



**“DVA6”**

# **Headlamp Alignment System**



## **Manufacturing Application**

Manual for Use and Maintenance



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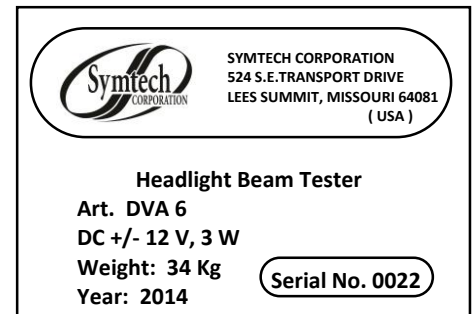
Thank you for your trust in selecting the Symtech DVA 6 as your choice for headlamp alignment assurance, we are confident you will find the DVA 6 capable of meeting all of your needs. The DVA 6 is an electronic, camera based system that is programmed to address all of the lamp types and patterns utilized now in the automotive arena, the system is extremely user intuitive with logical step by step operation. System will evaluate and align all legal lamps mounted no greater than 54" in height, system is programmed to address North American and European lamp patterns, right and left hand drive.

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## ACCEPTANCE OF THE MACHINE

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At the time of delivery it is essential to check at once and make sure you have received all the material indicated in the shipping documents, and that the machine has not undergone damage during shipment. In this case, show the damage to the forwarder and inform our customer service department. Only if you proceed promptly in this way will it be possible to obtain any missing material and reimbursement of the damage.



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## FOREWORD

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The DVA 6 is designed for correct beam alignment of any type of motor vehicle headlight.

The DVA 6 must be used for this purpose only. Even the finest of machines can function properly and ensure profitable service only if it is used correctly and kept in the best possible condition. For this reason, we ask you to read this manual with care and to reread it whenever difficulties should arise in using the DVA 6, contact Symtech Corporation, Customer Service Department at 888-884-8182 for assistance.

**NOTE:** the manufacturer may decide to make changes in the device without notice, in order to adapt it to technological advances and specific production or installation needs. Therefore, even if the illustrations shown in the manual differ slightly from the machine in your possession, the safety and instructions about it are guaranteed.

TECHNICAL DATA	
Field of measurement	
orientation: above and below right and left	0 – 24" / 25 ft (0 - 6 %) 0 – 39" / 25 ft (0 - 10 %)
Intensity:	0 - 240 lx (Lux/25mt) 0 - 150.000 cd (Candle) 0 – 150.000 lx (Lux/1mt)
Unit of intensity measurement	Lux (a 25mt) – Kcand – Klux (a 1 mt)
Unit of orientation measurement	% - inches/25 ft – degrees (°)
Height from ground of optical center	from 10" to 57"
Supply voltage with internal battery	12 V
Input voltage of battery charge	100 – 240 V / 50 mt (0 - 60 Hz)
Working temperature	+ 40°F - + 113°F
Width - height - length	inches 26" x 70" x 27"
Weight	pounds 79.5

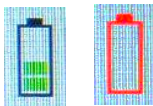
## SYMBOLS USED IN MANUAL



Warning Symbol

Read the sections preceded by this symbol with particular care, for the safety of the operator and the machine.

## SYMBOLS USED IN DVA 6 SOFTWARE



Indicator of internal battery charge status.

When the symbol is red, the DVA 6 requires change of battery, Remove discharged battery and replace with charged battery.



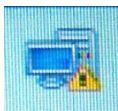
Indicator of state of connection with station PC.

\*\*\*\*\* **NOT CONNECTED** \*\*\*\*\*



Indicator of state of connection with station PC.

\*\*\*\*\* **CONNECTED** \*\*\*\*\*



Indicator of state of connection with station PC.

\*\*\*\*\* **INVALID DATA ITEM TRANSMITTED OR RECEIVED** \*\*\*\*\*



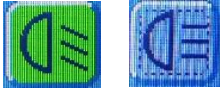
Touch key function to go back:

When key is pressed, the menu returns to the previous page.



Touch key function to switch the laser point on:

When **LASER** is pressed, the internal laser beams become active and the key changes its color to green



Touch key function to start test:

When **MEASURE** is pressed, the internal laser lights and the key changes its color to green



Real touch key function:

When **REAL** is pressed, the window opens with the REAL image projected on the internal screen of the optical box



Graphic touch key function:

When **GRAPHIC** is pressed, the window opens with the image reconstructed graphically of the measurement point projected on the internal screen of the optical box.



Save touch key function:

When **Save** is pressed, the data are saved and remain available for transmission to the PC when required.



Print touch key function:

When **Print** is pressed, the test result is printed

## PREPARATION OF DVA 6 SYSTEM

### CONTENTS OF PALLET:

1. Headlamp Alignment Component:
  - a. Optical Head
    - i. Printer
  - b. Rotating Mast
  - c. Three Wheel Base with Floor Slope Adjustment
  - d. Battery
  - e. Battery Charger

**NOTE:** If items are missing, or pallet has been damaged during shipment, contact Symtech Customer Service for immediate assistance.

## ASSEMBLY OF SYSTEM

Inspect all components of the **DVA 6** system to assure that no damage has occurred during shipment, if a component is damaged or missing, contact our customer service department at 888-884-8182 for an immediate replacement.

## BASE / WHEEL ATTACHMENT

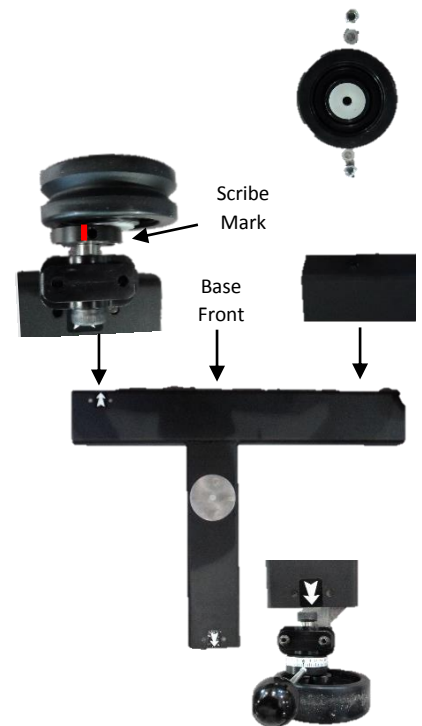
Place base of system on floor, or table with channel facing downward.

Mount two grooved wheel assemblies to the front of the base per illustration.

Mount the eccentric axel wheel assembly making sure that the scribe mark on the eccentric axel is aligned with the arrow on the base.

Mount the non-eccentric axel wheel by inserting bolt through mounting hole, place flat washer and then nut on bolt and tightening securely. Complete wheel assembly by placing in order a small nylon washer, wheel, small nylon washer and self-locking 5/16" nut on bolt. Tighten self-locking nut snug against wheel, but not so tight as to hinder free wheel movement.

Insert floor slope eccentric and wheel into mounting block on base (rear wheel). Tighten friction bolt until floor slope eccentric can be moved, but not loose enough to move by itself.



## MAST / GLIDE PLATE / ROTATIONAL MAST MOUNT

Place rotation bearing over mast stud and insert rotational mast stud into base. Secure mast to base with 1/2" flat washer and 1/2" self-locking nut. Tighten nut securely then back-off 1/4 turn, or until mast rotates freely with minor resistance.

The Mast, Counterweight Spring Cover and spring are packaged as an assembly, remove attachment screw at top of mast spring cover.

Slide Glide Plate over end of mast, between mast and mast spring cover, ensuring that handle is pointed away from spring cover. Slide glide plate down over mast until the spring hook of the glide plate is even with the bottom of the spring inside of the mast spring cover. Place bottom of spring into spring hook, and reattach screw at top of mast spring cover.

Move glide plate up and down the mast through its full motion, by depressing handle.

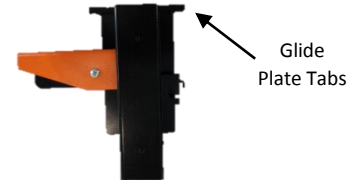


## OPTICAL ALIGNMENT HEAD

Remove optical alignment head from shipping carton. Inspect for any damage that may have occurred during shipment i.e. lens, case, etc...

Attach optical alignment head to the mast glide plate by first removing two attachment screws from bottom of optical head, slide optic head onto glide plate making sure that tabs on glide plate fit securely into grooves on optical head, insert mounting screws and tighten securely.

Move optical head through the full range of movement to assure of smooth operation.



## VEHICLE ALIGNMENT LINE LASER

Vehicle alignment laser assembly is enclosed in the accessories box.

**NOTE:** Install batteries and secure line laser cover per instruction that accompany Line laser assembly.

Mount line laser assembly so that unit is located directly over the optical head.

Insert 2,  $\frac{1}{4}$ " x 20 x 1  $\frac{1}{2}$ " screws (Small Parts Package) into line laser calibration block and attach all to top of mast.

**DO NOT TIGHTEN.** Tighten to a tension that allows for sufficient movement during calibration. After calibration has been performed tighten securely.

**NOTE: Line laser unit must be calibrated to the optical head prior to alignment of headlamps.**





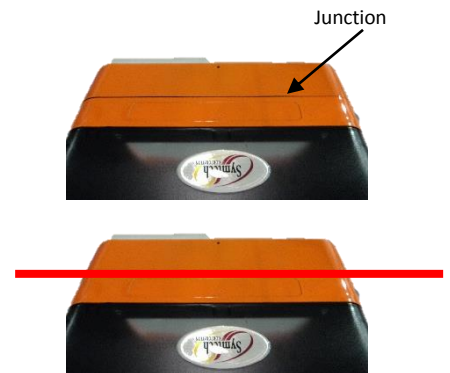
## LINE LASER CALIBRATION

Calibration of line laser unit must be performed prior to alignment of headlamps.

Raise optical head of **DVA 6** to the approximate center of travel of mast. Activate the line laser and turn the line laser unit until you can see the projected laser line on the junction line of the front lens assembly and the body of the optical head. Projected laser line should line up with this junction.

If line does not line up with the junction of the front lens assembly and optical head body, rotate line laser assembly right or left until projected laser line is parallel with junction of the lens assembly and optical head body. Tighten screws.

It is important that periodical checking of calibration of the vehicle alignment line laser be performed, to assure customer satisfaction.



## FLOOR SLOPE LASER

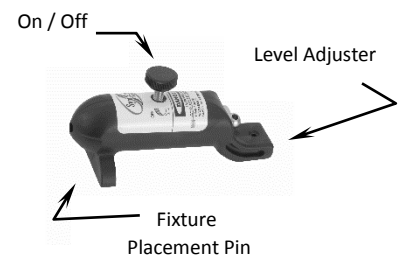
The floor slope laser assembly is factory calibrated, **DO NOT** turn the level adjustment set screw which is at the back of laser assembly.

**The laser is used for floor slope measurement only. Remove laser after floor slope measurements have been recorded**

Remove floor slope laser from packaging and insert front fixture placement pin into hole on top and at front of the optical head.

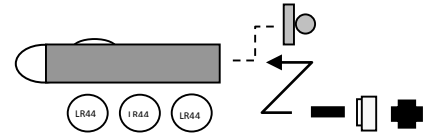
Activate the laser by turning front knob clockwise (CAUTION: Excessive turning may damage laser ON/OFF mechanism) to assure of functionality, turn off laser. No further adjustment is required.

NOTE: Should calibration of the laser become necessary in the future, Refer to "LASER CALIBRATION". Calibration,



## Laser Battery Replacement

Unscrew back of laser and replace batteries with three (3), **LR 44** button batteries. Reverse process for assembly.



**After battery replacement, CALIBRATION MAY BE REQUIRED.**

## MECHANICAL OPERATION, DVA 6:

### Glide Plate Handle

The optical head is adjustable in height by means of a glide plate with brake that rides on a vertical shaft, by depressing the brake handle, the optical head can be moved vertically.



### Base

The base is mounted on three wheels two of which are grooved, grooved wheels are mounted on front of base, and an eccentric axel with wheel is mounted on the rear of base allowing for smooth movement throughout the plane of operation. The mast can be rotated to allow for precise horizontal alignment to the vehicle.

### Line Laser

A line laser is mounted to the top of the mast and used to align the optical system to the vehicle. The line laser is activated via a push button located on the laser enclosure. An internal timer will deactivate the laser after approximately 5 minutes of operation.



## OPTICAL HEAD COMPONENTS, DVA 6:

### CONTROL PANEL / CONNECTIONS:

The control panel is located on right side of optical head, System is activated here and all external connections are located at this point. To activate system, press on/off button momentarily, to deactivate system hold on/off button until audio beep and release. All up-upgrades to software is initiated through the USB port.



## MONITOR;

The control screen is equipped with an LCD graphic color monitor that, with a few touches of the TOUCH SCREEN, guides the operator in performance of the test with accuracy and ease. By loosening of an allen screw located on the rear of monitor housing, monitor housing can be reversed for viewing from the rear of system.



## Cross Hair Lasers:

Two line lasers are mounted in the front optical lens assembly, lasers create a cross hair to position optical head precisely in the center of the headlamp bulb, or fiducial mark on the lamp lens



## GERNERAL SAFETY RULES:

The following rules must be followed carefully to prevent damage to the operator and machine.

- ❑ Read the machine labels, do not cover them for any reason, and replace them immediately if they should be damaged.
- ❑ The device should only be used by authorized personnel, trained in its use.
- ❑ Do not use the device in an explosive atmosphere.
- ❑ The working environment should be dry and sufficiently ventilated.
- ❑ When moving the machine, pay attention to other people, especially children, in the vicinity.
- ❑ **Do not** bump shelves or scaffoldings where there may be a danger of falling objects: you and the machine could be damaged.
- ❑ The storage temperature should be between 23° and 131°F.
- ❑ The working temperature should be between 41° and 113°F.
- ❑ Provide an adequate exhaust system for the exhaust gas, since the headlight test must be performed with the engine of the motor vehicle running. Accidental inhalation of carbon monoxide can cause serious damage to the organism, with a fatal outcome in some cases. Contact our agent in your zone, who can indicate the most suitable system for your company.
- ❑ Do not leave the headlight tester in the sun as the front lens is a precision ground convex lens which will function as powerful magnifying glass and the focused rays of the sun will damage to internal components of system.
- ❑ Do not leave the headlight tester out in the rain or in an excessively damp place as its electronic circuits could be damaged.
- ❑ If the headlight tester will not be used for a long period, we recommend that you cover it with its dust cover (optional).
- ❑ When you encounter any malfunction in use of the machine, contact Symtech Corporation, 888-884-8182
- ❑ In case of parts replacements, only use ORIGINAL replacement parts, contact Symtech Corporation for correct componentry.

**Tampering with any part of the machine will invalidate the warranty.**

## PREPARATION of VEHICLE:

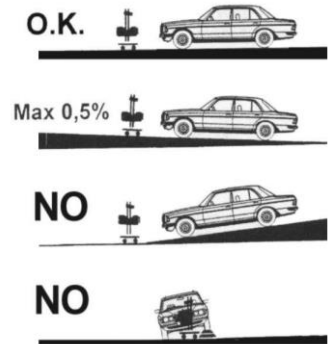
Make sure the headlights are clean and dry. Eliminate anything that could affect the correct position of the vehicle: mud, snow, ice, etc. Straighten the vehicle wheels. Make sure the vehicle does not have any distortions of the frame. Make sure the tires are inflated at the correct pressure.

### CAUTION!

When operating in an enclosed space with the engine on it is essential to evacuate the toxic gasses produced by combustion. We recommend using a specific fan for exhaust fumes.

### FLOOR INCLINATION:

During the headlight test the floor surface must be level. The drive through rail system is designed to provide a level surface, to confirm surface is level, periodically check the level bubble inside the optical head. Do not test headlights on floors that are not perfectly regular and level, as the measurement will not be accurate.



If, when the machine is switched on, the symbol for BATTERY DISCHARGED is displayed, connect battery charger. If battery discharges in less than four hours of operation, it is a symptom of battery deterioration, refer to BATTERY REPLACEMENT.



## ALIGNMENT with VEHICLE:

### HEADLAMP HEIGHT SETTING:

Place the headlight tester in front of either drivers side or passenger side headlight of the vehicle, measure the height from the floor at the center of the headlamp bulb or fiduciary mark and select the correct lamp height category on the “TEST Headlamp Screen”. Software will automatically adjust the lamp pattern position according to height.

NOTE: Categories of headlamp height are;

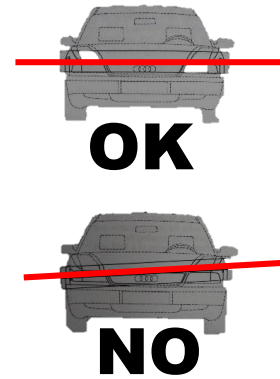
23” ~ 36”

36.1” ~ 48” (Lamp pattern lowered 2”)

48.1 ~ 54” (Lamp pattern lowered 2.5”)

## ALIGNMENT TO THE VEHICLE:

Locate two details, on the front of the vehicle, that are perfectly symmetrical between them (for example the top of the windshield or the headlights themselves). Activate line laser and rotate the optical head until the laser line intersects the two selected points.



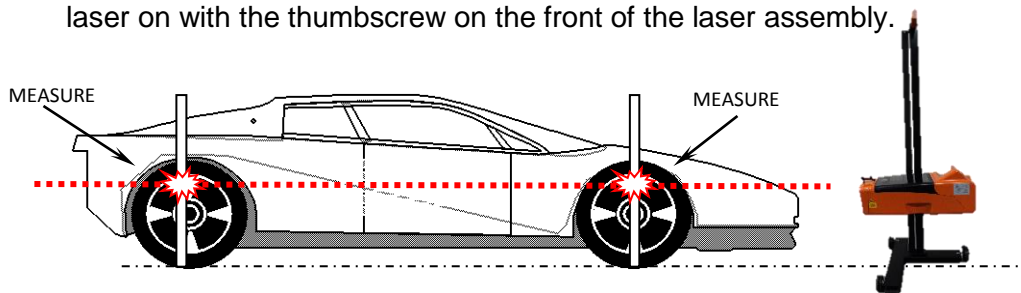
## FLOOR SLOPE MEASUREMENT

Tool Required: **Tape Measure** or **Ruler**

Move the **DVA 6** to the service bay to be used for headlamp alignment and place the **DVA 6** at the front of the vehicle, off to one side. If multiple bays are to be used, procedure for determining floor slope will need to be performed in each bay and recorded.



Lower the optical head to the bottom of the mast. Adjust optical head by rotating eccentric wheel at rear of base until level vial registers level. Turn the laser on with the thumbscrew on the front of the laser assembly.



At the center point of the front wheel of the vehicle measure the distance from the floor to the point where the laser strikes the tape measure, **RECORD**.

Move to the center point of the rear wheel of vehicle and measure the point where the laser strikes the tape measure, **RECORD**.

If the measurements at the front and rear wheels are not equal, the bay has a slope.

Rotate the floor slope handle on rear wheel until equal measurements are registered at the front and rear wheels.

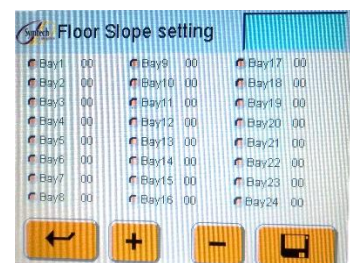


**NOTE:** When rotating eccentric axle on **DVA 6**, both measurements will change at front and rear vehicle wheels, to achieve equal measurements, more than one eccentric axle adjustment may be required.



Note the number on the floor slope gauge and record in Options screen, Floor Slope/Bay. Repeat procedure for other bays and record.

**NOTE:** After measurements have been taken, remove laser and store in a secure place



## SCREENS & SETTINGS

Activate alignment system by pressing the ON / OFF button located on side of optical head, wait a few seconds for loading of the process software.

The HEADLIGHT ALIGNER screen will appear, select "APPLICATIONS".

### OPTIONS Screen:

Select OPTIONS

#### Option buttons:

##### **Language**

English  
French  
Spanish

##### **Display Timer**

Always ON  
1 Minute  
5 minutes

##### **Software**

Selected when a Software up-date is required

##### **Info**

System Operation Program

##### **Date – Hour**

Sets date and time

##### **Floor Slope Bay**

Used when multiple bays are used for alignment

##### **Service**

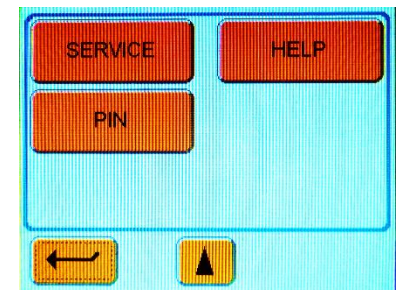
Utilized by Authorized personnel ONLY

##### **Help**

Instruction of how to perform alignment

##### **Pin**

Utilized by Authorized personnel ONLY



### Select APPLICATIONS

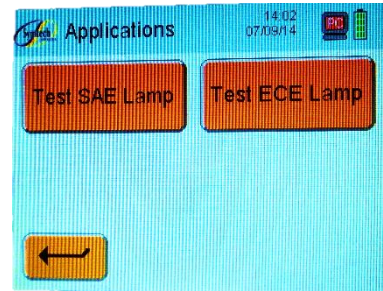


## Test SAE Lamp

All, lamps that have a North American lamp Pattern, SAE, VOL, VOR

## Test ECE Lamps

All, lamps that have a European lamp Pattern, UK, (Left hand drive), EU Asymmetrical, Symmetrical



**NOTE:** After selecting North American or European lamp, a Settings screen will appear where all parameters are set

## Setting Parameters

### Vehicle

Car  
Truck  
Motorcycle

### Lamp Pattern

SAE  
VOL  
VOR

### Pattern Type

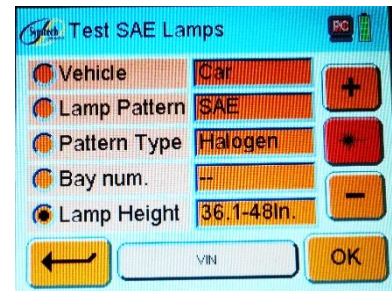
Halogen  
Xenon  
LED

### Bay Number

Only set when alignment is performed in multiple bays


### Lamp Height

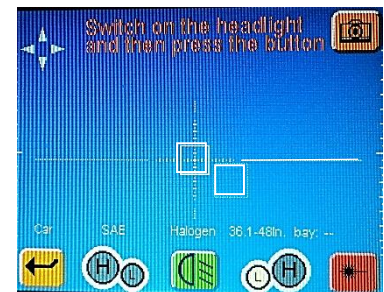
23 ~ 36"  
36.1 ~ 48"  
48.1 ~ 54"



## Alignment Screen

After setting all parameters of vehicle and lamp, pressing OK on the settings screen the alignment screen will appear.

With the headlamp on, the location of pattern will appear, press  low beam symbol, software will begin to analyse the lamp pattern and a red or green dot on the screen will appear. RED dot represents that the lamp pattern is out of alignment, GREEN Dot

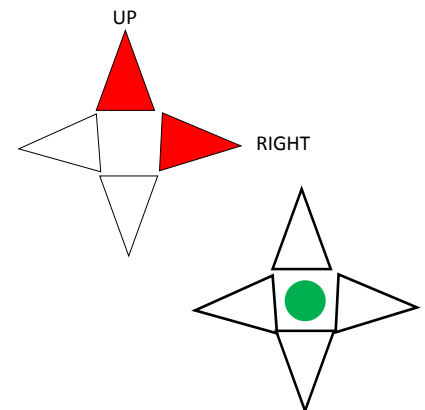


represents that the lamp pattern is aligned within allowable limits.







Measurement of location of lamp pattern is depicted in the left hand, upper corner of screen, arrows show direction that the lamp pattern is misaligned.

When dot in center of arrows turns GREEN, lamp is aligned within allowable limits.



### HEADLAMP ALIGNMENT PROCEDURE:

- ❖ **Turn on System.**
- ❖ **Move DVA 6 to center of vehicle and activate line laser.**
  - **Align line laser with pre-selected horizontal alignment points.**
- ❖ **Move DVA 6 to driver side lamp.**
- ❖ **Select APPLICATIONS**
- ❖ **Select Test SAE Lamp**  
**OR**  
**Select Test ECE Lamp**
- ❖ **Confirm Settings are correct for lamp being tested**
- ❖ **Activate optical head cross hair laser and center optical head on headlamp.**
- ❖ **Press OK**
- ❖ **Press Lamp Button  Low Beam**
- ❖ **Adjust lamp accordingly, until dot is GREEN, or until acceptable measurement is achieved**
- ❖ **Press  Record Button**
- ❖ **Press Lamp Button  High Beam**
- ❖ **Adjust lamp accordingly, until dot is GREEN, or until acceptable measurement is achieved**
- ❖ **Press  Record Button**



- ❖ **Repeat process until all lamps have been aligned, after pressing Record button for the final lamp, Statistics will appear of service performed.**

## **BATTERY REPLACEMENT, OPTICAL HEAD**

The original battery which is installed in the optical head is 12 volt, 7 amp battery, rated for a life span of three to four years under normal usage and diligent attention to charging every two to three days dependent upon power demand. In the event of a battery not taking a charge, replacement can be performed in the following manner.

1. Remove battery cover located in bottom rear of optical head by removing phillips screw as depicted.
2. Disconnect battery connector
3. Loosen phillips screw on battery hold down and remove battery.
4. Replace depleted battery with new battery and reverse process.

NOTE: Charge new battery for at least twelve (12) hours prior to using DVA 6.



## **LINE LASER, BATTERY REPLACEMENT:**

Remove cover from line laser enclosure by removing 4 philips head screws.

Remove depleted AA batteries and replace with new, taking note of correct battery + and – registration.

Replace cover.



## FLOOR SLOPE LASER CALIBRATION

**“LASER IS CALIBRATED AT THE FACTORY PRIOR TO SHIPMENT”**

**“Calibration Required ONLY if Rear- LASER Adjustment Set Screw has been tampered with”**

Tools Required: **Elevated Surface** (wheel alignment, frame machine)

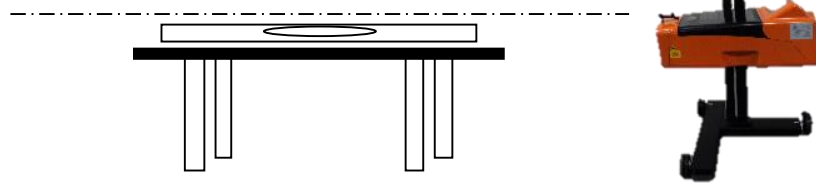
**Level** (carpenters level or other means)

**6' Straight Edge** (board or other means)

**5/64” Allen Wrench**

Locate an elevated surface and lay the straight edge on surface facing away from optical head. Check straight edge for level, shim if necessary.

Move **DVA 6** to end of straight edge, turn on the laser and adjust height of optical head so that the mounted laser will shoot down the straight edge.



Adjust the rear floor slope wheel until the level in the optical head is centered. Readjustment of height of optical block may be necessary.

Adjust the rear height adjustment set screw of the laser assembly (Lock Tight has been installed on screw at factory, minor pressure should break seal) till laser is viewed at both ends of straight edge equally.

Laser is now calibrated, installing lock tight or other adhesive to adjustment screw is recommended.

## **WARRANTY**

All Symtech Corporation Headlamp Alignment Service Equipment Systems are warranted to be free from defects in material and workmanship under normal use and service for a period of one year after the sale of the product. Exception to this policy will be individually evaluated and must be approved by Symtech Corporate. The sole obligation under this warranty shall be to repair or replace any defective product, or component thereof, which upon examination are deemed to the manufacturer's satisfaction to be defective.

The warranty shall not apply to any product which has been subject to misuse, negligence, or accident. The manufacturer shall not be responsible for any special or consequential damages and the warranty as set forth is in lieu of all other warranties, either expressed or implied.

Symtech Corporation DVA 6 Camera Based Optical Headlamp Alignment Systems have been tested and found to comply with the Society of Automotive Engineers (SAE) recommended practices prescribed in standards J599, J600, J1383 and J1735.

The manufacturer makes no claims or warranties of any kind that the Symtech Corporation Optical Headlamp Alignment System will align headlamps that do not conform to Society of Automotive Engineers Recommended practices described in J599, J600, J1383 and J1735



**524 S. E. Transport Drive  
Lee's Summit, Missouri 64081  
816-525-9263 FAX: 816-525-9283  
888-884-8182**