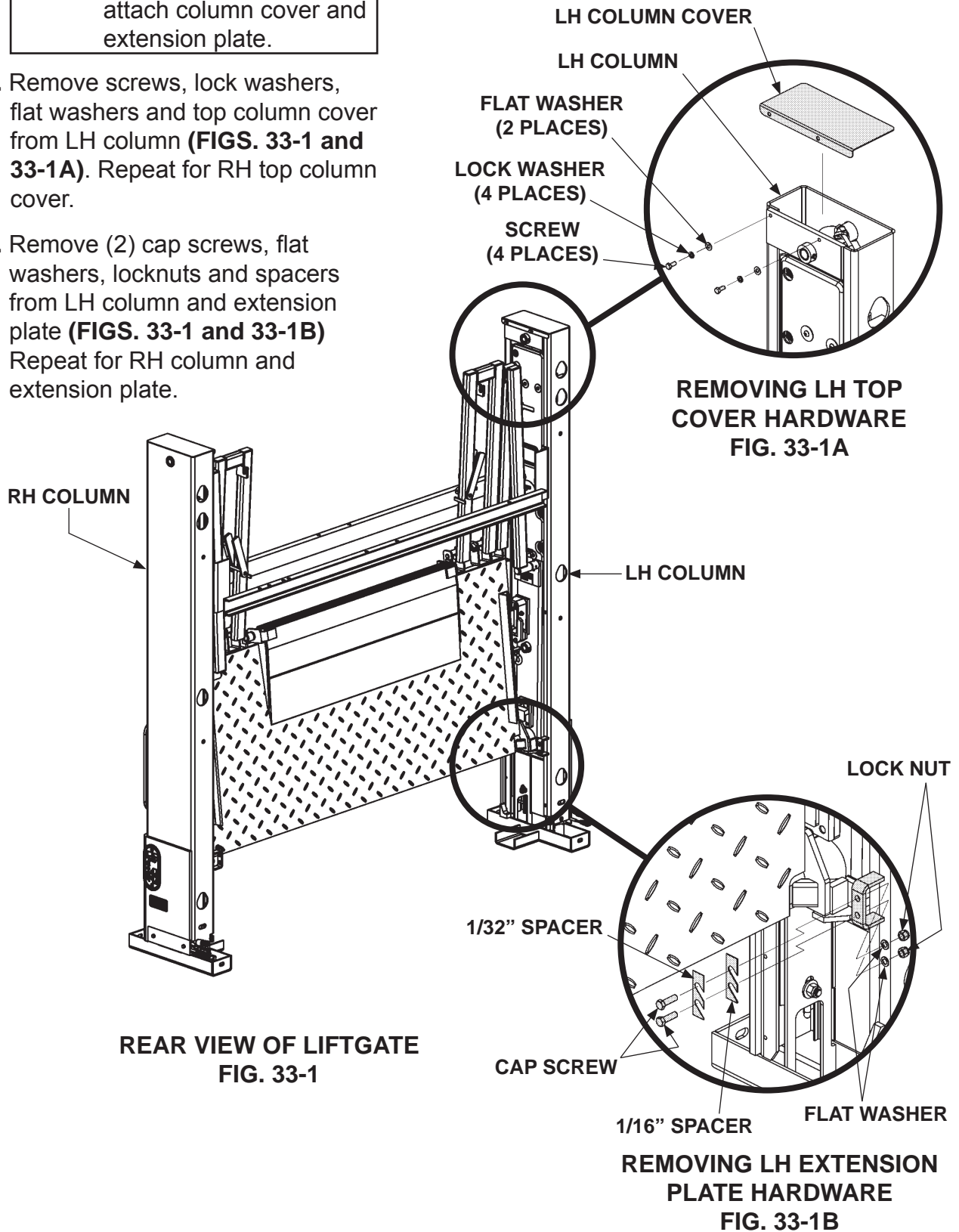
**GO TO STEP 5: REMOVE LOWER SUPPORT FIXTURES**

## STEP 4 - BOLT LIFTGATE TO VEHICLE

### METHOD 1 - PRE-INSTALLED MOUNTING PLATES & EXTENSION PLATE ON VEHICLE

**NOTE:** Save all hardware to re-attach column cover and extension plate.

1. Remove screws, lock washers, flat washers and top column cover from LH column (**FIGS. 33-1 and 33-1A**). Repeat for RH top column cover.
2. Remove (2) cap screws, flat washers, locknuts and spacers from LH column and extension plate (**FIGS. 33-1 and 33-1B**). Repeat for RH column and extension plate.



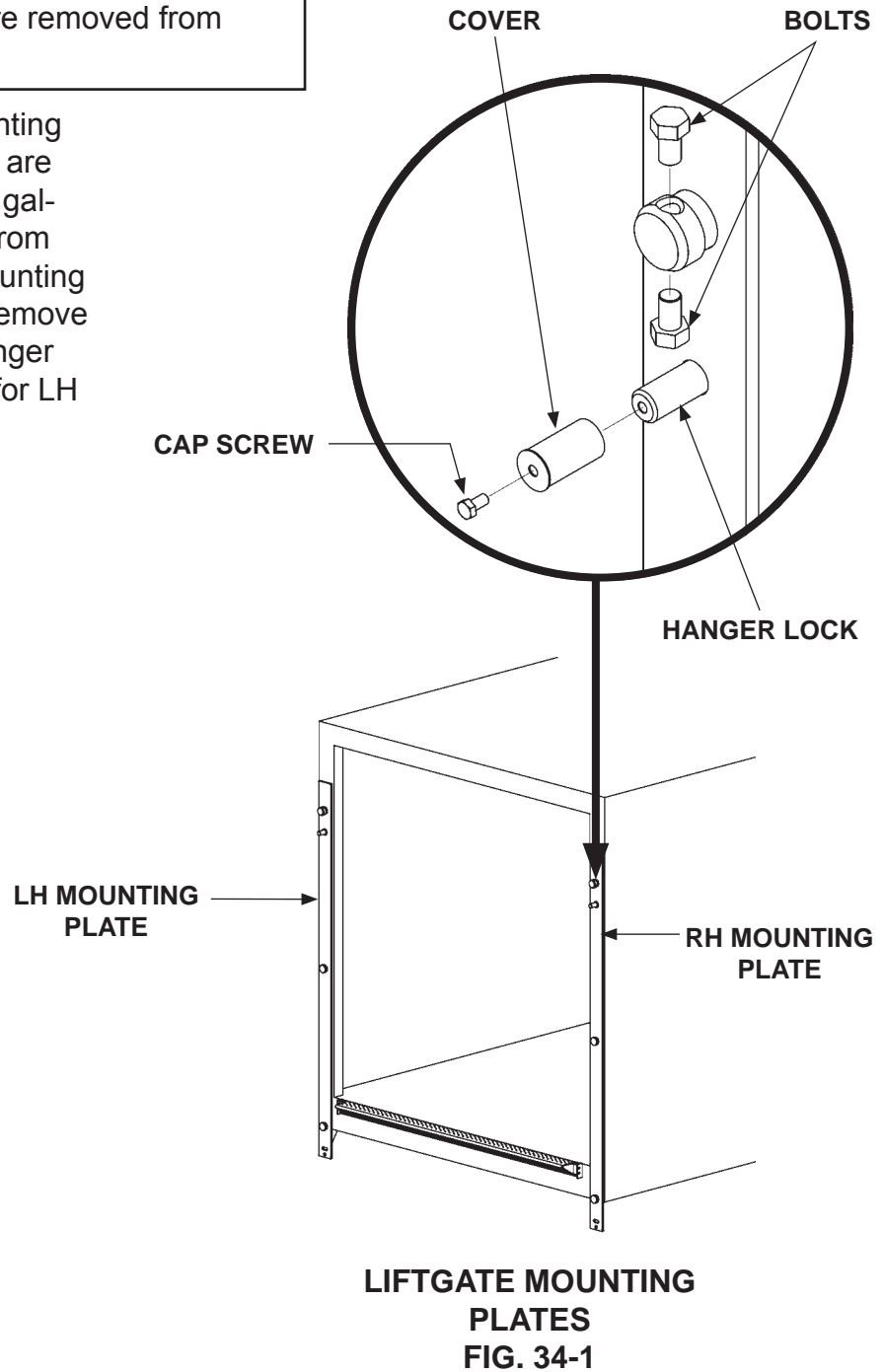
## STEP 4 - BOLT LIFTGATE TO VEHICLE - Continued

### METHOD 1 - PRE-INSTALLED MOUNTING PLATES & EXTENSION PLATE ON VEHICLE - Continued

**NOTE:** If the rear of the vehicle & Liftgate mounting plates are galvanized, make sure:

- Bolts are removed from top hanger
- Bolt & cover are removed from hanger lock

3. Check if the Liftgate mounting plates and rear of vehicle are galvanized (**FIG. 34-1**). If galvanized, remove 2 bolts from top hanger on the RH mounting plate (**FIG. 34-1**). Then, remove screw and cover from hanger lock (**FIG. 34-1**). Repeat for LH mounting plate.



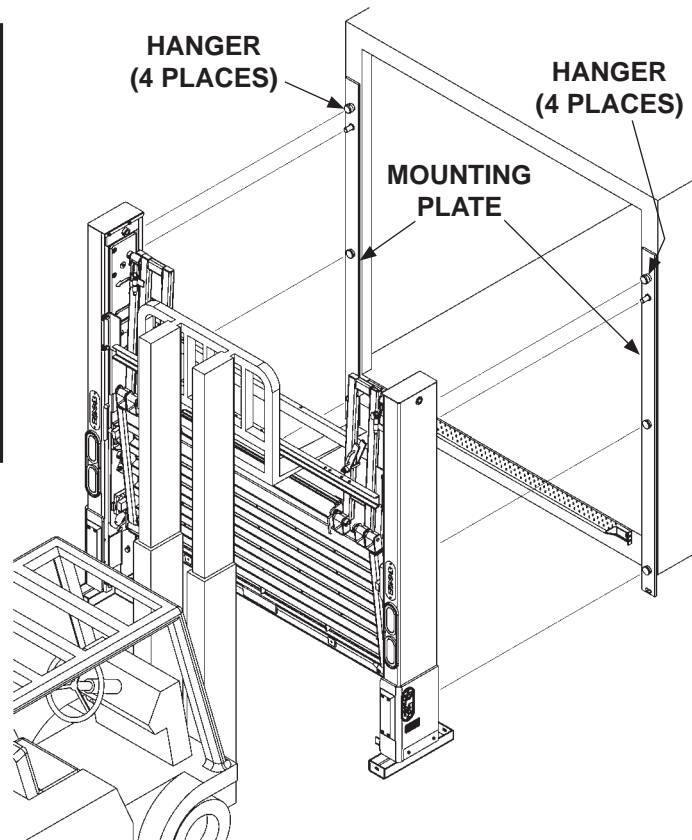
## STEP 4 - BOLT LIFTGATE TO VEHICLE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

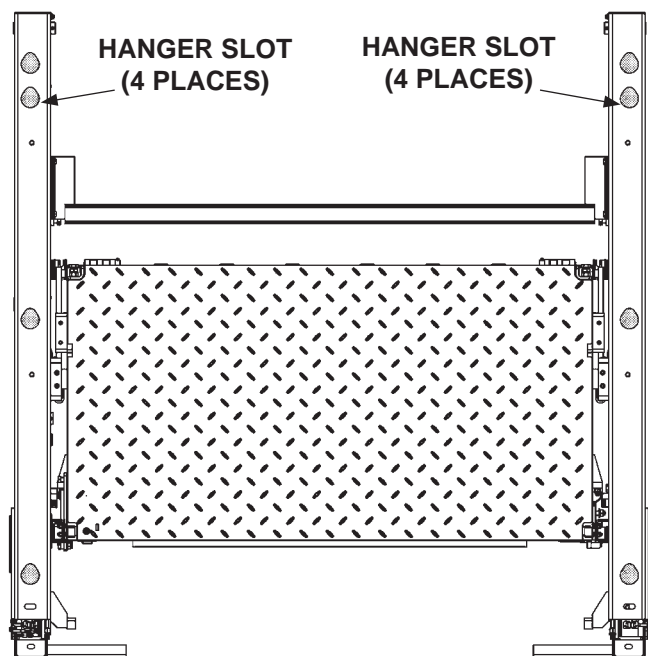
#### **⚠ WARNING**

Tighten top hanger bolts on the columns while the Liftgate is supported by forklift. Loose hanger bolts could allow the Liftgate to disengage from the hangers and fall off the vehicle when platform is lowered to the ground. Serious personal injury and equipment damage could result.

4. Hang liftgate on the mounting plates by inserting hangers into hanger slots (FIGS. 35-1 and 35-2).



**HANGING LIFTGATE  
FIG. 35-1**

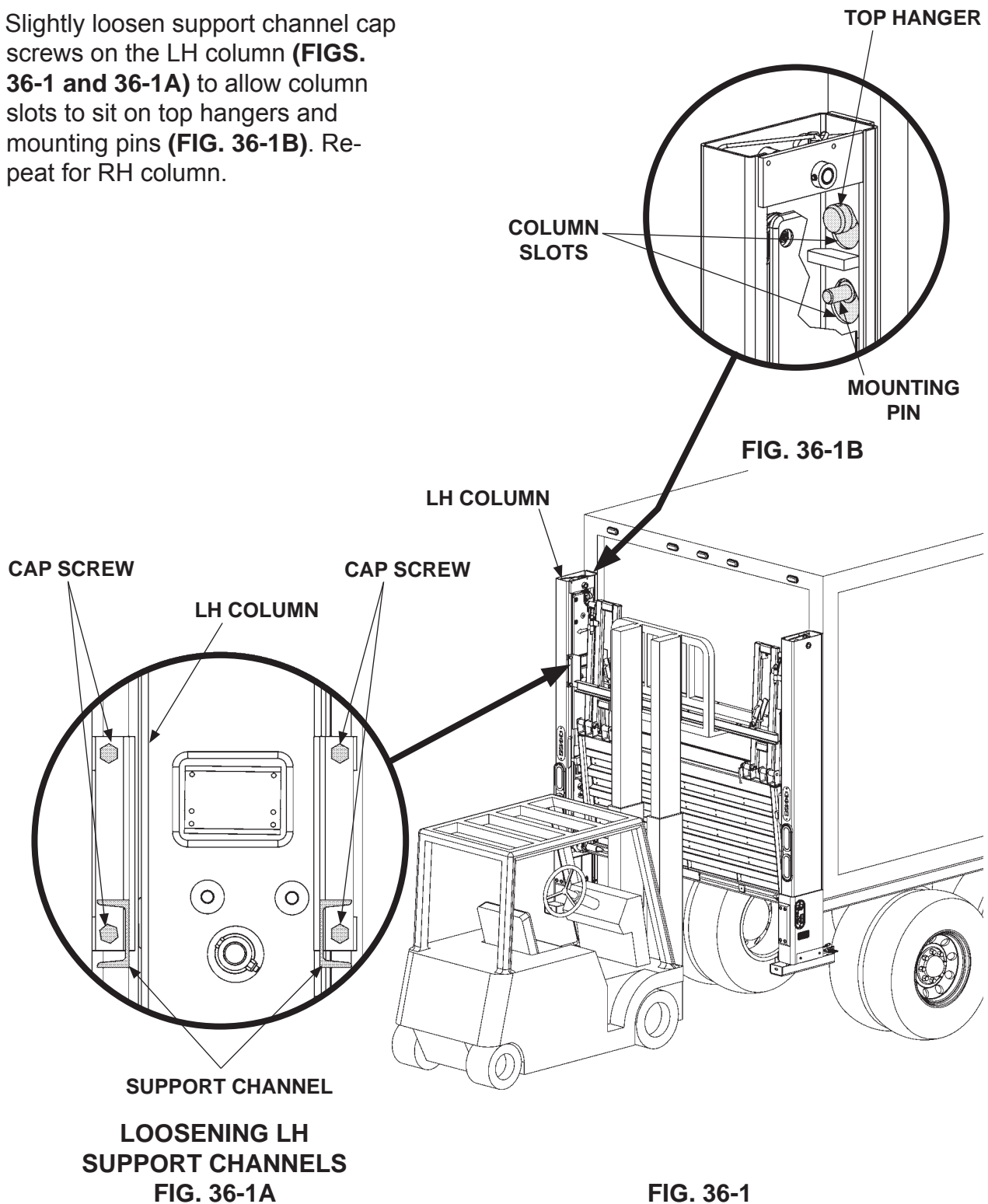


**REAR VIEW OF LIFTGATE  
FIG. 35-2**

## STEP 4 - BOLT LIFTGATE TO VEHICLE - Continued

### METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE ON VEHICLE - Continued

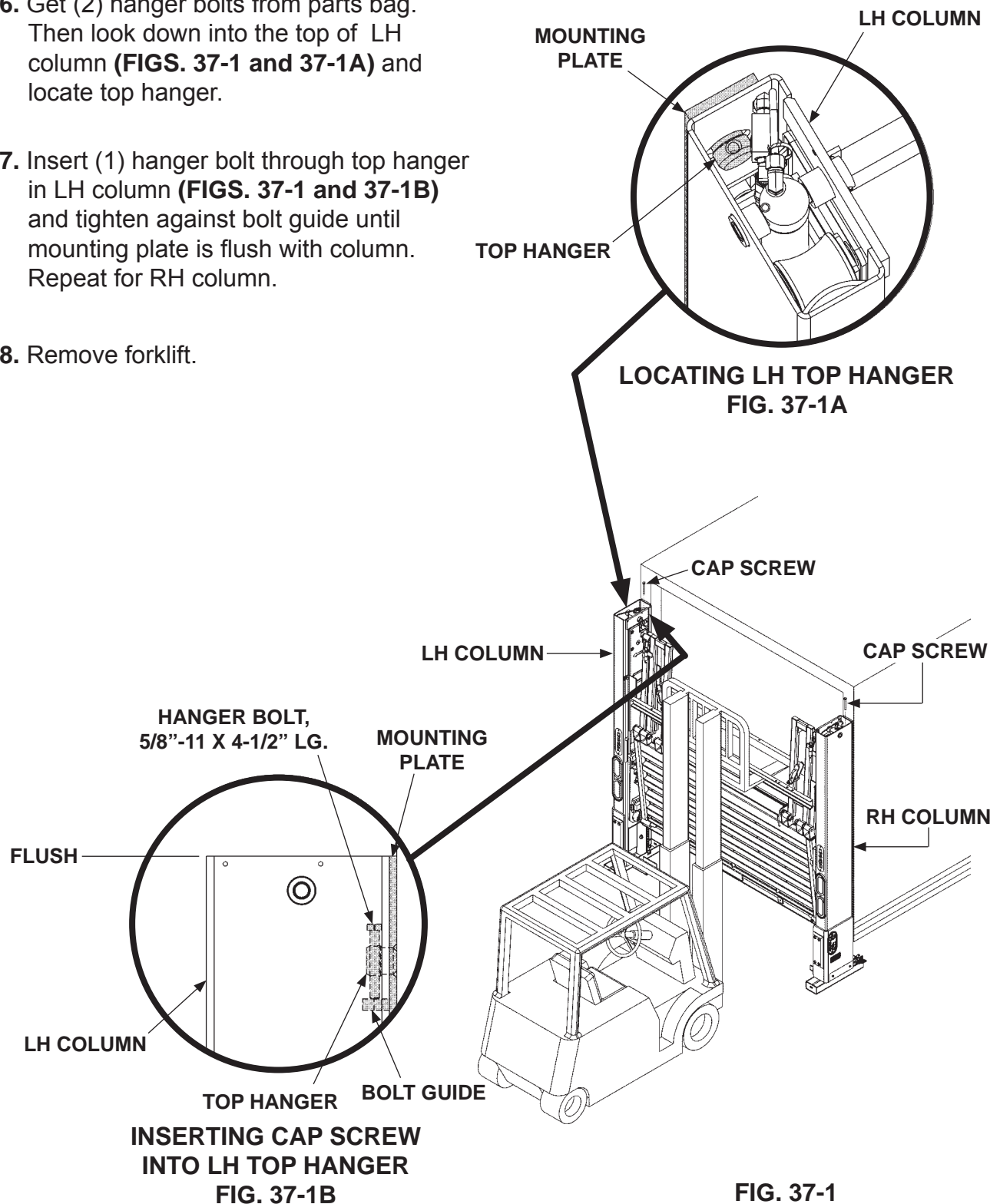
5. Slightly loosen support channel cap screws on the LH column (**FIGS. 36-1 and 36-1A**) to allow column slots to sit on top hangers and mounting pins (**FIG. 36-1B**). Repeat for RH column.



# **STEP 4 - BOLT LIFTGATE TO VEHICLE - Continued** **METHOD 1 - PRE-INSTALL MOUNTING PLATES AND EXTENSION PLATE** **ON VEHICLE - Continued**

6. Get (2) hanger bolts from parts bag. Then look down into the top of LH column (**FIGS. 37-1 and 37-1A**) and locate top hanger.
7. Insert (1) hanger bolt through top hanger in LH column (**FIGS. 37-1 and 37-1B**) and tighten against bolt guide until mounting plate is flush with column. Repeat for RH column.

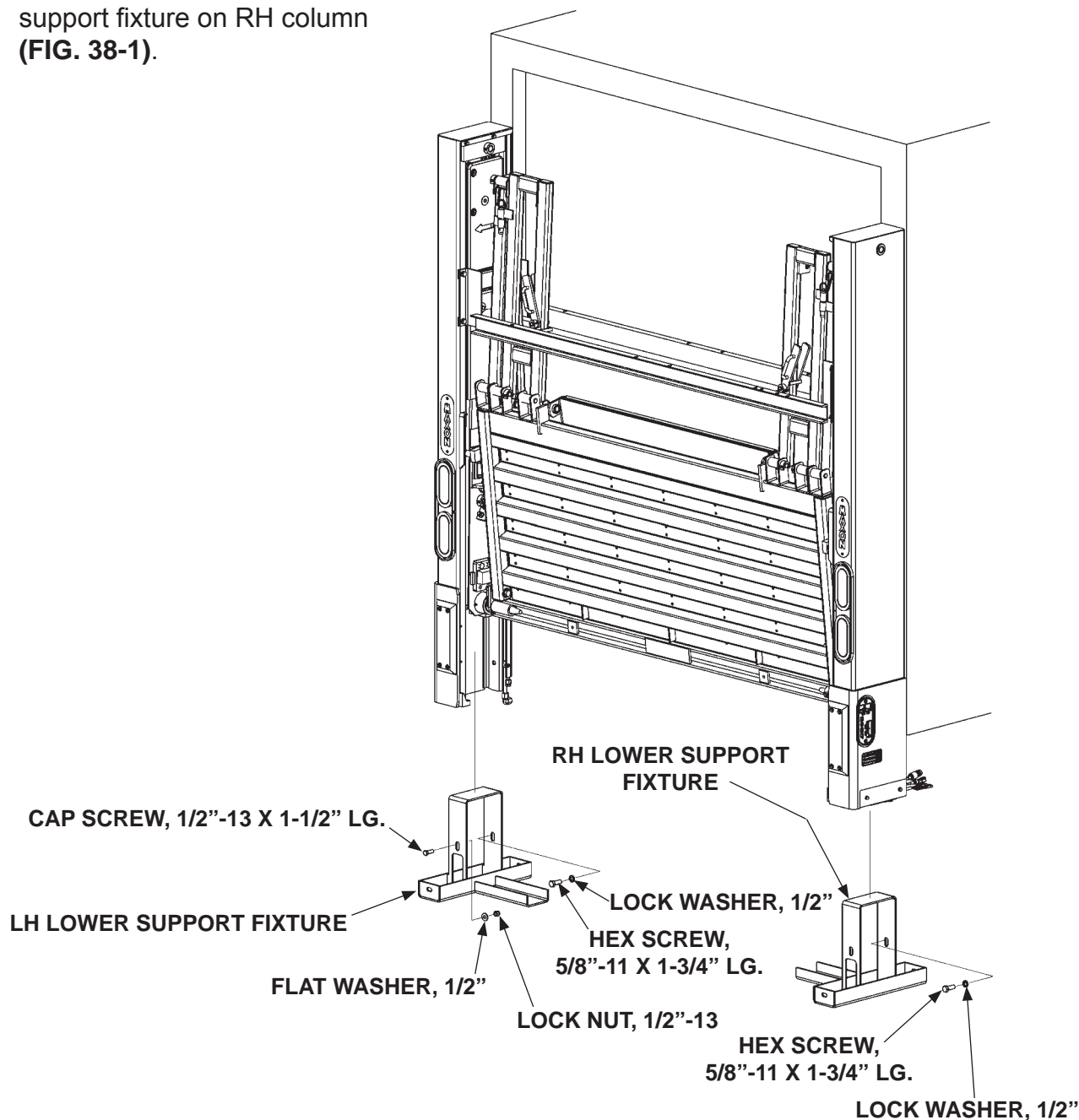
8. Remove forklift.



## STEP 5 - REMOVE LOWER SUPPORT FIXTURES

**NOTE:** Use short wrenches for unbolting lower support fixtures.

1. Unbolt and remove lower support fixture from LH column (**FIG. 38-1**). Repeat for lower support fixture on RH column (**FIG. 38-1**).

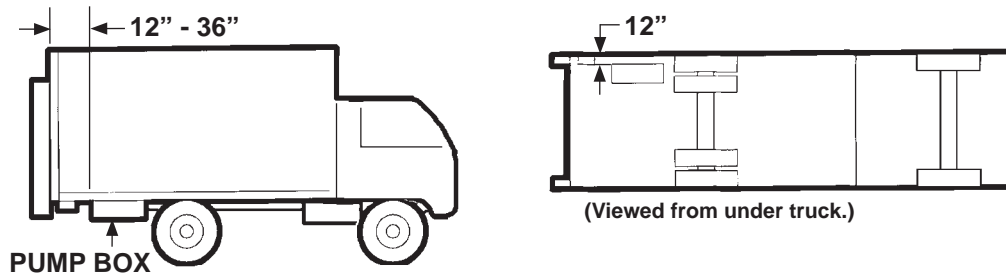


REMOVING LOWER SUPPORT FIXTURES  
FIG. 38-1

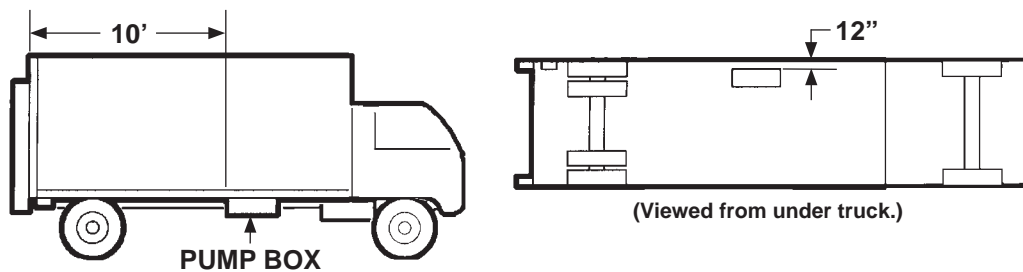
## STEP 6 - POSITION PUMP BOX FRAME

**NOTE:** Make sure pump box is closer to Liftgate than battery box (if installed) and pump box cover opens toward curb-side of vehicle. Also, make sure hydraulic hoses are installed without straining hoses. Distance from pump box to Liftgate is limited by lengths of hydraulic hoses and wiring harness supplied with Liftgate.

Position pump box frame (or optional battery box) on the ground where it will be welded to vehicle body in the next step. Make sure pump box (and battery box if supplied) are securely bolted to the frame. Typical installations are shown in **FIGS. 39-1, 39-2, 40-1, 40-2 and 40-3.**

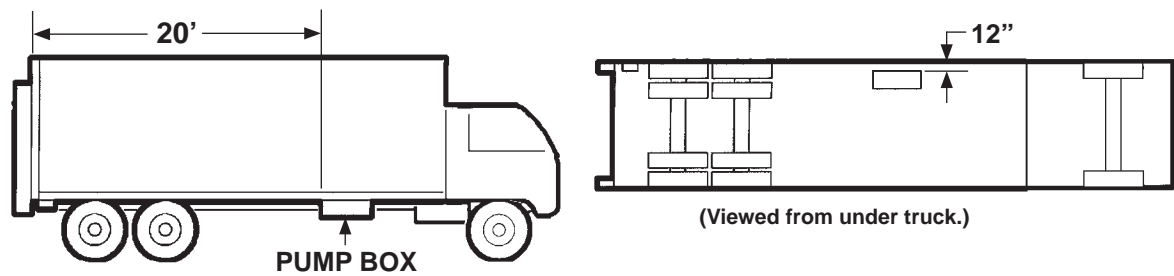


**TYPICAL 3 FT. INSTALLATION  
FIG. 39-1**

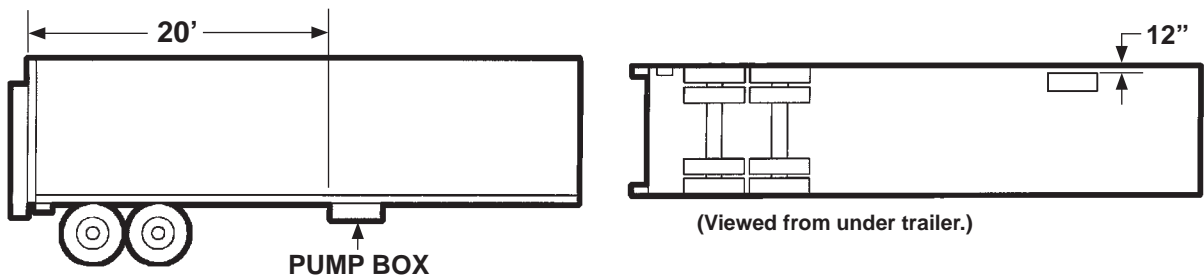


**TYPICAL 10 FT. INSTALLATION  
FIG. 39-2**

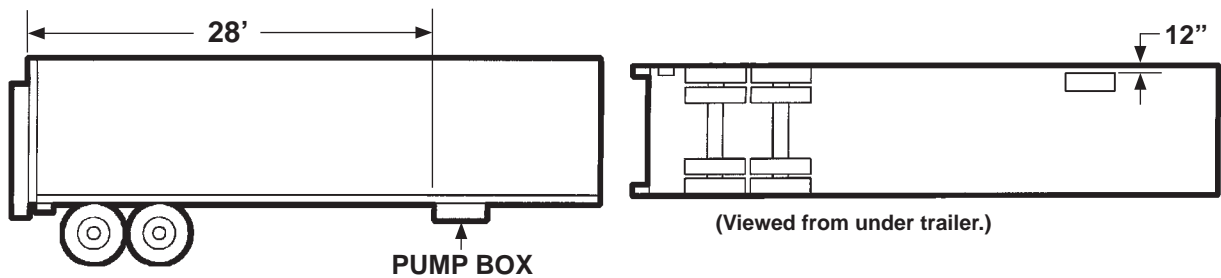
## STEP 6 - POSITION PUMP BOX FRAME - Continued



TYPICAL 20 FT. INSTALLATION  
FIG. 40-1



TYPICAL 20 FT. INSTALLATION  
FIG. 40-2



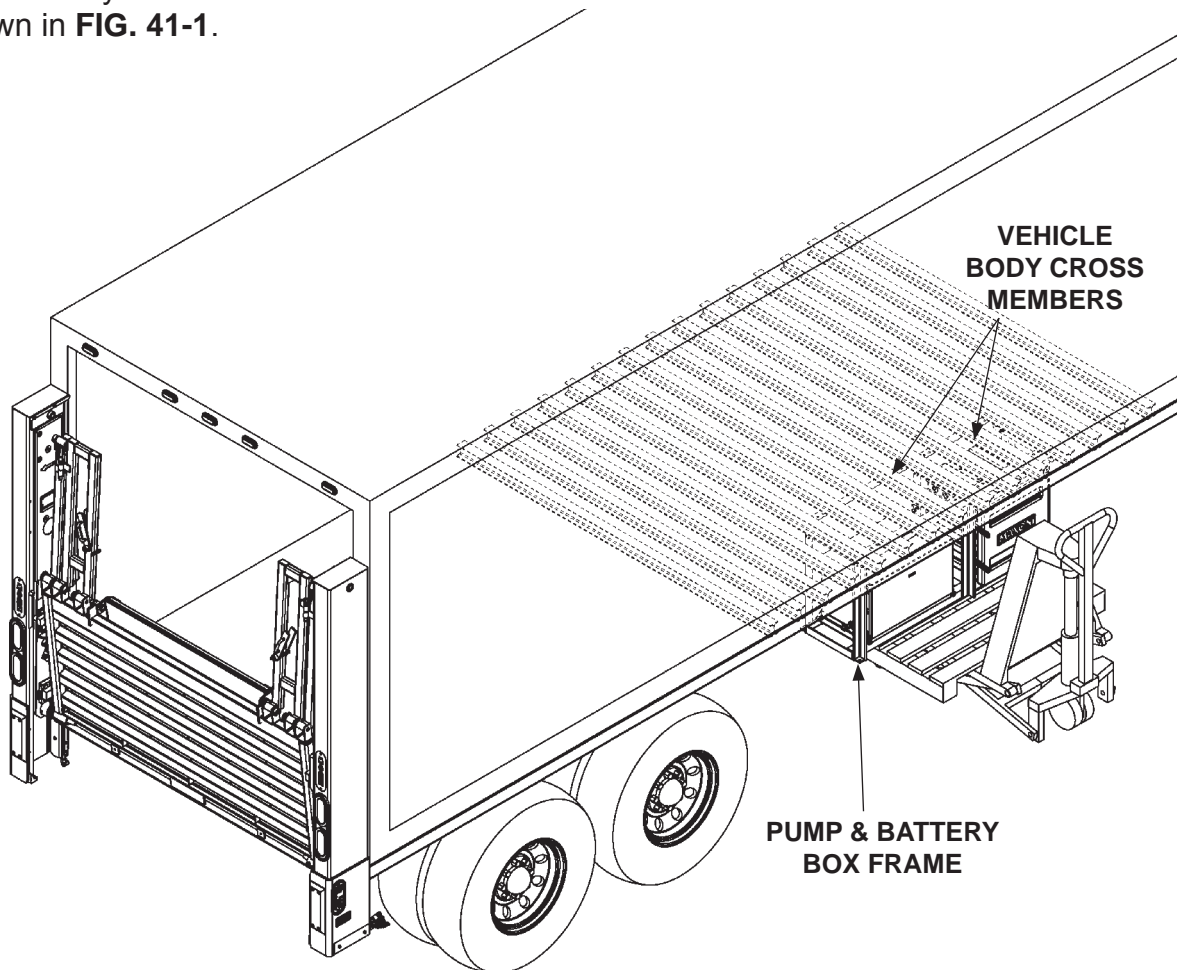
TYPICAL 28 FT. INSTALLATION  
FIG. 40-3

## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE

**NOTE:** There are 2 methods to mount pump and battery box frame to vehicle frame.

- Bolt pump and battery box frame to hanger brackets welded to vehicle frame.
- Weld pump and battery box frame to vehicle frame.

1. Use floor jack or equivalent lifting device to place pump and battery box frame in position on vehicle body cross members as shown in **FIG. 41-1**.



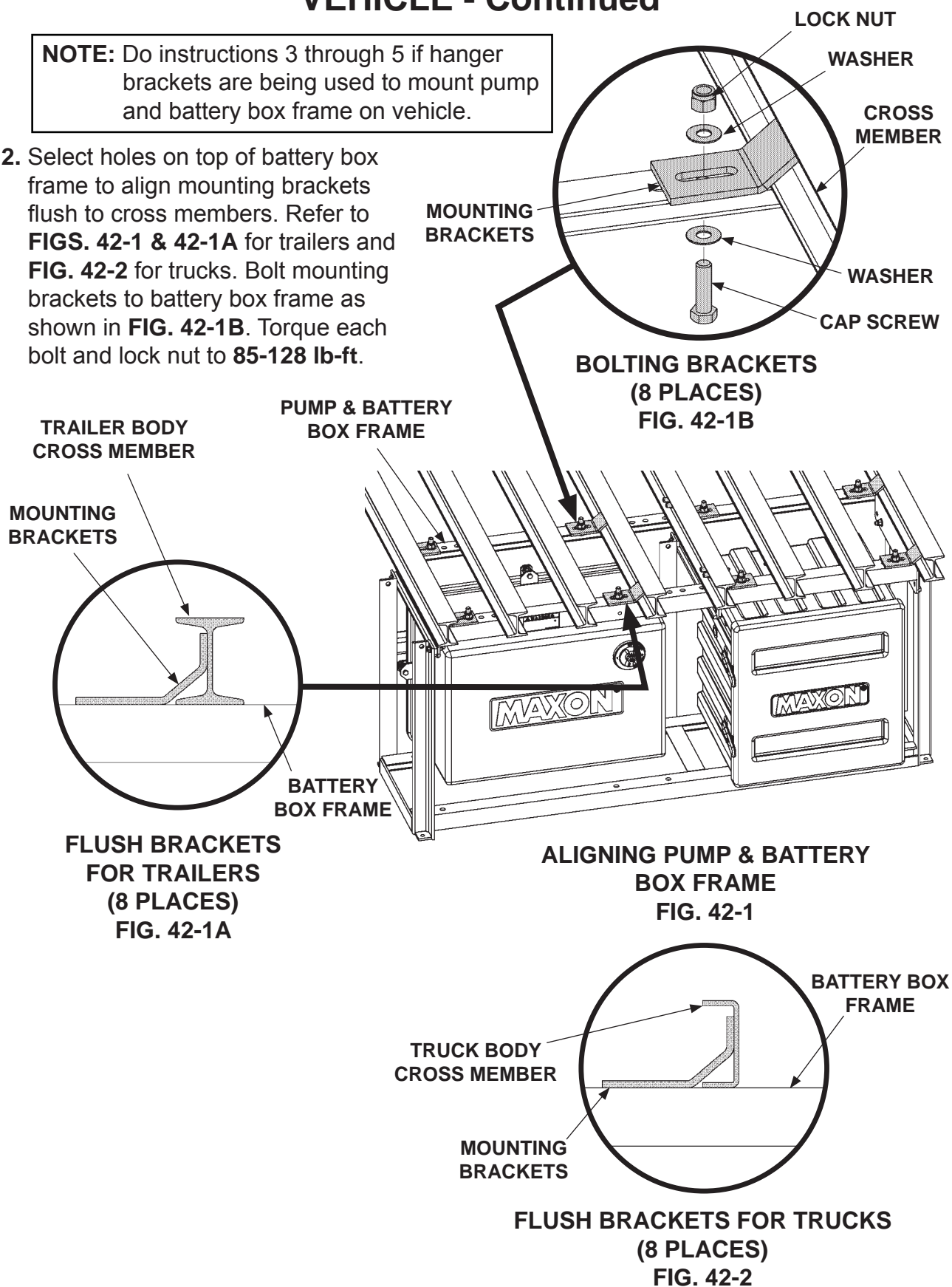
**TRAILER WITH PUMP & BATTERY BOX FRAME**  
**FIG. 41-1**

**NOTE:** If pump and battery box frame is to be welded directly to cross members on vehicle body, skip **instructions 2 through 4**. Continue with **instruction 5**.

## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE - Continued

**NOTE:** Do instructions 3 through 5 if hanger brackets are being used to mount pump and battery box frame on vehicle.

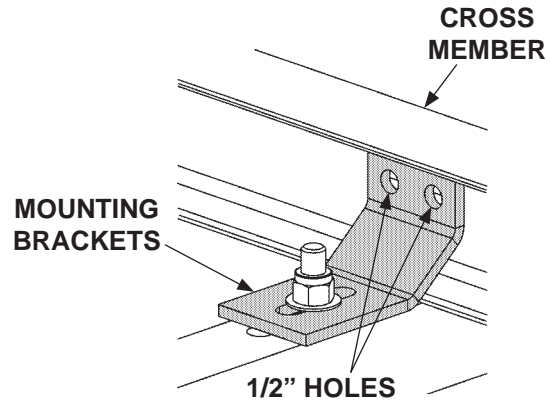
2. Select holes on top of battery box frame to align mounting brackets flush to cross members. Refer to **FIGS. 42-1 & 42-1A** for trailers and **FIG. 42-2** for trucks. Bolt mounting brackets to battery box frame as shown in **FIG. 42-1B**. Torque each bolt and lock nut to **85-128 lb-ft.**



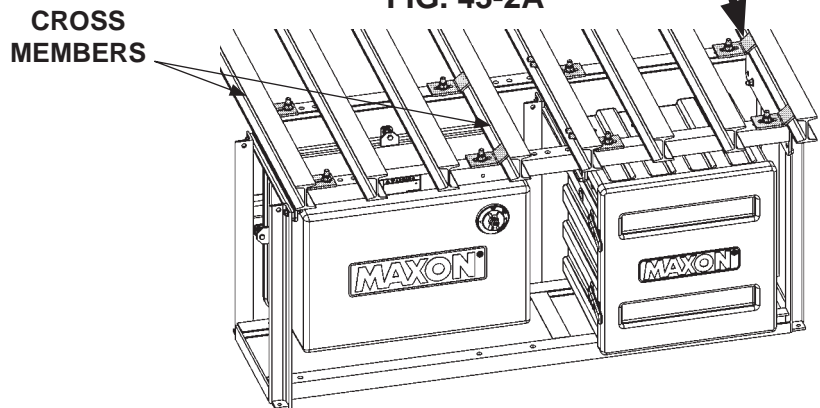
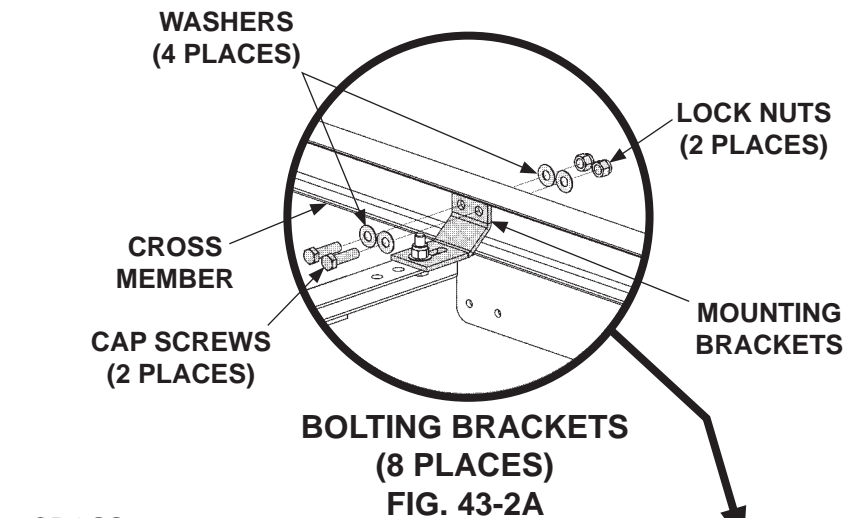
## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE - Continued

**NOTE:** If welding mounting brackets to cross members, skip **instruction 3**.

- Using mounting brackets as a template mark and drill holes through cross members (**FIG. 43-1**). Bolt mounting brackets to cross members as shown in **FIGS. 43-2 and 43-2A**. Torque bolts and lock nuts to **85-128 lb-ft**.



**MARK AND DRILL  
FIG. 43-1**



**BOLTING PUMP & BATTERY  
BOX FRAME  
FIG. 43-2**

## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE - Continued

### ⚠ WARNING

Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.

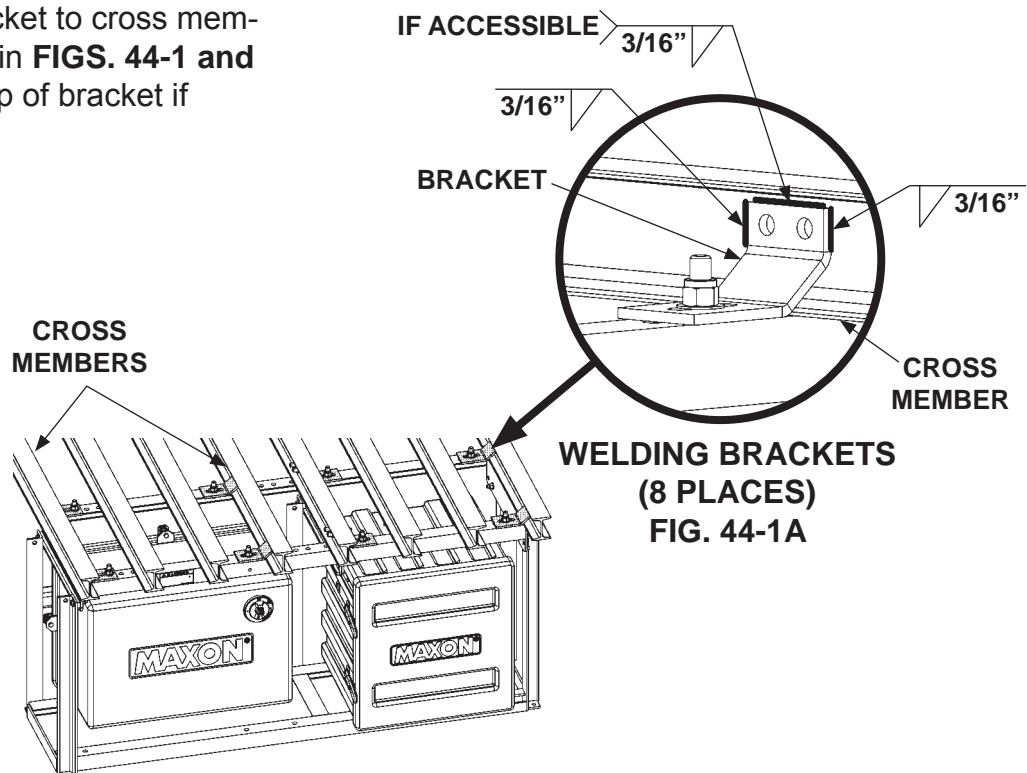
### CAUTION

To prevent pump box components from being damaged by electric current from welding, connect welder grounding cable to the part being welded.

### CAUTION

Cover pump box and optional battery box with flame-resistant covering before welding pump box frame to vehicle.

4. Weld each bracket to cross members as shown in **FIGS. 44-1 and 44-1A**. Weld top of bracket if accessible.



WELDING PUMP & BATTERY BOX FRAME  
FIG. 44-1

**GO TO THE END OF STEP 5 & OBSERVE THE WARNING ABOUT HYDROGEN GAS BUILD-UP. THEN GO TO STEP 6.**

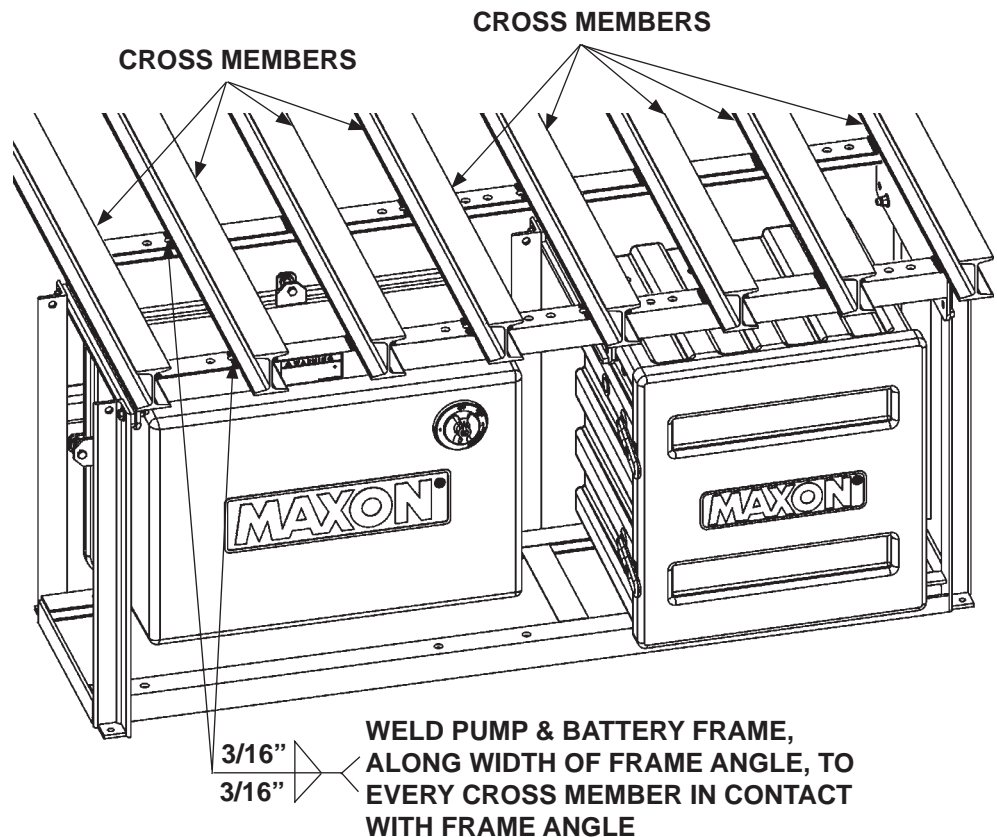
## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE - Continued

### ⚠ WARNING

Explosive hydrogen gas from charging batteries can accumulate in battery box if not vented from the box. To prevent hydrogen gas from accumulating, ensure the 3 ventilation holes in battery box are not plugged or covered.

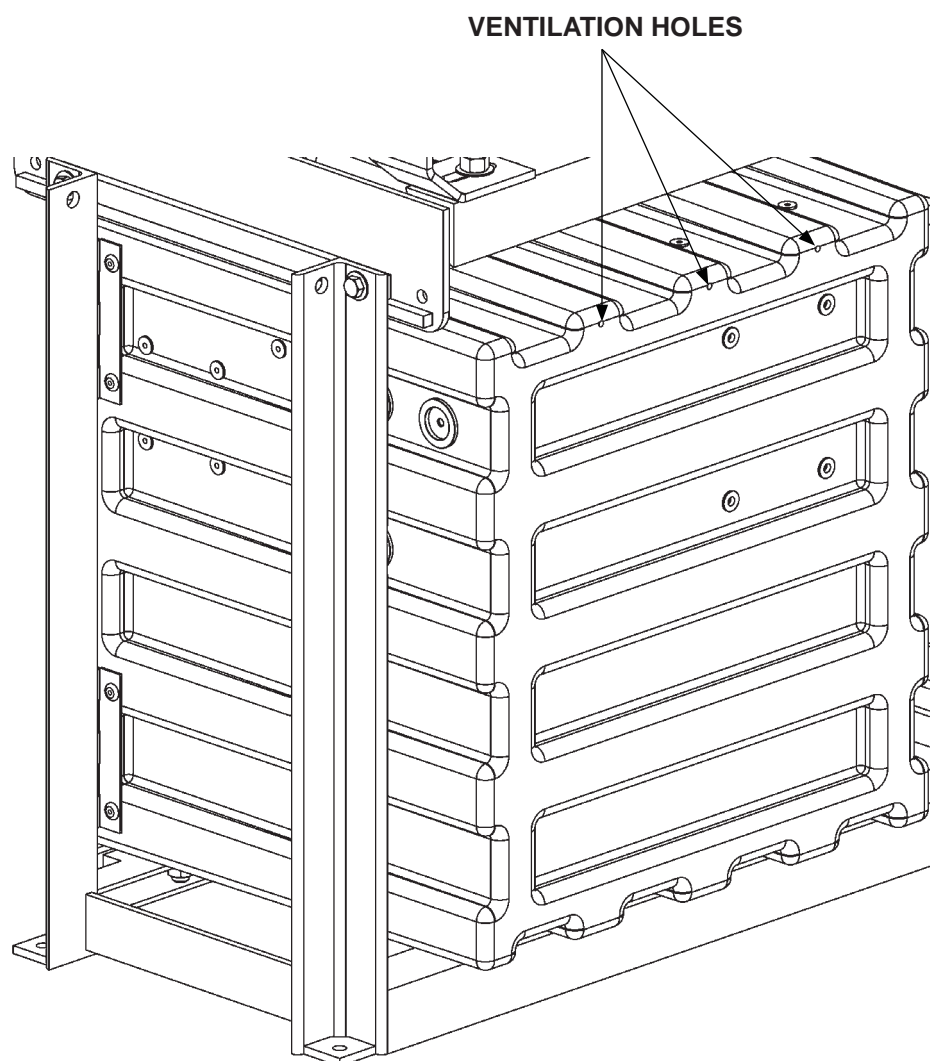
**NOTE:** Any methods not shown in this section, for welding mounting brackets to cross members, must be approved by body or trailer manufacturer.

5. Position pump and battery box frame on vehicle frame cross members (**FIG. 45-1**). Ensure vent holes on back of the battery box are not obstructed or covered (**FIG. 45-1**). Weld pump and battery box frame to cross members as shown in **FIG. 45-1**.



ALIGNING PUMP & BATTERY BOX FRAME  
TO WELD ON CROSS MEMBERS  
FIG. 45-1

## STEP 7 - ATTACH PUMP & BATTERY BOX FRAME TO VEHICLE - Continued



**BATTERY BOX ASSEMBLY  
(REAR VIEW SHOWN)  
FIG. 46-1**

## STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES

### CAUTION

Always route hydraulic hoses and electrical wiring clear of moving parts, brake lines, sharp edges and exhaust systems. Avoid making sharp bends in hoses and wiring. Make sure that bends in the electrical wiring are 1" or more away from electrical connector. Attach securely. If drilling is necessary, first check behind the drilling surface so you do not damage any fuel lines, vent lines, brake lines or wires.

**NOTE:** The hydraulic cylinders in the Liftgate are filled with hydraulic fluid and bled at the factory. To keep air out of the hydraulic system, follow instructions carefully for installing hydraulic system components.

**NOTE:** The fold and unfold hydraulic hoses are identical hoses. To avoid confusion when running hoses through the channel, MAXON recommends taping both ends of one of the hoses for easy identification.

1. Get hydraulic hoses, hydraulic tee, channel guard (if required) and plastic ties from parts box and pump box installation kit. Run hydraulic hoses from LH and RH columns to pump box. Connect hydraulic hoses as shown in **FIG. 48-1** and **TABLES 49-1 and 49-2** for Gravity Down Liftgate or **FIG. 51-1** and **TABLES 52-1 and 52-2** for Power Down Liftgate.
2. Get interconnect harness from pump box installation kit. Run the interconnect harness from pump box to RH and LH columns as shown in **FIG. 53-1**.
3. If channel guard is required, bolt up one side of the channel (**FIGS. 48-1, 51-1 and 52-1**) to vehicle body. Leave bolts loose until all hydraulic hoses (**FIGS. 48-1 and 51-1**) and wiring harness (**FIG. 53-1**) are run through channel. After hoses and wiring harness are run, bolt up second side of channel and tighten all bolts and nuts. Use plastic ties to secure runs of hydraulic hoses and wiring harness that are outside of channel guard.

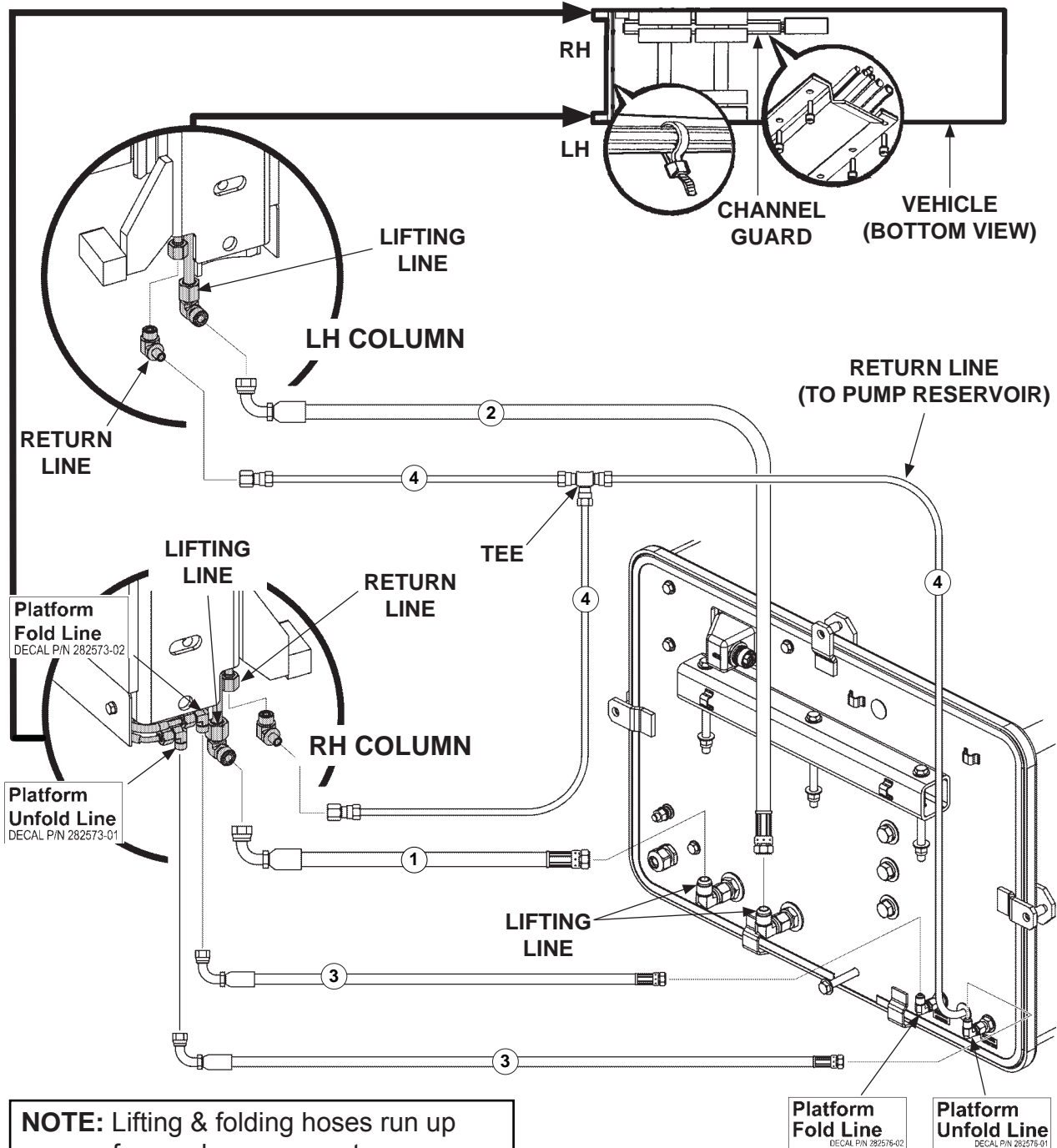
# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

## RUN GRAVITY DOWN HYDRAULIC LINES

**NOTE:** See TABLES 49-1 & 49-2 for information on the numbered hoses in this illustration.

### CAUTION

Before connecting hoses, ensure face seal o-rings are in place.



**NOTE:** Lifting & folding hoses run up from column connectors, as shown, to bottom of vehicle floor.

FIG. 48-1

## STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

### RUN GRAVITY DOWN HYDRAULIC LINES

**NOTE:** Each pump extension kit contains 2 hoses of the same length (**item 3**). One hose is for the **Platform Fold Line** and the second hose is for the **Platform Unfold Line**. One hose has a yellow band on each connector to help connect the 2 hoses to the correct fittings. For example, connect hose with yellow bands to the **Fold Line** on the RH column and the **Fold Line** on the back of the pump box.

**NOTE:** For torque values for the hydraulic hose connectors, see **TABLES 50-1, 50-2 & 50-3**.

GRAVITY DOWN PUMP BOX INSTALLATION: REQUIRED HOSES & PLASTIC TUBING			
	3 FT.	10 FT.	15 FT.
1	HP 3/8" X 72" LG.	HP 3/8" X 196" LG.	HP 3/8" X 256" LG.
2	HP 3/8" X 150" LG.	HP 3/8" X 274" LG.	HP 3/8" X 334" LG.
3	HP 1/4" X 64" LG.	HP 1/4" X 188" LG.	HP 1/4" X 248" LG.
4	PLASTIC 3/8" OD X 84" LG.	PLASTIC 3/8" OD X 192" LG.	PLASTIC 3/8" OD X 264" LG.

**TABLE 49-1**

GRAVITY DOWN PUMP BOX INSTALLATION: REQUIRED HOSES & PLASTIC TUBING		
	20 FT.	28 FT.
1	HP 3/8" X 316" LG.	HP 3/8" X 412" LG.
2	HP 3/8" X 394" LG.	HP 3/8" X 490" LG.
3	HP 1/4" X 308" LG.	HP 1/4" X 404" LG.
4	PLASTIC 3/8" OD X 324" LG.	PLASTIC 3/8" OD X 420" LG.

**TABLE 49-2**

# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES

## - Continued

### TORQUE VALUES FOR HYDRAULIC CONNECTORS

#### SAE O-RING CONNECTORS

SIZE	TORQUE (LB-FT)	TORQUE (NEWTON-METER)
-4	13-15	17.6-20.3
-6	22-24	29.8-32.5
-8	40-43	54.2-58.3

TABLE 50-1

#### SAE 37 DEGREE FLARE CONNECTORS

SIZE	TORQUE (LB-FT)	TORQUE (NEWTON-METER)
-4	11-12	14.9-16.3
-6	18-20	24.4-27.1
-8	36-39	48.8-52.8

TABLE 50-2

#### O-RING FACE-SEAL CONNECTORS

SIZE	TORQUE (LB-FT)	TORQUE (NEWTON-METER)
-4	17-18	23-25.4
-6	25-27	33.9-37.3
-8	38-41	51.5-56.7

TABLE 50-3

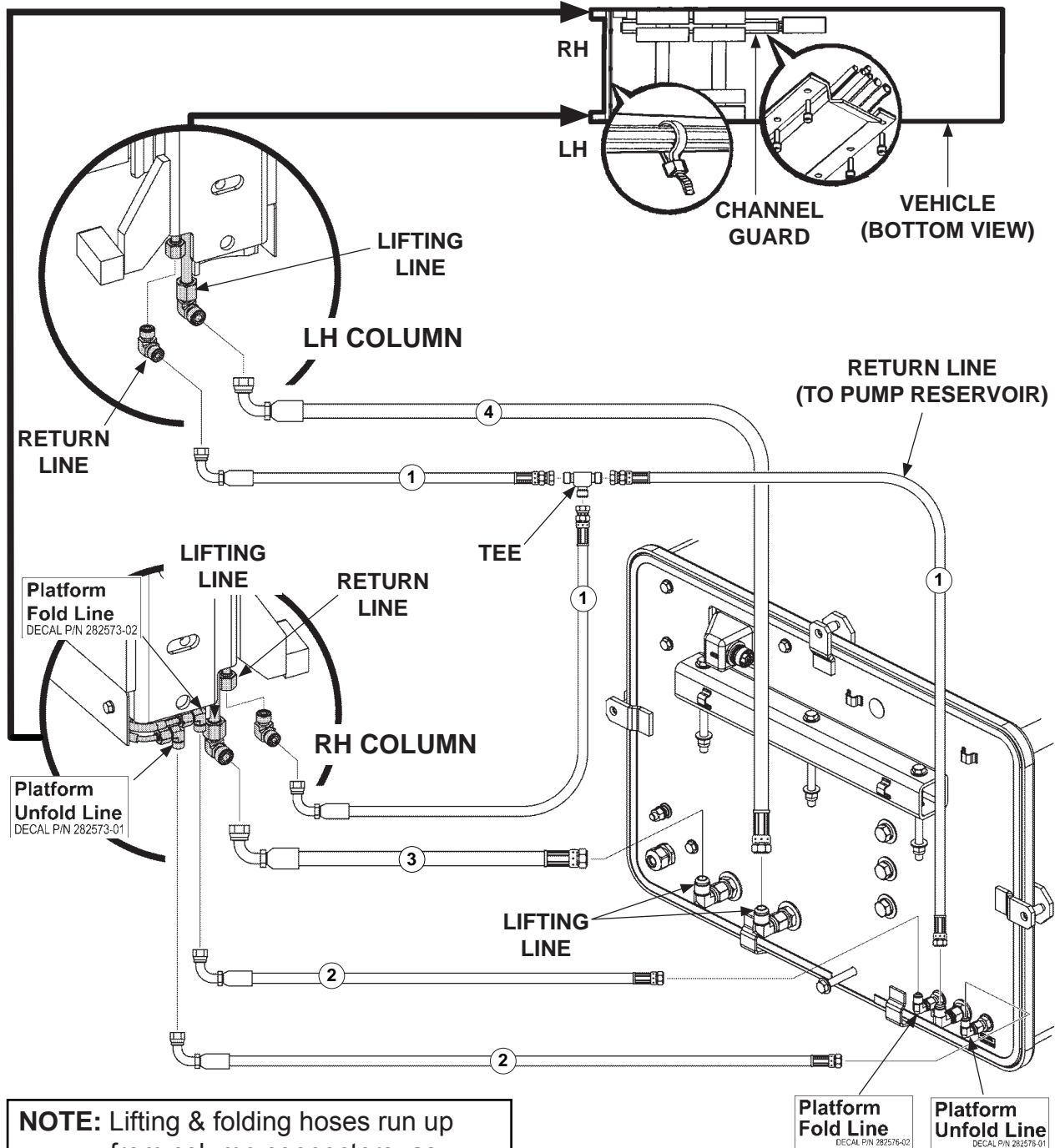
# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

## RUN POWER DOWN HYDRAULIC LINES

**NOTE:** See TABLES 52-1 & 52-2 for information on the numbered hoses in this illustration.

### CAUTION

Before connecting hoses, ensure face seal o-rings are in place.



**NOTE:** Lifting & folding hoses run up from column connectors, as shown, to bottom of vehicle floor.

FIG. 51-1

## STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES

### - Continued

### RUN HYDRAULIC LINES

**NOTE:** Each pump extension kit contains 2 hoses of the same length (**item 1**). One hose is for the **Platform Fold Line** and the second hose is for the **Platform Unfold Line**. One hose has a yellow band on each connector to help connect the 2 hoses to the correct fittings. For example, connect hose with yellow bands to the **Fold Line** on the RH column and the **Fold Line** on the back of the pump box.

**NOTE:** See **TABLES 50-1, 50-2 & 50-3** for hydraulic fittings torque values.

POWER DOWN PUMP BOX INSTALLATION: REQUIRED HOSES			
	3 FT.	10 FT.	15 FT.
1	HP 1/4" X 34" LG.	HP 1/4" X 166" LG.	HP 1/4" X 226" LG.
2	HP 1/4" X 64" LG.	HP 1/4" X 188" LG.	HP 1/4" X 248" LG.
3	HP 3/8" X 72" LG.	HP 3/8" X 196" LG.	HP 3/8" X 256" LG.
4	HP 3/8" X 150" LG.	HP 3/8" X 274" LG.	HP 3/8" X 334" LG.

**TABLE 52-1**

POWER DOWN PUMP BOX INSTALLATION: REQUIRED HOSES		
	20 FT.	28 FT.
1	HP 1/4" X 286" LG.	HP 1/4" X 382" LG.
2	HP 1/4" X 308" LG.	HP 1/4" X 404" LG.
3	HP 3/8" X 316" LG.	HP 3/8" X 412" LG.
4	HP 3/8" X 394" LG.	HP 3/8" X 490" LG.

**TABLE 52-2**

# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued RUN ELECTRIC CABLES

**NOTE:** Liftgates with auxiliary or street-side controls have a tee assembly with three green connectors. Use the following procedure on all green connectors.

1. Locate GREEN connector at the base of RH column, that connects runner switch to interconnect harness (**FIG. 53-1**).

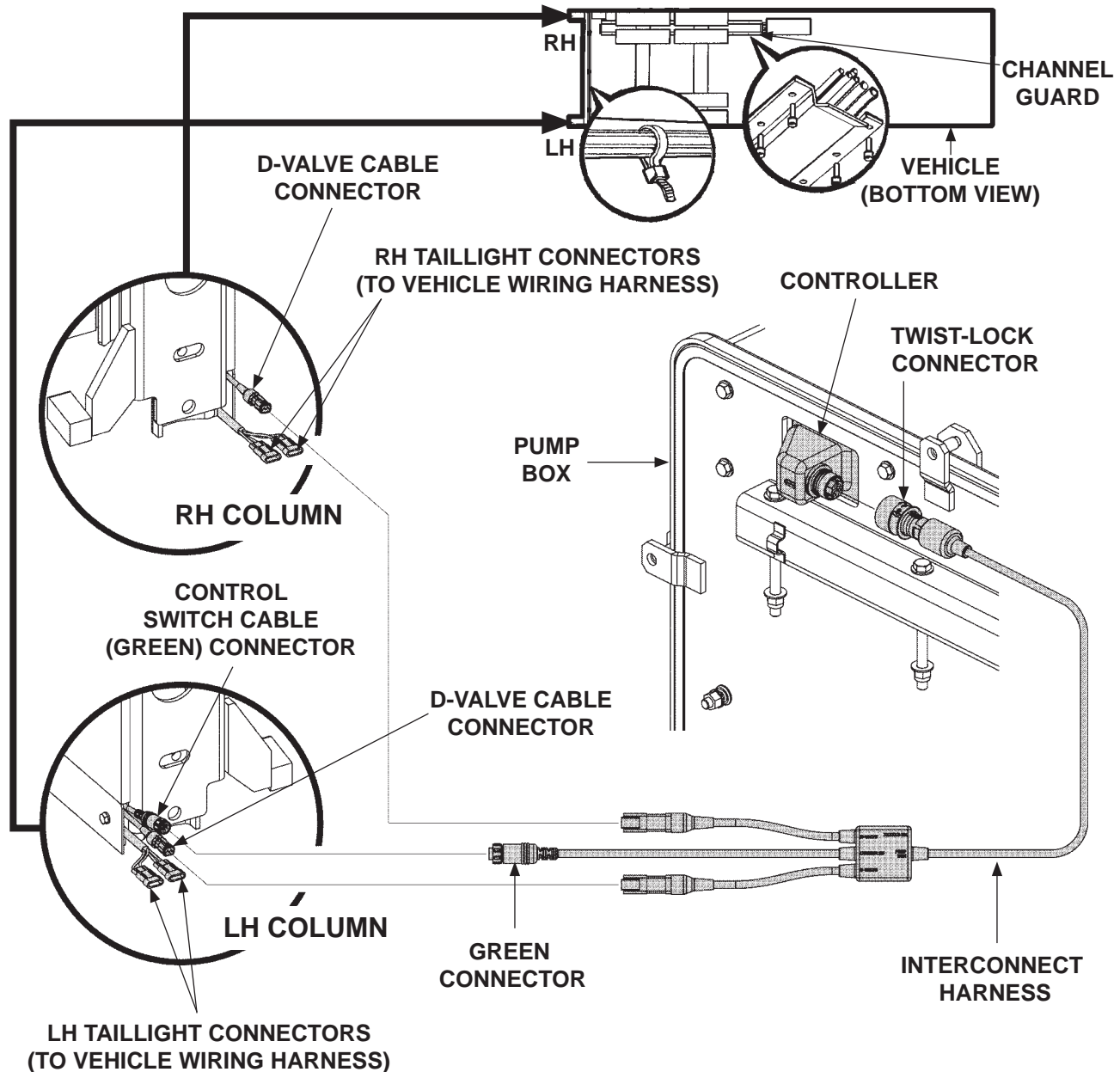
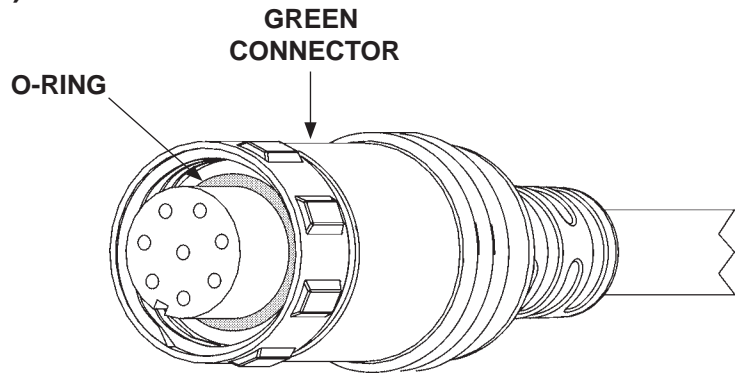


FIG. 53-1

## STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued RUN ELECTRIC CABLES

2. Check that O-ring is in position and there is no dirt or debris on the O-ring or in the connector with sockets (**FIG. 54-1**).



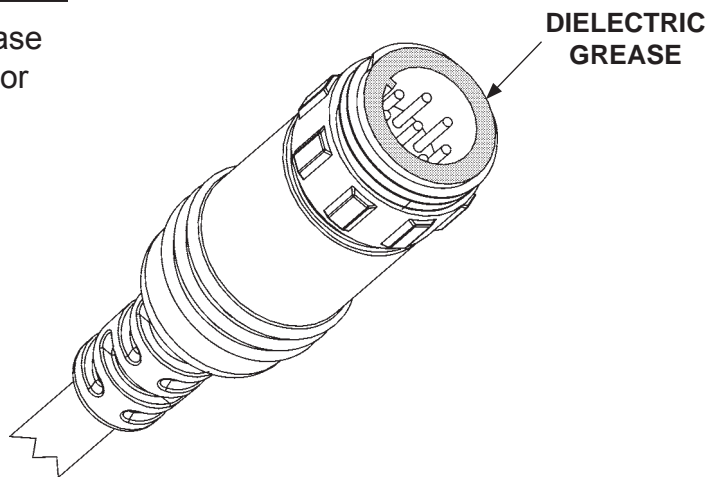
**CHECKING CONNECTOR O-RING  
FIG. 54-1**

3. Slide a 2" long piece of 1" diameter heat shrink sleeving (**P/N 905189-04 in parts box**) over the connector.

### CAUTION

Do **NOT** apply any dielectric grease to the pins or inside the connectors.

4. Apply a thin coating of dielectric grease around the outer face of the connector with pins, as shown in **FIG. 54-2**.

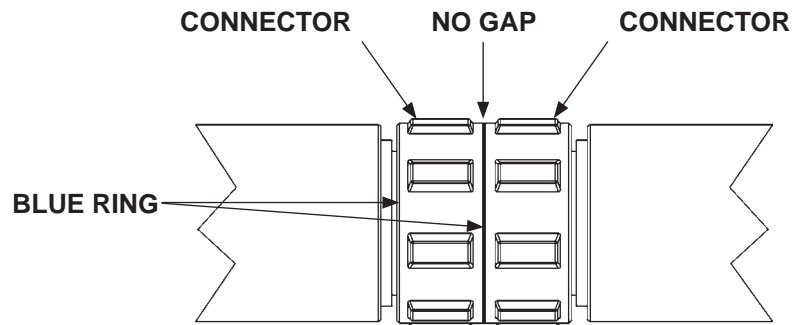


**APPLYING DIELECTRIC GREASE TO CONNECTOR  
FIG. 54-2**

# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

## RUN ELECTRIC CABLES

- Align the keyed connectors and push together. Tighten blue rings until fully seated with no gap between the connectors. Grip both ends of connector firmly by hand and tighten (**FIG. 55-1**).



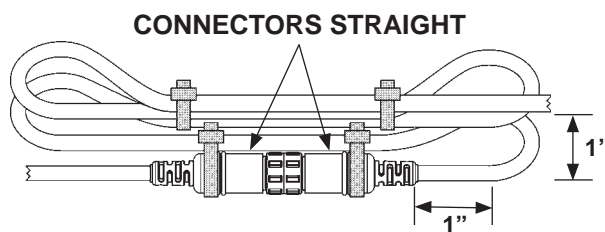
**ALIGNING AND TIGHTENING CONNECTORS**  
**FIG. 55-1**

- Center heat shrink sleeving over connection and apply heat until sleeving is fully sealed around the connectors.

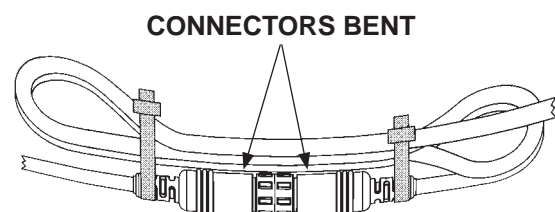
### CAUTION

Bending connectors will result in damaged connectors. Tie connector housings to cable bundle to prevent damage.

- Secure harness under trailer with plastic ties, as needed. Ensure cables exiting the connectors are stress-relieved. Cables should exit connector with 1" of straight cable before bending to maximum 1" radius (**FIG. 55-2**).



**CORRECT CABLE ALIGNMENT**  
**FIG. 55-2**



**INCORRECT CABLE ALIGNMENT**  
**FIG. 55-3**

**NOTE:** Go to next page for more information about connecting & disconnecting twist-lock connectors.

# STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

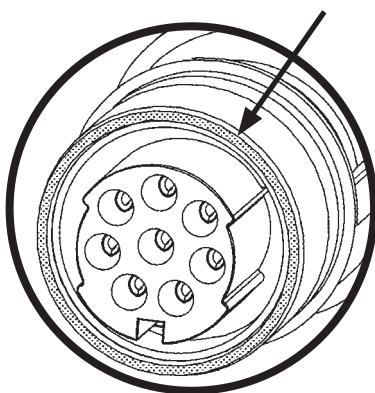
## RUN ELECTRIC CABLES

### CAUTION

Before connecting, ensure connectors are clean inside. Ensure there is a thin coating of dielectric grease on face of receptacle, and there is no dielectric grease on connector contacts.

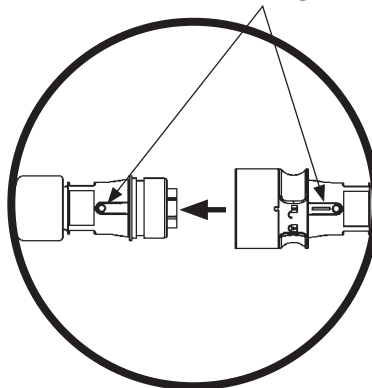
8. Refer to illustrations below for checking for dielectric grease, connecting and disconnecting twist-lock style connectors.
9. Connect twist-lock connector to controller on back of pump enclosure (**FIG. 53-1**).

ENSURE THERE IS A THIN COATING  
OF DIELECTRIC GREASE  
ON THIS SHADED AREA

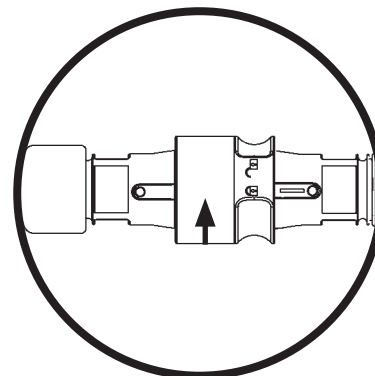


**DIELECTRIC GREASE  
ON RECEPTACLE  
FIG. 56-1**

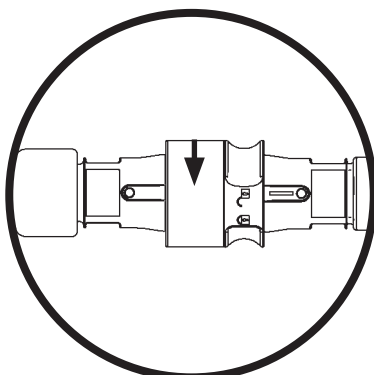
ALIGN  
MARKS



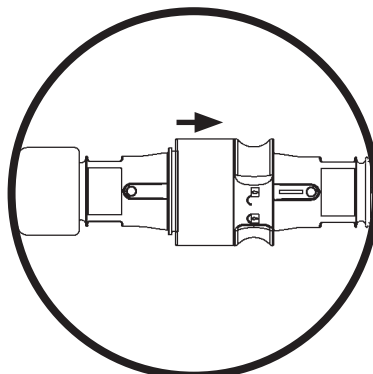
**ALIGN & CONNECT  
FIG. 56-2**



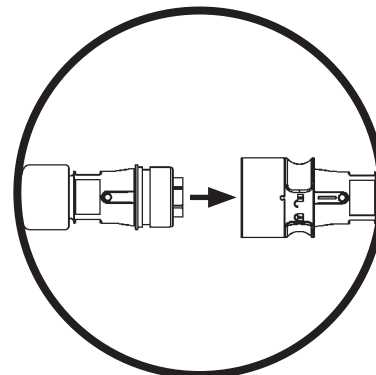
**TWIST TO LOCK  
FIG. 56-3**



**TWIST COUPLING  
RING TO UNLOCK  
FIG. 56-4**



**PULL COUPLING RING  
TO DISENGAGE  
FIG. 56-5**

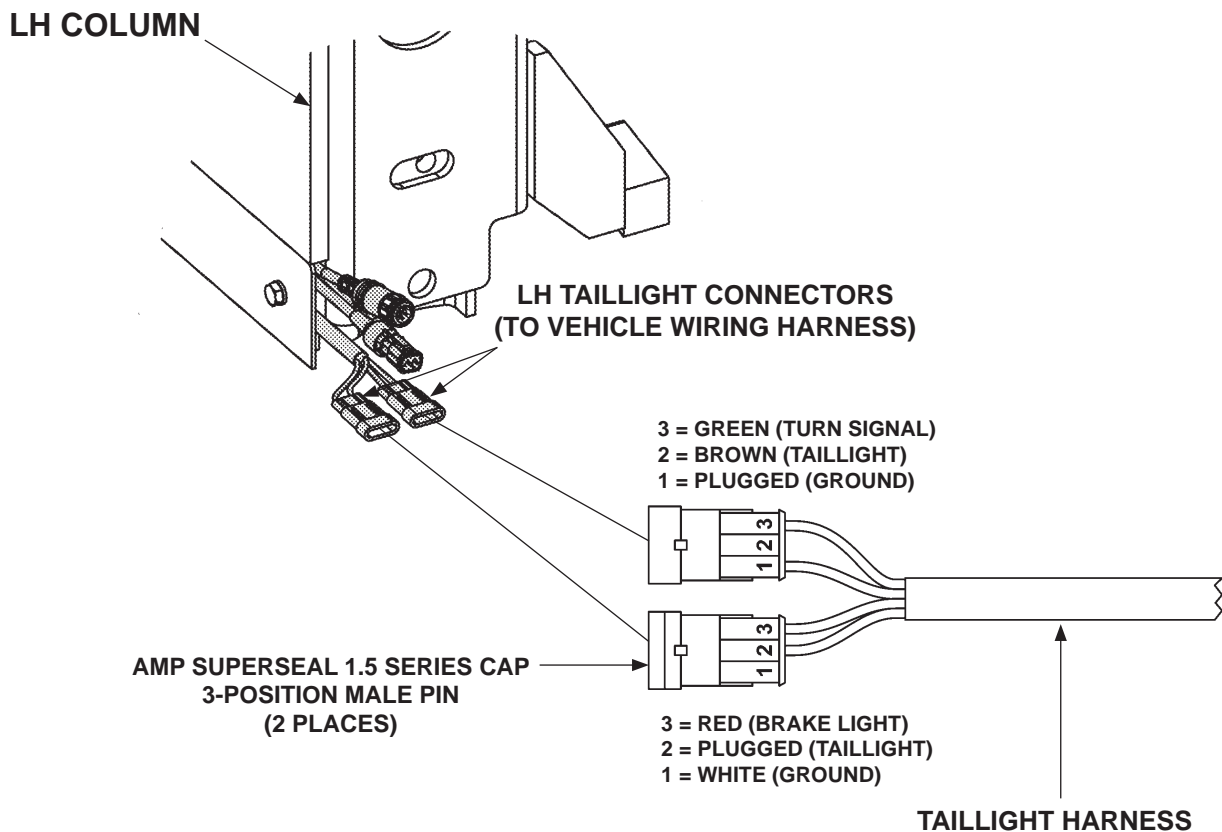


**PULL CONNECTORS  
TO DISCONNECT  
FIG. 56-6**

## STEP 8 - RUN HYDRAULIC LINES & ELECTRIC CABLES - Continued

### RUN ELECTRIC CABLES

10. Connect taillight harness to LH taillight connectors at bottom of LH column (**FIG. 57-1**).
11. Repeat for RH column.



CONNECTING TAILLIGHT HARNESS TO TAILLIGHT CONNECTORS  
(LH COLUMN SHOWN)  
FIG. 57-1

## STEP 9 - GROUND PUMP TO VEHICLE FRAME

**NOTE:** Make sure the Liftgate power unit, all batteries on the vehicle for power unit, and taillights on Liftgate are connected correctly to a common ground.

1. Bolt ground cable to the ground stud on pump box (**FIG. 58-1**).

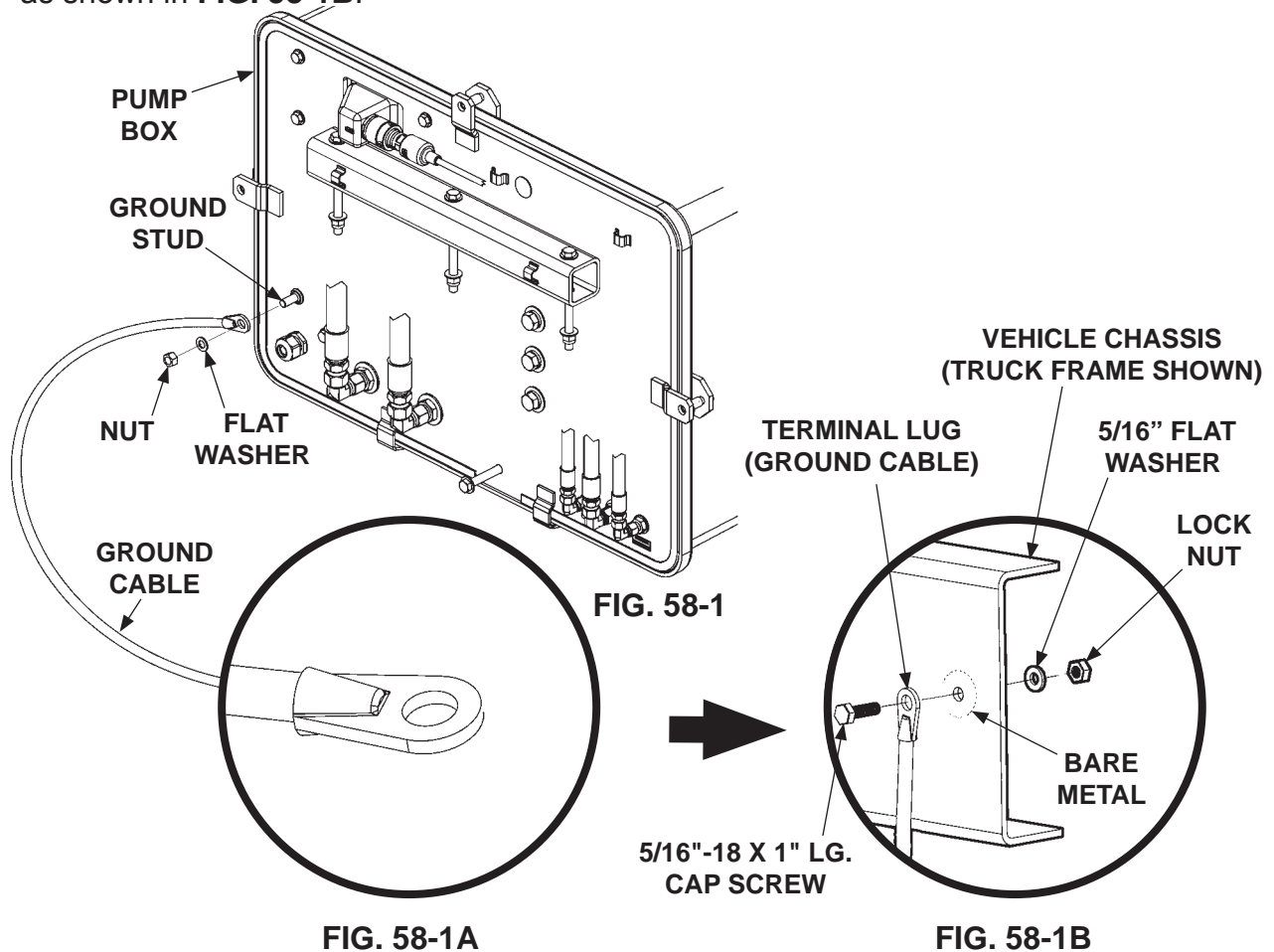
**NOTE:** If there is an existing grounding point on truck frame, use it to connect ground cable and skip the step for drilling a hole.

2. Extend the ground cable to reach vehicle frame (**FIG. 58-1B**) without putting tension on cable (after connection). Connect to an existing grounding point if available.
3. If necessary, drill a 11/32" (0.343") hole in vehicle frame for bolting the ground cable terminal lug (**FIG. 58-1B**).

**NOTE:**

- Before connecting ground cable to frame, clean connection point on the frame down to bare metal.
- After connecting ground cable, **MAXON** recommends sealing the ground connection with galvanized coating for galvanized surfaces, or black paint for painted surfaces.

4. Bolt ground cable terminal lug (**FIG. 58-1A**) to vehicle frame as shown in **FIG. 58-1B**.



## STEP 10 - RUN CHARGE LINES

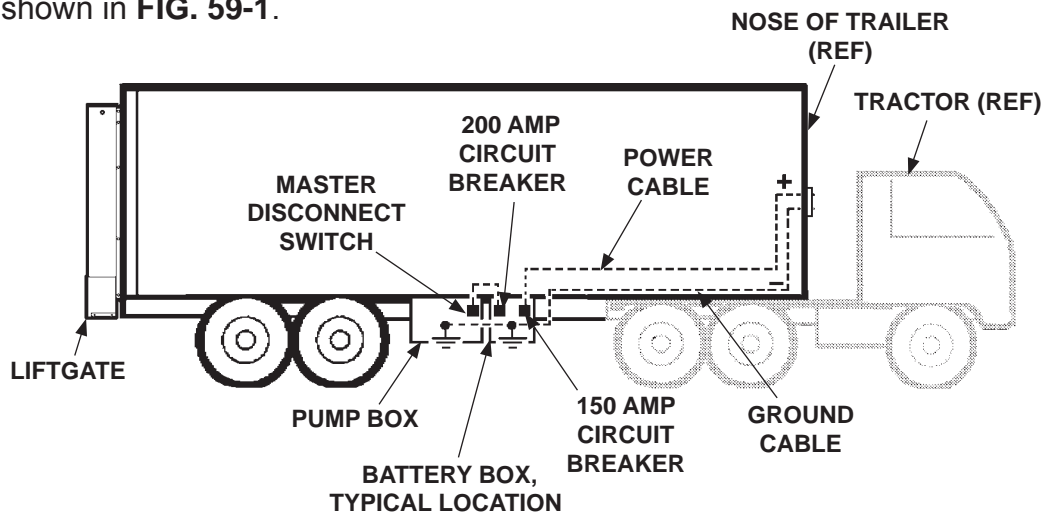
### RECOMMENDED POWER CONFIGURATIONS

#### ⚠ CAUTION

Never route an energized wire. Make sure battery is disconnected. Always route electrical wires clear of moving parts, brake lines, sharp edges and exhaust systems. Avoid making sharp bends in wiring. Attach securely. If drilling is necessary, first check behind the drilling surface so you do not damage any fuel lines, vent lines, brake lines or wires.

**NOTE:** Make sure the power unit for the Liftgate, and all batteries on the vehicle used as the power source, are connected correctly to a common chassis ground.

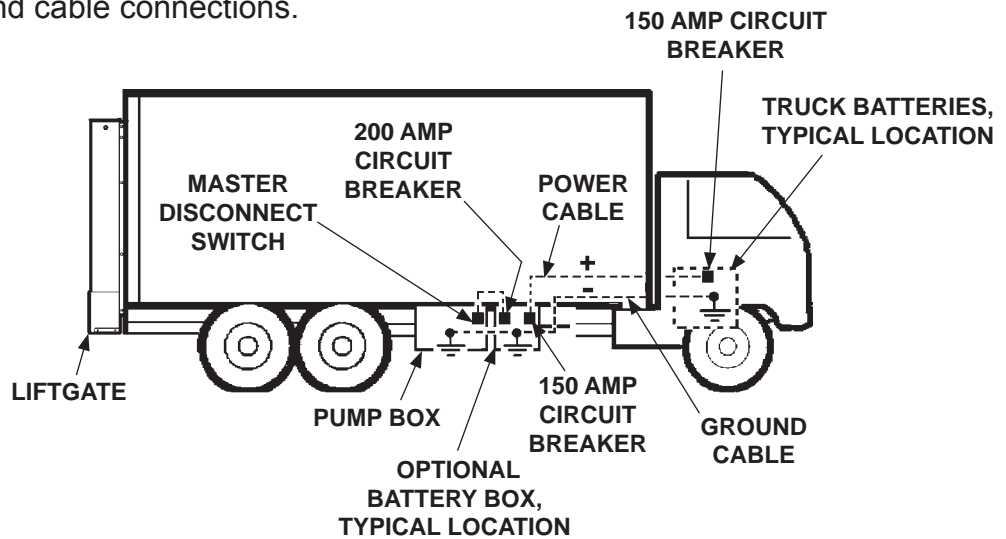
1. Liftgate, pump box, and battery box are typically installed on trailers as shown in **FIG. 59-1**.



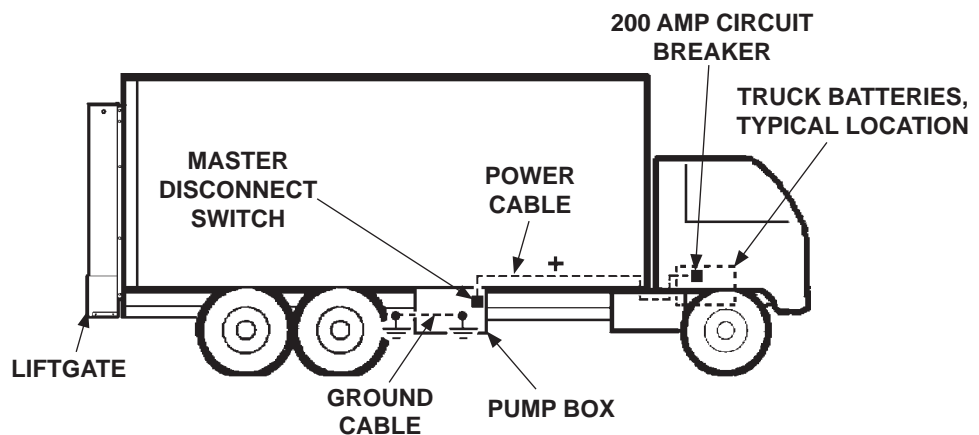
**RECOMMENDED LIFTGATE & BATTERY BOX  
INSTALLATION ON TRAILER**  
**FIG. 59-1**

## STEP 10 - RUN CHARGE LINES - Continued

2. Liftgate, pump box, and optional battery box are typically installed on trucks as shown in **FIG. 60-1** and **FIG. 60-2**. See the following page for battery and cable connections.



**RECOMMENDED LIFTGATE & BATTERY BOX  
INSTALLATION ON TRUCK  
FIG. 60-1**



**RECOMMENDED LIFTGATE INSTALLATION  
WITHOUT OPTIONAL BATTERY BOX  
FIG. 60-2**

## STEP 10 - RUN CHARGE LINES - Continued

### RUNNING CABLE FROM VEHICLE BATTERY

**NOTE:** Make sure cable is long enough to reach master disconnect switch on Liftgate pump box, or circuit breaker in optional battery box (if equipped), without putting strain on the cable. If equipped with fused cable, ensure the **fuse** end is by the vehicle battery.

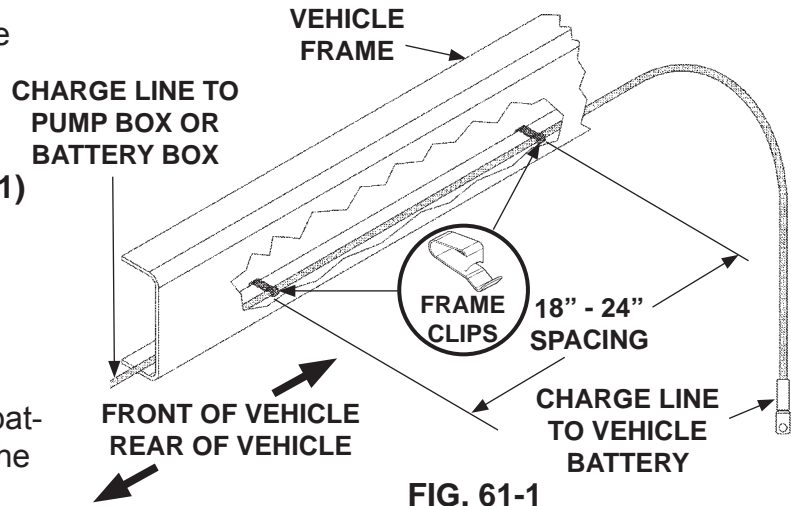
1. Install charge line by running the line along vehicle frame as follows.

- Inside of truck frame (**FIG. 61-1**)
- Bottom of trailer frame

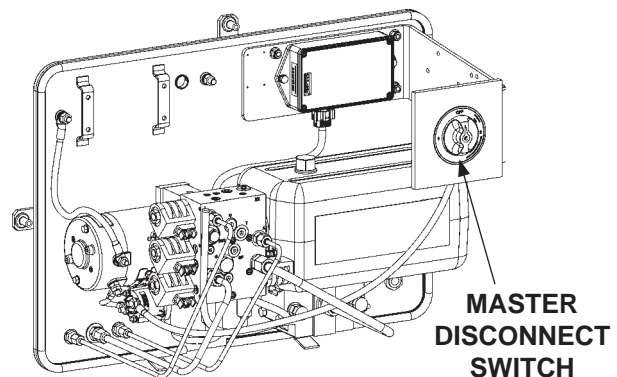
2. Run the charge line from truck battery or nose of trailer to one of the following devices.

- Master disconnect switch on pump box (**FIG. 61-2**)
- The 150 amp circuit breaker in optional battery box (**FIG. 61-3**)

Use frame clips (Parts Box item) (**FIG. 61-1**) and plastic ties, as required from charge line kit, to secure cable to vehicle.



**FIG. 61-1**

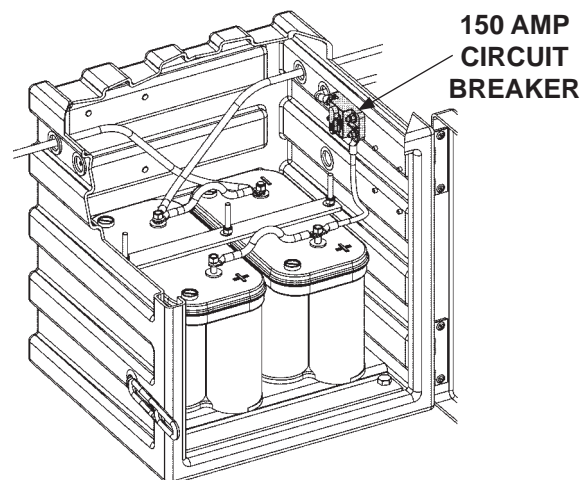


**FIG. 61-2**

3. If Liftgate comes with:

- Single Pole Tractor Charge Line Kit
- Single Pole Trailer Charge Line Kit
- Dual Pole Tractor Charge Line Kit
- Dual Pole Trailer Charge Line Kit

Install charge line according to **Instruction Sheet** contained in each kit.



**FIG. 61-3**

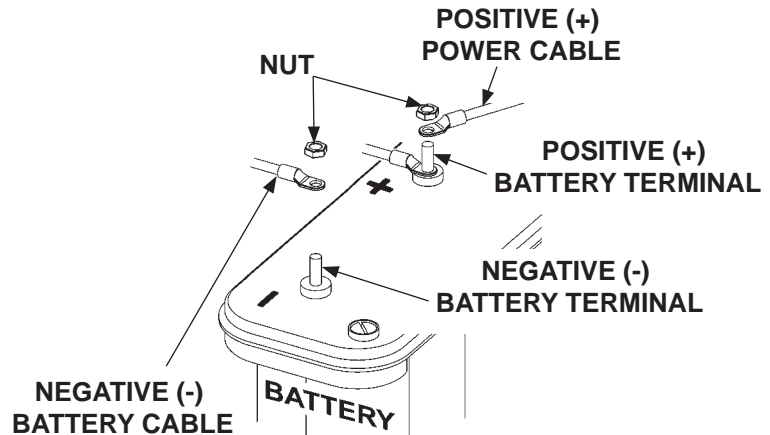
## STEP 11 - CONNECT CHARGE LINES & BATTERIES

### ⚠ WARNING

Prevent injury and equipment damage. Before connecting charge lines or power cables, ensure negative (-) battery cable is disconnected at vehicle battery or battery box (if equipped). Ensure master disconnect switch is turned OFF on the pump box.

**NOTE:** Ensure batteries are fully charged before operating Liftgate & before delivery to customer.

1. Remove nut from negative (-) battery terminal. Disconnect negative (-) battery cable from vehicle battery (**FIG. 62-1**). Start nut on the terminal.

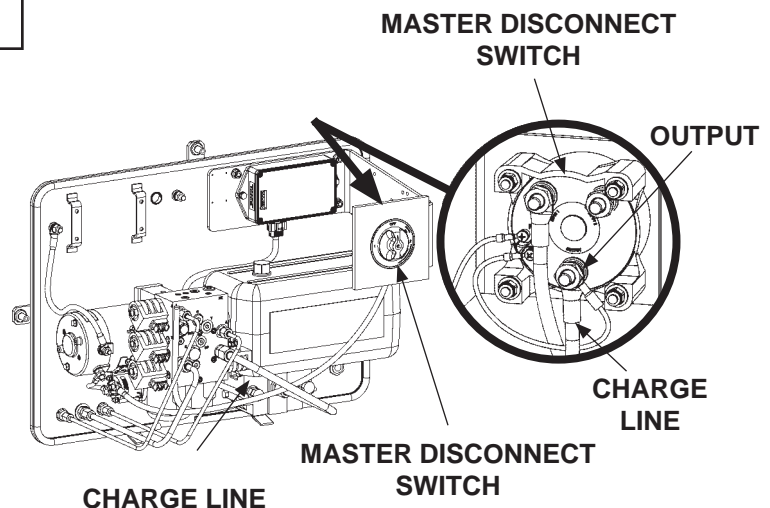


CONNECTING CHARGE LINE TO BATTERY  
FIG. 62-1

2. Remove nut from positive (+) battery terminal. Connect positive (+) power cable (charge line) to positive (+) battery terminal (**FIG. 62-1**). Reinstall and tighten nut.

**NOTE:** Skip instruction 3 below if connecting to optional battery box.

3. If **vehicle batteries** are used to power the Liftgate, do the following. At the pump box, remove nut from **OUTPUT** terminal on master disconnect switch (**FIG. 62-2**). Connect positive (+) power cable (charge line) to **OUTPUT** terminal on master disconnect switch (**FIG. 62-2**). Reinstall and tighten nut.



CONNECTING CHARGE LINE TO MASTER DISCONNECT SWITCH  
FIG. 62-2

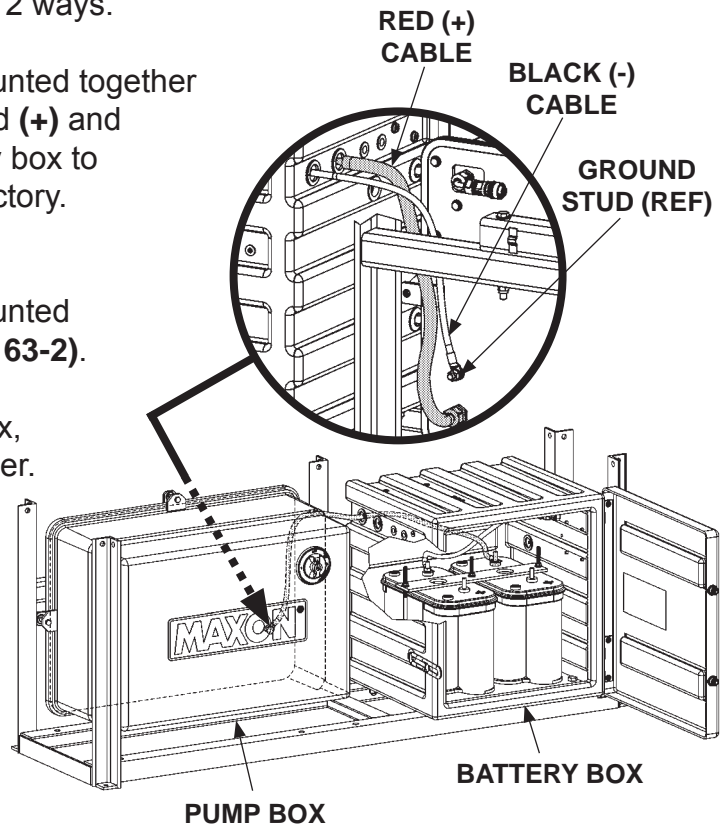
# STEP 11 - CONNECT CHARGE LINES & BATTERIES - Continued

**NOTE:** Skip instruction 4 below if vehicle battery is connected to master disconnect switch on the pump box.

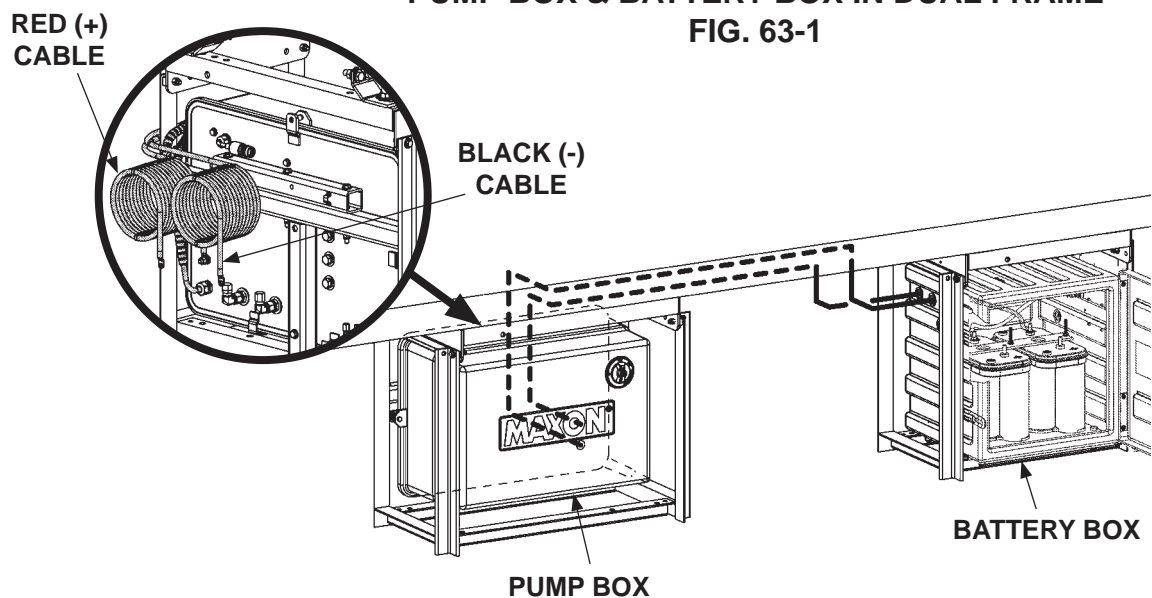
4. If optional battery box is installed for the Liftgate, the battery box is mounted in one of 2 ways.

- Pump box and battery box are mounted together in a dual frame (FIG. 63-1). The red (+) and black (-) cables, connecting battery box to pump box, are connected at the factory. **Go to instruction .**

- Pump box and battery box are mounted separately in 2 single frames (FIG. 63-2). The red (+) and black (-) cables, connecting battery box to pump box, need to be connected by the installer. **Go to instruction 5.**



**PUMP BOX & BATTERY BOX IN DUAL FRAME**  
**FIG. 63-1**

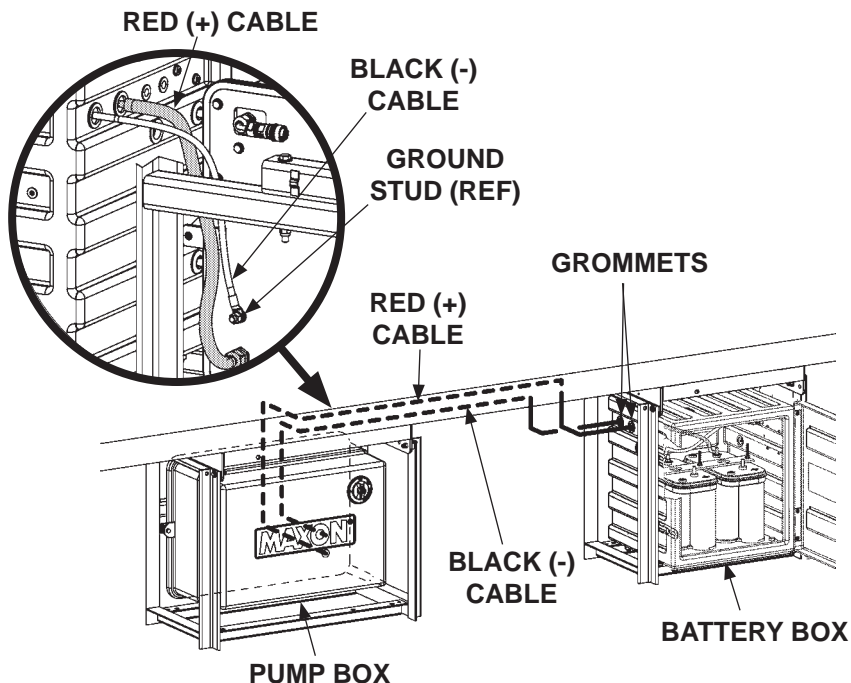


**PUMP BOX & BATTERY BOX IN DUAL FRAME**  
**FIG. 63-2**

## STEP 11 - CONNECT BATTERIES TO LIFTGATE - Cont'd

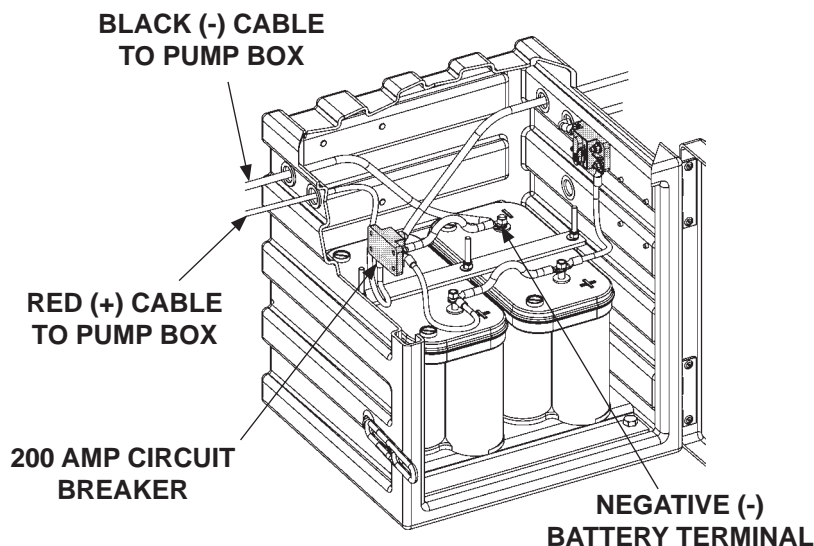
**NOTE:** The following instructions are only required if Liftgate is equipped with optional battery box, and the pump box and battery box are mounted in separate single frames. In the dual frame shown below, the power cable is connected between pump box and battery box at the factory.

5. Uncoil the red (+) cable from back of the pump box (**FIG. 64-1**). Next, run cable along vehicle frame, through grommet on battery box, and to the 200 amp circuit breaker inside battery box (**FIG. 64-2**).



**PUMP BOX & BATTERY BOX IN SINGLE FRAMES  
FIG. 64-1**

6. Uncoil the black (-) cable from back of the pump box (**FIG. 64-1**). Next, run cable along vehicle frame, through grommet on battery box, and to the negative (-) battery terminal inside battery box (**FIG. 64-2**).

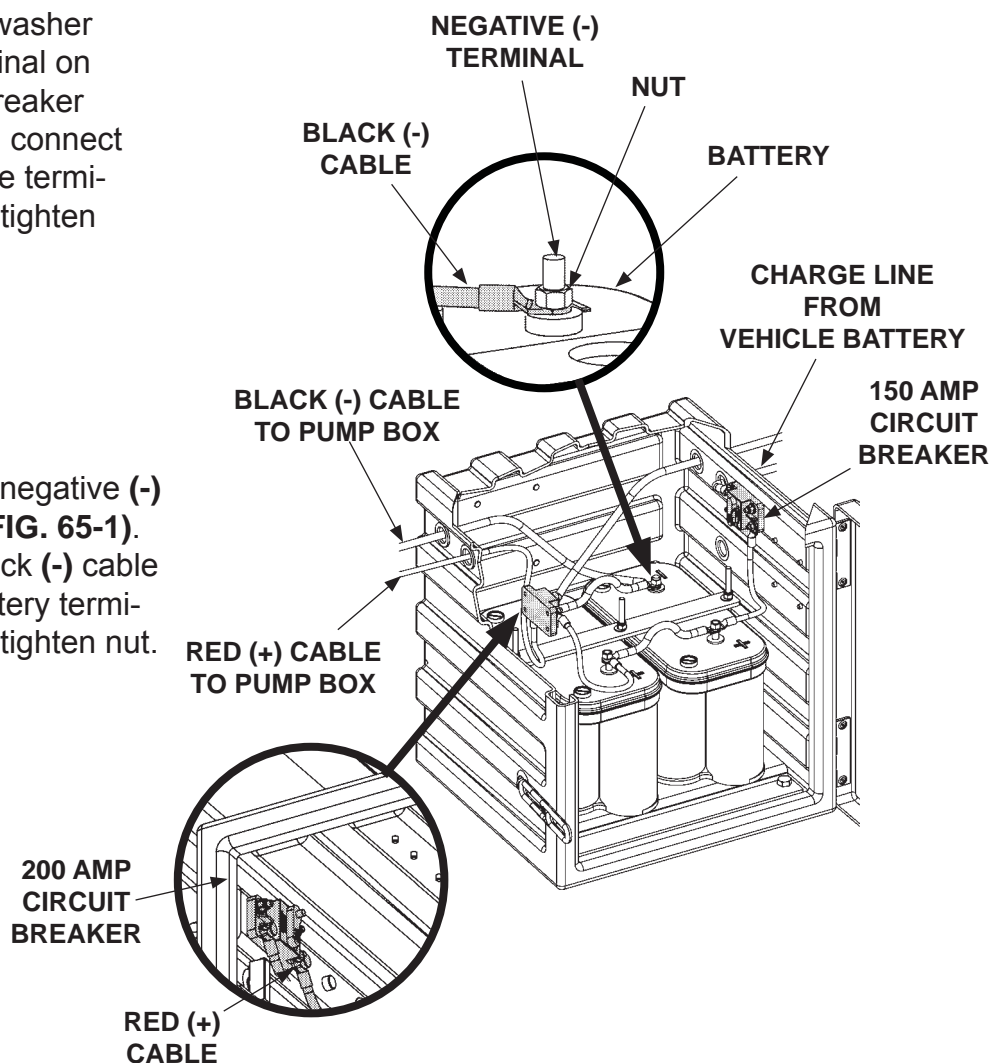


**ELECTRICAL CONNECTIONS IN BATTERY BOX  
FIG. 64-2**

## STEP 11 - CONNECT BATTERIES TO LIFTGATE - Cont'd

7. Remove nut and washer from unused terminal on **200 amp** circuit breaker (**FIG. 65-1**). Then, connect red (+) cable to the terminal. Reinstall and tighten nut.

8. Remove nut from negative (-) battery terminal (**FIG. 65-1**). Then, connect black (-) cable to negative (-) battery terminal. Reinstall and tighten nut.



**CONNECTING RED & BLACK CABLES  
AND CHARGE LINE  
FIG. 65-1**

9. Remove nut and washer from unused terminal on **150 amp** circuit breaker (**FIG. 65-1**). Then, connect charge line to the terminal. Reinstall and tighten nut.

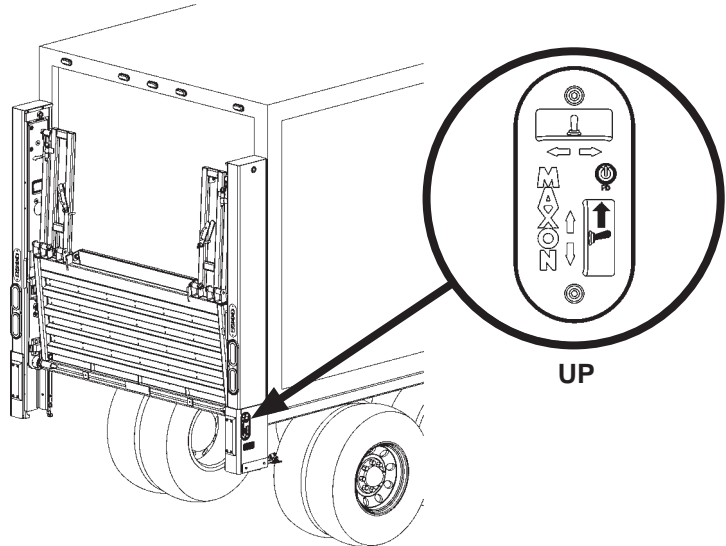
## STEP 12 - PRESSURIZE HYDRAULIC SYSTEM

### **WARNING**

To prevent injury and equipment damage, pressurize hydraulic system before removing lower support fixtures and operating Liftgate.

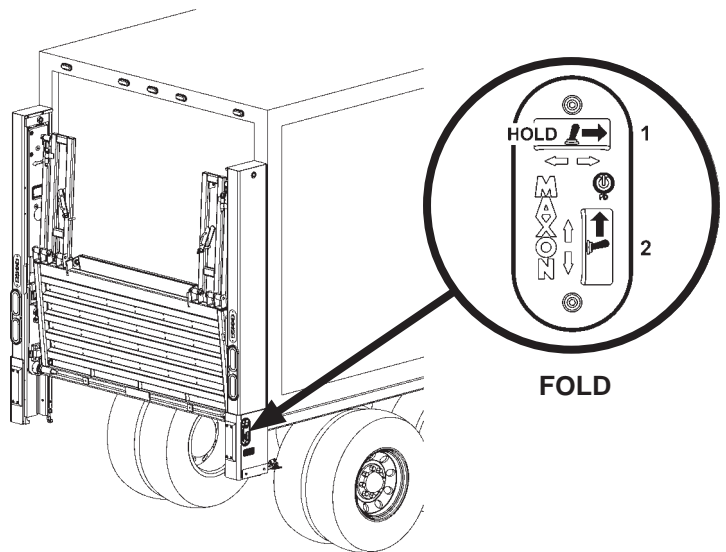
**NOTE:** Before operating liftgate, read and understand the operating instructions in the **Operation Manual**.

1. To pressurize lifting cylinders, set control box toggle switch to **UP** for 10-15 seconds as shown in **FIG. 66-1**.



**PRESSURIZING LIFTING CYLINDERS**  
**FIG. 66-1**

2. To pressurize closing cylinder, set control box toggle switches to **FOLD** for 10-15 seconds as shown in **FIG. 66-2**.



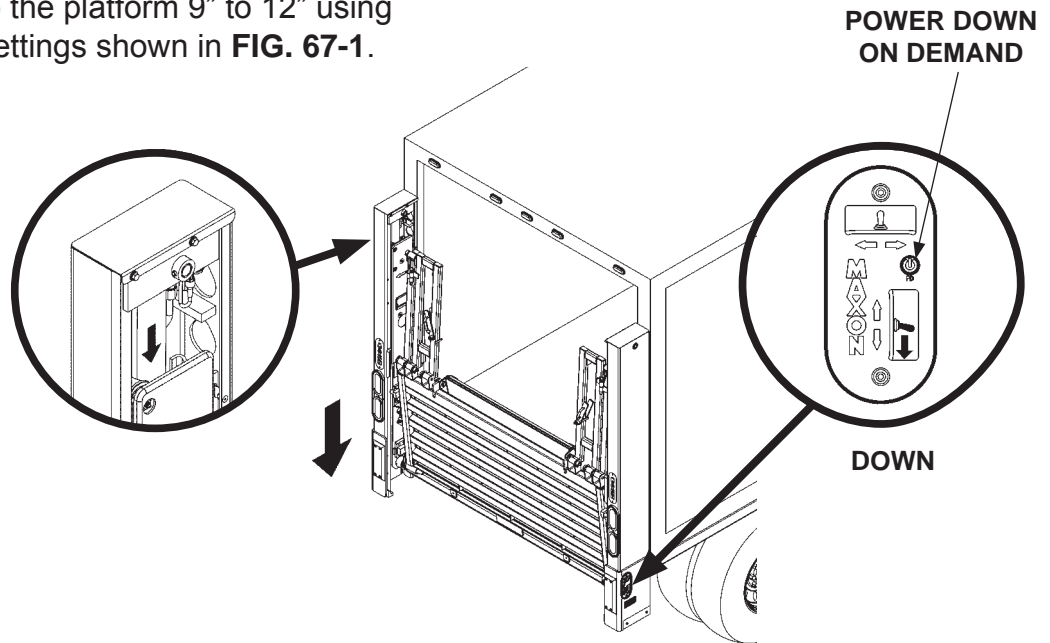
**PRESSURIZING CLOSING CYLINDER**  
**FIG. 66-2**

**NOTE:** Liftgate is shipped with **Exxon Unis HVI-13** hydraulic fluid in the hydraulic cylinders. This fluid is suitable for operation in temperature range of **-40° F to +120° F**. If necessary, a different brand or higher viscosity hydraulic fluid may be used. Refer to the **CHANGING HYDRAULIC FLUID** procedure in the **BMR Maintenance Manual**.

## STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL

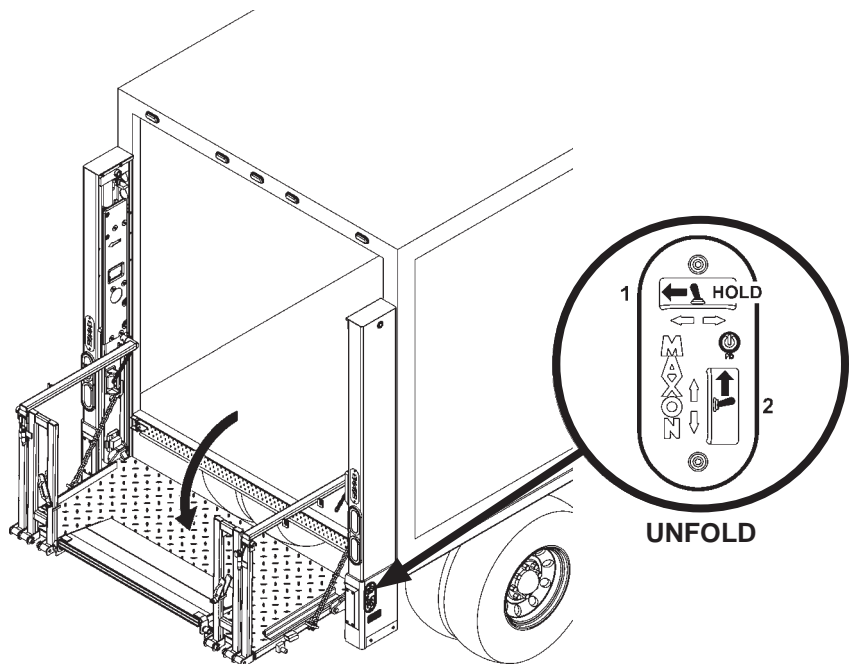
**NOTE:** If equipped, select **power down on demand** for optimizing hydraulic fluid level (FIG. 67-1).

1. Lower (**DOWN**) the platform 9" to 12" using toggle switch settings shown in FIG. 67-1.



**LOWERING PLATFORM**  
**FIG. 67-1**

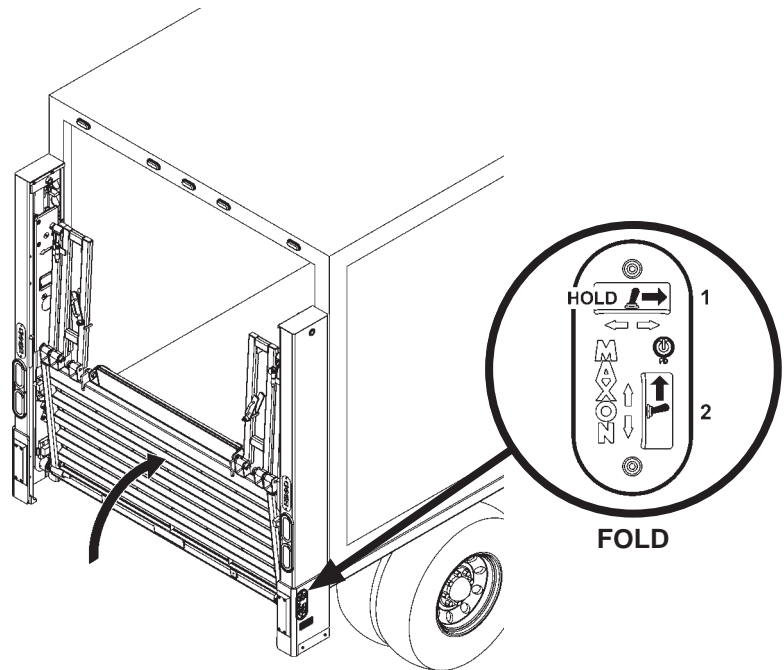
2. Open (**UNFOLD**) the platform by setting toggle switches as shown in FIG. 67-2.



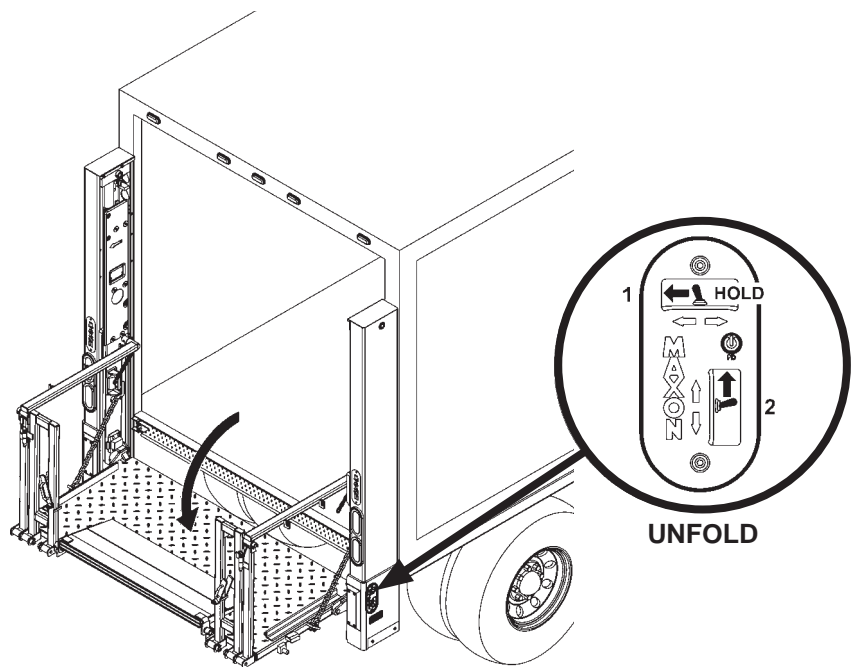
**UNFOLDING PLATFORM**  
**FIG. 67-2**

## STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL - Continued

3. Close (**FOLD**) the platform by setting toggle switches as shown in **FIG. 68-1**. Then, open (**UNFOLD**) the platform by setting toggle switches as shown in **FIG. 68-2**.



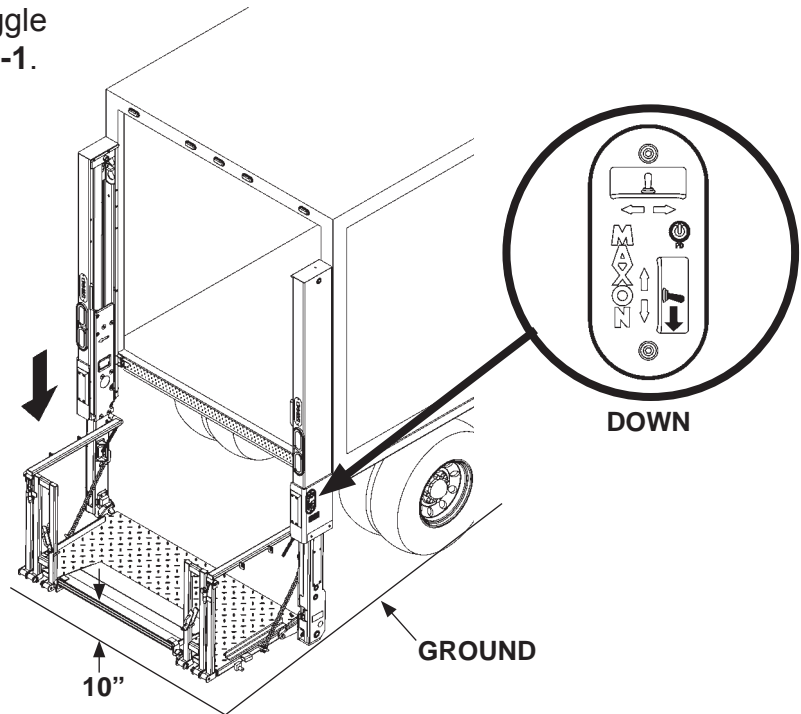
**FOLDING PLATFORM**  
**FIG. 68-1**



**UNFOLDING PLATFORM**  
**FIG. 68-2**

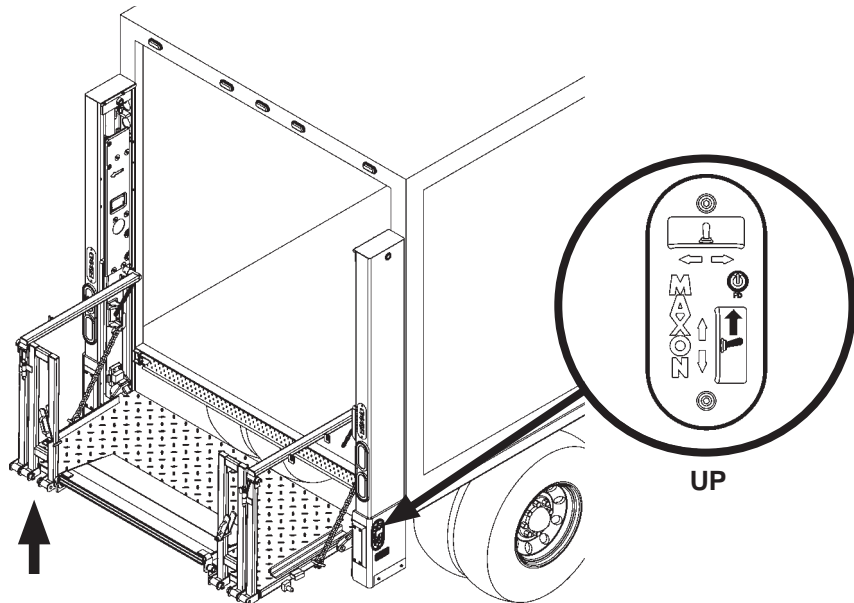
## STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL - Continued

4. Lower (**DOWN**) the platform to 10" above ground level using the toggle switch settings shown in **FIG. 69-1**.



**LOWERING PLATFORM**  
**FIG. 69-1**

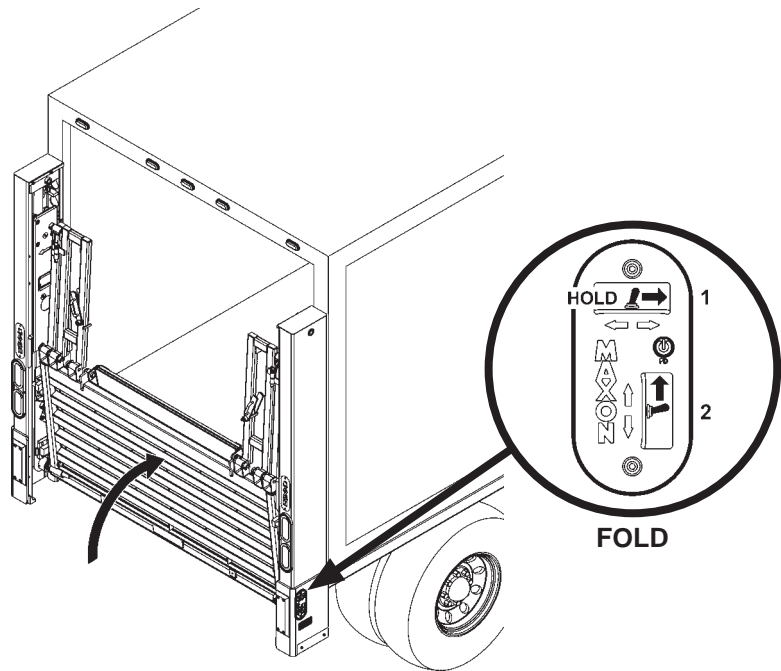
5. Raise (**UP**) the platform to about 6" below bed height using toggle switch setting shown in **FIG. 69-2**.



**RAISING PLATFORM**  
**FIG. 69-2**

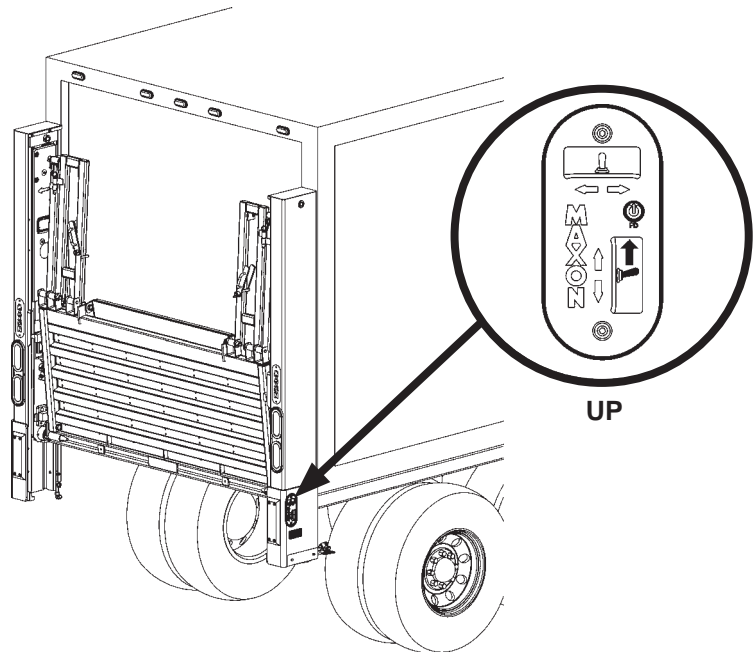
## STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL - Continued

6. Close (**FOLD**) the platform by setting toggle switches as shown in **FIG. 70-1**.



**FOLDING PLATFORM**  
**FIG. 70-1**

7. Raise (**UP**) the runners to stow platform by setting toggle switches as shown in **FIG. 70-2**.

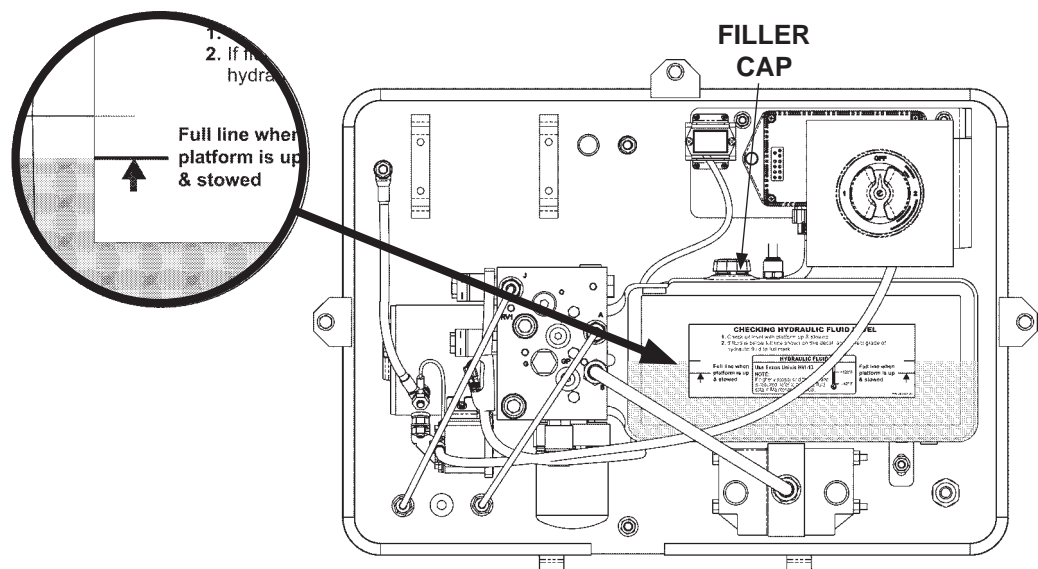


**RAISING PLATFORM**  
**FIG. 70-2**

## STEP 13 - OPTIMIZE HYDRAULIC FLUID LEVEL - Continued

**NOTE:** Information for checking hydraulic fluid level is shown on a decal on the pump reservoir.

8. Check if hydraulic fluid level is at the full line (**FIG. 71-1**). If necessary, remove filler cap (**FIG. 71-1**) and add hydraulic fluid until level rises to the full line (**FIG. 71-1**). Then, reinstall filler cap (**FIG. 71-1**).



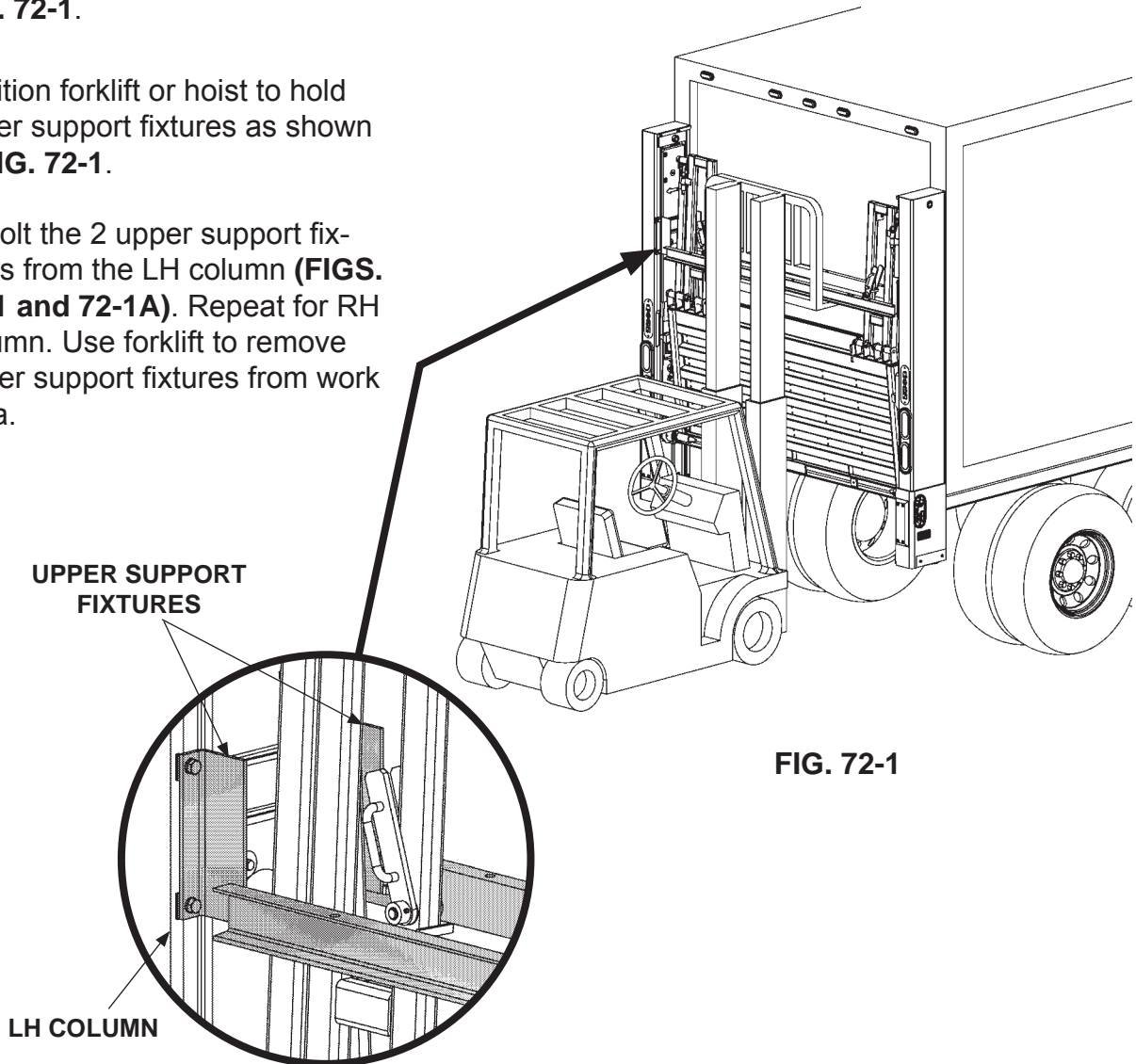
**CHECKING HYDRAULIC FLUID LEVEL  
FIG. 71-1**

## STEP 14 - REMOVE UPPER SUPPORT FIXTURES

### ⚠ CAUTION

Upper support fixtures are heavy. To prevent injury to installer and damage to Liftgate, use forklift or hoist to hold support fixtures during removal.

1. Stow the platform as shown in **FIG. 72-1**.
2. Position forklift or hoist to hold upper support fixtures as shown in **FIG. 72-1**.
3. Unbolt the 2 upper support fixtures from the LH column (**FIGS. 72-1 and 72-1A**). Repeat for RH column. Use forklift to remove upper support fixtures from work area.



**FIG. 72-1**

**FIG. 72-1A**

## STEP 15 - SECURING COLUMNS

### METHOD 1 & METHOD 2

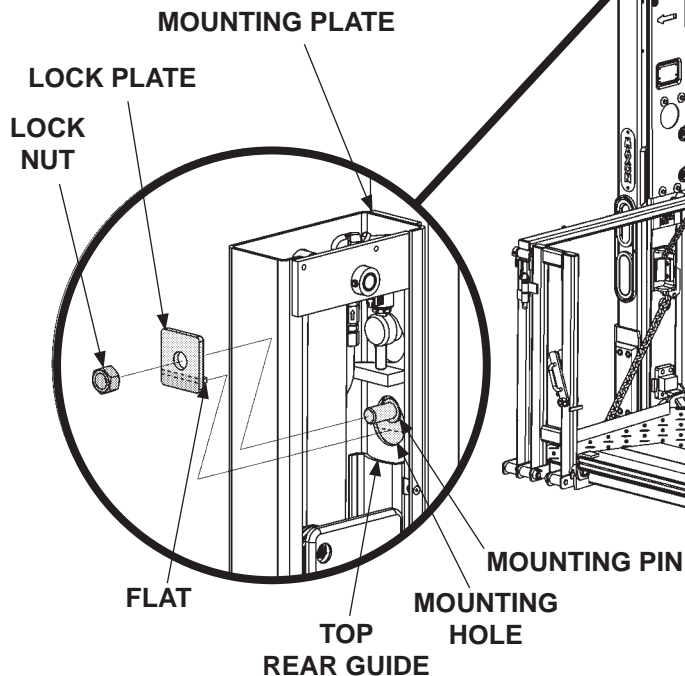
**NOTE:** Skip this step if using the **METHOD 3** weld-on version of installation with no mounting plates.

1. Slightly lower and open platform for access to mounting pin.

### CAUTION

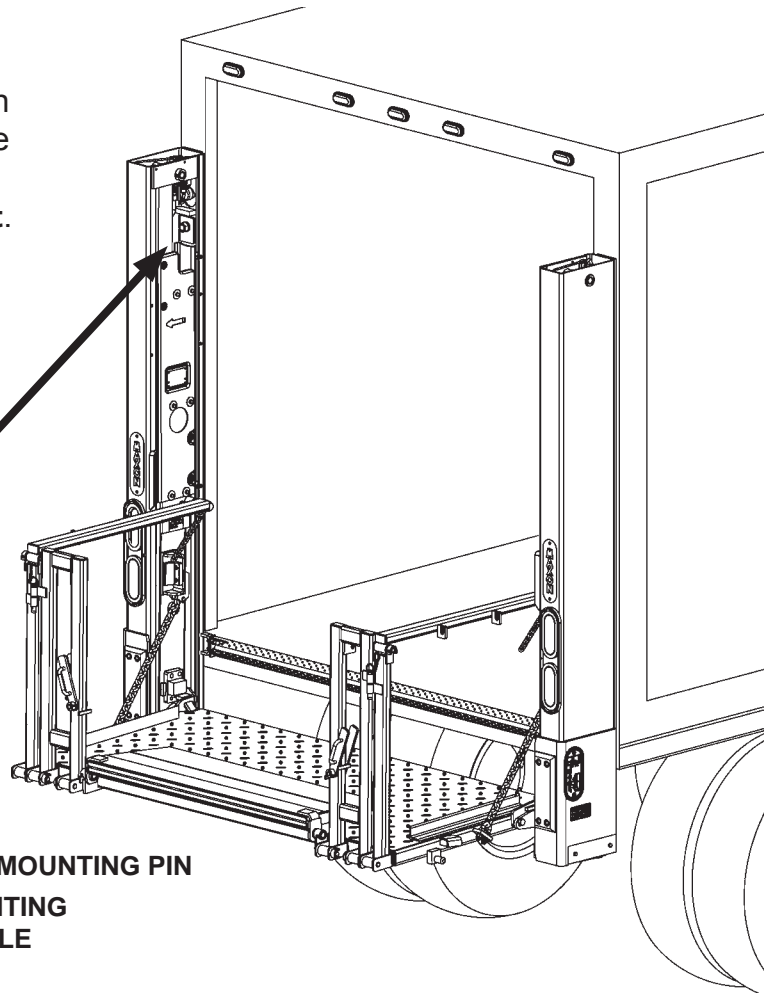
To prevent damage to hydraulic line, ensure flat on lock plate is seated in the mounting hole on the column before tightening lock nut on mounting pin.

2. Get two lock plates and two 1"-8 lock nuts from parts bag. Then, install 1 lock plate and 1 lock nut on top rear guide of the mounting plate on the LH column (**FIGS. 73-1 and 73-1A**). Torque lock nut to **200 lb-ft**. Repeat for RH column.



**INSTALLING LOCK PLATE  
(LH COLUMN SHOWN)**

**FIG. 73-1A**



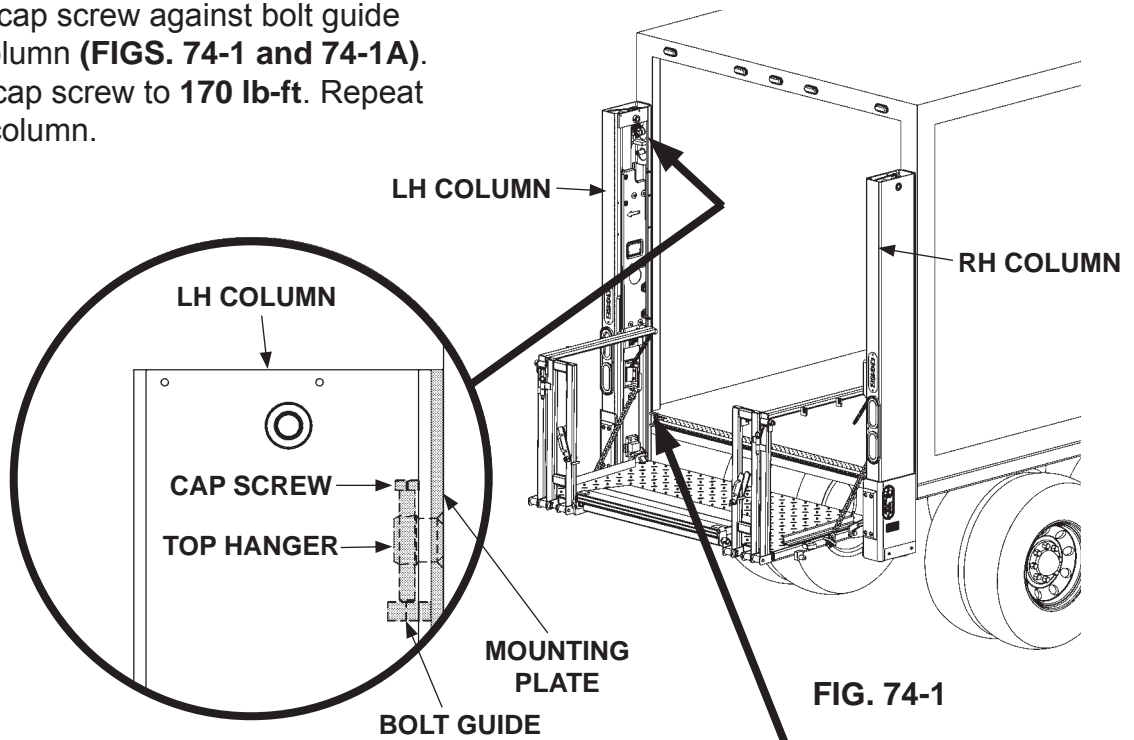
**FIG. 73-1**

## STEP 15 - SECURING COLUMNS - Continued

### METHOD 1 ONLY

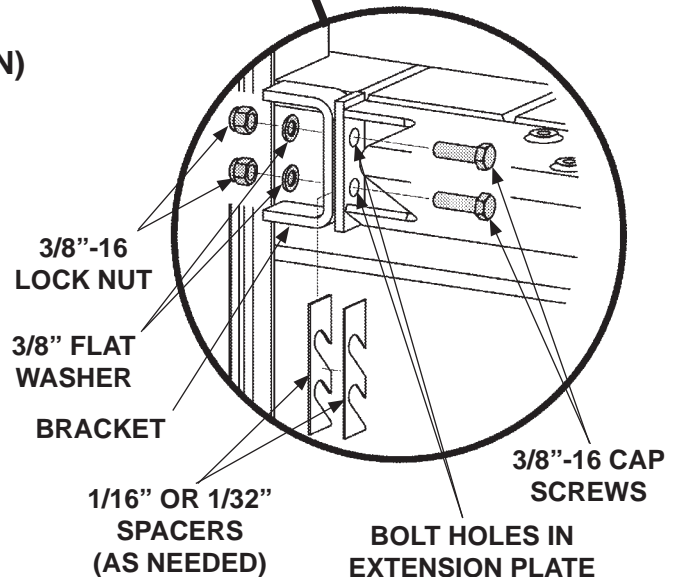
**NOTE:** Skip 3 and 4 if using **METHOD 2** or **METHOD 3** to install Liftgate on vehicle.

3. Tighten cap screw against bolt guide in LH column (**FIGS. 74-1 and 74-1A**). Torque cap screw to **170 lb-ft**. Repeat for RH column.



**TIGHTENING HANGER CAP SCREW (LH COLUMN SHOWN)**  
**FIG. 74-1A**

**NOTE:** For **METHOD 1**, bolting extension plate to LH & RH columns is not required. However, extension plate may be bolted to LH & RH columns, if needed, and if the bracket holes are aligned correctly.



**BOLTING EXTENSION PLATE, IF NEEDED (LH COLUMN SHOWN)**  
**FIG. 74-1B**

4. If needed, fill gap between LH column bracket and extension plate with spacers (**FIGS. 74-1 and 74-1B**). Then, bolt extension plate to column. Torque 3/8"-16 cap screws and lock nuts **35-52 lb-ft**. Repeat for RH column.

## STEP 15 - SECURING COLUMNS - Continued

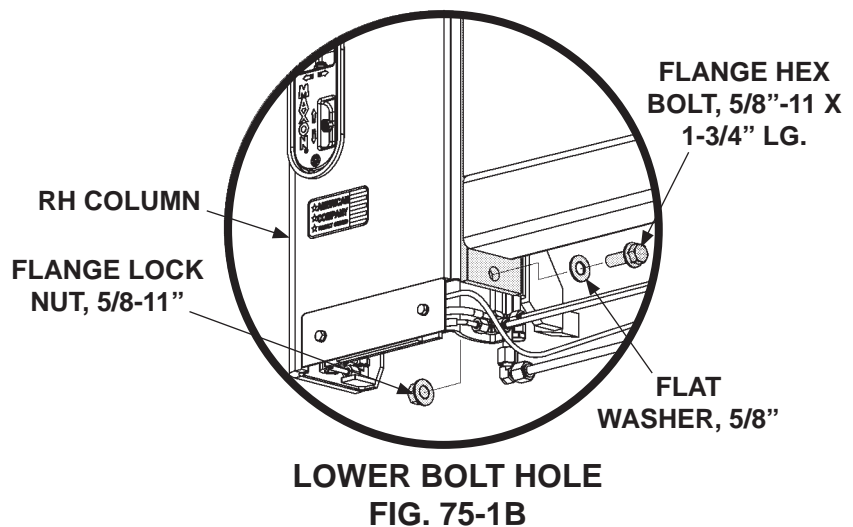
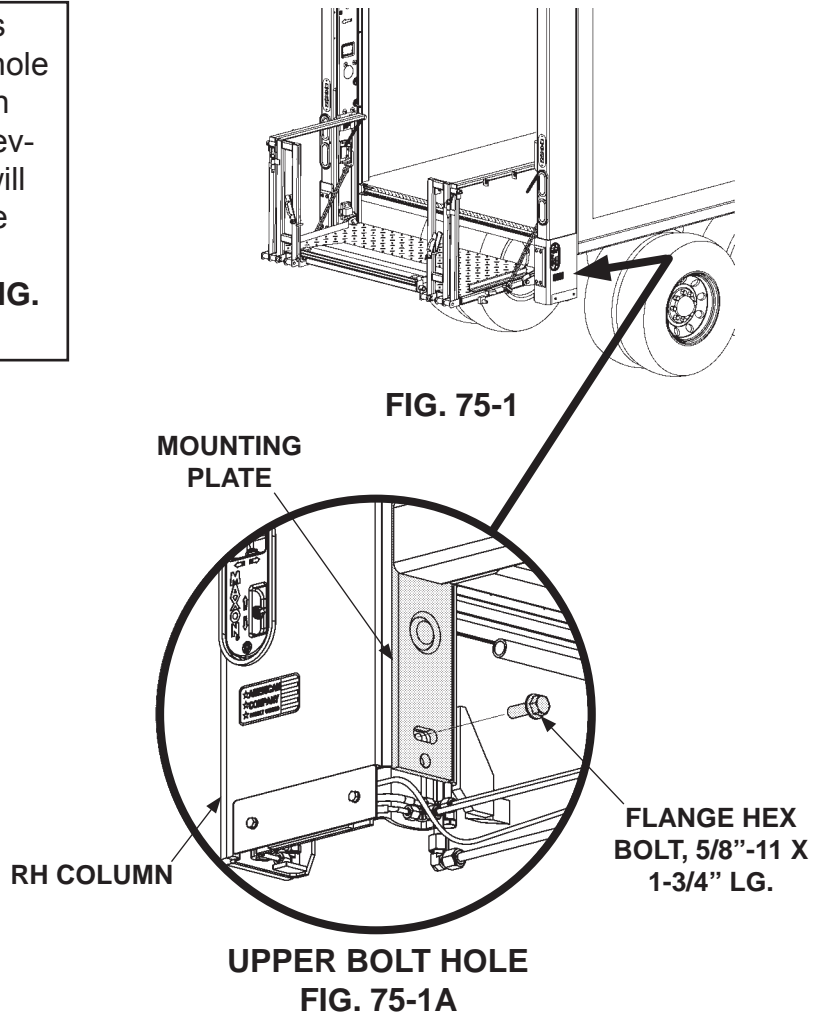
### METHOD 1 & METHOD 2

**NOTE:** Skip this step if using the **METHOD 3** weld-on version of installation with no mounting plates.

**NOTE:** MAXON recommends using the upper bolt hole (**FIG. 75-1A**) to attach mounting plate. However, if the upper hole will be covered by vehicle corner post, then use the lower bolt hole (**FIG. 75-1B**).

5. Get (2) flange hex bolts, (2) flange lock nuts (if needed), and (2) flat washers (if needed) from parts bag. Then, install (1) bolt, (1) nut (if needed), and (1) flat washer (if needed) through mounting plate and RH column (**FIGS. 75-1, 75-1A and 75-1B**) Repeat for LH column.

6. Torque 5/8"-11 bolts to **170 lb-ft.** Repeat for LH column.

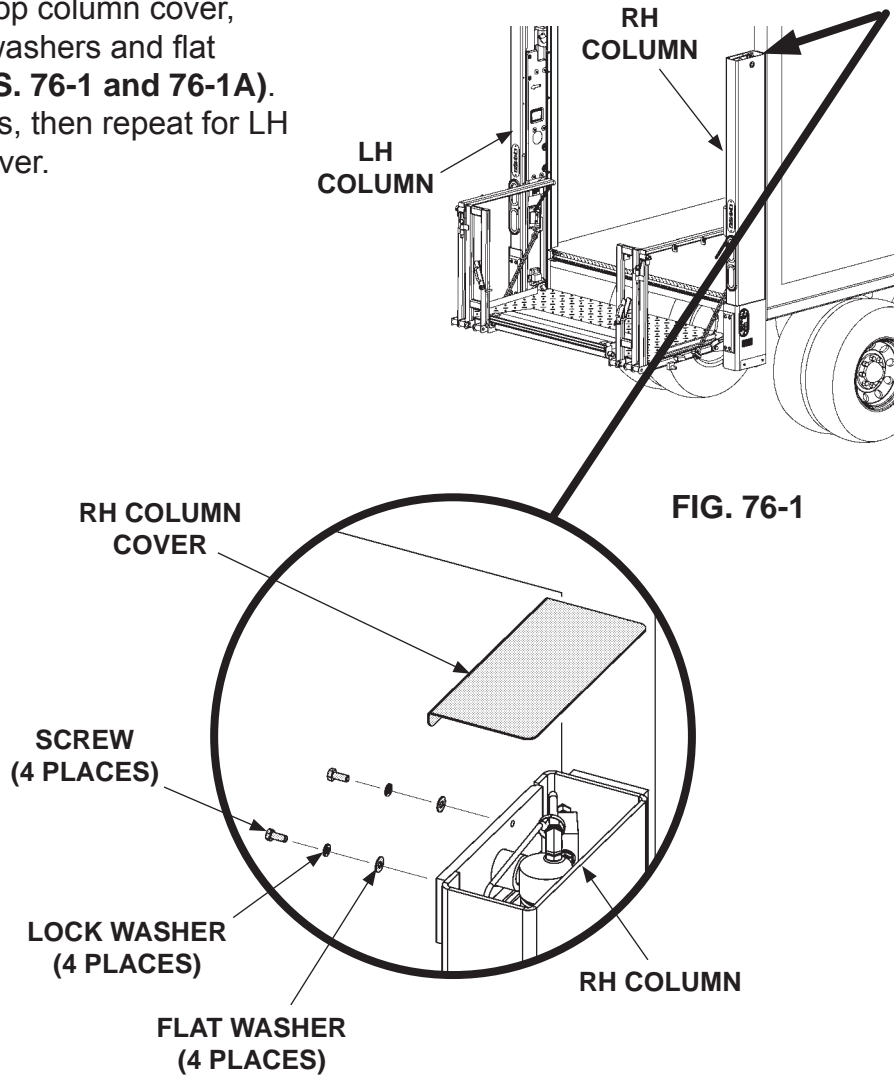


## STEP 15 - SECURING COLUMNS - Continued

### METHOD 1 & METHOD 2

**NOTE:** Skip this step if using the **METHOD 3** weld-on installation with no mounting plates.

7. Reinstall RH top column cover, screws, lock washers and flat washers (**FIGS. 76-1 and 76-1A**). Tighten screws, then repeat for LH top column cover.



REINSTALLING RH COLUMN COVER  
FIG. 76-1A

## STEP 16 - FINISH WELDING LIFTGATE TO VEHICLE METHOD 2 & METHOD 3 - WELD LIFTGATE TO BODY

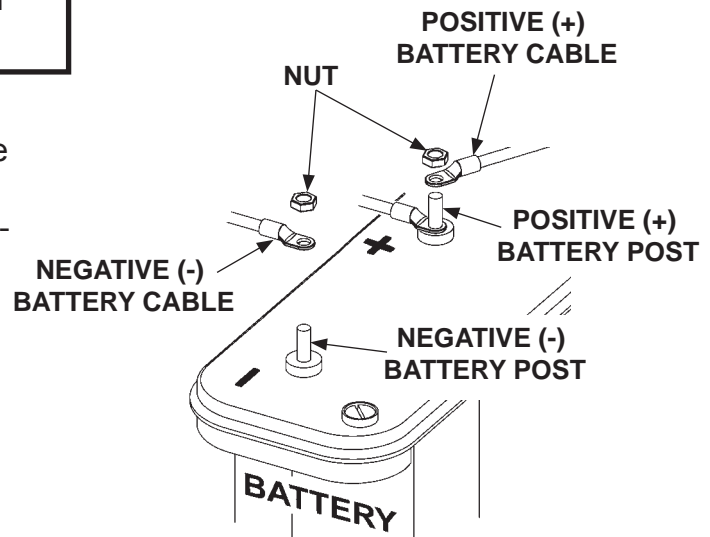
**NOTE:** Skip this step if using **METHOD 1** installation where mounting plates and extension plate are preinstalled on vehicle.

1. Check operation of Liftgate before final welding. See **BMR-CS Operation Manual**.

### **⚠ WARNING**

To prevent accidental personal injury and equipment damage, disconnect (-) battery cable and (+) cable from battery.

2. Disconnect power to the pump by disconnecting negative (-) and positive (+) cables from battery (**FIG. 77-1**). Reinstall nuts on negative (-) and positive (+) battery terminals.



**DISCONNECTING BATTERY POWER  
FIG. 77-1**

## STEP 16 - FINISH WELDING LIFTGATE TO VEHICLE

### METHOD 2 & METHOD 3 - WELD LIFTGATE TO BODY - Continued

#### ⚠ WARNING

Recommended practices for welding on steel parts are contained in the current AWS (American Welding Society) D1.1 Structural Welding Code - Steel. Damage to Liftgate and/or vehicle, and personal injury can result from welds that are done incorrectly.

**NOTE:** If Liftgate columns cannot be mounted flush against rear of vehicle, a filler such as tubing, channel, or plate stock may be used to bridge gap between vehicle body and Liftgate columns. Make sure the added materials and welds meet the **BODY STRENGTH REQUIREMENTS** indicated in this manual.

#### CAUTION

To prevent damage to Liftgate:

- Connect welder ground to vehicle body.
- Protect hydraulic hoses and electrical cables with flame-resistant cover.

3. Cover platform as shown in FIG. 78-1.

4. Weld the Liftgate RH and LH columns to vehicle body as shown in FIG. 78-1.

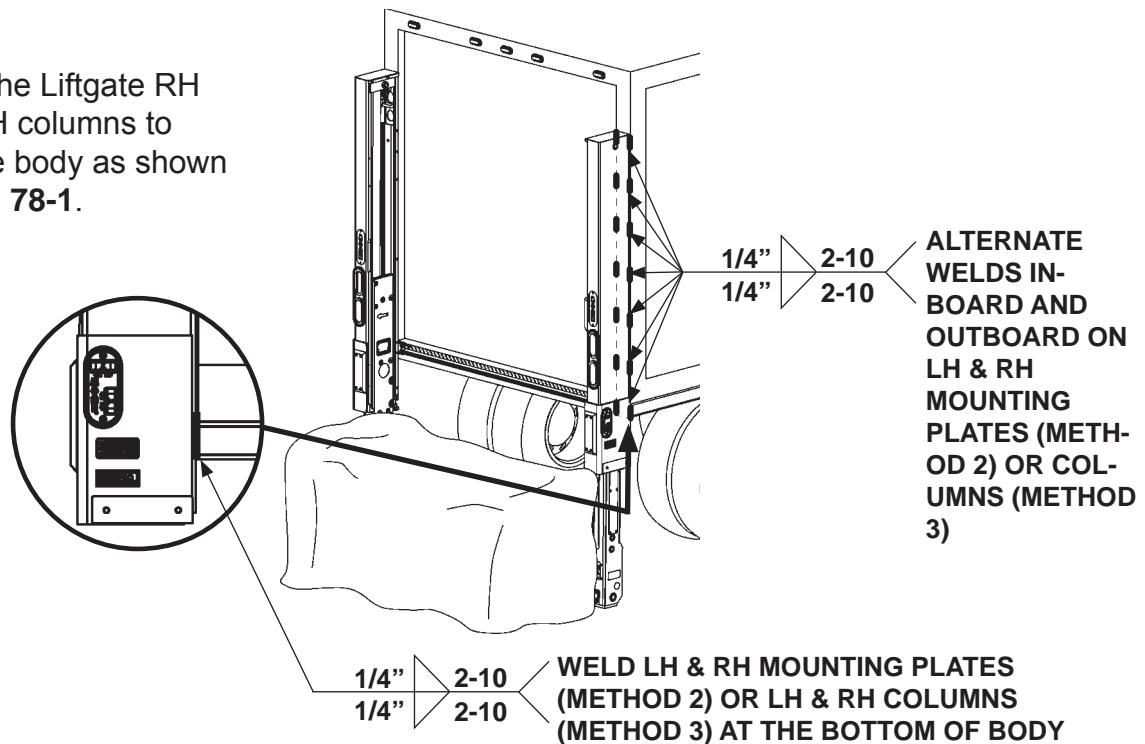


FIG. 78-1

## STEP 16 - FINISH WELDING LIFTGATE TO VEHICLE METHOD 2 & METHOD 3 - WELD LIFTGATE TO BODY - Continued

### CAUTION

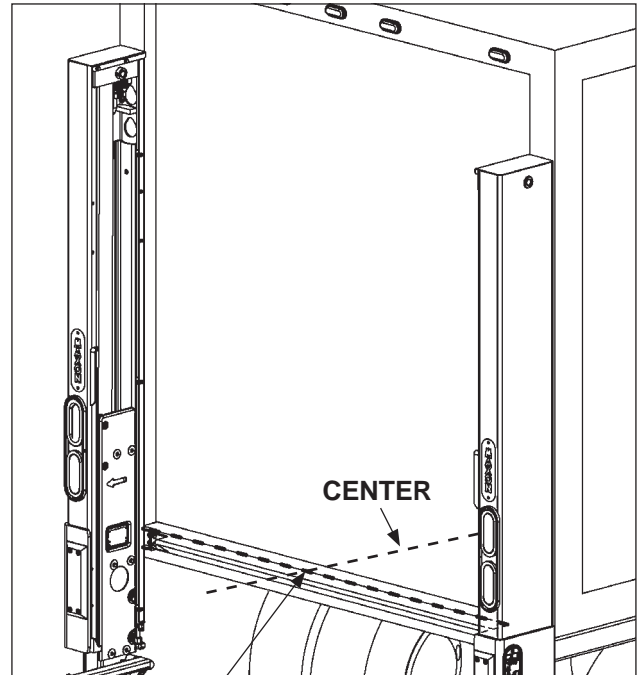
To prevent damage to Liftgate components, welder ground must be connected to Liftgate extension plate.

5. Make sure platform is at ground level to provide access to the extension plate.

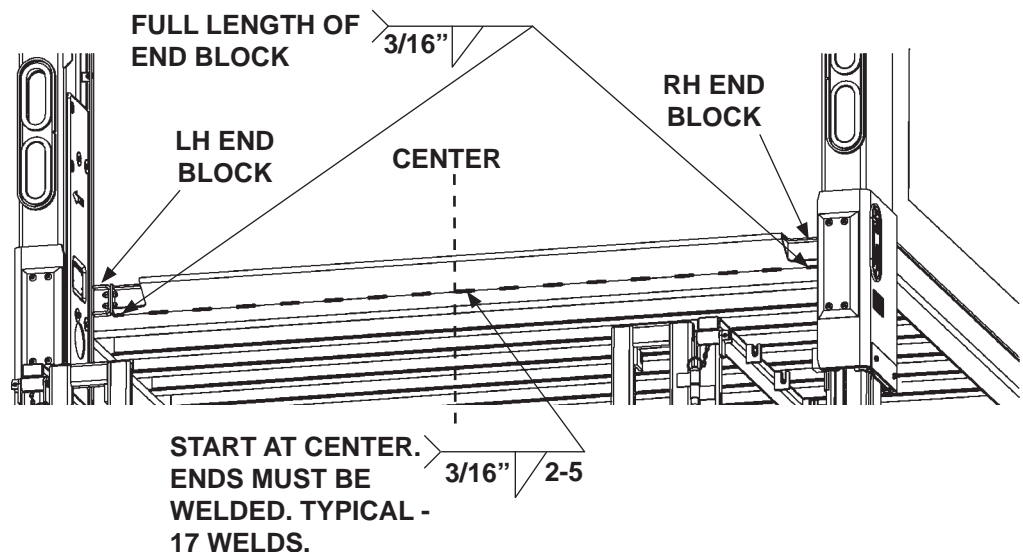
**NOTE:** After welding top of extension plate, if you see a gap between bottom of extension plate & vehicle body sill, fill the gap. To fill the gap, use A-36 General Purpose steel and the same welds shown in **FIG. 79-2**.

6. Weld the top and bottom surfaces of extension plate (**FIGS. 79-1 & 79-2**) to vehicle body sill.

7. Weld entire length (**FIG. 79-2**) on the bottom of LH and RH end blocks.



**WELDING TOP OF EXTENSION PLATE  
FIG. 79-1**

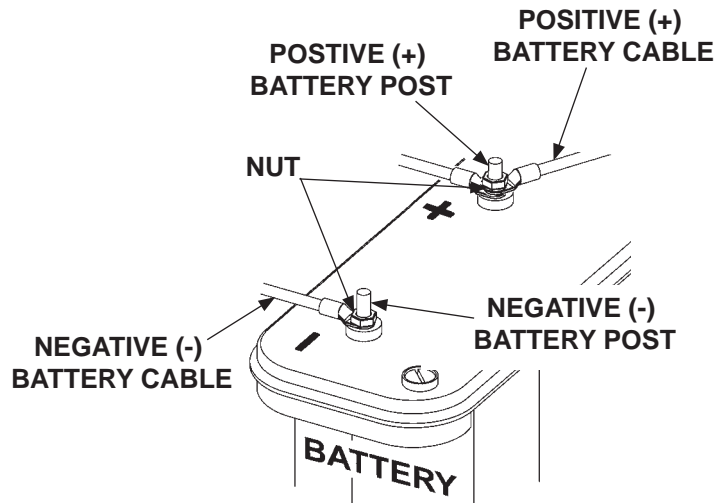


**WELDING BOTTOM OF EXTENSION PLATE  
FIG. 79-2**

## STEP 16 - FINISH WELDING LIFTGATE TO VEHICLE

### METHOD 2 & METHOD 3 - WELD LIFTGATE TO BODY - Continued

8. Reconnect power to the pump by reconnecting positive (+) and negative (-) cables to battery (**FIG. 80-1**). Reinstall and tighten nut when each battery cable is reconnected.



**BATTERY POWER RECONNECTED**  
**FIG. 80-1**

## STEP 17 - CHECK CLEARANCE OF CONNECTOR BAR SIDE BRACKETS & STOP BLOCKS

1. To check for interference between platform connector bar side bracket and stop block (**FIG. 81-1A**), lower columns to approximately 10" above the ground, then begin to unfold platform (**FIG. 81-1**).
2. As platform is unfolding, check for interference from the connector bar side bracket as it slides into the stop block (**FIG. 81-1A**).

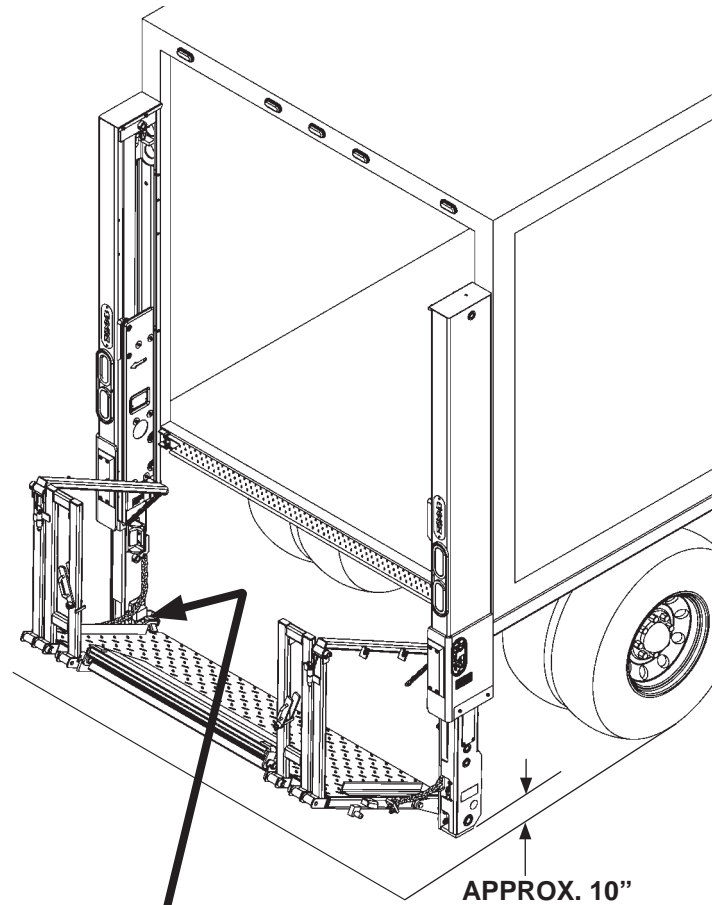
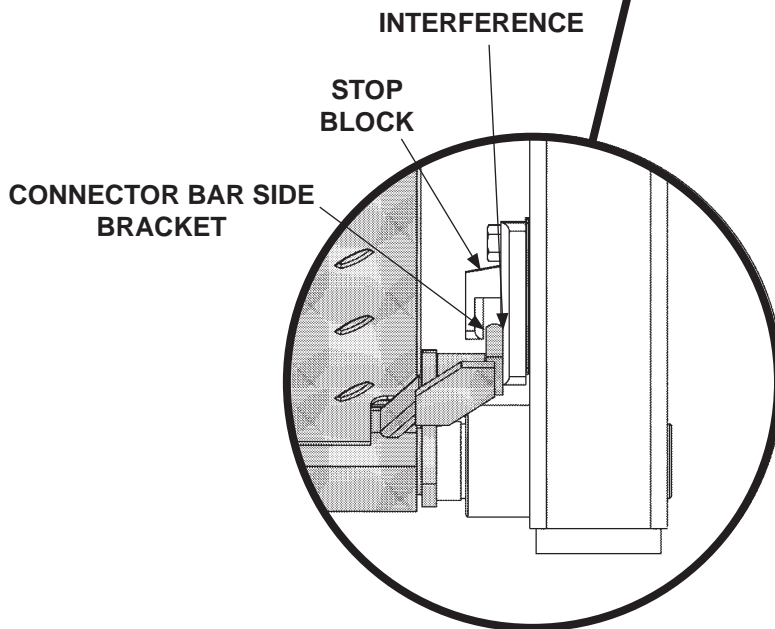


FIG. 81-1

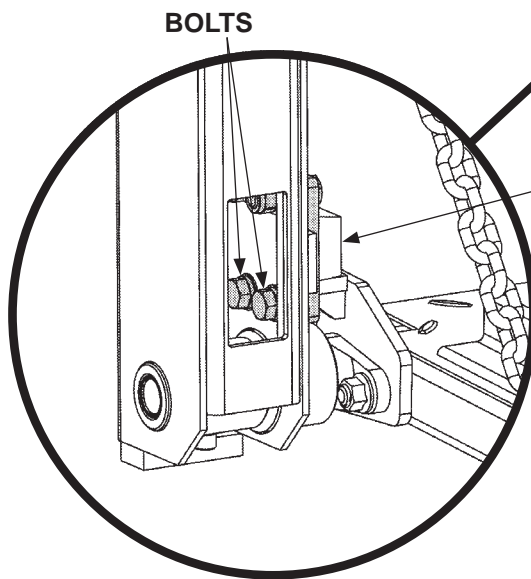


REAR VIEW OF LH RUNNER  
FIG. 81-1A

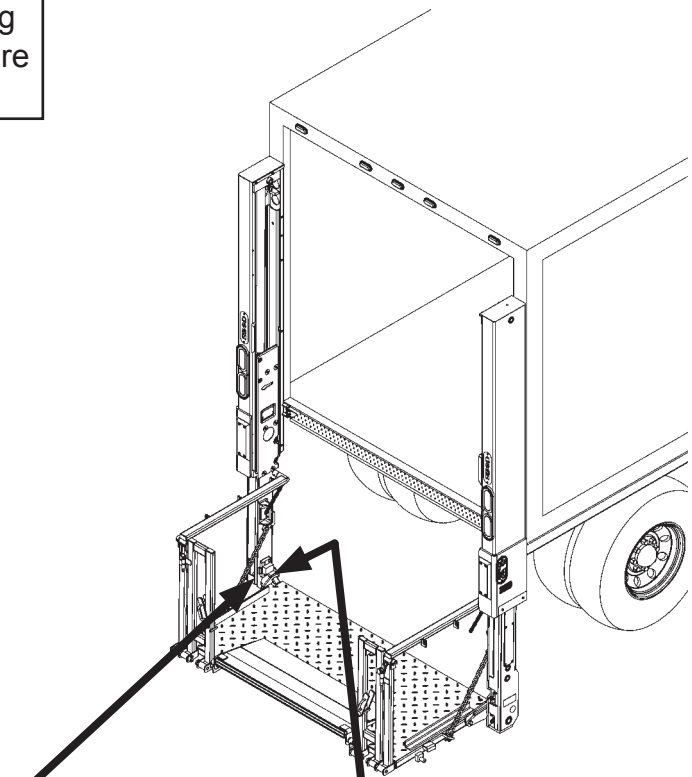
## STEP 17 - CHECK CLEARANCE OF CONNECTOR BAR SIDE BRACKETS & STOP BLOCKS - Continued

**NOTE:** Perform this step only if folding operation is not smooth or there is interference.

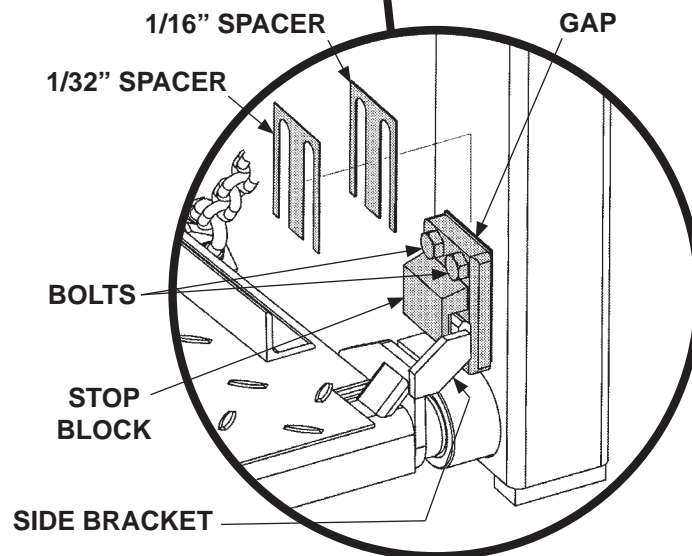
3. If LH side bracket fits too tight against either side of stop block, operation is not smooth, or if there is interference (**FIG. 82-1A**) adjust with spacers as shown in **FIG. 82-1A**.
4. To adjust stop block, make sure platform is lowered to the ground (**FIG. 82-1**). Then, loosen (4) bolts (**FIGS. 82-1A and 82-1B**) and check gap (**FIG. 82-1A**). Add or remove shims (parts box) to fill or lessen the gap, then retighten bolts (**FIGS. 82-1A and 82-1B**).



**FRONT VIEW OF LH RUNNER  
FIG. 82-1B**



**FIG. 82-1**



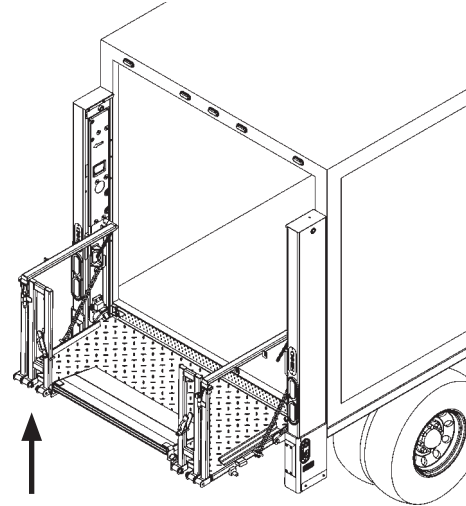
**REAR VIEW OF LH RUNNER  
FIG. 82-1A**

## STEP 18 - CHECK CLEARANCE OF RUNNER PADS

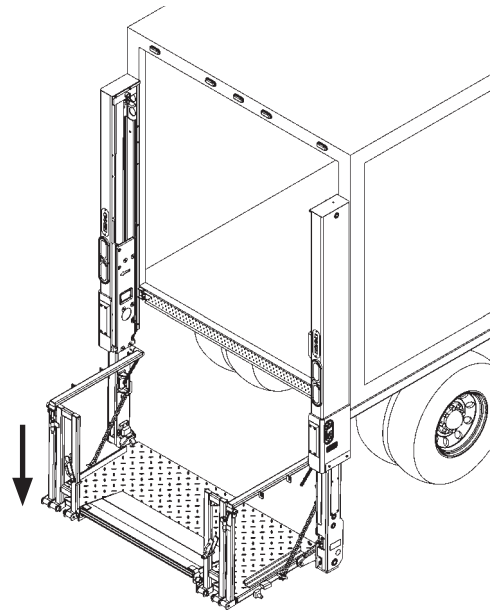
**NOTE:** Perform the following steps with no load on the platform.

1. Raise the platform to bed height (**FIG. 83-1**). Then, lower the platform to the ground (**FIG. 83-2**). Look for the following conditions:

- Platform lowers smoothly.
- Platform lowers evenly on both sides.
- Platform lowers in **8 to 20 seconds** (**BMR-CS35/BMR-CS44**).



**PLATFORM AT BED HEIGHT  
FIG. 83-1**



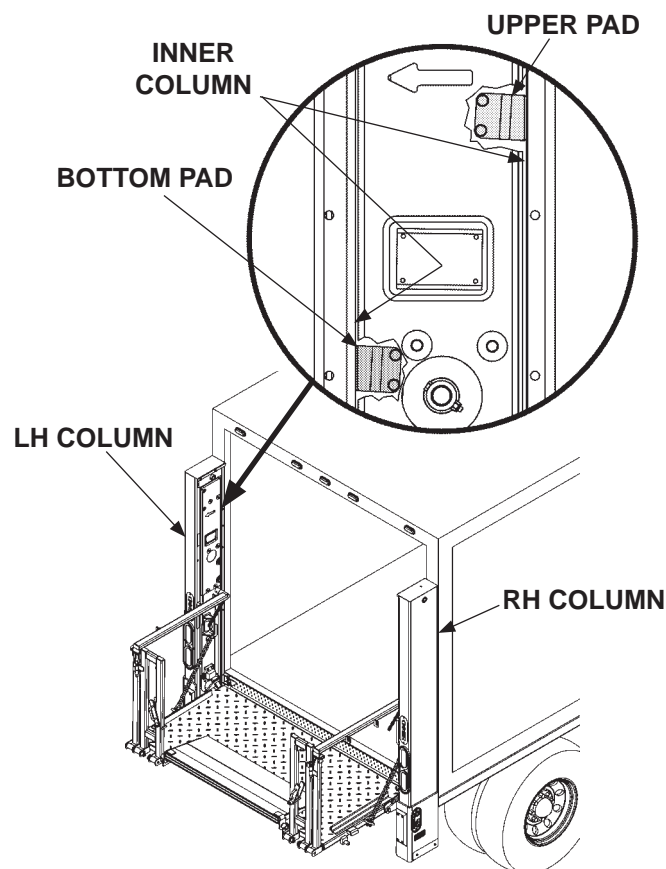
**PLATFORM ON THE GROUND  
FIG. 83-2**

## STEP 18 - CHECK CLEARANCE OF RUNNER PADS - Continued

2. Raise the platform to bed height (**FIG. 84-1**). Check clearance of the runner pads as follows:

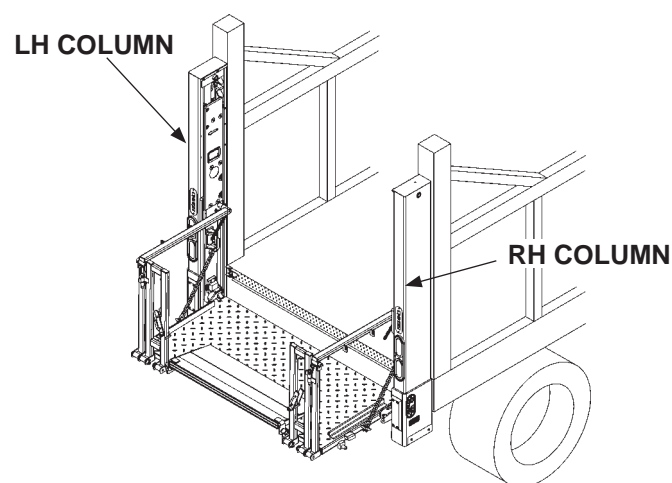
- Between upper runner pad and inner LH column.
- Between bottom runner pad and inner LH column.
- Between upper runner pad and inner RH column.
- Between bottom runner pad and inner RH column.

**Sufficient clearance** is equal to thickness of **2 business cards or .012" to .025"** measured with thickness gauge. Leaves of the thickness gauge should be 3" or longer to reach the runner pads.



**CHECKING CLEARANCE OF RUNNER PADS  
WITH PLATFORM AT BED HEIGHT  
FIG. 84-1**

3. Lower the platform half the distance to the ground (**FIG. 84-2**). Repeat the clearance checks in 2.

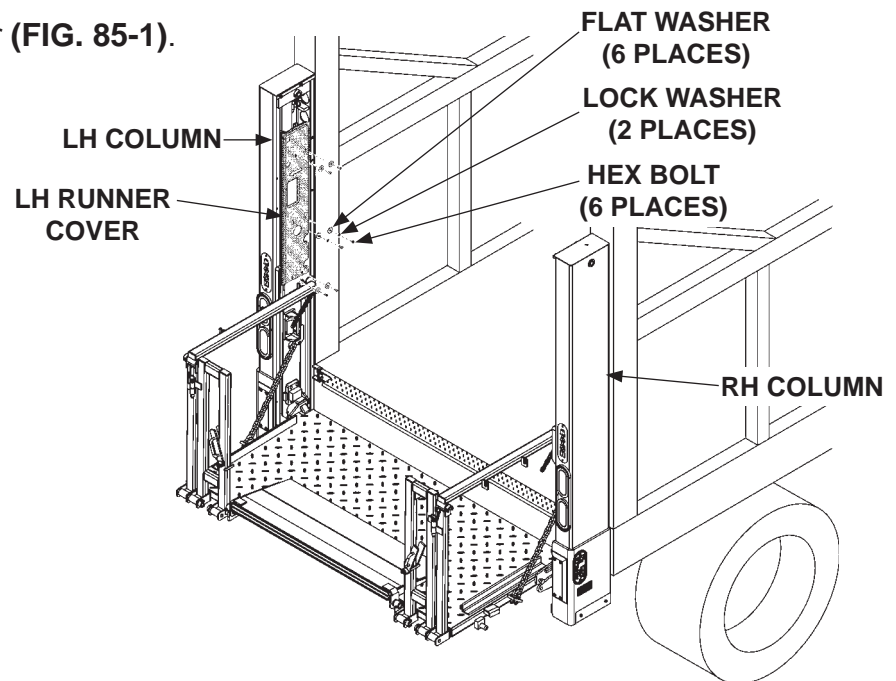


**CHECKING CLEARANCE OF RUNNER PADS  
WITH PLATFORM BETWEEN BED  
HEIGHT & THE GROUND  
FIG. 84-2**

4. If there is no clearance or clearance is not sufficient, continue with adjustment procedure on the next page.

## STEP 18 - CHECK CLEARANCE OF RUNNER PADS - Continued

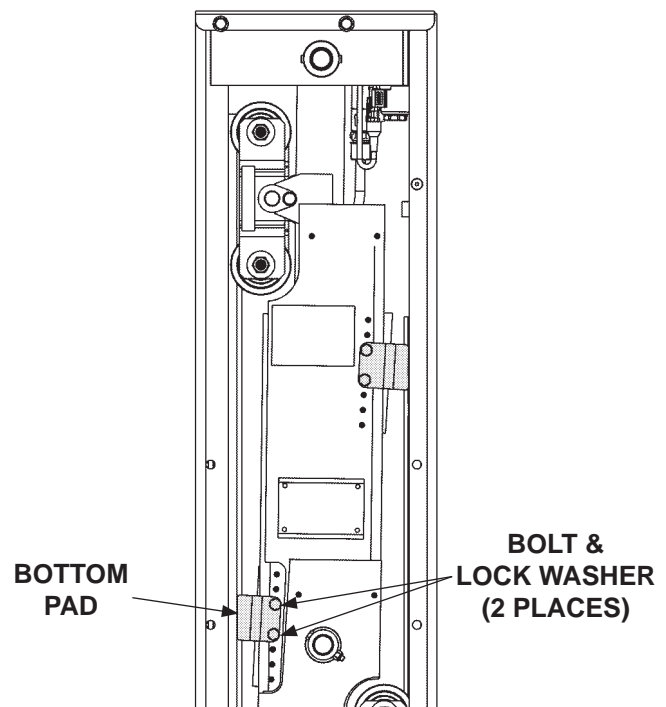
5. Remove LH runner cover (FIG. 85-1).



REMOVING RUNNER COVERS  
FIG. 85-1

**NOTE:** Keep spacer pad in place between column & runner after unbolting pad from runner.

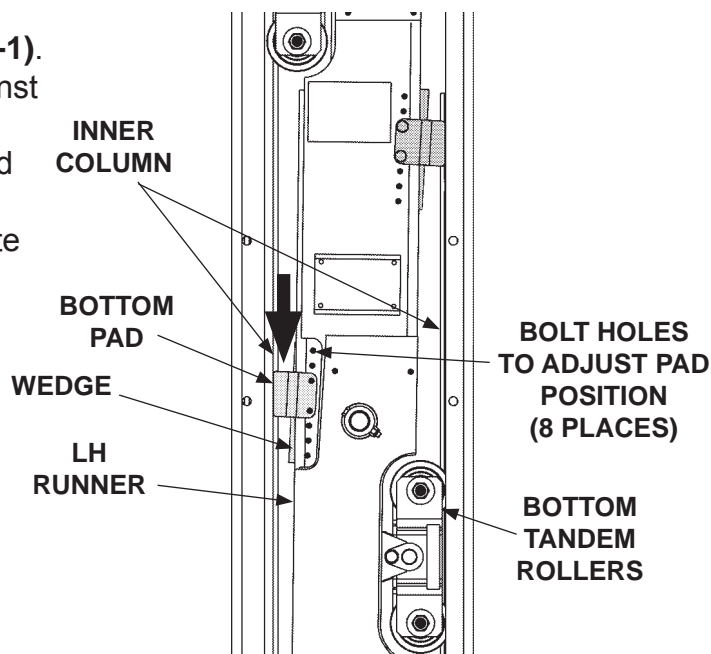
6. Unbolt bottom spacer pad from LH runner (FIG. 85-2). Keep bolts and lock washers to reinstall.



UNBOLTING PADS  
(LH COLUMN & RUNNER SHOWN)  
FIG. 85-2

## STEP 18 - CHECK CLEARANCE OF RUNNER PADS - Continued

7. Ensure the bottom tandem rollers are seated against inner column (**FIG. 86-1**). Next, slide the bottom pad down against wedge until there is no clearance between inner column and bottom pad (**FIG. 86-1**). Then, back off (slide up) bottom pad by 1 hole position to create clearance between pad and inner column.

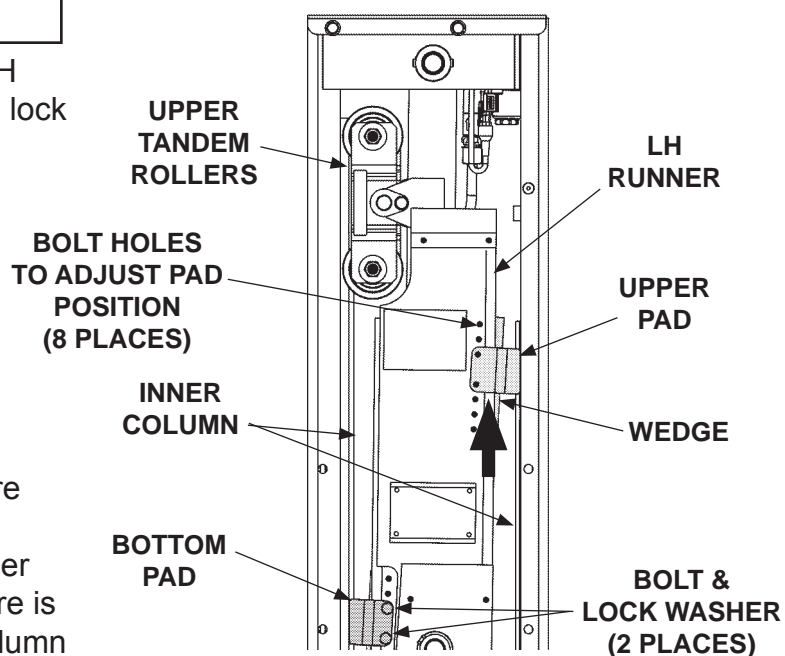


**ADJUSTING LOWER PAD  
FIG. 86-1**

8. Bolt bottom pad to LH runner with 2 bolts and 2 lock washers (**FIG. 86-2**). Torque the 2 bolts to **9-14 lb-ft**.

**NOTE:** Keep spacer pad in place between column & runner after unbolting pad from runner.

9. Unbolt upper spacer pad from LH runner (**FIG. 86-2**). Keep bolts & lock washers to reinstall.

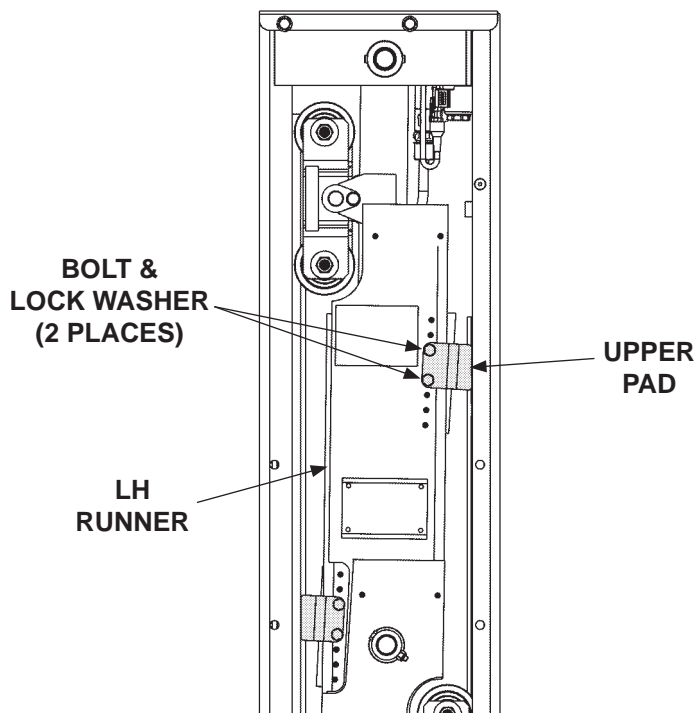


**BOLTING LOWER PAD &  
ADJUSTING UPPER PAD  
FIG. 86-2**

10. Ensure upper tandem rollers are seated against inner column (**FIG. 86-2**). Next, slide the upper pad up against wedge until there is no clearance between inner column and upper pad (**FIG. 86-2**). Then, back off (slide down) upper pad by 1 hole position to create clearance between upper pad and inner column.

## STEP 18 - CHECK CLEARANCE OF RUNNER PADS - Continued

11. Bolt upper pad to LH runner with 2 bolts and 2 lock washers (**FIG. 87-1**). Torque the 2 bolts to **9-14 lb.-ft.**

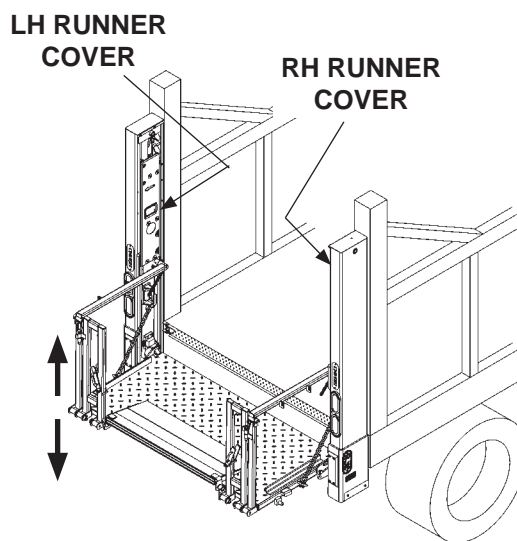


**BOLTING UPPER PAD  
FIG. 87-1**

12. Repeat instructions 5 to 11 for RH column.

13. Raise the platform to bed height (**FIG. 87-2**). Then, lower the platform to the ground (**FIG. 87-2**). Look for the following conditions:

- Platform lowers smoothly.
- Platform lowers evenly on both sides.
- Platform lowers in **8 to 20 seconds** (**BMR-CS35/BMR-CS44**).

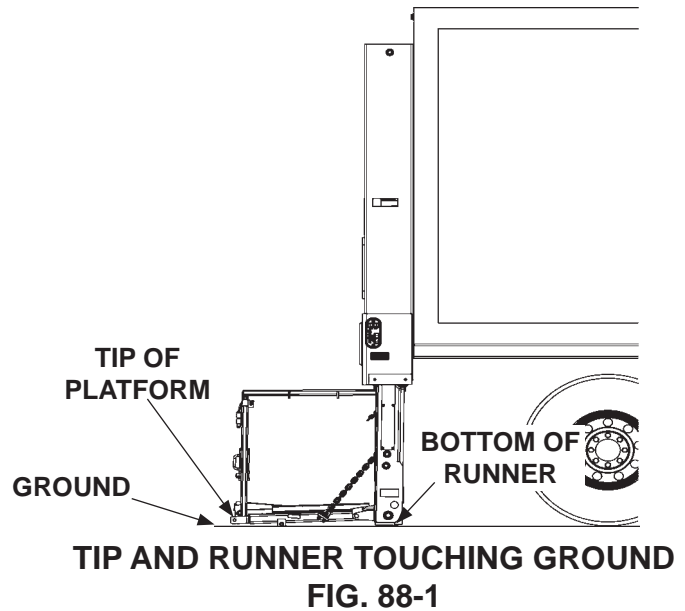


**CHECKING CLEARANCE OF RUNNER PADS  
WITH PLATFORM BETWEEN BED  
HEIGHT & THE GROUND  
FIG. 87-2**

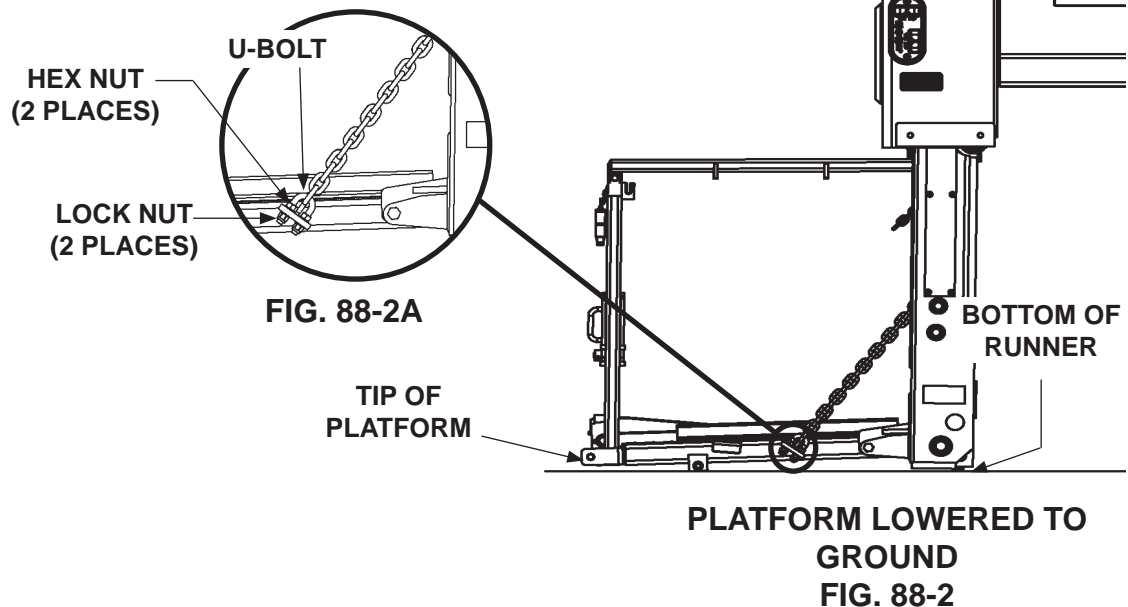
14. When platform raises and lowers correctly, reinstall LH and RH runner covers (**FIG. 87-2**). Torque 6 bolts on each runner cover to **9-14 lb.-ft.**

## STEP 19 - PLATFORM CHAIN ADJUSTMENT

1. Lower the platform to ground level.  
Check if tip of the platform and bottom of the runners touch the ground at the same time (**FIG. 88-1**).



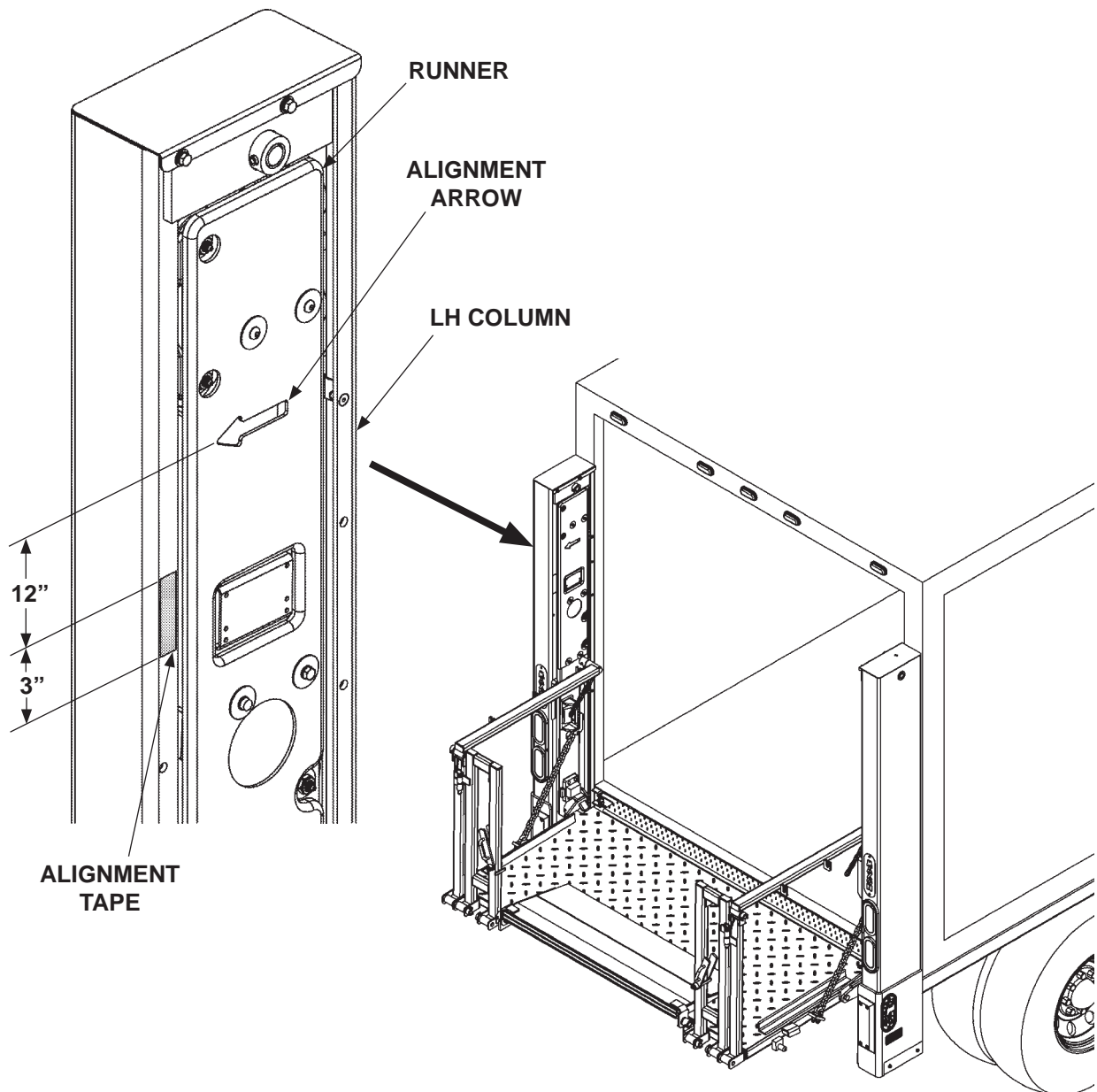
2. If tip of platform touches first, tighten the u-bolt by loosening the hex nuts and turning the lock nuts clockwise (**FIG.88-2A**). Retighten hex nuts. If more adjustment is required, remove one chain link until tip of the platform and bottom of the runners touch the ground at the same time (**FIG.88-2**).



## STEP 20 - PLACE "ALIGN ARROWS" DECAL

**NOTE:** Make sure **RUNNERS** are raised all the way up (closest to top of **COLUMN**) before doing the following steps.

Peel backing from alignment tape and place it on LH column as shown in **FIG. 89-1**. Repeat for RH column.



**FIG. 89-1**

# DECALS & PLATES

**NOTE:** Ensure there is no residue, dirt, or corrosion where decals are attached. If necessary, clean surface before attaching decals.

**NOTE:** Decals on the Liftgate are attached at the factory.

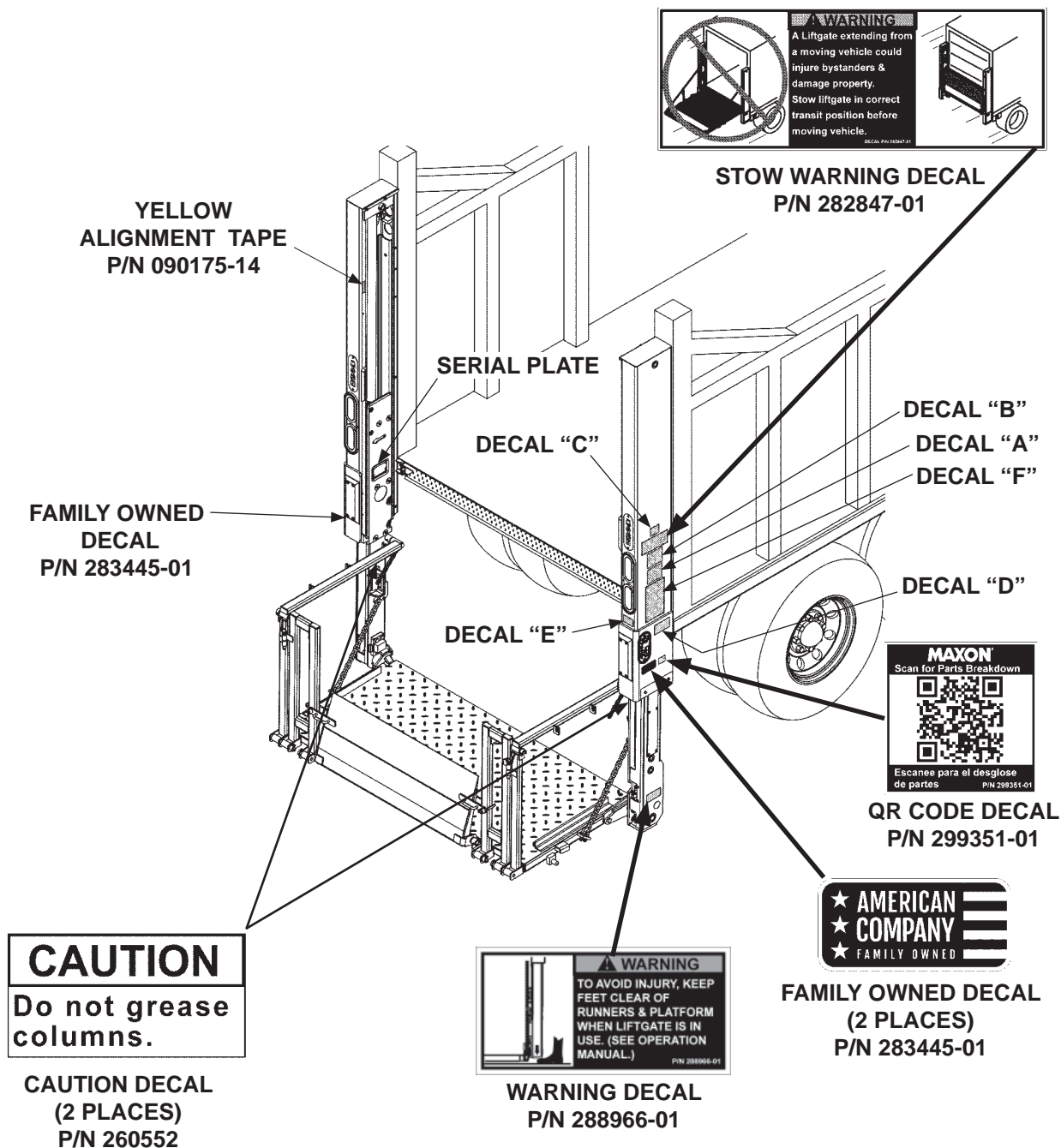


FIG. 90-1

# DECALS - Continued

**⚠ WARNING**  
**Read this information carefully.**

- Improper operation of this Liftgate can result in serious personal injury. If you do not have a copy of the operating instructions, please obtain them from your employer, distributor, or lessor before you attempt to operate Liftgate.
- If there are signs of improper maintenance, damage to vital parts, or slippery platform surface, do not use the Liftgate until these problems have been corrected.
- If you are using a pallet jack, be sure it can be maneuvered safely.
- Do not operate a forklift on the platform.
- Do not allow any part of yours or your helper's body to be placed under, within, or around any portion of the moving Liftgate, or its mechanisms, or in a position that would trap them between the platform and the ground or truck when the Liftgate is operated.
- If a helper is riding the platform with you, make sure you are both doing so safely and that you are not in danger of coming in contact with any moving or potentially moving obstacles.
- **USE GOOD COMMON SENSE.**
- If load appears to be unsafe, do not lift or lower it.

For a free copy of other manuals that pertain to this model Liftgate, please visit our website at [www.maxonlift.com](http://www.maxonlift.com) or call Customer Service at (800) 227-4116. **(B)**

**SAFETY INSTRUCTIONS**  
**Read all decals and operation manual before operating liftgate.**

1. Do not use liftgate unless you have been properly instructed and have read, and are familiar with, the operating instructions.
2. Be certain vehicle is properly and securely braked before using the liftgate.
3. Always inspect this liftgate for maintenance or damage before using it. Do not use liftgate if it shows any sign of damage or improper maintenance.
4. Do not overload
5. Make certain the area in which the platform will open and close is clear before opening or closing the platform.
6. Make certain platform area, including the area in which loads may fall from platform, is clear before and at all times during operation of liftgate.
7. This liftgate is intended for loading and unloading of cargo only. Do not use this liftgate for anything but its intended use.

**(A)**

**THE MAXIMUM CAPACITY  
OF THIS LIFT IS**

**\_\_\_\_ LB [ \_\_\_\_ KG]**

**WHEN THE LOAD IS  
CENTERED ON THE LOAD  
CARRYING PLATFORM**

**(REFER TO TABLE 91-1)**

**(C)**

**⚠ CAUTION**  
**Always stand clear of  
platform area.**

**(E)**

**⚠ WARNING**  
**Liftgate hazards can result  
in crushing or falling.**  
**Keep hands and feet clear of  
pinch points.**  
**If riding liftgate, make sure load  
is stable and footing is solid.**

**Read and understand all instructions and WARNINGS before use.**

**(D)**

**OPERATING INSTRUCTIONS**

Scan this QR code to see operation manual or video.

**OPERATE**

1. LOWER RUNNERS TO LINE UP YELLOW ARROW WITH YELLOW STRIPE. THIS SHOWS PLATFORM IS CLEAR TO UNFOLD.
2. UNFOLD PLATFORM.
3. 1 - LOWER PLATFORM. IF IT IS SLOW TO LOWER & LIFTGATE IS POWER DOWN EQUIPPED, PUSH POWER DOWN BUTTON. 2 - RAISE PLATFORM. POWER DOWN BUTTON (IF EQUIPPED)

**STOW**

1. RAISE PLATFORM TO LINE UP YELLOW ARROW WITH YELLOW STRIPE. THIS SHOWS PLATFORM IS CLEAR TO FOLD.
2. FOLD PLATFORM.
3. RAISE RUNNERS TO STOW PLATFORM.

P/N 289163-01 **(F)**

**DECAL SHEET  
FIG. 91-1**

MODEL	ORDER P/N	DECAL "C"
BMR-CS35	289163-01	3500 LBS. [1600 KG]
BMR-CS44	289163-02	4400 LBS. [2000 KG]

**DECAL SHEET PART NUMBERS  
TABLE 91-1**

## TOUCH UP GALVANIZED FINISH

### CAUTION

Damaged cylinder seals and contaminated hydraulic fluid can result from applying cold galvanized spray to the polished portion of the cylinder rod. To prevent damage, protect the exposed polished portion of the cylinder rod while spraying.

- If bare metal is exposed on galvanized portions of the Liftgate, touch up the galvanized finish. To maintain the protection provided by the original galvanized finish, **MAXON** recommends cold galvanize spray.

# HYDRAULIC SYSTEM DIAGRAMS

## PUMP & MOTOR SOLENOID OPERATION - GRAVITY DOWN

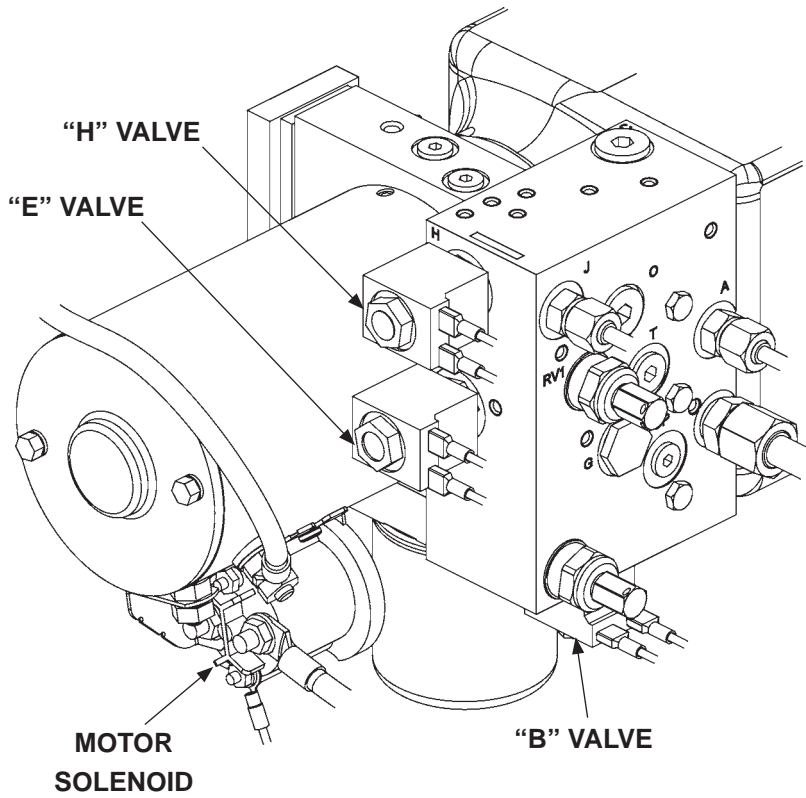
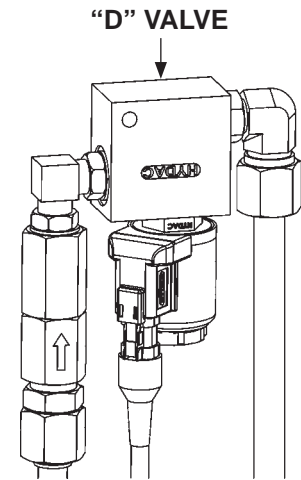


FIG. 93-1



"D" VALVES  
(TOP OF EACH COLUMN)  
FIG. 93-2

POWER UNIT MOTOR & SOLENOID OPERATION - GRAVITY DOWN								
LIFTGATE FUNCTION	PORT	SOLENOID OPERATION ( ✓ MEANS ENERGIZED)						
		SWITCH	RELAY	MOTOR	VALVE "B"	VALVE "D"	VALVE "E"	VALVE "H"
LIFT	B	"GD"	-	✓	-	-	-	-
LOWER	C		✓	-	✓	✓	-	-
OPEN	J		-	✓	-	-	✓	✓
CLOSE	A		-	✓	-	-	✓	-
REFER TO VALVES SHOWN ON HYDRAULIC SCHEMATIC								

TABLE 93-1

# HYDRAULIC SYSTEM DIAGRAMS - Continued

## PUMP & MOTOR SOLENOID OPERATION - POWER DOWN

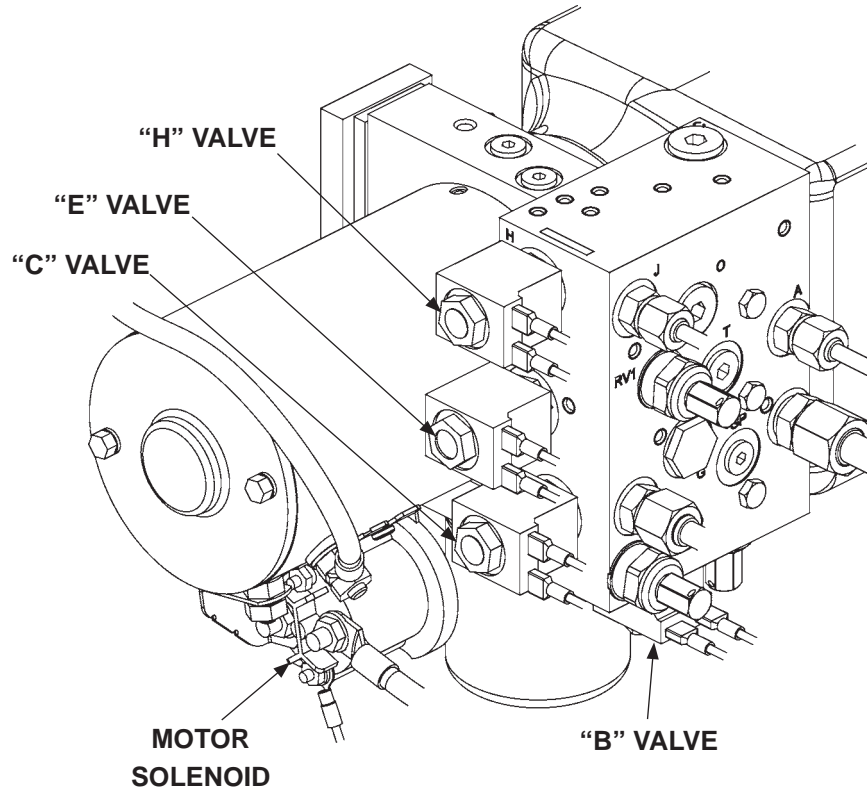
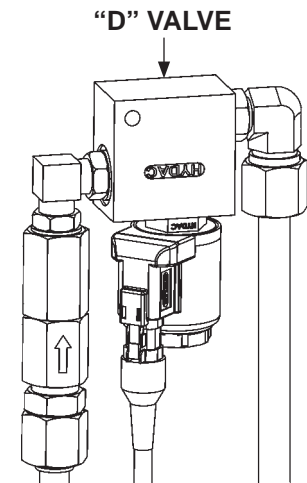


FIG. 94-1



"D" VALVES  
(TOP OF EACH COLUMN)  
FIG. 94-2

POWER UNIT MOTOR & SOLENOID OPERATION - POWER DOWN									
LIFTGATE FUNCTION	PORT	SOLENOID OPERATION ( ✓ MEANS ENERGIZED)							
		SWITCH	RELAY	MOTOR	VALVE “B”	VALVE “C”	VALVE “D”	VALVE “E”	VALVE “H”
LIFT	B	“PD”	-	✓	-	-	-	-	-
LOWER	C		-	✓	✓	✓	✓	-	-
OPEN	J		-	✓	-	-	-	✓	✓
CLOSE	A		-	✓	-	-	-	✓	-
REFER TO VALVES SHOWN ON HYDRAULIC SCHEMATIC									

TABLE 94-1

# HYDRAULIC SYSTEM DIAGRAMS

## GRAVITY DOWN HYDRAULIC SCHEMATIC

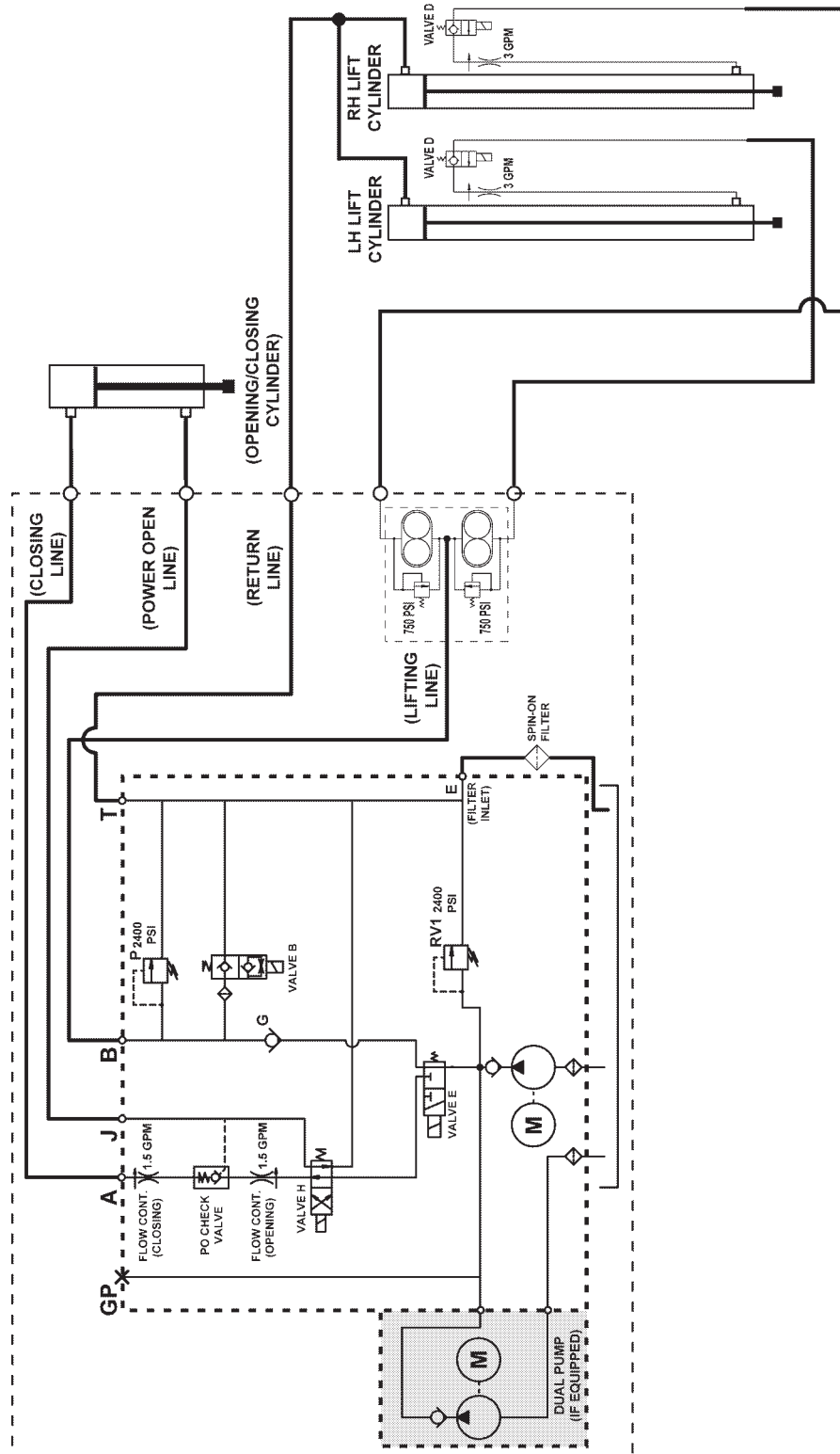


FIG. 95-1

# HYDRAULIC SYSTEM DIAGRAMS

## POWER DOWN HYDRAULIC SCHEMATIC

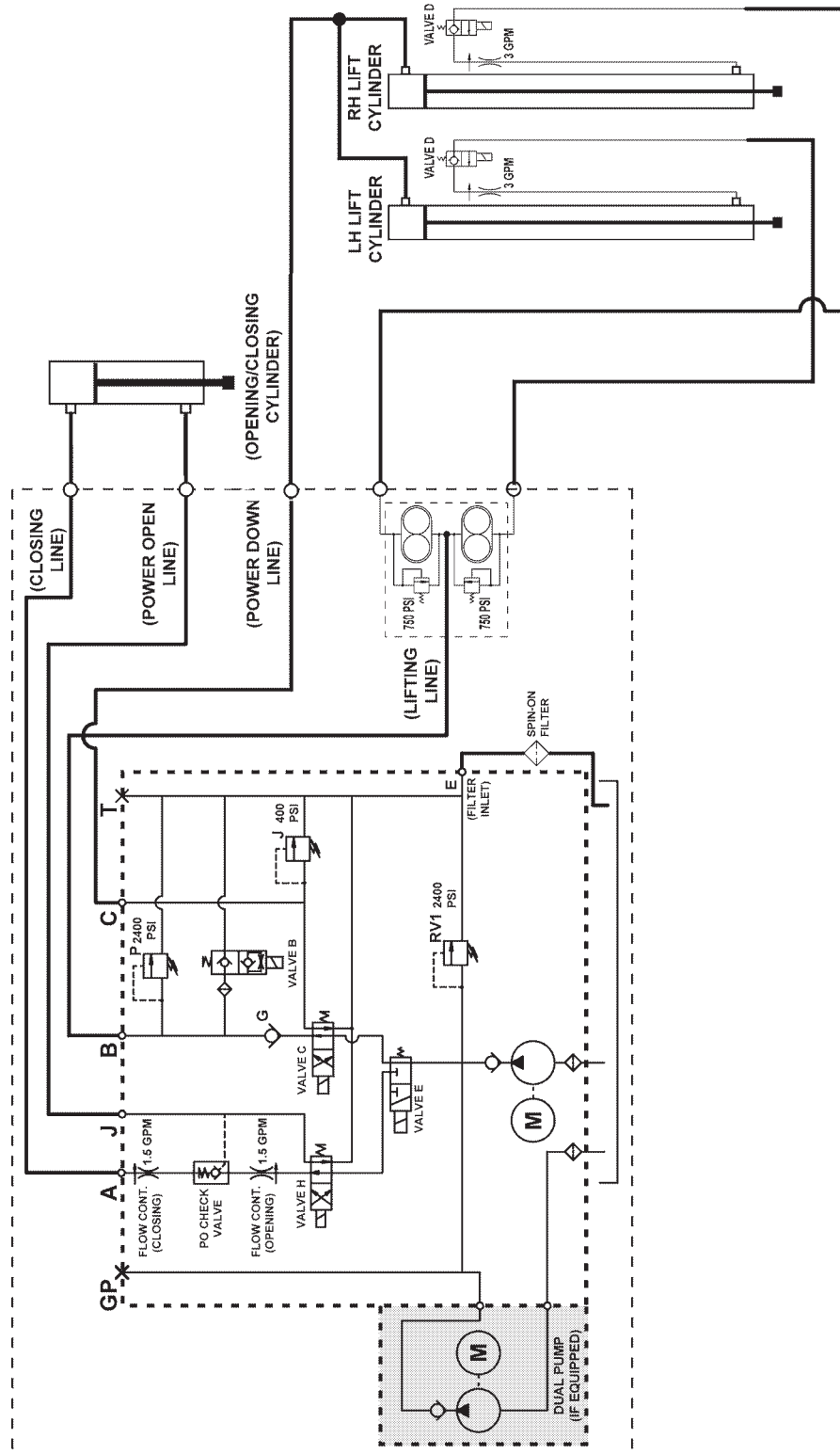


FIG. 96-1

# ELECTRICAL SYSTEM DIAGRAMS

## INTERCONNECTING ELECTRICAL SCHEMATIC - GRAVITY DOWN

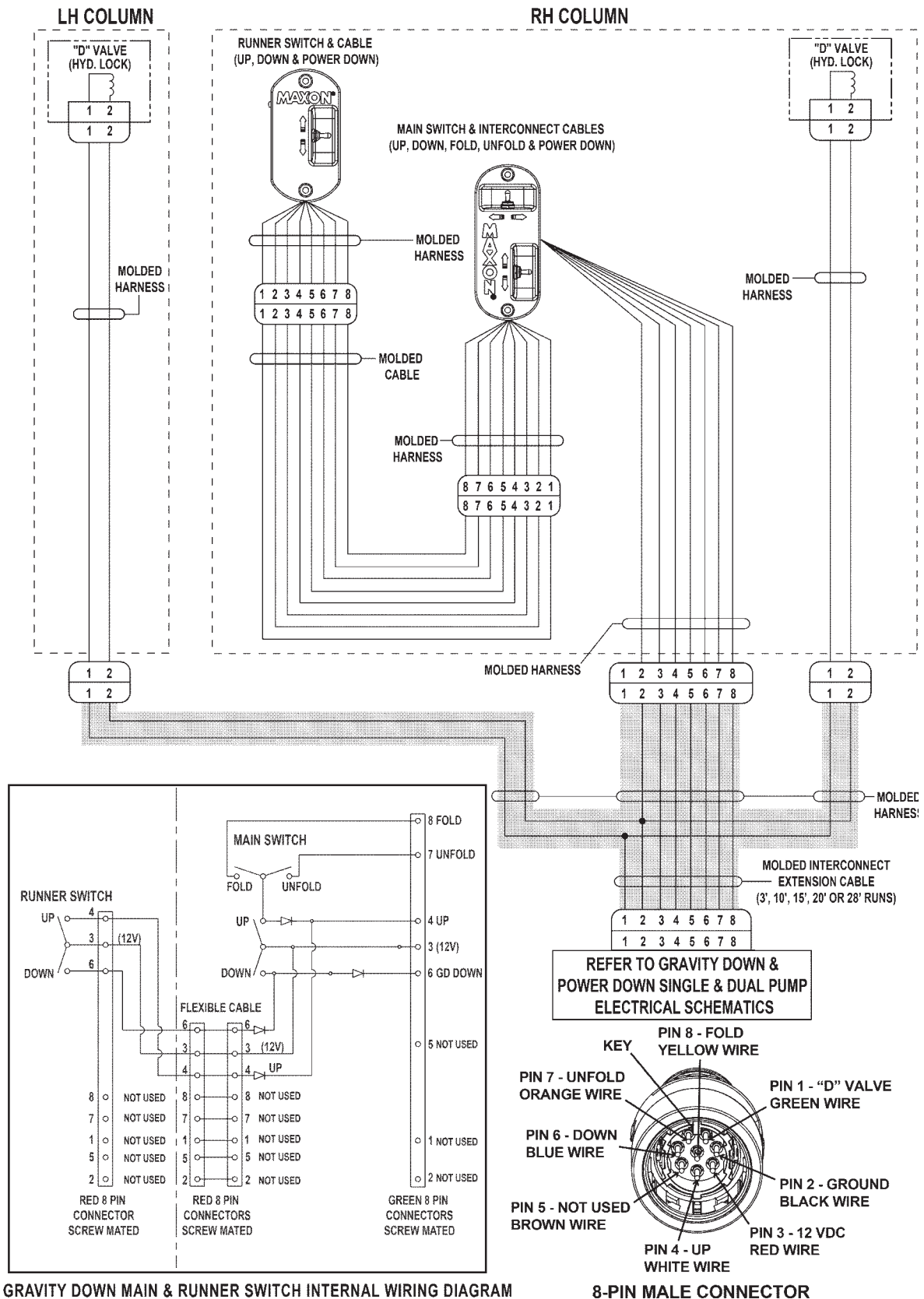


FIG. 97-1

# ELECTRICAL SYSTEM DIAGRAMS

## GRAVITY DOWN SINGLE & DUAL PUMP ELECTRICAL SCHEMATIC

**NOTE:** Refer to **BMR-CS ELECTRICAL VALUES** page.

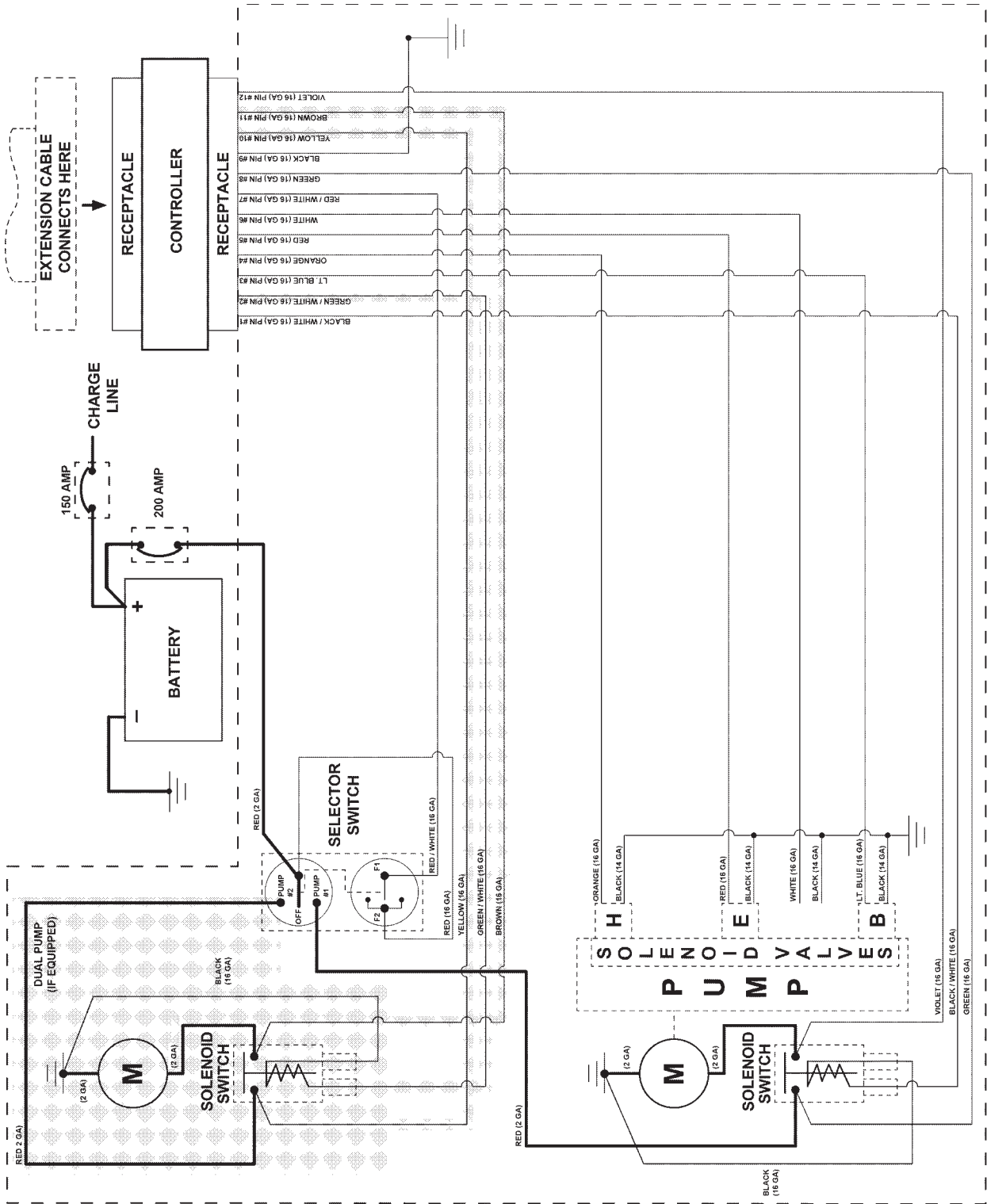


FIG. 98-1

**MAXON®** 11921 Slauson Ave. Santa Fe Springs, CA. 90670 (800) 227-4116 FAX (888) 771-7713



99

# ELECTRICAL SYSTEM DIAGRAMS

## POWER DOWN SINGLE & DUAL PUMP ELECTRICAL SCHEMATIC

**NOTE:** Refer to **BMR-CS ELECTRICAL VALUES** page.

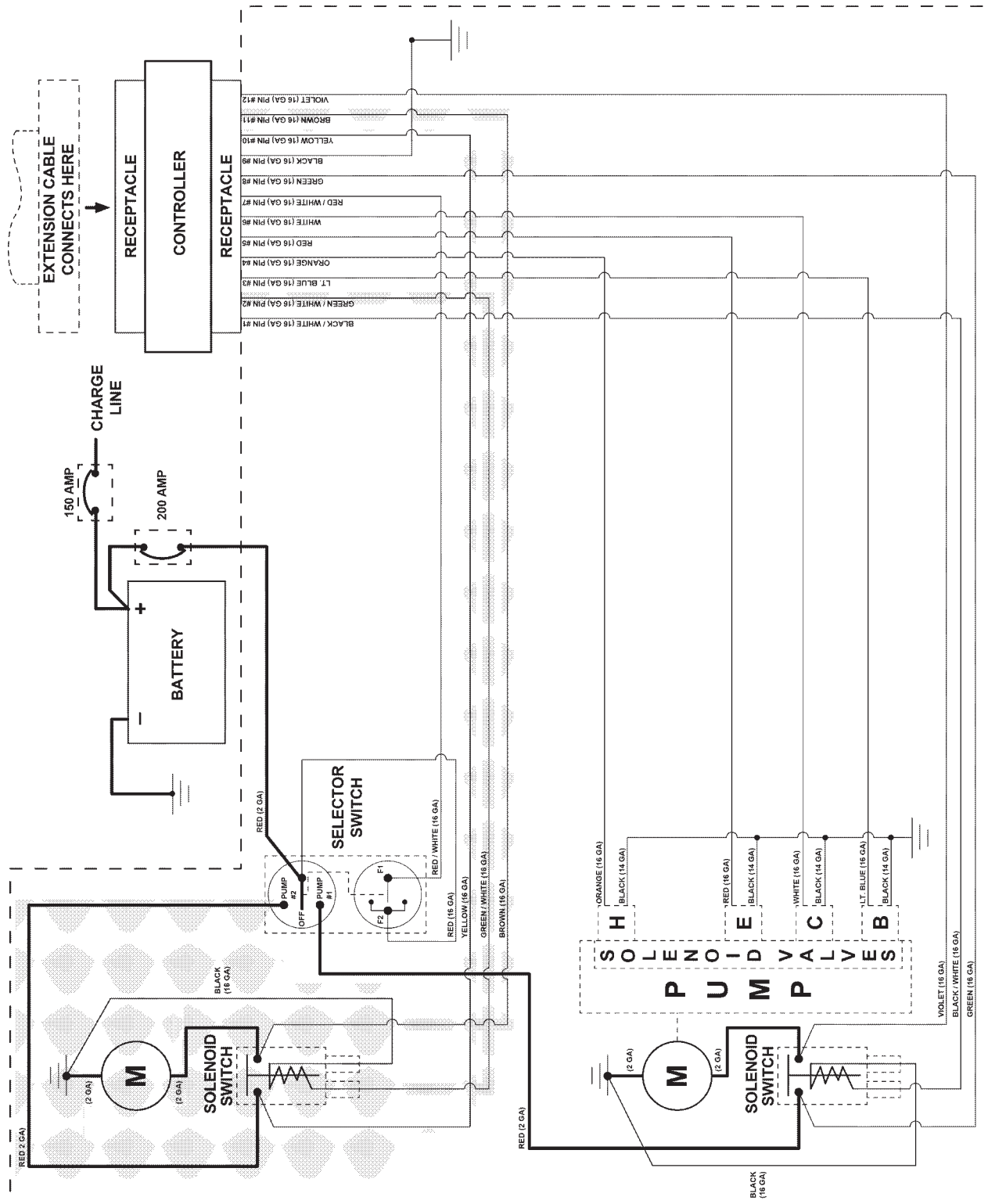


FIG. 100-1

# ELECTRICAL SYSTEM DIAGRAMS

## BMR-CS ELECTRICAL & HYDRAULIC VALVES TORQUE VALUES

MTE PUMP	BUCHER PUMP
<b>Solenoid Switch:</b> <ul style="list-style-type: none"> <li>• Coil: 5.4Ω @ 70°F. ±15%</li> <li>• Ampere: 2.2A @ 12V</li> <li>• Coil terminal torque: 10-15 <b>lb-in</b></li> <li>• Contact terminal torque: 30-35 <b>lb-in</b></li> </ul>	<b>Solenoid Switch:</b> <ul style="list-style-type: none"> <li>• Coil: 5.4Ω @ 70°F. ±15%</li> <li>• Ampere: 2.2A @ 12V</li> <li>• Coil terminal torque: 10-15 <b>lb-in</b></li> <li>• Contact terminal torque: 30-35 <b>lb-in</b></li> </ul>
<b>Solenoid Valves (H, E, and C):</b> <ul style="list-style-type: none"> <li>• Coil: 6.6Ω @ 70°F. ±15%</li> <li>• Ampere: 1.8A @ 12V</li> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>	<b>Solenoid Valves (H, E, and C):</b> <ul style="list-style-type: none"> <li>• Coil: 4.0Ω @ 70°F. ±15%</li> <li>• Ampere: 2.5A @ 10V</li> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>
<b>Solenoid Valve (B):</b> <ul style="list-style-type: none"> <li>• Coil: 7.5Ω @ 70°F. ±15%</li> <li>• Ampere: 1.6A @ 12V</li> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>	<b>Solenoid Valve (B):</b> <ul style="list-style-type: none"> <li>• Coil: 4.0Ω @ 70°F. ±15%</li> <li>• Ampere: 2.5A @ 10V</li> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>
<b>H, E, C &amp; B Valve Cartridge Torque:</b> 25-30 <b>lb-ft</b> maximum <ul style="list-style-type: none"> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>	<b>H, E, C &amp; B Valve Cartridge Torque:</b> 25-30 <b>lb-ft</b> maximum <ul style="list-style-type: none"> <li>• Coil nut torque: 15-45 <b>lb-in</b></li> </ul>
<b>Solenoid Valve (D):</b> <ul style="list-style-type: none"> <li>• Coil: 8.0Ω @ 70°F. ±15%</li> <li>• Ampere: 1.5A @ 12V</li> <li>• Coil nut torque: 3-4.5 <b>lb-ft</b></li> <li>• Valve cartridge torque: 18.5-22 <b>lb-ft</b></li> </ul>	<b>Solenoid Valve (D):</b> <ul style="list-style-type: none"> <li>• Coil: 8.0Ω @ 70°F. ±15%</li> <li>• Ampere: 1.5A @ 12V</li> <li>• Coil nut torque: 3-4.5 <b>lb-ft</b></li> <li>• Valve cartridge torque: 18.5-22 <b>lb-ft</b></li> </ul>
<b>Pump Selector Switch Terminal Stud Torque:</b> 140 <b>lb-in</b> maximum	<b>Pump Selector Switch Terminal Stud Torque:</b> 140 <b>lb-in</b> maximum
<b>Cable Ground Stud Torque:</b> 24 <b>lb-ft</b> maximum	<b>Cable Ground Stud Torque:</b> 24 <b>lb-ft</b> maximum



## PRE-DELIVERY INSPECTION FORM

**Important!** This pre-delivery checklist is to aid the installer in confirming the proper installation of this Maxon product. It is not a comprehensive list and does not replace the use of the installation manual. The installer is responsible for following all instructions in the installation manual.

**Model:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

**Technician:** \_\_\_\_\_

### Pre-Installation Inspection:

- ☐ Correct model
- ☐ Correct capacity
- ☐ Correct platform size
- ☐ Correct options
- ☐ Correct manuals & decals

### Structural Inspection:

- ☐ Liftgate is centered on vehicle rear door & mounted per dimensions in this manual.
- ☐ Pump box is mounted securely.
- ☐ All installation welds are done per instructions in this manual.
- ☐ All roll pins, bolts & fasteners on liftgate are tight.
- ☐ All hardware & fasteners, used to secure liftgate to vehicle body, are tight.
- ☐ Ensure platform ramp touches ground when runner is 1" above ground. The main platform & flipover surfaces should be level to one another and rest evenly when touching the ground.
- ☐ Verify runner slide pads are in adjustment per **STEP 18** in this manual.

### Hydraulic Inspection:

- ☐ Fluid is at correct level (See **OPTIMIZE HYDRAULIC FLUID LEVEL** step in this manual.)
- ☐ No leaks from hydraulic fittings in pump box
- ☐ No leaks from hydraulic line connections

### Electrical Inspection:

- ☐ Power/charge plug and terminals are clean & tight.
- ☐ Individual wire connections are tight.
- ☐ Circuit breaker (150A) is installed in battery box (if equipped) or by truck/tractor battery.
- ☐ Batteries are fully charged, all cable connections are tight & tie-downs are tight.
- ☐ Solenoid wiring connections are tight.
- ☐ Wiring harness connections are tight.
- ☐ Electrical cable connections are tight & secured clear of moving parts & sharp edges.

### Operation Inspection:

**NOTE:** The following times are for 56" bed height, aluminum platform and flipover, 85" W x 42" + 42" L, Exxon Unis HVI-13 oil, & temperature at 70°F. Times are for reference only and may vary for larger platforms, smaller platforms, steel platforms, or temperature changes.

### All BMR-CS

- ☐ Liftgate operates correctly using all main & optional control switches.
- ☐ Platform unfolds in 5 to 7 sec.
- ☐ Platform can be lowered onto the bottom stop position for dock loading, and 1" below the threshold plate.
- ☐ Platform folds in 5 to 7 sec.
- ☐ Unloaded platform lowers in **8 to 20 sec.**
- ☐ Unloaded platform raises in **9 to 21 sec.**
- ☐ Unloaded platform raises and lowers evenly in GD and PD modes. Maximum 1" difference of runners from side to side.
- ☐ Platform stores securely behind both column wedges.
- ☐ Cycle counter indicates total number of up and down cycles and adds 1 more count each time platform is raised and lowered.
- ☐ Decals in correct location and legible.

### Verify all lights are operational

- ☐ Platform lights turn **ON** when platform is unfolded, and turn **OFF** when platform is stowed.
- ☐ Taillights, stop lights, turn lights, and backup lights turn **ON** and **OFF** correctly.

11921 Slauson Ave. Santa Fe Springs, CA. 90670 (800) 227-4116 FAX (888) 771-7713



