

OPERATOR'S MANUAL SUPPLEMENT

Lane Keeping Assist &
Torque-Assisted Steering

SUPPLÉMENT AU MANUEL DU CONDUCTEUR

Assistance au Maintien de Voie et Assistance
à la Direction par Couple

SUPLEMENTO DEL MANUAL DEL OPERADOR

Asistencia de Mantenimiento en el Carril
y Direccion Asistida por Torque

English
Français
Español



Safety

1

Indications and Controls

2

Driving

3

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This manual illustrates and describes the operation of features or equipment which may be either standard or optional on this vehicle. This manual may also include a description of features and equipment which are no longer available or were not ordered on this vehicle. Please disregard any illustrations or descriptions relating to features or equipment which are not on this vehicle. PACCAR reserves the right to discontinue, change specifications, or change the design of its vehicles at any time without notice and without incurring any obligation. The information contained in this manual is proprietary to PACCAR. Reproduction, in whole or in part, by any means is strictly prohibited without prior written authorization from PACCAR Inc.

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Foreword

This manual contains supplemental information for the vehicle operator's manual. Keep this manual, and any OEM manuals, with the equipment.

Using this Manual

Please take the time to get acquainted with your vehicle by reading this Operator's Manual. We recommend that you read and understand this manual from beginning to end before you operate this equipment. This manual contains useful information for the safe and efficient operation of this equipment. It also provides service information, with an outline for performing safety checks and basic preventive maintenance inspections. When replacement parts are needed, we recommend using only genuine PACCAR parts.

We have tried to present the information needed to learn about functions, controls, and operation—and to present it as clearly as possible. Occasionally, you may need to

reference this manual, and we hope you find it easy to use.



NOTE

After you've read this manual, it should be stored in the cab for convenient reference and remain with this truck when sold.

Your vehicle may not have all the features or options mentioned in this manual. Therefore, you should pay careful attention to the instructions that pertain to just your vehicle. In addition, if your vehicle is equipped with special equipment or options not discussed in this manual, consult your dealer or the manufacturer of the equipment.

There are several tools built into this manual to help you find what you need quickly and easily; first is the Table of Contents. Located at the front of the manual, this table arranges the subject matter into chapters, which can be quickly referenced using the numbers shown in the outer margin. The first page of each chapter presents a list of the major subjects contained in that chapter. Cross-referenced citations can also help you find

information. If more information on the current subject is located elsewhere in the manual, a cross-reference may be provided, such as "see [Safety Alerts](#) on page 5." Finally, you'll find a helpful index at the back of the manual, which lists the subjects covered, alphabetically. All information contained in this manual is based on the latest production information available at the time of publication. If you find differences between your instruments and the information in this manual, contact an authorized PACCAR dealer. PACCAR reserves the right to make changes at any time without notice.

Safety Alerts

Read and follow all of the safety alerts contained in this manual. They are there for your protection and information. These alerts can help you avoid injury to yourself, your passengers, and help prevent costly damage to the vehicle. Safety alerts are highlighted by safety alert symbols and signal words such as WARNING, CAUTION, or NOTE. **Do not** ignore any of these alerts.

Warnings

The safety message following this symbol and signal word provides a warning against operating procedures that could cause death or injury. They could also cause equipment or property damage. The alert will identify the hazard, how to avoid it, and the probable consequence of not avoiding the hazard.

Example:

**WARNING**

Hot engine oil can be dangerous. You could be burned. Let the engine oil cool down before changing it. Failure to comply may result in death, personal injury, equipment or property damage.

Cautions

The safety message following this symbol and signal word provides a caution against operating procedures that could cause equipment or property damage. The alert will identify the hazard, how to avoid it, and the probable consequence of not avoiding the hazard.

Example:

**CAUTION**

Continuing to operate your vehicle with insufficient oil pressure will cause serious engine damage. Failure to comply may result in equipment or property damage.

Notes

The message following this symbol and signal word provides important information that is not safety related but should be followed. The alert will highlight things that may not be obvious and is useful to your efficient operation of the vehicle.

Example:

**NOTE**

Pumping the accelerator pedal will not assist in starting the engine.

Illustrations

Some of the illustrations found in this manual are generic, and may not look exactly like the parts or assemblies you find installed on your vehicle. When an illustration differs from what you see physically present on your vehicle, the language describing the procedure will still be correct for your application.

General Safety Instructions



WARNING

Improper practices, carelessness, or ignoring any warnings may cause property damage, personal injury, or death.

Before performing any repair, read and understand all of the safety precautions and warnings. The following is a list of general safety precautions that must be followed to provide personal safety. Failure to follow these instructions may cause death or injury. Special safety precautions are included in the procedures when they apply.

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Warning Lights

Lane Departure Warning (LDW) Fault



This amber warning light appears when a fault occurs in the *lane departure warning (LDW)* system. If this occurs, the *LDW* feature is disabled.

ADAS Camera Fault



This amber warning light appears when a fault occurs with the camera used by the various *advanced driver-assistance system (ADAS)* features: *lane departure warning (LDW)*, *lane keeping assist (LKA)*, and *adaptive cruise control (ACC)*. The *LDW* and optional *lane keeping assist (LKA)* features are both dependent on the *ADAS* camera and both are disabled when this warning occurs.

In addition to issues internal to the camera, please read the topic *Lane Departure Warning (LDW)* on page 13 for conditions which may limit camera performance, resulting in an *ADAS* Camera Fault.

Lane Keeping Assist (LKA) Fault



This white warning light appears when there is a fault in the *lane keeping assist (LKA)* system. When this occurs, the *LKA* feature is disabled.

Torque-Assisted Steering Fault



This amber warning light appears inside a *popup* when there is a fault in the *torque-assisted steering* system. When the *popup* with this symbol occurs, *torque-assisted steering* is not available.



NOTE

Because the optional *lane keeping assist (LKA)* feature uses the *torque-assisted steering* system, a fault in the *Torque-assisted steering* system will also disable *LKA*, if equipped.

Indicators

Lane Keeping Assist (LKA) Disabled



This gray indicator means that *lane keeping assist (LKA)* is disabled (see *Lane Keeping Assist (LKA)* on page 15).

Lane Keeping Assist (LKA) Enabled/ Engaged



Indicates, when white, that the *lane keeping assist (LKA)* feature is enabled. When green, this indicator signifies that the conditions for *LKA* have been met and that the vehicle has engaged the *LKA* feature (see *Lane Keeping Assist (LKA)* on page 15).

Dash Switches

Lane Departure Warning (LDW) Disable



The *lane departure warning (LDW)* disable switch disables both audible and visual lane departure warning alerts for 15

minutes (or until the next ignition key cycle) after which time *lane departure warning (LDW)* will automatically re-enable. This switch will not affect any audible or visual alerts for the *adaptive cruise control (ACC)* feature. This switch lights up green when used to disable *LDW*.



NOTE

Disabling *LDW* will also disable *lane keeping assist* until the *LDW* system is re-enabled.

Lane Keeping Assist (LKA) Disable



This switch will disable the *lane keeping assist (LKA)* feature. *LKA* will remain disabled until the next key cycle unless re-enabled by toggling this switch again. This switch lights up green when used to disable *LKA*.

Torque-Assisted Steering Effort Adjustment



Three-position switch that adjusts how much steering assistance is provided for vehicles equipped with *torque-assisted steering*.

The top position provides the most assistance (requiring the operator to exert less effort to turn the wheel), the middle position moderate assistance, and the bottom position the least amount of steering assistance (requiring more effort to turn the wheel than the top and middle positions).

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Driver Assistance

Driver Assistance (or Advanced Driver-assistance Systems ([ADAS](#))) defines a variety of electronic features that assist the operator while driving. These features improve operator and vehicle safety by alerting the operator (and in some cases taking actions) to the driving environment. Driver Assistance features use electronic and hardware improvements to accomplish this task: cameras, radar, sensors, driving automation, and in-cab notifications. The features described in this section should supplement the explanations, warnings, and preventative maintenance information located in the [ADAS OEM](#) operator's manuals for the equipment particular to the vehicle. It is important that the operator become familiar with the [OEM](#) manuals associated with their [ADAS](#) equipment prior to driving the vehicle

ZF WABCO™ Advanced Driver-assistance Systems (ADAS)

Product	Feature
ZF WABCO™ OnLane ALERT	Lane Departure Warning (LDW)
ZF WABCO™ OnGuard ACTIVE	Adaptive Cruise Control (ACC)
	Collision Mitigation

Bendix™ Advanced Driver-assistance Systems (ADAS)

Product	Feature
Bendix™ Wingman Advanced	Adaptive Cruise Control (ACC)
	Collision Mitigation
Bendix™ Wingman Fusion	Adaptive Cruise Control (ACC)
	Collision Mitigation

Product	Feature
	Lane Departure Warning (LDW)

Lane Departure Warning (LDW)



WARNING

The driver must remain alert, react appropriately, and use safe driving practices while using this driver assistance feature. Ultimate responsibility for safe operation of the vehicle remains with the driver at all times. Failure to comply may result in death, personal injury, or property damage.



WARNING

The driver must remain visually aware of the roadway and traffic and not rely solely on Drivers Assistance features to identify and respond to the variety of vehicles or objects sharing the road. The driver must read the ADAS operator's manual associated with this feature and understand its limitations prior to driving the vehicle. Failure to comply may result in death, personal injury, or property damage.

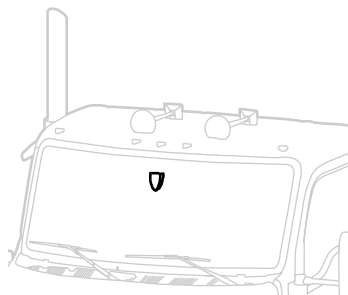


WARNING

Driver Assistance features respond differently to specific road, weather, and traffic conditions. The operator must read the ADAS operator's manual associated with this feature and understand how it responds to these specific conditions prior to driving the vehicle. Failure to comply may result in death, personal injury, or property damage.

Using a windshield-mounted, forward facing camera, the *lane departure warning (LDW)* feature monitors the road for lane

markings and alerts the driver when the vehicle departs its lane without the use of the turn signal. Lane departure warning is only active at speeds greater than 37 mph (60 km/h).



LDW is not available when the system cannot accurately detect lane markings. Keep the *advanced driver-assistance system (ADAS)* camera clear of potential obstructions for the *LDW* feature to operate properly.

The following lists some conditions that can limit the performance of the features that use the *ADAS* camera:

- Buildup of dirt, mud, water, snow, ice, bugs, etc. on the windshield. These should be able to be

resolved with proper use of the windshield washer/wiper system as the camera is intentionally installed in the wiper path.

- Adverse snow, fog, heavy rain, road glare, or lane marking quality may hinder functionality.
- Windshield damage directly in front of the camera. This should be fixed as soon as possible.
- Items on the windshield (such as stickers, paint, and window tint) should not be placed in front of the camera.
- Items on the exterior of the truck (such as aftermarket visors, wind deflectors, hood ornaments, car racks, crane booms / hooks / buckets, snowplows, and mirrors) should not obstruct the camera.

The *ADAS* area of the *digital display* indicates if the *LDW* system recognizes lane markings as follows:

- White lines indicate detected lanes.
- Gray lines indicate where the road is monitored for lane markings, but none are detected.
- Black lines indicate that the *LDW* feature is disabled.

- A yellow line indicates an active lane departure event.

A lane departure event occurs when the vehicle tire crosses a lane marking without the use of the turn signal. A lane departure event is accompanied by an audible alert.

Lane Departure Active Warning Left



The **LDW** feature provides audible and visual alerts only and does not attempt to correct the vehicle's position in the lane. The operator can temporarily disable **LDW** (disabling audible and visual alerts) by using the dash mounted lane departure warning disable switch (See [Lane Departure Warning Disable](#)). For more information on [lane departure warning](#), see the lane departure warning [OEM](#) manual and/or the lane departure warning section in your vehicle operator's manuals.

Lane Keeping Assist (LKA)

Vehicles with [lane keeping assist \(LKA\)](#) will provide steering assistance when the system detects the vehicle is departing the lane without the use of a turn signal. Using [torque-assisted steering, LKA](#) will steer the vehicle in an attempt to move the vehicle back into the lane. The operator can always override a [LKA](#) decision using the steering wheel.



WARNING

The operator must keep their hands on the steering wheel at all times. Driver assistance features are not a substitute for operator-controlled steering. Failure to comply may result in death, serious injury, or property damage.



WARNING

The driver must remain alert, react appropriately, and use safe driving practices while using this driver assistance

feature. Ultimate responsibility for safe operation of the vehicle remains with the driver at all times. Failure to comply may result in death, personal injury, or property damage.



NOTE

Using this feature may decrease awareness to components that are in need of inspection or maintenance, such as (but not limited to) improper tire inflation, suspension, or brake drag.

The operator is informed that their vehicle is equipped with the [LKA](#) feature at vehicle start-up.

Additionally, when [LKA](#) is enabled or engaged, the lane keeping assist enabled/engaged indicator is present:

Lane Keeping Assist Enabled/Engaged Indicator



(See [Lane Keeping Assist \(LKA\) Enabled/Engaged](#) on page 10.)

When vehicle speed is above 40 mph (65 kph) and all operating conditions are met, including hands on the steering wheel, the LKA indicator steering wheel turns green, indicating the [LKA](#) system is ready to provide assistance.



NOTE

[Lane keeping assist](#) will disengage if vehicle speed drops below 31 mph (49 km/h).

When system operating conditions are not met, [LKA](#) disengages (the indicator turns white), re-engaging once the operating conditions are again satisfied. [LKA](#)

disengages during the following operating conditions:

- Inability to identify lane markings
- Detecting non-typical lane spacing (especially wide or narrow lanes)
- Detecting significantly curved lane lines (tight curves)
- Vehicle speed dropping below 31 mph
- Rapid deceleration
- Activating the vehicle hazard warning lights

[LKA](#) can be disabled using the lane keeping assist disable switch (see [Lane Keeping Assist \(LKA\) Disable](#) on page 10). For the [lane keeping assist](#) feature to safely operate, the driver must maintain their hands on the wheel. If the system cannot detect the presence of the driver's hands on the wheel, it will disengage the [LKA](#) feature.

Situations Requiring Cautious Use of Lane Keeping Assist

The operator should use caution and pay close attention to how [lane keeping assist \(LKA\)](#) reacts during certain road situations.



WARNING

Ultimate responsibility for the safe operation of the vehicle remains with the driver at all times. Even when using the Lane Departure Warning or Lane Keeping Assist features, the driver still must remain alert, use safe driving practices, and react appropriately and in a timely manner to all driving conditions. Failure to comply may result in death, personal injury and/or property damage.

These situations include, but are not limited to

- Temporary lane widening (such as when approaching an on or off-ramp, or when a lane branches)
- Objects that mistakenly appear like lane markings (such as lines in the pavement)
- White or yellow lane lines that are difficult to see
- Erroneous lane markings

Situations Unsuitable for Lane Keeping Assist

In certain road situations, the [lane keeping assist \(LKA\)](#) system may not be able to accurately detect lane markings.



WARNING

Ultimate responsibility for the safe operation of the vehicle remains with the driver at all times. Even when using the Lane Departure Warning or Lane Keeping Assist features, the driver still must remain alert, use safe driving practices, and react appropriately and in a timely manner to all driving conditions. Failure to comply may result in death, personal injury and/or property damage.

In certain road situations, the [LKA](#) system may not be able to accurately detect lane markings. These situations include but are not limited to

- Snow covered roads
- Lane lines that are difficult to see
- Objects that may appear like a lane marking such as curbs
- Partially covered lane lines

- Temporary lanes (marked with traffic cones/barrels)
- Lanes too wide (highway off ramps)
- Lanes too narrow (farm roads)
- Erroneous lane markings
- Construction zones



NOTE

Double or triple semi-trailer configurations are not approved for using the [LKA](#) feature.

In these and similar situations, temporarily disable the [LKA](#) feature using the lane departure warning disable switch (see [Lane Departure Warning \(LDW\) Disable](#) on page 10). [LKA](#) may also be disabled (until the next ignition key cycle) using the dash mounted, lane keeping assist disable switch (see [Lane Keeping Assist \(LKA\) Disable](#) on page 10).

Hands Off Detection

If the system cannot detect the presence of the driver's hands on the wheel, it will disable the [lane keeping assist \(LKA\)](#) feature. There are four stages of hands off

detection that notify the operator of the current state.

Stage	Notification
1	Ten seconds after hands off detection engages, there is an audible chime and the hands on the LKA indicator turn amber. The operator is prompted to keep hands on the wheel. After five seconds, if hands are not detected, the second stage begins.
2	The audible chime is continuous and the hands on the LKA indicator turn red. The operator is prompted to keep hands on the steering wheel. After 15 seconds, if hands are not detected, the third stage begins.

Stage	Notification
3	The audible tone becomes more urgent and the hands on the LKA indicator remain red. The operator is prompted to take control of the steering wheel. After 30 seconds, if hands are not detected, the fourth stage begins.
4	<i>LKA</i> is disabled. The continuous audible tone remains urgent and the LKA disabled indicator appears. The operator is prompted to take over the steering wheel because steering assist has been disengaged.

Torque-Assisted Steering

The *torque-assisted steering* feature enhances the vehicle's traditional power steering, reducing the amount of effort required by the operator to steer the vehicle. Torque-assisted steering also works with the optional *lane keeping assist (LKA)* feature, improving safety and the

overall driving experience (see *lane keeping assist (LKA)*).

Using electric motors coupled to the steering column, *torque-assisted steering* assists steering effort applied to the wheel, using different levels of steering assistance dependent on driving conditions (such as vehicle speed and brake usage). *Torque-assisted steering* is active when the engine is running with the parking brake released.

The amount of steering assistance provided by the *torque-assisted steering* feature can also be adjusted using the torque-assisted steering effort adjustment switch (see *Torque-Assisted Steering Effort Adjustment* on page 10).

Torque-assisted steering does not replace the vehicle power steering. In the event that the *torque-assisted steering* feature is disabled, the standard power steering system will not be affected, allowing the vehicle to be steered the same as a vehicle not equipped with the *torque-assisted steering* feature.

need of inspection or maintenance, such as (but not limited to) improper tire inflation, suspension, or brake drag.



NOTE

Using this feature may decrease awareness to components that are in

Glossary

Adaptive Cruise Control (ACC) - An electronic system that automatically adjusts the speed of a truck in cruise control to a predetermined following distance and/or time. This feature includes a warning system to warn the driver for collision avoidance.

Advanced driver-assistance system (ADAS) - Electronic systems, using sensors and a camera, which assist drivers in driving and parking functions, increasing car and road safety. Many ADAS features are presented graphically near the bottom of the digital display.

Digital Display - Screen located behind the steering wheel that digitally presents many gauges, dashboard indications, and operational tools used to drive the vehicle. The display also allows access to instrument customization and VIN specific information using the menu.

Lane departure warning (LDW) - System that detects lane markers and warns the operator if the vehicle gets too close or crosses them. Also referred to as lane departure.

Lane keeping assist (LKA) - System that reduces the occurrence of unintended lane crossings through active steering assistance.

Original equipment manufacturer (OEM) - Refers to the company that originally manufactured the product, often synonymous with the truck makers/truck divisions unless otherwise noted.

Popup - A popup is a dashboard notification alerting the operator about a specific vehicle condition. This notification usually contains a graphic that represents the system, followed by text pertaining to the popup condition.

Torque-assisted steering - System that assists the operator when steering the vehicle, reducing the amount of steering effort.

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Do not remove the manual from vehicle.

Before operating vehicle study the manual carefully.

Read and understand all warnings, cautions and notes.

Laissez Le Manuel Dans Le Véhicule. Avant De Conduire Le Véhicule,
Étudiez Attentivement Le Manuel. Lisez Et Assurez-vous de
comprendre tous les Avertissements, Mises En Garde Et Notices.

No retire este manual del vehículo.

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