ROADWATCH®

Temperature Indicating System

Commercial Vehicle Group

www.cvgrp.com

RoadWatch® Service Center *Phone 800-459-7328*

What is a Temperature Indicating System?

RoadWatch® is a passive infrared temperature indicating system. It uses infrared technology to determine road surface temperature without physical contact. The RoadWatch® system consists of two components: the sensor and the display. The sensor is the "thermal camera" for the system, and is installed with a clear view of the road surface. The display is mounted on the vehicle instrument panel, gives the driver a digital read-out of both the air and road surface temperatures.

The technology of the RoadWatch® Temperature Indicating System is similar to the light meter in a camera. The light meter absorbs (passive) light energy from whatever source is in the field of view, and converts that light energy to an electrical signal. RoadWatch® does the same, except it is absorbing heat energy (infrared), and converting that heat energy to an electrical signal. The display then takes that electrical signal, processes it and shows the temperature.

RoadWatch® displays two sets of numbers: the smaller number at the top of the display is the air temperature. The larger number at the bottom of the display is the road surface temperature.

There are other options to the RoadWatch® temperature indicating system. Mounting brackets allow for the installation of the sensor at locations other than the truck mirror. Also, gauge mounts allow the display to be secured on top of or under the vehicle dash.

How does this temperature indicating system work?

RoadWatch® is a simple to install, easy to use temperature indicating system consisting of two parts, a sensor and a display.

The sensor, which is mounted outside the vehicle, "reads" the temperature of whatever it is seeing at that moment. In the normal mounting, it sees a spot on the pavement, about a foot across, next to the driver's side of the vehicle. If the pavement is covered with snow, it will read the surface temperature of the snow. The sensor samples at 4 times per second, so even while the vehicle is in motion, the readings are "real time".

The display, which mounts in the cab, shows the driver the outside air temperature as well as the road surface temperature. The display is "dampened", to update road surface temperature every 1/2 second. Large variations in road surface temperature will immediately be displayed.

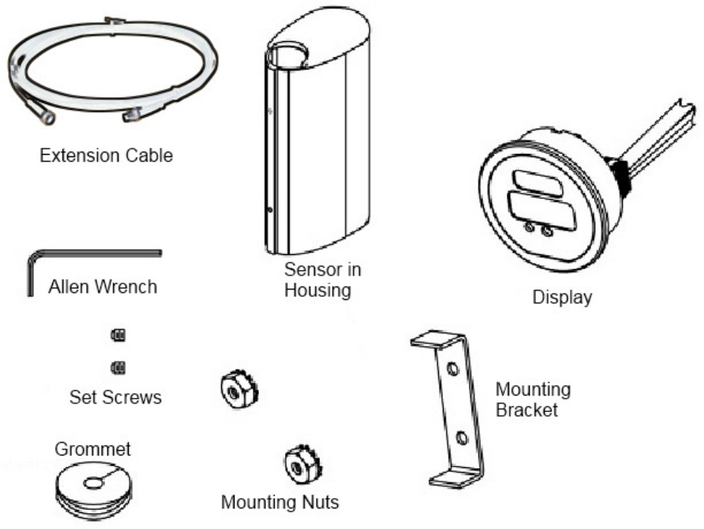
In use, as the road surface temperature lowers to 35° F, a small caution light appears on the display. The light will remain on whenever the road temperature is below 35° F.

Parts included in kit:

- Sensor
- Cable
- Display
- 1 small allen wrench to tighten the screws on the Sensor
- 2 set screws
- 1 rubber grommet
- 2 mounting nuts
- 1 Display mounting bracket

Recommended Tools and Parts for Installation:

- Electric drill
- 5/8"" drill bit
- Wire cutter/striper
- 11/32" Box End Wrench
- Ground Wire Terminals
- Tie Straps



Sensor Replacement

RoadWatch® Bullet™ now has provisions for replacing the sensor core without the need to remove the cable from the cab. This feature simplifies sensor head servicing. Since the sensor connection is now inside the protective housing, you may have to retrieve some of the slack of the existing cable or obtain a short extension cable. For servicing only the sensor, contact the factory for available options.

Sensor Installation

The sensor is typically located on the mirror but other vehicle mounting locations can also be acceptable. Be sure to allow the sensor a clear view of the road, with no interference from the vehicle. Avoid mounting in locations that are prone to debris collection and splashing. Also be aware that location near heat sources or without passing air flow can significantly reduce measurement accuracy.

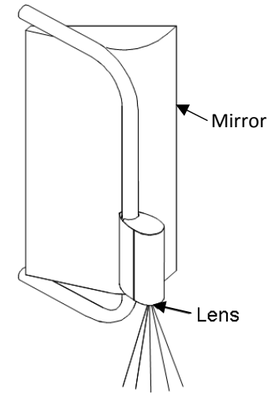


Fig. 1

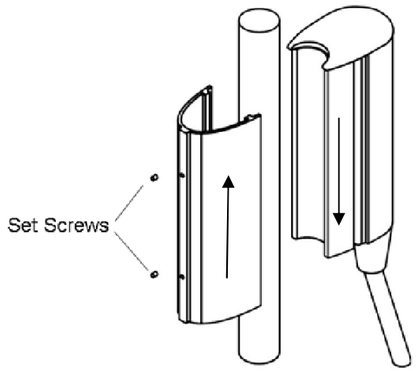


Fig. 2

Fig 1: Demonstrates how the sensor can be attached to the mirror.

Fig 2: Exploded view of how to attach the sensor to the mirror.

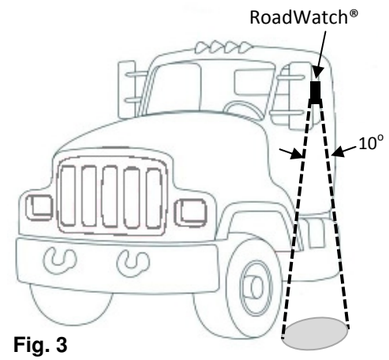


Fig. 3

Assure sensor can 'see' only the road

Sensor Installation (cont)

1. The recommended mounting position for the sensor is on the C-loop of the driver's side mirror. It is not necessary to loosen the mirror or remove the C-loop. Ref Figure 3. The sensor must be mounted a minimum of 20" above the road surface, with a clear view of the road. To optimize performance, mount the sensor approximately 2" away from the side of the vehicle for every 1' of height above the road. If this is not possible, you may mount the sensor angled away from the vehicle for a clear view of the road. Do not exceed a 30-degree angle.

   - The bullet™ sensor is held by a two-piece plastic assembly. Separate the plastic assembly from the aluminum housing by sliding the unit apart. Set the plastic unit aside. Separate the two parts of the aluminum housing and reassemble around the C-loop as in Figure 2

   - Position the sensor housing low on the outside of the C-loop and tighten the two small allen set screws with the allen wrench from the kit. Check that nothing obstructs the view of the road, including step boards

2. Locate the female connector end of the extension cable. Feed this end up through the aluminum housing about 5" beyond the top. Tie strap the cable to the C-loop, and route the remaining cable to the door or cowl. Avoid pinching, crunching, pulling or sharp bends.

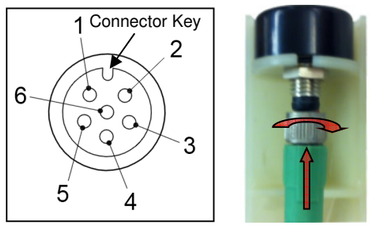
   CAUTION: Do not locate cables near hot surfaces, moving parts, or engine exhaust. Avoid routing sensor cable near transmitting antenna cables.

3. If necessary, drill a 5/8" hole in the door or cowl to run the cable into the cab. A rubber grommet is provided to protect the cable and seal the hole.

4. Route the cable up to the back of the dash and to the display opening. Tie strap as necessary.

Make the RoadWatch® Bullet™ M8 Connections:

- Locate and align the key on the female side of the cable with the key on the sensor connector. The key is on the top or 12 o'clock position on the sensor bulkhead connector. Ref Figure 4
- Push the mating connector ends together, as far as they will go easily
- Screw the outer ring together finger-tight



Female Cable Side

Fig. 4

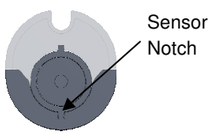


Fig. 5a

Sensor must be fully seated

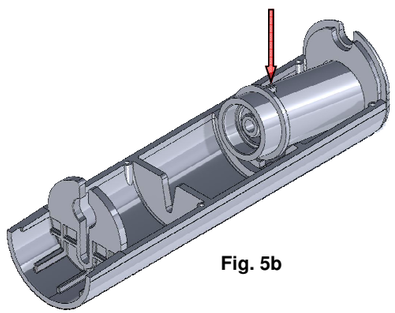


Fig. 5b

- Once the cable connection is secure, assure the sensor notch is aligned. Ref Figure 5a and 5b. The sensor should lie flat in the sensor holder of Fig 5b. Slide the sensor holder assembly up through the aluminum housing. Attach the plastic mating cover making sure the sensor is still seated. The cover and housing must fit together without edge gaps. The unit should now slide down into the aluminum housing

RoadWatch® was designed to be maintenance free, requiring no service or adjustment. There are a few cautions for certain situations:

The sensor reads the road surface temperature through a small "window" at the bottom of the sensor body. Normal air flow will keep the lens clean. When driving in extreme conditions of salt spray or other dirt that covers the headlights., the sensor lens may also get dirty. If this occurs, carefully rinse and wipe with a soft cloth. The sensor element is factory sealed against moisture. However, a high pressure washer aimed directly at the lens may damage the unit.

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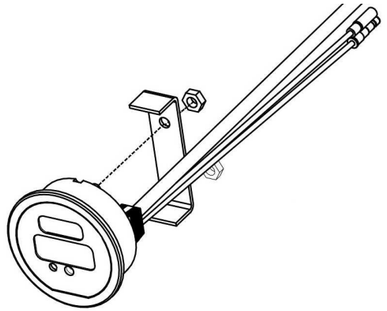
Fig. 6: Attachment of the display using the bracket and mounting nuts.

Display Installation

Choose a location for the display. It is best to install the display in your primary field of view.

If you do not have an available standard 2" gauge opening, cut or drill a 2 1/16" opening in the dash panel. Loosen the screws that hold the panel in place and pull the panel out as far as possible. The cable from the Sensor must reach this opening. Avoid installing in a heated or confined area where the rated temperature may be exceeded.

Set the display into the opening in the dash panel and connect the cable from the Sensor to the short cable exiting the display. Use cable ties (not supplied) to secure the routing.

Note: There are key notch features on both connectors that assure proper pin-to-pin connection. When joining the two connectors together, be sure the latch fully engages.

Place the mounting bracket over the attachment studs on the rear of the display. Install the supplied nuts. Be sure not to over tighten. Ref Figure 6.

Connect the orange power wire to an appropriately rated fused power source. Connect the "Black" wire to a suitable ground. Two bullet style connectors are supplied for connecting to the vehicle power. Attach these to the vehicle power wiring.

To test the unit, start the vehicle. The display should show dashes across the read out for a few seconds as the system warms up, then you will see two temperature readings.

On The Road

Sudden changes in air temperature may cause the unit to temporarily read inaccurately. For example, when the unit is in a heated garage and then moved into a freezing environment, it may take a few minutes of driving for both the air and road temperatures to fully acclimate.

Standard Features

Sensor

- Type: Passive Infrared (IR) temperature measurement
- Housing: Anodized aluminum extrusion
- Cable: 4, 12(standard) or 16 feet available

Display

- Size: Standard 2" diameter
- Weight: 3 oz
- Features: High contrast LED display
  Air and road readout
  Caution light at 35° F
  Auto-dimming

General features

- Fast response time
- IR reflective rugged metal housing
- Versatile sensor mounting

Technical Specifications

RoadWatch® technology is protected under US patents 5796344, 6166657, and 6206299 with additional US and foreign patents pending.

System Operating Range: -40° to +150° F
Thermal Shock: ISO 16750-4 (2010) Section 5.3.1.3
Water Immersion: ISO 20653 Section 6 IPX7
Salt Fog: ISO 16750-4 (2010) Section 5.5.2.1
Storage Range: -40 to 75℃ or -40 to 167 ℉
Relative Humidity: 95% non-condensing
Vibration: 4g sensor and display
Shock: 100g sensor element
Road Accuracy: ± 2 ℉ (15 to 100 ℉ under ambient stable)
Air Accuracy: ±2 ℉ (-40 to 131 ℉) while moving > 5 MPH
Field Calibration: accuracy ±1 ℉ (0 to 100 ℉)
Repeatability: ±1 ℉ under stable ambient conditions
Emissivity: Factory calibrated at 0.96
Field of View Angle: 5° typical
Weight: 11oz sensor, 3oz display
Operating Voltage: 9-28Vdc Sensor, 12Vdc display (nominal)
Current Requirement: 0.1A
Sensor Data Rate: 4 readings per second
J1708 Data Format

Miscellaneous

Installation Time: Approximately one hour

Electrical Connections: Power and ground. M8 signal connectors

Sensor Features: Rugged 4" anodized IR reflective enclosure. Twelve foot cable length standard. EMI/RFI shielded electronics. Mirror bracket clamp mounting standard, other mounting brackets available

Display Features: Standard 2" diameter display with green high contrast air temperature and red high contrast road surface temperature readouts. LED illuminates near freezing. Automatic nighttime dimming

Limited One Year Warranty

Commercial Vehicle Group, Inc. (CVG) warrants the RoadWatch® System (the Product) to be free from defects in material and workmanship for a period of one (1) year from the date of original purchase by the consumer, as evidenced by the sales receipt. In the absence of such purchase receipt, the warranty period shall be eighteen (18) months from the date of manufacture as indicated by the manufacturing code.

CVG will repair or replace, at its option and free of charge during the warranty period, Product that proves defective in material or workmanship under normal installation, use, and service provided the Product is returned to the factory, transportation charge prepaid. Product returned to our factory must be accompanied by a photocopy of the purchase receipt. In the absence of such purchase receipt, the warranty period shall be eighteen (18) months from the date of manufacture as indicated by the manufacturing code. Any damage to the Product as a result of misuse, abuse, neglect, accident, incorrect wiring, improper installation, destruction or altering of the manufacturing code, repair or alteration outside our factory, or any violation of instructions furnished by us will void the warranty. CVG makes no warranty against driver's loss of control of any vehicle equipped with the Product. Installation labor, removal and reinstallation charges are not the responsibility of CVG, or the selling dealer or distributor.

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