

## **UATT OPERATORS MANUAL**



### **Introduction**

Stronghaul has been in the trailer manufacturing business since 2010, with all those years of experience Stronghaul has created the newest model to add to its trailer lineup, the gravity tilt deck trailer. With the development of more complex and sophisticated trailers comes the need for proper operating instructions and safety documentation.

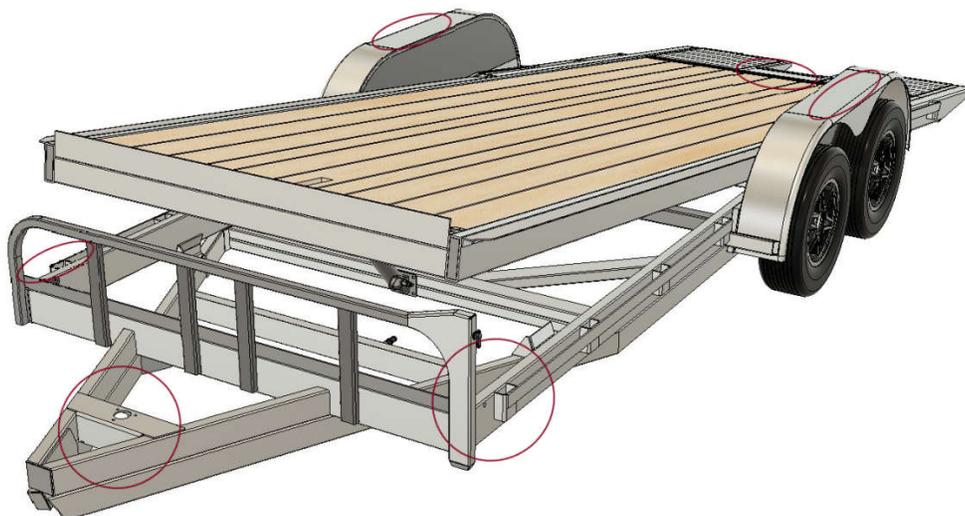
The purpose of this document is to educate the owner of the trailer on the safety risks/precautions that this new style trailer poses and how to properly operate the trailer without injury or damage to personal property. Failure to fully read and understand proper loading techniques, safety concerns, and danger areas on or around the trailer may result in serious injury or in extreme cases, death. Please use caution at all times while operating trailer to ensure safety and avoid accidents.

### **Safety Information**

When there are areas on or around the trailer to take precaution, one of the following symbols will be featured followed by a brief message on what the symbol is regarding.



If when operating/loading the trailer the precautions are not followed the outcome may result in injury or in severe cases death. Some of the areas you will find these symbols are highlighted in the diagram below.

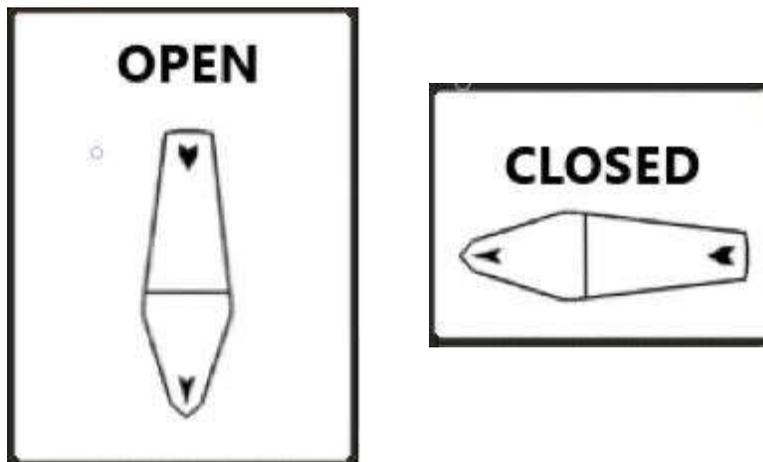


## Tilt Deck Operation, Loading

To operate the tilting portion of the deck, follow the steps below to understand the certain procedures and considerations to make before attempting to load the vehicle.

In order to lower the deck, the first step is to remove the safety hair pins and the tilt deck locking pins located at both front corners of the trailer.

The next step is to unlock the hydraulic stop valve. This valve is located at the front driver's side corner of the trailer. The following diagram shows the valve in both the open position and closed position (positions are also on warning label below valve).



After the valve is unlocked, the tilt deck should automatically start to lower to the ground, the deck may not always lower by itself due to moisture in the decking boards, snow on the deck, how dirty the trailer is etc. If the deck doesn't lower by itself, one can lower the deck by standing on the rear of the rear knife edge. To return the deck to the travel position without a load on the trailer, the operator would have to stand at the front of the tilting deck to lower it.

Once the deck is lowered there are two options. You can either leave the hydraulic stop valve unlocked or lock the valve again. **Which option you choose depends on the length of vehicle you are hauling.**

### **For Vehicles with 120" Wheelbase or Shorter:**

If the vehicle being loaded has a wheelbase of 120" or shorter than 120", then the best option is to leave the valve unlocked. As the operator drives the vehicle up the trailer it will automatically start to lower the deck into the travel position once the center of gravity passes the pivot point of the tilting deck.

### **For Vehicles over 120" Wheelbase:**

Vehicles with a wheelbase longer than 120" require the hydraulic locking valve to be closed during the loading of the vehicle. If the valve is left unlocked while a vehicle with over a 120" wheelbase is being loaded, the front wheels of the vehicle will cross the pivot point of the tilting deck before the rear wheels touch the knife edge. If this happens the tilting deck will start to pivot down and the knife edge will lift upwards into the body of the vehicle being loaded and may cause damage to the vehicle being loaded. **Failure to follow Stronghaul's instructions and loading procedures may result in damage to personal property, injury, or in extreme cases death. Stronghaul will not be held liable for any damage to personal property caused by the misuse of the tilt deck trailer. Any resulting issues with the trailer due to misuse will not be covered under warranty.**



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## Tilt Deck Operation, Loading

### For Vehicles over 120" Wheelbase: (Continued)

Once the vehicle has been driven up the tilt deck with the valve locked, the vehicle is to be parked and then the valve unlocked. To avoid sudden movement and possibly injury, Stronghaul recommends slowly opening the hydraulic valve. The trailer does incorporate a flow restrictor but, depending on the weight of the vehicle, the speed at which the deck lowers will change.

After the tilt deck is lowered with the vehicle parked and in the desired travel position, the hydraulic stop valve can be closed, the tilt deck locking pins re-installed with safety hair pins and you are ready to strap the vehicle down.

## Positioning Load

Due to this trailer being a tilt deck it is critical to position your load accordingly. Stronghaul normally incorporates a 60/40 weight distribution. On this trailer the weight distribution is set at 55/45 to achieve optimal load angle. This means that the axles on the trailer are positioned with 60% of the deck space in front of the centerline of the two axles and 40% of the deck space behind the centerline on standard Stronghaul trailers.

On the tilt deck model 55% of the deck is in front of the centerline and 45% behind on the wooden decked area only. This percentage does not include the rear 3' of the trailer that is checker plate aluminum. The trailer is intended to only carry weight on the wooden portion of the deck. If the load is positioned too far back onto the knife edge portion, then the trailer may become tail heavy and can lead to trailer sway and become unstable at highway speed. **Never have the weight rear loading your trailer as it may lead to serious injury or in extreme cases, death.**

## Tilt Deck Operation, Un-Loading

This section will explain the procedures to follow while unloading a vehicle off of a Stronghaul tilt deck trailer.

With the tilt deck still in the transport position and after having unstrapped your vehicle, the hydraulic stop valve can be opened and tilt deck locking pins removed.

**Before proceeding to unload the vehicle, the length and weight of the vehicle that was being transported must be considered again, and there are two options for unloading.**

### For Vehicles with 120" Wheelbase or Shorter:

Vehicles with 120" wheelbase or shorter can have the hydraulic stop valve open through the duration of the unloading procedure. While unloading ensure, to drive slowly and always be riding the brakes as once the tilting motion starts to occur the vehicles weight will start to affect the vehicle's braking ability.

Once the tilt deck has fully tilted and is touching the ground, the driver may back the vehicle off the trailer.

To return the tilted deck back to the travel position the operator has to stand at the front of the tilting deck and the trailer will return to the travel position. At this point the hydraulic stop valve can be closed and tilt deck locking pins reinstalled with safety hair pins.



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## Tilt Deck Operation, Un-Loading

### For Vehicles over 120" Wheelbase:

Vehicles over 120" need more attention while unloading to avoid damage to personal property and/or injury. Begin by having the hydraulic stop valve open. The operator can now begin to back the vehicle towards the pivot point of the tilt deck.

Once the tilting motion downward begins, the operator is to stop the vehicle. After the tilting motion has stopped, the knife edge will now be in contact with the ground and the operator will have to park their vehicle on the now tilted deck and ensure the hydraulic stop valve now gets closed. This is much easier to accomplish with an additional person helping as the operator would not have to exit the vehicle to switch the hydraulic stop valve.

After switching the hydraulic stop valve to closed, with the vehicle still on the tilted deck, it may now be backed down slowly until the rear wheels are at the knife edge.

Depending on the vehicle's weight, the suspension will compress and the aluminum frame of the trailer will flex while under load. This will cause the trailer to spring back once the vehicles weight is off of the knife edge. This is unavoidable due to the natural characteristics of aluminum. **So, as the rear wheels roll off the knife edge of the trailer, it is normal to see 4"-6" of spring back from the frame and suspension relaxing, while the front wheels of the vehicle are still pushing downwards in front of the pivot point.** The heavier and longer the vehicle, the more of this spring back motion will be seen. For an example of this spring back with a vehicle, please refer to the section "Loading Case Example".

To minimize this spring back as the vehicle's rear wheels are rolling off the knife edge, it is necessary to back off slowly and ensure the knife edge will not contact the vehicle being unloaded. Once the trailer has sprung back to its natural position, the driver can now back the vehicle down the tilt deck until the front wheels are at the knife edge of the trailer.

As the vehicle's front wheels are approaching the rear of the trailer, the operator will notice the suspension of vehicle that was towing the trailer will start to rise. This is due to the trailer hydraulic stop valve being locked and not allowing the nose of the trailer or the tilt deck to fully retract downward; again, due to the weight of the loaded vehicle causing the trailer to bend. In this case it is necessary to open the hydraulic stop valve while the front wheels of the vehicle being unloaded are still on the knife edge. This will release the pressure in the hydraulic system and allow the tilting deck to extend further and the nose of the trailer and towing vehicle will return downward.

After the trailer has settled with the hydraulic stop valve open, the vehicle can be reversed off the deck fully. Unloading a vehicle with a wheelbase longer than 120" is easier to accomplish with an additional person working the hydraulic stop valve. **Failure to follow Stronghaul's instructions and unloading procedures may result in damage to personal property, injury, or in extreme cases, death. Stronghaul will not be held liable for any damage to personal property caused by the misuse of the tilt deck trailer. Any resulting issues with the trailer due to misuse will not be covered under warranty.**

Loading and unloading of any vehicle on a tilt deck trailer must be done with extreme caution and must not be rushed. If rushing while loading, it is more likely a mistake will be made.

## **Loading Case Example**

The Stronghaul team has tested these trailers with a 2007, Mega Cab, 6.5' box, ½ tonne pick-up truck weighing in at an estimated 7,000lbs that has a wheel base of 160" (13' 4"). With this being one of the longest and heaviest vehicles that should be hauled on this style of trailer, it helps simulate one of the worst case scenarios. After loading this vehicle, the rear wheels were at the very back of the useable deck space, the back of the 18' wooden decking portion, and the bumper within 6" of the front rail. This trailer is NOT intended to have a load on the checker plate portion of the deck. The knife edge is only to be used for loading and unloading.

During the unloading of the vehicle, the spring back on the knife edge was recorded to spring up to 7" on our prototype model. Part of this spring back is due to the trailer suspension rising as the weight of the vehicle is being removed from the trailer. The majority of the spring back is from the natural characteristics of aluminum being able to flex under load and spring back once the load is removed. In the diagram below you can see with the trailer loaded, the frame flex an estimated 3" at the tip of the knife edge. To reiterate, the longer and heavier the vehicle the more stress will be induced on the trailer, causing more frame flex and suspension compression.



All trailers released after this prototype have added gusseting and reinforcements to help prevent the tilt deck from deflecting to this extent, but all tilt deck models will still have some spring back and it is important to take this into account when unloading.

## **Winch Mount Bracket Information**

Installing a winch on a gravity tilt trailer is ideal for picking up vehicles that broke down or purchasing new non-running projects, but it can be troublesome to install the winch. This section of the document will go over the different steps for installing a winch/winch mount on a tilt deck trailer.

Due to this trailer being aided by gravity to tilt, it is not possible to have the winch mounted at the front and center of the tilting portion of the deck and have the trailer still tilt. To overcome the weight of the winch and battery, the trailer would have to be loaded up with an additional 350 lbs in the rear of the trailer to counter the added 200 lbs from the winch on the front of the trailer.

To bypass this issue, Stronghaul has designed a custom winch mount that places the winch and battery under the decking, directly at the pivot point of the trailer. So no added ballast weights are needed in order to get this trailer to tilt with the winch and battery. The battery can also be mounted in a toolbox if the customer would rather have the battery more accessible.

With the winch mounting under the decking, the winch cable is run forwards under the cross members of the tilting portion of the deck and wraps around a pulley. The cable stays hooked above the decking at all times. With the winch and battery being mounted under the deck, Stronghaul does run a 12v charge wire near the area where the winch is to be placed in order to maintain the battery when trailer is being towed.

If the customer sees themselves using the winch for extended periods of time with short travel distances, it is recommended to install the battery into a toolbox at the front of the trailer. Stronghaul recommends this so the customer can maintain their battery with a few different methods, which will be covered later on.

With the winch mounting to the underside of the decking, **it is required that a wireless remote winch is purchased** as a corded remote winch will not be easily accessible to plug in the winch remote.

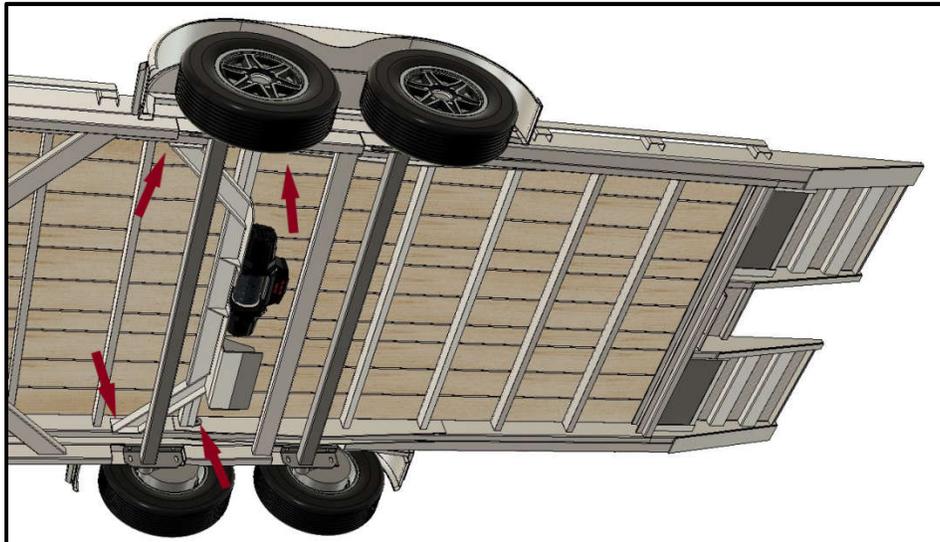
## **Winch Mount Bracket, Installation**

The following section will cover how to install the winch mount that Stronghaul produces to custom fit this trailer and application.

In some cases the dealer may pre-order the trailer with the winch mount. If so, the winch pulley and decking cover plate will be bolted under the tilting deck out of sight until the customer chooses to install a winch.

For new installations, the winch mount bracket will be bolted in place on the 6<sup>th</sup> cross member from the back of the trailer. This will place the winch directly between the axles of the trailer and as close to the pivot point of the trailer as possible. Please refer to image on the next page.

## Winch Mount Bracket, Installation



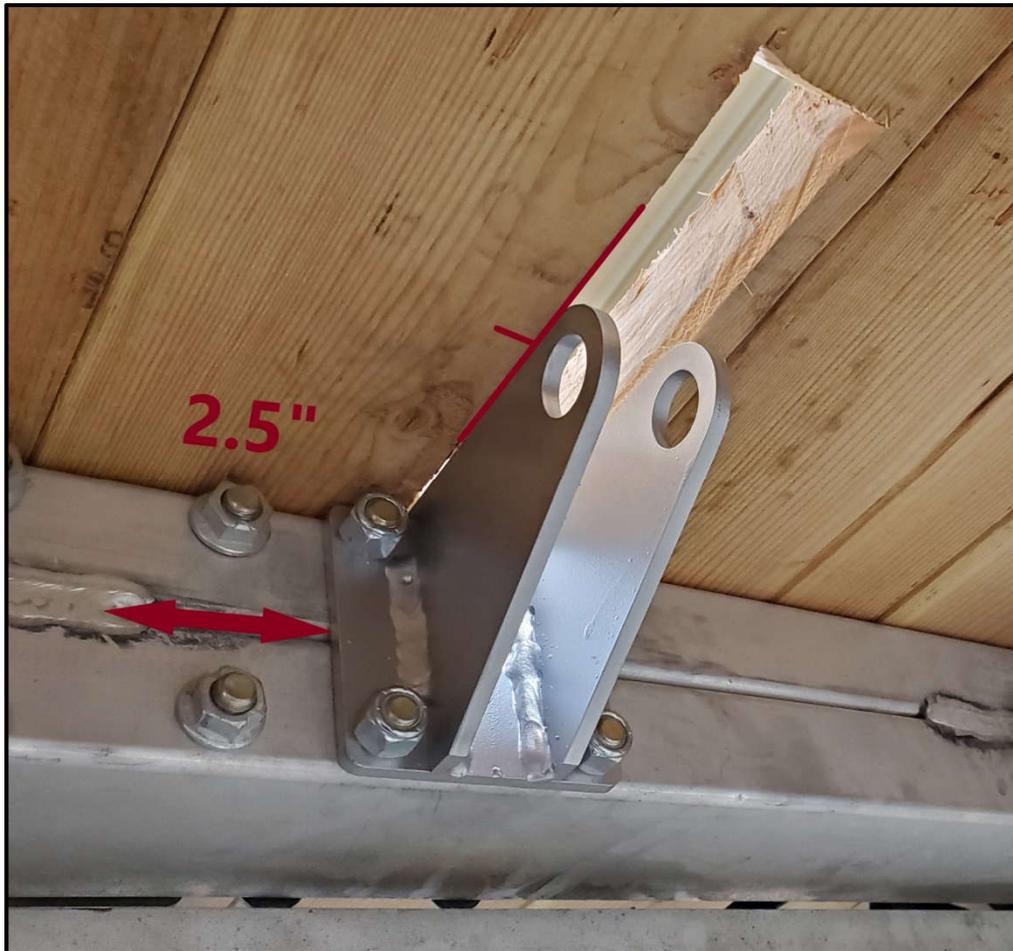
In order to bolt the bracket in place, the installer must ensure the bracket is sitting flush with cross member as far to the front of the trailer as possible. With the bracket clamped in place 4 x 1/2" holes must be drilled in the tilting deck frame and two in the laser cut plate with a pre-existing hole. As well as two holes in the blank plate. The measurements for hole position is 1" back from the front of the plate and 1" down from the top of the plate. Please refer to red arrows in above diagram to identify hole locations. After the holes are drilled, the supplied 1/2" hardware can be installed and tightened down.

Next step is to scribe the winch mounting holes onto the bracket overtop the notch in the bracket. **The winch must sit as high as possible for the cable to clear the trailers axles while operating.** The bolting pattern should allow two bolts to go through the .250" plate beside the notch for the winch cable as well as two bolts to go directly through the cross member, winch bracket channel, and the .250" plate. Winch mounting hardware is not supplied as the winch bolt size may change depending on the size and brand of winch installed. See below image for winch position.



## **Winch Mount Bracket, Installation**

Once the winch has been bolted in place, the next step is to align the pulley at the front of the deck. The pulley will have to be disassembled for proper install. With the bare pulley mount, the position is to be measured from the center of the crossmember, 2.5" over to the pulley bracket edge. Refer to the image below.



While bracket is in place without the pulley, scribe the hole positions onto the cross member. Then scribe the pulley center line and outside faces of pulley bracket onto bottom of decking boards. The bracket can now be removed and the 4x 1/2" holes drilled.

After the holes are drilled, align the decking cap (rectangular piece of aluminum shown on next page) to the markings from the centerline of the pulley as well as centered on the two outer face markings from the pulley mount. Once aligned, the decking cap can be used as a stencil to trace the area out that will be cut into the deck. With the cut out traced, the corners can be drilled out and then the remaining cuts can be done from the top side of the trailer.

Now the pulley bracket may be bolted in place and pulley installed with the winch cable wrapped around the pulley. See below images for final product.

## **Winch Mount Bracket, Installation**



## **Winch Mount Bracket, Wiring**

After completing the hardware installation, it's time to look at the wiring of the winch. As previously stated, the battery can either be mounted under the deck beside the winch, or if the customer wanted to purchase a toolbox, the battery can be mounted in a much more accessible location.

### **High Usage of Winch:**

The recommended route for high usage of the winch is to purchase a Stronghaul tool box and run the power cables along the frame rail to the winch. **Please ensure to research the proper power cable size needed for the size of your winch being installed. Undersized power cables can be a potential fire hazard. Stronghaul will not be held liable in the outcome of a power cable fire. If unsure what size power cable to use, please let a professional install the winch system.**

If the battery is installed in the tool box, the battery can be attached to the 12v hookup in the junction box, but the battery must be grounded as well in order to charge. The standard 12v hookup from a pick-up truck charges at a rate of 5 amps per hour. This rating does change vehicle to vehicle. But, this means if the battery were fully dead, it would take an estimate 3 hours of travel time to fully charge the winch battery. Keep in mind this is if the battery was completely dead. So for high usage and short travel times this may not keep the battery charged enough.

An additional option to ensure a full charge on the battery would be to mount a solar panel on the lid of the tool box and a charge controller, so any time the trailer is in direct sunlight it will be trickle charging the battery. A secondary option would be to hook up a battery maintainer, and then whenever the trailer is parked for long periods of time, the battery can be plugged into any 110v source and it would keep the battery charged.

### **Low Usage of Winch:**

If the winch will be used only on the odd occasion, the owner may opt to save on the cost of a tool box and have the battery beside the winch. Take note that the standard 12v hookup from a pick-up truck charges at a rate of 5 amps per hour. This rating does change vehicle to vehicle. But, this means if the battery were fully dead, it would take an estimate 3 hours of travel time to fully charge the winch battery. Keep in mind this is if the battery was completely dead.

The battery can then be mounted on the built in shelf on the winch bracket. The battery will need an aftermarket battery hold down that runs the width of the battery. The battery hold down shown on the next page required the winch mount to be modified in order to work.

In this scenario, the power cables that come with the winch should be the proper size to connect to the battery due to the short distance. Stronghaul does prewire the trailer to have the 12v charge wire brought near where the battery would mount. This charge wire will need to be extended in order to connect to the battery. In addition the battery will also need to be grounded in order to charge properly. See image on next page for wiring configuration.

## **Winch Mount Bracket, Wiring**



## **Conclusion**

In conclusion, thank you for taking the time to fully read and understand this document, Stronghaul wants the operator and people around the trailer to always be safe and out of harms way. We also want the operator to know exactly what to do in which situation and by having you, the customer, read this document, it helps prevents any confusion or questions you may have while operating your new trailer.

Thank you for choosing Stronghaul.