

LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT FMVSS-108

Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Supplied by Procarparts (www.procarparts.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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Approved By: Mark 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-02-4 | 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 | |
| 9. Performing Organization Name and Address Calcoast - ITL 4072 Watts Street Emeryville, CA 94608 | | 8. Performing Organization Report No. 1214-1B/01 | |
| 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 | | 10. Work Unit No. N/A | |
| 15. Supplementary Notes | | 11. Contract or Grant No. | |
| 16. Abstract The scope of this testing was limited to photometry and color tests to demonstrate the performance of a headlamp when a Procarparts "9004-hid-phil" HB1 HID conversion kit is substituted for the standardized replaceable light source intended for use in the headlamp. Test failures identified were as follows: upper and lower beam photometry, and headlamp color. | | 13. Type of Report and Period Covered | |
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| | | 22. Price N/A | |



INDUSTRIAL TESTING LABORATORY

Report No. 1214-1B/01

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TEST REPORT

Report Date: January 29, 2002

Test Component: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Supplied by: Procarparts (www.procarparts.com)

Submitted By: NHTSA

Test Laboratory: Calcoast - ITL
Emeryville, CA 94608

Devices Tested: One (1) Complete Kit with Two(2) Modified D2R 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 **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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Supplied by: Procarparts (www.procarparts.com)

GENERAL DESCRIPTION:

MARKINGS:

BALLAST: "PHILIPS", "LVQ 212-L300", "Bulbtype D2S/D2R 35W"
See photos for additional markings

IGNITER: N/A

BULB: "OSRAM XENARC", "D2R 35W 66050", "GERMANY", "DOT"

DESCRIPTION:

BULB USED: QUANTITY: Two (2) D2R (Modified)

DESIGN VOLTS: 12.80V

| Ballast 1/ Bulb 1 | Ballast 2/ Bulb 2 |
|-------------------|-------------------|
| 2885 lumens | 2751 lumens |

TEST DATA SHEET

Device Name: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Supplied by: Procarparts (www.procarparts.com)

COLOR TEST: SAE J578c

Test Method: Tristimulus Method using Minolta Chroma Meter CL100

Lamp Voltage: 12.80V

Test Performed By: Mark Evans

Test Distance: 50 ft

Date: 01/28/2002

RESULTS

| | |
|--|--|
| Measured xy chromaticity coordinate values: | |
| White | |
| Lower Beam w/HID Kit @ 1.5D/2R x=0.4034 y=0.4162 | 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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Test Sample: 9004/HB1 Comparison Bulb

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

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

| Test Points | | Location | | LOW BEAM | Reaim | Required | |
|----------------|---------|----------|-------|----------|----------|----------|---------|
| Degrees | | | | Measured | | Minimum | Maximum |
| H | V | | | 1176.81 | | - | - |
| 4.0U | 8.0L | | | 177.54 | | 64 | - |
| 4.0U | 8.0R | | | 275.79 | | 64 | - |
| 2.0U | 4.0L | | | 361.76 | | 135 | - |
| 1.5U | 1.0R TO | 3.0R | 1.00R | 738.63 | | 200 | - |
| 1.5U | 1.0R TO | R | 2.03R | 773.43 | | - | 1400 |
| 1.0U | 1.5L TO | L | 1.50L | 606.66 | | - | 700 |
| 0.5U | 1.5L TO | L | 1.50L | 781.26 | | - | 1000 |
| 0.5U | 1.0R TO | 3.0R | 1.00R | 1388.99 | | 500 | - |
| 0.5U | 1.0R TO | 3.0R | 1.89R | 1546.28 | | - | 2700 |
| H | 4.0L | | | 744.59 | | 135 | - |
| H | 8.0L | | | 449.37 | | 64 | - |
| 0.5D | 1.5L TO | L | 1.50L | 1261.39 | | - | 2500 |
| 0.5D | 1.5R | | | 5498.49 | 11245.34 | 8000 | 20000 |
| 1.0D | 6.0L | | | 1120.23 | | 750 | - |
| 1.5D | 2.0R | | | 26546.05 | | 15000 | - |
| 1.5D | 9.0L | | | 1437.33 | | 750 | - |
| 1.5D | 9.0R | | | 1612.67 | | 750 | - |
| 2.0D | 15.0L | | | 953.50 | | 700 | - |
| 2.0D | 15.0R | | | 900.79 | | 700 | - |
| 4.0D | 4.0R | | | 10444.10 | | - | 12500 |
| Maximum | | 2.25D | 1.85R | 30415.05 | | - | - |
| 10.0U TO 90.0U | | 10.02U | 0.00 | 124.08 | | - | 125 |

Device meets requirements at all points.

Aim: 13H 18V (warm)

Bulb: ITL-779 (HB1/9004)

Voltage: 12.80V / Current: 3.470A / Flux: ~700 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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Test Sample: HB1/9004 Comparison Bulb

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

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

| Test Points | | Location | HIGH BEAM | Reaim | Required | |
|-------------|-------|-------------|-----------|-------|----------|---------|
| Degrees | | | Measured | | Minimum | Maximum |
| 2.0U | V | | 11928.15 | | 1000 | - |
| 1.0U | 3.0L | | 11014.29 | | 2000 | - |
| 1.0U | 3.0R | | 27710.63 | | 2000 | - |
| H | 12.0L | | 5004.39 | | 750 | - |
| H | 9.0L | | 7113.59 | | 1500 | - |
| H | 6.0L | | 9275.24 | | 3250 | - |
| H | 3.0L | | 15946.30 | | 10000 | - |
| H | V | | 35226.59 | | 20000 | 75000 |
| H | 3.0R | | 30645.96 | | 10000 | - |
| H | 6.0R | | 7631.11 | | 3250 | - |
| H | 9.0R | | 4843.55 | | 1500 | - |
| H | 12.0R | | 3378.59 | | 750 | - |
| 1.5D | 9.0L | | 6447.86 | | 1500 | - |
| 1.5D | V | | 18406.90 | | 5000 | - |
| 1.5D | 9.0R | | 5868.22 | | 1500 | - |
| 2.5D | 12.0L | | 3192.83 | | 750 | - |
| 2.5D | V | | 9026.67 | | 2500 | - |
| 2.5D | 12.0R | | 2893.74 | | 750 | - |
| 4.0D | V | | 2291.88 | | - | 5000 |
| Maximum | | 0.61U 1.48R | 41740.27 | | - | 75000 |

Device meets requirements at all points.

Aim: 13H 18V (warm)

Bulb: ITL-779 (HB1/9004)

Voltage: 12.80V / Current: 5.208A / Flux: ~1200 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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Test Sample: HID Conversion Kit

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

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

| Test Points | | Location | | LOW BEAM | Reaim | Required | |
|----------------|---------|----------|-------|----------|-----------|----------|---------|
| Degrees | | | | Measured | | Minimum | Maximum |
| H | V | | | 34494.02 | | - | - |
| 4.0U | 8.0L | | | 977.55 | | 64 | - |
| 4.0U | 8.0R | | | 1030.51 | | 64 | - |
| 2.0U | 4.0L | | | 6162.61 | | 135 | - |
| 1.5U | 1.0R TO | 3.0R | 1.00R | 9099.74 | | 200 | - |
| 1.5U | 1.0R TO | R | 2.43R | 18036.50 | 15753.78* | - | 1400 |
| 1.0U | 1.5L TO | L | 1.64L | 15938.85 | 13352.45* | - | 700 |
| 0.5U | 1.5L TO | L | 2.08L | 25208.16 | 19852.08* | - | 1000 |
| 0.5U | 1.0R TO | 3.0R | 1.00R | 20180.56 | | 500 | - |
| 0.5U | 1.0R TO | 3.0R | 3.00R | 30998.49 | 25748.19* | - | 2700 |
| H | 4.0L | | | 23091.42 | | 135 | - |
| H | 8.0L | | | 10376.82 | | 64 | - |
| 0.5D | 1.5L TO | L | 1.50L | 56788.39 | 51663.01* | - | 2500 |
| 0.5D | 1.5R | | | 72821.74 | 56279.22* | 8000 | 20000 |
| 1.0D | 6.0L | | | 19436.56 | | 750 | - |
| 1.5D | 2.0R | | | 49137.68 | | 15000 | - |
| 1.5D | 9.0L | | | 12141.73 | | 750 | - |
| 1.5D | 9.0R | | | 14097.40 | | 750 | - |
| 2.0D | 15.0L | | | 7104.24 | | 700 | - |
| 2.0D | 15.0R | | | 6820.37 | | 700 | - |
| 4.0D | 4.0R | | | 9025.79 | | - | 12500 |
| Maximum | | 0.77D | 0.35R | 78972.85 | | - | - |
| 10.0U TO 90.0U | 10.04U | | 1.03R | 402.97* | | - | 125 |

*** Denotes failure.**

Aim: 13H 18V (warm)

Bulb: Hid Conversion Kit (Ballast #1 / Bulb #1)

Voltage: 12.80V / Current: 3.307A / Flux: 2885 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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Test Sample: HID Conversion Kit

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

Test Lamp: 1998 Nissan Frontier Headlamp (LH)

Luminous Intensity, Candela

| Test Points | | Location | HIGH BEAM | Reaim | Required | |
|-------------|-------|-------------|-----------|-------|----------|---------|
| Degrees | | | Measured | | 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 | | 0.00D 0.00R | 0.00 | | - | 75000 |

*** Denotes failure.**

Aim: 13H 18V (warm)

Bulb: Hid Conversion Kit (Ballast #1 / Bulb #1)

Voltage: 12.80V / Current: 0.000 / 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: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Calcoast-ITL Report No. 1214-1B/01
Baseline Replaceable Headlamp With Rated HB1 Light Source
LOWER BEAM - Candela

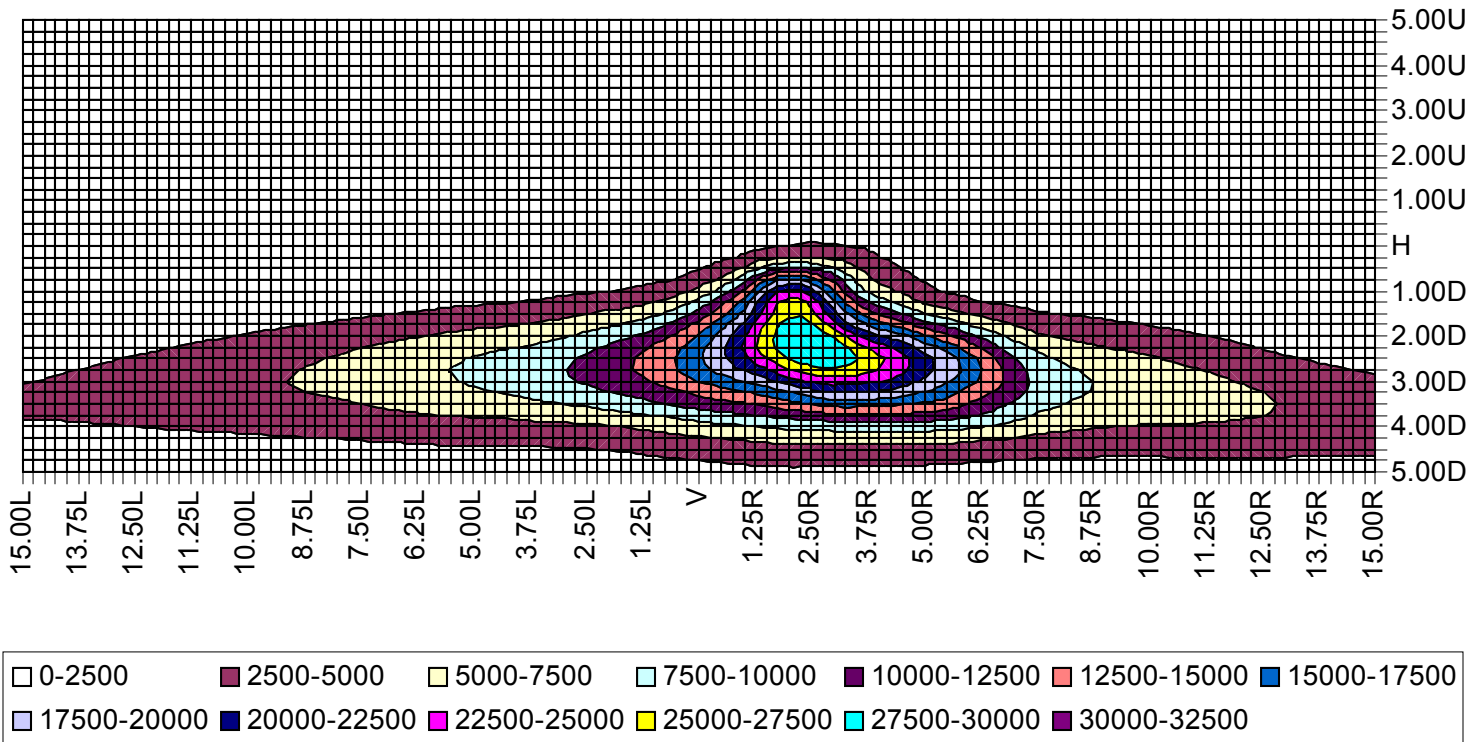


CHART DATA SHEET

Device Name: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

Calcoast-ITL Report No. 1214-1B/01
Baseline Replaceable Headlamp With Rated HB1 Light Source
UPPER BEAM - Candela

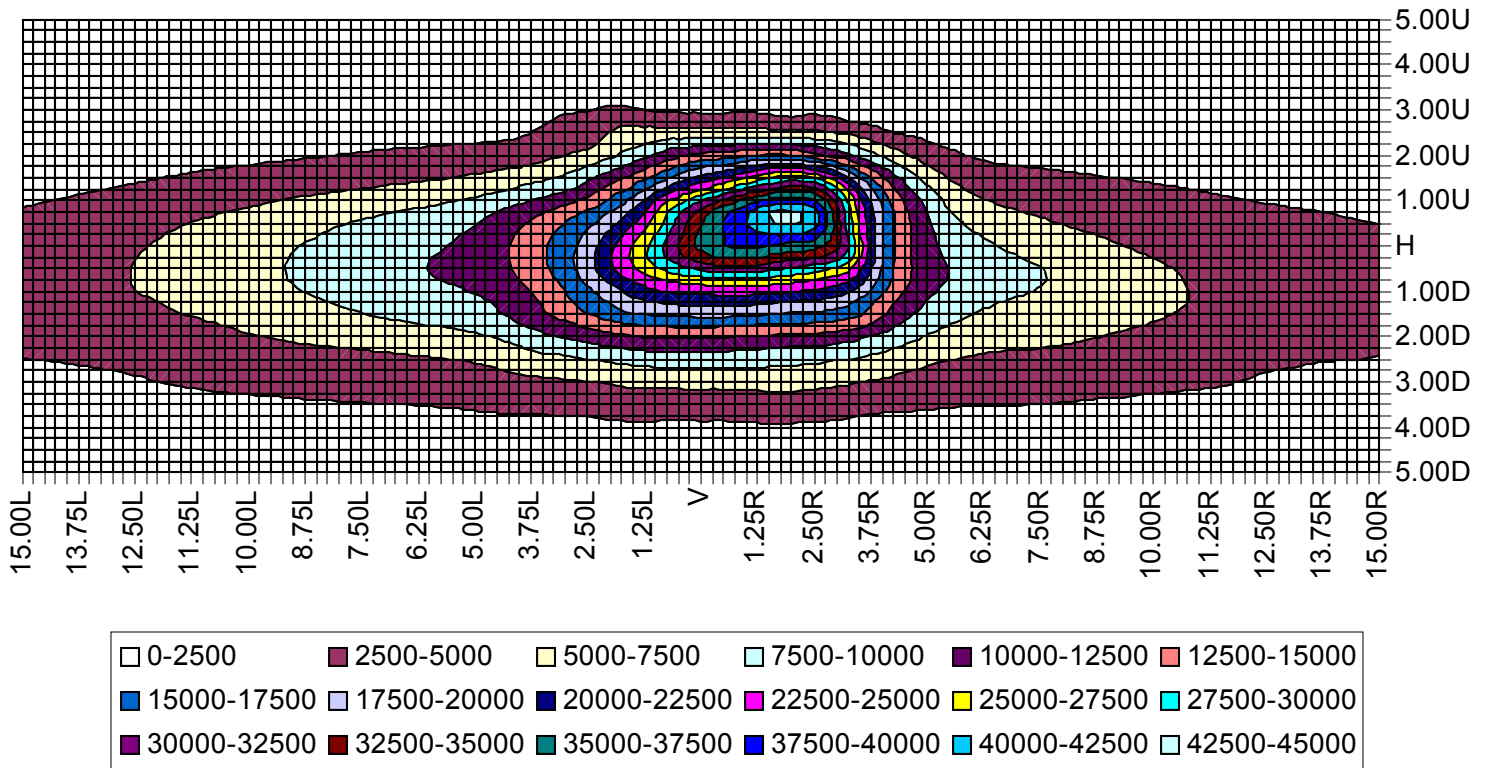
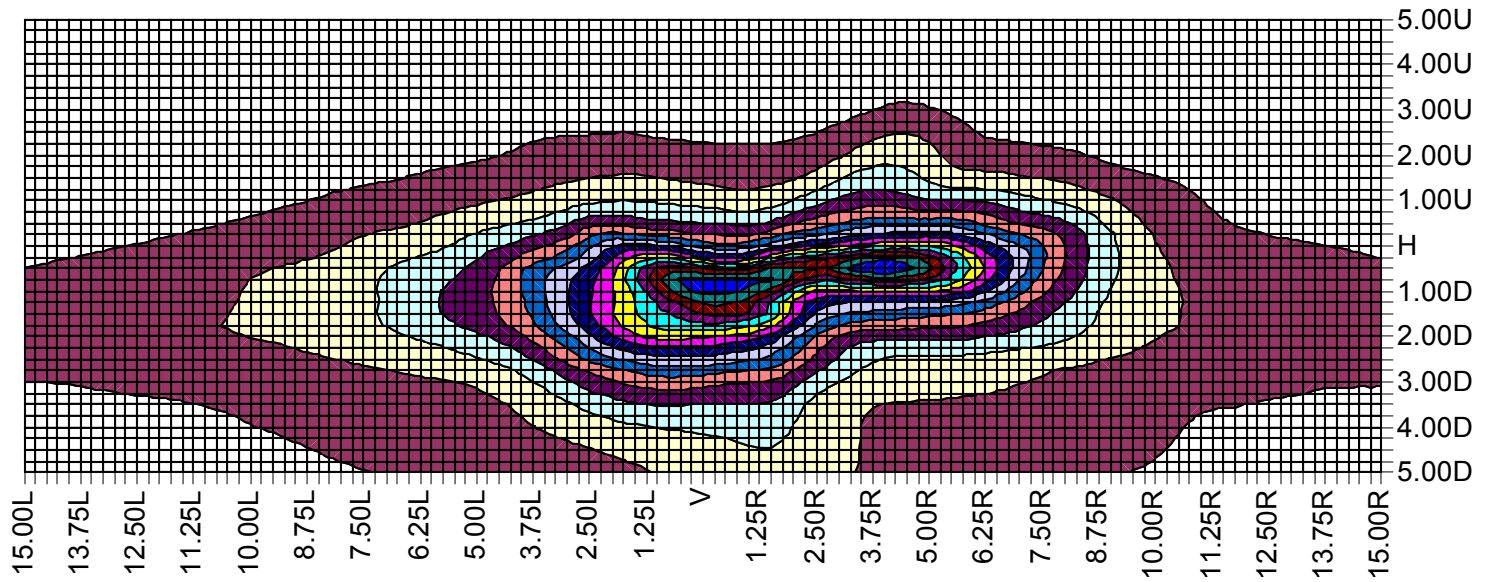


CHART DATA SHEET

Device Name: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

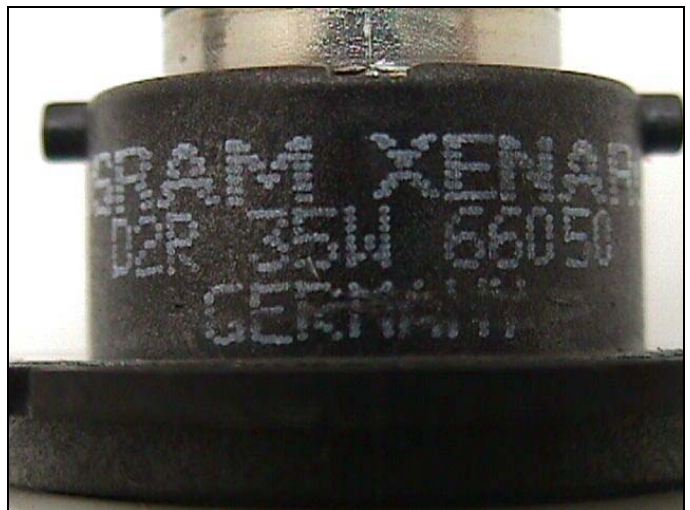
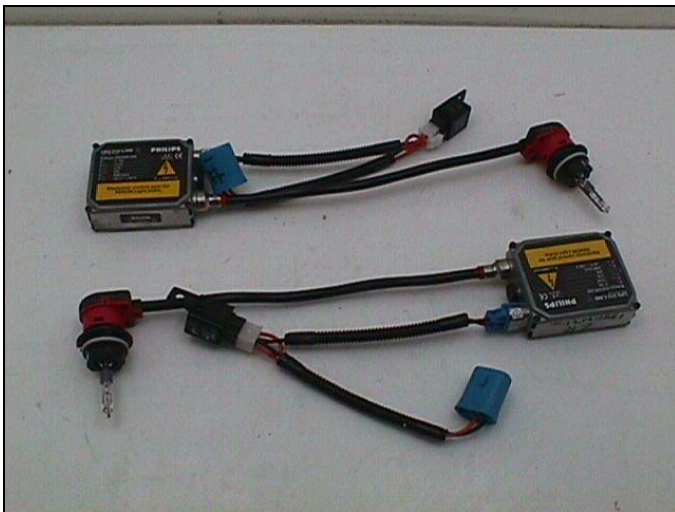
**Calcoast-ITL Report No. 1214-1B/01
 "9004-hid-phil" HID Conversion Kit
 LOWER BEAM - Candela**



| | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 0-5000 | 5000-10000 | 10000-15000 | 15000-20000 | 20000-25000 | 25000-30000 |
| 30000-35000 | 35000-40000 | 40000-45000 | 45000-50000 | 50000-55000 | 55000-60000 |
| 60000-65000 | 65000-70000 | 70000-75000 | 75000-80000 | | |

PHOTOGRAPH SHEET

Device Name: Procarparts "9004-hid-phil" HB1 HID Conversion Kit



PHOTOGRAPH SHEET

Device Name: Procarparts "9004-hid-phil" HB1 HID Conversion Kit

