

# **CLEARCAM™ CAMERA IN LEM MIRROR SYSTEM OWNERS MANUAL**



Lower Electronic Module (LEM) with Camera



ClearCam Camera Assembly



LEM with Faceplate and Camera Assembly removed

Velvac's *ClearCam* Camera in LEM Mirror System is a fully integrated camera/mirror module in the V-Max™ and V-MaxIII mirror head designs.

## **Features and Specifications**

- Fully tested to ISO 11452-2 (EMI), ISO 10605 (ESD) standards, CISPR 25 (ESD) temperature and Vibration (-40°C to +85°C), humidity and AEC-Q1000 certified.
- Built-in anti-blooming protection to maintain visibility under sunlight, glare and headlight conditions
- Exceptional low-light performance (down to approximately 1 lux)
- 60 degree horizontal viewing angle and 65 degree vertical viewing angle
- Minimum supply voltage 9.0 VDC, Maximum supply voltage 30.0 VDC
- Maximum current draw 50 mA
- Sealed camera housing and conformal-coating protects the electronics from environment
- Wiring harness designed to be a direct fitment to ASA monitors

# CARE FOR YOUR MIRRORS

## CAMERA ADJUSTMENT

### Care for your Mirrors and Camera

Clean the mirror glass with a clean cloth and glass cleaner. Clean the mirror housing, arm, and base with a wet cloth or sponge. After drying, to protect the finish apply a product designed for plastic.

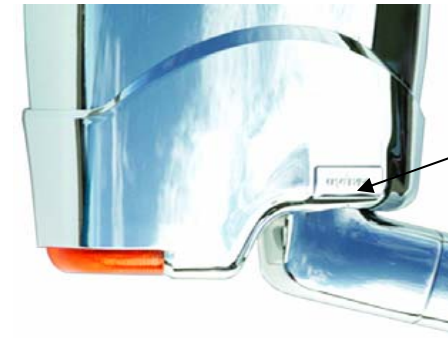
**DO NOT USE A WAX ON THE TEXTURED SURFACES! Non abrasive waxes and polishes can be used on chrome and smooth surfaces. A recommended polish is Flitz™. See the Velvac web site for information on Flitz™ polish.**

The camera should be cleaned as you would the lens of your personal hand held camera. A soft cloth and lens cleaner should be used without abrasives which can scratch the camera lens.



### Camera Adjustment

NOTE: Camera adjustment should be made AFTER adjusting the head as described below. The camera assembly can be rotated horizontally in the lower electronic module (LEM) to optimize visibility. Only horizontal movement can be made. To rotate the camera assembly loosen the screw next to the camera. This will take the tension off the camera and friction pad on the faceplate. Manually rotate the camera assembly. After obtaining the desired view, tighten the mounting screw.



Set Screw Cover

### Head Adjustment

The mirror head is adjusted in the factory allowing for several left to right hand adjustments during installation. If additional Adjustments are necessary, access to the set screw is required. With a small flat head screwdriver carefully remove the "Velvac" rectangular cover from the back of the LEM housing. The cover provides access to a set screw which can be loosened with a 3/16" Allen wrench. Loosen the screw just enough to allow the mirror head to pivot. Adjust the head to the desired position, tighten the set screw to 90-100 in-lbs and snap the cover back into position.



**VELVAC**  
Quality Driven Vehicle Components Since 1934

# CAMERA ASSEMBLY AND LIGHT REPLACEMENT INSTRUCTIONS



**Assembled LEM**



**LEM with Faceplate removed**



**Camera assembly removed**

## Camera Assembly Removal

The camera assembly is aligned with the faceplate with a series of lines molded into the top edge of the camera assembly. The notches are visible with the faceplate fully assembled on the LEM. See the Assembled LEM photo. Take note as to the alignment of the camera assembly prior to disassembling. To remove the camera remove the two Phillips head screws which hold on the faceplate and remove the faceplate. Then remove the camera from the module shell by disconnecting the short harness lead from the connector.

## Light Removal

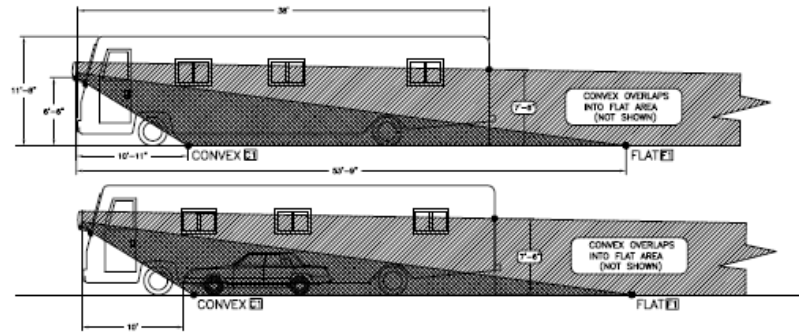
After removal of the faceplate described above, there is access to the connector for the light. The light will slide out of the module shell and can be replaced after disconnecting the short harness lead from the electrical connector.

## Camera Assembly and Light Installation

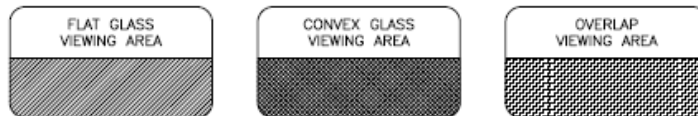
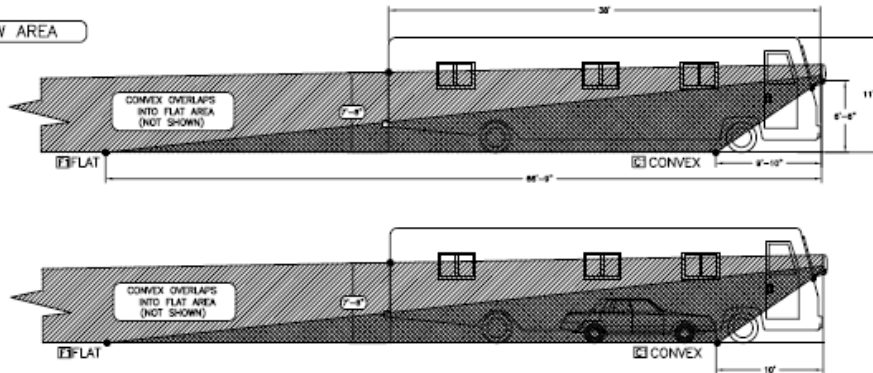
Install the new camera assembly and light in the reverse order. Remember to align the lines on the new camera assembly with the faceplate. Install the faceplate and secure with the two Phillips head screws.

# MIRROR GLASS ADJUSTMENT

DRIVER'S SIDE VIEW AREA



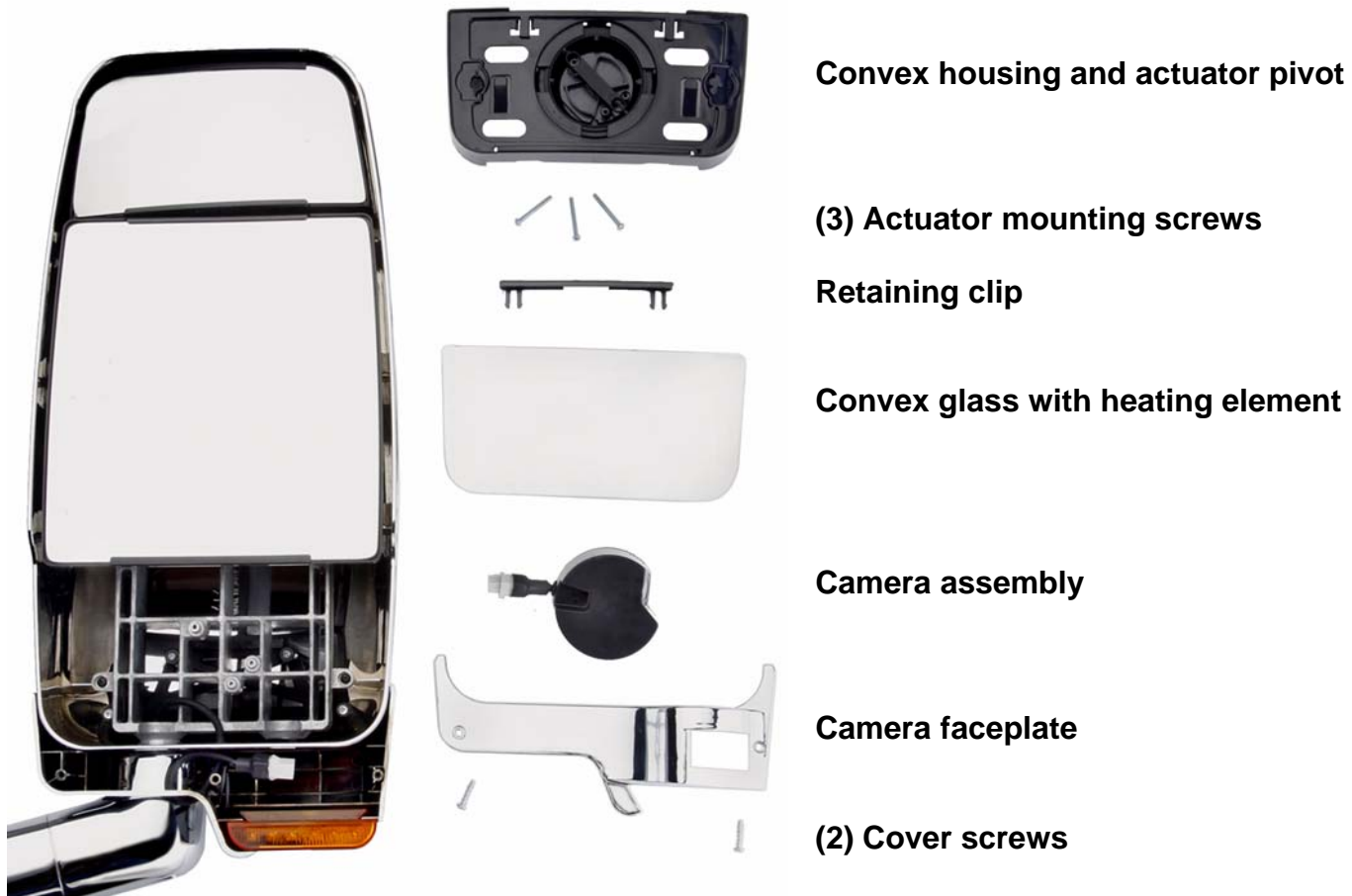
PASSENGER'S SIDE VIEW AREA



## Refer to views above

With a person in the driver's seat and mirrors in the normal driving position use the remote control switch to adjust the mirror glass. If the mirrors are manual, adjust the mirror glass by gently pushing on the glass surface. If necessary, mirror glass on remote controlled mirrors can be moved manually by gently pushing on the mirror glass. Adjust flat glass horizontally to view side of vehicle and out. Then adjust flat glass vertically to view from point F1 and up. Adjust convex glass horizontally to view side of vehicle and out. Then adjust convex glass vertically from point C1 and up. Note there will be overlap of the viewing area with the flat glass and convex glass.

# REPLACEMENT PARTS





# REPLACEMENT PARTS

LEM Replacement Parts		
Part #	Description	Includes
709731	Left (driver) side camera assembly	Camera assembly with attached harness and connector
709730	Right (passenger) side camera assembly	Camera assembly with attached harness and connector
709724	Light	LED Light with harness and connector
C709715	Chrome Left (driver) side LEM housing	Housing with removable set screw snap cover
C709716	Chrome Right (passenger) side LEM housing	Housing with removable set screw snap cover
C709723	ChromeSet screw snap cover	2 covers
C709717	Chrome Left (driver) front LEM cover plate	Face plate and 2 mounting screws with friction pad
C709718	Chrome Right (passenger) front LEM cover plate	Face plate and 2 mounting screws with friction pad
Q709715	Black Left (driver) side LEM housing	Housing with removable set screw snap cover
Q709716	Black Right (passenger) side LEM housing	Housing with removable set screw snap cover
Q709723	Black Set screw snap cover	2 covers
Q709717	Black Left (driver) front LEM cover plate	Face plate and 2 mounting screws with friction pad
Q709718	Black Right (passenger) front LEM cover plate	Face plate and 2 mounting screws with friction pad
L709715	White Left (driver) side LEM housing	Housing with removable set screw snap cover
L709716	White Right (passenger) side LEM housing	Housing with removable set screw snap cover
L709723	White Set screw snap cover	2 covers
L709717	White Left (driver) front LEM cover plate	Face plate and 2 mounting screws with friction pad
L709718	White Right (passenger) front LEM cover plate	Face plate and 2 mounting screws with friction pad

# REPLACEMENT PARTS

## Replacement Glass Kits

	<p style="text-align: center;"><b>Flat glass has 98.7 Square inches of viewing area</b></p> <p style="text-align: center;"><b>Convex glass has 30.1 square inches of viewing area</b></p>	
<b>Vmax</b>		
<b>Part #</b>	<b>Description</b>	<b>Includes</b>
709450	Flat glass kit	Flat glass with heating element, straight clip
709650	Convex glass kit	Convex glass with heating element, curved clip
709651	Convex repair kit	Convex glass with heating element, curved clip, convex housing and actuator pivot
	<p style="text-align: center;"><b>Upper convex glass has 26.4 square inches of viewing area</b></p> <p style="text-align: center;"><b>Flat glass has 72.5 Square inches of viewing area</b></p> <p style="text-align: center;"><b>Lower convex glass has 30.1 square inches of viewing area</b></p>	
<b>Vmax III</b>		
<b>Part #</b>	<b>Description</b>	<b>Includes</b>
709732	Flat glass kit	Flat glass with heating element, straight clip
709733	Upper convex glass kit	Convex glass with heating element, curved clip
709734	Lower convex glass kit	Convex glass with heating element, curved clip
709735	Lower convex repair kit	Convex glass with heating element, curved clip, convex housing and actuator pivot



**For ordering parts, warranty assistance, and technical support contact Velvac directly:**

**Phone: 1-800-783-8871 Monday-Friday 7:00am-4:00pm central time**

**Velvac web site: [www.Velvac.com](http://www.Velvac.com)**

**Technical support Email: [technicalsupport@Velvac.com](mailto:technicalsupport@Velvac.com)**

### **Limited Warranty**

The standard warranty coverage is for twelve months from date of purchase. This warranty covers all defects in material which under normal use or service are proven defective after a factory evaluation. If proven defective, Velvac will replace, ground freight prepaid, with a new part.

This warranty does not extend to any which have been subject to misuse, accident, improper application, improper installation or improper maintenance, nor does it extend to products which have been repaired or altered outside of Velvac's plant. This warranty does not cover charges for installation, labor, travel, consequential damage, loss of time or other incidental charges. Broken mirror glass is not warrantable.

Velvac® is a registered trademark of Velvac, Inc.

ClearCam™ is a trademark of Velvac, Inc.

V-Max™ is a trademark of Velvac, Inc.