

[INCH-POUND]  
A-A-59494  
September 17, 1999

## COMMERCIAL ITEM DESCRIPTION

### WHEELS AND HUBS FOR INDUSTRIAL PNEUMATIC TIRES

The General Services Administration has authorized the use of this commercial item description (CID) for all federal agencies as a replacement for wheels and type I and II hubs of MIL-W-8005E(2) and related associated specifications MS24322A, MS24323B, MS24324C, MS24325C, MS24326B, MS24327B, MS24328B, MS24329B, and MS24330B.

1. **SCOPE.** This CID covers wheels and hubs, with or without industrial pneumatic tires and tubes (see 7.1). The hubs covered herein are of the cantilever or fork mounting types.

2. **CLASSIFICATION.** The hub types with their associated sizes of wheels, tires, and tubes are as follows:

Type I Cantilever mounting

Tire sizes: 3.50-6, 4.00-8, 6.00-9, 7.50-10, and 9.00-10

Type II Fork mounting

Tire sizes: 3.50-6, 4.00-8, 6.00-9, and 7.50-10

3. **SALIENT CHARACTERISTICS.**

3.1 **Configuration.** Wheel and hub assemblies shall conform to the types shown on figure 1 and shall interface with and provide the capabilities specified in table I.

Beneficial comments, recommendations, additions, deletions, clarifications, and any other data that may improve this document should be sent by letter to: Defense Supply Center, Columbus, Attn: DSCC-VAI, 3990 E. Broad Street, Columbus, OH 43213-5000.
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TABLE I. Industrial tires, loads, and inflation pressures. <sup>1/</sup>

Tire size (TRA)	Ply rating	Valve hole location	TRA rim contour number	Tire OD, inches (approx.)	On paved road						Off-road <sup>3/</sup>	
					5 MPH		10 MPH		50 MPH		10 MPH	
					Load rating, lbs. <sup>2/</sup>	Infl. press. psi	Load rating, lbs. <sup>2/</sup>	Infl. press. psi	Load rating, lbs. <sup>2/</sup>	Infl. press. psi	Load rating, lbs. <sup>2/</sup>	Infl. press. psi
3.50-6	4	Center	3-1/4 I	13	590	80	490	75	295	65	220	30
4.00-8	6	Center	3-3/4 I	16	1,090	100	950	100	570	85	370	30
6.00-9	10	9/16 inch offset	4.00 E	21	2,290	100	1,990	100	1,175	95	780	30
7.50-10	10	1 inch offset	5.50 F	25	3,520	95	2,860	85	1,620	75	1,230	30
9.00-10 <sup>4/</sup>	10	1 inch offset	5.50 F	28	4,270	80	3,580	75	2,000	65	1,655	30

## NOTES:

- <sup>1/</sup> Table I is based on the recommendations of The Tire and Rim Association, Inc (TRA). Worst case conditions of use, not average conditions, should be used in tire selection. For given conditions of use, loads below the load rating specified permit use of lower inflation pressures and hence affords an increase in flotation.
- <sup>2/</sup> Loads specified apply to both ferrous and aluminum alloy wheels.
- <sup>3/</sup> No tire smaller than size 6.00-9 should be used as the main wheels for equipment to be used in unpaved areas. The use of sizes 3.50-6 and 4.00-8 should be limited to auxiliary wheels.
- <sup>4/</sup> Ferrous wheels and hubs only.

### 3.2 Performance.

3.2.1 Pressure loads. Wheels, when mounted with tires and tubes, shall not deform when the tires and tubes are subjected to the inflation pressure specified in table II.

TABLE II. Minimum wheel deformation inflation pressure.

Size	Ply rating	Inflation pressure, psi
3.50-6	4-ply	140
4.00-8	6-ply	175
6.00-9	10-ply	175
7.50-10	10-ply	175
9.00-10	10-ply	175

3.2.2 Static loads. Wheels, when mounted with tires and tubes and mounted to applicable hubs, shall withstand the maximum static loads specified in table III.

TABLE III. Wheel maximum static loads.

Wheel size	Tire inflation, psi	Maximum static load, lbs. (at each wheel)
3.50-6	80	2,500
4.00-8	100	5,000
6.00-9	100	6,250
7.50-10	95	10,000
9.00-10	80	10,000

3.2.3 Towing. Wheel and hub assemblies shall be capable of being moved by hand or towed by a tug over concrete pavement in a circular path having a 35 foot radius (as measured to the outside of the wheels) for a minimum of one-half mile at speeds up to 15 miles per hour (mph) under the 10 percent overrated load condition for 5 mph specified in table I.

3.3 Materials. Wheels and hubs shall be made out of steel, iron, or aluminum alloy as specified on figures 2 through 9. These materials, which are subject to deterioration when exposed to climatic and environmental conditions, shall be of corrosion-resistant type metal or shall be of metal that is protected against deterioration in a manner that will in no way prevent compliance with the requirements of this CID. The use of any protective coating that will crack, chip, or scale with age or extremes of climate and environmental conditions shall be avoided.

3.4 Usage. The wheels and hubs shall be capable of being used as running gear on equipment that may be moved by hand or towed by a tug on paved areas, pierced plank areas, unpaved roads, and unimproved level terrain, whether such areas are dry, wet, or covered with up to 6 inches of snow or 4 inches of mud.

3.5 Construction. Wheel and hub assemblies shall be constructed so that no parts will work loose in service.

3.5.1 Wheels. Wheels shall be of the split-rim type, with all of the necessary bolts, lockwashers, and nuts required for assembly of the two halves as shown on figures 2, 3, 4, and 5. The wheels shall allow removal of the wheel from the hub without deflating the tire.

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3.5.2 Hubs. A hub shall consist of all the parts shown on figures 6, 7, 8, or 9, as applicable, including all bolts, nuts, and lockwashers for attaching the wheel to the hub. All parts such as grease seals and hubcaps that are not specified in detail shall meet the requirements specified in 3.6. Axles are not a part of the hubs covered by this CID, and are shown in the figures for reference purposes only.

3.5.2.1 Bearing cup removal. Slots or other provisions shall be inside the hubs to facilitate removal of bearing cups.

3.5.2.2 Attachment bolts. Hub-to-wheel attachment bolts shall be of the sizes shown on the applicable figures and shall be ribbed-neck carriage bolts. The length of the ribbed part of the bolt shall be from the head to within 1/16 inch of extending through the flange of the hub. Bolts shall be capable of being pressed out to allow for attachment of a brake mechanism to the hub body.

3.5.2.3 Seals. Seals for the hub as shown on figures 6 through 9 shall be standard grease seals of the molded, synthetic-rubber type. The seals shall provide protection for the wheel bearings under the environmental conditions specified herein.

3.5.2.4 Brake drum pilot. Each type 1 cantilever mounting hub shall be provided with a brake drum pilot surface on the hub flange as shown on figures 6 and 7.

3.5.3 Threads. Unless other specified, all threads shall conform to FED-STD-H28 (see 7.3).

3.6 Environmental conditions. The wheels and hubs shall be capable of withstanding exposure to the following environmental conditions:

- a. Temperatures from -65 to 125 °F.
- b. Relative humidity of 95±5 percent at a temperature of 125±5 °F.
- c. Airborne sand and dust particles incident to normal road operation.
- d. Atmosphere containing salt-laden moisture (a salt fog of 5±1 percent salt solution).

3.7 Tires and tubes. All industrial pneumatic-type tires and tubes furnished with the wheels shall conform to ZZ-T-410, except that tire size 7.50-10 shall be 10-ply rating. Tire size 9.00-10 shall be used only with ferrous metal hubs and wheels. All tires shall have a free-rolling tread design, be of a non-directional type, and have multiple ribs.

3.7.1 Flaps. Unless otherwise specified (see 7.2), all 10-ply rating tires shall be equipped with flaps.

3.7.2 Valve stem. The valve stem on the tube furnished with the tire shall conform to the appropriate TRA Standard (see 7.3) as indicated:

<u>Tire size</u>	<u>TRA Standard</u>
3.50-6	TR 87
4.00-8	TR 13 or TR 87
6.00-9 and 7.50-10	TR 135
9.00-10	TR 150

3.8 Finishes and protective coatings.

3.8.1 Color. Wheels and hubs shall be finished in the color specified in the contract or order (see 7.2).

3.8.2 Bearings, grease seals, enclosed parts, and utility parts. The bearings, grease seals, and enclosed parts and surfaces of the hub shall not be painted. The outside surface of the seals shall be painted or

plated in accordance with the applicable finishes specified above. Bearing cup bores shall not be finished. Utility parts (e.g., wheel mounting bolts) shall be masked or otherwise protected during painting of the hubs.

3.9 Workmanship. The wheels and hubs shall be fabricated and finished using commercially acceptable workmanship standards.

3.9.1 Wheel surface. The surface of the wheel between bead seats shall be free of defects that would be injurious to the innertube and tire.

3.9.2 Flanges. The hub face and mating wheel faces shall be smooth and free from defects.

3.9.3 Register. The register bore of the wheel and register diameter of the hub shall be concentric and free from defects. The least clearance between these surfaces shall be maintained consistent with the applicable figures.

#### 4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The use of recovered materials is encouraged to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR) (see 7.3).

4.2 Toxic chemicals, hazardous substances, and ozone depleting chemicals (ODCs). The use of toxic chemicals, hazardous substances, or ODCs shall be avoided, whenever feasible.

#### 5. QUALITY ASSURANCE PROVISIONS.

5.1 Product conformance. The products provided shall meet the salient characteristics (see 3) of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices; and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

5.2 Market acceptability. The wheels and hubs (and tires and tubes, if procured as part of an assembly) must have been sold to the government or in the commercial market for a minimum of one year.

#### 6. PACKAGING.

6.1 Preservation, packing, packaging, and marking. Preservation, packing, packaging, and marking shall be as specified in the contract or order (see 7.2).

#### 7. NOTES.

7.1 Intended use. Wheels and hubs covered by this CID are intended for use as standard components of mobile equipment used by the Department of Defense under all extremes of climatic and environmental conditions. Users should consider the conditions expressed in 7.1.1 through 7.1.3 when selecting wheels and hubs.

7.1.1 Use with pneumatic casters. Where wheels and hubs are to be used as components of single-tired or dual-tired pneumatic casters, cantilever mounting should be used to facilitate wheel removal.

7.1.2 Fork mounting. Fork mounting of wheels and hubs will be used only when specified by the procuring activity.

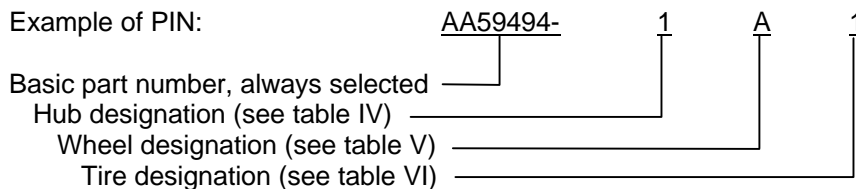
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7.1.3 Tire selection criteria. The TRA Yearbook (see 7.3) should be used as a guide for the selection of tire sizes for use on a specific item of mobile equipment, subject to the following:

- a. Conditions. Select for the worst expected conditions of use: generally, off-road, 10-mph conditions.
- b. Load rating. To ensure adequate flotation, use no more than 75 percent of the tire load rating in initial design.
- c. Tire sizes. Use tire size 6.00-9, or larger, where equipment items must be mobile over pierced plank and level unpaved surfaces. (Size 6.00-9, 6-ply rating tires may be used in lieu of 6.00-9, 10-ply rating tires where use of this rule results in under-loading of the tire). Use tire sizes 3.50-6 and 4.00-8 for two-wheel trailers and similar items, or where the equipment item is light in weight and will be moved only over paved surfaces.

7.1.4 Part identification number. The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.

The part or identifying number (PIN) is made up of the basic CID number and a three-digit alphanumeric dash number.



Note: Table VII shows the conversion from the previously used MSXXXXX PIN to the PIN established under this CID. The national stock number (NSN) for the items procured under this CID is also shown. Tires and tubes are not separately procurable under this CID. Size 9.00-10 tire should be used only with ferrous wheel and hub.

7.2 Ordering data. Acquisition documents must specify the following:

- a. Number, title, and date of this CID.
- b. Applicable PIN (see 7.1.4 and table VII), which covers: size; whether wheels, hubs, or both, are to be procured; whether tires and tubes are required with wheels; and whether a cantilever-mounting or fork-mounting type hub is required.
- c. Whether tire flaps are not required with 10-ply rating tires (see 3.7.1).
- d. Color (see 3.8.1). The color to be specified will normally be either Yellow (color 13538), Green 383 (color 34094), Dark Green (color 24052), or Sand (color 33303) of FED-STD-595 (see 7.3).
- e. Preservation, packing, packaging, and marking requirements (see 6.1).

7.3 Source of documents.

7.3.1 The Federal Acquisition Regulation (FAR) may be obtained from the Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402.

Table IV. Hub designation.

Type	Fits wheel size	Material	Designation	Figure
No hub ordered			0	
I	3.50-6 or 4.00-8	Steel, cast iron, or Aluminum alloy	1	6
	6.00-9, 7.50-10, or 9.00-10	Steel or iron	2	7
	6.00-9 or 7.50-10	Aluminum alloy	3	
II	3.50-6 or 4.00-8	Steel, cast iron, or aluminum alloy	4	8
	7.50-10 (with spacers)	Steel, cast iron, or aluminum alloy	5	9
	6.00-9 (without spacers)		6	

Table V. Wheel designation.

Size	Material	Designation	Figure
No wheel ordered		0	
3.50-6	Steel	A	2
	Aluminum alloy	B	
4.00-8	Steel	C	3
	Aluminum alloy	D	
6.00-9	Steel	E	4
7.50-10 or 9.00-10	Steel	F	5
7.50-10	Aluminum alloy	G	

Table VI. Tire designation.

Tire size	Ply rating	Designation
No tire ordered		0
3.50-6	4	1
4.00-8	6	2
6.00-9	6	3
6.00-9	10	4
7.50-10	10	5
9.00-10	10	6

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Table VII. Former MSXXXXX PIN to CID A-A-59494 PIN conversion.

Former MSXXXXX PIN	CID PIN AA59494-			NSN
	Hub	Wheel	Tire	
MS24322-1	1	A	0	2530-000631358
MS24322-1A4	1	A	1	none established
MS24322-2	4	A	0	none established
MS24322-2A4	4	A	1	2530-006744824
MS24322-3	1	C	0	2530-000631359
MS24322-3A6 or 3A4	1	C	2	2530-008837623
MS24322-4	4	C	0	none established
MS24322-4A6	4	C	2	2530-011228340
MS24322-5	2/3	E	0	2530-000631361
MS24322-5A6	2/3	E	3	2530-007561210
MS24322-5A10	2/3	E	4	2530-009305193
MS24322-6	6	E	0	none established
MS24322-6A6	6	E	3	none established
MS24322-6A10	6	E	4	none established
MS24322-7	2/3	F/G	0	2530-012957168
MS24322-7A10	2/3	F/G	5	2530-014074862
MS2432208	5	F/G	0	none established
MS24322-8A10	5	F/G	5	none established
MS24322-9	2	F	0	2530-000631364
MS24322-9A10	2	F	6	none established
MS24323-1	0	A	0	2530-005292706
MS24323-2	0	B	0	none established
MS24324-1	0	C	0	2530008824784
MS24324-2	0	D	0	none established
MS24325-1	0	E	0	2530-005287224
MS24326-1	0	F	0	2530-005902680
MS24326-2	0	G	0	none established
MS24327-1	1	0	0	2530-004457593
MS24328-1	2	0	0	2530-008930568
MS24328-2	3	0	0	2530-006467705
MS24329-1	4	0	0	2530-008970957
MS24330-1	5	0	0	none established
MS24330-2	6	0	0	2530-009302712



7.3.2 Federal specifications, standards, and handbooks may be obtained from the Defense Automated Printing Service, DODSSP, Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

ZZ-T-410	-	Tires, Pneumatic, Industrial
FED-STD-H28	-	Screw-Thread Standards for Federal Services
FED-STD-595	-	Colors Used in Government Procurement

FED-STD-595 with color samples, fan deck, individual color chips, and sets of color chips are for sale by the General Services Administration at the following address:

General Services Administration  
Federal Supply Service Bureau  
Specification Section  
Suite 8100  
470 East L'Enfant Plaza, SW  
Washington, DC 20407

7.3.3 The Tire and Rim Association (TRA) Standards are included in the Tire and Rim Association Yearbook, which may be obtained from The Tire and Rim Association, Inc., 175 Montrose Avenue W., Copley, OH 44321.

7.3.4 National Aerospace Standards may be obtained from the Aerospace Industries Association of America, 1250 Eye St. NW, Suite 1100, Washington, DC 20005.

NASM24665	-	Pin, Cotter (Split)
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#### MILITARY INTERESTS:

##### Custodians:

Army - AT  
Air Force - 99  
DLA - CC

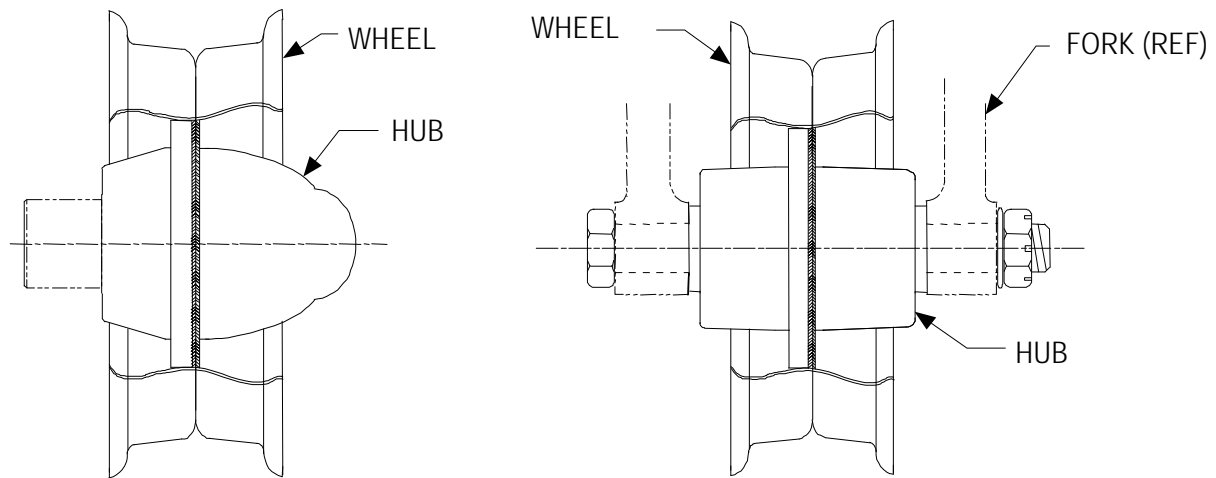
Preparing activity:  
DLA - CC

(DoD Project 2530-0396-01)

##### Review activity:

Air Force - 84

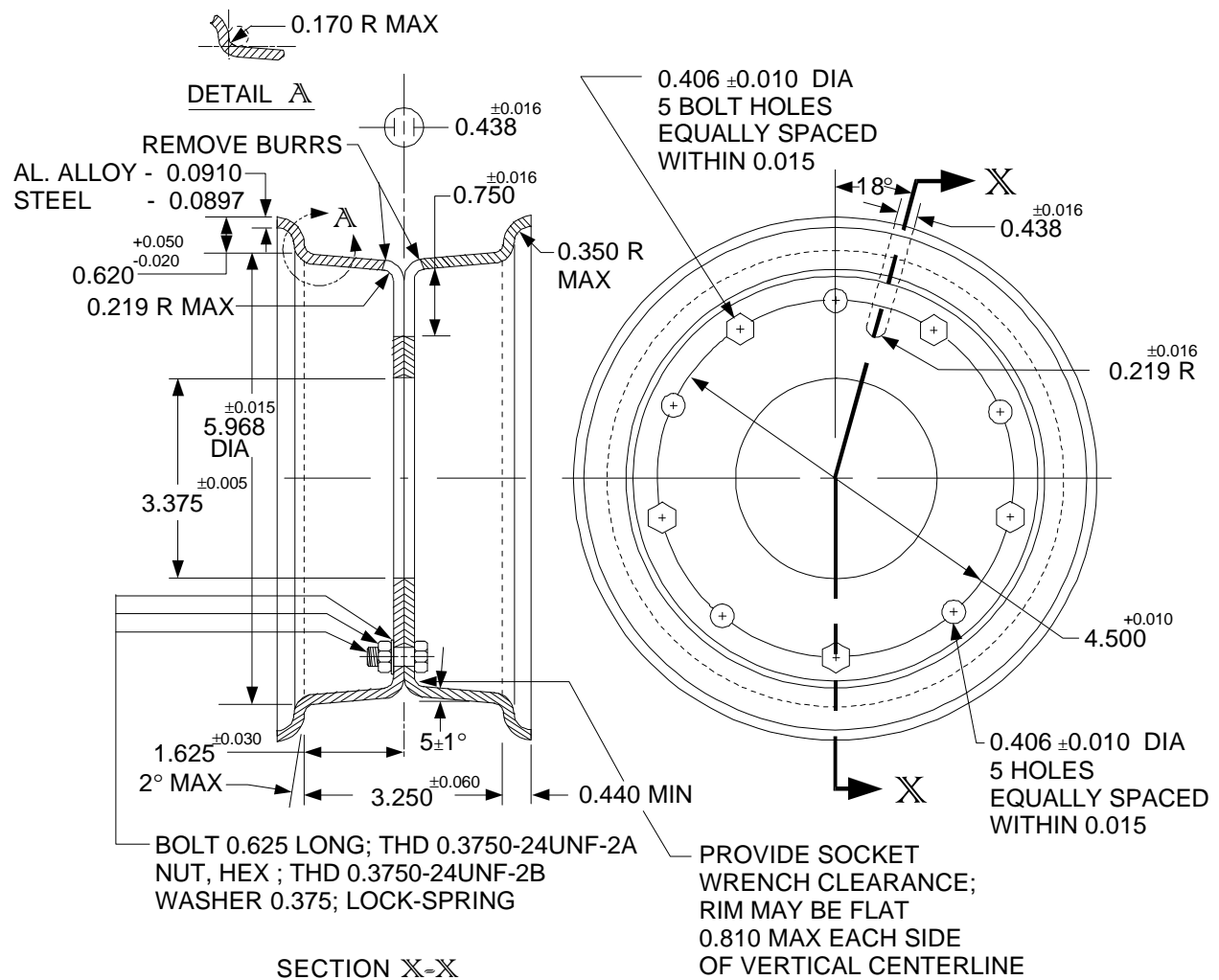
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Type I, cantilever mounting

Type II, fork mounting

FIGURE 1. Wheel and hub assembly types

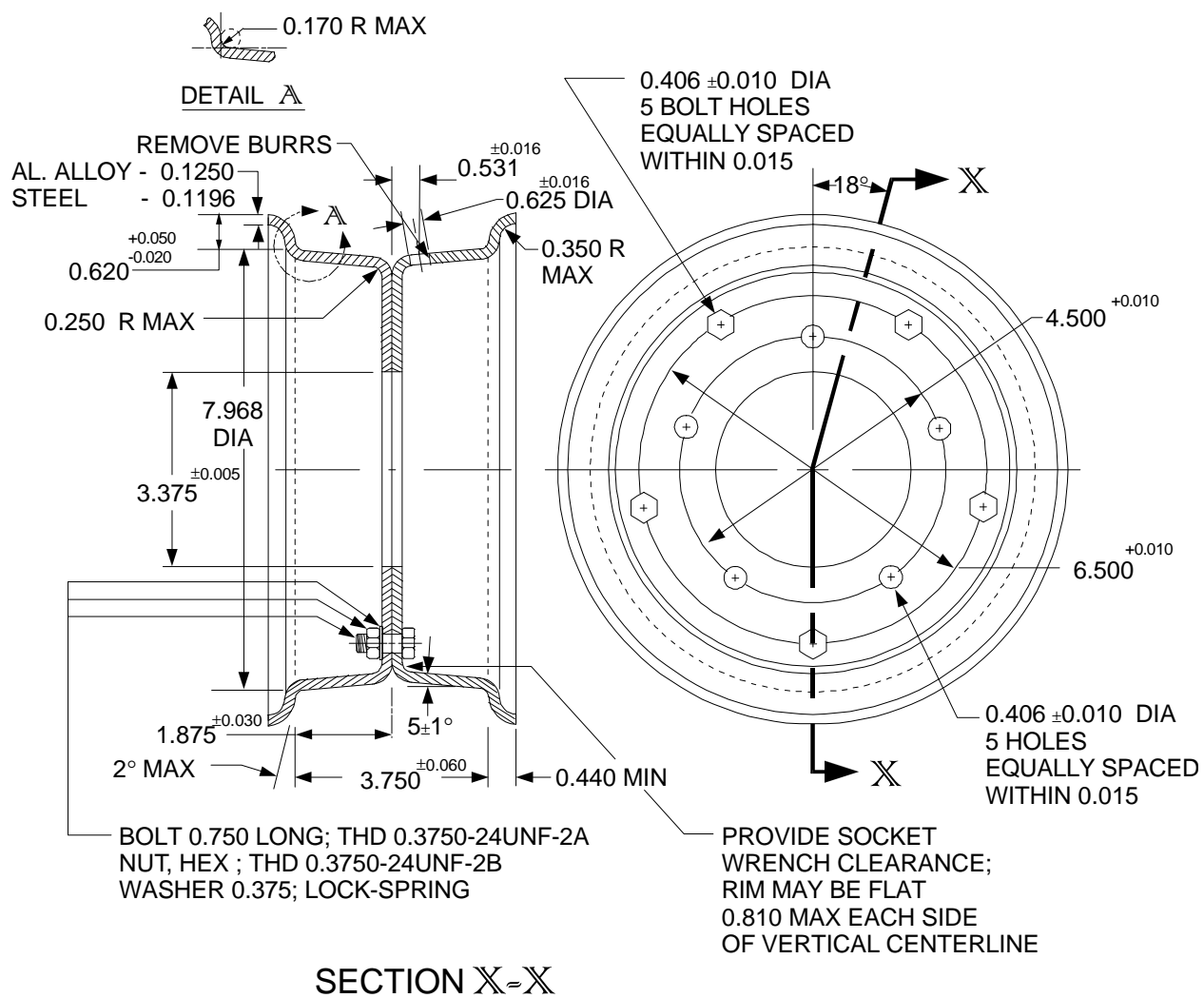


## NOTES:

1. All dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.020$ .
2. Wheels shall fit hubs shown on figures 6 and 8.
3. Material: AA59494-0A0, steel;  
AA59494-0B0, aluminum alloy.

FIGURE 2. Wheel, pneumatic tire, 3.50-6

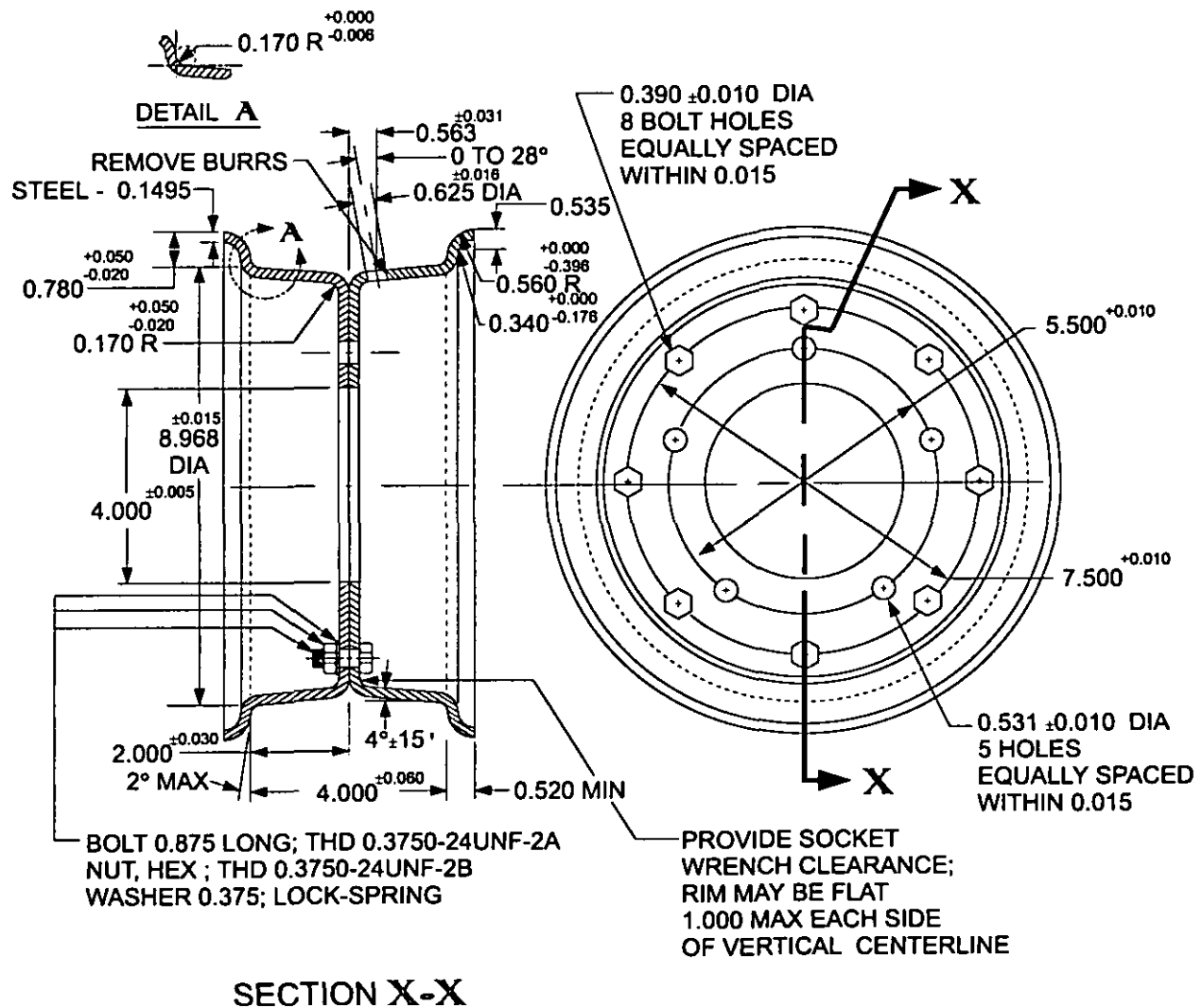
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## NOTES:

1. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.020$ .
2. Wheels shall fit hubs shown on figures 6 and 8.
3. Material: AA59494-0C0, steel;  
AA59494-0D0, aluminum alloy.

FIGURE 3. Wheel, pneumatic tire, 4.00-8

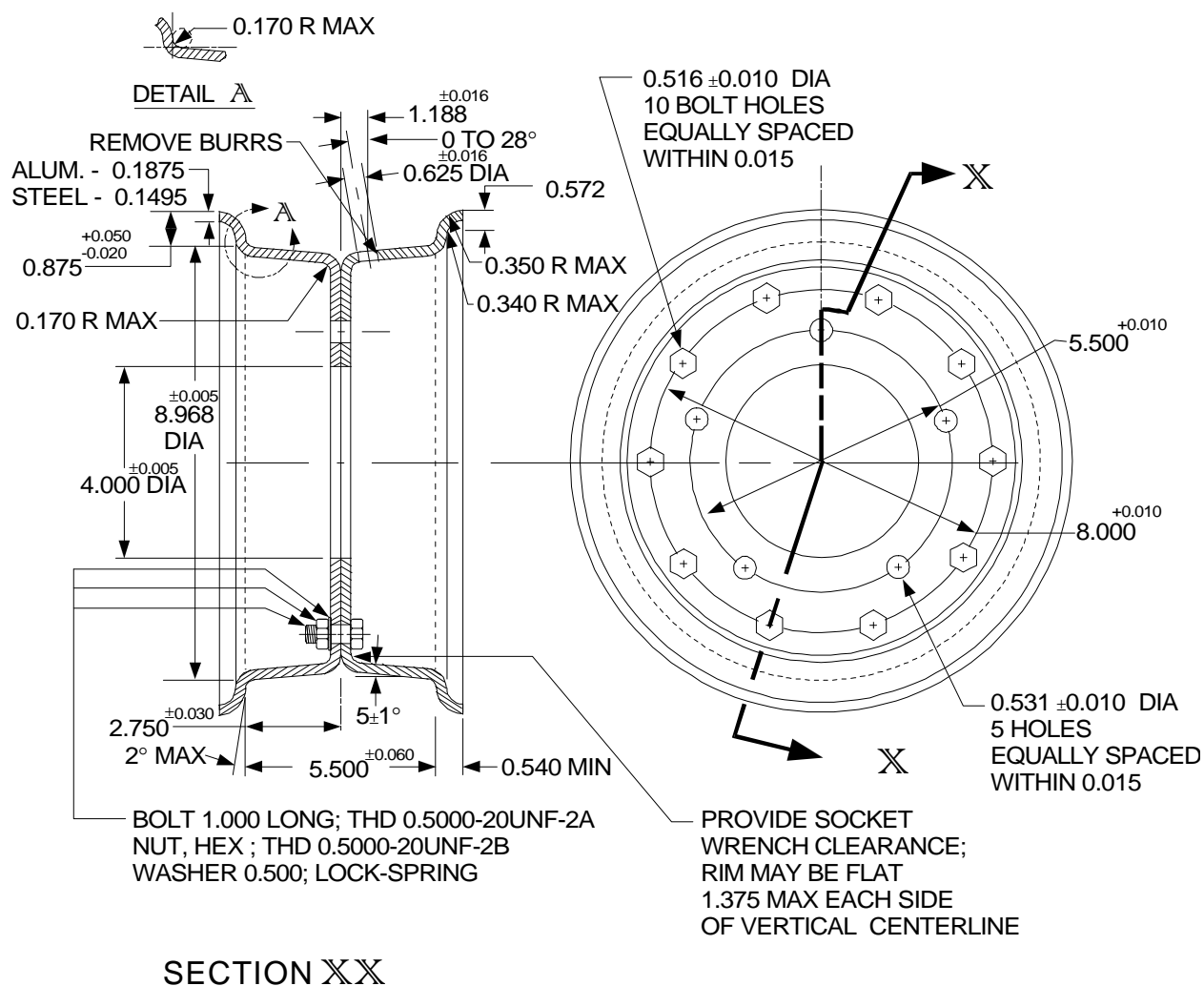


## NOTES:

1. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.020$ .
2. Wheels shall fit hubs shown on figures 7 and 9.
3. Material: AA59494-0E0, steel.

FIGURE 4. Wheel, pneumatic tire, 6.00-9

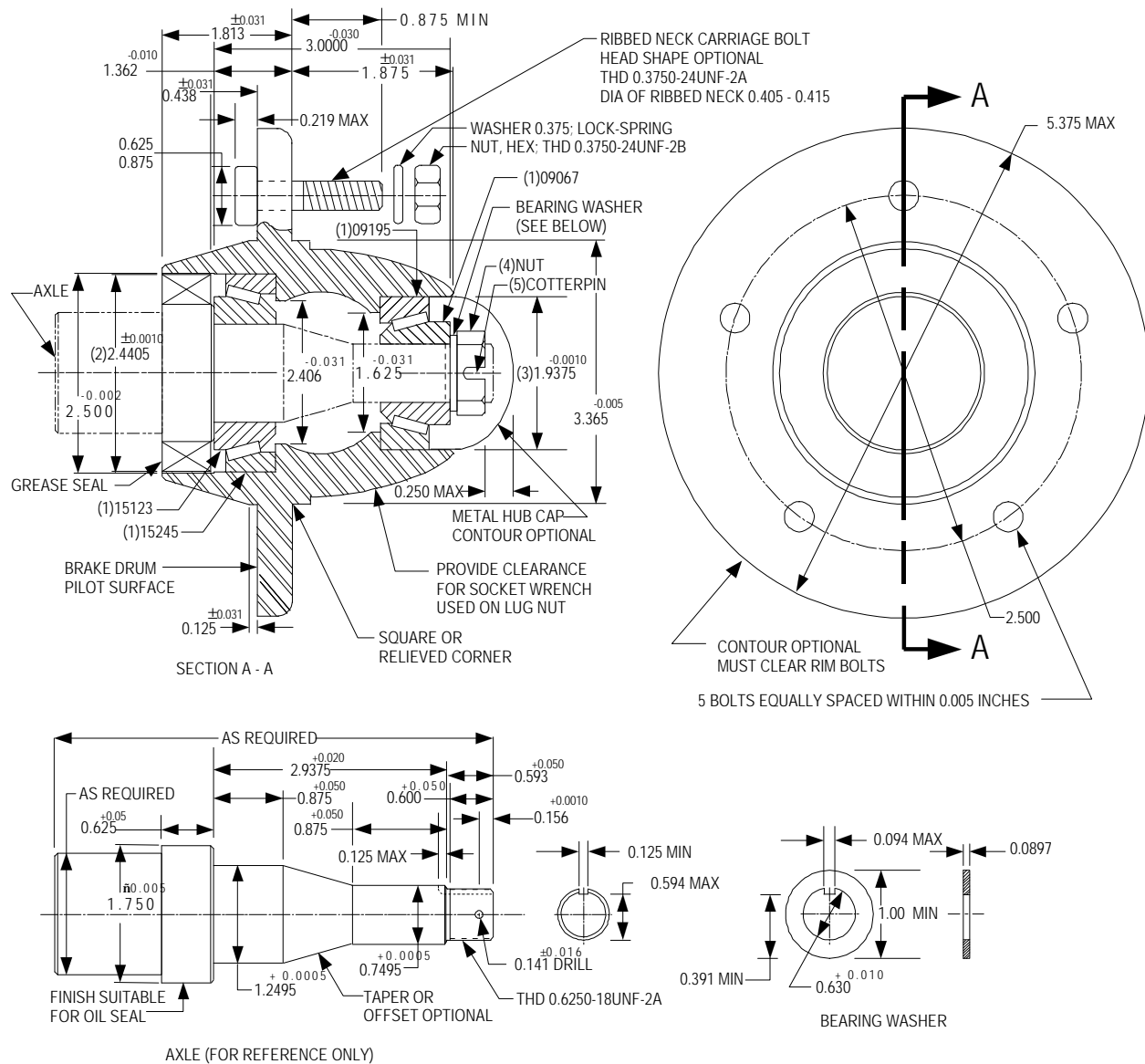
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NOTES:

1. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.020$ .
2. Wheels shall fit hubs shown on figures 7 and 9.
3. Material: AA59494-0F0, steel;  
AA59494-0G0, aluminum alloy.

FIGURE 5. Wheel, pneumatic tire, 7.50-10 or 9.00-10

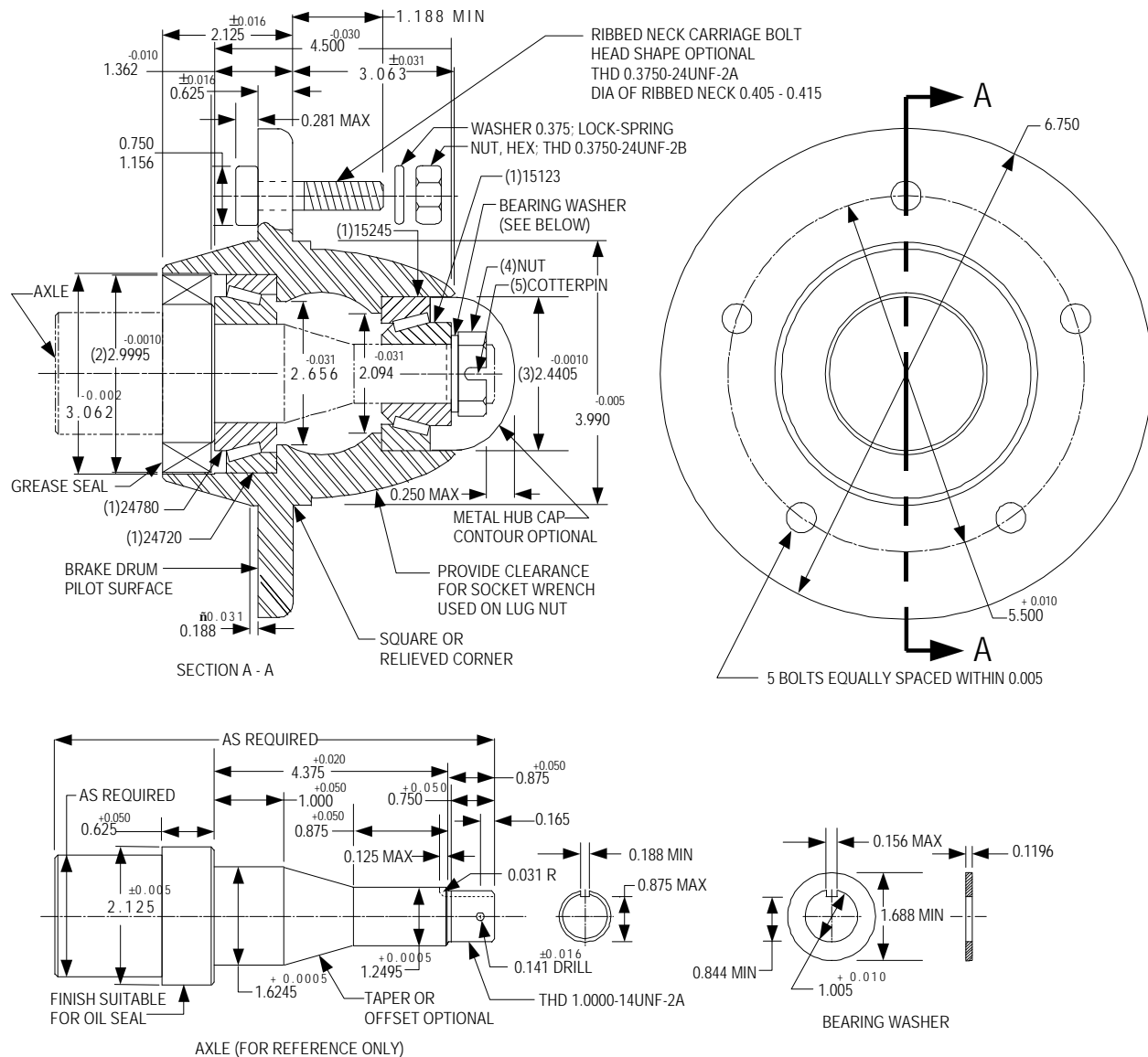


## NOTES:

1. Timken Company roller PIN denoted, or equal.
2. Dimension shown is for steel or cast iron hub. For aluminum, use 2.4386, +0.0000, -0.0010.
3. Dimension shown is for steel or cast iron hub. For aluminum, use 1.9361, +0.0000, -0.0010.
4. Nut, castellated, steel, thread 0.6250-18UNF-3B, zinc plated.
5. Cotterpin, 0.1250 (nominal) diameter.
6. Hub shall fit wheels shown on figures 2 and 3.
7. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.010$ .
8. Material: AA59494-100, steel, cast iron, or aluminum alloy.

FIGURE 6. Hub assembly, cantilever mounting, for 3.50-6 or 4.00-8 wheels

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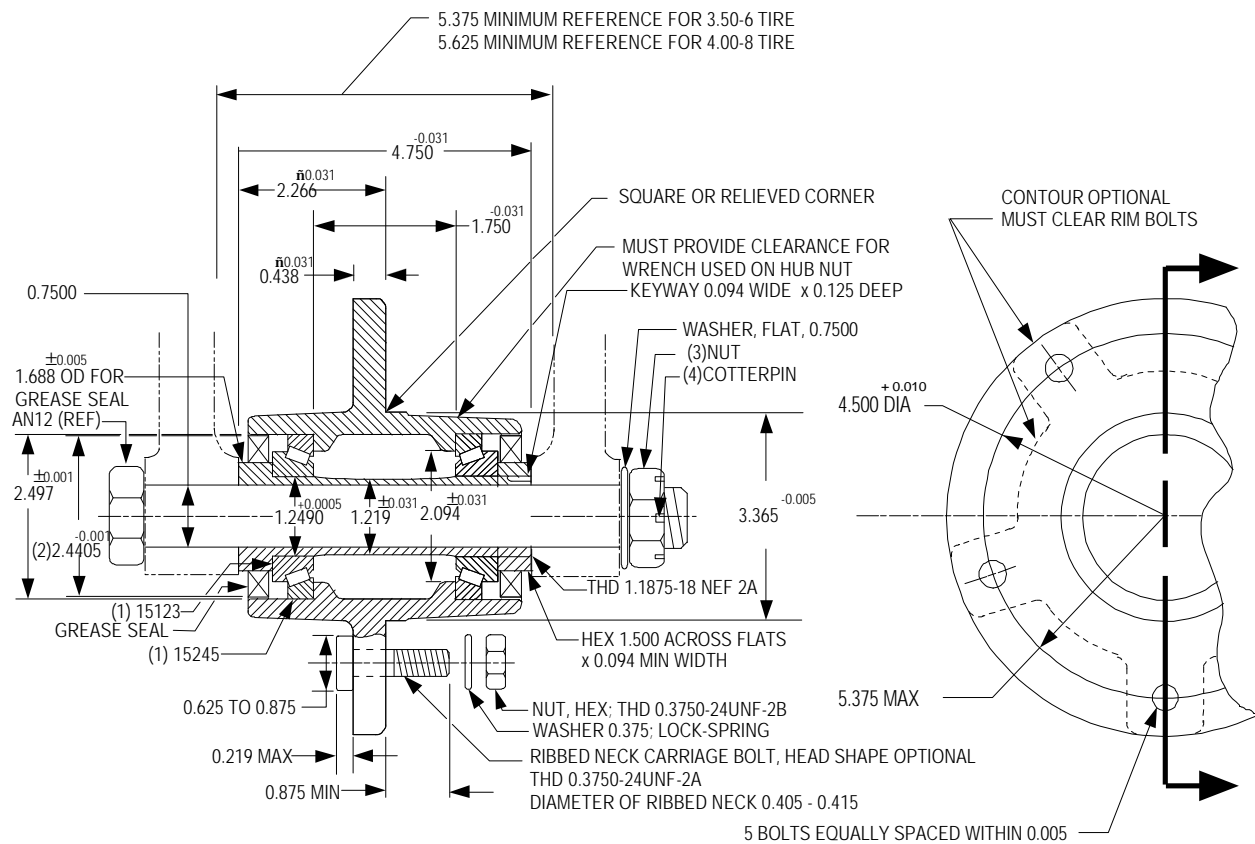


# NOTES:

1. Timken Company roller PIN denoted, or equal.
2. Dimension shown is for steel or cast iron hub. For aluminum, use 2.9985, +0.0000, -0.0010.
3. Dimension shown is for steel or cast iron hub. For aluminum, use 2.4395, +0.0000, -0.0010.
4. Nut, castellated, steel, thread 1.0000-14UNF-3B, zinc plated.
5. Cotterpin, 0.1250 (nominal).diameter
6. Hub shall fit wheels shown on figures 4 and 5.
7. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.010$ .
8. Material: AA59494-200, cast or fabricated steel or cast or malleable iron;  
AA59494-300, aluminum alloy.

FIGURE 7. Hub assembly, cantilever mounting, for 6.00-9, 7.50-10, and 9.00-10 wheels



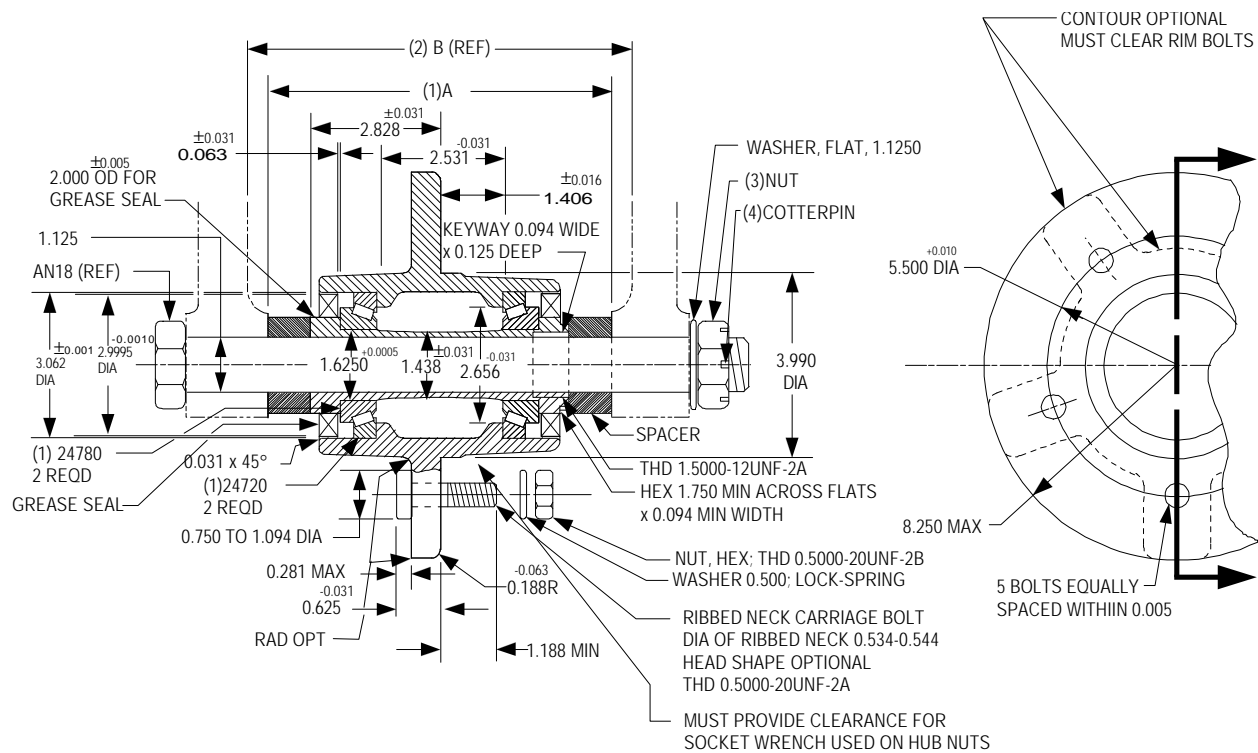


## NOTES:

1. Timken Company roller PIN denoted, or equal.
2. Dimension shown is for steel or cast iron hub. For aluminum, use 2.4386, +0.0000, -0.0010.
3. Nut, castellated, steel, thread 0.7500-18UNF-3B, zinc plated.
4. Cotterpin, 0.1250 (nominal) diameter.
5. Hub shall fit wheels shown on figures 2 and 3.
6. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.010$ .
7. Material: AA59494-400, steel, cast iron, or aluminum alloy.

FIGURE 8. Hub assembly, fork mounting, for 3.50-6 and 4.00-8 wheels

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# NOTES:

1. A dimension:  $7.375 \pm 0.031$  for AA59494-500;  $6.000 \pm 0.031$  for AA59494-600.
2. B dimension: 8.125 for AA59494-500; 7.000 for AA59494-600.
3. Timken Company roller PIN denoted, or equal.
4. Nut, castellated, steel, thread 1.1250-12UNF-3B, zinc plated.
5. Cotterpin, 0.1250 (nominal) diameter.
6. Dimension shown is for steel or cast iron hub. For aluminum, use 2.9970,  $+0.0000$ ,  $-0.0010$ .
7. AA59494-500 (with spacers) shall fit wheels shown on figure 5.  
AA59494-600 (without spacers) shall fit wheels shown in figure 4.
8. Dimensions are in inches. Unless otherwise specified, tolerances are  $\pm 0.010$ .
9. Material: AA59494-500 and AA59494-600, steel, cast iron, or aluminum alloy.

FIGURE 9. Hub assembly, fork mounting for 6.00-9 and 7.50-10 wheels