



This Supplement is not intended to replace your vehicle Owner's Manual which contains more detailed information concerning the features of your vehicle, as well as important safety warnings designed to help reduce the risk of injury to you and your passengers. Please read your entire Owner's Manual carefully as you begin learning about your new vehicle and refer to the appropriate sections when questions arise.

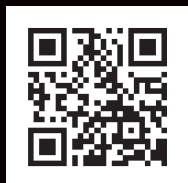
All information contained in this supplement was accurate at the time of publication. We reserve the right to change features, operation and/or functionality of any vehicle specification at any time. Your Ford dealer is the best source for the most current information. For detailed operating and safety information, please consult your Owner's Manual.



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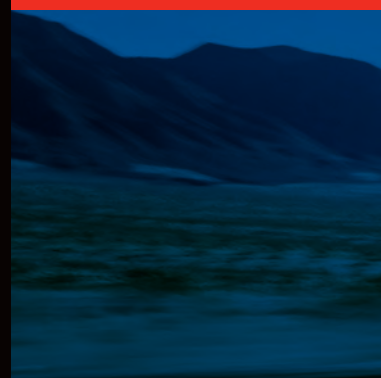


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## 2018 FORD F-150 RAPTOR SUPPLEMENT



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# Introduction

## ABOUT THIS SUPPLEMENT

Thank you for choosing Ford Performance. If you have owned or leased a Ford Performance vehicle before, welcome back. If this is your first Ford Performance vehicle, welcome to the family. We are confident that our dedication to performance, quality, craftsmanship and customer service will provide you with many miles of exhilarating, safe and comfortable driving.

We strive to build engaging vehicles that involve the driver in every aspect of the driving experience. Although performance is at the heart of every Ford Performance vehicle, we go further.

Our goal is to deliver a comprehensive, complete vehicle, paying close attention to the smallest details such as the sound of the exhaust, the quality of the interior materials and the functionality and the comfort of the seats, to make sure that you enjoy not only exceptional performance but an outstanding driving environment as well. This philosophy is expressed in this vehicle through a sophisticated powertrain, outstanding chassis dynamics and significant interior and exterior enhancements.

We have created this supplement to help you get to know the unique features of your Ford Performance vehicle. It only contains the instructions for the unique features of the Ford Performance vehicle and is not a substitute for the Owner's Manual. You must read the full instructions in the Owner's Manual. The more that you know about your vehicle, the greater the safety and pleasure you will get from driving it.

**Note:** *This supplement describes product features and options available throughout the range of available models, sometimes even before they are generally available. It may describe options not fitted to the vehicle you have purchased.*

**Note:** *Some of the illustrations in this supplement may show features as used in different models, so may appear different to you on your vehicle.*

## SPECIAL NOTICES

### New Vehicle Limited Warranty

For a detailed description of what is covered and what is not covered by your vehicle's New Vehicle Limited Warranty, see the **Warranty Guide** that is provided to you along with your Owner's Manual.

### Special Instructions

For your added safety, your vehicle is fitted with sophisticated electronic controls.

#### WARNINGS



You risk death or serious injury to yourself and others if you do not follow the instruction highlighted by the warning symbol. Failure to follow the specific warnings and instructions could result in personal injury.



Airbags can kill or injure a child in a child restraint. Never place a rear-facing child restraint in front of an active airbag. If you must use a forward-facing child restraint in the front seat, move the seat upon which the child restraint is installed all the way back.

### On Board Diagnostics Data Link Connector

#### WARNING



Do not connect wireless plug-in devices to the data link connector. Unauthorized third parties could gain access to vehicle data and impair the performance of safety related systems. Only allow repair facilities that follow our service and repair instructions to connect their equipment to the data link connector.

# Introduction

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Your vehicle has an OBD Data Link Connector (DLC) that is used in conjunction with a diagnostic scan tool for vehicle diagnostics, repairs and reprogramming services. Installing an aftermarket device that uses the DLC during normal driving for purposes such as remote insurance company monitoring, transmission of vehicle data to other devices or entities, or altering the performance of the vehicle, may cause interference with or even damage to vehicle systems. We do not recommend or endorse the use of aftermarket plug-in devices unless approved by Ford. The vehicle Warranty will not cover damage caused by an aftermarket plug-in device.

## Notice to owners of pickup trucks and utility type vehicles

### WARNING



Utility vehicles have a significantly higher rollover rate than other types of vehicles.

Before you drive your vehicle, please read this Owner's Manual carefully. Your vehicle is not a passenger car. As with other vehicles of this type, failure to operate your vehicle correctly may result in loss of vehicle control, vehicle rollover, personal injury or death.

## Using your vehicle as an ambulance

Do not use this vehicle as an ambulance. Your vehicle does not have the Ford Ambulance Preparation Package.

## Using a Slide-In Camper

Your pickup is not recommended for carrying a slide-in camper.

## SVT

The Special Vehicle Team (SVT) was established in 1991 to polish the Ford Oval by creating low-volume, factory-produced vehicles designed for people whose idea of driving is a high-powered, passionate experience - not just a means of getting from A to B.

To support such spirited enthusiasm, we carefully integrated the wide array of talent in the company into a small, cross-functional group of engineers and product planners and located them under one roof with a common mission to create vehicles specifically designed to meet the unique needs and desires of the driving enthusiast.

We produced more than 250,000 SVT vehicles since 1993 model year including the SVT Mustang Cobra and the Cobra R, the SVT F-150 Lightning, the SVT Contour, the SVT Focus, Ford GT, Shelby GT500, GT500KR and the F-150 SVT Raptor.

## FORD PERFORMANCE

Welcome to the Ford Performance family!

Performance and racing are deeply embedded in Ford's DNA, dating back to October 10, 1901 when Henry Ford won his first race against Alexander Winton, America's greatest racer at the time. Henry Ford founded Ford Motor Company 18 months later with capital raised on the back of this remarkable upset victory.

Today, that spirit of passion, innovation and performance lives on through Ford Performance. Established in 2015, the company's performance teams -- Ford Special Vehicle Team (United States), Team RS (Europe), Ford Performance (Australia) and Ford Racing (United States) -- have unified under the mission to create the world's leading performance

# Introduction

vehicles, parts, accessories and experiences for enthusiasts. This includes accelerating the development of advanced aerodynamics, lightweighting, electronics, powertrain performance, fuel efficiency and other technologies that can be applied

across Ford's product portfolio.

We are proud and passionate about what we do and we look forward to a long and exciting relationship with you. Thank you for choosing Ford Performance!



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# At a Glance

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## UNIQUE FEATURES



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### Powertrain

- 3.5L EcoBoost HO engine.
- 10R80 10-speed automatic transmission.
- Torque On Demand™ 2-speed transfer case with 4 Hi-Loc.
- Modified rear differential capable of locking in 4A, 4H and 4L.

# At a Glance

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- 35 spline rear axle shafts for increased capability.
- 4.10 front and rear axle ratios.
- Dual exhaust, 4.5 in (114.3 mm) exhaust tips.

## Chassis

- Longer, cast aluminum lower control arms.
- Longer, forged steel upper control arms.
- Fox Racing 2.25 in (57.15 mm) piston, 3 in (76.2 mm) body, internal bypass front shocks.
- Fox Racing 2.25 in (57.15 mm) piston, 3 in (76.2 mm) body, internal bypass, remote reservoir rear shocks.
- Long travel suspension.
- Unique underbody shields.
- Heavy duty fully boxed frame.

## Exterior

- Modified rear bumper with integrated rear tow hooks.
- Unique underbody shields plus front tow hooks.
- Hood with functional air extractors.
- Front fenders with functional air extractors.
- Front and rear LED marker lamps.
- 17 x 8.5 aluminum wheels.
- Optional 17 x 8.5 forged beadlock compatible wheels.
- LT 315/70-17 BF Goodrich all-terrain tires.

## Interior

- Unique terrain-mode and hill descent functionality plus six auxiliary switches.
- Off-road specific calibrations for engine, transmission, driveline and AdvanceTrac system.

# Information Displays

## GENERAL INFORMATION

Your Ford Performance vehicle has additional and modified menu items. Depending on your instrument cluster, you may be able to add some of these displays to your **MyView**. For complete menu structures, refer to your Owner's Manual.



This icon gives you the ability to switch a feature on or off. A check in the box indicates the feature is enabled, and unchecked indicates the feature is disabled.

- Press the up and down arrow buttons to scroll through and highlight the options within a menu.
- Press the right arrow button to enter a sub-menu.
- Press the left arrow button to exit a menu.
- Press the **OK** button to choose and confirm a setting or messages.

### Average Speed (If Equipped)

Your Ford Performance vehicle tracks your average driven speed. Average Speed is available on your **Trip/Fuel** menu. Press and hold the **OK** button to reset your average speed.

### Raptor Status Screen

Your Ford Performance vehicle displays unique off road information for your vehicle.

In addition to pitch, steering angle, roll and power distribution information, your Ford Performance off road screen also displays:

- Hill Descent Status.
- AdvanceTrac Status.

- Terrain Mode.
- Steering Effort Mode.

Your Raptor Status screen is available on your **Off Road** menu.

### Neutral Tow

Your Ford Performance vehicle can be put in neutral tow through the information display. See **Towing the Vehicle on Four Wheels** (page 29).

## INFORMATION MESSAGES

**Note:** Depending on your vehicle options and instrument cluster type, not all of the messages will display or be available. The information display may abbreviate or shorten certain messages.



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Press the **OK** button to acknowledge and remove some messages from the information display. The information display will automatically remove other messages after a short time.

You need to confirm certain messages before you can access the menus.

# Information Displays

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## Terrain Management System

Message	Action
Selected 4x4 Mode Not Available in Current Terrain Mode	Displays when the 4x4 system cannot be used in the current terrain mode.
Locking Differential Not Available in Current Terrain Mode	Displays when the locking differential cannot be used in the current terrain mode.
Terrain Management System Fault	Displays when the terrain management system detects an error.
Selected Terrain Mode Preconditions Not Met	Displays when the preconditions have not been met to select the desired terrain mode.

# Transmission

## AUTOMATIC TRANSMISSION

### WARNINGS



Always fully apply the parking brake. Make sure you shift into park (P) for vehicles with an automatic transmission. Switch the ignition off and remove the key whenever you leave your vehicle.



Do not apply the brake pedal and accelerator pedal simultaneously. Applying both pedals simultaneously for more than a few seconds will limit engine performance, which may result in difficulty maintaining speed in traffic and could lead to serious injury.

**Note:** Under certain conditions, you may not be able to shift out of park (P) unless the intelligent access key is inside the vehicle.

### Understanding your SelectShift™ Automatic Transmission

Your vehicle is equipped with a SelectShift automatic transmission gearshift lever and steering wheel mounted shifter paddles. The buttons on the gearshift lever and the shifter paddles serve the same functions. The SelectShift Automatic transmission gives you the ability to change gears up or down (without a clutch) as desired.

In order to prevent the engine from running at too low an RPM, which may cause it to stall, SelectShift still automatically makes some downshifts if it has determined that you have not downshifted in time. Although SelectShift will make some downshifts for you, it still allows you to downshift at any time as long as the SelectShift determines that damage will not be caused to the engine from over-revving.

SelectShift will not automatically upshift, even if the engine is approaching the RPM limit. It must be shifted manually by pressing the **+** button or paddle.

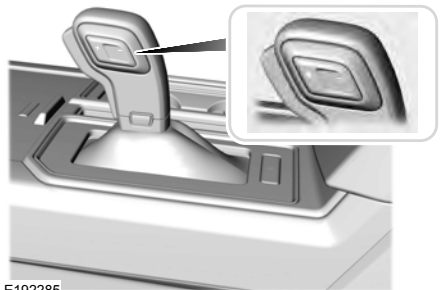
**Note:** Engine damage may occur if you maintain excessive engine revving without shifting.

The SelectShift Automatic transmission feature has two modes: PRS and M mode.

### Manual (M)

Moving the gearshift lever to the manual (M) position allows you to manually select the gear you desire. Only the current gear will display. Use the buttons on the gearshift lever or steering wheel to manually select gears. Press the **+** button or paddle to upshift or the **-** button or paddle to downshift. Return the transmission to a different gearshift position to deactivate manual control.

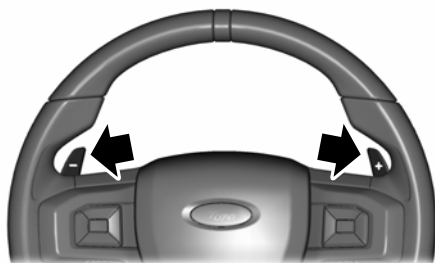
### Console Shifter



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# Transmission

## Steering Wheel



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Upshift to the recommended shift speeds according to the following chart:

Upshifts When Accelerating (Recommended for Best Fuel Economy)	
Shift from:	
1 – 2	15 mph (24 km/h)
2 – 3	20 mph (32 km/h)
3 – 4	27 mph (43 km/h)
4 – 5	32 mph (51 km/h)
5 – 6	37 mph (60 km/h)
6 – 7	42 mph (68 km/h)
7 – 8	48 mph (77 km/h)
8 – 9	52 mph (84 km/h)
9 – 10	60 mph (97 km/h)

## Progressive Range Selection

Progressive Range Selection gives you the ability to lockout gears from the automatic shifting range. This may provide you with an improved driving experience (for example, in slippery conditions or when experiencing a steep grade).

With the transmission in drive (D), press the **-** button or paddle to activate PRS. The available and selected gears are indicated on the instrument cluster.

All available gears display with the current gear indicated. Press the **-** button or paddle again to lock out gears beginning with the highest gear. For example, press the **-** button or paddle twice to lock out 10th and 9th gears. Only the available gears display and the transmission automatically shifts between the available gears. Press the **+** button or paddle to unlock gears to allow the transmission to shift to higher gears. The transmission shifts automatically within the gear range you select.

# Four-Wheel Drive

## USING FOUR-WHEEL DRIVE

**Note:** For important information regarding the safe operation of this type of vehicle, see General Information in the Wheels and Tires chapter.

**Note:** Do not use 4H or 4L mode on dry, hard surfaced roads. Doing so can produce excessive noise, increase tire wear and may damage drive components. 4H or 4L mode is only intended for consistently slippery or loose surfaces. Use of 4L mode on these surfaces may produce some noise (such as occasional clunks), but will not damage drive components.

**Note:** If 4L is selected while your vehicle is moving above 3 mph (5 km/h), the 4WD system will not perform a shift. This is normal and should be no reason for concern. Refer to Shifting to or from 4L (4X4 Low) for proper operation.

**Note:** You can switch on and switch off the electronic locking differential by pressing the center of the 4WD control. See **Electronic Locking Differential** (page 19).

## 4WD Indicator Lights

**Note:** When a 4X4 system fault is present, the system will typically remain in whichever 4X4 mode was selected prior to the fault condition occurring. It will not default to 4X2 in all circumstances. When this warning is displayed, have your vehicle serviced by an authorized dealer.

### 4X2



Momentarily illuminates when 2H is selected.

### 4X4 Auto



Continuously illuminates when 4A is selected.

### 4X4 HIGH



Continuously illuminates when 4H is selected.

### 4X4 LOW



Continuously illuminates when 4L is selected.

### CHECK 4X4



Displays when a 4X4 system fault is present.

## Using the 2-Speed Automatic 4WD System With Mechanical Lock

This system provides similar 4A capabilities as other 2-speed Torque-On-Demand™ (TOD™) systems but with mechanically locking 4H and 4L settings. In 4A mode, the system is interactive with the road, continually monitoring and adjusting power delivery to the front and rear wheels to optimize traction based on terrain mode selection. See **Principle of Operation** (page 21).

**Note:** The AdvanceTrac system has the ability to take over control of the transfer case clutch in 4A mode and disable it during driving maneuvers when necessary.

**Note:** 4WD mode availability is based on terrain mode selection. See **Principle of Operation** (page 21).

**Note:** The information display may show messages during 4WD operation. See **Information Messages** (page 8).

# Four-Wheel Drive



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## 2H (4X2)

For general on-road driving, this mode provides optimal smoothness and fuel economy at high speeds. Sends power to the rear wheels only.

**Note:** 2H may engage or disengage automatically based on terrain mode selection. See **Principle of Operation** (page 21).

## 4A (4X4 AUTO)

Provides electronic controlled four-wheel drive with power delivered to the front and rear wheels, as required, for increased traction. The system continuously monitors road conditions, driver's input as well as other vehicle sensors and optimizes the system's behavior based on terrain mode selection.

**Note:** 4A may engage or disengage automatically based on terrain mode selection. See **Principle of Operation** (page 21).

## 4H (4X4 HIGH)

Provides mechanically locked four-wheel drive power to both the front and rear wheels for use in off-road or winter conditions such as deep snow, sand or mud. This mode is not for use on dry pavement.

**Note:** 4H may engage or disengage automatically based on terrain mode selection. See **Principle of Operation** (page 21).

## 4L (4X4 LOW)

Provides mechanically locked four-wheel drive power to both the front and rear wheels with additional gearing for increased torque multiplication. Intended only for off-road applications such as deep sand, steep grades, or pulling heavy objects. 4L (4X4 low) will not engage while your vehicle is moving above 3 mph (5 km/h); this is normal and should be no reason for concern. Refer to Shifting to or from 4L (4X4 low) for proper operation.

**Note:** 4L may engage or disengage automatically based on terrain mode selection. See **Principle of Operation** (page 21).

## Shifting between 4WD system modes

**Note:** Momentarily releasing the accelerator pedal while a shift in progress message displays will improve engagement or disengagement performance.

**Note:** Do not perform this operation if the rear wheels are slipping or when applying the accelerator pedal.

**Note:** You may hear some noise as the system shifts or engages; this is normal.

You can move the control from 2H to 4A or 4H at a stop or while driving. The information display may display a message indicating a 4X4 shift is in progress and the LED light for the selected mode flashes. Once the shift is complete the information display shows the system mode selected and the LED light for the selected mode turns solid.

## Shifting to or from 4L (4X4 low)

**Note:** You may hear some noise as the system shifts or engages; this is normal.

# Four-Wheel Drive

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1. Bring your vehicle to a speed of 3 mph (5 km/h) or less.
2. Place the transmission in neutral (N).
3. Move the 4WD control to the desired position.

The information display will display a message indicating a 4X4 shift is in progress. The information display will then display the system mode selected. If any of the above shift conditions are not present, the shift will not occur and the information display will display information guiding the driver through the proper shifting procedures. If the above conditions are not satisfied in 30 seconds, the system reverts back to the previous 4WD mode or terrain mode.

If **Shift Delayed Pull Forward** displays in the information display, a transfer case gear tooth blockage is present. To alleviate this condition, place the transmission in a forward gear, move your vehicle forward approximately 5 ft (1.5 m), and shift the transmission back to neutral (N) to allow the transfer case to complete the range shift.

## How Your Vehicle Differs From Other Vehicles

### WARNING



Vehicles with a higher center of gravity (utility and four-wheel drive vehicles) handle differently than vehicles with a lower center of gravity (passenger cars). Avoid sharp turns, excessive speed and abrupt steering in these vehicles. Failure to drive cautiously increases the risk of losing control of your vehicle, vehicle rollover, personal injury and death.

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Truck and utility vehicles can differ from some other vehicles. Your vehicle may be higher to allow it to travel over rough terrain without getting hung up or damaging underbody components.

The differences that make your vehicle so versatile also make it handle differently than an ordinary passenger car.

Maintain steering wheel control at all times, especially in rough terrain. Since sudden changes in terrain can result in abrupt steering wheel motion, make sure you grip the steering wheel from the outside. Do not grip the spokes.

Drive cautiously to avoid vehicle damage from concealed objects such as rocks and stumps.

You should either know the terrain or examine maps of the area before driving. Map out your route before driving in the area. To maintain steering and braking control of your vehicle, you must have all four wheels on the ground and they must be rolling, not sliding or spinning.

## Driving Off-Road With Truck and Utility Vehicles

**Note:** *On some models, the initial shift from two-wheel drive to four-wheel drive while your vehicle is moving can cause some momentary clunk and ratcheting sounds. This is the front drivetrain coming up to speed and the automatic locking hubs engaging and is not cause for concern.*

**Note:** *Momentarily releasing the accelerator pedal while a shift in progress message displays will improve engagement or disengagement performance.*

Four-wheel drive vehicles are specially equipped for driving on sand, snow, mud and rough terrain and have operating characteristics that are somewhat different from conventional vehicles, both on and off the road.

# Four-Wheel Drive

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The transfer case supplies power to all four wheels. On four-wheel drive vehicles, the transfer case allows you to select different 4WD modes when necessary. You can find information on transfer case operation and shifting procedures in this chapter. You can find information on transfer case maintenance in the Maintenance chapter. You should become thoroughly familiar with this information before you operate your vehicle.

Four-wheel drive (when you select a 4WD mode) uses all four wheels to power your vehicle. This increases traction, enabling you to drive over terrain and road conditions that a conventional two-wheel drive vehicle cannot.

## Basic Operating Principles

- Drive slower in strong crosswinds which can affect the normal steering characteristics of your vehicle.
- When driving your vehicle on surfaces made slippery by loose sand, water, gravel, snow or ice proceed with care.
- Do not use 4H or 4L on dry, hard surfaced roads. Doing so will produce excessive noise, increase tire wear and may damage drive components. 4H or 4L modes are only for consistently slippery or loose surfaces.

## If Your Vehicle leaves the Road

If your vehicle leaves the road, reduce your vehicle speed and avoid severe braking. When your vehicle speed decreases, ease your vehicle back onto the road. Do not turn the steering wheel sharply while returning your vehicle to the road.

It may be safer to stay on the shoulder of the road and slow down gradually before returning to the road. You may lose control if you do not slow down or if you turn the steering wheel too sharply or abruptly.

It may be less risky to strike small objects, such as freeway reflectors, with minor damage to your vehicle rather than attempt a sudden return to the road which could cause your vehicle to slide sideways out of control or roll over. Remember, your safety and the safety of others should be your primary concern.

## Emergency Maneuvers

In an unavoidable emergency situation where a sudden sharp turn must be made, remember to avoid over-driving your vehicle (i.e. turn the steering wheel only as rapidly and as far as required to avoid the emergency). Excessive steering can result in loss of vehicle control. Apply smooth pressure to the accelerator pedal or brake pedal when changes in vehicle speed are required. Avoid abrupt steering, acceleration and braking. This could result in an increased risk of vehicle roll over, loss of vehicle control and personal injury. Use all available road surface to bring your vehicle to a safe direction of travel.

In the event of an emergency stop, avoid skidding the tires and do not attempt any sharp steering wheel movements.

If your vehicle goes from one type of surface to another (i.e. from concrete to gravel) there will be a change in the way your vehicle responds to a maneuver (i.e. steering, acceleration or braking).

## Sand

When driving over sand, try to keep all four wheels on the most solid area of the trail. Avoid reducing the tire pressures but shift to a lower gear and drive steadily through the terrain. Apply the accelerator slowly and avoid excessive wheel slip.

When driving at slow speeds in deep sand under high outside temperatures, use a low gear when possible. Low gear operation will maximize the engine and transmission cooling capability.

# Four-Wheel Drive

Avoid driving at excessive speeds, this causes vehicle momentum to work against you and your vehicle could become stuck to the point that assistance may be required from another vehicle. Remember, you may be able to back out the way you came if you proceed with caution.

## Mud and Water

### Mud

Be cautious of sudden changes in vehicle speed or direction when you are driving in mud. Even four-wheel drive vehicles can lose traction in slick mud. If your vehicle does slide, steer in the direction of the slide until you regain control of your vehicle.

After driving through mud, clean off residue stuck to rotating driveshafts and tires. Excess mud stuck on tires and rotating driveshafts can cause an imbalance that could damage drive components.

### Water

If you must drive through high water, drive slowly. Traction or brake capability may be limited.

When driving through water, determine the depth to make sure your vehicle can safely travel through it. See **Off-Road Driving** (page 32). If the ignition system gets wet, your vehicle may stall.

Once through water, always try the brakes. Wet brakes do not stop your vehicle as effectively as dry brakes. Drying improves by applying light pressure to the brake pedal while moving slowly.

**Note:** *Driving through deep water may damage the transmission. If the front or rear axle is submerged in water, the axle lubricant and power transfer unit lubricant should be checked and changed if necessary.*

## Driving on Hilly or Sloping Terrain

Although natural obstacles may make it necessary to travel diagonally up or down a hill or steep incline, you should always try to drive straight up or straight down.

**Note:** *Avoid turning on steep slopes or hills. A danger lies in losing traction, slipping sideways and possible vehicle roll over. Whenever driving on a hill, determine beforehand the route you will use. Do not drive over the crest of a hill without seeing what conditions are on the other side. Do not drive in reverse over a hill without the aid of an observer.*

When climbing a steep slope or hill, start in a lower gear rather than downshifting to a lower gear from a higher gear once the ascent has started. This reduces strain on the engine and the possibility of stalling.

If your vehicle stalls, do not try to turn around because this could cause vehicle roll over. It is better to reverse back to a safe location.

Apply just enough power to the wheels to climb the hill. Too much power will cause the tires to slip, spin or lose traction, resulting in loss of vehicle control.



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# Four-Wheel Drive

Descend a hill in the same gear you would use to climb up the hill to avoid excessive brake application and brake overheating. Do not descend in neutral. Disengage overdrive or move the transmission selector lever to a lower gear. When descending a steep hill, avoid sudden hard braking as you could lose control. The front wheels have to be turning in order to steer your vehicle.

If your vehicle has anti-lock brakes, apply the brakes steadily. Do not pump the brakes.

## Driving on Snow and Ice

### WARNING



If you are driving in slippery conditions that require tire chains or cables, then it is critical that you drive cautiously. Keep speeds down, allow for longer stopping distances and avoid aggressive steering to reduce the chances of a loss of vehicle control which can lead to serious injury or death. If the rear end of your vehicle slides while cornering, steer in the direction of the slide until you regain control of your vehicle.

**Note:** Excessive tire slippage can cause transmission damage.

Four-wheel drive vehicles have advantages over two-wheel drive vehicles in snow and ice but can skid like any other vehicle. Should you start to slide while driving on snowy or icy roads, turn the steering wheel in the direction of the slide until you regain control.

Avoid sudden applications of power and quick changes of direction on snow and ice. Apply the accelerator slowly and steadily when starting from a full stop.

Avoid sudden braking. Although a four-wheel drive vehicle may accelerate better than a two-wheel drive vehicle in snow and ice, it will not stop any faster as braking occurs at all four wheels. Do not become overconfident as to road conditions.

Make sure you allow sufficient distance between you and other vehicles for stopping. Drive slower than usual and consider using one of the lower gears. In emergency stopping situations, apply the brake steadily. Do not pump the brake pedal.

## If Your Vehicle Gets Stuck In Mud or Snow

### WARNING



Do not spin the wheels at over 34 mph (55 km/h). The tires may fail and injure a passenger or bystander.

If your vehicle gets stuck in mud or snow, you may rock it out by shifting between forward and reverse gears, stopping between shifts in a steady pattern. Press lightly on the accelerator in each gear.

**Note:** Do not rock your vehicle if the engine is not at normal operating temperature, damage to the transmission may occur.

**Note:** Do not rock your vehicle for more than a minute, damage to the transmission and tires may occur or the engine may overheat.

## Parking

### WARNINGS



If the parking brake is fully released, but the brake warning lamp remains illuminated, the brakes may not be working properly. Have your vehicle checked as soon as possible.

# Four-Wheel Drive

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## WARNINGS



Always fully apply the parking brake. Make sure you shift into park (P) for vehicles with an automatic transmission. Switch the ignition off and remove the key whenever you leave your vehicle.

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On some four-wheel drive vehicles, when the transfer case is in the neutral (N) position, the engine and transmission disconnect from the rest of the driveline. Therefore, your vehicle is free to roll even if the automatic transmission is in park (P) or the manual transmission is in gear. Do not leave your vehicle unattended with the transfer case in the neutral (N) position. Always set the parking brake fully and turn off the ignition when leaving your vehicle.

## Maintenance and Modifications

The suspension and steering systems on your vehicle have been designed and tested to provide predictable performance whether loaded or empty. For this reason, we strongly recommend that you do not make modifications such as adding or removing parts (for example, lift kits or stabilizer bars) or by using replacement parts not equivalent to the original factory equipment.

We recommend that you use caution when your vehicle has either a high load or device (such as ladders or luggage racks). Any modifications to your vehicle that raise the center of gravity may cause your vehicle to roll over when there is a loss of vehicle control.

Failure to maintain your vehicle correctly may void the warranty, increase your repair cost, reduce vehicle performance and operational capabilities and adversely affect you and your passenger's safety. We recommend you frequently inspect your vehicle's chassis components when your vehicle is subject to off road usage.

# Rear Axle

## ELECTRONIC LOCKING DIFFERENTIAL

**Note:** *The electronic locking differential is for off-road use only and is not for use on dry pavement. Using the electronic locking differential on dry pavement will result in increased tire wear, noise and vibration.*

The electronic locking differential is a device housed in the rear axle that allows both rear wheels to turn at the same speed. The electronic locking differential can provide additional traction should your vehicle become stuck. You can activate the differential electronically and shift it

on the fly within the operating speed range. The electronic differential will automatically disengage when the vehicle speed exceeds a set value and it will automatically reengage when the vehicle speed goes below a set value (see table below). It will also automatically engage based on certain selected drive modes. See **Principle of Operation** (page 21).

The electronic locking differential is for use in mud, rocks, sand, or any off-road condition where you need maximum traction. It is not for use on dry pavement.

**Note:** *The electronic locking differential is not available in 2H.*

## Electronic Locking Differential Engagement Speed and Availability

Terrain Modes (4WD Modes)	Maximum Engagement Speed	Automatic Disen-gage Speed	Automatic Re-Engagement Speed
Normal (4A, 4H)	20 mph (30 km/h)	25 mph (41 km/h)	20 mph (30 km/h)
Sport (4A, 4H)	20 mph (30 km/h)	25 mph (41 km/h)	20 mph (30 km/h)
Weather (4A, 4H)	20 mph (30 km/h)	25 mph (41 km/h)	20 mph (30 km/h)
Mud/Sand (4H) <sup>1</sup>	No set speed	No set speed	No set speed
Baja (4H)			
Rock crawl (4L) <sup>1</sup>			
4WD Mode	Maximum Engagement Speed	Automatic Disen-gage Speed	Automatic Re-Engagement Speed
4L	55 mph (90 km/h)	62 mph (100 km/h)	55 mph (90 km/h)

<sup>1</sup> Automatically engages when these drive modes are selected. You can manually override the automatic engagement by pressing the electronic locking differential switch.

**Note:** *The selection of 4L will override the Terrain Mode based speed engagement and disengagement.*

**Note:** *The Advance Trac system has the ability to take over control of the electronic locking differential and disable it during driving maneuvers when necessary.*

## Rear Axle

When you switch the system on, if you do not meet the required conditions for electronic locking differential activation, the instrument cluster will display the appropriate information guiding you through the proper activation process.

### Activating the Electronic Locking Differential

**Note:** Do not use the electronic locking differential on dry, hard surfaced roads. Doing so will produce excessive noise, vibration and increase tire wear.

**Note:** If the electronic locking differential has difficulty disengaging, release the accelerator pedal and turn the steering wheel in the opposite direction while rolling.



E225301

Push the center of the 4WD select knob to manually activate and de-activate the electronic locking differential. An LED on the knob will illuminate to indicate the system is activated.

**Note:** The LED may illuminate automatically based on terrain mode selection.



Once the indicator light illuminates in the information display, both rear wheels will be locked together providing added traction.

If the indicator does not come on, or the indicator turns off while driving, one of the following has occurred:

- The vehicle speed is too high.
- The vehicle is experiencing an anti-lock brake activation.
- The left and right rear wheel speed difference is too high during an engagement attempt.
- The system has malfunctioned and is accompanied by CHECK LOCKING DIFFERENTIAL in the information display. See your authorized Ford dealer for assistance.

# Terrain Control (If Equipped)

## PRINCIPLE OF OPERATION

The Terrain Management System delivers a driving experience through a suite of sophisticated electronic vehicle systems. These systems optimize steering, handling and powertrain response. This provides a single location to control multiple systems performance settings.

Changing the drive mode automatically changes the functionality of the following systems:

- Electronically power-assisted steering system adjusts steering effort and feel based on the mode you select.
- Electronic stability control and traction control maintains your vehicle control in adverse conditions or high performance driving.
- Electronic throttle control enhances the powertrain response to your inputs.
- Transmission controls are optimized with shift schedules tuned to each terrain.
- Transfer case; automatically engages specific 4WD modes and raises or lowers torque output depending on selected terrain mode. (See Terrain Mode availability table below).
- Electronic Locking Differential; engages automatically during certain terrain modes.

**Note:** Do not use electronic locking differential on dry, hard surfaced roads. Doing so will produce excessive noise, vibration and increase tire wear. See **Electronic Locking Differential** (page 19).

## Using the Terrain Management System

The Terrain Management System automatically tailors your vehicle configuration for each mode you select.



E232133

To change the drive mode setting, press the drive mode button on the steering wheel.

**Note:** Mode changes are not available when the vehicle ignition is off.

### On-Road Modes



**Normal Mode** - For everyday driving. Normal mode is a perfect balance of excitement, comfort and convenience.



**Sport Mode** - For aggressive on-road driving. Sport mode increases throttle response, provides a sportier steering feel, along with quicker shifting. The transmission also holds gears longer, helping your vehicle accelerate faster.



**Weather Mode** - For less than ideal road conditions, such as snow or ice covered roads.

Weather mode inspires confidence without taking away from driving pleasure. Weather mode automatically engages 4x4 Auto, lowers throttle response and optimizes shifting for slippery surfaces.

## Terrain Control (If Equipped)

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### Off-Road Modes



**Mud/Sand Mode** - For navigating tight trails and over obstacles. Mud/Sand mode automatically engages 4x4 High and the electronic locking differential for improved off-road capability, and provides a comfortable steering feel.



**Baja Mode** - For high speed off-road driving. Baja mode automatically engages 4x4 High and optimizes the throttle control for better response and torque delivery.



**Rock Crawl Mode** - For optimum rock-climbing ability. Rock mode prompts you to put your vehicle in 4x4 Low and automatically engages the electronic locking differential. Rock Crawl mode optimizes the throttle and transmission response to provide you additional control of your vehicle.

**Note:** *If you select the Mud and Sand, Baja or Rock mode, the traction and stability control performance degrades and the warning indicator illuminates in the instrument cluster.*

**Note:** *The Terrain Management System has diagnostic checks that continuously monitor the system for proper operation. Certain drive modes will not be available based on gear shifter position. If a mode is unavailable due to a system fault, the mode defaults to Normal.*

## Terrain Control (If Equipped)

### Terrain Mode Configurations

	On-Road Modes			Off-Road Modes		
	Normal	Sport	Weather	Mud/Sand	Baja	Rock Crawl
Engine/ Trans Controls	Normal	Sport	Weather	Mud/Sand	Baja	Rock Crawl
Advan- ceTrac Controls	Normal	Normal	Weather	Mud/Sand	Baja	Rock Crawl
Steering Effort	Normal	Sport	Normal	Comfort	Normal	Comfort
Electronic Locking Differential (4x4 only)	Available below 25 mph (40 km/h)	Available below 25 mph (40 km/h)	Available below 25 mph (40 km/h)	Engaged at all speeds; can be dis- engaged manually	Available at all speeds	Engaged at all speeds; can be dis- engaged manually
Default Transfer Case	4x2	4x2	4x4 Auto	4x4 High	4x4 High	4x4 Low

## Terrain Control (If Equipped)

### Transfer Case Availability

Driveselec- tion / Terrain mode	Normal mode <sup>1</sup>	Sport mode	Weather mode	Mud/Sand mode	Baja mode	Rock Crawl mode
4x2	Default mode unless key cycle	Default mode	Not Avail- able	Not Avail- able	Available	Not Avail- able
4x4 Auto	Available Normal Tuning	Available Sport Tuning	Default mode Weather Tuning	Not Avail- able	Not Avail- able	Not Avail- able
4x4 High	Available	Available	Available	Default mode	Default mode	Not Avail- able
4x4 Low	Available	Not Avail- able	Available	Available	Available	Default mode

<sup>1</sup> Default Terrain Mode across ignition cycles.

**Note:** 4WD Modes are maintained across ignition cycles.

**Note: Default Mode** - Automatically engages specific 4WD mode depending on selected Terrain Mode.

**Note: Available** - Selectable 4WD mode for additional driver preference via the 4WD switch.

### Selectable Steering

**Note:** The steering setting defaults to Normal if the battery is disconnected or removed.



To change the steering feel, press the button on the steering wheel. The first press illuminates the selected mode, subsequent presses will change the selected mode.

Modes:

- Normal - Default factory setting.
- Sport - Slightly higher effort required for steering with more road force felt through the steering wheel.
- Comfort - Slightly less effort required for steering with less road force felt through the steering wheel.

After selecting the desired setting, you may feel a soft feedback bump in the steering wheel when the changeover occurs.

# Driving Aids

## COLLISION WARNING SYSTEM

### Principle Of Operation (If Equipped)

#### WARNINGS



This system is an extra driving aid. It does not replace your attention and judgment, or the need to apply the brakes. This system does NOT automatically brake your vehicle. If you fail to press the brake pedal when necessary, you may collide with another vehicle.



The collision warning system with brake support cannot help prevent all collisions. Do not rely on this system to replace your judgment and the need to maintain correct distance and speed.

**Note:** The system does not detect, warn or respond to potential collisions with vehicles to the rear or sides of your vehicle.

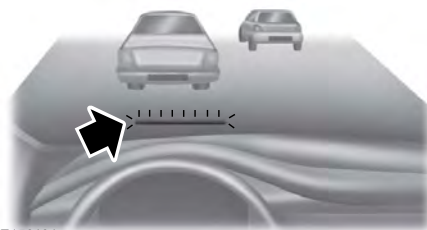
**Note:** The collision warning system is active at speeds above approximately 5 mph (8 km/h).

**Note:** The collision warning system will be unavailable if you disable the electronic stability control.



E156130

The system alerts you of certain collision risks. The system's sensor detects your vehicle's rapid approach to other vehicles traveling in the same direction as your vehicle.



E156131

When your vehicle rapidly approaches another vehicle, a red warning light flashes and a tone sounds.

The brake support system assists you in reducing any collision speed by pre-charging the brakes. If the risk of collision continues to increase after the audio-visual warning, the brake support prepares the brake system for rapid braking. The system does not automatically activate the brakes, but if the brake pedal is pressed even lightly, the brakes apply full stopping power.

### Using the Collision Warning System

#### WARNING



The collision warning system's brake support reduces collision speed only if you brake your vehicle before any collision. As in any typical braking situation, you must press your brake pedal.

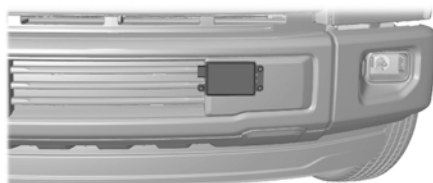
You can use your information display control to adjust the collision warning system's sensitivity or to turn the system On or Off. Your vehicle will remember these settings across key cycles. You may change the collision warning system sensitivity to any one of three possible settings. See **General Information** (page 8).

# Driving Aids

**Note:** It is recommended that you turn the collision warning system off if a snow plow or similar object is installed in such a way that it may block the radar sensor. Your vehicle will remember the selected setting across key cycles.

**Note:** When possible, the manufacturer recommends using the highest sensitivity setting. If warnings are too frequent, you can reduce your system's sensitivity. Reduced sensitivity causes fewer and later system warnings. See **General Information** (page 8).

## Blocked Sensors



E183741

If a blocked sensor message appears in the information display, dirt, water, or an object is blocking the sensor. The sensor is located behind a cover near the driver side of the lower grille. If anything blocks the sensor, your vehicle cannot see through the sensor, and the collision warning system will not work. Possible causes for the blocked sensor message and corrective actions are listed below.

Cause	Action
The radar sensor cover in the grille is dirty or obstructed	Clean the radar sensor cover or remove the obstruction
The surface of the radar sensor cover is clean but the message remains in the display	Wait a short time. The radar may take several minutes to reset after you remove the obstruction
Heavy rain, spray, snow or fog in the air interferes with the radar signals	The collision warning system is temporarily disabled. Shortly after weather conditions improve, the collision warning system automatically reactivates
Swirling water, snow or ice on the road surface interferes with the radar signals	The collision warning system is temporarily disabled. Shortly after weather conditions improve, the collision warning system automatically reactivates

## System Limitations

### WARNING



The collision warning system's brake support only reduces collision speed if you first apply your brakes. You must brake as you would in any typical braking situation.

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Due to the nature of radar technology, there may be certain instances where vehicles do not provide a collision warning. These include:

- Stationary vehicles or vehicles moving below 6 mph (10 km/h).
- Pedestrians or objects in the roadway.
- Oncoming vehicles in the same lane.
- Severe weather conditions (see blocked sensor section).
- Debris build-up on the grille near the headlamps (see blocked sensor section).
- Small distance to vehicle ahead.
- Large steering wheel and pedal movements (very active driving style).

Damage to the front end of your vehicle may alter the radar sensor's coverage area. This may result in missed or false collision warnings. Have an authorized dealer check your radar sensor for proper coverage and operation.

# Towing

## RECOMMENDED TOWING WEIGHTS

### WARNINGS



Do not exceed the lowest rating capacity for your vehicle or trailer hitch. Overloading your vehicle or trailer hitch can impair your vehicle stability and handling. Failure to follow this instruction could result in the loss of control of your vehicle, personal injury or death.



Do not cut, drill, weld or modify the trailer hitch. Modifying the trailer hitch could reduce the hitch rating.

The standard integrated hitch has two ratings depending on mode of operation:

- Weight-carrying mode requires a draw bar and hitch ball. The draw bar supports all the vertical tongue load of the trailer.
- Weight-distributing mode requires an aftermarket weight-distributing system, which includes draw bar, hitch ball, spring bars and snap-up brackets. This system distributes the vertical tongue load of the trailer between the truck and the trailer.

Vehicle Type	Hitch Mode <sup>1,2</sup>	Maximum Trailer Weight <sup>3</sup>	Maximum Tongue Load	Maximum Gross Combination Weight Rating (GCWR) <sup>3</sup>
SuperCab Raptor	Weight-Carrying	5,000 lb (2,267.9 kg)	500 lb (226.7 kg)	11,100 lb (5,034.9 kg)
	Weight-Distributing	6,000 lb (2,721.5 kg)	600 lb (272.1 kg)	12,050 lb (5,465.8 kg)
CrewCab Raptor	Weight-Carrying	5,000 lb (2,267.9 kg)	500 lb (226.7 kg)	11,550 lb (5,239 kg)
	Weight-Distributing	8,000 lb (3,628.7 kg)	800 lb (362.8 kg)	14,250 lb (6,463.7 kg)

<sup>1</sup>Hitch receivers do not include a hitch ball or ball mounting. The vehicle owner is responsible for obtaining the proper hitch ball, ball mounting, weight-distributing equipment (such as equalizing arms, snap-up brackets and sway control system) and other appropriate equipment to tow both the trailer and its cargo load.

<sup>2</sup> 5th-wheel towing is not recommended.

<sup>3</sup> Calculated with SAE J2807 method.

# Towing

## Weight-distributing Hitch

### WARNING



Do not adjust the spring bars so that your vehicle's rear bumper is higher than before attaching the trailer.

Doing so will defeat the function of the weight-distributing hitch, which may cause unpredictable handling, and could result in serious personal injury.

**Note:** A weight-distributing hitch is required to tow over 5,000 lb (2,267.9 kg) maximum trailer weight or 500 lb (226.7 kg) tongue weight due to your vehicle's high travel suspension tuning.

Follow these steps to setup a weight-distributing hitch that helps maintain the proper angle of your tow vehicle and trailer for better combination control.

1. Park the loaded vehicle, without the trailer, on a level surface.
2. Measure the height to the top of your vehicle's front wheel opening on the fender. This is H1.
3. Attach the loaded trailer to your vehicle without the weight-distributing bars connected.
4. Measure the height to the top of your vehicle's front wheel opening on the fender a second time. This is H2.
5. Install and adjust the tension in the weight-distributing bars so that the height of your vehicle's front wheel opening on the fender is approximately half the way down from H2, toward H1.
6. Check that the trailer is level or slightly nose down toward your vehicle. If not, adjust the ball height accordingly and repeat Steps 2-6.

When the trailer is level or slightly nose down toward the vehicle:

- Lock the bar tension adjuster in place.
- Check that the trailer tongue securely attaches and locks onto the hitch.
- Install safety chains, lighting, and trailer brake controls as required by law or the trailer manufacturer.

Refer to the **Towing** chapter in your **Owner's Manual** for additional towing information such as suggested towing pre-checks, calculating max trailer weight for your vehicle, load placement guidance, trailer electrical connector information, using safety chains, sway control function, trailer brakes, and using the integrated trailer brake controller.

## TOWING THE VEHICLE ON FOUR WHEELS

### WARNING



If your vehicle has a steering wheel lock make sure the ignition is in the accessory or on position when being towed.

## Emergency Towing

If your vehicle becomes inoperable (without access to wheel dollies, car-hauling trailer, or flatbed transport vehicle), it can be flat-towed (all wheels on the ground, regardless of the powertrain and transmission configuration) under the following conditions:

- Your vehicle is facing forward for towing in a forward direction.
- Place the transmission in neutral (N). If you cannot move the transmission into neutral (N), you may need to override it. See **Automatic Transmission** (page 10).

# Towing

- Maximum speed is 35 mph (56 km/h).
- Maximum distance is 50 mi (80 km).

## Recreational Towing

**Note:** Put your climate control system in recirculated air mode to prevent exhaust fumes from entering your vehicle.

Follow these guidelines if you have a need for recreational towing, such as towing your vehicle behind a motorhome. We designed these guidelines to prevent damage to your transmission.

Your Ford Performance vehicle can be put in neutral tow (Recreational Towing Mode) by placing the transfer case in its neutral position and engaging the four-wheel-down towing feature. Perform the steps outlined in the following section after positioning your vehicle behind the tow vehicle and properly securing them together.

**Note:** Make sure you properly secure your vehicle to the tow vehicle.

1. Put the ignition in the on position, but do not start the engine. If your vehicle has an ignition key, turn the key to on. If your vehicle has intelligent access, press the engine **START/STOP** button once without pressing the brake pedal.
2. Press and hold the brake pedal.
3. Rotate the four-wheel drive switch to **2H**.
4. Shift the transmission to neutral (N).
5. Enable Neutral Tow through the information display by selecting **Settings** from the cluster menu.
6. Then select **Advanced Settings**.
7. Then select **Vehicle**.
8. Then select Neutral Tow.

**Note:** If completed successfully, the information display shows **NEUTRAL TOW LEAVE IN N or NEUTRAL TOW ENABLED LEAVE TRANSMISSION IN NEUTRAL**.

This indicates that your vehicle is safe to tow with all wheels on the ground.

**Note:** If you do not see the message in the display, you must perform the procedure again from the beginning.

**Note:** You may hear an audible noise as the transfer case shifts into its neutral position. This is normal.

9. Leave the transmission in neutral (N) and turn the ignition as far as it will go toward the off position (it will not turn fully off when the transmission is in neutral). If your vehicle has an ignition key, you must leave the key in the ignition while towing. To lock and unlock your vehicle, use the keyless entry keypad or extra set of keys. If your vehicle has intelligent access, press the engine **START/STOP** button once without pressing the brake pedal. You do not need to leave your keys in the vehicle. You can lock and unlock your vehicle as you normally do.
10. Release the brake pedal.

## WARNINGS



Do not disconnect the battery during recreational towing. It prevents the transfer case from shifting properly and may cause the vehicle to roll, even if the transmission is in park (P).



Shifting the transfer case to its neutral position for recreational towing may cause the vehicle to roll, even if the transmission is in park (P). It may injure the driver and others. Make sure you press the foot brake and the vehicle is in a secure, safe position when you shift to neutral (N).

# Towing

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**Note:** Failing to put the transfer case in its neutral position will damage vehicle components.

**Note:** You can check four-wheel-down towing status at any time by opening the driver's door or turning the ignition to the accessory or on position and verifying the **NEUTRAL TOW ENABLED** message displays in the cluster.

To exit four-wheel-down towing and return the transfer case to its **2H** position:

1. With your vehicle still properly secured to the tow vehicle, put the ignition in the on position, but do not start the engine. If your vehicle has an ignition key, turn the key to on. If your vehicle has intelligent access, press the engine **START/STOP** button once without pressing the brake pedal.
2. Press and hold the brake pedal.
3. Shift the transmission out of neutral (N) and into any gear.
4. Release the brake pedal.

**Note:** If completed successfully, the instrument cluster displays **4X2**, and **NEUTRAL TOW DISABLED**.

**Note:** If the indicator light and message do not display, you must perform the procedure again from the beginning.

**Note:** You may hear an audible noise as the transfer case shifts out of its neutral position. This is normal.

**Note:** If **SHIFT DELAY PULL FORWARD** displays in the instrument cluster, transfer case gear tooth blockage is present. See the instructions after this section.

5. Apply the parking brake, and then disconnect the vehicle from the tow vehicle.
6. Release the parking brake, start the engine, and shift the transmission to drive (D) to make sure the transfer case is out of neutral.

7. If the transfer case does not successfully shift out of neutral, set the parking brake until you can have your vehicle serviced.

## Resolving the SHIFT DELAY PULL FORWARD Message

If the instrument cluster displays **SHIFT DELAY PULL FORWARD** perform the following:

1. Press and hold the brake pedal.
2. Put the transmission into neutral (N), and then start the engine.
3. With the engine running, shift the transmission to drive (D) and let the vehicle roll forward, up to 3 ft (1 m). You may hear an audible noise as the transfer case shifts out of its neutral position. This is normal.
4. Make sure the instrument cluster displays **NEUTRAL TOW DISABLED**.

# Driving Hints

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## OFF-ROAD DRIVING

In addition to providing an excellent on-road driving experience, your vehicle excels at all types of off-road driving. The truck has been designed and equipped to allow you to explore those places where the road doesn't take you whether it's a forest trail or the open desert. Before going off-roading, consult with your local governmental agencies to determine designated off-road trails and recreation areas. Also, be sure to understand any off-road vehicle registration requirements for the area in which you plan on driving.

Tread Lightly is an educational program designed to increase public awareness of land-use regulations and responsibilities in our nation's wilderness areas. Ford joins the U.S. Forest Service and Bureau of Land Management in encouraging you to help preserve our national forest and other public and private lands by treading lightly.

Before taking your vehicle off-roading, a basic vehicle inspection should be done to make sure that the vehicle is in top working condition.

It is always recommended that at least two vehicles are used while off-roading. The buddy system helps make sure that help is close at hand should a vehicle become stuck or damaged. It is also wise to take supplies such as a first aid kit, supply of water, tow strap, cell or satellite phone with you any time an off-road excursion is planned.

Remove the front license plate before off-roading to achieve optimal performance.

## Basic Off-road Driving Techniques

- Grip the steering wheel with thumbs on the outside of the rim. This will reduce the risk of injury due to abrupt steering wheel motions that occur when negotiating rough terrain. Do not grip the steering wheel with thumbs inside the rim.
- Throttle, brake and steering inputs should be made in a smooth and controlled manner. Sudden inputs to the controls can cause loss of traction or upset the vehicle, especially while on sloped terrain or while crossing obstacles such as rocks or logs.
- Look ahead on your route noting upcoming obstacles, surface texture or color changes or any other factors which may indicate a change in available traction, and adjust the vehicle speed and route accordingly. During pre-run, mark obstacles with GPS markers to make sure appropriate speeds are used to avoid potential vehicle damage.
- When driving off-road, if the front or rear suspension is bottoming-out and/or excessive contact with the skid-plates is encountered, reduce vehicle speed to avoid potential damage to the vehicle.
- When running with other vehicles, it is recommended that communication is used, and the lead vehicle notify other vehicles of obstacles that could cause potential vehicle damage.
- Always keep available ground clearance in mind and pick a route that minimizes the risk of catching the underside of the vehicle on an obstacle.

# Driving Hints

- When negotiating low speed obstacles, applying light brake pressure in conjunction with the throttle will help prevent the vehicle from jerking and will allow you to negotiate the obstacle in a more controlled manner. Using 4L will also help with this.
- Use and equip supplemental safety equipment as discussed later in this chapter.
- Please consult your local off-road group for other helpful tips.
- Off-roading requires a high degree of concentration. Even if your local law does not prohibit alcohol use while driving off-road, Ford strongly recommends against drinking if you plan to off-road.

## Crossing Obstacles

- Review the path ahead before attempting to cross any obstacle. It is best if the obstacle is reviewed from outside the vehicle so that there is a good understanding of terrain condition both in front of and behind the obstacle.
- Approach obstacles slowly and slowly inch the vehicle over.
- If a large obstacle such as a rock cannot be avoided, choose a path that places the rock directly under the tire rather than the undercarriage of the vehicle. This will help prevent damage to the vehicle.
- Ditches and washouts should be crossed at a 45 degree angle, allowing each wheel to independently cross the obstacle.

## Hill Climbing

### WARNING



Extreme care should be used when steering the vehicle in reverse down a slope so as not to cause the vehicle to swerve out of control.

- Always attempt to climb a steep hill along the fall line of the slope and not diagonally.
- If the vehicle is unable to make it up the hill, DO NOT attempt to turn back down the slope. Place the vehicle in low range and slowly back down in reverse.
- When descending a steep slope, select low gear and engage hill descent control. Use the throttle and brake pedals to control your descent speed as described earlier in this section using hill descent control. Note that hill descent control is functional in reverse and should be used in this situation.

## Water Wading

Your vehicle is designed to operate in water depths up to 32 inches (810 millimeters). However, as the water depth increases, vehicle speed must be reduced to avoid potential vehicle damage.

- Always determine the depth before attempting a water crossing.
- Proceed slowly and avoid splashing water any more than is necessary.
- Be aware that obstacles and debris may be beneath the water's surface.
- Keep the doors fully closed during the water crossing.
- Upon completion of the water crossing, slowly drive a short distance and check the brakes for full effectiveness.

# Driving Hints

Refer to chart below for the maximum allowable speeds when driving through water.

**Note:** *Failure to follow the recommended speeds may result in vehicle damage.*

Water Depth	Maximum Allowable Vehicle Speed
6 in (150 mm)	40 mph (65 km/h)
8 in (200 mm)	31 mph (50 km/h)
10 in (250 mm)	19 mph (30 km/h)
12 in (300 mm)	8 mph (12 km/h)
18 to 32 in (450 mm to 810 mm)	4 mph (7 km/h)
Reverse – up to 30 in (760 mm)	Less than 6 mph (10 km/h)

## High Speed Off-Roading

The off-road driving discussed thus far has focused on the type of events typically encountered during slow speed off-road driving conditions. Your vehicle provides excellent performance in a full size pick-up truck during these slower speed conditions, but truly excels at higher speed baja style off-road driving. High speed off-roading presents a unique challenge, but extra care and caution should be taken before engaging in this type of driving.

If you plan on using the truck for severe, high speed off-road use, the following is recommended:

- Equip your truck with the safety equipment used for the Stock-Full Class as defined in the rule books for SCORE International Off-Road Racing ([www.score-international.com](http://www.score-international.com)).
- Use personal safety equipment including a SNELL SA certified helmet and approved neck restraint device.
- Before venturing off-road in unfamiliar areas at high speeds, do a low speed reconnaissance run (prerun) to become aware of any obstacles that you will encounter.

Ford Performance has engineered your vehicle for off-road use beyond what is normal for a F-150. However, it can incur damage if driven beyond its capabilities. Skid plates, shock guards and running boards were designed to help limit damage to vital components and exterior finishes, but cannot prevent all damage if driven in extreme off-road conditions. Damage to skid plates, shock guards, running boards and exterior finishes as well as bent, cracked or broken body, frame and chassis components may not be covered by warranty.

It is important that you take the time to become familiar with the controls and dynamics of your vehicle before attempting higher speed off-roading.

# Driving Hints

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Some points to consider:

- Build up speed slowly. Initially, drive at a pace which allows ample time to fully assess the terrain around you and to understand how the vehicle is responding to both the terrain and driver inputs. Increase pace as comfort increases while always being mindful of how the vehicle is responding to various events at different speeds.
- Find a wide open place to experiment with different functions on the truck. Try a given maneuver with different vehicle settings (4H vs. 4L), (differential locked vs. unlocked), (AdvanceTrac in key-on vs. single press vs. press and hold modes) and see how the truck responds. Start slowly and build pace as comfort increases.
- Similarly, in a wide open space, experiment with different driving techniques. For example, if the vehicle is tending to push straight ahead when trying to negotiate a turn (understeering or plowing), a light application of the brake while turning may help rotate the truck. A wider entry to the corner or entering the corner more slowly may help the truck turn and allow you to apply the throttle sooner after negotiating the turn.
- Remember the phrase "smooth is fast". This refers to your steering, throttle, and brake movements. Smooth decisive movements will yield improved results while helping to increase safety.
- As speed increases, it is wise to look farther ahead of the vehicle so that there is time to react to oncoming obstacles. Remember that in many off-road environments, obstacles will be hard to see until they are relatively near. A good strategy is to alternate between looking far ahead and up closer to the front of the vehicle as you're driving.
- Also remember to drive what you can see. This refers to not driving faster than you are able to negotiate unforeseen upcoming obstacles. This could refer to obstacles over a brow, in a ravine, in brush, in dusty conditions, and in the darkness among others.
- If you are driving in a dusty area, be sure to leave ample distance between you and any other vehicles to allow for adequate vision.
- Always remember that you may not be the only one in a particular recreational area, always be cognizant of others in your area. This is especially true of motorcycles and ATV's which may be more difficult to spot than a full-sized vehicle.
- If driving in desert conditions, it is advised that you always drive with your headlights on to help other drivers more easily see you.
- While driving in desert conditions, the midpoint of the day is the most difficult time to see many of the small ridges and dips due to flat shadows from the sun being at its highest point. Extreme care should be taken at these times to not inadvertently run into these obstacles.
- It is highly encouraged that you switch to off-road mode for off road operation. Please see the **Terrain Control** section of this supplement for more details.

## After Off-Road Driving

It is important to complete a full vehicle inspection after off-road driving. Some items to check include:

- Make sure that tires are inflated to proper tire pressure as indicated on the tire placard.
- Check the wheels and undercarriage for built up mud or debris which can cause vehicle vibration.
- Make sure that the grille and radiator are clear of any obstructions that may affect cooling.
- Make sure that the brakes are in proper working order and free of any mud, stones and debris, which can become trapped around the brake rotor, backing plate and caliper.
- Check that the air filter is clean and dry.
- Inspect for torn or punctured boots on ball joints, half shafts, steering gears.
- Inspect exhaust system for damage or looseness.
- Inspect undercarriage fasteners. If any are loose or damaged, tighten or replace ensuring that the proper torque specification is used.
- Inspect the tires for any cuts in the tread or sidewall area. Also inspect the sidewall for any bulge indicating damage to the tire.
- Inspect the wheels for dents, cracks, or other damage.
- Refit the front license plate if removed previously.

## CLEANING THE EXTERIOR

**Note:** *Do not use front bumper openings as a step. This could cause damage to your vehicle.*

Do not drive your vehicle through an automated, commercial car wash due to the vehicle's tire width and track. Wash your vehicle by hand, or by using a touchless commercial wash with no mechanical tracks on the floor. Do not use a commercial or high-pressure wand on the bed-side graphic surface or graphics edges.

# Wheels and Tires

## WHEELS

Your vehicle is equipped with unique wheels matched to the tires. To avoid damage to your wheels:

- Maintain proper tire pressure. See **Tire Care** (page 38).
- Due to extreme tire/wheel width, this vehicle cannot be taken through an automatic car wash that uses mechanical tracks, as wheel damage may result.
- When installing wheels, always torque lug nuts to specification with a torque wrench.
- Inspect your wheels for damage on a regular basis. If you have a damaged wheel, replace it immediately.
- In the event that you encounter an abnormally harsh impact, inspect the outside tire wall of your wheels, both inside and out, for damage.

### Optional Bead-Lock Compatible Wheel

**Note:** *Ford Performance only recommends using bead-lock rings from Ford Performance Parts, in conjunction with the OEM tire. Any other combination using this wheel could result in air loss or tire failure.*

**Note:** *Converting the bead-lock compatible wheel to true bead-locks is for off-road use only. On road driving is not permitted.*

If your vehicle is equipped with the optional bead lock compatible wheel, you have the ability to convert this wheel to use a true bead-lock ring, which allows operation at low tire pressures when off-road to minimize risk of de-beading the tire. See your local Ford Performance Parts Dealer for more information.

## TIRE CARE

### WARNINGS



Always re-inflate tires to recommended tire pressures before the vehicle is operated on-road. The recommended pressure is located on the tire label or safety certification label, located on the B-pillar, inside the driver's door.



After off-road use, before returning to the road, check the wheels and tires for damage. Off-road use may cause damage to your wheels and tires that can lead to tire failure, loss of vehicle control, serious injury or death.



Replace the wheels and tires with the exact original brand, size and construction that came originally on your vehicle. Use of any other wheel or tire combinations, even with identical size ratings, may result in insufficient running clearances, tire rubbing and eventual puncture. Failure to follow tire replacement recommendations can lead to tire failure, loss of vehicle control, serious injury or death.

**Note:** *If you have reduced your tire pressure for off-road use, the tire pressure monitoring system (TPMS) warning light will then activate in the instrument panel as a reminder to re-inflate the tires before returning to the road.*

# Wheels and Tires

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Your vehicle is equipped with high performance, all-terrain tires designed to optimize handling, steering and braking to provide the performance you expect in a Ford Performance vehicle. These tires are optimized for both on and off-road performance, and their ride, noise and wear characteristics are different from other tires. Also, because of their aggressive tread profile, it is important that you maintain your tires properly.

- Always maintain your tire pressures according to the tire information placard located on the driver's door B-pillar, using an accurate gauge. Remember to be prepared to re-inflate your tires before returning to the road. If a tire filling station is not available, remember to prepare a supplemental means to inflate the tires, such as a portable compressor.
- In cold temperature, check the tire pressure after the vehicle has been parked for more than three hours. Do not reduce pressure of warm tires.
- Check your tire pressure often to maintain it properly. Tire pressure can diminish over time and fluctuate with temperature.
- Do not overload your vehicle. Maximum vehicle and axle weights are listed on the tire information placard.

- Extra caution should be taken when operating the vehicle near its maximum load, including assuring proper tire pressure and reducing speeds.
- In the event that you encounter an abnormally harsh impact, inspect your tires for damage.
- Inspect your tires for damage on a regular basis. Replace a damaged tire immediately.
- The original equipment tires on your vehicle are not designed to be used with snow chains. If you operate your vehicle with snow chains, use a smaller tire and wheel combination as recommended in your owner's manual.
- Proper suspension alignment is critical for maximum performance and optimal tire wear. If you notice uneven tire wear, have your alignment checked.

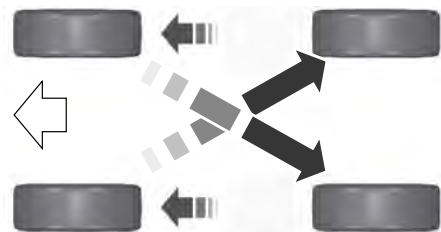
## Tire Rotation

Because your vehicle's tires perform different jobs, they often wear differently. To make sure your tires wear evenly and last longer, have them rotated.

**Note:** *Front tires are shown on the left side of the diagram.*

# Wheels and Tires

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**Note:** Your vehicle requires tire rotations every scheduled oil change, see **Servicing Your Vehicle** for more information. If you notice that the tires wear unevenly, have them checked.

**Note:** Uneven tread depth between the front and rear tires may lead to degradation in 4WD engagement and disengagement performance, additional noise from the 4WD system or possible damage.

## Spare Tire and Wheel

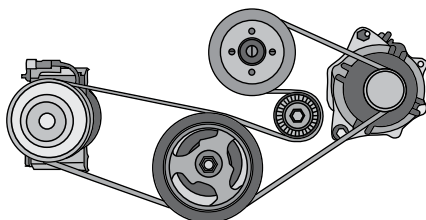
Your vehicle is equipped with an LT315/70R17 spare tire. The spare tire/wheel assembly has the same capability as the road tire/wheel assembly, but is not equipped with a tire pressure monitoring sensor.

# Capacities and Specifications

## ENGINE SPECIFICATIONS

Measurement	Specification
Cubic inches	213
Required fuel	Minimum 87 octane
Firing order	1-4-2-5-3-6
Ignition system	Coil on plug
Spark plug gap	.030-.033 in. (0.75 - 0.85 mm)
Compression ratio	10.0:1

## Drivebelt Routing



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## MOTORCRAFT PARTS

Component	Motorcraft Part number
Air filter element.	FA-1883
Oil filter.	FL-500-S
Battery.	BAGM-94RH7-800
Spark plugs.	SP-534
Windshield wiper blade.	WW-2242
Cabin air filter.	FP-79

# Capacities and Specifications

We recommend Motorcraft replacement parts available at your Ford dealer or at [fordparts.com](http://fordparts.com) for scheduled maintenance. These parts meet or exceed Ford Motor Company's specifications and are engineered for your vehicle. Use of other parts may impact vehicle performance, emissions and durability. Your warranty may be void for any damage related to use

of other parts.

If a Motorcraft oil filter is not available, use an oil filter that meets industry performance specification SAE/USCAR-36.

For spark plug replacement, contact an authorized dealer. Replace the spark plugs at the appropriate intervals.

## CAPACITIES AND SPECIFICATIONS

### Capacities

#### WARNING



The air conditioning refrigerant system contains refrigerant under high pressure. Only qualified personnel should service the air conditioning refrigerant system. Opening the air conditioning refrigerant system can cause personal injury.

Item	Capacity
Engine oil (with oil filter)	6.0 qt (5.7 L)
Engine coolant	13.74 qt (13 L)
Brake fluid	Between MIN/MAX on brake fluid reservoir
Front axle fluid	1.8 qt (1.7 L)
Rear axle fluid	2.7 qt (2.6 L)
Automatic transmission fluid	14.1 qt (13.3 L) *
Transfer case fluid	1.5 qt (1.4 L)
Windshield washer fluid	Fill as required
Fuel tank (super cab)	26.0 gal (98.4 L)
Fuel tank (crew cab)	36.0 gal (136.2 L)
A/C Refrigerant	30.7 oz (0.87 kg)
A/C Refrigerant Compressor Oil	3 fl oz (80 ml)

\*Approximate dry fill capacity. Actual amount may vary during fluid changes.

# Capacities and Specifications

## Specifications

### Materials

Name	Specification
Recommended motor oil (U.S.): Motorcraft® SAE 5W-30 Premium Synthetic Blend Motor Oil XO-5W30-QSP	WSS-M2C946-A
Recommended Motor oil (Canada): Motorcraft® SAE 5W-30 Super Premium Motor Oil CXO-5W30-LSP12	WSS-M2C946-A
Recommended motor oil (Mexico): Motorcraft® SAE 5W-30 Synthetic Motor Oil MXO-5W30-QSP	WSS-M2C946-A
Optional motor oil (U.S. and Mexico): Motorcraft® SAE 5W-30 Full Synthetic Motor Oil XO-5W30-QFS	WSS-M2C946-A
Optional Motor oil (Canada): Motorcraft® SAE 5W-30 Synthetic Motor Oil CXO-5W30-LFS12	WSS-M2C946-A
Engine coolant (U.S. and Mexico): Motorcraft® Orange Prediluted Antifreeze/Coolant VC-3DIL-B	WSS-M97B44-D2
Engine coolant (Canada): Motorcraft® Orange Prediluted Antifreeze/Coolant CVC-3DIL-B	WSS-M97B44-D2
Brake fluid: Motorcraft® DOT 4 Low Viscosity (LV) High Performance Motor Vehicle Brake Fluid PM-20	WSS-M6C65-A2
Front axle fluid : Motorcraft® SAE 75W-85 Premium Synthetic Hypoid Gear Lubricant XY-75W85-QL	WSS-M2C942-A
Rear axle fluid: Motorcraft® SAE 75W-85 Premium Synthetic Hypoid Gear Lubricant XY-75W85-QL	WSS-M2C942-A
Automatic transmission fluid:	WSS-M2C94-A

## Capacities and Specifications

<b>Name</b>	<b>Specification</b>
Motorcraft® MERCON ULV Automatic Transmission Fluid XT-12-ULV	MERCON ULV
Transfer case fluid (Torque On Demand™) (U.S. and Mexico): Motorcraft® MERCON® LV Automatic Transmission Fluid XT-10-QLVC	WSS-M2C938-A MERCON® LV
Transfer case fluid (Torque On Demand™) (Canada): Motorcraft® MERCON® LV Automatic Transmission Fluid CXT-10-LV12	WSS-M2C938-A MERCON® LV
Windshield washer fluid (U.S. and Mexico): Motorcraft® Premium Windshield Wash Concentrate with Bitterant ZC-32-B2	WSS-M14P19-A
Windshield washer fluid (Canada): Motorcraft® Premium Quality Windshield Washer Fluid CXC-37-(A, B, D, F)	WSS-M14P19-A
A/C refrigerant (U.S.): Motorcraft® R-134a Refrigerant YN-19	WSH-M17B19-A
A/C refrigerant (Canada): Motorcraft® R-134a Refrigerant CYN-16-R	WSH-M17B19-A
A/C refrigerant (Mexico): Motorcraft® R-134a Refrigerant MYN-19	WSH-M17B19-A
A/C refrigerant compressor oil: Motorcraft® PAG Refrigerant Compressor Oil YN-12-D	WSH-M1C231-B
Transmission, parking brake linkage and pivots and brake pedal shift grease: Premium Long-Life Grease XG-1-E1	ESA-M1C75-B
Multi-purpose grease: Motorcraft® Multi-Purpose Grease Spray XL-5-A	ESB-M1C93-B

## Capacities and Specifications

Name	Specification
Lock cylinders (U.S.): Penetrating and Lock Lubricant XL-1	-
Lock cylinders (Canada): Penetrating Fluid CXC-51-A	-
Lock cylinders (Mexico): Penetrating and Lock Lubricant MXL-1	-

If you use oil and fluids that do not meet the defined specification and viscosity grade, this may lead to:

- Component damage which is not covered by the vehicle warranty.
- Longer engine cranking periods.
- Increased emission levels.
- Reduced engine performance.
- Reduced fuel economy.
- Degraded brake performance.

We recommend Motorcraft motor oil for your vehicle. If Motorcraft oil is not available, use motor oils of the recommended viscosity grade that meet API SN requirements and display the API Certification Mark for gasoline engines. Do not use oil labeled with API SN service category unless the label also displays the API certification mark.



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An oil that displays this symbol conforms to current engine, emission system and fuel economy performance standards of ILSAC

Do not use supplemental engine oil additives because they are unnecessary and could lead to engine damage that may not be covered by your vehicle warranty.

**Note:** Ford recommends using DOT 4 Low Viscosity (LV) High Performance Brake Fluid or equivalent meeting WSS-M6C65-A2. Use of any fluid other than the recommended fluid may cause degraded brake performance and not meet the Ford performance standards. Keep brake fluid clean and dry. Contamination with dirt, water, petroleum products or other materials may result in brake system damage and possible failure.

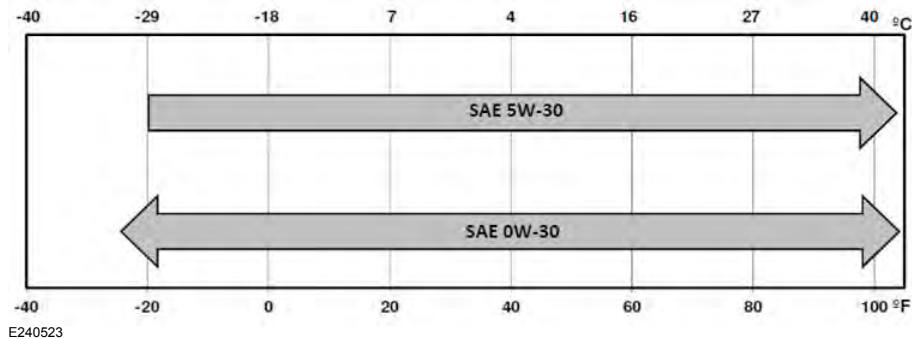
# Capacities and Specifications

**Note:** Automatic transmissions that require MERCON® LV transmission fluid should only use MERCON® LV transmission fluid. The use of any other fluid may cause transmission damage.

## Alternative Engine Oil for Extremely Cold Climates

To improve engine cold start performance, we recommend that you use the following alternative engine oil in extremely cold climates, where the ambient temperature reaches -22.0°F (-30°C) or below.

Name	Specification
Motorcraft® SAE 0W-30 Premium Synthetic Blend Motor Oil: Engine oil - SAE 0W-30 XO-0W30-QSP	WSS-M2C953-A1



# Accessories

## AUXILIARY SWITCHES

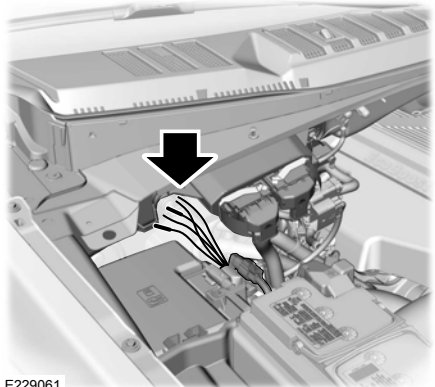
The auxiliary switchboard on the overhead console makes aftermarket customization easier, with six prewired switches attached to the power distribution box for electrical accessories.



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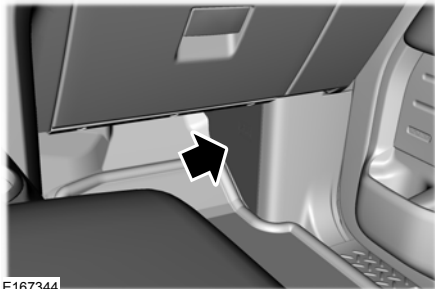
These switches are labeled **AUX 1, AUX 2, AUX 3, AUX 4, AUX 5** and **AUX 6**. They will only operate while the ignition is in the on position, whether the engine is running or not. It is, however, recommended that the engine remain running to maintain a battery charge when using the switches for an extended duration or higher current draws. When switched on by the operator they provide electrical battery power for a variety of uses.

The switches control relays and fuses that are under the hood in the power distribution box. The Aux switch powered circuits are found as blunt-cut sealed wires, located by the power distribution box.



E229061

There will also be one Aux Switch pass through circuit for each switch found as a wire located to the right of the glove box door and just above the passenger-side kick panel.



E167344

You may need to pull down the auxiliary cords to access them.

Refer to the **Fuses** chapter of your **Owner's Manual** for information on fuse and relay locations. See your authorized dealer for service.

Additional pass through circuits that run through the dash panel and under the hood, are located in the same location.

## Accessories

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**The relays are coded as follows:**

<b>Switch</b>	<b>Circuit number</b>	<b>Wire color</b>	<b>Fuse</b>
AUX 1	CBB47A	Green/Blue	15A
AUX 2	CBB48A	Gray/Yellow	15A
AUX 3	CBB94	Violet/Orange	10A
AUX 4	CBB96	Brown/Blue	10A
AUX 5	CBB98A	Gray/Orange	5A
AUX 6	CBBA0B	Yellow/Violet	5A

# Warranty Terms and Conditions

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## BASE WARRANTY

The F-150 Raptor carries the same New Vehicle Limited Warranty as other Ford F-150 models. This information is covered in its entirety in your warranty information.

Warranty service for the F-150 Raptor or any Ford Performance vehicle can be obtained at any Ford dealer nationwide.

Ford Performance does not recommend modifying or racing Ford Performance vehicles, as they are designed and built to be driven as delivered from the factory.

The warranty information discusses vehicle usage and the installation of aftermarket parts and their effect on warranty coverage.

These modifications may not necessarily protect your engine from damage in competition conditions. Subjecting your vehicle to competition conditions even with these modifications may render repairs non-reimbursable under the New Vehicle Limited Warranty.

Ford Performance has engineered your F-150 Raptor for off-road use beyond what is normal for a F-150. However, it can incur damage if driven beyond its capabilities. Skid plates, shock guards and running boards were designed to help limit damage to vital components and exterior finishes, but cannot prevent all damage if driven in extreme off-road conditions. Damage to skid plates, shock guards, running boards and exterior finishes as well as bent, cracked or broken body, frame and chassis components may not be covered by warranty.

Vehicle damage caused by driving through deep water at excessive speeds may not be covered under warranty. See **Off-Road Driving** (page 32).

Please see the warranty information for complete information.

Perform Multi-Point Inspection and the inspections outlined in Scheduled Maintenance information. Refer to the vehicle's Workshop Manual for removal and installation procedures. Replace with genuine Ford and Motorcraft service parts as needed.



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