Turboway Passenger Boarding Ramp
Operations & Parts Manual

Maintenance Schedule

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• Overview •

The KCI Turboway Passenger Boarding Ramp is a universal ramp designed to serve regional aircraft such as the Q-400 up to the CRJ 900. The Turboway Boarding Ramp allows for a seamless boarding process for all passengers. This ramp, with its adjustable slope and pivoting bridge, provides for a faster, safer, and more economical means of boarding and deplaning. The Turboway Passenger Ramp is comfortably sloped, non-motorized, and easy to operate. The combination of steel and aluminum construction, non-skid surface, provides strength and versatility.

• *Tow Bar and Towing the Ramp* •

1. Ensure the ramp is fully lowered prior to towing the ramp. Remove the tow bar from the holding tube located on the left side of the Turboway ramp.

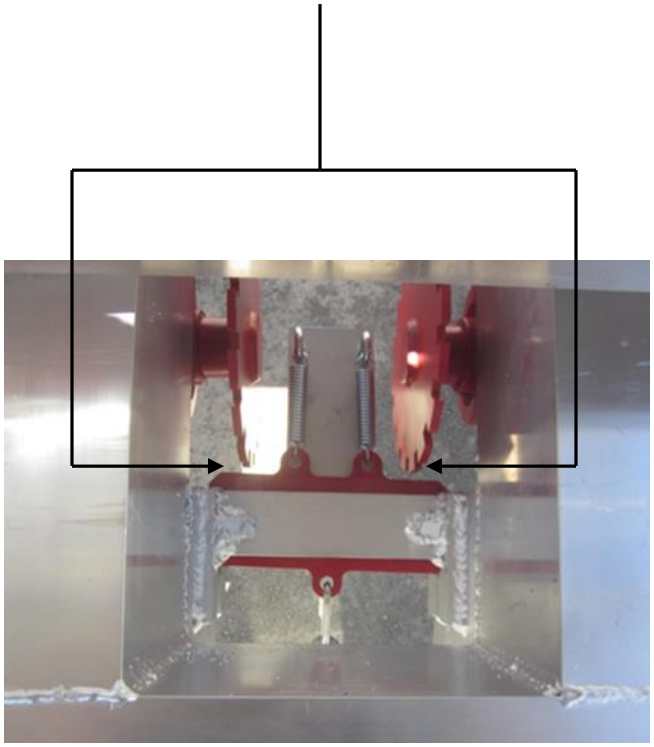
2. Install in mount at the swivel castor end of the ramp below the lower bridge and secure with the hitch pin provided.

When towing, do not exceed 10 MPH as damage to the swivel castors can occur.

Do not back up using the tow bar.

The tow bar should always be stowed in the holding tube when not in use.

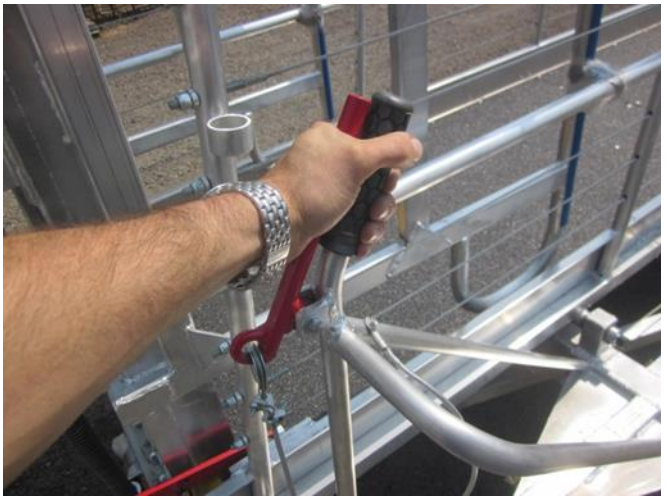
Visually check and verify the brake plate is fully disengaged prior to towing the ramp.



• *Brake Station and Towing or Moving the Ramp* •

The Turboway Passenger Ramp has a brake/push station located to the right of the lower bridge.

3. For moving the ramp by hand, simply grasp and squeeze the brake handle as shown.



4. For towing the ramp, hold the brake handle and place the brake cup over the brake handle, the brake cup will keep the brakes disengaged while towing.

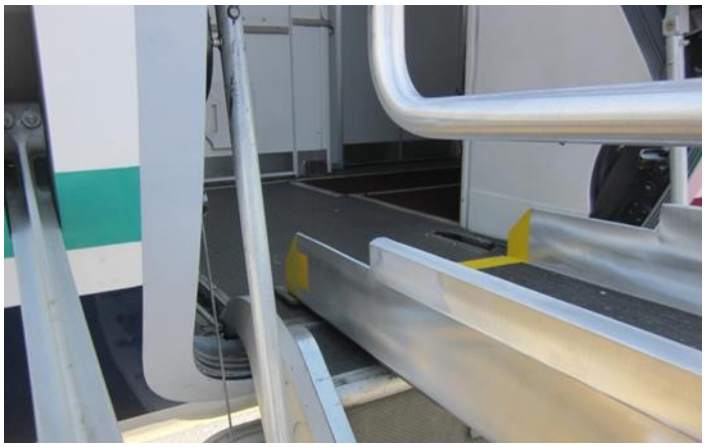
5. When towing is complete, remove the brake cup and verify the brakes are locked.

Visually check and verify brake plate is fully disengaged prior to towing the ramp.

• *Initial Setup* •

1. The ramp is to be maneuvered from the end with the castor wheels; this end will be farthest from the aircraft when the ramp is in place.

2. The operator must be positioned at the push station located at the lower right end of the ramp when pushing into place. The ramp will not move unless the brake lever is depressed and held in that position for movement.



3. Open the aircraft cabin door.

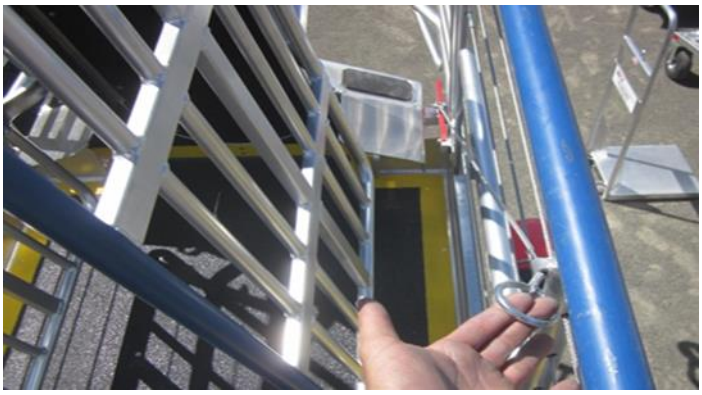
4. Push the ramp to within approximately four (4) feet of the aircraft. Every attempt should be made to center the ramps upper bridge with the door opening.

5. The ramp should be set 1-3 inches above the aircraft doorsill.

6. Adjust the height of the ramp as required. (Refer to Page 16).

7. Lift up on the safety latch of the lower bridge and deploy, do not allow the lower bridge to drop of its own weight.

8. Proceed up the ramp, grasp the pull ring to release the upper bridge and carefully lower into the aircraft cabin. The upper bridge should rest on the cabin floor 4-6” inside of the cabin. The upper bridge should **never** rest on the top step of the aircraft airstair door. Adjust position and height of the ramp if necessary.



• *Initial Setup Continued* •

9. When proper positioning has been achieved, extend the locator rod until the orange bumper makes contact with the fuselage and mark for type aircraft being serviced.

• *Setting the Ramp Height* •

Prior to aircraft arrival, adjust the ramp so the height is 1-3” above the aircraft door sill height. Door sill heights and ramp settings can be found on page 17.

1. Move the hydraulic pump valve to the full counter clockwise (closed) position.

2. Operate the pump so as to raise the ramp to the desired height. Located on the “H-Frame” are type aircraft decals, raise the ramp until the bottom of the black bumper pad is even with the type aircraft decal.

3. From the side of the ramp with the pump, lift the support chain from its lock slot and pull tight, reinstall in the lock slot. (Described on page 18).

4. Once the support chain has been pulled tight, move the hydraulic pump valve to the clockwise position (open position) to release the hydraulic pressure. This will allow for the ramp to rest on the support chain.

Under no circumstances should the height of the ramp be adjusted with someone on it!

The weight of the ramp must always rest on the safety/support chain when in use. Failure to do so can result in damage to the hydraulic cylinder. The safety/support chain must be adjusted with each height adjustment to the ramp.

• *Ramp Height and Locator Rod Settings* •

Using the table below, select the type aircraft to be serviced and, measuring from the ground up, mark the "H-Frame" with corresponding H-Frame height mark. For the locator rod, measure from the back of the buoy "can", the distance listed in the locator rod column and mark for the type aircraft as shown above.

Type Aircraft	*H-Frame Height Mark*	*Locator Rod*
EMB-120	52.5"	32"
1900D	47"	40"
Dash 8/Q-400	44"	40"
CRJ 100/200	57"	32"
CRJ 700/900	60.5"	32"
Saab 340	55"	38"
RJ	58"	28"
ATR	57"	32-34"
Metro	60" Measured From the Upper Bridge Pin	40"

• 90° Level Deck and Locator Rod Setup •*

Some Turboway models are equipped with a 90° level deck and upper bridge. This design allows for the ramp to be positioned parallel with the aircraft. This design uses an alternate locator rod that will require onsite setup.

The locator rod can be seen installed in the image below. The locator rod will need to be bolted into position and trimmed to length.

* Turboway ramps with a 90° Level Deck are typically designed for a specific aircraft and as such are NOT height adjustable.

• 90° Level Deck and Locator Rod Setup •

1. From the ground and facing the upper bridge, the locator rod will bolt into place on the right hand side of the upper bridge block.

2. Bolt the locator rod into position and tighten. Once tightened, it will be necessary to position the ramp up to the aircraft and measure where to trim the locator rod.

3. With the airstair door in the down position, move the ramp into position parallel to the aircraft. The main wheel of the ramp should be approximately 12” from the bottom of the airstair door.

4. With the ramp in the initial position, check the upper bridge. It should rest inside of the cabin as shown in the image to the right. (It may be necessary to position the ramp more than once to achieve optimal positioning). When positioning up to the Q-400, check clearances around the handrails and adjust position as needed.

5. Once optimal positioning has been achieved, the locator rod will need to be trimmed to length. The locator rod should be long enough to contact the side of the airstair door as seen in the image to the right. This can be done using a hand saw or the locator rod can be removed, trimmed and reinstalled.

Trimmed Locator Rod Shown Above

• *Support/Safety Chain* •

1. Once the ramp is at the desired height, release the safety/support chain from the lock slot and pull tight.

2. Once the safety/support chain has been pulled tight, release the hydraulic pressure from the pump by moving the pump valve to the open position, this will allow the ramp to rest on the chain.

• *For Each Subsequent Change of Height* •

1. Operate the pump to slightly raise the ramp off of the chain.
2. Raise or lower the chain as needed and reset into the lock slot.
3. Raise or lower the ramp accordingly.
4. Reset the chain snugly under the ramp.
5. Release the hydraulic pressure to lower the ramp onto the chain.

• *Wheel Chocks* •

A wheel chock is provided and can be located just forward of the brake station. Wheel chocks should be used whenever the ramp is stationary.

• Preparing the Ramp for Passengers •

• *Deploying the Lower Bridge* •

1. Grasp the safety latch located at the bottom right corner of the lower bridge and lift up. →
2. Gently lower the bridge to the ground.
3. The latch will automatically engage when the lower bridge is restored to the up and locked position.

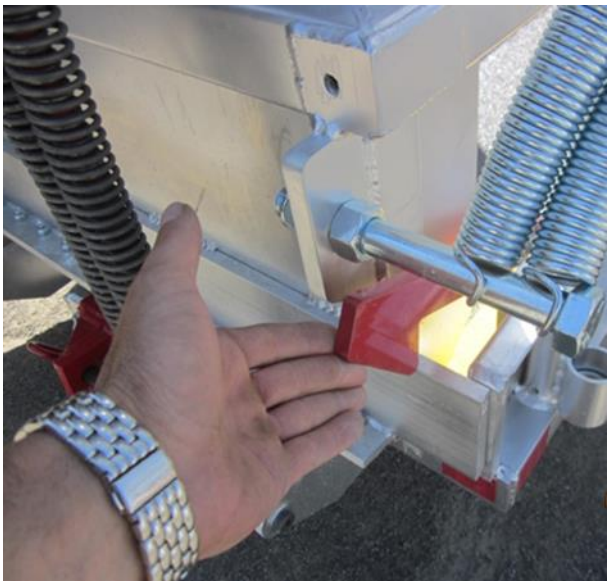


Image showing Lower Bridge deployed

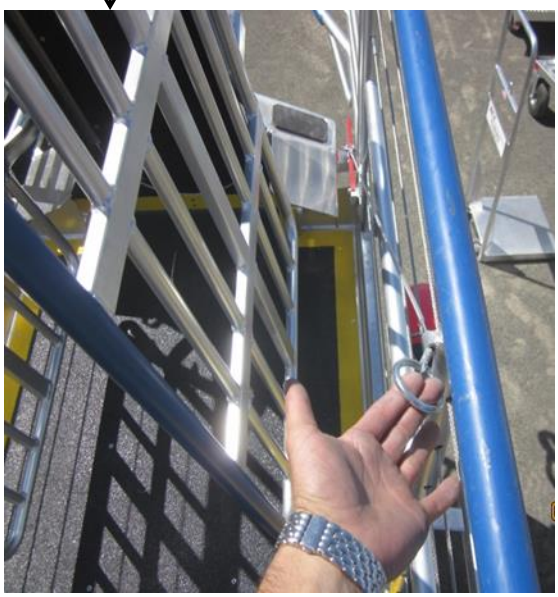
→

Do not allow the lower bridge to drop of its own weight as damage to the bridge or injury to personnel could occur.

• Preparing the Ramp for Passengers •

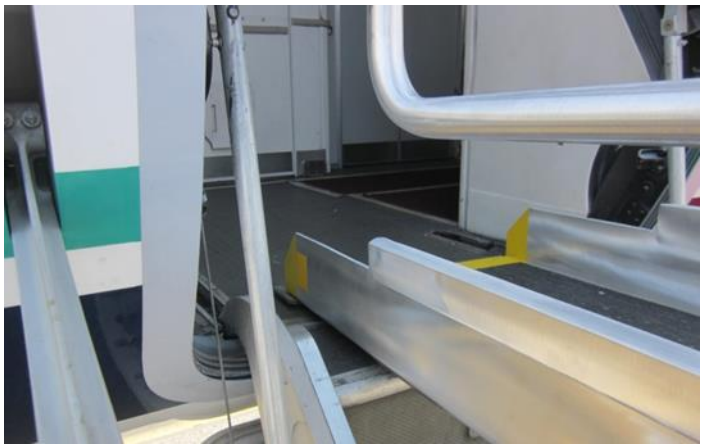
• *Deploying the Upper Bridge into the Aircraft* •

1. Once the lower bridge has been deployed, proceed up the ramp and approach the upper bridge.
2. Grasp the "O" ring located on the right hand side of the handrail.
3. Pull the "O" ring so as to lift the safety latch and begin to lower the upper bridge.



With the upper bridge slightly deployed, it is possible to slide the upper bridge side to side and pivot to make minor adjustments for proper alignment with the cabin door

1. With minor adjustments made and proper alignment achieved, lower the upper bridge completely into the aircraft cabin.
2. The upper bridge should rest inside of and on the floor of the aircraft cabin, NEVER on the top step of the airstair door or doorsill.



Do not allow the upper bridge to drop of its own weight, damage to equipment or injury to personnel could occur.

When setting the ramp up to the F28 type aircraft, the upper bridge will rest on the platform used for jetways, or on the first step from the top. If the bridge is resting on the first step, passengers in aisle chairs may have to be assisted up over that step. Two operators must always be present when servicing this aircraft

• Optional Light Kit (If Equipped) •

• Light Kit (If Equipped) •

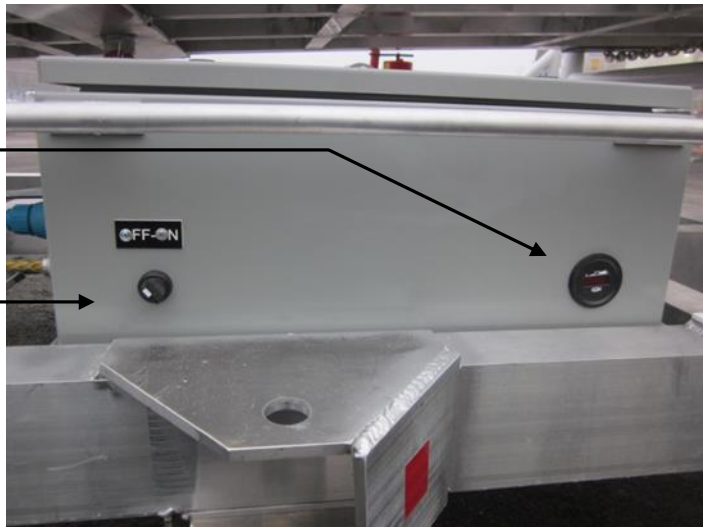
If selected as an option, the Turboway Ramp can be equipped with LED Lighting.

Located on the right hand side of the ramp is the battery box. The battery box has on it the on/off switch for the lights as well as a charge indicator for the battery.

Only qualified personnel should access the battery box. Risk of electrical shock exists, damage to equipment or injury to personnel could occur!

Battery Charge Indicator

ON/OFF Switch



• Optional Light Kit (If Equipped) •

When exposed to temperatures below 0° Fahrenheit, the battery box must remain plugged in or it must be removed and taken to a suitable location.

1. To remove the battery box, depress the lock on the plug as shown.

1. Turn the plug slightly in a counter clockwise direction and remove.

The battery box may now be removed.

The battery box weighs 123 lbs. Exercise caution when removing the battery box. Assistance from a second individual is recommended.

• Preparing the Ramp for Passengers •

• Boarding and Deplaning Passengers •

Once the ramp has been adjusted and properly positioned at the aircraft, boarding and deplaning of passengers may begin.

Water, ice, snow or any other natural or foreign substance should never be allowed to accumulate on the ramp walking surface.

Load capacities are as follows:
Lower Bridge: 1000 lbs.
Main Ramp: 3000 lbs.
Upper Bridge: 750 lbs.

No passengers should ever be allowed on the ramp until it has been properly positioned at the aircraft with brakes engaged and wheel chocks in place.

• Assisting Passengers with Mobility Impairments •

1. When assisting passengers with mobility impairments, great care and caution should be used.
2. When assisting passengers in an aisle chair, the operator must slowly ascend and descend the ramp.
3. Passengers requiring an aisle chair must be securely fastened into the chair using all safety restraints provided.
4. In the absence of airline or airport S.O.P.'s, passengers requiring an aisle chair are to be boarded and deplaned with their back towards the cabin door.
5. Passengers requiring an aisle chair or assistance must never be left unattended on the Turboway Boarding Ramp.

• Preparing the Ramp for Passengers •

• *Removing the Ramp from the Aircraft* •

Upon completion of boarding/deplaning, prepare the ramp to be pulled away from the aircraft.

1. Raise the upper bridge until the safety latch has engaged.
2. Proceed down the ramp and raise the lower bridge until the safety latch has engaged.
3. Remove and stow the wheel chock.
4. With the operator positioned at the brake/push station, release the brakes and slowly pull the ramp away from the aircraft and wing. Care should be taken to maintain adequate clearance of the propeller and wing. Continue to pull the ramp away from the aircraft and position in its designated parking area.
5. Once parked, engage the brakes by releasing the brake handle, place the wheel chock under the swivel wheel.

The upper and lower bridges should always be in the up and latched position whenever the ramp is not in use.

When equipped with a canopy, it is strongly recommended that the outriggers be deployed at any time the ramp is in use or stowed.

• Preparing the Ramp for Passengers •

• Outriggers (When Equipped with a Canopy) •

Outriggers are required when the ramp is equipped with a canopy.

1. Grasp the handle of the outrigger and lift up slightly.
2. Articulate the outrigger 90° away from the frame of the ramp. Outriggers will automatically lock into position when fully deployed.
3. To stow the outriggers, lift up on the locking arms and articulate the outrigger towards the frame. Lift up slightly to rest the outrigger on to the stowing bracket.

It is recommended that the outriggers be deployed during storage and when the ramp is in service. Use of outriggers is required where winds or jet blast exceed 45 MPH. The ramp should be stowed in the full down position.

• *Warnings and Restrictions Summary* •

1. It is the responsibility of the operating staff to ensure that the aircraft is not damaged when using the KCI Passenger Ramp.

2. To ensure the aircraft is not damaged, the ramp should never come in contact with the aircraft.

3. Only trained and authorized personnel should raise, lower, or adjust the ramp, operate the hydraulic mechanism, or adjust the ramps height.

4. The ramp is to be maneuvered from the end with swivel wheels; this end will be farthest from the aircraft when in place.

5. Disabled passengers in an aisle or wheel chair must never be left unattended on the ramp.

6. Two attendants are required to assist disabled passengers who are overweight or of large stature.

7. Under no circumstances should the ramp be raised, lowered, moved, or towed with any person on it.

8. Water, ice, snow or any other natural or foreign substance should not be allowed to accumulate on the ramps surface.

9. The ramp should be inspected before each use to ensure a clean and unobstructed pathway.

10. The weight of the ramp, when in use, must always rest on the safety chain and not be dependent upon the hydraulic cylinder to support it.

11. The ramp is not to be towed at speeds exceeding 10 MPH and should always be stowed when not in use. Do not back up using the tow bar.

12. Prior to towing the ramp, a visual check of the brake plate must be performed to verify the brake plate is fully disengaged.

13. The lower bridge should always up and locked when not in use.

14. The ramp has a maximum capacity of 3000 lbs. for the main ramp, upper bridge 750 lbs., and the lower bridge 1000 lbs.

15. The adhesive non-skid surface affixed to the ramp will lose its traction enhancing properties over time, depending on the extent of usage and climactic conditions, which exist at each airport. Replacing non-skid surface is the responsibility of the ramp owner; material can be obtained directly from KCI.

• *Warnings and Restrictions Summary* •

16. Do not let the lower bridge drop of its own weight.

17. The canvas canopy should be inspected for rips or tears. Replacing the canopy is the responsibility of the ramp owner. The canopy material can be obtained directly from KCI.

18. Qualified airport ground crew personnel or airline personnel should always be present when the ramp is in use.

19. No passengers are allowed on or near the ramp except when it has been properly set up at the aircraft and wheel chocks are in place.

20. The ramp and bridges have been designed solely for the usual and customary operation of loading and deplaning of qualifying aircraft. Any other use is strictly forbidden, and voids any and all warranties relating to the passenger ramp.

21. It is recommended that the outriggers be deployed during storage and when ramp is in service. It is required to deploy outriggers where winds or jet blast may exceed 45 MPH. The ramp should be stowed in the full down position.

22. Outriggers must be stowed during ground movements.

23. Where winds are forecasted over 70 MPH it is strongly recommended that the canopy be removed. Should this not be feasible, then some type of wind protection should be taken, at a minimum, position the lower end of the ramp into the wind.

24. Never tow the ramp in a raised or slightly raised position. The ramp must be lowered to the lowest setting prior to towing.

•Preventative Maintenance Checklist •

. The following is a general maintenance checklist which covers the major components of your Turboway Ramp. It is recommended that the following be checked regularly as scheduled to ensure proper function and safety of your Turboway Ramp.

COMPONENT	SUGGESTED ACTION	SCHEDULE			
		Daily	Monthly	Quarterly	Bi-Annually
WHEELS	Grease swivel wheels and pillow block bearings.				
STRUCTURAL	General Check: Loose bolts, etc. tightened. Cracks, broken areas.				
TIRES	Inspect for serviceability.				
HYDRAULICS	Check fluid level, check hydraulic hose and fittings for leaks				
WALKING SURFACE	General check for adequate traction, No loose rivets in Safeguard panels.	Check for unobstructed pathway			
SAFETY CHAIN	Inspect for cracks and disconnects				
BRAKES	Adjust as needed				

• Recommended Lubricants •

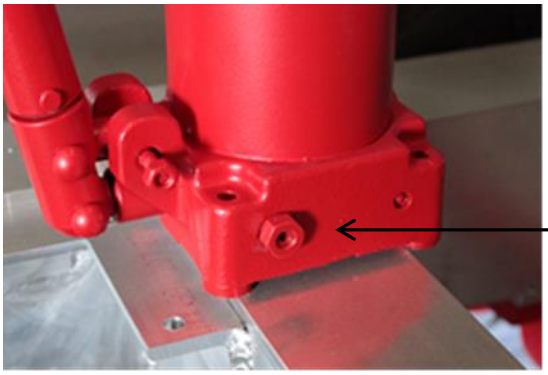
Axle Pillow Block Bearings	Lubriplate® 1552 NLGI 2 Grease
Hydraulic Pump	Lubriplate® HO-1 Hydraulic Oil
Swivel Wheels	Lubriplate® 1552 NLGI 2 Grease

•Preventative Maintenance •

• *Servicing the Hydraulic Pump* •

- When servicing the hydraulic pump, the ramp must be fully lowered. Remove the filler plug from the top of the pump and add fluid as needed. The reservoir is considered full when the fluid is within ½" of the top of the pump.

Filler Plug

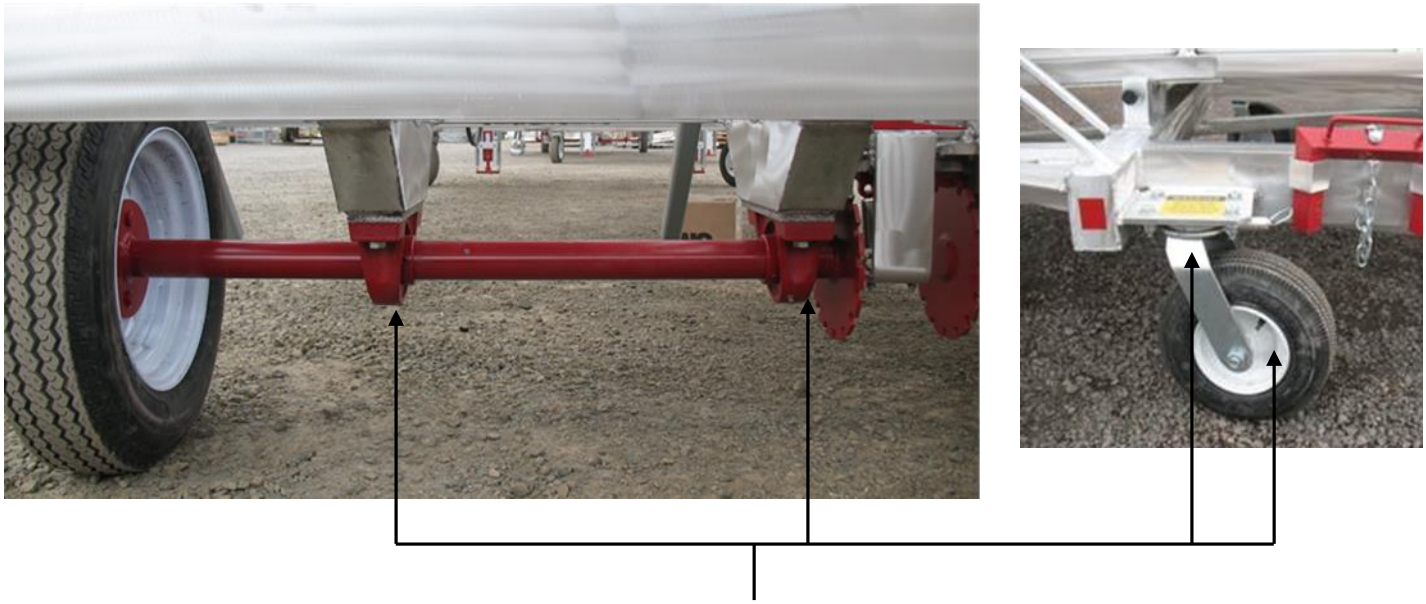


All hydraulic pumps have on them a pressure regulator that can be adjusted if needed.

1. Using a crescent wrench, loosen the outer regulator nut.
2. While keeping the crescent wrench on the outer regulator nut, use a 5/32" allen wrench to adjust the inner regulator screw. Re-tighten outer regulator nut.

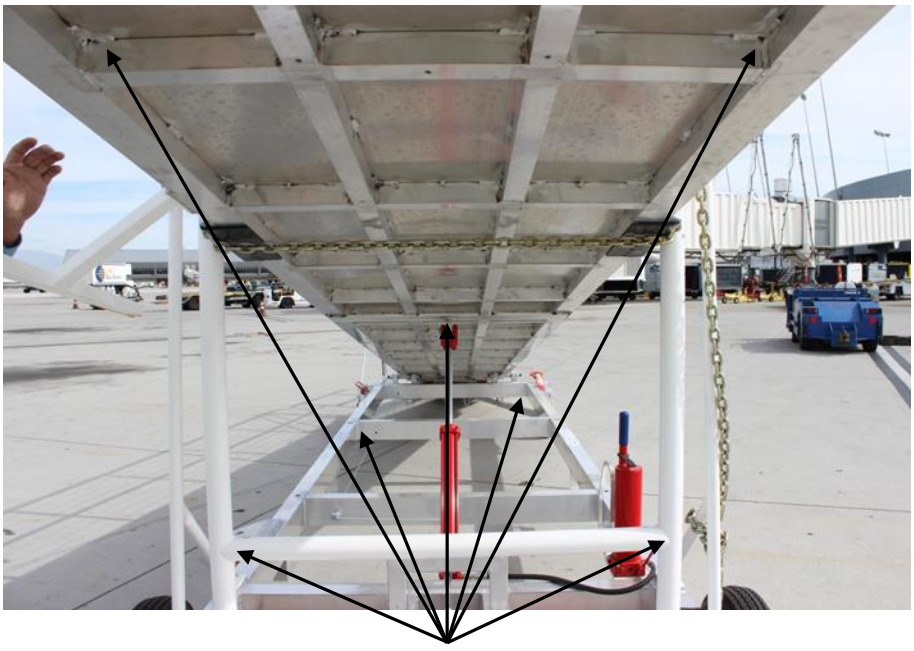
•Preventative Maintenance •

• *Lubrication Points* •



Wheels and bearings should be lubricated with multi-purpose grease such as Lubriplate® 1552 NLGI 2 Grease.

• *Structural Check* •



The areas indicated should be visually checked monthly

• *Adjusting the Brakes* •

Turnbuckle for adjusting the brakes

To adjust the brakes, loosen the backing nuts at the turnbuckle. Adjust the tension as needed. Re-tighten the backing nuts.

•Preventative Maintenance •

• *Canopy Check* •

Canopy cover should be tight and free from cuts or tears

• How to Order Replacement Parts •

Please have model number and serial number available when ordering replacement parts

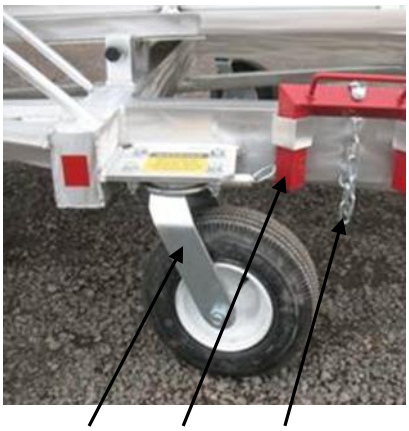
When ordering replacement parts:

a. Contact the KCI parts dept. at (541) 830-4877 or email msankey@kci.nu
b. Give the Model Number, Serial Number, and Mfg. Date) to the parts representative.
c. If possible, give the part number and a description from the parts list. Or describe the needed part(s) to the best of your ability.
d. If you are in a breakdown situation, please tell us, we will try to get your unit operational as soon as possible.

Serial Number
(The ID Plate is located on the frame.)

Mfg. Date
(You may be asked the Mfg. Date of your unit, have it ready if you are asked for it)

• Parts Breakdown •



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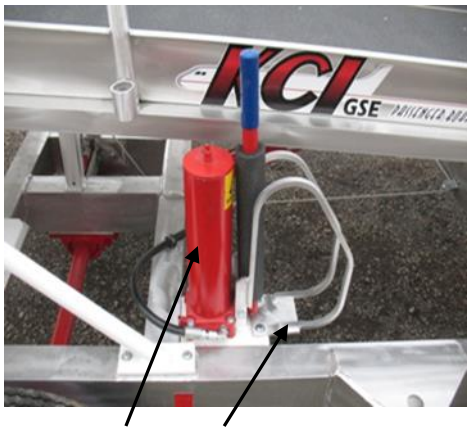

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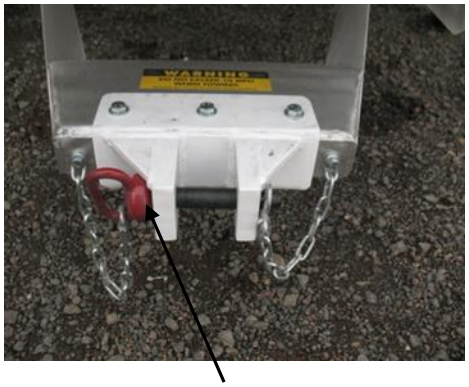

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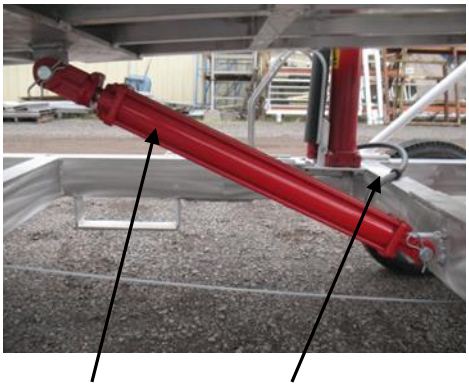

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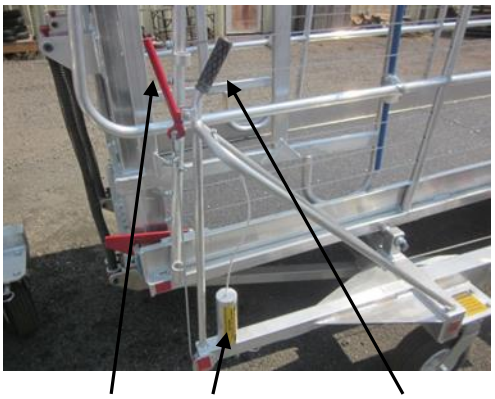
Item	*Description*	*Part Number*
1	12” Swivel Wheel Assy.	P00014
2	Wheel Chock with Chain	K00310
3	Chain for Wheel Chock	TC11041
4	Hydraulic Pump	P00108
5	Pump Guard	K00315
6	22” Foam Filled Tire	P00096
7	Tow Bar	K00314
8	Hitch Pin for Tow Bar	P00068
9	Hydraulic Cylinder	P00111
10	Hydraulic Hose	TW-HH32

• Parts Breakdown •



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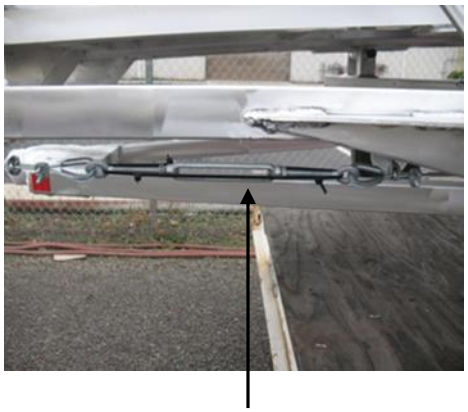
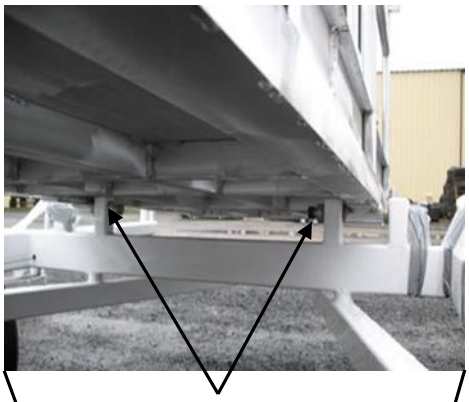


14, 14A, 14B



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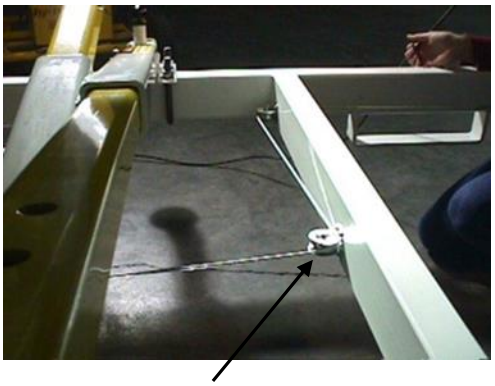

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Item	*Description*	*Part Number*
11	Brake Handle (Yellow or Red)	K00319
12	Brake Cup w/Cable	TW-BC
13	Brake Handgrip	TW-HG-K21
14	Turnbuckle	P00355
14A	1/8” Thimble	P00051
14B	1/8” Wire Cable Clamp	P00053
15	Main Ramp Mounting Pin	TW-CSP12
15A	Bronze Flanged Bushing	P00079
15B	1” Set Collar	P00078
15C	Black End Cap	P00081
16	Brake Cable Pulley	P00038
17	Ramp Support Assy.	K00299
18	5/16” Ramp Safety/Support Chain	TW-TC12

• Parts Breakdown •

Lower Bridge when equipped with Safeguard

Lower Bridge without Safeguard

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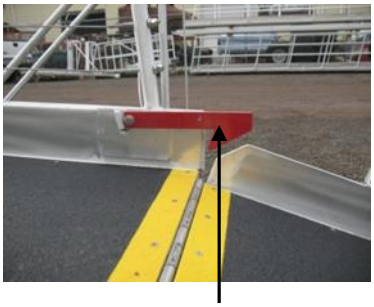

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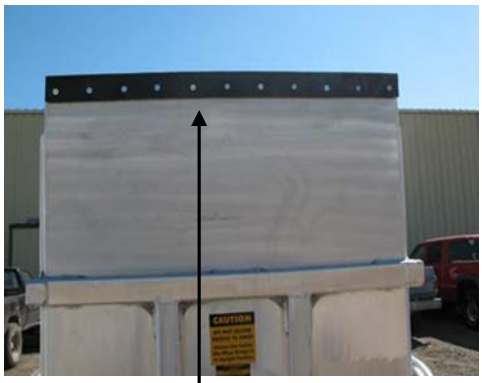
Item	*Description*	*Part Number*
19	Complete Spring Kit	Mark has
19A	Inner Spring	P00124
19B	Outer Spring	P00123
19C	Spring Block-Double	K00356
19D	Spring Rod	K00357
19E	Shoulder Bolt	P00126-036
19F	Bronze Bushing	P00125
19G	Spring Plate (2ea Per Side)	WJ-A-375-61
20	Lower Bridge Assembly	K00333
21	Lower Bridge Safety Latch	WJ-S375-6

• Parts Breakdown •



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23

24, 24A

25

26

27, 27A, 27B

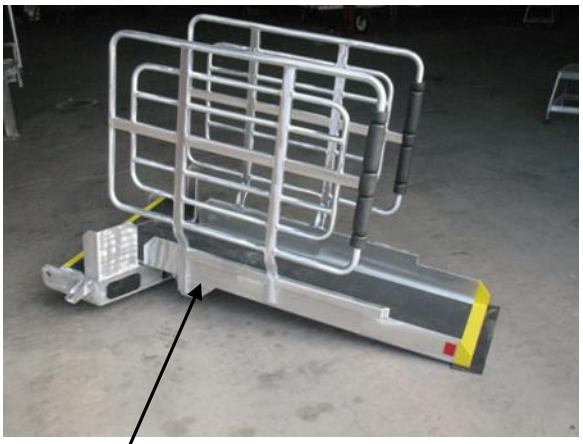
Item	***Description***	***Part Number***
22	Lower Bridge Rubber Pad	P00109
23	Upper Bridge Safety Latch	WJ-S375-6
24	Upper Bridge Latch Pull Ring	P00354
24A	Upper Bridge Latch Assembly	TW-LA50
25	Upper Bridge Bearing	P00112
26	Upper Bridge Bushing	P00113
27	Upper Bridge Chromoly Pin	TW-CSP36
27A	1” Set Collar	P00078
27B	Black End Cap	P00081

• Parts Breakdown •

28, 28A, 28B

29

30



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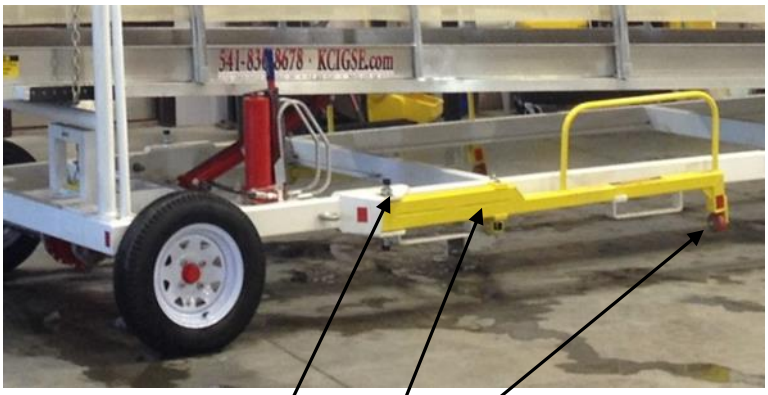
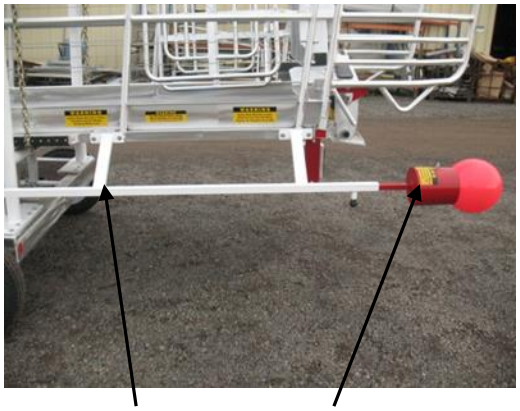


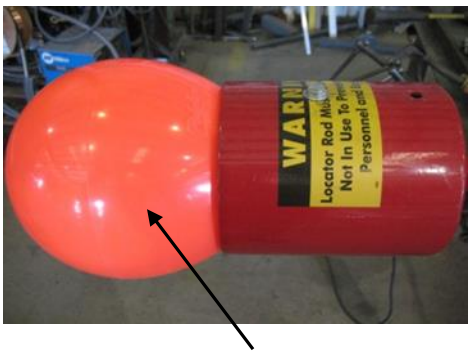
32 32A 32B

Item	*Description*	*Part Number*
28	Counter Weight Assembly	K00311
28A	Counter Weight Block	K00313
28B	Counter Weight Bracket	K00312
29	Upper Bridge Rubber Pad	P00110
30	Main Ramp Bolt On Handrail	K00304
31	Upper Bridge Assembly	K00294
32	Outrigger 1” Chromoly Pin	TW-CSP10
32A	Outrigger Assembly	K00316
32B	3” Red Outrigger Wheel	P00076

• Parts Breakdown •



33 34

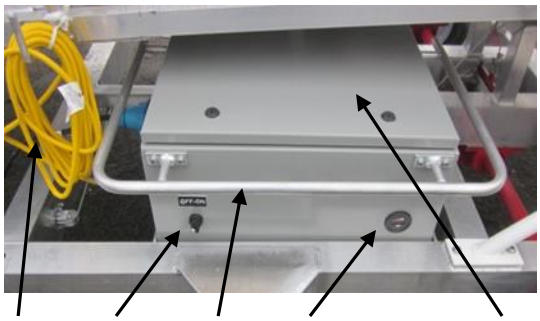


35

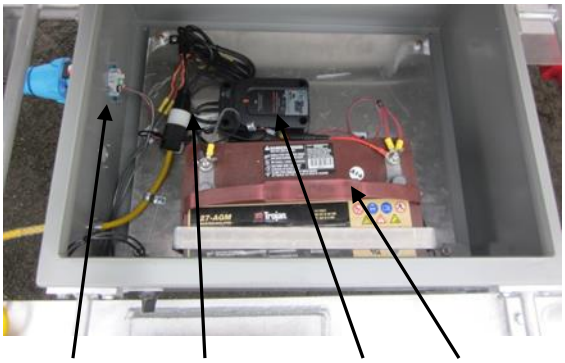
36 37 38 39

Item	*Description*	*Part Number*
33	Locator Rod Mount	K00306
34	Locator Rod Assembly	K00307
35	Orange Bumper	P00107
36	Axle Assembly with Bearings	K00309
37	Pillow Block Bearings	P00032
38	Brake Springs	C141
39	Brake Plate	WJ-S375-41

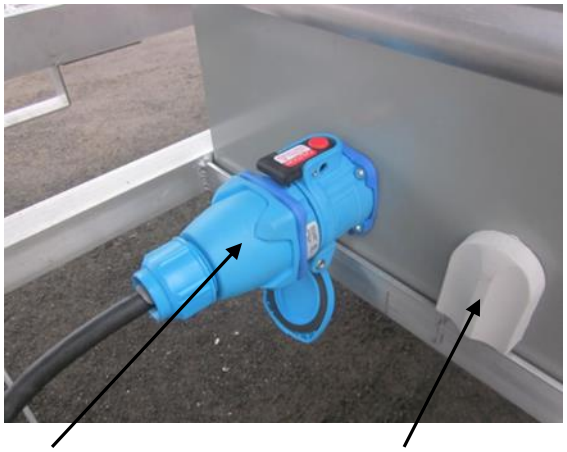
• Parts Breakdown •



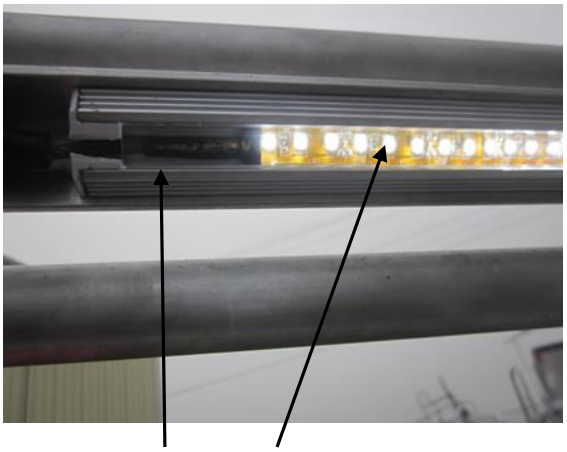
40 41 42 43 44



45 46, 46A 47 48



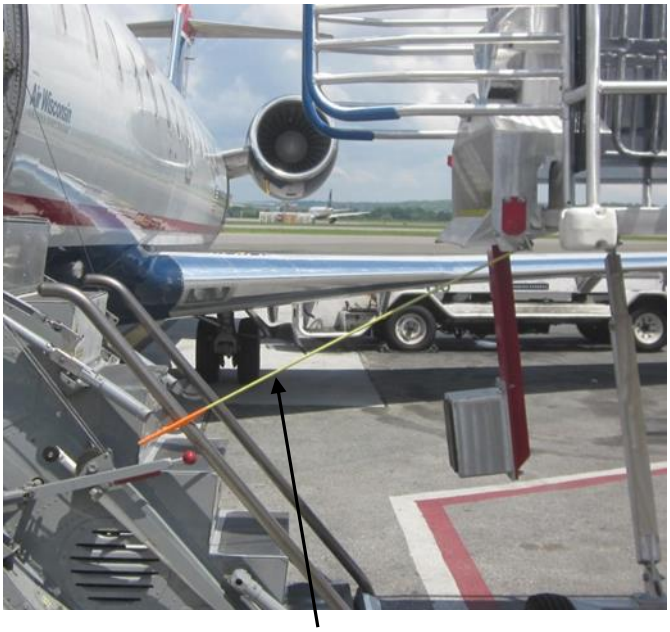
49, 49A 50



51 52

Item	*Description*	*Part Number*
40	14/3, 20 ft. Charging Cord	CLM 01487-00-02
41	2 Position ON/OFF Switch	ABB C2SS210B-210
42	Battery Enclosure Transport Handle	KCI
43	Battery Charge Monitor	GD12LIL-13-204A
44	Battery Enclosure	KCI
45	Female Flanged Receptacle	MEL-3314209
46	Female Plug End	HBL-5269C
46A	Male Plug End	HBL-5269C
47	Battery Charger, 12V, 5A, WP	PM-31405
48	12 Volt AGM Battery	72-AGM
49	Male All Weather Connector	MEL-3318209
49A	Plug/Receptacle Housing	MEL-FH111
50	Enclosure Vent	HOFF-ANM-V6
51	LED Light Track	NF-ST-25
52	LED Light Strip	NF-PW-120-15-LD

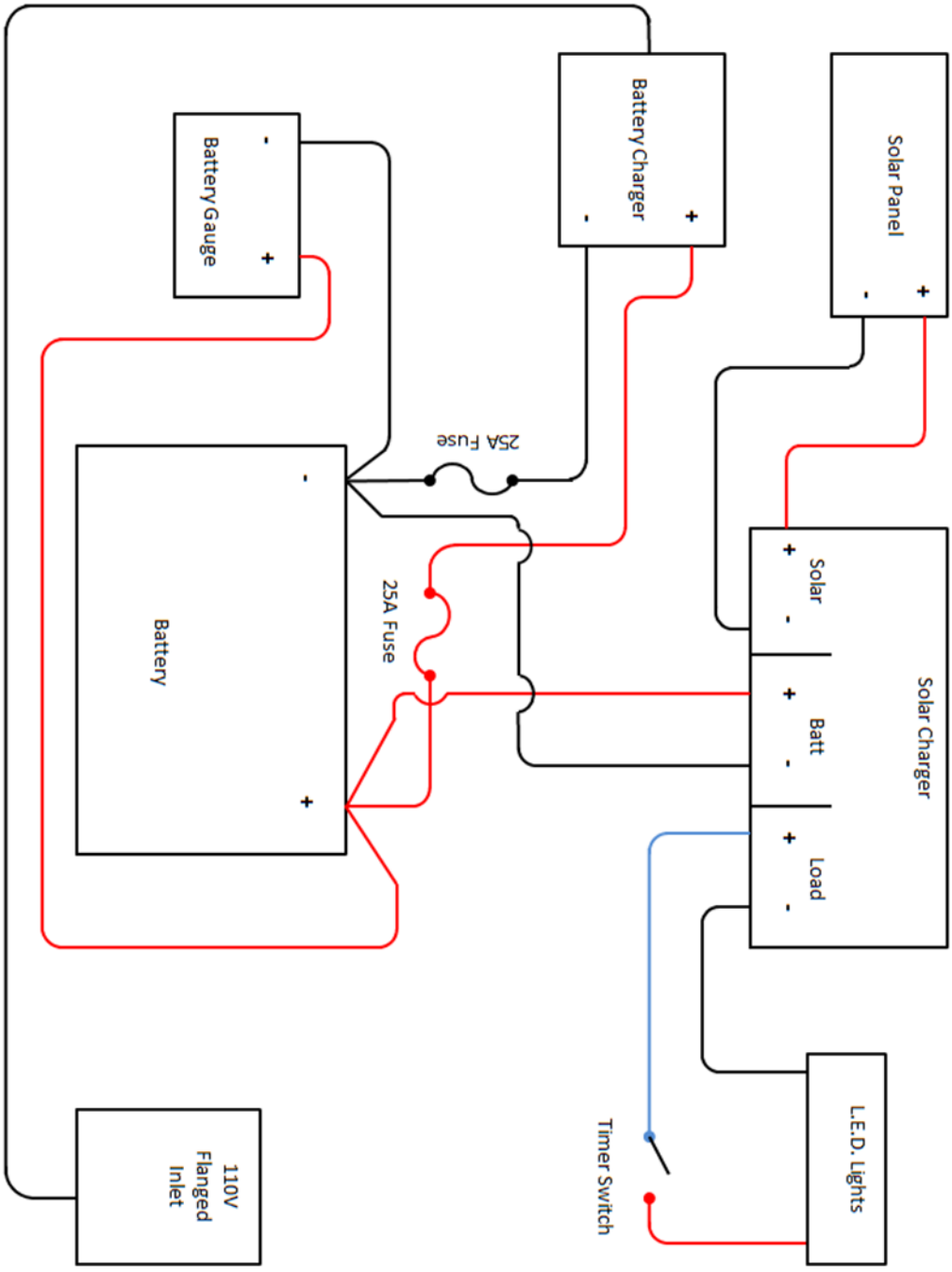
• Parts Breakdown •



53

Item	*Description*	*Part Number*
53	90 ° Level Deck Locator Rod	P00389

• Electrical Schematic •



• Warranty •

This warranty is in lieu of all other warranties, either expressed or implied.

What is Covered:

This warranty covers equipment manufactured by KCI, Inc. from any defects in materials, workmanship and/or installations performed.

Period of Coverage:

This warranty lasts for a period of two years, electrical component coverage is for one year from the date the product ships, or until the original ownership of the ramp is transferred to another party, whichever comes first. Any repairs or modifications without the express written consent of KCI, Inc. will be grounds to immediately void all or part of this warranty.

What is Not Covered:

This warranty does not cover the following:

1. Accidental damage.
2. Misuse or abuse.
3. Damage caused by adverse weather, disasters, or other forces of nature.
4. Worn out adhesive skid walk.
5. Worn out tires/wheels.
6. Worn out/faded canvas canopies.
7. Any other wear or damage caused by the equipment's general use.
8. Any consequential or incidental damages to include:
    a. Any loss of profit.
    b. Loss by reason of airport or flight line shutdown.
    c. Non-operation or increased expense of operation.
    d. Loss of passengers or business.

What KCI Will Do:

Repair or replace any original part, component or piece of equipment that is found to have defects from time of shipment through the end of the period of coverage.

How to Make a Service Claim:

Provide a claim in writing within the period of coverage to the address listed below or email to msankey@kci.nu. We will then determine if the problem is a defect with the product. Once the nature of the problem is ascertained, we will notify the buyer of our planned resolution. This may include an on-site visit by KCI, Inc. for repairs, or that the buyer ships the defective part or component to us for inspection and replacement at KCI's expense.

KCI GSE Inc.
1718 Antelope Road
White City, Oregon 97503