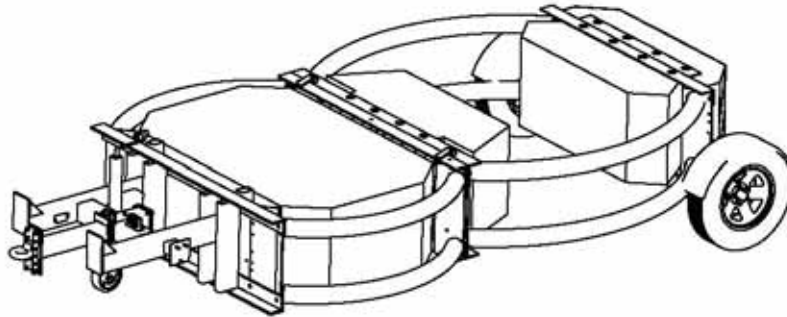
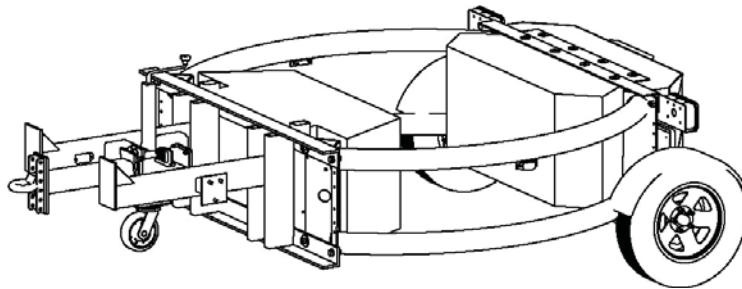


# Scorpion Trailer Attenuator Installation, Maintenance, and Repair Manual



10002-TL3-12TA



10002-TL2-12TA

**TraFFix**  
**Devices Inc.** 

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PN 13192 Rev A 04/02/09



## **Safety Instructions**

### **Scorpion Trailer Attenuator (TA)**

- A. Before attempting to install or operate the Scorpion 10002 TA this manual should be read and understood. Those areas with warnings or cautions should be carefully followed.
- B. Before operation on the roadway, check all fasteners between the TARS, Strut and Cartridge areas for tightness and excessive wear.
- C. Check lug nuts for proper torque values to 75 ft-lbs.
- D. Check that the single crank jack is fully retracted and up in the locked pinned position before transport.
- E. Inspect all lights for proper function.
- F. For correct TA operation in the use mode, the entire TA should be  $12" \pm 1"$  [30.48cm  $\pm$  2.54] cm above the ground and horizontal to the roadway.
- G. The responsible agency for the truck should check that the following specifications are met. The truck should have a minimum weight of 10,000 lbs. to provide correct performance. It should be equipped with proper operator safety equipment such as seat belts and headrest, etc. If ballast is needed, it should be properly anchored to the truck frame to prevent movement during an impact.
- H. Before disconnecting the TA from the truck, make sure the TA rear wheels are chocked to prevent rolling when removed from truck.

### **Special Warnings**

---

- 1. After a vehicle impact with the TA, do not drive the truck with the damaged TA. Remove the TA at the pintle hook and have the TA transported back to the maintenance yard.**
- 2. Check the TA model to make sure that the posted speed matches the TA rating.**

## General Maintenance

| Item to Service   | Frequency            |
|---|----------------------|
| 1. Check all fasteners between the TARS, Strut and Cartridge areas for tightness and excessive wear                       | Check before driving |
| 2. Check for levelness and that the height 12" $\pm 1$ " [30.48cm $\pm 2.54$ ] clearance with the truck ballasted to 20k. | Check before driving |
| 3. Check 1/4" bolts that attach all four modular energy absorbers for tightness   | Check before driving |
| 4. Grease jack, caster, and wheel bearings  | As required          |
| 5. Replace light bulbs  | As required          |

## After Impact Removal & Repairs

1. Have an insurance inspector inspect the damage prior to performing any work.
2. Disassemble system and mark for replacement, all bent and damaged parts.
3. Write down all part numbers for those items that need replacing – only Traffix replacement parts can be used for warranty validity.
4. After receiving replacement parts verify that the new part fit against the older parts and proceed to assemble per the installation manual.

## **Limitations and Warnings**

The Scorpion 10002 (Trailer Mounted Attenuator), TL-2, has been tested and evaluated per the recommendations of the National Cooperative Highway Research Program (NCHRP) Report 350. It is capable of decelerating and stopping light and heavy weight vehicles (820 kg. and 2000 kg.) in accordance with the criteria of tests 2-50 and 2-51 for TL-2 certification (70 kph). Reference FHWA letter HSSD/CC-65D for additional information.

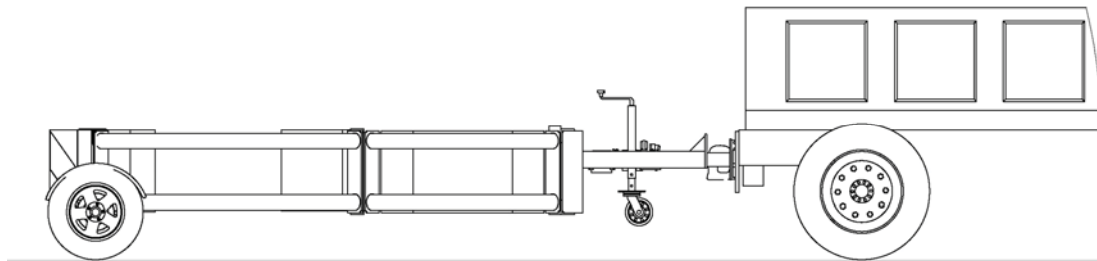
Also, the Scorpion 10002 (Trailer Mounted Attenuator), TL-3, is capable of decelerating and stopping light and heavy weight vehicles (820 kg. and 2000 kg.) in accordance with the criteria of tests 3-50, 3-51, and optional tests 3-52 and 3-53 for TL-3 certification (100 kph.). Reference FHWA letter HSSD/CC-65C for additional information.

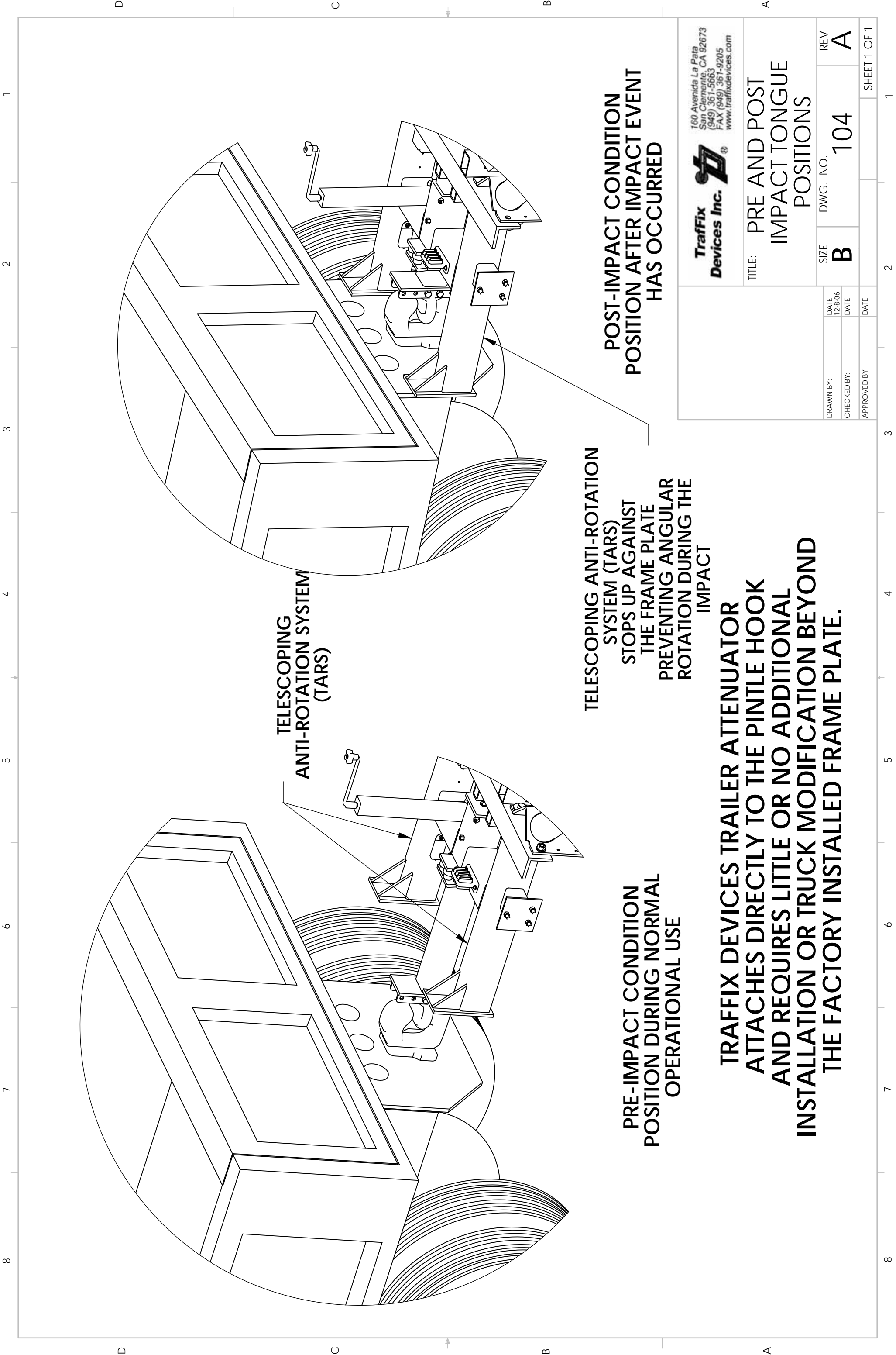
To achieve acceptable impact performance, it is recommended that the Scorpion 10002 be attached to a host vehicle with a minimum weight of approximately 10,000 lbs (4535 kg). The entire TA must be mounted level with the ground and the bottom of the TA must be 12"  $\pm$  1" (305 mm.  $\pm$  25 mm.) above the ground.

Impacts that exceed the design capabilities described in this manual (vehicle weight, speed, and impact angle) may not result in acceptable crash performance as described in NCHRP 350 relative to structural adequacy, occupant risk and vehicle trajectory factors.

## **Operator's Deployment Instructions**

1. For deployment of TMA in stationary applications, truck drive/operator must ensure truck is parked with emergency brake on and the transmission is engaged in gear or park.
2. For night operation, truck drive/operator must check and ensure that the side and rear light marker lights are switched on via the truck light switch.





**TELESCOPING  
ANTI-ROTATION SYSTEM  
(TARS)**

**TELESCOPING ANTI-ROTATION  
SYSTEM (TARS)  
STOPS UP AGAINST  
THE FRAME PLATE  
PREVENTING ANGULAR  
ROTATION DURING THE  
IMPACT**

**PRE-IMPACT CONDITION  
POSITION DURING NORMAL  
OPERATIONAL USE**

**POST-IMPACT CONDITION  
POSITION AFTER IMPACT EVENT  
HAS OCCURRED**

**TRAFFIX DEVICES TRAILER ATTENUATOR  
ATTACHES DIRECTLY TO THE PINTLE HOOK  
AND REQUIRES LITTLE OR NO ADDITIONAL  
INSTALLATION OR TRUCK MODIFICATION BEYOND  
THE FACTORY INSTALLED FRAME PLATE.**

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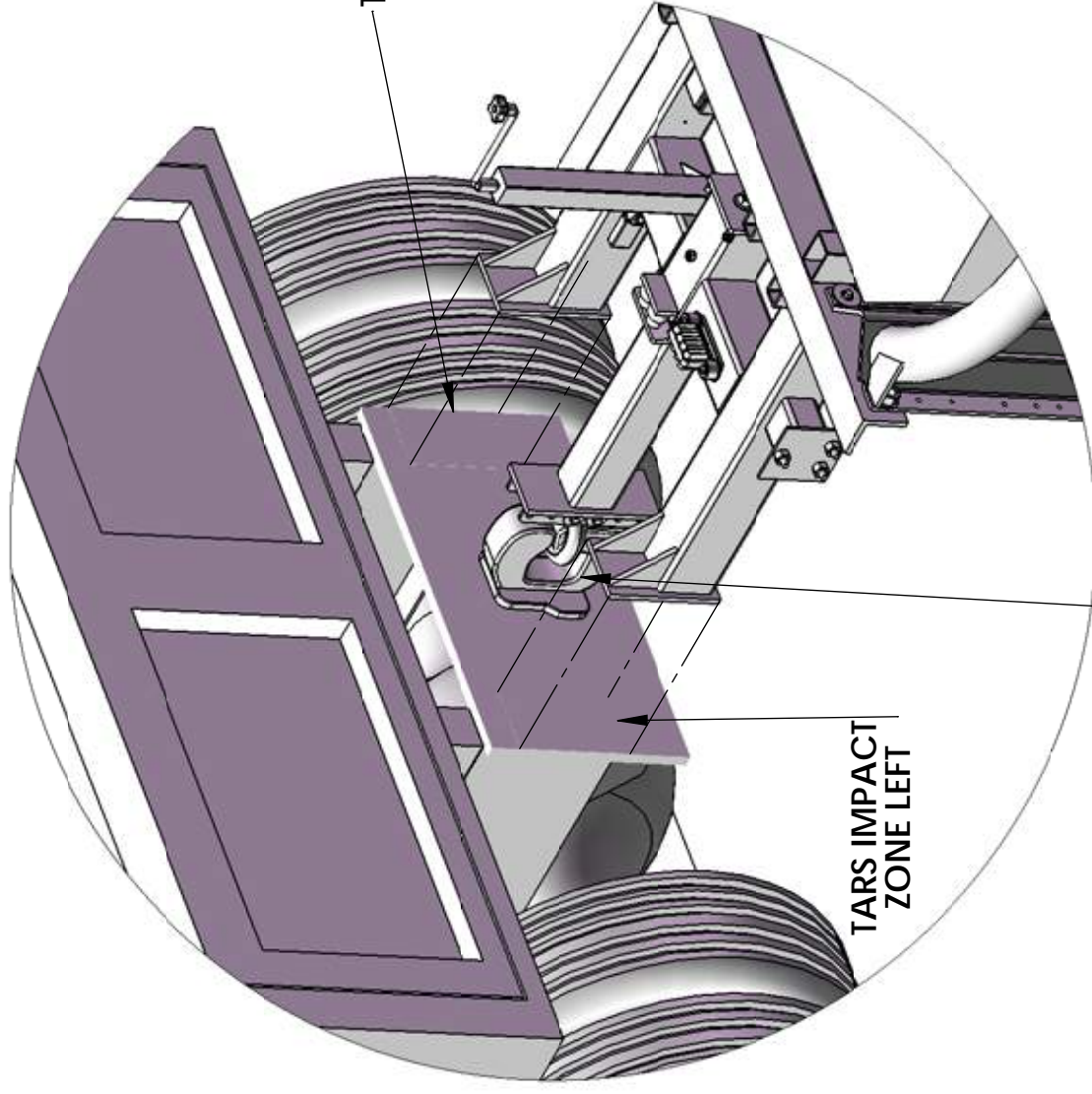
TITLE: **PRE AND POST  
IMPACT TONGUE  
POSITIONS**

SIZE **B** DWG. NO. **104** REV **A**

DRAWN BY: DATE: 12-8-06  
CHECKED BY: DATE:  
APPROVED BY: DATE:

SHEET 1 OF 1

**FULL MOUNTING PLATE PREPARATIONS FOR THE  
TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR  
W/TELESCOPING ANTI-ROTATION SYSTEM (TARS)  
PLEASE REFERENCE FHWA ACCEPTANCE LETTER HSSD/CC-65B  
AND CC-65C FOR PROPER HOST VEHICLE WEIGHT**

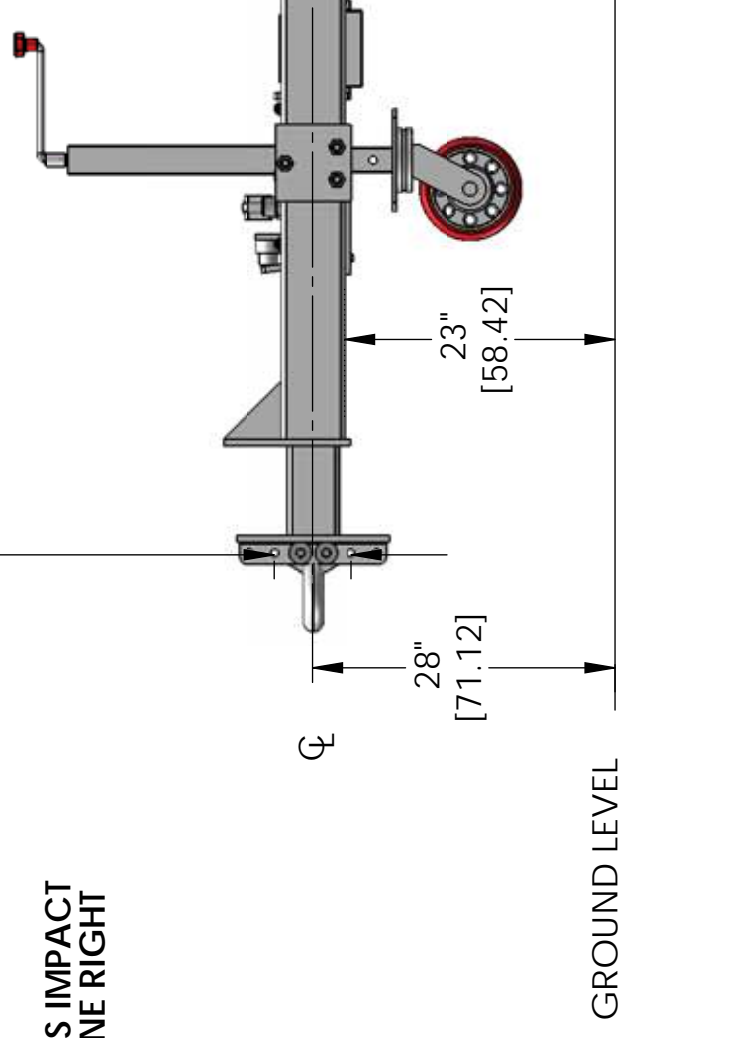


LUNETTE EYE  
6" [15.24] TOTAL VERTICAL  
HEIGHT ADJUSTABILITY  
3" [7.62] UP AND 3" [7.62] DOWN  
FROM FACTORY POSITION

TARS IMPACT  
ZONE RIGHT

TARS IMPACT  
ZONE LEFT

20 TON PINTLE HOOK  
POSITION 28" FROM THE GROUND  
TO THE CENTER OF THE  
LUNETTE EYE



DIMENSIONS: INCHES  
[CENTIMETERS]

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TITLE: TARS VERTICAL  
IMPACT ZONE  
POSITION

SIZE DWG. NO. REV  
**B** 908 **A**

DRAWN BY:  
Mary Dralle

DATE:  
6-15-07

CHECKED BY:

DATE:

APPROVED BY:

DATE:

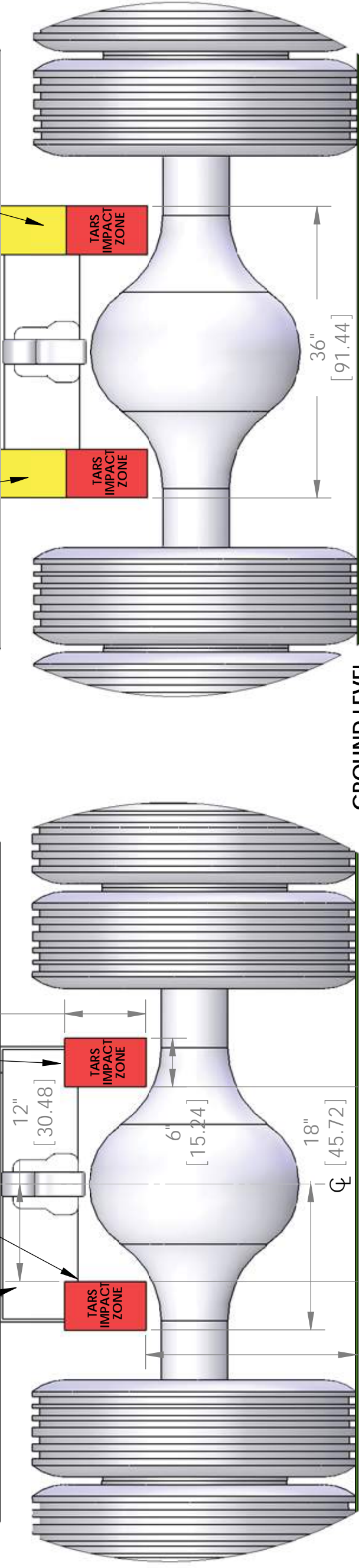
SHEET 1 OF 1



ADDITIONAL SUPPORT PLATE  
MUST BE ADDED WHEN FRAME  
PLATE DOES NOT DROP LOW  
ENOUGH FOR TARS IMPACT ZONE

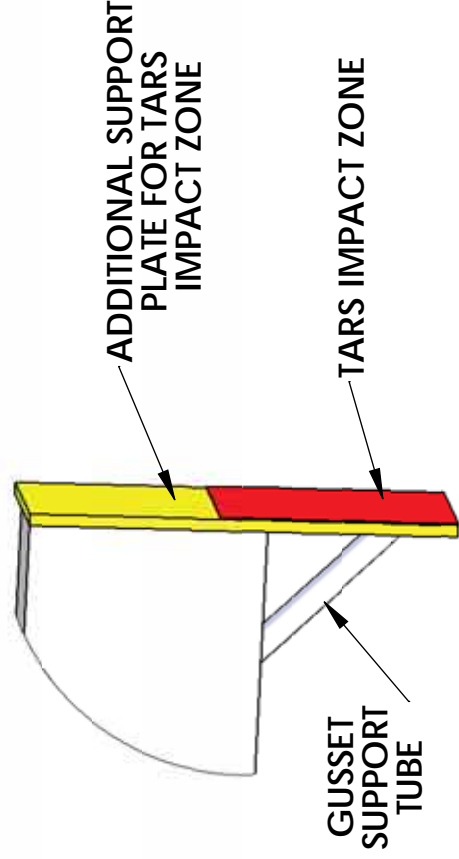
1/2" OR THICKER FRAME  
PLATE W/PIN/LE HOOK  
34"  
[86.36]  
WIDTH

10"  
[25.40]



GROUND LEVEL

ADDITIONAL SUPPORT PLATE  
FOR TARS IMPACT ZONE ALIGNMENT  
1/2" THK X 6" A-36 STEEL  
[1.27] X [15.24]  
HEIGHT OF ADDITIONAL PLATE WILL  
VARY DEPENDING  
ON HEIGHT OF FRAME



**TRAFFIX DEVICES SCORPION TRAILER  
ATTENUATOR W/TELESCOPING  
ANTI-ROTATION SYSTEM (TARS)  
PLEASE REFERENCE FHWA ACCEPTANCE  
LETTER HSSD/CC-65B AND CC-65C FOR  
PROPER HOST VEHICLE WEIGHT**

DIMENSIONS: INCHES  
[CENTIMETERS]

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TITLE: **PARTIAL PLATE  
INSTALLATION FOR  
TARS IMPACT ZONE**

DRAWN BY:  
Mary Drille  
DATE:  
6-28-07

CHECKED BY:  
DATE:

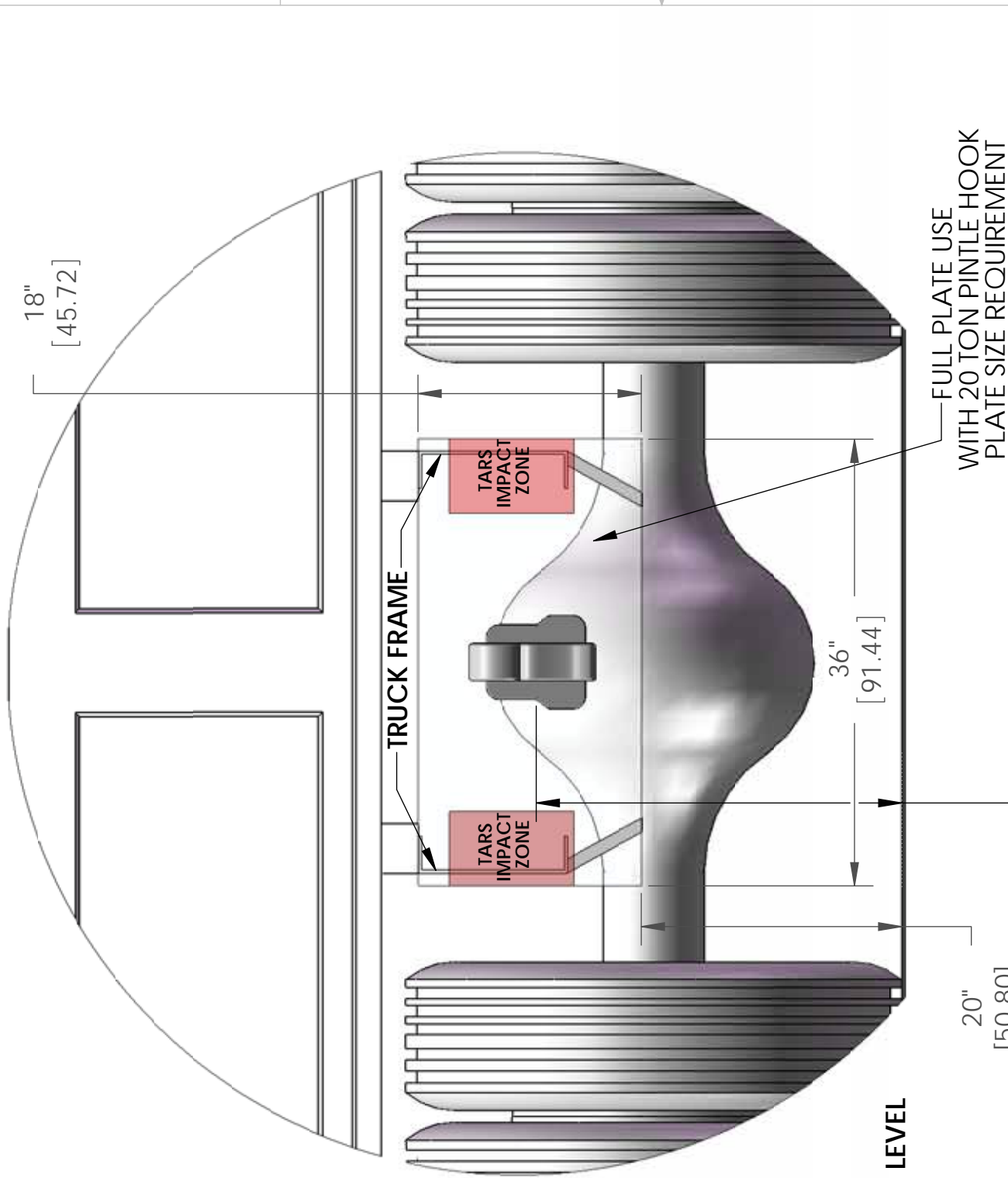
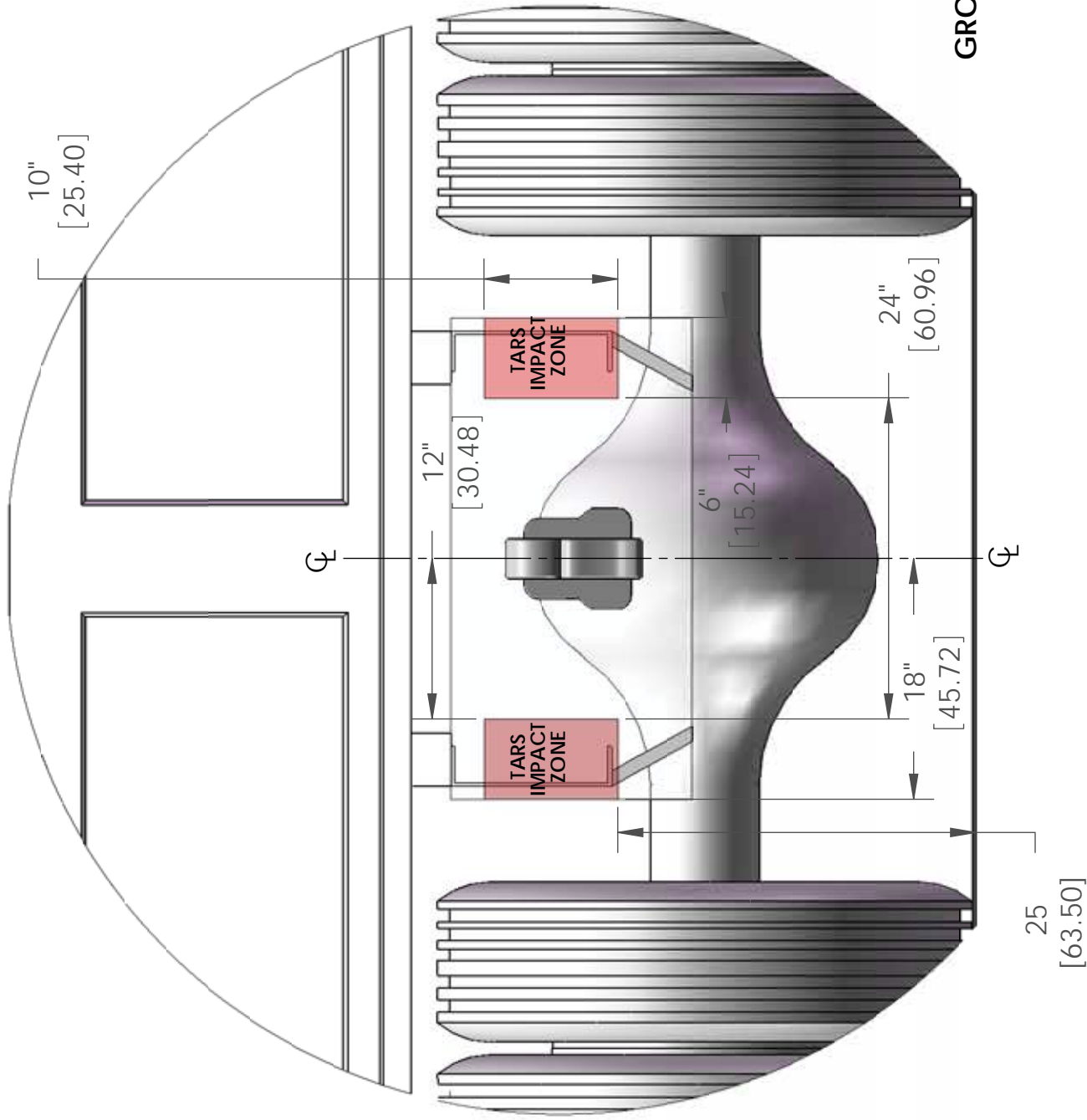
APPROVED BY:  
DATE:

SIZE **B** DWG. NO. **909** REV **A**

SHEET 1 OF 1



# FACTORY INSTALLED FRAME PLATE



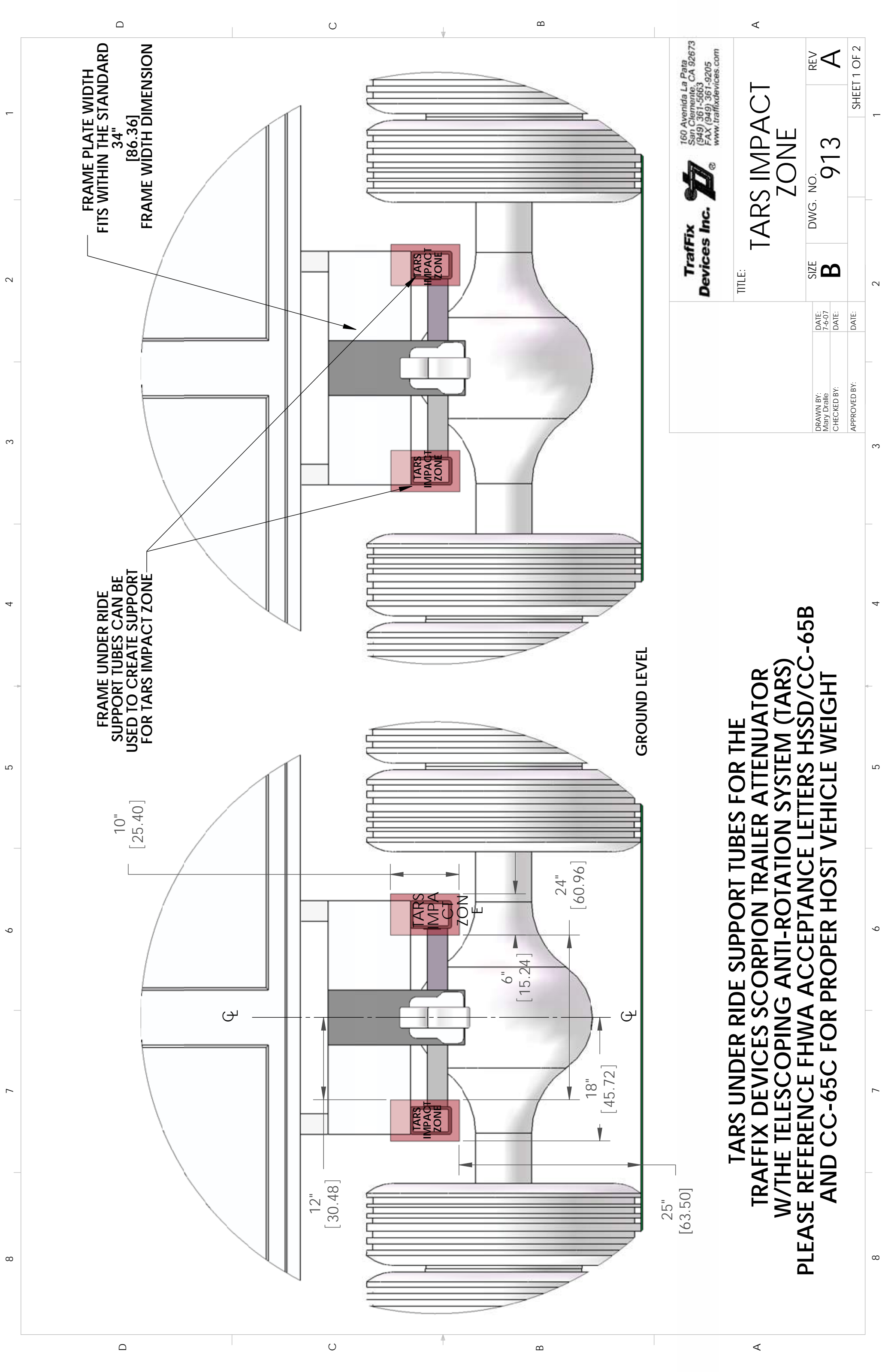
FULL PLATE USE  
WITH 20 TON PINTLE HOOK  
PLATE SIZE REQUIREMENT  
1/2" THK OR GREATER X 18" X 36" A-36 STEEL  
[1.27] X [45.72] X [91.44]

DIMENSIONS: INCHES  
[CENTIMETERS]

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|              |            |                         |              |
|--------------|------------|-------------------------|--------------|
| TITLE:       |            | <b>TARS IMPACT ZONE</b> |              |
| DATE:        | DWG. NO.   | REV                     |              |
| 6-28-07      | <b>910</b> | <b>A</b>                |              |
| CHECKED BY:  | SIZE       | DWG. NO.                | REV          |
|              | <b>B</b>   | <b>910</b>              | <b>A</b>     |
| APPROVED BY: |            |                         |              |
|              |            |                         | SHEET 1 OF 1 |

**FULL MOUNTING PLATE PREPARATIONS FOR THE  
TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR  
W/THE TELESCOPING ANTI-ROTATION SYSTEM (TARS)  
PLEASE REFERENCE FHWA ACCEPTANCE LETTER HSSD/CC-65B  
AND CC-65C FOR PROPER HOST VEHICLE WEIGHT**



FRAME UNDER RIDE  
SUPPORT TUBES CAN BE  
USED TO CREATE SUPPORT  
FOR TARS IMPACT ZONE

FRAME PLATE WIDTH  
FITS WITHIN THE STANDARD  
34"  
[86.36]  
FRAME WIDTH DIMENSION

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TITLE: **TARS IMPACT ZONE**

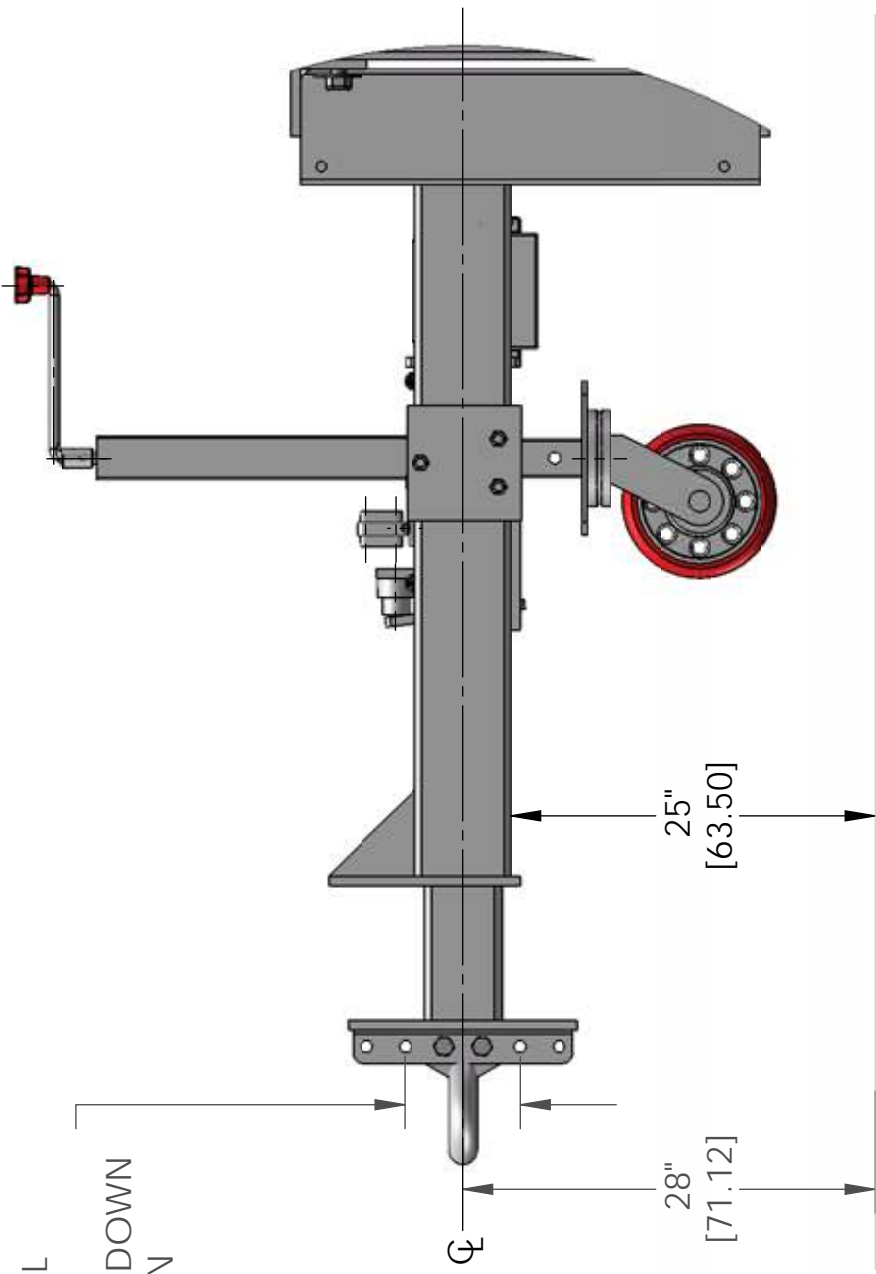
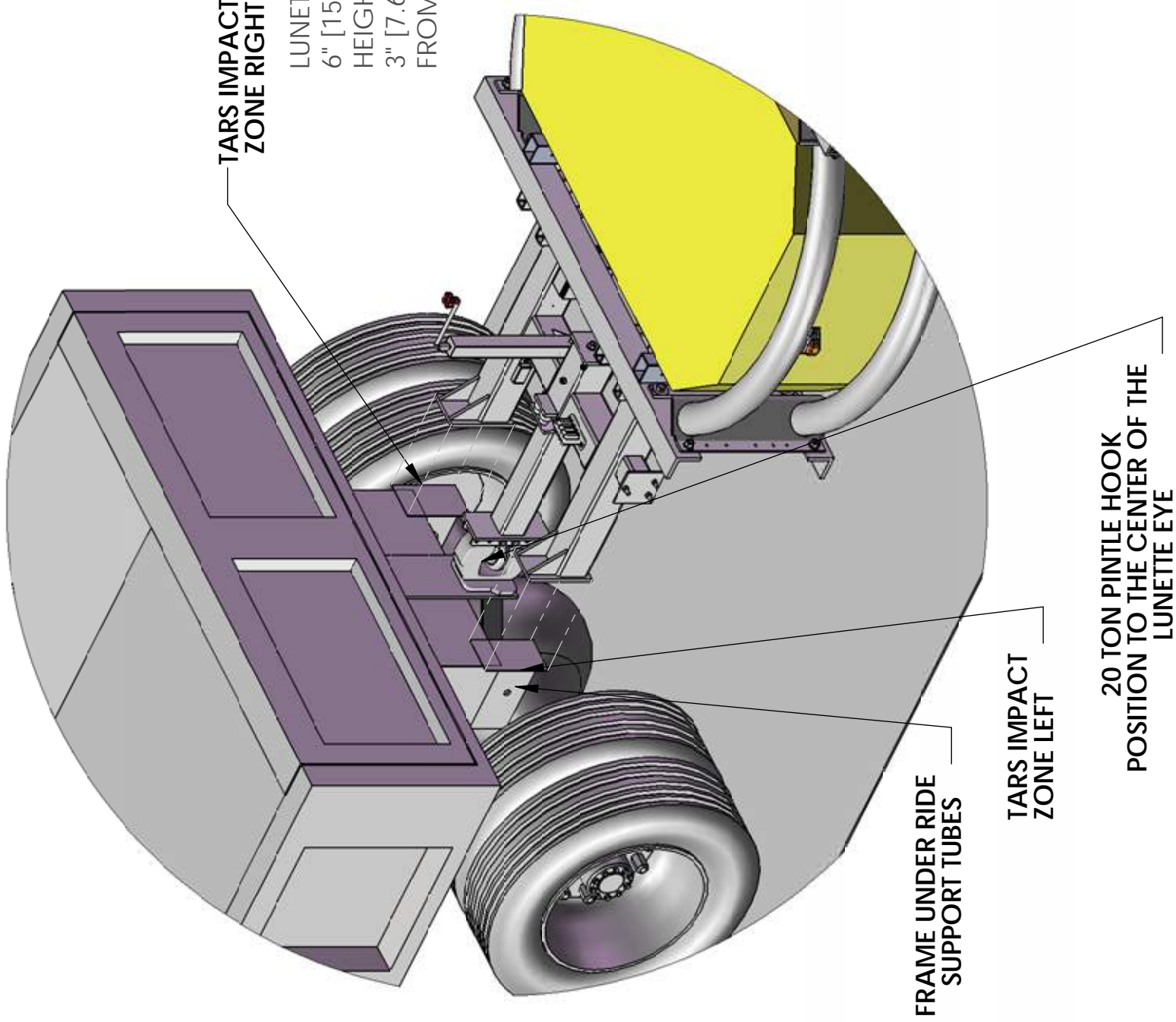
DATE: 7-6-07  
DRAWN BY: Mary Drille  
CHECKED BY:  
APPROVED BY:

SIZE **B** DWG. NO. **913** REV **A**

SHEET 1 OF 2

**TARS UNDER RIDE SUPPORT TUBES FOR THE  
TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR  
W/THE TELESCOPING ANTI-ROTATION SYSTEM (TARS)  
PLEASE REFERENCE FHWA ACCEPTANCE LETTERS HSSD/CC-65B  
AND CC-65C FOR PROPER HOST VEHICLE WEIGHT**

**TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR  
W/TELESCOPING ANTI-ROTATION SYSTEM (TARS)  
PLEASE REFERENCE FHWA ACCEPTANCE LETTER HSSD/CC-65B  
AND CC-65C FOR PROPER HOST VEHICLE WEIGHT**



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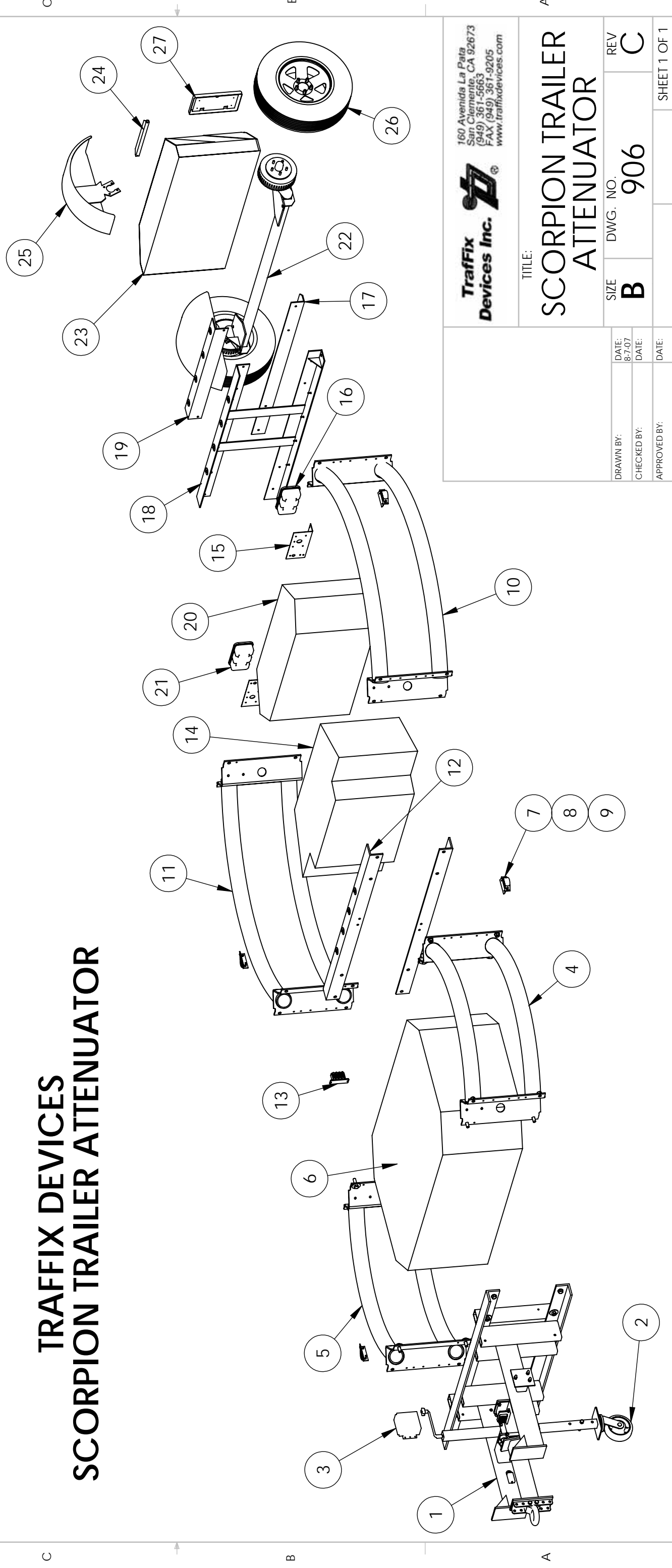
|   |              |                |                      |               |
|---|--------------|----------------|----------------------|---------------|
| TITLE: TARS VERTICAL IMPACT ZONE POSITION |              | SIZE: <b>B</b> | DWG. NO.: <b>914</b> | REV: <b>A</b> |
| DRAWN BY:                                 | DATE: 7-6-07 | CHECKED BY:    | DATE:                | APPROVED BY:  |
|   |              |                |                      | SHEET 2 OF 2  |



# TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR

| ITEM NO. | PN      | DESCRIPTION                           | QTY |
|----------|---------|---------------------------------------|-----|
| 1        | 13100   | TONGUE                                | 1   |
| 2        | 13130   | JACK, MODIFIED HEAVY DUTY SINGLE POST | 1   |
| 3        | 13154   | BRAKE SWITCH ENGAGER                  | 1   |
| 4        | 10200TL | STRUT TUBE FRAME LEFT                 | 1   |
| 5        | 10200TR | STRUT TUBE FRAME RIGHT                | 1   |
| 6        | 13400D  | MODULE D ENERGY ABS. TRAILER          | 1   |
| 7        | 10502   | SIDE MARKER LIGHTS- 12 V              | 4   |
| 8        | 10520   | SIDE LIGHT BRACKET                    | 4   |
| 9        | 10524   | SIDE LIGHT ALUMINUM ANGLE BRACKET     | 4   |
| 10       | 10100L  | CARTRIDGE TUBE FRAME LEFT             | 1   |
| 11       | 10100R  | CARTRIDGE TUBE FRAME RIGHT            | 1   |
| 12       | 10105S  | STEEL ANGLE                           | 2   |
| 13       | 10518   | JUNCTION BOX                          | 2   |
| 14       | 10400C  | MODULE C ENERGY ABSORBER              | 1   |

| ITEM NO. | PN       | DESCRIPTION                      | QTY   |
|----------|----------|----------------------------------|-------|
| 15       | 10532L/R | LIGHT BRACKET REAR               | 1 ea. |
| 16       | 10508    | LIGHT HOUSING W/LIGHTS LEFT-12V  | 1     |
| 17       | 10127    | REAR BOTTOM ANGLE, CARTRIDGE     | 1     |
| 18       | 13155    | TRAILER DIAPHRAGM ASSY           | 1     |
| 19       | 10465    | REAR TOP ANGLE, CARTRIDGE        | 1     |
| 20       | 10400B   | MODULE B ENERGY ABSORBER         | 1     |
| 21       | 10516    | LIGHT HOUSING W/LIGHTS RIGHT-12V | 1     |
| 22       | 13230    | TRAILER AXLE                     | 1     |
| 23       | 10400A   | MODULE A ENERGY ABSORBER         | 1     |
| 24       | 10557    | ICC BAR LIGHT                    | 1     |
| 25       | 13240L/R | FENDER W/MOUNTING BRACKET        | 1 ea. |
| 26       | 13260    | TIRE AND WHEEL                   | 2     |
| 27       | 13295    | LICENSE PLATE HOLDER W/LIGHT     | 1     |



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TITLE:  
**SCORPION TRAILER  
ATTENUATOR**

SIZE **B** DWG. NO. **906** REV **C**

DRAWN BY:

DATE: 8-7-07

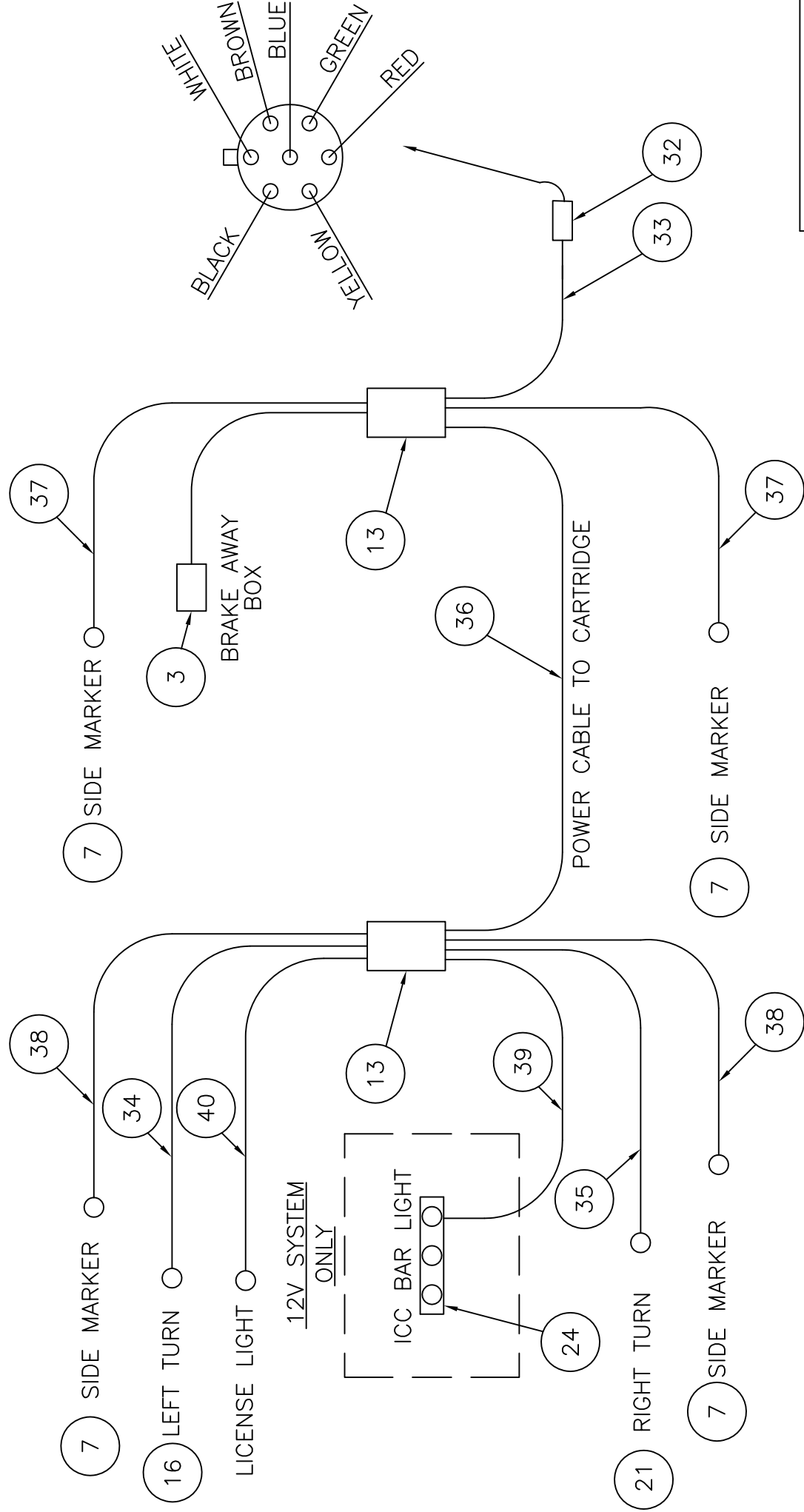
CHECKED BY:

DATE:

APPROVED BY:

DATE:

# LIGHT WIRING DIAGRAM



| ELECTRICAL PARTS |                                  |       |
|------------------|----------------------------------|-------|
| ITEM             | DESCRIPTION                      | PN    |
| 3                | BRAKE SWITCH ENGAGER             | 13154 |
| 7                | SIDE MARKER LIGHTS-12 V          | 10502 |
| 13               | JUNCTION BOX                     | 10518 |
| 16               | LEFT TURN LIGHT                  | 10508 |
| 21               | RIGHT TURN LIGHT                 | 10516 |
| 24               | ICC BAR LIGHT                    | 10557 |
| 32               | PLUG 7 WAY                       | 10506 |
| 33               | POWER CABLE TO STRUT             | 10511 |
| 34               | LEFT TURN WIRE HARNESS           | 10519 |
| 35               | RIGHT TURN WIRE HARNESS          | 10509 |
| 36               | POWER CABLE TO CARTRIDGE         | 10510 |
| 37               | SIDE LIGHT HARNESS TO STRUT      | 10512 |
| 38               | SIDE LIGHT HARNESS TO CARTRIDGE  | 10513 |
| 39               | ICC BAR LIGHT CABLE              | 10556 |
| 40               | LICENSE PLATE LIGHT WIRE HARNESS | 13277 |

| 7 WAY PLUG WIRING |                                   |
|-------------------|-----------------------------------|
| WHITE             | GROUND                            |
| BLACK             | ICC BAR LIGHT                     |
| YELLOW            | LEFT TURN                         |
| RED               | STOP                              |
| GREEN             | RIGHT TURN                        |
| BROWN             | TAILLIGHTS, SIDE MARKERS, LICENSE |
| BLUE              | BACKUP                            |

UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES.

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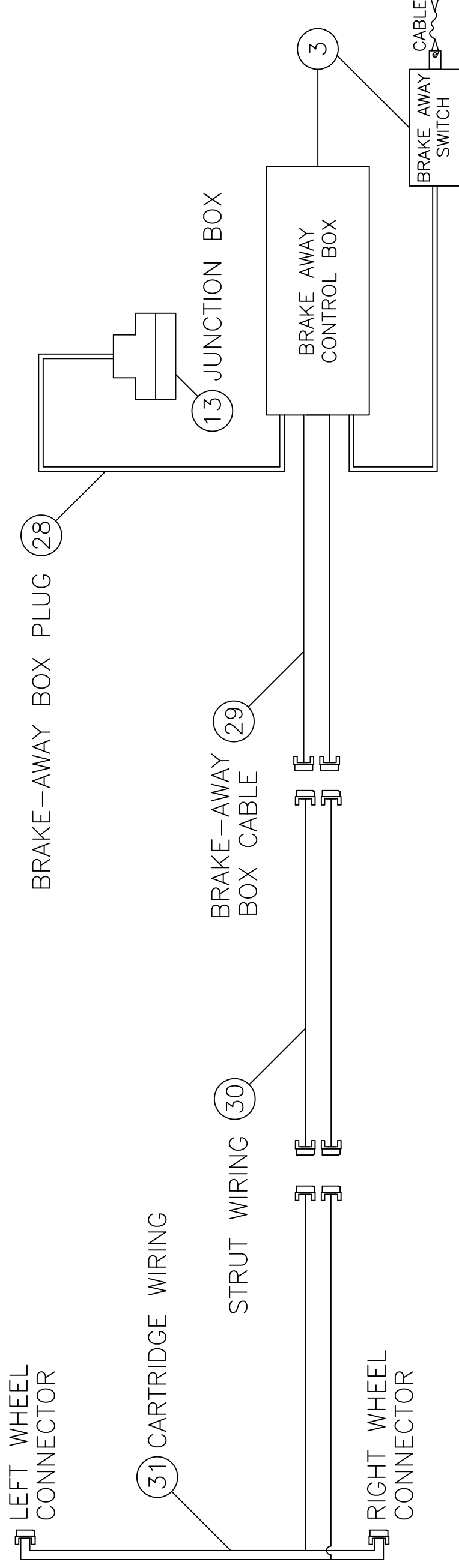
## TRAILER ATTENUATOR WIRING DIAGRAM

|               |                |
|---------------|----------------|
| DRAWN BY:     | DATE: 07/27/07 |
| CHECKED BY:   | DATE:          |
| APPROVED BY:  | DATE:          |
| SIZE <b>B</b> | DWG NO. 916    |
| SCALE 1/1     | SHEET 1 OF 1   |
| REV <b>C</b>  |                |

NOTES: UNLESS OTHERWISE SPECIFIED.

## BRAKE WIRING SCHEMATIC

| BRAKE WIRING PARTS |  |       |
|--------------------|--|-------|
| ITEM               | DESCRIPTION                                    | PN    |
| 3                  | BRAKE SWITCH ENGAGER                           | 13154 |
| 13                 | JUNCTION BOX                                   | 10518 |
| 28                 | BRAKE-AWAY PLUG                                | 13275 |
| 29                 | BRAKE-AWAY BOX CABLE                           | 13273 |
| 30                 | BRAKE STRUT WIRING                             | 13276 |
| 31                 | CARTRIDGE/RIGHT WHEEL/<br>LEFT WHEEL CONNECTOR | 13274 |



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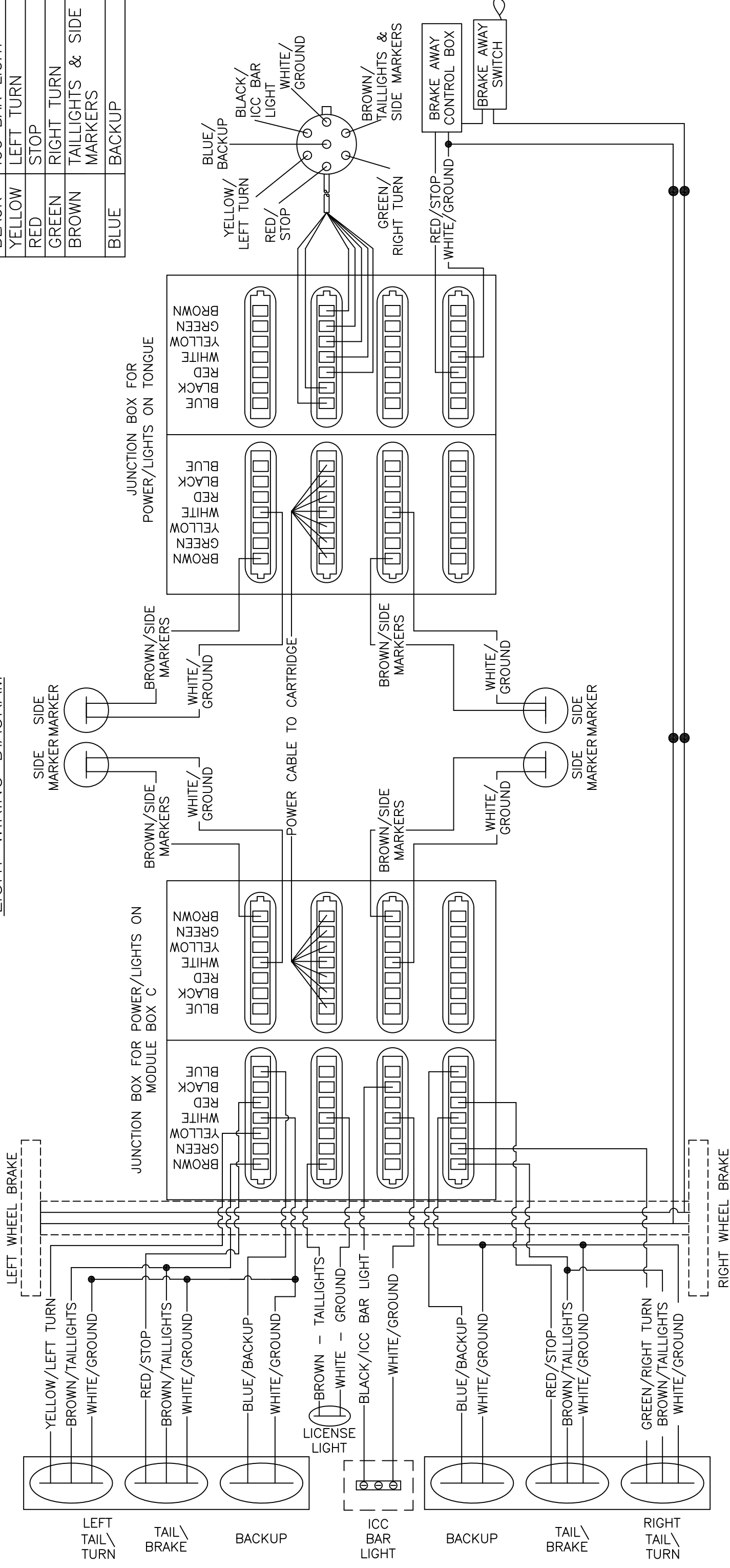
## TA BRAKE WIRING DIAGRAM

|              |                   |                  |                 |          |
|--------------|-------------------|------------------|-----------------|----------|
| DRAWN BY:    | DATE:<br>11/01/07 | SIZE<br><b>B</b> | DWG NO.<br>921  | REV<br>C |
| CHECKED BY:  | DATE:             |                  |                 |          |
| APPROVED BY: | DATE:             | SCALE<br>NTS     | SHEET<br>1 OF 1 |          |

NOTES: UNLESS OTHERWISE SPECIFIED.

# LIGHT WIRING DIAGRAM

| 7 WAY PLUG WIRING |                           |
|-------------------|---------------------------|
| WHITE             | GROUND                    |
| BLACK             | ICC BAR LIGHT             |
| YELLOW            | LEFT TURN                 |
| RED               | STOP                      |
| GREEN             | RIGHT TURN                |
| BROWN             | TAILLIGHTS & SIDE MARKERS |
| BLUE              | BACKUP                    |



UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES.



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## TRAILER ATTENUATOR DETAILED 12V WIRING DIAGRAM

|                          |                   |
|--------------------------|-------------------|
| DRAWN BY:<br>Mary Dralle | DATE:<br>12/04/07 |
| CHECKED BY:              | DATE:             |
| APPROVED BY:             | DATE:             |

SIZE  
**B**

DWG NO.

929

REV  
**D**

SCALE  
1/1

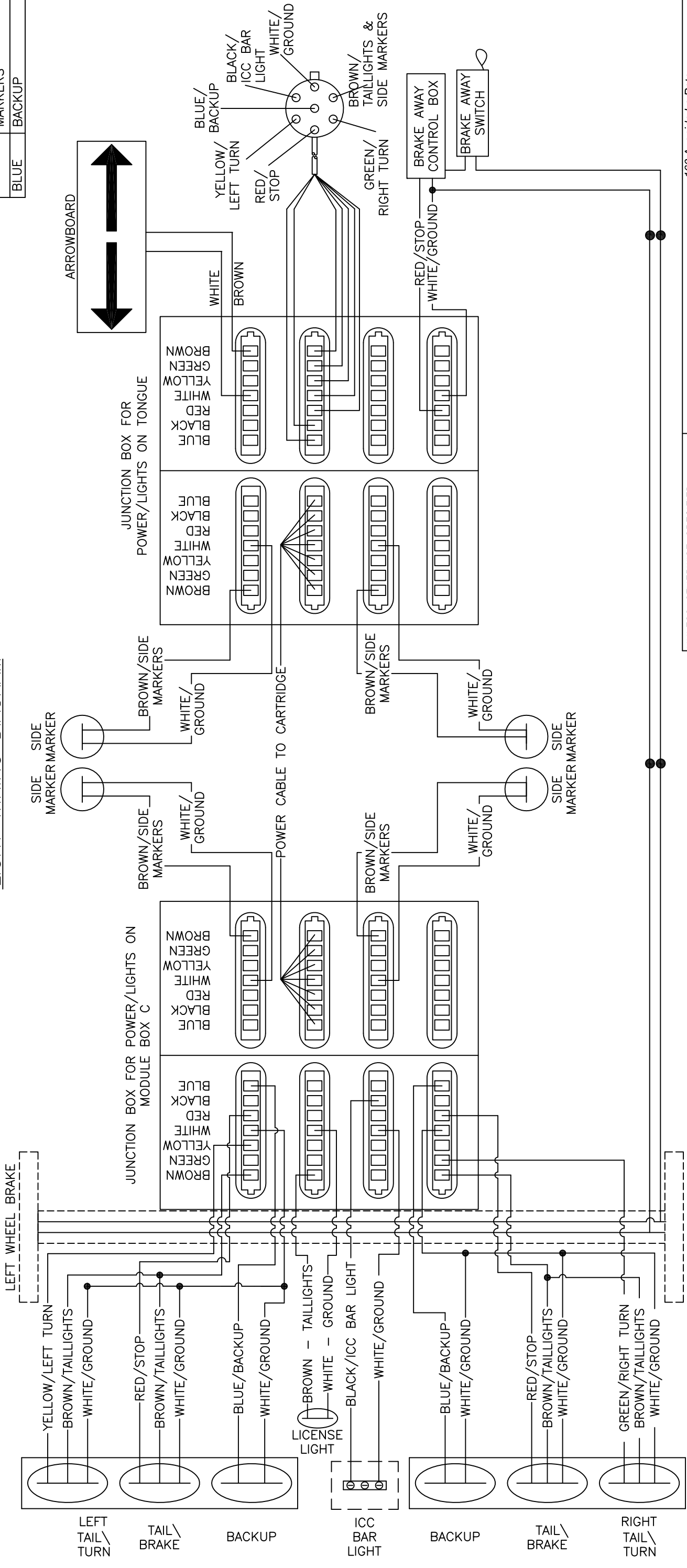
SHEET  
1 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED.



LIGHT WIRING DIAGRAM

| 7 WAY PLUG WIRING |
|-------------------|
| WHITE             |
| BLACK             |
| YELLOW            |
| RED               |
| GREEN             |
| BROWN             |
| BLUE              |



UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES.

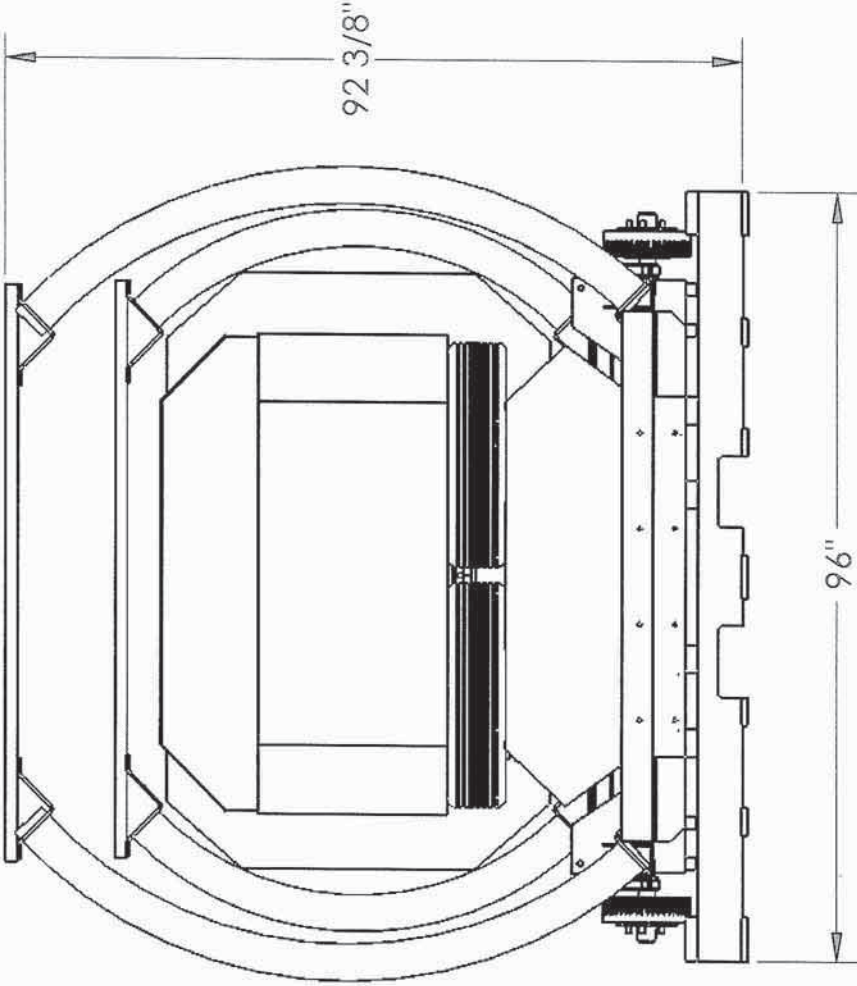
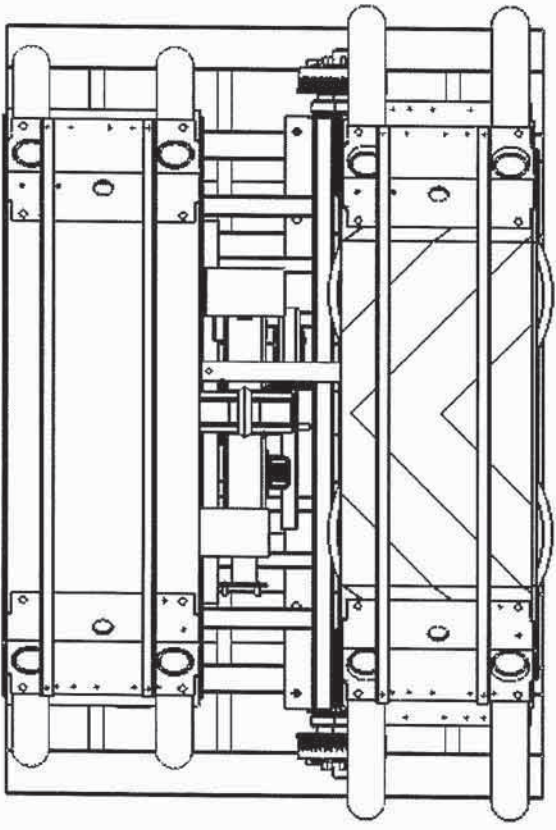
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TRAILER ATTENUATOR WITH ARROWBOARD  
DETAILED 12V WIRING DIAGRAM

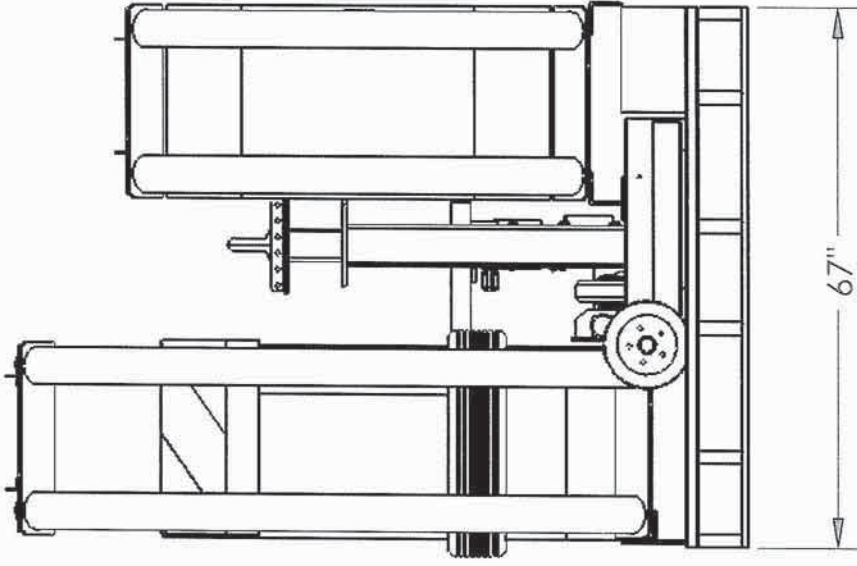
|                          |                   |                  |                 |          |
|--------------------------|-------------------|------------------|-----------------|----------|
| DRAWN BY:<br>Mary Dralle | DATE:<br>01/16/08 | SIZE<br><b>B</b> | DWG NO.<br>955  | REV<br>A |
| CHECKED BY:              | DATE:             | SCALE<br>1/1     | SHEET<br>1 OF 1 |          |
| APPROVED BY:             | DATE:             |                  |                 |          |

NOTES: UNLESS OTHERWISE SPECIFIED.

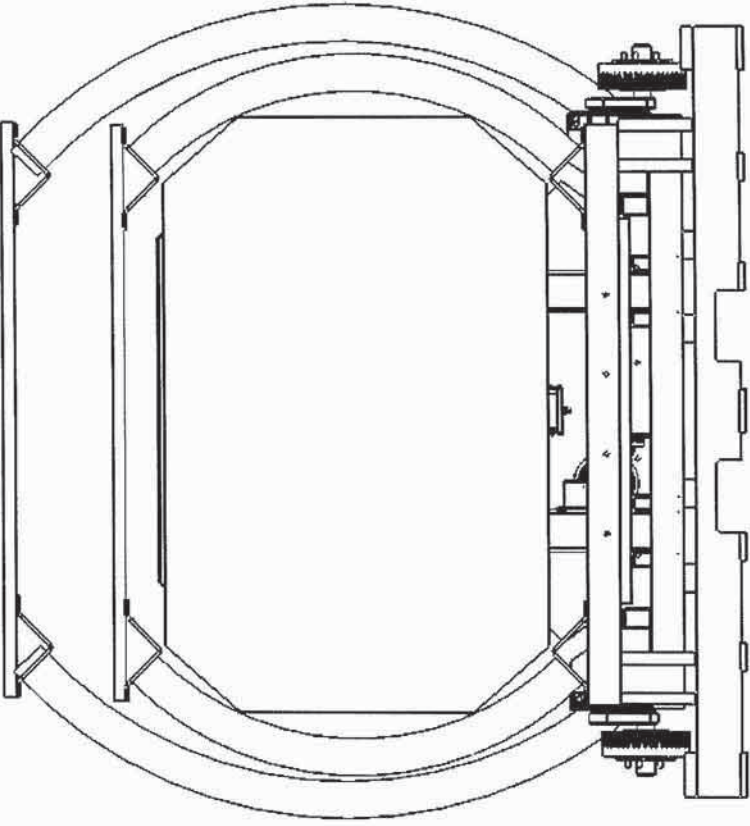
# SCORPION TRAILER ATTENUATOR (TA) PACKAGED ON PALLET



92 3/8"



67"



|   |                |                             |               |
|---|----------------|-----------------------------|---------------|
|  <p>220 Calle Pintoresco<br/>San Clemente, CA 92672<br/>(949) 361-5663<br/>FAX (949) 361-9205<br/>www.traffixdevices.com</p> |                | TITLE: TA PACKAGE ON PALLET |               |
| DRAWN BY:   | DATE: 06-29-07 | SIZE: B                     | DWG. NO.: 911 |
| CHECKED BY:   | DATE:          | REV: -                      | SHEET 1 OF 1  |
| APPROVED BY:  | DATE:          |                             |               |

D

C

B

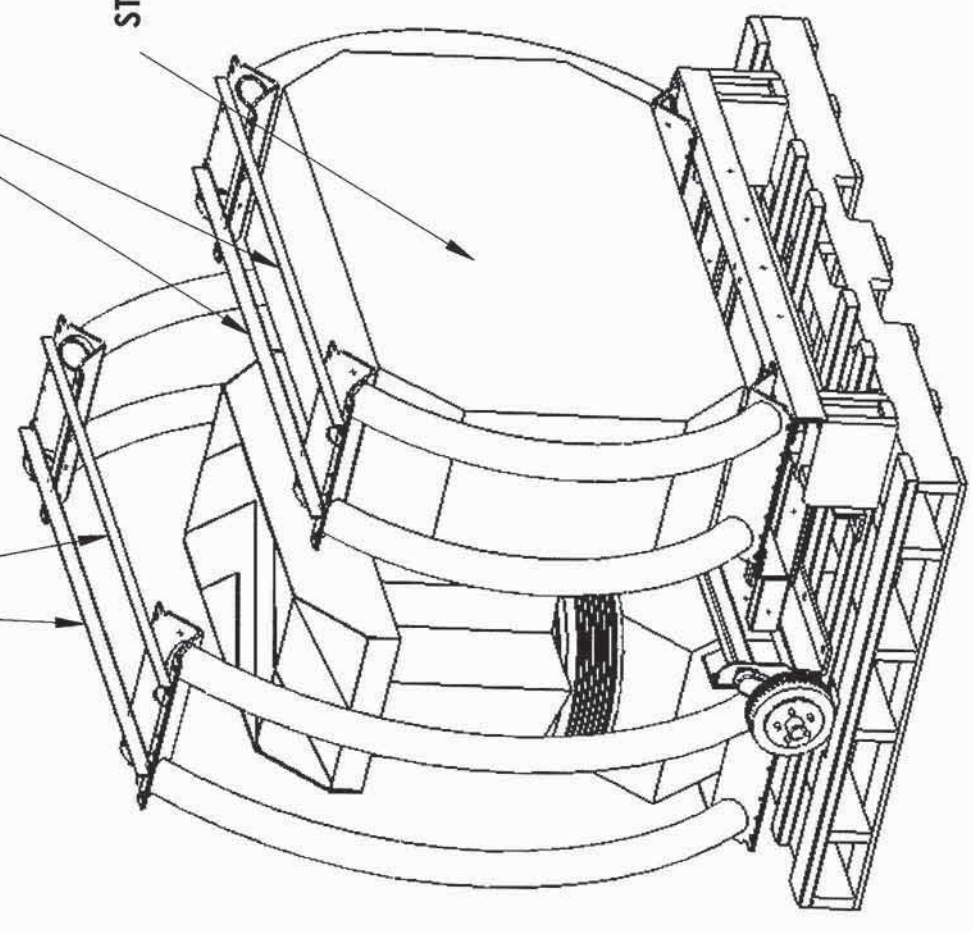
A

1 2 3 4 5 6 7 8

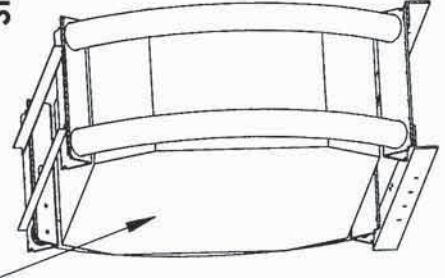
1 2 3 4 5 6 7 8



DISPOSABLE SHIPPING ANGLES  
REMOVE PRIOR TO  
ASSEMBLY OF TA

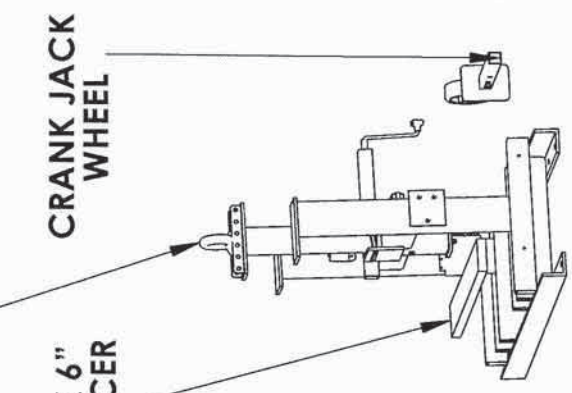


STRUT SECTION



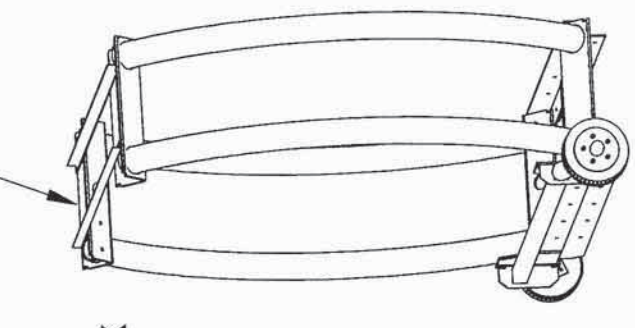
2" X 6" SPACER

TARS TOUNGE SECTION



CRANK JACK WHEEL

CARTRIDGE SECTION

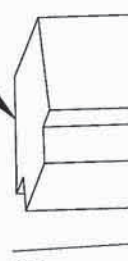


WHEELS/TIRE

MODULE BOX A



MODULE BOX C

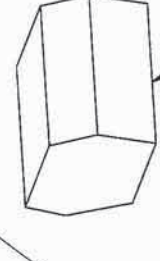


RIGHT FENDER

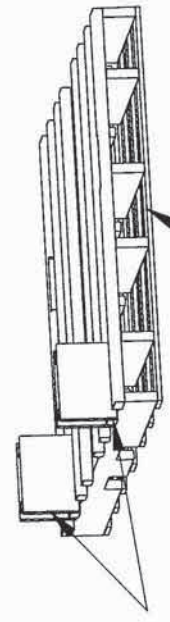
LEFT FENDER



MODULE BOX B



STACKING BLOCKS



TA SHIPPING PALLETS

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TITLE: TA PACKAGE ON PALLET

DATE: 06-29-07

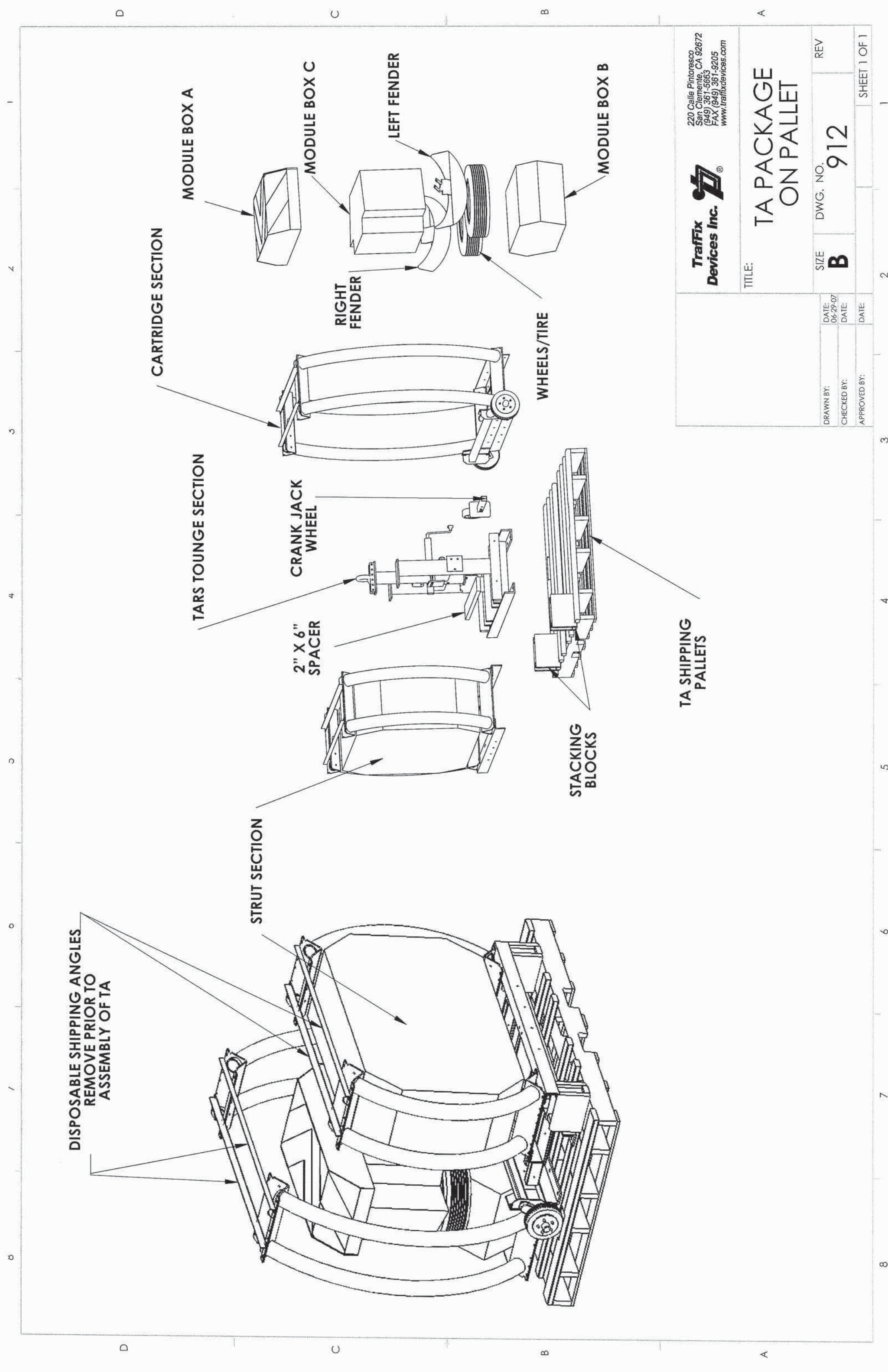
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DRAWN BY: CHECKED BY: APPROVED BY:

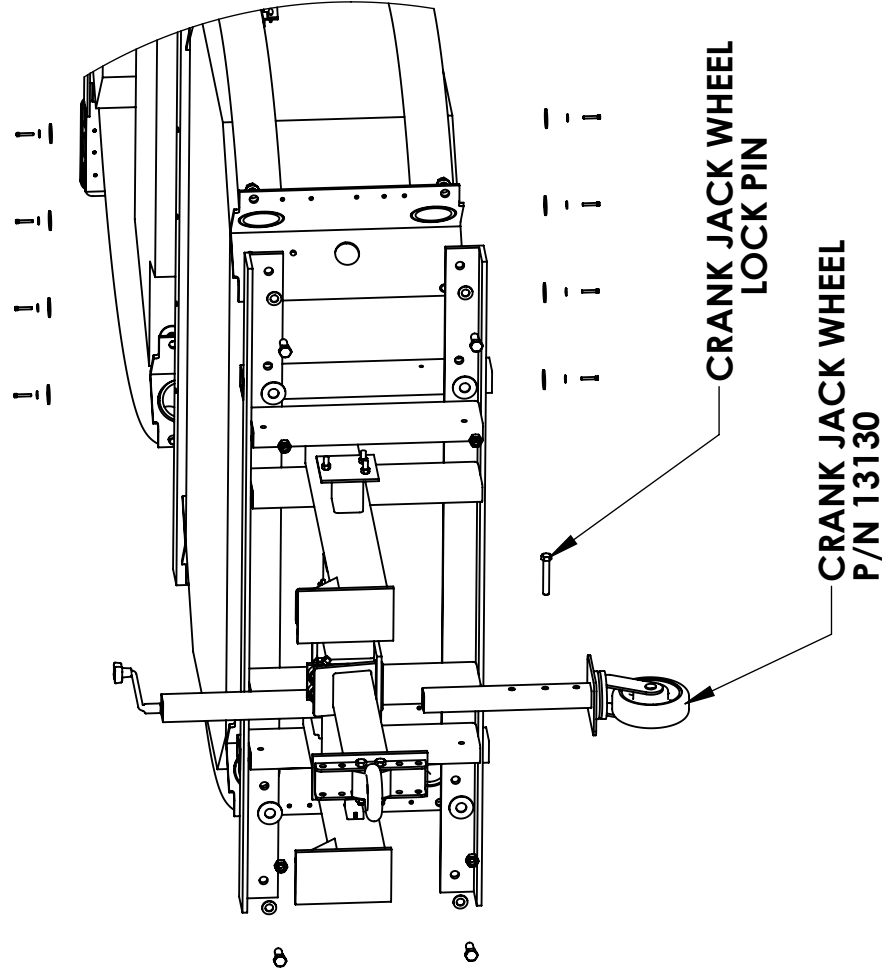
SIZE DWG. NO. REV

**B** 912

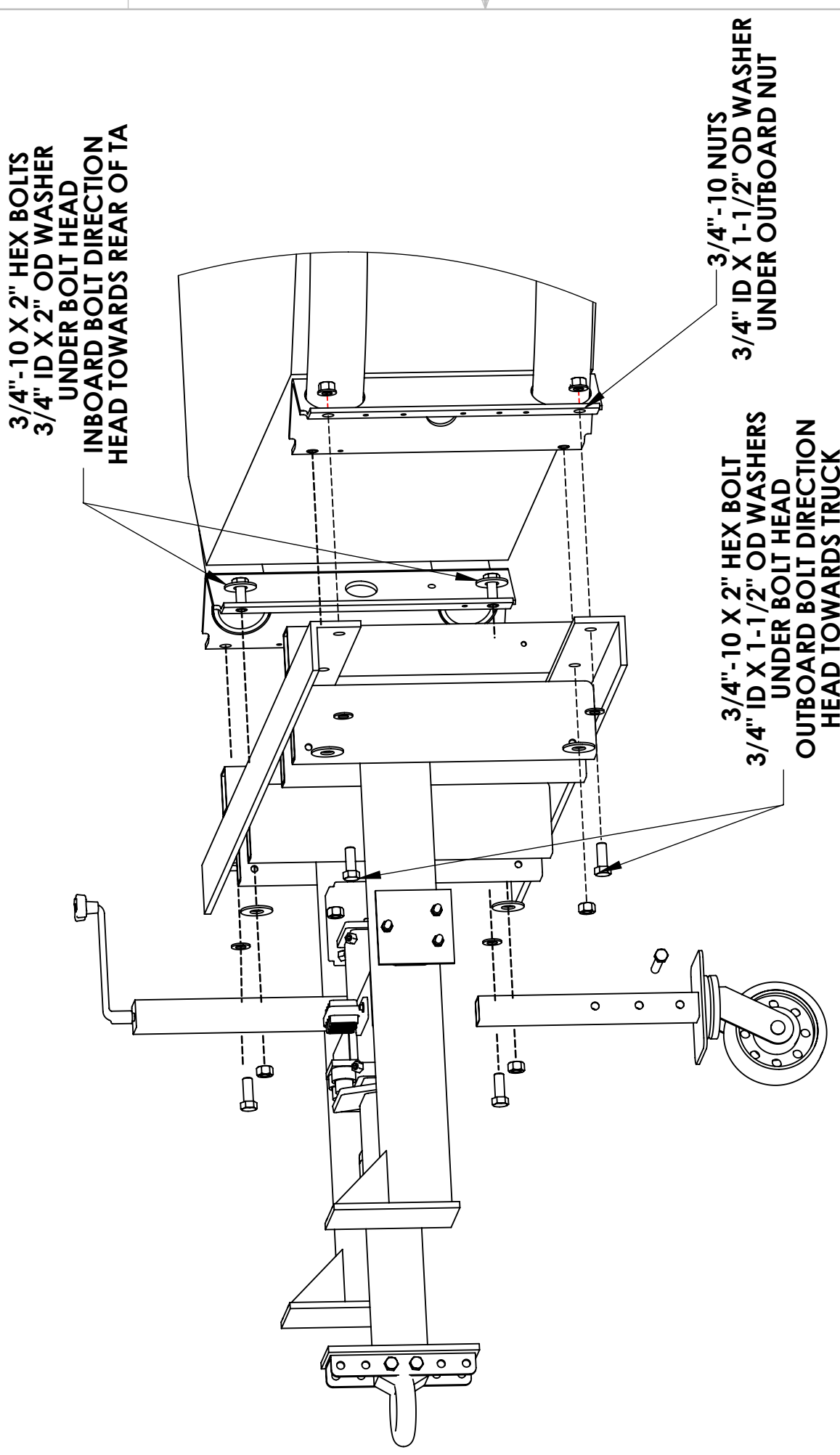
SHEET 1 OF 1



# TA CRANK WHEEL INSTALLATION



# TARS TONGUE TO STRUT INSTALLATION



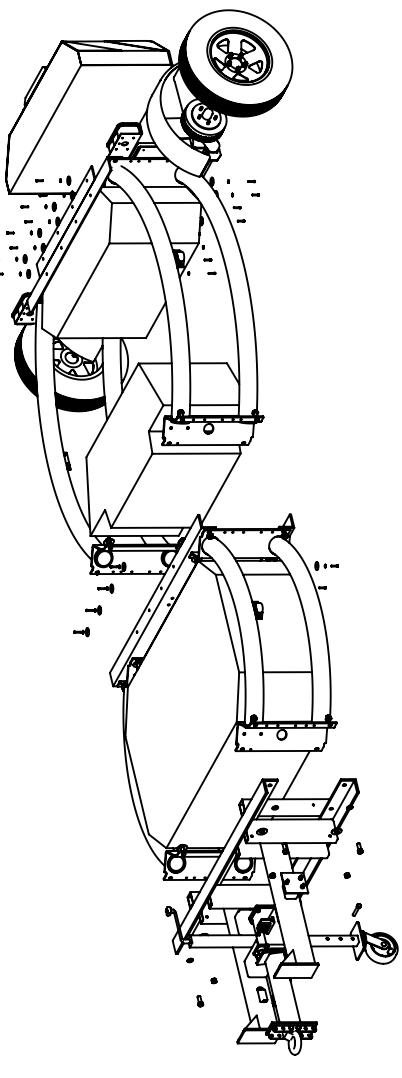
| P/N   | Description                 | Qty |
|-------|-----------------------------|-----|
| 12006 | 3/4"-10 X 2" Hex Bolts      | 8   |
| 12008 | 3/4"-10 Nylock Nuts         | 8   |
| 12060 | 3/4" ID X 1-1/2" OD Washers | 8   |
| 12009 | 3/4" ID X 2" OD Washers     | 8   |

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Devices Inc.** 

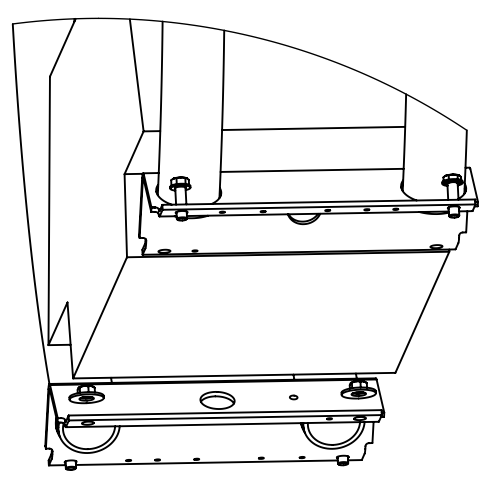
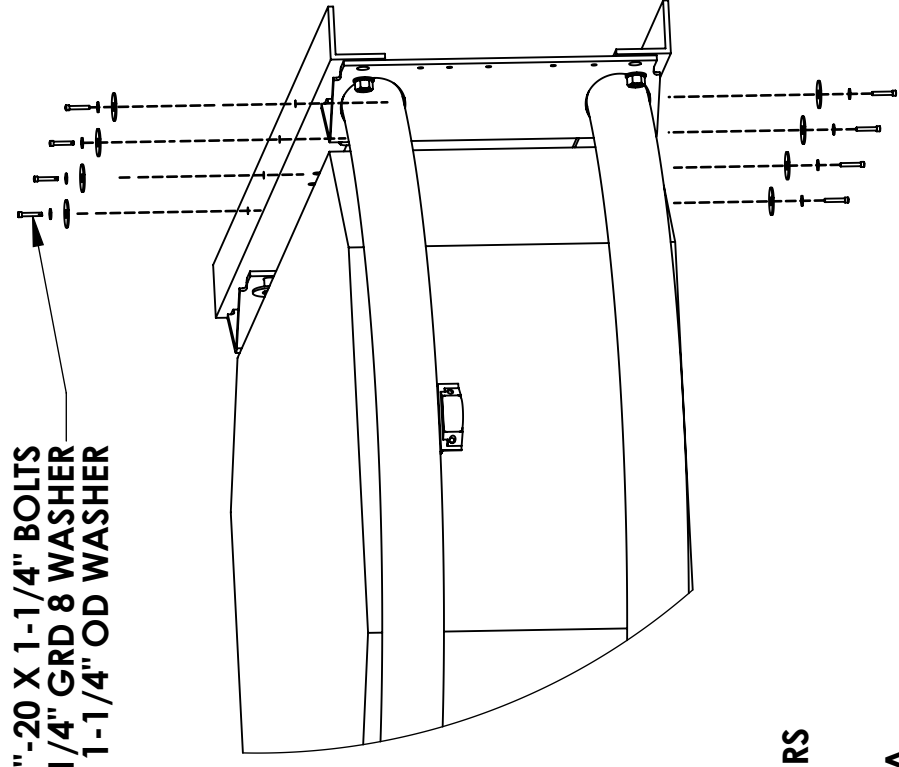
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TITLE:  
**TA TONGUE  
INSTALLATION**

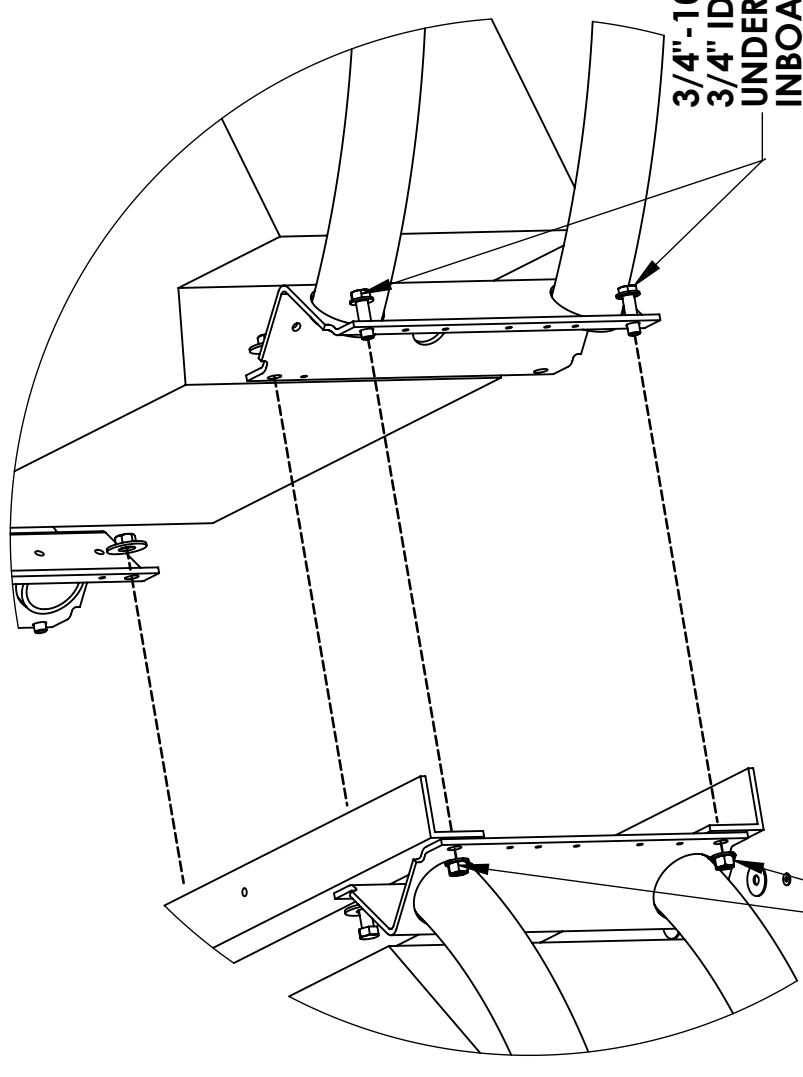
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|--------------|-------|--------------|------------|----------|
| DRAWN BY:    | DATE: | SIZE         | DWG. NO.   | REV      |
| CHECKED BY:  | DATE: | <b>B</b>     | <b>924</b> | <b>B</b> |
| APPROVED BY: | DATE: | SHEET 1 OF 4 |            |          |



1/4"-20 X 1-1/4" BOLTS  
 1/4" GRD 8 WASHER  
 1/4" ID X 1-1/4" OD WASHER



3/4"-10 X 2-1/2" HEX BOLT  
 3/4" ID X 1-1/2" OD WASHERS  
 UNDER BOLT HEAD  
 INBOARD BOLT DIRECTION  
 HEAD TOWARDS REAR OF TA



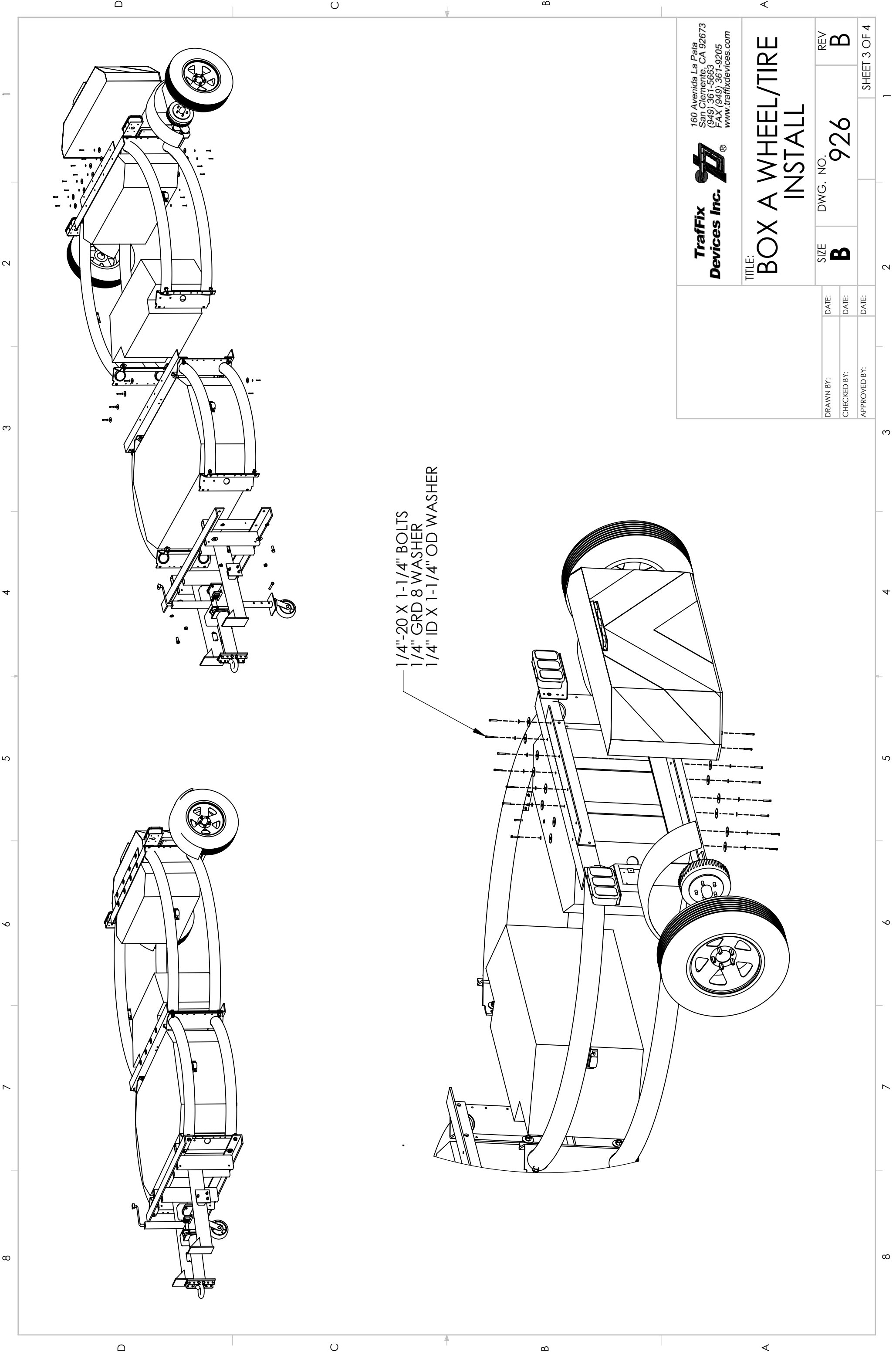
3/4"-10 X 2-1/2" HEX BOLT  
 3/4" ID X 2" OD WASHER  
 UNDER BOLT HEAD  
 OUTBOARD BOLT DIRECTION  
 HEAD TOWARDS TRUCK

| P/N    | Description                 | Qty |
|--------|-----------------------------|-----|
| 12007  | 3/4"-10 X 2-1/2" Hex Bolts  | 8   |
| 12008  | 3/4"-10 Nylock Nuts         | 8   |
| 12060  | 3/4" ID X 1-1/2" OD Washers | 8   |
| 12009  | 3/4" ID X 2" OD Washers     | 8   |
| 12032A | 1/4"-20 X 1-1/4" Bolts      | 8   |
| 12005  | 1/4" ID X 1-1/4" OD Washer  | 8   |
| 12042  | 1/4" Grd 8 Washer           | 8   |

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TITLE: **STRUT TO CARTRIDGE  
 ATTACHMENT**  
 SIZE: **B** DWG. NO.: **925** REV: **B**

DRAWN BY: DATE:  
 CHECKED BY: DATE:  
 APPROVED BY: DATE:

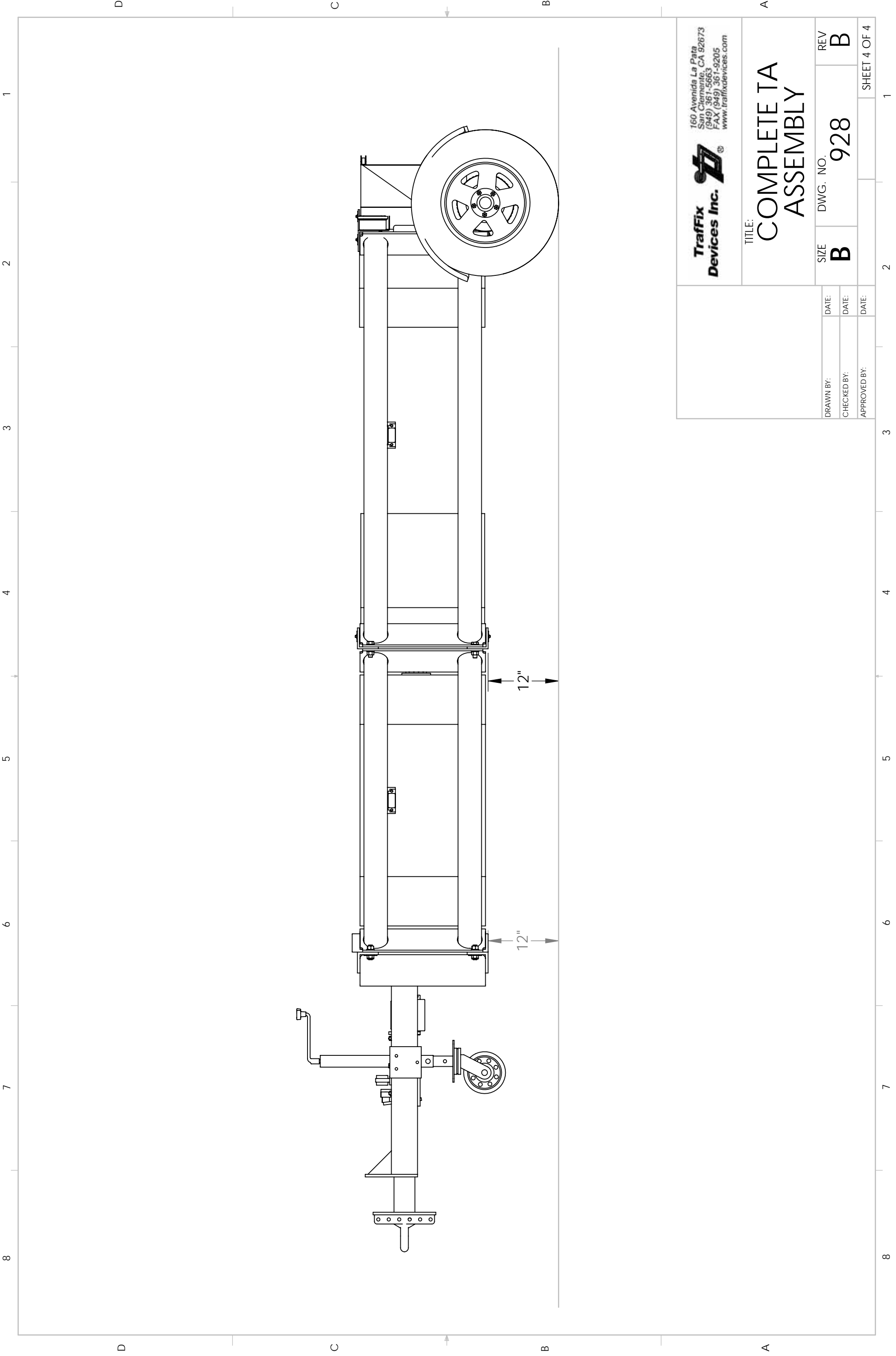


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TITLE: **BOX A WHEEL/TIRE INSTALL**

|          |            |          |
|----------|------------|----------|
| SIZE     | DWG. NO.   | REV      |
| <b>B</b> | <b>926</b> | <b>B</b> |

|              |       |
|--------------|-------|
| DRAWN BY:    | DATE: |
| CHECKED BY:  | DATE: |
| APPROVED BY: | DATE: |



**Traffix**  
**Devices Inc.**

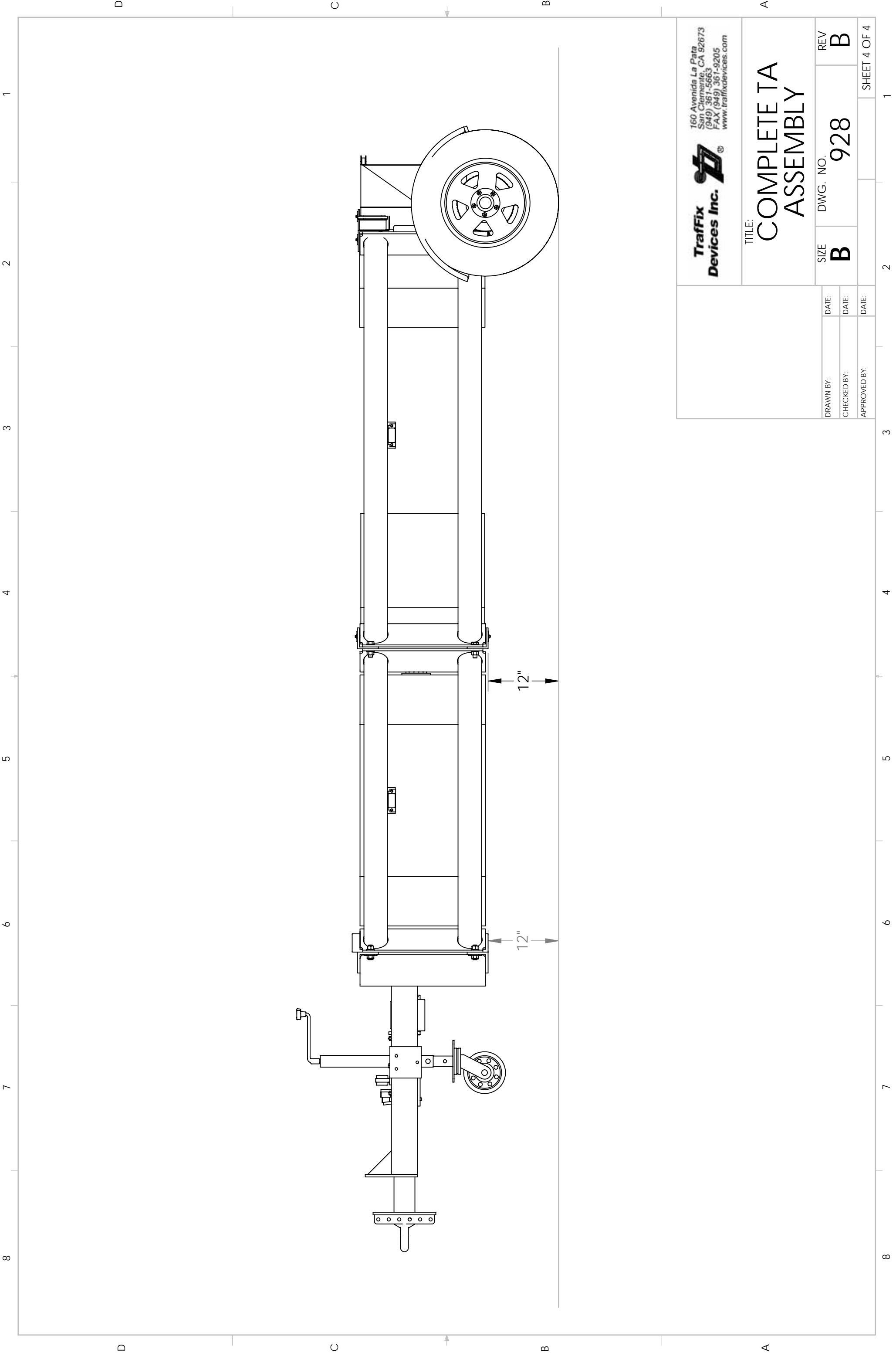
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 San Clemente, CA 92673  
 (949) 361-5663  
 FAX (949) 361-9205  
 www.traffixdevices.com

TITLE:  
**COMPLETE TA  
 ASSEMBLY**

|          |            |          |
|----------|------------|----------|
| SIZE     | DWG. NO.   | REV      |
| <b>B</b> | <b>928</b> | <b>B</b> |

|              |       |
|--------------|-------|
| DRAWN BY:    | DATE: |
| CHECKED BY:  | DATE: |
| APPROVED BY: | DATE: |

SHEET 4 OF 4





## Assembly of Scorpion Trailer Attenuator (TA) (TL-3)

1. Note that the Warning Top Heavy means that caution should be used in moving the pallets. Use fork extenders on forklift and keep all personnel away while moving. **Note: Components are heavy and cumbersome. It may take several people to properly set up the Scorpion TA.**
2. Unpack the pallet by removing the shrink-wrap and cutting the steel bands (Refer to Drawing 911). **Caution: It is possible that when the steel banding is cut the TA cartridge and strut may fall a few inches. Keep personnel away from the TA when the steel bands are cut. Keep a few feet away from pallet when pallet is pulled free of the cartridge because it will drop a few inches.**

Remove Module Box A, B, and C, the fenders, and the wheels/tires from the Cartridge Section before it is taken off the pallet. Place TARS Tongue, Cartridge and Strut Sections in the horizontal position on a level work surface (Refer to Drawing 912 for full view).

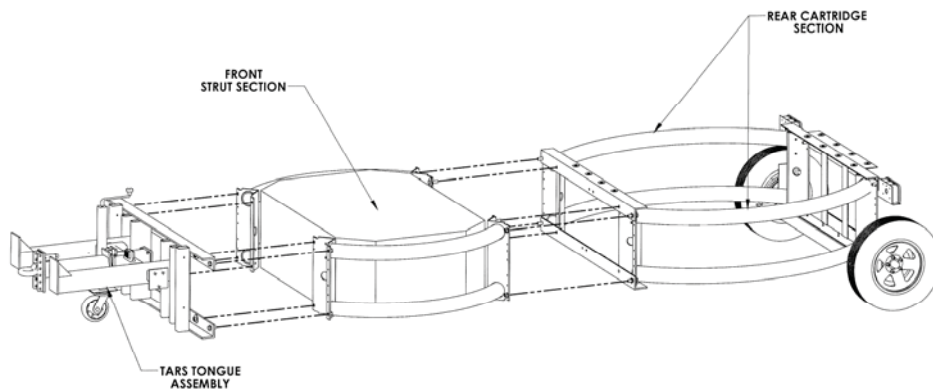


Figure 1

3. Position automotive roller jacks or other supports under both sides of the cartridge section. The supports should be about midway between front and back and about 12" high.
4. Repeat with Strut section. Refer to Drawing 925 for full view
5. Locate the TARS Tongue Section, the Crank Jack Wheel, and the Crank Jack Wheel Lock Pin from the Accessories box, and the Heavy Duty Single Post Jack wheel. Install the wheel as follows:
  - A. Lift the TARS.
  - B. Insert the wheel into the jack.
  - C. Secure with Crank Jack Wheel Lock Pin.

(Refer to Drawing 924 for full view)

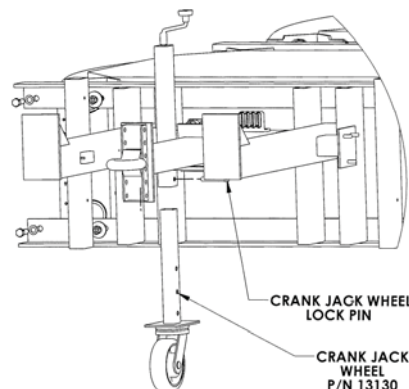


Figure 2

6. Remove the following parts from the Strut:

- Bolts, 3/4"-10x2", PN12006
- Washers, 3/4" x 2" OD, **Large** dia, PN12069
- OD Washers, 3/4" x 1 1/2", **Small** dia, PN12009
- Nylon Nuts, 3/4"-10, PN12008

Roll the strut into position in front of the TARS Tongue and bolt as follows:

- Starting with the outboard hole on the top of the vertical bracket of the strut, thread the bolt, head towards truck, through a **small** diameter washer, the hole in the TARS, and then the hole in the strut. Once the bolt is through, secure with another **small** diameter washer and the Nylock nut. Repeat on the bottom and the other side.
- On the inboard hole on the top of the vertical bracket of the strut, thread the bolt, head towards rear of TA, through a **large** diameter washer, the hole in the TARS, and then the hole in the strut. Once the bolt is through, secure with another **large** diameter washer and the Nylock nut. Repeat on the bottom and the other side.

(Refer to Drawing 924 for full view)

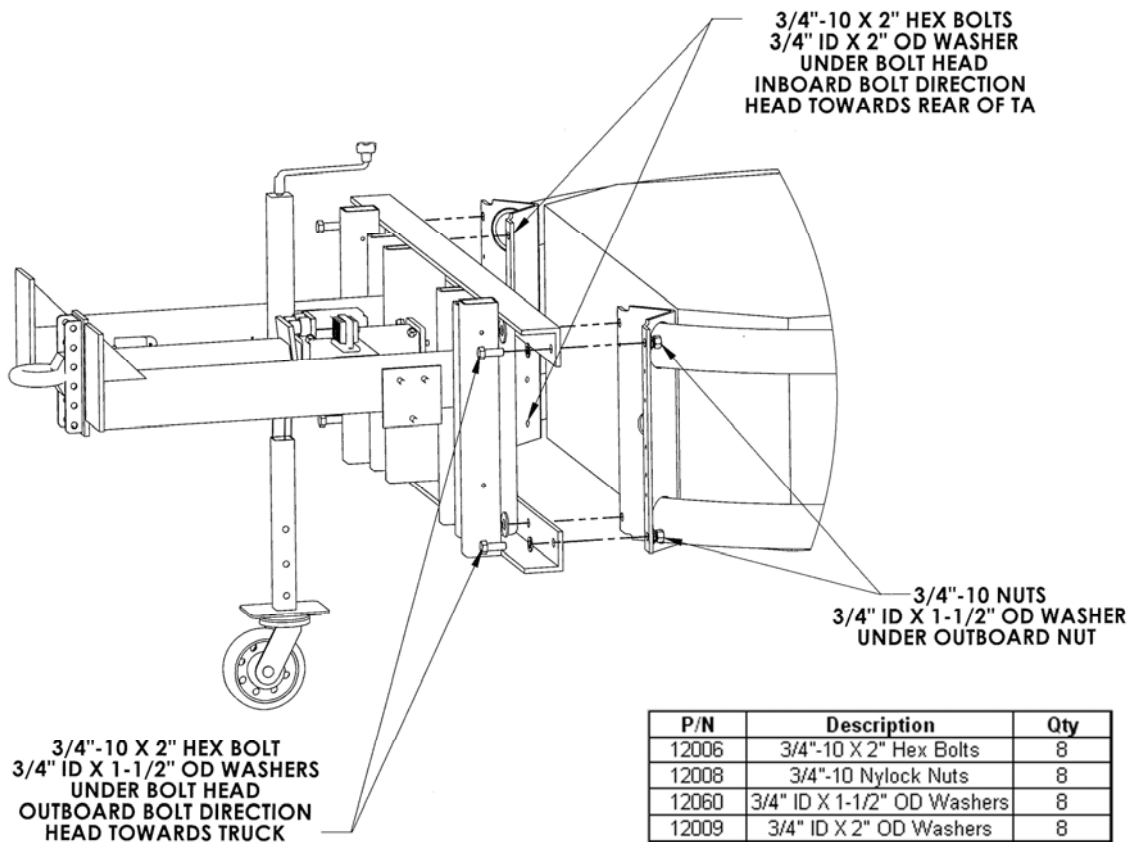


Figure 3

7. Remove the following parts from the Cartridge:

- Bolts, 3/4"-10x2 1/2", PN 12007
- Washers, 3/4"x 2" OD, **Large** dia, PN 12069
- Washers, 3/4"x 1 1/2" OD **Small** dia, PN 12009
- Nylon Nuts, 3/4"-10, PN 12008

Roll the strut into position in front of the cartridge and bolt as follows:

- Starting with the outboard hole on the top of the vertical bracket of the cartridge, thread the bolt, head towards rear of TA, through a **small** diameter washer, the hole in the cartridge, and then the hole in the strut. Once the bolt is through, secure with another **small** diameter washer and the Nylock nut. Repeat on the bottom and the other side.

- On the inboard hole on the top of the vertical bracket of the cartridge, thread the bolt, head towards truck, through a **large** diameter washer, the hole in the strut, and then the hole in the cartridge. Once the bolt is through, secure with another **large** diameter washer and the Nylock nut. Repeat on the bottom and the other side.

(Refer to Drawing 924 for full view)

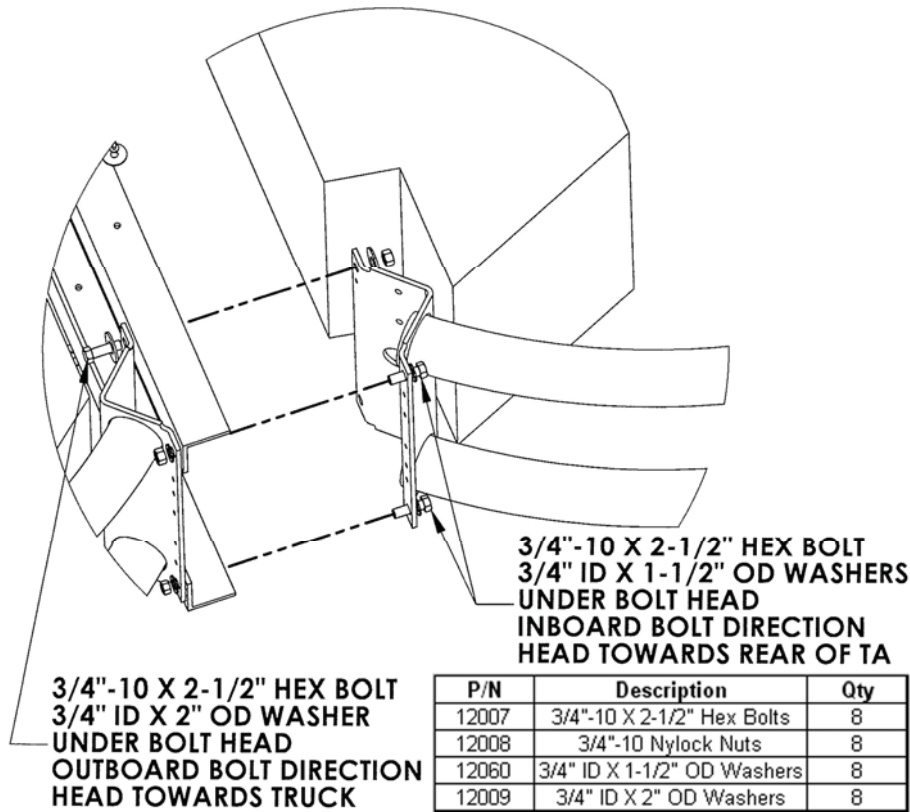


Figure 4

8. Install Module Box C, within the cartridge section, to the top and bottom angles on the backside of the strut. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward.

(Refer to Drawing 925 for full view)

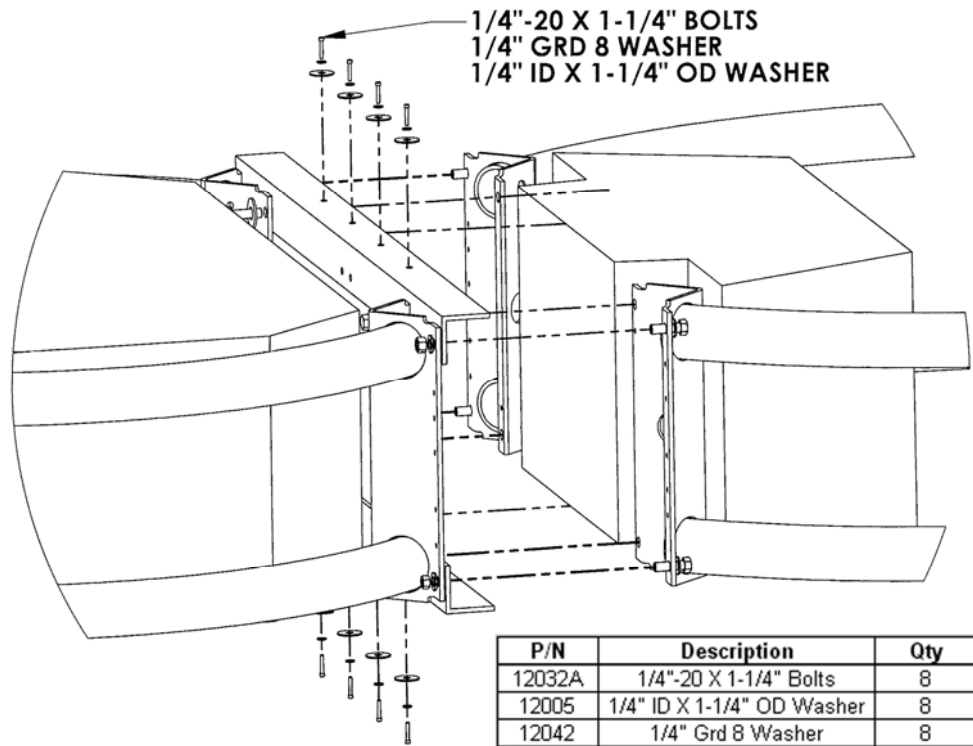


Figure 5

9. Install Module Box B to the top and bottom angles within the cartridge section at the rear. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers one small washer with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward.
10. Install Module Box A to the top and bottom angles on the backside of the rear diaphragm. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers one small washer with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward. Make sure to position the ICC bar light to the top of the rear panel on the box.

11. Remove the nuts from the studs on each of the axle. Install the fenders and wheel/tire. Secure with nuts. Repeat for remaining side.

(Refer to Drawing 926 for full view)

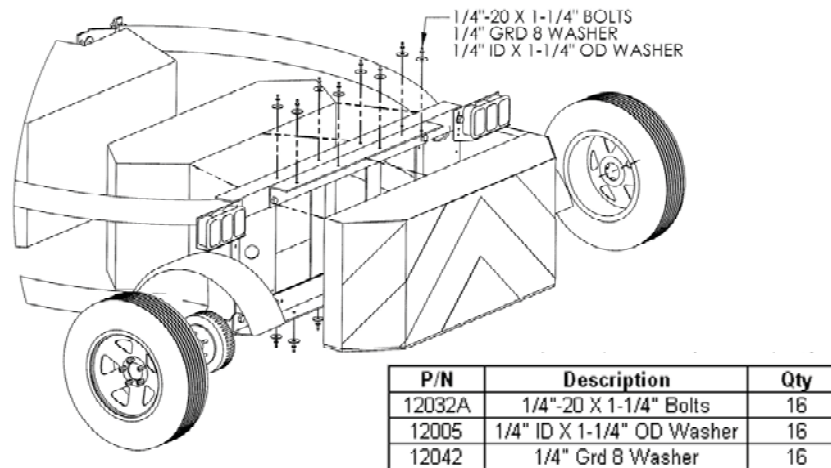
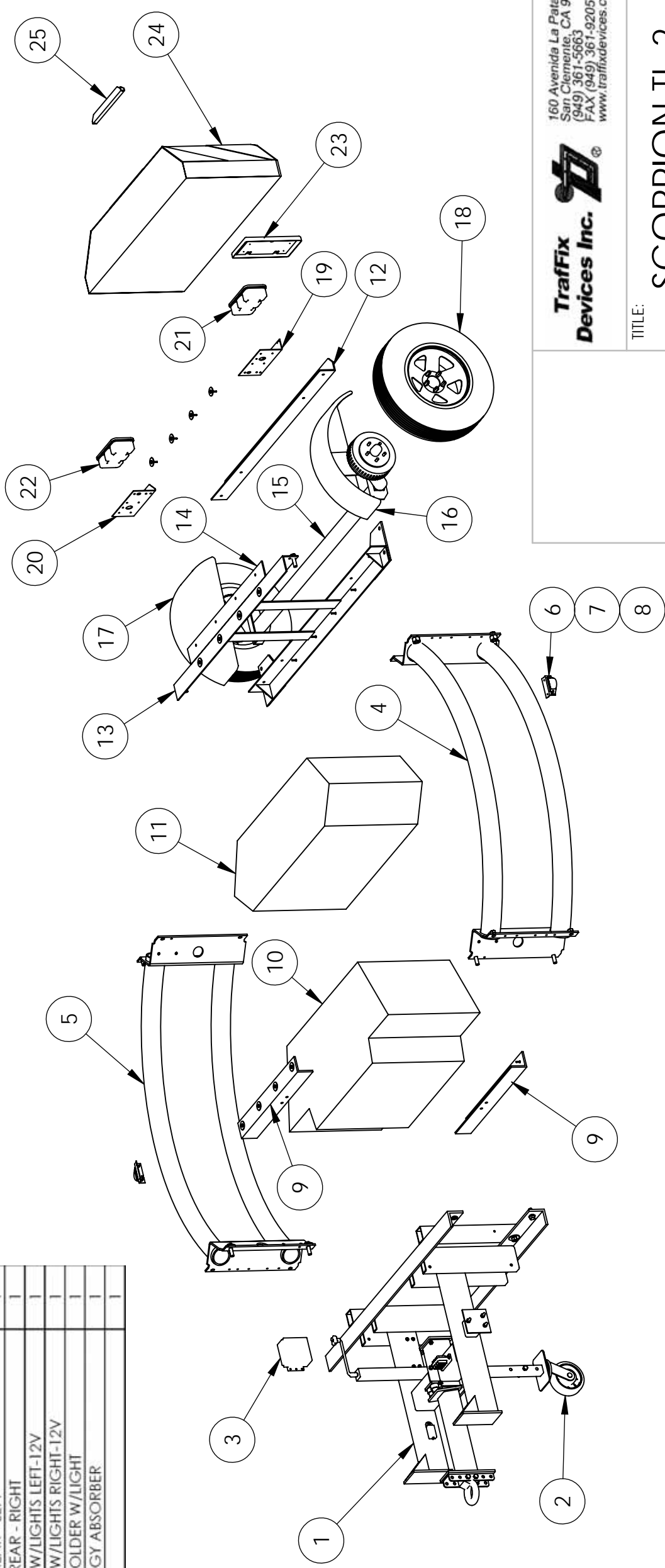


Figure 6

12. Plug the main power cable from the strut (left side) into the electrical connector box on the cartridge. Snap the wire retainers in place on the electrical connector box and wire tie the retainers together
13. The rear ICC bar light has two wires extending from it with plugs. Connect the plugs into the electrical wire plugs at the light.
14. Connect the 7-pin electrical connector and verify that all the lights function correctly.  
(Refer to Wiring Schematic)
15. Hook up to appropriate host vehicle and road test the Scorpion TA.
16. Check all bolts for tightness after the road test and refer to the maintenance section of the manual to set up regular maintenance.

| 976 Scorpion Trailer Attenuator 10002-TL2-12TA |        |                                       |     |
|--|--------|---------------------------------------|-----|
| ITEM NO.                                       | PN     | DESCRIPTION                           | QTY |
| 1  | 13100  | TONGUE                                | 1   |
| 2  | 13130  | JACK, MODIFIED HEAVY DUTY SINGLE POST | 1   |
| 3  | 13154  | BRAKE SWITCH ENGAGER                  | 1   |
| 4  | 10100L | CARTRIDGE TUBE FRAME LEFT             | 1   |
| 5  | 10100R | CARTRIDGE TUBE FRAME RIGHT            | 1   |
| 6  | 10502  | SIDE MARKER LIGHTS- 12 V              | 2   |
| 7  | 10520  | SIDE LIGHT BRACKET                    | 2   |
| 8  | 10524  | SIDE LIGHT ALUMINUM ANGLE BRACKET     | 2   |
| 9  | 10137  | TL-2 TARS CARTRIDGE ANGLE             | 2   |
| 10   | 10400C | MODULE C ENERGY ABSORBER              | 1   |
| 11   | 10400B | MODULE B ENERGY ABSORBER              | 1   |
| 12   | 10127  | REAR BOTTOM ANGLE, CARTRIDGE          | 1   |
| 13   | 13155  | TRAILER DIAPHRAGM ASSY                | 1   |
| 14   | 10465  | REAR TOP ANGLE, CARTRIDGE             | 1   |
| 15   | 13230  | TRAILER AXLE                          | 1   |
| 16   | 13240L | FENDER W/MOUNTING BRACKET - LEFT      | 1   |
| 17   | 13240R | FENDER W/MOUNTING BRACKET - RIGHT     | 1   |
| 18   | 13260  | TIRE AND WHEEL                        | 2   |
| 19   | 10532L | LIGHT BRACKET REAR - LEFT             | 1   |
| 20   | 10532R | LIGHT BRACKET REAR - RIGHT            | 1   |
| 21   | 10508  | LIGHT HOUSING W/LIGHTS LEFT-12V       | 1   |
| 22   | 10516  | LIGHT HOUSING W/LIGHTS RIGHT-12V      | 1   |
| 23   | 13295  | LICENSE PLATE HOLDER W/LIGHT          | 1   |
| 24   | 10400A | MODULE A ENERGY ABSORBER              | 1   |
| 25   | 10557  | ICC BAR LIGHT                         | 1   |



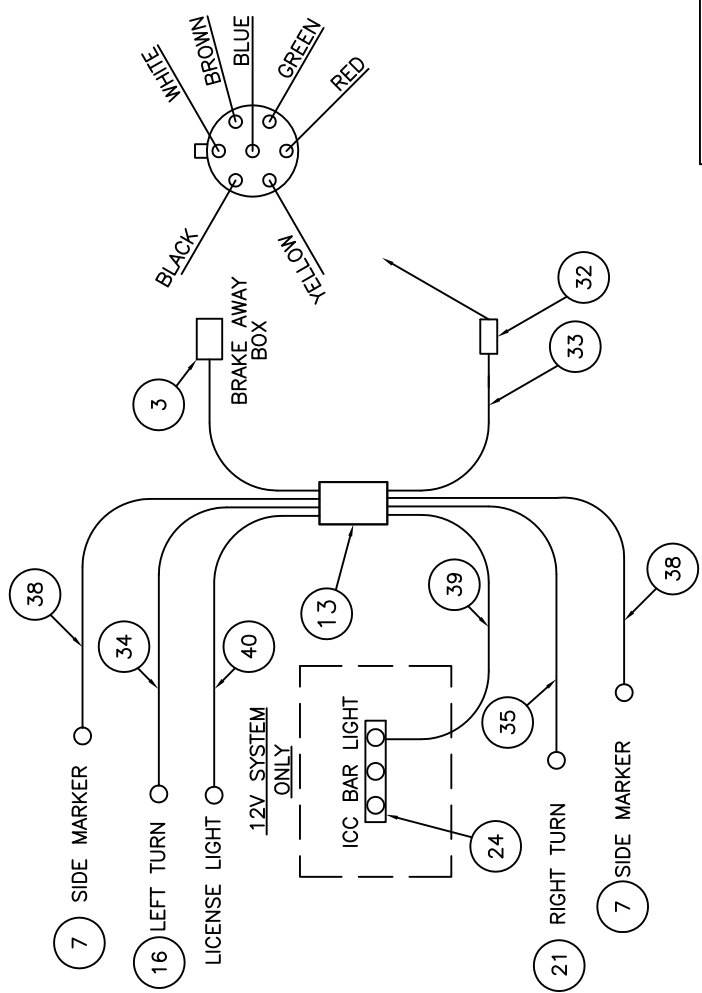
# TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR TL-2

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 San Clemente, CA 92673  
 (949) 361-5663  
 FAX (949) 361-9205  
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TITLE: **SCORPION TL-2  
TRAILER ATTENUATOR**

|                          |                   |                  |                        |                 |
|--------------------------|-------------------|------------------|------------------------|-----------------|
| DRAWN BY:<br>Mary Dralle | DATE:<br>07-25-08 | SIZE<br><b>B</b> | DWG. NO.<br><b>976</b> | REV<br><b>-</b> |
| CHECKED BY:<br>x         | DATE:<br>XX-XX-XX |                  |                        |                 |
| APPROVED BY:<br>x        | DATE:<br>XX-XX-XX | SHEET 1 OF 1     |                        |                 |

# LIGHT WIRING DIAGRAM



| ELECTRICAL PARTS |                                  |       |
|------------------|----------------------------------|-------|
| ITEM             | DESCRIPTION                      | PN    |
| 3                | BRAKE SWITCH ENGAGER             | 13154 |
| 7                | SIDE MARKER LIGHTS-12 V          | 10502 |
| 13               | JUNCTION BOX                     | 10518 |
| 16               | LEFT TURN LIGHT                  | 10508 |
| 21               | RIGHT TURN LIGHT                 | 10516 |
| 24               | ICC BAR LIGHT                    | 10557 |
| 32               | PLUG 7 WAY                       | 10506 |
| 33               | POWER CABLE TO STRUT             | 10511 |
| 34               | LEFT TURN WIRE HARNESS           | 10519 |
| 35               | RIGHT TURN WIRE HARNESS          | 10509 |
| 38               | SIDE LIGHT HARNESS TO CARTRIDGE  | 10513 |
| 39               | ICC BAR LIGHT CABLE              | 10556 |
| 40               | LICENSE PLATE LIGHT WIRE HARNESS | 13277 |

| 7 WAY PLUG WIRING |                                   |
|-------------------|-----------------------------------|
| WHITE             | GROUND                            |
| BLACK             | ICC BAR LIGHT                     |
| YELLOW            | LEFT TURN                         |
| RED               | STOP                              |
| GREEN             | RIGHT TURN                        |
| BROWN             | TAILLIGHTS, SIDE MARKERS, LICENSE |
| BLUE              | BACKUP                            |

UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES.

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**TL-2 TRAILER ATTENUATOR WIRING DIAGRAM**

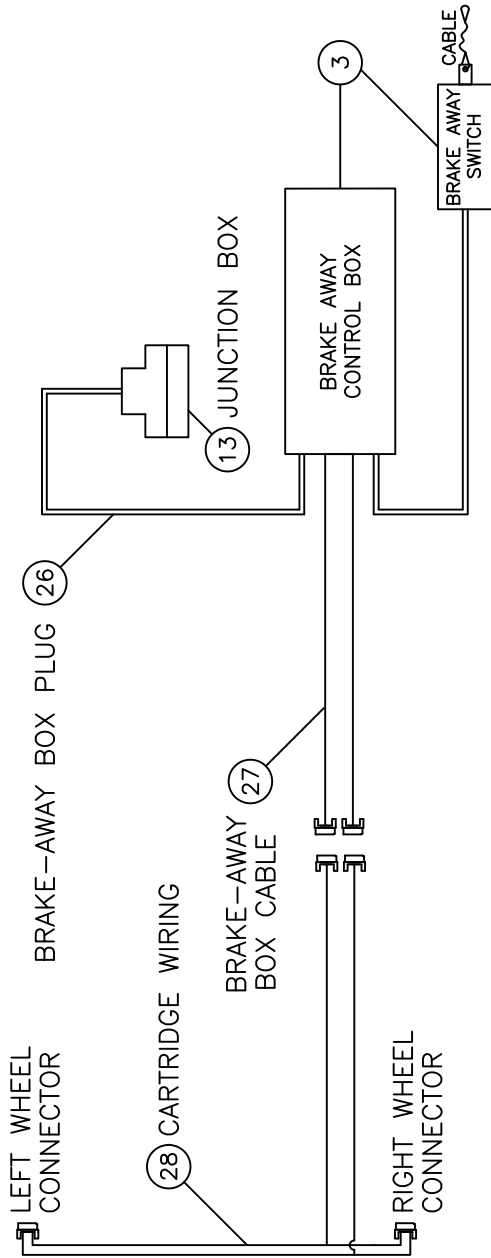
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| CHECKED BY:  | DATE:          | SCALE: 1/1     | SHEET 1 OF 1 |     |        |
| APPROVED BY: | DATE:          |                |              |     |        |

NOTES: UNLESS OTHERWISE SPECIFIED.



| BRAKE WIRING PARTS |  |       |
|--------------------|--|-------|
| ITEM               | DESCRIPTION                                    | PN    |
| 3                  | BRAKE SWITCH ENGAGER                           | 13154 |
| 30                 | JUNCTION BOX                                   | 10518 |
| 26                 | BRAKE-AWAY PLUG                                | 13275 |
| 27                 | BRAKE-AWAY BOX CABLE                           | 13273 |
| 29                 | CARTRIDGE/RIGHT WHEEL/<br>LEFT WHEEL CONNECTOR | 13274 |

BRAKE WIRING SCHEMATIC



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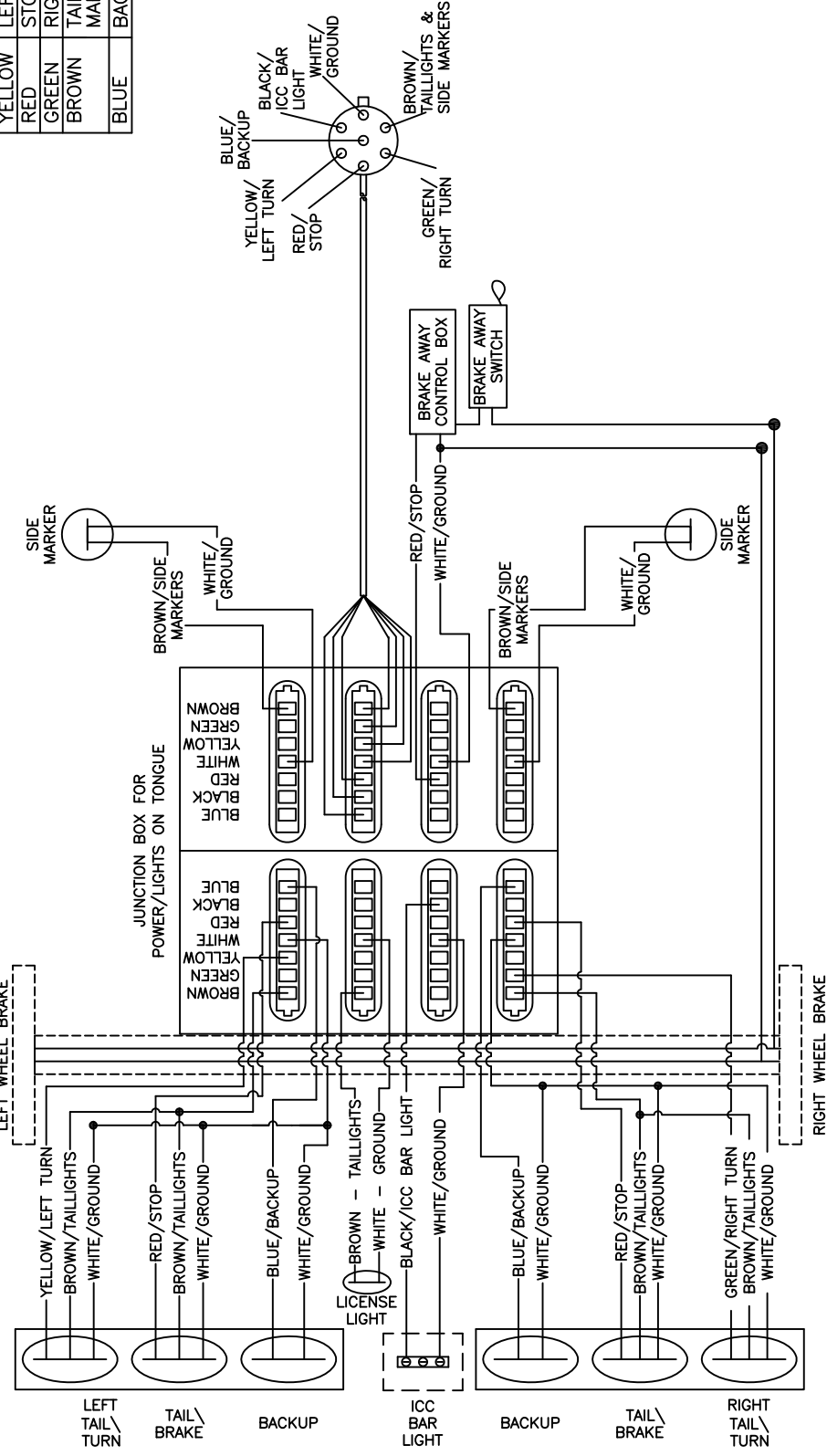
**TL-2 BRAKE WIRING DIAGRAM**

|              |                |                |               |        |
|--------------|----------------|----------------|---------------|--------|
| DRAWN BY:    | DATE: 07/25/08 | SIZE: <b>B</b> | DWG NO. 984   | REV: — |
| CHECKED BY:  | DATE:          | SCALE: NTS     | SHEET: 1 OF 1 |        |
| APPROVED BY: | DATE:          |                |               |        |

NOTES: UNLESS OTHERWISE SPECIFIED.

| 7 WAY PLUG WIRING |                           |
|-------------------|---------------------------|
| WHITE             | GROUND                    |
| BLACK             | ICC BAR LIGHT             |
| YELLOW            | LEFT TURN                 |
| RED               | STOP                      |
| GREEN             | RIGHT TURN                |
| BROWN             | TAILLIGHTS & SIDE MARKERS |
| BLUE              | BACKUP                    |

LIGHT WIRING DIAGRAM



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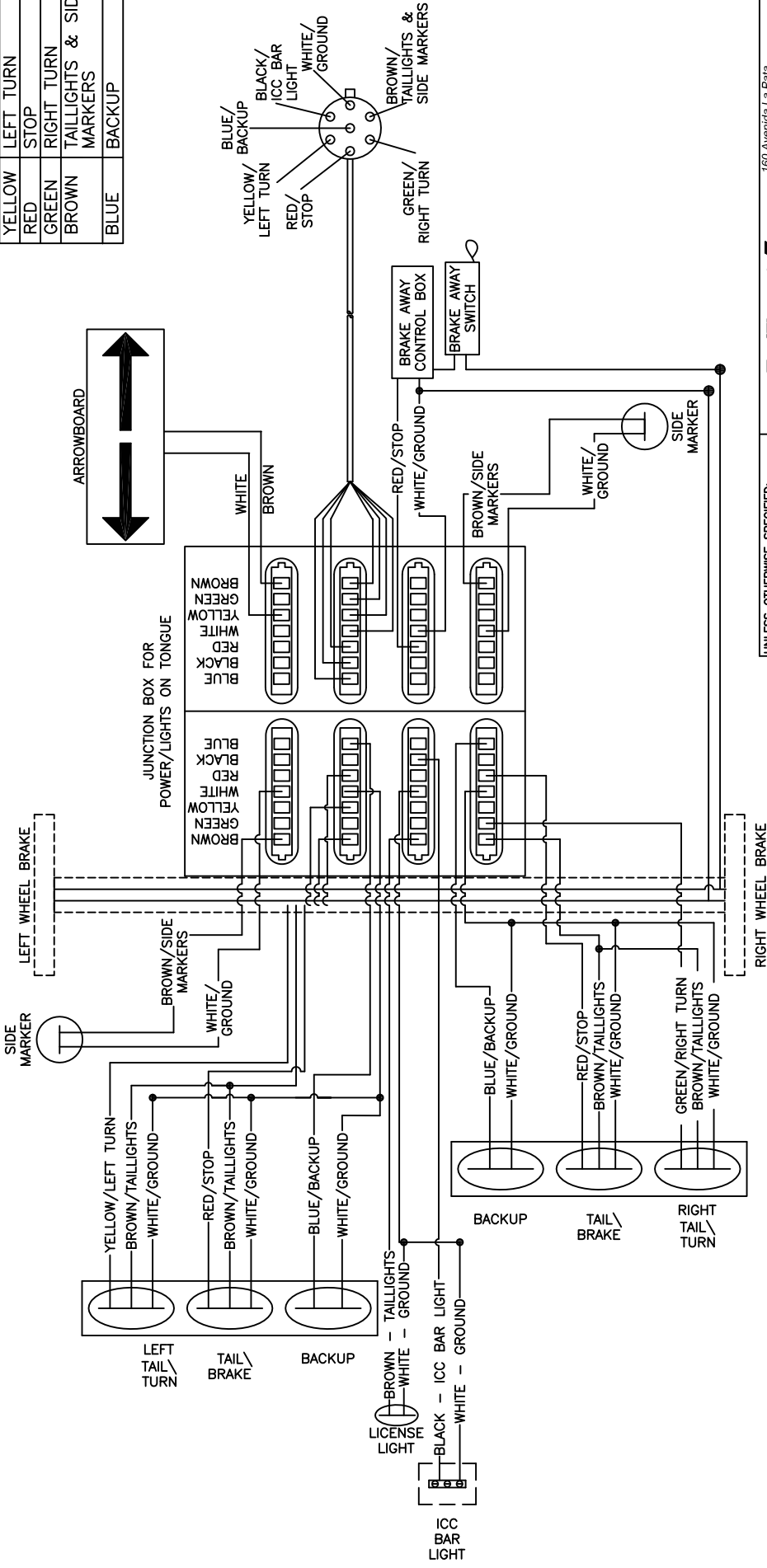
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|--------------------------|-------------------|------------------|-----------------|----------|
| DRAWN BY:<br>Mary Dralle | DATE:<br>05/20/08 | SIZE<br><b>B</b> | DWG NO.<br>972  | REV<br>— |
| CHECKED BY:              | DATE:             | SCALE<br>1/1     | SHEET<br>1 OF 1 |          |
| APPROVED BY:             | DATE:             |                  |                 |          |

**TL-2 TRAILER ATTENUATOR  
 DETAILED 12V WIRING DIAGRAM**

NOTES: UNLESS OTHERWISE SPECIFIED.

|                                 |
|---------------------------------|
| 7 WAY PLUG WIRING               |
| WHITE GROUND                    |
| BLACK ICC BAR LIGHT             |
| YELLOW LEFT TURN                |
| RED STOP                        |
| GREEN RIGHT TURN                |
| BROWN TAILLIGHTS & SIDE MARKERS |
| BLUE BACKUP                     |

LIGHT WIRING DIAGRAM



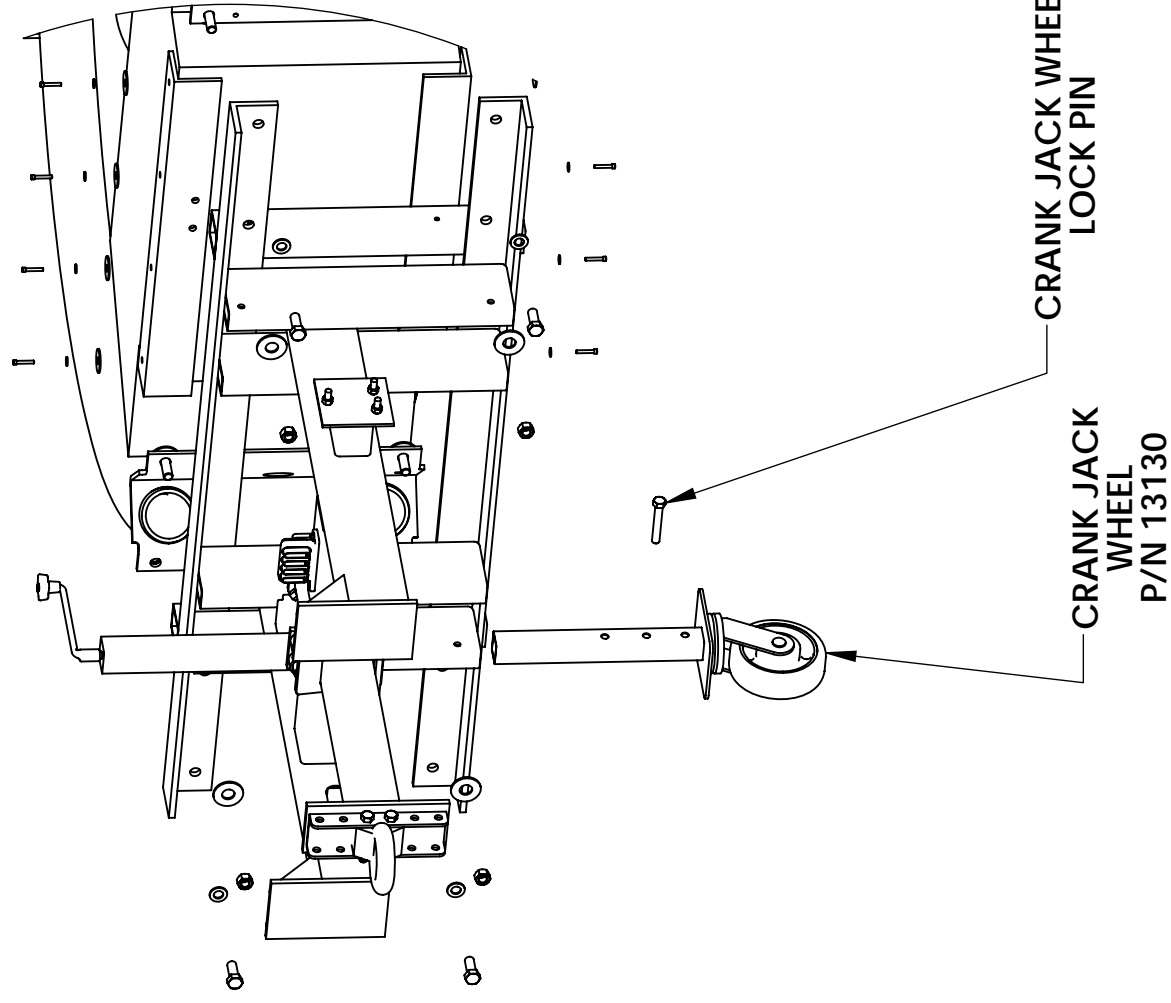
**Traffix Devices Inc.**  
 160 Avenida La Plata  
 San Clemente, CA 92673  
 (949) 361-5663  
 FAX (949) 361-9205  
 www.traffixdevices.com

TL-2 TRAILER ATTENUATOR WITH  
 ARROWBOARD DETAILED 12V WIRING DIAGRAM

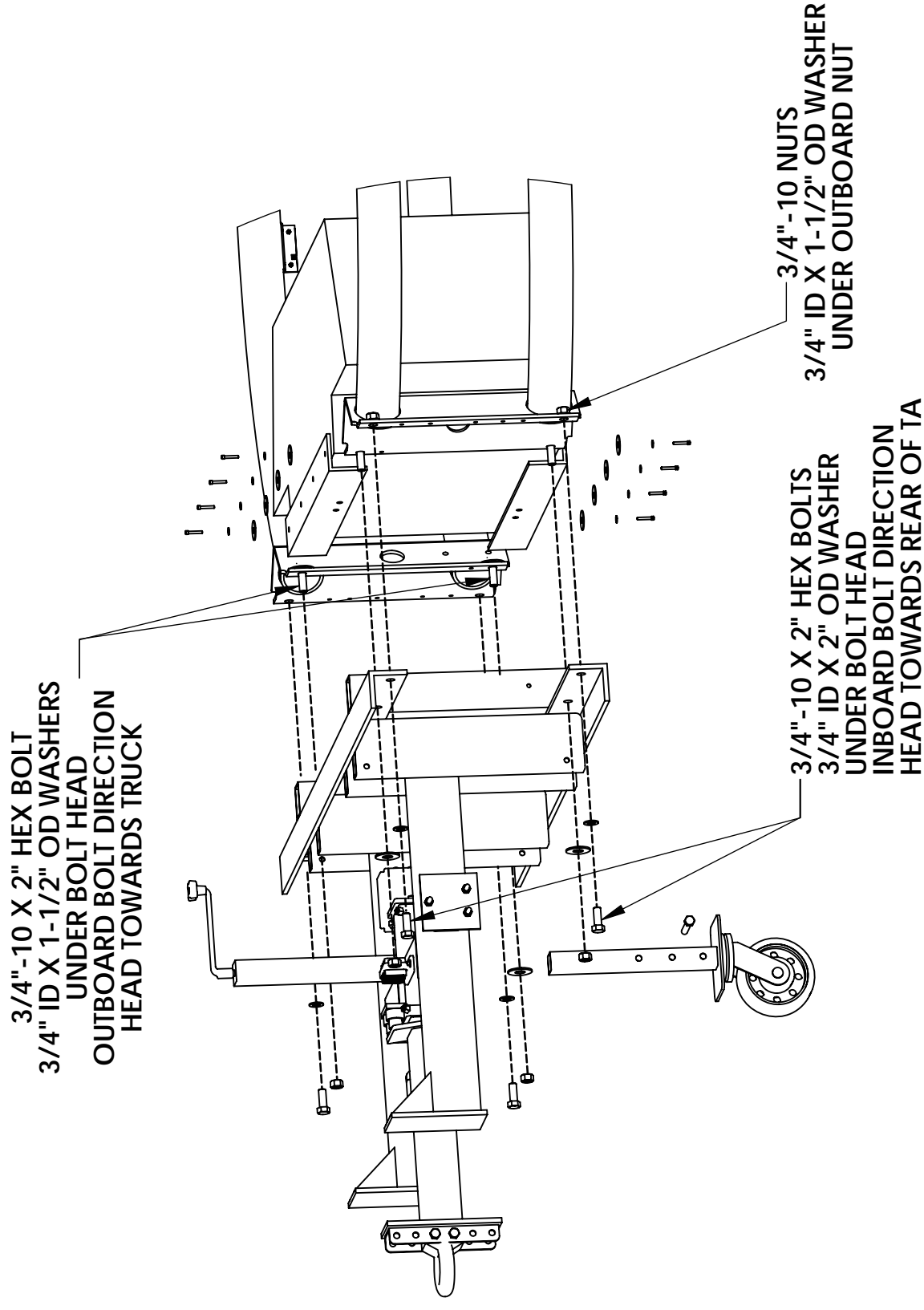
|  |                |
|--|----------------|
| UNLESS OTHERWISE SPECIFIED:<br>ALL DIMENSIONS ARE IN INCHES. |                |
| DRAWN BY: Mary Dralle  | DATE: 05/20/08 |
| CHECKED BY:  | DATE:          |
| APPROVED BY:   | DATE:          |
| SIZE: B  | DWG NO. 985    |
| SCALE: 1/1   | SHEET 1 OF 1   |

NOTES: UNLESS OTHERWISE SPECIFIED.

# TA CRANK WHEEL INSTALLATION



# TARS TONGUE TO CARTRIDGE INSTALLATION



UNLESS OTHERWISE SPECIFIED,  
ALL DIMENSIONS ARE IN INCHES.  
TOLERANCES:  
FRACTIONAL: X/X ± 1/16"

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TITLE: **TL-2 TONGUE  
INSTALLATION**

SIZE **B** DWG. NO. **978** REV **-**

| P/N   | Description                 | Qty |
|-------|-----------------------------|-----|
| 12006 | 3/4"-10 X 2" Hex Bolts      | 8   |
| 12008 | 3/4"-10 Nylock Nuts         | 8   |
| 12060 | 3/4" ID X 1-1/2" OD Washers | 8   |
| 12009 | 3/4" ID X 2" OD Washers     | 8   |

DRAWN BY: Mary Dralle DATE: 08-20-08  
CHECKED BY: DATE: XX-XX-XX  
APPROVED BY: DATE: XX-XX-XX

SHEET 1 OF 1

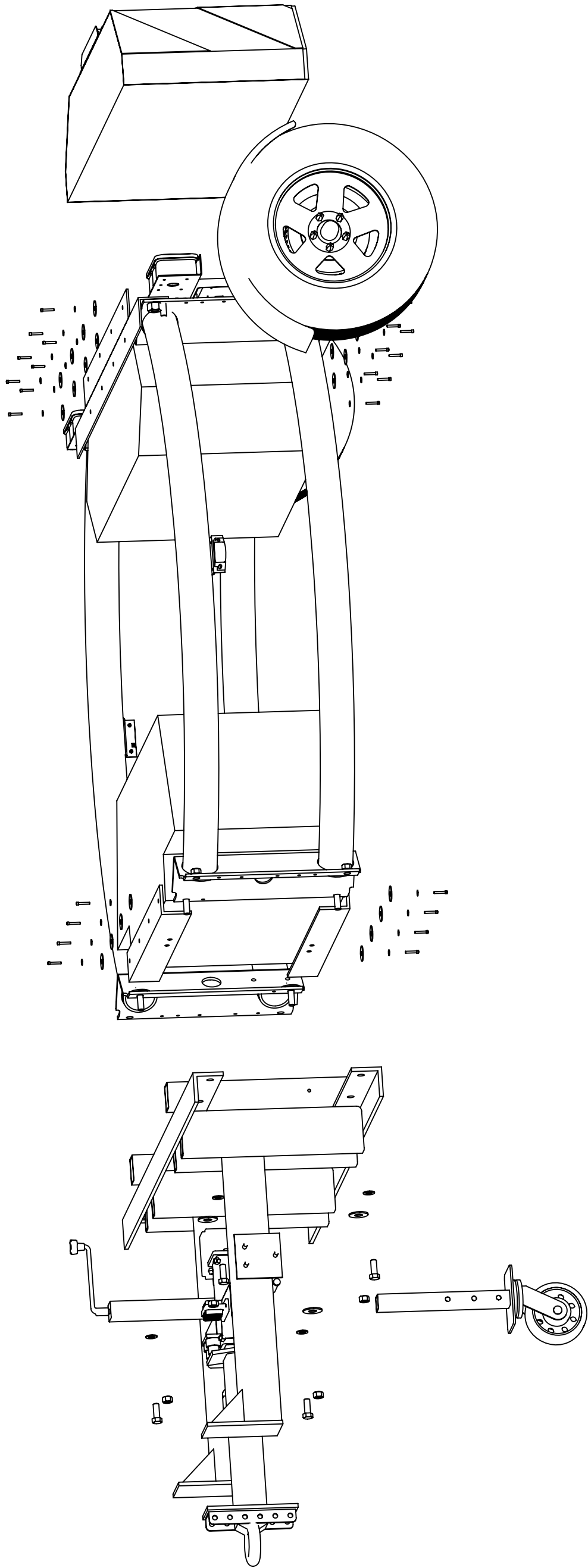
1 2 3 4 5 6 7 8

D

C

B

A



UNLESS OTHERWISE SPECIFIED:  
 ALL DIMENSIONS ARE IN INCHES.  
 TOLERANCES:  
 FRACTIONAL: X/X ± 1/16"

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**Devices Inc.**

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 FAX (949) 361-9205  
 www.traffixdevices.com

TITLE:

**TRAFFIX DEVICES SCORPION  
 TRAILER ATTENUATOR TL-2**

|                          |                   |
|--------------------------|-------------------|
| DRAWN BY:<br>Mary Dralle | DATE:<br>08-14-08 |
| CHECKED BY:              | DATE:             |
| APPROVED BY:             | DATE:             |

|          |            |          |
|----------|------------|----------|
| SIZE     | DWG. NO.   | REV      |
| <b>B</b> | <b>979</b> | <b>-</b> |

SHEET 1 OF 1

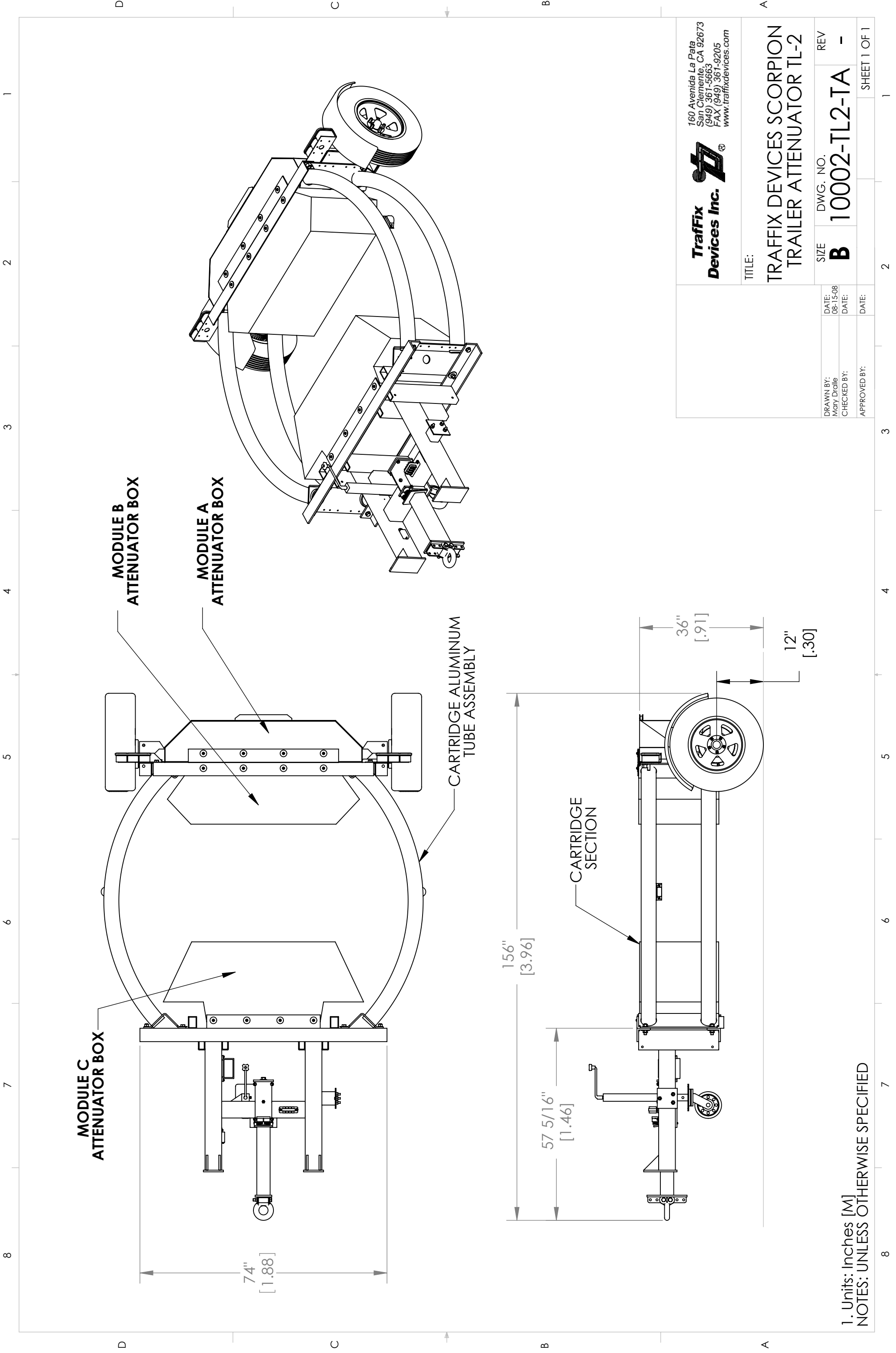
D

C

B

A

1 2 3 4 5 6 7 8



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 160 Avenida La Pata  
 San Clemente, CA 92673  
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 FAX (949) 361-9205  
 www.traffixdevices.com

TITLE:  
**TRAFFIX DEVICES SCORPION TRAILER ATTENUATOR TL-2**

DATE: 08-15-08  
 DRAWN BY: Mary Drille  
 CHECKED BY:  
 APPROVED BY:

DATE:  
 DATE:  
 DATE:

SIZE **B** DWG. NO. **10002-TL2-TA** REV **-**

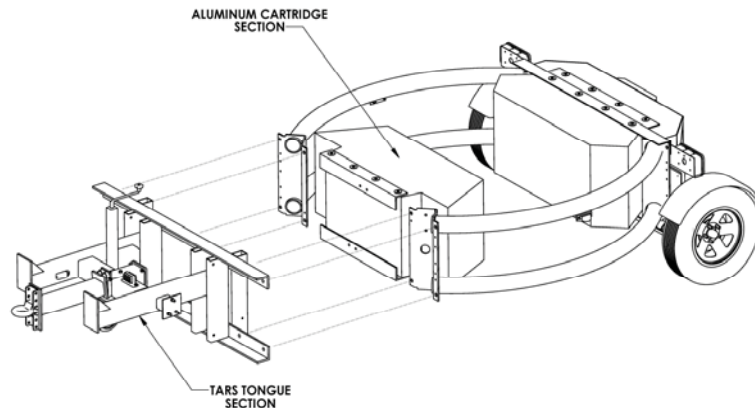
SHEET 1 OF 1

1. Units: Inches [M]  
 NOTES: UNLESS OTHERWISE SPECIFIED

## Assembly of Scorpion Trailer Attenuator (TA) (TL-2)

1. Note that the Warning Top Heavy means that caution should be used in moving the pallet. Use fork extenders on forklift and keep all personnel away while moving. *Note: Components are heavy and cumbersome. It may take several people to properly set up the Scorpion TA.*
2. Unpack the pallet by removing the shrink-wrap and cutting the steel bands. **Caution: It is possible that when the steel banding is cut the TA may fall a few inches. Keep personnel away from the TA when the steel bands are cut. Keep a few feet away from pallet when pallet is pulled free of the cartridge because it will drop a few inches.**

Remove Module Box A, B, and C, the fenders, and the wheels/tires from the Cartridge Section before it is taken off the pallet. Place TARS Tongue and Cartridge Sections in the horizontal position on a level work surface (Refer to Drawing 10002-TL2-12TA for full view).

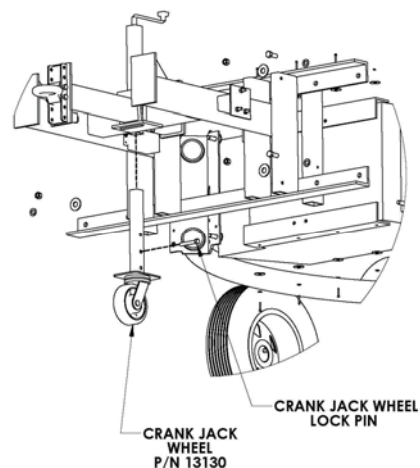


**Figure 1**

3. Position automotive roller jacks or other supports under both sides of the cartridge section. The supports should be about midway between front and back and about 12" high.
4. Locate the TARS Tongue Section, the Crank Jack Wheel, and the Crank Jack Wheel Lock Pin from the Accessories box, and the Heavy Duty Single Post Jack wheel. Install the wheel as follows:

- A. Lift the TARS.
- B. Insert the wheel into the jack.
- C. Secure with Crank Jack Wheel Lock Pin.

(Refer to Drawing 978 for full view)



**Figure 2**



6. Remove the following parts from the Cartridge:

- Bolts, 3/4"-10x2", PN12006
- Washers, 3/4" x 2" OD, **Large** dia, PN12069
- OD Washers, 3/4" x 1 1/2", **Small** dia, PN12009
- Nylon Nuts , 3/4"-10, PN12008

Roll the cartridge into position in front of the TARS Tongue and bolt as follows:

- Starting with the outboard hole on the top of the vertical bracket of the cartridge, thread the bolt, head towards truck, through a **small** diameter washer, the hole in the TARS, and then the hole in the cartridge. Once the bolt is through, secure with another **small** diameter washer and the Nylock nut. Repeat on the bottom and the other side.
- On the inboard hole on the top of the vertical bracket of the cartridge, thread the bolt, head towards rear of TA, through a **large** diameter washer, the hole in the TARS, and then the hole in the cartridge. Once the bolt is through, secure with another **large** diameter washer and the Nylock nut. Repeat on the bottom and the other side.

(Refer to Drawing 978 for full view)

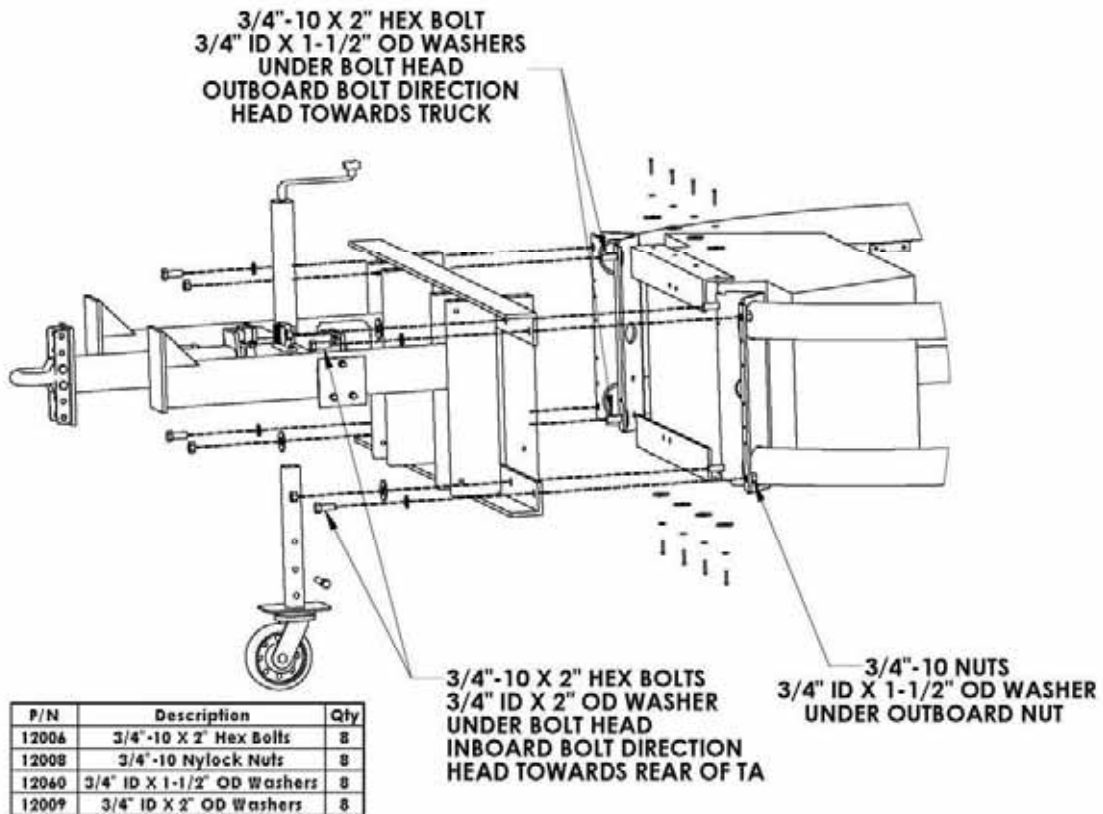
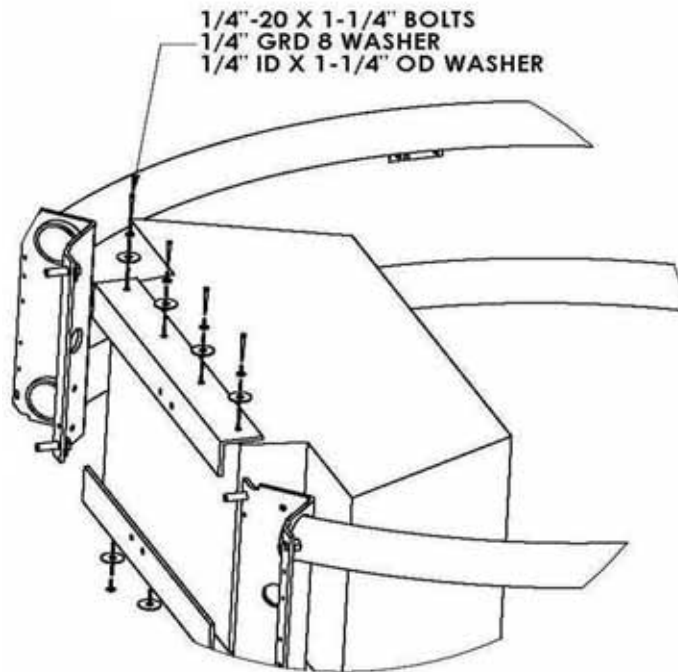


Figure 3

7. Install Module Box C, within the cartridge section, to the top and bottom angles on the front of the cartridge. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward.

(Refer to Drawing 979 for full view)



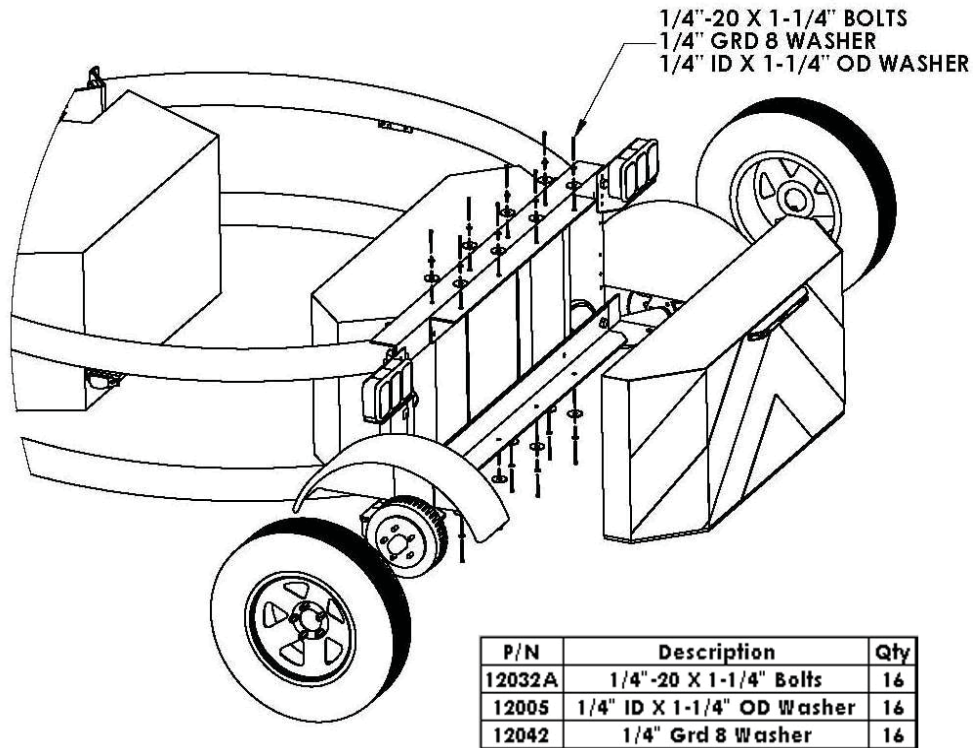
| P/N    | Description                | Qty |
|--------|----------------------------|-----|
| 12032A | 1/4"-20 X 1-1/4" Bolts     | 8   |
| 12005  | 1/4" ID X 1-1/4" OD Washer | 8   |
| 12042  | 1/4" Grd 8 Washer          | 8   |

*Figure 4*

8. Install Module Box B to the top and bottom angles within the cartridge section at the rear. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward.
9. Install Module Box A to the top and bottom angles on the backside of the rear diaphragm. Use one 1/4" x 1-1/4" Fender Washers and 1/4" Grd 8 Washers with each 1/4"-20 x 1-1/4" Allen bolt and back the small washer with one larger washer before installing. Torque the Allen bolt until the large washers just start to dish inward. Make sure to position the ICC bar light to the top of the rear panel on the box.

- Remove the nuts from the studs on each of the axle. Install the fenders and wheel/tire. Secure with nuts. Repeat for remaining side.

(Refer to Drawing 979 for full view)



*Figure 5*

- Plug the main power cable from the cartridge (left side) into the electrical connector box. Snap the wire retainers in place on the electrical connector box and wire tie the retainers together
- The rear ICC bar light has two wires extending from it with plugs. Connect the plugs into the electrical wire plugs at the light.
- Connect the 7-pin electrical connector and verify that all the lights function correctly.

(Refer to Wiring Schematic)

- Hook up to appropriate host vehicle and road test the Scorpion TA.
- Check all bolts for tightness after the road test and refer to the maintenance section of the manual to set up regular maintenance.

## TA Limited Warranty

TraFFix Devices warrants to the purchaser that the Scorpion Trailer Mounted Attenuator (TA) 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 option, the defective product free of charge. The period of this warranty is the one year period 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 fill out a warranty authorization form and fax same to TraFFix Devices to have our technical services 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 deems to have been defective. All replacement parts claimed to be defective will be invoiced at the time of shipment, and upon receipt and evaluation a credit memo will be issued.

This warranty does not extend to any failure of the Scorpion TA caused by misuse, abuse or material alteration of this product, 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, the operator's deployment instructions, and the operator's checklist.

### **Warranty Authorization Form**

1. Company Name \_\_\_\_\_
2. Address \_\_\_\_\_
3. Phone, Fax Number, and E-Mail \_\_\_\_\_
4. Name of Customer \_\_\_\_\_
5. Date \_\_\_\_\_
6. Serial number of TA near controller outlet: \_\_\_\_\_
7. Repair parts are listed in Illustration 906 and on the corresponding parts list which section of the installation manual.
8. List part numbers of replacement or repair items:  
\_\_\_\_\_  
\_\_\_\_\_
9. Describe the problem and reason for failure: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. Fax this form and e-mail any pictures. Then phone TraFFix Devices technical services.  
Phone: (949) 361-5663      Fax: (949) 361-9205      E-mail: info@traffixdevices.com



