MirrorEye®

MirrorEye Service Manual

08/13/2021

MirrorEye Service Manual

Technician Manual for Standard Service and Repair Job Types

Table of Contents:

Tool List

MirrorEye Installation Tool List			
Required Tool	**Description**	**Quantity**	**Check-Off**
Drill Bit	3/8" Cobalt or Titanium Drill Bit	1	☐
Drill Bit	1/4" Cobalt of Titanium Drill Bit	1	☐
Drill Bit	1/2" Cobalt or Titanium Drill Bit	1	☐
Step Bit	1 3/8" Step Bit	1	☐
Hole Saw	2" Hole Saw	1	☐
Hole Saw	1" Hole Saw	1	☐
Hole Saw	1 1/8" Hole Saw	1	☐
Hole Saw	1 1/2"	1	☐
Drill	Cordless 20v Drill	1	☐
Drill Battery	Extra 20v Drill Battery	1	☐
Rivnut Tool	Rivnut Securement Tool/Impact Attachment	1	☐
Screwdriver	Phillips Head Screwdriver	1	☐
Screwdriver	Flat Head Screwdriver	1	☐
Pannel Removal Tool	Pry Tool to Remove Interior Pannels	1	☐
Cutters	Flush Zip Tie Cutters	1	☐
Zipties	Zipties (6"-12")	30	☐
Pliars	Needle Nose Pliars	1	☐
Pliars	Groove Locking Pliars	1	☐
Electricians Torch	Butane Electricians Torch	1	☐
Rotary Tool	Dremmil or Similar Cutting Tool	1	☐
Cutting Blades	Cutting Blade for Cutting Tool	2	☐
Torque Bit Set	Torque Bit Set T15-T60	1 Set	☐
Bit Driver	12v Torque Driver (Impact Tool)	1	☐
Bit Adapter	Hex Bit Adapter for Torque Driver Tool	1	☐
Wrench	Torque Wrench with Adjustable Torque Settings	1	☐
Wrench Set	Allen Wrench Set (Metric)	1 Set	☐
Allen Keys	Allen Keys- #6, #5, #4, #3, #2.5, #2	1 of Each	☐
Manual Wire Strippers	Maunal Wire Strippers with Various Wire Sizes	1	☐
Cones or Buckets	Cones or Buckets to Mark Distances Behind Truck	6	☐
Ladder	6' A Frame Ladder	1	☐
Terminal Crimpers	Klien Terminal Crimpers or Equivalent	1	☐
Measurement Tool	Measuring Tape, Measuring Wheel, Phone App. Capable of Measuring 80'.	1	☐

Section 1
DVR Installation

Preparation

Part 1 — Documentation Steps

1. Begin by locating the box containing the DVR device kit.
2. Using the Stoneridge authorized Field Service application or an included materials checklist, ensure that the kit has all required components.
3. Record the DVR device serial number.
4. Record the vehicle asset number and vehicle VIN.
5. Take images of the condition of the vehicle exterior and interior.

    5.1 If personal items in the vehicle need to be relocated during the installation process you can refer to these preparation pictures to ensure that you can replace the personal items in the correct location.

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Part 2 — Disassembly Steps

1. Locate the interior driver light on the underside of the vehicle headliner.
2. Remove the two small phillips head retention bolts from the center of the driver light
3. Using a pry tool, gently pry the light away from the headliner.
4. Unplug the small electrical connector from the light and pull free of the headliner.

    4.1 Relocate the driver light away from the installation area until the reassembly process of the installation.

5. If this vehicle already has a MirrorEye system: locate the Class V monitor.

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Preparation

6. Remove the four (4) phillips head screws holding the RAM ball mount assembly to the headliner of the vehicle.
   6.1 Monitor and ball mount assembly can remain together, there is no need to detach the monitor.
7. Detach the small power and fakra cable from the back of the Class V monitor and detach from the headliner.
   7.1 Relocate the Class V away from the installation area until the reassembly process of the installation.
8. Locate the shelves in the center of the vehicle headliner
9. Remover the two (2) T25 retention bolts from the shelf cover.
10. Use a pry tool to remove the shelf cover from the vehicle headliner. Expose the shelf cavity and shelf cavity retention bolts.
    10.1 Relocate the shelf cover away from the installation area until the reassembly process of the installation.
11. Locate the center two (2) T25 retention bolts for the center shelf. Remove the two retention bolts and remove the center shelf.
    11.1 Relocate the center shelf away from the installation area until the driver control button portion of the installation.
12. Locate the six (6) T25 retention bolts holding the shelf cavity in place in the vehicle. Remove the six (6) retention bolts holding the shelf cavity in the headliner.
13. By hand or with a pry tool disengage the two retention tabs on either side of the shelf cavity. Gently pull, and remove the cavity from the headliner of the vehicle.
    13.1 Relocate the shelf cavity away from the installation area until the reassembly process of the installation.


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Preparation

Part 3

DVR Attachment Bracket Installation Steps

1. The vehicle headliner cavity should be exposed.
   - 1.1 Metal vehicle frame and vehicle wire harnesses should be visible behind the area where the shelf cavity was located.
2. Inside the headliner cavity locate the existing FA470 MirrorEye system telematics box and the main harness.
   - 2.1 In non-prewire vehicles with the MirrorEye system the FA470 as well as main harness will be located within the dash panel of the vehicle.
3. The FA470 will be attached to a bracket on the passenger side of the headliner cavity. The DVR bracket will be placed in the headliner cavity opposite the FA470 device.
   - 3.1 If there is no FA470 device in the headliner cavity, the DVR device must be located on the driver side of the headliner cavity.
   - 3.2 Locate the FA470 telematics box in the dash panel of the vehicle before proceeding with further installation steps of the DVR device.
   - 3.3 Locate the DVR device in the headliner in a position with the shortest wire routing distance between the FA470 box and the DVR.
4. In the kitted box of parts for the DVR device locate the small sealed bag of hardware labeled, “Set Fasteners Bracket DVR.”
5. In the set of hardware, identify the two (2) black “flange clips.”
   - 5.1 Refer to the picture of this step for reference.
6. On the interior of the headliner locate the two plastic tabs on the driver side of the headliner cavity.

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Preparation

7. Attach the two flange clips to the plastic tabs in the headliner cavity.

   7.1 Refer to the picture of this step for reference.

8. Locate the M6 x 1mm clip-on barrel nut in the "Set Fasteners Bracket DVR" bag of supplied parts.

   8.1 This clip-on barrel nut has a silver finish and is unique from all of the other items in this bag of parts.

9. In the driver side headliner cavity, locate a third attachment tab at the bottom of the cavity above the driver's seating location.

   9.1 Refer to the picture of this step for reference.

10. Attach the M6 x 1mm clip-on barrel nut to the third attachment tab. Ensure that the flat surface of the clip-on nut is facing upwards.

11. In the box of kitted parts for the DVR device locate the black DVR attachment bracket.

    11.1 Refer to the picture of this step for reference.

12. In the "Set Fasteners Bracket DVR" bag of supplied parts locate the three (3) M5 x 0.8mm flanged edge nuts.

    12.1 These flanged edge nuts have a silver finish.

    12.2 These flanged edge nuts are identical to one another.

13. On the black attachment bracket locate the three holes on the bracket perimeter.

    13.1 Refer to the picture of this step for reference.

    13.2 Ensure that the flat side of the attachment bracket is facing upwards.

14. Install the three (3) flanged edge nuts on the attachment bracket to cover the attachment holes on the perimeter of the bracket.

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Preparation

15. Make sure the flat surface of the M5 x 0.8mm flange edge nuts are placed on the attachment bracket so that the shortest portion is on the flat side of the attachment bracket.

    15.1 Refer to the picture of this step for reference.

16. Place the attachment bracket in the driver side cavity of the headliner.

17. There are two small holes at the top of the attachment bracket to accommodate the retention clips that were applied to the plastic tabs in the headliner cavity.

    17.1 Refer to the picture of this step for reference.

18. Press the attachment bracket down and ensure that the bracket is fully seated over the clips that were placed on the plastic tabs in the headliner cavite.

19. The flat side of the attachment bracket should be facing upwards, with the bent tab of the attachment bracket positioned over the previously placed M6 x 1mm clip-on barrel nut.

    19.1 Ensure that the hole on the attachment bracket is over the clip-on barrel nut.

20. Locate in the "Set Fasteners Bracket DVR" bag of supplied parts the M6 button head bolt.

21. Using an allen head wrench attach the M6 bolt through the attachment bracket and into the M6 x 1mm clip-on barrel nut.

22. At this time the attachment bracket should be fully secured within the driver side of the vehicle headliner. This will accommodate the later attachment of the DVR device.

23. Take a picture of the attachment bracket installed.

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Preparation

Part 4

Driver Control Button Installation Steps

1. Locate the center shelf that was previously removed driver headliner and moved away from the installation area.
2. Prepare to measure and mark the outer edge of the center shelf. This is the surface where the driver control button will be located and would be accessible to the driver one all system components are installed.
3. Using a measuring tape and light color marker, measure a point 1.5in from the left side of the shelf (closest to the driver) and in the center of the exposed surface.
   - 3.1 Refer to the picture of this step for reference.
4. Using a ⅝" standard drill bit and cordless power drill carefully drill a hole in the shelf edge.
   - 4.1 Ensure that the hole has clean edges and that there is no marring or abrasion on the outer surface of the shelf.
   - 4.2 Take a picture of the hole drilled before device integration.
5. In the box of DVR kitted parts locate the bag of parts labeled "Cable Button DVR Action Trigger."
6. In the bag locate the button trigger component. This should have a small rubber gusset and tightening nut attached.
7. Remove the attachment nut and while leaving the rubber gusset against the driver trigger head.
8. Insert the DVR action trigger into the ⅝" hole that was drilled into the center shelf.
   - 8.1 The hole and rubber gusset should ensure a tight fit. If the button does not securely insert all the way into the hole, use a small file to slowly remove excess material until the button will fit securely into place.

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Preparation

9. Rest the center shelf on a work bench near the installation site.
10. Carefully remove the foam/fiber shelf liner from the interior portion of the center shelf. This should be held in place by a mild adhesive or velcro.
11. Once the shelf liner is removed, reattach the retention nut to the back of the DVR action trigger.
12. Attach the driver DVR action cable to the back of the trigger using the matching connector.
    - 12.1 Take a picture of this connection once made.
    - 12.2 Refer to the picture for this step for reference.
13. In the box of DVR parts locate the "Cable USB DVR 1.5m Interface cable" and the "Alcatel Linkey" SIM card device from the kit.
14. In the bag of items for the Cable USB DVR 1.5m Interface cable there will be a short piece of velcro with adhesive sides for attaching the Acatel device to the shelf interior.
15. Place the Acatel device on the passenger side of the shelf interior opposite the driver DVR action trigger.
    - 15.1 This will not need to be accessed by the driver while seated.
    - 15.2 Refer to the picture of this step for this reference.
16. Using the small velcro strip, attach the Acatel Linkey device to the floor of the center shelf.
17. Attach the USB DVR 1.5m interface cable to the Acatel Linkey device using the USB connector end on the cable.
18. Using zip ties and best practices for wire management, run the wire to the back of the shelf and run over the back lip of the shelf where they can be run to the DVR device during later installation steps.

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Preparation

19. Using a razor blade modify the foam/fiber shelf lining to accommodate the action DVR control trigger and the Acatel Linkey device. This should alleviate pressure on the wire connections and allow the shelf lining to be fully seated on the shelf floor.
20. Replace the shelf lining and ensure that it is secure and covers the wire harnesses from the Driver DVR action trigger and the Acatel Linkey device.
21. This should complete the steps for the Driver DVR Action Trigger installation and the Acatel Linkey device installation. The shelf will remain outside of the vehicle until the reassembly steps of the installation.
    21.1 Take a picture of the shelf post installation steps.

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Part 5 HDMI Cable Routing Steps

1. Begin this portion of the installation by first removing driver and passenger side grab bars from the interior of the truck near the dash panel.
    1.1 The grab bar removal is a precursor to removing the A pillar cover, only remove the grab bars that allow for the A pillar covers to be removed.
    1.2 The attachment bolts for the grab bars are T25 bit size and should only be removed using a hand wrench and not a power impact tool.
    1.3 Relocate the grab bars away from the installation area until the reassembly process of the installation.
2. Using a pry tool remove the A pillar covers from both the passenger and driver side of the vehicle.

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Preparation

2.1 The A pillar metal frame should now be exposed as well as harnesses for the Driver and Passenger side monitors of the MirrorEye system.

2.2 Follow the wire routing paths for the video cables for the monitors to the FA470 telematics device for the HDMI wire routing steps of this installation process step.

3. In the box containing the DVR device kit locate the "Cable 2.1m HDMI, Cable 3.4m HDMI, and Cable 1.7m HDMI."

4. The cable lengths will correspond to the cables that will be used for the three separate monitors.

4.1 Use the following table for reference before routing HDMI wires.

HDMI Cable Length	Associated Monitor
1.7m	Class V Monitor
2.1m	Driver Side Monitor
3.4m	Passenger Side Monitor

5. Bring or locate wire routing tool "fish tape" for the wire routing steps of this process

6. Using fish tape, tape the monitor connector end of the HDMI cable to the fish tape using electrical tape or attachment method that will not damage the connector end or the wire sheath.

6.1 Fish tape will only be needed for routing the driver and passenger side HDMI cables back to the DVR device. Class V monitor HDMI cable routing will not require fish tape.

7. Following the camera cable wire from the FA470 telematics device route the fish tape from the center cavity of the headliner towards the A pillars.

8. Look for the fish tape end at the section of the headliner where the A Pillar and headliner meet.

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Preparation

9. Once the fish tape end is positively located, gently pull the fish tape through the hole at the top of the A pillar and route the HDMI cable through the headliner cavity.

10. Ensure that the cable length will reach from the DVR device attachment bracket location to the back of the driver and passenger side monitor.

11. Once the HDMI cable ends are routed through the headliner cavity and down the A pillar to the back of the monitor plug the HDMI cable end into the back of the monitor into the female HDMI port.

    11.1 Take a picture of the driver and passenger side HDMI connection made once complete.

12. The Class V monitor HDMI cable can be placed in the center cavity of the headliner in the area where the DVR attachment bracket is located. Once the Class V monitor is reinstalled during the finishing steps of the installation. The HDMI can be plugged into the monitor.

13. This should conclude the HDMI cable routing steps of the installation process.

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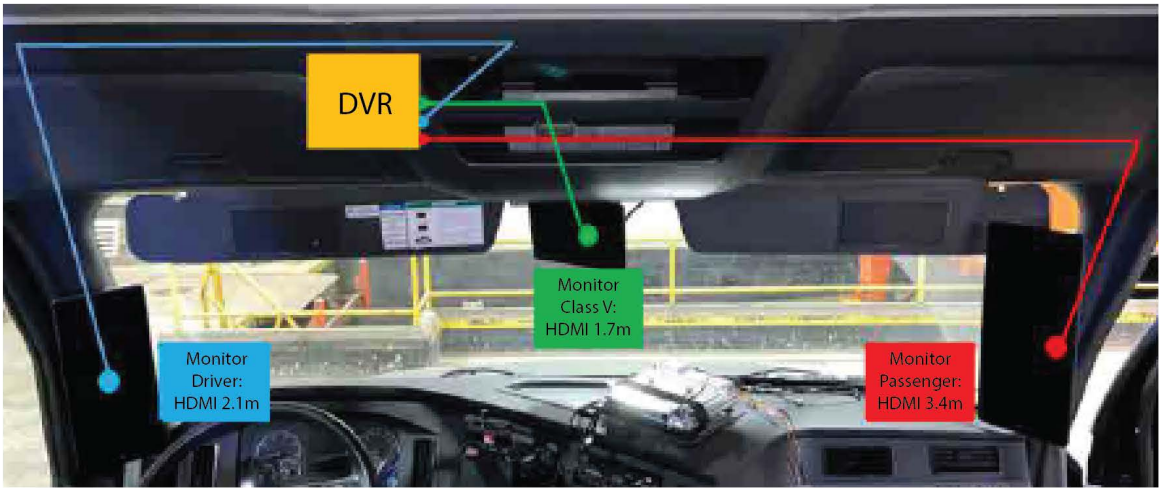

Preparation

Part 6

Main Cable Cabin Harness DVR Installation Steps

1. In the box of DVR device kit parts, locate the bag labeled "Cable Cabin Harness DVR."
2. This harness will have five (5) connector ends.

   2.1 Connector ends include:

Connector End	Description
FA470 Connector	Small Y cable connector that attaches to FA470 device directly.
MirrorEye Class VI Connector	Small Y cable connector that attaches to truck power/CAN harness directly.
DVR Device Connector	Large connector end that will attach to the largest port on the DVR device.
Button Connector	Long end of harness with small connector end that attaches to the DVR action trigger cable.
GMSL Connector	Large connector end. Will not be plugged in during the installation process.

3. Once located, unfurl the harness and identify all of the connector ends using the labels on the harness or the connector end description.
4. Begin by placing the DVR Device connector inside the truck headliner cavity near the DVR attachment bracket.
5. Locate the FA470 device in the passenger side cavity of the headliner and locate the FA470 KL15 and KL30 wire harness.

   5.1 This should have a Y connection similar to that found on the DVR device main harness and will have two similar connector ends to the FA470 and MirrorEye Class VI Connector found on the DVR device harness.

6. Connect the KL15 and KL30 wire harness ends from the vehicle and the FA470 into the DVR device harness. This should create a "looped" connection so that power, and vehicle communication wires are connected to the DVR device and the FA470 telematics box.

   6.1 After connections are made take a photo of this step.

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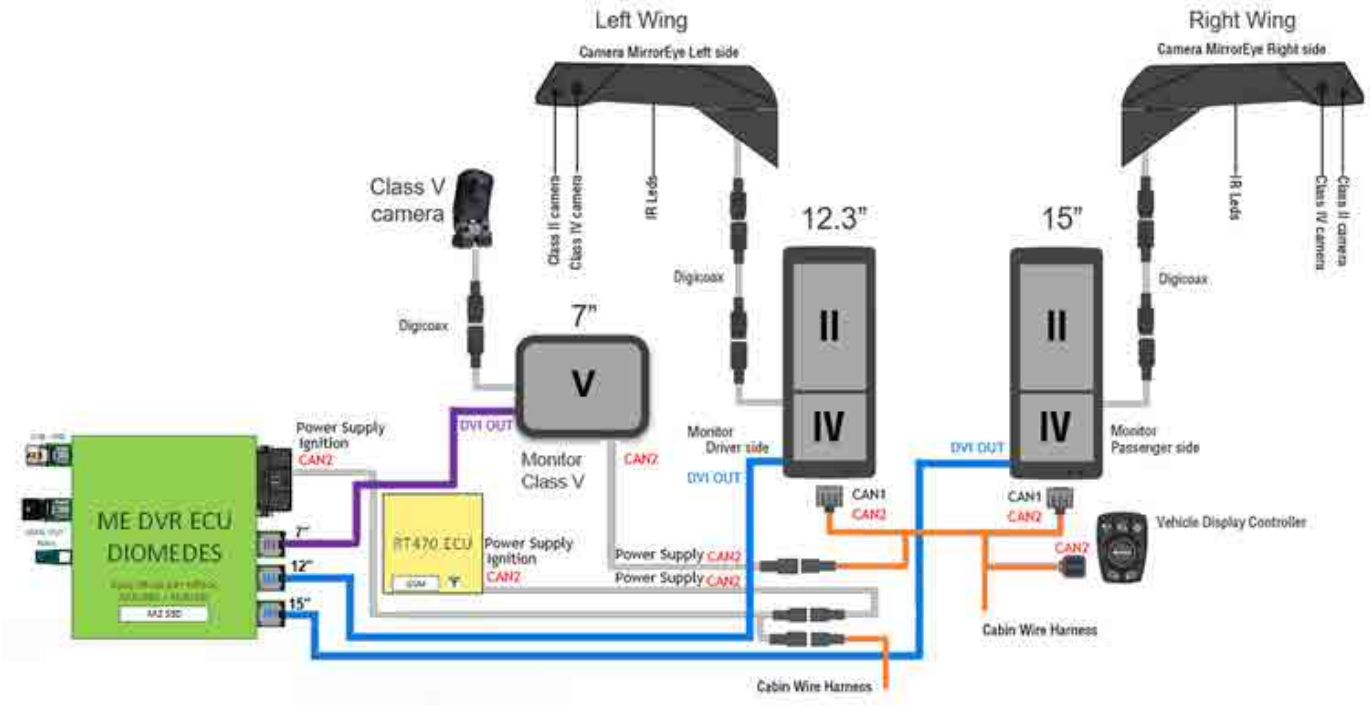
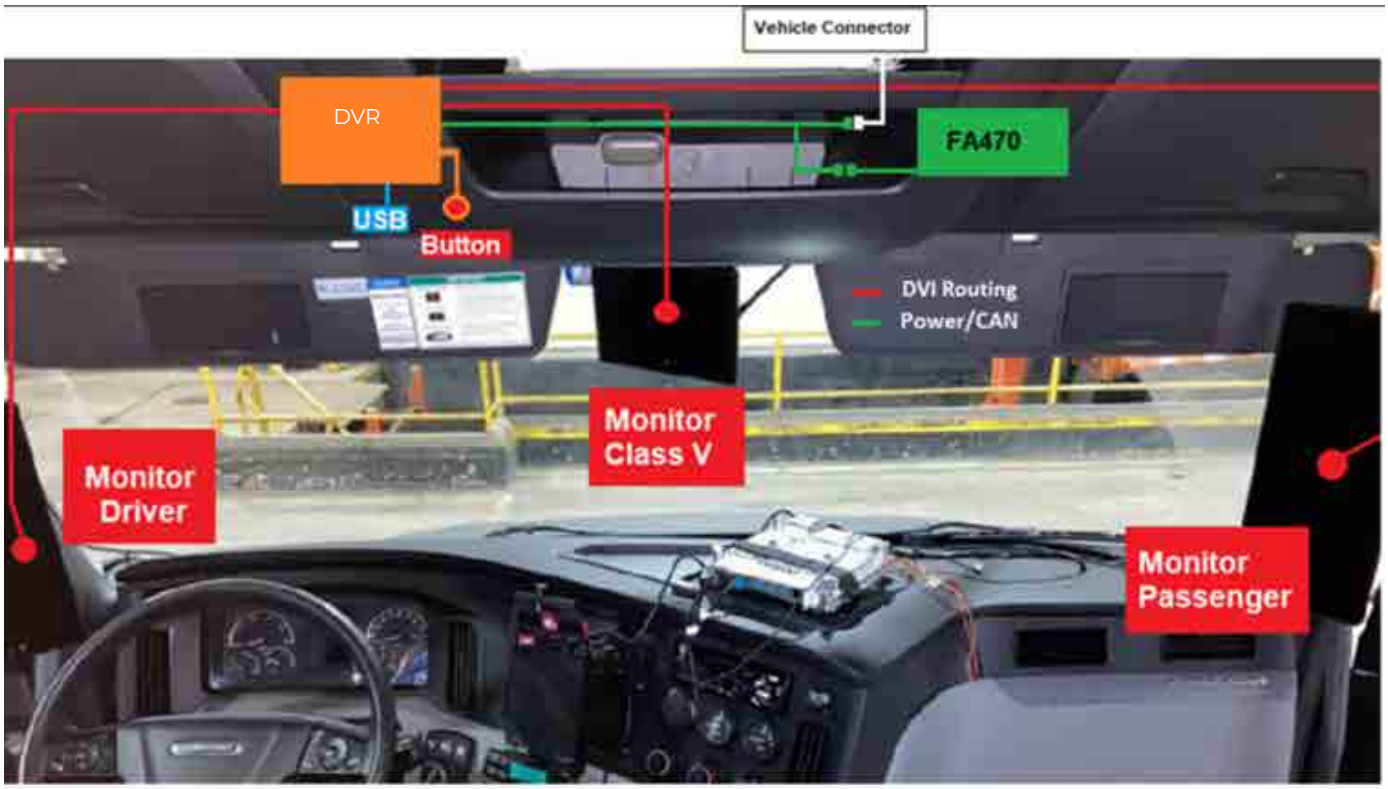
Preparation

7. Keep the button trigger connector in a space that will allow it to be run through the shelf backing and plug into the Driver Action Trigger during the reassembly steps of the installation process. 8. Ensure that all wires from the DVR device harness have adequate length to make required connections. Tuck wires, use zip ties, electrical tape, and use best practices for wire management to ensure that there are no loose wires that could vibrate and become disconnected during vehicle operation. 9. This concludes the DVR device main harness installation steps.	


Left Wing
Camera MirrorEye Left side
Right Wing
Camera MirrorEye Right side
Class V camera
Class II camera
Class IV camera
IR Leds
Digicoax
12.3"
15"
7"
II
IV
V
Power Supply Ignition
CAN2
DVI OUT
Monitor Class V
Monitor Driver side
Monitor Passenger side
CAN1
ME DVR ECU DIOMEDES
RT470 ECU
Power Supply CAN2
Vehicle Display Controller
Cabin Wire Harness


Vehicle Connector
DVR
FA470
USB
Button
DVI Routing
Power/CAN
Monitor Driver
Monitor Class V
Monitor Passenger

Preparation

Part 7

DVR Device Installation Steps

1. Locate the DVR device.
2. In the headliner cavity on the DVR device attachment bracket locate the three attachment points where the M5 x 0.8mm flange edge nuts were installed.
3. The flat side of the DVR device should be facing down on the flat side of the DVR device attachment bracket.
4. Line up the device and notice all of the connector ports to ensure that all of the connectors can be easily plugged into the DVR device.
5. Plug in all of the HDMI connectors.
6. Plug in the USB 2.0 connector and the main harness connector.
7. Once all connections have been made to the device rest the DVR device on the attachment bracket and prepare to secure it.
8. Locate bag labeled "Set Fasteners DVR Bracket."
9. Locate the three remaining bolts in this bag of supplied parts. There will be three (3) M5-0.8 x 25mm socket bolts.
10. Place these three (3) bolts in the retention holes in the corners of the DVR device.
11. Using an allen head hand wrench, tighten the retention

    10.1 The wire connector locations will inform the correct orientation of the device on the attachment bracket.

    10.2 Refer to the picture of this step for reference.

    bolts into the M5 x 0.8mm flange edge nuts.
12. Ensure that the device is tightened and that there is no movement of the device on the attachment bracket.
13. This completed the DVR device installation steps.

    13.1 Capture a picture of this step once completed.

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Preparation

Part 8

Reassembly Installation Steps

1. Using zip ties make sure that all of the wire harnesses have been coiled and are secured against the frame of the headliner. Ensure that there are no loose wires that could generate noise during normal vehicle operation.
2. Locate the driver and passenger side A pillar covers and replace. Ensure that the HDMI cables and monitor video cables are not strained or over radiused.
3. Replace the driver and passenger side grab bars. Ensure that all bolts are replaced.
4. Locate the Class V HDMI cable on the interior of the cavity. Route through the plastic trim panels of the driver and passenger side portion of the headliner. A trim tool may be needed to gently pry apart trim pieces to ensure that the wire can be routed outside the back of the headliner near the windshield.
   - 4.1 Ensure that the monitor connector will have room to attach to the Class V monitor when complete.
   - 4.2 Wire routing can follow Class V monitor power and video cable.
5. Locate the headliner shelf plastic liner.
6. Near the back of the plastic shelf liner there is a small hole where the Driver action control button harness can be routed into the cavity interior.
7. Route the USB port cable connector into the cavity interior into the position near the Acatel Linkey device.
8. Replace plastic shelf liner to the cavity in the headliner.
9. Replace the six (6) T25 retention bolts to secure the plastic shelf liner.
10. Locate the middle shelf containing the driver action control button, and the Acatel Linkey device.
11. Make all connections to the device harnesses.
12. Verify that the driver action control trigger should illuminate green.

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Preparation

13. Replace the center shelf and secure using the two (2) T25 retention bolts.
    13.1 Ensure that all of the devices are flush within the shelf lining and make that all wires are routed underneath the foam shelf lining.
14. Replace the headliner trip piece by hand and ensure that all retention bolt heads are covered and that the headliner exterior is restored.
    14.1 Take a picture of this step once complete.
15. Locate the class V monitor and RAM ball mount.
16. Locate the Phillips head retention screws and replace the Class V monitor in its original position.
17. Make all connections on the back of the Class V monitor including power, video cable, and HDMI cable.
18. This completes the reassembly steps of the installation process.

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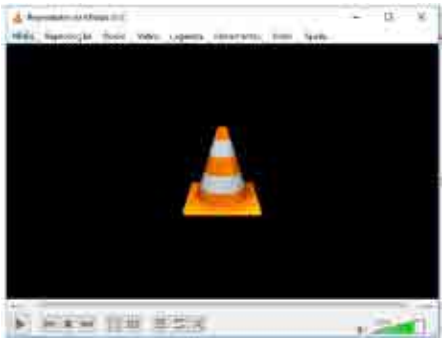
Part 9

DVR Verification Test Steps

1. With ignition off and USB flash drive not connected.
2. Turn on the ignition and wait until the Green LED (push-button) is ON.
   2.1 If steady Green LED (push-button) - Product ready.
   2.2 If blinking Green LED (push-button) during 20 sec and after steady Green LED. – Product ready and informing that there are videos recorded to be exported for the USB flash drive.
   2.3 If Blinking Red LED (push-button) during 20 sec and steady Red LED. – Errors detected.
3. After Green LED is ON, wait 2 minutes
4. Press push-button.
   4.1 Files will be transferred to the internal SSD exporting folder.
   4.2 Blinking Green LED (slow blinking).

Preparation

5. After the push-button is pressed, wait 2 minutes.
6. Plug USB flash drive to the USB connector installed in the overhead compartment.
   - 6.1 Green LED will blink fast while files are transferred from SSD export folder to the USB flash drive. (Green LED fast blinking)
   - 6.2 USB flash drive speed must be 2.0 or 3.0 (3.1 is not supported)
7. When LED status changes to off, all files are transferred, and the USB flash drive is in safe mode to be removed. RED LED means error or USB full.
8. Pull the USB flash drive out of the vehicle. After USB removal, LED will change status.
   - 8.1 Steady Green LED (push-button) - Product ready.
   - 8.2 Blinking Green LED (push-button) during 20 sec and then steady Green LED – Product ready and informing that there are videos recorded to be exported for the USB flash drive.
9. Insert the USB flash drive into a USB port on your computer. Open files with VLC media player software and run videos. (see steps in the next slide)
10. Confirm if videos recorded are ok (See examples on the next slide)
11. Delete files from USB flash drive before removal.
12. Using a computer Install VLC Media Player.
    - 12.1 https://www.videolan.org/vlc/index.html
    - 12.2 vlc-3.0.12-win64.exe (Win64)
13. Open VLC Media Player
14. Connect a USB flash drive to a computer.
    - 14.1 Insert the USB flash drive into a USB port on your computer
    - 14.2 Depending on how your computer is set up, a dialog box may appear. If it does, select the Open folder to view files.



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Preparation

15. If a dialog box does not appear, open Windows Explorer and locate and select the USB flash drive on the left side of the window.
16. Drag the file on Windows Explorer and drop it into the program`s window
17. Expected results during verification tests.
    - 17.1 Confirm if the system is working properly and recorded videos are ok.
    - 17.2 Confirm if images/videos from all 5 cameras are working and videos were recorded properly.
18. Delete file from USB.
19. Eject USB flash driver from computer.

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Section 2
Camera Wing Replacement

Replacement Steps:

Part 1 — Documentation Steps

1. Begin by accessing the Stoneridge Field Service application or the provided job checklist for a summary of work required.
2. Locate the correct truck number and open the asset in the Field Service application or record the truck asset number in the checklist.
3. Record the vehicle asset number and the vehicle VIN number in the application and take a picture of both for reference.
4. Take images of the condition of the vehicle exterior and interior.
   - 4.1 If personal items in the vehicle need to be relocated during the installation process you can refer to these preparation pictures to ensure that you can replace the personal items in the correct location.

Part 2 — Issue Investigation Steps

1. Utilizing the provided description of scope in the Field Service application or provided job checklist analyze whether there are any visible defects in the system.
2. Record any images of the issue that present
   - 2.1 Known issues include: blue screen on interior monitor, camera wing damage, camera wing inability to deploy away from stowed position, and missing infrared sensor cover.
   - 2.2 In order to complete investigation steps the vehicle will have to be turned on and the system must be allowed to power up fully.
   - 2.3 If issues can be seen this must be recorded with pictures and videos and uploaded to the application or included in a job summary at the conclusion of the job.

Replacement Steps:

Part 3 — Camera Wing Removal Steps

1. Turn off the vehicle for these process steps.
2. Locate the camera wing on the exterior of the vehicle experiencing the issue.
   - 2.1 Camera wing will be identified in the work order within the Field Service application or will be included on the job checklist.
   - 2.2 In some cases the correct camera wing will be identified during the investigation portion of the replacement steps.
3. Using a ladder, and with proper safety precautions in place, access the defective camera wing component.
4. Once level with the camera wing, begin by removing the lower cover of the device. This cover will slide off away from the side of the vehicle.
   - 4.1 The cover will house the camera cable drip loop and the camera cable connector. On the passenger side the lookdown camera will also be evident when the cover is removed. On the driver side the OAT temperature sensor will be contained within the lower cover.
5. Next disconnect the camera cable end from the camera wing.
   - 5.1 Review the connector end to ensure that there are no damaged pins and that the cable connector was secured upon removal.

     Review the camera cable drip loop to ensure that the cable was not pinched or over radiused during installation. These issues can cause communication issues and can be the root cause of camera wing damage.
6. Once the camera cable coming from the truck body is disconnected from the camera wing. Review the three (3) allen head attachment screws near the center of the camera wing attachment bracket.
7. Using a hand wrench begin removing the three (3) attachment screws.


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Replacement Steps:

8. Once all three attachment screws are removed, relocate them away from the replacement area until reinstallation process steps.
9. The camera wing should now be loose sitting on the attachment bracket.
10. Gently rotate the camera wing into the position which will allow the camera wing to pull away from the attachment bracket freely.
11. Ensure that the camera cable is removed slowly from the center of the attachment bracket and is not damaged while pulling through the attachment bracket hole.
12. This completes the camera wing removal steps.

Part 4 — Camera Wing Replacement Steps

1. Locate the box containing the Stoneridge provided replacement camera for the proper side of the vehicle.
2. Document the device condition and serial number using the Field Service application or the provided checklist.
3. Approach the attachment bracket with the new camera wing.
4. Slowly thread the camera cable through the attachment bracket hole until the camera wing bottom is fully resting on the attachment point on the bracket.
5. Gently rotate the camera wing until the attachment holes on the camera wing align with the attachment holes on the bracket.
6. Using the removed allen head attachment screws replace them in the correct attachment holes.

Replacement Steps:

7. Ensure that the camera cable was not pinched or damaged during the attachment process.
8. Verify that the camera wing is secure on the vehicle attachment bracket.
9. Once attached, reconnect the camera cable to the camera cable end that is protruding from the vehicle exterior.
   9.1 Take a picture of this camera cable connection.
10. Use best installation practices for wire routing and make sure that there is a proper drip loop and that the camera cable is not kinked or over radiused.
11. Replace the bottom cover of the camera wing assembly by sliding it over the bottom of the camera wing attachment assembly.
12. The cover should be fully seated against the truck body.

10

Part 5 Camera Adjustment Steps

1. Begin by keying on the vehicle and letting the system power on, this should confirm whether the camera wing replacement fixed the issue that was previously identified.
2. Check the view in the monitor that corresponds to the camera wing that was replaced.
3. The view from the camera should show the area alongside the vehicle and a very small portion of the truck body.
4. If the camera is improperly adjusted it will need to be manually positioned to show the correct view coming from the camera.

Replacement Steps:

5. Approach the exterior of the camera wing in the same manner as during the replacement steps of the process.
6. Identify the two (2) allen head attachment screws located on the top of the camera wing.
7. Remove the two attachment screws on top of the camera wing and using a hand wrench carefully remove them from the camera wing.
8. Using a pry tool, gently pry apart the top cover of the camera wing from the camera wing device.
9. Locate the two (2) small adjustment screws on the interior camera housing.
   - 9.1 These will be two small screws that will change the camera field of view.
   - 9.2 Only make very minor adjustments using this method and ensure that the screws are not over tightened.
   - 9.3 Ensure that no water or debris gets into the open camera wing while the cover is removed.
10. Keep checking the monitor view of the camera during the adjustment process and align the camera so that the view of the side of the truck points towards the horizon with a small part of the truck body in view.
    - 10.1 Take a picture of the monitor screen once complete.
11. Replace the camera wing cover and make sure that it is in place securely on the camera wing device.
12. Using the two (2) retention screws replace the camera wing cover completely.

6

9

Replacement Steps:

Part 6 — Calibrating Flat Distance Lines Steps

1. Begin by collecting a measuring tape and six (6) cones or stationary objects that can be used for marking distance.
2. FIrst measure the distance from the camera wing to the ground.
   - 2.1 Record the measurement you collect on the provided checklist or in your phone.
   - 2.2 Mark the place on the ground directly beneath the camera lens. As close to the center of the camera lens as possible.
3. From that cone measure 10m and 15m in line with the first cone. Place cones at the 10m and 15m point on the ground.
   - 3.1 Ensure that all cones are in line and are directly behind the camera wing lens.
4. Bring up the driver menu with a long push on the driver side manual panning button.
5. Access the advanced menu by scrolling down to the exit menu option and again, with a long push, holding down the driver side manual panning button and the center driver controller button.
6. This will bring up a warning display screen.
   - 6.1 Select the option that allows you to access the advanced settings.
7. Scroll down to the distance lines menu option and select this option using the center button.
8. Scroll down to the calibration menu option and select this option using the center button.
9. Scroll down to the type of calibration and select this and scroll to the flat option using the driver control knob.
10. Go down to “auto” menu option and select using the driver control knob.

Replacement Steps:

11. Select ender calibration mode using the driver control knob, by selecting this you will be able to scroll down and enter calibration distances.
12. Begin by inputting the distance from the camera down to the ground using the camera height setting.
    12.1 You must convert your measurement into meters.
13. Next set near marker distance as 10m.
14. Next set far marker distance as 15m.
15. Next select "(M1) Marker position x."
16. Using the driver control knob align the orange crosshairs that appear on the top screen with the first 10m cone. You will only be able to make a horizontal adjustment using this setting.
17. Next select the "(M1) Marker position y."
18. Using the driver control knob align the orange crosshairs that appear on the top screen with the first 10m cone. You will only be able to make vertical adjustments using this setting.
19. Next select the "(M2) Marker position x."
20. Using the driver control knob align the orange crosshairs that appear on the top screen with the second 15m cone. You will only be able to make a horizontal adjustment using this setting.
21. Next select the "(M2) Marker position y."
22. Using the driver control knob align the orange crosshairs that appear on the top screen with the second 15m cone. You will only be able to make vertical adjustments using this setting.

Replacement Steps:

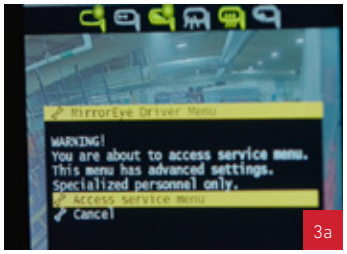
23. Scroll down one additional menu item on the screen to "start automatic calibration." Select this option.
24. This will automatically calibrate the distance lines and will display them on the upper portion of the monitor.
25. Next exit the calibration mode by scrolling to the top of the calibration menu and deselecting the "enter calibration mode" menu option.
    12.1 Once you unselect the "warning must select the end of trailer" option will display on the bottom portion of the screen.
26. You may now exit the menu completely and this will conclude the distance calibration portion of the replacement steps.
27. Take a picture of the distance lines displaying on the screen once complete.

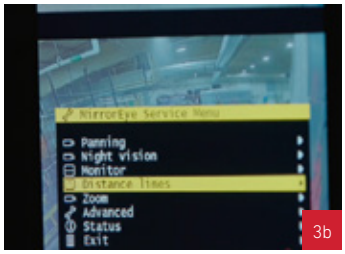
Replacement Steps:

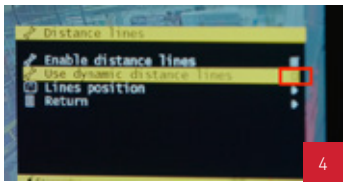
Part 7

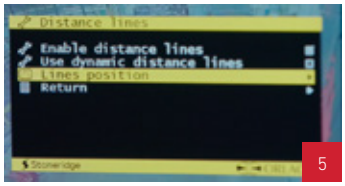
Switching between dynamic and static reference lines

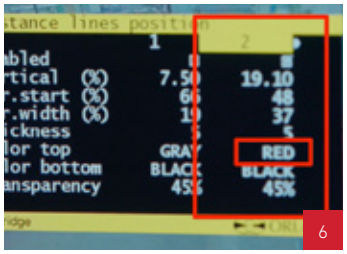
1. Enter the driver menu with a long push of the driver's side manual panning button. Using the control knob, scroll down to exit.
2. You now need to access the service (advanced) menu. To do so, simultaneously push the left side manual panning button and the center control knob.
3. Using the control knob, scroll to Access Service Menu and press the control knob to enter. Please note. There will be a warning that notifies you are going to enter the service menu. Using the control knob, scroll down to Distance Lines. Press the control knob to enter.
4. To switch between dynamic distance lines and static reference distance lines check the box on the menu line "use dynamic distance lines." To do this, press the control knob.
5. The system will automatically change to the static distance lines mode, which needs to be manually calibrated. Using the control knob, scroll down to "line positions."
6. Select column number two. This is the red line represented on the monitor. This line represents the end of the trailer.
7. Enter column number two by pushing the control knob, then scroll down to vertical and adjust the line on the screen to match with the cone that we have placed representing the end of the trailer.
8. To lock it in the end of the trailer line position, push the control knob.
9. To exit column number two, push the driver's side manual panning button.
10. Scroll to column three and push in the control knob. This represents the orange 40 foot distance line.

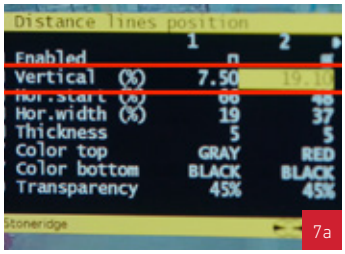


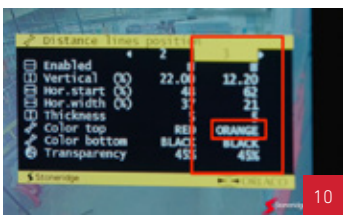










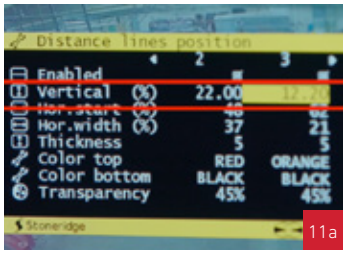


Replacement Steps:

Part 7

Switching between dynamic and static reference lines

11. To adjust the settings, scroll down to vertical. Push the control knob to adjust the position. Scroll until the orange line is on top of the cone placed outside of the trailer. Once you are satisfied, push the control knob to lock it in.
12. To exit column number three, push the driver's side manual panning button.
13. Scroll to column number four to adjust the green line, which represents 80 feet behind the end of the trailer and push the control knob.
14. Scroll down to vertical, push the control knob and adjust the green line until it is on top of the cone that we have measured out to be approximately 80 feet behind the trailer. Lock in the position of the green line by pushing the control knob.
15. To exit column number four, push the driver's side manual panning button.
16. To exit the distance line positions, push the driver's side manual panning button.
17. To exit the menus, scroll down to return, then scroll down to exit.
18. You will also need to follow the same steps and do the same process for the passenger side.



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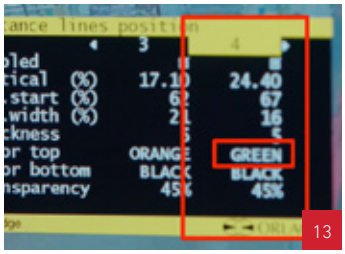

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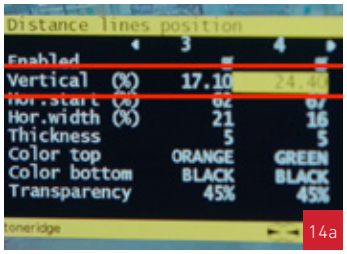

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Section 3
Peterbilt and Kenworth
Driver Controller Placement

Controller Placement

Peterbilt

Kenworth

Connection Method

Power, ground, and ignition wires

Route wires behind driver control panel

Make connections to spice pack behind driver control panel

Section 4
FA470 Troubleshooting

Troubleshooting Steps:

Part 1 — Documentation Steps

1. Begin by accessing the Stoneridge Field Service application or the provided job checklist for a summary of work required.
2. Locate the correct truck number and open the asset in the Field Service application or record the truck asset number in the checklist.
3. Record the vehicle asset number and the vehicle VIN number in the application and take a picture of both for reference.
4. Take images of the condition of the vehicle exterior and interior.
   - 4.1 Once you unselect the "warning must select the end of trailer" option will display on the bottom portion of the screen.

Part 2 — Device Locating Steps

1. For this process some vehicle trim panel removal will be required.
   - 1.1 Prepare by locating a trim panel removal tool and a hand wrench with torque bits in varying sizes.
2. For vehicles with known pre-wired elements. FA470 box will be located in the headliner cavity of the vehicle.
   - 2.1 Refer to DVR device installation process steps for directions on how to disassemble the headliner panels and expose the cavity where the FA470 device will be located.
3. For vehicles that don't have any pre-wired elements the FA470 device will be located behind the driver control panel.
4. Locate the driver control panel in the driver compartment. This panel will contain all of the vehicle electrical system controls.
   - 4.1 Using a trim tool and a hand wrench with the proper torque bits remove the driver control panel.
5. In the dash panel locate the FA470 telematics device.

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Troubleshooting Steps:

Part 3	FA470 Troubleshooting Steps

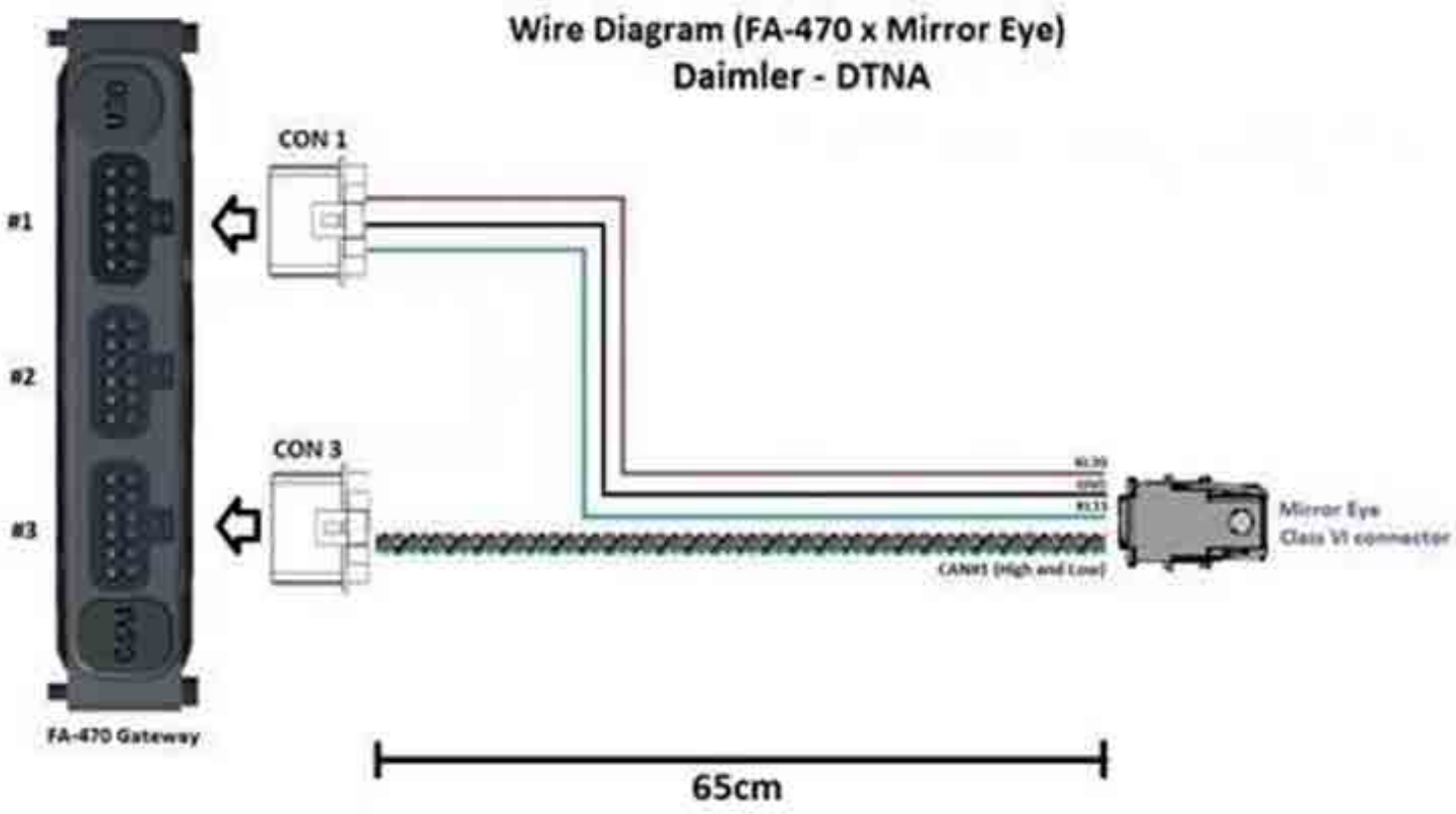
1. Once the FA470 device is located, document the serial number on the device.
2. Locate the device indicator light.
   2.1 Ensure that the light is blinking.
3. Check all of the connections to the device and ensure that all of the connectors are securely connected to the device.
4. Check the number of blinks that the device indicator light is displaying and reference the following table to determine the proper way to proceed.

1

LED	LED Status	Possible Reason	Solution/Action
No illumination	Device working only with internal battery or not working.	Power supply is not connected.	Please check harness conection.
No illumination	Device in normal operation (power supply is connected).	1) Ignition signal is off: device is in stand by mode. 2) After 8 hours of system working the device will turn of the LED and the LED status will not be available.	Cycle the ignition signal. If the LED status is not active after 5 seconds, disconnect the power supply (KL30) and wait 10 seconds. Reconnect it and the feature should be available again. Connect Installation App to have a complete diagnostic information.
1 blink	Device ON.	Device is searching for a mobile network.	Wait up to 10 minutes for the next stage of the LED status. If the next stage is not reached, check mobile network coverage or connect the Installation App to have a complete diagnostic information.
2 blinks	Registered on the mobile network. Invalid GNSS geo-location.	Device is waiting for data network availability and for GNSS geo-location.	Wait up to 10 minutes for the next stage of the LED status. If the next stage is not reached, check the mobile data plan or connect the Installation App to have a complete diagnostic information.
3 blinks	Registered on the mobile network. Valid GNSS geo-location.	Device is waiting for data network availability.	Wait up to 10 minutes for the next stage of the LED status. If the next stage is not reached, check the mobile data plan or connect the Installation App to have a complete diagnostic information.
4 blinks	Data network available. Invalid GNSS geo-location.	Device is waiting for a connection with the server and for GNSS geo-location.	Wait up to 10 minutes for the next stage of the LED status. If the next stage is not reached, connect the Installation App to have a complete diagnostic information.
5 blinks	Data network available. Valid GNSS geo-location.	Device is waiting for a connection with the server.	Wait up to 10 minutes for the next stage of the LED status. If the next stage is not reached, connect the Installation App to have a complete diagnostic information.
6 blinks	Connected to the server. Invalid GNSS geo-location.	GNSS Signal not found - If the truck is under a metallic roof or indoors during the installation, GNSS signal maybe unavailable.	Please move the vehicle to an open sky and check the LED indicator.
		GNSS antenna is obstructed, thus signal reception is not possible. Device is installed in a shielded place or there is a metal obstruction above the GNSS antenna.	Install the device in another position, one that could maximize the GNSS reception, such as below the dashboard, close to the window and with the clearest possible view of the sky. Please make sure there are no metal obstructions above the GNSS antenna.
7 blinks	Connected to the server. Valid GNSS geo-location.	Device is ok.	

Troubleshooting Steps:

1. Discuss the solution with the Stoneridge representative and determine what MirrorEye technical support would suggest.	



Troubleshooting Steps:

Part 4 — Resetting FA470 Steps

1. If the Stoneridge technical support team determines that a hard reset of the device is required take the following steps:
2. Begin by removing all connections from the FA470 device.
3. Remove the tamper proof tape.
   - 3.1 **WARNING** This will void device warranty, only take this step if instructed by Stoneridge technical support representative.
4. Detach the two (2) retention tabs and gently remove the device cover.
5. An exposed electrical board is contained within the device housing.
6. Gently remove the electrical board.
7. Notice the small interior wire from an auxiliary battery also contained in the housing.
8. Disconnect the interior wire.
9. Wait until the device indicator light stops blinking.
10. This will perform a hard reset of the device and may be a solution to connectivity issues.
11. Once complete reinsert the electrical board so that it is seated within the retention slot within the housing.
    - 11.1 These slots will guide the board into the device housing correctly and prevent movement of the device electrical components.
12. Replace the device cover and ensure that the retention tabs are back in place and that the cover is securely in place.
13. Replace the tamper proof tape if possible.

Troubleshooting Steps:

Part 5 — Reinstallation Steps

1. Determine how the device was secured.
   - 1.1 In the headliner cavity the FA470 may be secured using zip ties.
   - 1.2 In the dash cavity of the vehicle the FA470 may be secured using double sided adhesive.
2. Replace the FA470 in its original location and make sure that it is secured using the same method by which it was secured when initially removed.
3. Take pictures of the device upon reinstallation.
4. Replace all vehicle components and trim panels removed during disassembly steps.

Section 5
Monitor Troubleshooting

Troubleshooting Steps:

Part 1 — Documentation Steps

1. Begin by accessing the Stoneridge Field Service application or the provided job checklist for a summary of work required.
2. Locate the correct truck number and open the asset in the Field Service application or record the truck asset number in the checklist.
3. Record the vehicle asset number and the vehicle VIN number in the application and take a picture of both for reference.
4. Take images of the condition of the vehicle exterior and interior.
   - 4.1 If personal items in the vehicle need to be relocated during the troubleshooting process you can refer to these preparation pictures to ensure that you can replace the personal items in the correct location.

Part 2 — Monitor Removal Steps

1. Begin by locating the Ram ball mount on all of the three monitor types.
2. The driver and passenger side monitors are held in place on a fixed ball socket attached to the A pillar, a ball mount will be fixed to the back of the monitor itself.
3. The Class V monitor is held by a ball socket with two ends. The RAM ball will be located on both the headliner as well as the monitor back.
4. Prepare for this process by locating a metric set of allen head wrenches in varying sizes.
5. For the A pillar Ram ball mounts you will notice two (2) small allen head bolts on the side of the RAM ball socket attached to the A pillar.

4

6. Carefully remove the two (2) small allen head screws and their backing nut.
7. This should allow the monitor to pull freely away from the A pillar only held by the power and camera video cable still attached.
8. To remove the Class V monitor loosen the middle hand screw in the center of the double sided RAM ball socket. This should allow the monitor side to come freely away from the socket.
   - 8.1 If you loosen this too far the socket assembly will come apart and small parts may fall behind the dash panel on the windshield side.
9. The monitors are now down exposing the back of the monitor with the RAM ball and backing screws.
10. Leave on the RAM ball mount unless this is physically damaged.
    - 10.1 The RAM ball mount can be replaced by removing the 3 allen head attachment bolts. The RAM ball mount can then be replaced and the attachment bolts can be reused.
    - 10.2 Reusing the RAM ball mount may be required in a situation where a full monitor replacement is required.
11. To remove the Class V monitor begin by first disconnecting the camera power cable, then the monitor power cable, remove the fakra video connector last.
    - 11.1 Ensure that the fakra connector is not bent or radiused when removing. This cable is not flexible and must be carefully removed.
    - 11.2 Bending this cable during the connector removal process can be the root cause for system communication issues.
12. Inspect the Class V monitor for signs of physical damage.
    - 12.1 If physical damage is noticed, take images and document the damage in the field service application or the provided job checklist.
13. Reconnect all of the Class V monitor connections. Begin by reattaching the fakra cable first, ensuring that it is not bent or kinked, then reconnect the two power cables in any order.
    - 13.1 Check all of the connectors on the back of the monitor to ensure that they are connected properly. Power on the system to determine if this resolves the issue.

Troubleshooting Steps:

Part 3 — Checking Video Cables

1. Monitors may be displaying camera feed improperly. This can often be a result of a poor video cable connection.
2. To check video cable connections to the driver or passenger side begin by removing the A pillar covers. This will expose the camera connector from the camera wing as well as the power cable from the MirrorEye system main harness.
   - 2.1 Refer to the DVR device installation steps for instructions on how to remove the A pillar covers.
   - 2.2 The video camera cable has a blue and back barrel end, and the power connection will be evident by a yellow connector end.
3. Check that all of the video cable connectors are properly secured and that there are no kinks or abrasions to the video cable.
4. Check the camera cable ends to ensure that there are no bent or damaged pins.
5. Reconnect all video cables after first inspecting and replace the A pillar cover.
   - 5.1 When replacing the A pillar cover make sure that the video cables are not kinked by the cover or are over radiused when the monitor is mounted.
6. Class V monitor can be checked for similar problems with the small fakra video connector at the back of the device. Ensure that the video cable is connected properly.
7. After all connections have been checked. Power on the system and determine if the video feed has been restored.
8. Restore all connections, monitor backing, A pillar covers, and RAM ball mount upon completion.
9. Complete the reinstallation of the monitor and ensure that it is displaying properly from the driver seat view. Adjust the monitor position and angle if necessary.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5.1


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Troubleshooting Steps:

Part 4 — Swapping Monitors

1. To swap an individual monitor, begin by recording the existing monitor serial number.
2. Locate the Stoneridge provided box with the replacement monitor and power and video cable pigtails. Record the new monitor serial number. Record this number in the Field Service app or on the provided checklist.
3. Disconnect all video and power connections from where they are connected to the camera wing and the full system behind the A pillar.
   - 3.1 Do not disconnect the monitor connections from the back of the monitor. The power and video pigtails will need to be sent back to Stoneridge for evaluation.
4. Carefully reconnect all cables to the new monitor.
5. When the MirrorEye system is powered on the monitor should display images and function as required.
6. Replace the monitor in the proper position.
7. Ensure that vehicle A pillar covers are replaced as well as driver grab bars. Restore the truck interior to its original condition. This concludes monitor troubleshooting steps.

Replacement Steps:

Part 7

Switching between dynamic and static reference lines

1. Enter the driver menu with a long push of the driver's side manual panning button. Using the control knob, scroll down to exit.
2. You now need to access the service (advanced) menu. To do so, simultaneously push the left side manual panning button and the center control knob.
3. Using the control knob, scroll to Access Service Menu and press the control knob to enter. Please note. There will be a warning that notifies you are going to enter the service menu. Using the control knob, scroll down to Distance Lines. Press the control knob to enter.
4. To switch between dynamic distance lines and static reference distance lines check the box on the menu line "use dynamic distance lines." To do this, press the control knob.
5. The system will automatically change to the static distance lines mode, which needs to be manually calibrated. Using the control knob, scroll down to "line positions."
6. Select column number two. This is the red line represented on the monitor. This line represents the end of the trailer.
7. Enter column number two by pushing the control knob, then scroll down to vertical and adjust the line on the screen to match with the cone that we have placed representing the end of the trailer.
8. To lock it in the end of the trailer line position, push the control knob.
9. To exit column number two, push the driver's side manual panning button.
10. Scroll to column three and push in the control knob. This represents the orange 40 foot distance line.


1


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3a

3b

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7a


7b


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Replacement Steps:

Part 7

Switching between dynamic and static reference lines

11. To adjust the settings, scroll down to vertical. Push the control knob to adjust the position. Scroll until the orange line is on top of the cone placed outside of the trailer. Once you are satisfied, push the control knob to lock it in.
12. To exit column number three, push the driver's side manual panning button.
13. Scroll to column number four to adjust the green line, which represents 80 feet behind the end of the trailer and push the control knob.
14. Scroll down to vertical, push the control knob and adjust the green line until it is on top of the cone that we have measured out to be approximately 80 feet behind the trailer. Lock in the position of the green line by pushing the control knob.
15. To exit column number four, push the driver's side manual panning button.
16. To exit the distance line positions, push the driver's side manual panning button.
17. To exit the menus, scroll down to return, then scroll down to exit.
18. You will also need to follow the same steps and do the same process for the passenger side.

11a


11b


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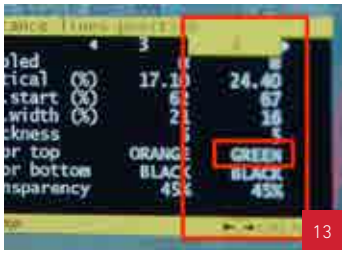

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14a


14b


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