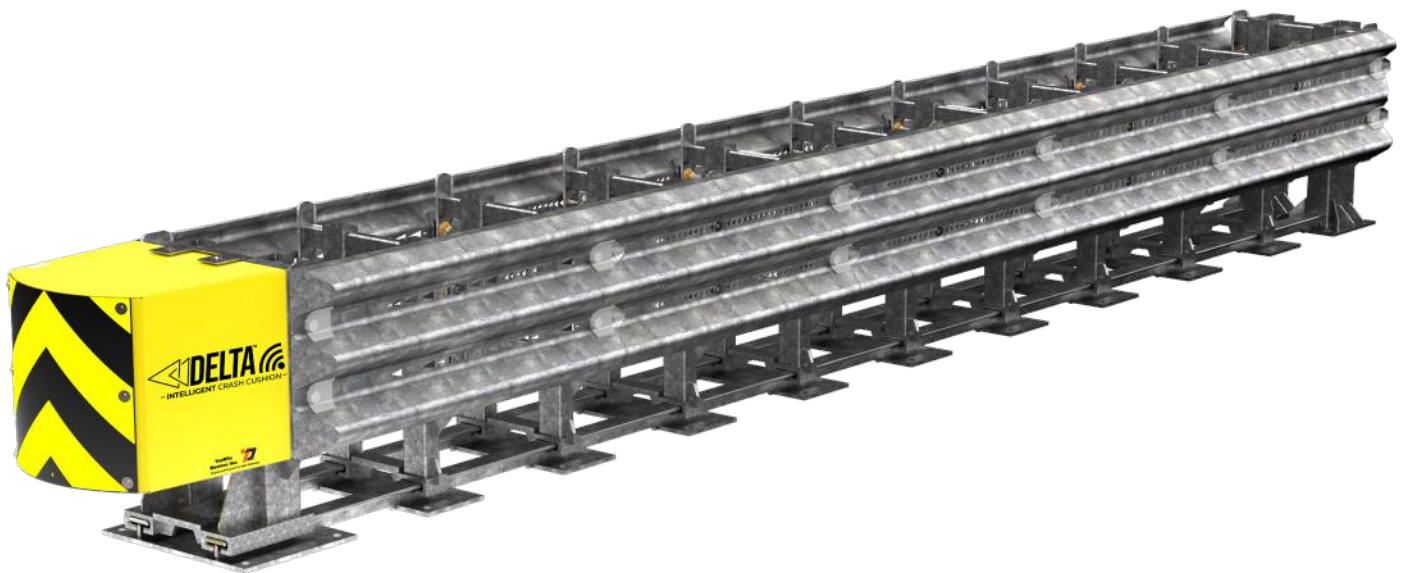




Maintenance & Repair Guide


For *TraFFix MASH Delta[®] Intelligent Crash Cushion*

















Introduction to Guide

 **Important:** These instructions pertain only to the repair and installation of the Delta® Intelligent Crash Cushion (ICC). Any deviation from the Delta ICC shown would require consultation with the appropriate highway authority Engineer and or certified TrafFix Devices, Inc. representatives. Contact information for TrafFix Devices representatives can be found on page 62 of this manual.

 Correct Repair of the Delta ICC is essential for proper performance of the system. For this reason, contacting a TrafFix Devices, Inc. Engineering Department manager for assistance in repairing the system is recommended. Please read this manual in its entirety before assembling or repairing the Delta ICC. The information in this Manual supersedes all previous versions and manuals, with updated illustrations and other information available at time of printing; however; TrafFix Devices, Inc. reserves the right to make changes at any time. For any questions on proper Installation and Operation of the Delta ICC, please contact us at (949) 361-5663 or email info@traffixdevices.com.

 **Important:** This manual applies to the Delta ICC by TrafFix Devices, Inc. It pertains only to the model referenced herein. It requires that all installation, service and repair parts be genuine Original Equipment Manufacturer (OEM) Delta ICC parts that have not been modified or repaired from the original factory design.

Safety Symbols

	Attention! Read and Understand.
	Proceed with Caution.
	Hard Hat Protection Required.
	Hearing Protection Required.
	Safety Glasses or Safety Goggles Required.
	Dust Mask Required. Dust Hazard, wear appropriate dust mask in this area.
	Safety Gloves Required.
	Safety Shoes Required.
	Tip Over Hazard. Do not move this equipment without mechanical assistance.
	Pinch point. Keep hands clear during operation.
	Crush Hazard. Keep feet clear.
	Two Person Lift Required.
	Forklift Required. Caution Forklift Operating.
	Warning Overhead Crane. Stay out from under suspended loads.



NOTE: The safety symbols list provided is a general recommendation and should not be considered an all-inclusive list. Always follow best practice.

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Warning and Limitations

TraFFix Devices Inc. (TDI), in compliance with the Manual for Assessing Safety Hardware (MASH) recommended procedures for the Safety Performance of Highway Features. TDI contracts with ISO accredited testing facilities to conduct crash tests, evaluation of tests, and submittal of results to the Federal Highway Administration for Eligibility for Federal-Aid Reimbursement. The Delta® Intelligent Crash Cushion (ICC) was tested to meet the safety evaluation guidelines of MASH. The Delta ICC has been tested at TL-3 (62.1 mph/ 100 km/hr) impact speed conditions. These tests are intended to evaluate product performance by simulating those impacts outlined by MASH involving a range of vehicles on the roadways, from cars with an approx. weight of 2425 lbs [1100 kg] to trucks with an approx. weight of 5004 lbs [2270 kg]. The Delta ICC is a TL-3 tested device capable of decelerating and stopping the light and heavy weight vehicles 2425 lbs [1100 kg] and 5004 lbs [2270 kg] in accordance with the criteria of Tests 3-30, 3-31, 3-32, 3-33, 3-34, 3-35, 3-36, 3-37 and 3-38 for TL-3 (62.1 mph/ 100 km/ hr). These specified tests are not intended to represent the systems performance when impacted by every vehicle type or every impact condition existing on the roadway. This system is tested only to the test matrix criteria of MASH. TraFFix Devices does not represent nor warrant that the results of these controlled tests show that vehicle impacts with the products in other conditions would necessarily avoid injury to person(s) or property. Impacts that exceed the system's specifications may not result in acceptable crash performance as outlined in MASH; relative to structural adequacy, occupant risk, and vehicle trajectory. TDI expressly disclaims any warrant or liability for injury or damage to person(s) or property resulting from any impact, collision, or harmful contact with products, other vehicles, or nearby hazards or objects by any vehicle, object or person, whether or not the products were installed by third parties. The Crash Cushion system is intended to be assembled, installed and maintained in accordance with specific State and Federal guidelines. TDI offers a directional object marker for the Delta ICC. However, the material is only intended to supplement delineation required by the Department of Transportation's "Manual on Uniform Traffic Control Devices" (MUTCD). The appropriate highway authority approved engineer should be careful to properly select, assemble, and maintain the product. Careful evaluation of the speed, traffic direction, and visibility are some of the elements that require evaluation for the proper selection of a safety appurtenance by the appropriate specifying highway authority.

Warranty

TrafFix Devices warrants to the purchaser that the Delta[®] Intelligent Crash Cushion (ICC) is free from any defects in materials and workmanship. If this product proves to be defective in material or workmanship during the period of this warranty, TrafFix Devices will repair or replace, at its discretion, the defective product free of charge. The period of this warranty is one-year beginning from the date the purchaser puts the unit into service or one-year from the date of purchase.

To obtain warranty service, the purchaser or distributor must first photograph the unit in question, fill out a warranty authorization form (Pg.7) and email TrafFix Devices to have our Engineering Department evaluate the problem and recommend repair procedures. TrafFix Devices will then issue a signed warranty work approval form to authorize the distributor or customer to repair or replace any items, which TrafFix Devices deems to have been defective. All replacement parts claimed to be defective will be invoiced at the time of shipment, and upon returned and evaluation of defective parts a credit memo will be issued.

This warranty does not extend to any failure of the Delta ICC caused by misuse, abuse, material alteration, non-OEM components, or any negligence in connection with the installation, service, or use of this product. For the correct installation, service, or use of this product refer to the installation manual, repair guide and the inspection checklist.

Warranty Authorization Form

Company Name: _____

Address: _____

Phone: _____ Fax Number: _____

Email: _____

Name of Customer: _____

Date: _____

Serial Number: _____

Replacement and Repair Parts Listed Below? _____

List Part Numbers of Replacement or Repair Items:

Describe the Problem and Reason for Failure:

**Email this Form along with Pictures to Traffix Devices
Email: info@traffixdevices.com Phone: (949) 361-5663**

Dismantling & Recycling

After the Delta ICC is impacted the damaged parts can be recycled. The front attenuation module is composed of aluminum and can be recycled. In the event of a frontal impact the attenuation module should be removed from the steel impact head and recycled separately from the steel weldments. The Fender Panels, Diaphragms, and Track Weldment are galvanized steel and can be recycled.



Expected Design Life

The Delta ICC is primarily constructed from galvanized steel. The expected life cycle of the Delta ICC is similar to other galvanized steel products on the roadway. There are no modules or plastic that will degrade due to exposure to the environment. The system should be inspected periodically to check for rust and damaged parts. If the system is exposed to harsh environmental conditions, such as road salt, it should be inspected more frequently. If the system is impacted it can potentially be repairable. Damaged parts should be replaced, repair parts must be genuine Original Equipment Manufacturer (OEM) Delta ICC parts that have not been modified or repaired from the original factory design.

Overview

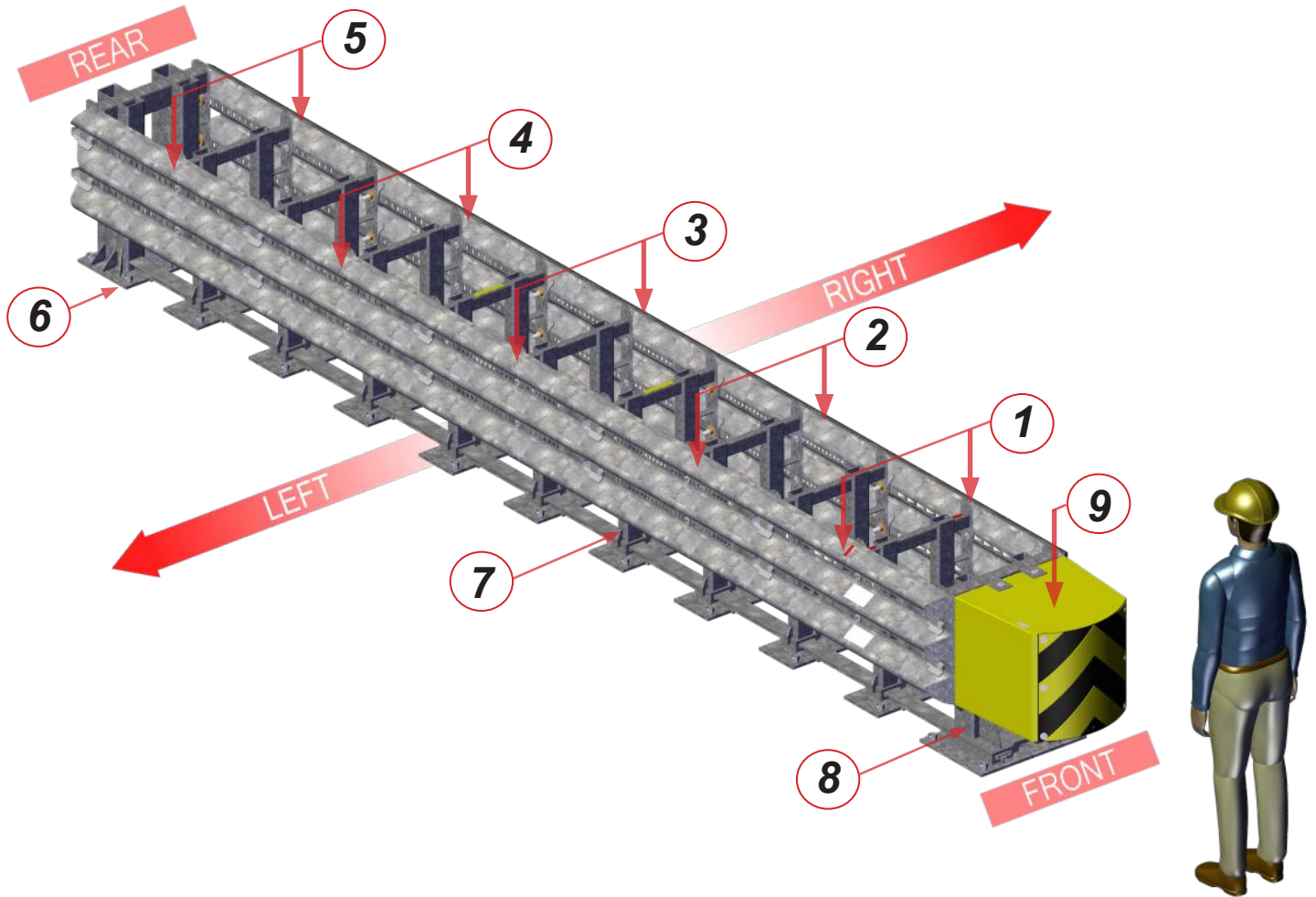
The Delta ICC is a Non-Gating Redirective crash cushion manufactured by Traffix Devices, Inc. The Delta ICC has passed all required AASHTO MASH crash tests and can be used in Uni-Directional or Bi-Directional applications. The Delta ICC was designed to be simple and effective in protecting errant vehicles from striking a wide variety of roadside hazards. The fender panels use the standard AASHTO M-180 Thrie beam profile. Utilizing this profile allows the Delta ICC to be easily attached to standard roadside safety hardware. The Delta ICC was Co-Developed with Midwest Roadside Safety Facility (MwRSF) at the University of Nebraska-Lincoln (UNL).

Product Description

The Delta ICC redirects errant vehicles when struck along the side and when impacted at the nose, it attenuates the impacting vehicles kinetic energy. When struck on the nose of the device, the vehicle's kinetic energy is absorbed by the fender panels telescoping rearward and simultaneously shearing/tearing material in the valley's of the Thrie Beam. The cutout patterns in the valleys of the Thrie beam progressively change from the front to the rear to allow the errant vehicle to be safely brought to a controlled stop.



Delta Orientation



1 - Fender Panel 1N

2 - Fender Panel 2N

3 - Fender Panel 3N

4 - Fender Panel 45N

5 - Fender Panel 45N (*rear most panel*)



6 - Track

7 - Diaphragm

8 - Front Impact Head Diaphragm

9 - Front Attenuation Module

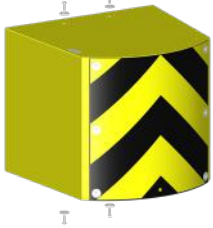
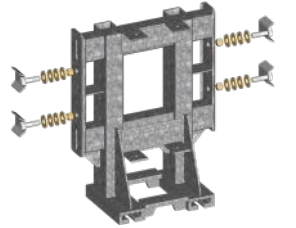
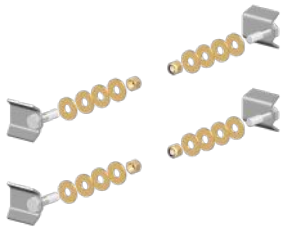

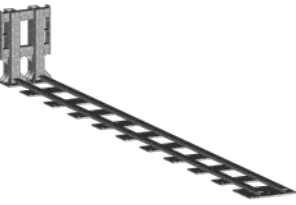


Tools Required

	<p>Lifting and moving equipment to safely lift 5000 lbs, either a fork lift, tractor or crane. Industrial Lifting Slings to safely lift 5000 lbs.</p>
	<p>3/8" Grade 70 or 80 Welded Chain with Hooks</p>
	<p>Rotary Drill: Bosch RH1255VC or Equivalent 1" Diameter Drill Bit, 12" Long for Rotary Drill Bit for Concrete 20" Long for Rotary Drill Bit for Asphalt</p>
	<p>Socket Wrench 7/16" Socket</p>
	<p>Impact Driver with 7/16" Socket 1-1/8" Socket Torque Wrench with 1-7/16" Socket</p>
	<p>7/16" Wrench 1-1/16" Ratchet Wrench Drill with philips head driver</p>



NOTE: The tool list provided is a general recommendation and should not be considered an all-inclusive list. Depending on specific site conditions and complexity of the installation or repair other tools may be required. Decision as to what tools are necessary to perform the job are the responsibility of the individuals or contractor conducting the installation specified by the road authority.

Delta Replacement Parts

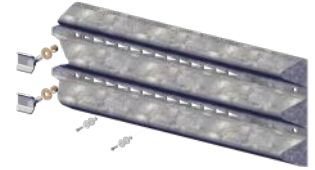
<u>Part No.</u>	<u>Description</u>	
75220-N-Y4	Front Attenuation Module Kit with Hardware, 4 Bolts (1/4"-20 x 1"), 4 Washers (1/4") and Object Marker with Hardware, 6 Bolts (1/4"-20 x 1") and 6 Washers (1/4")	
75230-N-KIT	Front Impact Diaphragm Kit, 1 Front Impact Head Diaphragm, 4 Wing Washers, 4 Nuts (3/4"-10) and 16 Washers (3/4")	
75230-HW-KIT	Front Impact Head Diaphragm Hardware Kit, 4 Wing Washers, 4 Nuts (3/4"-10) and 16 Washers (3/4")	
75240-N	Steel Diaphragm (9 per system)	
75250-TL3-N	Track Weldment	
75208-CA	Concrete Anchor Rod Assembly, 1 Anchor Rod (7/8"-9 x 8"), 1 Nut (7/8"-9) and 1 Washers (7/8") (39 per system)	
75218-AA	Asphalt Anchor Rod Assembly, 1 Anchor Rod (7/8"-9 x 18"), 1 Nut (7/8"-9) and 1 Washers (7/8") (39 per system)	

Part No.

Description

75260-TL3-1N-KIT

Fender Panel 1N, Kit with Hardware,
2 Wing Washers, 2 Lock Nuts (3/4"-10), 2 Washers (3/4"),
2 Sacrificial Bolts (1/4"-20 x 1-1/2"), 2 Lock Nuts (1/4"-20) and
4 Washers (1/4") (2 per system)



75260-TL3-2N-KIT

Fender Panel 2N, Kit with Hardware,
2 Wing Washers, 2 Lock Nuts (3/4"-10), 2 Washers (3/4"),
2 Sacrificial Bolts (1/4"-20 x 1-1/2"), 2 Lock Nuts (1/4"-20) and
4 Washers (1/4") (2 per system)



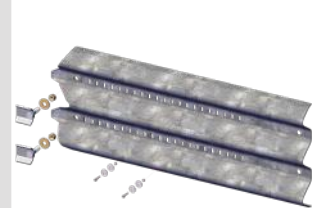
75260-TL3-3N-KIT

Fender Panel 3N, Kit with Hardware,
2 Wing Washers, 2 Lock Nuts (3/4"-10), 2 Washers (3/4"),
2 Sacrificial Bolts (1/4"-20 x 1-1/2"), 2 Lock Nuts (1/4"-20) and
4 Washers (1/4") (2 per system)



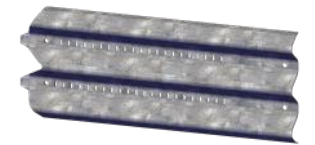
75260-TL3-45N-KIT

Fender Panel 45N, Kit with Hardware,
2 Wing Washers, 2 Lock Nuts (3/4"-10), 2 Washers (3/4"),
2 Sacrificial Bolts (1/4"-20 x 1-1/2"), 2 Lock Nuts (1/4"-20) and
4 Washers (1/4") (2 per system)



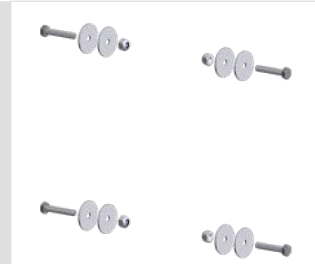
75260-TL3-45N

Fender Panel 45N



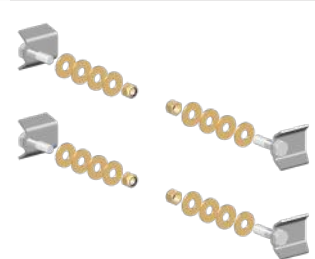
75240-HW-KIT

Floating Diaphragm Hardware Kit,
4 Bolts (1/4"-20 x 1-1/2"),
4 Nuts (1/4"-20) and 8 Washers (1/4") (5 kits per system)

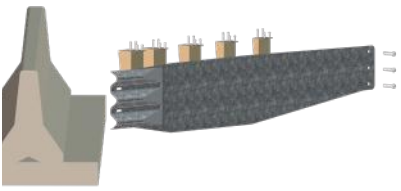


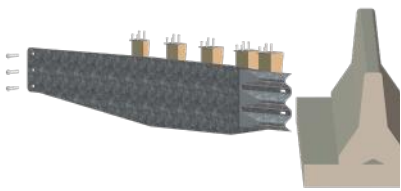


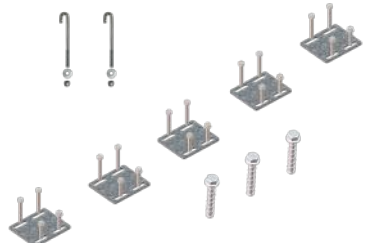


75250-HW-KIT

Rear Track Backup Weldment Hardware Kit,
4 Wing Washers, 4 Nuts (3/4"-10) and 16 Washers (3/4")



Transition Replacement Parts

<u>Part No.</u>	<u>Description</u>	
75270-RH-KIT	Right Transition Weldment Kit with Hardware, 3 Anchor Bolts (3/4"), 5 Blockout Holders, 10 Wooden Lag Bolts (3/8"), 10 Self-Tapping Screw (3/8"), 2 J-Bolt (8") and 2 Nylock Nuts (1/2"-13)	
	 <i>Wood Blocks NOT Included. Barrier NOT Included.</i>	
75270-RH	Right Transition Weldment	
75270-LH-KIT	Left Transition Weldment Kit with Hardware, 3 Anchor Bolts (3/4"), 5 Blockout Holders, 10 Wooden Lag Bolts (3/8"), 10 Self-Tapping Screw (3/8"), 2 J-Bolt (8") and 2 Nylock Nuts (1/2"-13)	
	 <i>Wood Blocks NOT Included. Barrier NOT Included.</i>	
75270-LH	Left Transition Weldment	
75270-HW-KIT	Transition Hardware, 3 Anchor Bolts (3/4"), 5 Blockout Holders, 10 Wooden Lag Bolts (3/8"), 10 Self-Tapping Screw (3/8"), 2 J-Bolt (8") and 2 Nylock Nuts (1/2"-13)	



NOTE: Wood Blocks NOT Included. Barrier NOT Included.



Frontal Compression Inspection:

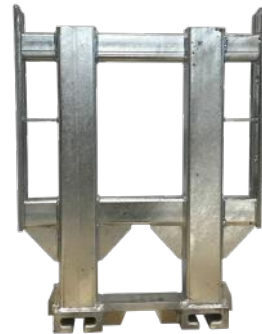
Step:1

Inspect Track



Step:2

Inspect Diaphragms



Step:3

Inspect Fender Panels



Step:4

**Inspect Hardware
(Wing Washers, Anchor
Bolts and Sacrificial
Bolts)**





Side Impact Inspection:

Step:1

Inspect Track



Step:2

Inspect Fender Panels



Step:3

Inspect Diaphragms



Step:4

Inspect Front Attenuation Module and Object Marker



Step:5

Inspect Hardware (Wing Washers, Anchor Bolts and Sacrificial Bolts)





Reverse Side Impact Inspection:

Step:1

Inspect Track



Step:2

Inspect Transition



Step:3

Inspect Fender Panels



Step:4

Inspect Diaphragms



Step:5

**Inspect Hardware
(Wing Washers, Anchor
Bolts, Sacrificial Bolts
and Wood Blocks)**



**NOTE: Wood Blocks
NOT Included.**

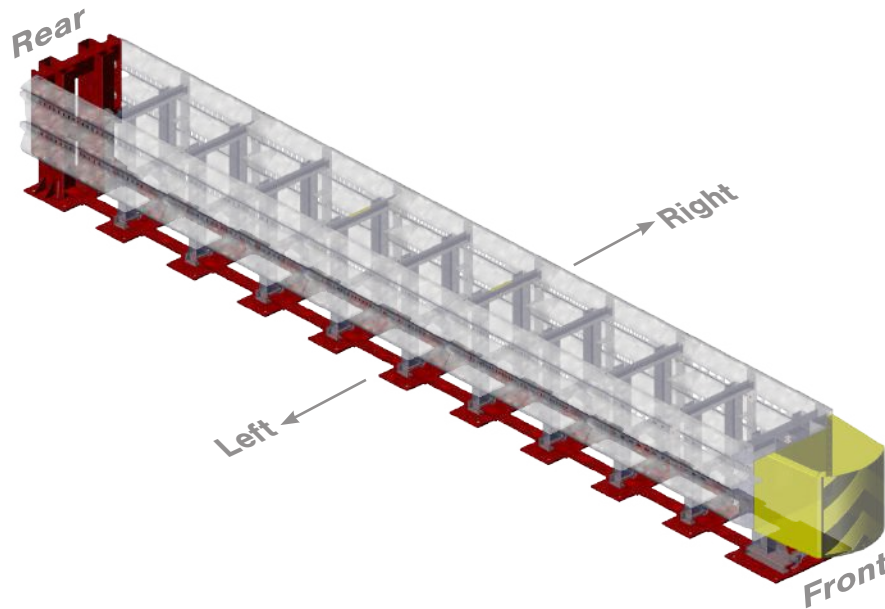
Section 1: Assessing Damaged Parts



Acceptable Sentinel must be in the following condition:

The Sentinel must not be broken, cracked or cut. Internal components must not be exposed. The enclosure cover must be sealed tight with all four (4) screws intact. Sentinel must be firmly secured to the Delta backup structure.

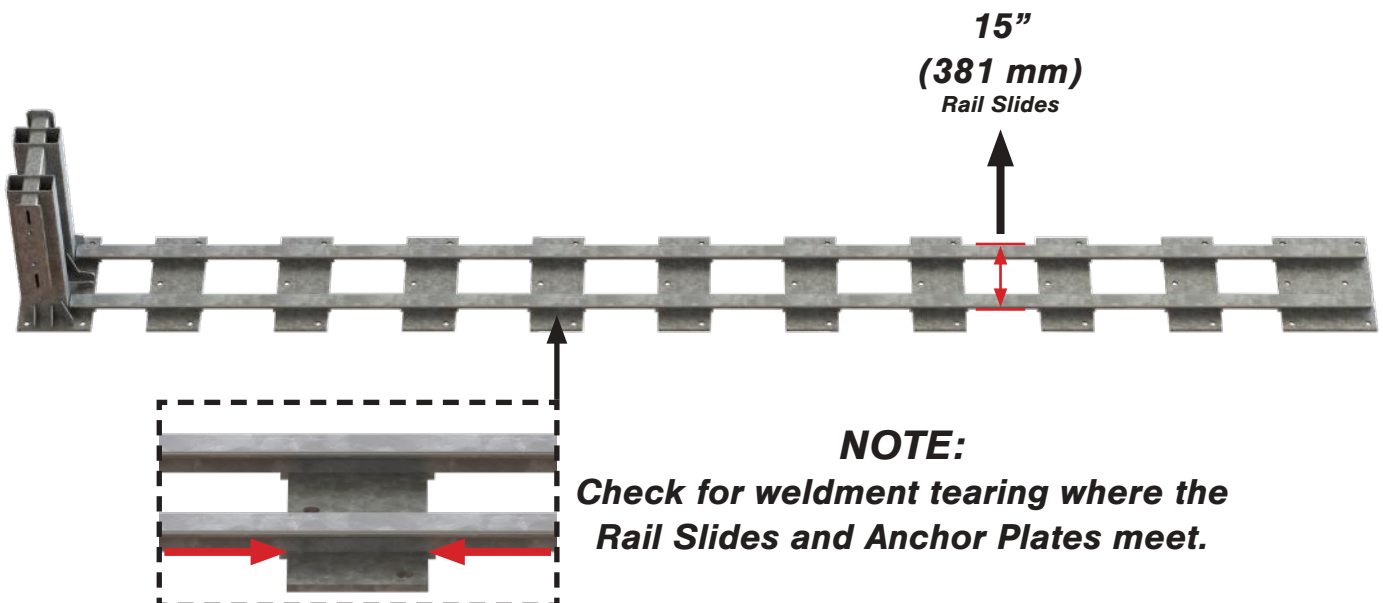
Track Weldment

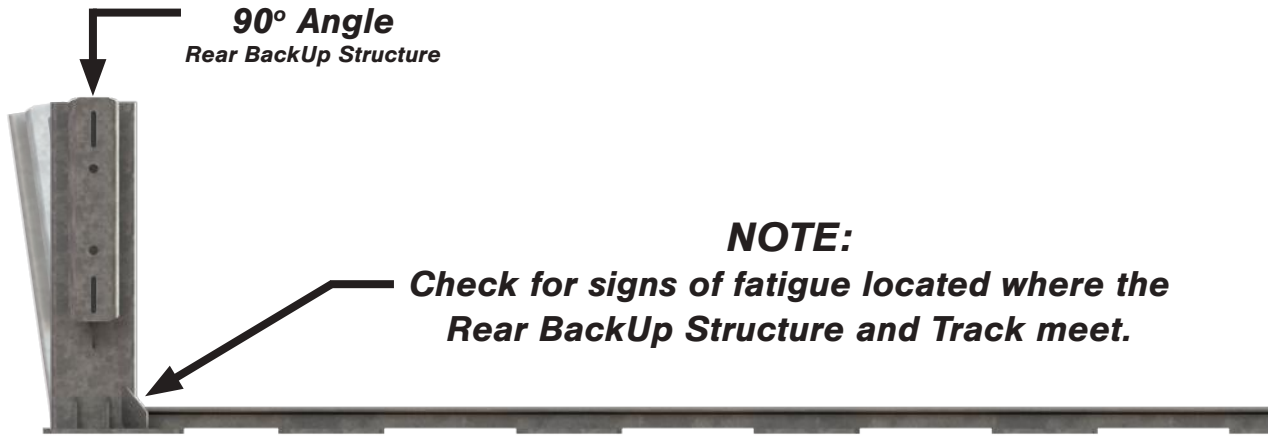


Track must be in the following condition:

Inspection of the Delta Track is key in determining the next steps in a repair. The Delta track is designed to withstand a test level 3 impact at 62 mph (100 km/h), an impact outside of these conditions could result in damage to the track. Any damage that violates the criteria in the following pages will require replacement of the Track.

Rail Slides: The width of the rail slides should be 15" \pm 3/8" (381 mm). The diaphragms must slide freely down the track without binding.

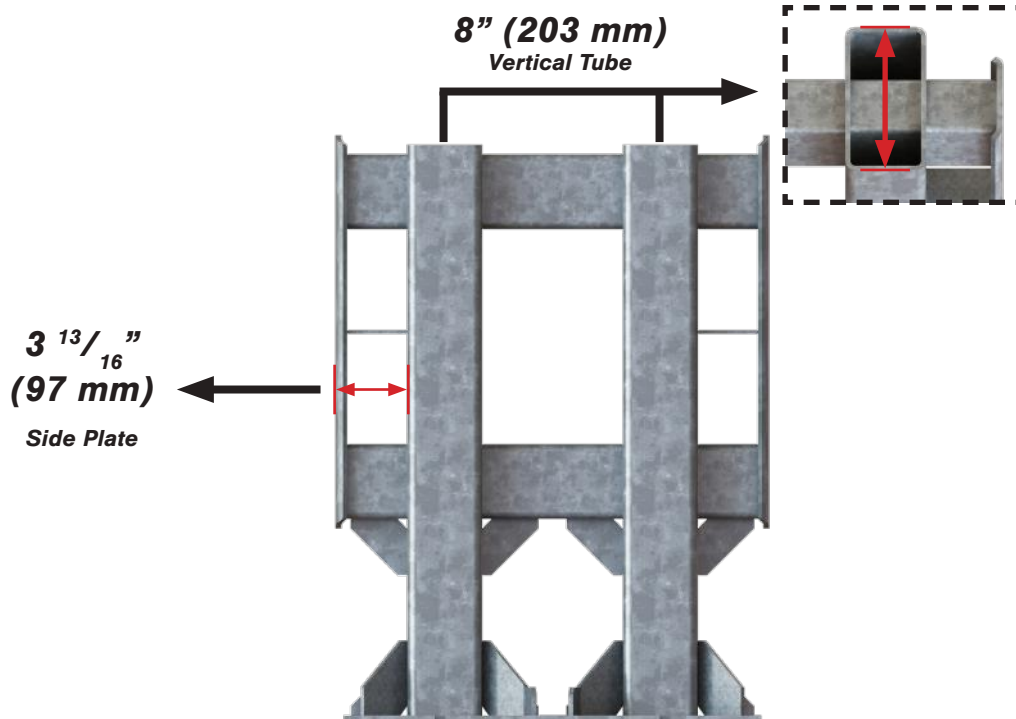




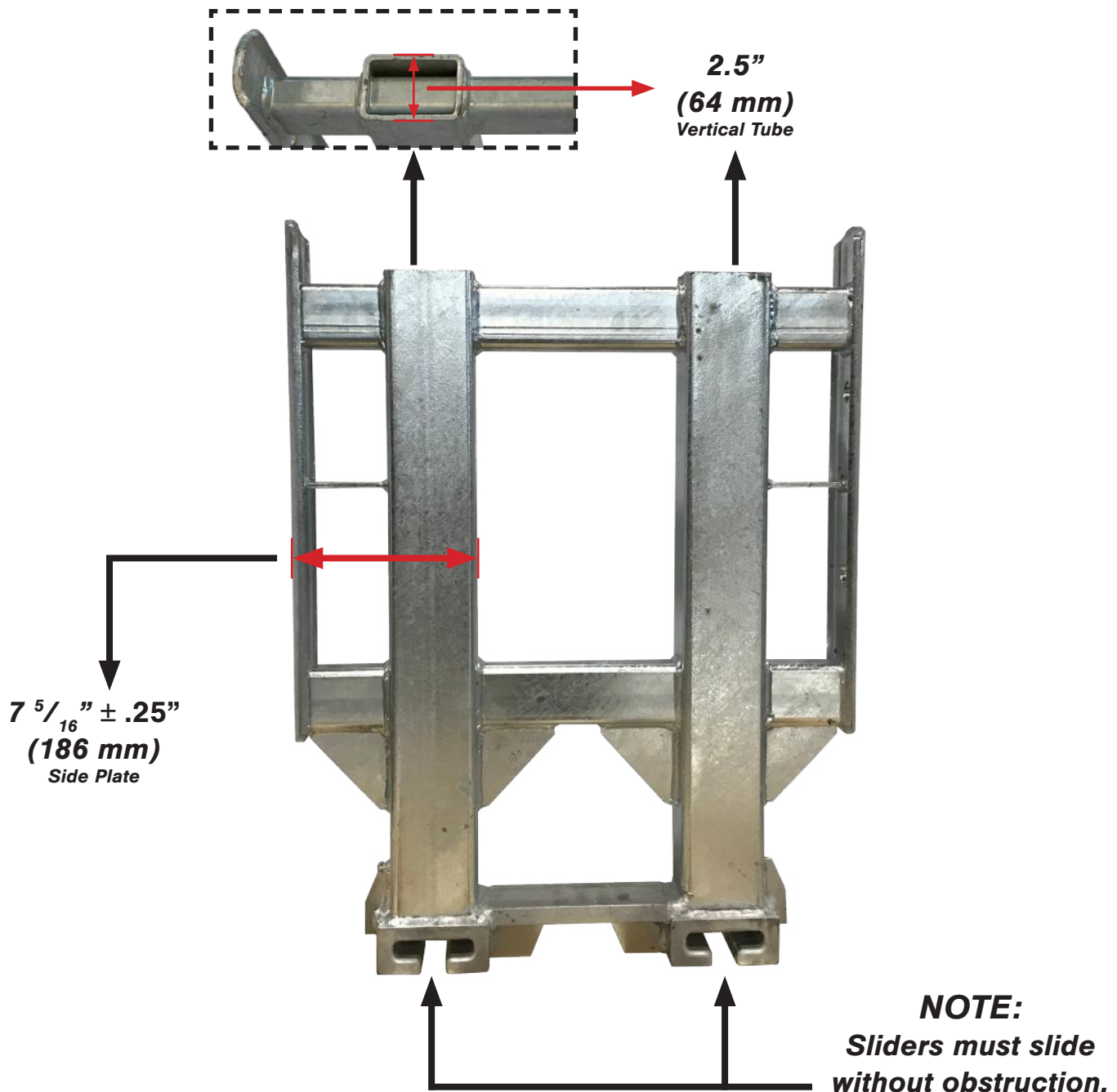
BackUp Structure Angle: The BackUp Structure must have a 90° vertical angle with an allowable 1" (25 mm) out of plumb. If the BackUp Structure exceeds 1" (25 mm) Track replacement is required.

Vertical Tubes: The vertical tubes must not be torn and have a length of 8" (203 mm) with total allowable deformation depth of .50" (13 mm). Total deformation depth that exceeds .50" (13 mm) or if tearing is present on the vertical tubes, replacement of the Track is necessary.

Side Plates: Measurements for side plates must be taken from the inner vertical tube (facing the side plates) to the outer side plate, as shown below. The total allowable deformation of the side plate is .25" (6 mm).

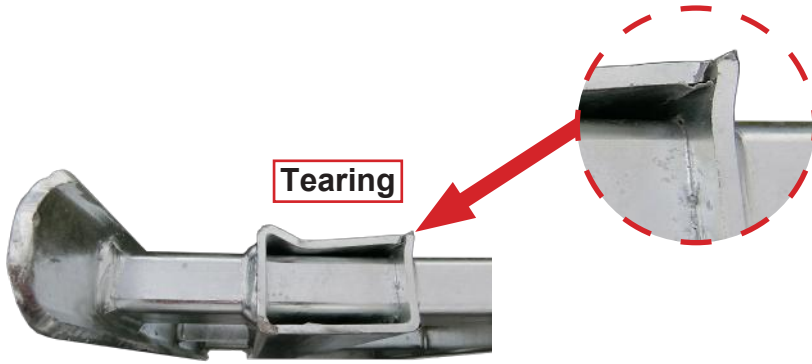


Diaphragms

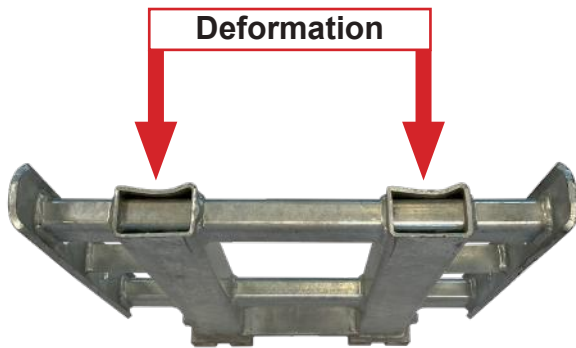


Acceptable Diaphragms must be in the following condition:

The vertical tubes must not be torn and have a length of 2.5" (64 mm) with total allowable deformation depth of .25" (6 mm). Side plates must be 7 5/16" ± .25" (186mm) and measured as above to determine if reusable after an impact. Sliders must have the capability of sliding onto the track without obstruction.

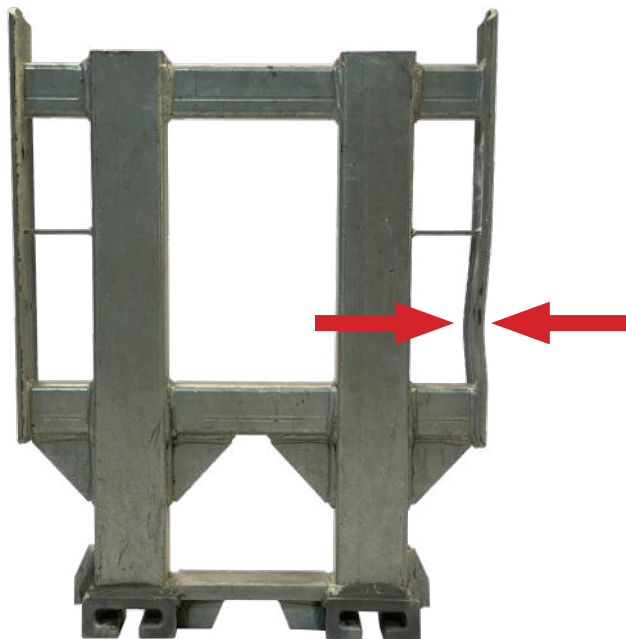


Damaged Diaphragm(s) that require replacement:



The Delta system has nine (9) galvanized steel diaphragms located between the Front Impact Head Diaphragm and the Back Up Structure. An impact that exceeds test level 3 criteria 62 mph (100 km/h) could cause potential damage to the vertical tubes or side plates.

When inspecting vertical tubes, key things to look for are deformation and tearing. Total deformation depth that exceeds .25" (6 mm) shall require replacement. If any tearing is present on the vertical tubes, replacement of the diaphragm(s) is necessary.

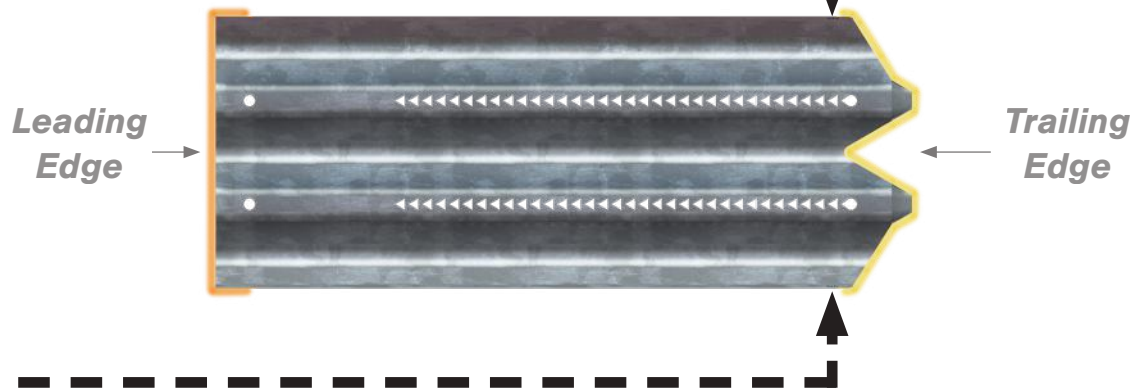


Inspecting the side plates of the diaphragms is crucial to the performance of the system. Total deformation depth that exceeds .25" (6 mm) shall require replacement.

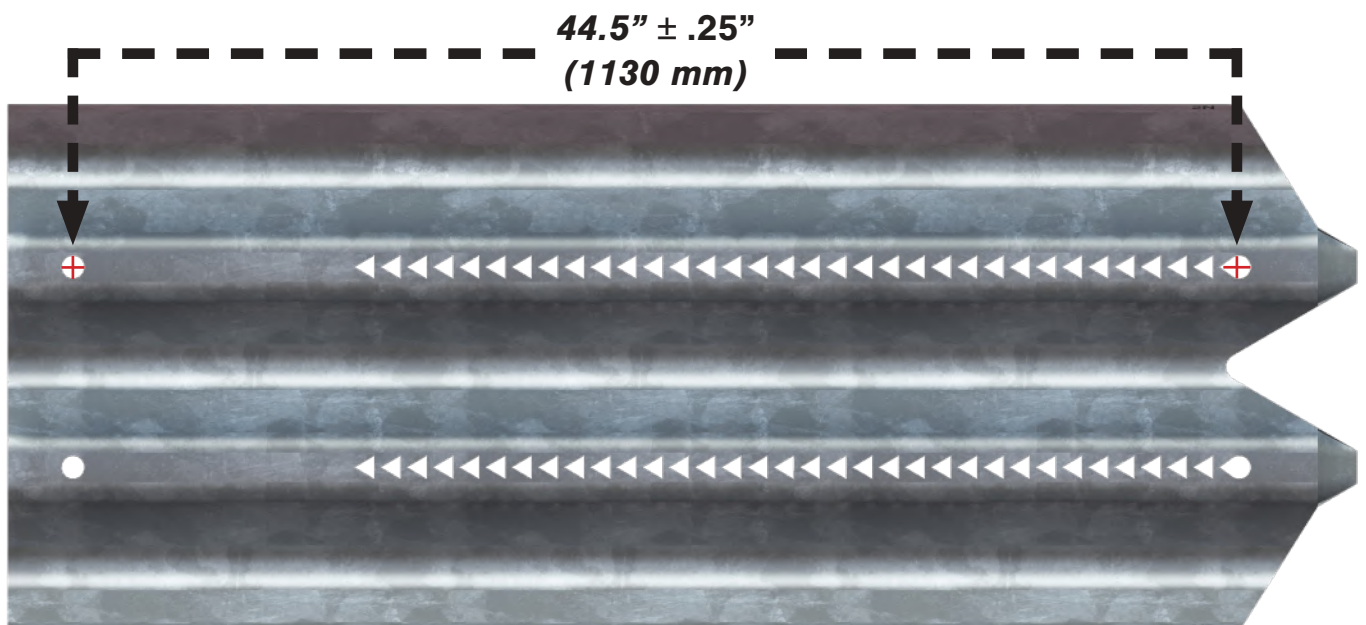
Fender Panels



NOTE:
The Fender Panels identification number is located on the trailing edge corner of each panel.

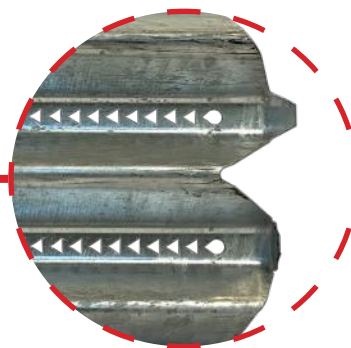


Acceptable Fender Panels must be in the following condition:
The pattern cutouts must all be undamaged, without tears or bulging. The trailing edge must not be bent or damaged. The panels must have a length of $44.5'' \pm .25''$ (1130 mm) measured from the center of the leading to trailing edge mounting location (as below).





Reverse Side Impact



Damaged Fender Panels that require replacement:



Side Impact

When inspecting fender panels, it is important to look for any deformation that would prevent proper telescoping, lapping or attenuation of the system. If deformation causes a gap at the lapping joint greater than .875" (22 mm) the fender panel should be replaced. The trailing edge ramps should also be in acceptable condition to ensure proper performance of the system. The panels should measure 44.5" (1130 mm) from the center of the leading edge mounting holes to the center of the trailing edge mounting holes.



Frontal Impact

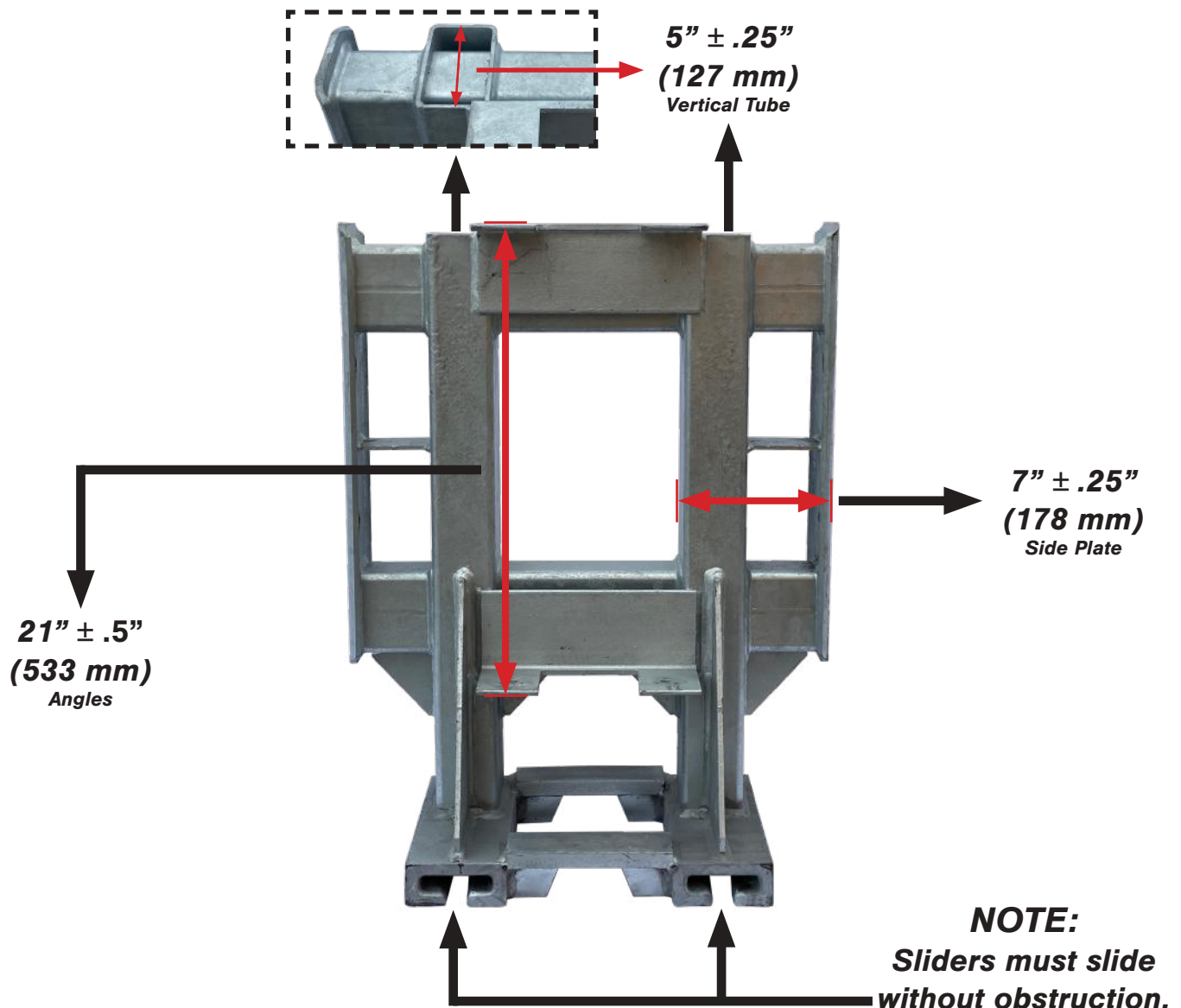
Inspecting the panels cutout pattern is crucial. Look for partially torn, fully torn and any bulging of the pattern cutout located in the wing washer area. If any tearing or bulging of the pattern cutouts is visible, fender panel(s) replacement is required.



Frontal Impact

Front Impact Head

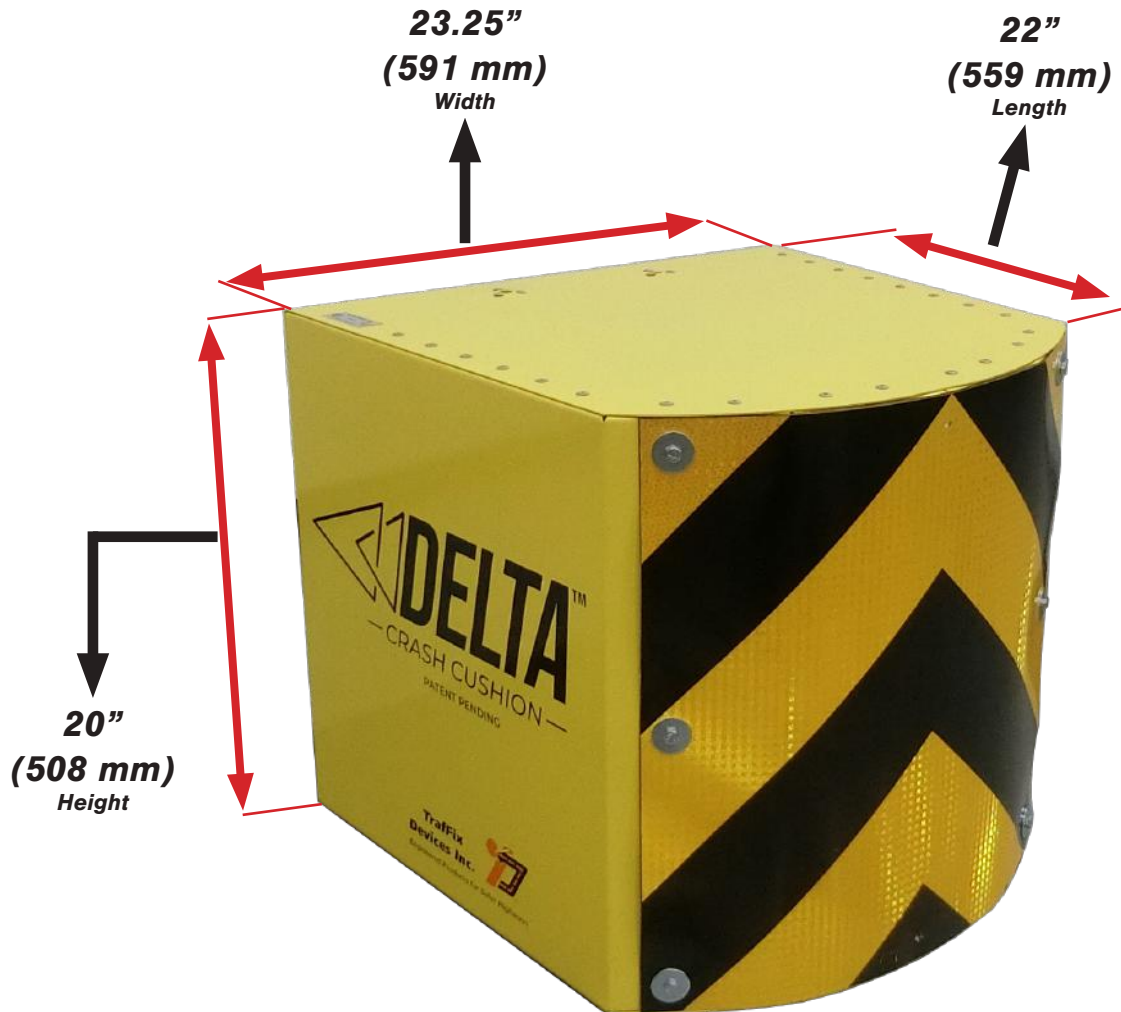
Diaphragm



Acceptable Front Impact Diaphragm must be in the following condition:

The vertical tubes must not show tearing and have a length of 5" (127 mm) with total allowable deformation depth of .25" (6 mm). Side plates must be $7'' \pm .25''$ (178mm) and measured as above to determine if reusable after an impact. The top and bottom angles used to mount the attenuation module should be spaced 21" (533 mm) apart with an allowable deformation limit of $\pm .5''$. Sliders must have the capability of sliding onto the track without obstruction.

Front Attenuation Module



Acceptable Front Attenuation Module must be in the following condition:

The front attenuation module must not be torn. Honeycomb located inside the front attenuation module must not be exposed. The curved section can be dented, as long as delineation panel (object marker) can be mounted.

Delta Hardware **Wing Washers**

The Delta ICC contains 24 wing washers. The wing washer hardware consist of (1) wing washer, (1) washer *Front Impact Head and BackUp Structure Require (4) washers and (1) nut. Wing washers must not be loose, worn, rusted or damaged. If wing washers have become loose, tighten to have 4 threads visible or approximately .5" (13 mm). Any damaged wing washers must be replaced.

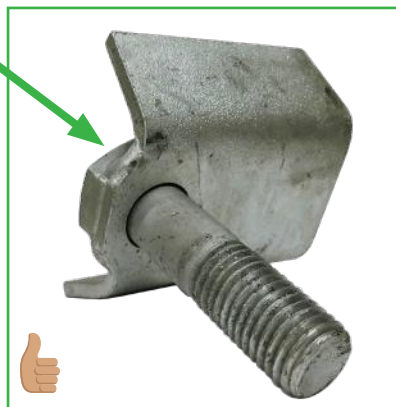
Leading
Edge →



← Trailing
Edge

NOTE:

When installing Wing Washers the trailing edge must face the rear end of the system.



Anchor Bolts

The Delta system consist of 39 anchor bolts. Each anchor bolt assembly consist of (1) bolt, (1) washer and (1) nut. Anchor bolt(s) must hold the proper torque. They must not be bent, cracked or rusted. If any of these conditions apply the anchor bolt must be replaced.

Asphalt
10 ft-lbs (14 Nm)

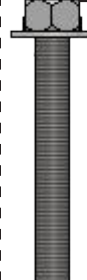


Concrete
100 ft-lbs (135 Nm)



MAX

.5 in (13 mm)

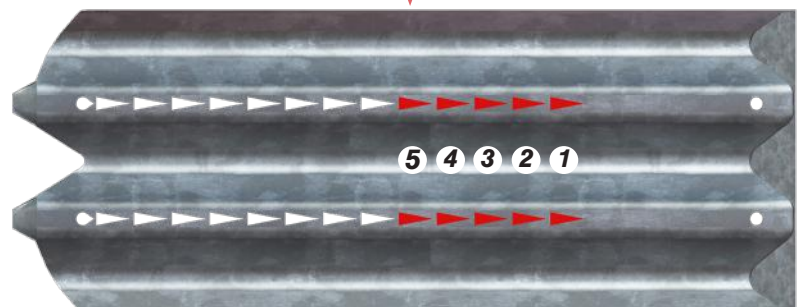
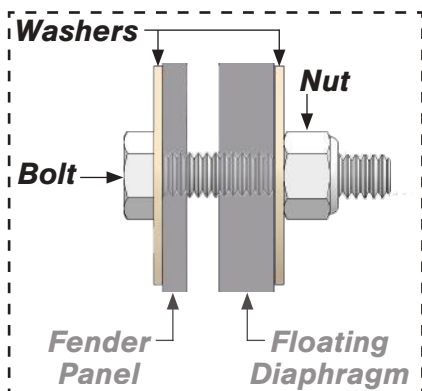
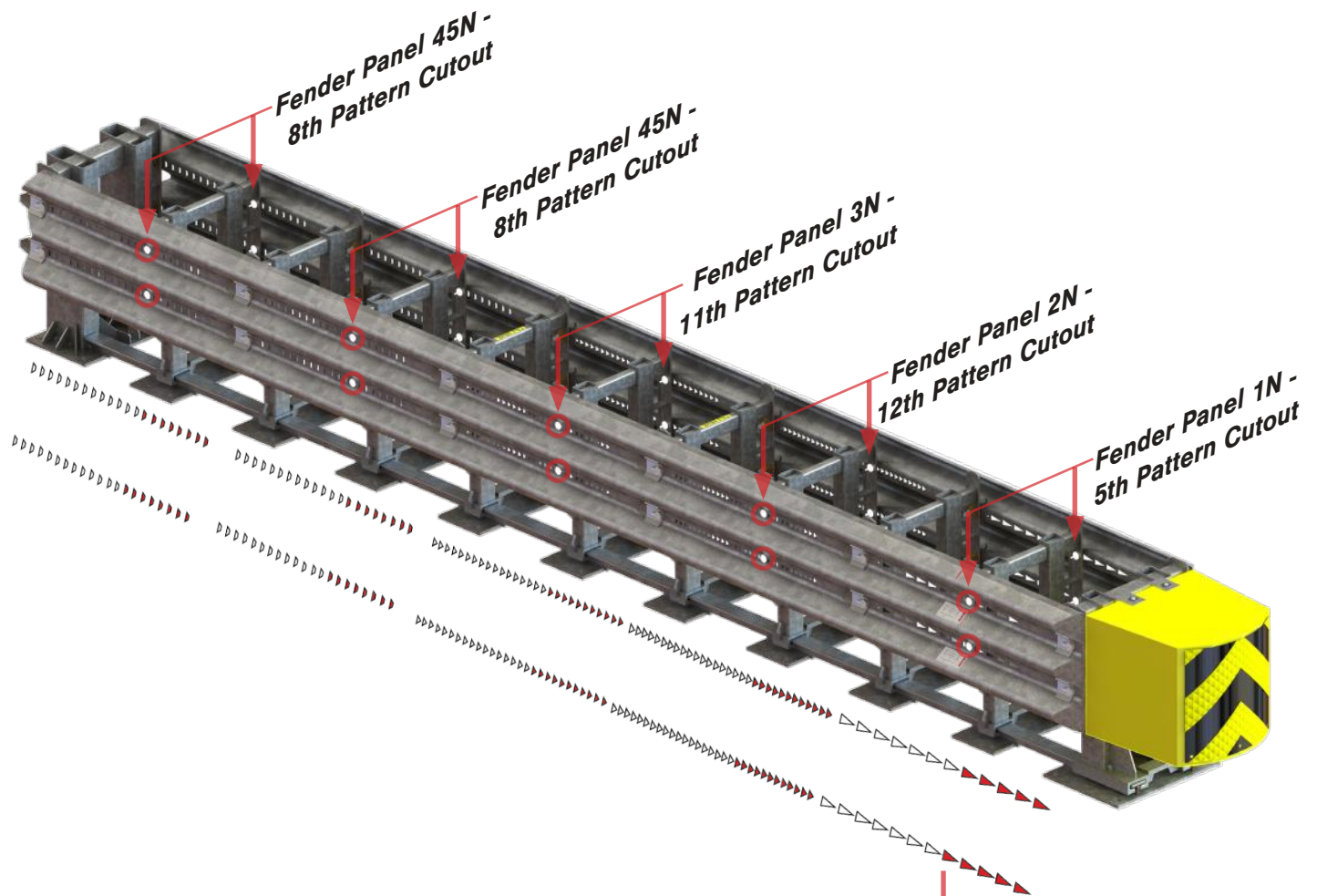


NOTE:

Anchor bolt shall not exceed .5 in (13 mm) past the anchor nut on all 39 anchor bolt assemblies.

Sacrificial Hardware

The Delta system consist of 20 sacrificial bolts. The sacrificial bolts secure the floating diaphragms in place. Inspect the system for any loose, missing or damaged bolts. The sacrificial hardware assembly consists of (1) bolt, (2) washers, and (1) nut. If bolts have become loose, tighten bolts so that the diaphragm is centered between the fender panels and the washers do not rotate freely. For missing or damaged bolts, replacement is necessary. For correct placement of the sacrificial bolts, space floating diaphragms 22.25" (565 mm) on centers or refer to the fender panel pattern cutout (shown below). *Detailed illustration Pg.50.*



Transition

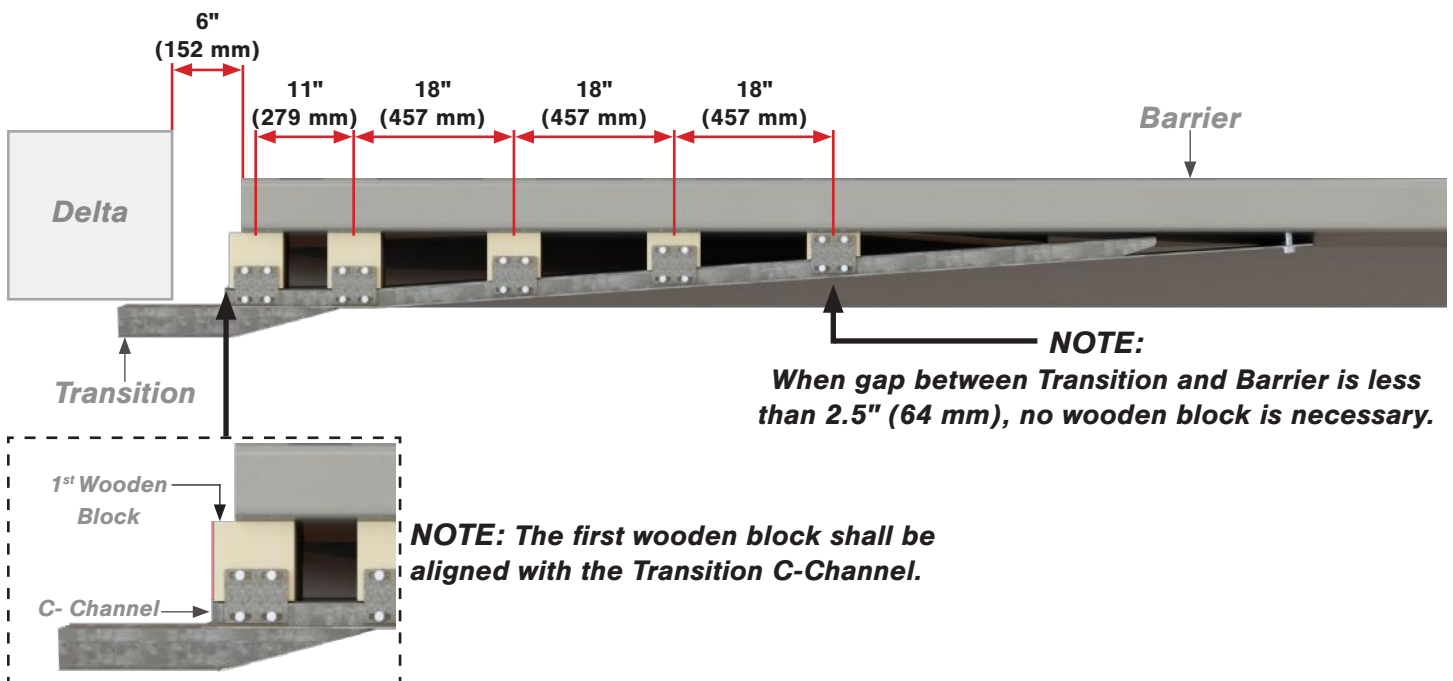
NOTE:

Check for any fatigue on Weldment.



Acceptable Transition must be in the following condition:

The Thrie beam (leading edge) shall not be torn or show deformation that would prevent proper telescoping of the fender panels. There shall be no deformation that would create a gap between the fender panel (45N) and transition panel that exceeds .875" (22 mm). The weldment must not show fatigue at welded areas. Anchor bolts must be tightened so the trailing edge of the transition panel is flush with the barrier.



Transition Hardware

3/4" Hilti Anchor Bolt

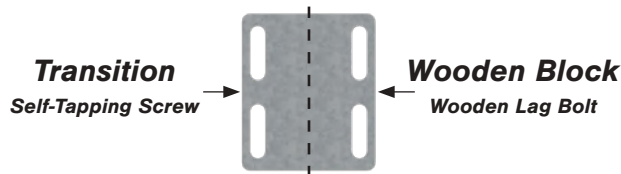


The trailing edge of the Delta Transition requires three (3) anchor bolts. The anchor bolts secure the transition to barrier. Anchor bolts must be tightened so the trailing edge of the transition is flush with the barrier.

Blockout Holder



The Delta Transition requires each wooden block to have a blockout holder. The blockout holder prevents the wood blocks from shifting.



3/8" Self-Tapping Screw

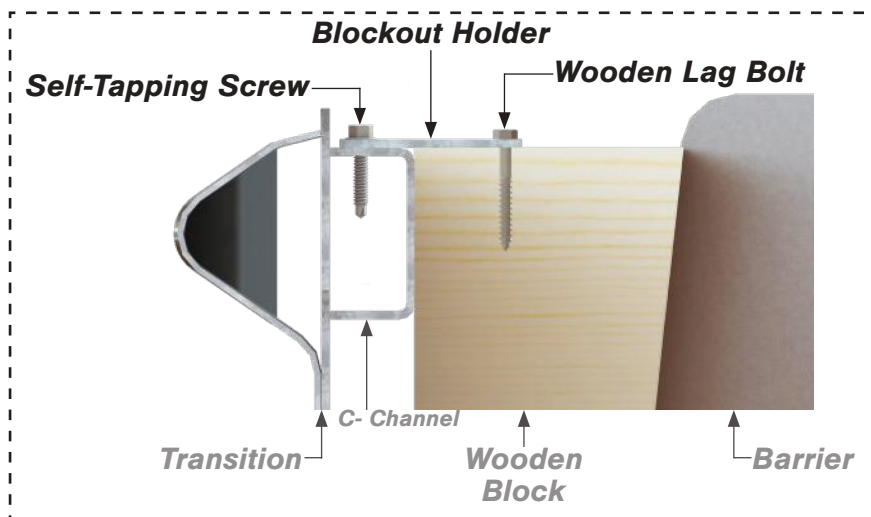


The self-tapping steel screws are drilled into the C-Channel of the transition. Each blockout holder requires two (2) self-tapping screws. For correct placement of self-tapping screws refer to the image below.

3/8" Wooden Lag Bolt



The wooden lag bolts are drilled into the wooden block(s). Each blockout holder requires two (2) wooden lag bolts. For correct placement of wooden lag bolts refer to the image below.



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Section 2: Removing Damaged Parts

Side Impact

Removing damaged Fender Panels from a side impact.



1. Identify the damaged fender panels and loosen all wing washers that are securing those panels in place.



2. Starting with the forward-most damaged fender panel loosen and remove the leading and trailing edge wing washer hardware and remove fender panel.

NOTE: When removing damaged fender panels always inspect diaphragms for any damage.



3. Moving rearward on the system begin loosening the next damaged fender panel. This panel will only be supported by the trailing edge wing washers so the leading edge must be supported. Remove the wing washer hardware and remove fender panel.

NOTE: Repeat steps 1-3 for any remaining damaged panels.



NOTE: If any diaphragms have damage outside of the acceptable range, proceed onto Step 4.

If the diaphragms are not damaged, move onto Section 3 for Installation of New Parts.

4. Loosen the bolts securing the Front Attenuation Module to the Front Impact Head Diaphragm. Start by removing the bottom two (2) bolts and then remove the top two (2) bolts. Lift the Front Attenuation Module out of position.

NOTE: Place and keep Front Attenuation Module and hardware in safe area.



5. In order to remove damaged diaphragms, the non-impacted side fender panels must be removed. Follow steps 1-3 for the panels on the opposite side (the undamaged panels). Remove panels far back enough to reach damaged diaphragm(s).



6. Slide and remove the Front Impact Head Diaphragm off the track.

NOTE: Place and keep Front Impact Head Diaphragm in safe area.



7. Slide and remove the diaphragms off the track, until damaged diaphragm has been reached and removed.

NOTE: Place and keep Diaphragm(s) in safe area.



8. Once all damaged fender panels and diaphragms have been removed they shall be recycled.



NOTE: Refer to Page 8 for dismantling and recycling instructions.

Frontal Compression

Removing damaged Attenuation Module and Fender Panels from a front impact.



1. Loosen and remove the wing washers from the rear most damaged fender panel. This will detach all damage fender panels from the track.



2. Remove any debris from the track. Loop chain around Front Impact Head Diaphragm, pull the damaged panels and diaphragms forward off the track.



3. Once the damaged components are off the track, remove chain looped around Front Impact Head Diaphragm. Insert the forklift blade through the center of the diaphragms. Pick up and put onto truck.



NOTE: Caution floating diaphragms may fall when lifted. Refer to Page 8 for dismantling and recycling instructions.



NOTE: STAY OUT FROM UNDER SUSPENDED LOADS.

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Section 3: Installing New Parts

System Rebuild





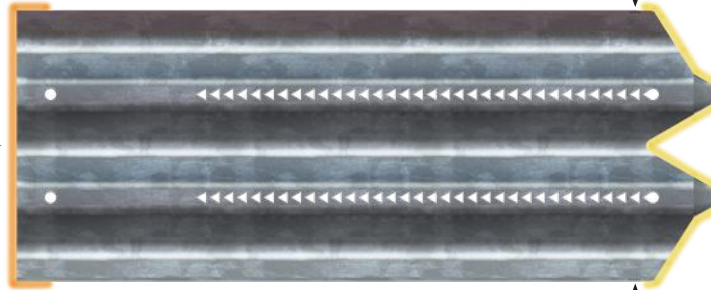
Attention! Read and Understand.



NOTE:

The Fender Panels identification number is located on the trailing edge corner of each panel.

Leading Edge →



← Trailing Edge

NOTE:

When installing Fender Panels the trailing edge of the panels must face the rear end of the system.

NOTE:

When installing the Fender Panels, every other diaphragm will be secured with wing washers. The unsecured floating diaphragms will be secured in a later step.



Correct



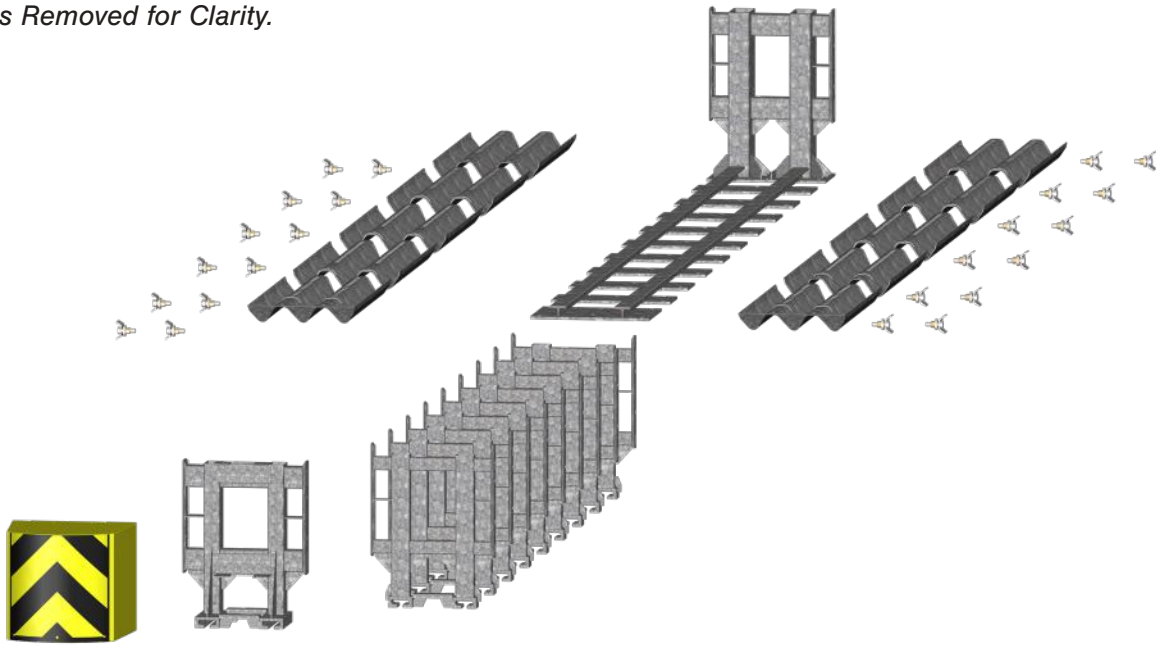
NOTE:

Wing Washers must be installed with the long end facing the rear end of the system.

Incorrect



Components Removed for Clarity.



1. Lay parts in order to make installation fast and easy.

You must have the following parts:

- 1 - Track**
- 9 - Diaphragms**
- 1 - Front Impact Head Diaphragm (4 Wing Washers & 16 Washers)**
- 4 - Fender Panel 45N**
- 2 - Fender Panel 3N**
- 2 - Fender Panel 2N**
- 2 - Fender Panel 1N**
- 1 - Front Attenuation Module**
- 24 - Wing Washers (48 Washers & 24 Nuts)**
- 20 - Floating Diaphragm Bolts (40 Washers & 20 Nuts)**

2. Slide nine (9) diaphragms onto track with diaphragms spaced 22.25" ± 1" (565 mm). Front Impact Head Diaphragm goes on last (this holds the Front Attenuation Module).

NOTE: DO NOT INSTALL Front Attenuation Module, this will be a later step.



3. Fender panels must be lapped under one another starting from the rear of the system.



3A. Place Fender Panel 45N into position with the trailing edge facing the rear end of the system. Insert wing washer and install four (4) washers and one (1) nut to the trailing edge of the panel. Do not fully tighten hardware at this time.



3B. Lift and align the loose leading edge holes of panel 45N to the trailing edge holes of the next panel 45N, this will lap one end of the two panels. Insert wing washer and install one (1) washer and one (1) nut to the trailing edge of the panel. Do not fully tighten hardware at this time.



NOTE: This will hold the first panel in position.



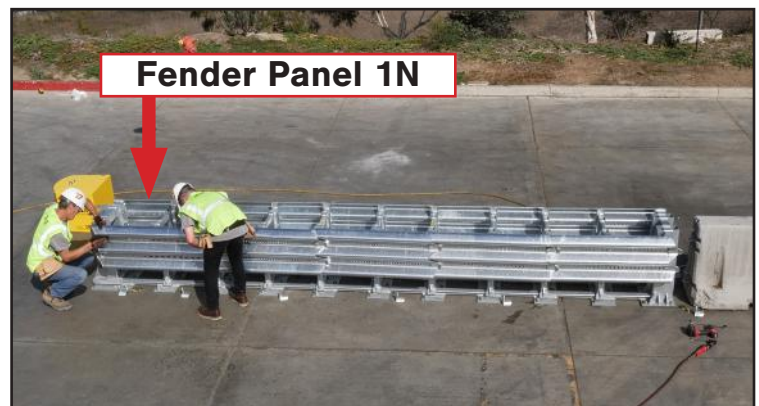
3C. Lift and align the loose leading edge holes of panel 45N to the trailing edge holes of panel 3N, this will lap one end of the two panels. Insert wing washer and install one (1) washer and one (1) nut to the trailing edge of the panel. Do not fully tighten hardware at this time.



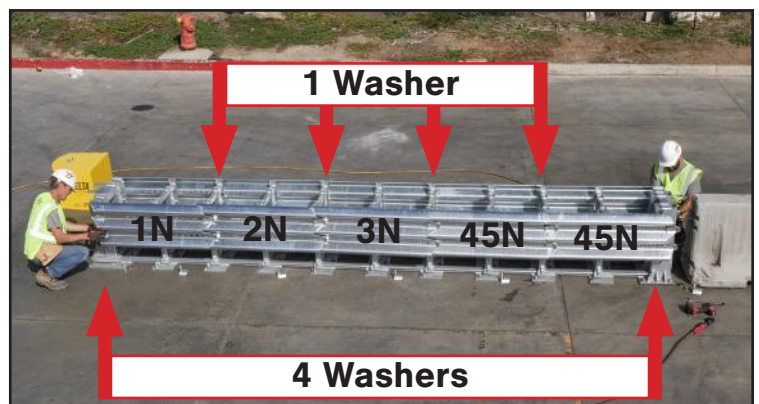
3D. Lift and align the loose leading edge holes of panel 3N to the trailing edge holes of panel 2N, this will lap one end of the two panels. Insert wing washer and install one (1) washer and one (1) nut to the trailing edge of the panel. Do not fully tighten hardware at this time.



3E. Lift and align the loose leading edge holes of panel 2N to the trailing edge holes of panel 1N, this will lap one end of the two panels. Insert wing washer and install one (1) washer and one (1) nut to the trailing edge of the panel. Insert wing washer into the leading edge of the panel and through the impact head diaphragm mounting holes. Install four (4) washers and (1) one nut onto each wing washer, do not fully tighten hardware at this time.



4. Once all Fender Panels are in place, and wing washers have been installed correctly. Before tightening verify correct washer configuration.

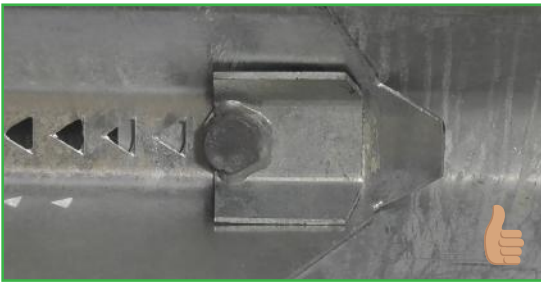


4A. Once washer configuration and wing washer orientation has been verified and inspected the hardware is ready to be tightened. Tighten wing washers to have 4 threads visible or approx. 1/2" (13 mm) protruding past the end of the nut.

NOTE: DO NOT Over Tighten.



Correct

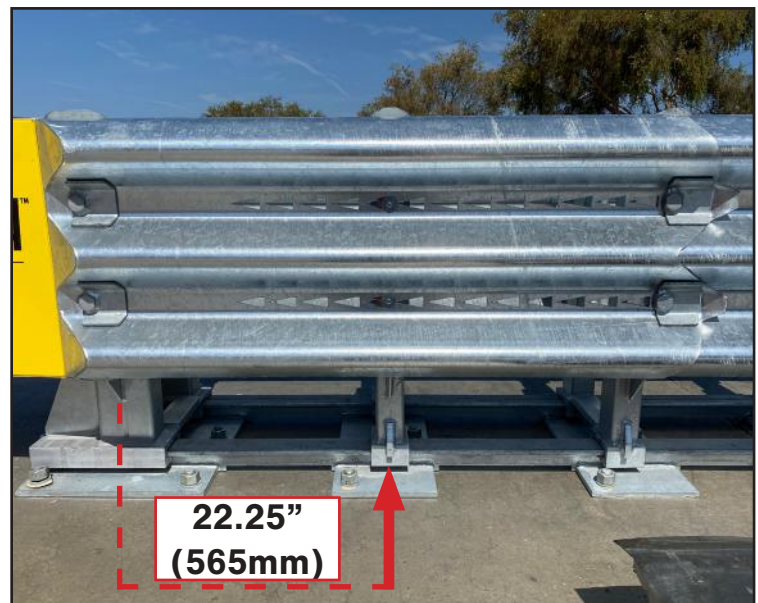


NOTE:
Wing Washers must be installed with the long end facing the rear end of the system.

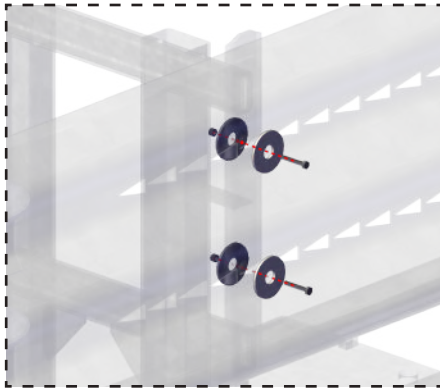
Incorrect



5. Once all wing washers have been tightened. The five (5) floating diaphragms are located between the diaphragms secured with wing washers. Position floating diaphragms to be spaced 22.25" ± 1" (565mm) from the secured diaphragms.



6. The sacrificial hardware assembly consists of one (1) bolt, two (2) washers, and one (1) nut. Each floating diaphragm requires two assemblies per side. Tighten bolts so that the diaphragm is centered between the fender panels and the washers do not rotate freely.



NOTE: Still unsure about the placement of the floating diaphragms? You can align diaphragms with fender panel cutouts. As shown below.

Fender Panel 1N - 5th Pattern Cutout



Fender Panel 2N - 12th Pattern Cutout



Fender Panel 3N - 11th Pattern Cutout



Fender Panel 45N - 8th Pattern Cutout



Fender Panel 45N - 8th Pattern Cutout

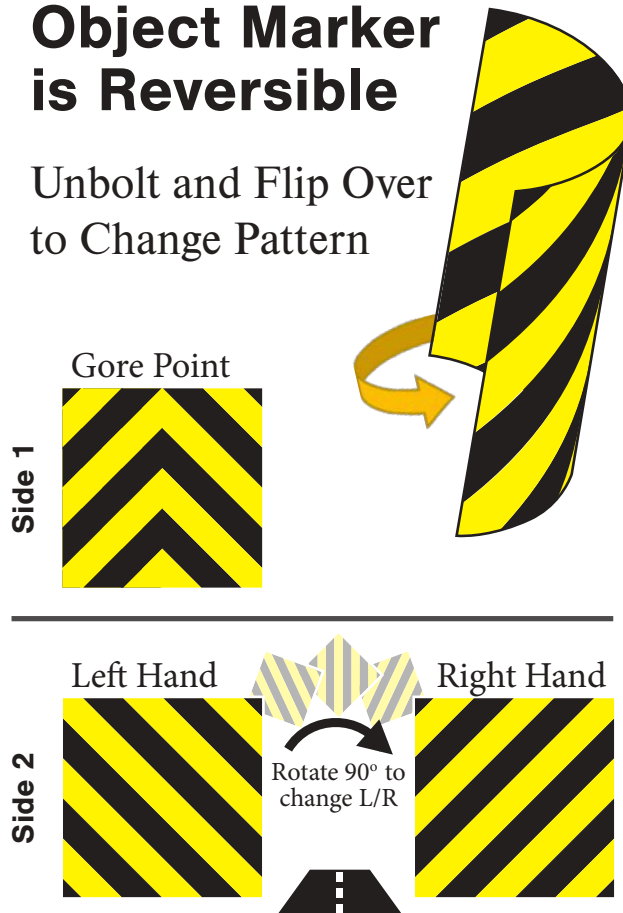


7. Lift the Front Attenuation Module into position by aligning the back openings with the Front Impact Head Diaphragm gussets. Once in position, secure (4) bolts and (1) washer per bolt, on top of the module and under the module.



Object Marker is Reversible

Unbolt and Flip Over to Change Pattern

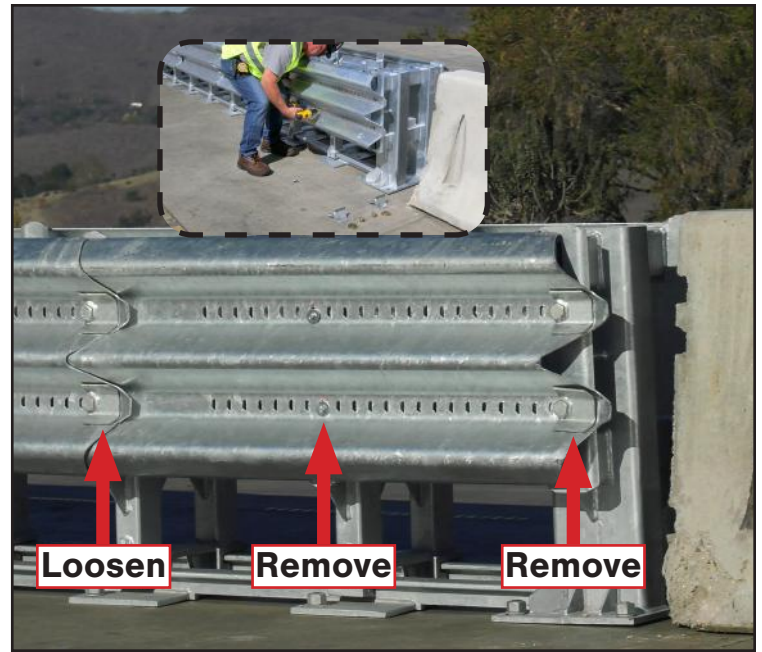


The nose sheeting has been provided as a way to easily customize field use. The diagonal stripes used on the Left Hand Traffic Flow can be rotated 90 degrees for Right Hand Traffic Flow. Turn the sheeting over and it is used for Gore Point Traffic Flow. To determine the correct nose sheeting side follow state regulations and installation location. Once the direction is determined, secure the sheeting to the front attenuation module with supplied screws using a 7/16" socket.

Transition Installation



1. Remove rear wing washers, washers and nuts from rear fender panel (45N). Remove sacrificial hardware. Loosen nuts from wing washers. Once the hardware on fender panel (45N) has been removed, pull the panel outward.



2. Attach lifting strap to the J-Bolts located on the top of the transition. Lift Transition into alignment with the Delta's rear fender panel (45N). The transition must be lapped under fender panel (45N)



3. Once transition is lapped under and is in alignment with rear fender panel (45N) insert wing washers to hold transition in place. Proceed to install and tighten wing washers and sacrificial hardware from Step 1.

NOTE: Remove lifting strap and J-Bolts from the transition.



4. Mark drill bit to the length of the anchor bolt.



5. Use the 3 trailing edge holes of the transition as a drilling template. Drill holes to a depth of 5" (127 mm) with a rotary hammer drill and a 3/4" drill bit.

NOTE: Clean the holes after drilling.

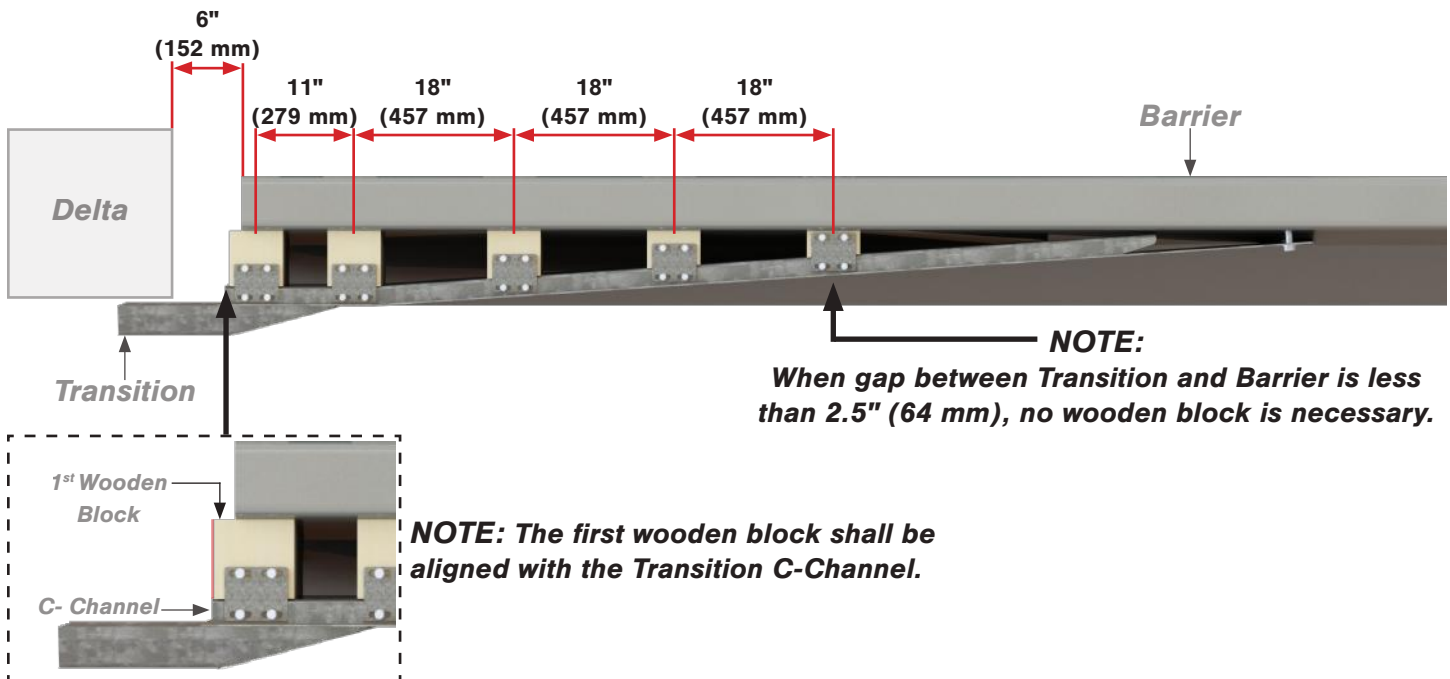


6. Install the mechanical anchor bolts with an impact wrench and 1-1/8" socket. Tighten anchor bolts until the trailing edge of the transition is flush with the barrier.

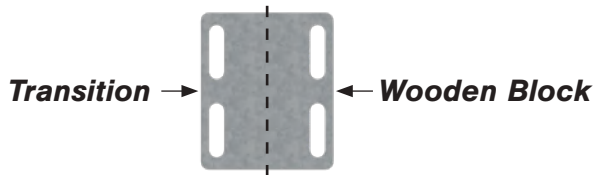


7. The leading blockout is to be aligned with the C-channel on the back side of the transition panel. A standard blockout is 6" (150 mm) wide so the center of the first block will be 3" (75 mm) from the leading edge of the C-channel. Once the center of the first block has been determined use the dimensions below to locate the center of the remaining blocks. Mark the center location of each block on the C-channel.

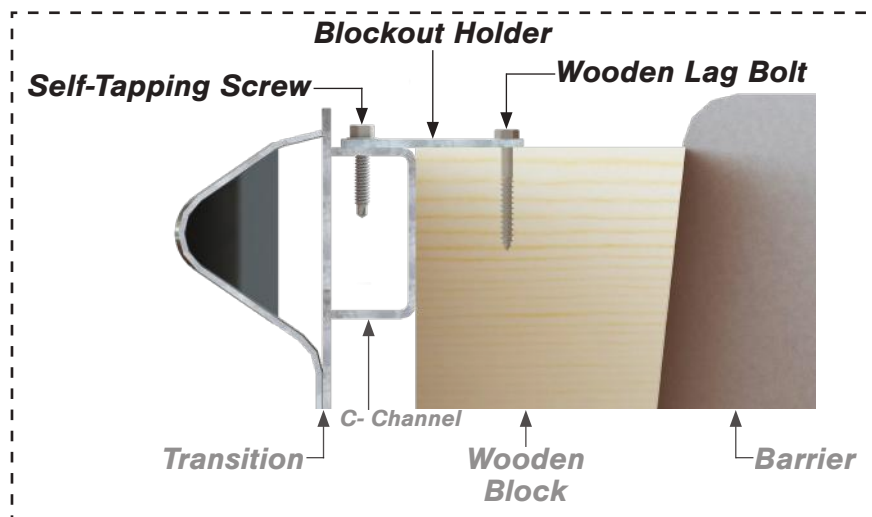
7A. Once the center of the blocks have been located measure the top and bottom opening from the C-channel to the barrier. This will determine the angle of the cut when field trimming blocks. Mark each block with the top and bottom opening dimension and field trim blocks.



8. Place a blockout holder on each wooden block. Center the blockout holders on the wooden blocks with the long edge parallel to the barrier. Use the blockout holder as a drilling template to pre drill pilot holes in the transitions C-Channel and the wooden blocks.



9. Insert the self-tapping screws and wooden lag bolts, tighten with an impact driver to secure the blockout holder plate.



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Serial Number

Date of Installation: _____

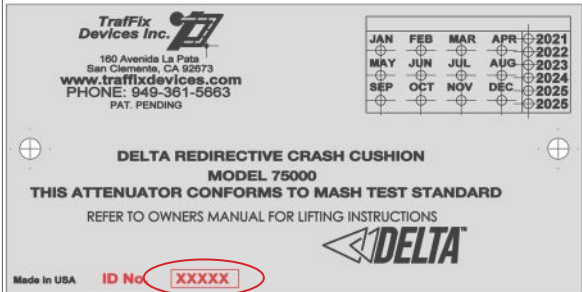
Location: _____

Condition of Delta: _____



The image shows a rectangular label for a Front Attenuation Module. It features the TrafFix Devices Inc. logo at the top left. Below the logo, the text "SN" is followed by a box containing "DXXXXX", which is circled in red. At the bottom, it says "Serialized Component".

Front Attenuation Module Serial Number:



The image shows a label for a Delta Redirective Crash Cushion. It includes the TrafFix Devices Inc. logo and contact information: "160 Avenida La Pata San Clemente, CA 92673 www.traffixdevices.com PHONE: 949-361-5663 PAT. PENDING". A calendar grid shows months from JAN to DEC for years 2021 to 2025. Below the grid, it reads "DELTA REDIRECTIVE CRASH CUSHION MODEL 75000 THIS ATTENUATOR CONFORMS TO MASH TEST STANDARD REFER TO OWNERS MANUAL FOR LIFTING INSTRUCTIONS". At the bottom left, it says "Made in USA ID No. XXXXX" with "XXXXX" circled in red. The Delta logo is at the bottom right.


Track Serial Number:



The image shows a rectangular device labeled "Sentinel IMPACT TRACKER". It has a QR code and a "Serial Number" field circled in red. The device also displays the website "www.traffixdevices.com (949) 361-5663" and FCC/IC compliance information.

Sentinel Serial Number:

Inspection Checklist

<u>Items to Inspect</u>	
39 Anchor Bolts are Installed	
39 Anchor Bolts Do Not Exceed .5 in (13 mm) Past Anchor Nut	
39 Anchor Bolts are Properly Torqued. Concrete Installations 100 ft- lbs (135 Nm). Asphalt Installations 10 ft-lbs (14 Nm)	
All Diaphragms are Spaced 22.25" ± 1" If Spacing Falls out of Spec the Diaphragms with the Sacrificial Hardware shall be Adjusted.	
Rear Fender Panels can Telescope Rearward 35" (889 mm) without Obstruction	
All Wing Washers are the Correct Orientation	
Check all Factory Hardware	
Front Attenuation Module is Installed with 4 Fasteners	
Front Attenuation Module has Proper Sheeting for the Site	
All Tools and Debris are Cleared from Delta	
Serial Numbers have been Documented	

Inspected By: _____

Contact Information: _____ **Date:** _____

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