

LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT FMVSS-108

**RM Lighting Model No. H4-70
(HID Conversion Kit w/ 7" Headlamp)**

Manufactured by RM Racing, LLC (www.rmhid.com)

CALCOAST - ITL

Lighting Technology
4072 Watts Street
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

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Prepared By: Mat A. Evan

Approved By: Mat A. Evan

Approval Date: 29 January 2002

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Michael Cole

Acceptance Date: 2/21/02

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 108-CCITL-02-1	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	
		6. Performing Organization Code N/A	
7. Author(s) Mark A. Evans Photometric Engineer		8. Performing Organization Report No. 1128-1B/01	
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	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on RM Lighting Model No. H4-70 HID Conversion Kit in accordance with FMVSS 108. Test failures identified were as follows: lower beam photometry, upper beam photometry, and headlamp color requirements.			
17. Key Words Federal Motor Vehicle Safety Standard 108 Lamps, Reflective Devices and Associated Equipment		18. Distribution Statement Unlimited	
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INDUSTRIAL TESTING LABORATORY

Report No. 1128-1B/01

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TEST REPORT

Report Date: January 29, 2002

Test Component: RM Lighting Model H4-70 (HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Submitted By: NHTSA Test Laboratory: Calcoast - ITL

Devices Tested: One (1) Complete Set (Includes Headlamp, D2S, Modified H1, Ballast, Ignitor and Wiring)

SUMMARY

Specifications: FMVSS 108 Figure 32/ SAE J584 OCT93

Photometric Tests

Lower Beam using H4 Bulb/J584 Aim..... PASSED

Upper Beam using H4 Bulb/J584 Aim PASSED

Lower Beam using HID Conversion Kit/J584 Aim FAILED

Upper Beam using HID Conversion Kit/J584 Aim FAILED

Lower Beam using HID Conversion Kit/J599 Aim..... FAILED

Upper Beam using HID Conversion Kit/J599 Aim..... FAILED

Color Tests

SAE J578..... FAILED

Note: In addition to being aimed using the J584 procedure for compliance purposes, the HID Conversion kit was aimed in accordance with SAE J599, "Lighting Inspection Code," to represent a typical aiming procedure that might be used at a vehicle repair shop.

Signature of Responsible Laboratory Official:

Mark A. Evans
Photometric Engineer

MAE:cc(2)

DESCRIPTION SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

GENERAL DESCRIPTION:

MARKINGS:

LENS: "TOP", "CPI", "H4", "MOTORCYCLE", "7022", "DOT",
"MADE IN JAPAN", "SAE M79"

REFLECTOR: None

BALLAST: "RM LIGHTING™", www.rmlighting.com,
"Bulbtype D2S/D2R 35W", "V_{in} 9-16V", "V_{norm} 13.2V",
"I_{norm} 3.2V", "I_{in} max 20A", "P_{out} 35Wnorm",
"T_{case} -40C +105C", "V_{start} 23kVmax"

IGNITER: "HIGH VOLTAGE", "AM90005", "17Y70039"

BULB (D2S): "PHILIPS", "GERMANY", "D2S", "35W", "85122", "E1", "03V", "DOT",
"H022"

BULB (H1): None

DESCRIPTION:

LENS: MATERIAL: Glass

SHAPE/DIMENSIONS: Round, 7" Diameter

REFLECTOR: MATERIAL: Steel (Metalized Interior)

SHAPE/DIMENSIONS: Round Paraboloid, 7" Diameter

BULB USED: QUANTITY: One (1) D2S

DESIGN VOLTS: 13.20V

MEASURED FLUX (@ 13.20V): 3195 Lumens

QUANTITY: One (1) Modified H1

DESIGN VOLTS: 13.20V

MEASURED FLUX: Not Tested

TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

COLOR TEST: SAE J578c

Test Method: Tristimulus Method using Minolta Chroma Meter CL100

Lamp Voltage: 13.20V

Test Performed By: Mark Evans

Test Distance: 15 ft

Date: 11/30/2001

RESULTS

Measured average xy chromaticity coordinate values:			
White			
Lower Beam w/HID Kit x=0.3785 y=0.3994		Upper Beam w/ HID Kit x=0.3810 y=0.3996	
xy Chromaticity Coordinate Boundaries:			
Red	Yellow	White	Signal Blue
$y \leq 0.33$ $y \geq 0.98 - x$	$y \leq x - 0.12$ $y \geq 0.79 - 0.67x$ $y \geq 0.39$	$0.38 \leq y < 0.44$ $0.31 \leq x < 0.50$ $y \leq 0.15 + 0.64x$ $y \geq 0.05 + 0.75x$	$y \leq 0.32$ $x \leq 0.13 + 0.60y$ $x \leq 0.16$ or $x \leq 0.40 - y$

Summary:

Red- N/A

Yellow- N/A

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

Signal Blue- N/A

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Rated H4 / HB2

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Lower Beam)

Luminous Intensity, Candela

Test Points				LOWER BEAM		Required	
Degrees		Location		Measured	Reaim	Minimum	Maximum
H	V			910.73		-	-
1.5U	1.0R TO	R	4.88R	553.48		-	1400.0
1.0U	1.5L TO	L	1.50L	431.95		-	700.0
0.5U	1.5L TO	L	1.50L	550.46		-	1000.0
0.5U	1.0R TO	3.0R	2.98R	878.74		-	2700.0
1.5D	9.0L			3510.07		700.0	-
1.5D	9.0R			9134.39		700.0	-
2.0D	12.0L			1675.95		700.0	-
2.0D	6.0L			5508.68		1500.0	-
2.0D	3.0L			5928.63		4000.0	-
2.0D	V			7302.63		7000.0	-
2.0D	3.0R			8855.02		4000.0	-
2.0D	6.0R			12033.90		1500.0	-
2.0D	12.0R			5730.85		700.0	-
3.0D	6.0L			6489.69		800.0	-
3.0D	6.0R			10807.28		800.0	-
4.0D	V			10918.80		2000.0	-
4.0D	4.0R			11553.90		-	12500.0
Maximum		1.29D	5.54R	12884.04		-	-

Device meets requirements at all points.

Aimed per SAE J584 OCT93

Rated Bulb: ITL-1119 (H4/HB2)

Voltage: 13.20V / Current: 4.937A / Flux: Not Measured / LCL: 28.45mm

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Rated H4 / HB2

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Upper Beam)

Luminous Intensity, Candela

Test Points		Location	UPPER BEAM	Required		
Degrees			Measured	Reaim	Minimum	Maximum
2.0U	V		13507.93		1000.0	-
1.0U	3.0L		25802.07		2000.0	-
1.0U	3.0R		25275.83		2000.0	-
H	V		46862.13		12500.0	-
0.5D	12.0L		1808.22		800.0	-
0.5D	9.0L		7710.93		1500.0	-
0.5D	6.0L		15765.67		3300.0	-
0.5D	3.0L		31359.49		10000.0	-
0.5D	V		46725.46		20000.0	-
0.5D	3.0R		34031.75		10000.0	-
0.5D	6.0R		28079.64		3300.0	-
0.5D	9.0R		31032.10		1500.0	-
0.5D	12.0R		19886.46		800.0	-
1.0D	V		35675.00		17500.0	-
2.0D	V		13564.80		5000.0	-
3.0D	12.0L		1750.67		300.0	-
3.0D	9.0L		3241.96		1500.0	-
3.0D	V		6980.25		2500.0	-
3.0D	9.0R		8012.85		1500.0	-
3.0D	12.0R		5989.73		300.0	-
4.0D	V		3314.11		1500.0	7500.0
Maximum	0.37D	0.00	48387.96		-	75000.0

Device meets requirements at all points.

Aimed per SAE J584 OCT93

Rated Bulb: ITL-1119 (H4/HB2)

Voltage: 13.20V / Current: 5.453A / Flux: Not Measured / LCL: 26.49mm

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Submitted HID Conversion Kit

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Lower Beam)

Luminous Intensity, Candela

Test Points				LOWER BEAM		Required	
Degrees		Location		Measured	Reaim	Minimum	Maximum
H	V			65355.77		-	-
1.5U	1.0R TO	R	1.00R	11343.91	9328.18*	-	1400.0
1.0U	1.5L TO	L	1.50L	21462.42	15213.71*	-	700.0
0.5U	1.5L TO	L	1.50L	42883.08	31844.61*	-	1000.0
0.5U	1.0R TO	3.0R	1.00R	34989.05	27274.03*	-	2700.0
1.5D	9.0L			36625.84		700.0	-
1.5D	9.0R			9798.05		700.0	-
2.0D	12.0L			23455.90		700.0	-
2.0D	6.0L			34614.70		1500.0	-
2.0D	3.0L			33259.76		4000.0	-
2.0D	V			39505.48		7000.0	-
2.0D	3.0R			40118.79		4000.0	-
2.0D	6.0R			33993.47		1500.0	-
2.0D	12.0R			3230.14		700.0	-
3.0D	6.0L			20874.05		800.0	-
3.0D	6.0R			20392.93		800.0	-
4.0D	V			13605.18		2000.0	-
4.0D	4.0R			13226.56	11585.88	-	12500.0
Maximum		0.44D	0.47L	74090.42		-	-

*** Denotes failure.**

Aimed per SAE J584 OCT 93 upper beam maximum intensity zone placed at 0.4D.

Bulb: Submitted HID Conversion Kit - Philips D2S

Voltage: 13.20V / Current: 3.392A / Flux: lumens / LCL: mm

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70®
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Submitted HID Conversion Kit

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Upper Beam)

Luminous Intensity, Candela

Test Points		UPPER BEAM		Required	
Degrees	Location	Measured	Reaim	Minimum	Maximum
2.0U	V	9134.82		1000.0	-
1.0U	3.0L	21778.76		2000.0	-
1.0U	3.0R	17088.03		2000.0	-
H	V	64275.82		12500.0	-
0.5D	12.0L	26014.16		800.0	-
0.5D	9.0L	48123.43		1500.0	-
0.5D	6.0L	44074.75		3300.0	-
0.5D	3.0L	57363.41		10000.0	-
0.5D	V	75663.98		20000.0	-
0.5D	3.0R	56630.49		10000.0	-
0.5D	6.0R	31936.05		3300.0	-
0.5D	9.0R	5543.42		1500.0	-
0.5D	12.0R	1636.93		800.0	-
1.0D	V	70076.57		17500.0	-
2.0D	V	40552.86		5000.0	-
3.0D	12.0L	17782.56		300.0	-
3.0D	9.0L	21420.65		1500.0	-
3.0D	V	24379.99		2500.0	-
3.0D	9.0R	12130.98		1500.0	-
3.0D	12.0R	4850.54		300.0	-
4.0D	V	14068.12	12201.01*	1500.0	7500.0
Maximum	0.51D 0.59L	76309.82*		-	75000.0

* Denotes failure.

Aimed per SAE J584 OCT93 maximum intensity zone placed at 0.4D

Bulb: Submitted HID Conversion Kit - Philips D2S + H1 Bulb
Voltage: 13.20V / Current: 10.61A / Flux: N/A / LCL: N/A

Beam must be moved up 1.05 degrees to meet 4D/V.

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70 (HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Submitted HID Conversion Kit

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Lower Beam)

Luminous Intensity, Candela

Test Points		Location		LOWER BEAM	Reaim	Required	
Degrees				Measured		Minimum	Maximum
H	V			6011.73		-	-
1.5U	1.0R TO	R	4.02R	3575.22	3228.13*	-	1400.0
1.0U	1.5L TO	L	1.50L	3423.50	3014.82*	-	700.0
0.5U	1.5L TO	L	1.50L	4240.55	3867.12*	-	1000.0
0.5U	1.0R TO	3.0R	3.00R	5818.80	4998.59*	-	2700.0
1.5D	9.0L			2706.38		700.0	-
1.5D	9.0R			25876.58		700.0	-
2.0D	12.0L			1027.44		700.0	-
2.0D	6.0L			22667.07		1500.0	-
2.0D	3.0L			39589.75		4000.0	-
2.0D	V			35294.16		7000.0	-
2.0D	3.0R			60818.96		4000.0	-
2.0D	6.0R			59650.75		1500.0	-
2.0D	12.0R			13703.00		700.0	-
3.0D	6.0L			32642.02		800.0	-
3.0D	6.0R			69411.88		800.0	-
4.0D	V			34070.49		2000.0	-
4.0D	4.0R			36804.12	32603.20*	-	12500.0
Maximum		2.49D	4.87R	76147.59		-	-

*** Denotes failure.**

Aimed per SAE J599 AUG97 in low beam mode

Bulb: Submitted HID Conversion Kit - Philips D2S

Voltage: 13.20V / Current: 3.395A / Flux: lumens / LCL: mm

Beam must be moved down 2.05 degrees to meet 1.5U/1R-R.

Beam must be moved down 4.86 degrees to meet 1U/1.5L-L.

Beam must be moved down 3.44 degrees to meet 0.5U/1.5L-L.

Beam must be moved down 1.84 degrees to meet 0.5U/1R-3R.

Beam must be moved up 1.84 degrees to meet 4D/4R.

PHOTOMETRIC TEST DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Manufactured By: RM Racing, LLC (www.rmhid.com)

Sample Number: Submitted HID Conversion Kit

Specification: FMVSS 108 (Figure 32) / SAE J584 OCT93 (Motorcycle Upper Beam)

Luminous Intensity, Candela

Test Points Degrees	Location	UPPER BEAM		Required	
		Measured	Reaim	Minimum	Maximum
2.0U	V	3927.18		1000.0	-
1.0U	3.0L	4519.32		2000.0	-
1.0U	3.0R	5609.73		2000.0	-
H	V	6986.21	7958.35*	12500.0	-
0.5D	12.0L	936.10		800.0	-
0.5D	9.0L	1733.07		1500.0	-
0.5D	6.0L	5105.80		3300.0	-
0.5D	3.0L	7478.77	9076.65*	10000.0	-
0.5D	V	9353.44	11894.15*	20000.0	-
0.5D	3.0R	13165.75		10000.0	-
0.5D	6.0R	13303.09		3300.0	-
0.5D	9.0R	11614.53		1500.0	-
0.5D	12.0R	6805.11		800.0	-
1.0D	V	15708.44	19210.74	17500.0	-
2.0D	V	35561.95		5000.0	-
3.0D	12.0L	2122.57		300.0	-
3.0D	9.0L	11236.96		1500.0	-
3.0D	V	44321.10		2500.0	-
3.0D	9.0R	55176.82		1500.0	-
3.0D	12.0R	26978.33		300.0	-
4.0D	V	34027.00	30655.99*	1500.0	7500.0
Maximum	2.43D 4.46R	76176.37*		-	75000.0

* Denotes failure.

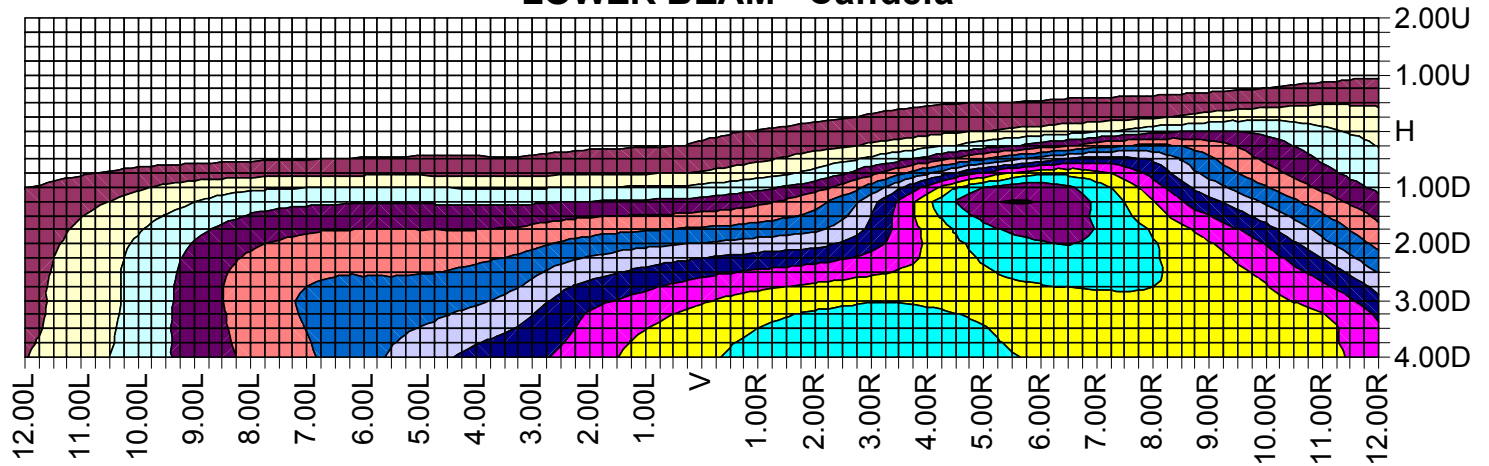
Aimed per SAE J599 AUG97 in low beam mode

Bulb: Submitted HID Conversion Kit - Philips D2S + H1 Bulb
Voltage: 13.20V / Current: 10.58A / Flux: N/A / LCL: N/A

CHART DATA SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Calcoast-ITL Report No. 1128-1B/01
RM Lighting Model No. H4-70
H4 Bulb / J584 Aim
LOWER BEAM - Candela



0-1000	1000-2000	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000
7000-8000	8000-9000	9000-10000	10000-11000	11000-12000	12000-13000	13000-14000

CHART DATA SHEET

Device Name: RM Lighting Model No. H4-70
 (HID Conversion kit w/7" Headlamp)

Calcoast-ITL Report No. 1128-1B/01
RM Lighting Model No. H4-70
HID Kit / J584 Aim
LOWER BEAM - Candela

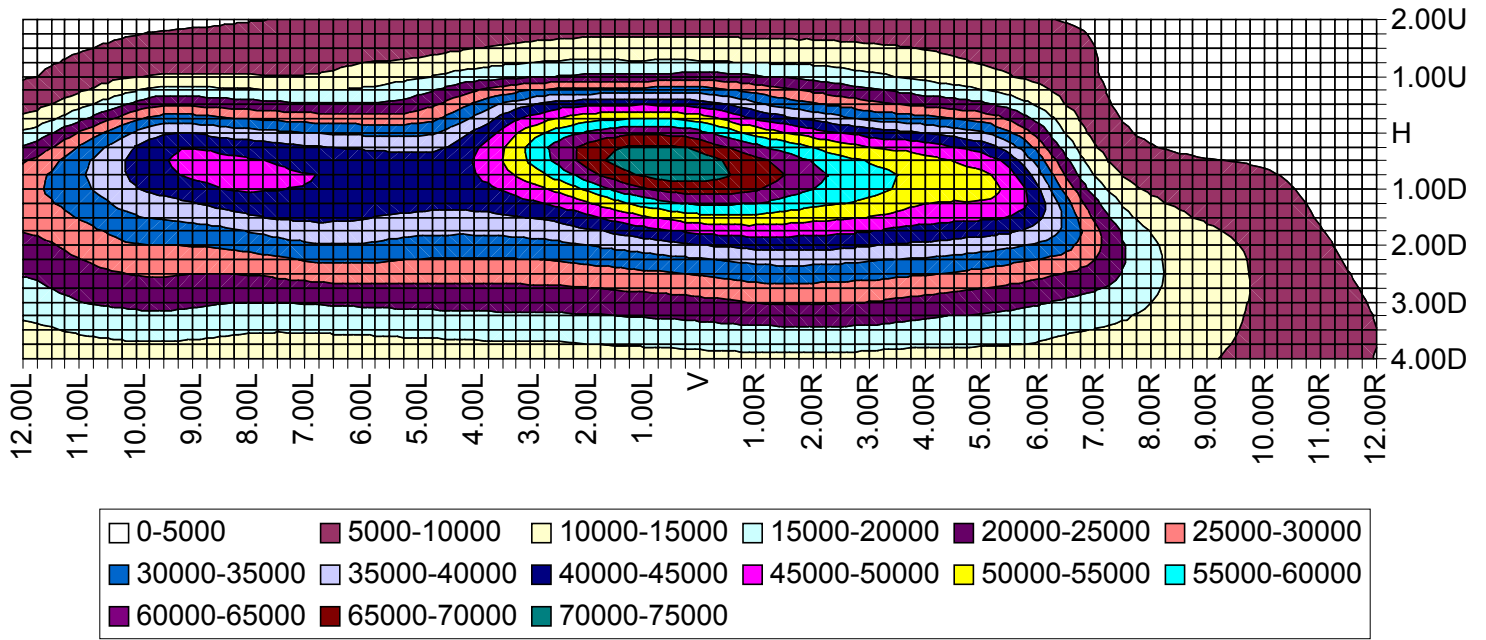


CHART DATA SHEET

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(HID Conversion kit w/7" Headlamp)

Calcoast-ITL Report No. 1128-1B/01
RM Lighting Model No. H4-70 (HID Conversion Kit)
H4 Bulb / J584 Aim
UPPER BEAM - Candela

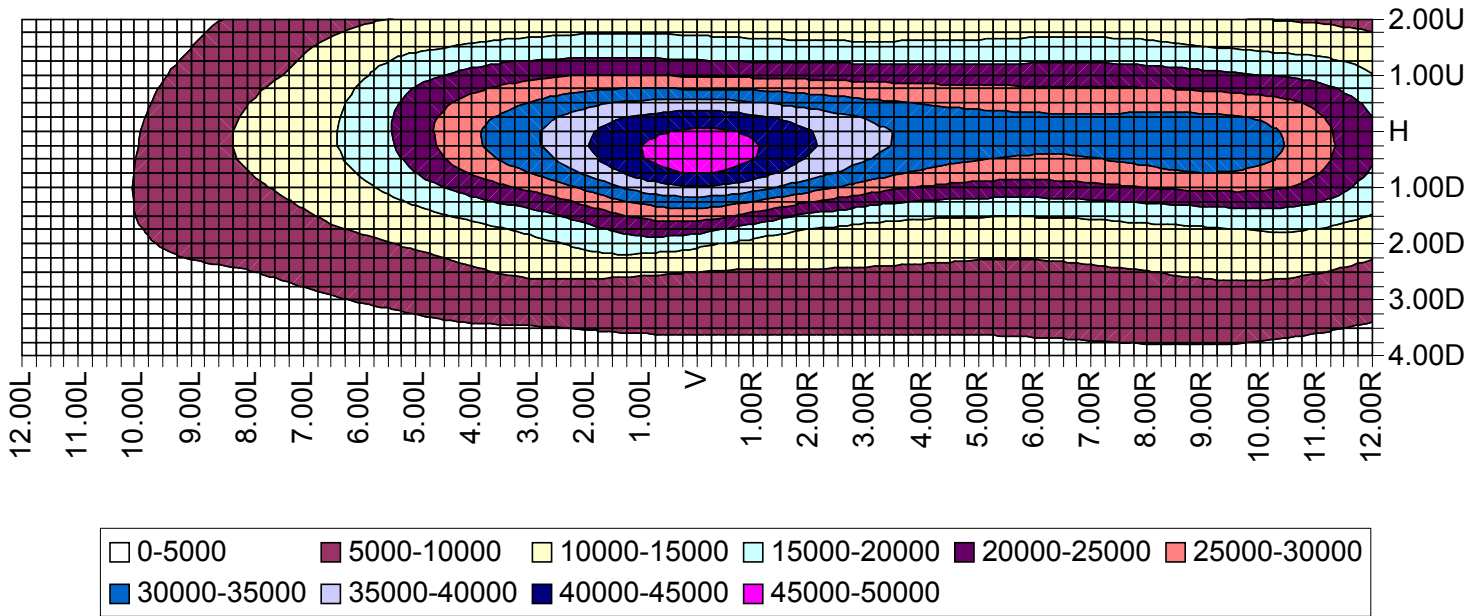
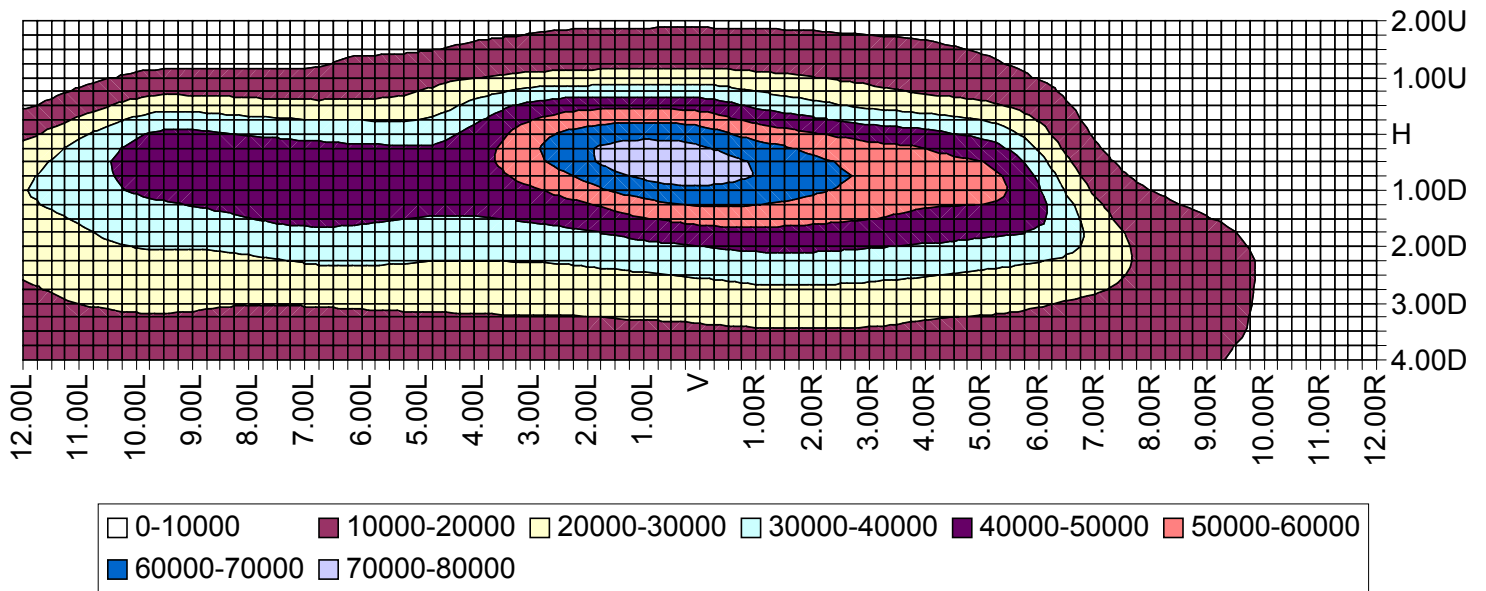


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Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

Calcoast-ITL Report No. 1128-1B/01
RM Lighting Model No. H4-70 (HID Conversion Kit)
HID Kit / J584 Aim
UPPER BEAM - Candela



PHOTOGRAPH SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)



PHOTOGRAPH SHEET

Device Name: RM Lighting Model No. H4-70
(HID Conversion kit w/7" Headlamp)

