



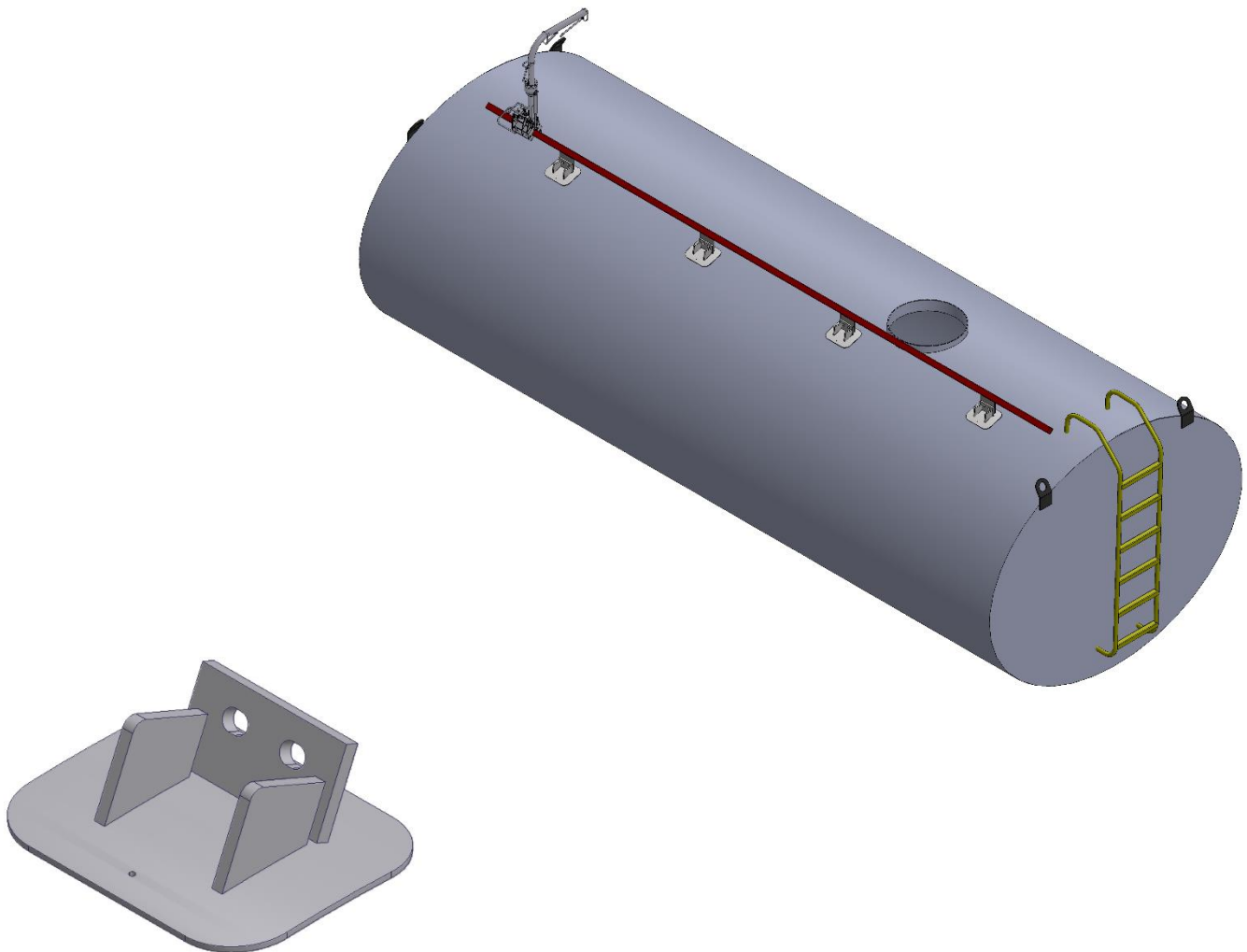
TRAM INSTALLATION GUIDE

BARREL MOUNT BLOCKS, welded

TR-30-34 Mild Steel

TR-30-35 Stainless Steel

TR-30-36 Aluminum



Rev.03/2015



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The evolution of **TRAM**
FALL PROTECTION SYSTEMS

1. INTRODUCTION

This Manual contains information and instructions for installing the TRAM height safety system. This Manual should be stored where it is easily accessible to people responsible for installing the system.

Continued improvement and advancement of product design may have caused changes to your TRAM system, which are not shown in this Manual. Because of this, some photographs or illustrations in this Manual may show details or attachments that are different from your TRAM system. Whenever a question arises regarding this, or any of the information contained in this manual, please consult the Standfast website at www.standfastusa.com for the latest available information.

Further information regarding TRAM installation or operation can also be gained by emailing: support@standfastusa.com

The Equipment Record and an Operators Manual must be supplied to the end user whenever the TRAM system, the TRAM belt or the TRAM Installation is sold, resold, rented, or otherwise made available for use. This is to ensure that the end-user gets the necessary information for the safe use of the TRAM system.

2. CUSTOMER SERVICE

Your satisfaction is a primary concern to Standfast and its dealers. Please contact the authorized TRAM distributor in your area for enquiries regarding the operation, Periodic Examination, Overhaul and Repair of your TRAM system. The distributor nearest you can be found by consulting www.standfastusa.com

Standfast USA, LLC (Main Office)

2630 W Bradley Pl.

Unit A

Chicago, IL 60618

Telephone +1 (877) 850-TRAM (8726)

Fax +1 (773) 248-2865

Email cs@standfastusa.com

Website www.standfastusa.com

3. DISCLAIMER AND COPYRIGHT NOTICE

The purpose of this Manual is to provide information about the Standfast TRAM Safety System. It is not exhaustive in its coverage of rights or obligations nor is it legal advice.

This Manual has no legal status or legal effect whatsoever. Any reference to systems to prevent falls is for guidance only. Readers of this Manual should seek appropriate guidance from the appropriate Regulatory Authority as well as obtain appropriate legal advice in respect of the application of the legislation and regulation in respect of the safety system.

This Manual may be affected by changes to Legislation or Regulation. Standfast USA, LLC accepts no responsibility for the accuracy, completeness or currency of the material included in this Manual.

Users of this Manual are encouraged to obtain professional advice on the relevant Legislation and Regulations and to exercise their own skill and care in relation to any material contained in this Manual.

Standfast disclaims any and all liability or responsibility for any loss or damages arising out of any use, or reliance on, this Manual.

This Manual is copyright. You may use and reproduce this material in an unaltered form only for your personal non-commercial use or non-commercial use within your organization. Apart from any use permitted under the Copyright Act 1968, all other rights are reserved.

Requests for other types of use should be directed to Standfast.

TRAM is a registered trademark of Standfast USA, LLC.




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4. READING THE DOCUMENTATION

4.1. ALERTS USED IN THIS MANUAL

Please read the list below of alerts used in this manual. These alerts are used to indicate important instructions. Be sure to obey these instructions.

ALERT	MEANING
	Indicates a warning concerning an operation or hazard that may lead to death or injury to persons if not performed correctly or with due care. Always pay attention to these warnings.
Important!	Indicates a restriction or important information. Be certain to read these items to avoid improper use or damage to the equipment.
Hint!	Indicates additional information or explanation which is not required for installation but may ease or simplify installation or assembly.

4.2. LITERATURE INFORMATION

This manual contains safety information and instructions for the installation of the TRAM System. This Manual should be stored in an area where it is accessible to those responsible for installing the equipment.

The information, specifications, and illustrations in this publication are provided on the basis of information available at the time of writing. Continued improvement and the advancement of product design may have caused changes to your TRAM System which are not included in this Manual.

Important!

For the following reasons, some photographs or illustrations in this Manual show details or attachments that may appear different to your TRAM system:

Subassemblies, guards or covers, etc., may have been removed for illustrative purposes.

The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time.

These changes can affect the service given to the product.

Whenever a question arises regarding your TRAM System or this Manual, and before starting any job, please consult your Standfast TRAM dealer to obtain the complete and most current information available.



5. IMPORTANT SAFETY INFORMATION



This system saves lives!

The purpose of the TRAM Safety System is to protect the user from a fall from height. All elements of the system and its method of installation have been carefully designed to reliably and repeatedly hold the user safely on the work platform/walkway in the event that they slip, become incapacitated (e.g. a heart attack), or are hit by a foreign object (e.g. a hose at an overhead gantry).

If the system is not properly installed, it may no longer protect against a fall from height. Failure to follow the instructions or to heed the warnings contained in this manual could result in the injury or death of the end user.



5.1. INSTALLATION BY A COMPETENT PERSON

TRAM shall only be installed by a person deemed competent to do so. A Competent Person for the purpose of installing TRAM is defined as a person who is:

- knowledgeable of recommendations and instructions on the TRAM System issued by Standfast USA (including the information contained in this manual);
- authorized by Standfast USA to carry out the installation;
- trained, skilled and tooled to perform the work properly;
- capable of identifying existing and predictable defects and hazards in any component of the TRAM safety system and any equipment used to perform the installation;
- authorized by the person responsible for the workplace to take prompt corrective action to eliminate or control hazards, and has the skills and resources to do so; and
- familiar with all relevant safe working statutory requirements and guidelines



5.2. GENERAL GUIDELINES FOR PROTECTING WORKERS INSTALLING TRAM

All work must be performed in a manner that complies with the statutory health and safety requirements of the jurisdiction in which the TRAM System is installed.

Most accidents during installation are caused by the failure to identify and/or control hazards. Recognizing potentially hazardous situations and controlling them before work commences can often avoid an accident. A job safety analysis (also called *hazard assessments*, *risk assessments* or other titles) should be performed before the task commences. It should involve all workers in order to identify as many hazards as possible and to best determine the means of controlling those hazards.

If whilst performing an installation a “new” hazard is discovered, work should be stopped until the risk has been assessed and brought to a tolerable level.

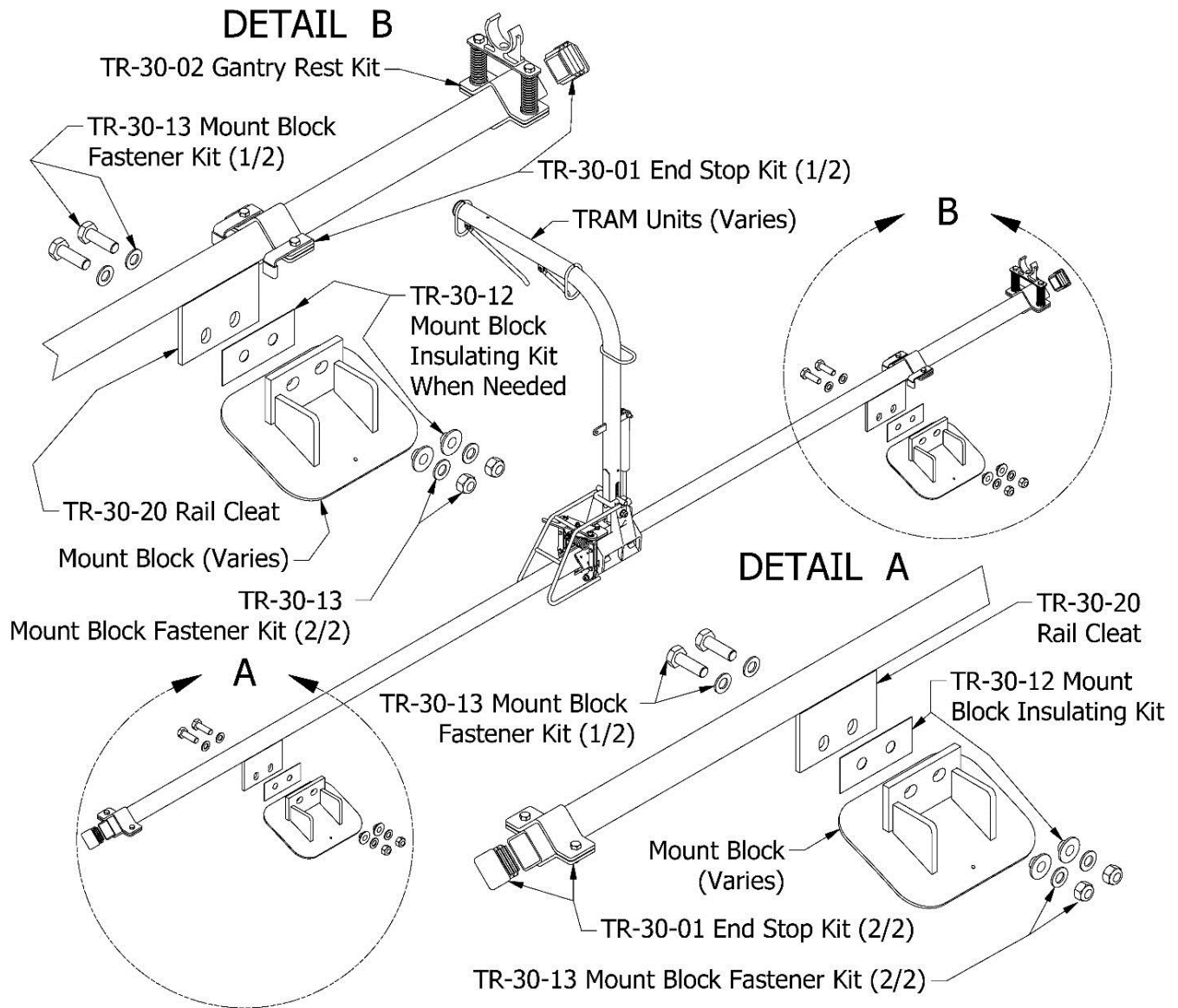
Standfast USA cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this Manual and on the product are therefore not all-inclusive. If a tool, procedure, work method or operating technique not specifically recommended by Standfast USA is used, you must satisfy yourself that it is safe to do so. You should also ensure that the product will not be damaged or made unsafe by the operation, lubrication, maintenance or repair procedures that you choose in place of the ones recommended by Standfast.



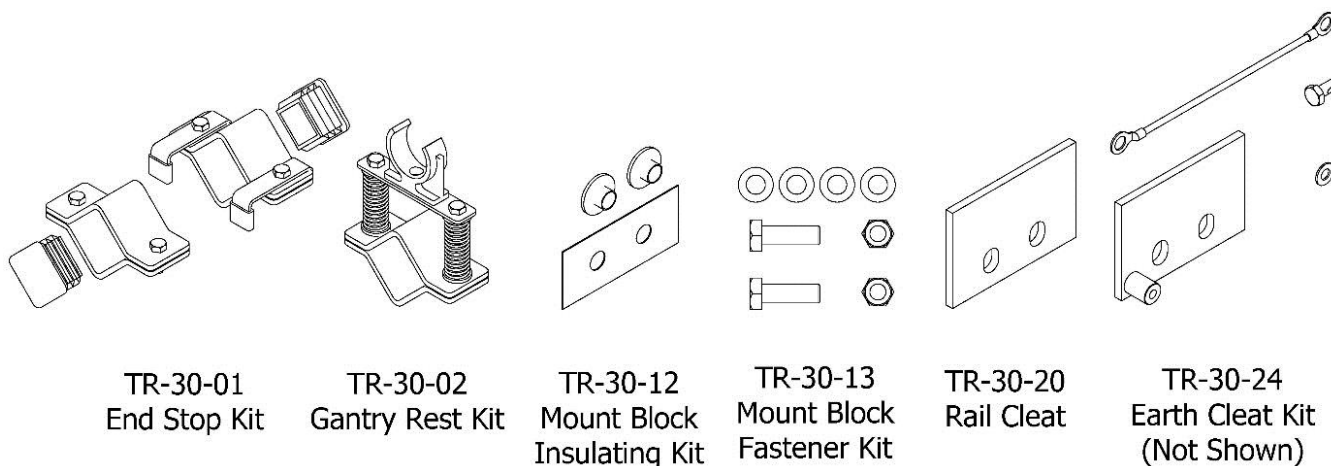
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THE FALL PROTECTION SYSTEM

6. DESCRIPTION OF EQUIPMENT

Below is an overview of a typical TRAM System, your system may vary. Contact your Standfast Representative with any questions. The TRAM System consists of a TRAM Unit to which the operator is attached using either with a restraint belt or a fall restraint harness and the TRAM Installation. The TRAM Installation consists of the TRAM Rail and mounting parts which attach the TRAM Rail to the platform being accessed. The most common types of mount hardware are shown below (your system may vary).



The evolution of **TRAM**



6.1. Equipment Materials and Specifications

TRAM Unit

The TRAM unit is mostly constructed of various grades of stainless steel as well as some non-corroding plastic and brass parts where required. See technical manual for maintenance and service requirements.



There are brass bushings within the TRAM brake system. If the system is being installed in an environment where explosives are being used they must be replaced. Contact your Standfast Representative to arrange alternative bushings. Your system may already have non brass bushings. Please verify by providing a TRAM serial number to Standfast USA to verify option build. TRAMs built after June 2014 do not include any brass bushings.

TRAM Mount Blocks

TRAM Mount Blocks are directly attached to the supporting platform by welding, bolting, riveting, or adhesives depending on the application. In most cases, especially if welding is involved, the mount blocks are constructed of the same material as the supporting platform. Mount Blocks are available in numerous styles and material combinations, however due to the versatility of the TRAM System custom Mount Blocks are sometimes required, contact your Standfast Representative for further information on custom Mount Blocks.

TRAM Rail Weldment

The TRAM Unit slides along a 2"x2" or 50x50mm grade 304 stainless steel square tubing that is referred to as the TRAM Rail. The rail is supported by stainless steel Rail Cleats which are welded to the rail at 8 foot (2400mm) centers or less!



IMPORTANT! When the mount blocks used to attach the TRAM System to the supporting platform are aluminum, material separation gaskets (TR-30-14 MB INSULATION KIT) are required. When these gaskets are used, one Earth Cleat Kit per rail is required to ground the system and replaces 1 of the standard cleats. Earth Cleat Kits come in the same size as a cleat specified for a particular installation.



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RAIL PROTECTION SYSTEM

7. Installation Overview

TRAM installations consist of five main steps, they are:

1. Installation Assessment
2. Mount Blocks Installation
3. TRAM Rail Dry Fitment
4. TRAM Rail Weldment Fabrication
5. TRAM Unit Fit Up

All of these steps are outlined in more detail in the Installation Procedure section of this document, briefly they include:

Installation Assessment

After a work site safety check these steps include determining the length and location of the TRAM Rail required for the installation. Determination of the location and spacing of the Mount Blocks required.

Mount Blocks Installation

Install Mount Blocks where determined during assessment using the installation method appropriate to the Mount Block. Ensure that Mount Block can withstand the loads specified in the TRAM Loading Specifications.

TRAM Rail Dry Fitment

Install TRAM Rail assembly without any permanent attachments. Verify all cleat locations match Mount Block locations and all clearances are maintained. Mark and perform any rail modifications needed prior to Rail Weldment Fabrication.

TRAM Rail Weldment Fabrication

If required, weld sections of TRAM Rail together. Weld Rail Cleats, and Earth Cleat if required, to TRAM Rail at spacing determined during assessment and corresponding with either pre-slotted locations or Mount Block placements. Maintain proper angle between rail center line and cleat face.



Always use a TR-30-90 Rail Joiner when butt welding multiple rail sections. If the rail utilized is slotted, use a TR-30-90-S Slotted Rail Joiner (for cleats at joint locations) and TR-30-22 through cleats!

TRAM Unit Fit Up

Bolt TRAM Rail Weldment to Mount Blocks, install TRAM Unit on TRAM Rail, install End Stop Kit and Ground Cable (if required) and install System Installation Label (if required).



The evolution of **TRAM**
RAIL PROTECTION SYSTEM

8. INSTALLATION PROCEDURE

8.1. Warnings and Safety Notes



All welding must be performed in accordance with the applicable welding code for the jurisdiction of installation, with due consideration given to the implications of performing hot work. All procedures should at minimum follow AWS D01.6 standards (Stainless Steel), AWS D01.2 standards (Aluminum) or local equivalent. Follow AWS or local equivalent SWPS. All welding areas need to be passivated after all work is completed.

All fasteners used in TRAM installations must be pre-tensioned according to the specifications in Appendix 5.



IMPORTANT! When tightening TRAM fasteners do NOT use impact or pneumatic tools. These may result in damage to the fasteners, equipment and or inadequate joint tension. Always use Torque Indicating wrenches.

IMPORTANT! Always use an anti-seize, thread lubricant and/or locking compound in combination with TRAM fasteners. Appropriate compound should be selected based on fastener type and function.

8.2. STEP 1 – Installation Assessment

Perform Safety Check

IMPORTANT! Perform a full safety check of the worksite where work is to be performed.

Fill out and file all relevant safety checks and procedures, including hot work if required. Know and follow all safe work practices for the location where work is being performed!

Adequately prepare for the installation process by:

- reading and understanding this installation guide;
- ensuring all required materials and equipment are present;
- ensuring personnel with the required skills and certifications are available; and
- preparing the worksite.

Checklists 1 and 2 may assist with this task.

Determine Rail Length and Parts Required

The TRAM Rail should run the length of the area of the platform being accessed. In most cases this will be the entire length. However the length does not need to run the entire length of the platform as in the down position of the TRAM Arm.

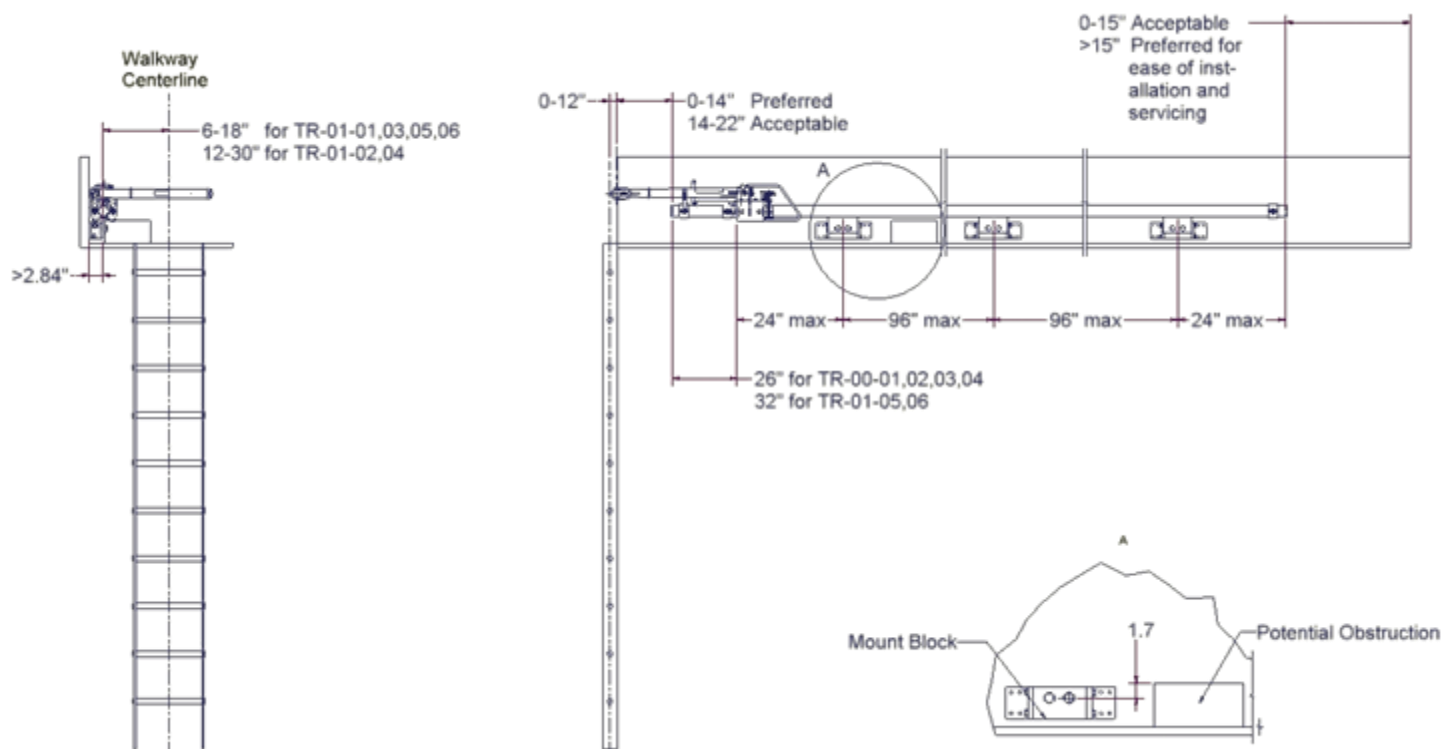
RAIL LENGTH

- Determine the rail length using the diagrams below and/or documentation drawings (if supplied).
- Lay out the entire system and verify completeness of the kit (per packing list and system drawings).



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RAIL PROTECTION SYSTEM

- Choose a rail length which gives system operators access to all areas required for their work. If your installation uses engineered rail lengths verify proper lengths, orientation and their locations prior to Dry Fit.



PARTS REQUIRED

- Mount Blocks with Fastening Hardware
- Rail Joiners (TR-30-90 and/or TR-30-90-S)
- Rail Cleats (Model # Varies)
- End Stop Kit
- Anti-Seize and Thread locking Compounds
- Welding Filler to match material being welded



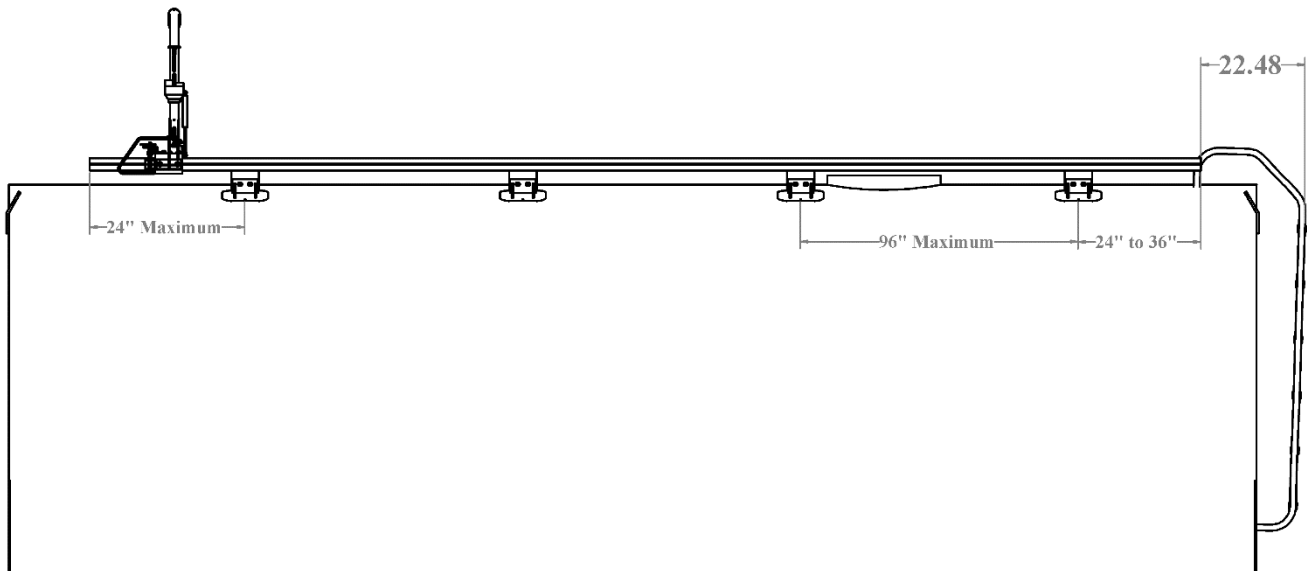
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8.3. STEP 2 – Mount Block Installation

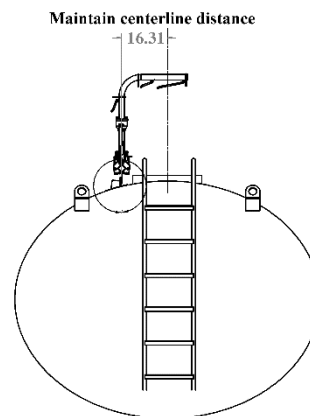
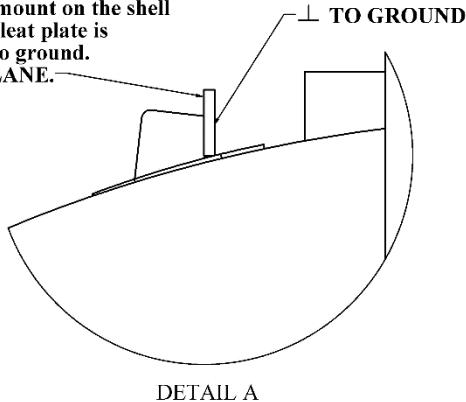
Perform a temporary installation of mount blocks to verify design accuracy and determine proper placement.

When locating mount blocks follow these steps:

- Determine the vertical plane of the mount blocks. To ensure appropriate clearance the horizontal center line of the mount block must be no more than 1.75" below the top level of any obstructions (See figure above and below).
- Space the mount blocks at maximum center distances of 96", adhering to the specifications shown in the diagrams above. **If you are installing an engineered system, follow mount block spacing provided in the documentation drawings.**
- Once the correct placement of the mount blocks is verified, attach the mount blocks using the method appropriate for the mount block being used (If in doubt, ask! Same mount blocks may have multiple installation options).
- **It may be necessary to dry fit mount blocks with the entire TRAM system prior to any permanent attachments are made.**



When locating mount on the shell make sure the cleat plate is perpendicular to ground. VERTICAL PLANE.



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FULL PROTECTION SYSTEM

8.4. STEP 3 – TRAM Rail Dry Fitment

Perform a temporary installation of rail assembly, to verify design accuracy and determine proper placement. It is helpful to use temporary fasteners between mount blocks and rail system at this time.

- While performing the dry fitment, no welding is necessary, however dry fitment process will result in correct placement and ultimately will become the final placement and location of the TRAM system. If mount blocks were properly spaced and clearance is maintained, block mount welding prior to rail welding is recommended (You can perform this by following block mount welding procedure from next step). **Correct installation may require multiple dry fitments!**
- Install rail cleats with temporary means to the previously fitted mount blocks. Insert rail joiners between rail lengths to verify overall length and clearances. Mark extended welds or rails that might need to be corrected for a good fit.
- When installing continuous rail lengths, it is necessary to clamp rails together with C clamps and flat bars. Flat bars should be no less than 10" and no more than 12" long. Flat bars should be 1.5" to 1.75" wide and at least ¼" thick to allow the joint inspection.
- At this time, determine the location of the end stop kit and mark excess rail for cutting. **Cut off excess rail lengths prior to any welding is performed to ease rail handling.**
- **If you are installing an engineered system, follow cleat and joiner location schedule provided in the documentation drawings.**
- Once the correct placement of the rail system is verified, perform rail corrections (if necessary) for precise installation, including edge chamfering. Grind a chamfer at the ends of each rail to prepare the rail for welding.
- Reassemble rail to dry fit position after rail corrections and chamfering is completed. **Verify Fit!**

8.5. STEP 4 – TRAM Rail Weldment Fabrication

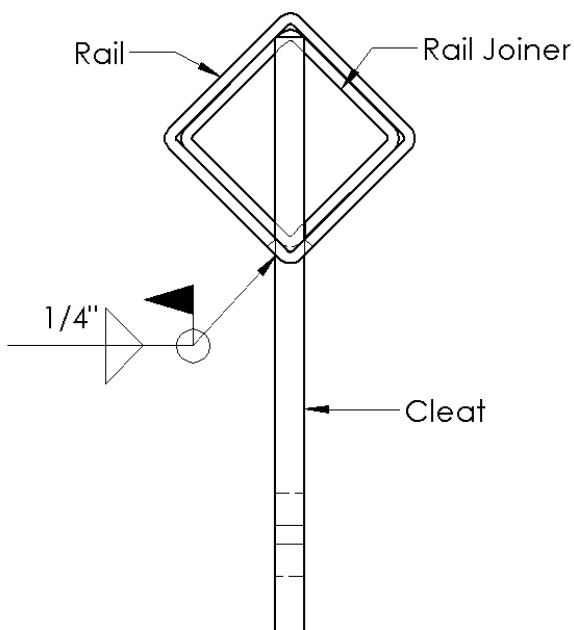
Once Dry Fit is performed and verified, proceed with Weldment Fabrication.

- **Weld all mount blocks to surface after performing Steps 1 and 2. This will ensure no free movement in the rail assembly. Follow all Safety Notices!**
 - Mark the cleat locations from dry fitment.
 - Weld the cleats to the rail, using a continuous ¼" fillet weld on all sides. Correct alignment of the cleats with the rail is important. **It is helpful to use jigs or fixtures during welding.**
- IMPORTANT! Follow rail welding details below.**
- Depending on length of the installation, the rail system itself can be welded as continuous rail or multiple pieces:
 - Option 1: If conditions permit, rail can be continuously welded after dry fit, minimizing the rail disassembly and reducing the chance of an error.
 - Option 2: It may be necessary to weld rail in multiple sections away from the dry fit process. At this point, it is necessary to tack weld sections into manageable lengths while they are dry fitted and continue installation while re-checking the dry-fit of removed sections prior to final welding.
 - Complete the welding procedure while following SWPS.

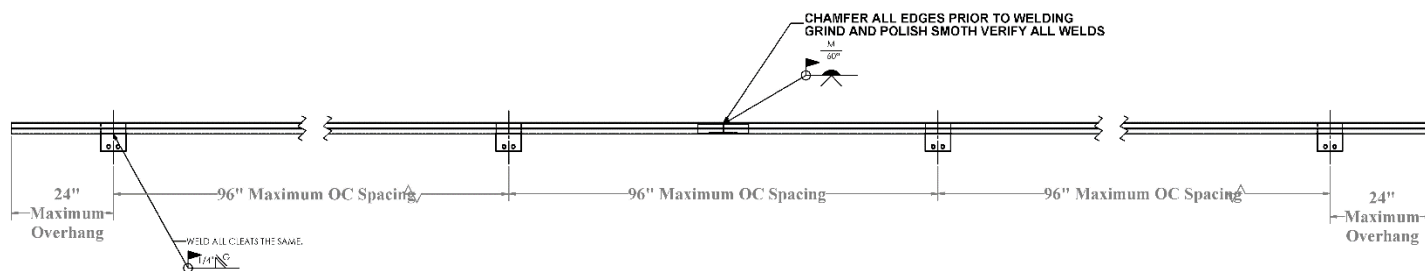


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RAIL PRODUCTION SYSTEM

- Once the rail has adequately cooled, proceed with weld grinding and smoothing to bring all sections to a uniform dimension.
- Place the TRAM onto the TRAM rail. Test for free movement of the TRAM along the rail, particularly near weld joints.
- **IMPORTANT!** It is necessary to passivate stainless steel weld areas after all work is completed.



In Line View of Welded Rail Assembly



The evolution of **TRAM** RAIL PROTECTION SYSTEMS

8.6. Step 5 – Fitting

PROPERLY FASTEN TRAM RAIL TO MOUNT BLOCKS

- If TRAM Rail was fitted to the mount blocks with temporary fasteners for dry fitment, replace all mounting hardware with fasteners supplied in the mount block kit.

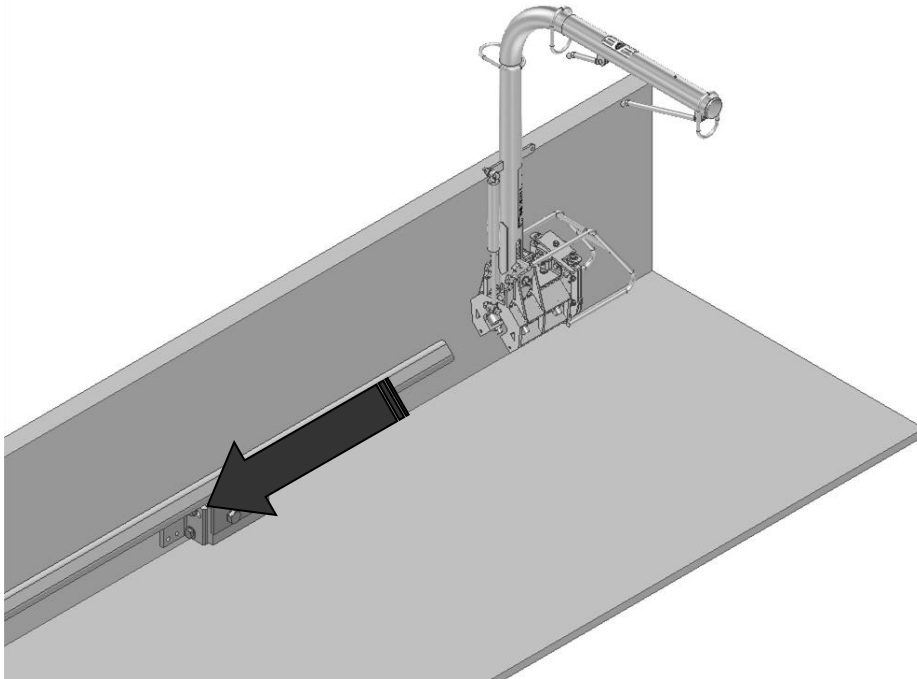


Fasten the TRAM Rail to the mounting blocks using the fasteners and the procedure provided with the mount block kit.

IMPORTANT! Follow all pre-tensioning schedules!

- **FASTENING BOND STRAP (WHERE REQUIRED)**
 - Where necessary, install the equipotential bond strap using the procedure and components provided with the equipotential bond strap kit.
- **FIT TRAM TO RAIL**
 - Depress the TRAM brake lever and slide the TRAM onto the TRAM Rail as depicted below.
 - It is easier to install the TRAM from the end of the rail (Shown Below) as breaks will not interfere during initial sliding of the TRAM onto the rail.

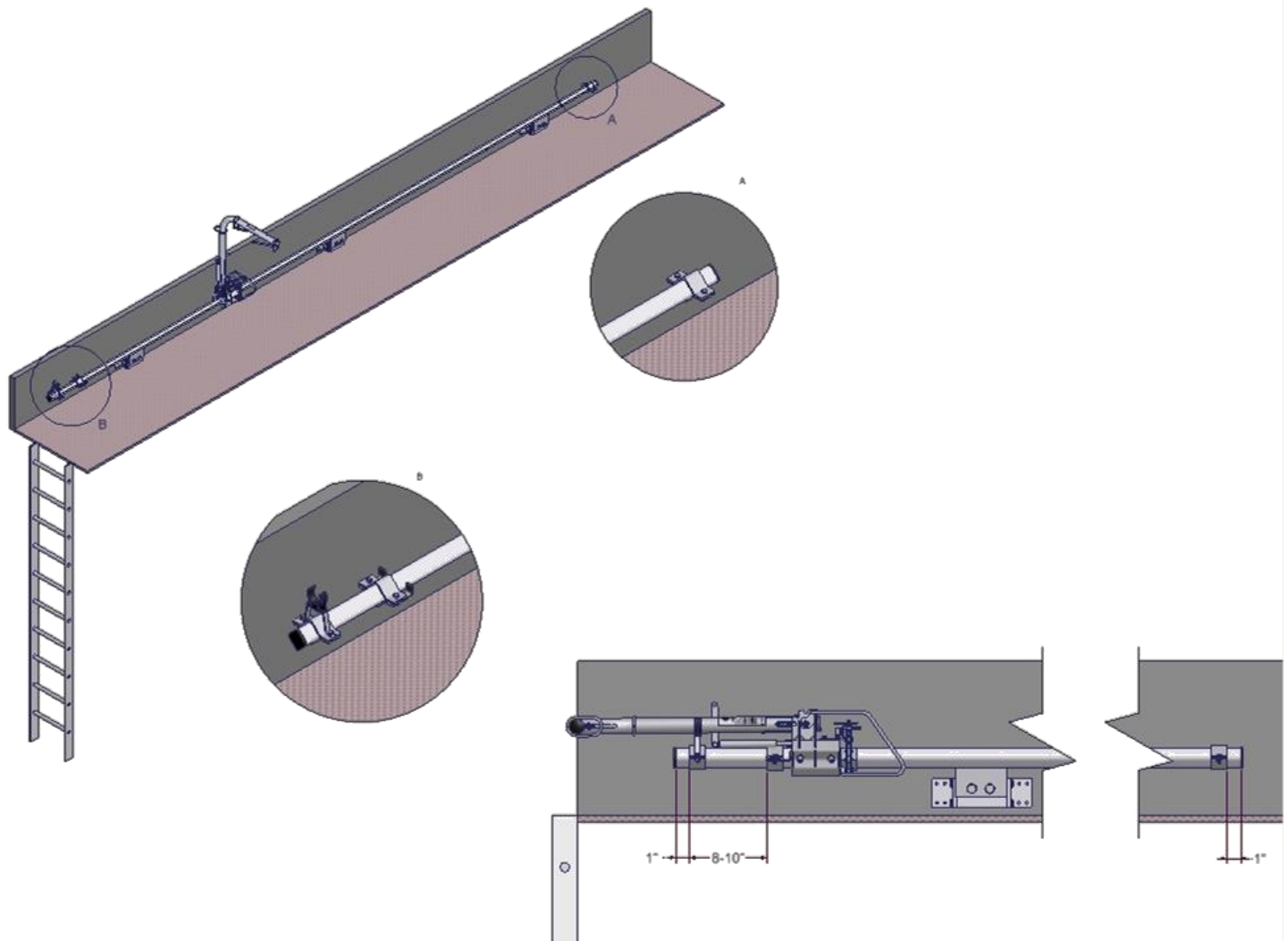
Your installation may vary and may include reverse TRAM installation (Brake orientation and stow position will be affected)



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FALL PROTECTION SYSTEMS

- **FIT ENDSTOP KIT**

- Install the end stop kit as shown below, paying particular attention to the orientation of end stop components. Your system may not have all components shown, depending on design.
- Make sure to maintain all clearance and positioning distance.



8.7. Step 6 – Check Installation and Test TRAM System

- Clear all waste material from the worksite, and remove all tools and equipment.
- Test the TRAM system function and inspect the installation, using checklist 3 as a guide.
- The installation of the TRAM system is now complete.



8.8. CHECKLIST 1: TRAM COMPONENTS

ITEM	DESCRIPTION	QTY	CHECK	COMMENTS
1	Correct TRAM unit type i.e. left or right hand TRAM.		<input type="checkbox"/>	
2	Correct type and number of mount blocks.		<input type="checkbox"/>	
3	Correct number of cleats, gaskets, bolts, washers, and nuts.		<input type="checkbox"/>	
4	End Stop Kit		<input type="checkbox"/>	
5	TRAM Restraint Belt		<input type="checkbox"/>	
6	TRAM System Operators Manual		<input type="checkbox"/>	
7	Sufficient quantity of TRAM Rail		<input type="checkbox"/>	
8	Equipotential Bond Strap Kit (where required)		<input type="checkbox"/>	

8.9. CHECKLIST 2: TOOLS

ITEM	DESCRIPTION	QTY	CHECK	COMMENTS
1	Welding equipment		<input type="checkbox"/>	
2	Welding fillers to match material		<input type="checkbox"/>	
3	Metrics spanners		<input type="checkbox"/>	
4	Imperial spanners		<input type="checkbox"/>	
5	Clamps		<input type="checkbox"/>	
6	Grinder		<input type="checkbox"/>	
7	Grinding and polishing discs (hard and flap type)		<input type="checkbox"/>	
8	Anti-seize compound		<input type="checkbox"/>	
9	Thread locking compound		<input type="checkbox"/>	
10	Standard tool set		<input type="checkbox"/>	
11	Torque wrenches		<input type="checkbox"/>	
12	Levels and Squares		<input type="checkbox"/>	
13	Flat Bars (per sizes listed in this manual)		<input type="checkbox"/>	
	Any additional tools that may be required			



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FALL PROTECTION SYSTEMS

8.10. CHECKLIST 3: POST -INSTALLATION CHECK

ITEM	DESCRIPTION	CHECK	COMMENTS
1	Check all fasteners ensuring they are tight and secure.	<input type="checkbox"/>	
2	Check all welds ensuring they have been performed in accordance with the applicable code in the jurisdiction of installation.	<input type="checkbox"/>	
3	Check all areas of supporting structure close to welds and insure they are clean and free from debris and obstructions such as weld spatter.	<input type="checkbox"/>	
4	Ensure all foreign matter such as tools and/or equipment are removed from the work area.	<input type="checkbox"/>	
5	Ensure the top of the walkway is cleaned of all grind and/or weld material.	<input type="checkbox"/>	
6	Test the earth bonding strap and Bracket (If equipped)	<input type="checkbox"/>	
7	Ensure the TRAM Gantry is square and appropriately positioned over the access ladder (If present).	<input type="checkbox"/>	
8	Ensure the TRAM Safety System freely operates along the full length of the TRAM rail.	<input type="checkbox"/>	
9	Ensure the TRAM Safety System freely operates with an operator attached via the TRAM Safety Harness.	<input type="checkbox"/>	

8.11. CHECKLIST 4: FASTENER PRETENSIONING TORQUE VALUES

Thread Size		Standard Torque		
		N.m	Lb.Ft.	
M6 SS		12±3	9±2	
M8 SS		28±7	20±5	
M10 SS		55±10	40±7	
M12 SS		100±20	75±15	
M14 SS		160±30	120±20	
M16 SS		240±40	175±30	
M20 SS		460±60	340±40	
IMPERIAL	Galv + Wax	Plain	Galv + Wax	Plain
1/2" A449/SAE Grade 5	52	127	38	94
5/8" A449/SAE Grade 5	102	203	75	150
1/2" A325	68-78	135-158	50-58	100-117
5/8" A325	134-162	268-325	99-120	198-240

The above Table specifies torque values for tightening all types of bolts and nuts that may be present in the TRAM system installation. These settings are to be used for all relevant installation, maintenance and repair work of the TRAM System. **LOCAL JURISDICTION HAS PREVAILING RIGHT TO SET PRETENSIONING VALUES!**



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