



# AEV Front Bumper

## 2023+ Super Duty

### NEW PRODUCT

Please visit [www.aev-conversions.com](http://www.aev-conversions.com) to view the most current installation guide for this product.

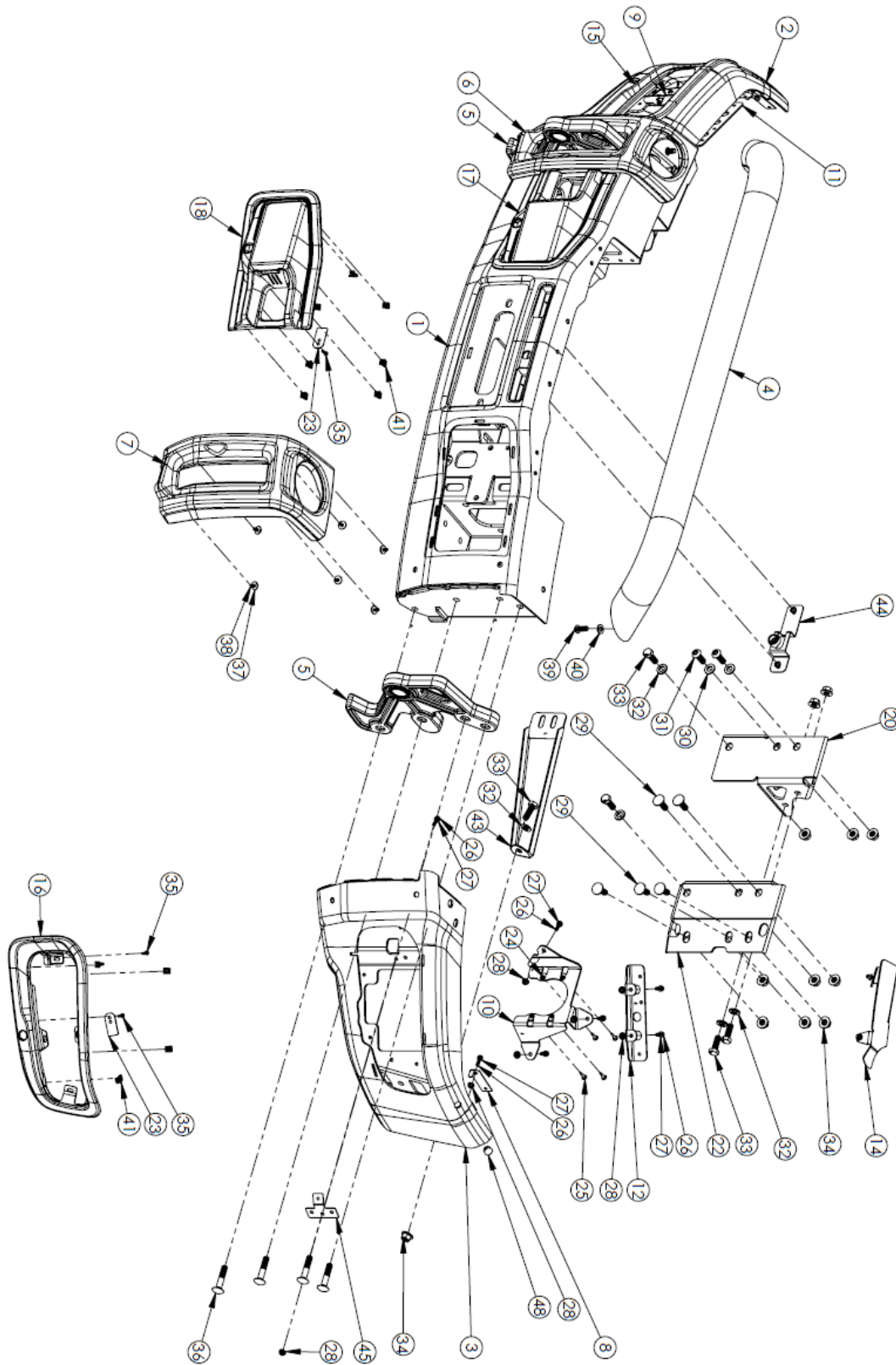
This is a new product and we want to make sure that you receive the latest and most accurate information based on customer feedback, product revisions, and/or model year updates. We value customer feedback, so we encourage you to contact our Technical Support department if you have any suggestions on how to make the installation of this product easier or if you have any questions regarding the installation of this product. AEV's Technical Support can be reached by email at [tech@aev-conversions.com](mailto:tech@aev-conversions.com) or by giving us a call at (248)-926-0256.



**PLEASE READ BEFORE YOU START**

To guarantee a quality installation, we recommend reading these instructions thoroughly before beginning any work. These instructions assume a certain amount of mechanical ability and are not written nor intended for someone not familiar with auto repair.

| INCLUDED PARTS             | QTY | REQUIRED TOOLS   |
|----------------------------|-----|--|
| Center Section             | 1   | 6mm to 22mm sockets and wrenches   |
| Corner Kit (37in or 40 in) | 1   | Torx bits T15 – T20  |
| Mounting Kit               | 1   | E 6 Torx bit   |
| Low Tube Assembly          | 1   | ¼, 3/8, ½, Ratchet   |
| Hardware Pack              | 1   | Extension pieces for Ratchets<br>Flat head and Philips head screw drivers<br>Pry Tools for plastic trees<br>Torque Wrench<br>Rust Inhibitor<br>Transmission Jack or extra hands<br>Common Hand Tools |





| Item NO. | Part Number       | Description                     | QTY. |
|----------|-------------------|---------------------------------|------|
| 1        | FD5B0100AD        | Center Section Weldment         | 1    |
| 2        | FD5B0102AD/0104AC | Corner Weldment RH 37in /40in   | 1    |
| 3        | FD5B0103AD/0105AC | Corner Weldment LH 37in/40in    | 1    |
| 4        | ARMB0101AB        | Weldment Low Tube Bar           | 1    |
| 5        | ARMB1018AC        | Tow Loop Casting                | 2    |
| 6        | ARMB1020AB        | RH Tow Loop Bezel               | 1    |
| 7        | ARMB1021AB        | LH Tow Loop Bezel               | 1    |
| 8        | FD5B1017AD        | Corner Gap Hider Bracket        | 2-4  |
| 9        | FD5B1024AC        | RH Fog Bracket                  | 1    |
| 10       | FD5B1025AC        | LH Fog Bracket                  | 1    |
| 11       | FD5B1026AC        | Gap Filler RH Corner Bracket    | 1    |
| 12       | FD5B1027AC        | Gap Filler LH Corner Bracket    | 1    |
| 13       | FD5B1028AB        | Gap Filler RH Center Bracket    | 1    |
| 14       | FD5B1029AB        | Gap Filler LH Center Bracket    | 1    |
| 15       | FD5B1030AC        | RH Fog Adaptor Bezel            | 1    |
| 16       | FD5B1031AC        | LH Fog Adaptor Bezel            | 1    |
| 17       | FD5B1032AC        | RH Inner (Radar) Bezel          | 1    |
| 18       | FD5B1033AC        | LH Inner (Radar Bezel)          | 1    |
| 19       | FD5B1010AD        | RH Inner Frame Bracket          | 1    |
| 20       | FD5B1011AD        | LH Inner Frame Bracket          | 1    |
| 21       | FD5B1012AC        | RH Outer Frame Bracket          | 1    |
| 22       | FD5B1013AC        | LH Outer Frame Bracket          | 1    |
| 23       | FD5B1018AB        | FPA Retention Plate             | 4    |
| 24       | 11548579          | M4.2 x 1.41 U-Nut               | 8    |
| 25       | 11611883          | M4.2x 1.41 x 20 Torx Head Screw | 8    |
| 26       | AEV91017AA        | M6 X 20 Hex Head Bolt           | 18   |
| 27       | AEV98010AB        | M6 Washer                       | 18   |
| 28       | AEV93020AB        | M6 Serrated Nut                 | 18   |
| 29       | AEV91026AB        | M12-1.75x35 Carriage Bolt       | 10   |
| 30       | AEV98004AC        | M12 Black washer                | 5    |



|    |            |                                      |     |
|----|------------|--------------------------------------|-----|
| 31 | AEV91001AB | M12-1.75x35 Button Head Bolt – Black | 4   |
| 32 | AEV98057AA | M12 Washer Silver                    | 10  |
| 33 | AEV91016AA | M12-1.75x35 Hex Head Bolt – Silver   | 10  |
| 34 | AEV93001AB | M12 Flange Nut – Silver              | 32  |
| 35 | AEV91154AA | #8 x ¾" Torx Screw                   | 6   |
| 36 | AEV91130AA | M12-1.75x60 Carriage Bolt - Black    | 8   |
| 37 | AEV98027AA | M6 Washer – Black                    | 12  |
| 38 | AEV91193AA | M6X12 Hex Head Bolt - Silver         | 12  |
| 39 | AEV91029AA | M10-1.5x25 Button Head Bolt – Silver | 2   |
| 40 | AEV98006AA | M10 Washer – Black                   | 2   |
| 41 | 11570751   | Panel Clip                           | 22  |
| 42 | FD5B1042AC | RH Pencil Brace                      | 1   |
| 43 | FD5B1043AC | LH Pencil Brace                      | 1   |
| 44 | 14060106AA | Camera Relocation Kit                | 1   |
| 45 | FD5B1046AA | Fog Bezel Retention Bracket          | 0-2 |
| 46 | AEV98005AA | M14-2x40 Hex Flange Bolt – Black     | 8   |
| 47 | AEV93009AB | M14 Nut – Silver                     | 8   |
| 48 | P-85985K18 | 5/8" Plastic Plug                    | 2   |

## I. VEHICLE PREPARATION – OEM Bumper Removal

1. Disconnect OEM Wire Harness located on interior driver side frame.
  - A. If you have block heater as well, make sure to remove the zip ties on the bumper.



*Figure 1*

2. Remove OEM Pencil Braces RH and LH (14mm socket)



*Figure 2*



- A. Preserve Vehicle side, nut bracket and bolts from the pencil braces. (Figure 2)

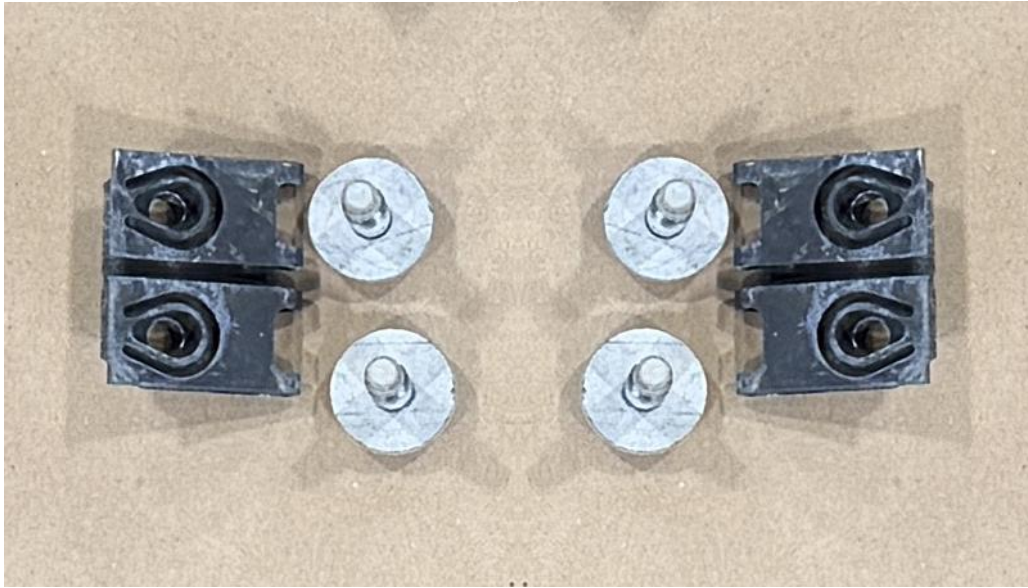


Figure 3



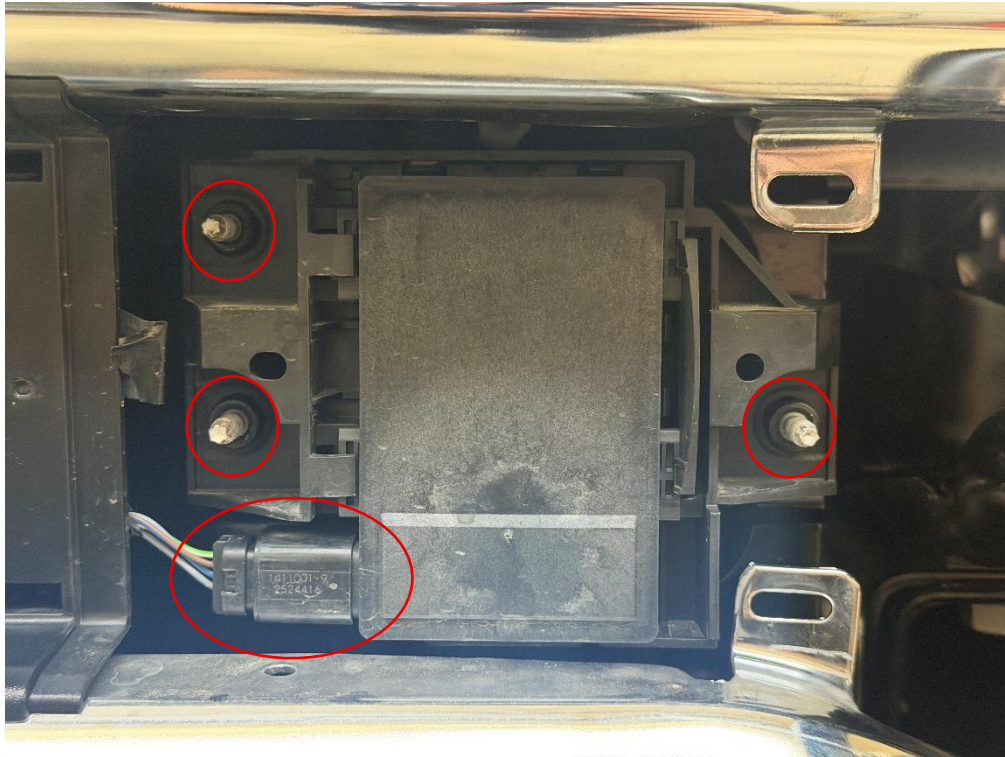
3. Pop off tow loop cover plastics. Pulling from the inside edge using plastic pry tools for best removal.
  - A. Passenger side is off, Driver side is still on (fig 4).
  - B. If your vehicle is not equipped with radar, your driver's side plastic may look different



Figure 4

4. For vehicles with Radar, remove the radar

- A. Remove 3 nuts (11mm socket) and disconnect the wire harness, utilize a flat head screwdriver if the wire harness is difficult to remove.



*Figure 5*

- B. Pop the radar off the stems. Try to pop off all stems at the same time to reduce torque on the radar.



5. Detach gap hidens from the vehicle side. This is located between the grill and the bumper (fig 6)
  - A. Attempt to preserve the 'Christmas Tree' plastics using a small pry bar.



Figure 6

6. The OEM Bumper is held on by 8 bolts shown in figure 7, remove these bolts (18mm socket), ensure you have a transmission jack and/or a second pair of hands as the bumper will now be free from the vehicle.
  - A. While removing ensure to clear the tow loops before lowering down.
  - B. Place the OEM bumper in a working space, there are many components that need to be preserved from the OEM bumper to be installed to the AEV Front Bumper



Figure 7

- 7. Remove OEM tow loops (8 18mm bolts) the bolts and loops will not be preserved
  - A. 4 Bolts per side



*Figure 8*

8. Remove OEM Frame Rail brackets (8 18mm bolts)
  - A. 4 Per side, preserve bolt plates and nuts



Figure 9



Figure 10

9. If you are relocating the front camera, at this time, pause and continue with the AEV Super Duty Camera Relocation Installation Guide.



## II. VEHICLE PREPARATION – OEM Bumper Component Carry Over

10. Below is an image of everything that will be carried over, please reference this through the bumper component removal steps

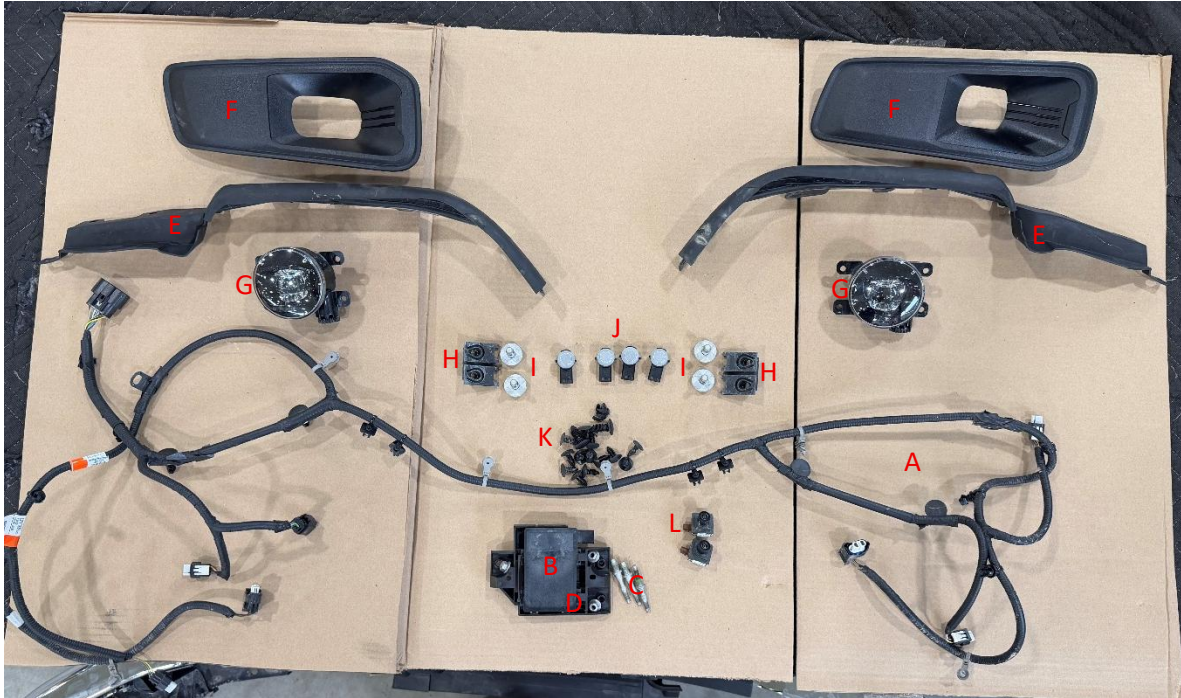


Figure 11

- A. OEM Wire Harness
- B. Radar
- C. 3x Radar Studs
- D. 3x Radar nuts
- E. RH/LH gap Hiders
- F. RH/LH Fog Bezels
- G. 2x Fog Lights
- H. 2x Frame Side Pencil Brace Nut Plate
- I. 4x Frame Side Pencil Brace Bolts
- J. 4x OEM Front Park Sensors
- K. As many Christmas tree fasteners as possible from the gap hider
- L. Camera if applicable (two photographed, only one on vehicle) (check AEV Super Duty Camera relocation for installation)



11. Fog lights (G)

- A. Disconnect Wire Harness from fog light housing
- B. Remove 3 bolts holding the plastic shroud around the fog bezel. This will help you gain access to the outer FPA sensors (front park assist sensors).
  - i 8mm Socket
- C. Remove Fog light housing from plastic containers.
  - i 4 T20 bolts per side.

12. Wire Harness (A)

- A. Preserve as many attachment pieces as possible for better routing in the AEV bumper
  - i These are all Christmas Tree or plastic clips, pull or use pry bar to remove.

13. Radar Studs (B,C,D)

- A. With your bumper off the vehicle, utilize an E6 torx bit to remove the raining studs from the AEV bumper
  - i The inboard top bolt is slightly longer, ensure upon installation that this bolt is installed in the same location on the AEV bumper. This is a locating stud for angling the radar.

14. FPA Sensors (J)

- A. There are two near the center and two near the edges of the bumper
  - i Ensure to pull out of the housing safely as added pressure or torque on the sensors can cause issues
- B. Once removed, set aside for paint matching if necessary.
  - i Tape off all but the painted area of the sensor
  - ii Apply a thin, even coat of black spray paint & sealant
    - 1 A thin layer will still allow the sensors to function correctly
  - iii If there is a functionality issue the ford replacement part number is NU5Z15K859DG

15. A surface Fog Bezels (F)

- A. Pop plastics out of the OEM bumper, ensure all clips are intact. It helps pushing from the back side to remove safely.

16. Gap hidens + Christmas Tree Fasteners

- A. Preserve as many fasteners as possible, AEV does not supply replacements. Mount locations should be similar on the AEV bumper

### III. Bumper Installation – Center Section

#### 17. Inner Frame Brackets

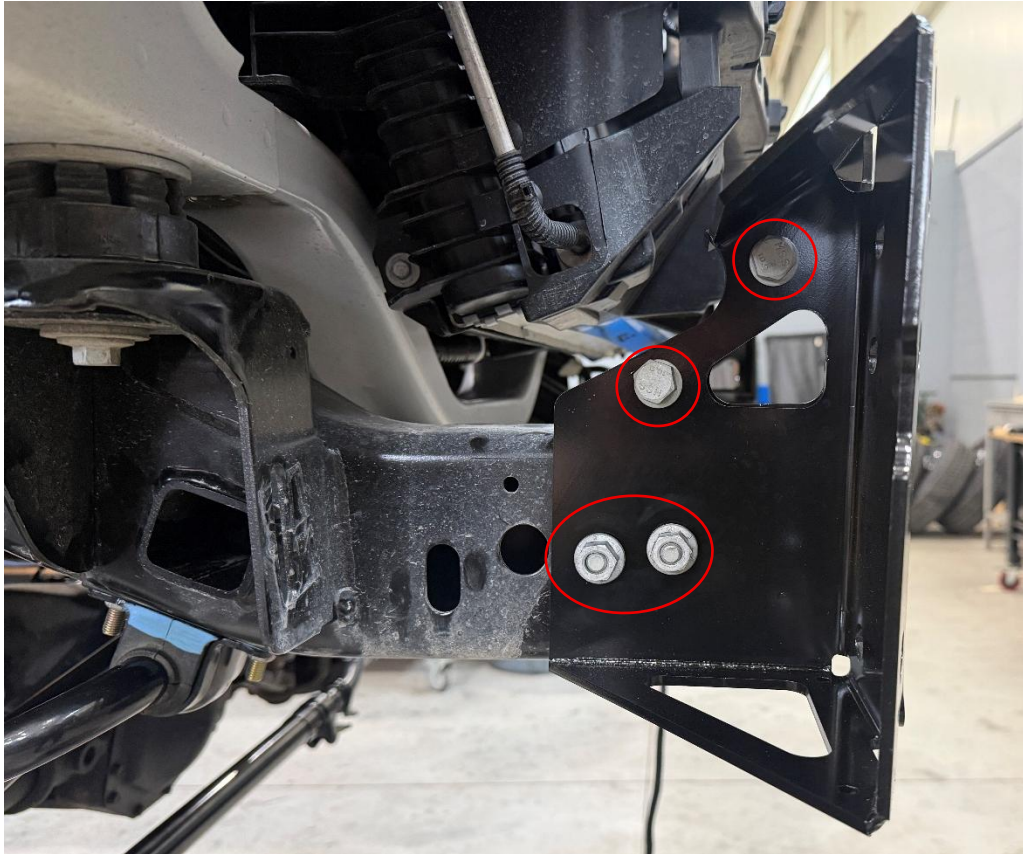
- A. Rest the 4 bolt hole locations onto the frame where the OEM tow loops initially were.
- B. Install 4 M14x2-20 black top-down frame bolts (21mm bolt - 18mm nut). (Figure 12 shows silver)
- C. Utilize the OEM bolt plate and nuts from the OEM Frame Rail Brackets to bolt the lower half of the AEV inner frame brackets.
- D. Install loosely as you will want to be able to adjust the bumpers' location once mounted.



*Figure 12*

18. Outer frame brackets

- A. Utilize the OEM bolt plate and nuts on the inner lower portion of the bracket  
i 18mm for nut 19mm for bolt
- B. Thread M12-1.75 x 35 bolts through inner and outer frame brackets, install loosely with washers.
- C. Align inner and outer brackets to create a flat perpendicular surface to the frame.



*Figure 13*



## 19. Radar and Studs

- A. Install radar studs utilizing an Etorx bit into the AEV Center Section, ensuring the upper inboard stud is the different length stud. There are weld studs on the bumper for installation.
- B. Tighten lower inboard and single outboard stud till it is flush.
- C. The upper inboard stud is the adjustment stud; tighten or loosen this stud to adjust the angle the radar is facing. Use lock tight as this likely will not sit entirely flush.

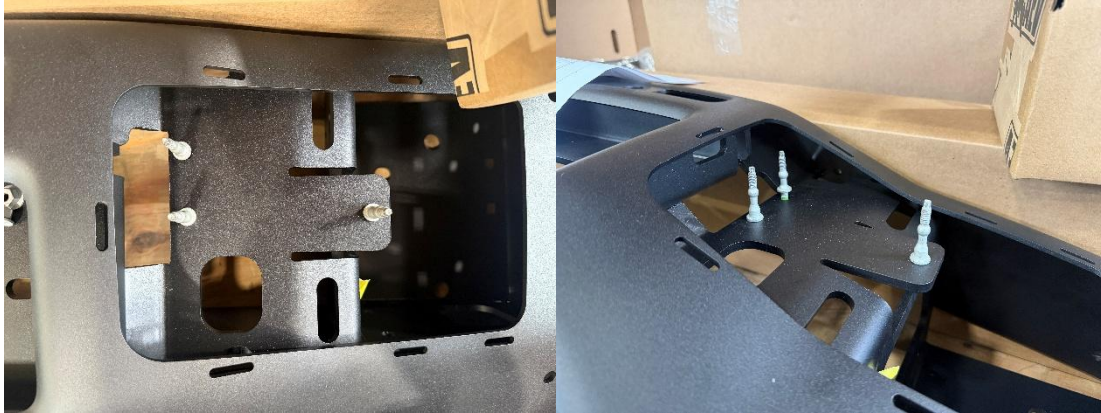


Figure 14

- D. Snap radar in and reinstall nuts

i It is important that the radar is in as vertical a position as possible, utilizing a laser level once installed on the vehicle to ensure its straightness.



Figure 15

## 20. Center Installation

- A. Place the center section on a protected surface.
- B. If installing a Warn 16.5 winch, install the winch fairlead using the fasteners provided with the winch. Torque as instructed by the winch manufacturer. Use the AEV provided Spacers between the winch and bumper. For Warn M12000 or M15000 winches see appendix A.



C. Install M12 non-shouldered carriage bolts to the outer upper bolt holes on the right and left side of the bumper. Place a metal retainer on the backside so the bolt stays on during initial installation.

D. Utilizing a second person and/or a transmission jack, lift the bumper to align to the respective holes on the frame brackets. Place bolts through outer upper holes on the outer mount brackets before the curved portion of the brackets (A1 within Figure 16). Use M12 nut to secure in place (18mm socket). It is important to keep these loose until the final fit up with the corners on. You want to align the corners as square as possible; you need all mount points on the center section and the corners to be loose to adjust.



Figure 16

E. Mount the final 10 bolts loosely. There should be 12 total bolts in the center section (6 per side). Reference figure 16 for which bolts to use for each location.

- i A = M12 X 35 Carriage Bolt (18mm socket)
- ii B = M12 X 35 Buttonhead Bolt (8mm allen+ 18 mm socket)
- iii C = M12 X 35 Hex Bolt + Washer (19mm socket + 18mm socket)



#### IV. Bumper Installation – Corner Prep Assembly

21. Attach Outer Close Out Brackets to the back side of the corners

A. Utilize two M6x20 bolts (10mm bolts and nuts)

i Ensure that you utilize the correct handed components (marked with L and R on parts)  
(right hand bracket would be utilized in figure 17)



Figure 17

22. Attach L shape close out piece to the upper outmost mount location. With the flag going into the hole utilizing the M6x20 bolts (10mm bolts and nuts).

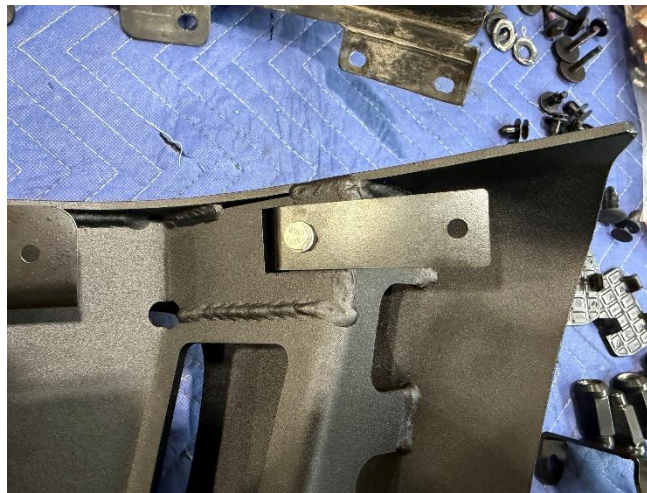


Figure 18



23. Attach T Shaped mount bracket to the inside of the corner shell/bracket

A. Depending on your revision level you may not have component within figure 19B. In which case you will have two additional brackets found within figure 18, modify this bracket, cutting the length just past the second hole on the long face figure 19C. These can serve the same purpose; ensure they are mounted in such a way that through the 'peep' hole (figure 19B) you can see the bracket.

- i This will be used to hold the plastic cover in place later within the assembly.



Figure 19A

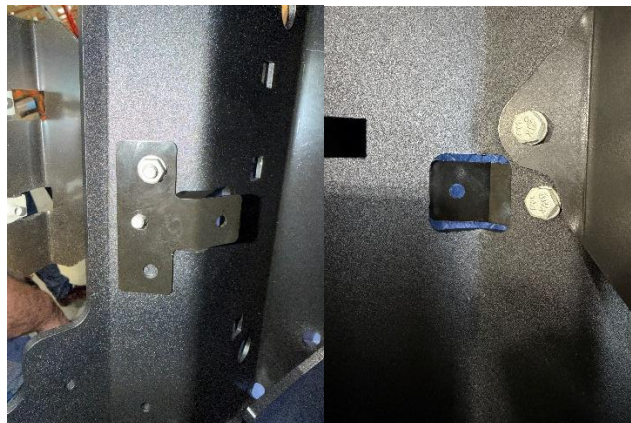


Figure 19B



Figure 19C

- 24. If you have front corner skids, please follow the instructions found on the website for installation.
- 25. Assemble and install Fog light brackets
  - A. Add clips to fog light brackets for later installation of the fog lights.



Figure 20

- A. Mount in three hole locations within figure 21. Utilize the M6x20 bolts. It is important to wait to install fog lights as it gives you maximum space to assemble the bumper.



Figure 21

26. Install gap hider brackets

- A. Attach gap hider to the top of the bumper corner
- B. Utilize Christmas trees on the three mount points on the inner gap hider bracket
- C. The outer bracket alignment may not be correct, mark the rubber gap hider and drill hole.
- D. Add final OEM Christmas tree through the drilled hole in the gap hider to the bracket.

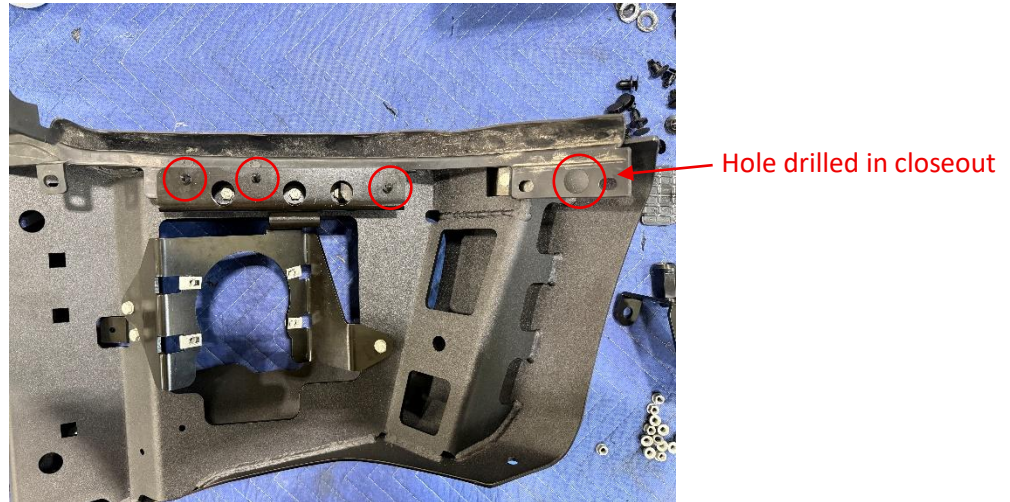


Figure 22



## V. Bumper Installation – Corner + Center Assembly

27. Attach powder coated gap hider bracket to the inner frame bracket with the M6x20 bolts (10mm bolts and nuts).
  - A. Ensure the gap hider bracket goes over the outer frame bracket, it will eventually be attached to the corner figure 23.



Figure 23

28. Assemble the tow loops and corners using M12x60 carriage bolts, and push nuts as shown in figure 24.
  - A. Install all bolts through the inside of the corner and tow loops to ensure proper alignment.



Figure 24



29. Lift the corner assembly onto the center section, inserting four bolts from the previous step into the corresponding holes in the center section Figure 25. Secure using M12 Nuts (18mm) and hand tighten.



Figure 25

30. Insert three M12X35 (19mm) carriage bolts into the bumper corner and through the holes in the outer frame bracket. Secure with M12 (18mm) nuts and Hand Tighten

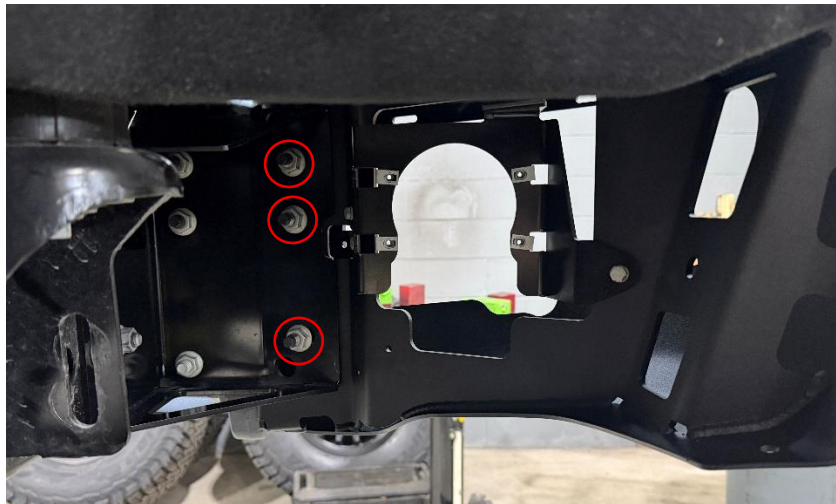


Figure 26

31. If you are installing AEV 40in Flares with your AEV front bumper, follow the Flare installation guide to install the front flair extension to the front bumper corners. Make sure to align the front bumper corners to match the front flairs gaps and widths.



## vi. Adjust, Align, & Torque

32. Before installing tow loop bezels, low tube, pencil braces, wire harnesses, and lighting, the bumper must be adjusted and all fasteners tightened. Be sure spacing between the bumper and the truck body are even.
33. Tighten all hardware in this order: 1) Center Section To Frame Brackets. 2) Frame brackets to Frame. 3) Tow loops to Center Section. 4) Corners to Center Section. Torque to the following spec:
  - A. M8 16 ft/lbs
  - B. M10 43 ft/lbs
  - C. M12 73 ft/lbs
  - D. M14 118 ft/lbs

## vii. Final Bumper Installation (Lighting, Low Tube, Plastics)

34. Attach Gap Hider Bracket to Corner Weldment Figure 27



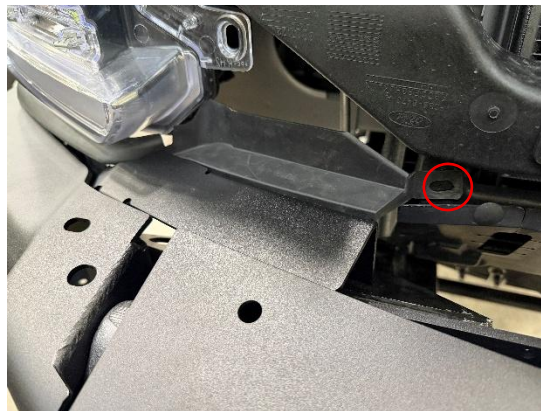
*Figure 27*

35. Attach OEM Gap Hider to the Gap Hider Bracket Figure 28



*Figure 28*

36. Reattach OEM Gap Hider to Vehicle (AEV images have the Grill removed, this is not needed for standard bumper installation)



*Figure 29*



37. Attach AEV Pencil braces to corners/frame mount points.

- A. Utilize OEM Nut Plate and bolts on the vehicle side of the pencil brace and hand tighten.
- B. Attach bumper end utilizing AEV supplied M12 Bolt, Washer, and Nut
- C. Torque OEM bolts to XXX ft/lbs, torque AEV bolts to XXX ft/lbs

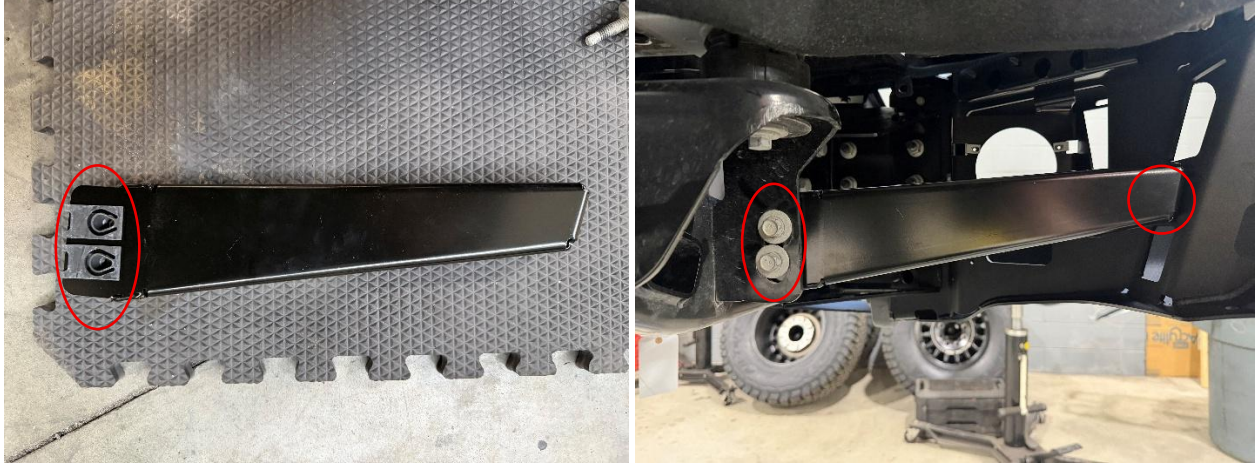


Figure 30

38. Attach one tow loop bezel using M6x12 bolts and washers. Hand tighten.

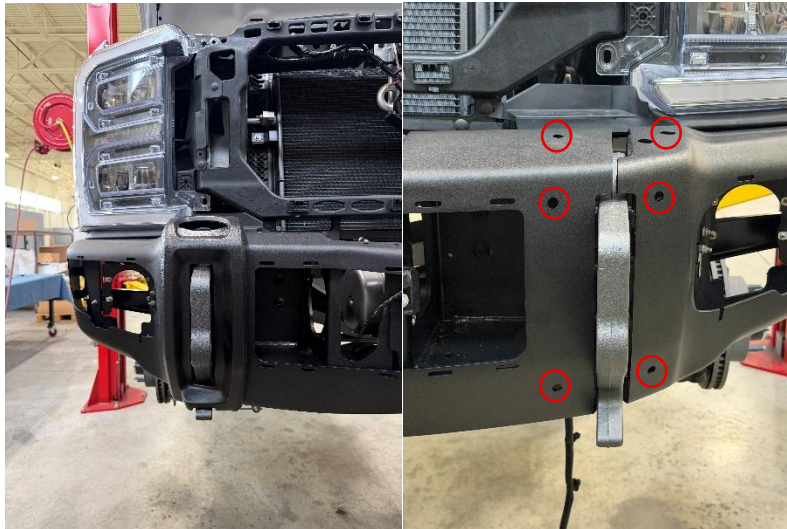


Figure 31



39. Install the M10x25 button head bolts and washers into the guards ends and hand tighten the low tube.

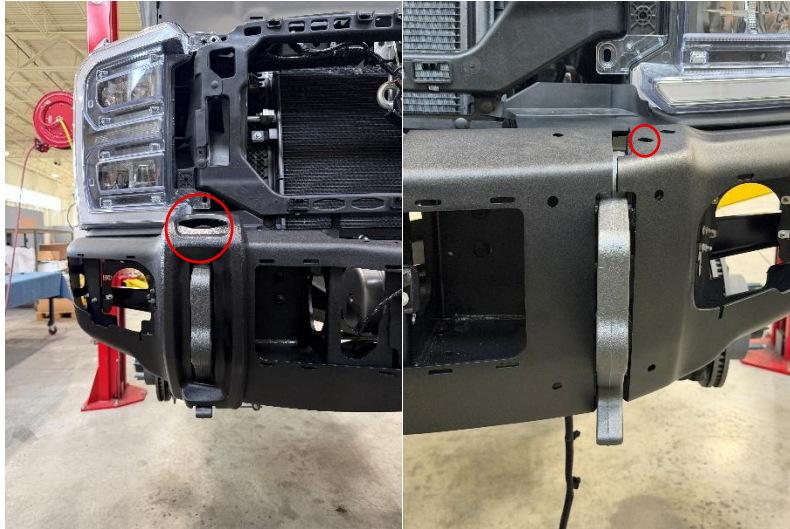


Figure 32

40. Fasten the second tow loop bezel and tighten both bezels to 9 ft/lb.

41. Tighten low tube bolts from figure 32 to 30 ft/lb.

42. Attach fog lights to fog light brackets

A. OEM lights are common and can be installed on either side. These lights from factory tend to set slightly inboard. While tightening, push as far outboard as possible to align better with the OEM fog bezel.

B. Tighten down 4 T15 screws to XXX ft/lbs

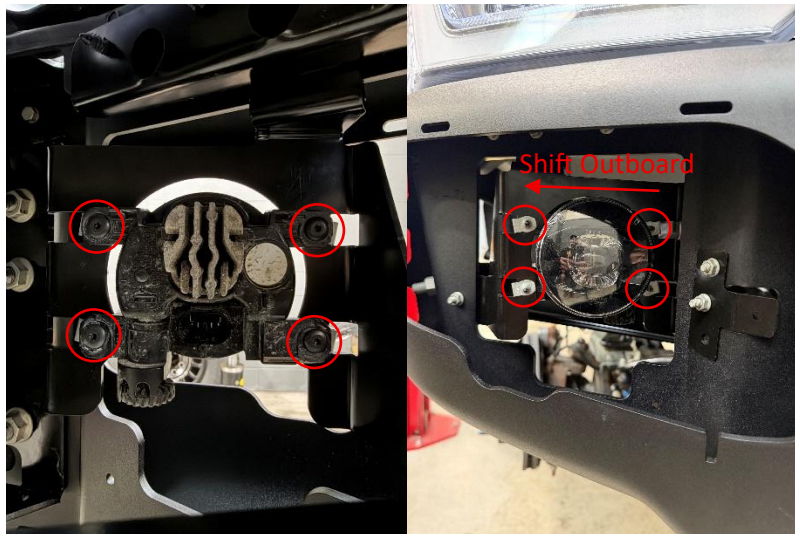


Figure 33



43. Attach Radar Bezels to AEV Front Bumper

- A. Add metal clips to the 7 plastic clip towers on each bezel.



Figure 34

- B. If you do not have FPA sensors add plastic caps to the bezels



Figure 35



- C. If you do have FPA sensors, place the sensor within the hole ensuring the locating pin is aligned to the sensor.
- D. Add the FPA retention plate and screw in place.



Figure 36

- E. If you do not have the adaptive cruise radar, Snap plastic bezel into the bumper. If you do, wait to install until wire harness installation.



Figure 37

44. Attach OEM Fog Bezels and Fog Bezel Snap Rings to AEV Front Bumper

- A. Add metal clips to plastic towers (4 per side)



- B. Snap plastic bezels in place.
  - i If you do not have sensors, snap in plastic caps.
  - ii If equipped, the sensors will be added later, due to the tight fitment behind some versions of the corner stamping, it is difficult to put in place before the plastics are installed. The sensor will be attached to the wire harness, then installed.
  - iii Install 'hook' or inboard side first then snap the clips in place.
- C. From the back side of the bumper, utilizing the T shaped (or L shaped) mount bracket, draw the plastic into the stamping utilizing the screws provided #8x 3/4" torx screw



Figure 38

- D. Snap OEM Fog Bezel within the AEV Fog Bezel Snap Ring.



Figure 39



## VIII. Wiring and Harnesses

45. Due to the variance in wire harnesses from the factory, you may or may not need to modify your OEM wire harness. You will not need to modify if you do not have front park assist sensors. Skip to step 63 and install loosely to see if all connectors make it to their sensors/fixtures.
46. The following steps will modify the OEM wire harness to cleanly remove slack, allow you to install in the cleanest way possible and most importantly increase the length to Park Assist sensor #3, as it sits rather tight/won't reach as is.
47. Remove all zip ties and clips from OEM wire harness
48. Ensure to keep as much split lume on the wire harness to reuse once measurements are completed.
  - A. Utilize a thread ripper or razor blade to cut split lume. Be careful as nicking a wire is always possible. (Continue to next page for diagrams)



49. For reference, figure 40 is initial, Figure 41 shows final, figure 42 shows lengths in the diagram.

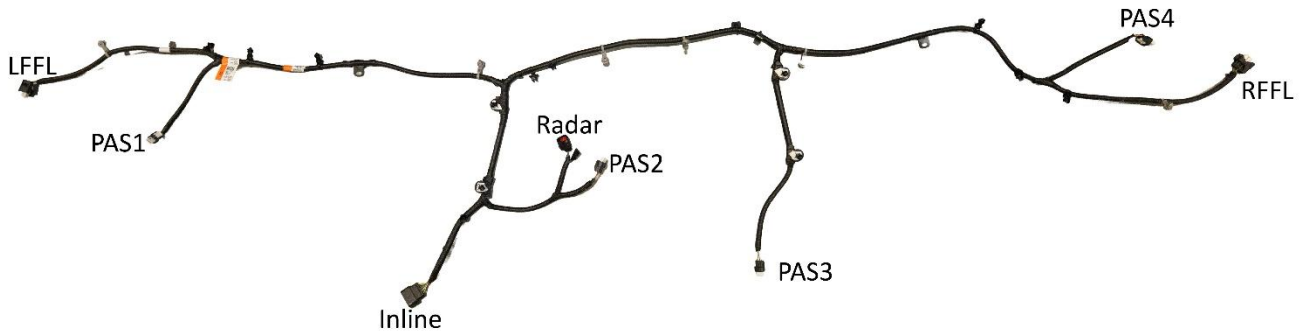


Figure 40

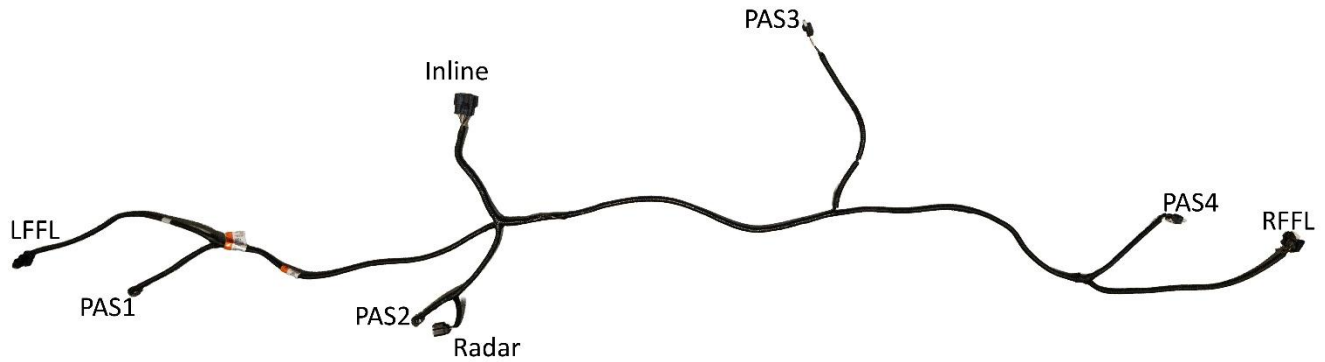


Figure 41

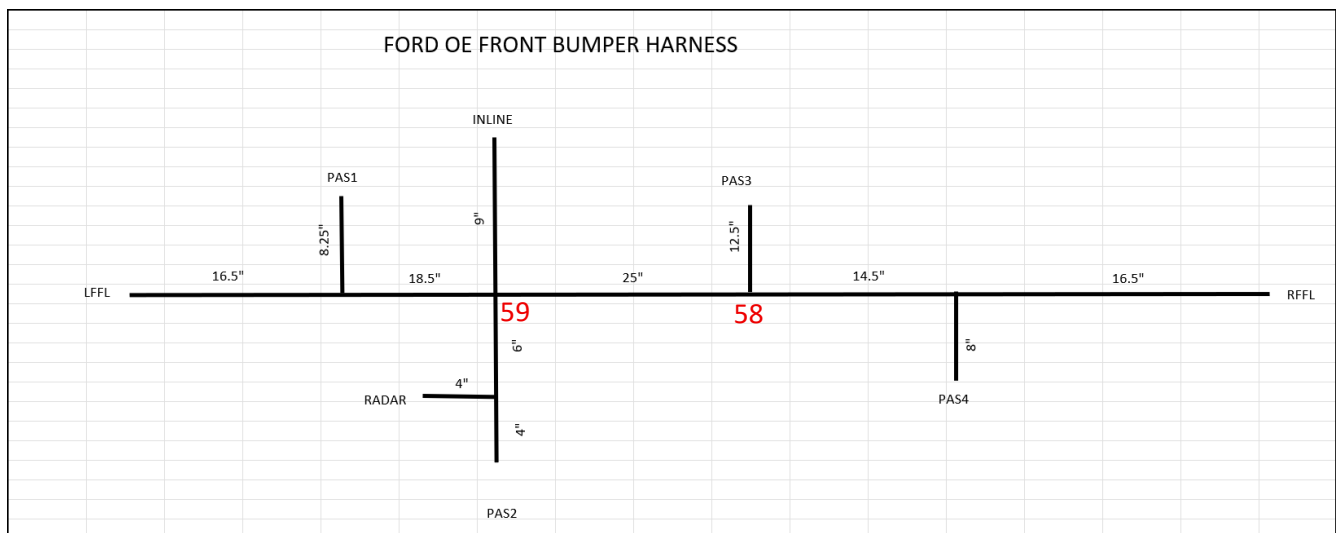


Figure 42



50. Utilizing a thread ripper or razor blade to cut the split lume starting 3 inches from the radar PAS2 junction to the radar-inline junction
51. Continue the cut 5 inches toward the inline
52. Continue cutting from the radar-inline junction to the mainline T
53. Continue cutting from the inline radar junction to PAS1 6 inches
54. Continue cutting from the Inline radar junction to the PAS3 Junction.
55. Continue cutting down the PAS3 line 12 inches
56. Continue the cut between PAS3 junction and PAS4 junction 12 inches
57. Figure 43 shows the areas where the split lume is cut, figure 44 has those same areas highlighted in red.

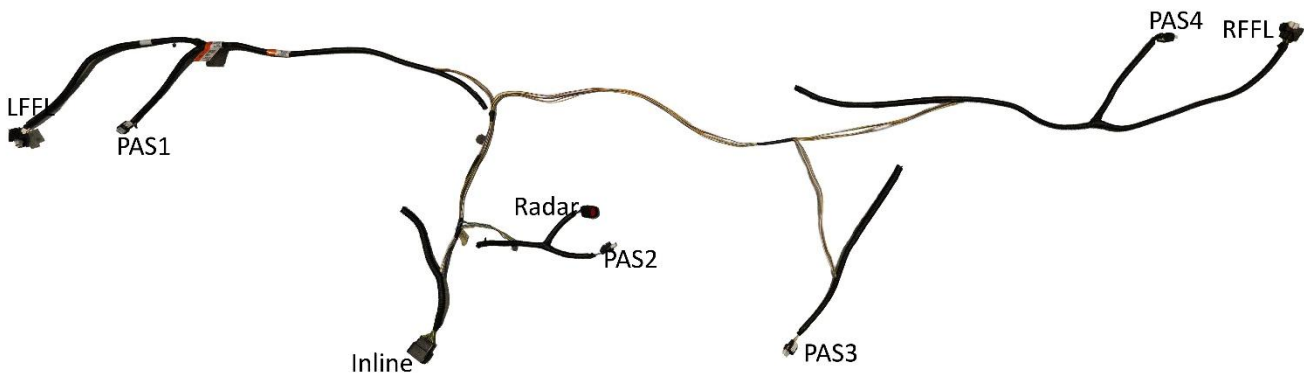


Figure 43

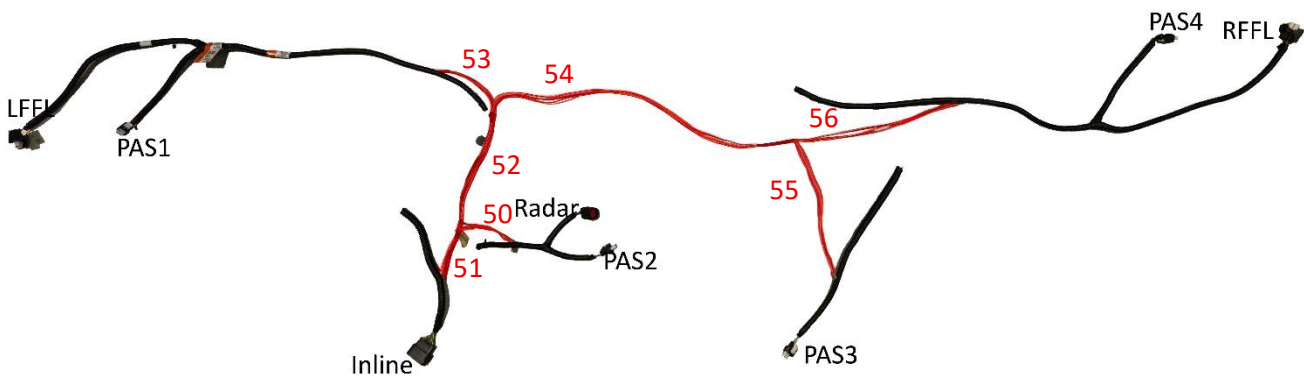


Figure 44

- 58. Reposition PAS3 Main line Junction to fit correct lengths (Figure 42, 45-46)
- 59. Create a loop around the Inline – Radar – PSA2 – Mainline Junction to align measurements to Figure 42, 45-46.

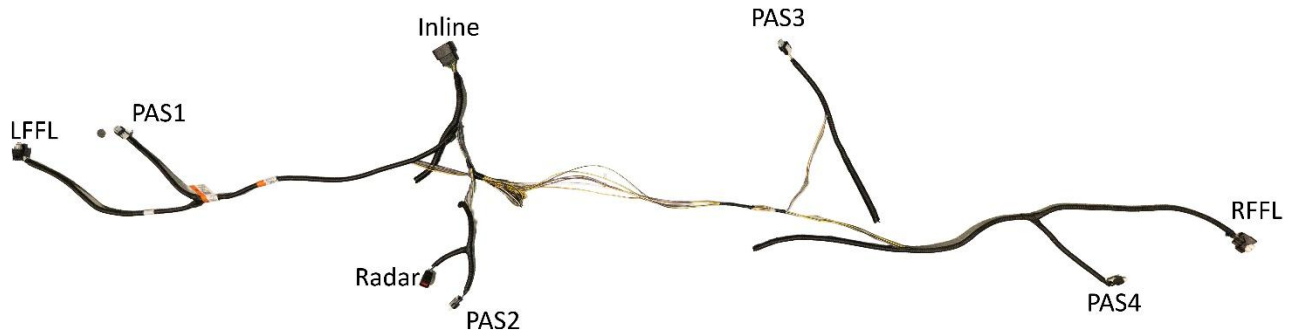


Figure 45

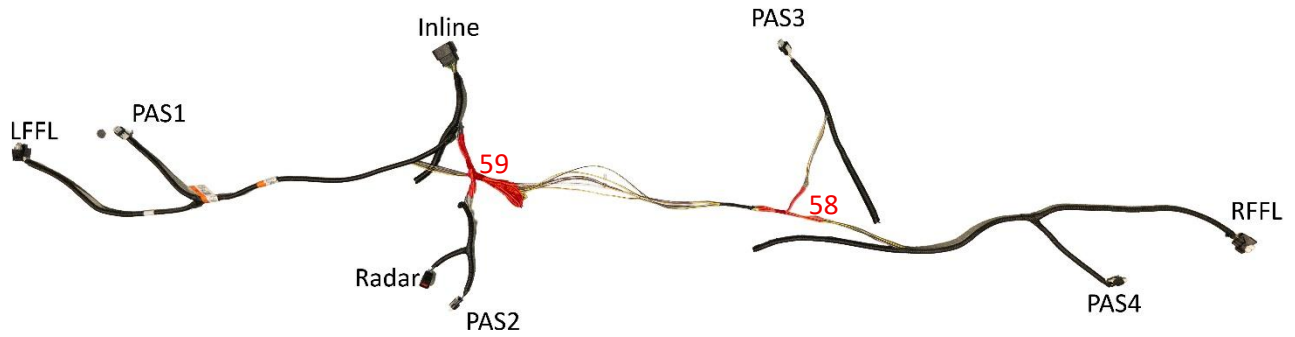


Figure 46

- 60. Tape loop inplace after ensuring lengths are correct.
- 61. Replace as much lumen as possible to the line.
- 62. Any Gaps, utilize electrical tape to cover.

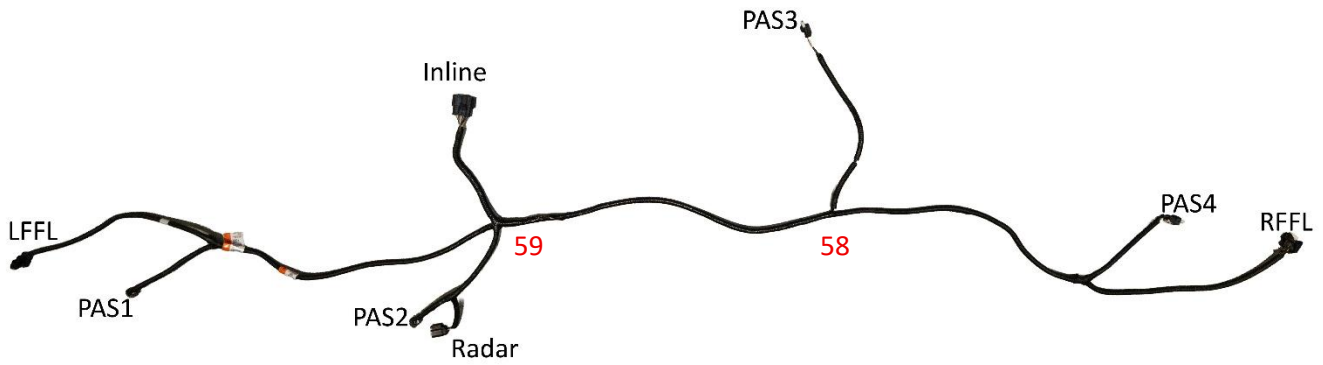
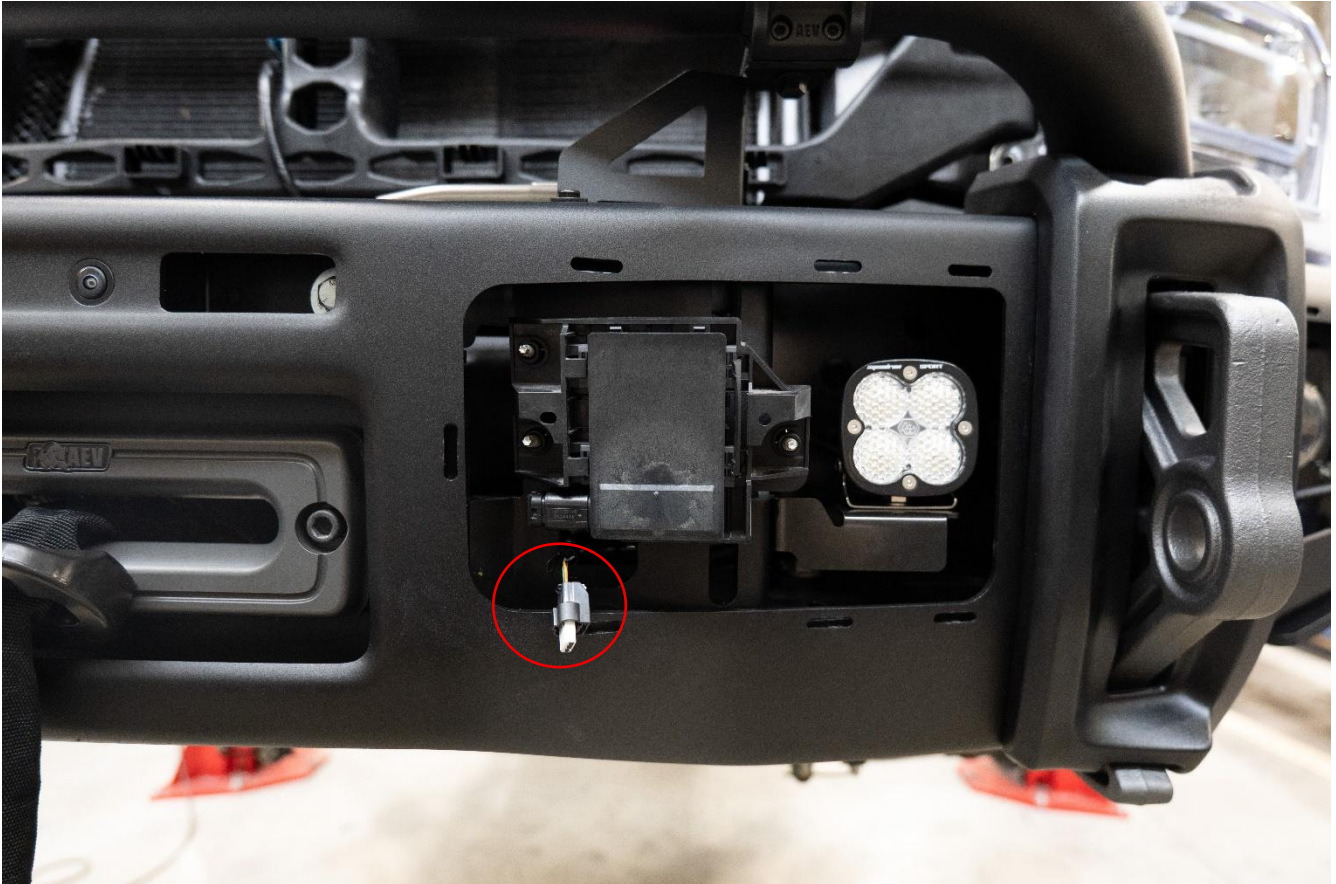


Figure 47



63. Reattach OEM wire harness to the connector on the frame. Installation may vary depending on options. Shown below has all front options from ford; Fog lights, Front park assist sensors, and radar sensor.
  - A. All OEM wiring will lead from here; any slack should be pulled out while wiring to hold harness tight to the vehicle.
64. First begin with connecting the radar connector. (Photo shown has FPA sensor attachment hanging below)



*Figure 40*

65. The OEM wire harness and block heater will be routed on the bottom edge of the bumper as shown in the detailed figures 41, 42
  - A. Once roughly in place, attach the exterior FPA sensors to the OEM wire harness
  - B. Place the exterior sensors within the Fog light bezel snap rings with the poka-yoke point aligned
  - C. Lastly utilize the FPA backing plates screw in place into the plastic





67. Face side images showing where the OEM wire harness is routing through



Figure 42



## ix. Appendix A – Warn M12000 & M15000 Installation

68. Requires AEV M12000 or M15000 Winch mounting Kit
69. Remove the four screws attaching the winch solenoid cover then remove cover. (Fig 1)
70. Remove the two nuts holding the solenoid pack to the mounting plate. (Fig 2)
71. Slide the solenoid pack out far enough to access the hold down bolts.
72. Remove the bolts and replace them with the supplied M6 x 15 bolts. (Fig 3)
73. Reassemble the solenoid pack.
74. Attach the new solenoid bracket as shown (fig. 5). DO NOT put the washers back on.
75. Install the solenoid bracket to the bumper with the supplied M6 x 20 bolts, nuts, and flat washers. (Fig 5)

