

2016

Sedan and Utility



Police Modifier Guide

Table of Contents

Contents	PAGE
Introduction	0-2

Introduction

Introduction

Ford Motor Company has assembled this Police Interceptor Modifier Guide to assist vehicle modifiers in producing safe and quality products. Ford believes that safety and quality come first. To achieve customer satisfaction, we want to assist modifiers in achieving the highest standards of safety and quality in their products.

This book is divided into topics pertinent to modifiers of police vehicles. Reference is made to the current Explorer and Taurus Workshop Manual for appropriate service procedures, torque specifications, component separation clearances and other standard information which is common with the unmodified vehicle. Specifications which are unique to the guide are designated.

This modifier guide is not a "how-to" book; it should be used as a checklist to help make sure that certain important steps in the modification process are considered. While Ford is providing this information to assist modifiers, it does not warrant the products, methods, materials or the workmanship of the modifier. Nor does it warrant against failures that result from the modification of a vehicle.

Following the guidelines contained in this guide it does not assure individual modifiers that the products they modify comply with U.S. Federal or Canadian Motor Vehicle Safety Standards in effect at the time of the modification. The guidelines set forth are based on engineering analyses of typical police vehicles. If followed, the modifier's efforts in certifying vehicles to applicable standards should be aided. Compliance testing that may be required for certification of specific vehicle configurations or construction is, however, the sole responsibility of the individual modifier.

The only model suitable for use in police service is the pursuit-rated Police Interceptor.

DuPont™ and KEVLAR® are trademarks or registered trademarks of DuPont™ or its affiliates.

Table of Contents

Contents	PAGE
Section 1: General Information	1-2
Important Safety Notice	1-2
Police Vehicle Definition	1-2
Identification Codes	1-9
Good Practices	1-15
New Vehicle Storage	1-16
Front Ride Height Measurement	1-17
Rear Ride Height Measurement	1-18
Tire Pressure Monitoring System (TPMS) Principles of Operation	1-20
Ambient Temperature Change and Tire Pressure	1-20

Section 1: General Information

Section 1: General Information

Important Safety Notice

NOTE:

The descriptions and specifications contained in this guide were in effect at the time this manual was approved for printing. Ford Motor Company reserves the right to discontinue models at any time, or change specifications or design without notice and without incurring obligation.

Appropriate repair methods and procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This manual provides general directions and guidelines for performing modifications to the Police Interceptor. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools and parts for modifying vehicles, as well as in the skill of the individual doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this manual must first establish that he or she compromises neither his or her personal safety nor the vehicle integrity by his or her choice of methods, tools or parts.

Notes, Notices and Warnings

As you read through this guide, you will come across NOTES, NOTICES and WARNINGS. Each one is there for a specific purpose. NOTES give you added information that will help you to complete a particular procedure. NOTICES are given to prevent you from making an error that could damage the vehicle. WARNINGS remind you to be especially careful in those areas where carelessness can cause you personal injury. The following list contains some general warnings that you should follow when you work on a vehicle.

**WARNING:**

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Make sure that the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. The gear selector should be set in PARK unless instructed otherwise for a specific operation. Place wood blocks (4 inch x 4 inch or larger) against the front and rear surfaces of the tires to help prevent the vehicle from moving.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide poisoning.
- Keep yourself and your clothing away from moving parts when the engine is running, especially the drive belts.
- To reduce the risk of serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tailpipe, catalytic converter and muffler.
- Do not smoke while working on a vehicle.
- To reduce the risk of injury, always remove rings, watches, loose hanging jewelry and loose clothing before beginning to work on a vehicle.
- When it is necessary to work under the hood, keep hands and other objects clear of the radiator fan blades and belts.
- Failure to follow these instructions may result in personal injury.

Making Safety Devices and Elements Inoperative

The vehicle contains many safety features required by Federal or Canadian Motor Vehicle Safety Standards. These features, which include the key-in-ignition chime and brake lights, should never be disabled or modified.

CFR 49 Section 30122 states that "A manufacturer, distributor, dealer or motor vehicle repair business may not knowingly make inoperative any part of a device or element of design installed on or in a motor vehicle or motor vehicle equipment in compliance with an applicable motor vehicle safety standard prescribed under this chapter unless the manufacturer, distributor, dealer or repair business reasonably believes the vehicle or equipment will not be used (except for testing or a similar purpose during maintenance or repair) when the device or element is inoperative."

Police Vehicle Definition

The Police Interceptor vehicle is put through twice as many cycles of Ford's standard vehicle durability tests to make sure it meets the rigors of police usage. This vehicle testing is in addition to substantial component durability testing. This extra testing for the Police Interceptor certifies to Ford the entire vehicle is "heavy-duty" and suitable for police usage.

Section 1: General Information

Sedan Standard Equipment — Exterior

Item	Description
Antenna	Roof mount - rear center of roof
Bumpers	Concealed with one-piece full wrap cover, body color
Decklid	Key cylinder lock and instrument panel push button
Door Handles	Painted black
Front Door Locks	Key cylinders (Front Driver/Passenger Doors)
Easy Fuel Capless Fuel-Filler	Easy Fuel Capless fuel-filler system has an integrated spring-loaded flapper door that allows customers to simply insert the fuel nozzle into the tank to fill up no screw cap is required
Headlamps	Projector halogen
Mirrors	Black Caps (Molded in Color - MIC), power electric remote, manual folding with integrated blind spot mirrors (integrated blind spot mirrors not included when equipped with BLIS®)
Nameplate Badge	Police Interceptor and Road Leaf FFV Badge
Paint	Clear coat Anti-chip paint primer Body color B-pillars
Tail Lamps	Halogen with Halogen Decklid Lamps
Tires	245/55R18 A/S BSW (includes Full Size Spare)
Wheel/Rims	Wheels – 18 inch x 8 inch (Painted E-coat with Black Top Coat) Steel and vented with Wheel Hub Cover (includes spare) - Full Size Spare Tire P245/55R18 A/S BSW 18 inch Conventional Steel Spare Wheel
Underbody	Deflector plate - Undercarriage deflector plates protect the underbody, powertrain and chassis components

Standard Equipment — Interior

Item	Description
Climate Control	Single Zone Manual
Console Mounting Plate	Steel between front driver/passenger seats along driveline tunnel
Door Locks	Power, Rear Door Handles and Locks Operable
Pedals	Power Adjustable
Flooring	Heavy-Duty Vinyl
Fuse Panel	Easy access, labeled
Powerpoints	2 located in I/P lower close-out
Glove Compartment	Illuminated, large bin, lockable with dampened glove compartment door, zippered owner's pouch with embossed car-line logo
Headliner	Removable with high intensity dome lamp (includes 5-inch round map light mounted behind rear view mirror)
Head Restraints	Two way
Instrument Panel	With side window de-misters
Lamps	Dome and luggage compartment
Luggage Compartment Trim	Full carpet
Map Pockets	Integral front door
Mirror	Day/night inside rear view
Radio Speakers	Front speakers are mounted in the door. Rear speakers mounted in rear deck.

Section 1: General Information

Standard Equipment — Interior

(Continued)

Item	Description
Personal Safety System With Dual Stage Airbags	Driver and right front passenger (includes safety belt pretensioners, dual stage airbags, seat position and weight sensors)
Safety Belts	Three-point active for front and rear outboard occupants (safety belt pretensioners on front seat shoulder belts)
Rear Passenger Doors	2nd row doors open extra wide. Door panels simplified with no cup holders or pockets for ease of cleaning
Scuff Plates	Color-keyed front and rear doors
Seats	1st Row Heavy-Duty Cloth Bucket - 6-way power driver (manual recline, manual lumbar with 2-way manual passenger (manual recline, no lumbar) - Built-in composite intrusion plates in both front seatbacks - 2nd Row Vinyl Bench - 2nd Row Door-Panels – simplified, no pockets or door speakers
Storage	Overhead console with dome/map lights and sunglass holder
Sun Visors	Non-illuminated driver/passenger
Steering Wheel	Manual/Tilt, Urethane Wrapped with Speed Controls Audio Controls
Trip Odometer	—
Trunk	Deep well, carpeted
Shifter	Column mounted
Speedometer	Digital certified
Universal Equipment Tray	Tray mounted at top center of instrument panel (mounting of radar, video, and other police equipment)
Windows	Power, 1-touch Up/Down Driver Side Window Disable Lock – 2nd Row Only - Power Rear Windows Driver Switch Only
Work Task Light	Red, White 1st Row overhead

Standard Equipment — Functional Sedan Interceptor

Item	Description
Air Conditioning	Manual with positive shutoff registers Wide Open Throttle (WOT) shut off
Generator	220A maximum output.
Battery	Heavy-duty maintenance free 78A / 750CCA
Brakes	4-wheel heavy-duty disc with heavy-duty front and rear calipers
Antenna, Radio	Integral to the rear window glass
Battery Saver	Turns off lights after 30 minutes
Brake Shift Interlock Protection	Brake pedal must be pressed to move shift lever out of park position and engage the transmission.
Child Safety Latches on Rear Doors	
Coolant Recovery System	
Decklid Release	A switch located on the center instrument panel, with an additional optional switch on the door panel. The switch located on the instrument panel can be configured to work at all times or only with the ignition key in the ON position, depending on the customer preference.
Defroster, Rear Window	Electric
Disc Brakes	4-wheel heavy-duty disc with heavy-duty front and rear calipers
Drive Shaft	Aluminum
Engine	3.5L V6 Ti-VCT Sedan

Section 1: General Information

Standard Equipment — Functional Sedan Interceptor

(Continued)

Item	Description
Engine Idle Meter	The engine idle meter records how long the vehicle engine runs while in PARK or NEUTRAL. This information can be combined with the vehicle mileage to determine when an engine oil change is required hour of engine idle time = 33 miles driving distance
Engine Oil Cooler	
Exhaust System	Dual – Quasi
Fail Safe Cooling	
Fan	Dual electric
Spare Tire	Full size spare tire and wheel
Front Stabilizer Bar	
Front Suspension	Heavy-duty
Fuel Filler Cap	No fuel cap
Fuel Tank	19 gallon
Glass	Solar tinted, full
Headlamps	Halogen with on reminder chime
Heat Ducts	Front and rear floor mounted
Frame, Steering Gear/Rack And Pinion, Body Mounts And Suspension	Heavy-duty
Hood Assists	Gas cylinder, monotube
Horn	Dual note
Ignition System	Electronic distributorless
Jack	Scissor
Parking Brake	Single stroke, manual release
Parking Brake Release	Manual
Passenger Capacity	Five
Simple Fleet Key	Key without microchip, reduce cost for replacement
Power and Signal Distribution Vehicle Signals	<ul style="list-style-type: none"> • Vehicle Speed • Driver Door Ajar • Park Detect
New Upfitter Dash Panel Pass Through	<ul style="list-style-type: none"> • 4 Twisted Wire Pairs (20 AWG) • 2 Twisted Wire Pairs (14 AWG)
14-Way Connector	<ul style="list-style-type: none"> • B+ Feed 1 (20 Amps) • B+ Feed 2 (20 Amps) • B+ Feed 3 (15 Amps) • Run/Start Feed #1 (20 Amps) • Run/Start Feed #2 (20 Amps) • Battery Saver/Accessory Delay (15 Amps) • Start Feed (2.5 Amps)
6-Way Connector	<ul style="list-style-type: none"> • Three 40 Amp fused circuits w/grounds
14-Way Connector	<ul style="list-style-type: none"> • Front Wig-Wag Power • Front LH/RH Corner LED Lights • Front Flasher Module Power • Front LH/RH Corner LED Lights SYNC • Brake Output (5 Amp) • Grille Lamp Power • Front LH/RH Corner LED Lights Pattern
Power Steering	Electric Power Assist (EPAS)

Section 1: General Information

Standard Equipment — Functional Sedan Interceptor

(Continued)

Item	Description
Power Steering Oil Cooler	Integral with transmission oil cooler
Rear Stabilizer Bar	
Rear Suspension	Independent
Shock Absorbers	Monotube
MyFord	Police Cluster - AM/FM / CD / MP3 Capable / Clock / 4 speakers 4.2 inch Color LCD Screen Center Stack "Smart Display" 5-way Steering Wheel Switches Redundant Controls
Speedometer	160 mph certified calibration in 2 MPH increments
Tachometer	
Tether Straps	Both front driver and passenger doors
Tires	P235/55R17 98W — All-season BSW Goodyear Eagle RSA
Transmission	Electronically controlled six-speed automatic overdrive with final drive ratio of: 3.39:1 for AWD
Transmission Oil Cooler	Dedicated
Upper Ball Joints	Low friction, non-greaseable
Voltage Regulator	Electronic, integral to generator
Wheel Rims	Heavy-duty steel (17 in x 7.5 in)
Windows	Power with express-down driver window
Windshield Washers	Dual jet
Windshield Wipers	Intermittent fixed interval

Standard Equipment - Utility Police Interceptor - Exterior

Item	Description
Antenna	Roof Mount rear center of roof
Bumpers	Concealed with one-piece full wrap cover, body color
Cladding	Lower bodyside cladding (Black)
Door Handles	Black (MIC)
Front Door Locks	Key cylinders (Front Driver/Passenger Doors)
Capless Fuel-Filler	The Easy Fuel capless fuel-filler system has an integrated spring-loaded flapper door that allows customers to simply insert the fuel nozzle into the tank to fill up no screw cap is required
Headlamps	Projector halogen
Liftgate	Manual 1 piece fixed glass with door lock cylinder
Mirrors	Black Caps (MICE), Power Electric Remote, Manual Folding with Integrated Blind Spot Mirrors (integrated blind spot mirrors not included when equipped with BLIS)
Nameplate Badge	Police Interceptor and Road Leaf FFV Badge
Spoiler	Painted black
Tail Lamps	LED
Tires	245/55R18 A/S BSW
Wheel / Rims	Wheels – 18 inch x 8 inch Painted Black Steel and vented with Wheel Hub Cover (includes spare)
Wheel Lip Molding	Black (MIC)
Climate Control	Single Zone Manual

Section 1: General Information

Standard Equipment - Utility Police Interceptor - Exterior

(Continued)

Item	Description
Console Mounting Plate	Steel between front driver/passenger seats along driveline tunnel
Door Locks	Power Rear Door Handles and Locks Operable
Flooring	Heavy-Duty Vinyl
Pedals	Power Adjustable
Powerpoints	2 located in I/P lower close-out; 1 in rear cargo area
Scuff Plates	Front and Rear
Seats	1st Row Heavy-Duty Cloth Bucket - 6-way power driver (manual recline, manual lumbar with 2-way manual passenger (manual recline, no lumbar) - Built-in composite intrusion plates in both front seat backs - 2nd Row Vinyl, 60/40 split bench - 2nd Row Door-Panels – simplified, no pockets
Shifter	Column mounted
Speedometer	Digital Certified
Steering Wheel	Manual/Tilt, Urethane Wrapped with Speed Controls / Audio Controls
Storage	Overhead Console with dome/map lights
Sun Visors	Non-Illuminated Driver/Passenger
Trunk	Flat Load Floor with living hinge for access below
Universal Equipment Tray	Tray mounted at top center of instrument panel (mounting of radar, video, and other police equipment)
Windows	Power, one touch Down Driver Side - Window Disable Lock – 2nd Row Only - Power Rear Windows Driver Switch Only
Work Task Light	Red/White 1st Row Overhead

Standard Equipment - Utility Police Interceptor

Item	Description
Alternator	220 Amp
Battery	Heavy-duty maintenance free 78A / 750CCA
Brakes	4-wheel heavy-duty disc w/ heavy-duty front and rear calipers
Defroster, Rear Window	Electric
Drive Shaft (AWD)	Aluminum
Easy Fuel® Capless Fuel-Filler	The Easy Fuel® capless fuel-filler system has an integrated spring-loaded flapper door that allows customers to simply insert the fuel nozzle into the tank to fill up, no screw cap and tether is required.
Engine	3.7L V6 Ti-VCT
Engine Idle Meter	The engine idle meter records how long the vehicle engine runs while in PARK or NEUTRAL. This information can be combined with the vehicle mileage to determine when an engine oil change is required. 1 hour of engine idle time = 33 miles driving distance
Engine Oil Cooler	
Exhaust System	Stainless steel, true dual
Fail Safe Cooling	
Fan	Dual electric, PCM controlled
Front Stabilizer Bar	
Front Suspension	
Fuel Tank	18.6 gallon
Glass	Solar tinted, full windshield and front doors. Privacy glass 2nd and 3rd row

Section 1: General Information

Standard Equipment - Utility Police Interceptor

(Continued)

Item	Description
Frame, Steering Gear/Rack and Pinion, Body Mounts and Suspension	Heavy-duty
Hood Assists	Gas cylinder, monotube
Horn	Dual note
Ignition System	Electronic distributorless
Jack	Scissor

Section 1: General Information - Sedan/Utility Police Interceptor

Item	Description
MyFord	Police Cluster - AM/FM / CD / MP3 Capable / Clock / 6-speakers - 4.2 inch Color LCD Screen Center-Stack Smart Display 5-Way Steering Wheel Switches, Redundant Controls
Parking Brake	Single stroke, manual release
Passenger Capacity	Five
Plastic Head Ignition Key	Primary only
Power Distribution Center	Two (50A) battery fused circuits One (15A) battery fused circuits Two (20A) RUN/ACC fused circuits Three (40A) RUN/ACC fused circuits Vehicle signals: Hazard in and Hazard out Hazard in Hazard out Battery saver Vehicle speed sensor Vehicle start
Power Pigtail Harness	(3) 40 Amp fused at bottom of center stack and floor console interface
Power Steering	Electric Power Assist (EPAS)
Rear Stabilizer Bar	-
Rear Suspension	Independent
Recovery Hooks	Front mounted
Shock Absorbers	Nitrogen pressurized, monotube
Simple Fleet Key	Simple Fleet Key (without microchip, easy to replace)
Speedometer	160 MPH certified calibration in 2 MPH increments
Tachometer	
Tether Straps	Both front driver and passenger doors
Transmission	Electronically controlled six-speed automatic overdrive (with final drive ratio of: 3.65:1 for AWD)
Transmission Oil Cooler	Dedicated
Two-way Radio Pre-Wire	Wiring provided in floor console between front driver/passenger seats
Upper Ball Joints	Low friction, non-greaseable
Voltage Regulator	Electronic, integral to generator
Windshield Washers	Dual jet
Windshield Wipers	Front speed sensitive intermittent; rear
Electronic Stability Control	Advance Trac® with Electronic Stability Control (ESC) with Hydraulic Brake Assist
Airbags	2nd generation driver and front-passenger front airbags, steering wheel and passenger side I/P - side-impact airbag, external side of front driver/passenger seat back deployment - and safety canopy
Anti-Lock Brakes (ABS) with Traction Control	ABS brake modulation with traction control individual wheel brake application
Battery Saver Feature	Disconnect battery power 30 minutes after key off event

Section 1: General Information

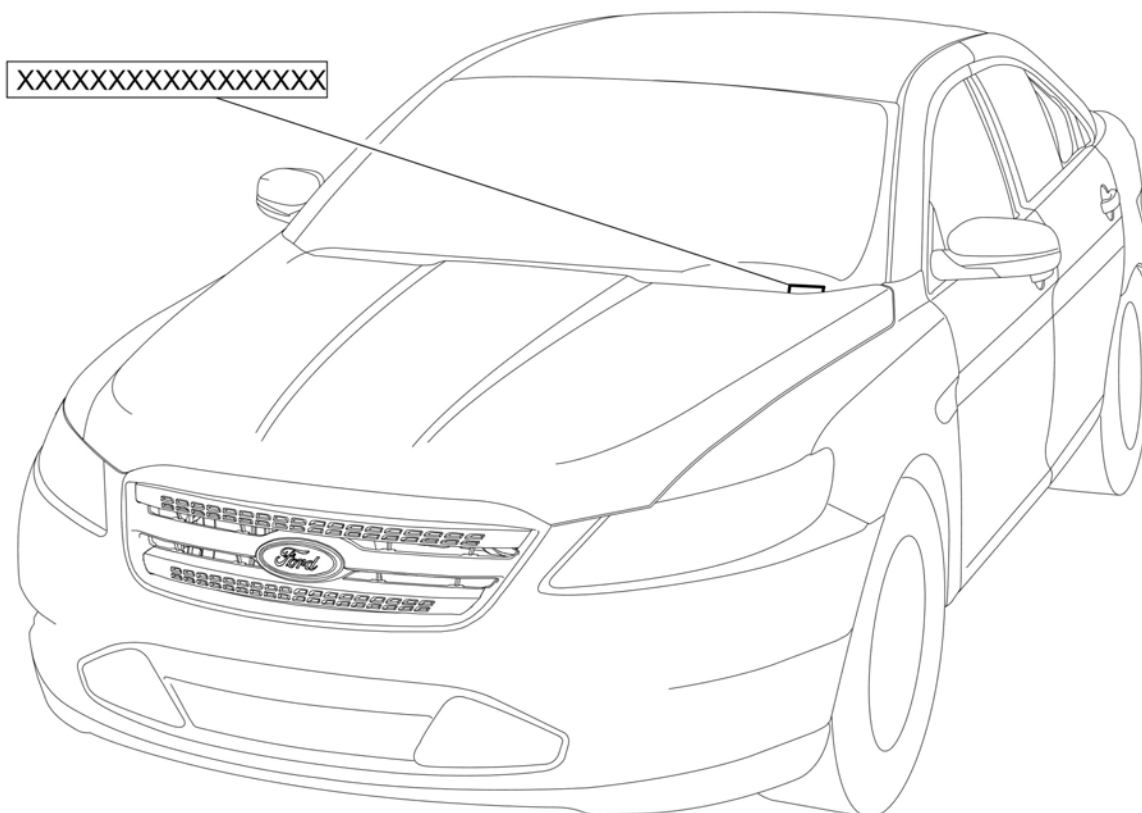
Section 1: General Information - Sedan/Utility Police Interceptor

(Continued)

Item	Description
Belt Milder	Front driver and passenger positions
LATCH (Lower Anchors and Tethers for Children) system on rear outboard seat locations	A standard feature that Ford offers on all its vehicles is the LATCH (Lower Anchors and Tethers for Children) system, which incorporates universal anchoring points in the vehicle seat bight (where the seat back and cushion meet), providing the secure and easy installation of compatible child seats
Seat Belts	Pretensioner/Energy-Management System with Adjustable Height in 1st Row
SOS Post-Crash Alert System	Integrated technology that automatically unlocks the doors and activates the emergency flashers in the event of an airbag deployment
Tire Pressure Monitoring System (TPMS)	The TPMS is designed to alert the driver if the air pressure in one or more tires need/requires attention

Identification Codes

Vehicle Identification Number (VIN) Location

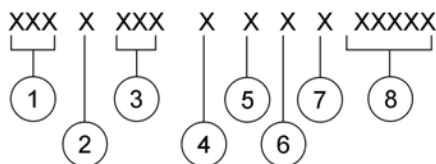


N0150845

Sedan/Utility Vehicle Identification Number (VIN) Positions

The VIN is a 17-digit combination of letters and numbers. The VIN is stamped on a metal tab riveted to the instrument panel, top upper left of the dash. The VIN is also found on the Vehicle Certification (VC) label.

Section 1: General Information



N0108505

Position	Description
1	World manufacturer identifier (WMI)
2	Restraint-type code
3	Vehicle line, series, body type code
4	Engine type code
5	Computer-generated check digit
6	Model year code
7	Assembly plant code
8	Production sequence code

1. World Manufacturer Identifier (WMI)

The first 3 VIN positions are the WMI code.

- 1FA - Ford Motor Company USA, passenger car (Sedan)
- 1FM - Ford Motor Company, USA, MPV. (Utility)

2. Restraint Type

The fourth VIN position is the vehicle restraint system type code.

- H - Active safety belts — all positions, driver and front passenger airbags with 1st and 2nd row side impact protection (Sedan)
- 5 - Active safety belts, all positions, driver and front passenger airbags and side impact airbags - all positions. (Utility)

3. Vehicle Line and Series Code

Positions 5 through 7 indicate vehicle line, and series.

- P2D - Taurus, Front Wheel Drive (FWD), SE
- P2E - Taurus, FWD, SEL
- P2F - Taurus, FWD, Limited
- P2H - Taurus, All-Wheel Drive (AWD), SEL
- P2J - Taurus, AWD, Limited
- P2K - Taurus, AWD, SHO
- P2L - Taurus, FWD, Police Interceptor
- P2M - Taurus, AWD, Police Interceptor
- K7A - Explorer, FWD, Police package
- K7B - Explorer, FWD
- K7D - Explorer, FWD, XLT

Section 1: General Information

- K7F - Explorer, FWD, Limited
- K8A - Explorer, AWD, Police package
- K8D - Explorer, AWD, XLT
- K8F - Explorer, AWD, Limited

4. Engine Type

The eighth VIN position is the engine displacement and number of cylinders.

- T - 3.5L, DOHC, turbocharged, 4 valve, V6
- 8 - 3.5L, Twin Independent Variable Cam Timing (Ti-VCT) V6
- 9 - 2.0L Gasoline Turbocharged Direct Injection (GTDI), in-line 4 cylinder
- R - 3.7L, V6, Ti-VCT

5. VIN Check Digit

The ninth VIN position is the check digit code (0-9).

6. Model Year Code

The tenth VIN position is the model year code.

- F- 2015

7. Assembly Plant Code

The eleventh VIN position is the assembly plant code.

- G - Chicago (Chicago, Illinois)

8. Production Sequence Number

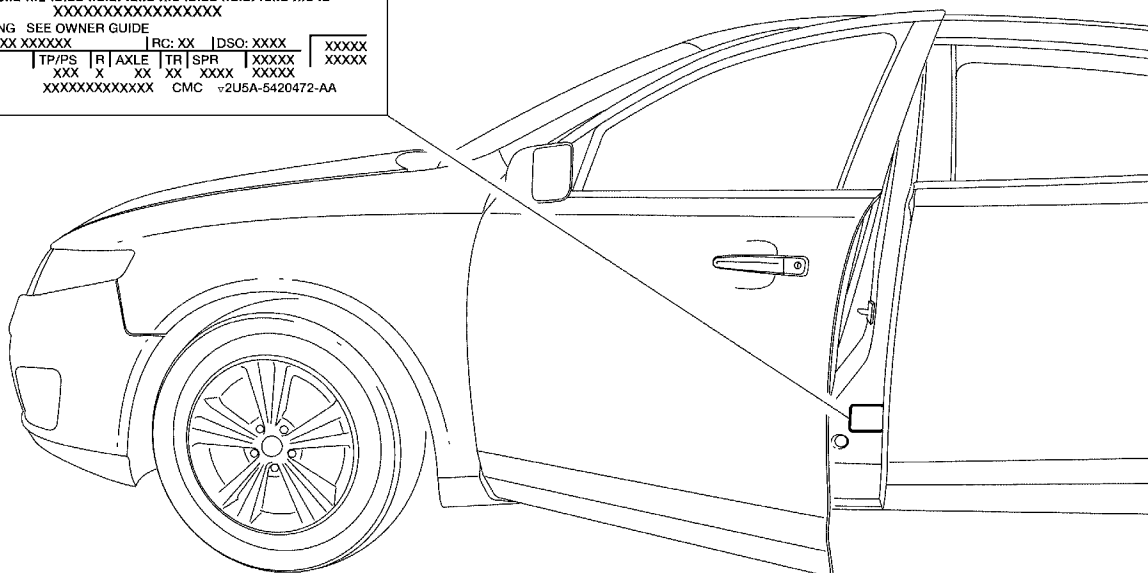
The last 6 VIN positions are a numeric code for the vehicle build sequence. This is also the vehicle serial and warranty number. The serial number can also be found on the engine block, transmission and frame.

- A00001-L99999

Vehicle Certification (VC) Label

Section 1: General Information

MFD. BY FORD MOTOR CO.
 DATE: XXXXX GVWR: XXXXXXX/XXXXXXXX
 FRONT GAWR: XXXXXXX/XXXXXXXX REAR GAWR: XXXXXXX/XXXXXXXX
 THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
 VIN: XXXXXXXXXXXXXXXXXXXX TYPE: XXXXXXXXXXXXXXXXXXXX
 MAXIMUM LOAD = OCCUPANTS + LUGGAGE = XXXXXXXXXXXX
 OCCUPANTS = XXXXXXXXXXXX TOTAL: XXXXXXXXXXXX XXXXXXXX
 TIRE (FR): XXXXXXXXXXXXXXXXXXXX RIMS (FR): XXXXXXXX
 (RR): XXXXXXXXXXXXXXXXXXXX RIMS (RR): XXXXXXXX
 PRESSURE (FR): XXXX kPa/XXX PSI COLD (RR): XXXX kPa/XXX PSI COLD
 XXXXXXXXXXXXXXXXXXXX
 TRAILER TOWING SEE OWNER GUIDE
 EXT PNT: XXXXXX XXXXXX RC: XX DSO: XXXX
 INT TR TP/PS R AXLE TR SPR XXXX
 XX X XX XX XXXX XXXX
 XXXXXXXXXXXXX CMC v2U5A-5420472-AA

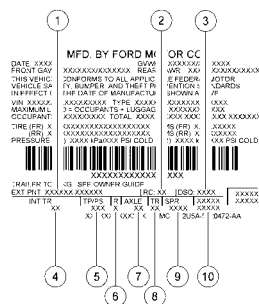


N0081713

The Vehicle Certification (VC) label contains the manufacturer name, the month and year of manufacture, the certification statement and the Vehicle Identification Number (VIN). It also includes Gross Vehicle Weight Rating (GVWR).

If a vehicle requires replacement of the VC label and is 4 years old or less, an authorized dealer must submit the VIN to their respective regional office. The regional office will submit a web form to the assembly plant for the replacement label. Once the label has been printed, a representative from the regional office will deliver the label to the dealer and witness installation on the vehicle. If a vehicle is more than 4 years old and requires a replacement label, the dealer must submit a request to the Department of Motor Vehicles.

Vehicle Certification (VC) Label Code Positions



N0039636

Section 1: General Information

Position	Description
1	Exterior paint color code
2	Region code
3	Domestic special order
4	Interior trim code
5	Tape/paint stripe code
6	Radio code
7	Axle code
8	Transmission code
9	Spring code
10	Powertrain calibration numbering

1. Paint Codes

Vehicle paint codes may be listed as a 2-part code. The first set of paint code numbers/letters listed indicate the vehicle primary body color. The second set of numbers/letters listed (if applicable) indicate a 2-tone or accent body color. All colors are base coat/clear coat.

- E3 - Arizona Beige
- BU - Medium Brown Metallic
- HG - Smokestone Metallic
- J1 - Kodiak Brown Metallic
- J4 - Deep Impact Blue
- JL - Dark Toreador Red (clear coat metallic)
- KR - Norsesea Blue Pearl
- YZ - Oxford White
- LK - Dark Blue (police/fleet)
- LM - Royal Blue (police/fleet)
- MM - Ultra Blue (police/fleet) (clear coat metallic)
- LN - Light Blue Metallic (police/fleet)
- TN - Silver Gray Metallic (police/fleet)
- UA - Ebony
- UH - Tuxedo Black Metallic
- W6 - Green Gem #2
- UJ - Sterling Grey Metallic
- UX - Ingot Silver Metallic
- YG - Medium Titanium Metallic
- YZ - Oxford White Solid

4. Interior Trim Code

The interior trim codes are listed below. The first digit listed indicates the seat and fabric style. The second digit listed indicates the interior trim color.

- 7 - Greenwich cloth seating (Sedan)
- C - Cloth seating (police package) (Sedan)
- J - Milled Pebble leather seating (Sedan)
- M - Kensington cloth seating (Sedan)
- P - SOHO mini-perforated leather seating (Sedan)
- Q - Leather with perforated suede seating (Sedan)
- R - Cloth/vinyl seating (police package) (Sedan)

Section 1: General Information

- S - SOHO mini-perforated leather seating SHO (Sedan)
- 7 - Cloth trim A (Utility)
- 8 - Cloth trim B (Utility)
- 9 - Cloth trim C with vinyl, Police package (Utility)
- B - Leather with 10-way driver/6-way passenger power seats (Utility)
- C - Leather with 10-way driver/10-way passenger power seats (Utility)
- F - Cloth trim D, Police package (Utility)

Interior trim color code

- D - Dune (Sedan)
- M - Charcoal Black/Mayan Gray (Sedan)
- W - Charcoal Black (Sedan)
- L - Medium Light Stone (Utility)
- Q - Charcoal Black/Pecan (Utility)
- M - Stone/Medium Light Stone (Utility)
- W - Charcoal Black (Utility)

6. Radio Type Code

The radio type codes are:

- H - High-definition AM/FM stereo with CD player and clock (Sedan)
- X - Premium electronic AM/FM stereo with CD player and clock (Sedan)
- Z - Electronic AM/FM stereo with CD player and clock (Sedan)
- A - Premium AM/FM stereo with CD player (MP3 capable) (Utility)
- M - Premium Plus AM/FM stereo with CD player (MP3 capable) (Utility)
- Z - Electronic AM/FM stereo with CD player (MP3 capable) - Sony (Utility)

7. Axle Ratio Code

The axle ratios are:

- 1 - 2.77 ratio (Sedan)
- 2 - 3.16 ratio (Sedan)
- 3 - 3.39 ratio (Sedan)
- 4 - 3.07 ratio (Sedan)
- 3E - 3.16 ratio (Utility)
- 3F - 3.39 ratio (Utility)
- 3G - 3.36 ratio (Utility)
- 3H - 3.51 ratio (Utility)
- 3J - 3.65 ratio (Utility)

8. Transmission Code

The transmission codes are:

- 6 - 6-speed automatic (6F35)
- C - 6-speed automatic (6F55), Taurus SHO
- J - 6-speed automatic (6F50)

9. Spring Codes

Spring codes list both front and rear spring codes. The first set of characters identify the front springs. The second set of characters identify the rear springs.

- AA - Front Wheel Drive (FWD) vehicles

Section 1: General Information

- BB - All-Wheel Drive (AWD) vehicles
- CC - AWD, Gasoline Turbocharged Direct Injection (GTDI)
- DD - AWD, GTDI performance package
- EE - FWD vehicles
- FF - FWD vehicles
- GG - AWD vehicles
- HH - AWD, GTDI performance package

The front spring base part number is: 5310 (Utility)

The rear spring base part number is: 5560 (Utility)

- AA - AWD vehicles
- BB - FWD, GTDI performance package
- CC - FWD vehicles
- GG - FWD vehicles
- GG - AWD, GTDI performance package
- HH - AWD vehicles
- MM - AWD, GTDI performance package
- NN - AWD, GTDI performance package
- PP - AWD, GTDI performance package

10. Engine Calibration Information

Engine calibration information is located in the lower right corner between the spring code field and the powertrain calibration information. Engine calibration information is limited to a maximum of 5 characters per line (2 lines maximum). Calibration information more than 5 characters long will wrap to the second line of this field.

11. Powertrain Calibration Information

Powertrain calibration information is printed in the lower right corner of the VC label. Only the base calibration information is printed. Revision levels will not appear, however, they can be obtained through a scan tool using the most current software revision.

12. Vehicle Identification Number (VIN)

The VIN is located just below the bar code.

NOTE:

Powertrain calibration information is limited to a maximum of 5 characters per line on the VC label. Because of this, calibration identification consisting of more than 5 characters will wrap to the second line on the VC label.

Item	Description
1	Model year (year in which calibration strategy was first introduced)
2	Vehicle code
3	Transmission code
4	Unique calibrations (designates different hardware to similar vehicles), example: tires or drive ratios
5	Fleet code (describes fleet to which the vehicle belongs), example: 6 — Evaporative Emission (EVAP)
6	Certification region (lead region where multiple regions are included in one calibration), example: A — US federal
7	Revision level (will advance as revisions occur), not printed on label

Good Practices

Process And Quality Assurance Systems

Section 1: General Information

A formalized Process and Quality Assurance system may be helpful in consistently producing high quality products. An overview of some of the key items for such a system are outlined in this section.

Quality Assurance

Completed Unit Sign-Off: All control items should be inspected with a written sign-off. All labels should be inspected and signed off, including verification the information on the labels is correct. All appropriate systems should be checked for leaks. A road test should be performed to verify that all systems are operating correctly. All systems and functions that were provided by Ford should be checked to make sure they function correctly after the build process.

The modifier's Process and Quality Assurance Systems should also assure that appropriate training is provided to the employees.

Minimum And Maximum Screw Sizes

When installing aftermarket equipment, avoid using fasteners that are too long for the application or are in an area which might damage vehicle components, including wiring, brake lines, fuel tank and lines, powertrain components, exhaust system and suspension.

New Vehicle Storage

New Vehicle Storage — General

- Vehicle should be stored in a dry, ventilated place, and protected from sunlight, if possible.
- If vehicle is stored outside, maintenance against rust and damage, as described below, is recommended.

NOTICE:

Keep all rubber parts free from oil and solvents.

New Vehicle Storage — Body

- Wash vehicle thoroughly to remove dirt, grease, oil, tar or mud from exterior surfaces and underside of front fender.
- Periodically wash if vehicle is stored in exposed locations.
- Touch up exposed raw or primed metal to provide rust protection.
- Cover chrome and stainless steel parts with a thick coat of auto wax to prevent discoloration. Rewax as necessary when the vehicle is washed.
- Lubricate all hood, door hinges and latches with a light grade oil.
- Cover the interior soft trim to prevent fading.

New Vehicle Storage — Engine

- Start the engine every 15 days. Run it at fast idle until it reaches normal operating temperature.
- With foot on brake pedal (and brake applied), shift the transmission into all gears while the engine is running.

New Vehicle Storage — Fuel System

- Regularly move vehicle short distances to mix fuel anti-oxidation agents.

NOTE:

During extended periods of vehicle storage (60 days or more), gasoline may deteriorate due to oxidation. This can damage rubber and other polymers in the fuel system and may clog small orifices. A commercially available gasoline fuel stabilizer (Sta-Bil or equivalent) should be added to gasoline-powered vehicles whenever actual or expected storage periods exceed 60 days. The manufacturer's instructions packaged with the product should be followed. The vehicle should then be operated at an idle speed to circulate the additive throughout the fuel system.

New Vehicle Storage — Tires

Most high performance tires are made with nylon overlay.

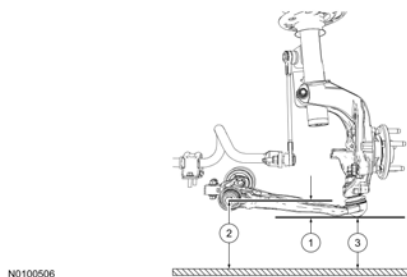
As such, the following steps should be taken to avoid flat spotting when the vehicle is not used for a period of time.

- Keep the vehicles tire pressure at the recommended operating pressure.
- If the vehicle is stored for a period longer than 15 days, it should be moved several feet during each 15-day period. The vehicle should be parked after being moved so that a different portion of the tread contacts the ground.

Section 1: General Information

Front Ride Height Measurement

Item	Specification
Front Ride Height	
Front (base)	66 mm (2.59 in) ± 10.0 mm (0.39 in)



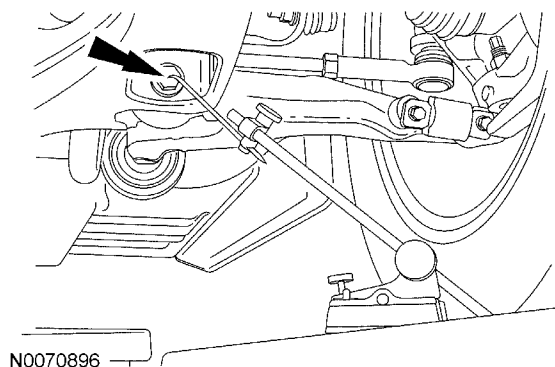
Item	Description
1	Ride height = 2 - 3
2	Measurement 2
3	Measurement 3

NOTE:

Make sure the vehicle is positioned on a flat, level surface and the tires are inflated to the correct pressure. Vehicle should have a full tank of fuel.

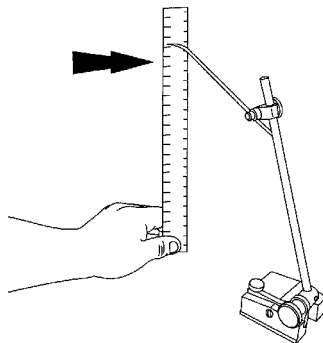
- Position a suitable surface gauge (such as Starrett 57D Surface Gauge) on a flat, level surface and adjust the gauge's arm until the scribe point is located in the center of the lower arm forward mounting bolt.

Lock the surface gauge in this position.



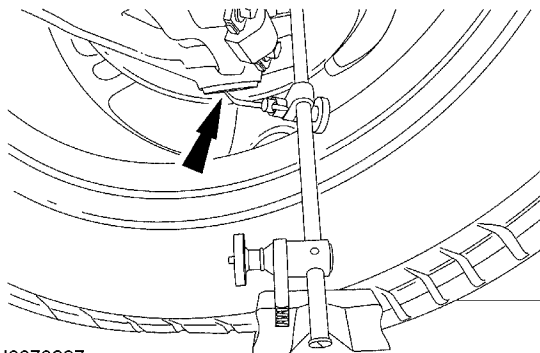
- With the surface gauge positioned on a flat, level surface, record the measurement of the surface gauge position (measurement 2).

Section 1: General Information



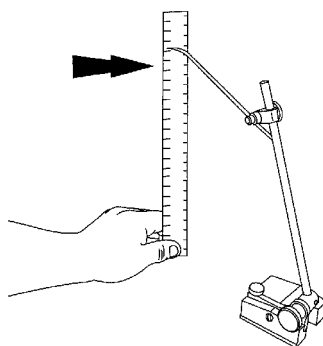
N0072247

3. Position the surface gauge on the same flat, level surface and adjust the gauge's arm until the scribe point is located on the lowest and furthest inboard point of the lower ball joint.
- Lock the surface gauge in this position.



N0070897

4. With the surface gauge positioned on a flat, level surface, record the measurement of the surface gauge position (measurement 3).



N0072247

5. Subtract measurement 2 from measurement 1 to obtain the front ride height.

Refer to Specifications in this section.

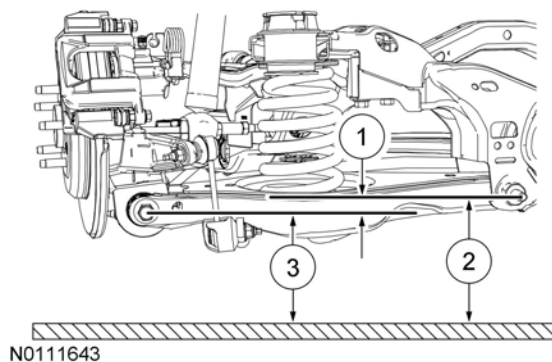
Rear Ride Height Measurement

NOTE:

Make sure that the vehicle is positioned on a flat, level surface and the tires are inflated to the correct pressure. The vehicle should have a full tank of fuel.

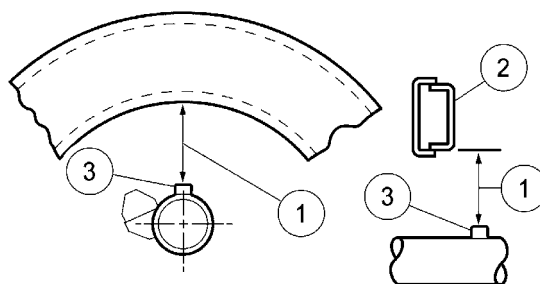
Section 1: General Information

1. Measure the distance between the flat level surface and the center of the lower control arm-to-subframe bolt (measurement 2).
 2. Measure the distance between the same flat level surface and the center of the lower arm-to-knuckle bolt (measurement 3).
 3. Subtract measurement 3 from measurement 2 to obtain the rear ride height.
- Refer to Specifications in this section.



Item	Description
1	Ride height = 2 - 3
2	Measurement 2
3	Measurement 3

Item	Specification
Rear Ride Height	
Police (coil)	145.0 mm (5.7 in) ± 10.0 mm (0.39 in)



Item	Specification
1	Ride height
2	Inner frame reinforcement
3	Rear axle jounce stop

Section 1: General Information

NOTE:

Make sure that the vehicle is positioned on a flat, level surface and the tires are inflated to the correct pressure. Vehicle should have a full tank of fuel.

4. Measure the distance between the inner frame reinforcement (Item 2) and the rear axle jounce stop (Item 3) to obtain the rear ride height (Item 1).

Tire Pressure Monitoring System (TPMS) Principles of Operation

The TPMS monitors the tire pressure using 4 valve stem mounted TPMS sensors to provide accurate tire pressures. Each individual sensor contains its own battery and transmits tire pressure data to the controlling module every 60 seconds when the vehicle speed exceeds 32 km/h (20 mph). The TPM module is a radio receiver that collects the tire pressure data and relays the information via the MS-CAN to the BCM. All of the TPMS functions are controlled by the BCM. The TPMS sensors are trained to the BCM, which records each TPMS sensors unique identifier. The BCM records where each TPMS sensor is located based on the training order and compares the actual tire pressure with the desired tire pressure as indicated on the Vehicle Certification label. If the tire pressure deviates from the desired tire pressure the BCM, using the HS-CAN, signals the IPC to illuminate the TPMS warning indicator and also displays a message on the message center. The programmed tire pressure cannot be changed.

This vehicle, as delivered by Ford Motor Company, conforms to Standard FMVSS138, Tire Pressure Monitoring Systems.

This system may not function if any of the following components are removed, relocated or modified in any way:

- Original Equipment Manufacturer (OEM) wheels and tires
- Tire pressure sensors or valve stems
- Body Control Module (BCM)
- Body Control Module (BCM) software and calibrations
- Tire Pressure Module (TPM)
- Instrument Cluster (IC) module
- Instrument Cluster (IC) software and calibrations
- Vehicle wheelbase longer than originally released

Certain modification could cause reduced system performance, up to and including the complete loss of TPMS functionality. This may include:

If concerns are present on a Utility Interceptor please reference police modifier bulletin P-018 located at www.fleet.ford.com/truckbbas/non-html/2013/P-018.pdf

- Non-OEM wheels or tires
- The addition of steel carcass or run-flat tires
- Modification of the vehicle's recommended tire pressure
- Lengthening of the vehicle's wheelbase may affect signal strength of the sensors to a point where the rear sensors can no longer be heard by the TPM module. (Vehicles certified at released wheelbases only)
- The addition of metallic structures, such as prisoner partitions, may affect the signal strength of the sensors and could interfere or prevent the TPM module from hearing the rear sensors.
- The addition of intended or unintended transmitters to the vehicle may affect the signal strength of the sensors or interfere with the TPM module's antenna

The TPMS, as delivered from the Ford Motor Company, complies with part 15 of the FCC rules and with RS-210 of Industry Canada.

Operation is subject to the following 2 conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Ambient Temperature Change and Tire Pressure

NOTICE:

Do not inflate tire higher than maximum pressure stamped on tire sidewall. Premature tire wear or damage to the tire may result.

Tire pressures fluctuate with temperature changes. For this reason, tire pressure must be set to specification when tires are at outdoor ambient temperatures. If the vehicle is allowed to warm up to shop temperatures, and the outside temperature is less than shop temperature, the tire inflation pressure must be adjusted accordingly.

Section 1: General Information

If the tires are inflated to specification at shop temperatures, and the vehicle is moved outdoors when the outdoor ambient temperature is significantly lower, the tire pressure may drop enough to be detected by the TPMS and activate the TPMS warning lamp.

As the ambient temperature decreases by 6°C (10°F), tire pressure decreases 7 kPa (1 psi). Adjust the tire pressure by 7 kPa (1 psi) for each 6°C (10°F) ambient temperature drop as necessary to keep the tire at the specified vehicle certification label pressure. Refer to the following tables to adjust the tire pressure indoors for colder outside temperatures.

Table 1. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature¹

**** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. ****

Table is based on a Garage Temperature of 70°F. Max Pressure Adjustment is 7 psi.		Tire Placard Pressure (PSI)																	
Outside Temperature (°F)		30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
70		30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
60		31	33	35	36	39	41	42	43	46	51	56	61	67	72	77	82	87	92
50		32	34	36	37	40	42	43	44	47	53	58	63	68	73	79	84	89	94
40		33	35	37	38	41	43	44	45	49	54	59	64	70	75	80	86	91	96
30		34	36	38	39	42	44	46	47	50	55	61	66	72	77	82	87	92	97
20		35	37	39	40	43	46	47	48	51	57	62	67	72	77	82	87	92	97
10		36	38	40	41	45	47	48	49	52	57	62	67	72	77	82	87	92	97
0		37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-10		37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-20		37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-30		37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-40		37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97

Table 2. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature (Metric Units)¹

**** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. ****

Table is based on a Garage Temperature of 21°C. Max Pressure Adjustment is 50 kPa.		Tire Placard Pressure (kPa)																	
Outside Temperature (°C)		205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
21		205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
16		215	230	240	250	270	285	290	295	315	350	385	420	460	495	530	565	600	635
10		220	235	250	255	275	290	295	305	325	365	400	435	470	505	545	580	615	650
4		230	240	255	260	285	295	305	310	340	370	405	440	485	515	550	595	625	660
-1		235	250	260	270	290	305	315	325	345	380	420	455	495	530	565	600	635	670
-7		240	255	270	275	295	315	325	330	350	395	425	460	495	530	565	600	635	670
-12		250	260	275	285	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-18		255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-23		255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-29		255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-34		255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-40		255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670

¹When Outside (Ambient) Temperature is greater than 21°C (70°F), Inflate tires to placard pressure.

¹Use the table to adjust tire pressure for P-metric and LT tires only.

N0072166

Table of Contents

Contents	PAGE
Section 2: Electrical	2-3
Electrical Basics	2-3
NEW Utility Visor Mounted LED Lights Option	2-3
NEW Front Headlamp Housing Only – 86P	2-5
NEW Front Headlamp Lighting Solution-66A-Changes	2-6
NEW Forward Indicator Pocket Warning Lights – 21W	2-6
NEW Feature Change To The Ready For The Road (option 67H)	2-7
NEW Forward Warning Auxiliary Light – 21L	2-8
Tail Lamp Housing Prep - 86T	2-8
NEW Feature Change – Tail Lamp Lighting	2-8
Side Marker LED – Side View Mirrors - 63B	2-9
Rear Quarter Glass Side Marker Lights - 63L	2-9
Rear Lighting Solution – 66C	2-10
General Guidelines For Vehicle Modification	2-11
Keep-Alive Memory Power	2-11
Wire Routing	2-14
Wire Retention and Routing	2-15
Splices and Repairs	2-16
Heat Shrinkable Tubing (Heat Shrink) (Ford Specification ESB-M99D56-A2)	2-19
Recommended Splicing Method — Crimp (For 10–22 AWG Diameter Wire to Like Wire Diameter)	2-19
Electrical Systems Management	2-21
Alternator Output	2-21
Charging Margins	2-22
Vehicle Component Electrical Loads	2-22
PCM — Red Area	2-24
Headlight and Tail Light Modifications	2-24
Disabling Brake Lights	2-24
Brake Applied Signal	2-24
Sedan Interceptor - Front Ground Strap - Passenger Side Hood	2-25
Sedan Interceptor - Trunk Lid Strap - Passenger Side	2-25
Utility Interceptor - Front Ground Strap - Passenger Side Hood	2-26
Utility Interceptor - Liftgate - Driver Side	2-26
Regular Production Options (RPO)	2-27
Siren/Speaker	2-27
Signaling Limitations	2-27
Driving Limitations	2-27
Configuration Instructions	2-27
Individual LED Flash Pattern Programming	2-28
Sedan/Utility Interceptor Wig-Wag	2-29
Group LED Flash Pattern Programming	2-30
NEW Utility - Standard Feature On Utility Police Interceptor Rear Cargo Door Release	2-31
Sedan - Luggage Compartment Lid Release Switch	2-33
NEW Sedan Second Luggage Compartment Lid Release Switch	2-33
Sedan Upfitter Wire Bundle Dash Panel Pass-Through	2-34
Sedan — Lower Center Instrument Panel Removal and Installation	2-35
Sedan — Front Power And Vehicle Signals Access Area	2-37
Sedan — Siren Speaker Connector	2-40
Sedan — Police Options 14-Way Connector	2-41
Sedan/Utility — Horn Ring Circuit	2-42
Sedan — Radio and Speaker Connector	2-44
Sedan — 4-Way Connector For All Police LED Light Heads	2-48
Sedan — Grille LED Light Connector	2-49
Sedan — Front Wiring Prep Blunt Cut Circuits	2-50
Sedan — Siren Speaker Connector	2-51
Sedan — Front Lighting Solution Wig-Wag LED And Front Corner LED Lights Connector.	2-52
Sedan — Pigtail Information	2-54
Sedan — Rear Power Access	2-54
Sedan — Trunk Relay Center	2-60
Sedan — My Fleet Management	2-60
Sedan — Courtesy Lamp Disable (Dark Mode)	2-60
Sedan — Steering Wheel Switches	2-61
Sedan — Steering Wheel Switch Cluster Display	2-62
Fuse Information	2-62
Sedan — Battery Junction Box	2-63
Sedan — Body Control Module	2-64
Electrical Component Resource	2-65

SECTION 2: Electrical

Sedan — Body Control Module	2-66
Sedan — Electrical Component Resource	2-68
NEW Utility Upfitter Wire Bundle Dash Panel Pass-Through	2-68
Utility — Power and Vehicle Signal Access Areas	2-70
Utility — Lower Center Instrument Panel Removal	2-70
Front Power And Vehicle Signals Access Area	2-73
Utility — Police Options 14-Way Connector	2-76
Utility — Radio And Speaker Connector	2-79
Utility — 4-Way Connector For All Police LED Light Heads	2-83
Utility — Front Wiring Prep Blunt Cut Circuits	2-85
Utility — Siren Speaker	2-86
Utility — NEW Rear Power Access Location — late model year availability	2-90
Utility — Rear Power Access	2-91
Utility — Steering Wheel Switches	2-94
Utility — Wiring Reference Information	2-97
Sedan — Wiring Diagrams: Police Interceptor	2-97
Utility — Wiring Diagrams: Police Interceptor Battery Junction Box (BJB)	2-118

Section 2: Electrical

Section 2: Electrical

Electrical Basics

Inside a vehicle, electricity is supplied through "hot" wires, comparable to the pressurized supply pipes of a plumbing system. At various points along the wires are outlets in the form of lights, switches and receptacles. Turning on a light switch is somewhat like opening a faucet to let water run — an electric current flows through the hot wire to make the light glow. Once the electricity has done its work, its potential drops to zero, just as water loses pressure after flowing through a sink or laundry tub. The electrical system has "drains" — which are the ground wires that return the current to its source just as a plumbing system has drain pipes through which water runs into the sewer mains or the ground.

The light or equipment powered by the current, technically called the load, can be compared to a water wheel that remains motionless until a stream of water causes it to turn. A load may be one of two kinds. The first consists of a resistance — a material that permits the passage of electric current, but only with difficulty, and thereby creates heat. The tungsten filament of an incandescent bulb is resistance; so is the heating element of an electric heater of a coffee pot. A load may also be an inductance — typically a motor with windings of copper wire, in which the magnetic fields generated by the current create motion. At any moment, the demand on an electrical system depends on the number of loads in operation and their consumption of energy, just as demand on a water system depends on how many faucets are opened and how wide they are opened.

The mechanics and physical fittings of the system are simple. Current moves throughout the vehicle in wires of different sizes, according to the current a circuit may have to carry. Power is supplied directly to equipment through connectors.

Electrical Terms

VOLT is the unit of electrical potential, equal to the difference of electrical potential between two points on a circuit.

AMPERE is the unit used to measure the amount of current - that is, the number of electrically charged particles called electrons - that flows past a given point on a circuit each second. It is similar to measuring the amount of water flowing through a pipe at any given point. The larger the pipe is, the more water that can flow past the point per second. Similarly, the bigger the wire is, the more current that can flow through it at any given point. Current that has lost its voltage still has amperage as it completes the circuit and returns to the battery.

WATT is the unit of power. It indicates that rate at which a device converts electric current to another form of energy, either heat or motion, or to put it another way, the rate at which a device consumes energy.

The relationship of volts, amperes and watts to one another is expressed in a simple equation that enables you to make any calculations you may need for proper and safe electrical modifications to the vehicle. Volts x amperes = watts. If the current is at 12 volts and a device requires 4 amperes of current, the equation will read 12 volts x 4 amperes = 48 watts.

To figure the current needed for a device rated in watts, turn the equation around: watts/volts = amperes. For example, if you have a piece of equipment, such as a communications radio, that uses 120 watts: 120 watts/12 volts = 10 amperes.

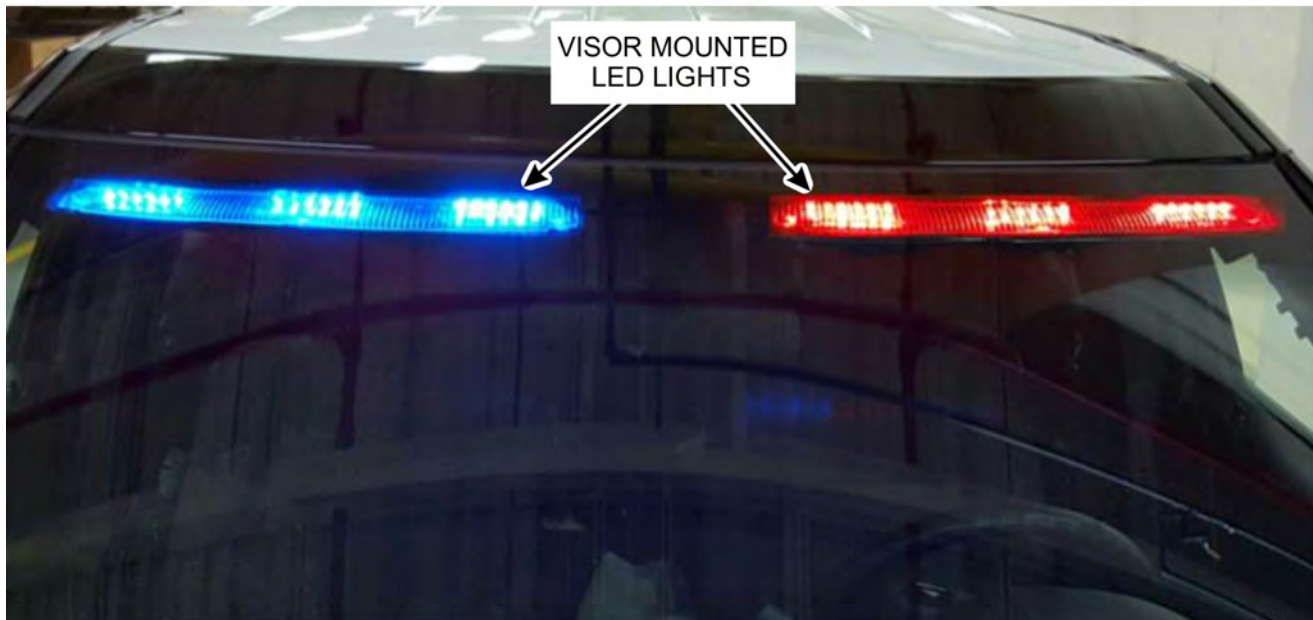
NEW Utility Visor Mounted LED Lights Option

See police modifier Bulletin P-023 for module setup

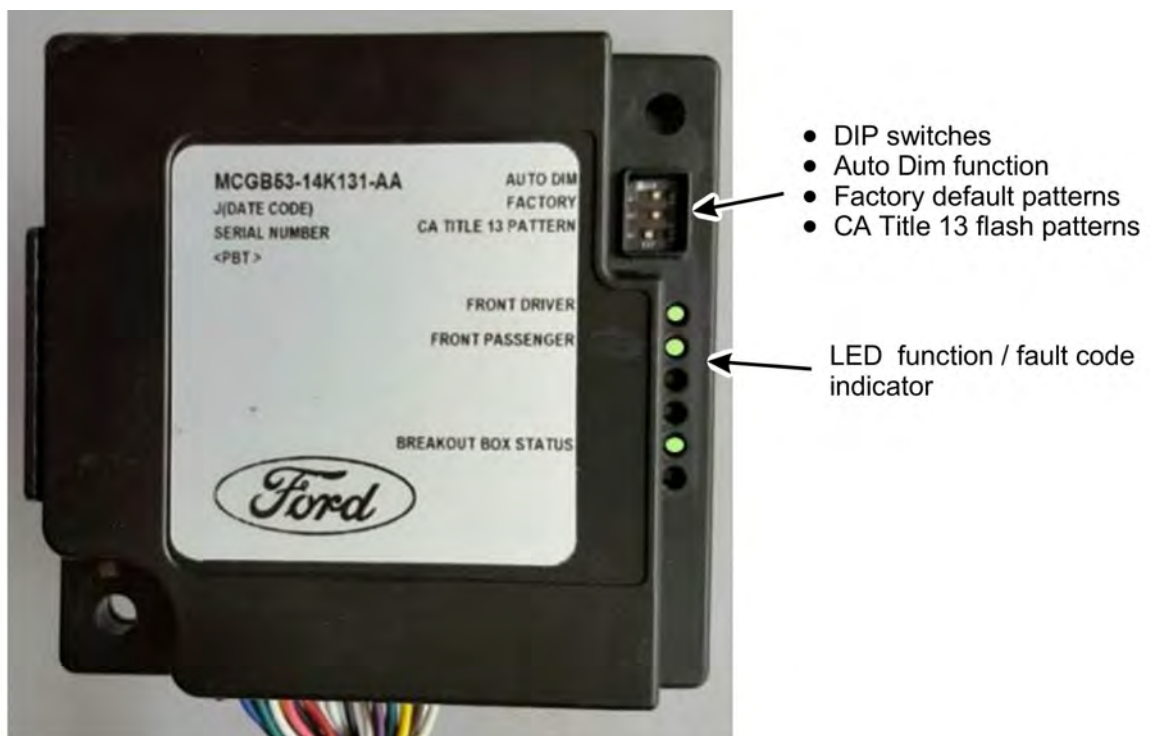
Visor mounted LED lights option includes

- Passenger side LED visor light assembly
- Driver side LED visor light assembly
- Visor T-harness (A-pillar)
- Front-to-back overlay harness
- Visor control module (B.O.B module)
- Flash pattern selection
- Diagnostic
- Visor module jumper harness

Section 2: Electrical



N0168870



N0168871

Section 2: Electrical

- AUX 1 button:
- Control Red/Blue LED visor lights



- LP button:
- Control White LED visor lights

- Visor LED Light with Option
- CENCOM controls visor LED lights



N0168888

NEW Front Headlamp Housing Only – 86P

A – Preformed hole for new LED front corner marker light used in police applications. Does not include LED installed lights (eliminates the need to drill/cut headlamp housing assemblies – shipped with cover with 4 screws.



N0165653

Section 2: Electrical

NEW Front Headlamp Lighting Solution-66A-Changes

A – High Beam Wig-Wag Warning

- The option is synchronized independently from other LEDs
- Stand-alone option - **wiring not included**
- Pre-wiring included with option 60A. Pre-wiring for grille lamp, siren and speaker – (option 60A)

B – High Intensity Front Corner Marker Lights

- Synchronized to the grille lights, forward auxiliary lights (Figure A) and mirror lights
- Stand-alone option – **wiring not included**
- Pre-wiring included with option 60A. Pre-wiring for grille lamp, siren and speaker – (option 60A)
- Flash pattern 1 – factory setting



NEW Forward Indicator Pocket Warning Lights – 21W

A – Forward Indicator Pocket Warning Lights – 21W

- Controlled through the forward lighting harness and the instrument panel control circuit (white 14 - way connector)
- This option is synchronized independently from the other LEDs
- Stand-alone option – **wiring not included**
- Wiring kits recommended-with option
- Pre-wiring for grille lamp, siren and speaker – (option 60A) or
- Included with Ultimate wiring package – (option 67U)
- Flash pattern 1 – factory setting

Section 2: Electrical



N0165657

NEW Feature Change To The Ready For The Road (option 67H)

- Controlled through the forward lighting harness (14290) instrument panel and overlay harness control circuit (included with this option)
- Synchronized with the forward marker lights Option 66A side view mirror lights – (Option 63B) and forward auxiliary lights – (Option 21L)
- Flash pattern 11 – factory setting



N0165658

A. Integrated LED grille lights

Section 2: Electrical

NEW Forward Warning Auxiliary Light – 21L

A – Front Warning Auxiliary Light – 21L

- Stand-alone option – **control wiring not included**
- To receive factory wiring, requires option:
- Pre-wiring for grille LED lights (option 60A)
- Controlled through the forward lighting harness 14290 instrument panel control circuit (white 14-way connector)
- Flash pattern 10



Tail Lamp Housing Prep - 86T

- Pre-formed holes with standard twist lock sealing capability
- Eliminates need to drill housing assemblies
- Pre-formed holes are plugged
- **NOTE:**
Does not include LED installed lights



NEW Feature Change – Tail Lamp Lighting

A – Tail Lamp Lighting Solution – 66B Rear Corner Marker Light - Feature Change

- Synchronized with rear quarter glass side marker lights (option 63L) and rear lighting solution (option 66C)

Section 2: Electrical

- Installed adjacent to reverse light pocket
- Flash pattern 1 – factory setting



Side Marker LED – Side View Mirrors - 63B

Side View Mirrors - Side Marker LEDs

- Linear-high-intensity LED lights (driver side red / passenger side blue)
- Stand-alone option - **wiring not included**
- Pre-wiring for grille LED lights, siren and speaker – (Option 60A)
- Forward Lighting Harness (14290) instrument panel control circuit (14-way connector)
- Flash pattern red 1 / blue 2 – factory setting



Rear Quarter Glass Side Marker Lights - 63L

A - Rear Quarter Glass Side Marker Lights

Section 2: Electrical

- Wide-angle high-intensity LED lights (driver side red / passenger side blue)
- Standalone Option – **wiring not included**
- Flash Pattern Red 1 / Blue 2 – factory setting

Rear Lighting Solution – 66C

A - Includes 2 flashing linear high-intensity LED lights (driver side red / passenger side blue) mounted to the inside of the liftgate glass

B - Includes 2 flashing linear high-intensity LED lights (driver side red / passenger side blue) mounted to the inside lip of liftgate

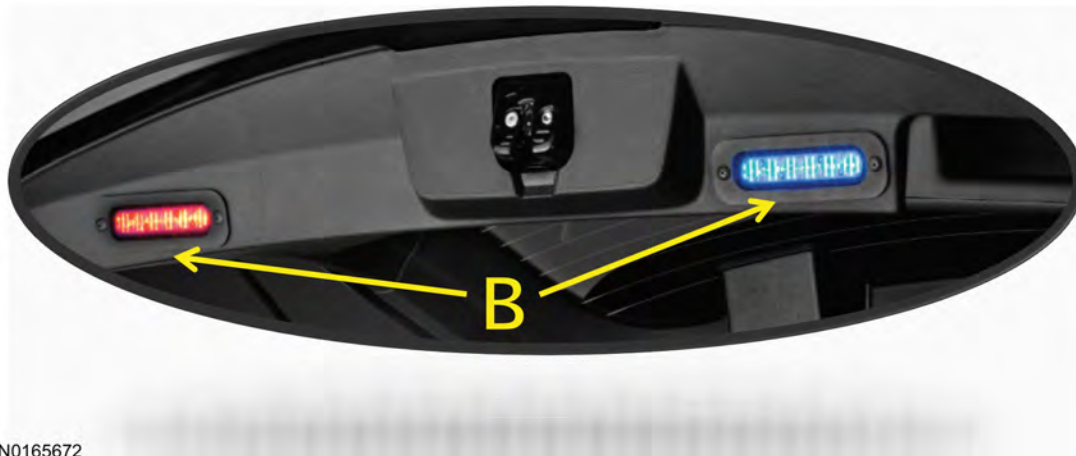
- Stand-alone option – wiring not included (LED lights only).
- Flash pattern red 1/ blue 2 – factory setting

NOTE:

This package (66C) is included with ready for the road package (67H)



Section 2: Electrical



General Guidelines For Vehicle Modification

- Provide circuit protection (fuses) for all wiring. The fuse rating should not exceed either the rated wiring current capacity or the total current requirements for all the add-on components on the circuit. Install fuses as close to the point of tapped power as possible.
- Document all revisions to the electrical system and place with the vehicle Owner's Literature. Color code and/or label all revisions or additions to wiring.
- Provide protective covering in all areas that could be damaged during normal equipment installations.
- Disconnect the negative battery cable of vehicles stored on site to reduce the possibility of draining the battery by lights or other equipment.
- Do not allow control panels attached to the instrument panel to protrude into the driver and passenger air bag deployment zones. For additional information, refer to Section 5: Reference Information in this guide.
- Do not install switches and gauges in the driver or passenger knee impact areas.
- Inspect all Ford gauges, lights and switches for correct operation after instrument panel work is performed.
- Properly secure any relocated or removed wiring while working behind the instrument panel to prevent chafing, squeaks and rattles.
- Provide adequate retention for wiring harnesses so that they are clear of bolts, corners or edges which could abrade the wires during normal vehicle operation.
- Anticipate incorrectly routed wiring situations and protect all wiring from penetration by screws and raw edges.
- Weather-seal all electrical connectors exposed to the elements.
- Do not use quick splice connectors or wire nuts.
- Install the fuse panel so fuses are readily accessible.
- Make sure that connections are easily accessible for assembly and service.
- Make sure submersible connectors do not lose their seals under extreme assembly conditions such as bending wires 90 degrees immediately after the connector.
- Whenever using connectors, use a socket (female) connector on the electrical source side and a plug (male) connector on the electrical load side to reduce the possibility of a short circuit when disconnected.
- Air bag restraint systems must remain intact as received from Ford Motor Company. Before any vehicle modifications are performed, the system must be disarmed by following the instructions provided in the current Workshop Manual.
- Adherence to the above guidelines is not to be construed as approval by Ford Motor Company of any specific revisions or additions to the vehicle's original electrical system.

Keep-Alive Memory Power

The electronic engine and transmission control modules require battery power to be supplied at all times in order to maintain the keep-alive memory. Keep this in mind when installing load disconnect switches or solenoids.

Equipment Grounding Guidelines

Section 2: Electrical

- Do not ground the body to the transmission or transmission cross-member. Ground accessories to the chassis or the vehicle battery.
- Splicing into circuitry relating to the electronic engine and/or transmission control systems is not acceptable because of the adverse effect on the electronic system operation.
- Adequately protect electrical connections exposed to the elements.

Wire Insulation

- Polyvinyl Chloride (PVC), rated at 90°C (194°F), is the standard wire insulation that is acceptable for inside body use but is not acceptable for under hood/under body wiring.
- Hypalon insulation should be used on links only (Ford Specification ESB-M1L54-A).
- Cross-linked Polyethylene (XLPE or SXL), rated at 135°C (275°F), is the required insulation for under hood/underbody applications (Ford Specification ESB-M1L123-A).
- GXL can be used as an alternate wire (Ford Specification ESB-M7L85B) as long as the concentricity specifications are met. To provide a water-resistant seal in conjunction with crimp connectors, a Duraseal crimp connector is recommended since it is designed to account for outside wire diameter that is smaller than the present SXL wire.

Terminals and Connectors

Connector Types

- Submersible (Sealed) — A connector that is capable of being immersed in water.
- Weather-resistant — A connector that will retain its sealing and connection qualities while being exposed to adverse weather conditions.
- Duraseal crimp — A supplier trade name for a sealed wiring repair or splice.

When a connection is not defined (typical situation — harness-to-harness connectors), the following suggestions should be implemented:

- Determine the connector type. If it will be located in a hostile environment, use a submersible (sealed) connector; if not, use an open connector. A hostile environment is defined as being exposed to water and/or salt accumulation and/or high temperatures (i.e., under hood, exterior panels and footwells). Use in-line connectors with secondary locks to prevent the terminal from being pushed out.
- Do not use single wires smaller than 14-gauge in a 2-way or larger weather-resistant connector (the very large style), since the wire may break during disengagement.
- Use Hypalon, XLPE or Elexar insulation in submersible connectors to maintain sealing integrity. PVC is not acceptable because cold flows and allows setting in a deformed pattern, therefore compromising the integrity of the seal.
- Determine the terminal type. Base your decision on wire gauge, current carrying capacity, connector type and insulation type.
- Use non-detent low insertion force terminals whenever possible.
- Do not use low insertion force female terminals in weather-resistant connectors.
- Analyze circuit requirements (signal levels, current, voltage) to determine the proper plating material (such as gold). Use of non-plated terminals is not recommended.
- Do not use plugs to seal holes in micropin connector grommets. It is very easy to forget to insert them during manufacturing and ruin the seal. Only use a grommet with the necessary number of holes or use dummy wires at least 600 mm (24 in) long.
- Fully align connectors prior to terminal connection — terminal cavities should have minimum tolerance to prevent terminals from floating, bending or pin push-out during mating/engagement.
- Make sure connectors of similar type and color are identifiable to the operator to eliminate crossed connections and minimize assembly time. Avoid using similar types and colors of connectors close together.
- Be sure that connectors have positive locking devices that allow easy installation with a low insertion force and easy removal. The connector snap should be easily felt and heard.
- Eliminate the use of edgeboard, tang-type and molded-over connectors. The use of blade-type weather-resistant connectors is restricted to high current applications which cannot be handled by submersible connectors.

Circuit Protection and Electrical Load

- Modification to existing vehicle wiring should be done only with caution and careful consideration of effects on the completed vehicle's electrical system. Anticipated circuitry should be studied to determine the required circuit protection and to avoid feedback loops.
- Added circuitry must be protected either by a base vehicle fuse or circuit breaker, or by a similar device supplied by the modifier.
- When adding loads to a base vehicle-protected circuit, make sure that the total electrical load through the base vehicle fuse or circuit breaker is less than the device's load rating.
- Use 80% of the fuse rating to determine maximum steady state load to reduce nuisance fuse failures.
- Use 135% of the fuse rating when sizing wiring to protect the circuit in the event of an overload. Fuses will last for 1 hour at 135% of their rating.

Section 2: Electrical

- Total current draw is the sum of the base vehicle's circuit current requirement (measured with an ammeter) and the anticipated add-on component current requirements.
- Never increase the rating of a factory installed fuse or circuit breaker.
- If the total electrical load including additional electrical components, on any circuit, is less than the fuse protection rating or the capacity of some limiting component (switch, relay), the items to be added can be connected directly to that circuit. The headlamp switch circuits should never have additional lighting or electrical components directly connected.
- Added devices that exceed the current capabilities of the factory-installed system are best controlled through the use of a relay or separate switch. The coil of the relay can be fed from the circuit in the factory harness (now acting as a signal circuit) with added wiring providing feeds to the added electrical device. The relay selection is important and depends on current requirements, number of cycles expected in the relay lifetime, whether the relay is to be operated intermittently or for long periods of time and whether the relay is exposed to weather conditions or is installed in a protected area. When the current requirements of a circuit exceed the capacity of an available relay, the load should be reduced or divided through the use of additional relays.

Wire Protection Requirements

General Notes:

- Anticipate any potential problems and design accordingly to accommodate. Try to anticipate what could go wrong and modify your designs to address any adverse impact.
- Review all connector applications and electrical systems to determine the need for solder, grease, weather-resistant or sealed connectors. Make sure components and wire insulation are compatible with greased connectors (important for long-term durability).
- Make sure that drip loops or other means are provided to prevent water leakage into the vehicle through wiring assemblies that pass through the dash panel.
- Use greased or sealed connectors in floor pan troughs which are subject to moisture coming through the carpeting.
- Use XLPE insulation for uncovered runs that exceed 305 mm (12 in).

Electrical Protection

- Correctly route wires away from noise-generating wires or components. However, if routing near noisy wires or plugging into noisy components is unavoidable, additional protection must be designed into the harness.
- Shielding — Electro Magnetic Interference (EMI) — Consider shielding if you must route close to high-current or noisy circuits. Use shielded wire and ground one side. Seal all splices in wire assemblies that use bare coaxial shielding (braid or tape) for EMI suppression, and insulate or tape over all shielding ends that terminate near any open connectors. This prevents splice and terminal shorts to the shielding. Minimize the length of conductors which extend beyond the shield. Failure to do this reduces the effectiveness of the shield.
- Spike suppression, in general, is accomplished by connecting a diode or resistor-diode combination across the terminals of the noisy component. The diode should be sufficiently close to the component (both electrically and physically) so that inductive spikes are clamped off. Make sure the diode is connected with the proper polarity.

Proper routing and retention will reduce the likelihood of chafing or pinching. When this ideal routing is unattainable, the following additional protection is needed:

Mechanical/Environmental Protection

- Tape — Tape is the most basic means of protection. It contains the wires in a loose bundle and provides limited environmental protection. It does not protect against chafing and pinching.
- Kendall Polyken Fiberglass Base Tape (Ford Specification ESB-M3G38-A) is used for engine compartment applications. This durable tape provides against cut-through and abrasion commonly found in underhood applications.
- Polyken 267 is a substitute tape that may be used in lower temperature areas of the engine compartment (apron area).
- Convolute — Use convolute for all underhood/underbody applications or when increased temperature, abrasion or pinch resistance is required. Convolute tubing comes in different diameters and materials to accommodate different temperature ranges and harness sizes.
- Use polyethylene convolute when abrasion is the only consideration; this convolute is adequate up to 96°C (205°F) maximum. Use nylon convolute when underhood/underbody or abrasion and temperature are considerations; nylon convolute is adequate up to 177°C (350°F) maximum.
- On all engine-mounted wiring or bend points. Use vinyl tape on the outside of the convolute to prevent wiring from looping out. This tape must be able to withstand temperatures 135°C (275°F) or higher.
- Tape convolute junctions with abrasion-resistant tape (Polyken 267, fiberglass).
- Scroll — Similar to convolute, but without the ridges. Scroll is used where harness rigidity is required, especially for maintaining critical locator dimensions. Use scroll for short lengths only, as it is quite inflexible.

NOTE:

This is not meant to be an all-inclusive list of methods for physically protecting the wires. There are other means of protection available that are not listed.

Section 2: Electrical

Grommets and Sealing Requirements

Any additional wiring routed through sheet metal must pass through a grommet that both seals the opening and locates the wire(s). Two-piece grommets (rubber with plastic inserts) are recommended to facilitate installation and retention.

- Locate grommets so they are accessible for proper seating (achieved by pulling) in sheet metal holes.
- Ramp grommets at the insertion end to facilitate installation and sealing.
- Be sure that the direction of the hole punch is in the direction of grommet seating and the hole is burr-free.
- Make sure the grommet moulding compound will adhere to the harness to prevent slippage.
- Make sure the grommet will withstand the environment (temperature, splash).
- Be sure that holes are large enough to allow the installation of the harness without causing circuit damage.
- Use adhesive tape on main trunks or branches with at least a 50% overlap to prevent wicking through grommets. Be certain to diaper-wrap the takeouts.

Wire Routing

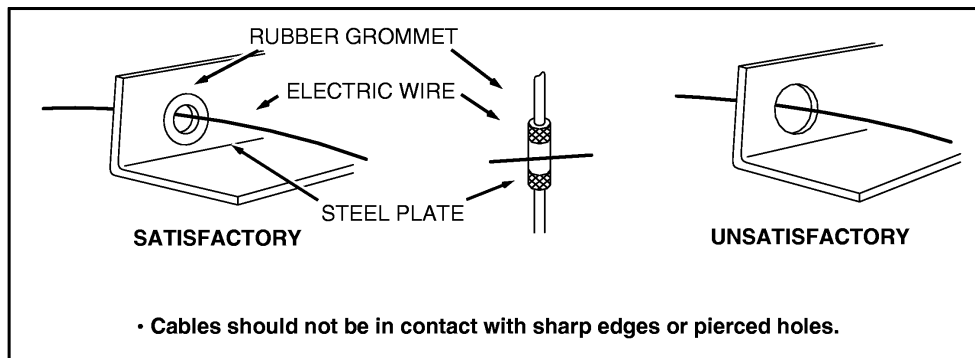


WARNING:

Do not place electrical component attachments or ground screws adjacent to vehicle fuel tanks, fuel filler pipes, fuel lines, fuel vapor lines or carbon canisters. Failure to follow these instructions may result in personal injury in the event of a collision.

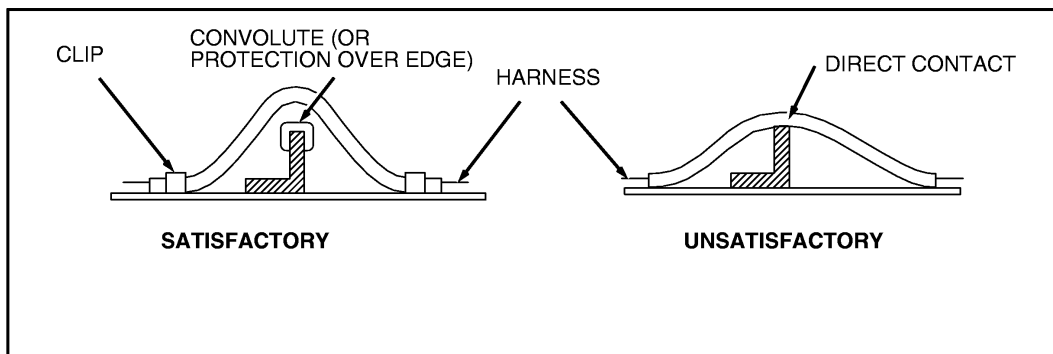
Wire harness routing should conform to the following:

- Protect wires routed through holes in sheet metal or castings with a grommet whether or not conduit is used (see figure below).



A0073515

- Route wires to avoid metal edges, screws, trim fasteners and abrasive surfaces. When such routing is not possible, use protective devices (shields, caps) to protect the wires. Cover metal edges with a protective shield and fasten the wiring within 76 mm (3 in) on each side of the edge (see figure below).



A0073514

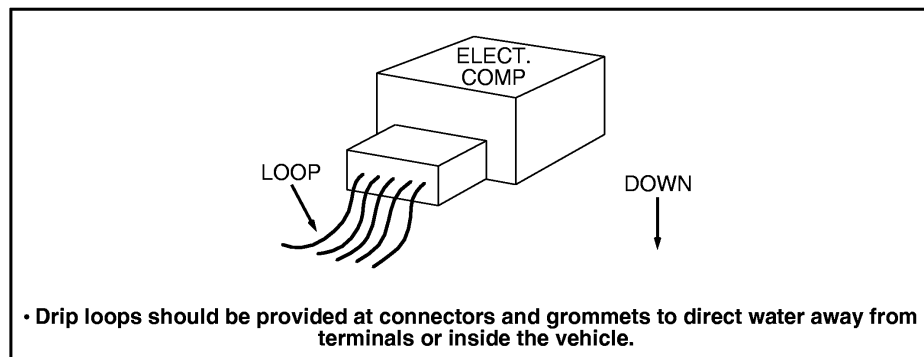
Section 2: Electrical

- Route wires to provide at least 76 mm (3 in) of clearance to moving parts in their extreme movement location, unless positively fastened and protected by a conduit.
- Avoid wire routing without conduit in areas where temperatures exceed 82°C (180°F). Minimum clearance of 152 mm (6 in) should be maintained from exhaust system components. Heat insulation and heat shields must be used on the wires routed in high-temperature areas.
- Make certain that all underhood or underbody wiring is cross-linked polyethylene high temperature insulation wire 135°C (275°F) (minimum rating) consistent with SAE specification J1128 Type SXL wire. Normal PVC wire must not be used in underhood or underbody applications.
- Make sure all ground locations are readily accessible for installation, service and verification.
- Do not place ground attachments in high-splash areas.
- Do not route underbody wiring over the exhaust system.
- Under hood/underbody wiring must be routed in conduit for protection. Minimum conduit rating is 177°C (350°F).

Wire Retention and Routing

Use the following criteria to determine the location of retainers:

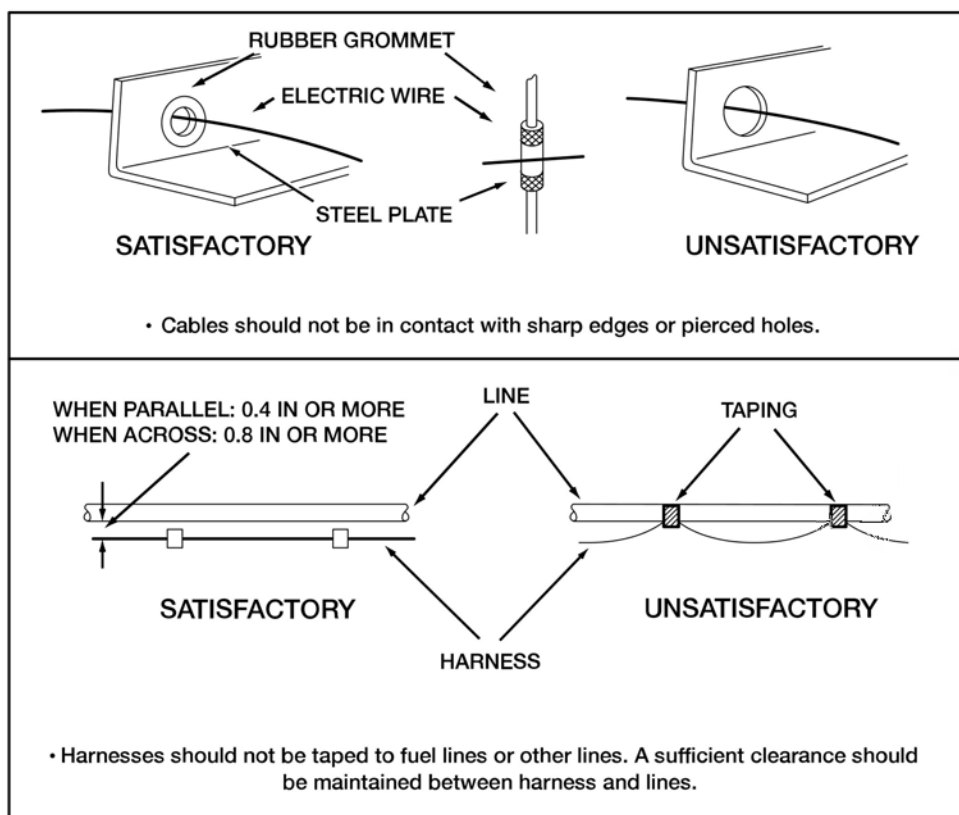
- Size and weight of wire bundle.
- Holes with poor accessibility that prevent installation of locators.
- Movement of wires that can result in abrasion, squeaks and rattles.
- When wiring is routed between 2 members where relative motion can occur, the wiring should be secured to each member with enough wire slack to allow flexing without damaging the wire.
- Wiring exposed to weather must provide a drip loop to prevent moisture from being conducted into the device through the wire connection (see figure below).



A0073517

- Avoid routing wires into areas exposed to wheel splash. When such routing cannot be avoided, adequate clipping and/or protective shields are required to protect the wires from stone and ice damage. Allow adequate slack in wiring between the engine and stationary components to compensate for engine roll.
- Avoid routing wires under the frame side members or at points lower than the bottom frame flange.
- Use plastic "zip" straps for "bundling" only (securing to other wires).
- The wire retainers and grommets installed by the assembly plant are usually designed to accommodate only the Ford-installed wires. Additional wiring or tubing should be retained by additional clips. When added wires or tubes are routed through sheet metal panels, new holes with proper wire protection and sealing must be used.

Section 2: Electrical



N0072291

For retainer screws, the following guidelines apply:

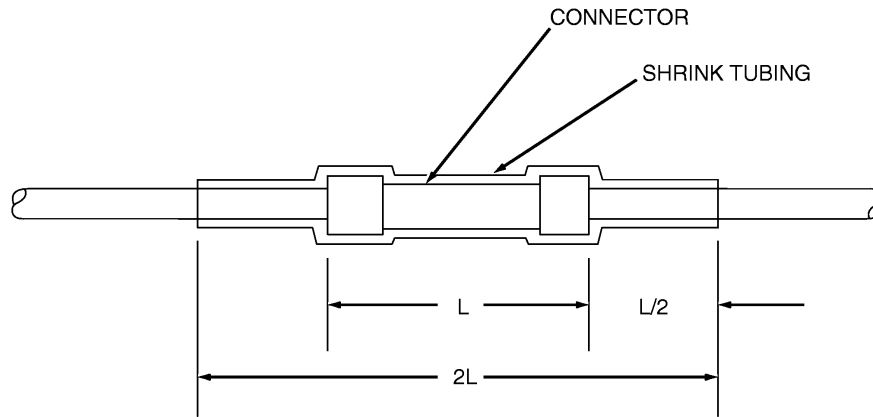
- Avoid using fasteners that are too long for the application or are in an area which might damage vehicle components, including wiring, brake lines, fuel tank and lines, powertrain components, exhaust system and suspension.
- Do not use pointed screws for attachments. Also check that screws used in the vicinity of the wiring are blunt-ended.
- To minimize the potential for wiring shorts, do not use drill point screws. Trim components (including wiring shields) should use pin-type attachments instead of screws.
- Always check areas that screws protrude into for verification that an interference condition to other components does not exist.
- Make sure that retainers used are capable of withstanding the environment over the vehicle's life expectancy.

Splices and Repairs

For quality splicing and to reduce potential problems, the following guidelines are recommended:

- Stagger the splices within a harness to reduce increased harness diameter. Splice only on straight areas as installed, not on bends.
- Strip wire ends making sure that individual conductor strands are not damaged.
- When soldering, make sure an adequate mechanical joint exists before applying solder. Use only resin-core solder. Acid-core solder should not be used since it may result in corrosion.
- For crimp joints, use butt-type metal barrel fasteners and the proper tool at the appropriate setting for the wire size (such as Motorcraft crimp tool S-9796) specifically designed for this type of work.
- Make sure splice joints are adequately sealed and insulated. In an outside environment, use Duraseal butt connectors or equivalent. A durable substitute splice joint can be achieved by using a bare metal barrel, crimping, flow-soldering and covering with shrink tubing. Quality electrical tape can be used inside the vehicle but is not recommended for an outside environment.
- Be sure that the new wire is not a lesser gauge than its original mating wire.

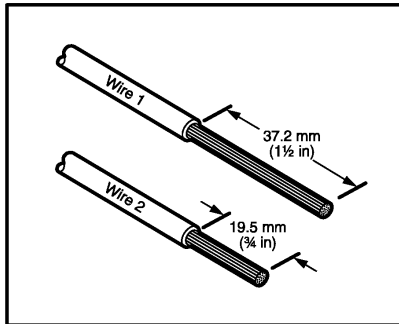
Section 2: Electrical



A0074039

Recommended Splicing Method — Solder (For 16 AWG and Smaller Diameter Wire Only)

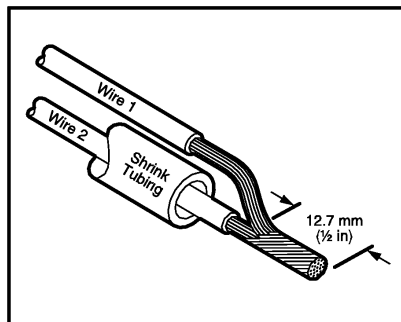
1. Disconnect the battery ground cable.
2. Strip wires to appropriate length.



A0075761

3. Install heat shrink tubing.
4. Twist the wires together.
5. **NOTE:**
Use resin-core mildly-activated (RMA) solder. Do not use acid-core solder.

Solder wires together.

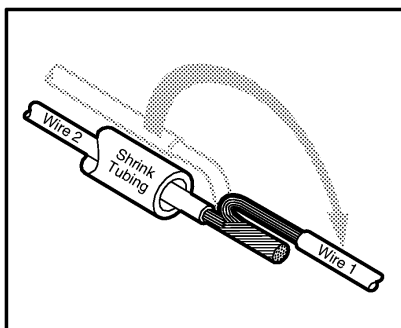


A0075762

Section 2: Electrical

6. **NOTE:**
Wait for solder to cool before moving wires.

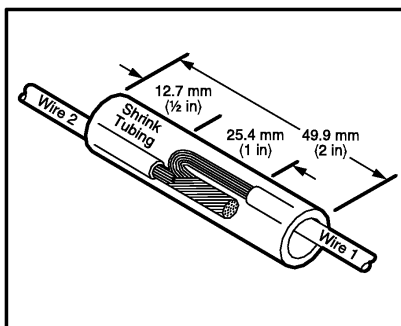
Bend wire 1 back in a straight line.



A0075763

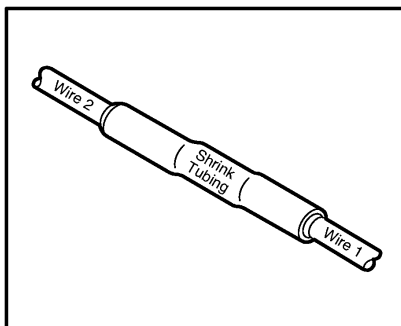
7. **NOTE:**
Overlap tubing on both wires.

Evenly position heat shrink tubing over wire repair.



A0075764

8. Use a shielded heat gun to heat the repaired area until adhesive flows out of both ends of the heat shrink tubing.



A0075765

9. Reconnect the battery ground cable.

Sealed Connectors

Section 2: Electrical

Ford Part Number	Part Name	Class
E6FZ-14488-A	Butt Connector Gauge: 18-22, Color: Red	C
E6FZ-14488-B	Butt Connector Gauge: 14-16, Color: Blue	C
E6FZ-14488-C	Butt Connector Gauge: 10-12, Color: Yellow	C

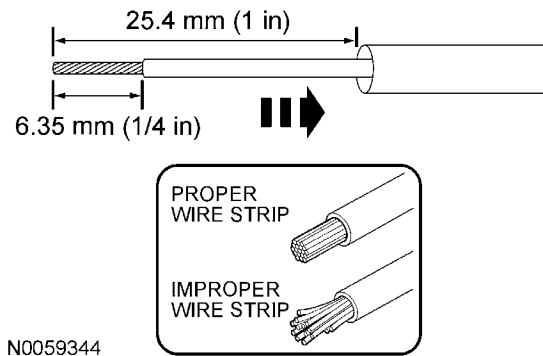
Heat Shrinkable Tubing (Heat Shrink) (Ford Specification ESB-M99D56-A2)

Heat shrinkable tubing is available in various diameters for different splice sizes and configurations. When shrunk, it forms a small, flexible hermetic seal.

Other methods (tape, PVC mold) do not provide a hermetic seal and are not recommended. Splice balancing is critical with heat shrink insulation. If the splice is extremely unbalanced (more circuits on one side than the other), heat shrink insulation will not provide a proper seal. Evaluate the use of double terminals instead of splices where practical in these situations.

Recommended Splicing Method — Crimp (For 10–22 AWG Diameter Wire to Like Wire Diameter)

1. Disconnect the battery ground cable.
2. Strip wires to appropriate length.
3. Install heat shrink tubing.

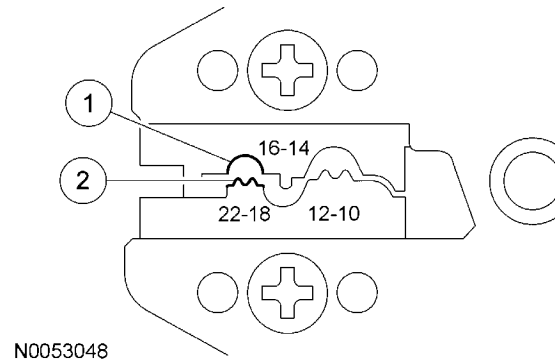


4. Select the appropriate wire slice for the wires to be spliced from Rotunda Wire Splice Kit 164-R5903.
5. **NOTE:**
Rotunda 164-R5901 Pro-Crimper supplied with the wire splice kit is the only tool that can be used with these splices.

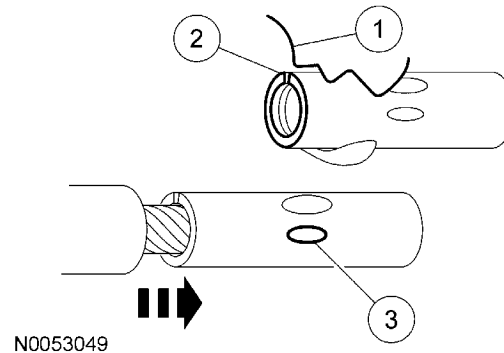
Identify the appropriate chamber on the Rotunda Pro-Crimper by matching the wire size on the dies with the wire size stamped on the butt splice.

- (1) Cavity
- (2) Indenter

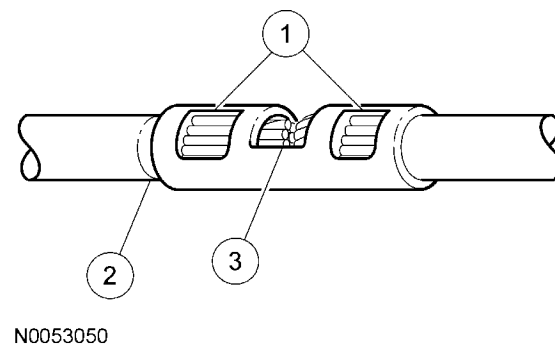
Section 2: Electrical



6. Crimp the connector.
 - (1) Center one end of the wire splice in the appropriate crimping chamber.
 - (2) Insert stripped wire into the barrel.
 - (3) Holding the wire in place, squeeze the tool handles until ratchet releases.

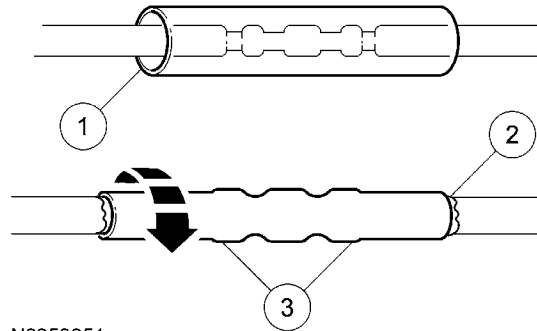


7. Repeating Step 6, crimp the other half of the splice.
8. Check for acceptable crimp.
 - (1) Crimp should be centered on each end of the butt splice.
 - (2) Wire insulation does not enter butt splice.
 - (3) Wire is visible through inspection hole of splices.



9. Evenly position supplied heat shrink tubing over wire repair.
10. Use a shielded heat gun to heat the repaired area until adhesive flows out of both ends of the heat shrink tubing.

Section 2: Electrical



11. Reconnect the battery ground cable.

Heat Shrinkable Tubing (Heat Shrink) (Ford Specification ESB-M99D56-A2)

Heat shrinkable tubing is available in various diameters for different splice sizes and configurations. When shrunk, it forms a small, flexible hermetic seal.

Other methods (tape, PVC mold) do not provide a hermetic seal and are not recommended. Splice balancing is critical with heat shrink insulation. If the splice is extremely unbalanced (more circuits on one side than the other), heat shrink insulation will not provide a proper seal. Evaluate the use of double terminals instead of splices where practical in these situations.

Electrical Systems Management

Care must be given in deciding what equipment should be installed into a police vehicle given the power demands of the equipment and the power available from the vehicle. A power load strategy should be developed to minimize the risk of running out of power. Examine the proposed equipment for vehicle installation. Add up the current requirements. If the current requirements exceed what the vehicle can reasonably be expected to be able to provide, the battery will begin discharging to provide the power to the equipment that the generator is unable to provide. After some period of time, the vehicle will shut off as the battery voltage decreases to a level that cannot sustain vehicle operation.

There are alternatives that can be considered to minimize system electrical overload. Consider the current requirements of equipment before it is purchased and installed. Modern light bars and radios use a fraction of the current than units made as recently as 1996. As the light bar is the most power intensive unit installed on most police vehicles, considerable attention should be given to its current requirements. Changes in officer habits while in the field can make a difference as well. When a vehicle is sitting at an accident scene and no one is in the car, the air conditioner can be turned off until the officer is ready to get back into the vehicle. The air conditioner is among the largest current users of non-police equipment. As such, it can impact available power for other uses as well.

Alternator Output

On 2013 Sedan and Utility Police Interceptors, the alternator is controlled by the PCM.

The Police Interceptor alternator is different from that used on the standard retail vehicles. The Police Interceptor has a 220 amp alternator. This results in significantly greater current output, especially at idle, where police vehicles need it most.

- Alternator amp output:
 - ___ Maximum output for the Police Interceptor is 220 amps
- Alternator drive ratio, determined by generator pulley size:
 - ___ Sedan Police Interceptor 2.67:1
 - ___ Utility Police Interceptor 2.67:1
- Idle speed:
 - ___ Police Interceptor 600 rpm

NOTE:

In order to calculate engine rpm from the graph below, divide the alternator speed by 2.67 (or 3 as an approximate). Alternator speed/3.0 = engine rpm.

Section 2: Electrical



N0140614

Charging Margins

Alternator output varies with engine speed and ambient temperature as illustrated in the Alternator Output Section. The worst case scenario for police vehicles is when the vehicle is idling for long periods of time on a very hot day. Lower engine speeds while idling, coupled with high under hood temperatures that may approach 93°C (200°F), combine to minimize power output from the generator. At the same time, electrical demand on the vehicle is often at its highest because the air conditioner loads are added to the usual electrical loads experienced in emergency situations.

Vehicle Component Electrical Loads

Vehicle component electrical loads are shown in the table below. Not all features are powered all the time, so actual vehicle loads on the power supply system will vary.

Component	Amps
Base	
Miscellaneous Base Loads	19.1A
Cooling	

Section 2: Electrical

(Continued)

Component	Amps
Cooling Fan (variable speed)	48A High Speed 12A Low Speed
Climate Control	
A/C Clutch	3.5A
A/C Fan-to-Face — High Speed (recirculating air)	18.9A
A/C Fan-to-Face — Medium/High Speed (recirculating air)	15.2A
Heater Fan-to-Foot — Medium/High Speed (fresh air)	13.9A
Lighting	
Exterior and Instrument Panel Lamps (non-dimmable)	3.2
Headlamps — Low Beam	Part of Police Load
Headlamps — High Beam (incremental)	Part of Police Load
Brake Lights (with High Mount Stop Lamp)	3.3A
Heated Features	
Heated Rear Window (includes heated mirrors)	26A
Other	
Radio	2.4A
Wiper Speed 1 (low)	2.3A
EPAS	70A (13% sized for CLCC)
Police Load	65A (80% sized for CLCC)
Typical Vehicle Load = 60-70 Amps	

NOTE:

Cooling and Climate Fan sizing measured from wind tunnel data (at the ambient temperatures of 110°F for AC and 30°F for Heat).

NOTE:

Police Load includes all lighting except for Exterior and IP lights. Police vehicles we measured had higher worse case lighting loads operated in wig/wag - strobe version than baseline. For CLCC, we assume 80% duty cycle throughout the three drive cycles. For EPAS sizing, it is assumed 100%.

NOTE:

EPAS peak load is 70A, for CLCC max duty cycle is 13%, for EPAS it is again 100%.

Typical Police Equipment

Loads for equipment commonly found on police vehicles are shown in the table below. Not all equipment will be operating at the same time, so actual loads on the power supply system will vary.

Component	Amps
Communications Radio	4.0 (9.0 w/mic active)
Mobile Data Transmitter	3.0
Light Bar	28-43
Light Bar with All Internal Accessory Lights Activated	36-63
Spot Lights (each)	7.8
Alley Lights (each)	1.0

Section 2: Electrical

(Continued)

Component	Amps
Radar	0.8
Digital Video	0.5

PCM — Red Area

NOTICE:

DO NOT make electrical connections to vehicle electrical systems not specifically designed for police equipment installations.

Do not install any components into the PCM or PCM harness. Connecting into this system may affect engine and transmission operation. Vehicle speed output available in 14-way connector at base of center stack see Chapter 2 Section 28 for Front Power Access and Signals for pinout. For example: connection of aftermarket electrical equipment into the brake light circuit or any other circuit which is connected to the PCM, anti-lock brake computer, air bag system or any other vehicle system will cause vehicle malfunction.

Headlight and Tail Light Modifications

NOTICE:

To prevent current spike damage to the Body Control Module (BCM), do not splice into any lighting circuits

Headlight Flashers (Wig-wag)

NOTE:

It is recommended that wig-wag function is accomplished through a dedicated solution. Ford offers a high-output durable LED based solution that combines wig-wag, turn signal, and park lights.

Tail Light/Brake Light Flashers (Wig-wag)

Adding tail light flashers (wig-wag) to the brake light circuit requires that the splice location is inside the trunk area. Splicing into the brake light circuit at any other location will cause critical systems on the vehicle to malfunction. Circuit protection devices have been added to the vehicle to accommodate tail light flashers. These protection devices will only be effective if the tail light flasher (wig-wag) module is spliced into the section of the brake light circuit that is in the trunk area.

Disabling Brake Lights

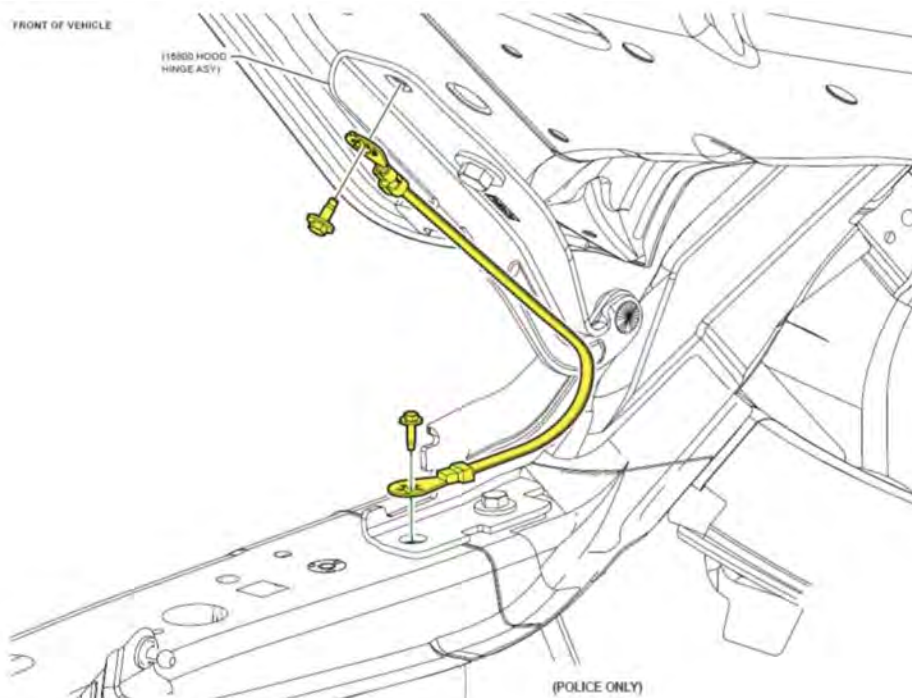
Do not disable the brake light circuits for any reason. For additional information, refer to Section 2: General Information in this guide.

Brake Applied Signal

For brake output circuit see 14-way connector pin 8 in BU5T-14A459-BA located at bottom of instrument panel above driveline tunnel between front seats. For access to this connector, remove valence panel per process in Chapter 2 Front Power Access and Vehicle Signals.

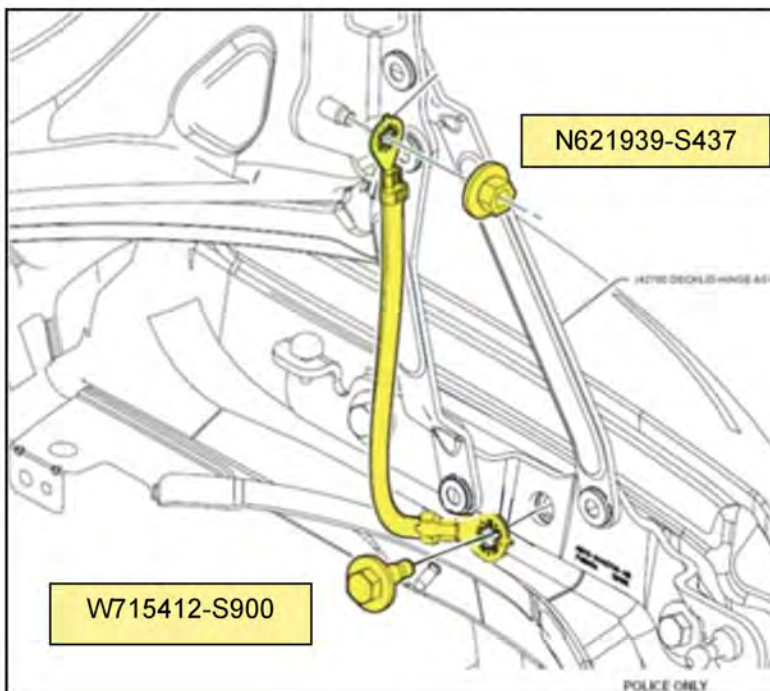
Section 2: Electrical

Sedan Intercepter - Front Ground Strap - Passenger Side Hood



N0140615

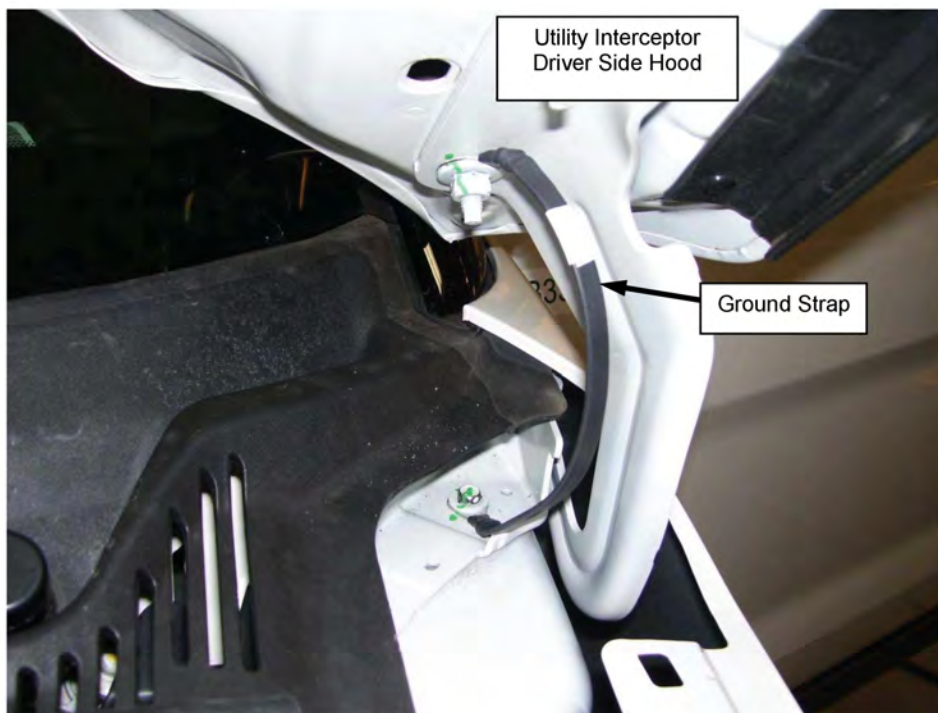
Sedan Intercepter - Trunk Lid Strap - Passenger Side



N0140616

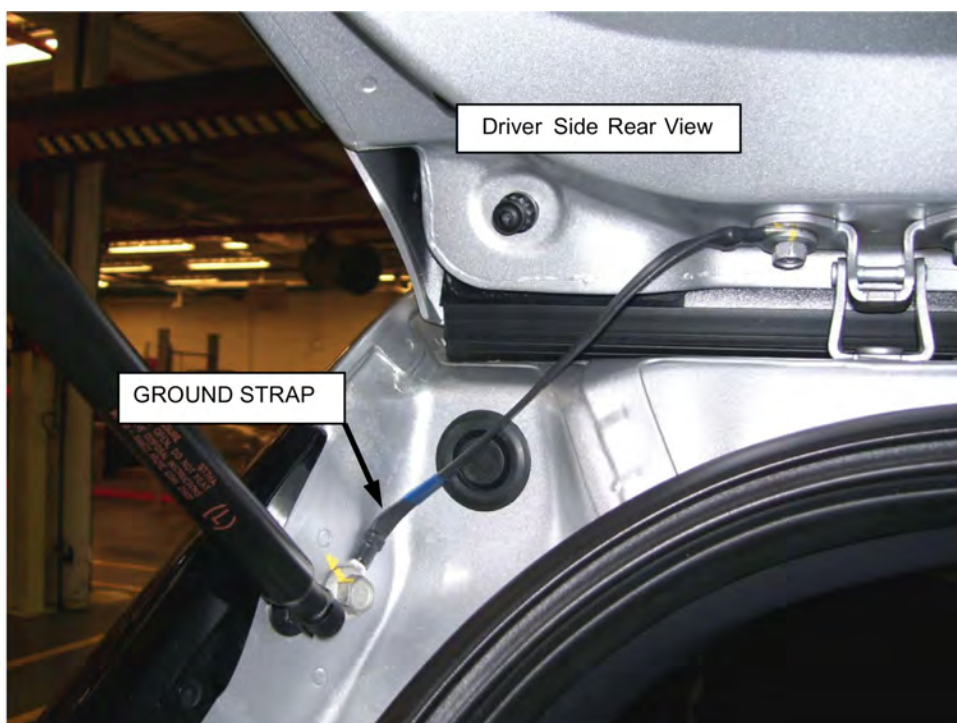
Section 2: Electrical

Utility Interceptor - Front Ground Strap - Passenger Side Hood



N0140617

Utility Interceptor - Liftgate - Driver Side



N0140618

Section 2: Electrical

Regular Production Options (RPO)

Product Information see: www.fordpoliceinterceptor.com

Siren/Speaker

NOTICE:

Exposure to loud sounds can damage hearing. Hearing by those inside or outside in near proximity of the vehicle can be damaged. Hearing protection should always be used with exposure to sirens and horns. Sirens and horns should not be turned on indoors that will expose yourself or others to the sound generated. Refer to federal, state, and or local recommendations for requirements applicable to your area. Guidance is provided in OSHA Standard 1910.95 under "Permissible Noise Exposure".

- Exposure to sounds produced by typical sirens and horns (near or greater than 120 dB) could result in permanent hearing loss.
- Certain packages for both the Sedan and Utility Police Interceptors include system designed siren amplifiers and speakers. Using a siren and/or speaker(s) from other manufacturers may reduce the output, the overall warning effectiveness of the siren system and possibly cause reduced component useful life. Your system should be tested to conform to federal, state, and local performance standards. Packages for the Sedan and Utility Police Interceptors are tested to SAE J1849, 500 feet audibility, OSHA Sound Compliance Standards and have been salt spray tested for corrosion and durability.
- Adhere to all Ford Police Interceptor Modifier Guide, Owners Manual, diagnostic manual safety and precaution procedures when servicing or relocating the vehicle or warning system.
- Loud sounds can damage your hearing as well as others in or within close proximity to your emergency vehicle. Exposure to very loud sounds in short duration or longer duration to moderately loud sounds can also damage hearing. For hearing conservation guidance, refer to federal, state, or local recommendations. OSHA Standard 1910.95 provides guidance on "Permissible Noise Exposure"
- Effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your and others' exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.
- Siren amplifiers and speakers are designed to work together as a system. Combining a siren and speaker from different manufacturers may reduce the warning effectiveness of the siren system and may damage the components. You should verify or test your combination to make sure the system works together properly and meets federal, state and local standards or guidelines. The factory installed components are tested and verified to support SAE J1849, 500 ft. Audibility, OSHA Sound Compliance Standards, and have been salt spray tested for durability.
- Frequently inspect the speaker to ensure it is clear of any obstruction, such as mud or snow, which will reduce maximum sound output and could lead to premature speaker failure.
- Follow all safety and precautions procedures in the Ford Police Interceptors Modifier Guide, Owners Manuals and diagnostic manuals when servicing or moving this equipment.

NOTICE:

The lives of people depend on your safe operation of this system. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:

Signaling Limitations

- Be aware that the use of your visual and audible signaling device does not give you the right to force your way through traffic. Your emergency lights, siren, and actions are REQUESTING the right-of-way.
- Although your warning system is operating properly, it may not alert everyone. People may not hear, see or heed warning signal. Your must recognize this fact and continue driving cautiously.
- Situations may occur which obstruct your warning signal when natural or man made objects are between your vehicle and others.

Driving Limitations

- At the start of your shift, you should make sure that the light/sound system is securely attached to the vehicle and operating properly.
- If the unique combination of emergency vehicle equipment installed in your vehicle has resulted in the siren controls being installed in a position that does not allow you to operate them by touch only, OPERATE CONTROLS ONLY WHILE YOUR VEHICLE IS STOPPED.
- If driving conditions require your full attention, you should avoid operating the siren controls while the vehicle is in motion.
- File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees.
- Failure to follow these safety precautions may result in property damage, serious injury, or death to you, to passengers, or to others.

Configuration Instructions

The factory installed system is an extremely versatile electronic siren and light control system. Available siren tones are: wail, yelp, priority, hi-lo and an air horn sound. Horn ring control of siren tones is provided. Public address and radio rebroadcast are also available. Eight relays are available for controlling light bars, other auxiliary lights and accessories.

Section 2: Electrical

For operations and configuration instructions, refer to the corresponding section of this manual.



WARNING:

Property damage, serious injury, or death to you or to others may result if the factory installed system is improperly programmed.

Programming, if desired by the police agency, is to be performed at the time of installation. It is NOT intended for operators to "customize" the unit's operation for their individual preferences. It is the police agencies' responsibility to determine compatibility, suitability, and ensure proper programming of the factory installed system.

The person responsible for programming MUST be familiar with local codes and procedures for safe emergency vehicle siren and light operation.

- Since many factory installed features are programmable, operation is described for the "Standard" program. Refer to the supplied Operation and Configuration section of this manual for additional discussion of the "standard" program. It is the operator's responsibility to understand how his particular unit is configured (programmed) to operate.
- The factory installed key pad is designed to assist the operator's selection of functions. Each control head switch is recessed and aids in guiding the operator's finger to the switch's center for activation. When a switch is pressed, tactile feedback provides function selection indication as follows: a click is felt, a beep is heard, and the selected function's key illuminates brightly.

Individual LED Flash Pattern Programming



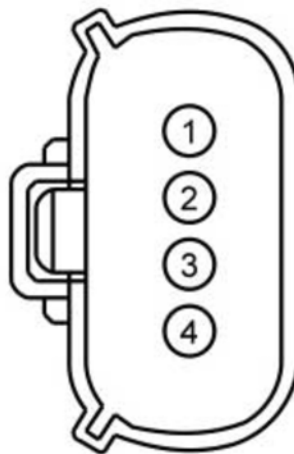
WARNING:

Police Package warning lights are a high-intensity Light-Emitting Diode (LED) type. Do not stare directly at these lights, as doing so may cause temporary blindness and/or eye damage. Failure to follow this instruction may result in personal injury.

NOTE:

When cycling through flash patterns, most flash patterns include an off/on pattern followed by an inverse on/off pattern. Setting the LED on one side to the on/off and the other to off/on creates the alternating pattern effect which should not be confused with synchronization which applies to the pattern timing between LED groups. For proper synchronization, the correct flash patterns must be selected for the individual flashing LEDs. Refer to the Explorer, Taurus Police Interceptor Modifier Guide for specific flashing LED patterns.

1. Disconnect the flashing LED to be programmed.
2. Connect ground to pin 4, component side of the flashing LED.



N0146097

Section 2: Electrical

Connector Pin #	Circuit #	Signal Name/Function
1		Power from I/P Blunt
2		Scan Lock (CAP04 <=> LT, cap05 <=> RT)
3		Sync
4	GD	GND

N0141106

NOTICE:

This step will activate the individual flashing LED. The flashing LED must be active to change the flash pattern.

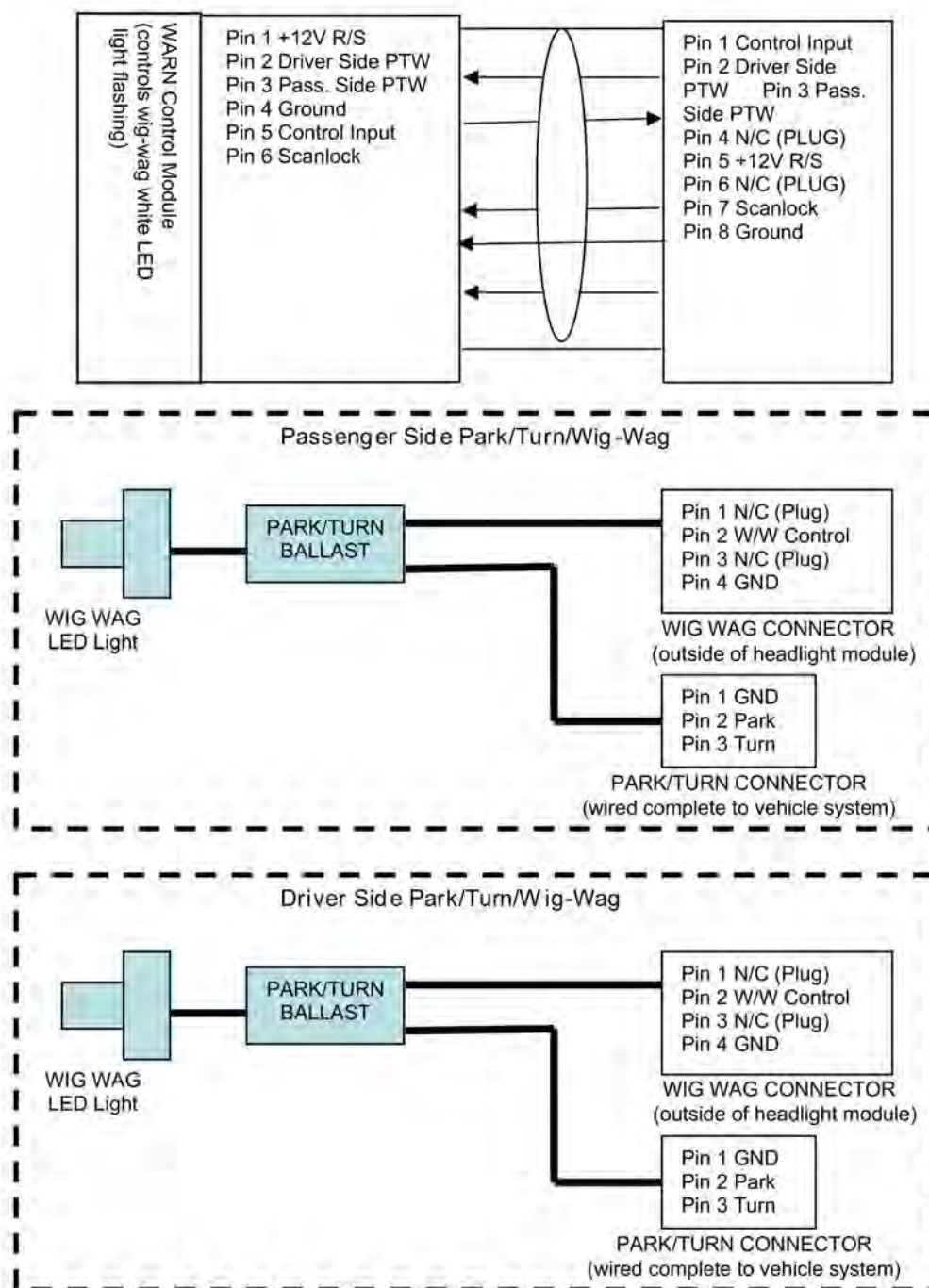
3. Connect 12 volts to pin 1, component side of the flashing LED.
4. Change the flashing LED flash pattern:
 - To cycle forward to the next pattern, connect 12 volts to pin 2, component side of the flashing LED for less than 1 second.
 - To cycle back to the previous pattern, connect 12 volts to pin 2, component side of the flashing LED for greater than 1 second.

Sedan/Utility Interceptor Wig-Wag

WARN Control Module controls the wig-wag (white LED lights in headlight module) alternating flash.

- With full OEM wire harness, no further wiring is required for wig-wag function. The amber turn signal/Park function is wired complete into the vehicle harness and will function without additional wiring.
- Without full OEM wire harness, upfit wiring is required to connect the control circuit, WARN control module and white LED wig-wag light pigtail for wig-wag function. The amber turn signal/Park function is wired complete into the vehicle harness and will function without additional wiring.

Section 2: Electrical



N0146596

Group LED Flash Pattern Programming

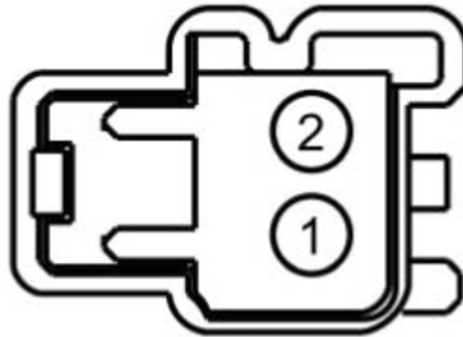
NOTE:

When cycling through flash patterns, most flash patterns include an off/on pattern followed by an inverse on/off pattern. Setting the LED on one side to the on/off and the other to off/on creates the alternating pattern effect which should not be confused with synchronization which

Section 2: Electrical

applies to the pattern timing between LED groups. For proper synchronization, the correct flash patterns must be selected for the individual flashing LEDs. Refer to the Explorer, Taurus Police Interceptor Modifier Guide for specific flashing LED patterns.

1. Activate the flashing LEDs in the group to be programmed.
2. Locate the pattern programming circuits at in-line C4231. To change the flashing pattern:
 - Sedan - Connector C4231 located right side of trunk
 - Utility - Connector C4231 located in the left rear corner of the vehicle near floor.



N0146096

3. For park/turn/warn, grille, front corner and tail lamp flashing LEDs:
 - To cycle forward to the next pattern, connect 12 volts to pin 2 of in-line C4231 for less than 1 second.
 - To cycle back to the previous pattern, connect 12 volts to pin 2 of in-line C4231 for greater than 1 second.
4. For high mount and deck lid flashing LEDs:
 - To cycle forward to the next pattern, connect 12 volts to pin 1 of in-line C4231 for less than 1 second.
 - To cycle back to the previous pattern, connect 12 volts to pin 1 of in-line C4231 for greater than 1 second.

NEW Utility - Standard Feature On Utility Police Interceptor Rear Cargo Door Release

The independent liftgate locking feature provides a means to enable and disable the liftgate to be opened/released using the external liftgate release switch on the liftgate.

Switch the ignition to the run, start or accessory position. Pull and release the liftgate control on the overhead console.

NOTE:

Only the liftgate unlocks. All the other passenger doors remain in the previous locking state.

A warning lamp illuminates in the instrument cluster for 45 seconds. You can then open the liftgate using the exterior release button.

Once the 45 second timer expires, the lamp turns off and you can no longer open the liftgate. Pull and release the liftgate control on the overhead console again to restart the timer.

NOTE:

You can also unlock the liftgate by using the key blade inserted into the liftgate lock cylinder.

The liftgate locks when any of the following occur:

- You open and close the liftgate after you pull and release the liftgate control on the overhead console.
- The 45 second timer expires.

Opening The Liftgate With The Key FOB Liftgate Button (if Equipped)

Press the button to unlock the liftgate. The liftgate unlocks for 45 seconds, during which time you can open the liftgate using the exterior liftgate release button.

Section 2: Electrical

NOTE:

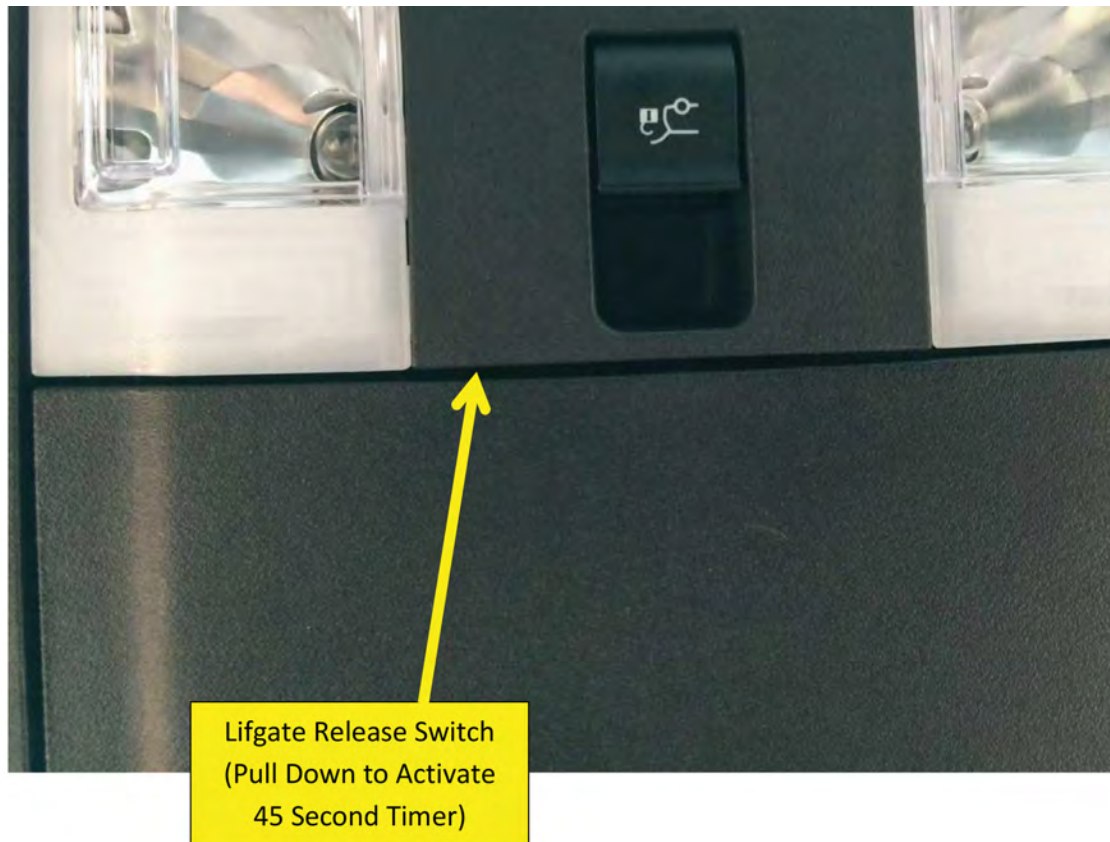
Only the liftgate unlocks. All the other passenger doors remain in the previous locking state.

NOTE:

If you do not open the liftgate within 45 seconds of unlocking it, the liftgate locks again. Press the button on the remote control or use the key blade inserted into the liftgate lock cylinder to unlock the liftgate again.

NOTE:

The liftgate does not unlock when you unlock all the doors using the remote control or power door lock control.



N0170848

Section 2: Electrical



N0165652

Sedan - Luggage Compartment Lid Release Switch

The new standard configuration is effective with all job 1 orders

- Sedan Interceptors are shipped from the assembly plant with trunk release activated on Run/Start power.
- Converting to activate trunk release on Battery power, hot all the time, requires Integrated Diagnostic Service (IDS) tool to enable this function.

NEW Sedan Second Luggage Compartment Lid Release Switch

New for 2016 Model Year Sedan Police Interceptor

Standard Feature on Sedan Police Interceptor

- The addition of a second trunk release switch that is located in the overhead console between the map lights in the headliner at top of windshield. It activates the trunk release by pulling downward and away from the overhead console.
- This switch provides 2nd method for trunk release if access to the existing trunk release button on the instrument panel is covered by items such as a laptop.
- This 2nd switch function provides the same function as the existing push-button switch on the instrument panel. When activated, it releases the trunk lid.

Section 2: Electrical



N0167443

Sedan Upfitter Wire Bundle Dash Panel Pass-Through

Certain Police Interceptor vehicles come equipped with auxiliary dash panel pass-through wire circuits (upfitter auxiliary) depending on selected option packages.

New for 2015 MY, the **standard** upfitter auxiliary pass-through wire circuits (6 twisted pairs) can be used by the vehicle modifier.

- The vehicle interior end of the auxiliary upfitter circuits is found beneath the instrument panel near the Body Control Module (BCM).
- The underhood end of the auxiliary upfitter circuits is found taped to a harness underhood near the Battery Junction Box (BJB).

1. Twisted Pair A (20AWG)

- White
- White / Blue

2. Twisted Pair B (20AWG)

- Yellow
- Yellow / Black

3. Twisted Pair C (20AWG)

- Green
- Green / White

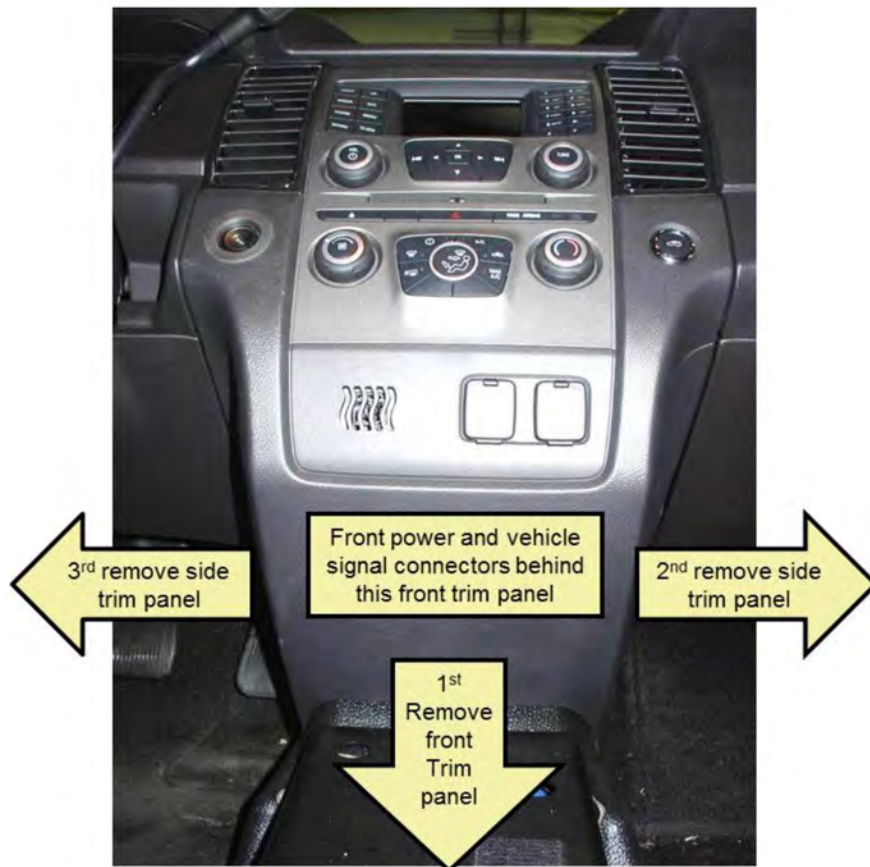
4. Twisted Pair D (20AWG)

- Blue
- Blue / White

Section 2: Electrical

5. Twisted Pair E (14AWG)
 - Orange
 - Orange / Black
6. Twisted Pair E (14AWG)
 - Black
 - Black / White

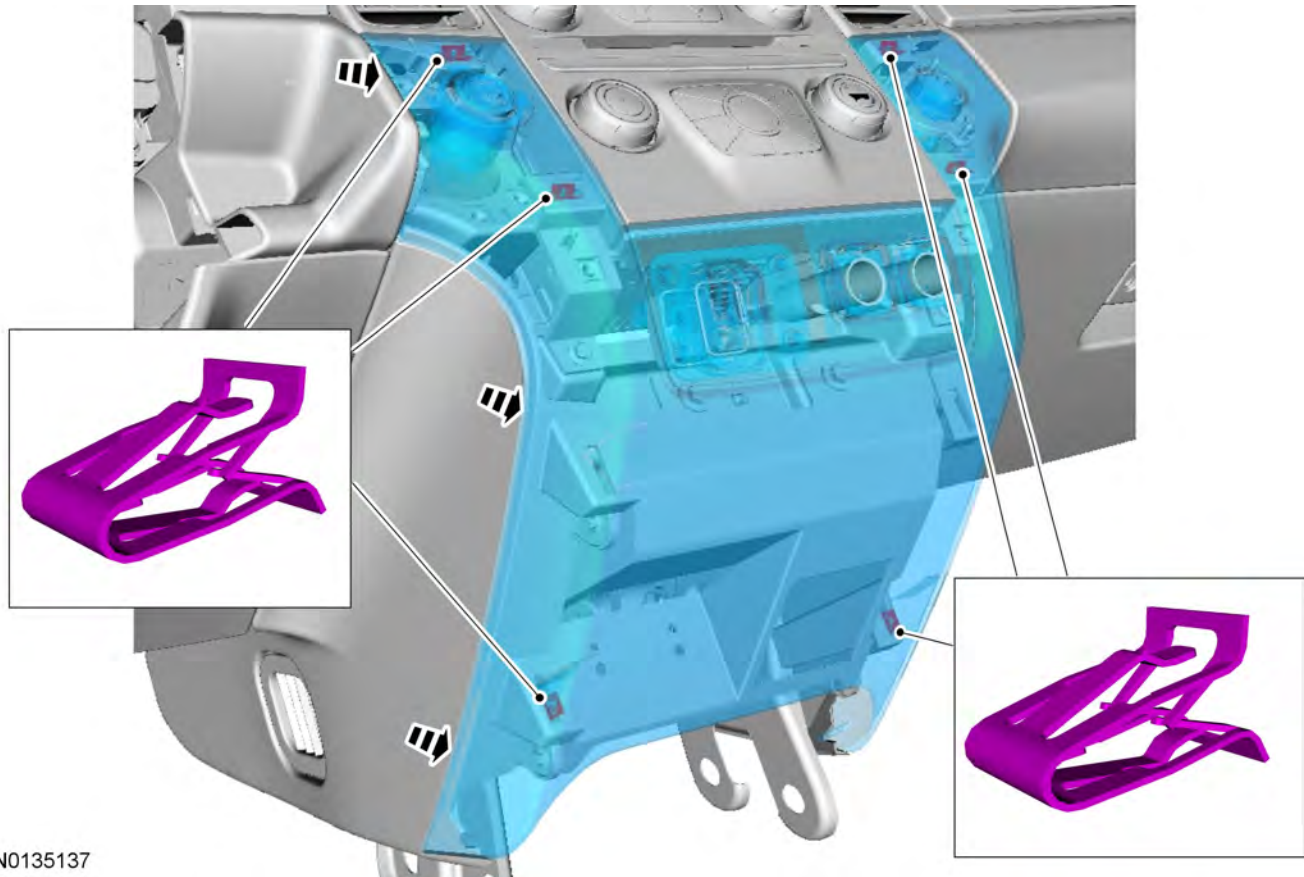
Sedan — Lower Center Instrument Panel Removal and Installation



N0151478

1. Remove the lower center instrument panel finish panel.

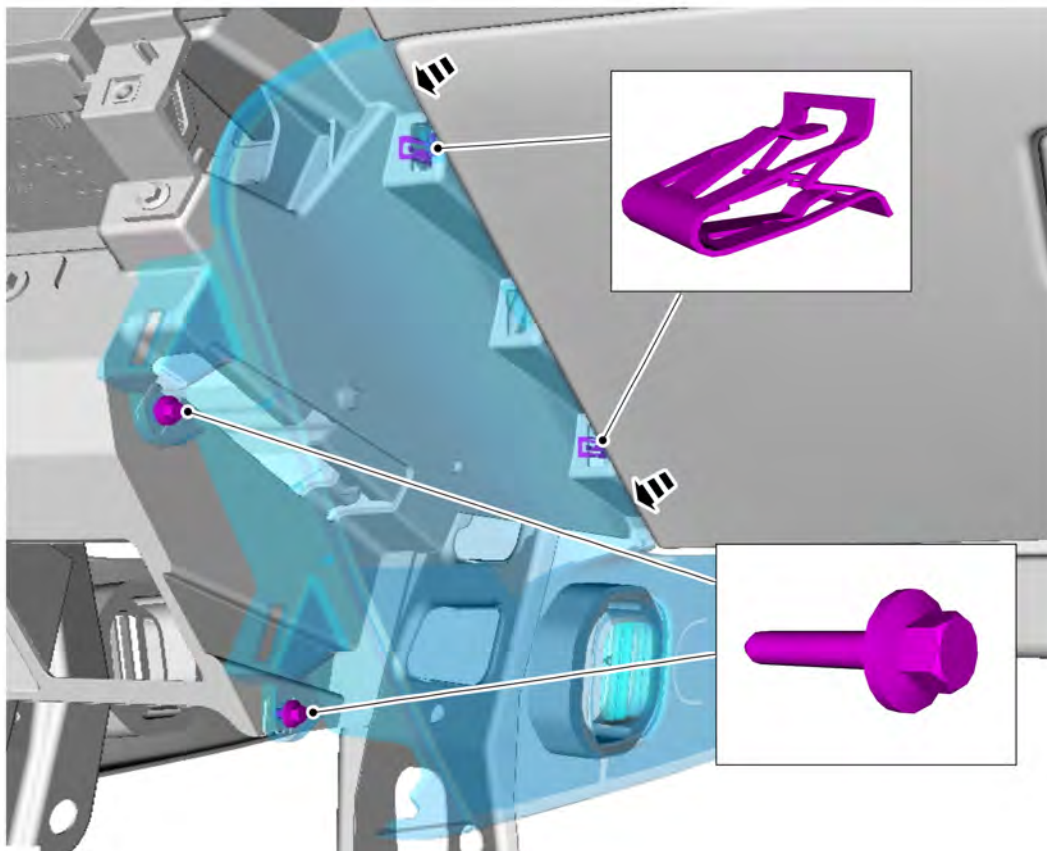
Section 2: Electrical



N0135137

2. Remove the LH and RH lower cowl panel side trim.

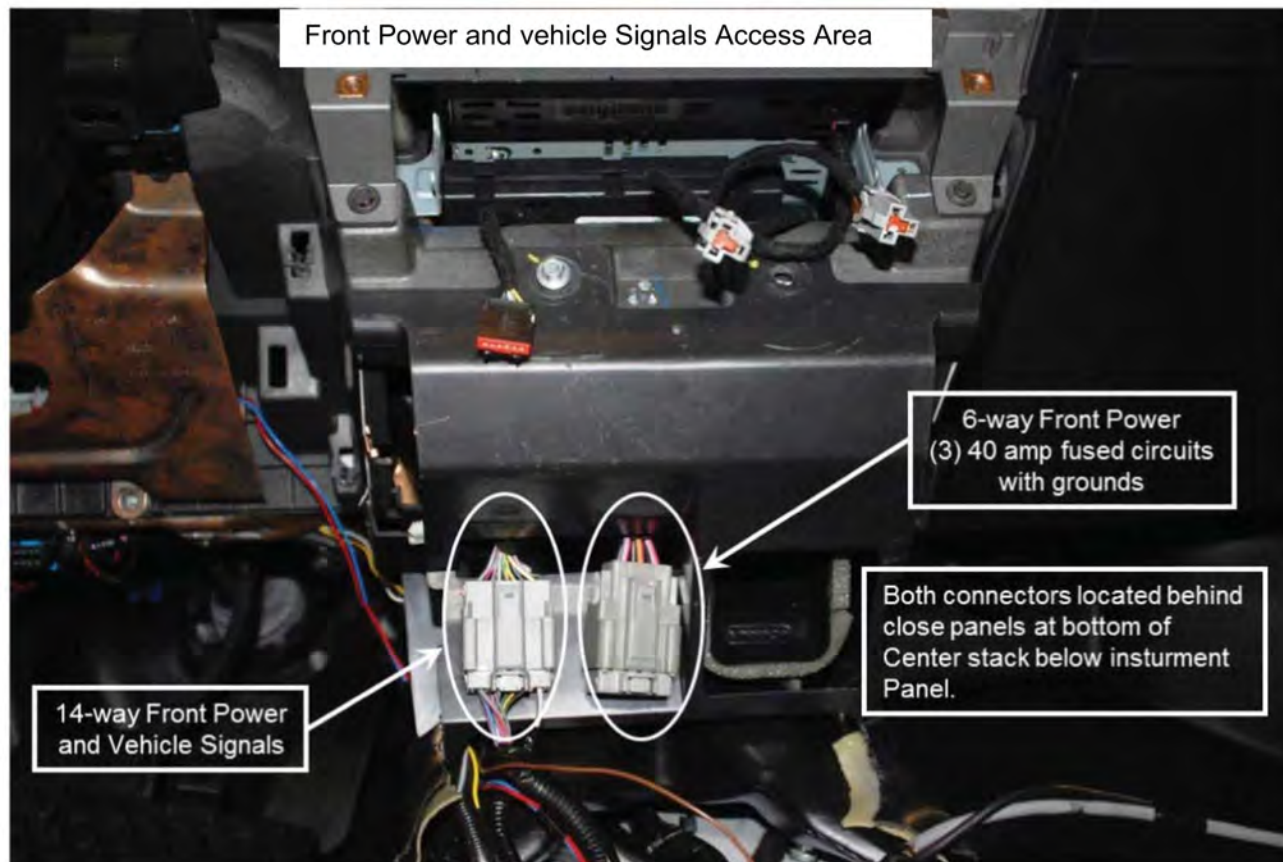
Section 2: Electrical



Sedan — Front Power And Vehicle Signals Access Area

- Located behind lower center instrument panel trim panels
- Siren speaker at Instrument panel center stack (4 Pin)
- Power/vehicle signals at instrument panel center stack (14 Pin)
- Police lights at instrument panel center stack (14 Pin)
- Police radio connector at instrument panel/center stack (4 Pin)
- 40A auxiliary power at instrument panel/center stack (6 Pin)

Section 2: Electrical



N0151471



Part# 3U2Z-14S411-BJAC



Part# 3U2Z-14S411-HEA

N0151470

Connector View For Connector 3U2Z-14S411-HEA (continued on the next page).

Pin Number	Description	Fuse	Wire Color
1	B+ (40A)	BJB #40	VT-RD
2	B+ (40A)	BJB #6	BN-RD
3	B+ (40A)	BJB #16	VT-RD
4	Ground	IP Tunnel	BK-BJ

Section 2: Electrical

(Continued)

5	Ground	IP Tunnel	BK-BJ
6	Ground	IP Tunnel	BK-BJ

Connector View For Connector 3U2Z-14S411-BJAC.

Pin Number	Description	Fuse	Wire Color
1	B+ Feed #1 (20A)	IP #2	GY-RD
2	Steering Wheel Switch #1 Output (1A) Grnd	GNRL Function Module	GY-BN
3	Steering Wheel Switch #2 Output (1A) Grnd	GNRL Function Module	WH-VT
4	Steering Wheel Switch #3 Output (1A) Grnd	GNRL Function Module	GN-BN
5	Steering Wheel Switch #4 Output (1A) Grnd	GNRL Function Module	YE-GY
6	Start (2A)	BJB #95	BN-BU
7	Run/Start #1 (20A)	BJB #73	WH-BN
8	B+ Feed #2 (20A)	IP #32	BU-RD
9	Vehicle Speed Output (VSS)	PCM	VT-OG
10	Delay Accessory (15A)	IP #17	GN-VT
11	B+ Feed #2 (15A)	IP #5	YE-RD
12	Park Detect Signal (Transmission)	Sifter GRND	GN
13	Driver Door Ajar Signal	IP #9 GRND	GN-VT
14	Run/Start #2 (20A)	IP #74	VT-BN

NOTE:

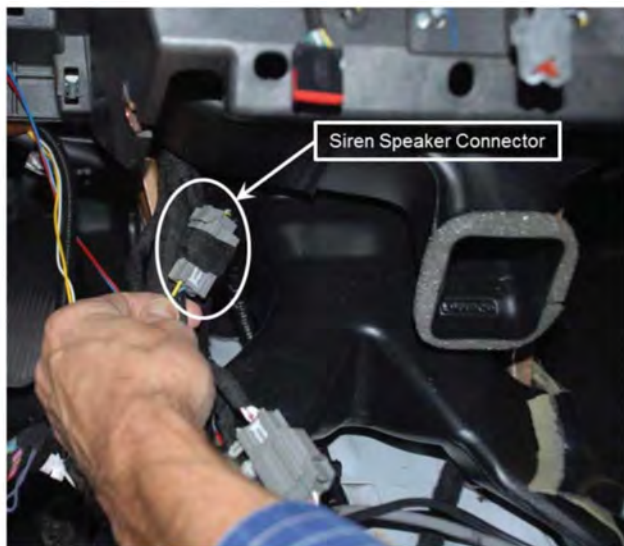
Fuse sizes are given to help locate the fuse in the Power Distribution Box (PDB). Ford recommends that current be limited to 85% of the value: 20 Amp should be limited to 17 Amp 15 Amp should be limited to 12 Amp.

Park Detect: Sources a ground when the vehicle is in park. This circuit is capable of grounding 1 Amp.

Driver Door Ajar: This circuit is a sense only grounded circuit when the door is closed. It is used to supply a module that has pull up resistors in its input.

Section 2: Electrical

Sedan — Siren Speaker Connector



Siren Speaker Connector



Part# 3U2Z-14S411-LUB



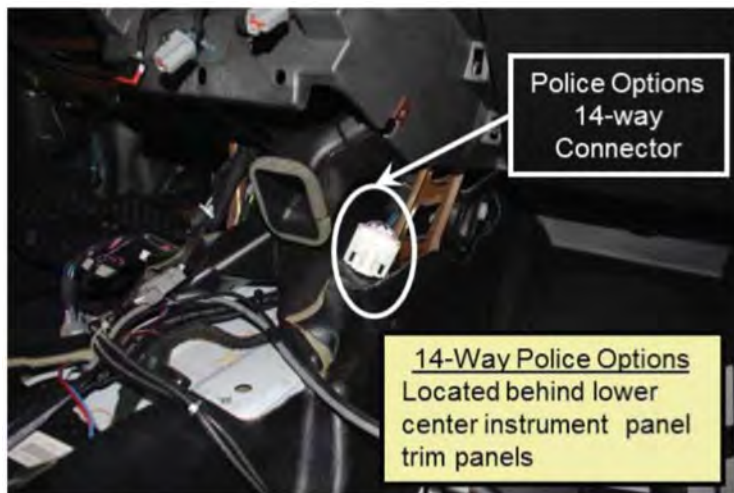
N0N0151473

Connector View For Connector 3U2Z-14S411-LUB.

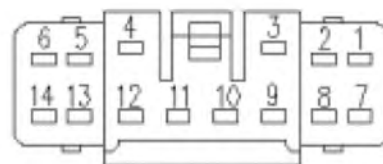
Pin Number	Description	Wire Color
1	Siren Driver Side Feed (+)	YE
2	Siren Shield Driver Side (-)	
3	Open Passenger Side Front (+)	
4	Siren Return Passenger Side Front (-)	BU-WH

Section 2: Electrical

Sedan — Police Options 14-Way Connector



Police Options 14-Way Connector



Part# CU2Z-14S411-APA



N0N015474

Connector View For Connector 3U2Z- 14S411-APA (continues on the next page).

Pin Number	Description	Wire Color
1	Wig Wag Control	VT
2	Front Corner LED Power Control	VT-OG
3	Front Flasher Power Control	BN-YE
4	Speaker (-) at Grille (Option)	GN-BU
5	Open	

Section 2: Electrical

(Continued)

6	Front Corner LED Light Sync	GY-OG
7	Dimmer	VT-GY
8	Brake Output Signal Ground	BU-OG
9	Speaker (+) at Grille (Option)	BN
10	Open	
11	Open	
12	Open	
13	Open	
14	LED Flash Pattern	GY-BN

Front WIGWAG Power: Supplies power to the wigwag connectors at the headlamps.

Front Flasher Power: Supplies power to the flasher relay.

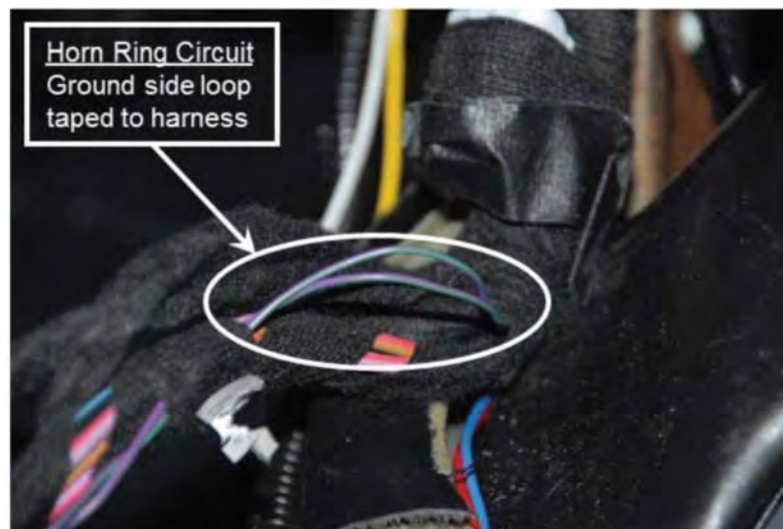
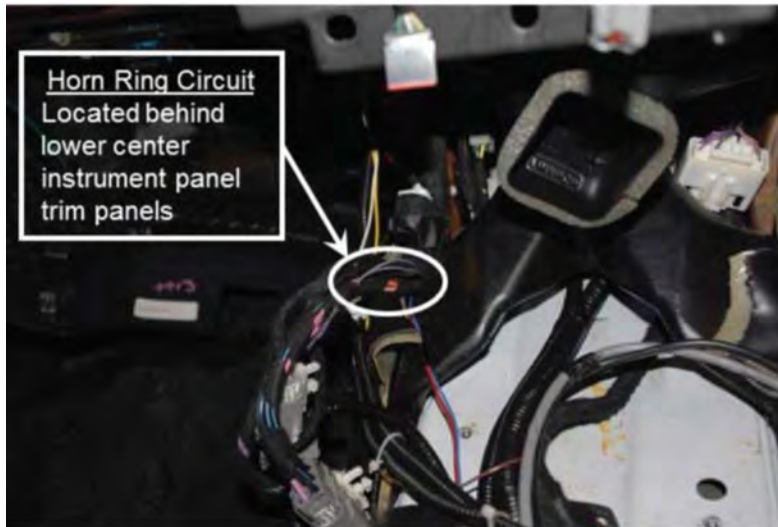
Dimmer: Circuit supplied to allow backlight dimming of aftermarket equipment.

Brake Output: Fused Brake output.

Sedan/Utility — Horn Ring Circuit

Ground side loop of horn ring circuit from Body Control Module (BCM) (sedan violet/Green) (utility green) wire loop taped to harness from above the opening in lower center instrument panel trim panels.

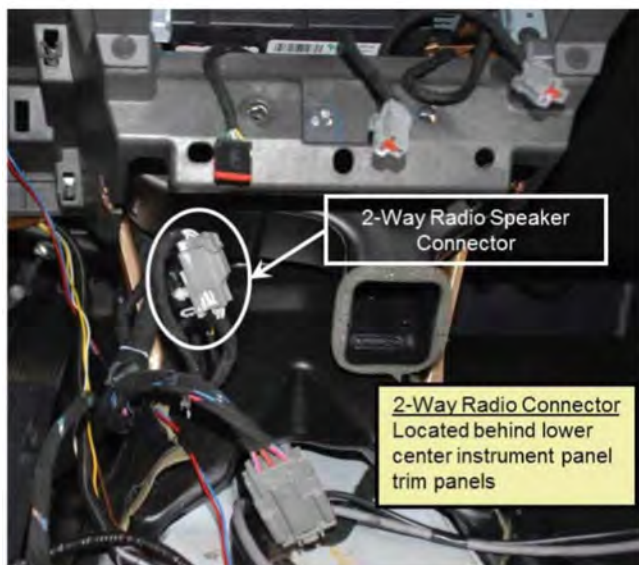
Section 2: Electrical



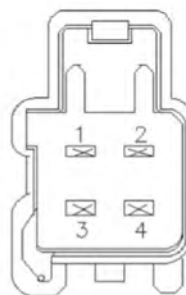
N0151475

Section 2: Electrical

Sedan — Radio and Speaker Connector



Radio and Speaker Connector



Part# 3U2Z-14S411-BUB



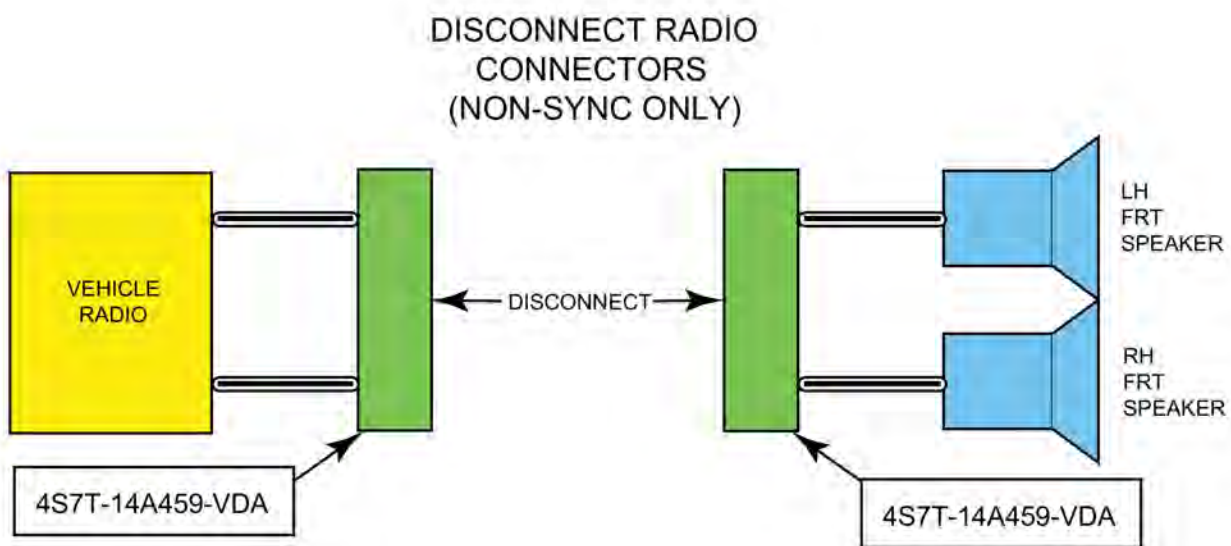
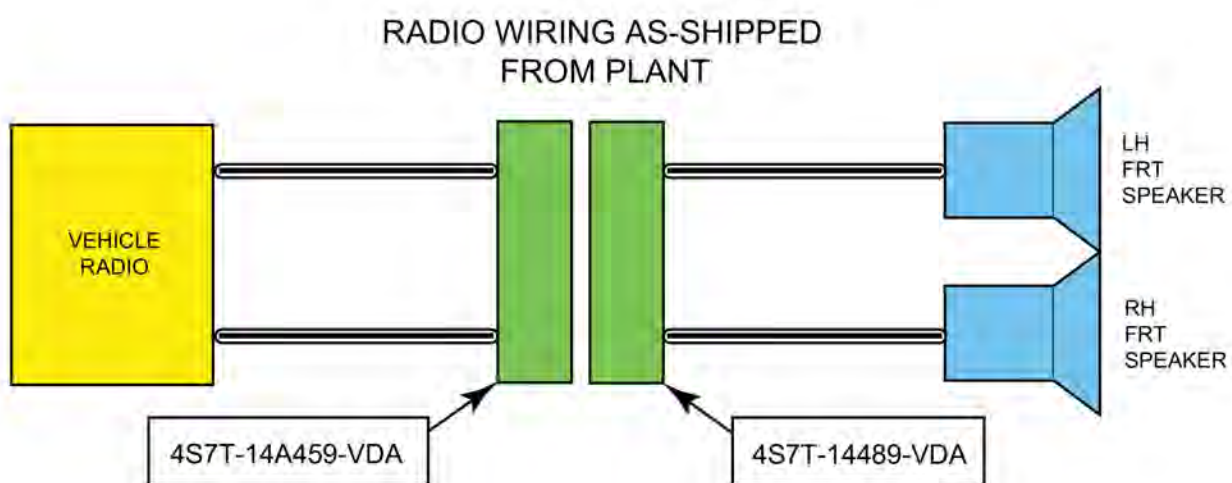
Part# 3U2Z-14S411-LUB

N0151472

Connector View For Connector 3U2Z- 14S411-BUB.

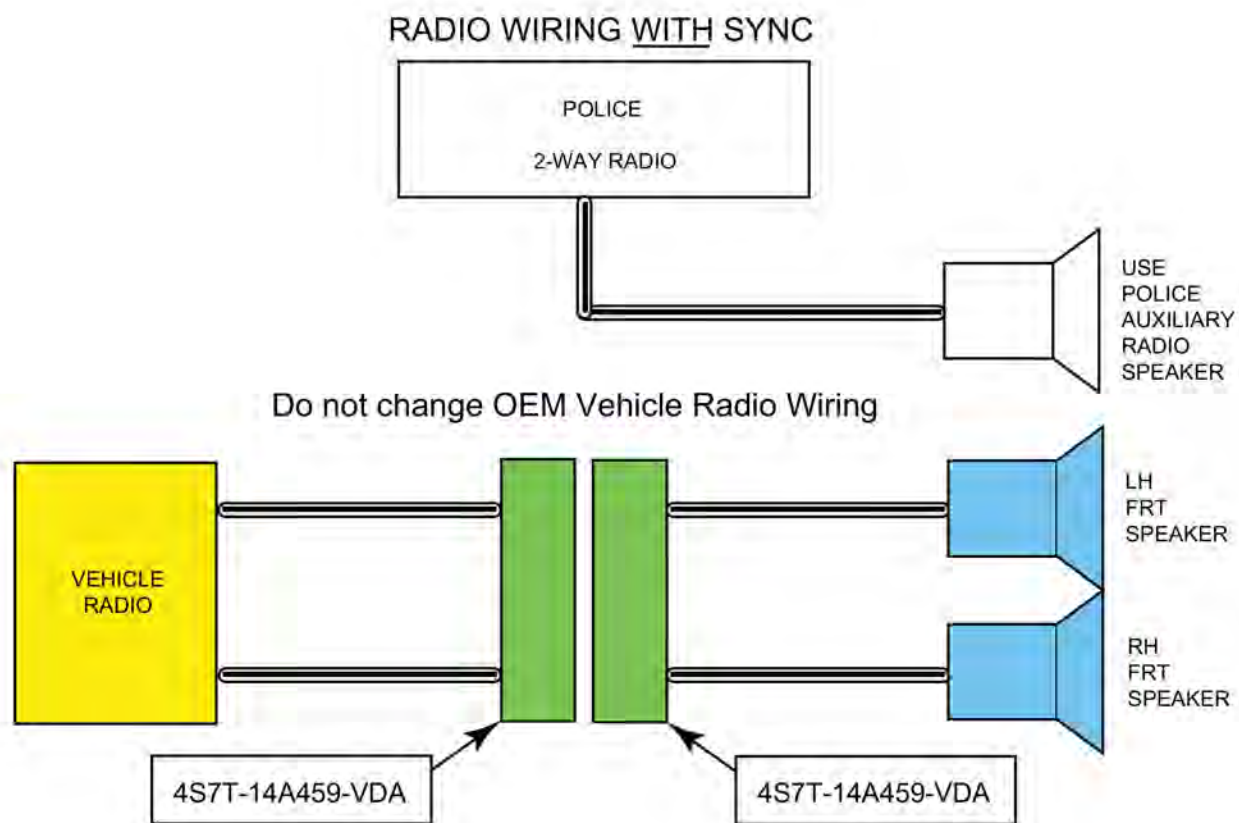
Pin Number	Description
1	Driver Side Front Speaker (+)
2	Driver Side Front Speaker (-)
3	Passenger Side Front Speaker (+)
4	Passenger Side Front Speaker (-)

Section 2: Electrical



N0150582

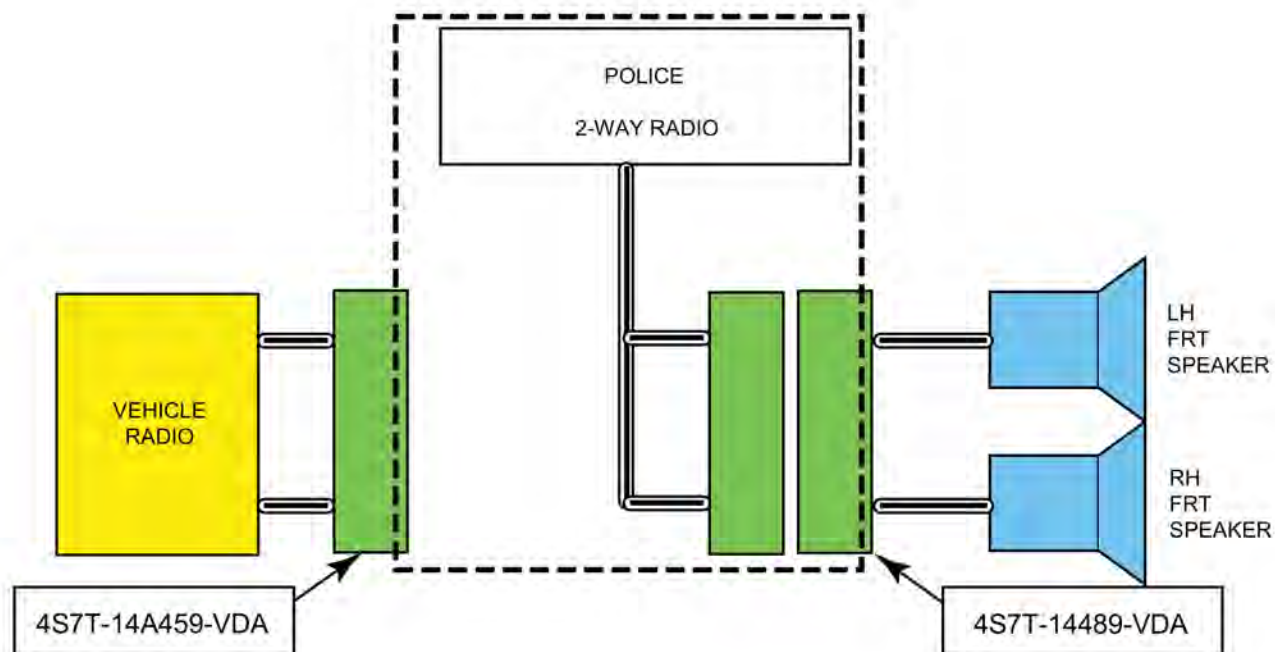
Section 2: Electrical



N0150583

Section 2: Electrical

INSTALL POLICE 2-WAY RADIO AND MAKE
CONNECTIONS TO OEM CONNECTORS
(NON-SYNC ONLY)



N0150581

Section 2: Electrical

Sedan – 4-Way Connector For All Police LED Light Heads



4-Way Connector For All Police LED Light Heads



N0151525

Connector View For Connector 8U2Z-14S411-TA

Pin Number	Description
1	Control Power
2	LED Light Pattern
3	LED Light Synch
4	Ground

Section 2: Electrical

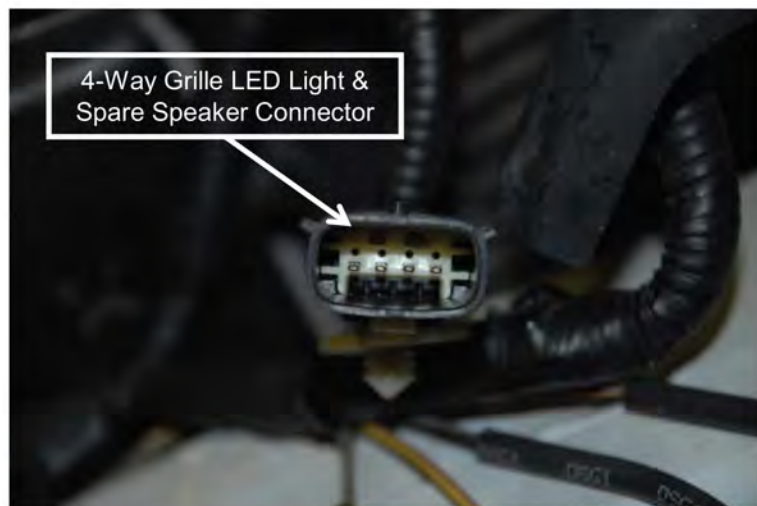
Sedan — Grille LED Light Connector



Grile LED Light Connector
Attached above front bumper



Part# 8U2Z-14S411-TA



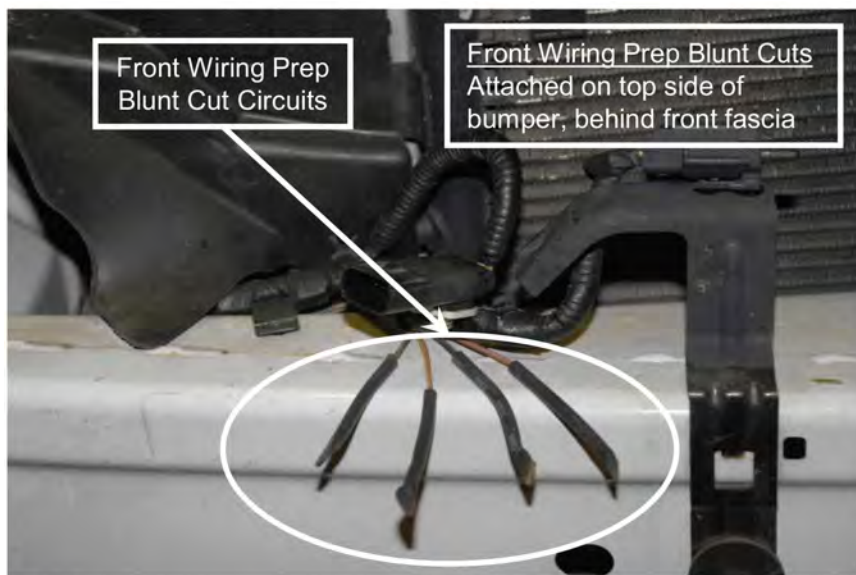
N0151479

Connector View For Connector 8U2Z-14S411-TA.

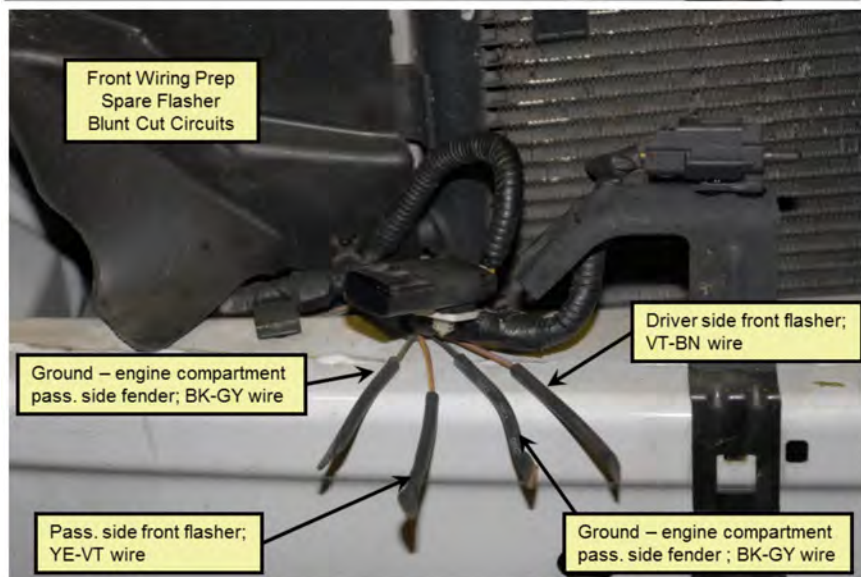
Pin Number	Description	Wire Color
1	Grille LED Light Ground	BN
2	Grille LED Light Pattern	GY-BN
3	Speaker (-)	GY-OG
4	Speaker (+) Spare	BK-GY

Section 2: Electrical

Sedan — Front Wiring Prep Blunt Cut Circuits



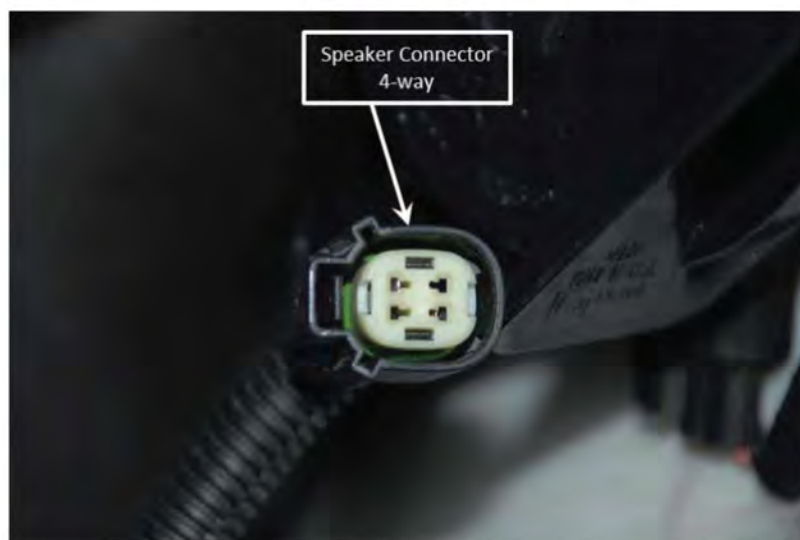
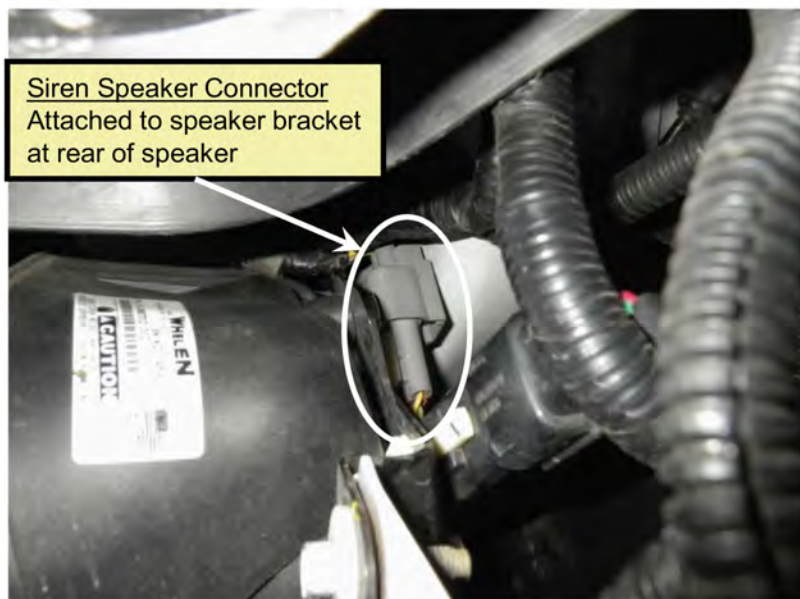
Front Wiring Prep Blunt Cut Circuits Attached to Front Bumper



N0151480

Section 2: Electrical

Sedan — Siren Speaker Connector



Siren Speaker Connector



Part# BU2Z-14S411-TA

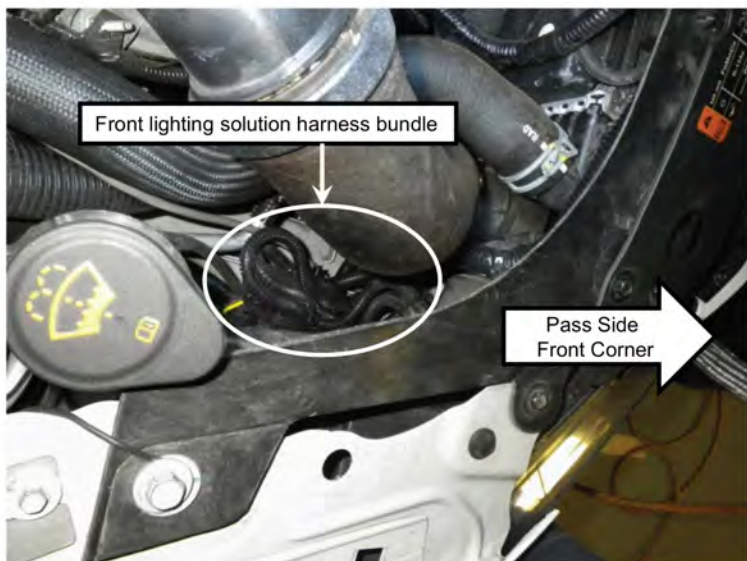
N0151481

Connector View For Connector BU2Z-14S411-TA.

Pin Number	Description	Wire Color
1	Siren (+)	YE
2	Open	
3	Open	
4	Siren (-)	BU-WH

Section 2: Electrical

Sedan — Front Lighting Solution Wig-Wag LED And Front Corner LED Lights Connector.



Front Lighting Solution Wig-Wag LED And Front Corner LED Lights Connector



Part # CU2Z-14S411-ALA



N0151482

Connector View For Connector CU2Z-14S411-ALA (continued on the next page).

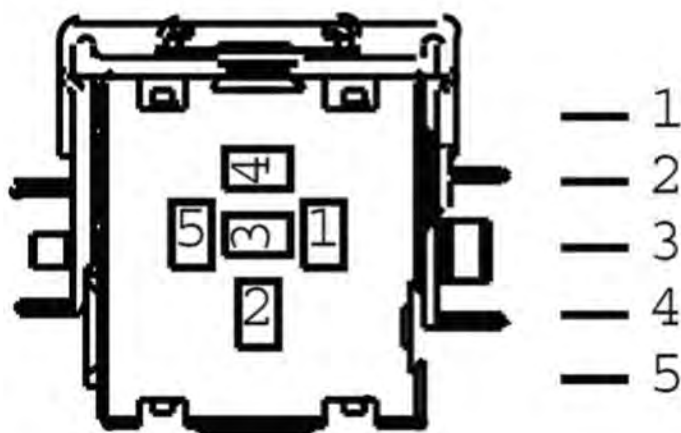
Pin Number	Description	Fuse	Wire Color
1	Wig-Wag Control		VT
2	Wig-Wag Passenger Side Pattern		GN-WH
3	Wig-Wag Driver Side Pattern		GY
4	Open		
5	Wig-Wag Run/Start (20A)	BJB #74	VT-BN

Section 2: Electrical

(Continued)

6	Front Corner LED Lights Control/Power		
7	Front Corner LED Lights Pattern		GY-BN
8	Wig-Wag Ground		BK-GY

Sedan — Flasher Relay



DU5T-14D089-AA

N0141078

Connector View For Connector DU5T-14D089-AA.

Pin Number	Circuit Number	Signal Name/Function
1		Flasher Power
2		
3		
4		Right Side Flasher Blunt Cut
5		Left Side Flasher Blunt Cut

N0141079

Front flasher power is supplied through the second 14 way power connector and is available on the sedan and utility. The right and left blunt cuts are located in the front grille area.

The rear flasher relay is used to turn modifier supplied decklid flashers on in the Sedan when the trunk is open.

NOTE:

Fuse sizes are given to help locate the fuse in the PDB. Ford recommends that current be limited to 85% of the value (40 Amp should be limited to 34 Amp).

Section 2: Electrical

Sedan — Pigtail Information

2013MY SEDAN/UTILITY POLICE INTERCEPTOR PIGTAIL INFORMATION							
CONNECTOR PICTURE	HARNESS	DEVICE	CONN. TYPE	PIN	FUNCTION	Service Pigtail #	INFO
	14290	POL FLASH	8-WAY	1 2 3 4 5 6 7 8	WW INPUT WW RH PTRN/PWR WW LH PTRN/PWR WW R/S STROBES PWR PATTERN WW GND	CU2Z-14S411-ALA	Must splice cavities 1 and 6 together if function is not being used. Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	LH WIG WAG RH WIG WAG	4-WAY	1 2 3 4	WW INPUT WW SCN LOCK WW SYNC WW GND	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	SIREN SPEAKER	4-WAY	1 2 3 4	SIREN + (UNUSED) (UNUSED) SIREN -	BU2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	LH SIDE CORNER MARKER RH SIDE MARKER	4-WAY	1 2 3 4	Power Pattern Sync GND	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	GRILLE & LOUD SPEAKER	4-WAY	1 2 3 4	TDM GRL GND TDM PATTERN LD SPKR - LD SPKR +	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14401	POLICE POWER & VEHICLE SIGNALS	14-WAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14	WIGWAG LAMP CONTROL SIDE LAMP PWR CONTROL FRONT FLASHER PWR CONTROL LOUDSPEAKER NEG OPEN SIDE LAMP SYNC CONTROL DIMMER BRAKE OUTPUT LOUDSPEAKER PWR/TDM GRILL OPEN OPEN OPEN OPEN SIDE STROBE PATTERN	CU2Z-14S411-APA	0.64 CAVITIES- 2TAD-0.75mm 2.8 CAVITIES- 2TAD-1.0mm 0.64 CAVITIES- 1/2/5/6/7/8/13/14 TERMINAL 3F2T-14474-RA 2.8 CAVITIES- 3/4/9/10/11/12 TERMINAL 97BG-14474-8BA
	14401	SIREN	4-WAY	1 2 3 4	SIREN FEED/LEFT FRONT SPK + SIREN SHIELD/LEFT FRONT SPK - OPEN/RIGHT FRONT SPK + SIREN RETURN/RIGHT FRONT SPK -	3U2Z-14S411-LUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14474-ABB
	14401	2-WAY RADIO	4-WAY	1 2 3 4	LEFT FRONT SPK + LEFT FRONT SPK - RIGHT FRONT SPK + RIGHT FRONT SPK -	3U2Z-14S411-LUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14474-ABB
	14401	2-WAY RADIO	4-WAY	1 2 3 4	LEFT FRONT SPK + LEFT FRONT SPK - RIGHT FRONT SPK + RIGHT FRONT SPK -	3U2Z- 14S411-BUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14421-ABB
	14401	POLICE FEATURES & BRAKE OUTPUT	14-WAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14	B+ FEED 17AMP CNTRL BUTTON 1 CNTRL BUTTON 2 CNTRL BUTTON 3 CNTRL BUTTON 4 POL START POL_R/S #1 B+ FEED #2 17AMP VSS DEL ASSY B+ FEED #3 12AMP PARK DETECT DRV DOOR ALARM POL_R/S #2	3U2Z-14S411-BJAC	1.5 CAVITIES- 0.75mm 2.8 CAVITIES- 1.5mm 0.64 CAVITIES- 2/3/4/5/6/9/10/11/12/13 TERMINAL 97BG-14474-ABB 2.8 CAVITIES- 17/7/8/14 TERMINAL 97BG- 14474-8CA WIRE TYPE- 2TAD
	14401	POLICE POWER	6-WAY	1 2 3 4 5 6	POLICE B+ 34AMP POLICE B+ 34AMP POLICE B+ 34AMP GROUND GROUND GROUND	3U2Z- 14S411-HEA	WIRE TYPE- 2TAD-0.50mm TERMINAL 97BG-14474-CCA
	14AZZ7 (0258 ONLY)	POLICE INLINE	2-WAY	1 2	CHMSL LAMP DECKLID	3U2Z- 14S411-LAB	WIRE TYPE- 2TAD-0.50mm TERMINAL 97BG-14421-ABB

N0150616

Sedan — Rear Power Access

The rear power access point is a battery access port for police auxiliary equipment mounted in the trunk. It is capable of supplying 80 amps of battery voltage. Voltage to the positive terminal of the rear power access point is supplied through two 50A fused circuits crimped together,

Section 2: Electrical

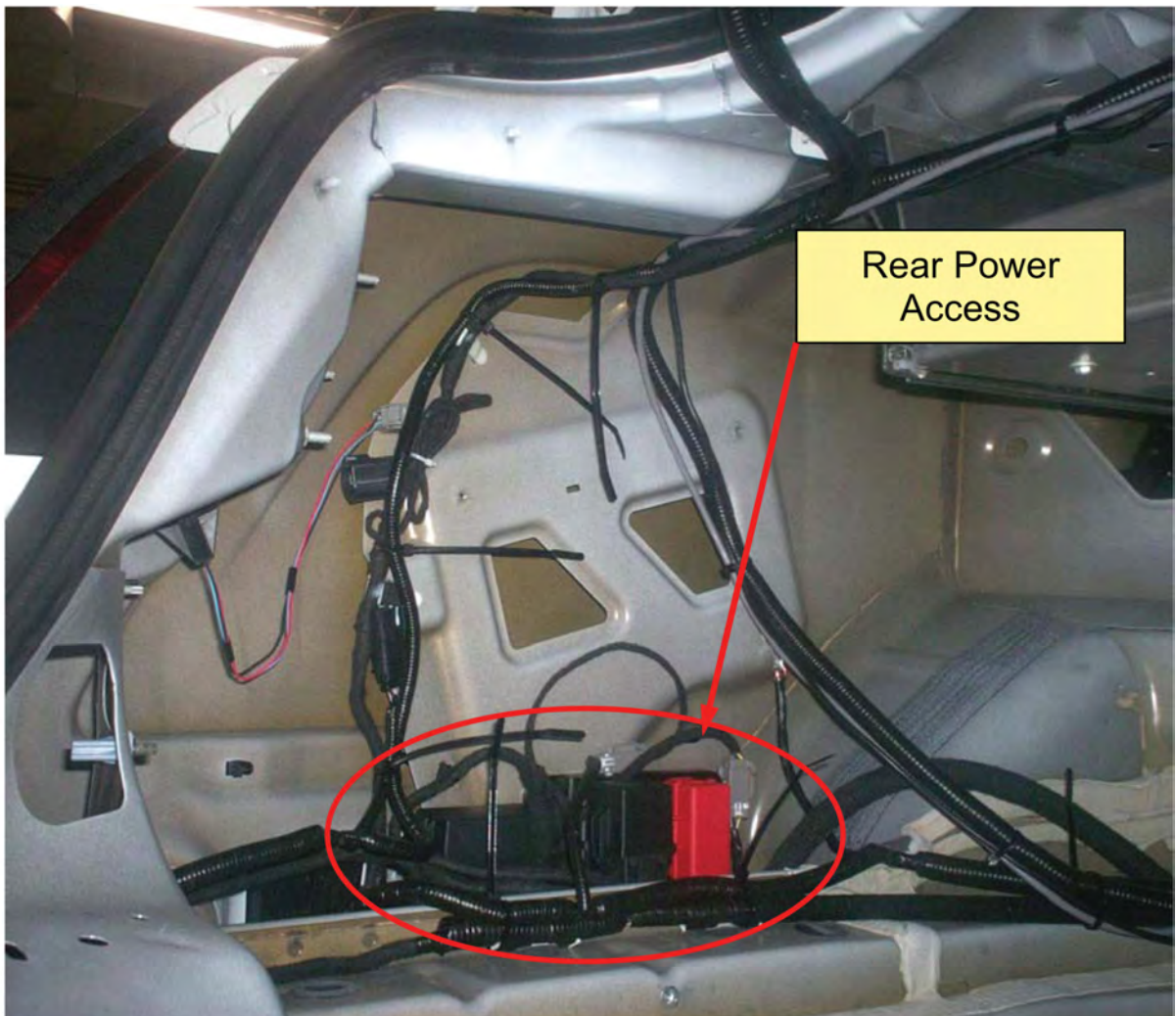
connected to the battery through under hood battery junction box (BJB) fuses #1 and #2. Battery access is provided by 2 studs contained in an enclosure, mounted in the trunk behind the carpet, on the driver side fender support. The terminal with the red wire is the battery positive. Remove both fuses in the BJB before removing the cover to the rear power point. Make sure load devices can be turned off and are switched off when reinserting the fuses.



WARNING:

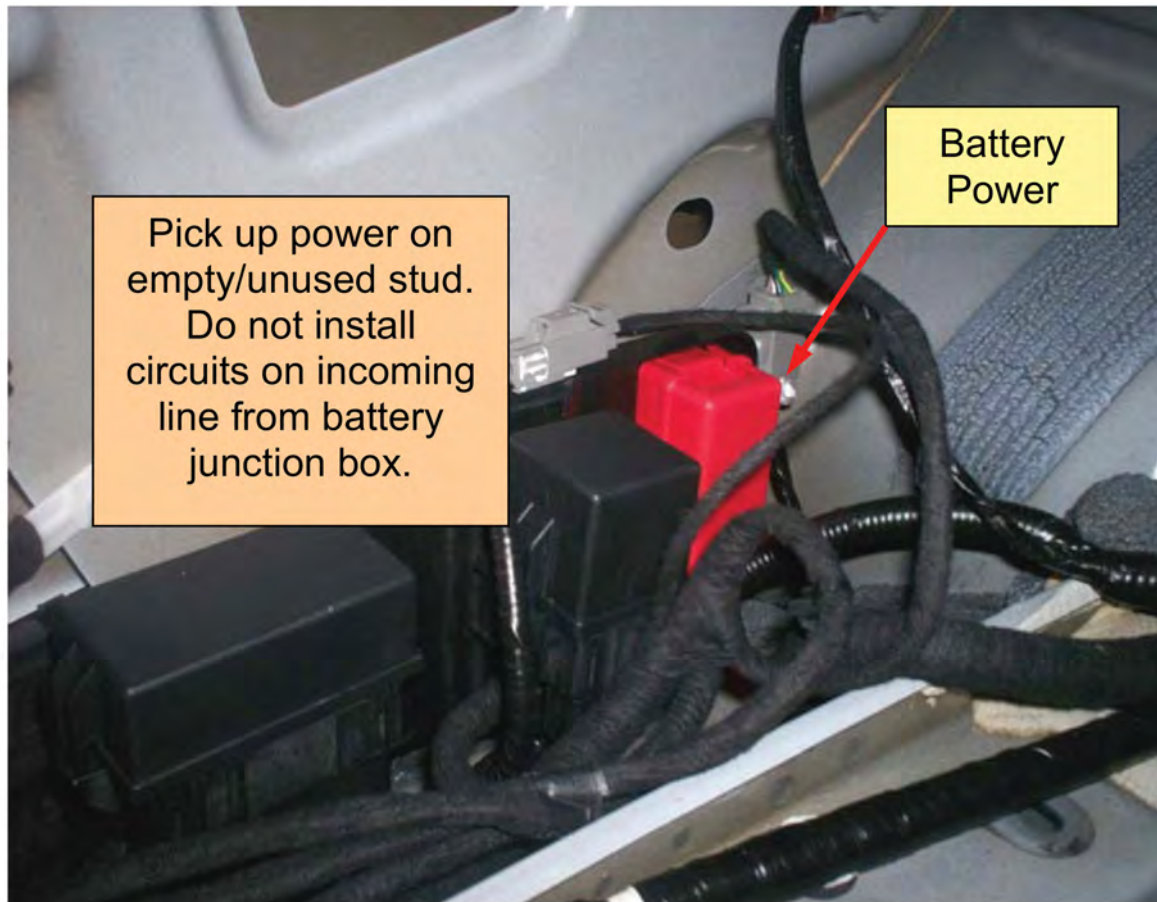
Under no circumstance should the rear power access point cover be removed without first removing the battery junction box (BJB) fuses #1 and #2. Removing the cover without removing the fuses could result in an electrical hazard. Turn off load devices before inserting the fuses. Failure to follow these instructions may result in personal injury.

It will be necessary to remove trunk lockable storage if equipped, to access rear power point section 4.



N0141041

Section 2: Electrical



N0141043

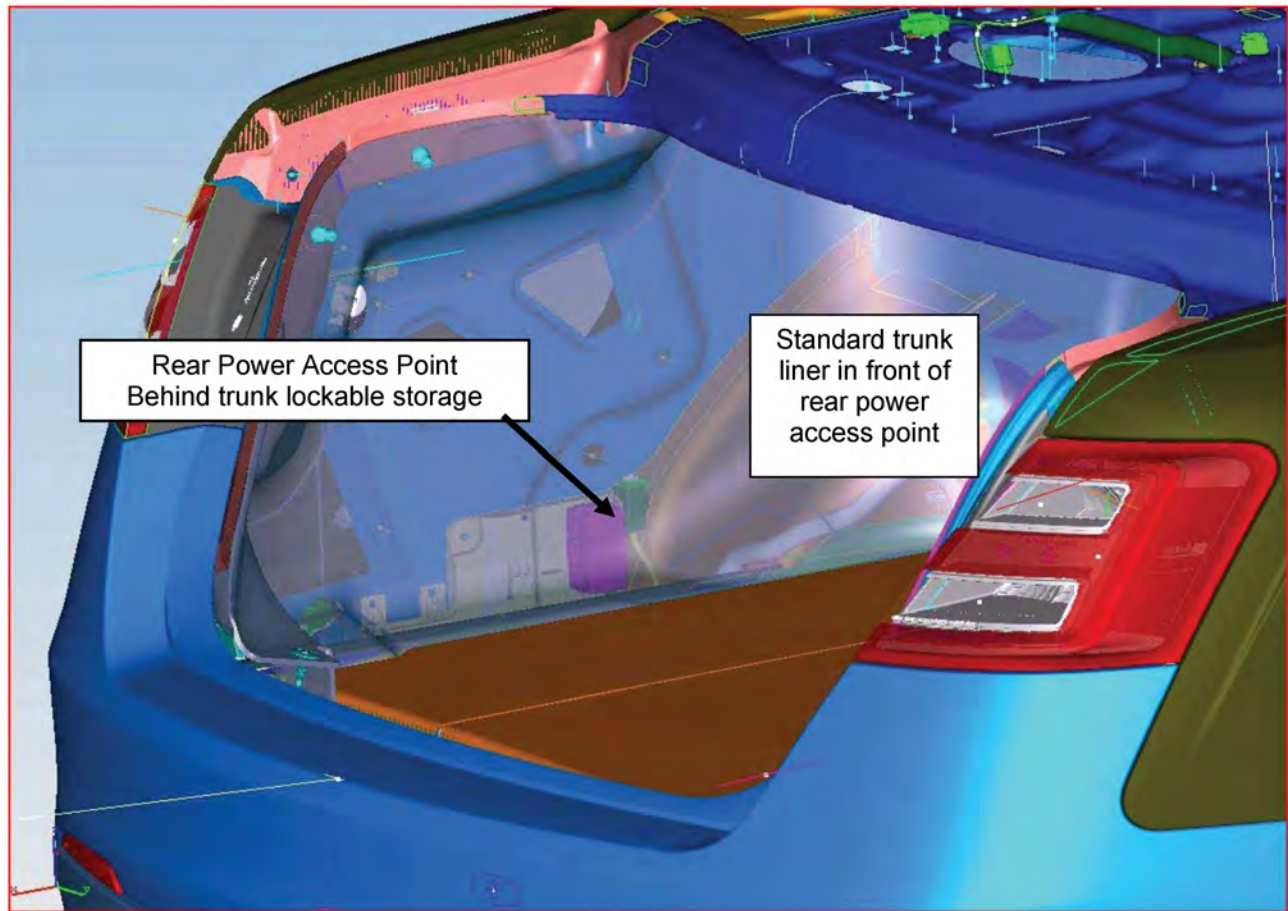
Section 2: Electrical



N0141044

Sedan Interceptor with standard trunk liner

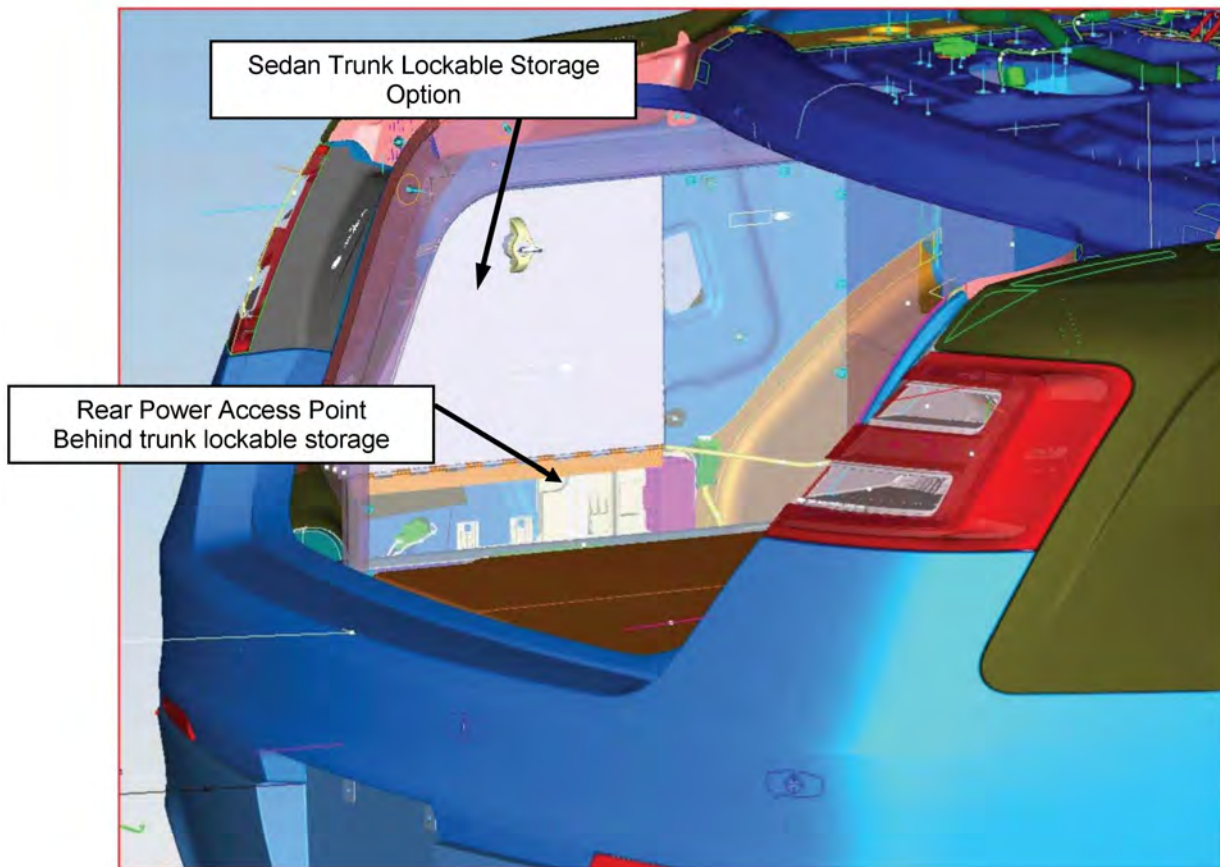
Section 2: Electrical



N0141042

Sedan Interceptor with optional lockable trunk storage

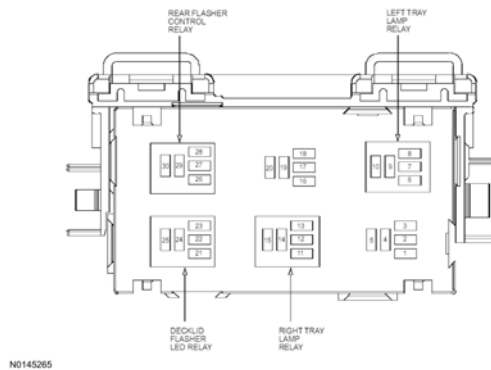
Section 2: Electrical



N0141046

Section 2: Electrical

Sedan — Trunk Relay Center



Sedan — My Fleet Management

Allows configuration of following functions using an Integrated Diagnostic System (IDS) service tool

- Ability to set vehicle maximum speed from 90 MPH to the factory maximum speed setting.
- Ability to set maximum radio volume from 0% to 100%.

Sedan — Courtesy Lamp Disable (Dark Mode)

This option offers deletion of the illuminated entry function. Upon vehicle power-up, the Smart Junction Box (SJB) will not provide interior lighting during entry or exit of the vehicle. The interior lighting will, however, still operate on demand whenever the dome lamp switch is active. If the dark car feature is necessary, the assembly plant enables this feature through the SJB. The vehicle can be configured by entering diagnostics, enabling/disabling the courtesy lamps and then exiting diagnostics.

Use the following steps to enable or disable the courtesy lamps:

1. Connect the IDS (at the latest calibration) to the vehicle via the DLC.
2. Allow the IDS to ID the vehicle. Select the Tool Box.
3. Select Module Programming, Programmable Parameters, Interior Lighting, then the TIC.
4. A screen will come up to remind you to turn the ignition on.
5. Select Dark Enable and the TIC.
6. During configuration the lights will flash and the system changes from Disabled to Enabled.
7. Final Screen: Module configuration complete, check/clear any DTCs that may have been set.

Section 2: Electrical

Sedan — Steering Wheel Switches



Configurable Steering Wheel Switches:

- ⌚ 2 switches with two positions (up/down) each
- ⌚ Total of 4 grounded outputs sourcing available for operating police equipment
- ⌚ 4 grounded outputs allocated at bottom of I/P center stack in 14-way connector

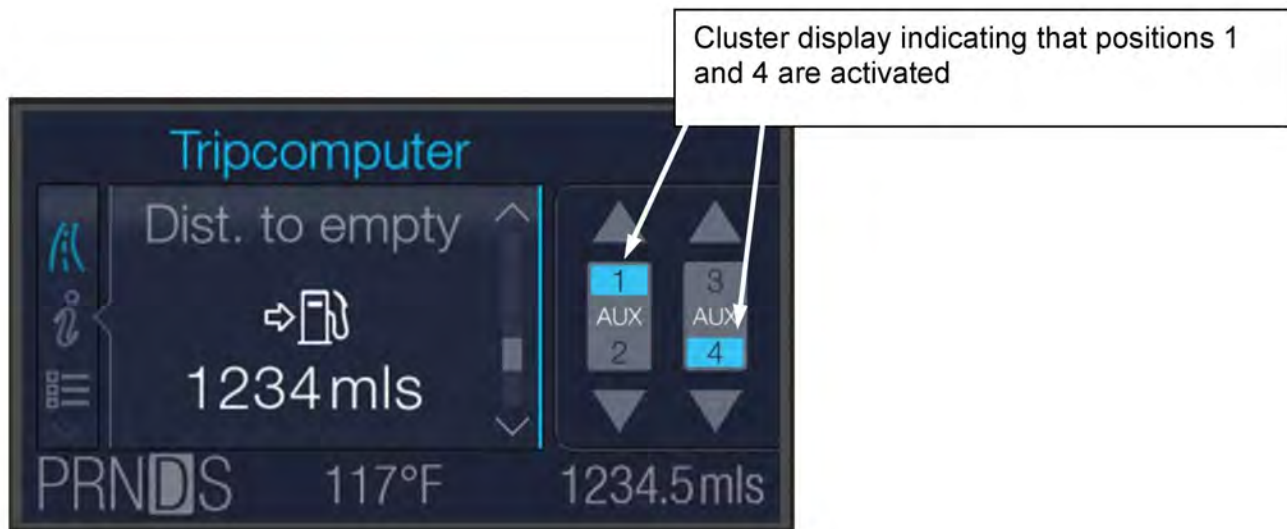
N0141056

Steering Wheel Operation

- Two switches are available for configuration as indicated above.
- Each switch has 2 positions (up/down).
- Four total ground side switching outputs are available in 14-way connector located behind the close out panel at the bottom of the Electronic Finish Panel (EFP).
- Any combination or all of the four outputs can be turned on simultaneously.
- To activate a switch/output, push the desired switch in the direction of the label either above or below the switch.
- To deactivate that function, push the desired switch in the same direction as was used when activating the output.
- Cluster display will illuminate the switch/position while activated.

Section 2: Electrical

Sedan — Steering Wheel Switch Cluster Display



N0141057

Fuse Information

If electrical components in the vehicle are not working, a fuse may have blown. Blown fuses are identified by a broken wire within the fuse. Check the appropriate fuses before replacing any electrical components.

NOTE:

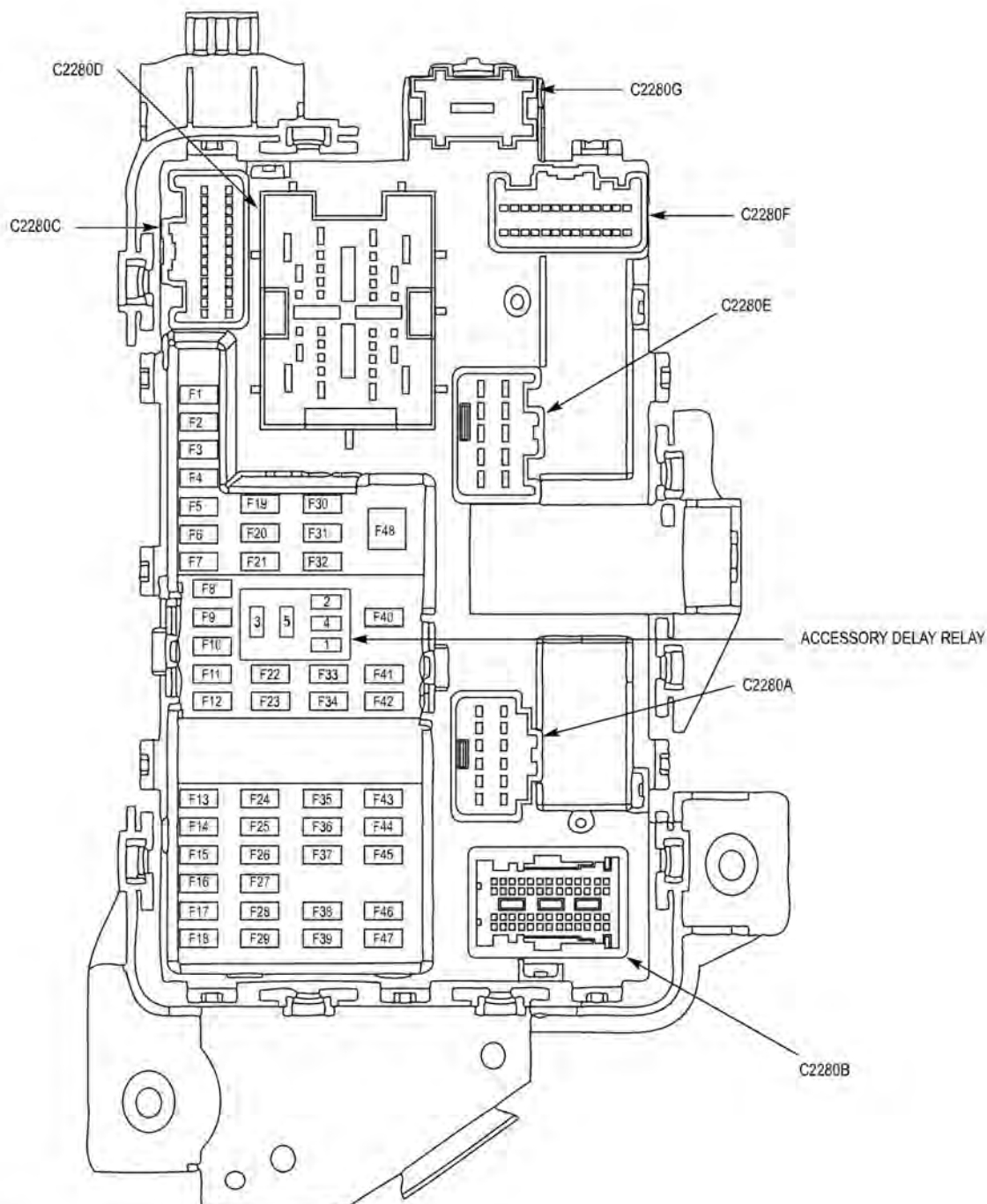
Always replace a fuse with one that has the specified amperage rating. Using a fuse with a higher amperage rating can cause severe wire damage and could start a fire.

Sedan — Battery Junction Box



Section 2: Electrical

Sedan — Body Control Module



N0142686



WARNING:
Always disconnect the battery before servicing high current fuses.

Section 2: Electrical

**WARNING:**

To reduce risk of electrical shock, always replace the cover to the power distribution box before reconnecting the battery or refilling fluid reservoirs. The power distribution box is located in the engine compartment. It has high current fuses that protect your vehicle's main electrical systems from overloads. If the battery has been disconnected and reconnected, refer to Changing the Vehicle Battery in the Maintenance chapter.

Mating connectors, terminals and subcomponent availability are managed for Ford Fleet and Pool Accounts through Ford Component Sales. Ford Component Sales, LLC (FCS) uses Globe Component Products or Dynamic Supply Solutions (DSS) to process and coordinate all Fleet and Pool Purchase Orders. By using Globe or DSS, FCS is able to offer the Fleet and Pool community reasonable minimum order quantities while still having the benefit of Ford Production pricing benefits.

Electrical Component Resource

See part numbers and supplier in the chart below to obtain terminals and connectors.

Section 2: Electrical

POLICE INTERCEPTOR CONNECTOR FORD TO SUPPLIER PART NUMBER CROSS REFERENCE MATRIX					
COMPONENT IN VEHICLE LOCATION	FORD COMPONENT CONNECTOR PART NUMBER	SUPPLIER	SUPPLIER PART NUMBER	UPFIT HARNESS SIDE PART NUMBER	SUPPLIER PART NUMBER
ION Grill LEDs @ Behind Grille Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
ION Rear CHMSL LEDs @ Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
ION Rear Decklid/Liftgate LEDs @ Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
VERTICEX Front Corner LEDs @ Headlight Modules (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
VERTICEX Rear Corner LEDs @ Rear Tailights (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
PARKTURN/WARN LEDs @ Headlight Modules (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
PARKTURN/WARN LEDs @ Headlight Module (3 Pin)	7T4T-14A464-BA (000)	MOLEX	33471-0301	7T4T-14A624-AA (000)	33481-0301
Siren Speaker @ Driver Side Behind Fascia(2X2 Pin)	5W7T-14A464-CA (004)	MOLEX	33472-4416	5W7T-14A624-BA (002)	33482-0416
WARN CONTROL MODULE @ Underhood near Coolant Bottle (4X2 Pin)	5W7T-14A464-GA (000)	MOLEX	33472-0801	5W7T-14A624-DA (000)	33482-0801
Relay Center & CENCOM (5X2 Pin)	4S7T-14489-VJA	YAZAKI	7283-6455-40	4S7T-14A459-VJA	7282-6455-40
AI CENCOM (2X2 Pin)	4S7T-14489-VDA	YAZAKI	7283-6449-40	4S7T-14A459-VDA	7282-6449-40
AI Cooling Fan (2 Pin)	4S7T-14489-VAA	YAZAKI	7283-6443-40	4S7T-14A459-VAA	7282-6443-40
Siren Speaker @ Instrument Panel/Center Stack (2X2 Pin)	4S7T-14A459-VDA	SUMITOMO		4S7T-14489-VDA	
Power/Vehicle Signals @ Instrument Panel/Center Stack (2x7 Pin)	4S7T-14459-YRA	SUMITOMO		4S7T-14489-YRA	
Police Lights@ Instrument Panel Center Stack (2x7 Pin)	BU5T-14A459-BA	SUMITOMO		4L3T-14489-AC	
Police Radio Connector @ Instrument Panel/Center Stack (2x2 Pin)	4S7T-14489-VDA	SUMITOMO		4S7T-14A459-VDA	
40A Auxiliary Power @ Instrument Panel/Center Stack (3x3 Pin)	BU5T-14A459-AA	YAZAKI		4S7T-14489-YMA	
WIRE GAUGE or Part Number	COMPONENT TERMINAL NUMBER	SUPPLIER	SUPPLIER PART NUMBER	HARNESS TERMINAL PART NUMBER	SUPPLIER PART NUMBER
Based on wire size					
14, 16	33012-2001	MOLEX	33012-2001	33000-0001	33000-0001
18, 20	33012-2002	MOLEX	33012-2002	33000-0002	33000-0002
22	33012-2003	MOLEX	33012-2003	33000-0003	33000-0003
Based on wire size					
16, 18	7116-4101-02	YAZAKI	7116-4101-02	7114-4101-02	7114-4101-02
20, 22	7116-4100-02	YAZAKI	7116-4100-02	7114-4100-02	7114-4100-02
4S7T-14459-YRA / 4S7T-14489-YRA	Terminals for Pins: 1,7,8 97BG-14474-BCA 2,3,4,5,6 97BG-14474-AAB	SUMITOMO			
BU5T-14A459-BA / 4L3T-14489-AC	Terminals for Pins: 1,2,7 3F2T-14474-SA 6,14 3F2T-14474-RA 9 97BG-14474-BBA	SUMITOMO			
4S7T-14489-VDA / 4S7T-14A459-VDA	2TAD-0.75 1.5MM FLAT				
For 40A Auxiliary Power Connector	97BG-14421-CCA	YAZAKI			

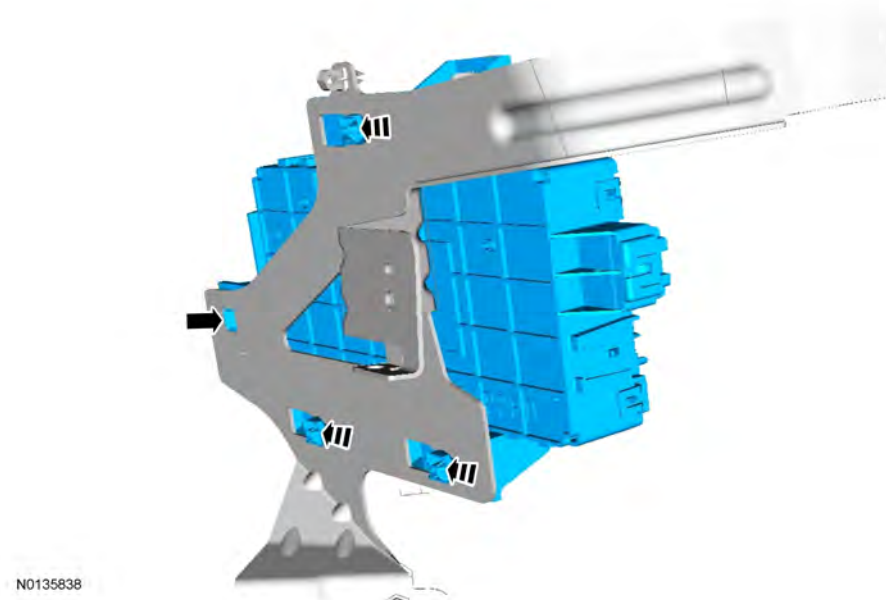
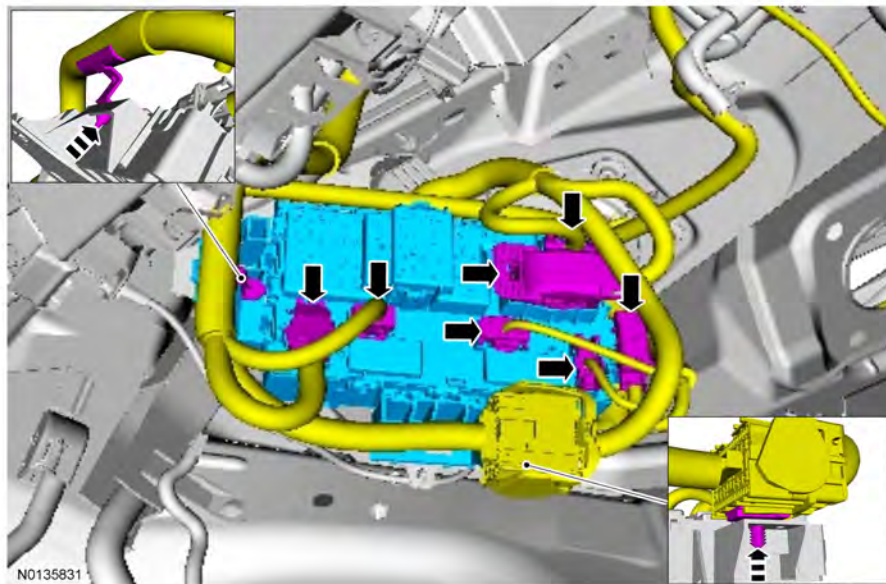
N0146595

Sedan — Body Control Module

The Body Control Module (BCM) is located behind the steering column opening panel. It acts as a gateway module by receiving information in one format and transmitting it to other modules using another format. For example, the BCM receives the vehicle speed data from the PCM over the HS-CAN. The BCM converts the data into a MS-CAN message and sends (gateways) the message to other network modules such

Section 2: Electrical

as the HVAC module. This enables network communication between modules that do not communicate using the same network (HS-CAN or MS-CAN).



Section 2: Electrical

Sedan — Electrical Component Resource

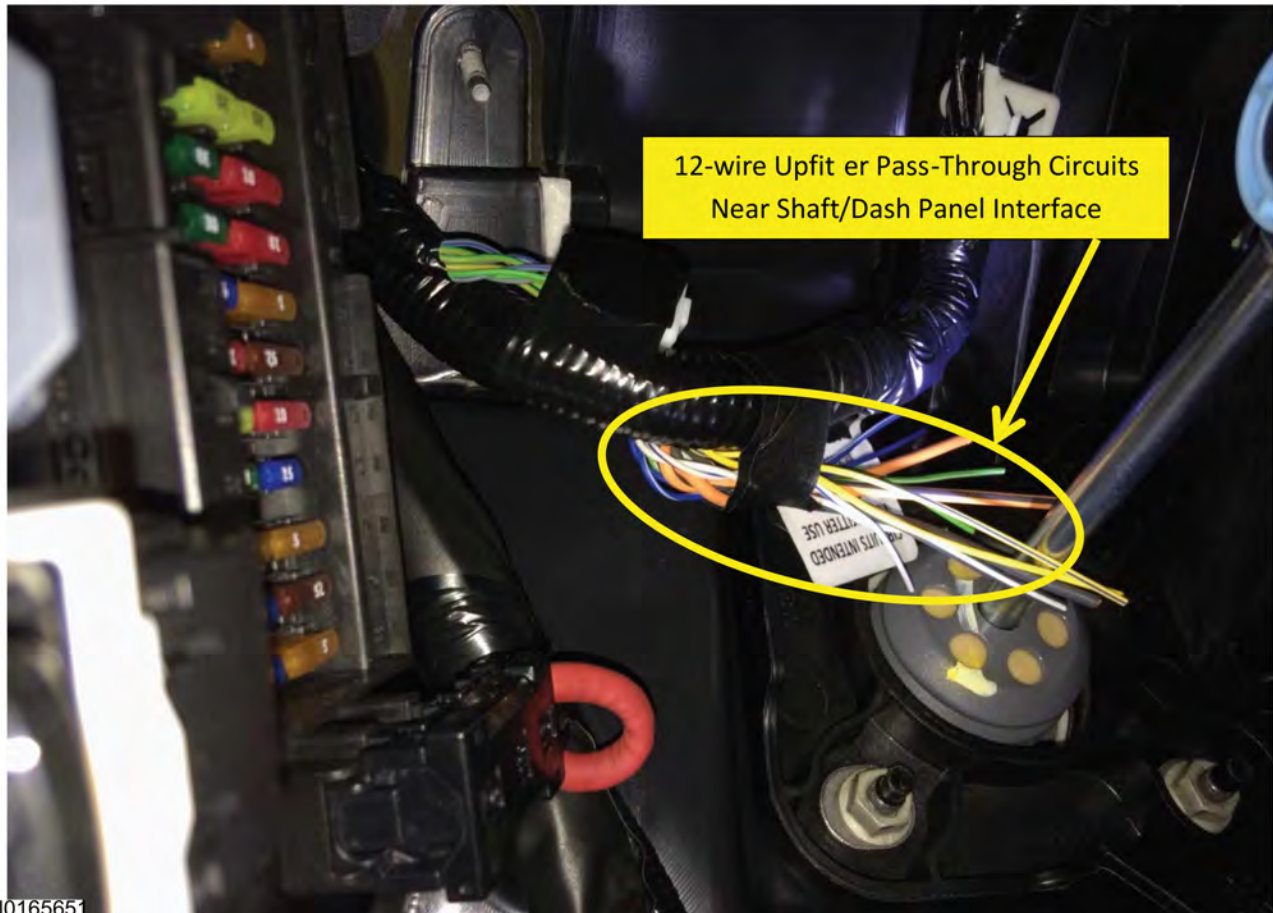
Mating connectors, terminals and subcomponent availability are managed for Ford Fleet and Pool Accounts through Ford Component Sales. Ford Component Sales, LLC (FCS) uses Globe Component Products or Dynamic Supply Solutions (DSS) to process and coordinate all Fleet and Pool Purchase Orders. By using Globe or DSS, FCS is able to offer the Fleet and Pool community reasonable minimum order quantities while still having the benefit of Ford Production pricing benefits.

NEW Utility Upfitter Wire Bundle Dash Panel Pass-Through

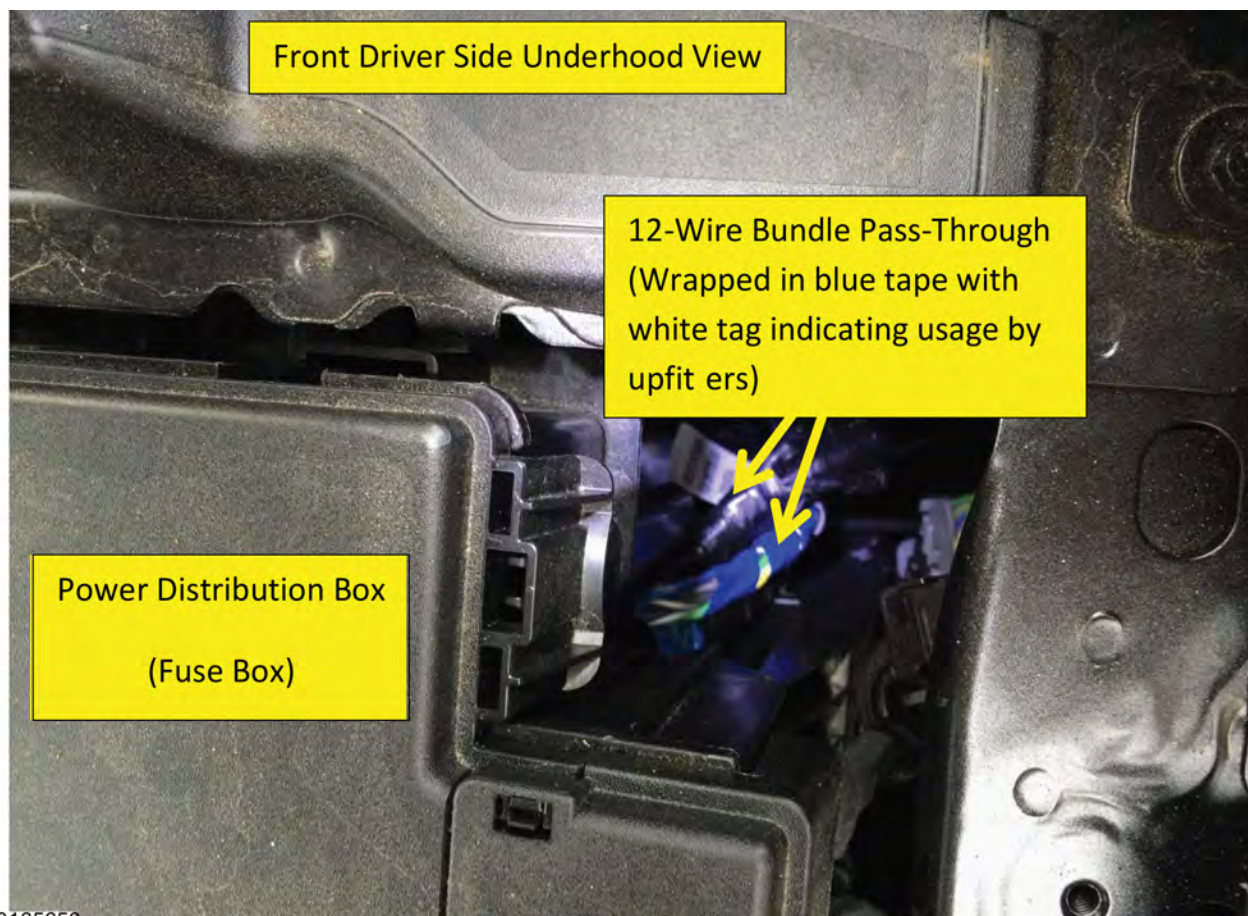
Certain Police Interceptor vehicles come equipped with auxiliary dash panel pass-through wire circuits (upfitter auxiliary) depending on selected option packages.

New for 2016 MY, the **standard** upfitter auxiliary pass-through wire circuits (6 twisted pairs) can be used by the vehicle modifier.

- The vehicle interior end of the auxiliary upfitter circuits is found beneath the instrument panel near the Body Control Module (BCM).
- The underhood end of the Aux Upfitter Circuits is found taped to a harness underhood near the Battery Junction Box (BJB).



Section 2: Electrical



N0165650

1. Twisted Pair A (20AWG)
 - White
 - White / Blue
2. Twisted Pair B (20AWG)
 - Yellow
 - Yellow / Black
3. Twisted Pair C (20AWG)
 - Green
 - Green / White
4. Twisted Pair D (20AWG)
 - Blue
 - Blue / White
5. Twisted Pair E (14AWG)
 - Orange
 - Orange / Black
6. Twisted Pair E (14AWG)
 - Black
 - Black / White

Section 2: Electrical

Utility — Power and Vehicle Signal Access Areas

- Located behind lower center instrument panel trim panels
- Siren speaker at instrument panel center stack (4 Pin)
- Power/vehicle signals at instrument panel center Stack (14 Pin)
- Police lights at instrument panel center stack (14 Pin)
- Police radio connector at instrument panel/center stack (4 Pin)
- 40A auxiliary power at instrument panel/center stack (6 Pin)

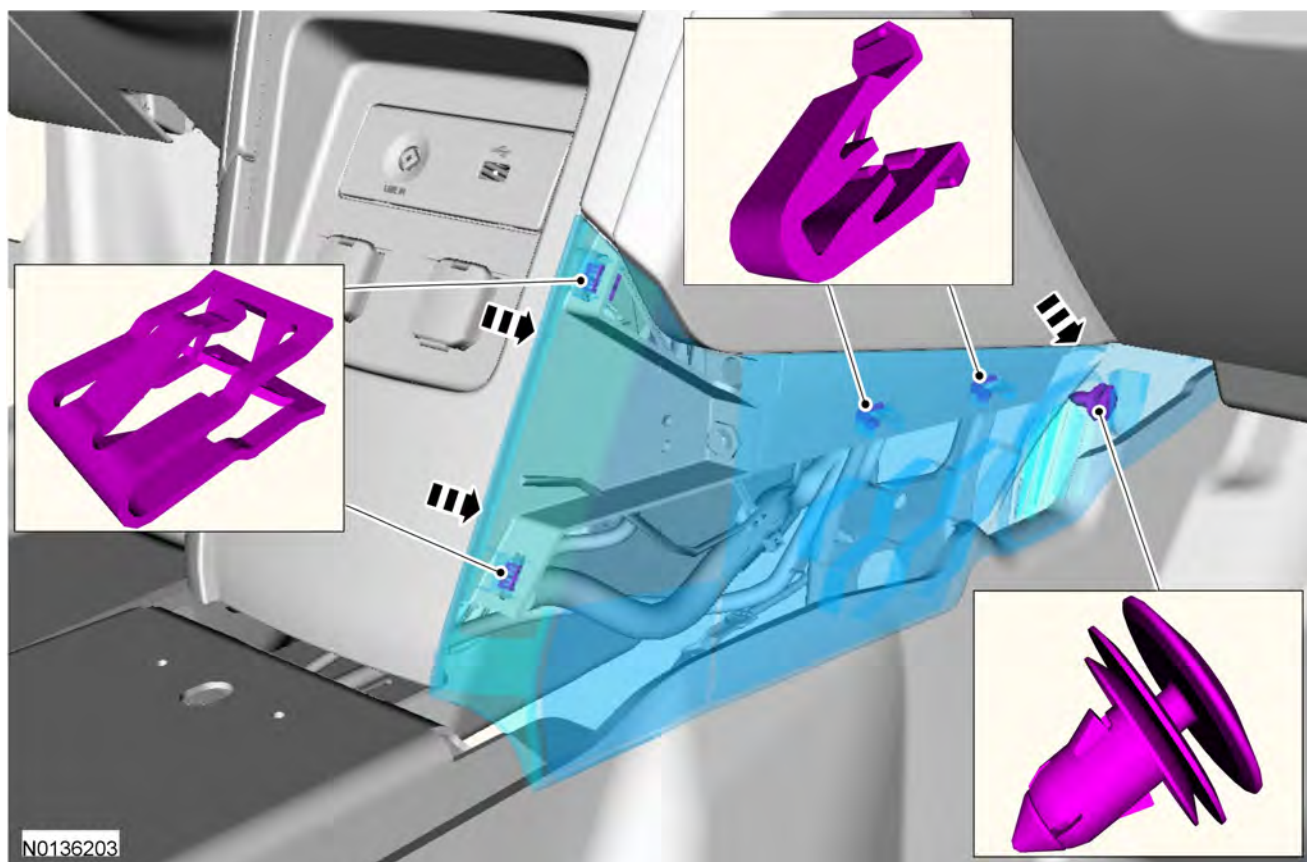


N0151524

Utility — Lower Center Instrument Panel Removal

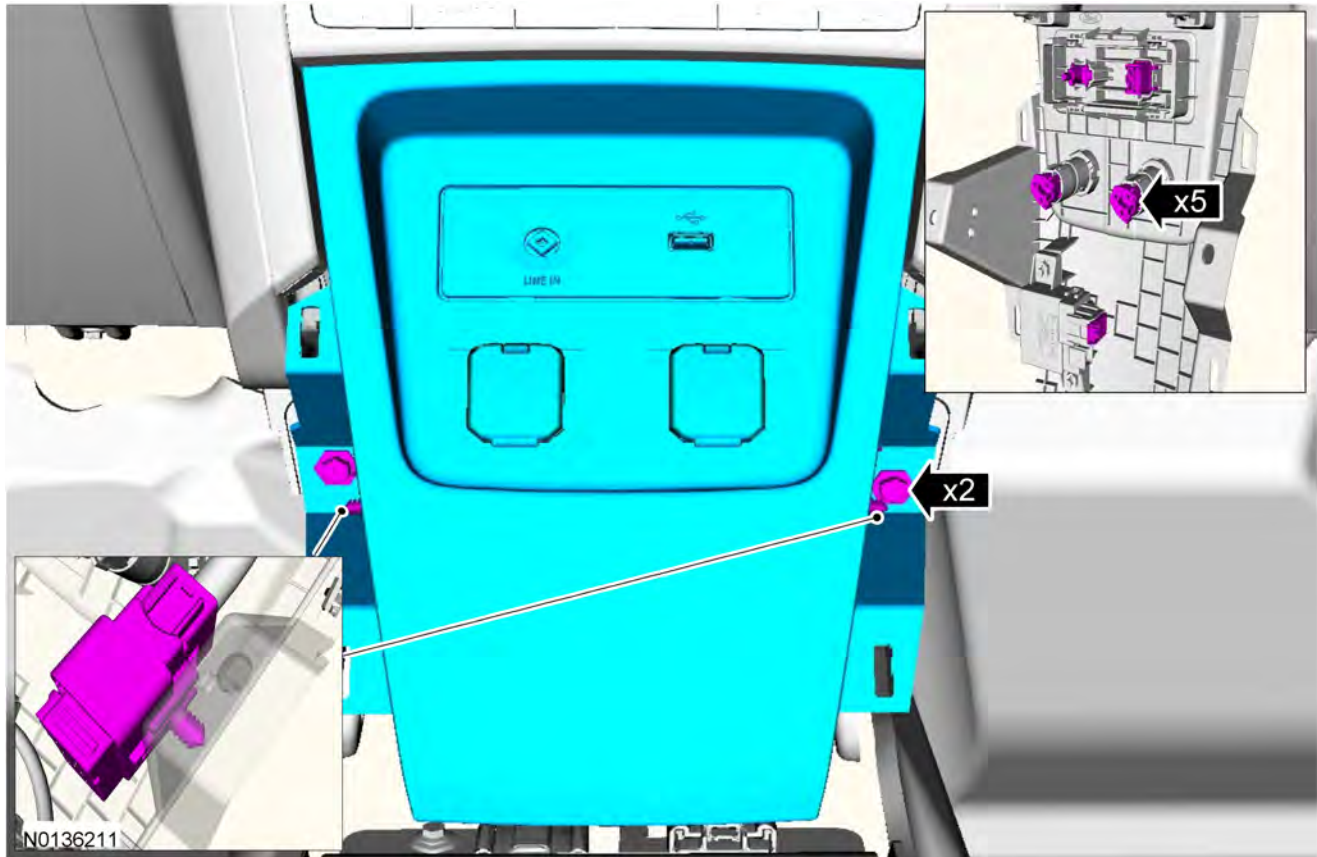
1. Remove the driver and passenger side lower center instrument panel finish panels.

Section 2: Electrical



2. Remove the 2 fasteners then carefully remove panel.

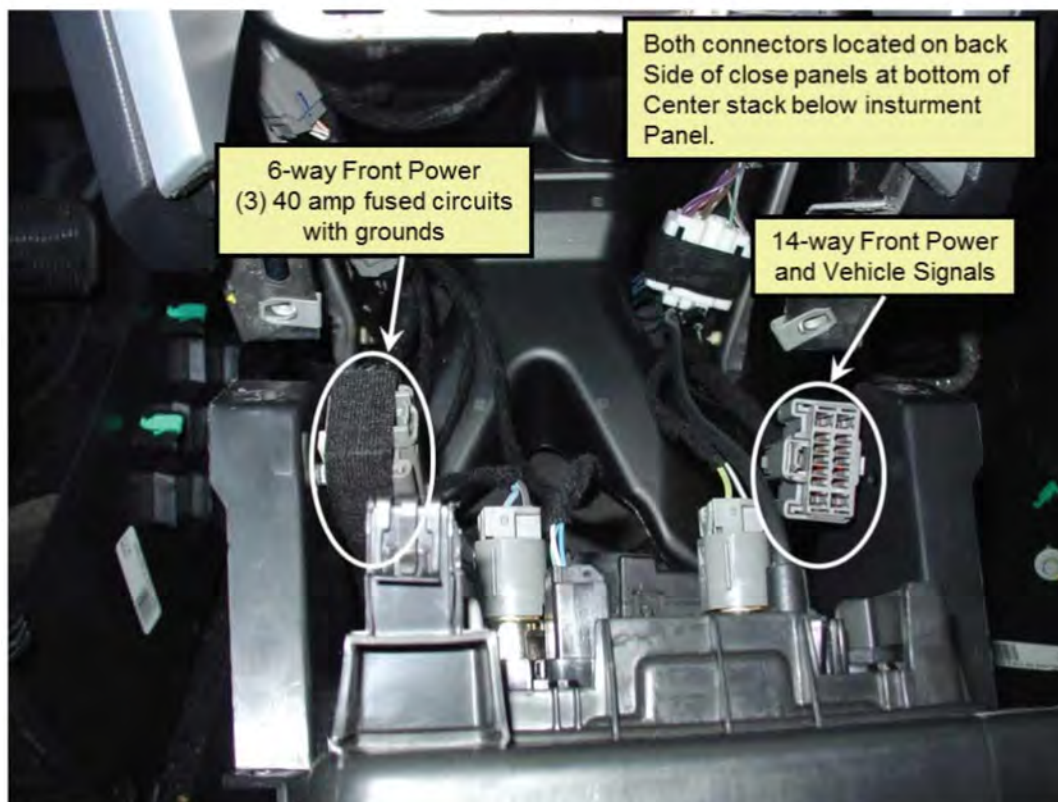
Section 2: Electrical



Section 2: Electrical

Front Power And Vehicle Signals Access Area

Front Power and Vehicle Signals Access Area



N0151483



Part# 3U2Z-14S411-BJAC



Part# 3U2Z-14S411-HEA

N0151470

Connector View For Connector 3U2Z-14S411-HEA (continued on the next page).

Pin Number	Description	Fuse	Wire Color
1	B+ (40A)	BJB #40	VT-RD
2	B+ (40A)	BJB #6	BN-RD

Section 2: Electrical

(Continued)

3	B+ (40A)	BJB #16	VT-RD
4	Ground	IP Tunnel	BK-BJ
5	Ground	IP Tunnel	BK-BJ
6	Ground	IP Tunnel	BK-BJ

Connector View For Connector 3U2Z- 14S411-BJAC.

Pin Number	Description	Fuse	Wire Color
1	B+ Feed #1 (20A)	IP #2	GY-RD
2	Steering Wheel Switch #1 Output (1A) Grnd	GNRL Function Module	GY-BN
3	Steering Wheel Switch #2 Output (1A) Grnd	GNRL Function Module	WH-VT
4	Steering Wheel Switch #3 Output (1A) Grnd	GNRL Function Module	GN-BN
5	Steering Wheel Switch #4 Output (1A) Grnd	GNRL Function Module	YE-GY
6	Start (2A)	BJB #95	BN-BU
7	Run/Start #1 (20A)	BJB #73	WH-BN
8	B+ Feed #2 (20A)	IP #32	BU-RD
9	Vehicle Speed Output (VSS)	PCM	VT-OG
10	Delay Accessory (15A)	IP #17	GN-VT
11	B+ Feed #2 (15A)	IP #5	YE-RD
12	Park Detect Signal (Transmission)	Sifter GRND	GN
13	Driver Door Ajar Signal	IP #9 GRND	GN-VT
14	Run/Start #2 (20A)	IP #74	VT-BN

NOTE:

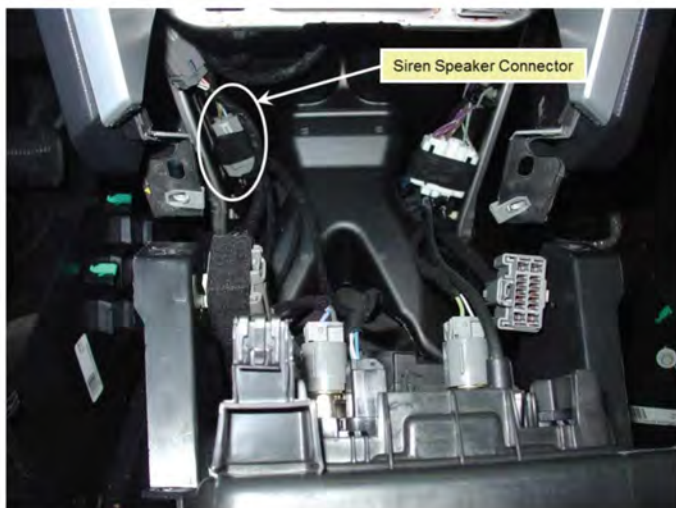
Fuse sizes are given to help locate the fuse in the PDB. Ford recommends that current be limited to 85% of the value: 20 Amp should be limited to 17 Amp 15 Amp should be limited to 12 Amp.

Park Detect: Sources a ground when the vehicle is in park. This circuit is capable of grounding 1 Amp.

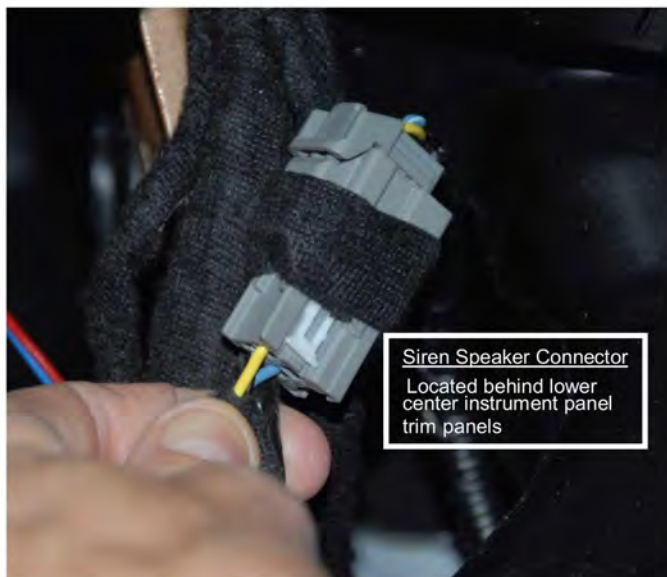
Driver Door Ajar: This circuit is a sense only grounded circuit when the door is closed. It is used to supply a module that has pull up resistors in its input.

Section 2: Electrical

Utility — Siren Speaker Connector



Siren Speaker Connector



Part # 3U2Z-14S411-LUB

N0151517

Connector View For Connector 3U2Z-14S411-LUB.

Pin Number	Description	Wire Color
1	Siren Driver Side Feed (+)	YE
2	Siren Shield Driver Side (-)	
3	Open Passenger Side Front (+)	
4	Siren Return Passenger Side Front (-)	BU-WH

Section 2: Electrical

Utility — Police Options 14-Way Connector



Police Options 14-Way Connector



Part # CU2Z-14S411-APA



N0151518

Connector View For Connector 3U2Z- 14S411-APA

Pin Number	Description	Wire Color
1	Wig Wag Control	VT
2	Front Corner LED Power Control	VT-OG
3	Front Flasher Power Control	BN-YE
4	Speaker (-) at Grille (Option)	GN-BU
5	Open	

Section 2: Electrical

(Continued)

6	Front Corner LED Light Sync	GY-OG
7	Dimmer	VT-GY
8	Brake Output Signal Ground	BU-OG
9	Speaker (+) at Grille (Option)	BN
10	Open	
11	Open	
12	Open	
13	Open	
14	LED Flash Pattern	GY-BN

Front WIGWAG Power: Supplies power to the wigwag connectors at the headlamps.

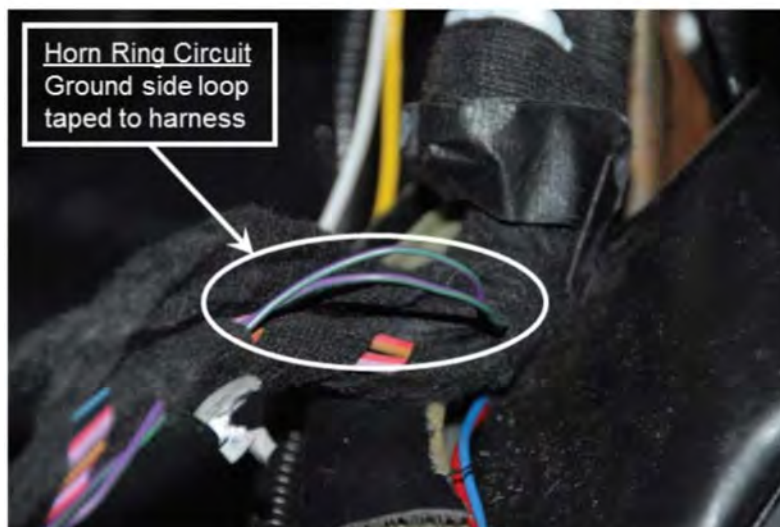
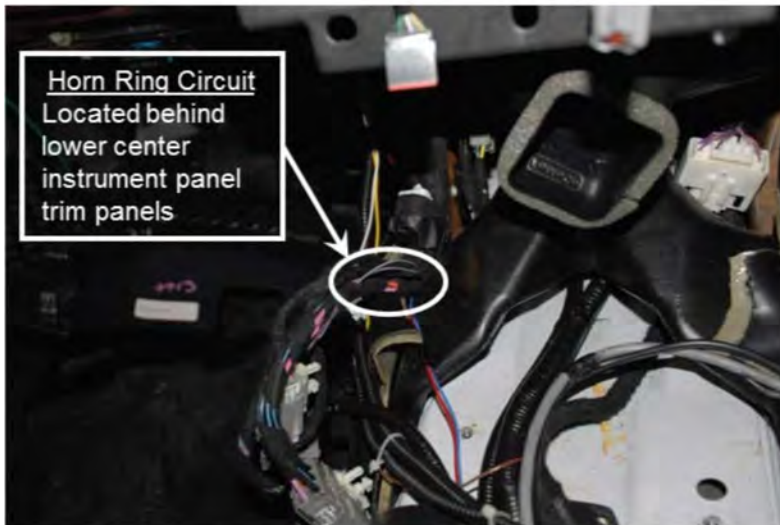
Front Flasher Power: Supplies power to the flasher relay.

Dimmer: Circuit supplied to allow backlight dimming of aftermarket equipment.

Brake Output: Fused brake output.

Section 2: Electrical

Utility — Horn Ring Circuit



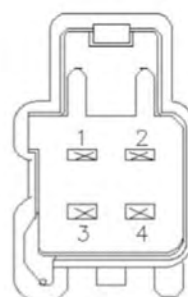
N0151519

Section 2: Electrical

Utility — Radio And Speaker Connector



Radio and Speaker Connector



Part # 3U2Z-14S411-BUB



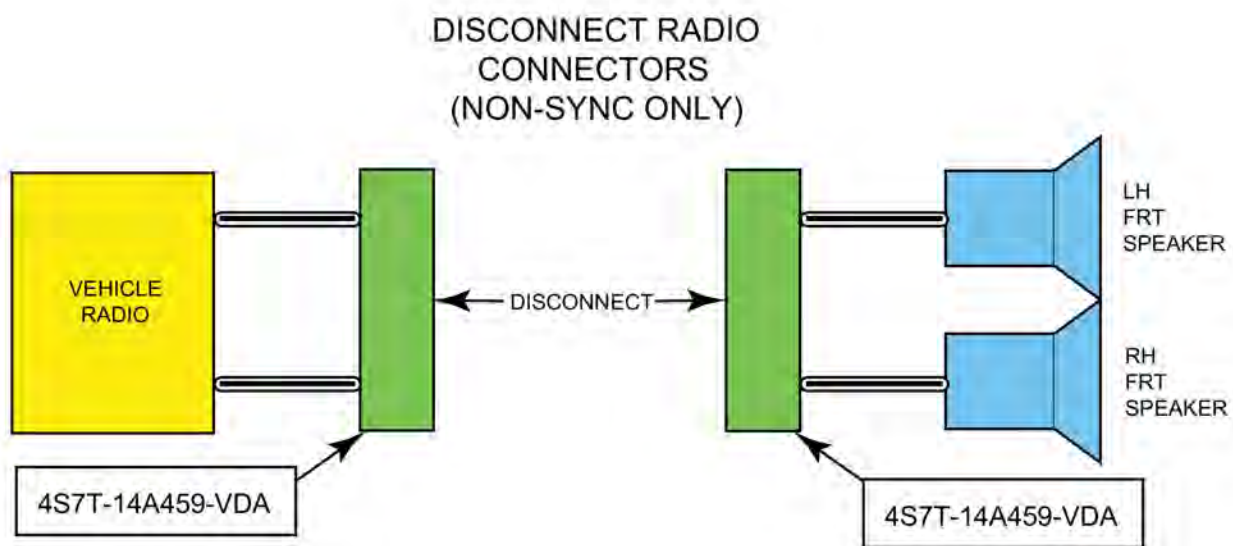
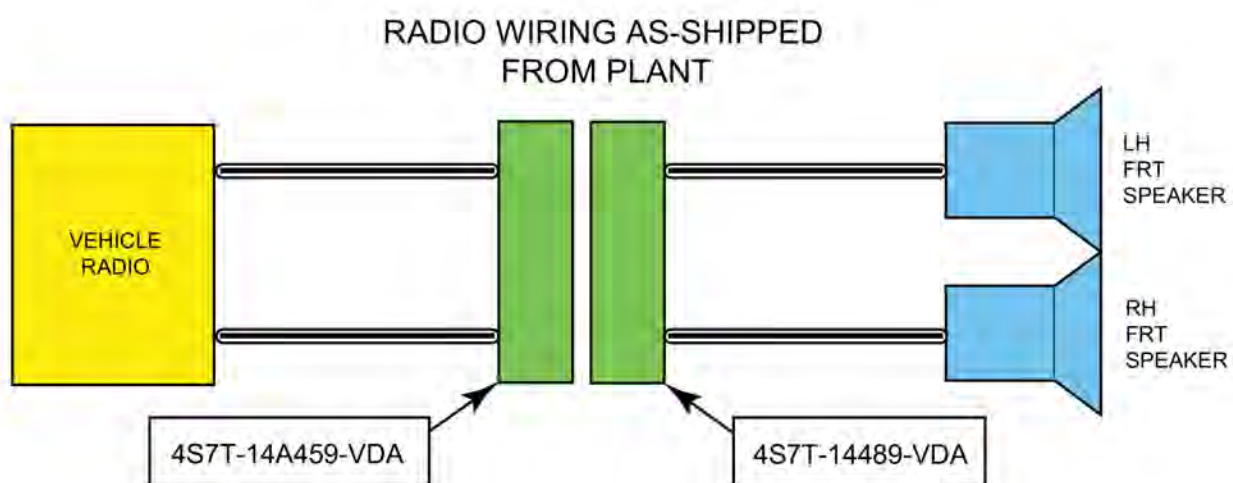
Part # 3U2Z-14S411-LUB

N0151516

Connector View For Connector 3U2Z- 14S411-LUB

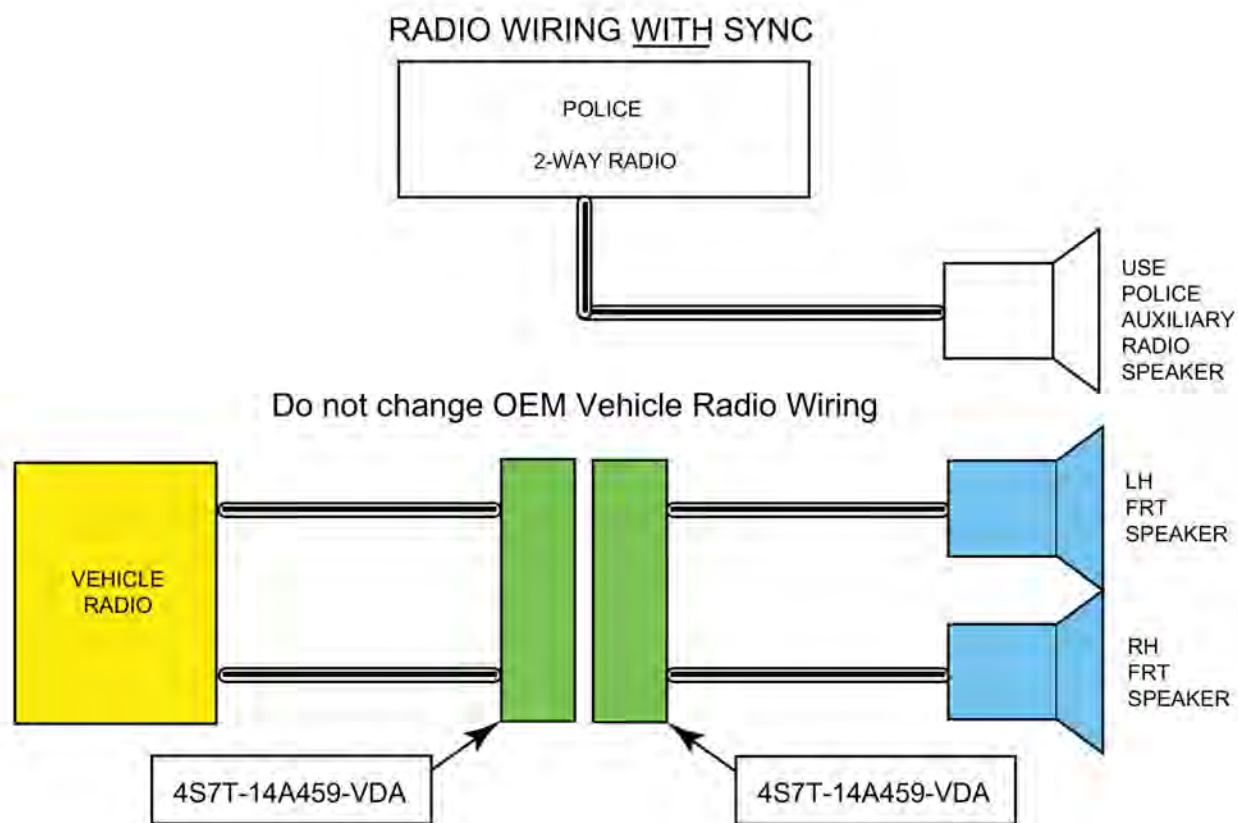
Pin Number	Description
1	Driver Side Front Speaker (+)
2	Driver Side Front Speaker (-)
3	Passenger Side Front Speaker (+)
4	Passenger Side Front Speaker (-)

Section 2: Electrical



N0150582

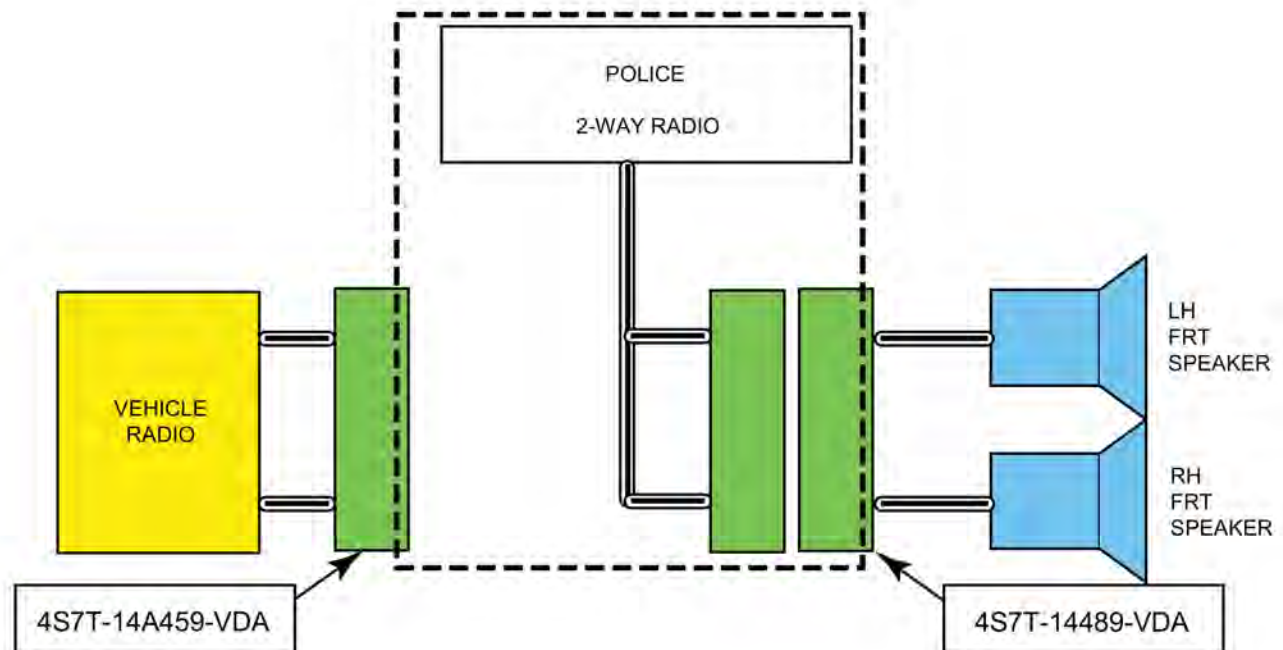
Section 2: Electrical



N0150583

Section 2: Electrical

INSTALL POLICE 2-WAY RADIO AND MAKE
CONNECTIONS TO OEM CONNECTORS
(NON-SYNC ONLY)



N0150581

Section 2: Electrical

Utility – 4-Way Connector For All Police LED Light Heads



4-Way Connector For All Police LED Light Heads



N0151525

Connector View For Connector 8U2Z-14S411-TA

Pin Number	Description
1	Control Power
2	LED Light Pattern
3	LED Light Sync
4	Ground

Section 2: Electrical

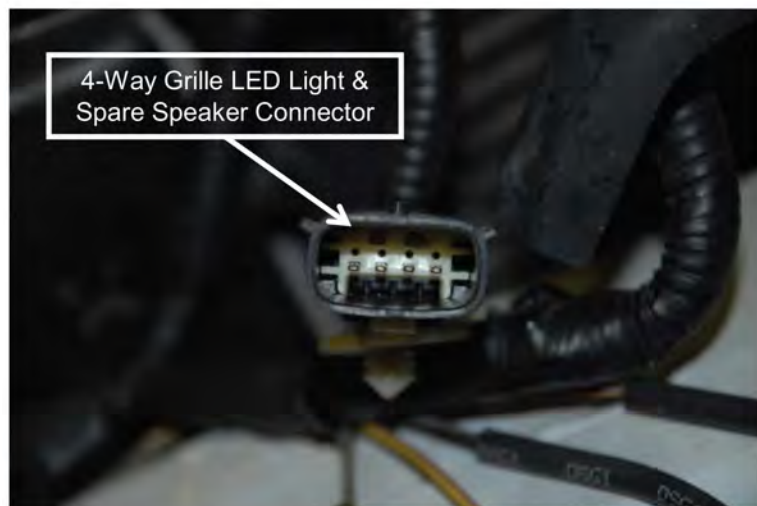
Grille LED Light Connector



Grile LED Light Connector
Attached above front bumper



Part# 8U2Z-14S411-TA



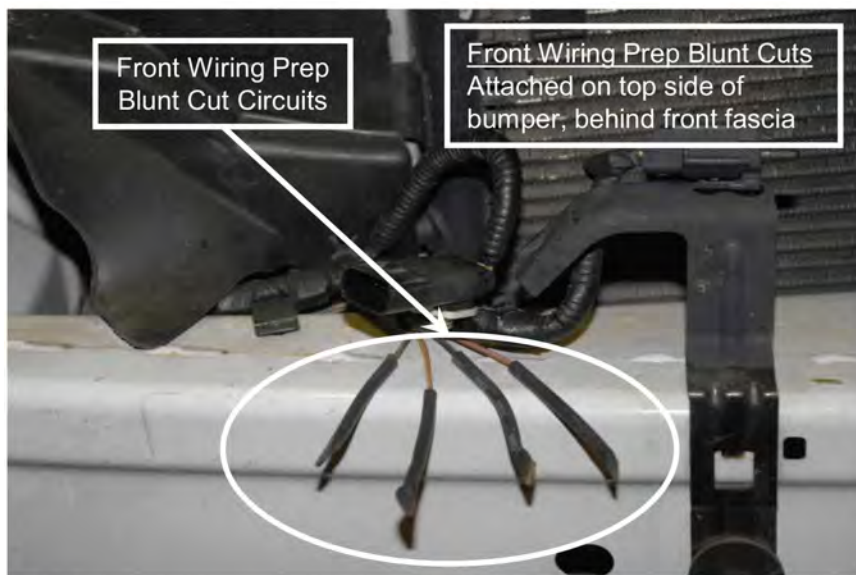
N0151479

Connector View For Connector 8U2Z-14S411-TA.

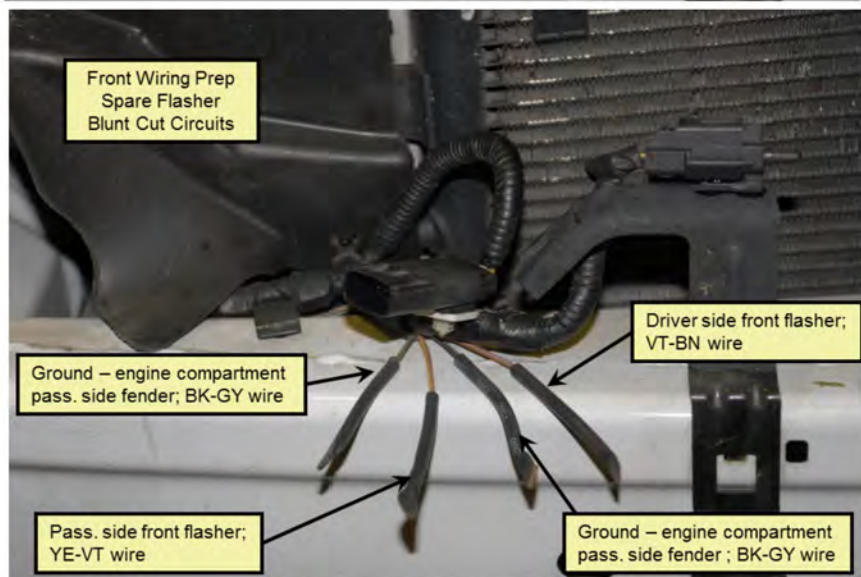
Pin Number	Description	Wire Color
1	Grille LED Light Ground	BN
2	Grille LED Light Pattern	GY-BN
3	Speaker (-)	GY-OG
4	Speaker (+) Spare	BK-GY

Section 2: Electrical

Utility — Front Wiring Prep Blunt Cut Circuits



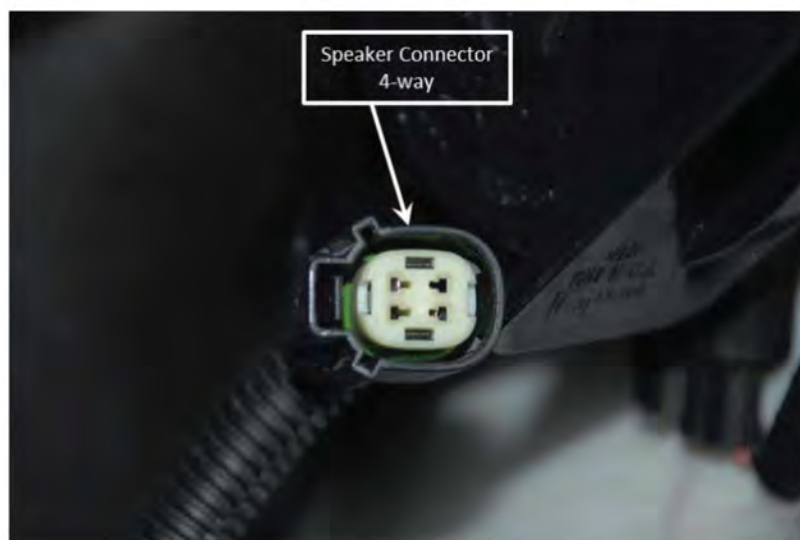
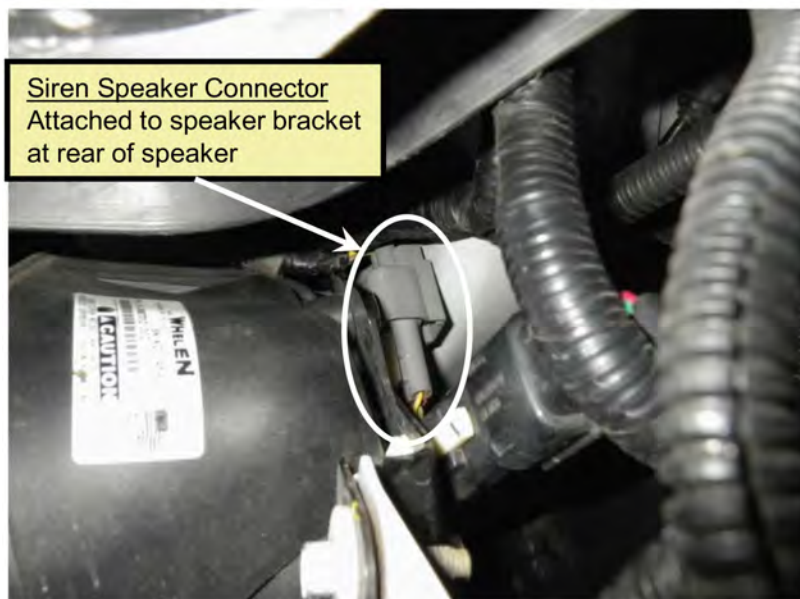
Front Wiring Prep Blunt Cut Circuits Attached to Front Bumper



N0151480

Section 2: Electrical

Utility — Siren Speaker



Siren Speaker Connector



Part# BU2Z-14S411-TA

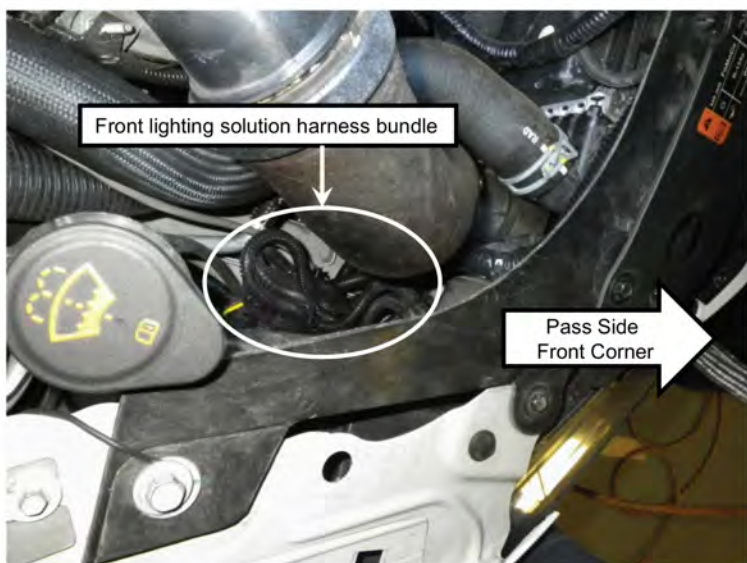
N0151481

Connector View For Connector BU2Z-14S411-TA.

Pin Number	Description	Wire Color
1	Siren (+)	YE
2	Open	
3	Open	
4	Siren (-)	BU-WH

Section 2: Electrical

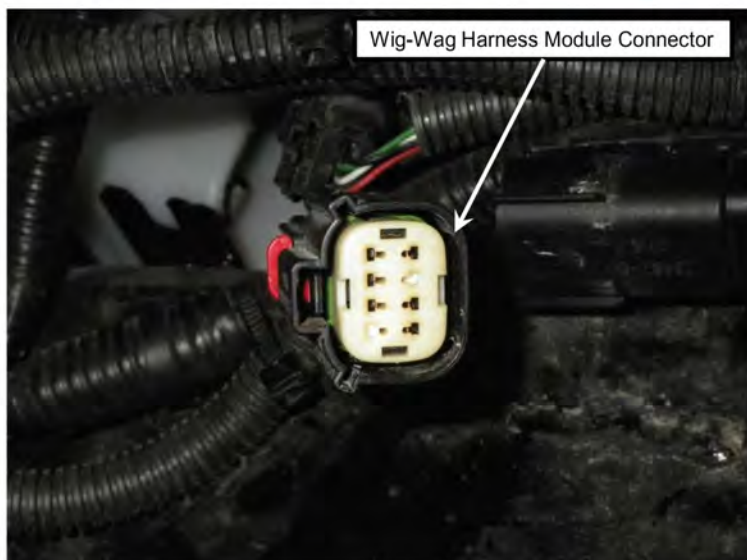
Utility — Front Lighting Solution Wig-Wag LED And Front Corner LED Lights Connector



Front Lighting Solution Wig-Wag LED And Front Corner LED Lights Connector



Part # CU2Z-14S411-ALA



N0151482

Connector View For Connector CU2Z-14S411-ALA Pin Out Continued On The Next Page.

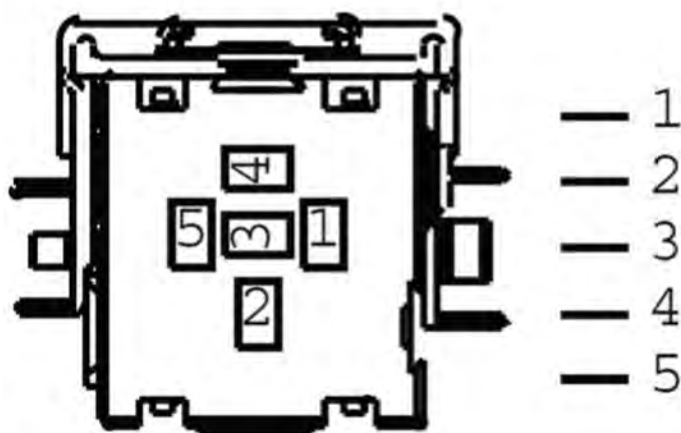
Pin Number	Description	Fuse	Wire Color
1	Wig-Wag Control		VT
2	Wig-Wag Passenger Side Pattern		GN-WH
3	Wig-Wag Driver Side Pattern		GY
4	Open		
5	Wig-Wag Run/Start (20A)	BJB #74	VT-BN

Section 2: Electrical

(Continued)

6	Front Corner LED Lights Control/Power		
7	Front Corner LED Lights Pattern		GY-BN
8	Wig-Wag Ground		BK-GY

Utility — Flasher Relay



DU5T-14D089-AA

N0141078

Connector View For Connector DU5T-14D089-AA

Pin Number	Circuit Number	Signal Name/Function
1		Flasher Power
2		
3		
4		Right Side Flasher Blunt Cut
5		Left Side Flasher Blunt Cut

N0141079

Front flasher power is supplied through the second 14 way power connector and is available on the Sedan and Utility. The right and left blunt cuts are located in the front grille area.

The rear flasher relay is used to turn modifier supplied decklid flashers on in the Sedan when the trunk is open.

NOTE:

Fuse sizes are given to help locate the fuse in the PDB. Ford recommends that current be limited to 85% of the value (40 Amp should be limited to 34 Amp).

Section 2: Electrical

Utility — Pigtail Information

2013MY SEDAN/UTILITY POLICE INTERCEPTOR PIGTAIL INFORMATION							
CONNECTOR PICTURE	HARNESS	DEVICE	CONN. TYPE	PIN	FUNCTION	Service Pigtail #	INFO
	14290	POL FLASH	8-WAY	1 2 3 4 5 6 7 8	WW INPUT WW RH PTRN/PWR WW LH PTRN/PWR WW R/S STROBES PWR PATTERN WW GND	CU2Z-14S411-ALA	Must splice cavities 1 and 6 together if function is not being used. Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	LH WIG WAG RH WIG WAG	4-WAY	1 2 3 4	WW INPUT WW SCN LOCK WW SYNC WW GND	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	SIREN SPEAKER	4-WAY	1 2 3 4	SIREN + (UNUSED) (UNUSED) SIREN -	BU2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	LH SIDE CORNER MARKER RH SIDE MARKER	4-WAY	1 2 3 4	Power Pattern Sync GND	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14290	GRILLE & LOUD SPEAKER	4-WAY	1 2 3 4	TDM GRL GND TDM PATTERN LD SPKR - LD SPKR +	8U2Z-14S411-TA	Wire type- 3TBD-1.0mm Terminal- 7C3T-14474-DA
	14401	POLICE POWER & VEHICLE SIGNALS	14-WAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14	WIGWAG LAMP CONTROL SIDE LAMP PWR CONTROL FRONT FLASHER PWR CONTROL LOUDSPEAKER NEG OPEN SIDE LAMP SYNC CONTROL DIMMER BRAKE OUTPUT LOUDSPEAKER PWR/TDM GRILL OPEN OPEN OPEN OPEN SIDE STROBE PATTERN	CU2Z-14S411-APA	0.64 CAVITIES- 2TAD-0.75mm 2.8 CAVITIES- 2TAD-1.0mm 0.64 CAVITIES- 1/2/5/6/7/8/13/14 TERMINAL 3F2T-14474-RA 2.8 CAVITIES- 3/4/9/10/11/12 TERMINAL 97BG-14474-8BA
	14401	SIREN	4-WAY	1 2 3 4	SIREN FEED/LEFT FRONT SPK + SIREN SHIELD/LEFT FRONT SPK - OPEN/RIGHT FRONT SPK + SIREN RETURN/RIGHT FRONT SPK -	3U2Z-14S411-LUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14474-ABB
	14401	2-WAY RADIO	4-WAY	1 2 3 4	LEFT FRONT SPK + LEFT FRONT SPK - RIGHT FRONT SPK + RIGHT FRONT SPK -	3U2Z-14S411-LUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14474-ABB
	14401	2-WAY RADIO	4-WAY	1 2 3 4	LEFT FRONT SPK + LEFT FRONT SPK - RIGHT FRONT SPK + RIGHT FRONT SPK -	3U2Z- 14S411-BUB	WIRE TYPE- 2TAD-1.0mm TERMINAL 97BG-14421-ABB
	14401	POLICE FEATURES & BRAKE OUTPUT	14-WAY	1 2 3 4 5 6 7 8 9 10 11 12 13 14	B+ FEED 17AMP CNTRL BUTTON 1 CNTRL BUTTON 2 CNTRL BUTTON 3 CNTRL BUTTON 4 POL START POL_R/S #1 B+ FEED #2 17AMP VSS DEL ASSY B+ FEED #3 12AMP PARK DETECT DRV DOOR ALARM POL_R/S #2	3U2Z-14S411-BJAC	1.5 CAVITIES- 0.75mm 2.8 CAVITIES- 1.5mm 0.64 CAVITIES- 2/3/4/5/6/9/10/11/12/13 TERMINAL 97BG-14474-ABB 2.8 CAVITIES- 1/7/8/14 TERMINAL 97BG-14474-8CA WIRE TYPE- 2TAD
	14401	POLICE POWER	6-WAY	1 2 3 4 5 6	POLICE B+ 34AMP POLICE B+ 34AMP POLICE B+ 34AMP GROUND GROUND GROUND	3U2Z- 14S411-HEA	WIRE TYPE- 2TAD-0.50mm TERMINAL 97BG-14474-CCA
	14AZ27 (0258 ONLY)	POLICE INLINE	2-WAY	1 2	CHMSL LAMP DECKLID	3U2Z- 14S411-LAB	WIRE TYPE- 2TAD-0.50mm TERMINAL 97BG-14421-ABB

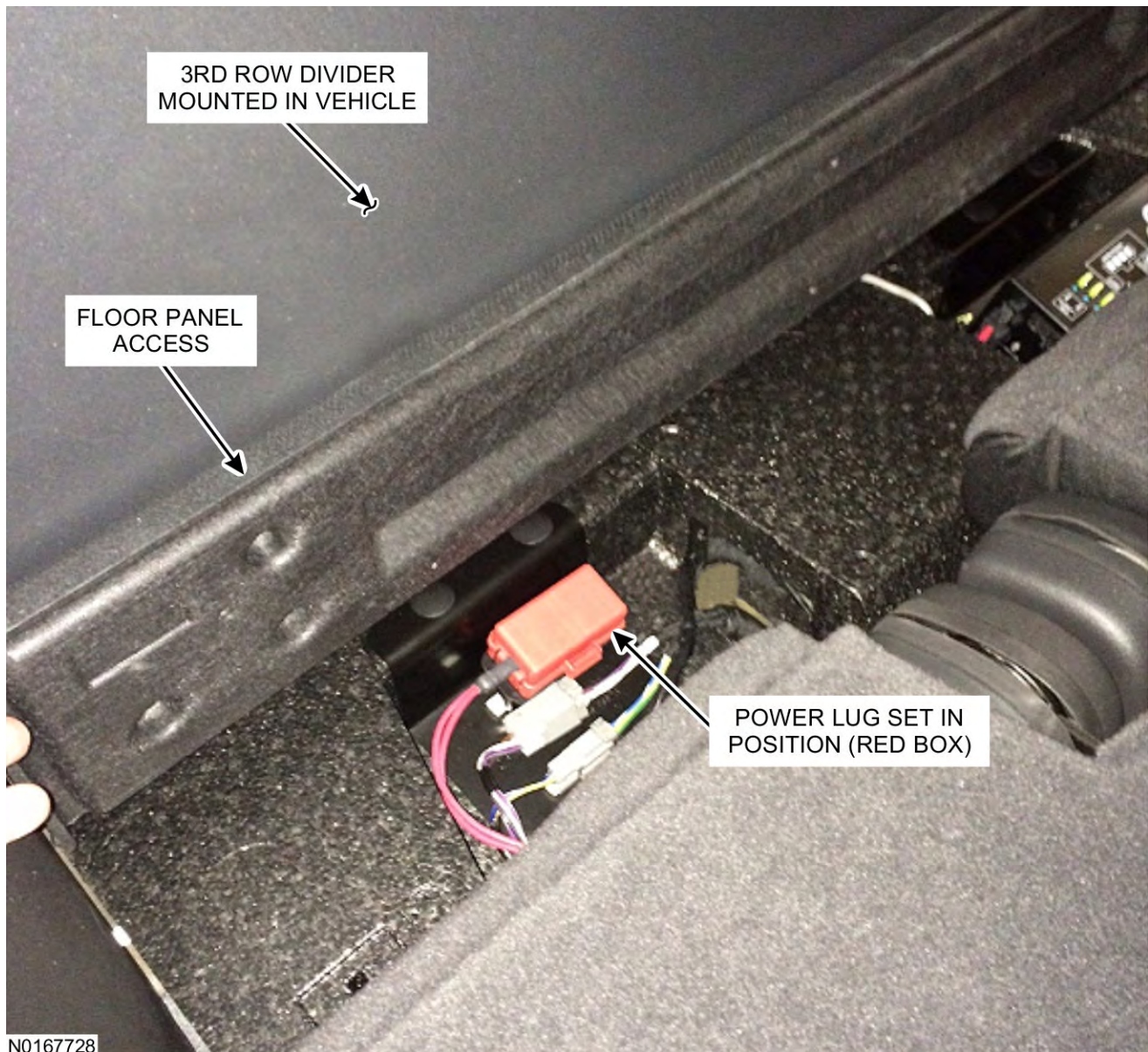
N0150616

Section 2: Electrical

Utility — NEW Rear Power Access Location — late model year availability

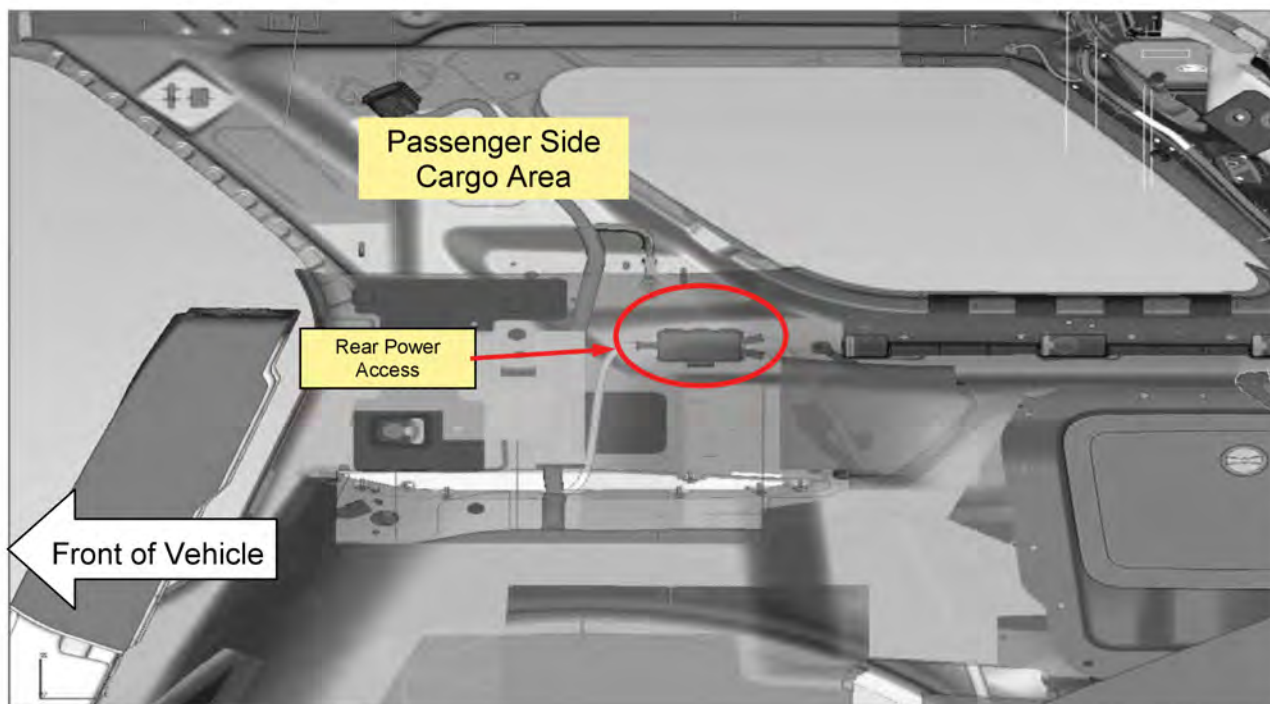
New location for the Utility rear power access for vehicles built late in the model year (late 2015)

Rear power access for these vehicles can be found beneath an access panel between the second row seat and load floor.



Section 2: Electrical

Utility — Rear Power Access



N0141051

Utility — Remove cargo area passenger side trim panel:

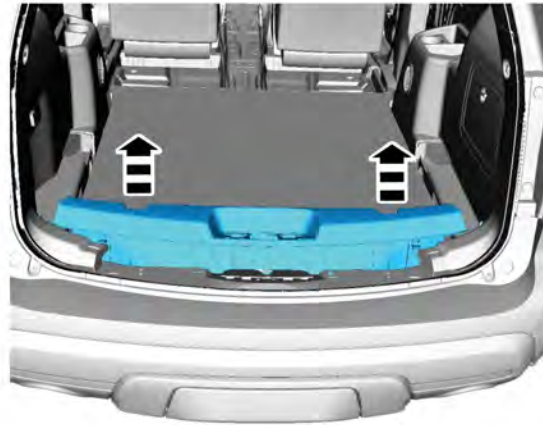
1. Position aside the liftgate weatherstrip.

NOTICE:

To avoid damage to the liftgate scuff plate trim panel, remove any retaining clips from the body and attach them to the liftgate scuff plate trim panel before installing.

2. Pull upward to release the retaining clips.
3. If equipped, disconnect the rear passive start antenna electrical connector and remove the liftgate scuff plate trim panel.

Section 2: Electrical



N0145094

NOTICE:

To avoid damage to the scuff plate trim panel, remove any retaining clips from the body and attach them to the scuff plate trim panel before installing.

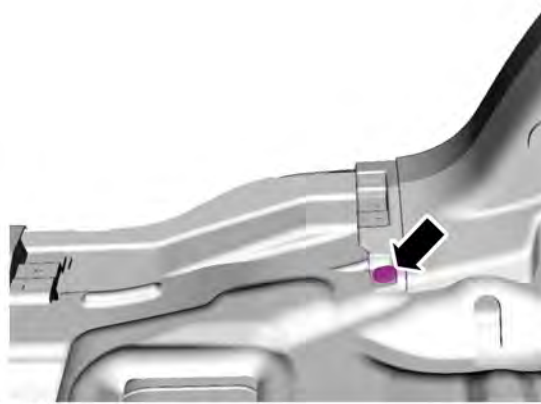
4. Remove the rear door scuff plate trim panel.
5. Remove the quarter trim panel push pin retainer.



N0145096

6. Position the second row seat in the flat position and then tilt the second row seat forward.
7. Position the third row seat in the flat position if equipped.
8. Remove the 2 quarter trim panel tie down hooks.

Section 2: Electrical



N0145095

9. Remove the third row safety belt anchor bolt cover on the quarter trim panel.
10. Remove the third row safety belt anchor bolt.
- To install, tighten to 40 Nm (30 lb-ft).

NOTICE:

To avoid damage to the quarter trim panel, remove any retaining clips from the body and attach them to the quarter trim panel before installing.

11. Pull the quarter trim panel toward the inside of the vehicle to release the quarter trim panel clips and disconnect electrical connectors and remove the quarter trim panel.

Installation

12. To install, reverse the removal procedure.

Utility — My Fleet Management

Allows configuration of following functions using an Integrated Diagnostic System (IDS) service tool

- Ability to set vehicle maximum speed from 90 MPH to the factory maximum speed setting.
- Ability to set maximum radio volume from 0% to 100%.

Utility — Courtesy Lamp Disable (Dark Mode)

This option offers deletion of the illuminated entry function. Upon vehicle power-up, the Smart Junction Box (SJB) will not provide interior lighting during entry or exit of the vehicle. The interior lighting will, however, still operate on demand whenever the dome lamp switch is active. If the dark car feature is necessary, the assembly plant enables this feature through the SJB. The vehicle can be configured by entering diagnostics, enabling/disabling the courtesy lamps and then exiting diagnostics.

Use the following steps to enable or disable the courtesy lamps:

1. Connect the IDS (at the latest calibration) to the vehicle via the DLC.
2. Allow the IDS to ID the vehicle. Select the Tool Box.
3. Select Module Programming, Programmable Parameters, Interior Lighting, then the TIC.
4. A screen will come up to remind you to turn the ignition on.
5. Select Dark Enable and the TIC.
6. During configuration the lights will flash and the system changes from Disabled to Enabled.
7. Final Screen: Module configuration complete, check/clear any DTCs that may have been set.

Section 2: Electrical

Utility — Steering Wheel Switches



Configurable Steering Wheel Switches:

- ⌚ 2 switches with two positions (up/down) each
- ⌚ Total of 4 grounded outputs sourcing available for operating police equipment
- ⌚ 4 grounded outputs allocated at bottom of I/P center stack in 14-way connector

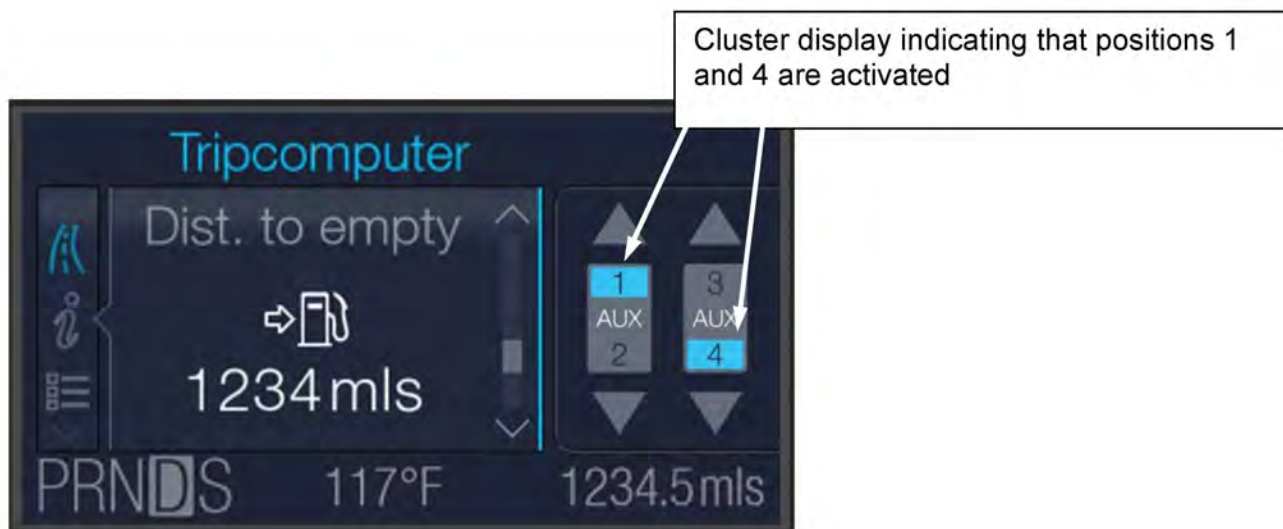
N0141056

Steering Wheel Operation

- Two switches are available for configuration as indicated above.
- Each switch has 2 positions (up/down).
- Four total ground side switching outputs are available in 14-way connector located behind the close out panel at the bottom of the Electronic Finish Panel (EFP).
- Any combination or all of the four outputs can be turned on simultaneously.
- To activate a switch/output, push the desired switch in the direction of the label either above or below the switch.
- To deactivate that function, push the desired switch in the same direction as was used when activating the output.
- Cluster display will illuminate the switch/position while activated.

Section 2: Electrical

Utility — Steering Wheel Switch Cluster Display



N0141057

Fuse Information

If electrical components in the vehicle are not working, a fuse may have blown. Blown fuses are identified by a broken wire within the fuse. Check the appropriate fuses before replacing any electrical components.

NOTE:

Always replace a fuse with one that has the specified amperage rating. Using a fuse with a higher amperage rating can cause severe wire damage and could start a fire.

Electrical Component Resource

See part numbers and supplier in the chart below to obtain terminals and connectors.

Section 2: Electrical

POLICE INTERCEPTOR CONNECTOR FORD TO SUPPLIER PART NUMBER CROSS REFERENCE MATRIX					
COMPONENT IN VEHICLE LOCATION	FORD COMPONENT CONNECTOR PART NUMBER	SUPPLIER	SUPPLIER PART NUMBER	UPFIT HARNESS SIDE PART NUMBER	SUPPLIER PART NUMBER
ION Grill LEDs @ Behind Grille Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
ION Rear CHMSL LEDs @ Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
ION Rear Decklid/Liftgate LEDs @ Light Heads (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
VERTICEX Front Corner LEDs @ Headlight Modules (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
VERTICEX Rear Corner LEDs @ Rear Tailights (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
PARKTURN/WARN LEDs @ Headlight Modules (4 Pin)	4F9T-14A464-HA (000)	MOLEX	33471-0401	4F9T-14A624-KA (000)	33481-0401
PARKTURN/WARN LEDs @ Headlight Module (3 Pin)	7T4T-14A464-BA (000)	MOLEX	33471-0301	7T4T-14A624-AA (000)	33481-0301
Siren Speaker @ Driver Side Behind Fascia (2X2 Pin)	5W7T-14A464-CA (004)	MOLEX	33472-4416	5W7T-14A624-BA (002)	33482-0416
WARN CONTROL MODULE @ Underhood near Coolant Bottle (4X2 Pin)	5W7T-14A464-GA (000)	MOLEX	33472-0801	5W7T-14A624-DA (000)	33482-0801
Relay Center & CENCOM (5X2 Pin)	4S7T-14489-VJA	YAZAKI	7283-6455-40	4S7T-14A459-VJA	7282-6455-40
AI CENCOM (2X2 Pin)	4S7T-14489-VDA	YAZAKI	7283-6449-40	4S7T-14A459-VDA	7282-6449-40
AI Cooling Fan (2 Pin)	4S7T-14489-VAA	YAZAKI	7283-6443-40	4S7T-14A459-VAA	7282-6443-40
Siren Speaker @ Instrument Panel/Center Stack (2X2 Pin)	4S7T-14A459-VDA	SUMITOMO		4S7T-14489-VDA	
Power/Vehicle Signals @ Instrument Panel/Center Stack (2x7 Pin)	4S7T-14459-YRA	SUMITOMO		4S7T-14489-YRA	
Police Lights @ Instrument Panel Center Stack (2x7 Pin)	BU5T-14A459-BA	SUMITOMO		4L3T-14489-AC	
Police Radio Connector @ Instrument Panel/Center Stack (2x2 Pin)	4S7T-14489-VDA	SUMITOMO		4S7T-14A459-VDA	
40A Auxiliary Power @ Instrument Panel/Center Stack (3x3 Pin)	BU5T-14A459-AA	YAZAKI		4S7T-14489-YMA	
WIRE GAUGE or Part Number	COMPONENT TERMINAL NUMBER	SUPPLIER	SUPPLIER PART NUMBER	HARNESS TERMINAL PART NUMBER	SUPPLIER PART NUMBER
Based on wire size					
14, 16	33012-2001	MOLEX	33012-2001	33000-0001	33000-0001
18, 20	33012-2002	MOLEX	33012-2002	33000-0002	33000-0002
22	33012-2003	MOLEX	33012-2003	33000-0003	33000-0003
Based on wire size					
16, 18	7116-4101-02	YAZAKI	7116-4101-02	7114-4101-02	7114-4101-02
20, 22	7116-4100-02	YAZAKI	7116-4100-02	7114-4100-02	7114-4100-02
4S7T-14459-YRA / 4S7T-14489-YRA	Terminals for Pins: 1, 7, 8 97BG-14474-BCA 2, 3, 4, 5, 6 97BG-14474-AAB	SUMITOMO			
BU5T-14A459-BA / 4L3T-14489-AC	Terminals for Pins: 1, 2, 7 3F2T-14474-SA 6, 14 3F2T-14474-RA 9 97BG-14474-BBA	SUMITOMO			
4S7T-14489-VDA / 4S7T-14A459-VDA	2TAD-0.75 1.5MM FLAT				
For 40A Auxiliary Power Connector	97BG-14421-CCA	YAZAKI			

N0146595

Electrical Component Resource

Mating connectors, terminals and subcomponent availability are managed for Ford Fleet and Pool Accounts through Ford Component Sales. Ford Component Sales, LLC (FCS) uses Globe Component Products or Dynamic Supply Solutions (DSS) to process and coordinate all Fleet and Pool Purchase Orders. By using Globe or DSS, FCS is able to offer the Fleet and Pool community reasonable minimum order quantities while still having the benefit of Ford Production pricing benefits.

Section 2: Electrical

Utility — Wiring Reference Information

Police Interceptor Sedan and Utility Wiring Diagram Excerpts

The following pages are from sections of both the Police Interceptor Sedan and Utility Wiring Diagrams.

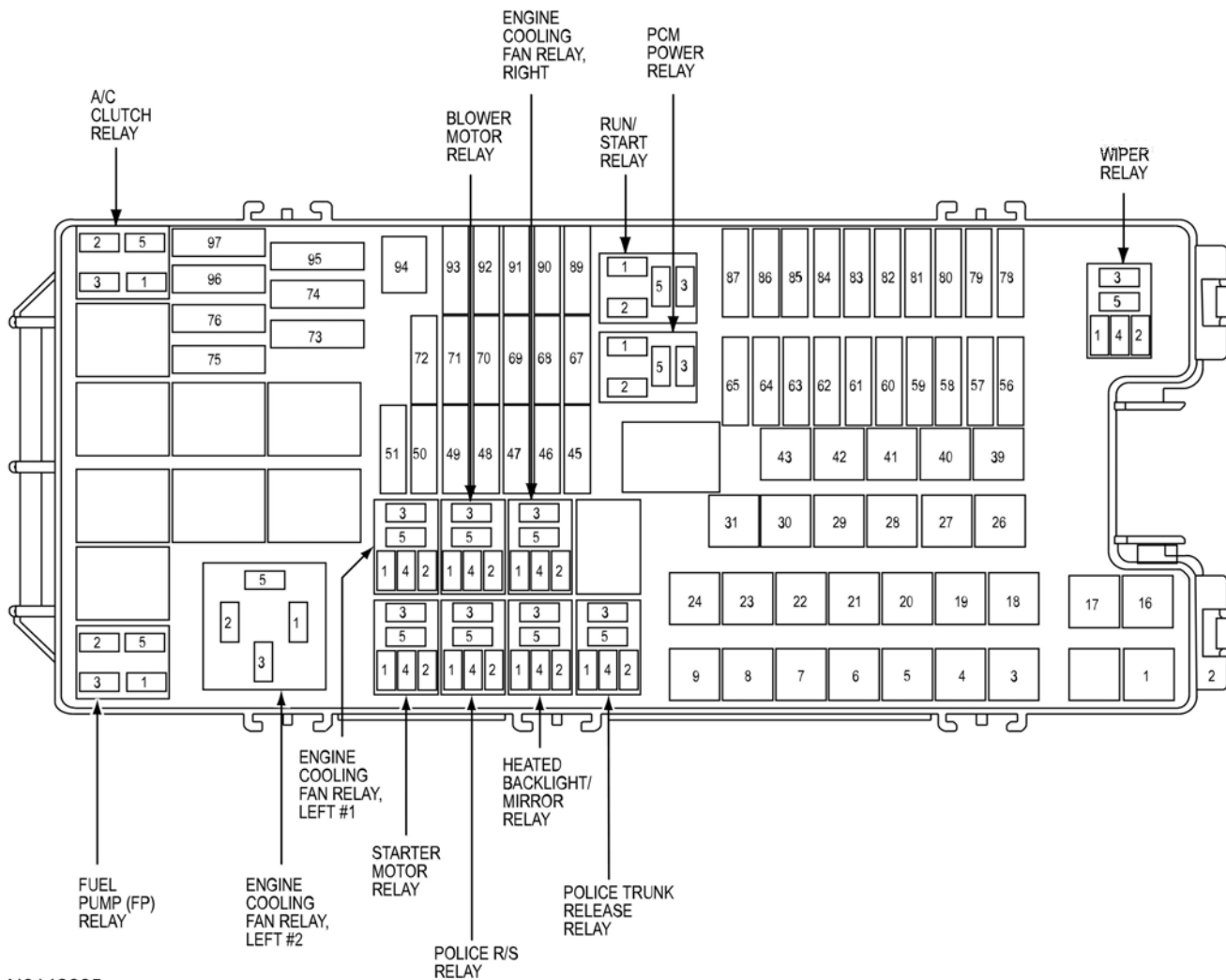
Publication Ordering Information

To obtain information about ordering complete copies of Ford or Lincoln/Mercury publications, call 1-800-782-4356 or at www.helminc.com.

Available publications include Workshop Manuals, Wiring Diagrams, PC/ED Manuals and Owner Guides.

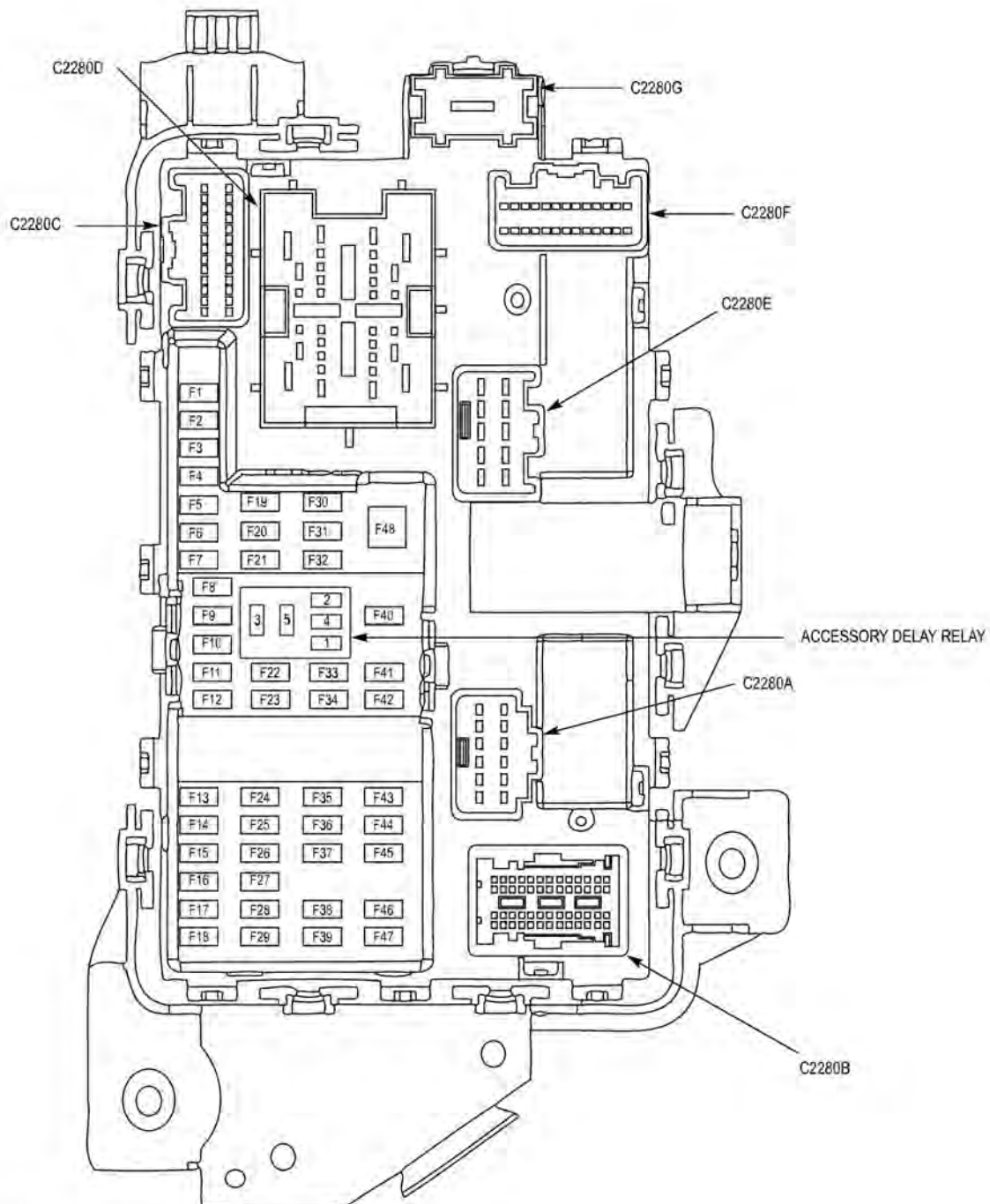
Sedan — Wiring Diagrams: Police Interceptor

Battery Junction Box (BJB)



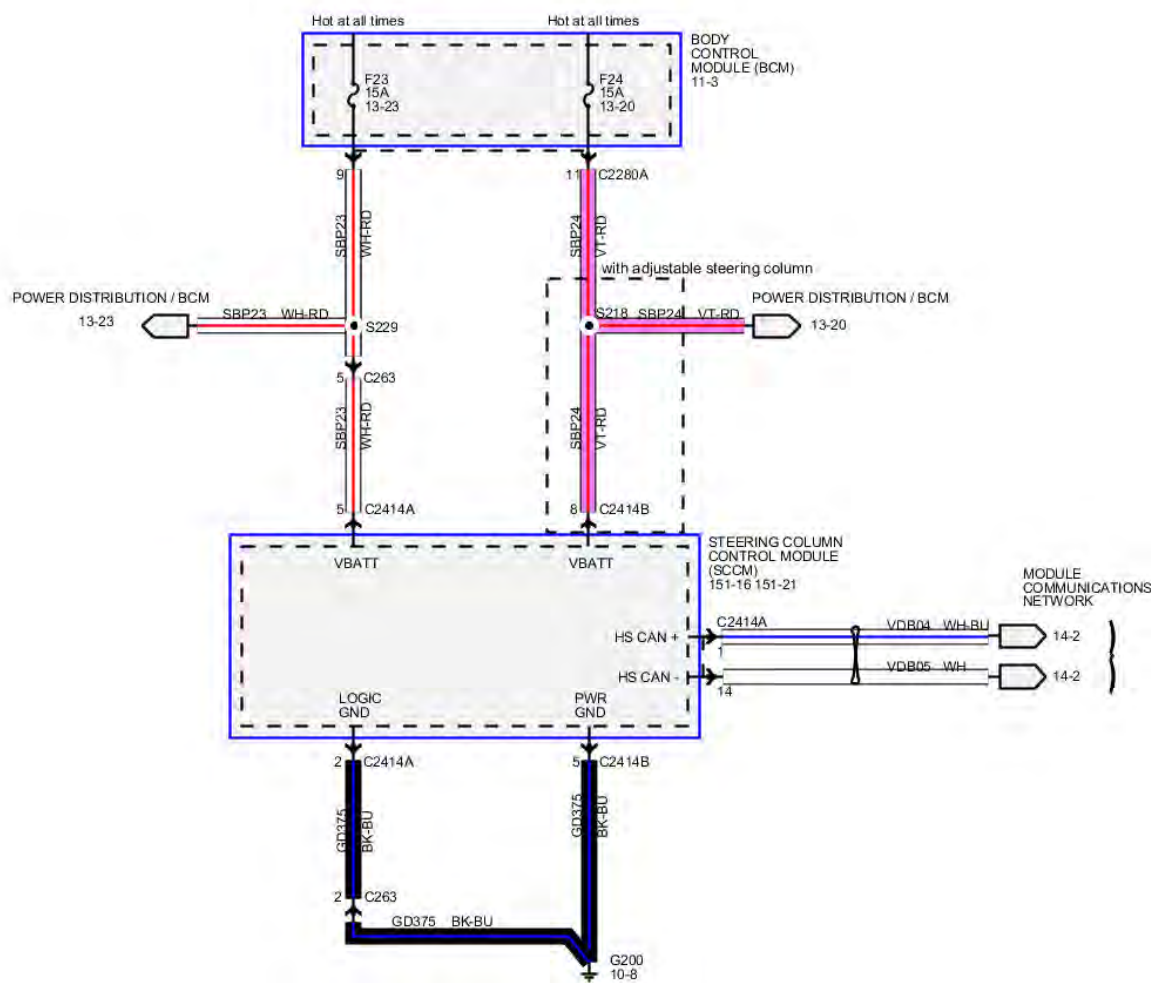
Body Control Module (BCM)

Section 2: Electrical



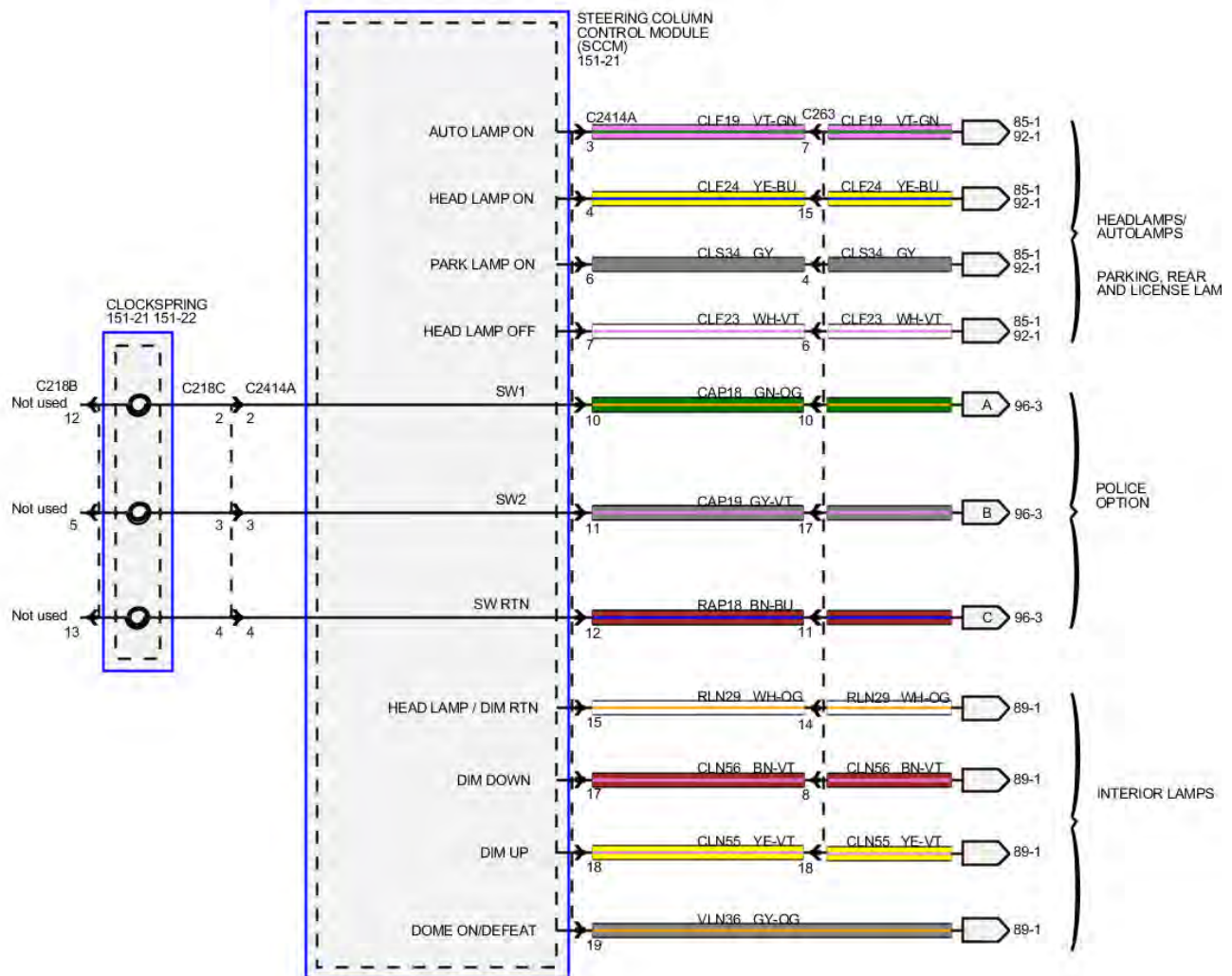
N0142686

Section 2: Electrical



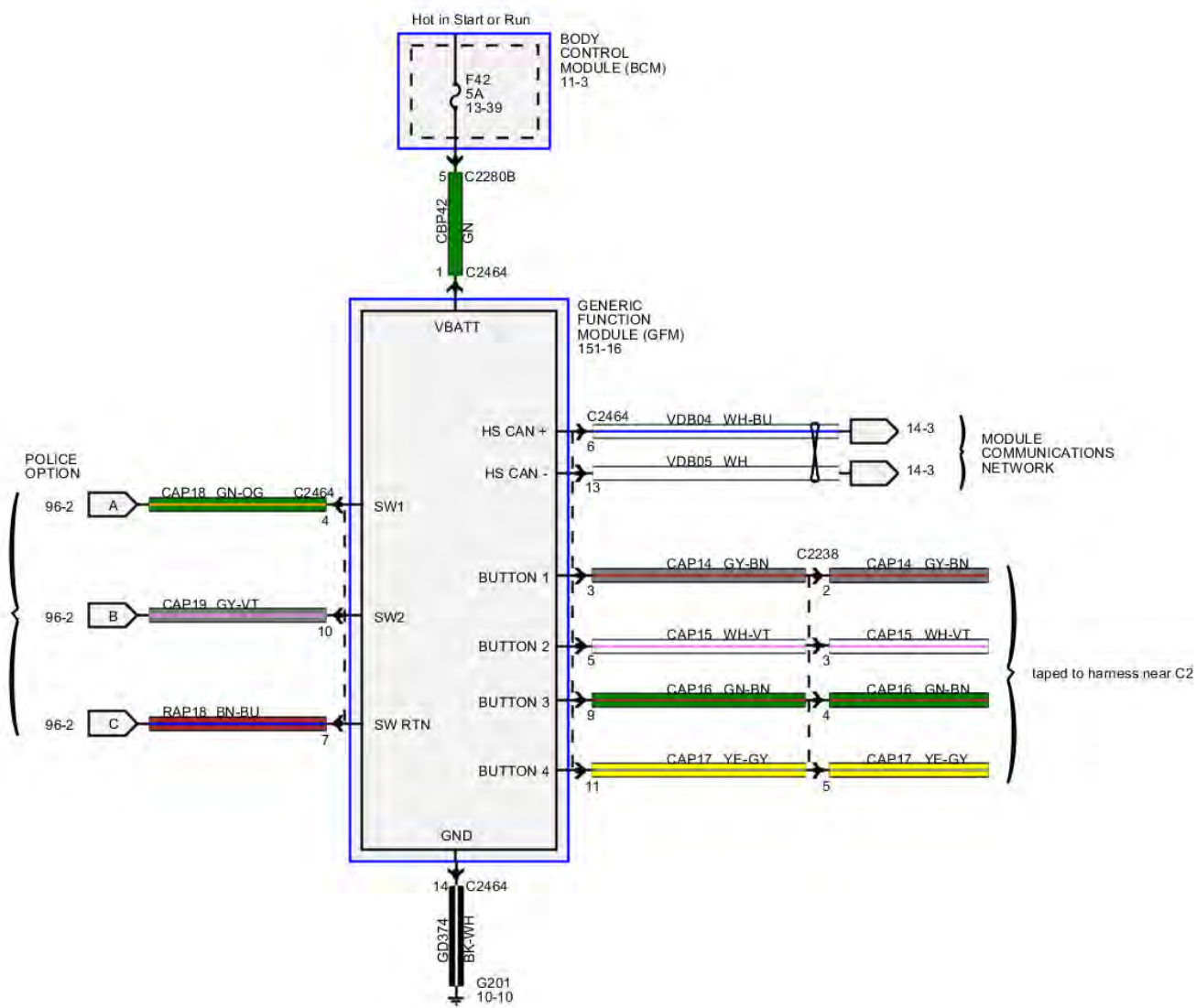
N0163441

Section 2: Electrical



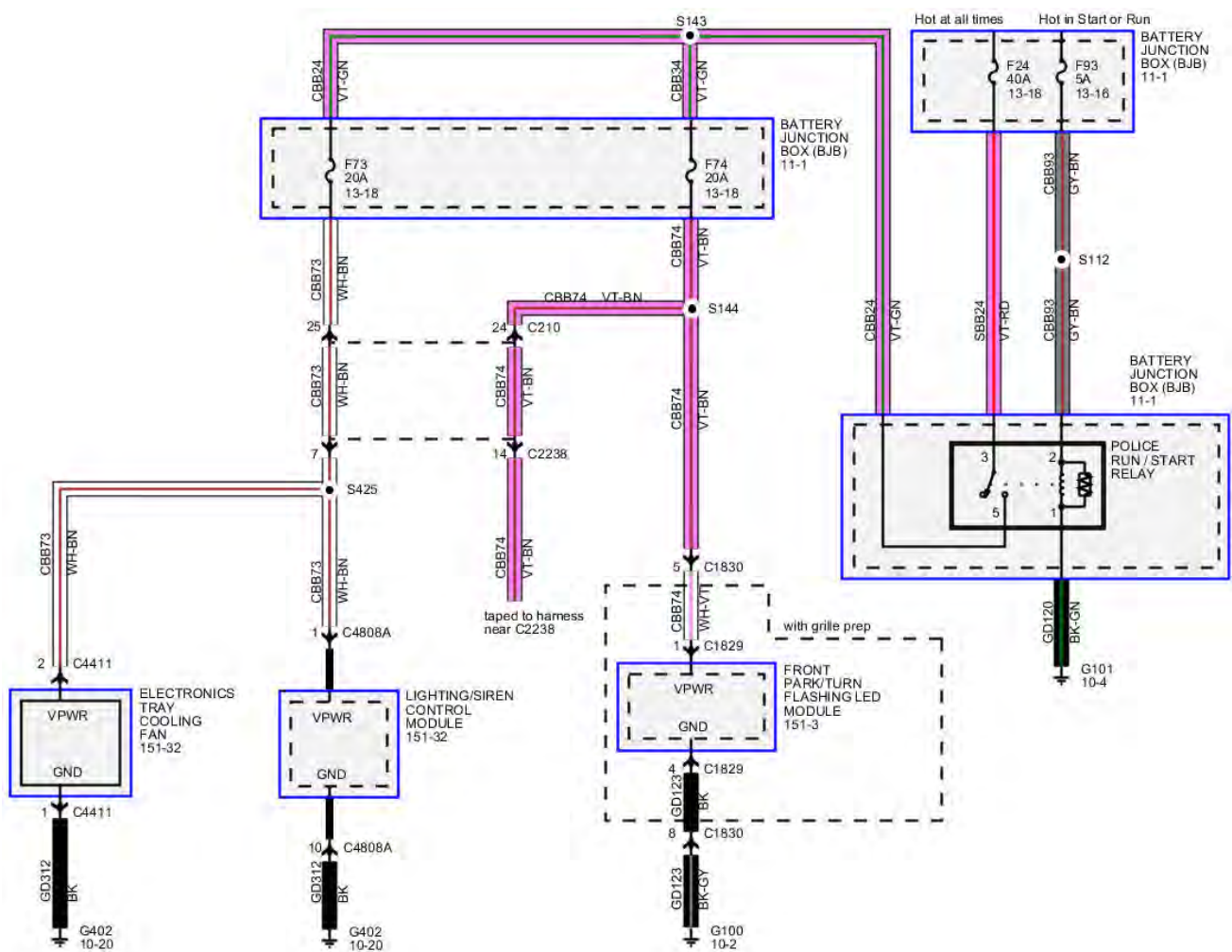
N0163442

Section 2: Electrical



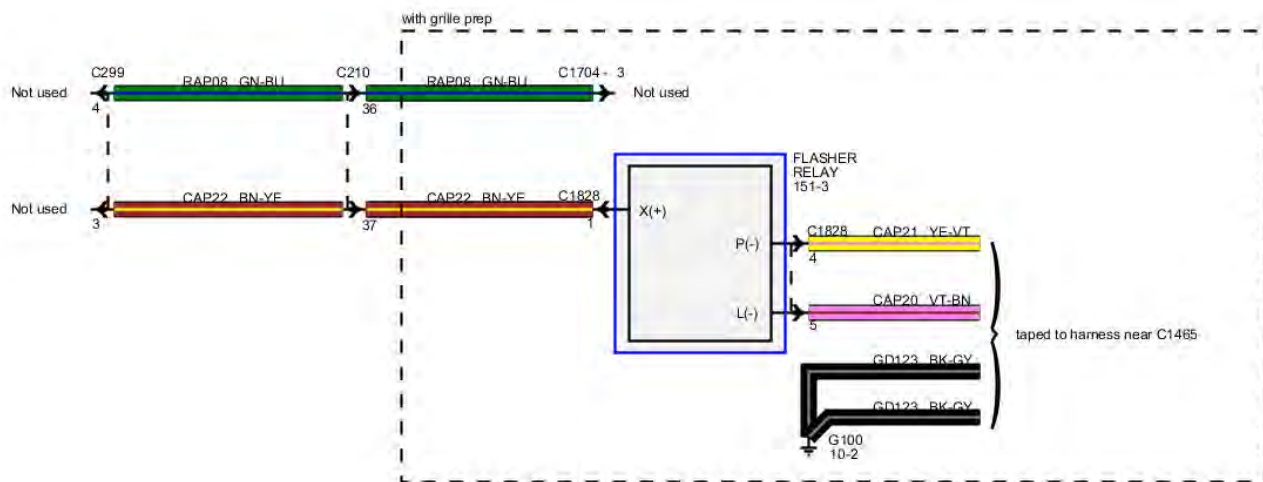
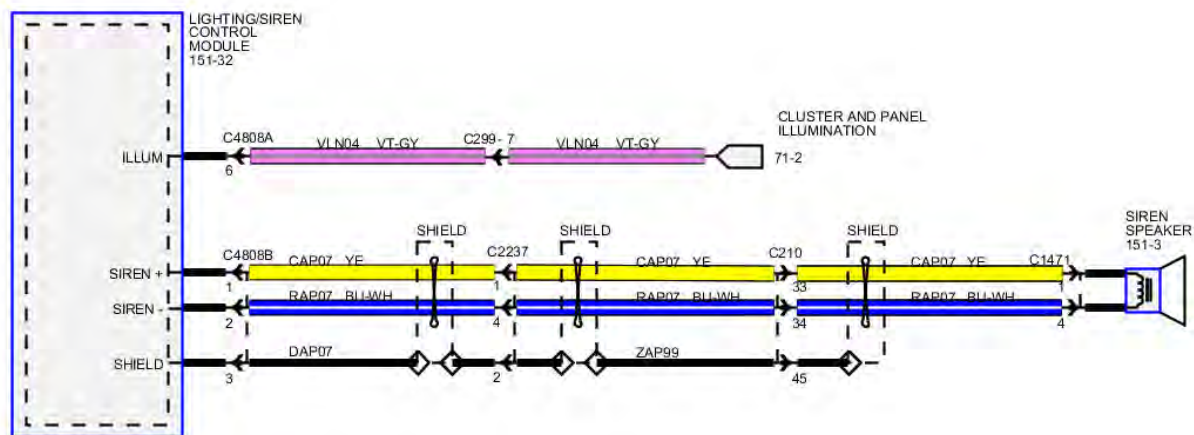
N0163443

Section 2: Electrical



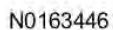
N0163444

Section 2: Electrical



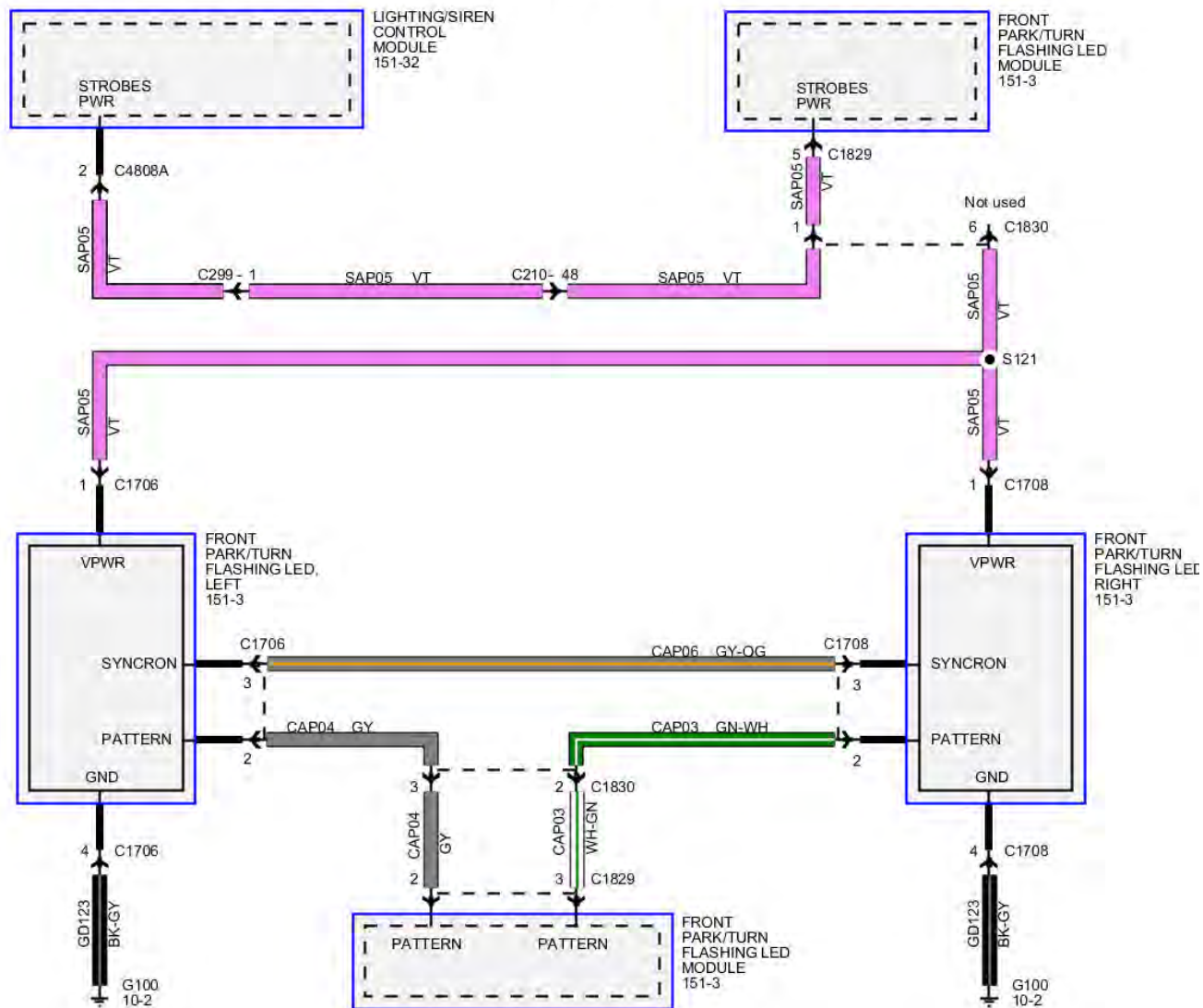
N0163445

Section 2: Electrical



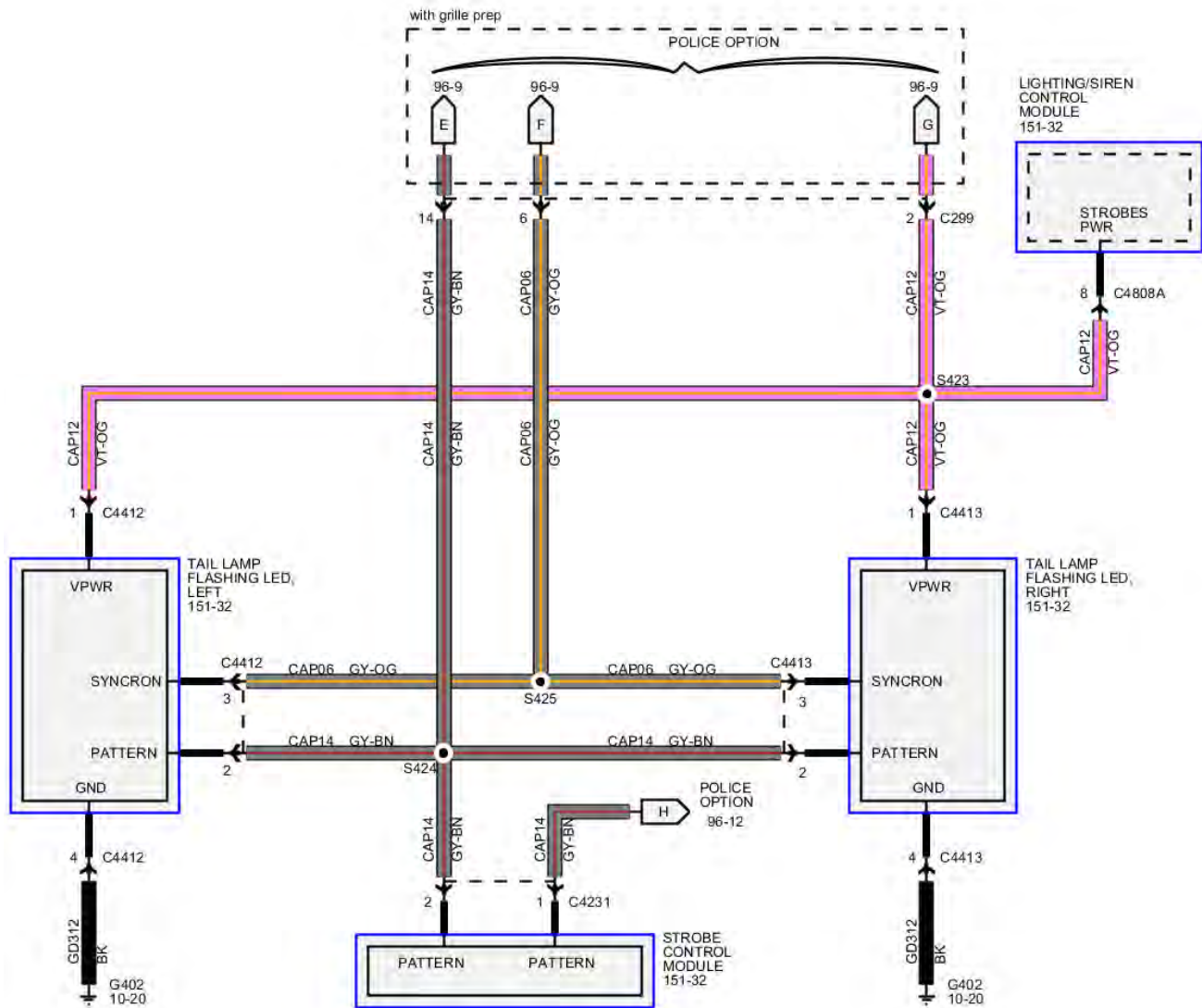
Section 2: Electrical

WITH GRILLE PREP



N0163447

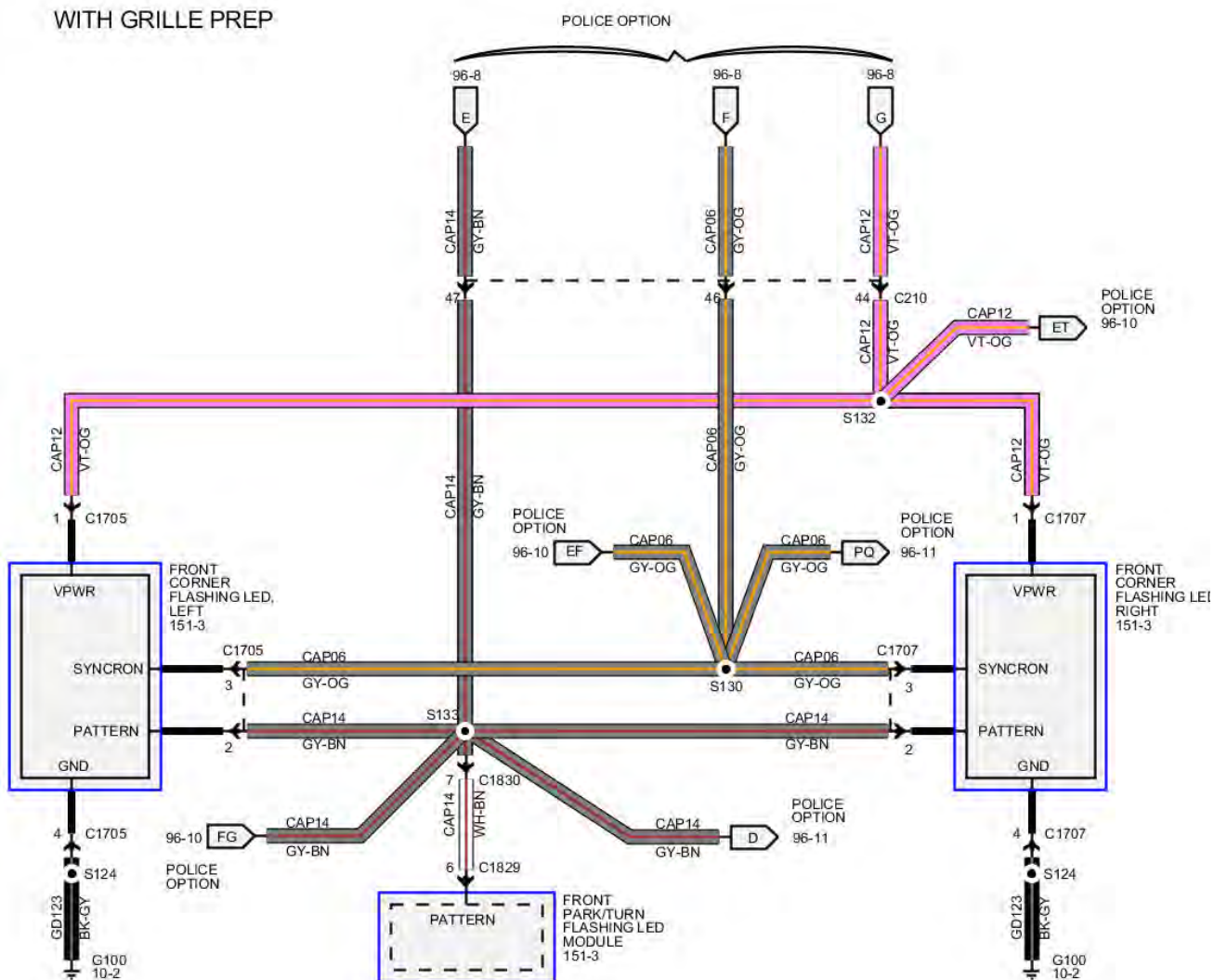
Section 2: Electrical



N0163448

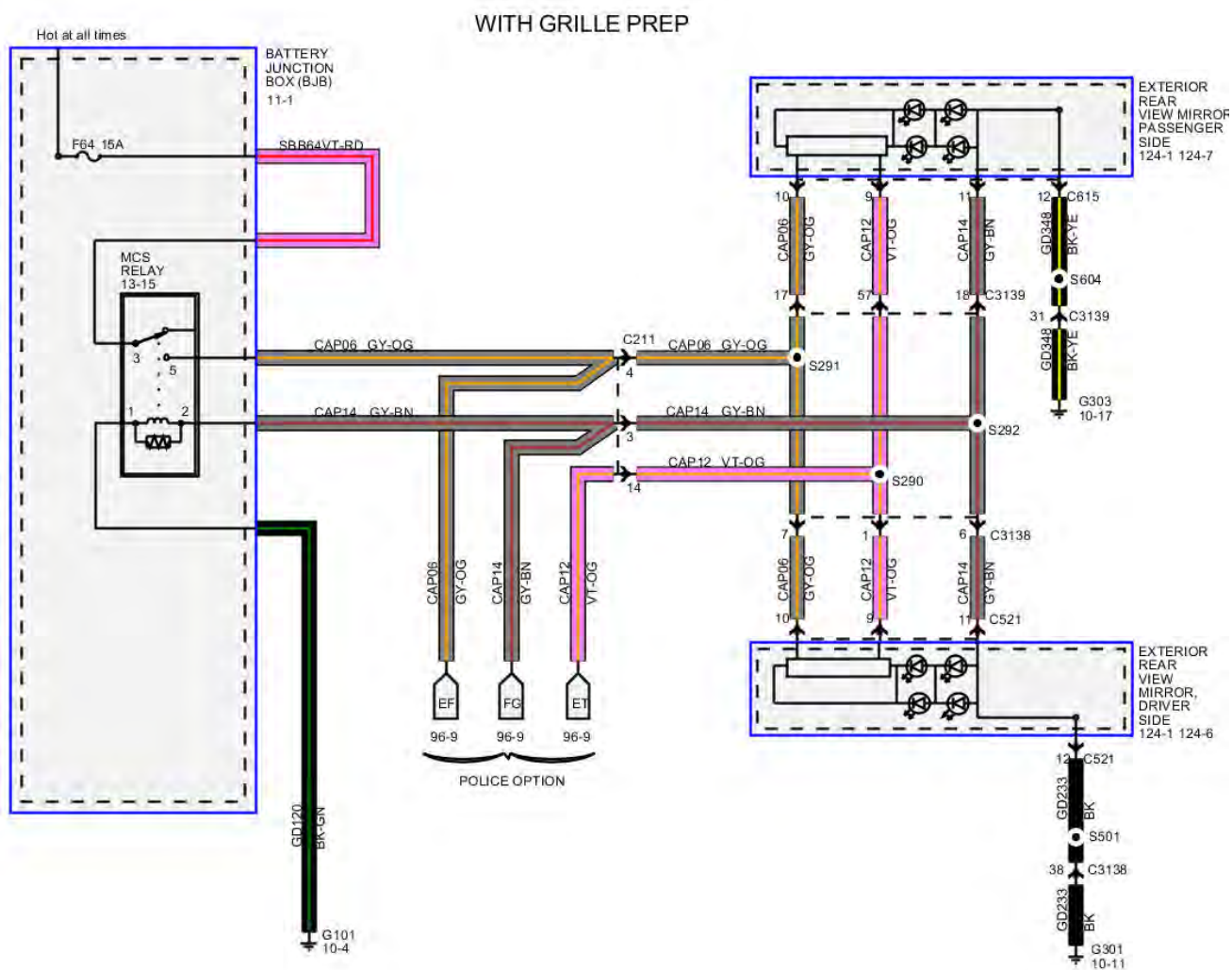
Section 2: Electrical

WITH GRILLE PREP



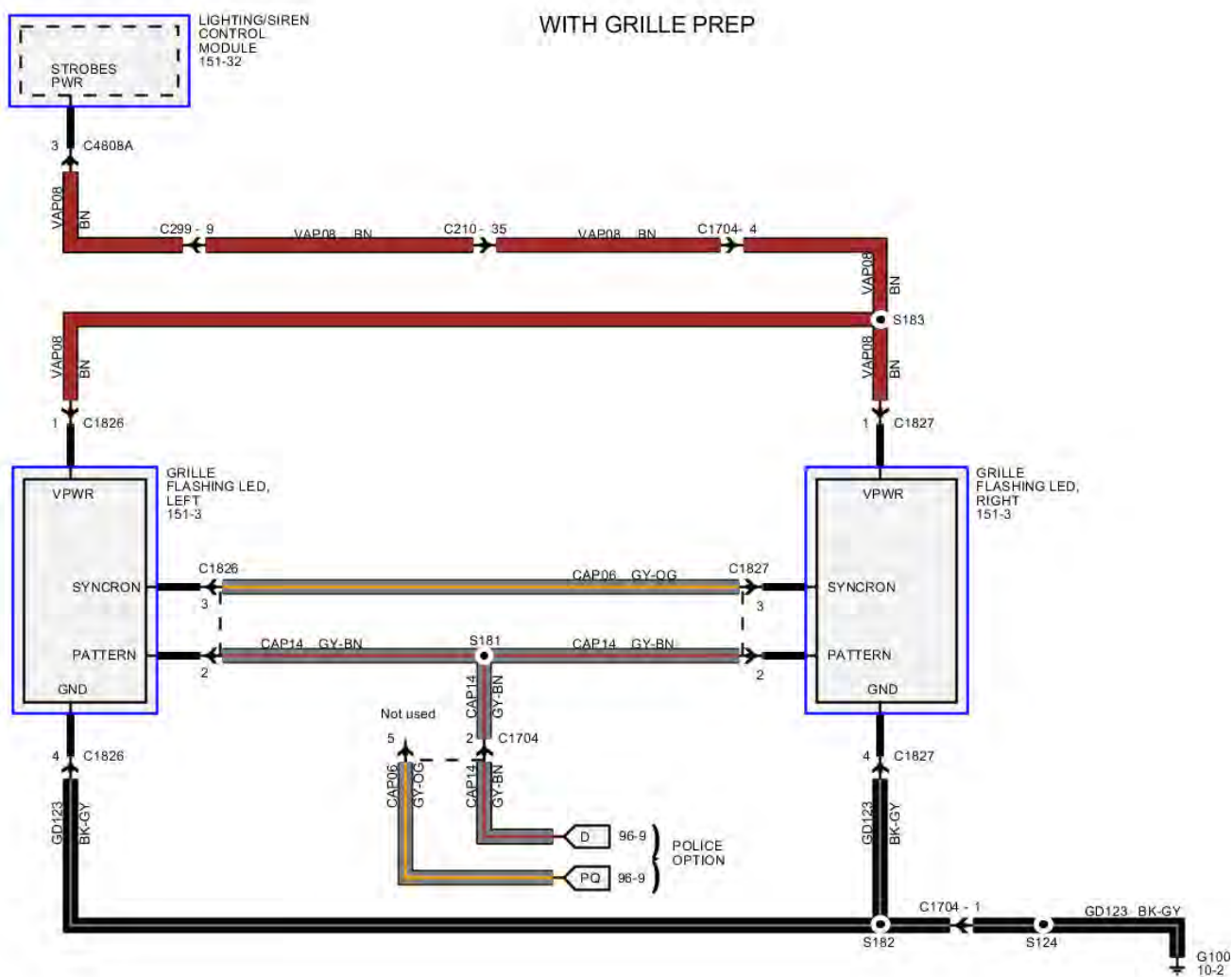
N0163449

Section 2: Electrical



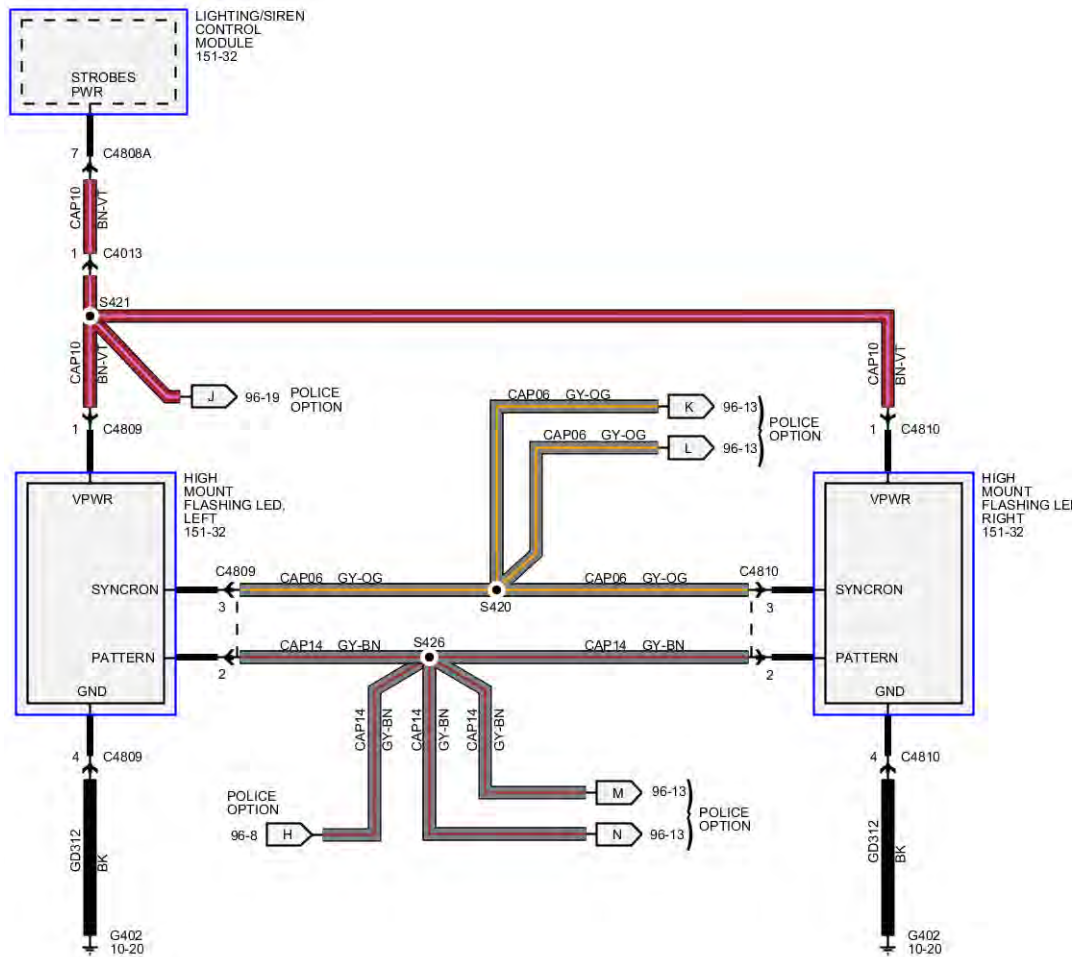
N0163450

Section 2: Electrical



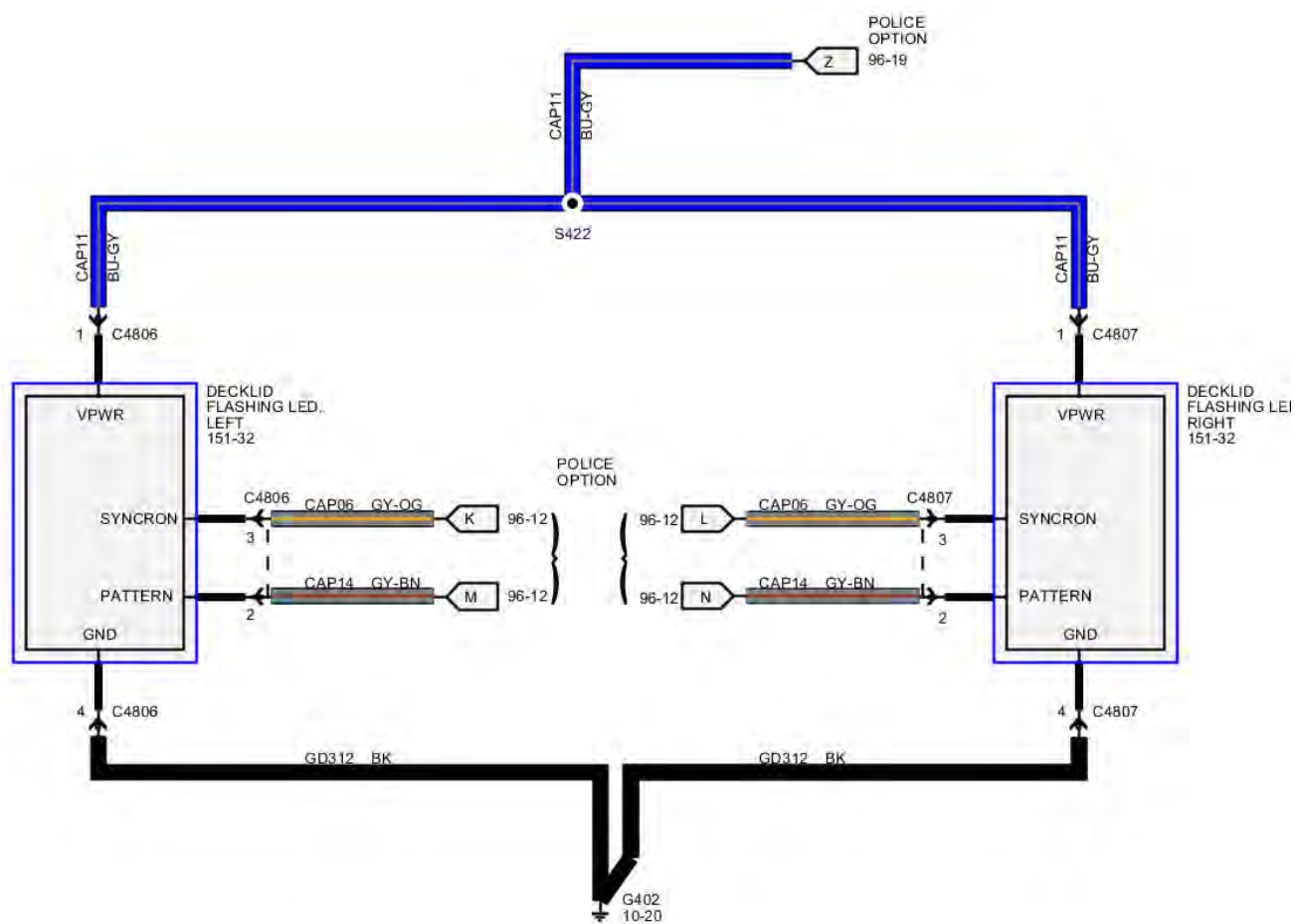
N0163451

Section 2: Electrical



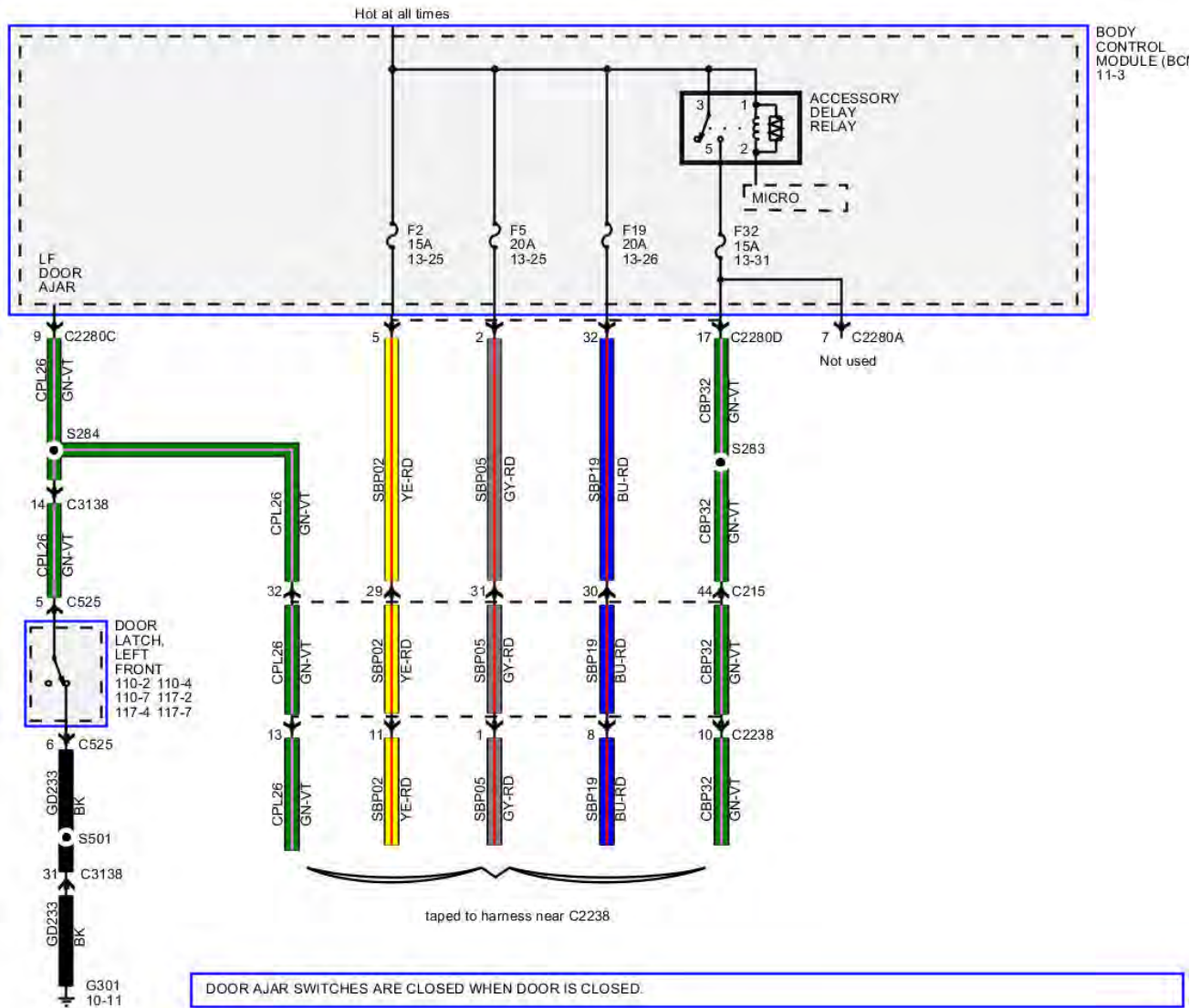
N0163452

Section 2: Electrical



N0163453

Section 2: Electrical

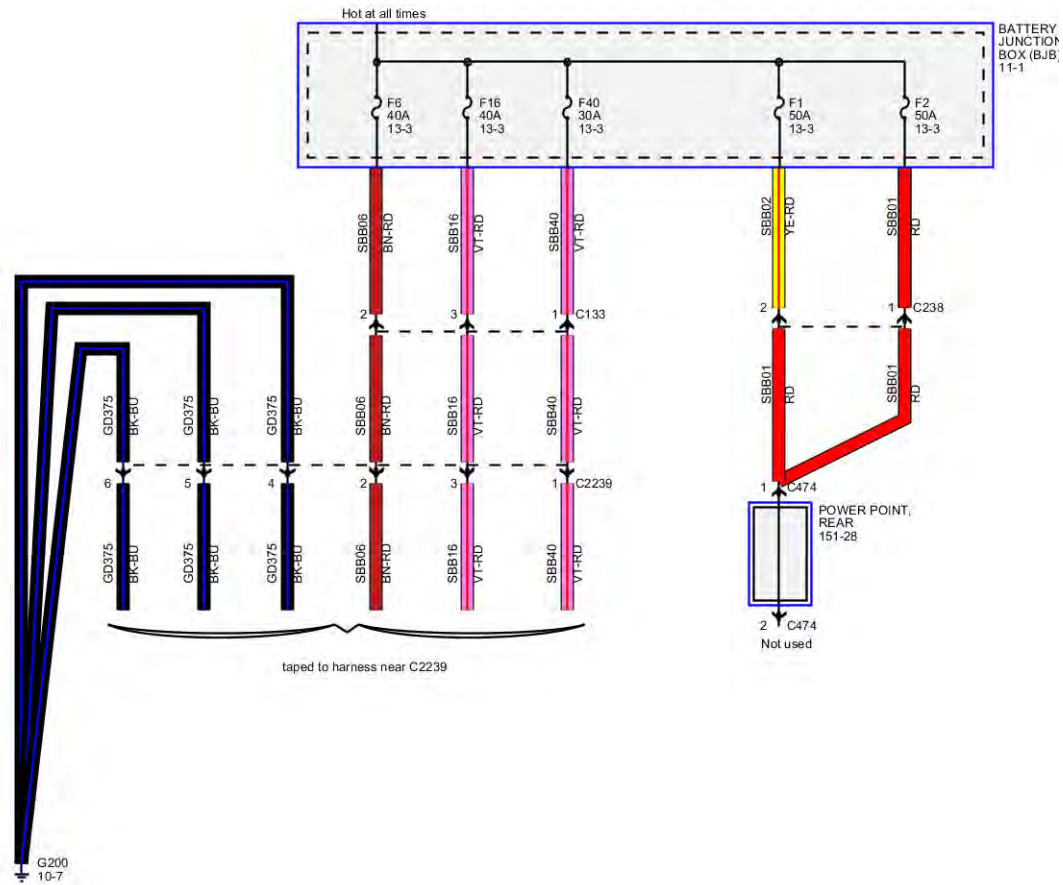


N0163454

N0163455

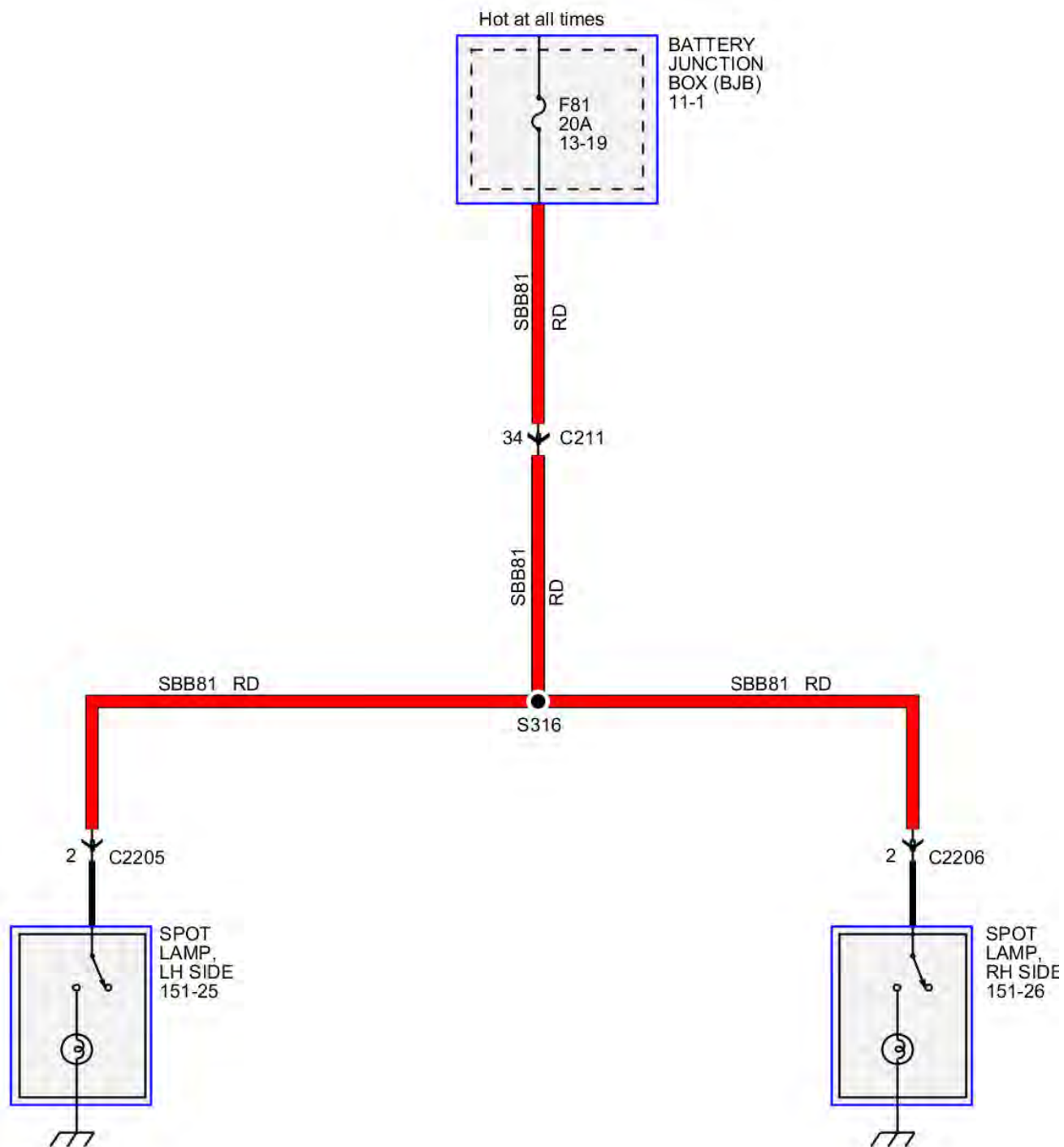


Section 2: Electrical



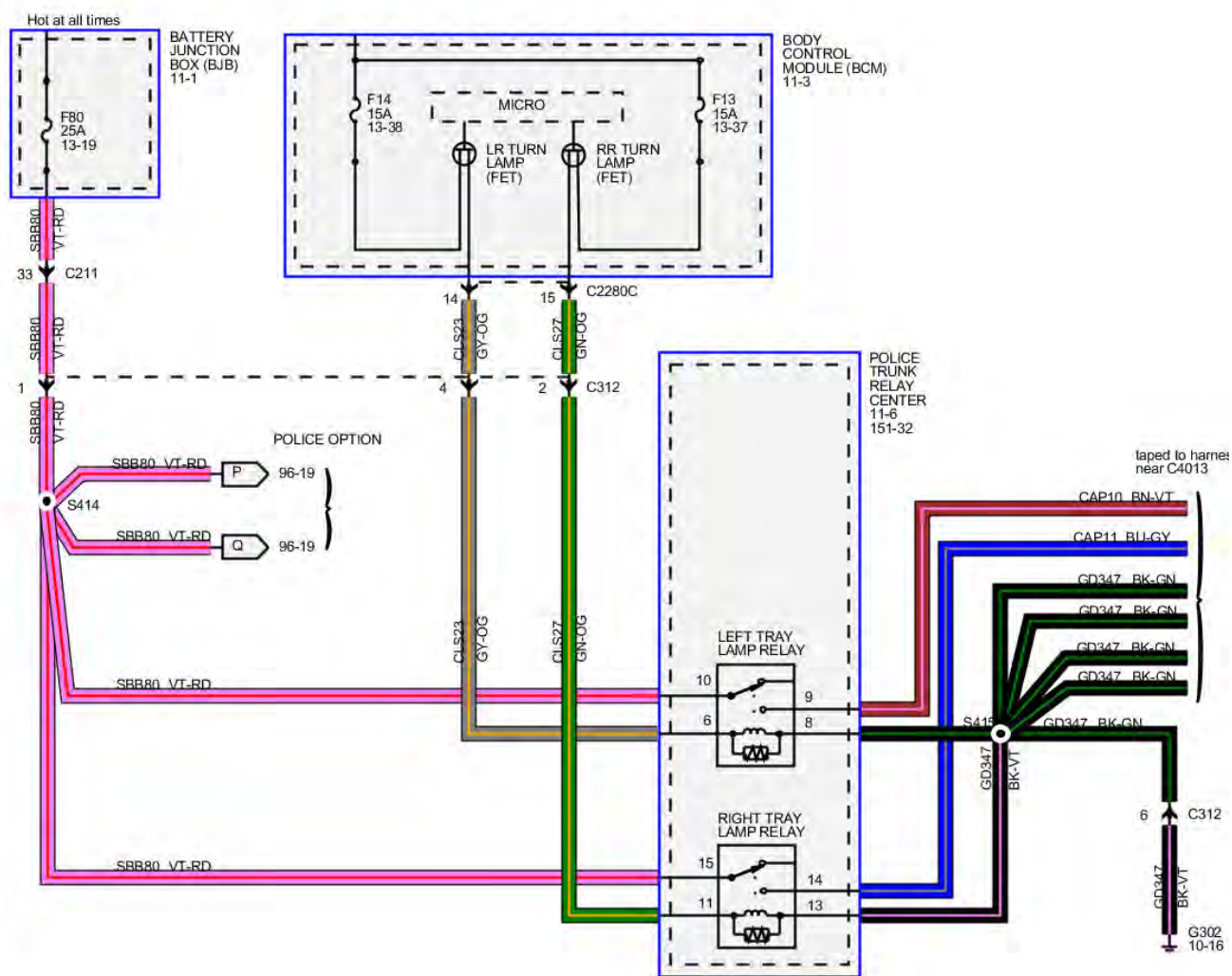
N0163456

Section 2: Electrical

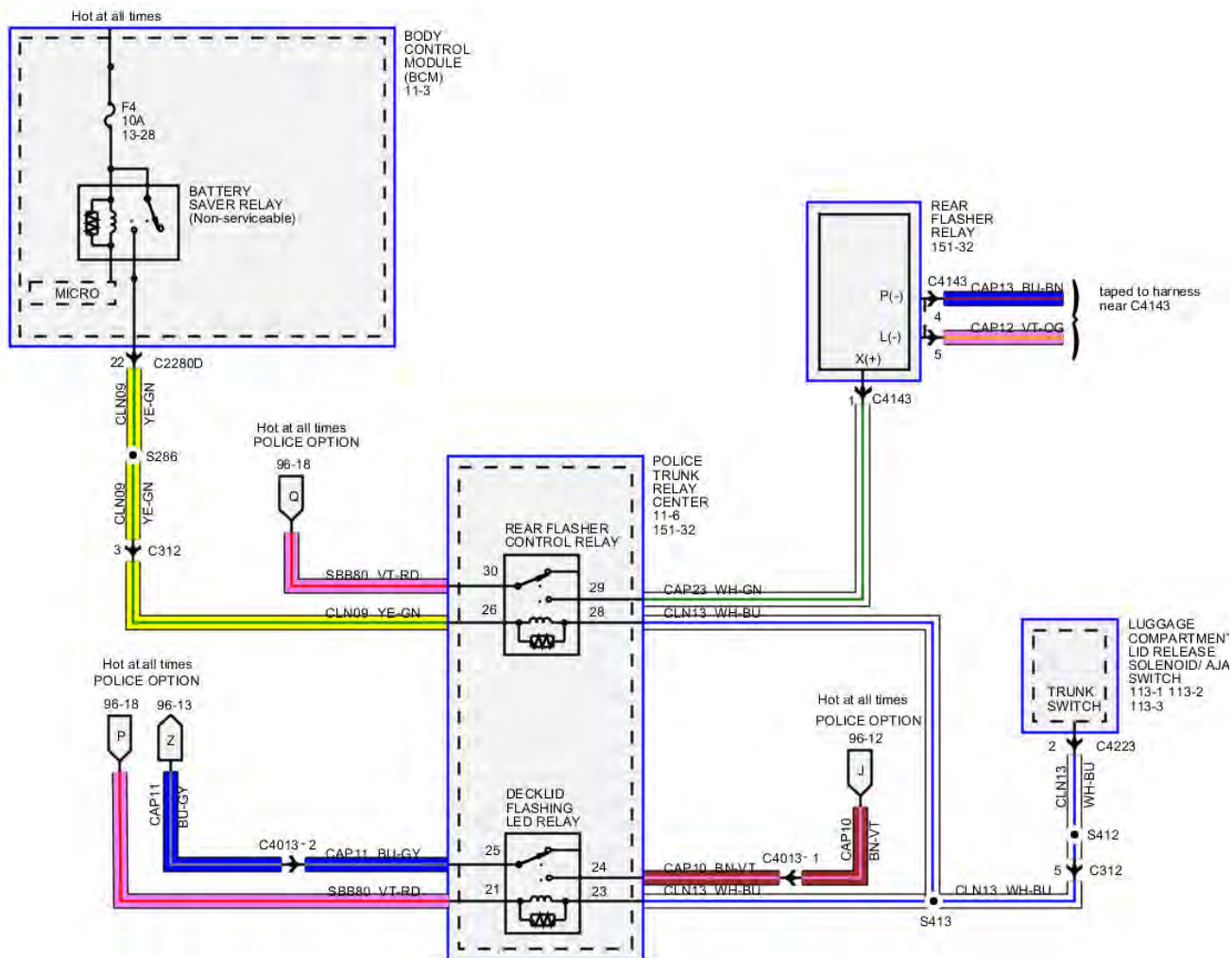


N0163457

N0163458

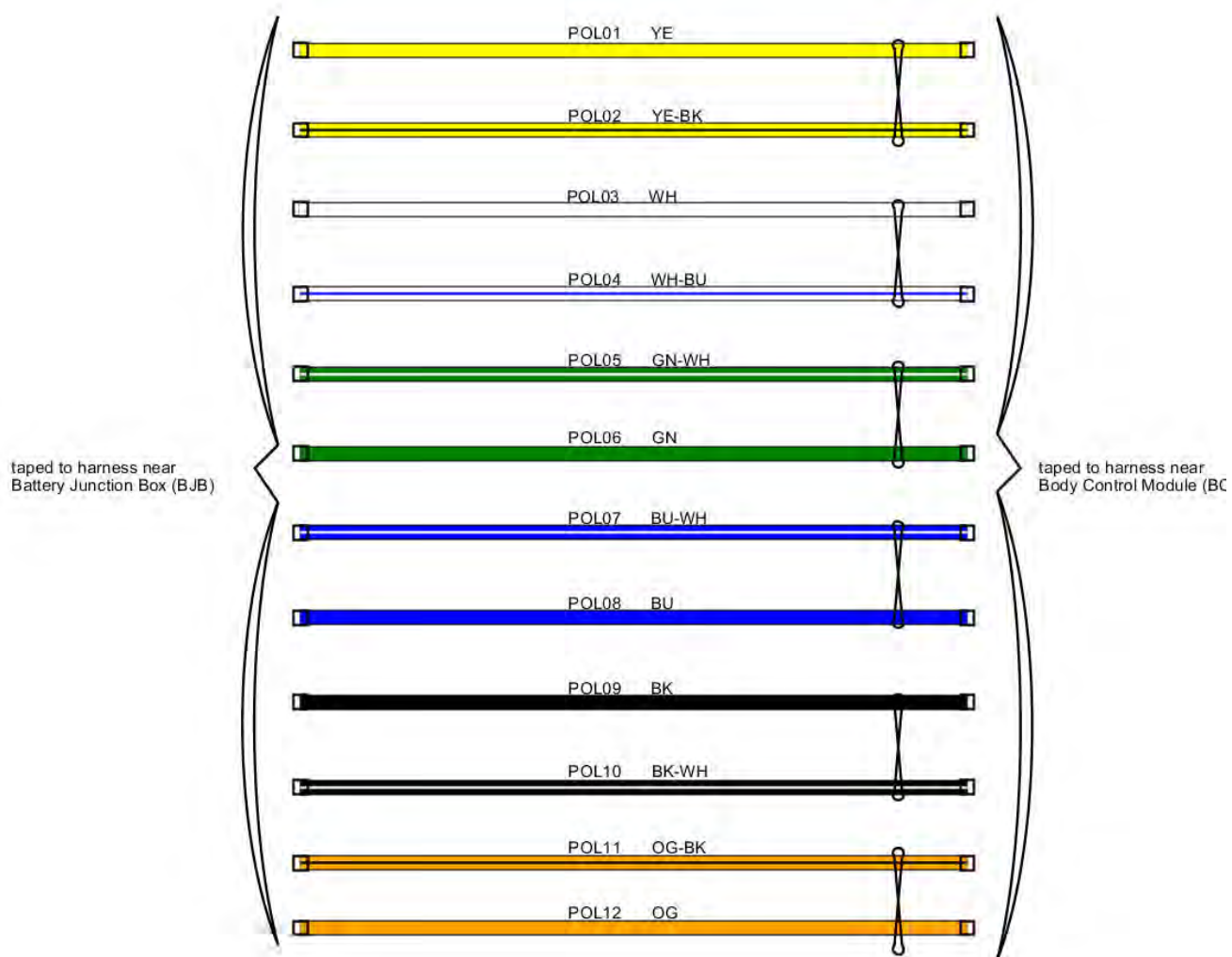


Section 2: Electrical



N0163459

Section 2: Electrical



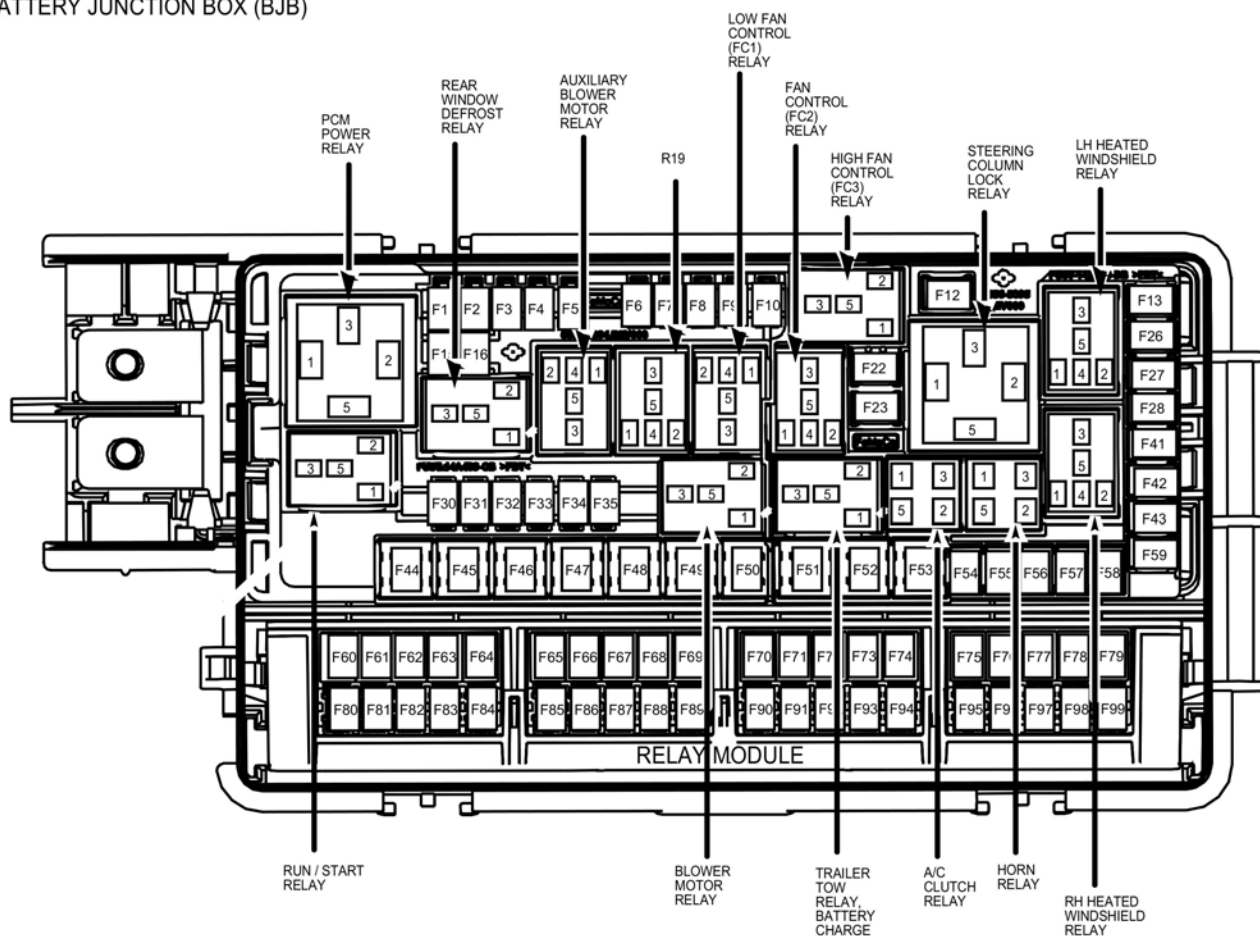
N0163460

Utility — Wiring Diagrams: Police Interceptor Battery Junction Box (BJB)

Battery Junction Box (BJB)

Section 2: Electrical

BATTERY JUNCTION BOX (BJB)

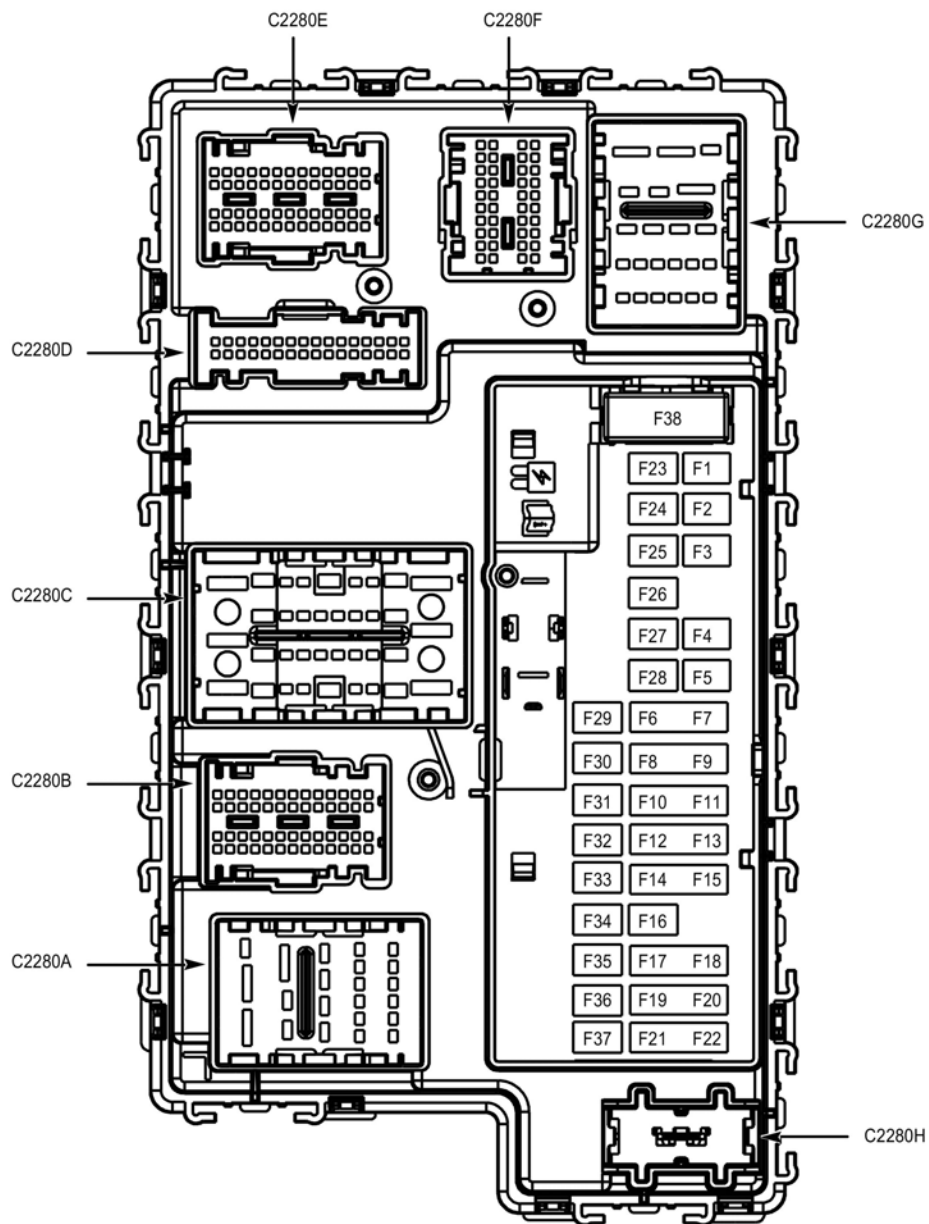


N0165772

Body Control Module (BCM)

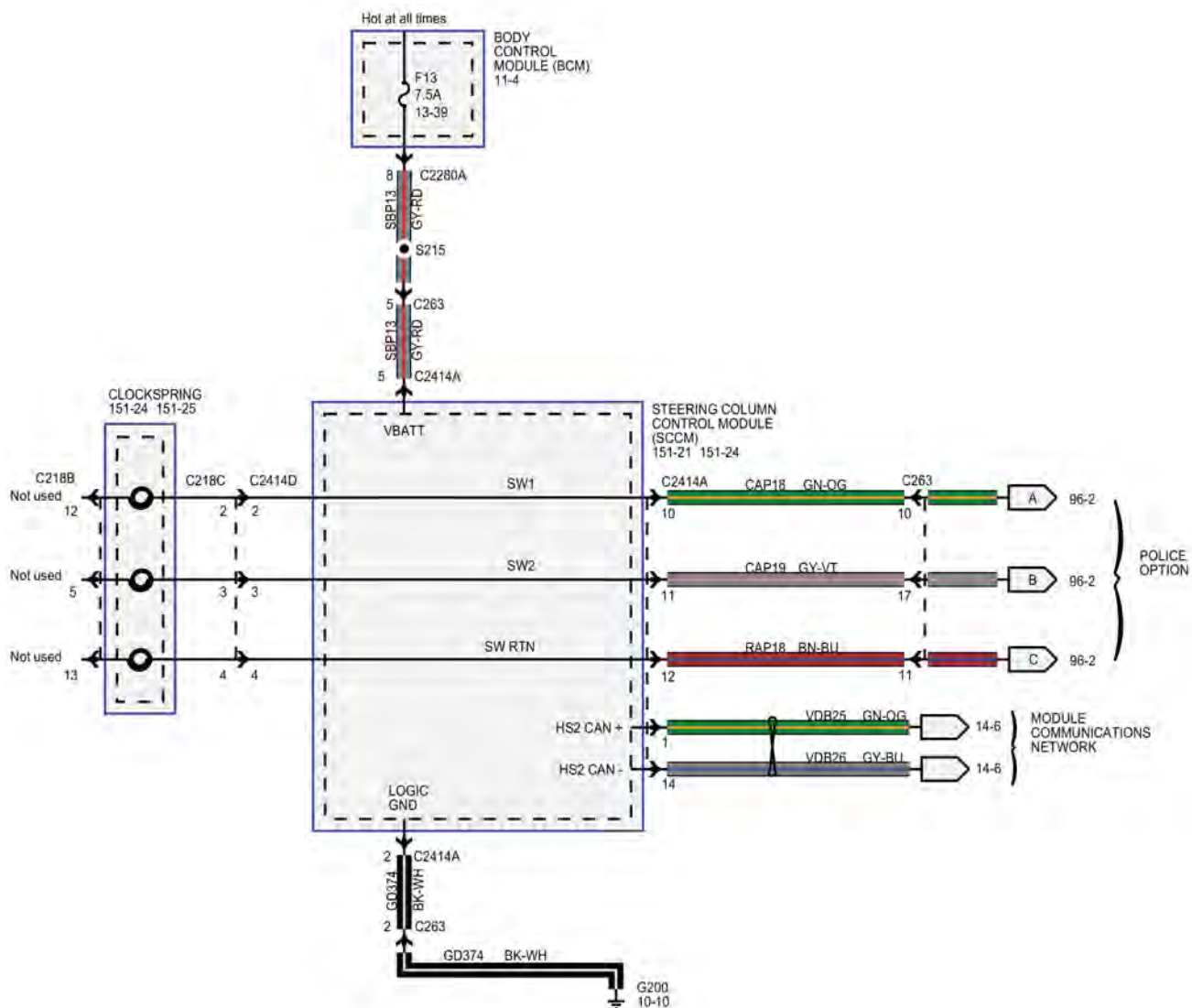
Section 2: Electrical

BODY CONTROL MODULE (BCM)



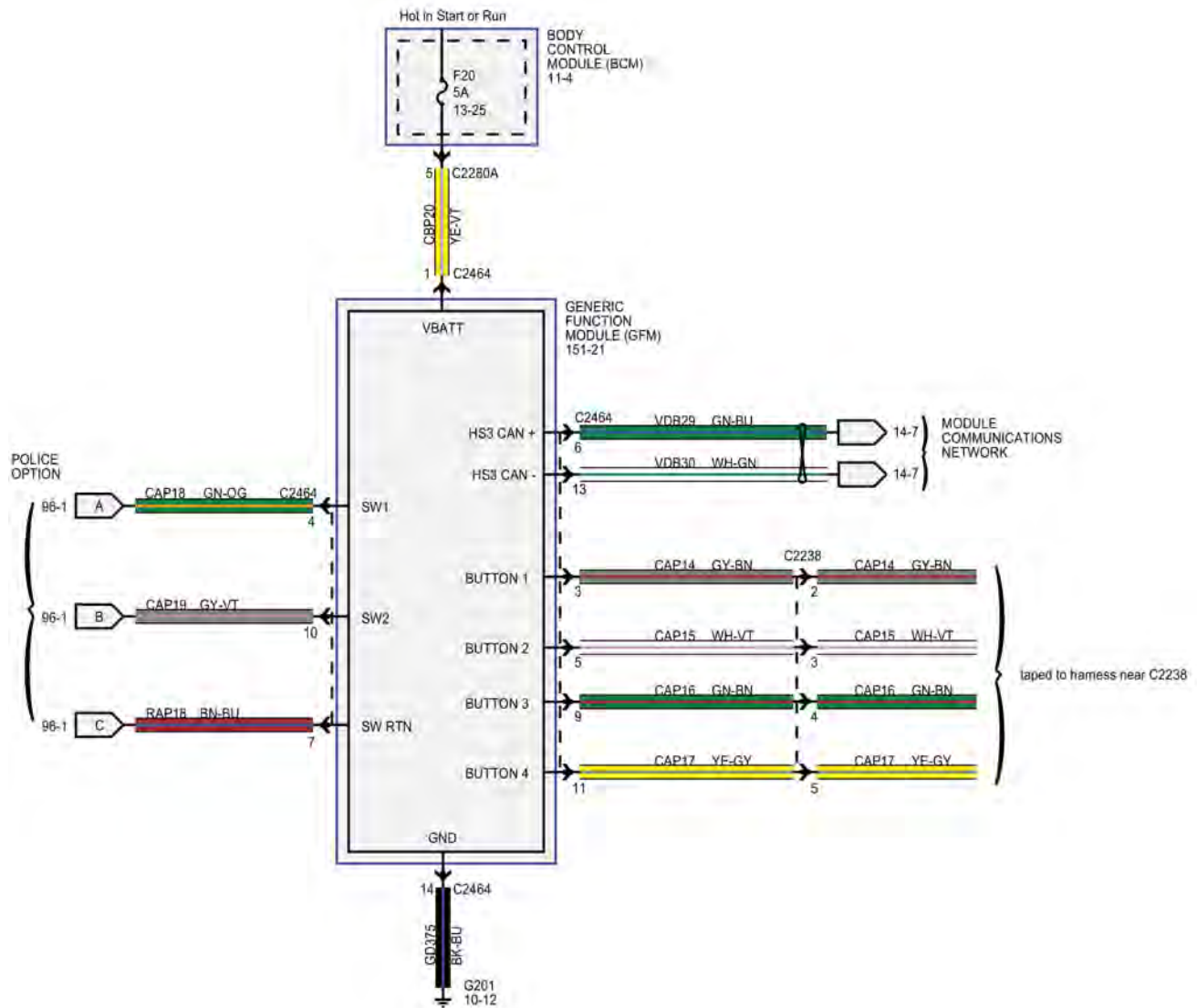
N0165773

Section 2: Electrical



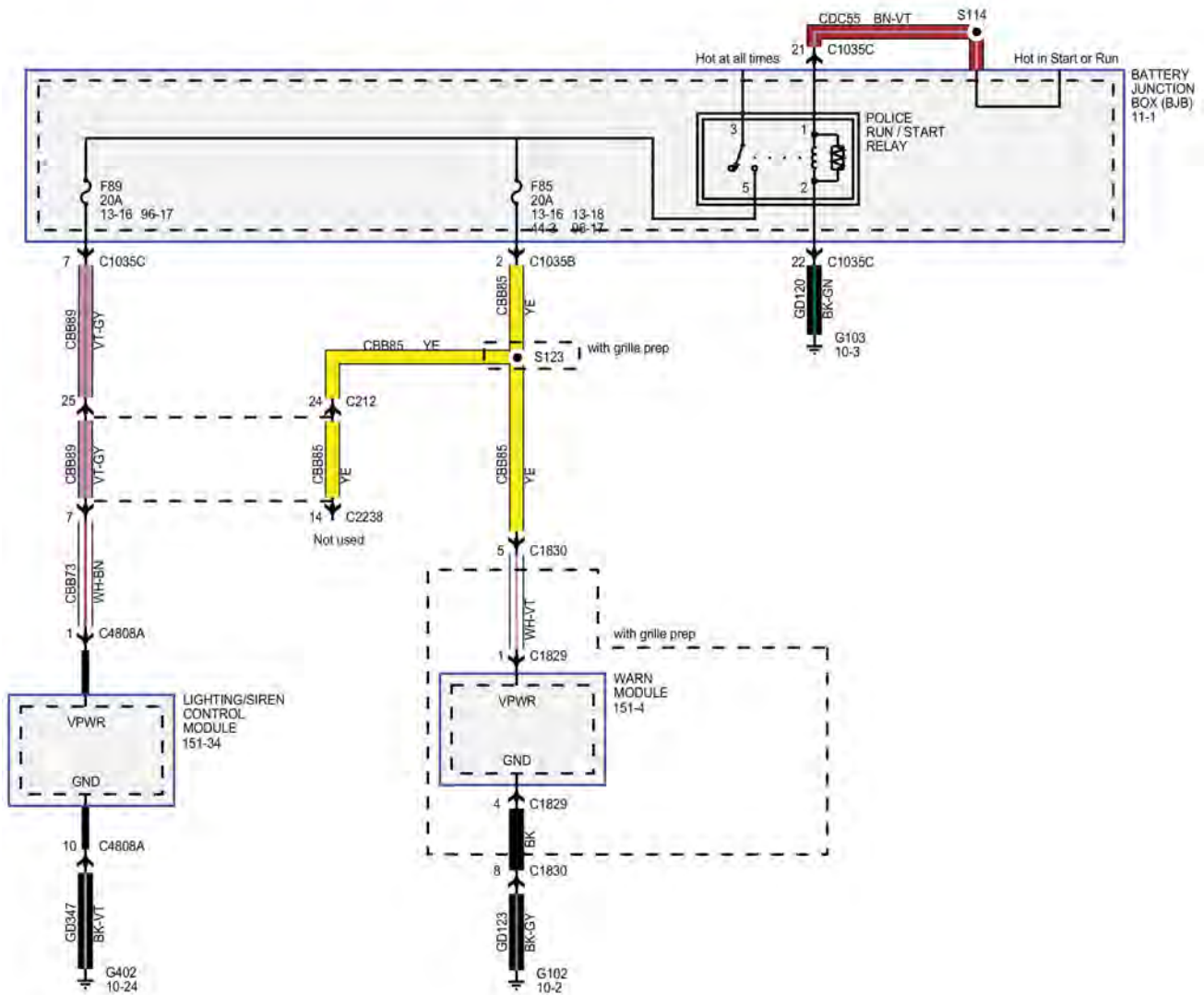
N0165619

Section 2: Electrical



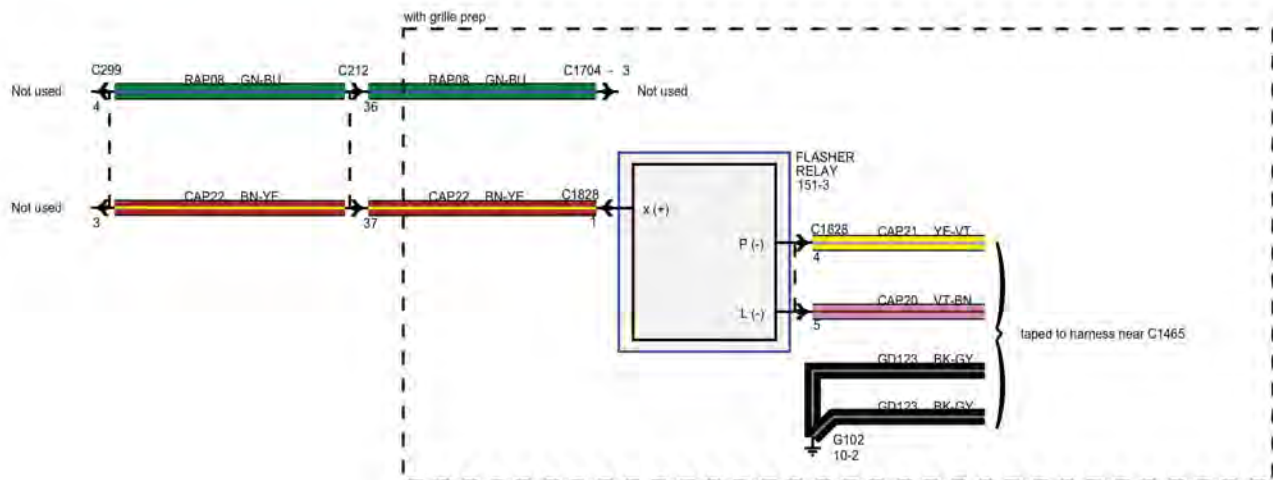
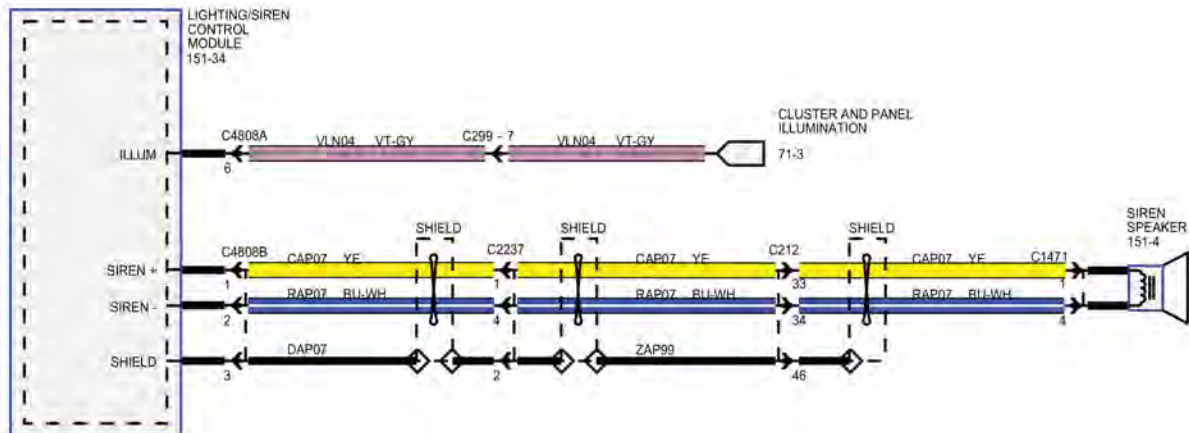
N0165618

Section 2: Electrical



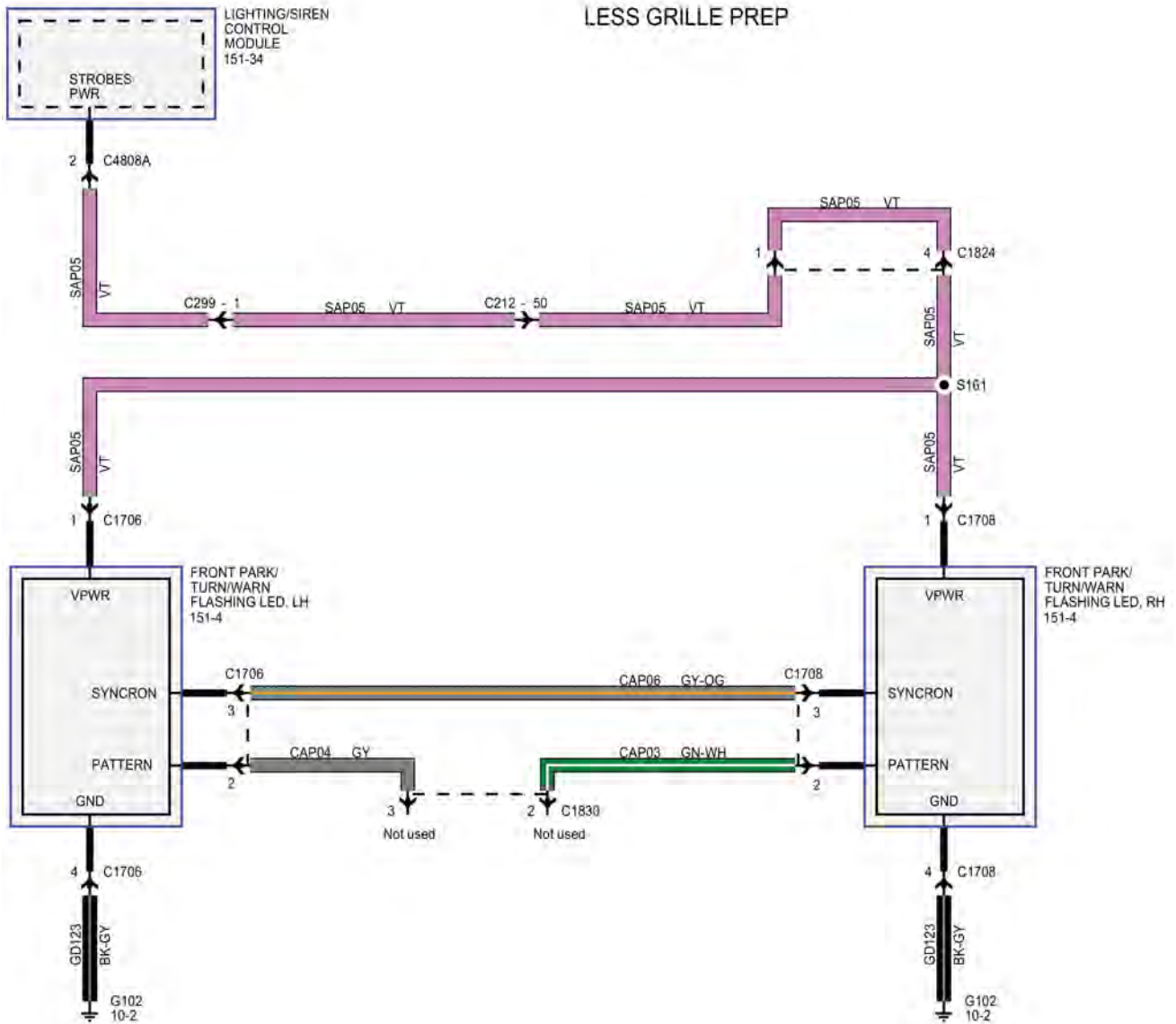
N0165617

Section 2: Electrical



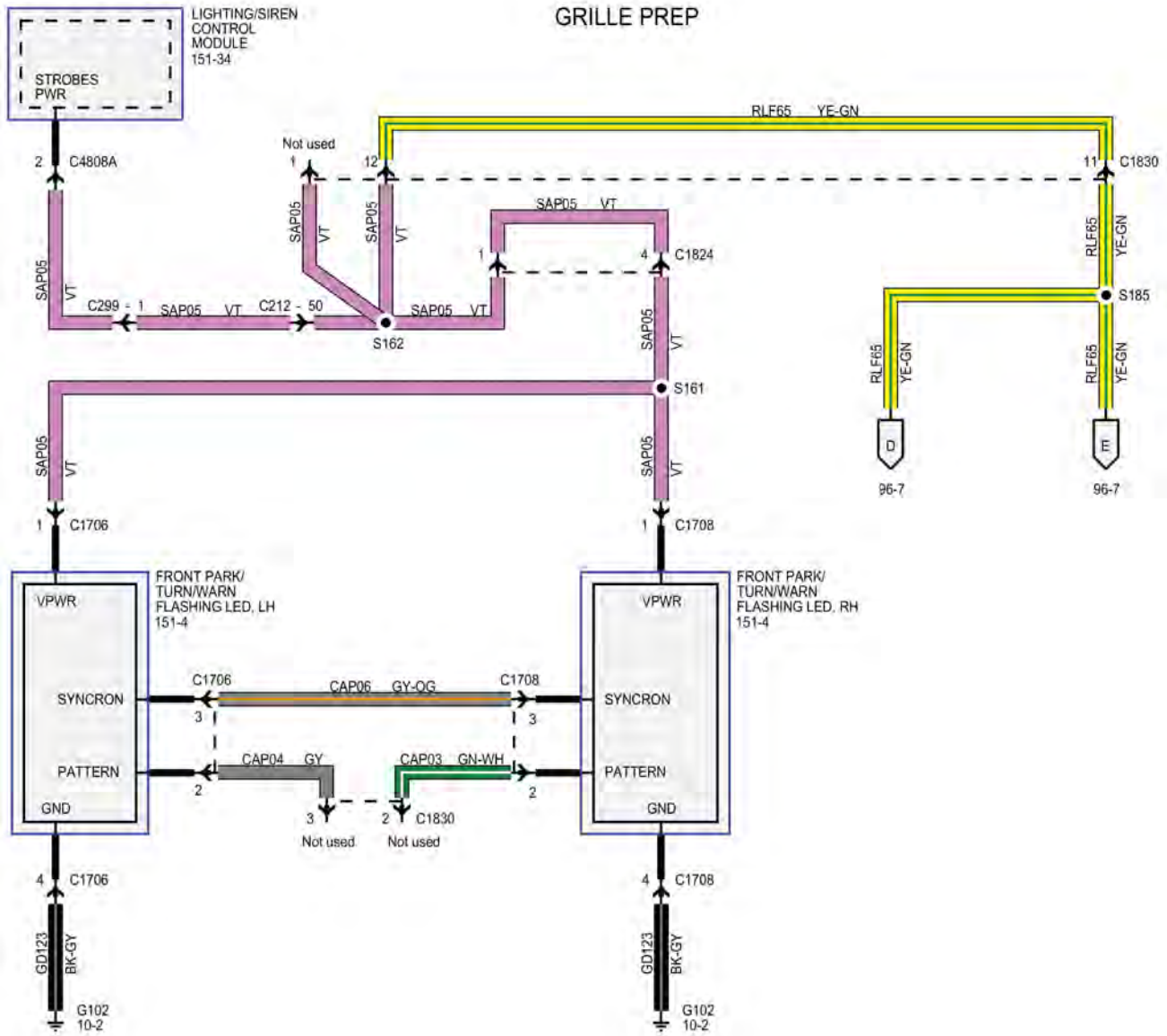
N0165616

Section 2: Electrical



N0165615

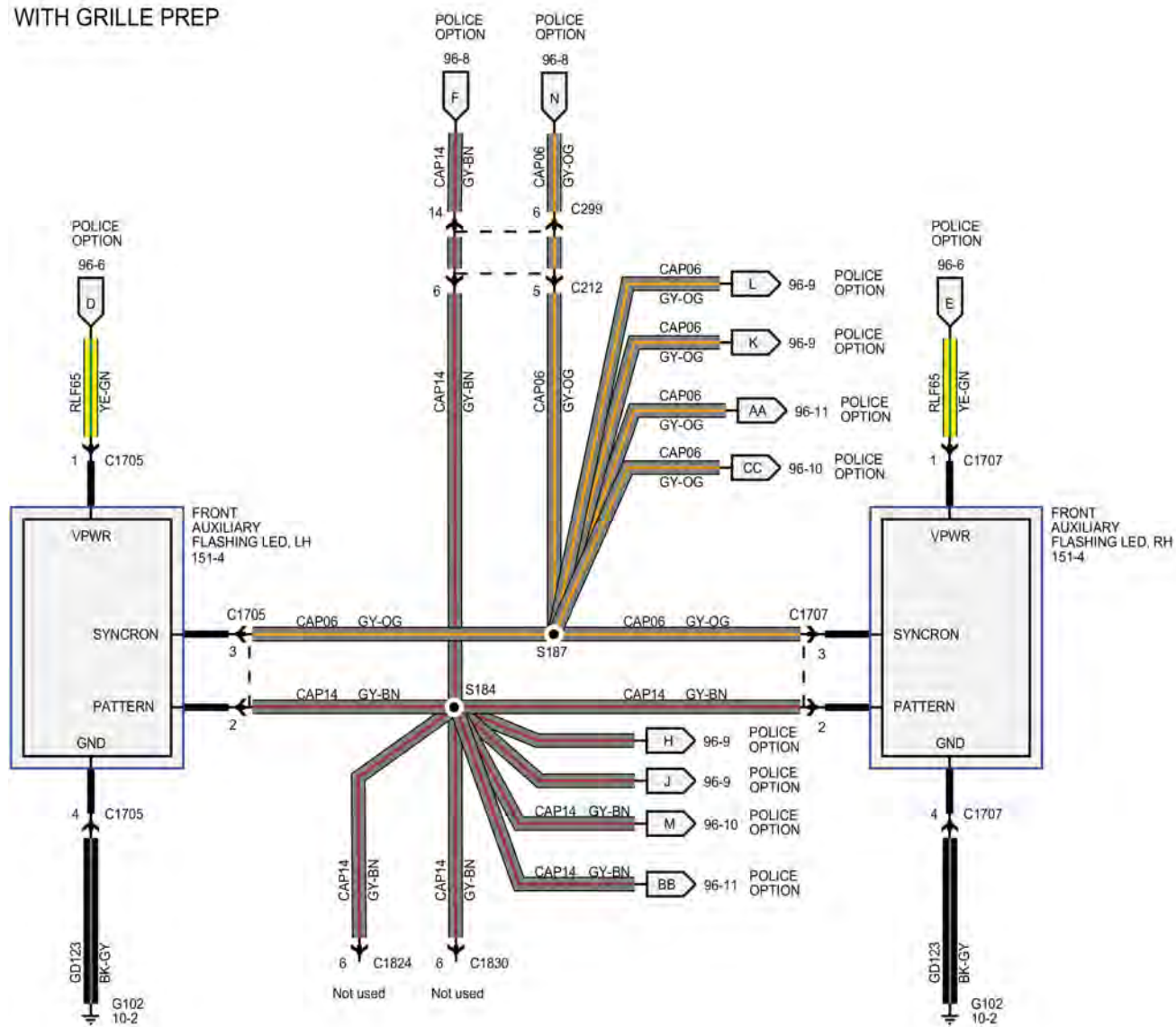
Section 2: Electrical



N0165614

Section 2: Electrical

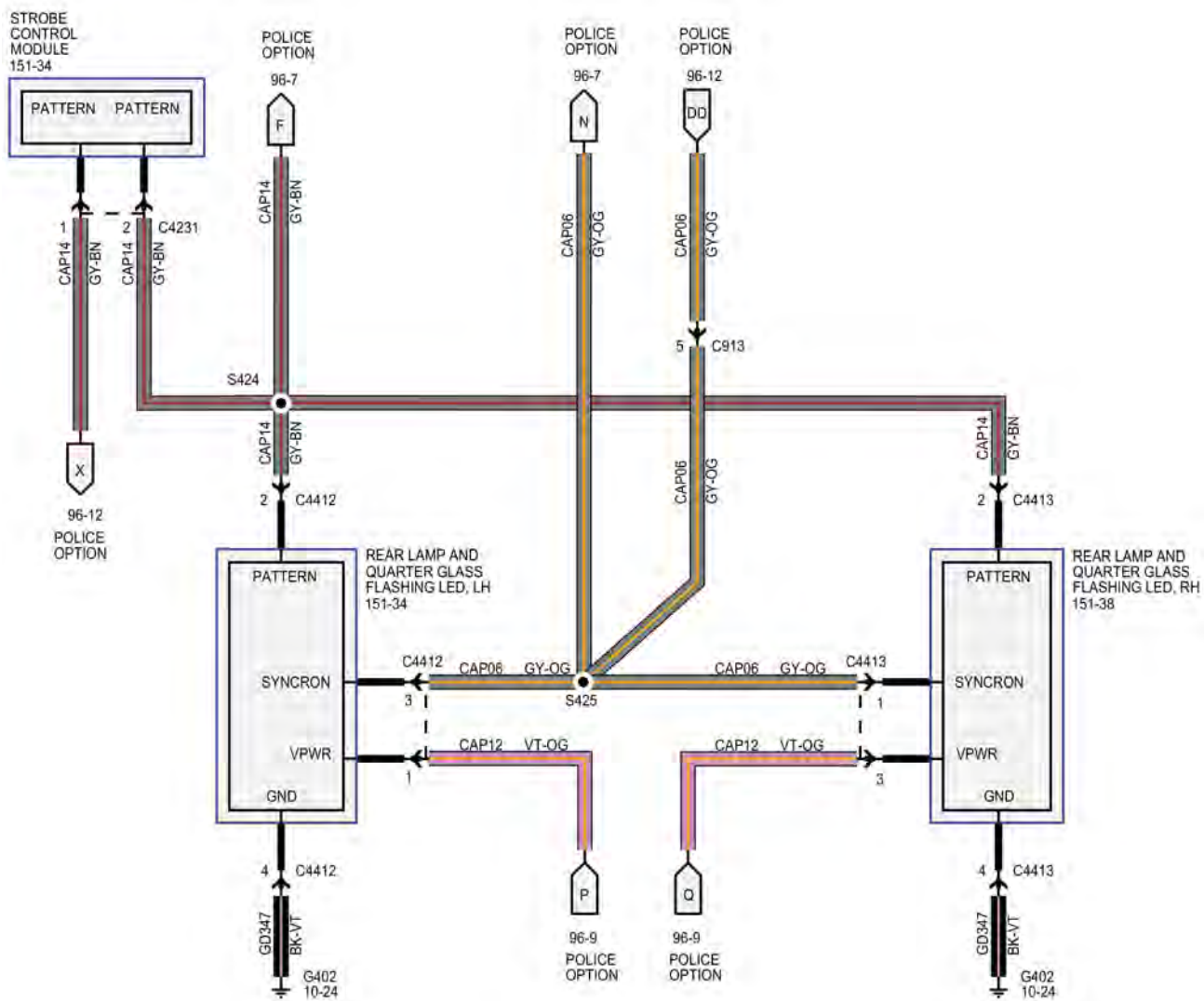
WITH GRILLE PREP



N0165613

Section 2: Electrical

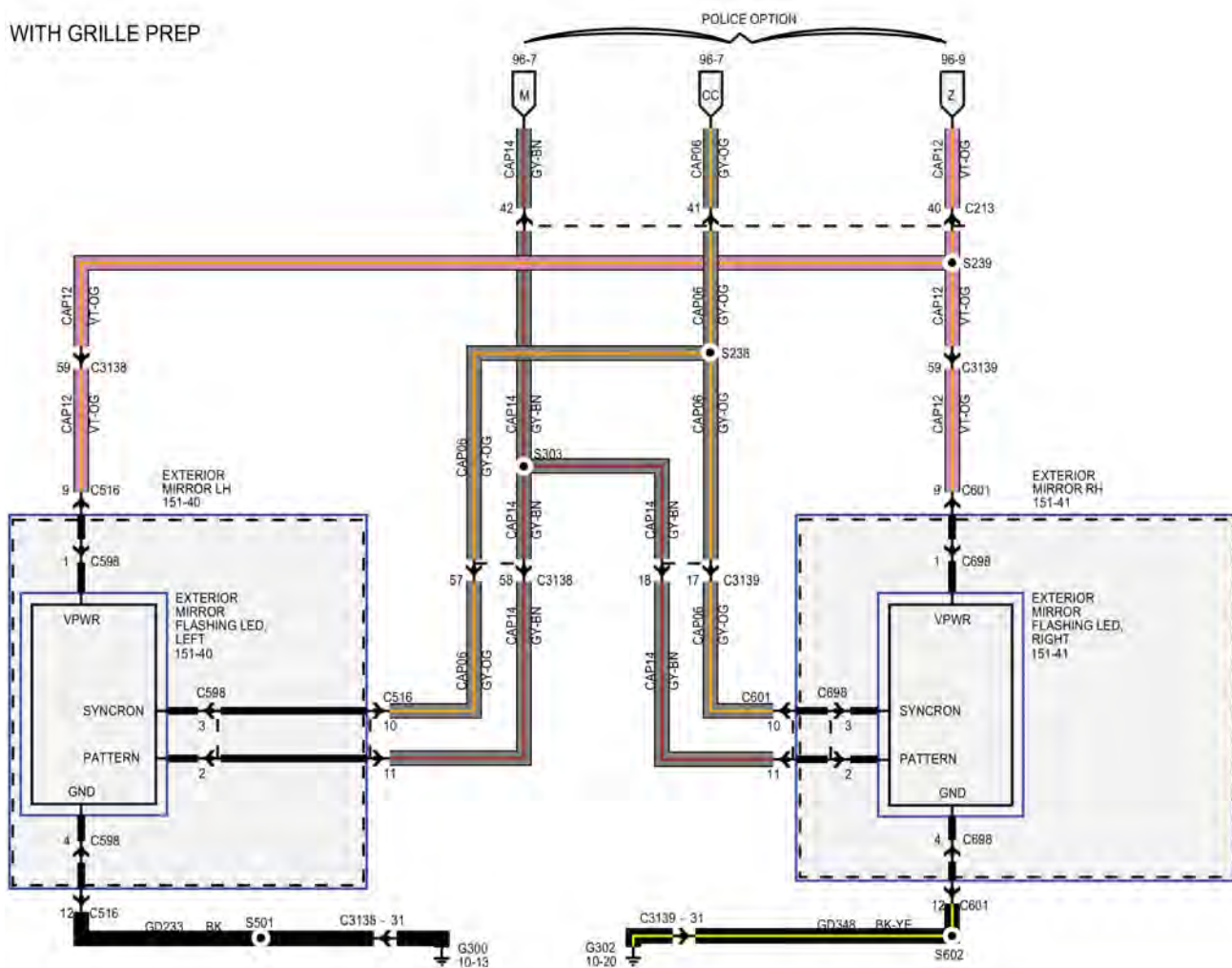
WITH GRILLE PREP



N0165612

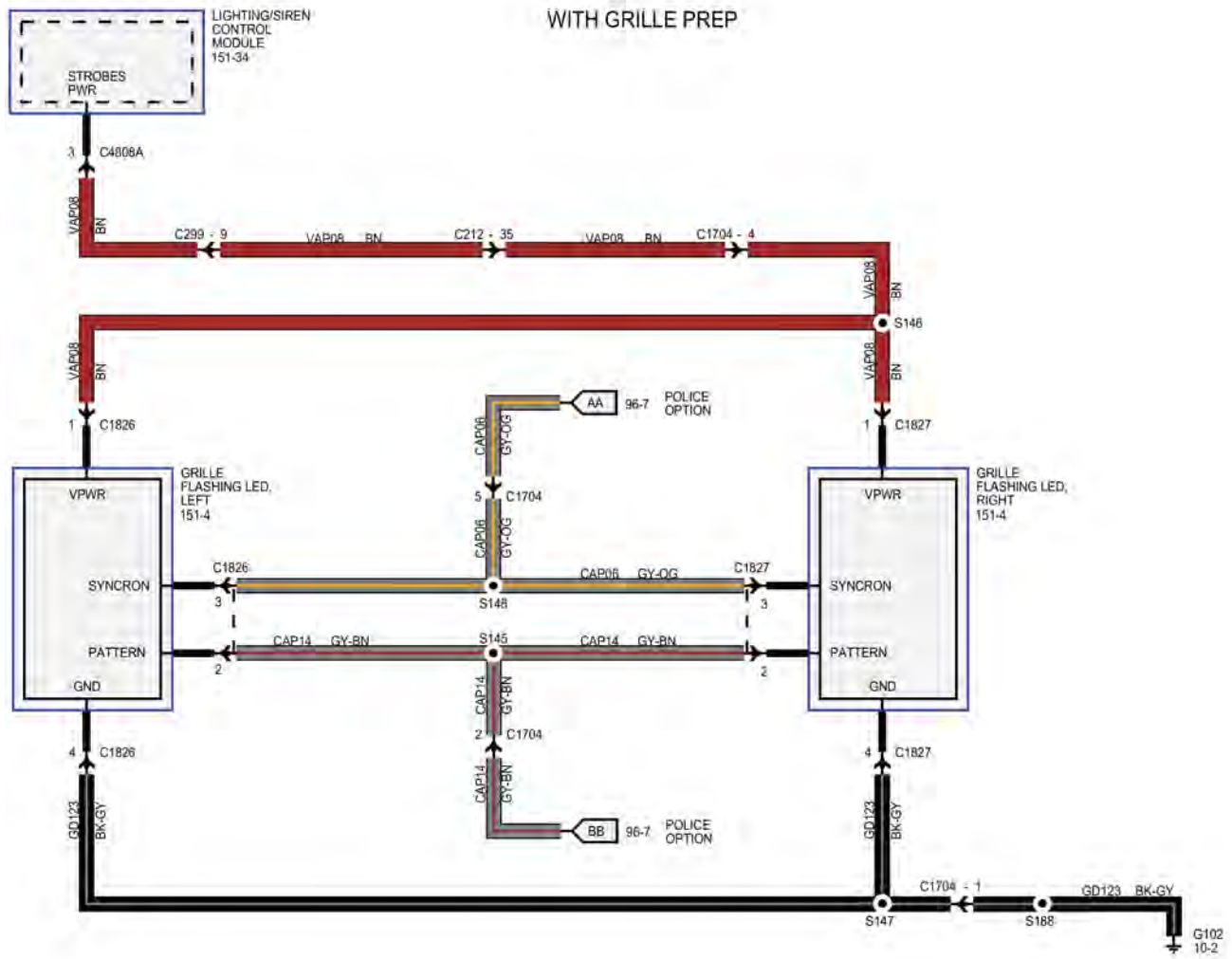
Section 2: Electrical

WITH GRILLE PREP



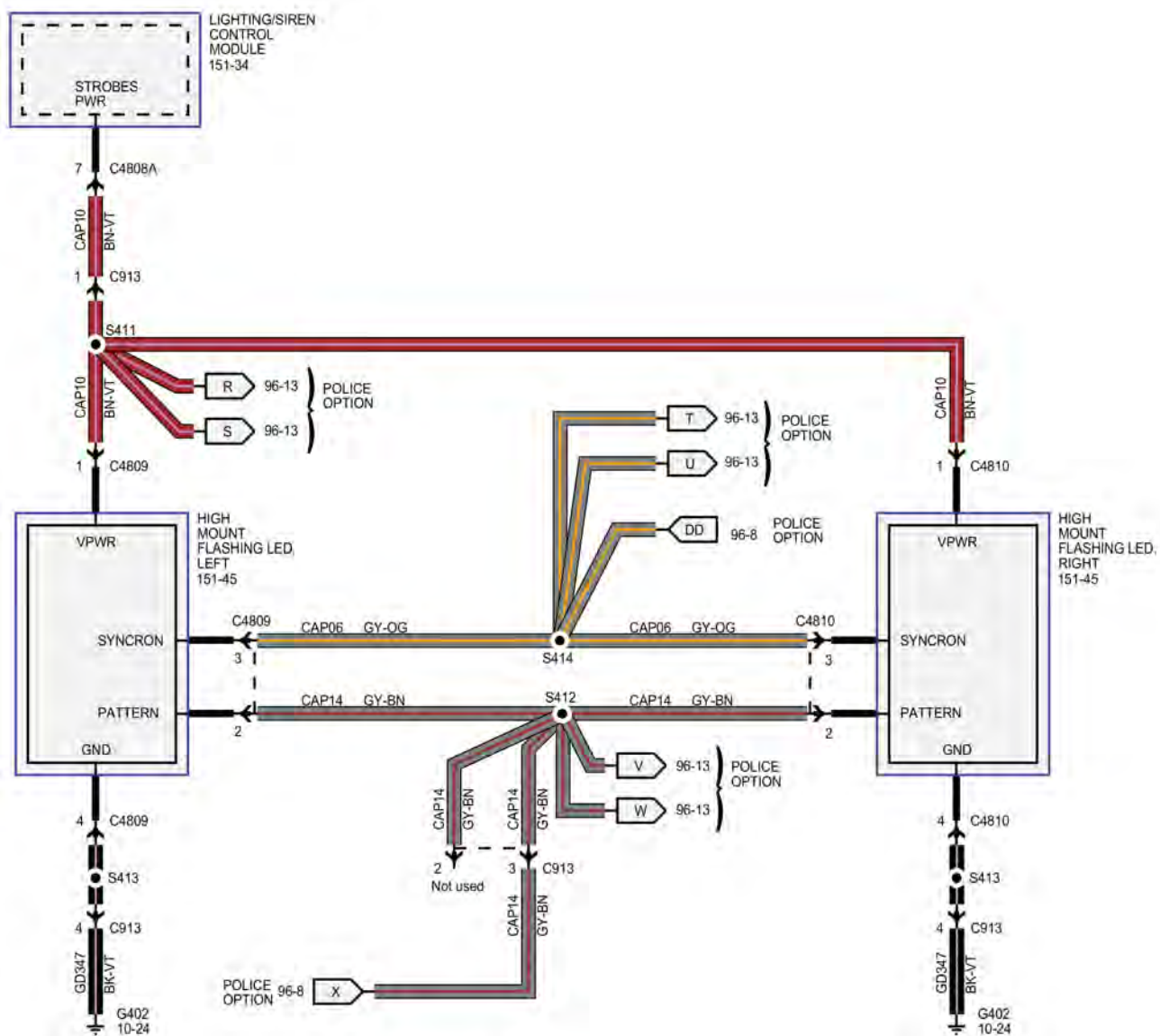
N0165611

Section 2: Electrical



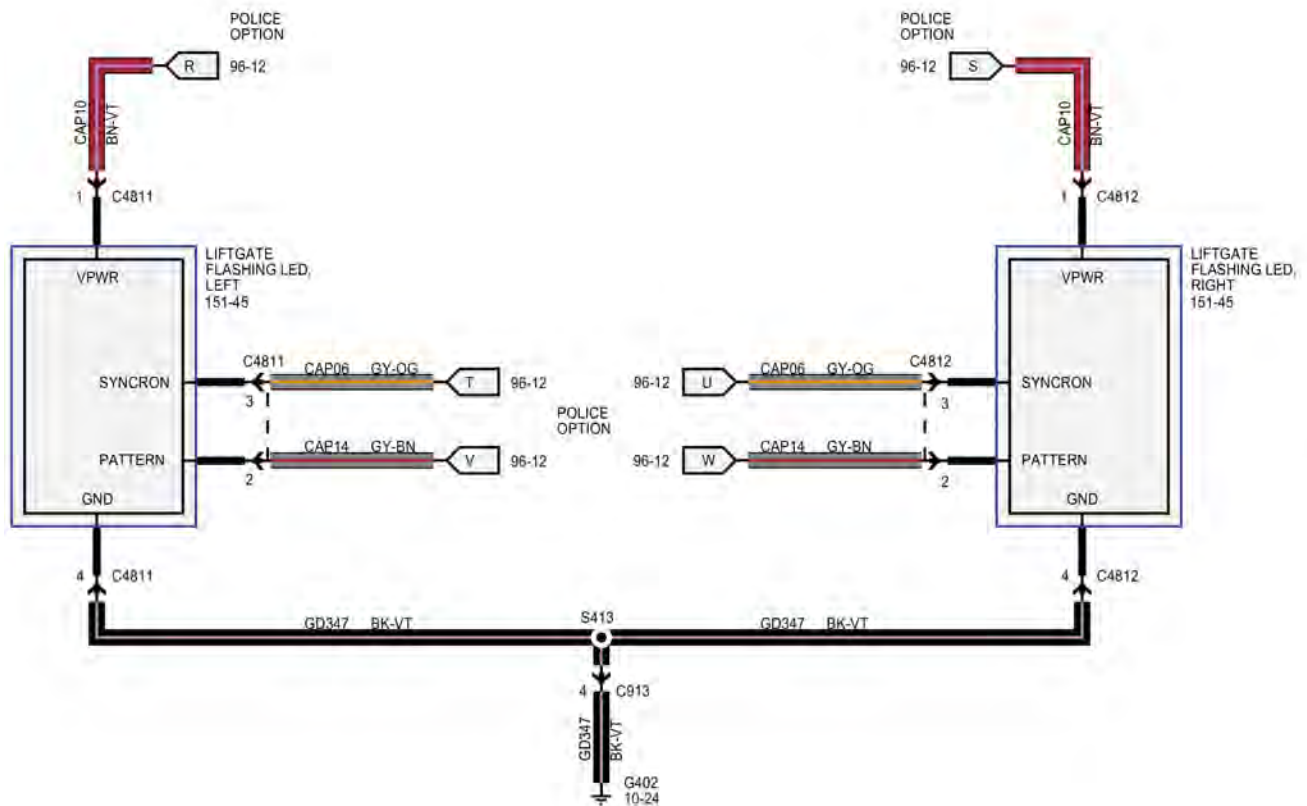
N0165610

Section 2: Electrical



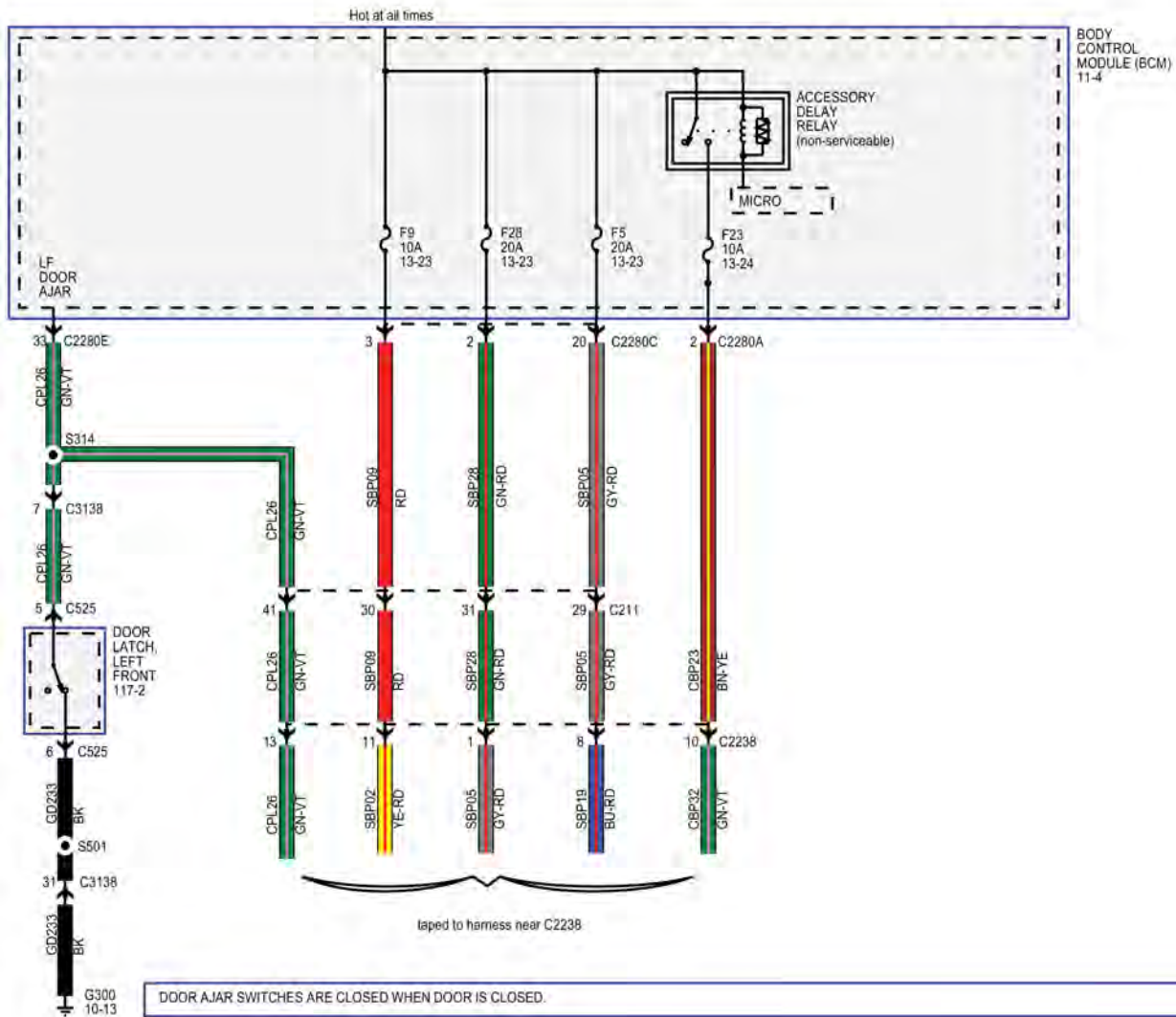
N0165609

Section 2: Electrical



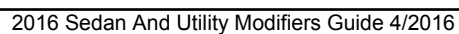
N0165579

Section 2: Electrical

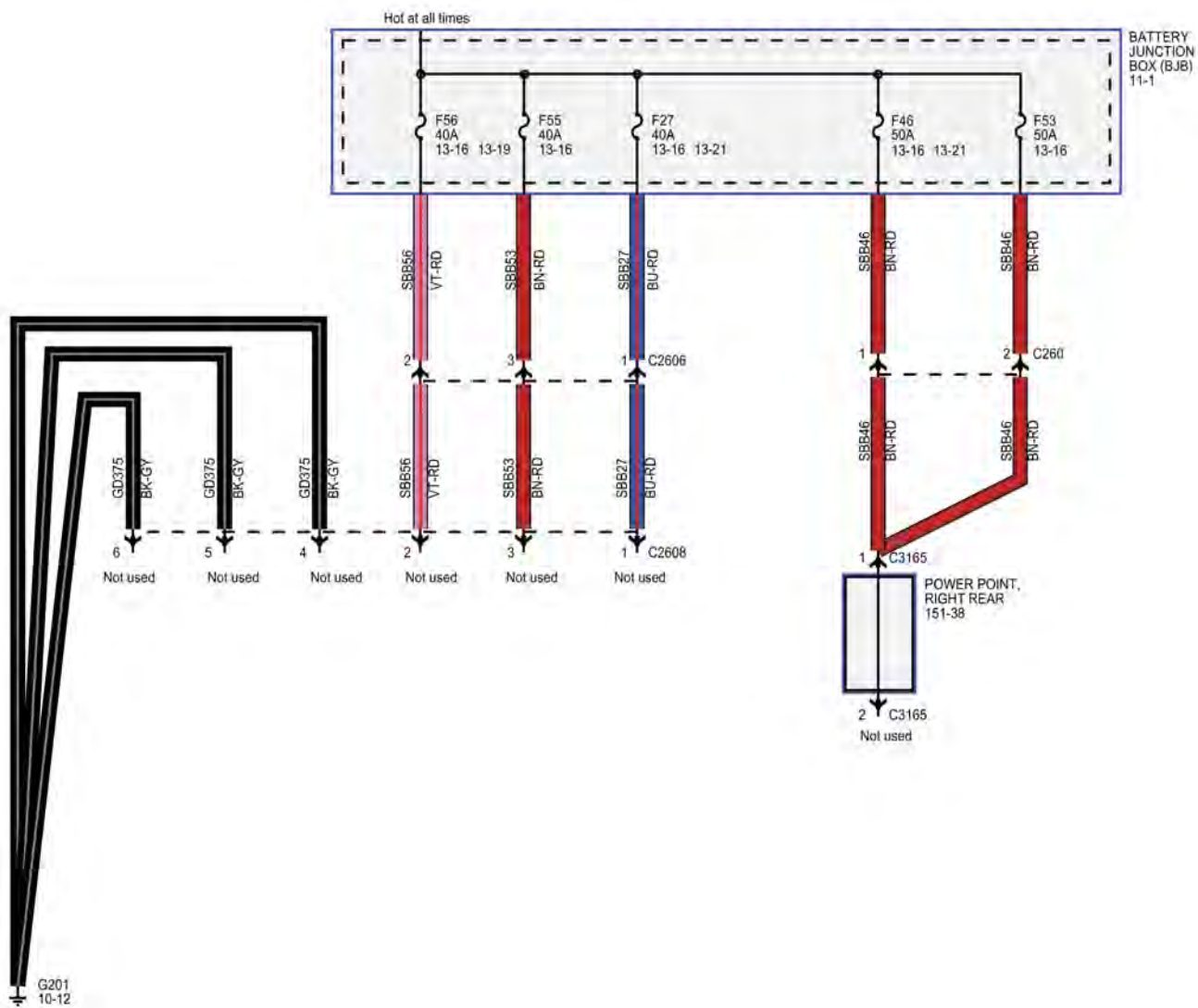


N0165580

N0165581

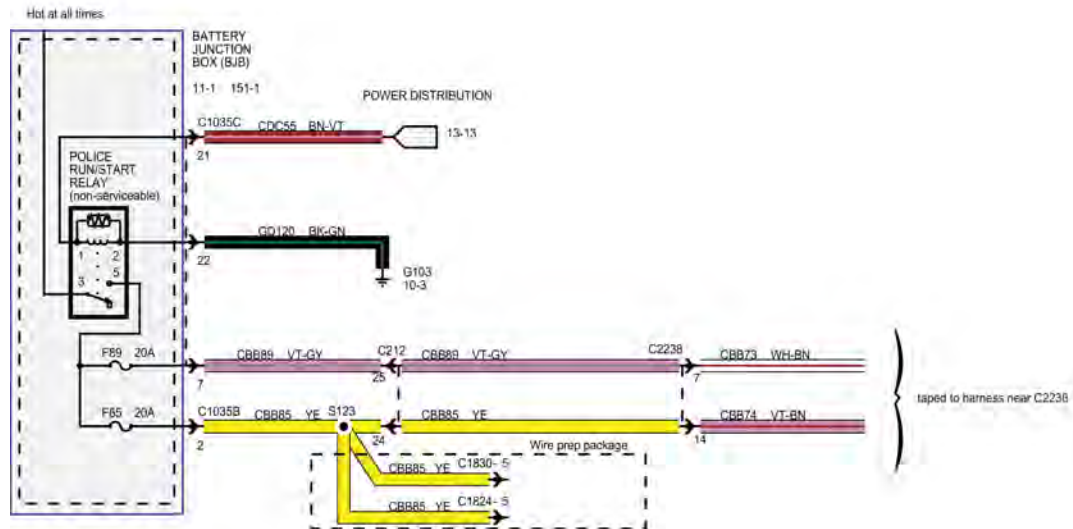


Section 2: Electrical



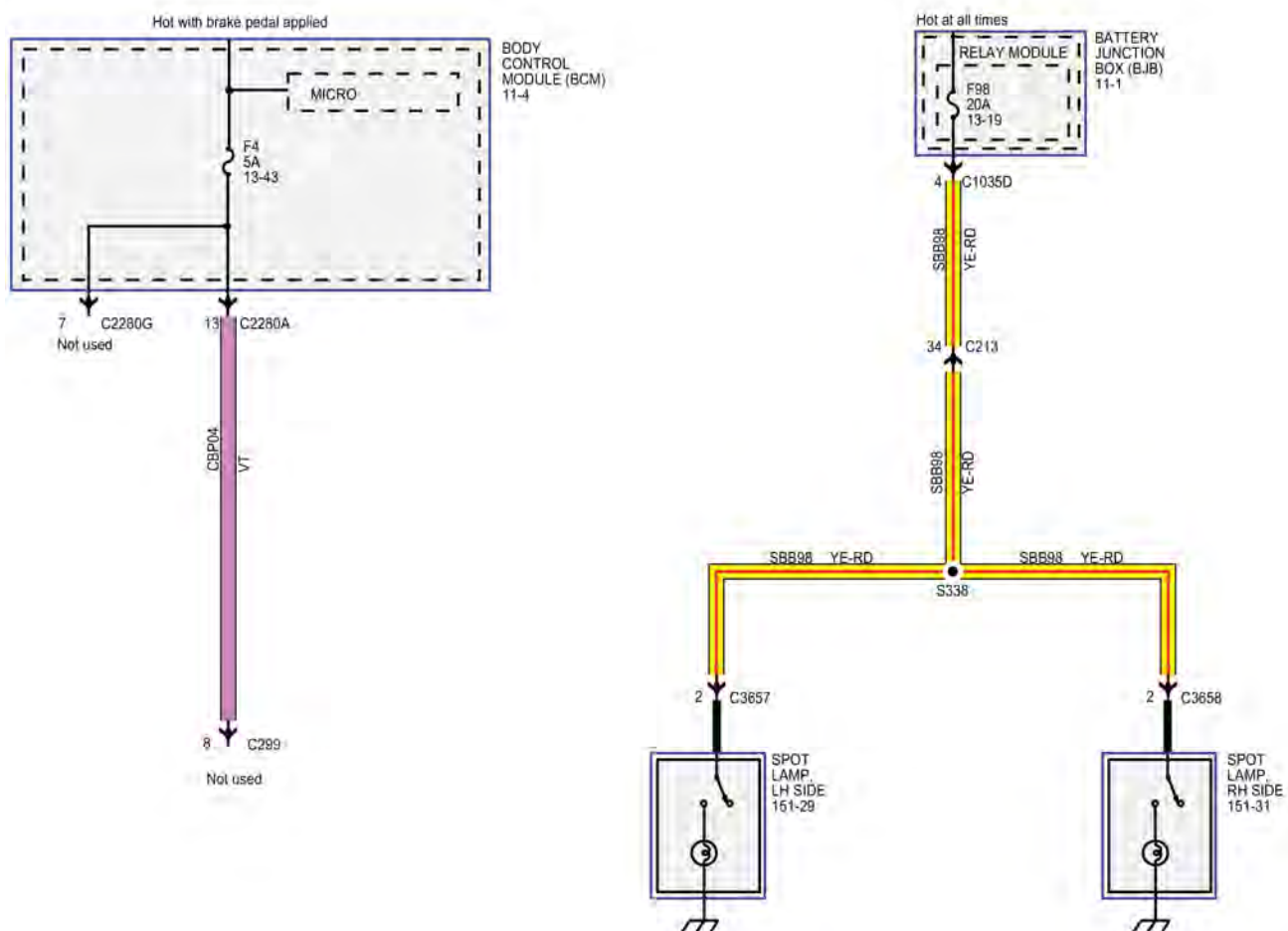
N0165582

Section 2: Electrical



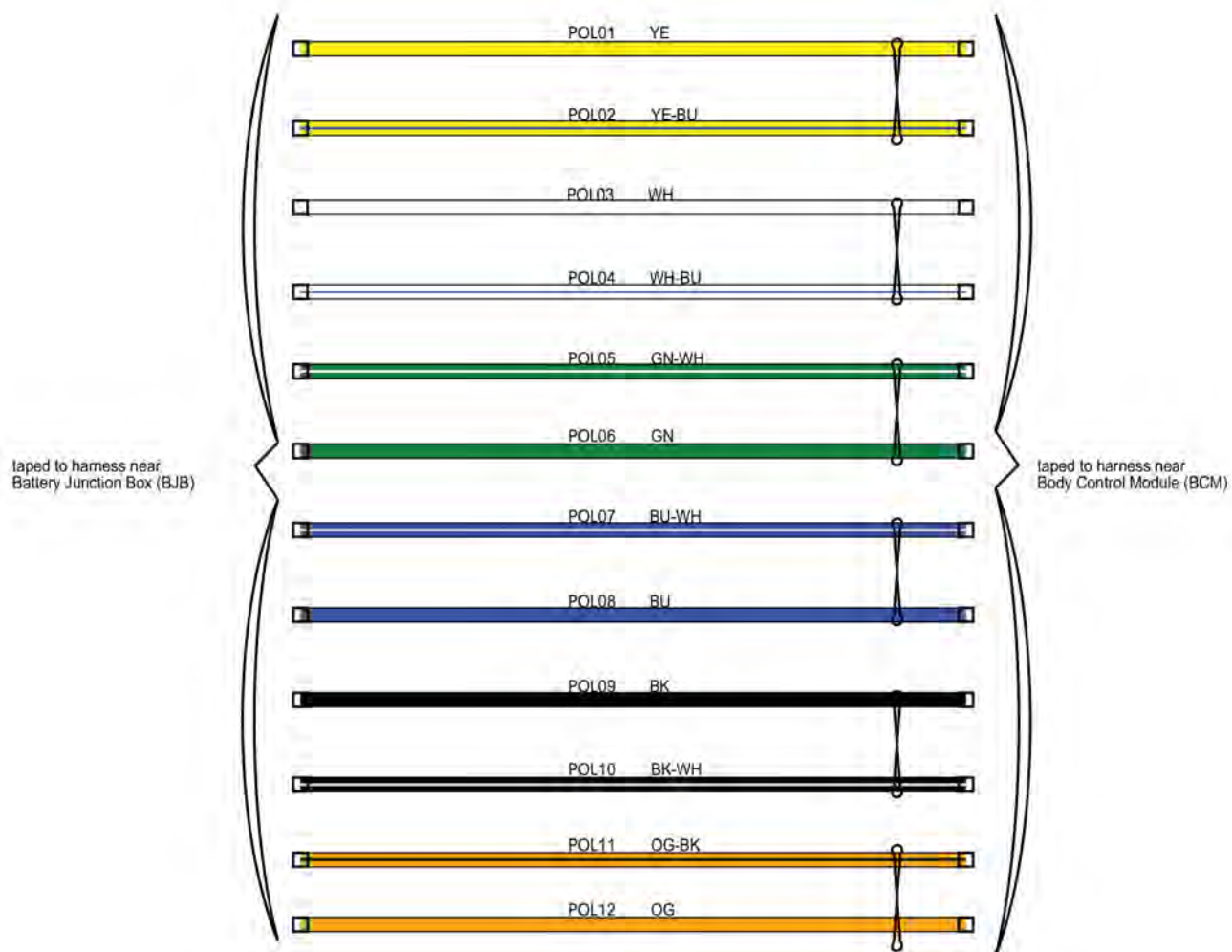
N0165583

Section 2: Electrical



N0165584

Section 2: Electrical



N0165585

Table of Contents

Contents	PAGE
Section 4: Trunk Mounting Considerations	4-2
Trunk Equipment Mounting Guide	4-2
Sedan Trunk Lockable Storage	4-5
Trunk Pack™ and Trunk Loading	4-8
Headlamp Adjustment	4-11
Photometric Aiming	4-12
Screen Method Aiming	4-12
Trunk Weight	4-14
Sedan Trunk Full-Size Spare Tire Retainer	4-16
Sedan Full-Size Tire in Foam/Wheel Well	4-17
Sedan Trunk Electronics Tray	4-17

Section 4: Trunk Mounting Considerations

Section 4: Trunk Mounting Considerations

Trunk Equipment Mounting Guide

The following trunk equipment mounting templates illustrate where fasteners are not allowed, where blunt head fasteners must be used and where standard fasteners are allowed. Be aware of the following component locations when mounting equipment in the trunk:

- Fuel tank
- Fuel lines
- Brake lines
- Evaporative emissions canister
- Electronic modules
- Wiring harnesses

NOTE:

Refer to Section 5: Reference Information in this guide for additional illustrations showing location of the fuel tank, fuel lines, brake lines, evaporative emissions canister, electronic modules, and wiring harnesses.

NOTE:

Trunk equipment mounting templates are for reference only. Inspection behind trunk side trim and under carriage advised for accurate component locations.

NOTE:

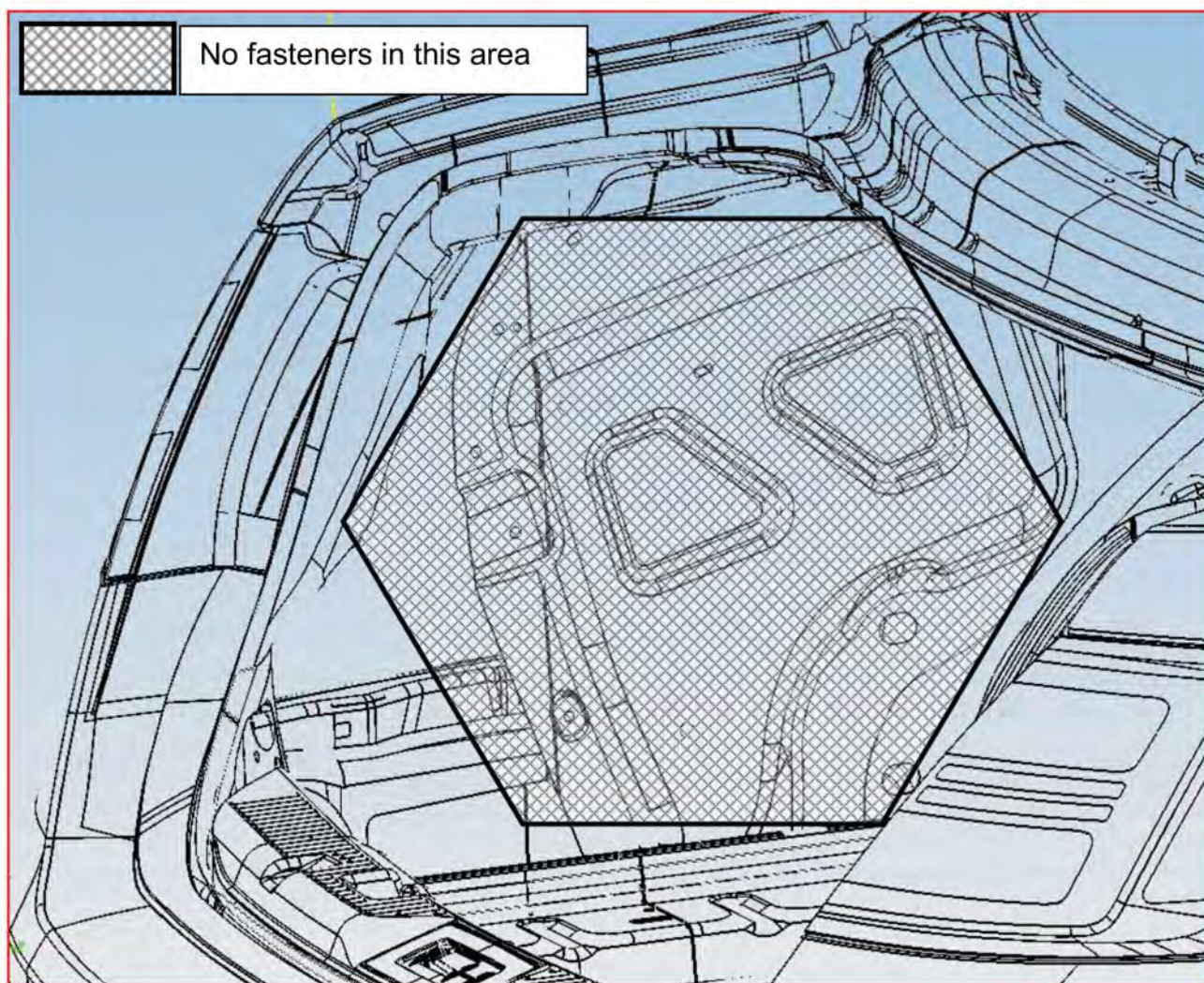
Maintain minimum part-to-part clearances of 6 mm unless otherwise noted when mounting any non-factory installed equipment.

NOTE:

Utilize self-locking fasteners when mounting equipment.

Trunk Sides Sedan Left Side Shown Applies To Right Side Also.

Section 4: Trunk Mounting Considerations



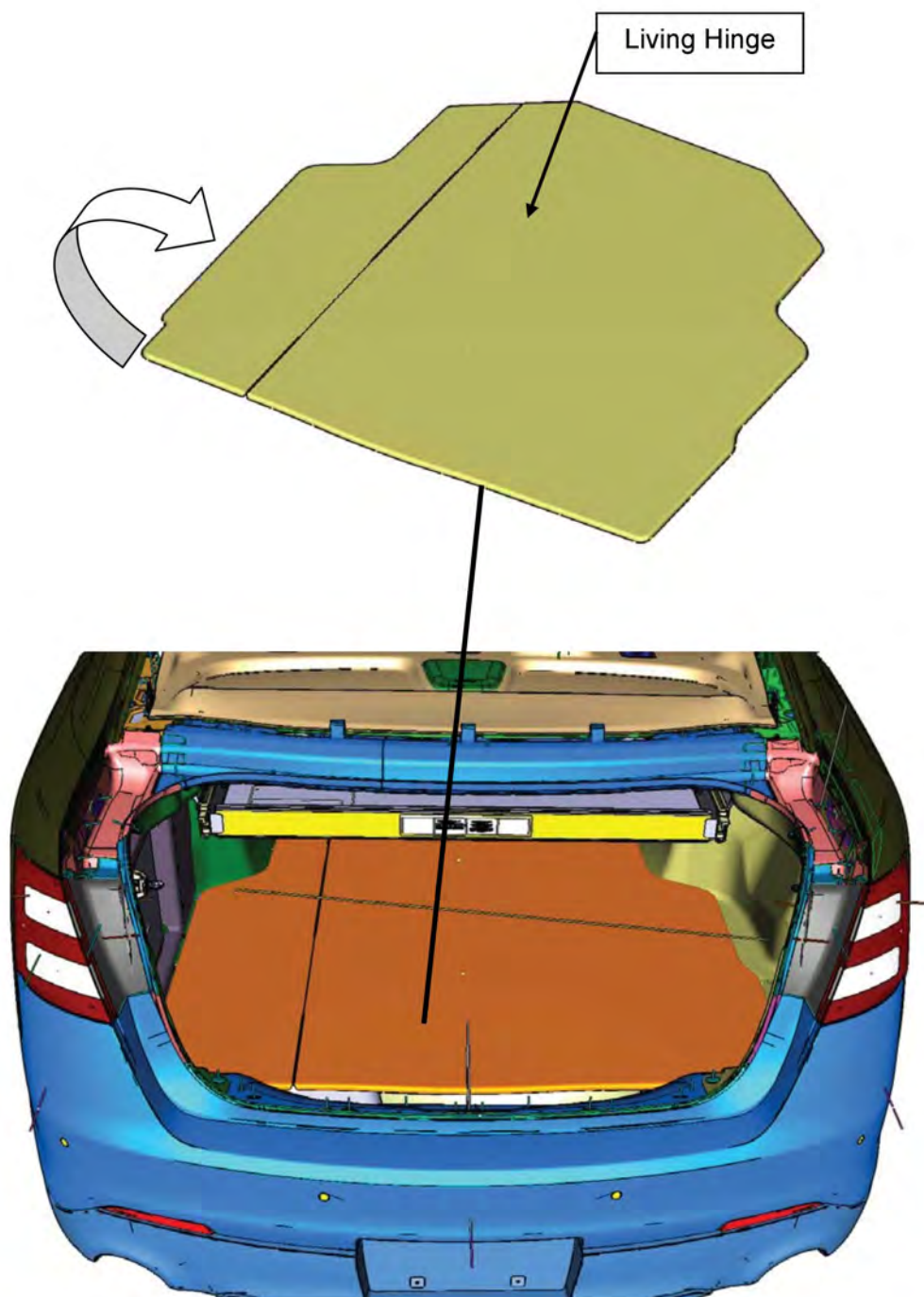
N0140497

Trunk Load Floor

The trunk load floor is capable of supporting up to 181 Kg (400 lbs). Weight should be evenly distributed over the surface of the load floor.

Combined weight of occupants and cargo should not exceed the payload capacity as stated on the tire label and must not exceed the Gross Axle Weight Rating (GAWR).

Section 4: Trunk Mounting Considerations



N0140501

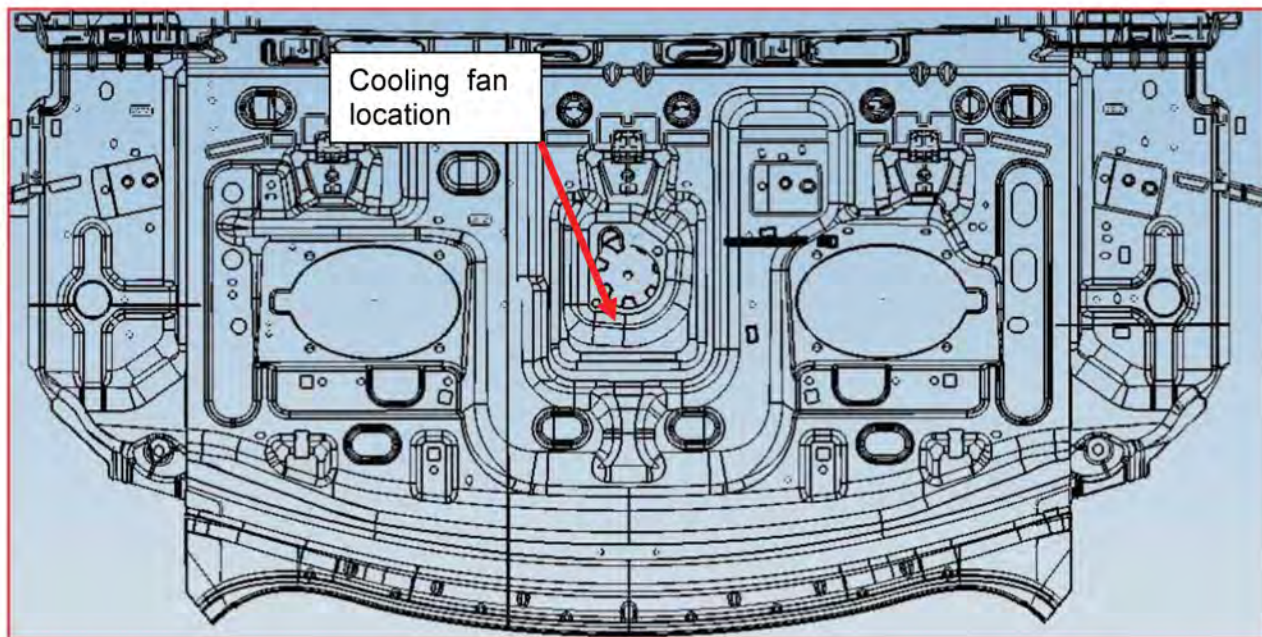
The trunk load floor is capable of supporting up to 400 lbs. Weight should be evenly distributed over the surface of the load floor.

Combined weight of occupants and cargo should not exceed the payload capacity as stated on the tire label and must not exceed the Gross Axle Weight Rating.

Package Tray

Section 4: Trunk Mounting Considerations

Do not mount equipment to package tray in rear window of sedan

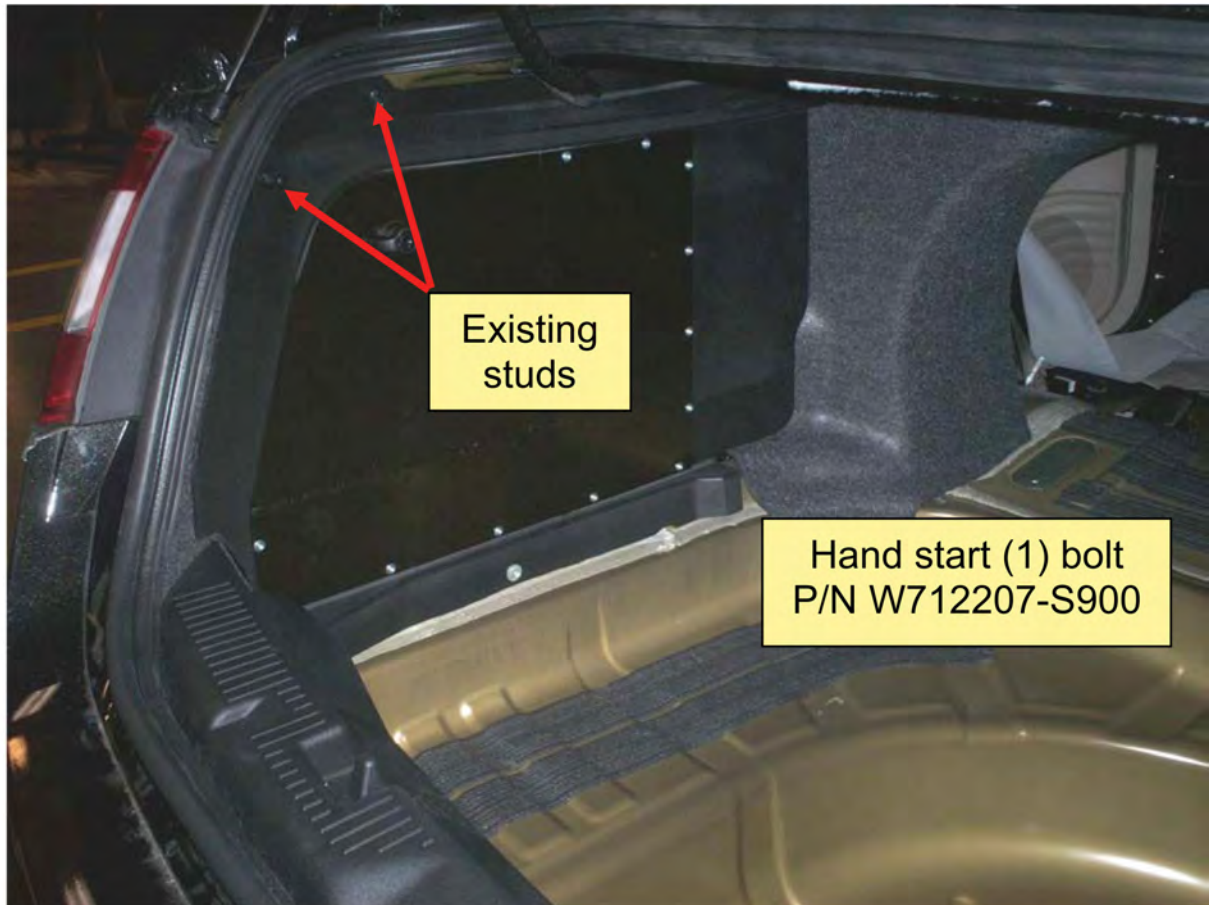


N0140557

Sedan Trunk Lockable Storage

1. Obtain 1 storage box P/N DG135431149ABW and install into the driver side of the trunk as shown, make sure the 2 upper rear holes in the plastic storage box are aligned to the 2 existing studs in the trunk.
2. Obtain 1 bolt P/N W712207-S900, hand start 1 bolt in the lower outside of the storage box as shown.

Section 4: Trunk Mounting Considerations



N0141049

3. Open metal door on storage box, install 2 bolts P/N W710330-S439 through the storage box to the existing weld nuts in the body as shown, tighten the 3 previously installed bolts to $9 \text{ Nm} \pm 1.4 \text{ Nm}$.

Section 4: Trunk Mounting Considerations



N0141052

4. Obtain 2 push on caps P/N W714241-S300 and install to the existing studs protruding through the storage box, push the caps on over the studs until secure.

Section 4: Trunk Mounting Considerations



N0141050

Trunk Pack™ and Trunk Loading

WARNING:

Ford recommends that police equipment be both secured and laterally aligned. Hard, stiff or sharp objects, especially when not secured or properly located, pose a risk to the fuel tank and back seat occupants. Aftermarket organizers that do not adequately deform in rear-impacts can themselves become injury-producing objects. When locating, securing and mounting police equipment, please review the Trunk Equipment Mounting Guide, available on the www.fleet.ford.com web site, which provides recommended fastener mounting types and locations.

Following the trunk packing recommendations (also on the www.fleet.ford.com web site) is the most meaningful method of reducing risk. If your department practice is inconsistent with the trunk packing recommendations, then Ford suggests that you consider purchasing an optional drop-in Trunk Pack™ to further reduce the risk of injury resulting from police equipment pushing forward into the back seat and/or fuel tank in the event of a high-speed rear impact.

To improve trunk packing by police agencies, Ford has made the following items available:

- Trunk Equipment Mounting Guide — an outline pattern with recommended fastener mounting locations in the trunk. The guide can be found on previous pages in this section and on the Internet at www.fleet.ford.com.
- Trunk Packing Considerations — the following guidelines are offered to reduce the risk of unique police equipment items pushing through the fuel tank and/or back seat. See www.fleet.ford.com for more details.

A slogan has been developed to increase police agency awareness of the importance of trunk packing.

Improve police officer safety by implementing a trunk-packing process called "LOAD SAFE".

Section 4: Trunk Mounting Considerations

LOAD	SAFE
Lateral	Soft
Orientation	And
And	Fixed
Direction	Equipment

Equipment Categories and Placement



WARNING:

Gasoline should not be stored in the trunk at any time, regardless of container. Failure to follow this instruction may result in personal injury.

It is recognized that a wide variety of equipment is carried in the trunks of police vehicles as noted above. This section addresses the inherent risks of various types of equipment in the event of a high-speed rear impact.

This information is divided into 3 categories:

- **Carrying Not Recommended** —The following items have been observed in police vehicles and **should not be transported in the vehicle trunk**: containers with gasoline, loose ammunition, loose flares, loose fire extinguisher(s), loose 4-point lug wrenches, loose crowbars, loose axes and other loose equipment with potential puncture capability in high-speed rear-end collisions.
- **Carry With Caution** —These items will require special packing or mounting consideration and possible use of the Trunk Pack™ as an additional level of safety. Examples include (with proposed orientation): fire extinguisher (fixed), lug wrench 4-point (fixed, vertical), rotolape measuring wheel (fixed, vertical), safety flares (lateral orientation, in a container), Stop Stick (lateral, mount on deck lid inner panel), shovel (lateral, place at rear of trunk), shotgun and rifle (lateral, store in case), baton (lateral, place at rear of trunk), electronic equipment (use Trunk Equipment Mounting Guide to determine equipment mounting locations) and ammunition (container). Flares should be placed in a protective storage container (preferably soft-sided plastic). Flares with spikes attached should be laterally oriented in the trunk area.
- **Spare Tire Special Considerations**: The safest location for the spare tire, jack and lug wrench is the production location on the forward package shelf above the rear axle. If unable to mount there, the next safest location for the spare tire is mounted vertically inside the Trunk Pack™ using the J-bolt attachment device provided with the Trunk Pack™. However, if the manufacturer's location for the spare tire is changed and the area above the axle is used to mount a sliding tray, use the Trunk Equipment Mounting Guide and suitable fasteners of appropriate length to reduce the risk of fuel tank puncture. The jack and lug wrench should be stored in the rearward compartment of the Trunk Pack™.
- **Electronic Equipment**: The safest location for the electronic equipment is on the trunk forward package shelf. Some equipment can be mounted in the side shelf areas, but it must not intrude into the fuel tank area in a crash (noted in Trunk Equipment Mounting Guide). The optional Complete Police Prep Package, described in Section 1, is available to facilitate packaging of electronic components with a sliding tray forward package shelf and side in the right and left shelf area. All equipment should be located and mounted using the "Trunk Equipment Mounting Guide" for proper positioning of fasteners. This guide can be accessed on www.fleet.ford.com. The sliding tray can also be used, depending on size, to properly store parts with rigid and sharp edges.
- **Ammunition**: The safest place for ammunition is the forward package shelf and on the side shelves. It is recommended that a plastic storage container (see Police Prep Package (68P) - Trunk storage boxes, LH or RH box can be purchased separately from any authorized Ford dealer) be used and mounted using the "Trunk Mounting Equipment Guide" for proper fastener locations. It is also recommended that ammunition remain in the purchased container and be placed in a safe storage container.
- **Low Risk Items** — These items are soft in feel and pose a low risk of trunk wall, rear seat area or fuel tank puncture. Examples are: a soft camera case, biohazard kit in plastic boxes, gloves, safety rope, tow strap, traffic cones and sleeves, rain gear, riot gear (soft), emergency blankets, bullet-resistant vests, tie straps, cloth tape, garment bags, first responder kit, Res-Q-Flo masks (placed in garment bag), fuses (plastic container), briefcases, notebooks, spray bottles, helmets and jumper cables. It is not essential but recommended that the Trunk Pack™ be considered for organization of low risk items, especially if mixed with Carry With Caution items.

Section 4: Trunk Mounting Considerations



N0140558

Section 4: Trunk Mounting Considerations



N0140559

Headlamp Adjustment

NOTE:

Refer to the Owner Literature for the headlamp adjustment screw location.

NOTE:

Consult your state vehicle inspection manual for recommended tolerance ranges for visual aiming.

NOTE:

Horizontal aim is not adjustable.

1. Identify the headlamp type. Vehicles are equipped with visually optically aligned left (VOL) or visually optically aligned right (VOR) headlamps. Molded in small letters on the headlamp lens is one of the following:
 - VOL and SAE.

Section 4: Trunk Mounting Considerations

- VOR and SAE.
2. Aim the headlamps using one of the following methods:
 - Photometric aimers (preferred method).
 - Visual or screen method aiming (acceptable method).

Photometric Aiming

For the photometric aiming procedure, refer to the appropriate photometric headlamp aimer instruction manual.

Screen Method Aiming

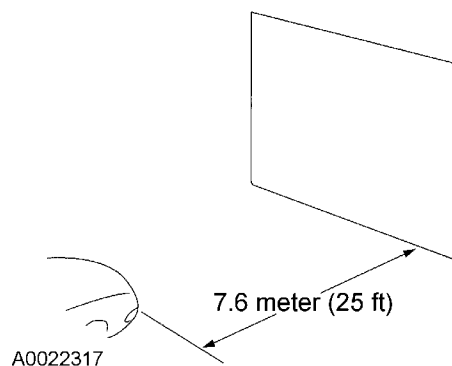
All headlamp types

1. Before starting headlamp adjustment:
 - vehicle must be on level ground.
 - tires must be correctly inflated.
 - vehicle must be normally loaded.
 - headlamps must be clean.
 - air suspension switch must be on (if equipped).
2. **NOTE:**
The vertical wall or screen must be a minimum of 2.4 m (8 ft) wide.

NOTE:

This procedure should be done in a dark environment to effectively see the headlamp beam pattern.

Park the vehicle on a level surface with the low beam headlamp lens surface approximately 7.6 m (25 ft) from the vertical wall or screen directly in front of it.



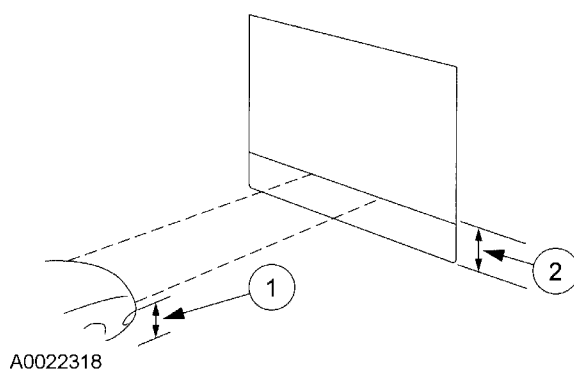
3. **NOTE:**
The bulb center of the low beam bulb is sometimes marked on the lens (circle, crosshair or other mark) or is the center of the low beam reflector, bulb shield or the low beam projector inner lens.

Mark a horizontal reference line on the vertical wall or screen.

- Measure the distance between the center of the low beam headlamp bulb and ground. Record the measurement.
- Make a 2.4 m (8 ft) horizontal mark (using masking tape) on the vertical wall or screen at the height as follows:

Section 4: Trunk Mounting Considerations

Headlamp bulb center height	Horizontal reference line height
below 95 cm (37.5 inches)	same as bulb center height
95 cm - 105 cm (37.5 inches - 41.5 inches)	bulb center height minus 1.3 cm (.5 inch)
above 105 cm (41.5 inches)	bulb center height minus 2.5 cm (1.0 inch)



- Turn on the low beam headlamps to illuminate the wall or screen and open the hood.

5. **NOTE:**

The cut off of the beam pattern is the horizontal line of the beam pattern where there is MAXIMUM change between light & dark. On the wall or screen, locate the cut off of the beam pattern.

VOR Type Headlamps

NOTE:

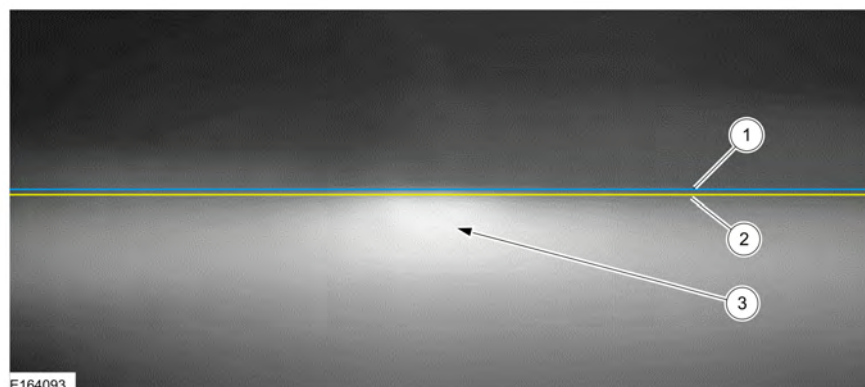
Procedure applies to both left and right headlamps with VOR molded on lens.

6. **NOTE:**

The appearance of the VOR beam pattern may vary between vehicles.

There is a distinct cutoff in the right portion of the beam pattern.

- Horizontal reference line.
- Cut off.
- High intensity zone.



7. **NOTE:**

Align one headlamp while covering the other headlamp.

Section 4: Trunk Mounting Considerations

Align the headlamps to the horizontal reference line.

Adjust the headlamp as necessary using the headlamp adjusting screw.
Repeat this step for the remaining headlamp.

VOL type headlamps

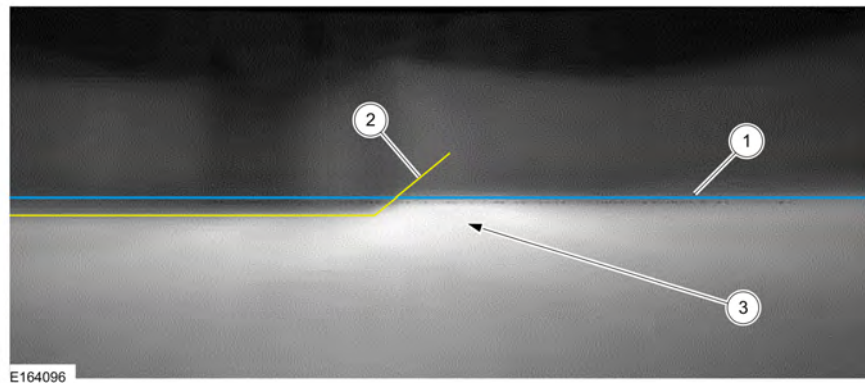
NOTE:

Procedure applies to both left and right headlamps with "VOL" molded on lens.

8. NOTE:

The appearance of the VOL beam pattern may vary between vehicles.

1. Horizontal reference line.
2. Cut off.
3. High intensity zone.



9. NOTE:

Align one headlamp while covering the other headlamp.

Align the headlamps to the horizontal reference line.

Adjust the headlamp as necessary using the headlamp adjusting screw.
Repeat this step for the remaining headlamp.

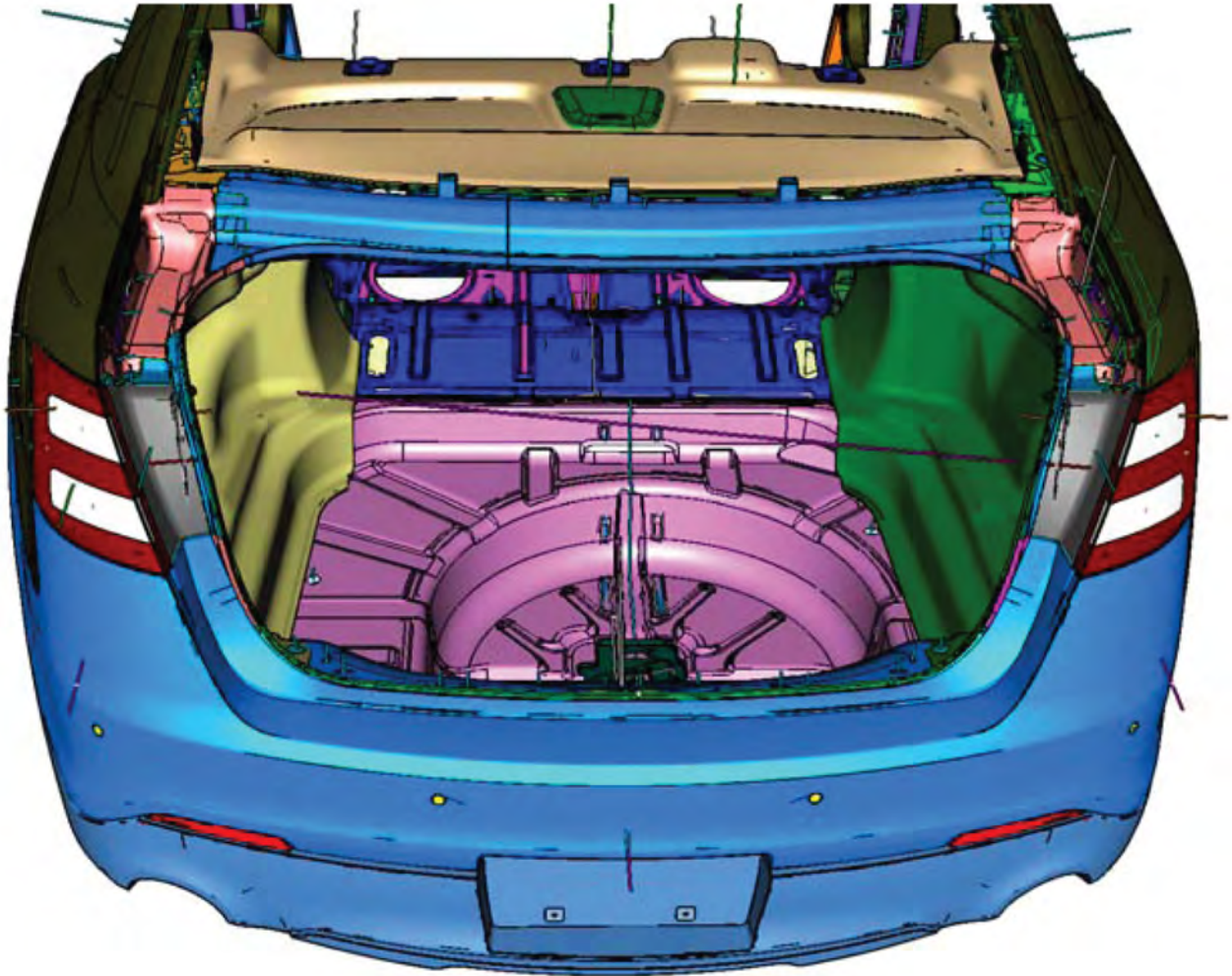
Trunk Weight

The vehicle's high-speed handling and curb height will become increasingly affected as weight is added to the trunk or cargo area. The more weight that is placed in the trunk or cargo area, the more it will change the ride and handling characteristics of the vehicle. Consider these factors when installing equipment and placing items in the trunk or cargo area of the vehicle.

Vehicle weight can be impacted considerably based on final upfit content and as a result of changes in the weight distribution headlamp aim may require adjustment. Upon final upfit, it is recommended that headlamp aim is inspected and adjusted as necessary following the Ford headlamp aim procedure.

The Vehicle Certification (VC) label on the driver door lists a maximum load for the vehicle (occupants + luggage + police equipment).

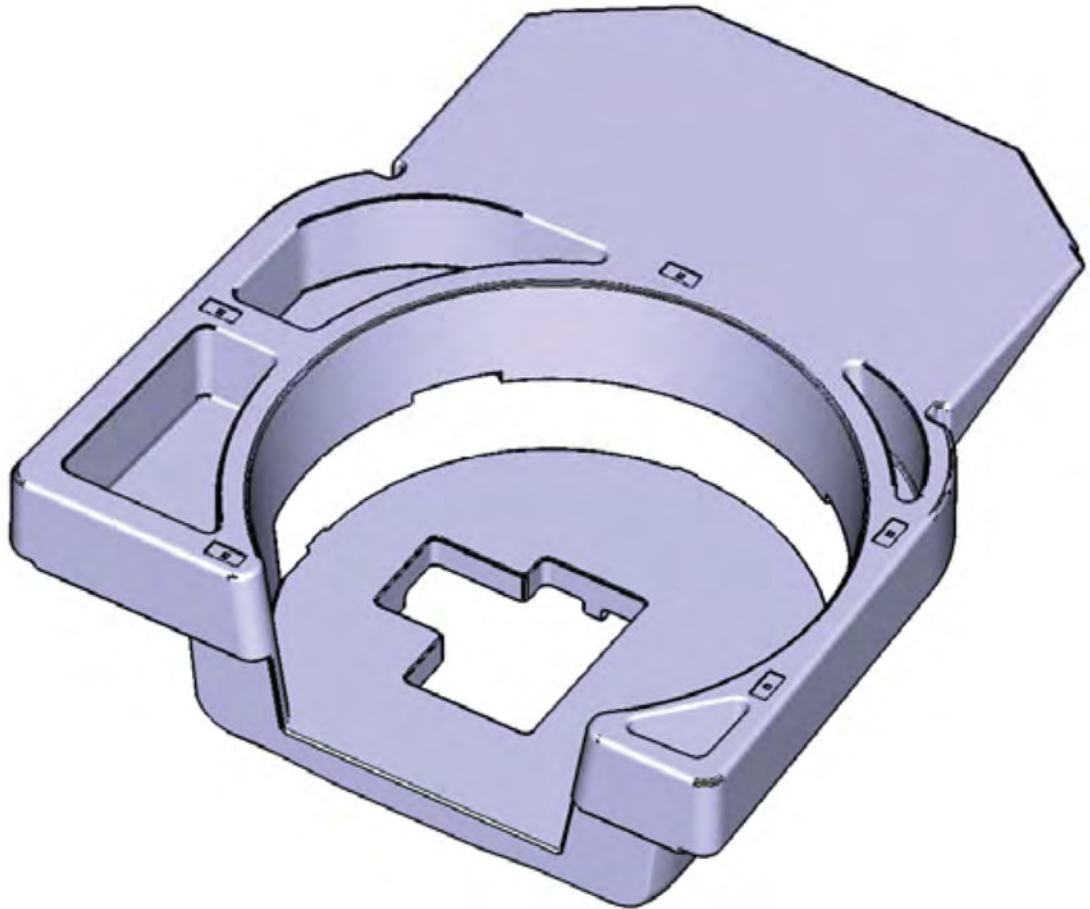
Section 4: Trunk Mounting Considerations



N0140560

Section 4: Trunk Mounting Considerations

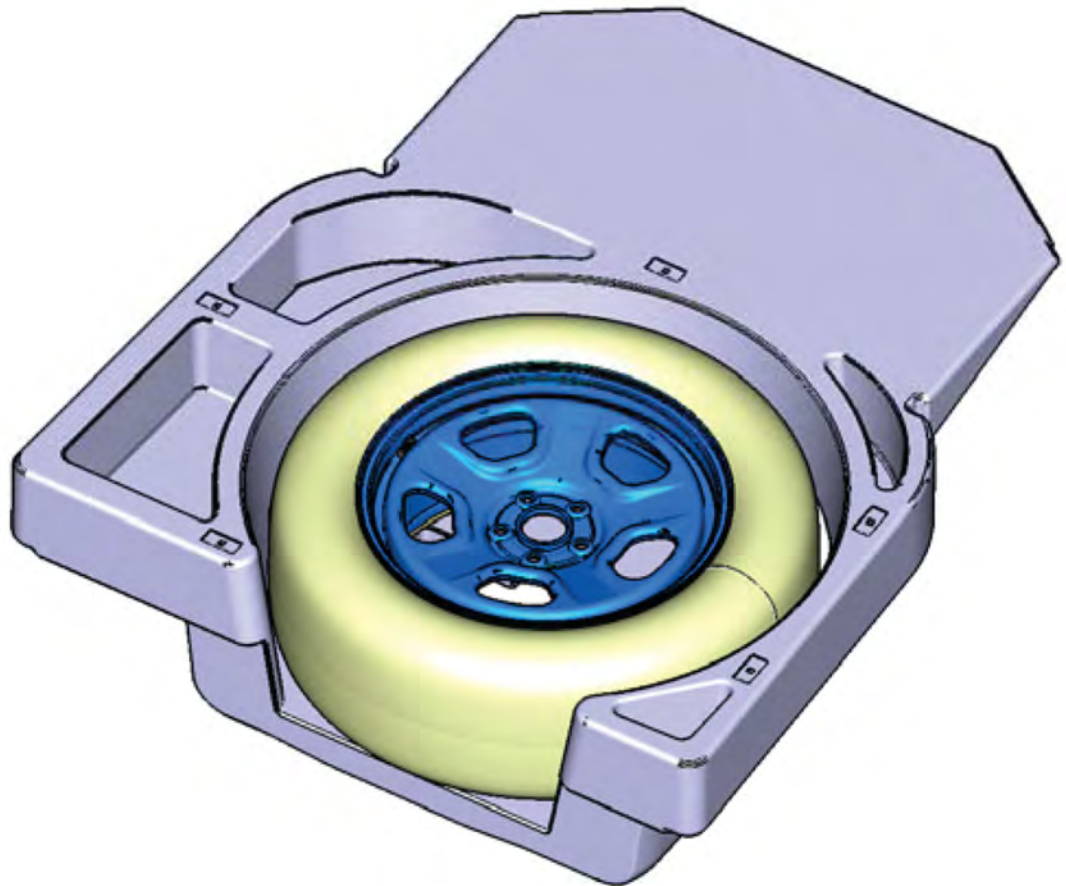
Sedan Trunk Full-Size Spare Tire Retainer



N0140561

Section 4: Trunk Mounting Considerations

Sedan Full-Size Tire in Foam/Wheel Well

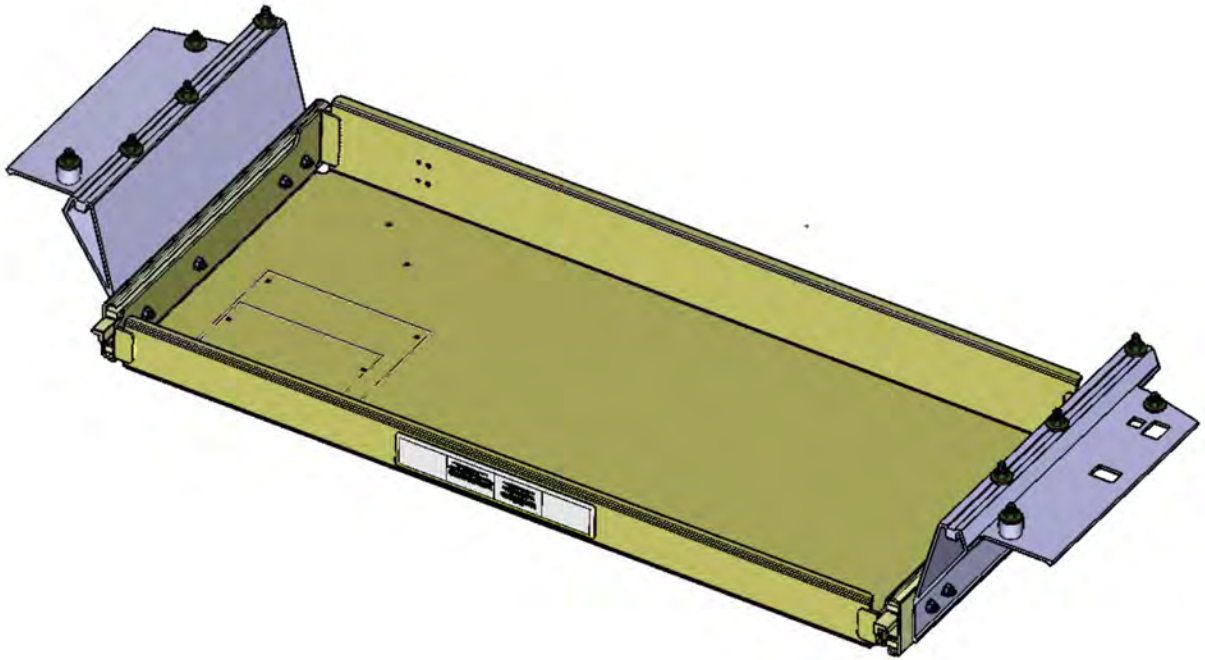


N0140562

Sedan Trunk Electronics Tray

Weight should be distributed evenly over the horizontal mounting surface of the electronics trunk tray.

Section 4: Trunk Mounting Considerations



N0140563

Table of Contents

Contents	PAGE
Section 5: Reference Information	5-2
Airbag Deployment Interference	5-2

Section 5: Reference Information

Section 5: Reference Information

Airbag Deployment Interference

Engineering Drawings

**WARNING:**

Do not place objects or mount equipment in front of the airbag module cover or in front seat areas that may come in contact with a deploying airbag. Dash, tunnel or console-mounted equipment should be placed within the specified zone. Failure to follow these instructions may result in personal injury.

**WARNING:**

Dash, tunnel or console-mounted equipment should not be placed outside the specified zone. Failure to follow these instructions may result in personal injury.

**WARNING:**

Do not mount equipment by the side of the front seat to the door trim that would block deployment of the side airbag. Failure to follow these instructions may result in personal injury.

**WARNING:**

Do not mount equipment by inside the roof line along the upper edge of the side windows from front to rear of the vehicle that would block deployment of the Safety Canopy® Airbag. Failure to follow these instructions may result in personal injury.

Driver/passenger airbags affect the way police equipment can be mounted in police vehicles. Any surfaces that could come into contact with an airbag during deployment must not damage the airbag or alter its deployment path. Sharp edges, corners or protrusions could damage the nylon airbag material and reduce the effectiveness of the airbag. Do not mount or place objects in the deployment path of an airbag. Airbags must be allowed to fully deploy without restriction. The deployment of airbags is not compatible with any configuration of police equipment mounting that places objects in the airbag deployment path. Equipment mounted or placed in the deployment area of an airbag will reduce the effectiveness of the airbag, damage the airbag and potentially damage or dislodge the equipment.

Some approximate dimensions for airbags, at full inflation, are provided in Figures 1 through 5. These dimensions are somewhat flexible and represent free-form deployments without the loading of occupants. The illustrations in this section represent available police equipment mounting zones. These zones are shown for police vehicles equipped with standard bucket seats.

All airbag and equipment mounting zone dimensions are approximate due to different airbag deployment characteristics.

Mount no equipment between the side of the front seat and the door trim that would block deployment of the side airbag.

Mount no equipment inside the upper edge of the roof line or along side windows trim panels from front to rear of vehicle that would block deployment of the Safety Canopy® airbag.

**WARNING:**

Do not attempt to service, repair, or modify the airbag, its fuses or the seat cover on a seat containing an airbag. Contact your authorized dealer as soon as possible.

**WARNING:**

If the side airbag has deployed, the airbag will not function again. The side airbag system (including the seat) must be inspected and serviced by an authorized dealer. If the airbag is not replaced, the unrepaired area will increase the risk of injury in a collision.

The side airbags will deploy on the side affected by the collision during significant lateral collisions. The airbags will inflate within a few thousandths of a second and deflate on contact with occupants, thus providing protection for the chest and shoulder areas. During minor lateral collisions, roll-overs, front collisions and rear collisions, the side airbags will not deploy.

NOTE:

The passenger sensing system will deactivate the passenger seat-mounted side airbag if it detects an empty, unbuckled passenger seat.

The system consists of the following

Section 5: Reference Information

- A label or embossed side panel indicating that side airbags are fitted to your vehicle.
- Side airbags located inside the seatback of the driver and front passenger seatbacks.
- Canopy curtain airbag.
- Knee airbag module (Utility Only)
- The same warning light, electronic control and diagnostic unit as used for the front airbags.
- Crash sensors located within the vehicle.



WARNING:

Do not place objects or mount equipment in an area that may come into contact with a deploying curtain airbag. Failure to follow these instructions may increase the risk of personal injury in the event of a collision.



WARNING:

Do not lean your head on the door. The curtain airbag could injure you as it deploys from the headliner.



WARNING:

Do not attempt to service, repair, or modify the curtain airbags, its fuses, the A, B, or C pillar trim, or the headliner on a vehicle containing curtain airbags. Contact your authorized dealer as soon as possible.



WARNING:

All occupants of the vehicle including the driver should always wear their safety belts even when an airbag SRS and Curtain airbag is provided.



WARNING:

To reduce risk of injury, do not obstruct or place objects of the deployment path of the canopy curtain airbag.



WARNING:

If the canopy air curtain has deployed, the air curtain will not function again. The side curtain system (including the A, B and C pillar trim and headliner) must be inspected and serviced by an authorized dealer. If the curtain airbag is not replaced, the unrepaired area will increase the risk of injury in a collision. The curtain airbags will deploy during significant lateral collisions or when the likelihood of a rollover event is detected by the rollover sensor. The airbag will inflate within a few thousandths of a second and deflate within a brief period, thus providing protection for the head. During minor lateral collisions, front collisions or rear collisions the curtain airbags will not deploy.

The system consists of the following:



- Curtain airbags fitted above the trim panels over the front and rear side windows.
- A flexible headliner which opens above the side doors to allow air curtain deployment.
- The same warning light, electronic control and diagnostic unit as used for the front airbags.

Section 5: Reference Information

- Crash, rollover and pressure sensors located within the vehicle.

Police Equipment Mounting and Airbag Locations

Dual driver/passenger airbags, side airbags and knee airbags affect the way police equipment can be mounted in police vehicles. Any surfaces that could come into contact with an airbag, once it has deployed, must not damage the airbag or alter its deployment path.

Once the airbag has fully deployed, any peripheral equipment surfaces that could come into contact with the airbag (such as when the airbag deflates with the loading of an occupant) must not damage the airbag or alter its deployment path. Sharp edges, corners or protrusions could damage the nylon airbag material and reduce the effectiveness of the airbag.



WARNING:

Do not place objects or mount equipment in front of the airbag module cover or in front of the seat areas that may come in contact with a deploying airbag. Failure to follow this instruction could result in personal injury. For equipment placed within the air bag deployment zone the path of the deploying air bag must be considered so as not to affect the air bag deployment. Also, occupant positions in a collision or event causing air bag deployment must be considered. Failure to follow this instruction could result in personal injury.



WARNING:

Dash, tunnel or console mounted equipment should be placed outside of the specified zone. Failure to follow this instruction could result in personal injury.

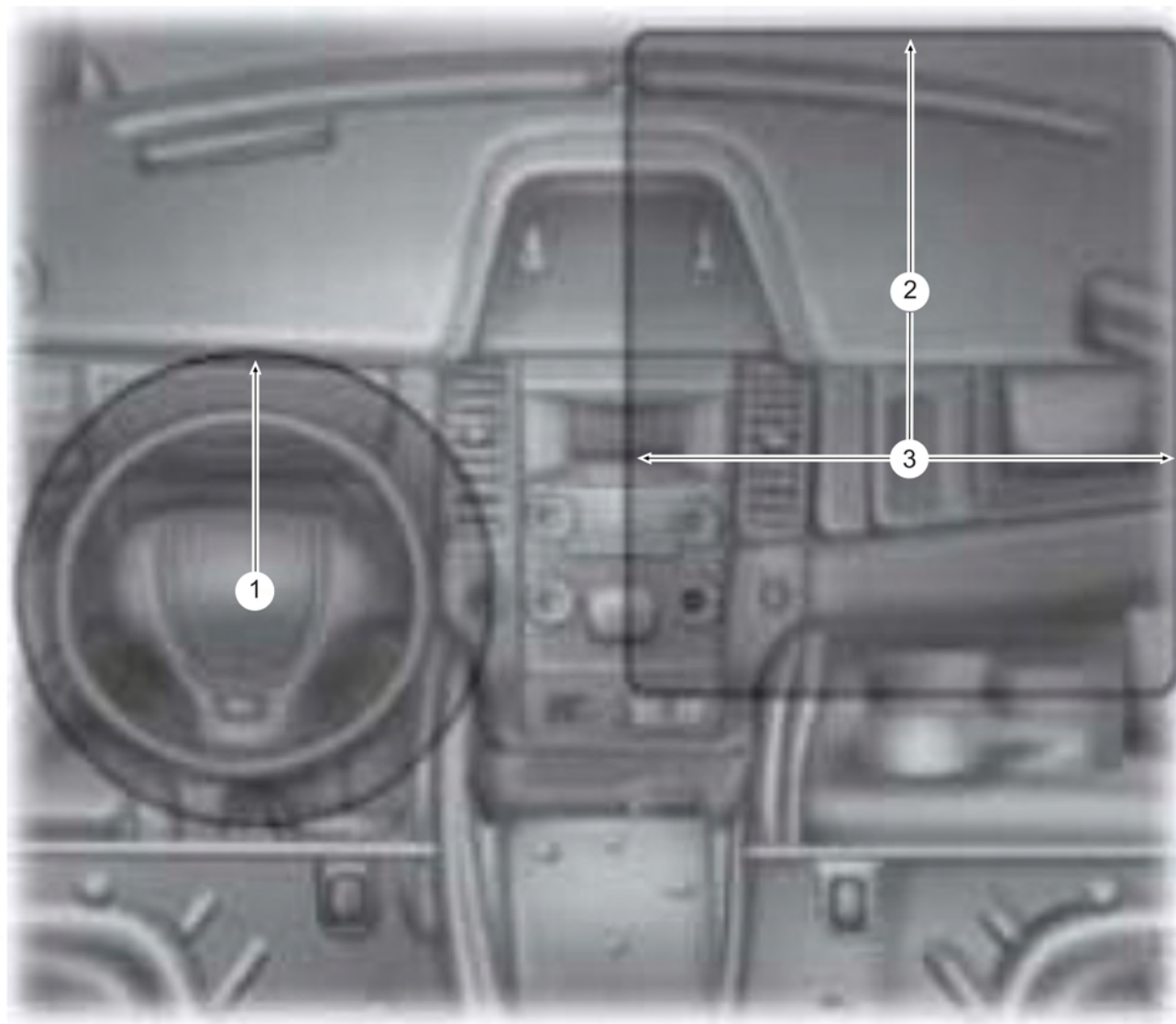


WARNING:

Do not mount equipment by the side of front seat to the door trim to block deployment of the side airbag. Failure to follow this instruction could result in personal injury. Some approximate dimensions for airbags, at full inflation, are provided in the illustrations in this section. These dimension are somewhat flexible and represent free form deployments without the loading of occupants. The shaded areas represent airbag deployment zones and should be avoided. Consideration of airbag deployment paths and occupant positions must be considered when mounting equipment near these areas. These zones are shown for police vehicles equipped with standard bucket seats. The zone dimensions provided are approximate and will vary with the loading of the occupants in the seats. All airbag and equipment mounting zone dimensions are approximate due to different airbag deployment characteristics. No equipment will mount between the side of the front seat and the door trim to block deployment of the side airbag.

Sedan Police Interceptor — Front Airbag Deployment Zones

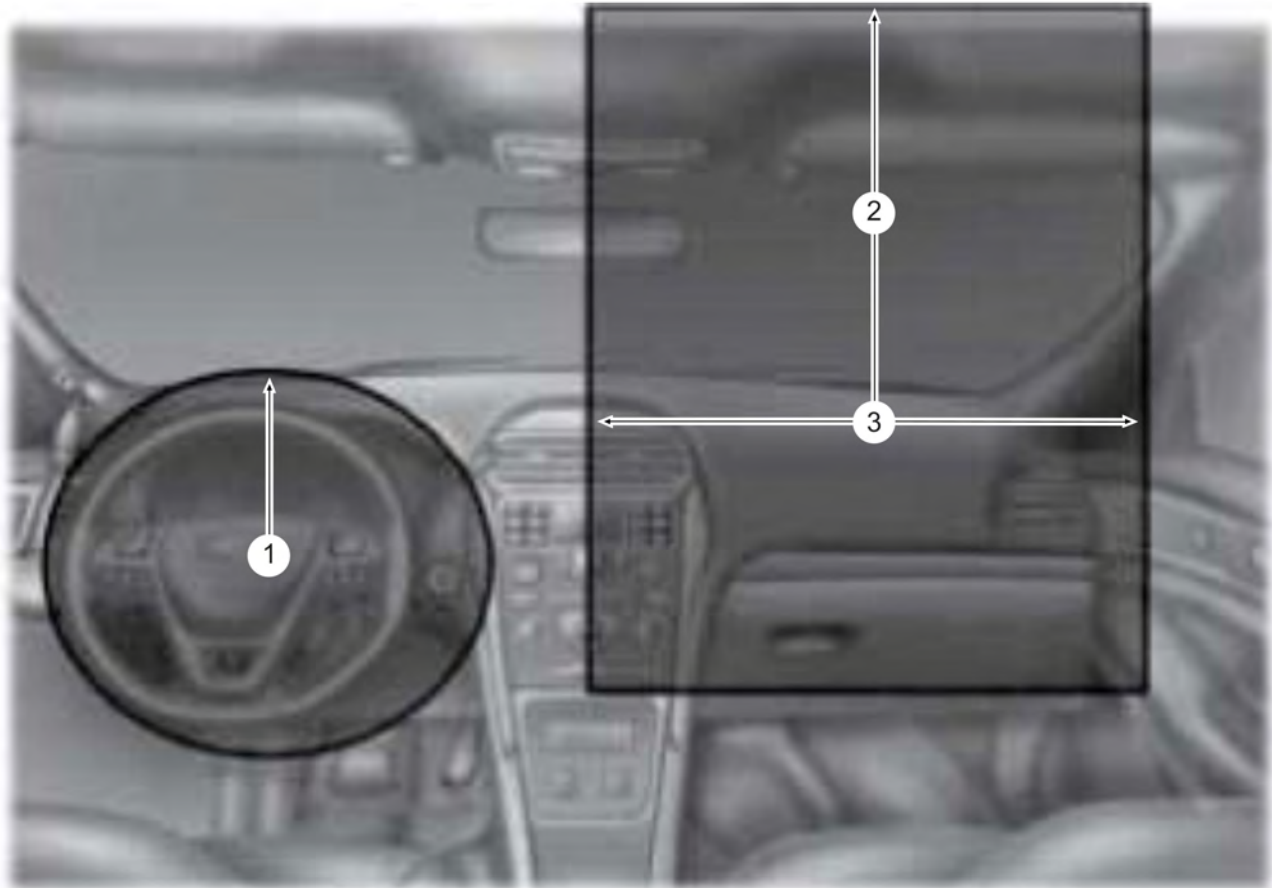
Section 5: Reference Information



N0146348

Utility Police Interceptor — Front Airbag Deployment Zones

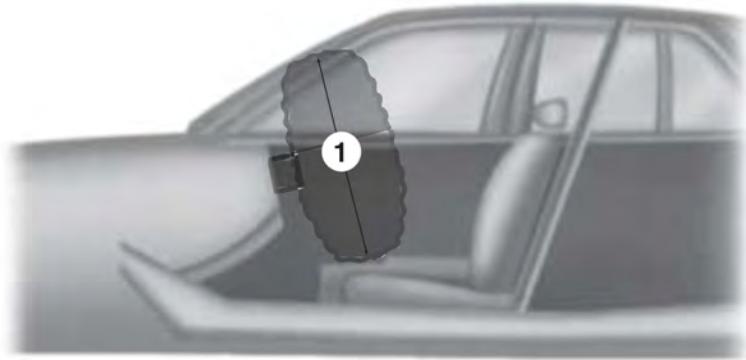
Section 5: Reference Information



N0146349

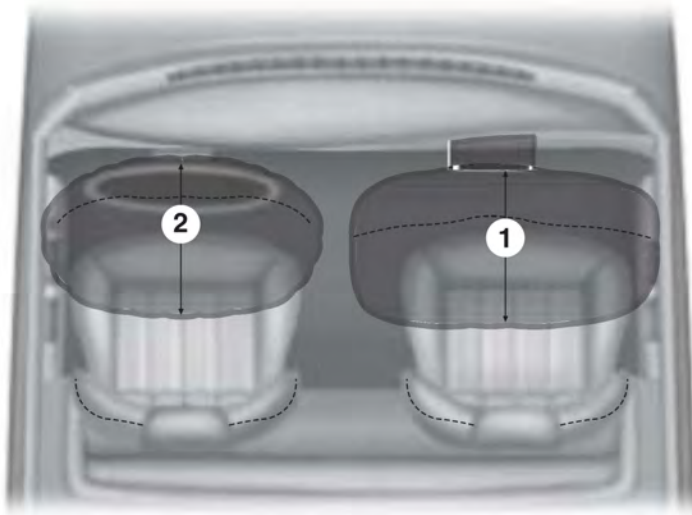
Item	Description Sedan	Description Utility
1	From the center of emblem. 13 inches (330 mm)	From the center of emblem. 9.5 inches (240 mm)
2	From the center of airbag door. 13.2 inches (335 mm)	From the center of airbag door. 13.8 inches (350 mm)
3	No objects should be placed between the airbags due to airbag variability. 29.5 inches (750 mm)	No objects should be placed between the airbags due to airbag variability. 28.3 inches (720 mm)

Section 5: Reference Information



N0146250

Item	Description Sedan	Description Utility
1	760 mm (29.9 in)	700 mm (27.5 in)

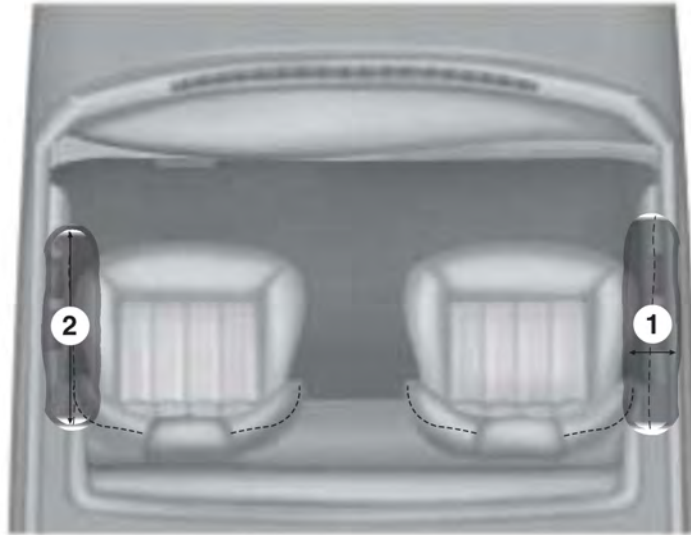


N0146351

NOTE:
No objects should be placed between the driver side steering wheel airbag and the passenger side dash airbag.

Item	Description Sedan	Description Utility
1	Front passenger airbag 27.5 inches (700 mm)	Front passenger airbag 22.8 inches (580 mm)
2	Front driver 17 inches (430 mm)	Front driver 17 inches (430 mm)

Section 5: Reference Information



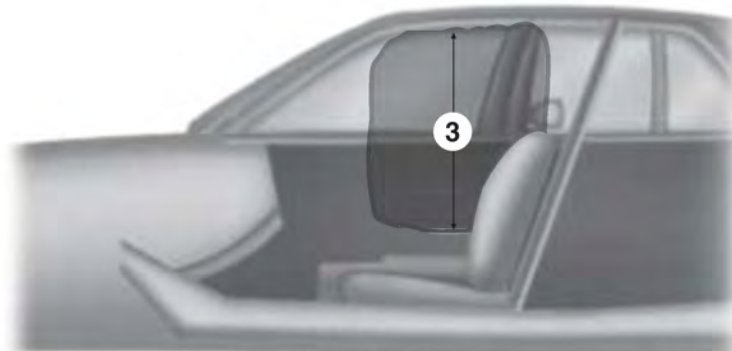
N0146352

Item	Description Sedan	Description Utility
1	From outboard side of seat 6 inches (152 mm)	From outboard side of seat 8 inches (200 mm)
2	Forward of seat back 14 inches (356 mm)	Forward of seat back 15 inches (380 mm)



WARNING:

The partition and the installation hardware of the partition must not interfere with the operation and deployment of the Safety Canopy® Airbag and seat side airbags. Failure to follow these instructions may cause personal injury.

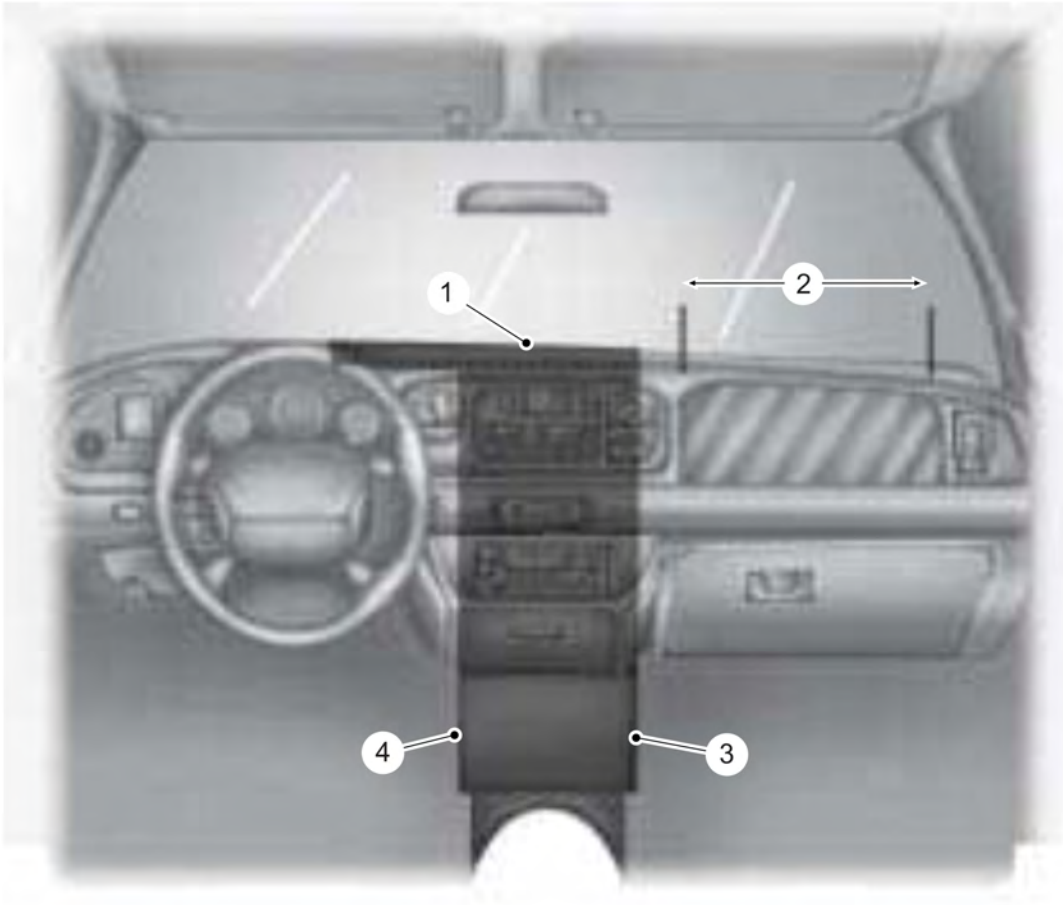


N0146353

Item	Description Sedan	Description Utility
3	Up from the side airbag module 16 inches (406 mm)	Up from the side airbag module 27.5 inches (700 mm)

Sedan Police Interceptor

Section 5: Reference Information



N0146354

Utility Police Interceptor



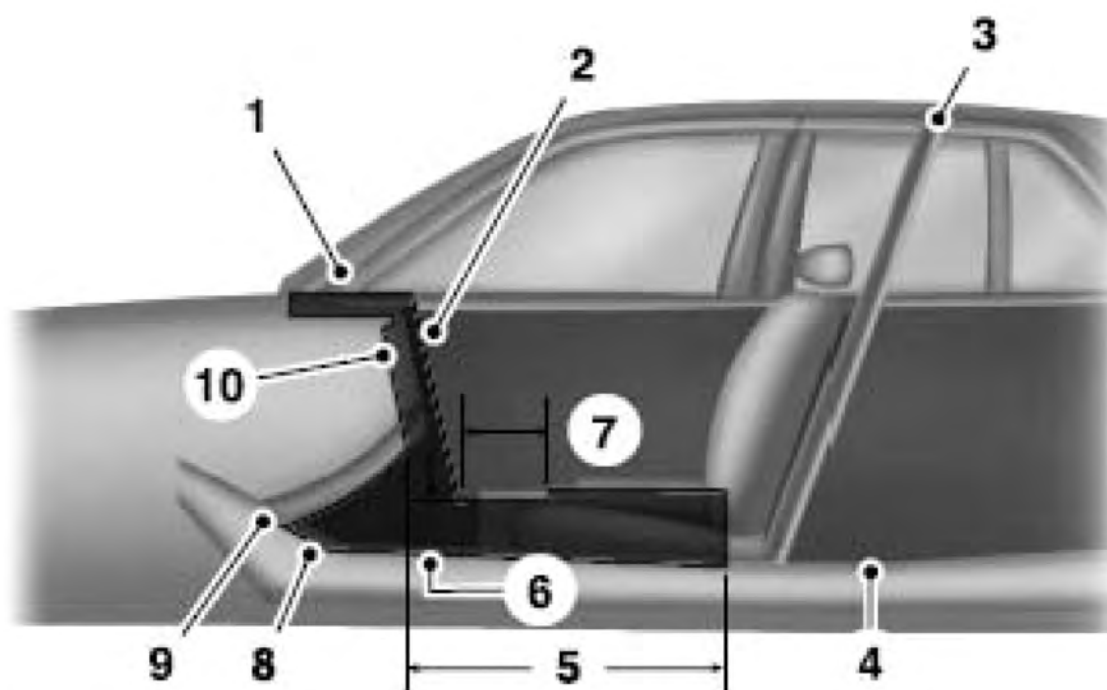
N0140484

Item	Description Sedan	Description Utility
1	Area on top of instrument panel Equipment must not interfere with driver visibility	Area on top of instrument panel Equipment must not interfere with driver visibility

Section 5: Reference Information

(Continued)

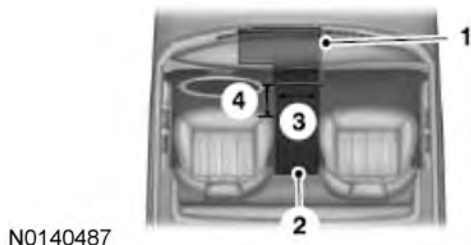
Item	Description Sedan	Description Utility
2	Airbag door must be kept clear for deployment of airbag	Airbag door must be kept clear for deployment of airbag
3	Area in front of electronic finish panel from the bottom of the ashtray to the top of the instrument panel	Area in front of the center console from bottom of ashtray to top of the instrument panel
4	—	Area in front of the electronic finish panel from the bottom to the top of the instrument panel



N0140485

Item	Description
1	Area on top of instrument panel
2	Area in front of center console from tunnel to instrument panel
3	Prisoner screen
4	10 inches (254 mm)
5	Area on tunnel between seats
6	Height: 8.5 inches (216 mm)
7	12 inches (305 mm)
8	Area on tunnel beneath center console
9	Tunnel
10	Depth: 1.5 inches (38 mm)

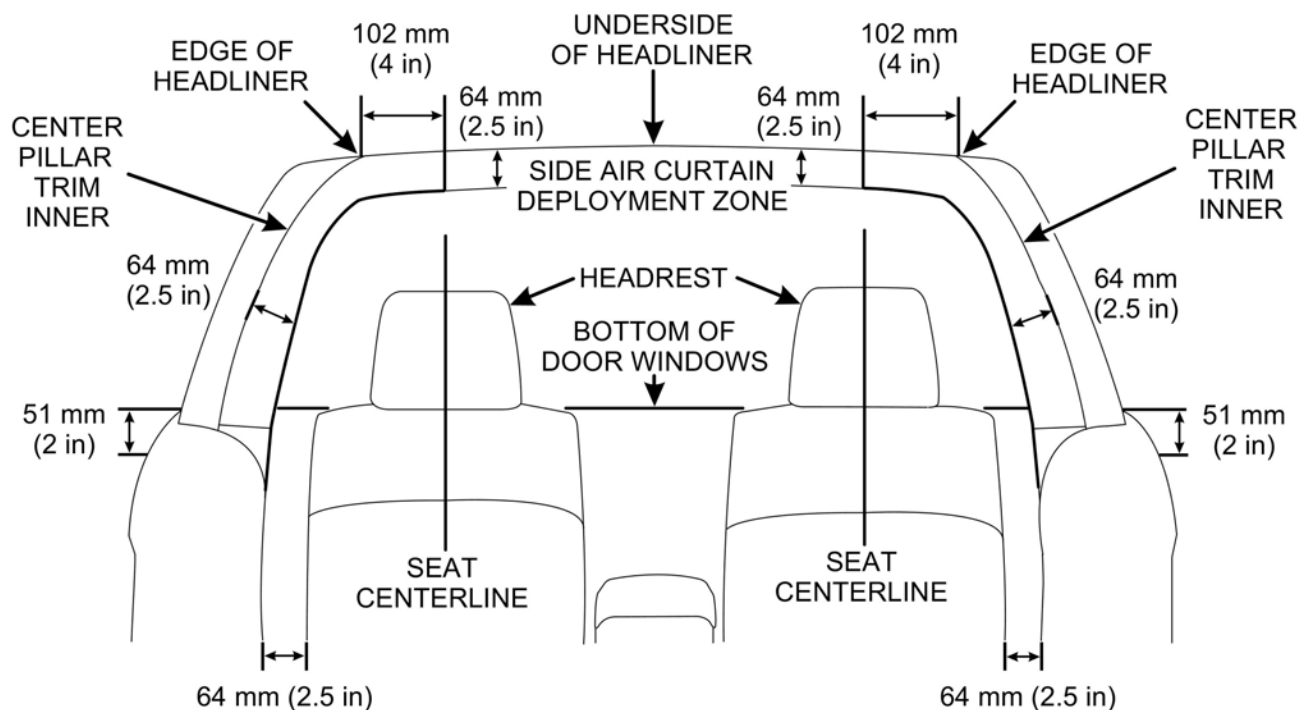
Section 5: Reference Information



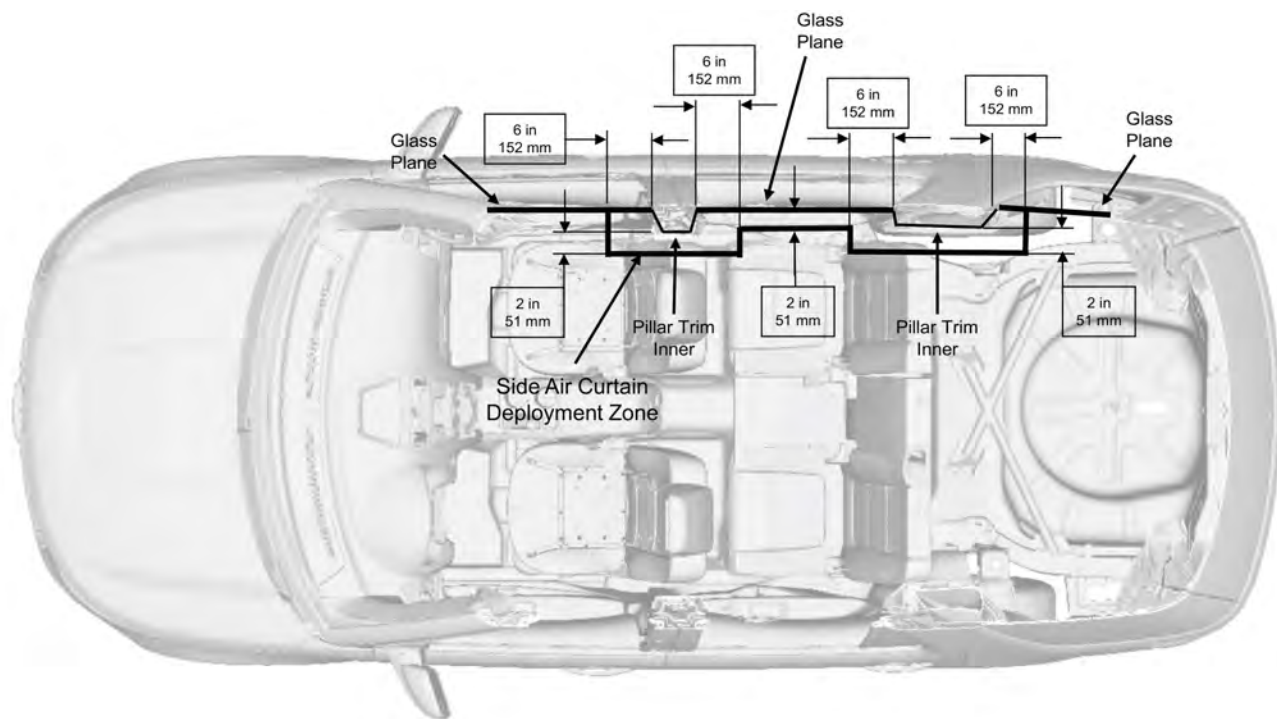
Item	Description
1	Area on top of instrument panel. Equipment must not interfere with driver visibility
2	Area on tunnel between seats
3	229 mm (9 in)

Air Curtain Deployment Zones

CURTAIN AIRBAG DEPLOYMENT ZONE



Section 5: Reference Information



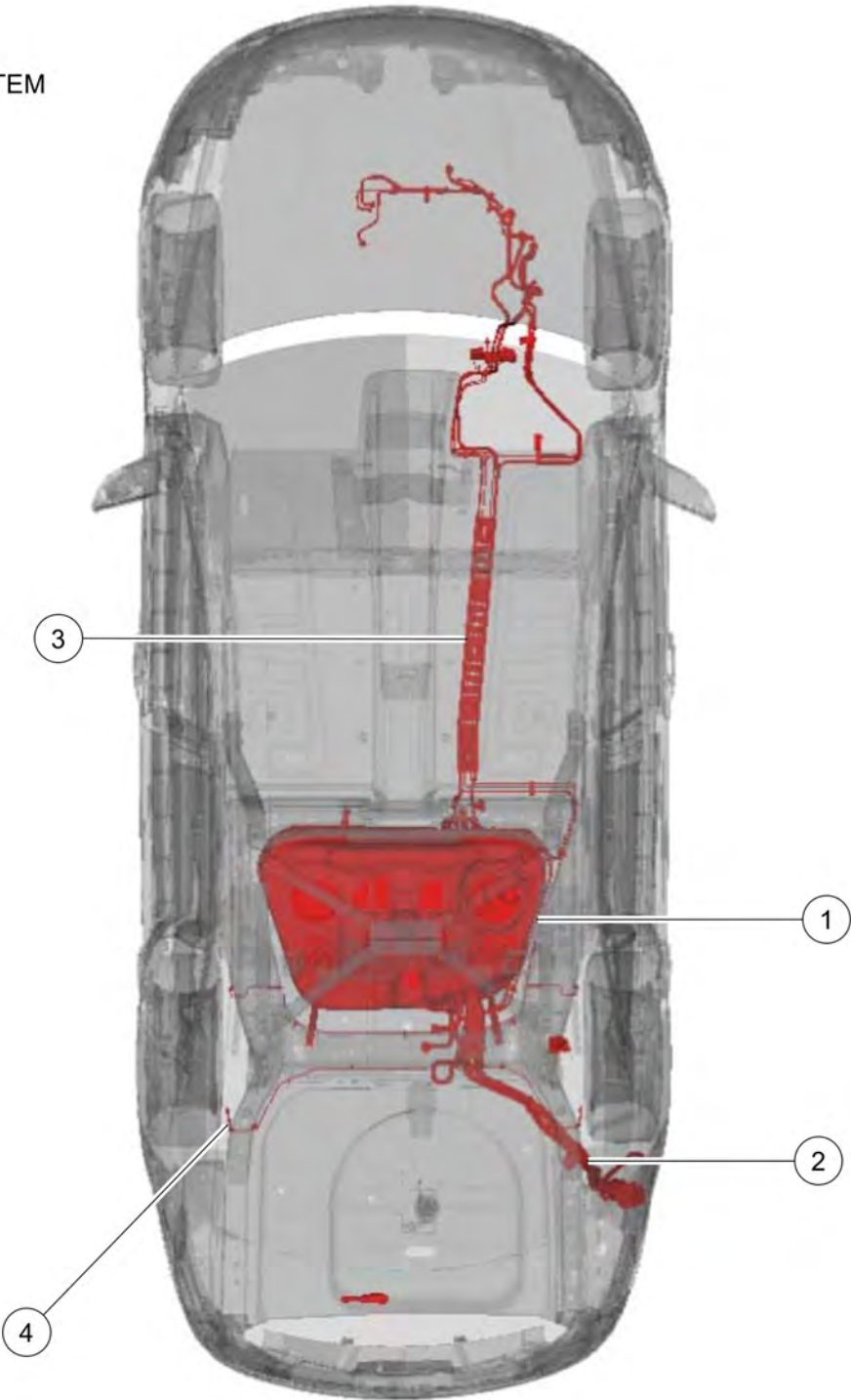
N0146530

Under Vehicle Components

Sedan

Section 5: Reference Information

FUEL SYSTEM



N0146458

Item	Description
1	Fuel Tank

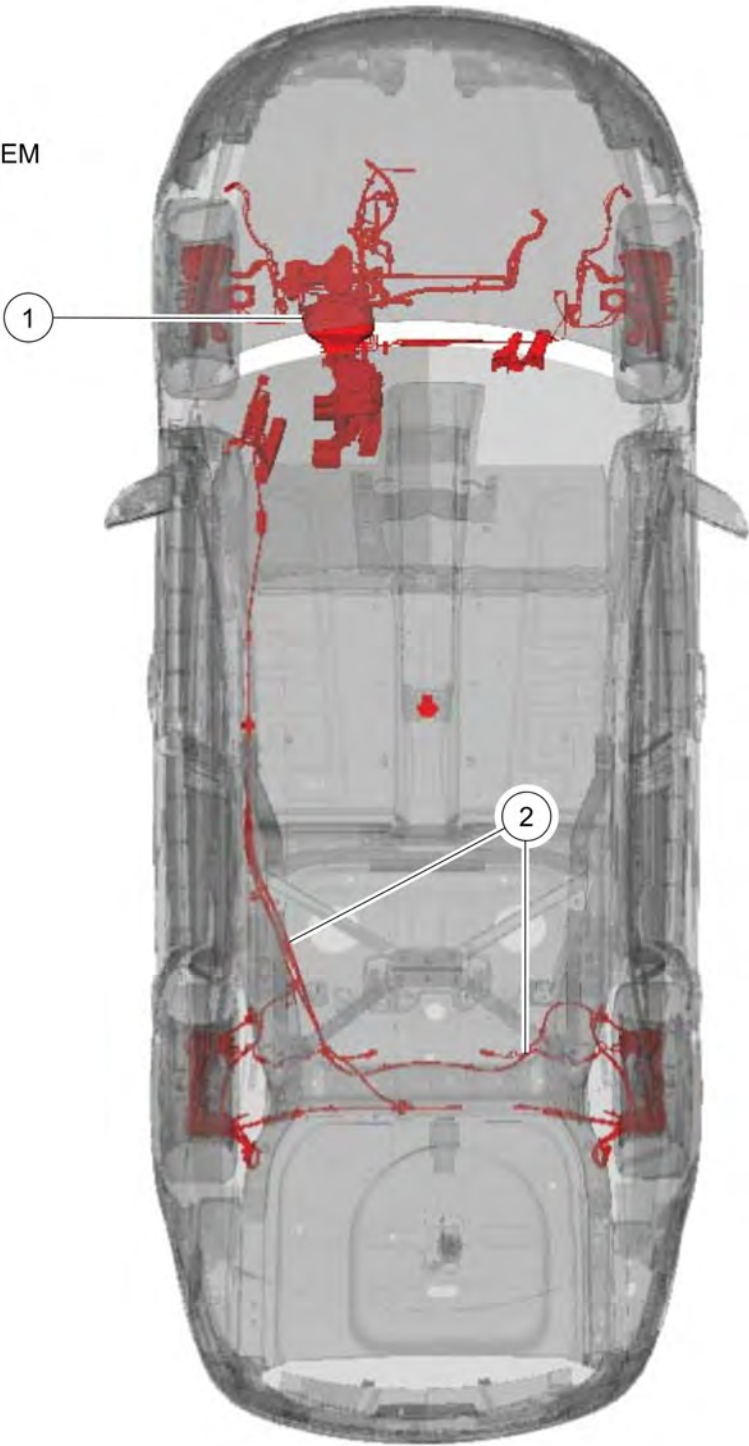
Section 5: Reference Information

(Continued)

Item	Description
2	Fuel Fill Pipe
3	Fuel Lines/Brake Lines
4	Brake Lines

Section 5: Reference Information

BRAKE SYSTEM



N0146459

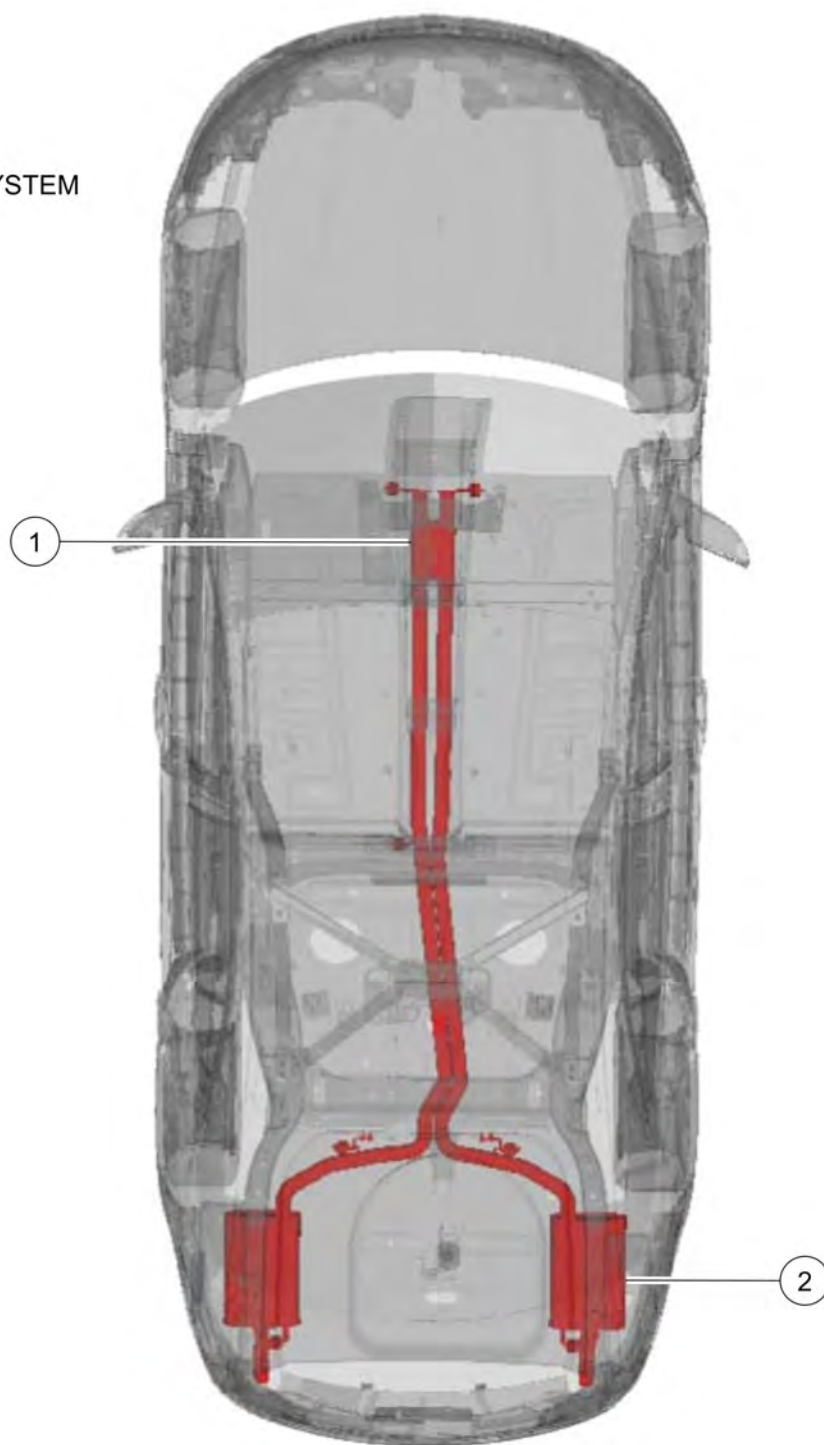
Item	Description
1	Brake Master Cylinder

Section 5: Reference Information

(Continued)

Item	Description
2	Park Brake Cable

EXHAUST SYSTEM



N0146460

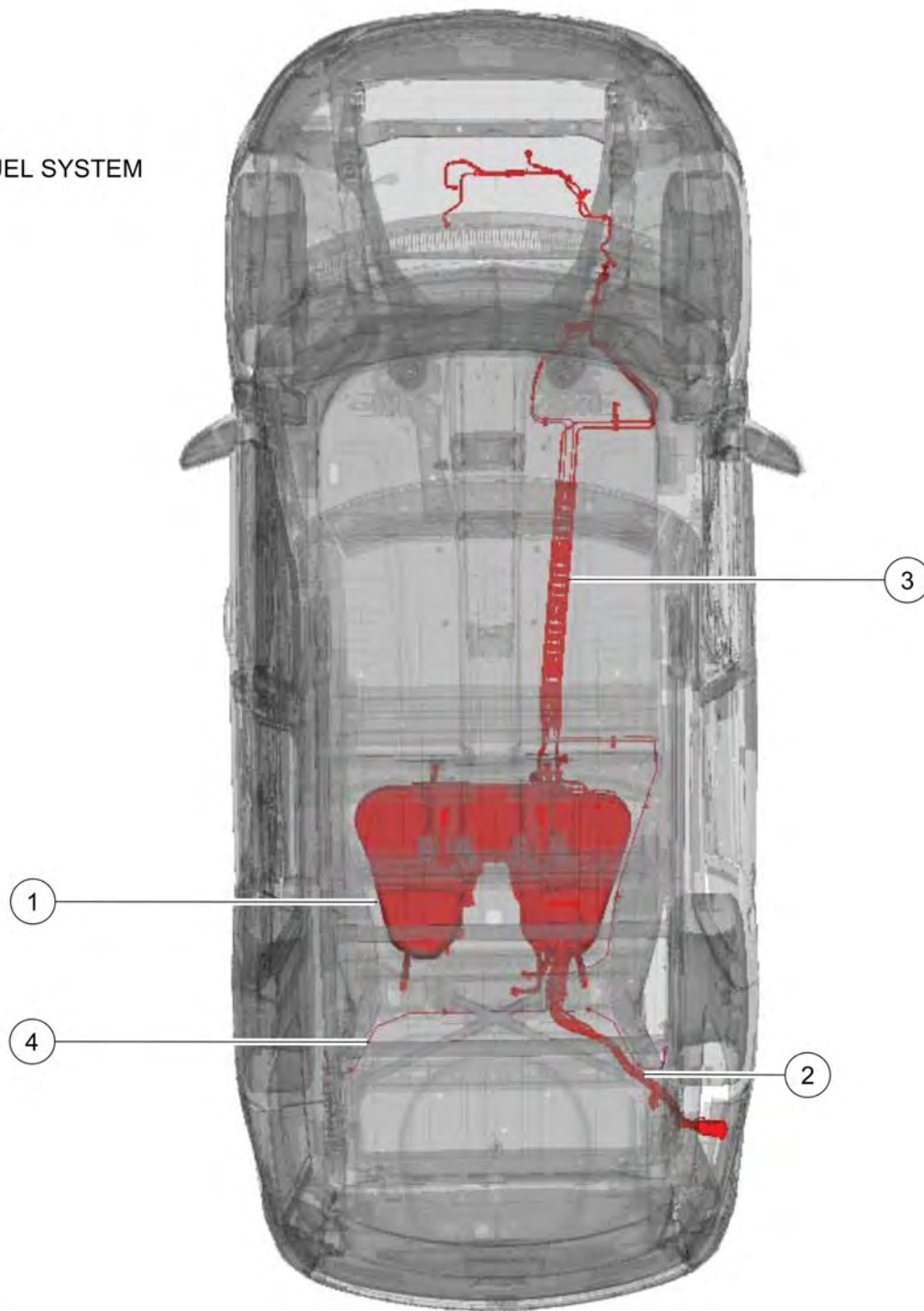
Section 5: Reference Information

Item	Description
1	Catalytic Converter
2	Muffler

Utility

Section 5: Reference Information

FUEL SYSTEM



N0146461

Item	Description
1	Fuel Tank

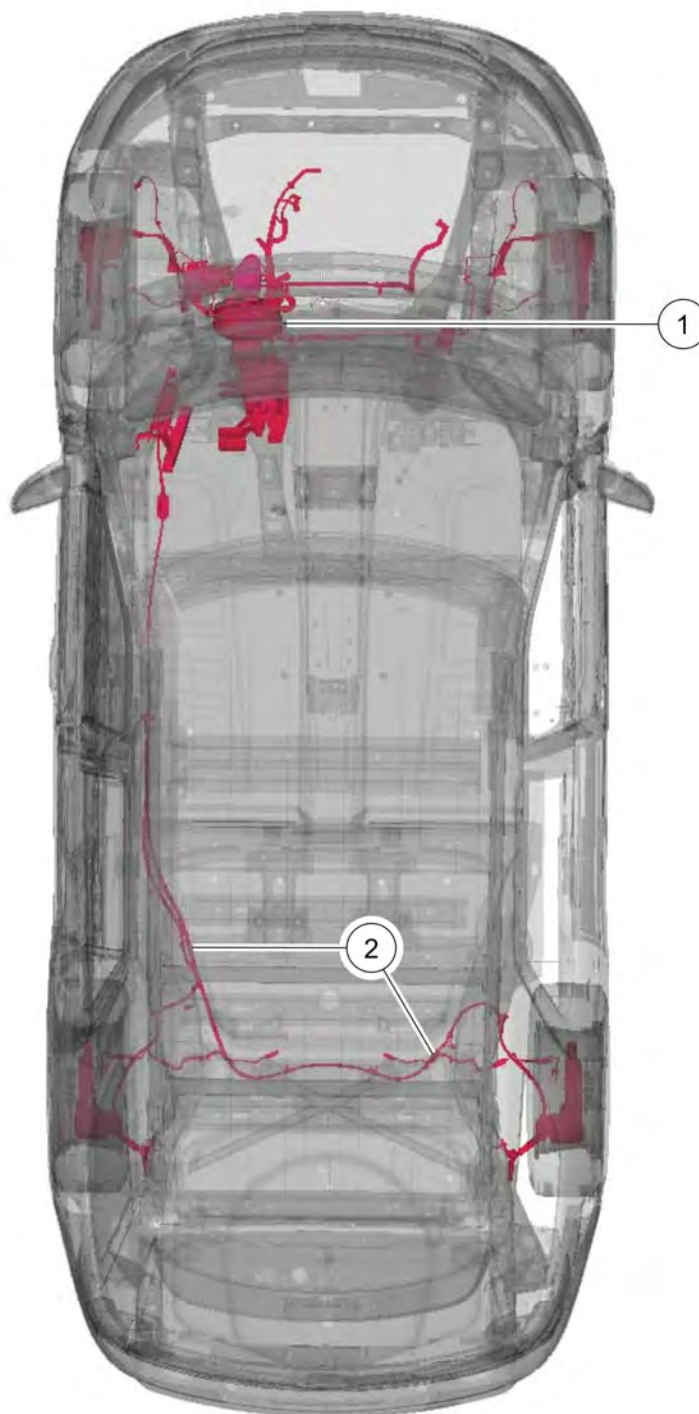
Section 5: Reference Information

(Continued)

Item	Description
2	Fuel Fill Pipe
3	Fuel Lines/Brake Lines
4	Brake Lines

Section 5: Reference Information

BRAKE SYSTEM



N0146462

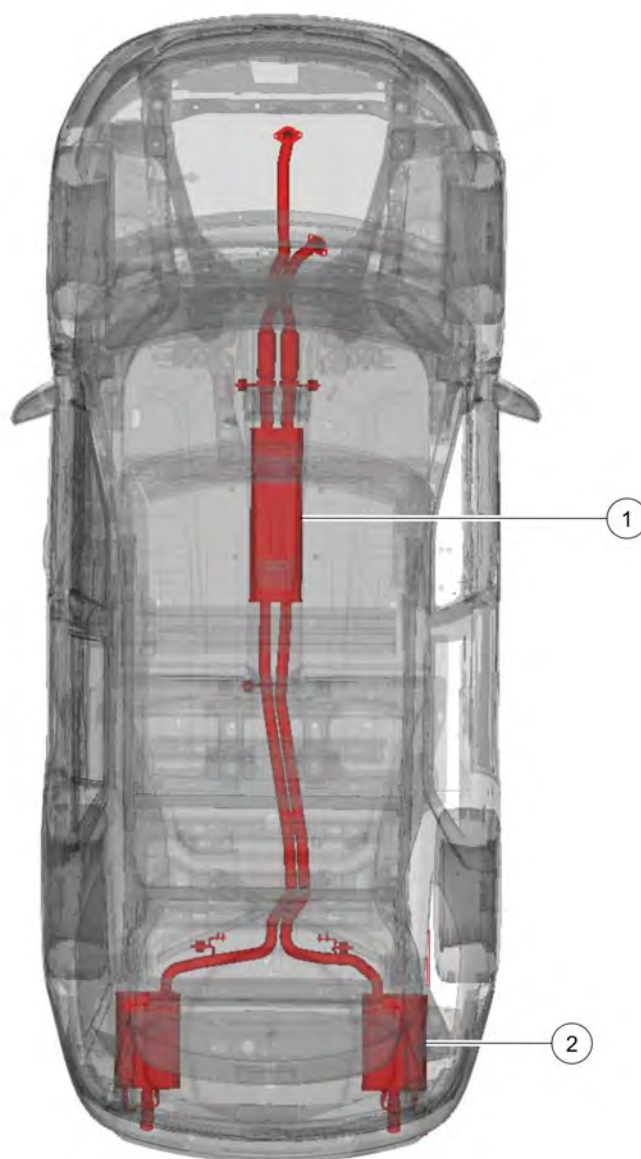
Item	Description
1	Brake Master Cylinder

Section 5: Reference Information

(Continued)

Item	Description
2	Park Brake Cable

EXHAUST SYSTEM



N0146463

Item	Description
1	Catalytic Converter
2	Muffler

DISPOSAL OF AIRBAGS AND AIRBAG EQUIPPED VEHICLES (INCLUDING PRETENSIONERS)

Contact your authorized dealer as soon as possible. Airbags MUST BE disposed of by qualified personnel.

Section 5: Reference Information

SOS POST-CRASH ALERT SYSTEM

The system flashes the turn signal lamps and sounds the horn (intermittently) in the event of a serious impact that deploys an airbag (front, side, side curtain or safety canopy) or the safety belt pretensioner.

The horn and laps will turn off when:

- The hazard control button is pressed or
- The vehicle runs out of power.

Fuel Pump (FP) Shut-off Feature

NOTE:

Refer to the Description and Operation, Intelligent Access with Push Button Start in Section 419-01A to review the procedures for achieving the various ignition states (ignition OFF, ignition in ACCESSORY, ignition ON and ignition START) on vehicles with this feature.

In the event of a moderate to severe collision, the vehicle is equipped with a Fuel Pump (FP) shut-off feature that is initiated by the event notification signal.

The event notification signal is a signal provided by the Restraints Control Module (RCM) to the FP control module. Signal communication between the RCM and the FP control module allows the PCM to shut-off the FP.

Should the vehicle shut off after a collision due to this feature, the vehicle may be restarted by first turning the ignition to the OFF position and then turn the ignition to the ON position. In some instances the vehicle may not start the first time and may take one additional ignition cycle.