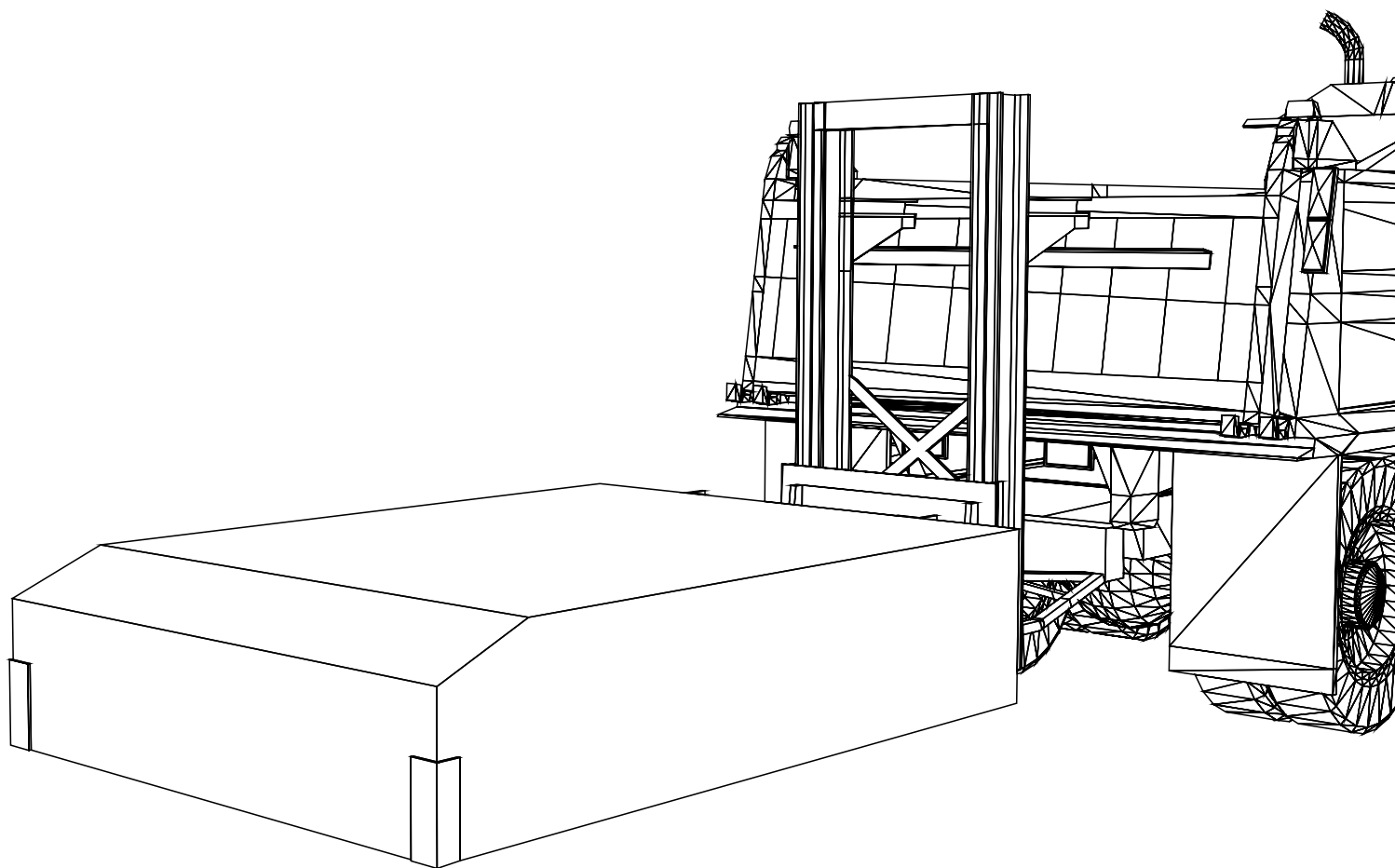


## U-MAD<sup>®</sup> TMA

NCHRP 350 TL-2 and TL-3 Truck Mounted Attenuator



**BARRIER SYSTEMS<sup>®</sup>**

BY LINDSAY

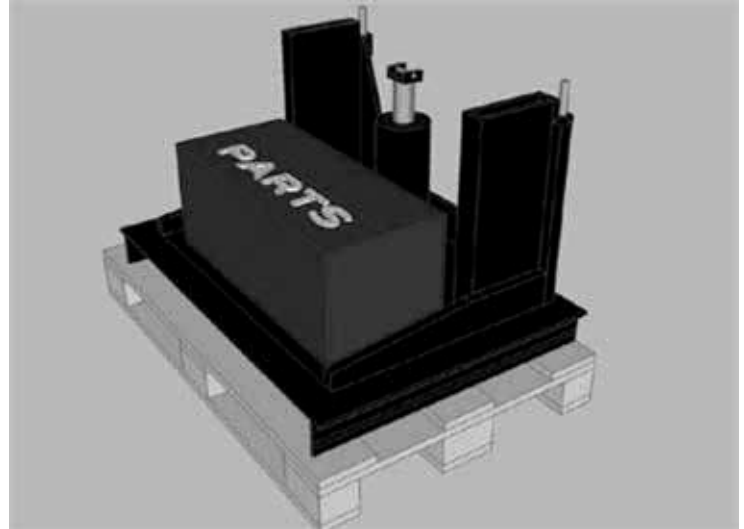
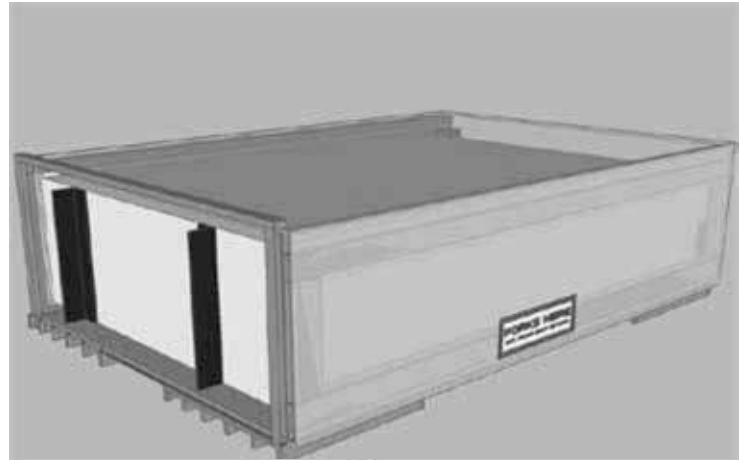
## Introduction

The U-MAD system packaging consist of a large crate which holds the TMA Cartridge and a second pallet which holds the L-Lift and a box of additional components.

### Contact Information

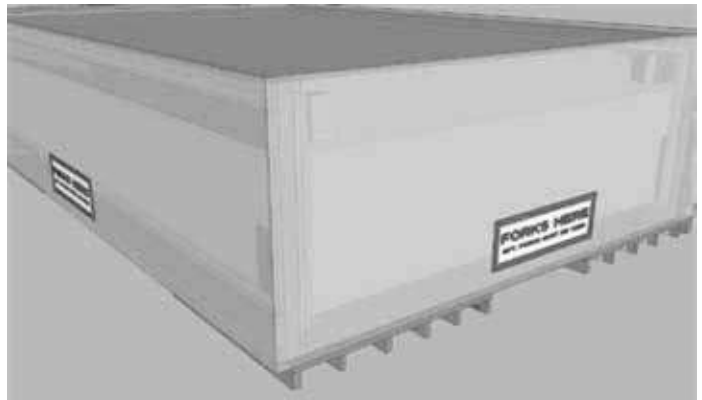
If you need additional information, or have questions about the U-MAD TMA, please call the Lindsay Transportation Solutions Customer Service Department at (888) 800-3691 (U.S. toll free) or (707) 374-6800.

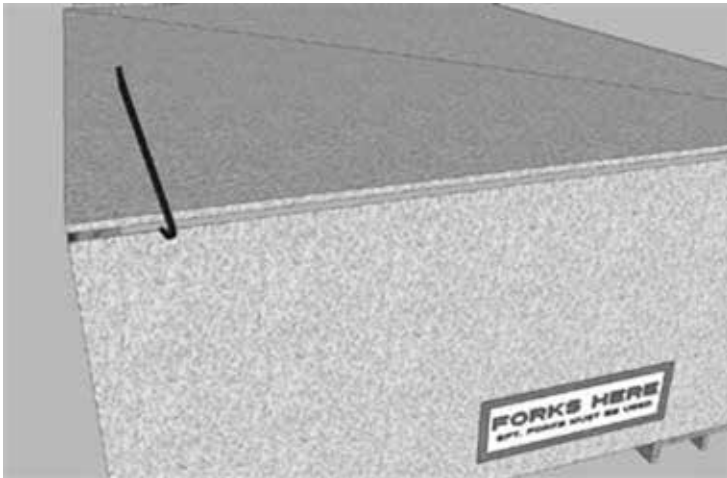
Address:  
Lindsay Transportation Solutions  
Sales and Services, Inc.  
180 River Road  
Rio Vista, CA 94571  
[www.BarrierSystemsInc.com](http://www.BarrierSystemsInc.com)  
email: [info@barriersystemsinc.com](mailto:info@barriersystemsinc.com)



### Step 1

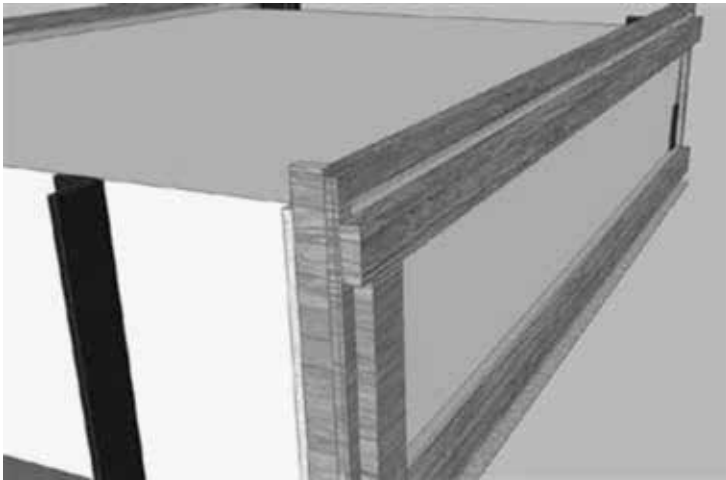
Place the cartridge crate in an open area that will allow for access all the way around the crating. When the cartridge is being moved a fork lift with 6 ft. (2m) fork extension should be used so as not to damage the cartridge. **Only lift from marked points on the crate.**





### Step 2

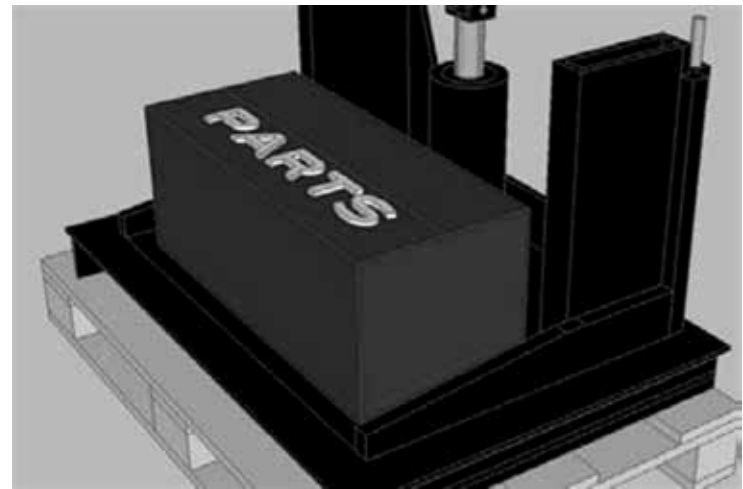
Carefully remove the plywood shell using a crowbar and hammer.



### Step 3

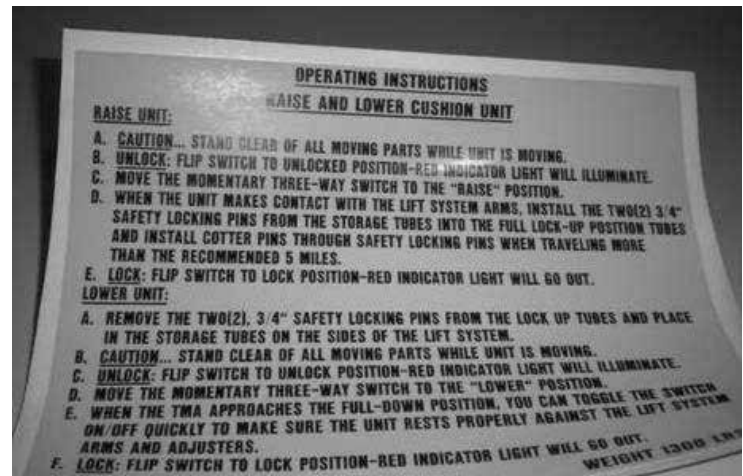
Carefully remove padded lumber from around the cartridge. **Do not pry against the cartridge as this will cause denting and scratching which will impede crash performance.**

If necessary, use an automotive grade polishing compound to lift minor scratches.



### Step 4

Once the cartridge is uncrated, remove the box of additional components and verify inventory of that box. The box will contain electrical controls, two decals to be placed in the cab of the truck as reminders for proper operation, and hardware for mounting unit to the truck (ie. bolts, brackets).



### Step 5

Once verification and uncrating of Cartridge, L-Lift, and Hardware, please proceed to the Mounting Instructions in the installation manual.



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W030587 Rev. 8

revised February 4, 2013



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## U-MAD® Installation and Operations Manual

### Introduction

The U-MAD Truck Mounted Attenuator (TMA) offers outstanding performance, excellent life cycle costs and quick, simple refurbishment. The U-MAD TMA is available in various sizes for workzones with speed capacities from 45 mph to 62 mph (70 km/h to 100 km/h) to supply a wide range of protection for workers, motorists and equipment. The TMAs are designed to absorb collision energy during rear-end impacts, prevent impacting vehicles from underriding the truck and reducing expensive damage to equipment.

The system offers many flexible options in lifts, mounting systems, hydraulics, and controllers to make installation, use, and maintenance as simple and cost-effective as possible.

Applications for the U-MAD TMA include stationary and slow-moving operations such as striping, sweeping, marking, road plowing, and roadside maintenance operations such as repairing crash cushions, guardrails, and road surfaces.

### Contact Information

If you need additional information, or have questions about the U-MAD TMA, please call the Lindsay Transportation Solutions Customer Service Department at (888) 800-3691 (U.S. toll free) or (707) 374-6800.

Address:  
Lindsay Transportation Solutions  
Sales and Service  
180 River Road  
Rio Vista, CA 94571

[www.BarrierSystemsInc.com](http://www.BarrierSystemsInc.com)  
email: [Info@barriersystemsinc.com](mailto:Info@barriersystemsinc.com)

### Safety Instructions

The TMA support structure and cartridge should be rigidly attached to the frame rails of the truck, after the support vehicle has been properly equipped with ballast and counterweights (if needed) to meet its' fully designated weight (including amenities such as an arrow panel). The cartridge must be aluminium of 11" (280 mm) and a maximum of 13" (330 mm) from the ground and level when in the full-down position. The U-MAD TMA must be in the full-down position whenever the unit is "in service" as either a parked protection device or as a moving protective shadow vehicle.

- All personnel should stand clear of the TMA before a qualified operator raises or lowers it.
- Lock pins must be in place when the TMA is in the travel (up) position or when traveling more than 5 miles (8 km).
- When traveling less than 5 miles with the TMA in the up position without the pins inserted, the maximum speed should not exceed 25 mph (40 km/h).
- The maximum speed in the deployed (down) position should not exceed 25 mph (40 km/h).
- Caution must be observed when attaching or detaching the TMA cartridge. Never attempt to use the force of the hydraulic power mechanism to align the pins or bolts.
- Never stand, sit, or place any objects onto a lowered U-MAD TMA. The top of the TMA should never be used for a work surface.
- Safety warning labels have been provided for the cab of the truck and the area where the control box is being mounted on the outside of the truck. Always have a qualified operator that is familiar with all of the warning labels located throughout the lift and cushion areas.

## U-MAD® Installation and Operations Manual

### Required Installation Tools

Standard mechanics tools are required to install the U-MAD TMA. These tools include, but are not limited to:

1. Lifting device (standard fork lift with fork extensions)
2. Side cutters
3. Wire crimpers
4. 3 lb. + hammer
5. Drill (able to penetrate 3/8" steel)
6. Drill bits 7/8" with starter bits
7. 2 ea. 1 1/2" wrench or socket
8. 2 ea. 1 1/8" wrench or socket
9. Tape measure
10. 24" + carpenters level
11. Plumb bob and line

Note: In the event that welding is required, use only a certified welder.

### Optional Installation Tools

These tools while not required have proven to aide in the ease of installation on the U-MAD TMA.

1. Large clamps (C-clamp, Bessie clamp, etc...)
2. Hand bar or crow bar
3. Electromagnetic drill
4. Multi-meter

## U-MAD® Installation and Operations Manual

### Installation Mounting Instructions

All welding, drilling, and/or bolt work should be accomplished and inspected by a qualified mechanic and a certified welder.

It is recommended that the U-MAD TMA be mounted to a truck weighing between 19,000 lbs. (8,618.4 kg) and 20,000 lbs. (9,072.0 kg) to achieve the proper NCHRP 350 impact performances.

It is recommended that any additional permanent weight that will normally be on the vehicle should be added at this time (prior to TMA installation). If this step is neglected, the weight added after the TMA is installed may cause the TMA to be too close to the ground and out of specification.

**STOP:** *If you are installing an optional mounting system, refer to the installation instructions included in your shipment. If the installation instructions are missing, contact your local distributor or a BSI customer service representative.*

### Step 1: Inspect the shipped materials

1.1 Inspect the U-MAD TMA at the time of receipt and note any shipping damages on the carrier truck driver's bill of lading. Have the notation initialed by the driver and subsequently report the damages to your BSI authorized Distributor.

1.2 Remove the parts list from the sealed package and assure that all of the parts listed are present. Report any missing parts to your Distributor immediately.

### Step 2: Unpack the materials

2.1 Cautiously remove the protective shipping material from the TMA support structure.

2.2 Cautiously remove the protective shipping materials from the UMAD Cartridge.

2.3 The following items will be needed to mount the TMA support structure to the vehicle:

(10) each - 3" x 3/4" (76 mm x 19 mm), Grade 8 hex head bolts with washers and nuts.

(2) each - 4" x 36" C-channels (102 mm x 914 mm) or at a minimum, (2) each 3" x 3" x 36" x 1/4" angle iron (30 mm X 30 mm X 360 mm X 2.5 mm).

Electrical cable with a minimum diameter of 5/16" (0.80 cm) or 1/0 cable for power to the hydraulics.

(2) each - jack stands to support the rear of the TMA.



## U-MAD® Installation and Operations Manual

### Step 3: Install the TMA

3.1 *Move the truck to a level working area.*  
(Figure 1)

#### 3.2 *Prepare the Frame Rails.*

Check for vertical plumb at rear of the truck frame rails with a tape measure or carpenter's level. It may be necessary to repair or modify the suspension to bring the frame rails to equal height. You can also use ballast in the truck bed to aide in leveling the truck. The rails should be the same length and not be more than 9 inches under the furthestmost rear edge of the back of the truck. If frame rails are more than 9 inches under the truck, then the frame shall be modified with a frame extension. (Figure 1.)

#### 3.3 *Connect the Frame Rail Ends.*

Connect the ends of the frame rails by bolting (or welding) a heavy steel plate or C-channel from end to end (if not already there). It is critical that this structure be heavy enough to adequately join the rail ends and maintain the spacing. (Figure 2.)

**Note: The support truck should already be loaded to its final adjusted weight prior to mounting the U-MAD TMA.**

#### 3.4 *Install the Support Structure.*

Using a lifting device such as a forklift, position the Support Structure over the frame rail assembly. (Figure 3)

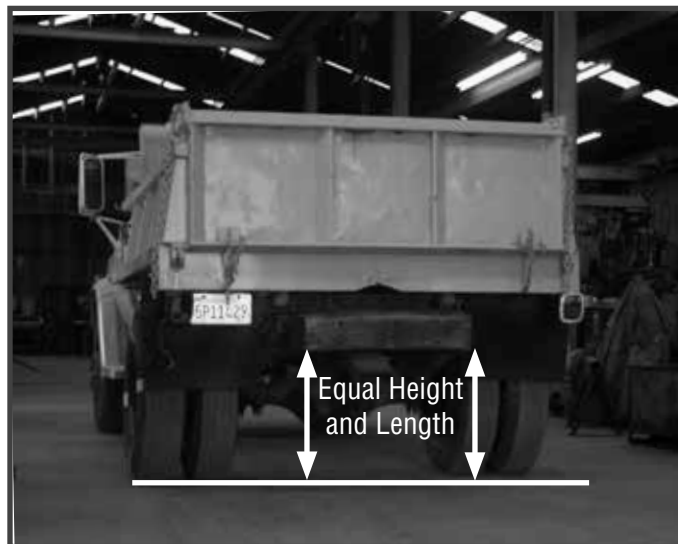


Figure 1. Move Truck to Level area. Prepare the Frame Rails.



Figure 2. Connect the Frame Rail Ends.



Figure 3. Install the Support Structure.

U-MAD® Installation and Operations Manual

**3.5 Adjust the Support Structure**

Adjust the position of the Support Structure so that it is level and the distance from the ground to the top of the support structure tubes is 23 in. (584 mm). Mark the attachment holes for drilling (Figure 4).

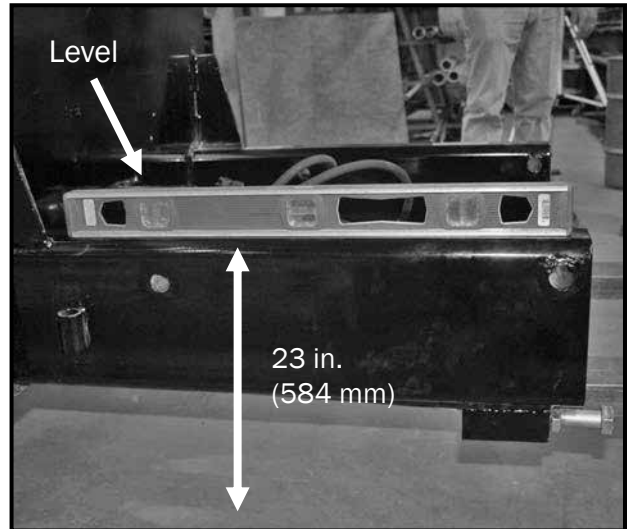


Figure 4. Adjust level and height of the Support Structure.

**3.6 Drill Holes**

After the Support Structure is level and at the correct height, mark and drill (4) 7/8 in. (22 mm) holes (Figure 5). Refer to drawing 1, TMASMS, in the Appendix.



Figure 5. Drill holes through the frame rails.

**3.7 Bolt Assembly**

Bolt the Support Structure assembly to the frame using (2 each per side) 3" x .75" (76 mm x 190 mm) grade 8 bolts, using washers, lock washers and nuts (Figure 6). Torque the bolts to 145 – 150 ft. lbs. (197 -203 Newton meters).

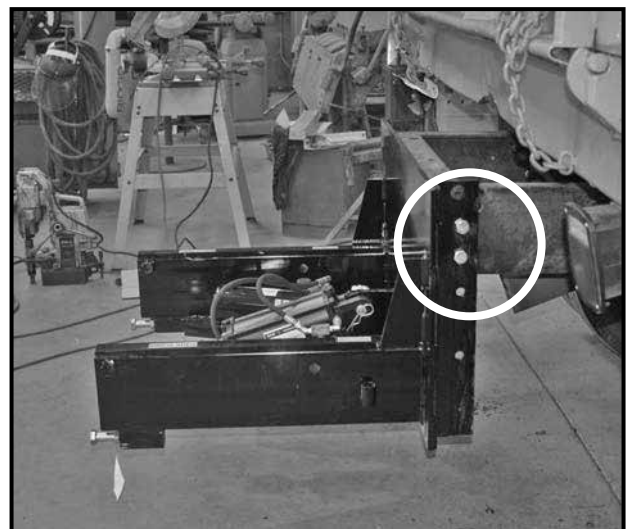


Figure 6. Bolt the support structure.

## U-MAD® Installation and Operations Manual

### 3.8 Install Side Channel Braces

Position the Channel Braces on the truck frame insuring that the channels extend out even with, or past the rear of the support vehicle at a 45 degree angle to the lower section of the lift system as noted in drawing 1, notation 2 in Appendix (Figure 7).

### 3.9 Bolt the Channel Braces

Torque the bolts to 145 - 150 ft. lbs. (197 -203 Newton meters)

### 3.10 Route Control Wires

It is recommended that wiring be fed to the rear of the truck to accept the 7 round, or 4 flat, plug supplied to connect the vehicles lights to the U-MAD TMA to run the taillights, travel lights, 3 light bars and any accessories.

### 3.11 Route Power Source

A secondary electrical power source (+) will need to be provided to the electrical/hydraulic lifting pump (minimum cable diameter of 5/16" (8.0 mm) or 1/0 cable).

Refer to Appendix C for proper wiring diagram for different hydraulic systems.



Figure 7. Install side Channel Braces.

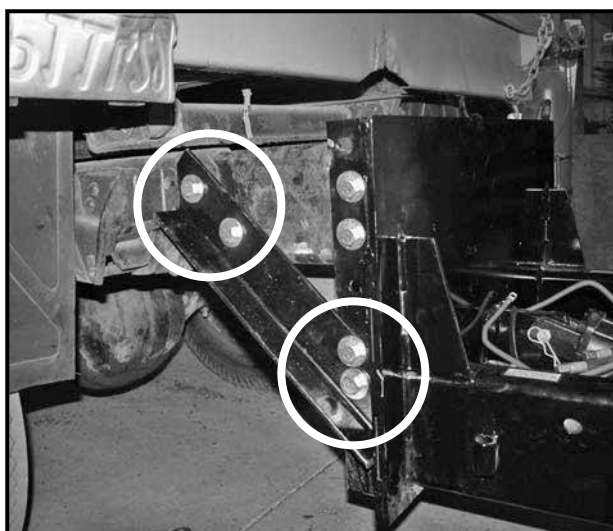


Figure 8. Bolt the side Channel Braces.

## U-MAD® Installation and Operations Manual

### 3.12 Pick up the TMA

Using a standard duty forklift with fork extensions, carefully transfer the TMA to the back of the truck for installation.



Figure 9. Transport the TMA.

### 3.13 Attach TMA to Support Structure

Attach the U-MAD cartridge to the Support Structure using the (2) 1" x 6" (25.4 mm x 152 mm) bolts and nuts provided. (Figure 10 - 11)

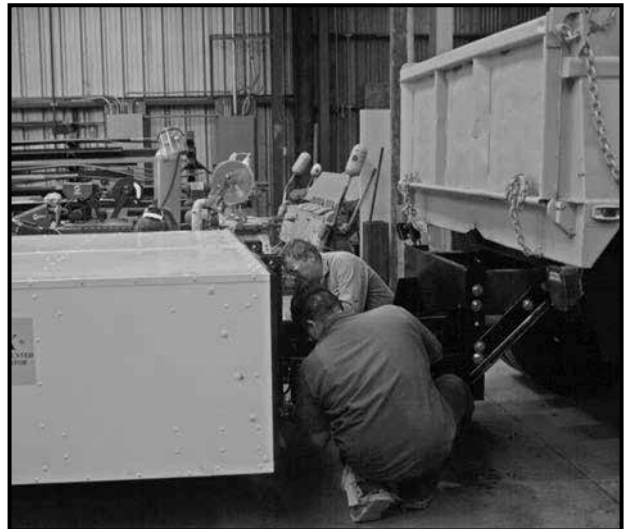


Figure 10. Bolt the TMA to the Support Bracket.

### 3.14 Fill Hydraulic Oil

Fill the hydraulic pump reservoir with AW45 clear, non foaming hydraulic fluid.

**Note:** During the manufacturing process of the unit, the hydraulic fluid has been added and cycled to remove any air from the system.

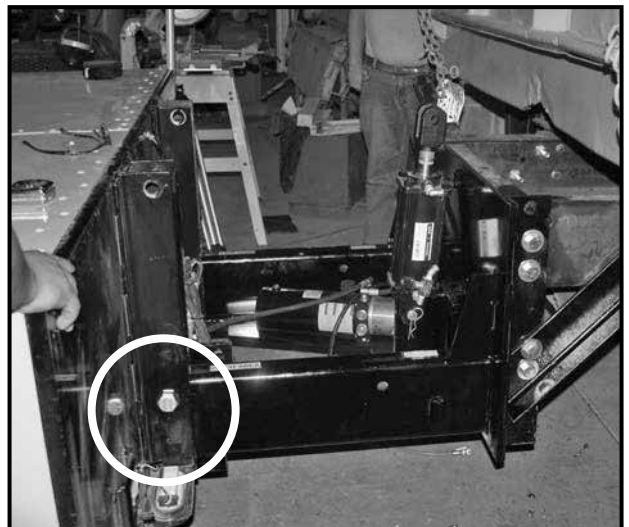


Figure 11. Fully attached TMA.

## U-MAD® Installation and Operations Manual

### 3.15 Attach Cylinder

Attach lift cylinder to the cartridge using the 1" pin (2.54 cm) provided (Figure 12).

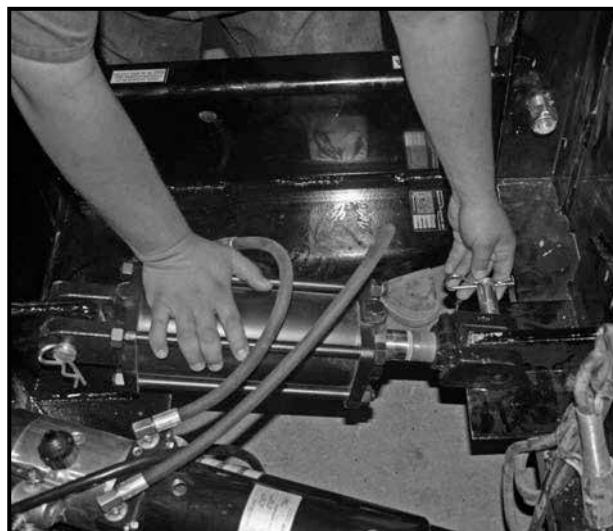


Figure 12. Install the lift cylinder.

### 3.16 Connect Plug

Connect the quick disconnect 4 flat or 7 round plug from the truck to the 4 flat or 7 round plug from the cartridge and test the lighting (Figure 13).

Refer to Appendix B for proper wiring diagram.



Figure 13. Plug in the quick disconnect.

### 3.17 Connect Power

Connect the power cable to the motor (Figure 14). Be sure that the power source is not energized before making this connection.

**NOTE: Power and grounding of the hydraulic power unit motor must be done in accordance with the truck manufacturer's specifications and recommendations for supplying auxiliary power to accessories. Some vehicles have complex electronic and/or computer control systems that must be considered and integrated when providing power to accessories. It is recommended that a 200 amp in-line fuse or breaker is used on the power cable. This will reduce the potential for power unit failure or damage to the TMA or host vehicle.**



Figure 14. Attached to Support Structure.

## U-MAD<sup>®</sup> Installation and Operations Manual

### 3.18 Level the Cartridge

Using the adjusters, level the entire U-MAD TMA cartridge to between 11" (279 mm) and 13" (330 mm) off of a level ground surface (Figure 15).

### 3.19 Wiring the Control Box

Using the diagrams in Appendix C, properly wire the CAB / BED control box or boxes. Please take note of the hydraulics on your active system.

There are two types of hydraulics; standard and locking. Ensure to wire the system using the appropriate diagram in Appendix C.



Figure 15. Adjust the level of the cartridge.

## U-MAD® Installation and Operations Manual

### Operating Instructions: Raising and Lowering the TMA

#### Raising the U-MAD TMA:

**1. Caution! Stand clear of all moving parts while unit is moving.**

2. Move the momentary three-way switch to the “Raise” position.

3. When the unit makes contact with the support structure tubes, install the two (2) 3/4” (19 mm) safety locking pins from the storage tubes into the full lockup position tubes and install cotter pins through safety locking pins.

#### Lower the U-MAD TMA:

1. Remove the two (2), 3/4” (19 mm) safety locking pins from the lock up tubes and place in the storage tubes on the sides of the support structure.

**2. Caution! Stand clear of all moving parts while unit is moving.**

3. Move the momentary three-way switch to the “Lower” position.

4. When the U-MAD TMA approaches the full-down position, toggle the switch on/off quickly to make sure the unit rests properly against the support structure arms and adjusters.

**IMPORTANT NOTE:**

It is recommended that the U-MAD TMA be placed into the full down position when the unit is being used as a shadow vehicle for a moving operation or a parked protection device. The cartridge is not intended to be driven extensive miles at highway speeds in the full-down position and 25 mph is the maximum recommended speed when unlocked and in the down position.

If the need arises to move the unit through a highway median with steep up and down grades or to navigate through steep driveways or turn in or turn outs. It is recommended that the U-MAD TMA be elevated at least 15° while the obstacle is being circumvented.

General maintenance and Adjustments	Interval
1. Check tightness of bolts, fasteners and locking pins	Weekly
2. Oil swivel jack pivot points	Monthly
3. Check hydraulic pump fluid	Weekly
4. Change hydraulic pump fluid (AW46 Clear Hydraulic)	Quarterly
5. Add hydraulic fluid (non-foaming clear hydraulic oil)	As Needed
6. Grease hinge point between cartridge and support structure	Quarterly
7. Clean exterior of hydraulic pump	As Needed
8. Check and clean hydraulic ram	Weekly
9. Clean working parts of support structure (dirt, salt, oil, etc.)	As Needed
10. Check U-MAD TMA for level and height of cartridge from ground	Weekly
11. Check all friction points for lubrication	Weekly
12. Check hydraulic system and clean	Weekly

Table 1. Maintenance Schedule.

## U-MAD® Installation and Operations Manual

**IMPORTANT NOTE: DO NOT POWER WASH OR USE HARMFUL CHEMICALS ON CARTRIDGE OR SUPPORT STRUCTURE. EXCESSIVE PRESSURE OR CHEMICALS COULD CAUSE PAINT TO PEEL OR WEAR PREMATURELY.**

### MINOR ADJUSTMENTS

#### NOTE:

The U-MAD electric/hydraulic system provides power to raise and lower the TMA to the full up and deployed (down) positions. The needle control valve has been set at the factory to provide for a slow safe lowering time, you may experience greater speeds deploying the cushion until air is extracted from the cylinder; This speed should be checked before putting the unit into service and periodically from then on during the life of the U-MAD TMA.

#### NOTE:

It may sometimes become necessary to adjust the in-line hydraulic oil needle control valve to speed up or slow down the decent of the TMA cartridge. To increase speed: loosen control screw jam nut and turn the control screw 1/4 turn counter clockwise --continue making 1/4 turn adjustments until desired speed is achieved. Re-tighten the control screw jam nut. To decrease speed: reverse above direction (i.e. clockwise).

The initial factory setting is 1 full counter clockwise turn from a slightly seated position. Temperature when set was 75 degrees Fahrenheit and rising.

**CAUTION . . .** if the jam nut was loosened to adjust, it must be re-tightened before normal usage is instituted.

After on site testing of the full-up, full-down operation of the TMA, smooth operation of the lock-up pins should be checked. The pins were checked and adjusted at the factory but to avoid any field problems, it is advised that they be rechecked.





U-MAD® Installation and Operations Manual

**Appendix A - Mounting**

The U-MAD TMA is available with a series of attachment systems to accommodate different host vehicles.

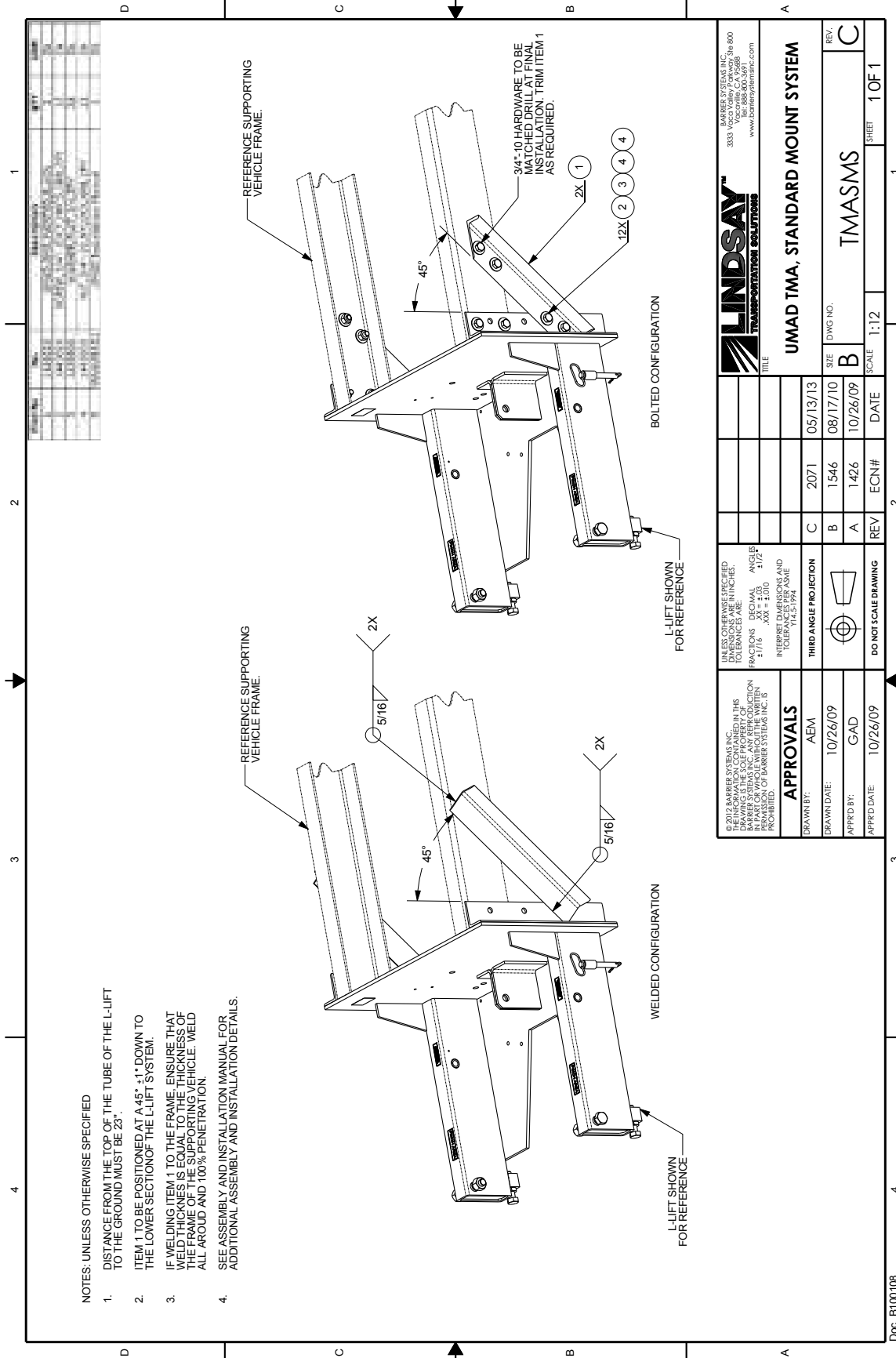
The available attachment systems include:

- TMASMS - Standard Mount System
- TMAQMS-A - Quick Mount System
- TMADMS - Dump Mount System
- TMAFMS - Flat bed Mount System
- TMAESS - Extension Mount System
- TMAQMS-B - Quick Mount System for ESS Mount

Prior to installation and assembly of the U-MAD TMA, identify the mounting system being installed and review the appropriate drawings. This installation manual outlines the proper installation steps required to assemble and install the U-MAD Standard Mount System (TMASMS). When installing a different mounting system, please reference the appropriate drawing in this appendix for proper assembly.

DRAWINGS

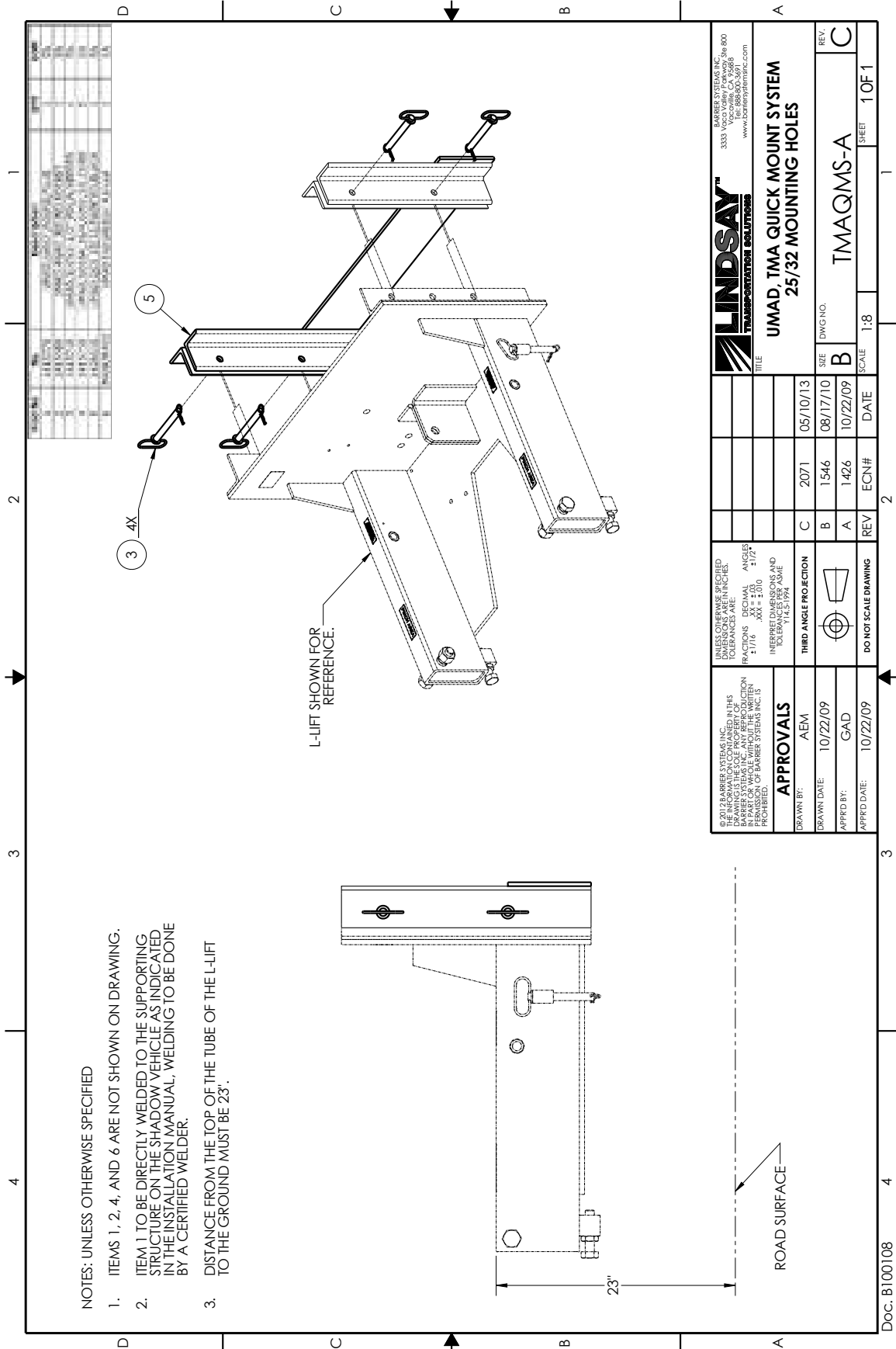
Standard Mount System DWG # TMASMS	14
Quick Mount System DWG# TMAQMS-A	15
Dump Mount System DWG# TMADMS	16
Flat bed Mount System DWG# TMAFMS	17
Extension Mount System DWG# TMAESS	18
Quick Mount System for ESS Mount DWG# TMAQMS-B	19



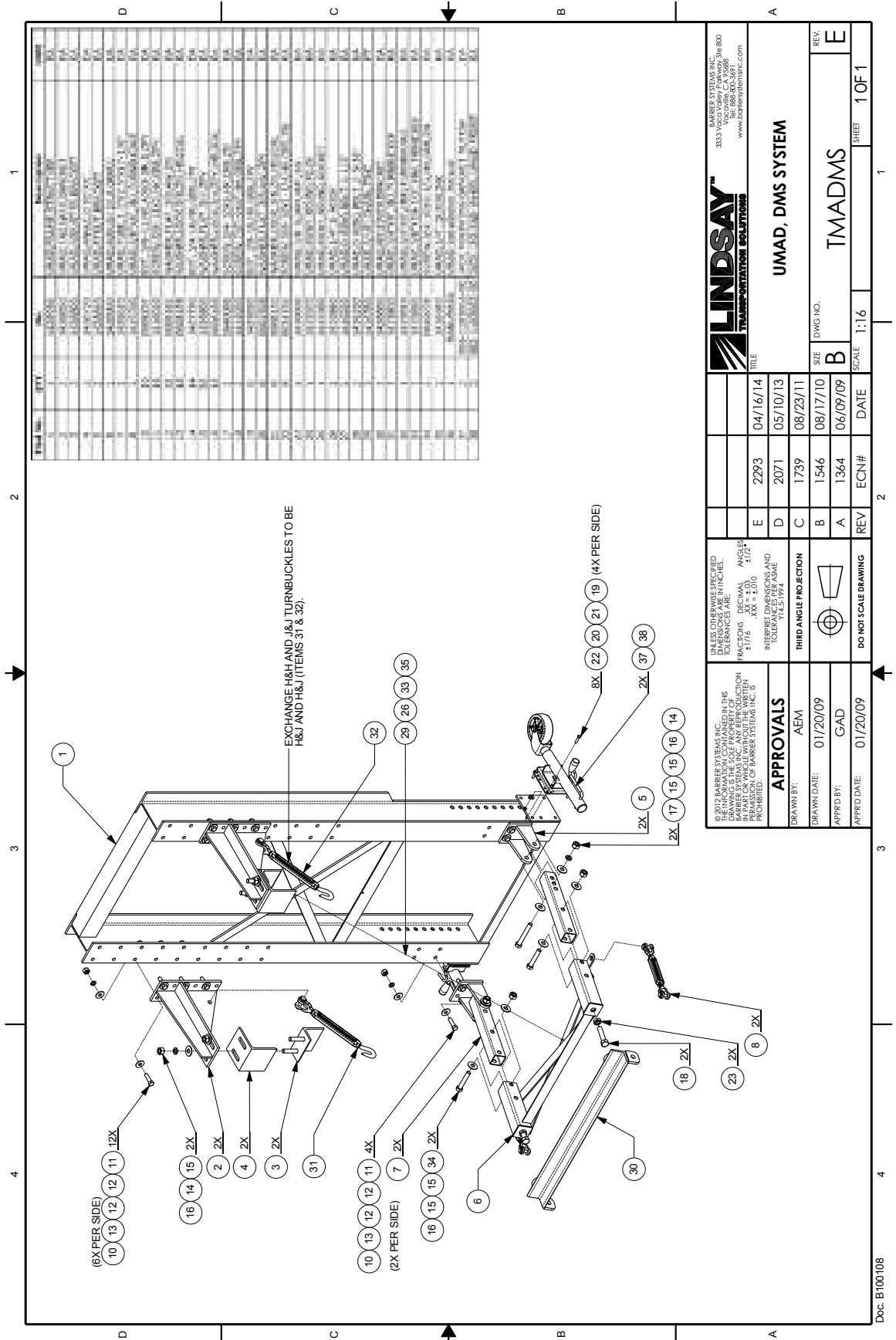
- NOTES: UNLESS OTHERWISE SPECIFIED
1. DISTANCE FROM THE TOP OF THE TUBE OF THE L-LIFT TO THE GROUND MUST BE 23".
  2. ITEM 1 TO BE POSITIONED AT 45° ±1° DOWN TO THE LOWER SECTION OF THE L-LIFT SYSTEM.
  3. IF WELDING ITEM 1 TO THE FRAME, ENSURE THAT WELD THICKNESS IS EQUAL TO THE THICKNESS OF THE FRAME. WELD TO BE FULL PENETRATION. WELD ALL AROUND AND 100% PENETRATION.
  4. SEE ASSEMBLY AND INSTALLATION MANUAL FOR ADDITIONAL ASSEMBLY AND INSTALLATION DETAILS.

		BARRIER SYSTEMS INC. 3033 A Yocumville, CA 95688 www.barteriansysteminc.com	
TITLE <b>UMAD TMA, STANDARD MOUNT SYSTEM</b>		REV. <b>C</b>	
SIZE <b>B</b>		DWG. NO. <b>TMASMS</b>	
SCALE <b>1:12</b>		SHEET <b>1 OF 1</b>	
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. FRACTIONS: DECIMAL ANGLES: 1/16 .XXX ±.010 1/2		INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994	
APPROVALS DRAWN BY: AEM DATE: 10/26/09 APPR'D BY: GAD DATE: 10/26/09		2071 1546 1426 REV ECN# DATE DO NOT SCALE DRAWING	

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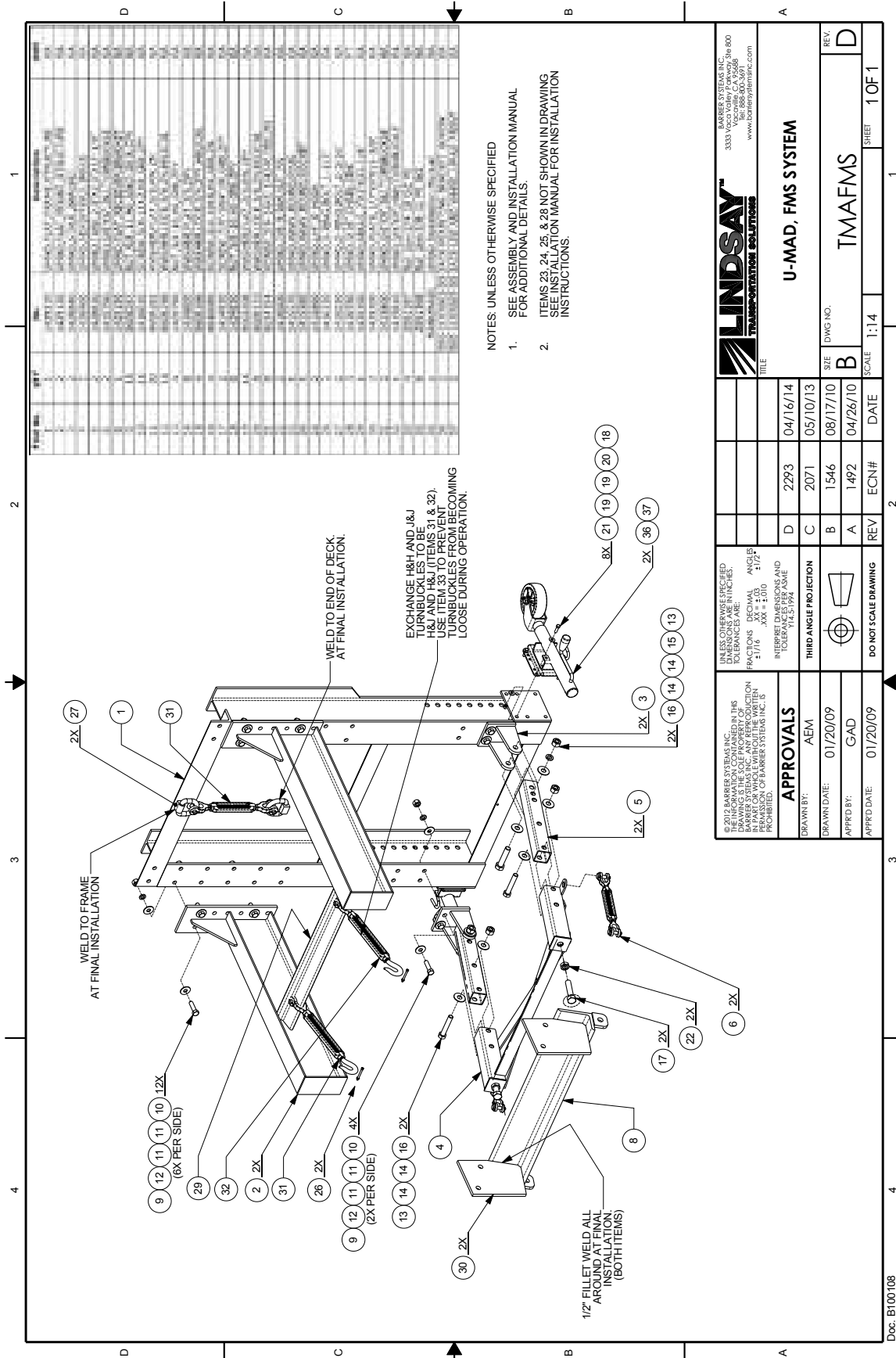
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TITLE <b>UMAD, DMS SYSTEM</b>		REV. <b>E</b>	
DWG. NO. <b>B</b>		SCALE <b>1:16</b>	
DATE <b>06/09/09</b>		SHEET <b>1 OF 1</b>	
ECN# <b>1364</b>		DATE <b>08/23/11</b>	
REV <b>A</b>		DATE <b>05/10/13</b>	
REV <b>D</b>		DATE <b>04/16/14</b>	
REV <b>C</b>		DATE <b>08/23/11</b>	
REV <b>B</b>		DATE <b>08/17/10</b>	
REV <b>A</b>		DATE <b>06/09/09</b>	

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<b>APPROVALS</b> DRAWN BY: AEM DRAWN DATE: 01/20/09 APPR'D BY: GAD APPR'D DATE: 01/20/09		INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994 THIRD ANGLE PROJECTION DO NOT SCALE DRAWING	

Doc. B100108

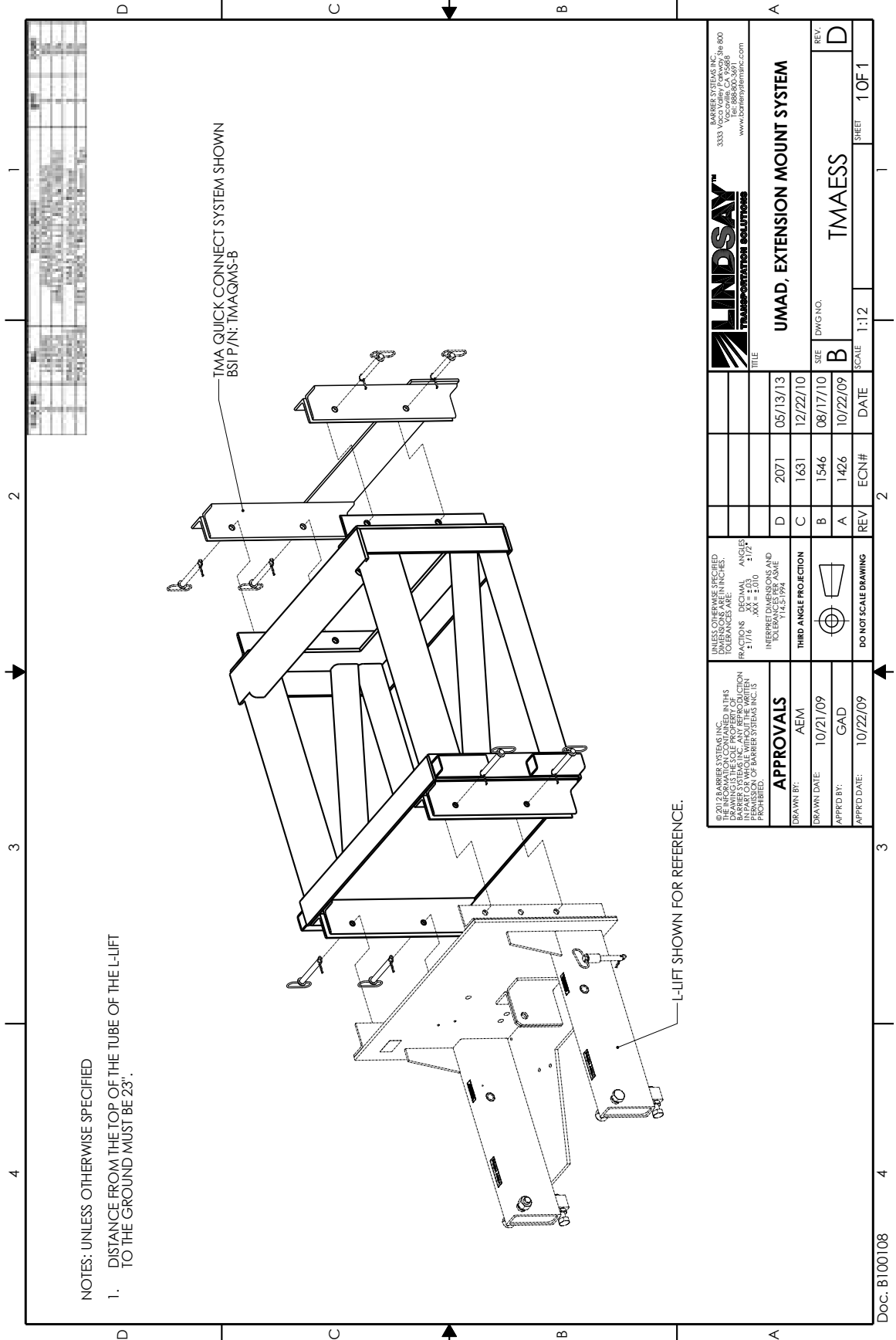


- NOTES: UNLESS OTHERWISE SPECIFIED
1. SEE ASSEMBLY AND INSTALLATION MANUAL FOR ADDITIONAL DETAILS.
  2. ITEMS 23, 24, 25 & 28 NOT SHOWN IN DRAWING SEE INSTALLATION MANUAL FOR INSTALLATION INSTRUCTIONS.

		BARRIER SYSTEMS INC. 3333 Valley View Dr., Suite 206 San Jose, CA 95128 Tel: 888-800-3691 www.lindsayts.com	
<b>U-MAD, FMS SYSTEM</b>		TITLE	
D 2293	04/16/14	C 2071	05/10/13
B 1546	08/17/10	A 1492	04/26/10
REV	ECN#	DATE	SHEET
D	TMAFMS	1:14	1 OF 1
DWG NO.	B	SCALE	1 OF 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. FRACTIONS DECIMAL ANGLES 1/16 .0625 1/2° .001 .001 .001 .001 .001 .001 .001 .001 .001 .001 .001 .001	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. FRACTIONS DECIMAL ANGLES 1/16 .0625 1/2° .001 .001 .001 .001 .001 .001 .001 .001 .001 .001 .001 .001
APPROVALS AEM 01/20/09 GAD 01/20/09	APPROVALS AEM 01/20/09 GAD 01/20/09

Doc: B100108



NOTES: UNLESS OTHERWISE SPECIFIED

1. DISTANCE FROM THE TOP OF THE TUBE OF THE L-LIFT TO THE GROUND MUST BE 23".

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<p>APPROVALS</p>		<p>THIRD ANGLE PROJECTION</p>		<p>DO NOT SCALE DRAWING</p>	
<p>DRAWN BY: AEM</p>	<p>DATE: 10/21/09</p>	<p>REV: A</p>	<p>ECN# 1426</p>	<p>DATE: 10/22/09</p>	<p>SHEET 1 OF 1</p>
<p>APPROVED BY: GAD</p>	<p>DATE: 10/22/09</p>	<p>REV: B</p>	<p>ECN# 1546</p>	<p>DATE: 08/17/10</p>	<p>SHEET 1 OF 1</p>
<p>REV: D</p>		<p>REV: D</p>		<p>REV: D</p>	

**LINDSAY™**  
 TRANSPORTATION SOLUTIONS

BARRETT SYSTEMS, INC.  
 3333 VALLEYVIEW BLVD.  
 YOCUMVILLE, CA 95969  
 WWW.BARRIER-SYSTEMS.COM

**UMAD, EXTENSION MOUNT SYSTEM**

DATE: 05/13/13

DATE: 12/22/10

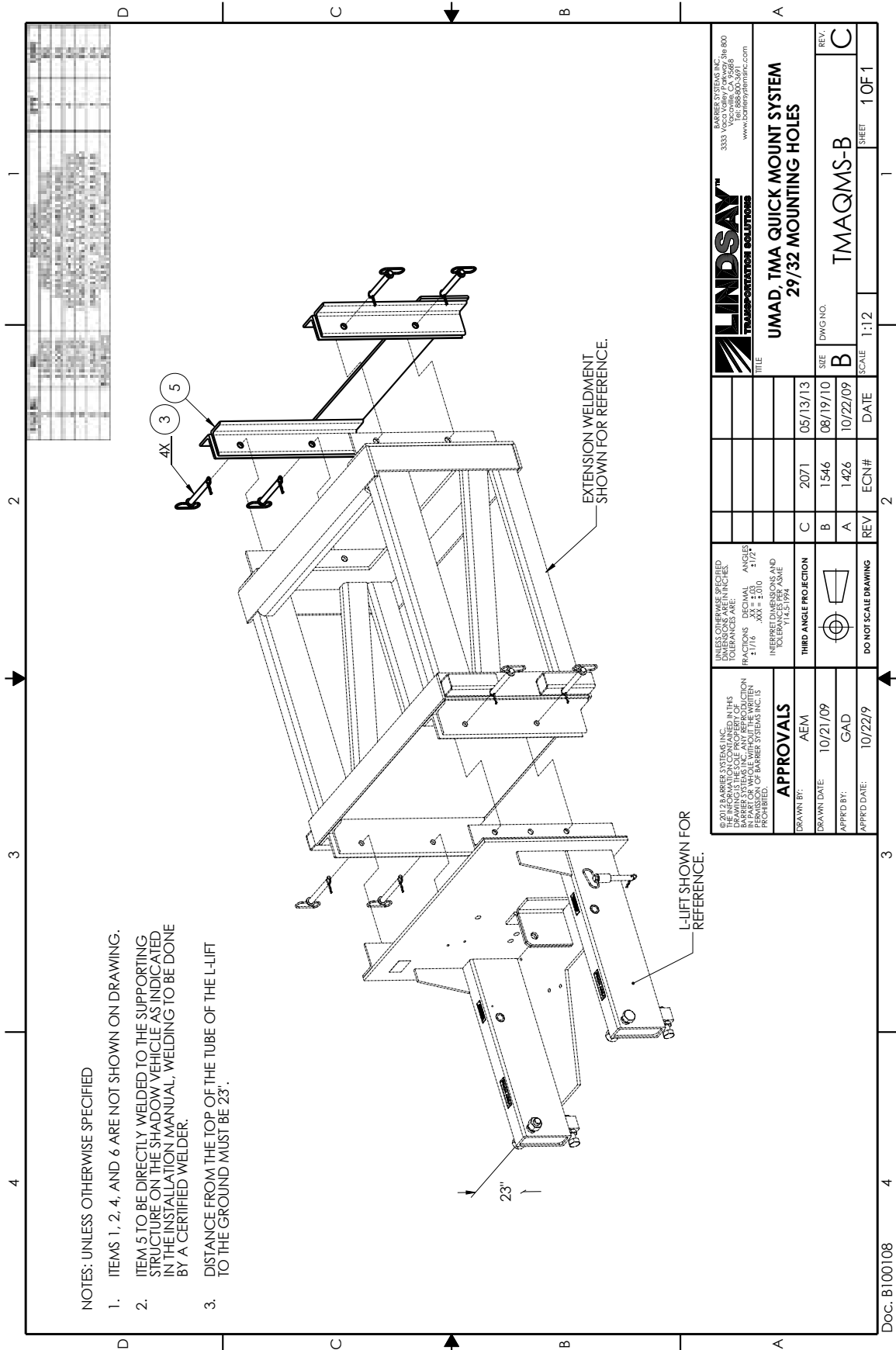
DATE: 08/17/10

DATE: 10/22/09

SCALE: 1:12

SHEET: 1 OF 1

Doc. B100108



- NOTES: UNLESS OTHERWISE SPECIFIED**
- ITEMS 1, 2, 4, AND 6 ARE NOT SHOWN ON DRAWING.
  - ITEM 5 TO BE DIRECTLY WELDED TO THE SUPPORTING STRUCTURE ON THE SHADOW VEHICLE AS INDICATED IN THE INSTALLATION MANUAL. WELDING TO BE DONE BY A CERTIFIED WELDER.
  - DISTANCE FROM THE TOP OF THE TUBE OF THE L-LIFT TO THE GROUND MUST BE 23".

 <b>LINDSAY™</b> TRANSPORTATION SOLUTIONS		BARBER SYSTEMS, INC. 3333 Vacco Valley Parkway, Ste 800 Dallas, TX 75244 Tel: 888.800.3691 www.lindsaytransport.com	
UMAD, TMA QUICK MOUNT SYSTEM		REV. C	
29/32 MOUNTING HOLES		TMAQMS-B	
DWG NO.		SHEET 1 OF 1	
2071		10/22/09	
05/13/13		1:12	
08/19/10		DATE	
1546		ECN#	
1426		REV	
A		SCALE	
B		DATE	
C		REV	
C		SCALE	
DO NOT SCALE DRAWING		1:12	
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES: DECIMAL ANGLES .1/16 .003 ±1/2° .XXX ±1.010 DECIMAL DIMENSIONS AS SHOWN ±14.5:1 PFA		APPROVALS DRAWN BY: AEM DRAWN DATE: 10/21/09 APP'D BY: GAD APP'D DATE: 10/22/09	
FOR ALL OTHERS: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF LINDSAY TRANSPORTATION SOLUTIONS AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF BARBER SYSTEMS, INC. IS PROHIBITED.		DO NOT SCALE DRAWING	

Doc: B100108



## Appendix B - Wiring Diagrams for Electric Lighting, Connectors

Electric wiring for the U-MAD Cartridge was completed by the factory. The electric wiring harness has been pre-installed.

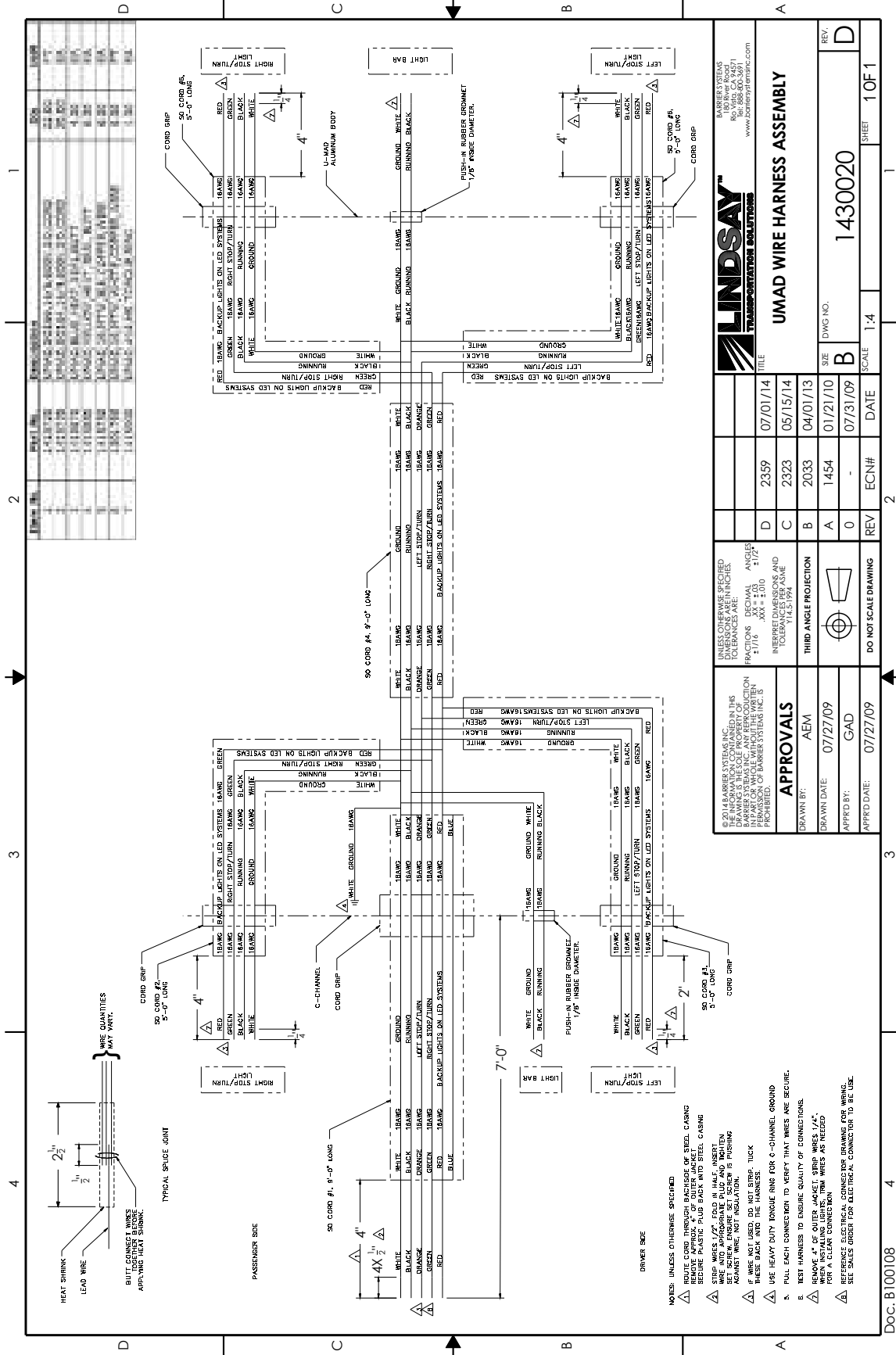
However, to match the connection plug on the host vehicle, you may need to adjust the wiring on the receiving plug.

The wiring diagram in the Appendix will assist you in achieving proper wiring for your TMA.

All work should be accomplished and inspected by a qualified mechanic with experience in electrical & hydraulic systems.

### DRAWINGS

Cartridge Wiring Diagram DWG# 1430020	21
7-Pin Round Connector DWG# 1422030	22
7-Pin Spade Connector DWG# B100104	23

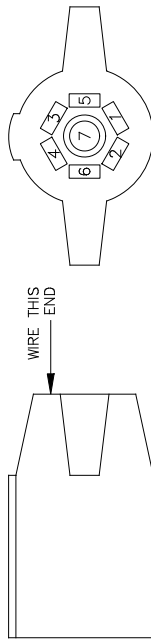


		<b>UMAD WIRE HARNESS ASSEMBLY</b>	
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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994		THIRD ANGLE PROJECTION	
APPROVALS DRAWN BY: AEM DRAWN DATE: 07/27/09 APP'D BY: GAD APP'D DATE: 07/27/09		DO NOT SCALE DRAWING	
D 2359	07/01/14	B 1454	01/21/10
C 2323	05/15/14	0	07/31/09
B 2033	04/01/13	REV	DATE
A	01/21/10	ECN#	2
0	07/31/09	SCALE	1:4
1430020	DING NO.	SHEET	1 OF 1



**WIRING INSTRUCTIONS FOR 7-PIN SPADE PLUG (2)**

1. REMOVE PLASTIC PLUG FROM CASING.
2. ROUTE 6 WIRE HARNESS THROUGH BACKSIDE OF CASING.
3. REMOVE APPROX. 4" OF OUTER JACKET
4. WIRE PER DIAGRAM/NOTES BELOW.
5. SECURE PLASTIC PLUG BACK INTO STEEL CASING.
6. TEST COMPLETED LIGHT SYSTEM TO VERIFY PROPER CONNECTIONS.



VIEW FOR WIRING

PLUG #	FUNCTION
1	GROUND
2	OPEN
3	RUNNING LIGHTS BOTH SIDES
4	OPEN
5	DRIVER SIDE ONLY--BRAKE & TURN SHOULD BE BRIGHTER THAN RUNNING LIGHTS
6	PASS. SIDE ONLY--BRAKE & TURN SHOULD BE BRIGHTER THAN RUNNING LIGHTS
7	14--2199--0 & 14--2202--0 --OPEN 14--2200--0 -- BACKUP LIGHTS -- WHITE LIGHTS ON LED SYSTEM

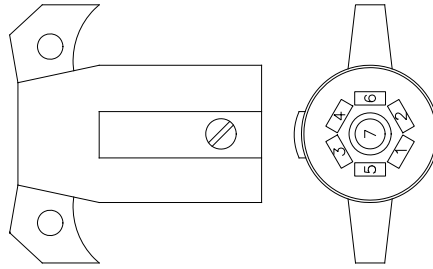
**NOTES:**  
 --ON WIRES THAT ARE USED, STRIP APPROX. 1/2" OF WIRE. FOLD BARE WIRE IN HALF (WIRE IS DOUBLE THICKNESS). INSERT WIRE INTO APPROPRIATE PLUG AND TIGHTEN SET SCREW. MAKE SURE SET SCREW IS PUSHING AGAINST BARE WIRE, NOT INSULATION.  
 --IF A WIRE IS NOT USED, DO NOT STRIP. TUCK THESE WIRES BACK INTO THE HARNESS.

DIAGRAM FOR "OVAL" LIGHT SYSTEM 14--2199--0 AND "BLANK" LIGHT SYSTEM 14--3452--0

PLUG #	WIRE HARNESS
1	WHITE
3	BLACK
6	GREEN
5	ORANGE
NOT USED	RED
NOT USED	BLUE

DIAGRAM FOR "LED" LIGHT SYSTEM 14--2200--0

PLUG #	WIRE HARNESS
1	WHITE
3	BLACK
6	GREEN
5	ORANGE
7	RED
NOT USED	BLUE



VIEW FOR TESTING



DIAGRAM FOR "24V" LIGHT SYSTEM 14--2202--0

PLUG #	WIRE HARNESS
1	WHITE
3	BLACK
6	GREEN
5	ORANGE
NOT USED	RED
NOT USED	BLUE

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REV.	CHANGES	DATE BY	REC'D	NEXT ASSY	ITEM
B	SEE ECN 1712	6/20/11 JN			
A	SEE ECN# 1454	6/20/10 AEM			

SCALE: 1:1

DATE	INIT.	STANDARD TOLERANCE
DRAWN BY 07/20/10	AEM	Angular ± 1/2°
APPROV BY	GAD	Fractional ± 1/16"
		Decimal ± .010

TITLE:

UMAD, CONNECTOR, 7 SPADE ROUND

SHEET	DRAWING NUMBER	REV.
1 OF 1	B100104	B



## Appendix C - Wiring Diagrams, Drawings for Hydraulics & Controls

The wiring of the hydraulic system and control boxes was completed by the factory. In order to operate the TMA, power and grounding of the hydraulic power unit motor must be done in accordance with the host vehicle manufacturer's specifications and recommendations for supplying auxiliary power to accessories. Some vehicles have complex electronic and/or computer control systems that must be considered and integrated when providing power to accessories. It is recommended that a 200-amp in-line fuse or breaker is used on the power cable. this will reduce the potential for power unit failure or damage to the TMA or host vehicle.

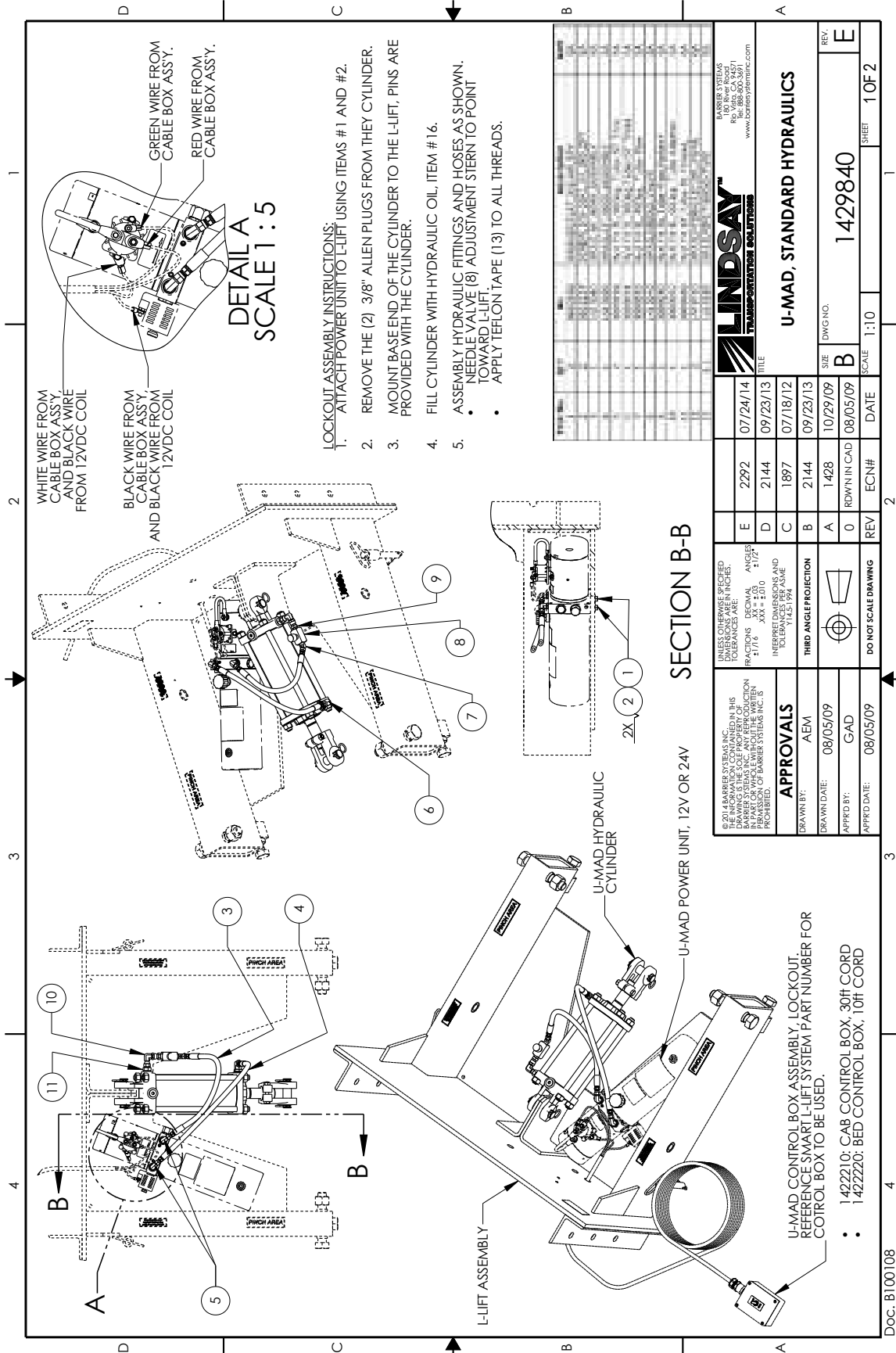
In addition, the control box must be properly wired to the hydraulic power unit per the wiring diagrams found in the Appendix.

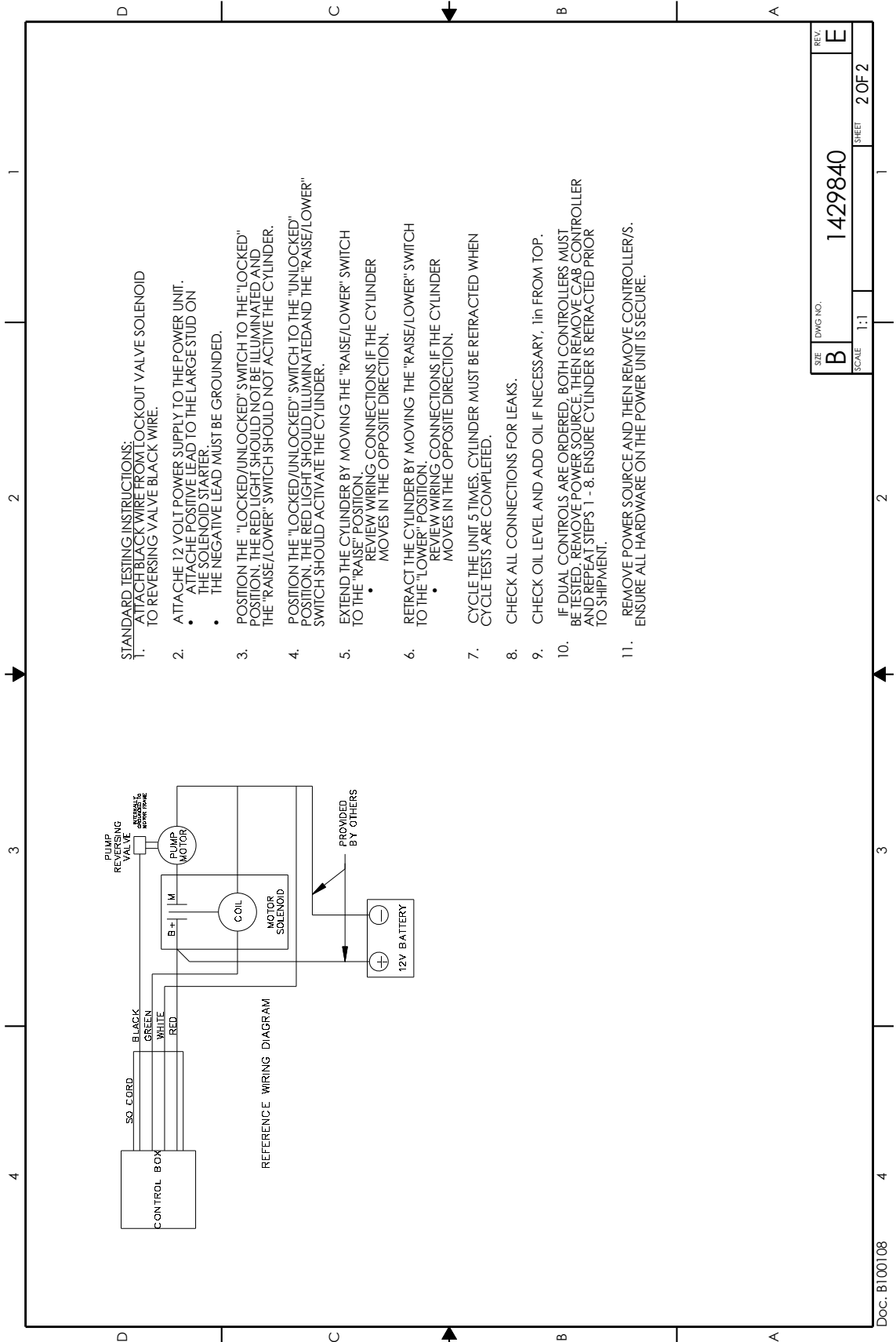
Prior to wiring, identify what hydraulic system is on the unit. There are two different systems; standard hydraulics and locking hydraulics.

All work should be accomplished and inspected by a qualified mechanic with experience in electrical & hydraulic systems.

### DRAWINGS

Standard Hydraulics DWG# 1429840	25
Cab Control   Standard Hydraulics DWG# 1422210	27
Bed Control   Standard Hydraulics DWG# 1422220	28
Lockout Hydraulics DWG# 1429850	29
Cab Control   Lockout Hydraulics DWG# 1422240	31
Bed Control   Lockout Hydraulics DWG# 1422250	32





- STANDARD TESTING INSTRUCTIONS:**
1. ATTACH BLACK WIRE FROM LOCKOUT VALVE SOLENOID TO REVERSING VALVE BLACK WIRE.
  2. ATTACHE 12 VOLT POWER SUPPLY TO THE POWER UNIT.
    - ATTACHE POSITIVE LEAD TO THE LARGE STUD ON THE SOLENOID STARTER.
    - THE NEGATIVE LEAD MUST BE GROUNDED.
  3. POSITION THE "LOCKED/UNLOCKED" SWITCH TO THE "LOCKED" POSITION. THE RED LIGHT SHOULD NOT BE ILLUMINATED AND THE "RAISE/LOWER" SWITCH SHOULD NOT ACTIVE THE CYLINDER.
  4. POSITION THE "LOCKED/UNLOCKED" SWITCH TO THE "UNLOCKED" POSITION. THE RED LIGHT SHOULD ILLUMINATED AND THE "RAISE/LOWER" SWITCH SHOULD ACTIVATE THE CYLINDER.
  5. EXTEND THE CYLINDER BY MOVING THE "RAISE/LOWER" SWITCH TO THE "RAISE" POSITION.
    - REVIEW WIRING CONNECTIONS IF THE CYLINDER MOVES IN THE OPPOSITE DIRECTION.
  6. RETRACT THE CYLINDER BY MOVING THE "RAISE/LOWER" SWITCH TO THE "LOWER" POSITION.
    - REVIEW WIRING CONNECTIONS IF THE CYLINDER MOVES IN THE OPPOSITE DIRECTION.
  7. CYCLE THE UNIT 5 TIMES. CYLINDER MUST BE RETRACTED WHEN CYCLE TESTS ARE COMPLETED.
  8. CHECK ALL CONNECTIONS FOR LEAKS.
  9. CHECK OIL LEVEL AND ADD OIL IF NECESSARY, 1in FROM TOP.
  10. IF DUAL CONTROLS ARE ORDERED, BOTH CONTROLLERS MUST BE TESTED, REMOVE POWER SOURCE, THEN REMOVE CAB CONTROLLER AND REPEAT STEPS 1 - 8. ENSURE CYLINDER IS RETRACTED PRIOR TO SHIPMENT.
  11. REMOVE POWER SOURCE AND THEN REMOVE CONTROLLER/S. ENSURE ALL HARDWARE ON THE POWER UNIT IS SECURE.

REV	DWG NO.	SHEET
<b>B</b>	<b>1429840</b>	<b>2 OF 2</b>
SCALE	1:1	

Doc: B100108

Find No.	No.	Description	QTY	UOM
1	1412910	UMAD,DECAL,RAISE,CAB,CONTROL	1	EA
2	1413100	UMAD,DPDT,MOMENTARY,SWITCH	1	EA
3	1414870	UMAD,PVC,GLUE,ADHESIVE	0.05	EA
4	1415730	UMAD,S0164,16/4,600V,SO,CORD	30	FT
5	1415760	UMAD,1/2",GROMMET,CONNECT	1	EA
6	1415830	UMAD,CAB,CONTROL,COVER	1	EA
7	1415840	UMAD,CAB,CONTROL,BOX	1	EA
8	1415890	UMAD,#10,HS,TONGUE,RING	3	EA
9	1415910	UMAD,#34,HS,TONGUE,RING	1	EA
10	1415950	UMAD,10-12,NON-INS,FEMALE,FLAG	5	EA
11	1416300	UMAD,TOGGLE,BOOT,WATERPROOF	1	EA
12	1424920	UMAD,1/2",PVC,PIPE	0.02	EA
13	1424930	UMAD,1/2",PVC,FEMALE,ADAPTER	1	EA

NOTES: UNLESS OTHERWISE SPECIFIED  
 1. USE ADHESIVE (#3) TO ATTACH ITEMS #5,7,11, & 12.  
 2. WHEN COMPLETE, TIGHTEN #5. ATTACH #6 (COVER) TO #7 (BOX) BE SURE GASKET IS POSITIONED PROPERLY.  
 3. USE 1/2" DRILL BIT TO DRILL HOLE FOR #2 (SWITCH) IN #6 (COVER). HOLE TO BE CENTERED.  
 4. ATTACH ITEMS #8, AND #9 AS SHOWN. REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AND USE HEAT GUN TO SHRINK. PULL EACH CONNECTION TO ENSURE CRIMP IS HOLDING WIRES.  
 5. REMOVE APPROX. 4" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AS SHOWN. PULL ON EACH CONNECTION TO MAKE SURE CRIMPS ARE TIGHT. USE ITEM #10 FOR ALL TERMINALS (WIRES TO OUTSIDE OF SWITCHES).  
 6. ATTACH BLACK WIRE TO "B" TERMINAL  
 7. ATTACH RED WIRE TO "D" TERMINAL, ADD JUMPER TO "C" TERMINAL.  
 8. ATTACH GREEN WIRE TO "F" TERMINAL, ADD JUMPER TO "A" TERMINAL.

CONTROL BOX

(BACKSIDE OF COVER)

WIRING DIAGRAM



Find No.	No.	QTY	Description	UOM
1	1412910	1	UMAD,DECAL,RAISE,CAB,CONTROL	EA
2	1413100	1	UMAD,DPDT,MOMENTARY,SWITCH	EA
3	1413200	0.05	UMAD,1/2",PVC,PIPE	EA
4	1415760	10	UMAD,1/2",GROMMET,CONNECT	EA
5	1415760	1	UMAD,1/2",GROMMET,CONNECT	EA
6	1415830	1	UMAD,CAB,CONTROL,COVER	EA
7	1415840	1	UMAD,CAB,CONTROL,BOX	EA
8	1415850	3	UMAD,#10,US,LOCKE,RING	EA
9	1415850	3	UMAD,#10,US,LOCKE,RING	EA
10	1415940	5	UMAD,10-12,NON-INS,FEMALE,FLAG	EA
11	1416300	1	UMAD,10GGLE,BOOT,WATERPROOF	EA
12	1424920	0.02	UMAD,1/2",PVC,PIPE	EA
13	1424930	1	UMAD,1/2",PVC,FEMALE,ADAPTER	EA

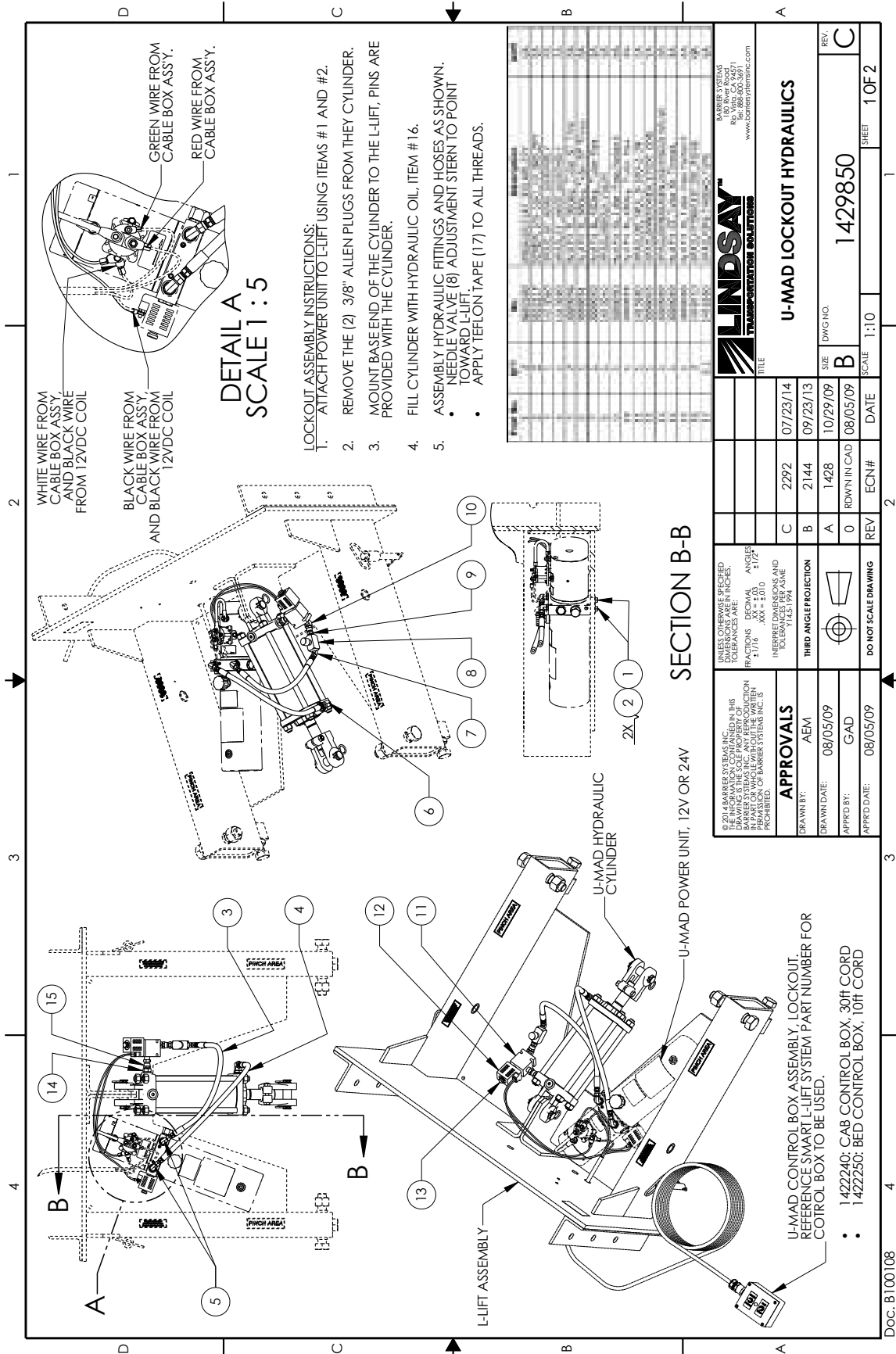
NOTES: UNLESS OTHERWISE SPECIFIED  
 1. USE ADHESIVE (#3) TO ATTACH ITEMS #5,7,11, & 12.  
 2. WHEN COMPLETE, TIGHTEN #5. ATTACH #6 (COVER) TO #7 (BOX) BE SURE GASKET IS POSITIONED PROPERLY.  
 3. USE 1/2" DRILL BIT TO DRILL HOLE FOR #2 (SWITCH) IN #6 (COVER). HOLE TO BE CENTERED.  
 4. ATTACH ITEMS #8, AND #9 AS SHOWN. REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AND USE HEAT GUN TO SHRINK. PULL EACH CONNECTION TO ENSURE CRIMP IS HOLDING WIRES.  
 5. REMOVE APPROX. 4" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AS SHOWN. PULL ON EACH CONNECTION TO MAKE SURE CRIMPS ARE TIGHT. USE ITEM #10 FOR ALL TERMINALS (WIRES TO OUTSIDE OF SWITCHES).  
 6. ATTACH BLACK WIRE TO "B" TERMINAL  
 7. ATTACH RED WIRE TO "D" TERMINAL, ADD JUMPER TO "C" TERMINAL.  
 8. ATTACH GREEN WIRE TO "F" TERMINAL, ADD JUMPER TO "A" TERMINAL.

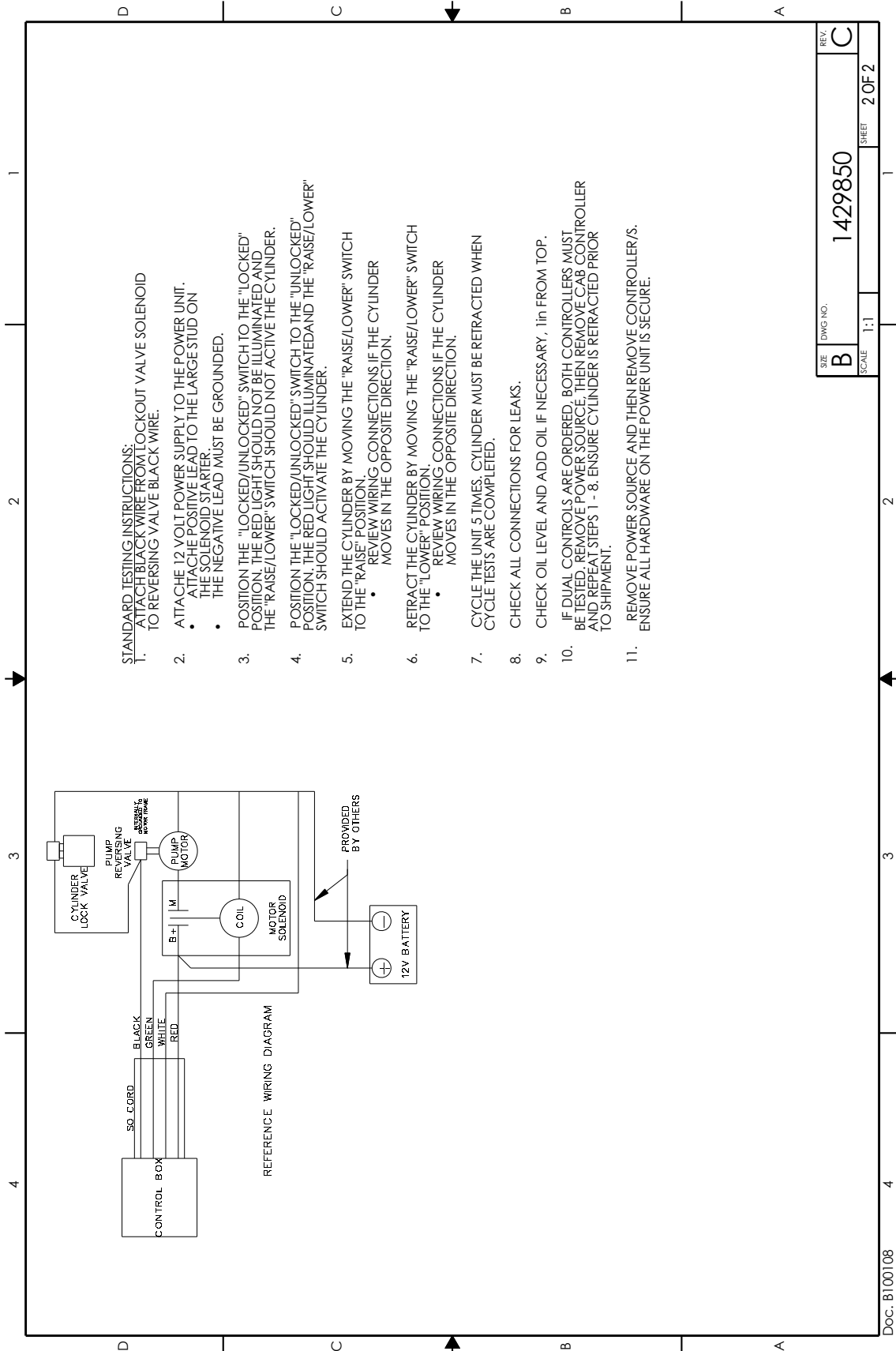
**WIRING DIAGRAM**

(BACKSIDE OF COVER)

SWITCH SPECIFICATIONS PRINTED HERE

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. FRACTIONS ARE DECIMAL ANGLES ARE 31/76. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED. INTERSECT DIMENSIONS ARE THE SAME UNLESS OTHERWISE SPECIFIED.		THIRD ANGLE PROJECTION	DO NOT SCALE DRAWING
<b>APPROVALS</b> DRAWN BY: AEM DRAWN DATE: 08/05/09 APP'D BY: CAD APP'D DATE: 08/05/09	REV: B DATE: 08/05/09 ECN#: 0 ROWN IN CAD	SIZE: B DATE: 08/23/13 DATE: 08/05/09	SHEET: 1 OF 1





- STANDARD TESTING INSTRUCTIONS:**
1. ATTACH BLACK WIRE FROM LOCKOUT VALVE SOLENOID TO REVERSING VALVE BLACK WIRE.
  2. ATTACHE 12 VOLT POWER SUPPLY TO THE POWER UNIT.
    - ATTACHE POSITIVE LEAD TO THE LARGE STUD ON THE SOLENOID STARTER.
    - THE NEGATIVE LEAD MUST BE GROUNDED.
  3. POSITION THE "LOCKED/UNLOCKED" SWITCH TO THE "LOCKED" POSITION. THE RED LIGHT SHOULD NOT BE ILLUMINATED AND THE "RAISE/LOWER" SWITCH SHOULD NOT ACTIVE THE CYLINDER.
  4. POSITION THE "LOCKED/UNLOCKED" SWITCH TO THE "UNLOCKED" POSITION. THE RED LIGHT SHOULD ILLUMINATED AND THE "RAISE/LOWER" SWITCH SHOULD ACTIVATE THE CYLINDER.
  5. EXTEND THE CYLINDER BY MOVING THE "RAISE/LOWER" SWITCH TO THE "RAISE" POSITION.
    - REVIEW WIRING CONNECTIONS IF THE CYLINDER MOVES IN THE OPPOSITE DIRECTION.
  6. RETRACT THE CYLINDER BY MOVING THE "RAISE/LOWER" SWITCH TO THE "LOWER" POSITION.
    - REVIEW WIRING CONNECTIONS IF THE CYLINDER MOVES IN THE OPPOSITE DIRECTION.
  7. CYCLE THE UNIT 5 TIMES. CYLINDER MUST BE RETRACTED WHEN CYCLE TESTS ARE COMPLETED.
  8. CHECK ALL CONNECTIONS FOR LEAKS.
  9. CHECK OIL LEVEL AND ADD OIL IF NECESSARY, in FROM TOP.
  10. IF DUAL CONTROLS ARE ORDERED, BOTH CONTROLLERS MUST BE TESTED, REMOVE POWER SOURCE, THEN REMOVE CAB CONTROLLER AND REPEAT STEPS 1 - 8. ENSURE CYLINDER IS RETRACTED PRIOR TO SHIPMENT.
  11. REMOVE POWER SOURCE AND THEN REMOVE CONTROLLER/S. ENSURE ALL HARDWARE ON THE POWER UNIT IS SECURE.

REV	DWG NO.	REV
B	1429850	C
SCALE	1:1	SHEET
		2 OF 2

Doc: B100108

4
3
2
1

D
C
B
A

**NOTES: UNLESS OTHERWISE SPECIFIED**

- USE ADHESIVE (#6) TO SECURE ITEM 18 TO ITEM #10.
- WHEN COMPLETE, TIGHTEN #9. ATTACH #9 (COVER) TO #10 (BOX) BE SURE GASKET IS POSITIONED PROPERLY
- USE 1/2" DRILL BIT TO DRILL 1 HOLE FOR #16 (RED LIGHT) IN #9 (COVER). HOLE TO BE CENTERED.
- USE 1/2" DRILL BIT TO DRILL 2 HOLES FOR SWITCHES #5 & #17 HOLES TO BE CENTERED BETWEEN #16 & EDGE OF COVER.
- ATTACH ITEMS #12 & #14 AS SHOWN. REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AS SHOWN. PULL ON EACH CONNECTION TO MAKE SURE CRIMPS ARE TIGHT. USE ITEM #15 FOR ALL TERMINALS (WIRES TO OUTSIDE OF SWITCHES. TIGHT.
- REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE. CRIMP CONNECTIONS AS SHOWN. PULL ON EACH CONNECTION TO MAKE SURE CRIMPS ARE TIGHT. USE ITEM #15 FOR ALL TERMINALS (WIRES TO OUTSIDE OF SWITCHES. TIGHT.

**REAR VIEW OF PANEL**

WIRING DIAGRAM

Find No.	No.	QTY	Description	UOM
3	1412910	1	UMAD,DECAL,RAISE,CAB,CONTROL	EA
4	1412920	1	UMAD,DECAL,LOCK,CAB,CONTROL	EA
5	1414870	1	UMAD,SPST,ON/OFF,SWITCH	EA
6	1414870	0.05	UMAD,PVC,GULE,ADHESIVE	EA
7	1415730	30	UMAD,SC0184,16/4,600V,SO,CORD	EA
8	1415760	1	UMAD,1/2",GROMMET,CONNECT	EA
9	1415830	1	UMAD,CAB,CONTROL,COVER	EA
10	1415840	1	UMAD,CAB,CONTROL,LEVER	EA
11	1415850	3	UMAD,1/2",PVC,FEMALE,RING	EA
12	1415910	1	UMAD,1/2",PVC,FEMALE,FLAG	EA
13	1415950	7	UMAD,10-12AON-INS,FEMALE,FLAG	EA
14	1416190	1	UMAD,RED,SNAP,12VDC	EA
15	1416230	1	UMAD,SPST,ON/OFF,SWITCH	EA
16	1424830	0.02	UMAD,1/2",PVC,FEMALE,ADAPTER	EA
17	1424830	1	UMAD,1/2",PVC,FEMALE,ADAPTER	EA
18	1416300	2	UMAD,TOGGLE,BOOT,WATERPROOF	EA
20	1416300	2	UMAD,TOGGLE,BOOT,WATERPROOF	EA

**APPROVALS**

DESIGNED BY: AEM  
 DRAWN DATE: 08/05/09  
 APPR'D BY: GAD  
 APPR'D DATE: 08/05/09

**REVISIONS**

REV	DATE	DESCRIPTION
F	07/24/14	2292
E	08/23/13	2144
D	11/04/10	1608
C	12/10/09	1439
B	10/29/09	1428
A	08/05/09	ROWEN IN CAD

**GENERAL INFORMATION**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS .005" MINUS .002" PLUS DECIMALS .005" MINUS .002" PLUS ANGLES .005" MINUS .002" PLUS

APPROVALS: AEM  
 DRAWN DATE: 08/05/09  
 APPR'D BY: GAD  
 APPR'D DATE: 08/05/09

DO NOT SCALE DRAWING

**PRODUCT INFORMATION**

UMAD, CL, B080241, LOCK, CAB, BOX

DATE: 08/05/09

REV: F

SIZE: B

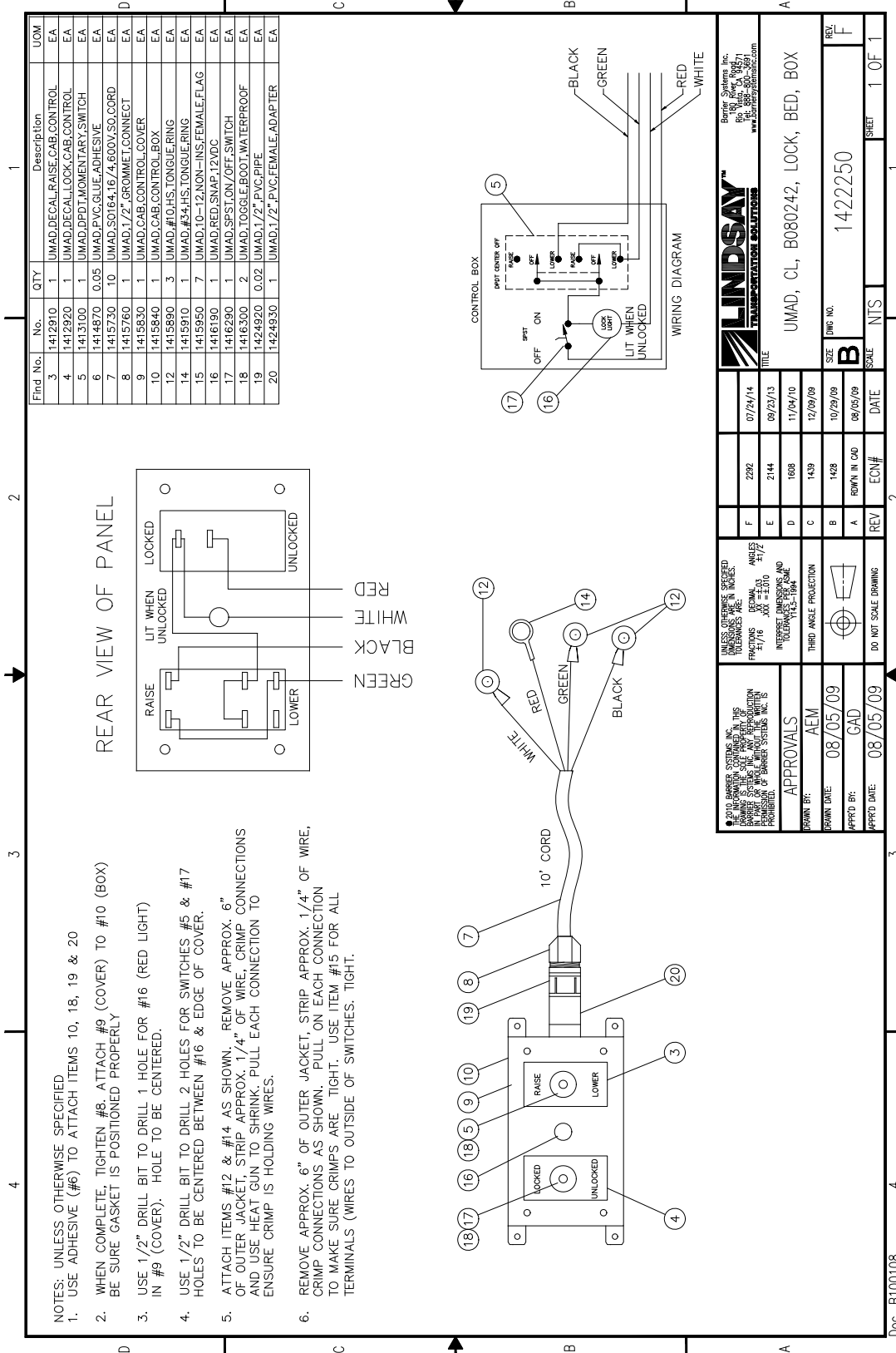
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SHEET: 1 OF 1

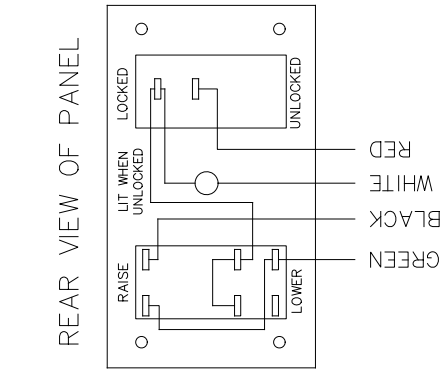
**COMPANY INFORMATION**

**LINDSAY**  
 TRANSPORTATION SOLUTIONS

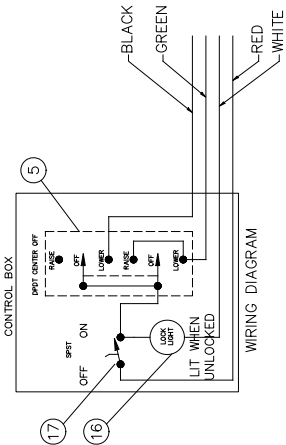
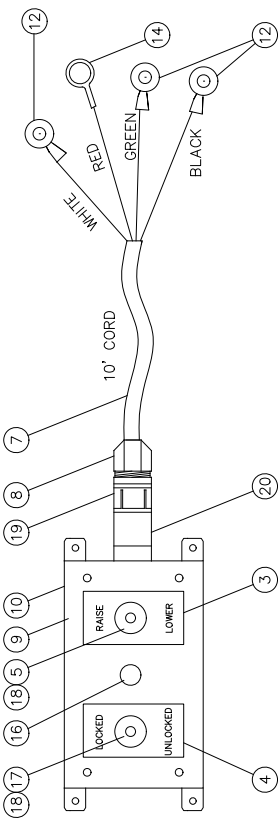
Barber Systems Inc.  
 1450 Park Ridge  
 Ft. Worth, TX 76107  
 Tel: 888-800-3691  
 www.lindsay-systems.com



Find No.	No.	QTY	Description	UOM
3	1412910	1	UMAD,DECAL,RAISE,CAB,CONTROL	EA
4	1412920	1	UMAD,DECAL,LOCK,CAB,CONTROL	EA
5	1413100	1	UMAD,DPDT,MOMENTARY,SWITCH	EA
6	1414870	0.05	UMAD,PVC,GLUE,ADHESIVE	EA
7	1415730	10	UMAD,50164,16/4,600V,50,CORD	EA
8	1415760	1	UMAD,1/2",GROMMET,CONNECT	EA
9	1415830	1	UMAD,CAB,CONTROL,COVER	EA
10	1415840	1	UMAD,CAB,CONTROL,BOX	EA
12	1415890	3	UMAD,#10,HS,TONGUE,RING	EA
14	1415910	1	UMAD,#34,HS,TONGUE,RING	EA
15	1415950	7	UMAD,10-12,NON-INS,FEMALE,FLAG	EA
16	1416190	1	UMAD,RED,SNAP,12VDC	EA
17	1416290	1	UMAD,SPST,ON/OFF,SWITCH	EA
18	1416300	2	UMAD,TOGGLE,BOOT,WATERPROOF	EA
19	1424920	0.02	UMAD,1/2",PVC,PIPE	EA
20	1424930	1	UMAD,1/2",PVC,FEMALE,ADAPTER	EA



- NOTES: UNLESS OTHERWISE SPECIFIED  
 1. USE ADHESIVE (#6) TO ATTACH ITEMS 10, 18, 19 & 20  
 2. WHEN COMPLETE, TIGHTEN #8, ATTACH #9 (COVER) TO #10 (BOX) BE SURE GASKET IS POSITIONED PROPERLY  
 3. USE 1/2" DRILL BIT TO DRILL 1. HOLE FOR #16 (RED LIGHT) IN #9 (COVER). HOLE TO BE CENTERED.  
 4. USE 1/2" DRILL BIT TO DRILL 2. HOLES FOR SWITCHES #5 & #17 HOLES TO BE CENTERED BETWEEN #16 & EDGE OF COVER.  
 5. ATTACH ITEMS #12 & #14 AS SHOWN. REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE, CRIMP CONNECTIONS AND USE HEAT GUN TO SHRINK. PULL EACH CONNECTION TO ENSURE CRIMP IS HOLDING WIRES.  
 6. REMOVE APPROX. 6" OF OUTER JACKET, STRIP APPROX. 1/4" OF WIRE, CRIMP CONNECTIONS AS SHOWN. PULL ON EACH CONNECTION TO MAKE SURE CRIMPS ARE TIGHT. USE ITEM #15 FOR ALL TERMINALS (WIRES TO OUTSIDE OF SWITCHES. TIGHT.



<p><b>LINDSAY</b>                  TRANSPORTATION SOLUTIONS</p>		Bendix Systems Inc. P.O. Box 10077 10000 W. 10th Ave. Denver, CO 80201-3699 Tel: 303-555-3699 Fax: 303-555-3699 www.bendixsystems.com	
TITLE		UMAD, CL, B080242, LOCK, BED, BOX	
DATE	SIZE	DWG NO.	REV.
07/24/14	F	2292	F
09/23/13	E	2144	B
11/09/10	D	1608	A
12/09/09	C	1439	
10/29/09	B	1438	
08/05/09	A	ROW'N IN CAD	
DATE	REV	ECN#	SCALE
08/05/09			1 OF 1
APPROVALS		SHEET	
DRAWN BY: AEM	THIRD ANGLE PROJECTION	1	
APPROVED BY: GAD	DO NOT SCALE DRAWING	1	
DATE: 08/05/09		1	

Doc. B100108



Lindsay Transportation Solutions Sales and Services, Inc

180 River Road • Rio Vista, CA 94571 • +1 707.374.6800 U.S. Toll Free: 888.800.3691 • [www.barrriersystemsinc.com](http://www.barrriersystemsinc.com)

Installation manual details for the U-MAD TMA are subject to change without notice to reflect improvements and upgrades.

Additional information is available from Lindsay Transportation Solutions Sales and Service © Lindsay Transportation Solutions

UMADTMA 08072015 v14