SAF-HOLLAND Group

Operation and Maintenance Manual

DH Series Liftgates

- 4500 / 5500 / 6600 Lb. Capacity

XL-TG10139OM-en-US Rev B

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Introduction

This manual provides the information necessary for the proper operation and maintenance of the SAF-HOLLAND® Series Liftgate.

When replacement parts are required, SAF-HOLLAND® highly recommends the use of SAF-HOLLAND® Original Parts ONLY. A list of technical support locations that supply SAF-HOLLAND® Original Parts and an Aftermarket Parts Catalog are available on the internet at www.safholland.us or contact Customer Service at 888-396-6501 USA or 800-503-9847 Canada.

Warranty

Refer to the complete warranty for the country in which the product will be used. A copy of the written warranty is included with the fifth wheel and can also be found on the SAF-HOLLAND® website at www.safholland.com.

Notes, Cautions, and Warnings

Before starting any work on the unit, read and understand all the safety procedures presented in this manual. This manual contains the terms "NOTE", "IMPORTANT", "CAUTION", and "WARNING" followed by important product information. These terms are defined as follows:

NOTE: Includes additional information to enable accurate and easy performance of procedures.

IMPORTANT: Includes additional information that if not followed could lead to hindered product performance.

CAUTION — Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

⚠CAUTION — Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠WARNING — Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

1. General Safety Precautions

- Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠WARNING Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- Operators of a HOLLAND® Liftgate MUST be fully trained on the capabilities and the limitations of this equipment to operate the equipment properly.
- When operating the liftgate, ALWAYS stand to one side of the platform. Make sure that the area is clear of obstacles, other personnel, fingers, arms, hands, legs, and/or feet.

⚠WARNING Failure to keep area near the liftgate clear could create a crush and/or pinch hazard which, if not avoided, could result in death or serious injury.

IMPORTANT: DO NOT exceed liftgate capacity when raising or lowering the platform.

⚠WARNING Failure to avoid overloading the liftgate could result in platform failure which, if not avoided, could result in death or serious injury.

- Make sure the liftgate is in stowed position when not in use.
- NEVER step off moving equipment. Only step off the platform when it is in contact with the ground or at deck height when entering the vehicle.

⚠CAUTION Failure to lower the platform to ground level before stepping on or off platform could result in mild to moderate injury.

- Check for slippery surfaces before stepping off the liftgate platform.
- NEVER jump off the liftgate.
- In an emergency situation, release the control switch to stop the liftgate operation.
- HOLLAND® Liftgates require routine service, inspection, and maintenance in order to maintain optimum performance, proper operation, and to identify normal wear.

⚠WARNING Failure to properly engage the vehicle parking brake prior to operating or maintaining liftgate could allow vehicle movement which, if not avoided, could result in death or serious injury.

Servicing Safety Precautions

- DO NOT work underneath the liftgate without properly supporting the raised platform and lift frame in accordance with workplace safety requirements.
- NEVER strike any part of the liftgate with a steel hammer.

⚠CAUTION DO NOT hit steel parts with a steel hammer as parts could break, sending flying steel fragments in any direction creating a hazard which, if not avoided, could result in minor or moderate injury.

- Safety protection should ALWAYS be worn as protection from pressurized fluid spray, flying debris, and other airborne matter when working with tools, power tools, welding equipment, and dangerous chemicals.

NOTE: NEVER operate the liftgate with the vehicle running unless instructed to by this manual for specific service items.

⚠WARNING Failure to turn off vehicle motor before commencing work could allow vehicle to move which, if not avoided, could result in death or serious injury.

- While servicing or repairing equipment, ALWAYS disconnect the electrical power to the pump motor and ensure that the platform and lift frame is supported, on the ground, or secured in the travel lugs.
- Avoid contact with electrical connections inside the pump box which are not isolated.

⚠WARNING Failure to avoid contact with electrical connections will result in shock which, if not avoided, could result in death or serious injury.

- When welding is required, ensure the battery ground cable is disconnected and all electrical equipment is completely electrically isolated before welding is initiated ***(Figure 1)***.
- Before starting any welding, ensure that the area to be repaired is cleaned of debris and combustible material. ALWAYS have a charged fire extinguisher available and know how to use it.
- When searching for an oil leak, wear work gloves and use a piece of cardboard or wood as a detector. Wear a safety face shield or goggles for eye protection. NEVER use bare hands to check for fluid leaks ***(Figure 2)***.

⚠WARNING Failure to properly protect the body when searching for hydraulic leaks could result in fluid injection into the skin which, if not avoided, could result in death or serious injury.

- Pressure can remain in a hydraulic system after the power source and pump have been shut down. Ensure that there is no pressure in any of the hydraulic cylinders or hoses before performing work on components, or disconnecting any hoses ***(Figure 3)***.

⚠WARNING Failure to depressurize the hydraulic system could result in fluid injection into the skin which, if not avoided, could result in death or serious injury.

NOTE: Batteries contain acid that can burn and produce gas that can explode, follow battery manufacturers' provided safety instructions when working on the battery.

⚠CAUTION Failure to follow manufacturers' safety instructions when handling batteries could result in explosion which, if not avoided, could result in minor to moderate injury.

- Inspect the equipment daily for potential fire hazards and make any necessary repairs immediately.
- Inspect electrical wiring, connections, and hydraulic hose runs to ensure they are secure and not rubbing against other components.
- Clean up any excess grease, oil accumulation and spillage immediately. Use only non-flammable products for cleaning the liftgate or components.

Figure 1

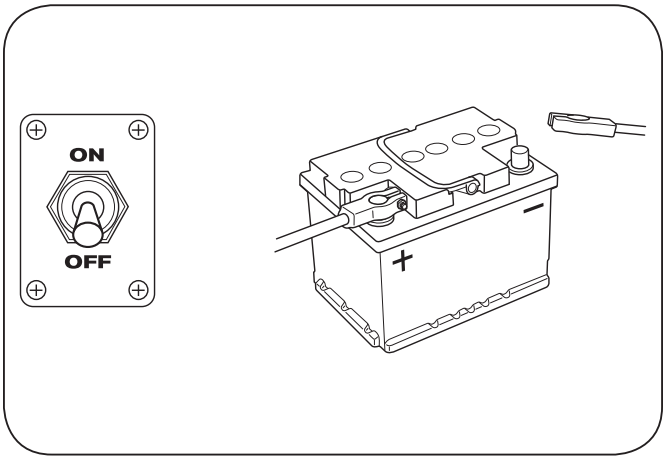


Figure 2

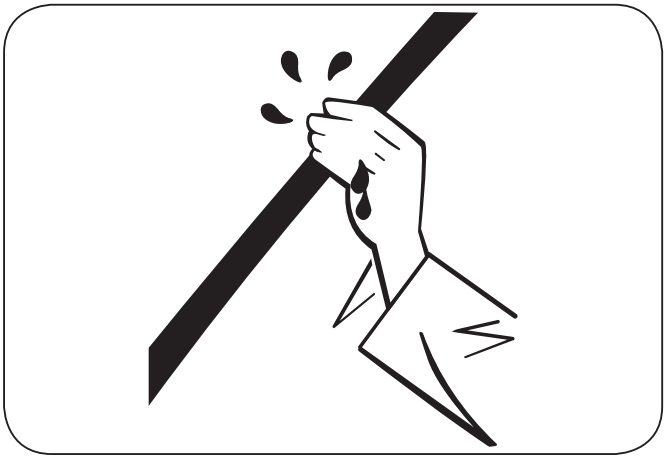


Figure 3

2. Welding Standards

2.1 Scope

This specification applies to all components supplied by SAF-HOLLAND®, and its products. The customer assumes all responsibility for weld integrity if weld material and procedure differ from that listed below.

2.2 Material

Frame attachment components made from low carbon or high-strength alloy steel are to be welded with AWS filler metal specification AWS A5.18, filler metal classification ER-70S-3, ER-70S-6 or equivalent unless specified on the installation drawing.

NOTE: Any substitution for filler material from the above standard MUST comply, as a minimum, with the following mechanical properties:

Tensile Strength - 72k psi (496 MPa)
Yield Strength - 60k psi (414 MPa)
Charpy V notch - 20 ft.-lbs. (27 N•m) at 0° F (-17.7° C)
% Elongation - 22%

The recommended welding gas for gas metal arc welding (GMAW) is 90% Argon / 10% CO2. If a different gas is used, welds MUST comply with penetration requirements shown ***(Figure 4)***. Where the installation drawing specifies different than above, the drawing shall prevail.

2.3 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. Tack weld should be completely fused to the finish weld. DO NOT break arc at the end of the weld. Back up all finish welds at least 1/2" (12.7 mm) or a sufficient amount to prevent craters at the end of the weld. Where weld is shown to go around corners, it is assumed the corner represents a stress concentration area. DO NOT start or stop weld within 1" (25.4 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

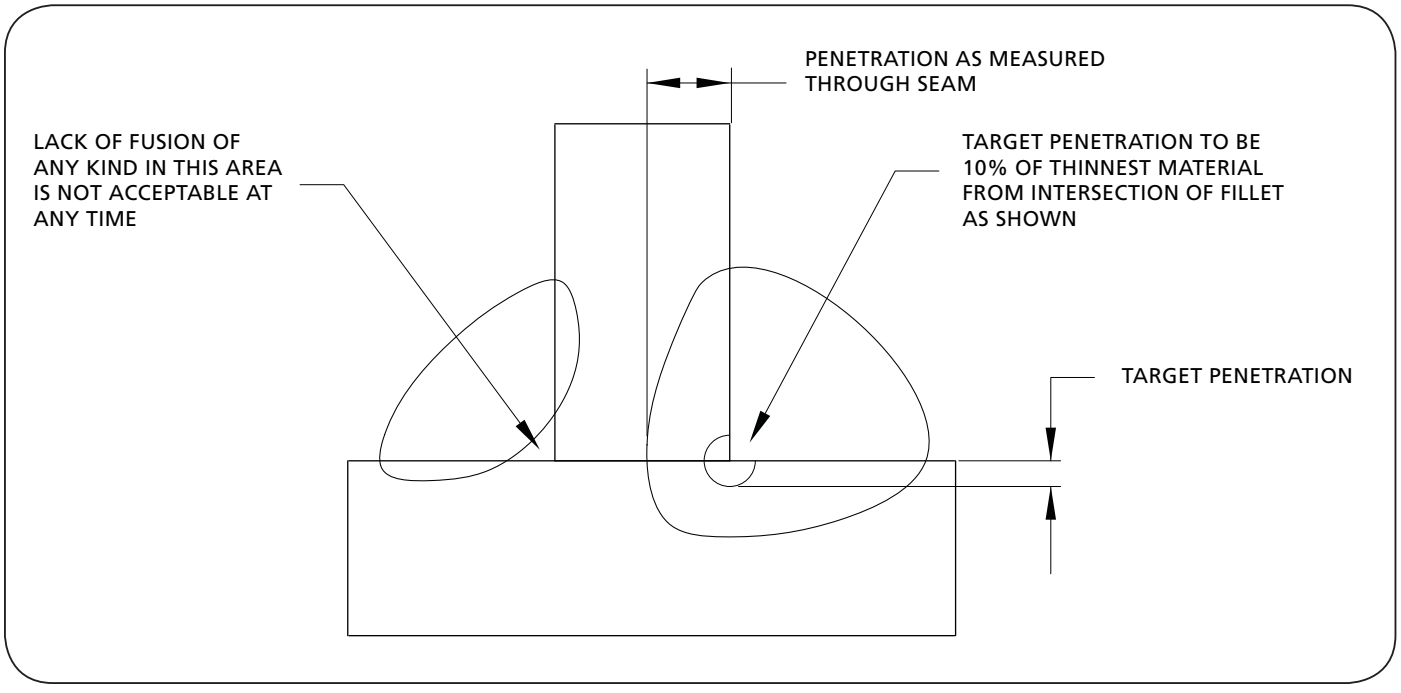
2.4 Workmanship

It is the responsibility of the customer to provide good workmanship when attaching components to the frame structure.

2.5 Weld Size

If weld size is not specified, the effective throat of the weld MUST be no smaller than the thinnest material being welded ***(Figure 4)***.

Figure 4



3. Liftgate Model and Serial Number Location

Each SAF-HOLLAND® liftgate has a stamped metal tag that identifies the liftgate model number and the serial number. This tag is attached to the front of the roadside main tube ***(Figure 5 and 6)***. In order to properly identify the SAF-HOLLAND® liftgate and its components when communicating with SAF-HOLLAND® or the dealer, please record the model and serial numbers and refer to them when ordering replacement parts.

Model Number

DH 55 B 84

Platform Size
60" long
72" long
84" long

Configuration Code
A Flow Dividing Hydraulic System
B Master-Slave Hydraulic System

Capacity
4,500 lbs.
5,500 lbs.
6,600 lbs.

Model

Serial Number

92 08 312 0123

Sequence Number
Day of Year
Year Code
Facility Code

Equipment Model No.: _____

Serial No.: _____

Purchase Date: _____

Dealer: _____

Figure 5

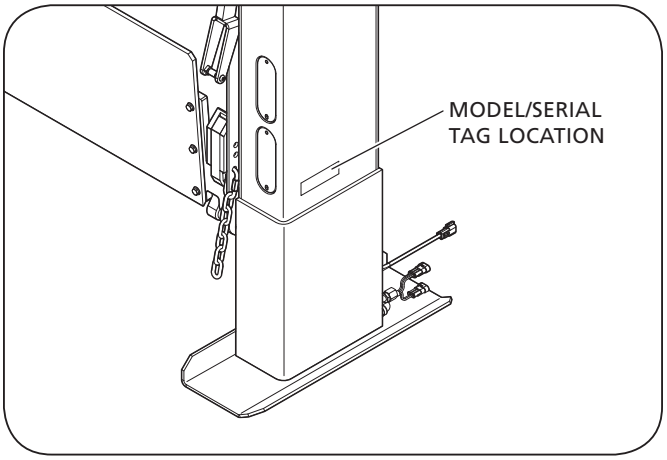
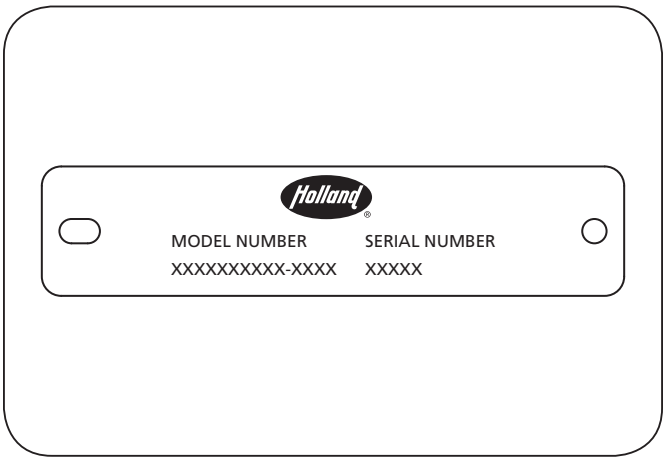


Figure 6



4. Decal Part Numbers

IMPORTANT: All decals MUST be installed, maintained, visible and legible.

Prior to putting the vehicle into service, inspect all decals listed on the chart below and reference the liftgate decal location, to ensure correct placement and legibility ***(Figures 7, 8 and 9)***. Replace any damaged and or missing decals.

It is the responsibility of the end user to periodically inspect all decals and ensure cleanliness and complete legibility. If any decals are missing, loose, damaged or difficult to read, contact SAF-HOLLAND® Customer Service to order replacements immediately.

DECAL	DESCRIPTION	ENGLISH	FRENCH	QTY
A	Maximum Capacity 6600 lbs.	XB-57502	XB-57503	2
	Maximum Capacity 5500 lbs.	XA-58099	XA-58100	2
	Maximum Capacity 4500 lbs.	XA-58090	XA-58091	2
B	Instruction Decal, DH Series	XA-58401	XA-58402	1
C	WARNING – DH Series	XA-58403	XA-58404	1
D	CAUTION – Always Stand Clear	XB-50344	XB-50349	2
E	DANGER – Serious Injury	XB-51170	XB-57067	2
F	WARNING – High Pressure	XB-54995	XB-64388	2
G	Align Arrows	XA-58505	N/A	1
H	Dual Toggle Control	XA-58288	N/A	1
I	Up/Down, Bilingual	XB-51741	N/A	1
J	WARNING – Auxiliary DH Control	2112100002180	2112100002180	1
L	WARNING – Riding Platform	XB-62815	XB-62878	1

Figure 7

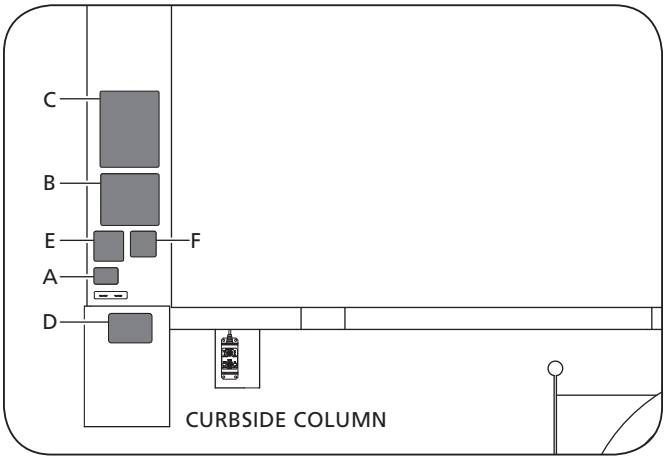


Figure 8

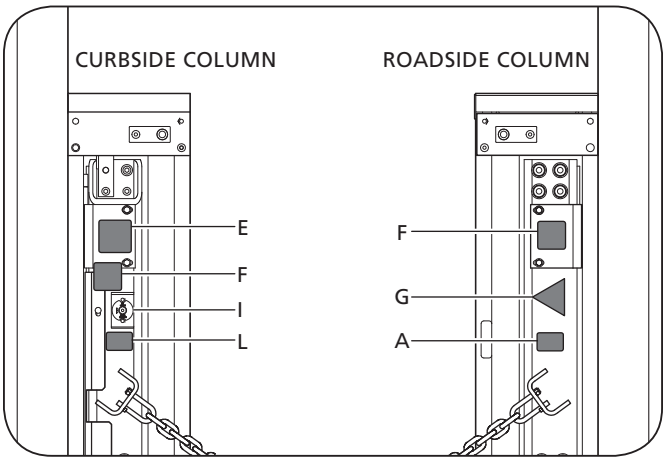
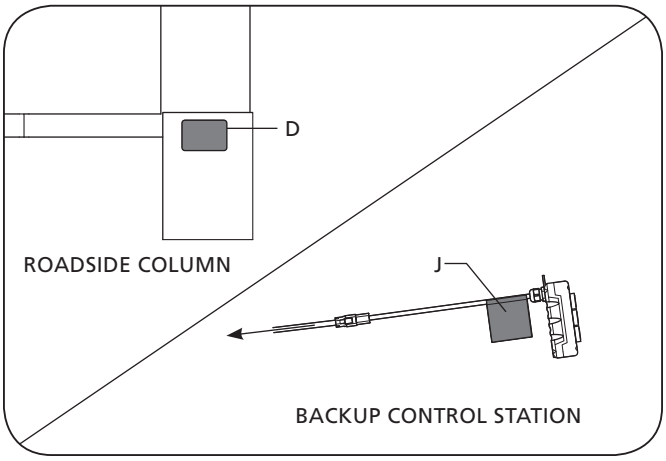
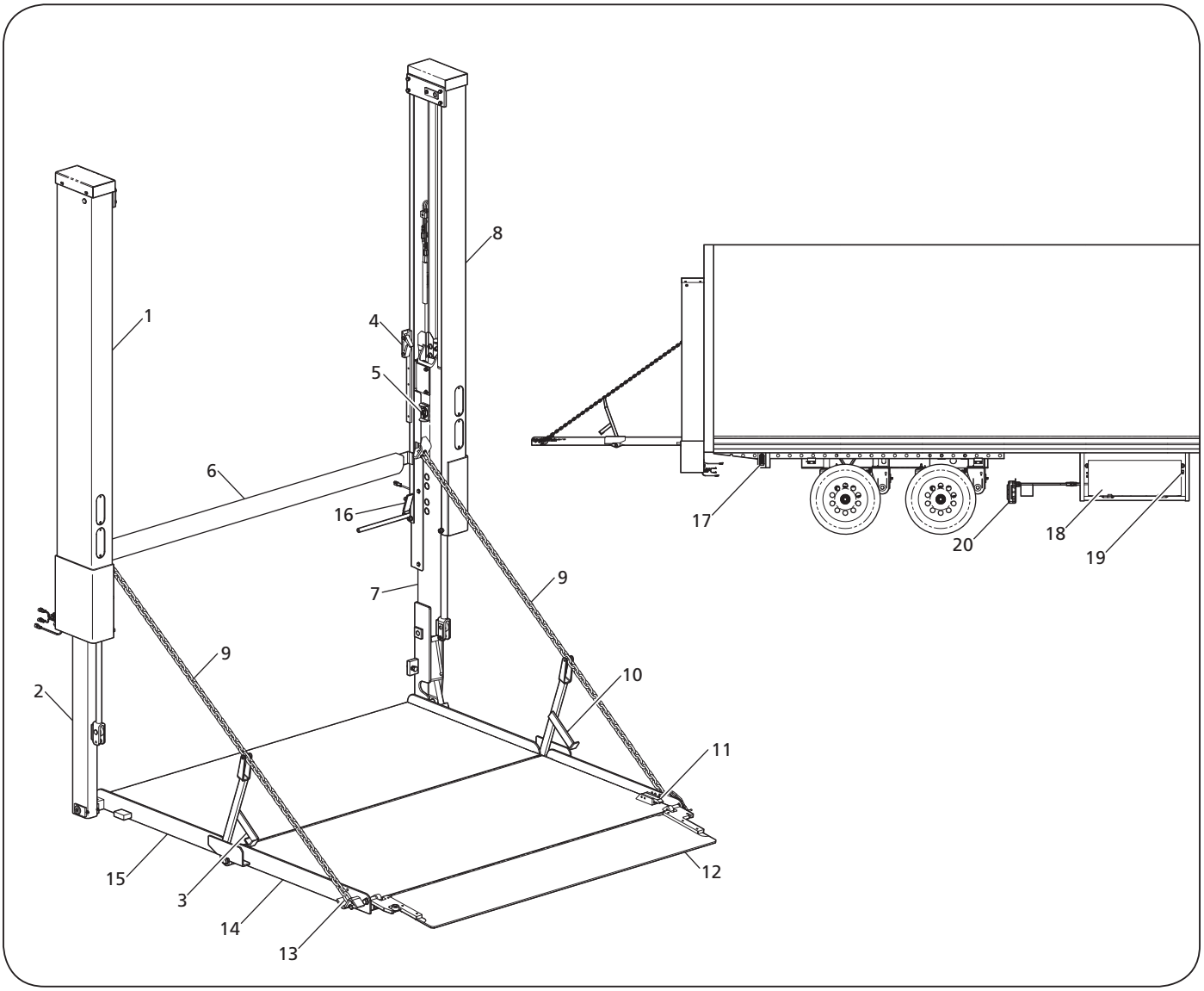


Figure 9



5. DH Series Terminology



ITEM	DESCRIPTION
1	Roadside Column
2	Roadside Runner
3	Stanchion – Roadside
4	Travel Lock Lug
5	Column Toggle Switch (mounted to runner)
6	Deck Extension (welded to door sill)
7	Curbside Runner
8	Curbside Column
9	Chain
10	Stanchion – Curbside

ITEM	DESCRIPTION
11	Spring Bolt Hinge
12	Platform Retention Ramp
13	U-Bolt Adjustment
14	Outer Platform
15	Inner Platform
16	Dock Storage Lock Lug
17	Control Station
18	Pump Box
19	Master Disconnect Switch
20	Back-up Control Station

6. Pre-Operation Information

1. Ensure the platform area is clear of obstacles.
2. Inspect the liftgate for any damage, bruised paint, or bent components.
3. Inspect the electrical cables and hydraulic hoses, repair or secure as necessary.

⚠WARNING Failure to repair and/or replace worn or damaged components before use could result in liftgate failure which, if not avoided, could result in death or serious injury.

4. Read and understand the decals referenced in Section 4.
5. The vehicle MUST be positioned on flat, level ground before operating liftgate.
6. Ensure that the vehicle parking brake is securely engaged.

7. Retention Ramp Operation

1. Lower and open the platform from the stowed position to ground level ***(Figure 10)*** as referenced in Sections 8, 9, and 10.

IMPORTANT: While operating the retention ramp, ALWAYS stand to one side of the platform. Ensure fingers and hands are clear of moving parts.

⚠CAUTION Failure to keep clear of the retention ramp operation could create a crush and/or pinch hazard which, if not avoided, could result in minor to moderate injury.

2. With the platform lowered and open, slide the retention ramp latch to release the retention ramp from the stowed position. Rotate the ramp until the leading edge rests firmly on the ground ***(Figure 10 and 11)***.
3. To engage the retention ramp from the loading position to the cart stop position, rotate the ramp until the retention ramp chain can attach to the ramp hinge lock slot ***(Figure 12)***.
4. To close the retention ramp, with the platform open, hold the ramp with one hand and release the retention ramp chain from the ramp hinge lock slot and rotate the retention ramp down onto the platform. Slide the retention ramp latch back over the ramp hinge.

Figure 10

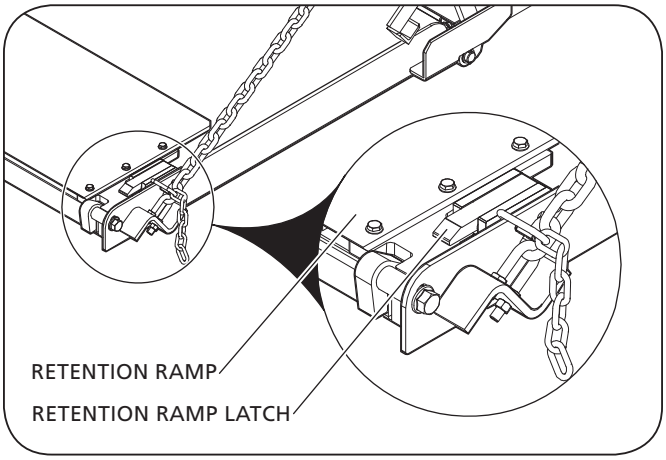


Figure 11

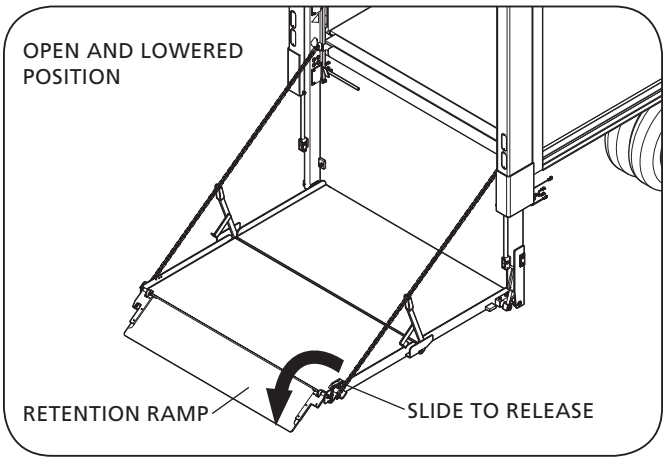
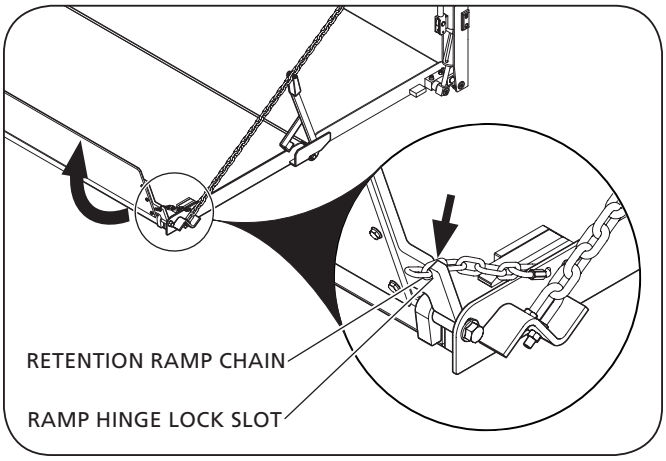


Figure 12



8. Main Control Station and Column Toggle Switch Operation

To operate the liftgate, use the toggle switches on either the main control station, located on the curbside of the vehicle ***(Figure 13)***, or on the column, located on the curbside inner column ***(Figure 14)***.

The main control station toggle switch enables the operator to raise, lower, fold, and unfold the liftgate platform ***(Figure 15)***.

NOTE: Up/Down mode is the default position of the bottom toggle switch ***(Figure 15)***.

⚠WARNING Failure to keep clear of the moving liftgate could create a crush and/or pinch hazard which, if not avoided, could result in death or serious injury.

NOTE: If the operator is required to ride the platform, a toggle switch is located on the curbside inner column. The switch only allows the operator to raise or lower the platform (***Figure 13***).

⚠WARNING Failure of operator to use column toggle switch ONLY while standing on the platform could create a crush or fall hazard which, if not avoided, could result in death or serious injury.

Figure 13

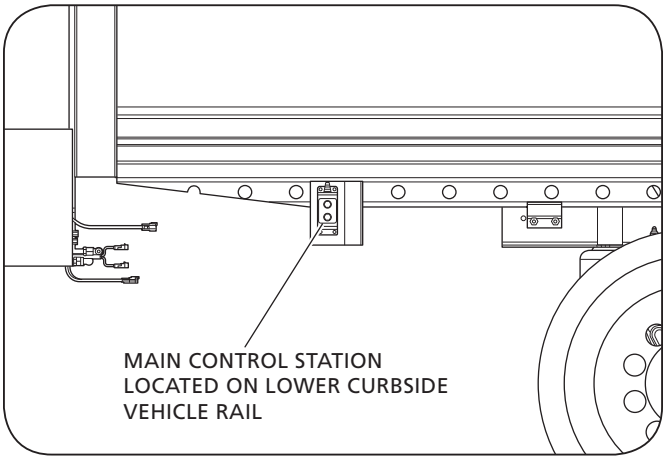


Figure 14

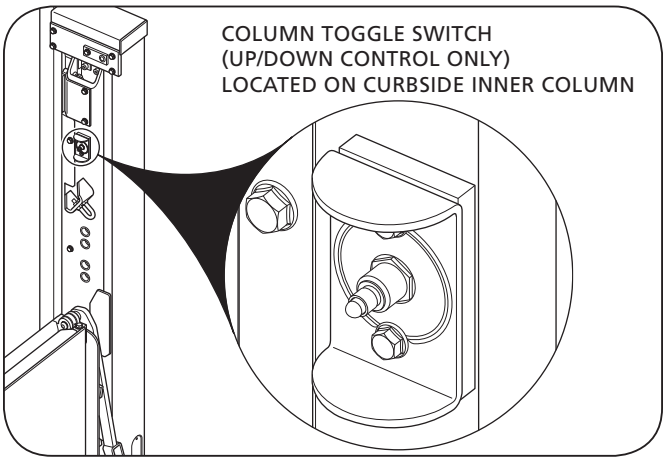
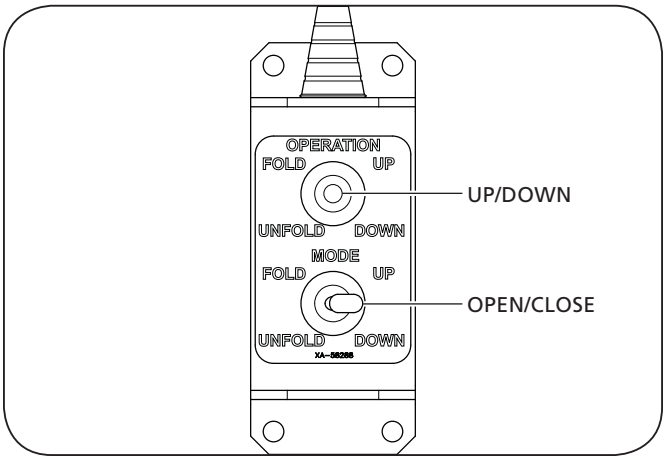


Figure 15



9. Raising and Opening the Platform

1. Turn the master disconnect switch to the "ON" position ***(Figure 16)***.
2. Push the control station top toggle switch to the "UP" position ONLY, raising the folded platform to the utmost vertical position and releasing the stanchion bracket from the travel lock lug ***(Figures 17 and 18)***.
3. Visually verify that both sides of the platform are at the same height.

IMPORTANT: One side of the liftgate stanchion bracket could disengage from the travel lock lug before the other. Ensure that both travel lock lugs are disengaged before opening platform.

4. If the platform is not level, push and hold the control station top toggle switch in the up position for 15-20 seconds. Repeat 2-3 times.

Figure 16

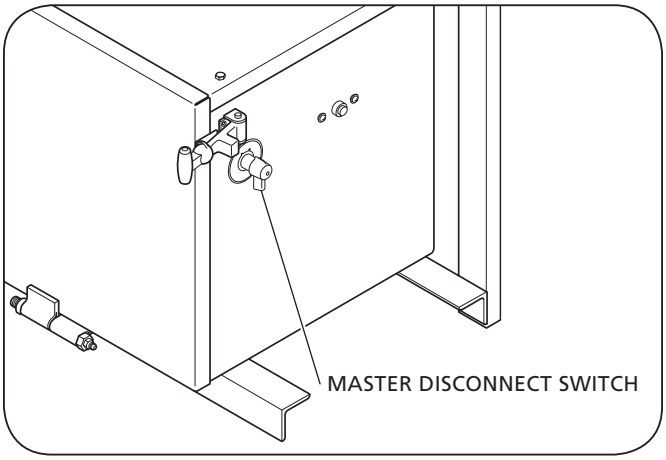


Figure 17

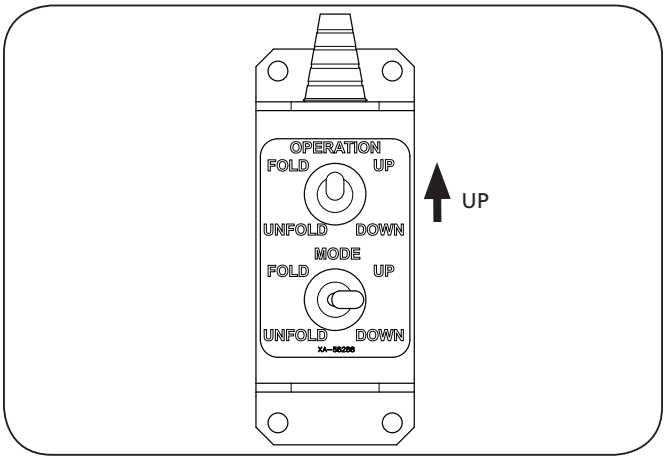
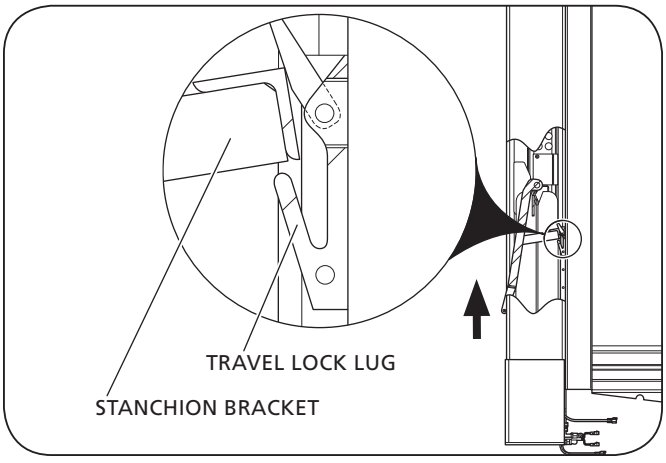


Figure 18



5. Push and hold the bottom toggle switch to the left to place the control into fold/unfold mode. Push and hold the top toggle switch to "Unfold" position to unfold the platform ***(Figure 19)***.
6. Hold both switches until platform reaches deck height and is unfolded and flat, then release both switches ***(Figure 20)***.

CAUTION Failure to turn off the master disconnect in the event of an emergency could result in damage to the liftgate components.

Figure 19

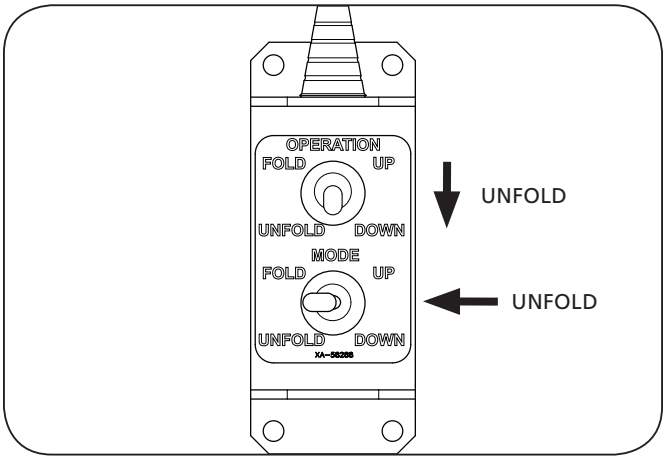
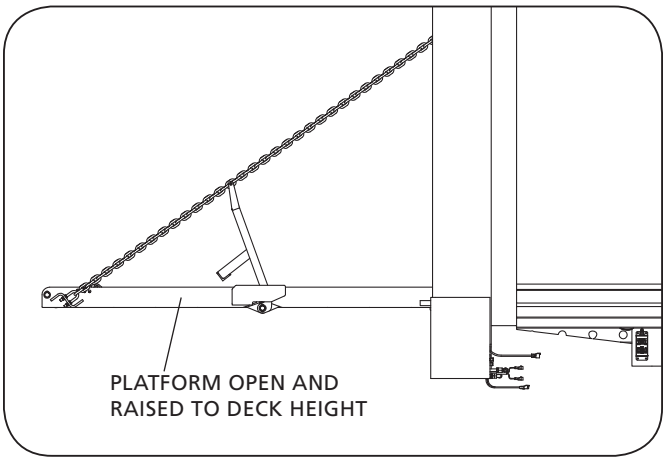


Figure 20



10. Lowering the Platform

CAUTION Failure to place the retention ramp in the cart stop position prior to operating the liftgate could allow the load to fall off the platform which, if not avoided, could result in property damage.

1. Place the ramp in the cart stop position as referenced in Section 7.
2. Push the control station top toggle switch ONLY to the "DOWN" position ***(Figure 21)***. Hold the toggle switch until platform reaches ground level and release the switch ***(Figure 22)***.
3 . To prevent unauthorized use when leaving the liftgate unattended, turn the master disconnect switch to "OFF" ***(Figure 23)***.

Figure 21

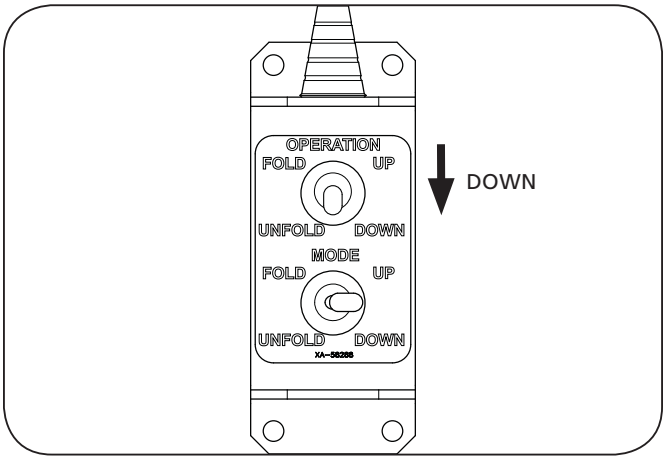


Figure 22

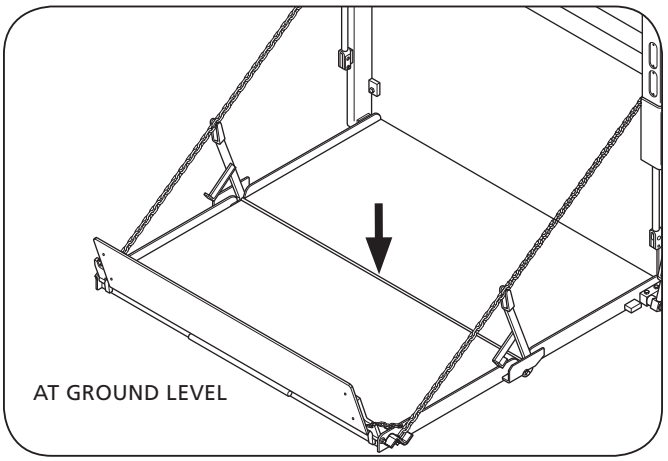
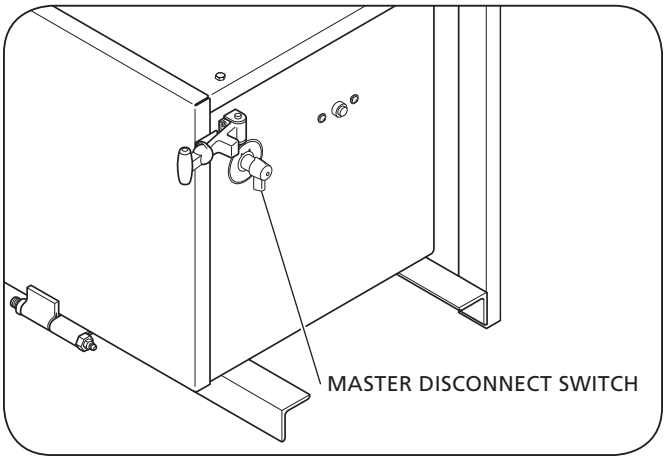


Figure 23



11. Platform Loading

CAUTION Failure to keep load within the platform edge, could create a crush hazard which, if not avoided, could result in damage to the load.

⚠WARNING Failure to keep the load stable and within the design capacity could result in falling objects or component failure which, if not avoided, could result in death or serious injury.

⚠WARNING Failure to keep feet within the front edge of the platform when riding the platform could create a crush hazard which, if not avoided, could result in death or serious injury.

⚠WARNING Failure to lower the platform to ground level before accessing the platform toggle could result in the operator falling which, if not avoided, could result in death or serious injury.

11.1. Loading From Ground

- Using the control station, open the platform from the stowed position and lower it to the ground as Referenced in Section 10.

IMPORTANT: NEVER operate a fork lift truck on or over the platform.

⚠WARNING Failure to remove the fork lift trucks from the liftgate platform area could cause component failure which, if not avoided, could result in death or serious injury.

- Ensure the retention ramp is in the cart ramp position ***(Figure 24)***.
- When loading, distribute the weight as close to the center of the platform as possible and place the heaviest part of the load to the front of the platform ***(Figure 25)***.
- Engage the retention ramp to the cart stop position ***(Figure 25)***. Refer to Section 7 and 10.
- Using the control station toggle switch on the curbside runner, raise the platform to deck height and unload ***(Figure 26)***. If required, repeat procedures to continue with additional loads.
- When the liftgate has been unloaded, raise the platform to the stowed position, as indicated Section 7 and 12.

Figure 24

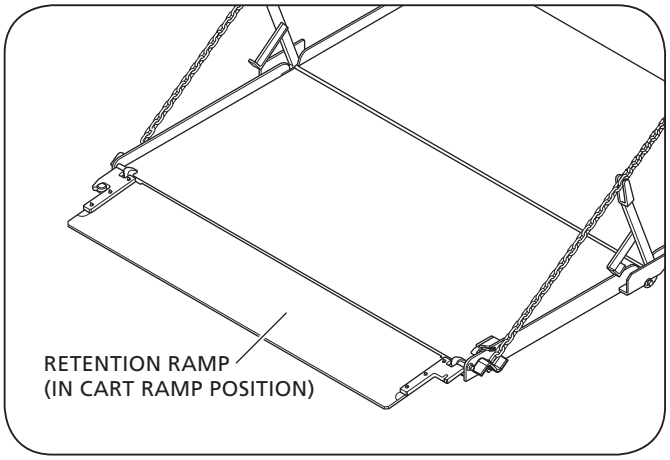


Figure 25

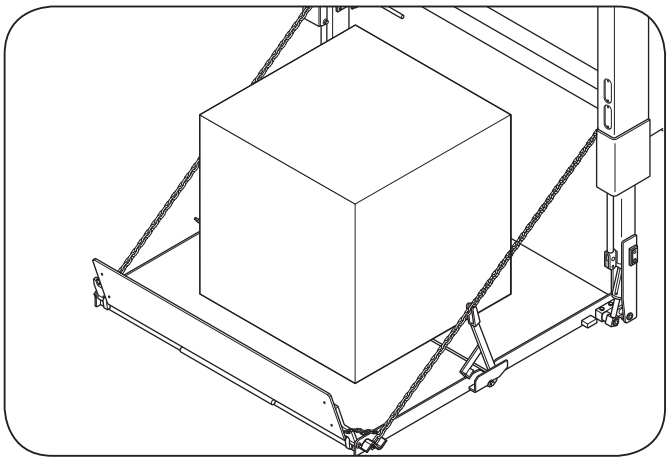
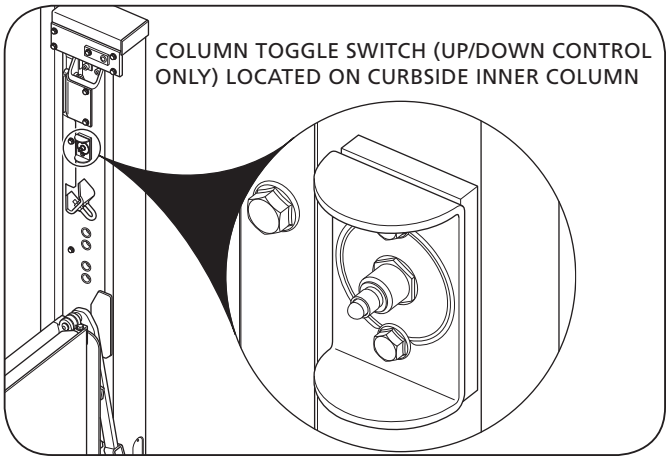


Figure 26



11.2. Loading From Vehicle

- Using the control station, open and raise the platform to deck height.
- Engage the retention ramp to the cart stop position referenced in Section 7 and 10, ***(Figure 27)***.
- When loading, distribute the weight as close to the center of the platform as possible and place the heaviest part of the load to the front of the platform ***(Figure 27)***.

IMPORTANT: NEVER place a fork lift truck on the platform.

⚠WARNING Failure to remove fork lift trucks from the liftgate platform area could cause component failure which, if not avoided, could result in death or serious injury.

- Using the control station toggle switch on the curbside runner, lower the platform to the ground and unload ***(Figure 28)***. If required, repeat procedures to continue with additional loads.
- When the liftgate has been unloaded, raise the platform to the stowed position as indicated in Section 7 and 12.

Figure 27

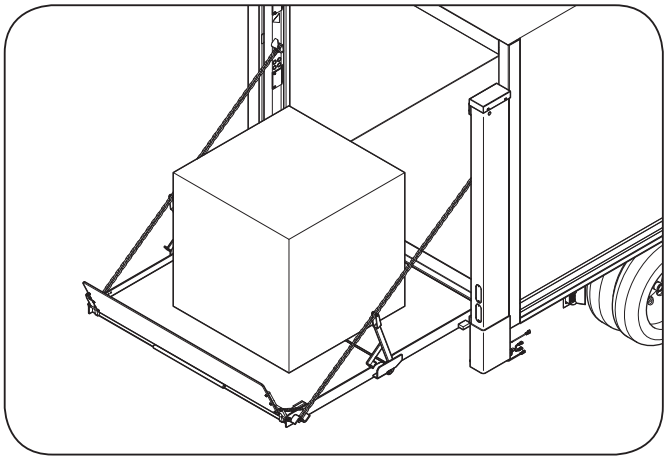
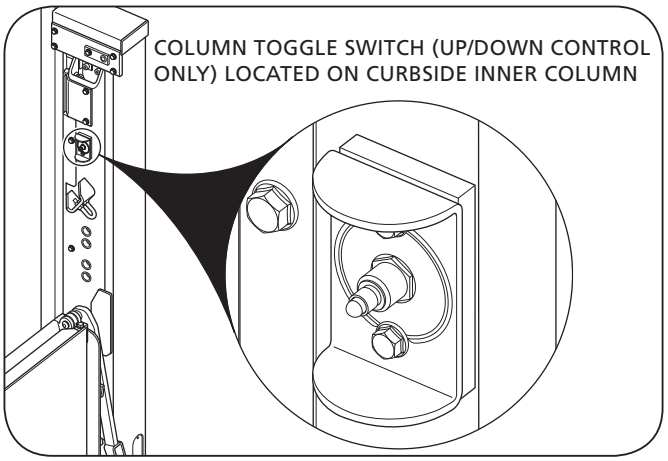


Figure 28



12. Platform Stowage

⚠WARNING Failure to keep clear of the moving liftgate could create a crush and/or pinch hazard which, if not avoided, could result in death or serious injury.

1. Verify that the liftgate is on level ground and that the vehicle parking brake is properly engaged.
2. Verify that the master disconnect switch is in the "ON" position.
3. Close the platform retention ramp as referred to in Section 7 ***(Figure 29)***.
4. Push the control station top toggle switch only to the "UP" position, raise the platform high enough off the ground to close the platform to the stowed position ***(Figure 30)***.
5. Push and hold the bottom toggle switch to the left to put the control into "FOLD/UNFOLD" mode. Push the top toggle switch to the "FOLD" position to fold the platform ***(Figure 30)***.
6. Visually verify that the platform is in the closed position and that both sides of the platform are at the same height ***(Figure 31)***.

Figure 29

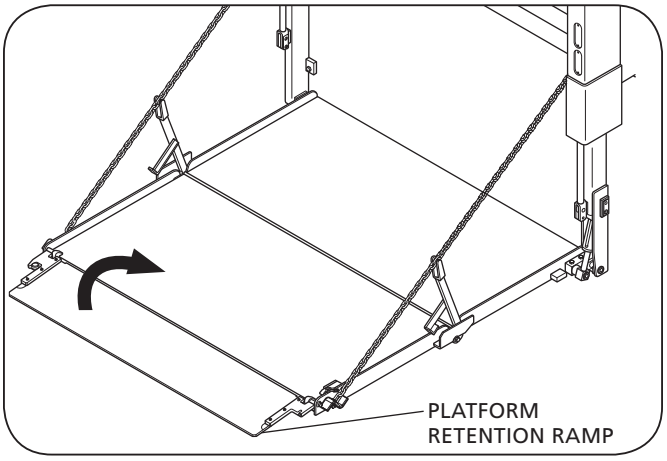


Figure 30

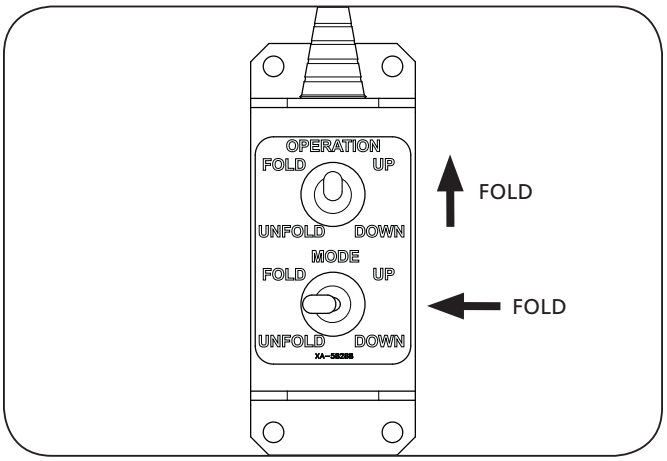
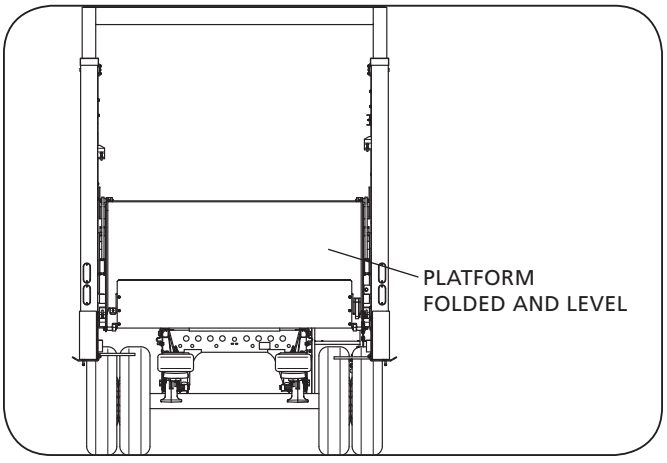


Figure 31



7. Push only the control station top toggle switch to the "UP" position, raising the folded platform until the alignment arrows on the roadside column and the runner are even with each other. ***(Figure 32)***.
8. When the column and runner arrows are aligned, push only the control station top toggle switch to the "DOWN" position, lowering the folded platform so the stanchion brackets are securely resting on the column travel lock lugs ***(Figure 33)***.
9. Turn the master disconnect switch to the "OFF" position ***(Figure 34)***.

Figure 32

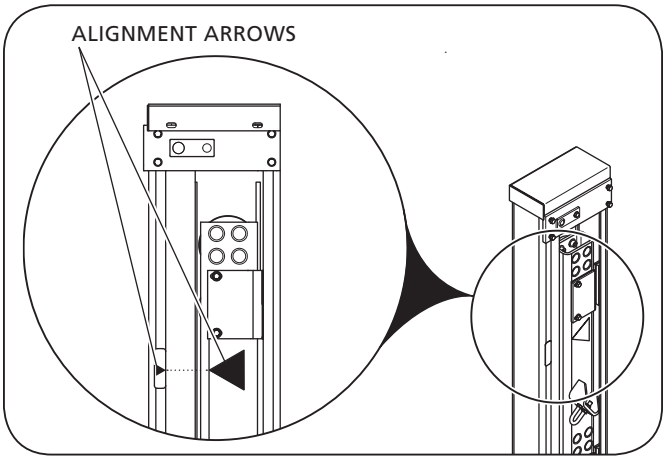


Figure 33

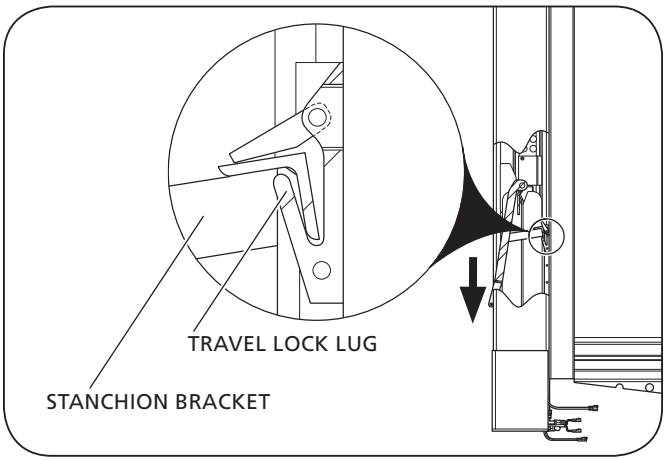
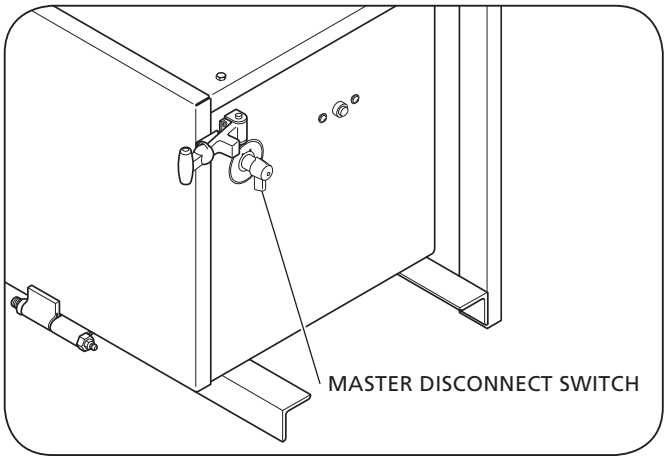


Figure 34



13. Dock Loading

1. Back the vehicle up until the vehicle contacts the dock bumpers. Engage vehicle parking brake.
2. Push the control station top toggle switch to the "UP" position ONLY, raising the folded platform to the utmost vertical position and releasing the stanchion bracket from the travel lock lug ***(Figure 35)***.
3. Visually verify that both sides of the platform are at the same height.

IMPORTANT: One side of the liftgate stanchion bracket could disengage from the travel lock lug before the other. Ensure that both travel lock lugs are disengaged before opening the platform.

4. If the platform is NOT level, push and hold the control station top toggle switch in the "UP" position for 15-20 seconds. Repeat 2-3 times.
5. Lower the folded platform onto dock stowage lock lugs. Ensure that stanchion brackets engage both sides ***(Figure 36)***.

IMPORTANT: Ensure that the folded platform assembly securely rests on the dock storage lugs before proceeding with dock loading material. If, after many attempts, the platform will not engage in the dock stowage lock lugs have the liftgate promptly inspected by a trained service technician.

6. Turn the master disconnect switch to the "OFF" position.

Figure 35

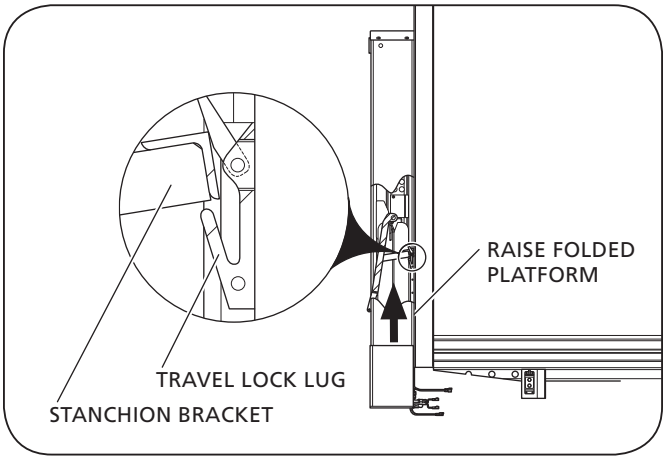
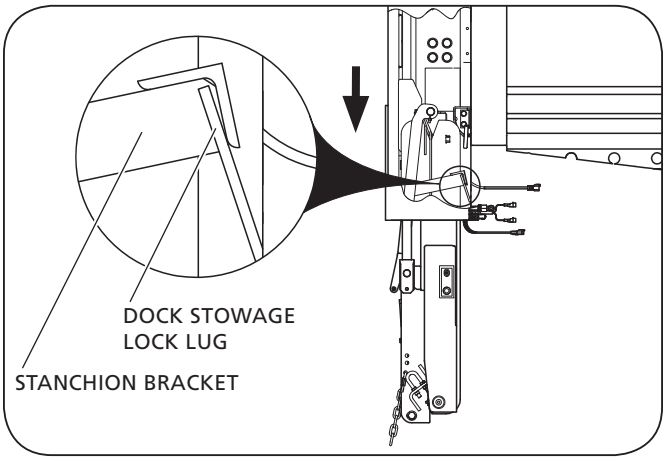


Figure 36



14. Power Down/Gravity Down Selection

The liftgate is equipped with a mode selection switch inside the pump box on the pump manifold ***(Figure 37)***.

IMPORTANT: Avoid contact with electrical connections inside the pump box which are not isolated.

⚠WARNING Failure to avoid contact with electrical connections will result in shock which, if not avoided, could result in death or serious injury.

1. Open the pump box by disengaging the rubber hold down straps from each end of the pump box and rotating the cover down ***(Figure 38)***.

IMPORTANT: While deploying the pump box cover, ALWAYS ensure fingers and hands are clear of moving parts.

⚠CAUTION Failure to keep clear of moving parts could create a crush and/or pinch hazard which, if not avoided, could result in minor to moderate injury.

2. Toggle switch to the left for "POWER DOWN" operation. ***(Figure 39)***. Toggle switch to the right for "GRAVITY DOWN" operation. ***(Figure 39)***.
3. Once the down mode has been selected, close the pump box and re-engage the rubber hold down straps at both ends of the pump box.

Figure 37

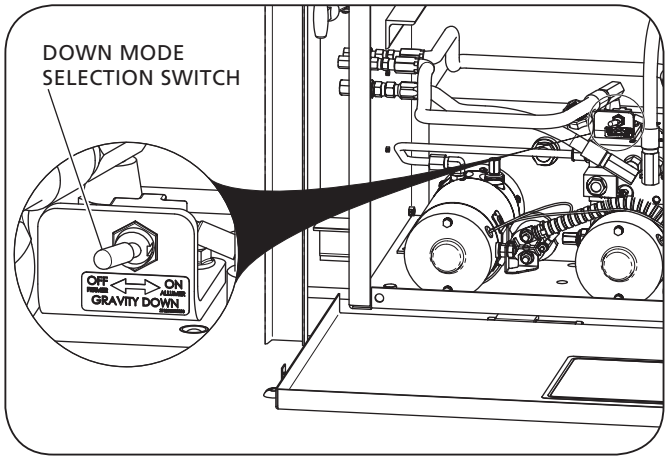


Figure 38

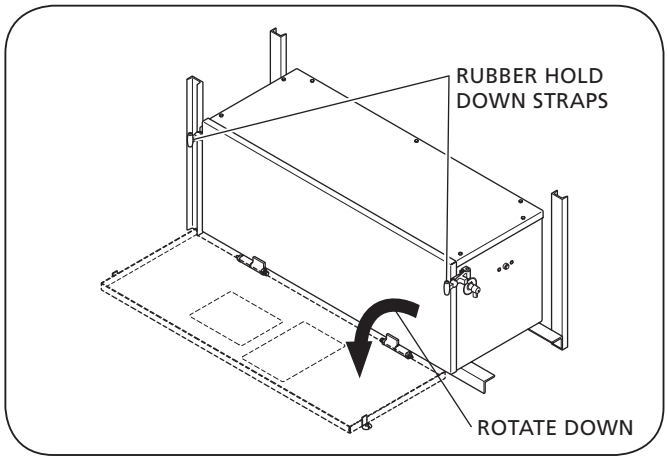
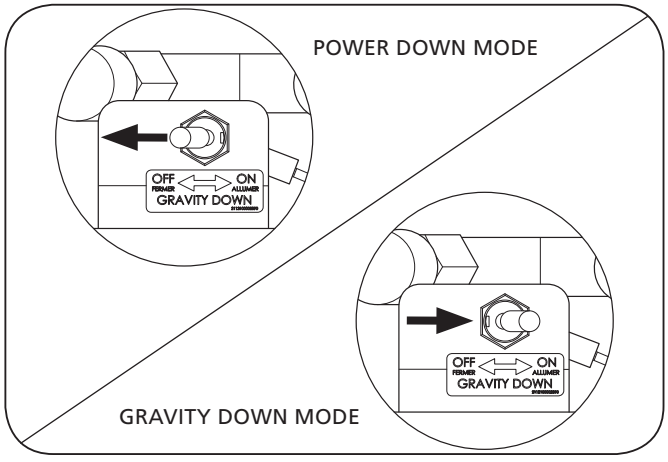


Figure 39



15. Back-up Control Station Operation

There is a back-up control station located in the pump box. The push buttons on the back-up control station enable the operator to raise, lower, fold and unfold the liftgate platform.

IMPORTANT: The back-up control station is not meant to be used on a regular basis. It is only meant as a back-up when the main control station does not work.

IMPORTANT: Avoid contact with electrical connections inside the pump box which are not isolated.

⚠WARNING Failure to avoid contact with electrical connections will result in shock which, if not avoided, could result in death or serious injury.

1. Open the pump box by disengaging the rubber hold down straps from each end of the pump box and rotating the cover down ***(Figure 40)***.

IMPORTANT: While deploying the pump box cover, ALWAYS ensure fingers and hands are clear of moving parts.

⚠CAUTION Failure to keep clear of moving parts could create a crush and/or pinch hazard which, if not avoided, could result in minor to moderate injury.

2. Locate the auxiliary six (6) pole connection on the pump wiring harness and remove the connection plug ***(Figure 41)***.
3. Locate the back-up control station in the pump box and insert the back-up control station six (6) pin connector into the pump wiring harness six (6) pin auxiliary connection ***(Figure 42)***.
4. With the back-up control station, walk back to the location of the main control station.

⚠WARNING Failure to keep clear of the moving liftgate could create a crush and/or pinch hazard which, if not avoided, could result in death or serious injury.

5. With the liftgate platform in view, the liftgate can be operated as required.

⚠WARNING Failure to keep off the platform while operating the liftgate with the back-up control station could create a crush and/or fall hazard which if not avoided, could result in death or serious injury.

Figure 40

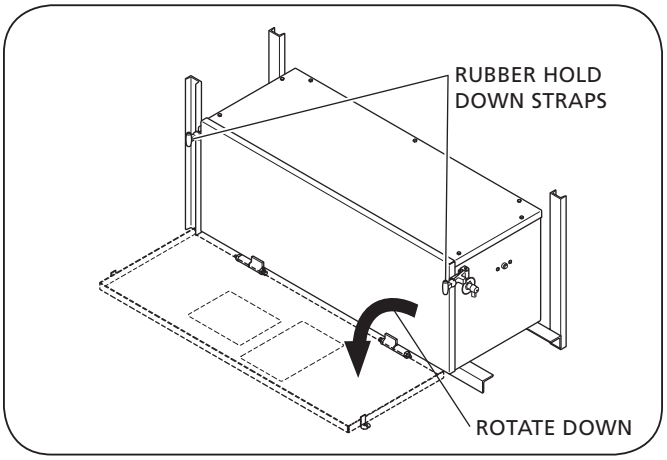


Figure 41

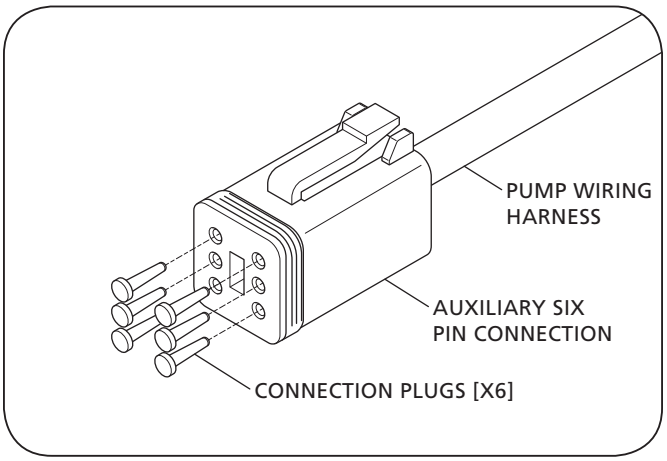
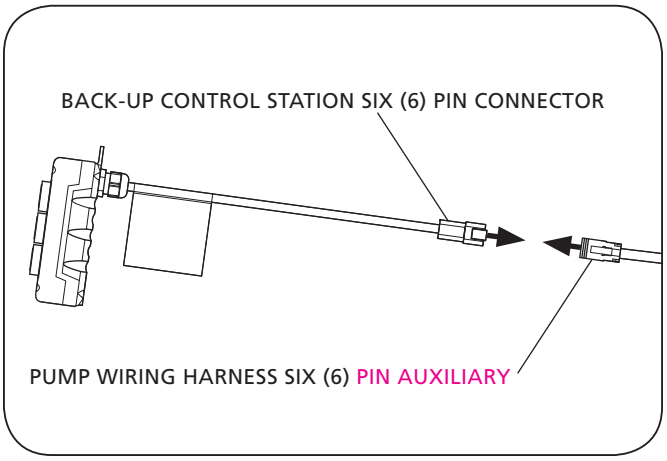


Figure 42



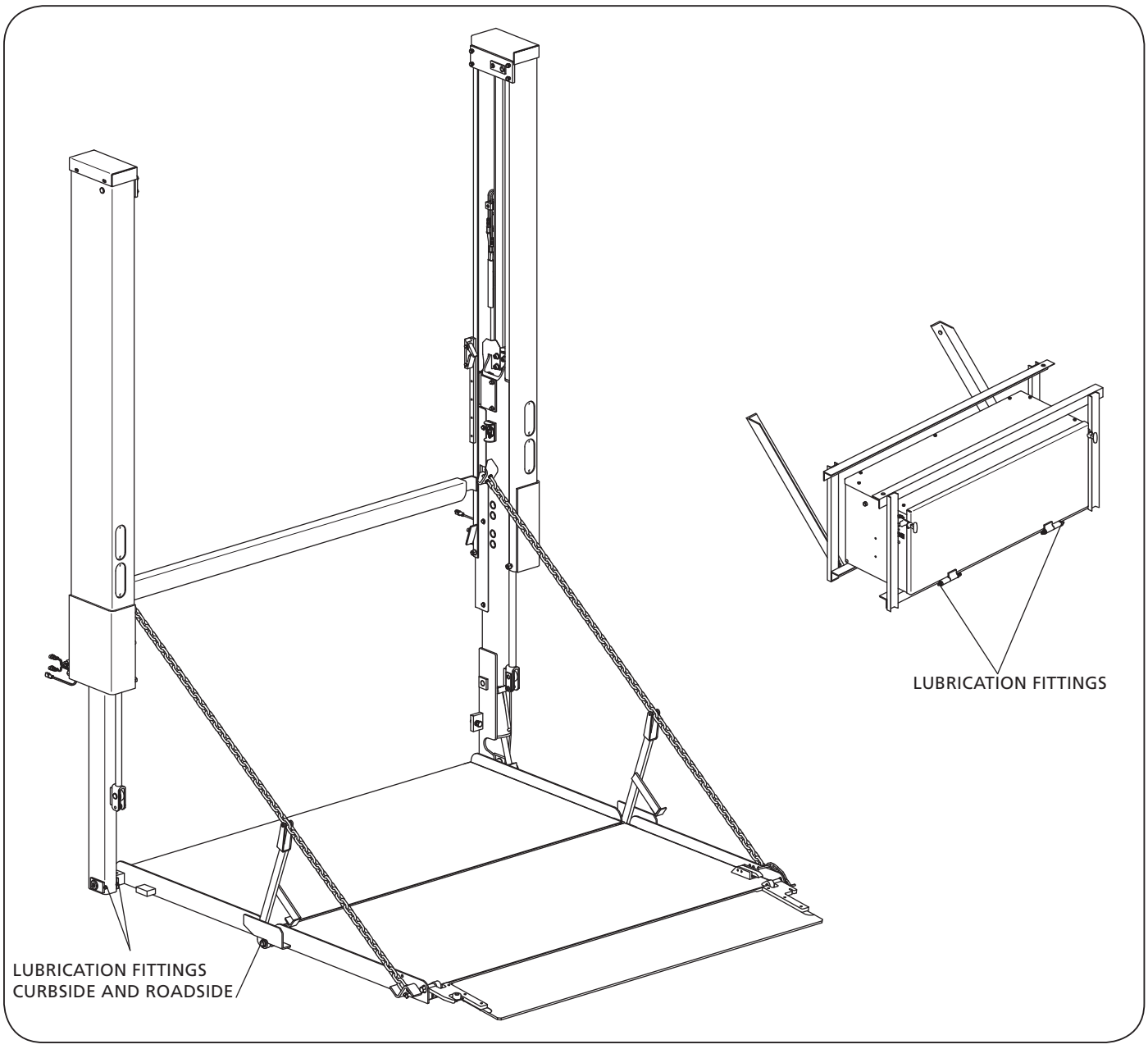
6. Once the back up control station is no longer required, disconnect the back-up control station six (6) pin connector from the pump wiring harness six (6) pin auxiliary connector and store it to its original storage location.
7. Close the pump box and re-engage the rubber hold down straps at both ends of the pump box.
8. Remove the liftgate from service until the main control station is repaired.

16. Liftgate Lubrication

All pivot points should be lubricated using EP2 chassis grease. In severe winter conditions, it may be necessary to lubricate more frequently ***(Figure 43)***.

NOTE: Some models are equipped with greaseless bushings at all or most pivot points.

Figure 43



17. Filling the Hydraulic Reservoir

IMPORTANT: Keep dirt, water and other contaminants from entering the hydraulic system; clean the area to prevent contamination of the hydraulic fluid.

1. Set the vehicle parking brake.
2. Using the control station, place the platform in the up and open position ***(Figure 44)***.
3. Remove the filler cap ***(Figure 45)*** and add recommended hydraulic fluid to pump reservoir. Check that the hydraulic fluid is at the proper fill level.

IMPORTANT: ALWAYS use the correct grade of hydraulic fluid. Refer to the chart below for recommended hydraulic fluid or contact a SAF-HOLLAND® representative.

TEMPERATURE RANGE	RECOMMENDED FLUIDS	
	MANUFACTURER	TYPE
Above 0° C (32° F)	Any	AW-32 ISO 32
-25 to 65° C (-15 to 150° F)	Any Esso, Exxon Mobil, Shell	HYDRAUL 50 DTE 11 DONAX TD Low Viscosity
-35 to 50 ° C (-30 to 120° F)	Exxon, Esso Shell, Petro--Can	UNIVIS N15 TELLUS T15 MV ARCTIC 15
-45 to 40° C (-50 to 100° F)	Any Esso, Exxon, Shell	MIL-H-5606 UNIVIS J-13 UNIVIS HV1 13 FLUID #4

Figure 44

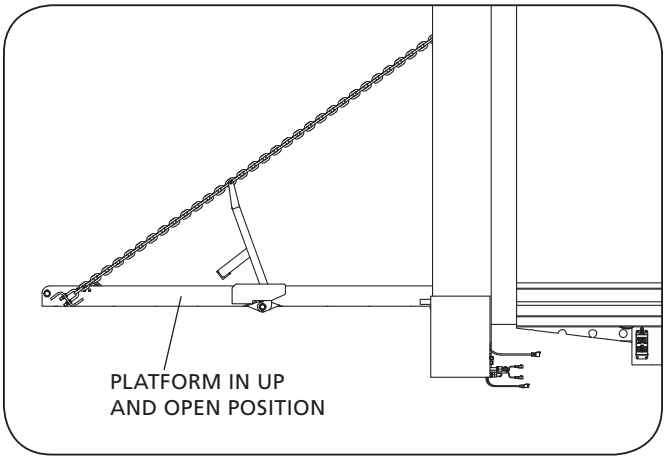
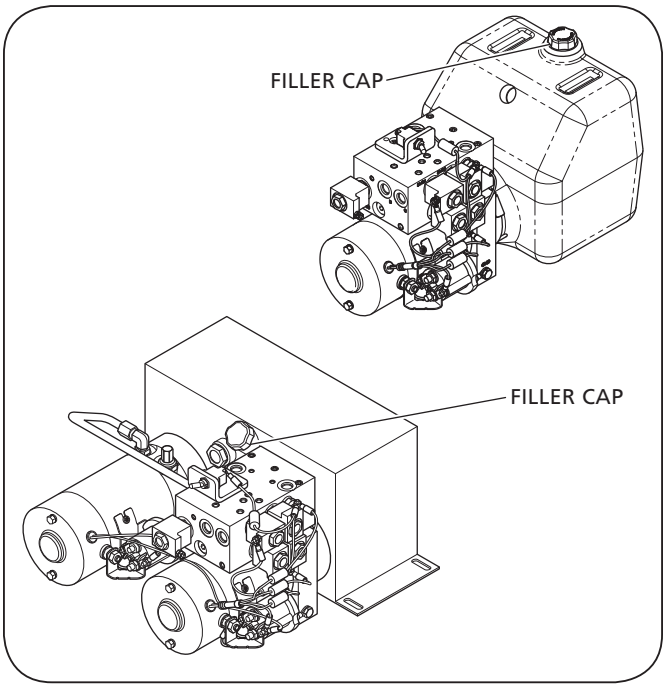


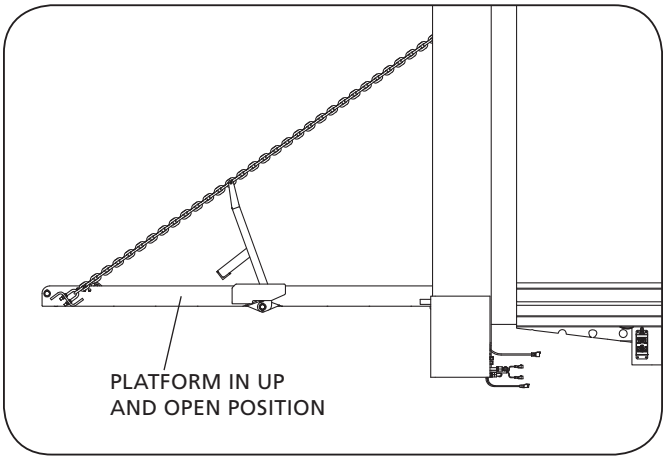
Figure 45



18. Purging the Hydraulic System

1. Set the vehicle parking brake.
2. Check for leaks and thoroughly clean up any spilled hydraulic fluid.
3. Using the control station, put the platform in the up and open position ***(Figure 46)***.
4. Lower the platform to the ground and raise it up fully. Once it reaches deck height, hold the "UP" button for an additional 15-20 seconds, then release.
5. Put toggle switch in "UP" position and hold for an additional 15-20 seconds.
6. Lower the platform to the ground and raise it up fully. Once it reaches deck height hold the "UP" button for an additional 15-20 seconds.
7. Check the hydraulic fluid level with the platform in the up and open position; add fluid if necessary.
8. Continue to operate the liftgate in accordance with the procedures in this manual.

Figure 46



19. Routine Service and Inspection

19.1 Daily Inspection

1. Before use, inspect the liftgate for damage to mounting assemblies, mechanical parts, and hydraulic components and hoses. Any noticeable defects MUST be repaired prior to operation to avoid damage and possible injury.
2. Inspect and replace any decals that have been removed or have become illegible.

19.2 Monthly Inspection

1. Perform the following procedures to ensure the control station operates correctly:
   - With the master disconnect switch in the "OFF" position, the liftgate should be disabled.
   - With the master disconnect switch in the "ON" position, and the bottom toggle switch in the default position "UP/DOWN," push the top toggle switch to "UP;" this should raise the folded platform.
   - With the master disconnect switch in the "ON" position, and the bottom toggle switch in the default position "UP/DOWN," push the top toggle switch to "DOWN;" this should lower the folded platform.
   - With the master disconnect switch in the "ON" position, the bottom toggle switch to "CLOSE/OPEN," push the top toggle switch down to "OPEN;" this should unfold the platform.
   - With the master disconnect switch in the "ON" position, the bottom toggle switch to "CLOSE/OPEN," push the top toggle switch up to "CLOSE;" this should fold the platform.
2. Check to ensure the liftgate operates freely and smoothly throughout the entire operating cycle without any unusual noise or vibration.
3. Check to ensure the platform is level when raised or lowered.
4. Check to ensure there is no damage to either stanchion or travel lock lug.
5. Check to ensure there are no damaged sections, twists, or missing links to either chain.
6. Check to ensure the platform chains have an equal amount of tension when the platform is completely unfolded and off the ground.
7. Ensure the U-bolts that anchor the chains to the platform are not loose in their respective Z-bracket. If the U-bolts are loose, ensure the U-bolt hole sizes on the Z-bracket have not increased due to wear.
8. Perform an overall inspection on liftgate for damage such as bent or distorted members, or cracked welds, which could have resulted from overloading and/or abuse.
9. Check to ensure all nuts, bolts, pins and hinges are in place and properly secured, and none are missing or damaged.
10. Check all covers and guards to ensure they are properly placed and secure.
11. With the liftgate fully opened and at ground level, ensure the retention ramp operates properly.
12. Check that the platform engages properly with the travel lock lugs in the travel position.
13. Ensure hydraulic connections at pump box and liftgate columns are securely mounted and free of twists or kinks.
14. Check for oil leaks from lift cylinders, hydraulic hoses, hydraulic fittings and hydraulic components. Tighten any loose connections and fittings.
15. Check that the oil level in the hydraulic reservoir, located in the pump box assembly, is at the proper level. Refer to the Section 17, Filling Hydraulic Reservoir, for proper filling procedure.
16. Check all electrical wiring and battery cable connections are to ensure they are tight and free of corrosion.
17. Check electrolyte level of the batteries.
18. Inspect all decals, ensure they are legible and not damaged. Replace any damaged or missing decals. Refer to Section 4, Decal Requirements.
19. Perform lubrication procedure, referenced in Section 16.

19.3 Quarterly Inspection (90 days):

1. Check to ensure master disconnect switch on pump-box is functional (in "OFF" position, liftgate is disabled).
2. Check liftgate operation:
   - Open platform
   - Lower platform (less than 30 seconds)
   - Lift platform (less than 30 seconds)
   - Close platform
3. Check that chain stanchions engage – travel lock position.
4. Check that chain stanchions engage – dock loading lock position.
5. Verify that platform is level (u-bolts) – adjust if necessary.
6. Verify that platform is flat (bi-fold bolts) – adjust if necessary.
7. On dual motor power-packs, check that both motors are operating when raising and lowering platform.
8. Check hydraulic fluid level (platform open and in raised position).
9. Check hydraulic fluid for contamination (clear and not gritty).
10. Check that batteries are secure.

11. Perform load test and voltage test to each individual battery.
12. For bolt-on option, verify mounting bolts are in good condition and nuts are torqued to 100-120 ft-lbs., (136-163 N•m) 12 places.
13. Perform a voltage test of liftgate charging system (test in pump-box).
14. Apply dielectric grease to all electrical connections in pump-box.
15. Check that all ground cables are tight and secure.
16. Visually inspect for damage, broken or missing parts and cracked welds on the ramp, platform, columns, pump-box, and conduit channel.
17. Verify that all hydraulic fittings are tight, with no hydraulic fluid leaks.
18. Check for missing, loose or worn fasteners, bolts, nuts, and roll-pins ensuring that all guards are in place.
19. Apply grease to platform pivot pins and grease fittings at bottom of lower runners.
20. Spray light lubricant on chain stanchion pivot pin and on ramp pivot pins.
21. Inspect all electrical cables and hydraulic hoses to ensure they are secure and not chaffing.

19.4 Semi-Annual Inspection:

1. Perform all procedures indicated in Quarterly Inspection, Section 19.2.
2. Check for any excessive wear in the following areas:
   - Roller and pin assemblies
   - Platform hinge pins and hinge plates
   - Platform inner and outer hubs (both sides)
   - Platform chain and stanchion
   - All pivot points
   - All cylinder pins, nuts and bolts
3. Perform the following procedure if hydraulic oil in reservoir is dirty:
   - Drain oil from hydraulic system and flush entire system
   - Remove and clean hydraulic system and flush entire system
   - Replace oil. Refer to Section 17, Filling Hydraulic Reservoir for procedures and oil requirements.

19.5 Annual Inspection (Once per Year):

1 Perform all inspections listed in Semi-Annual Inspection, Section 19.3.

2. Pressure wash or steam-clean liftgate columns and liftgate platform.
3. Inspect the following areas for wear:
   - Platform hinge pins and column bushings
   - Column cylinder pins
   - Open/Close cam arm (platform closed and lowered)

19.6 Five-Year Inspection:

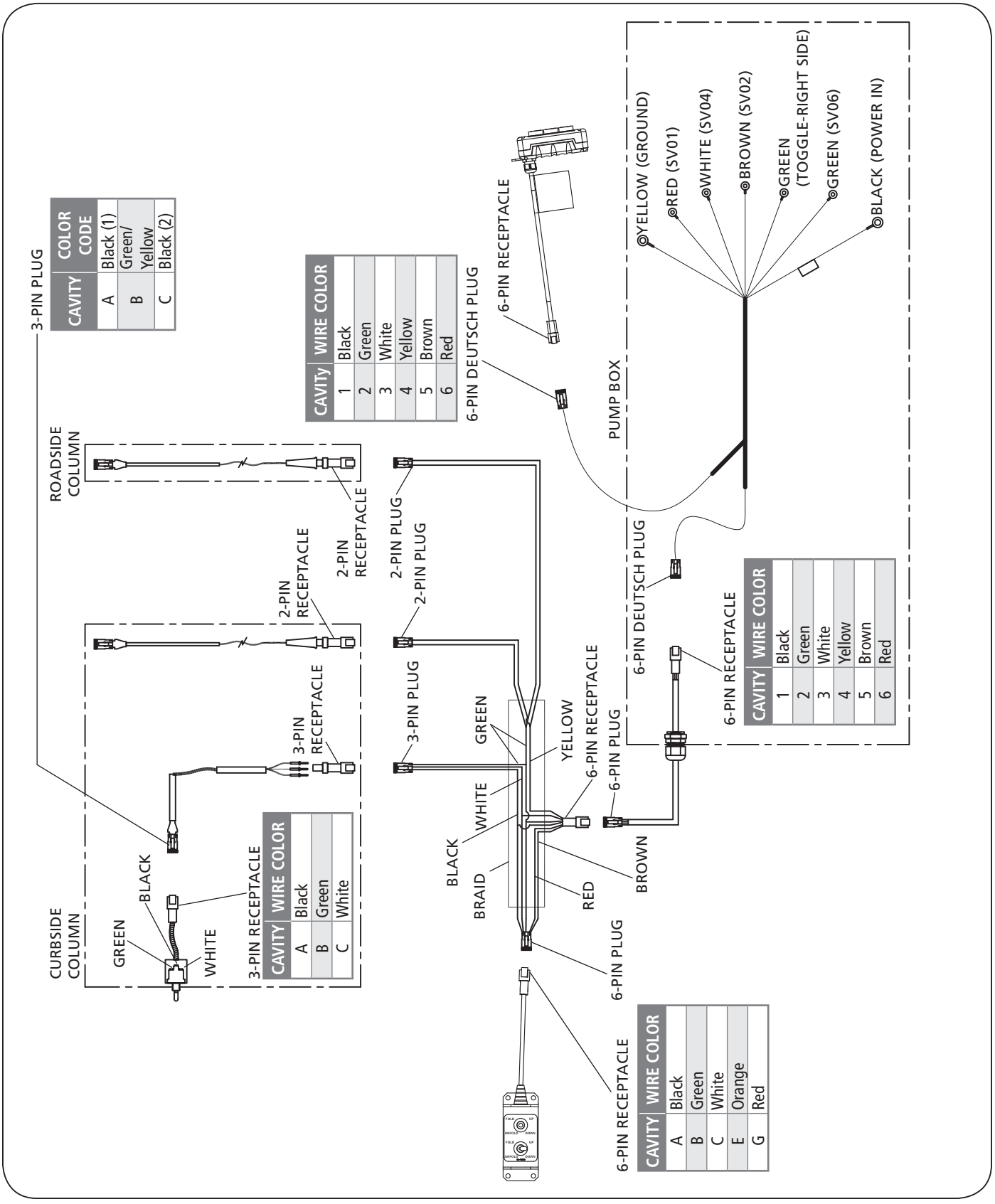
1. Flush and replace the hydraulic fluid.
2. Remove and check the pump-motor brushes for wear, replace if brushes are less than 1/8" (3 mm) long.
3. Clean all residue from inside motor housing.
4. Apply several drops of lightweight machine oil to the armature shaft bearing in the motor end and reassemble the motor end cover.

20. Troubleshooting

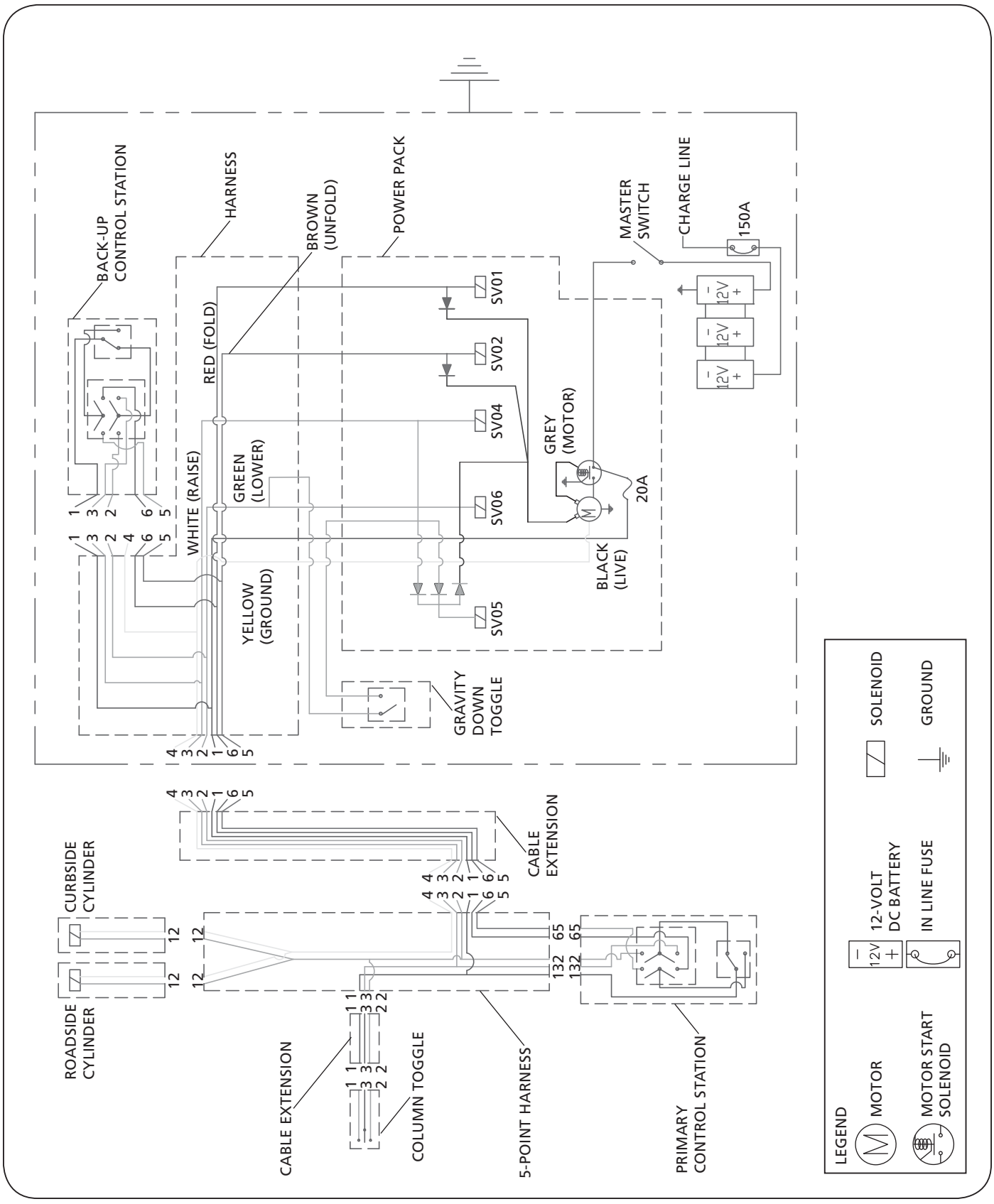
PROBLEM	POSSIBLE CAUSE	RESOLUTION
Oil expels from reservoir	Too much oil in reservoir.	Check hydraulic fluid level (platform up and open)
Platform will not go up or down (motor[s] running)	Incorrect or contaminated oil	Hydraulic fluid should be clean and suitable for climate
	Insufficient oil in system	Fill with suitable hydraulic fluid (platform up and open)
	Oil leak	Tighten fittings or replace leaking hose(s)
	Air in hydraulic system	Purge hydraulic system. Cycle motors in "UP" position for 15-20 seconds—repeat
	Blocked or restricted hydraulic hose	Check that hoses are not blocked or pinched
Platform will not go up or down (solenoid clicking at motor)	Low battery voltage	Check battery voltage; change batteries if less than 11.7 volts
		Check that the pump motor is properly grounded
		Check liftgate charging system: 13.6 volts minimum
Platform will not go up or down (no sound at motor)	Main disconnect switch at pump-box "OFF"	Turn main disconnect switch at pump-box to "ON"
	Circuit-breaker tripped	Reset circuit breaker—batteries not charging
	Pump-box in-line fuse burned-out	Replace 20 amp fuse
	No power to electrical motor(s)	Check motor start solenoid (jump solenoid)
		Check battery voltage; charge batteries if less than 11.7 volts
		Check liftgate charging system: 13.6 volts minimum
		Check for signal to electric motor(s)
		Check that pump motor is properly grounded
		Check that wires and cables are intact and not corroded
	Column toggle switch inoperative	Check function using control station (up and down)
	Control station switch inoperative	Check for signal at toggle switch
		Check for signal at electrical harness (3-pin)
		Check function using column toggle (up and down)
		Check for signal at control station
		Check for signal at control station electrical harness (6-pin)
Platform lowers or raises slowly (more than 30 seconds)	Insufficient oil in system Blocked or restricted hydraulic hose	Check hydraulic fluid level (platform up and open)
		Check that hoses are not blocked or pinched
	Motor(s) turn slowly (laboring)	Check battery voltage; replace/charge liftgate batteries
	Electrical motor[s] not operating (cautiously	Check charging system: 13.6 volts minimum
		Check that wires and cables are intact and are not corroded
		Check for electric power to motor(s)
	touch both motor[s], an inoperative motor will be cool to the touch)	Check that pump motor is properly grounded
		Check that wires and cables are intact and are not corroded, and that an electrical signal is present
		Check for electrical signal at solenoid , if signal is present, but motor does not start, replace solenoid
		If no signal is detected at solenoid, blue and orange = signal
	Pump wear	Rebuild or replace pump if less than 2900 psi (up and loaded)
One side of the platform drifts down over time when not stowed in travel locks	Check valve ball not seated properly	Replace lift cylinder check valve
		Remove the lift cylinder check valve and clean soot and debris
Platform stanchion locks do not catch travel latches	Improper platform stop adjustment	Adjust platform fold stops on column runners
	Bent stanchion arms	Replace stanchion arms

PROBLEM	POSSIBLE CAUSE	RESOLUTION
Platform will not go down	No power to electrical motor(s)	Check that wires and cables are intact and are not corroded Verify wire harness black = power, green = signal
	Blocked or restricted hydraulic hose	Check that return (low pressure) hoses are not restricted
	Column cylinder solenoid(s) not releasing	Replace solenoid valve and coil if signal present Replace column solenoid valve wire if signal present at wire harness Replace wire harness if no signal is present at column wire connection
	Plugged flow control valve	Clean / replace pressure compensated flow valve
Platform lowers / raises unevenly	Air in hydraulic cylinder(s), (column or master)	Purge hydraulic system. Cycle motors in "UP" position for 15-20 seconds—repeat
	Restriction of hydraulic fluid	Disconnect hydraulic fittings at back of pump-box, individually and verify flow, if no flow is present, replace master cylinder Switch hydraulic hoses at back of pump-box, if platform lowers unevenly on opposite side, replace master cylinder If platform lowers unevenly on the same side as original, check flow at column cylinder. Verify that hose is not blocked or pinched.
	Flow control valve improperly installed	Rotate pressure compensated flow control valve (arrow to "up")
	Column cylinder solenoid not releasing	Replace solenoid valve and coil if signal present Replace column solenoid valve wire if signal present at wire harness Replace wire harness if no signal is present at column wire connection
	Internal fluid by-pass cylinder	Lower platform to ground, disconnect and plug one hydraulic fitting at back of pump-box, close and purge cylinder. Repeat with other hydraulic fitting. Switch hydraulic hoses at back of pump-box, if problem moves to opposite side, replace master cylinder If problem stays on the same side replace column cylinder
Cylinders squeal when lowering or lifting	Piston seal friction against cylinder walls	Add hydraulic fluid conditioner (i.e. CAT additive 1U9891)
Platform does not raise	Platform is overloaded	Decrease load on platform
	Pump wear	Rebuild or replace pump if less than 2750 psi (up & loaded) [For DH45B] Rebuild or replace pump if less than 3250 psi (up & loaded) [For DH55B] Rebuild or replace pump if less than 2750 psi (up & loaded) [DH55A/DH66A]
Platform will not open	Still stowed in travel position	Align arrows to open - refer to Section 8 for further information
	Insufficient oil in system	Check hydraulic fluid level (platform up and open)
	Platform pivot requires lubrication	Lubricate platform through grease fitting at bottom of inner column
	Blocked or restricted hydraulic hose	Check that hose is not restricted
	Worn/missing platform pivot pin bushings	Replace platform pivot pin bushings
	Damage/wear to chain stanchions	Re-align or replace chain stanchions
Platform will not close	Insufficient oil in system	Check hydraulic fluid level (platform up and open)
	Platform pivot requires lubrication	Lubricate platform through grease fitting at bottom of inner column
	Blocked or restricted hydraulic hose	Check that hose is not restricted
	Worn/missing platform pivot pin bushings	Replace platform pivot pin bushings
	Damage/wear to chain stanchions	Re-align or replace chain stanchions

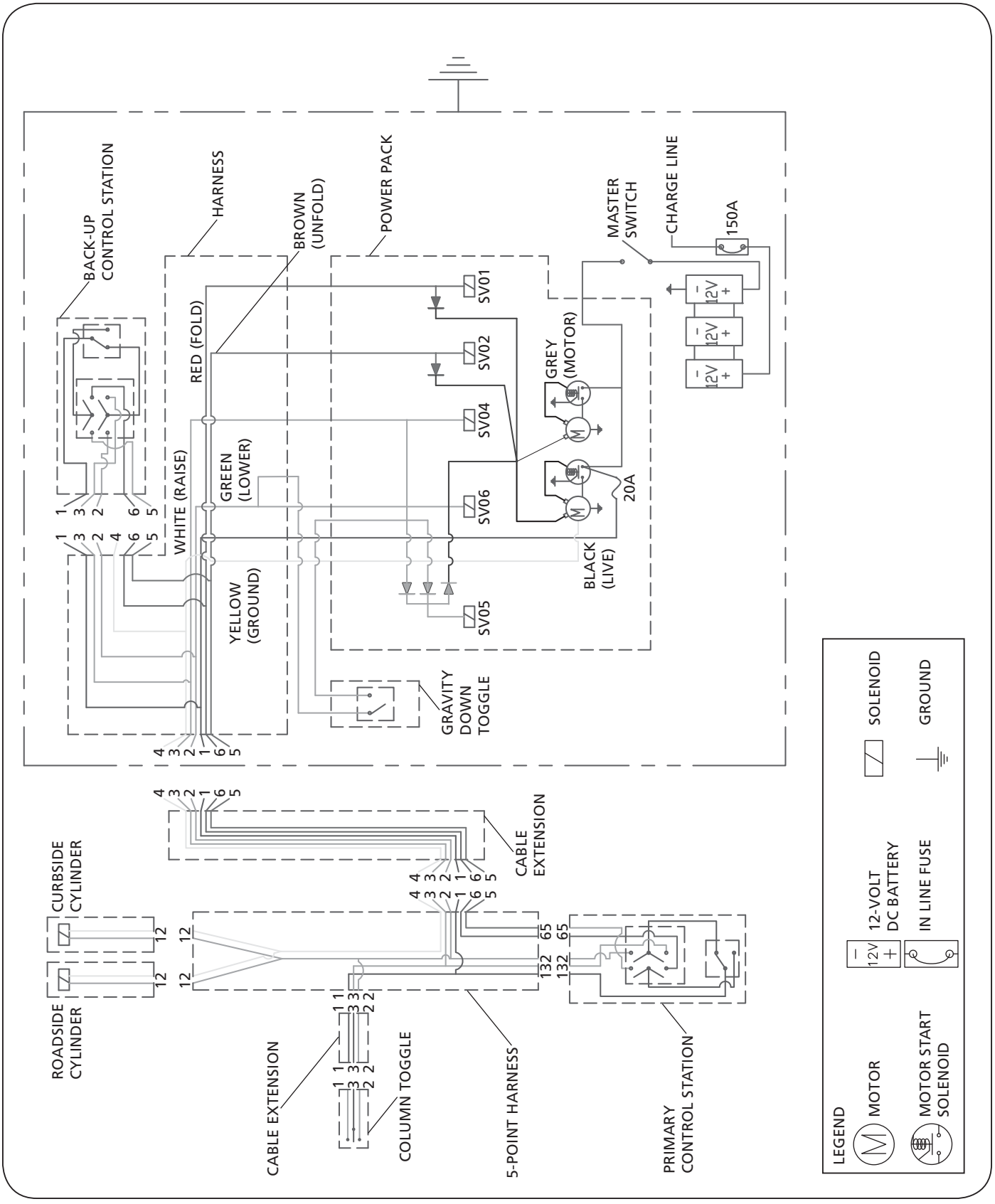
21. Interconnecting Electrical Schematic For All Capacities



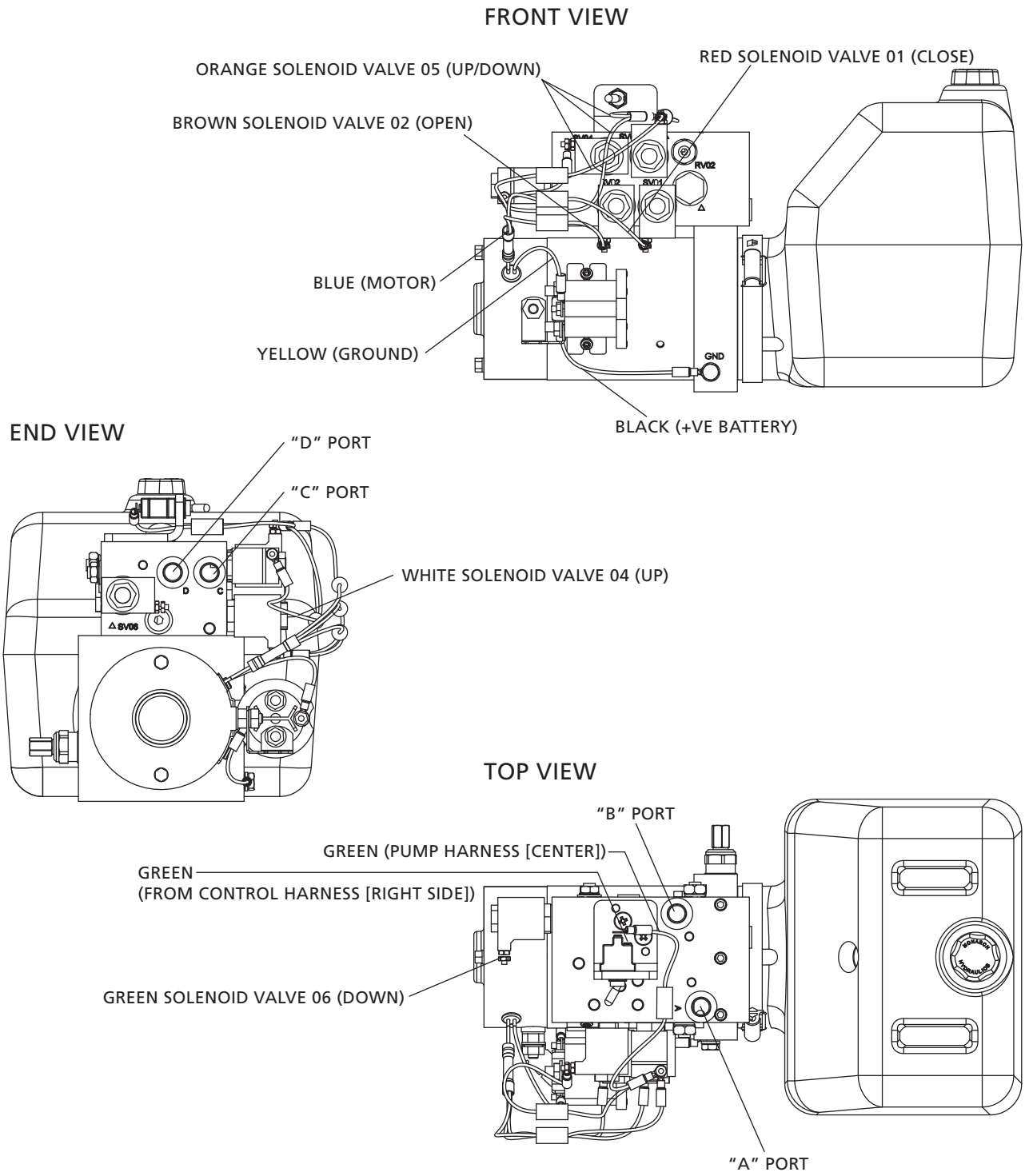
22. DH45B Electrical Schematic



23. DH55B, DH55A and DH66A Electrical Schematic

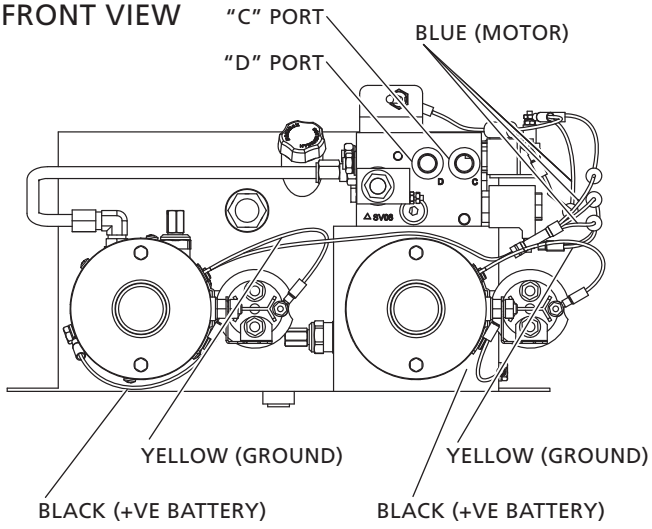


24. DH45B Hydraulic and Electrical Diagram

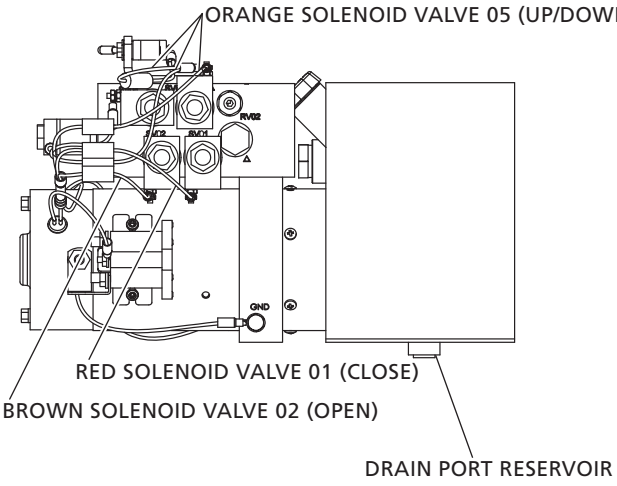


25. DH55A, DH55B and DH66A Hydraulic and Electrical Diagram

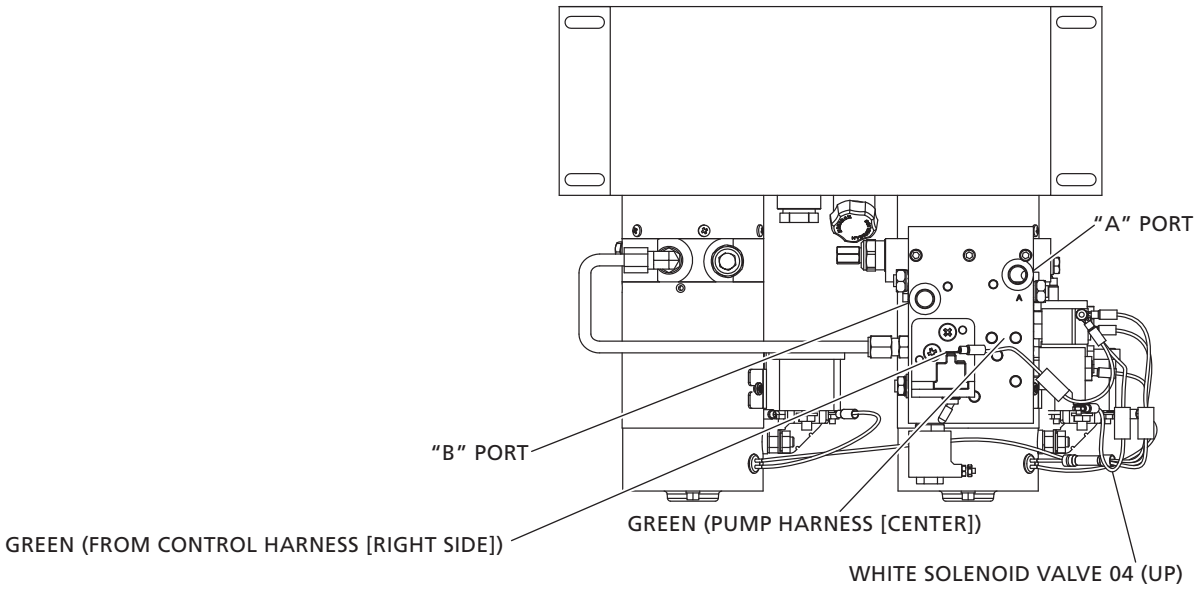
FRONT VIEW



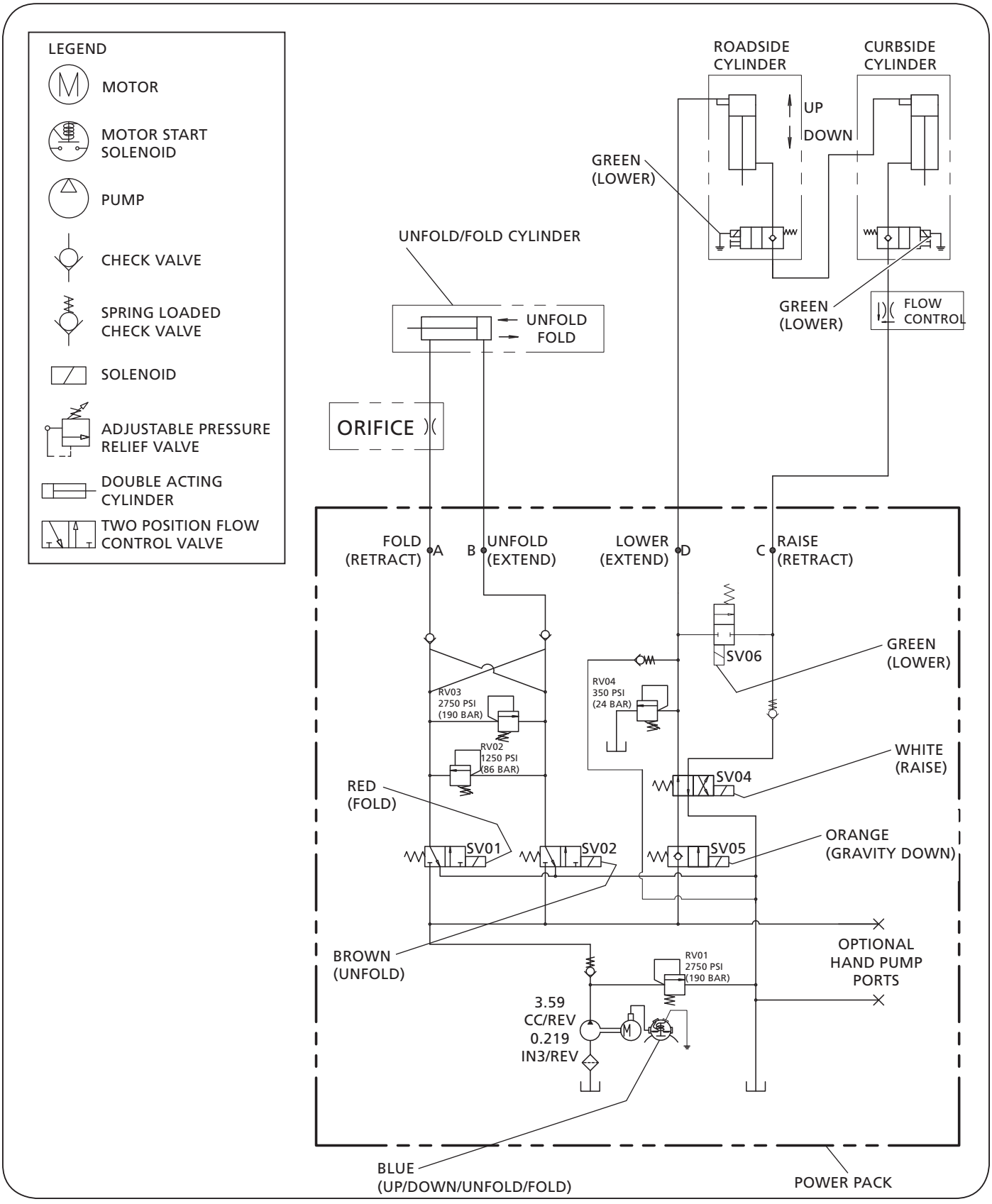
END VIEW



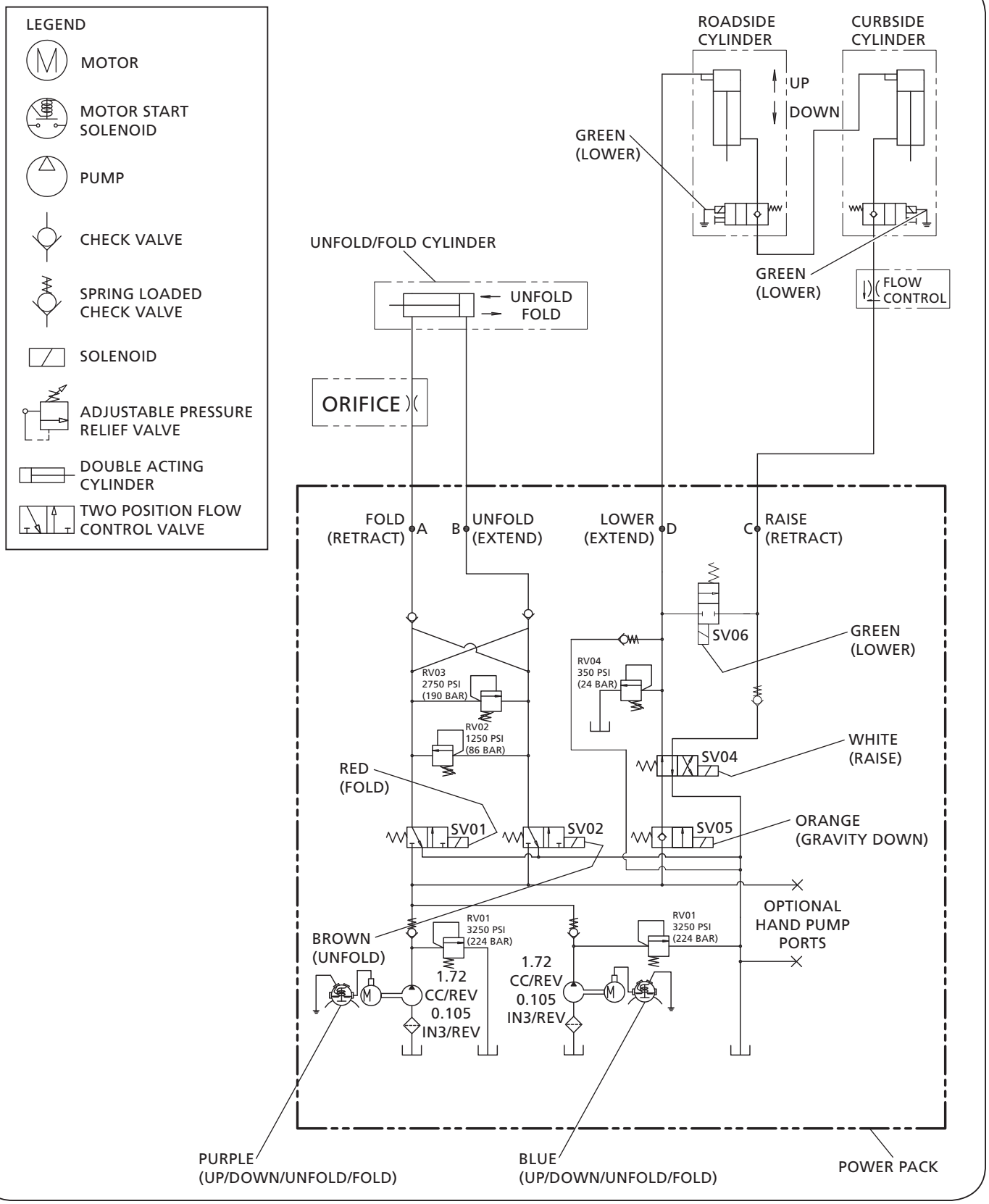
TOP VIEW



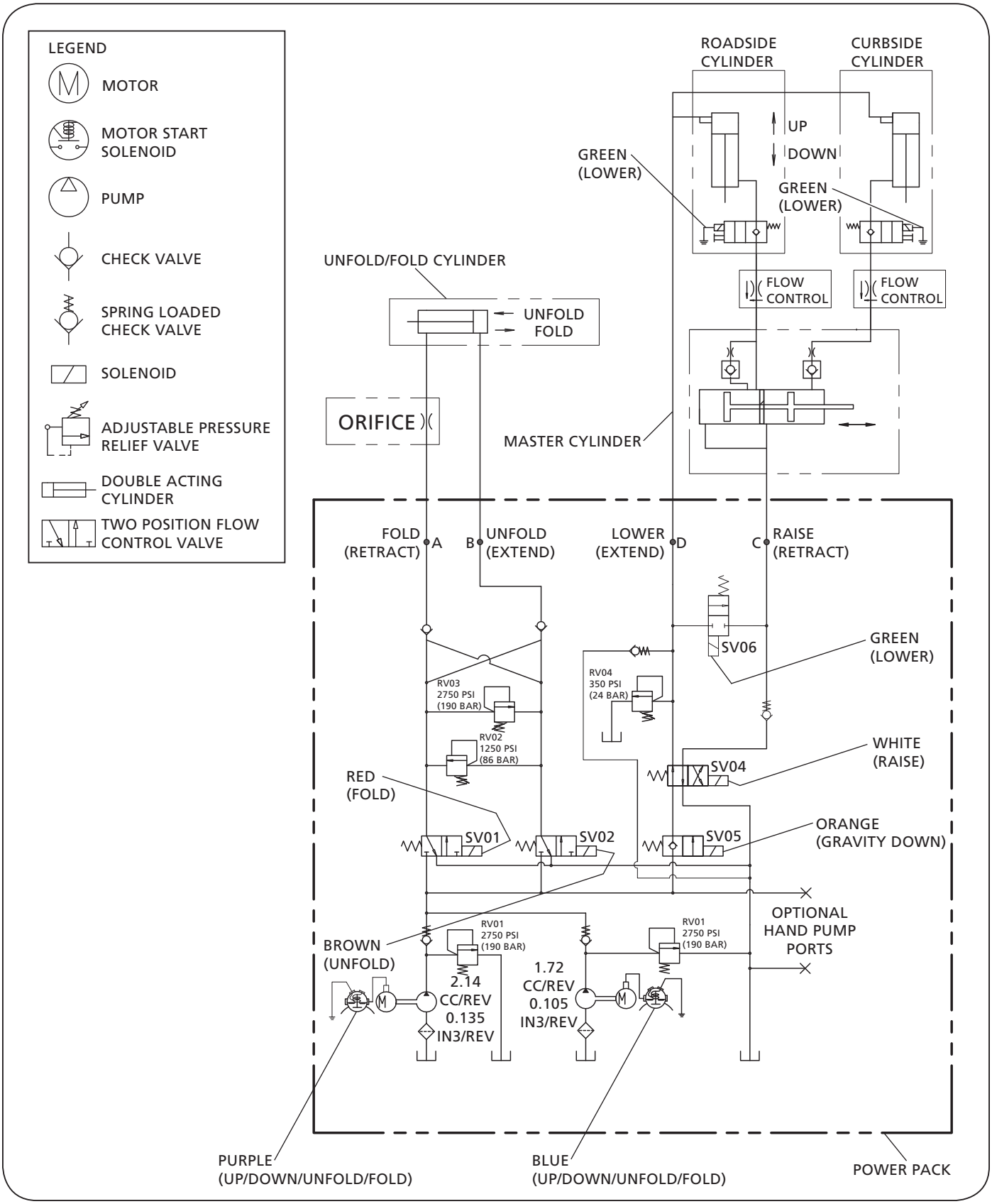
26. DH45B Hydraulic Schematic



27. DH55B Hydraulic Schematic



28. DH55A and DH66A Hydraulic Schematic



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