2017+ Ford E-Venture Shock Package

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Note

Please review the product instructions prior to attempting installation to ensure installer is equipped with all tools and capabilities necessary to complete the product installation. We recommend thoroughly reading the instructions at least twice prior to attempting Installation.

Before beginning disassembly of the vehicle, check the "What's Included" section of the instructions to ensure you've received all parts necessary to complete installation. Further, verify that the parts received are PROPER TO YOUR application (year range, motor, etc.) to avoid potential down-time in correcting potential discrepancies. Any discrepancies will be handled by Carli Suspension and the correcting products will be shipped UPS Ground.

Parts Checklist

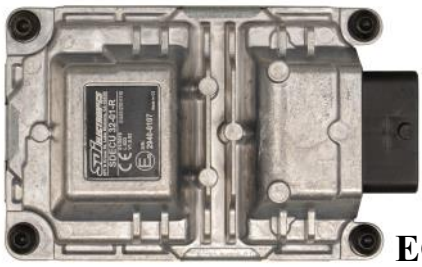
- ☐ **LVL DIESEL SHOCKS**
  - ☐ Front: SDI-MA-2141001
  - ☐ Rear: SDI-MA-2041005
- ☐ **LVL GAS SHOCKS**
  - ☐ Front: SDI-MA-2241003
  - ☐ Rear: SDI-MA-2241004
- ☐ **4.5/5.5" SHOCKS**
  - ☐ Front: SDI-MA-2041006
  - ☐ Rear: SDI-MA-2041005
- ☐ **IMU (Inertial Measurement Unit) & Mount**
  - ☐ 25mm Bolt
  - ☐ 40mm Bolt
  - ☐ 3 Billet Spacers
- ☐ **Touch Screen with 17-22 Mount & 23+ Mount**
- ☐ **ECU**
- ☐ **ECU Harness**
- ☐ **Front Shock Harness**
- ☐ **Rear Shock Harness**
- ☐ **Communication Harness**
- ☐ **Power Harness**

COMMUNICATION HARNESS

ECU HARNESS

POWER HARNESS

FRONT & REAR SHOCK HARNESSES



ECU

IMU

TOUCH SCREEN & MOUNT

23+ Mount Included, Not Pictured

Installation Instructions

1. **5.5mm or 7/32" Socket** - Remove Driver's side fender liner - take note of the hidden fender liner bolts angled on the inside lip of the fender. This will gain better access to the firewall gromet through which the harnesses will be passed. Also, note all the push-fittings in the top of the fender liner; make sure to dislodge these prior to pulling the liner to ensure none of the attached modules are damaged.

NOTE:

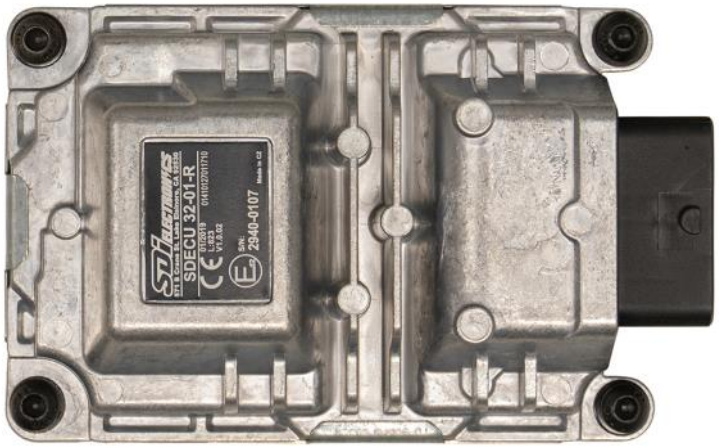
This shock package fits several versions of the Alumiduty — pay attention to the titles on the pages as there are sections specific to Year Ranges and Motor Type as it pertains to:

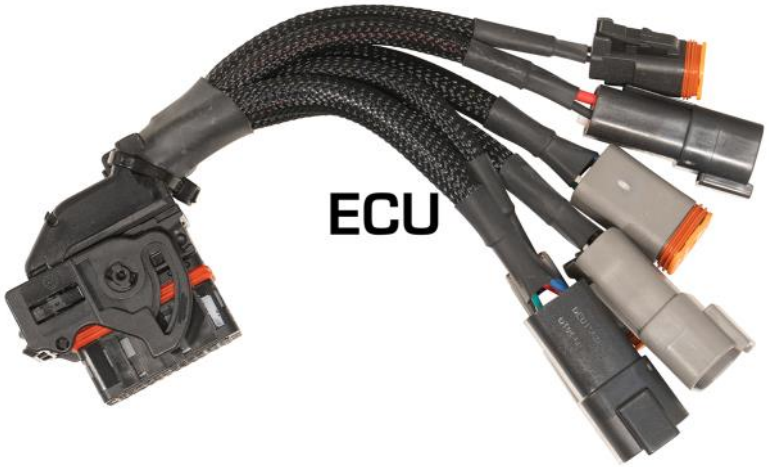
- **A-Pillar Mount Applications**
  - 20117-22: Gas and Diesel
  - 23+ : Gas and Diesel
- **IMU Applications**
  - 17-19 Diesel
  - 20-22 Diesel
  - 20-23 GAS
  - 23+ 6.7L Standard Output
  - 23+ 6.7L HO
- **Fuse Tap Applications**
  - 17-22: Gas and Diesel
  - 23+ Gas and Diesel

ECU — Electronic Control Unit – ALL YEARS/MOTORS

2. Install ECU:

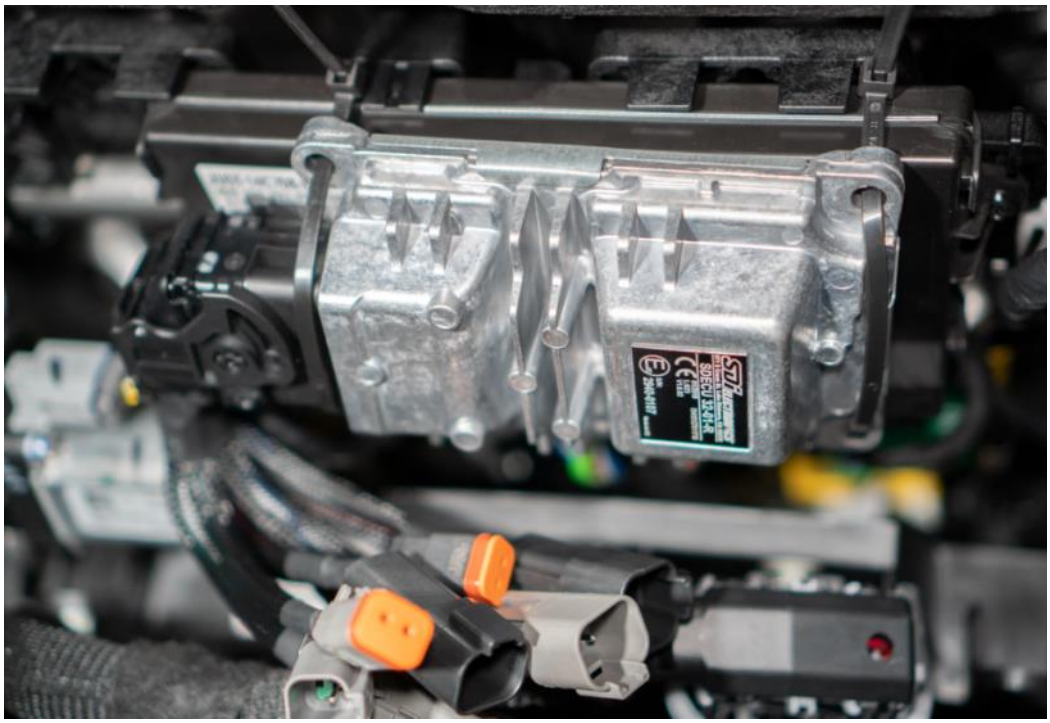
- Secure the ECU Harness to the ECU. Pull the rocker arm of the harness all the way back and guide the connector onto the ECU. The rocker should begin to acuate on it's own. Use the rocker to secure the harness in place until it clicks securely.





Should you need to disconnect this for any reason, ensure that you depress the small safety tab which releases the rocker!

- The ECU with the harness mounts under the Driver's seat. Different trim packages have different configurations. This truck is a Lariat Ultimate and has the Memory seats so there's a "Seat Memory Module" attached to the seat bracket secured by (4) T20 Torx screw. Our 2017 XLT had the bracket but no module. For this reason, we give the installer discretion here. The module can be mounted to the floor, seat, seat bracket, module, etc. So long as there's enough slack in the wires to travel if mounted to the seat, you're good! We used a T20 to remove the 4 bolts that held in the memory seat module and zip-tied the ECU to the module, then secured it back in place with the T20 Screws. If you'd prefer, double-sided tape or Velcro can be used here as well. With the temp swings in Southern California Summers, we elected to run Zip ties to avoid delamination of any adhesives.
- The ECU will mount with the connector facing inward and back/down.



Power Harness

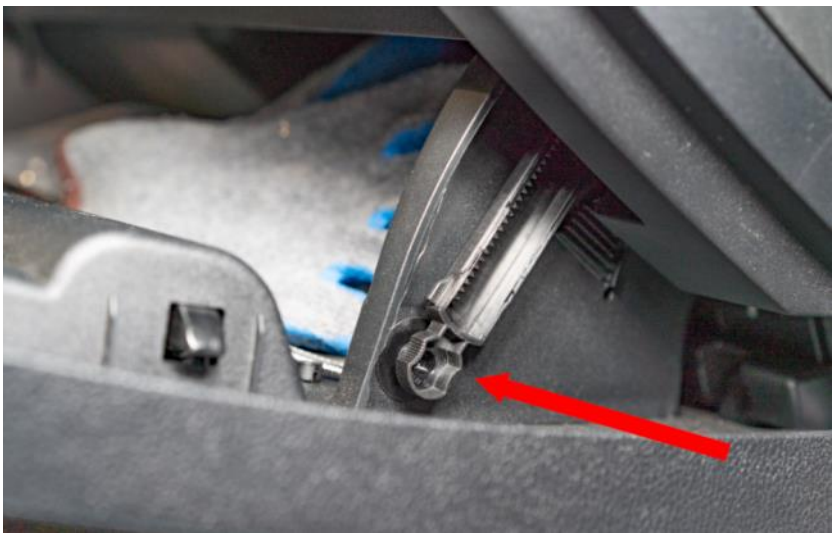
3. **Install Power Harness:**

- This harness has connections for the ECU, Power and Negative to go to the battery and a fuse tap to go to the fuse box to signal ignition power.
- **There are specific fitments for 17-22 Trucks and 23+ Trucks, pay attention to the titles!**

Power Harness — 2017-2022

- Locate the Fuse box in the passenger kick panel. Remove your floor mat and, pulling from the back, pull the tab on the back of the cover toward the front of the truck to remove the cover and expose the fuse box.

- Open the glove box on the passenger's side.
- Find the damper on the right side of the fuse box and remove it from the hole in the glove box by sliding it toward the read of the truck until it snaps out of position. If you look at the attachment point from the inside of the glove box, you'll see it needs to unseat toward the larger hole.
- You'll pull it outward once unseated to clear it from the glove box.



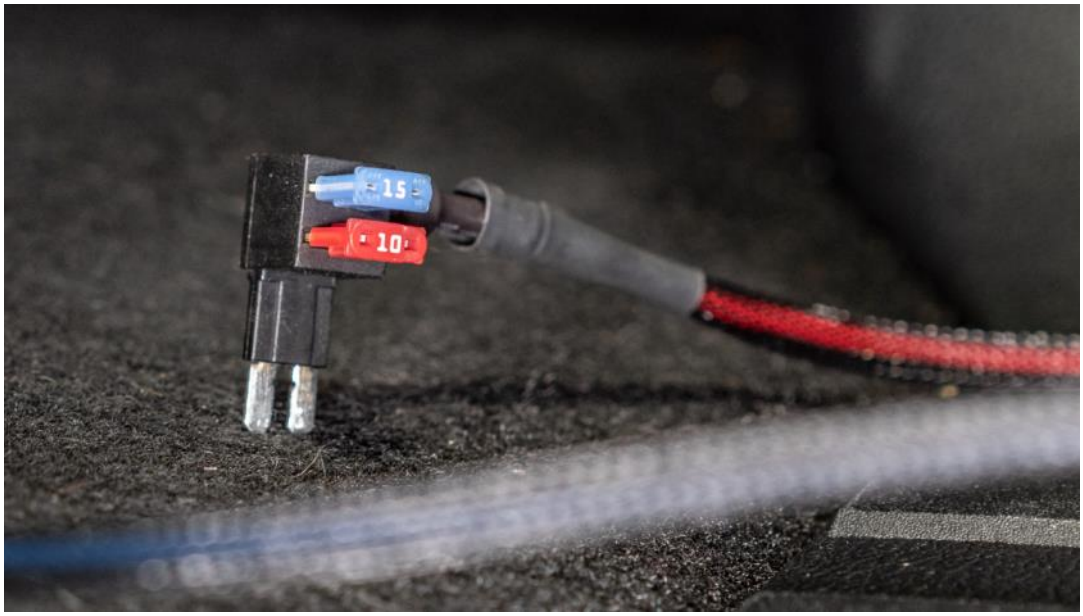
- Depress the sides of the glovebox inward to clear the bumpers from the side panels and either remove the glove box entirely or let it hang.

Power Harness 2017-22 — *Continued*

- Use a wire fish tape from the passenger's side to toward the driver to determine the path of the cable within the dash.
- Remove the included 15A fuse to avoid damage and attach the fish tape to the fuse tap/holder in the driver footwell and gently pull it through to the passenger's side.
- Pull the slack from the harness to provide plenty of cable to make the connection.

- Behind the glovebox, there's an orange wire that runs in wire clips, remove this from the clips and place the harness inside the clips, then reinstall the orange wire to secure the run.
- Drop the fuse tap into the passenger side footwell along the existing harnesses.

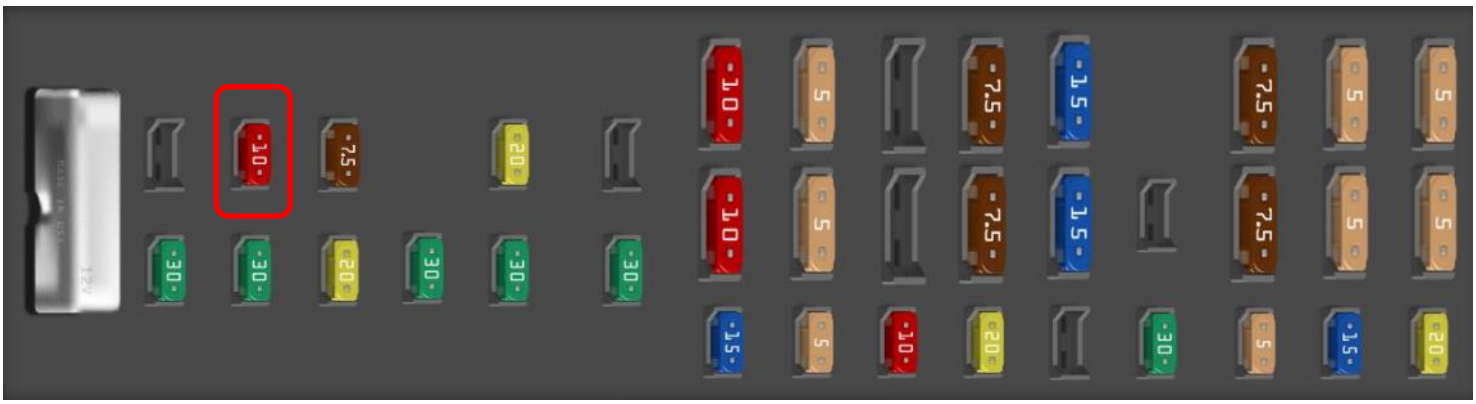
- Reinstall the 15A fuse in the top slot - remove the designated fuse from the panel and place it in the bottom slot of the fuse-tap. The 15A top fuse is for the EVENTURE Kit.



FUSE LOCATION

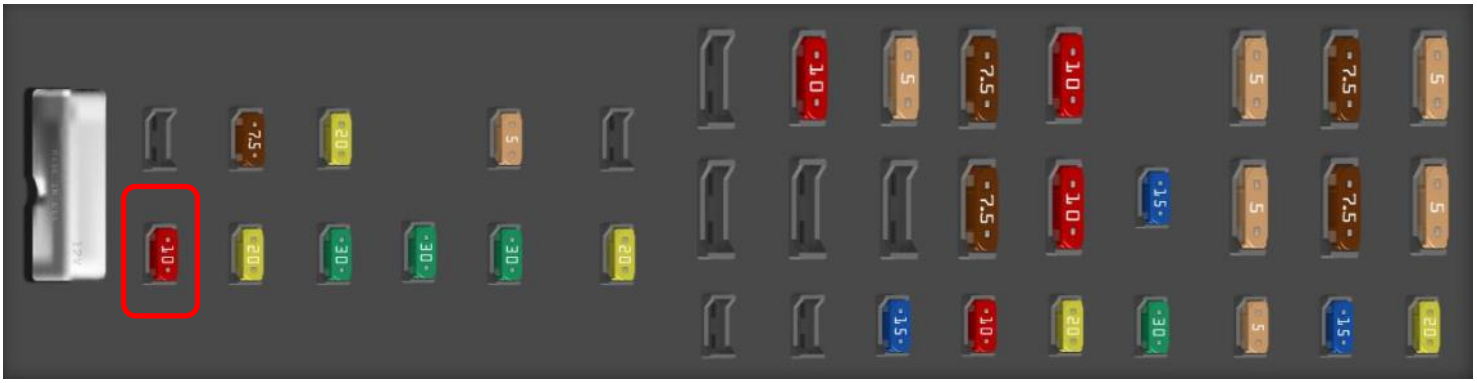
2020-22 — 6.7L Diesel: Secure the fuse tap to Fuse “02” (10A)

2020-22 — 7.3L GAS: Secure the fuse tap to Fuse “02” (10A)

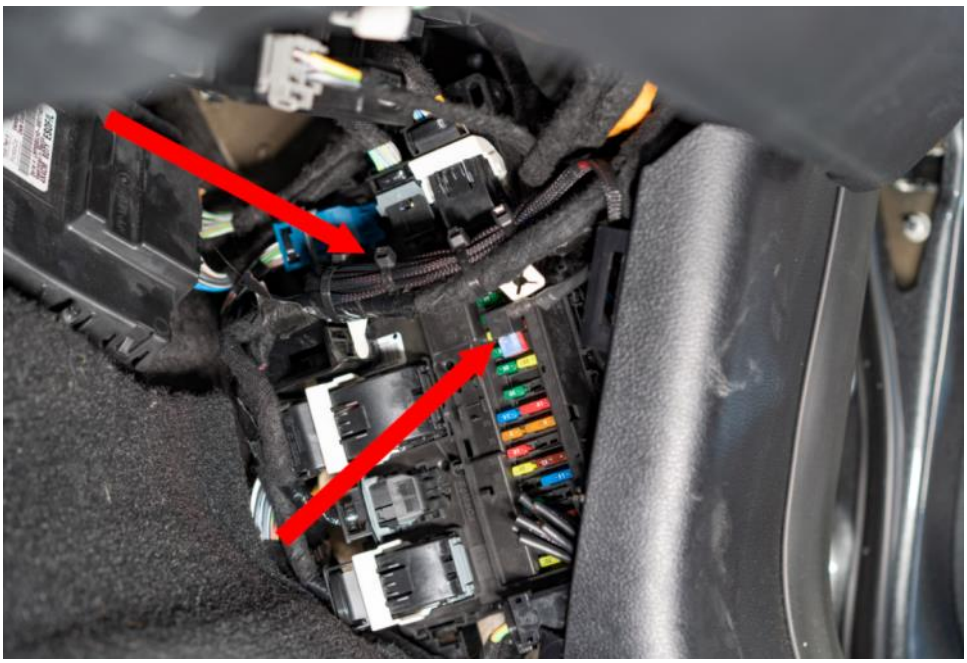


FUSE LOCATION:

2017-19 — 6.7L Diesel: Secure the fuse tap to Fuse “23” (10A)

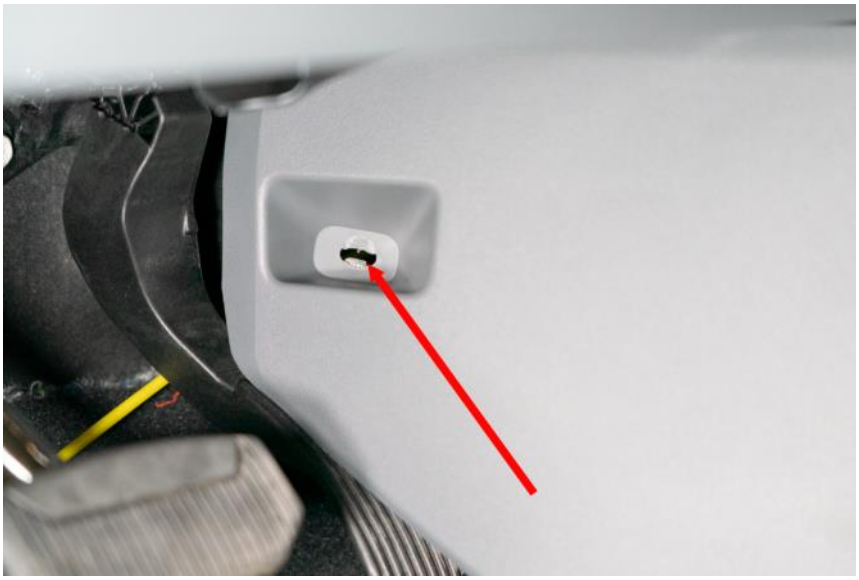


- With the fuse tap installed, secure all wiring with zip-ties. You CAN wait until the end of installation to tie up the slack if you’d like to do so in the passenger side kick panel as we did. Second options, pull all the excess slack through to the driver side foot well and tie the slack under the dash if you’d prefer. We recommend waiting until the end of the install (complete the other in-cab wiring to ensure sufficient slack) and tying the slack in the fuse tap wire to the harness above the fuse box in the kick panel as pictured.

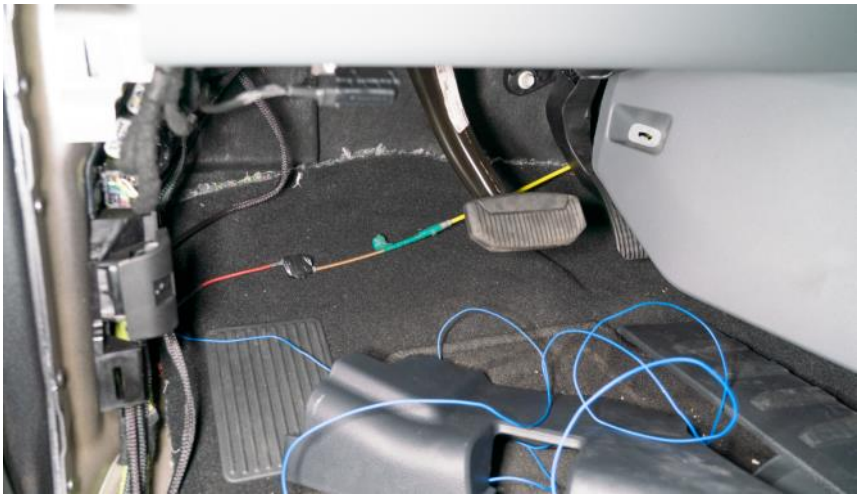


Power Harness: 2023+

- 7mm Socket—Remove the bolt retaining the front of the driver's side center console panel.
- Use a panel-popper to carefully dislodge the clips that retain the front of the panel.
- Use a wire fish tape from the passenger's side to toward the driver to determine the path of the cable within the dash. It should pop out behind the dislodged panel on the center console.



- Connect the wire fish tape to the fuse tap from the power harness and gently guide it through to the passenger side.

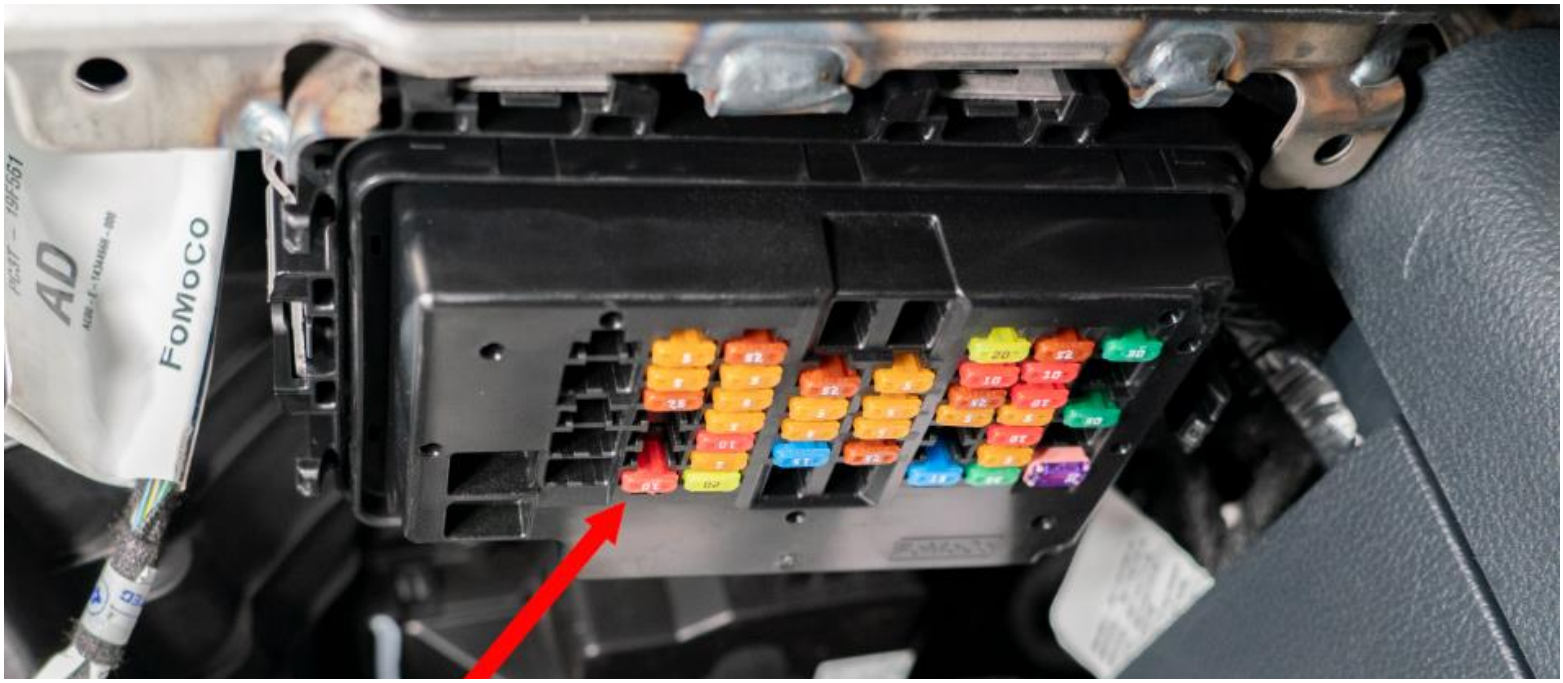


- Use a panel popper to dislodge the 3 push-fittings that secure the felt protector to the bottom of the glove-box frame and lay it on the floor, away from the fuse box.

Power Harness: 2023+ - *Continued*

- Remove the fuse box cover
- Remove Fuse Number 8 (10A)

NOTE:
The image is tough to compare to the fuse layout on the box lid. To provide context to the image, the orientation of the picture is taken from the passenger side floor mat looking forward. The Number 8 Slot with the 10A fuse is the one pictured above. It will be the fuse closest to the firewall and driver's side of the truck.



- Insert this fuse into the wire-tap
- Install the wire tap back into the Number 8 Slot. The fuse box cover will NOT be reinstalled; there's no room for the fuse tap with it installed and the felt guard provides sufficient protection for the fuse-box once reinstalled.

- With the fuse tap installed, clean up all wiring (remove all slack) as it runs from the fuse box, behind the dash and toward the wire side.
- Reinstall the felt cover's push-lock connections to secure it back in place.

IMU — 2017-19: 6.7L

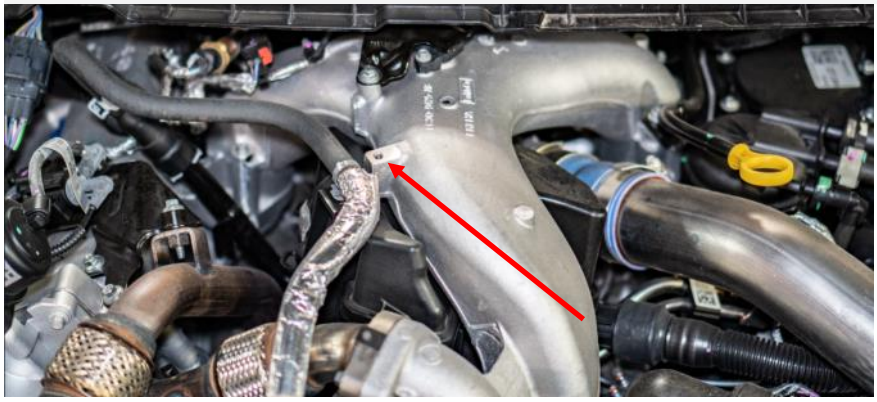
The IMU mounts to the center, front factory bolt pictured below. You will not utilize any of the provided hardware or spacers for this year range.

- Remove this bolt by unthreading it until it's loose and remove the bolt and sleeve combination from the plastic housing.
- To release this bolt from the sleeve, use a 1/4" drill bit to drill one of the 3 detents holding the bolt in place.
- Reinstall the sleeve into the plastic housing.
- Place the factory bolt through the IMU Bracket and secure it in place in it's original location using an 8mm socket.
- **Again — This year range will NOT use the provided spacer & Bolt!**

- The IMU calibration happens at the end of the installation - for now, use a 4MM allen to slightly loosen the IMU bracket adjustments enough to tilt the bracket up and down for calibration later in the installation process. The plate to which the IMU is secured should be in the lower position (of the available hole-sets).

IMU — 2020-22: 6.7L

The IMU will secure using the provided spacer and bolt to the empty threaded hole pictured. Place the provided spacer to the back of the mounting plate and secure to the hole pictured below. This will place it in close proximity to the wiring harness.



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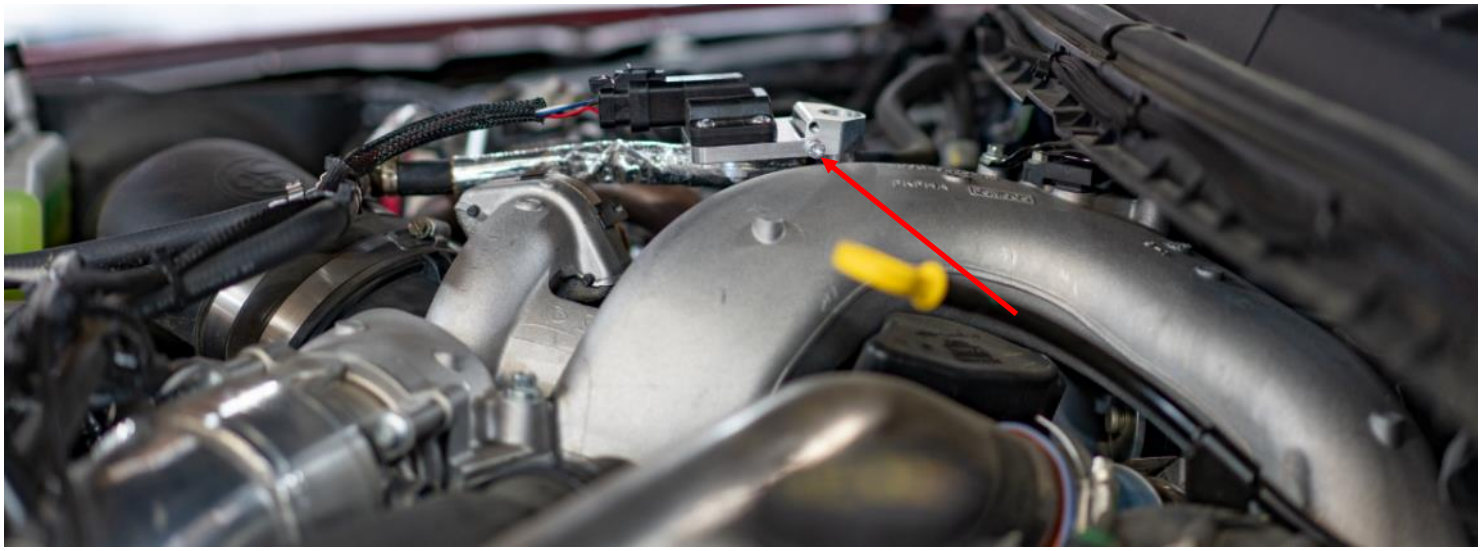
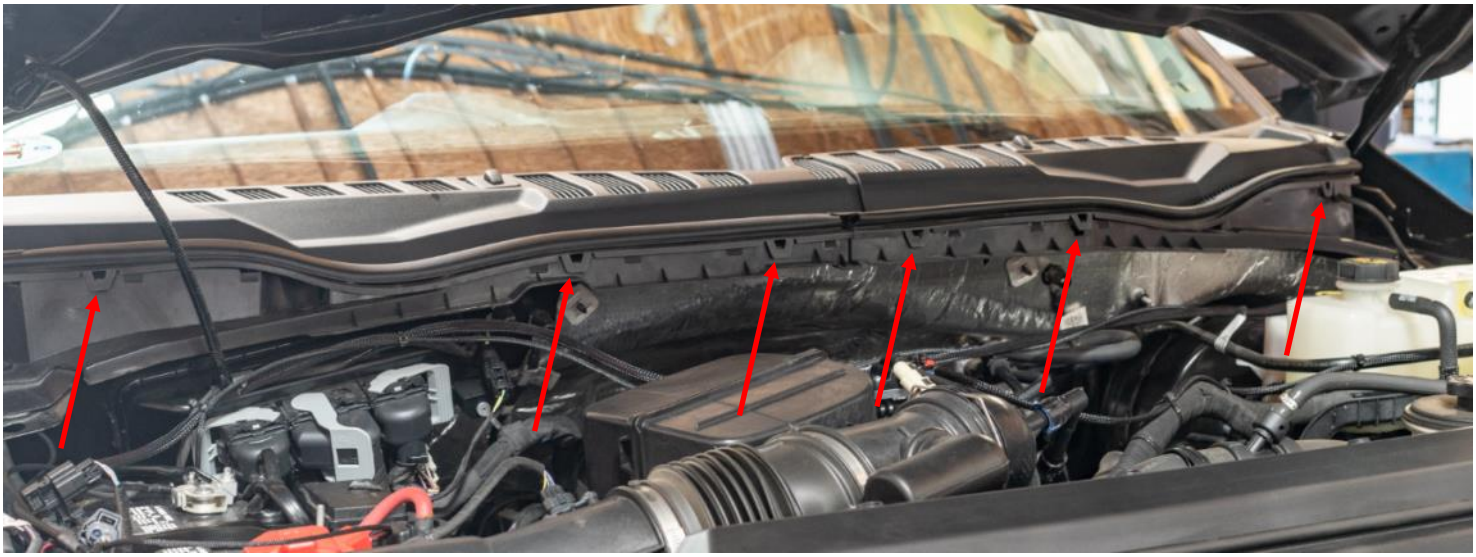


IMU — 2020-23: 7.3L Gas

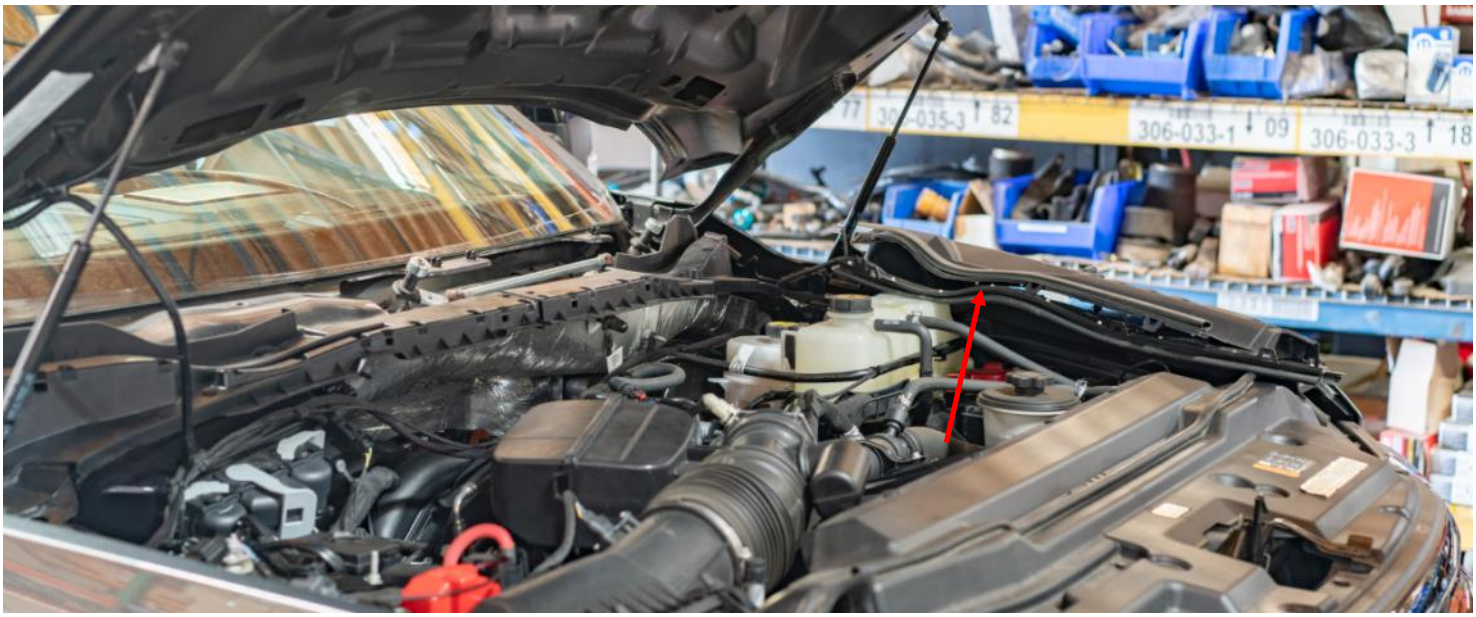
The IMU will bolt to the firewall above the intake manifold.

- Locate the locking “tab” on the side of the windshield wiper base facing the cab. Pull this away from the wiper to release it and gently wiggle the wiper until removed; set these aside.

- Pop the hood and locate the 6-clips that secure the molding in front of the windshield. This is split, 3 clips per side; there’s a driver and passenger side piece.



- Once unclipped, you can gently pull up on the molding and dislodge the clips underneath it to remove the molding. We left the wiper washer lines attached and set the molding on the driver’s side of the engine bay to clear the working area.



IMU — 2020-23: 7.3L Gas — *Continued 1*

- The IMU need to be mounted as centered as possible. Looking at the area above the motor, feel inside the compartment housing the windshield wiper linkages. There's a small area where the sheet metal of the engine bay and wiper linkage housing share a “wall” with no void. Mark and drill this with a 1/4” drill bit through the insulation in the engine bay.

- Configure the IMU bracket so the IMU is on top, the countersunk hole is on the bottom and the bracket is in the lower of the two mounting holes. The spacer will attach to the back of the bracket, spacing the IMU from the firewall then use the included bolt and nut to secure it to the hole drilled into the firewall. The Spacer will disappear into he insulation; it may take a bit of struggle to get the 1” bolt to engage but it’s plenty of thread once you get it and clears the wiper assembly/linkage on the nut side.

IMU — 2020-23: 7.3L Gas — *Continued 2*

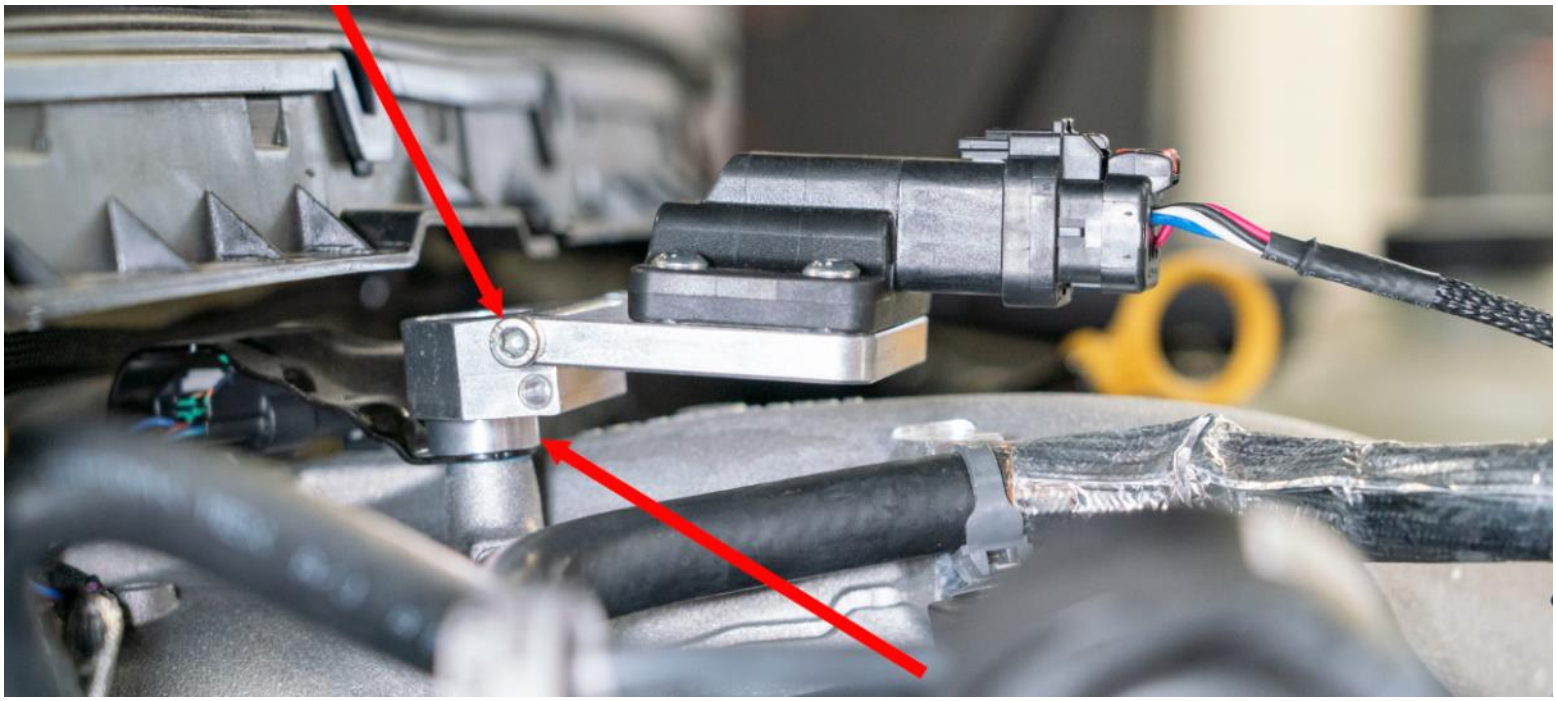
- Ensure truck is on level ground and that the IMU is flat/level with the ground, then tighten the hardware.
- Reassemble the molding and reattach the windshield wipers.

IMU — 2023+ Diesel, 6.7L and 6.7L HO

The IMU will secure to the back of the intake manifold; there's a sensor bracket secured by a small bolt.

- Use an 8mm socket to remove this bolt.
- To accommodate both the standard 6.7L Diesel and the 6.7L HO, we provide you with 3 spacers and 2 bolt lengths, 25mm and 40mm.

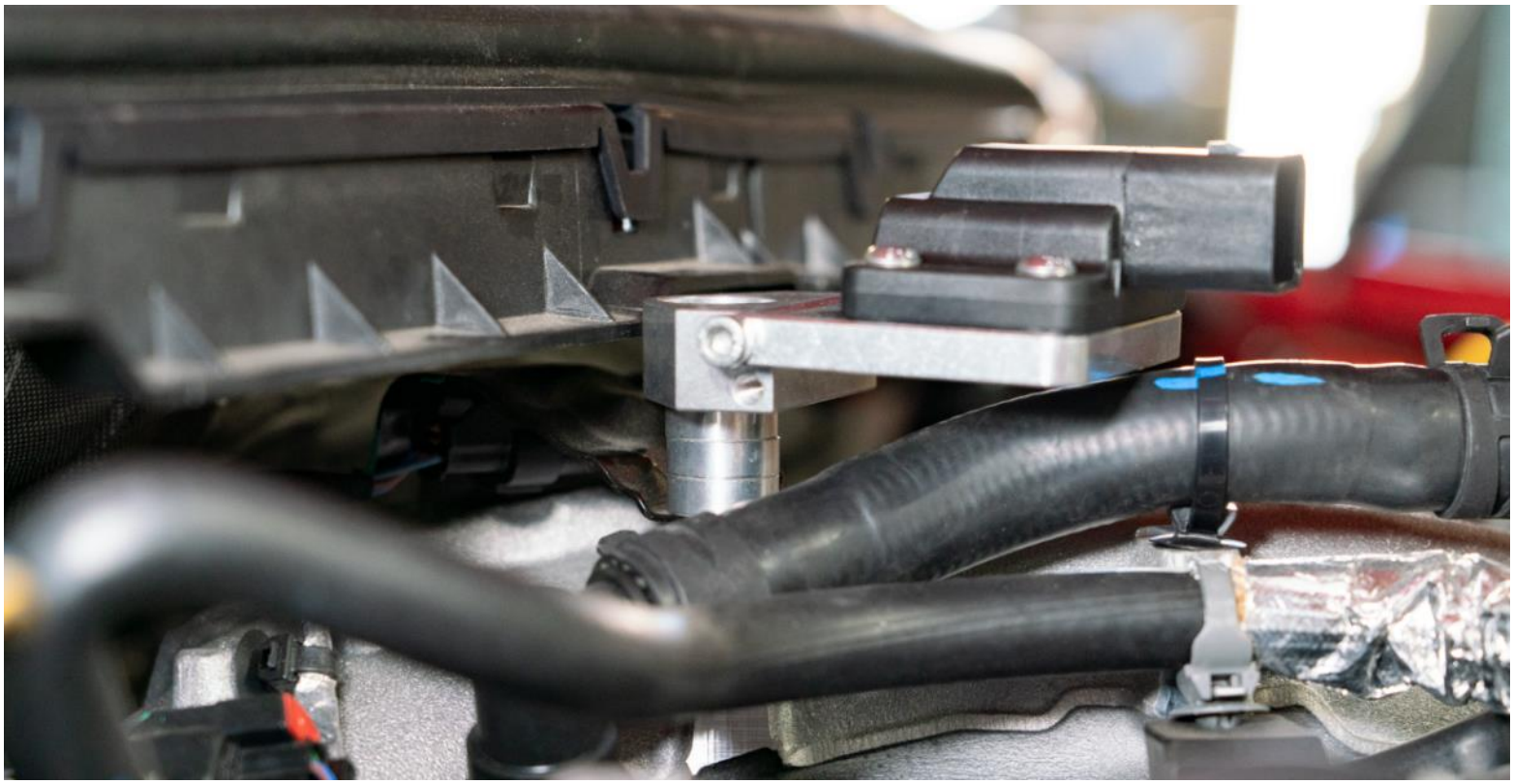
- 10mm Socket — The 6.7L Standard Output will use 1 spacer (see lower arrow in below picture) and the 25mm bolt. Coat threads of the 25mm bolt with blue Loctite.



NOTE:
BOTH CONFIGURATIONS will require the IMU plate to attach to the upper mounting hole on the pivot-bracket. See top arrow, in the above picture.

IMU — 2023+ Diesel, 6.7L and 6.7L HO — *Continued*

- 10mm Socket — The 6.7L HO has a hose running near the mount, this will use all 3 provided spacers and the 40mm bolt. Coat the threads with blue Loctite before installing. If there's any contact between the IMU mount and the plastic trim behind it, use a barrel sander (on the trim) to ensure the IMU has 1/8" of clearance from the trim. We didn't encounter this but it's tight and production tolerance may show different result on another HO.



Touch Screen Installation — 2017-22

4. **Touch Screen Installation**

- Begin by removing the trim covering the bolt securing the A-Pillar grab handle just below the handle. A small screwdriver carefully manipulated will dislodge the cover without marring it. There's a little tab/tether that keeps this cover dangling once dislodged. Carefully remove this to completely remove the cover.

- With the cover removed, use a 10mm socket to remove the factory bolt.

- Place the touch screen/mount in place of the cover and secure using the provided bolt and 10mm socket. A small 10mm socket is required here; the bolt and hole in the bracket are very tight tolerance to ensure cleanest overall look. Do not overtighten this bolt!
- Remove the driver side dash cover using a panel popper tool. No hardware secures this; just clips. That said, they're fragile so take care when removing. This panel is best pulled outward and slightly forward to avoid damaging the clips.

Touch Screen Installation — 2023+

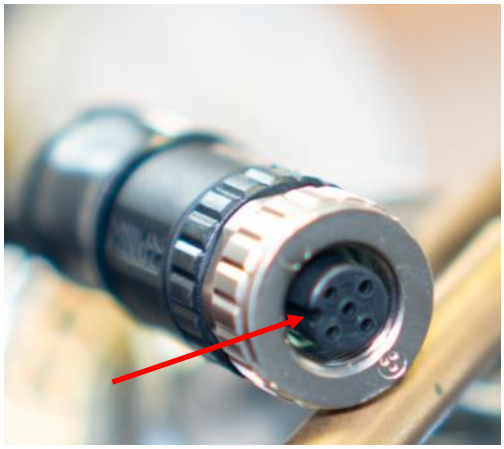
- Use a thin panel popper at the corner of the A-Pillar bolt-trim to remove the cover from the grab handle and disconnect the lanyard that keeps it in place.
- Loosen the nut to remove the touch screen from the 2017-22 mount and attach it to the 23+ mount. Do not overtighten as the plastic threads are easily stripped.

- Remove the lower bolt from the grab handle and use a small-diameter 10mm socket and the provided bolt to secure the mount to the lower grab handle bolt position.

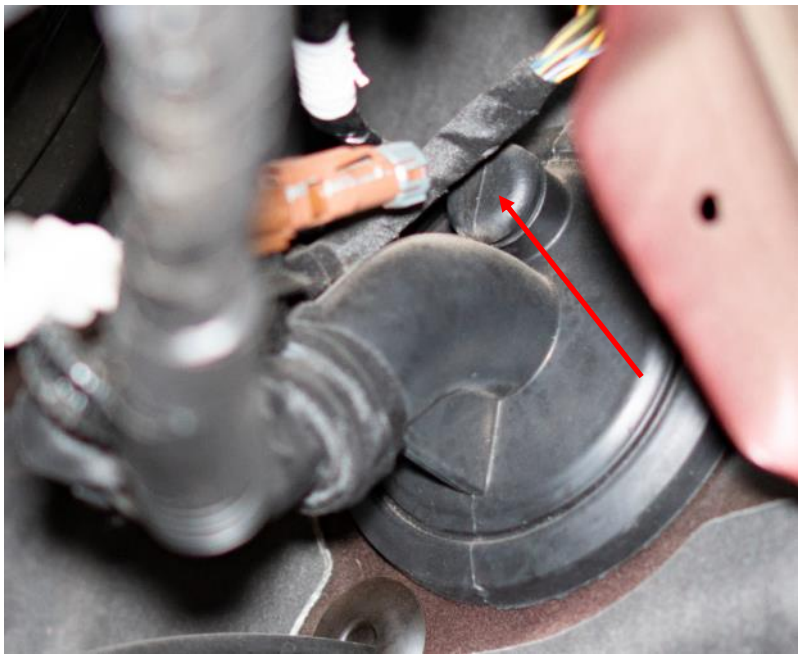
- Mock up the trim piece you removed to access the bolts—it will need to be cut flush to the A-Pillar mount. We designed the mount to sit into the A-Pillar and intersect the trim right before the bend to ensure the cut-line is nearly invisible. We recommend cutting as little as you can away until the fit is a perfect, butted seam.

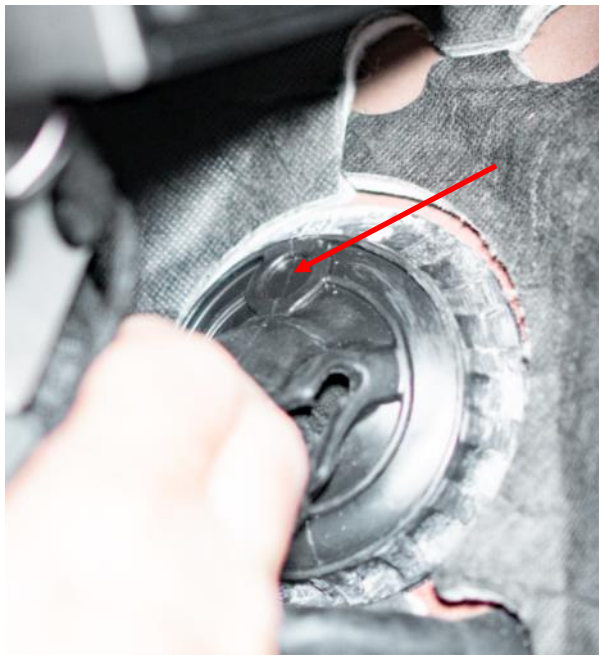
Communication Harness—ALL YEARS/ENGINES

5. Install Communication Harness:

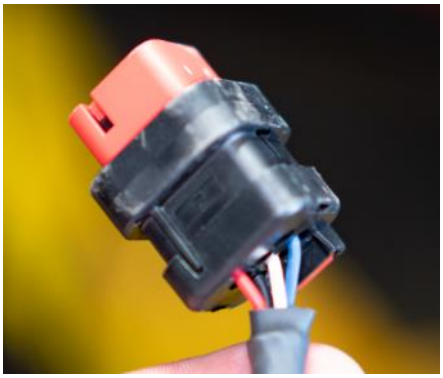


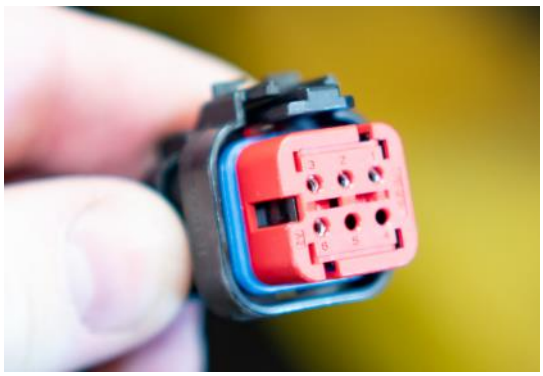
6. Pass the touch screen connector from the harness under the dash, behind the side defrost vent and out the top of the dash to meet the back of the touch screen. Secure the connector to the touch screen. NOTE the female index on the connector and male index on the touch screen - ensure it's lined up or the connection won't fully seat and the touch screen won't function.
7. Gently dislodge the door seal and route the harness behind it and into the dash. You should end up with a clean wire run that slightly deforms the door seal when replaced. If desired, installer CAN notch the a-pillar for the cable to avoid deforming the door seal.
8. Replace the driver-dash trim panel.
9. Plug OBDII portion of the Communication Harness into the OBDII port.





10. With the Fender liner removed, you should have easy access to the firewall grommet that houses the main wiring harness. Above the main wiring harness, there's a nipple on the engine bay side and a circle on the cab side (you'll need to pull the wiring harness down inside the cab to reveal this circle). Use a sharp knife to cut the engine side nipple off entirely, then slice an "X" through the remaining material and inside circle through which you'll pass the wires.
11. With the nipple cut and the grommet "X" cut to pass the wires, grab the wire bundle from the engine side and pull the gromet out of the firewall and into the engine bay. We do this with gradually increasing pressure while wiggling it to dislodge it without tearing it. This is not required but makes the wiring portion MUCH easier.
12. First wire pass should be the IMU connection from the Communication harness - it's a BLK/RED 6-pin connector. This will pass from the cab to the engine bay. Route it through the firewall and grommet.





13. Next, unravel the front and rear shock harnesses. The Front Shock Harness will be the shorter of the two; the longer is the rear. These will be unique connections to ensure they cannot be mixed up on the ECU Connection (one is male, one is female). These are both 4-Pin connectors. Route these from the engine side through the grommet and into the cab. The Connectors are GRY/GRN and GRY/ORG. The other end of these connection is to the shock, itself. These are laser etched with Front Right (FR), Front Left (FL), Rear Right (RR), Rear Left (RL).

Shock Connection Labels

14. Next, the BLK/ORG 4-Pin power connector: The fuse tap from this is already run inside the cab. The power and ground ring terminals from this connector will pass from the inside of the cab, through the firewall grommet into the engine bay to connect to the passenger's side battery.

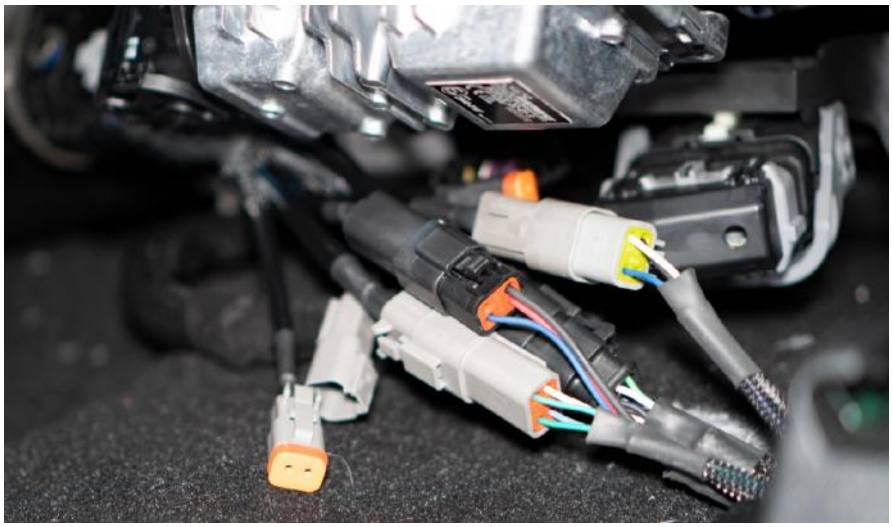
Wire Passes: Summary:

- □ Route the **Power and Ground Ring Terminals** from the Black/ Orange 4-pin Power Harness Connector through the firewall grommet and into the engine bay.
- □ Route the Black/Red IMU 6-pin sensor connector into the engine bay through the firewall grommet.
- □ Route the Grey/Orange 4-pin Front Shocks connector inside the cab through the firewall grommet.
- □ Route the Grey/Green 4-pin Rear Shocks connector inside the cab through the firewall grommet.

15. Unclip the driver's interior door-sill step cover. For our install, was also removed the driver' kick-panel cover as it eases the wire runs.
16. Pull all wires through the firewall gromet to ensure enough slack to reach the ECU harness under the seat.
17. Route the following from under the dashboard to under the driver's seat to the E-CLIK ECU harness:

- □ Black/Orange 6-pin connector - Communication Harness
- □ Black/Orange 4-pin connector - Power Harness
- □ Grey/Orange 4-pin connector - Rear Shock Harness
- □ Grey/Green 4-pin connector - Front Shock Harness

18. Routing of the above should be AROUND the outside of the E-brake cable so it's hidden inside the driver's kick panel instead of visible next to it. The wires will run along the factory wiring in the door sill. There's a factory slit in the carpet under the seat for the wiring to come through and the wires will easily pass under the carpet in between the seat mounts. With the wiring under the seat, make all connections. Again, they're all unique.
19. With all connections made to the under-seat ECU and all wires pulled through the firewall grommet, the in-cab wiring can be zip tied and cleaned up in the wire runs and kick-panel/trim reinstalled.
20. We recommend zip tying the harness together where it passes through the door-sill clips to avoid any wiring making it's way into the clips as you're assembling it.



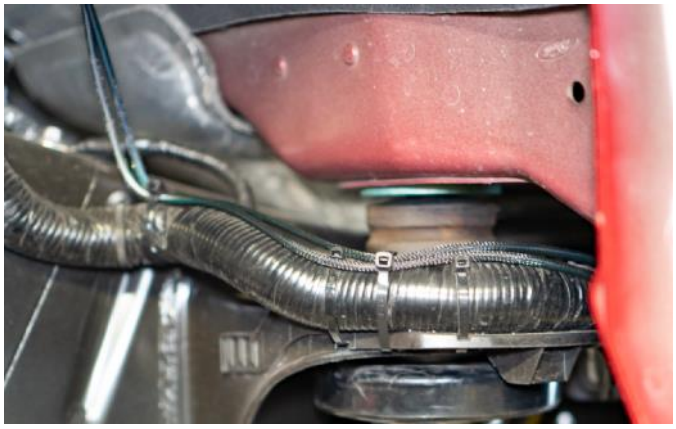
NOTE:

There are 3 **UNUSED** connections in the ECU Harness.

- □ BLK Male 2-Pin
- □ GRY Male 2-Pin
- □ GRY Female 2-Pin

21. Reinstall the firewall grommet (tug/manipulate from the inside of the cab until seated).
22. That wraps up the in cab-wiring/install; move onto the engine-bay side.
23. Route the BLK/RED connector along stock hoses or harnasses (or loop back to the firewall cable run) and connect to the IMU - Secure by pushing in the red locking tab.

24. Route the "FR" And "FL" connectors to the Front Right and Front left shocks, respectively.
25. Connect the Positive and Negative ring terminals to the passenger's side battery terminals.
26. Route the "RR" And "RL" connectors to the Front Right and Front left shocks. This main harness Runs along (and zip-ties to) the main wiring harness on the outside of the frame rail, around the body mounts to the shocks. The Rear passenger breaks off and should be routed over the fuel tank at the cab/bed separation. From there, it's up to the installer. We ran it along the factory exhaust hangers and into the shock location.
27. Front Shocks: 3/4" Ratcheting Wrench Top, 21mm lower, remove the factory front shocks.
28. Rear Shocks: 18mm Socket for the upper nut - lower is an 18mm wrench for the head, 21mm socket for the nut. Remove the factory rear shocks.



29. With the factory shocks out of the way, begin by installing the front shocks. They install exactly as the factory shocks were removed.
30. Remove nut and bushing top cap from the stem-top mount of the front shock.
31. Install the front shocks into the upper mounts. The "cone" of the pintop bushing installs from the bottom. With the pintop and lower half of the bushing in place, install the upper half of the bushing ensuring the side with the corresponding taper to receive and seat the cone of the lower bushing is oriented correctly.

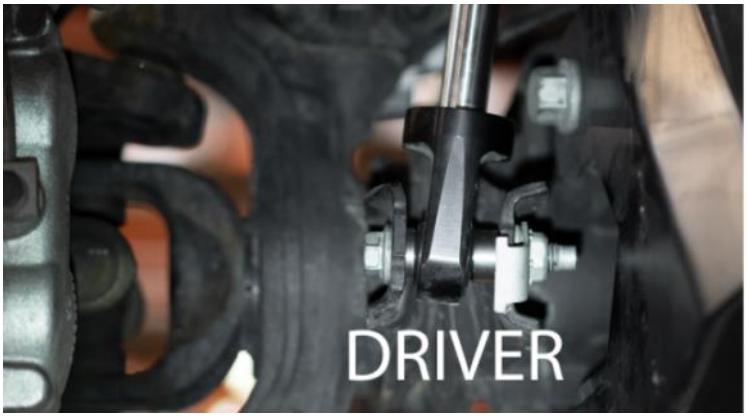
NOTE:

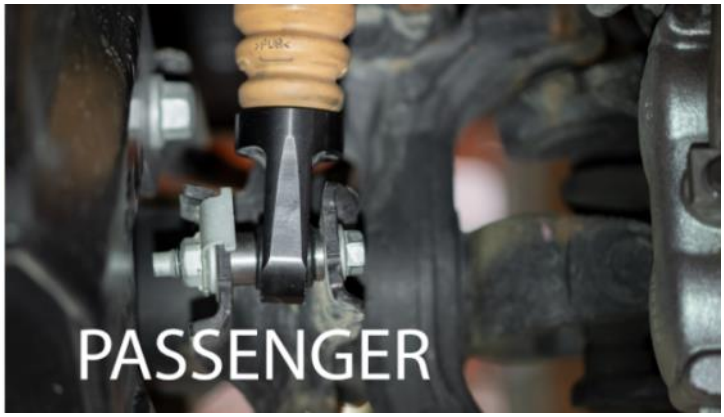
The shock installation is easiest at full droop (extension) with the front track bar disconnected. This will allow the shocks to be installed and aligned without requiring the installer to attempt to compress them. The shocks would need to be powered and solenoids opened, then drained of nitrogen to be able to compress them. We DO NOT RECOMMEND installers attempt to drain/refill or compress to ease installation of the shocks.

32. Install the bushing cap and Nyloc nut. Use a 3/4" wrench to tighten the nut until it's on a couple threads; don't fully tighten until lower shock bolts are in.
33. This step is best accomplished with one person operating the vehicle lift or jacks, then one person on each side supporting the coil assemblies while guiding the lower shock rod-end into the shock mount from the top or slide the shock rod-ends in from the rear of the mount. Lower the front axle until the mounts sit directly below the lower rod end of the shocks with the bearing spacers pre-installed (on both passenger and driver side). *When lowering the axle, make sure the front end is not tensioning any brake lines, ABS lines, vent tubes, etc.!*

NOTE:
As the shocks can't be compressed to ease installation, the axle needs to drop slightly below the shock mounts then lifted while 2 assistants support the springs/isolators/reservoir mounts, coils and guide the shocks into the mounts on both sides.

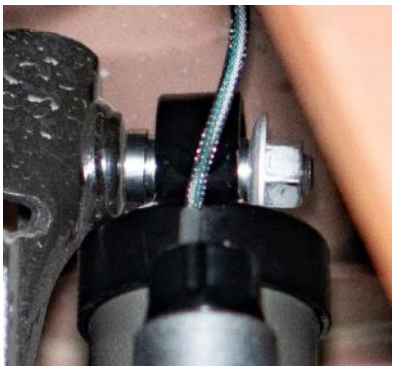
34. Jack up on the axle and guide the shock's rod end into the mounting brackets, securing with the factory bolt and capture nut. Note the Offset Misalignment spacers—the wider spacer goes to the INSIDE, narrow to the outside.
35. Torque lower shock mount to 100lb/ft.
36. With the lower secured, jack up the axle slightly to load the Pintop bushings and tighten the upper nyloc nuts. Do not overtorque this as the Nylock prevents the nut from backing off. You want a slightly preload on this bushing assembly, that's all!



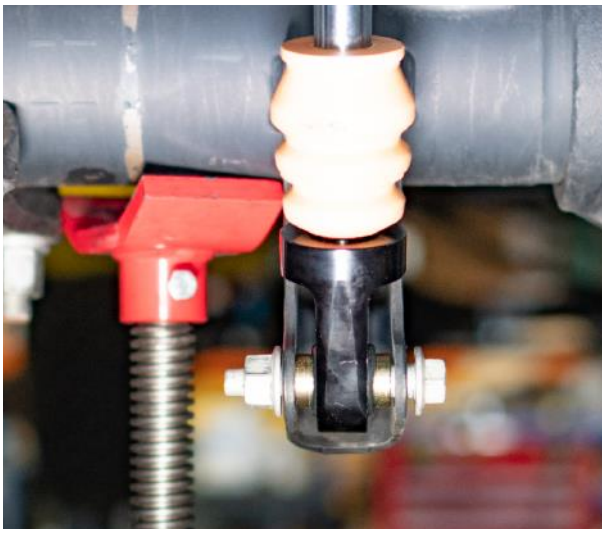


37. With the front shocks installed, secure the reservoirs to the reservoir mounts. Note, the stainless hose clamps provided can be wrapped with heat-shrink for a cleaner look, as pictured. This is not required but prevents marring of the reservoir finish and makes for a cleaner looking install. The hose clamps should be backed off all the way and slid over the reservoir; then, put the reservoir in place and slide the holes clamps around the open ends of the mount. The hole clamps slide OVER the open end, NOT THROUGH the openings as this provides more support. The hose should have a nice arc to it and not touch the coil bucket.
38. Use an 8mm to secure the reservoir in place with the clamps.
39. Plug the "FL" connection into the Driver's side shock and "FR" into the passenger.





40. Moving to the rear, ensure the upper studs are free of debris, rust, overspray, etc. use some scotch brite to clean them if necessary. The rear shock are assembled with offset upper spacers; the thicker spacer goes to the frame to space the shock inboard!
41. Install the thick spacer to the stud, slide the shock on, put the thin spacer on then the factory nut.
42. The lower shock mount installs into the factory axle mount (with the 2 spacers installed to center the shock) with the factory hardware. **Note:** Pictured is the Driver's side with the reservoir clocked 90° inward to prevent contact with the factory wiring harness. The passenger side will not be clocked like this.

43. Repeat this installation on the Passenger side shock. Both install body up, shaft down, reservoirs facing away from the axle (driver's reservoir faces rear, passenger faces forward). Again, driver's shock is the one with the reservoir clocked slightly inward!
44. Torque the Upper Shock mount to 35lb/ft. using an 18mm Socket
45. Torque the Lower Rear Shock Bolts to 100lb/ft. using a 21mm Socket, 18mm wrench.
46. Connect the "RL" and "RR" connectors to the shocks. **NOTE:** If you have a Crew-Cab Long-Bed Chassis, you'll require the extension harnesses, install these now.
47. With the shocks installed and torqued and all connectors installed, now is the time to clean up the wire runs. Tidy up the wires run to all shocks using zip ties to prevent slack and anything rubbing the cables from any of the installed harnesses.
48. Under the hood, tie the IMU harness to factory hoses or loop it back to the firewall run of the Power harness and front, right shock harness.
49. Pull the truck out and take it for a spin around the block to confirm all is seated - then park the truck on a CONFIRMED level platform.
50. With the truck on, you should have power to the touch screen. After 30 seconds, the touch screen defaults to the screen showing correction at each corner.

51. Swipe left and you'll see a "speed" screen; swipe left one more time to reveal the Roll/Pitch screen.
52. Have an assistant use a 4mm allen to adjust the tilt of the IMU under the hood until these values read 0° and 0°, then tighten the IMU adjustment screws. WE RECOMMEND BLUE LOCTITE on this hardware to avoid vibrations rattling this loose.

NOTE:
The 2017-19 trucks will not be able to access the 4mm allen head on the passenger-side of the plate to which the IMU is mounted when installed. That bolt will be pre-torqued to the 50in.lb. value.

Once 0° roll and 0° pitch reading are achieved, torque the driver side allen to 50in.lb. There will likely be a few attempts to get this right as the bracket moves when torqued.

53. This IMU calibration completes the installation of the EVenture Shock Package.
54. We recommend taking the vehicle for a full steering alignment upon completion of this suspension installation.
55. Retorque all fasteners after 500 miles as per the values in this instruction.