

How to Install Ford's OEM 360 Cameras and Front Parking Sensors on an F150 Lightning

First of all, shoutout to @Tlusk7 for the 360 Cam Install writeup for the ICE F150s, @Omodan for the Front Parking Sensors writeup, and most of all to @Jesse-Infotainment for the IPMA and the multiple hours of Forscan troubleshooting and answering all my questions.

A few initial notes:

- This is not necessarily a full step-by-step guide, however, I did expand on some steps that were unclear to me when I began. But that said, this is simply a Lightning-specific guide for installing the 360 cameras and the front parking sensors. While there is much overlap between the ICE and Lightning F150s, these mods are not identical. If you want to install the 360 cams on your Lightning, read over the write-up [here](#) to get an initial idea of the amount of work it will take. Watch his youtube video too. For the front parking sensors, read over everything [here](#).
- According to Jesse, the Lightnings must have both 360 cameras AND front parking sensors. You cannot just choose one.
- I also installed ACC/LKA at the same time, but many other Lightning owners have done this before me. Read the first 40-ish pages of that thread [here](#) and you'll be fine.
- I'll have tips and tricks sprinkled throughout to make your life easier.

Tip #1: BUY A LIGHTNING WITH 360 CAMERAS AND FRONT PARKING SENSORS FROM THE FACTORY. While these mods are relatively straightforward, they are not for the faint of heart.

360 Camera Installation

Overview:

The single most helpful graphic to understand what is required to wire up the 360 cameras can be found in Tlusk7's google drive [here](#). It might look complex, but it's very straightforward:

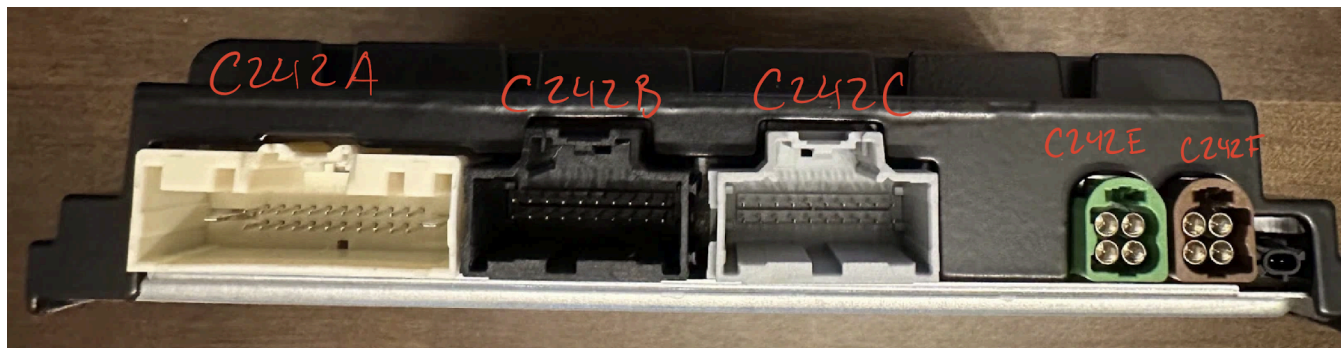
- You're adding four cameras, so you have four connections that all run through the IPMA (driver side footwell).
- The front camera and side cameras run off coax, which plug in directly into the green port on the IPMA. See pic of IPMA below while referencing the graphic I mentioned directly above. Everything is color-coded.
- The cargo cam, if you choose to install it, does not use coax. You'll need to run at least four wires. See the same graphic linked directly above.
- For the side cameras, I highly recommend just buying a set of take-off side mirrors that include the puddle lamps, turn lights, and cameras. A set of non-powerfold mirrors in good condition for \$700 or less is a good deal, IMO. Or, you can do what I did and go the budget route. I bought the cameras separately along with a set of Chinese knock-off mirrors and piecemealed them together to make the set. All in, I spent less than \$400 to upgrade/modify my existing mirrors, which is a steal, but I spent a lot of time redoing the internal wiring on them. Once installed, you'll need to enable the Turn Lamps and Puddle Lights via Forscan. See post # 1 and 2 [here](#) for the changes.

Tip #2: You will need a new IPMA. I highly recommend buying one from @jesse-Infotainment. He will program it per your VIN so that it is ready to go out of the box. You shouldn't have to make any Forscan changes with it, but I'll still provide the list of Forscan changes so you can double-check everything.

Tip #3: Ignore the steps and documents in the google drive related to upgrading an 8" screen to the 12" screen. All Lightnings have either the 12" or 15" screen.

Wiring the cameras (coax diagram [here](#)):

IPMA:



Front camera:

This is the biggest Lightning-specific difference for the front camera. On the ICE F-150, you have to run coax jumpers through multiple connectors (CDB → CCA → C1591 → CBA → C316). On the Lightning, Ford pre-installed a BEV-specific jumper that shortcuts most of this routing.

Component	Part Number	Qty
Front camera	ML3T-19G490-BC	1
Front camera plastic housing	ML3Z-19H511-A	1
Housing mounting screws	W506962S450 (comes with 4, you only need 3)	3
Ford emblem (with camera hole)	ML34-8B262-BC*	1
Coax jumper (camera to C101)	NL3Z-10E929-C (Lightning-specific)	1
Coax cable (C316 to IPMA)	ML3Z-10E929-CAA (shared w/ ICE F-150)**	1

*Many versions of this part number exist. I decided to NOT add the front camera washer. Ford eventually did away with it all together so I chose to save money and keep it simple. If you decide to do the same, get an emblem W/O the extra hole for the washer. If you want the washer, see Tlusk7's part list for the additional components required.

**This cable has three coax cables combined. One for the front, then the other two for the side mirror cams.

The complete signal path on the Lightning is:

Front Camera (ML3T-19G490-BC)	→ NL3Z-10E929-C (coax cable)	C101 Pin 1	→ Pre-installed jumper (goes thru C1591, then to C316)	C316 Pin 64	→ ML3Z-10E929-CAA (coax cable)	IPMA C242E Pin 1
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In plain English: you only need to run TWO coax connections. Run NL3Z-10E929-C from the camera to the pre-installed jumper. Then run ML3Z-10E929-CAA from C316 Pin 64 to the IPMA (C242E Pin 1). The jumper in between should already be there. Watch this short video [here](#).

Steps:

- You'll need to remove the front trim pieces on the hood to replace the Ford emblem with the new emblem + camera. To do that, see the graphics [here](#). Below is a picture of the back of the grille after I swapped the old emblem with the new emblem. The old is next to the new one (installed).



- Next, remove the hood decorative trim piece. Just take out the pushclips with a pry tool.



C101. Has a dummy plug installed from the factory. Remove dummy plug and plug in NL3Z-10E929-C.



- Install coax cable ML3Z-10E929-CAA. See Tlusk7's instructions starting on page 5 [here](#). His instructions also apply to the Lightning. **Follow his instructions for running the coax through the firewall to C316 and the other two coax cables to the side mirrors.**
- Remove the old IPMA and replace it with the new one. Ford's instructions [here](#).

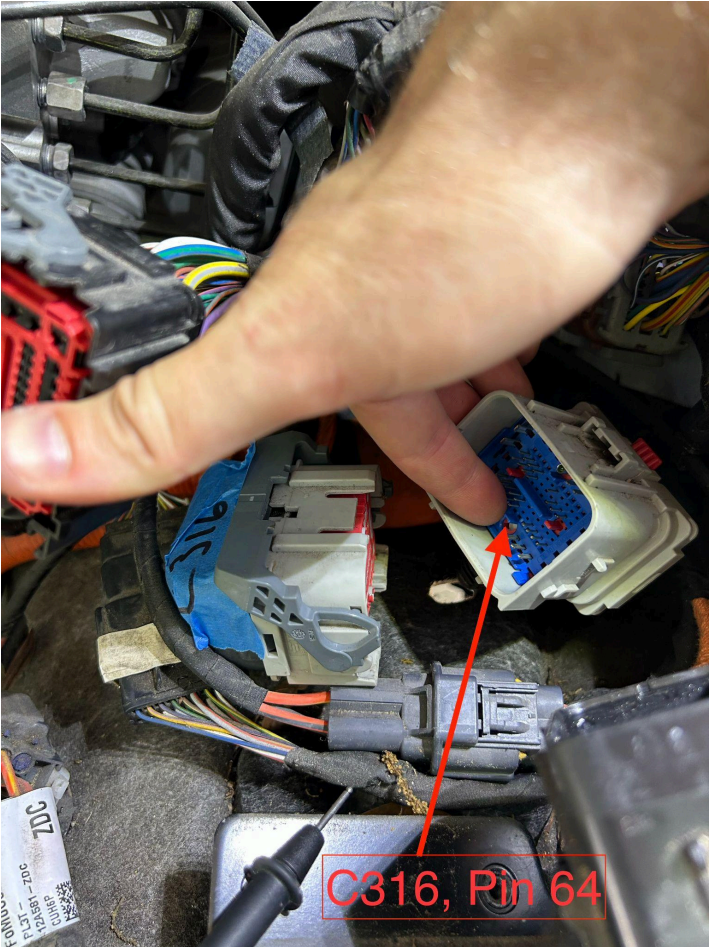
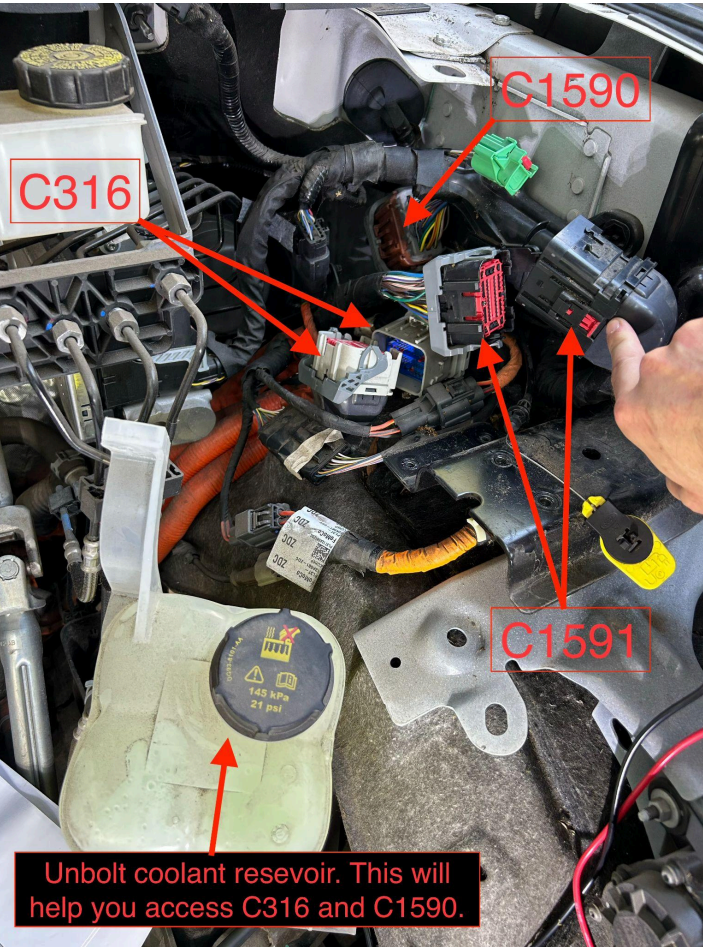
Tip #4: Wait until you're ready to run the 6 additional wires for the Front Parking Sensors (and the wires for the CCM if you're installing that too) before you go through the firewall. It'll be easier if you run them all through the firewall at the same time. More on that later.

- The next two pics show coax jumper NL3Z-10E929-C after being installed, connected to C101 and the front camera.



Tip #5: Taking apart C316 is probably the worst part of the project. See TLusk7's advice on taking it apart [here](#) and on page 5 [here](#).

- The pics below show where C316 is on the Lightning.



Side cameras:

- The coax cables for the side mirrors will both connect via ML3Z-10E929-DBA (you need qty 2), one on each side - same as the ICE F150s.
 - One end will connect to the side mirror. Remove the door panel, then run the coax through the door's "rubber boot" to connector [C511](#) (driver side) and [C611](#) (passenger side). Watch TLusk7's video [here](#) for tips. Start around 21 minutes.
 - Once you have these installed, then you'll connect ML3Z-10E929-CAA to the same connectors (C511 and C611).

Left (Driver) Side Camera	→ ML3Z-10E929-DBA (coax cable)	C511 Pin 12	→ ML3Z-10E929-CAA (coax cable from IPMA)	IPMA C242E Pin 3
Right (Passenger) Side Camera	→ ML3Z-10E929-DBA (coax cable)	C611 Pin 12	→ ML3Z-10E929-CAA (coax cable from IPMA)	IPMA C242E Pin 4

Rear camera:

- Simply unplug the existing coax cable from C242F Pin 2 and move it to C242 E Pin 2 on the IPMA. This is the same as the ICE F150s.

Cargo camera:

Part list:

Component	Part Number	Qty
Third brake light assembly w/ camera	HC3B13A613AM	1
IPMA terminals/pigtails	DU2Z-14474-CA (You can order packs of 5 online)	4
C904 terminals/pigtails	EU2Z-14421-CA (You can order packs of 5 online)	4
22 AWG wire		
Braidled sleeving		

- I recommend buying a complete third brake light assembly WITH the camera, part number HC3B13A613AM. You can find used take-offs for under \$200 on ebay. Make sure it comes with the harness as shown in the image below. It was practically impossible to find and order just this harness, so that's why I suggest buying the full assembly.



- Build a harness using 22 AWG wire with the following connections:
 - [C242B Pinout](#)
 - [C242C Pinout](#)
 - [C904 Pinout](#)
 - [Wiring Schematic for Third Brake Light Camera](#)

From (IPMA side)		To (Camera / C904)
C242B Pin 1 GN-VT (DU2Z-14474-CA)	→	C904 Pin 9 (EU2Z-14421-CA)
C242C Pin 10 Black (DU2Z-14474-CA)	→	C904 Pin 5 (EU2Z-14421-CA)
C242C Pin 19 YE-GN (DU2Z-14474-CA)	→	C904 Pin 4 (EU2Z-14421-CA)
C242C Pin 20 BN-BU (DU2Z-14474-CA)	→	C904 Pin 3 (EU2Z-14421-CA)
Existing YE-OG wire (CBBD7 → C242A Pin 1)*	→	C904 Pin 6

* Power (C904 Pin 6) comes from the existing YE-OG wire on CBBD7 that already connects to C242A Pin 1. You do not need to run a new power wire - reuse what is already there.

- Remove the third brake light and replace it with the new one. Using an electrical fish tape, run the custom harness between the roof and headliner over to the rear driver side pillar. I then ran it down the pillar and underneath the trim pieces at the bottom of both doors and toward the IPMA. See pics below of the four new wires (yellow, brown, green, and black), first wrapped in braided sleeving.
- Next, install the pigtails at the IPMA connectors per the chart above and connect/crimp to the wiring harness you ran from the third brake light camera.



Front Parking Sensors Installation

Tip # 6: Check C1590 for the needed wires coming from C134 at the front bumper before proceeding.

Part List:

Component	Part Number	Qty
Front parking sensors	LU5Z-15K859-AAPTM	4
Sensor retainer — position A	ML3Z-15A862-AAPTM	1
Sensor retainer — position B	ML3Z-15A862-ABPTM	1
Sensor retainer — position C	ML3Z-15A862-ACPTM	1
Sensor retainer — position D	ML3Z-15A862-ADPTM	1
Front bumper sensor harness	ML3Z-15K867-NA*	1
Pigtails for C242A (IPMA)	DU2Z-14474-CA**	6
Pigtails for C1590	EU2Z-14421-CA**	6

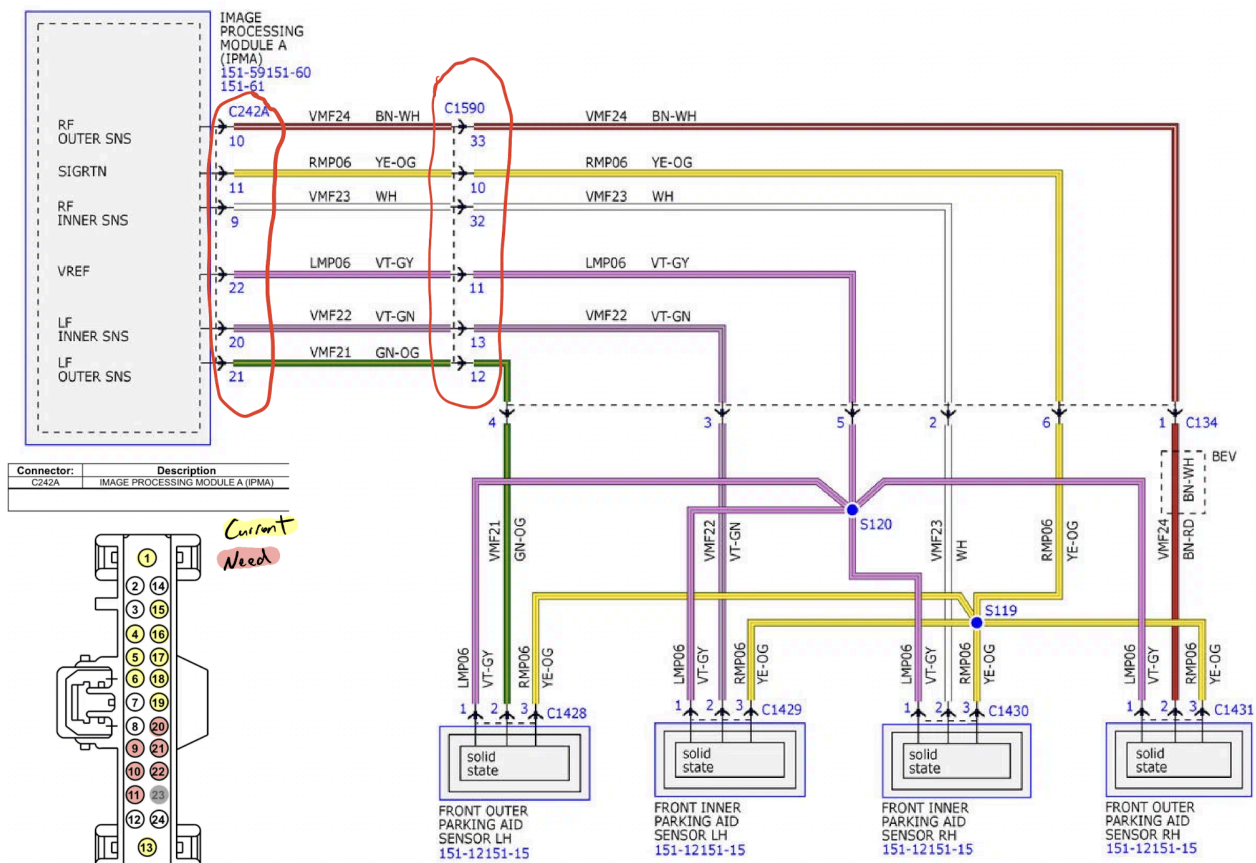
* Same harness used for the ACC/LKA install

** You can get these in packs of 5. Since you need 6 each for the front parking sensors and 4 each for the third brake light camera, just get two packs of 5 (10 each) and you'll have the exact amount you need.

- See the schematic below. I had the necessary wires going from C134 to C1590, but not from C1590 to C242A at the IPMA. So, I had to run 6 wires through the firewall to connect them.
 - [C242A pinout](#)
 - [C1590 pinout](#)

FRONT PARKING AID

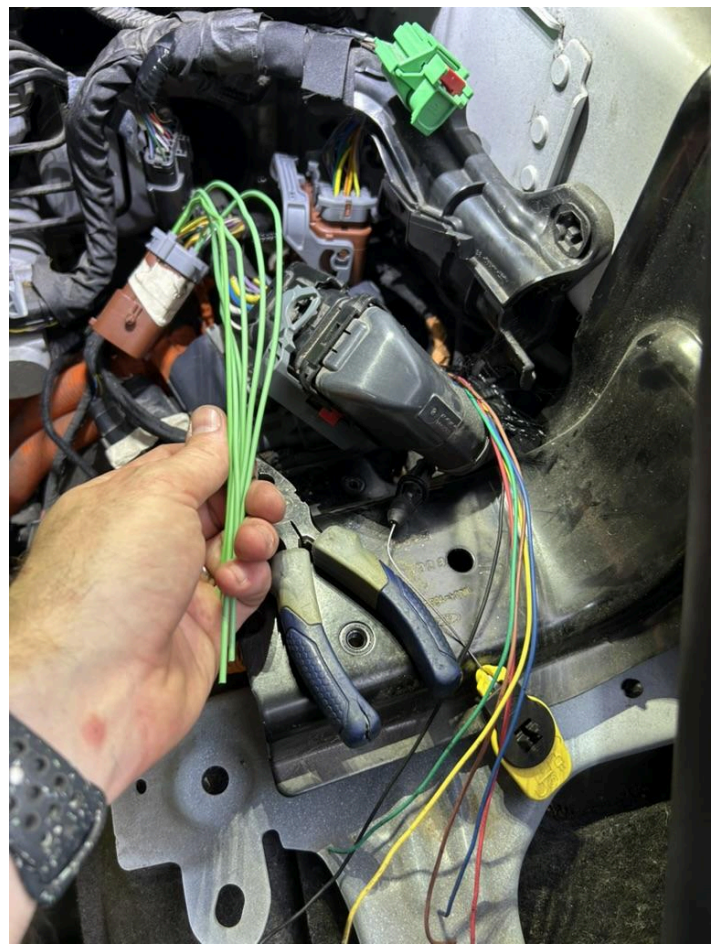
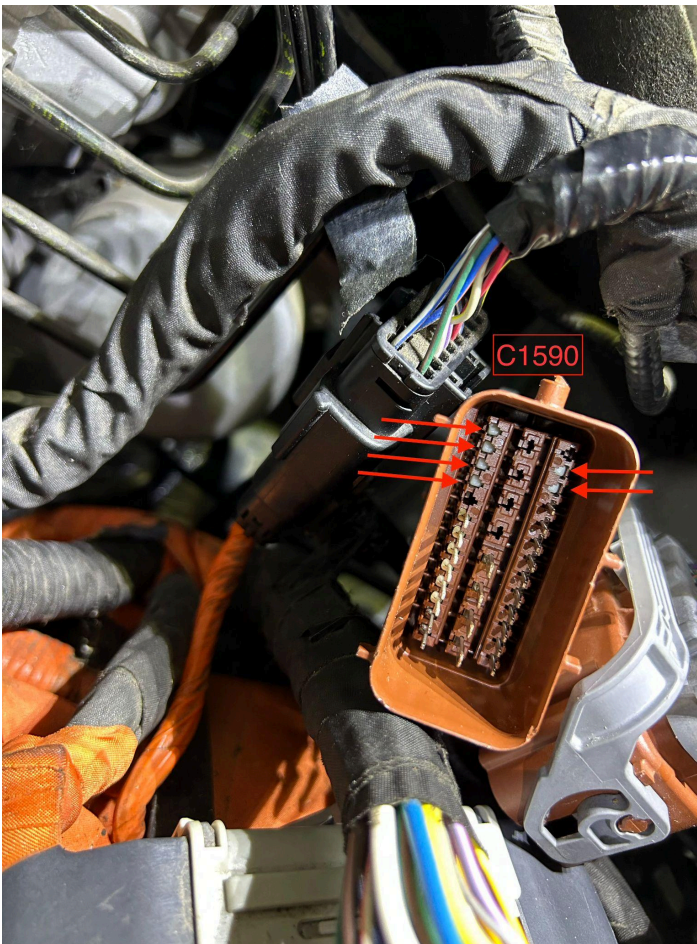
ADVANCED AUTOMATED PARKING SYSTEM



- Build a harness connecting C242A (IPMA) to C1590. See schematic above.

C242A (IPMA)		C1590
Pin 9 (DU2Z-14474-CA)	→	Pin 32 (EU2Z-14421-CA)
Pin 10 (DU2Z-14474-CA)	→	Pin 33 (EU2Z-14421-CA)
Pin 11 (DU2Z-14474-CA)	→	Pin 10 (EU2Z-14421-CA)
Pin 20 (DU2Z-14474-CA)	→	Pin 13 (EU2Z-14421-CA)
Pin 21 (DU2Z-14474-CA)	→	Pin 12 (EU2Z-14421-CA)
Pin 22 (DU2Z-14474-CA)	→	Pin 11 (EU2Z-14421-CA)

- The left photo below is of C1590. It had these white plugs from the factory in the exact places where I had to put the new terminals. They were easy to remove. Just use a tiny flathead to pry the clips (see arrows) out a little bit then pull the white plugs from the back side of the connector and they'll come right out. The connector has the terminal numbers on it so you know which one is which.
- The right photo below is after I installed the EU2Z-14421-CA pigtails. In the same photo you'll see the six wires I ran through the firewall to the IPMA. Just crimp the butt connectors that come with the pigtails to connect the wires. Don't forget to use heat shrink around the connectors!



Drilling the holes for the sensors:

- I won't expand on this too much because it will be very similar to the ICE F150s. See the supplies list on the original ICE write-up I linked at the top of this document.
- The Lightning bumpers are different from the ICE bumpers; the Lightnings don't have fog lights. So I just found a picture online for reference on where to drill the holes. See pic below for example. I wasn't too worried about how precise they were SO LONG AS everything was symmetrical.

Tip # 7: Remove the original bumper harness before drilling the holes. Kinda self explanatory - you don't want to drill through anything you shouldn't.



- Here's my bumper afterward.



- After drilling the holes and installed the clips and sensors (orientation does matter!), run the new harness (ML3Z-15K867-NA) back in place of the old one.
- If you don't already have ACC/LKA installed, I highly recommend it. This is the perfect time to install that as well.

Running Wires through the Firewall

- The only place you can run all the wires through the firewall is through a single existing grommet, see pic below. There are wires present so BE VERY CAREFUL.
- You'll need to make an incision on both sides of the firewall. Take your time; it isn't too bad.
- Wires to run through the firewall: 6 wires for the front parking sensors and 1 coax cable for the front camera. Using vaseline or some kind of lubrication will help you push the wires through with electrical fish tape.
 - If you are also installing the ACC/LKA, then you'll need to run the necessary wires/harness through the firewall for it as well.



FORScan Changes

- After installing everything I made the changes in FORScan exactly as each of the other guides specified. I ended up having a handful of programming issues mainly because there were some Lightning-specific changes, and 12" screen-specific changes, that had to be made when compared to the original guides. Again, HUGE shoutout to Jesse. He spent at least several hours answering my questions and even remote-accessed my laptop to troubleshoot the programming changes. We eventually got it figured out.
- All said, I'll post my current FORScan values below. I went through each of the relevant modules and compared them to my original values and found the differences, which are the ones listed below. I'll admit, there may be something I missed here, or perhaps a change that Jesse made that I am not aware of.
- As you'll see, a number of the module changes share the same values for multiple mods.

360 Cameras					Shared Mods
APIM	7D0-01-01	0001	1002	BD- -	
	7D0-01-02	A300	C229	18- -	360 cams, FPS
	7D0-01-04	13E4	FE80	60- -	
IPMA	706-01-01	8A58	A015	0E- -	360 cams, ACC/LKA, FPS
	706-02-01	736B	FFDC	41FA	360 cams, ACC/LKA, FPS
	706-02-02	E05F	CE00	001E	360 cams, ACC/LKA, FPS
	706-03-01	4000	0000	0056	
	706-12-01	19A4	6800	00- -	360 cams, FPS
	706-15-01	A979	0000	0045	*for 12" screens only
	706-16-01	124B	0000	00- -	360 cams, ACC/LKA
ACC / LKA					Shared Mods
ABS	760-03-01	C092	--		
IPC	720-01-01	0F8A	1064	70- -	
	720-01-02	0227	80- -		
	720-03-01	E500	0000	00- -	
	720-03-02	C84C	29- -		
	720-09-01	B042	15D4	99- -	
	720-09-02	240D	21- -		ACC/LKA, FPS
	720-10-01	1B08	0023	00- -	
BCM	726-16-01	C110	4390	60- -	
APIM	7D0-05-01	2D86	0400	00- -	
	7D0-09-01	6113	4E28	F2- -	
	7D0-09-02	D06F	5700	0D- -	

	7D0-09-04	9140	0251	E0- -	
IPMA	706-01-01	8A58	A015	0E- -	360 cams, ACC/LKA, FPS
	706-02-01	736B	FFDC	41FA	360 cams, ACC/LKA, FPS
	706-02-02	E05F	CE00	00- -	360 cams, ACC/LKA, FPS
	706-16-01	124B	0000	00- -	360 cams, ACC/LKA
PSCM	730-02-02	FFFF	FFFF	00- -	
	730-02-03	FF00	0000	00- -	
Front Parking Sensors					Shared Mods
IPMA	706-01-01	8A58	A015	0E- -	360 cams, ACC/LKA, FPS
	706-02-01	736B	FFDC	41FA	360 cams, ACC/LKA, FPS
	706-02-02	E05F	CE00	00- -	360 cams, ACC/LKA, FPS
	706-12-01	19A4	6800	00- -	360 cams, FPS
IPC	720-09-02	240D	21- -		ACC/LKA, FPS
	720-10-02	0502	18- -		
APIM	7D0-01-02	A300	C229	18- -	360 cams, FPS
	7D0-08-01	C000	0002	00- -	
	7D0-09-03	0040	0004	07- -	