



Standard Specification for Wildcats, Ship Anchor Chain¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers wildcats as used in windlasses to haul in and pay out anchor chain on board ships. An associated chain stopper is used to secure the chain while the ship is anchored, or the anchor is housed.

1.2 Wildcats are of the five whelp type for use with stud link anchor chain conforming to the American Bureau of Shipping Grades 1, 2, and 3. Wildcat dimensions are provided for chains in integral $\frac{1}{8}$ -in. (3-mm) steps, ranging in size from $\frac{3}{4}$ to $4\frac{1}{8}$ in. (19 to 104 mm). Wildcat dimensions for chains in intermediate $\frac{1}{16}$ -in. (1.5-mm) steps are not provided, but wildcats in these sizes are permitted within the scope of this specification.

1.3 Wildcats are configured to pass detachable links oriented parallel or perpendicular to the wildcat shaft centerline.

1.4 The values stated in inch-pound units are to be regarded as the standard. This specification is for use with anchor chain that is measured in inch-pound units.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[A27/A27M Specification for Steel Castings, Carbon, for General Application](#)

[A36/A36M Specification for Carbon Structural Steel](#)

[A148/A148M Specification for Steel Castings, High Strength, for Structural Purposes](#)

[E10 Test Method for Brinell Hardness of Metallic Materials](#)

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

2.2 Other Documents:

[American Bureau of Shipping Rules for Building and Classing Steel Vessels, Section, 2.2.2 Anchor Chain³](#)

[American Welding Society Structural Welding Code Chapter D1.1⁴](#)

3. Classification

3.1 The size of the wildcat is identified by the chain size.

3.2 Wildcats are furnished in four types as follows:

3.2.1 *Type I*—Fabricated from structural steel plate for flanges, hubs, whelps, and chain pockets, joined by electric welding. Surface hardness is approximately 150 HB.

3.2.2 *Type II*—Fabricated from structural steel plate for flanges, hubs, and chain pockets; and high-strength steel castings for whelps, joined by electric welding. Surface hardness is approximately 150 HB for flanges and hubs and 300 HB for whelps.

3.2.3 *Type III*—Cast from medium-strength carbon steel castings to provide a surface hardness of approximately 150 HB.

3.2.4 *Type IV*—Cast from high-strength steel castings to provide a surface hardness of approximately 300 HB.

4. Descriptions of Terms

4.1 *chain groove*—circumferential groove at the chain centerline to provide clearance for links passing normal to the wildcat shaft centerline.

4.2 *chain pockets*—recesses between the flanges and whelps into which links with flat side orientated parallel to the wildcat shaft centerling lay.

4.3 *detachable link*—a “C” shaped link, closed by means of a pair of closing pieces and a taper pin, and used to join anchor chain lengths and appendages into a continuous length aboard ship.

4.4 *flanges*—circumferential rims on the outside of the whelps, chain pockets, and chain groove.

³ Available from American Bureau of Shipping (ABS), ABS Plaza, 16855 Northchase Dr., Houston, TX 77060, <http://www.eagle.org>.

⁴ Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.

4.5 *link grip*—the inside dimension of a chain link representing the effective length of a chain link in an assembled chain. Generally four times the nominal size of a stud link anchor chain, see Fig. 1.

4.6 *whelps*—protrusions on the inside of the flanges of the wildcat that resemble gear teeth and of such shape and dimensions so as to follow the path of the chain, as it enters and leaves the wildcat. Faces of protrusions are separated by the chain groove to permit links with the flat side normal to the wildcat shaft centerline to pass, but blocking links with the flat side oriented parallel to the wildcat shaft centerline.

4.7 *wildcat*—a rotating member specially contoured to receive assembled chain links and connecting links around the circumference of the member and of suitable strength to impart motion to the chain when rotated.

5. Ordering Information

5.1 Orders for wildcats under this specification shall include the following:

- 5.1.1 Quantity (number),
- 5.1.2 Size (chain size),
- 5.1.3 ASTM designation and date of issue,
- 5.1.4 Type (I, II, III, or IV),
- 5.1.5 Size, grade, and type of chain,
- 5.1.6 Availability of assembled chain and detachable link to be furnished by the purchaser for test (see Section 9),
- 5.1.7 As-cast or machined dimensions for wildcat bore, hub width, and outside boss diameter, and
- 5.1.8 Marking (shipping).

6. Materials and Manufacture

6.1 Material for Type I wildcats shall conform to Specification A36/A36M for flanges, hubs, whelps, and chain pockets, joined by electric welding in accordance with AWS, structural welding code Chapter D1.1. Type I wildcats in sizes 2 in. and larger shall be stress-relieved. Material for Type II wildcats

shall conform to Specification A36/A36M for flanges and hubs, and chain pockets, and Specification A148/A148M for whelps, joined by electric welding in accordance with AWS, Structural Welding Code, Chapter D1.1, stress-relieved and heat-treated. Material for Type III wildcats shall conform to Specification A27/A27M, Grade 70–40, quenched and tempered. Material for Type IV wildcats shall conform to Specification A148/A148M, Grade 150–125, quenched and tempered.

6.2 The manufacturer’s name or identification mark, chain size, and pattern or drawing number shall be cast or stamped on the wildcat, using minimum 3/4-in. (19-mm) size characters. The marking shall not appear on a wearing surface and shall be visible on an assembled windlass.

7. Dimensions

7.1 Wildcat must be fitted to the sample chain, and detachable link (see Section 9). Principal dimensions of Types III and IV wildcats for chains in steps of 1/8 in. (3 mm) are shown for information only in Table 1 and Table 2.

7.2 Dimensions in Table 1 and Table 2 are developed in accordance with the following (see also Fig. 2 and Fig. 3):

7.2.1 Bottom of chain pockets are relieved to clear enlargements occurring at centers of chain links as manufactured.

7.2.2 Each face of the whelp is a partial frustrum of a cone developed so that each link whose plane is parallel to the wildcat shaft centerline will have end play as noted in Table 1 and Table 2. This end play provides clearance between nonbearing side of whelp and the end of the next following link, the centerline plane of which is parallel to the axis of shaft.

7.2.3 The inner surfaces of the chain pockets, that form the flanges of the wildcat, are flat surfaces together forming the frustrums of pentagonal pyramids. The traces of the intersections of these flat surfaces or sides of the frustrums coincide with the centerline of the whelps.

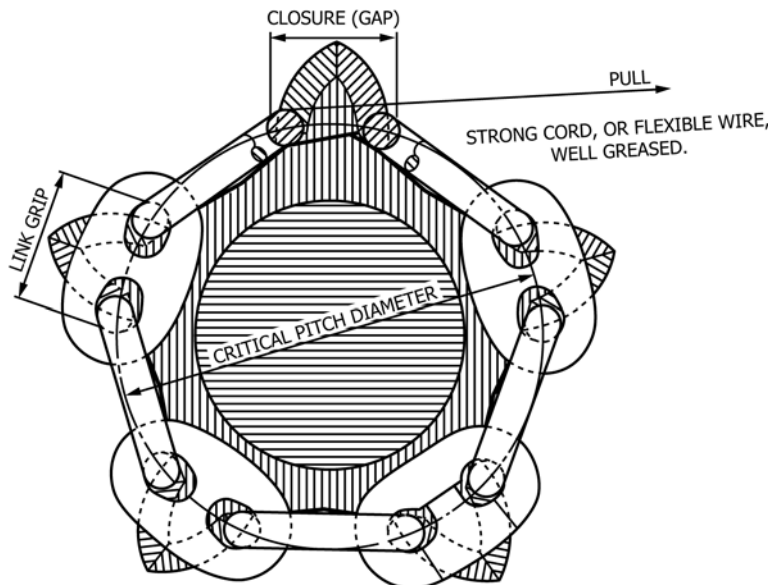


FIG. 1 Chain Wrap Test



TABLE 1 Dimensions in Inches of Types III and IV Wildcats for Chains

| Size of Chain | R | R ₁ | R ₂ | R ₃ | X | A | B | O | P | S | T | U | V | R ₄ | R ₅ | End Play of Link |
|---------------|-------|----------------|----------------|----------------|---------|-------|--------|-------|---------|---------|----------|--------|--------|----------------|----------------|------------------|
| 3/4 | 4.12 | 4.09 | 3.00 | 4.87 | 2 3/8 | 1 3/8 | 3 3/8 | 1/2 | 1 5/16 | 1 15/32 | 2 21/32 | 1 3/16 | 3/16 | 2 | 1 3/8 | 3/4 |
| 7/8 | 4.80 | 4.77 | 3.50 | 5.68 | 2 11/16 | 1 1/2 | 3 7/8 | 5/8 | 1 13/32 | 1 5/8 | 3 3/32 | 7/8 | 7/32 | 2 5/16 | 1 1/2 | 7/8 |
| 1 | 5.49 | 5.43 | 4.00 | 6.49 | 3 | 1 5/8 | 4 3/8 | 3/4 | 1 7/32 | 1 13/16 | 3 1/2 | 1 | 1/4 | 2 5/8 | 1 3/4 | 1 |
| 1 1/8 | 6.18 | 6.12 | 4.62 | 7.31 | 3 1/4 | 1 7/8 | 4 7/8 | 3/4 | 1 27/32 | 2 1/8 | 3 31/32 | 1 1/8 | 9/32 | 3 | 2 1/16 | 1 1/16 |
| 1 1/4 | 6.87 | 6.81 | 5.12 | 8.12 | 3 1/2 | 2 | 5 3/8 | 7/8 | 2 3/32 | 2 7/16 | 4 7/16 | 1 1/4 | 5/16 | 3 5/16 | 2 1/2 | 1 1/8 |
| 1 3/8 | 7.56 | 7.50 | 5.62 | 8.93 | 3 3/4 | 2 1/8 | 5 7/8 | 7/8 | 2 9/32 | 2 23/32 | 4 7/8 | 1 3/8 | 1 1/32 | 3 5/8 | 2 5/8 | 1 1/8 |
| 1 1/2 | 8.24 | 8.18 | 6.19 | 9.74 | 4 1/16 | 2 1/4 | 6 3/8 | 1 | 2 17/32 | 3 1/16 | 5 3/8 | 1 1/2 | 3/8 | 4 | 3 | 1 1/8 |
| 1 5/8 | 8.93 | 8.87 | 6.75 | 10.55 | 4 3/8 | 2 1/2 | 6 3/8 | 1 1/8 | 2 7/8 | 3 3/8 | 5 27/32 | 1 5/8 | 1 3/32 | 4 5/16 | 3 1/4 | 1 3/16 |
| 1 3/4 | 9.63 | 9.57 | 7.31 | 11.37 | 4 11/16 | 2 3/4 | 7 3/8 | 1 1/8 | 3 1/32 | 3 3/8 | 6 1/4 | 1 3/4 | 7/16 | 4 5/8 | 3 9/16 | 1 1/4 |
| 1 7/8 | 10.31 | 10.25 | 7.87 | 12.18 | 5 | 2 7/8 | 7 7/8 | 1 1/4 | 3 1/4 | 3 29/32 | 6 23/32 | 1 7/8 | 1 5/32 | 4 15/16 | 3 3/16 | 1 5/16 |
| 2 | 10.99 | 10.93 | 8.37 | 12.99 | 5 1/4 | 3 | 8 3/8 | 1 1/4 | 3 7/16 | 4 5/32 | 7 1/8 | 2 | 1/2 | 5 1/4 | 3 7/8 | 1 3/8 |
| 2 1/8 | 11.68 | 11.62 | 8.87 | 13.80 | 5 9/16 | 3 1/8 | 8 7/8 | 1 3/8 | 3 19/32 | 4 15/32 | 7 5/8 | 2 1/8 | 1 7/32 | 5 5/8 | 4 1/4 | 1 7/16 |
| 2 1/4 | 12.37 | 12.31 | 9.50 | 14.62 | 5 7/8 | 3 3/8 | 9 1/4 | 1 3/8 | 3 29/32 | 4 3/4 | 7 31/32 | 2 1/4 | 9/16 | 5 15/16 | 4 5/8 | 1 1/2 |
| 2 3/8 | 13.05 | 12.99 | 10.00 | 15.42 | 6 3/16 | 3 1/2 | 9 3/4 | 1 1/2 | 4 1/8 | 5 1/16 | 8 7/16 | 2 3/8 | 1 9/32 | 6 1/4 | 4 11/16 | 1 7/32 |
| 2 1/2 | 13.74 | 13.68 | 10.62 | 16.24 | 6 1/2 | 3 5/8 | 10 1/4 | 1 1/2 | 4 7/16 | 5 1/8 | 8 15/16 | 2 1/2 | 5/8 | 6 5/8 | 5 1/4 | 1 9/16 |
| 2 5/8 | 14.43 | 14.37 | 11.25 | 17.05 | 6 13/16 | 3 7/8 | 10 3/4 | 1 5/8 | 4 19/32 | 5 3/8 | 9 3/8 | 2 5/8 | 2 1/32 | 6 15/16 | 5 3/8 | 1 5/8 |
| 2 3/4 | 15.11 | 15.06 | 11.75 | 17.86 | 7 1/8 | 4 | 11 1/4 | 1 3/4 | 4 29/32 | 6 | 9 15/16 | 2 3/4 | 1 1/16 | 7 1/4 | 5 3/4 | 1 11/16 |
| 2 7/8 | 15.80 | 15.74 | 12.25 | 18.67 | 7 1/16 | 4 1/4 | 11 3/4 | 1 3/4 | 5 1/16 | 6 3/16 | 10 5/16 | 2 7/8 | 2 3/32 | 7 5/8 | 5 15/16 | 1 3/4 |
| 3 | 16.48 | 16.42 | 12.75 | 19.48 | 7 3/4 | 4 3/8 | 12 1/4 | 1 7/8 | 5 1/4 | 6 1/2 | 10 23/32 | 3 | 3/4 | 7 13/16 | 6 5/16 | 1 7/8 |
| 3 1/8 | 17.17 | 17.11 | 13.25 | 20.30 | 8 1/16 | 4 5/8 | 12 3/4 | 1 7/8 | 5 17/32 | 6 25/32 | 11 3/16 | 3 3/8 | 2 5/32 | 8 1/4 | 6 1/2 | 1 5/16 |
| 3 1/4 | 17.85 | 17.79 | 13.87 | 21.10 | 8 3/8 | 4 3/4 | 13 1/4 | 1 7/8 | 5 23/32 | 7 1/32 | 11 3/8 | 3 1/4 | 1 3/16 | 8 5/8 | 6 5/8 | 2 |
| 3 3/8 | 18.55 | 18.49 | 14.37 | 21.92 | 8 11/16 | 5 | 13 3/4 | 2 | 6 1/32 | 7 5/16 | 12 1/16 | 3 3/4 | 2 7/32 | 8 15/16 | 7 1/16 | 2 1/16 |
| 3 1/2 | 19.23 | 19.17 | 15.00 | 22.73 | 9 | 5 1/8 | 14 1/4 | 2 | 6 9/16 | 7 9/16 | 12 7/16 | 3 1/2 | 7/8 | 9 1/4 | 7 5/16 | 2 1/8 |
| 3 5/8 | 19.92 | 19.86 | 15.50 | 23.54 | 9 5/16 | 5 3/8 | 14 3/4 | 2 1/8 | 6 19/32 | 7 31/32 | 13 | 3 5/8 | 2 9/32 | 9 9/16 | 7 11/16 | 2 3/16 |
| 3 3/4 | 20.60 | 20.54 | 16.00 | 24.35 | 9 5/8 | 5 5/8 | 15 1/4 | 2 1/4 | 6 3/4 | 8 1/8 | 13 7/16 | 3 3/4 | 1 5/16 | 9 7/8 | 8 | 2 1/4 |
| 3 7/8 | 21.30 | 21.24 | 16.62 | 25.17 | 9 15/16 | 5 3/4 | 15 3/4 | 2 1/4 | 6 31/32 | 8 7/16 | 13 3/8 | 3 7/8 | 3 1/32 | 10 1/4 | 8 3/16 | 2 5/16 |
| 4 | 21.98 | 21.92 | 17.00 | 25.98 | 10 1/4 | 6 | 16 1/4 | 2 3/8 | 7 3/16 | 8 13/16 | 14 5/16 | 4 | 1 | 10 7/16 | 8 9/16 | 2 3/8 |
| 4 1/8 | 22.67 | 22.61 | 17.50 | 26.39 | 10 5/16 | 6 1/4 | 16 3/4 | 2 3/8 | 7 5/8 | 9 1/16 | 14 13/16 | 4 1/8 | 1 1/32 | 10 7/8 | 8 7/8 | 2 7/16 |

TABLE 2 Dimensions in Millimetres of Types III and IV Wildcats for Chains

| Size of Chain | R | R ₁ | R ₂ | R ₃ | X | A | B | O | P | S | T | U | V | R ₄ | R ₅ | End Play of Link |
|---------------|-------|----------------|----------------|----------------|-------|-------|-------|------|-------|-------|-------|-------|------|----------------|----------------|------------------|
| 3/4 | 104.6 | 103.9 | 76.2 | 123.7 | 60.3 | 34.9 | 85.7 | 12.7 | 33.3 | 37.3 | 67.5 | 20.6 | 4.8 | 50.8 | 34.9 | 19.1 |
| 7/8 | 121.9 | 121.2 | 88.9 | 144.3 | 68.3 | 38.1 | 98.4 | 15.9 | 35.7 | 41.3 | 78.6 | 22.2 | 5.6 | 58.7 | 38.1 | 22.2 |
| 1 | 138.4 | 137.9 | 101.6 | 164.8 | 76.2 | 41.3 | 111.1 | 19.1 | 38.9 | 46.0 | 88.9 | 25.4 | 6.4 | 66.7 | 44.5 | 25.4 |
| 1 1/8 | 157.0 | 155.4 | 117.3 | 185.7 | 82.6 | 47.6 | 123.8 | 19.1 | 46.8 | 54.0 | 100.8 | 28.6 | 7.1 | 76.2 | 52.4 | 27.0 |
| 1 1/4 | 174.5 | 173.0 | 130.0 | 206.2 | 88.9 | 50.8 | 136.5 | 22.2 | 53.2 | 61.9 | 112.7 | 31.8 | 7.9 | 84.1 | 63.5 | 28.6 |
| 1 3/8 | 192.0 | 190.5 | 142.7 | 226.8 | 95.3 | 54.0 | 149.2 | 22.2 | 57.9 | 69.1 | 123.8 | 34.9 | 8.7 | 92.1 | 66.7 | 28.6 |
| 1 1/2 | 209.3 | 207.8 | 157.2 | 247.4 | 103.2 | 57.2 | 161.9 | 25.4 | 64.3 | 77.8 | 136.5 | 38.1 | 9.5 | 101.6 | 76.2 | 28.6 |
| 1 5/8 | 226.8 | 225.3 | 171.5 | 268.0 | 111.1 | 63.5 | 174.6 | 28.6 | 73.0 | 85.7 | 148.4 | 41.3 | 10.3 | 109.5 | 82.6 | 30.2 |
| 1 3/4 | 244.6 | 243.1 | 185.7 | 288.8 | 119.1 | 69.9 | 187.3 | 28.6 | 77.0 | 92.1 | 158.8 | 44.5 | 11.1 | 117.5 | 90.5 | 31.8 |
| 1 7/8 | 261.9 | 260.4 | 199.9 | 309.4 | 127.0 | 73.0 | 200.0 | 31.8 | 82.6 | 99.2 | 170.7 | 47.6 | 11.9 | 125.4 | 96.8 | 33.3 |
| 2 | 279.1 | 277.6 | 212.6 | 329.9 | 133.4 | 76.2 | 212.7 | 31.8 | 87.3 | 105.6 | 181.0 | 50.8 | 12.7 | 133.4 | 98.4 | 34.9 |
| 2 1/8 | 296.7 | 295.1 | 225.3 | 350.5 | 141.3 | 79.4 | 225.4 | 34.9 | 91.3 | 113.5 | 193.7 | 54.0 | 13.5 | 142.9 | 108.0 | 36.5 |
| 2 1/4 | 314.2 | 312.7 | 241.3 | 371.3 | 149.2 | 85.7 | 235.0 | 34.9 | 99.2 | 120.7 | 202.4 | 57.2 | 14.3 | 150.8 | 117.5 | 38.1 |
| 2 3/8 | 331.5 | 329.9 | 254.0 | 391.7 | 157.2 | 88.9 | 247.7 | 38.1 | 104.8 | 128.6 | 214.3 | 60.3 | 15.1 | 158.8 | 119.1 | 38.9 |
| 2 1/2 | 349.0 | 347.5 | 269.8 | 412.5 | 165.1 | 92.1 | 260.4 | 38.1 | 112.7 | 136.5 | 227.0 | 63.5 | 15.9 | 168.3 | 133.4 | 39.7 |
| 2 5/8 | 366.5 | 365.0 | 285.8 | 433.1 | 173.0 | 98.4 | 273.1 | 41.3 | 116.7 | 142.9 | 238.1 | 66.7 | 16.7 | 176.2 | 136.5 | 41.3 |
| 2 3/4 | 383.8 | 382.5 | 298.5 | 453.6 | 181.0 | 101.6 | 285.8 | 44.5 | 124.6 | 152.4 | 252.4 | 69.9 | 17.5 | 184.2 | 146.1 | 42.9 |
| 2 7/8 | 401.3 | 399.8 | 311.2 | 474.2 | 188.9 | 108.0 | 298.5 | 44.5 | 128.6 | 157.2 | 261.9 | 73.0 | 18.3 | 193.7 | 150.8 | 44.5 |
| 3 | 418.6 | 417.1 | 323.9 | 494.8 | 196.9 | 111.1 | 311.2 | 47.6 | 133.4 | 165.1 | 272.3 | 76.2 | 19.1 | 198.4 | 160.3 | 47.6 |
| 3 1/8 | 436.1 | 434.6 | 336.6 | 515.6 | 204.8 | 117.5 | 323.9 | 47.6 | 140.5 | 172.2 | 284.2 | 79.4 | 19.8 | 209.6 | 165.1 | 49.2 |
| 3 1/4 | 453.4 | 451.9 | 352.3 | 535.9 | 212.7 | 120.7 | 336.6 | 47.6 | 145.3 | 178.6 | 288.9 | 82.6 | 20.6 | 219.1 | 168.3 | 50.8 |
| 3 3/8 | 471.2 | 469.6 | 365.0 | 556.8 | 220.7 | 127.0 | 349.3 | 50.8 | 153.2 | 185.7 | 306.4 | 85.7 | 21.4 | 227.0 | 179.4 | 52.4 |
| 3 1/2 | 488.4 | 486.9 | 381.0 | 577.3 | 228.6 | 130.2 | 362.0 | 50.8 | 157.2 | 192.1 | 315.9 | 88.9 | 22.2 | 235.0 | 185.7 | 54.0 |
| 3 5/8 | 506.0 | 504.4 | 393.7 | 597.9 | 236.5 | 136.5 | 374.7 | 54.0 | 167.5 | 202.4 | 330.2 | 92.1 | 23.0 | 242.9 | 195.3 | 55.6 |
| 3 3/4 | 523.2 | 521.7 | 406.4 | 618.5 | 238.1 | 142.9 | 387.4 | 57.2 | 171.5 | 206.4 | 341.3 | 95.3 | 23.8 | 250.8 | 203.2 | 57.2 |
| 3 7/8 | 541.0 | 539.5 | 422.1 | 639.3 | 252.4 | 146.1 | 400.1 | 57.2 | 177.0 | 214.3 | 352.4 | 98.4 | 24.6 | 260.4 | 208.0 | 58.7 |
| 4 | 558.3 | 556.8 | 431.8 | 659.9 | 260.4 | 152.4 | 412.8 | 60.3 | 182.6 | 223.9 | 363.5 | 101.6 | 25.4 | 268.3 | 214.3 | 60.3 |
| 4 1/8 | 575.8 | 574.3 | 444.5 | 680.5 | 268.3 | 158.8 | 425.5 | 60.3 | 193.7 | 230.2 | 376.2 | 104.8 | 26.2 | 276.2 | 225.4 | 61.9 |

7.2.4 The trace of the intersection of the plane at the bottom of the chain pocket and the side of whelp forms a hyperbolic

section of a cone and is therefore a curved line.

