

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J543

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Submitted for recognition as an American National Standard

(R) STARTING MOTOR PINIONS AND RING GEARS

Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

1. Scope—The scope of this document is to provide uniform guidelines for the application of starter motor pinions and ring gears. SAE J543 contains guidelines for the use of diametral pitch gearing. The pinion data shown are based on the Fellows stub tooth system. Refer to ISO 8123, ISO 9457-1, and ISO 9457-2 for module gearing, and corresponding metric dimensions.

2. References

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein.

2.1.1 ISO PUBLICATIONS—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 8123—Diametral pitch starter motor pinions

ISO 9457-1—Road vehicles—Metric starter motor pinions—Part 1: Currently used pinions

ISO 9457-2—Road vehicles—Metric starter motor pinions—Part 2: Pinions with 20 degree pressure angle

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3. **Calculations for Spur Gears**—Table 1 and Figures 1 to 3 are to be used as a guide in establishing starter motor pinions and ring gear designs. Consult the gear manufacturer for detail dimensions.

TABLE 1—SPUR GEAR DIMENSIONS

P1/P2 ⁽¹⁾	P.A. (deg)	N1/N2	O.D. MAX. (in)	P.D. THEO. (in)	P.D. LAYOUT (in)	R.D. MAX. ⁽²⁾ (in)	HT (in)	C.T.T MAX. ⁽³⁾ (in)	W2 MAX. (in)
12/14	12	10.48/9	1.016	0.750	0.873	0.695	0.1607	0.161	0.416
10/12	20	10/9	1.167	0.900	1.000	0.789	0.1890	0.188	0.484
10/12	20	10/9	1.167	0.900	1.000	0.789	0.1890	0.187	0.485
10/12	20	12/11	1.367	1.100	1.200	0.989	0.1890	0.187	0.486
10/12	20	13/12	1.467	1.200	1.300	1.089	0.1890	0.187	0.488
8/10	20	10/9	1.450	1.125	1.250	1.000	0.2250	0.245	0.615
8/10	20	11/10	1.575	1.250	1.375	1.125	0.2250	0.245	0.617
8/10	20	12/11	1.700	1.375	1.500	1.250	0.2250	0.245	0.618
8/10	20	13/12	1.825	1.500	1.625	1.375	0.2250	0.245	0.619
8/10	20	14/13	1.950	1.625	1.750	1.525	0.2125	0.244	0.622
6/8	20	12/11	2.240	1.833	2.000	1.688	0.2760	0.317	0.814

1. The two diametral pitch gear data are based on Fellows stub tooth system.
2. If larger root diameter is desired, consult gear manufacturers.
3. Circular Tooth Thickness.