AMERICAN GEAR MANUFACTURERS ASSOCIATION

Inspection Practices - Gear Blanks, Shaft Center Distance and Parallelism

AGMA 915-3-A99

AGMA INFORMATION SHEET

(This Information Sheet is NOT an AGMA Standard)

American Gear Manufacturers Association

Inspection Practices - Gear Blanks, Shaft Center Distance and Parallelism
AGMA 915-3-A99
ISO/TR 10064-3:1996 (MOD)

Approved May 20, 1999

ABSTRACT

This information sheet provides the description of recommended numerical values relating to the inspection of gear blanks, shaft center distance and parallelism of shaft axes.

Published by

American Gear Manufacturers Association
1500 King Street, Suite 201, Alexandria, Virginia 22314

Printed in the United States of America

ISBN: 1-55589-738-X

Contents

Tables

Figures

Foreword

[The foreword, footnotes and annexes, if any, in this document are provided for informational purposes only and are not to be construed as a part of AGMA Information Sheet 915–3–A99, *Inspection Practices – Gear Blanks, Shaft Center Distance and Parallelism.*]

In the course of revising ANSI/AGMA 2000–A88, *Gear Classification and Inspection Handbook – Tolerances and Measuring Methods for Unassembled Spur and Helical Gears*, the AGMA Inspection Handbook Committee agreed that the ISO information from ISO/TR 10064–3:1996, relative to the inspection of gear blanks, shaft center distance and parallelism of axes should be published under separate cover as an AGMA Information Sheet.

For the general replacement of ANSI/AGMA 2000–A88, a system of documents as listed below, together with this information sheet, has been established:

- AGMA 915–1–AXX, *Inspection Practices for Cylindrical Gears – Tangential Measurements*
- AGMA 915–2–AXX, *Inspection Practices for Cylindrical Gears – Radial Measurements*
- AGMA 915–4–AXX, *Inspection Practices – Recommendations Relative to Surface Texture*
- AGMA 2015–1–AXX, *Accuracy Classification System for Cylindrical Gears – Tangential Measurements*
- AGMA 2015–2–AXX, *Accuracy Classification System for Cylindrical Gears – Radial Measurements*

ISO/TR 10064–3:1996 was prepared by ISO Technical Committee TC 60, Gears.

AGMA 915–3–A99 is not identical to ISO/TR 10064–3:1996, *Cylindrical gears – Code of inspection practice – Part 3: Recommendations relative to gear blanks, shaft centre distance and parallelism of axes.* It was agreed to be sent directly to committee comment in May of 1998, after project approval by the TDEC. The Committee, during comment resolution, made the following changes to the original ISO Technical Report:

- Addition of reference to ISO 1101 in clause 4;
- Changed the wording of the first paragraph of 4.3;
- Revised figure 4, reversing the datum and runout callouts;
- Changed 4.11 and figure 5, replacing datum surfaces with reference bands.

The Committee decided that these changes were sufficient enough to require an additional committee comment in February, 1999.

It was approved by the AGMA Technical Division Executive Committee on May 20, 1999.

Suggestions for improvement of this standard will be welcome. They should be sent to the American Gear Manufacturers Association, 1500 King Street, Suite 201, Alexandria, Virginia 22314.

PERSONNEL of the AGMA Inspection and Handbook Committee

Chairman Classification Section: E. Lawson . . . . . Mahr Corporation
Chairman Measurement Section: R.E. Smith . . . . . R. E. Smith & Company, Inc.

ACTIVE MEMBERS

W.A. Bradley . . . . Consultant
D.R. Choiniere . . Profile Engineering, Inc.
J. Clatworthy . . . . Fassler AG
B.L. Cox . . . . . Lockheed Martin Energy Sys.
T.C. Glasener . . . Xtek, Incorporated
G.G. Grana . . . . . The Gleason Works
D. Heinrich . . . . . Xtek, Incorporated
B. Hofrichter . . . . Arrow Gear Company
I. Laskin . . . . . Consultant
S. Lindley . . . . . The Falk Corporation
D.A. McCarroll . . ZF Industries
D.R. McVittie . . . . Gear Engineers, Inc.
L.J. Smith . . . . . Invincible Gear Company

ASSOCIATE MEMBERS

M. Antosiewicz . . The Falk Corporation
M.J. Barron . . . . . Oliver Gear, Inc.
R.E. Brown . . . . . Caterpillar, Inc.
M.K. Considine . . Considine Associates
R. Considine . . . . Considine Associates
J.S. Cowan . . . . . Eaton Corporation
M.E. Cowan . . . . M&M Precision Systems Corp.
B. Cowley . . . . . Mahr Corporation
C. Dick . . . . . The Horsburgh & Scott Co.
H.D. Dodds . . . . . Caterpillar, Inc.
R. Green . . . . . Eaton Corporation
D. Gregory . . . . . Gear Products, Inc.
B. Gudates . . . . . Fairfield Manufacturing Co., Inc.
J.S. Hamilton . . . Regal-Beloit Corporation
H. Harary . . . . . NIST
G. Henriot . . . . . Consultant
J. Horwell . . . . . Brown & Sharpe Mfg. Corp.
S. Johnson . . . . . The Gear Works - Seattle, Inc.
T. Klemm . . . . . Liebherr Gear Technology Co.
D.E. Kosal . . . . . National Broach & Machine Co.
J. Koshiol . . . . . Columbia Gear Corp.
W.E. Lake . . . . . Focus Tech. - Gear Mfg & Met.
A.J. Lemanski . . . Penn State University
G.A. Luetkemeier Rockwell Automation/Dodge
J. Marfice . . . . . Caterpillar, Inc.
D. Matzo . . . . . Northwest Gears, Inc.
M. May . . . . . The Gleason Works
P.A. McNamara . Caterpillar, Inc.
W.J. Michaels . . . Sundstrand Corporation
M. Milam . . . . . Amarillo Gear Company
T. Miller . . . . . The Cincinnati Gear Co.
M. Nanlawala . . . IIT Research Institute
M. Octrue . . . . . CETIM
T. Okamoto . . . . . Nippon Gear Company, Ltd.
J.A. Pennell . . . . . Univ. of Newcastle-Upon-Tyne
K.R. Price . . . . . Eastman Kodak Company
R.S. Ramberg . . . The Gear Works - Seattle, Inc.
V.Z. Rychlinski . . Brad Foote Gear Works, Inc.
D.H. Senkfor . . . . Precision Gear Company
S. Shariff . . . . . PMI Food Equipment Group
E.L. Storm . . . . . Consultant
T. Waldie . . . . . Philadelphia Gear Corporation
R.F. Wasilewski . Arrow Gear Company
F.M. Young . . . . . Forrest City Gear Company
P. Zwart . . . . . Caterpillar, Inc.

(This page is intentionally left blank.)

American Gear Manufacturers Association –

Inspection Practices – Gear Blanks, Shaft Center Distance and Parallelism

1 Scope

This information sheet provides recommended values for dimensional deviations on blanks, center distance and parallelism of axes of gears.

Numerical values given in this document are not to be regarded as strict ISO and AGMA quality criteria, but may serve as a guide for mutual agreements, for ferrous components.

2 References

The following standards contain provisions which are referenced in the text of this AGMA information sheet. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

ISO 53: 1998, *Cylindrical gears for general and heavy engineering – Basic rack.*

ISO 54: 1996, *Cylindrical gears for general engineering and for heavy engineering – Modules.*

ISO 286-1:1988, *ISO system of limits and fits – Part 1: Bases of tolerances, deviations and fits.*

ISO 1101:1983, *Technical drawings – Geometrical tolerancing – Tolerancing of form orientation, location and run-out – Generalities, definitions, symbols, indications on drawings.*

ISO 1328-1:1995, *Cylindrical gears – ISO System of accuracy – Definitions and allowable values of deviations relevant to corresponding flanks of gear teeth.*

ISO 1328-2:1996, *Cylindrical gears – ISO System of accuracy – Definitions and allowable values of deviations relevant to radial composite deviations and runout information.*

3 Symbols and definitions

3.1 Symbols

Symbols used for deviations of individual element measurements are composed of lower case letters, such as "f", with subscripts, whereas symbols used for "total" deviations, which may represent combinations of several individual element deviations, are composed of capital letters, such as "F", also with subscripts, see table 1.

NOTE: The symbols and definitions used in this information sheet may differ from other AGMA standards. The user should not assume that familiar symbols can be used without a careful study of their definitions.

Table 1 – Symbols and terms

Symbol	Definition	Units
a	Center distance	mm
b	Face width	mm
D_d	Diameter of datum surface	mm
$f_{\Sigma\delta}$	Shaft parallelism in-plane deviation	μm
$f_{\Sigma\beta}$	Shaft parallelism out-of-plane deviation	μm
F_β	Total helix deviation of gear teeth	μm
F_p	Total cumulative pitch deviation of gear teeth	μm
L	Larger shaft bearing span distance	mm
n	Number of links in a tolerance chain	--