

Operation, Use & Maintenance Manual



**IMPORTANT!
DO NOT DESTROY**

RANGER™
MOBILE ANCHOR

Gorbel® Customer Order No. / Serial No. _____

Gorbel® Dealer _____

Date _____
Month Year

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Questions? Concerns? Comments? Please call (800) 821-0086 (US and Canada) or (585) 924-6262 (outside US).	

DEFINITION OF TERMS

AUTHORIZED PERSON - ANSI defines an **Authorized Person** as a “person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard”.

ANTI-RATCHETING - This refers to a feature of an **SRD** that prevents a cascading effect during a fall event. When a personnel fall arrest system has the capacity to act as a spring (e.g. cantilevers, flexible lifelines, fast braking **SRDs** with web lines, stretch harnesses), the user may experience a zero G condition which could unlock an **SRD** thus causing a smaller secondary fall. **SRDs** with this feature will remain locked during a spring-back event.

COMPLETE FALL ARREST SYSTEM - A **Complete Fall Arrest System** consists of three main components:

- A. Engineered Anchor System - Gorbel's Ranger and Road Ranger have been engineered to provide the maximum safety possible. The mobile design allows for easy repositioning, ensuring that the anchor point can be located directly over the work area.
- B. Body Support - Only a full body harness is allowed for fall arrest systems. Proper fitting and wearing of the harness is critical so that it can evenly dissipate the fall arrest forces to the strongest body parts.
- C. Connecting Means - This is the link between the anchor and body support. A self-retracting device is recommended. This provides maximum mobility and minimum fall distance. An energy absorbing lanyard may also be used. These components must have an average arresting force of 1350 lbs. or less.

FALL CLEARANCE ZONE - The space below the person where there is a potential to fall. This space must remain clear of obstructions to prevent injury from contact with any objects during a fall event.

LEADING EDGE - The edge of the working surface that a person could fall off. This edge may restrict the lifeline from reaching a vertical orientation and cause off-vertical (horizontal) loading of the anchorage system. Avoid sharp **Leading Edges** or use lifelines designed to withstand a sharp **Leading Edge** fall event.

QUALIFIED PERSON - ANSI defines a **Qualified Person** as “A person with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems...”

SRD - Self-Retracting Device

COMPETENT PERSON - In the context of fall protection, OSHA defines a **Competent Person** as a person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as in their application and use with related equipment.



INTRODUCTION

Congratulations on your purchase of a Ranger™ Mobile Fall Arrest Anchor. Comprehensive development and testing has allowed you to procure a top-quality mobile anchor product to protect your employees from harm while working at height. When properly applied, set-up, and used under supervision from a **Qualified Person**, Ranger™ Mobile Anchors provide a user-friendly solution for a variety of applications. The ability to position the anchor directly above the fall hazard combined with an attached self-retracting device (**SRD**) minimizes fall distance while the optimized flexible counterweight design reduces arrest force to the user. The Ranger's reliable performance along with an ANSI-approved Managed Fall Protection Program provides safety assurance to the user and aims to encourage further safe work practices.

The Ranger's innovative design minimizes the required counterweight, allowing mobility to optimally position the anchor. The combination and strategic placement of outriggers and jacks reduces movement in the event of an offset fall. When leveled on a non-deforming surface, no more than 12 inches is required for the deflection and movement of the Ranger in the fall clearance calculation.

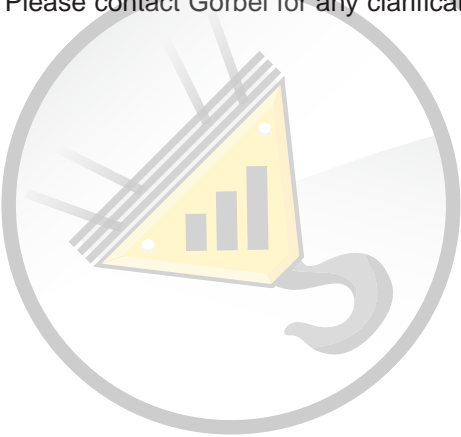
This manual describes the operation, use and maintenance of Gorbels Ranger™ Mobile Anchors. These products currently consist of the Ranger and the Road Ranger. The Ranger is intended for indoor or tarmac use and can only be used on slopes up to 2°. It has a hard mounted axle and must not be towed at speeds greater than 25 MPH. It's smaller footprint, lighter weight, folding tongue and integral dolly make it ideal for easy maneuvering on hard, flat surfaces.

The Road Ranger provides the same safe and secure anchorage point as the Ranger with the added ability to be used on slopes up to 5°. The Road Ranger comes equipped with electric brakes, required Federal lighting, parking brake, torsion axle, safety towing chains, and safety towing break-away system. It meets all the requirements for a specialty equipment trailer and can be licensed (if required by your state, county or province) for highway travel at a maximum speed of 65 MPH.

Prior to shipment, all Ranger™ Mobile Anchors are statically proof loaded to verify compliance with the 2X OSHA required safety factor for the worst case suspended load condition. During the verification phase, dynamic testing was performed to ensure conformity with the most current ANSI guidelines. The dynamic safety factor of the Ranger well exceeds OSHA requirements.

Please review the entire manual and have your employees sign the back cover as verification of understanding this manual. All users must understand the safe requirements for the use of the Ranger and its compatible attachments.

Fall arrest is the last line in protection for workers at risk of a fall from height. Your adherence to all warnings contained in this manual and in the instructions of all the components of the entire fall arrest system is required. Please contact Gorbels for any clarification or questions you may have.



APPLICATION

The Ranger™ Mobile Anchors are the best choice for providing temporary coverage to a conical work zone where it is not practical to install a permanent solution. A flat work area is a circle with the center directly under the anchor having a diameter equal to the difference of the anchor height and the work surface height.

WARNING

Fall protection of Ranger™ Mobile Anchors is restricted to within a 30 degree from vertical cone about the anchor.

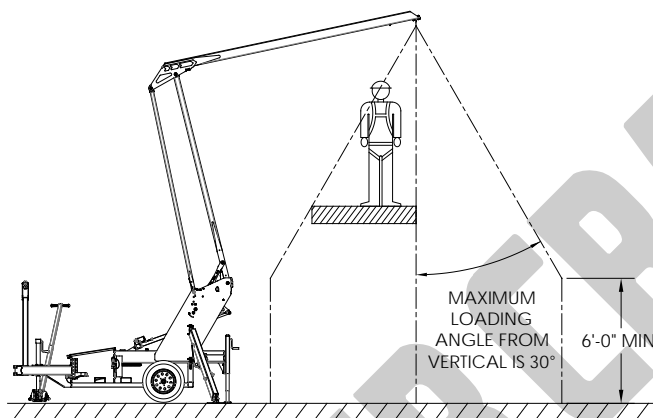


Figure A. Safe Working Zone

DANGER

Ranger™ Mobile Anchors must never be supported within 2 feet of an edge or change in elevation.

When the Ranger or Road Ranger is leveled and load is removed from the wheels, the bearing pressure of the tongue jack is twice the bearing pressure of the outrigger feet. If inspection of the surface at the tongue jack reveals sinking, there is not an adequate safety factor for the supporting surface bearing capacity.

WARNING

Ranger™ Mobile Anchors must be supported by a firm surface.

The Ranger and Road Ranger have three height settings, 18', 20' and 22'. This setting is adjusted prior to the mast being raised. If overhead clearance is adequate, it is recommended to keep the height at the factory setting of 22'. This will provide the largest safe work area. The anchor must be sufficiently above the work surface so that the **SRD** is above the user and its cable or webbing is always in tension. For example, the worker's back harness D-ring is 5' off the work surface and the **SRD** with carabiner is 20" long retracted, then the maximum work surface height, with the Ranger set at 22', would be 15' above the supporting surface to always ensure the **SRD's** cable or webbing is in tension.

The minimum working height from the supporting surface is dependent on all components that comprise the fall arrest system. See the next section for examples and requirements for **SRD** selection.

Indoor and outdoor use are possible. Ranger™ Mobile Anchors use sealed structural tubing, ultra-corrosion resistant hardware, and a durable two part urethane coating to provide years of maintenance free use in a typical outdoor environment. Contact Gorbel if your application involves an extreme corrosive environment.

MINIMUM PLATFORM HEIGHT FOR SAFE USE

There are a variety of factors to consider when a **Qualified Person** is determining the minimum platform height for use with a Ranger or Road Ranger. These factors include, but are not limited to, the following:

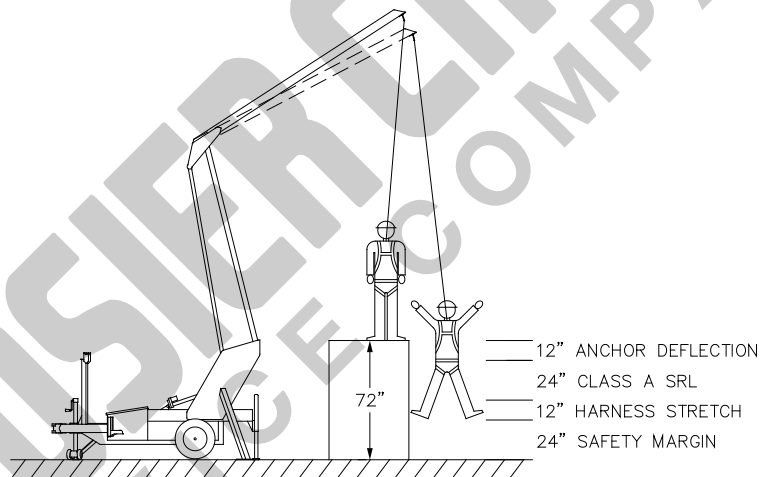
- **SRD performance**
 - The **SRD** shall be an **Anti-Ratcheting** design due to the flexible nature of the anchorage
 - If work conditions allow the **SRD** cable to contact the **Leading Edge** of the work surface, a **SRD** rated for this application must be used (**Leading Edge SRDs** may have different clearance requirements)
 - Follow all manufacturer's guidelines concerning the use and inspection of **SRDs**
- Anchor deflection
 - The Ranger has a 12" maximum deflection when used on a firm and level surface
- Harness stretch
- Required safety margin
- Work position (standing, kneeling, laying down)
- Swing fall drop (offset distance height)

Example #1:

- ANSI Z359.14 Class A **SRD**, maximum arrest distance = 24"
- Anchor deflection (max.) = 12"
- Harness stretch = 12"
- Required safety margin = 24"
- Standing work position
- Anchorage directly overhead (no swing fall drop)

In this specific scenario, the minimum work platform height would be:

$$24" + 12" + 12" + 24" = 72" \text{ (or 6'-0")}$$

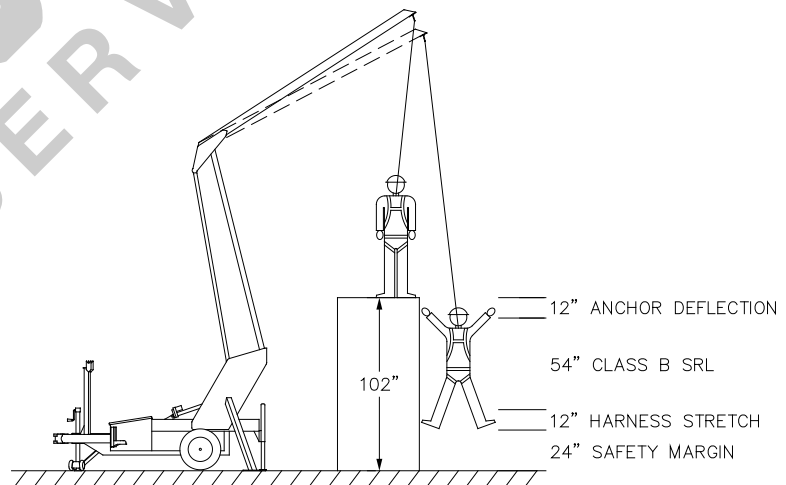


Example #2:

- ANSI Z359.14 Class B **SRD**, maximum arrest distance = 54"
- Anchor deflection (max.) = 12"
- Harness stretch = 12"
- Required safety margin = 24"
- Standing work position
- Anchorage directly overhead (no swing fall drop)

In this specific scenario, the minimum work platform height would be:

$$54" + 12" + 12" + 24" = 102" \text{ (or 8'-6")}$$



WARNINGS AND RESTRICTIONS

1. Do not throw away these instructions. Always keep a copy with equipment.
2. Read and understand this manual before operating and using equipment.
3. The information contained in this manual should be incorporated as part of a training program as required by OSHA or any state and local regulatory agency.
4. This and any other included instructions shall be provided to the users of this equipment. The user shall demonstrate understanding of the proper equipment use and limitations.
5. Any fall event can result in injuries. The proper use of this equipment can eliminate or substantially reduce an injury. For maximum safety, the worker shall be trained in the proper use of this equipment and all of the components of the **Complete Fall Arrest System**.
6. A managed fall protection program which includes a rescue plan is required for the safe use of this equipment. A worker suspended from this system can lose vital blood flow to the brain as blood pools in the legs. This is referred to as suspension trauma. Incorporating a rescue plan that can be enacted in less than 15 minutes is the best method to reduce this risk.
7. The Ranger and Road Ranger are only to be used as part of a complete fall protection system. The buyer or user is responsible for the safety and compatibility of the complete system. Nether Gorbel, nor its distributor, takes responsibility for the system as a whole. The Ranger and Road Ranger are designed and tested by Gorbel in accordance with applicable OSHA requirements and ANSI Z359 guidelines using a minimum design factor of two. The structural steel construction is designed in accordance with applicable AISC guidelines.
8. The end user is responsible to make sure that the **Complete Fall Arrest System** and its application is configured, operated and used under the supervision of a **Qualified Person** in accordance with application OSHA regulations and ANSI Z359 Fall Protection Code voluntary consensus standard. State and local jurisdictions may have additional requirements.
9. It is the responsibility of the user to determine the sustainability of equipment and any attachments prior to each use and to have certification inspection on a periodic basis with recurrence of at least once per year by a **Qualified Person**.
10. Any component replacement, addition or change to the complete system requires evaluation by a **Qualified Person**.
11. Do not field modify the Ranger or Road Ranger in any way. Any modifications without the written consent of Gorbel Inc. will void warranty.
12. Consult a **Qualified Person** to determine if your supporting surface is adequate to support the bearing pressure generated by the equipment's weight and the arresting force. Gorbel Inc. assumes no responsibility for the adequacy or integrity of the supporting surface.
13. Before each use, the equipment shall be inspected as outlined in the inspection section of this manual.
14. Lanyards or Self Retracting Devices (**SRDs**) to be used with the Ranger and Road Ranger shall have an Average Arresting Force (AAF) equal to or less than 1350 lbs.
15. The rated capacity and the rated maximum average arresting force of the Ranger shall not be exceeded. If the lanyard or **SRD** connected to the Ranger does not list an Average Arresting Force, the Maximum Arresting Force rating listed shall not exceed the Maximum Average Arresting Force of the Ranger or Road Ranger.
16. Customer chosen lanyards or **SRDs** shall minimize freefall distance.
17. It is the responsibility of the end user to verify that the height of the Ranger™ Mobile Anchors will provide adequate fall clearance when used with the customer chosen lanyard or **SRD** and harness.
18. Ranger™ Mobile Anchors shall have no more than one person attached.
19. Ranger™ Mobile Anchors shall be optimally positioned to minimize a swing fall and the lengthening of the freefall distance.
20. This equipment is not electrically insulated. Stay clear of power lines in accordance with federal and local guidelines. Do not operate or use this equipment during a lightning storm. If equipment comes in contact with electrically charged power lines, DO NOT touch or operate equipment until electricity has been removed from the lines.
21. The **Fall Clearance Zone** shall be free of dangerous obstructions and electrical hazards.
22. To avoid the equipment from tipping over: never exceed the rated capacity, never raise the boom on greater than a 2 degree slope for the Ranger or a 5 degree slope for the Road Ranger, only set-up on a firm surface, never use unless equipment is leveled and all footpads are in firm contact with supporting surface.
23. Do not move equipment with a fork lift when boom is raised.
24. Manual positioning of this equipment should never be attempted on surfaces with a slope greater than 2 degrees. Use wheel chocks before detaching this equipment from tow vehicle.

WARNINGS AND RESTRICTIONS (CONTINUED)

25. Unhitch trailer from tow vehicle before leveling to prevent damage to the trailer tongue and/or the tow vehicle.
26. This equipment may pivot and move up to 12 inches away from set-up location. Stay at least two feet away from drop-offs, holes, unstable surfaces, and other possible hazards.
27. Only use equipment with outriggers extended and captured by back stops.
28. Stay clear of boom, mast and link during actuation to prevent potential crushing or pinching if actuator should malfunction.
29. Locking features only function when the boom is fully extended. Only use this equipment when automatic locking pin is fully engaged.
30. To prevent inadvertent operation of the actuator from other remote microwave devices, remove key before using.
31. When in use, cordon off the area around this equipment to protect personnel from injury if the equipment moves during a fall event and to protect this equipment from being hit by other moving equipment.
32. Only connect yourself to this equipment when set-up is complete.
33. Do not unlock boom when anyone is attached. Actuator is not rated for rescue or as a personnel lift.
34. The user may not be attached to a Ranger™ Mobile Anchor during repositioning. The user must safely descend from the work surface, detach, and then the Ranger may be moved.
35. Do not use this equipment in weather conditions that may affect the user and/or the stability of this equipment including but not limited to, lightning, wind gusts greater than 28 miles an hour, heavy downpours, and temperatures below 0 degrees or above 110 degrees Fahrenheit.
36. Do not exceed 25 MPH when towing the Ranger or 65 MPH when towing the Road Ranger. Tow only when in the stored position. Keep tires properly inflated and in good condition, and keep lug nuts properly tightened. Do not overload your tow vehicle.
37. Use only a 2" ball on the tow vehicle with the factory supplied receiver on this equipment.
38. Do not tow or use this equipment if any component is bent, worn or not properly functioning.
39. Do not tow this equipment if tow vehicle mounting bracket, hitch, or ball is damaged.
40. 2" ball must be fully seated in receiver and receiver latch closed and locked with supplied pin before towing this equipment.
41. On Road Ranger, before towing this equipment, make sure trailer safety chains are properly connected according to SAE J684 and lighting is hooked up and functioning properly.
42. Where required by state or local requirements, make sure brakes and break-away switch are functioning properly and break-away battery is charged before towing the Road Ranger.
43. When charging the battery, only use a 3-wire grounded extension cord connected to a grounded AC circuit.
44. This equipment is not designed to be used as a crane.
45. Failure to follow these instructions can result in serious injury or death.



SPECIFICATIONS

Ranger™ Technical Specifications

	Ranger™
Maximum Capacity	310 lbs. (user with tools)
Maximum Lanyard or SRD AAF Rating	1350 lbs.
Maximum Number of Users	1
Maximum Towing Speed	25 MPH
Total Weight	2,685 lbs.
Tongue Weight	658 lbs.
Ground Clearance	8 in.
Leveling Capability	5°
Wedge Latch Coupler	Use Only 2" Ball
Charger	110V 60 Hz
Battery for Mast, Link and Boom	(1) 12V 79 amp-hour, Deka 7T31
Battery for Break-Away System	NA
Tire Size	ST 175/80 D13 Load Range C
Maximum Tire Air Pressure	50 psi
Tire Lug 1/2" Nut Torque	90 ft.-lbs.
Axle 3/8" U-Bolt Torque	30 ft.-lbs.
Axle Mounting 5/8" Bolt	NA
Wheel Hub Bearing Castle Nut Torque	See procedure on page 29
Ball Hitch Coupler 5/8" Bolt Torque	100 ft.-lbs.
Folding Tongue Coupler 5/8" Pin Bolt Torque	50 ft.-lbs.
Anchor D-Ring and Cradle 1/2" Bolt Torque	70 ft.-lbs.
Bolt-On A-Frame Tongue Jack 3/8" Bolt Torque	20 ft.-lbs.
Bolt-On Jacks 3/8" Bolt Torque	25 ft.-lbs.
3/4" Pin Bolt Torque	snug tight - 70 ft.-lbs.
7/8" Pin Bolt Torque	snug tight - 100 ft.-lbs.
Actuator and Gas Spring Bolt Torque	15 ft.-lbs.
Wireless Remote Frequency	915 Hz
Wireless Remote Battery	(1) 12V A23
Localized Pressure, Outrigger Foot	53 psi
Localized Pressure, Tongue Jack	100 psi
Parking Brake	No
Electric Brakes	NA
Trailer Lights and Brake Connector	NA
Spare Tire	No
Folding Tongue	Yes
Operating and Use Temperature Range	0° to 110° Fahrenheit

SPECIFICATIONS (CONTINUED)

Ranger™ Dimensional Information

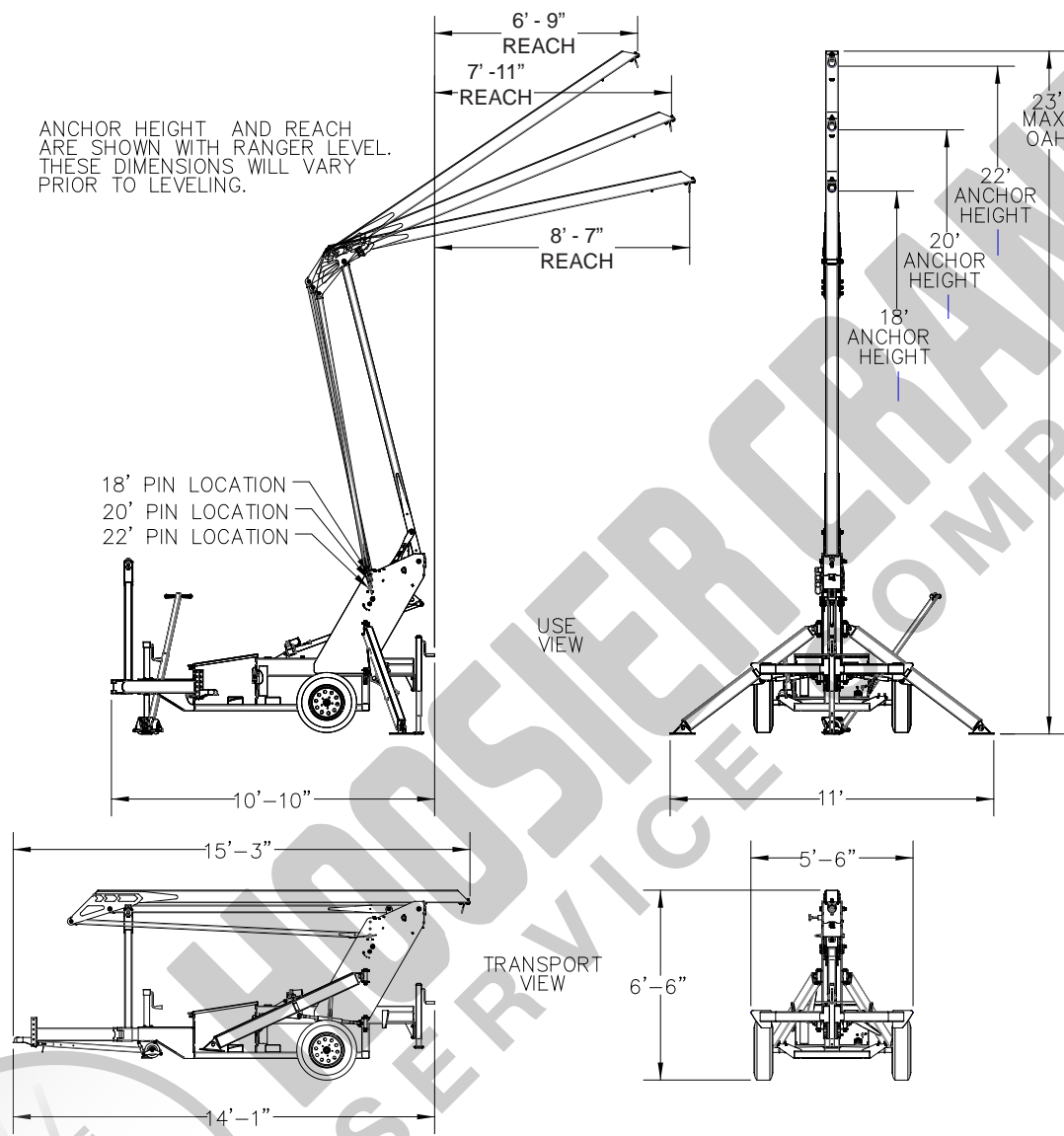


Figure A. Ranger™ Dimensional Information.

SPECIFICATIONS (CONTINUED)

Road Ranger™ Technical Specifications

	Road Ranger™
Maximum Capacity	310 lbs. (user with tools)
Maximum Lanyard or SRD AAF Rating	1350 lbs.
Maximum Number of Users	1
Maximum Towing Speed	65 MPH
Total Weight	3,120 lbs.
Tongue Weight	625 lbs.
Ground Clearance	10 in.
Leveling Capability	5°
Wedge Latch Coupler	Use Only 2" Ball
Charger	110V 60 Hz
Battery for Mast, Link and Boom	(1) 12V 79 amp-hour, Deka 7T31
Battery for Break-Away System	(1) 12V 5 amp-hour
Tire Size	ST 205/75 D14 Load Range C
Maximum Tire Air Pressure	50 psi
Tire Lug 1/2" Nut Torque	90 ft.-lbs.
Axle 3/8" U-Bolt Torque	NA
Axle Mounting 5/8" Bolt	120-155 ft.-lbs.
Wheel Hub Bearing Castle Nut Torque	See procedure on page 29
Ball Hitch Coupler 5/8" Bolt Torque	100 ft.-lbs.
Folding Tongue Coupler 5/8" Pin Bolt Torque	NA
Anchor D-Ring and Cradle 1/2" Bolt Torque	70 ft.-lbs.
Bolt-On A-Frame Tongue Jack 3/8" Bolt Torque	NA
Bolt-On Jacks 3/8" Bolt Torque	25 ft.-lbs.
3/4" Pin Bolt Torque	snug tight - 70 ft.-lbs.
7/8" Pin Bolt Torque	snug tight - 100 ft.-lbs.
Actuator and Gas Spring Bolt Torque	15 ft.-lbs.
Wireless Remote Frequency	915 Hz
Wireless Remote Battery	(1) 12V A23
Localized Pressure, Outrigger Foot	25 psi
Localized Pressure, Tongue Jack	50 psi
Parking Brake	Yes
Electric Brakes	10" x 2-1/4" Drum
Trailer Lights and Brake Connector	7 Way RV Blade Style
Spare Tire	Optional
Folding Tongue	No
Operating and Use Temperature Range	0° to 110° Fahrenheit

SPECIFICATIONS (CONTINUED)

Road Ranger™ Dimensional Information

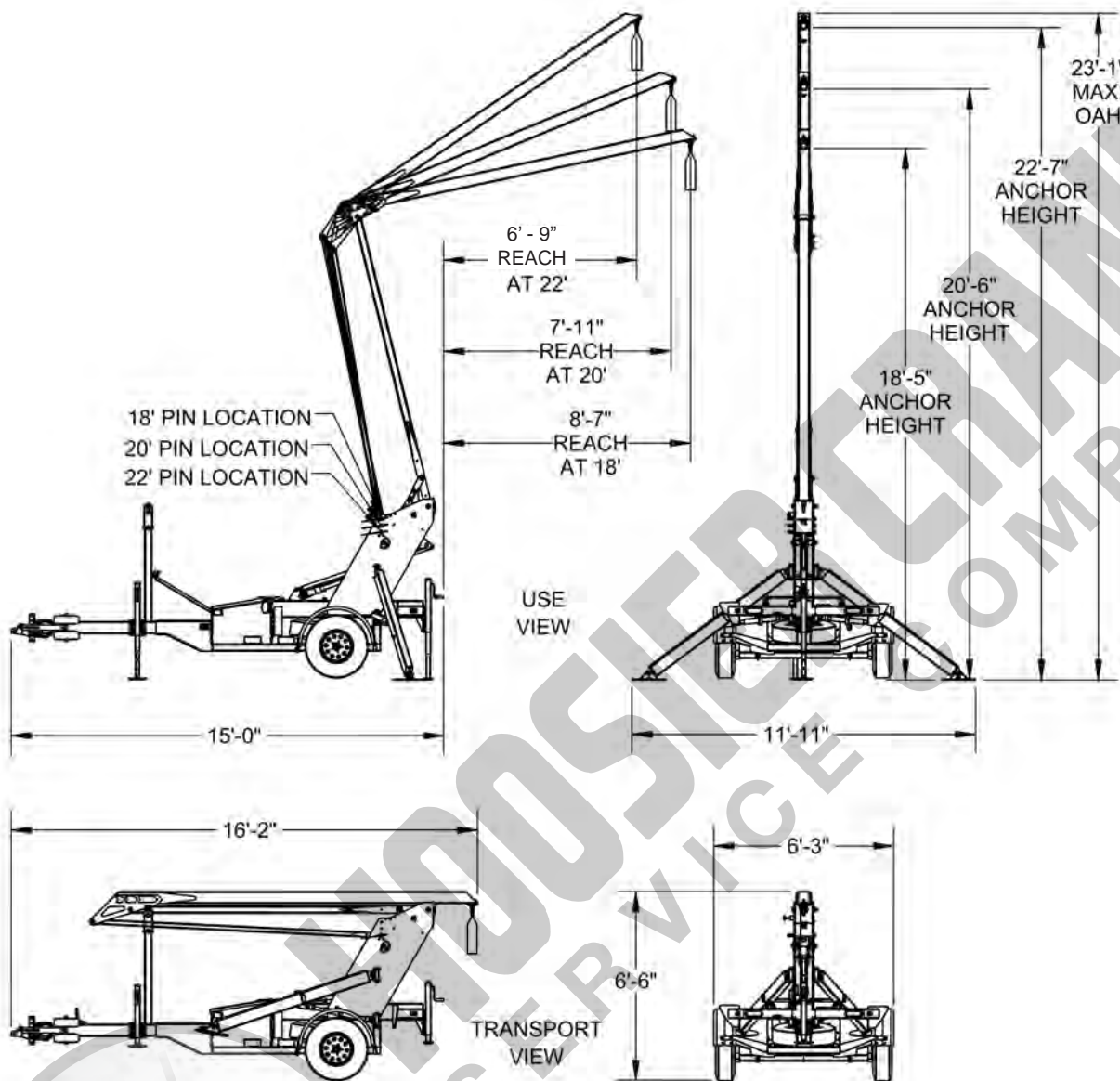


Figure B. Road Ranger™ Dimensional Information.

SPECIFICATIONS (CONTINUED)

Major Components of Ranger and Road Ranger

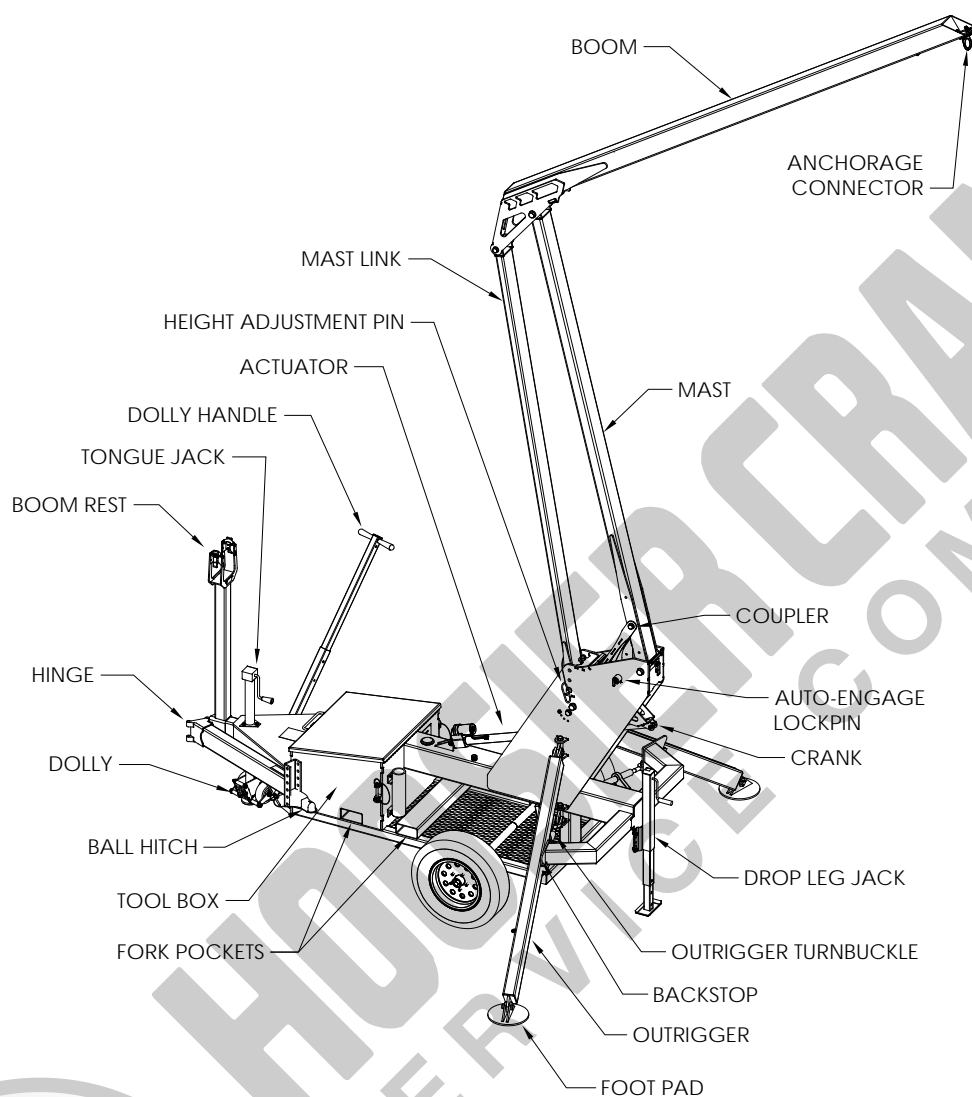


Figure C. Major Component Names



OPERATION

STEP 1 - POSITIONING

- 1.1 Using the tow vehicle or fork truck, position the anchor end near the work area, leaving room for the outriggers to be deployed. If the slope is too great to manually position, the tow vehicle should be used for final positioning. Ranger™ Mobile Anchor products must be used on firm, level ground, away from ledges and drops.
- 1.2 Block the wheels. For the Ranger's integral jack/dolly, unpin the tow dolly handle from the tongue. For the Road Ranger, apply the parking brake. Remove the pin from the wedge latch coupler, open the latch and reinsert the pin in the open position.

CAUTION

The integral jack/dolly, only on the Ranger, will be damaged if the pin holding the handle for towing is not removed before lowering the wheels/jack foot.

- 1.3 On the Road Ranger, set the pin on the drop leg tongue jack to minimize cranking. Wind the tongue jack crank handle clockwise to lower the foot to the ground and lift the coupler from the ball of the tow vehicle. If vehicle's 2" ball will not separate from coupler, move the tow vehicle slightly back. Disconnect the safety chains, break-away switch cable and wiring harness from the tow vehicle.

WARNING

Never use blocking material under jacks or outriggers.

- 1.4 Move the tow vehicle away from the Ranger™ Mobile Anchor and adjust the tongue jack to level the unit from front to back.
- 1.5 Only on the Ranger, the tongue may be folded to reduce the Ranger's "in use" length and facilitate the use of the integral dolly while final positioning. Remove the hairpin cotter pin on the folding tongue coupler hitch pin. Pull out the folding tongue hitch pin and swing outer tongue toward frame. Outer tongue can be secured to frame by aligning dolly handle bracket with bracket on the side of the frame and inserting pin.



STEP 2 - HEIGHT ADJUSTMENT (OPTIONAL)

- 2.1 In order to maximize work area, we recommend that the 22' position is used. In instances where overhead obstructions prevent the use of the 22' position, the anchor height can be set to 20 or 18 feet high by repositioning the link end pivot position with the corresponding pivot holes on the frame using the link hitch pin and link support strap.
- 2.2 The height adjustment must be performed with the boom in the transport position. That is, the boom must be fully supported by the boom rest (cradle) at one end and the frame at the other end. Rotate the link hitch pin to verify it is unloaded but **DO NOT** remove it. If it will not rotate, jog the actuator slightly to release any tension on the link (see Step 3). If the red lock out key is installed, remove it to prevent accidental raising of the boom during adjustment.

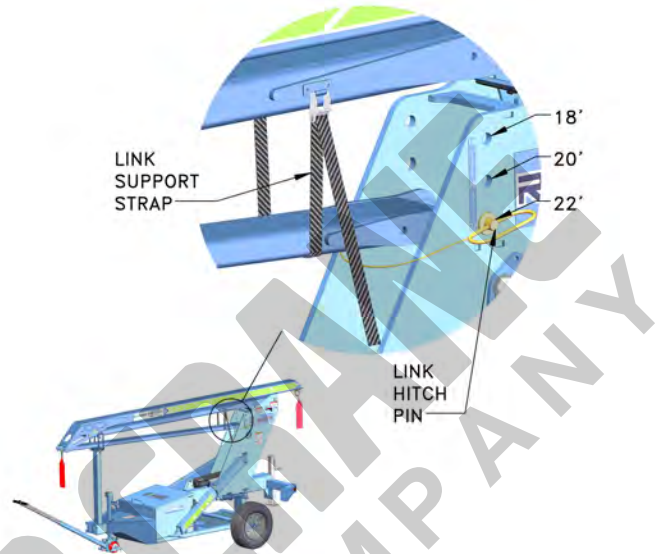


Diagram 2A. Height adjustment.

- 2.3 Attach the link support strap to the hooks welded on either side of the mast and tighten so that the link is supported by the strap.
- 2.4 Remove the lynch pin (locking ring pin) from the hitch pin and pull the pin handle to remove it from the frame.
- 2.5 Using the link support strap, loosen or tighten the strap to align the lower link pivot bushings with the holes in the frame corresponding to the desired height.
- 2.6 Reinsert the link hitch pin through the frame and link pivot end, and secure it with the tethered lynch pin (locking ring pin) to complete the adjustment. Remove and store support strap.



STEP 3 - RAISING AND LOCKING

After Steps 1 & 2 have been completed, it is now safe to attach the **SRD** and raise the mast. If the Ranger or Road Ranger is more than 2° out of level, go to Step 5 to level the unit before raising the Mast.

- 3.1 Remove the pin from the rear drop leg jack, lower the foot to the lowest overlapping hole, and reinsert the pin. Crank the handle to lower the foot to within 1" of the ground.
- 3.2 Attach the **SRD** to the D-ring anchorage connector per the instructions supplied with the **SRD**. Connect a tagline to the **SRD** in order to access the **SRD** from ground level.
- 3.3 Unlock and flip back the three boom hold-down latches: (2) at the boom rest and (1) at the rear of the frame; ensuring that the latch claw is clear of the catch plate.
- 3.4 Insert the red lock out key into the slot located at the right rear corner of the tool box. Turn the key 90 degrees clockwise to power on the system.
- 3.5 Access the tethered pendant located inside the toolbox and stand clear of the boom.
- 3.6 Press and hold the UP button to raise the unit, while standing at a distance to the side of the unit to best view the boom as it raises and check for obstructions in its path.

WARNING

Never stand under the mast while it is being raised or lowered.

- 3.7 Continue to hold the UP button until the actuator reaches its preset limit switch and stops. Check that the auto-engage lock pin has fired and is fully seated.
- 3.8 Verify the coupling is in-line with the crank mounting bolt. When the hinged connection between the coupling and crank is in-line or just past in-line, the mast is locked. This hinged connection should be within 1/4" of the frame backstop. If it is more, see the Maintenance Section to adjust actuator limit switches. The auto-engage lock pin and this in-line hinge provide the Ranger and Road Ranger with double locking required for this kind of equipment.



Diagram 3A. Pendant (left) and Wireless remote (right).



Diagram 3B. Mast Lock Pin Warning.

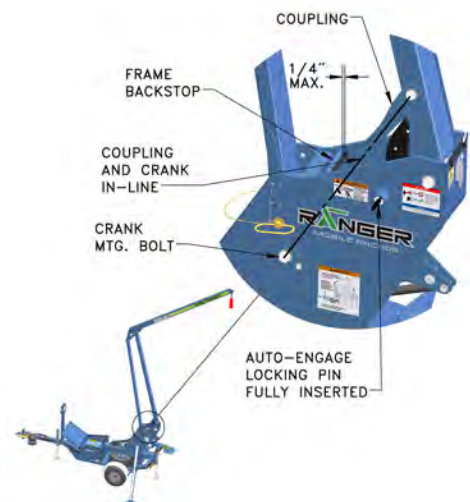


Diagram 3C. Mast Double Locking.

STEP 4 - FINAL POSITIONING

The Ranger can be positioned on firm, level ground using the built in tongue jack / trailer dolly. For the Ranger, follow Steps 4.1 through 4.4.

- 4.1 Remove the hitch pin from the folding tongue and swing the tongue back against the side of the frame.
- 4.2 Extend the telescoping dolly handle to one of the preset positions and check that both of the spring buttons are fully seated.
- 4.3 Pull up on the handle to engage the wheels and maneuver the Ranger into its final position.
NOTICE: Raising or lowering the handle angle beyond the dolly mechanism rolling range will engage the foot and can act as an emergency brake.
- 4.4 Gently lower the handle to the ground to reengage the tongue jack foot and pivot the handle beneath the unit to keep it out of the way.

The Road Ranger can be positioned on firm, level ground using the wheeled tongue jack. For the Road Ranger, follow Steps 4.5 through 4.10.

- 4.5 Engage the parking brake. The parking brake is engaged when the handle is in-line with the tongue.
- 4.6 Pull the spring loaded pin on the wheeled jack and swing the jack wheels downward until the pin engages in the position lock hole. The jack should be perpendicular with the tongue.
- 4.7 Align the wheels for the direction the Road Ranger will be pushed and lower the wheels using the wheeled jack and/or raising the foot on the tongue leveling jack.
- 4.8 Release the parking brake (handle will be perpendicular to tongue) being careful to re-engage the brake if the Road Ranger starts to roll on its own.
- 4.9 Push the Road Ranger into its final position optimizing the safe work area and minimizing the possible fall distance.
- 4.10 Re-engage the parking brake and lower the leveling jack foot until it is in contact with the ground.



STEP 5 - LEVELING

- 5.1 Check the bubble level, located in front of the actuator, to determine the high side of the Ranger™ Mobile Anchor.
- 5.2 Starting on the high side, unpin and swing the outrigger over the wheel to the back stop plate.
- 5.3 Using the ratcheting outrigger turnbuckle, lower the outrigger until the foot pad firmly contacts the ground, making certain that the backstop plate is captured between the outrigger and the outrigger angle.

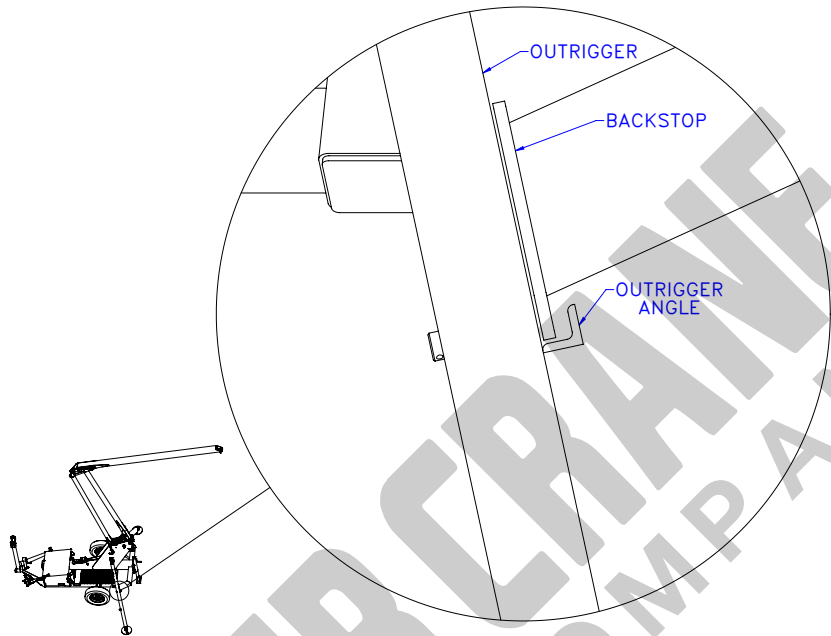


Diagram 5A. Outrigger overlap.

- 5.4 Switch to the low side and repeat steps 5.2 and 5.3 and lower the outrigger until the Ranger™ Mobile Anchor is level from side to side.
- 5.5 Raise or lower the tongue jack to level the Ranger from front to back.
- 5.6 At this point both tires should be raised off the ground with the unit fully supported by the outriggers and tongue jack. If the tires are contacting the ground, raise the outriggers and tongue jack until the unit is level and the wheels are off the ground. If the feet sink into the ground and the wheels cannot be raised, **DO NOT USE**. The ground is too soft.
- 5.7 Lower the rear drop leg jack until the foot just touches the ground.

STEP 6 - FINAL STEPS

- 6.1 With the unit raised, locked out and leveled, it is now safe to use the Ranger™ Mobile Anchor.
- 6.2 Turn the red lockout key counterclockwise and remove it to prevent accidental lowering of the mast while a worker is attached.
- 6.3 Use the tagline to lower the **SRD** and hook it to the full body harness's dorsal D-ring per the **SRD** instructions.

STEP 7 - UNLOCKING AND LOWERING

After the worker has safely returned from height and detached the **SRD** from their dorsal harness D-ring, it is safe to unlock and lower the boom.

- 7.1 Reinsert the red lockout key into the slot located at the right rear corner of the toolbox. Turn the key 90 degrees clockwise to power on the system.
- 7.2 Rotate the handle of the auto-engage lock pin clockwise to ensure the pin is unloaded. If you are unable to rotate the handle, **STOP! THE PIN IS LOADED AND SHOULD NOT BE REMOVED.** Use the up arrow on the remote to ensure the actuator is fully raised and recheck the pin handle.
- 7.3 If the pin is free, pull the handle to full extension with one hand, then depress the DOWN button on the remote with the other hand. You can release the handle when you see the mast begin to lower.
- 7.4 Hold the DOWN button to continue lowering the mast, while standing clear of the path of the boom and checking for obstructions.
- 7.5 Continue to hold the DOWN button until the boom is fully seated and resting on the boom rests, and the actuator reaches its lower limit switch.
- 7.6 The actuator should have a minimum tension load to prevent it from rattling during travel.
- 7.7 Engage the three boom hold down latches: (2) at the boom rest and (1) at the rear of the frame; ensuring that the latches are fully seated with their safety catches engaged.
- 7.8 Remove the red lockout key and store it with the manual.

NOTICE: The electric actuator is equipped with a manual override option, in the event that power is lost and the actuator cannot be lowered using the controls. To use the manual override:

1. Use a 3/16" hex wrench to remove the cap from the override access port, located on the fixed end of the actuator.
2. While standing next to the actuator, use a cordless drill or non-impact driver with a 1/4" square drive extension inserted fully into the port. On slow speed, drive the actuator ball screw counterclockwise to lower the unit while another operator temporarily retracts and holds the auto-engage spring pin handle to initiate the mast lowering procedure.

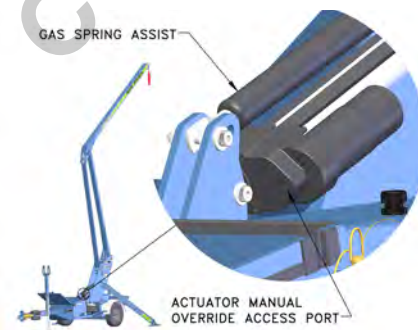


Diagram 7A. Override access port.

STEP 8 - STOWING

- 8.1 Detach the **SRD** from the D-ring and store it in the toolbox.
- 8.2 Secure the toolbox using a lock with up to a 3/8" diameter shackle.
- 8.3 Block the wheels to prevent the unit from rolling if parked on a slope or in the event of high winds.
- 8.4 Raise the rear drop leg jack to its highest setting.
- 8.5 Raise, fold away and pin the outriggers in their stowed position along the sides of the toolbox, ensuring that the hitch pins are through the retaining eyelet on the outrigger as well as both holes in the frame mounted bracket.
- 8.6 Install lynch pins (locking ring pins) into the outrigger retaining hitch pins.
- 8.7 Tension each outrigger ratchet turnbuckle to lower the outriggers and lightly preload the retaining hitch pins. This will prevent the outriggers from rattling while towing.
- 8.8 For the Road Ranger, engage the parking brake (handle in-line with tongue).

STEP 9 - BATTERY CHARGING

This equipment is conveniently fitted with a 10 amp battery charger and male 110V socket on the back of the toolbox for charging. It can be charged with or without the lockout key in the socket. The charging status light can be viewed on top of the charger, inside the toolbox. For maximum battery life, we recommend the unit is charged weekly or every 30 up/down cycles, whichever comes first.

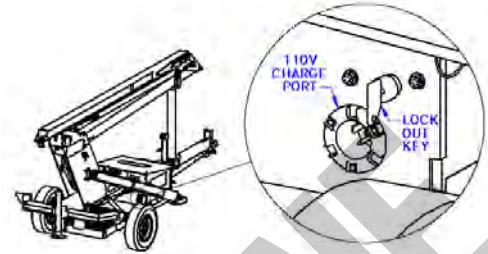


Diagram 9A. Charging port.

- **DO NOT** over discharge battery. Over discharge will lead to battery failure.
- **DO NOT** charge battery in excessively hot temperatures; wait until the cool of the evening.
- **DO NOT** charge near fuels, grain, dust, solvents or other flammables - charger can ignite flammable materials and vapors.
- **DO NOT** charge battery if it may be frozen. See Battery section in Inspection and Maintenance Schedule for more details.

- 9.1 Pull back the protective rubber cap from the charge port and plug in the female end of a 3-prong grounded extension cord of 18 AWG or thicker. For safety, the extension cord length should be kept as short as practical and located where it will not be stepped on, tripped over or otherwise subjected to damage or stress. The charger must be plugged into a grounded and fuse-protected outlet of 2A or greater. Open the toolbox cover to observe the charging status light on the charger. The charger will initially flash red for a few seconds, then turn steady red. When the cycle is 80% complete, it will turn yellow, and finally green when the cycle is complete.
- 9.2 The charger can be plugged in overnight without fear of overcharging the battery. The charger is set to maintain a full charge when plugged in.
- 9.3 When the battery is done charging, unplug and put away the extension cord, and reinstall the protective rubber charge port cap.



STEP 10 - TOWING/TRANSPORTING

The Ranger and Road Ranger are equipped with a height adjustable 2" ball coupling (receiver). To use this, the tow vehicle requires a 2" ball. When level, the height of the ball coupling is adjustable from 18" to 26" above the ground. This must be adjusted such that the Road Ranger is level when being towed. The ball coupling is removable and can be replaced with a Lunette Ring if the tow vehicle has a Pintle Hitch.

The Ranger's weight is 2,685 lbs. and its tongue weight is 658 lbs. The Road Ranger's gross vehicle weight rating (GVWR) is 3,200 lbs. and the tongue weight is 625 lbs. This requires a Class IV hitch. Observe caution when reviewing the tow vehicle capacity. If it only lists towing capacity and not tongue weight capacity, a rule of thumb is 10% tongue weight to towing capacity.

WARNING

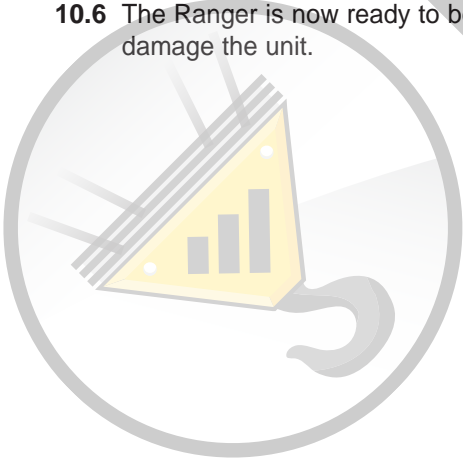
The Ranger is not equipped for highway use. Towing speeds must be kept under 25 MPH. The Ranger must be transported on a trailer, flat bed or box truck if traveling over long distances or at higher speeds.

The Road Ranger is equipped for highway use. Towing speeds must be kept under 65 MPH.

TOWING

For the Ranger, follow steps 10.1 through 10.6

- 10.1** Extend the folding tongue to the towing position and secure the joint by inserting the 5/8" hitch pin and tethered hairpin cotter pin.
- 10.2** Raise ball receiver above the 2" ball on the tow vehicle using the tongue jack. Use the dolly or the tow vehicle to position receiver over the 2" ball. Verify the ball receiver latch pin is pinned in the *open* position.
- 10.3** Lower the dolly handle to the ground and press the two spring buttons to collapse the handle.
- 10.4** Crank the tongue jack handle counterclockwise to lower the receiver firmly onto the ball hitch and pin the receiver latch in the closed position. Check to see that the ball clamp is below the ball. At this point, the trailer should be level with the dolly wheels raised off the ground. If the tongue is too low or too high, the receiver should be lifted from the ball and the receiver height adjusted to level the trailer.
- 10.5** Position the dolly handle under the tongue, then continue to crank the handle counterclockwise until the top of the dolly is seated under the bottom of the frame. Secure the dolly handle to the underside of the tongue with the included hitch pin.
- 10.6** The Ranger is now ready to be towed around the job-site. Avoid bumps, pot holes, and other impacts that may damage the unit.



STEP 10 - TOWING/TRANSPORTING (CONTINUED)

For the Road Ranger, follow Steps 10.7 through 10.13

The Road Ranger is equipped with a 7-way RV standard blade style female connector.



The Road Ranger is equipped with electric brakes and a break-away switch. The tow vehicle must have an electric brake controller if required by state or local jurisdiction. Many states require brakes for trailers over 3,000 lbs.

- 10.7** Raise ball receiver using the drop leg tongue jack until it is higher than the tow vehicle's 2" ball. Back up the tow vehicle until the ball and receiver are vertically aligned. Verify the receiver's latch is pinned open. Lower the receiver down until the ball is firmly seated in the ball pocket. Remove pin from the receiver's latch and lower latch. Verify latch is locked by trying to lift up on the end of the latch. It should not move unless you also press the latch trigger. Verify bottom of receiver is below ball. Insert pin in receiver latch's lock hole.
- 10.8** With the tow vehicle fully supporting the tongue weight, the Road Ranger should be level. If this is not the case, the receiver's variable height mounting bracket should be used. If necessary, disconnect Road Ranger from tow vehicle, change mounting location of the receiver by removing 5/8" bolts and reinstall receiver in higher or lower mounting holes as needed (see Specifications) for bolt torque. Repeat Step 10.7.
- 10.9** Pull wheeled jack pin and swing wheels up. Release pin and verify jack is locked in towing position. Remove pin on drop leg jack, fully insert drop leg into jack and install pin. Crank jack to raise foot for adequate ground clearance.
- 10.10** Disengage the parking brake (handle perpendicular to tongue).
- 10.11** Attach safety chains to tow vehicle. Chains must cross underneath the tongue.
- 10.12** Attach break-away switch cable to the tow vehicle. Test break-away battery in tool box to verify it is charged.
- 10.13** Connect trailer brake and light wires to the tow vehicle. Adjust brake gain setting on tow vehicle controller per controller instructions.

TRANSPORTING

10.14 The Ranger™ Mobile Anchor features built-in fork pockets for moving around the jobsite or lifting onto a flatbed. Alternately, the Ranger can be towed onto a flatbed or box truck if a loading dock is available.

10.15 The Ranger™ Mobile Anchor should be positioned on the trailer with the wheels blocked and two 4x4 blocks stacked and positioned under the flat bottom of the toolbox.

10.16 The dolly jack should be raised and pinned under the tongue, per Step 10.5.

10.17 A tie down strap should be positioned through each fork pocket, anchored and tensioned in opposing directions to provide lateral, vertical and front-to-back stability.

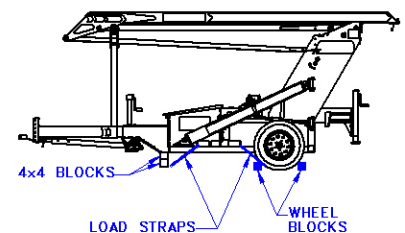


Diagram 10A. Transporting Ranger.

LABELS

The labels below are affixed to the Ranger and Road Ranger as noted at time of shipment. Do not remove any labels from the unit. If labels are damaged or illegible, contact Gorbel for replacements.

RANGER AND ROAD RANGER LABELS

Capacity Label

1 WORKER MAXIMUM
310 LBS CAPACITY
 (140KG) WORKER WITH TOOLS
1350 LBS MAXIMUM AVERAGE
 (6KN) ARRESTING FORCE

RANGER™
 MOBILE ANCHOR

P/N: 30932 Fishers, NY, USA COMPLIES WITH OSHA REQUIREMENTS PATENT PENDING GORBEL®
 A CLASS ABOVE

Capacity Label

Warning Labels

⚠ DANGER
 ELECTROCUTION HAZARD

It is unlawful to operate this equipment within 10 feet of high voltage lines of 50,000 volts or less.

This equipment is NOT insulated.

Serious injury or death will result from contact with this equipment if it should become electrically charged.

KEEP CLEAR

P/N: 30933.1

Electrocution Hazard Warning.

⚠ WARNING
 Pinch point.
 Keep hands clear during operation.

Pinch Point Warning.

⚠ DANGER
 LEAD ACID BATTERY INSIDE

Adhere to DANGERS, WARNINGS, and Safety Data Sheet contained in the Manual before removing cover.

P/N: 30933.12

Battery Warning.

⚠ WARNING
 SWING OUTRIGGER TO BACK STOP AND LOWER TO LEVEL UNIT. BACKSTOP MUST BE CAPTURED BY ANGLE TAB.

P/N: 30933.3

Outrigger Warning.

⚠ WARNING
 ANCHOR CAN MOVE UP TO 1 FOOT DURING A FALL EVENT

MAXIMUM 30 DEGREE OFF-VERTICAL ALLOWABLE WORKING CONE

USEABLE WORKING SURFACE MUST BE WITHIN CONE

P/N: 30933.17

Work Zone Warning.

⚠ WARNING
 FORK LIFT USE

Lower mast, lock latches, and pin outriggers in the transport position before lifting.

P/N: 30933.2

Fork Lift Use Warning.

⚠ DANGER

THE MAST MUST BE COMPLETELY RAISED, WITH THE LOCKING PIN FULLY SEATED BEFORE USE.

NOTICE
 TO LOWER: FULLY RETRACT AND HOLD THE HANDLE UNTIL THE MAST BEGINS TO MOVE

P/N: 30933.2

Locking Pin Warning.

⚠ WARNING

Unlocked boom can cause serious injury or death. Keep clear.

Stay out from under boom while raising or lowering and when boom is not locked.

P/N: 30933.11

Boom Impact Warning.

⚠ DANGER
 FAILURE TO READ, UNDERSTAND AND FOLLOW THESE SAFETY INSTRUCTIONS WILL RESULT IN SERIOUS INJURY OR DEATH.

BEFORE USE
 Operator is responsible for proper operation of this equipment. User is responsible for the proper use of this equipment. DO NOT operate or use this equipment unless you have read and understood the Operation, Use and Maintenance Manual. DO NOT use this equipment unless the application and supporting surface have been approved by a Qualified Person. Inspect for damaged, worn or missing components.

SET UP
 Operator is responsible to avoid all hazardous situations. Inspect jobsite and identify all potential hazards. Adjust height as specified by Qualified Person for the application. DO operate on a level and approved surface. DO NOT use this equipment on any surface that will not support weight and fall arrest forces applied to outrigger foot. Outriggers must be positioned against and captured by back stops. Weight of equipment must be fully supported by outriggers and tongue jack. Equipment must stay level to within 1 degree. Stay clear of mast, link and boom while raising and lowering. Equipment must be fully actuated and locked. Key must be removed when in use.

USE
 DO only use with approved full body harness, self-retracting device and compatible connector specified by a Qualified Person for the application. DO NOT use if wind gusts exceed 28 MPH. DO NOT use in severe weather that would soften the supporting surface. DO NOT use as a personnel lift or for material handling. DO NOT unlock mast when in use. DO NOT reposition this equipment when in use. DO NOT alter this equipment. DO only use when your position and working surface are within limits prescribed by a Qualified Person for the application.

IF YOU DO NOT HAVE A MANUAL OR HAVE QUESTIONS CONCERNING THE SAFE USE OF THIS EQUIPMENT, CONTACT GORBEL, INC. AT 800-821-0086

P/N: 30933.6

Safety Instructions.

LABELS (CONTINUED)

RANGER LABELS



Max Tow Speed Warning.

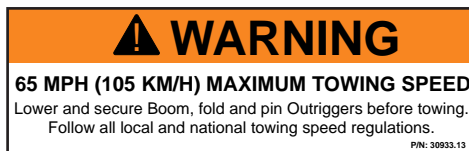


Weight Notice.

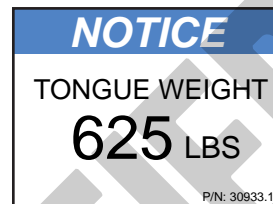


Handle Storage Notice.

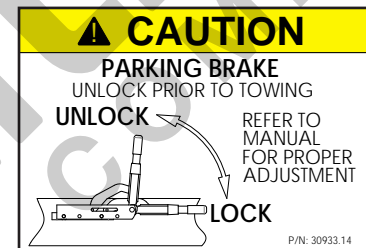
ROAD RANGER LABELS



Max Tow Speed Warning.



Tongue Weight Notice.



Parking Brake Notice.



AUTHORIZED PERSON INSTRUCTIONS

Performing duties where a fall hazard exists can be dangerous. Therefore, it is important for the **Authorized Person** to be instructed in the use of their **Complete Fall Arrest System** and to understand the severe consequences of careless use. It is not intended that these suggestions take precedence over existing plant safety rules and regulations or OSHA regulations. However, a thorough study of the following information should provide a better understanding of safe use and afford a greater margin of safety. It must be recognized that these are suggestions for the **Authorized Person** working in the presence of a fall hazard. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes, and to make certain **Authorized Persons** are properly trained.

Qualifications

Working while being exposed to a fall hazard, to be safe and efficient, requires skill: the exercise of extreme care and good judgement, alertness and concentration, and rigid adherence to proven safety rules and practices as outlined in applicable and current ANSI and OSHA safety standards. In general practice, no person should be authorized to work while being exposed to a fall hazard:

- Who cannot speak the appropriate language or read and understand the printed instructions.
- Who is not of legal age to work while being exposed to a fall hazard.
- Whose hearing or eyesight is impaired (unless suitably corrected with good depth perception).
- Who may be suffering from heart or other ailments which might interfere with their safe performance.
- Who may be pregnant or have any condition where the exposure to maximum arresting force of a fall event may be a health risk.
- Unless the person has carefully read and studied this operation manual.
- Unless the person has been properly instructed.
- Unless there is a rescue plan in place and at least one additional **Authorized Person** that has been instructed in the implementation of the rescue plan who is within visual sight of the fall hazard.
- Unless the person has demonstrated his or her understanding of the instructions through practical use of the **Complete Fall Arrest System**.
- Unless the person is familiar with fall protection equipment and the safe use of this equipment.

Work Area Limits

Before using this equipment, the **Authorized Person** shall verify the proper set-up of the Ranger™ Mobile Anchor, the proper attachment of the **SRD** to both the Ranger™ Mobile Anchor and their harness, the proper wearing and adjustment of their harness, and the fall zone, beneath where the work will be performed, is clear of any obstructions that would decrease the required fall clearance height. The **Authorized Person** shall verify the Ranger or Road Ranger's anchor point is located to provide coverage for the area to be occupied. This coverage is limited to a maximum off vertical angle of 30 degrees. Exceeding this work area limit may cause a pendulum motion during a fall event that will increase fall distance, may expose the user to a side impact with any obstructions, and may exceed the stability safety factor of the Ranger™ Mobile Anchor causing it to tip over. As well as staying within the safe 30 degree from vertical working zone, the Authorized User must verify that the anchor point always remains overhead and that it is high enough to never allow the **SRD** to completely retract during use.

Outdoor Use

It is recommended that the user should not expose themselves to a fall hazard if wind gusts exceed 28 mph or if weather and walking surface conditions increase the risk of a fall event occurring. If there is any concern that severe weather has affected the integrity of the supporting surface or any component of the fall arrest system, remove yourself from the fall hazard and do not use the fall protection system until the weather has improved and the system is inspected. After an extreme weather event, a maintenance inspection is recommended. If the Ranger™ Mobile Anchor is left outdoors, always lower and lock the boom and mast when not in use. Also, secure the trailer to prevent damage.

GENERAL USE REQUIREMENTS

Know Your Environment and Your Complete Fall Arrest System

Authorized Persons shall be familiar with the principal parts of the Fall Arrest System and have a thorough knowledge of the safe use, inspection, and limitations of this equipment. The **Authorized Person** shall be required to know the procedure to rescue a person after a fall event and be trained to rapidly implement this procedure. The **Authorized Person(s)** shall be aware of any condition that may change while they are exposed to a fall hazard that may jeopardize the integrity of the fall arrest system and the rescue plan. For example, obstructions moving into a **Fall Clearance Zone**.

Responsibility

Each **Authorized Person(s)** shall be held directly responsible for the safe use of the Fall Arrest System. Whenever there is any doubt as to SAFETY, the **Authorized Person** shall remove themselves from exposure to the fall hazard and refuse to re-expose themselves until safety has been assured. It is the responsibility of the employer to train the **Authorized Person(s)** in the safe use of the Fall Arrest System and to have managed Fall Protection in place. Do not permit **ANYONE** to use this equipment unless they are authorized, there is at least one other **Authorized Person** within visual range, and there is a rescue plan in place.

Inspection

Ensure the Ranger is properly and completely set up. Verify that the auto-engage lock pin is fully inserted, the outriggers are securely captured by the backstops, and the actuator controls are locked out. Confirm that the mounting surface is firm and stable, that the unit is fully supported by the outriggers and jacks, and that the Ranger™ Mobile Anchor is level. Test any attachments and connections before each use. Whenever the **Authorized Person(s)** finds anything wrong or apparently wrong, the problem shall be reported immediately to the proper supervisor and appropriate corrective action taken.

Suggestions for the use of the Ranger and Road Ranger

The **Authorized Person** shall know and follow these suggestions for safe use of this protection equipment.

1. Only attach yourself to the lanyard or **SRD** after you have verified:
 - a. the application, support surface and fall arrest system components are as specified by a **Qualified Person**,
 - b. the Ranger™ Mobile Anchor is optimally positioned to minimize swing falls,
 - c. the work zone boundaries,
 - d. the Ranger or Road Ranger has been completely set-up and is ready for use,
 - e. there are no electrocution hazards from overhead lines or from lightning,
 - f. weather conditions are appropriate to work at height and wind gusts are below 28 MPH.
2. If a self-retracting device is being used, you shall always feel tension in the lifeline. Never let the lifeline go slack, or contact an obstruction. The lifeline shall always maintain the shortest distance between you and the anchorage connector D-Ring of the Ranger or Road Ranger.
3. Always stay within the safe working zone. If work needs to be performed outside of this zone, you must either use another means of protection or remove yourself from the fall hazard and then detach from the Ranger™ Mobile Anchor. It can now be repositioned to cover the new work area. Never reposition the Ranger or Road Ranger while you are connected to it.
4. The Ranger and Road Ranger are designed to allow for a 30 degree off-vertical side pull. This maximum angle is selected to minimize horizontal acceleration and excessive side impact forces experienced during a swing fall. Exceeding the 30 degree off-vertical angle can cause the equipment to become unstable leading to possible tip over with catastrophic results. You must never work outside of the designed fall zone.
5. Be sure everyone in the immediate area is aware of your use of fall protection equipment and that the fall zone and area around the Ranger™ Mobile Anchor remains clear. Confirm that there is at least one person visually aware of your activities and that there is an authorized fall rescue person on-site.
6. Do not exceed the rated load capacity, number of workers, or maximum average arresting force of the Ranger. Labels with this information are located on either side of the boom.
7. Before exposing yourself to a fall hazard, make certain that components are properly connected, connectors are properly oriented and connector latches are fully closed and locked.
8. Check to be sure that all trip hazards are removed and that the fall protection zone remains clear of dangerous obstructions while using this equipment. Be aware of the boundaries of the fall protection zone. Refer to Figure A of this manual and to information provided by a **Qualified Person** for the application.

GENERAL USE REQUIREMENTS (CONTINUED)

9. At no time shall the **Authorized Person** be working alone while exposed to a fall hazard. In the event of a fall, a worker left suspended will lose the ability to circulate blood by the contractions of muscles in their legs. This combined with being suspended vertically will eventually result in lack of blood flow to the brain and can lead to death.
10. Do not use equipment with unused Y-lanyard webs, straps or taglines hanging loose. These shall be properly stored to prevent tripping hazards and the possibility of snagging during a fall event that may cause an excessive arresting force.
11. This equipment shall not be used for any purpose other than fall protection.
12. Whenever the **Authorized Person** leaves the protection of the fall arrest system, the following procedure shall be followed:
 - Verify that you are removed from the fall hazard or that you have another method of fall protection.
 - Remove your lifeline from the body harness D-ring or remove the lanyard from the anchorage connector.
 - If using a self-retracting lifeline, securely attach a tagline to the lifeline and allow it to slowly retract.
 - Remove lanyard and harness and clean any grease or dirt per manufacturer's instructions. Allow to drip dry and store in a cool, clean, dry environment out of direct sunlight.
 - If outdoors, follow Operation Steps 7 and 8 for lowering and stowing the Ranger™ Mobile Anchor
 - Notify appropriate person that you are no longer using the fall arrest system.
13. After a fall event or if a safety concern is uncovered during inspection, an "out-of-service" warning sign or signal shall be displayed on the equipment until the system can be inspected and repaired or replaced.
14. Never remove any labels. If a label is worn or illegible, have it replaced.
15. Charge the battery after use or at least every month.
16. Keep the equipment clean and free from rust. Clean with a soft brush, warm water and a mild soap solution.
17. Properly maintain all components of the Ranger™ Mobile Anchor. See Inspection and Maintenance section.
18. ANY SAFETY FEATURES AND MECHANISMS BUILT-IN OR OTHERWISE PROVIDED WITH THE RANGER™ MOBILE ANCHOR BY GORBEL ARE REQUIRED FOR THE SAFE USE OF THIS EQUIPMENT. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE OR OTHERWISE IMPAIR OR DISABLE THE PROPER FUNCTIONING OF ANY SAFETY MECHANISMS OR FEATURES BUILT-IN OR OTHERWISE PROVIDED BY GORBEL FOR SAFE OPERATION OF THIS EQUIPMENT. ANY REMOVAL, IMPAIRMENT OR DISABLING OF ANY SUCH SAFETY MECHANISMS OR FEATURES, OR OTHER OPERATION OF THE RANGER™ MOBILE ANCHOR WITHOUT THE COMPLETE AND PROPER FUNCTIONING OF ANY SUCH SAFETY MECHANISMS OR FEATURES, AUTOMATICALLY AND IMMEDIATELY VOIDS ANY AND ALL EXPRESS AND IMPLIED WARRANTIES OF ANY KIND OR NATURE.



LIMITED WARRANTY

It is agreed that the equipment hereunder is subject to the following LIMITED warranty and no other. Gorbel Incorporated ("Gorbel") warrants the Ranger™ products to be free from defects in material or workmanship for a period of one year from date of shipment. This warranty shall not cover failure or defective operation caused by operation in excess of recommended capacities, misuses, negligence or accident, and alteration or repair not authorized by Gorbel. No system shall be field modified after manufacture without the written authorization of Gorbel, Inc. Any field modification made to the system without the written authorization of Gorbel, Inc. shall void Gorbel's warranty obligation. OTHER THAN AS SET FORTH HEREIN, NO OTHER EXPRESS WARRANTIES, AND NO IMPLIED WARRANTIES, ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE BY GORBEL WITH RESPECT TO ITS PRODUCTS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED. GORBEL SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES WHATSOEVER, WHETHER OR NOT FORESEEABLE, INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOST PROFITS AND ALL SUCH INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES ARE HEREBY ALSO SPECIFICALLY DISCLAIMED. Gorbel's obligation and Purchaser's or end user's sole remedy under this warranty is limited to the replacement or repair of Gorbel's products at the factory, or at the discretion of Gorbel, at a location designated by Gorbel. Purchaser or end user shall be solely responsible for all freight and transportation costs incurred in connection with any warranty work provided by Gorbel hereunder. Gorbel will not be liable for any loss, injury or damage to persons or property, not for damages of any kind resulting from failure or defective operation of any materials or equipment furnished hereunder. Components and accessories not manufactured by Gorbel including but not limited to batteries and tires are not included in this warranty. Purchaser's or end user's remedy for components and accessories not manufactured by Gorbel is limited to and determined by the terms and conditions of the warranty provided by the respective manufacturers of such components.

A) DISCLAIMER OF IMPLIED WARRANTY OF MERCHANTABILITY

Gorbel and Purchaser agree that the implied warranty of merchantability is excluded from this transaction and shall not apply to the goods involved in this transaction.

B) DISCLAIMER OF IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE

Gorbel and Purchaser agree that the implied warranty of fitness for particular purpose is excluded from this transaction and shall not apply to the goods involved in this transaction.

C) DISCLAIMER OF EXPRESS WARRANTY

Gorbel's agents, or dealer's agents, or distributor's agents may have made oral statements about the machinery and equipment described in this transaction. Such statements do not constitute warranties, and Purchaser agrees not to rely on such statements. Purchaser also agrees that such statements are not part of this transaction.

D) DISCLAIMER OF SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES

Gorbel and Purchaser agree that any claim made by Purchaser which is inconsistent with Gorbel's obligations and the warranty remedies provided with Gorbel's products, and in particular, special, incidental and consequential damages, are expressly excluded.

E) DEALER OR DISTRIBUTOR NOT AN AGENT

Gorbel and Purchaser agree that Purchaser has been put on notice that dealer or distributor is not Gorbel's agent in any respect for any reason. Gorbel and Purchaser also agree that Purchaser has been put on notice that dealer or distributor is not authorized to incur any obligations or to make any representations or warranties on Gorbel's behalf other than those specifically set forth in Gorbel's warranty provided in connection with its product.

F) MERGER

This warranty agreement constitutes a final and complete written expression of all the terms and conditions of this warranty and is a complete and exclusive statement of those terms.

G) PAINTING

Every Ranger and Road Ranger (excluding components) receives a quality paint job before leaving the factory. Unfortunately, no paint will protect against the abuses received during the transportation process via common carrier. If touch up paint is required, contact a Gorbel® Customer Service Representative at 1-800-821-0086 or 1-585-924-6262.

Title and Ownership:

Title to the machinery and equipment described in the foregoing proposal shall remain with Gorbel and shall not pass to the Purchaser until the full amount herein agreed to be paid has been fully paid in cash.

Claims and Damages:

Unless expressly stated in writing, goods and equipment shall be at Purchaser's risk on and after Seller's delivery in good shipping order to the Carrier. Gorbel shall in no event be held responsible for materials furnished or work performed by any person other than it or its authorized representative or agent.

Cancellations:

If it becomes necessary for the Purchaser to cancel this order wholly or in part, he shall at once so advise Gorbel in writing. Upon receipt of such written notice all work will stop immediately. If the order entails only stock items, a flat restocking charge of 15% of the purchase price will become due and payable by Purchaser to Gorbel. Items purchased specifically for the canceled order shall be charged for in accordance with the cancellation charges of our supplier plus 15% for handling in our factory. The cost of material and/or labor expended in general fabrication for the order shall be charged for on the basis of total costs to Gorbel up to the time of cancellation plus 15%.

Returns:

No equipment, materials or parts may be returned to Gorbel without express permission in writing to do so.

Extra Charge Delay: If Purchaser delays or interrupts progress of Seller's performance, or causes changes to be made, Purchaser agrees to reimburse Gorbel for expense, if any, incident to such delay.

Changes and Alterations:

Gorbel reserves the right to make changes in the details of construction of the equipment, as in its judgment, will be in the interest of the Purchaser; will make any changes in or additions to the equipment which may be agreed upon in writing by the Purchaser; and Gorbel is not obligated to make such changes in products previously sold any customer.

Third Party Action:

Should Gorbel have to resort to third party action to collect any amount due after thirty (30) days from date of invoice, the Purchaser agrees to pay collection costs, reasonable attorney's fees, court costs and legal interest.

OSHA Responsibilities:

Gorbel agrees to fully cooperate with Purchaser in the design, manufacture or procurement of safety features or devices that comply with OSHA regulations. In the event additional equipment or labor shall be furnished by Gorbel, it will be at prices and standard rates then in effect, or as may be mutually agreed upon at the time of the additional installation.

Equal Employment Opportunity:

Gorbel agrees to take affirmative action to ensure equal employment opportunity for all job applicants and employees without regard to race, color, age, religion, sex, national origin, handicap, veteran, or marital status. Gorbel agrees to maintain non-segregated work facilities and comply with rules and regulations of the Secretary of Labor or as otherwise provided by law or Executive Order.

INSPECTION AND MAINTENANCE SCHEDULE

Gorbel, in agreement with OSHA and ANSI, requires inspections for each of the following:

- Before each use by the Authorized User
- At least annually by a **Competent Person** other than the user (extreme conditions may dictate more frequent inspections, consult **Qualified Person**).
- After a fall event.

Annual and post-fall event inspections should be recorded and saved for reference. If any component fails inspection, immediately remove the Ranger or Road Ranger from service and contact Gorbel. Any repairs, replacements or modifications require Gorbel's approval.

GORBEL® RANGER™ MOBILE ANCHOR: INSPECTION BEFORE EACH USE

OSHA and ANSI require an inspection of the entire fall protection system before each use. The Ranger™ Mobile Anchor is a vital component of the complete fall protection system. Checking for the proper functioning of this component is essential. These pre-use checks are intended to be tactile and visual.

Verify the required maintenance procedures have been properly followed. Any extreme conditions that you are aware of that may have occurred since the last maintenance procedure should be reported to the proper supervisor and an evaluation made to determine if the maintenance schedule requires modification. Some examples of extreme conditions are: a fall arrest event, excessive vibration in the system or structure, an impact to the system, or an unauthorized person working on the system.

The previous sections, **Authorized Person** Instructions and General Use Requirements, provide important pre-use and in-use instructions and inspection guidance. The following provides a suggested checklist divided into the four main components of the Ranger product. Components not listed required pre-use inspection as detailed by their manufacturers.

	YES	NO!
AUTHORIZED PERSON		
Are you authorized by your employer to perform work at height?		
Are you aware of a written procedure for the use of this equipment and does it include a rescue plan?		
Have you been trained in the use of this equipment?		
Do you, with your tools, weigh less than 310 lbs?		
SURROUNDING ENVIRONMENT		
Is this system being used as approved by a Qualified Person ?		
Is there adequate clearance to arrest a fall?		
Will you remain in the work zone area allowed by this system?		
Are dangerous obstructions removed from the fall zone?		
Are nearby people aware of your pending work at height?		
Is there an Authorized Person within sight that has been trained in the rescue procedure?		
SUPPORTING SURFACE		
Is the integrity of the supporting surface adequate? Does the tongue jack foot sink into it?		
Is the supporting surface level (slope equal to or less than 2° for the Ranger and slope less than 5° for the Road Ranger)?		
Are the outrigger and jack feet at least 24 inches away from drop-offs, holes, unstable surfaces, and other possible hazards?		
RANGER™ MOBILE ANCHOR		
Has scheduled maintenance been appropriately performed?		
Is the unit level (bubble indicator within 1°)?		
Are the outriggers fully extended and captured by the back stops?		
Is the unit fully supported by outriggers and tongue jack? Wheels should be able to spin freely.		
Is the rear jack making contact with the supporting surface?		
Is the mast in the fully raised position with auto-engage lock pin fully inserted?		
Is SRD or lanyard compatibly connected to the Ranger™ Mobile Anchor D-ring?		
Are bolts attaching the Ranger™ D-ring to boom in place?		
Are two 7/8" bolts connecting mast to boom and frame in place?		
Are 3/4" bolt and pin connecting link to boom and frame in place?		
Are all outrigger pivot bolts and pins in place?		
Is the Ranger or Road Ranger free of deformed, bent or damaged members?		
Does the harness and SRD or lanyard being used meet specifications for the application?		
Is there only one lanyard or SRD attached to the Ranger™ Mobile Anchor's D-ring?		
Is the key removed to prevent operation of the actuator?		

If the answer to any of these questions on the checklist is no, remove yourself from the fall hazard and report the issue to the proper supervisor.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: INSPECTION AFTER A FALL ARREST EVENT

After a fall event, the Ranger or Road Ranger must be removed from service until it has been thoroughly inspected by a Competent Person.

Supporting Surface

- Inspect supporting surface for damage or deformation. If there is deformation or visual damage or any reason to suspect damage, a **Qualified Person** must re-evaluate the integrity of the surface and approve or disprove it for further use.

Ranger™ Mobile Anchor

- Inspect members for any deformation, bends, weld cracks or other damage. If mast, boom or link has retained permanent deformation, measure the bow or camber using a string and clamps. If this is greater than 1/2" across the entire length of the member, it should be replaced. If any other member shows any signs of deformation, it should be replaced.
- Verify normal operation by going through use to stow and back to use positions. In use position, verify the auto-locking pin is fully inserted and the coupling is in-line or past in-line with the crank. If there are any issues with the normal operation of the Ranger, do not use.
- Examine outriggers and jacks for any bends or other damage. Ensure normal operation.

Anchorage Connector (D-ring)

- Examine connector for any sign of cracks, distortion, bends or other damage.
- Inspect mounting hardware and mounting plate for any sign of damage.
- Ensure connector swings freely.

Damaged components must be replaced before the Ranger or Road Ranger can be put back into service.

WARNING

All other components are to be inspected per their manufacturer's instruction.

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE

CLEANING

- Periodically clean with mild soap and rinse thoroughly. Do not spray directly at actuator, gas spring, jacks or battery compartment. If unit has been exposed to corrosive chemicals, clean with mild soap and rinse thoroughly. Perform a comprehensive inspection prior to returning to service.

STORAGE

- Store in a cool, dry environment. If storing for more than 30 days, disconnect negative battery cable or use a trickle charger to maintain battery charge. To prevent flat spots on tires, support unit on outriggers and jack stands. Inspect entire unit thoroughly after extended storage.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE (CONTINUED)

WHEEL HUB

- Grease the tapered wheel bearings as following:
 1. Remove the rubber plug from the grease cap
 2. Press grease gun into fitting located behind hub on the Ranger. On the Road Ranger, fitting is located at the end of the spindle. Do not use a powered grease gun as these may dislodge the inner seal causing the brake to be contaminated with grease.
 3. Pump grease while slowly turning wheel
 4. When new grease appears around spindle, wipe up excess grease and replace plug
- On the Ranger, a Tie Down Engineering Super Lube hub is used with pregreased bearings using Lucas Red N' Tacky extreme pressure #2 grease. Use this or a quality lithium based marine grease. The Road Ranger uses a Dexter E-Z Lube hub. More detailed information about drum, bearing and seal inspection and approved grease sources can be found at www.dexteraxle.com in their Hubs, Drums, & Bearings Service Manual. Replace the wheel hub as follows:
 1. Loosen wheel lug nuts
 2. Raise wheels off ground using fully extended outriggers and tongue jack
 3. Remove tire/wheel assembly
 4. Pry grease cap from hub
 5. For the Ranger, remove cotter pin, washer and spindle nut. On the Road Ranger, a nut retainer is used. Gently pry this off and then remove nut and D washer.
 6. Remove hub
 7. Install new hub, washer and spindle nut. The Ranger's hub comes with pre-greased bearings. For the Road Ranger, pack the bearings with grease prior to installing hub.
 8. While rotating hub, tighten spindle nut to approximately 50 ft.-lbs. to seat the bearings
 9. Loosen nut making sure not to rotate the hub
 10. Snug tighten nut. For the Ranger, back off only enough to install cotter pin. For the Road Ranger, snap the nut retainer into place. The retainer/nut assembly should be free to slightly move. If not, remove retainer and back nut off about 1/12 of a turn. Reinstall retainer.
 11. Grease

WARNING

After installing wheels, always re-check lug nuts after 25 miles of use.

BATTERY

The equipment uses a standard, maintenance free, vented, lead-acid battery. Proper precautions must be followed to prevent injury whenever you are near the battery.

DANGER/POISON

Protect your eyes. The battery contains explosive gases that can cause blindness. **ALWAYS WEAR SAFETY GLASSES AND A FACE SHIELD WHEN WORKING ON OR NEAR BATTERIES.** No sparks, flames or smoking near battery. The battery emits combustible hydrogen gas. Perform all work in a well ventilated area.

- The battery contains sulfuric acid that can cause blindness and severe burns.
- Flush eyes immediately with water and get medical help if exposed to battery vapors or fluids.
- Do not open battery.
- Do not tip battery.
- Keep battery away from children.

CALIFORNIA PROPOSITION 65 WARNING

Batteries, battery posts, terminals and related accessories contain lead and lead components, and other chemicals known to the State of California to cause cancer and birth defects and other reproductive harm. **WASH HANDS AFTER HANDLING!**

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE (CONTINUED)

BATTERY

- Charge weekly or daily. See Step 9 of Operation Instructions. The battery will provide sufficient power to actuate the Ranger™ Mobile Anchor many times between charges. However, battery life will be prolonged through charging more often. For optimum battery life, the battery charge level should be maintained above 75%. A battery run down below this level and not charged within a few days may be permanently damaged through the formation of crystalline sulfates. A battery will slowly discharge from prolonged storage. Self-discharge is accelerated at temperatures above 80° F. To ensure the battery will not fall below 75% charge, do not let the battery go uncharged for more than a month.
- Cold temperature will affect the performance of a battery. Battery voltage will drop approximately .01 volts and battery capacity will drop about 5% for every 10° F below 70° F. Colder temperatures will require charging more often.

WARNING

Charging a frozen battery can cause the battery to explode. A battery at 40% charge can freeze at -15° F. A fully charged battery may freeze at -100° F. If the battery may be frozen, remove the battery and place in a warm, ventilated area. Allow battery to thaw before charging.

Approximate recharge time at 70° F

OCV	State of Charge	Recharge Time (hrs)
12.6V	100%	Ready to Use
12.4V	75%	2.5
12.2V	50%	5.1
12.0V	25%	7.8
11.8V	0%	10.7

Charging times will vary based on battery age and temperature.

- Replace if battery will not fully charge or if battery will not maintain a charge. A battery indicator is provided. This indicator measures voltage from the battery. To reset the indicator, the key must be left ON while the battery is charging. If the indicator falls below 8 bars on the 1 thru 10 bar LED scale after fully charging, then replacement is required. Note, the charger has a charge indicator on it that measures current. This indicator may turn red when first plugged in even if the battery indicator is at full voltage (10 bars). This is normal.
 1. Unplug the extension cord from the Ranger. Never disconnect any wires from the battery while the charger is on.
 2. Remove #10-32 screws securing the battery cover and remove cover (5/16" socket or wrench).

WARNING

Do not place or drop any metal object across the two battery terminals. This will short the battery and may cause an electrical shock and/or an explosion.

3. Remove nut and (4) wires from negative post. This post should be located closer to the tool box wall. Although there is no connection to the frame, it is always best practice to disconnect negative battery terminal wires first and connect them last.
4. Slide back red terminal cover and remove nut from positive battery post. Lift off (2) wires from post (11/16" wrench).

WARNING

Battery stores an enormous amount of energy that can deliver several hundred amps. Always use insulated tools and remove jewelry.

5. Remove 3/8" nuts from J-bolt and pivot battery hold strap out of the way ((2) 9/16" wrenches).
6. Remove battery and properly dispose of it. The battery contains hazardous materials and must be kept upright while handling and storing.
7. Reverse order to install new battery. Supplied is a model 7T31, 12-volt, heavy-duty, commercial severe service, dual purpose battery.
8. Charge new battery.

This battery contains hazardous chemicals and emits explosive gases. OSHA requires employers to communicate hazards of lead acid batteries to employees that are exposed to this hazard. Please contact the battery manufacturer, East Penn Manufacturing (www.eastpennmanufacturing.com), for an up to date Safety Data Sheet.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE (CONTINUED)

LINEAR ACTUATOR

The Ranger is supplied with a maintenance free actuator. If the actuator fails to operate or becomes damaged, replace following the steps below.

WARNING

Stay clear of mast while raising and lowering. The actuator provides the only means of support to the boom, link and mast assembly when the Ranger is not in the use or transport position. Always keep your head and other body parts clear of the potential path of the mast, link and boom.

1. If the Ranger is not fully raised and locked or if it is not in the storage configuration, do not attempt to remove the actuator. The actuator must be unloaded.
2. Verify there is power to the actuator. Disconnect actuator motor wire connector from mating frame wiring harness connector by pushing firmly down on the frame harness connector tab while pulling the connectors apart. Do not pull on the wires. Using a voltmeter, verify there is power to the motor when the up or down button is pressed. If there is 12 volts across wire harness connector pins, proceed to step 3. Otherwise, if no power is being supplied to the motor, review the electrical circuit.
3. Reconnect motor to wiring harness and try to actuate. Look for damaged wires or loose connector terminals to motor. If actuator still fails to operate, use manual override on actuator to fully raise or fully lower the mast. See Notice at end of Operation Step 7.
4. Verify there is no load on actuator by rocking actuator cylinder sideways. If you are able to jiggle it, the actuator is unloaded and can be removed. If not, slightly jog the actuator using motor or manual override until you can see the actuator rod attachment at the crank is in the middle of the mounting slot.
5. Verify the boom is fully supported by the frame and boom rest if in the stow position (fully lowered) or that the mast is double locked by the in-line hinge and auto-engage lock pin if in the use position (fully raised).
6. Disconnect actuator motor harness from frame harness by pushing firmly down on the frame harness connector tab while pulling the connectors apart. Do not pull on the wires.
7. Loosen 3/8"-16 nylon insert lock nuts from shoulder bolts securing actuator at either end (9/16" wrench, 1/4" hex key).
8. Support actuator and remove should bolts, washers and nylon washers.
9. Reverse steps to install new actuator (p/n 30967). Nylon washers go between actuator and mounting plates. Actuator may need to be operated to align mounting holes and slots.

LINEAR ACTUATOR LIMIT SWITCH ADJUSTMENT

The actuator uses two adjustable magnetic switches to control the end of travel positions. These are factory set to prevent over travel and clutch slippage of the actuator. When an actuator is replaced, these switches require field adjustment.

1. Remove protective channel cover on actuator aluminum tube cover. There are two covers. The channel next to the motor that has wires going into it is the one that contains the limit switches. Use a small, flat blade screwdriver to pry off the channel end cap. Insert a small screw driver into the open end of the channel and start to pry off plastic cover. Pull off the rest of the cover by hand.
2. Set the limit switches. The lower travel limit is when the boom is fully resting on the frame and the actuator is unloaded. The upper travel limit is when the auto-engage lock pin is fully inserted and the crank is 1/4" away to just touching the frame hard stop. Use a 5/64" hex key to loosen the switch set screw. Position the Ranger™ Mobile Anchor at the travel limit described above. Slide the limit switch to prevent further actuation. Tighten the set screw and check the travel limit. Repeat as required.
3. Replace protective cover and cap. Be careful not to pinch wires. Place one edge of cover in channel groove. Align end of plastic cover with end of aluminum tube. Press down on other edge of cover until it snaps into other channel groove. Continue down the length of the cover. Push on end cap.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE (CONTINUED)

GAS SPRING

A pneumatic spring assist may be installed to prolong the life of the actuator. Keep piston rod clean and free of scratches. Do not grease or paint it. If gas spring is damaged, bent or leaking oil, replacement is required.

WARNING

Gas spring has high internal pressure. **DO NOT** open.

1. The gas spring must be fully extended and unloaded to remove it from the Ranger™ Mobile Anchor. Fully raise the mast.
2. Verify the mast is double locked.
3. Remove the upper 14mm mounting bolt, nylock flange nut, nylon washers and steel washers (22mm and 21mm wrenches).
4. Support gas spring and remove lower should bolt, nylock nut, nylon washers and stainless steel washers (6mm hex key, 17mm wrench).
5. Unthread clevis end with split ring bushing and install on new gas spring (p/n 31165).
6. Reverse steps to install. Nylon washers contact the gas spring surfaces.
7. To dispose of old has spring, nitrogen gas must be released and oil drained and properly disposed of. Wearing a face shield and using a 2mm or 3mm drill bit, drill into the non-rod end of the fully extended gas spring 40mm up from the start of the cylinder. Next, drill 65mm down from the rod end of the cylinder.
8. Drain oil into a suitable container and properly dispose of it. The gas spring can now be disposed of.

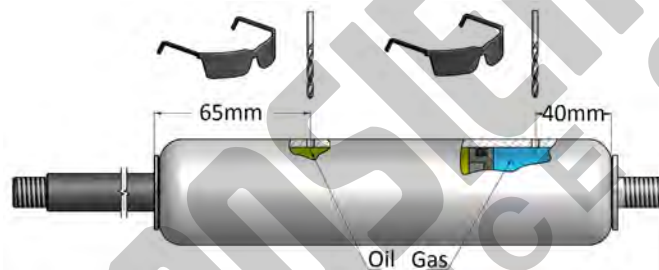


Figure 1. Gas spring.

TIRES AND WHEELS

WARNING

An overinflated tire can explode and may cause serious injury or death.

WARNING

An excessively worn tire can cause poor handling and continued use can result in tire failure.

- Replace tire if tire surface or sidewalls have cuts, cracks, punctures or uneven or excessive tread wear.
- Replace wheel if damaged, cracked or bent.
- Check tire air pressure with a gauge and add air as needed.
- Check the torque of each lug nut. Tighten lug nuts in a star pattern first to 25 ft.-lbs. of torque, repeat to 50 ft.-lbs. of torque and finally repeat to 90 ft.-lbs. of torque.

NOTICE

Tire and wheel must be replaced with tires and wheels of the same specification.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® RANGER™ MOBILE ANCHOR: GENERAL MAINTENANCE (CONTINUED)

BRAKES (Road Ranger Only)

The Road Ranger is equipped with Dexter 10" x 2-1/4" electric brakes. Brakes require manual adjustment after the first 200 miles and then every 3,000 miles or as needed.

1. Level Road Ranger per Operation Step 5.

WARNING

Never place any parts of your body underneath the trailer. An unexpected incident can cause the trailer to fall, leading to serious injury or death.

2. Remove the plug from the adjusting slot on the bottom of the brake backing plate.
3. Using a screwdriver or adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel difficult to turn.
4. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight drag.
5. Replace the slot plug.
6. Repeat for the other brake.
7. Follow tow vehicle brake controller instructions for proper synchronization of brakes.

Test brake operation before each time you tow the Road Ranger. Refer to Dexter Axle for troubleshooting brake issues.

PARKING BRAKE

The Road Ranger is equipped with a manual operated parking brake. Cables connect the hand lever to a cam protruding from the brake backing plates. When the lever is pushed down to be in-line with the tongue, the cable is tensioned and the cam is rotated which presses the brake shoes against the drum lining.

WARNING

On grades, always chock the wheels when trailer is detached from tow vehicle.

If the hand lever is difficult to apply, the cables are too tight. If the cables are too loose, the brakes will not activate. Adjustment is required as cables stretch and brake shoes wear.

1. Remove cover located in the middle of the tool box (3/8" nut driver).
2. Actuate hand lever and check that balancer is perpendicular to cables. If not, adjust appropriate secondary cable until primary cable is equally activating secondary cables (balancer is perpendicular).
3. Remove cotter pins from clevis pins on balancer and remove clevis pins to access nuts and lock nuts on cables.
4. Loosen lock nut against balancer on primary cable (1/2" wrench).
5. Move adjuster nut on primary cable further on adjuster thread to tighten cable or toward end of adjuster thread to loosen cable.
6. Reassemble making sure lock nuts are tight and test manual brake by pushing on Road Ranger.
7. Repeat as required.

Lubricate cables where they exit sheathing with silicone spray.

WARNING

Towing with parking brake engaged or with parking brake improperly adjusted can overheat brakes and cause failure.

INSPECTION AND MAINTENANCE SCHEDULE

GORBEL® RANGER™ MOBILE ANCHOR INSPECTION AND MAINTENANCE SCHEDULE			
ITEM	COMPONENT	MAINTENANCE	FREQUENCY*
1	Battery	Charge. If charged battery shows less than nine (9) bars on battery indicator, replace battery.	After every use and monthly
2	Wheels/Tires	Check tire pressure. Look for signs of damage, excessive or uneven wear and loose or missing lug nuts.	Before towing and annually
3	Swing Tongue (Ranger only)	Check for signs of wear or damage.	Before towing and annually
4	Paint	Chipped paint and/or spots of corrosion should be immediately addressed.	Weekly and annually
5	Fasteners	Verify all pins and bolts are correctly installed.	Before each use and annually
6	Anchorage Connector	Check for wear, damage, and corrosion. Check that hardware is securely holding mounting plate. Ensure connector can freely pivot.	Before each use and annually
7	Capacity and Warning Labels	Check that all labels are in place and legible. Replace labels if damaged or illegible.	Before each use and annually
8	Auto-Engage Lock Pin	The pin should automatically engage when the unit is raised. Ensure full engagement so that no red is showing when the unit is in the raised position.	Before each use and annually
9	Actuator	Test that the remote and backup pendant are operable. Look for signs of binding or other damage. Listen for sounds that indicate damage.	Annually
10	Actuator Limit Switches	Check adjustment of limit switches. When fully extended, mast must be double locked. When fully retracted, boom must be supported by frame and boom rest.	Annually
11	Crank and Coupling	Verify crank and coupling are in-line or past in-line position (toward hard stop) when auto-lock pin engages.	Annually
12	Bolts	Check that nuts are tightened to specifications.	Annually
13	Structural Steel Components	Inspect for bends, dents, cracks, or other signs of damage. Check welds for signs of cracks.	Annually
14	Outriggers and Jacks	Inspect for bends, dents, cracks, or other signs of damage. Confirm that the pivots, cranks, and/or turnbuckles operate smoothly. Foot pads on outriggers must freely pivot. Outrigger must be able to lock to backstop.	Annually
15	Jacks and Outrigger Turnbuckles	Grease. Spray turnbuckle ratchet with lithium spray.	Annually
16	Wheel Hub Bearings	Grease.	Annually
17	Actuator Battery Disconnect Switch	Confirm that power is disconnected to actuator when key is removed.	Annually
18	Level Indicator	Bubble level must be present, operable and accurate.	Annually
19	Connecting Equipment	Inspect all protective equipment connected to the Ranger™ Mobile Anchor following the operation and maintenance manuals provided for each piece of equipment.	As required by manufacturer
20	Wheel Lug Nuts	Tighten to specified torque.	After 25 miles of use and monthly
21	Electric Brakes (Road Ranger only)	Check functional operation. Adjust per Brake Section.	Before towing and annually
22	Break-Away System (Road Ranger only)	Check break-away battery charge and switch operation.	Before towing and annually
23	Trailer Wiring and Lights (Road Ranger only)	Check trailer connection, wiring, running lights, break lights and turn lights for proper operation.	Before towing and annually
24	Parking Brake (Road Ranger only)	Check adjustment. Clean and lubricate exposed wire cable.	Monthly

*Federal, state and local codes may require inspection and maintenance checks more often. Please check the federal, state and local code manuals in your area. Gorbel recommends a certification inspection interval of no more than one year by a Qualified Person. Extreme conditions may dictate more frequent inspections, consult Gorbel.

WIRING SCHEMATICS

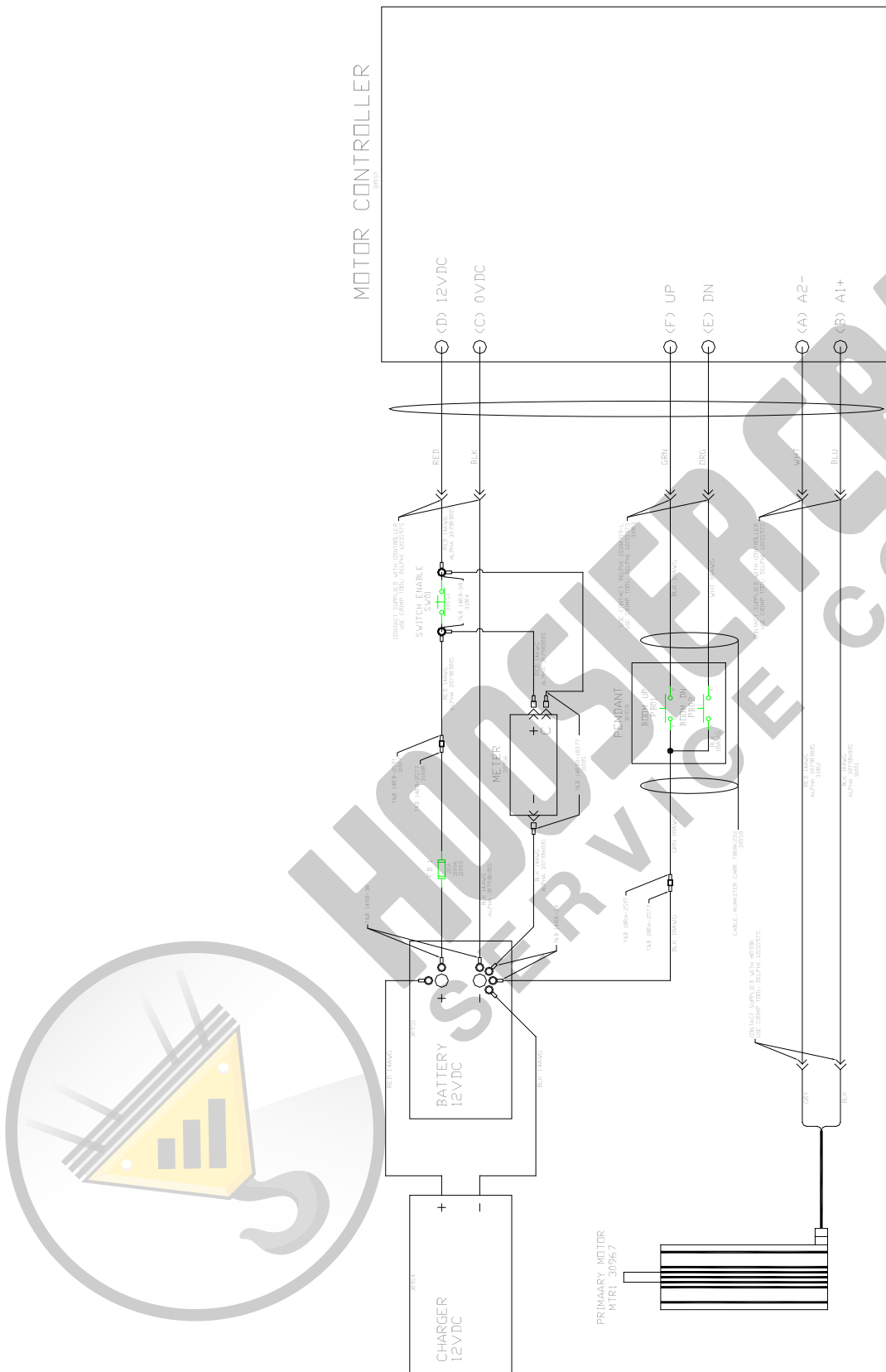
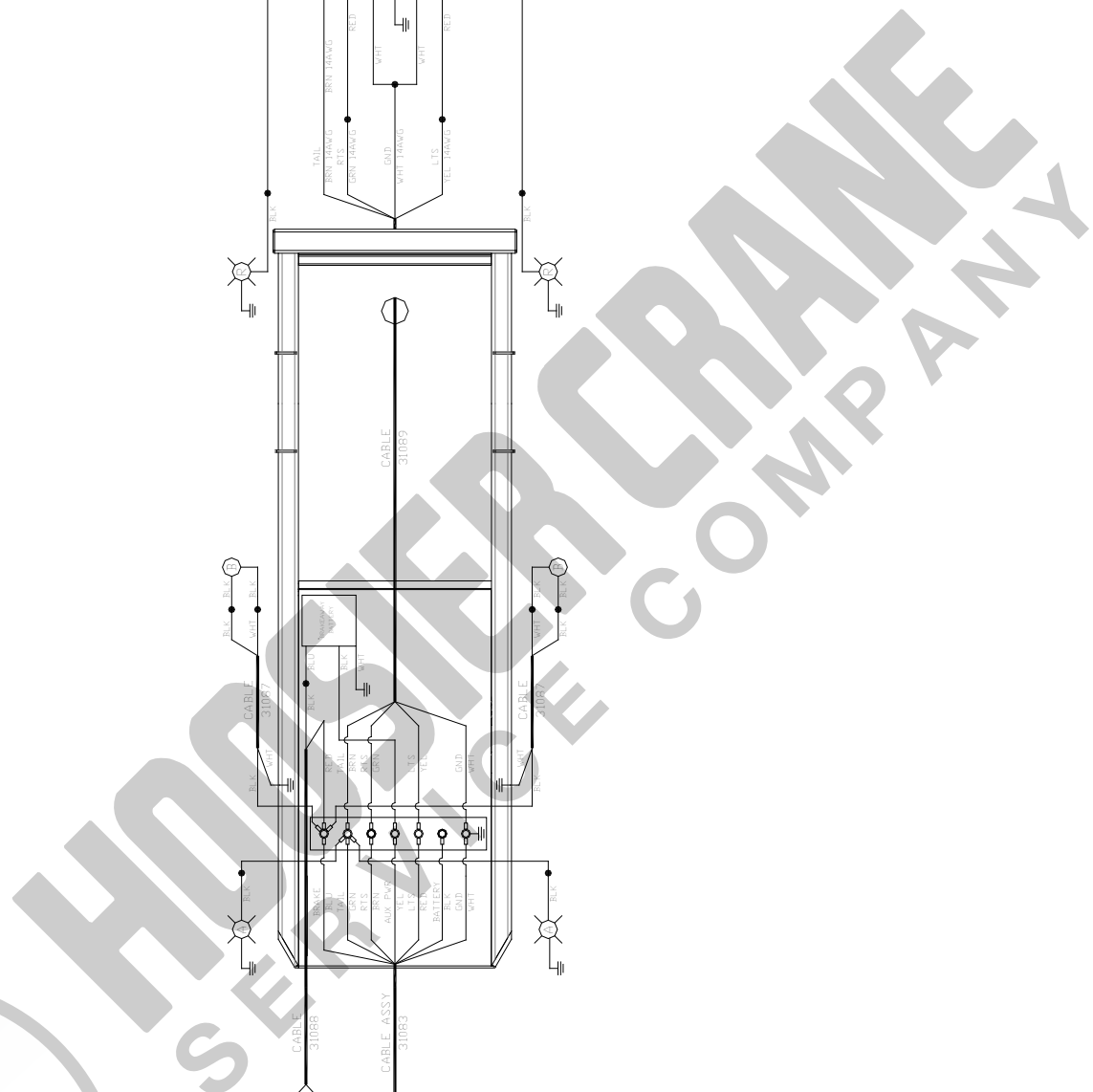


Diagram A. Wiring Schematic - Actuator.



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INSPECTION AND MAINTENANCE LOG

[illegible]

AUTHORIZED PERSON SIGNATURE LOG

Signature of **Authorized Person** acknowledging their understanding of the entire contents of this manual prior to using this equipment.

[illegible]

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