

LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT FMVSS-108

Astex USA 9004-hids2500 Conversion Kit

Manufactured by Astex USA (www.hidkits.com)

CALCOAST - ITL

Lighting Technology
4072 Watts Street, Suite 204
Emeryville, CA 94608



January 29, 2002

FINAL REPORT

PREPARED FOR

U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: Mark A. Evans

Approved By: Mark A. Evans

Approval Date: January 29, 2002

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Michael Cole

Acceptance Date: 3/6/02

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 108-CCITL-02-2	2. Government Accession No. N/A	3. Recipient's Catalog No. N/A	
4. Title and Subtitle Test Series High Intensity Discharge (HID) Conversion Kits		5. Report Date January 29, 2002	
7. Author(s) Mark A. Evans Photometric Engineer		6. Performing Organization Code N/A 8. Performing Organization Report No. 1128-2B/B01	
9. Performing Organization Name and Address Calcoast - ITL 4072 Watts Street Emeryville, CA 94608		10. Work Unit No. N/A	11. Contract or Grant No.
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance 400 7th Street, S.W., Room 6111 (NSA 30) Washington, D.C. 20590		13. Type of Report and Period Covered	
15. Supplementary Notes		14. Sponsoring Agency Code	
16. Abstract The scope of this testing was limited to photometry and color tests to demonstrate the performance of a headlamp when a Astex USA 9004-hids2500 HB1 HID Conversion Kit is substituted for the standardized replaceable light source intended for use in the headlamp. Test failures identified were as follows: lower beam photometry, upper beam photometry and headlamp color.			
17. Key Words Federal Motor Vehicle Safety Standard 108 Lamps, Reflective Devices and Associated Equipment		18. Distribution Statement Unlimited	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this report) Unclassified	21. No. of Pages 12	22. Price N/A



INDUSTRIAL TESTING LABORATORY

Report No. 1128-2B/01

Page 1 of 12

TEST REPORT

Report Date: January 29, 2002

Test Component: Astex USA 9004-hids2500 Conversion Kit

Manufactured By: Astex USA (www.hidkits.com)

Submitted By: NHTSA

Test Laboratory: Calcoast - ITL
Emeryville, CA 94608

Devices Tested: One (1) Complete Kit with Two(2) Modified D2S Light Sources and Ballast Assemblies

SUMMARY

Specifications: FMVSS 108

Photometric Tests (Figure 27-1)

Lower Beam using HB1 Bulb.....	PASSED
Upper Beam using HB1 Bulb	PASSED
Lower Beam using HID Conversion Kit(Lowest Settings)	FAILED
Lower Beam using HID Conversion Kit(Highest Settings)	FAILED
Upper Beam using HID Conversion Kit(No UB Function)	FAILED

Color Tests

SAE J578c.....	FAILED
----------------	---------------

Note: Tested using 1998 Nissan Frontier RBHL (LH) Manufactured by NAL

Signature of Responsible Laboratory Official:

Mark A. Evans
Photometric Engineer

MAE:cc(2)

DESCRIPTION SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Manufactured By: Astex USA (www.hidkits.com)

GENERAL DESCRIPTION:

MARKINGS:

BALLAST: None

IGNITER: N/A

BULB: None

DESCRIPTION:

BULB USED: QUANTITY: Two (2) D2S (Modified)

DESIGN VOLTS: 12.80V

MEASURED FLUX (@12.80v)		
Setting	Ballast 1/ Bulb 1	Ballast 2/ Bulb 2
1	1484 lumens	1447 lumens
2	1771	1773
3	2191	2188
4	2563	2545
5	3083	3056

Notes: System permits multiple output setting

TEST DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Manufactured By: Astex USA (www.hidkits.com)

COLOR TEST: SAE J578c

Test Method: Tristimulus Method using Minolta Chroma-Meter CL-100

Lamp Voltage: 12.80V

Test Performed By: Mark Evans

Test Distance: 50 ft

Date: 12/26/2001

RESULTS

Measured xy chromaticity coordinate values:	
White	
Lower Beam w/HID Kit @ 1.5D/2R x=0.3935 y=0.4026	Upper Beam w/ HID Kit @ HV x=0.0000 y=0.0000
xy Chromaticity Coordinate Boundaries:	
White	
$0.38 \leq y < 0.44$ $0.31 \leq x < 0.50$ $y \leq 0.15 + 0.64x$ $y \geq 0.05 + 0.75x$	

Summary:

White- The color of the light emitted from the clear lens on device falls **outside** the acceptable limits for white.

Unable to measure upper beam color- no upper beam function included in kit.

PHOTOMETRIC TEST DATA SHEET

Device Name: Baseline Replaceable Headlamp With Rated HB1 Light Source

Specification: FMVSS 108 Fig. 27-1 (Lower Beam)

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

Test Points				LOWER BEAM		Required	
Degrees		Location		Measured	Reaim	Minimum	Maximum
H	V			1190.80		-	-
4.0U	8.0L			179.55		64	-
4.0U	8.0R			282.39		64	-
2.0U	4.0L			410.31		135	-
1.5U	1.0R TO	3.0R	2.58R	848.81		200	-
1.5U	1.0R TO	R	1.00R	881.09		-	1400
1.0U	1.5L TO	L	1.50L	679.29		-	700
0.5U	1.5L TO	L	1.50L	838.16		-	1000
0.5U	1.0R TO	3.0R	1.00R	1307.32		500	-
0.5U	1.0R TO	3.0R	2.10R	1609.08		-	2700
H	4.0L			754.43		135	-
H	8.0L			468.07		64	-
0.5D	1.5L TO	L	1.50L	1389.27		-	2500
0.5D	1.5R			8093.99		8000	20000
1.0D	6.0L			1392.51		750	-
1.5D	2.0R			29180.16		15000	-
1.5D	9.0L			1754.00		750	-
1.5D	9.0R			1934.93		750	-
2.0D	15.0L			1146.02		700	-
2.0D	15.0R			971.79		700	-
4.0D	4.0R			9415.29		-	12500
Maximum		2.11D	2.60R	33250.07		-	-
10.0U TO 90.0U		10.02U	0.07R	123.41		-	125

Device meets requirements at all points.

Aim: 13H 18V (warm)

Bulb: ITL-776 (HB1/9004)

Voltage: 12.80V / Current: 3.475A / Flux: ~765 lumens

Note: Lamp mounted in fixture designed to hold this lamp.

Lamp laser aimed using ITL Group I aiming plate.

Lamp was reaimed before each test series to assure proper aim.

PHOTOMETRIC TEST DATA SHEET

Device Name: Baseline Replaceable Headlamp With Rated HB1 Light Source

Specification: FMVSS 108 Fig. 27-1 (Upper Beam)

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

Test Points		Location	UPPER BEAM		Required	
Degrees			Measured	Reaim	Minimum	Maximum
2.0U	V		15213.90		1000	-
1.0U	3.0L		11842.96		2000	-
1.0U	3.0R		36219.02		2000	-
H	12.0L		5225.46		750	-
H	9.0L		7561.38		1500	-
H	6.0L		10153.33		3250	-
H	3.0L		16607.37		10000	-
H	V		37607.63		20000	75000
H	3.0R		36794.53		10000	-
H	6.0R		9137.75		3250	-
H	9.0R		5907.08		1500	-
H	12.0R		4045.84		750	-
1.5D	9.0L		7016.05		1500	-
1.5D	V		20283.10		5000	-
1.5D	9.0R		6989.78		1500	-
2.5D	12.0L		3213.99		750	-
2.5D	V		8648.92		2500	-
2.5D	12.0R		3488.07		750	-
4.0D	V		2051.04		-	5000
Maximum		0.69U 1.88R	47988.82		-	75000

Device meets requirements at all points.

Aim: 13H 18V (warm)

Bulb: ITL-776 (HB1/9004)

Voltage: 12.80V / Current: 5.220A / Flux: ~1315 lumens

Note: Lamp mounted in fixture designed to hold this lamp.

Lamp laser aimed using ITL Group I aiming plate.

Lamp was reaimed before each test series to assure proper aim.

PHOTOMETRIC TEST DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Specification: FMVSS 108 Fig. 27-1 (Lower Beam)

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

Test Points				LOWER BEAM		Required	
Degrees		Location		Measured	Reaim	Minimum	Maximum
H	V			28776.53		-	-
4.0U	8.0L			227.07		64	-
4.0U	8.0R			383.71		64	-
2.0U	4.0L			757.65		135	-
1.5U	1.0R TO	3.0R	1.00R	3394.76		200	-
1.5U	1.0R TO	R	3.79R	7076.17	5497.75*	-	1400
1.0U	1.5L TO	L	1.50L	3199.00	2193.69*	-	700
0.5U	1.5L TO	L	1.54L	6194.58	4357.21*	-	1000
0.5U	1.0R TO	3.0R	1.00R	15152.93		500	-
0.5U	1.0R TO	3.0R	2.98R	18267.32	12733.66*	-	2700
H	4.0L			6946.65		135	-
H	8.0L			3919.37		64	-
0.5D	1.5L TO	L	1.50L	17508.92	14437.38*	-	2500
0.5D	1.5R			73220.53	61570.04*	8000	20000
1.0D	6.0L			10736.85		750	-
1.5D	2.0R			62486.57		15000	-
1.5D	9.0L			9200.49		750	-
1.5D	9.0R			11068.36		750	-
2.0D	15.0L			5194.45		700	-
2.0D	15.0R			5667.88		700	-
4.0D	4.0R			7975.30		-	12500
Maximum		0.62D	2.77R	84357.13		-	-
10.0U TO 90.0U		10.03U	2.41R	157.13*		-	125

*** Denotes failure.**

Aim: 13H 18V (warm)

Bulb: Astex HID HB1 (Module 1 / Bulb 1)

Voltage: 12.80V / Current: 2.509A / Flux: 1484 lumens

Note: Lamp mounted in fixture designed to hold this lamp.

Lamp laser aimed using ITL Group I aiming plate.

Lamp was reaimed before each test series to assure proper aim.

Lamp tested in lowest setting light output mode.

The following HV values were measured: 28700Cd (setting 1)

33900Cd (setting 2)

42000Cd (setting 3)

48300Cd (setting 4)

57200Cd (setting 5)

PHOTOMETRIC TEST DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Specification: FMVSS 108 Fig. 27-1 (Lower Beam)

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

Test Points				LOW BEAM		Required	
Degrees		Location		Measured	Reaim	Minimum	Maximum
H	V			46775.63		-	-
4.0U	8.0L			492.19		64	-
4.0U	8.0R			742.58		64	-
2.0U	4.0L			1359.15		135	-
1.5U	1.0R TO	3.0R	1.00R	5682.23		200	-
1.5U	1.0R TO	R	3.34R	13423.96	8107.84*	-	1400
1.0U	1.5L TO	L	1.50L	5122.67	3549.54*	-	700
0.5U	1.5L TO	L	1.50L	9742.24	6773.79*	-	1000
0.5U	1.0R TO	3.0R	1.00R	24011.21		500	-
0.5U	1.0R TO	3.0R	2.98R	34235.89	23474.31*	-	2700
H	4.0L			11014.94		135	-
H	8.0L			6264.74		64	-
0.5D	1.5L TO	L	1.50L	30379.31	24422.33*	-	2500
0.5D	1.5R			138835.81	112979.11*	8000	20000
1.0D	6.0L			18964.48		750	-
1.5D	2.0R			126569.29		15000	-
1.5D	9.0L			16662.31		750	-
1.5D	9.0R			19367.94		750	-
2.0D	15.0L			9142.98		700	-
2.0D	15.0R			9878.84		700	-
4.0D	4.0R			14442.02	10016.52	-	12500
Maximum		0.71D	2.52R	166736.63		-	-
10.0U TO 90.0U		10.02U	0.67R	376.34*		-	125

*** Denotes failure.**

Aim: 13H 18V (warm)

Bulb: Astex HID HB1 (Module 2 / Bulb 2)

Voltage: 12.80V / Current: 3.560A / Flux: 3056 lumens

Note: Lamp mounted in fixture designed to hold this lamp.

Lamp laser aimed using ITL Group I aiming plate.

Lamp was reaimed before each test series to assure proper aim.

Lamp tested in highest output mode.

The following HV values were measured:

- 23500Cd (setting 1)
- 28800Cd (setting 2)
- 34800Cd (setting 3)
- 39600Cd (setting 4)
- 46800Cd (setting 5)

PHOTOMETRIC TEST DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Specification: FMVSS 108 Fig. 27-1 (Upper Beam)

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

Test Points Degrees	Location	UPPER BEAM		Required	
		Measured	Reaim	Minimum	Maximum
2.0U	V	0.00	0.00*	1000	-
1.0U	3.0L	0.00	0.00*	2000	-
1.0U	3.0R	0.00	0.00*	2000	-
H	12.0L	0.00	0.00*	750	-
H	9.0L	0.00	0.00*	1500	-
H	6.0L	0.00	0.00*	3250	-
H	3.0L	0.00	0.00*	10000	-
H	V	0.00	0.00*	20000	75000
H	3.0R	0.00	0.00*	10000	-
H	6.0R	0.00	0.00*	3250	-
H	9.0R	0.00	0.00*	1500	-
H	12.0R	0.00	0.00*	750	-
1.5D	9.0L	0.00	0.00*	1500	-
1.5D	V	0.00	0.00*	5000	-
1.5D	9.0R	0.00	0.00*	1500	-
2.5D	12.0L	0.00	0.00*	750	-
2.5D	V	0.00	0.00*	2500	-
2.5D	12.0R	0.00	0.00*	750	-
4.0D	V	0.00		-	5000
Maximum		0.00		-	75000

*** Denotes failure.**

Aim: 13H 18V (warm)

Bulb: Astex HID HB1 (Module 1 / Bulb 1)

Voltage: 12.80V / Current: 0.000A / Flux: 0 lumens

Note: Lamp mounted in fixture designed to hold this lamp.

Lamp laser aimed using ITL Group I aiming plate.

Lamp was reaimed before each test series to assure proper aim.

CHART DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Calcoast-ITL Report No. 1128-2B/01
Baseline Replaceable Headlamp With Rated HB1 Light Source @ 12.80V
LOWER BEAM - Candela

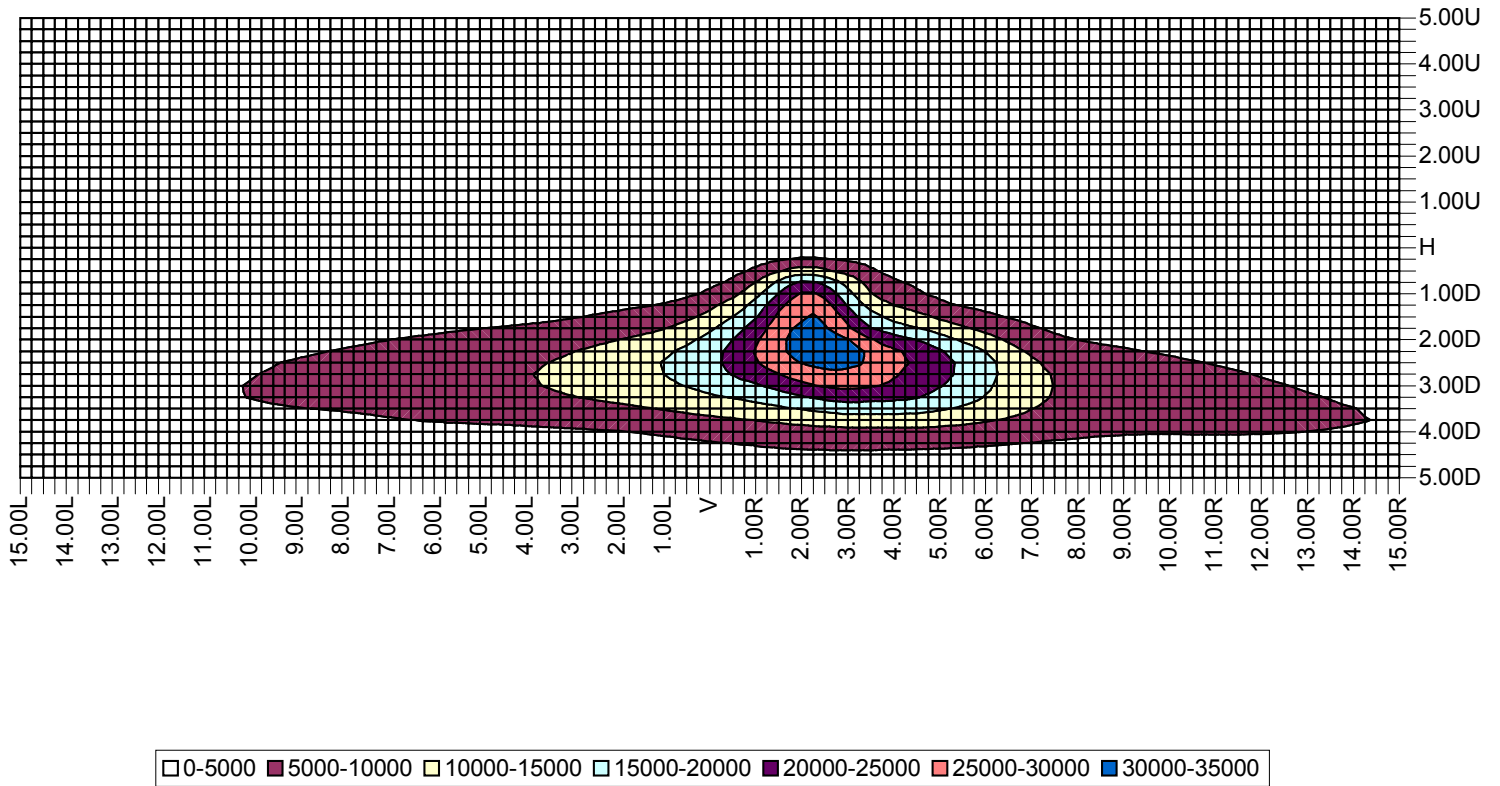


CHART DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Calcoast-ITL Report No. 1128-2B/01
Astex HB1 HID Conversion Kit
Module 1/Bulb 1 @ Lowest Setting
HID Kit - LOWER BEAM
Candela

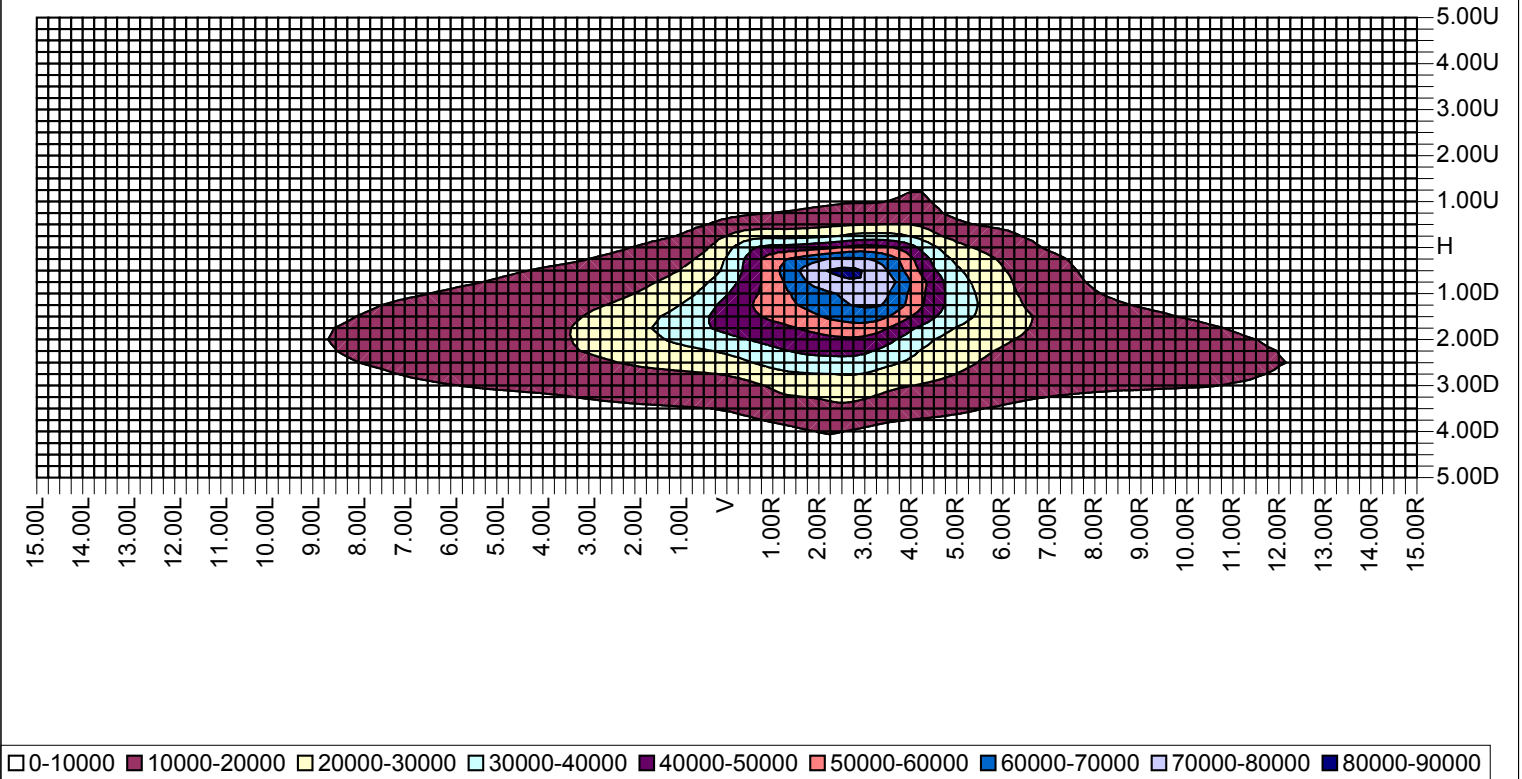
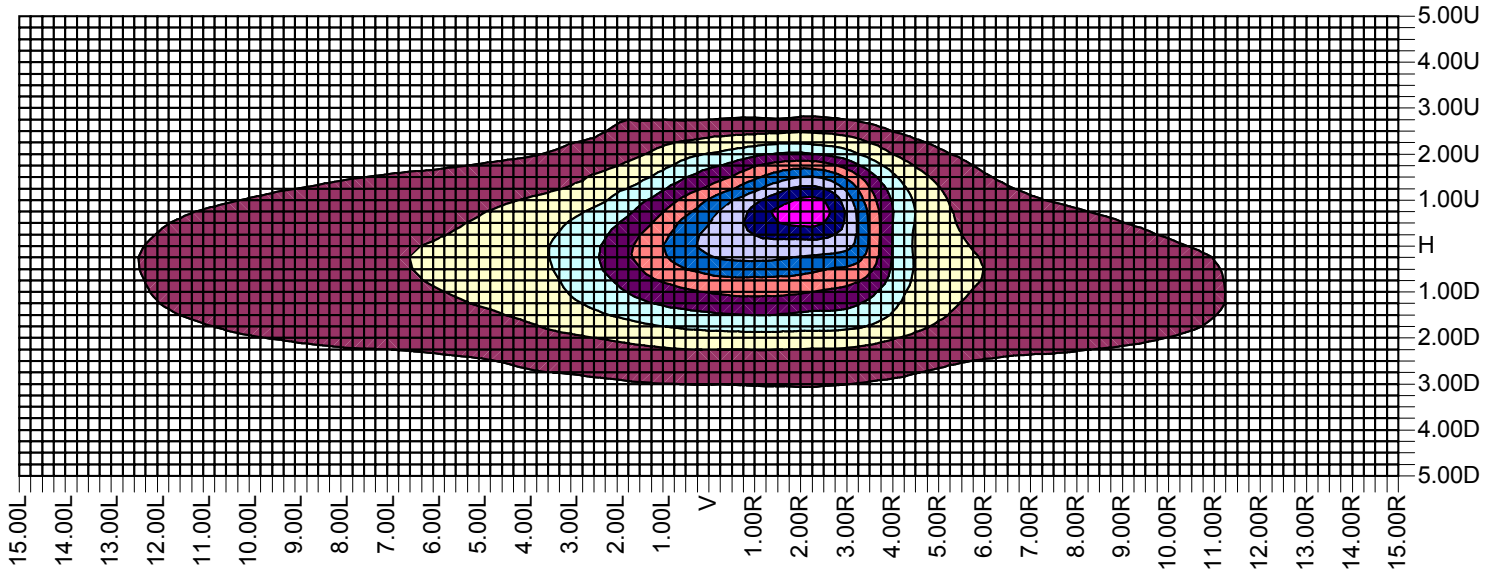


CHART DATA SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

Calcoast-ITL Report No. 1128-2B/01
Baseline Replaceable Headlamp With Rated HB1 Light Source @12.80V
UPPER BEAM - Candela



0-5000	5000-10000	10000-15000	15000-20000	20000-25000	25000-30000	30000-35000
35000-40000	40000-45000	45000-50000				

PHOTOGRAPH SHEET

Device Name: Astex USA 9004-hids2500 Conversion Kit

