

## **TRAFFIX SCORPION TRUCK MOUNTED ATTENUATOR SPECIFICATIONS**



### Features and Benefits (NCHRP-350 TL-2 & TL-3 approved)

- Aluminum cartridge and strut weighs only **(1,627 lbs.)**
- Curved aluminum tube frame **provides protection** against vehicles impacting into coffin corner area at the rear of truck.
- Open cartridge area – **very low wind resistance** and no buffing at high speeds
- System fully extended length is only **13 feet**.
- System crushes in progressive stages – **lower repair costs**
- **Modular system** allows for easy replacement of all parts
- Diamond grade reflective tape and extensive rear lighting helps warn oncoming vehicles
- Four built-in jacks allow system to be stored with cartridge in the vertical position
- 90 degree tilt is hydraulic with hydraulic pump and cab controls
- Coating is durable polyester powder coat for maximum longevity
- Energy absorbing cartridges are aluminum honeycomb in environmentally sealed aluminum containers
- Second 90-degree tilt allows for minimum truck overhang and extension and minimum transport height of only **10' 6"**.

## **TraFFix Scorpion 10,000 Truck Mounted Attenuator**

### **Performance and Safety Features:**

- Approved By FHWA – for use on the National Highway System (NHS);
- Crash Tested and Certified – to NCHRP Report 350 TL-2 and TL-3 requirements; the only TMA to have been subjected to and pass both TL-3 optional off-set impacts (Tests 3-52 & 3-53);
- Additional Crash Test – TMA has been subjected to and passed a rear corner, worst case, "real world" type impact using TL-3 testing criteria (TraFFix Test 3-54);
- Curved Aluminum Tube Frame – is exceptionally strong, provides re-directional capacity along entire length of TMA, and resists damage from coincidental contacts (self-inflicted wounds);
- Full Lane Width Protection – is sufficiently wide to prevent potential vehicle pocketing at the non-cushion, truck support region (the "coffin corner" area at rear of truck);
- Open Cartridge Design – TMA has very low wind resistance when transporting, with no buffeting at high speed, and allows rearward visibility when raised;
- Scorpion TMAs are Modular – system crushes in progressive stages, designed for lower repair costs and easy parts replacement;
- Energy Absorbing Cushions – are aluminum honeycomb in environmentally sealed aluminum containers, and are powder coated with durable polyester powder coat for maximum longevity;
- Aluminum Cartridge and Strut – are lightweight and resist corrosion; weighs only 1,627 lbs.;
- Steel, Heavy Duty Under-Ride Support System (Backup) – provides a stable and secure mounting platform;
- Strut 90° Tilt – allows for minimum truck overhang or extension, and minimum transport height (10' 6");
- Cartridge & Strut 90° Tilt(s) – are hydraulic for smooth operation and power up/power down in stages;
- Hydraulic Lockouts & Support Bracket – prevent unit from swaying or rocking when transporting;
- Hydraulic Tilt Velocity Fuses – prevents TMA from lowering/falling should lines ever rupture or break;
- Hydraulic Controls – can be mounted in either the truck cab or at rear of truck;
- Heavy Duty Electrical System – is pre-manufactured and pre-set, eliminates the guesswork & confusion;
- Warning Alarm – sounds when actuating TMA upward to storage or downward to deployed position;
- Four Storage Jacks – are built-in and allow system to be rolled/stored with cartridge in the vertical position;
- Diamond Grade Reflective Tape (per MUTCD) and Extensive Rear Lighting – helps warn oncoming vehicles.

## 1. SCOPE

**1.1 Product** – These specifications describe a Truck Mounted Attenuator (TMA) which is mounted to a shadow vehicle for purposes of protecting the work crew in front of the shadow vehicle and protecting the motorist that might drive into the lane closed off by the shadow vehicle. Shadow vehicles should be trucks in a weight range of 16,000 lbs. to 20,000 lbs. and preferably 20,000 lbs., which is the weight of the truck tested for certification.

The Traffix Scorpion TMA 10,000 is available in three basic models. Model A is a TL-2 device tested at 70 km/hr., fig's 1, 2 & 3, for use on trucks needing low speed protection or as a replacement cartridge for trucks already equipped with a TL-2 attenuator cartridge. Model B is a TL-3 device tested at 100 km/hr for use on trucks needing high speed protection. The Model B uses a strut section in addition to the TL-2 cartridge section to achieve a higher speed device, figs. 4, 5 & 6. The rear cartridge section has a hinged hydraulic coupling with fluid on both sides of the cylinders and solenoid valve lockouts. The rear cartridge can be raised to 90° where a scissors lock engages to lock the cartridge in the 90° position. An operator's switch has an up and down button and the down button releases the lockout and lowers the cartridge. The release of the up or down button stops the cartridge at that angle. The Model B has a 10° tilt at the strut to allow clearance at driveways, fig. 6. During construction when the shadow vehicle truck has to drive in and out of sloped areas such as the drainage median or a driveway, the strut can be temporarily raised 10° to travel over this terrain. In the normal transport mode the rear cartridge is elevated and locked at 90° for the Model B. The Model C uses a 90° hydraulic tilt attached to the strut, fig. 7. This allows the Model C system to raise the strut to the vertical position with the cartridge in a horizontal position over the top of the truck for the normal transport mode.

The Scorpion TMA 10,000 is mounted to a truck at a road clearance height of 12" ±1". In the deployed mode shown in fig. 8, the system extends 13' to the rear of the truck.

## 2. PRODUCT SPECIFICATIONS

**2.1 Construction** – The Scorpion TMA 10,000 consists of three basic components. A steel back-up is attached to the rear of the truck with an all-steel support structure, figs. 11, 12 & 13. An all aluminum tube frame extends out 13' from the back-up. Inside the tube frame is a series of four aluminum boxes filled with energy absorbing aluminum honeycomb, fig. 10.

**2.2 Materials** – The back-up support structure uses all steel angles, plates, and C-channels welded using wire feed mig welding. The tube frame construction uses all aluminum tube and plate construction welded using wire feed mig welding on both sides of the tube/plate interface. The aluminum boxes use closed end sealing rivets for joining the sheet metal. The aluminum honeycomb is joined to the aluminum face sheets using oven cured epoxy resin.

Aluminum tubing – 6063 Aluminum T4

Aluminum plate – 5052 Aluminum 0.250"

Aluminum sheet – 5052 Aluminum 0.062"

Aluminum honeycomb – Commercial Grade 1" and ½" cell size

Aluminum rivets – 3/16" Sealed

Back up bolts – 1" and 3/4" bolts grade #5

## 1. Ordering Instructions

**1.1 Part Numbers** – The complete TMA system is ordered using part number 10,000. A model designation of A, B, or C is used to distinguish the TL-2, the TL-3 with 10° strut tilt, and the TL-3 with 90° strut tilt. Fig. 9 is an exploded isometric view showing a TL-3 TMA.

## 2. Truck Frame Inspection

**2.1 Pre-installation** – The truck frame should be inspected for rust prior to any assembly. If there is any noticeable reduction in the structural integrity of the frame, the TMA should not be installed. The truck should also be checked for any portion of the bed that might overhang the frame. For the strut to raise to 90° the end of the frame cannot have any interference above it.

## 3. Installation

**3.1 Manual** – Refer to the manual before starting to install the TMA. The manual tries to cover the different frame types and their custom mountings. Customer service is available for particular installation problems.

## 4. Maintenance

**4.1 Manual** – Refer to the manual for periodic maintenance and periodic inspection.

**4.2 Warning Sticker** – The following warning label will appear on all TMA's.

## 5. Repair

**5.1 Inspection** – After a system has been impacted or damaged inspect the TMA completely. Usually in low speed impacts the front energy-absorbing cartridge will be crushed and the cartridge tube frame will be bent and will need replacement. In higher speed impacts, the whole cartridge section will need replacement. After a high-speed impact the cartridge and strut sections will both need replacement. It is important to inspect the total system to assess the level of damage and order all of the necessary replacement parts.

## 6. Shipping

**6.1 Unloading** – TMA systems are palletized with the cartridge section and the strut section mounted vertically in order to maximize the number of TMA's per truckload. It is important to use extended forks on the forklift when unloading because the load is tall and top heavy. A pallet jack can also be used when loading dock is available.

- 1. Processing Procedures** – All welded joint sections have been established for length of weld and machine settings for the mig welder. These will not be altered.
  - A. All steel welds will be 100% inspected by the vendors.
  - B. Periodic x-rays of the weld sections will be used to verify correct weld penetration.
  - C. All mig wire and insert gas will be Q.C. inspected for compliance with that specified.
- 2. Assembly Procedures** – The left and right bolted assemblies will be 100% Q.C. inspected for compliance with the correct fastener grade, length, and torque requirement.
- 3. Electrical Wiring** – All 12v and 24v wiring assemblies will be 100% Q.C. inspected for proper functioning.
- 4. Energy Absorbing Cartridges** – All cartridges will be 100% inspected and Q.C. logged for proper honeycomb sub-assembly within the aluminum cartridge container.
- 5. Hydraulic System** – The hydraulic system will be checked by Q.C. after final assembly to verify all fittings are leak-proof.
- 6. Final Q.C. Inspection** – All TMA systems will have a final Q.C. inspection to verify that they comply with the manufacturing specifications. An I.D. number will be affixed to the backup and logged with the customer purchase order number.

# WARNING:

Before installing or operating this TrafficFix 10,000 TMA, read the installation and maintenance manual.

1. Check that the area around the TMA is clear when lowering and raising the TMA.
2. In the down position, the TMA must be  $305 \text{ mm} \pm 25$  ( $12'' \pm 1''$ ) above the ground to perform correctly.
3. Check that all 1" pins are properly secured with retainer safety pins and that the bracket mounting bolts are secure.
4. The correct travel position is the raised position – check for wide turns because of the extended rear truck over hang.
5. After a vehicle impact with this TMA, the width will be wider than 96" – either remove the damaged cartridge by removing the four 1" pins or use a wide load shadow vehicle while transporting a crushed cartridge.
6. Provide proper maintenance by periodically checking the hydraulic pump fluid level, checking for secure bolts on the module lights, and the jack wheels, clean the rods on the hydraulic cylinders and check for operation of all light bulbs.
7. Check that the four jacks are all secured in the up position before driving the truck.
8. Check that the four energy-absorbing cartridges are in place if the system has been repaired. For proper crash performance, all four cartridges must be installed.

# WARNING:

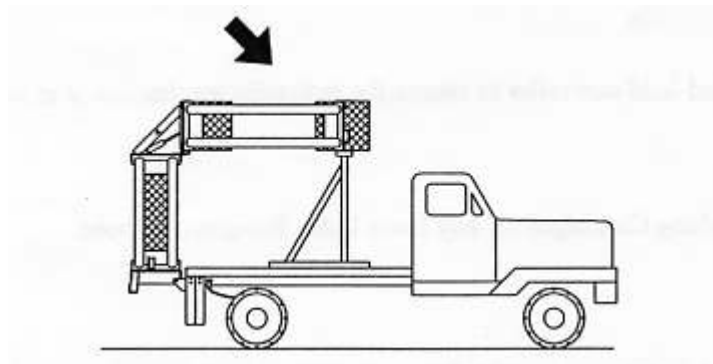
In the event that the operator of this TMA system is not sure of proper installation, operation, or maintenance of this TMA system, call customer service (949) 361-5663.

# THESE INSTRUCTIONS MUST BE PLACED IN TRUCK CAB

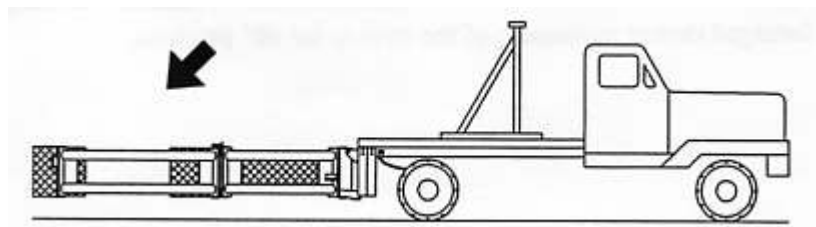
## SCORPION 10,000 TMA

### OPERATOR'S DEPLOYMENT INSTRUCTIONS

1. For operation, truck driver/operator will plug in hand held operating control located at right side rear of the truck and raise or lower the TMA.
2. Before travel to or from work zones, TMA must be hydraulically powered to the full stop position on the support post. **(Continue to push the up button for two seconds after stopping point is reached to ensure a full power lock.)**
3. For deployment of TMA (0-30 mph.), truck driver/operator must ensure the TMA is locked into the horizontal position by action of the hydraulic system. When fully deployed, the hydraulic pressure cut-off system will ensure the TMA is set and locked into position. **(Continue to push the down button for two seconds after stopping point is reached to ensure a full power lock.)**
4. For deployment of TMA in stationary applications, truck driver/operator must ensure truck is parked with the emergency brake on and is engaged in gear or park.
5. For night operation, truck driver/operator must check and ensure that the side and rear light markers are switched on via the truck light switches.
6. On completion of the deployment, truck driver/operator must check for clearance before retracting the TMA to its' fully folded position.
7. Truck driver/operator must ensure that the TMA is hydraulically powered to the full stop position on the support post before travel. **(Continue to push the up button for two seconds after stopping point is reached to ensure a full power lock.)** Disconnect the hand held operation control unit from the truck.



**MUST BE FULLY POWERED DOWN  
FOR TRAVEL 0 TO 60 MPH**



**MUST BE FULLY POWERED DOWN  
FOR DEPLOYMENT 0 TO 30 MPH**

# OPERATOR'S CHECKLIST

## SCORPION 10,000 TMA

**Before deployment of Scorpion 10,000 TMA, operator must observe the following checklist.**

1. Check that all lights are in working order, such as brake, running and sidelights, etc.
2. Check all bolt/nut connections on Scorpion TMA mounting.
3. Check hydraulic pump to ensure no leakage etc. and check fluid level. Use only AUTO TRANSMISSION FLUID.
4. Check all hydraulic hose/connections to detect any leakage including hydraulic pistons.
5. Check battery connection to insure a good contact connection and clean grease-dirt if required to ensure a full battery charge for Scorpion 10,000 TMA operation.
6. Trial-activate the hand-held controller to ensure the hydraulic mechanism is in working order.
7. Check Energy Absorbing Cartridges for any loose bolts. Retighten if loose.
8. Grease all hinge points.
9. Check all electrical wire cables and ensure all cables do not come in contact with hinge joints to prevent being damaged during movement of the strut to the 90° position.



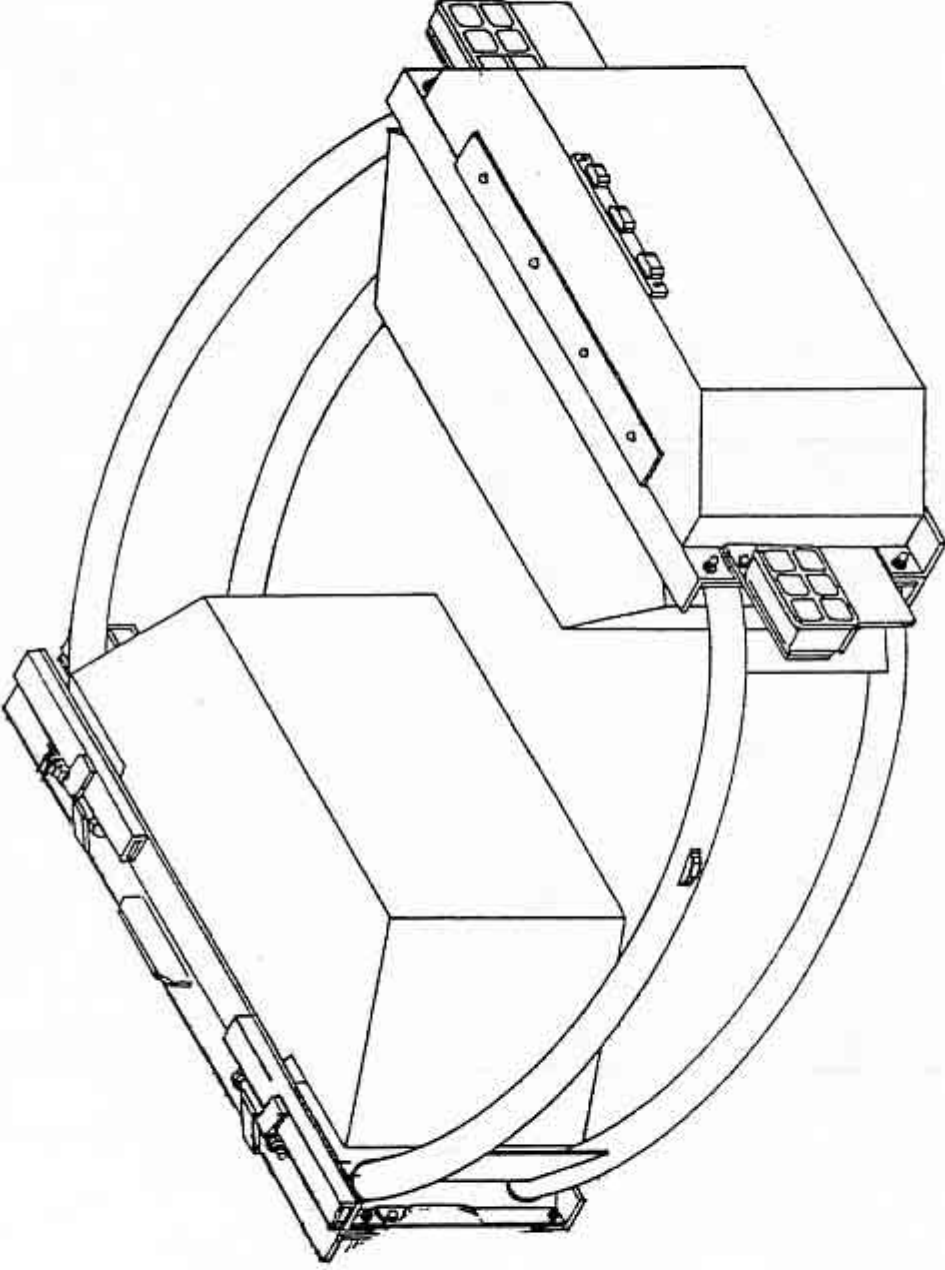


Fig. 1 – Scorpion TMA Model A (TL-2)

Revision A

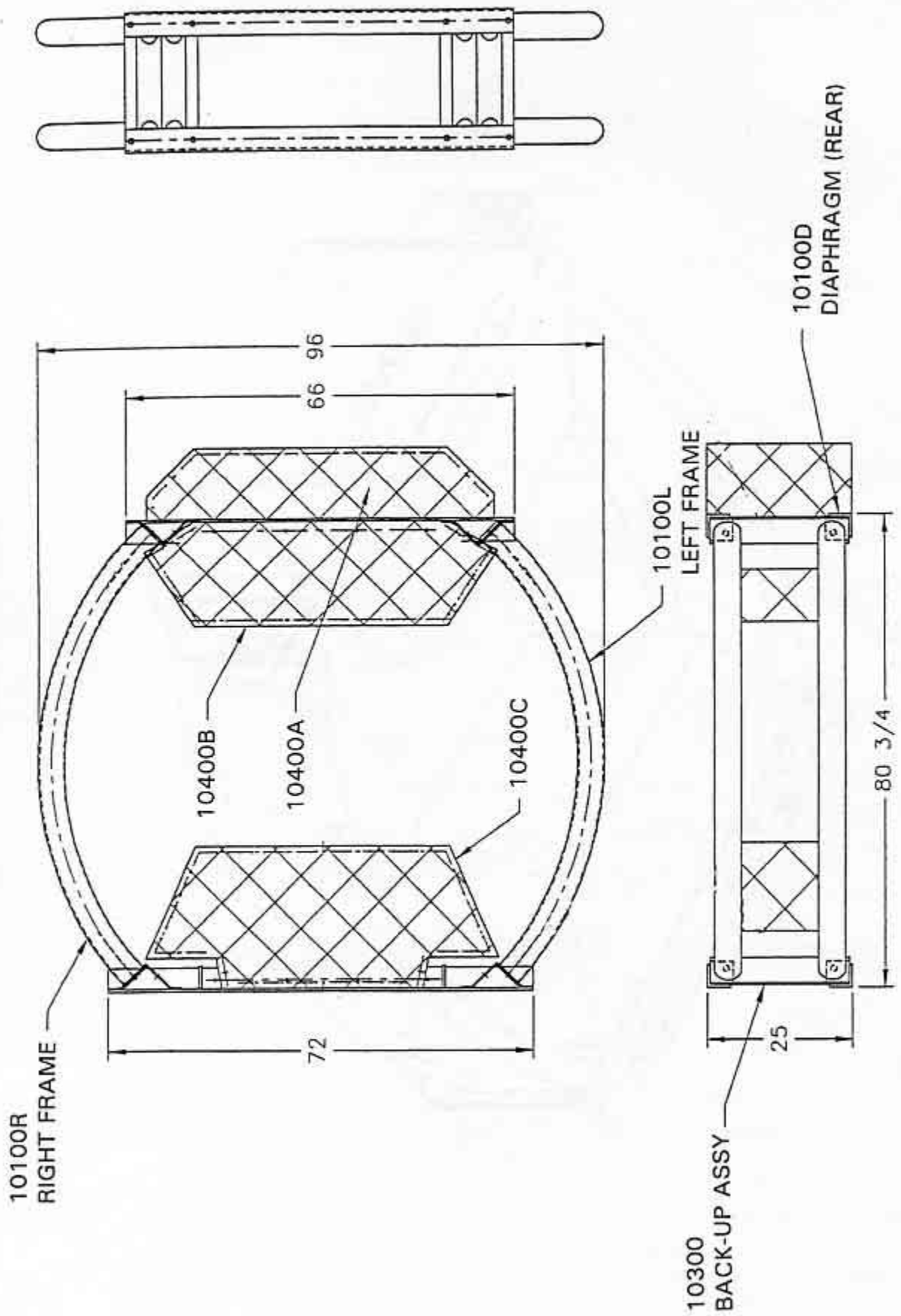


Fig. 2 - Scorpion TMA Model A (TL-2)

Revision A

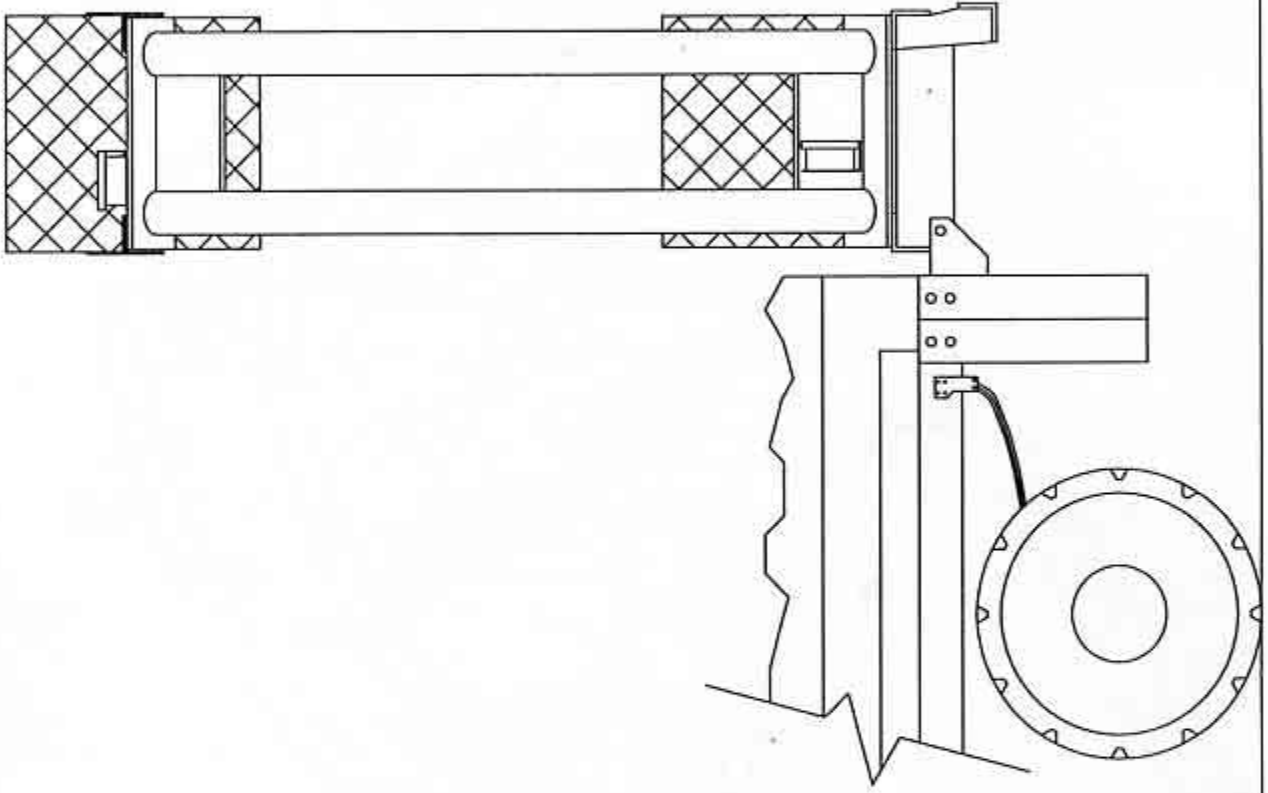


Fig. 3 - Scorpion TMA Model A (TL-2)

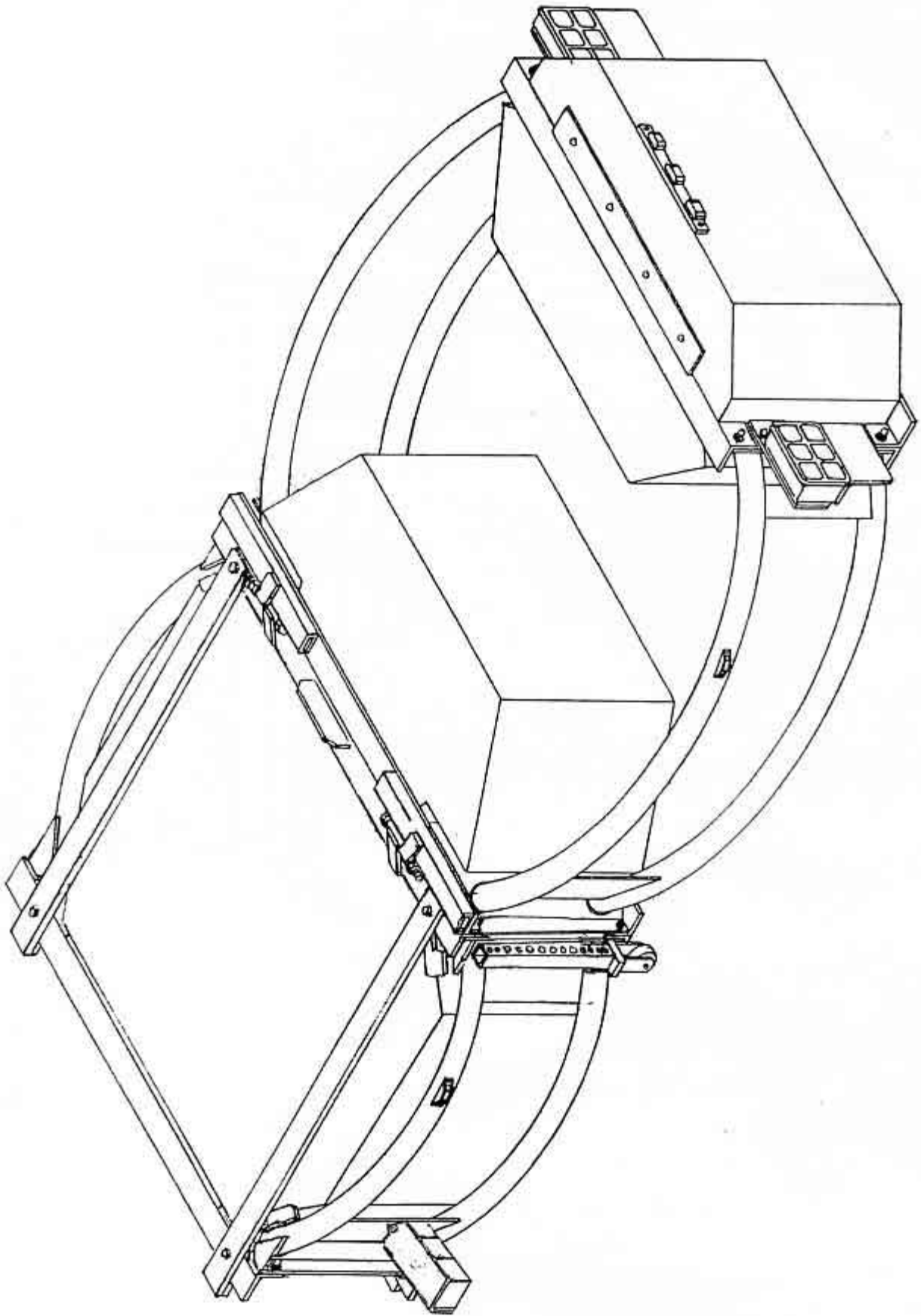


Fig. 4 – Scorpion TMA Model B or C (TL-3)

Revision A

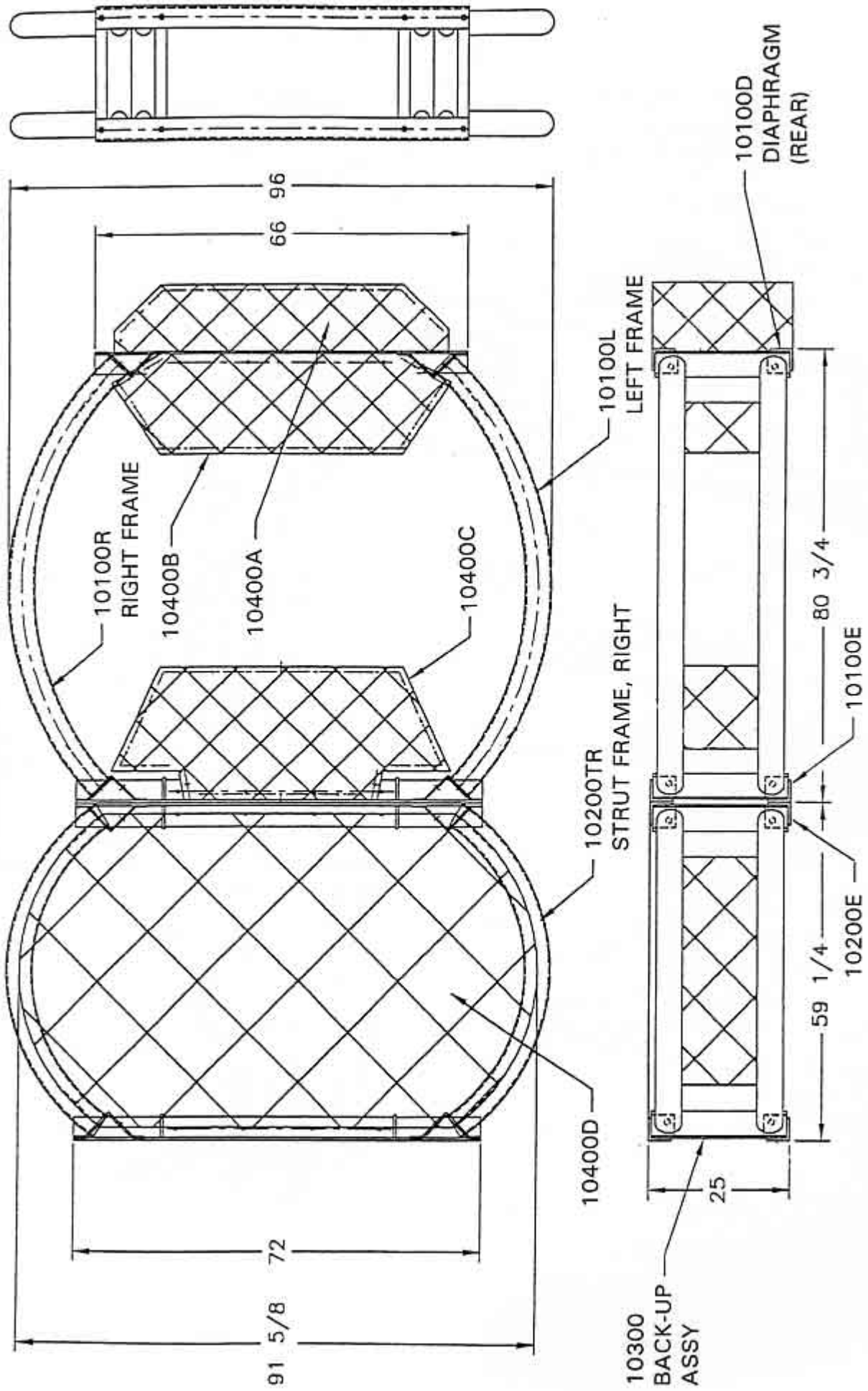


Fig. 5 - Scorpion TMA Model B or C (TL-3)

Revision A

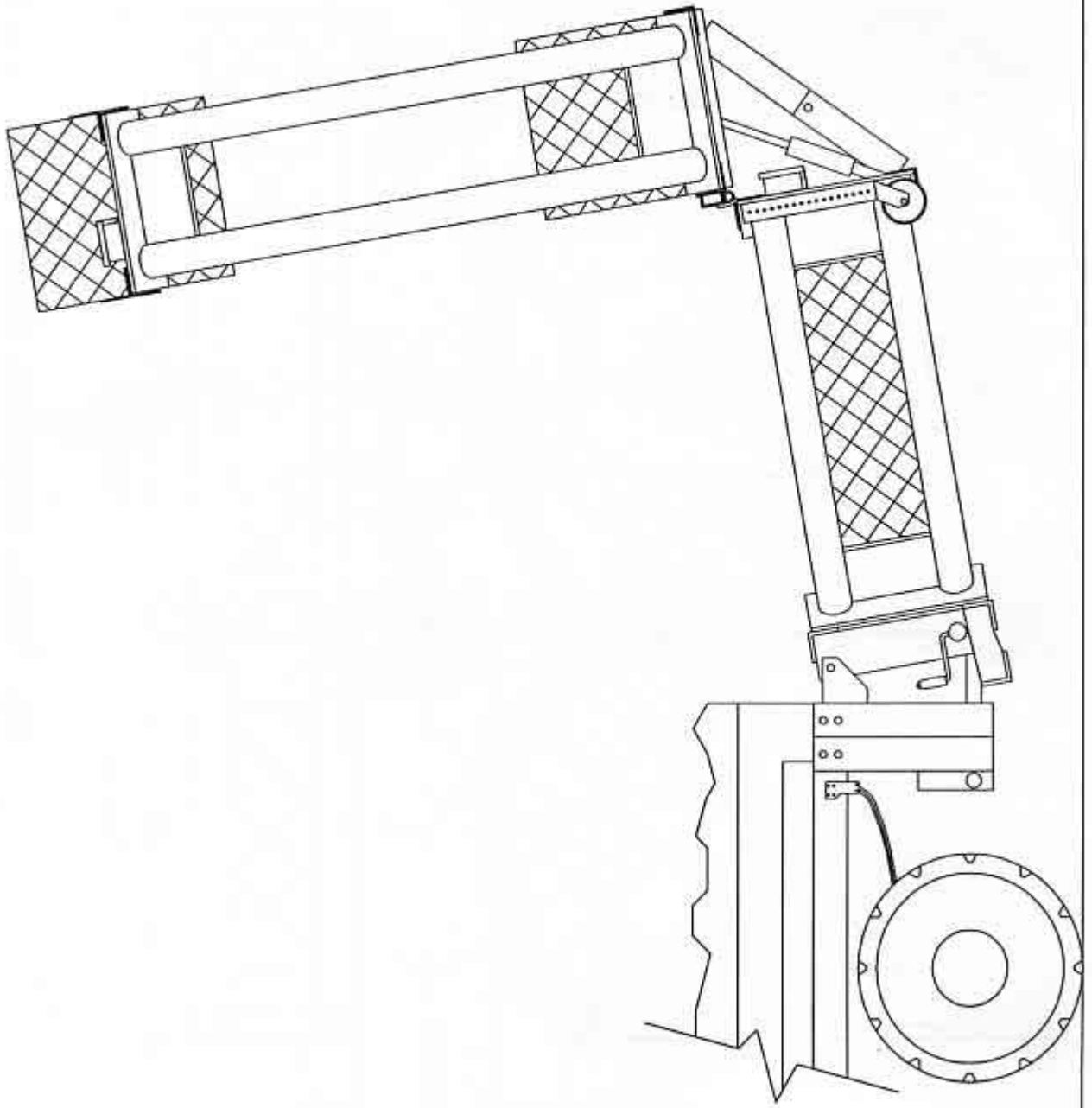


Fig. 6 - Scorpion TMA Model B (TL-3)

Revision A

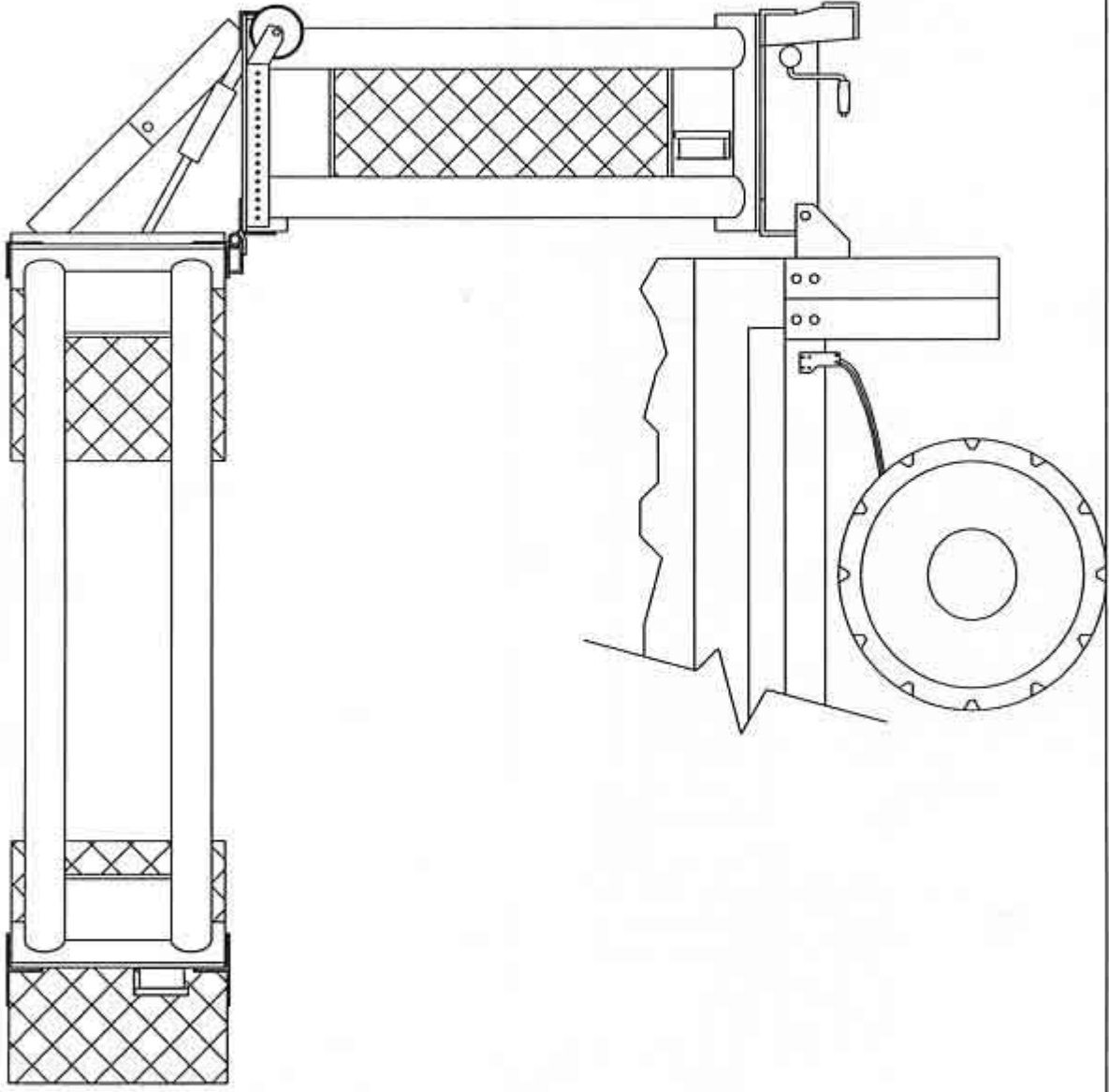


Fig. 7 - Scorpion TMA Model C (TL-3)

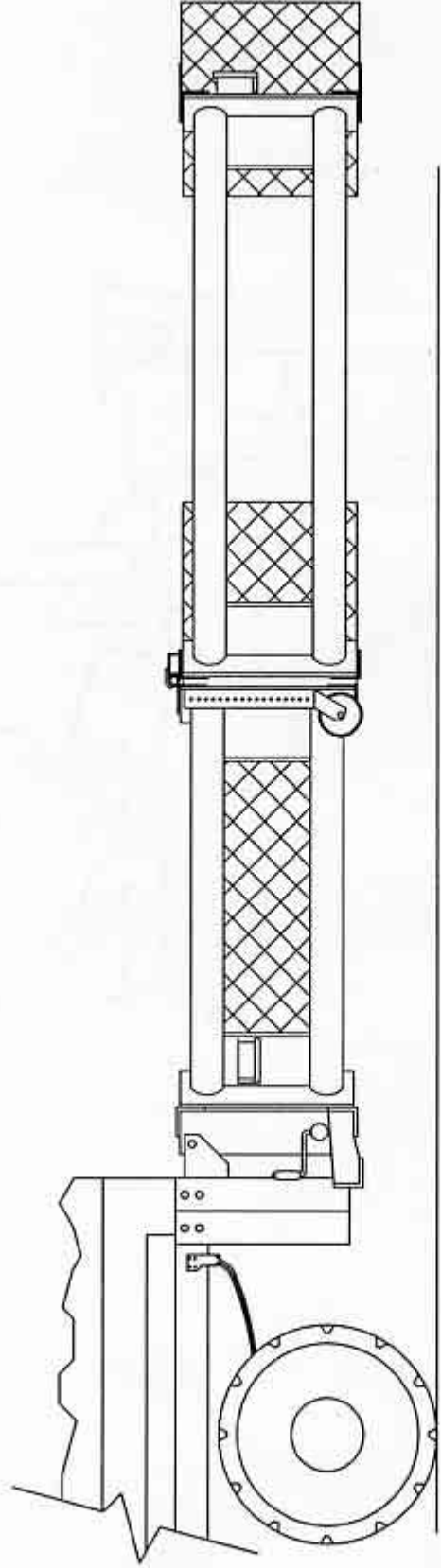


Fig. 8 - Scorpion TMA Model C (TL-3)

Revision A



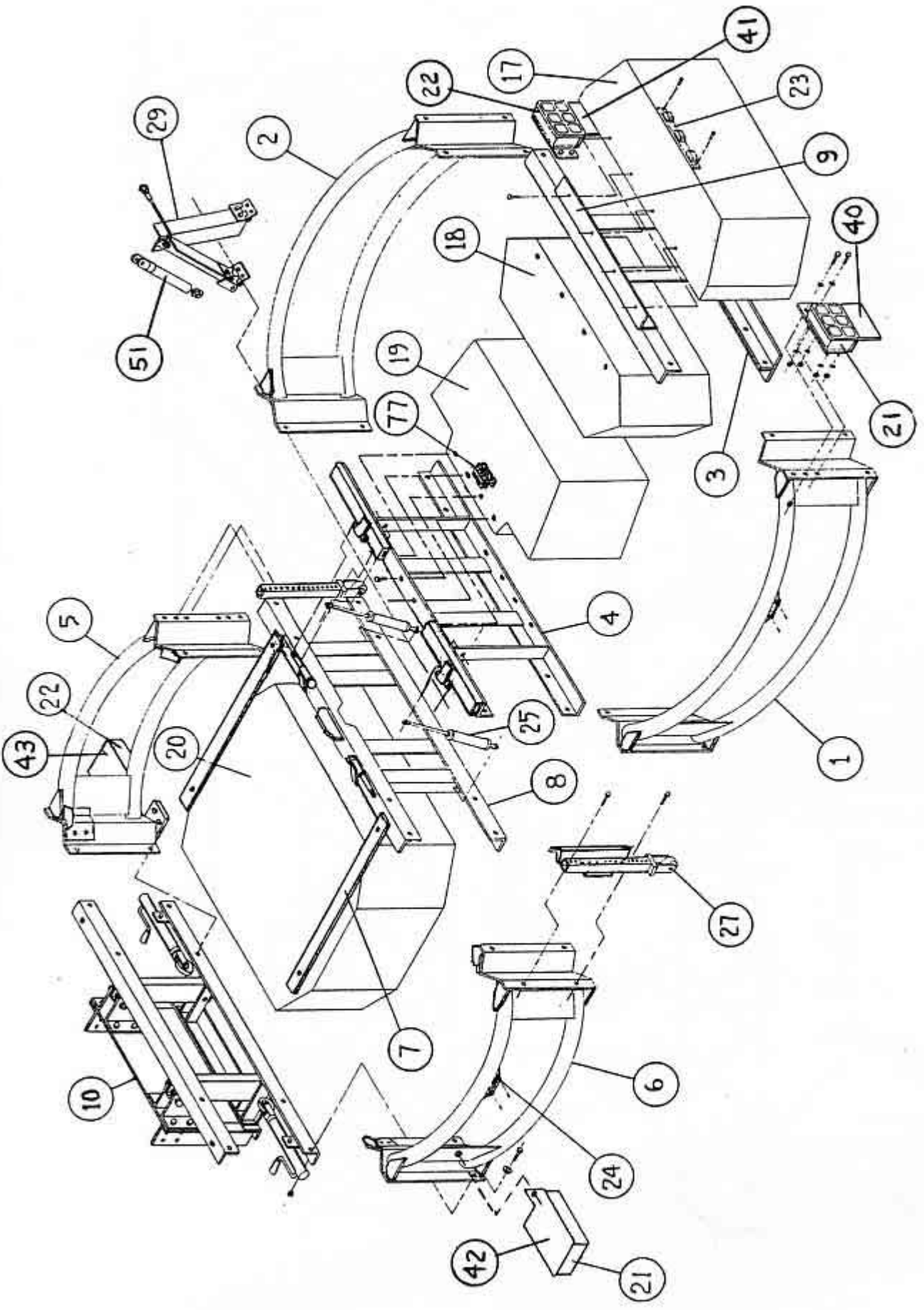


Fig. 9 – Scorpion TMA Model B or C (TL-3) Exploded View

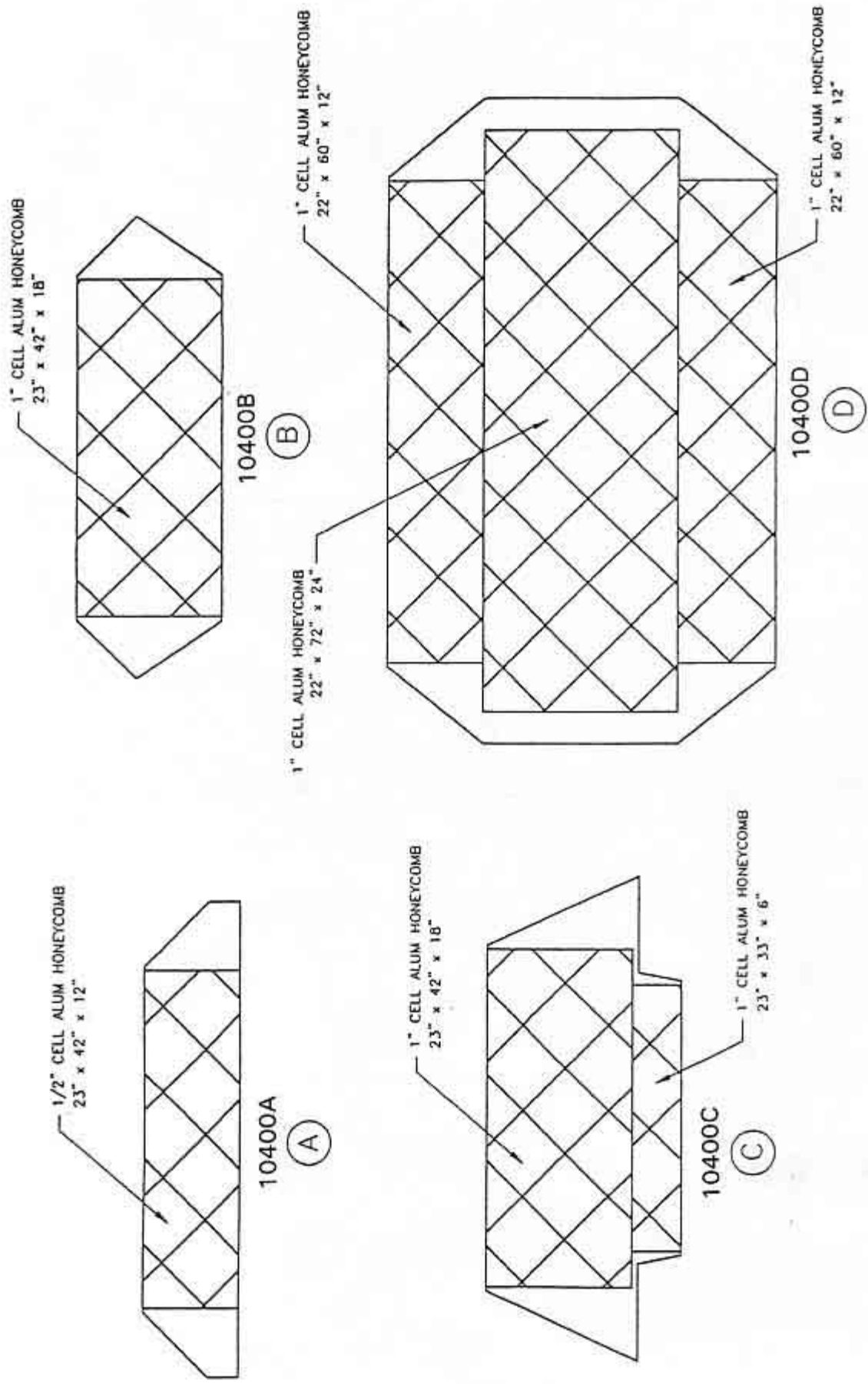


Fig. 10 – Scorpion TMA Model B or C Energy Absorbers

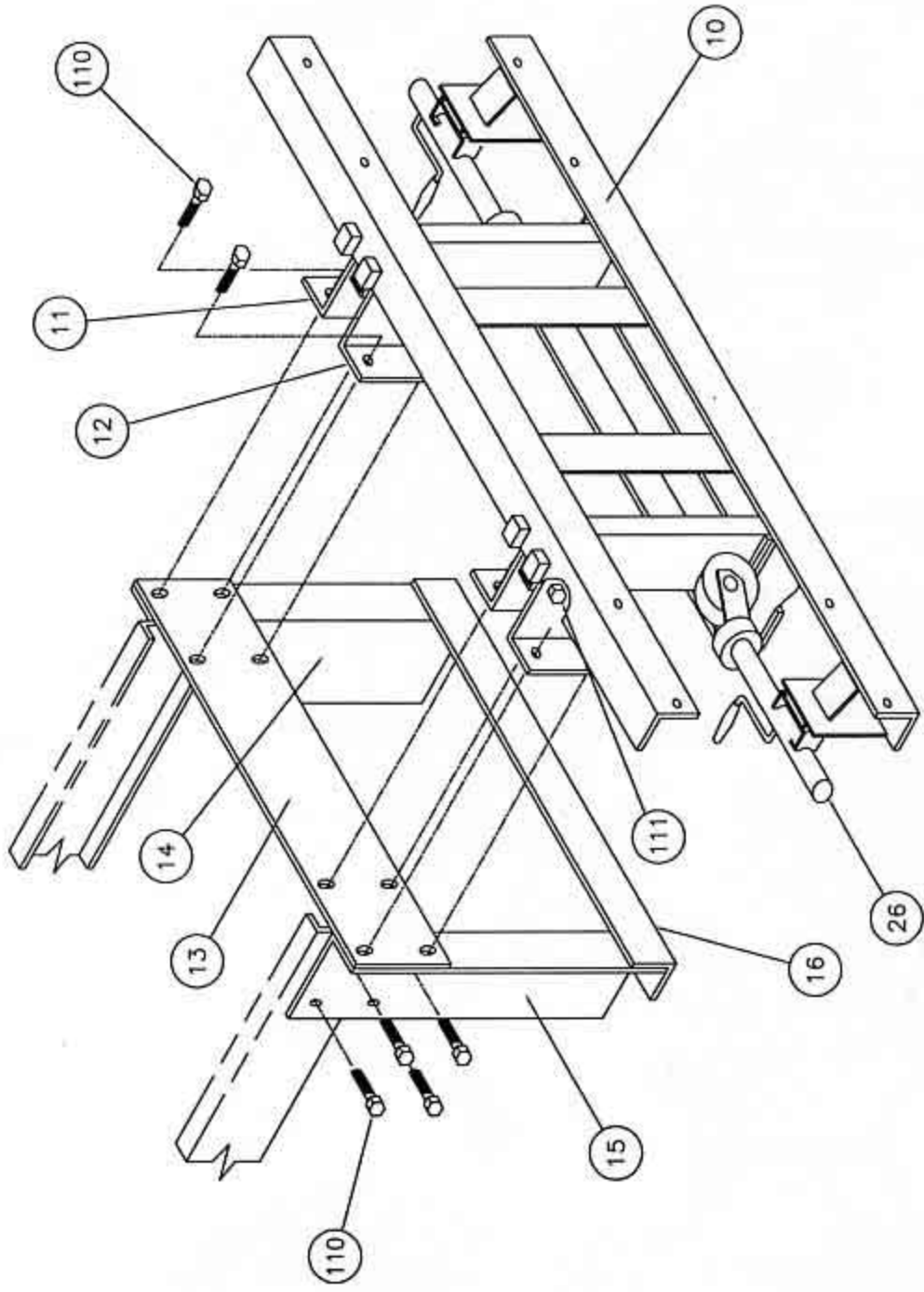


Fig. 11 - Standard Backup for Flatbed Truck Mount

Revision A

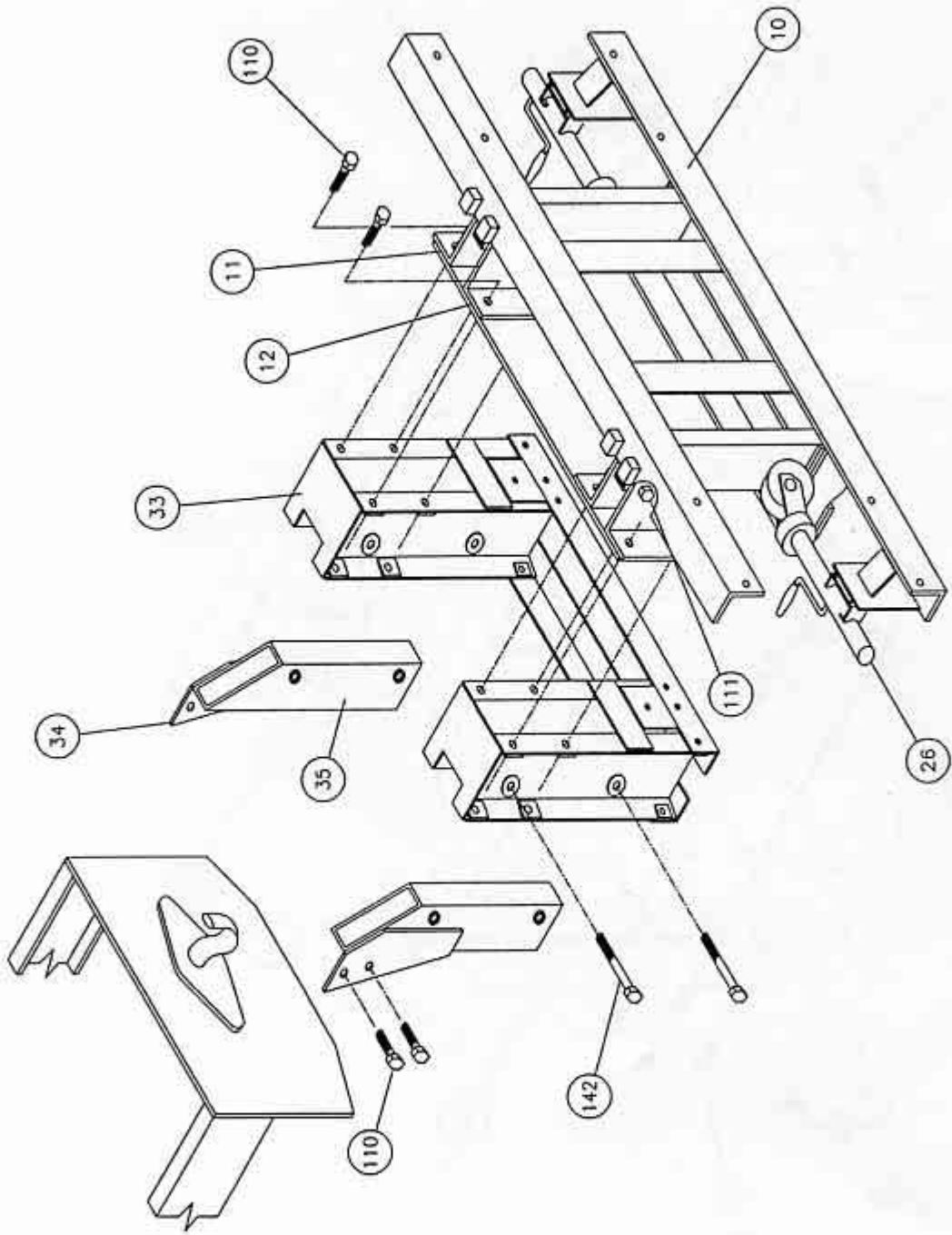


Fig. 12 - Standard Backup and Support Assy for Dump Truck Mount

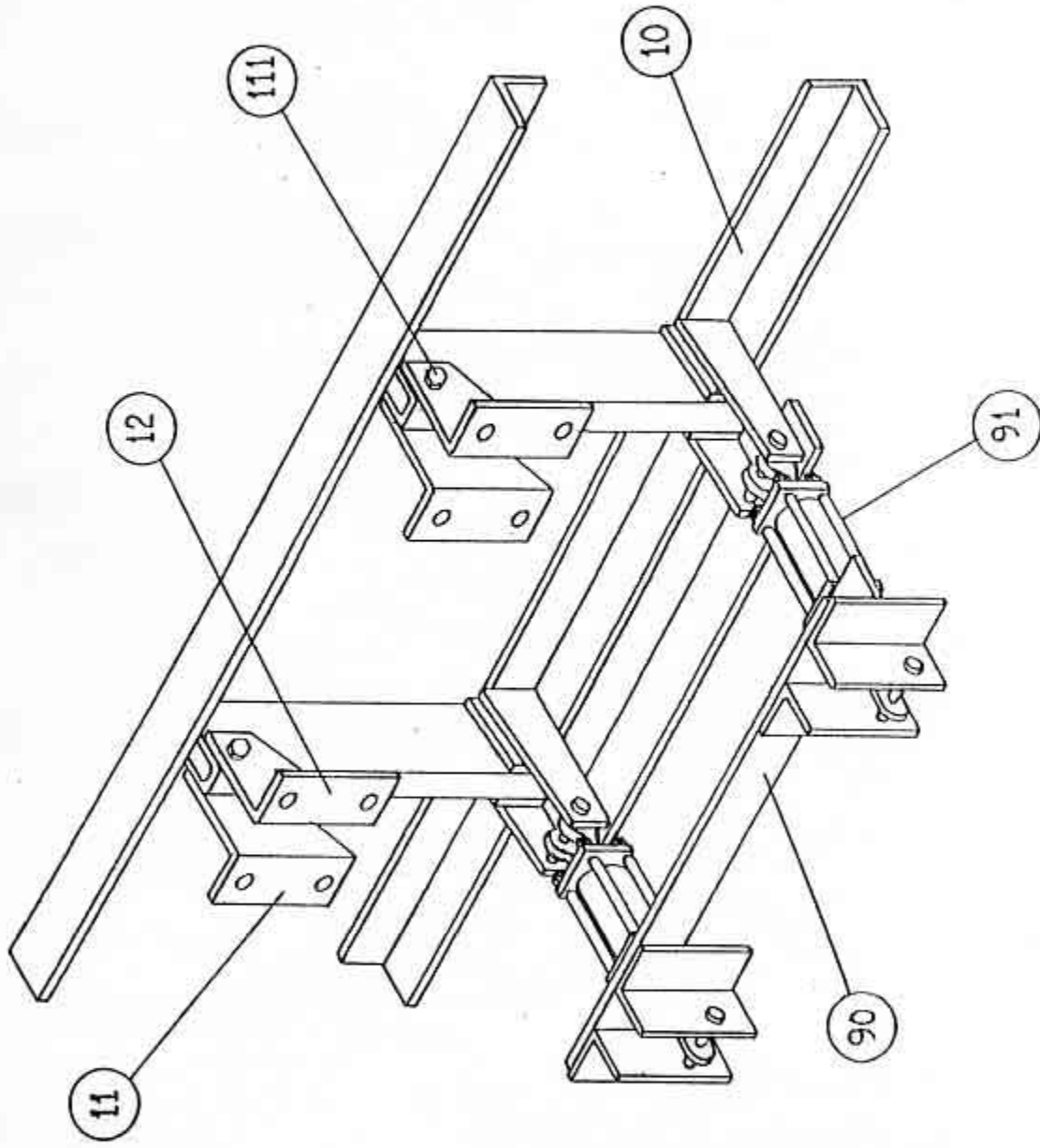


Fig. 13 – Standard Backup and Support Assy for Model B TMA

Revision A