



U.S. Department
of Transportation
**Federal Highway
Administration**

December 28, 1999

400 Seventh St., S.W.
Washington, D.C. 20590

Refer to: HMHS

Mr. Dave Gertz
Director of Engineering
TrafFix Devices, Inc.
220 Calle Pintoresco
San Clemente, California 92672

Dear Mr. Gertz:

Thank you for your letter of August 19 requesting the Federal Highway Administration (FHWA) find a number of your company's work zone traffic control devices as crashworthy and acceptable for use on the National Highway System (NHS) under the provisions of the National Cooperative Highway Research Program Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." Accompanying your letter was a copy of the crash test report by Karco Engineering and video documentation of the crash tests. In response to our request you sent additional information on November 17, 1999.

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first dated July 25, 1997, titled "Information: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This recent memorandum lists devices that are acceptable under Categories I, II, and III.

Full-scale automobile testing was conducted on your company's cones, tubes, barricades, drums, and portable sign supports. The unlighted cones and tubes are Category I devices and do not need an acceptance letter from the FHWA, but they will be included in the lists below for continuity. Two examples of each Category II device were tested in tandem, one head-on and the next at 90 degrees, as called for in our guidance memoranda. The items in the following table were included in this testing program:

| Item Name | Ballast, Lights, Flags | Test # | WZ Category Designation |
|---|---|--------|-------------------------|
| 28-inch Grabber Tube | 5.5 kg rubber base | 1 | Category 1 |
| 28-inch Grabber Cone | 4.5 kg rubber base | 1 | Category 1 |
| 42-inch Grabber Tube | 5.5 kg rubber base | 1 | Category 1 |
| 42-inch Grabber Cone | 7.3 kg rubber base | 1 | Category 1 |
| Model 18000 HDPE Drum with Tire Ring | Empco-Lite Model #100 with 11 kg Tire Ring | 2 | Category 2 |
| 42-inch Grabber Cone | Empco-Lite Model #100 with 13.6 kg rubber base | 3 | Category 2 |
| Vertical Panel Barricade | Empco-Lite Model #100 19.5 kg rubber base | 4 | Category 2 |
| Economy Plastic Folding Barricade, sand-filled panels | Empco-Lite Model #100 8.2 kg ballasted top panels | 5 | Category 2 |
| 42-inch Traffix Cone | Empco-Lite Model #100 6.8-kg sand-filled base | 6 | Category 2 |
| Traffix A-Cade, 8-foot Traffix rail | Empco-Lite Model #100 2.7 kg sand Ballast | 7 | Category 2 |
| Big Buster Dual Spring Folding Leg Sign Stand | 1.5 m mounting height 1220 mm rollup signs, 3 flags | 8 | Category 2 |
| Little Buster Dual Spring Folding Sign Stand | 1270 mm mounting height 1220 mm rollup signs, 3 flags | 10 | Category 2 |
| Econo Buster Sign Stand | 1270 mm mounting height 1220 mm rollup signs, 3 flags | 11 | Category 2 |

Drawings/specification sheets for the devices tested are enclosed. All lights were securely attached to the test articles with a "light bolt heavy duty protector" also shown in the enclosure.

All tests were conducted with an 844-kg or an 845-kg automobile with a live driver. The tests and their results are summarized in the following table.

| Test No. | Impact Speed (km/hr) | Impact Speed (km/hr) | Velocity Change (m/s)* | Description of Damage to Windshield | Results | Device |
|----------|----------------------|----------------------|------------------------|-------------------------------------|---------|-------------------|
| | Head-on | 90-deg. | | | | |
| 1 | 105.9 | 102.8 | 0.43 | No contact | Pass | Tube, Cone |
| 2 | 101.8 | 92.9 | 1.24 | No contact | Pass | Drum |
| 3 | 102.5 | 100.2 | 0.32 | No contact | Pass | Cone |
| 4 | 104.3 | 100.7 | 0.50 | No contact | Pass | Vert. Panel |
| 5 | 103.9 | 85.4 | 2.57 | Contact, no damage | Pass | Plastic barricade |
| 6 | 103.0 | 100.4 | 0.44 | No contact | Pass | Cone |
| 7 | 104.1 | 98.1 | 0.84 | No contact | Pass | Barricade |
| 8 | 103.5 | 92.1 | 1.59 | Minor cracking | Pass | Sign stand |
| 10 | 102.8 | 97.8 | 0.69 | Shattered, No intrusion | Pass | Sign stand |
| 11 | 100.5 | 82.4 | 2.52 | Shattered, no intrusion | Pass | Sign stand |

* Velocity change is the average vehicle velocity change per impact across both devices.

The results of tests 1-8, 10, and 11 met the FHWA requirements and, therefore, the following devices are acceptable for use on the NHS under the range of conditions tested, when proposed by a State:

- 28-inch Grabber Tube, ballasted
- 28-inch Grabber Cone, ballasted
- 42-inch Grabber Tube, ballasted
- 42-inch Grabber Cone, ballasted
- Model 18000 HDPE Drum with light and Tire Ring
- 42- inch Grabber Cone, ballasted, with light
- Vertical Panel Barricade, ballasted, with light
- Economy Plastic Folding Barricade, sand-tilled panels, with light
- 42-inch Traffix Cone, ballasted, with light
- Traffix A-Cade, 8-foot rail, ballasted, with light
- Big Buster Dual Spring Folding Leg Sign Stand, with rollup sign at 1.5 m
- Little Buster Dual Spring Folding Sign Stand, with rollup sign at 1.27 m
- Econo Buster Sign Stand, with rollup sign at 1.27 m

Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices. Presumably, you will supply potential users with sufficient information on design and installation requirements to ensure proper performance. We anticipate that the States will require certification from Traffix Devices, Inc., that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance. To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-24, shall not be reproduced except in full.

If any of your company's work zone traffic control devices are patented products they are considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are specified for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

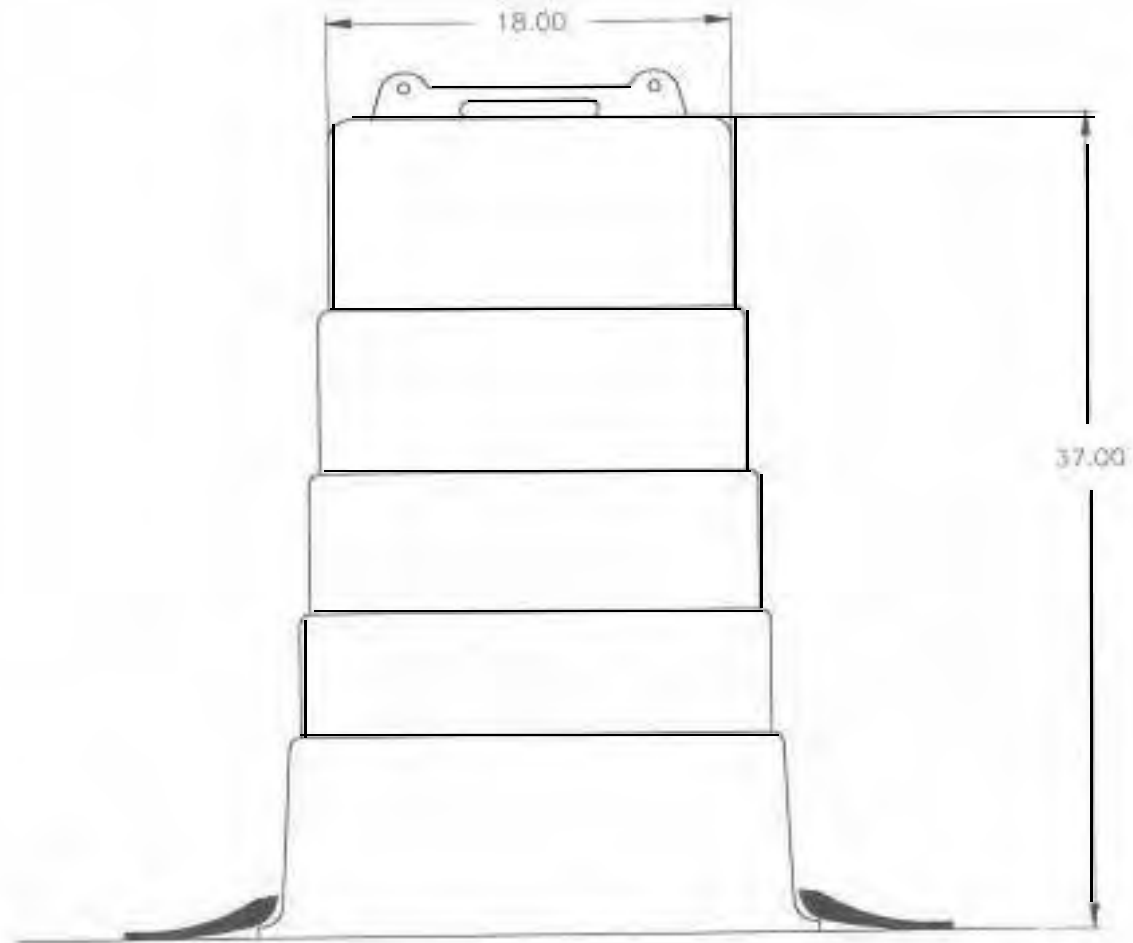
Sincerely yours,



Dwight A. Horne

Director, Office of Highway Safety Infrastructure

Enclosure



| Quantity | Part Number | Description | Material | Finish |
|----------|-------------|-------------|----------|--------|
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TRAFFIX DEVICES, INC.
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Traffix Devices, Inc.
 #10018 HOC ORLA W/PAK 0991

| | | | |
|----------|-------|----------|-------|
| QUANTITY | 10018 | QUANTITY | 10018 |
| DATE | | DATE | |

Two Piece Vertical Panel

1. Dimensional Requirements:

- a. Vertical Panel height 40"
- b. Vertical panel Width 14"
- c. Vertical Panel thickness 2"
- d. Specific Panel Dimensions:
[bid per the checked panel (s)]

12" x 24" 1 side
12" x 24" 2 sides
12" x 30" 1 side
12" x 30" 2 sides

(Panels have rounded corners)



Vertical Panel

2. Sheeting Requirements:

(Bid per checked sheeting)

Engineer Grade (orange & white)
High intensity (orange & white)

3. Base Requirements:

(Bid checked base)

42lb. base
30lb. base

4. Additional Information:


Vertical panel is to be of 2-piece breakaway design consisting of either a 42 lb. or 30 lb. recycled rubber base and a 5 lb. high density polyethylene panel.. The VP panel has an 8" wide bottom that is inserted into a matching socket in the base. Socket has two vertical ribs on each side 1 1/2" wide which prevent panel from rocking side to side. Base socket includes a laminated recess area that engages a locking button on the panel to secure the panel in the base. Panel pulls free from base on impact by an automobile. Reflective sheeting is applied to H.D.P.E. backing which is then welded to the panel. The VP handle shall be designed to secure a light on the top by bolting a light on using the center hole in the handle. Color: the panel is to be white. The base is to be black in color.

TrafFix Plastic Folding Barricade


The Latest Innovation In Plastic Barricades




Type 1 Barricade with 12'x24" top panel and 36'x24" bottom panel



Type 1 Barricade with 12'x24" top panel and 36'x24" bottom panel



Type 1 Barricade with 18'x24" top panel and 18'x24" bottom panel



Type 2 Barricade with 18'x24" top panel and 36'x24" bottom panel

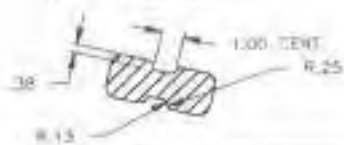
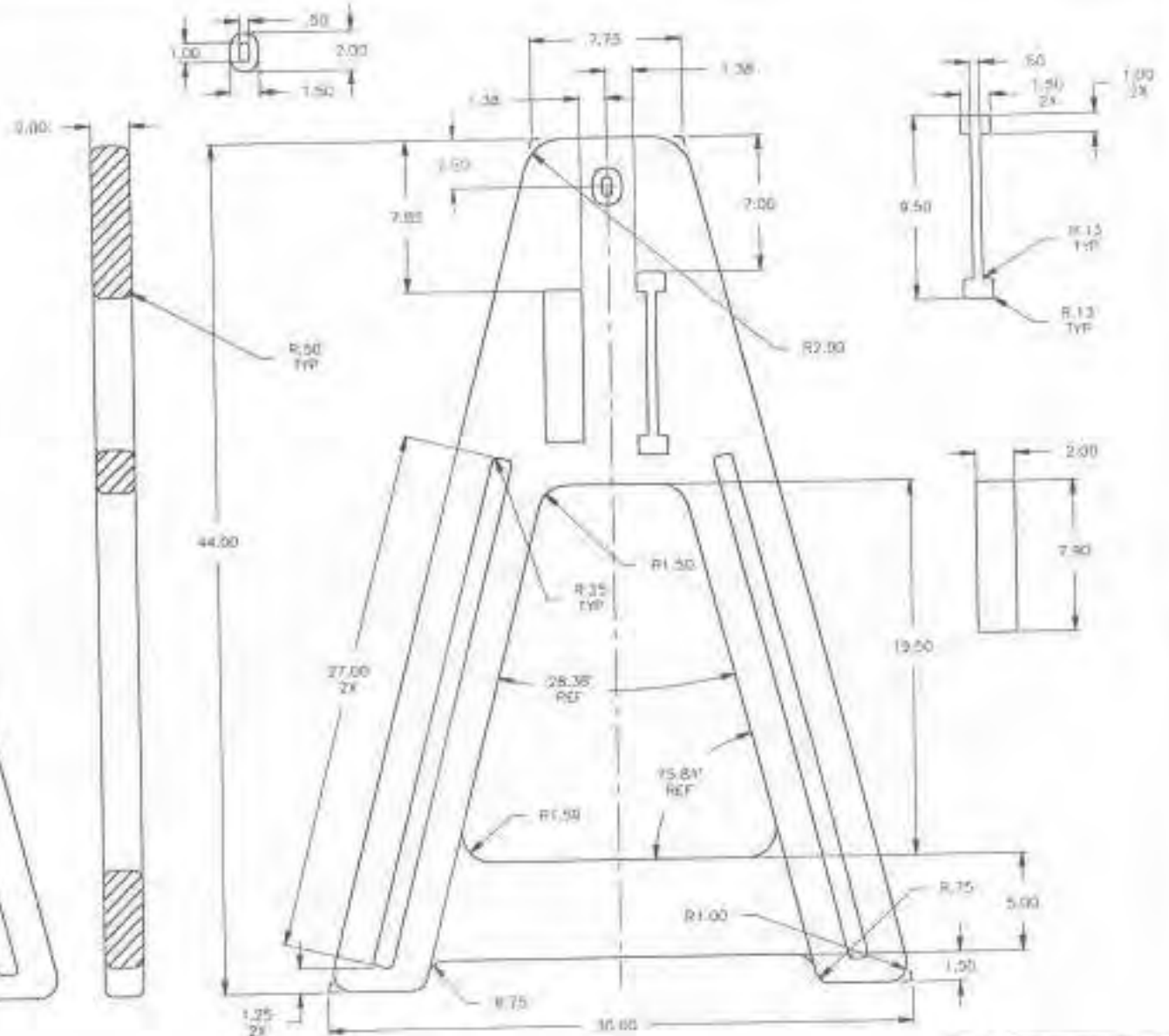
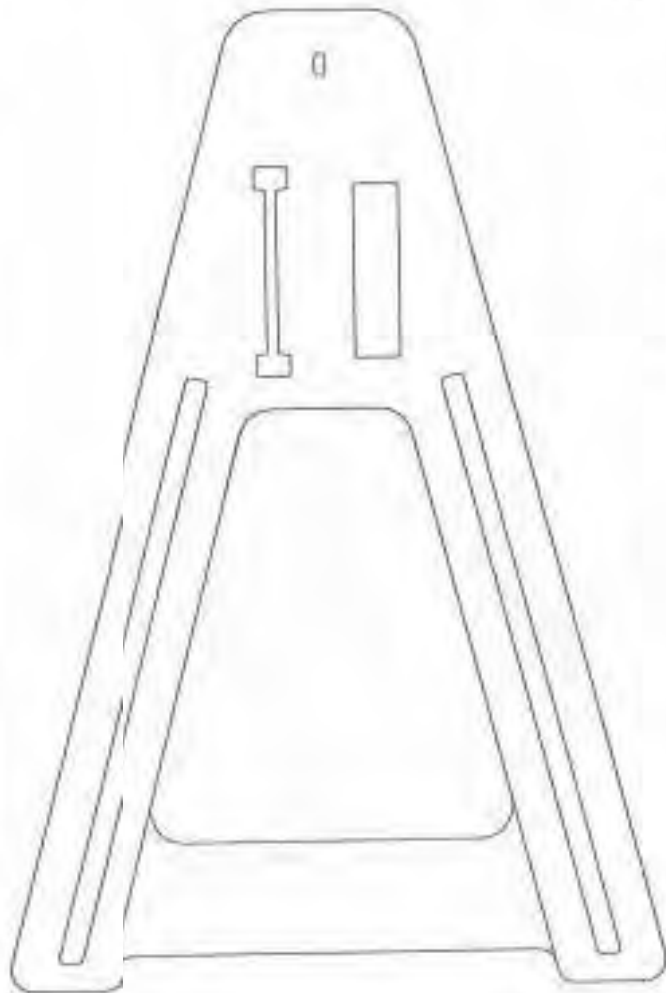


Vertical Panel Barricade with 12'x24" panel



Type 1 Barricade with 12'x24" top panel and 18'x24" bottom panel

TrafFix Devices offers you a wide range of options to fulfill all of your barricade requirements. Because the Plastic Folding Barricade is assembled with individual components, you can select any combination of top and bottom panels as illustrated in this brochure. You can also specify engineer grade or high intensity reflective sheeting.



| REV | DESCRIPTION | DATE | BY | CHKD |
|-----|-------------|------|----|------|
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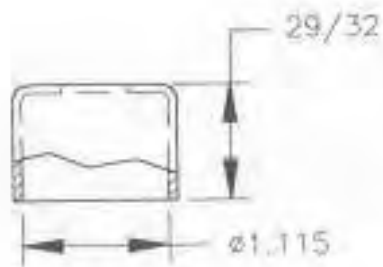
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| QUANTITY | 100 |
| DATE | 10/15/82 |
| BY | J. J. ... |
| CHKD | |

TrafFix Devices, Inc.

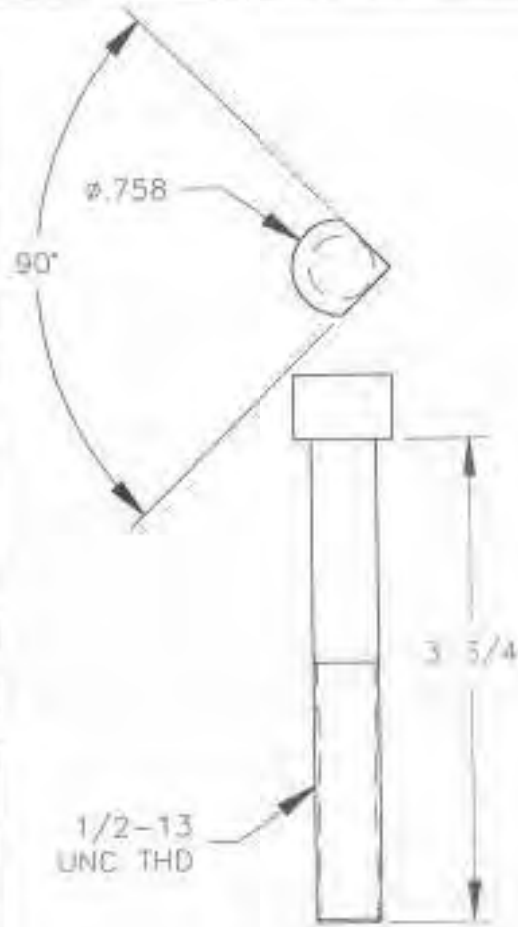
A-FRAME

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|----------|-------|-------------|----------|
| Part No. | 10032 | Drawing No. | 10032 |
| Rev. | | Date | 10/15/82 |

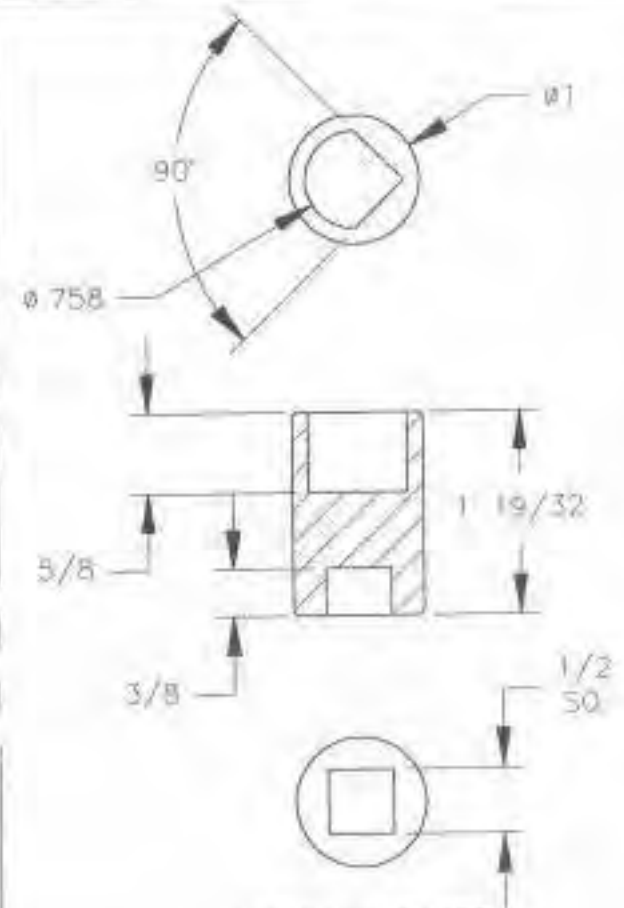
NOTES:



LIGHT BOLT
HD PROTECTOR



SPECIAL BOLT
STEEL



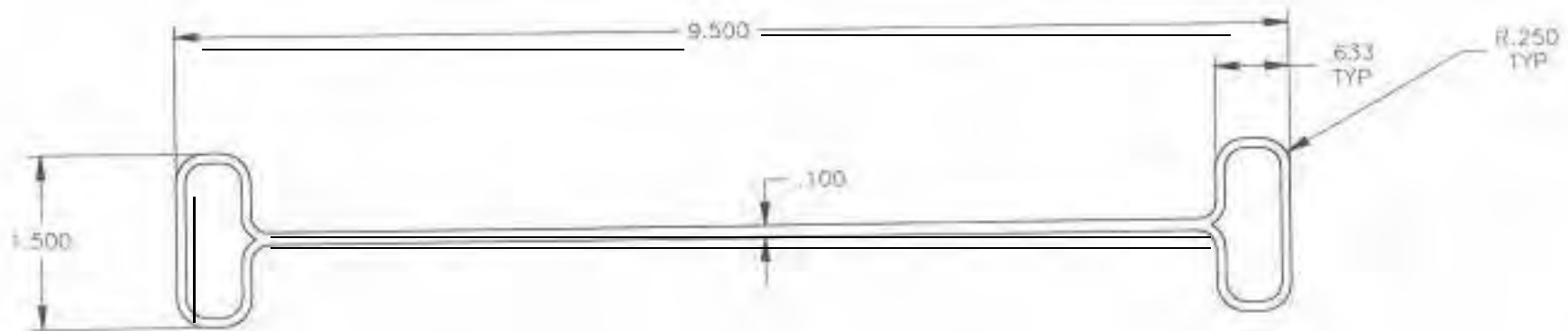
SPECIAL SOCKET
FOR 1/2" DRIVE
STEEL

NOTES:

| Revision | Part Description | Approved | Date |
|----------|------------------|----------|------|
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TRAFFIX DEVICES, INC.
 10000 S. 100TH ST.
 SUITE 100
 MCKEEVILLE, PA 15205
 (412) 241-1000
 FAX (412) 241-1001
 11/13/2008
 1.0001

| | | | |
|------------------------------------|-------------|-------------|------------|
| Traffix Devices, Inc. | | | |
| DETAILS LIGHT HD BOLT PROTECTOR | | | |
| Inventory | ECO The No. | Drawing No. | Rev. |
| | 10031 | 10031 | - |
| Scale | 1/1 | Spec. No. | 10031 of 1 |

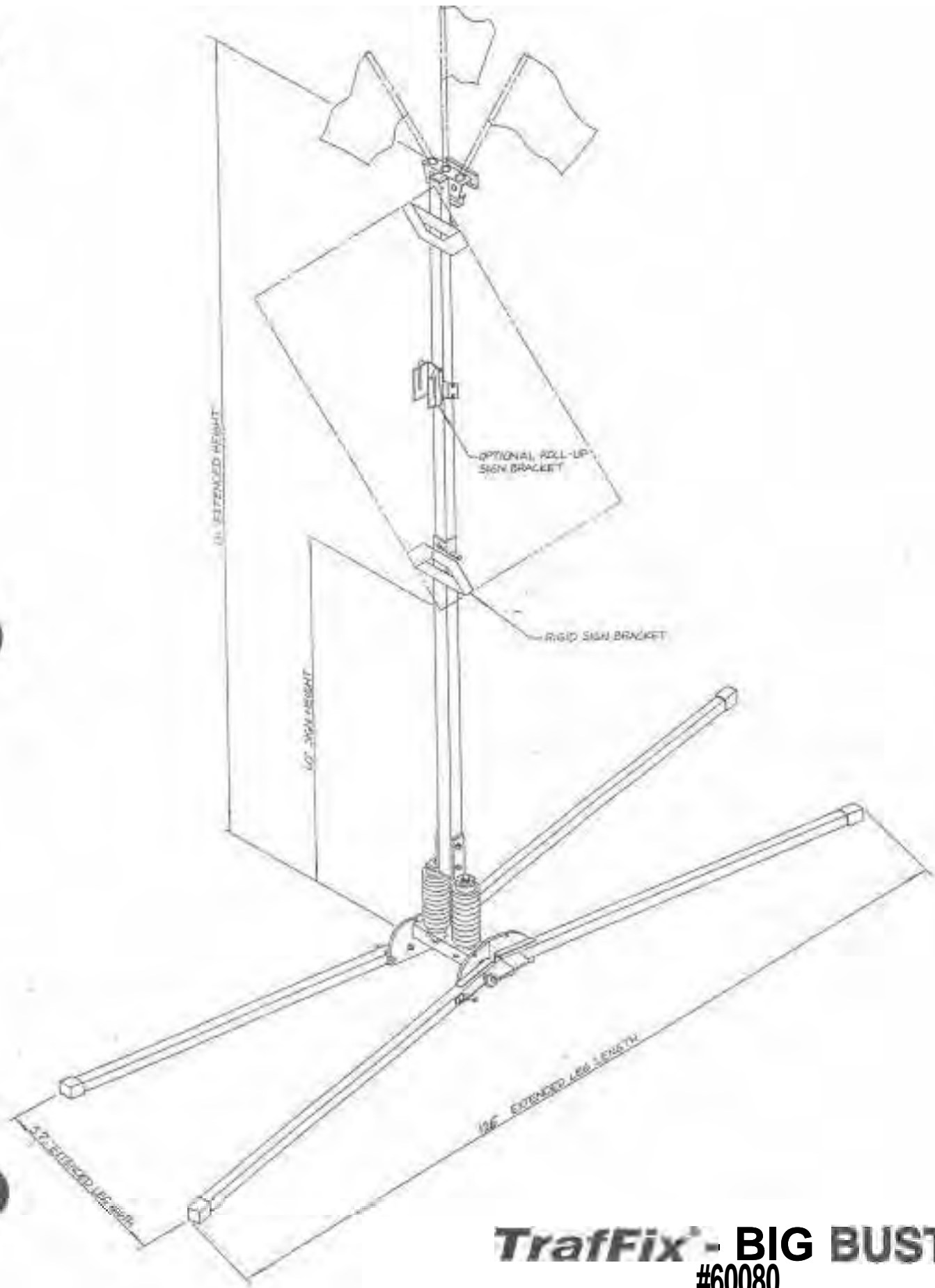


1 MATERIAL: HDPE
 NOTES:

| | | | |
|----------|--|----|--|
| DATE | | BY | |
| APPROVED | | BY | |
| DATE | | BY | |
| DATE | | BY | |
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| DATE | 11/21/2010 |
| TIME | 11:00 AM |

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|------------------------------|---------------|--------------|
| TraFFix Devices, Inc. | | |
| RAIL, HDPE | | |
| Quantity | DWG. File No. | Drawing No. |
| | RAIL | 10030 |
| Scale | 1:1 | Sheet 1 of 1 |

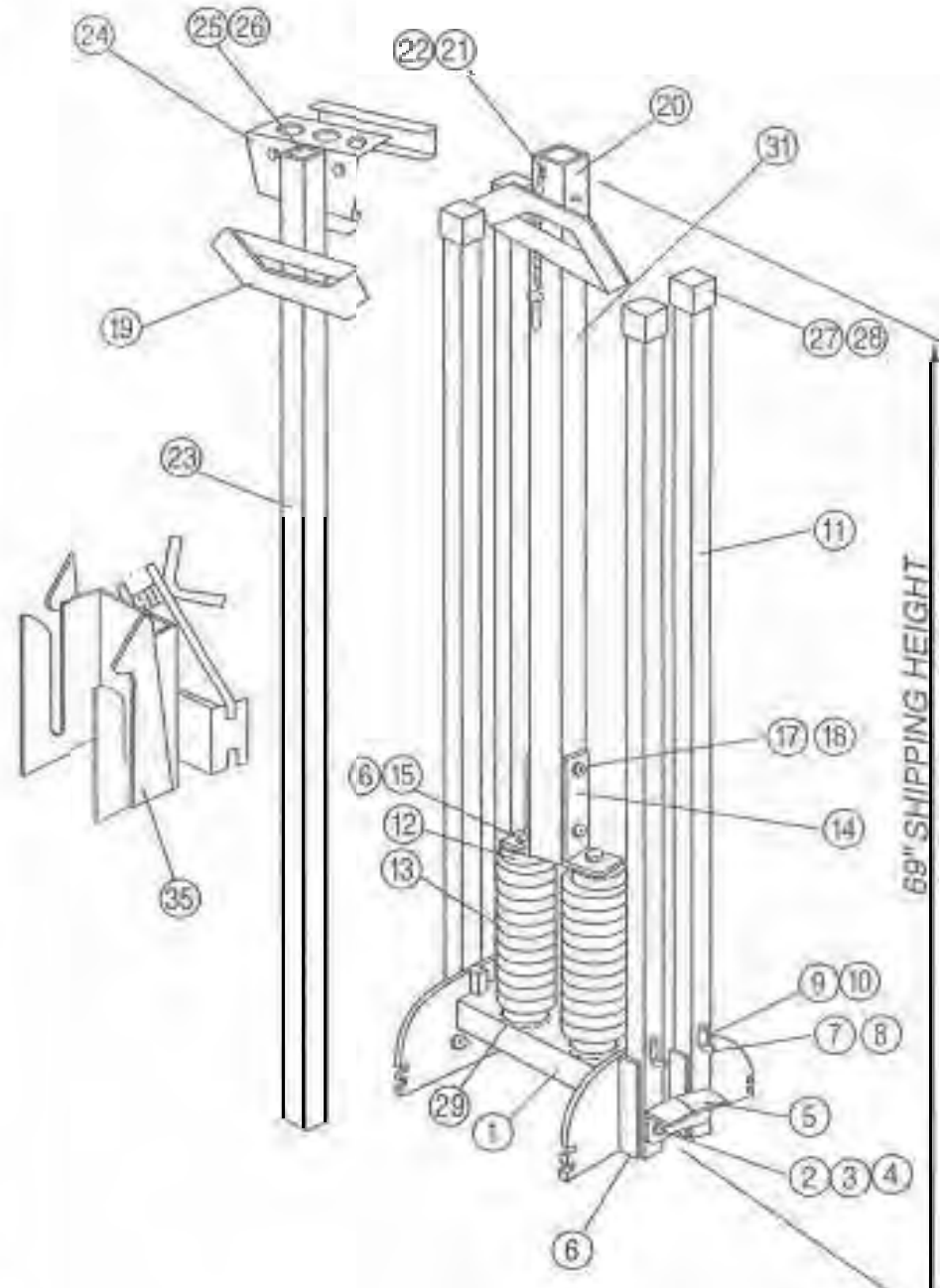


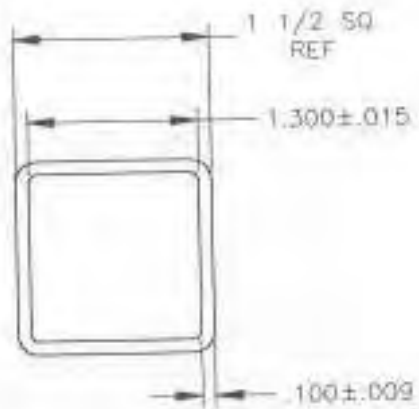
TraFix® - BIG BUSTER™
#60080

TrafFix® - BIG BUSTER™

#60000

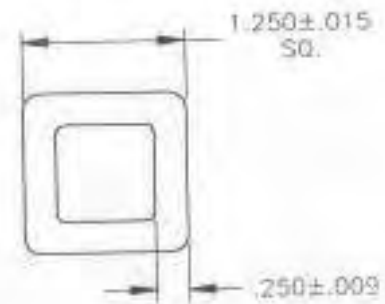
| ITEM # | PART # | ITEM DESCRIPTION | QTY. ASSEM. |
|--------|--------|---|----------------|
| 1 | 60001 | Base Plate | 1 |
| 2 | 24302 | Hex. Lock nut | 4 |
| 3 | 24303 | Space Washer | 8 |
| 4 | 24304 | Hex. Bolt | 4 |
| 5 | 60005 | Tie Bracket | 2 |
| 6 | 60006 | Channel Bracket | 4 |
| 7 | 60007 | Step lever | 4 |
| 8 | 24308 | Extension Spring | 4 |
| 9 | 24309 | Cover Plate | 4 |
| 10 | 24310 | Round Head Screw | 8 |
| 11 | 60011 | Leg (Excluding 60007, 24308, 24309, & 60010) | 4 |
| 12 | 60012 | Insert Plug(Spring holder) | 4 |
| 13 | 60013 | Spring | 2 |
| 14 | 60014 | Spring Bracket | 2 |
| 15 | 60015 | Hex. Bolt | 4 |
| 16 | 24316 | Lock Washer | 4 |
| 17 | 24317 | Hex. Bolt | 2 |
| 18 | 24318 | Hex. Lock Nut | 2 |
| 19 | 60019 | Rigid Sign Bracket | 2 |
| 20 | 60020 | Outer Mast | 1 |
| 21 | 60021 | 1/16" x 5/16" Rivet | 1 |
| 22 | 60022 | Faspin C5-16-R, with Chain | 1 |
| 23 | 60023 | Inner Mast (Excluding 24324, 60025, & 60026) | 1 |
| 24 | 60024 | Flag Holder Assembly | 1 |
| 25 | 60025 | #10-24 x 1/2" Phil. Hd. Screw | 2 |
| 26 | 60026 | #10-24 Lock Nut | 2 |
| 27 | 24327 | Cap Adhesive (Tube) | 1 |
| 28 | 60028 | Black Cap | 4 |
| 29 | 24329 | 1/2" I. D. Hvy. Washer | 2 |
| 31 | 60031 | Decal & Label | 1 |
| 35 | 60035 | Spring Loaded Roll-Up Sign Bracket(Optional) | 1 |





OUTER MAST

MATERIAL: 6061-T6 ALUM SQ. TUBING



INNER MAST

MATERIAL: PVC SQ. TUBING

- NOTES:
- MIN CLEARANCE = .020
MAX CLEARANCE = .080

| Revision | Author | Description | Approved | Date |
|----------|--------|-------------|----------|---------|
| 1 | NEW | 10028 | | 11/2/20 |

TrafFix Devices, Inc.

TELESCOPING MAST,
BIG BUSTER

| | | | |
|----------|--------------|-------------|--------------|
| Quantity | S&O Qty. No. | Drawing No. | Rev. |
| | 10028 | 10028 | 1 |
| Scale | 1:1 | Size | 8 1/2" x 11" |



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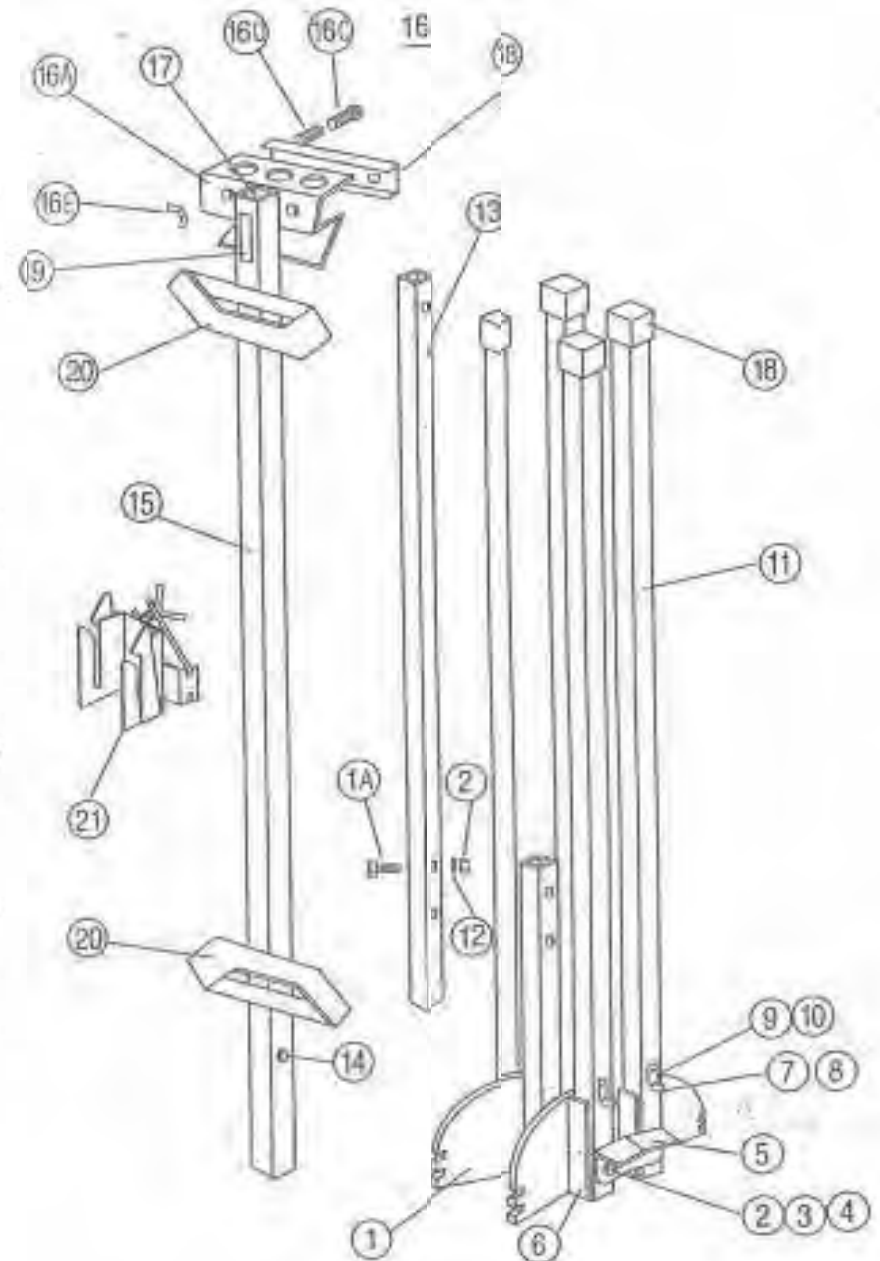
Traffic Devices, Inc.

TRAFFIC SIGNS FOLDING LED SIGN BOARD
SIGN BOARD

| | | | |
|------|----------|-----------|-------|
| DATE | 08/14/14 | ORDER NO. | 10027 |
| | | | |

TrafFix[®] ECONO BUSTER[™]

| ITEM # | PART # | DESCRIPTION | QTY. PER ASSY. |
|--------|-----------|-------------------------|----------------|
| 1 | 80301 | BASE PLATES | 1 |
| 1A | 80301B | HEX. BLT | 2 |
| 2&18 | 24302 | HEX LOCK NUT | 6 |
| 3 | 24303 | SPACER WASHER | 8 |
| 4 | 24304 | HEX BOLT | 4 |
| 5 | 24305 | TIE BRACKET | 2 |
| 6 | 24306 | CHANNEL BRACKET | 4 |
| 7 | 24307 | STEP LEVER | 4 |
| 8 | 24308 | EXTENSION SPRING | 4 |
| 9 | 24309 | COVER PLATE | 4 |
| 10 | 24310 | ROUND HEAD SCREW | 8 |
| 11 | 24311 | LEG | 4 |
| 12 | 24319 | LOCK WASHER | 2 |
| 13 | 24320 | OUTER MAST | 1 |
| 14 | 24322 | INSERTED PLATE SPRING | 1 |
| 15 | 24323 | INNER MAST | 1 |
| 16 | 24324 | FLAG HOLDER ASSY | 1 |
| 16A | 24324A | FLAG HOLDER | 1 |
| 16B | 24324B | CLAMP | 1 |
| 16C | 24324C | CARRIAGE BOLT | 2 |
| 16D | 24324D | COMPRESSION SPRING | 2 |
| 16E | 24324E | 5/16 BUTTERFLY NUT | 2 |
| 17 | 24325-A | ROUND HEAD SCREW | 2 |
| | 24325-B | LOCK NUT | 2 |
| 18 | 24326 | BLACK CAP | 4 |
| 19 | 80321 | SIGN SIDE DECAL & LABEL | 1 |
| 20 | 24321 | RIGID SIGN BRACKET | 2 |
| 21 | 24000-BRU | ROLL-UP SIGN BRACKET | 1 |



TrafiX[®] LITTLE BUS[®]R™

| ITEM # | PART # | ITEM DESCRIPTION | QT ASS |
|--------|-----------|--|--------|
| 1 | 24301 | Base Plate | 1 |
| 2 & 18 | 24302 | Hex. Lock Nut | 6 |
| 3 | 24303 | Spacer Washer | 8 |
| 4 & 17 | 24304 | Hex. Bolt | 6 |
| 5 | 24305 | Tie Bracket | 2 |
| 6 | 24306 | Channel Bracket | 4 |
| 7 | 24307 | Step Lever | 4 |
| 8 | 24308 | Extension Spring | 4 |
| 9 | 24309 | Cover Plate | 4 |
| 10 | 24310 | Round Head Screw | 8 |
| 11 | 24311 | Leg Including 24326 (Excluding 24307, 24308, 24309, 24310) | 4 |
| 12 | 24312 | Insert Plug | 4 |
| 13 | 24313 | Spring | 2 |
| 14 | 24314 | Spring Bracket | 2 |
| 15 | 24315 | Hex. Bolt | 4 |
| 16 | 24316 | Lock Washer | 4 |
| 19 | 24319 | Lock Washer | 2 |
| 20 | 24320 | Outer Mast | 1 |
| 21 | 24321 | Rigid Sign Bracket | 2 |
| 22 | 24322 | Inserted Plate Spring | 1 |
| 23 | 24323 | Inner Mast (Excluding 24322, 24324 & 24325) | 1 |
| 24 | 24324 | Flag Holder Assembly | 1 |
| | | Flag Holder Assy. Includes The Following | |
| 24A | 24324A | Flag Holder | 1 |
| 24B | 24324B | Flag Holder Clamp | 1 |
| 24C | 24324C | Carriage Bolt | 1 |
| 24D | 24324D | Compression Spring | 2 |
| 24E | 24324E | Butterfly Nut | 2 |
| 25 | 24325-A | Round Head Screw | 2 |
| | 24325-B | Lock Nut | 2 |
| 26 | 24326 | Black Cap | 1 |
| 30 | 24000-BRU | Spring Loaded Roll-up Sign Bracket (optional) | 1 |
| 31 | 24031 | Sign Side Decal & Label | 1 |
| 32 | 24329 | Stiffener Washer | 2 |

