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Metric Ball Joints		

RATIONALE

The technical report covers general technology, products, or processes for Metric Ball Joints. Manufacturers should be consulted for specific design considerations with respect to application and usage.

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1. Scope

- 1.1 This SAE Standard covers the general and dimensional data for industrial quality ball joints commonly used on control linkages in metric automotive, marine, construction, and industrial equipment applications.
- 1.2 The ball joints described are available from several manufacturers within the range of the interchangeable specifications. The sliding contact self-aligning bearing members (ball and socket) are available in a variety of materials in the types shown. The load capacities and wear capabilities vary considerably with the design and fabrication. It is suggested that the manufacturers be consulted for recommendations for the type and design appropriate to particular applications.
- 1.3 The inclusion of dimensional data in the document is not intended to imply that all the products described are stock production sizes. Consumers are requested to consult with manufacturers concerning availability of stock production parts.

2. References

- 2.1 **Applicable Documents**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE Publications shall apply.
- 2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
SAE J490—Ball Joints
- 2.1.2 ANSI AND ISO PUBLICATIONS—Available from ANSI, 11 West 42nd Street, New York, NY 10036.
ANSI/ASME B1.13—Metric Screw Threads—M Profile
ISO 965-2—ISO general purpose metric screw threads—Tolerances—Part 2: Limits of sizes for general purpose bolt and nut threads—Medium quality
- 2.1.3 ASTM PUBLICATION—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.
ASTM B 117—Method of Salt Spray (Fog) Testing

3. **Dimensions**

- 3.1 All dimensions and tolerances are in millimeters. See SAE J490 for the ball joint specification with unified threads.
- 3.2 Tabulated dimensions shall apply to the finished parts, plated or otherwise processed, as specified by the user. Limits on hexagon of round bar shapes shall be within the commercial tolerance of the bar stock material from which the components are produced.
- 3.3 Dimensions of ball joints are shown in Figures 1, 2, and 3.
- 3.4 **Nominal Sizes**—The ball joint sizes are specified by a number indicating the thread size (size 6 has M6 threads).
- 3.5 **Threads**
- 3.5.1 Thread form, diameter, and associated pitches are in accordance with ISO 965-2 and ANSI/ASME B1.13, tolerance class 6g external and 6H internal.
- 3.5.2 The threads shall be right hand unless otherwise specified. The threads must be chamfered to insure a clean start according to good industrial practice.

4. **Material and Finishes**

- 4.1 Ball joints are normally made from low carbon free machining steel. The ball stud and the ball sockets on Type A Style 2 ball joints shall be case hardened unless otherwise specified. For special application, ball joints can be produced from alloy steel, corrosion resistant steel, brass, bronze, or other materials.
- 4.2 Retainer clips shall be made of high carbon steel. Springs shall be stainless steel.
- 4.3 Unless otherwise specified, carbon steel ball joints shall be furnished with a zinc protective finish with subsequent chromate treatment and shall meet the requirements of 72 h salt spray test in accordance with ASTM B 117.
- 4.3.1 Plated, hardened carbon steel components of ball joints (subject to hydrogen embrittlement) shall be baked or otherwise processed to obviate such embrittlement.

5. **Lubrication**

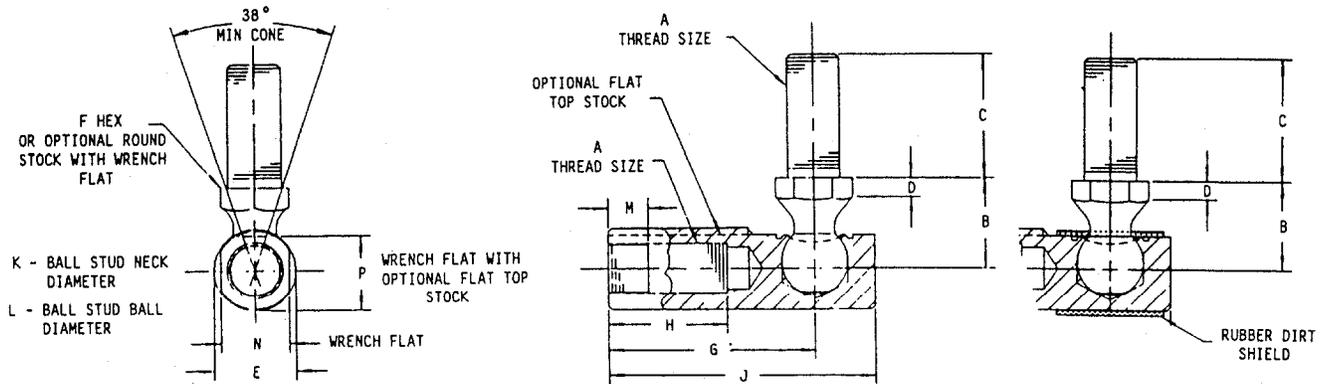
- 5.1 Unless otherwise specified by the user, ball joints shall be supplied with ball sockets suitably lubricated in accordance with the manufacturer's practice.

6. **Dust Covers**

- 6.1 Where so specified by the user, Type G Style 1 ball joints shall be supplied with an oil resistant rubber shield of such construction as to prevent dirt and dust from entering the ball cavity.

7. **Workmanship**

- 7.1 Ball joints must be free from burrs, loose scale, sharp edges, and any other defects which might affect their serviceability.



Size	A Thread Size	B ±0.5	C ±0.5	D MIN	D ₁ MAX	E MAX	F MAX	G ±0.5	H MIN	J MAX	K MIN	L NOM	M ±0.5	N -0.25	P ±0.25
5	M5X0.8	9.0	11.0	2.4	3.0	10	8	22.0	12	30	4.25	7.60	6.5	8	8
6	M6X1	10.5	14.5	2.0	3.0	12	10	24.5	13	34	5.05	8.75	6.5	9	9
8	M8X1.25	12.5	17.5	2.4	3.5	13	13	28.5	15	40	6.10	10.25	7.0	11	11
10	M10X1.5	16.0	22.0	3.6	4.0	16	13	35.0	20	47	7.10	12.45	8.0	12	14
12	M12X1.75	20.5	28.5	4.4	4.5	20	16	49.0	28	64	9.45	15.60	9.5	16	16

FIGURE 1—DIMENSIONS OF TYPE A NONDETACHABLE BALL JOINT

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