



### Atwood Mobile Products

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LITERATURE NUMBER 297-333465

# Universal Hinged Ladder for Recreational Vehicle

Model # MHL2241

This Universal Hinged Ladder design has been verified to the guidelines stated in this document for use on recreation vehicles.

## SERVICE CALLS & QUESTIONS

Location and phone numbers of qualified Service Centers can be found at our website <http://www.atwoodmobile.com> or call 866-869-3118 to locate a Service Center.

### SAFETY ALERT SYMBOLS

Safety Symbols alerting you to potential personal safety hazards.  
Obey all safety messages following these symbols



#### WARNING

avoid possible  
injury or death



#### CAUTION

avoid possible  
injury and/or property damage



#### WARNING

#### MAY CAUSE PERSONAL INJURY OR DEATH

For your safety and protection, it is important that this installation manual is read and understood before installation or use. Failure to properly install the unit or attempting to modify it in any way can be extremely hazardous and may result in property damage and personal injury and will void the warranty.



#### CAUTION

#### MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE

Incorrect or improper installation may cause  
personal injury and/or property damage.

## •Installation •Operation •Maintenance

Effective 01/16/2014

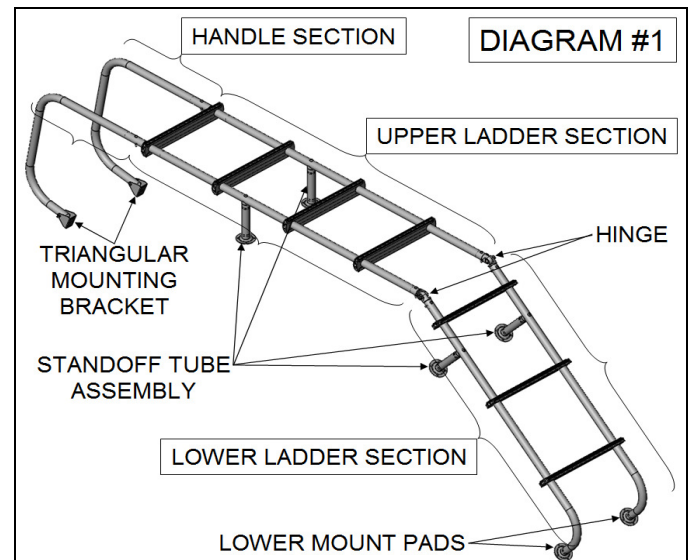
## GENERAL INFORMATION

### Package Contents:

- Handle Section: Quantity 2
- Upper Ladder Section: Quantity 1
- Lower Ladder Section: Quantity 1
- Installation Kit: Quantity 1
  - consisting of the following:
    - Die Cast Hinge: Quantity 2
    - Triangular Mounting Bracket: Quantity 2
    - #10-24x1-1/2" Pan-head Machine Screw: Quantity 8
    - #10-24 Nut, Nylon Self-locking: Quantity 8
    - Standoff tube assembly: Quantity 4
    - #1/4-20x3" Round-head Machine Screw: Quantity 4
- Instruction Sheet

### TOOLS REQUIRED:

- Drill with 13/64" and 17/64" bits (can be slightly larger)
- Hacksaw or tube cutter
- File
- Tape Measure
- Phillips-tip screwdriver (Screw gun recommended)
- 7/16" Hex Driver (wrench/socket/nut driver)
- Tall Step Ladder (For Roof Access)



## PURPOSE

This product is designed for installation onto the roof and rear wall of a recreational vehicle to provide and/or increase accessibility to the recreational vehicle roof.

-The **MAXIMUM WEIGHT CAPACITY of the Universal Hinged Ladder is 300 lbs.**

Before you begin...



### **WARNING**

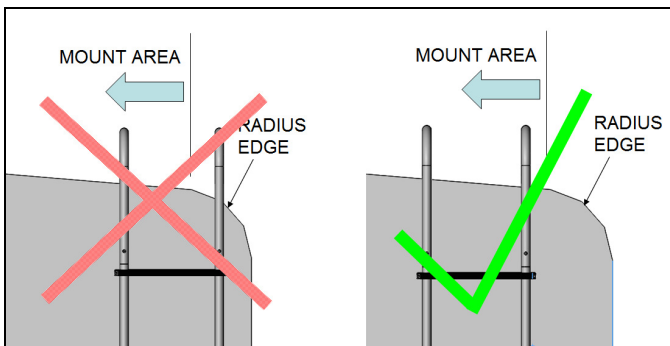
#### **MAY CAUSE PERSONAL INJURY OR DEATH**

The vehicle's roof and rear wall surfaces must contain proper support for fastening, consisting of the RV's framing or backing material provided by the RV manufacturer specifically for this purpose. Refer to your RV dealer, local installer or vehicle manufacturer for frame and backing locations or suggested ladder placement specific to your model. Do not connect the ladder to any surface not supported by framing or backing material designed to meet the ladder's weight capacity requirements. It is the responsibility of the installer to determine that respective conditions and rated capacity will allow the use of this Universal Hinged Ladder.

-The vehicle's roof surface and substructure should be in good condition with no dented, cracked, broken or rusted parts.

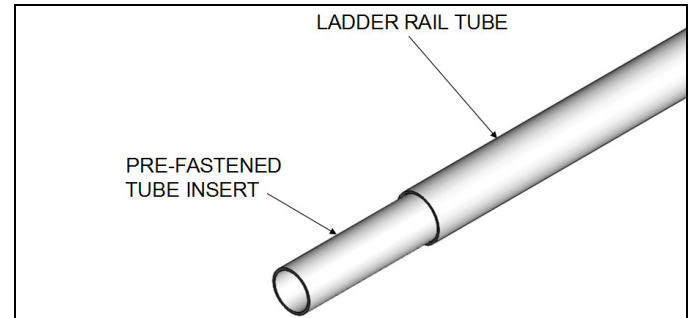
-The vehicle's rear wall surface and substructure should be in good condition with no dented, cracked, broken or rusted parts.

-The handle portion of the Universal Hinged Ladder is intended to be mounted on a relatively flat portion of the roof. Most RV roofs remain relatively flat all the way up to the edge of the roof, but for roofs that have "radius" edges use caution to ensure the ladder is not mounted into the radius.



-Familiarize yourself with the ladder components. The

ladder rail construction consists of tubing with two different diameters. The smaller diameter tube is slid inside the larger diameter tube and permanently held in place by a formed feature of the tube or by a fastener. The smaller diameter tube is used to junction two pieces of larger diameter tube together and is referred to as an insert.



## INSTALLATION

**How to mount the Universal Hinged Ladder to your RV.**

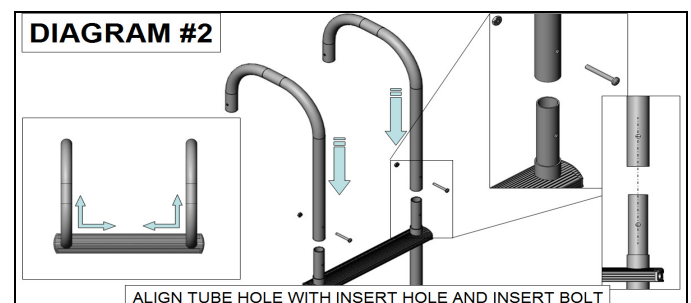


### **WARNING**

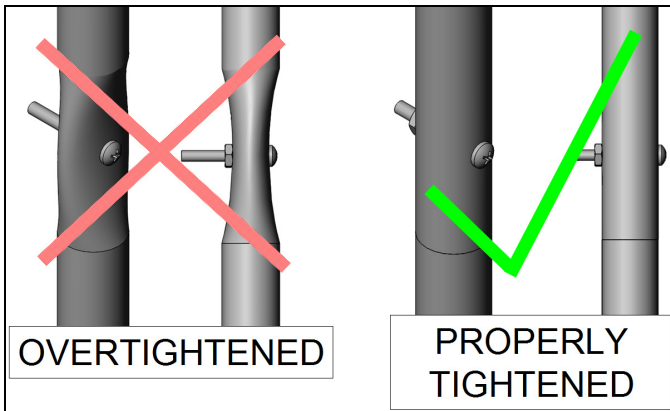
#### **MAY CAUSE PERSONAL INJURY OR DEATH**

The Universal Hinged Ladder is intended to be a permanent fixture. The Universal Hinged Ladder should only be installed when the vehicle is parked on level ground.

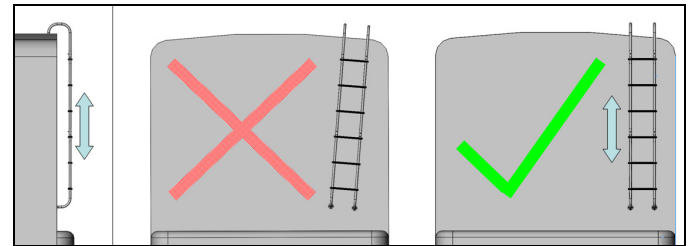
1. The major portions of the ladder are to be pre-assembled prior to installation. Slide the handle sections over the smaller-diameter inserts of the upper ladder section. Turn the handles until the pre-drilled holes of the handle line up with the holes of the insert. If holes are not present, turn the handles until they are perpendicular to the ladder section and drill a 13/64" hole through each handle and inner tube insert approximately 1-1/2" from the handle insert end. NOTE: When drilling, always drill perpendicular through the center of the tube; do not drill at an angle or off-center. Place a #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon lock insert (see Diagram #2).



Tighten the bolt until snug to surface. Be careful not to over-tighten the bolt or tube may be crushed. NOTE: Do not apply final torque until instructed as handle bolts may need to be removed later in instructions.



3. The ladder will be mounted from the top down. Begin by placing the upper portion of the ladder on the roof with the curved handle section ends resting on the roof and the rest of the ladder hanging vertical down along the rear wall. Move the ladder until it aligns vertically with known frame or backer locations. Swing ladder side-to-side until it is vertical from left to right when facing the rear wall.



## CAUTION

### MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE

Over-tightening bolts will cause damage to the ladder and render it unusable and unsafe. The nylon-lock nuts allow the bolt to be assembled to hold parts in place without being tightened to the required application torque. When instructed, all bolt and nut assemblies should be tighten to the specified torque without exceeding the specified torque values.

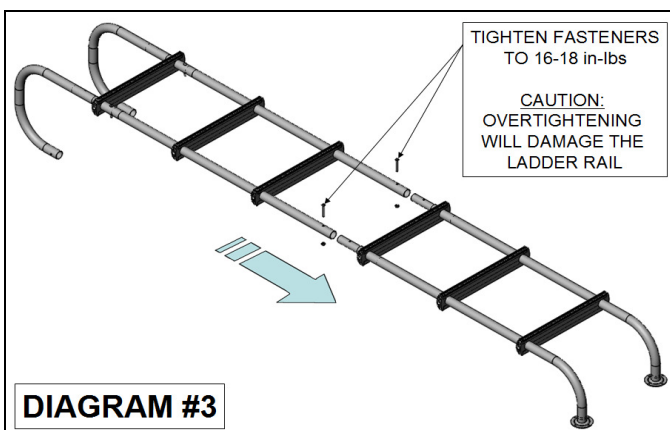


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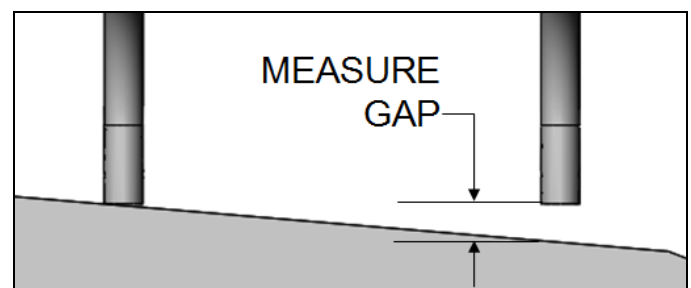
### MAY CAUSE PERSONAL INJURY OR DEATH

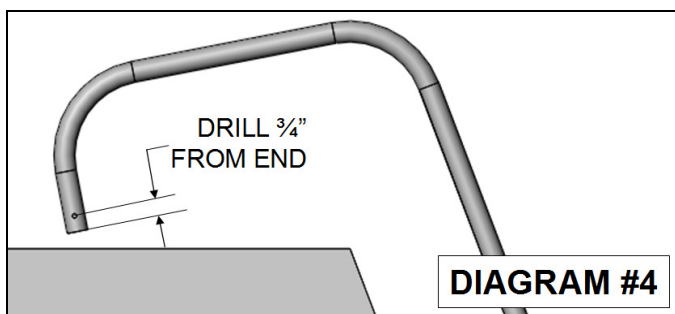
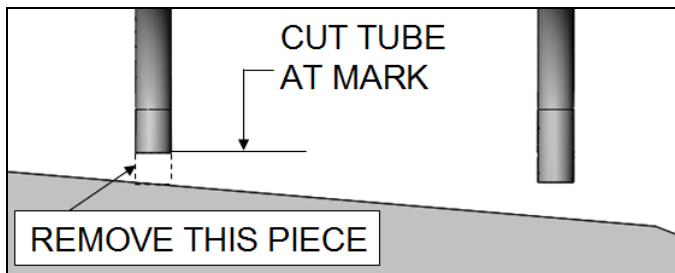
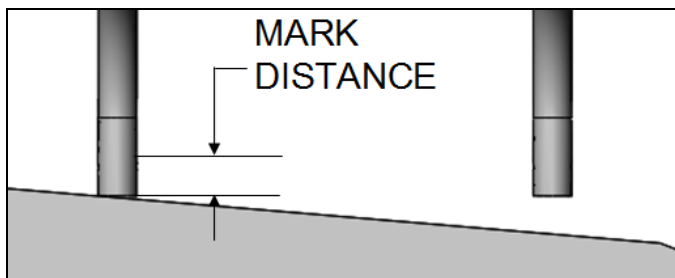
Mounting your ladder will involve heights that will require most individuals to be elevated off of the ground, especially for roof access. Make sure that any structure you use for climbing is secure and that you can safely maneuver up and down the various positions safely before attempting this installation.

2. Slide the upper ladder assembly over the smaller-diameter inserts of the lower ladder section. Pre-drilled holes should line up in both sections. If holes are not present, drill a 13/64" hole through the each upper ladder assembly section rail and inner tube insert approximately 1-1/2" from the upper ladder assembly rail end. Place a #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon lock insert. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #3). Be careful not to over-tighten the bolt or tube may be crushed.

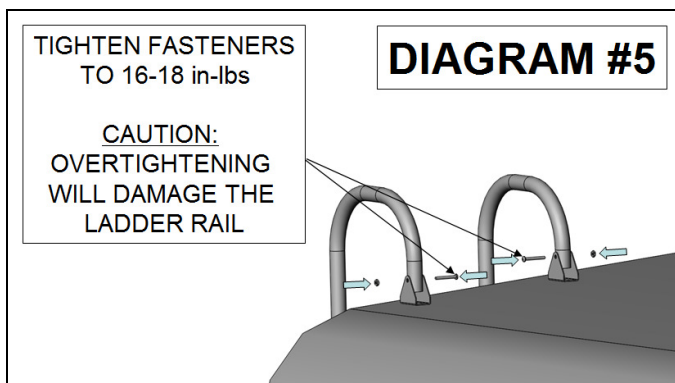


4. Check the ends of the handles setting on the roof. If the roof is flat, the handle ends should lay flat against the roof and no modifications will need to be done. If one end is resting on the roof and one end is raised above the roof, then the roof more than likely has a radius or angle built into it and the handle ends will need to be modified. Measure the gap between the end of the raised handle portion and the roof. Mark the measured gap distance onto the handle portion that is resting on the roof. Using a hacksaw or tube cutter, remove the end of the resting handle portion at the mark and check the fit. Both handles should now be resting on the roof and the ladder should be vertical from left to right. Drill a 13/64" hole through the side of each handle section 3/4" from the end (see Diagram #4). To clarify orientation, the triangular mounting bracket is intended to allow the ladder to swivel away from the rear wall of the vehicle once attached and mounted.





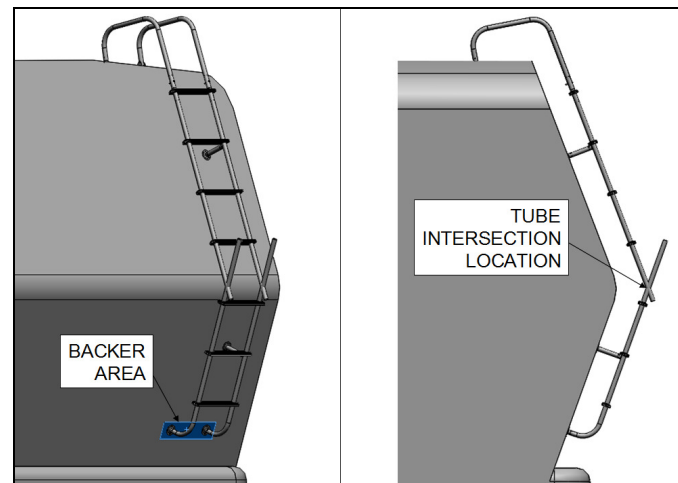
5. Align the holes of a triangular mounting bracket with the holes on a respective handle section. Place a #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon lock insert. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #5). Be careful not to over-tighten the bolt or tube may be crushed. Repeat with the other handle section.



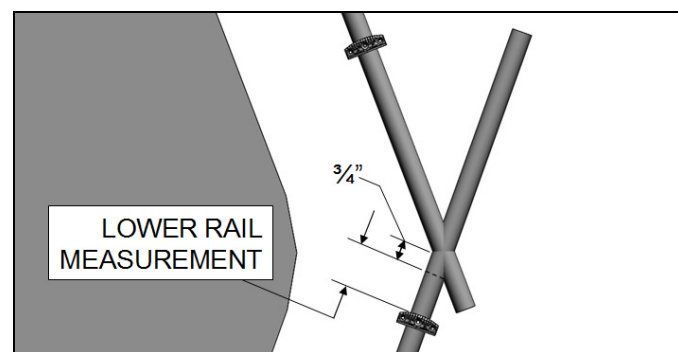
6. The ladder as packaged is designed with lower mount pads that are intended to mount to the rear wall below the rear wall bend line. With the ladder handles resting on the roof, it can be determined if the ladder will need to be modified to align with any backer location(s).

If there is an intended backer location that the ladder must be shortened in order to align to, place the lower portion of the ladder on the lower portion of the rear wall and align the pads with the backer area. Now adjust the

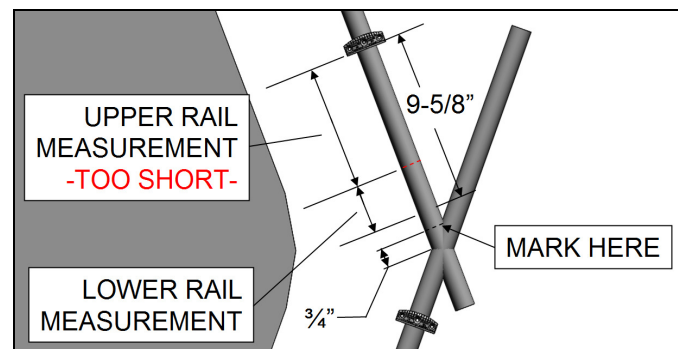
angle of the lower ladder portion to be as near parallel to the lower rear wall as possible. Place a loose standoff assembly between the rear wall and the lower ladder section to maintain proper spacing from the rear wall. When viewed from the side, the upper ladder rails should intersect the lower ladder rails.



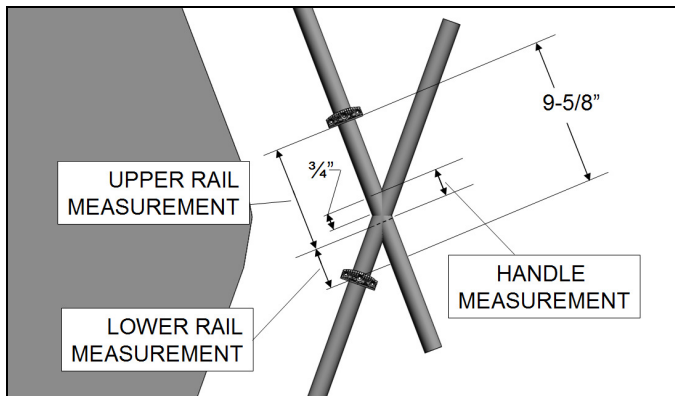
Measure the distance from the top of the top step on the lower ladder portion to a point  $\frac{3}{4}$ " below where the tubes intersect. Mark the lower rails at this location. This is the lower rail measurement.



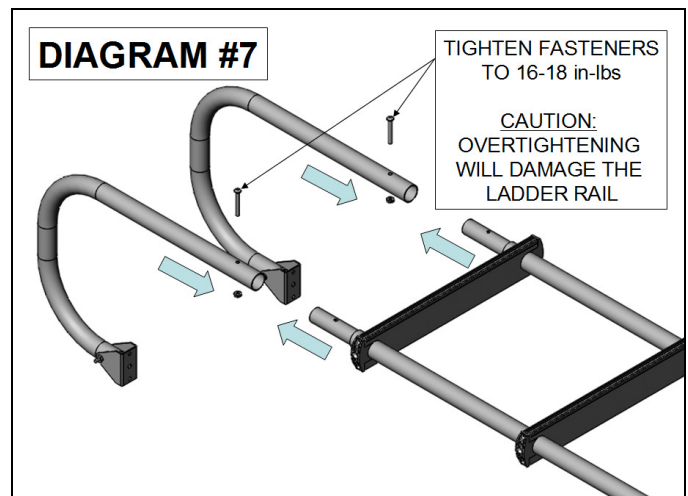
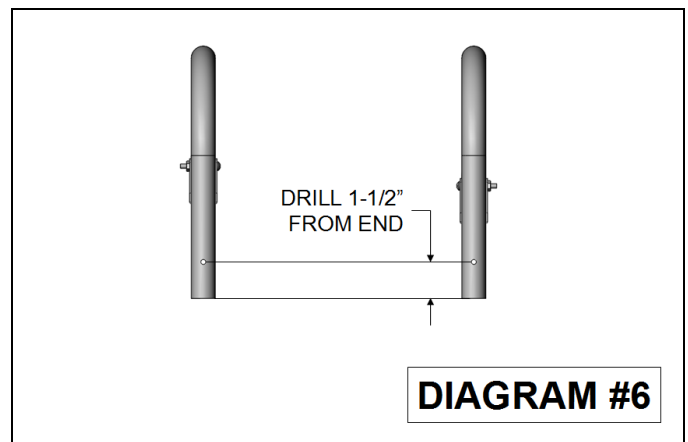
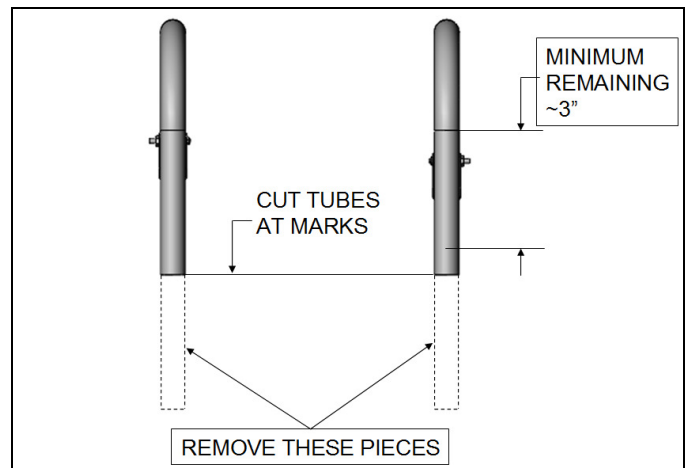
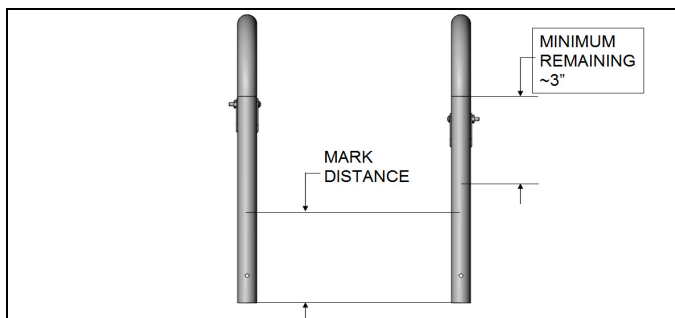
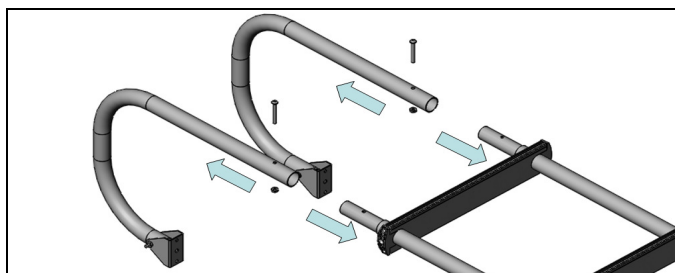
Subtract the lower rail measurement from 9-5/8". The difference is the upper rail measurement. Identify the upper ladder step that is just above the tube intersection location. Mark the upper rail measurement distance from the bottom of this step on onto the upper rail. If the mark ends up at or above the tube intersection location, that mark is too short and should be disregarded. A new mark should be made  $\frac{3}{4}$ " above the tube intersection location.



If the mark ends up below the tube intersection location, then the handles will need to be modified. To determine the handle measurement, measure the distance from bottom of the upper rail step to the tube intersection location. Subtract this distance from the upper rail measurement, and then add  $\frac{3}{4}$ " to the difference. This is the handle measurement.

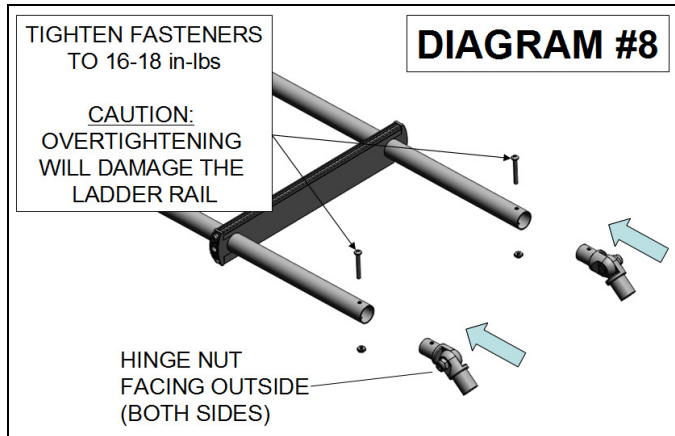


Once the handle measurement has been determined, remove the ladder from the roof and disassemble both the handle portions from the upper ladder assembly by removing the #10-24x1-1/2" bolt and #10-24 nut with nylon-lock insert. Mark the measured distance on the handle portion from the end that the upper ladder assembly inserts into. Using a hacksaw or tube cutter, remove the end of the handle portion at the mark. Slide the handle sections over the smaller-diameter inserts of the upper ladder section. Turn the handles until they are perpendicular to the ladder section and drill a  $\frac{13}{64}$ " hole through each handle and inner tube insert approximately 1-1/2" from the handle insert end (see Diagram #6). Replace the #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon-lock insert. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #7). Be careful not to over-tighten the bolt or tube may be crushed.

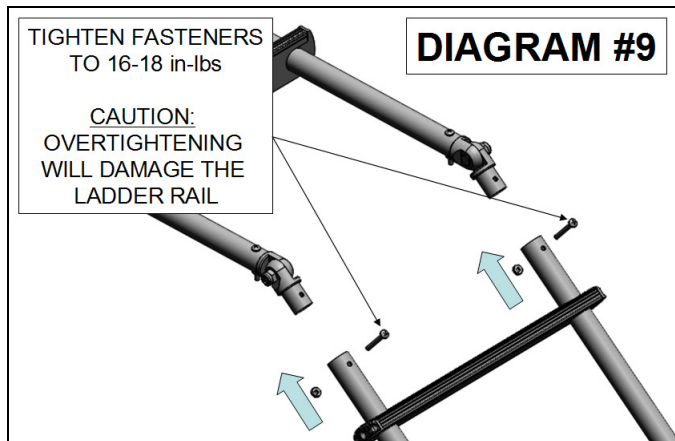


Using a hacksaw or tube cutter, remove the ends of the upper ladder section at the mark on each rail. Insert the bolt-leaf end of a die cast hinge into one rail of the upper ladder section. Turn the hinge until the hinge-nut surface is facing outside (away from the other upper ladder section rail) and drill a  $\frac{13}{64}$ " hole through the rail and hinge end approximately 1/2" from the rail end (it may be easier to pre-drill a starter hole through the rail before inserting and drilling the hinge.) Place a #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon-lock insert. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #8). Be careful not to over-tighten the bolt or tube may be

crushed. Repeat procedure for other upper ladder section rail.

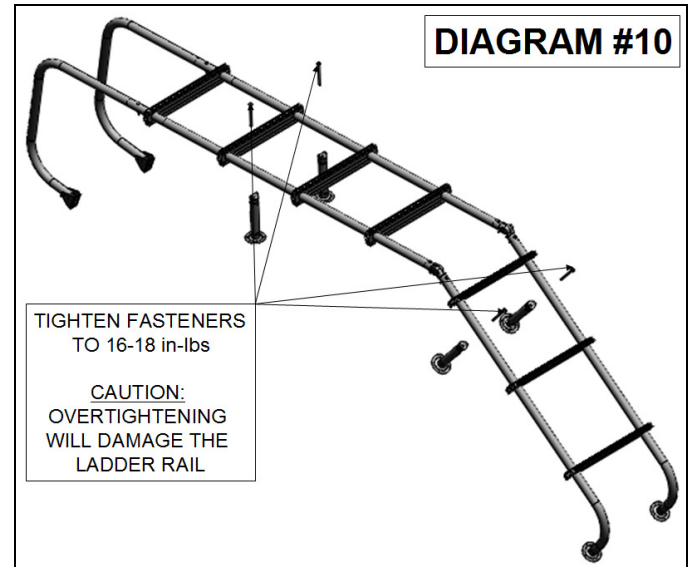


Using a hacksaw or tube cutter, remove the ends of the lower ladder section at the mark on each rail. Insert the respective nut-leaf ends of the die cast hinges installed on the upper ladder section into each rail of the lower ladder section. Drill a 13/64" hole through the rail and hinge end approximately 1/2" from the rail end (it may be easier to pre-drill a starter hole through the rail before inserting and drilling the hinge.) Place a #10-24x1-1/2" bolt through each set of holes and fasten each with a #10-24 nut with nylon-lock insert. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #9). Be careful not to over-tighten the bolt or tube may be crushed. Repeat procedure for other upper ladder section rail. Do not tighten the hinge bolt at this time. The hinge must be able to flex while being mounted to prevent binding in the ladder.



The ladder is provided with (4) standoff tube assemblies that are to be located along the ladder rail and aligned with the vehicle's intended backer locations. In most cases, the standoffs will be located evenly spaced from the roof line to the ladder bottom or in the immediate vicinity above and below a rear window. The standoffs should be installed in pairs which align horizontally on each respective ladder rail. Once locations have been determined, drill 17/64" hole through the center of each rail. Place a standoff between the ladder rail and the vehicle's rear wall, and then align the hole in the standoff with the drilled hole in the rail. Place a #1/4-20x3" round-

head machine screw through the hole on the other side of the rail and thread it into the inserted nut located inside the end of the standoff tube. Tighten the bolt to 16-18 in-lbs until snug to surface (see Diagram #10). Be careful not to over-tighten the bolt or tube may be crushed. Repeat for each standoff assembly until all are attached to the ladder. Set the ladder back into position with its handles resting on the roof.



### How to mount the ladder to your RV...

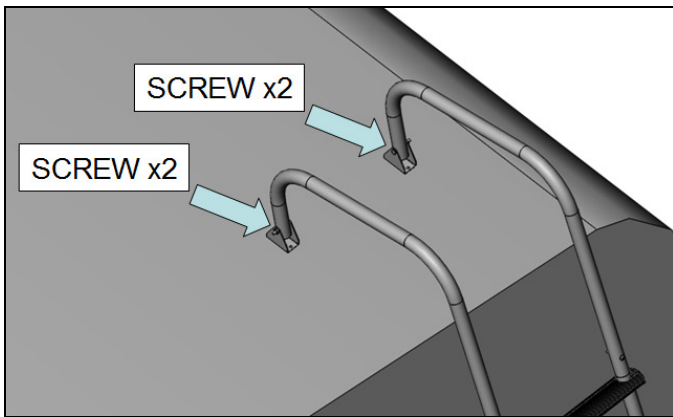
Begin mounting the ladder by starting at the top and working your way down.

**WARNING**

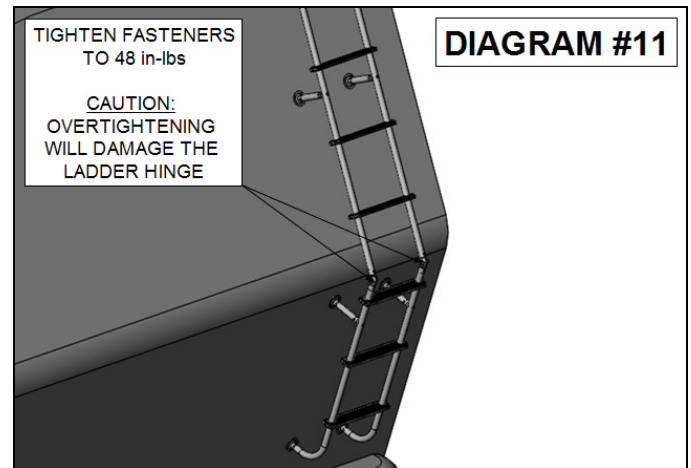
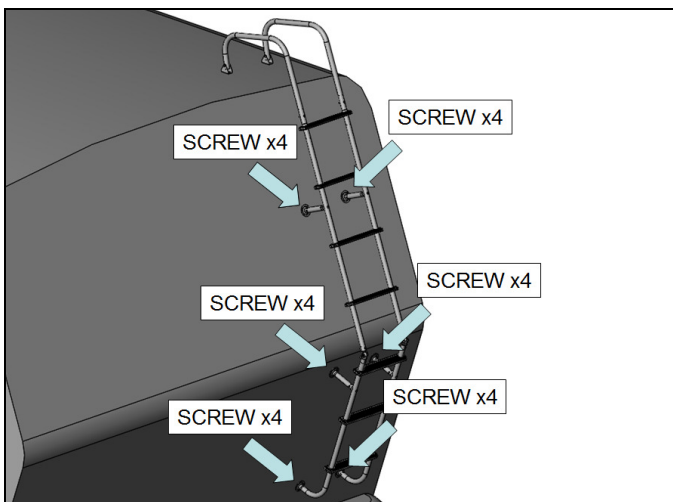
**MAY CAUSE PERSONAL INJURY OR DEATH**

Proper fastener specification is based on the framing or backer material provided in the RV's sub-structure. Refer to your RV dealer, local installer or vehicle manufacturer for recommended fastener specification, size, and type suitable for this type of installation

Place a screw into both mounting holes in each respective triangular mounting bracket and secure to the roof. Depending on the tools used, all of the mount holes may not be accessible. Securing the brackets may require you to swivel the ladder or separate the ladder from the brackets in order to access the mount holes. First secure the bracket with a screw through the accessible mounting hole. If ladder cannot be positioned to access the second mount hole, then remove the bolt holding the ladder to each bracket, remove the ladder and then place a screw through each bracket's second mounting hole. Replace the ladder into the brackets with the respective removed bolt-and-nut assembly.



Working down the back wall, secure the upper pair of standoffs and then secure the lower pair of standoffs to the rear wall. Once all standoffs are secured, secure the base pads of the ladder to the rear wall.



## OPERATION



### CAUTION

#### **MAY CAUSE PERSONAL INJURY OR PROPERTY DAMAGE**

For comfort as well as safety, hands should be completely dry and footwear should have solid bottoms to provide better grip and support when climbing a ladder. Bare feet, soft sandals or "flip-flops" are not recommended.



### WARNING

#### **MAY CAUSE PERSONAL INJURY OR DEATH**

Failure to properly secure the Universal Hinged Ladder to the vehicle may cause damage or injury. Always verify that the Universal Hinged Ladder is securely fastened to the vehicle when installed for use on the vehicle.

Now that the ladder is secured to the RV, tighten each hinge bolt to 48 in-lbs to restrict movement in the hinge and hold the ladder in its current position (see Diagram #11).

When climbing onto the Universal Hinged Ladder, grab onto the rungs of the ladder using a hand-over-hand method. Always keep a firm grip on the ladder as you ascend and descend, only releasing one hand before reaching and grabbing the next location. While ascending and descending the Universal Hinged Ladder and/or vehicle ladder, always make sure feet are planted firmly on the occupied step before advancing to the next step.



### WARNING

#### **MAY CAUSE PERSONAL INJURY OR DEATH**

The Universal Hinged Ladder is intended to be used within the specified limits to securely access the RV roof. Consider all applied forces including the weight of the operator, the weight of any additional load the operator may be handling and any other weight that may be applied to the ladder. The Universal Hinged Ladder is not designed to withstand excessive force in any direction.

## **MAINTENANCE**

The Universal Hinged Ladder is made from durable materials and is intended for outdoor use. However, minor maintenance may be required periodically.

The Universal Hinged Ladder may be cleaned with warm soapy water. Be sure to thoroughly rinse with clean water to retain finish. May be towel or air-dried.

Check to make sure all fasteners are tight before and after each use, and replace any missing fasteners before use. Do not use Universal Hinged Ladder if any fasteners are damaged, broken or missing.

Periodically inspect the Universal Hinged Ladder tubing and components for any damage, cracks or broken pieces. Replace the Universal Hinged Ladder if damaged, cracked or broken. Do not use Universal Hinged Ladder if any components are damaged, broken or missing.

The Universal Hinged Ladder is intended to be a permanent fixture. When vehicle is in storage or parked for extended periods, the Universal Hinged Ladder should be covered as minimizing the Universal Hinged Ladder components' exposure to the elements or other hazards will prolong the life of the Universal Hinged Ladder and its components.

## **ATWOOD MOBILE PRODUCTS LLC LIMITED WARRANTY**

Atwood Mobile Products LLC warrants to the original retail customer of products manufactured by Atwood Mobile Products LLC and subject to the below mentioned conditions, that this product will be free of defects in material and workmanship for the below specified period of time from the original date of purchase or manufacture. For the remainder of this document Atwood Mobile Products LLC will be referred to as Atwood. Atwood's liability hereunder is limited to the replacement of the product, repair of the product, or replacement of the product with a reconditioned product at the discretion of the manufacturer. This warranty is not transferable and is intended for original purchaser only. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, tampering, or other causes not arising from defects in material or workmanship. The warranty extends to the original owner of the product and is subject to the following conditions.

- 1) Atwood will repair or replace any part defective in material or workmanship, after inspection by Atwood. This warranty includes labor charges per Atwood's Flat Rate Schedule as required to remove and replace the part. Service calls to customer's location and diagnostic time are not considered part of these charges and, therefore may be the responsibility of the owner.
- 2) In the event of a warranty claim, service may be performed at any approved OEM dealer location
- 3) Parts being replaced must be shipped to Atwood "Prepaid" in first class saleable condition and identified with a return goods number, unless other arrangements have been made. Credit for shipping costs will be included with the warranty claim. The defective parts become the property of Atwood and must be returned to Atwood.
- 4) Returned goods – Goods may not be returned without our consent. Requests for returns should be made within 10 days from receipt of our invoice. If the parts being returned are not defective, Atwood reserves the right to apply a 20% restocking fee. We cannot accept material which has been custom fabricated or modified from its original design.
- 5) This warranty applies only if the product is installed, repaired, maintained and operated according to the installation/service instructions. Any deviations from these recommended specifications must be approved in writing by Atwood.
- 6) The warranty period on replacement parts is the unused portion of the original warranty period.
- 7) Damage or failure resulting from misuse (including failure to seek proper repair service), misapplication or alterations is the owner's responsibility.
- 8) Atwood does not assume responsibility for any loss of use, loss of time, inconvenience, expense for gasoline, telephone, travel lodging, loss or damage to personal property, or revenues. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.
- 9) Any implied warranties are limited to the product's warranty period. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.
- 10) Replacement parts purchased outside of the original warranty carry a 90-day warranty.
- 11) Any action to enforce this warranty shall not be commenced more than 3 months after the expiration of this warranty.
- 12) THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR PURPOSE.

Product Specifications for products listed below are designed for use for their specific application. Any other use, unless authorized in writing by the Atwood Engineering Department, voids this warranty. Original date of purchase of unit refers to the date the consumer purchases the vehicle from a dealer. Date of manufacture refers to the date the item was produced by Atwood Mobile Products.

**Ladders** – Two (2) year from original date of purchase of unit.

- 1) This limited warranty is valid only when the product is applied, installed, maintained and operated in accordance with this Atwood Installation, Maintenance and Operating Manual. Any deviation from these recommended specifications must be approved in writing by Atwood.
- 2) Any implied warranties are limited to the duration of this limited warranty as stated above. Atwood does not assume responsibility for consequential damage or loss, including loss of vehicle, loss of time, inconvenience, expense for gasoline, telephone, travel, lodging, loss or damage to personal properties, or loss of revenues. Atwood's maximum liability shall not exceed the cost of the goods. Some states do not allow limitations on how long an implied warranty lasts or limitations on consequential damages, so the above limitations may not apply to you. This limited warranty gives you specific legal rights which may vary from state to state.