Engineered

Innovative

Products & Services

For Transportation

Pole-Safe®

Breakaway Lightpole Support Systems

Design Book
Pole-Safe®
Breakaway Light Pole Support System

Saving Lives with Breakaway Support

Transpo’s Pole-Safe® is an omni-directional breakaway support system for light poles and other roadside elements located within roadside clear zones or other locations vulnerable to vehicular impacts. The primary component of the system is a high strength coupling, designed to break away quickly and cleanly upon impact, thus saving lives and reducing property damage costs. Pole-Safe® is omni-directional, meaning the system breaks away with consistent, predictable behavior, regardless of the vehicle’s angle of impact. Pole-Safe® has been vehicle crash-tested in accordance with NCHRP Report 350, and is approved for use on all FHWA funded projects.

Features and Advantages

- Superior Breakaway Performance
- High Structural Capacity
- High Durability
- Easy to Install and Maintain
- Low Cost

TESTED AND APPROVED TO NCHRP 350
Features and Advantages

Superior Breakaway Performance: The precisely machined geometry of the Pole-Safe® coupling design causes the system to fracture safely at relatively low force and energy levels. This unique capacity is better than AASHTO’s requirements for impact velocity change. The low stub projection after impact eliminates under carriage damage to the vehicle, thus reducing the risk of fire.

High Structural Capacity: Pole-Safe® is available in a variety of models, designed to support many different pole configurations subjected to various loading conditions. The high strength coupling design offers exceptional resistance to forces created by wind and dead loads. All Pole-Safe® crash tests were conducted using a 55’ high, 930 lb. pole which is the maximum allowable mass as specified by AASHTO. The unique physical properties and breakaway performance of Pole-Safe® gives designers the greatest flexibility in sizing poles for specific lighting requirements.

High Durability: All Pole-Safe® couplings and hardware are hot-dip galvanized in accordance with ASTM A153 to provide proven corrosion protection in harsh roadside environments. Additionally, independent fatigue testing has demonstrated that Pole-Safe® couplings are capable of withstanding more than two million loading cycles with no reduction in structural capacity.

Easy to Install and Maintain: No special tools or equipment are required to properly install and maintain Pole-Safe®. All components are easily secured using the American Institute of Steel Construction (AISC) turn-of-nut tightening method, which eliminates the need for precise torque levels on bolts.

Low Cost: Pole-Safe® is the lowest cost breakaway system for poles. Low initial cost coupled with high structural capacity and zero maintenance makes Pole-Safe® the most cost-effective solution for all breakaway light poles.

Pole-Safe® 4000 Series:

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Anchor Bolt Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4050</td>
<td>1/2” (12.7mm)</td>
</tr>
<tr>
<td>4062</td>
<td>5/8” (16mm)</td>
</tr>
<tr>
<td>4075</td>
<td>3/4” (19mm)</td>
</tr>
<tr>
<td>4100</td>
<td>1” (25mm)</td>
</tr>
<tr>
<td>4125</td>
<td>1-1/4” (32mm)</td>
</tr>
</tbody>
</table>

Pole-Safe® 5000 Series:

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Anchor Socket Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>5062</td>
<td>5/8” (16mm)</td>
</tr>
<tr>
<td>5075</td>
<td>3/4” (19mm)</td>
</tr>
<tr>
<td>5100</td>
<td>1” (25mm)</td>
</tr>
<tr>
<td>5125</td>
<td>1” (25mm)</td>
</tr>
</tbody>
</table>

Applications

- Light Poles
- Traffic Monitoring Poles
- Weather Station Poles
- Call Boxes
- Residential Poles
- Any Other Roadside Element Requiring Breakaway Support
Specifications

Performance Criteria:

1. Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Physical Properties per Coupling:

1. Ultimate Tensile Strength = 53.8 kN (12.1 kips), minimum.
2. Ultimate Tensile Strength = 46.5 kN (10.4 kips), minimum.
3. Ultimate Tensile Strength = 4.4 kN (1.0 kips), maximum.
4. Ultimate Tensile Strength = 3.9 kN (0.9 kips), minimum.

Patent Nos. 5,474,408 & 6,056,471

Melted and Manufactured in the USA

Galvanized Anchor Bolt

1/2"-13 UNC (13 mm) Threads

3x1427mm (1/8",17/32",11/16")

Flat Washer per ASTM F436

Galvanized Steel Shim (if required for leveling)

14g and/or 18g Thickness

3x14x27mm (1/8"x17/32"x1-1/16")

Flat Washer per ASTM F436

Pole Base Plate

3x1427mm (1/8",17/32",11/16")

Step-Up Support System for Light Poles Model No. 4050

Brakeaway Support System for Light Poles Model No. 4050

Performance Criteria:

1. Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Physical Properties per Coupling:

1. Ultimate Tensile Strength = 53.8 kN (12.1 kips), minimum.
2. Ultimate Tensile Strength = 46.5 kN (10.4 kips), minimum.
3. Ultimate Tensile Strength = 2.6 kN (0.6 kips), minimum.
4. Ultimate Tensile Strength = 3.9 kN (0.9 kips), minimum.

Patent Nos. 5,474,408 & 6,056,471

Melted and Manufactured in the USA

Galvanized Anchor Bolt

1/2"-13 UNC (13 mm) Threads

3x1427mm (1/8",17/32",11/16")

Flat Washer per ASTM F436

Galvanized Steel Shim (if required for leveling)

14g and/or 18g Thickness

3x14x27mm (1/8"x17/32"x1-1/16")

Flat Washer per ASTM F436

Pole Base Plate

3x1427mm (1/8",17/32",11/16")

Step-Up Support System for Light Poles Model No. 4050

Brakeaway Support System for Light Poles Model No. 4050

Performance Criteria:

1. Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Physical Properties per Coupling:

1. Ultimate Tensile Strength = 53.8 kN (12.1 kips), minimum.
2. Ultimate Tensile Strength = 46.5 kN (10.4 kips), minimum.
3. Ultimate Tensile Strength = 2.6 kN (0.6 kips), minimum.
4. Ultimate Tensile Strength = 3.9 kN (0.9 kips), minimum.

Patent Nos. 5,474,408 & 6,056,471

Melted and Manufactured in the USA

Galvanized Anchor Bolt

1/2"-13 UNC (13 mm) Threads

3x1427mm (1/8",17/32",11/16")

Flat Washer per ASTM F436

Galvanized Steel Shim (if required for leveling)

14g and/or 18g Thickness

3x14x27mm (1/8"x17/32"x1-1/16")

Flat Washer per ASTM F436

Pole Base Plate

3x1427mm (1/8",17/32",11/16")

Step-Up Support System for Light Poles Model No. 4050

Brakeaway Support System for Light Poles Model No. 4050

Performance Criteria:

1. Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.
NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

5. Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).
Specifications

Performance Criteria:
1. Double-Neck™ Pole-Safe® coupling, Model No. 4062
2. Pole Base Plate
3. Flat Washer per ASTM F436
4. Galvanized Steel Shim

Corrosion Protection:
1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Physical Properties per Coupling:
1. Ultimate Tensile Strength = 101.9 kN (22.8 kips), minimum.
2. Ultimate Restrained Shear Strength = 6.6 kN (1.5 kips), minimum.
3. Ultimate Restrained Shear Strength = 11.1 kN (2.5 kips), maximum.
4. Tensile Yield Strength = 88.3 kN (19.8 kips), minimum.

Fabrication in accordance with AASHTO M65.

Galvanized Anchor Bolt 5/8"-11 UNC (16 mm) Threads

5/8"-11 UNC (16 mm) Nut per ASTM A563 Grade DH

Melted and Manufactured in the USA

Patent Nos. 5,474,408 & 6,056,471

Lower Wrench Flats

51 mm (2"

Upper Wrench Flats

29 +/- 3 mm

1 1/8" +/- 1/8"

148 mm (5 13/16"

3x17x33mm (1/8"x11/16"x1-5/16"

Flat Washer per ASTM F436

14g and/or 18g Thickness (if required for leveling)

(Anchor bolts supplied by others)

3x17x33mm (1/8"x11/16"x1-5/16"

Flat Washer per ASTM F436

14g and/or 18g Thickness (if required for leveling)
NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

5. Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).
Specifications

Performance Criteria:

1. Pole-Safe® Pole-Safe® Coupling, Model No. 4075 Breakaway Support System for Light Poles

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® Couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

Physical Properties per Coupling:

1. Ultimate Tensile Strength = 13.3 kN (3.0 kips), minimum.
2. Ultimate Restrained Shear Strength = 13.6 kN (2.9 kips), minimum.
3. Ultimate Restrained Shear Strength = 13.6 kN (2.9 kips), minimum.
4. Ultimate Tensile Strength = 13.6 kN (2.9 kips), minimum.

Fabrication:

1. All Double-Neck™ Pole-Safe® Couplings are fabricated in accordance with AASHTO A663.

Performance Evaluation of Highway Features:

2. Standard Specifications for Highway Safety Features
3. Performance Evaluation of Highway Features
4. FHWA Approved in accordance with the requirements of NCHRP Report 350.

Breakaway Features:

1. Double-Neck™ Pole-Safe® has been crash-tested and meets the requirements of NCHRP Report 350.

Technical Information:

Patent Nos. 5,474,408 & 6,056,471
Melted and Manufactured in the USA

www.transpo.com
Pole-Safe® Model No. 4075
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

**NOTE:** Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. **Existing anchor bolts MUST be sized** to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). **No more than 2 shims shall be installed on any one coupling.** For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

5. **Use lower wrench flats** to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. **Do not use a pipe wrench.** Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. **Pole-Safe couplings must be held with an additional wrench on the upper wrench flats** to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).
Specifications

Performance Criteria:

1. Double-Neck™ Pole-Safe® coupling, Model No. 4100

2. Pole-Safe® Model No. 4100 Breakaway Support System for Light Poles

3. Maximum Allowable Pole Mass = 450 kg (992 lb.) (Total, including fixtures).

4. Pole - Base Plate

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153.

2. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

3. Double-Neck™ Pole-Safe® has been crash-tested and approved by FHWA in accordance with the requirements of NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features.

4. Pole - Base Plate

Physical Properties per Coupling:

1. Ultimate Tensile Strength = 221.5 kN (49.8 kips), minimum.

2. Tensile Yield Strength = 192.0 kN (43.2 kips), minimum.

3. Ultimate Restricted Shear Strength = 16.9 kN (3.8 kips), minimum.

4. Ultimate Restricted Shear Strength = 24.4 kN (5.5 kips), maximum.

Fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153.

Galvanized Anchor Bolt, 1"-8 UNC (25 mm) Threads per ASTM A563 Grade DH

3x28x51 mm (1/8"x1 1/16"x2") Flat Washer per ASTM F436

Pole Base Plate

Galvanized Steel Shim 14g and/or 18g Thickness

(Melted and Manufactured in the USA)

Patent Nos. 5,474,408 & 6,056,471

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Pole-Safe® Model No. 4100
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

5. Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).

Transpo Industries, Inc., 20 Jones Street, New Rochelle, NY 10801-6098
Phone: 914-636-1000  Fax: 914-636-1282
www.transpo.com
Specifications

Performance Criteria:
1. Double-Neck™ Pole-Safe® coupling, Model No. 4125 Breakaway Support System for Light Poles
2. Pole-Safe® has been crash-tested and FHWA approved in accordance with the requirements of NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features," and NCHRP Report 350.
3. Maximum allowable pole mass = 450 kg (992 lb) (total, including fixtures).
4. Maximum allowed pole mass = 450 kg (992 lb) (total).

Corrosion Protection:
1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A653. All leveling washers are galvanized after fabrication in accordance with ASTM A153.
2. All leveling shims are galvanized after fabrication in accordance with ASTM A153.

Physical Properties per Coupling:
1. Ultimate Tensile Strength = 221.5 kN (49.8 kips), minimum.
2. Ultimate Restrained Shear Strength = 16.9 kN (3.8 kips), minimum.
3. Ultimate Restrained Shear Strength = 192.0 kN (43.2 kips), minimum.
4. Ultimate Tensile Strength = 24.4 kN (5.5 kips), minimum.

Fabrication in accordance with ASTM A563. All fixtures are galvanized after fabrication in accordance with ASTM A563.

Melted and Manufactured in the USA

Patent Nos. 5,474,408 & 6,056,471
Pole-Safe® Model No. 4125
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

**NOTE:** Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. **Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions.** Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). **No more than 2 shims shall be installed on any one coupling.** For larger adjustments that may be required, install **no more than one** additional flat washer under the base plate, on the top shank of the coupling(s).

5. **Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts.** Secure couplings as tight as possible using conventional wrenches. **Do not use a pipe wrench.** Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. **If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.**

8. **Tighten each nut on to pole base plate.** Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).
 specifications

**Performance Criteria:**
1. **Double-Neck™ Pole-Safe® Coupling, Model No. 5062**
   - 4 per Pole, Typical
   - Transpo® Type A Female Anchor, Threads (Anchors sold separately)

**Physical Properties per Coupling:**
1. Ultimate Tensile Strength = 101.9 kN (22.8 kips), minimum.
2. Tensile Yield Strength = 88.3 kN (19.8 kips), minimum.
3. Ultimate Restrained Shear Strength = 6.6 kN (1.5 kips), minimum.
4. Ultimate Restrained Shear Strength = 11.1 kN (2.5 kips), maximum.

**Corrosion Protection:**
1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153.
2. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

**Fabrication in accordance with:**
1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

**Breakaway Support System for Light Poles**

Transpo® Model No. 5062

14g and/or 18g Thickness (if required for leveling)

20 Jones Street
New Rochelle, NY 10801
914-636-1000
www.transpo.com

Patent Nos. 5,474,408 & 6,056,471
Melted and Manufactured in the USA

Performance Criteria:
2. Double-Neck™ Pole-Safe® has been crash-tested and FHWA approved in accordance with the requirements of NCHRP Report 350. Recommended Procedures for the Safety Performance Evaluation of Highway Features."
Pole-Safe® Model No. 5062
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

Anchor Assembly:
1. Fasten Transpo® Type A Female Anchors to a rigid template pre-fabricated to match the specified bolt circle.
2. Lower entire anchor assembly into the fresh concrete foundation, and vibrate assembly into place, such that the anchors are in the proper location to match the holes in the pole base plate. Ensure that all anchors are level and that the tops of the individual anchors and the bottom of the template are flush with the finished top surface of the foundation.
3. Allow foundation to fully cure, and remove template from the anchors.

Coupling Assembly:
1. Surface of foundation around anchors must be smooth, flat and free of debris.
2. Thread Pole-Safe couplings into Transpo® Type A Female Anchors.
3. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).
4. Use lower wrench flats to tighten Pole-Safe couplings into the anchors. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on top of the anchors.
5. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.
6. Install a flat washer and nut on to each coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 3 above.
7. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (1/3 rotation past “snug tight”).

Transpo Industries, Inc., 20 Jones Street, New Rochelle, NY 10801-6098
Phone: 914-636-1000 Fax: 914-636-1282
www.transpo.com

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Specifications

**Physical Properties:**
1. Ultimate Tensile Load = 267 kN (60.0 kips)
2. Actual Pullout Strength depends on foundation
   minimum per Anchor
3. 3.2 mm (1/8") Thick
4. 17.5 mm (11/16") O.D.
5. 56 mm (2-3/16") Closed Wire Coil
6. 5/8"-11 UNC (16 mm) Thread Depth = 29 mm (1-1/8"") minimum

**Installation Instructions:**
1. Fabricate a Flat Steel Template with four (4) 16 mm (5/8") diameter holes located to match the specified bolt pattern of the Break-Safe brackets attached to the signpost. See other side of page for typical Installation diagrams.
2. Attach four (4) Break-Safe® Type A Female Anchors using four (4) 16 mm (5/8") diameter bolts. Ensure that each Anchor Washer is flush and snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete such that the tops of the Anchor Washers are flush with the finished top surface of the foundation.
4. Support template such that all Anchors are level and in their proper locations.
5. Allow concrete to cure and then remove bolts and模板 from the top of the foundation.

**Transpō® Type A Female Anchor** for use with Pole-Safe® Model No. 5062 Breakaway Support System for Light Poles

**Installation Instructions:**
1. Fabricate a Flat Steel Template with four (4) 16 mm (5/8") diameter holes located to match the specified bolt pattern of the Break-Safe brackets attached to the signpost.
2. Attach four (4) Break-Safe® Type A Female Anchors using four (4) 16 mm (5/8") diameter bolts. Ensure that each Anchor Washer is flush and snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete such that the tops of the Anchor Washers are flush with the finished top surface of the foundation.
4. Support template such that all Anchors are level and in their proper locations.
5. Allow concrete to cure and then remove bolts and template from the top of the foundation.

**Transpō® Type A Female Anchor** for use with Pole-Safe® Model No. 5062 Breakaway Support System for Light Poles
Breakaway Support System for Light Poles for use with Pole-Safe® Model No. 5062

Transpo® Type A Female Anchor
(Typical, 4 per Pole)

Foundation Form or other means of support for template while concrete cures

Typical Anchor Layout

Bolt Circle Diameter

Concrete Foundation (temporarily)

Top Surface of Template Bolt

See other side of page for complete Installation Instructions
Performance Criteria:


2. Double-Neck™ Pole-Safe® has been crash-tested and approved by FHWA.

3. Ultimate Restrained Shear Strength = 8.9 kN (2.0 kips), minimum.

4. Ultimate Restrained Shear Strength = 13.6 kN (3.0 kips), minimum.

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

2. Galvanized Steel Shim 14g and/or 18g Thickness (if required for leveling)

3. Pole Base Plate

4. Type C Female Anchor, 3/4"-10 UNC (19 mm) Internal Threads (Anchors sold separately)

Specifications:

- Transpo® Type C Female Anchor, 3/4"-10 UNC (19 mm) Internal Threads (Anchors sold separately)
- Galvanized Steel Shim 14g and/or 18g Thickness (if required for leveling)
- Pole Base Plate
- Upper Wrench Flats
- Lower Wrench Flats
- Flat washer per ASTM F436
- Flat washer per ASTM F436
- 2 Double-Neck™ Pole-Safe® Coupling, Model NO. 5075
- 4 per Pole, Typical
- 3/4"-10 UNC (19 mm) Nut per
- ASTM A455 Grade DH
- Melted and Manufactured in the USA
- Transpo®
- Pole-Safe® Model NO. 5075
- Breakaway Support System for Light Poles
- 20 Jones Street
- New Rochelle, NY 10801
- 1.414-636-1000
- www.transpo.com
Pole-Safe® Model No. 5075
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

Anchor Assembly:
1. Fasten Transpo® Type C Female Anchors to a rigid template pre-fabricated to match the specified bolt circle.
2. Lower entire anchor assembly into the fresh concrete foundation, and vibrate assembly into place, such that the anchors are in the proper location to match the holes in the pole base plate. Ensure that all anchors are level and that the tops of the individual anchors and the bottom of the template are flush with the finished top surface of the foundation.
3. Allow foundation to fully cure, and remove template from the anchors.

Coupling Assembly:
1. Surface of foundation around anchors must be smooth, flat and free of debris.
2. Thread Pole-Safe couplings into Transpo® Type C Female Anchors.
3. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).
4. Use lower wrench flats to tighten Pole-Safe couplings into the anchors. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on top of the anchors.
5. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.
6. Install a flat washer and nut on to each coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 3 above.
7. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (1/3 rotation past “snug tight”).
381 mm (15") Top of Concrete Foundation

Stainless Steel Washer
64 mm (2-1/2") O.D.
20.6 mm (13/16") I.D.
3.2 mm (1/8") Thick

Stainless Steel Threaded Ferrule
3/4"-10 UNC (19 mm) Thread Depth = 29 mm (1-1/8 '), minimum

Steel Wire, 11.1 mm (7/16") Diameter
(4) per Anchor

Closed Wire Coil
37 mm (1-7/16") O.D.
51 mm (2-3/16") Long
37 mm (1-7/16") O.D.

56 mm (2-3/16") Closed Wire Coil

6 Revolutions 1.2 mm (1/32") Thick

Physical Properties:
1. Ultimate Tensile Load = 266.9 KN (60.0 Kips)
2. Actual Pullout Strength depends on foundation design and concrete properties.
3. Allow concrete to cure and then remove bolts and
4. Support template such that all Anchors are level and
5. Allow concrete to cure, and then remove bolts and

SPECIFICATIONS

Physical Properties:
1. Ultimate Tensile Load = 266.9 KN (60.0 Kips)
2. Actual Pullout Strength depends on foundation design and concrete properties.

Installation Instructions:
1. Fabricate flat steel or wood template with four (4) 19 mm (3/4") diameter holes located to match the specified bolt pattern of the pole base plate.
2. Attach four (4) Pole-Safe® Type C Female Anchors to template using four (4) 19 mm (3/4") diameter bolts. Ensure that each Anchor Washer is flush and snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete
4. Support template such that all Anchors are level and in their proper locations.
5. Allow concrete to cure, and then remove bolts and
6. Support template such that all Anchors are level and

Transpo® Type C Female Anchor

56 mm (2-3/16")

Steel Wire, 11.1 mm (7/16") Diameter
(4) per Anchor

Closed Wire Coil
37 mm (1-7/16") O.D.
51 mm (2"") Long
6 Revolutions 1.2 mm (1/32") Thick

3.2 mm (1/8") Thick
20.6 mm (13/16") I.D.
64 mm (2-1/2") O.D.

Stainless Steel Washer
381 mm (15") Top of Concrete Foundation

Metal and Manufactured in the USA

Transpo®, Pole-Safe®, and Transpo® Type C Female Anchor are registered trademarks of Transpo Solutions Company.

20 Jones Street
New Rochelle, NY 10801
914-636-1000
www.transpo.com
Installation Instructions
See other side of page for complete

Transpo® Type C Female Anchor
(Typical, 4 per Pole)

Typical Anchor Layout

Bolt Circle Diameter

Foundation Form or other means of support for template while curing concrete

Concrete Cures

Concrete Foundation

Top Surface of Concrete Foundation

Template Bolt (Temporary)

Template Bolt (Temporary)

Foundation Form or other means of support for template while curing concrete

Concrete Cures

Concrete Foundation

Top Surface of Concrete Foundation

Template Bolt (Temporary)

Template Bolt (Temporary)

See other side of page for complete
Specifications

Performance Criteria:

1. Double-Neck\textsuperscript{TM}\ Pole-Safe\textsuperscript{®} conforms to AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."

2. Double-Neck\textsuperscript{TM}\ Pole-Safe\textsuperscript{®} has been crash-tested and FHWA approved in accordance with the requirements of NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

3. Double-Neck\textsuperscript{TM}\ Pole-Safe\textsuperscript{®} has been crash-tested and FMVSS 300, "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."

4. Double-Neck\textsuperscript{TM}\ Pole-Safe\textsuperscript{®} conforms to ASTM A370 and A563 Grade DH.

Corrosion Protection:

1. All Double-Neck\textsuperscript{TM}\ Pole-Safe\textsuperscript{®} couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

2. Maximum Allowable Pole Mass = 450 kg (992 lb) (total, including fixtures).

3. Threads (Anchors sold separately)

4. Threads per Pole, Type B Female Anchor. 1/8 UNC (25 mm) Internal Threads (required for leveling)

Corrosion Resistant Steel Shim

Galvanized Steel Shim

14g and/or 18g Thickness (if required for leveling)

Melted and Manufactured in the USA

Patents Nos. 5,474,408 & 6,056,471

29 mm (1-1/8")

129 mm (5-1/16")

70 mm (2-3/4")

3x28x51 mm (1/8"x1-1/8"x2") Flat Washer per ASTM F436

1"-8 UNC (25 mm) Nut per ASTM A563 Grade DH

1 1/8"-8 UNC (25 mm) Internal Threads, Type B Female Anchor

Transpo\textsuperscript{®} Type B Female Anchor

Upper Wrench Flats

Double-Neck\textsuperscript{TM} Pole-Safe\textsuperscript{®} Coupling, Model No. 5100

4 per Pole, Typical

Lower Wrench Flats

Transpo\textsuperscript{®} Model No. 5100

Breakaway Support System for Light Poles

20 Jones Street
New Rochelle, NY  10801
914-636-1000
www.transpo.com
Pole-Safe® Model No. 5100
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

Anchor Assembly:
1. Fasten Transpo® Type B Female Anchors to a rigid template pre-fabricated to match the specified bolt circle.

2. Lower entire anchor assembly into the fresh concrete foundation, and vibrate assembly into place, such that the anchors are in the proper location to match the holes in the pole base plate. Ensure that all anchors are level and that the tops of the individual anchors and the bottom of the template are flush with the finished top surface of the foundation.

3. Allow foundation to fully cure, and remove template from the anchors.

Coupling Assembly:
1. Surface of foundation around anchors must be smooth, flat and free of debris.

2. Thread Pole-Safe couplings into Transpo® Type B Female Anchors.

3. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

4. Use lower wrench flats to tighten Pole-Safe couplings into the anchors. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on top of the anchors.

5. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

6. Install a flat washer and nut on to each coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 3 above.

7. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (1/3 rotation past “snug tight”).
**Specifications**

Fabrication in accordance with ASTM A653. All attachment points (bolts, nuts, washers, etc.) are galvanized after fabrication in accordance with ASTM A153. 2. All Double-Neck® Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A653.

**Corrosion Protection:**

1. Maximum Corrosion Protection:
   - All Double-Neck® Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

**Performance Criteria:**

1. Ultimate Restrained Shear Strength = 22.15 kN (5.0 kips), minimum.
2. Tensile Field Strength = 179.0 kN (40.2 kips), minimum.
3. Ultimate Restrained Shear Strength = 16.9 kN (3.8 kips), minimum.
4. Ultimate Tensile Strength = 22.15 kN (5.0 kips), minimum.

**Physical Properties per Coupling:**

1. Maximum Allowable Pole Mass = 450 kg (992 lb.) (total, including fixtures).
2. Double-Neck® Pole-Safe® has been crash-tested and approved by FHWA in accordance with NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features, and has been crash-tested and approved by FHWA in accordance with NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features.
Pole-Safe® Model No. 5125
Breakaway Support System for Light Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

Anchor Assembly:
1. Fasten Transpo® Type B Female Anchors to a rigid template pre-fabricated to match the specified bolt circle.
2. Lower entire anchor assembly into the fresh concrete foundation, and vibrate assembly into place, such that the anchors are in the proper location to match the holes in the pole base plate. Ensure that all anchors are level and that the tops of the individual anchors and the bottom of the template are flush with the finished top surface of the foundation.
3. Allow foundation to fully cure, and remove template from the anchors.

Coupling Assembly:
1. Surface of foundation around anchors must be smooth, flat and free of debris.
2. Thread Pole-Safe couplings into Transpo® Type B Female Anchors.
3. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).
4. Use lower wrench flats to tighten Pole-Safe couplings into the anchors. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on top of the anchors.
5. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.
6. Install a flat washer and nut on to each coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 3 above.
7. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (1/3 rotation past “snug tight”).
Specifications

**Physical Properties:**
1. Ultimate Tensile Load = 267 kN (60.0 kips)
2. Actual Pullout Strength depends on foundation design and concrete properties.
3. Minimum per Anchor.
4. Actual Pullout Strength depends on foundation design and concrete properties.
5. Allow concrete to cure and then remove bolts and washers.

**Installation Instructions:**
1. Fabricate steel or wood template with four (4) 25 mm (1”) diameter holes located to match the specified bolt pattern of the Break-Safe® Type B Female Anchors.
2. Attach four (4) Break-Safe® Type B Female Anchors to template using four (4) 25 mm (1”) diameter bolts. Ensure that each Anchor Washer is flush and snug against the bottom of the template.
3. Lower Anchor Assembly into fresh concrete such that the tops of the Anchor Washers are flush with the finished top surface of the foundation.
4. Support template such that all Anchors are level and in their proper locations.
5. Allow concrete to cure and then remove bolts and washers.

**Transpo® Type B Female Anchor** for use with Pole Safe Model No. 5100 and 5125 Breakaway Support System for Light Poles

See other side of page for typical installation diagrams.
Transpo® Type B Female Anchor

Typical Anchor Layout

Bolt Circle Diameter

(4 per Pole)

Foundation Form or other means of support for template while concrete cures

Concrete Foundation

Top Surface of Concrete Foundation

Template Bolt

Typical Foundation Layout

(4 per Foundation)

Installation Instructions

See other side of page for complete
Pole-Safe Breakaway Support System for Call Box Poles
Specifications

Performance Criteria:


2. Double-Neck™ Pole-Safe® has been crash-tested and approved in accordance with the requirements of FHWA.

3. Ultimate Restrained Shear Strength = 12.0 kN (2.7 kips), minimum.

4. Ultimate Tensile Strength = 17.8 kN (4.0 kips), minimum.

Physical Properties per Coupling:

1. Galvanized Anchor Bolt, 1”-8 UNC (25 mm) Threads per ASTM F436

2. Galvanized Steel Shim, 14g and/or 18g Thickness

3. Galvanized Per ASTM F436

4. Pole Base Plate

5. Washer Per ASTM F436

Corrosion Protection:

1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A653. All leveling shims are galvanized after fabrication in accordance with ASTM A153.

2. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A653. All leveling shims are galvanized after fabrication in accordance with ASTM A153.

3. Ultimate Restrained Shear Strength = 12.0 kN (2.7 kips), minimum.

4. Ultimate Tensile Strength = 17.8 kN (4.0 kips), minimum.

Pole-Safe® Model No. 4100

Breakaway Support System for Call Box Poles

20 Jones Street
New Rochelle, NY 10801
914-636-1000
www.transpo.com
Pole-Safe® Model No. 4100C
Breakaway Support System for Call Box Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

1. Surface of foundation around anchor bolts must be smooth, flat and free of debris.

2. Existing anchor bolts MUST be sized to the proper projection height as shown on the reverse side of these instructions. Then, anchor bolts shall be cleaned, and if necessary, coated with cold galvanizing material prior to installing Pole-Safe couplings.

3. Install lower flat washers, and thread Pole-Safe couplings on to anchor bolts.

4. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).

5. Use lower wrench flats to tighten Pole-Safe couplings on to the anchor bolts. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on the washers, and washers must be seated uniformly on top of the foundation. If necessary, remove coupling and reduce the anchor bolt projection height to allow proper seating of the couplings.

6. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.

7. Install a flat washer and nut on to each Pole-Safe coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 4 above.

8. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (for ASTM A325 and A490 anchor bolts, 1/3 rotation past “snug tight”).
**Performance Criteria:**

1. Double-Neck™ Pole-Safe® conforms to AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." (Reserved for future supports for standard supports for structural supports for highway signs, luminaires and traffic signals.)

2. Double-Neck™ Pole-Safe® has been crash-tested and approved by FHWA.

3. UL-certified according to UL 2741 and UL 492.

4. UL-certified according to UL 2741 and UL 492.

**Corrosion Protection:**

1. Galvanized after fabrication in accordance with ASTM A653.

2. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

3. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A653.

**Physical Properties per Coupling:**

1. Ultimate Tensile Strength = 158.7 kN (35.7 kips), minimum.

2. Tensile Yield Strength = 137.5 kN (30.9 kips), minimum.

3. Ultimate Restrained Shear Strength = 12.0 kN (2.7 kips), minimum.

4. Ultimate Restrained Shear Strength = 17.8 kN (4.0 kips), maximum.

**Corrosion Protection:**

1. All Double-Neck™ Pole-Safe® couplings, nuts, bolts, and washers are galvanized after fabrication in accordance with ASTM A153.

2. All leveling shims are galvanized after fabrication in accordance with ASTM A653.

**Assemblies:**

1. 29 mm (1-1/8")

2. 70 mm (2-3/4")

3. 129 mm (5-1/16")

4. 70 mm (2-3/4")

5. 1"-8 UNC (25 mm) Nut per ASTM A563 Grad DH

6. 1"-8 UNC (25 mm) Nut per ASTM F436

**Material:**

1. Melted and Manufactured in the USA

2. Patents Nos. 5,474,408 & 6,056,471

3. Transpo® Type B Female Anchor, 1"-8 UNC (25 mm) Internal Threads (Anchors sold separately)

4. 14g and/or 18g Thickness Galvanized Steel Shim (required for leveling)

5. Score Mark, For Identification Purposes Only

6. 4 per Pole, Typical Coupling, Model No. 5100 C
Pole-Safe® Model No. 5100C
Breakaway Support System for Call Box Poles

INSTALLATION INSTRUCTIONS

NOTE: Proper Installation is essential for the Pole-Safe Breakaway Support System to function correctly as designed.

Anchor Assembly:
1. Fasten Transpo® Type B Female Anchors to a rigid template pre-fabricated to match the specified bolt circle.
2. Lower entire anchor assembly into the fresh concrete foundation, and vibrate assembly into place, such that the anchors are in the proper location to match the holes in the pole base plate. Ensure that all anchors are level and that the tops of the individual anchors and the bottom of the template are flush with the finished top surface of the foundation.
3. Allow foundation to fully cure, and remove template from the anchors.

Coupling Assembly:
1. Surface of foundation around anchors must be smooth, flat and free of debris.
2. Thread Pole-Safe couplings into Transpo® Type B Female Anchors.
3. If needed, shims are provided for leveling of the pole base plate, and may be installed at the base of the coupling(s). No more than 2 shims shall be installed on any one coupling. For larger adjustments that may be required, install no more than one additional flat washer under the base plate, on the top shank of the coupling(s).
4. Use lower wrench flats to tighten Pole-Safe couplings into the anchors. Secure couplings as tight as possible using conventional wrenches. Do not use a pipe wrench. Couplings must be seated squarely on top of the anchors.
5. Install a flat washer on top of each Pole-Safe coupling, and set the pole with base plate on top of the couplings.
6. Install a flat washer and nut on to each coupling extended through the pole base plate. If pole is not plumb, install shims and/or washers for proper leveling as described in Step 3 above.
7. Tighten each nut on to pole base plate. Pole-Safe couplings must be held with an additional wrench on the upper wrench flats to prevent an induced torque stress across the necked portion of the couplings. Nuts shall be tightened using the turn-of-nut method in accordance with American Institute of Steel Construction (AISC) procedures (1/3 rotation past “snug tight”).
Pole-Safe® Skirt Details

Breakaway Support System for Light Poles

- Bolt Circle Diameter
- Pole-Safe® Couplings (Typical, 4 per Pole)
- Pole Base Plate

Stainless Steel Sheet Metal
- #10 x 10 mm (#10 x 3/8") Stainless Steel Sheet Metal Screw, Typical, 8 per Skirt
- 3003-H14 Aluminum Sheet, 1.6 mm (1/16") Thick (4 panels per Skirt)

Skirt Height

Installation Instructions for Skirt Sizes and Pole Heights
See Reverse Side of Page

Melted and Manufactured in the USA
# Pole-Safe®
Breakaway Support System for Light Poles

## SKIRT INFORMATION

### Selection Table:

<table>
<thead>
<tr>
<th>Pole-Safe® Model No.</th>
<th>Bolt Circle Diameter</th>
<th>Skirt Part No.</th>
<th>Skirt Part No.</th>
<th>Skirt Height (H) mm (in.)</th>
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<td>254 mm to 380 mm (10” to 15”)</td>
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<tr>
<td>4062</td>
<td></td>
<td>SPMKDN-4</td>
<td>SPMKDN-4L</td>
<td>146 (5-3/4)</td>
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<td>146 (5-3/4)</td>
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<td>SPMKDN-5L</td>
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<td>380 mm to 500 mm (15” to 20”)</td>
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<td>SPMKDN-3L</td>
<td>133 (5-1/4)</td>
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</table>

### Installation Instructions:

1. Place 4 skirt panels around Pole-Safe Couplings using overlap configuration shown on reverse side of page. All 4 sides of the skirt box should have 2 slots facing outside.

2. Thread 8 sheet metal screws through the outside slots into the closest corresponding holes in the adjacent inside panel.

3. Position panels snug against the Pole-Safe Couplings.

4. Tighten all 8 sheet metal screws.
Mr. Arthur M. Dinitz  
Transpo Industries, Inc.  
20 Jones Street  
New Rochelle, New York 10801-6024  

Dear Mr. Dinitz:

This is in response to your December 12, 1996, letter to Mr. Gerald L. Eller requesting Federal Highway Administration's (FHWA) acceptance of your double neck Pole-Safe breakaway support couplings for light poles, call boxes, and small sign posts. Transmitted with your letter were a report and video of full-scale testing conducted by E-Tech Testing Services, static test reports from PSI\Pittsburgh Physical Testing, and drawings of the couplings.

Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. We also recognize the testing and evaluation guidelines found in the National Cooperative Highway Research Report Number 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features.

Drawings of the Series 4000 and 5000 Pole-Safe couplings are enclosed. The various coupling series and sizes are manufactured of proprietary "E.T.D. 150" steel. Dimensions and physical properties of the couplings are summarized in the following table:

<table>
<thead>
<tr>
<th>Model</th>
<th>4062</th>
<th>4100*</th>
<th>4125</th>
<th>5062</th>
<th>5100*</th>
<th>5125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>188.9 mm</td>
<td>227.0 mm</td>
<td>257.0 mm</td>
<td>184.1 mm</td>
<td>227.0 mm</td>
<td>254.0 mm</td>
</tr>
<tr>
<td>Neck Diam.</td>
<td>11.18 mm</td>
<td>16.51 mm</td>
<td>16.51 mm</td>
<td>11.17 mm</td>
<td>16.51 mm</td>
<td>16.51 mm</td>
</tr>
<tr>
<td>U.T.S. **</td>
<td>133.5 kN</td>
<td>267 kN</td>
<td>267 kN</td>
<td>133.5 kN</td>
<td>267 kN</td>
<td>267 kN</td>
</tr>
<tr>
<td>Yield Strength</td>
<td>89 kN</td>
<td>191 kN</td>
<td>191 kN</td>
<td>89 kN</td>
<td>191 kN</td>
<td>191 kN</td>
</tr>
<tr>
<td>Model</td>
<td>4062</td>
<td>4100*</td>
<td>4125</td>
<td>5062</td>
<td>5100*</td>
<td>5125</td>
</tr>
<tr>
<td>-------------</td>
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<td>-------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>Anchor Bolt:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threads</td>
<td>External</td>
<td>External</td>
<td>External</td>
<td>Internal</td>
<td>Internal</td>
<td>Internal</td>
</tr>
<tr>
<td>Diameter</td>
<td>16 mm</td>
<td>25 mm</td>
<td>32 mm</td>
<td>16 mm</td>
<td>25 mm</td>
<td>32 mm</td>
</tr>
<tr>
<td>Diam. (English)</td>
<td>5/8&quot;</td>
<td>1&quot;</td>
<td>1 1/4&quot;</td>
<td>5/8&quot;</td>
<td>1&quot;</td>
<td>1 1/4&quot;</td>
</tr>
</tbody>
</table>

*Couplings used in tests. Because the neck diameter of the largest of the three couplings in both the 4000 and 5000 series is the same as that of the tested coupling, similar performance can be expected.

** Ultimate Tensile Strength of the coupling.

A summary of the crash testing is presented in the following table:

<table>
<thead>
<tr>
<th>Test Number</th>
<th>03-8287-001</th>
<th>03-8287-002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Article - Model Number</td>
<td>4100</td>
<td>5100</td>
</tr>
<tr>
<td>Pole Mass</td>
<td>423 kg (1000 #)</td>
<td>423 kg (1000 #)</td>
</tr>
<tr>
<td>Pole Height</td>
<td>16.8 m (55 ft)</td>
<td>16.8 m (55 ft)</td>
</tr>
<tr>
<td>Vehicle Mass</td>
<td>829 kg (1828 #)</td>
<td>839 kg (1850 #)</td>
</tr>
<tr>
<td>Impact Speed</td>
<td>34.35 km/h (21.3 m/h)</td>
<td>101.56 km/h (63.11 m/h)</td>
</tr>
<tr>
<td>Occupant Impact Speed</td>
<td>4.35 m/s (14.37 ft/s)</td>
<td>3.27 m/s (10.73 ft/s)</td>
</tr>
<tr>
<td>Approximate Stub Height</td>
<td>54 mm (2 1/8 in)</td>
<td>25.4 mm (1 in) *</td>
</tr>
</tbody>
</table>

*Three couplings broke at the lower notch. The fourth broke at the upper wrench flat and was left nearly intact attached to the foundation. It was judged that the remaining coupling would not present a significant hazard.

The results of the tests meet the change-in-velocity and stub height criteria adopted by the FHWA. Therefore, Pole Safe Couplings Series 4000 and 5000, as noted in the table above, are acceptable for use on the National Highway System (NHS) within the range of conditions tested when requested by a State.

Our acceptance is limited to the breakaway characteristics of the couplings and does not cover their durability or structural performance. 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 Transpo Industries that the hardware
furnished has essentially the same mechanical properties and geometry as those used in the crash testing, and that they will meet the FHWA change in velocity requirements.

The loading eccentricity in the reported fatigue test was not very significant in comparison to an eccentricity in excess of half the bearing diameter of the hold-down nut that will result from an out-of-plumb anchor bolt. However, because our review does not include the structural adequacy of your new couplings, the fatigue testing is not relevant to our review. Our reason for commenting on the eccentricity is to ensure that we will not be interpreted as having accepted the distance used. In addition we have offered no opinion on the relevance of the loading range used in the fatigue testing from minus 6.3 percent to 17.4 percent of the reported minimum yield strength of the couplings. We would also point out that the fatigue test report supplied did not contain adequate descriptions of the items tested.

The Pole-Safe couplings are a proprietary product. To be used in 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, Chief
Federal-Aid and Design Division

2 Enclosures
Eric C. Lohrey, P.E.
Chief Engineer
Transpo Industries, Inc.
20 Jones Street
New Rochelle, NY 10801

Dear Mr. Lohrey:

Thank you for your letter of November 1 requesting Federal Highway Administration (FHWA) acceptance for two additional production models of your “Double Neck” Pole-Safe breakaway couplings. You requested that we find Models 4075 and 5075 acceptable for use on the National Highway System (NHS) under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 “Recommended Procedures for the Safety Performance Evaluation of Highway Features.”

Introduction

Your current request is to add two additional production models, the details of which are in the table below:

<table>
<thead>
<tr>
<th>Model Description</th>
<th>4075</th>
<th>5075</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor Thread Type</td>
<td>External</td>
<td>Internal</td>
</tr>
<tr>
<td>Anchor Diameter</td>
<td>19 mm (3/4 inch)</td>
<td>19 mm (3/4 inch)</td>
</tr>
<tr>
<td>Coupling Length</td>
<td>208 mm (8 - 3/16 inch)</td>
<td>196 mm (7 - 3/4 inch)</td>
</tr>
<tr>
<td>Neck Diameter</td>
<td>12.7 mm (½ inch)</td>
<td>12.7 mm (½ inch)</td>
</tr>
<tr>
<td>Ultimate Tensile Strength</td>
<td>131.0 kN (29,400 pounds)</td>
<td>131.0 kN (29,400 pounds)</td>
</tr>
<tr>
<td>Tensile Yield Strength</td>
<td>113.6 kN (25,500 pounds)</td>
<td>113.6 kN (25,500 pounds)</td>
</tr>
</tbody>
</table>
Findings
The couplings used in the tests (and reported in LS-45B) had a neck diameter of 16.51 mm. The two models for which you are requesting acceptance have significantly smaller neck diameters. Since all Double Neck couplings are fabricated from E.T.D. 150 Steel (a proprietary grade of steel with a tensile strength of 1034 mPa [150 ksi]), Models 4075 and 5075 will break at a lower energy level, causing less of a velocity change than the couplings used in the successful tests. Therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions that the earlier couplings were tested, when proposed by a State.

Please note the following standard provisions which apply to FHWA letters of acceptance:

- 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.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number LS-45C shall not be reproduced except in full. As this letter and the supporting documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The “Pole-Safe Double Neck” couplings are patented products and considered "proprietary." The use of proprietary devices specified on Federal-aid projects, except exempt, non-NHS projects (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, copies of which have been enclosed with previous correspondence.

Sincerely yours,

[Signature]

Frederick G. Wright, Jr.
Program Manager, Safety