

INSTRUCTION MANUAL

FOR

**TC10-S PORTABLE
TRUCK AND RAIL ACCESS
FALL PROTECTION PLATFORM
WITH SIDE-MOUNTED CART**

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1) READ THIS FIRST

a) GENERAL

- i) This Installation, Operation, and Maintenance manual is considered an integral part of the Carbis equipment to which it applies. It is the Owner's responsibility to ensure that personnel who operate and maintain the Carbis equipment receive comprehensive training in the operation and maintenance of the equipment, including adjustments where required. Operating and Maintenance personnel must also be familiar with the basic characteristics of the equipment so as to avert errors that might result in equipment damage or personnel injury. It is also the Owner's responsibility to ensure that maintenance activities are appropriately documented, including any abnormal operating condition and its associated root cause evaluation, followed by corrective actions implemented to eliminate recurrence.
- ii) Aging of equipment and associated service life-limiting variables, such as corrosion, fatigue, wear, etc., must be remedied during maintenance periods to preclude operational failure.
- iii) While this manual provides guidance to operating personnel in the matter of safe operation and recommended practices, it is not, and cannot be, a substitute for well-trained operations personnel. For a successful and trouble-free operation, great reliance must be placed upon the knowledge, background, and experience of the operating personnel, with this manual serving as a guide. The warranty on the equipment is automatically voided if the information contained in this manual is disregarded, whether inadvertently or willfully.

2) INTRODUCTION

This product has been inspected and meets Carbis' Quality Control Standards. It is important that the information contained in this manual be reviewed before operating the unit, including the following:

- a) Inspect equipment upon delivery for shipping damage or loose bolts. All fastening hardware that has been factory installed has been done so to remain tight. If any fastening hardware, whether factory or field installed, has been loosened, it must be tightened before using the product.
- b) It is imperative that operating and maintenance personnel become familiar with the safety information contained in section **3) IMPORTANT SAFETY INFORMATION**.
- c) Check that all safety placards, signs, and decals are clearly visible, legible, and in good repair. Operating personnel must be familiar with the contents of such placards, signs, and decals.
- d) **NOTICE** **AVOID PROBLEMS WITH STAINLESS STEEL BOLTS.** Keep bolts and nuts free of grime and other contaminants that may get into threads. Lubricate stainless steel bolts and nuts prior to tightening. Avoid the use of impact speed wrenches. If one is used, a slower speed will allow heat to dissipate as the connection is tightened.

3) IMPORTANT SAFETY INFORMATION

a) GENERAL

This section is a compilation of all of the various hazards and safety messages relative to the equipment described herein and as depicted on the drawings. Some are duplicates of safety messages used in various sections throughout this manual, while others appear only the one time in this section. The hazards shown in this section are listed in order of greatest to least risk as DANGER, WARNING, CAUTION, and NOTICE, identified as follows:

- i) **DANGER:** Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
- ii) **WARNING:** Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
- iii) **CAUTION:** Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
- iv) **NOTICE:** Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

b) HAZARDS

Following are the safety messages grouped by hazard as used throughout this manual:

i)  **DANGER**

- (1) This equipment CAN conduct electricity.
 - (a) Any grounding that may be required is to be performed per the owner's safety code.
 - (b) Do NOT allow this unit to come in contact with live electrical wires.
 - (c) Do NOT handle live electrical wires while standing on or in contact with this unit.

Failure to comply with these warnings WILL result in serious injury or death.

ii)  **WARNING**

- (1) Correct vehicle positioning and proper deployment of Carbis equipment are imperative to its function. Incorrectly positioned vehicles, or improper use of this equipment, increase the risk of serious injury or death. Carbis equipment is designed to function only as described in the manual and depicted on the drawings. **IT IS THE SOLE RESPONSIBILITY OF THE OWNER TO ENSURE PROPER USE OF CARBIS EQUIPMENT.**
- (2) Before accessing Carbis equipment, a vehicle must be in the correctly spotted position and the Carbis equipment properly deployed, supported, and secured.

- (3) The TC10-S is only self-supporting when the locking pins are fully engaged; otherwise, the unit **MUST** rest on a vehicle. **NOTE:** Without the addition of any optional enclosure, the locking pins **MUST** support the unit.
- (4) Personnel must not access Carbis equipment during any controlled operation.
- (5) Nonessential personnel must stay clear of Carbis equipment during any controlled operation.
- (6) Operator must be certain that nonessential personnel are clear of Carbis equipment during any controlled operation.
- (7) Operator must not place Carbis equipment in motion while occupying the same equipment.
- (8) Carbis equipment must never be forced, by any means, to overcome any seen or unseen obstacle or obstruction.
- (9) If the equipment will not function as intended, discontinue use and contact Maintenance immediately.
- (10) Never make repairs of damaged or missing parts. Replace missing parts only with approved equal parts.
- (11) Material being loaded onto/into vehicles or unloaded from vehicles may present a health hazard. It is the sole responsibility of the owner to ensure that operating personnel are familiar with any hazards associated with the material, and to implement the appropriate safety measures to protect personnel against such hazards.

Failure to comply with these warnings COULD result in serious injury or death.

iii)



- (1) Read this manual carefully before unpacking or installing Carbis equipment.
- (2) Only qualified personnel in good physical condition, trained in the proper operation of this equipment, should be permitted to operate it.
- (3) Appropriate Personnel Protective Equipment (PPE), such as gloves, safety glasses, safety shoes, etc., should be worn at all times during operation of this equipment.
- (4) For operator safety, equipment should be stored and not used if wind speed exceeds Carbis' recommended safe working wind speed limit of 35 mph.

Failure to comply with these cautions COULD result in personnel injury or damage to equipment.

iv)

NOTICE

- (1) Make certain that the ladder is in the lowest stored position and that the leveling jacks are in the horizontal stored position whenever the unit is being transported.

4) PRODUCT DESCRIPTION:
HAND WINCH OPERATED SIDE-MOUNTED TC10-S CART

a) GENERAL

- i) The TC10-S tank car and rail car access system is a versatile, universal, hand winch operated, side-mounted cart and ladder system for safely accessing the tops of a variety of truck and rail car vehicles, and includes optional enclosures such as cages, platforms, and knock down handrails for fall protection as reflected by the following drawings (refer to specific drawing or system that applies):
 - (1) TC10-S: Ladder Platform on Rail Car - Side Mounted
 - (2) TC10-RC-S: Ladder Platform and Rail Car Cage on Rail Car – Side Mounted
 - (3) TC10-HC-S: Ladder Platform and Knock Down ISO Platform on Hopper Car – Side Mounted
 - (4) TC10-TR-S: Ladder Platform and Knock Down ISO Platform on Tank Truck – Side Mounted
 - (5) TC10-ISO-S: Ladder Platform and Knock Down ISO Platform on ISO Truck – Side Mounted
 - (6) TC10-HT-S: Ladder Platform and Knock Down ISO Platform with Rotating Panel on Hopper Truck – Side Mounted
 - (7) Ladder Platform and Knock Down ISO Platform with Flip-Up Panels – Side Mounted
 - (8) For any TC10-S that has been modified, or that includes the addition of ancillary components not otherwise identified above, see project-specific drawings that reflect the modification or addition.
- ii) The TC10-S requires assembly before use. See section **5) ASSEMBLY** for instructions.
- iii) The TC10-S design load capacity is 500 lbs. When used as a stand-alone unit without the addition of any optional enclosure, fully engaged locking pins must support the monolithic ladder fly section and ladder platform. With the addition of any optional enclosure, the system can be supported by a vehicle or by the locking pins.
- iv) While more than one person may access the vehicle, only one person at a time is permitted access to the ladder sections and ladder platform.
- v) The TC10-S working range height from grade level to the underside of the platform is from a minimum of 9'-10" to a maximum of 16'-6".

b) MECHANICAL EQUIPMENT

Features of the TC10-S cart are as follows:

- (1) The basic cart consists of a galvanized steel base and a telescoping aluminum ladder fly section with handrails on the sides and a ladder platform at the top.
- (2) The side-mounted base incorporates an aluminum fixed ladder bolted to a frame support cart, a set of foam-filled pneumatic tires on one side, and on the opposite side are dual foam-filled pneumatic tires that are integral with a tow bar/steering mechanism.
- (3) Leveling jacks are mounted on the rear and front outrigger bars of the steel base.
- (4) Steel counterweight bars are fixed to the front counterweight frame.
- (5) All walk surfaces are slip-resistant.

- (6) The uprights of the top ladder platform incorporate bolt holes for mounting the following optional aluminum safety enclosures:
 - (a) Rail car cage
 - (b) Truck and rail car knock down ISO platform and handrail system that includes a partial walk surface at the ladder platform, with the remaining area within the handrails open
 - (c) Truck knock down ISO platform and handrail system that includes a partial walk surface at the ladder platform and an optional rotating platform on the outboard handrail
 - (d) Truck knock down ISO platform and handrail system that includes flip-up panels
- (7) Wire rope attached to the inside bottom of the telescoping ladder, and running over pulleys on the cart frame, is attached to a hand winch mounted on the frame support. The hand winch is the source of power for raising and lowering the telescoping ladder platform.
- (8) Pinholes located on 6" centers along the fixed ladder rails each side are for pinning the telescoping ladder platform which makes the unit self-supporting.
- (9) For any TC10-S that includes forklift tubes on the underside of the cart base, the forklift tubes are included to provide optional transport within the same site by forklift from spot to spot or to/from storage.
- (10) The knock down design of the ladder section and optional platform and handrail sections provide easier shipping/transport from site to site.

5) ASSEMBLY

SEE DRAWINGS IN SECTION 9) ADDENDA

a) GENERAL

- i) Carbis must approve any alterations required to this system.
- ii) It is the Owner's responsibility to:
 - (1) Ensure that their existing area supports new Carbis equipment
 - (2) Identify to Carbis any conditions or obstructions that may interfere with the location or proper operation of Carbis equipment
 - (3) Remove or relocate any obstructions in preparation for use of the new Carbis equipment

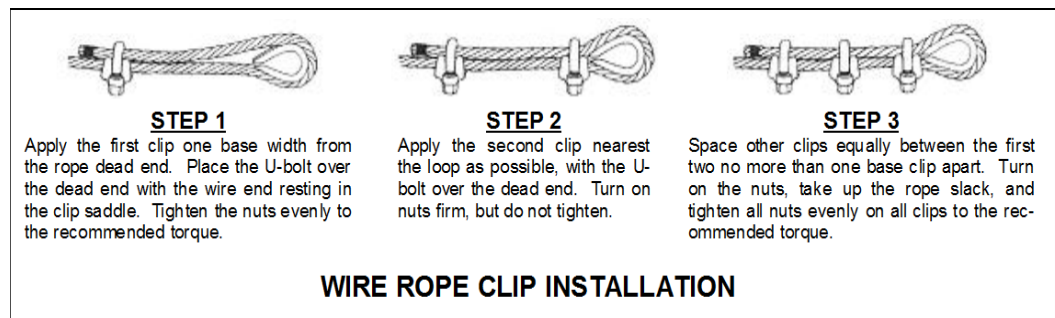
b) INSPECTION AND OFF-LOADING

- i) Care has been taken to package Carbis equipment and components in the best manner possible for safe shipping and practical off-loading purposes.
- ii) It is the owner's responsibility to inspect the shipment for completeness by comparing the shipment with the parts identified in the Parts Lists, including the items identified in the Hardware and Component Lists. Check for any shipping damages or missing components, and report the same to Carbis.
- iii) It is also the owner's responsibility to provide the appropriate off-loading devices to safely and effectively rig and handle the Carbis equipment and components during the off-loading process, paying particular attention to eccentric loading conditions such as counterweighted components, including those whose eccentric loads are visually apparent.
- iv) Some components may ship pre-assembled.

c) ASSEMBLY

- i) **REQUIRED BOLT TENSIONING FOR STRUCTURAL CONNECTIONS**
 - (1) **A325 Bolts - Snug Tight Condition**
 - (a) The snug tight condition is defined as the tightness that exists when all plies in a joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. Carbis' standard bolt installation is snug tight in a bearing type connection. Different requirements will be specifically detailed on the drawings.
 - (b) Any bolts less than 1/2" diameter, torque to 60 in.-lbs.

- (2) Stainless Hardware - Snug Tight Condition
- (a) The snug tight condition is defined as the tightness that exists when all plies in a joint are in firm contact. This may be attained by the full effort of a man using an ordinary spud wrench. Carbis' standard bolt installation is snug tight in a bearing type connection. Different requirements will be specifically detailed on the drawings.
 - (b) Keep bolts and nuts free of grime and other contaminants that may get into threads. Lubricate stainless steel bolts and nuts prior to tightening.
 - (c) Any bolts less than 1/2" diameter, torque to 60 in.-lbs.
- ii) A qualified erector should perform the assembly and installation of the Carbis equipment in conformity with industry standards and local building code requirements, and in accordance with the most recent industry practices for safe rigging. The procedures outlined in this section describe safe and practical sequences. Any deviation preferred by the erector/rigger must be in conformance with the above-referenced standards, codes, and practices. See drawings in section 9) **ADDENDA** for Carbis-supplied components and hardware lists. **NOTE:** Some parts may be pre-assembled.
- iii) Unless noted otherwise, use Carbis-supplied hardware to assemble the components listed in the Parts Lists per the following sequence:
- (1) Where applicable, assemble the ISO knock down platform and handrail system, including the rotating panel or flip-up panels as required.
 - (2) Where applicable, assemble the platform or cage to the top of the telescoping ladder.
 - (3) Where applicable, assemble any modified or additional ancillary component.
 - (4) Assemble the aluminum handrails to the telescoping ladder platform.
 - (5) Assemble the aluminum fixed ladder to the front of the steel base.
 - (6) Assemble screw jacks to the ends of each steel outrigger bar.
 - (7) Run the wire rope from the hand winch up over the two block pulleys on the steel base down between the steel base and the extension ladder. Loop the thimble through the hole in the bracket mounted on the inside of the bottom step of the telescoping ladder.
 - (8) Install wire rope clips per the following steps:



6) OPERATION

a) GENERAL

- i) Verify that all safety placards, signs, and decals are clearly visible, legible, and in good repair. Operating personnel must be familiar with the contents of such placards, signs, and decals.

b) PRE-OPERATIONAL SAFETY INFORMATION

Following are the pre-operational safety messages grouped by hazard:

i) **DANGER**

- (1) This equipment CAN conduct electricity.
 - (a) Any grounding that may be required is to be performed per the owner's safety code.
 - (b) Do NOT allow this unit to come in contact with live electrical wires.
 - (c) Do NOT handle live electrical wires while standing on or in contact with this unit.

Failure to comply with these warnings WILL result in serious injury or death.

ii) **WARNING**

- (1) Correct vehicle positioning and proper deployment of Carbis equipment are imperative to its function. Incorrectly positioned vehicles, or improper use of this equipment, increase the risk of serious injury or death. Carbis equipment is designed to function only as described in the manual and depicted on the drawings. **IT IS THE SOLE RESPONSIBILITY OF THE OWNER TO ENSURE PROPER USE OF CARBIS EQUIPMENT.**
- (2) Before accessing Carbis equipment, a vehicle must be in the correctly spotted position and the Carbis equipment properly deployed, supported, and secured.
- (3) Personnel must not access Carbis equipment during any controlled operation.
- (4) Nonessential personnel must stay clear of Carbis equipment during any controlled operation.
- (5) Operator must be certain that nonessential personnel are clear of Carbis equipment during any controlled operation.
- (6) Operator must not place Carbis equipment in motion while occupying the same equipment.
- (7) Before operation, visually inspect the area between the equipment and the vehicle for any obstruction that would impede movement or create a tripping hazard. Remove any obstruction before operating the equipment.
- (8) Carbis equipment must never be forced, by any means, to overcome any seen or unseen obstacle or obstruction.
- (9) Visually inspect the equipment before each use. Never access damaged or broken components.
- (10) Do not overload the unit; the ladder is designed for one person.

- (11) The TC10-S is only self-supporting when the locking pins are fully engaged; otherwise, the unit **MUST** rest on a vehicle. **NOTE:** Without the addition of any optional enclosure, the locking pins **MUST** support the unit.
- (12) Material being loaded onto/into vehicles or unloaded from vehicles may present a health hazard. It is the sole responsibility of the owner to ensure that operating personnel are familiar with any hazards associated with the material, and to implement the appropriate safety measures to protect personnel against such hazards.

Failure to comply with these warnings COULD result in serious injury or death.

iii)  **CAUTION**

- (1) Only qualified personnel in good physical condition, trained in the proper operation of this equipment, should be permitted to operate it.
- (2) Appropriate Personnel Protective Equipment (PPE), such as gloves, safety glasses, safety shoes, etc., should be worn at all times during operation of this equipment.
- (3) Make certain that walk surfaces are free of product that would otherwise interfere with the safe, slip-resistant feature of the walk surface. The walking-working surfaces of every work area are to be kept in a clean and, so far as possible, dry condition.
- (4) Do not use this unit on slippery surfaces.
- (5) For operator safety, equipment should be stored and not used if wind speed exceeds Carbis' recommended safe working wind speed limit of 35 mph.



Failure to comply with these cautions COULD result in personnel injury or damage to equipment.

iv)  **NOTICE**

- (1) Make certain that the ladder is in the lowest stored position and that the leveling jacks are in the horizontal stored position whenever the unit is being transported.

c) **OPERATING SEQUENCE**

- (1) Remove wheel chocks (if used) or raise the leveling jacks that were used to store the unit.
- (2) With the ladder in the lowest stored position, move the unit into approximate position at the vehicle.
- (3) Using the hand winch, extend the ladder and platform full height to be certain the unit will clear any point on the vehicle.
- (4) Move the unit closer to the vehicle so that the ladder platform/enclosure is in the approximate desired area.
- (5) The following step options are determined by operational requirements, and they dictate whether or not the unit is self-supporting. If the unit does not include an optional enclosure, Step (a) must be followed:

- (a) Extend or retract the ladder as needed for optimum position with the ladder pinholes aligned. Make certain that no part of the unit is resting on any vehicle component subject to damage when a load is applied. Insert the locking pins, making certain they are fully engaged to ensure the unit is self-supporting, or:
 - (b) Lower the ladder/enclosure so that the protective bumpers on the underside of the system rest on the vehicle. Make certain that the bumpers or any part of the enclosure are not resting on any vehicle component subject to damage when a load is applied. As long as the locking pins are not engaged, the unit must rest on the vehicle, and it is not self-supporting.
- (6) Lock the leveling jacks in the vertical position, and extend them to disengage the wheels from the ground.
- (7)  If the unit is not self-supporting, the ladder and platform/enclosure will need to be lowered again to rest on the vehicle as noted in Step (5) (b).
- (8) Face the ladder when climbing up or down. Maintain center of gravity; i.e., belt buckle between ladder side rails.
- (9) Maintain a firm grip; use both hands when climbing.
- (10) For systems with flip-up panels, perform the following sub-steps:
 - (a) Enter the platform and ensure all flip-up panels are lying flat and securely resting on their supports, and that no tripping hazards are apparent. Adjust as needed.
 - (b) At this point, it is safe to access the vehicle. Lift only the flip-up panels required to perform the work. Make certain the flip-up panels are secure against the handrail.
 - (c) Before leaving the vehicle, ensure all flip-up panels are lowered and flush with the walk surface.
- (11) When finished with the work, remove any tools from the cage area, platform, or ladder stand.
- (12) Face the ladder to descend, maintain center of gravity, and firmly grip the ladder with both hands when climbing back down.
- (13) When finished with the unit, remove the locking pins (if used), and extend the ladder and platform full height to clear any point on the vehicle when the wheels engage the ground and the unit is moved away from the vehicle.
- (14) Retract the leveling jacks to engage the wheels with the ground, and rotate the jacks to the horizontal stored position.
- (15) Move the unit clear of the vehicle.
- (16) Lower the ladder to its lowest position for transport.
- (17) Steer the unit to its stored location. Chock the wheels or extend at least two jacks (front or back) to disengage the associated wheels from the ground to keep the unit immobile.
- (18) If the unit is to be towed, connect the tow bar to the towing vehicle, and do not exceed a tow speed of 5 mph.
- (19) For units with the optional forklift tubes, if the unit is to be transported using a forklift, make certain the unit is secure on the forklift tines.
- (20)  If the unit will not move when pushed or pulled, or if the ladder will not extend or retract when using the hand winch, or if any leveling jack will not function as needed, discontinue use and contact Maintenance immediately. Failure to follow instructions, or any attempt to dislodge obstructions, may result in severe injury or death.

7) MAINTENANCE

a) MECHANICAL SYSTEM

- (1) Before servicing the TC10-S, ensure that the equipment is properly “locked and tagged” per safety regulations.
- (2) Visually inspect the assemblies before each use. Replace any damaged parts. If component replacement requires any disassembly, refer to section 5) ASSEMBLY to restore the system to its operational status.
- (3) Monthly inspection of the assemblies is recommended as a minimum. Harsh atmosphere and/or heavy use may dictate more frequent inspection and maintenance.
- (4) Make certain that walk surfaces are free of product that would otherwise interfere with the safe, slip-resistant feature of the walk surface. The walking-working surfaces of every work area are to be kept in a clean and, so far as possible, dry condition. Frequency of cleaning is dictated by the frequency of product build-up on the walk surfaces.
- (5) All fastening hardware that has been factory installed has been done so to remain tight. If any fastening hardware, whether factory or field installed, has been loosened, it is imperative that it be tightened before using the equipment.
- (6) Check that all moving parts are properly functioning.
- (7) Keep assemblies clean and free from grease, oil, mud, snow, wet paint, and any other slippery material.
- (8) Never make repairs of damaged or missing parts. Replace missing parts only with approved equal parts.
- (9) Lubricate the wheel bearings with lithium-based grease. See section 9) ADDENDA for lubrication of winch.
- (10) Wire rope and associated components maintenance procedures:
 - (a) Refer to the hand winch manufacturer’s literature to let out the wire rope sufficient to slip the rope away from the sheaves for inspection.
 - (b) Never inspect a wire rope by passing bare hands over the rope body.
 - (c) Clean the rope with a cloth or wire brush to thoroughly inspect.
 - (d) Check the entire length of the wire rope, and replace if any distortion such as kinking, crushing, unstranding, birdcaging, main strand displacement, or core protrusion is found.
 - (e) Replace any end connection that is severely corroded, cracked, bent, worn, or broken per the following:



STEP 1

Apply the first clip one base width from the rope dead end. Place the U-bolt over the dead end with the wire end resting in the clip saddle. Tighten the nuts evenly to the recommended torque.



STEP 2

Apply the second clip nearest the loop as possible, with the U-bolt over the dead end. Turn on nuts firm, but do not tighten.



STEP 3


Space other clips equally between the first two no more than one base clip apart. Turn on the nuts, take up the rope slack, and tighten all nuts evenly on all clips to the recommended torque.

WIRE ROPE CLIP INSTALLATION

- (f) Repair or replace sheaves containing corrugated grooves, flat spots, or broken flanges.
- (g) Immediately lubricate wire rope after cleaning, using a cloth or sponge soaked with a lubricant that is free from acids and alkalis, has sufficient adhesion to remain on the rope, has a viscosity that will allow penetration between the wires and strands, has a high film strength, and has anti-corrosion additives.



Extreme care must be taken during hand lubrication due to the potential hazard to personnel.

- (h)  Per the hand winch manufacturer's maintenance caution, do not get oil or grease on the hand winch friction discs; this could allow the load to slip or fall.
 - (i) Slip wire rope back over the sheaves, and refer to the hand winch manufacturer's literature to pull in the cable.
- (11) See section **9) ADDENDA** for manufacturer's literature for maintenance requirements of components supplied by Carbis but not manufactured by Carbis.
 - (12) For any assistance, replacement parts, comments, or questions, please call Carbis' Customer Service Department at 1-800-845-2387. Please have your model number, serial number, or drawing number available to expedite your request.

8) EXTENDED INSPECTION ADDENDUM

The low maintenance nature of Carbis equipment means that it does not require any more stringent inspection than that noted in section **7) MAINTENANCE** of this instruction manual. However, at the request of some customers whose internal programs require annual inspections, the following extended inspection procedure can be performed during an annual inspection:

- (1) Remove all tires and leveling jacks.
- (2) Thoroughly clean all surfaces in preparation for visual inspections.
- (3) Although this note is in section **7) MAINTENANCE** of this manual, its importance bears repetition here: Make certain that walk surfaces are free of product that would otherwise interfere with the safe, slip-resistant feature of the walk surface. The walking-working surfaces of every work area are to be kept in a clean and, so far as possible, dry condition.
- (4) Check all welds on all surfaces of all components, including those ordinarily hidden from view, to be certain there are no weld cracks.
- (5) Thoroughly check all surfaces of all components, including those ordinarily hidden from view, for any signs of corrosion.
- (6) Check all bolted connections. First, make certain that none can be hand loosened; then check the connections again using a wrench to make certain they are securely snug.
- (7) Thoroughly check the foam-filled tires for excessive tread wear. Remove all debris caught in the treads. If any tire has been punctured, remove the object and externally repair the tire. Replace any tire whose condition is beyond repair or excessively worn.
- (8) Install tires and lubricate wheel bearings.
- (9) Check each leveling jack for corrosion, excessive wear, and ease of operation. Replace any leveling jack whose condition so warrants.
- (10) Install leveling jacks.
- (11) Check hand winch per manufacturer's recommendations noted in this instruction manual.
- (12) The wire rope maintenance procedures as described in section **7) MAINTENANCE** of this instruction manual can be performed as part of an annual inspection procedure.

9) ADDENDA