

EXTERNAL INVOLUTE SPLINE DATA

FLAT ROOT SIDE FIT TOLERANCE CLASS - 6 SPECIAL
SIMILAR TO ANSI B92.2M-1980 (R1989)

NUMBER OF TEETH	39
MODULE	1.5000
PRESSURE ANGLE	30.0°
PITCH DIAMETER (REF)	58.500
BASE DIAMETER (REF)	50.662
MAJOR DIAMETER	60.00-59.75
MINOR DIAMETER	56.25-55.96
FORM DIAMETER (MAX.)	56.79
CIRCULAR TOOTH THICKNESS MAX. EFFECTIVE	2.232
CIRCULAR TOOTH THICKNESS MIN. ACTUAL	2.126
FILLET RADIUS MINIMUM	N/A
PIN DIAMETER	3.000
MEASUREMENT OVER PINS (REF)	63.021-62.919

INTERNAL INVOLUTE SPLINE DATA

FLAT ROOT SIDE FIT TOLERANCE CLASS - 6 MODIFIED
SIMILAR TO ANSI B92.1-1996

NUMBER OF TEETH	27
MODULE	1.0583
PRESSURE ANGLE	30.0°
PITCH DIAMETER (REF)	28.575
BASE DIAMETER (REF)	24.747
MAJOR DIAMETER	30.73-30.48
MINOR DIAMETER	28.07-27.94
FORM DIAMETER (MIN.)	29.85
CIRCULAR TOOTH SPACE MIN. EFFECTIVE	1.821
CIRCULAR TOOTH SPACE MAX. ACTUAL	1.923
FILLET RADIUS MINIMUM	N/A
PIN DIAMETER	2.032
MEASUREMENT BETWEEN PINS (REF)	25.729-25.559

EXTERNAL HELICAL GEAR DATA

NUMBER OF TEETH	50
NORMAL MODULE	1.4571
NORMAL PRESSURE ANGLE	20.0°
HELIX ANGLE	23.383°
HAND OF HELIX	LEFT
LEAD	578.7070
PITCH DIAMETER (REF)	79.374
BASE DIAMETER (REF)	73.784
MAJOR DIAMETER	81.23-81.03
MINOR DIAMETER	73.19-72.81
CHAMFER DIAMETER (MINIMUM)	80.47
CHAMFER INCLUDED ANGLE	80.0°-140.0°
T.I.F. DIAMETER (MAXIMUM)	76.11
TRANSVERSE CIRCULAR TOOTH THICKNESS	1.675-1.624
BALL DIAMETER	3.175
MEASUREMENT OVER BALLS	83.448-83.327
BACKLASH WITH MATING PART ON 52.895 CENTER DISTANCE	0.206-0.104
FOR LEAD AND INVOLUTE SPECIFICATIONS SEE SHEET #2	

HEAT TREAT:
K232ME (10-00-447-232-D)
OPT: K232MEJ (10-00-447-232-D)

SHAFT SURFACE FINISH: THE SURFACE FINISH AT THE SHAFT/SEAL INTERFACE SHALL BE 0.25-0.50 MICROMETERS (10-20 MICROINCHES) RA AND SHALL HAVE NO LEAD (AS DEFINED IN BorgWarner SPEC. #44-00-430-032.)

UNLESS OTHERWISE SPECIFIED:
RADIUS: 0.8 ±0.4
CHAMFERS: 27° ±5°
CORNER BREAKS: 1.5 X 35° - 55°

PART MUST MEET BorgWarner SPEC. #44-00-447-008

PART MUST BE FREE FROM BURRS AND SHARP CORNERS

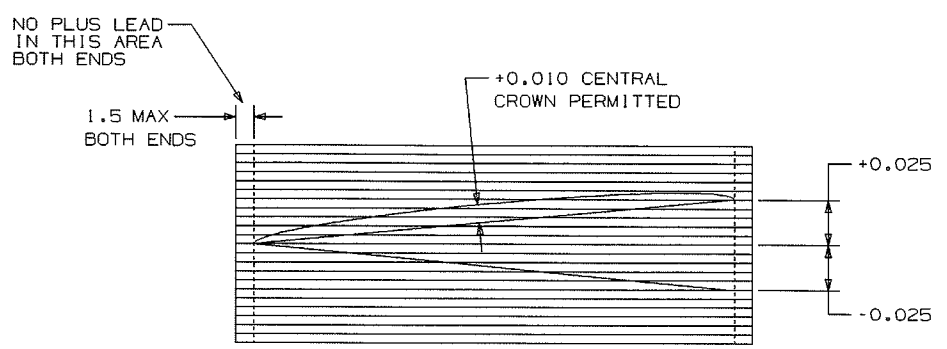
EXTERNAL SPLINES MUST BE ACCEPTED BY A "GO COMPOSITE RING GAGE" MADE TO THE MAXIMUM EFFECTIVE SPLINE TOOTH THICKNESS. SPLINES MUST MEET THE MINIMUM DIMENSION OVER PINS SPECIFIED.

INTERNAL SPLINES MUST BE ACCEPTED BY A "GO COMPOSITE PLUG GAGE" MADE TO THE MINIMUM EFFECTIVE SPLINE SPACE WIDTH. SPLINES MUST MEET THE MAXIMUM DIMENSION BETWEEN PINS SPECIFIED.

SPLINE GAGE PRACTICES AND TOLERANCES MUST CONFORM TO ANSI B92.1-1996 AND ANSI B92.2M-1980 (R1989) AS NOTED.

SHT.	LET.	ZONE	DESCRIPTION	DATE	BY	OK'D.
-	A	--	DWO-6111, RELEASED FOR PROTOTYPE	11-5-04	A M	S.T.
1	B1	B6	DWO-6111, ADDED "Ø 4.0" DIM.	11-30-04	A M	DWN
1	B2	B6	DWO-6111, ADDED "LOCATION" NOTE	11-30-04	A M	DWN
1	B3	B4	DWO-6111, ADDED "53.42" DIM.	11-30-04	A M	DWN
1	C1	A3	DWO-6111, WAS "SAE J946 10.1-10.5"	1-31-05	A M	DWN
1	C2	D7	DWO-6111, "30°" WAS "(30°)"	1-31-05	A M	DWN
1	C3	D7	DWO-6111, ADDED "30°" DIM.	1-31-05	A M	DWN
1	C4	D8	DWO-6111, ADDED "2.0" DIM.	1-31-05	A M	DWN

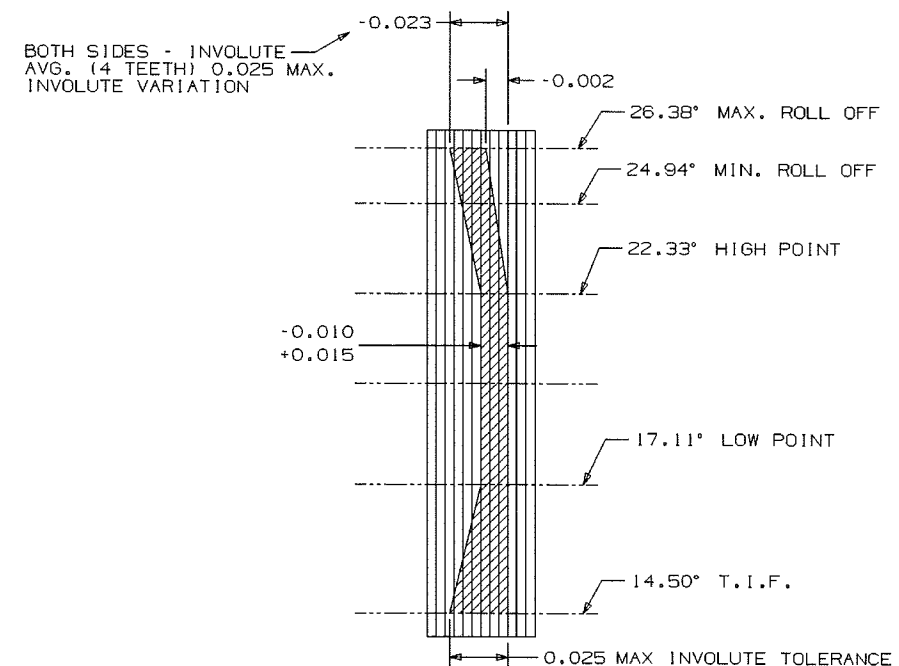
G.D. & T. IN ACCORDANCE WITH ASME Y14.5M-1994		TOLERANCES UNLESS OTHERWISE SPECIFIED: X.X±0.4 X.XX±0.15 ANGLES±5°		THIRD ANGLE PROJECTION -METRIC-	
RELEASE TO PROD. T.R.# DATE:		W.O. NO. DWO-6111		REF. NO. 44-93-189-004	
CHANGE RESTRICTED NO MANUAL CHANGES		SPECIAL CHARACTERISTIC UNLESS OTHERWISE SPECIFIED ALL FINISHED SURFACES TO BE 5.0/		TITLE SHAFT - INPUT	
MATERIAL U.N.S. HB6200 Rc 31-37 @ J4		HEAT TREAT SEE NOTE		DRN, GULVAS DATE 10-12-04	
DESIGN REL. ENG. JVS/VDJUC DATE 10-20-04		ENGR. APP'D, DWN DATE 11-4-04		DWG. NO.	
MFG. APP'D, XXXX DATE XX-XX-XX		SCALE FULL		DO NOT SCALE SIZE D SHEET 1 of 2	



LEAD CHART

THE LEAD ON ANY FOUR TEETH SPACED APPROXIMATELY 90° APART MUST CONFORM TO THE ABOVE CHART AND THE FOLLOWING SPECIFICATIONS:

- A. NO HOLLOWES PERMITTED.
- B. LEAD IRREGULARITY NOT TO EXCEED 0.025 ON ANY TOOTH.
- C. LEAD VARIATION BETWEEN ANY TWO TEETH NOT TO EXCEED 0.050.
- D. GEAR CROWN MUST BE WITHIN THE LIMITS SHOWN.



50 TOOTH GEAR MEMBER

THE INVOLUTE TRACE OF EACH OF ANY FOUR TEETH SPACED APPROXIMATELY 90° APART MUST BE WITHIN THE ABOVE CHART AND THE FOLLOWING SPECIFICATIONS:

- A. THE TRACE FROM THE HIGHEST POINT ON THE INVOLUTE TO THE POINT OF OUTSIDE DIAMETER AND THE FORM DIAMETER SHALL NOT BE A STRAIGHT LINE OR A CONVEX CURVE.
- B. NO HOLLOWES PERMITTED BETWEEN LOW POINT AND HIGH POINT.
- C. +0.010 MAX. CENTRAL CROWN PERMITTED BETWEEN LOW POINT AND HIGH POINT.
- D. NO PLUS INVOLUTE ALLOWED FOR 3° MIN. ROLL ANGLE BELOW T.I.F. DIAMETER.
- E. THE INVOLUTE FORM IS DEFINED FURTHER FOR THE DRIVE AND COAST SIDES AS FOLLOWS:
 1. THE SLOPE OF THE LINE JOINING THE INVOLUTE'S INTERSECTION WITH THE LOW POINT AND T.I.F. ROLL ANGLES SHALL BE +0.000 TO +0.025.
 2. THE SLOPE OF THE LINE JOINING THE INVOLUTE'S INTERSECTION WITH THE LOW POINT AND HIGH POINT ROLL ANGLES SHALL BE -0.010 TO +0.015.
 3. THE SLOPE OF THE LINE JOINING THE INVOLUTE'S INTERSECTION WITH THE HIGH POINT AND MAXIMUM SPECIFIED ROLL ANGLES SHALL BE -0.002 TO -0.023.

G.D. & T. IN ACCORDANCE WITH ASME Y14.5M-1994		TOLERANCES UNLESS OTHERWISE SPECIFIED: X.XX±0.4 X.XXX±0.15 ANGLES±45°		THIRD ANGLE PROJECTION 	-METRIC-
CHANGE RESTRICTED NO MANUAL CHANGES		RELEASE TO PROD. T.R.# DATE: W.O. NO. DWO-6111			
◇ SPECIAL CHARACTERISTIC		REF. NO. SEE SHEET #1		TITLE SHAFT - INPUT	
UNLESS OTHERWISE SPECIFIED ALL FINISHED SURFACES TO BE 5-V		WEIGHT ---		MATERIAL SEE SHEET #1	
ASME Y14.35M-1996		FINISH ---		HEAT TREAT SEE SHEET #1	
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DRN. GULVAS		CHK'D A.J.M.		DESIGN REL. ENG. J.S.VADDOVIC	
DATE 11-4-04		DATE 11-4-04		DATE 10-20-04	
MFG. APP'D. XXXX		SCALE FULL		DO NOT SCALE	
DATE XX-XX-XX		SIZE		SHEET 2 OF 2	