



OPERATING AND SERVICE MANUAL

Serial Number: _____

For technical service or repair,

FIRST CALL - INSTALLING CONTRACTOR:

SECOND CALL: Titan Representative
XXX-YYY-ZZZZ

FINAL CALL: Titan Air Inc.
715-597-2050

Please have serial number available when calling



TABLE OF CONTENTS

FOREWARD	3
SPECIFICATIONS	4
FEATURES/OPTIONS	5
EQUIPMENT ARRIVAL	5
INSTALLATION	6-8
OPERATIONAL INSTRUCTION	8
SAFETY	9
MAINTENANCE	10-16
WARRANTY	17
PARTS RETURN POLICY	18
SUGGESTED SPARE PARTS	19-20
REFERENCE DRAWINGS	21

SAFETY ALERTS



**KNOW AND UNDERSTAND YOUR SAFETY SYMBOLS AND ALERTS!
ACCIDENTS CAN BE AVOIDED, SAFETY IS VERY IMPORTANT TO US,
IT SHOULD BE VERY IMPORTANT TO YOU!**

Follow instructions on safety tags on your equipment. Your safety is of great concern, so please be alert to warnings, cautions and notes. Labels on equipment and in this manual are intended to make you aware of possible safety issues. When you see this symbol, be alert to the possibility of personal injury or death.

DANGER – Death, personal injury or property damage **WILL** be the result if you fail to follow instructions.

WARNING – Death, personal injury or property damage **COULD** be the result if you fail to follow instructions.

CAUTION – Damage to equipment **COULD** be the result if you fail to follow instructions.

NOTE – Information to further explain operations or instructions.

FOREWORD

Titan Air has manufactured the highest quality air makeup systems since 1983 and has carried over this commitment to excellence in the manufacturing of personnel lifts. Quality, technology and teamwork have enabled us to set standards of excellence. We believe that our obligation to our customers goes beyond providing them with a high quality product. We must also provide the highest quality product support and warranty. We pledge to continue improvements through the use of customer input and new technologies that become available. As our valued customer, we realize that you have come to expect nothing less.

Manuals for Titan Lifts will be an on going and improving process as we strive to supply the best features available.

In 2004 Titan Air Inc. introduced the 2nd Generation Series of personnel lifts which have incorporated many new features to improve the quality, performance and safety of our lifts.

If we have overlooked something, if some information is incorrect, or if you have comments on printed material which may make our Titan Lift a better product, contact us. Your opinions do matter!

TITAN LIFT

SPECIFICATIONS

ANSI A92.6-1990 & OSHA Compliant Self-Propelled Elevating Work Platform

1. X – AXIS TRAVEL – HORIZONTAL TRAVEL OF THE LIFT.

The lift is driven by two aluminum wheels connected by chain and sprockets which in-turn is driven by gearbox & air motor. The design speed in both directions is 40 ft. per minute. *Note-Single wheel drive has no chain or sprockets.*

2. Y – AXIS TRAVEL – EXTEND & RETRACT BASKET.

The basket extends & retracts horizontally from the booth wall. This movement can be accomplished at any vertical elevation and is achieved by means of a linear actuator pushing or pulling the scissors arms. The rate of travel is non-linear but averages approximately 15 ft. per minute.

NOTE: THE AUTO EXTEND FEATURE IS OFFERED AS AN OPTION AND WILL PROVIDE AN ADDITIONAL 21” TO THE FULLY EXTEND DIMENSION.

3. Z – AXIS TRAVEL – VERTICAL TRAVEL OF BASKET

The maximum vertical travel of the lift basket is dependent upon the lift selected. For example, model TL-8 has a lift height from ground to basket floor of 8 ft. The lift travel is accomplished by means of a ball screw/ball nut driven by air motor & gear box. The rate of speed is designed at 15 ft. per minute.

The z axis travel includes 2 safety devices that prevent uncontrolled descent of basket. In the unlikely event of ball screw/ball nut failure, a mechanical safety device is provided to prevent free fall of the basket. In addition, a fail safe pneumatic brake is provided between the air motor & gear box should a loss of air supply occur.

4. OPERATOR BASKET CONTROLS

The control panel for basket movement is located on the front of the basket. the controls are “joy stick” valves that are moved in the direction of desired travel and will spring return to stopped position when released. Foot control is available upon request. The Emergency Down Switch is included along with an auxiliary air receiver to lower the unit in the event of air loss to the basket. Ground control is also provided to allow the raising or lower the basket from ground level (see figure 9).

5. UTILITIES

Each Titan Lift requires an air supply of 80 scfm at 100 psi of clean, dry air. All internal components are provided with the lift and only one point of connection is required. The internal components include all of the piping, tubing, valves, pneumatic switches, filter/regulator/lubricator and safety lock-out valve for required maintenance. The single air supply source will be provided through a festooning system.

TITAN LIFT

FEATURES/OPTIONS

2nd Generation

1. **Ball Screw & Drive** – The 2nd Generation lift includes the re-designed ball Screw drive location. The ball screw is being held in tension. This feature eliminates the problems encountered with the ball screw in compression and all of the guide mechanism required for the “column effect” generated by a column in compression.
2. **Safety Bumper Stop** – This option provides for a means to stop the lift movement should any obstruction be in the path of Y Axis movement. It is located on the front of the basket. Once the bumper is moved, the lift will stop until the obstruction is cleared. There is a manual override in the basket to allow the basket to be moved away from the work piece.
3. **Auto-Roll Out** – This is an option available that extends the basket an additional 21” beyond the normal extension of scissor arms. As the scissor arms are extending, the “auto-roll out” feature moves the basket out proportionately an additional 21”.

EQUIPMENT ARRIVAL

When the trucker arrives with your Titan Lift, inspect the equipment for damage. The equipment has been inspected and tested before leaving the factory. Read the bill of lading and verify that the items listed are what you have received. Any damage or missing items should be reported to the shipper immediately. **DO NOT SEND DAMAGED FREIGHT BACK TO THE FACTORY.**

All claims must be filed with the shipper. It is recommended to take photographs and get the driver’s signature to confirm the damage. Request a written inspection report from the claims inspector to substantiate any necessary claim. Notify Titan Air Inc. of the damage and order replacement parts if needed.

If for some reason you are unable to install the equipment immediately, protect the equipment from the elements. Water damaged parts are not covered under Titan’s warranty. If the lift is to be stored beyond 60 days, protective measures should be taken to preserve the integrity of the lift.

Read the product warranty, installation and operating instructions before installing the equipment. Titan Air Inc. offers installation supervision and on-site training for a pre-determined fee.

TITAN LIFT INSTALLATION

1. TOP RAIL INSTALLATION:

The top rail supports (by others) must be in place prior to the lift installation. On a single scissors extension lift, the rail supports must be spaced on no more than 10 Ft. on center and designed to carry no less than 1000 lbs. of horizontal force at the point of top rail connection. On a double scissors extension lift, the rail supports must be spaced no more than 8 Ft. on center and designed to carry no less than 2000 lbs. of horizontal force at the point of connection.

The standard top rail is a W6x15 beam.

- A. Raise the top rail into position. The height of rail must be set at the elevation indicated on the approval drawing.
- B. The rail must be set parallel to the floor.
- C. Weld the top rail to the vertical rail supports (see figure 3). The welds should be continuous $\frac{1}{4}$ " fillet weld around the perimeter of the contact surfaces.
- D. The welding should be performed by Structural Certified Welders only.

2. BOTTOM RAIL INSTALLATION:

It is very important to maintain parallelism between the top rail and bottom track rail. Any excessive misalignment will cause potential binding in the X-Axis drive. In addition, upper rail and bottom track rail must be positioned to insure that the lift is vertical or 90 deg. to the floor. The standard bottom rail is 2" square tubing anchored with $\frac{3}{8}$ " masonry anchor bolts spaced 5 Ft. apart. (see figure 2). If the installation is non-standard, please refer to submittal drawings.

- A. After top rail has been installed, locate the bottom rail tube as shown in figure 1. Drop a plumb line from the outside face of the top rail to the booth floor. The bottom rail tube center line should be between $\frac{1}{8}$ " to $\frac{1}{4}$ " offset toward the booth wall (see figure 1)
- B. Bolt the bottom rail sections in place, butt weld rail sections together & grind flush to assure drive wheels run smoothly across each of the welded joints.

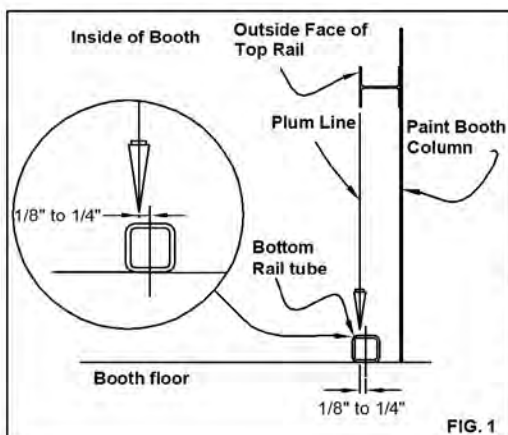


FIG. 1

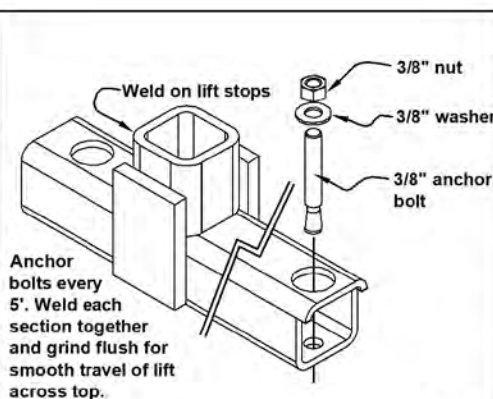


FIG. 2

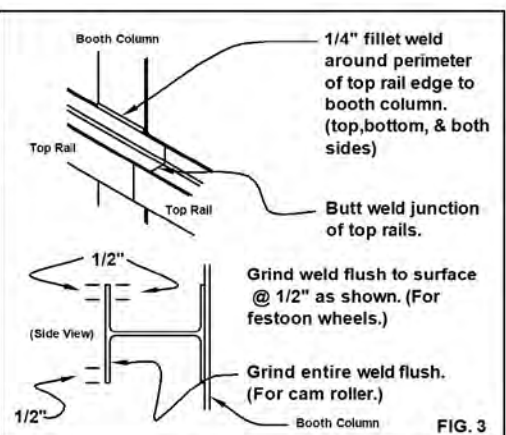


FIG. 3

3. INTERMEDIATE RAIL INSTALLATION:

It is very important to maintain parallelism between the top rail, bottom rail and the intermediate rail. The standard intermediate rail is a W5x16 beam, which is secured to the same supports as the top rail.

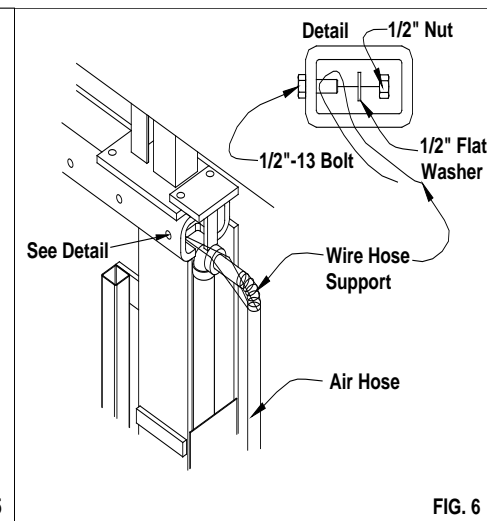
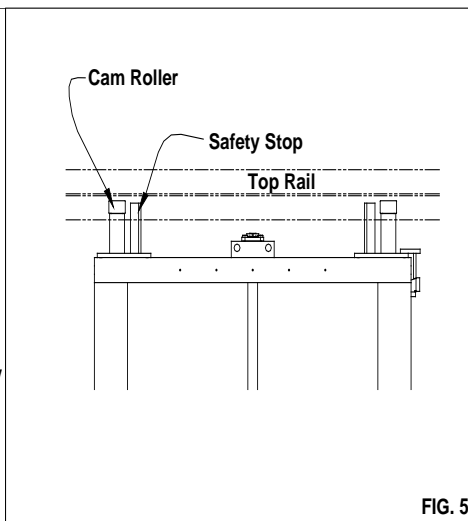
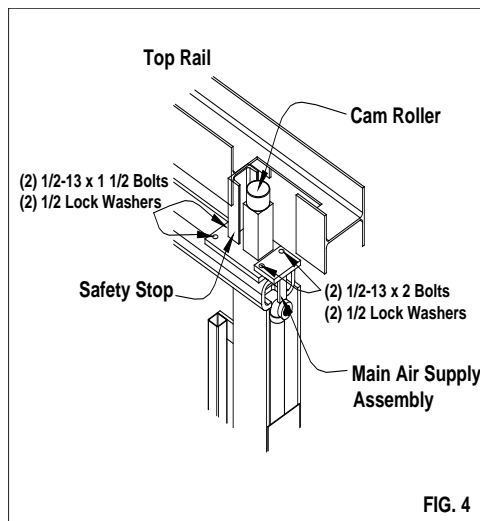
- A. Raise the intermediate rail into position. The height of the rail must be set at the elevation indicated on the approval drawing.
- B. The rail must be set parallel to the floor.
- C. Weld the intermediate rail to the vertical rail supports (same as the top rail). The welds should be continuous 1/4" fillet weld around the perimeter of the contact surfaces.
- D. The welding should be performed by Structural Certified Welders only.

4. LIFT INSTALLATION:

- A. A lifting bar is provided (one per job site) for raising the assembly into the vertical position.
Raise the lift into the vertical position & place the aluminum wheels on the bottom rail. Use a forklift or other suitable lifting device with no less than 5000# capacity.
- B. Once the lift has been positioned under the top rail, the cam roller & safety stop assembly can be bolted on the top lift tube (see figure 4), this will lock the lift into operating position. (Caution- until the cam roller assembly is bolted in place, the lift is only being held into the vertical position by the lifting device.) The cam roller assembly bracket includes a 3" channel x 6" long vertical stop (see figure 5). In the event that a cam roller should fail or cam block should fatigue, the vertical stop will prevent the lift from falling forward.
- C. Install the intermediate cam roller assembly on the back of the lift mast by utilizing the pre drilled and tapped holes. The cam roller assembly bracket includes a 6" x 3" wide angle with two cam rollers.
- D. Remove the lift bar from unit and retain for future service requirements or for installing additional lifts on the project.
- E. Attach any items such as rail scrapers, paint pot carriers, etc.

5. UTILITIES

- A. Each Titan Lift requires an air supply of 80 CFM at 100PSI of clean, dry air. Attach air supply hose (supplied with unit) to lift using the hose clamp provided and bolt wire rope hose support to the hole in the top roller mount (see figure 6).
NOTE: Install the air hose avoiding any kinks or bends that would restrict the air supply to the unit.
- B. Fill the air lubricator located at the base of the lift with oil supplied with the unit.



6. LOAD RATING

A. The maximum load allowance in the basket for standard lifts is 500 lbs. This includes the operator & all related equipment in the basket (live load). Double extension lifts and lifts with special sized baskets are restricted to 350 lbs. Refer to rating plate attached to the lift.

TITAN LIFT

OPERATIONAL INSTRUCTIONS

ALL OPERATING AND MAINTENANCE PERSONNEL MUST BE TRAINED ON THE TITAN LIFT.

1. The basket has a total maximum weight capacity of 500 pounds for standard Titan Lifts. Refer to rating plate on lift.
2. The operator must stay in the basket with the spring loaded access doors completely closed
3. With the air supply connected, slowly open the main air supply shutoff valve (see figure 7). Once the air supply is turned on, confirm the air pressure air regulator is set at 100 PSI. The lift is then ready to operate. Make sure the lubricator has been filled.
4. Operating the basket – the lift is very simple to operate. The axis movement is controlled by the respective “joystick” and in the direction of desired travel (see figure 8). When the basket has reached full travel or full stroke, the basket will stop. Likewise, when the basket is fully retracted or lowered, the basket will stop.
5. **OTHER LIFT CONTROLS**
 - A. **EMERGENCY STOP** – The e-stop is located on the basket control panel & will shut off the air supply to all axis controls. This is a simple push/pull button (red). Push to activate and pull to reset (see figure 8).
 - B. **EMERGENCY DOWN** – This control valve allows the basket to be lowered when the main air supply to the lift is interrupted. This control is activated by simply depressing the emergency down button (see figure 8).
 - C. **SAFETY SHUT OFF VALVE** – The lift is equipped with a lockable safety shut off valve which will turn off the air supply to the unit. This will completely disable the Titan Lift which will allow the required maintenance or repairs. Rotate the valve handle 90 degrees (horizontal). This will exhaust all air pressure from the system. It is recommended that lockout/tag out procedures be followed.

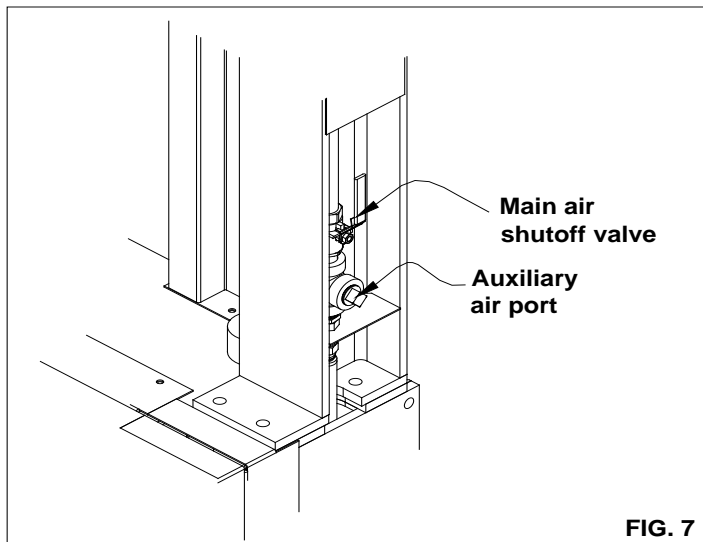


FIG. 7

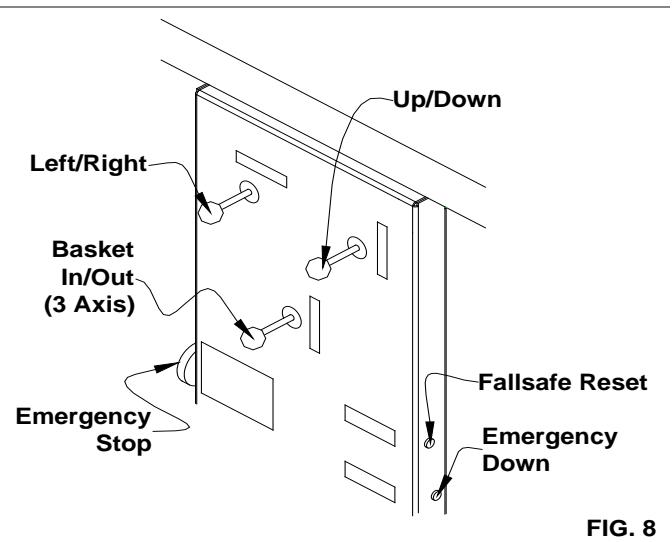


FIG. 8

TITAN LIFT SAFETY

Safety is the single most important feature that must be taken into consideration when developing, manufacturing and operating a product. Titan has taken many precautions to assure that the product offered is the safest it can be. It should be noted that a machine can be the safest in the world but if the operator does not operate or maintain it properly, the safety that has been built into the machine will be compromised.

The following is a list of DO'S and DON'TS that must be followed:

DO read the operation and maintenance manual completely prior to operating the lift for the first time.

DO use care, caution, and common sense when operating your Titan lift.

DO check all lifting clearance.

DO use safety devices at all times. Leave all guards and screens in place.

DO use caution and relieve the pressure before opening any pressurized system or lines.

DO remember that failure to follow safety precautions could result in injury or death.

DO periodically clean warning labels and replace them if they become damaged.

DO start and maintain a regular maintenance program. Failure to do so will reduce the life span of the lift.

DO check ball screw for wear and lubricate regularly with a lithium base grease.

DO NOT attempt to get off the lift unless it is in the fully lowered and retracted position.

DO NOT operate the lift if it is damaged or not running properly.

DO NOT overload the basket beyond the rated capacity.

DO NOT attempt to service the lift unless it is fully lowered and air supply is shut off. (If lift must be raised for service, the assembly **MUST** be securely supported, so it can not descend)

DO NOT allow the lift to become excessively dirty. Periodically clean off paint over spray and/or debris that may accumulate.

TITAN LIFT MAINTENANCE

- 1. TROUBLE SHOOTING – YOUR TITAN LIFT IS DESIGNED AND BUILT TO GIVE YEARS OF TROUBLE FREE SERVICE. HOWEVER, BECAUSE MECHANICAL PARTS CAN AND DO FAIL, PROBLEMS MAY OCCUR. LISTED BELOW IS A TROUBLE SHOOTING GUIDE WHICH WILL ASSIST IN DIAGNOSIS AND RESOLUTION TO THE PROBLEM.**

PROBLEM & CAUSE

SOLUTION

1. Lift Will Not Operate.

Main air supply off or line pinched.

Turn on air supply or check hoses.

Air pressure regulator needs adjustment.

Adjust air regulator.

Plugged air filter.

Replace or clean filter.

2. Lift Operates Slow or Intermittent.

Air supply line is pinched.

Inspected all air lines.

Low air pressure or air supply

Regulator must be set at 100 PSI- Air supply must consistently deliver 80 SCFM at 100 PSI.

High moisture content in air supply.

Inspect air dryer on compressor.

Plugged air filter or mufflers.

Clean or replace.

Lack of lubrication.

Lubricate all zerks.

Insufficient air lubrication.

Check fluid level and drip rate of lubricator.

3. Basket Will Not Move Vertically.

Ball screw air motor will not rotate.

Repair or replace.

Quick exhaust muffler plugged.

Replace.

Air brake on Z-axis not working.

Repair or replace.

Z-axis shuttle valve malfunction.

Replace.

Pilot valve not shifting

Repair or replace.

4. Erratic or Loss of Vertical Control.

Quick exhaust muffler plugged.

Replace.

Leaking valve.

Repair or replace.

Pilot valve or shuttle valve sticking.

Replace.

Ball screw dry or contaminated.

Clean & lubricate.

- | | |
|--|---|
| <p>5. <u>Basket Will Not Descend.</u>
 Safety stop latch caught on safety catches on mast beam when trying to descend.</p> <p>Safety stop is not releasing.</p> <p>STOP!</p> | <p>This may happen at times when safety latch is near a safety catch when descent is stopped and then started. Simply go up briefly and then down again. Do not force down.</p> <p>Repair – DO NOT RUN LIFT WITH FAULTY SAFETY</p> |
| <p>6. <u>Slow or Erratic Movement Along Rails</u>
 Upper rail not parallel with lower track.</p> <p>Rails obstructed or rail joints not smooth.</p> <p>Drive chain tension incorrect.</p> <p>Some type of obstruction in drive chain.</p> | <p>Rail must be re-aligned.</p> <p>Clean rails or grind rail joints.</p> <p>Adjust chain tension.</p> <p>Inspect.</p> |
| <p>7. <u>Unit is Extremely Noisy When Moving Vertically.</u>
 Missing muffler.</p> <p>Damaged ball screw or lack of lubrication.</p> | <p>Replace</p> <p>CALL FACTORY.</p> |
| <p>8. <u>Basket Will Not Extend or Retract.</u>
 Damaged scissors linear actuator</p> | <p>CALL FACTORY.</p> |
| <p>9. <u>Basket Extends and Retracts Slowly</u>
 Scissors arm cams are obstructed</p> <p>Failed cam bearings.</p> | <p>Clean channels.</p> <p>Replace.</p> |
| <p>10. <u>Unit Continues to Run After Release of “Joy stick”.</u>
 Shuttle or pilot valve sticking.</p> <p>Leaking valve.</p> <p>Leaking or pinched air line.</p> <p>Control valve muffler plugged.</p> | <p>Replace.</p> <p>Replace.</p> <p>Inspect & repair as necessary.</p> <p>Clean or replace.</p> |
| <p>11. <u>Air Motors Not Running or Running Slow</u>
 Motor temperature excessively hot.</p> <p>Motor will not run.</p> <p>Runs normally then slows.</p> | <p>Lack of lubrication.</p> <p>Check air supply/muffler.
 Check lubrication.
 Replace motor.</p> <p>Confirm 100 PSI air pressure.</p> |

	Defective air motor/replace.
Low Torque.	Lack of lubrication, misalignment, internal corrosion, inadequate air pressure.
Low Speed.	Lack of lubrication, misalignment, internal corrosion, inadequate air pressure.

TITAN LIFT

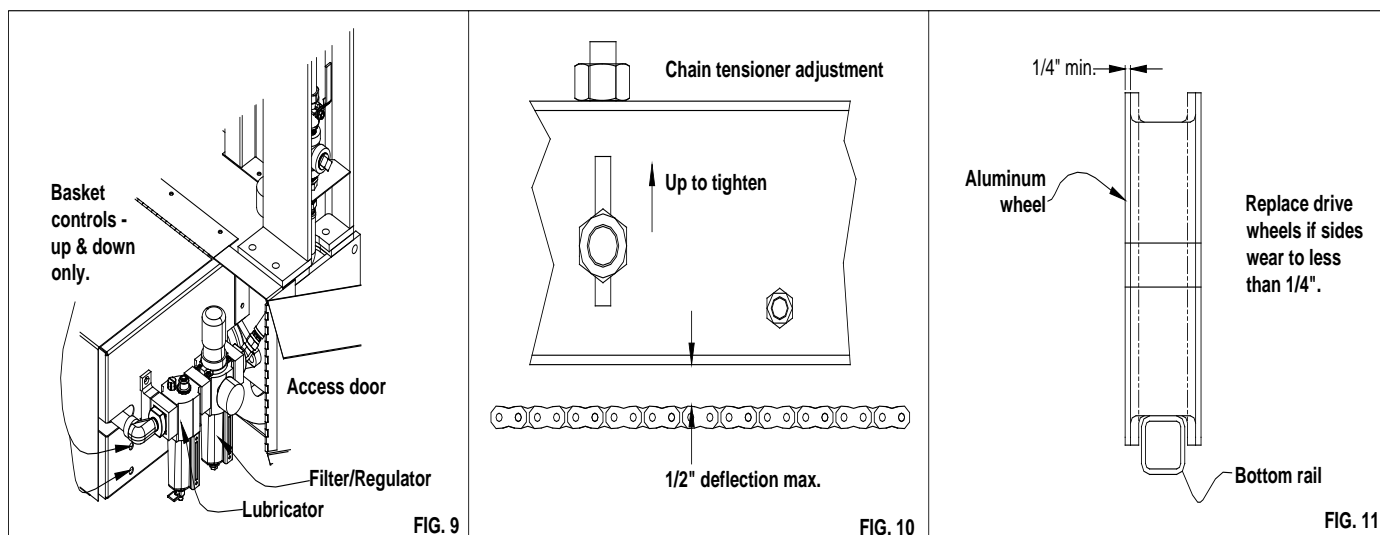
2. GENERAL MAINTENANCE INFORMATION

A. FILTER/REGULATOR

A combination filter/regulator is installed in the base of the unit (see fig. 9) which filters out contamination and small amounts of moisture for the air supply. This device is equipped with an automatic float valve to drain off normal amounts of moisture. However, if there is too much moisture in the air, the customer will need to install a dryer in the supply line that is feeding the unit. The regulator should be set at 100 PSI.

B. AIR LUBRICATOR

All pneumatic components in the Titan Lift are lubricated by an oil mist lubricator that is installed in the lower base of the unit (see fig. 9) next to the filter/regulator. The oil level should be checked daily and refilled when necessary. The oil mist is important for two reasons: 1. Lubrication and 2. Prevention of surface rust on internal components such as valves and air motors. Whenever adding oil to the lubricator the air supply must be shut off and drained by turning off the safety lockout valve (see fig. 7) in the unit base. Only good quality air tool oil should be used in the lubricator. If air tool oil is not available, use high quality petroleum based oil with a viscosity of 150-200 SSU at 100 deg. F. (Equivalent to SAE #10). Because some oils have additives which damage pneumatic components never substitute another type of oil. The oil delivery setting on the lubricator of 10-15 drops per minute is present at the factory and should not need readjustment. The rate can be checked by counting the number of drops of oil per minute in the feed sight dome.



C. BALLSCREW

The ball screw and nut must be inspected on a regular basis (see suggested PM schedule). Visually inspect the ball screw for signs of wear and/or damage. Clean the screw. If there are any signs of wear, flaking or pitting on the surface of the ball screw, both ball screw and nut must be replaced. Once the screw starts to deteriorate, rapid degradation will occur, therefore the screw and nut must be replaced to avoid catastrophic failure. If the ball screw is cleaned and inspected on a frequent basis, both screw and nut should last the life of the lift.

D. DRIVE CHAIN

The drive chain is located in the base of the unit and should be lubricated at least every 160 hours of use (see PM schedule) with a lubricant designed for industrial roller chain. The chain will need to be readjusted whenever more than $\frac{1}{2}$ " deflection can be measured between drive sprockets as shown (see fig. 10). Adjusting the chain tension is an easy task. Loosen the chain tensioner nut, raise chain tensioner to take up the slack, retighten tensioner nut. (see fig. 10) Note – If your lift has single wheel drive, ignore all items referenced in above mentioned D. Drive Chain.

E. GEAR BOXES

The gearboxes used in each Titan Lift have “sealed for life” bearings and should require little or no maintenance. Periodically make visual inspections and check for oil leaks.

F. ALUMINUM DRIVE WHEELS

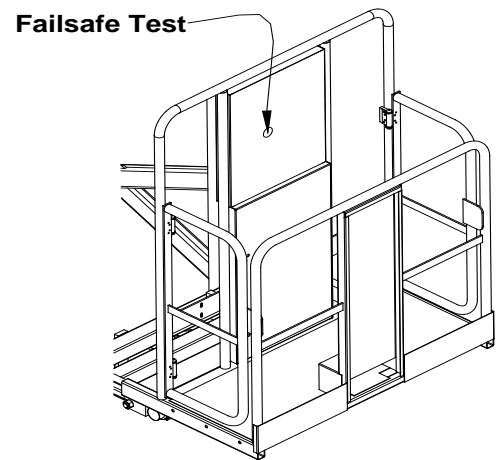
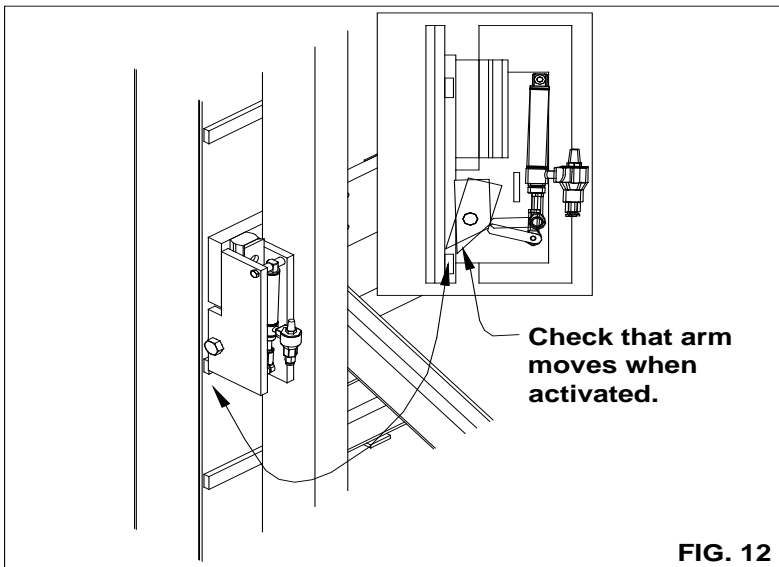
In order to reduce the possibility of sparking in an explosive environment, the drive wheels are made of aluminum. These wheels should be inspected periodically for damage or wear and replaced when excessive wear is

evident. The inner wheel flange may wear because of the force applied to the wheel by the lower rail. (see fig. 11)

G. SAFETY STOPS

The Titan Lift is equipped with safety devices to prevent uncontrolled descent of the basket. The first safety device is a pneumatic brake mounted between the air motor and gear box on the ball screw drive. The brake is released by air pressure when the Z-axis control valve is activated. This is a “FAILSAFE” device that will be energized with loss of air supply. The second safety device is a mechanical stop which will lock onto stops that are welded on the mast columns. This safety device is applied by an air cylinder that is released by air pressure when the Z-axis control valve is activated. The air cylinder and linkage will also operate instantaneously when excessive vertical acceleration is detected. This will minimize free fall to a maximum of 6 in. This assembly should be inspected periodically to insure proper operation (see PM schedule & fig. 12).

**NOTE: 1.) THE MOUNTING BOLTS MUST BE TORQUED TO 150 FT. LBS. IF THE SAFETY LATCH IS REMOVED OR REPLACED FOR WHATEVER REASON.
2.) IT IS CRUCIAL TO THE SAFETY OF OPERATING PERSONNEL THAT THIS DEVICE BE TESTED ON A DAILY BASIS TO VERIFY ITS PERFORMANCE.**



FAILSAFE TEST

To test the operation of the failsafe device, locate the test hole on the front of the unit and slightly lift the weighted arm which is located just inside the test hole. (see fig. 13). When the arm is lifted, a click will be heard inside the device which will disable the safety stop cylinder. Verify that the safety stop does not release by trying to operate the Z-axis controls downward. Push the reset button on the front of the control panel to return the safety stop to the normal position. If the device does not work properly, check all air lines to see that they are installed correctly and that there are no air leaks.

NOTE: If this device does not work properly, or ever engages due to a drive line failure, immediately contact Titan Air Inc. for further instructions.

H. SUGGESTED PREVENTATIVE MAINTENANCE PROGRAM

ITEM	QTY	MAINTENANCE REQUIRED	FREQUENCY
Lubricator	1	Check level and fill as needed	Daily
Grease Ball Nut	1	White lithium on ball screw	40 Hours
Ball Screw	1	Clean & inspect for signs of damage or excessive wear	40 Hours
Scissor Arm Actuator	1	Inspect and lubricate	160 Hours
Drive wheel flange bearings.	4	Grease Fittings(until excess shows)	1000 Hours
Drive wheel chain & sprockets	2	Lubricate & adjust if necessary (See General Maintenance Information for details.)	120 Hours
Aluminum drive wheels	2	Inspect for sign of excessive wear, replace as needed	1000 Hours
Mechanical Safety Stop	2	Inspect all mechanical components, follow “failsafe” test. (See General Maintenance Information for details.)	40 Hours
Fasteners		Check for loose fasteners, tighten as needed	1000
Hoses		Visually inspect for wear or damage, replace as needed	1000
Decals		Clean or replace if necessary	As needed
Cleaning		Remove dirt & paint buildup, relube as needed	As needed
Exhaust Valves		Replace	As needed
Air Motor Mufflers		Replace	As needed

TITAN LIFT WARRANTY

12/04

Titan Air Inc. hereby warrants its products against defects in material and workmanship for a period of (13) thirteen months from date of shipment.

Titan Air Inc. reserves the right to replace or repair free of charge, any part proven by Titan Air Inc. to be defective. Prompt notification of defective part must be provided to Titan Air Inc. and the defective part must be returned freight prepaid within (30) thirty days of notification. (Air mufflers not covered by warranty)

Warranty includes only parts supplied by Titan Air Inc. Incidental costs and labor charges shall be the responsibility of others. Locally purchased parts will not be reimbursed w/o Titan Air Inc. prior approval.

All warranty parts are to be obtained from Titan Air Inc. This warranty is void if attempts to correct or repair any alleged defective part or parts are made by unauthorized personnel without Titan Air Inc. written approval.

In no event shall Titan Air Inc. be held liable for any damage, incidental or consequential, arising from the installation, performance or operation of the product.

This warranty supersedes voids and/or is in lieu of any other verbal or written understanding which may not be in total accordance with this expressed warranty.

TITAN LIFT

PARTS RETURN POLICY

All warranty parts are to be obtained from Titan Air Inc.

Locally purchased parts will not be reimbursed.

When ordering replacement parts, it is important to have the following information available:

- 1. Serial number of the lift (This is on the lift ID plate).**
- 2. Part number or description of part needed.**
- 3. Explanation of failure/defect.**
- 4. Complete shipping and billing instructions.**
 - a.) Ship to address.**
 - b.) Shipping method desired (Regular UPS, Next day air etc.)**
 - c.) Billing address including your purchase order number.**
 - d.) A warranty tag will accompany the replacement part.
The customer shall fill out the information required on the tag and return it with the defective part.**
 - e.) The defective part with return tag must be returned to Titan Air Inc. prepaid within 30 days to receive credit.**

You will be billed for the part(s) immediately. Credit will be issued for warranty parts after the defective part(s) have been returned to the factory.

TITAN LIFT

TITAN CROSS REFERENCE PART NO. AND DESCRIPTION SUGGESTED SPARE PARTS (2ND GENERATION)

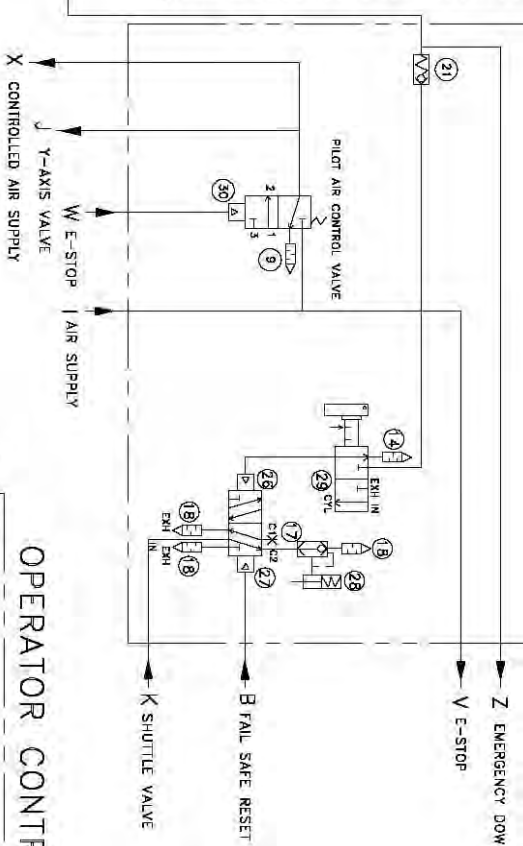
DESCRIPTION/FUNCTION	LOCATION	TITAN PT. NO.	QTY/ LIFT
VALVES-HUMPHREY			
FLOOR MOUNTED MANUAL UP/DOWN CONTROL	LOWER BASE	4-06-50-00352	2
WEIGHT BAR PILOT VALVE	FAIL SAFE CONTROL BOX	4-06-50-00214	1
AIR PILOT OPERATOR	FAIL SAFE CONTROL BOX	4-06-50-00222	1
FAIL SAFE CONTROL VALVE	FAIL SAFE CONTROL BOX	4-06-50-00215	1
QUICK EXHAUST	Z-AXIS CONT VALVE	4-06-50-00184	2
VALVES-AAA			
SPOOL VALVE	X AXIS & Z AXIS CONTROL	4-06-50-00343	2
VALVES-NORGREN			
CONTROL AIR SUPPLY VALVE	CONTROL PANEL	4-06-50-00357	1
DOWN LIMIT SWITCH	TOP OF RUNNING GEAR	4-06-50-00355	1
E-STOP	OPERATOR CONTROL PANEL	4-06-50-00358	1
VALVES-DELTROL			
SHUTTLE VALVE	Z-AXIS CONTROL VALVE	4-06-50-00351	1
CHECK VALVE	FAILSAFE/ACCUMULATOR	4-06-50-00353	1
QUICK EXHAUST VALVE (3-AXIS ONLY)	AIR MOTORS (Y & Z AXIS)	4-06-50-00242	3
QUICK EXHAUST VALVE (2-AXIS ONLY)	AIR MOTORS (Z AXIS)	4-06-50-00242	1
VALVES- MILTON			
¼ RELIEF VALVE	MAIN AIR SUPPLY	4-06-50-00342	1
VALVES-DYNAQUIP			
LOCKABLE BALL VALVE	MAIN AIR SUPPLY	4-06-50-00309	1
VALVES-CONTROL DEVICES			
(GRANGER)RELIEF VALVE	CONTROL PANEL	4-06-50-00347	1
VALVES-ARO			
Y-AXIS CONTROL VALVE	BASE ASSEMBLY	4-06-50-00345	1
JOY STICK CONTROL X-Y-Z AXIS	OPERATOR CONTROL PANEL	4-06-50-00356	3
BEARINGS-MRC			
4" DIA. MAST ROLLER	SIDE PLATES	4-06-20-00165	4
BEARINGS-NSK			
FESTOON ROLLERS	FESTOON TROLLEYS	4-06-30-00300	4/F
BEARINGS-FAFNIR			
DRIVE WHEEL FLANGE BRG.	BASE ASSEMBLY	4-06-01-00008	4
BEARINGS-McGill			
CAM FOLLOWER	SIDE PLATE	4-06-20-00164	4
BEARING-P.C.I.			

TOP RAIL HORIZONTAL TRAVEL GUIDE	MAST TOP TUBE	4-06-30-00259	2
FIXED BASKET ROLL OUT GUIDE BRG.	ROLL OUT RAILS	4-06-60-00201	2
BASKET ROLL OUT RAIL BRG.	BASKET FRAME	4-06-20-00043	2
SCISSOR ARM BACK PLATE CHANNEL	OUTTER SCISSOR ARM	4-06-80-00163	2
SCISSOR ARM BASKET CHANNEL.	INNER SCISSOR ARM	4-06-20-00043	3
MUFFLERS			
ARROW AIR EXHAUST MUFFLERS	1/8" NPT LOCATIONS	4-06-50-00217	8
	¼" NPT LOCATIONS	4-06-50-00186	1
	3/8" NPT LOCATIONS	4-06-50-00346	4
	½" NPT LOCATIONS	4-06-50-00350	1
	AS SHOWN ON DWG	4-06-50-00021	3
	AS SHOWN ON DWG	4-06-50-00349	6
MCMASTER CARR MUFFLER	½" NPT LOCATIONS	4-06-50-00348	1
ALLIED WITAN	BALL SCREW AIR MTR	4-06-50-00354	1
CONE/TEXTRON GEAR BOX			
60:1	HORIZONTAL DRIVE BOX	4-06-01-00044	1
20:1	VERTICAL BALL SCREW BOX	4-06-01-00341	1
AIR BRAKE-NEXON			
(SE100-1-.625)	BALL SCREW	4-06-01-00022	1
STUB SHAFT FOR BRAKE	AIR BRAKE		1
ACTUATOR – JOYCE/DAYTON			
	SCISSORS ARM TO BASKET	4-06-60-00237	1
AIR MOTORS			
INGERSOLL RAND	HORIZ. DRIVE & BALL SCREW	4-06-50-00241	1
	BASKET EXT./RETRACT	4-06-50-00021	2
AIR CYLINDER			
BIMBA	EMERGENCY LATCH	4-06-50-00181	2
FILTER/REG/LUBRICATOR			
NORGREN	BASE	4-06-50-00127	1
	BASE	4-06-50-00126	1
Quick clamp	FRL	4-06-50-00128	2
Quick clamp & wall bracket	FRL	4-06-50-00129	2
Quick Exhaust Pipe Adaptor	FRL	4-06-50-00328	2
LINE/HOSE TRACK			
IGUS			
KABEL SCHLEPP			

ITEM	PART #	TITAN PART #
1	WINDUP - 3/4" - Air Shut-Off	4-08-50-00109
2	WINDUP - 3/4" - Air Shut-Off	4-08-50-00109
3	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
4	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
5	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
6	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
7	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
8	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
9	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
10	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
11	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
12	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
13	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
14	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
15	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
16	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
17	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
18	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
19	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
20	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
21	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
22	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
23	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
24	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
25	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
26	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
27	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
28	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
29	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
30	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
31	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
32	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109
33	NORLEN - 1/2" - Air Shut-Off	4-08-50-00109

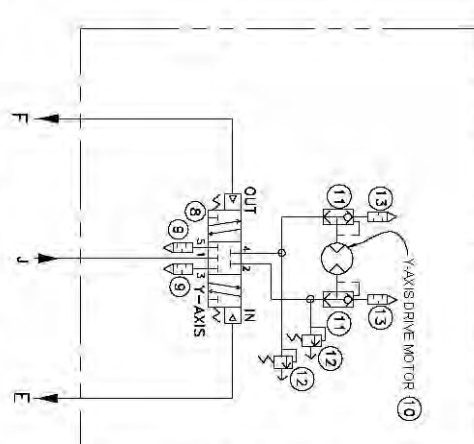
OPERATOR CONTROL UPPER BACK PANEL

FAIL SAFE SYSTEM

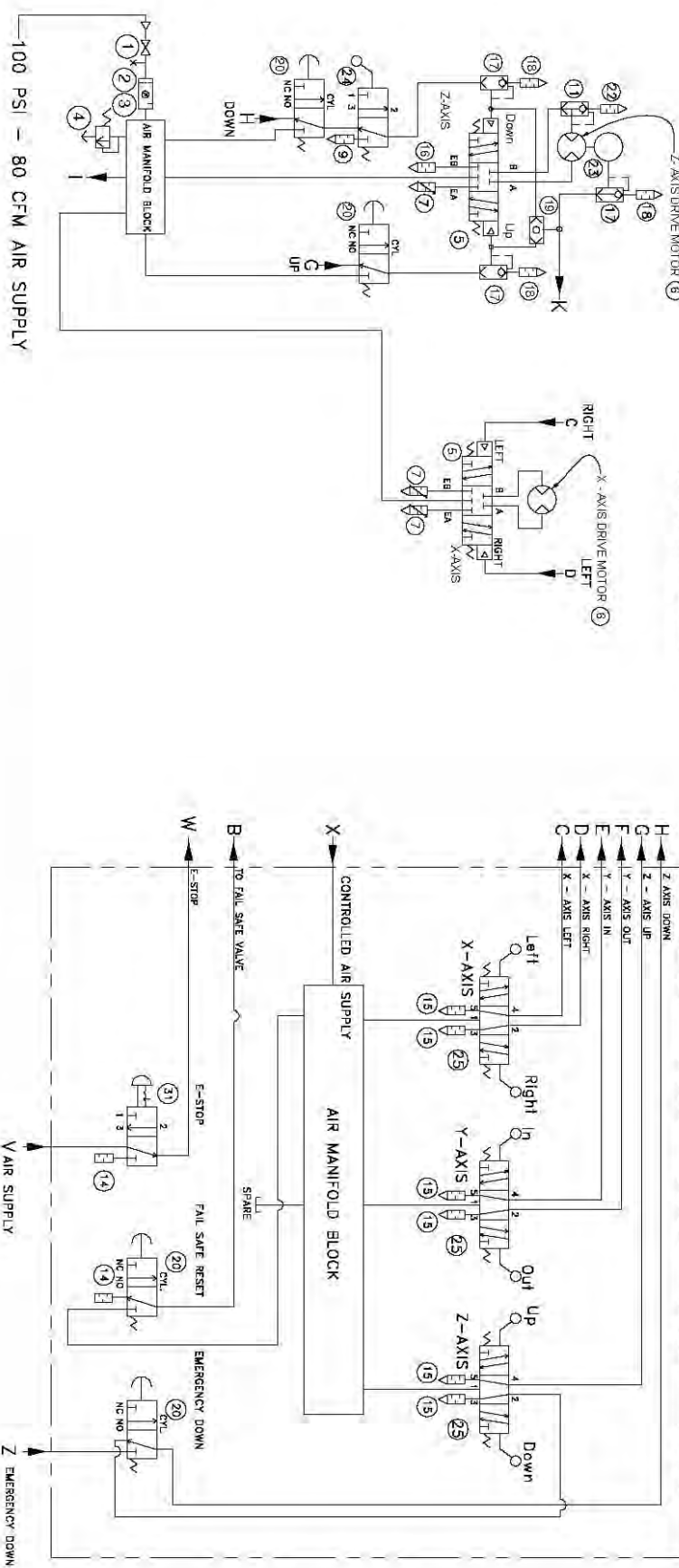


OPERATOR CONTROL LOWER BACK PANEL

Y-AXIS DRIVE MOTOR



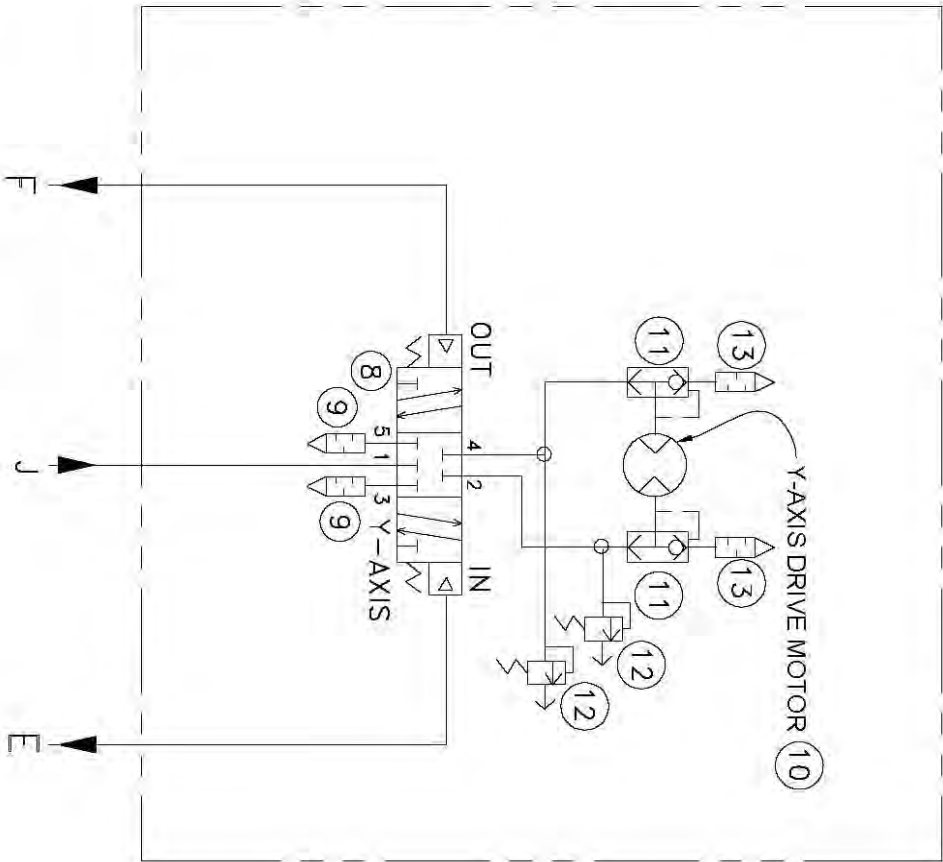
OPERATOR CONTROL PANEL-FRONT



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						MATERIAL: N/A		DRAWN DATE: 12-22-04				ISSUE NUMBER: 00	

ITEM:	PART #:	TITAN PART #:
8	ARO - M313 4PD - 3pos. 4way Valve	4-06-50-00345
9	ASP-3 - Muffler	4-06-50-00346
10	Cast - 4AM-NRV-70C - Air Motor	4-06-50-00241
11	EV30A2 - Quick Exhaust	4-06-50-00242
12	Granger - NC25-002 - Relief Valve	4-06-50-00347
13	McMaster Carr 4869K14 - Muffler	4-06-50-00348

OPERATOR CONTROL LOWER BACK PANEL



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DRAWING NAME:
DESCRIPTION:
2ND. GENERATION SCHEMATIC
OPERATOR CONTROL LOWER BACK

PRODUCT LINE:
2nd. Generation Lifts
MATERIAL:
N/A

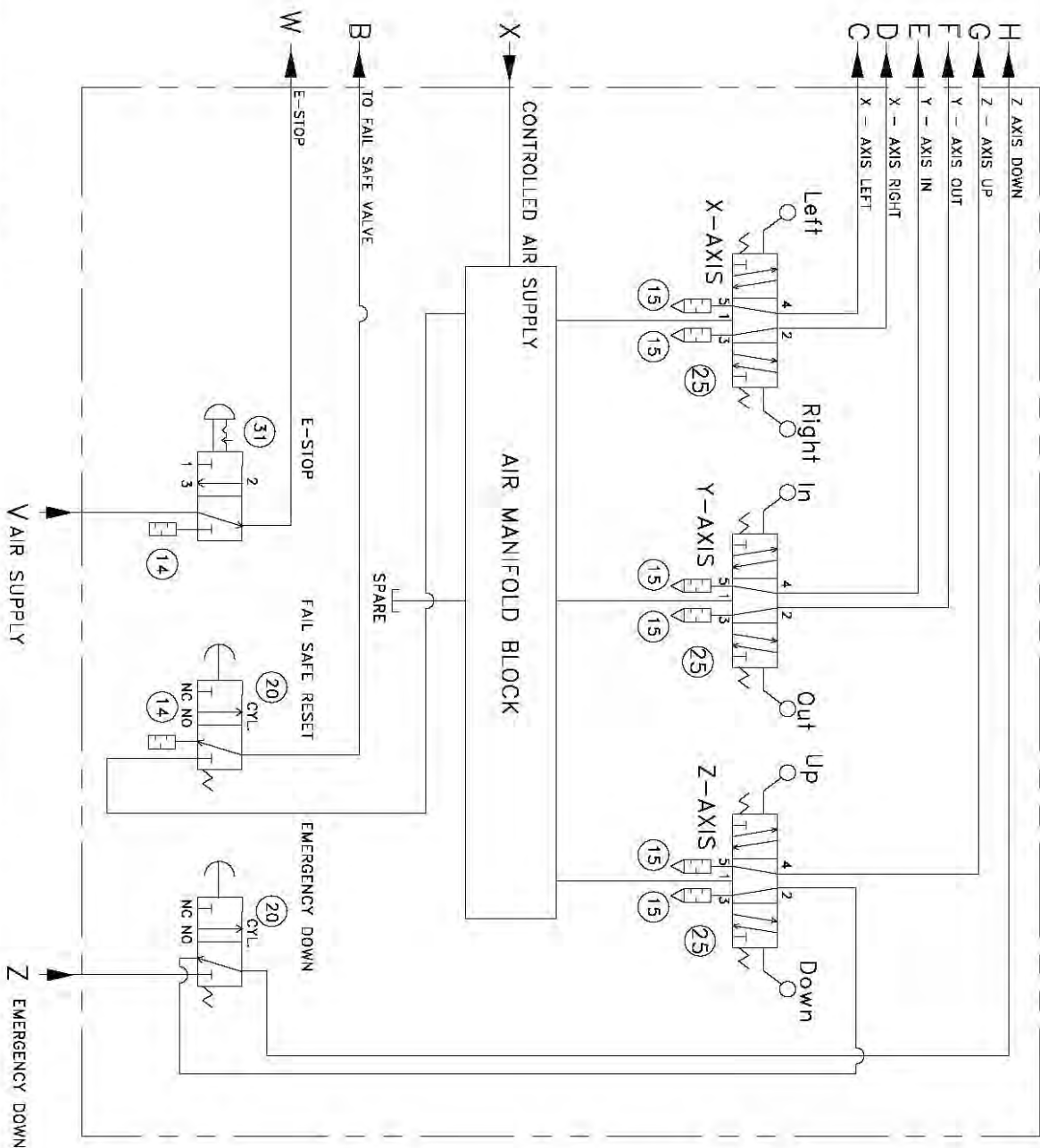
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BOB GYNNILD
DRAWN DATE:
12-22-04

SCALE:
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DRAWING NUMBER:
4-03-50-00340

SHEET NUMBER:
1 of 1
ISLE NUMBER:
00

ITEM:	PART #:	TITAN PART #:
14	ASP-1 - Muffler	4-06-50-00217
15	ASP-4BY - Muffler	4-06-50-00349
20	Humphry - 3P - 2pos. 3way Button Valve	4-06-50-00352
25	ARO E712LS, 3 Pos. - 4 Way Valve	4-06-50-00356
31	NORGREN WH12BDA31C005 - 2 POS./3 WAY VALVE	4-06-50-00358

OPERATOR CONTROL PANEL-FRONT



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DRAWING NAME:
 2ND. GENERATION SCHEMATIC
 OPERATOR CONTROL FRONT

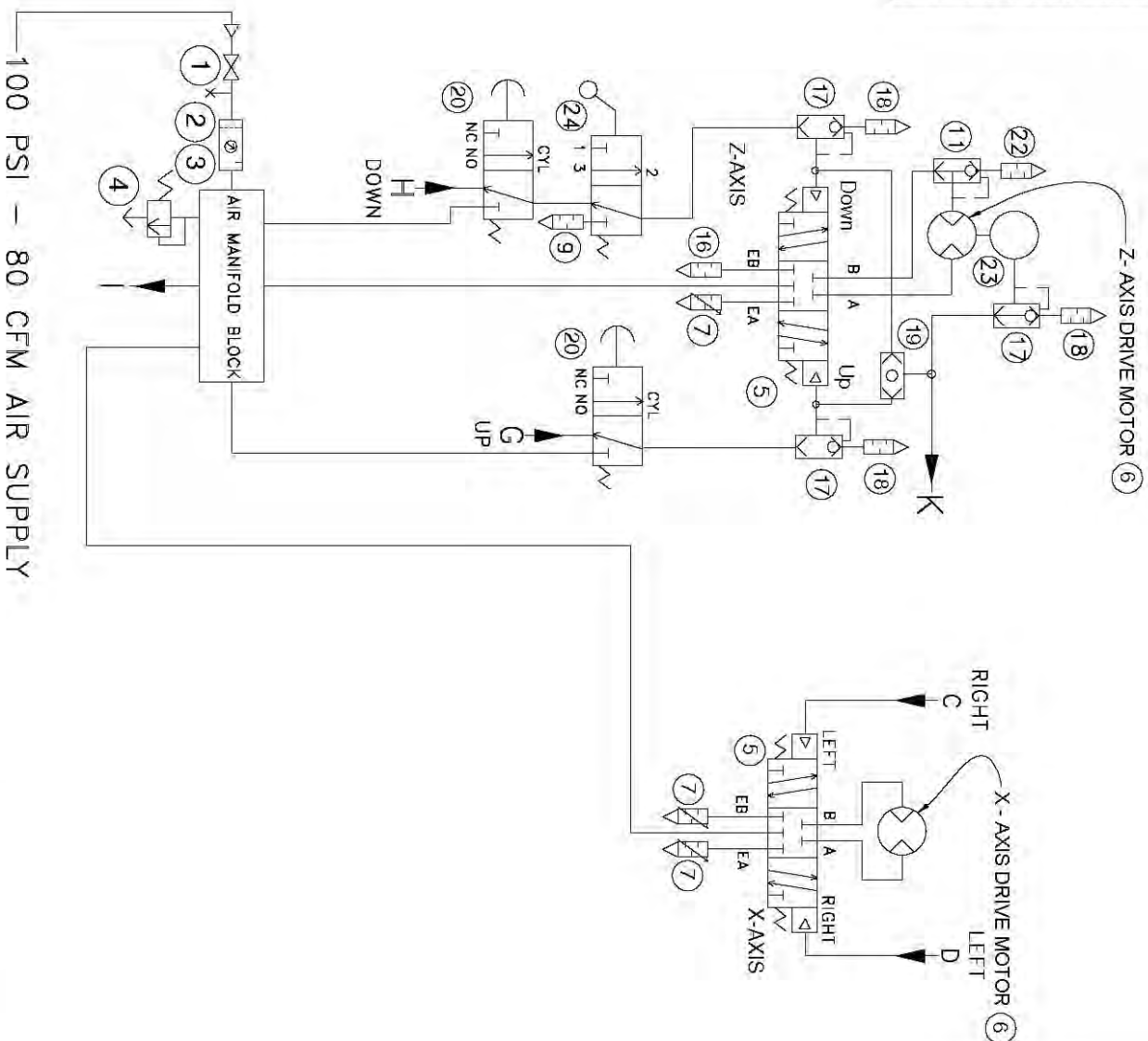
PRODUCT LINE:
 2nd. Generation Lifts
 MATERIAL: N/A

DRAWN BY:
 BOB GYNNILD
 DRAWN DATE:
 12-22-04

SCALE:
 1 = 1
 DRAWING NUMBER:
 4-03-50-00340

SHEET NUMBER:
 1 of 1
 ISSUE NUMBER:
 00

ITEM:	PART #:	TITAN PART #:
1	Dynoquip - VMH2-A9JP 3/4" - Air Shut-Off	4-06-50-003309
2	Norgren - B74M-44K-AD33MG - Filter/Regulator	4-06-50-001127
3	Norgren - L74M-44P-QDN - Lubricator	4-06-50-001026
4	Milton - 1/4" NPT - Relief Valve 1090-150	4-06-50-003342
5	AAA - RY4 - 3pos. 4way Valve	4-06-50-003343
6	Gast - 6AM-NRV-22H - Air Motor	4-06-50-00021
7	Arrow - ASP-4SC - Flow Control/Muffler	4-06-50-00344
9	ASP-3 - Muffler	4-06-50-00344
11	EV30A2 - Quick Exhaust	4-06-50-00346
16	ASP-4 - Muffler	4-06-50-00350
17	Humphrey - SQEI - Quick Exhaust	4-06-50-00184
18	ASP-2 - Muffler	4-06-50-00186
19	SV10B - Shuttle Valve	4-06-50-00351
20	Humphrey - 3JP - 2pos. 3way Button Valve	4-06-50-00352
22	MOS 1 1/2" NPT-Exhaust Muffler-ALLIED WITHAN 0111005	4-06-50-00354
23	SE 1001 0.625 bore - Brake - Nexon	4-06-01-00022
24	Norgren - K41EAKSIKR4 - 2pos. 3way Valve	4-06-50-00355



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DRAWING NAME:
DESCRIPTION:

2ND. GENERATION SCHEMATIC BASE MOUNTED

PRODUCT LINE:

2nd. Generation Lifts

MATERIAL:

N/A

DRAWN BY:

BOB GYNNILD

12-22-04

SCALE:

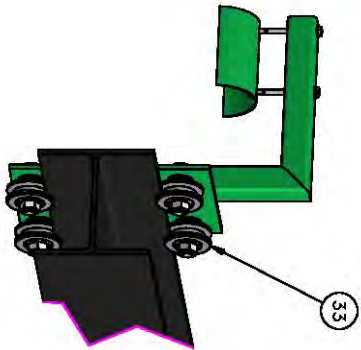
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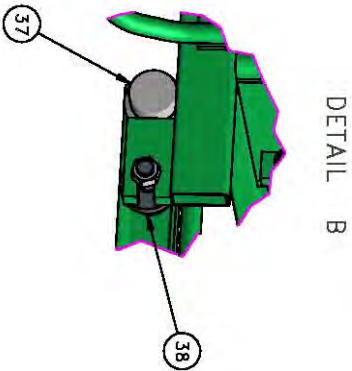
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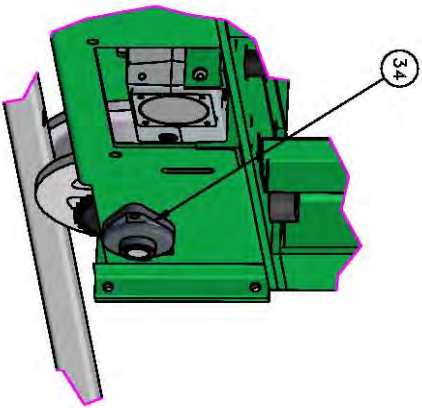
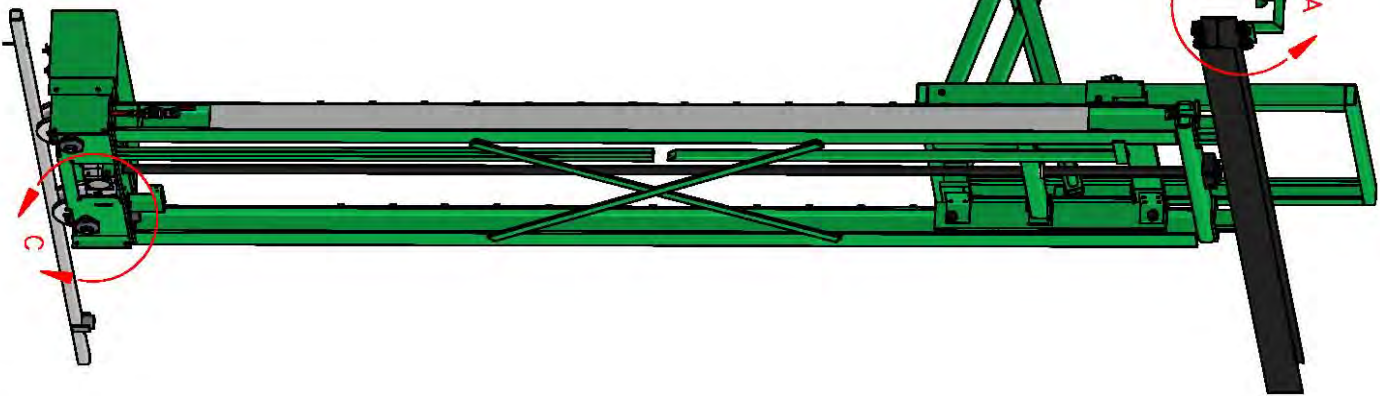
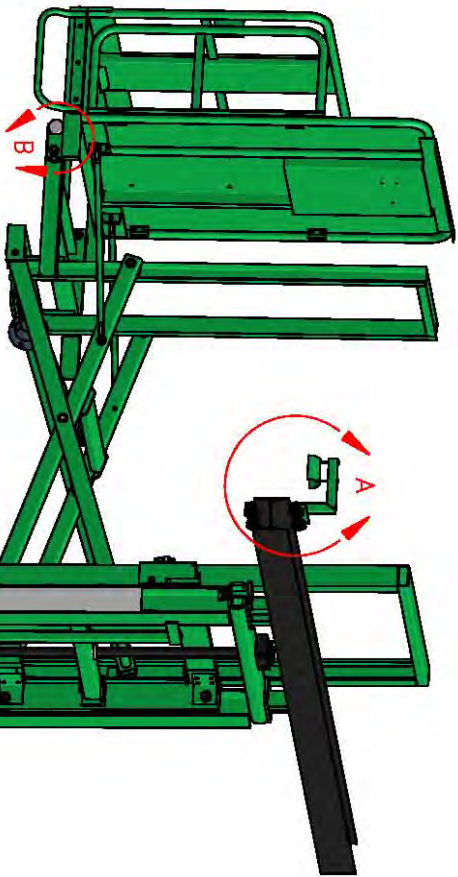
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DETAIL A



DETAIL B



DETAIL C



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.000 = $\pm .005$

DESCRIPTION:
SUGGESTED SPARE PARTS
DRAWN BY:

ASSEMBLY #:

DRAWING #:

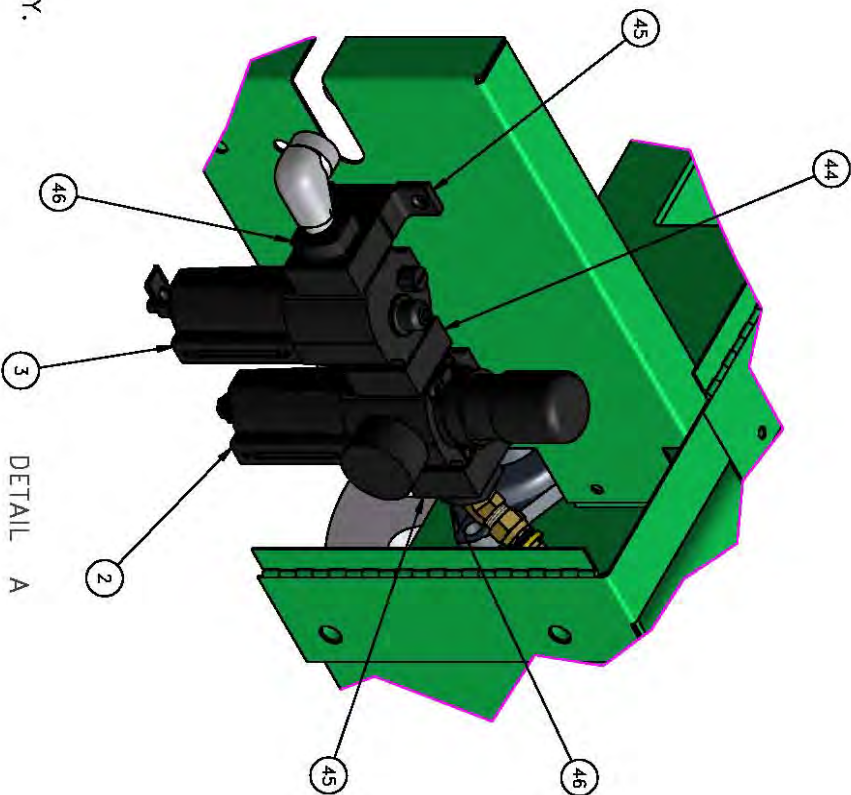
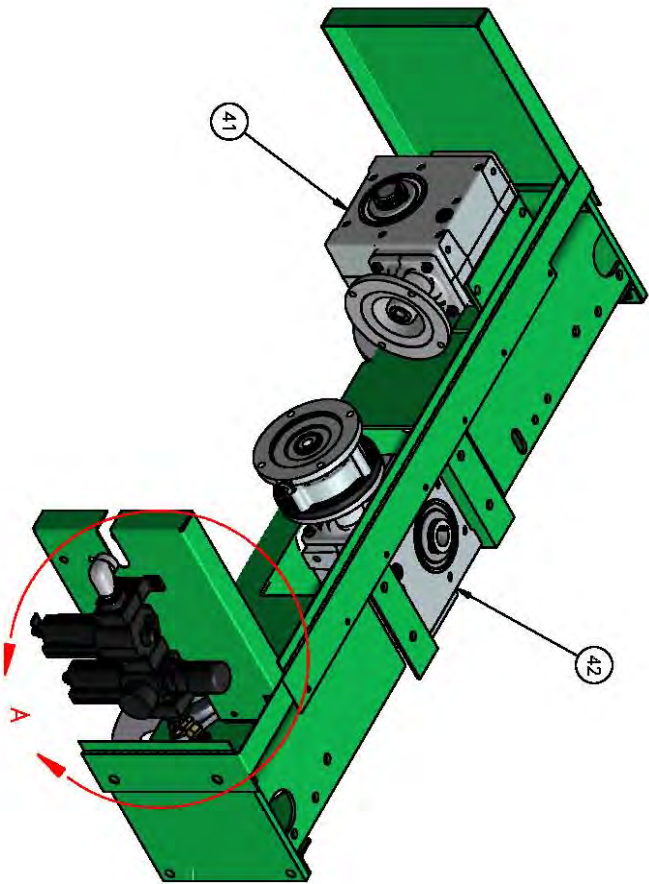
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PRODUCT LINE:

SCALE:

MATERIAL:
SHEET #:

REVISION #:



ASSEMBLY COVER & TUBE TOP PLATE NOT SHOWN FOR CLARITY.



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DRAWN BY:

DRAWING #:

ASSEMBLY #:

PRODUCT LINE:

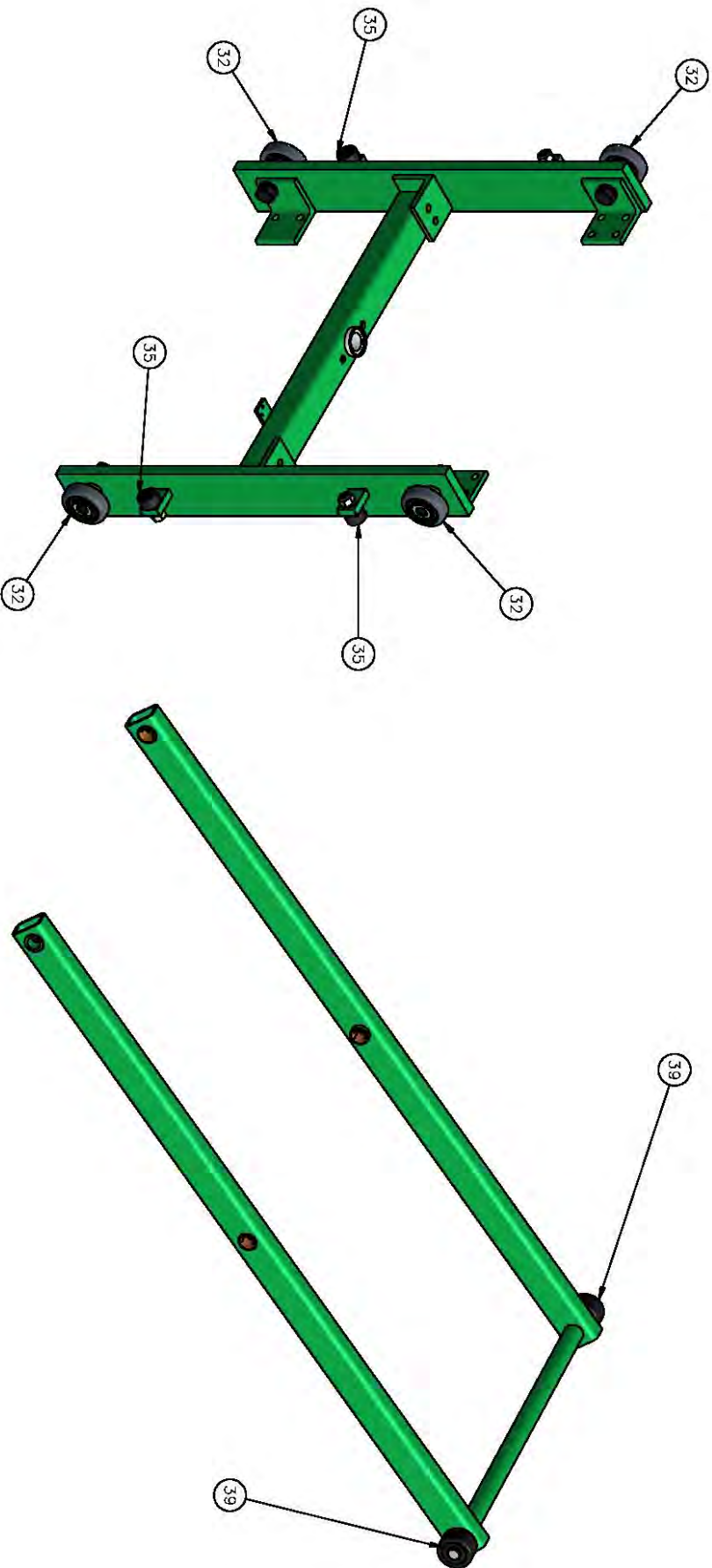
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ASSEMBLY #:

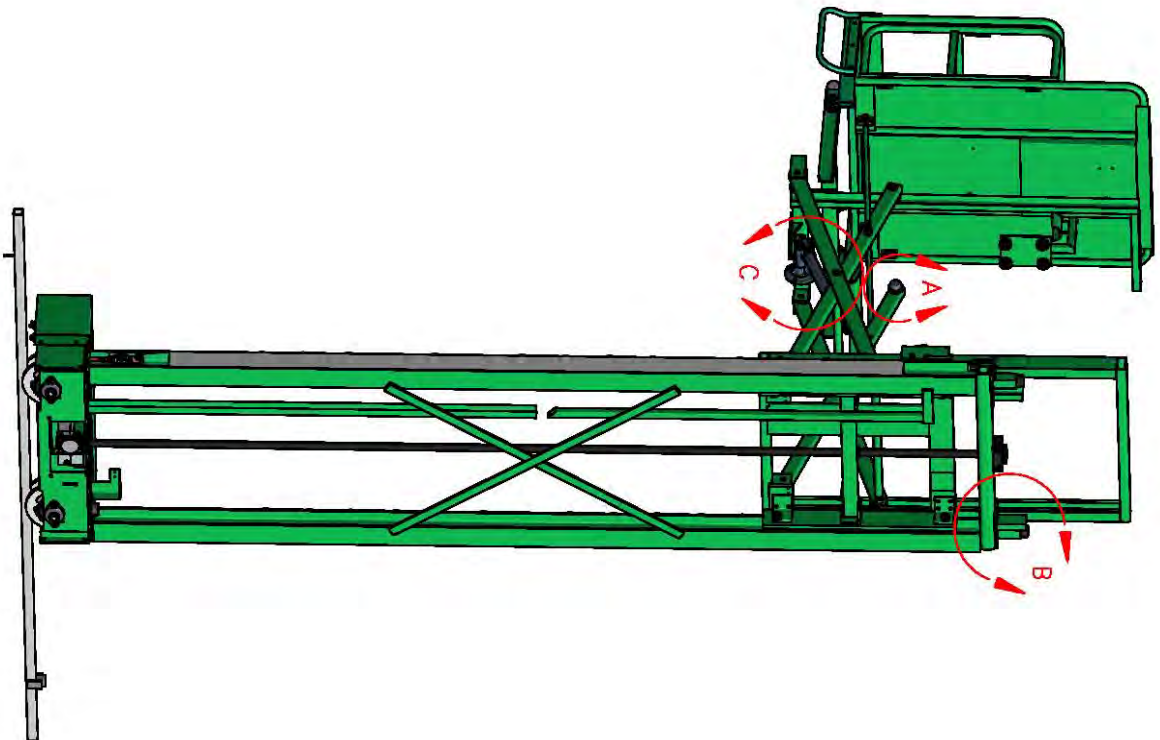
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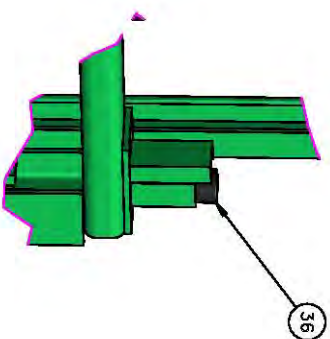
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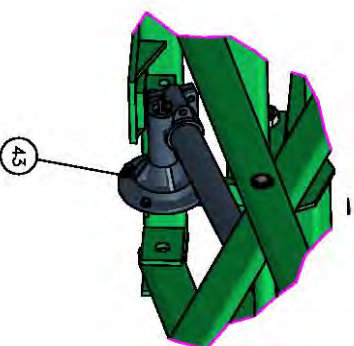
REVISION #:



DETAIL A



DETAIL B



DETAIL C

TOP RAIL (I-BEAM) & BASKET "C" CHANNEL NOT SHOWN FOR CLARITY.



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DESCRIPTION:
SUGGESTED SPARE PARTS
DRAWN BY:

DRAWING #:
ASSEMBLY #:

DATE:
SCALE:

PRODUCT LINE:
MATERIAL:
SHEET #:

REVISION #: