



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

**Administration**

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

Refer to: HSA-10/SS-99

Mr. Eric C. Lohrey, P.E.  
Chief Engineer  
Transpo Industries Inc.  
20 Jones Street  
New Rochelle, NY 10801-6098

Dear Mr. Lohrey:

Thank you for your letter of September 7 requesting Federal Highway Administration (FHWA) acceptance of your company's multiple post installations using the "Double-Neck" Pole-Safe breakaway system for use on the National Highway System (NHS). Accompanying your letter was a report from E-Tech Testing services and videos of the crash tests. You requested that we find the two- and three-post installations acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

**Introduction**

Testing of the supports was in compliance with the guidelines contained in the NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. 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.

**Testing**

Pole-Safe Double-Neck couplings were previously tested and found acceptable for use with single post installations in FHWA Acceptance Letter SS-45B dated January 16, 1997. Multiple posts in a narrow installation were required for a client and it was agreed that pendulum testing would be satisfactory in this instance. The table below provides details on the couplings in question.

Model	4050	5050	4062	5062	4075	5075
Anchor Thread Type	External	Internal	External	Internal	External	Internal
Anchor Diameter	13 mm (1/2")	13 mm (1/2")	16 mm (5/8")	16 mm (5/8")	19 mm (3/4")	19 mm (3/4")
Coupling Length	189 mm (7-7/16")	178 mm (7")	198 mm (7-13/16")	184 mm (7-1/4")	208 mm (8-3/16")	196 mm (7-3/4")
Neck Diameter	8.1 mm (0.320")	8.1 mm (0.320")	10.2 mm (0.400")	10.2 mm (0.400")	12.7 mm (0.500")	12.7 mm (0.500")

Utl. Tensile Strength	53.4 kN (12,000 #)	53.4 kN (12,000 #)	83.9 kN (18,850 #)	83.9 kN (18,850 #)	131.0 kN (29,400 #)	131.0 kN (29,400 #)
Tensile Yield Strength	46.5 kN (10,450 #)	46.5 kN (10,450 #)	72.7 kN (16,300 #)	72.7 kN (16,300 #)	113.6 kN (25,500 #)	113.6 kN (25,500 #)
Maximum No. of Posts in 2.1 m path	3	3	3	3	2	2

During the test program the neck diameter of Models 4062 and 5062 was reduced from 11.2 mm to 10.2 mm to improve the dynamic performance in the 3-post test. In addition, this table identifies two new models (4050 and 5050) for use with 13 mm anchors. All couplings are fabricated from the same high-strength steel as those previously accepted.

Pendulum testing with a mass of 845 kg was conducted on your company's devices. NCHRP Report 350 test # 3-60 is conducted at a nominal speed of 35 kmh with calculations used to extrapolate the result to 100 kmh conditions. The pendulum was affixed with a 10-stage aluminum honeycomb nose which simulates the crush characteristics of a small passenger car. Ordinarily pendulum testing is not used on multiple supports, but single post installations have already been tested and found acceptable, and the concept is known to work well. The complete devices as tested are shown in the Enclosure 1.

Test #	# of Posts	Speed	Neck Diameter	Article	Stub Height	Delta V
145	3	34.24 kmh	10.2 mm	4062	60 mm	3.18 m/s
146	2	34.09 kmh	12.7 mm	4075	140 mm *	3.45 m/s

Occup. Speed: Occupant Impact Speed: Speed at which a theoretical front seat occupant will contact the windshield. In meters per second.``

Delta V: Speed change of the test vehicle. In meters per second.

\* The 140 mm stub height consisted of the 60 mm lower anchor portion plus the central section of the coupling. This central section of coupling would not impede a vehicle by snagging on the undercarriage because it would readily break at the neck if impacted.

### Findings

Velocity changes were all within acceptable limits, and the stub heights were also acceptable, as explained above. The results of test met the FHWA requirements and, 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 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.

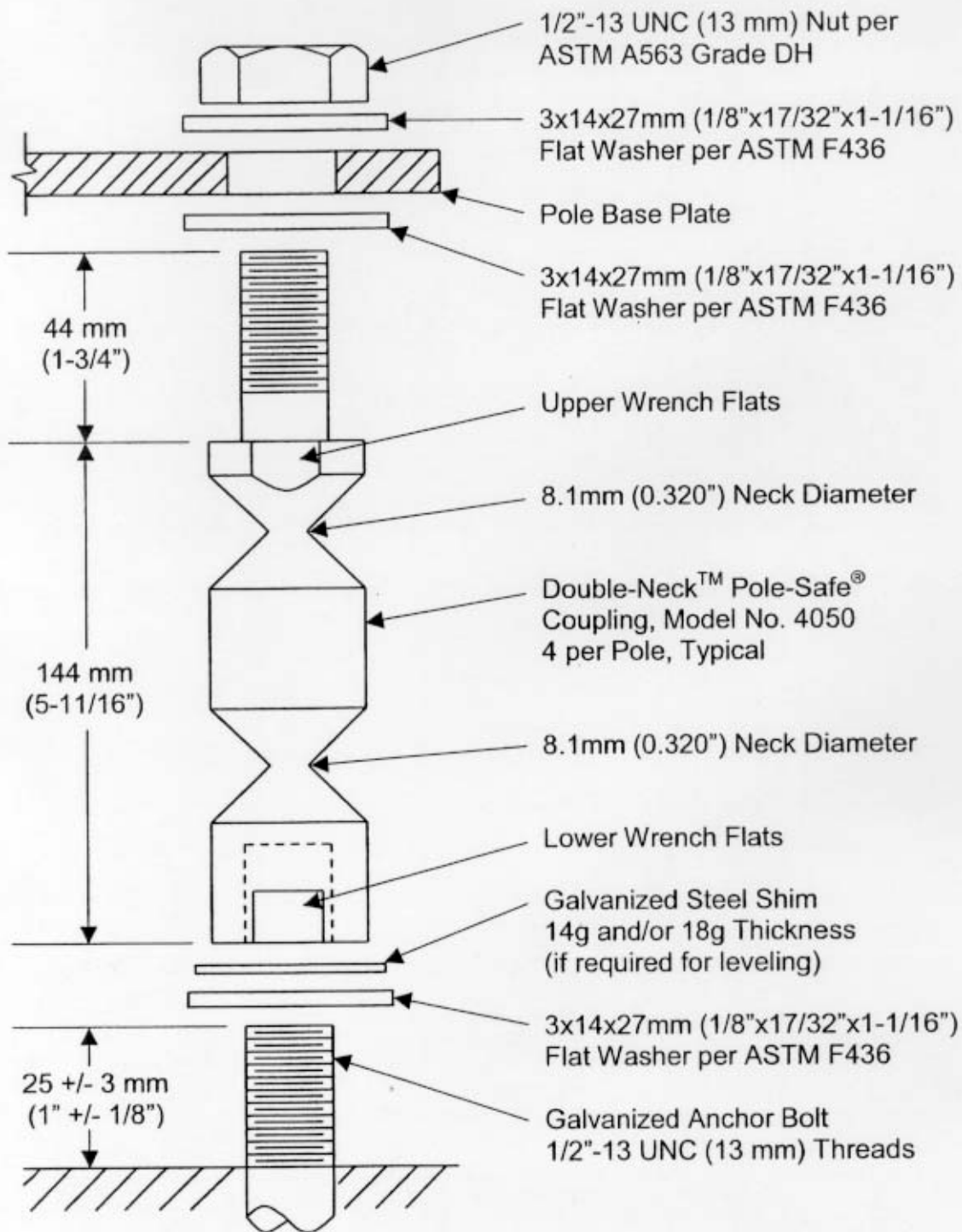
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You 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 SS-99 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.
- Transpo Industries Double Neck Break Safe couplings are or will be a patented product and is 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, a copy of which is enclosed.

Sincerely yours,

Frederick G. Wright, Jr.  
Program Manager, Safety

Enclosure

FHWA:HSA-10:NArtimovich:tm:x61331:10/18/01  
File: LohreyOctSS99.wpd  
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;  
N. Artimovich, HSA-10)



Patent Nos. 5.474.408 & 6.056.471

## Pole-Safe® Model 4050

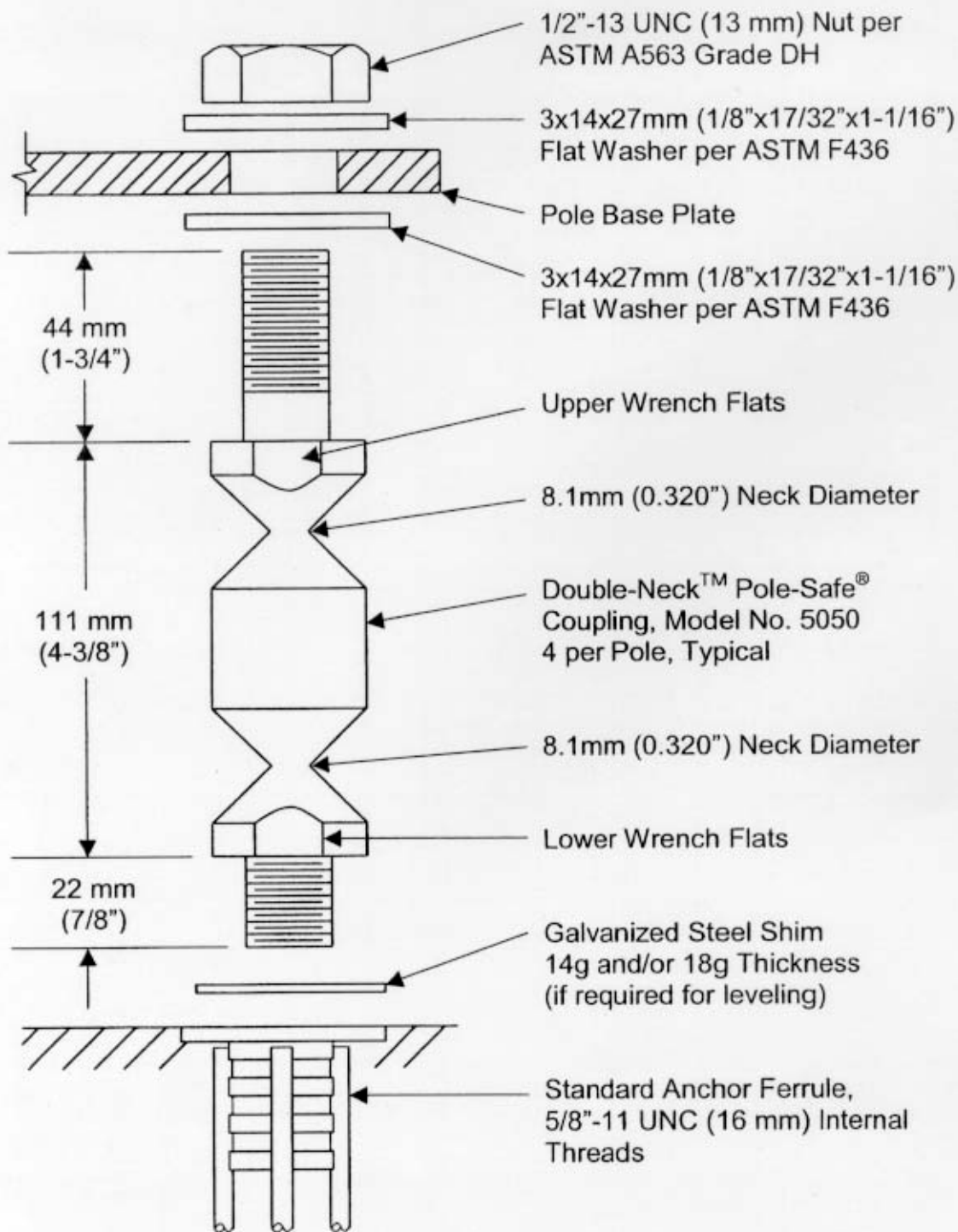
Breakaway Support System

**Transpo Industries, Inc**

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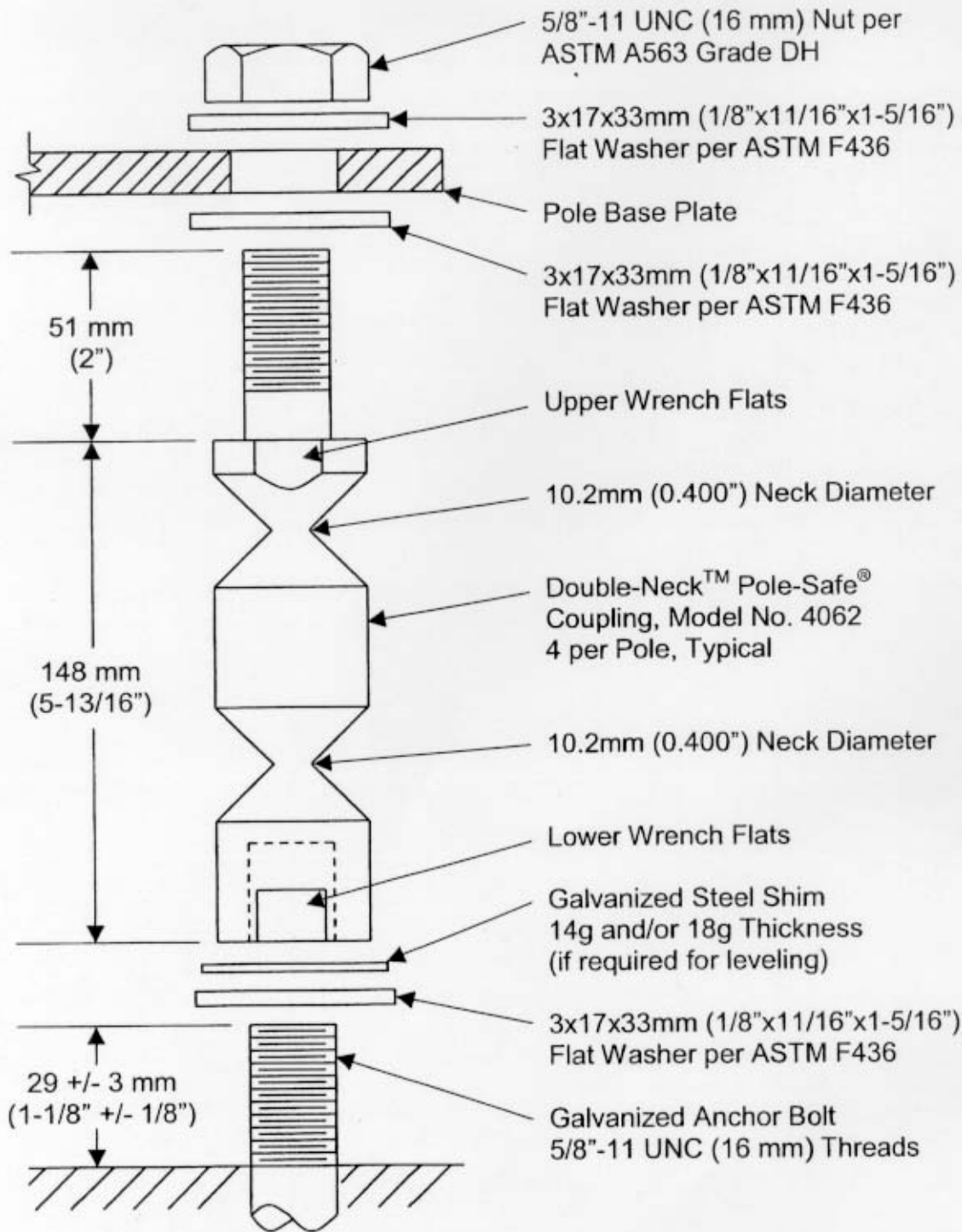
[www.transpo.com](http://www.transpo.com)



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

**Pole-Safe® Model 5050**  
Breakaway Support System

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

## Pole-Safe® Model 4062

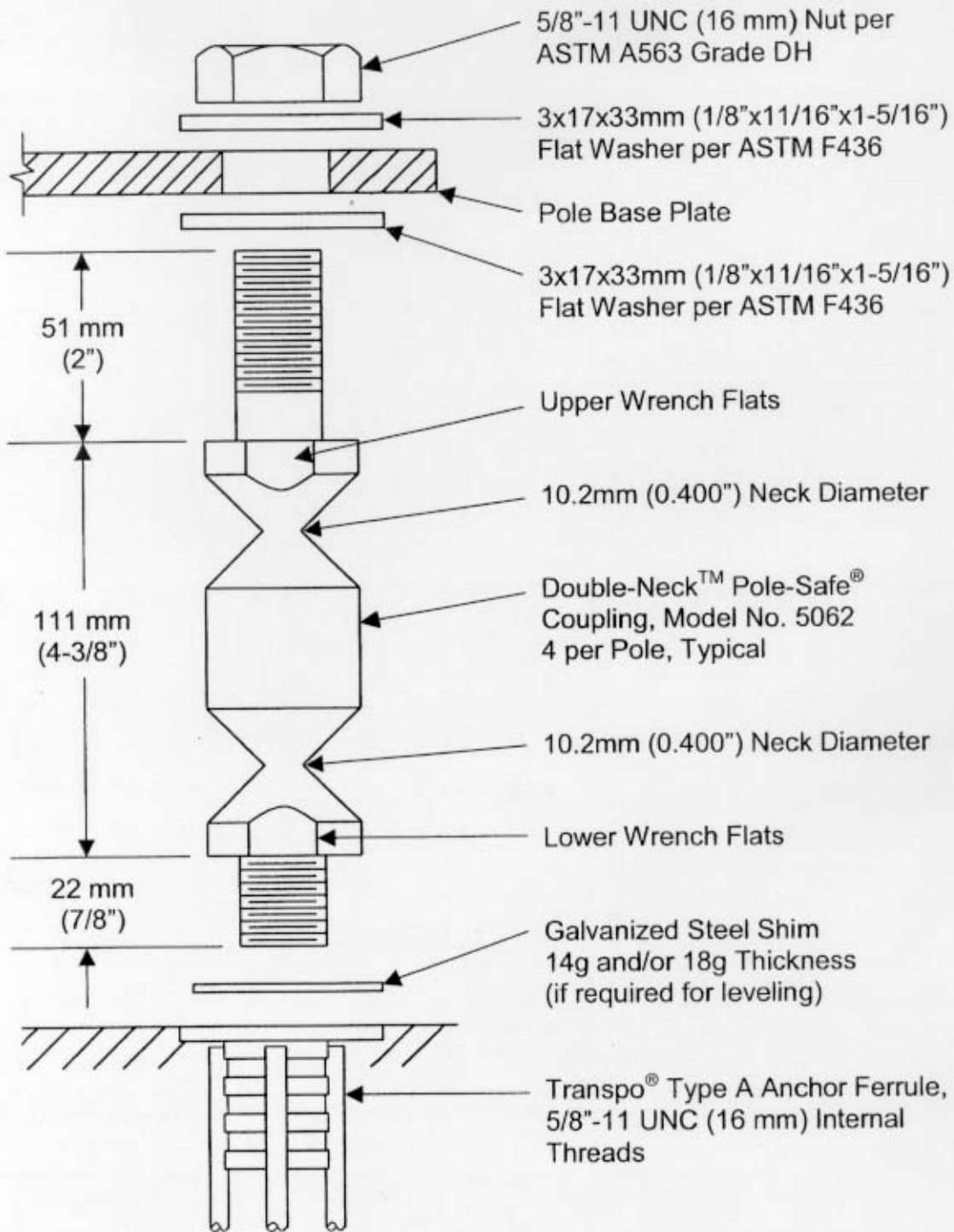
Breakaway Support System

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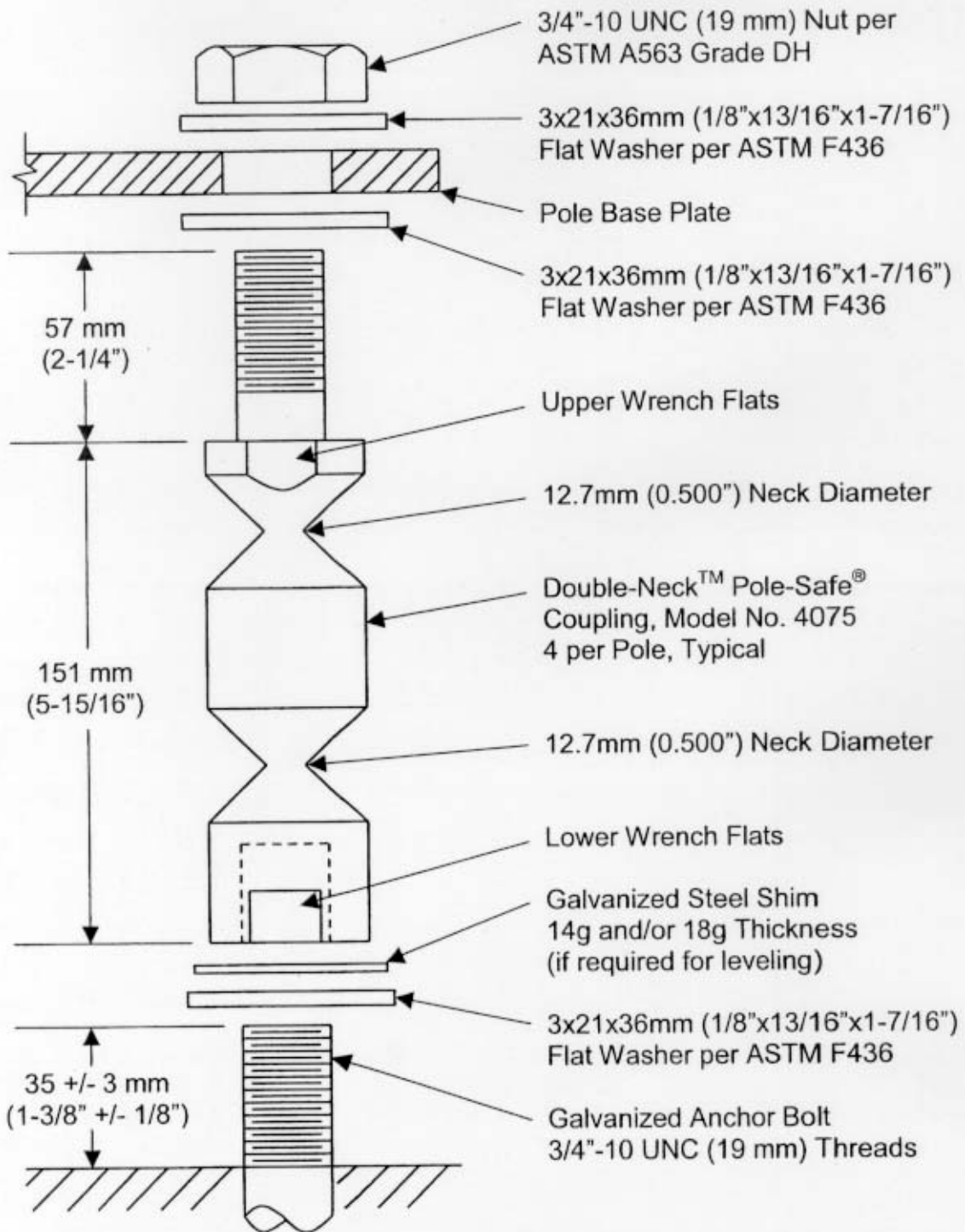
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Patent Nos. 5,474,408 & 6,056,471

**Pole-Safe® Model 5062**  
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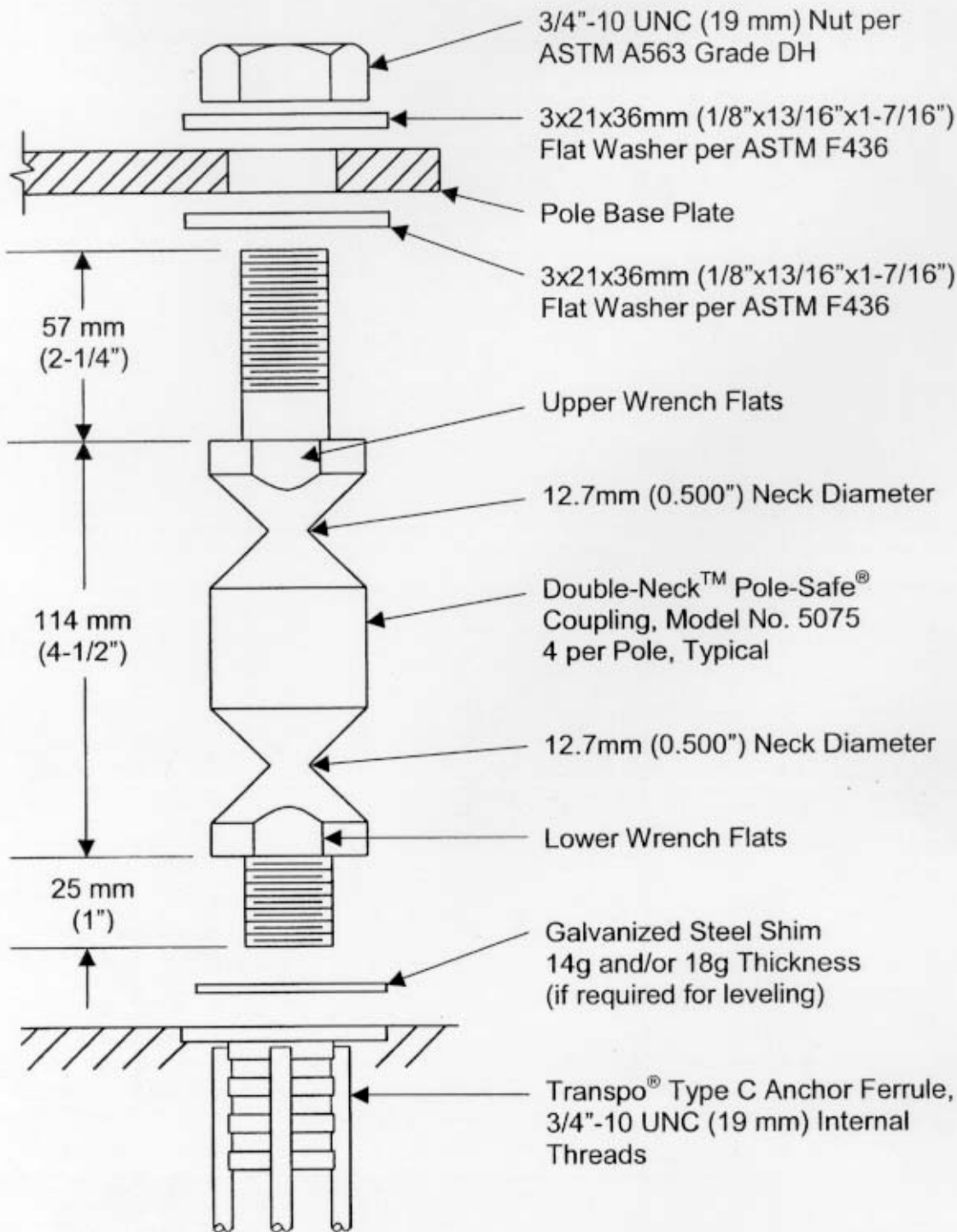


Patent Nos. 5,474,408 & 6,056,471

**Pole-Safe® Model 4075**  
Breakaway Support System

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

**Pole-Safe® Model 5075**  
Breakaway Support System

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