

APPENDIX E: SAFETY RAIL SYSTEM INSTALLATION INSTRUCTIONS



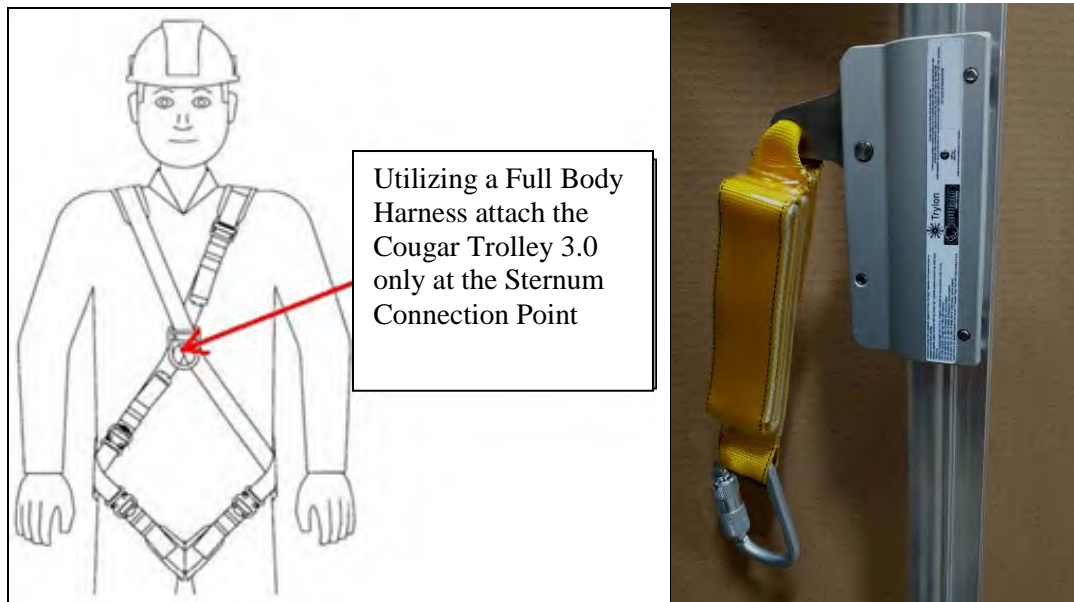
ISO 9001 Registered

USER INSTALLATION & INSTRUCTION MANUAL

Manual #4.957.0000.R05



Rail Fall Protection System Ladder and Titan Towers Installations



CSA Z259.2.4-15

Revision Date: October 26, 2016



Table of Contents	Page
1.0 Forward	3
2.0 General Warnings	4
3.0 Use and Limitations on Use-Climbing with the Cougar Safety Rail System	4
4.0 Training	6
5.0 Inspection of the Safety Rail System	6
6.0 Trolley to Rail Installation Steps	7
7.0 INSTRUCTIONS FOR DESCENDING WITH THE COUGAR TROLLEY 3.0	8
8.0 Care and Maintenance of the Cougar Trolley 3.0	9
9.0 Labels / Markings	10
10.0 Installation Instructions for Cougar Rail Systems	11
11.0 Installation Drawings for Cougar Ladder Rail Systems	12
12.0 Installation Drawings for Cougar Rail onto Titan Towers	13
13.0 Inspection and Maintenance Log	14
14.0 Warranty	15

SAFETY RAIL SYSTEM INSTRUCTIONS



WARNING

This manual is intended to be used as part of an employee fall-protection program including training and supervision in accordance with local regulatory authorities and the applicable voluntary standards of the Canadian Standards Association (CSA).

All persons using or installing this equipment must read, understand and follow all instructions before the installation or use of the system. Failure to do so may result in serious injury or death. DO NOT use this equipment unless you are properly trained.

1.0 FORWARD

These instructions describe the installation and the use of the Trylon TSF COUGAR Safety Rail System. They should be used as part of a fall protection employee training program as required by the regulations governing occupational safety as well as the applicable standards of CSA. It is the employer's responsibility to ensure that all users are trained in the proper use, inspection and maintenance of the Cougar Rail System.

IMPORTANT: If you have questions on the installation, application, use, or maintenance of this equipment, contact Trylon TSF. If additional instructions are required, supplemental clarification will be provided.

Before using this equipment, the product identification information shown on the installation and service labels should be recorded in the maintenance log in Section 13.0 of this manual. If the system includes a Trolley, record serial number in the maintenance log as well.

All safety rail systems and components are to be used under the safety standards in place in the jurisdiction in which you are working. These instructions are not meant to modify or supersede any local or federal safety standards.

These instructions must be provided to all users. Follow the manufacturer's instructions for safety equipment used with this system.



2.0 GENERAL WARNINGS

Follow these instructions for the proper use, inspection and maintenance of this safety equipment.

- 2.1 Failure to follow both the manufacturer's instructions and the safety standards in the jurisdiction may result in serious injury or death.
- 2.2 Alterations, substitutions or misuse of this product may result in serious injury or death.
- 2.3 **Any Trylon COUGAR TROLLEY 3.0 which has been used during a fall arrest incident should not be used afterwards and should be replaced.** As well, the section of the rail involved and all terminations needs to be replaced at once. Until a full replacement of the system is implemented you should not ascend or descend on a system that has been subjected to a fall.
- 2.4 All equipment must be inspected before each use according to the manufacturer's instructions. Do not use if any part of the System appears to be damaged.
- 2.5 Do not remove or deface any product labels or warnings.
- 2.6 To minimize the potential for accidental disengagement, a competent person must ensure system compatibility.
- 2.7 Use caution when installing the Cougar Safety Rail System. Wear personal protective equipment, including safety glasses and steel-toed shoes. Use personal fall arrest systems when exposed to a fall hazard. Use caution when installing Cougar Safety Rail Systems near power lines. Cougar rail is conductive. Do not connect to a partially installed System.
- 2.8 Climber connected to the Cougar Rail System must be engaged in ascending or descending a compatible fixed ladder in the approved manner, ie., with three points of contact on the ladder rungs and rails at all times. Climbing the structure off of the ladder while connected to the Cougar Rail System is not recommended and could result in serious injury or death in the event of an accidental fall.
- 2.9 Do not insert and/or wedge any foreign object into the Cougar Trolley 3.0; doing so, may cause the brake to malfunction.

3.0 USE AND LIMITATIONS ON USE – CLIMBING WITH THE COUGAR SAFETY RAIL SYSTEM

- 3.1 **Trylon's fall protection systems must NOT be used as a work positioning device or lifeline while working. Such a practice is strictly prohibited. The Cougar Rail System is only approved for fall protection while climbing. A back-up fall arrest system is required when transitioning on and off the Rail System at a height.**
- 3.2 The Cougar Rail System is provided as an integrated kit and may not be used for other applications in conjunction with other fall protection systems. CSA Certification is void if components are purchased or introduced outside of the kit.



- 3.3 The Cougar Rail System is designed with a maximum capacity of up to four (4) climbers connected to the rail at one time. Each user must be connected to the rail by a personal fall arrest system which includes a Cougar Trolley 3.0, compatible Karabiner and a suitable full body harness.
- 3.4 When multiple climbers are connected to the Cougar Rail System at the same time, each climber must maintain a distance vertically of at least 2.4 meter (8 feet) from nearest adjacent climber.
- 3.5 The Cougar Rail System is designed to be used in a vertical operating position. The system must be installed plumb ($\pm 3^\circ$) to ensure proper activation of the Trolley brake cam.
- 3.6 Workers should always tie off to an appropriate anchorage structure by means of a lanyard while working or resting, in accordance with the relevant safety standards. The anchor point for such a lanyard should be above the user to prevent a pendulum fall.
- 3.7 You are required to use this System with a properly certified full body harness (CSA Z259.10-12), with a frontal D-ring attachment at the sternum (chest) certified for ladder climbing.
- 3.8 Make sure that clothing, the harness itself and the length of any D-rings or connectors supplied with the harness do not impede the locking mechanism on the Rail Trolley.
- 3.9 When installing the Cougar Trolley 3.0 to the rail, ensure that the UP arrow engraved on the Trolley is pointing up the ladder. With the SafetyLock™ orientation lockout feature incorporated into the Trolley and functioning properly, you should not be able to install the Trolley upside down. **Never disable or otherwise modify the SafetyLock™ feature as this may lead to the installation of the Trolley upside down which may result in the Trolley failing to lock on to the rail in a fall thereby resulting in serious injury or death.**
- 3.10 The Cougar Trolley 3.0 is equipped with a certified non-removable karabiner. Do not use a second karabiner or any other devices such as a short lanyard, chain, link or clevis to connect with the Trolley.
- 3.11 Trylon's Safety Rail System (including the Cougar Trolley 3.0) is intended to arrest personnel (not material) should they (the individual) slip or fall while climbing a fixed ladder.
- 3.12 The Cougar Safety Rail System is designed to arrest the fall of up to four (4) climbers at a time while ascending or descending the ladder only. All other climbers must be tied-off appropriately.
- 3.13 Ensure the anchorage system can support a minimum load of 3,600 pounds. The design working load is 880 pounds (400 kg) **DO NOT EXCEED THIS WEIGHT.** Certification is applicable to the device only. Neither the manufacturer nor CSA has investigated the anchorage system. The Cougar Trolley 3.0 is designed to work on Trylon's Safety Rail Systems only.



- 3.14 When detaching from the trolley to work elsewhere on the structure, as a best practice, climbers should also tie off their trolley to avoid the unlikely event of the trolley ‘slipping’ down the rail during extreme vibrations.
- 3.15 When possible the Cougar Trolley 3.0 should be positioned above the user to prevent pendulum fall. Trolley is not suitable for use when the climber is positioned on unstable surface, fine grain material or particulate.
- 3.16 The Cougar Trolley 3.0 is designed to arrest within 300 mm for the Dynamic Strength Test as outlined by Clause 5.3.4 in CSA Z259.2.4-15 standard.
- 3.17 Cougar Rail is extruded from T6061T6 Billeted Aluminum.

4.0 TRAINING

- 4.1 Climbers should fully familiarize themselves with these instructions and the inspection, operation, maintenance and limitations of the system before ascending the tower. Training should be conducted periodically without exposing the trainee to a fall hazard.
- 4.2 All climbers should ensure that the correct certified (CSA Z259.10-12) body harness which includes a sternum connection point is properly fitted according to the manufacturer’s instructions and ensures that it does not interfere with arresting features of the fall protection system.
- 4.3 All instructions and warnings provided with the full body harness must be read and understood before using the fall protection system. A proper harness fit also helps ensure that the climbing action of the Trolley on the rail is smooth and reduces the potential to “snag”. Snagging is a nuisance to climbers, although not a safety hazard. A body belt is NOT approved or recommended for use with the Cougar Rail System. Climber MUST use a harness with a sternum connection point.
- 4.4 Make certain all applicable hazards are properly addressed to provide climber safety. Factors such as hazardous power lines, antenna radiation, physical obstructions, icing, frost and the climber’s knowledge, ability and health all determine the usage of this equipment.

5.0 INSPECTION OF THE SAFETY RAIL SYSTEM

- 5.1 The Safety Rail Trolley system is designed to function as an integrated system and the use of non-compatible materials or devices is strictly prohibited and may result in serious injury or death.
- 5.2 A visual inspection of the Cougar Trolley 3.0 is required before each use. Detailed inspections should be conducted on a regularly scheduled basis as determined by the user and in compliance with local and federal safety standards. There should be a minimum of two (2) detailed inspections per year by a competent person other than the climber. Inspect all components and fasteners of the trolley for bends, cracks and deformities. Operation of the fall



- arrest lever mechanism and the SafetyLock™ orientation lock-out device moves freely. Inspect the rail Trolley body for excess wear on the inside where the rail passes through. Inspect the compression spring and ensure it is in place. Ensure that all four rollers (wheels) are secure and not damaged or unduly worn. Refer to 5.7 for inspection details specific to the aluminum rail.
- 5.3 The Shock Absorber integrated into the Cougar Trolley 3.0 should also be visually inspected prior to each use. Webbing must be free from signs of cuts, punctures, abrasion, fraying, and excessive wear. Stitching must be secure and free of discolouration; in the event that there is dirt on the Trolley, or on the integrated shock absorber, it is necessary to clean the Trolley prior to visual inspection.
 - 5.4 Always check the Cougar Trolley 3.0 before ascending to ensure it runs free and locks properly onto the rail.
 - 5.5 Ensure the Trolley and lanyard are free of any dirt, oil, or foreign substance prior to use or inspection.
 - 5.6 Should you detect any worn Trolley parts, Trylon should be contacted for further instructions on repair & replacement.
 - 5.7 A Visual inspection of the aluminum rail is required prior to each use to ensure that the rail mounting system is properly attached and has not been tampered with or vandalized. Check that the rail does not show signs of undue corrosion, wear or foreign substances that may prevent the Trolley from functioning properly. Make sure that the ladder is securely fastened to the structure. A detailed inspection of the aluminum rail, as an appurtenance of the structure, must be performed at intervals that comply with local and federal safety standards.
 - 5.8 **If inspection reveals an unsafe or a defective condition, due not attempt to climb with it and remove it from service immediately and notify your supervisor.**

6.0 TROLLEY TO RAIL INSTALLATION STEPS



Step 1:

Hold the Trolley so that the UP arrow is pointing upwards and insert trolley onto bottom of rail.



Step 2:

Pull up on the karabiner to duplicate a climbing up motion. By pulling up, the cam will disengage and Trolley will move up freely in the up direction.



Step 3:

To ensure Trolley is functioning properly, pull down on karabiner to duplicate a fall arresting situation. Trolley should grab safety rail immediately.

Notes/Best Practice:

1. Climbers should tie off to a structure by means of a lanyard while working or resting.
2. Climbers should also tie off the trolley when they are detached from it and working elsewhere on the structure. This is an extra precaution to avoid any slippage of trolley down the rail during extreme vibrations.



7.0 INSTRUCTIONS FOR DESCENDING WITH THE COUGAR TROLLEY 3.0

Step 1: Using your thumb to brace the Trolley body, pull up on the brake/lever with your index finger to disengage the brake.

Step 2: Once the brake/lever is disengaged, slide the Trolley body down the rail to a reasonable position, while maintaining your 3-points of contact on the ladder.

Step 3: Release the brake/lever to re-engage the brake, and proceed to climb down to the Trolley's lower position.

Step 4: Repeat Steps 1-3 until you are safely at the bottom of the tower.

8.0 CARE AND MAINTENANCE OF THE COUGAR TROLLEY 3.0

8.1 The Cougar Trolley 3.0 can be cleaned by dipping it in a mild soap and water solution. Do not use harsh detergents or chemicals or pressure washers. After cleaning, the unit should be rinsed in clear water and allowed to air dry naturally. After washing, hardware should be inspected. No lubrication is necessary

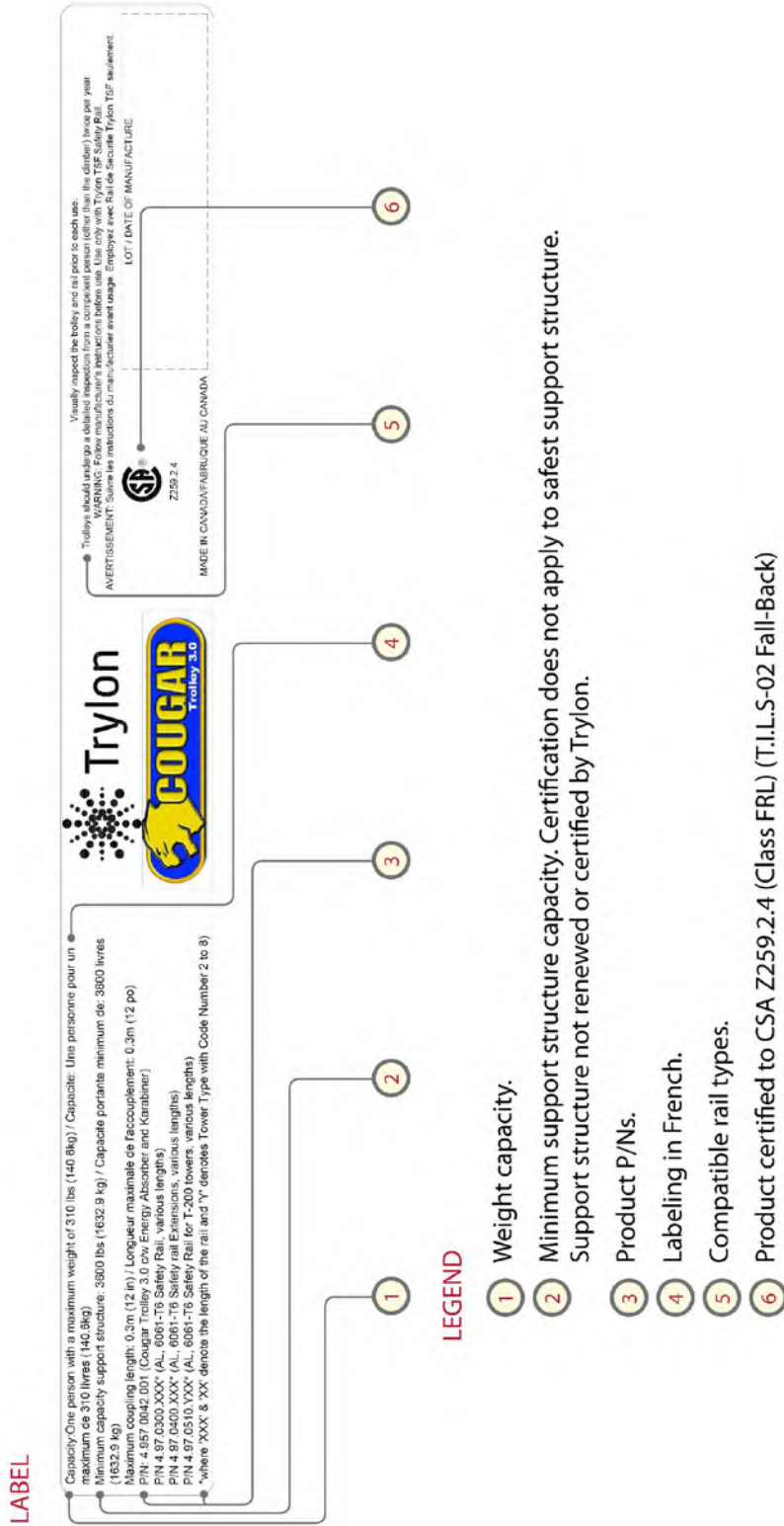
8.2 The Cougar Trolley 3.0 should be stored in a clean, dry area with limited exposure to the following:

- 1) Sunlight
- 2) excessive heat
- 3) harmful fumes
- 4) corrosive chemicals or conditions

9.0 LABELS/MARKINGS

9.1 Serial Number is located on bottom of trolley:
 ‘YYMM###’ (YY = Year, MM = Month, ### = Counter)

9.2 TROLLEY/RAIL LABELS





INSTALLATION INSTRUCTIONS FOR COUGAR RAIL SYSTEMS

COUGAR SAFETY RAIL SYSTEM INSTALLATION INSTRUCTIONS FOR LADDERS (CANADA)

PLEASE NOTE:

C.S.A. Certification is valid only if the system is installed using only the manufacturer's components and in accordance with the manufacturer's instructions.

WARNING:

Any Cougar Safety Rail System which has experienced a fall arrest must not be used after such fall arrest and must be replaced.

NOTE:

The Cougar Rail System must be attached to a structure capable of supporting a 5000 LB. static load.

STEPS:

1. Start bottom rail approximately 3 feet from bottom of ladder or base starting position. Locate rail at center of ladder of climbway to allow balanced foot placement.
2. Attach the first clamp one foot from the lower end of the bottom rail. Clamp every 4' to 5' as rungs permit. Top clamp should be on top rung of ladder. Rail can safely extend max. 1.5 feet above ladder top to permit safe arrival at ladder top. For best results, place clamp bolts in continuous T-slots and finger tighten at approximate locations before raising rail sections into place.
3. Splice rail sections at top of each section and tighten to allow positive joining of rails. Raise and secure the first rail to the ladder rung before continuing with intermediate rails. Leave 1/16" open at each joint for expansion and contraction.
4. Install top rail with bolt stop (3/8" x 2-1/2") through top hole. Stop bolt must be installed 3" below top of the rail section. The 3/8" bolts supplied are suitable for most applications.

OPERATION:

1. The Cougar Rail System is provided as an integrated kit and may not be used for other applications or in conjunction with other fall protection systems. CSA Certification is void if components are purchased or introduced outside of this kit.
2. The Cougar Rail System is designed to arrest the fall of up to three (3) climbers at a time while ascending or descending the ladder only.
3. The Cougar Rail System is designed to be used in a vertical operating position. The system must be installed plumb ($\pm 3'$) to ensure proper activation of the trolley brake cam.

TO CLIMB:

1. Slide trolley onto rail, attach a full body harness with a frontal D-ring at the sternum (Type AS), snugly fit (refer to manufacturer's instructions for proper body fit of the harness).
2. Attach trolley to sternum 'D' ring on harness with a CSA approved karabiner.
3. Upward pull on the trolley allows for climb. Releasing tension automatically engages locking mechanism.
4. See Section 7.0 for descent instructions.

IMPORTANT NOTE:

Ladder type, rung size, rung spacing and all information pertaining to the installation should be given when ordering each kit. Installation recommendations and special brackets for non-typical installations available by contacting Trylon TSF.

REFER TO DRAWING 000001.957.0034 FOR INSTALLATION DIAGRAMS

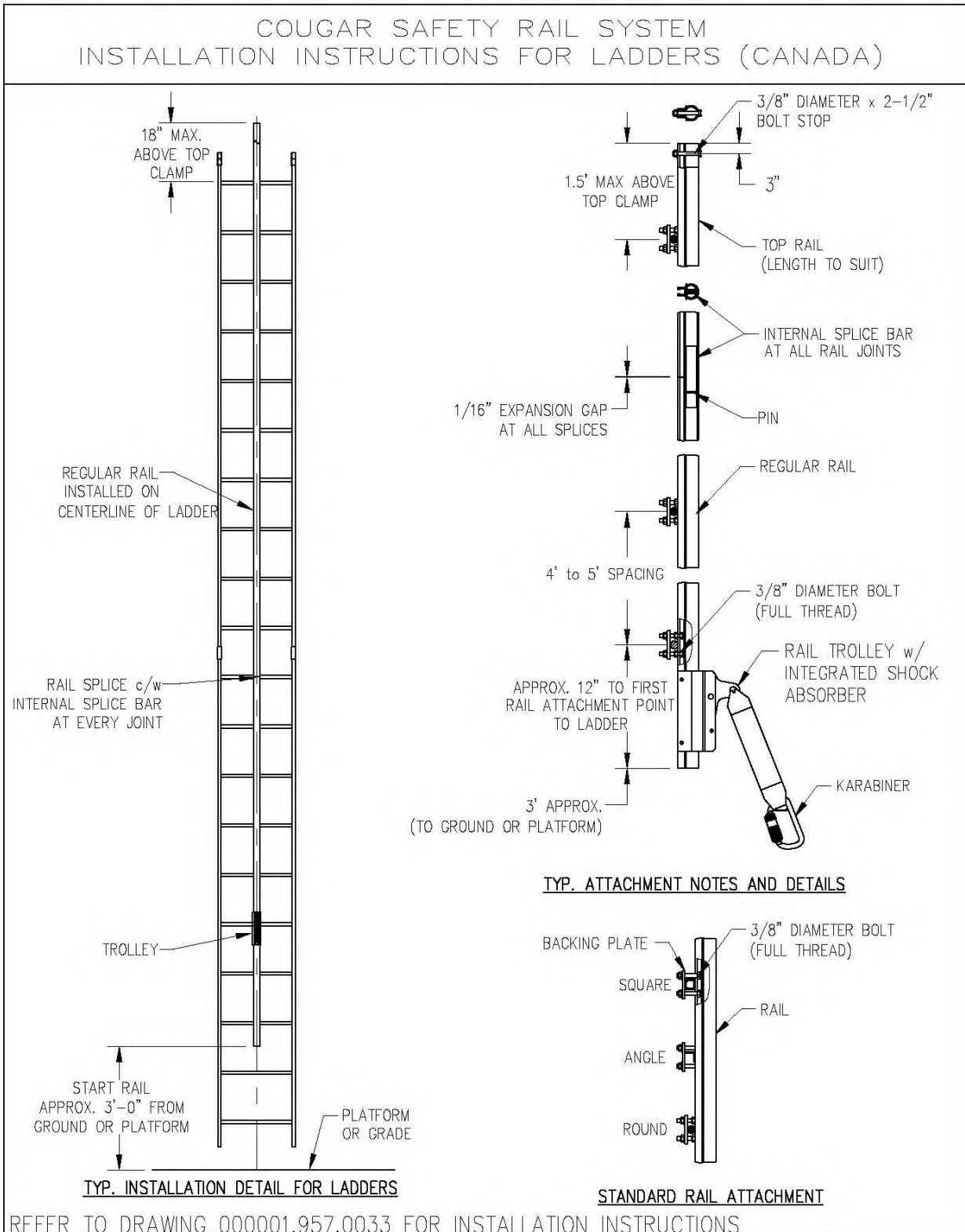
000001.957.0033

21 SOUTH FIELD DRIVE
ELMIRA, ONTARIO
CANADA
N3B 0A4



TEL: (519) 669-5421
FAX: (519) 669-8912
WEBSITE: WWW.TRYLON.COM
EMAIL: INFO@TRYLON.COM

11.0 INSTALLATION DRAWING FOR COUGAR LADDER RAIL SYSTEMS



000001.957.0034

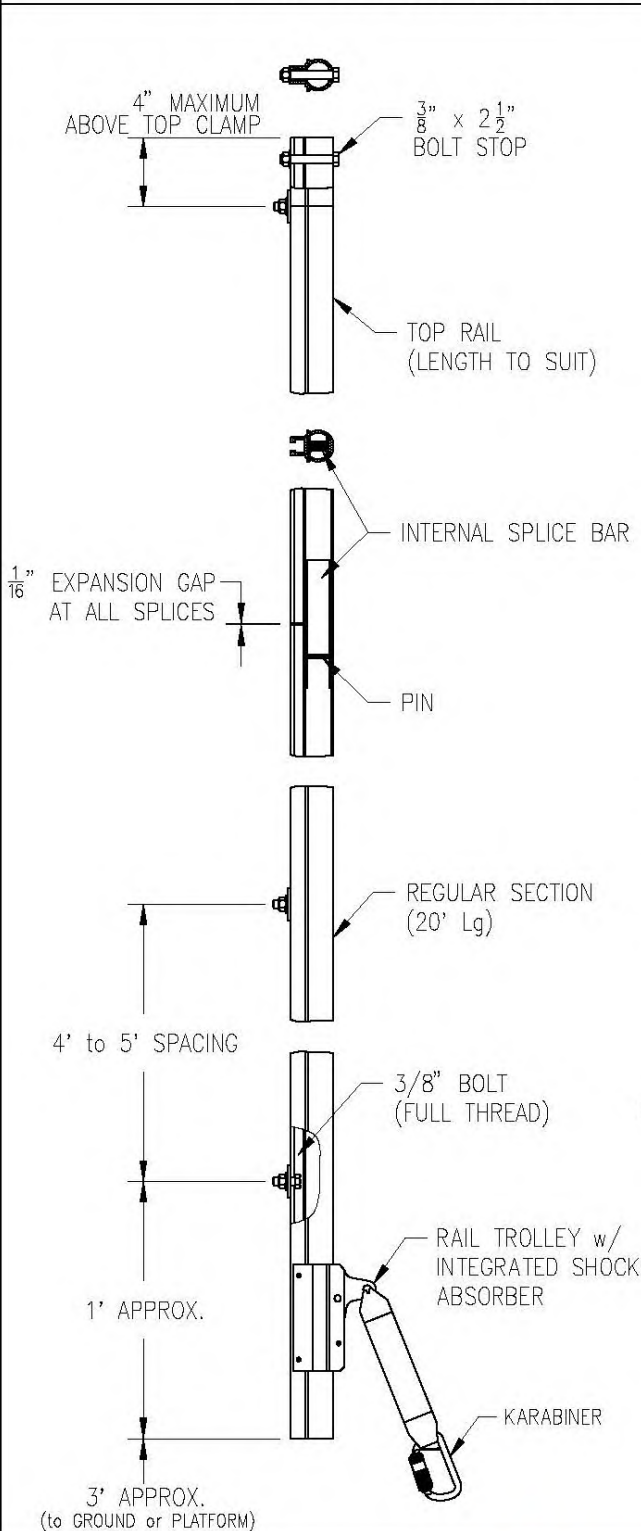
21 SOUTH FIELD DRIVE
ELMIRA, ONTARIO
CANADA
N3B 0A4



TEL: (519) 669-5421
FAX: (519) 669-8912
WEBSITE: WWW.TRYLON.COM
EMAIL: INFO@TRYLON.COM

12.0 INSTALLATION INSTRUCTIONS FOR COUGAR RAIL ONTO TITAN TOWERS

COUGAR® SAFETY RAIL INSTALLATION INSTRUCTIONS FOR TITAN SELF-SUPPORT TOWERS [CAN]



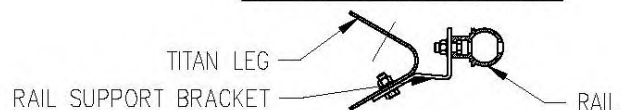
LOCATE THE BOTTOM RAIL AT ONE CORNER OF THE TITAN TOWER. (IE. AT THE APEX OF ONE OF THE TOWER LEGS). THIS LOCATION WILL ALLOW BALANCED FOOT PLACEMENT DURING CLIMBING BY "STRADDLING" THE RAIL/TOWER LEG. START THE BOTTOM RAIL APPROXIMATELY 3 FEET FROM THE BOTTOM OF THE TOWER OR BASE STARTING POSITION.

ATTACH THE "RAIL SUPPORT" BRACKETS EVERY 4'-5' IN THE PRE-STAMPED 'ACCESSORY HOLES' LOCATED ON THE TOWER LEG. EACH TOWER SECTION EXCEPT #13 PROVIDES 7 ACCESSORY HOLES (FOR VARIOUS ACCESSORIES LIKE SAFETY RAIL, SIDE MOUNT KITS, GROUNDING, WORK PLATFORMS, ETC.). SELECT ONLY 2 OF THESE ACCESSORY HOLES PER SECTION AS YOUR SAFETY RAIL ATTACHMENT POINTS, SPACED APPROXIMATELY 4'-5' AS LEG PERMITS. IF YOUR TOWER MODEL INCLUDES A SECTION #13, SIMPLY ATTACH THE SAFETY RAIL SUPPORT BRACKET ON ONE OF THE DIAGONAL BRACE HOLES. DO THIS BY LOOSENING AND REMOVING THE BOLT AND THEN RE-BOLTING THAT HOLE WITH THE RAIL SUPPORT BRACKET ALSO INSERTED. THE BOLT IS LONG ENOUGH TO GO THROUGH THE RAIL SUPPORT BRACKET, TOWER LEG & THE DIAGONAL BRACE.

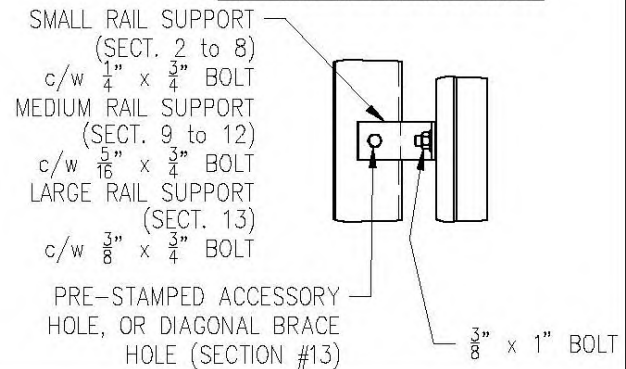
TOP CONNECTION SHOULD BE AT TOP OF TOWER. RAIL CAN SAFELY EXTEND MAX. 4 INCHES ABOVE TOWER TOP TO PERMIT SAFE ARRIVAL AT TOWER TOP. FOR BEST RESULTS, PLACE CLAMP BOLTS IN CONTINUOUS T-SLOTS AND FINGER TIGHTEN AT APPROXIMATE LOCATIONS BEFORE RAISING RAIL SECTIONS INTO PLACE. PUT SPLICE SECTIONS RAIL TOPS AND TIGHTEN TO ALLOW POSITIVE JOINING OF RAILS. RAISE AND SECURE THE FIRST RAIL BEFORE CONTINUING WITH INTERMEDIATE RAILS. LEAVE $\frac{1}{16}$ " OPEN AT EACH JOINT FOR EXPANSION AND CONTRACTION. INSTALL TOP RAIL WITH BOLT STOP ($\frac{3}{8}$ " x $2\frac{1}{2}$ ") THROUGH TOP HOLE. THE $\frac{3}{8}$ " BOLTS SUPPLIED ARE WITH RAIL SUPPORT BRACKET AND TOWER LEG ATTACHMENT HARDWARE.

TO CLIMB: SLIDE TROLLEY ONTO RAIL. ATTACH SAFETY HARNESS SNUGLY AROUND WAIST WITH 'D' RING AT FRONT REFER TO MANUFACTURERS INSTRUCTIONS FOR PROPER BODY FIT ON THE HARNESS. ATTACH TROLLEY KARABINER TO 'D' RING ON HARNESS. UPWARD PULL ON THE TROLLEY ALLOWS FOR CLIMB. SEE SECTION 7.0 FOR DESCENT INSTRUCTIONS.

TOP VIEW OF RAIL ATTACHMENT



SIDE VIEW OF RAIL ATTACHMENT



000001.957.0038

21 SOUTH FIELD DRIVE
ELMIRA, ONTARIO
CANADA
N3B 0A4



TEL: (519) 669-5421
FAX: (519) 669-8912
WEBSITE: WWW.TRYLON.COM
EMAIL: INFO@TRYLON.COM



13.0 INSPECTION AND MAINTENANCE LOG

DATE OF MANUFACTURE: _____

RAIL KIT MODEL NUMBER AS SUPPLIED: _____

DATE PURCHASED: _____

SITE/LOCATION NAME: _____

INSPECTION DATE	STATUS OF ITEMS	CORRECTIVE ACTIONS	MAINTENANCE PERFORMED	PERFORMED BY:

14.0 WARRANTY

Supplier warrants that, at time of shipment, the Products furnished by Supplier are free from defects in material and workmanship. Supplier's obligation under this warranty is limited to repair and replacement of any defective Product within one (1) year from the date of shipment to the first Purchaser.

Supplier shall have the sole discretion as to which of these remedies it shall provide. These warranties shall not apply to any Product which has been subjected to misuse, neglect, alteration, accidental damage, damage or defects attributes after shipment, defects during storage or installation, defects attributable to improper installation or use for purposes other than the Product was intended, and any other defects out of the reasonable control of Supplier.

Seller makes no warranties, guarantees, covenants or representations other than those expressly set out in this Warranty. The warranties and remedies provided herein are Purchaser's sole and exclusive remedies and are provided expressly in lieu of all other warranties, whether express, implied, or arising by statute or otherwise in law or from a course of dealing or usage of trade, including but not limited to, warranties of merchantability or fitness for a particular purpose.

Purchaser agrees that Supplier's liability under this Agreement, and any Purchase Order issued pursuant to this Agreement, shall never exceed the purchase price of the line item upon which liability is based. Under no circumstances shall Supplier be liable for consequential, incidental, special, direct, or indirect damages including but not limited to labour costs, installation costs, inconvenience, cost of replacement goods, loss of revenue or profits, or other costs of any nature as a result of the use of Products manufactured by Supplier.

This warranty does not extend to the appearance of corrosion on any of the components where the Product has been subjected to severe physical and/or chemical abrasion due to, but not limited to sandblasting, salt spray or atmospheric conditions classified as "highly industrial" or the equivalent.



Trylon