ANTHONY LIFTGATES, INC.®

SM

SM-1800
SM-2500
SM-3000

MAINTENANCE MANUAL

QUALITY, RELIABILITY, CUSTOMER SERVICE

MADE IN THE USA

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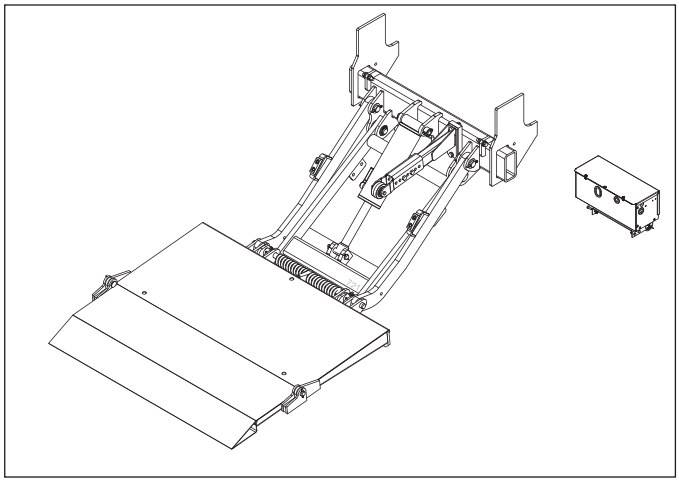
1. General Information

1.1 Introduction

Congratulations on selecting an Anthony Liftgates TuckUnder™ liftgate.

All Anthony tuckunder model liftgates are factory assembled, energized, and tested to ensure the highest quality performance standards.

To ensure your liftgate will perform to your expectations, we have provided this Maintenance Manual, which is designed to provide you with the necessary instructions and safety precautions for the maintenance of the Side Mount Tuckunder™ liftgate.



Typical Anthony Liftgates Side Mount Tuckunder Model.

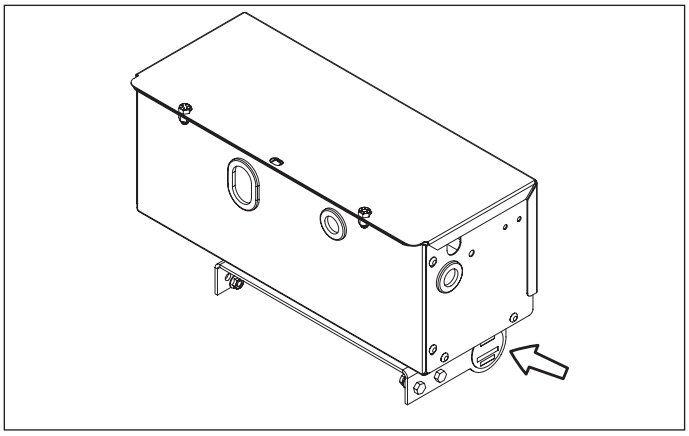
1.2 General Safety

WARNING **Read, Understand, and Follow the Manual**

The success or failure of this liftgate to properly and efficiently operate depends on proper maintenance. Failure to read, understand, and follow the instructions and safety recommendations in this manual, before performing any service or maintenance on the liftgate, can result in serious injury or death to the service technician or bystander.

Also, read and understand the operating instructions in the separate Operation Manual (also found in the information packet) before beginning any maintenance.

1.3 Serial Number Location



Before calling with questions or other product information requests, have the serial number, model number, and lift capacity of the liftgate available. This information is stamped into the identification plate on the side of the power unit.

1.4 Basic Instructions

1. This liftgate should only be maintained by someone with sufficient skills to understand the procedures provided in this manual, along with the use of any equipment or tools used to maintain the liftgate.
2. This manual provides easy-to-follow instructions, along with illustrations. Safety precautions have been clearly identified throughout each section of this manual and must be followed.
3. A complete explanation of the safety terminology and recommendations are included in section “2. Safety” on page 4 of this manual and should be read thoroughly before proceeding.
4. We urge the service technician to call our qualified personnel if you have questions.

1.5 If Help is Required

1.5.1 Maintenance (Dealer)

For additional information, refer to the Anthony Liftgates website **www.anthonyliftgates.com** to find the most current version of the reference material.

If you have any doubts or questions about maintenance, call us. Before doing so, have the serial number, model number, and lift capacity of your liftgate available.

Anthony Liftgates, Inc.
1037 West Howard Street
Pontiac, Illinois 61764
(815) 842-3383 or 800-482-0003

1.5.2 Customer Service and Parts (End User)

For service or ordering replacement parts, contact an authorized dealer by going to **www.anthonyliftgates.com** and selecting the FIND A DEALER tab. Enter your zip code to find the nearest authorized service location.

1.6 Warranty

For a detailed copy of the Warranty Statement, refer to the Operation Manual. To make an online warranty claim, go to www.anthonyliftgates.com and select CUSTOMER SERVICE and then select WARRANTY CLAIM.

NOTICE *The liftgate must be maintained according to these instructions or the warranty will be void.*

1. Unauthorized modifications may cause improper operation or other unforeseen problems or dangers. If any deviation is deemed necessary, written permission must be obtained from Anthony Liftgates.
2. All decals must be attached and legible, or all warranties are void.

1.7 Replacement Parts and Hazard Decals

To order replacement parts or hazard/informational decals, contact us through your normal dealer channels.

SAFETY INSTRUCTIONS **Being unaware of safety recommendations can lead to personal injury. The service technician must make sure all decals are attached to any replacement parts and the truck and are clearly legible.**

2. Safety

2.1 Safety is Your Responsibility

It is the responsibility of the maintenance personnel to understand proper operating procedures. Be aware of the inherent dangers in the use of this product and the tools used to maintain it. Read and understand all Warnings, Cautions, Notices, Safety Instructions, and Notes in this manual, on the liftgate, or on the truck.

Accidents can often be avoided by being alert and recognizing potentially hazardous situations. The safety information in this manual serves as a basic guide in an attempt to prevent injury or death.

Anthony Liftgates cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the product itself are, therefore, not all-inclusive. If tools, procedures, work methods, or operating techniques are used that are not specifically mentioned by Anthony Liftgates, you must satisfy yourself that they are safe for you and for others.

DO NOT proceed with any maintenance procedure if doubt arises about the correct or safe method of performing any procedure found in this manual. If you have any doubts or questions, call your authorized dealer.

2.2 Safety Signal Words

Personal injury hazards are identified by the "Safety Alert Symbol" and followed by a signal word such as WARNING or CAUTION to indicate the severity of the hazard.

This safety alert icon surrounds an image showing a specific type of injury which should be avoided. These icons are shown in "2.3.3 Hazard Avoidance" on page 5.

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

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

NOTICE — *Indicates that equipment or property damage can result if instructions are not followed.*

SAFETY INSTRUCTIONS — **Indicates specific safety-related instructions or procedures.**

Note: *Contains additional information important to a procedure.*

2.3 Safety Icons Nomenclature

This manual and the equipment have numerous safety icons. These safety icons provide important operating instructions, which alert you to potential personal injury hazards.

2.3.1 Personal Protection/ Important Information


Read the manual


Eye protection


Face shield / welding helmet


Breathing protection


Head protection


Protective shoes


Hand protection


Use two people when lifting heavy objects


Use proper tools

Weight rating

Set parking brake


Remove key


Lockout / prevent use


Properly installed parts

OEM parts


Damaged safety sign

2.3.2 Prohibited Actions


Do not alter or modify


Do not weld


No smoking


No open flame


No alcohol


No drugs

2.3.3 Hazard Avoidance

 Safety alert symbol

 Slipping injury

 Tripping injury

 Pinch point hazard

 Pinch hazard (foot)

 Dangerous fumes

 Adequate ventilation

 Crush hazard

 Crush hazard

 Crush hazard (chock wheels)

 Chock wheels /rollover hazard

 Fall hazard (truck)

 Fall hazard (platform)

 Damaged parts hazard

 Fire hazard

 Sparks / fire hazard

 Battery gas hazard

2.4 Safety Rules

2.4.1 Personal Protection

WARNING 

Do not work under the liftgate while it is in a raised position. Unintentional lowering of the liftgate can cause serious crushing injuries.

CAUTION 

When servicing this unit, wear appropriate personal protective equipment. This list may include, but is not limited to:

- **A hard hat.**
- **Protective shoes with slip resistant soles.**
- **Protective goggles, glasses, or face shield.**
- **Protective clothing.**

CAUTION 

Anthony Liftgates recommends not riding the liftgate; however, if the operation requires it, make sure your footing is stable before raising or lowering the platform. Always stand away from the edge. When on the ground, always stand clear of the liftgate when it is operating.

Do not attempt to maintain the liftgate under the influence of drugs or alcohol. Consult your doctor before using the liftgate while taking prescription medications.

To prevent personal injury, clean up any spilled fluids immediately. To avoid tripping, do not leave tools or components laying around in the work area.

Failure to prevent the truck from moving during the maintenance of the liftgate could result in a serious crushing injury.

Always use/set the truck's parking brake and remove the ignition key before servicing the liftgate. Failure to follow this recommendation can result in injury.

Do not place hands or feet in pinch points.

Do not place your feet under the liftgate or between the platform and floor extension.

To prevent injury, the liftgate and its related components should only be maintained by a qualified installer having knowledge and skill in using a lifting device, a cutting torch, and welding equipment.

To prevent possible injuries due to improper operation, make sure all decals are attached to the liftgate and/or truck and are legible at all times.

2.4.2 Equipment / Tools / Parts

CAUTION 

Do not operate this unit if it is damaged. If you believe the unit has a defect, which could cause it to work improperly, you should immediately stop and remedy the problem before continuing.

Make sure the liftgate or truck will not be damaged or made unsafe by the maintenance or use of the liftgate.

Never secure the power cable to anything which allows it to contact sharp edges, other wiring, fuel tank, fuel lines, brake lines, air lines, exhaust system, or any other object that could cause the power cable to wear or be damaged. A cut battery cable can cause sparks and/or component damage resulting in loss of vehicle control, serious injury, or even death.

CAUTION 

If replacement parts are necessary, genuine factory OEM replacement parts must be used to restore the liftgate to the original specifications. Anthony Liftgates will not accept responsibility for damages as a result of using unapproved parts. If non-OEM replacement parts are used, the warranty will be voided.

2.4.3 Battery / Fuel Tank Safety

WARNING  **To prevent serious bodily injury, keep sparks, lighted matches, and open flames away from the top of the battery because battery gas can explode. Always follow all the manufacturers' safety recommendations when working around the truck's battery.**

 **Take precautions to avoid sparks coming into contact with the truck's fuel tank, brake lines, or other flammable components. Sparks can cause an explosion of combustible materials, resulting in serious injury or death.**

2.4.4 Cutting Torch / Welding Safety

WARNING  **Take precautions to avoid sparks from contacting the truck's fuel tank, brake lines, or other flammable components. Sparks can ignite combustible materials, resulting in serious injury or death.**

 **Always weld or use a cutting torch in a well-ventilated area and, if in an enclosed area, vent the fumes to the outside. Breathing welding smoke and paint fumes can cause serious injury.**

 **Always follow all State and Federal health and safety laws and/or local regulations when using an arc welder, mig welder, or cutting torch. Also, follow all manufacturers' safety guidelines. If other people are present during the maintenance of the liftgate, make sure the assembly area is shielded from their view.**

 **To avoid eye injury during welding, always wear a welding helmet with the proper lens to protect your eyes.**

 **To avoid eye injury while using a cutting torch, always use eye protection with the proper lens to protect your eyes.**

SAFETY INSTRUCTIONS  **Do not modify safety devices. Do not weld on the liftgate assembly, except the adapter frame tube. Unauthorized modifications may impair its function and safety.**

 **Make sure all parts are in good working condition and properly installed. Replace any damaged parts immediately.**

2.5 Welding or Grinding Galvanized or Stainless Steel Material

2.5.1 Galvanized Metal

CAUTION 

Follow all OSHA and other workplace safety standards when welding galvanized steel, which creates zinc oxide fumes. Always grind the coating off in the area to be welded and provide adequate ventilation to avoid breathing the fumes.

Always wear proper breathing protection when grinding or welding. Use ventilation or vacuum systems to remove any contaminated air from the work area.

Metal Fume Fever:

When zinc vapor mixes with the oxygen in the air, it reacts instantly to become zinc oxide, which is non-toxic and non-carcinogenic.

Zinc oxide that is inhaled is absorbed and eliminated by the body without complications or chronic effects.

Exposure to zinc oxide fumes causes a flu-like illness called metal fume fever.

Symptoms include headache, fever, chills, muscle aches, nausea, vomiting, weakness, and tiredness.

There are no long-term health effects. Metal fume fever typically begins about four hours after exposure, and full recovery occurs within 48 hours.

2.5.2 Stainless Steel

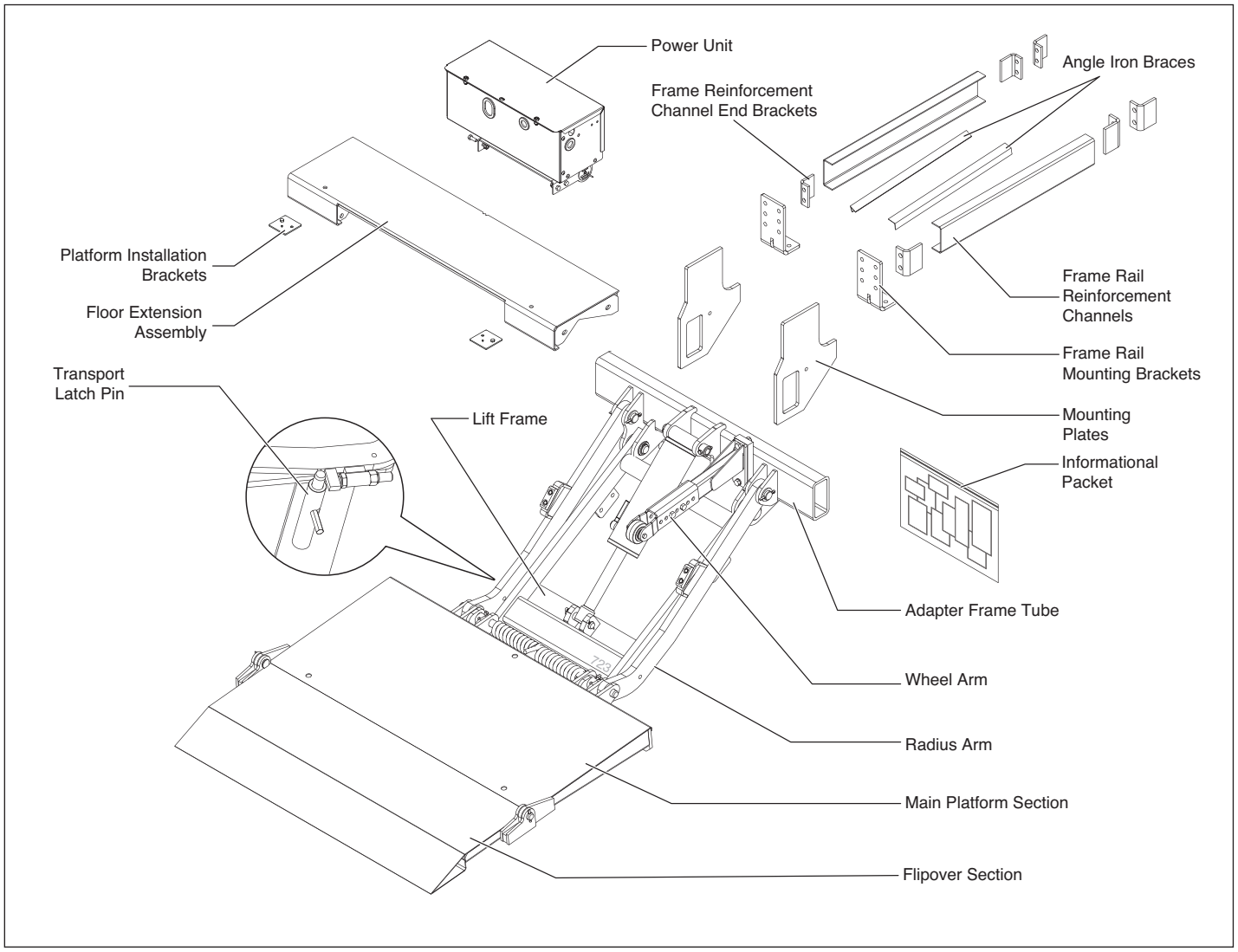
Follow all OSHA and other workplace safety standards when welding stainless steel, which creates hexavalent chromium fumes that can irritate the nose, throat, and lungs.

Repeated or prolonged exposure can damage the mucous membranes of the nasal passages and result in ulcers. In severe cases, exposure causes perforation of the septum (the wall separating the nasal passages).

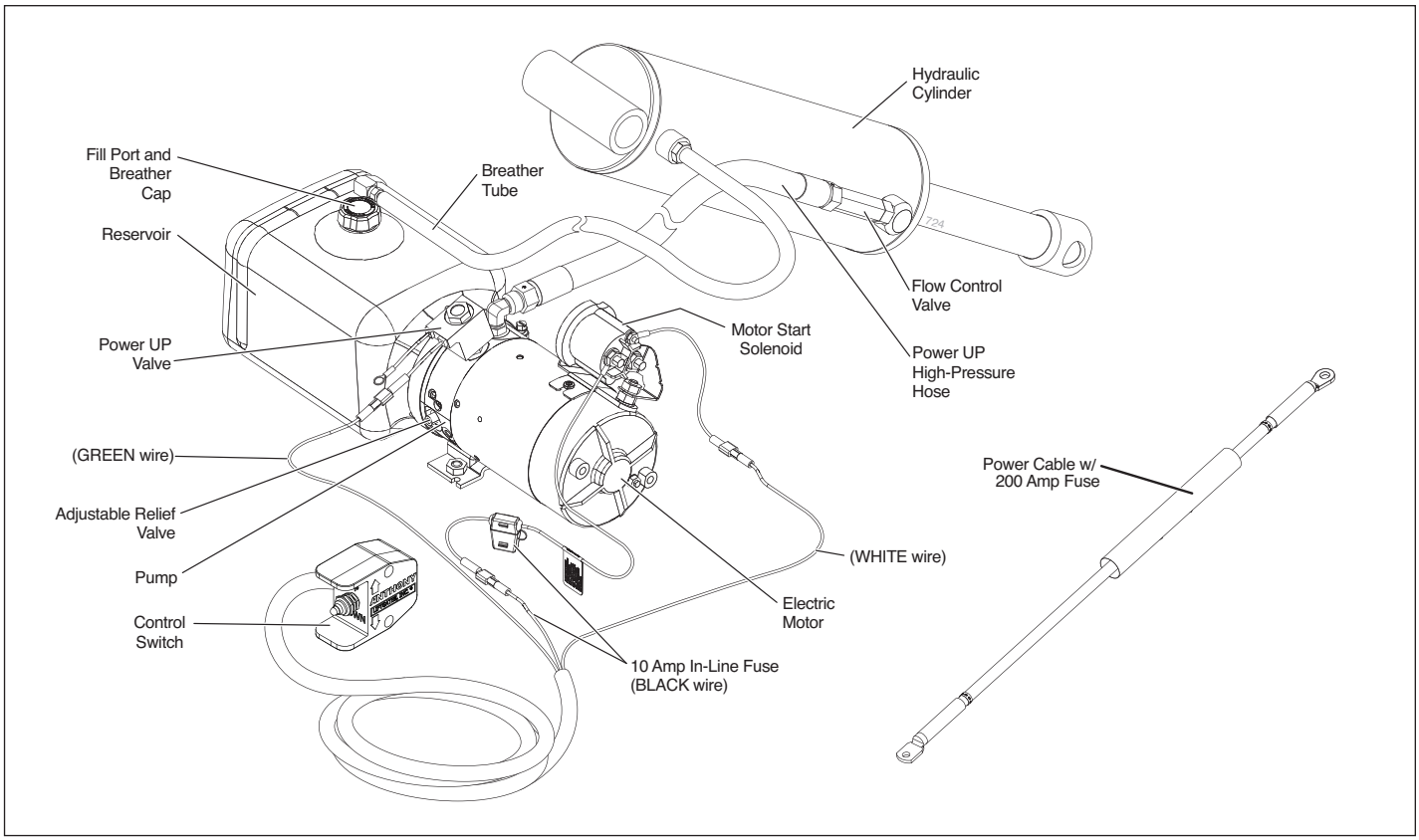
Always wear proper breathing protection when grinding or welding. Use ventilation or vacuum systems to remove any contaminated air from the work area.

3. Nomenclature

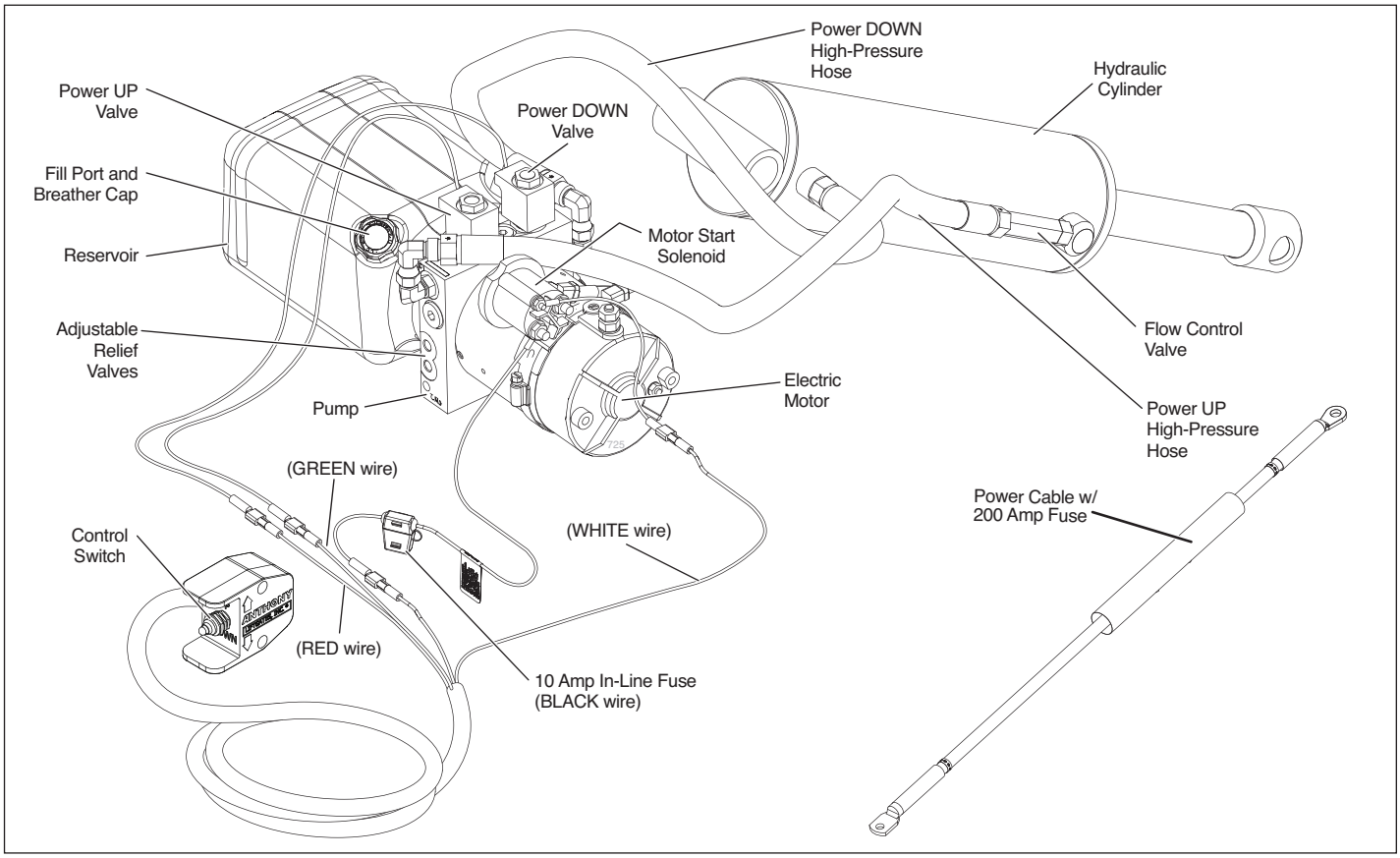
3.1 Liftgate Nomenclature



3.2 Gravity Down Power Unit Nomenclature



3.3 Power Down Power Unit Nomenclature



4. Maintenance

4.1 Monthly Inspection

All Anthony Tuckunder Liftgates are “Service-Free” which means they have lubrication-free bushings at the major pivot points.

Mechanical Components

1. Make sure the liftgate operates freely and smoothly throughout its entire range of movement.
2. Check for damage to the liftgate, such as bent or distorted parts. Check for excessively worn parts.
3. Check for cracked welds which may have resulted from overload or abuse.
4. Check all pins and pivot points. Secure all pins with proper retainers. Replace worn bushings and pins.
5. Oil the roller of the wheel arm and make sure it spins freely.
6. Make sure the platform is angled upward from truck bed 1/2 to 3/4 inch when raised to bed height. See Platform Adjustment for shimming procedure, “4.5 Platform Adjustment” on page 10.

Power Unit

7. Check for oil leaks in the following areas:
   a. Hydraulic lift cylinder.
   b. Hydraulic hoses. Replace any hose that shows signs of leakage or excessive abrasion of the covering.
   c. Check all hydraulic fittings for damage or leakage. Tighten fittings to stop leaks or replace if damaged.
8. Check reservoir oil level. Refer to section “4.3 Check Power Module Fluid Level” on page 9. Fill as required with Hyken Glacial Blu.

NOTICE *To prevent damage to the pump, use only the recommended Hyken Glacial Blu anti-wear, low-viscosity, hydraulic fluid in the power unit reservoir.*

In an emergency, use any anti-wear hydraulic fluid, but flush the system and replace it with our recommended fluid soon as reasonably possible. Do not mix hydraulic oil and automatic transmission fluid due to possible compatibility problems.

Use the appropriate viscosity of fluid based on the surrounding climate conditions. Viscosity is important because the pump will not cause a temperature increase to the oil in the reservoir, like a typical closed-loop hydraulic system.

DO NOT use brake fluid in place of our recommended fluids.

Electrical Components

9. Make sure all electrical wires, switches, and connections are in good working condition and operate properly.
10. Proper wire connection is crucial to the life and dependability of the liftgate’s electrical components. A poor connection can result in low Voltage, causing the liftgate to work incorrectly.
11. Check the fluid level of the vehicle battery.

Safety Signs and Informational Decals

12. Examine all warning, capacity, and operational decals. If they are not readable, replace them. Decals may be obtained free of charge your authorized dealer.

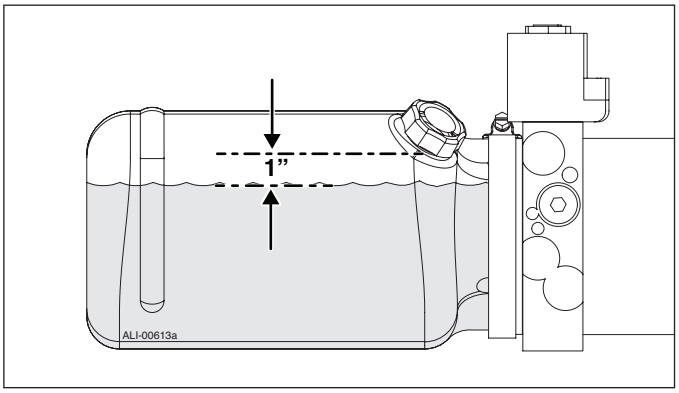
4.2 Semi-Annual Inspection

In addition to the items requiring monthly inspection, also inspect the condition of the hydraulic fluid.

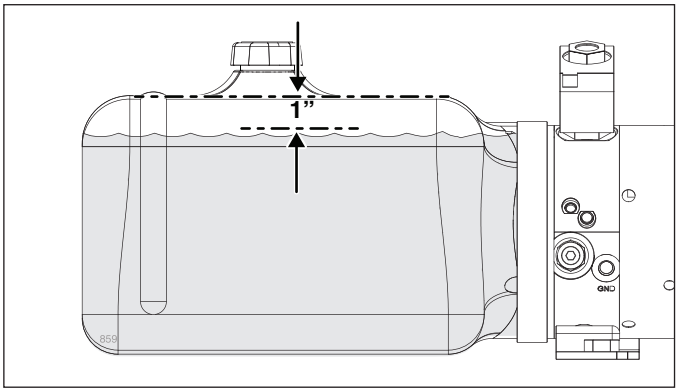
If the oil in the hydraulic tank is dirty, drain the oil and flush the entire system. Refill the system with the recommended oil outlined in Step 8 of the “Monthly Inspection” section.

4.3 Check Power Module Fluid Level

Power Down Models: Check the fluid level with the platform fully raised. The oil level should be approximately 1 inch below the filler cap.



Gravity Down Models: Check the fluid level with the platform resting on the ground. The oil level should be a maximum of 1 inch from the top of the reservoir.



NOTICE *To prevent damage to the pump, use only the recommended Hyken Glacial Blu anti-wear, low-viscosity, hydraulic fluid in the power unit reservoir.*

In an emergency, use any anti-wear hydraulic fluid, but flush the system and replace it with our recommended fluid soon as reasonably possible. Do not mix hydraulic oil and automatic transmission fluid due to possible compatibility problems.

Use the appropriate viscosity of fluid based on the surrounding climate conditions. Viscosity is important because the pump will not cause a temperature increase to the oil in the reservoir, like a typical closed-loop hydraulic system.

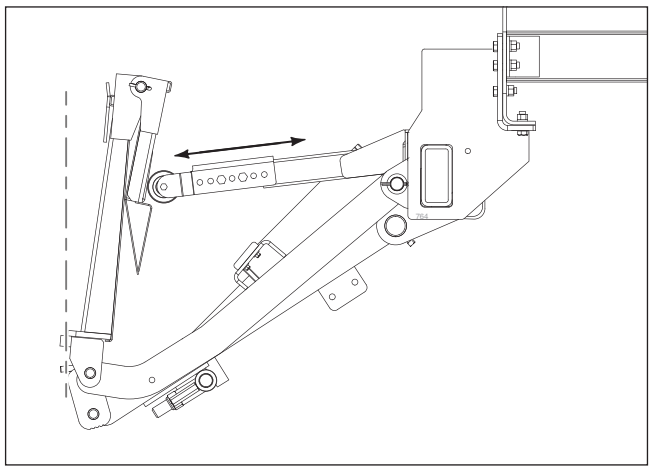
DO NOT use brake fluid in place of our recommended fluids.

4.4 Adjusting Wheel Arm

The wheel arm helps unfold the platform as it is lowered from the stored position. The wheel arm can be adjusted, so the platform unfolds with either greater or lesser effort.

WARNING **Never stand in front of the platform when it is opened. Always stand to the side and away from the edge of the platform.**
When adjusting the position of the wheel arm, consider that the vehicle may be parked on a sloped surface. Adjust the wheel arm to prevent the platform from completely unfolding in this type of situation.

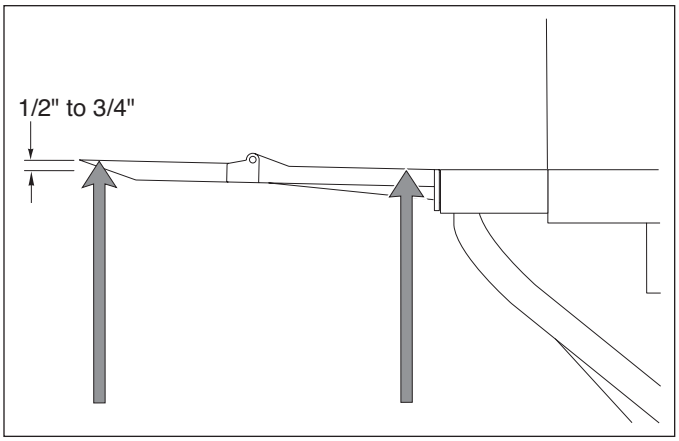
1. If adjustment is needed, remove the two bolts and nuts on the wheel arm.
2. Lengthen or shorten the wheel and channel assembly on the tube, as desired.



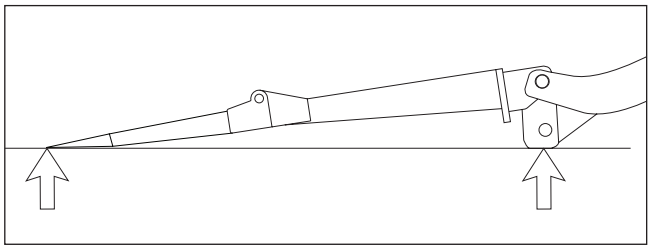
3. Align the two holes in the wheel and channel assembly with the holes in the tube nearest the desired position.
4. Re-install the two bolts and nuts. Tighten the nuts to secure the wheel and channel assembly.

4.5 Platform Adjustment

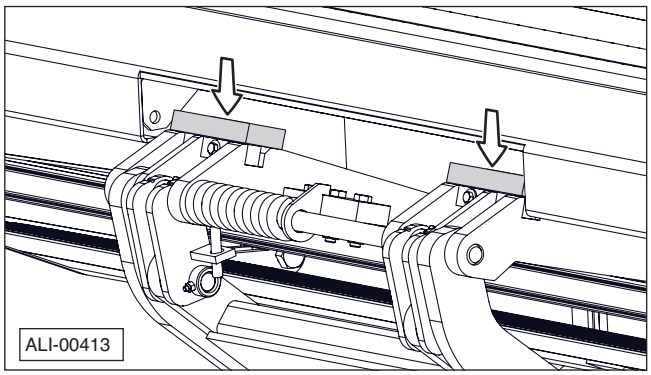
The ramp (outboard) end of the platform should be 1/2 to 3/4 inches higher than the truck floor when in the raised position. If the outboard end of the platform is sagging, add shims as described below. Shimming is a normal procedure as the liftgate ages, and the parts become worn.



1. The front edge of the flip-over platform section should lower to the ground and contact the ground at the points seen below, and the back of the platform should raise flush to the floor extension. If the front edge does not touch the ground, refer to the next step.



2. If the end of the platform does not contact the ground, adding a shim to the stop block will raise the outboard end of the flip-over section.
   Removing material from the stop blocks will lower the outboard end of the flip-over section.



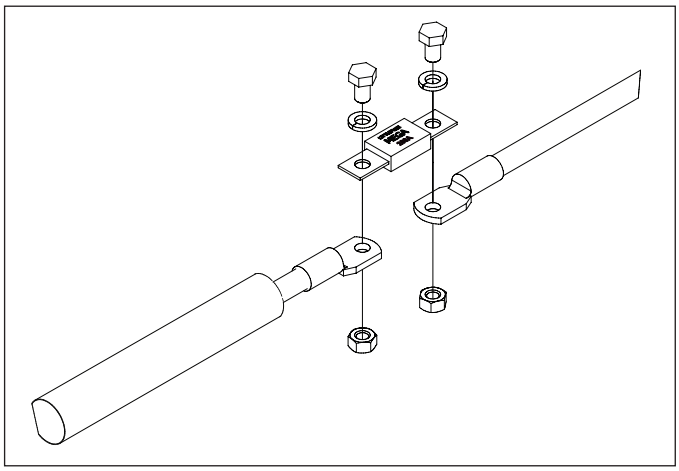
Note: *One shim can move the ramp end of the platform as much as 1/2 inch.*

   d. Raise and lower the platform to recheck its position.
   e. Weld the steel shim plates to the blocks on the platform.

3. To lower the ramp end, remove material from the contact area (arrows shown in Step 2) between the cam plates and platform.
4. If the platform does not align with the floor extension, contact Anthony Liftgates for a solution to correct the problem.

4.6 Power Cable Fuse - 200 Amp

CAUTION To avoid injury or property damage, disconnect the liftgate's power cable from the battery before starting to replace the fuse. An "arc" can occur, resulting in personal injury or property damage if the power cable is connected to the battery.



1. Cut the heat shrink tube to expose the fuse, mounting hardware, and lugs.
2. Remove the bolt, washer, and lock washer from each end of the fuse.
3. Use the A-133610, 200 Hi-Amp Fuse Replacement Kit for the replacement parts.
4. Slide the new heat shrink tube over one side of the wiring.
5. Bolt the new fuse to the cable lugs using the bolts, washers, and lock washer, as shown.
6. Slide the heat shrink tube over the fuse, hardware, and lugs. Using a heat gun apply heat evenly to shrink the tubing.
7. Reconnect the power cable to the battery after you are certain the platform area is clear.

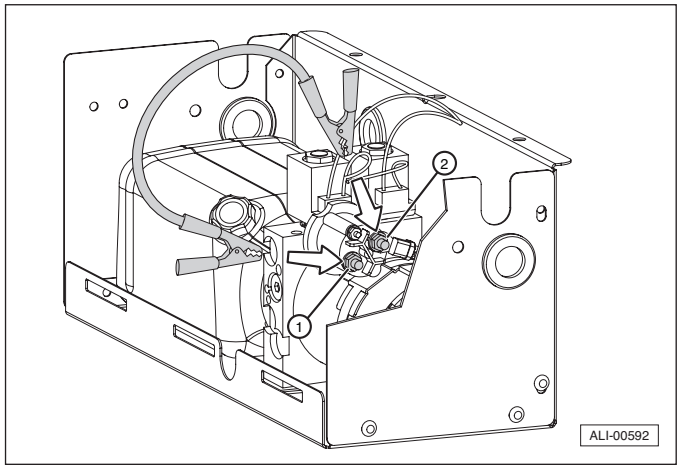
Note: If the fuse continues to blow, contact your authorized dealer.

4.7 Checking the Power Cable

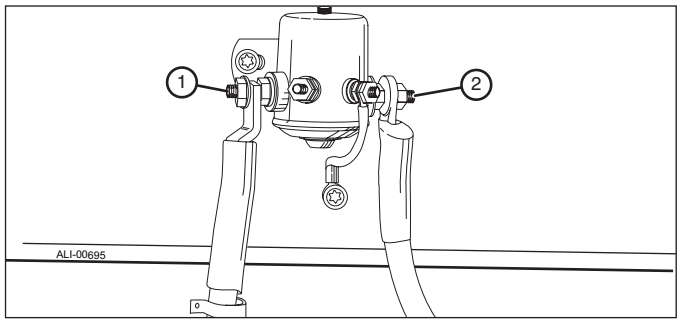
To check for a defective power cable, run the motor directly from a spare battery using jumper cables.

1. Remove the battery connection to the motor.
2. Connect the negative jumper cable (ground) directly to the liftgate. Connect the positive cable to the terminal on the motor start solenoid.
3. If the motor operates, the battery cable is defective and should be replaced.

4.8 Checking Motor Start Solenoid and Power Cut-off Solenoid



Motor start solenoid.



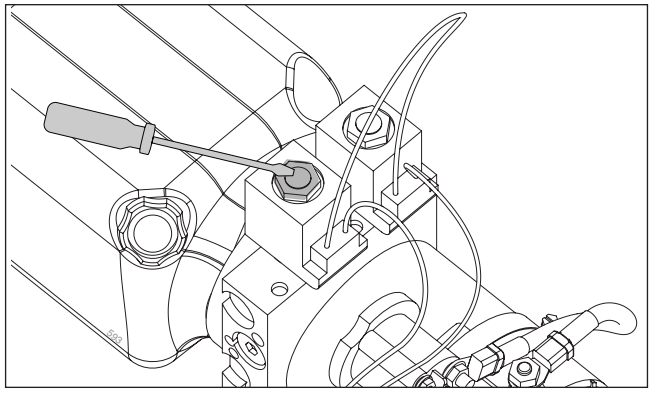
Power cut-off solenoid.

Both the motor start solenoid and power cut-off solenoid can be checked by bypassing the solenoid itself.

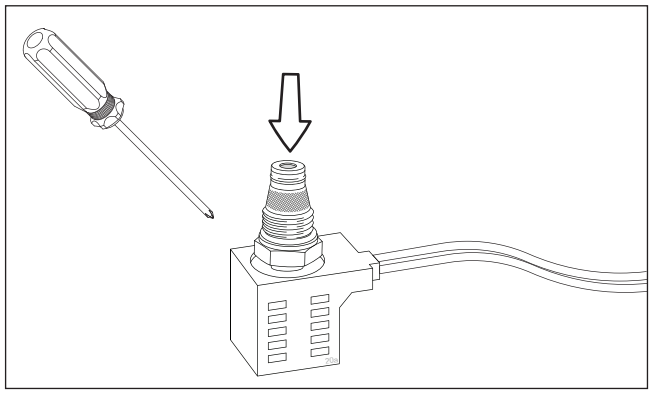
1. Use 12 Volt jumper cables for this test.
2. Connect one jumper cable to the battery side of the solenoid. Connect the other cable to the motor side of the solenoid.
3. If the liftgate is activated, the solenoid is defective and should be replaced. Replacement part — ATU-120 (motor start solenoid) or A-150263 (power cut-off solenoid).

4.9 Checking Valve Cartridge and Solenoid

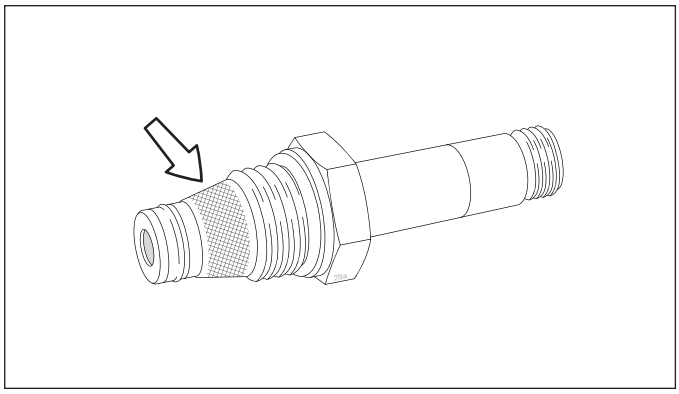
1. Place the liftgate on the ground in the open position.
2. Place a steel screwdriver over the top of the power down valve solenoid.



3. Momentarily activate the control switch in the DOWN position. The screwdriver should be attracted to the magnetic field created by the solenoid.
4. Repeat the process to check the power up solenoid. Momentarily activate the control switch in the UP position.
5. If no magnetic pull is produced, the solenoid is defective and should be replaced. If the solenoid is activated, check the cartridge valve.
6. Remove the solenoid from the valve assembly. Replacement part — A-176315.
7. Remove the valve cartridge from the pump body. Replacement part — A-130216 (lowering valve) or A-130215 (raising valve).
8. Clean the cartridge and blow it dry with compressed air (not greater than 30 psi). Also, blow out the pump body.
9. Use a small screwdriver and carefully press on the spool inside the cartridge. If the spool moves freely, the cartridge is good. If it does not move, replace the cartridge, as the spool could be bent, pitted, or damaged in some other way.

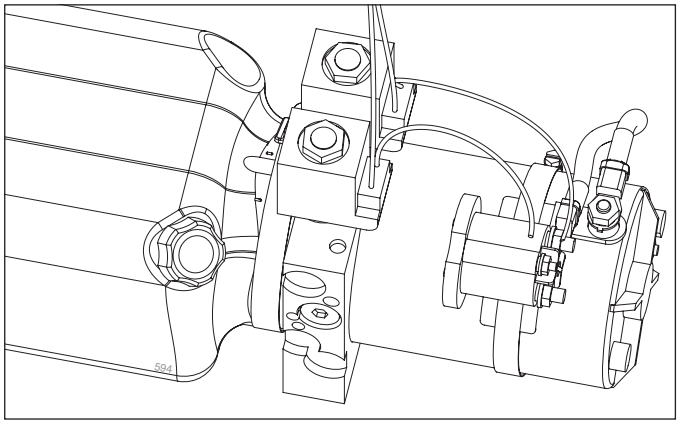


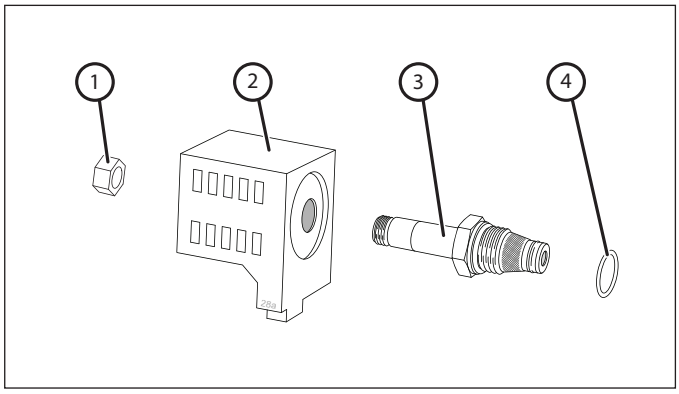
4.10 Solenoid Valve Screen



If the solenoid is working electrically, check the debris screen and clean if dirty.

4.11 Replacing the Solenoid Valve





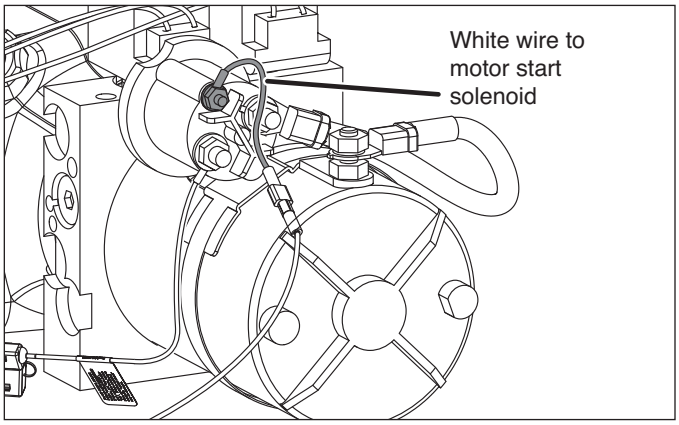
1. While installed in the pump, remove nut (1).
2. Remove coil (2) from cartridge (3).
3. Remove cartridge (3) from pump body.
4. O-ring (4) is not required on current models and can be discarded.

4.12 Checking Cylinder Piston Seals

4.12.1 Power Down Models

1. First, check the lowering valve. Make sure it is operating correctly, and the valve is not sticking or dirty. Replace the valve if necessary. Refer to “4.9 Checking Valve Cartridge and Solenoid” on page 12.
2. Raise the platform approximately 12 inches off of the floor.

3. Place a floor jack securely under the platform to support its full weight. An overhead lifting device could also be used.
4. Raise the floor jack until the platform begins to raise slightly.
5. Disconnect the white wire from the motor start solenoid. Place electricians tape around the end of the wire to prevent it from making a ground connection.



6. With the platform securely supported by the lifting device, activate the control switch in the DOWN position and hold the switch for 15 seconds. This will release any pressure in the power down hose.
7. Now activate the control switch in the UP position and hold it for 15 seconds. This will release any pressure in the power up hose.
8. Repeat holding the control switch in the DOWN position for 15 seconds and again in the UP position for 15 seconds. This should release any trapped pressure.
9. Carefully remove the flow control valve from the rod end of the cylinder. Plug or cap the fitting.
10. Remove the hose from the cap end of the cylinder and attach a temporary hose to catch any potential leakage from the cylinder. Place the end of the hose in a minimum one gallon container.
11. Lower the floor jack or lifting device.
12. Major seal damage will be apparent right away as the platform would begin to slowly lower and fluid will come out of the hose. Less extensive damage may take longer to be seen. Allow the platform to sit for several hours or overnight.

WARNING **Make sure nothing or no one could accidentally go under the platform while the hoses are disconnected.**

13. If the platform does not lower, the seals are not the problem, most likely it is a faulty lowering valve.
14. Reconnect the white wire to the motor start termial. Raise and lower the platform several times to remove any trapped air.

4.12.2 Gravity Down Models

1. Completely raise the platform.

WARNING **Do not stand under the platform.**

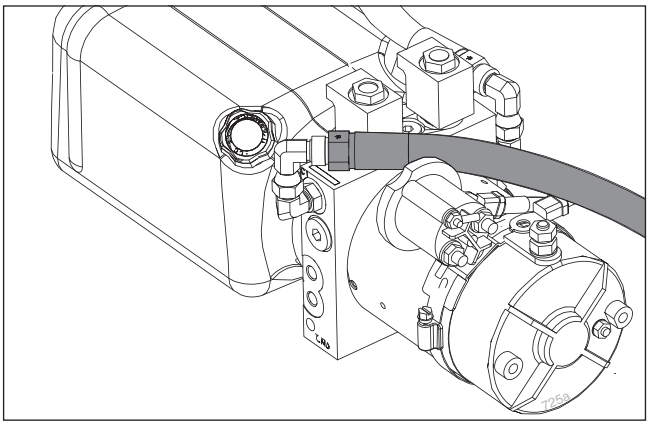
2. Remove breather tube from the cap end of the cylinder and attach a short piece of hose routed into a hand-held container.
3. Activate the control switch in the UP position.
4. If oil is continuously pumped out of the hose, replace the cylinder.

4.13 Checking System Pressure

For gravity down systems, there is only one relief valve (power up). Power down models have two relief valve settings; one for raising the platform (power up, upper adjusting screw) and one for lowering the platform (power down, lower adjusting screw).

To check the “power up” pressure setting:

1. Place the liftgate on the ground and remove the pressure hose from the power up port of the pump.



Power UP Model Pressure Hose Shown

2. Install a T-fitting (customer supplied) into the power up port.
3. Connect a pressure gauge and reconnect the hydraulic hose.

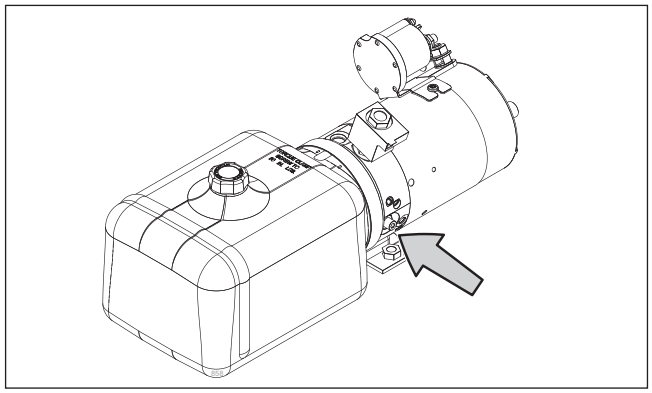
   The pressure gauge must be rated above the maximum pressure of the liftgate. For example, use a 4000 psi pressure gauge on a 3000 psi maximum capacity liftgate.
4. Raise the liftgate and check the pressure on the gauge.

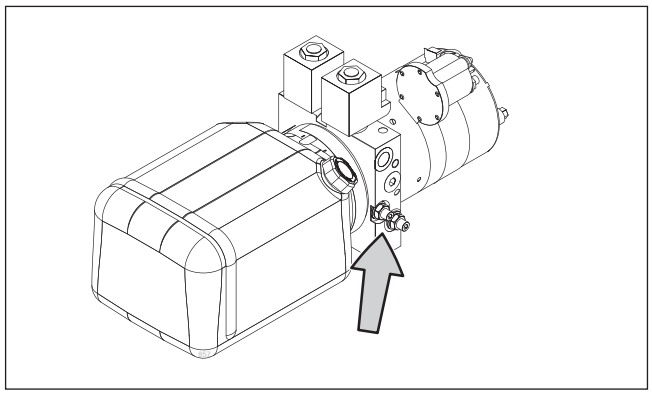
Low Pressure Threshold Chart		
Model	**Power Up**	**Power Down**
1800	2800 psi	350 psi
2500	1850 psi	
3000	2400 psi	

WARNING **Do not stand or work in the platform's work area while operating the liftgate. Place the pressure gauge so it can be read while operating the liftgate from a safe location. Serious injury or death could result if this action is not followed.**

5. To adjust the pressure, loosen the lock nut and turn Allen screw clockwise to increase pressure or counterclockwise to decrease the pressure. *Retighten locknut, and retest the pressure setting.*

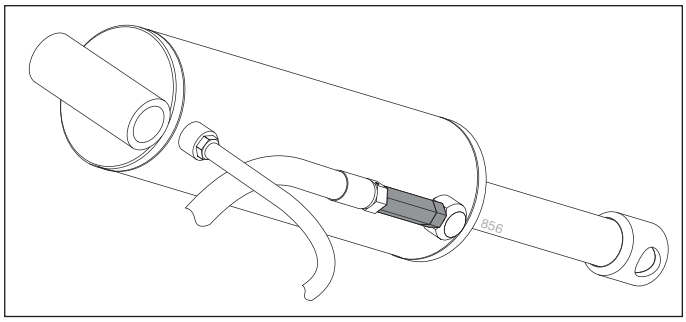
   Note: *To rest the pressure from zero, turn the adjusting screw in all the way, then back out one full turn. Retighten lock nut, test liftgate with load. If liftgate performs well, set pump pressure according to factory settings.*





6. Check the "power down" relief valve pressure in the same way as the "power up" by installing a T-fitting and pressure gauge in the power down port.

4.14 Checking Flow Control Valve

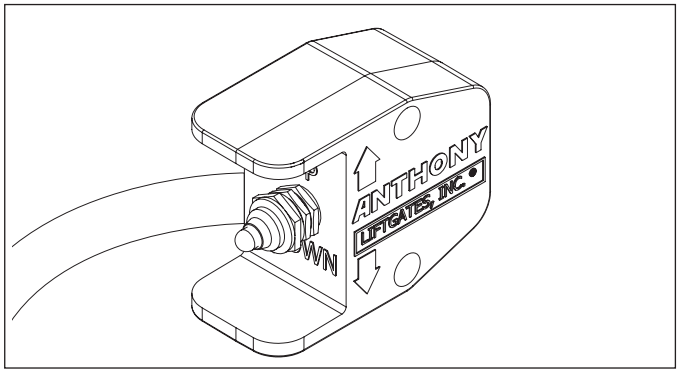


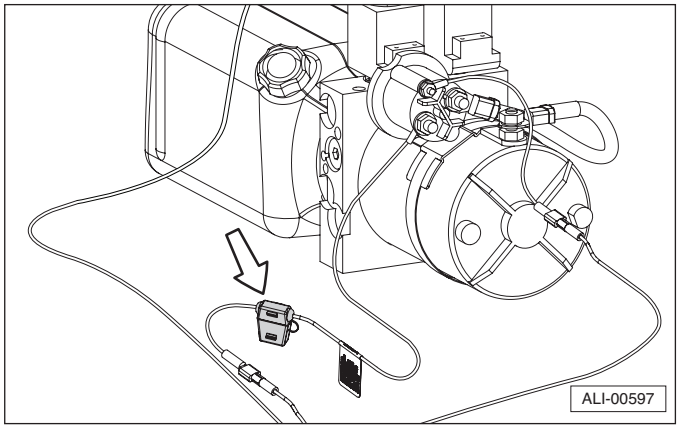
If the cylinder does not operate or operates slower than normal, remove the flow control valve and hook the hydraulic hose directly to the cylinder. If the cylinder operates properly, replace the flow control valve. Replacement part — A-130102.

WARNING **Do not operate the liftgate without the flow control valve. Serious injury or death could result if this action is not followed.**

4.15 Control Switch Fuse - 10 Amp

If the control switch is not operating the liftgate, check the in-line fuse located on the control cable inside the power unit box. Replace with A-150438 10A Fuse.

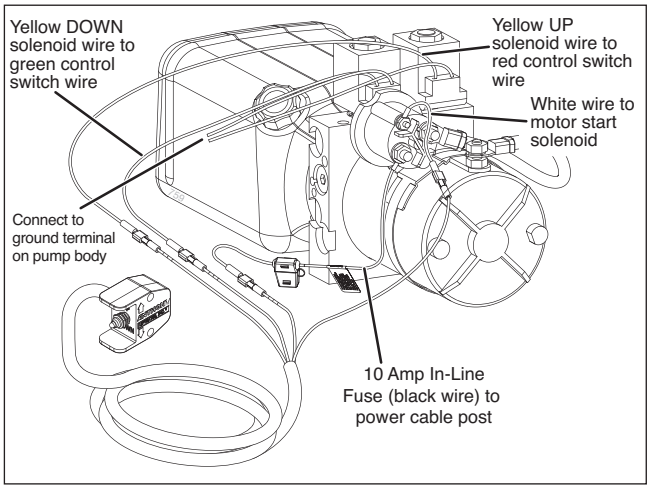




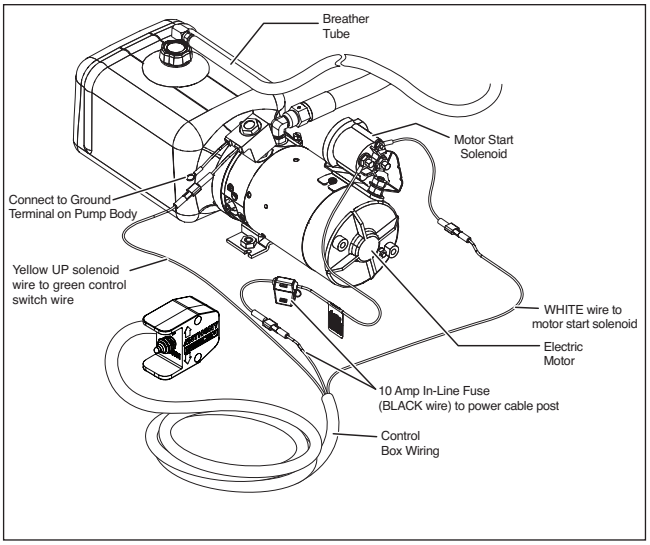
4.16 Reattaching Control Unit Wires to Appropriate Terminals

If the control cable wires have been removed, reattach them to the appropriate terminals, as shown.

1. Power down models:



2. Gravity down models:

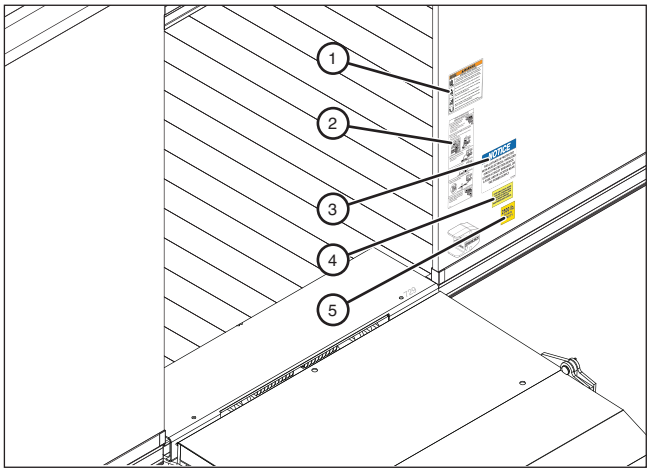


5. Decals

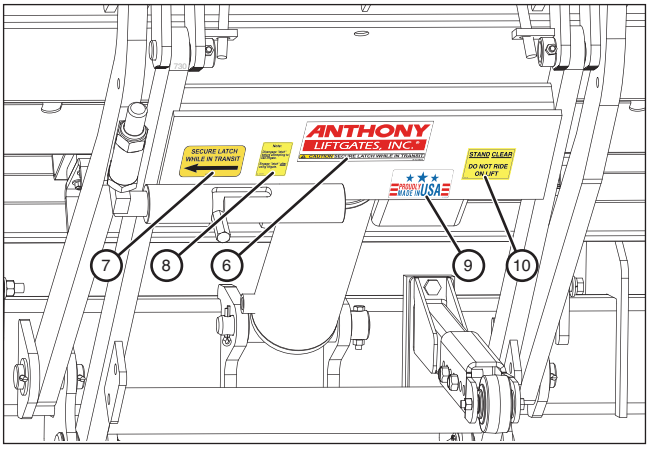
SAFETY INSTRUCTIONS **To prevent possible injuries due to improper operation, make sure all decals are attached to the liftgate and truck and are legible.**

5.1 Decal Placement

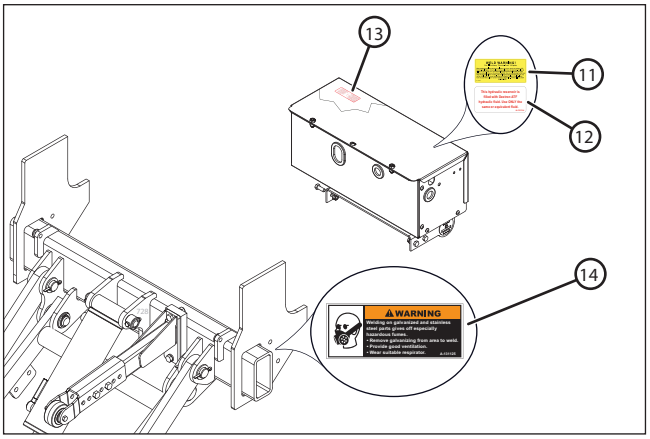
1. Attach decals 1 through 5 to the truck body, as shown.



2. Make sure factory-installed decals 6 through 10 are attached to the lift arms and platform.



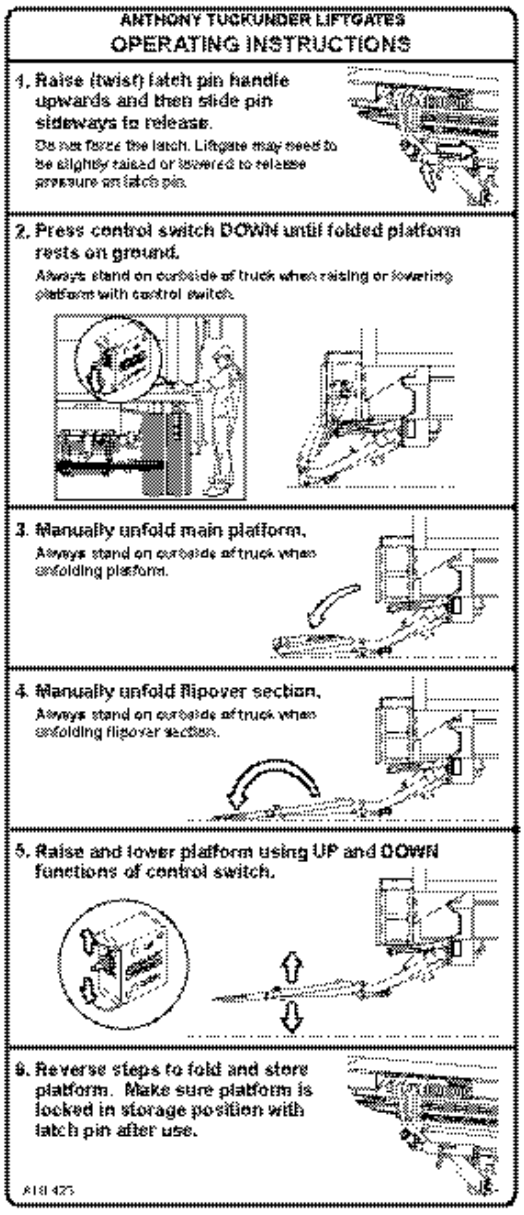
3. Make sure factory-installed decals 11 through 13 are installed on the power unit. Decal 14 is only attached to galvanized liftgates on the adapter frame tube.



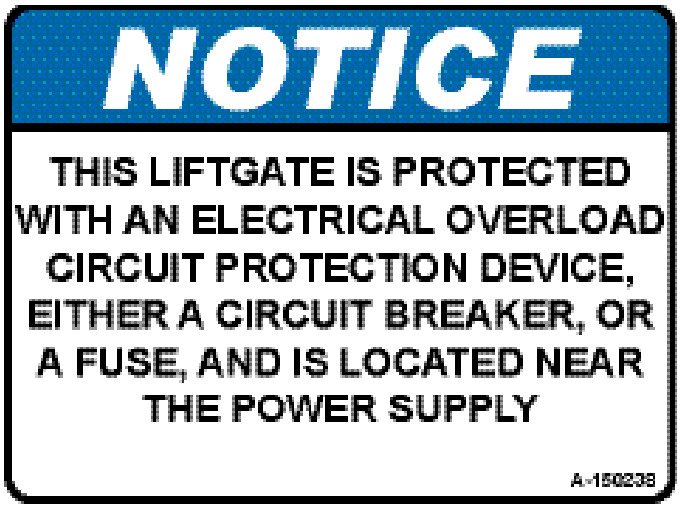
5.2 Decals

1 — A-131115

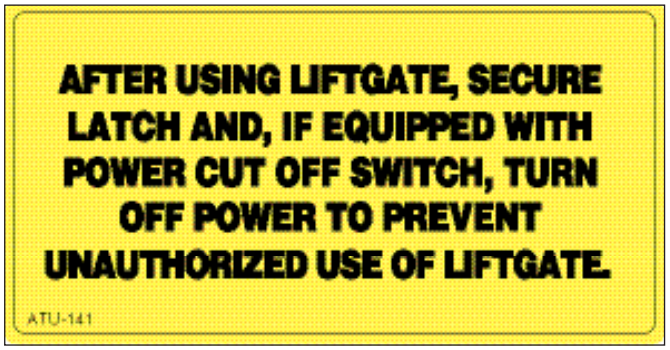
2 — ATU-423



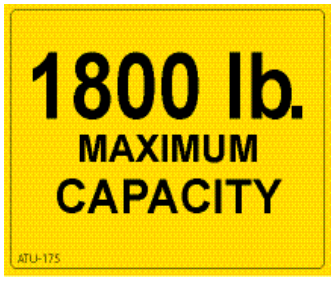
3 — A-150238

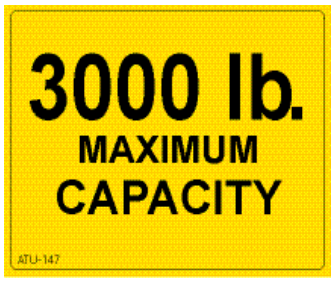


4 — ATU-141



5 — ATU-175, ATU-174, ATU-147





CAUTION **Make sure the proper "MAXIMUM CAPACITY" decal is placed on the truck for the appropriate lifting capacity of the liftgate being installed. Do not put a higher rated decal on a liftgate with a lower capacity; this could result in liftgate damage or possibly personal injury.**

6 — A-131034

7 — ATU-143

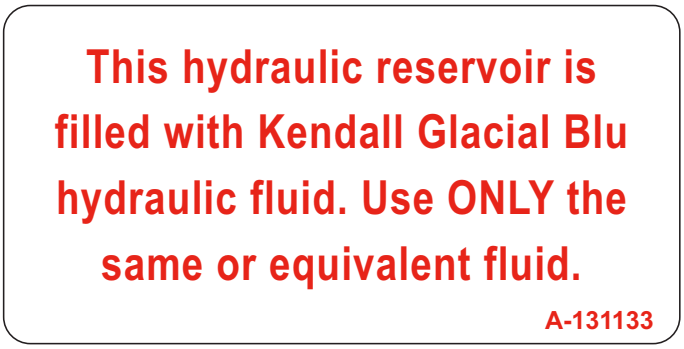
8 — A-131017

9 — A-150601

10 — ATU-146

11 — A-131028

12 — A-131133



13 — A-131001 (attached to control cable)

14 — A-131125 (only on galvanized liftgates)

6. Welding Stainless Steel to Galvanized

If the maintenance requires welding galvanized steel parts to stainless steel, special procedures must be followed to ensure the safety of the welder and the integrity of the welds.

6.1 Safety

6.1.1 Welding or Grinding Galvanized Material

Follow all OSHA and other workplace safety standards when welding galvanized steel, which creates zinc oxide fumes. Always grind the coating off in the area to be welded and provide adequate ventilation to avoid breathing the fumes.

Always wear proper breathing protection when grinding or welding. Use ventilation or vacuum systems to remove any contaminated air from the work area.

Metal Fume Fever:

> **When zinc vapor mixes with the oxygen in the air, it reacts instantly to become zinc oxide, which is non-toxic and non-carcinogenic.**
>
> **Zinc oxide that is inhaled is absorbed and eliminated by the body without complications or chronic effects.**
>
> **Exposure to zinc oxide fumes causes a flu-like illness called metal fume fever.**
>
> **Symptoms include headache, fever, chills, muscle aches, nausea, vomiting, weakness, and tiredness.**
>
> **There are no long-term health effects. Metal fume fever typically begins about four hours after exposure, and full recovery occurs within 48 hours.**

6.1.2 Welding or Grinding Stainless Steel

Follow all OSHA and other workplace safety standards when welding stainless steel, which creates hexavalent chromium fumes that can irritate the nose, throat, and lungs.

Repeated or prolonged exposure can damage the mucous membranes of the nasal passages and result in ulcers. In severe cases, exposure causes perforation of the septum (the wall separating the nasal passages).

Always wear proper breathing protection when grinding or welding. Use ventilation or vacuum systems to remove any contaminated air from the work area.

6.2 General Guidelines

1. Welders should position themselves upwind of the airflow that removes the fumes so that fumes and dust do not collect inside the welding shield (helmet).
2. In addition to proper positioning, an effective method to prevent inhaling zinc oxide fumes or hexavalent chromium fumes is to wear a good fume-rated respirator.

6.2.1 Weld Wire

We recommend AWS E312T1 flux core wire, such as Midalloy Mastercor™ E312T1-1/4 or equivalent.
Do not use stainless steel weld wire.

6.2.2 Shielding Gas

100% CO^2 or 75/25 Argon/CO^2 mix can be used.

6.2.3 Welding Guidelines

1. The welding of galvanized steel is the same as welding bare steel of the same composition. It uses the same welding processes, Volts, amps, travel speed, etc.

Wire Diameter (inches)	Voltage (V)	Amperage (Amp) [Wire Feed Speed (ipm)]	
		Flat	Vertical & Overhead
.045	24-28	130-200 [250-425]	120-160 [225-300]
.062	25-30	180-250 [150-250]	180-220 [150-200]

2. Use a soft disc grinder to remove the galvanized coating in the area to be welded. This will improve weld quality and reduce the welder's exposure to zinc oxide fumes.
3. No preheating of the dissimilar metals is needed.
4. When welding is complete, and after the area has cooled, use a cold galvanizing spray to restore corrosion resistance.

7. Troubleshooting Chart

Troubleshooting Chart		
Problem	**Possible Causes**	**Possible Solution**
Motor does not run when control switch is activated.	Cab cut-off switch.	Turn switch to ON position. Replacement part — A-150031
	Optional power cut-off solenoid.	Check solenoid. “4.8 Checking Motor Start Solenoid and Power Cut-off Solenoid” on page 11. Replacement part — A-150263
	Dead battery.	Make sure battery is fully charged. Check for loose or corroded battery connections. Replace or recharge battery.
	Circuit protection (200 Amp fuse).	Replace fuse. Refer to “4.6 Power Cable Fuse - 200 Amp” on page 11. Replacement part — A-133610.
	Control switch (10 Amp) fuse is blown.	Replace the fuse inside power unit box. If problem continues, check for shorts in the electrical system. “4.15 Control Switch Fuse - 10 Amp” on page 14 Replacement part — A-150438.
	Battery cable.	Inspect main power cable from batteries, to circuit breakers, to cut-off switch to power unit. To verify a faulty cable, connect motor directly to a spare battery using the procedure in the Maintenance section. Replacement part — A-133604
	Corroded or loose wire connections.	Check all wire connections on power unit for corrosion or looseness. Replace defective terminals with ‘heat shrink’ factory type terminals.
	Motor start solenoid.	Check solenoid. “4.8 Checking Motor Start Solenoid and Power Cut-off Solenoid” on page 11. Replacement part — ATU-120.
	Power unit motor.	If the motor is determined to be defective, it should be replaced. Defective motors are typically caused by weak batteries (low Voltage), loose connections, corrosion, or a poor ground. Replacement part — A-150018
		If the motor does not operate in freezing conditions, make sure the motor housing does not contain water.
Sagging platform.	Normal wear.	Add shims to platform. “4.5 Platform Adjustment” on page 10. Replacement part — ATU-071 SHIM, 14GA
	Bushing wear where lift arms connect to platform.	Replace bushings. Refer to separate Parts Manual.
	Structural damage.	Replace worn parts. Refer to separate Parts Manual.

Troubleshooting Chart		
Problem	**Possible Causes**	**Possible Solution**
Foaming oil.	Air in the hydraulic hose(s) or cylinder.	Fill reservoir with proper fluid. Refer to “4.1 Monthly Inspection” on page 9 for oil specifications and “4.3 Check Power Module Fluid Level” on page 9 for oil level. Raise and lower platform several times to remove any trapped air.
	Filter screen.	Filter screen in pump reservoir is damaged or plugged with dirt. Replace filter screen. Replacement part — A-150016.
	Broken or loose fluid return tube.	Remove oil reservoir and make sure return tube is below oil level. If tube has turned or fallen out, reinstall it into the pump housing. Use a center punch to “stake” tube into position. Replacement part — A-150015
Motor runs, but liftgate will not open or platform will not lower to the ground.	Structural damage. Check clearance between platform and floor extension.	Fix damage. Replace worn parts. Refer to the separate Parts Manual.
	Latch pin.	Slide the latch pin to the open position.
	Lowering valve solenoid (power down models only).	Check the solenoid. “4.9 Checking Valve Cartridge and Solenoid” on page 12. Replacement part — A-176315.
	Lowering valve cartridge (power down models only).	With platform on ground, check, remove, and clean valve cartridge using the procedure in section “4.9 Checking Valve Cartridge and Solenoid” on page 12. If plunger will not move freely, replace. Replacement part — A-130216.
	Cylinder seals.	Cylinder piston seal are damaged allowing fluid to leak past piston when trying to raise platform. Replace the cylinder, repair is not practical. Refer to section “4.12 Checking Cylinder Piston Seals” on page 12. Replacement part — A-130113 Cylinder 3” or A-130114 Cylinder 4”.
	Flow control valve.	Remove flow control valve and hook hydraulic hose directly to the cylinder. If the cylinder operates properly, replace the valve. “4.14 Checking Flow Control Valve” on page 14. Replacement part — A-130102.

Troubleshooting Chart		
Problem	**Possible Causes**	**Possible Solution**
Motor runs, but platform will not raise, will not raise rated capacity, or raises but drifts down when control switch is released.	Load capacity has been exceeded.	Verify load capacity and reduce load weight.
	Structural damage.	Replace damaged parts. Refer to the separate Parts Manual.
	Low fluid level.	Fill reservoir with proper fluid. Refer to "4.1 Monthly Inspection" on page 9 for oil specifications and "4.3 Check Power Module Fluid Level" on page 9 for oil level.
	Low Voltage.	Inspect the battery connection terminals and check the battery's Voltage (9 Volts minimum).
	Lowering valve (power down models only).	Valve may not be fully closing. Cartridge may need cleaning or replacement. See section "4.9 Checking Valve Cartridge and Solenoid" on page 12. Replacement part — A-130216
	Defective piston seals.	Cylinder piston seals are damaged allowing fluid to leak past piston when raising platform. Replace the cylinder, repair is not practical. Refer to section "4.12 Checking Cylinder Piston Seals" on page 12. Replacement part — A-130113 Cylinder 3" or A-130114 Cylinder 4".
	Hydraulic pump is worn.	Replace power unit. Replacement part — A-130117 Power Down or A-130116 Gravity Down.
Latch pin is broken or bent.	Operator has lowered platform without releasing latch pin.	The latch pin is only used to prevent the liftgate from opening due to a pressure leak or pressure bleed-off over an extended period of time. Always release latch before opening liftgate.
Platform raises truck when lowered to the ground (power down models only).	Power down system pressure is set too high.	See section "4.13 Checking System Pressure" on page 13.
Platform will not open.	Platform operating area is not clear.	Clear platform operating area.
	Latch pin will not slide freely to release liftgate.	Activate the "UP" switch and raise the liftgate to the fully stored position. The latch pin should slide freely.

Troubleshooting Chart		
Problem	**Possible Causes**	**Possible Solution**
Platform lowers extremely slow.	Low oil level on power down models.	Fill reservoir with proper fluid. Refer to "4.1 Monthly Inspection" on page 9 for oil specifications and "4.3 Check Power Module Fluid Level" on page 9 for oil level.
	Improper oil in hydraulic reservoir.	Fill reservoir with proper fluid. Refer to "4.1 Monthly Inspection" on page 9 for oil specifications and "4.3 Check Power Module Fluid Level" on page 9 for oil level.
	Bushing wear where lift arms connect to platform.	Replace bushings. Refer to the separate Parts Manual.
	Damaged or kinked hydraulic hose.	Repair or replace. Refer to the separate Parts Manual.
	Cylinder rod is scored, pitted, or bent.	Replace the cylinder, repair is not practical. Replacement part — A-130113 Cylinder 3" or A-130114 Cylinder 4".
	Flow control valve.	Remove flow control valve and hook hydraulic hose directly to the cylinder. If the cylinder operates properly, replace the valve. "4.14 Checking Flow Control Valve" on page 14. Replacement part — A-130102.
	Lowering valve (power down models only).	Solenoid or cartridge may need cleaning or replacement. Refer to section "4.9 Checking Valve Cartridge and Solenoid" on page 12. Replacement part — A-130216.
Platform raises partially and stops.	Load capacity has been exceeded.	Verify load capacity and adjust load weight.
	Structural damage.	Replace damaged parts. Refer to the separate Parts Manual.
	Low Voltage.	Recharge battery (if less than 9 Volts).
	Low pressure.	Fill reservoir with proper fluid. Refer to "4.1 Monthly Inspection" on page 9 for oil level and oil specifications. Also check pump and motor. "4.1 Monthly Inspection" on page 9.
Platform will not lower.	Platform operating area is not clear.	Clear area.
	Structural damage.	Replace damaged parts. Refer to the separate Parts Manual.
	Low Voltage.	Recharge battery (if less than 9 Volts).
	Lowering valve (power down models only).	Solenoid or cartridge may need cleaning or replacement. Refer to section "4.9 Checking Valve Cartridge and Solenoid" on page 12. Replacement part — A-130216.
	Hydraulic pump and motor.	Replace power unit. Refer to the separate Parts Manual.

Troubleshooting Chart		
Problem	**Possible Causes**	**Possible Solution**
Motor runs, but platform will not lift stated load or drifts down after being raised raised.	Low fluid level has caused air in the lines.	Fill reservoir with proper fluid. Refer to “4.3 Check Power Module Fluid Level” on page 9 for oil level and specifications. Raise and lower the platform several times to expel any trapped air.
	Lowering valve stuck in the open position (power down models only).	With platform on ground, check, remove, and clean valve cartridge using the procedure in section “4.9 Checking Valve Cartridge and Solenoid” on page 12. If plunger will not move freely, replace. Replacement part — A-130216.
	Damaged cylinder piston seals.	Refer to section “4.12 Checking Cylinder Piston Seals” on page 12 for additional information.
	Relief valve is set too low or clogged with contaminants.	Loosen locknut and turn Allen screw clockwise to increase pressure. Remove and clean if necessary.

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Form No. L-102-MM (03-20)

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