RUBBER manufacturers association

MPTA

POWER TRANSMISSION BELT TECHNICAL BULLETIN (IP-3-17)

Approved: 2006

1400 K Street, N.W. / Washington, D.C. 20005 / Tel. (202) 682-4800 / Fax (202) 682-4854 / www.rma.org

POWER TRANSMISSION BELTS -- STANDARD SYMBOLS

Introduction

The following symbols have been established for use in power transmission belt standards, technical bulletins, and Technical Committee documents. The symbols reflect domestic practice in existing standards or standards under development for V-belts, V-ribbed, and synchronous belts. In the case of synchronous belts, the symbols also reflect ISO wherever possible (reference ISO 5296).

The information included in this bulletin was formerly presented in RMA/Document No. 5, 1992.

The symbols in this document are listed alphabetically.

RMA Power Transmission Belt Standard Symbols

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	Metric
A	Angle, Twist or Non-Alignment of Drives	degree (º)	degree (º)
AL_e	Length, Arc, Effective	inch (in/”)	millimeter (mm)
AL_p	Length, Arc, Pitch	inch (in/”)	millimeter (mm)
2a	Diameter Differential, Effective to Pitch	inch (in/”)	millimeter (mm)
$2a_p$	Diameter Differential, Outside to Pitch	inch (in/”)	millimeter (mm)
2av	Diameter Variation, Pitch	inch (in/”)	millimeter (mm)
b	Width, Keyway	inch (in/”)	millimeter (mm)
b_b	Width, Top of Belt, Nominal	inch (in/”)	millimeter (mm)
b_d	Width, Groove, Datum	inch (in/”)	millimeter (mm)
b_e	Width, Groove, Effective	inch (in/”)	millimeter (mm)
b_f	Width, Inside Flanges of Synchronous Pulley, Minimum	inch (in/”)	millimeter (mm)

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	Metric
b'_f	Width, Face of Synchronous Pulley, Unflanged, Minimum	inch (in/”)	millimeter (mm)
b_g	Width, Top of V-Groove also variable speed grooves (Flanges in Closed Position)	inch (in/”)	millimeter (mm)
b_{go}	Width, Top of Variable Speed Groove (Flanges in Open Position)	inch (in/”)	millimeter (mm)
b_r	Width, Bottom of Synchronous Rack Form	inch (in/”)	millimeter (mm)
C	Center Distance, Between Pulleys or Sheaves	inch (in/”)	millimeter (mm)
CL	Clearance, Between Bottom of Belt and Groove	inch (in/”)	millimeter (mm)
C_m	Clearance, Between Flanks of Synchronous Belt and Measuring Pulley	inch (in/”)	millimeter (mm)
D_d	Diameter, Larger Pulley or Sheave, Datum	inch (in/”)	millimeter (mm)
D_p	Diameter, Larger Pulley or Sheave, Pitch	inch (in/”)	millimeter (mm)
D_e	Diameter, Larger Pulley or Sheave, Effective	inch (in/”)	millimeter (mm)
D_F	Diameter, Fixed Pitch Sheave, Pitch	inch (in/”)	millimeter (mm)
DN	Pulley or Sheave, DriveN		
DN_1	Pulley or Sheave, DriveN, First		
DN_2(etc.)	Pulley or Sheave, DriveN, Second, Etc.		
DR	Pulley or Sheave, DriveR		
D_{vp}	Diameter, Variable Pitch Sheave, Pitch	inch (in/”)	millimeter (mm)
D_o	Diameter, Larger Pulley or Sheave, Outside	inch (in/”)	millimeter (mm)
d_B	Diameter, Ball or Rod, Groove Measuring	inch (in/”)	millimeter (mm)

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	**Metric**
d_d	Diameter, Smaller Pulley or Sheave, Datum	inch (in/”)	millimeter (mm)
d_e	Diameter, Smaller Pulley or Sheave, Effective	inch (in/”)	millimeter (mm)
d_o	Diameter, Smaller Pulley or Sheave, Outside	inch (in/”)	millimeter (mm)
d_p	Diameter, Smaller Pulley or Sheave, Pitch	inch (in/”)	millimeter (mm)
e	Offset, Quarter-Turn Drive	inch (in/”)	millimeter (mm)
F	Width, Face of Pulley or Sheave	inch (in/”)	millimeter (mm)
F_a	Width, Overall Face Width of Adjustable Pulley or Sheave	inch (in/”)	millimeter (mm)
F_b	Width, Band of Belts	inch (in/”)	millimeter (mm)
F_f	Width, Overall Face Width of Fixed Pitch Pulley or Sheave	inch (in/”)	millimeter (mm)
g	Angle, Belt Entry into Sheave Groove	degree (º)	degree (º)
h_b	Thickness, Belt, Nominal	inch (in/”)	millimeter (mm)
h_{bb}	Thickness, Joined V-Belt, Nominal	inch (in/”)	millimeter (mm)
$2h_d$	Diameter Differential, Datum (Nomenclature) to Outside	inch (in/”)	millimeter (mm)
$2h_e$	Diameter Differential, Effective to Outside	inch (in/”)	millimeter (mm)
h_g	Depth, V-Groove	inch (in/”)	millimeter (mm)
h_{gv}	Depth, Top of V-Groove to Hub (Variable Speed Movable Flange Sheaves)	inch (in/”)	millimeter (mm)
h_r	Depth, Tooth of Synchronous Rack Form	inch (in/”)	millimeter (mm)
h_s	Thickness, Synchronous Belt, Overall	inch (in/”)	millimeter (mm)

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	Metric
h_{sd}	Thickness, Double Sided Synchronous Belt Overall	inch (in/”)	millimeter (mm)
h_t	Height, Synchronous Belt Tooth	inch (in/”)	millimeter (mm)
K_f	Factor, Length-Flex Correction		
K_L	Factor, Belt Length Correction		
K_M	Factor, Static Tension		
K_{SR}	Factor, Speed Ratio		
K_Y	Factor, Deflection Force		
K_S	Factor, Service		
K_Z	Factor, Teeth in Mesh of Synchronous Belt		
K_θ	Factor, Arc of Contact Correction		
L_d	Length, Datum	inch (in/”)	millimeter (mm)
L_e	Length, Effective	inch (in/”)	millimeter (mm)
L_i	Length, Inside	inch (in/”)	millimeter (mm)
L_o	Length, Outside	inch (in/”)	millimeter (mm)
L_p	Length, Pitch	inch (in/”)	millimeter (mm)
L_s	Length, Span	inch (in/”)	millimeter (mm)
N_b	Belts, Number on Drive		
N_g	Grooves, Number in Pulley or Sheave		
n	Pulley or Sheave, Number on Drive		
P	Power, Required	horsepower (hp)	kilowatt kW

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	**Metric**
P_b	Pitch, Synchronous Belt and Pulley	inch (in/”)	millimeter (mm)
P_d	Power, Design	horsepower (hp)	kilowatt kW
P_r	Power, Uncorrected Rating Per Belt	horsepower (hp)	kilowatt kW
p	Force, Belt Deflection	pound force (lbf)	newton (N)
Q	Torque, Required	pound-inch (lb-in)	newton-meter (Nm)
Q_d	Torque, Design	pound-inch (lb-in)	newton-meter (Nm)
Q_r	Torque, Uncorrected Rating per Belt	pound-inch (lb-in)	newton-meter (Nm)
q	Deflection, For Measuring Belt Tension	inch (in/”)	millimeter (mm)
R	Ratio, Tension		
R_a	Surface Finish Roughness Height (Arithmetic Avg.)	micro-inch (µin)	micrometers (µm)
R_B	Ride, Position of Ball or Rod in V-Groove	inch (in/”)	millimeter (mm)
R_p	Ride, Position of Belt in Pulley	inch (in/”)	millimeter (mm)
r	Rotational Frequency, Faster Shaft	rpm/1000	rpm/1000
r_a	Radius, Bottom Corner Synchronous Belt	inch (in/”)	millimeter (mm)
r_b	Radius, Bottom Corner, Pulley or Sheave Groove	inch (in/”)	millimeter (mm)
r_r	Radius, Top Corner, Synchronous Belt	inch (in/”)	millimeter (mm)
r_t	Radius, Top Corner, Pulley or Sheave Groove	inch (in/”)	millimeter (mm)
r_1	Radius, Bottom Corner, Synchronous Rack Form	inch (in/”)	millimeter (mm)
r_2	Radius, Top Corner, Synchronous Rack Form	inch (in/”)	millimeter (mm)
S	Speed, Belt	fpm/1000	

SYMBOL	DESCRIPTION	UNITS	
		Inch-Pound	**Metric**
S_e	Spacing, Edge of V-Grooves	inch (in/”)	millimeter (mm)
S_g	Spacing, Between V-Groove	horsepower (hp)	kilowatt kW
T_B	Tension, Bending	pound force (lbf)	newton (N)
T_c	Tension, Centrifugal	pound force (lbf)	newton (N)
T_e	Tension, Effective Pull	pound force (lbf)	newton (N)
T_s	Tension, Slack Side	pound force (lbf)	newton (N)
T_T	Tension, Tight Side	pound force (lbf)	newton (N)
T_r	Tension, Allowable Tight Side	pound force (lbf)	newton (N)
T_{st}	Tension, Static (Belt Installation)	pound force (lbf)	newton (N)
TIR	Total Indicator Reading (for measuring eccentricity or wobble of pulley or sheave)	inch (in/”)	millimeter (mm)
t_2	Depth, Keyway	inch (in/”)	millimeter (mm)
V	Speed, Belt	feet per minute (fpm)	meters per second (m/sec)
V_r	Speed, Rim	feet per minute (fpm)	meters per second (m/sec)
W_s	Mass, Pulley or Sheave	pound lb	kilogram kg
Z_1	Grooves, Number in Small Synchronous Pulley		
β	Angle, Between Synchronous Tooth Flank and Center Line Through Tooth for Both Rack Form & Belt Tooth	degree (º)	degree (º)
α	Angle, Between Groove Sidewalls of Pulley or Sheave	degree (º)	degree (º)
θ	Angle, Arc of Belt Contact With Pulley or Sheave	degree (º)	degree (º)