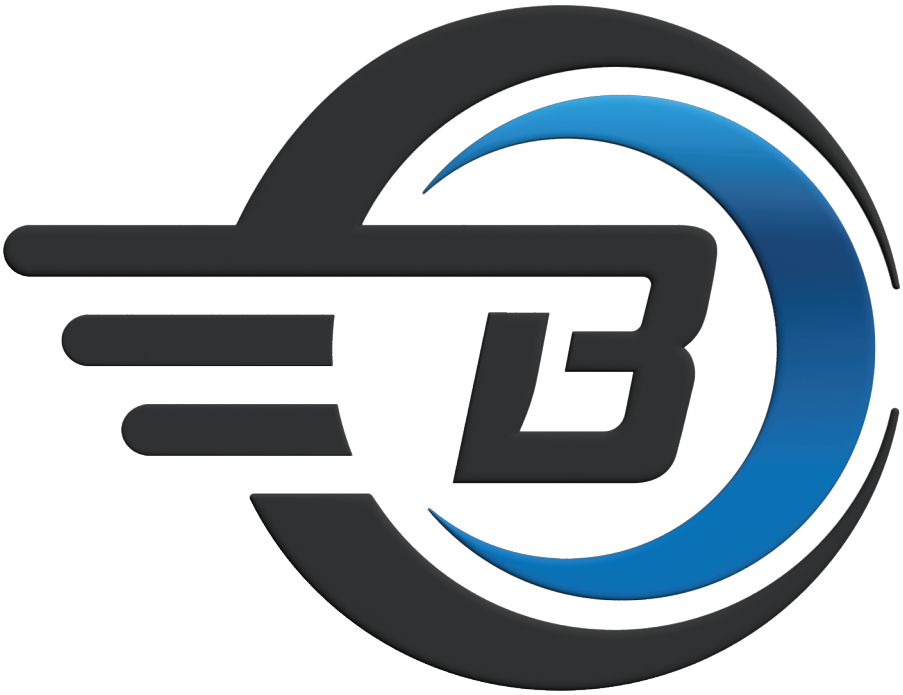
User Manual



R12

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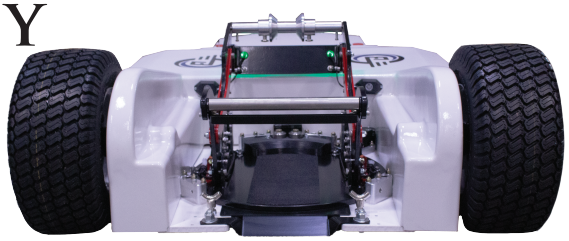
Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

What's in the Crate?

Heavy Duty Romeo



Romeo Remote

Romeo Charger

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Uncrating

Congratulations on the purchase of your Heavy Duty Romeo tug, to start off with let's get your new tug out of the crate!

Any Screws you need to remove will be marked with Red paint.

1: Remove lid of crate - set aside.

2: Remove accessories box. (Cardboard box strapped to inner wall)

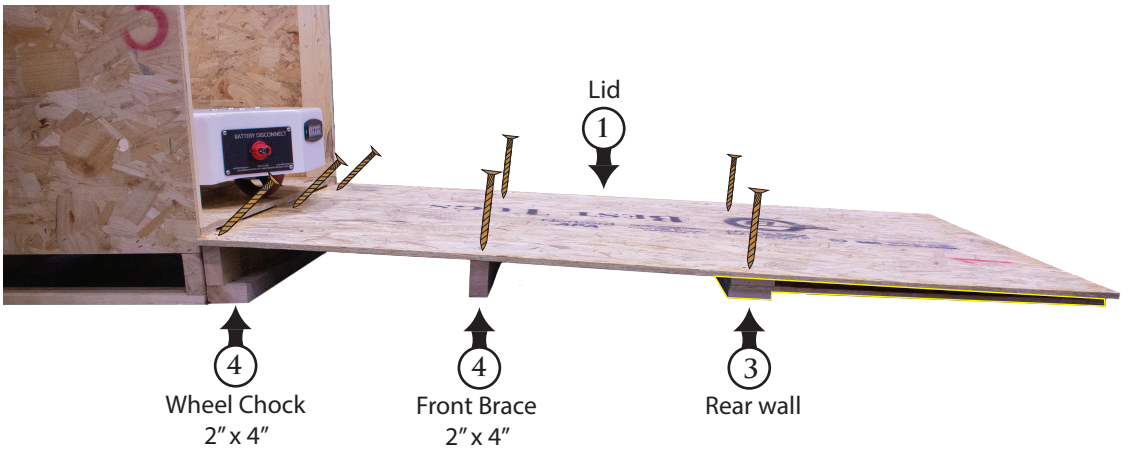
3: Remove front wall - set aside.

4: Remove wheel chock boards, there will be 4 screws (two per side) holding each board in. These screws are located on the outside of the crate.

5: Create ramp as shown below and screw boards together to prevent rapid unplanned disassembly.

6: Follow the instructions for tug operation and slowly remove the tug from the crate. You can remove the side walls for more clearance.

See Pg. 11 For more information on how to assemble the ramp.



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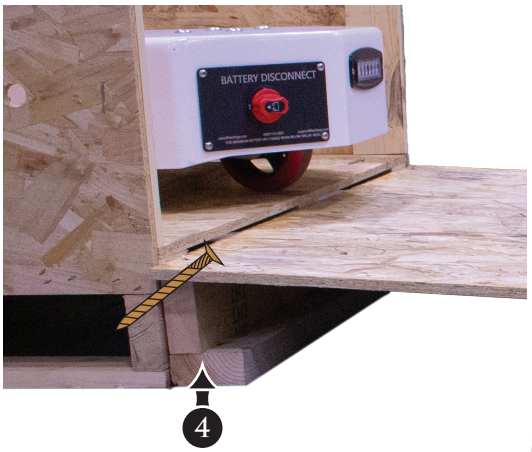
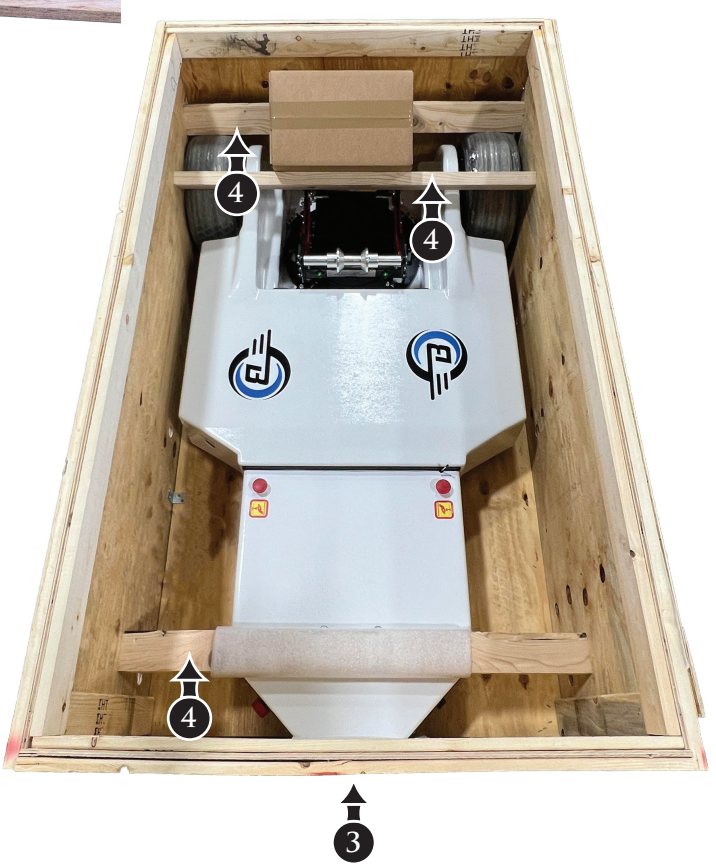
801-855-7757

Uncrating Continued

When assembling the ramp to drive your Romeo out of the crate, make sure the screws inserted on #4 go through the lid, the vertical 2x4, and the 2x4 that makes the base of the crate as shown below.





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Safety

Safety precautions

Please read and follow the instructions laid out for use of your new Best Tugs equipment. Remember this tug is capable of moving several tons. If used incorrectly it can cause harm or even death to persons, aircraft, hangars, and itself. We hope the tug will aid you in the safe & easy movement of your aircraft, however you are responsible for the safe use and operation of the tug. Always be aware of your surroundings when operating your Tug. Be aware of your wingtips and tail to avoid any kind of property or personal damage. This model is controlled by radio, it is subject to possible radio interference and can momentarily lose radio communication, in the event that this happens, the tug is designed to come to a gentle stop. Always stay close enough to the unit to use the E-stop in case of an emergency.

The E-stops on the tug are for Emergency use only, they are not meant to be used as the primary power switch. Using the E-stop may cause damage to the tug and aircraft, only use it in case of an emergency. Be aware of the distance the tug needs to slow down and come to a stop. Get familiar with acceleration and deceleration of the tug before using it with an aircraft connected. The acceleration and deceleration times will change only slightly with an aircraft connected. Always ensure that the aircraft is loaded securely and is safe to move before you start driving the tug.

This includes the use of any safety and securing devices provided by Best Tugs for use with your Romeo and aircraft. ie: tighten aircraft down using the provided strap(s) or Quick Lock Fork(s). If you notice damage on the securing straps contact Best Tugs for a replacement.

The tug should be turned off before the remote is set down. Setting the remote down with the tug ON could lead to accidental movement if the remote is moved.

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Electrical Safety

Electrical Warning

This tug is powered by a 24 Volt 1000 Amp system.
This is enough to cause damage to persons and components incorrectly connected to the tug. Be careful of the motor controller and motors during and after use as they can become hot.

When charging the tug be sure to turn the battery disconnect to the disconnected position to avoid damage to the batteries. See Pg. 16 for more detail on properly charging the tug.

DO NOT short circuit, crush, disassemble or expose the batteries to flame.

When removing batteries for maintenance be aware of the tools you're using and where they may touch. Touching more than one battery terminal at a time can cause shorts, sparks, and heat. Any batteries that have been shorted should be replaced immediately or they risk damaging the other batteries in the tug.

When performing a partial replacement of the batteries all batteries should be charged independently to ensure they are at the same level of charge. Failure to do this can lead to damage to the batteries and in severe cases acid leaks, or fire.

Contact information
Support@besttugs.com
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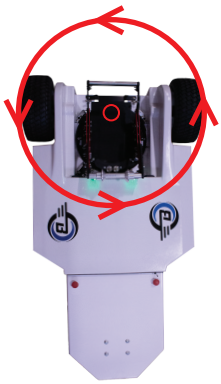
801-855-7757

Safety Continued

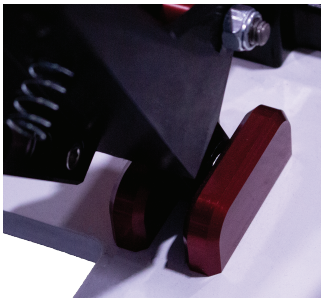
When loading the aircraft remember to chock the main gear to prevent the aircraft rolling away from the tug and potentially into any objects or persons.



Point of rotation

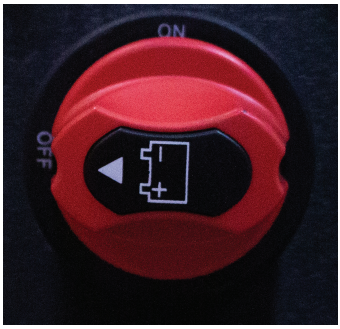
When operating the Jump Start unit on the tug always inspect the cable for any loose connections, frayed wires, or damage to the insulation on the copper cable. Any of these are a potential electrical shock and fire hazard.

Inspect the loading area of the tug before use to make sure there are no loose bolts or connections. Make sure all hard-points are fastened down securely. It's crucial to perform basic maintenance in order to keep the tug safe to use. The chains on the tug need to be tightened annually or when they get loud. Failure to do this can lead to chain skip which can damage your tug and in an emergency can lead to failure to stop.



Cradle hard-points

Perform a system controls check before you load any aircraft on the tug to ensure everything is in working order and there are no present system errors. The operators check list can be found on Pg. 24 . Always check that the tug is off and the battery disconnect is in the disconnected position. If the tug is left on you are risking damage to persons, and property. This is a radio controlled unit and with that comes risk of intercepted radio communications that can cause unwanted movement of the tug.



Battery Disconnect

You alone are responsible for the safe use, operation, maintenance and storage of the tug. If you have any questions and can not find an answer in this user manual please reach out to us at the contact points listed under each page of the manual.

Contact information
Support@besttugs.com
Sales@besttugs.com
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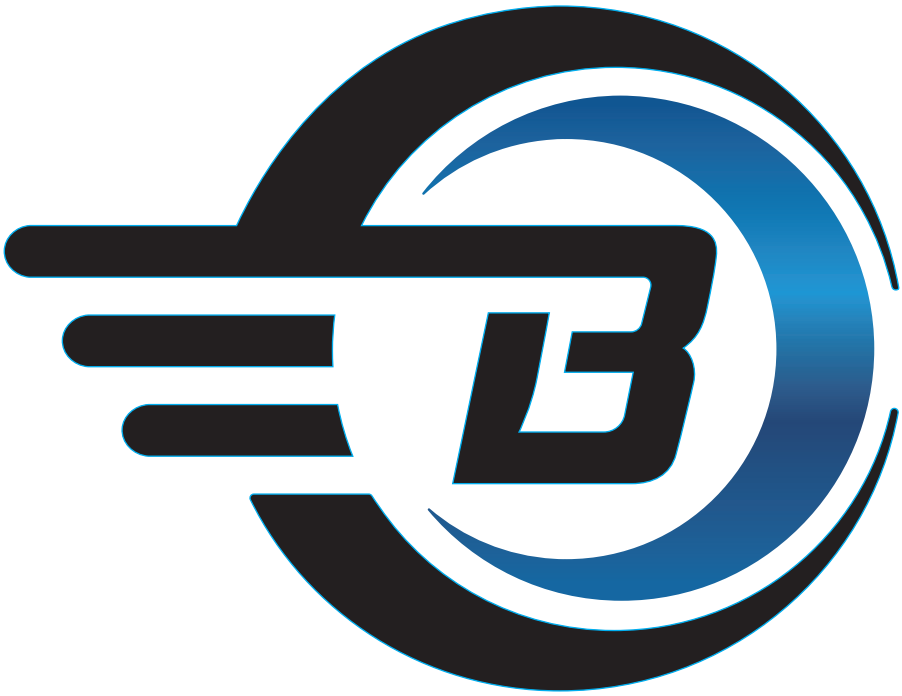


Operations

Operation

The display on top of the remote is labeled with functions so you can see at a glance the status of each system. See Pg. 9.

A The wheel on the remote controls the left and right throttle of the tug. Turn the wheel clockwise to go right and counter clockwise to go left.

Remote functions 1

B The trigger on the remote controls the forward and reverse throttle of the tug. Push the trigger away from you to go backwards and towards you to go forward. Both throttle controls are exponential, meaning the more you pull, or turn them the faster the tug will drive or turn.

C If you have a Lazy Susan, option "C - Rotate/Lock" on the remote will be used to allow or to disallow the rotation of the cradle.

D If you chose one of the hands free loading options it will also be controlled through the remote. "D - load/unload" will release the cradle to unload the aircraft when held on. Your cradle hooks default to locked when the "D - Load/Unload" button is not being depressed.

Remote functions 2

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Operation Continued

1. Turn the remote on by pressing the "POWER" button on the side.

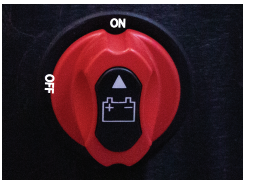
2. Rotate both E stops clockwise to make sure they are on.

3. Rotate the battery disconnect clockwise to the "ON" position.

4. Click the "E" switch on the remote to wake the tug.

   (Slider should indicate "Awake")

The tug will start to boot up once in the wake state and will take about 15 Seconds to be ready to use.



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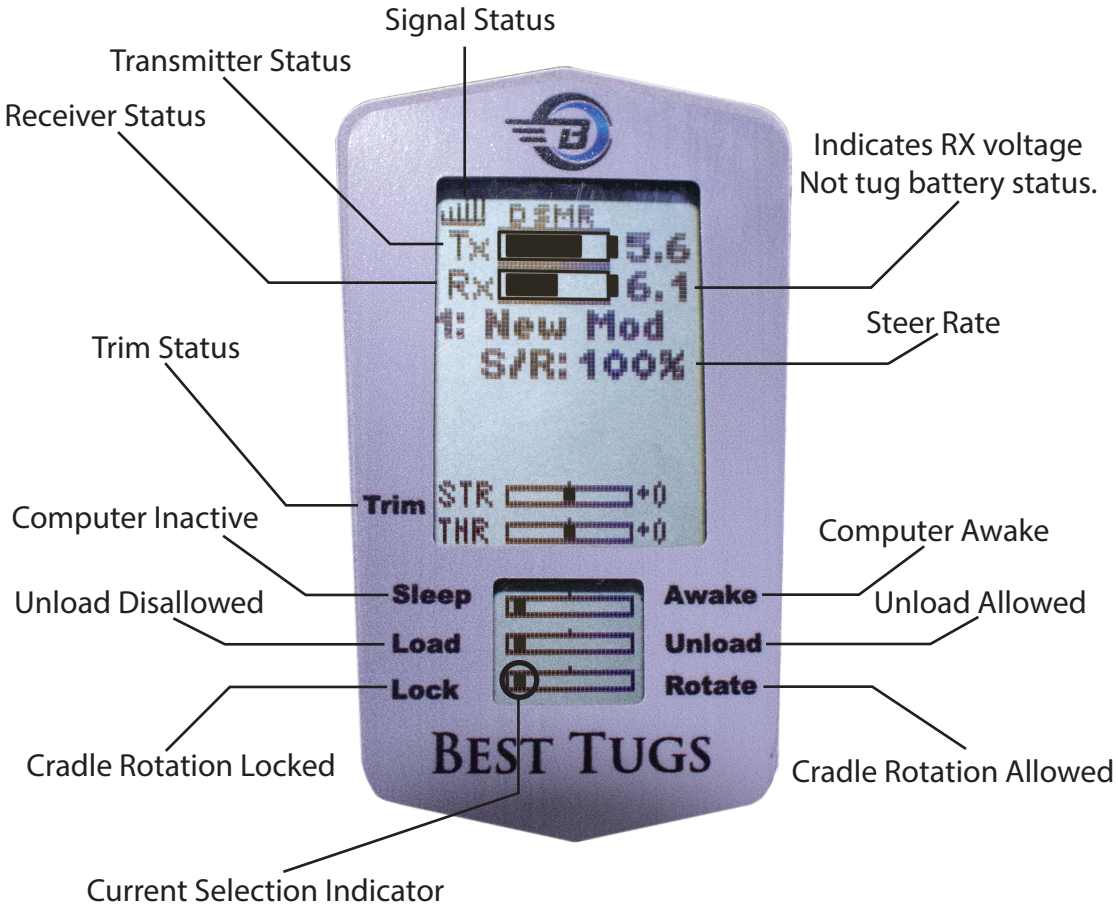
801-855-7757

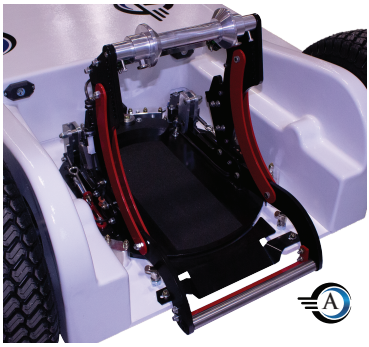
Operation Display



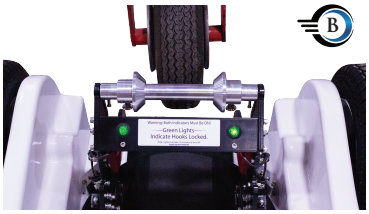
Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Aircraft Loading

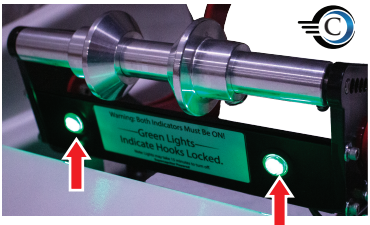
Please read the corresponding page about the set up of your specific loading device. {Pg. 13-14 Lazy Susan, Pg. 15 Easy Load}



A To load an aircraft onto the tug, first position the ramp in the unload position. Do this by holding the "D - Unload/Load" switch on the remote, then pivot the cradle down so it creates a ramp onto the platform. Once in the unload position, release the "D - Unload/-Load" switch.



B Once the Cradle is in the unload position chock the main gear of the aircraft to prevent the plane rolling. Align the tug with the loading gear of the aircraft (The nose or tail wheel). Once aligned drive the tug under the aircraft, as the wheel loads the cradle locking bars will automatically lock in the loaded position.

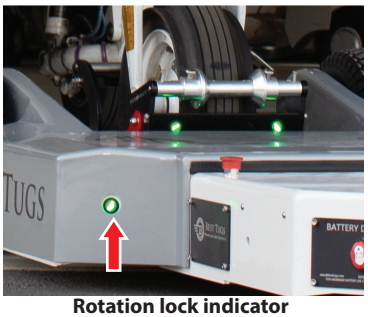


C If you have an 18" or 22" Lazy Susan you'll see both green load lock indicator lights come on when the plane is loaded.

Load lock indicators

To unload the aircraft, first lock the rotation of the cradle, rotate the tug until the cradle is aligned straight with the tug and the rotation lock light comes on. Chock the main gear of your aircraft. Drive the tug towards the aircraft slightly to apply pressure into the back of the cradle. This will release the safety mechanism on the locking bars and allow them to unlock.

Hold "D - Load/Unload" to unlock the cradle, once both load lock lights turn off drive the tug away from the aircraft and the cradle will be allowed to fall and unload the aircraft. Release "D" after the cradle has fallen and the aircraft is unloaded.



Rotation lock indicator

Contact information
Support@besttugs.com
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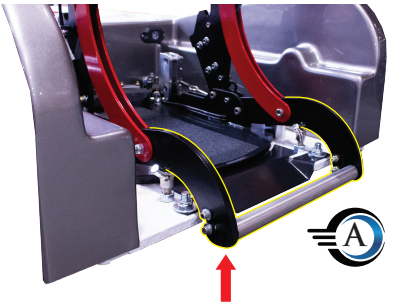
801-855-7757

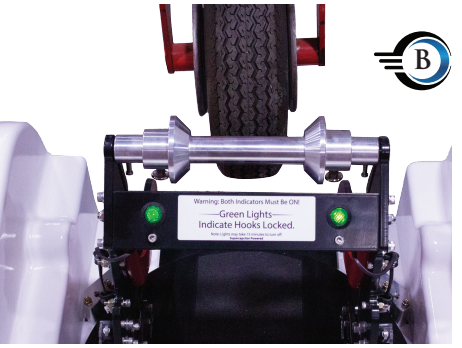
Cradle Setup - Lazy Susan

Before you use your new tug with your aircraft, it's important to set up the loading system for your aircraft. Properly setting up the loading system will make the tug easier, and safer to use.



Front Ramp

A Start by setting the ramp height so the front ramp is as close to the ground as possible without touching it when loading the aircraft. Set the ramp in the unloaded/ready to load position as shown.
Chock the main gear of your aircraft.
Make sure the screen indicates that the rotation is in the "Locked" position and the cradle is in the "Load" position. (See pg. 7)



B Now align the tugs ramp with the wheel of your aircraft and begin to load the aircraft. Pay close attention to the front ramp and ensure that it does not come into contact with the ground.

DO NOT POSITION YOURSELF BETWEEN THE TUG AND THE AIRCRAFT, OR OTHER OBJECTS.

When on ice or other slippery surfaces unlock the cradle rotation. In the event that one tire looses traction the tug can start turning abruptly. This can cause damage to your Aircraft & Lazy Susan due to the twisting force it applies.

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Cradle Setup - Lazy Susan

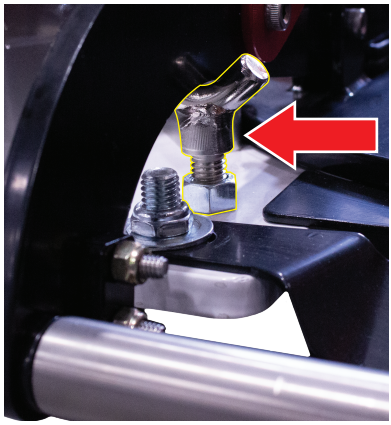
C If the ramp is too low to the ground while loading (Less than 1/8“) immediately stop loading. Back the tug out from underneath the aircraft. Adjust the ramp height bolts to raise it.
Repeat this process until you achieve 1/8” clearance between the bottom of the ramp and the ground.

D After you get the optimal ground clearance on the ramp, load the aircraft and drive the tug forward until there is slight pressure on the front of the ramp (The side the aircraft loads & unloads from). Move the rear roller to be within 3/8” of the tire. You do not want the tire to touch the front and rear roller simultaneously as this can lock the wheel in place. Next adjust the two back roller centering slides until they are nearly or lightly touching the tire. These will give you a center line to aim for when loading the aircraft and will help keep the tire centered while in tow.

DO NOT POSITION YOURSELF BETWEEN THE TUG AND THE AIRCRAFT, OR OTHER OBJECTS.

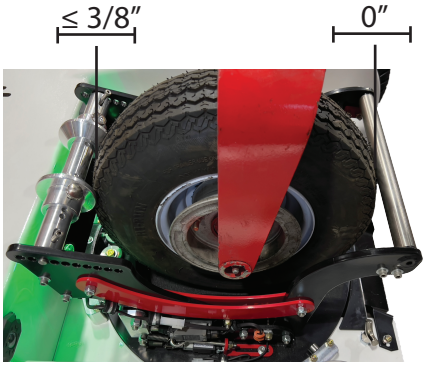
* **Failure to adjust your ramp could cause damage to painted hangar floors**

C



Ramp height adjustment

D

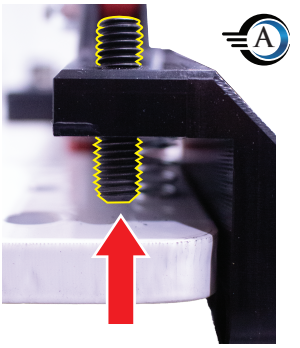


Cradle tire distances

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Cradle Setup - Easy Load

Before you use your new tug with your aircraft it's important to set up the loading system for your aircraft. Properly setting up the loading system will make the tug easier, and safer to use.



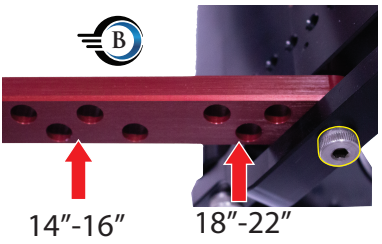
Ramp height adjustment

A To start with the set up of this tug you're going to adjust the ramp height. Set the ramp in the unloaded/ready to load position. Adjust the set screw shown to increase, or decrease the minimum ramp height.

Chock the main gear of your aircraft.

Make sure the screen indicates load locked. (See pg. 10)

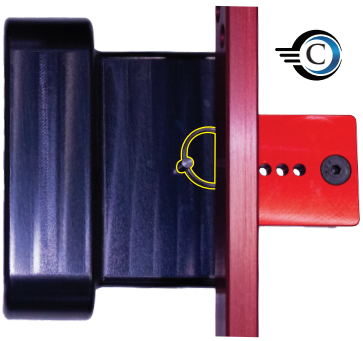
Now align the tugs ramp with the wheel of your aircraft and begin to load the aircraft. Pay close attention to the distance between the bottom of the ramp and the ground, if the ramp gets below 1/8" stop immediately, back the tug away from the aircraft and adjust the ramp.



Cradle size adjustment bolts

The optimal clearance is 1/8" between the ramp and the ground.

B After the ramp height is set up, Load the aircraft and then drive the tug toward the aircraft gently until the tire is pushing against the back ramp (leave the aircraft chocked so it doesn't roll). Then remove both of the cradle size adjustment bolts and get the front ramp 1/8" - 1/4" from the tire.
Then re install the cradle size adjustment bolts.



Tire centering slide

C To center the tire in the loading tray you have two tire centering slides. Remove the detention pin from the slides and adjust them to the proper width for your aircrafts tire.

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Maintenance

Charging

It's important to plug your tug in after you're done using it. The charger that comes with your tug is a smart charger that will recharge the batteries, and then maintain them for you until next time you use the tug.

This will help to increase the life span of your batteries.

To properly read the battery status indicator on the tug the unit should be at rest for at least 30 Seconds. The battery indicator will rapidly deplete during use & rise when resting this is normal.

Do not let the batteries get below 70% charge when resting. The batteries may get down below 70% when pulling an aircraft.

Before plugging the charger into your tug check that the red AC light is on. Plugging the charger into your tug when it does not have wall power will discharge the batteries, Which can lead to battery failure over time.

Charger light indications;

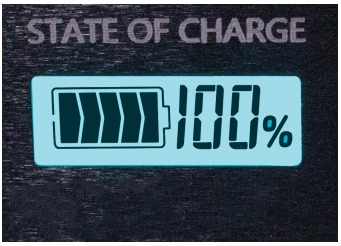
When plugged into wall power the Status light will indicate red to show it is plugged in. When you connect it to the tug the light will change to yellow to indicate that it is applying charge to the batteries. When the green light turns on it indicates the batteries are at a full state of charge.

Do NOT leave tug on while charging! Doing so could cause damage to the batteries and in severe cases could lead to a fire or acid leak.

Red
AC Power

Yellow
Charging

Green
Charged



Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

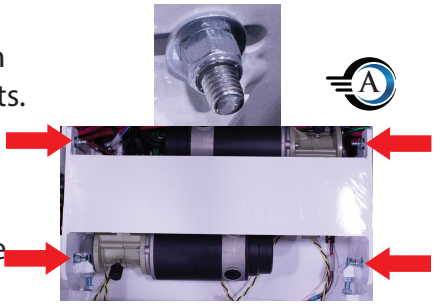
Internal Access

The cover on your Romeo is held on by magnets, lifting up on the cover will allow these magnets to slide off of the metal frame. Underneath the cover there are wires for the lights, they have a two pin Molex connector that can be separated from the main harness in the tug to allow full removal. If you have a hands free loading device on your tug it will need to be in the unloaded position before removing the cover or you risk damage to the cover.

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Tightening Chains

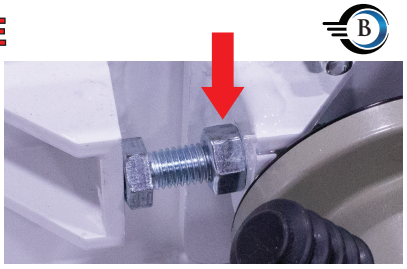
Your tug is driven by chains that run from the drive sprocket to the wheel hub. Over time the chains can stretch which can lead to Chain skip on the sprockets. Chain stretch is normal and not a cause for concern.



Motor cage bolts

These chains should be tightened once per year, or when they start to make excessive amounts of noise. Tightening the chains is an important part of maintaining your tug. It helps to reduce the wear on mechanical components as well as keeping the tug safe to operate.

THE TUG MUST BE TURNED OFF BEFORE WORKING ON THE CHAINS!



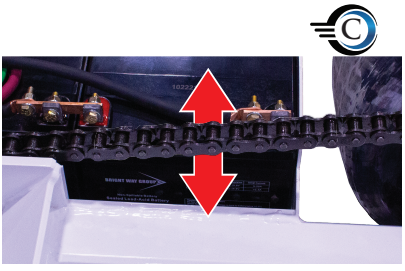
Chain tension bolts

A There are four carriage bolts through the motor cage and frame of the tug. Loosen these using a 9/16" wrench. (Do not fully remove)

B Now loosen the Jam nut on the chain tension adjustment bolt Using a 3/4" wrench. Rotate the bolt counter clockwise to tighten the chain or clockwise to loosen the chain.

C Optimal chain tightness will allow for 1/2" total play at the center of the chain (Between the sprockets).

Once the chains are at the correct tension, tighten the lock nut on the chain adjustment bolt until snug and tighten all four 3/8" Nylock nuts to 23 Ft-lbs.



Chain tension check

Contact information
Support@besttugs.com
Sales@besttugs.com
801-855-7757

Grease Points

Greasing mechanical parts in the tug is a required part of maintaining your Romeo tug. Grease allows components to move freely and reduces wear on surfaces.

• Wheel Hub

To Grease hub bearings by hand you can put a dollop of grease in your palm and holding the bearing like a ring, smack it gently into the palm with grease. This will force the grease into the bearings. Rotate the bearing between each hit. Repeat until grease comes out of the side of the bearing not being smacked on your palm. (See Pg. 22 For information on removing the hubs from your tug).

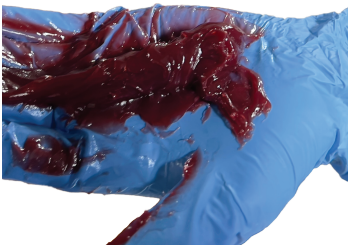
• Caster Wheel

Connect the grease gun nozzle to the grease zerk on the caster wheel and pump grease into the bearing until it starts to come out of the bearing.

• Lazy Susan bearings

Underneath your Lazy Susan is a needle bearing washer which can be reached by removing the two front roller bearing mounts and lifting the Lazy Susan out of the center hole then sliding it off of the tug frame.

Packing Bearings



Grease in palm

Hold bearing so half is exposed

Smack bearing into palm with grease

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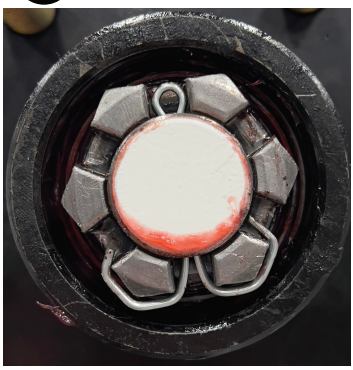
Removing the Hubs

Use a jack to lift the wheels off the ground, remove all lug nuts and pull the wheel off of the hub.

To remove the hub and access the internal bearings you'll need to loosen the motor chains as shown on page 19.

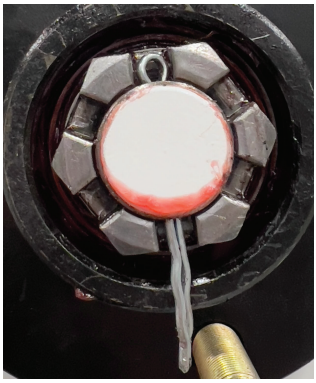
A Next use a set of needle nose pliers to remove the master link by grabbing the rivet at the closed end of the master link key and squeezing against the pin. Once the key is removed slide the master link out of the chain and the chain will be removable.

B



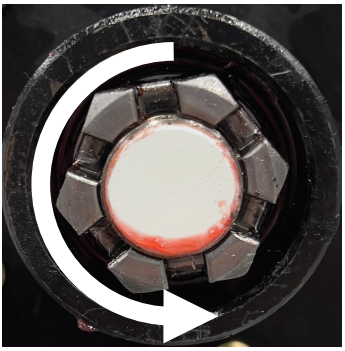
Use a flat head screw driver to remove the dust cap by prying the lip of the dust cap away from the hub.

B Remove the cotter pin holding the castle nut in place and then turn the castle nut counterclockwise to remove it. This will allow the hub to slide off the spindle.



Follow grease instructions on Pg. 21

Reinstall the hub by reversing the steps to remove it. Tighten the castle nut as tight as you can BY HAND and then back it off until the first slot aligns with the hole in the spindle and reinstall the cotter pin. Be sure to bend the pin as it was previously to avoid it rubbing on the dust cap. Replacing the cotter pin is recommended.



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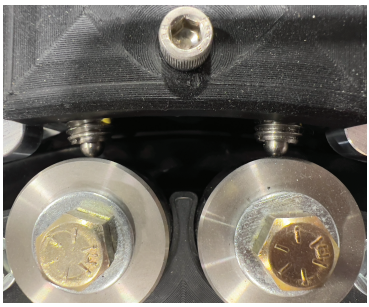
Lazy Susan

To keep this Lazy Susan in perfect working order, it will need some occasional adjustments. These adjustments will be to the systems that allow the cradle to rotate.



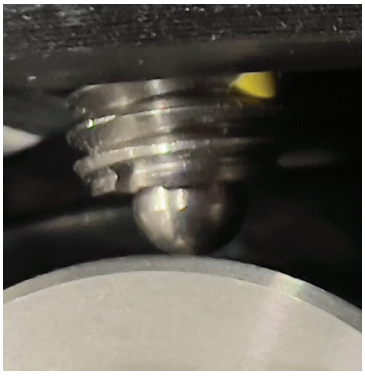
Good

If the cradle does not unload upon command, follow these steps to adjust the contacts.

• Allow the cradle to rotate

• Watch the plunger set screws as you rotate the cradle into the centered position, if they are adjusted properly they should depress 40-60% into their housing. This indicates that a good contact is being made to the cradle.

• If the set screws do not depress the desired amount, remove the cover over top of them, and loosen the jam nut on the pin not contacting. Then tighten the set screw in until properly contacting. Once it's been adjusted re-tighten the jam nut, and install the top cover.



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Operation Checklist

This page is an operation checklist that can assist you in the start up and operational processes of using your Best Tugs Romeo HD.

Read the full manual before proceeding with the operation of your tug

Loading

- Turn on hand held remote.
- Turn both red E-stops on - clockwise (Out).
- Turn Battery disconnect to "ON" Position.
- Watch remote until Tx And Rx appear and show a battery status.
- Hit "E - Tug Power " switch and wiggle steering wheel lightly to wake tug.
- Chock Aircraft and lower cradle into loading position.
- Align cradle with tire and drive tug underneath aircraft until load lock lights turn on.
- Click the "C - Rotate" button once to allow rotation of the cradle.
- Wiggle the steering slightly to relieve pressure on the rotation pin and the rotation will unlock

Unloading

- Click the "C - Rotate" Button once to disallow rotation of the cradle. (if enabled)
- Rotate the tug back and forth using the steering wheel until the cradle locks in place.
- Drive the tug slightly into the aircraft to apply pressure into the back of the cradle. (This is needed to allow the locking bars to unlock).
- Hold the "D - Load/Unload" button until the locking bars are fully unlocked.
- While holding the "D" button drive away from the aircraft and the cradle will unload the aircraft.
- Turn off the battery disconnect.
- Turn off Remote.
- Plug the tug into the provided charger.

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Troubleshooting

Tug Is Struggling To tow Aircraft	• Batteries are dead - Charge batteries or replace if bad. • Excessive slope / Weight - Slope too steep for tug capacity or aircraft weight. • Tug has Overheated - Allow several minutes to cool.
Tug Won't Turn On	• E-stops pressed - Cycle E-stops off & on (Depress and release). • Battery Disconnect Off - Turn Disconnect to "ON" position. • Cycle "E" and wait 15 Seconds • Check Fuses - Red light will be ON in fuse box if one has blown • Remote too close to tug - optimal connection is at 15 ft
Tug Not Unloading Correctly	• Ensure pressure is against rear ramp • Hold "D" until locking bars fully unlock • Rotation not centered/Locked
Tug Not Loading Correctly	• Batteries are dead - Charge batteries or replace if bad • Ramp height set incorrectly - Follow the steps on Pg. 12-15 • Wheels not chocked - Aircraft is allowed to roll away from tug

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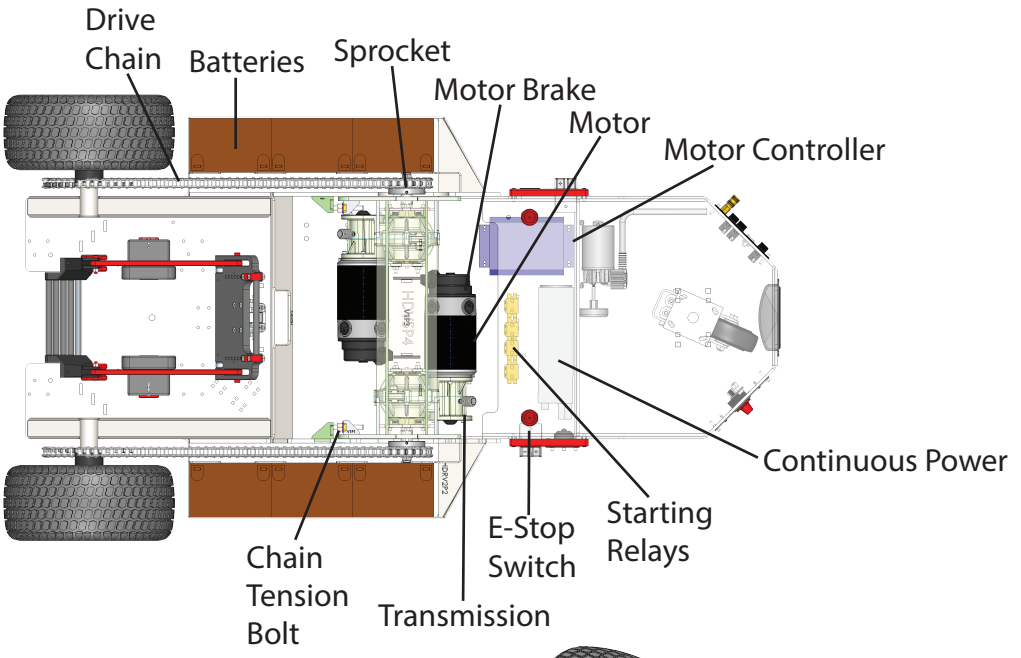
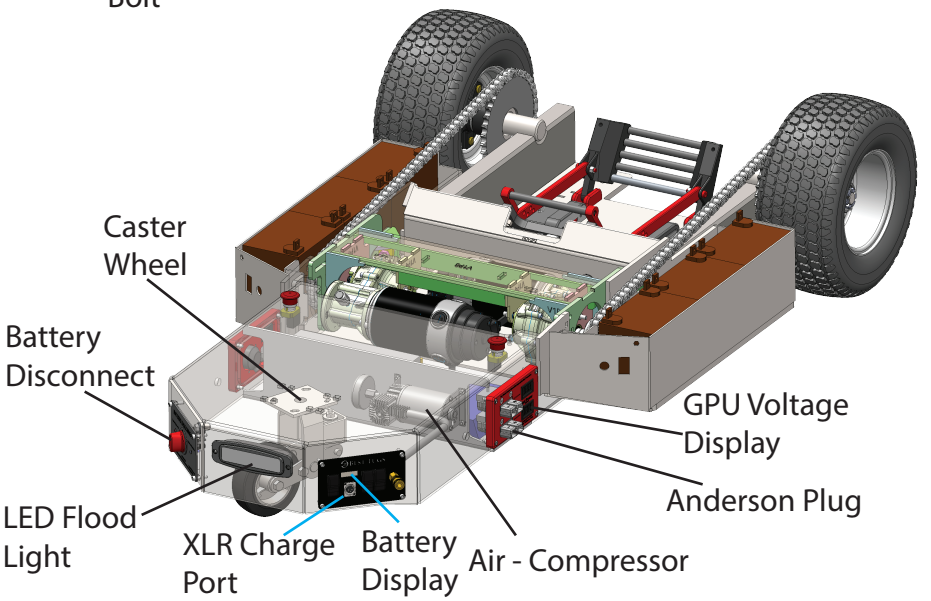
Part Catalog Romeo





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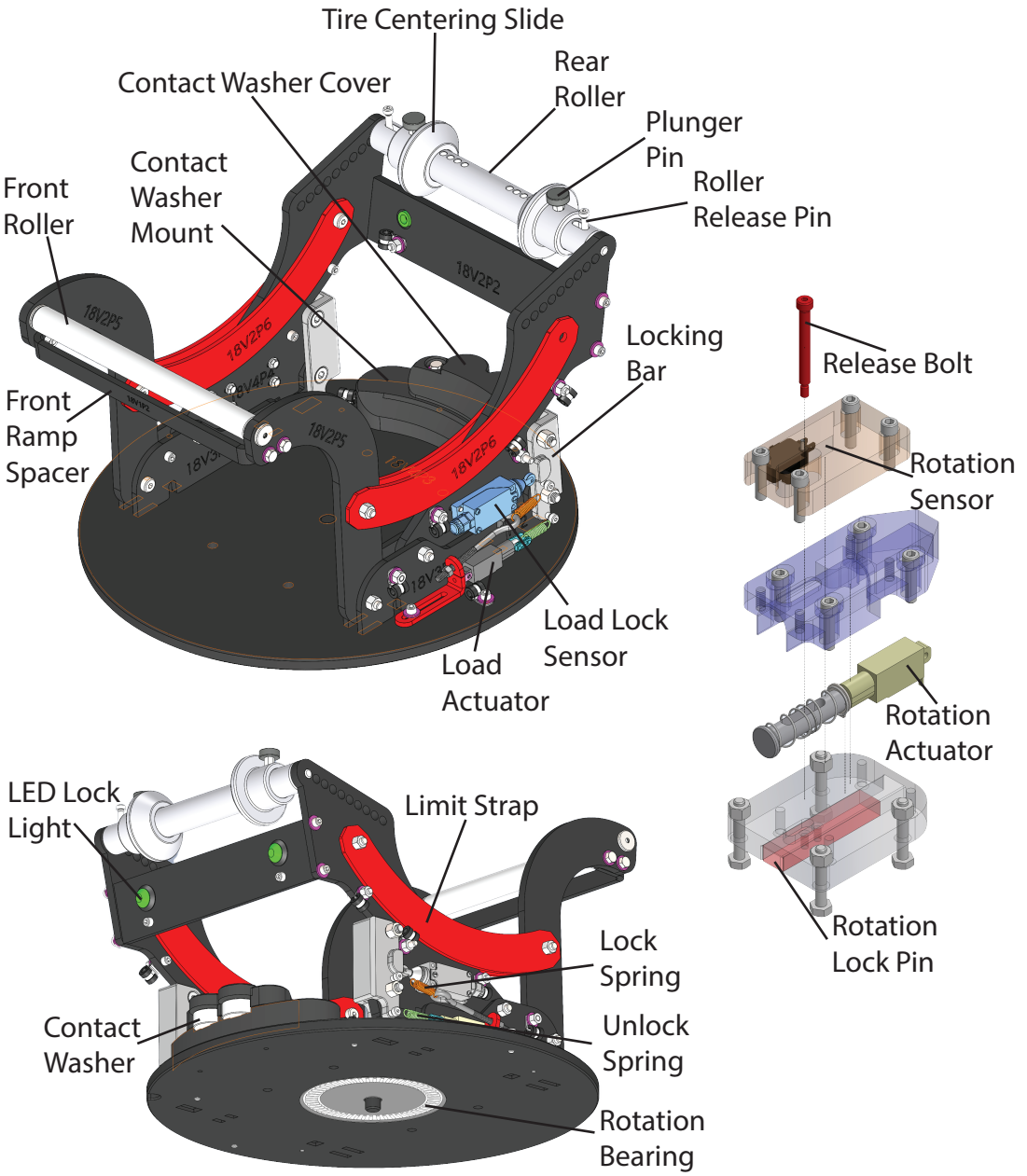
Part Catalog Lazy Susan



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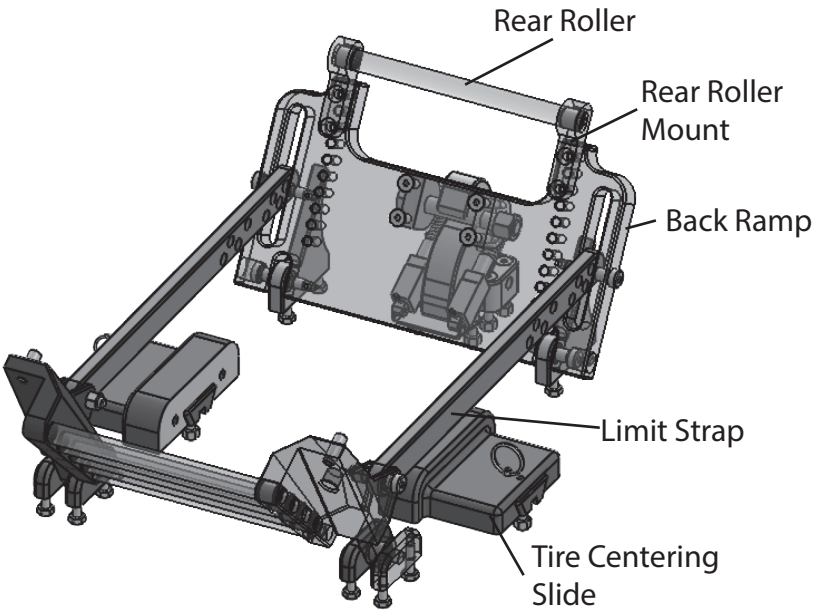
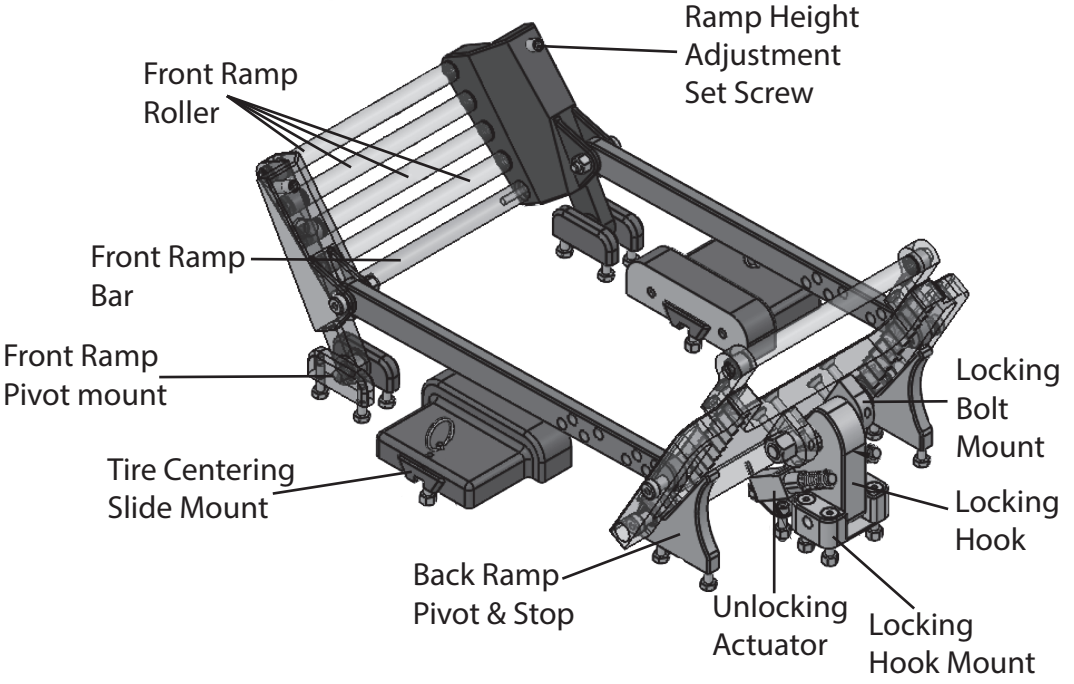
Part Catalog Easy Load





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Information

• Batteries

Your batteries are a 12 Volt 35 AH (Amp Hour) AGM (Active Glass Mat) with an NB (Nut & Bolt) Terminal. These Batteries are not custom, you can source them locally for your convenience.

• Wheels

The tires on your tug are foam filled to prevent flats. You can not add or remove air from them, there may be a hole in the tire as a result of the screw that is driven in during the foam filling process. This is normal and not cause for concern.

• Warranty Information

Batteries are NOT covered under warranty.
Your tug comes with a one (1) year limited warranty. This warranty covers parts including the drive train. Warranty excludes shipping cost and labor. Extended warranty is available, call sales for more information.

This warranty does not apply to any Best Tugs Components that have damage caused by, Misuse, Accidents, Collisions, Vandalism, Fire, Explosion, Water damage, Customer applied chemicals. Nor does it apply to Best Tugs parts which have been modified or repaired outside of Best Tugs provided Maintenance. Furthermore any modification of Best Tugs electrical system MUST be approved prior to modification, and documented in writing by Best Tugs. Failure to do so voids the units warranty. Contact Best Tugs with any questions or concerns.

Tug Duty Cycles are Based on 2 Minutes

R12 HD Load & Duty Cycle			
Degree	**6,250**	**9,375**	**12,500**
0	100	100	100
0.5	100	100	94
1	100	91	69
1.5	100	72	54
2	89	59	N/A
2.5	76	51	N/A
3	66	N/A	N/A

R15 HD Load & Duty Cycle			
Degree	**7,500**	**11,250**	**15,000**
0	100	100	100
0.5	100	100	88
1	100	86	64
1.5	100	68	51
2	84	56	N/A
2.5	71	N/A	N/A
3	62	N/A	N/A

R18 HD Load & Duty Cycle			
Degree	**9,000**	**13,500**	**18,000**
0	100	100	100
0.5	100	100	84
1	100	82	61
1.5	96	64	N/A
2	80	53	N/A
2.5	68	N/A	N/A
3	59	N/A	N/A

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Operator Notes

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Maintenance Schedule

Date of Arrival: _____

Every Use • Check remote battery level (do not use tug when low battery warning is on!) • Inspect winch strap for damage
Monthly • Check loading ramp is at optimal height (Lazy Susan & Easy Load Pg. 12-15)
3-5 Months • Inspect for loose fasteners in ramp area • Grease Lazy Susan/Easy Load Bearings
Annually • Tighten chains (Pg. 19) • Grease wheel hubs (Pg. 21-22 • Grease caster wheel (Pg. 21)
3-5 Years • Replace tug batteries
5-10 Years • Inspect drive tires & caster wheel, replace if needed

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Electrical

Replacing Batteries

Batteries are a consumable item, they will need to be replaced every 3-4 Years under ideal care. It's possible they will need to be replaced sooner than this if they are not used under ideal conditions.

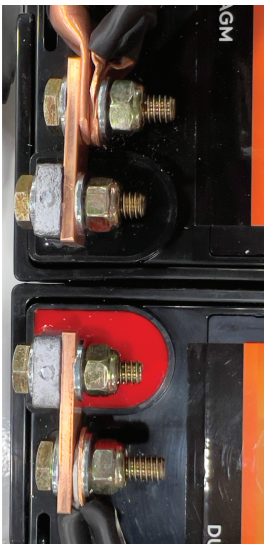
Each battery post will have a copper jump bar that all the associated wires for that terminal will connect to. This will allow you to remove the battery wires without needing to keep track of all of them individually.

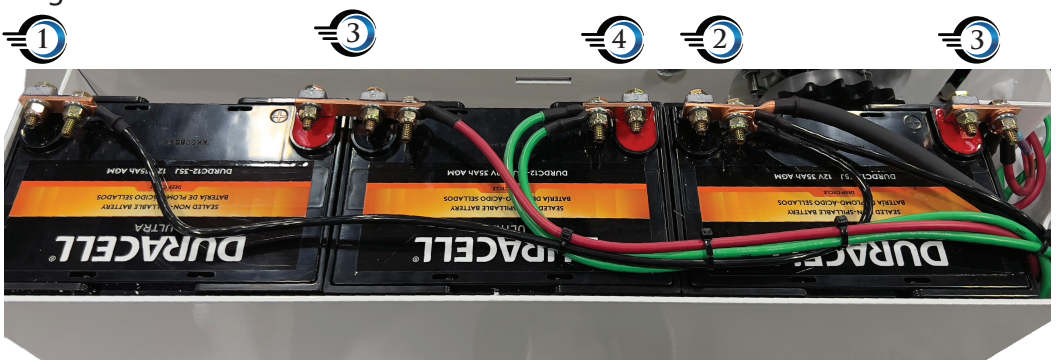
Start by removing the ground terminals on each battery, one at a time and then covering the exposed copper with electrical tape to prevent any potential shorts. After you have removed all battery grounds remove the positive terminals and tape the exposed copper.
(See the Numbered terminals below for removal order.)

Remove each battery by lifting it directly out of the battery tray. Install the new batteries by lowering them in with the terminals on the side nearest to the drive chains. Lowering them at a slight angle can help ensure they seat properly.

Once all batteries are seated, reinstall the battery jumpers starting with the Positive terminals and doing the grounds last.

These posts are not in series and will short if connected.





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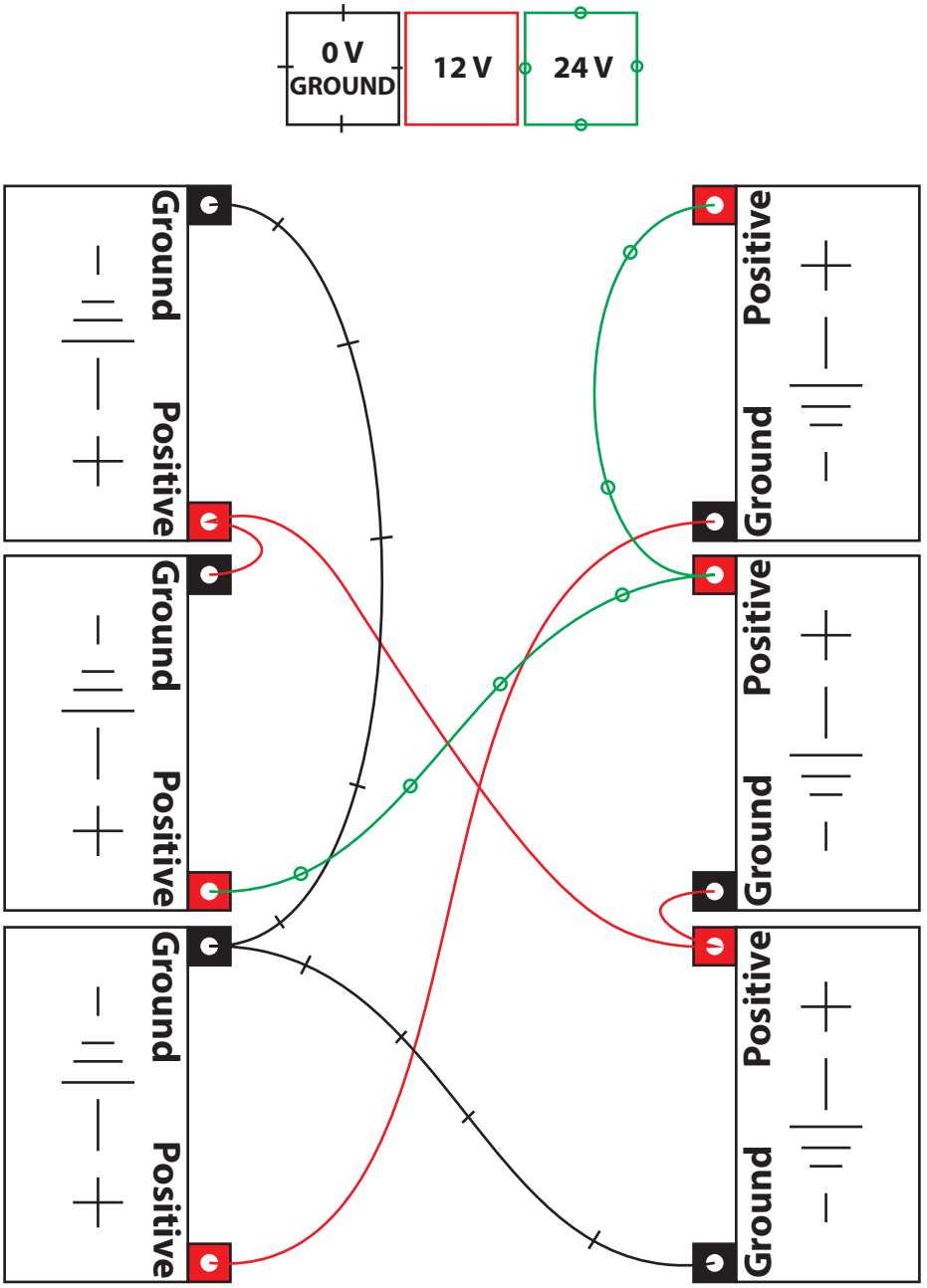
Battery Wiring



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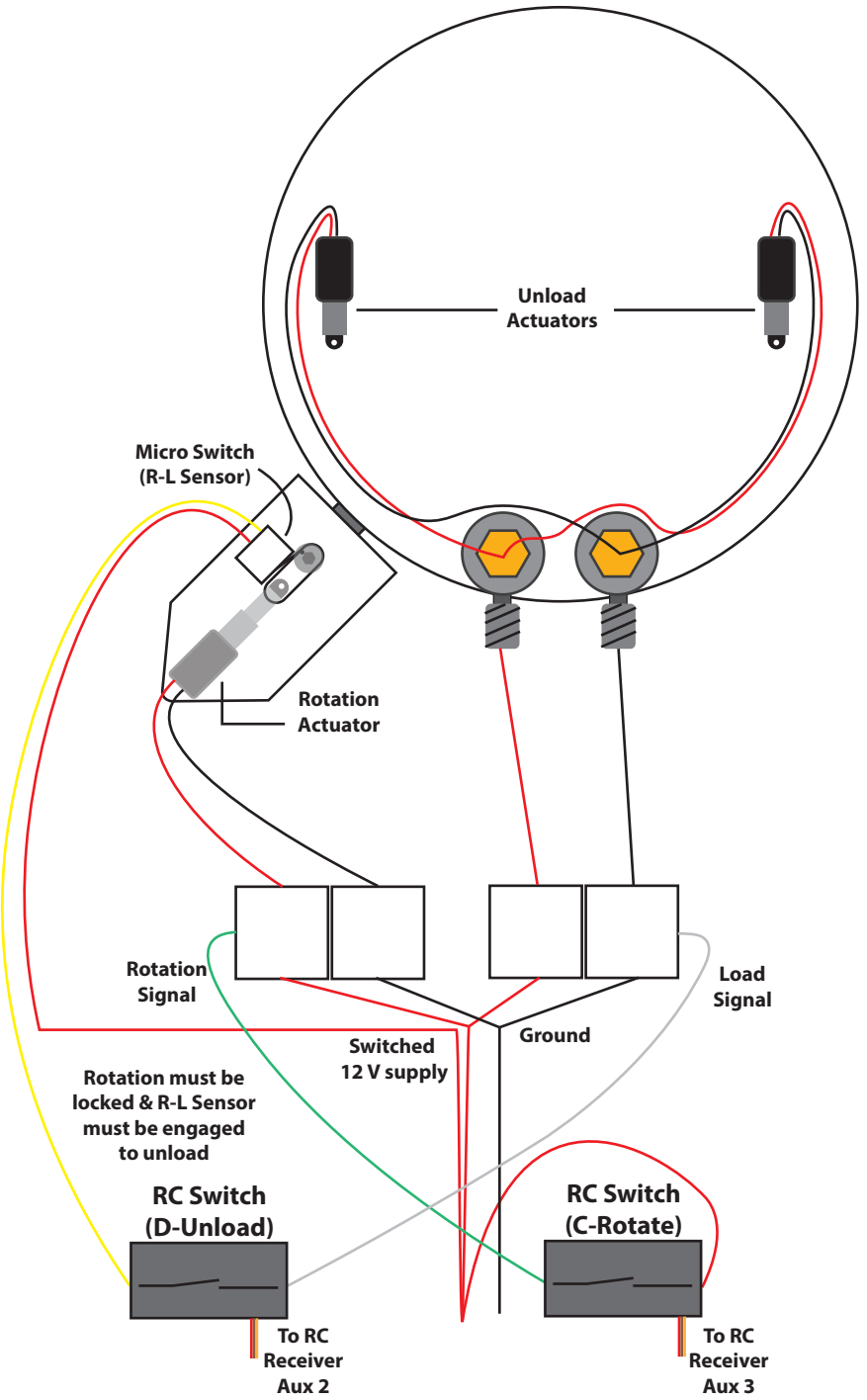
Lazy Susan Wiring



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